aws

User Guide

Amazon Pinpoint

Copyright © 2026 Amazon Web Services, Inc. and/or its affiliates. All rights reserved.

Amazon Pinpoint: User Guide

Copyright © 2026 Amazon Web Services, Inc. and/or its affiliates. All rights reserved.

Amazon's trademarks and trade dress may not be used in connection with any product or service that is not Amazon's, in any manner that is likely to cause confusion among customers, or in any manner that disparages or discredits Amazon. All other trademarks not owned by Amazon are the property of their respective owners, who may or may not be affiliated with, connected to, or sponsored by Amazon.

Table of Contents

..... x
What is Amazon Pinpoint? 1
Features of Amazon Pinpoint 1
Define audience segments 1
Engage your audience with messaging campaigns 2
Create user journeys 2
Provide consistent messaging with templates 2
Deliver personalized content 2
Analyze user behavior 3
Regional availability 3
Sign up for an AWS account 3
Get started 3
Amazon Pinpoint end of support 4
Choosing the right migration path 5
Migration steps: Transition features for Amazon Pinpoint engagement 6
Customers seeking engagement features 6
Events collection and mobile analytics customers 10
Offboarding steps: Export data to 3rd party 11
Endpoints 11
Segments, campaigns, and journeys 11
Message templates 11
Amazon Pinpoint and mobile analytics 12
Summary 17
Additional resources 17
Getting started 18
About this tutorial 18
Create a project 19
Create and configure a project 20
Create an orchestration sending role arn 21
Import data and create a segment 21
Download and modify the sample file 22
Import the sample customer data file 23
Create a targeted segment 23
Create a campaign 24

Create the campaign and choose a segment ... 24
Create the campaign message ... 25
Schedule the campaign ... 27
View campaign analytics ... 27
Interact with your campaign ... 27
View metrics for the campaign ... 28
Next steps ... 29
Tutorials ... 31
Using Postman with Amazon Pinpoint ... 31
About this tutorial ... 31
Prerequisites ... 32
Create IAM policies and roles ... 33
Set up Postman ... 37
Send requests ... 44
Set up an SMS registration system ... 51
About double opt-in ... 52
About this solution ... 52
Prerequisites ... 54
Set up SMS in Amazon Pinpoint ... 55
Create IAM policies and roles ... 61
Create Lambda functions ... 64
Set up Amazon API Gateway ... 76
Create and deploy the web form ... 81
Next steps ... 89
Projects ... 92
Managing projects ... 92
Creating a project ... 93
Editing a project ... 95
Deleting a project ... 98
Channels ... 100
Push notifications ... 101
Troubleshooting ... 102
Email ... 103
Choosing between Amazon Pinpoint and Amazon SES ... 105
Email sandbox ... 106
Setting up ... 106

Monitoring ... 116
Managing ... 118
Sending email ... 126
Using dedicated IP addresses ... 127
Deliverability dashboard ... 137
Email best practices ... 157
Troubleshooting ... 163
SMS ... 165
Setting up ... 166
Managing ... 168
Message routes ... 170
Message fallback ... 170
Troubleshooting ... 171
Voice ... 173
Setting up ... 174
Managing ... 176
Troubleshooting ... 177
In-app messages ... 177
How Amazon Pinpoint handles in-app messages ... 178
Custom channels ... 178
Setting up and managing custom channels ... 179
Segments ... 180
Building segments ... 180
Segment groups ... 181
Creating a dynamic segment ... 181
Managing segments ... 189
Importing segments ... 191
Imported segment considerations ... 192
Segment files ... 192
Importing a segment ... 194
Supported attributes ... 197
Exporting segments ... 203
Troubleshooting ... 204
Segment import failed ... 204
Segment export failed ... 205
Endpoint count for a dynamic segment ... 205

BadRequestException: Exceeded maximum endpoint per user count: 15 205
BadRequestException when calling the UpdateEndpointsBatch or UpdateEndpoints operation: Too many custom attributes 206
Campaigns 207
Create a campaign 208
Specify the segment 209
Configure the message 210
Set up the campaign 210
Use message variables 222
Test the message 223
Schedule the campaign 227
Scheduling an email, SMS, voice message, push, or custom campaign 227
Scheduling an in-app campaign 231
Launch the campaign 234
Managing campaigns 234
Troubleshooting 235
Some endpoints were not processed or targeted successfully by the campaign 235
Journeys 238
Take a tour of journeys 238
Journeys terminology 239
Parts of the journeys interface 240
Create a journey 242
(Optional) Configuring journey schedule settings 248
Set up the journey entry activity 250
Add participants when they perform an activity 250
Add participants from a segment 253
Add activities to the journey 258
Setting up journey activities 259
Review and test a journey 287
Reviewing a journey 287
Testing a journey 289
Publish a journey 290
Pause, resume, or stop a journey 291
Pausing a journey 291
Resuming a journey 292
Stopping a journey 293

View journey metrics ... 293
Journey-level execution metrics ... 294
Activity-level execution metrics ... 297
Journey-Level engagement metrics ... 299
Activity-level engagement metrics ... 300
Tips and best practices ... 308
Scope and settings ... 309
Segments ... 312
Activities ... 313
Email messages ... 315
Reviewing and testing ... 316
Analytics ... 316
Lifecycle management ... 317
Troubleshooting ... 318
Event based journey isn't triggered when using a PutEvents request ... 319
All journey participants go through 'No' branch during 'Yes/No' split activity ... 320
Test messages ... 321
Sending an email message ... 321
Sending a push notification ... 323
Sending an SMS message ... 325
Analytics ... 328
Mobile and web app analytics settings ... 328
Chart reference ... 329
Endpoints and users in Amazon Pinpoint analytics ... 329
Exporting dashboards ... 330
Overview charts ... 330
Usage charts ... 335
Revenue charts ... 340
Events charts ... 342
Demographics charts ... 345
Campaign charts ... 346
Transactional messaging charts ... 354
Creating funnel charts ... 363
Enabling funnels ... 364
Creating funnels ... 364
Streaming event data ... 365

About Amazon Kinesis ... 365
Streaming to Kinesis ... 366
Message templates ... 369
Creating email templates ... 370
Including unsubscribe links in message templates ... 373
Creating in-app templates ... 373
Creating push templates ... 377
Creating a standard push notification template ... 378
Creating a push notification template with raw message data ... 381
Creating SMS templates ... 382
Creating voice templates ... 384
Adding personalized content ... 386
Adding message variables ... 387
Supported attributes ... 390
Using message template helpers ... 396
Using variables with message template helpers ... 423
Using nested helpers ... 424
Managing templates ... 424
Viewing message templates ... 425
Opening a message template ... 426
Editing a message template ... 426
Copying a message template ... 427
Deleting a message template ... 428
Adding a tag to a template ... 428
Removing a tag from a template ... 429
Managing template versions ... 429
How versioning works ... 431
Viewing template versions ... 433
Viewing the active template version ... 433
Designating the active template version ... 434
Editing the active template version ... 435
Machine learning models ... 437
How recommendations work ... 438
Preparing to use recommendations ... 439
Amazon Personalize campaigns ... 440
AWS Identity and Access Management roles and policies ... 443

AWS Lambda functions ... 443
Setting up recommendations ... 444
Before you begin ... 444
Step 1: Set up the model ... 445
Step 2: Add attributes to the model ... 447
Step 3: Review and publish the model ... 448
Using recommendations in messages ... 448
Adding recommendations to messages ... 450
Removing recommendations from messages ... 452
Managing machine learning models ... 453
Viewing your collection of models ... 453
Viewing the settings for a model ... 454
Changing the settings for a model ... 454
Copying a model ... 455
Deleting a model ... 456
Settings ... 458
Monitoring ... 460
Exported metrics ... 460
Metrics related to message delivery ... 461
Metrics related to endpoints ... 463
Metrics related to import jobs ... 463
Metrics related to one-time passwords ... 464
Metrics related to events ... 465
View Amazon Pinpoint metrics ... 465
Create CloudWatch alarms ... 466
Troubleshooting ... 468
CLI examples of common tasks ... 469
Document history ... 473
Earlier updates ... 487

End of support notice: On October 30, 2026, AWS will end support for Amazon Pinpoint. After October 30, 2026, you will no longer be able to access the Amazon Pinpoint console or Amazon Pinpoint resources (endpoints, segments, campaigns, journeys, and analytics). For more information, see Amazon Pinpoint end of support. **Note:** APIs related to SMS, voice, mobile push, OTP, and phone number validate are not impacted by this change and are supported by AWS End User Messaging.

What is Amazon Pinpoint?

Amazon Pinpoint is an AWS service that you can use to engage with your customers across multiple messaging channels. You can use Amazon Pinpoint to send push notifications, in-app notifications, emails, text messages, voice messages, and messages over custom channels. It includes segmentation, campaign, and journey features that help you send the right message to the right customer at the right time over the right channel.

The information in this user guide is intended for all Amazon Pinpoint users, including marketers, business users, and developers. This guide contains information that's especially helpful for users who mainly interact with Amazon Pinpoint by using the AWS Management Console. If you're new to Amazon Pinpoint, start by reading *Getting started*.

If you're an application developer, also refer to the Amazon Pinpoint Developer Guide and the Amazon Pinpoint API Reference. These documents provide information about using the features of Amazon Pinpoint programmatically. They also contain information about integrating Amazon Pinpoint features into your applications.

If you only need application-to-person (A2P) SMS and voice messaging, then see the AWS End User Messaging SMS User Guide.

Topics

- Features of Amazon Pinpoint
- Regional availability
- Sign up for an AWS account
- Get started

Features of Amazon Pinpoint

This section describes the major features of Amazon Pinpoint and the tasks that you can perform by using them.

Define audience segments

Reach the right audience for your messages by defining audience segments. A segment designates which users receive the messages that are sent from a campaign or journey. You can define

dynamic segments based on data that's reported by your application, such as operating system or mobile device type. You can also import static segments that you define outside of Amazon Pinpoint.

Engage your audience with messaging campaigns

Engage your audience by creating a campaign. A campaign sends tailored messages on a schedule that you define. You can create campaigns that send push notifications, email, SMS text messages, and voice messages.

To experiment with alternative campaign strategies, set up your campaign as an A/B test, and analyze the results with Amazon Pinpoint analytics.

Create user journeys

Create custom, multi-step experiences for your customers by designing and building journeys. With journeys, you can send messages to your customers based on their attributes, behaviors, and activities. When you build a journey, you design an automated workflow of activities that perform a variety of different actions—for example, sending an email message to participants, waiting for a certain period of time, or splitting participants based on actions that they take, such as clicking a link in a message.

Provide consistent messaging with templates

Design consistent messages and reuse content more effectively by creating and using message templates. A message template contains content and settings that you want to reuse in messages that you send for any of your Amazon Pinpoint projects. You can create templates for email, push notifications, in-app messages, SMS messages, and voice messages.

Deliver personalized content

Send content that's customized for each recipient of a message. Using message variables and attributes, you can deliver dynamic, personalized content in messages that you send from campaigns and journeys.

To streamline development, you can also use message variables and attributes to add personalized content to message templates. With message templates, this content can come from attributes that you create directly in Amazon Pinpoint or a machine learning model that you create in Amazon Personalize. By connecting message templates to models in Amazon Personalize, you

can use machine learning to send relevant promotions or recommendations to each recipient of a message.

Analyze user behavior

Gain insight into your audience and the effectiveness of your campaigns and messaging activities by using the analytics that Amazon Pinpoint provides. You can view trends in your users' level of engagement, purchase activity, demographics, and more. You can also monitor your message traffic by viewing metrics such as the total number of messages that you sent for a campaign or project. Through the Amazon Pinpoint API, your application can also report custom data, which Amazon Pinpoint makes available for analysis.

To analyze or store analytics data outside Amazon Pinpoint, configure Amazon Pinpoint to stream the data to Amazon Kinesis.

Regional availability

Amazon Pinpoint is available in several AWS Regions in North America, Europe, Asia, and Oceania. In each Region, AWS maintains multiple Availability Zones. These Availability Zones are physically isolated from each other, but are united by private, low-latency, high-throughput, and highly redundant network connections. We use these Availability Zones to provide very high levels of availability and redundancy, while also minimizing latency.

To learn more about AWS Regions, see Managing AWS Regions in the *Amazon Web Services General Reference*. For a list of all the Regions where Amazon Pinpoint is currently available and the endpoint for each Region, see Amazon Pinpoint endpoints and quotas and AWS service endpoints in the *Amazon Web Services General Reference*. To learn more about the number of Availability Zones that are available in each Region, see AWS global infrastructure.

Sign up for an AWS account

To get started with AWS, you need an AWS account. For information about creating an AWS account, see Getting started with an AWS account in the *AWS Account Management Reference Guide*.

Get started

Get started with Amazon Pinpoint by creating a new project.

Amazon Pinpoint end of support

After careful consideration, we decided to end support for Amazon Pinpoint, effective October 30, 2026. Amazon Pinpoint will no longer accept new customers beginning May 20, 2025. As an existing customer with an account signed up for the service before May 20, 2025, you can continue to use Amazon Pinpoint features. After October 30, 2026, you will no longer be able to use Amazon Pinpoint.

Today, customers use Amazon Pinpoint either for its engagement capabilities (endpoints, segments, campaigns, journeys, and analytics), or its messaging channel APIs (SMS, MMS, push, WhatsApp, and text to voice messaging capabilities). We have created offboarding plans for both sets of customers.

What this means for you

If you are using Amazon Pinpoint engagement features (endpoints, segments, campaigns, journeys, and analytics), we recommend you to migrate to Connect Customer proactive engagement solutions (e.g., Amazon Connect Customer outbound campaigns and Amazon Connect Customer Customer Profiles) to drive personalized, timely engagement across channels with unified performance tracking and the ability to manage inbound (e.g., customer support) and outbound (e.g., proactive communications) using one unified application. If you are using events collection and mobile analytics, we recommend to use Amazon Kinesis.

Amazon Pinpoint communication channels (SMS, MMS, push, WhatsApp, and text to voice messaging capabilities) were renamed in Q3 2024 as AWS End User Messaging, and will continue to serve developer needs for message delivery with customers. Use of APIs related to SMS, Voice, Mobile Push, OTP and Phone Number Validate will not be affected by this change. If you are using Amazon Pinpoint to send email, we recommend you migrate to Amazon Simple Email Service (SES). If you are using email deliverability dashboard in Amazon Pinpoint, we now offer email deliverability dashboard functionality in Amazon Simple Email Service Virtual Deliverability Manager.

Topics

- Choosing the right migration path
- Migration steps: Transition features for Amazon Pinpoint engagement
- Offboarding steps: Export data to 3rd party

- Summary
- Additional resources

Choosing the right migration path

Amazon Connect Customer outbound campaigns and AWS End User Messaging (EUM) with Amazon Simple Email Service serve different use cases. Before you begin migration, review your workload characteristics to determine the right destination.

Consider Amazon Connect Customer outbound campaigns if your workload includes:

- Personalized customer engagement across voice, SMS, email, and WhatsApp
- AI-driven contact strategies such as predictive dialing, progressive dialing, or customer segmentation
- Agent-assisted outbound calling with real-time routing
- Coordinated inbound and outbound engagement in a single application

Consider AWS End User Messaging and Amazon Simple Email Service if your workload includes:

- Throughput requirements that exceed Amazon Connect Customer outbound campaign limits or needs for guaranteed delivery SLAs (see Service quotas)
- No requirement for agent involvement or AI-driven decisioning
- No requirement for customer segmentation, contact orchestration, or contact limit management

For workloads that combine both patterns, you can use Amazon Connect Customer for agent-assisted engagement and AWS End User Messaging with Amazon Simple Email Service for high-volume transactional delivery.

For automated migration assistance, see Pronetx migration tooling on AWS Marketplace.

Migration steps: Transition features for Amazon Pinpoint engagement

Customers seeking engagement features

To use the proactive engagement features of Connect Customer, including segments, message templates, campaigns, journeys, analytics, please follow this guide to migrate Amazon Pinpoint engagement capabilities to Connect Customer.

Migrate endpoints and segments

Amazon Pinpoint Endpoints can be modeled as Connect Customer Customer Profiles. Customer Profiles allows you to combine multiple endpoints into a single profile, allowing up to 3 email addresses and 4 phone numbers to be modeled as a single Profile. To migrate your endpoints, you can

1. Create an Amazon Pinpoint Segment with no filters, effectively encompassing all your endpoints.
2. Export that Segment to an S3 bucket or to your local machine.
3. Upload your transformed endpoints to Customer Profiles and use Customer Profiles' S3 connector to create a Data Integration into Customer Profiles.

In case you want to aggregate endpoints under a single Customer Profile, you can parse the downloaded Amazon Pinpoint segment to collect the email addresses and phone numbers under a single profile. Here is a sample Python script to read the exported file in JSON format and created the Profiles which can be imported to Customer Profiles.

```
from collections import defaultdict
import json

def process_pinpoint_endpoints(input_file, output_file):
    # Dictionary to store grouped endpoints by user ID
    grouped_endpoints = defaultdict(list)

    endpoints = []

    # Read the input file
    with open(input_file, 'r') as file:
        for line in file:
```

```
            endpoints.append(json.loads(line))


    # Group endpoints by user ID
    for endpoint in endpoints:
        user_id = endpoint.get('User', {}).get('UserId')
        if user_id:
            grouped_endpoints[user_id].append(endpoint)

    # Convert grouped endpoints to Customer Profiles format
    # We will assume the userId is stored as an AccountNumber
    # since the AccountNumber can be queried
    customer_profiles = []
    for user_id, user_endpoints in grouped_endpoints.items():
        profile = {
            'AccountNumber': user_id,
            'Attributes': {},
            'Address': {}
        }

        phone_numbers = set()
        email_addresses = set()

        output_dict = {}

        for endpoint in user_endpoints:
            # Extract attributes
            attributes = endpoint.get('Attributes', {})
            for key, value_list in attributes.items():
                if len(value_list) == 1:
                    output_dict[key] = value_list[0]
                else:
                    for i, item in enumerate(value_list):
                        output_dict[f"{key}_{i}"] = item

            demographics = endpoint.get('Demographic')
            for key, value in demographics.items():
                attributes[f"Demographic_{key}"] = value

            location = endpoint.get('Location', {})
            profile['Address']['City'] = location['City']
            profile['Address']['Country'] = location['Country']
            profile['Address']['PostalCode'] = location['PostalCode']
            profile['Address']['County'] = location['Region']
```

```
            profile['Attributes']['Latitude'] = location['Latitude']
            profile['Attributes']['Longitude'] = location['Longitude']

            metrics = endpoint.get('Metrics', {})
            for key, value in metrics.items():
                profile['Attributes'][f"Metrics_{key}"] = str(value)

            user = endpoint.get('User', {})
            user_attributes = user.get('UserAttributes', {})
            for key, value_list in user_attributes.items():
                if len(value_list) == 1:
                    output_dict[key] = value_list[0]
                else:
                    for i, item in enumerate(value_list):
                        output_dict[f"UserAttributes.{key}_{i}"] = item

            profile['Attributes'].update(output_dict)

            # Extract phone number
            address = endpoint.get('Address')
            if (endpoint.get('ChannelType') == 'SMS' or endpoint.get('ChannelType') ==
'VOICE') and address:
                phone_numbers.add(address)

            # Extract email address
            if endpoint.get('ChannelType') == 'EMAIL' and address:
                email_addresses.add(address)

        # Assigning the phone numbers to the different parameters in the Customer
Profile
        for i, phone_number in enumerate(phone_numbers):
            if i == 0:
                profile['PhoneNumber'] = phone_number
            elif i == 1:
                profile['HomePhoneNumber'] = phone_number
            elif i == 2:
                profile['MobilePhoneNumber'] = phone_number
            elif i == 3:
                profile['BusinessPhoneNumber'] = phone_number
            else:
                profile['Attributes'][f"PhoneNumber_{i}"] = phone_number

        # Assigning the email addresses to the different parameters in the Customer
Profile
```

```
        for i, email_address in enumerate(email_addresses):
            if i == 0:
                profile['EmailAddress'] = email_address
            elif i == 1:
                profile['PersonalEmailAddress'] = email_address
            elif i == 2:
                profile['BusinessEmailAddress'] = email_address
            else:
                profile['Attributes'][f"EmailAddress_{i}"] = email_address

        customer_profiles.append(profile)

    # Write the output to a file
    with open(output_file, 'w') as f:
        json.dump(customer_profiles, f, indent=2)

    print(f"Processed {len(endpoints)} endpoints into {len(customer_profiles)} customer
 profiles.")

# Example usage
input_file = 'pinpoint_endpoints.json'
output_file = 'customer_profiles.json'
process_pinpoint_endpoints(input_file, output_file)
```

Migrate channel configurations

Follow the onboarding steps to enable SMS and email communications in Connect Customer.

Migrate templates

Templates in Connect Customer use the same message rendering engine (Handlebars) as Amazon Pinpoint. However, the attribute placeholders are represented differently.

1. You can use our existing Amazon Pinpoint APIs to fetch a template (for example, get-email-template, get-sms-template). Alternatively, you can follow this guide to edit a template so you can copy its content.
2. After fetching the template, update its placeholders. For example, your Amazon Pinpoint templates earlier used a placeholder like `{{User.UserAttributes.PurchaseHistory}}`. These can now be changed to `{{Attributes.Customer.Attributes.PurchaseHistory}}`.

3. Next, create templates in Q in Connect Customer using the create-message-template API or using this guide to create message templates.

To map your attributes, follow the mappings you did earlier when you mapped Endpoints to Profiles, prefixed with `Attributes.Customer`.

Migrate campaigns

For every campaign, we recommend you use the get-campaign API to fetch its definition, and then recreate it in Connect Customer using the campaign creation guide.

Migrate journeys

Journeys are now supported in Amazon Connect Customer outbound campaigns. You can recreate your Amazon Pinpoint journeys using Amazon Connect Customer campaign orchestration features. Use the get-journey API to fetch your journey definitions, and then recreate them using the Amazon Connect Customer journey creation guide.

Events collection and mobile analytics customers

Amplify SDK customers

If you use Amplify SDK to send events to Amazon Pinpoint for updating Endpoints, triggering campaign or journeys, or analyzing your application's usage, you can migrate to using Kinesis. Using Kinesis, you can stream events to a compute platform of your choice to them send updates to Customer Profiles, which can update the application user's profile and trigger Connect Customer campaigns.

Put-Events customers

If you only use Amazon Pinpoint to stream events from your web/mobile application to a Kinesis stream, you can now use Amplify SDK to directly stream the events to Kinesis.

Unavailable features

As of now, the following Amazon Pinpoint engagement features are not available in Connect Customer.

- In-App Messaging

- PUSH (GCM, APNS, BAIDU, etc.) notifications are not natively supported in campaigns. However, you can send push notifications through journeys using a Lambda action with Amazon Connect Customer push templates.
- Custom Channel is available for journeys but not for campaigns.

Offboarding steps: Export data to 3rd party

If you would like to delete all Amazon Pinpoint data, feel free to simply delete the application using the delete-app API. Following this, please delete any unused message templates using this guide on deleting templates.

Alternatively, if you want to extract all your resources and store them, follow the steps below.

Endpoints

To offboard your endpoints, you can

- Create an Amazon Pinpoint Segment with no filters, effectively encompassing all your endpoints.
- Export that Segment to an S3 bucket or to your local machine.

Segments, campaigns, and journeys

To offboard your segments, campaigns, and journeys, use our APIs or our UI to retrieve them. For this, you can use our get-segment, get-campaign, or get-journey APIs.

Message templates

To offboard your templates, you can use list-templates API followed by the channel-specific APIs -

- get-email-template
- get-in-app-template
- get-push-template
- get-sms-template

Amazon Pinpoint and mobile analytics

To offboard your events and KPIs from Amazon Pinpoint Analytics or Mobile Analytics you can use the following options:

1. To export future raw events before migration, customers can onboard to event data stream.
2. Customers can export the KPIs for past 3 months using the following commands:
   - get-application-date-range-kpi
   - get-journey-date-range-kpi
   - get-campaign-date-range-kpi
   - get-journey-execution-activity-metrics
   - get-journey-execution-metrics
   - get-journey-run-execution-activity-metrics
   - get-journey-run-execution-metrics

For customers who need to delete Mobile Analytics applications as part of their migration, you can use the following Python script. This script uses AWS Signature Version 4 to authenticate with the Mobile Analytics API and requires Python 3.11 or later (Download Python 3.11).

1. Save the following script as `delete_mobile_analytics_application.py`.

```
# Copyright 2010-2019 Amazon.com, Inc. or its affiliates. All Rights Reserved.
#
# This file is licensed under the Apache License, Version 2.0 (the "License").
# You may not use this file except in compliance with the License. A copy of the
# License is located at
#
# http://aws.amazon.com/apache2.0/
#
# This file is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS
# OF ANY KIND, either express or implied. See the License for the specific
# language governing permissions and limitations under the License.
#
# ABOUT THIS PYTHON SAMPLE: This sample is part of the AWS General Reference
# Signing AWS API Requests top available at
# https://docs.aws.amazon.com/general/latest/gr/sigv4-signed-request-examples.html
#
```

```
# AWS Version 4 signing example

# Delete Mobile Analytics application

# See: http://docs.aws.amazon.com/general/latest/gr/sigv4_signing.html
# This version makes a DELETE request and passes the signature
# in the Authorization header.
import sys, os, base64, datetime, hashlib, hmac
import requests # pip install requests
import argparse

# Parse command line arguments
parser = argparse.ArgumentParser(description='Delete a Mobile Analytics
 application')
parser.add_argument('--appId', type=str, help='Mobile Analytics application ID to
 be deleted', required=True)
args = parser.parse_args()

# ************* REQUEST VALUES *************
delimiter = "/"
method = 'DELETE'
service = 'mobileanalytics'
host = 'mobileanalytics.us-east-1.amazonaws.com'
region = 'us-east-1'
appId = args.appId  # Use the appId from command line arguments
endpoint = 'https://mobileanalytics.us-east-1.amazonaws.com/2016-07-01/apps' +
 delimiter + appId
request_parameters = ''


# Function for signing. Refer the AWS documentation below for more details.
# http://docs.aws.amazon.com/general/latest/gr/signature-v4-
examples.html#signature-v4-examples-python
def sign(key, msg):
    return hmac.new(key, msg.encode('utf-8'), hashlib.sha256).digest()


# Function for computing signature key. Refer the AWS documentation below for more
 details.
# http://docs.aws.amazon.com/general/latest/gr/signature-v4-
examples.html#signature-v4-examples-python.
def getSignatureKey(key, dateStamp, regionName, serviceName):
    kDate = sign(('AWS4' + key).encode('utf-8'), dateStamp)
    kRegion = sign(kDate, regionName)
```

```
    kService = sign(kRegion, serviceName)
    kSigning = sign(kService, 'aws4_request')
    return kSigning


# Read AWS access key from environment variables or configuration file. Best
 practice is NOT
# to embed credentials in code.
access_key = os.environ.get('AWS_ACCESS_KEY_ID')
secret_key = os.environ.get('AWS_SECRET_ACCESS_KEY')
session_token = os.environ.get('AWS_SESSION_TOKEN')
if access_key is None or secret_key is None:
    print('No access key is available.')
    sys.exit()

# Create a date for headers and the credential string
t = datetime.datetime.now(datetime.UTC)
amzdate = t.strftime('%Y%m%dT%H%M%SZ')
datestamp = t.strftime('%Y%m%d')  # Date w/o time, used in credential scope

# ************* TASK 1: CREATE A CANONICAL REQUEST *************
# http://docs.aws.amazon.com/general/latest/gr/sigv4-create-canonical-request.html

# Step 1 is to define the verb (GET, POST, etc.)--already done with defining
 "method" variable above.

# Step 2: Create canonical URI--the part of the URI from domain to query
# string (use '/' if no path)
canonical_uri = '/2016-07-01/apps' + delimiter + appId

# Step 3: Create the canonical query string. In this example (a DELETE request),
# request parameters are in the query string. Query string values must
# be URL-encoded (space=%20). The parameters must be sorted by name.
# For this example, the query string is pre-formatted in the request_parameters
 variable.
canonical_querystring = request_parameters

# Step 4: Create the canonical headers and signed headers. Header names
# must be trimmed and lowercase, and sorted in code point order from
# low to high. Note that there is a trailing \n.
canonical_headers = 'host:' + host + '\n' + 'x-amz-date:' + amzdate + '\n'

# Step 5: Create the list of signed headers. This lists the headers
# in the canonical_headers list, delimited with ";" and in alpha order.
```

```
# Note: The request can include any headers; canonical_headers and
# signed_headers lists those that you want to be included in the
# hash of the request. "Host" and "x-amz-date" are always required.
signed_headers = 'host;x-amz-date'

# Step 6: Create payload hash (hash of the request body content). For GET
# requests, the payload is an empty string ("").
payload_hash = hashlib.sha256(request_parameters.encode('utf-8')).hexdigest()

# Step 7: Combine elements to create canonical request
canonical_request = method + '\n' + canonical_uri + '\n' + canonical_querystring +
 '\n' + canonical_headers + '\n' + signed_headers + '\n' + payload_hash

# ************* TASK 2: CREATE THE STRING TO SIGN*************
# Match the algorithm to the hashing algorithm you use, either SHA-1 or
# SHA-256 (recommended)
algorithm = 'AWS4-HMAC-SHA256'
credential_scope = datestamp + '/' + region + '/' + service + '/' + 'aws4_request'
string_to_sign = algorithm + '\n' + amzdate + '\n' + credential_scope + '\n' +
 hashlib.sha256(
    canonical_request.encode('utf-8')).hexdigest()

# ************* TASK 3: CALCULATE THE SIGNATURE *************
# Create the signing key using the function defined above.
signing_key = getSignatureKey(secret_key, datestamp, region, service)

# Compute signature by invoking hmac.new method by passing signingkey,
 string_to_sign
signature = hmac.new(signing_key, string_to_sign.encode('utf-8'),
 hashlib.sha256).hexdigest()

# ************* TASK 4: ADD SIGNING INFORMATION TO THE REQUEST *************
# The signing information can be either in a query string value or in
# a header named Authorization. This code shows how to use a header.
# Create authorization header and add to request headers
authorization_header = algorithm + ' ' + 'Credential=' + access_key + '/' +
 credential_scope + ', ' + 'SignedHeaders=' + signed_headers + ', ' + 'Signature='
 + signature

# The request can include any headers, but MUST include "host", "x-amz-date",
# and (for this scenario) "Authorization". "host" and "x-amz-date" must
# be included in the canonical_headers and signed_headers, as noted
# earlier. Order here is not significant.
```

```
# Python note: The 'host' header is added automatically by the Python 'requests'
 library.
headers = {
    'x-amz-date': amzdate,
    'accept': 'application/hal+json',
    'content-type': 'application/json; charset=UTF-8',
    'Authorization': authorization_header}

if session_token:
    headers['X-Amz-Security-Token'] = session_token

# ************* SEND THE REQUEST *************
request_url = endpoint + '?' + canonical_querystring

print('\nBEGIN REQUEST++++++++++++++++++++++++++++++++++++')
print('Request URL = ' + request_url)
print('Request Headers = ', headers)

r = requests.delete(request_url, data=request_parameters, headers=headers)

print('\nRESPONSE++++++++++++++++++++++++++++++++++++')
print('Response code: %d\n' % r.status_code)
print(r.text)
```

2. Ensure you have valid AWS credentials set as environment variables.
3. Run the script with your Mobile Analytics application ID:

```
python delete_mobile_analytics_application.py --
appId <YOUR_MOBILE_ANALYTICS_APP_ID>
```

This script makes a `DELETE` request to the Mobile Analytics API to remove the specified application. Make sure to run this for each Mobile Analytics application you need to delete.

> **Note**
>
> Active Mobile Analytics customers can continue to ingest events through `putEvents` API and view them in Amazon Pinpoint until the Amazon Pinpoint end of support date.

Summary

Organizations with at least one Amazon Pinpoint account, can continue to use Amazon Pinpoint engagement features, including segments, campaigns, journeys, analytics and email until October 30, 2026, when support for the service will end.

Additional resources

The following additional resources are available:

- Amazon Pinpoint website
- Amazon Pinpoint User Guide
- Amazon Connect Customer outbound campaigns
- Amazon Connect Customer Customer Profiles
- Amazon Kinesis website
- AWS End User Messaging
- Amazon Simple Email Service (SES)

If you need assistance or have feedback, contact AWS Support.

Getting started with Amazon Pinpoint

> **Important**
>
> Amazon Pinpoint is no longer accepting new customers as of May 20, 2025. Existing customers can continue using Amazon Pinpoint until end of support on October 30, 2026. For migration guidance, see Amazon Pinpoint end of support.

The following tutorial content is preserved for existing customers who need to reference the original onboarding steps. New implementations should use Amazon Connect Customer outbound campaigns or AWS End User Messaging instead.

About this tutorial

This section contains an overview of this tutorial.

Intended Audience

This tutorial is designed for marketing and business users.

If you're a software developer or system administrator, you might also find the tutorials in the *Amazon Pinpoint Developer Guide* to be useful.

Features Used

This tutorial shows you how to complete all of the following steps by using the Amazon Pinpoint console:

- Importing customer data from a file.
- Creating a segment that targets specific users based on their attributes.
- Creating an email campaign and scheduling it to be sent at a specific time.
- Viewing email delivery and response data by using the analytics dashboards that are built into Amazon Pinpoint.

Time Required

It should take about 30–45 minutes to complete this tutorial.

Regional Restrictions

There are no regional restrictions associated with using this solution.

Resource Usage Costs

There's no charge for creating an AWS account. However, by implementing this solution, you might incur some or all of the costs that are listed in the following table.

Description	Cost (US dollars)
Message sending costs	You pay $0.0001 for each email that you send through Amazon Pinpoint.
Monthly targeted audience costs	You pay $0 for the first 5,000 endpoints that you target in Amazon Pinpoint each month. (An *endpoint* is a destination that you can send messages to, such as a user's email address or mobile phone number.) After that, you pay $0.0012 per endpoint that you target.

If you use this tutorial to send 5 messages to 5 separate endpoints in one month, you incur charges of $0.0005.

For detailed information about the costs that you might incur using Amazon Pinpoint, see Amazon Pinpoint pricing.

Next: Create and Configure a Project

Create and configure a project

> **Important**
>
> Amazon Pinpoint is no longer accepting new customers as of May 20, 2025. Existing customers can continue using Amazon Pinpoint until end of support on October 30, 2026. For migration guidance, see Amazon Pinpoint end of support.

In Amazon Pinpoint, a *project* is a collection of settings, customer information, segments, and campaigns. If you're new to Amazon Pinpoint, the first step you should take is to create a project.

> **Note**
>
> If you've used the Amazon Pinpoint API, you might have seen references to "applications." In Amazon Pinpoint, a *project* is the same as an *application*.

This section shows you how to create a project. As part of this procedure, you verify an email address and grant Amazon Pinpoint access to use your Amazon SES resources to send email from a campaign. The verified email address is used as the sender email address when you create your email campaign later in this tutorial.

Create and configure a project

The procedures in this section show you how to create a project and verify an email address.

To create a project and verify an email address

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. If this is your first time using Amazon Pinpoint, you see a page that introduces you to the features of the service.

   In the **Get started** section, enter a name for your project, and then choose **Create a project**.

   > **Note**
   >
   > The project name can contain up to 64 characters.

3. On the **Configure features** page, next to **Email**, choose **Configure**.
4. For **Email address**, type an email address that you want to use to send email. For example, you can use your personal email address, or your work email address. Choose **Verify**.
5. Wait for 1–2 minutes, and then check the inbox for the email address that you specified in step 4. You should see an email from *Amazon Web Services (no-reply-aws@amazon.com)* with the subject line "Amazon Web Services – Email Address Verification Request in Region *`RegionName`*", where *`RegionName`* is the name of the AWS Region that you're configuring Amazon Pinpoint in.

6. Open the email, and then click the link in the body of the email.
7. Return to the Amazon Pinpoint console in your browser. On the **Set up email** page, choose **Save**.

Create an orchestration sending role arn

You must create an **Orchestration sending role arn** to grant Amazon Pinpoint access to use your Amazon SES resources to be able to send email from a campaign or journey. If you already have an **Orchestration sending role arn**, then you can choose to use that role in step 6.

Create orchestration sending role arn

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to update email settings for.
3. In the navigation pane, under **Settings**, choose **Email**.
4. On the **Identities** tab, choose **Edit**.
5. Choose **Enable campaigns and journeys for this email channel**.
6. For **IAM role** choose either:

   - **Create a new role** (Recommended) – To have Amazon Pinpoint create the IAM role and configure the IAM roles permissions. Enter a name for the IAM role in **IAM role name**.
   - **Use an existing role** – If you have an existing IAM role that already contains permissions to allow Amazon Pinpoint access to `ses:SendEmail` and `ses:SendRawEmail` then choose that IAM role from the drop down list. If you need to create the IAM role, see IAM role for sending email through Amazon SES in the Amazon Pinpoint Developer Guide.
7. Choose **I acknowledge that the IAM role I selected has the required permissions.**
8. Choose **Save**.

Next: Import customer data and create a segment

Import customer data and create a segment

A *segment* is a group of your customers that share certain attributes. For example, a segment might contain all of your customers who use version 2.0 of your app on an Android device, or all customers who live in the city of Los Angeles.

When you create a campaign, you have to choose a segment to send the campaign to. You can send multiple campaigns to a single segment, and you can send a single campaign to multiple segments.

There are two types of segments that you can create in Amazon Pinpoint:

- **Dynamic segments** – Segments that are based on attributes that you define. Dynamic segments can change over time. For example, if you add new endpoints to Amazon Pinpoint, or if you modify or delete existing endpoints, the number of endpoints in that segment may increase or decrease. For more information about dynamic segments, see Building segments.
- **Imported segments** – Segments that are created outside of Amazon Pinpoint and saved in CSV or JSON format. Imported segments are static—that is, they never change. When you create a new segment, you can use an imported segment as a base segment, and then refine it by adding filters. For more information about importing segments, see Importing segments.

In this tutorial, you create an imported segment by uploading a file from your computer. Next, you create a dynamic segment that is based upon the imported segment.

Download and modify the sample file

In this section, you download a file that contains fictitious customer data. You also modify the data to include your own contact information. Later in this tutorial, you use this data to create a segment.

1. In a web browser, download the sample file from the GitHub user content website. Save the file to your computer.

   > **Tip**
   >
   > You can quickly save this file to your computer by right-clicking the link, and then choosing **Save Link As**. Some browsers may download the file with the **txt** file extension name. Before downloading and saving the file make sure that the extension is changed to **csv**.

2. Open the file in a spreadsheet application. On the last row of the file, replace the items in angle brackets (<...>) with your own contact information.

In the `Address` column, enter the same email address that you verified in Create and configure a project. The message that you send in this campaign will be sent to that address.

3. When you finish, save the file.

> **Note**
>
> If you used a spreadsheet application to modify the file, make sure that you save the modified file in Comma-Separated Values (.csv) format. Amazon Pinpoint can't import proprietary file formats, such as .xlsx.

Import the sample customer data file

Now that you have a file that contains customer data, you can import it into Amazon Pinpoint. To import customer data, you have to create a new segment.

To create an imported segment

1. In the Amazon Pinpoint console, in the navigation pane, choose **Segments**.
2. Choose **Create a segment**.
3. On the **Create a segment** page, choose **Import a segment**.
4. In the **Specifications** section, under **Import method**, choose **Upload files from your computer**.
5. Select **Choose files**. Navigate to the `Pinpoint_Sample_Import.csv` file that you downloaded and modified in the previous section.
6. Choose **Create segment**. Amazon Pinpoint copies the file from your computer and creates a segment. Wait for about 1 minute while the import completes.

Create a targeted segment

Your Amazon Pinpoint project now contains some customer data, and a segment that contains your entire customer list. It also contains your contact information.

In this section, you create a targeted segment. You add segment criteria that filter the segment so that you're the only member of the segment.

To create the segment

1. On the **Segments** page, choose **Create a segment**.
2. On the **Create a segment** page, choose **Build a segment**.
3. For **Name**, enter a name for the segment.
4. Under **Segment group 1**, do the following:

    a. Next to **Include endpoints that are in any of the following segments**, choose the **Pinpoint_Sample_Import** segment that you created in the previous step.

    b. Choose **Add criteria**.

    c. From the menu under **Attribute**, choose **Channel Types > Email**.

    d. Choose **Add filter**.

    e. In the new menu that appears in the **Attribute** column, choose **Custom User Attributes > Company**. Next, in the **Operator** column, choose **Is**. Finally, in the **Values** column, enter the unique company name that you specified for your own contact record in Download and modify the sample file.

    f. Choose **Create segment**.

Next: Create and schedule a campaign

Create and schedule a campaign

A *campaign* is a messaging initiative that engages a specific audience segment. A campaign sends tailored messages on the days and times that you specify. You can use the console to create a campaign that sends messages through the email, push notification, or SMS channels.

In this section, you create an email campaign. You create a new campaign, choose your target segment, and create a responsive email message for the campaign. When you finish setting up the message, you choose the day and time when you want the message to be sent.

Create the campaign and choose a segment

When you create a segment, you first give the segment a name. Next, you choose the segment that the campaign applies to. In this tutorial, you choose the segment that you created in Import the sample customer data file.

To create the campaign and choose segment

1. In the Amazon Pinpoint console, in the navigation pane, choose **Campaigns**.
2. Choose **Create a campaign**.
3. Under **Campaign details**, for **Campaign name**, enter a name for the campaign.
4. For **Campaign type**, choose **Standard campaign**.
5. For **Choose a channel for this campaign**, choose **Email**.
6. Choose **Next**.
7. On the **Choose a segment** page, choose **Use an existing segment**. Then, for **Segment**, choose the targeted segment that you created in Create a targeted segment. Choose **Next**.

Create the campaign message

After you specify a campaign name and choose a segment, you can create your message. This tutorial includes a link to an HTML file that you can use to create your message.

This sample file uses responsive HTML to create a message that renders properly on both computers and mobile devices. It uses inline CSS to provide compatibility with a wide variety of email clients. It also includes tags that are used to personalize the message with the recipient's name and other personal information.

To create the message

1. On the **Create your message** page, under **Message content**, choose **Create a new message**.
2. For **Subject**, enter a subject line for the email.
3. In a web browser, download the sample file from the GitHub user content website. Save the file to your computer.

   > **Tip**
   >
   > You can quickly save this file to your computer by right-clicking the link, and then choosing **Save Link As**. Otherwise, you can click the link to open the HTML text in a browser tab. Keep the tab open until you've completed Step 4.

4. Open the file that you just downloaded in a text editor, such as Notepad (Windows) or TextEdit (macOS). If you opened the file in a browser tab then select that tab. Press **Ctrl+A** (Windows)

or **Cmd+A** (macOS) to select all of the text. Then, press **Ctrl+C** (Windows) or **Cmd+C** (macOS) to copy it.

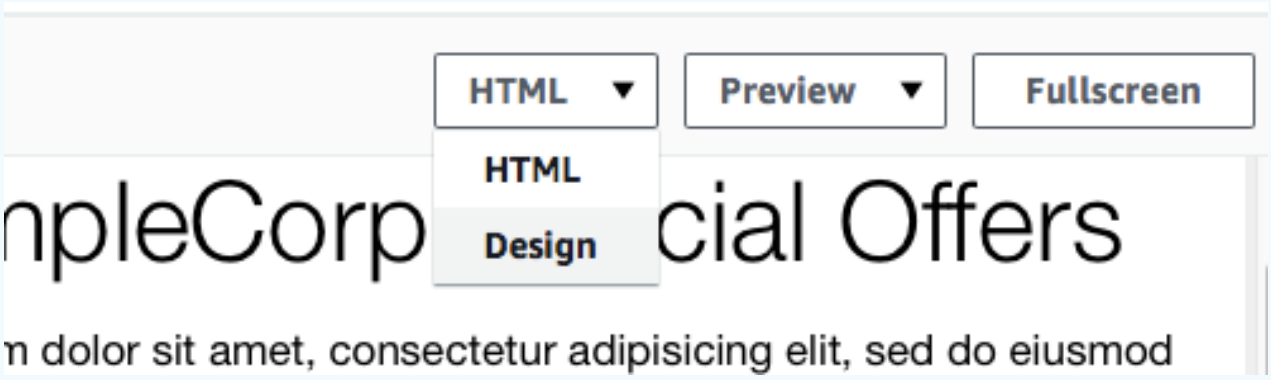
5. Under **Message**, erase the sample HTML code that's shown in the editor. Paste the HTML code that you copied in the last step.
6. (Optional) Modify the content of the message to include a message that you want to send.

   You can personalize the message for each recipient by including the name of an attribute inside two sets of curly braces. For example, the sample message includes the following text: `{{User.UserAttributes.FirstName}}`. This code represents the User.UserAttributes.FirstName attribute, which contains the recipient's first name. When you send the campaign, Amazon Pinpoint removes this attribute name and replaces it with the appropriate value for each recipient.

   You can experiment with other attribute names. Refer to the column headers in the spreadsheet that you imported in Import the sample customer data file for a complete list of attribute names that you can specify in your message.

   Tip

   You can use Design view to edit the content of the message without having to edit the HTML code. To use this view, choose **Design** from the view selector above the message editor, as shown in the following image.

7. In **Email settings** for **Sender email address** choose the verified email address that you created while creating the project.
8. In **Send a test email** choose **A segment** and then choose the segment you created from the dropdown list.
9. Choose **Next**.

Schedule the campaign

The last step in creating the campaign is to choose when to send it. In Amazon Pinpoint, you can set up your campaigns so that they're sent immediately after you launch them. You can also schedule them to be sent in the future—anywhere from 15 minutes from the current time, to six months into the future. Finally, you can schedule your messages to be sent on a recurring basis (that is, hourly, daily, weekly, or monthly). Recurring campaigns are a great way to send account or status updates where the appearance of the campaign message stays the same over time, but is populated with information that changes dynamically.

In this section, you schedule your campaign to be sent immediately after you launch it.

To schedule the campaign

1. On the **Choose when to send the campaign** page, choose **At a specific time**. Then, under **Choose when the campaign should be sent**, choose **Immediately**. Finally, choose **Next**.
2. On the **Review and launch** page, review all of the details of the campaign. When you're ready to send it, choose **Launch campaign**.

Congratulations—you've created your first campaign with Amazon Pinpoint! Because you're the only member of the segment that you created in Create a targeted segment, you should receive the message in your inbox within a few seconds.

Next: View campaign analytics

View campaign analytics

At this point, you've created a segment that you're a member of. You've also created an email campaign and sent it to yourself. In this section, you look at the delivery and response metrics for the campaign.

Interact with your campaign

Before you can view the delivery and response metrics for your campaign, you have to interact with the message that you sent yourself in Create and schedule a campaign.

To interact with the email

1. In your email client, open the message that you sent yourself in Create and schedule a campaign.
2. If your email client automatically hides images by default, choose the **Download pictures** (or equivalent) button to load the images in the message.
3. Click one or more of the links that are contained in the message.
4. Wait for a few minutes, and then proceed to the next section.

View metrics for the campaign

After you interact with the email that you sent from the campaign, you can view the metrics for the campaign.

To view the campaign metrics

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you used to send the campaign.
3. In the navigation pane, under **Analytics**, choose **Campaigns**.
4. In the **Campaigns** section, choose the campaign that you created in Create and schedule a campaign.
5. (Optional) Use the date control to choose a date range for the reports on this page.

   On the metrics page for your campaign, you see the following information:

   - **Delivery count metrics** – This section provides information about the delivery of the messages that were sent from your campaign. It includes the following information:
     - **Messages sent** – The number of messages that were sent.
     - **Messages delivered** – The number of messages that were delivered to their recipients.
     - **Links clicked** – The number of times that links in the messages were clicked by recipients. If a single recipient clicks a link more than once, each click is represented in this section.
     - **Endpoint deliveries** – The average number of endpoints that the campaign was sent to, for each day in the chosen date range. The chart shows the number of endpoints that the campaign was delivered to, for each day in the chosen date range.
   - **Delivery rate metrics** – This section shows the overall delivery and response rates for the messages that were sent from your campaign. It includes the following information:

    - **Delivery rate** – The percentage of messages that were delivered to recipients, of the total number of endpoints that you targeted in the segment that you sent this campaign to.
    - **Email open rate** – The percentage of messages that were opened by recipients, of the total number of messages that were delivered.
    - **Bounce rate** – The percentage of messages that weren't delivered to recipients because they bounced. This value includes only hard bounces—that is, messages that bounced because of a permanent issue. For example, hard bounces could occur when the recipient's email address doesn't exist, or when the recipient permanently rejects email from your domain.
- **Campaign runs** – This section shows information that's specific to each time the campaign ran. Because you can use Amazon Pinpoint to create recurring campaigns, this section can show information for several campaign runs. However, if you completed the procedures in this tutorial, this section contains information for only one campaign run because you ran the campaign only once. This section contains the following metrics, in addition to the metrics that are defined in the preceding sections:
    - **Endpoints targeted** – The number of endpoints that were targeted by the segment that was associated with the campaign run. This number includes endpoints that were part of the segment, but didn't receive the message.
    - **Total email opened** – The total number of times that messages sent from the campaign run were opened. For example, if a message was opened two times by one recipient, both of those opens are counted.

Next: Next steps

Next steps

After completing this tutorial, you can explore additional Amazon Pinpoint features. For example:

- You can improve the delivery of your email campaigns by making sure that your campaigns align with industry best practices. For more information, see Email best practices.
- You can verify an entire domain, which allows you to send email from any address on that domain. For more information about verifying domains, see Verifying a domain.
- You can obtain dedicated IP addresses for sending your email. Dedicated IP addresses are useful for sending email in certain use cases. For more information, see Using dedicated IP addresses with Amazon Pinpoint.

- You can use email deliverability features through Amazon Simple Email Service Virtual Deliverability Manager. Virtual Deliverability Manager helps you identify issues that could impact the delivery of your emails.
- You can send messages through other channels, such as SMS or push. Before you can use these channels, you have to enable and configure them on the Settings page. For more information about using the Settings page to enable and configure channels, see Amazon Pinpoint channels.
- You can send data about your campaigns outside of Amazon Pinpoint. For example, you can send delivery and response data for your campaigns to Amazon S3 for long-term storage. You can also send data to Amazon Redshift to perform custom analyses. For more information about sending your data outside of Amazon Pinpoint, see Streaming events with Amazon Pinpoint.
- You can integrate Amazon Pinpoint with your apps, or interact with Amazon Pinpoint programmatically, by using an AWS SDK. For more information, see the Amazon Pinpoint Developer Guide.

Tutorials

The tutorials in this section are intended to show new Amazon Pinpoint users how to complete several important tasks. If you're new to Amazon Pinpoint, or just unfamiliar with certain features, these tutorials are a good place to start.

The tutorials in this guide include tasks that are oriented toward a developer or system administrator audience. These tutorials show you how to perform tasks by using the Amazon Pinpoint API, the AWS SDKs, and the AWS CLI.

Tutorials

- Tutorial: Using Postman with the Amazon Pinpoint API
- Set up an SMS registration system in Amazon Pinpoint

Tutorial: Using Postman with the Amazon Pinpoint API

Postman is a popular tool for testing APIs in an easy-to-use graphical environment. You can use Postman to send API requests to any REST API, and to receive responses to your requests. Using Postman is a convenient way to test and troubleshoot the calls that you make to the Amazon Pinpoint API. This tutorial includes procedures for setting up and using Postman with Amazon Pinpoint.

> **Note**
>
> Postman is developed by a third-party company. It isn't developed or supported by Amazon Web Services (AWS). To learn more about using Postman, or for assistance with issues related to Postman, see the Support center on the Postman website.

About this tutorial

This section contains an overview of this tutorial.

Intended Audience

This tutorial is intended for developers and system implementers. You don't have to be familiar with Amazon Pinpoint or Postman to complete the steps in this tutorial. You should be comfortable managing IAM policies and modifying JSON code examples.

The procedures in this tutorial were designed to prevent new users from using API operations that can permanently delete Amazon Pinpoint resources. Advanced users can remove this restriction by modifying the policy that's associated with their users.

Features Used

This tutorial includes usage examples for the following Amazon Pinpoint feature:

- Interacting with the Amazon Pinpoint API by using Postman

Time Required

It should take about 15 minutes to complete this tutorial.

Regional Restrictions

There are no regional restrictions associated with using this solution.

Resource Usage Costs

There's no charge for creating an AWS account. However, by implementing this solution, you might incur AWS usage costs if you use Postman to do any of the following:

- Send email, SMS, mobile push, or voice messages
- Create and send campaigns
- Use the phone number validation feature

For more information about the charges that are associated with using Amazon Pinpoint, see Amazon Pinpoint pricing.

Prerequisites for using Postman with Amazon Pinpoint

Before you begin this tutorial, complete the following prerequisites:

- Make sure that the account that you use to sign in to the AWS Management Console can create new IAM policies and roles.
- Make sure you have at least one sample project created that has email turned on and a verified email identity. See Creating an Amazon Pinpoint project with email support in the *Amazon Pinpoint User Guide*.

- Make sure you have an AWS Account ID. Your AWS Account ID can be found in the upper-right corner of the console or you can use the command line interface (CLI). See Finding your AWS account ID.
- You must download and install Postman on your computer. You can download Postman from the Postman website.
- After you install Postman on your computer, create a Postman account. When you first start the Postman application, you're prompted to log in or create a new account. Follow the instructions provided by Postman to log in to your account or to create an account if you don't already have one.

Create IAM policies and roles for use with Amazon Pinpoint

When you use Postman to test the Amazon Pinpoint API, the first step is to create a user. In this section, you create a policy that permits users to interact with all the Amazon Pinpoint resources. Then, you create a user and attach the policy directly to the user .

Create an IAM policy

Learn how to create an IAM policy. Users and roles that use this policy can interact with all of the resources in the Amazon Pinpoint API. It also provides access to resources that are associated with the Amazon Pinpoint Email API, as well as the Amazon Pinpoint SMS and Voice API.

To create the policy

1. Sign in to the AWS Management Console and open the IAM console at https://console.aws.amazon.com/iam/.
2. In the navigation pane, choose **Policies**, and then choose **Create policy**.
3. In the **Policy editor** select **JSON**. Delete any JSON that is current in the **Policy editor** so that it is blank. Copy and paste the following JSON into the **Policy editor** and then in the **Policy editor** replace all instances of *123456789012* with your AWS account ID.

   Your AWS account ID can be found in the upper right hand corner of the console, or you can use the CLI, see Finding your AWS account ID.

   > **Note**
   >
   > To protect the data in your Amazon Pinpoint account, this policy only includes permissions that allow you to read, create, and modify resources. It doesn't include

permissions that allow you to delete resources. You can modify this policy by using the visual editor in the IAM console. For more information, see Managing IAM policies in the IAM User Guide. You can also use the CreatePolicyVersion operation in the IAM API to update this policy.
Also, this policy includes permissions that permit you to interact with the `ses` and `sms-voice` services, in addition to the `mobiletargeting` service. The `ses` and `sms-voice` permissions allow you to interact with the Amazon Pinpoint Email API and Amazon Pinpoint SMS and Voice API, respectively. The `mobiletargeting` permissions allow you to interact with the Amazon Pinpoint API.

JSON

```
{
    "Version":"2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "mobiletargeting:Update*",
                "mobiletargeting:Get*",
                "mobiletargeting:Send*",
                "mobiletargeting:Put*",
                "mobiletargeting:Create*"
            ],
            "Resource": [
                "arn:aws:mobiletargeting:*:123456789012:apps/*",
                "arn:aws:mobiletargeting:*:123456789012:apps/*/campaigns/*",
                "arn:aws:mobiletargeting:*:123456789012:apps/*/segments/*"
            ]
        },
        {
            "Sid": "VisualEditor1",
            "Effect": "Allow",
            "Action": [
                "mobiletargeting:TagResource",
                "mobiletargeting:PhoneNumberValidate",
                "mobiletargeting:ListTagsForResource",
                "mobiletargeting:CreateApp"
```

```
            ],
            "Resource": "arn:aws:mobiletargeting:*:123456789012:*"
        },
        {
            "Sid": "VisualEditor2",
            "Effect": "Allow",
            "Action": [
                "ses:TagResource",
                "ses:Send*",
                "ses:Create*",
                "ses:Get*",
                "ses:List*",
                "ses:Put*",
                "ses:Update*",
                "sms-voice:SendVoiceMessage",
                "sms-voice:List*",
                "sms-voice:Create*",
                "sms-voice:Get*",
                "sms-voice:Update*"
            ],
            "Resource": "*"
        }
    ]
}
```

Choose **Next**.

4. For **Policy name**, enter a name for the policy, such as **`PostmanAccessPolicy`**. Choose **Create policy**.
5. (Optional) You can add tags to the policy by selecting **Add Tag**.
6. Choose **Next: Review**.

Create an IAM user

> **Warning**
>
> IAM users have long-term credentials, which presents a security risk. To help mitigate this risk, we recommend that you provide these users with only the permissions they require to perform the task and that you remove these users when they are no longer needed.

After you create the policy, you can create a user and attach the policy to it. When you create the user, IAM provides a set of credentials that allow Postman to carry out Amazon Pinpoint API operations.

To create the user

1. Open the IAM console at https://console.aws.amazon.com/iam/.
2. On the IAM console, in the navigation pane, choose **Users**, and then choose **Create users**.
3. Under **User details**, for **User name**, enter a name that identifies the user, such as **`PostmanUser`**. Then choose **Next**.
4. Under **Set permissions**, for **Permissions options**, choose **Attach policies directly**.
5. Under **Permissions policies**, choose the policy (**`PostmanAccessPolicy`**) that you created in Create an IAM policy. Then choose **Next**.
6. On the **Review and create** page, optionally add tags that help you identify the user. For more information about using tags, see Tagging IAM resources in the *IAM User Guide*.
7. When you're ready to create the user, choose **Create user**.

Create access keys

> **Warning**
>
> This scenario requires IAM users with programmatic access and long-term credentials, which presents a security risk. To help mitigate this risk, we recommend that you provide these users with only the permissions they require to perform the task and that you remove these users when they are no longer needed. Access keys can be updated if necessary. For more information, see Update access keys in the *IAM User Guide*.

IAM provides a set of credentials that you can use to allow Postman to carry out Amazon Pinpoint API operations.

To create the user

1. Open the IAM console at https://console.aws.amazon.com/iam/.
2. On the IAM console, in the navigation pane, choose **Users**. Select the user (**`PostmanUser`**) created in Create an IAM user, and then select the **Security credentials** tab.

3. In the **Access keys** section, choose **Create access key**.
4. On the **Access key best practices & alternatives** page, select **Application running outside AWS**.

   Then choose **Next**.
5. (Optional) You can add a description tag to the policy.
6. Choose **Create access key**.
7. On the **Retrieve access keys** page, copy the credentials that are shown in the **Access key** and **Secret access key** columns.

   > **Note**
   >
   > You must provide both the access key ID and the secret access key later in this tutorial. This is the only time that you're able to view the secret access key. We recommend that you copy it and save it in a safe location.
8. After you've saved both keys, choose **Done**.

Set up Postman for use with Amazon Pinpoint

Now that you've created a user that's able to access the Amazon Pinpoint API, you can set up Postman. In this section, you create one or more environments in Postman. Next, you import a collection that contains a request template for each of the operations in the Amazon Pinpoint API.

Create a Postman workspace

In Postman, a *workspace* is an organizational container for projects and environments. In this section, you create at least one workspace to use with Amazon Pinpoint.

Create a workspace

In Postman, choose the more actions choose **File**, then choose **New**.

1. On the **Create New** window, choose **Workspace**.
2. Enter a name, summary, and set the visibility to personal. Then choose **Create Workspace**.

Create Postman environments

In Postman, an *environment* is a set of variables that are stored as key-value pairs. You can use environments to change the configuration of the requests that you make through Postman, without having to change the API requests themselves.

In this section, you create at least one environment to use with Amazon Pinpoint. Each environment that you create contains a set of variables that are specific to your account in a single AWS Region. If you use the procedures in this section to create more than one environment, you can change between Regions by choosing a different environment from the **Environment** menu in Postman.

To create an environment

1. In Postman, choose the more actions menu, choose **File**, then choose **New**.
2. On the **Create New** window, choose **Environment**.
3. On the **MANAGE ENVIRONMENTS** window, for **Environment Name**, enter **`Amazon Pinpoint - Region Name`**. Replace *`Region Name`* with one of the following values:

   - US East (N. Virginia)
   - US West (Oregon)
   - Asia Pacific (Mumbai)
   - Asia Pacific (Sydney)
   - Europe (Frankfurt)
   - Europe (Ireland)

   > **Note**
   >
   > At a minimum, you only need to create one environment for a single AWS Region, and that AWS Region must contain one project. If you haven't created a project in one of the previously listed AWS Regions, see Creating an Amazon Pinpoint project with email support in the *Amazon Pinpoint User Guide*.

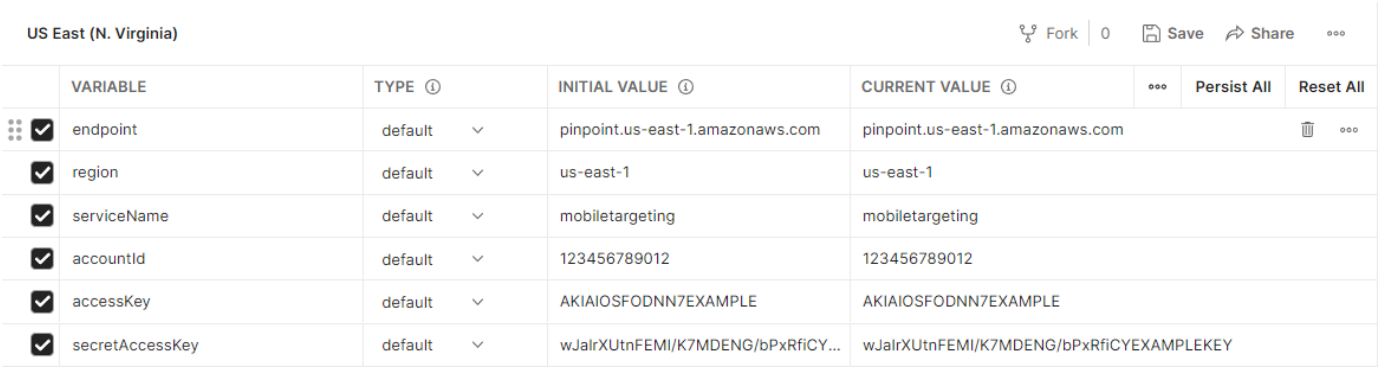
4. Create six new variables: `endpoint`, `region`, `serviceName`, `accountId`, `accessKey`, and `secretAccessKey`. Use the following table to determine which value to enter in the **Initial Value** and **Current Value** columns for each variable.

Region	Variable	Initial and Current value
US East (N. Virginia)	endpoint	**pinpoint.us-east-1.amazonaws.com**
	region	**us-east-1**
	serviceName	**mobiletargeting**
	accountId	*(your AWS account ID)*
	accessKey	*(your IAM access key ID)*
	secretAccessKey	*(your IAM secret access key)*
US West (Oregon)	endpoint	**pinpoint.us-west-2.amazonaws.com**
	region	**us-west-2**
	serviceName	**mobiletargeting**
	accountId	*(your AWS account ID)*
	accessKey	*(your IAM access key ID)*
	secretAccessKey	*(your IAM secret access key)*
Asia Pacific (Mumbai)	endpoint	**pinpoint.ap-south-1.amazonaws.com**
	region	**ap-south-1**
	serviceName	**mobiletargeting**
	accountId	*(your AWS account ID)*

Region	Variable	Initial and Current value
	accessKey	*(your IAM access key ID)*
	secretAccessKey	*(your IAM secret access key)*
Asia Pacific (Sydney)	endpoint	**pinpoint.ap-southeast-2.amazonaws.com**
	region	**ap-southeast-2**
	serviceName	**mobiletargeting**
	accountId	*(your AWS account ID)*
	accessKey	*(your IAM access key ID)*
	secretAccessKey	*(your IAM secret access key)*
Europe (Frankfurt)	endpoint	**pinpoint.eu-central-1.amazonaws.com**
	region	**eu-central-1**
	serviceName	**mobiletargeting**
	accountId	*(your AWS account ID)*
	accessKey	*(your IAM access key ID)*
	secretAccessKey	*(your IAM secret access key)*
Europe (Ireland)	endpoint	**pinpoint.eu-west-1.amazonaws.com**

Region	Variable	Initial and Current value
	`region`	**`eu-west-1`**
	`serviceName`	**`mobiletargeting`**
	`accountId`	*(your AWS account ID)*
	`accessKey`	*(your IAM access key ID)*
	`secretAccessKey`	*(your IAM secret access key)*

After you create these variables, the **MANAGE ENVIRONMENTS** window resembles the example shown in the following image.



When you finish, choose **Save**.

> **Important**
>
> The access keys shown in the preceding image are fictitious. Don't share your IAM access keys with others.
>
> Postman includes features that permit you to share and export environments. If you use these features, make sure not to share your access key ID and secret access key with anybody who shouldn't have access to these credentials.
>
> For more information, see IAM best practices in the *IAM User Guide*.

5. (Optional) Repeat steps 1–4 for each additional environment that you want to create.

> **Tip**
>
> In Postman, you can create as many environments as you need. You can use environments in the following ways:
>
> - Create a separate environment for every Region where you must test the Amazon Pinpoint API.
> - Create environments that are associated with different AWS accounts.
> - Create environments that use credentials that are associated with other user.

6. When you finish creating environments, proceed to the next section.

Create an Amazon Pinpoint collection in Postman

In Postman, a *collection* is a group of API requests. Requests in a collection are typically united by a common purpose. In this section, you create a new collection that contains a request template for each operation in the Amazon Pinpoint API.

To create the Amazon Pinpoint collection

1. In Postman, choose the more actions menu, choose **File**, then choose **Import**.
2. On the **Import** window, choose **Import From Link**, and then enter the following URL: https://raw.githubusercontent.com/awsdocs/amazon-pinpoint-developer-guide/master/Amazon%20Pinpoint.postman_collection.json.

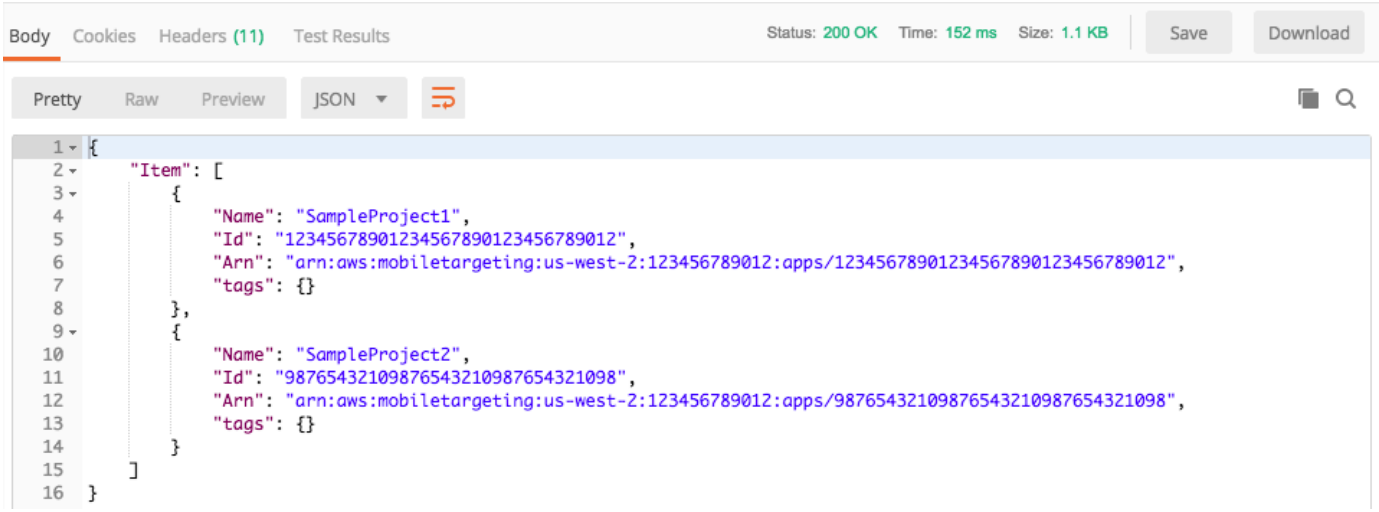
   Choose **Import**. Postman imports the Amazon Pinpoint collection, which contains 120 example requests.

Test your Postman configuration

After you import the Amazon Pinpoint collection, we recommend that you perform a quick test to verify that all of the components are properly configured. You can test your configuration by submitting a `GetApps` request. This request returns a list of all of the projects that exist in your Amazon Pinpoint account in the current AWS Region. This request doesn't require any additional configuration, so it's a good way to test your configuration.

To test the configuration of the Amazon Pinpoint collection

1. In the left navigation pane, select **Collections**, expand the **Amazon Pinpoint** collection, and then expand the **Apps** folder.
2. In the list of requests, choose **GetApps**.
3. Use the **Environment** selector to choose the environment that you created in Create Postman environments.
4. Choose **Send**. If the request is sent successfully, the response pane shows a status of `200 OK`. You see a response that resembles the example in the following image.



> **Note**
>
> If you don't have any projects created in the AWS Region then Amazon Pinpoint returns `{ "Item": [] }`.

This response shows a list of all of the Amazon Pinpoint projects that exist in your account in the Region that you chose in step 3.

Troubleshooting

When you submit your request, you might see an error. See the following list for several common errors that you might encounter, and for steps that you can take to resolve them.

Error message	Problem	Resolution
Could not get any response There was an error connecting to https://%7B%7Bendpoint%7D%7D/v1/apps.	There is no current value for the `{{endpoint}}` variable, which is set when you choose an environment.	Use the environment selector to choose an environment.
The security token included in the request is invalid.	Postman wasn't able to find the current value of your access key ID or secret access key.	Choose the gear icon near the environment selector, and then choose the current environment. Verify that the `accessKey` and `secretAccessKey` values appear in both the **INITIAL VALUE** and **CURRENT VALUE** columns, and that you entered the credentials correctly.
"Message": "User: arn:aws:iam::123456789012:user/PinpointPostmanUser is not authorized to perform: mobiletargeting:GetApps on resource: arn:aws:mobiletargeting:us-west-2:123456789012:*"	The IAM policy associated with your user doesn't include the appropriate permissions.	Verify that your user has the permissions that are described in Create an IAM policy, and that you provided the correct credentials when you created the environment in Create Postman workspace.

Send requests to the Amazon Pinpoint API

When you finish configuring and testing Postman, you can start sending additional requests to the Amazon Pinpoint API. This section includes information that you must know before you start sending requests. It also includes two sample requests that describe how to use the Amazon Pinpoint collection.

Important

When you complete the procedures in this section, you submit requests to the Amazon Pinpoint API. These requests create new resources in your Amazon Pinpoint account, modify existing resources, send messages, change the configuration of your Amazon Pinpoint projects, and use other Amazon Pinpoint features. Use caution when you carry out these requests.

Examples in the Amazon Pinpoint Postman collection

You must configure most of the operations in the Amazon Pinpoint Postman collection before you can use them. For `GET` and `DELETE` operations, you typically only need to modify the variables that are set on the **Pre-request Script** tab.

Note

When you use the IAM policy that's shown in Create an IAM policy, you can't carry out any of the `DELETE` requests that are included in this collection.

For example, the `GetCampaign` operation requires you to specify a `projectId` and a `campaignId`. On the **Pre-request Script** tab, both of these variables are present, and are populated with example values. Delete the example values and replace them with the applicable values for your Amazon Pinpoint project and campaign.

Of these variables, the most commonly used is the `projectId` variable. The value for this variable should be the unique identifier for the project that your request applies to. To get a list of these identifiers for your projects, refer to the response to the `GetApps` request that you sent in the preceding step of this tutorial. In that response, the `Id` field provides the unique identifier for a project. To learn more about the `GetApps` operation and the meaning of each field in the response, see Apps in the *Amazon Pinpoint API Reference*.

Note

In Amazon Pinpoint, a "project" is the same as an "app" or "application."

For POST and PUT operations, you must also modify the request body to include the values that you want to send to the API. For example, when you submit a `CreateApp` request, which is a POST request, you must specify a name for the project that you create. You can modify the request on the **Body** tab. In this example, replace the value next to `"Name"` with the name of the project. If you want to add tags to the project, you can specify them in the `tags` object. Or, if you don't want to add tags, you can delete the entire `tags` object.

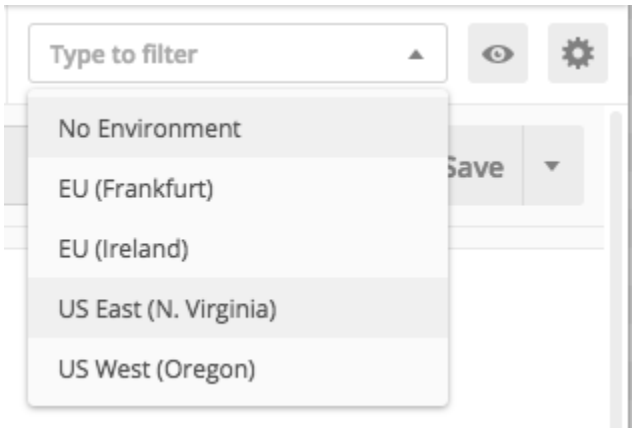
> **Note**
>
> The `UntagResource` operation also requires you to specify URL parameters. You can specify these parameters on the **Params** tab. Replace the values in the **VALUE** column with the tags that you want to delete for the specified resource.

Example request: Create a project by using the `CreateApp` operation

Before you create segments and campaigns in Amazon Pinpoint, you first have to create a project. In Amazon Pinpoint, a *project* consists of segments, campaigns, configurations, and data that are united by a common purpose. For example, you could use a project to contain all of the content that's related to a particular app, or to a specific brand or marketing initiative. When you add customer information to Amazon Pinpoint, that information is associated with a project.

To create a project by sending a CreateApp API request

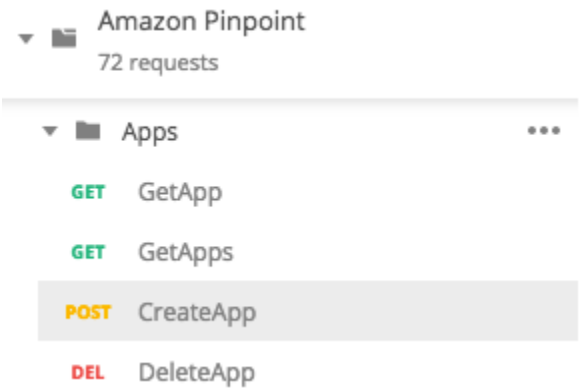
1. On the **Environments** menu, choose the AWS Region that you want to create the project in.



   In this example, Postman has been configured so that the **Environments** menu shows the following four options:

- US East (N. Virginia)
- US West (Oregon)
- Europe (Frankfurt)
- Europe (Ireland)

2. In the **Apps** folder, choose the **CreateApp** operation>.



The **Apps** folder in the Amazon Pinpoint Postman collection are expanded and show the following requests:

- `GetApp`
- `GetApps`
- `CreateApp`
- `DeleteApp`

3. On the **Body** tab, next to `"Name"`, replace the placeholder value (`"string"`) with a name for the campaign, such as **`"MySampleProject"`**.
4. Delete the comma after the campaign name, and then delete the entire `tags` object on lines 3 through 5. When you finish, your request should resemble the example that's shown in the following code snippet.

```
{
    "Name": "MySampleProject"
}
```

Postman is configured to send the request as a raw JSON payload.

5. Choose **Send**. If the campaign is created successfully, the response pane shows a status of `201 Created`.

```
{
    "Name": "MySampleProject"
    "Id": "12345678901234567890123456789012",
    "Arn": "arn:aws:mobiletargeting:us-
east-1:123456789012:apps/12345678901234567890123456789012",
    "tags": {}
}
```

Example: Send an email by using the SendMessages operation

It's very common to use the Amazon Pinpoint `SendMessages` API to send transactional messages. One advantage to sending messages by using the `SendMessages` API as opposed to creating campaigns, is that you can send messages to any address, such as an email address, phone number, or device token. The address that you send messages to doesn't have to exist in your Amazon Pinpoint account. Let's compare this method to sending messages by creating campaigns. Before you send a campaign in Amazon Pinpoint, you must add endpoints to your Amazon Pinpoint account, create segments, create the campaign, and carry out the campaign.

The example in this section shows you how to send a transactional email message directly to a specific email address. You can modify this request to send messages through other channels, such as SMS, mobile push, or voice.

To send an email message by submitting a SendMessages request

1. Verify that the email channel is enabled for the project and the email address or domain that you want to use to send and receive the message is configured. For more information, see Enabling and disabling the email channel and Verifying email identities in the *Amazon Pinpoint User Guide*.

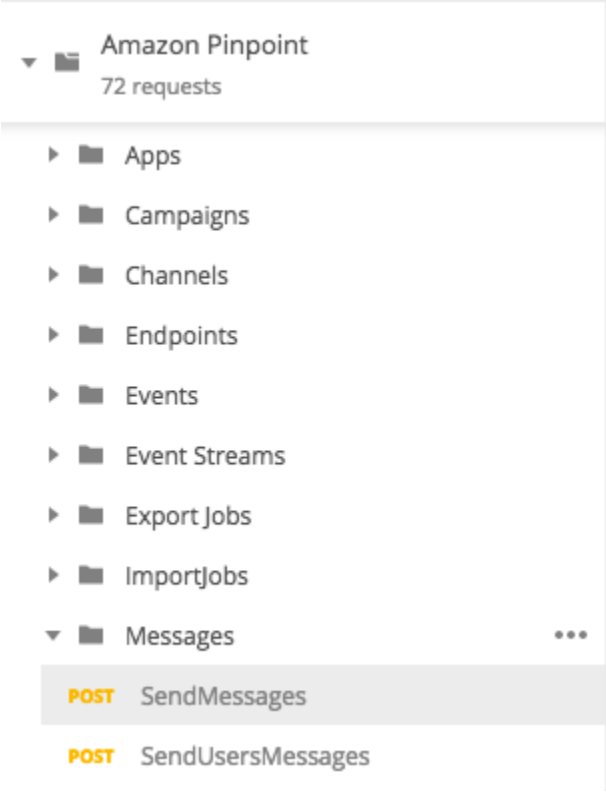
> **Note**
>
> To complete the procedure in this section, you must verify and email address

2. On the **Environments** menu, choose the AWS Region that you want to send the message from.

In this example, Postman has been configured so that the **Environments** menu shows the following four options:

- US East (N. Virginia)
- US West (Oregon)
- Europe (Frankfurt)
- Europe (Ireland)

3. In the **Messages** folder, choose the **SendMessages** operation.



4. On the **Pre-request Script** tab, replace the value of the `projectId` variable with the ID of a project that already exists in the Region that you selected in step 2 of this section.
5. On the **Body** tab, delete the example request that's shown in the request editor. Paste the following code:

```
{
    "MessageConfiguration":{
        "EmailMessage":{
            "FromAddress":"sender@example.com",
            "SimpleEmail":{
                "Subject":{
```

```
                    "Data":"Sample Amazon Pinpoint message"
                },
                "HtmlPart":{
                    "Data":"<h1>Test message</h1><p>This is a sample message sent
 from <a href=\"https://aws.amazon.com/pinpoint\">Amazon Pinpoint</a> using the
 SendMessages API.</p>"
                },
                "TextPart":{
                    "Data":"This is a sample message sent from Amazon Pinpoint
 using the SendMessages API."
                }
            }
        }
    },
    "Addresses":{
        "recipient@example.com": {
            "ChannelType": "EMAIL"
        }
    }
}
```

6. In the preceding code, replace *sender@example.com* with your verified email address. Replace *recipient@example.com* with the verified email address that you want to send the message to.

> **Note**
>
> If your account is still in the Amazon Pinpoint email sandbox, you can only send emails to addresses or domains that are verified in your Amazon Pinpoint account. For more information about having your account removed from the sandbox, see Requesting production access for email in the *Amazon Pinpoint User Guide*.

7. Choose **Send**. If the message is sent successfully, the response pane shows a status of `200 OK`.

```
{
    "ApplicationId": "12345678901234567890123456789012",
    "RequestId": "<sampleValue>",
    "Result": {
        "recipient@example.com": {
            "DeliveryStatus": "SUCCESSFUL",
            "StatusCode": 200,
            "StatusMessage": "<sampleValue>",
```

```
            "MessageId": "<sampleValue>"
        }
    }
}
```

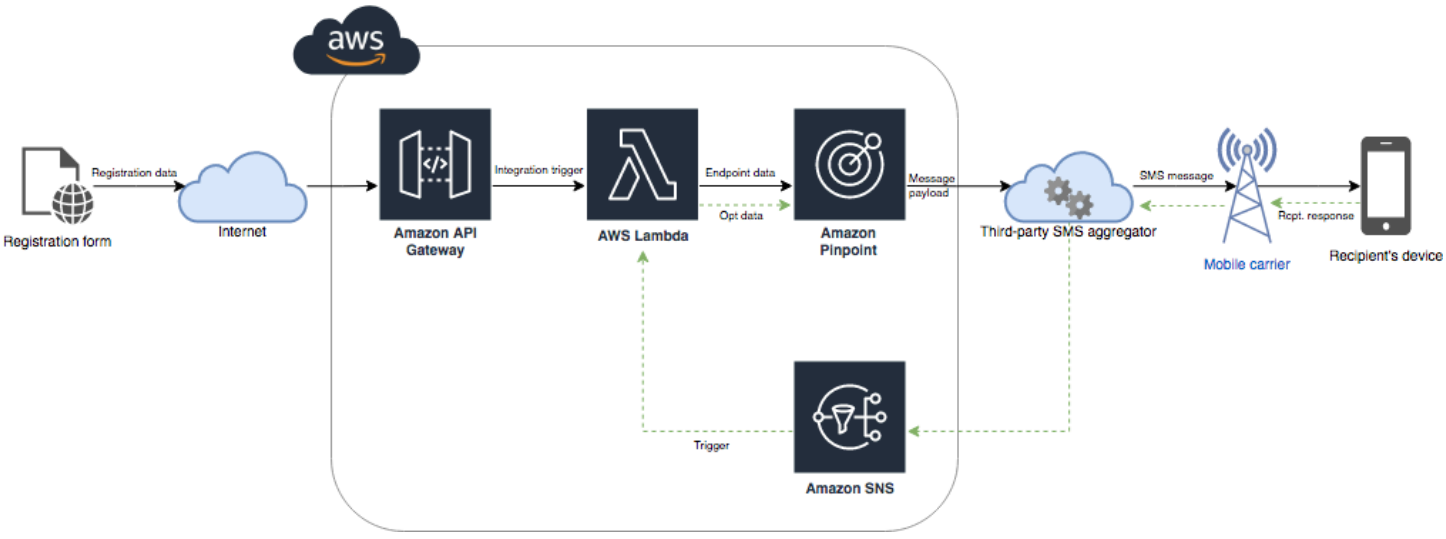
Set up an SMS registration system in Amazon Pinpoint

SMS messages (text messages) are a great way to send time-sensitive messages to your customers using Amazon Pinpoint. Many people keep their phones nearby at all times, and SMS messages tend to capture people's attention more than push notifications, emails, or phone calls.

A common way to capture customers' mobile phone numbers is to use a web-based form. After you verify the customer's phone number and confirm their subscription, you can start sending promotional, transactional, and informational SMS messages to that customer.

This tutorial shows you how to set up a web form to capture customers' contact information. The web form sends this information to Amazon Pinpoint. Next, Amazon Pinpoint verifies that the phone number is valid, and captures other metadata that's related to the phone number. After that, Amazon Pinpoint sends the customer a message asking them to confirm their subscription. After the customer confirms their subscription, Amazon Pinpoint opts them in to receiving your messages.

The following architecture diagram shows the flow of data in this solution.



About double opt-in

This tutorial shows you how to set up a double opt-in system in Amazon Pinpoint that uses two-way SMS messaging.

In an SMS double opt-in system, a customer provides you with their phone number by submitting it in a web form or within your app. When you receive the request from the customer, you create a new endpoint in Amazon Pinpoint. The new endpoint should be opted out of your communications. Next, you send a message to that phone number. In your message, you ask the recipient to confirm their subscription by replying with a specific word or phrase (such as "Yes" or "Confirm"). If the customer responds to the message with the word or phrase that you specified, you change the endpoint's status to opted-in. Otherwise, if the customer doesn't respond or they respond with a different word or phrase, you can leave the endpoint with a status of opted-out.

About this solution

This section contains information about the solution that you're building in this tutorial.

Intended Audience

This tutorial is intended for developer and system implementer audiences. You don't have to be familiar with Amazon Pinpoint to complete the steps in this tutorial. However, you should be comfortable managing IAM policies, creating Lambda functions in Node.js, and deploying web content.

Features Used

This tutorial includes usage examples for the following Amazon Pinpoint features:

- Sending transactional SMS messages
- Obtaining information about phone numbers by using phone number validation
- Receiving incoming SMS messages by using two-way SMS messaging
- Creating dynamic segments
- Creating campaigns
- Interacting with the Amazon Pinpoint API by using AWS Lambda

Time Required

It should take about one hour to complete this tutorial. After you implement this solution, there are additional steps that you can take to refine the solution to suit your unique use case.

Regional Restrictions

This tutorial requires you to lease a long code by using the Amazon Pinpoint console. You can use the Amazon Pinpoint console to lease dedicated long codes that are based in several countries. However, only long codes that are based in Canada can be used to send SMS messages. (You can use long codes that are based in other countries and regions to send voice messages.)

We developed the code examples in this tutorial with this restriction in mind. For example, the code examples assume that the recipient's phone number always has 10 digits, and a country code of 1. If you implement this solution in countries or regions other than the United States or Canada, you have to modify the code examples appropriately.

Resource Usage Costs

There's no charge for creating an AWS account. However, by implementing this solution, you might incur the following costs:

- **Long code lease costs** – To complete this tutorial, you have to lease a long code. Long codes that are based in Canada cost $1.00 per month.
- **Phone number validation usage** – The solution in this tutorial uses the phone number validation feature of Amazon Pinpoint to verify that each number you receive is valid and properly formatted, and to obtain additional information about the phone number. You pay $0.006 for each phone number validation request.
- **Message sending costs** – The solution in this tutorial sends outbound SMS messages. You pay for each message that you send through Amazon Pinpoint. The price that you pay for each message depends on the country or region of the recipient. If you send messages to recipients in the United States (excluding US Territories), you pay $0.00645 per message. If you send messages to recipients in Canada, you pay between $0.00109–$0.02, depending on the recipient's carrier and location.
- **Message receiving costs** – This solution also receives and processes incoming SMS messages. You pay for each incoming message that's sent to phone numbers that are associated with your Amazon Pinpoint account. The price that you pay depends on where the receiving phone number is based. If your receiving number is based in the United States (excluding US Territories), you pay $0.0075 per incoming message. If your number is based in Canada, you pay $0.00155 per incoming message.

- **Lambda usage** – This solution uses two Lambda functions that interact with the Amazon Pinpoint API. When you call a Lambda function, you're charged based on the number of requests for your functions, for the time that it takes for your code to execute, and for the amount of memory that your functions use. The functions in this tutorial use very little memory, and typically run for 1–3 seconds. Some or all of your usage of this solution might fall under the Lambda free usage tier. For more information, see Lambda pricing.
- **API Gateway usage** – The web form in this solution calls an API that's managed by API Gateway. For every million calls to API Gateway, you pay $3.50–$3.70, depending on which AWS Region you use Amazon Pinpoint in. For more information, see API Gateway pricing.
- **Web hosting costs** – This solution includes a web-based form that you have to host on your website. The price that you pay for hosting this content depends on your web hosting provider.

> **Note**
>
> All prices shown in this list are in US Dollars (USD).

Next: Prerequisites

Prerequisites for setting up SMS in Amazon Pinpoint

Before you begin this tutorial, you have to complete the following prerequisites:

- The account that you use to sign in to the AWS Management Console has to be able to perform the following tasks:
  - Create new IAM policies and roles
  - Create new Amazon Pinpoint projects
  - Create new Lambda functions
  - Create new APIs in API Gateway
- You must have a method of hosting and publishing webpages. Although you can use AWS services to host your webpages, you aren't required to.

> **Tip**
>
> To learn more about hosting webpages using AWS services, see Host a static webpage.

Next: Set Up Amazon Pinpoint

Set up SMS in Amazon Pinpoint

Before you can set up SMS messages, you need an Amazon Pinpoint project. In this section, you do the following:

- Create an Amazon Pinpoint project
- Enable the SMS channel and lease a phone number
- Configure two-way SMS messaging

Before you begin, review the prerequisites.

Create an Amazon Pinpoint project

To get started, you need to create an Amazon Pinpoint project. In Amazon Pinpoint, a *project* consists of segments, campaigns, configurations, and data that are united by a common purpose. For example, you could use a project to contain all of the content that's related to a particular app, or to a specific brand or marketing initiative. When you add customer information to Amazon Pinpoint, that information is associated with a project.

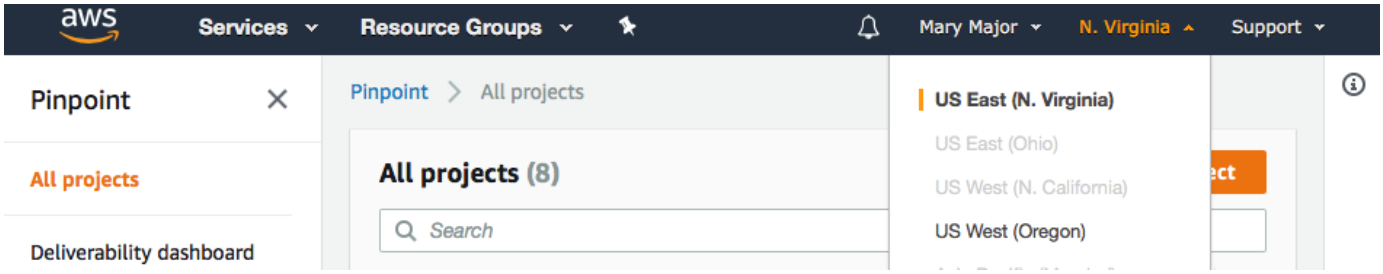
The steps involved in creating a new project differ depending on whether you've created a project in Amazon Pinpoint previously.

Creating a project (new Amazon Pinpoint users)

These steps describe the process of creating a new Amazon Pinpoint project if you've never created a project in the current AWS Region.

To create a project

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. Use the Region selector to choose the AWS Region that you want to use, as shown in the following image. If you're unsure, choose the Region that's located closest to you.



3. Under **Get started**, for **Name**, enter a name for the campaign (such as **`SMSRegistration`**), and then choose **Create project**.
4. On the **Configure features** page, choose **Skip this step**.
5. In the navigation pane, choose **All projects**.
6. On the **All projects** page, next to the project you just created, copy the value that's shown in the **Project ID** column.

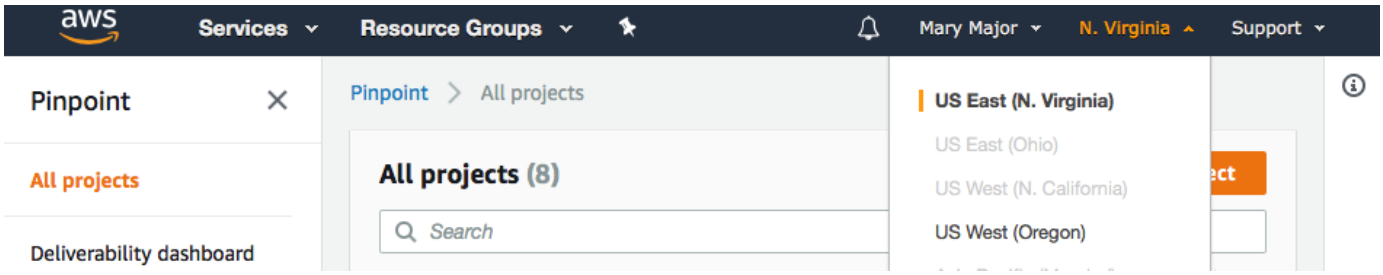
> **Tip**
>
> You need to use this ID in a few different places in this tutorial. Keep the project ID in a convenient place so that you can copy it later.

Creating a project (existing Amazon Pinpoint users)

These steps describe the process of creating a new Amazon Pinpoint project if you've already created projects in the current AWS Region.

To create a project

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. Use the Region selector to choose the AWS Region that you want to use, as shown in the following image. If you're unsure, choose the Region that's located closest to you.



3. On the **All projects** page, choose **Create a project**.

4. On the **Create a project** window, for **Project name**, enter a name for the project (such as **`SMSRegistration`**). Choose **Create**.
5. On the **Configure features** page, choose **Skip this step**.
6. In the navigation pane, choose **All projects**.
7. On the **All projects** page, next to the project you just created, copy the value that's shown in the **Project ID** column.

> **Tip**
>
> You need to use this ID in a few different places in this tutorial. Keep the project ID in a convenient place so that you can copy it later.

Obtain a dedicated phone number

> **Note**
>
> Amazon Pinpoint has updated their user guide documentation. To get the latest information regarding how to create, configure, and manage your SMS and voice resources, see the new AWS End User Messaging SMS user guide.

After you create a project, you can start to configure features within that project. In this section, you enable the SMS channel, and obtain a dedicated phone number to use when sending SMS messages.

> **Note**
>
> This section assumes that you're leasing a United States 10DLC phone number after brand and campaign registration, United States Toll-Free number, or Canada long code. If you follow the procedures in this section, but choose a country other than the United States or Canada, you won't be able to use that number to send SMS messages. To learn more about leasing SMS-capable long codes in countries other than the United States or Canada, see Supported countries and regions (SMS channel) in the *AWS End User Messaging SMS User Guide*.

To enable the SMS channel using the Amazon Pinpoint console, follow these steps:

Enable SMS channel

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, under **Settings**, choose **SMS and voice**.
3. Next to **SMS settings**, choose **Edit**.
4. Under **General settings**, choose **Enable the SMS channel for this project**, and then choose **Save changes**.

To request a phone number using the AWS End User Messaging SMS console, follow these steps:

Request a phone number (Console)

1. Open the AWS End User Messaging SMS console at https://console.aws.amazon.com/sms-voice/.

   > **Note**
   >
   > Make sure you request a phone number in the same AWS Region that you created your Amazon Pinpoint project in.

2. In the navigation pane, under **Configurations**, choose **Phone numbers** and then **Request originator**.
3. On the **Select country** page for **Message destination country** choose either the United States or Canada. Choose **Next**.
4. On the **Messaging use case** section, enter the following:

   - Under **Number capabilities** choose **SMS**

     > **Important**
     >
     > Capabilities for SMS and Voice can't be changed once the phone number has been purchased.

   - For **Two-way messaging** choose **Yes**.
5. Choose **Next**.

6. Under **Select originator type** choose either **Long code** or **10DLC**.

   If you choose 10DLC and already have a registered campaign you can choose the campaign from the **Associate to registered campaign**.

7. Choose **Next**.
8. On **Review and request** you can verify and edit your request before submitting it. Choose **Request**.
9. A **Registration Required** window may appear depending on the type of phone number you requested. Your phone number is associated with this registration and you can't send messages until your registration has been approved. For more information about registrations requirements see Registrations.

   a. For **Registration form name** enter a friendly name.

   b. Choose **Begin registration** to finish registering the phone number or **Register later**.

> **Important**
>
> Your phone number can't send messages until your registration has been approved.
> You are still billed the recurring monthly lease fee for the phone number regardless of registration status. For more information about registrations requirements see Registrations.

Enable two-way SMS

Now that you have a dedicated phone number, you can set up two-way SMS. Enabling two-way SMS makes it possible for your customers to respond to the SMS messages that you send them. In this solution, you use two-way SMS to give your customers a way to confirm that they want to subscribe to your SMS program.

To enable two-way SMS using the AWS End User Messaging SMS console, follow these steps:

Enable two-way SMS

1. Open the AWS End User Messaging SMS console at https://console.aws.amazon.com/sms-voice/.
2. In the navigation pane, under **Configurations**, choose **Phone numbers**.

3. On the **Phone numbers** page choose a phone number.
4. On the **Two-way SMS** tab choose the **Edit settings** button.
5. On the **Edit settings** page choose **Enable two-way message**.
6. For **Destination type** choose **Amazon SNS**.
   - **New Amazon SNS topic** – AWS End User Messaging SMS creates a topic in your account. The topic is automatically created with all of the required permissions. For more information on Amazon SNS topics see Configuring Amazon SNS in the *Amazon SNS developer guide*.
   - For **incoming message destination** enter a topic name, such as **`SMSRegistrationFormTopic`**.
7. For **Two-way channel role** choose **Use SNS topic policies**.
8. Choose **Save changes**.

Use the AWS End User Messaging SMS console to add keywords to your phone number that customers send you to confirm their subscriptions (such as **`Yes`** or **`Confirm`**).

Add a keyword

1. Open the AWS End User Messaging SMS console at https://console.aws.amazon.com/sms-voice/.
2. In the navigation pane, under **Configurations**, choose **Phone number**.
3. On the **Phone number** page choose the phone number to add a keyword to.
4. On the **Keywords** tab choose the **Add keyword** button.
5. In the **Custom Keyword** pane add the following:
   - **Keyword** – The new keyword to add (such as **`Yes`** or **`Confirm`**).
   - **Response message** – The message to send back to the recipient.
   - **Keyword action** – The action to perform when the keyword is received. Choose **Automatic response**.
6. Choose **Add keyword**.

Next: Create IAM policies and roles

Create IAM policies and roles for use with SMS in Amazon Pinpoint

The next step in implementing the SMS registration solution in Amazon Pinpoint is to configure a policy and a role in AWS Identity and Access Management (IAM). For this solution, you need to create a policy that provides access to certain resources that are related to Amazon Pinpoint. You then create a role and attach the policy to it. Later in this tutorial, you create an AWS Lambda function that uses this role to call certain operations in the Amazon Pinpoint API.

Create an IAM policy

This section shows you how to create an IAM policy. Users and roles that use this policy are able to do the following:

- Use the Phone Number Validate feature
- View, create, and update Amazon Pinpoint endpoints
- Send messages to Amazon Pinpoint endpoints

In this tutorial, you want to give Lambda the ability to perform these tasks. However, for added security, this policy uses the principal of granting *least privilege*. In other words, it grants only the permissions that are required to complete this solution, and no more. This policy is restricted in the following ways:

- You can only use it to call the Phone Number Validate API in a specific Region.
- You can only use it to view, create, or update endpoints that are associated with a specific Amazon Pinpoint project.
- You can only use it to send messages to endpoints that are associated with a specific Amazon Pinpoint project.

To create the policy

1. Sign in to the AWS Management Console and open the IAM console at https://console.aws.amazon.com/iam/.
2. In the navigation pane, choose **Policies**, and then choose **Create policy**.
3. On the **JSON** tab, paste the following code.

JSON

```
{
    "Version":"2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "logs:CreateLogStream",
                "logs:PutLogEvents",
                "logs:CreateLogGroup"
            ],
            "Resource": "arn:aws:logs:*:*:*"
        },
        {
            "Effect": "Allow",
            "Action": "mobiletargeting:SendMessages",
            "Resource": "arn:aws:mobiletargeting:us-
east-1:111122223333:apps/projectId/*"
        },
        {
            "Effect": "Allow",
            "Action": [
                "mobiletargeting:GetEndpoint",
                "mobiletargeting:UpdateEndpoint",
                "mobiletargeting:PutEvents"
            ],
            "Resource": "arn:aws:mobiletargeting:us-
east-1:111122223333:apps/projectId/endpoints/*"
        },
        {
            "Effect": "Allow",
            "Action": "mobiletargeting:PhoneNumberValidate",
            "Resource": "arn:aws:mobiletargeting:us-
east-1:111122223333:phone/number/validate"
        }
    ]
}
```

In the preceding example, do the following:

- Replace *region* with the AWS Region that you use Amazon Pinpoint in, such as `us-east-1` or `eu-central-1`.

  > **Tip**
  >
  > For a complete list of AWS Regions where Amazon Pinpoint is available, see AWS regions and endpoints in the *AWS General Reference*.

- Replace *accountId* with the unique ID for your AWS account.
- Replace *projectId* with the unique ID of the project that you created in Create an Amazon Pinpoint project of this tutorial.

  > **Note**
  >
  > The `logs` actions enable Lambda to log its output in CloudWatch Logs.

4. Choose **Next**.
5. For **Policy name**, enter a name for the policy, such as **`RegistrationFormPolicy`**. Choose **Create policy**.

Create an IAM role

To create the role

1. Open the IAM console at https://console.aws.amazon.com/iam/.
2. In the IAM console, in the navigation pane, choose **Roles**, and then choose **Create role**.
3. Under **Trusted entity type**, choose **AWS service**, and then for **Service or user case** choose **Lambda** from the drop down list.
4. Choose **Next**.
5. Under **Permissions policies**, choose or search for the policy that you created in the previous section, and then choose **Next**.
6. Under **Role details**, for **Role name**, enter a name for the role, such as **`SMSRegistrationForm`**. Choose **Create role**.

Next: Create Lambda functions

Create Lambda functions for use with Amazon Pinpoint SMS messaging

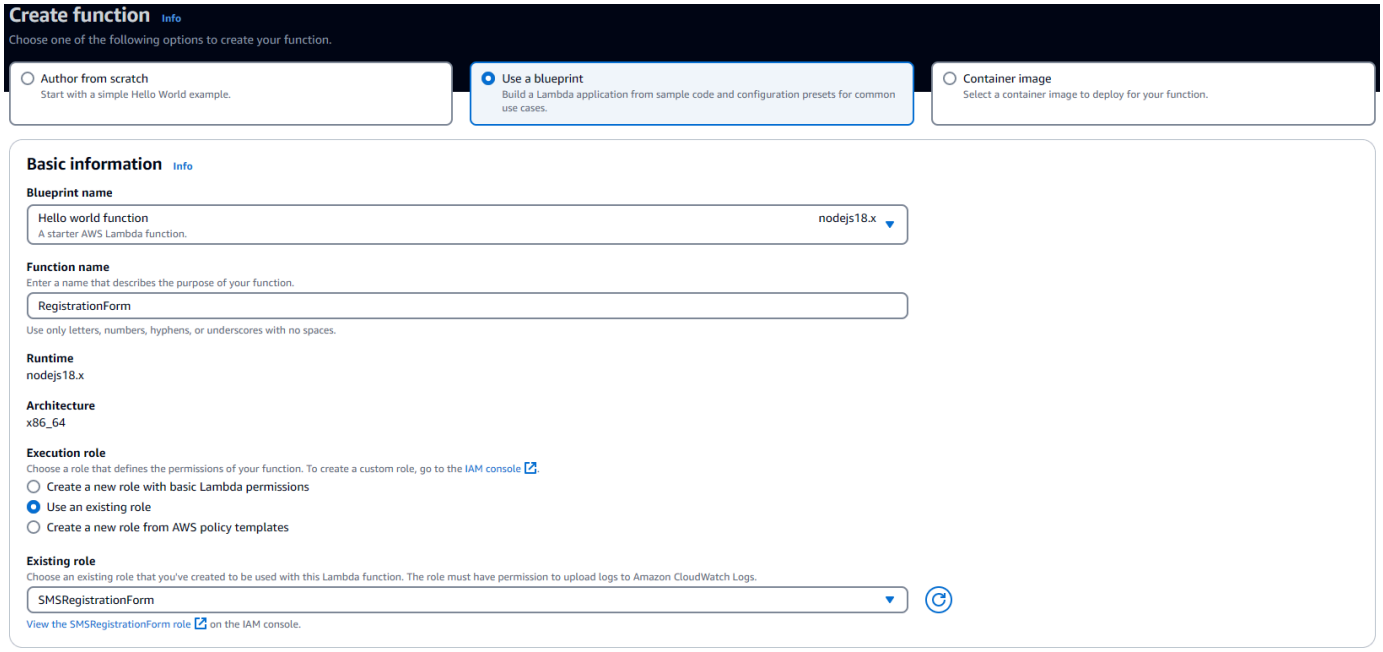
This section shows you how to create and configure two Lambda functions for use with Amazon Pinpoint SMS messaging. Later, you set up API Gateway and Amazon Pinpoint to invoke these functions when certain events occur. Both of these functions create and update endpoints in the Amazon Pinpoint project that you specify. The first function also uses the phone number validation feature.

Create the function that validates customer information and creates endpoints

The first function takes input from your registration form, which it receives from Amazon API Gateway It uses this information to obtain information about the customer's phone number by using the phone number validation feature of Amazon Pinpoint. The function then uses the validated data to create a new endpoint in the Amazon Pinpoint project that you specify. By default, the endpoint that the function creates is opted out of future communications from you, but this status can be changed by the second function. Finally, this function sends the customer a message asking them to verify that they want to receive SMS communications from you.

To create the Lambda function

1. Open the AWS Lambda console at https://console.aws.amazon.com/lambda/.
2. Choose **Create function**.
3. Under **Create a function**, choose **Use a blueprint**.
4. In the search field, enter **`hello`**, and then press Enter. In the list of results, choose the `hello-world` Node.js function, as shown in the following image.



5. Under **Basic information**, do the following:

   - For **Name**, enter a name for the function, such as **`RegistrationForm`**.
   - For **Role**, select **Choose an existing role**.
   - For **Existing role**, choose the **SMSRegistrationForm** role that you created in [Create an IAM role](#).

   When you finish, choose **Create function**.

6. For **Code source** delete the sample function in the code editor, and then paste the following code:

```
import { PinpointClient, PhoneNumberValidateCommand, UpdateEndpointCommand,
 SendMessagesCommand } from "@aws-sdk/client-pinpoint"; // ES Modules import
const pinClient = new PinpointClient({region: process.env.region});

// Make sure the SMS channel is enabled for the projectId that you specify.
// See: https://docs.aws.amazon.com/pinpoint/latest/userguide/channels-sms-
setup.html
var projectId = process.env.projectId;

// You need a dedicated long code in order to use two-way SMS.
// See: https://docs.aws.amazon.com/pinpoint/latest/userguide/channels-voice-
manage.html#channels-voice-manage-request-phone-numbers
var originationNumber = process.env.originationNumber;
```

```
// This message is spread across multiple lines for improved readability.
var message = "ExampleCorp: Reply YES to confirm your subscription. 2 msgs per "
            + "month. No purchase req'd. Msg&data rates may apply. Terms: "
            + "example.com/terms-sms";

var messageType = "TRANSACTIONAL";

export const handler = async (event, context) => {
  console.log('Received event:', event);
  await validateNumber(event);
};

async function validateNumber (event) {
  var destinationNumber = event.destinationNumber;
  if (destinationNumber.length == 10) {
    destinationNumber = "+1" + destinationNumber;
  }
  var params = {
    NumberValidateRequest: {
      IsoCountryCode: 'US',
      PhoneNumber: destinationNumber
    }
  };
  try{
    const PhoneNumberValidateresponse = await pinClient.send( new
 PhoneNumberValidateCommand(params));
    console.log(PhoneNumberValidateresponse);
     if (PhoneNumberValidateresponse['NumberValidateResponse']['PhoneTypeCode'] ==
 0) {
        await createEndpoint(PhoneNumberValidateresponse, event.firstName,
 event.lastName, event.source);

      } else {
        console.log("Received a phone number that isn't capable of receiving "
                   +"SMS messages. No endpoint created.");
      }
  }catch(err){
    console.log(err);
  }
}

async function createEndpoint(data, firstName, lastName, source) {
```

```
  var destinationNumber = data['NumberValidateResponse']
['CleansedPhoneNumberE164'];
  var endpointId = data['NumberValidateResponse']
['CleansedPhoneNumberE164'].substring(1);

  var params = {
    ApplicationId: projectId,
    // The Endpoint ID is equal to the cleansed phone number minus the leading
    // plus sign. This makes it easier to easily update the endpoint later.
    EndpointId: endpointId,
    EndpointRequest: {
      ChannelType: 'SMS',
      Address: destinationNumber,
      // OptOut is set to ALL (that is, endpoint is opted out of all messages)
      // because the recipient hasn't confirmed their subscription at this
      // point. When they confirm, a different Lambda function changes this
      // value to NONE (not opted out).
      OptOut: 'ALL',
      Location: {
        PostalCode:data['NumberValidateResponse']['ZipCode'],
        City:data['NumberValidateResponse']['City'],
        Country:data['NumberValidateResponse']['CountryCodeIso2'],
      },
      Demographic: {
        Timezone:data['NumberValidateResponse']['Timezone']
      },
      Attributes: {
        Source: [
          source
        ]
      },
      User: {
        UserAttributes: {
          FirstName: [
            firstName
          ],
          LastName: [
            lastName
          ]
        }
      }
    }
  };
  try{
```

```
    const UpdateEndpointresponse = await pinClient.send(new
 UpdateEndpointCommand(params));
    console.log(UpdateEndpointresponse);
    await sendConfirmation(destinationNumber);
  }catch(err){
    console.log(err);
  }
}

async function sendConfirmation(destinationNumber) {
  var params = {
    ApplicationId: projectId,
    MessageRequest: {
      Addresses: {
        [destinationNumber]: {
          ChannelType: 'SMS'
        }
      },
      MessageConfiguration: {
        SMSMessage: {
          Body: message,
          MessageType: messageType,
          OriginationNumber: originationNumber
        }
      }
    }
  };
  try{
    const SendMessagesCommandresponse = await pinClient.send(new
 SendMessagesCommand(params));
    console.log("Message sent! "
          + SendMessagesCommandresponse['MessageResponse']['Result']
[destinationNumber]['StatusMessage']);
  }catch(err){
    console.log(err);
  }
}
```

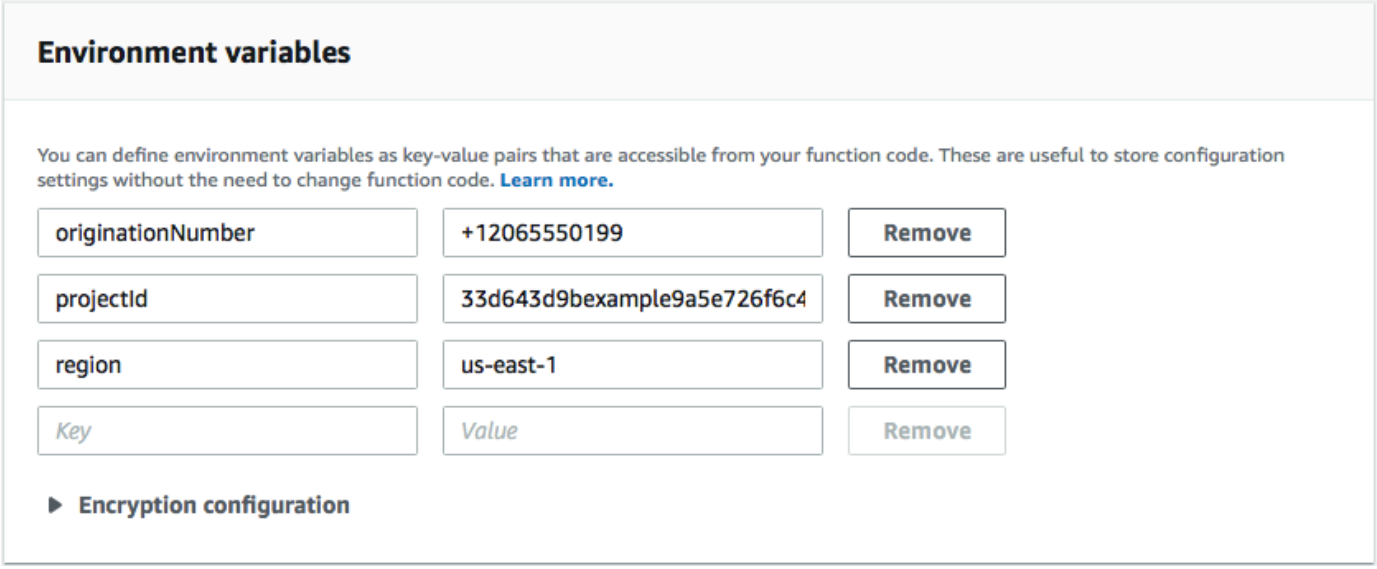
7. On the **Configuration** tab for **Environment variables**, choose **Edit** and then **Add environment variable**, do the following:

   - In the first row, create a variable with a key of **`originationNumber`**. Next, set the value to the phone number of the dedicated long code that you received in Step 1.2.

> **Note**
>
> Be sure to include the plus sign (+) and the country code for the phone number. Don't include any other special characters, such as dashes (-), periods (.), or parentheses.

- In the second row, create a variable with a key of **`projectId`**. Next, set the value to the unique ID of the project that you created in Step 1.1.
- In the third row, create a variable with a key of **`region`**. Next, set the value to the Region that you use Amazon Pinpoint in, such as **`us-east-1`** or **`us-west-2`**.

When you finish, the **Environment Variables** section should resemble the example shown in the following image.



8. At the top of the page, choose **Save**.

Test the function

After you create the function, you should test it to make sure that it's configured properly. Also, make sure that the IAM role you created has the appropriate permissions.

To test the function

1. Choose the **Test** tab.

2. Choose **Create new event**, do the following:

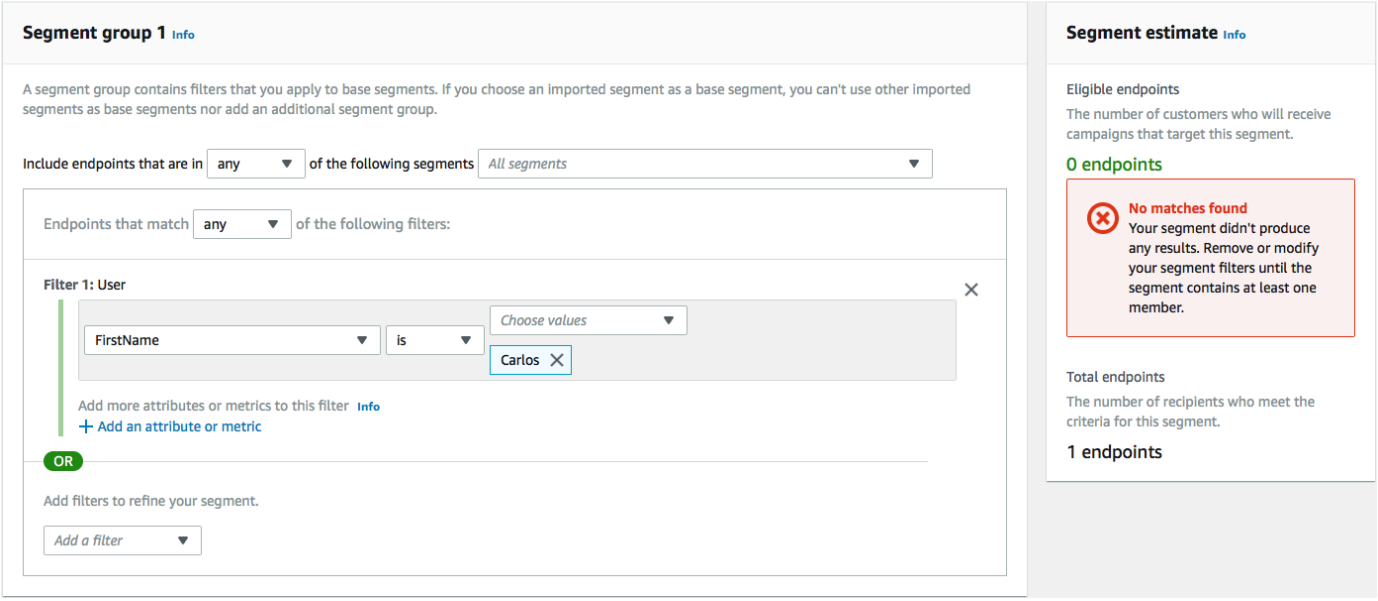
   - For **Event name**, enter a name for the test event, such as **`MyPhoneNumber`**.
   - Erase the example code in the code editor. Paste the following code:

     ```
     {
       "destinationNumber": "+12065550142",
       "firstName": "Carlos",
       "lastName": "Salazar",
       "source": "Registration form test"
     }
     ```

   - In the preceding code example, replace the values of the `destinationNumber`, `firstName`, and `lastName` attributes with the values that you want to use for testing, such as your personal contact details. When you test this function, it sends an SMS message to the phone number that you specify in the `destinationNumber` attribute. Make sure that the phone number that you specify is able to receive SMS messages.
   - Choose **Create**.
3. Choose **Test**.
4. Under **Execution result: succeeded**, choose **Details**. In the **Log output** section, review the output of the function. Make sure that the function ran without errors.

   Check the device that's associated with the `destinationNumber` that you specified to make sure that it received the test message.
5. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
6. On the **All projects** page, choose the project that you created in Create an Amazon Pinpoint project.
7. In the navigation pane, choose **Segments**. On the **Segments page**, choose **Create a segment**.
8. In **Segment group 1**, under **Add filters to refine your segment**, choose **Filter by user**.
9. For **Choose a user attribute**, choose **FirstName**. Then, for **Choose values**, choose the first name that you specified in the test event.

   The **Segment estimate** section should show that there are zero eligible endpoints, and one total endpoint, as shown in the following image. This result is expected. When the function creates a new endpoint, the endpoint is opted out. Segments in Amazon Pinpoint automatically exclude opted-out endpoints.



Create the function that opts in customers to your communications

The second function is only executed when a customer replies to the message that's sent by the first function. If the customer's reply includes the keyword that you specified in Enable two-way SMS, the function updates their endpoint record to opt them in to future communications. Amazon Pinpoint also automatically responds with the message that you specified in Enable two-way SMS.

If the customer doesn't respond, or responds with anything other than the designated keyword, then nothing happens. The customer's endpoint remains in Amazon Pinpoint, but it can't be targeted by segments.

To create the Lambda function

1. Open the AWS Lambda console at https://console.aws.amazon.com/lambda/.
2. Choose **Create function**.
3. Under **Create function**, choose **Blueprints**.
4. In the search field, enter **`hello`**, and then press Enter. In the list of results, choose the `hello-world` Node.js function, as shown in the following image. Choose **Configure**.
5. Under **Basic information**, do the following:
   - For **Name**, enter a name for the function, such as **`RegistrationForm_OptIn`**.
   - For **Role**, select **Choose an existing role**.

- For **Existing role**, choose the SMSRegistrationForm role that you created in Create an IAM role.

When you finish, choose **Create function**.

6. Delete the sample function in the code editor, and then paste the following code:

```
import { PinpointClient, UpdateEndpointCommand } from "@aws-sdk/client-
pinpoint"; // ES Modules import

// Create a new Pinpoint client instance with the region specified in the
 environment variables
const pinClient = new PinpointClient({ region: process.env.region });

// Get the Pinpoint project ID and the confirm keyword from environment variables
const projectId = process.env.projectId;
const confirmKeyword = process.env.confirmKeyword.toLowerCase();

// This is the main handler function that is invoked when the Lambda function is
 triggered
export const handler = async (event, context) => {
    console.log('Received event:', event);

    try {
        // Extract the timestamp, message, and origination number from the SNS
 event
        const timestamp = event.Records[0].Sns.Timestamp;
        const message = JSON.parse(event.Records[0].Sns.Message);
        const originationNumber = message.originationNumber;
        const response = message.messageBody.toLowerCase();

        // Check if the response message contains the confirm keyword
        if (response.includes(confirmKeyword)) {
            // If the confirm keyword is found, update the endpoint's opt-in status
            await updateEndpointOptIn(originationNumber, timestamp);
        }
    }catch (error) {
        console.error('An error occurred:', error);
        throw error; // Rethrow the error to handle it upstream
    }
};

// This function updates the opt-in status of a Pinpoint endpoint
```

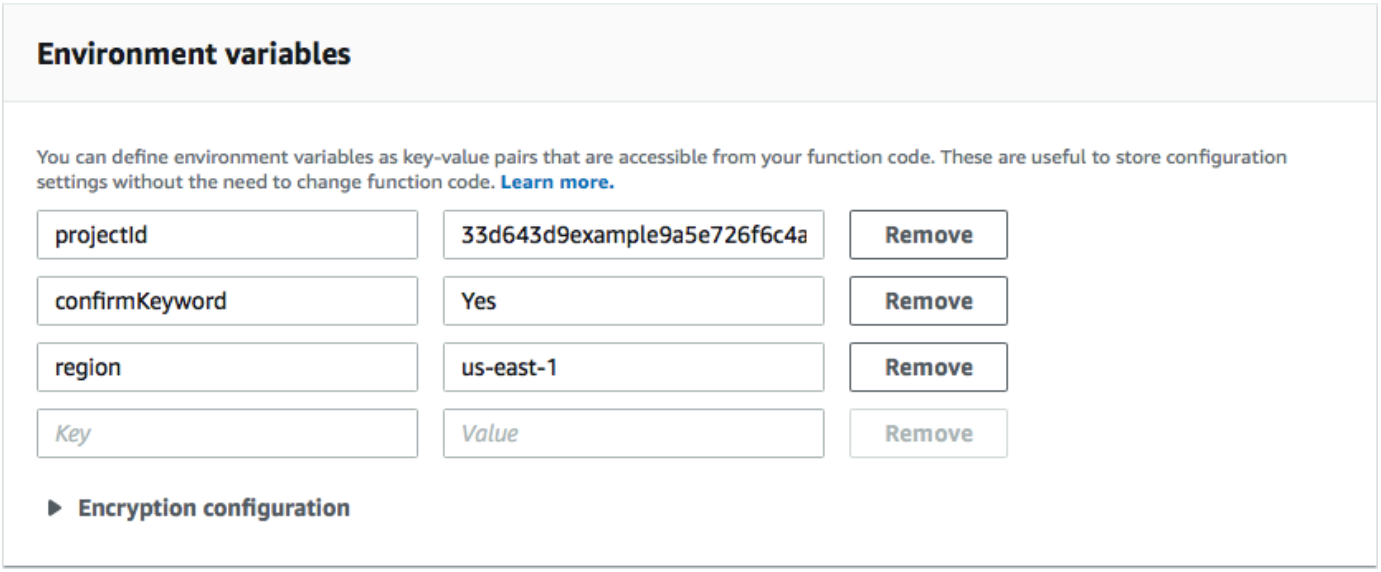
```
async function updateEndpointOptIn(originationNumber, timestamp) {
    // Extract the endpoint ID from the origination number
    const endpointId = originationNumber.substring(1);

     // Prepare the parameters for the UpdateEndpointCommand
    const params = {
        ApplicationId: projectId,
        EndpointId: endpointId,
        EndpointRequest: {
            Address: originationNumber,
            ChannelType: 'SMS',
            OptOut: 'NONE',
            Attributes: {
                OptInTimestamp: [timestamp]
            },
        }
    };

    try {
        // Send the UpdateEndpointCommand to update the endpoint's opt-in status
        const updateEndpointResponse = await pinClient.send(new
 UpdateEndpointCommand(params));
        console.log(updateEndpointResponse);
        console.log(`Successfully changed the opt status of endpoint ID
 ${endpointId}`);
    } catch (error) {
        console.error('An error occurred while updating endpoint:', error);
        throw error; // Rethrow the error to handle it upstream
    }
}
```

7. Under **Environment variables**, do the following:

   - In the first row, create a variable with a key of **`projectId`**. Next, set the value to the unique ID of the project that you created in Create an Amazon Pinpoint project.
   - In the second row, create a variable with a key of **`region`**. Next, set the value to the Region that you use Amazon Pinpoint in, such as **`us-east-1`** or **`us-west-2`**.
   - In the third row, create a variable with a key of **`confirmKeyword`**. Next, set the value to the confirmation keyword that you created in Enable two-way SMS.

> **Note**
>
> The keyword isn't case sensitive. This function converts the incoming message to lowercase letters.

When you finish, the **Environment Variables** section should resemble the example shown in the following image.



8. At the top of the page, choose **Save**.

Test the function

After you create the function, you should test it to make sure that it's configured properly. Also, make sure that the IAM role you created has the appropriate permissions.

To test the function

1. Choose **Test**.
2. On the **Configure test event** window, do the following:
   a. Choose **Create new test event**.
   b. For **Event name**, enter a name for the test event, such as **`MyResponse`**.
   c. Erase the example code in the code editor. Paste the following code:

```
{
  "Records":[
    {
      "Sns":{
        "Message":"{\"originationNumber\":\"+12065550142\",\"messageBody\":
\"Yes\"}",
        "Timestamp":"2019-02-20T17:47:44.147Z"
      }
    }
  ]
}
```

In the preceding code example, replace the values of the `originationNumber` attribute with the phone number that you used when you tested the previous Lambda function. Replace the value of `messageBody` with the two-way SMS keyword that you specified in Enable two-way SMS. Optionally, you can replace the value of `Timestamp` with the current date and time.

d. Choose **Create**.

3. Choose **Test** again.
4. Under **Execution result: succeeded**, choose **Details**. In the **Log output** section, review the output of the function. Make sure that the function ran without errors.
5. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
6. On the **All projects** page, choose the project that you created in Create an Amazon Pinpoint project.
7. In the navigation pane, choose **Segments**. On the **Segments page**, choose **Create a segment**.
8. In **Segment group 1**, under **Add filters to refine your segment**, choose **Filter by user**.
9. For **Choose a user attribute**, choose **FirstName**. Then, for **Choose values**, choose the first name that you specified in the test event.

   The **Segment estimate** section should show that there is one eligible endpoint, and one total endpoint.

Next: Set up Amazon API Gateway

Set up Amazon API Gateway for SMS messaging in Amazon Pinpoint

In this section, you create a new API by using Amazon API Gateway as part of the SMS registration for Amazon Pinpoint. The registration form that you deploy in this solution calls this API. API Gateway then passes the information that's captured on the registration form to the Lambda function you created in Create Lambda functions.

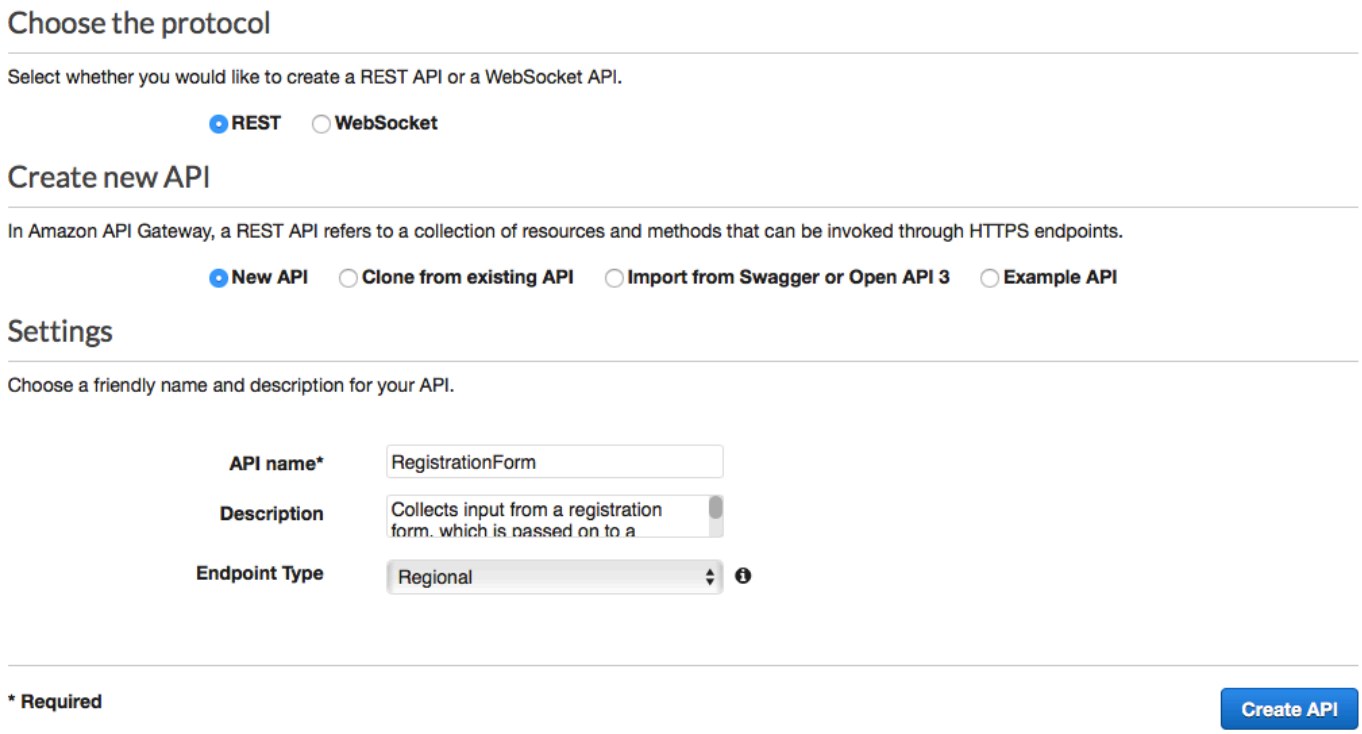
Create the API

First, you have to create a new API in API Gateway. The following procedures show you how to create a new REST API.

To create a new API

1. Open the API Gateway console at https://console.aws.amazon.com/apigateway/.
2. Choose **Create API**. Make the following selections:
   - Under **Choose the protocol**, choose **REST**.
   - Under **Create new API**, choose **New API**.
   - Under **Settings**, for **Name**, enter a name, such as **`RegistrationForm`**. For **Description**, optionally enter some text that describes the purpose of the API. For **Endpoint Type**, choose **Regional**. Then, choose **Create API**.

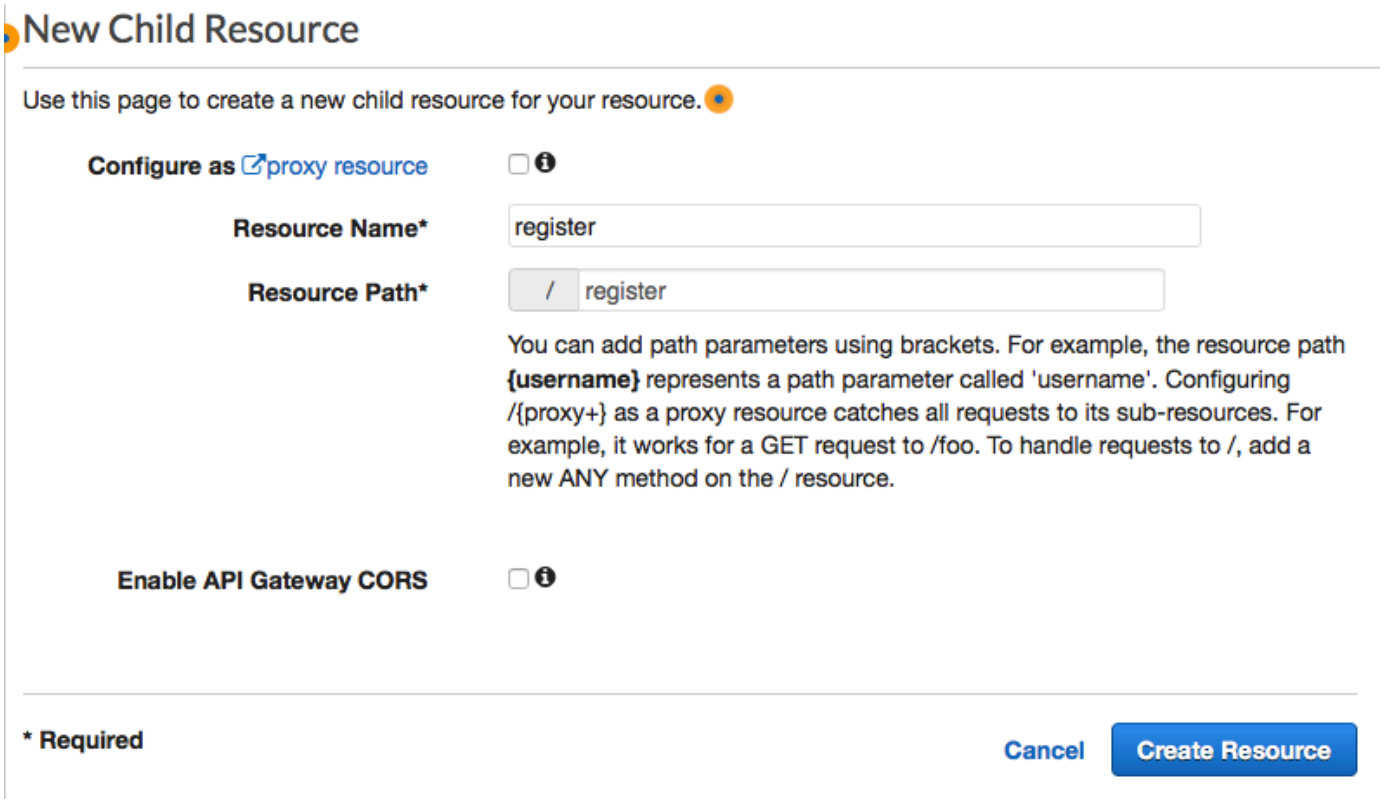
   An example of these settings is shown in the following image.



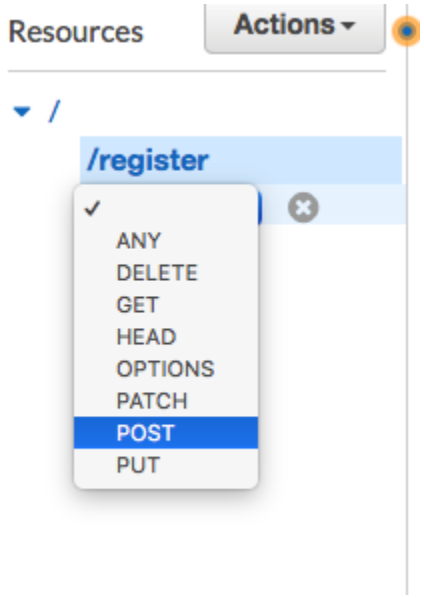
Create a resource

Now that you've created an API, you can start to add resources to it. After that, you add a POST method to the resource, and tell API Gateway to pass the data that you receive from this method to your Lambda function.

1. On the **Actions** menu, choose **Create Resource**. In the **New Child Resource** pane, for **Resource Name**, enter **`register`**, as shown in the following image. Choose **Create Resource**.



2. On the **Actions** menu, choose **Create Method**. From the menu that appears, choose **POST**, as shown in the following image. Then choose the **check mark** button.

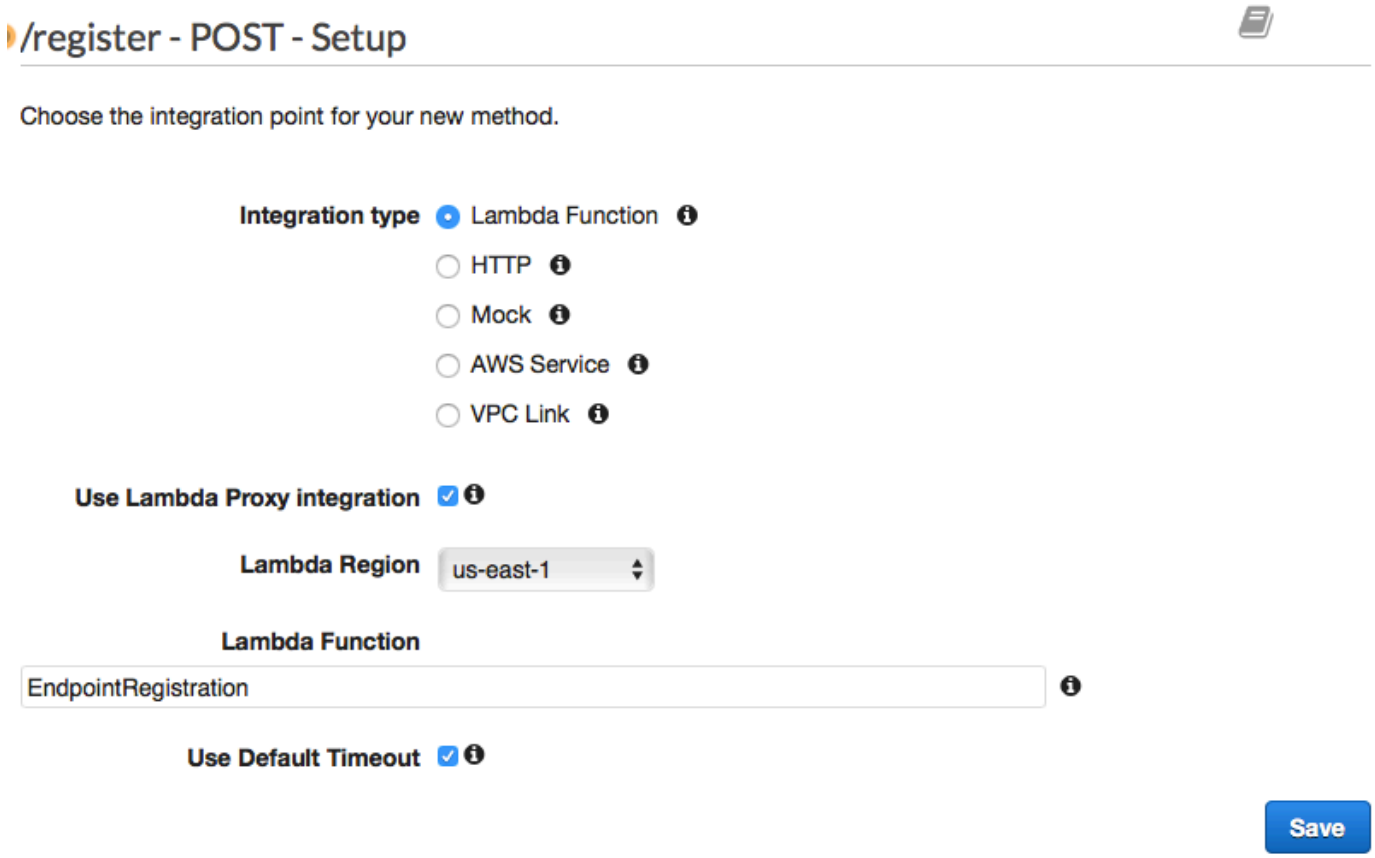


3. In the **/register - POST - Setup** pane, make the following selections:

   - For **Integration type**, choose **Lambda Function**.
   - Choose **Use Lambda Proxy Integration**.

- For **Lambda Region**, choose the Region that you created the Lambda function in.
- For **Lambda Function**, choose the RegisterEndpoint function that you created in Create Lambda functions.

An example of these settings is shown in the following image.



Choose **Save**. On the window that appears, choose **OK** to give API Gateway permission to execute your Lambda function.

Deploy the API

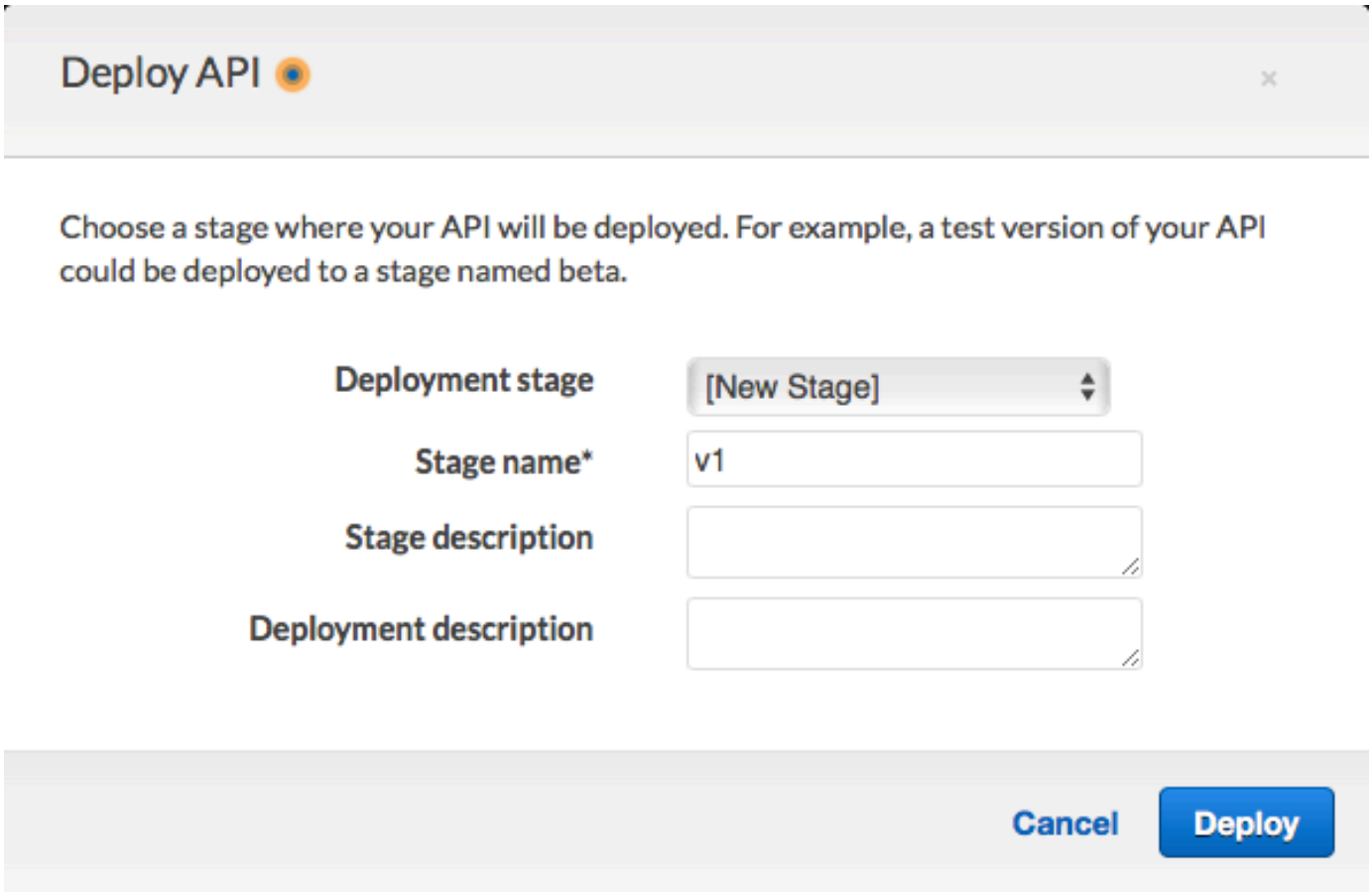
The API is now ready to use. At this point, you have to deploy it in order to create a publicly accessible endpoint.

1. On the **Actions** menu, choose **Deploy API**. On the **Deploy API** window, make the following selections:

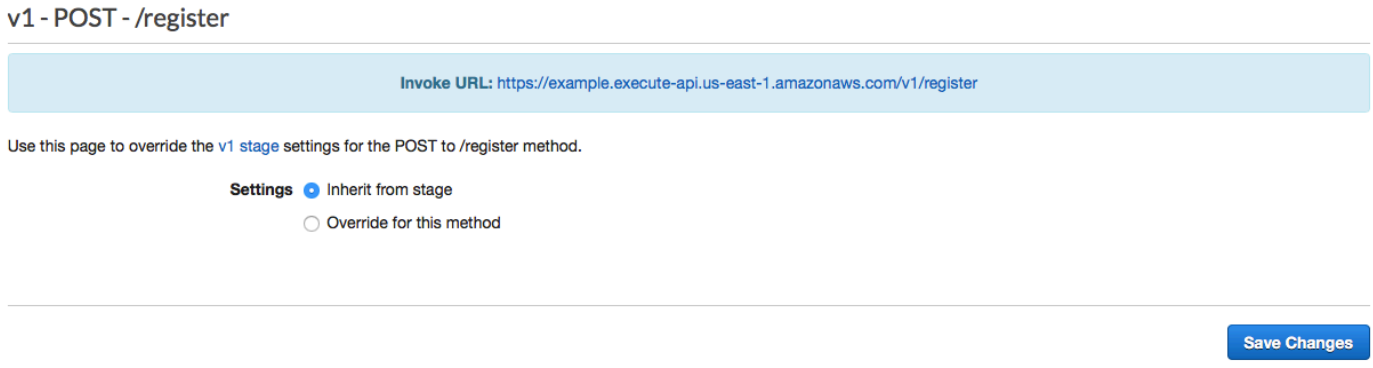
   - For **Deployment stage**, choose **[New Stage]**.

- For **Stage name**, enter **v1**.
- Choose **Deploy**.

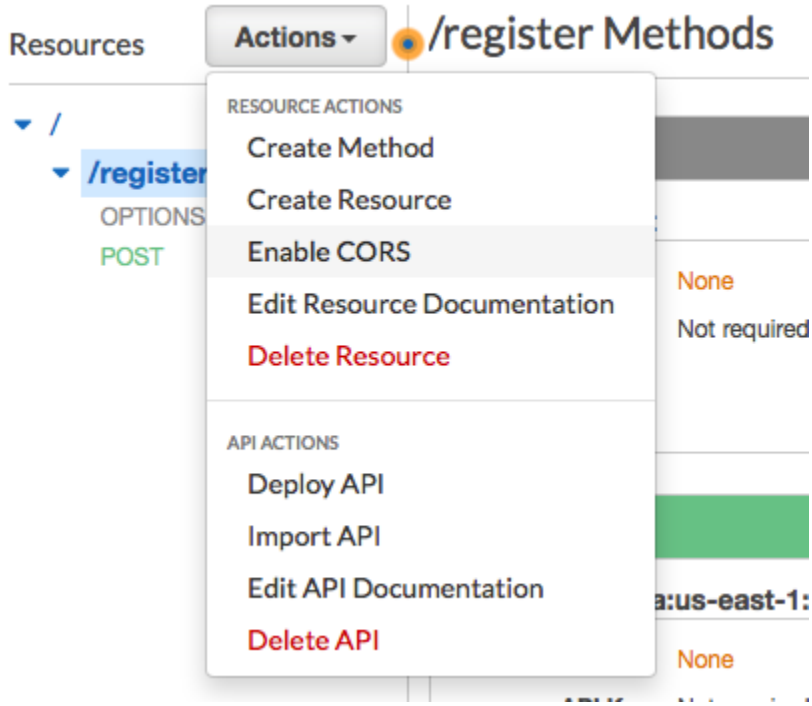
An example of these selections is shown in the following image.



2. In the **v1 Stage Editor** pane, choose the **/register** resource, and then choose the **POST** method. Copy the address that's shown next to **Invoke URL**, as shown in the following image.



3. In the navigation pane, choose **Resources**. In the list of resources, choose the **/register** resource. Finally, on the **Actions** menu, choose **Enable CORS**, as shown in the following image.



4. On the **Enable CORS** pane, choose **Enable CORS and replace existing CORS headers**.

Next: Create and deploy the web form

Create and deploy the web form to use SMS messaging for Amazon Pinpoint

All of the components that use AWS services for SMS messaging using Amazon Pinpoint are now in place. The last step is to create and deploy the web form that captures customer's data.

Create the JavaScript form handler

In this section, you create a JavaScript function that parses the content of the web form that you create in the next section. After parsing the content, this function sends the data to the API that you created in Set up Amazon API Gateway.

To create the form handler

1. In a text editor, create a new file.
2. In the editor, paste the following code.

```
$(document).ready(function() {
```

```
 // Handle form submission.
 $("#submit").click(function(e) {

   var firstName = $("#firstName").val(),
       lastName = $("#lastName").val(),
       source = window.location.pathname,
       optTimestamp = undefined,
       utcSeconds = Date.now() / 1000,
       timestamp = new Date(0),
       phone = $("#areaCode").val()
             + $("#phone1").val()
             + $("#phone2").val();

   e.preventDefault();

   if (firstName == "") {
     $('#form-response').html('<div class="mt-3 alert alert-info"
role="alert">Please enter your first name.</div>');
   } else if (lastName == "") {
     $('#form-response').html('<div class="mt-3 alert alert-info"
role="alert">Please enter your last name.</div>');
   } else if (phone.match(/[^0-9]/gi)) {
     $('#form-response').html('<div class="mt-3 alert alert-info"
role="alert">Your phone number contains invalid characters. Please check the phone
number that you supplied.</div>');
   } else if (phone.length < 10) {
     $('#form-response').html('<div class="mt-3 alert alert-info"
role="alert">Please enter your phone number.</div>');
   } else if (phone.length > 10) {
     $('#form-response').html('<div class="mt-3 alert alert-info"
role="alert">Your phone number contains too many digits. Please check the phone
number that you supplied.</div>');
   } else {
     $('#submit').prop('disabled', true);
     $('#submit').html('<span class="spinner-border spinner-border-sm"
role="status" aria-hidden="true"></span>  Saving your preferences</button>');

     timestamp.setUTCSeconds(utcSeconds);

     var data = JSON.stringify({
       'destinationNumber': phone,
       'firstName': firstName,
       'lastName': lastName,
       'source': source,
```

```
        'optTimestamp': timestamp.toString()
      });

      $.ajax({
        type: 'POST',
        url: 'https://example.execute-api.us-east-1.amazonaws.com/v1/register',
        contentType: 'application/json',
        data: data,
        success: function(res) {
          $('#form-response').html('<div class="mt-3 alert alert-success"
 role="alert"><p>Congratulations! You&apos;ve successfully registered for SMS
 Alerts from ExampleCorp.</p><p>We just sent you a message. Follow the instructions
 in the message to confirm your subscription. We won&apos;t send any additional
 messages until we receive your confirmation.</p><p>If you decide you don&apos;t
 want to receive any additional messages from us, just reply to one of our messages
 with the keyword STOP.</p></div>');
          $('#submit').prop('hidden', true);
          $('#unsubAll').prop('hidden', true);
          $('#submit').text('Preferences saved!');
        },
        error: function(jqxhr, status, exception) {
          $('#form-response').html('<div class="mt-3 alert alert-danger"
 role="alert">An error occurred. Please try again later.</div>');
          $('#submit').text('Save preferences');
          $('#submit').prop('disabled', false);
        }
      });
    }
  });
});
```

3. In the preceding example, replace *https://example.execute-api.us-east-1.amazonaws.com/v1/register* with the Invoke URL that you obtained in Deploy the API.
4. Save the file.

Create the form file

In this section, you create an HTML file that contains the form that customers use to register for your SMS program. This file uses the JavaScript form handler that you created in the previous section to transmit the form data to your Lambda function.

Important

When a user submits this form, it triggers a Lambda function that calls several Amazon Pinpoint API operations. Malicious users could launch an attack on your form that could cause a large number of requests to be made. If you plan to use this solution for a production use case, you should secure it by using a system such as Google reCAPTCHA.

To create the form

1. In a text editor, create a new file.
2. In the editor, paste the following code.

```
<!doctype html>
<html lang="en">

<head>
  <!-- Meta tags required by Bootstrap -->
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-
fit=no">

  <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/
css/bootstrap.min.css" integrity="sha384-ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/
iJTQUOhcWr7x9JvoRxT2MZw1T" crossorigin="anonymous">
  <script src="https://code.jquery.com/jquery-3.3.1.slim.min.js" integrity="sha384-
q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi6jizo"
 crossorigin="anonymous"></script>
  <script src="https://cdnjs.cloudflare.com/ajax/libs/
popper.js/1.14.7/umd/popper.min.js" integrity="sha384-
UO2eT0CpHqdSJQ6hJty5KVphtPhzWj9WO1clHTMGa3JDZwrnQq4sF86dIHNDz0W1"
 crossorigin="anonymous"></script>
  <script src="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/js/
bootstrap.min.js" integrity="sha384-JjSmVgyd0p3pXB1rRibZUAYoIIy6OrQ6VrjIEaFf/
nJGzIxFDsf4x0xIM+B07jRM" crossorigin="anonymous"></script>
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js"></
script>

  <script type="text/javascript" src="SMSFormHandler.js"></script>
  <title>SMS Registration Form</title>
</head>
```

```
<body>
  <div class="container">
    <div class="row justify-content-center mt-3">
      <div class="col-md-6">
        <h1>Register for SMS Alerts</h1>
        <p>Enter your phone number below to sign up for PromotionName messages from
 ExampleCorp.</p>
        <p>We don't share your contact information with anyone else. For more
 information, see our <a href="http://example.com/privacy">Privacy Policy</a>.</p>
        <p>ExampleCorp alerts are only available to recipients in the United
 States.</p>
      </div>
    </div>
    <div class="row justify-content-center">
      <div class="col-md-6">
        <form>
          <div class="form-group">
            <label for="firstName" class="font-weight-bold">First name</label>
            <input type="text" class="form-control" id="firstName"
 placeholder="Your first name" required>
          </div>
          <div class="form-group">
            <label for="lastName" class="font-weight-bold">Last name</label>
            <input type="text" class="form-control" id="lastName" placeholder="Your
 last name" required>
          </div>
          <label for="areaCode" class="font-weight-bold">Phone number</label>
          <div class="input-group">
            <span class="h3">( </span>
            <input type="tel" class="form-control" id="areaCode" placeholder="Area
 code" required>
            <span class="h3"> ) </span>
            <input type="tel" class="form-control" id="phone1" placeholder="555"
 required>
            <span class="h3"> - </span>
            <input type="tel" class="form-control" id="phone2" placeholder="0199"
 required>
          </div>
          <div id="form-response"></div>
          <button id="submit" type="submit" class="btn btn-primary btn-block
 mt-3">Submit</button>
        </form>
      </div>
    </div>
```

```
    <div class="row mt-3">
      <div class="col-md-12 text-center">
        <small class="text-muted">Copyright © 2019, ExampleCorp or its
 affiliates.</small>
      </div>
    </div>
  </div>
</body>

</html>
```

3. In the preceding example, replace *SMSFormHandler.js* with the full path to the form handler JavaScript file that you created in the previous section.
4. Save the file.

Upload the form files

Now that you've created the HTML form and the JavaScript form handler, the last step is to publish these files to the internet. This section assumes that you have an existing web hosting provider. If you don't have an existing hosting provider, you can launch a website by using Amazon Route 53, Amazon Simple Storage Service (Amazon S3), and Amazon CloudFront. For more information, see Host a static website.

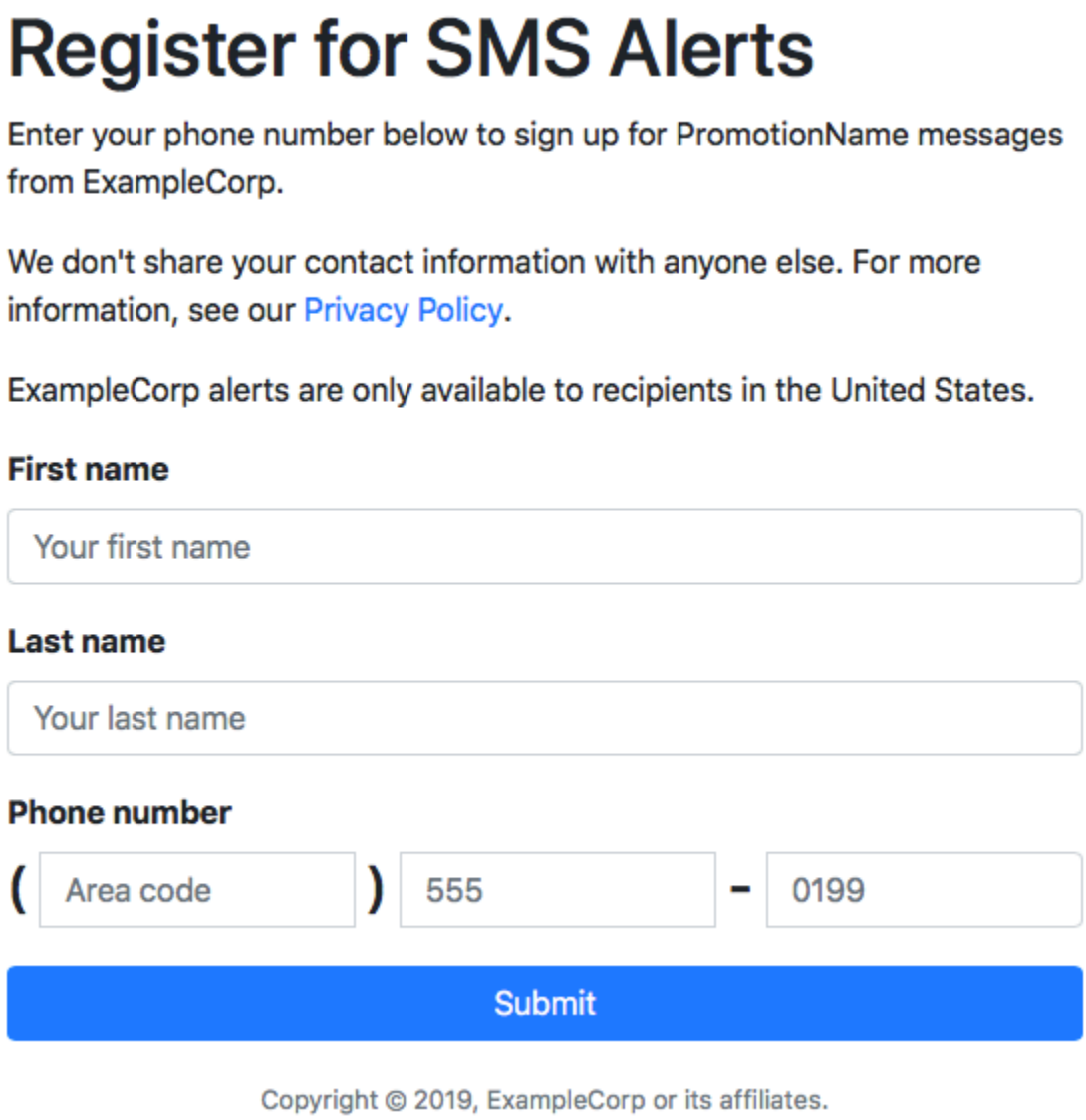
If you use another web hosting provider, consult the provider's documentation for more information about publishing webpages.

Test the form

After you publish the form, you should submit some test events to make sure that it works as expected.

To test the registration form

1. In a web browser, go to the location where you uploaded the registration form. If you used the code example from Create the JavaScript form handler, you see a form that resembles the example in the following image.

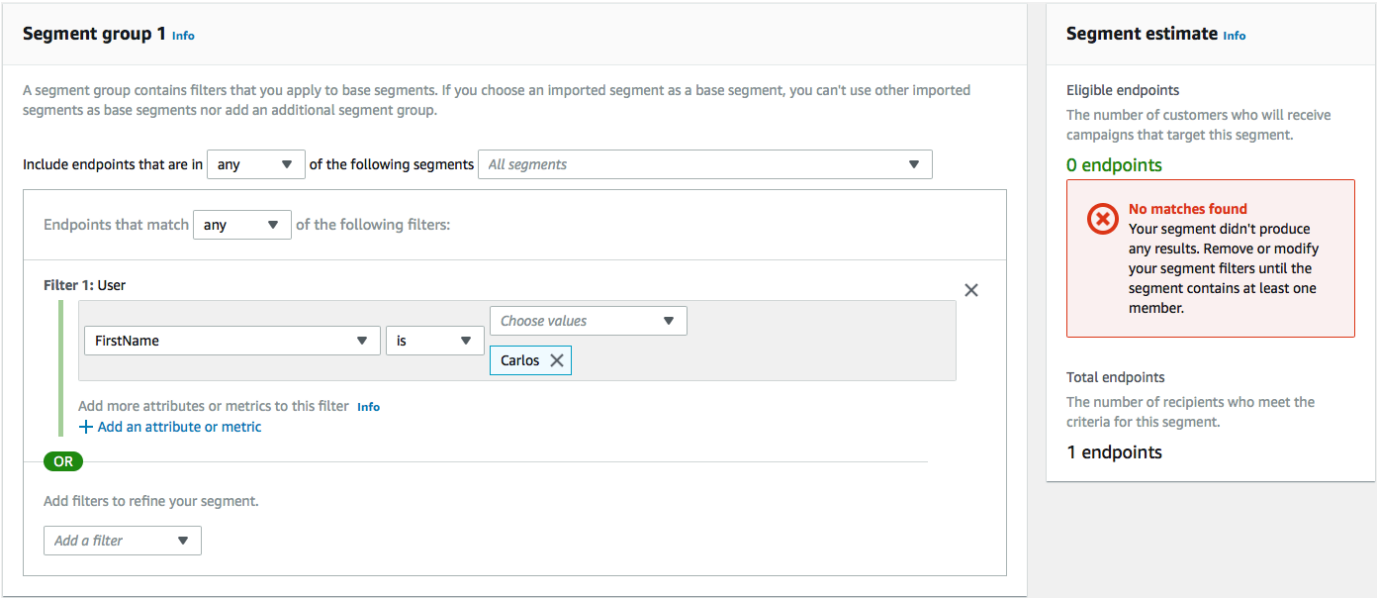


2. Enter your contact information in the **First name**, **Last name**, and **Phone number** fields.

> **Note**
>
> When you submit the form, Amazon Pinpoint attempts to send a message to the phone number that you specified. Because of this functionality, you should use a real phone number to test the solution from beginning to end.
> If you tested the Lambda function in Create Lambda functions, your Amazon Pinpoint project already contains at least one endpoint. When you test this form, you should either submit a different phone number on the form, or delete the existing endpoint by using the DeleteEndpoint API operation.

3. Check the device that's associated with the phone number that you specified to make sure that it received the message.
4. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
5. On the **All projects** page, choose the project that you created in Create an Amazon Pinpoint project.
6. In the navigation pane, choose **Segments**. On the **Segments page**, choose **Create a segment**.
7. In **Segment group 1**, under **Add filters to refine your segment**, choose **Filter by user**.
8. For **Choose a user attribute**, choose **FirstName**. Then, for **Choose values**, choose the first name that you specified when you submitted the form.

   The **Segment estimate** section should show that there are zero eligible endpoints, and one endpoint (under Total endpoints), as shown in the following example. This result is expected. When the Lambda function creates a new endpoint, the endpoint is opted out by default.



9. On the device that received the message, reply to the message with the two-way SMS keyword that you specified in Enable two-way SMS. Amazon Pinpoint sends a response message immediately.
10. In the Amazon Pinpoint console, repeat steps 4 through 8. This time, when you create the segment, you see one eligible endpoint, and one total endpoint. This result is expected, because the endpoint is now opted in.

Next steps

By completing this tutorial, you've done the following:

- Created an Amazon Pinpoint project, configured the SMS channel, and obtained a dedicated long code.
- Created a IAM policy that uses the principal of least privilege to grant access rights, and associated that policy with a role.
- Created two Lambda functions that use the PhoneNumberValidate, UpdateEndpoint, and SendMessages operations in the Amazon Pinpoint API.
- Created a REST API using API Gateway.
- Created and deployed a web-based form that collects customers' contact information.
- Performed tests on the solution to make sure it works.

This section discusses a few ways that you can use the customer information that you collect by using this solution. It also includes some suggestions of ways that you can customize this solution to fit your unique use case.

Create customer segments

All of the customer details that you collect through this form are stored as endpoints. This solution creates endpoints that contain several attributes that you can use for segmentation purposes.

For example, this solution captures an endpoint attribute called `Source`. This attribute contains the full path to the location where the form was hosted. When you create a segment, you can filter the segment by endpoint, and then further refine the filter by choosing a `Source` attribute.

Creating segments based on the `Source` attribute can be useful in several ways. First, it allows you to quickly create a segment of customers who signed up to receive SMS messages from you. Additionally, the segmentation tool in Amazon Pinpoint automatically excludes endpoints that aren't opted in to receive messages.

The `Source` attribute is also useful if you decide to host the registration form in several different locations. For example, your marketing material could refer to a form that's hosted in one location, while customers who encounter the form while browsing your website could see a version that's hosted somewhere else. When you do this, the Source attributes for customers who complete the form after seeing your marketing materials are different from those who complete the form after

finding it on your website. You can use this difference to create distinct segments, and then send tailored communications to each of those audiences.

Send personalized campaign messages

After you create segments, you can start sending campaigns to those segments. When you create campaign messages, you can personalize them by specifying which endpoint attributes you want to include in the message. For example, the web form used in this solution requires the customer to enter their first and last names. These values are stored in the user record that's associated with the endpoint.

For example, if you use the `GetEndpoint` API operation to retrieve information about an endpoint that was created using this solution, you see a section that resembles the following example:

```
...
"User": {
  "UserAttributes": {
    "FirstName": [
      "Carlos"
    ],
    "LastName": [
      "Salazar"
    ]
  }
}
...
```

If you want to include the values of these attributes in your campaign message, you can use dot notation to refer to the attribute. Then enclose the entire reference in double curly braces. For example, to include each recipient's first name in a campaign message, include the following string in the message: `{{User.UserAttributes.FirstName}}`. When Amazon Pinpoint sends the message, it replaces the string with the value of the `FirstName` attribute.

Use the form to collect additional information

You can modify this solution to collect additional information on the registration form. For example, you could ask the customer to provide their address, and then use the address data to populate the `Location.City`, `Location.Country`, `Location.Region`, and `Location.PostalCode` fields in the `Endpoint` resource. Collecting address information on the registration form might result in the endpoint containing more accurate information. To make

this change, you need to add the appropriate fields to the web form. You also have to modify the JavaScript code for the form to pass the new values. Finally, you have to modify the Lambda function that creates the endpoint to handle the new incoming information.

You can also modify the form so that it collects contact information in other channels. For example, you could use the form to collect the customer's email address in addition to their phone number. To make this change, you need to modify the HTML and JavaScript for the web form. You also have to modify the Lambda function that creates the endpoint so that it creates two separate endpoints (one for the email endpoint, and one for the SMS endpoint). You should also modify the Lambda function so that it generates a unique value for the `User.UserId` attribute, and then associates that value with both endpoints.

Record additional attributes for auditing purposes

This solution records two valuable attributes when it creates and updates endpoints. First, when the first Lambda function initially creates the endpoint, it records the URL of the form itself in the `Attributes.Source` attribute. If the customer responds to the message, the second Lambda function creates an `Attributes.OptInTimestamp` attribute. This attribute contains the exact date and time when the customer provided their consent to receive messages from you.

Both of these fields can be useful if you're ever asked by a mobile carrier or regulatory agency to provide evidence of a customer's consent. You can retrieve this information at any time by using the GetEndpoint API operation.

You can also modify the Lambda functions to record additional data that might be useful for auditing purposes, such as the IP address that the registration request was submitted from.

Amazon Pinpoint projects

In Amazon Pinpoint, a *project* is a collection of recipient information, segments, campaigns, and journeys. New Amazon Pinpoint users should start by creating a project. If you've used the Amazon Pinpoint API, you might have seen references to *applications*. In Amazon Pinpoint, projects and applications are interchangeable terms.

Generally, you configure settings for each project, and these settings apply by default to all the campaigns and journeys in the project. If you want to tailor an individual campaign or journey to meet specific needs, you can change certain settings for the campaign or journey. Your changes then override the default settings for the project, and the campaign or journey uses the custom settings that you chose.

In addition to the settings that are specific to an individual project, campaign, or journey, there are also some account-level settings. These account-level settings apply to all the projects for your Amazon Pinpoint account and, in some cases, other AWS services. These settings include:

- Production access and sending quotas for channels.
- SMTP credentials and other settings for sending email by using the Amazon Pinpoint SMTP interface.
- Dedicated phone numbers for sending SMS and voice messages, and for receiving SMS messages.
- Verified identities for sending email and SMS messages.
- SMS information such as short codes, long codes, 10DLC, keywords, and registered sender IDs for sending SMS messages.

To view all the settings for your Amazon Pinpoint account, open an Amazon Pinpoint project, choose **Settings** in the navigation pane, and then choose the type of setting that you want to view.

Topics

- Managing Amazon Pinpoint projects

Managing Amazon Pinpoint projects

You can use the Amazon Pinpoint console to create, view, edit, and delete projects. Within a project, you can also import endpoints, build segments, create campaigns, create journeys, and view analytics data for that project.

Use the **General settings** page to specify when Amazon Pinpoint can send messages for campaigns and journeys in the current project and how many messages Amazon Pinpoint can send for those campaigns and journeys. This includes settings such as the time frame for sending messages and the maximum number of messages to send to each endpoint. You can also use the **General settings** page to delete a project.

Creating a project

The procedure for creating a new project differs depending on whether your account already contains projects in the current AWS Region.

Option 1: Create and configure a project (new Amazon Pinpoint users)

The procedures in this section show you how to create a new project. If you've never created a project in Amazon Pinpoint, complete the procedures in this section.

If your Amazon Pinpoint account includes one or more existing projects, you should complete the steps in Option 2: Create and configure a project (existing Amazon Pinpoint users) instead.

To create a project

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. If this is your first time using Amazon Pinpoint, you see a page that introduces you to the features of the service.

   In the **Get started** section, enter a name for your project, and then choose **Create a project**. The project name that you specify can contain up to 64 characters.

   > **Note**
   >
   > You can't rename a project after it's been created.

3. On the **Configure features** page, choose a channel to configure. For example, if you plan to use the project to send email, choose the **Configure** button in the **Email** section.

   When you choose to set up a channel, you see options related to configuring that channel. For example, if you choose to set up the email channel, you see options related to verifying an email address. If you choose to , you see options related to setting your spending limit and default message type.

> **Note**
>
> You can configure additional channels in this project later. You aren't limited to only sending messages through the channel that you configured during this process.

Option 2: Create and configure a project (existing Amazon Pinpoint users)

The procedures in this section show you how to create a project if your Amazon Pinpoint account already includes one or more existing projects.

If your Amazon Pinpoint account doesn't contain any projects, you should complete the steps in Option 1: Create and configure a project (new Amazon Pinpoint users) instead.

To create a project

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose **Create a project**.
3. On the **Create a project** window, for **Project name**, enter a name for your project, and then choose **Create**. The project name that you specify can contain up to 64 characters.
4. On the **Configure features** page, choose a channel to configure. For example, if you plan to use the project to send email, choose the **Configure** button in the **Email** section.

   When you choose to set up a channel, you see options related to configuring that channel. For example, if you choose to set up the email channel, you see options related to verifying an email address. If you choose to set up the SMS channel, you see options related to setting your spending limit and default message type.

   > **Note**
   >
   > You can configure additional channels in this project later. You aren't limited to only sending messages through the channel that you configured during this process.
   > If you prefer to set up channels later, choose **Skip this step**.

Editing a project's default settings

On the **General settings** page, you can configure default settings and quotas that you want to apply to campaigns and journeys in a project. When you change these settings, Amazon Pinpoint automatically applies them to all new campaigns and journeys that you create for the project. The settings aren't applied to any campaigns or journeys that you previously created. You can also configure these same settings for individual campaigns and journeys. If you configure settings for an individual campaign or journey, those settings override the settings that you choose on the **General settings** page.

To configure default settings for a project

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to change the default settings for.
3. In the navigation pane, under **Settings**, choose **General settings**.
4. Choose **Edit**.
5. On the **Edit general settings** page, change any of the following settings:

   a. *Campaign settings*

      Quiet time hours

      Use these settings to prevent Amazon Pinpoint from sending messages during specific hours. When you configure these settings, you provide a **Start time** and an **End time**. If a message would be sent between the start and end times in an endpoint's local time zone, Amazon Pinpoint doesn't attempt to send the message to that endpoint.

      > **Note**
      >
      > In order for this setting to observe local time zones, the endpoint definition for a recipient has to include a properly-formatted `Demographic.Timezone` attribute.

      The times that you specify must use 24-hour notation and be in *HH:MM* format. For example, for 9:30 PM, enter **`21:30`**.

Maximum number of daily messages per endpoint

Use this setting to specify the maximum number of messages that can be sent to a single endpoint during a 24-hour period by all the campaigns in the project. The value that you specify can't be larger than 100.

> **Note**
>
> In certain situations, it's possible for an endpoint to receive a number of messages that exceed the value that you specify in this setting. For example, assume that this setting is configured to send a maximum of five messages per day. If you have 10 campaigns that target the endpoint, and all 10 are launched at the same time, then the endpoint receives 10 messages. However, if there are 10 campaigns that target the endpoint, and the start times for the campaigns are separated by several minutes, then the recipient only receives five messages.

Maximum number of messages per endpoint

Use this setting to specify the maximum number of messages that can be sent to a single endpoint by each campaign. If a campaign recurs, this setting applies to all runs of the campaign. The value that you specify can't be larger than 100.

> **Note**
>
> This setting considers the number of messages that *target* an endpoint, as opposed to the number of messages that are actually *delivered* to an endpoint. For example, if a campaign is configured to automatically send a message when a customer creates a new account, but the endpoint isn't able to receive the message (for example, if the quiet time setting applies to the endpoint), then the endpoint is still counted as having been targeted. In this situation, the endpoint would be removed from subsequent runs of the campaign.

Maximum number of messages per second

Use this setting to specify the maximum number of messages that can be sent each second by a campaign. The value that you specify has to be a number between 1 and 20,000. If you define a messages per second parameter, we try to match it. Otherwise, if this isn't defined, we attempt to deliver the message as fast as possible. Note that delivery speed, however, is dependent on channel latency at any given time.

Maximum amount of time for a campaign run

Use this setting to specify the maximum amount of time, in seconds, that a campaign can attempt to deliver a message after the scheduled start time. The minimum value for this setting is 60 seconds.

b. *Journey settings*

Maximum daily messages per endpoint across all journeys

Use this setting to specify the maximum number of times in a 24 hour period that an endpoint can be messaged across all journeys. The default value is zero and means that there is no limit on the number of times an endpoint can be messaged in a 24 hour period.

Maximum number of messages across all journeys within a time frame

Use this setting to specify the maximum number of times a message can be sent to a single endpoint within the specified **Timeframe**. For example, if you want to send a maximum of three messages within a **Timeframe** of seven days to each endpoint. The default setting is 0, which means that there is no limit on the number of messages that endpoints in the journey can receive.

Timeframe

The number of days applied to the **Maximum number of messages across all journeys within a time frame** if not set to 0. The default setting is 0, which means that there is no limit on the number of days that endpoints in the journey can receive.

6. When you finish, choose **Save**.

Deleting a project

If you want to remove a project from Amazon Pinpoint completely, you can delete the project by using the Amazon Pinpoint console.

> **Warning**
>
> If you delete a project, Amazon Pinpoint deletes all project-specific settings, campaigns, journeys, and other information for the project. The information can't be recovered.

When you delete a project, Amazon Pinpoint deletes all project-specific settings for the push notification and two-way SMS messaging channels, and all segments, campaigns, journeys, and project-specific analytics data that's stored in Amazon Pinpoint, such as the following:

- Segments – All segment settings and data. For dynamic segments, this includes segment groups and filters that you defined. For imported segments, this includes endpoints, user IDs, and other data that you imported, and any filters that you applied.
- Campaigns – All messages, message treatments and variables, analytics data, schedules, and other settings.
- Journeys – All activities, analytics data, schedules, and other settings.
- Analytics – Data for all engagement metrics, such as the number of messages sent and delivered for campaigns and journeys, and all journey execution metrics. For mobile and web apps, all event data that wasn't streamed to another AWS service such as Amazon Kinesis, all funnels, and data for application usage, revenue, and demographic metrics. Before you delete a project, we recommend that you export this data to another location. For more information, see the section called “Exporting dashboards”.

Note that account-level settings and data for your Amazon Pinpoint account and your AWS account aren't deleted. This includes:

- Message templates.
- Production access and sending quotas for channels.
- Dedicated phone numbers for sending SMS and voice messages, and for receiving SMS messages.
- Verified identities for sending email and SMS messages.

- SMS information such as short codes, long codes, keywords, and registered sender IDs for sending SMS messages.
- SMTP credentials and other settings for sending email by using the Amazon Pinpoint SMTP interface.
- Configuration settings for connecting to and using machine learning models.

In addition, data that's stored in other AWS services isn't deleted. This includes event data that you streamed to other AWS services such as Amazon Kinesis, files that you imported from an Amazon Simple Storage Service (Amazon S3) bucket to define a segment, and any Amazon Pinpoint metrics and spending alarms that you configured in Amazon CloudWatch.

To delete a project

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to delete.
3. In the navigation pane, under **Settings**, choose **General settings**.
4. Choose **Delete project**.
5. Enter the name of the project that you want to delete, and then choose **Ok**.

Amazon Pinpoint channels

A *channel* represents the platform through which you engage your audience segment with messages. For example, to send push notifications to users of your apps, you must have an Amazon Pinpoint project in which the *push notifications* channel is enabled. Amazon Pinpoint supports the following channels:

- Push notifications
- Email
- SMS
- Voice
- In-app messages

In addition to these channels, you can also extend the capabilities to meet your specific use case by creating custom channels.

Before you can use Amazon Pinpoint to engage your audience, you have to create an Amazon Pinpoint project. After you create a project, you can use it to send campaigns. To engage your customers using campaigns, start by defining the audience segment that you want to engage. Next, define that campaign that you want to send to the segment.

Topics in this section

- Amazon Pinpoint push notifications
- Amazon Pinpoint email channel
- Amazon Pinpoint SMS channel
- Amazon Pinpoint voice channel
- Amazon Pinpoint in-app messaging channel
- Custom channels in Amazon Pinpoint

Amazon Pinpoint push notifications

Note

Amazon Pinpoint has updated their user guide documentation. To get the latest information regarding how to create, configure, and manage your Push resources, see the new AWS End User Messaging Push User Guide.
The following topics have been moved:

- Setting up Amazon Pinpoint mobile push channels
- Monitoring push notification activity

  To monitor push notification activity, you must use a campaign. You can't monitor push notification activity outside a campaign.
- Managing mobile push channels
- Sending Safari web push notifications
- Best practices

With Amazon Pinpoint, you can engage users of your apps by sending push notifications through a push notification channel. You can send push notifications to your apps using separate channels for the following push notification services:

- Firebase Cloud Messaging (FCM)
- Apple Push Notification service (APNs)

  Note

  You can use APNs to send messages to iOS devices such as iPhones and iPads, as well as to the Safari browser on macOS devices, such as Mac laptops and desktops.
- Baidu Cloud Push
- Amazon Device Messaging (ADM)

> **Note**
>
> Amazon Pinpoint sets the push endpoints with the earliest **EffectiveDate** to `INACTIVE` if a user has 15 endpoints and you add more push endpoints. See Older push endpoints automatically set to inactive for more information.

Topics

- Troubleshooting the push channel

Troubleshooting the push channel

Verify that logging is turned on to assist in identifying the cause of failure. For more information, see Monitoring and logging. For transactional push notifications that are not sent via a Campaign or Journey, log API response to learn on delivery status.

Monitoring delivery issues

- For direct push notification messages sent through the SendMessages API, verify that you capture the API response to get insights on the delivery. To do so, review the StatusMessage attribute inside the EndpointResult object in the response. This attribute contains the Platform response codes received from the Downstream Push Notification Service.
- For campaigns, verify that logging through Kinesis Data Streams is turned on. Review the Platform response codes in the _campaign.send event for delivery outcome received by Amazon Pinpoint from the Downstream Push Notification Service.

Message not received

Issues and solutions

- Device connectivity issues – If the issue is only occurring on certain devices, verify that these devices aren't blocked from connecting to the push notification service endpoints. See FCM ports and your firewall and If your Apple devices aren't getting Apple push notifications.
- Endpoint **OptOut** attribute value – If an endpoint **OptOut** value is set to `ALL`, the endpoint will not receive notifications. Use the get-endpoint CLI to confirm that the endpoint **OptOut** value is set to `NONE`. If the endpoint is opted out, messages sent through campaigns or journeys won't be delivered to the endpoint, and no logs will be generated.

- Token environment – Verify that the channel type for your Amazon Pinpoint endpoint matches the token generated for the device. For example, use GCM as a channel for an app token address with FCM integration and for APNs, APNS_Sandbox for your app in sandbox, or APNS for app in production.

  For insights on delivery attempts with a failure status, see the Push Notification Response codes for the respective Push Channel used in the delivery attempt.

Messages are not displayed

- If the logs show a Successful Delivery and if messages are not displayed on the system notification tray, this indicates an issue with the notification being delivered to the device but not being handled appropriately in the client application.
- You might see that the Kinesis event logs show a **Successful Delivery** status, or that an issue only occurs with a particular request payload or message type. This issue might indicate that the notification is being delivered to the device, but not being displayed on the system notification tray.

  This can occur with a particular request payload or Message type (E.g. Data for FCM, Silent for APNs). For example, if messages are received as alert/ notification payload but not as data/silent payload, check what the intended action is when a message type of data, notification, alert, or background is received on your application, and whether the application can handle the different message types.
- To troubleshoot, incorporate log statements in your app's message handler. For an example, see FCM and APNs. This will help determine whether the the notification is received by the device but not displayed in the system notifications tray.

Amazon Pinpoint email channel

> **Note**
>
> Amazon Pinpoint has always used Amazon SES for email delivery, and this update gives you more control over how Amazon Pinpoint uses your Amazon SES resources in your AWS account. For example, an Amazon SES resource can be a verified identity or configuration set. As part of this update, email billing will transition from Amazon Pinpoint to Amazon SES after you've updated your AWS account permissions.

Existing Amazon Pinpoint customers: Starting on *4/30/2024*, you should update your existing email projects to use the **Orchestration sending role arn**. All of your journeys and campaigns that send email will continue to function and use the Amazon Pinpoint API until you update the **Orchestration sending role arn**.

- For more information on creating the IAM role for **Orchestration sending role arn**, see Creating an email orchestration sending role in Amazon Pinpoint.
- For direct send, your IAM identity must have `ses:SendEmail` and `ses:SendRawEmail` permissions.
- To check if your project has been updated with an **Orchestration sending role arn**, see Find your email orchestration sending role ARN in Amazon Pinpoint.

New Amazon Pinpoint customers: Use the **Orchestration sending role arn** to send emails from your journeys or campaigns. Your journeys and campaigns that send email will use the Amazon SES API.

- For more information on creating the IAM role, see Creating an email orchestration sending role in Amazon Pinpoint.
- For direct send, your IAM identity must have `ses:SendEmail` and `ses:SendRawEmail` permissions.

You can test IAM policies to verify how they will work with a given identity by using the IAM policy simulator. For more information, see Testing IAM policies with the IAM policy simulator in the IAM User Guide.

Use the Email channel in Amazon Pinpoint to send email messages to your end users.

If you haven't used Amazon Pinpoint to send email, your account is in the email sandbox by default. When your account is in the email sandbox, you can only send email to addresses that you verify. Additionally, you can only send 200 emails in a 24-hour period, at a maximum throughput rate of one message per second. You can request to have your account removed from the sandbox by requesting production access for email.

You can monitor your email activity by viewing analytics in the Amazon Pinpoint console or by streaming email events to Kinesis.

As your email needs change, you can manage the email channel by updating your email address or domain, or requesting an increase to your sending quotas.

Choosing between Amazon Pinpoint and Amazon Simple Email Service (Amazon SES)

AWS also offers an email-only service called Amazon SES. Amazon Pinpoint uses Amazon SES highly scalable email infrastructure to send email. The two services offer different features and are intended for different audiences and use cases.

Amazon SES has an API and an SMTP interface, both of which are well suited to sending email from your applications or services. You can also use the Amazon SES SMTP interface to integrate with existing third-party applications, such as Customer Relationship Management (CRM) applications. Amazon SES also offers email features not included in Amazon Pinpoint, including email receiving capabilities, dedicated IP pools, and cross-account sending authorization capabilities.

Amazon Pinpoint is well-suited to users who want to send orchestrated communications, including scheduled campaigns and multi-step customer journeys. Amazon Pinpoint also includes features not included with Amazon SES, such as audience segmentation, campaign and journey analytics, and a web-based console that is accessible to less technical users.

For more information about sending email using Amazon SES, see the Amazon SES Developer Guide.

Topics

- Amazon Pinpoint email sandbox
- Setting up the Amazon Pinpoint email channel
- Monitoring email activity with Amazon Pinpoint
- Managing the Amazon Pinpoint email channel
- Sending email in Amazon Pinpoint
- Using dedicated IP addresses with Amazon Pinpoint
- The Amazon Pinpoint Deliverability dashboard
- Email best practices
- Troubleshooting the email channel

Amazon Pinpoint email sandbox

We use a sandbox environment to help protect our customers from fraud and abuse. The sandbox environment also helps you establish your sender reputation with ISPs and email recipients. New Amazon Pinpoint email user accounts are placed in the sandbox environment. While your account is in the sandbox, you have full access to Amazon Pinpoint email sending methods, with the following restrictions:

- You can send email only from verified addresses and domains.
- You can send email only to addresses that you have verified or addresses that are associated with the mailbox simulator.
- You can send a maximum of 200 messages within 24 hours.
- You can send a maximum of one message per second.

To learn how to remove these restrictions, see Requesting a quota increase.

Setting up the Amazon Pinpoint email channel

To set up the Amazon Pinpoint email channel, you start by verifying the email address or domain that you want to use when you send email from that project. Next, you create a project, enable the email channel in that project, and choose an email address or domain to use.

When you enable the email channel for the first time, Amazon Pinpoint doesn't immediately provide production access for email messaging. Instead, your AWS account has access only to the email sandbox, which imposes restrictions on your email traffic. To gain production access, submit a request to Support.

Use the **Email** settings page to view information about email usage for your Amazon Pinpoint account, such as the number of emails that you've sent during the past 24 hours and whether there are sending restrictions on your account.

You can also use the **Email** settings page to enable or disable the email channel for the current project. If you disable the email channel for the project, you can't send email from campaigns or journeys in the project. However, you can send transactional email from your Amazon Pinpoint account. To enable Amazon Pinpoint to send email for your campaigns or journeys you must create or update an IAM role to allow Amazon Pinpoint to send email on your behalf through Amazon SES, see Creating an email orchestration sending role in Amazon Pinpoint.

In addition, you can use the **Email** settings page to verify email identities for the current project. In Amazon Pinpoint, an *identity* is an email address or domain that you use to send email. Every email address that you want to use as a *From*, *Source*, *Sender*, or *Return path* address in email has to be verified before you can send email with it by using Amazon Pinpoint.

Topics

- Creating an Amazon Pinpoint project with email support
- Verifying email identities
- Creating an email orchestration sending role in Amazon Pinpoint

Creating an Amazon Pinpoint project with email support

To send email with Amazon Pinpoint, you start by creating an Amazon Pinpoint project. When you create a project, you can enable the email channel for it, and then choose the email identity that you want to use as the sender address. If you haven't already verified an identity to use with Amazon Pinpoint, you can verify an email address when you create the project.

In Amazon Pinpoint, an *identity* is an email address or domain that you use to send email. Before you can send email using Amazon Pinpoint, you must verify each identity that you plan to use as a *From*, *Source*, *Sender*, or *Return path* address to prove that you own the identity. For more information about verifying identities, see Verifying email identities.

> **Note**
>
> If your account is still in the Amazon Pinpoint email sandbox, you also need to verify the identities that you plan to send email to. For more information about the email sandbox, see Increasing your sending quotas.
> If you have already created the project you can enable email by following the directions at Enabling and disabling the email channel.

Topics

- Creating an email project when you haven't yet verified an identity
- Creating an email project when you've already verified an identity

Creating an email project when you haven't yet verified an identity

If you haven't used Amazon Pinpoint to send email in the past, you probably haven't verified any identities. The procedure in this section describes the process of creating a project and verifying a single email address at the same time.

If you've already verified an identity, or if you want to verify an entire domain instead of a single address, use the procedures in Verifying a domain instead.

To create a new email project and verify an email address

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose **Create a project**.
3. For **Project name**, enter a name, and then choose **Create**.

   > **Note**
   >
   > The project name can contain up to 64 alphanumeric characters. It can also include the following characters: comma (,), period (.), at sign (@), underscore (_), equals sign (=), and plus sign (+).

4. On the **Configure features** page, under **Email**, choose **Configure**.
5. On the **Set up email** page, for **Email address**, enter the email address that you want to use to send email from this project. Amazon Pinpoint sends an email to the address that you entered. Open the email, and then click the link in the message to verify the email address.

Creating an email project when you've already verified an identity

If you've already verified an email identity, you can use that identity with your new project.

To create a new email project and choose an existing identity

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose **Create a project**.
3. For **Project name**, enter a name, and then choose **Create**.

> **Note**
>
> The project name can contain up to 64 alphanumeric characters. It can also include the following characters: comma (,), period (.), at sign (@), underscore (_), equals sign (=), and plus sign (+).

4. On the **Configure features** page, choose **Skip this step**.
5. In the navigation pane, under **Settings**, choose **Email**.
6. Next to **Identity details**, choose **Edit**.
7. Choose **Enable the email channel for this project**.
8. For **Identity type**, choose either **Email address** or **Domain**, depending on the type of verified identity that you want to use.
9. Choose **Use an existing email address** if you chose **Email address** in the preceding step, or choose **Use an existing domain** if you chose **Domain**.
10. From the list, choose the verified email address or domain that you want to use.
11. If you're setting up a domain, specify the **Default sender address** for that domain.
12. (Optional) For **Friendly sender name**, enter the name that you want to appear in your recipients' email clients.
13. When you finish, choose **Save**.

Verifying email identities

In Amazon Pinpoint, an *identity* is an email address or domain that you use to send email. Before you can send email by using Amazon Pinpoint, you must verify each identity that you plan to use as a *From*, *Source*, *Sender*, or *Return path* address to prove that you own it. If your account is still in the Amazon Pinpoint sandbox, you also must verify the identities that you plan to send email to.

Before you verify an identity, you have to create a project and enable the email channel for the project. For more information, see Creating an Amazon Pinpoint project with email support.

Topics in this section

- Verifying an email address
- Verifying a domain

Verifying an email address

If you've already created a project for sending email, you probably already verified an email address. You can verify a different email address by using the Amazon Pinpoint console.

To verify an email address

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, under **Email**, choose **Email identities**.
3. Choose **Verify email identity**.
4. Under **Identity type**, choose **Email address**.
5. For **Verify a new email address**, enter the email address that you want to verify.
6. Choose **Verify email address**.
7. Check the inbox of the address that you entered and look for an email from *no-reply-aws@amazon.com*. Open the email and select the link in the email to complete the verification process for the email address.

   > **Note**
   >
   > You should receive the verification email within five minutes. If you don't receive the email, do the following:
   >
   > - Make sure you typed the address correctly.
   > - Make sure the email address that you're attempting to verify can receive email. You can test this by using another email address to send a test email to the address that you want to verify.
   > - Check your junk mail folder.
   >
   > The link in the verification email expires after 24 hours. To resend the verification email, choose **Send verification email again**.

When you verify an email address, consider the following:

- Amazon Pinpoint has endpoints in multiple AWS Regions and the verification status of an email address is separate for each Region. If you want to send email from the same identity in more

than one Region, you must verify that identity in each Region. You can verify as many as 10,000 identities (email addresses and domains, in any combination) in each AWS Region.

- The *local part* of the email address, which is the part that precedes the at sign (@), is case sensitive. For example, if you verify *user@example.com*, you can't send email from *USER@example.com* unless you verify that address too.
- Domain names are case insensitive. For example, if you verify *user@example.com*, you can also send emails from *user@EXAMPLE.com*.
- You can apply labels to verified email addresses by adding a plus sign (+) followed by a string of text after the local part of the address and before the at sign (@). For example, to apply *label1* to the address *user@example.com*, use *user+label1@example.com*. You can use as many labels as you want for each verified address. You can also use labels in the *From* and *Return path* fields to implement Variable Envelope Return Path (VERP).

> **Note**
>
> When you verify an unlabeled address, you're verifying all addresses that could be formed by adding a label to the address. However, if you verify a labeled address, you can't use other labels with that address.

Verifying a domain

When you verify a domain, you verify all the email addresses that are associated with that domain. Therefore, you don't need to verify individual email addresses from the domain. For example, if you verify the *example.com* domain, you can send email from *carlos@example.com*, *jane@example.com*, and any other address from the *example.com* domain.

Before you can use Amazon Pinpoint to send email from a domain, you have to verify the domain to confirm that you own it and to prevent others from using it.

> **Note**
>
> To complete the verification process, you must be able to modify the DNS settings for the domain. The procedures for modifying the DNS settings for a domain vary depending on the DNS or web hosting provider. For information about changing the DNS settings for your domain, see the documentation for your provider.

To verify a domain

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, under **Email**, choose **Email identities**.
3. Choose **Verify email identity**.
4. Under **Identity type**, choose **Domain**, and then choose **Verify a new domain**.
5. For **Domain**, enter the domain that you want to verify.
6. Choose **Verify domain**.
7. Under **Record set**, copy the three CNAME records and save them to a location on your computer. Or, to download and save the values in a .csv file, choose **Download record set**.
8. Log in to the management console for your DNS or web hosting provider, and then create three new CNAME records that contain the values that you saved in the previous step. See the next section for links to the documentation for several common providers.
9. When Amazon Pinpoint detects all three of these CNAME records in the DNS configuration of your domain, the verification process is complete. You can check the verification status by returning to the **Email identities** page. In the **All identities** table, locate the domain that you attempted to verify. If the value in the **Status** column for that domain is *Active*, the verification process is complete.

> **Note**
>
> In some cases, it can take 72 hours or more for DNS changes to propagate across the internet. You can't send email from a domain until the verification process is complete.

When you verify a domain, consider the following:

- You can send email from any subdomain of the verified domain, without verifying the subdomain specifically. For example, if you verify *example.com*, you don't need to verify *a.example.com* or *a.b.example.com*.
- As specified in RFC 1034, each DNS label can have up to 63 characters. In addition, the whole domain name must not exceed a total length of 255 characters.
- Amazon Pinpoint is available in multiple AWS Regions, and the verification status of a domain is separate for each Region. If you want to send email from the same identity in more than one

Region, you must verify that identity in each Region. You can verify as many as 10,000 identities (domains and email addresses, in any combination) in each AWS Region.

Instructions for configuring DNS records for various providers

The procedures for updating the DNS records for a domain vary depending on which DNS or web hosting provider you use. The following table lists links to the documentation for several common providers. This list isn't exhaustive and inclusion in this list isn't an endorsement or recommendation of any company's products or services. If your provider isn't listed in the table, you can probably use the domain with Amazon Pinpoint.

DNS/hosting provider	Documentation link
Amazon Route 53	Working with records
GoDaddy	Add a CNAME record (external link)
Dreamhost	How do I add custom DNS records? (external link)
Cloudflare	Managing DNS records in cloudflare (external link)
HostGator	Manage DNS records with HostGator/eNom (external link)
Namecheap	How do I add TXT/SPF/DKIM/DMARC records for my domain? (external link)
Names.co.uk	Changing your domains DNS settings (external link)
Wix	Adding or Updating CNAME Records in Your Wix Account

Domain verification tips and troubleshooting

If you completed the preceding steps but your domain isn't verified after 72 hours, check the following:

- Make sure that you entered the values for the DNS records in the correct fields. Some providers refer to the **Name/host** field as *Host* or *Hostname*. In addition, some providers refer to the **Record value** field as *Points to* or *Result*.
- Make sure that your provider didn't automatically append your domain name to the **Name/host** value that you entered in the DNS record. Some providers append the domain name without indicating that they've done so. If your provider appended your domain name to the **Name/host** value, remove the domain name from the end of the value. You can also try adding a period to the end of the value in the DNS record. This period indicates to the provider that the domain name is fully qualified.
- The underscore character (_) is required in the **Name/host** value of each DNS record. If your provider doesn't allow underscores in DNS record names, contact the provider's customer support department for additional assistance.
- The validation records that you have to add to the DNS configuration for your domain are different for each AWS Region. If you want to use a domain to send email from multiple AWS Regions, you have to verify the domain in each of those Regions.

Creating an email orchestration sending role in Amazon Pinpoint

Amazon Pinpoint uses your Amazon SES resources for sending email messages that are either part of a campaign or a journey. To set up Amazon Pinpoint to use your Amazon SES resources to send email, create or update an IAM role to grant Amazon Pinpoint access.

> **Note**
>
> You only have to create an **Orchestration sending role arn** if you're sending emails from a campaign or a journey. For direct send email, you must have permissions for `ses:SendEmail` and `ses:SendRawEmail`.

Create orchestration sending role arn

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to update email settings for.
3. In the navigation pane, under **Settings**, choose **Email**.
4. On the **Identities** tab, choose **Edit**.
5. Choose **Enable campaigns and journeys for this email channel**.

6. For **IAM role** choose either:

   - **Create a new role** (Recommended) – To have Amazon Pinpoint create the IAM role and configure the IAM roles permissions. Enter a name for the IAM role in **IAM role name**.
   - **Use an existing role** – If you have an existing IAM role that already contains permissions to allow Amazon Pinpoint access to `ses:SendEmail` and `ses:SendRawEmail` then choose that IAM role from the drop down list. If you need to create the IAM role, see IAM role for sending email through Amazon SES in the Amazon Pinpoint Developer Guide.
7. Choose **I acknowledge that the IAM role I selected has the required permissions.**
8. Choose **Save**.

Deleting an email orchestration sending role in Amazon Pinpoint

You can delete the **Orchestration sending role arn** when you don't want to send email messages for the project. To delete the **Orchestration sending role arn**, delete the email channel from the project.

> **Important**
>
> This action deletes the email channel from your project. Only do this if you don't want to send emails from a campaign or a journey.

To delete the email channel, use the delete-email-channel command:

```
aws pinpoint delete-email-channel --application-id application-id
```

Where:

- *application-id* is the ID of the Amazon Pinpoint project that contains the email channel.

The response to this command is the JSON definition of the email channel that you deleted.

Find your email orchestration sending role ARN in Amazon Pinpoint

For Amazon Pinpoint to begin email through Amazon SES, delegate the required permissions to Amazon Pinpoint. When the IAM role is set up, Amazon Pinpoint uses the **Orchestration sending**

role arn to send email through Amazon SES. If the **Orchestration sending role arn** is present, then the project has delegated the permissions to Amazon Pinpoint.

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to update email settings for.
3. In the navigation pane, under **Settings**, choose **Email**.
4. On the **Identities** tab, you can view your **Orchestration sending role arn**.

Monitoring email activity with Amazon Pinpoint

For emails that you send for a project, Amazon Pinpoint provides options for monitoring your email activity.

Amazon Pinpoint analytics

The **Analytics** pages on the Amazon Pinpoint console provide many email-related metrics for the campaigns and transactional messages that you send for a project. For example, you can view the number of email endpoints that you can send messages to, and the number of endpoints that you've already sent messages to. Also, you can view the open, click, and opt-out rates for messages that you've already sent. For campaign messages, you can view these metrics across all of your campaigns or for individual campaigns. To learn more about these metrics and how to view them, see *Analytics*.

Amazon Pinpoint provides similar metrics for email that you send for a journey. For example, you can view the number of messages that were opened by participants in each activity of a journey. After you publish a journey, you can view the data for these metrics by using the **Journey metrics** pane in the journey workspace. To learn more about these metrics, see the section called “View journey metrics”.

Streaming email event data

To monitor data, such as successful and failed email deliveries, configure Amazon Pinpoint to stream email event data to Amazon Kinesis Data Streams or Amazon Data Firehose. Then, you can use the Kinesis platform to analyze this email data. For more information, see Streaming Amazon Pinpoint events to Kinesis.

For examples of the event data that Amazon Pinpoint streams to Kinesis, see Email events in the *Amazon Pinpoint Developer Guide*.

Viewing details about email usage

The **Email usage and restrictions** section of the **Email** settings page provides information about email usage for your Amazon Pinpoint account. You can see how many emails have been sent from your account during the past 24 hours. You can compare that number to the maximum number of emails that your account is allowed to send during a 24-hour period, referred to as your *sending quota*. You can also see the maximum number of emails that you can send per second, referred to as your *sending rate*. For additional detailed reports, see the analytics pages for Campaigns and Transactional messaging.

> **Note**
>
> The email sending quota, rate, and usage values that are shown in this section apply to your entire AWS account in the current AWS Region. If you've used Amazon SES to send emails in the same Region, then this section shows how many email messages you've sent from both Amazon SES and Amazon Pinpoint.

The **Email usage and restrictions** section also indicates whether your account is in the sandbox. If your account is in the sandbox, your sending quota and sending rate are set to relatively low values, and you can send email only to verified email addresses or domains. For information about requesting an increase to your sending quota or sending rate, see Managing email sending quotas. For information about removing your account from the sandbox, see the section called “Email sandbox”.

Tracking open and click events in email

Amazon Pinpoint automatically tracks how many of your emails were opened or clicked by their recipients. In order to track the number of opens and clicks, Amazon Pinpoint makes minor changes to the emails that you send.

First, Amazon Pinpoint adds a tiny, transparent image to the end of each email that you send. This image is hosted on an AWS server. The file name of this image is unique for each recipient. When a recipient opens an email, their email client downloads this file from our servers. When an email client downloads a tracking image from our servers, we count it as an open event.

Second, Amazon Pinpoint replaces all links in your emails with links that refer to a domain that is hosted by AWS. This link includes a parameter that is unique for each recipient. When a recipient

clicks one of these links, they are first sent to the AWS-hosted domain, and then immediately redirected to their intended destination. When a recipient visits one of these redirect links, we count it as a click event.

If a message recipient clicks multiple links in a message or clicks the same link more than once, those clicks will be counted as one click if they occur within the same hour. Multiple clicks taking place at different hours will be counted as separate clicks. For example, a link is clicked at 8:30 AM and 8:45 AM it will count as one click but if the link is clicked at 8:30 AM and 9:05 AM it will count as two clicks because the hour has changed. Email opens are counted the same way as clicks.

In order to view open and click events, you have to set up event streaming. For more information about creating event streams, see Streaming events with Amazon Pinpoint.

> **Note**
>
> If you have event streaming enabled you will still receive duplicate events and should handle such duplicates in your workflows accordingly.
> If a recipient's email server performs link validation checks then these checks will appear as click events.

Managing the Amazon Pinpoint email channel

You have the following options for managing your email channel with Amazon Pinpoint:

- To enable the email channel for an existing project, or to update your email address or domain, you can use the Amazon Pinpoint console.
- To increase your email sending quotas, you can open a quota increase case with Support.

The following sections explain how to update and manage your email channel settings.

Topics

- Updating email settings
- Managing email sending quotas
- Managing configuration sets
- Enabling and disabling the email channel

Updating email settings

You can use the Amazon Pinpoint console to update the email settings for a project. For example, you can change the verified identity that's associated with the project or verify a new identity for the project.

To update your email settings

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to update email settings for.
3. In the navigation pane, under **Settings**, choose **Email**.
4. On the **Identities** tab, choose **Edit**.
5. Under **Identity type**, choose the type of identity that you want to add or update: **Email address** or **Domain**.
6. Choose whether you want to update an existing identity or verify a new identity.
7. Enter the email address or domain, and then choose **Verify**.

   If you enter an email address, Amazon Pinpoint sends a verification email to the address that you entered. Follow the instructions in the email to complete the verification process.

   If you enter an email domain, the console displays a TXT record that you must add to the DNS settings for your domain.
8. Follow the instructions shown on the console. For more information about verifying an email address or domain, see Verifying email identities.
9. If you need to create or update your **Orchestration sending role arn**, see Creating an email orchestration sending role in Amazon Pinpoint.
10. When you finish, choose **Save**.

Managing email sending quotas

To regulate the number of email messages that you can send and the rate at which you can send them, your AWS account has sending quotas. These quotas benefit all Amazon Pinpoint users because they help to maintain the trusted relationship between Amazon Pinpoint and Internet service providers (ISPs). They help you gradually ramp up your sending activity. They decrease the likelihood that ISPs will block your emails because of sudden, unexpected spikes in your email sending volume or rate.

Amazon Pinpoint provides the following sending quotas for email:

Daily sending quota

The maximum number of emails that you can send during a 24-hour period. This quota reflects a rolling time period. Every time you try to send an email, Amazon Pinpoint checks how many emails you sent during the previous 24 hours. If the total number of emails that you have sent is less than your quota, your send request is accepted and your email is sent. If you have already sent your full quota, your send request is rejected with a throttling exception. For example, if your daily sending quota is 50,000, and you sent 15,000 emails during the previous 24 hours, then you can send another 35,000 emails right away. If you have already sent 50,000 emails during the previous 24 hours, you can't send more emails until some of the previous sending rolls out of its 24-hour window.

The sending quota, sending rate, and sandbox limits are shared between the two services in the same region. If you use Amazon SES in us-east-1, and you've been removed from the sandbox and had your sending quota/rate increased, then those changes all apply to your Pinpoint account in us-east-1.

Maximum sending rate

The maximum number of emails that Amazon Pinpoint can accept from your account per second. You can exceed this quota for short bursts, but not for a sustained period of time.

> **Note**
>
> The rate at which Amazon Pinpoint accepts your messages might be less than the maximum sending rate.

When your account is in the Amazon Pinpoint sandbox, your sending quota is 200 messages per 24-hour period and your maximum sending rate is one message per second. To increase these values, you can request production access for email. After your account moves out of the sandbox and you start sending emails, you can increase your quotas further by submitting a quota increase request to AWS Support.

Increasing your sending quotas

When your account is out of the sandbox, your sending quotas increase if you're sending high-quality content and we detect that your utilization is approaching your current quotas. Often, the system automatically increases your quotas, and no further action is needed.

If your existing quotas are not adequate for your needs and the system did not increase your quotas automatically, you can open an Amazon Pinpoint quota increase case in AWS Support Center.

> **Important**
>
> - Plan ahead. Be aware of your sending quotas and try to stay within them. If you anticipate needing higher quotas than the system allocated, open an Amazon Pinpoint quota increase case well before the date when you need the higher quotas.
> - If you anticipate needing to send more than one million emails per day, you must open an Amazon Pinpoint quota increase case.

For Amazon Pinpoint to increase your sending quotas, use the following guidelines:

- **Send high-quality content** – Send content that recipients want and expect.
- **Send real production content** – Send your actual production email. This enables Amazon Pinpoint to accurately evaluate your sending patterns, and verify that you are sending high-quality content.
- **Send near your current daily quota** – If your volume stays close to your daily sending quota without exceeding it, Amazon Pinpoint detects this usage pattern and can automatically increase your quota.
- **Have low bounce and complaint rates** – Try to minimize the numbers of bounces and complaints. High numbers of bounces and complaints can adversely affect your sending quotas.

> **Important**
>
> If you send test emails to your own email addresses, they may adversely affect your bounce and complaint metrics, or appear as low-quality content to our filters. Whenever possible, use the Amazon Simple Email Service (Amazon SES) mailbox simulator to test your system. Emails that are sent to the mailbox simulator do not count toward your

sending metrics or your bounce and complaint rates. For more information, see Sending test emails in Amazon SES.

Requesting a quota increase

To request higher sending quotas for Amazon Pinpoint, open a case in AWS Support Center by using the following instructions.

To request a sending quota increase

1. Sign in to the AWS Management Console at https://console.aws.amazon.com/.
2. On the **Support** menu, choose **Support Center**.
3. On the **Open support cases** tab, choose **Create case**.
4. Choose the **Looking for service limit increases?** link.
5. For **Limit type**, choose **Pinpoint Email**.
6. (Optional) Complete the following information:
   - For **Mail Type**, choose the type of email that you send. If multiple values apply, choose the option that applies to the majority of the emails that you send.
   - For **Website URL**, enter the URL of your website. Providing this information helps us better understand the type of content that you send.
   - For **Describe, in detail, how you will only send to recipients who have specifically requested your mail**, explain how you make sure that you send emails only to recipients who want to receive email from you.
   - For **Describe in detail the process that you will follow when you receive bounce and complaint notifications**, explain how you process bounces and complaints about the emails that you send.
   - For **Will you comply with AWS Service Terms and AUP**, choose the option that applies to your use case.
7. Under **Requests** complete the following:
   - For **Region**, choose the AWS Region that your request applies to.
   - For **Limit**, choose one of the following options:
     - To increase the number of messages that you can send per day, choose **Desired Daily Email Sending Quota**.

- To increase the number of messages you can send per second, choose **Desired Maximum Email Send Rate**.
- For **New limit value**, enter the new amount that you are requesting for the quota. Request only the amount that you think you will need. We can't guarantee that you will receive the amount that you request. The larger your request, the more justification you need to provide to have your request granted.

> **Note**
>
> Your request applies only to the AWS Region that you chose at the beginning of this step. To request a quota increase for another AWS Region, choose **Add another request**. Then complete the **Region**, **Limit**, and **New limit value** fields for the additional Region. Repeat this process for each Region that you want to request a quota increase for.

8. Under **Case description**, for **Use case description**, describe how you send email using Amazon Pinpoint, in as much detail as possible. For example, describe the type of emails that you send and how they fit into your business. The more you indicate that you send high-quality email messages to recipients who want and expect them, the more likely we are to approve your request.
9. Under **Contact options**, for **Preferred contact language**, choose the language you want to receive communications for this case in.
10. When you finish, choose **Submit**.

The AWS Support team provides an initial response to your request within 24 hours.

In order to prevent our systems from being used to send unsolicited or malicious content, we have to consider each request carefully. If we're able to do so, we'll grant your request within this 24-hour period. However, if we need to obtain additional information from you, it might take longer to resolve your request.

We might not be able to grant your request if your use case doesn't align with our policies.

Checking the status of your request

After you submit your request, we review your case. To check the status of your request, complete the following steps.

To check the status of your quota increase request

1. Sign in to the AWS Management Console at https://console.aws.amazon.com/.
2. On the **Support** menu, choose **Support Center**.
3. On the **Open support cases** tab, choose **View all cases**.
4. Under **Case history**, choo e the sending quota increase request case.
5. Review the messages in the **Correspondence** section. The messages in this section tell you if your request was accepted or rejected. If your request was accepted, the message specifies your daily and per-second sending quotas.

If your account is in the email sandbox and you are granted a sending quota increase, your account is automatically taken out of the sandbox. After your account is out of the sandbox, you can send email to non-verified addresses. However, you must still verify your sending addresses and domains.

Over time, we will gradually increase your sending quotas. If your needs exceed the gradual increase, you can open another request to increase your sending quotas.

Managing configuration sets

Configuration sets are groups of rules that you can apply to the emails that you send. When you apply a configuration set to an email, all of the rules in that configuration set are applied to the email. For example, you can configure a configuration set so that emails are only sent using a group of IP addresses (known as an *IP pool*) that you specify.

You can use configuration sets in both Amazon Pinpoint and Amazon Simple Email Service (Amazon SES). Configuration sets rules that you configure in Amazon SES are also applied to email messages that you send using Amazon Pinpoint.

You can view a list of configuration sets for your account in the Amazon Pinpoint console. However, you must use Amazon SES to setup and manage configuration sets. For more information about creating configuration sets, see Creating configuration sets in the *Amazon Simple Email Service Developer Guide*.

Viewing a list of configuration sets

To view a list of configuration sets in the Amazon Pinpoint console

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.

2. In the navigation pane, under **Email**, choose **Configuration sets**.

Applying a configuration set to an email identity

To use configuration sets with Amazon Pinpoint, you have to specify a default configuration set for the email identity (that is, the email address or domain) that you use to send email through Amazon Pinpoint. You can set up default configuration sets in the Amazon SES console.

When you set a default configuration set for an identity, all emails that you send through that identity are sent using that configuration set, unless you specify a different one. Currently, Amazon Pinpoint doesn't allow you to specify a different configuration set, so the only way to use configuration sets is to specify a default configuration set.

> **Note**
>
> The following procedure assumes that you've already verified an identity. Identities that you verify in Amazon SES are available in Amazon Pinpoint, and the other way around. For more information, see Verifying email identities.
> This procedure also assumes that you've created a configuration set.

To specify a default configuration set for an identity

1. Open the Amazon SES console at https://console.aws.amazon.com/ses/.
2. In the navigation pane, under **Configuration**, choose **Verified identities**.
3. In the list of identities, choose the identity that you want to specify a default configuration set for.
4. On the **Configuration set** tab, choose **Edit**.
5. Select **Assign a default configuration set**.
6. For **Default configuration set**, choose the configuration set that you want to use for this identity, and then choose **Save changes**.

Enabling and disabling the email channel

To send email for campaigns and journeys in the current project, you first have to enable the email channel for the project. If you don't plan to send email for any campaigns or journeys in a project, you can disable the email channel for the project.

Note that you don't need to enable the email channel to send transactional emails, which are emails that are typically sent only once in response to a specific action. For information about sending transactional email, see Sending email in Amazon Pinpoint.

To enable the email channel for a project

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to enable the email channel for.
3. In the navigation pane, under **Settings**, choose **Email**.
4. On the **Identities** tab, choose **Edit**.
5. Select **Enable the email channel for this project**.
6. If you haven't verified an email identity yet, complete the appropriate procedure in Verifying email identities. Otherwise, choose the identity that you want to use.
7. Choose **Save**.

The process for disabling the email channel is similar. If you disable the email channel, you can't send emails for any campaigns or journeys in the project. However, you can send transactional emails from your Amazon Pinpoint account.

To disable the email channel

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to disable the email channel for.
3. In the navigation pane, under **Settings**, choose **Email**.
4. On the **Identities** tab, choose **Edit**.
5. Clear **Enable the email channel for this project**, and then choose **Save**.

Sending email in Amazon Pinpoint

Before you can use Amazon Pinpoint to send an email, complete the procedures in Setting up the Amazon Pinpoint email channel.

There are several types of email that you can send using Amazon Pinpoint: campaign-based email, journey-based email, and transactional email. *Campaign-based emails* are messages that are sent either one time or on a recurring schedule, and that target customers based on their attributes.

Journey-based emails are messages that are sent when participants in a journey arrive at an email activity as part of a larger workflow. *Transactional emails* are sent one time only, and are typically sent in response to another action occurring. For example, you can use transactional messages to send an email when a customer chooses the "Forgot my password" link in your app, or to send a confirmation when a customer places an order on your site.

In Amazon Pinpoint, you typically use the web-based management console to send campaign-based emails and journey-based emails, whereas transactional emails are usually sent from applications that use an AWS SDK or call the Amazon Pinpoint API directly.

When you send a campaign-based email, you first create a segment. A segment is a group of recipients for the campaign. Next, you create a campaign. In Amazon Pinpoint, a campaign consists of one or more target segments, a message, and a delivery schedule for that message. To learn about creating campaigns, see *Campaigns*.

When you send a journey-based email, you also start by creating a segment. A segment is a group of participants in the journey. Next, you create an email template for each message that you want activities in the journey to send. Then, you create the journey. To learn about creating journeys, see *Journeys*.

To send a transactional email, you can use the `SendMessage` operation of the Amazon Pinpoint API. To learn more about using the Amazon Pinpoint API, see the Amazon Pinpoint API Reference. For code examples that show how to send email using various AWS SDKs, see Send transactional email messages in the *Amazon Pinpoint Developer Guide*.

Using dedicated IP addresses with Amazon Pinpoint

When you create a new Amazon Pinpoint account, your emails are sent from IP addresses that are shared with other Amazon Pinpoint users. For an additional monthly charge, you can lease dedicated IP addresses that are reserved for your exclusive use. Both of these options offer unique benefits and drawbacks, which are summarized in the following table.

Benefit	Shared IP addresses	Dedicated IP addresses
Ready to use with no additional setup	Yes	No
Reputation managed by AWS	Yes	No

Benefit	Shared IP addresses	Dedicated IP addresses
Good for customers with continuous, predictable sending patterns	Yes	Yes
Good for customers with less predictable sending patterns	Yes	No
Good for high-volume senders	Yes	Yes
Good for low-volume senders	Yes	No
Additional monthly costs	No	Yes
Complete control over sender reputation	No	Yes
Isolates reputation by email type, recipient, or other factors	No	Yes
Provides known IP addresses that never change	No	Yes

Important

If you don't plan to send large volumes of email on a regular and predictable basis, we recommend that you use shared IP addresses. If you use dedicated IP addresses in use cases that involve sending low volumes of email, or if your sending patterns are highly irregular, you might experience deliverability issues.

Ease of setup

If you choose to use shared IP addresses, then you don't need to perform any additional configuration. Your Amazon Pinpoint account is ready to send emails as soon as you verify an email address and move out of the sandbox.

If you choose to lease dedicated IP addresses, you have to determine how many dedicated IP addresses you need, submit a request, and optionally create dedicated IP pools.

Reputation managed by AWS

IP address reputations are based largely on historical sending patterns and volume. An IP address that sends consistent volumes of email over a long period of time usually has a good reputation.

Shared IP addresses are used by several Amazon Pinpoint customers. Together, these customers send a large volume of email. AWS carefully manages this outbound traffic in order to maximize the reputations of the shared IP addresses.

If you use dedicated IP addresses, it's your responsibility to maintain your sender reputation by sending consistent and predictable volumes of email.

Predictability of sending patterns

An IP address with a consistent history of sending email has a better reputation than one that suddenly starts sending out large volumes of email with no prior sending history.

If your email sending patterns are irregular (they don't follow a predictable pattern), then shared IP addresses are a better fit for your needs. When you use shared IP addresses, you can increase or decrease your email-sending patterns as the situation demands.

If you use dedicated IP addresses, you have to warm up those addresses by sending an amount of email that gradually increases every day. The process of warming up new IP addresses is described in Warming up dedicated IP addresses. After your dedicated IP addresses are warmed up, you must then maintain a consistent sending pattern.

Volume of outbound email

Dedicated IP addresses are more appropriately suited for customers who send large volumes of email. Most internet service providers (ISPs) only track the reputation of a given IP address if they receive a significant volume of mail from that address. For each ISP with which you want to

cultivate a reputation, you should send several hundred emails within a 24-hour period at least once per month.

In some cases, you might be able to use dedicated IP addresses if you don't send large volumes of email. For example, dedicated IP addresses might work well if you send to a small, well-defined group of recipients whose mail servers accept or reject email using a list of specific IP addresses, rather than IP address reputation.

Additional costs

The use of shared IP addresses is included in the standard Amazon Pinpoint pricing. Leasing dedicated IP addresses incurs an extra monthly cost beyond the standard costs that are associated with sending email using Amazon Pinpoint. Each dedicated IP address incurs a separate monthly charge. For pricing information, see the Amazon Pinpoint pricing page.

Control over sender reputation

When you use dedicated IP addresses, your Amazon Pinpoint account is the only one that is able to send email from those addresses. For this reason, the sender reputation of the dedicated IP addresses that you lease is determined by your email-sending practices.

Ability to isolate sender reputation

By using dedicated IP addresses, you can isolate your sender reputation for different components of your email program. If you lease more than one dedicated IP address for use with Amazon Pinpoint, you can create *dedicated IP pools*—groups of dedicated IP addresses that can be used for sending specific types of email. For example, you can create one pool of dedicated IP addresses for sending marketing email, and another for sending transactional email. To learn more, see Creating dedicated IP pools.

Known, unchanging IP addresses

When you use dedicated IP addresses, you can find the values of the addresses that send your mail in the **Dedicated IPs** page of the Amazon Pinpoint console. Dedicated IP addresses don't change.

With shared IP addresses, you don't know the IP addresses that Amazon Pinpoint uses to send your mail, and they can change at any time.

Requesting and relinquishing dedicated IP addresses

This section describes how to request and relinquish dedicated IP addresses by submitting a request in the AWS Support Center. We charge your account an additional monthly fee for each dedicated IP address that you lease for use with Amazon Pinpoint. For more information about the costs associated with dedicated IP addresses, see Amazon Pinpoint pricing.

Best practices for working with dedicated IP addresses

Although there's no minimum commitment, we recommend that you lease more than one dedicated IP address in each AWS Region where you use Amazon Pinpoint. Each AWS Region consists of multiple physical locations, called *Availability Zones*. When you lease more than one dedicated IP address, we distribute those addresses as evenly as possible across the Availability Zones in the AWS Region that you specified in your request. Distributing your dedicated IP addresses across Availability Zones in this way increases the availability and redundancy of your dedicated IP addresses.

For a list of all the Regions where Amazon Pinpoint is currently available, see Amazon Pinpoint endpoints and quotas in the *Amazon Web Services General Reference*. To learn more about the number of Availability Zones that are available in each Region, see AWS global infrastructure.

Requesting dedicated IP addresses

The following steps show how to request dedicated IP addresses by creating a case in the AWS Support Center. You can use this process to request as many dedicated IP addresses as you need.

To request dedicated IP addresses

1. Sign in to the AWS Management Console at https://console.aws.amazon.com/.
2. On the **Support** menu, choose **Support Center**.
3. On the **My support cases** tab, choose **Create case**.
4. Under **Create case**, choose **Service quota increase**.
5. Under **Case classification**, complete the following sections:

   - For **Quota type**, choose **Pinpoint Email**.
   - For **Mail Type**, choose the type of email that you plan to send using your dedicated IP addresses. If multiple values apply, choose the option that applies to the majority of the email that you plan to send.

- For **Website URL**, enter the URL of your website. Providing this information helps us better understand the type of content that you plan to send.
- For **Describe in detail how you will only send to recipients who have specifically requested your mail**, explain how you will make sure that you use your dedicated IP addresses to send email only to recipients who want to receive email from you.
- For **Describe in detail the process that you will follow when you receive bounce and complaint notifications**, explain how you will process bounces and complaints about the email that you plan to send using your dedicated IP addresses.
- For **Will you comply with AWS Service Terms and AUP**, choose the option that applies to your use case.

6. Under **Requests**, complete the following sections:

   - For **Region**, choose the AWS Region that your request applies to.
   - For **Quota**, choose **Desired Maximum Email Send Rate**.
   - For **New quota value**, enter the maximum number of messages that you need to be able to send per second. We use this value to calculate the number of dedicated IP addresses that you need to implement for your use case. For this reason, the estimate that you provide should be as accurate as possible.

   > **Note**
   >
   > A single dedicated IP address can be used only in the AWS Region that you choose in this step. If you want to request dedicated IP addresses for use in another AWS Region, choose **Add another request**. Then complete the **Region**, **Quota**, and **New quota value** fields for the additional Region. Repeat this process for each Region that you want to use dedicated IP addresses in.

7. Under **Case description**, for **Use case description**, state that you want to request dedicated IP addresses. If you want to request a specific number of dedicated IP addresses, mention that as well. If you don't specify a number of dedicated IP addresses, we provide the number of dedicated IP addresses that are necessary to meet the sending rate requirement that you specified in the previous step.

   Next, describe how you plan to use dedicated IP addresses to send email using Amazon Pinpoint. Include information about why you want to use dedicated IP addresses instead of shared IP addresses. This information helps us better understand your use case.

8. Under **Contact options**, for **Preferred contact language**, choose whether you want to receive communications for this case in **English** or **Japanese**.
9. When you finish, choose **Submit**.

After you submit the form, we evaluate your request. If we grant your request, we reply to your case in Support Center to confirm that your new dedicated IP addresses are associated with your account.

Relinquishing dedicated IP addresses

If you no longer need dedicated IP addresses that are associated with your account, you can relinquish them by completing the following steps.

> **Important**
>
> The process of relinquishing a dedicated IP address can't be reversed. If you relinquish a dedicated IP address in the middle of a month, we prorate the monthly dedicated IP usage fee, based on the number of days that have elapsed in the current month.

To relinquish dedicated IP addresses

1. Sign in to the AWS Management Console at https://console.aws.amazon.com/.
2. On the **Support** menu, choose **Support Center**.
3. On the **My support cases** tab, choose **Create case**.
4. Under **Create case**, choose **Service quota increase**.
5. Under **Case classification**, complete the following sections:
   - For **Quota type**, choose **Pinpoint Email**.
   - For **Mail Type**, choose any value.
   - For **Will you comply with the AWS Service Terms and AUP**, choose the option that applies to your use case.
6. Under **Requests**, complete the following sections:
   - For **Region**, choose the AWS Region that your request applies to.

> **Note**
>
> Dedicated IP addresses are unique to each AWS Region, so it's important to select the Region that the dedicated IP address is associated with.

- For **Quota**, choose **Desired Maximum Email Send Rate**.
- For **New quota value**, enter any number. The number that you enter here isn't important—you specify the number of dedicated IP addresses that you want to relinquish in the next step.

> **Note**
>
> A single dedicated IP address can be used in only a single AWS Region. If you want to relinquish dedicated IP addresses that you used in other AWS Regions, choose **Add another request**. Then complete the **Region**, **Quota**, and **New quota value** fields for the additional Region. Repeat this process for each dedicated IP address that you want to relinquish.

7. Under **Case Description**, for **Use case description**, indicate that you want to relinquish existing dedicated IP addresses. If you currently lease more than one dedicated IP address, include the number of dedicated IP addresses that you want to relinquish.
8. Under **Contact options**, for **Preferred contact language**, choose whether you want to receive communications for this case in **English** or **Japanese**.
9. When you finish, choose **Submit**.

After we receive your request, we send you a message that asks you to confirm that you want to relinquish your dedicated IP addresses. After you confirm that you want to relinquish the IP addresses, we remove them from your account.

Viewing a list of dedicated IP addresses that are associated with your account

You can view a list of dedicated IP addresses that are associated with your Amazon Pinpoint account in the current AWS Region. These IP addresses are available for use with both Amazon Pinpoint and Amazon Simple Email Service (Amazon SES).

You can also use the Amazon Pinpoint console to quickly determine if any of your dedicated IP addresses have been listed on Domain Name System-based Blackhole Lists (*DNSBLs*). DNSBLs are also called *Realtime Blackhole Lists* (*RBLs*), *deny lists*, *blocklists*, or *blacklists*). DNSBLs are lists of IP addresses that are suspected of sending spam, malicious content, or other unsolicited messages. Different DNSBLs have different impacts on email deliverability. The lists offered by Spamhaus have the most serious impact on email delivery.

To view a list of dedicated IPs in your account

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, under **Email**, choose **Dedicated IPs**.

   The list of IP addresses also includes the following information:

   Listing date

   If the IP address is currently listed on a DNSBL, this field shows the date when it was most recently added.

   Reputation

   A description of the health of the IP address.

   Blacklist name

   If the IP address is currently listed on a DNSBL, this field shows the name of the list that it's listed on.

   Blacklist reason

   If the IP address is currently listed on a DNSBL, this field displays the reason that the address was added to the list. This text is provided by the list providers themselves. Some providers offer detailed explanations, while others offer generic information.

Warming up dedicated IP addresses

When determining whether to accept or reject a message, email service providers consider the reputation of the IP address that sent it. One of the factors that contributes to the reputation of an IP address is whether the address has a history of sending high-quality email. Email providers are less likely to accept mail from new IP addresses that have little or no history. Email sent from IP

addresses with little or no history might end up in recipients' junk mail folders, or might be blocked altogether.

When you start sending email from a new IP address, you should gradually increase the amount of email you send from that address before using it to its full capacity. This process is called *warming up* the IP address.

The amount of time that's required to warm up an IP address varies between email providers. For some email providers, you can establish a positive reputation in around two weeks, while for others it might take up to six weeks. When warming up a new IP address, you should send emails to your most active users to ensure that your complaint rate remains low. You should also carefully examine your bounce messages and send less email if you receive a high number of blocking or throttling notifications.

Automatically warm up dedicated IP addresses

When you request dedicated IP addresses, Amazon Pinpoint automatically warms them up to improve the delivery of emails you send. The automatic IP address warm-up feature is enabled by default.

The steps that happen during the automatic warm-up process depend on whether you already have dedicated IP addresses:

- When you request dedicated IP addresses for the first time, Amazon Pinpoint distributes your email sending between your dedicated IP addresses and a set of addresses that are shared with other Amazon Pinpoint customers. Amazon Pinpoint gradually increases the number of messages sent from your dedicated IP addresses over time.
- If you already have dedicated IP addresses, Amazon Pinpoint distributes your email sending between your existing dedicated IPs (which are already warmed up) and your new dedicated IPs (which aren't warmed up). Amazon Pinpoint gradually increases the number of messages that are sent from your new dedicated IP addresses over time.

After you warm up a dedicated IP address, you should send around 1,000 emails every day to each email provider that you want to maintain a positive reputation with. You should perform this task on each dedicated IP address that you use with Amazon Pinpoint.

You should avoid sending large volumes of email immediately after the warm-up process is complete. Instead, slowly increase the number of emails you send until you reach your target

volume. If an email provider sees a large, sudden increase in the number of emails being sent from an IP address, they might block or throttle the delivery of messages from that address.

Creating dedicated IP pools

If you purchased several dedicated IP addresses to use with Amazon Pinpoint, you can create groups of those addresses. These groups are called *dedicated IP pools*. A common scenario is to create one pool of dedicated IP addresses for sending marketing communications, and another for sending transactional emails. Your sender reputation for transactional emails is then isolated from that of your marketing emails. In this scenario, if a marketing campaign generates a large number of complaints, the delivery of your transactional emails isn't impacted.

Dedicated IP pools are available for use in both Amazon Pinpoint and Amazon Simple Email Service (Amazon SES). When you create a dedicated IP pool, you have to choose a configuration set to associate it with. Currently, you can only manage configuration sets and IP pools using Amazon SES. For more information about setting up configuration sets, see Creating configuration sets in the *Amazon Simple Email Service Developer Guide*. For more information about setting up dedicated IP pools, see Creating dedicated IP pools in the *Amazon Simple Email Service Developer Guide*.

In order to use configuration sets (and therefore, dedicated IP pools) with Amazon Pinpoint, you must configure the configuration set as the default configuration set for the email identities that you use with Amazon Pinpoint. For more information, see Applying a configuration set to an email identity.

The Amazon Pinpoint Deliverability dashboard

> **Note**
>
> Email deliverability dashboard functionality is now available in Amazon Simple Email Service Virtual Deliverability Manager.

The Deliverability dashboard helps you identify and address issues that could impact the delivery of the emails that you send. By addressing the issues that the Deliverability dashboard identifies, you can increase the chances that the emails you send from Amazon Pinpoint and Amazon Simple Email Service (Amazon SES) arrive in your customers' inboxes, instead of their junk mail folders.

> **Important**
>
> There are additional fees associated with using the Deliverability dashboard. To learn more about these fees, see the Amazon Pinpoint pricing page.

You can access the Deliverability dashboard by using the Amazon Pinpoint console.

To view the Deliverability dashboard

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Deliverability dashboard**.

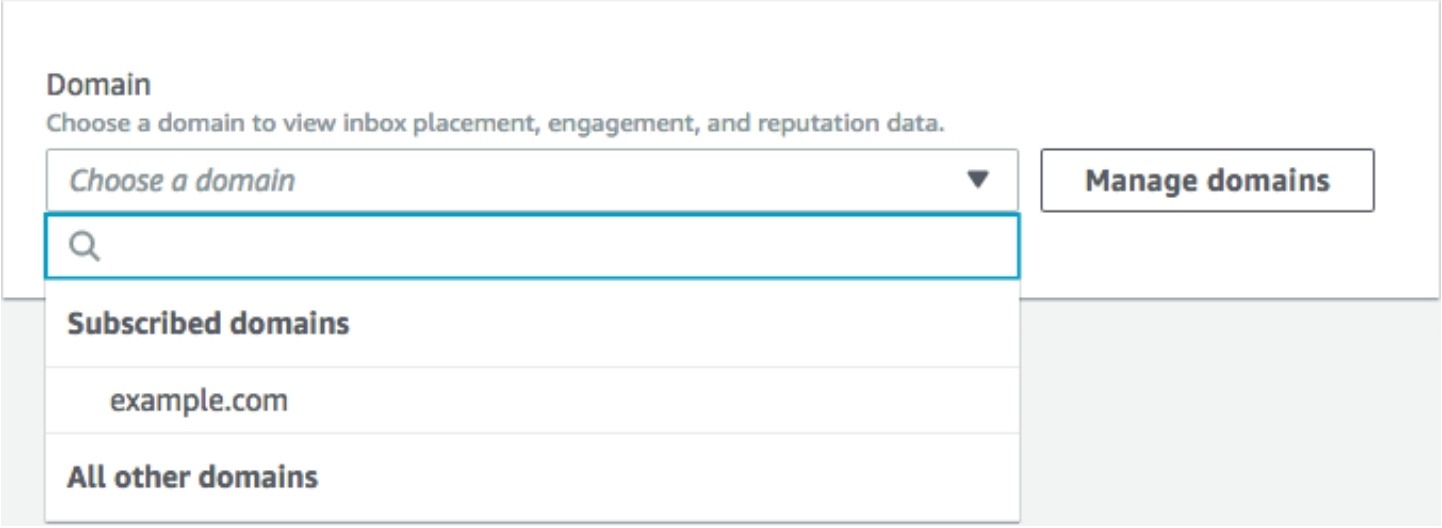
The Deliverability dashboard is made up of six parts, which are described in the following sections:

- Amazon Pinpoint domain reputation page
- IP reputation
- Bounce and complaint rates
- Campaign delivery metrics
- Inbox placement tests
- Deliverability dashboard settings

Amazon Pinpoint domain reputation page

The **Domain reputation** page contains information about the domains that you use to send email, including their engagement rates, inbox placement rates, and denylist activities.

Choose a domain from the **Domain** menu to see information about that domain, as shown in the following image.



Summary

This section contains information about the percentage of emails from a specific domain that arrived in your customers' inboxes. It also provides information about the percentage of emails that your customers engaged with by opening them or by clicking links in them. Finally, it shows the number of denylists that the IP addresses associated with the domain are on.

> **Note**
>
> The information in this section contains general guidance, as opposed to exact metrics. If you need precise metrics related to the delivery of your mail and engagement with it, we recommend that you set up Streaming events with Amazon Pinpoint.

To view data in this section, choose a subscribed domain, as shown in the following image. When you choose a domain, data appears in the **Summary**, **Inbox placement by email provider**, and **Denylist activities** sections.

When you choose a domain and a date range, the **Deliverability overview** section shows the following information:

- **Engagement rate** – The percentage of email sent from the selected domain that recipients opened or clicked links in. When determining whether to deliver your email to recipient's inboxes, many email providers (especially larger ones) consider how often recipients engaged with email sent from your domain in the past month or two. For this reason, you should try to maintain an engagement rate of at least 25%.

- **Inbox placement rate** – The percentage of email sent from the selected domain that arrived in recipients' inboxes. An inbox placement rate of around 80% is considered average.
- **Denylist activities** – The number of denylists that IP addresses associated with the domain appear on. To learn more about denylists, see Denylist activities.

Alarms

On the **Alarms** tab, you can create alarms that send you notifications for any of the metrics in the **Summary** section.

To create an alarm

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Deliverability dashboard**.
3. On the **Alarms** tab, choose **Create alarm**.
4. On the **Create alarm** page, do the following:

   a. For **Alarm name**, enter a name that helps you easily identify the alarm.

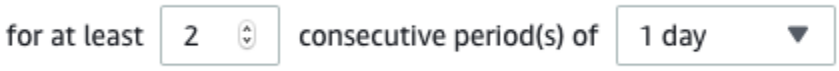
   b. For **Send notification when the**, choose one of the following options:

      - **Inbox placement rate** – When you choose this option, the alarm considers the inbox placement rate across all email providers.
      - **Inbox placement rate** – When you choose this option, the alarm considers the inbox placement rate for specific email providers, such as Gmail or Yahoo. When you choose this option, you also have to choose the email provider that the alarm applies to.

   c. Configure the values that cause the alarm to be triggered. For example, if you want to be notified when the inbox placement rate for your account is 75% or less, choose **<=**. Then enter a value of **75**, as shown in the following image.

   d. Specify the amount of time that has to elapse before the alarm is triggered. For example, you can configure the alarm so that it only sends a notification when the inbox placement rate goes below a certain rate and stays below that rate for more than two days. In this

example, next to **for at least**, enter a value of **2**. Then, next to **consecutive period(s) of**, choose **1 day**, as shown in the following image.



e. Under **Notification method**, choose one of the following options:

- **Use an existing SNS topic** – Choose this option if you've already created an Amazon SNS topic and subscribed endpoints to it.
- **Create a new topic** – Choose this option if you haven't yet created an Amazon SNS topic, or if you want to create a new topic.

> **Note**
>
> When you create a new topic, you must subscribe one or more endpoints to it. For more information, see Subscribing an Amazon SNS topic in the *Amazon Simple Notification Service Developer Guide*.

f. (Optional) You can choose or create more than one Amazon SNS topic. To add a topic, choose **Notify an additional SNS topic**.

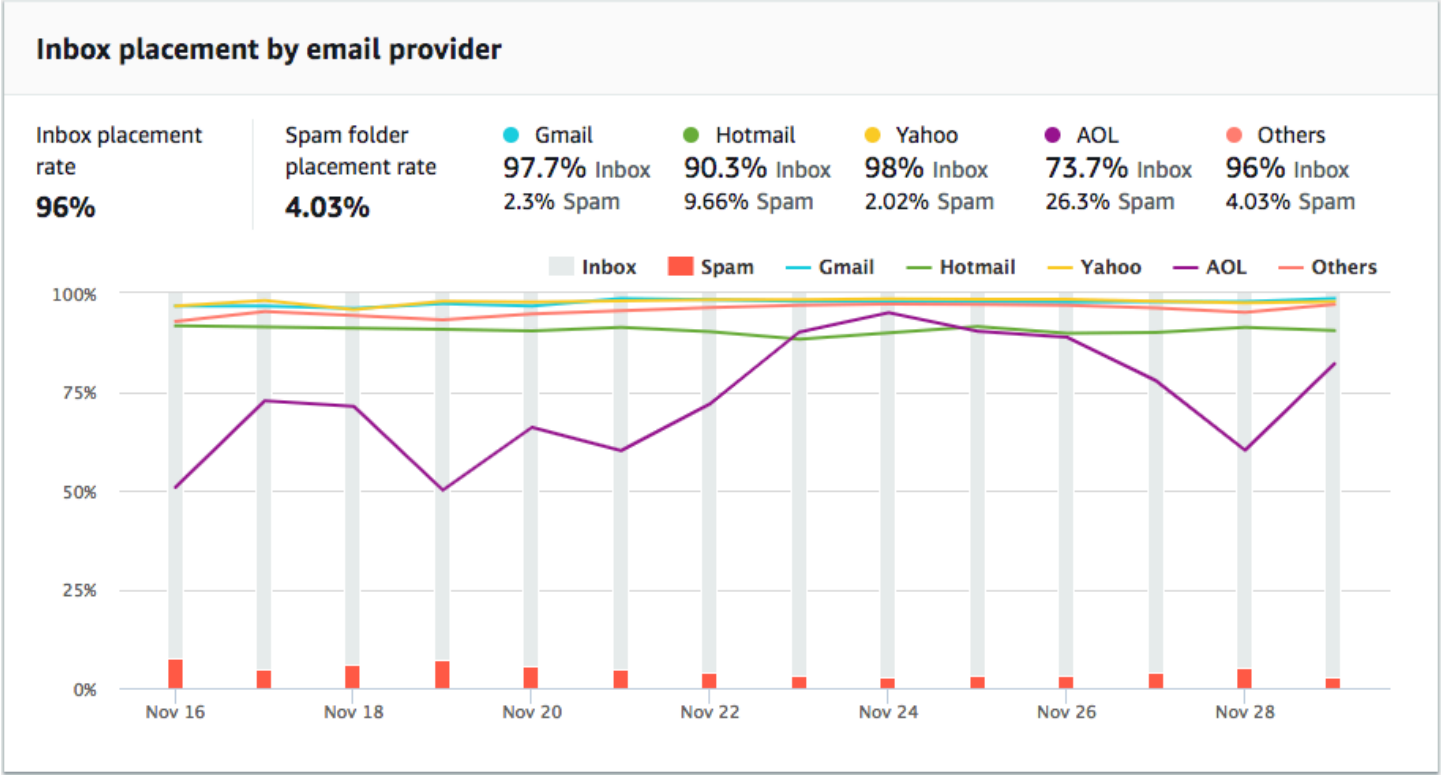
g. When you finish, choose **Create**.

Inbox placement by email provider

This section shows you how different email providers handled the email that was sent from your domain during the selected time period. The email providers analyzed in this section include Gmail, Hotmail, Yahoo, and AOL. This section also contains a category called **Others**. This category includes internet service providers and regional providers. When combined, the delivery metrics in this section represent a vast majority of all consumer email sent worldwide.

This section includes average rates for inbox placement and spam folder placement for each email provider. It also includes a chart, shown in the following image, that displays the inbox placement rate for each provider for every day in the analysis period. You can use the information in this chart to help identify campaigns that resulted in poor delivery rates.

> **Note**
>
> You can use the date filter to choose a date range that contains up to 30 days.



Denylist activities

This section helps you to quickly identify denylist events that could impact the delivery of emails sent from your domain. A *denylist* is a list of IP addresses that are suspected of sending unsolicited or malicious email. Different denylist providers have different criteria for adding IP addresses to their lists, and for removing ("delisting") IP addresses from their lists. Additionally, each email provider uses a different denylist or set of denylists. Also, each provider weighs denylisting events differently. If one of your dedicated IP addresses is listed in this section, it doesn't necessarily mean that there will be any impact on the delivery of your email.

If one of your dedicated IP addresses appears in this section, contact the organization that manages the denylist, and request that your IP address be removed. The following table includes a list of denylist operators that are considered in this section, and includes links to their procedures for delisting an IP address.

Denylist operator	Link to delisting procedures
Spamhaus	Spamhaus website
Barracuda	Barracuda website
Cloudmark Sender Intelligence (CSI)	Cloudmark sender intelligence website
LashBack	LashBack website
Passive Spam Block List (PSBL)	Passive spam block list website
SpamCop	SpamCop website

Domain authentication

This section contains information about the various methods that you can use to authenticate your domains. To configure DKIM or SPF authentication for a domain, you must add specific records to the DNS configuration for the domain. To view these records, choose **View the DNS record**.

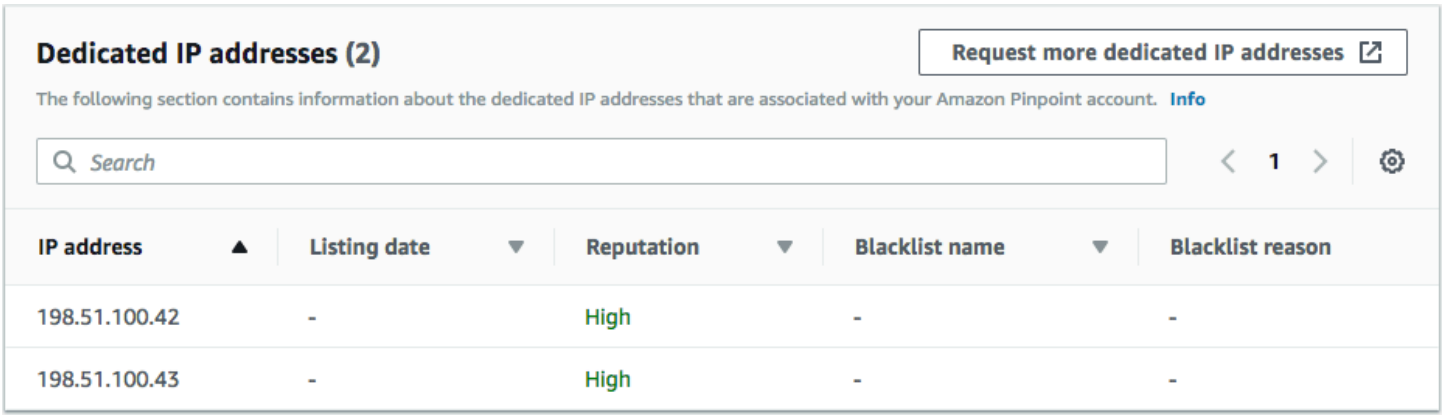
The procedures for updating the DNS records for a domain vary depending on which DNS or web hosting provider that you use. See your provider's documentation for more information about adding DNS records.

IP reputation

The **IP address reputation** page contains information about the denylist activities for the dedicated IP addresses that you use to send email by using Amazon Pinpoint and Amazon Simple Email Service (Amazon SES).

Overview

The **Overview** tab lists every dedicated IP address that's associated with your Amazon Pinpoint and Amazon SES accounts, as shown in the following image.



If the value in the **Reputation** column is *High*, then there are no denylist activities that impact the reputation of that IP address. If the IP address appears on a denylist, the name of that denylist is shown in the **Blacklist name** column.

If one of your dedicated IP addresses appears in this section, contact the organization that manages the denylist, and request that your IP address be removed. The following table includes a list of denylist operators that are considered in this section, and includes links to their procedures for delisting an IP address.

Denylist operator	Link to delisting procedures
Spamhaus	Spamhaus website
Barracuda	Barracuda website
Invaluement	Invaluement website
LashBack	LashBack website
Passive Spam Block List (PSBL)	Passive spam block list website

Alarms

On the **Alarms** tab, you can create alarms that send you notifications when your dedicated IPs are added to major denylists.

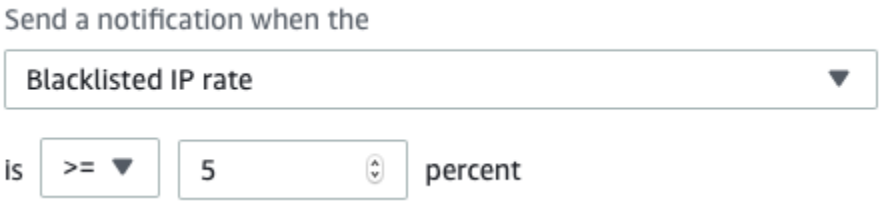
To create an alarm

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.

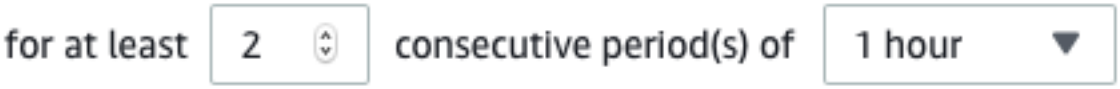
2. In the navigation pane, choose **Deliverability dashboard**.
3. On the **Alarms** tab, choose **Create alarm**.
4. On the **Create alarm** page, do the following:

   a. For **Alarm name**, enter a name to help you identify the alarm.

   b. Configure the values that cause the alarm to be triggered. For example, if you want to be notified when the denylisted IP rate for your account is 5% or greater, choose **>=**. Then enter a value of **5**, as shown in the following image.



   c. Specify the amount of time that has to elapse before the alarm is triggered. For example, you can configure the alarm so that it only sends a notification when the denylisted IP rate exceeds a certain rate and stays at that rate for more than 2 hours. In this example, next to **for at least**, enter a value of **2**. Then, next to **consecutive period(s) of**, choose **1 hour**, as shown in the following image.



   d. Under **Notification method**, choose one of the following options:

   - **Use an existing SNS topic** – Choose this option if you've already created an Amazon SNS topic and subscribed endpoints to it.
   - **Create a new topic** – Choose this option if you haven't yet created an Amazon SNS topic, or if you want to create a new topic.

> **Note**
>
> When you create a new topic, you must subscribe one or more endpoints to it. For more information, see Subscribing an Amazon SNS topic in the *Amazon Simple Notification Service Developer Guide*.

   e. (Optional) You can choose or create more than one Amazon SNS topic. To add a topic, choose **Notify an additional SNS topic**.

f. When you finish, choose **Create**.

Bounce and complaint rates

On the **Bounce and complaint rates** page, you can find important metrics related to the bounce and complaint rates for your combined Amazon Pinpoint and Amazon Simple Email Service (Amazon SES) account.

A *bounce* occurs when an email that you send can't be delivered because of a permanent issue. For example, a bounce might occur if the recipient's address doesn't exist, or the recipient's email provider is blocking email from your domain or IP address. Email providers consider a high bounce rate to be a negative sign. This is because it indicates that you're sending email to people who haven't explicitly opted to receive messages from you. A high bounce rate could have a negative impact on the delivery of your emails.

A *complaint* occurs when a customer receives an email from you and reports it to their email provider as an unwanted email (for example, by using the *Report Spam* feature in their email client). Email providers consider complaints to be a serious sign that your domain is sending unsolicited email. For this reason, a high complaint rate can have a very negative impact on the delivery of your email.

High bounce and complaint rates often indicate that a sender is sending unsolicited email to their recipients. For this reason, email providers carefully consider your bounce and complaint rates when they determine whether to send your email to the inbox or to the junk mail folder.

You can use the **Bounce and complaint rates** page to track these account-wide metrics. On this page, you can also create alarms that notify you when your bounce or complaint rates reach certain thresholds.

Overview

The **Overview** tab contains information about the bounce and complaint rates for each account.

> **Note**
>
> This page shows bounce and complaint metrics for your entire AWS account in the current AWS Region. If you use both Amazon Pinpoint and Amazon SES to send email, this page shows the combined bounce and complaint metrics for both services.

Summary

This section shows the status of your account. The following is a list of possible values:

- **Healthy** – There are no issues currently impacting your account.
- **Under review** – Your account is under review. If the issues that caused us to place your account under review aren't resolved by the end of the review period, we might pause your account's ability to send email.
- **Pending end of review decision** – Your account is under review. Because of the nature of the issues that caused us to place your account under review, we must perform a manual review of your account before we take any further action.
- **Sending paused** – We've paused your account's ability to send email. While your account's ability to send email is paused, you aren't able to send email using Amazon Pinpoint or Amazon SES. You can request that we review this decision.
- **Pending sending pause** – Your account is under review. The issues that caused us to place your account under review haven't been resolved. In this situation, we typically pause your account's ability to send email. However, because of the nature of your account, we must review your account before any further action is taken.

The number that's shown under **Emails sent** is the number of emails that we considered in making this determination. The number under **Sent over period** is the period of time during which you sent those emails.

To learn more about each status value and how we work with you to address issues that impact your account, see the sending review process FAQs in the *Amazon Simple Email Service Developer Guide*.

Bounce rate

This section shows the current bounce rate for your account. The bounce rate for your account should remain below 2%. If your bounce rate is 5% or greater, we'll place your account under review. If the bounce rate for your account exceeds 10%, we might temporarily pause your account's ability to send email.

This section contains the following information:

- **Eligible emails sent** – The number of emails that were considered in calculating the bounce rate.
- **Sent over period** – The time period that we considered to calculate the bounce rate.

We don't calculate your bounce rate based on a fixed period of time, because different senders send at different rates. Instead, we look at a *representative volume*–an amount of email that represents your typical sending practices.

- **Bounce rate** – The percentage of emails you sent during the analysis period that bounced.
- **Overall status** – Indicates the health of the metric. The status could be one of the following:
  - **Healthy** – The bounce rate for your account is within normal levels.
  - **Almost healed** – Your account was placed under review because the bounce rate was too high. Since the review period began, the bounce rate has stayed below the maximum rate. If the bounce rate remains below the maximum rate, the status of this metric changes to **Healthy** at the end of the review period.
  - **Under review** – Your account was placed under review because the bounce rate was too high. Since your account was placed under review, the bounce rate hasn't improved. If the issue that caused the bounce rate to exceed 5% isn't resolved by the end of the review period, we might pause your account's ability to send email.
  - **Sending pause** – Your account's ability to send email was paused because the bounce rate was too high. While your account's ability to send email is paused, you can't send email. You can request that we review this decision.
  - **Pending sending pause** – The metric caused us to place your account under review. The issues that caused this review period haven't been resolved. These issues might cause us to pause your account's ability to send email. A member of our team has to review your account before we take any further action.

  To learn more about each status value and how we work with you to address issues that impact your account, see the sending review process FAQs in the *Amazon Simple Email Service Developer Guide*.

Complaint rate

This section shows the current complaint rate for your account. The complaint rate for your account should remain below 0.1%. If the complaint rate for your account exceeds 0.5%, we might temporarily pause your account's ability to send email.

This section contains the following information:

- **Eligible emails sent** – The number of emails that were considered in calculating the complaint rate.

- **Sent over period** – The time period that we considered to calculate the complaint rate.
- **Complaint rate** – The percentage of emails you sent during the analysis period that resulted in complaints.
- **Overall status** – Indicates the health of the metric. The status could be one of the following:
  - **Healthy** – The complaint rate for your account is within normal levels.
  - **Almost healed** – Your account was placed under review because the complaint rate was too high. Since the review period began, the complaint rate has stayed below the maximum rate. If the complaint rate remains below the maximum rate, the status of this metric changes to **Healthy** at the end of the review period.
  - **Under review** – Your account was placed under review because the complaint rate was too high. Since your account was placed under review, the complaint rate hasn't improved. If the issue that caused the complaint rate to exceed 0.1% isn't resolved by the end of the review period, we might pause your account's ability to send email.
  - **Sending pause** – Your account's ability to send email was paused because the complaint rate was too high. While your account's ability to send email is paused, you can't send email. You can request that we review this decision.
  - **Pending sending pause** – Your account was placed under review because the complaint rate was too high. The issues that caused this review period haven't been resolved. These issues might cause us to pause your account's ability to send email. A member of our team has to review your account before we take any further action.

  To learn more about each status value and how we work with you to address issues that impact your account, see the sending review process FAQs in the *Amazon Simple Email Service Developer Guide*.

Alarms

On the **Alarms** tab, you can create alarms that send you notifications when the bounce or complaint rates for your account exceed certain levels.

To create an alarm

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Deliverability dashboard**.
3. On the **Alarms** tab, choose **Create alarm**.
4. On the **Create alarm** page, do the following:

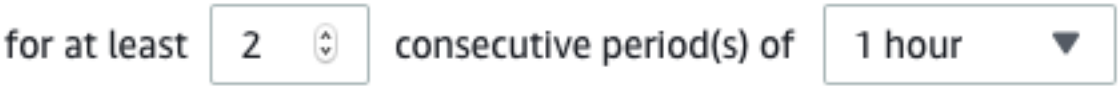
a. For **Alarm name**, enter a name that helps you easily identify the alarm.

b. For **Send a notification when the**, choose one of the following options:

- **Bounce rate**
- **Complaint rate**

c. Configure the values that cause the alarm to be triggered. For example, if you want to be notified when the bounce rate for your account is 5% or greater, choose **>=**. Then enter a value of **5**, as shown in the following image.

d. Specify the amount of time that has to elapse before the alarm is triggered. For example, you can configure the alarm so that it only sends a notification when the bounce rate exceeds a certain rate and stays at that rate for more than 2 hours. In this example, next to **for at least**, enter a value of **2**. Then, next to **consecutive period(s) of**, choose **1 hour**, as shown in the following image.



e. Under **Notification method**, choose one of the following options:

- **Use an existing SNS topic** – Choose this option if you've already created an Amazon SNS topic and subscribed endpoints to it.
- **Create a new topic** – Choose this option if you haven't yet created an Amazon SNS topic, or you want to create a new topic.

> **Note**
>
> When you create a new topic, you have to subscribe one or more endpoints to it. For more information, see Subscribing an Endpoint to a Topic in the *Amazon Simple Notification Service Developer Guide*.

f. (Optional) You can choose or create more than one Amazon SNS topic. To add a topic, choose **Notify an additional SNS topic**.

g. When you finish, choose **Create**.

Campaign delivery metrics

The **Campaign delivery metrics** section contains information about inbox placement rates for the email that you sent from your domains. However, unlike the Domain reputation page, the **Campaign delivery metrics** page contains information about specific email campaigns, as opposed to information for entire domains.

The Deliverability dashboard's **Campaign delivery metrics** uses heuristics such as the *from domain* and *send time* to group similar messages into categories. We can't guarantee that this aligns with Amazon Pinpoint campaigns or treatments. When sending an Amazon Pinpoint campaign with multiple treatments, you can review the campaign analytics page for reporting of open rate across treatments.

When you choose a domain and a date range, you see a table that contains the following information:

- **Preview** – A small image that shows the content of the email. Hover over the image to see a larger preview.
- **Last send date** – The date and time when the message was last sent.
- **Subject** – The subject line of the email.
- **Sender address** – The sender ("From") address for the message.
- **ESP** – The email provider (such as Gmail or Yahoo) that the metrics apply to.
- **Inbox rate** – The percentage of emails sent from the campaign that arrived in recipients' inboxes (as opposed to their junk mail folders).
- **Open rate** – The percentage of emails sent from the campaign that were opened by their recipients.

When you choose a campaign in this table, you see a details page for the campaign. Campaign details pages contain two sections: **Details** and **Sending IP addresses**.

Details

This section contains the following information about the campaign:

- **Latest sent date** – The date and time when the message was last sent.
- **First sent date** – The date and time when the message was first sent.
- **Subject** – The subject line of the email.
- **Sender address** – The sender ("From") address for the message.
- **Sender domain** – The domain that the message was sent from.
- **ESP** – The email provider (such as Gmail or Yahoo) that the metrics apply to.
- **Estimated volume** – The approximate number of recipients that were sent this campaign.
- **Inbox placement** – The percentage of emails sent from the campaign that arrived in recipients' inboxes (as opposed to their junk mail folders).
- **Spam placement** – The percentage of emails sent from the campaign that arrived in recipients' junk mail folders.
- **Read** – The percentage of emails that were opened by their recipients.
- **Read and deleted** – The percentage of emails that were opened by their recipients and then deleted.
- **Deleted** – The percentage of emails that were deleted by their recipients without being read.

The campaign details page also includes a larger preview of the body of the email. Amazon Pinpoint automatically removes identifying information from this preview image.

Sending IP addresses

This section of the campaign details page lists all the IP addresses that Amazon Pinpoint and Amazon SES used when sending the selected message to your recipients.

Inbox placement tests

On the **Inbox placement tests** page of the Deliverability dashboard, you can perform tests that can help you predict how specific messages are handled by over 95 major email providers around the world. When you perform an inbox placement test, you provide a sample message that contains the content that you plan to send to your customers. Amazon Pinpoint then sends that message to special email addresses on several major email domains. After about 24 hours, the test is complete, and you can view the results.

> **Important**
>
> When you perform an inbox placement test, we send your message to a third party for delivery testing and analysis. We impose our standard security requirements on this third party, and the contents of your emails are encrypted during transfer. However, because it isn't necessary to use real data when you perform these tests, we recommend that you avoid sending sensitive, confidential, or personally identifiable information in the messages that you use in these tests.

Inbox placement tests show you how different email providers handle specific messages. The test results tell you how many of your messages arrived in test recipients' inboxes on the various email providers. It also tells you how many messages were sent to recipients' junk mail folders, and how many weren't delivered at all. Performing inbox placement tests help you identify deliverability problems that could arise because of the content of your email.

Your monthly Deliverability dashboard subscription includes 25 inbox placement tests per month. You can purchase more tests for an additional fee. For more information, see Amazon Pinpoint pricing.

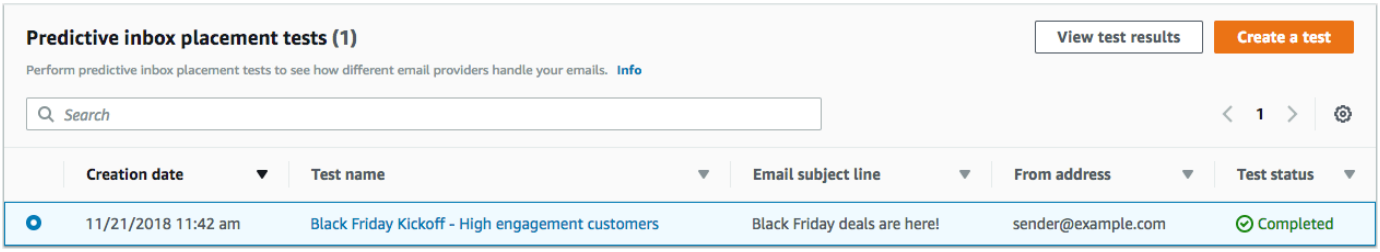
To create a new email placement test

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane of the Deliverability dashboard, choose **Inbox placement tests**.
3. Choose **Create a test**.
4. For **Name**, enter a name to identify this specific test.
5. For **From address**, choose either an **Email address** or a **Domain**, and then specify the email address that you plan to use to send the email.
6. For **Subject**, enter the subject line for the email.
7. For **HTML content**, enter the HTML-formatted content of the message.
8. Choose **Create**.

It takes approximately 24 hours for the test to complete. When the test is finished, complete the following steps to view the results.

To view the results of an inbox placement test

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane of the Deliverability dashboard, choose **Inbox placement tests**.
3. Confirm that the value in the **Test status** column is **Complete** for the test that you want to review. If it is, choose the test, and then choose **View test results**, as shown in the following image.



Each inbox placement test contains two sections: **Deliverability overview** and **ISP overview**.

The **Deliverability overview** section contains the following information about the message that you sent in the inbox placement test:

- **Test name** – The name that you provided when you created the test.
- **Report ID** – A unique identifier for the test.
- **From identity** – The email address that the test email was sent from.
- **Subject** – The subject line of the test email.
- **Inbox** – The percentage of emails that arrived in test recipients' email inboxes.
- **Spam** – The percentage of emails that arrived in test recipients' spam folders.
- **Missing** – The percentage of emails that didn't reach the recipient.
- **DKIM rate** – The percentage of messages that were verified using DKIM.
- **SPF rate** – The percentage of messages that were verified using SPF.

You can view the contents of the test email by expanding the **View HTML content** section.

The **ISP overview** section contains a list of over 95 major email providers located in countries around the world. For each provider, this table includes the following metrics:

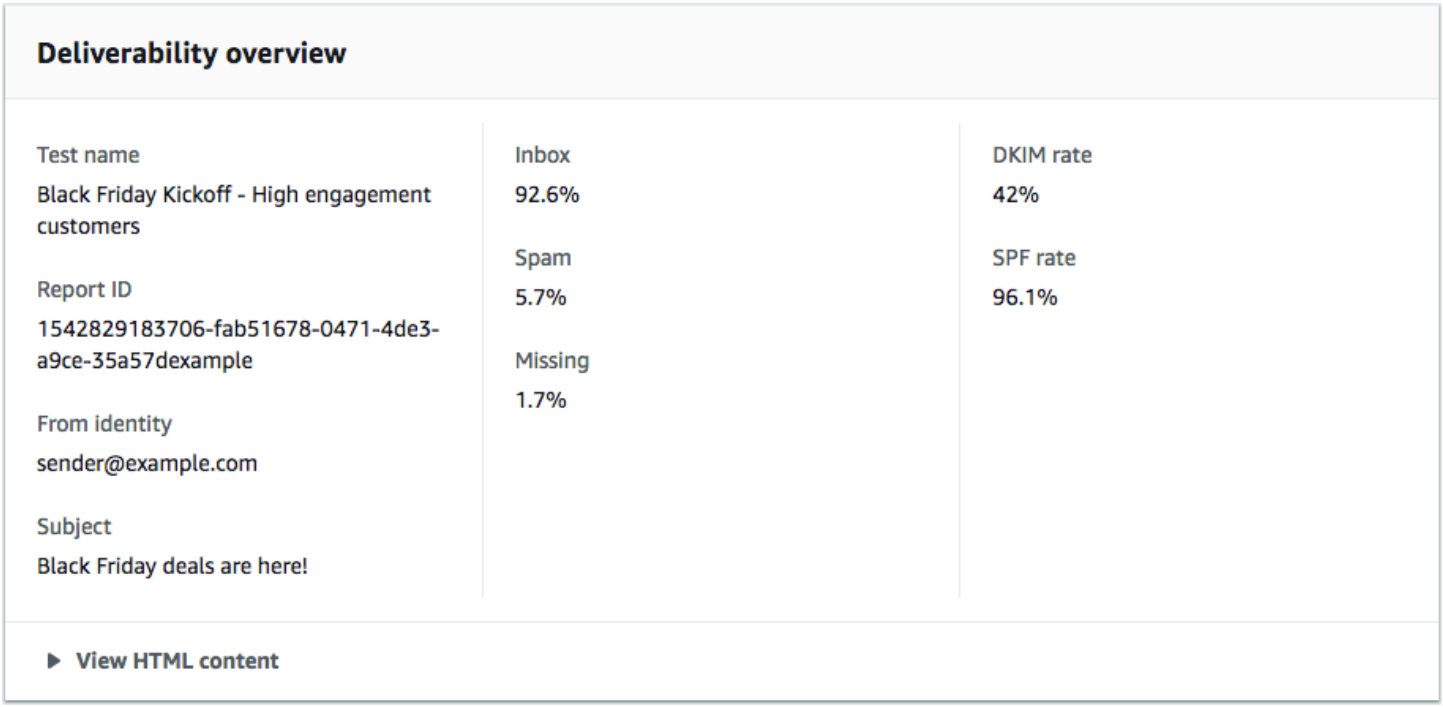
- **Inbox** – The percentage of emails that arrived in test recipients' email inboxes on the provider's domain.

- **Spam** – The percentage of emails that arrived in test recipients' spam folders on the provider's domain.
- **Missing** – The percentage of emails that didn't reach the recipient.
- **SPF** – The percentage of messages that were verified by the provider using SPF.
- **DKIM** – The percentage of messages that were verified by the provider using DKIM.

Test results

Inbox placement tests contain two sections: a **Deliverability overview** and an **ISP Overview**.

The following is an example of what the **Deliverability Overview** might look like for a test.



This section contains a summary of the inbox placement test. It includes the following information:

- **From identity** – The sender email address for the test email.
- **Subject** – The subject line of the email.
- **Inbox** – The percentage of test messages that arrived in recipients' inboxes.
- **Spam** – The percentage of test messages that were sent to recipients' junk mail folders.
- **Missing** – The percentage of test messages that weren't delivered to recipients at all.
- **DKIM rate** – The percentage of test messages that were authenticated by the recipient's mail providers by using DomainKeys Identified Mail.

- **SPF rate** – The percentage of test messages that were authenticated by the recipient's mail provider by using Sender Policy Framework.

You can also view the body of the email by choosing **View HTML content**.

ISP Overview

This section contains a list of all of the email providers that we sent your test message to during the test. For each provider in this list, we provide the same five metrics shown in the **Deliverability overview** section (**Inbox**, **Spam**, **Missing**, **SPF**, and **DKIM**).

Deliverability dashboard settings

> **Note**
>
> Email deliverability dashboard functionality is now available in Amazon Simple Email Service Virtual Deliverability Manager.

On the **Dashboard settings** page, you can change several settings that are related to the Deliverability dashboard. You can also find information that tells you about your usage of the Deliverability dashboard for the current month.

Subscription overview

The **Subscription overview** section contains information about the status of your Deliverability dashboard subscription. It also tells you how many days remain in the current billing cycle.

Your subscription to the Deliverability dashboard is billed each month. We don't offer subscriptions for a portion of a billing period. If you cancel your subscription before the end of a billing period, we continue to charge you for the remaining days in the billing period. However, we don't charge you for the next billing period. To cancel your subscription, choose **Cancel subscription**.

Monthly usage

The **Monthly usage** section provides information about your usage of the Deliverability dashboard for the current month.

In the **Domain reputation tracking** section, you can choose which domains are monitored on the **Domain reputation** and **Deliverability by campaign** pages. With your subscription to the

Deliverability dashboard, you can monitor up to five domains per month. You can monitor more than five domains for an additional monthly charge. To add or remove domains to the Deliverability dashboard, choose **Edit** in the **Subscribed domains** section.

> **Note**
>
> You can only monitor domains that you've verified. For more information about verifying domains, see Verifying a domain.

The **Predictive inbox placement tests** section shows you how many Predictive inbox placement tests that you've performed in the current month. Your subscription includes 25 tests. You can purchase additional tests for an additional fee.

For more information about Deliverability dashboard pricing, see Amazon Pinpoint pricing.

Email best practices

Even when you have your customers' best interests in mind, you might still encounter situations that impact the deliverability of your messages. The following sections contain recommendations to help make sure that your email communications reach your intended audience.

Topics

- General recommendations
- Domain and "from" address considerations
- Building and maintaining your lists
- Compliance
- Sending a high volume of email
- Bounces
- Complaints
- Message quality

General recommendations

- Put yourself in your customer's shoes. Ask yourself if the message that you're sending is something that you would want to receive in your own inbox. If the answer is anything less than an enthusiastic "yes!" then you probably shouldn't send it.

- Some industries have a reputation for poor quality or even malicious email practices. If you're involved in the following industries, you must monitor your reputation very closely and resolve issues immediately:
  - Home mortgage
  - Credit
  - Pharmaceuticals and supplements
  - Alcohol and tobacco
  - Adult entertainment
  - Casinos and gambling
  - Work-from-home programs

Domain and "from" address considerations

- Carefully consider the addresses that you send email from. The *From* address is one of the first pieces of information your recipients see, and therefore can leave a lasting first impression. Additionally, some ISPs associate your reputation with your *From* address.
- Consider using subdomains for different types of communications. For example, assume you're sending email from the domain *example.com*, and you plan to send both marketing and transactional messages. Rather than sending all of your messages from *example.com*, send your marketing messages from a subdomain such as *marketing.example.com*, and your transactional messages from a subdomain such as *orders.example.com*. Unique subdomains develop their own reputations. Using subdomains reduces the risk of damage to your reputation if, for example, your marketing communications land in a spam trap or trigger a content filter.
- If you plan to send a large number of messages, don't send those messages from an ISP-based address such as *sender@hotmail.com*. If an ISP notices a large volume of messages coming from *sender@hotmail.com*, that email is treated differently than an email that comes from an outbound email sending domain that you own.
- Work with your domain registrar to make sure that the WHOIS information for your domain is accurate. Maintaining an honest and up-to-date WHOIS record demonstrates that you value transparency, and allows users to quickly identify whether your domain is legitimate.
- Avoid using a no-reply address, such as no-reply@example.com, as your *From* or *Reply-to* address. Using a *no-reply@* email address sends your recipients a clear message: that you aren't offering them a way to contact you, and that you're not interested in their feedback.

Building and maintaining your lists

- Implement a double opt-in strategy. When users sign up to receive email from you, send them a message with a confirmation link, and don't start sending them email until they confirm their address by selecting that link. A double opt-in strategy helps reduce the number of hard bounces resulting from typographical errors.
- When collecting email addresses with a web-based form, perform minimal validation on those addresses upon submission. For example, make sure that the addresses you collect are well-formed (that is, they are in the format recipient@example.com), and that they refer to domains with valid MX records.
- Use caution when allowing user-defined input to be passed to Amazon Pinpoint unchecked. Forums registrations and form submissions present unique risks because the content is completely user-generated, and spammers can fill out forms with their own content. It's your responsibility to make sure that you only send email with high-quality content.
- It's highly unlikely that a standard alias (such as *postmaster@*, *abuse@*, or *noc@*) will ever sign up for your email intentionally. Make sure that you only send messages to real people who actually want to receive them. This rule is especially true for standard aliases, which are customarily reserved for email watchdogs.

Compliance

- Be aware of the email marketing and anti-spam laws and regulations in the countries and regions that you send email to. You're responsible for making sure that the email you send complies with these laws. This guide doesn't cover these laws, so it's important that you research them. For a list of laws, see Email spam legislation by country on Wikipedia.
- Always consult an attorney to obtain legal advice.

Sending a high volume of email

Consistency is important when sending email. When increasing email volume, it's important to steadily increase sending volume each day, with similar types of messages being sent at around the same time every day. However, situations might arise that require you to send an especially large volume of email to your customers. An example might be a Terms of Service update. There are several steps that you can take to protect your sender reputation and achieve high deliverability rates when increasing volume.

- Organize your recipient list to create segments of those customers who are most likely to open your email, and those who are most likely to mark your message as spam or unsubscribe.

  Build a foundation of trust with email providers by sending messages to the most engaged portion of the segment first.
- Spread out your campaign over several hours throughout the day, rather than sending all of your messages at once.

  Mimic your normal sending cadence when possible. For example, if on a normal day you send your list of 1M an email but split them into two distributions, one beginning at 8 AM and one at Noon, but if you needed to send 5M out one day, send in splits like your normal sending day.
- When you send volumes of email that are larger than your normal volumes, try to send in multiples of your typical volume.

  For example, if you send 250,000 emails on a normal day, try to limit higher-volume events to a multiple of that amount, such as 500,000 or 750,000. Limiting your sending volume in this way demonstrates to email providers that although you're sending more email than normal, you're still carefully maintaining your volume.

Bounces

A *bounce* occurs when an email can't be delivered to the intended recipient. There are two types of bounces: *hard bounces* and *soft bounces*. A hard bounce occurs when the email can't be delivered because of a persistent issue, such as when an email address doesn't exist. A soft bounce occurs when a temporary issue prevents the delivery of an email. Soft bounces can occur when a recipient's inbox is full, or when the receiving server is temporarily unavailable. Amazon Pinpoint handles soft bounces by attempting to re-deliver soft bounced emails for a certain period of time.

It's essential that you monitor the number of hard bounces in your email program, and that you remove hard-bouncing email addresses from your recipient lists. When email receivers detect a high rate of hard bounces, they assume that you don't know your recipients well. As a result, a high hard bounce rate can negatively impact the deliverability of your email messages.

The following guidelines can help you avoid bounces and improve your sender reputation:

- Try to keep your hard bounce rate below 5%. The fewer hard bounces in your email program, the more likely ISPs will see your messages as legitimate and valuable. This rate should be considered a reasonable and attainable goal, but isn't a universal rule across all ISPs.

- Never rent or buy email lists. These lists can contain large numbers of invalid addresses, which could cause your hard bounce rates to increase dramatically. Furthermore, these lists could contain spam traps—email addresses specifically used to catch illegitimate senders. If your messages land in a spam trap, your delivery rates and sender reputation could be irrevocably damaged.
- Keep your list up to date. If you haven't emailed your recipients in a long time, try to validate your customers' statuses through some other means (such as website login activity or purchase history).
- If you don't have a method of verifying your customers' statuses, consider sending a *win-back* email. A typical win-back email mentions that you haven't heard from the customer in a while, and encourages the customer to confirm that they still want to receive your email. After sending a win-back email, purge all of the recipients who didn't respond from your lists.

When you receive bounces, it's important that you immediately remove that address from your lists. Don't attempt to re-send messages to hard-bouncing addresses. Repeated hard bounces can ultimately harm your reputation with the recipient's ISP.

If you receive a *hard bounce*, you should note the following:

- The recipient's email address is added to a global suppression list for a period of 14 days. When you send an email and the recipient's address is on the global suppression list, the message is still accepted. However, Amazon Pinpoint doesn't attempt to deliver the message to the recipient.
- When an email *hard bounces*, it's important to remove the recipient's email address from your mailing lists. When you send email to an address that's on the global suppression list, Amazon Pinpoint generates bounce events, even though the email isn't sent. These bounce events count against your account's bounce rate. If your bounce rate gets too high, we might place your account under review in order to protect your reputation as a sender.

For more information about the global suppression list, see Amazon SES global suppression list.

Complaints

A complaint occurs when an email recipient selects the "Mark as Spam" (or equivalent) button in their web-based email client. If you accumulate a large number of these complaints, the ISP assumes that you're sending spam. This has a negative impact on your deliverability rate and sender reputation. Some, but not all, ISPs will notify you when a complaint is reported, which is

known as a *feedback loop*. Amazon Pinpoint automatically forwards complaints from ISPs that offer feedback loops to you.

The following guidelines can help you avoid complaints and improve your sender reputation:

- Try to keep your complaint rate below 0.1%. The fewer complaints in your email program, the more likely ISPs will see your messages as legitimate and valuable. This rate should be considered a reasonable and attainable goal, but isn't a universal rule across all ISPs.
- If a customer complains about a marketing email, you should immediately stop sending that customer marketing emails. However, if your email program also includes other types of emails (such as notification or transactional emails), it might be acceptable to continue to send those types of messages to the recipient who issued the complaint.
- As with hard bounces, if you have a list that you haven't sent email to in a while, make sure that your recipients understand why they're receiving your messages. We recommend that you send a welcome message reminding them of who you are and why you're contacting them.

When you receive complaints, it's vital that you respond to them appropriately by observing the following rules:

- Make sure that the address you use to receive complaint notifications is able to receive email.
- Make sure that your complaint notifications aren't being marked as spam by your ISP or mail system.
- Complaint notifications usually contain the body of the email. This is different from bounce notifications, which only include the email headers. However, in complaint notifications, the email address of the individual who issued the complaint is removed. Use custom X-headers or special identifiers embedded in the email body so that you can identify the email address that issued the complaint. This technique makes it easier to identify addresses that complained so that you can remove them from your recipient lists.

Message quality

Email receivers use *content filters* to detect certain characteristics of messages and determine whether a message is legitimate. These content filters automatically review the content of messages to identify common traits of unwanted to malicious messages. Amazon Pinpoint uses content filtering technologies to help detect and block messages that contain malware before they are sent.

If an email receiver's content filters determine that your message has characteristics of spam or malicious email, your message will most likely be flagged and diverted from recipients' inboxes.

Remember the following when designing your email:

- Modern content filters are intelligent, continuously adapting and changing. They don't rely on a predefined set of rules. Third-party services such as ReturnPath or Litmus can help identify content in your email that might trigger content filters.
- If your email contains links, check the URLs for those links against denylists, such as those found at URIBL.com and SURBL.org.
- Avoid using link shorteners. Malicious senders might use link shorteners to hide the actual destination of a link. When ISPs notice that link shortening services—even the most reputable ones—are being used for nefarious purposes, they might denylist those services altogether. If your email contains a link to a denylisted link shortening service, it won't reach your customers' inboxes, and the success of your email campaign suffers.
- Test every link in your email to verify that it points to the intended page.
- Make sure that your website includes Privacy Policy and Terms of Use documents, and that these documents are up to date. It's a good practice to link to these documents from each email you send. Providing links to these documents demonstrates that you have nothing to hide from your customers, which can help build a relationship of trust.
- If you plan to send high-frequency content (such as "daily deals" messages), make sure that the content of your email is different with each deployment. When you send messages with high frequency, you must make sure that those messages are timely and relevant, rather than repetitive and annoying.

Troubleshooting the email channel

Verify that logging is turned on to assist in identifying the cause of failure. For more information on logging, see Monitoring and logging and Email events.

Rendering issues

- When using an email template, a rendering failure occurs when message variables are missing, formatted incorrectly, or when there is a mismatch between message variables and endpoint data causing emails to fail during sending.

- To identify rendering failures, review the Amazon SES CloudWatch metric `RenderingFailure` during the time frame that the campaign ran. Rendering failures appear in the Amazon Pinpoint event logs as _email.rendering_failure events.
- To resolve the issue, verify that all message variables have a corresponding endpoint attribute present and are in the correct format. For more information, see Adding personalized content to message templates.
- Configure default values for all message variables in the template to avoid rendering failures when an attribute is missing for an endpoint.
- Test running the campaign without the template to confirm whether endpoints can successfully receive messages. This action can help confirm that the issue is related to template variables.

Bounce status

Solution for soft bounce

- A *soft bounce* occurs because of a temporary failure and will appear under the **_email.softbounce** event type in the logs. Amazon Pinpoint handles soft bounces by attempting to redeliver the soft bounced emails for a specified period of time.
- A soft bounce can occur in the following scenarios:
  - The recipient mailbox is full.
  - The recipient mailbox is temporarily unavailable.
  - The server limits are exceeded.
  - The server is overloaded.
- The specific error codes related to soft bounces are 421, 450, 451, or 452. For the descriptions of these error codes, see Simple Mail Transfer Protocol (SMTP) Enhanced Status Codes Registry. The **smtp_response** in the logs provide the error code for the bounce event.

Solution for hard bounce

- A *hard bounce* is a persistent delivery failure that appears under the **_email.hardbounce** event type in the logs. These failures aren't retried.
- A hard bounce can occur in the following scenarios:
  - The email address doesn’t exist.
  - The domain name doesn’t exist.

- The recipient's email server has blocked the emails.
- The email address is on the account suppression list.

- Monitor the number of hard bounces in your project and remove hard-bouncing email addresses from your recipient lists. Hard bounces can negatively impact your sending reputation and the deliverability of your email message. For more information, review the best practices on Bounces.

Amazon Pinpoint SMS channel

Note

Amazon Pinpoint has updated their User Guide documentation. To get the latest information regarding how to create, configure, and manage your SMS and voice resources, see the new AWS End User Messaging SMS User Guide.
The following topic have been moved to the new AWS End User Messaging SMS User Guide.

- About the SMS/MMS and Voice sandbox
- Choosing a phone number or sender ID
- SMS and MMS limits and restrictions
- Requesting support for SMS, MMS, and voice messaging
- Monitoring SMS, MMS, and voice spending activity with AWS End User Messaging SMS
- First time user tutorial
- Keywords
- Two-way SMS messaging
- SMS and MMS country capabilities and limitations
- Phone pools
- Best practices
- Understanding SMS billing and usage reports

You can use the SMS channel in Amazon Pinpoint to send SMS messages (text messages) to your customers' mobile devices. Amazon Pinpoint can send SMS messages to recipients in over 200 countries and regions. In some countries and regions, you can also receive messages from your customers by using the two-way SMS feature. When you create a new Amazon Pinpoint account,

your account is placed in an SMS sandbox. This initially limits your monthly spending and who you can send messages to. For more information, see SMS sandbox in the *AWS End User Messaging SMS User Guide*.

To send text messages using Amazon Pinpoint, you must enable the SMS channel in your project. Depending on how you use Amazon Pinpoint to send SMS messages, you might also need to initiate a request with Support to enable or modify certain SMS options for your account. For example, you can request to increase your SMS spending quota, to move from the sandbox to production, or you can request a short code to use when sending and receiving messages.

To receive text messages using Amazon Pinpoint, you should first obtain a dedicated short code or long code. When you have a dedicated number, you can enable two-way SMS for it. Finally, you can specify the messages that Amazon Pinpoint sends to customers when it receives incoming messages.

In the SMS and voice settings section of the Amazon Pinpoint console, you can manage SMS channel settings for your use case and budget. For example, you can set your monthly SMS spending quota, or change your default message type.

> **Note**
>
> When you configure SMS channel settings in Amazon Pinpoint, your changes apply to other AWS services that send SMS messages, such as Amazon SNS.

Topics

- Setting up the Amazon Pinpoint SMS channel
- Managing the Amazon Pinpoint SMS channel
- Message routes
- Message fallback
- Troubleshooting the SMS channel

Setting up the Amazon Pinpoint SMS channel

To send SMS messages with Amazon Pinpoint, you need an Amazon Pinpoint project in which the SMS channel is enabled.

You can also enable the SMS channel for an existing project by using the **SMS and voice** settings page on the Amazon Pinpoint console. For more information, see Managing the Amazon Pinpoint SMS channel.

Creating a new project using the Amazon Pinpoint console

The first step in setting up the SMS channel in Amazon Pinpoint is to create a new project. Next, you enable the SMS channel for that project.

To create a new Amazon Pinpoint project and enable the SMS channel

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose **Create a project**.
3. For **Project name**, enter a name, and then choose **Create**.

> **Note**
>
> The project name can contain up to 64 alphanumeric characters. It can also include the following characters: comma (,), period (.), at sign (@), underscore (_), equals sign (=), and plus sign (+).

4. Under **Project features**, in the **SMS and voice** section, choose **Configure**.
5. Choose **Enable the SMS channel for this project**.
6. Under **Account-level settings**, you can optionally change the following settings:

   - **Default message type** – The category of messages that you plan to send. Choose **Transactional** for time-sensitive content, such as alerts and one-time passwords, or choose **Promotional** for marketing-related content.
   - **Account spending limit** – The maximum amount of money, in US Dollars, that you want to spend sending SMS messages per calendar month. If your monthly spending exceeds this value, Amazon Pinpoint and other AWS services stop sending SMS messages from your account.

   > **Note**
   >
   > If you haven't used Amazon Pinpoint or Amazon SNS to send SMS messages from your AWS account, your account will have a default spending quota of $1.00 (USD). You can request an increase to this account-wide quota. For more information, see

Requesting increases to your monthly SMS or Voice spending quota in the *AWS End User Messaging SMS User Guide*.

- **Default sender ID** – The identity that appears on recipients' devices when they receive messages. Support for sender ID capabilities varies by country or region.

> **Important**
>
> These settings apply to your entire AWS account. When you change these settings, they apply to all other Amazon Pinpoint projects in your account, and to other AWS services that you use to send SMS messages, such as Amazon SNS.

7. When you finish, choose **Save changes**.

Next steps

You've created a project that's enabled for SMS messaging. Now you can use Amazon Pinpoint to send SMS messages.

Some SMS options, such as dedicated origination numbers or sender IDs, are unavailable until you contact Support. For more information, see Requesting support for SMS and voice messaging in the *AWS End User Messaging SMS User Guide*.

To engage an audience segment with an SMS campaign, see Amazon Pinpoint campaigns.

To send an SMS message directly to a limited audience without creating a campaign, see Send test messages with Amazon Pinpoint.

Managing the Amazon Pinpoint SMS channel

You can manage SMS settings, such as your default message type (transactional or promotional) and your monthly spending quota, directly in the Amazon Pinpoint console.

Updating SMS channel settings

You can change several SMS-related settings. Most of these settings apply to your entire AWS account, but some apply to specific projects.

To edit SMS settings for a project

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to edit SMS settings for.
3. In the navigation pane, under **Settings**, choose **SMS and voice**.
4. In the **SMS settings** section, choose **Edit**.
5. Change the SMS settings for your project as needed. You can change the following settings:

   - **Enable the SMS channel for this project**

     Select this option to enable or disable the SMS channel for the project. If this setting isn't enabled, you can't send SMS messages from this project. This setting only applies to the current project.

   - **Account-level settings** – Change these settings to modify the SMS settings for your AWS account. These settings apply to your entire Amazon Pinpoint account and to all AWS services that you can use to send SMS messages, such as Amazon Simple Notification Service (Amazon SNS). You can change the following settings:

     - **Default message type** – Choose the category of SMS messages that you plan to send from this account. If you send account-related messages or time-sensitive messages such as one-time passcodes, choose **Transactional**. If you plan to send messages that contain marketing material or other promotional content, choose **Promotional**. This setting applies to your entire AWS account.
     - **Account spending limit** – The maximum amount of money (in US Dollars) that you can spend sending messages each month. You can use this setting to make sure that your SMS sending doesn't exceed your budget, or as a way to prevent unexpected increases in spending. The price to send an SMS message varies depending on the destination country for that message. For current prices, see Amazon Pinpoint Pricing. This setting applies to your entire AWS account.
     - **Account sender ID** – The alphabetic sender ID that you want to use when you send messages from your account. This setting applies to your entire AWS account.

       > **Note**
       >
       > Alphabetic sender IDs are only supported in certain countries. If you don't send messages to countries where sender ID is supported by the mobile carriers in

that country, you don't need to specify anything in this field. Sender IDs aren't supported in common messaging destinations such as the United States, Canada, and Brazil.
Additionally, some countries require sender IDs to be pre-registered with government agencies or industry organizations.
For a list of countries that support alphabetic sender IDs, see Supported countries and regions (SMS channel) in the *AWS End User Messaging SMS User Guide*.

6. When you finish, choose **Save changes**.

Message routes

The route your message uses is dependent on the type set for the message, either **promotional** or **transactional**. When purchasing a new number using the Amazon Pinpoint console you will be prompted to choose the route type.

Promotional routes are typically marketing or sales-related messages. Some countries or regions have quiet time hours when you're not permitted to send promotional messages. A transactional route is for more time-sensitive messages, such as password resets or one-time passwords. This can be applied to the number when you're purchasing a new number or can be passed as an optional parameter in the SendMessages operation of the Amazon Pinpoint API. When sending a message using that number as the originator, Amazon Pinpoint chooses the applicable promotional or transactional route.

You pass the route type as an optional parameter using the SendMessages operation of the Amazon Pinpoint API. In some cases you might use a SenderID as the originator, or you might have a shared pool of numbers. If you have both transactional and promotional numbers associated with your account for the destination country, Amazon Pinpoint chooses a transactional number by default. Delivery receipts and the Delivery dashboard show the route as either promotional or transactional, based on the chosen number.

Message fallback

When sending a message using the Amazon Pinpoint API, three optional parameters can be passed in the request: `originationNumber`, `registeredKeyword`, and `senderID`. If Amazon Pinpoint encounters an `originationNumber` error – for example, an invalid character – and the error is retriable, Amazon Pinpoint uses a fallback process for choosing a valid number for the request.

Fallback checks for a valid number in the following order. At any point during this process Amazon Pinpoint will choose the first valid number it finds as the originating number.

1. Origination number. Any other valid origination numbers are checked.
2. Keyword. Registered keywords are scanned and matched against any dedicated number.
3. Sender ID. Any other valid sender IDs are checked.

> **Note**
>
> If you send a message with an `originationNumber` that doesn't exist in your account, there's no fallback process, and an exception message returned instead.

If none of the previous parameters are passed in the request, Amazon Pinpoint looks at your account and checks for a valid number in this order:

1. Dedicated numbers. Any dedicated numbers associated with your account are checked in this order: short code, 10DLC, then long code/toll-free number. Domestic numbers are checked before international numbers. If you have both transactional and promotional long codes in your account, Amazon Pinpoint chooses a transactional number by default.
2. Default sender IDs.
3. Shared routes.

> **Note**
>
> Amazon Pinpoint does attempt to deliver messages in countries where an origination identity isn't required.

Troubleshooting the SMS channel

Verify that logging is turned on to assist in identifying the cause of failure. For more information, see Monitoring and logging. To turn on logging for AWS End User Messaging SMS and Voice v2 API, see How do I set up logging for Amazon Pinpoint voice messages for Amazon Pinpoint SMS and Voice v2 API?.

SMS delivery failures

Issues and solutions

- Confirm that the number is valid using the Amazon Pinpoint number validator. SMS delivery is only supported for 'MOBILE' phoneType. SMS delivery to 'VOIP' numbers is attempted on a best effort.
- Confirm that your monthly SMS spend quota isn't depleted. For more information see Monitoring SMS, MMS, and voice spending activity in the *AWS End User Messaging SMS User Guide*.
- If the delivery issue is limited to one or two devices, then rule out device-related issues. Verify that the number(s) can receive SMS outside of Amazon Pinpoint at the time of the failure.
- Turn on SMS event logging to assist in identifying the cause of the failure.
  - Review the message status.
  - Review how to resolve Unknown error attempting to reach phone.
- Take note of the special requirements and regulations. See Supported countries and regions (SMS channel) in the *AWS End User Messaging SMS User Guide*, and confirm that these requirements are being met.

Two-way SMS troubleshooting

Two-way SMS responses are not received on either the SNS topic, subscribers, or both.

Issues and solutions

- Verify that you have a number with two-way SMS enabled for a country where the feature is supported. See Supported countries and regions (SMS channel) and Two-way SMS messaging in the *AWS End User Messaging SMS User Guide*.
- Verify that the sender number is from the same country as the two-way SMS-enabled number in Amazon Pinpoint.
- Verify that the users' number is a valid mobile number and not a virtual number by using the Amazon Pinpoint Phone Number validator API. Communication between two virtual numbers, like the ones in Amazon Pinpoint, will be attempted at a maximum effort.
- Review Amazon SNS CloudWatch metrics for `NumberOfMessagesPublished`, `NumberOfNotificationsDelivered`, and `NumberOfNotificationsFailed` to verify if the Amazon SNS topic is able to receive the inbound SMS.

- If there are data points for `NumberOfMessagesPublished` at the time of the inbound SMS timestamps, then the recipient response was successfully received from downstream. Enable logging on the Amazon SNS topic for the delivery protocol being used. See Amazon SNS message delivery status.
- If there are no data points for the `NumberOfMessagesPublished` metric at the time of the inbound SMS timestamps:
  - Review the Amazon SNS topic policy to confirm that it allows the Amazon Pinpoint service to publish to the Amazon SNS topic. For an example policy, see Two-way SMS messaging in the *AWS End User Messaging SMS User Guide*.
  - If the Amazon SNS topic linked to the two-way SMS number is encrypted:
    - Verify that the key used is symmetric.
    - Verify that the key policy is modified to allow Amazon Pinpoint to use the key, see Amazon SNS topic policies for Amazon SNS topics in the *AWS End User Messaging SMS User Guide*.

Amazon Pinpoint voice channel

> **Note**
>
> Amazon Pinpoint has updated their user guide documentation. To get the latest information regarding how to create, configure, and manage your AWS End User Messaging SMS and voice resources, see the new *AWS End User Messaging SMS User Guide*.
> The following topics have been moved to the new *AWS End User Messaging SMS User Guide*.
>
> - Amazon Pinpoint voice sandbox
> - Supported countries and regions (voice channel)
> - Managing Pools in Amazon Pinpoint
> - Best practices for the voice channel

You can use the voice channel to create voice messages from a text script, and then send those messages to your customers over the phone. The voice channel is a great way to reach customers whose phone numbers aren't able to receive SMS messages—for example, customers who use landlines or VoIP services.

To send voice messages using Amazon Pinpoint, you must first enable the voice channel in your project and lease a dedicated phone number for sending the messages. Depending on how you use Amazon Pinpoint to send voice messages, you might also want to change certain settings for your account. For example, you might want to request production access to increase the number of voice messages that you can send.

Topics

- Setting up the Amazon Pinpoint voice channel
- Managing the Amazon Pinpoint voice channel
- Troubleshooting the voice channel

Setting up the Amazon Pinpoint voice channel

To send voice messages by using Amazon Pinpoint, start by creating a new Amazon Pinpoint project. Then, enable the voice channel for the project and request a dedicated phone number, referred to as a *long code*, for sending voice messages. A *long code* is a standard telephone number that contains up to 15 digits, depending on the country or region that it's based in. These phone numbers are *dedicated*—that is, they're reserved for use only by your Amazon Pinpoint account. You can lease local phone numbers that are based in a variety of countries or regions.

> **Tip**
>
> You can also enable the voice channel for an existing project. To do this, use the **SMS and voice** settings page on the Amazon Pinpoint console. For more information, see Managing the Amazon Pinpoint voice channel.

Note that the settings that you choose for the voice channel also apply to the SMS channel for the project. If you want to send both voice and SMS messages from the project, choose settings that support your goals for both channels. To learn more about enabling and using the SMS channel, see Amazon Pinpoint SMS channel.

To set up the voice channel for a new project

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose **Create a project**.
3. For **Project name**, enter a name, and then choose **Create**.

> **Note**
>
> The project name can contain up to 64 alphanumeric characters. It can also include the following characters: comma (,), period (.), at sign (@), underscore (_), equals sign (=), and plus sign (+).

4. Under **Project features**, in the **SMS and voice** section, choose **Configure**.
5. Select **Enable the SMS channel for this project**.
6. Expand the **Advanced configurations** section, and then choose **Request phone number**.
7. On the **Define your phone numbers** page, for **Country**, choose the country where your recipients are located. You can choose only one country at a time, but you can add more countries later if necessary.
8. Specify the use case for the phone number. You can choose one of the following options:

   - **Promotional** – Choose this option for sending marketing messages or messages promoting your business or service.
   - **Transactional** – Choose this option for sending time-sensitive messages, such as password resets or transaction alerts.

   In some countries and regions, the value that you choose can determine the price that you pay for each message that you send. Transactional messages are optimized for high deliverability, resulting in a higher cost in many countries. Promotional messages are optimized for cost-effectiveness. For more information about SMS pricing, see Amazon Pinpoint pricing.
9. The **Summary** section displays information about the number. The **Price per month** shows the cost for a single number.
10. For **Quantity**, choose the quantity of numbers that you want to purchase. You can purchase up to 10 numbers in a single request. You can purchase additional numbers later. The **Subtotal** updates to display the total monthly cost for the quantity of phone numbers that you're purchasing.
11. (Optional) If you want to purchase additional phone numbers, choose **Add a country or region**, and repeat the previous steps until you've defined requests for all of the countries where you need long codes.
12. When you're done purchasing phone numbers, choose **Next**.

13. The **Review and request** page displays the number of request details for each destination country.
14. The **Total cost** displays the total cost for all numbers for all countries that you've chosen.
15. Choose **Request** if you're ready. Otherwise, choose **Previous** to go to back and make any changes. After you choose **Request**, you can no longer make changes.

Managing the Amazon Pinpoint voice channel

You can use the Amazon Pinpoint console to enable the voice channel for a project and to manage settings that apply to the voice channel for your Amazon Pinpoint account. For example, you can request production access for your account, or request dedicated phone numbers for sending voice messages.

Enabling the voice channel

Before you can use Amazon Pinpoint to send voice messages, you must enable the voice channel for one or more projects. To learn how to create a new project and enable the voice channel for it, see Setting up the Amazon Pinpoint voice channel. To enable the voice channel for an existing project, complete the following steps.

Note that the settings that you choose for the voice channel also apply to the SMS channel for the project. If you want to send both voice and SMS messages from the project, choose settings that support your goals for both channels. To learn more, see Amazon Pinpoint SMS channel.

To enable the voice channel for an existing project

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to enable the voice channel for.
3. In the navigation pane, under **Settings**, choose **SMS and voice**.
4. On the **SMS and voice** page, next to **SMS settings**, choose **Edit**.
5. Select **Enable the voice channel for this project**.
6. Choose **Save changes**.
7. On the **SMS and voice** page, under **Number settings**, refer to the table to determine whether any phone numbers that are already associated with your account can be used to send voice messages. If there are, the **Voice** column displays **Enabled** next to each phone number that you can use to send voice messages. If there aren't, Request a phone number in the *AWS End User Messaging SMS User Guide*.

Troubleshooting the voice channel

For logging of Amazon Pinpoint voice messages, see How do I set up logging for Amazon Pinpoint voice messages for Amazon Pinpoint SMS and Voice v1 API?.

Voice

Issues and solutions

- By default, the voice channel of an Amazon Pinpoint project is turned off. To see if voice is turned on for your project, select the **Settings** page under the project. Under **Features** for SMS and voice, you will see whether each of the two are turned off or turned on. While you can turn on SMS under the **Manage** option, you can turn on the voice channel by running the following command:

```
aws pinpoint update-voice-channel --application-id AppId --voice-channel-request
 Enabled=true
```

- TooManyRequests exception
  - If your account is in a sandbox, there's a 20-message limit over a 24 hour period. This limit can be increased by Voice sandbox in the *AWS End User Messaging SMS User Guide*.
  - Amazon Pinpoint voice channel has a hard limit of five messages per single recipient over a 24 hour period. This limit is a hard limit that can't be increased.

Amazon Pinpoint in-app messaging channel

You can use in-app messages to send targeted messages to users of your applications. In-app messages are highly customizable. They can include buttons that open websites or take users to specific parts of your app. You can configure background and text colors, position the text, and add buttons and images to the notification. You can send a single message, or create a carousel that contains up to five unique messages. Unlike other channels such as email or SMS, in-app messages are enabled by default in all Amazon Pinpoint projects. Additionally, in-app messages don't support the use of substitution variables.

You can use AWS Amplify to seamlessly integrate the in-app messaging capabilities of Amazon Pinpoint into your app. Amplify can automatically handle the processes of fetching messages, rendering messages, and sending analytics data to Amazon Pinpoint. This integration is currently

supported for React Native applications. For more information, see In-App Messaging in the *Amplify Framework Documentation*.

How Amazon Pinpoint handles in-app messages

Displaying in-app messages to your users consists of three steps. The first step is to create the message template. The message template defines the appearance and content of the message. In-app messages can be single messages that appear on the screen, messages that cover the entire screen, or carousels that consist of up to five messages. For more information about creating in-app message templates, see Creating in-app templates.

Next, you create an in-app campaign. You can configure your campaign to be sent when certain events occur. For example, you can trigger the campaign to send when a user reaches a certain level in a game, or when they look at a certain item in your online store. For more information about creating campaigns, see Amazon Pinpoint campaigns.

> **Note**
>
> In order to receive in-app messages, the endpoints that your campaign targets must have an endpoint type of `IN_APP`.

Finally, to display the in-app messages in your app, your app must call the GetInAppMessages API to retrieve the messages. The response provides a JSON-formatted list of the messages that each user is entitled to. When messages are displayed to users, you can pass analytics events back to Amazon Pinpoint. By doing this, you can collect metrics for the in-app message campaign. For more information about using in-app notifications in your apps, see Sending and retrieving in-app messages in the *Amazon Pinpoint Developer Guide* or Dynamically personalize your in-product user experience using Amazon Pinpoint in-app messaging on the AWS Messaging and Targeting Blog.

Custom channels in Amazon Pinpoint

You can extend the capabilities of Amazon Pinpoint by creating custom channels. You can use custom channels to send messages to your customers through any service that has an API—including third-party services. For example, you can use custom channels to send messages through third-party services such as WhatsApp or Facebook Messenger.

Note

To communicate over WhatsApp we recommend using AWS End User Messaging Social as it provides access to WhatsApp's messaging capabilities, enabling the creation of branded, interactive content with images, videos, and buttons. For more information on getting started with AWS End User Messaging Social, see Getting started with AWS End User Messaging Social.

Note

Amazon Web Services isn't responsible for any third-party service that you use to send messages with custom channels. Third-party services might be subject to additional terms. You should review these terms before you send messages with custom channels.

You can configure your campaigns to send messages through custom channels by using the Amazon Pinpoint console. For more information, see *Campaigns*.

Setting up and managing custom channels

You can create custom channels by using a webhook, or by calling a service's API through an AWS Lambda function. For more information about creating custom channel functions in Lambda, see Creating custom channels in the *Amazon Pinpoint Developer Guide*.

Unlike other channels in Amazon Pinpoint, you don't have to enable the custom channels feature. Custom channels are enabled by default in all Amazon Pinpoint projects. You don't have to request production access to use custom channels.

Amazon Pinpoint segments

When you create a campaign, you choose a *segment* to send that campaign to. A segment is a group of your customers that share certain attributes. For example, a segment might contain all of your customers who use version 2.0 of your app on an Android device, or all customers who live in the city of Los Angeles. You can send multiple campaigns to a single segment, and you can send a single campaign to multiple segments.

> **Note**
>
> We recommend you use data from all segments you import, and delete segment data from a project you no longer need. For example, you can delete endpoints programmatically to remove unutilized segment data. Accumulating segment data within a project may cause delays in subsequent import processes.

There are two types of segments that you can create in Amazon Pinpoint:

- **Dynamic segments** – Segments that are based on attributes that you define. Dynamic segments can change over time. For example, if you add new endpoints to Amazon Pinpoint, or if you modify or delete existing endpoints, the number of endpoints in that segment may increase or decrease. For more information about dynamic segments, see the section called "Building segments".
- **Imported segments** – Segments that are created outside of Amazon Pinpoint and saved in CSV or JSON format. When you create an imported segment, you upload your files to Amazon Simple Storage Service (Amazon S3). Amazon Pinpoint retrieves the files from Amazon S3 and creates new endpoints based on the contents of those files. Imported segments are static—they never change. To make changes, you must reimport the segment with those changes. When you create a new segment, you can use an imported segment as a base segment, and then refine it by adding filters. For more information about importing segments, see the section called "Importing segments".

Building segments

After you integrate your apps with Amazon Pinpoint, you can create dynamic segments that are based on the data your apps provide to Amazon Pinpoint. When you create a dynamic segment,

you choose the type of segment you want to create, create a segment group, and then refine that segment group by choosing the segments and the criteria that define those segments. For example, you could create a dynamic segment group, and then choose an audience segment and criteria of all customers who use version 2.0 of your app on an Android device and who have used your app within the past 30 days. Amazon Pinpoint continuously re-evaluates your segments as your app records new customer interactions. As a result, the size and membership of each segment changes over time. For information about integrating your apps with Amazon Pinpoint, see Integrating Amazon Pinpoint with your application in the *Amazon Pinpoint Developer Guide*.

Segment groups

When you create a dynamic segment, you create one or more *segment groups*. A segment group consists of these components:

- **Base segments** – The segments that define the initial user population. You can specify a single base segment, several base segments, or all of the segments in your Amazon Pinpoint project.
- **Criteria** – Categories of audience information that you apply on top of the base segments. You can add multiple groups of criteria and then create relationships between those criteria.
- **Filters** – Filters reduce the audience number that belong to the segment. You can add as many filters as you want in order to tailor the segment to your needs.

You have to create at least one segment group, but you can optionally create a second segment group, and then create a relationship between the two groups.

Creating a dynamic segment

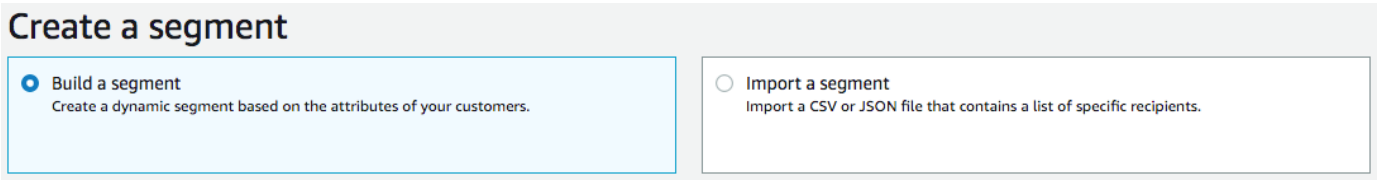
The following steps describe creating and configuring a segment:

- Step 1: Build a new segment or import an existing segment
- Step 2: Configure segment group 1
- Step 3: Choose the segments to include in the group
- Step 4: Choose and configure the segment criteria
- Step 5: Add a second criteria group
- Step 6: Add segment group 2

Step 1: Build a new segment or import an existing segment

To build a segment

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project to which you want to add the segment.
3. In the navigation pane, choose **Segments**. The **Segments** page opens and displays segments that you previously defined.
4. Choose **Create a segment**.
5. Under **Create a segment**, choose **Build a segment**.



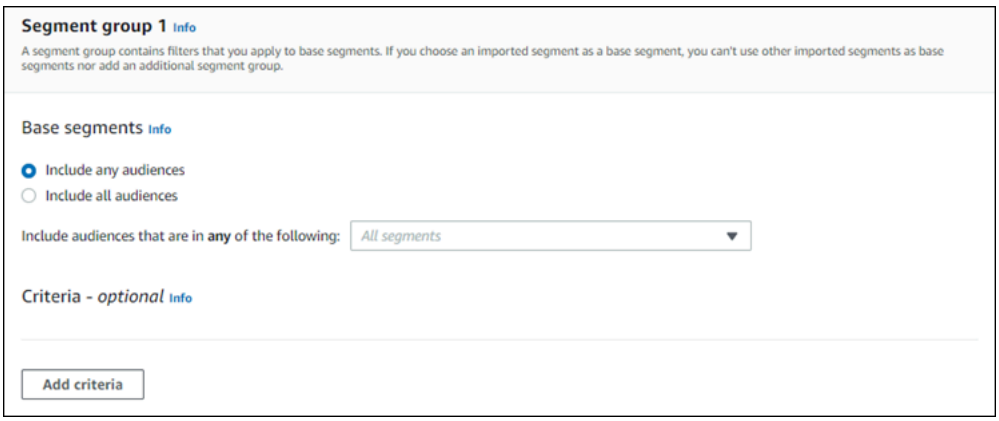
6. For **Segment name**, enter a name for the segment.

Step 2: Configure segment group 1

You will first choose how you want to define the audience segments for the segment group.

To configure segment group 1

- Under **Segment group 1**, for **Base segments**, choose one of the following options:
  - **Include any audiences** – If you use more than one segment as a base segment, your new segment contains endpoints that are in at least one of the segments you choose. For example, you might have two dynamic segments, `Older than 18` and `Lives in New York City`. Your target audience when choosing this option is any audience older than 18 *or* who live in New York City.
  - **Include all audiences** – If you use more than one segment as a base segment, your new segment only contains endpoints common to all of the selected segments. For example, you might have two dynamic segments, `Older than 18` and `Lives in New York City`. Your target audience when choosing this option is all audiences older than 18 *and* who live in New York City.

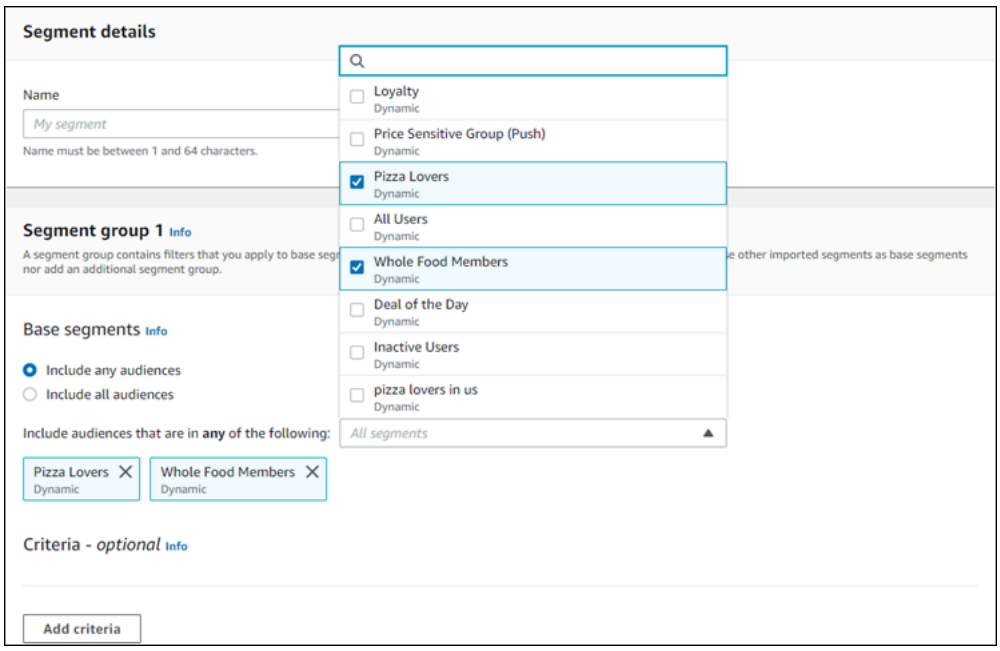


Step 3: Choose the segments to include in the group

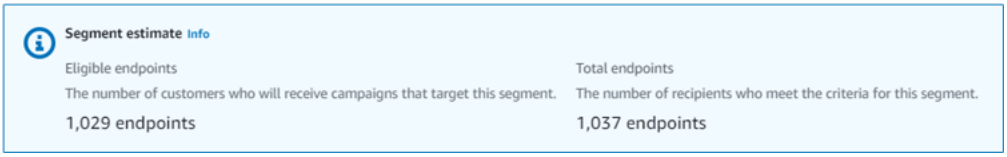
The next step is to choose which segments you will include in the group. These segments are composed of the audience that you want to target in the segment group.

1. For the dropdown list, select one or more segments to include in the segment group. Each segment that you add displays in the section.

> **Note**
>
> The segments dropdown list doesn't close when you choose a segment. It remains open, with a check mark by each segment you're including in the group. You can clear the checkbox by any segment that you want to remove. When you're done choosing segments, choose an area outside of the dropdown list to close it.



2. As you add or remove segments, the Segment estimate section updates to display the eligible and total endpoints set to receive the campaign. Eligible endpoints are those endpoints determined by the any/and relationship for the segment group, while the total is the sum of all endpoints regardless of the relationship connector.



Step 4: Choose and configure the segment criteria

After you've chosen your segments, you can further refine the target audience by applying attributes, operators, and values to those segments.

To choose and configure the segment criteria

1. For **Attribute**, you can choose from the following types:

   - **Standard attributes** – Filter the audience based on one of its default attributes.
   - **Channel Types** – Filter the audience based on the recipient's endpoint type: EMAIL, SMS, PUSH, or CUSTOM.
   - **Activity** – Filters the audience on whether they've been Active or Inactive.

- **Custom Endpoint Attributes** – Filter the audience based on an endpoint-specific attribute. For example, this might be a list of your customers who have opted out of a distribution list or a list of customers who signed up for a distribution list.
- **Customer User Attributes** – Filter the audience based on a user-specific attribute. For example, this might be *`LastName`* or *`FirstName`*.
- **Metrics** – Filter the audience based on a quantitative evaluation. For example, you might have a metric, *`Visits`*, that you can choose if you want to target an audience who have visited a specific location *`x`* number of times.

2. Choose the **Operator** and enter a **Value**. Operators determine the relationship of the attribute to a value that you enter. Values can be no longer than 100 characters and you can have no more than 100 total values between all groups, criteria, and filters. The following describes the available operators. Each attribute has its own set of supported operators.

> **Note**
>
> The Channel Types attributes don't use operators or values.

- **After** – Filters the audience after a specific date.
- **Before** – Filters the audience before a specific date.
- **Between** – Filters the audience based on a date range.
- **Contains** – Use this to filter the audience based on a substring within a string. For example, if you have a city metric, you could pass the *`ew`* to return *`New York City`* or Newcastle. The passed value is case-sensitive, so *`ew`* returns different results than *`EW`*.
- **During** – Only used for the Activity attribute. Filters the audience by one of the following time frames: **the last day**, **the last 7 days**, **the last 14 days**, or **the last 30 days**.
- **Equals** – Used for the Metrics attributes only, this operator filters the results by a numerical value. For example, you might have a metric, *`Visits`*, that you can use to filter results by only those customers who visited a location *`3`* times.
- **Greater than** – Used for the Metrics attributes only, this operator filters results that are greater than the number passed. For example, you might have a metric, *`Visits`*, that you can use to filter results by only those customers who visited a location greater than *`3`* times.
- **Greater than or equal** – Used for the Metrics attributes only, this operator filters results that are greater than or equal to the number passed. For example, if you have a metric, *`Visits`*,

you might use this operator to filter results by only those customers who visited a location *3* or more times.

- **Is** – Use this option to filter by endpoint-specific attributes. When you select this option, you specify how recently the endpoint was active, or how long it's been inactive. After that, you can optionally specify additional attributes associated with that endpoint.
- **Is not** – Use this option if you want to filter out results that match the passed value. For example, you might have a *city* customer user endpoint that you can use to filter out results that include a specific city. Use this operator and *New York City* for the value to ignore any results that include this city.
- **Less than** – Used for the Metrics attributes only, this operator filters results that are less than the number passed. For example, you might have a metric, *Visits*, that you can use to filter results by only those customers who visited a location less than *3* times.
- **Less than or equal** – Used for the Metrics attributes only, this operator filters results that are less than or equal to the number passed. For example, you might have a metric, *Visits*, that you can use to filter results by only those customers who visited a location *3* times or less.
- **On** – Use this metric for filtering results. For example, you might have a metric, *OptOut*, that you can use to filter results by only those customers who opted out of a distribution list on *2020/11/09* .

> **Note**
>
> The Amazon Pinpoint console uses a default time of 00:00:00 UTC for all time-based filters. You can filter on dates but times are recorded as the same value. If you enter a date of *2020-12-31*, the console passes the time as *2020-12-31T12:00:00Z*. Therefore, if you have multiple segments that pass the date, 2020-20-12 with different times, the Amazon Pinpoint console records the date and time for any of those segments as *2020-12-31T12:00:00Z*.

3. (Optional) To apply additional attributes to this criteria, choose **Add filter**. To create another group of segment criteria, choose **Add criteria**. To create a second segment group, choose **Add another segment group**. For information about adding a second segment group, see Step 6: Add segment group 2.
4. If you're finished setting up this segment, choose **Create segment**.

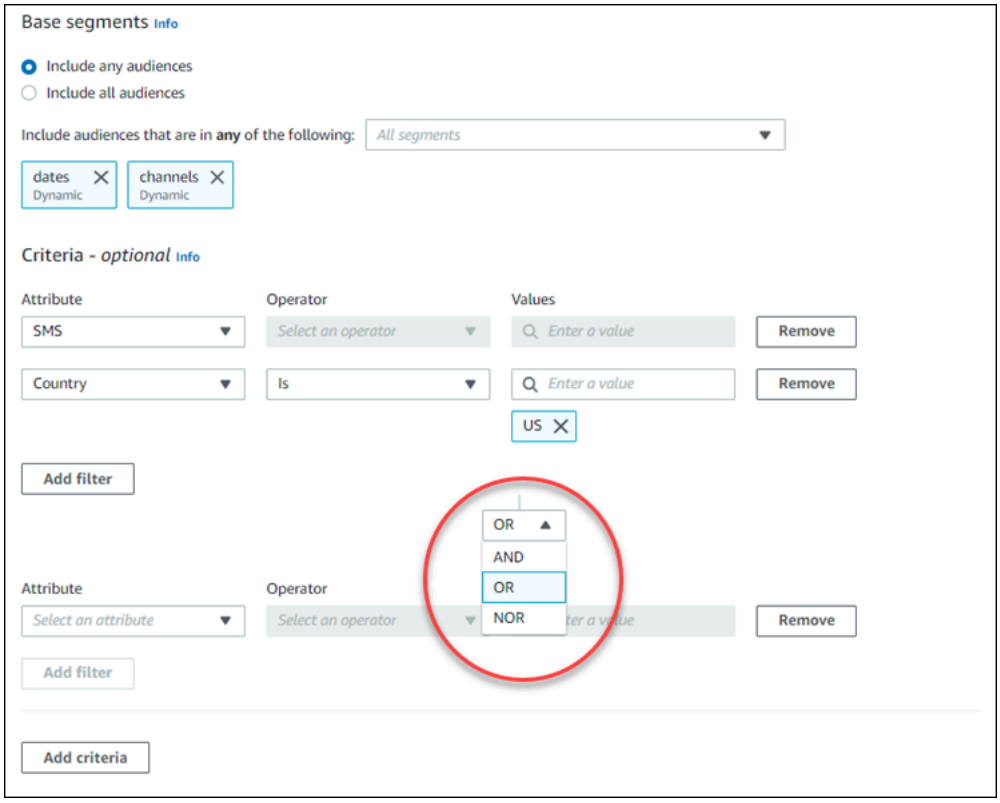
Step 5: Add a second criteria group

Optionally add criteria groups to further refine your results. You will create a relationship between this group of criteria and the group before it.

To add a second criteria group

1. Choose **Add criteria**.
2. Create the relationship between this group and the group previous to it by choosing one of the following:

   - **AND** – The segment contains only that audiences who meet the criteria for both criteria groups.
   - **OR** – The segment contains audiences who meet the criteria in either one of the criteria groups.
   - **NOR** – The segment excludes the audiences that fits the criteria from the results.



3. (Optional) To add another group of criteria, choose **Add criteria** or, to add a second segment group, choose **Add another segment group**. For more information, see Step 6: Add segment group 2.

4. If you're finished setting up the segment group, choose **Create segment**.

Step 6: Add segment group 2

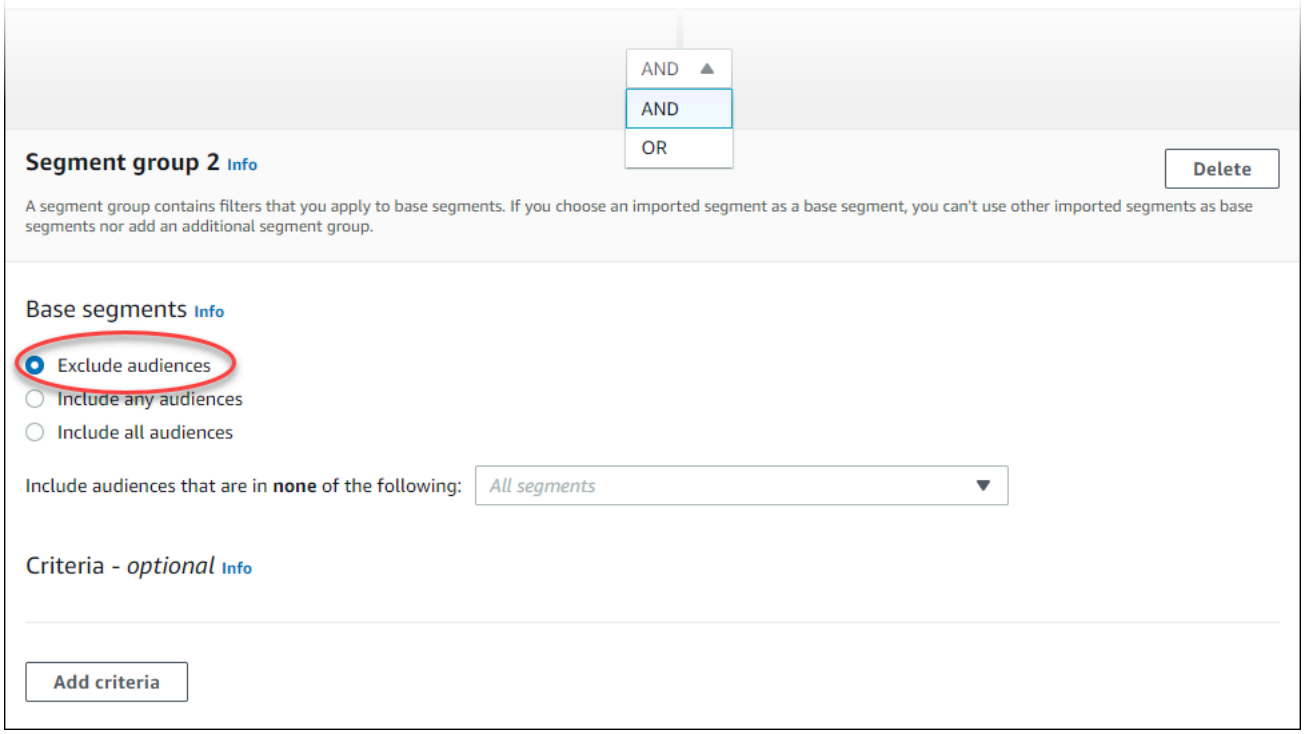
You can optionally create a second segment group and create a relationship with segment group 1. When you create a segment by using the Amazon Pinpoint console, you can have a maximum of two segment groups per segment. If you add a second segment group to your segment, you can choose one of two ways to specify how the two segment groups are connected:

- **By using AND logic** – If you use AND logic to connect two segment groups, your segment contains all endpoints who meet all of the criteria in both of the segment groups.
- **By using OR logic** – If you use OR logic to connect two segment groups, your segment contains all endpoints who meet all of the criteria in either one of the segment groups.

> **Note**
>
> If you use an imported segment as the base segment for your first segment group, you can't create a second segment group.

To configure second segment group

1. Choose **Add another segment group**.
2. Create the relationship with the first segment group. If you choose **AND**, the segment contains only those customers who meet the criteria for both segment groups. If you choose **OR**, the segment contains those customers who meet the criteria in either one of the segment groups. Within segment group 2, you have a third option to **Exclude audiences**. Segments that are excluded will not be included in the results. You can only exclude audiences in segment group 2.



3. Choose the segments that you want to include in segment group 2. See Step 3: Choose the segments to include in the group.
4. (Optional) Choose the criteria by which you want to filter your segments. See Step 4: Choose and configure the segment criteria.
5. (Optional) Add additional groups of criteria. See Step 5: Add a second criteria group.
6. When you finish setting up the segment, choose **Create segment**.

Managing segments

You can use the Amazon Pinpoint console to create, view, copy, and perform other management tasks for a project's segments. If you open a segment to view its settings, you can also quickly create a campaign that uses the segment. For more information on managing segments, see Creating segments in the Amazon Pinpoint Developer Guide.

To manage a segment

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that contains the segment that you want to manage.

3. In the navigation pane, choose **Segments**.
4. In the list of segments, select the segment that you want to manage.
5. On the **Actions** menu, choose one of the following options:

   - **View details** – Choose this option to show information about the segment, including the date and time when the segment was created, and the date and time when the segment was last updated.

     When you view the details of a dynamic segment, you also see the approximate number of endpoints that meet the segment criteria, and the segment groups and filters that define the segment. When you view the details of an imported segment, you also see the number of records that were imported for the segment. If you imported the segment from an Amazon S3 location, you also see details about that location and the name of the IAM role that was used to import the segment from that location.
   - **Edit** – Choose this option to change the settings for a dynamic segment.

     > **Note**
     >
     > You can't edit the properties of an imported segment.

   - **Copy to new** – Choose this option to create a new segment that's a copy of the selected segment. You can then modify any settings in the new segment, without changing the original segment.
   - **Export** – Choose this option to export the segment to a file on your computer. For more information, see Exporting segments.
   - **Delete** – Choose this option to delete the segment permanently. You can't recover a segment after you delete it.

     > **Important**
     >
     > If you delete a segment, any active campaigns that use the segment will fail and stop running. Similarly, any active journeys that use the segment might fail and stop running. If a journey does continue to run, any participants who were part of the segment might be removed from the journey prematurely. Before you delete a segment, it's a good idea to first verify that a segment isn't being used by any active campaigns or journeys.

Importing segments

With Amazon Pinpoint, you can define a user segment by importing a file that contains information about the users who belong to the segment. Importing segments is useful if you define user segments outside of Amazon Pinpoint but you want to engage your users with Amazon Pinpoint campaigns.

Unlike the dynamic segments that you create with the segment builder in the console, an imported segment is an unchanging set of *endpoints* or *user IDs*:

Endpoint

A destination that you can send messages to, such as an email address, mobile device identifier, or mobile phone number. An endpoint definition can include attributes that describe the user or device that you send messages to. It can also include a user ID.

You can define a segment by importing a list of endpoint definitions. Amazon Pinpoint creates the segment, and it updates any endpoints that you previously added to Amazon Pinpoint with the new information.

User ID

An ID that represents an individual user in your audience. This ID must be assigned to one or more endpoints. For example, if a person uses your app on more than one device, your app could assign that person's user ID to the endpoint for each device.

You can define a segment by importing user IDs only if you've added the endpoints that are associated with the user IDs to Amazon Pinpoint.

An imported segment consists of endpoints, user IDs, or a combination of both. When you use Amazon Pinpoint to send a message to the segment, the potential destinations include:

- Each endpoint that you list in the imported file.
- Each endpoint that's associated with each user ID that you list in the imported file.

When you create a new segment, you can use an imported segment as the base segment. You can then apply filters to the base segment to refine it according to your needs.

Imported segment considerations

Consider the following factors when you create imported segments:

- When you create a campaign, you must choose a segment. When you choose a dynamic segment, Amazon Pinpoint provides an estimate of the size of that segment. However, when you choose an imported segment, Amazon Pinpoint can't provide an estimate.
- If you create a campaign that sends messages when certain events happen, you can't use imported segments. Event-based campaigns can only use dynamic segments. For more information about creating dynamic segments, see Building segments.

Segment files

You define the endpoints or user IDs that belong to your segment in a comma-separated values (CSV) or JSON file. Then, you import the file into Amazon Pinpoint to create the segment.

When you import a segment, remember the following:

- Amazon Pinpoint can't import compressed files.
- The files that you import must use UTF-8 character encoding.
- If you're importing new endpoints, the `Address` and `ChannelType` attributes are required.
- If you're updating existing endpoints, the `Id` attribute is required for each endpoint that you want to update.
- Your endpoint definitions can include only certain attributes. For a list, see Supported attributes. In addition, an attribute name must be 50 or fewer characters. An attribute value must be 100 or fewer characters.

Example segment files

The example files in this section are based on the following data:

Example endpoint attribute values

ChannelType	Address	Location.Country	Demographic.Platform	Demographic.Make	User.UserId
SMS	+16045550182	CA	Android	LG	example-user-id-1
APNS	1a2b3c4d5e6f7g8h9i0j1a2b3c4d5e6f	US	iOS	Apple	example-user-id-2
EMAIL	john.stiles@example.com	US	iOS	Apple	example-user-id-2
GCM	4d5e6f1a2b3c4d5e6f7g8h9i0j1a2b3c	CN	Android	Google	example-user-id-3
EMAIL	wang.xiulan@example.com	CN	Android	OnePlus	example-user-id-3

Each row in this table represents an individual endpoint. Note that the user IDs `example-user-id-2` and `example-user-id-3` are assigned to two endpoints each.

Example File with endpoint definitions

CSV

You can import endpoints that are defined in a CSV file, as in the following example:

```
ChannelType,Address,Location.Country,Demographic.Platform,Demographic.Make,User.UserId
SMS,+16045550182,CA,Android,LG,example-user-id-1
APNS,1a2b3c4d5e6f7g8h9i0j1a2b3c4d5e6f,US,iOS,Apple,example-user-id-2
EMAIL,john.stiles@example.com,US,iOS,Apple,example-user-id-2
GCM,4d5e6f1a2b3c4d5e6f7g8h9i0j1a2b3c,CN,Android,Google,example-user-id-3
```

```
EMAIL,wang.xiulan@example.com,CN,Android,OnePlus,example-user-id-3
```

The first line is the header, which contains the endpoint attributes. For a complete list of possible attributes, see Supported attributes.

The subsequent lines define the endpoints by providing values for each attribute in the header.

To include a comma or double quote in a value, enclose the value in double quotes, as in `"aaa,bbb"`.

The CSV file can't contain line breaks or tabs. If your file contains data with line breaks or tabs, the data in the file might not be imported, or the import process might fail.

JSON

You can import endpoints that are defined in a newline-delimited JSON file. In this format, each line is a complete JSON object that contains an individual endpoint definition, as in the following example:

```
{"ChannelType":"SMS","Address":"+16045550182","Location":
{"Country":"CA"},"Demographic":{"Platform":"Android","Make":"LG"},"User":
{"UserId":"example-user-id-1"}}
{"ChannelType":"APNS","Address":"1a2b3c4d5e6f7g8h9i0j1a2b3c4d5e6f","Location":
{"Country":"US"},"Demographic":{"Platform":"iOS","Make":"Apple"},"User":
{"UserId":"example-user-id-2"}}
{"ChannelType":"EMAIL","Address":"john.stiles@example.com","Location":
{"Country":"US"},"Demographic":{"Platform":"iOS","Make":"Apple"},"User":
{"UserId":"example-user-id-2"}}
{"ChannelType":"GCM","Address":"4d5e6f1a2b3c4d5e6f7g8h9i0j1a2b3c","Location":
{"Country":"CN"},"Demographic":{"Platform":"Android","Make":"Google"},"User":
{"UserId":"example-user-id-3"}}
{"ChannelType":"EMAIL","Address":"wang.xiulan@example.com","Location":
{"Country":"CN"},"Demographic":{"Platform":"Android","Make":"OnePlus"},"User":
{"UserId":"example-user-id-3"}}
```

For a complete list of possible attributes, see Supported attributes.

Importing a segment

There are two ways to import segments into Amazon Pinpoint: you can upload files directly from your computer, or you can import files that are stored in an Amazon Simple Storage Service (Amazon S3) bucket.

We recommend that you upload files from your computer, especially if you already have the customer data on your computer. However, you can import only 10 files at a time, and you can only upload files that are smaller than 1 gigabyte (GB).

If you need to import more than 10 files at once, or if you need to upload files that are larger than 1 GB, then you should import files from Amazon S3. The Amazon S3 import option is also useful if you already have processes that send customer data files to Amazon S3 for storage.

This section includes procedures for importing segments by using both of these methods.

Importing a segment by uploading a file from your computer

You can create segments by uploading up to 10 files directly from your computer. The files that you upload can be in CSV or JSON format. You can upload files in any combination of formats. For example, you can upload one JSON file and three CSV files.

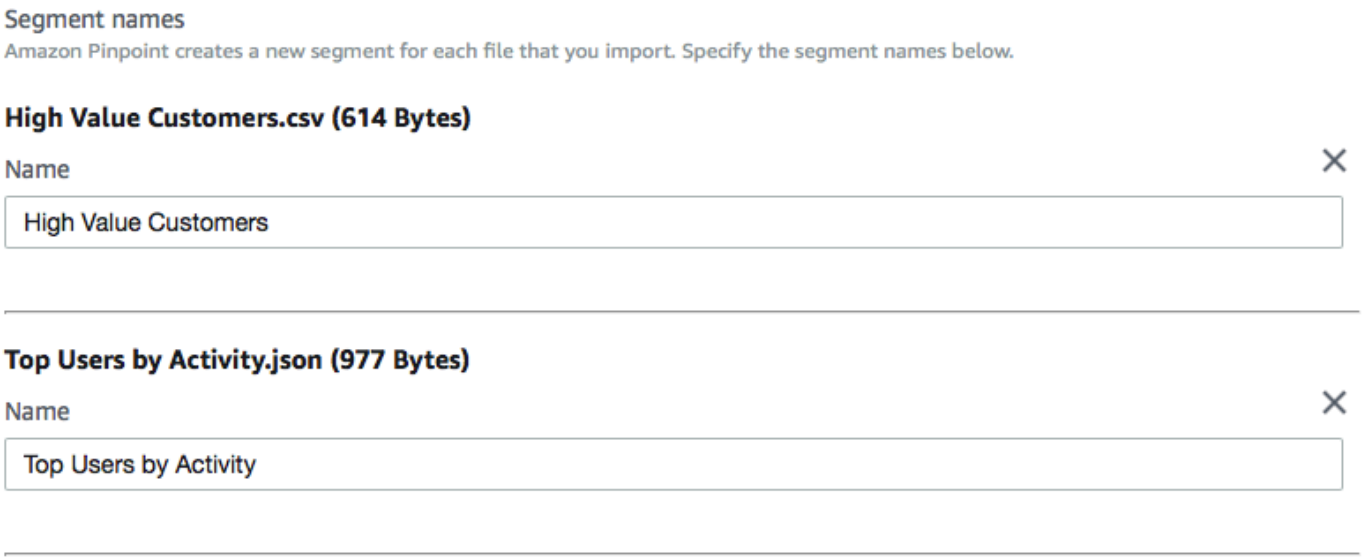
To import a segment

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to add the segment to.
3. In the navigation pane, choose **Segments**.
4. Choose **Create a segment**.
5. Under **Create a segment**, choose **Import a segment**.
6. Under **Import method**, choose **Upload files from your computer**.
7. Under **Files to import**, select **Choose files**. Select the file or files that you want to import.

   > **Note**
   >
   > You can also drag files from your computer's file explorer and drop them directly on the **Drop files here** area.

8. When you upload files to Amazon Pinpoint, you have to provide a segment name for each file that you import. Under **Segment names**, enter a segment name for each file that you want to import.

   By default, Amazon Pinpoint provides a segment name that is equal to the name of the imported file, but without the file name extension. You can change these default values to any name.



> **Note**
>
> You can use the same name for multiple segments. If you do, Amazon Pinpoint creates a distinct segment for each file, and assigns a unique ID to each file. The creation date is also slightly different for each file that you import. You can use these factors to distinguish between segments that have the same name.

9. When you finish, choose **Create segment**.

Importing a segment from a file stored in Amazon S3

Before you use this procedure to import a segment, you must first create an Amazon S3 bucket and upload your file to that bucket. You can organize the files for different segments into separate folders. When Amazon Pinpoint imports the endpoints or user IDs for a segment, it includes the files within all folders and subfolders that belong to the Amazon S3 location that you specify.

For an introduction to creating buckets and uploading objects, see the What is Amazon S3? in the Amazon Simple Storage Service User Guide.

Amazon Pinpoint can import only one file format (CSV or JSON) per segment, so the Amazon S3 path that you specify should only contain files of a single type.

To import a segment

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.

2. On the **All projects** page, choose the project that you want to add the segment to.
3. In the navigation pane, choose **Segments**.
4. Choose **Create a segment**.
5. Under **Create a segment**, choose **Import a segment**.
6. For **Segment name**, enter a name for your segment.
7. For **Amazon S3 URL**, enter the location of the Amazon S3 bucket that contains the file for your segment. The address of the bucket must be in the following format:

   ```
   s3://bucket-name/folder-name
   ```

   Amazon Pinpoint imports the files from the path that you specify, and from any subfolders in that path.
8. For **IAM role**, complete one of the following steps:

   - If you want to have Amazon Pinpoint create a role that allows it to read from an Amazon S3 bucket, choose **Automatically create a role**. Then, for **IAM role**, enter a name for the role that you're creating.
   - If you've already created an IAM role that allows Amazon Pinpoint to read from an Amazon S3 bucket, choose **Choose an existing role**. Then, for **IAM role**, choose a role that contains the appropriate permissions.

   If you want to create the IAM role yourself, see IAM role for importing endpoints or segments in the *Amazon Pinpoint Developer Guide*. After you create the role, specify it in the Amazon Pinpoint console.
9. Under **What type of file are you importing**, choose either **JavaScript Object Notation (JSON)** or **Comma-Separated Values (CSV)**, depending on the format the file that you uploaded to Amazon S3.
10. Choose **Create segment**.

Supported attributes

The table in this section lists and describes the attributes that you can specify, in endpoint definitions, that you import into Amazon Pinpoint. If you import segments by using CSV files, the headers in the file should match the names shown in the **Attribute** column.

For JSON files, a period in the attribute name indicates that the name following the period is an object that's nested in a parent object with a name that's equal to the value preceding the period. For example, a JSON file that contains the `Demographic.Make` and `Demographic.Model` attributes has the following structure:

```
{
...
"Demographic": {
  ...
  "Make":"Apple",
  "Model":"iPhone"
  ...
  }
...
}
```

The full JSON structure closely resembles the example endpoint request in the *Amazon Pinpoint API Reference*. However, not all attributes in the Endpoint request schema are supported when you import segments, including `EndpointStatus` and `EffectiveDate`.

For a custom field to have multiple values in CSV, you must replicate the header and keep one value per header. For example:

```
...,User.UserId,
 User.UserAttributes.new_multi_field,User.UserAttributes.new_multi_field
...,example-user-id-2,test10,test20
```

You can replace attribute names that are shown as *`custom_attribute`* with any value. For example, if you want to store users' first and last names in attributes named `FirstName` and `LastName`, you can create custom attributes named `User.UserAttributes.FirstName` and `User.UserAttributes.LastName`, respectively. An attribute name can contain up to 50 characters. An attribute value can contain up to 100 characters. Attribute names are case sensitive.

In JSON, the custom attribute must be formatted at `"Attributes":{"Ride":["Bus"]}`.

Attribute	Description
`Address`	The unique destination address for messages or push notifications that you send to the

Attribute	Description
	endpoint—for example, an email address, phone number, or device token. **Note** If the endpoint address is a phone number, you must specify it in E.164 format. For more information about the E.164 format, see E.164 on Wikipedia.
`Attributes.` *`custom_attribute`*	A custom attribute that describes the endpoint. You can use this type of attribute as selection criteria when you create a segment. You can replace *`custom_attribute`* with any value.
`ChannelType`	The channel to use when sending messages or push notifications to the endpoint. For example: • `APNS` – For an endpoint that can receive push notifications that you send through the Apple Push Notification service (APNs) channel to apps that are running on iOS devices. • `EMAIL` – For an endpoint that can receive email messages. • `GCM` – For an endpoint that can receive push notifications that you send through the Firebase Cloud Messaging (FCM) channel to apps that are running on Android devices. • `SMS` – For an endpoint that can receive SMS text messages.

Attribute	Description
`Demographic.AppVersion`	The version number of the application that's associated with the endpoint.
`Demographic.Locale`	The locale of the endpoint, in the following format: the ISO 639-1 alpha-2 code, followed by an underscore (_), followed by an ISO 3166-1 alpha-2 value. For example, `en_US` is the English language locale for the United States.
`Demographic.Make`	The manufacturer of the endpoint device, such as `apple` or `samsung`.
`Demographic.Model`	The model name or number of the endpoint device, such as `iPhone` or SM-G900F.
`Demographic.ModelVersion`	The model version of the endpoint device.
`Demographic.Platform`	The operating system on the endpoint device, such as `ios` or `android`.
`Demographic.PlatformVersion`	The version of the operating system on the endpoint device.

Attribute	Description

`Demographic.Timezone`	The endpoint's time zone, as a tz database value. For example, `America/Los_Angeles` for Pacific Time (North America).
	
	Note
	The following time zones are no longer supported and are automatically remapped to supported time zones.
	
	Time zone → **Remapped time zone**
	`Canada/East-Saskatchewan` → `America/Managua`
	`US/Pacific-New` → `America/Los_Angeles`

`EffectiveDate`	The date and time when the endpoint was last updated, in ISO 8601 format. For example, `2019-08-23T10:54:35.220Z` for 10:54 AM UTC August 23, 2019.
`Id`	A unique identifier for the endpoint.
`Location.City`	The city where the endpoint is located.
`Location.Country`	The two-character code, in ISO 3166-1 alpha-2 format, for the country or region where the endpoint is located. For example, US for the United States.

Attribute	Description
`Location.Latitude`	The latitude coordinate of the endpoint's location, rounded to one decimal place.
`Location.Longitude`	The longitude coordinate of the endpoint's location, rounded to one decimal place.
`Location.PostalCode`	The postal or ZIP code for the area where the endpoint is located.
`Location.Region`	The name of the region, such as a state or province, where the endpoint is located.
`Metrics.`*`custom_attribute`*	A custom numeric metric that your application reports to Amazon Pinpoint for the endpoint—for example, the number of sessions or number of items left in a cart—to use for segmentation purposes. You can replace *`custom_attribute`* with any value. These custom values can only be numeric. Because they're numeric, Amazon Pinpoint can perform arithmetic operations, such as average or sum, on them.
`OptOut`	Indicates whether a user opted out of receiving messages and push notifications from you. Acceptable values are: `ALL`, the user opted out and doesn't want to receive any messages or push notifications, or `NONE`, the user hasn't opted out and wants to receive all messages and push notifications.
`RequestId`	The unique identifier for the most recent request to update the endpoint.

Attribute	Description
`User.UserAttributes.` *`custom_attribute`*	A custom attribute that describes the user. You can replace *`custom_attribute`* with any value, such as `FirstName` or `Age`.
`User.UserId`	A unique identifier for the user.

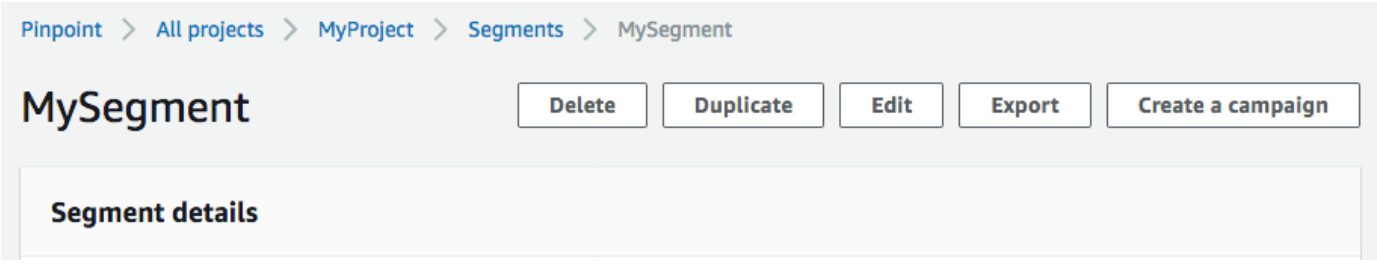
You can create as many as 250 custom attributes for endpoints and users in each project. For more information, see Amazon Pinpoint quotas in the *Amazon Pinpoint Developer Guide*.

Exporting segments in the Amazon Pinpoint console

From the **Segments** page in the Amazon Pinpoint console, you can export an existing segment to a file on your computer. When you do, Amazon Pinpoint exports all of the information that's associated with the endpoints in the segment to a file.

This feature is useful if you want to share a list of segment members with somebody else in your organization who doesn't use Amazon Pinpoint. It's also helpful in situations where you want to modify the segment by using a different application.

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that contains the segment that you want to export.
3. In the navigation pane, choose **Segments**.
4. In the list of segments, choose the segment that you want to export.
5. At the top of the page, choose **Export**, as shown in the following image.



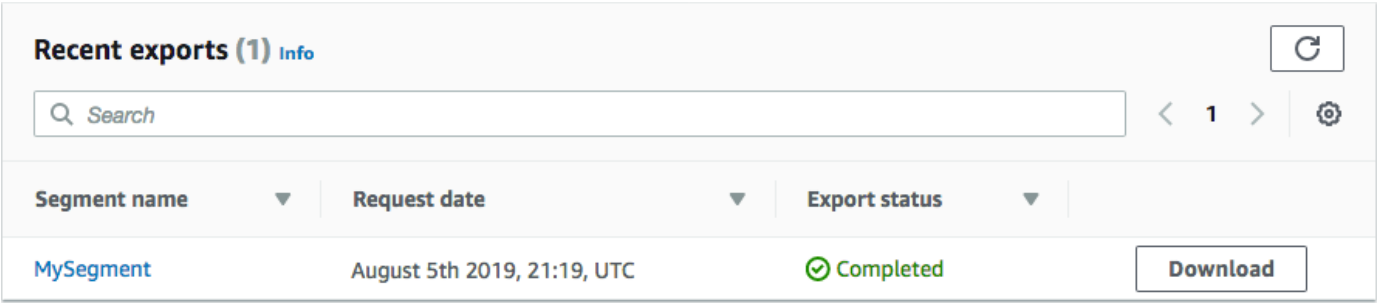
6. Amazon Pinpoint creates a new export job, and you see the **Recent exports** tab on the **Segments** page.

Note the value in the **Export status** column for the segment that you exported. When you first create the export job, the status is **In progress**.

Wait a few minutes, and then choose the **refresh** ( ) button. If the status is still **In progress**, wait another minute, and then repeat this step. Otherwise, if the status is **Complete**, proceed to the next step.

> **Note**
>
> If a segment requires more than 10 minutes to complete, the export process times out. If you need to export very large segments, you should use the CreateExportJob operation in the Amazon Pinpoint API.

7. Choose **Download** to save the segment to your computer, as shown in the following image.



Troubleshooting segments

Verify that logging is turned on to assist in identifying the cause of failure. For more information, see Monitoring and logging.

Segment import failed

If a segment import fails, you might see the following error message or similar:

Import job: Import failed for file SampleTemplate.csv with segment name SampleTemplate. Bad request: The data we received didn't match the format we expected for the createImportJob operation. Confirm that the information in your request is formatted properly, and then submit your request again.

Issue and solution

- This error occurs when the imported template isn't formatted correctly.
- Verify that the template is in valid JSON or CSV format. See Segment files for an example of the correct format. A sample template can also be downloaded from the Console. Under your project, select **Segments**, **Create a segment**, **Import a segment**, and select **Download example CSV**.
- Verify that all specified attributes are valid. **ChannelType** and **address** are required fields when importing segments. Attribute names are case-sensitive. For a complete list of possible attributes that can be added to a template, see Supported attributes.

Segment export failed

Issue and solution

- Large export jobs may fail when performing this action from the console.
- As a workaround for this limitation, the segment can be exported to an Amazon S3 bucket using the CreateExportJob API through the command line reference (CLI) or SDK.

Endpoint count for a dynamic segment

Issues and solutions

- When using a dynamic segment to create a campaign, the number of endpoint count is an approximation and may not be accurate. This is because endpoint data in dynamic segments are subject to change over time based on the defined criteria. The segment can be exported to confirm the exact number of endpoints at a given point in time.

BadRequestException: Exceeded maximum endpoint per user count: 15

This error occurs when attempting to add more than 15 endpoints associated with the same `UserId`.

> **Note**
>
> If the new endpoint has a channel type of ADM, GCM, APNS, APNS_VOICE, APNS_VOIP_SANDBOX, or BAIDU, the request will succeed if there's already an endpoint

with one of those channel types. For more information, see Managing an audience members maximum number of endpoints in the *Amazon Pinpoint Developer Guide*.

Issue and solution

- You might see this error when creating new endpoints or editing existing ones using the update-endpoint API, and the specific endpoint exceeds the maximum number of 15 endpoint addresses.
- This limit is currently a hard limit with the service. It can't be increased. For more information, see Endpoint quotas.

BadRequestException when calling the UpdateEndpointsBatch or UpdateEndpoints operation: Too many custom attributes

This error occurs when attempting to add more than 250 attributes. Custom attributes can be a maximum of 15 KB per endpoint.

Issue and solution

- Export the segment and inspect it to confirm the number of custom attributes.
- To help resolve the exception, see How do I resolve a "too many attributes" error in Amazon Pinpoint?

Amazon Pinpoint campaigns

A *campaign* is a messaging initiative that engages a specific audience segment. A campaign sends tailored messages according to a schedule that you define. You can use the console to create a campaign that sends messages through any single channel that is supported by Amazon Pinpoint: mobile push, in-app, email, SMS, or custom channels.

For example, to help increase engagement between your mobile app and its users, you could use Amazon Pinpoint to create and manage push notification campaigns that reach out to users of that app. Your campaign might invite users back to your app who haven't run it recently or offer special promotions to users who haven't purchased recently.

Your campaign can send a message to all users in a segment, or you can allocate a holdout, which is a percentage of users who receive no messages. The segment can be one that you created on the **Segments** page or one that you define while you create the campaign.

You can set the campaign's schedule to send the message once or at a recurring frequency, such as once per week. You can also set up your campaign to send messages when specific events occur. For example, you can send a campaign when a user creates a new account, or when a customer adds an item to their shopping cart, but doesn't complete their purchase. To prevent users from receiving your messages at inconvenient times, you can also configure your campaigns so that they don't send messages during specific quiet hours.

To experiment with alternative campaign strategies, set up your campaign as an *A/B test*. An *A/B test* includes two or more treatments of the message or schedule. Treatments are variations of your message or schedule. As your users respond to the campaign, you can view campaign analytics to compare the effectiveness of each treatment.

If you want to send a one-time message without engaging a user segment or defining a schedule, you can send a direct message instead of creating a campaign.

Topics

- Create a campaign
- Specify the audience for the campaign
- Configure the message
- Schedule the campaign
- Review and launch the campaign

- Managing campaigns
- Troubleshooting campaigns

Create a campaign

The first step in setting up a campaign is to create a new campaign. When you create a new campaign, you give the campaign a name, specify whether the campaign should be a standard campaign or an A/B test campaign, and choose the channel that you want to use to send the campaign.

To begin creating a campaign

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to create the campaign in.
3. In the navigation pane, choose **Campaigns**.
4. Choose **Create a campaign**.
5. For **Campaign name**, enter a descriptive name for the campaign. Using a descriptive name makes it faster to find or search for the campaign later.
6. For **Campaign type**, choose one of the following options:

   - **Standard campaign** – Sends a message to a segment on a schedule that you define.
   - **A/B test campaign** – Behaves like a standard campaign, but enables you to define different treatments for the campaign's message or schedule. In an A/B test campaign, you create several versions of a message or schedule to compare their performance.
7. Under **Choose a channel for this campaign**, choose the channel that you want to use to send the campaign.

   > **Note**
   >
   > You can only choose a single channel. You can only choose the channels that are enabled for the current project. The **Custom** channel is enabled for all projects by default.
8. If you chose **In-app messaging** in the preceding step, choose a **Prioritization** for the in-app message. The value that you choose determines which message is shown in response to a trigger event.

If you chose a different message type, proceed to the next step.

9. Choose **Next**.

Next

Specify the audience for the campaign

Specify the audience for the campaign

When you create a campaign, you choose a *segment* to send that campaign to. A segment is a group of your customers that share certain attributes. For example, a segment might contain all of your customers who use version 2.0 of your app on an Android device, or all customers who live in the city of Los Angeles.

Prerequisite

Before you begin, complete Create a campaign.

To specify a segment

1. On the **Choose a segment** page, choose one of the following options:

   - **Use an existing segment** – Choose this option if you've already created a segment and you're ready to send your campaign to it.
   - **Create a segment** – Choose this option if you haven't created any segments yet, or if you want to create a new segment for this campaign. If you choose this option, create a segment by completing the procedures in Building segments.

   > **Note**
   >
   > If you want to send your campaign when certain events occur (as opposed to sending it at a specific time), you must use a dynamic segment (as opposed to an imported segment). To learn more, see Building segments.

2. (Optional) Under **Segment hold-out**, specify the percentage of segment members who shouldn't receive this campaign. Amazon Pinpoint chooses the appropriate number of segment members at random, and omits them from the campaign.

You can use this feature to perform *hold-out testing*. In a *hold-out test*, you omit a sample group of random recipients, and then compare their behaviors (for example, the number of purchases they make) against the behaviors of the customers who received the campaign. In this way, you can determine the effectiveness of your campaigns.

Next

Configure the message

Configure the message

After you specify the target segment for the campaign, you can configure the message for the campaign.

If you created the campaign as a standard campaign, you configure a single message. If you set up the campaign as an A/B test campaign, you define two or more *treatments*. A *treatment* is a variation of your message that the campaign sends to different portions of the segment.

Prerequisite

Before you begin, complete Specify the audience for the campaign.

Set up the campaign

1. If you created this campaign as an A/B test campaign (as opposed to a standard campaign), specify the percentage of segment members who should receive each treatment. An A/B test campaign can include up to five treatments. Choose **Add another treatment** to add additional treatments.
2. On the **Create your message** page, configure the message for the campaign. The message options vary depending on the channel that you chose for the campaign.

   If you're creating an email campaign, see Configuring an email message.

   If you're creating an in-app campaign, see Configuring an in-app message.

   If you're creating an SMS campaign, see Configuring an SMS message.

   If you're creating a push notification campaign, see Configuring a push notification.

If you're creating a campaign that sends messages through a custom channel, see Configuring a custom channel message.

Configuring an email message

To configure an email message

1. Choose the priority level for the **Create your message** page, do one of the following:

   - To design and write a new message for the campaign, select **Create a new email message**.

     > **Note**
     >
     > The maximum email message size for **Create a new message** is 200 KB. You can use email templates to send larger email messages.

   - To create a message that's based on an email template:

     1. Select **Choose an existing email template**, and then select **Choose a template**.
     2. Browse for the template that you want to use. When you select a template from the list, Amazon Pinpoint displays a preview of the active version of the template. (The active version is usually the version of a template that's been reviewed and approved for use, depending on your workflow.)
     3. When you find the template that you want, select it, and then select **Choose template**.
     4. Under **Template version**, specify whether you want Amazon Pinpoint to automatically update the message to include any changes that you might make to the template before the message is sent. To learn more about these options, see Managing versions of message templates.
     5. When you finish choosing template options for the message, skip to step 5.

2. For **Subject**, enter the subject line for your email message.
3. For **Message**, enter the email body.

   > **Tip**
   >
   > You can enter the email body by using either HTML or Design view. In HTML view, you can manually enter HTML content for the email body, including features such as formatting and links. In Design view, you can use a rich text editor with a formatting

toolbar to apply formatting features such as links. To switch views, choose **HTML** or **Design** from the view selector above the message editor.

4. **Note**

   You must set up an email orchestration sending role before you can use email headers. For more information, see Creating an email orchestration sending role in Amazon Pinpoint.

   Under **Headers**, choose **Add new headers**, to add up to 15 headers for the email message. For a list of supported headers, see Amazon SES header fields in the Amazon Simple Email Service Developer Guide.

   - For **Name**, enter the name of the header.
   - For **Value**, enter the value of the header.

   (Optional) To add a One-click unsubscribe link to a promotional email, add the following two headers:

   1. Create a header with `List-Unsubscribe` for **Name** and set **Value** to your unsubscribe link. The link must support HTTP POST requests to process the recipients unsubscribe request.
   2. Create a header with `List-Unsubscribe-Post` for **Name** and set **Value** to `List-Unsubscribe=One-Click`.

5. (Optional) In the field below the message editor, enter the content that you want to display in the body of messages that are sent to recipients whose email applications don't display HTML.
6. If you created this campaign as an A/B test campaign (as opposed to a standard campaign), repeat the steps in this section for each treatment. You can switch between treatments by using the tabs at the top of the **Email details** section.
7. For **Sender email address**, choose the verified email address used to set up the email channel.
8. Choose where you want to send the test message to. This can be an existing segment of up to ten email addresses or endpoint IDs.
9. Choose **Next**.

Configuring an in-app message

Use in-app messages to send targeted messages to users of your applications. In-app messages are highly customizable. They can include buttons that open websites or take users to specific parts of your app. You can configure background and text colors, position the text, and add images to the notification. You can send a single message, or create a *carousel* that contains up to five unique messages that your users can scroll through.

When creating an in-app message, you can either choose to create a campaign from an existing template or create a new message.

If you chose to create an A/B testing campaign, you can apply a different template to each treatment. An A/B testing campaign can contain up to five different treatments.

1. On the **Create your message** page, do one of the following:

   - To create a new message for the campaign, select **Create a new in-app message**, and then proceed to step 2.
   - To create a message that's based on an existing in-app template, do the following:
     1. Select **Choose an existing in-app messaging template**, and then select **Choose a template**.
     2. Select the template that you want to use. When you select a template from the list, Amazon Pinpoint displays a preview of the active version of the template. The active version is typically the version of a template that's been reviewed and approved for use.
     3. When you find the template that you want do use, select it, and then select **Choose template**.
     4. Under **Template version**, specify whether you want Amazon Pinpoint to automatically update the message to include changes that are made to the template before the message is sent. To learn more about these options, see Managing versions of message templates.
     5. When you finish choosing template options for the message, proceed to step 11.
2. In the **In-app message details** section, under **Layout**, choose the type of layout for the message. You can choose from the following options:

   - **Top banner** – a message that appears as a banner at the top of the page.
   - **Bottom banner** – a message that appears as a banner at the bottom of the page.
   - **Middle banner** – a message that appears as a banner in the middle of the page.

- **Full screen** – a message that covers the entire screen.
- **Modal** – a message that appears in a window in front of the page.
- **Carousel** – a scrollable layout of up to five unique messages.

3. Under **Header**, configure the title that appears at the beginning of the message. If you created a Carousel message, you must create the first message for the Carousel, which includes the header.

   a. For **Header text** to display in the banner. You can enter up to 64 characters.

   b. For **Header text color**, choose the text color for the header. You can optionally enter RGB values or a hex color code.

   c. For **Header alignment**, choose whether you want the text to be **Left**, **Center**, or **Right** justified.

4. Under **Message**, configure the body of the message.

   a. For **Message**, enter the body text for the message. The message can contain up to 150 characters.

   b. For **Text color**, choose the text color for the message body. You can optionally enter RGB values or a hex color code.

   c. For **Text alignment**, choose whether you want the text to be **Left**, **Center**, or **Right** justified.

5. (Optional) Change the background color of the message. Under **Background** , choose a background color for the message. You can optionally enter RGB values or a hex color code.

6. (Optional) Add an image to the message. Under **Image URL**, enter the URL of the image that you want to appear in the message. Only .jpg and .png files are accepted. The dimensions of the image depend on the message type:

   - For a **Banner**, the image should be 100 pixels by 100 pixels, or a 1:1 aspect ratio.
   - For a **Carousel**, the image should be 300 pixels by 200 pixels, or a 3:2 aspect ratio.
   - For a **Fullscreen** message, the image should be 300 pixels by 200 pixels, or a 3:2 aspect ratio.

7. (Optional) Add a button to the message. Under **Primary button**, do the following:

   a. Choose **Add primary button**.

   b. For **Button text**, enter the text to display on the button. You can enter up to 64 characters.

c. (Optional) For **Button text color**, choose a color for the button text. You can optionally enter RGB values or a hex color code.

d. (Optional) For **Background color**, choose a background color for the button. You can optionally enter RGB values or a hex color code.

e. (Optional) For **Border radius**, enter a radius value. Lower values result in sharper corners, while higher numbers result in more rounded corners.

f. Under **Actions**, choose the event that occurs when the user taps the button:

- **Close** – Dismisses the message.
- **Go to URL** – Opens a website.
- **Go to deep link** – Opens an app or opens a particular place in an app.

If you want the button behavior to be different for different device types, you can override the default action. Under **Action**, use the tabs to choose the device type that you want to modify the button behavior for. For example, choose **iOS** to modify the button behavior for iOS devices. Next, choose **Override the default actions**. Finally, specify an action.

8. (Optional) Add a secondary button to the message. Under **Secondary button**, choose **Add secondary button**. Follow the procedures in the preceding step to configure the secondary button.

9. (Optional) Add custom data to the message. Custom data are key-value pairs delivered with your message. For example, you might want to pass a promotional code along with your message. If you're sending a carousel message, you can add custom data to each of the carousel messages. To add custom data, do the following:

a. Under **Custom data**, choose **Add new item**.

b. Enter a **Key**. For example, this might be *`PromoCode`*.

c. Enter a **Value** for the key. Your *`PromoCode`* might be *`12345`*.

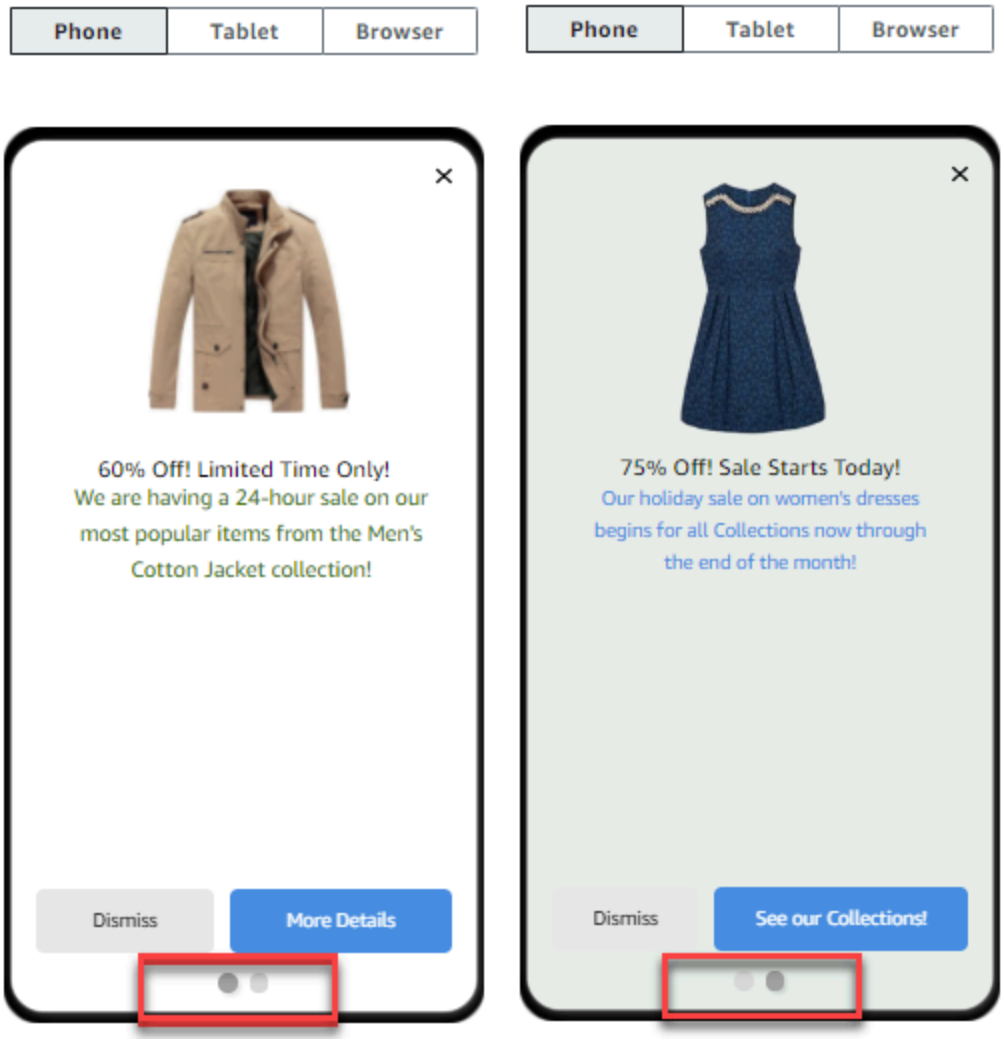
d. When the message is sent, the code *`12345`* is included in your message.

e. To add more key-value pairs, choose **Add new item**. You can add up to 10 key-value pairs to the message. When you finish adding custom data, proceed to the next step.

10. If your message is a carousel, you can add up to four more unique messages. To add messages to a carousel, expand the **Carousel overview** section. Next, choose **Add new message**. Repeat the preceding steps to configure the message.

As you add messages to the carousel, the **Preview** page updates by displaying icons at the bottom of the page showing the number of messages included in the carousel.

The following image shows a carousel with two messages:



11. (Optional) If you created this campaign as an A/B test campaign (as opposed to a standard campaign), repeat the steps in this section for each treatment. You can switch between treatments by using the tabs at the top of the **In-app messaging template** section.
12. Choose **Next**.

Configuring an SMS message

> **Important**
>
> If you send SMS messages to recipients in India using a Sender ID, you must complete additional steps. For more information, see India sender ID registration process in the *AWS End User Messaging SMS User Guide*.

To configure an SMS message

1. On the **Create your message** page, do one of the following:
   - To design and write a new message for the campaign, select **Create a new SMS message**, and then proceed to step 2.
   - To create a message that's based on an SMS template, do the following:
     1. Select **Choose an existing SMS template**, and then select **Choose a template**.
     2. Select the template that you want to use. When you select a template from the list, Amazon Pinpoint displays a preview of the active version of the template. The active version is typically the version of a template that's been reviewed and approved for use.
     3. When you find the template that you want, select it, and then select **Choose template**.
     4. Under **Template version**, specify whether you want Amazon Pinpoint to automatically update the message to include changes that are made to the template before the message is sent. To learn more about these options, see Managing versions of message templates.
     5. When you finish choosing template options for the message, proceed to step 6.
2. In the **SMS settings** section, for **Message type**, choose one of the following:
   - **Promotional** – Non-critical messages, such as marketing messages.
   - **Transactional** – Critical messages that support customer transactions, such as one-time passwords for multi-factor authentication.

> **Note**
>
> This campaign-level setting overrides your default message type, which you set on the SMS settings page.

3. (Optional) For the **Origination phone number**, select a phone number to send the message from. This list contains all of the dedicated phone numbers that are associated with your account. If your account contains multiple dedicated phone numbers, and you don't choose an origination number, Amazon Pinpoint looks for a short code in your account; if it finds one, it uses that short code to send the message. If a short code isn't found in your account, then it looks for a 10DLC number (US recipients only), and then a toll-free number (US recipients only), and then a long code.
4. (Optional) For **Sender ID**, enter the alphanumeric Sender ID that you want to use to send this message.

> **Important**
>
> Sender IDs are only supported in certain countries. In some countries, you must register your Sender ID with government or regulatory entities before you can use it. Only specify a Sender ID if you know that Sender IDs are supported in the countries of your recipients. For more information about Sender ID availability and requirements, see Supported countries and regions (SMS channel) in the *AWS End User Messaging SMS User Guide*.

5. For **Message**, enter the body of the message.

> **Tip**
>
> SMS messages can contain a limited number of characters. Long messages are split into multiple message parts, and you're charged separately for each of those parts. The maximum number of characters that you can include depends on the characters that you use in your messages. For more information, see SMS character limits in the *AWS End User Messaging SMS User Guide*.

6. (Optional) If you created this campaign as an A/B test campaign (as opposed to a standard campaign), repeat the steps in this section for each treatment. You can switch between treatments by using the tabs at the top of the **SMS details** section.
7. Choose **Next**.

Configuring a push notification

To configure a push notification

1. On the **Create your message** page, do one of the following:
   - To design and write a new message for the campaign, select **Create a new push notification**.
   - To create a message that's based on a push notification template:
     1. Select **Choose an existing push notification template**, and then select **Choose a template**.
     2. Browse for the template that you want to use. When you select a template from the list, Amazon Pinpoint displays a preview of the active version of the template. (The active version is typically the version of a template that's been reviewed and approved for use, depending on your workflow.)
     3. When you find the template that you want, select it, and then select **Choose template**.
     4. Under **Template version**, specify whether you want Amazon Pinpoint to automatically update the message to include any changes that you might make to the template before the message is sent. To learn more about these options, see Managing versions of message templates.
     5. If you created this campaign as an A/B test campaign (as opposed to a standard campaign), repeat the steps in this section for each treatment. You can switch between treatments by using the tabs at the top of the **Push notification details** section.
     6. When you finish, choose **Next**.
2. For **Notification type**, specify the type of message that you want to send:
   - **Standard notification** – A push notification that has a title, a message body, and other content and settings. Recipients are alerted by their mobile devices when they receive the message.

- **Silent notification** – A custom JSON attribute-value pair that Amazon Pinpoint sends to your app without producing notifications on recipients' devices. Use silent notifications to send data that your app is designed to receive and handle. For example, you can use silent notifications to update the app's configuration or to show messages in an in-app message center.
- **Raw message** – A push notification that specifies all of a notification's content and settings as a JSON object. Use raw messages for cases such as sending custom data to an app for processing by that app, instead of the push notification service.

  If you choose the **Raw message** option, the message editor displays an outline of the code to use for the message. In the message editor, enter the content and settings that you want to use for each push notification service, including any optional settings—such as images, sounds, and actions—that you want to specify. For more information, see the documentation for the push notification services that you use. After you enter all the raw message content, repeat this step for each treatment, if you created this campaign as an A/B test campaign. When you finish, choose **Next**.

To create a standard notification

To create a standard notification

1. For **Title**, enter the title that you want to display above the message.
2. For **Body**, enter the message body. Your push notification can have up to 200 characters. A character counter below the field counts down from 200 as you add characters to the message.
3. For **Action**, select the action that you want to occur when a recipient taps the notification:

   - **Open your app** – Your app launches, or it becomes the foreground app if it was sent to the background.
   - **Go to a URL** – The default mobile browser on the recipient's device launches and opens a webpage at the URL that you specify. For example, this action can be useful for sending users to a blog post.
   - **Open a deep link** – Your app opens to a specific page or component in the app. For example, this action can be useful to direct users to special promotions for in-app purchases.

4. (Optional) Under **Media URLs**, enter the URLs for any media files that you want to display in the push notification. The URLs must be publicly accessible so that the push notification services for Android or iOS can retrieve the images.
5. If you created this campaign as an A/B test campaign (as opposed to a standard campaign), repeat the steps in this section for each treatment. You can switch between treatments by using the tabs at the top of the **Push notification details** section.
6. Choose **Next**.

To create a silent notification

To create a silent notification

1. For **Message**, enter the content of the message in JSON format. The exact content of the message varies depending on the notification service that you use and the values that your app expects to receive.
2. If you created this campaign as an A/B test campaign (as opposed to a standard campaign), repeat the steps in this section for each treatment. You can switch between treatments by using the tabs at the top of the **Push notification details** section.
3. Choose **Next**.

Configuring a custom channel message

This section contains information about configuring a campaign to send messages by using a custom channel. You can use custom channels to send messages to your customers through any service that has an API or webhook functionality, including third-party services.

Sending a custom message using a Lambda function

To send messages through a service that has an API, you must create an AWS Lambda function that calls the API. For more information about creating these functions, see Creating custom channels in the *Amazon Pinpoint Developer Guide*.

To configure a custom channel that uses a Lambda function to call an API

1. On the **Create your message** page, for **Choose your custom message channel type**, choose **Lambda function**.

2. For **Lambda function**, choose the name of the Lambda function that you want to execute when the campaign runs.
3. For **Endpoint options**, choose the endpoint types that you want Amazon Pinpoint to send to the Lambda function or webhook that's associated with the custom channel.

   For example, if the segment you chose for this campaign contains several endpoint types, but you only want to send the campaign to endpoints that have the Custom endpoint type attribute, choose **Custom**. You aren't required to choose the Custom endpoint type. For example, you could choose to only send the custom channel campaign to endpoints with the Email endpoint type attribute.
4. Choose **Next**.

Sending a custom message using a webhook

You can also create custom channels that send information about your segment members to services that use webhooks.

To configure a custom channel that uses webhooks

1. On the **Create your message** page, for **Choose your custom message channel type**, choose **URL**.
2. For **Enter your custom message channel URL**, enter the URL of the webhook.

   The URL that you specify has to begin with "https://." It can only contain alphanumeric characters, plus the following symbols: hyphen (-), period (.), underscore (_), tilde (~), question mark (?), slash or solidus (/), pound or hash sign (#), and semicolon (;). The URL must comply with RFC3986.
3. For **Endpoint options**, choose the endpoint types that you want Amazon Pinpoint to send to the Lambda function. For example, if the segment that you chose for this campaign contains several endpoint types, but you only want to send the campaign to endpoints that have the "Custom" endpoint type attribute, choose **Custom**.
4. Choose **Next**.

Use message variables

To create a message that's personalized for each recipient, use *message variables*. *Message variables* refer to specific user attributes. These attributes can include characteristics that you create and

store for users, such as the user's name, city, device, or operating system. When Amazon Pinpoint sends the message, it replaces the variables with the corresponding attribute values for the recipient. For information about the attributes that you can use, see Endpoint properties in the *Amazon Pinpoint API Reference*.

To include a variable in your message, add the name of an existing attribute to the message. Enclose the name in two sets of curly braces ({}), and use the exact capitalization of the name—for example, `{{Demographic.AppVersion}}`.

Often, the most useful attributes for message variables are custom attributes that you create and store for users. By using custom attributes and variables, you can send personalized messages that are unique for each recipient.

For example, if your app is a fitness app for runners and it includes custom attributes for each user's first name, preferred activity, and personal record, you could use variables in the following message:

```
Hey {{User.UserAttributes.FirstName}}, congratulations
on your new {{User.UserAttributes.Activity}} record of
{{User.UserAttributes.PersonalRecord}}!
```

When Amazon Pinpoint sends this message, the content varies for each recipient after the variables are replaced. Possible final messages are:

```
Hi Jane Doe, congratulations on your new half marathon record of 1:42:17!
```

Or:

```
Hi John Doe, congratulations on your new 5K record of 20:52!
```

Test the message

Amazon Pinpoint can display a preview of an email message that you can view before you schedule the message to be sent. For email and other types of messages, you can also send a test message to a small group of recipients for testing purposes. You can send test messages in the following channels —email, push notification, in-app notification, or SMS.

Previewing an email message without sending it

The Design view in the Amazon Pinpoint message editor shows a preview of an email message as it would appear if it was rendered by your web browser.

If you're working in HTML view, instead of Design view, you can display a preview of an email message next to the HTML content of the message. This feature is helpful when you want to verify that a message renders as you expect, before you send a test.

Note that this preview only shows how the message would appear if it was rendered by your web browser. As a best practice, you should still send test emails to several recipients and view those test messages by using a variety of devices and email clients.

To preview an email

1. In the area above the HTML view of the message editor, choose **No preview**, and then choose **Preview**. Amazon Pinpoint displays a preview pane next to the HTML editor.
2. (Optional) To display the HTML content and the preview in a larger window, choose **Fullscreen** in the area above the message editor.

Sending a test message

It's often helpful to send a test message to actual recipients to make sure that your message appears correctly when your customers receive it. By sending a test version of a message, you can test incremental improvements to the content and appearance of your message without impacting the status of your campaign.

When you send test messages, consider the following factors:

- You're charged for sending test messages as if they were regular campaign messages. For example, if you send 10,000 test emails in a month, you're charged $1.00 (USD) for sending the test emails. For more information about pricing, see Amazon Pinpoint pricing.
- Test messages count toward your account's sending quotas. For example, if your account is authorized to send 10,000 emails per 24-hour period, and you send 100 test emails, you can send up to 9,900 additional emails in the same 24-hour period.
- When you send a test message to specific users, you can specify up to 10 addresses. Use commas to separate multiple addresses.

> **Note**
>
> The word "address" (as it's used in this section) can refer to any of the following: an email address, a mobile phone number, an endpoint ID, or a device token.

- When you send a test SMS message to specific phone numbers, the numbers must be listed in E.164 format. That is, they must include a plus sign (+), the country code without a leading zero, and the complete subscriber number, including area code—for example, +12065550142. E.164-formatted numbers shouldn't contain parentheses, periods, hyphens, or any symbols other than the plus sign. E.164 phone numbers can have a maximum of 15 digits.
- When you send a test push notification, the addresses must be either endpoint IDs or device tokens.
- When you send a test in-app notification, the test message is only active for 30 minutes after you send it. Also, if you send multiple test messages to the same endpoint, the new message overrides all previous messages. Finally, when you remove an endpoint from a test message, the message is no longer available for that endpoint.
- When you send a test message to a segment, you can only choose one segment. Additionally, you can only choose segments that contain 100 endpoints or fewer.
- When you send a test message to a segment, Amazon Pinpoint creates a campaign for that test. The name of the campaign contains the word "test", followed by four random alphanumeric characters, followed by the name of the campaign. These campaigns aren't counted toward the maximum number of active campaigns that your account can contain. Amazon Pinpoint doesn't create a new campaign when you send a test message to specific recipients.
- Events that are associated with test messages are counted in the metrics for the parent campaign. For example, the **Endpoint deliveries** chart on the **Campaigns** analytics page includes the number of test messages that were successfully delivered.

There are two ways to send a test message. You can send it to an existing segment or you can send it to a list of addresses that you specify. The method that you should choose depends on your use case. For example, if you have a regular group of people who test your messages, you might find it helpful to create a segment that contains all of their endpoints. If you need to send test messages to a group of testers that changes regularly, or to a dynamically generated address, you might want to specify your recipients manually.

To send a test message to a segment

1. Under the message editor, choose **Send a test message**.
2. In the **Send a test message** dialog box, under **Send a test message to**, choose **A segment**.
3. Use the dropdown list to choose the segment that you want to send the test message to.

> **Note**
>
> Amazon Pinpoint automatically excludes all segments that contain 100 endpoints or more from this list.

4. Choose **Send message**.

To send a test message to specific recipients

1. Under the message editor, choose **Send a test message**.
2. In the **Send a test message** dialog box, under **Send a test message to**, choose one of the options in the following table.

If you're sending...	Choose...	And then enter...
An email	**Email addresses**	A comma-separated list of valid email addresses.
An in-app message	Either **Endpoint IDs** or **A Segment**.	A comma-separated list of endpoint IDs, or a single segment. You can also build a new segment for the test.
An SMS message	**Phone numbers**	A comma-separated list of E.164-formatted phone numbers.
A mobile push notification	Either **Endpoint IDs** or **Device tokens**	A comma-separated list of endpoint IDs or device tokens, depending on the type of address you chose.

3. Choose **Send message**.

Next

Schedule the campaign

Schedule the campaign

After you write your message, you can specify when the campaign should be sent. You can choose to send the campaign immediately, at a scheduled date and time, on a recurring basis, or when certain events occur.

> **Tip**
>
> If a campaign is running, it will complete and then pause. Pause only pauses or skips the next run for a recurring future scheduled campaign. A campaign scheduled to be sent immediately can't be paused.

When you create a campaign, you choose a *segment* to send that campaign to. A segment is a group of your customers that share certain attributes. For example, a segment might contain all of your customers who use version 2.0 of your app on an Android device, or all customers who live in the city of Los Angeles.

Topics

- Scheduling an email, SMS, voice message, push, or custom campaign
- Scheduling an in-app campaign

Prerequisite

Before you begin, complete Configure the message.

Scheduling an email, SMS, voice message, push, or custom campaign

Topics in this section:

- Sending the campaign immediately
- Sending the campaign at a specific date and time
- Sending the campaign on a recurring basis
- Sending the campaign when events occur
- Best practices for using event-based campaigns

If you want to send the campaign as soon as you finish creating it, you can choose to send the campaign immediately.

Sending the campaign immediately

If you want to send the campaign as soon as you finish creating it, you can choose to send the campaign immediately. You can't pause a campaign that's set to run immediately.

To send the campaign immediately

1. Under **When should the campaign be sent**, choose **At a specific time**.
2. Under **How often should the campaign be sent**, choose **Immediately**.
3. Choose **Next** to continue to the final step.

Sending the campaign at a specific date and time

If you want to send a campaign only once, you can schedule it to be sent at a specific date and time.

To send the campaign at a specific date and time

1. Under **When should the campaign be sent**, choose **At a specific time**.
2. Under **How often should the campaign be sent**, choose **Once**.
3. For **Start date and time**, choose the date and time when Amazon Pinpoint should send the message.
4. Under **Time zone**, choose the time zone that you want to use to schedule the campaign. Optionally, choose **Use recipient's local time** to base the delivery time on each recipient's local time zone.
5. Choose **Next** to continue to the final step.

Sending the campaign on a recurring basis

You can also schedule the campaign to be sent on a recurring basis. You can specify the frequency and the start and end dates for the campaign.

To send the campaign on a recurring basis

1. Under **When should the campaign be sent**, choose **At a specific time**.

2. Under **How often should the campaign be sent**, choose how often Amazon Pinpoint should send the recurring campaign. For example, to send the campaign once per week, choose **Weekly**.
3. For **Start date and time**, choose the date and time when Amazon Pinpoint should send the first message in the recurring series.
4. For **End date and time**, choose the date and time when Amazon Pinpoint should stop sending recurring messages.
5. Under **Time zone**, choose a time zone to base the start and end times on. Optionally, choose **Use recipient's local time** to base the delivery time on each recipient's local time zone.
6. Choose **Next** to continue to the final step.

Sending the campaign when events occur

If you want to send the campaign when customers take certain actions, you can configure the campaign to be sent when a specific event occurs. For example, campaigns can be sent when a customer registers a new account, or when a customer adds an item to their shopping cart but doesn't purchase it. To learn more about sending events from your apps to Amazon Pinpoint, see Reporting events in your application in the *Amazon Pinpoint Developer Guide*.

> **Note**
>
> You can send event-based messages only if your campaign uses dynamic segments (as opposed to imported segments). In addition, if you integrate your app with Amazon Pinpoint by using an AWS Mobile SDK, messages from event-based campaigns are sent only to customers whose apps are running AWS Mobile SDK for Android version 2.7.2 or later, or AWS Mobile SDK for iOS version 2.6.30 or later.

To configure a campaign to be sent when an event occurs

1. Under **When should the campaign be sent**, choose **When an event occurs**.
2. For **Events**, choose the name of the event that initiates the campaign.
3. (Optional) For **Attributes** and **Metrics**, choose the specific characteristics that initiate the campaign.

> **Tip**
>
> The more event data that you capture from your users, the more options you have when you set up event triggers. Event attributes and metrics are available only if you've provided those values to Amazon Pinpoint. To learn more about capturing event data, see Reporting events in your application in the *Amazon Pinpoint Developer Guide*.

4. Under **Campaign Dates**, for **Start date and time**, choose a start date. Amazon Pinpoint sends the campaign only if the event that you specified earlier occurs after the start date.

> **Note**
>
> The **Start date and time** that you choose must be at least 15 minutes in the future.

5. For **End date and time**, choose an end date. Amazon Pinpoint sends the campaign only if the event that you specified earlier occurs before the end date.
6. Under **Time zone**, choose a time zone to base the start and end dates on.
7. Choose **Next** to continue to the final step.

Best practices for using event-based campaigns

There are a few restrictions and best practices that you should consider when you create event-based campaigns:

- You can create an event-based campaign only if you chose a dynamic segment (as opposed to an imported segment) in Step 2.
- If you integrate your app with Amazon Pinpoint by using an AWS Mobile SDK, your app should use the following versions of the SDK in order to work properly with event-based campaigns:
  - AWS Mobile SDK for Android version 2.7.2 or later
  - AWS Mobile SDK for iOS version 2.6.30 or later

  Because of this restriction, we recommend that you set up your segments to include only customers who use a version of your app that runs a compatible version of the SDK.
- Choose your events carefully. For example, if you send an event-based campaign every time a `session.start` event occurs, you might quickly overwhelm your users with messages. You can

limit the number of messages that Amazon Pinpoint sends to a single endpoint in a 24-hour period. For more information, see Editing a project's default settings.

Scheduling an in-app campaign

This section contains information about setting up the parameters of your in-app message using the Amazon Pinpoint console. These parameters include setting up the following:

- **Trigger event** – A trigger event is an action that a customer performs that makes your in-app message display. Trigger events might include opening an app, making a purchase, or opening a menu. With trigger events, you can see what users are doing within apps, and use that information to improve the apps.
- **Conversion event** – Conversion events help you get your website visitors to become customers, and can help you keep current customers. Use conversion events alone, or use them with trigger events. After you add conversion events, you can view their performance on the campaign analytics page of the Amazon Pinpoint console. A conversion is recorded for analytics when a user views your in-app message and performs the action set by the conversion event.

Topics in this section:

- Define triggers and set campaign start and end dates
- (Optional) Change campaign global settings

Define triggers and set campaign start and end dates

To set a trigger event

1. Add the **Trigger event** that initiates the campaign. You can manually enter a trigger event name, or choose an existing trigger from the dropdown list. For example, to show a message to a user who purchases something from your online store, enter *`Purchase`*.

   At this point, you don't need to enter any additional information, such as attributes or conversions. The *`Purchase`* trigger event displays your in-app campaign message to anyone who makes an online purchase.
2. (Optional) Add event attributes. An event attribute is used to refine a trigger. It consists of an attribute name and a value. For example, to narrow down the *`Purchase`* trigger event, you can

add an attribute that displays the in-app message to customers who purchase a specific item. Imagine that the item is a pair of gardening gloves that cost $10 USD or more. For **Attribute**, choose *`item`*, and then for **Value**, choose *`gardening gloves`*. (You set the event **Metric** for the cost in Step 3.)

To further narrow down who gets your in-app message, choose **Add new attribute** and add additional attributes and values. If an attribute has multiple possible values, you must add each attribute and value pair separately.

When you use the same attribute multiple times with different values, Amazon Pinpoint processes the campaign attributes using "or" between the values.

3. (Optional) Choose an event **Metric**. This event typically uses a range of numbers, such as a duration or a cost. After entering the event, choose one of the following **Operator** options:

   - **is equal to**
   - **is greater than**
   - **is less than**
   - **is greater than or equal to**
   - **is less than or equal to**

   Enter the **Value** for the operator. Only numeric values are supported. For example, enter the following values for the *`Purchase`* trigger. For **Metric**, choose *`Price`*, and for the **Operator**, choose **is greater than or equal to**. For the value, choose *`10`*. The in-app message now displays to any user that purchases gardening gloves at $10 USD or more.

   > **Note**
   >
   > You can use only a single metric in an in-app message.

4. Under **Campaign Dates**, for **Start date and time**, choose a start date. Amazon Pinpoint sends the campaign only if the event that you previously specified occurs after the start date.

   > **Note**
   >
   > The **Start date and time** that you choose must be set 15 minutes or more in the future.

5. For **End date and time**, choose an end date. Amazon Pinpoint sends the campaign only if the event that you previously specified occurs before the end date.
6. Under **Time zone**, choose a time zone to base the start and end dates on.

(Optional) Change campaign global settings

Campaign global settings determine how often a message is displayed to a user. Customers might not want to see the same in-app message every time they initiate a trigger event. Alternatively, you might want to set the number of times that a customer sees your in-app message.

To change global settings for the campaign

1. For **Maximum number of session messages viewed per endpoint**, specify the number of times a customer should see your in-app message during a session. A session is defined as the period of time when a customer interacts with your application. Set a level from *0* to *10*, with *0* displaying the message during an unlimited number of sessions. For example, if you enter a value of *2*, then your customer sees your in-app message during two separate sessions only. If your customer interacts with your app for a third session, the in-app message is not displayed.
2. For **Maximum number of daily messages viewed per endpoint**, choose **Override default setting**. Then, set the number of times during a day that a customer sees your message. Set a level from *0* to *10*, with *0* displaying the message an unlimited number of times during the day. For example, if you enter a value of *2*, then your customer sees your in-app message only twice during a 24-hour period.
3. For **Maximum number of session messages viewed per endpoint**, choose **Override default setting**. Then, set the number of in-app messages a customer can see. If you send out multiple in-app messages, you might want to restrict the number of messages that an endpoint displays. Set a level from *0* to *10*, with *0* displaying an unlimited number of messages. For example, if you enter a value of *2*, then your customers only see two in-app messages, regardless of how many you send out.

Next

Review and launch the campaign

Review and launch the campaign

At this point, you're almost ready to send the campaign to your audience segment. Before you launch the campaign, you should review your settings and make changes if needed.

Prerequisite

Before you begin, complete Schedule the campaign.

To review and launch a campaign

1. On the **Review and launch** page, review the settings for the campaign. If you need to make changes, use the navigation section on the left side of the window to go directly to the page that contains the content that you want to edit.
2. If all of the settings are correct, choose **Launch campaign**.

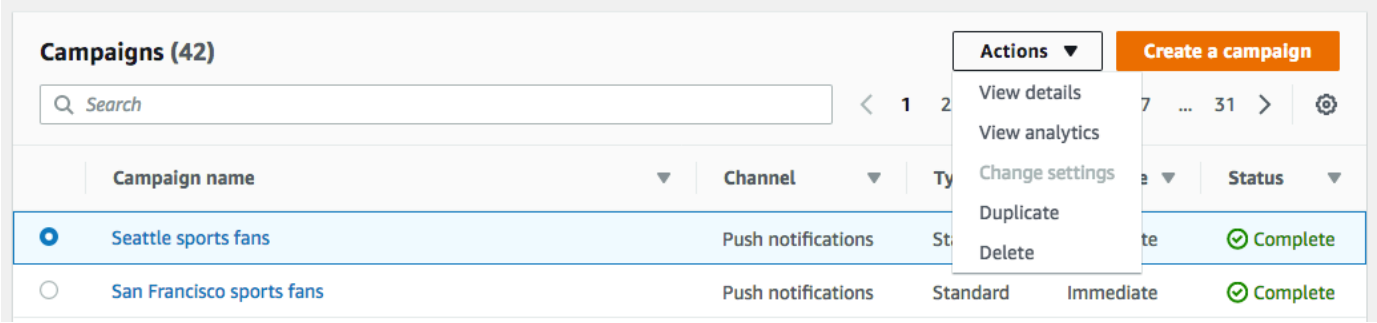
Managing campaigns

In the Amazon Pinpoint console, you can update the settings for a campaign, delete a campaign, or copy an existing campaign to a new campaign.

> **Note**
>
> Because 10DLC campaigns exist outside of a specific project, information about these campaigns can be found on the **10DLC campaigns** tab on the **SMS and voice** page of the Amazon Pinpoint console.

To manage a campaign

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project for which you want to manage campaigns.
3. In the navigation pane, choose **Campaigns**.
4. On the **Campaigns** page, choose the campaign that you want to manage. Then, on the **Actions** menu, select the action that you want to take, as shown in the following image.



On the **Actions** menu, you can do the following:

- **View details** – Shows the details page for the selected campaign. On this page, you can see information about the campaign, such as the campaign type, the status of the campaign, and the number of endpoints targeted by the campaign.
- **View analytics** – Shows the analytics page for the selected campaign. For more information about campaign analytics, see Campaign charts.
- **Change settings** – Change the settings for the campaign, including the target segment, the message content, and the delivery time. You can choose this option only for campaigns that haven't been sent yet.
- **Duplicate** – Copy the campaign to use its settings as a template for a new campaign, in which you can change or keep any of the original settings.
- **Delete** – Remove the campaign from Amazon Pinpoint and stop sending messages through the campaign.

Troubleshooting campaigns

Verify that logging is turned on to assist in identifying the cause of failure. For more information, see Monitoring and logging and Campaign events.

Some endpoints were not processed or targeted successfully by the campaign

Endpoints targeted: The total number of endpoints that will be targeted when the campaign runs for the chosen channel. This total excludes duplicate or inactive endpoints from the segment.

Endpoints processed: The total number of endpoints that were successfully targeted by the campaign run.

For **dynamic segments**, the endpoint count can change over time based on the criteria defined for the audience therefore the number of endpoints per channel is only an estimate. You may export the segment to get the total number of endpoints at any given time.

- Throttling based on delivery channel constraints
- If you schedule the campaign to use recipient's local time (isLocalTime is set to true)
- If the campaign does not have sufficient time configured to process all endpoints
- Downstream delivery issues or rendering issues
- Permanent failure

Throttling

- Review the Amazon CloudWatch metric `CampaignSendMessageThrottled` during the time frame that the campaign ran to confirm whether this is the issue. For more information, see View Amazon Pinpoint metrics in CloudWatch.
- Throttling occurs when the endpoint delivery rate capability is exceeded. For more information, see Amazon Pinpoint quotas.

Using recipients timezone

When a campaign is scheduled to use a recipients' local time (isLocalTime set to true) for the Campaign, all endpoints must have a `Demographic.Timezone` attribute value formatted correctly in the endpoint definition, else the endpoint will not be targetedsuccessfully. This is because the isLocalTime option bases the delivery time on each recipient's local time zone.

Processing time

- When a campaign doesn't have sufficient time to process all targeted endpoints, the endpoints aren't processed and logs show a `campaign_send_status` of `EXPIRED`.
- Based on the number of endpoints being targeted by your campaign, verify that the **Maximum amount of time for a campaign run** and **Maximum number of messages per second** is configured based on your use case and delivery channel. For more information, see Editing a project's default settings.

Delivery, render or permanent failure

- Delivery issues can occur when reaching the different endpoint types. Verify that logging is enabled to assist in identifying the cause of the failure. To troubleshoot downstream delivery issues further, see the delivery issues associated with the corresponding endpoint type Troubleshooting the email channel, Troubleshooting the SMS channel, Troubleshooting the voice channel, and Troubleshooting the push channel.
- Rendering issues occur for the following reasons: when a message template is used and template data is missing, template data is incorrectly formatted, or there's a mismatch between the template parameters and endpoint data. For more information, see the email section under delivery issues.
- Permanent failures occur when the endpoint address might not be reached by Amazon Pinpoint. The reason for the permanent error is displayed in the logs. Permanent failures are not retried. Examples of permanent failures can include invalid address, such as an email address or a phone number, as well as permission issues, account in a sandbox, or insufficient quota.

Amazon Pinpoint journeys

In Amazon Pinpoint, a *journey* is a customized, multi-step engagement experience. When you create a journey, you start by choosing a segment that defines which customers will participate in the journey. After that, you add the activities that customers pass through on their journeys. Activities can include sending messages or splitting customers into groups based on their attributes or behaviors.

There are several different types of journey activities, each with its own specific purpose. For example, you can add a **Send email** activity to your journey. When a customer arrives on this type of activity, they receive an email message. Another type of journey activity is the **Multivariate split** activity. When customers arrive on this type of activity, they are separated into multiple paths based on their segment membership or their interactions with previous journey activities. You can learn more about journey activities in Take a tour of journeys.

This chapter contains conceptual information about journeys in Amazon Pinpoint. It also contains information about creating, managing, testing, and publishing your journeys.

Topics in this section:

- Take a tour of journeys
- Create a journey
- Set up the journey entry activity
- Add activities to the journey
- Review and test a journey
- Publish a journey
- Pause, resume, or stop a journey
- View journey metrics
- Tips and best practices for journeys
- Troubleshooting journeys

Take a tour of journeys

Journeys includes some new concepts and terminology that you might not be familiar with. This topic explores these concepts in detail.

Journeys terminology

Journey workspace

The area of the journey page where you create your journey by adding activities.

Activity

A step in a journey. Different things can happen when participants arrive on different types of activities. In Amazon Pinpoint, you can create the following types of activities:

Send an email

When a participant arrives on a **Send an email** activity, Amazon Pinpoint sends them an email. When you create a **Send an email** activity, you specify an email template to use for the email. Email templates can include message variables, helping you to create a more personalized experience.

Send a push notification

When a participant arrives on a **Send a push notification** activity, Amazon Pinpoint immediately sends a push notification to the user's device. When you create a **Send a push notification** activity, you will choose the push notification template to use. Push notification templates can include messages variables, helping you to create a more personalized experience.

Send an SMS message

When a participant arrives on a **Send an SMS message** activity, Amazon Pinpoint immediately sends an SMS notification to the user's device. When you create a **Send an SMS notification** activity, you will choose the SMS template to use. SMS templates can include messages variables, helping you to create a more personalized experience.

Send through a custom channel

Send your message through one of your custom channels. For example, you can use custom channels to send messages through third-party services such as WhatsApp or Facebook Messenger. Amazon Pinpoint immediately sends a notification using that service to the user's device using either an AWS Lambda function or a webhook. For more information about creating custom channels, see Custom channels in Amazon Pinpoint.

Wait

When a participant arrives on a **Wait** activity, they remain on that activity until a certain date or for a specific amount of time.

Yes/No split

Sends participants down one of two paths based on criteria that you define. For example, you can send all participants who read an email down one path, and send everyone else down the other path.

Multivariate split

Sends participants down one of up to four paths, based on criteria that you define. Participants who don't meet any of the criteria proceed down an *Else path*.

Holdout

Ends the journey for a specified percentage of participants.

Random split

Randomly sends participants down one of up to five paths.

Path

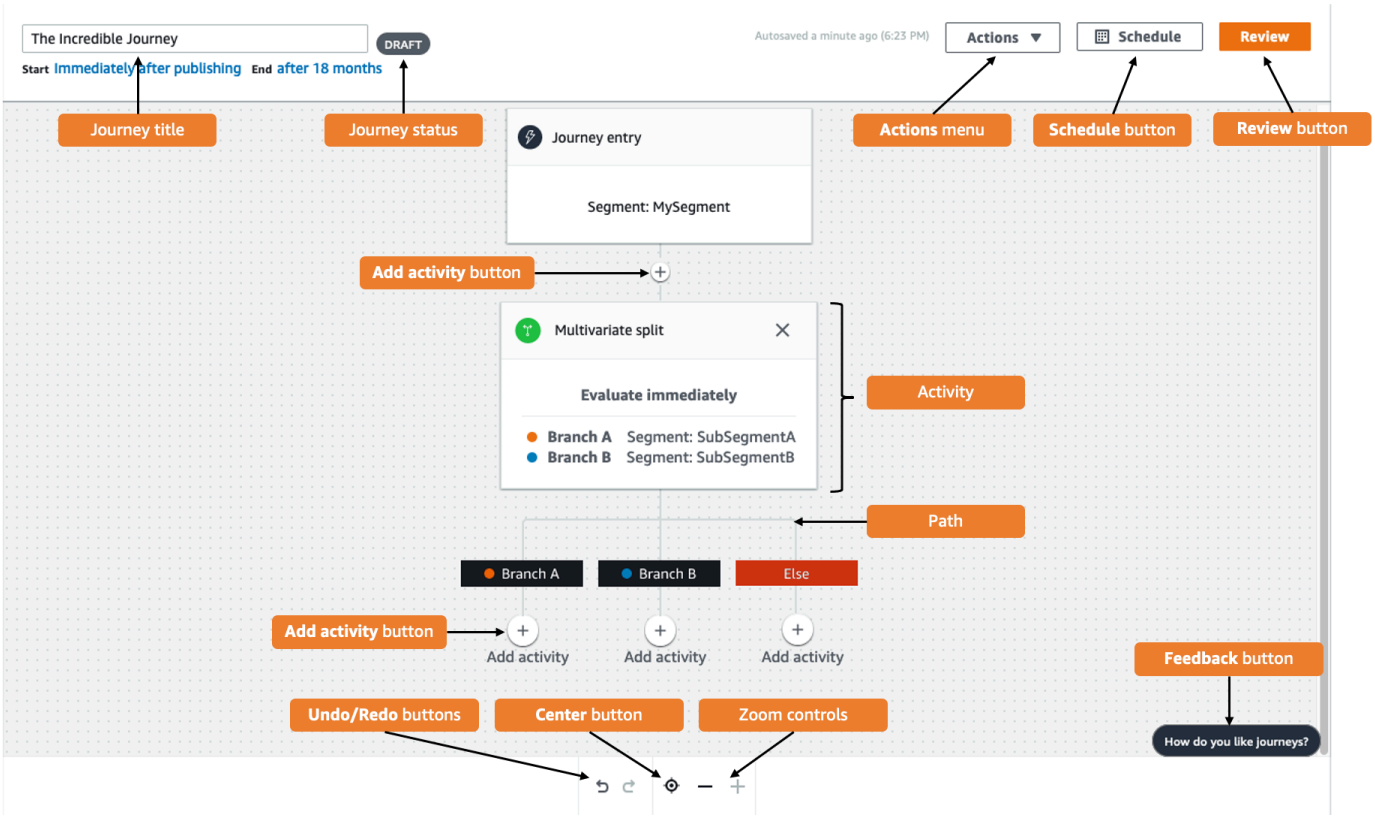
A connector that joins one activity to another. A split activity might have several paths.

Participant

A person who is traveling through the activities in a journey.

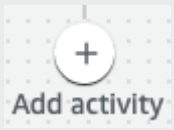
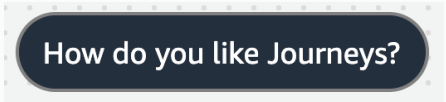
Parts of the journeys interface

This section contains information about the components of the journeys interface. When you create or edit a journey, you see the journey workspace. The following image shows an example of the journey workspace.



The following table includes descriptions of several of the buttons that appear in the journey workspace.

Appearance	Button name	Description
	Info	Opens the help panel, which shows additional informati on about individual journey activities.
	Delete activity	Deletes the highlighted activity.
	Undo	Reverts the most recent action.
	Redo	Restores an action that was previously undone by using the **Undo** button.

Appearance	Button name	Description
	Center	Moves to the top of the journey and centers the **Journey entry** activity on the journey workspace.
	Zoom out	Reduces the size of objects in the journey workspace.
	Zoom in	Increases the size of objects in the journey workspace.
	**Add activity**	This button appears at every point where you can insert another step in the journey. When you choose this button, you see a menu that lets you choose an activity type.
	**Feedback**	A quick way to provide feedback about your experience using journeys. We review all of the feedback that we receive through this button. We might contact you for additional information if we have any questions.

Create a journey

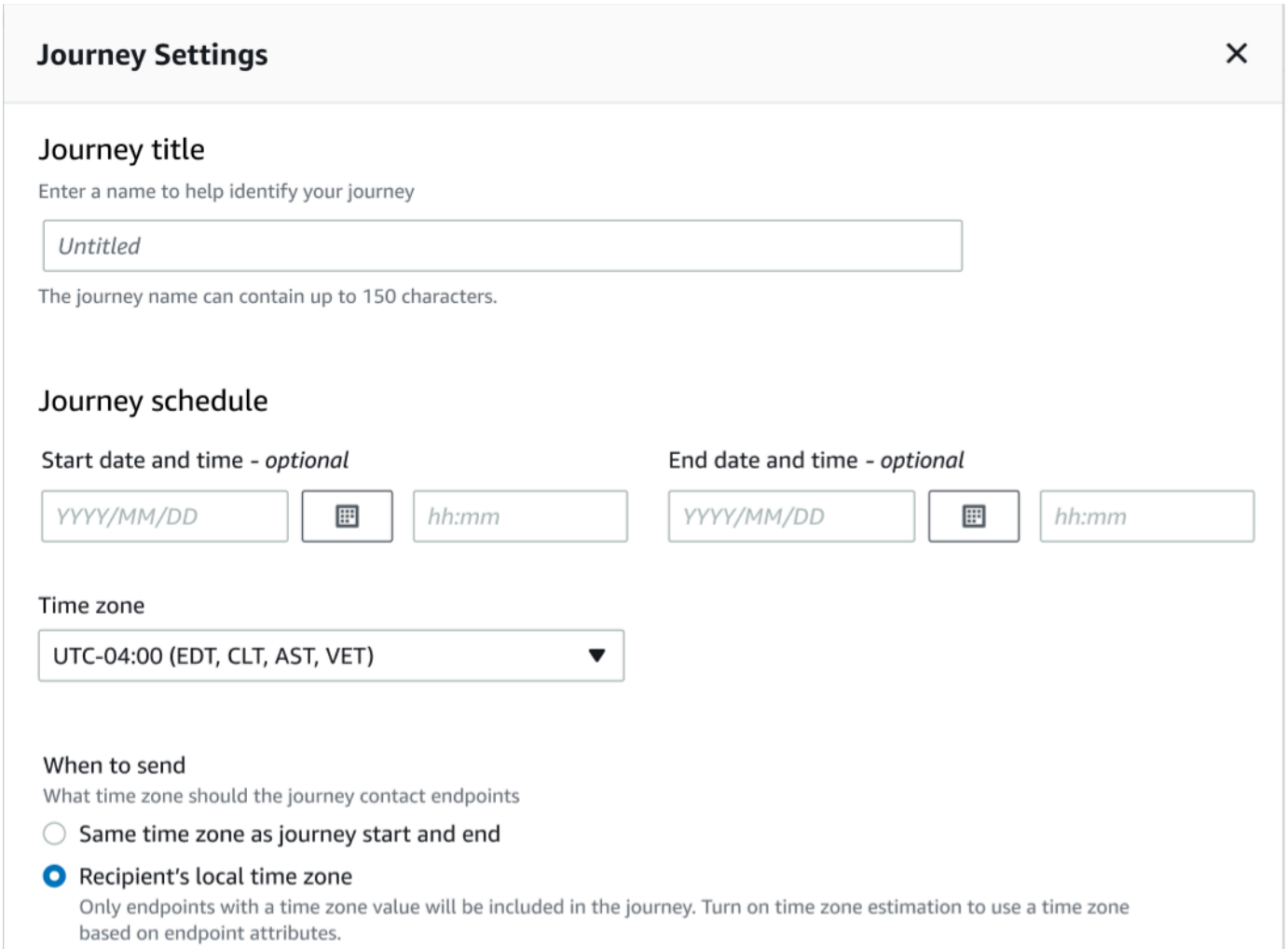
You can use the Amazon Pinpoint console to create powerful journeys through a graphical editor. The first step in building your journey is to create and configure it. You can configure the journey to begin immediately, or at a certain date and time. You can also configure it to end at a specific date and time.

To configure a journey

1. On the **All projects** page, choose the Amazon Pinpoint project that you want to create a journey in.

   > **Note**
   >
   > In Amazon Pinpoint, segments and endpoints are unique to each project. The project that you choose should contain the segments and endpoints that you want to engage with this journey.

2. In the navigation pane, choose **Journeys**.
3. Choose **Create journey**. The journey workspace appears.
4. On the **Actions** menu, choose **Settings**. The **Journey Settings** dialog box appears. An example of this dialog box is shown in the following image.



5. In the **Journey Settings** dialog box, do the following:

   a. For **Journey title**, enter a name that describes the journey.

   b. (Optional) For **Journey schedule**, enter a **Start date and time** and **End date and time**. If you don't enter a start date, customers enter the journey 5 minutes after you launch it. If you don't enter an end date, the journey runs continuously for up to 3600 days (approximately 120 months).

   c. (Optional) For **Time zone**, choose the time zone that the **Start date and time** and **End date and time** should be based on. By default, Amazon Pinpoint chooses a time zone from this list based on your location. You only need to complete this step if you set a start date or end date.

   d. For **When to send** choose either:

   - **Use the same time zone as journey start and end** – To use the journey's **Time zone**, **Start date and time**, and **End date and time** when sending messages.

     Tip

     Only send messages to recipients during business hours, see Send at appropriate times in the *AWS End User Messaging SMS User Guide*. If recipients are multiple time zones away from the Journey's **Time zone** they could receive messages outside of business hours.

   - **Recipient's local time zone** – To automatically adjust the sending time to the time zone value in the endpoint's `Demographic.Timezone` attribute.

     Important

     - An endpoint without a `Demographic.Timezone` attribute isn't included in the journey. Use **Time zone estimation** for endpoints without a `Demographic.Timezone` attribute to estimate the endpoints time zone and include it in the journey.
     - **Recipient's local time zone** isn't supported for event-triggered journeys. For event-triggered journeys, time zone estimation is still supported for time zone related features like *quiet time*.

   e. Under **Time zone estimation** choose:

> **Note**
>
> Time zone estimation is used for estimating a recipient's local time zone that is used for journey scheduling and quiet time.

i. **No time zone estimation (default)** – Time zone estimation isn't performed and Amazon Pinpoint uses the value in the `Demographic.Timezone` attribute.

ii. **Estimate by using phone number (for example area code)** – The geographic information of the endpoints phone number and country are used to estimate the time zone. The `Endpoint.Address` attribute must be a phone number and `Endpoint.Location.Country` attribute must have a value. For more information about the `Endpoint.Address` and `Endpoint.Location.Country` attributes, see Endpoint in the *Amazon Pinpoint API Reference.*

iii. **Estimate by using region (for example zip or postal code)** – The endpoints country and postal code are used to estimate the time zone. Both the `Endpoint.Location.PostalCode` and `Endpoint.Location.Country` attribute must have a value. For more information about the `Endpoint.Location.PostalCode` attribute, see Endpoint in the *Amazon Pinpoint API Reference.*

> **Note**
>
> Postal code estimation is only supported in the United States, United Kingdom, Australia, New Zealand, Canada, France, Italy, Spain, Germany, and in AWS Regions where Amazon Pinpoint is available. Time zone estimation isn't supported in AWS GovCloud (US-West).

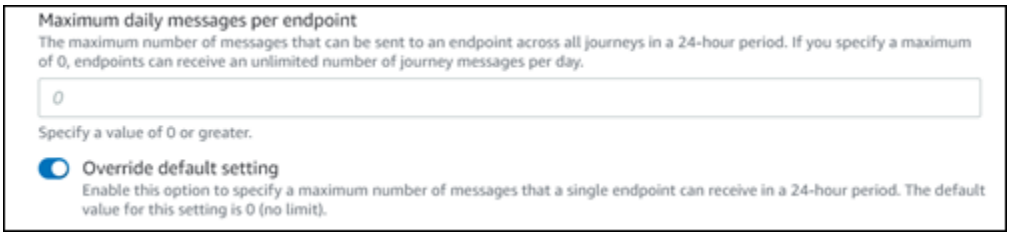
iv. **Estimate by using phone number and region** – Use both **Estimate by using phone number (for example area code)** and **Estimate by using region (for example zip or postal code)** to estimate the recipients time zone.

For more information about time zone processing rules, see Time zone estimation.

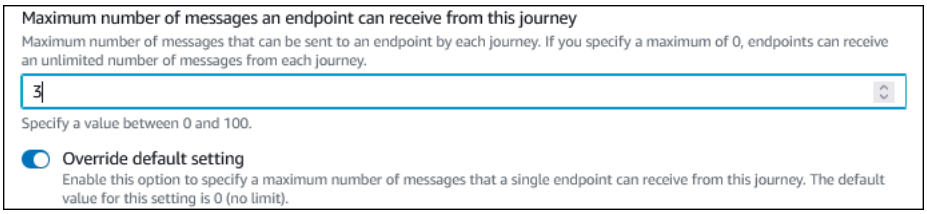
> **Important**
>
> **Time zone estimation** is only performed on endpoints that don't have a value for the `Demographic.Timezone` attribute. If **Time zone estimation** is unable to estimate a time zone or the estimated time zone isn't part of the `Endpoint.Location.Country`, then the endpoint will not be added to the journey. For more information, see Time zone estimation.

6. Under **Journey limits (advanced)**, set options for message processing. For example, this might be changing the number of journey messages per second or changing the number of entries per endpoint. Endpoints will only re-enter a journey if allowed by limits.

   - **Maximum daily messages per endpoint** – Choose **Override default setting** to override the maximum daily message setting for the project that contains this journey. If you specify a value in this section, Amazon Pinpoint limits the number of messages that are sent to each individual endpoint.

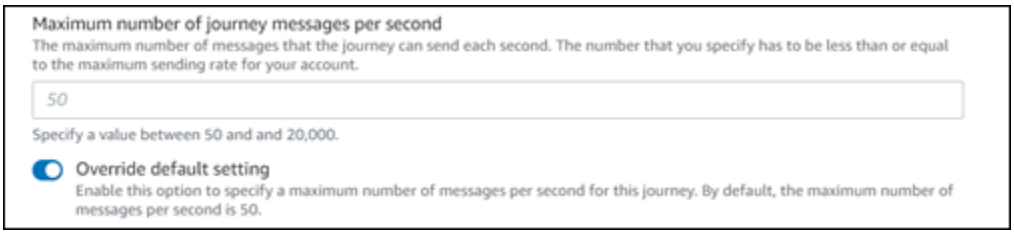


   - **Maximum number of messages an endpoint can receive from this journey** – Choose **Override default setting** to override the maximum messages an endpoint can receive from this journey. The default setting is 0, which means that there's no limit on the number of messages that endpoints in the journey can receive. When you enable this feature, other limits (such as **Maximum daily messages per endpoint**) still apply.



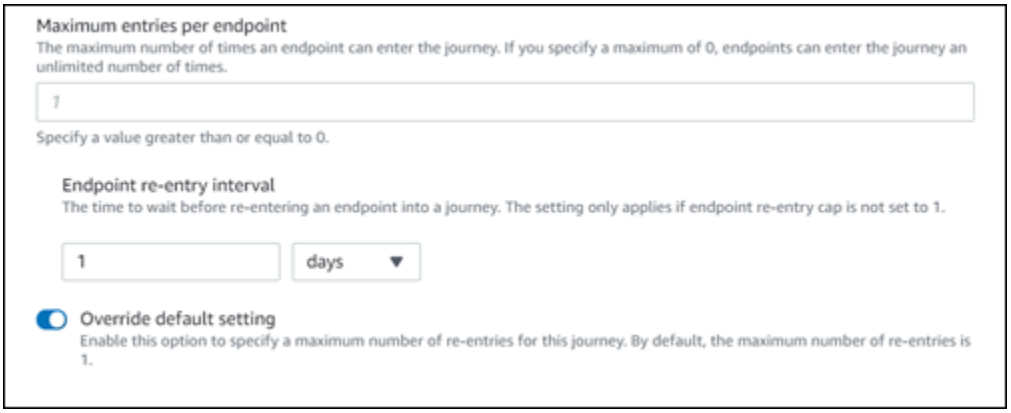
   - **Maximum number of journey messages per second** – Choose **Override default setting** to override the maximum messages per second setting for the project that contains this journey. If you specify a value in this section, Amazon Pinpoint limits the number of messages that the journey can send each second. The value that you specify should be less

than or equal to the maximum sending rate for your account. You can find the maximum sending rate for your account on the Email settings page on the Amazon Pinpoint console.



- **Maximum entries per endpoint** – Choose this setting to override the maximum entry setting for the project that contains this journey. If you specify a value in this section, Amazon Pinpoint limits the number of times that a participant can enter the journey. For example, if you specify a value greater than 1, a participant could enter a journey, complete several activities in the journey, arrive at an **End** activity, and start the journey again. If a participant is eligible for a journey, but they've already entered the journey the maximum number of times, they are prevented from entering the journey again. For example, if you have a maximum entry endpoint limit of **2**, and a participant has already entered and exited the journey two times, they will not re-enter that journey again.

  If you choose a value greater than **1** for the default, you can then choose **Endpoint re-entry interval**, setting how long to wait before an endpoint re-enters a journey. For example, you might set a re-entry interval if you want to space out messages sent to your users, thus preventing your users from being spammed.

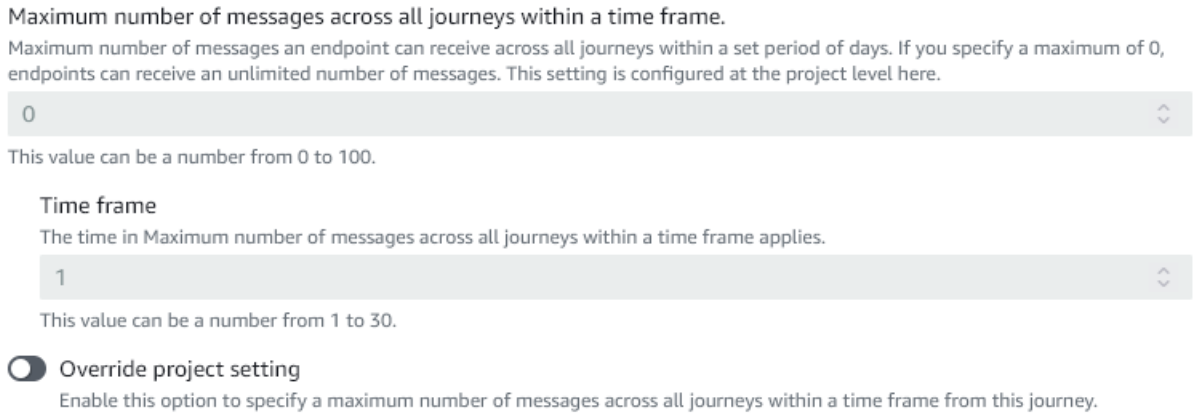


- **Maximum number of messages across all journeys within a time frame**

  Use this setting to specify the maximum number of times a message can be sent to a single endpoint within the specified **Timeframe**. For example, if you want to send a maximum of 3 messages within a **Timeframe** of 7 days to each endpoint. The default setting is 0, which means that there's no limit on the number of messages that endpoints in the journey can receive.

- **Timeframe**

  The number of days applied to the **Maximum number of messages across all journeys within a time frame** if not set to 0. The default setting is 0, which means that there's no limit on the number of days that endpoints in the journey can receive.



7. Choose **Confirm**

(Optional) Configuring journey schedule settings

When you create a journey, you can specify a sending schedule for that journey. There are two schedule settings that you can configure. The first setting is *do not send time*, which refers to a range of hours during which Amazon Pinpoint won't deliver messages to journey participants. The second setting is *sending time*, which refers to ranges of hours during which Amazon Pinpoint will deliver messages to journey participants. The *sending time* setting allows for more granular customization of time and channels than *do not send time*. These settings use each endpoint's time zone settings. To use journey schedule settings, each of the endpoints in your journey must include the `Demographic.Timezone` attribute.

> **Important**
>
> To use the **Use recipient's local time zone** settings, each of the endpoints in your journey must include the `Demographic.Timezone` attribute. A participant won't be included in the journey if you choose this option and the participant's endpoint record doesn't specify a time zone.

You can configure the schedule settings for a journey by choosing the **Schedule** button at the top of the journey workspace. Then, on the **Schedule settings** window, specify the **Start time** and **End time** for *Do not send time*. You can also choose to enable the following settings:

- **Resume sending after quiet times** – When you enable this feature, Amazon Pinpoint holds any messages that would have been sent during *Do not send time*, and then delivers them when *Do not send time* ends. If you don't enable this option, messages that would have been sent are dropped and not sent.
- **Configure sending time to define each day of a week** – Enable this option to configure different sending time hours for different days of the week. For example, if your *Do not send time* is scheduled between 8:00 AM and 8:00 PM (20:00), you can set sending time for Sunday between 8:00 AM and end at 6:00 PM (18:00), and set the sending time for all other days to begin at 8:00 AM and end at 8:00 PM (20:00). You can add up to four time ranges per day.

  You can also specify exceptions for specific days of the year. For example, if you want to make sure that you don't send any messages on New Year's Day, you can create an exception that begins on December 31st at 8:00 PM and ends on January 2nd at 8:00 AM. You can add up to 20 exceptions.

  > **Note**
  >
  > The hours that you specify for days of the week or for exceptions must respect the quiet time hours that you specify for the journey. In other words, if you set the journey quiet time hours to 8:00 PM through 8:00 AM, you can't set the quiet time hours for Monday to 8:30 PM through 7:30 AM.

- **Apply this schedule to all channels** – Enable this feature to automatically set the sending time setting for each channel to equal the **Start time** and **End time** that you specified for the *Do not send time* setting. If you don't enable this feature, you can define different sending time hours for different channels. For example, you can configure the email channel so that messages are sent from 6:00 AM to 10:00 PM (22:00), and configure the SMS channel so that messages are sent from 8:00 AM to 8:00 PM (20:00).

Next: Set up the journey entry activity

Set up the journey entry activity

After you create and configure the journey, you must configure the *Journey entry* activity. This activity determines how participants are added to the journey. There are two ways to add participants to a journey:

- **When an event occurs** – You can configure the journey so that participants are inserted into a journey dynamically, when specific events occur. For example, you can use this option to add participants to a journey when they complete a sign-up workflow. For more information, see Add participants when they perform an activity.

  Important

  Contact Center activities aren't supported in event triggered journeys.

- **Based on segment membership** – You can insert the members of an existing segment directly into the journey. The journey can be configured to periodically re-evaluate the segment to determine if there are new segment members to add. For more information, see Add participants from a segment.

Note

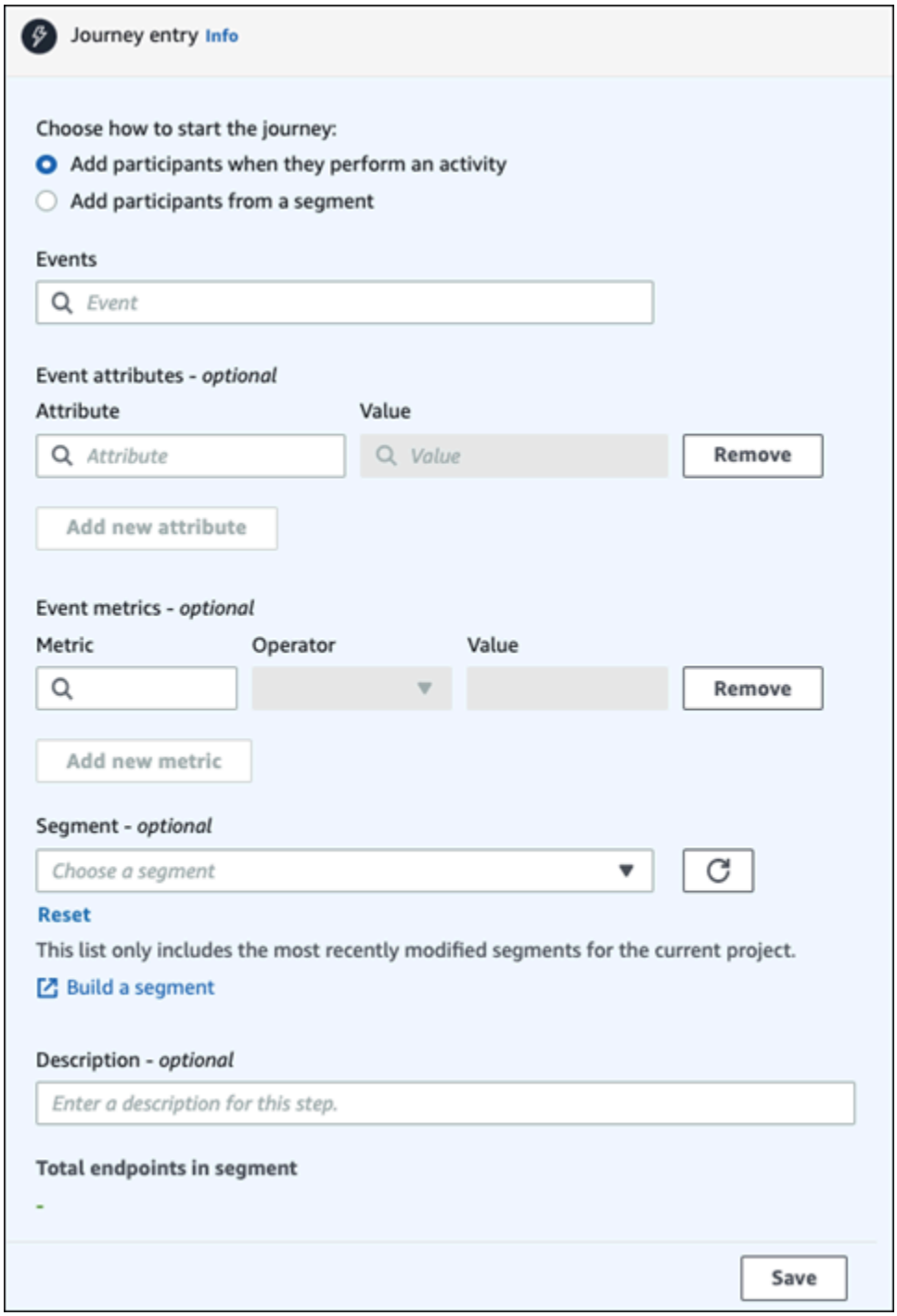
Participant refers to either a user and their endpoints or individual endpoints, depending on the data. If the journey entry segment consists of user-level data (user_id), then the *participant* is the user and all the endpoints associated with the user progress through the journey together. If the journey entry segment consists of endpoint-level data (no user_id), then the *participant* is the individual endpoints.

Add participants when they perform an activity

This event-triggered journey type adds participants based on a chosen event. You choose an event, such as music downloads, and then choose the event attributes to further define the journey event. This might be downloading music from a specific artist. When a user performs any of the activities described by the event, they become participants in the journey.

To add participants when they perform an activity

1. Choose **Add participants when they perform an activity** if it's not already chosen.



2. For **Events**, choose an event from a list of events or type a new event to add it. For example, you might want to trigger a journey when a user downloads a particular artist from your music service. Let's call this event `artist.download`. A journey can include only one event.

   Events can be submitted by using any of the following:

- The PutEvents API. See Events in the Amazon Pinpoint API Reference
- AWS Mobile SDK for Android: version 2.7.2 or later
- AWS Mobile SDK for iOS: version 2.6.30 or later

> **Note**
>
> If you're using either of the AWS Mobile SDKs you will be limited to a set of events. For the list of supported events, see App events in the Amazon Pinpoint Developer Guide.

3. (Optional) An event attribute is a specific piece of information used to refine an event. It's composed of an attribute name and a value. We'll narrow down the *artist.download* by adding an *artistName* attribute For **Attribute**, choose the attribute from the list. Because you want to add participants based on specific a specific artist, you'd choose *artistName* as the **Attribute**, and then choose a specific artist for the **Value** – for example, *Bruce Springsteen*. Your journey event now adds any participants from the *artist.download* event and the *artistName* is *Bruce Springsteen*.

   If you want to refine the journey even further, add additional attributes and values by choosing **Add new attribute** for each attribute that you want to add. If an attribute has multiple possible values, you must add each attribute and value pair separately. For *artist.download* event, you can now add in an additional *artistName* attribute, *Alicia Keys*. Choose **Add new attribute**, again choose *artistName* as the attribute, and then choose *Alicia Keys* for the **Value**. When you use the same attribute multiple times with different values, Amazon Pinpoint processes the journey attributes using "or" between the values. Your journey event now adds any participants from the *artist.download* event, and the *artistName* is either *Bruce Springsteen* or *Alicia Keys*.

   You can add a combination of attributes with multiple values in addition to attributes with only a single value.

4. (Optional) Choose an event **Metric**. This is an event that typically uses a range of numbers, such as a duration or a cost. After entering the event, choose an **Operator**:

   - **is equal to**
   - **is greater than**
   - **is less than**

- **is greater than or equal to**
- **is less than or equal to**

Enter the **Value** for the operator. Only numeric values are supported. Participants are added based on the metric, operator, and value. For the `artist.download` event you might add a `songLength` metric where you add participants when they download any song by either `Bruce Springsteen` or `Alicia Keys` and where the `songLength` is greater than or equal to `500 seconds`.

> **Note**
>
> You can't use the same metric with multiple values.

5. (Optional) Select the dynamic segment to use for the journey. You can have only one previously defined segment per journey entry. In addition, for any endpoint to enter into the journey, that endpoint must be part of the chosen segment. If you want to build a new segment for this journey, you can build that segment through the Amazon Pinpoint console. For more information about segments, see Building segments.

> **Note**
>
> Imported segments and dynamic segments based on an imported segment aren't supported. The dropdown list indicates the type of segment. While a segment displayed in the dropdown list might indicate that it's dynamic, if it's based on an imported segment, you will get an error.

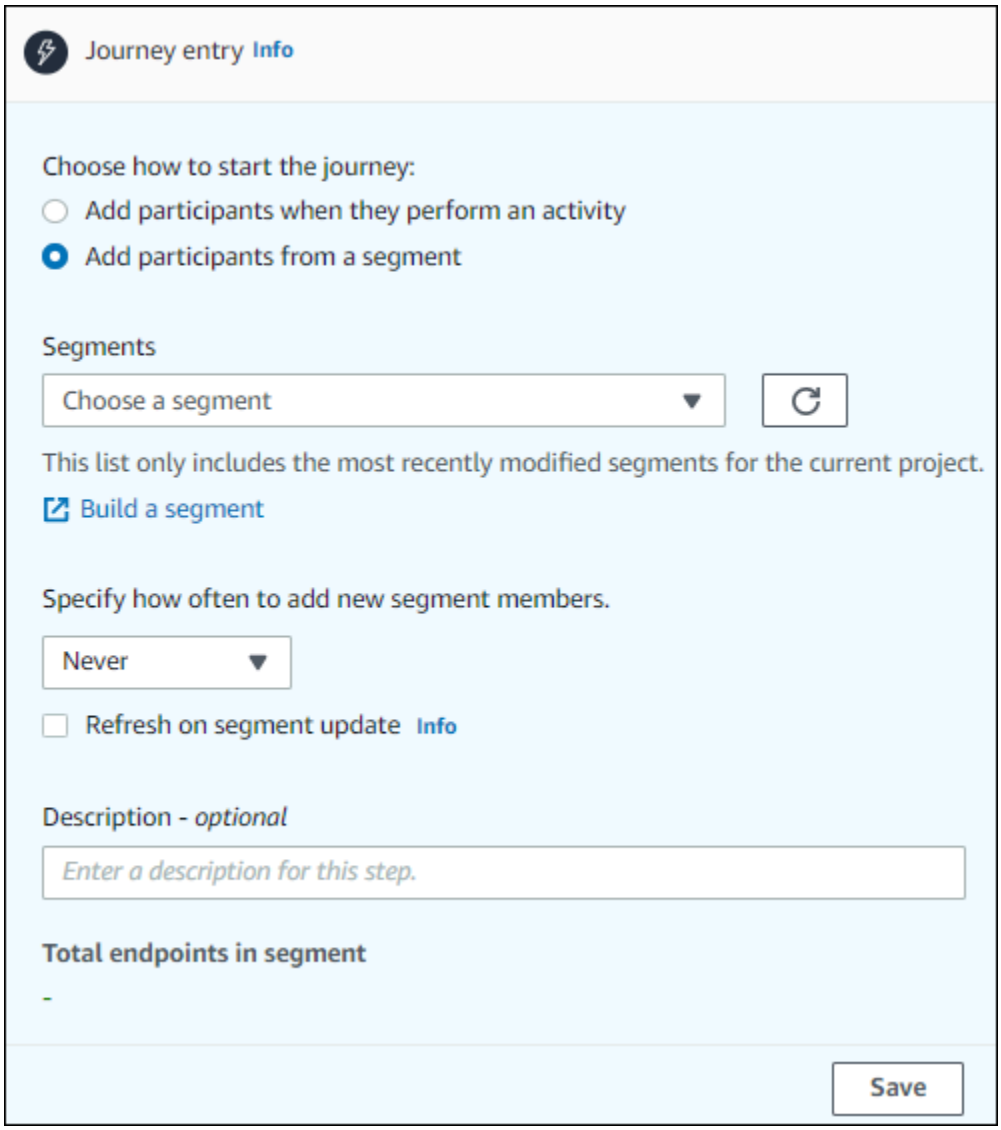
6. (Optional) For **Description**, enter text that describes the activity. When you save the activity, this text appears as its label.
7. Choose **Save**.

Add participants from a segment

For this type of journey, you choose a segment to participate in the journey. You can optionally configure the Journey entry activity to add new journey participants by periodically searching for new segment members.

To add participants from a segment

1. Choose **Add participants from a segment**.

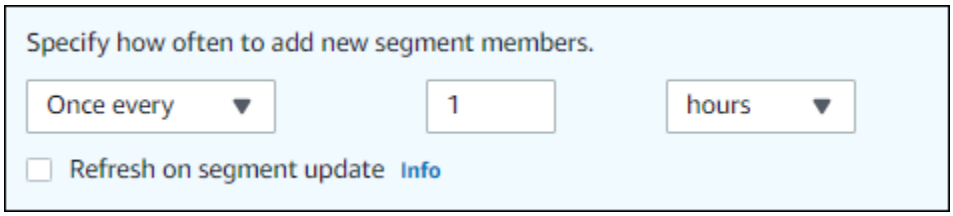


2. For **Segments**, choose the segment that you want to add to a journey.

> **Tip**
>
> You can include only one segment in the **Journey entry** activity. If you need to add more segments, you can create a new segment that includes all of the segments that you want to add to the journey. Then, later in the journey, you can use a multivariate split activity to divide journey participants into separate groups based on their segment membership.

3. (Optional) For **Specify how often to add new segment members**, choose how often the segment membership should be evaluated and refreshed. You can choose **Never**, or you can

choose to check on a schedule. For example, if you choose **Once every 12 hours**, Amazon Pinpoint checks for new segment members every 12 hours. If new segment members are found during one of these checks, they are added to the journey. Existing endpoints are also re-evaluated. If the **Maximum entries per interval** is greater than 1, then existing endpoints also re-enter the journey.



You can also optionally choose **Refresh on segment update**. If you enable this feature, new endpoints are added to the journey when the segment is updated. For this feature to work as expected, you must also choose a refresh interval.

The following table describes how changes to segment membership are handled in various situations.

Refresh interval	Status of Refresh on segment update option	Behavior
Set to **Never**	Not enabled	Only endpoints that were members of the original segment are processed. Any endpoints added before the journey starts are included. Endpoints that are added to or removed from the segment after the journey starts aren't processed.

Refresh interval	Status of Refresh on segment update option	Behavior
Set to **Never**	Enabled	If the journey is currently processing endpoints, any changes to the segment are evaluated. However, if the journey has finished processing endpoints, any endpoints that were added or removed after the journey started aren't included.

Refresh interval	Status of Refresh on segment update option	Behavior
Set to a period of time	Not enabled	Any endpoints that are added to a dynamic segment, or that are common across segment updates, are processed other journey limits allow it. Removed endpoints aren't processed by the journey. **Note** The journey re-evaluates the segment membership based on the segment criteria that were present when the journey was first launched. If you modify the criteria for the segment after launching a journey that uses this option, the journey will not consider the new criteria when re-evaluating the segment.

Refresh interval	Status of Refresh on segment update option	Behavior
Set to a period of time	Enabled	Changes to both dynamic and imported segments are evaluated and updated based on the refresh interval. Changes are also evaluated when segments are changed. Any segment endpoints that are added, or that are common across segment updates, are processed if allowed by other journey limits. Removed endpoints aren't processed by the journey.

4. (Optional) For **Description**, enter text that describes the activity. When you save the activity, this text appears as its label.
5. Choose **Save**. When you finish setting up the journey entry activity, you can begin to add other activities to the journey.

Next: Add activities to the journey

Add activities to the journey

Activities are the most important parts of any journey. Activities represent the steps that are applied to journey participants. You can use activities to send messages to journey participants across a variety of channels, or to split them into smaller groups, or to wait for a period of time. There are several different types of activities that you can add to a journey. This section provides basic information about adding activities to a journey. For detailed information about setting up each type of activity, see Setting up journey activities.

> **Note**
>
> An exit journey element is added to the journey flow after reviewing and publishing your journey.

Setting up journey activities

Each type of journey activity has separate components that you must configure. The following sections provide additional information about setting up each type of activity.

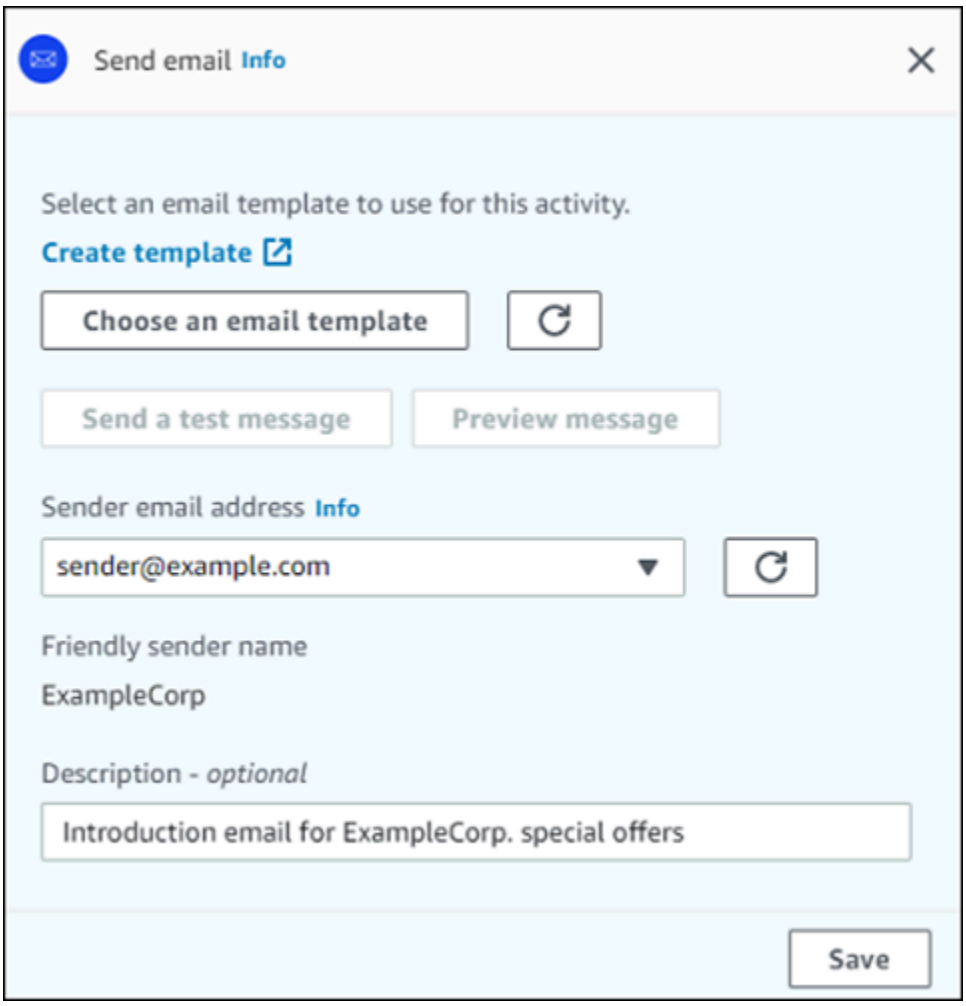
Topics in this section:

- Set up an email activity
- Set up a push notification activity
- Set up an SMS message activity
- Set up a contact center activity
- Set up a custom message channel activity
- Set up a wait activity
- Set up a yes/no split activity
- Set up a multivariate split activity
- Set up a holdout activity
- Set up a random split activity

Set up an email activity

When a journey participant arrives on a **Send email** activity, Amazon Pinpoint sends them an email immediately. Before you can configure an email activity, you must create an email template. For more information about creating email templates, see Creating email templates.

To set up an email activity



1. Choose **Add activity**.
2. For **Add an activity**, choose **Send an email**.
3. Under **Select an email template to use for this activity**, select **Choose an email template**, and then choose the email template for the message that you want participants to receive. Then, under **Template version behavior**, specify whether you want Amazon Pinpoint to automatically update the message to include any changes that you might make to the template before the message is sent. To learn more about these options, see Managing versions of message templates.

> **Tip**
>
> You can send yourself a preview of the message, even if your Amazon Pinpoint account doesn't contain an endpoint record for your email address. To send a preview, choose **Send a test message**.

4. For **Sender email address**, choose the email address that you want to send the message from. This list contains all the verified email addresses for your Amazon Pinpoint account in the current AWS Region. For information about verifying additional email addresses or domains, see Verifying email identities.

> **Tip**
>
> To display a friendly sender name for the message, choose the default email address for the project. A *friendly sender name* is the name that appears in participants' email clients when they receive the message. To change the default email address for the project or the friendly sender name for that address, update the project's settings for the email channel. To do this, choose **Settings** in the left navigation pane, and then choose **Email**. Then, enter the settings that you want.

5. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.
6. When you finish, choose **Save**.

Set up a push notification activity

When a journey participant arrives on a **Send a push notification** activity, Amazon Pinpoint sends them a push notification immediately. Before you can configure a push notification activity, you must create a push notification template. For more information about creating push notification templates, see Creating push notification templates.

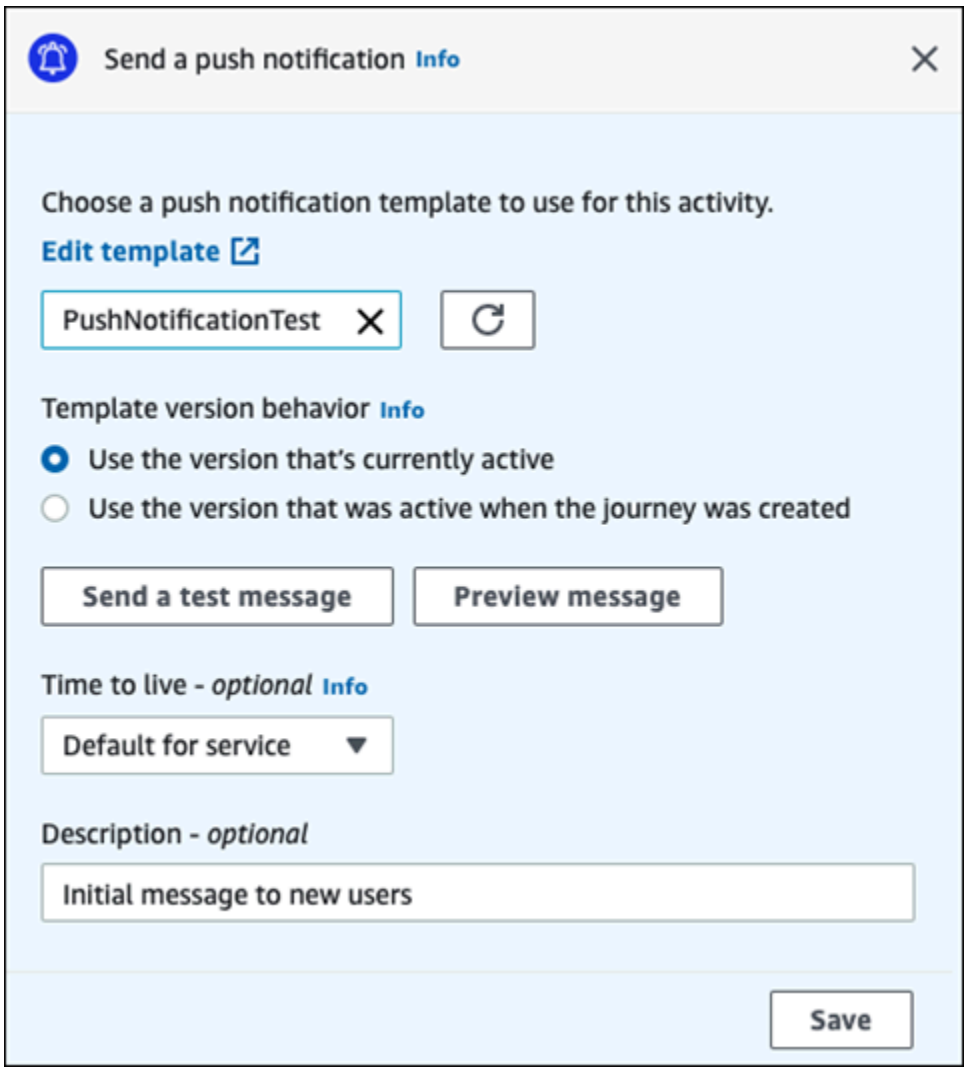
> **Note**
>
> To send push notifications to journey participants, your app must be integrated with an AWS SDK. For more information, see Handling Push Notifications in the *Amazon Pinpoint Developer Guide*.

To set up a push notification activity

1. Choose **Add activity**.
2. For **Add an activity**, choose **Send a push notification**.
3. Under **Choose a push notification template for this activity**, select **Choose a push notification template**, and then choose the push notification template for the message that you want participants to receive. Then, under **Template version behavior**, specify whether you want Amazon Pinpoint to use the template version that is currently designated as active or the template version that was active when the journey was created. To learn more about these options, see Managing versions of message templates.

   > **Tip**
   >
   > You can send yourself a preview of the message, even if your Amazon Pinpoint account doesn't contain an endpoint ID or device token that you specify. To send a preview, choose **Send a test message**.

4. (Optional) For **Time to live**, specify whether you want Amazon Pinpoint to use the default time to live (TTL) value or a custom value for each push notification service. By default, Amazon Pinpoint uses the maximum TTL value of each respective push notification service. You can also specify a custom TTL value for all push notification services. If the message delivery fails, the push notification service attempts to deliver the message for the amount of time that you specify in this setting. For information about specific time to live values, see Messages in the *Amazon Pinpoint API Reference*.
5. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.
6. When you finish, choose **Save**.



Set up an SMS message activity

When a journey participant arrives on a **Send an SMS message** activity, Amazon Pinpoint sends them an SMS message immediately. Before you can configure an SMS activity, you must create an SMS template. For more information about creating SMS templates, see Creating SMS templates.

To set up an SMS message activity

1. Choose **Add activity**.
2. For **Add an activity**, choose **Send an SMS message**.
3. Under **Choose an SMS message template for this activity**, select **Choose an SMS message template**, and then choose the SMS message template for the message that you want participants to receive. Then, under **Template version behavior**, specify whether you want

Amazon Pinpoint to use the template version that's currently designated as active or the template version that was active when the journey was created. To learn more about these options, see Managing versions of message templates.

4. Choose **Send a test message** if you want to first test this activity. Test messages don't count against your daily sending limits, but you are charged for each message. When sending a test message, you're prompted to optionally choose the origination number but required to choose a destination number.

> **Note**
>
> If your account is in the SMS sandbox, you can only send a test message to one of your verified destination numbers. If the destination number doesn't appear in the list, choose **Manage numbers** to add that new number. For more information about verifying destination numbers, see SMS sandbox in the *AWS End User Messaging SMS User Guide*.

5. For **Message type**, choose one of the following:

   - **Promotional** – Non-critical messages, such as marketing messages.
   - **Transactional** – Critical messages that support customer transactions, such as one-time passwords for multi-factor authentication.

6. (Optional) If necessary, expand the **Additional settings** section to configure optional SMS-related settings. The **Additional settings** section contains two tabs:

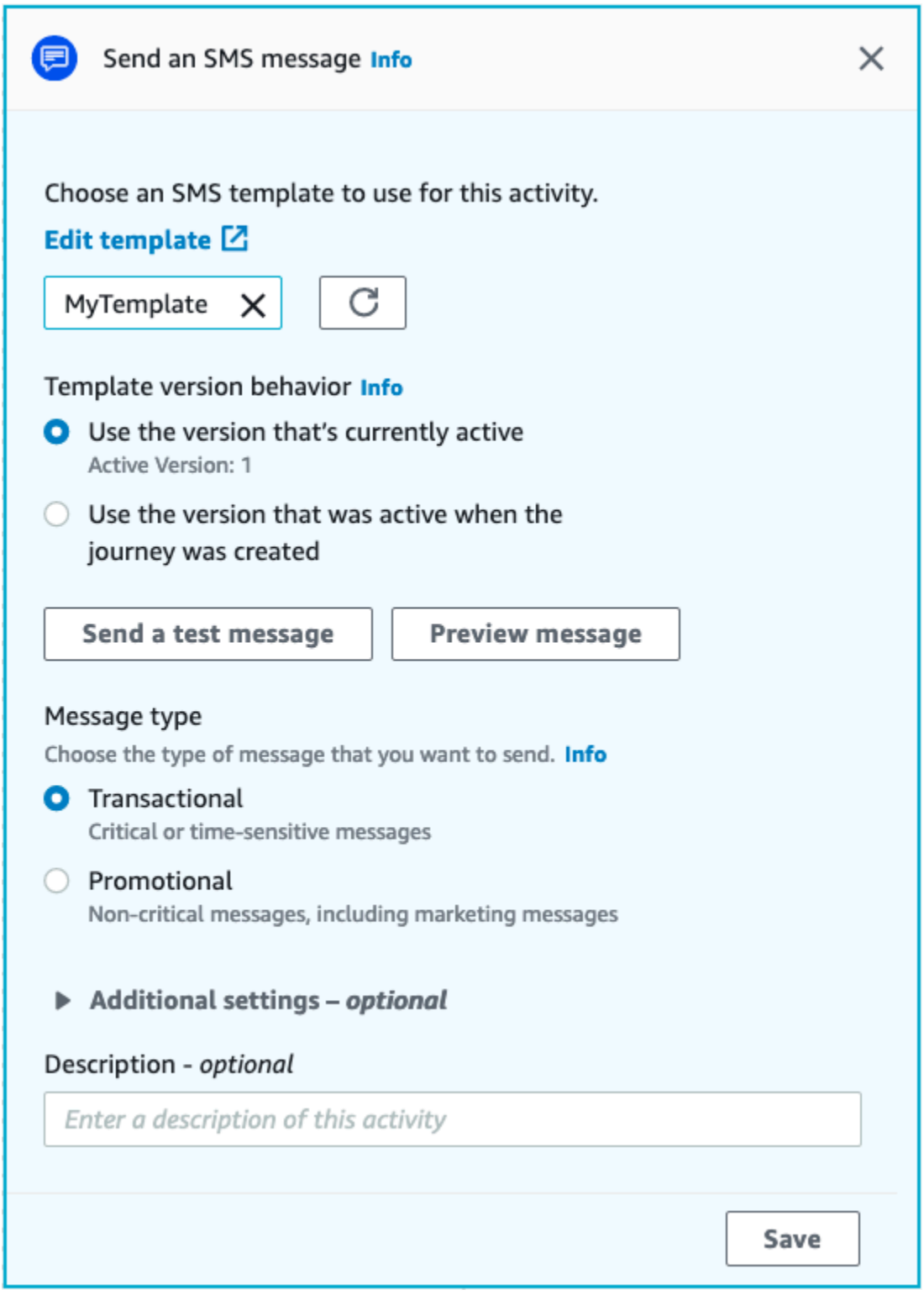
   - On the **SMS Settings** tab you can configure the following settings:
     - **Origination phone number** – The phone number that messages will be sent from. This list contains all of the dedicated phone numbers that are present in your Amazon Pinpoint account.
     - **Sender ID** – An alphanumeric ID that identifies the sender of the SMS message. The Sender ID appears on your recipients' devices only if the recipient is in a country where Sender IDs are supported. If you specify a Sender ID in a journey activity, it overrides the default value for your account. To learn more about which countries support Sender IDs, see Supported countries and regions (SMS channel) in the *AWS End User Messaging SMS User Guide*.

> **Note**
>
> You only need to set one of these values. If you specify both values, Amazon Pinpoint attempts to send the message using the dedicated origination phone number.

- On the **Regulatory Settings** tab, you can configure settings that apply specifically to sending messages to recipients in India. If you send messages to recipients in India, you must specify a Sender ID and both of the following values:
  - **Entity ID** – The ID that's associated with your company or brand, provided by TRAI during the Sender ID registration process.
  - **Template ID** – The ID that's associated with your message template. This value is also provided by TRAI during the Sender ID registration process.

> **Note**
>
> If you don't send messages to recipients in India, or if you send messages to India using International Long-Distance Operator routes, you don't need to specify the **Entity ID** and **Template ID** values.
> For more information about the regulatory requirements for sending SMS messages to India, see India sender ID registration process in the *AWS End User Messaging SMS User Guide*.

7. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.
8. When you finish, choose **Save**.


Send an SMS message Info
Choose an SMS template to use for this activity.
Edit template
MyTemplate
Template version behavior Info
Use the version that's currently active
Active Version: 1
Use the version that was active when the journey was created
Send a test message
Preview message
Message type
Choose the type of message that you want to send. Info
Transactional
Critical or time-sensitive messages
Promotional
Non-critical messages, including marketing messages
Additional settings – optional
Description - optional
Enter a description of this activity
Save

Set up a contact center activity

When a journey participant arrives on a **Send through a contact center** activity, Amazon Pinpoint places them into an Connect Customer outbound campaigns (referred to in Amazon Pinpoint as an *Connect Customer campaign*). You can configure this activity type to dial the journey participant's phone number and either connect them to an agent, or play a voice message.

Contact center activities behave differently when compared to other types of journey activities. When a journey participant arrives on a **Send through a contact center** activity, all of the preceding activities between the contact center activity and previous messaging activity that involve a **Multivariate split** or **Yes/no split** activities are reevaluated immediately before the participant's phone number is entered into the Connect Customer queue to be dialed. If there is no messaging activity before the contact center activity, then the journey entry criteria is also reevaluated.

The purpose of this reevaluation process is to make sure that the journey participant still qualifies to receive a phone call at the moment the phone call is queued. This behavior is useful because the participant's attributes could change between the time when they arrive on the contact center activity and the time when an agent becomes available to call them. This is the default behavior and can't be turned off.

The journey reevaluation stores the evaluation result of the participant to be dialed with a 10 second timer. A participant will be reevaluated once every 10 seconds and the results stored until the next reevaluation. This means that if the time between an update and dial is less than 10 seconds, an evaluation may not occur with the latest version of the participant.

For example, assume that a journey contains an entry step that adds members of a specific segment into the journey, and a **Yes/no split** activity that checks to see if the journey participant has completed a specific type of transaction. In this scenario, the "yes" branch of the yes/no split (for participants who complete the transaction) sends a follow-up email, while the "no" branch (for participants who didn't complete the transaction) leads to a contact center activity. Participants who arrive on the contact center activity remain there until the call is queued successfully to Connect Customer. When an agent becomes available, the journey reevaluates the participant's attributes against the criteria in the journey entry step and the yes/no split activity.

> **Important**
>
> Contact Center activities are not supported in event triggered journeys.

Prerequisites

Before you can add a contact center activity to a journey, you must do the following:

- Create an Connect Customer account and instance.
- Use Amazon AppIntegrations to enable high-volume outbound campaigns for your Connect Customer instance.
- Enable your Connect Customer instance for outbound calling.
- Create a dedicated outbound communications queue to handle any contacts that will be routed to agents because of the campaign. The queue must be assigned to the agent's routing profile.
- Create and publish a contact flow that includes a **Check call progress** block. This block enables you to branch based on whether a person answered the phone, for example, or a voice mail was detected.
- Make sure that the Connect Customer queue you plan to use has an outbound number defined in the queue.
- In IAM, create a policy and role that allow Connect Customer to send messages through Amazon Pinpoint.

> **Note**
>
> The **ResourceID** roles specified for **ConnectCampaignExecutionRoleArn** support IAM service-roles and service-linked-roles. For more information, see IAM identifiers in the *AWS Identity and Access Management User Guide*.

> **Important**
>
> Deletions or misconfiguration of IAM roles and resource access policies for published journeys can cause Amazon Pinpoint to halt outbound dials until the IAM configuration is reinstated with the original set of roles, access policies, and permissions.

You can find procedures for completing these tasks in steps 1–5 of Make predictive and progressive calls using Connect Customer outbound on the AWS Contact Center blog.

Setting up a contact center activity

You can connect your journey to an existing Connect Customer outbound campaign, or click to build an Connect Customer outbound campaign.

Note the following considerations when using contact center activities in Amazon Pinpoint:

- You can only use three contact center activities in a Journey.
- You can only use one Connect Customer campaign per journey. If a journey contains multiple contact center activities, and you change the Connect Customer campaign for one activity, the change is reflected in all other contact center activities in the same journey.
- You can use a single Connect Customer campaign in multiple journeys. Amazon Pinpoint shows a warning if the Connect Customer campaign is already in use when you publish the journey.
- Your phone numbers of your customers must exist in Amazon Pinpoint as voice endpoints.
- Endpoint phone numbers must be in E.164 format. For more information, see E.164: The international public telecommunication numbering plan on the International Telecommunications Union website.

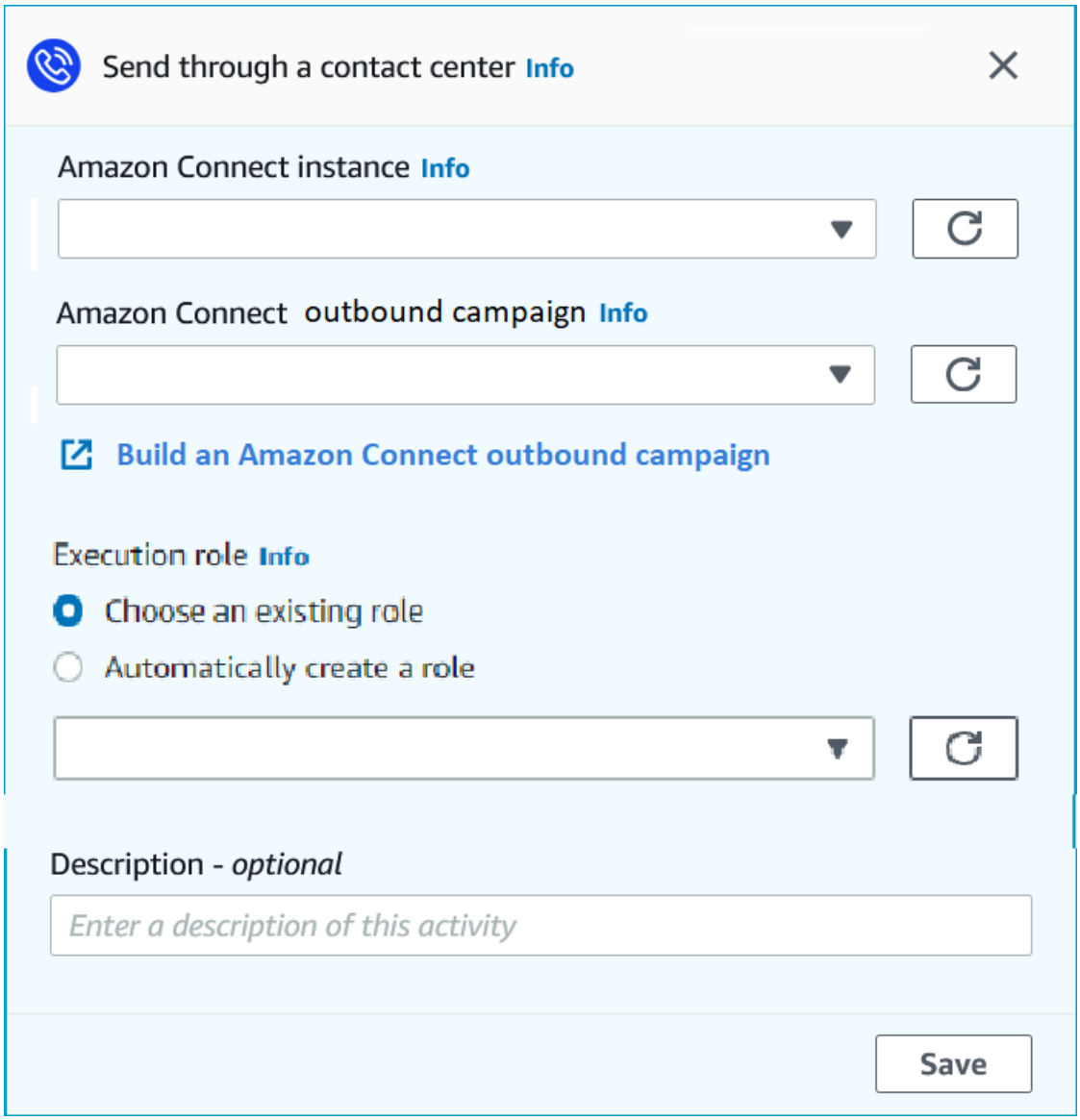
Using an existing Connect Customer campaign

1. Choose **Add activity**.
2. For **Add an activity**, choose **Send through a contact center**.
3. Choose the **Connect Customer instance** that you want to use.
4. Choose the **Connect Customer outbound campaign** from the dropdown list.
5. (Optional) You can choose **Build an Connect Customer outbound campaign**, which directs you to Connect Customer.
6. For **IAM role**, complete one of the following steps:

    a. If you want to have Amazon Pinpoint create a role that allows it to pass phone numbers to Connect Customer, select **Automatically create a role**. Then, for IAM role, enter a unique name for the new role that you're creating.

    b. If you've already created an IAM role that allows Amazon Pinpoint to pass phone numbers to Connect Customer, select **Choose an existing role**. Then, for IAM role, select a role that contains the appropriate permissions.
7. (Optional) In **Description**, describe the purpose of the activity. When you save the activity, this text appears as the activity's label.

8. When you finish, choose **Save**.



Set up a custom message channel activity

When a journey participant arrives on a **Send through a custom channel** activity, Amazon Pinpoint sends information about the participant to an AWS Lambda function or webhook. You can use a custom channel to send messages to your customers through any service that has an API, including non-AWS services.

Before you can configure a custom channel activity, you must decide whether to use a Lambda function or a webhook URL to send your message. For more information about creating custom

message channels, see Creating custom channels in Amazon Pinpoint in the *Amazon Pinpoint Developer Guide*.

To set up a custom message channel activity that calls a Lambda function

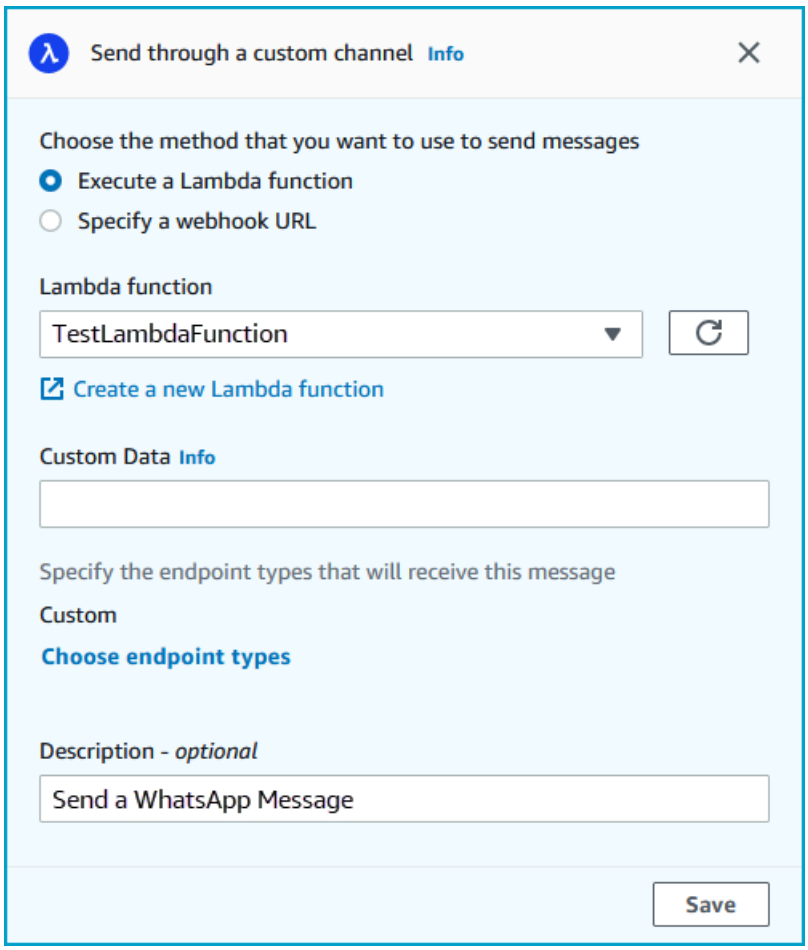
1. Choose **Add activity**.
2. For **Add an activity**, choose **Send through a custom channel**.
3. For **Choose the method that you want to use to send messages**, select **Execute a Lambda function**.
4. For **Lambda function**, choose the function that you want to execute.
5. (Optional) The **Custom Data** is for when endpoints are delivered to the custom channel, the custom data is in the payload as well. This field can contain up to 5,000 alphanumeric characters.
6. For **Specify the endpoint types that will receive this message**, select the endpoint types that the custom channel applies to. By default, only the **Custom** endpoint type is selected. To add additional endpoint types, select **Choose endpoint types**.

    a. The Lambda function can be used to evaluate which endpoints to include in the segment. For more information, see Customizing segments with AWS Lambda.

    b. The **Custom Data** is for when endpoints are delivered to the custom channel, the custom data is in the payload as well.

    > **Note**
    >
    > Other endpoint types that arrive at this activity are sent through it, but only the endpoint types that you specify are sent to the Lambda function or webhook.

7. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.
8. When you finish, choose **Save**.



To set up a custom message channel activity that uses a webhook URL

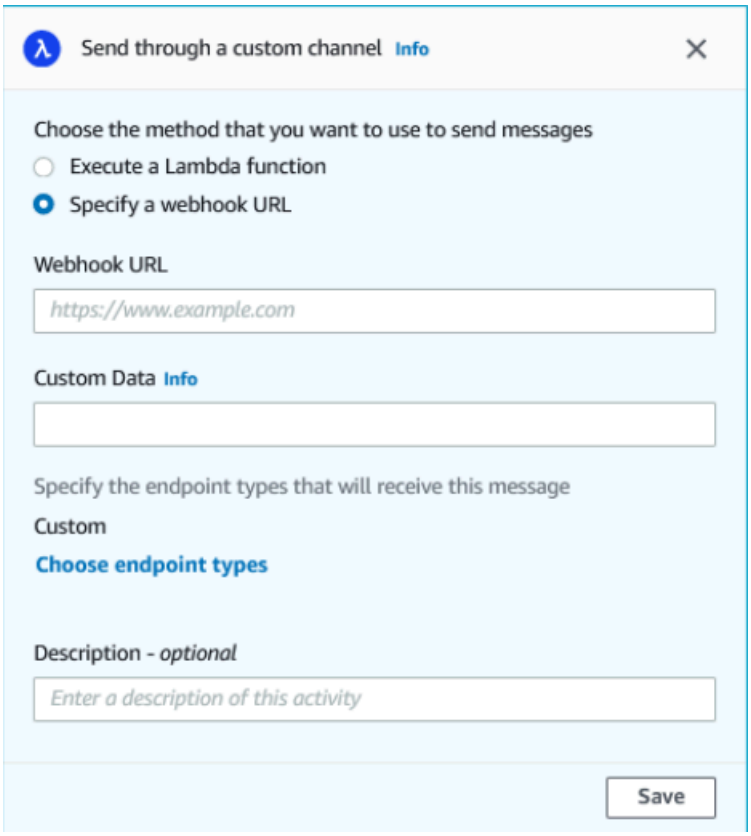
1. Choose **Add activity**.
2. For **Add an activity**, choose **Send through a custom channel**.
3. For **Choose the method that you want to use to send messages**, select **Specify a webhook URL**.
4. For **Webhook URL**, enter the address of the webhook that you want to execute. For more information about configuring webhooks, see Creating custom channels in Amazon Pinpoint in the *Amazon Pinpoint Developer Guide*.
5. (Optional) The Custom Data is for when endpoints are delivered to the custom channel, the custom data is in the payload as well. This field can contain up to 5,000 alphanumeric characters.

6. For **Specify the endpoint types that will receive this message**, select the endpoint types that the custom channel applies to. By default, only the **Custom** endpoint type is selected. To add additional endpoint types, select **Choose endpoint types**.

   > **Note**
   >
   > Other endpoint types that arrive at this activity are sent through it, but only the endpoint types that you specify are sent to the Lambda function or webhook.

7. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.

8. When you finish, choose **Save**.



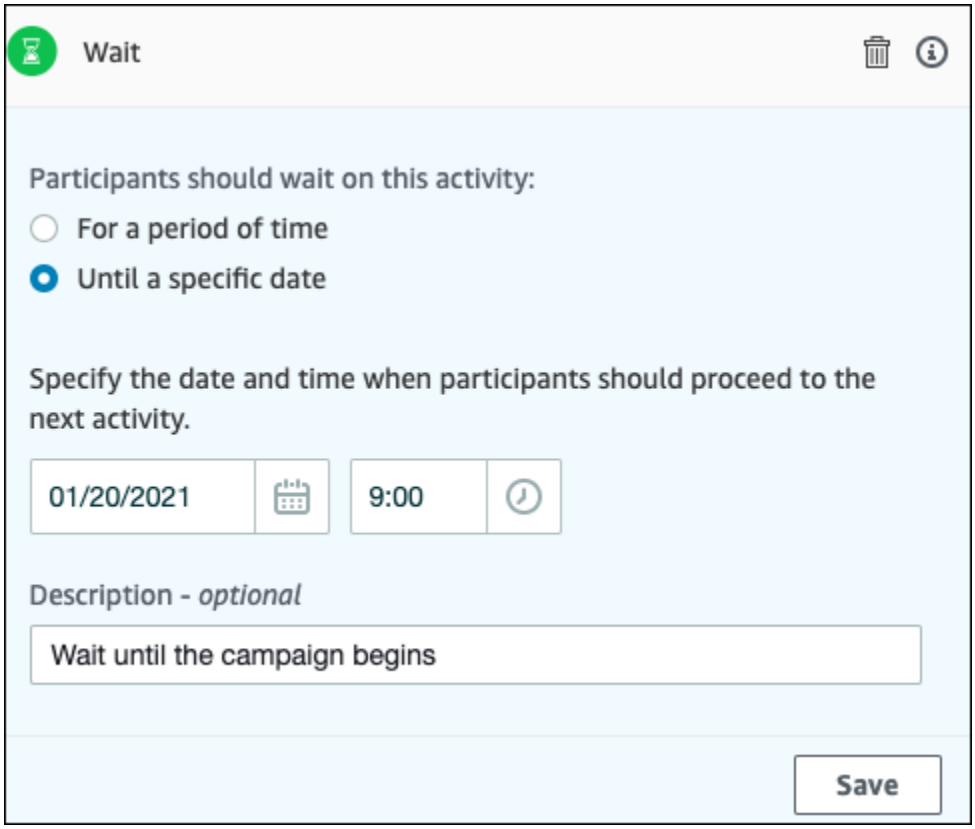
Set up a wait activity

When a journey participant arrives on a **Wait** activity, they remain on that activity for a certain period of time or until a specific date and time. This type of activity is a useful way to schedule the sending of time-sensitive communications, or to give customers time to interact with messages that you sent earlier in the journey.

To set up a wait activity

1. Choose **Add activity**.
2. For **Add an activity**, choose **Wait**.
3. Choose one of the following options:

   - **For a period of time** – Choose this option if you want journey participants to remain on this activity for a certain amount of time. Then, enter the amount of time that you want journey participants to wait on this activity before they proceed to the next activity. You can specify a value that's as short as 1 hour or as long as 365 days.
   - **Until a specific date** – Choose this option if you want journey participants to remain on this activity until a specific date and time. Then, enter the date and time when journey participants should move to the next activity. You can choose any date and time that precedes the end date of the journey.
4. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.
5. When you finish, choose **Save**.



Set up a yes/no split activity

When journey participants arrive on a **yes/no split** activity, they're sent down one of two paths based on their attributes or behaviors. You can use this type of split activity to send journey participants down separate paths based on their membership in a segment. You can also send participants down separate paths based on their interactions with other journey activities. For example, you can divide journey participants based on whether they opened an email that was sent earlier in the journey.

> **Note**
>
> To create split activities that send participants down different paths based on push notification events (such as Open or Received events), your mobile app has to specify the User ID and Endpoint ID values. For more information, see Integrating Amazon Pinpoint with your application in the *Amazon Pinpoint Developer Guide*.
> If the Journey segment is at the user-level, with user_id in the data and the criteria used for evaluating a conditional split is an endpoint attribute, Amazon Pinpoint processes the journey attributes using a logical OR between the attribute values for the different endpoints of the user. For example, if a single user has multiple endpoints, and if any of these endpoints had the criteria satisfied, all endpoints linked to that user would be grouped together and evaluated as a 'Yes', and would go down the 'Yes' branch of a Yes/No split activity.

To set up a yes/no split activity

1. Choose **Add activity**.
2. For **Add an activity**, choose **Yes/no split**.
3. For **Select a condition type**, choose one of the following options:

   - **Segment** – Choose this option to send all members of the chosen segment down the "Yes" path. Then, for **Segments**, choose a segment.
   - **Event** – Choose this option to send users down the "Yes" path based on their interactions with a previous step in this journey. Then, complete the following steps:

     1. For **Events**, select the messaging activity you want to split on:

2. For **Choose an activity**, choose the message activity that the split should be applied to. Depending on the channel type of messaging activity you select you will have the following options on split on:

   - For **Email** here are the events you can select.
     - **Send** – Amazon Pinpoint accepted the message and will attempt to deliver it.
     - **Delivered** – The message was successfully delivered to the recipient.
     - **Rejected** – Amazon Pinpoint rejected the message because it contained a virus or malware.
     - **Hard bounce** – The email wasn't delivered to the recipient because of a permanent issue. For example, the recipient's email address might not exist anymore. When a message generates a hard bounce, Amazon Pinpoint doesn't attempt to re-deliver it.
     - **Soft bounce** – The email wasn't delivered to the recipient because of a temporary issue. For example, the recipient's inbox could be full, or their email provider might be experiencing a temporary issue. When a soft bounce occurs, Amazon Pinpoint attempts to re-deliver the message for a certain period of time. If the message still can't be delivered, the message becomes a hard bounce.
     - **Complaint** – The recipient received the email, but used the "Report spam" or similar button in their email client to report the message as unwanted.

       > **Note**
       >
       > Amazon Pinpoint relies on complaint reports from email providers to generate complaint events. Some email providers give us these reports on a regular basis, while others send them infrequently.

     - **Open** – The recipient received the email and opened it.

       > **Note**
       >
       > For Amazon Pinpoint to capture an **Email open** event, the recipient's email client has to download the images contained in the message. Many common email clients, such as Microsoft Outlook, don't download email images by default.

     - **Click** – The recipient received the email and followed one of the links contained in the body of the message.

  - **Unsubscribe** – The recipient received the email and used the "Unsubscribe" link to opt out of future messages.
- For **SMS**, here are the events you can select.
  - **Send** – Amazon Pinpoint attempted to send the message.
  - **Delivered** – Amazon Pinpoint received a confirmation that the message was delivered.
  - **Failed** – An error occurred when delivering the message to the endpoint address.
  - **Opt-out** – The user who's associated with the endpoint address has opted out of receiving messages from you.
- For **Push**, here are the events you can select.
  - **Send** – Amazon Pinpoint attempted to send the message.
  - **Opened notification** – Amazon Pinpoint received a confirmation that the message was opened by the user.
  - **Received foreground** – Amazon Pinpoint received a confirmation that the message was received by the users device and displayed in the foreground.
  - **Received background** – Amazon Pinpoint received a confirmation that the message was received by the users device and displayed in the background.
- For **Contact Center**, here are the events you can select.
  - **Connected** – Amazon Pinpoint received a confirmation that the call was connected to an agent.
  - **SIT tone** – Amazon Pinpoint received a response that the call gave back a busy tone.
  - **Fax** – Amazon Pinpoint received a response that the call gave back a fax tone.
  - **Voicemail beep** – Amazon Pinpoint received a response that the call gave back a voicemail with beep.
  - **Voicemail no beep** – Amazon Pinpoint received a response that the call gave back a voicemail without beep.
  - **Not answered** – Amazon Pinpoint received a response that the call was not answered and rang out without a voicemail.
- **Custom channel** – For the custom channel activity you can define the response attribute and value you would like to split on. Make sure that this attribute and value is passed back to Amazon Pinpoint journeys in a way that can be read. For more information about how this response should be structured, see Creating custom channels in Amazon Pinpoint in the Amazon Pinpoint Developer Guide.

3. **Note**

   (Optional) For custom channel activities you can split based on the **Call to a function or webhook response**. To configure this, can you define:

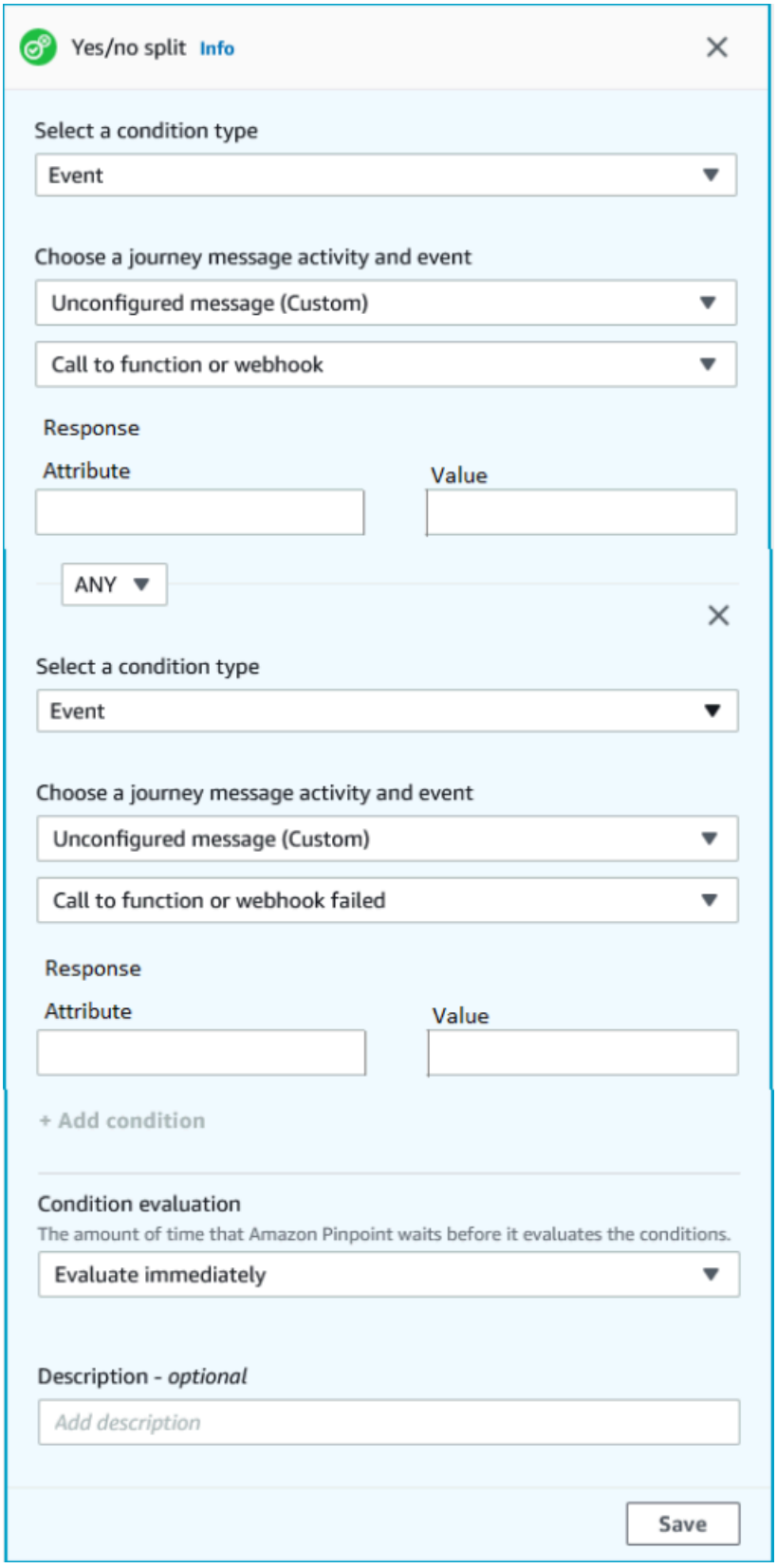
   - **Attribute** – The name of the attribute to evaluate.
   - **Value** – The value used to determine in which way to split.

4. For **Condition evaluation**, choose when Amazon Pinpoint should evaluate the condition. You can choose from the following options:

   - **Evaluate immediately** – If you choose this option, Amazon Pinpoint checks to see if the event condition that you specified has been met the moment when the journey participant arrives on the activity.
   - **Evaluate after** – If you choose this option, Amazon Pinpoint waits for a specified period of time. After the specified period of time has elapsed, Amazon Pinpoint checks to see if the event condition that you specified has been met.
   - **Evaluate on** – If you choose this option, Amazon Pinpoint waits until a specific date and time. When that date and time arrives, Amazon Pinpoint checks to see if the event condition that you specified has been met.

5. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.

6. When you finish, choose **Save**.


Yes/no split Info
Select a condition type
Event
Choose a journey message activity and event
Unconfigured message (Custom)
Call to function or webhook
Response
Attribute
Value
ANY
Select a condition type
Event
Choose a journey message activity and event
Unconfigured message (Custom)
Call to function or webhook failed
Response
Attribute
Value
+ Add condition
Condition evaluation
The amount of time that Amazon Pinpoint waits before it evaluates the conditions.
Evaluate immediately
Description - optional
Add description
Save

Set up a multivariate split activity

When journey participants arrive on a **Multivariate split** activity, they're sent down one of several paths based on their attributes or behaviors. This type of split is similar to a yes/no split. The advantage of using a multivariate split activity is that it can evaluate more than one condition. Additionally, every multivariate split activity contains an "Else" path. Journey participants who don't meet any of the conditions that you specified in other paths are automatically sent down the "Else" path.

You can use this type of split to send journey participants down separate paths based on their membership in a segment. You can also send participants down separate paths based on their interactions with other journey activities. For example, you can divide journey participants based on whether they opened an email that was sent earlier in the journey.

> **Note**
>
> If a journey participant meets more than one condition in a conditional split, they are sent down the first condition that they meet, in alphabetical order. For example, if a participant meets the conditions in Branch A and Branch D, they're sent down the path that corresponds with Branch A.
>
> To create split activities that send participants down different paths based on push notification events (such as Open or Received events), your mobile app has to specify the User ID and Endpoint ID values. For more information, see Integrating Amazon Pinpoint with your application in the *Amazon Pinpoint Developer Guide*.
>
> If the Journey segment is at the user-level, with user_id in the data and the criteria used for evaluating a conditional split is an endpoint attribute, Amazon Pinpoint processes the journey attributes using a logical OR between the attribute values for the different endpoints of the user. For example, if a single user has multiple endpoints, and if any of these endpoints had the criteria satisfied, all endpoints linked to that user would be grouped together and evaluated as a 'Yes', and would go down the 'Yes' branch of a Yes/No split activity.

To set up a multivariate split activity

1. Choose **Add activity**.
2. For **Add an activity**, choose **Multivariate split**.

3. Determine how many different paths (branches) you want to create. Choose **Add another branch** to create additional paths.
4. On each branch, for **Select a condition type**, choose one of the following options:

   - **Segment** – Choose this option to send all members of the chosen segment down the path. Then, for **Segments**, choose a segment.
   - **Event** – Choose this option to send users down the path based on their interactions with a previous step in this journey. Then, complete the following steps:

     1. For **Events**, select the messaging activity you would like to split on.
     2. For **Choose an activity**, choose the message activity that the split should be applied to. Depending on the channel type of messaging activity you select you will have the following options on split on:

        - For **Email**, here are the events you can select.
          - **Send** – Amazon Pinpoint accepted the message and will attempt to deliver it.
          - **Delivered** – The message was successfully delivered to the recipient.
          - **Rejected** – Amazon Pinpoint rejected the message because it contained a virus or malware.
          - **Hard bounce** – The email wasn't delivered to the recipient because of a permanent issue. For example, the recipient's email address might not exist anymore. When a message generates a hard bounce, Amazon Pinpoint doesn't attempt to re-deliver it.
          - **Soft bounce** – The email wasn't delivered to the recipient because of a temporary issue. For example, the recipient's inbox could be full, or their email provider might be experiencing a temporary issue. When a soft bounce occurs, Amazon Pinpoint attempts to re-deliver the message for a certain period of time. If the message still can't be delivered, the message becomes a hard bounce.
          - **Complaint** – The recipient received the email, but used the "Report spam" or similar button in their email client to report the message as unwanted.

            > **Note**
            >
            > Amazon Pinpoint relies on complaint reports from email providers to generate complaint events. Some email providers give us these reports on a regular basis, while others send them infrequently.

          - **Open** – The recipient received the email and opened it.

> **Note**
>
> For Amazon Pinpoint to capture an **Email open** event, the recipient's email client has to download the images contained in the message. Many common email clients, such as Microsoft Outlook, don't download email images by default.

  - **Click** – The recipient received the email and followed one of the links contained in the body of the message.
  - **Unsubscribe** – The recipient received the email and used the "Unsubscribe" link to opt out of future messages.
- For **SMS**, here are the events you can select.
  - **Send** – Amazon Pinpoint attempted to send the message.
  - **Delivered** – Amazon Pinpoint received a confirmation that the message was delivered.
  - **Failed** – An error occurred when delivering the message to the endpoint address.
  - **Opt-out** – The user who's associated with the endpoint address has opted out of receiving messages from you.
- For **Push**, here are the events you can select.
  - **Send** – Amazon Pinpoint attempted to send the message.
  - **Opened notification** – Amazon Pinpoint received a confirmation that the message was opened by the user.
  - **Received foreground** – Amazon Pinpoint received a confirmation that the message was received by the users device and displayed in the foreground.
  - **Received background** – Amazon Pinpoint received a confirmation that the message was received by the users device and displayed in the background.
- For **Contact Center**, here are the events you can select.
  - **Connected** – Amazon Pinpoint received a confirmation that the call was connected to an agent.
  - **SIT tone** – Amazon Pinpoint received a response that the call gave back a busy tone.
  - **Fax** – Amazon Pinpoint received a response that the call gave back a fax tone.
  - **Voicemail beep** – Amazon Pinpoint received a response that the call gave back a voicemail with beep.

- **Voicemail no beep** – Amazon Pinpoint received a response that the call gave back a voicemail without beep.
- **Not answered** – Amazon Pinpoint received a response that the call was not answered and rang out without a voicemail.

- **Custom channel** – For the custom channel activity you can define the response attribute and value you would like to split on. Make sure that this attribute and value is passed back to Amazon Pinpoint journeys in a way that can be read. For more information about how this response should be structured, see Creating custom channels in Amazon Pinpoint in the Amazon Pinpoint Developer Guide.

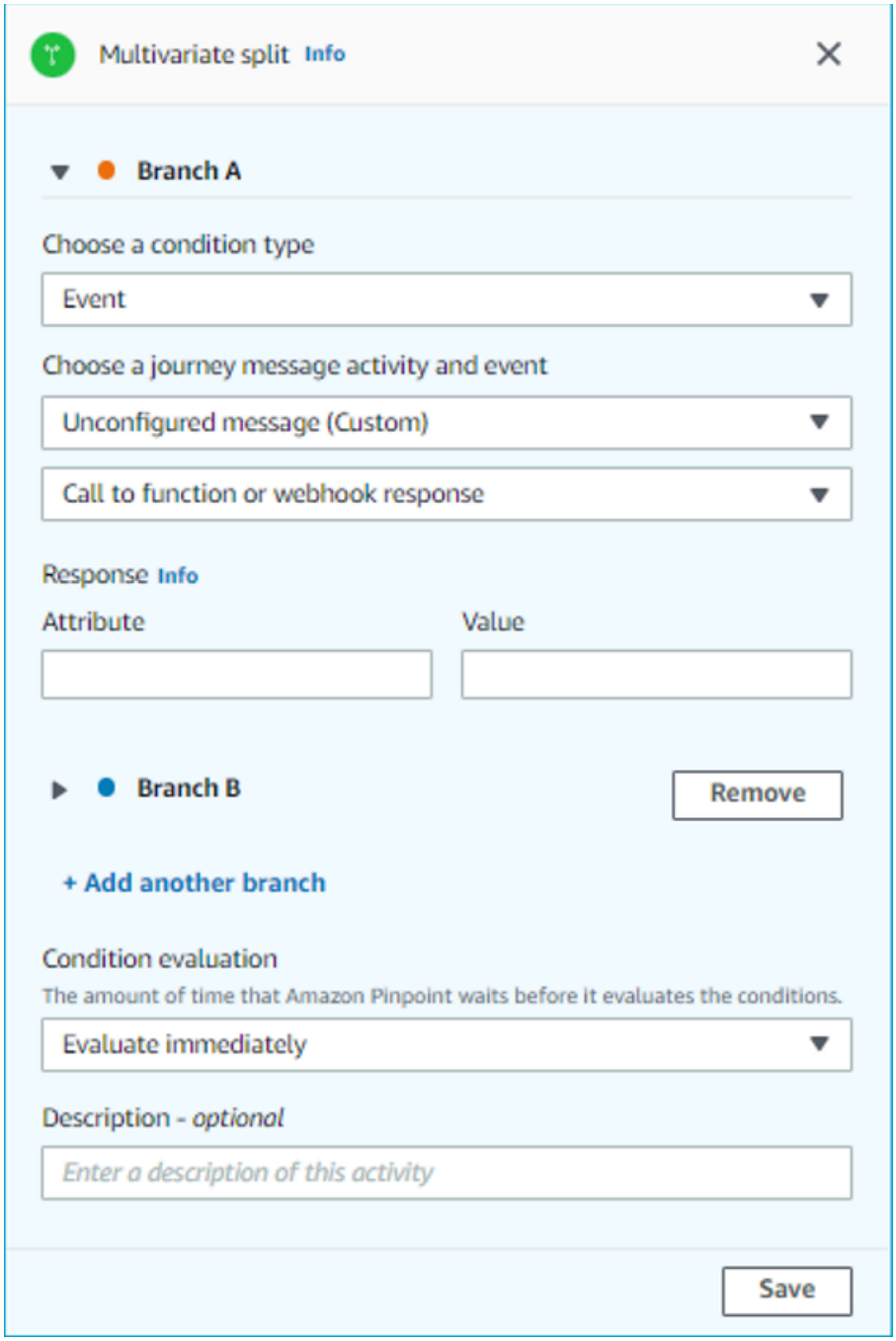
3. For **Choose a journey message activity and event** choose Call to a function or webhook response.
   - **Attribute** – The name of the attribute to evaluate.
   - **Value** – The value used to determine which branch to traverse for the path.

   Repeat this step for each path in the activity.

5. For **Condition evaluation**, choose when Amazon Pinpoint should evaluate the condition. You can choose from the following options:

   - **Evaluate immediately** – If you choose this option, Amazon Pinpoint checks to see if the event condition that you specified has been met at the moment the journey participant arrives on the activity.
   - **Evaluate after** – If you choose this option, Amazon Pinpoint waits for a specified period of time. After the specified period of time has elapsed, Amazon Pinpoint checks to see if the event condition that you specified has been met.
   - **Evaluate on** – If you choose this option, Amazon Pinpoint waits until a specific date and time. When that date and time arrives, Amazon Pinpoint checks to see if the event condition that you specified has been met.

6. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.
7. When you finish, choose **Save**.



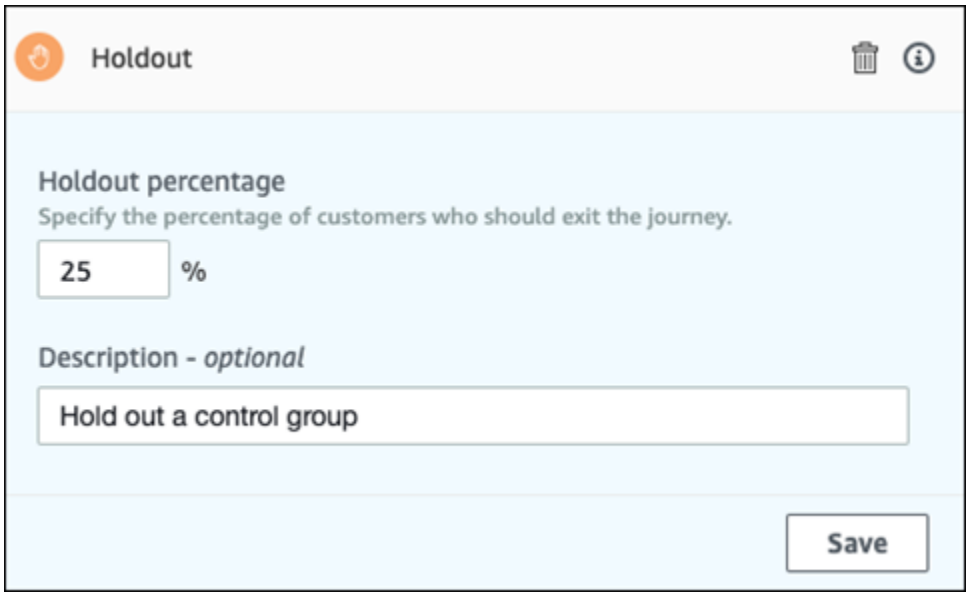
Set up a holdout activity

When journey participants arrive on a **Holdout** activity, the journey ends for a random selection of participants. You can specify the percentage of total journey participants who are held out. Holdout activities can help you measure the impact of a journey by creating a control group that doesn't receive your messages. When a journey finishes running, you can compare the behaviors of the users who participated in the journey against those who were part of the control group.

> **Note**
>
> Amazon Pinpoint uses a probability-based algorithm to determine which journey participants are held out. The percentage of journey participants who are held out will be very close to the percentage that you specify, but it might not be perfectly equal.

To set up a holdout activity

1. Choose **Add activity**.
2. For **Add an activity**, choose **Holdout**.
3. For **Holdout percentage**, enter the percentage of journey participants who should be prevented from proceeding to the next activity in the journey.
4. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.
5. When you finish, choose **Save**.



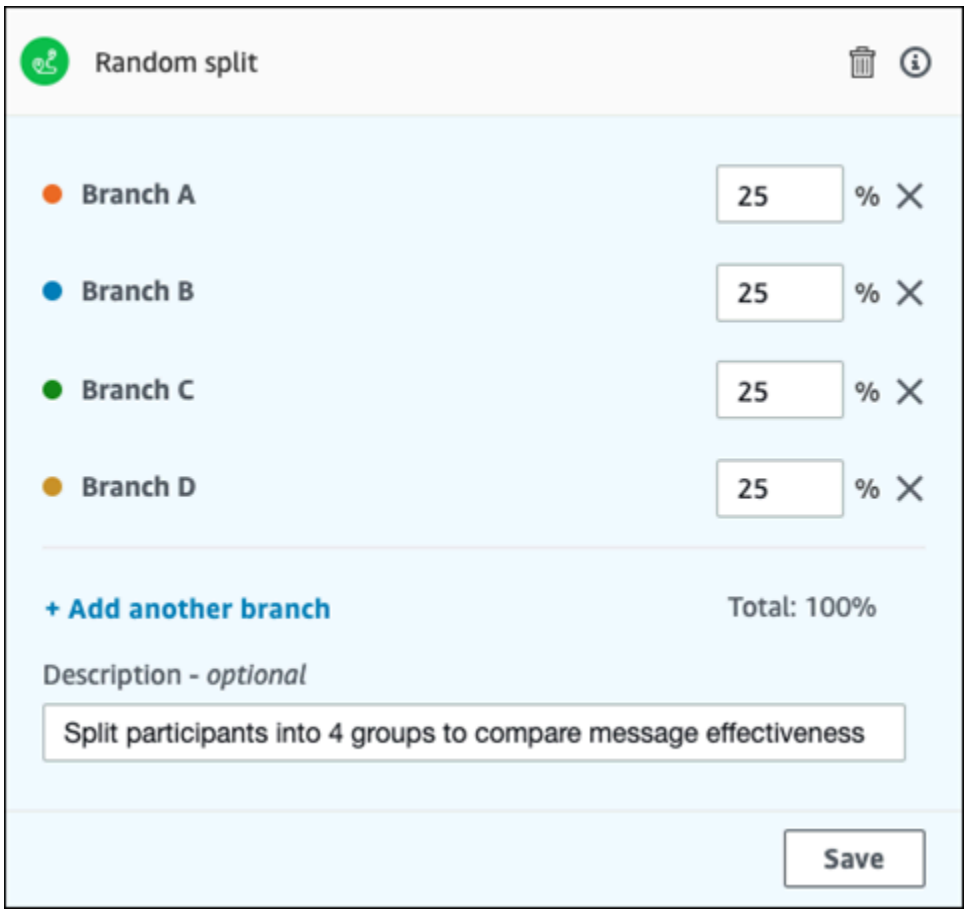
Set up a random split activity

When journey participants arrive on a **Random split** activity, they're randomly sent down one of up to five paths. You can create two to five separate paths for this type of activity. This type of activity is useful when you want to measure the effectiveness of different message variants.

> **Note**
>
> Amazon Pinpoint uses a probability-based algorithm to determine which journey participants are sent down each path in a random split activity. The percentages of journey participants who are sent down each path will be very close to the percentages that you specify, but they might not be perfectly equal.

To set up a random split activity

1. Choose **Add activity**.
2. For **Add an activity**, choose **Random split**.
3. Determine how many different paths (branches) you want to create. Choose **Add another branch** to create each additional path.
4. In the field next to each branch, enter the percentage of journey participants who should be sent down that branch. The values that you specify have to be positive numbers, and they can't contain decimals. The sum of the values that you enter across all branches has to equal exactly 100%.
5. (Optional) For **Description**, enter text that describes the purpose of the activity. When you save the activity, this text appears as its label.
6. When you finish, choose **Save**.



Next: Review and test a journey

Review and test a journey

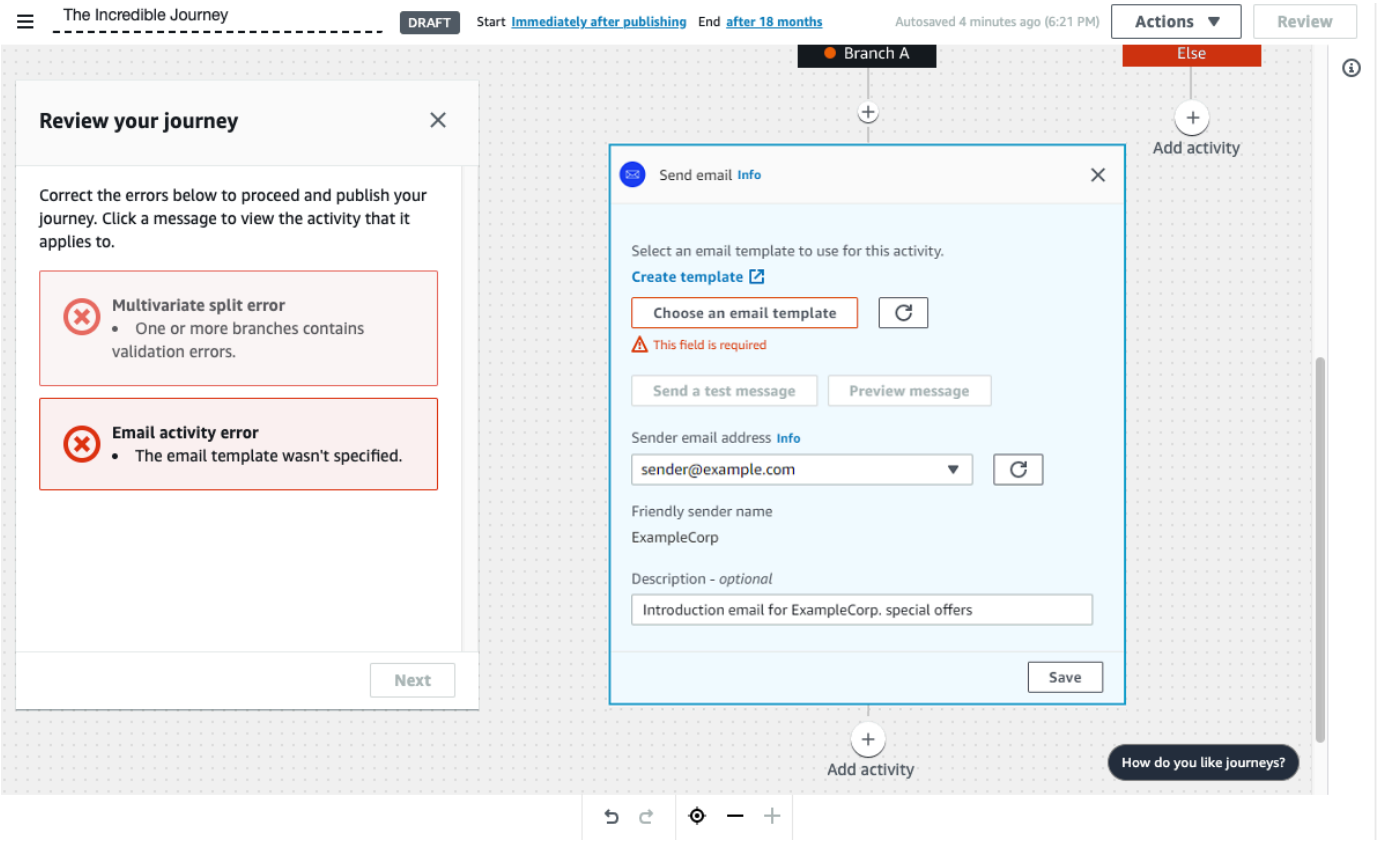
Before you can publish your journey, you must review it to make sure that all of the activities that it contains are configured properly. It's also a good idea to enroll test users in a copy of the journey before you publish it, to confirm that it behaves the way that you expect it to behave. This section contains information and procedures related to reviewing and testing your journey.

Reviewing a journey

The review feature provides information about configuration errors in your journey, and also provides some recommendations.

To review a journey

1. In the upper-right corner of the journey workspace, choose **Review**. The **Review your journey** pane appears in the journey workspace. The following image shows the journey workspace with the **Review your journey** pane opened.



2. Review the error messages that are shown on the first page of the **Review your journey** pane. You can't publish your journey until you resolve all the issues that are shown on this page. If there aren't any issues with your journey, you see a message stating that your journey doesn't contain any errors. When you're ready to proceed, choose **Next**.

> **Tip**
>
> Choose an error to go directly to the activity that it applies to.

3. The second page of the **Review your journey** pane contains recommendations and best practices that are relevant to your journey. You can proceed without resolving the issues that are shown on this page. When you're ready to proceed, choose **Mark as reviewed**.
4. On the third page of the **Review your journey** pane, you can publish your journey. If you're ready for customers to enter the journey, choose **Publish**. However, if you want to test your

journey first, close the **Review your journey** pane, and then complete the steps in Testing a journey.

Testing a journey

One of the most important steps in creating a journey is testing it to make sure that it behaves as intended. Journeys includes a testing feature that streamlines the process to send a group of test participants through the journey. It includes features to reduce or removes the amount of time that participants spend on wait or multivariate split activities, so that you can test each journey thoroughly and quickly.

To test a journey

1. Create a new segment that contains only the test participants who you want to participate in the test journey. Or, if you already have a segment of test participants, proceed to the next step.

   For more information about creating segments, see Building segments.

   > **Tip**
   >
   > We recommend that you create a test segment by importing a spreadsheet. For more information, see Importing segments.
   > Only dynamic segments are supported for testing journeys with an event based entry conditions.

2. On the **Actions** menu, choose **Test**.
3. For **Test segment**, choose the segment that contains the test participants.
4. Choose how to handle delays in the journey. You can choose one of the following options:

   - **Skip all waits and delays** – Choose this option to have test participants proceed from one activity to another without any intervening delays.
   - **Custom wait time** – Choose this option to have test participants wait for a pre-defined amount of time at each activity that includes a delay. This option is helpful if your journey contains wait activities, or yes/no split or multivariate split activities that are based on customer interactions.

5. Choose **Send test**. Amazon Pinpoint creates a new journey with `Test-` added to the beginning of the journey name. The test participants are added to the journey.
6. When you finish testing, choose **Stop journey** to permanently end the test journey.

> **Tip**
>
> During the testing process, if you discover that you need to make changes to the original journey (that is, the journey that the test journey was based on), return to the **Journeys** page. In the list of journeys, choose the original journey, and then make your changes. Changes that you make to the test journey aren't automatically applied to the journey that the test is based on.

Best practices for testing your journeys

- Include several test participants in the segment that you use to test your journey.
- Include test participants whose email addresses are on domains other than your own.
- Use a variety of email clients and operating systems to test the messages that are sent from your journey.
- If your journey includes yes/no split or multivariate split activities that are based on interactions with your emails, test those interactions. For example, if you have a split activity that checks to see if an email was opened, then some of your test participants should open the email. Then, check the **Journey metrics** pane to make sure that the correct number of users went down each path.
- If your email templates include message variables that refer to endpoint attributes, make sure that your test participants have those same attributes. For example, if your email template refers to a `User.UserAttributes.FirstName` attribute, the endpoints in your test segment should also have that attribute.

Next: Publish a journey

Publish a journey

After you've tested your journey and you're ready for customers to enter it, you can publish the journey. The publishing process requires you to complete the review process one more time.

To publish a journey

1. In the upper-right corner of the journey workspace, choose **Review**. The **Review your journey** pane appears in the journey workspace.
2. Review the error messages that are shown on the first page of the **Review your journey** pane. You can't publish your journey until you resolve all the issues that are shown on this page. If there aren't any issues with your journey, you see a message stating that your journey doesn't contain any errors. When you're ready to proceed, choose **Next**.
3. The second page of the **Review your journey** pane contains recommendations and best practices that are relevant to your journey. You can proceed without resolving the issues that are shown on this page. When you're ready to proceed, choose **Mark as reviewed**.
4. On the third page of the **Review your journey** pane, choose **Publish**.

> **Note**
>
> Even if you configure the journey to begin immediately, there is a five-minute delay before participants actually enter the journey. During this time, Amazon Pinpoint calculates all the segment members, and prepares to start capturing analytics data. This delay also gives you a final opportunity to stop the journey if necessary.

5. Reviewing and publishing a journey adds an exit journey element to the journey flow, indicating that the journey was reviewed and published successfully.

Next: Pause, resume, or stop a journey

Pause, resume, or stop a journey

Pausing a journey

After publishing a journey, you can pause that journey. During a paused journey, messages aren't sent and analytics data isn't generated. You can pause a journey during holidays, or if you need to re-evaluate the journey itself for changes. Any endpoints that entered the journey before the pause will complete the journey and are then paused. Any endpoints waiting to enter the journey don't enter the journey during the pause. If a journey is in a **Wait** activity, the timer on the **Wait** activity is paused. After the journey is resumed, the **Wait** activity continues from the point at which it was paused. A paused journey cannot be edited.

To pause a journey

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. For **All Projects**, choose an existing project.
3. In the navigation pane, choose **Journeys**.
4. Choose a currently published journey.
5. In the upper-right corner of the published journey's workspace, choose **Actions**.
6. Choose **Pause**.
7. When prompted to confirm pausing the journey, choose **Pause**.

   A paused journey stays paused indefinitely until you resume it.

Resuming a journey

A paused journey can only be resumed after five minutes have passed. When you resume a paused journey, participants resume traveling through the journey from the point they were at when the journey was paused. If any journeys were in a **Wait** activity, the **Wait** activity countdown resumes from the point at which the journey was paused.

To resume a journey

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. For **All Projects**, choose an existing project.
3. In the navigation pane, choose **Journeys**.
4. Choose a currently paused journey.
5. In the upper-right corner of the paused journey's workspace, choose **Actions**.
6. Choose **Resume**.
7. When prompted to confirm resuming the journey, choose **Resume**.

   The journey resumes.

Stopping a journey

Stopping a journey permanently ends the journey and all activities associated with it. Any activities that are currently in-process are ended. However, you will still be able to view analytics data.

> **Tip**
>
> If you are unsure whether to stop a journey, consider pausing instead. Because a stopped journey is stopped permanently, you must recreate the journey to use it again.

To stop a journey

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. For **All Projects**, choose an existing project.
3. In the navigation pane, choose **Journeys**.
4. Choose a currently published journey.
5. In the upper-right corner of the journey workspace, choose **Actions**.
6. Choose **Stop**.
7. When prompted to confirm stopping the journey, choose **Stop journey**.

   The journey permanently stops.

Next: View journey metrics

View journey metrics

After you publish a journey, the **Journey metrics** pane appears in the journey workspace, and Amazon Pinpoint begins to capture metrics related to the journey.

Topics

- Journey-level execution metrics
- Activity-level execution metrics
- Journey-Level engagement metrics
- Activity-level engagement metrics

Journey-level execution metrics

Journey-level execution metrics include information about the endpoints that entered (or were prevented from entering) your journey. To view engagement metrics, choose **Engagement metrics** in the **Journey metrics** pane.

These metrics are divided into several sections, which are discussed in detail in the following sections.

Entry metrics

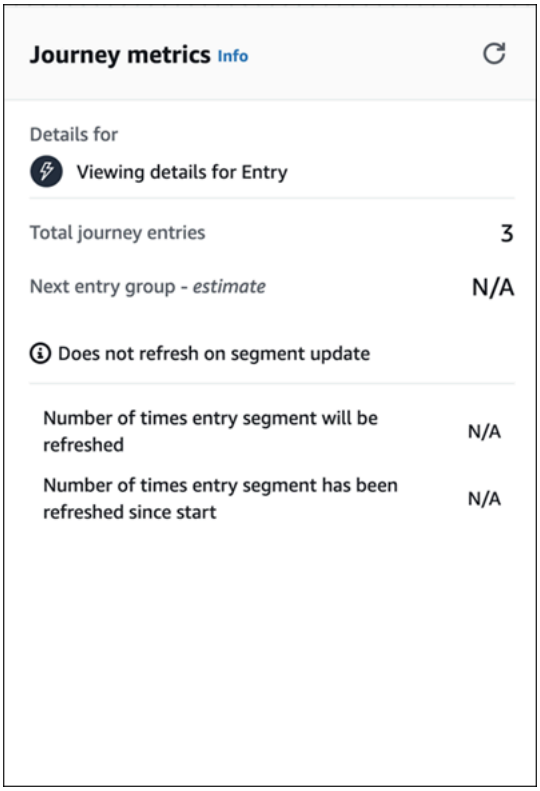
The first section in the list of journey execution metrics shows how many participants entered your journey. An example of this section is shown in the following image.

This section contains the following information:

- **Currently in journey** – The number of participants who are actively proceeding through the activities in the journey.
- **Completed journey** – The number of participants who have reached an end activity in the journey.
- **Lifetime journey entries** – The number of participants who have entered the journey since the start date of the journey. This section also contains a chart that shows the percentage of participants who completed the journey (shown in blue) and the percentage of participants who are still in the journey (shown in orange).

Journey refresh metrics

This section shows the refresh metrics for the journey. It includes information about the number of segments refreshed, how many times a segment has been refreshed, and whether the segment is set to refresh on update or not. An example of this section is shown in the following image.



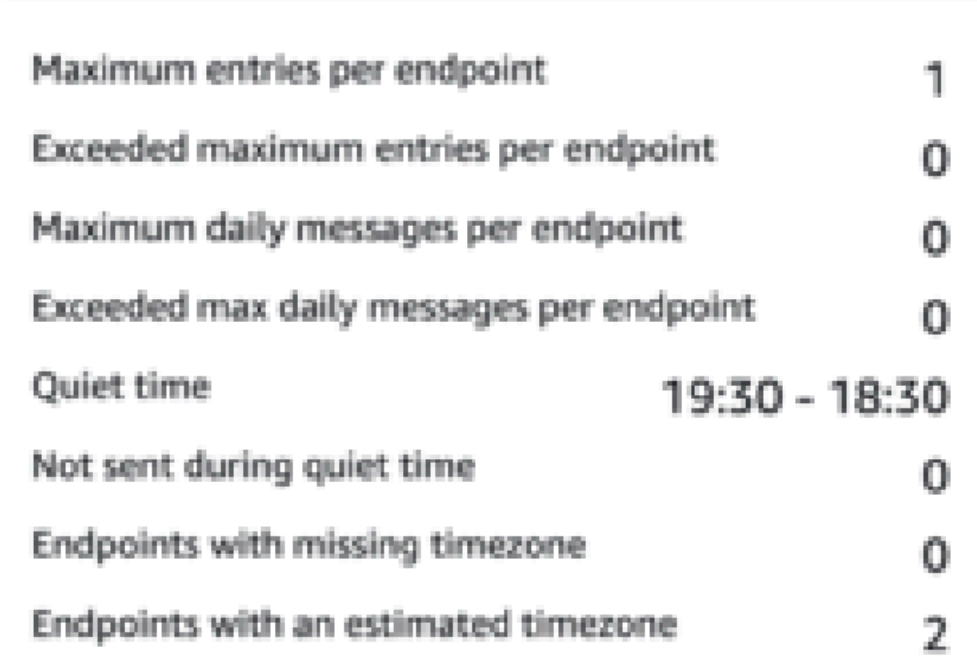
This section contains the following information:

- **Total journey entries** – The total number of journey entries.
- **Next entry group - *estimate*** – The number of endpoints that will be added on the next update. If a segment refresh interval isn't set, there will be no endpoints to add. The value displays as **N/A**.
- **Does not refresh on segment update/ Refreshes on update** – Indicates whether **Refresh on segment update** was chosen when adding endpoints for the journey entry activity.
- **Number of times entry segment will be refreshed** – The maximum number of times that the segment will be refreshed during the journey.
- **Number of times entry segment has been refreshed since start** – The current number of times the segment has been refreshed since the journey started.

- **Removed due to re-evaluation** – The number of endpoints that were removed from the journey because of the re-evaluation process that occurs when a participant reaches a **Send contact center** activity. For more information, see Set up a contact center activity.

Unsent Message Metrics

The next section in the list of journey execution metrics includes information about the reasons why messages weren't sent to journey participants. An example of this section is shown in the following image.



This section contains the following information:

- **Maximum entries per endpoint/Exceeded maximum entries per endpoint** – Displays the maximum number of entries per endpoint and the number of participants who were prevented from participating in the journey because they would have exceeded the maximum number of times that a single endpoint can participate in the journey.
- **Maximum daily messages per endpoint/Exceeded max daily messages per endpoint** – Displays the maximum number of daily messages per endpoint, and the number of messages that weren't sent because sending them would have exceeded the maximum number of messages that a single participant can receive during a 24-hour period.
- **Quiet time/Not sent during quiet time** – Displays the current quiet time hours set for the journey, and the number of messages that weren't sent for the following reasons.

- If **Resume sending after quiet times** is not turned on and sending is blocked due to encountering the quiet time window.
- If **Time zone estimation** is turned on and sending is blocked due to the endpoint having no time zone (result of missing `Demographic.Timezone` attribute and unsuccessful time zone estimation).

Activity-level execution metrics

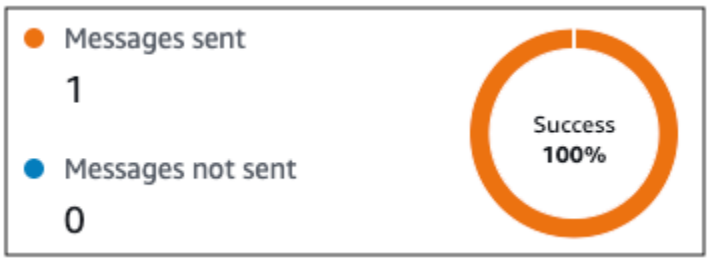
Activity-level execution metrics include information about the endpoints that entered (or were prevented from entering) your activity. Select an individual activity to view its execution metrics. To view engagement metrics, choose **Engagement metrics** in the **Journey metrics** pane.

> **Important**
>
> The number of endpoints that move through each activity in your journey is noted in the top right corner of each activity modal.

These metrics are divided into several sections, which are discussed in detail in the following sections.

Sent message metrics

The first section in the list of activity execution metrics shows how many endpoints entered your activity. An example of this section is shown in the following image.

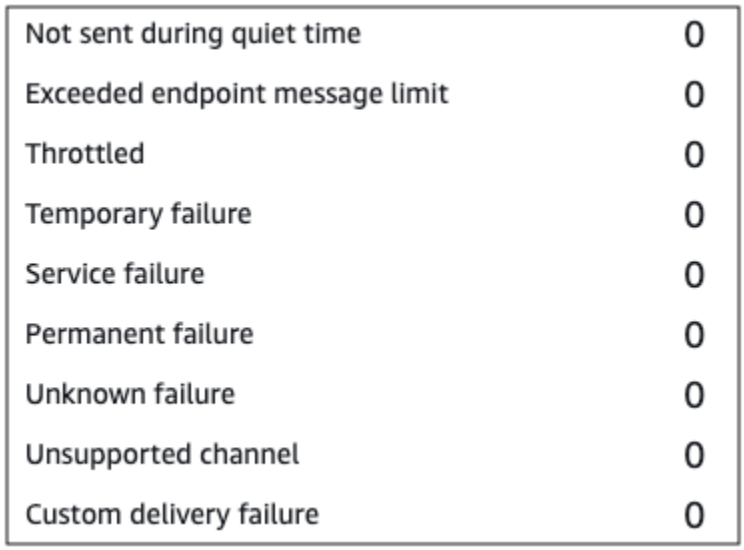


This section contains the following information:

- **Messages sent** – The number of messages sent.
- **Messages not sent** – The number of messages not sent.

Unsent Message Metrics

Each activity in your journey includes a list of execution metrics that indicates information about the number of messages that couldn't be delivered because of system issues, Amazon Pinpoint account configuration, or end user preferences such as an opt-out. An example of this section is shown in the following image.



This section contains the following information:

- **Not sent during quiet time** – The number of messages that weren't sent because they would have been delivered during quiet time in the recipient's time zone.
- **Exceeded endpoint message limit** – The number of messages that weren't sent because sending them would have exceeded the maximum number of messages that a single participant can receive during a 24-hour period.
- **Throttled** – The number of messages that weren't sent because sending them would exceed the sending quotas for your Amazon Pinpoint account.
- **Temporary failure** – The number of messages that weren't sent because of a temporary failure.
- **Service failure** – The number of messages that weren't sent because of an issue with the Amazon Pinpoint service.
- **Permanent failure** – The number of messages that weren't sent because of a permanent failure.
- **Unsupported channel** – The number of endpoints that weren’t sent through the activity because the endpoint didn't match the activity type.
- **Unknown failure** – The number of messages that weren't sent because of an unknown reason.

- **Custom delivery failure** – The number of messages that weren't sent because of a Lambda function or webhook failure.

  > **Note**
  >
  > This metric only appears on **Send through a custom channel** activities.

- **Dial failure** – The number of messages that couldn't be delivered through a **Send through a contact center** activity because an issue prevented the number from being dialed. This type of failure can occur if there are permissions issues that prevent the call from being made, if an Connect Customer service quota has been exceeded, or if a transient service issue occurs.
- **Removed due to re-evaluation** – The number of endpoints that were removed from the journey because of the re-evaluation process that occurs when a participant reaches a **Send through a contact center** activity. For more information, see Set up a contact center activity.

  > **Note**
  >
  > The **Dial failure** and **Removed due to re-evaluation** metrics only appear on **Send through a contact center** activities.

- **Quiet time/Not sent during quiet time** – Displays the current quiet time hours set for the journey, and the number of messages that weren't sent for the following reasons.
  - If **Resume sending after quiet times** isn't turned on and sending is blocked due to encountering the quiet time window.
  - If **Time zone estimation** is turned on and sending is blocked due to the endpoint having no time zone (result of missing `Demographic.Timezone` attribute and unsuccessful time zone estimation).

Journey-Level engagement metrics

Journey-level engagement metrics include information about the ways in which the participants in your journey interacted with the messages that were sent from the journey.

These metrics are divided into several sections, which are discussed in detail in the following sections.

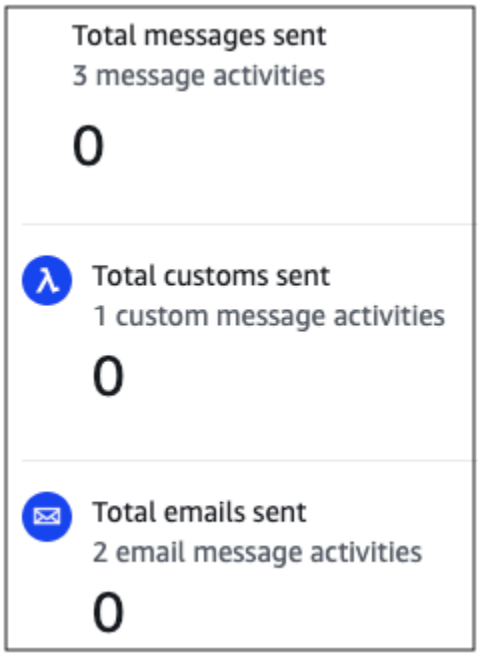
Important

Several of the engagement metrics are based on information that we receive from recipients' email providers or mobile phone carriers or from push notification services, such as Apple Push Notification service or Firebase Cloud Messaging. After we receive this data from these sources, there is a delay of up to two hours while we process the incoming metrics.

Number of message activities

The engagement metrics for each journey provide the number of message activities in that journey.

If there are multiple activity types in the journey, the engagement metrics are broken down by type, as seen in the following image.



Activity-level engagement metrics

Activity-level engagement metrics include information about the ways in which the participants in your journey interacted with the messages that were sent from the journey.

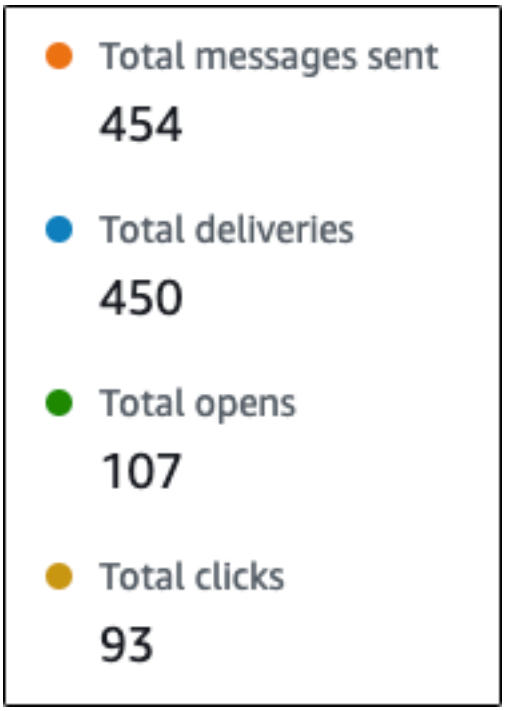
These metrics are divided into several sections, which are discussed in detail in the following sections.

Email activity

Email activities provide the following engagement metrics.

Response metrics

These metrics provide information about participants' interactions with the messages that were sent from the email message activity.



This section contains the following information:

- **Total messages sent** – The number of emails sent from this activity, whether the messages were successfully delivered to the recipients' inboxes.
- **Total deliveries** – The number of messages that were delivered to recipients' email providers.
- **Total opens** – The number of messages that were opened by recipients.

> **Note**
>
> For Amazon Pinpoint to count an email open event, the recipient must load the images in your messages. Several email clients, such as some versions of Microsoft Outlook, prevent images from being loaded by default.
> If a message is opened once or opened multiple times within the same hour, it will be counted as one open. Multiple opens taking place at different hours will be counted as separate opens. For example, if a message is opened at 8:30 AM and 8:45 AM, it will

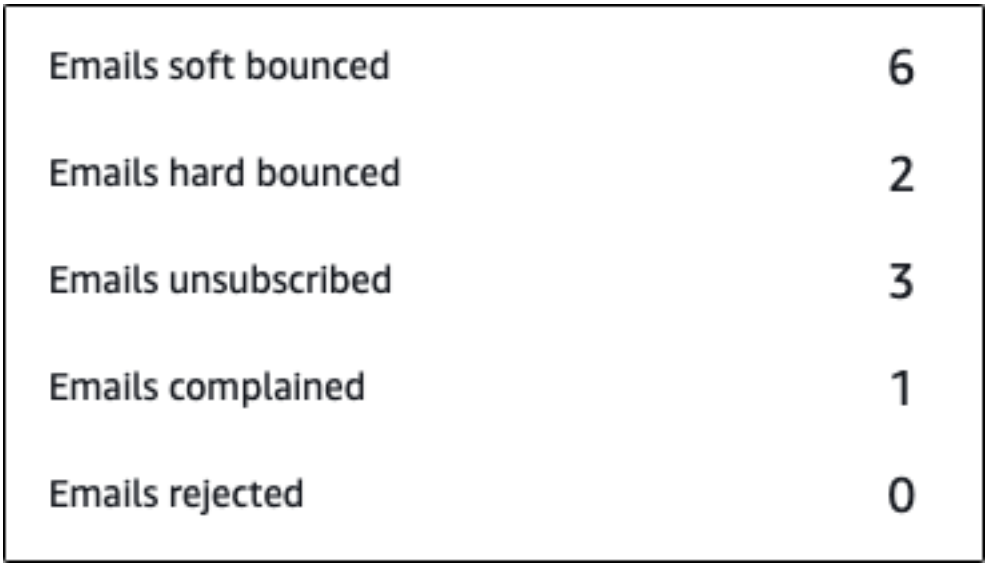
count as one open but if the messaged is opened at 8:30 AM and 9:05 AM, it will count as two opens because the hour has changed. For this reason, it's possible (but unlikely) for the number of opens to exceed the number of sends or deliveries.

- **Total clicks** – The number of times that recipients clicked links in messages.

> **Note**
>
> If a message recipient clicks multiple links in a message or clicks the same link more than once, those clicks will be counted as one click if they occur within the same hour. Multiple clicks taking place at different hours will be counted as separate clicks. For example, a link is clicked at 8:30 AM and 8:45 AM it will count as one click but if the link is clicked at 8:30 AM and 9:05 AM it will count as two clicks because the hour has changed. For this reason, it's possible for the number of clicks to exceed the number of opens or deliveries.

Message engagement metrics

The final section in the list of engagement metrics provides additional email response metrics. An example of this section is shown in the following image.



This section contains the following information:

- **Emails soft bounced** – The number of messages that resulted in a soft bounce. A soft bounce occurs when a message can't be delivered because of a temporary issue (for example, when the recipient's inbox is full).

> **Note**
>
> Amazon Pinpoint attempts to re-deliver messages that result in a soft bounce for a certain period of time. If the message is delivered during one of these redelivery attempts, then the message is counted in the **Total deliveries** metric and removed from the **Emails soft bounced** metric.

- **Emails hard bounced** – The number of messages that resulted in a hard bounce. A hard bounce occurs when a message can't be delivered because of a permanent issue (for example, when the destination email address no longer exists).

> **Note**
>
> Soft bounces that can't be delivered after a certain period of time are converted to hard bounces. For this reason, you might see the number of soft bounces decrease and the number of hard bounces increase.

- **Emails unsubscribed** – The number of messages that prompted the recipient to unsubscribe.

> **Note**
>
> For Amazon Pinpoint to count an unsubscribe event, the unsubscribe link in the email has to contain a special link tag (a tag called `unsubscribeLinkTag`, as in the following example: `<a ses:tags="unsubscribeLinkTag:click;" href="http://www.example.com/unsubscribe">`). Only links that contain this tag are counted as unsubscribes.

- **Emails complained** – The number of messages that were reported by the recipient as unsolicited mail.

> **Note**
>
> This metric is based on complaint report data that we receive from recipients' email providers. Some email providers send us complaint data immediately, while others send a weekly or monthly digest.

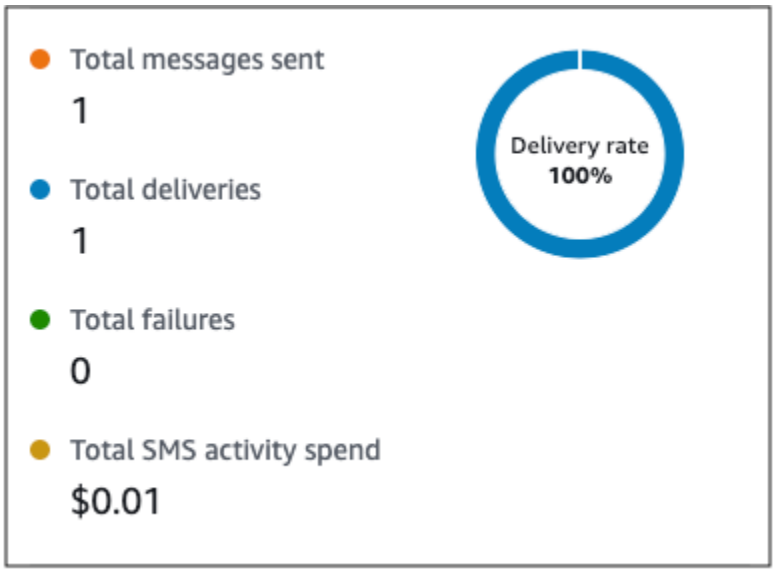
- **Emails rejected** – The number of messages that weren't sent because they were rejected. A message is rejected if Amazon Pinpoint determines that the message contains malware. Amazon Pinpoint doesn't attempt to send rejected messages.

SMS message activity

SMS message activities provide the following engagement metrics.

Delivery metrics

These metrics provide information about participants' interactions with the messages that were sent from the SMS message activity.



This section contains the following information:

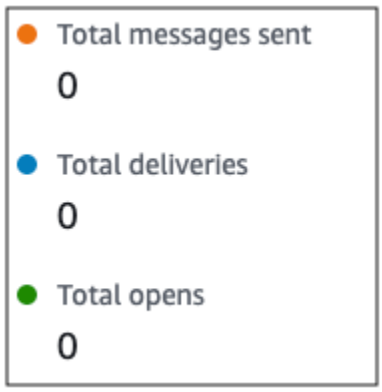
- **Total messages sent** – The number of SMS messages sent from this activity, whether the messages were successfully delivered to the recipients' devices.
- **Total deliveries** – The number of SMS messages delivered from the provider to the recipients' devices.
- **Total failures** – The number of SMS messages that failed to be delivered to recipients.
- **Total SMS activity spend** – The estimated amount of money you've spent sending SMS messages through this activity.

Push Notification Activity

Push notification activities provide the following engagement metrics.

Response Metrics

These metrics provide information about participants' interactions with the messages that were sent from the push notification activity.



This section contains the following information:

- **Total messages sent** – The number of push notifications sent from this activity, whether the messages were successfully delivered to the recipients' devices.
- **Total deliveries** – The number of push notifications delivered from the push notification service to the recipients' devices. This metric only reflects deliveries that are made when an app is running in the foreground or background of a recipient's device. Due to discrepancies in how mobile operating systems prioritize background notifications, delivery of push notifications are not guaranteed.
- **Total opens** – The number of push notifications that were opened by recipients.

Time to Live Metrics

The push notification engagement metrics also provide the time to live (TTL) value for the push notification activity. The TTL is the amount of time, in seconds, during which Amazon Pinpoint can deliver the message. After this time elapses, Amazon Pinpoint drops the message and doesn't attempt to re-deliver it.

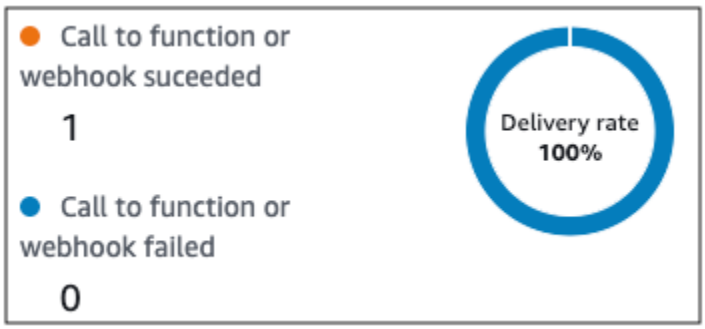
When the default TTL value is used, the metric displays a “-”. For custom TTL values, the metric displays the exact number and unit of time that you chose.

Custom Channel Activity

Custom channel activities provide the following engagement metrics.

Call Success Metrics

These metrics provide information about participants' interactions with the messages that were sent from the custom channel activity.



This section contains the following information:

- **Call to function or webhook succeeded** – The number of times that a Lambda function or webhook was successfully invoked because of this activity.

  > **Note**
  >
  > This doesn't indicate that the message was delivered to the destination, it only indicates that the Lambda function or webhook was called.

- **Call to webhook or function failed** – The number of times that a Lambda function or webhook was not successfully invoked because of this activity.

Contact Center Activity

You can use Contact center activity metrics to analyze participants' interactions with your calls.

Contact center metrics

The following call metrics are available:

- **Total successful dials** – The total number of calls that were successfully dialed.
- **Connected** – The number of calls that connected to an agent. If answering machine detection is enabled, then calls received by answering machines won't be included in the **Connected** metric. Otherwise, if answering machine detection is disabled they are included. For more information about answering machine detection, see AnswerMachine DetectionConfig in the *Connect Customer Outbound Campaigns API Reference*.
- **SIT tone** – The number of calls that received a busy tone.
- **Fax** – The number of calls that received a fax tone.
- **Voicemail beep** – The number of calls that reached voice mail with a beep sound.
- **Voicemail no beep** – The number of calls that reached voice mail without a beep sound.
- **Not answered** – The number of calls that received a response, but the call continued to ring without reaching voice mail.
- **Connection error** – The number of calls that received a response, but the call could not reach voice mail.
- **Connection rate** – The rate of calls that successfully connected to an agent as compared to all successful dials.
- **Total failed dials** – The number of calls that failed due to system issues, telecom issues, or permission errors.
- **Total expired dials** – The number of calls that expired because the dialer faced an error or there were no agents available.

Activity metrics

In addition to viewing metrics for channel-specific activity types (email, SMS, push, and custom channels), you can also view metrics for other activity types, which include the following: **Wait** activities, **Yes/no split** activities, **Multivariate split** activities, and **Random split** activities.

Wait activity metrics

Journey metrics for wait activities include the following information:

- **Wait completed** – The number of journey participants who completed the activity.
- **Wait date passed** – The number of journey participants who arrived on the activity and immediately moved to the next activity because the wait date occurred in the past.
- **Currently waiting** – The number of participants who are currently waiting (in the activity).

Yes/No split activity metrics

Journey metrics for yes/no split activities include the following information:

- **Total participants** – The number of journey participants who passed through the activity.
- **Details for *path*** – The number of journey participants who were sent down each path of the activity.

Multivariate split activity metrics

Journey metrics for multivariate split activities include the following information:

- **Total participants** – The number of journey participants who passed through the activity.
- **Details for *path*** – The number of journey participants who were sent down each path of the activity.

Holdout activity metrics

Journey metrics for holdout activities include the following information:

- **Total entered** – The number of journey participants who passed through activity.
- **Participants held out** – The number of participants who exited the journey because of being held out by the activity.

Random split activity metrics

Journey metrics for random split activities include the following information:

- **Total participants** – The number of journey participants who passed through the activity.
- **Details for *path*** – The number of journey participants who were sent down each path of the activity.

Tips and best practices for journeys

Although journeys are designed to be flexible and fully customizable, there are some fundamental strategies and practices that can help you plan, design, and manage any journey. Consider the following tips and best practices for designing and managing a successful journey.

Topics

- Scope and settings
- Segments
- Activities
- Email messages
- Reviewing and testing
- Analytics
- Lifecycle management

Scope and settings

Because a journey can perform a variety of different and interrelated tasks, it's a good idea to create a well-defined scenario for a journey. Also, you should choose journey settings that support your scenario and goals. By using journey settings, you can establish constraints that determine the timing, volume, and frequency with which a journey can engage participants.

When you define a scenario, consider limiting its scope to a small aspect of a larger customer experience. Although Amazon Pinpoint supports large-scale journeys that have extensive workflows, you have more opportunities to monitor, refine, and manage a customer's experience if you design a journey to be part of a sequence of related journeys.

For example, you can design a journey that focuses on welcoming new customers and providing them with recommended first steps during their first seven days as a customer. Based on each customer's actions during the first journey, you can then add them to a subsequent journey that's tailored to their initial level of engagement. One subsequent journey might provide next steps for customers who were highly engaged in the first journey. Another subsequent journey might promote different products or services to customers who were less engaged in the first journey. By creating a sequence of smaller-scope journeys, you can continually refine and manage the customer experience throughout the customer lifecycle.

After you define a scenario, choose journey settings that support your goals for the scenario. These settings define the timing, volume, and frequency with which any part of a journey can engage participants. To choose these settings, create or open the journey. Then choose **Settings** from the **Actions** menu, and expand the **Advanced settings** section.

Some key goals and related settings are:

Store and use participants' local time zones

To optimize participant engagement in a journey that has a scheduled start and end time, configure the journey to use each participant's local time zone. This helps to make sure that journey activities occur when a participant is most likely to participate in those activities.

Note, however, that the usefulness of this setting depends on whether you store local time zone values in the endpoint definitions for participants. If you use this setting and the endpoint definition for a participant doesn't specify a time zone, Amazon Pinpoint doesn't include the participant in the journey. To avoid this issue, use the `Demographic.Timezone` attribute to store time zone information for participants. This is a standard attribute that Amazon Pinpoint provides.

Address quiet-time conflicts

If you configure an activity to send messages at a time that conflicts with the quiet-time settings for the journey, Amazon Pinpoint doesn't send the messages. Once quiet time ends, new messages are sent. If you chose to resume sending messages after quiet time ends, any messages held during quiet time will also be sent. If not, then those messages held messages are dropped.

Time zone estimation

Time zone estimation helps to estimate an endpoints time zone based on `Endpoint.Location.Country` and depending on the estimation methods selected, either `Endpoint.Address` `Endpoint.Location.PostalCode` or both. The endpoints time zone is used to avoid sending messages at inappropriate times of the day when *quiet time* is configured and also when a journey sends messages based on the local time zone. Time zone estimation is only performed on endpoints that do not have a value for the `Demographic.Timezone` attribute.

> **Note**
>
> Time zone estimation is not supported in AWS GovCloud (US-West)

If a journey contains an endpoint with multiple time zones:

- The journey will *start* sending messages according to the *latest* time zone for an endpoint, when **Recipient's local time zone** is enabled.

- The journey will *stop* sending messages when either all messages have been sent or according to the *earliest* time zone for an endpoint, when **Recipient's local time zone** is enabled.
- The journey does not send messages to the endpoint when within quiet time of any timezone, when **Quiet time** is enabled.

The journey will only send messages when all endpoints in the journey are allowed to receive messages based on all of the configured journey sending rules.

Journey with endpoints in multiple time zones and *quiet time*

For example, if you set up your journey's *quiet time* between 20:00 (8:00 PM) to 08:00 (8:00 AM) and there are endpoints in UTC-8 `America/Los_Angeles` and UTC-5 `America/New_York` then the journey starts sending messages at 08:00 `America/Los_Angeles` (11:00 `America/New_York`) and stop sending messages at 17:00 `America/Los_Angeles` (20:00 `America/New_York`).

Limit the number of messages that participants can receive

To help make sure that participants don't receive too many messages from the journey or project, limit the number of messages that can be sent to a participant during a 24-hour period. This can be especially helpful if a journey uses a segment that's also used by campaigns or other journeys. You might also create and use a segment that's designed explicitly for use by only a specific journey.

Optimize the number of messages that can be sent

If a journey has a large number of participants and it sends a large number of messages, factor the amount of time that Amazon Pinpoint needs to process and send all of those messages.

For example, consider a situation where you have a journey activity that sends messages to 1,000,000 participants, and the maximum sending rate for your Amazon Pinpoint account is 200 messages per second. Some participants won't receive the message until approximately 80 minutes after the activity starts. This is especially relevant if a journey includes wait activities that follow email activities. If Amazon Pinpoint hasn't finished sending all the messages by the time the wait activity ends, participants might be moved to the activity that follows the wait activity, before they've received the message.

To mitigate this risk, consider increasing the maximum number of messages that a journey can send per second, and possibly increase it to the maximum sending rate for your account. Also consider increasing the sending quotas for your account.

Limit the number of times that participants can enter a journey

Depending on the nature and design of a journey, limit the number of times that a single participant can enter the same journey. If you don't set this limit, a participant could enter a journey, complete several activities in the journey, arrive at an end activity, and then start the journey again. You might prefer to have each participant start and complete a journey only once.

Note that Amazon Pinpoint doesn't allow a participant to enter a journey if they're already an active participant in the journey. For example, Amazon Pinpoint doesn't add a participant as a new participant if the participant starts a journey and you later update the participant's endpoint definition in a way that affects their inclusion in a segment (based on segment criteria) or the journey (based on activity conditions).

Maximize opportunities for participants to start a journey

The journey entry activity, which is the first activity in a journey, determines how often new participants are added to the journey. Because new or existing customers could become participants at any time, it's a good idea to configure the entry activity to add new members to the segment frequently. You can also configure the segment to add new participants automatically based on specific user attributes or events. For an example of how to configure a segment in these ways, see Building Your First Journey in Amazon Pinpoint on the AWS Messaging and Targeting Blog.

Segments

Segments are key. They determine who can participate in an overall journey and specific journey activities. When you create segments for a journey, consider the following best practices:

Create a dedicated test segment

If you have a regular group of people who test your journeys and messages, create a segment that contains only their endpoints. You can then use that segment as a consistent testing framework, especially if you use the journey testing feature that Amazon Pinpoint provides. For tips about how to build this segment, see Review and test a journey.

Use multiple segments

Although you can choose only one segment for the journey entry activity, that segment can include multiple smaller segments. Later in the journey, you can then use a multivariate split activity to divide participants into separate groups based on their segment membership. This

approach can help you provide a more tailored experience for each participant. It can also help reduce processing times for email activities, because those activities will send messages to a smaller, more targeted audience.

It's also a good idea to segment participants based on actions that they explicitly do or don't do. You can do this by using split activities. For example, you can use a yes/no split activity to send participants down a *Yes* path if they click a link in a message, and a *No* path if they don't. The absence of an action can be an opportunity to reengage a participant through a follow-up activity.

Don't delete segments and endpoints

We encourage you to maintain segments that are part of an active journey. If you delete a segment that's being used by an active journey, the journey could fail and stop running. If the journey does continue to run, any participants who were part of the segment might be removed from the journey prematurely. In addition, those participants will be reported as “dropped” in the analytics data for the last activity that they were part of. This weakens the usefulness of your analytics data—you won't be able to distinguish between participants who left a journey independently and participants whom you removed.

Leverage custom attributes

To identify and add journey participants to segments more easily, consider adding a custom, journey-specific attribute to endpoints when your application creates or updates endpoints. You can then use this attribute to identify a user or endpoint as someone who should participate in a journey.

Activities

Activities are the building blocks of any journey. Therefore, when you choose the type and settings for each activity, and the relationships between activities, consider the following guidelines:

Optimize the entry activity

The entry activity, which is the first activity in a journey, determines how often new participants are added to the journey. You can either add participants based on an activity – for example, adding users who download specific music – or add participants from existing segments. Because new or existing customers could become participants at any time, it's a good idea to configure the entry activity to update (add participants to) the associated segment frequently. By doing this, you maximize opportunities for participants to start a journey.

Prepare for changes to segment and participant data

An activity's evaluation of segment conditions is based on the latest data for each participant (endpoint) in the segment, and this data might change over time. For example, a participant's favorite food could be pizza when they start an activity. That participant could later change their preference to hot dogs. If this happens, subsequent activities will evaluate the participant based on the participant's preference for hot dogs, not pizza. One way to prepare for these kinds of changes is to use split activities that predict the changes and send participants down an appropriate path.

If an endpoint is `ACTIVE`, Amazon Pinpoint will send messages through campaigns and journeys. If an `ACTIVE` endpoint enters a journey and becomes `INACTIVE` before completing the journey, Amazon Pinpoint will continue to send messages to the endpoint.

Take advantage of the *Else* path

A multivariate split activity can contain as many as four paths (each with its own criteria), in addition to an *Else* path. The *Else* path is for participants who don't meet any of the criteria for the other paths. Therefore, it provides an excellent opportunity to handle unexpected or unusual cases that you might not have considered when you designed the journey.

Consider delays in receiving event data

Some event data, such as *email opens*, is based on information that we receive from participants' email providers. Some providers send us this information immediately, while others send it less frequently. Those delays can impact participants' experiences. When Amazon Pinpoint evaluates events as a condition of an activity, it moves a participant to a *No* path if it doesn't have any event data for a participant. To mitigate this risk, add buffer time to the evaluation schedule for activities that immediately follow email activities.

Avoid consecutive email activities

We recommend that you insert a wait or other type of activity between two or more email activities. This can help account for the amount of time that Amazon Pinpoint needs to process and send messages, and any delays in participants receiving messages.

Use re-entry intervals

Set a re-entry interval for when endpoints re-enter journeys. By setting a re-entry interval you'll space out the time between when users receive your messages, creating a better user engagement and also being less likely that your messages are processed as spam.

Email messages

In addition to general tips and best practices for sending email, consider doing the following before you create a journey:

Create a dedicated "From" address

Consider using a dedicated email address or domain for all the messages that you send from a journey. This provides a consistent experience across all the messages that participants receive from a journey. It also allows each participant to adjust their email application settings to ensure that all of a journey's messages arrive in their inbox. In addition, if you subscribe to the Deliverability Dashboard, using a dedicated address or domain can streamline the process for you to access advanced analytics data for specific journeys. To learn how to set up a dedicated address or domain for sending messages, see the section called "Verifying email identities".

Verify that you set up the email channel correctly

Before you publish a journey, make sure that your Amazon Pinpoint account has production access for email. If it doesn't, your account is in the sandbox environment, which means that participants might not receive messages from the journey. (In the sandbox environment, you can send only a limited number of messages and you can send messages to only certain email addresses.) Also, make sure the sending quota and sending rate for your account can support the number of messages that you plan to send from the journey. To check the sending quota and rate for your account, you can use the **Email Settings** page on the Amazon Pinpoint console.

Design a collection of related message templates

During the early stages of the planning process, it's a good idea to design and create a message template for each email activity that you expect to include in the journey. If you do this, you can make sure that all the messages have a consistent design. This also makes sure that each message is specific to and optimized for the corresponding phase of the journey. For example, in a journey that welcomes new customers, you might have three email templates. There is one template with introductory information, another with intermediate information for users who clicked a link in the first message, and another with revised introductory information for users who didn't click a link in the first message.

Reviewing and testing

Amazon Pinpoint includes a review feature that checks for and warns you about configuration errors in a journey. It also simplifies the process of finding and fixing any errors. To find the activity or setting that has an error, click the error description.

To fix an error, follow the recommendation provided in the **Review your journey** pane. We encourage you to use this feature to review and fix errors before you publish a journey. As a best practice, we also encourage you to complete this review process multiple times before you publish a journey.

Amazon Pinpoint also includes a testing feature that streamlines the testing process. After you complete the review process for a journey, you can use this feature to send a group of test participants through the journey.

To make sure that only test participants can enter the journey, you can create and use a dedicated test segment with this feature. To expedite testing, you can configure this feature to reduce or removes wait times for and between activities. We strongly recommend that you use this feature to test all aspects of a journey, including each message that a journey sends, before you publish a journey.

To learn more about reviewing and testing a journey, see the section called “Review and test a journey”.

Analytics

After you publish a journey, Amazon Pinpoint automatically starts collecting and aggregating analytics data for several types of standard metrics that apply to the overall journey and individual journey activities. We strongly recommend that you review these metrics regularly and frequently.

Among other things, these metrics provide key insight into issues to address, such as failures and errors that might have occurred when Amazon Pinpoint attempted to evaluate or perform an activity. Overall, these metrics can help you determine what is or isn't working well in a journey, which can help you design more effective journeys in the future. For detailed information about the available metrics and how to view them, see the section called “View journey metrics”.

Amazon Pinpoint automatically stores your analytics data for 90 days. Depending on a journey's projected duration or your organization's long-term storage and reporting needs, you might want to store the underlying event data for more than 90 days. To do this, we recommend that

you configure Amazon Pinpoint to export data to Amazon Kinesis Data Streams or Amazon Data Firehose. If you export data to Amazon Kinesis, you can also use other services and applications to perform deeper analysis or reporting. For more information, see the section called “Streaming event data”.

Lifecycle management

As you move a journey through various phases of development and execution, keep the following in mind for each phase of the journey's lifecycle. Also note that you can stop (cancel) a journey at any time if any issues arise.

Phase	Description
Draft	The journey is being developed and hasn't been published yet. In this phase, you can change any aspect of the journey, including segments, activities, and settings for the journey. You can also leverage Amazon Pinpoint features for reviewing and testing the journey. You can repeat the review and test processes as many times as you want.
Active	The journey has been developed, reviewed, tested, and published. Depending on the journey's schedule, it might currently be running or scheduled to start running at a later time. In this phase, you can't add, change, or remove activities from the journey.
Closed	The journey has been developed, reviewed, tested, and published. It has started running and is closed to new participants. Depending on the journey's schedule and settings, it might have also passed its scheduled end time. Or the journey might

Phase	Description
	have passed its scheduled start time, and it has an entry activity that's set to never add new segment members. In this phase, you can't add new participa nts to the journey, and no existing participa nts can enter the journey for the first time. However, any existing participants who are currently waiting to start an activity can resume the journey.
Stopped	The journey was developed, reviewed, tested, and published, and then later stopped. You can't restart a journey after you stop it. You will need to recreate the journey again. If you stop a journey, Amazon Pinpoint continues to perform activities that are currently in progress until those activities are complete. Amazon Pinpoint also continues to collect and aggregate analytics data for those activities until the activities are complete. It also does this for any activities that were complete when you stopped the journey. In this phase, you can't add, change, or remove any activities from the journey. In addition, Amazon Pinpoint stops evaluating the journey and doesn't perform any activities that haven't started.

Troubleshooting journeys

Verify that logging is turned on to assist in identifying the cause of failure. For more information on logging, see Monitoring and logging and Journey events.

Event based journey isn't triggered when using a PutEvents request

Issues and solutions

- Verify that the configured **Journey limits** are not being exceeded:
  - **Maximum daily messages per endpoint**
  - **Maximum number of messages an endpoint can receive from the journey**
  - **Maximum number of journey messages per second**
  - **Maximum entries per endpoint**
- Ensure that the active number of event triggered journeys does not exceed the provisioned threshold. For more information, see Quotas.
- Verify that all components of the PutEvents API request are complete, including Event Component and Endpoint Component.
- Verify that the specific journey is in the same application as the one in the PutEvent request.
- Verify that the correct event is configured to activate your journey. You can confirm this configuration in the Journey entry condition.
- Event-driven journeys are not conducive to Contact Center use cases because of the limited life span for dial operations is 3 minutes.
- You can use the following example request to activate a journey using “TestEvent” as the entry condition.

```
aws pinpoint put-events --application-id 7149cbb8XXXXXXXX --events-request file://
PutEvents.json
file://PutEvents.json
{
    "BatchItem": {
        "ExampleEndpointID": {
            "Endpoint": {
                "User": {
                    "UserId": "10107"
                },
                "ChannelType": "EMAIL",
                "Address": "johndoe@example.com"

            },
            "Events": {
                "JourneyEvent": {
                    "EventType": "TestEvent",
```

```
                    "Timestamp": "2019-02-10T19:48:57+00:00"
                }
            }
        }
    }
}
```

All journey participants go through ‘No’ branch during ‘Yes/No’ split activity

Issues and solutions

- This error can occur when no wait time is configured. Send events are evaluated immediately, which results in moving all participants to the 'No' branch.
  - To resolve this issue, verify that some wait time is configured after the condition evaluation.
- Yes/No splits based on an event criterion and following custom AWS Lambda activities have an implicit wait time of 15 minutes to accrue and process the event outcomes.
- Yes/No splits based on an event criterion and following channel activities (SMS, EMAIL, PNS) have a wait time of 1 hour to accrue and process the delivery event statuses for channel message deliveries.
- Only standard events specific to channel delivery statuses are supported for Yes/No splits.

Send test messages with Amazon Pinpoint

With Amazon Pinpoint, you can send *test messages*, which are one-time messages that you send directly to a specific set of recipients. Sending a test message is useful if you want to test the deliverability of a message, or see how a message appears to recipients. You can send a test message by using any channel that Amazon Pinpoint supports.

We charge you for each test message that you send. However, we don't bill you based on your monthly targeted audience (MTA) when you send test messages. For more information, see Amazon Pinpoint pricing.

When you use the Amazon Pinpoint console to send a test message, you can send the message to as many as 15 recipients, depending on the type of message. You can't send a test message to a segment—you must send it to individual users. In addition, Amazon Pinpoint delivers a test message immediately. You can't schedule the delivery of a test message. Finally, a test message doesn't generate messaging metrics, such as open, click, or bounce rates. If you want to send a message to a segment, schedule the delivery of a message, or obtain metrics data for a message, you should create a campaign instead of sending a test message.

To send a test message from the Amazon Pinpoint console, use the **Test messaging** page on the console.

To open the test messaging page

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to send a test message for.
3. In the navigation pane, choose **Test messaging**.

Sending a test email message

To send a test email message, you must use a project that has the email channel enabled. To learn how to create a new project and enable the email channel for it, see Setting up the Amazon Pinpoint email channel. To learn how to enable the email channel for an existing project, see Managing the Amazon Pinpoint email channel.

To send a test email message

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.

2. On the **All projects** page, choose the project that you want to send a test message for.
3. In the navigation pane, choose **Test messaging**.
4. On the **Test messaging** page, under **Channel**, choose **Email**.
5. For **Destination type**, choose one of the following destinations for your message:

   - **Email addresses** – Each destination is a recipient's email address.
   - **Endpoint IDs** – Each destination is a unique ID that's assigned to an endpoint for the project.
6. Depending on your selection for **Destination type**, enter one or more **Endpoint IDs** or **Email addresses**. You can enter up to 15 values. Use commas to separate multiple values.
7. For **Message content**, choose whether you want to **Create a new message** or **Use an existing template**.

   > **Note**
   >
   > The maximum email message size for **Create a new message** is 200 KB. You can use email templates to send larger email messages.

   If you choose to use an existing template, choose the template from the **Template** list. After you choose a template, Amazon Pinpoint displays a preview of the active version of the template. The active version is typically the version of a template that's been reviewed and approved for use, depending on your workflow.

   If you choose to create a new message, specify a subject in the **Subject** field, and a message body in the **Message** field.

   > **Tip**
   >
   > You can enter the message body by using either HTML or Design view. In the HTML view, you can manually enter HTML content for the message body, including formatting, links, and other features that you want to include in the message. In the Design view, you can use a rich text editor to enter the content of the message body. You can use the formatting toolbar to apply formatting and add links and other features to the message body. To switch views, choose **HTML** or **Design** from the view selector above the message editor.

In the field below the message editor, optionally enter the content that you want to display in the body of messages that are sent to recipients whose email applications don't display HTML content.

8.

> **Note**
>
> You must set up an email orchestration sending role before you can use email headers. For more information, see Creating an email orchestration sending role in Amazon Pinpoint.

Under **Headers**, choose **Add new headers**, to add up to 15 headers for the email message. For a list of supported headers, see Amazon SES header fields in the Amazon Simple Email Service Developer Guide.

- For **Name**, enter the name of the header.
- For **Value**, enter the value of the header.

(Optional) To add a One-click unsubscribe link to a promotional email, add the following two headers:

1. Create a header with `List-Unsubscribe` for **Name** and set **Value** to your unsubscribe link. The link must support HTTP POST requests to process the recipients unsubscribe request.
2. Create a header with `List-Unsubscribe-Post` for **Name** and set **Value** to `List-Unsubscribe=One-Click`.

9. When you finish, choose **Send message**.

Sending a test push notification

To send a test push notification, you must use a project that has one or more push notification channels enabled. To learn how to create a new project and enable a push notification channel for it, see Creating an application and enabling push channels in the *AWS End User Messaging Push User Guide*.

After you enable one or more push notification channels for a project, you can send a test push notification through any of those channels.

To send a test push notification

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to send a test message for.
3. In the navigation pane, choose **Test messaging**.
4. On the **Test messaging** page, under **Channel**, choose **Push notifications**.
5. For **Destination type**, choose one of the following destinations for your message:

   - **Endpoint IDs** – Each destination is a unique ID that's assigned to an endpoint for the project.
   - **Device tokens** – Each destination is a token that's assigned to the instance of the app that you're messaging. For example, this value can be a device token that's assigned by the Apple Push Notification service (APNs) or a registration token that's assigned by Firebase Cloud Messaging (FCM).
6. Depending on your selection for **Destination type**, enter one or more **Endpoint IDs** or **Device tokens**. You can enter up to 15 values. Use commas to separate multiple values.

   If you use device tokens as the destination type, you should only specify tokens that are associated with a single push notification service. Amazon Pinpoint can send the message through only one push notification service at a time.

   If you use endpoint IDs as the destination type, this restriction doesn't apply. You can specify endpoints that use any push notification service.
7. For **Push notification service**, specify the push notification service that you want to send the message through. If you use endpoint IDs as the destination type, Amazon Pinpoint detects the service automatically.
8. For **Notification type**, specify the type of test message that you want to send:

   - **Standard message** – A push notification that has a title, a message body, and other content and settings. Recipients are alerted by their mobile devices when they receive the message.
   - **Raw message** – A push notification that specifies all of a notification's content and settings as a JSON object. This type of notification can be useful for cases such as sending custom data to an app for processing by that app, instead of the push notification service. If you choose this option, the message editor displays an outline of the code to use for the message. In the message editor, enter the settings that you want to use for each push notification service. Include any optional settings (such as images, sounds, and actions) that

you want to specify. For more information, see the documentation for the push notification services that you use. When you finish entering all the raw message content, skip to step 12.

9. Under **Message**, for **Message content**, choose whether you want to **Create a new message** or **Use an existing template**.

   If you choose to use an existing template, choose the template from the **Template** list. After you choose a template from the list, Amazon Pinpoint displays a preview of the active version of the template. (The active version is typically the version of a template that's been reviewed and approved for use, depending on your workflow.) When you finish choosing a template, skip to step 12.

   If you choose to create a new message, specify a **Title** and **Body** for the message.

10. For **Action**, select the action that you want to occur if the recipient taps the notification:

    - **Open app** – Your app launches, or it becomes the foreground app if it was sent to the background.
    - **Go to URL** – The default mobile browser on the recipient's device launches and opens a webpage at the URL that you specify. For example, this action is useful for sending users to a blog post.
    - **Open a deep link** – Your app opens and displays a designated user interface in the app. Deep linking is an iOS and Android feature. For example, this action is useful for directing users to special promotions for in-app purchases.

11. (Optional) In the **Media URLs** section, provide URLs that point to media files that you want to display in the message. The URLs must be publicly accessible so that push notification services can retrieve the files.
12. When you finish, choose **Send message**.

Sending a test SMS message

To send a test SMS message, you must use a project that has the SMS channel enabled. To learn how to create a new project and enable the SMS channel for it, see the section called “Setting up”. To learn how to enable the SMS channel for an existing project, see Managing the Amazon Pinpoint SMS channel.

To send a test SMS message

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.

2. On the **All projects** page, choose the project that you want to send a test message for.
3. In the navigation pane, choose **Test messaging**.
4. On the **Test messaging** page, under **Channel**, choose **SMS**.
5. For **Destination type**, choose one of the following destinations for your message:

   - **Phone numbers** – Each destination is a recipient's phone number.
   - **Endpoint IDs** – Each destination is a unique ID that's assigned to an endpoint for the project.

6. Depending on your selection for **Destination type**, enter one or more **Endpoint IDs** or **Phone numbers**. You can enter up to 15 values. Use commas to separate multiple values.

   If you use phone numbers as the destination type, specify each number in E.164 format. E.164 is a standard for the phone number structure that's used for international telecommunication. Phone numbers that follow this format typically have up to 15 digits, and they are prefixed with the plus character (+) and the country code. For example, a US phone number in E.164 format appears as +12065550100.

7. (Optional) For the **Origination phone number**, select a phone number to send the message from. This list contains all of the dedicated phone numbers that are associated with your account. If your account contains multiple dedicated phone numbers, and you don't choose an origination number, Amazon Pinpoint looks for a short code in your account; if it finds one, it uses that short code to send the message. If a short code isn't found in your account, then it looks for a 10DLC number (US recipients only), and then a toll-free number (US recipients only), and then a long code.
8. For **Message type**, choose one of the following:

   - **Promotional** – Noncritical messages, such as marketing messages. If you choose this option, Amazon Pinpoint optimizes the message delivery to incur the lowest cost.
   - **Transactional** – Critical messages that support customer transactions, such as one-time passwords for multi-factor authentication. If you choose this option, Amazon Pinpoint optimizes the message delivery to achieve the highest reliability.

   > **Note**
   >
   > This message-level setting overrides the default message type that you chose on the **Settings** page for the project.

9. Under **Message**, for **Message content**, choose whether you want to **Create a new message** or **Use an existing template**.

   If you choose to use an existing template, choose the template from the **Template** list. After you choose a template from the list, Amazon Pinpoint displays a preview of the active version of the template. (The active version is typically the version of a template that's been reviewed and approved for use, depending on your workflow.) When you finish choosing a template, skip to step 10.

   If you choose to create a new message, specify the content of the message in the **Message** field.

10. (Optional) For **Sender ID**, enter a custom ID that contains up to 11 alphanumeric characters, including at least one letter, and no spaces. The sender ID is displayed as the message sender on the recipient's device. For example, you can use your business brand to make the message source easier to recognize.

    Support for sender IDs varies by country and region. For more information, see Supported countries and regions (SMS channel) in the *AWS End User Messaging SMS User Guide*.

    This message-level sender ID overrides your default sender ID, which you chose on the **Settings** page for the project.

11. When you finish, choose **Send message**.

Amazon Pinpoint analytics

Using the analytics that Amazon Pinpoint provides, you can gain insight into your user base by viewing trends related to user engagement, campaign outreach, revenue, and more.

As users interact with your project, Amazon Pinpoint collects and stores analytics data for these interactions. You can view that data to learn about areas such as usage charts, revenue charts, and demographics charts. For example, if you have a mobile app, you can view charts and metrics that show how many users open your app each day, when users open your app, and the revenue that's generated by your app.

By viewing charts about device attributes, you can also learn which platforms and devices your app is installed on. To report these and other metrics for a mobile app, your app must be integrated with Amazon Pinpoint through one of the supported AWS Mobile SDKs. For more information, see Integrating Amazon Pinpoint with your app in the *Amazon Pinpoint Developer Guide*.

You can also monitor campaign charts to see how your campaigns are performing in aggregate and individually. For example, you can follow the total number of messages or push notifications that were sent, the percentage of messages or push notifications that users opened, opt-out rates, and other information. If you create a campaign that includes an A/B test, you can also use analytics to compare the effectiveness of the campaign treatments. For example, you can assess whether users are more likely to open your mobile app because they received a certain variation of a campaign message.

To analyze how many users are completing each step in a conversion process, such as purchasing an item or upgrading your app, you can create and monitor funnels.

To analyze or store analytics data outside Amazon Pinpoint, you can configure Amazon Pinpoint to stream the data to Amazon Kinesis.

Mobile and web app analytics settings

Use the **Mobile app analytics** and **Web app analytics** pages as guides to help you integrate and configure your mobile and web apps to send usage data to Amazon Pinpoint. This data includes metrics that can help you determine how your customers use your apps. For example, you can determine how many customers logged in to your app during the past 30 days, how many customers used a specific feature of your app, and the percentage of customers who accessed your

app by using a specific type of device. You can use this data to improve the usability of your apps and to increase customer engagement, satisfaction, and retention.

Chart reference for Amazon Pinpoint analytics

The **Analytics** pages on the Amazon Pinpoint console provide overviews of key metrics. They also provide dashboards that give details about campaigns, demographics, funnels, usage, revenue, and more. You can filter many of these dashboards by date for further analysis. You can also filter some of these dashboards by other attributes, such as event or channel attributes.

Topics

- Endpoints and users in Amazon Pinpoint analytics
- Exporting dashboards
- Overview charts
- Usage charts
- Revenue charts
- Events charts
- Demographics charts
- Campaign charts
- Transactional messaging charts

Endpoints and users in Amazon Pinpoint analytics

Some of the charts and metrics in these dashboards provide data about *endpoints*. Others provide data about *users*.

An *endpoint* is a destination that you can send messages to—such as a user's mobile device, email address, or phone number. Before you can see data about endpoints, your application must register endpoints with Amazon Pinpoint, or you must import your endpoint definitions into Amazon Pinpoint.

A *user* is an individual who has a unique user ID. This ID can be associated with one or more endpoints. For example, if a person uses your app on more than one device, your app could assign that person's user ID to the endpoint for each device. Before you can see data about users, your

application must assign user IDs to endpoints, or you must import endpoint definitions that include user IDs.

For information about registering endpoints and assigning user IDs within a mobile app, see Registering endpoints in your application in the *Amazon Pinpoint Developer Guide*. For information about registering endpoints and assigning user IDs for other types of applications, see Adding endpoints to Amazon Pinpoint in the *Amazon Pinpoint Developer Guide*. For information about importing endpoint definitions, see Importing segments.

Exporting dashboards

You can export data from the dashboards that appear on the **Analytics** pages of the Amazon Pinpoint console. When you export data from a dashboard, Amazon Pinpoint creates a .zip file that contains a comma-separated values (.csv) file with the data for each section of the dashboard. You can open these .csv files by using any modern spreadsheet or data analysis application.

To export data from a dashboard, choose a date range for the data (and other attributes, if applicable), and then choose **Download CSV**.

Overview charts

The **Analytics overview** page contains several charts and metrics that provide an overview of endpoint, usage, and campaign responses for your project. If you've sent transactional email messages for your project, this page also provides information about responses to those messages.

Viewing the analytics overview charts

Complete the following steps to view the charts and metrics on the **Analytics overview** page of the Amazon Pinpoint console. You can filter the data by date.

To view and filter the analytics overview charts and metrics

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to view analytics data for.
3. In the navigation pane, choose **Analytics**.
4. (Optional) To apply a filter that displays the data for a specific date or range of dates, use the date selector at the top of the page to choose the dates for the time period that you want. After you choose new dates, the page updates to show the data for the selected time period.

Chart descriptions

The **Analytics overview** page contains three sections: App analytics, Campaign analytics, and Transactional email.

App analytics

The **App analytics** section contains some of the most commonly used metrics that are related to your app or project.

Daily active endpoints

Shows the number of endpoints that opened your app at least once in a 24-hour period for each day in the selected time period. This chart also provides the average number of daily active endpoints for the entire time period, and the percentage change in the number of daily active endpoints from the beginning to the end of the time period. If your app or project contains a high number of endpoints, there might be a delay of up to six hours for Amazon Pinpoint to display this data.

Monthly active endpoints

Shows the number of endpoints that opened your app at least once in the previous 30 days for each day in the selected time period. This chart also provides the average number of monthly active endpoints for the entire time period, and the percentage change in the number of monthly active endpoints from the beginning to the end of the time period. If your app or project contains a high number of endpoints, there might be a delay of up to six hours for Amazon Pinpoint to display this data.

New endpoints

Shows the number of endpoints that were registered with Amazon Pinpoint for the first time, for each day in the selected time period. This chart also provides the average number of new endpoints for the entire time period, and the percentage change in the number of new endpoints from the beginning to the end of the time period.

7-day retention rate

Shows the percentage of users who opened your app less than 8 days ago, and then opened it again at some point during the following 7 days. This chart also provides the average 7-day retention rate for the entire time period, the average daily retention rate for the time period, and the percentage change in the rate from the beginning to the end of the time period.

Sessions

Shows the total number of times that your app was opened each day in the selected time period. This chart also provides the average number of daily sessions for the entire time period, and the percentage change in the number of sessions from the beginning to the end of the time period.

Revenue

Shows the revenue, in USD, that was reported by your app for each day in the selected time period. This chart also provides the total revenue for the entire time period, and the percentage change in the amount of revenue from the beginning to the end of the time period.

Campaign analytics

The **Campaign analytics** section contains several important metrics that can help you understand the success of your campaigns. The metrics in this section provide aggregated metrics for all the campaigns in the current project.

Active targetable endpoints

Shows the number of endpoints that currently have a status of *active* for the project and are opted in to receive messages from you through at least one channel, and the number of active targetable endpoints for each channel—for example, push notifications, email, and SMS.

Campaigns

Shows information about the campaigns that were active during the selected time period. This section includes the following information:

Active campaigns

The number of campaigns that are currently active.

Messages delivered

The number of messages that were delivered to their intended recipients. Amazon Pinpoint calculates this number by subtracting the number of messages that bounced from the number of messages that you sent.

Delivery rate

The percentage of targeted endpoints that received messages from you. Amazon Pinpoint calculates this rate by dividing the number of messages that were delivered to their intended recipients by the total number of messages that you sent.

Opt-out rate

The percentage of users who opted out after receiving messages from you. Amazon Pinpoint calculates this rate by determining the number of recipients who received your messages and opted out, and dividing that number by the number of recipients who were active during the selected time period. (The recipient might have opted out by clicking an unsubscribe link in an email, or by replying to an SMS message with the keyword ST0P). If a single recipient opted out multiple times, the recipient is counted only once.

Email open rate

The percentage of recipients who opened messages from you. Amazon Pinpoint calculates this rate by dividing the number of email messages that were sent and opened by their recipients by the number of messages that were received by their recipients.

Push open rate

The percentage of push notifications that were opened by recipients. Amazon Pinpoint calculates this rate by dividing the number of recipients who opened push notifications from you by the number of push notifications that were received by their recipients.

Endpoint deliveries

The average number of unique endpoints that received messages from you on each day of the selected time period. The chart shows the number of unique endpoints that received messages from you, for each day in the selected time period.

Transactional email

The **Transactional email** section contains a chart and metrics that provide information about responses to all the transactional email messages that you sent during the selected time period. Note that this section doesn't include information about messages that you sent from campaigns or transactional messages that you sent through other types of channels. In addition, it can take up to two hours for new data to appear in this section.

Sent

The number of transactional messages that were sent:

- Average – The average number of messages that were sent each day of the selected time period.
- Total – The total number of messages that were sent during the selected time period.
- Change over period – The percentage of change between the number of messages that were sent on the first and last days of the selected time period. If this value is an em dash (—), no transactional email messages were sent on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

Delivered

The number of transactional messages that were delivered to their intended recipients:

- Average – The average number of messages that were delivered each day of the selected time period.
- Total – The total number of messages that were delivered during the selected time period.
- Change over period – The percentage of change between the number of messages that were delivered on the first and last days of the selected time period. If this value is an em dash (—), no transactional email messages were delivered on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

Opened

The number of transactional messages that were opened by recipients:

- Average – The average number of messages that were opened each day of the selected time period.
- Total – The total number of messages that were opened during the selected time period.
- Change over period – The percentage of change between the number of messages that were opened on the first and last days of the selected time period. If this value is an em dash (—), no transactional email messages were opened on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

Clicked

The number of times that recipients clicked links in transactional messages:

- Average – The average number of clicks that occurred each day of the selected time period.
- Total – The total number of clicks that occurred during the selected time period.
- Change over period – The percentage of change between the number of clicks that occurred on the first and last days of the selected time period. If this value is an em dash (—), no clicks occurred on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

If a message recipient clicks multiple links in a message or clicks the same link more than once, those clicks will be counted as one click if they occur within the same hour. Multiple clicks taking place at different hours will be counted as separate clicks. For example, if a link is clicked at 8:30 AM and 8:45 AM, it will count as one click but if the link is clicked at 8:30 AM and 9:05 AM, it will count as two clicks because the hour has changed.

Usage charts

The **Usage** page includes charts and metrics that show how often your app is being used and how successfully it retains user interest over time.

> **Note**
>
> Some of the charts and metrics on the **Usage** page refer to *endpoints*, while others refer to *users*. For information about the difference between users and endpoints, see Endpoints and users in Amazon Pinpoint analytics.

Viewing the usage charts

Complete the following steps to view the **Usage** charts and metrics on the Amazon Pinpoint console. You can filter the data by date and by endpoint attributes.

To view and filter the usage charts and metrics

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to view usage data for.
3. In the navigation pane, under **Analytics**, choose **Usage**.

4. (Optional) To apply a filter that displays the data for a specific date or range of dates, use the date selector at the top of the page to choose the dates for the time period that you want. After you choose new dates, the page updates to show the data for the selected time period.
5. (Optional) To apply a filter that displays data for only those users or endpoints that have specific attributes, expand the **Filters** section. Choose an attribute from the **Endpoint Attributes** list. After you choose an attribute, choose an attribute value from the **Endpoint Attribute Values** list. Then choose **View charts** to see the updated metrics.

   > **Note**
   >
   > We hide this filter if you haven't used it in the past 90 days.
   > If the **Filters** section shows a message stating that the filter is unavailable, choose **More information**, and then choose **Enable filters**. When you do, we restore the filter for your account in the current AWS Region. Depending on the amount of data that's associated with your account, this process can take up to 72 hours to complete.

   To further filter the data, repeat this step for each additional attribute and attribute value that you want to filter the data by.

Chart descriptions

The **Usage** page contains three sections: User metrics, Session metrics, and Authentication metrics.

User metrics

The **User metrics** section provides information about how users and endpoints interact with your application. These charts and metrics help you better understand user retention—that is, the likelihood that a customer who used your application in the past will use it again at a later time.

> **Note**
>
> The following metrics can be affected by API operations that impact endpoints: **Daily active endpoints**, **Monthly active endpoints**, **Daily active users**, **Monthly active users**. For example, if you use the `UpdateEndpoint` or `PutEvents` API operations to modify endpoints, metrics such as **Daily active users** could indicate higher counts than **Daily sessions**.

For information about the difference between users and endpoints, see Endpoints and users in Amazon Pinpoint analytics.

Daily active endpoints

Shows the number of endpoints that opened your application for each day in the selected time period. This chart also provides the average number of daily active endpoints for the entire time period, and the percentage change in the number of daily active endpoints from the beginning to the end of the time period. If your app or project contains a high number of endpoints, there might be a delay of up to six hours for Amazon Pinpoint to display this data.

Monthly active endpoints

Shows the number of endpoints that opened your application at some point in the preceding 30 days for each day in the selected time period. This chart also provides the average number of monthly active endpoints for the entire time period, and the percentage change in the number of monthly active endpoints from the beginning to the end of the time period. If your app or project contains a high number of endpoints, there might be a delay of up to six hours for Amazon Pinpoint to display this data.

New endpoints

Shows the number of endpoints that were registered with Amazon Pinpoint for the first time for each day in the selected time period. This chart also provides the average number of new endpoints for the entire time period, and the percentage change in the number of new endpoints from the beginning to the end of the time period.

Daily active users

Shows the number of users that opened your application for each day in the selected time period. This chart also provides the average number of daily active users for the entire time period, and the percentage change in the number of daily active users from the beginning to the end of the time period.

Monthly active users

Shows the number of users that opened your application at some point in the preceding 30 days for each day in the selected time period. This chart also provides the average number of monthly active users for the entire time period, and the percentage change in the number of monthly active users from the beginning to the end of the time period.

New users

Shows the number of new user IDs that were created in Amazon Pinpoint for each day in the selected time period. This chart also provides the average number of new users for the entire time period, and the percentage change in the number of new users from the beginning to the end of the time period.

7-day retention rate

Shows the percentage of users who opened your app less than 8 days ago, and then opened it again at some point during the following 7 days. This chart also provides the average daily retention rate for the entire time period, the average daily retention rate for the time period, and the percentage change in the rate from the beginning to the end of the time period.

Sticky factor

Shows the portion of monthly active endpoints that were active on each day of the selected time period. For example, a sticky factor of 0.25 indicates that 25% of active endpoints from the previous 30 days were active on the chosen day. This chart also shows the average sticky factor for the entire time period, and the percentage change in the sticky factor rate from the beginning to the end of the time period. If your app or project contains a high number of endpoints, there might be a delay of up to six hours for Amazon Pinpoint to display this data.

Session metrics

The **Session metrics** section provides information about how often your app was opened. These metrics can help you better understand how often individual customers use your app, and the days and times that they're most likely to use your app.

Sessions

Shows the number of times your app was opened for each day in the selected time period. This chart also provides the average number of sessions for the entire time period, and the percentage change in the number of sessions from the beginning to the end of the time period.

Sessions per endpoint

Shows the number of sessions for each endpoint. Amazon Pinpoint calculates this number by dividing the number of sessions in the time period by the number of unique endpoints that opened your app in the time period. This chart also provides the average number of sessions per endpoint for the entire time period, and the percentage change in the number of sessions per endpoint from the beginning to the end of the time period.

Sessions per user

Shows the number of sessions for each user. Amazon Pinpoint calculates this number by dividing the number of sessions in the time period by the number of unique users who opened your app in the time period. This chart also provides the average number of sessions per user for the entire time period, and the percentage change in the number of sessions per user from the beginning to the end of the time period.

Session heat map

Shows the days and times when endpoints opened your app. The times in this chart reflect each endpoint's local time. Darker rectangles in this chart indicate larger numbers of endpoints opening your app.

Authentication metrics

The **Authentication metrics** section provides information about how often existing users sign in to your app, and how often new users sign up for your app. These charts are useful for tracking the success of user acquisition programs, or the success of campaigns that attempt to draw disengaged users back to your app, for example.

Sign-ins

Shows the number of times that users signed in to your app for each day in the selected time period. This chart also provides the average number of sign-ins for the entire time period, and the percentage change in the number of sign-ins from the beginning to the end of the time period.

Sign-ups

Shows the number of times that users created new accounts for your app for each day in the selected time period. This chart also provides the average number of sign-ups for the entire time period, and the percentage change in the number of sign-ups from the beginning to the end of the time period.

Authentication failures

Shows the number of times that users attempted to sign in but were unable to do so for each day in the selected time period. This chart also provides the average number of authentication failures for the entire time period, and the percentage change in the number of authentication failures from the beginning to the end of the time period.

Revenue charts

The charts and metrics on the **Revenue** page provide details about user purchase activity and the revenue that's generated by your app.

> **Note**
>
> Some of the charts and metrics on the **Revenue** page refer to *endpoints*, while others refer to *users*. For information about the difference between users and endpoints, see Endpoints and users in Amazon Pinpoint analytics.

To report revenue and other metrics for a mobile app, your app must be integrated with Amazon Pinpoint through one of the supported AWS Mobile SDKs. For more information, see Integrating Amazon Pinpoint with your application in the *Amazon Pinpoint Developer Guide*.

Viewing the revenue charts

Complete the following steps to view the **Revenue** charts and metrics on the Amazon Pinpoint console. You can filter the data by date and by endpoint attributes.

To view and filter the revenue charts and metrics

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to view revenue data for.
3. In the navigation pane, under **Analytics**, choose **Revenue**.
4. (Optional) To apply a filter that displays the data for a specific date or range of dates, use the date selector at the top of the page to choose the dates for the time period that you want. After you choose new dates, the page updates to show the data for the selected time period.
5. (Optional) To apply a filter that displays data for only those endpoints that have specific attributes, expand the **Filters** section. Choose an attribute from the **Endpoint Attributes** list. After you choose an attribute, choose an attribute value from the **Endpoint Attribute Values** list. Then choose **View charts** to see the updated metrics.

   > **Note**
   >
   > We hide this filter if you haven't used it in the past 90 days.

If the **Filters** section shows a message stating that the filter is unavailable, choose **More information**, and then choose **Enable filters**. When you do, we restore the filter for your account in the current AWS Region. Depending on the amount of data that's associated with your account, this process can take up to 72 hours to complete.

To further filter the data, repeat this step for each additional attribute and attribute value that you want to filter the data by.

Chart descriptions

The **Revenue** page contains the following sections:

Revenue

Shows the amount of money, in USD, spent within your app by all users for each day in the selected time period. This chart also provides the average amount of revenue that was generated by the app for the entire time period, and the percentage change in the amount of revenue from the beginning to the end of the time period.

Revenue per endpoint

Shows the average amount of money that was spent within your app by each endpoint for each day in the selected time period. Amazon Pinpoint calculates this number by dividing the amount of revenue generated during the selected time period by the number of users who opened the app in that time period. This chart also provides the average amount of revenue per endpoint for the entire time period, and the percentage change in the amount of revenue per endpoint from the beginning to the end of the time period.

Paying users

Shows the number of unique users who made at least one purchase for each day in the selected time period. This chart also provides the total number of paying users, the average number of paying users, and the percentage change in the number of paying users from the beginning to the end of the time period.

Revenue per paying user

Shows the amount of money that was spent by each paying user. Amazon Pinpoint calculates this number by dividing the amount of revenue generated each day in the selected time period by the number of unique users who made at least one purchase during that day. This chart also

provides the average amount of revenue per paying user for the entire time period, and the percentage change in the amount of revenue per paying user from the beginning to the end of the time period.

Units sold

Shows the total number of items that were purchased in your app for each day in the selected time period. This chart also provides the total number of units sold, the average number of units sold per day, and the percentage change in the number of units sold from the beginning to the end of the analysis period.

Units sold per endpoint

Shows the daily average number of items that were purchased by each endpoint. Amazon Pinpoint calculates this number by dividing the number of units sold each day by the number of endpoints that were active during the selected time period. This chart also provides the average number of units that were sold per endpoint for the entire time period, and the percentage change in the number of units sold per endpoint from the beginning to the end of the analysis period.

Purchases

Shows the number of purchases that were made in your app for each day in the selected time period. This chart also provides the total number of purchases made in the time period, and the percentage change in the number of purchases from the beginning to the end of the analysis period.

Purchases per endpoint

Shows the daily average number of purchases per endpoint for each day in the selected time period. Amazon Pinpoint calculates this number by dividing **Purchases** by the number of endpoints that made a purchase for each day in the analysis period. This chart also provides the average number of purchases per endpoint for the entire time period, and the percentage change in the number of units sold per endpoint from the beginning to the end of the analysis period.

Events charts

The charts and metrics on the **Events** page help you see trends by displaying data for one or more types of events and event attributes. You can filter the data on the page to show any event that your application reports to Amazon Pinpoint.

Viewing the events charts

Complete the following steps to view the **Events** charts and metrics on the Amazon Pinpoint console. You can filter the data by date, event, and endpoint attributes.

To view and filter the events charts and metrics

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to view event data for.
3. In the navigation pane, under **Analytics**, choose **Events**.
4. (Optional) To apply a filter that displays the data for a specific date or range of dates, use the date selector at the top of the page to choose the dates for the time period that you want. After you choose new dates, the page updates to show the data for the selected time period.
5. (Optional) To apply additional filters, expand the **Filters** section.

   > **Note**
   >
   > We hide these filters if you haven't used them in the past 90 days.
   > If the **Filters** section shows a message stating that the filters are unavailable, choose **More information**, and then choose **Enable filters**. When you do, we restore the filters for your account in the current AWS Region. Depending on the amount of data that's associated with your account, this process can take up to 72 hours to complete.

   If the additional filters are available, do any of the following:

   - To apply a filter that displays the data for only a specific type of event, choose the event type from the **Event** list. After you choose an event type, choose event attributes or metrics and a value from the **Event Attributes and Metrics** and **Event Attribute Values** lists.

     The **Event** list displays the types of events that your app reported during the past 14 days. If your app didn't report any events during that time period, only the **All event types** option is available and you can't filter the data by a specific type of event.
   - To apply a filter that displays data for only those endpoints that have a specific attribute, choose the attribute from the **Endpoint Attributes** list. After you choose an attribute, choose an attribute value from the **Endpoint Attribute Values** list. Then choose **View charts** to see the updated metrics.

To further filter the data, repeat this step for each additional event or attribute that you want to filter the data by.

> **Note**
>
> If your app or project contains a high number of endpoints, there might be a delay of up to six hours for Amazon Pinpoint to display this data.

Chart descriptions

The **Events** page includes the following sections:

Event count

This chart displays the number of events that were reported by your app for each day in the selected time period. This chart also provides the average number of events per day, the total number of events in the time period, and the percentage change in the number of events from the beginning to the end of the time period.

Endpoint count

This chart displays the number of endpoints that reported the selected event for each day in the selected time period. This chart also provides the average number of endpoints that reported the event each day, the total number of endpoints that reported the event each day, and the percentage change in the number of endpoints that reported the event from the beginning to the end of the time period.

Events per session

This chart displays the average number of events that occurred in each app session for each day in the selected time period. Amazon Pinpoint calculates this metric by dividing the number of times the selected event occurred each day by the number of sessions that occurred that day.

This chart also provides the average number of events per session for the entire time period, and the percentage change in the number of events per session from the beginning to the end of the time period.

Demographics charts

The charts on the **Demographics** page help you understand the characteristics of your customers and the devices that they use to access your app. If you've configured your app to report custom metrics to Amazon Pinpoint, this page shows the data for those metrics.

Viewing the demographics charts

Complete the following steps to view the **Demographics** charts on the Amazon Pinpoint console. You can filter the data by channel.

To view and filter the demographics charts

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to view demographic data for.
3. In the navigation pane, under **Analytics**, choose **Demographics**.
4. (Optional) To apply a filter that displays the data for only a specific channel, choose **All channels**, and then choose a channel.

Chart descriptions

The **Demographics** page includes the following sections:

Platform

Shows the proportion of users who use your app on various platforms.

App version

Shows the proportion of users who use various versions of your app.

Device model

Shows the proportion of users who use your app on various device models, such as iPhone or Galaxy S9.

Device make

Shows the proportion of users who use your app on various makes of devices, such as Apple or Samsung.

User location

Shows the countries where users of your app are located.

Custom attributes

Shows the values for each custom attribute that's reported by your app.

Campaign charts

The charts and metrics on the **Campaigns** page provide information about all the campaigns for a project. You can also choose a specific campaign to view additional delivery and engagement metrics for that campaign.

Viewing the campaign charts

Complete the following steps to view the **Campaigns** charts and metrics on the Amazon Pinpoint console. You can filter the data by date.

To view and filter the campaigns charts and metrics

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to view campaign data for.
3. In the navigation pane, under **Analytics**, choose **Campaigns**.
4. (Optional) To apply a filter that displays the data for a specific date or range of dates, use the date selector at the top of the page to choose the dates for the time period that you want. After you choose new dates, the page updates to show the data for the selected time period.

Chart descriptions

The **Campaigns** page includes sections that provide aggregated charts and metrics for all the campaigns that were active during the selected time period. It also includes a table that lists all of those campaigns. When you choose a specific campaign from the table, you see a new set of charts and metrics with data that's specific to that campaign.

Aggregated campaign metrics

The **Campaigns** page includes the following charts and metrics, which are aggregated across all the campaigns that were active during the selected time period.

Active targetable endpoints

Shows the total number of *targetable endpoints*. A targetable endpoint is an endpoint that currently has a status of *active* for the project and is opted in to receiving messages from you through at least one channel. This section displays the total number of active targetable endpoints across all channels, and the number of active targetable endpoints for each channel—for example, push notifications, email, and SMS.

Campaigns

Shows the total number of campaigns that are currently active. For the selected time period, this section also shows the number of endpoints that received messages from you, and the delivery, open, and opt-out rates for those messages. The **Endpoint deliveries** area shows the number of unique endpoints that received messages from the campaigns.

Metrics for individual campaigns

When you select a campaign from the table of campaigns, you see charts and metrics that are specific to that campaign. The charts and metrics that you see depend on the type of channel that the campaign used.

> **Note**
>
> If you select an A/B test campaign, you see the charts and metrics listed in the following sections for each treatment. Using this report, you can compare the effectiveness of various treatments for a campaign.

Email campaigns

When you select a standard campaign that uses the email channel, you see the following charts and metrics.

Delivery count metrics

This section provides the following charts and metrics that relate to the number of messages that were sent and delivered for this campaign:

Messages sent

The number of messages that were sent.

Messages delivered

The number of messages that were delivered to their intended recipients. Amazon Pinpoint calculates this number by subtracting the number of messages that hard bounced from the number of messages that were sent.

Links clicked

If a message recipient clicks multiple links in a message or clicks the same link more than once, those clicks will be counted as one click if they occur within the same hour. Multiple clicks taking place at different hours will be counted as separate clicks. For example, if a link is clicked at 8:30 AM and 8:45 AM, it will count as one click but if the link is clicked at 8:30 AM and 9:05 AM, it will count as two clicks because the hour has changed.

Endpoint deliveries

The average number of unique email endpoints that the message was delivered to on each day. The chart shows the number of unique email endpoints that the message was delivered to, for each day in the selected time period.

Delivery rate metrics

This section provides the following metrics that relate to the delivery of messages from this campaign:

Delivery rate

The percentage of messages that were delivered to their intended recipients. Amazon Pinpoint calculates this rate by dividing the number of messages that were delivered by the number of messages that were sent.

Email open rate

The percentage of messages that were opened by their intended recipients. Amazon Pinpoint calculates this rate by dividing the number of messages that were opened by the number of messages that were delivered.

Bounce rate

The percentage of messages that couldn't be delivered to their intended recipients. This metric only measures *hard bounces*—that is, messages in which the recipient's email address had a permanent issue that prevented the message from being delivered. Amazon Pinpoint calculates this rate by dividing the number of bounced messages by the number of messages sent.

Campaign runs

This section provides the following metrics that relate to the timing and delivery of your messages each time this campaign ran:

Run date

The date and time when the campaign run was sent.

Endpoints targeted

The number of unique endpoints that you attempted to send the message to as part of the campaign run.

Messages sent

The number of messages that were sent during the campaign run. This number might differ from the number of endpoints targeted if the targeted segment included email addresses that were formatted incorrectly or were known to produce hard bounces. This number also omits endpoints that opted out.

Messages delivered

The number of messages that were sent from the campaign run and delivered to their intended recipients.

Delivery rate

The percentage of messages that were sent from the campaign run and delivered to their intended recipients. Amazon Pinpoint calculates this rate by dividing **Messages delivered** by **Messages sent**.

Total email opened

The number of messages that were sent from the campaign run and opened by their intended recipients. Due to technical limitations, this value only includes recipients who opened the message by using an email client that supports images.

Email open rate

The percentage of messages that were sent from the campaign run and opened by their intended recipients. Amazon Pinpoint calculates this rate by dividing **Total email opened** by **Messages delivered**.

Bounce rate

The percentage of messages that were sent from the campaign run and couldn't be delivered to their intended recipients. This metric measures only hard bounces. Amazon Pinpoint calculates this rate by dividing the number of messages that bounced during the campaign run by **Messages delivered**.

Push notification campaigns

When you select a standard campaign that sends push notifications, you see the following charts and metrics.

Campaign delivery counts

This section provides the following charts and metrics that relate to the number of push notifications that were sent and delivered for this campaign:

Messages sent

The number of push notifications that were sent.

Messages delivered

The number of push notifications that were delivered to their intended recipients. Amazon Pinpoint calculates this number by subtracting the number of notifications that couldn't be delivered from the total number of notifications that you sent.

Endpoint deliveries

The average number of unique push-notification endpoints that the message was delivered to on each day. The chart shows the number of unique push-notification endpoints that the message was delivered to, for each day in the selected time period.

Campaign engagement rates

This section provides the following charts and metrics that relate to delivery and engagement rates for the push notifications that were sent by this campaign:

Delivery rate

The percentage of push notifications that were delivered to their intended recipients. Amazon Pinpoint calculates this rate by dividing the number of push notifications that were delivered by the number of push notifications that were sent.

Push open rate

The percentage of push notifications that were opened by their intended recipients. Amazon Pinpoint calculates this rate by dividing the number of recipients who opened push notifications from you by the number of push notifications that were delivered to their intended recipients.

Campaign sessions

This section provides the following charts and metrics that relate to the number of times that your app was opened by unique endpoints within 24 hours of receiving a push notification from this campaign:

Total sessions

The number of times that your app was opened by endpoints during the selected time period.

Sessions per endpoint

Shows the number of times that your app was opened by unique endpoints within 24 hours of receiving the push notification from the campaign, for each day in the selected time period.

Campaign session heat map

Shows the days and times when users opened your app after receiving the push notification from the campaign. Darker rectangles represent greater numbers of users. Times are based on each user's local time zone.

Campaign units sold

This section provides the following charts and metrics that relate to the number of units that were purchased by unique endpoints within 24 hours of receiving a push notification from this campaign:

Total units sold

The number of units that were purchased by endpoints during the selected time period.

Units sold per endpoint

Shows the number of purchases that were made by unique endpoints within 24 hours of receiving the push notification from the campaign, for each day in the analysis period.

Campaign runs

This section provides the following metrics that relate to the timing and delivery of your push notifications each time this campaign ran:

Run date

The date and time when the campaign run was sent.

Endpoints targeted

The number of unique endpoints that you attempted to send the push notification to as part of the campaign run.

Messages sent

The number of push notifications that were sent during the campaign run. This number might differ from the number of endpoints targeted, if the targeted segment included invalid tokens or endpoints that opted out.

Messages delivered

The number of push notifications that were sent from the campaign run and were delivered to their intended recipients.

Delivery rate

The percentage of push notifications that were sent from the campaign run and delivered to their intended recipients. Amazon Pinpoint calculates this rate by dividing **Messages delivered** by **Messages sent**.

Total push opened

The number of push notifications that were sent from the campaign run and opened by their intended recipients.

Push open rate

The percentage of push notifications that were sent from the campaign run and opened by their intended recipients. Amazon Pinpoint calculates this rate by dividing **Total push opened** by **Messages delivered**.

SMS campaigns

When you select a standard campaign that uses the SMS channel, you see the following charts and metrics.

Delivery metrics

This section provides the following metrics that relate to the delivery of messages from this campaign:

Messages sent

The number of messages that were sent.

Messages delivered

The number of messages that were delivered to their intended recipients. Amazon Pinpoint calculates this number by subtracting the number of messages that couldn't be delivered from the number of messages that were sent.

Delivery rate

The percentage of messages that were delivered to their intended recipients. Amazon Pinpoint calculates this rate by dividing the number of messages that were delivered by the number of messages that were sent.

Endpoint deliveries

The average number of unique SMS endpoints that the message was delivered to on each day. The chart shows the number of unique SMS endpoints that the message was delivered to, for each day in the selected time period.

SMS spend

This section shows the total number of SMS message parts that you sent for the campaign during the selected time period. It also shows the total and average amount of money, in USD, that you spent sending those message parts.

A *message part* is a portion of an SMS message. If an SMS message contains more than the maximum number of characters that are allowed by mobile phone carriers, Amazon Pinpoint automatically splits the message into multiple message parts, and sends each message part to the recipient.

Campaign runs

This section provides the following metrics that relate to the timing and delivery of your messages each time this campaign ran:

Run date

The date and time when the campaign run was sent.

Endpoints targeted

The number of unique endpoints that you attempted to send the message to as part of the campaign run.

Messages sent

The number of messages that were sent during the campaign run. This number might differ from the number of endpoints targeted if the targeted segment included invalid phone numbers or endpoints that opted out.

Message parts sent

The number of message parts that were sent during the campaign run. This number might differ from the number of messages sent. This is the case if the campaign message contained more than the maximum number of characters that are allowed by mobile phone carriers.

Messages delivered

The number of messages that were sent from the campaign run and were delivered to their intended recipients.

Delivery rate

The percentage of messages that were sent from the campaign run and were delivered to their intended recipients. Amazon Pinpoint calculates this rate by dividing **Messages delivered** by **Messages sent**.

Transactional messaging charts

The **Transactional messaging** page provides charts and metrics that show how many transactional messages that you've sent, and helps you measure recipients' responses to those messages. For example, this page shows the number of transactional email messages that were delivered, opened, clicked, bounced, or reported as spam.

> **Note**
>
> The data on this page only includes information about transactional messages. It doesn't include information about messages that you sent by using campaigns. To see the data for messages that were sent by campaigns, use the Campaigns charts. In addition, it can take up to two hours for new data to appear on this page.

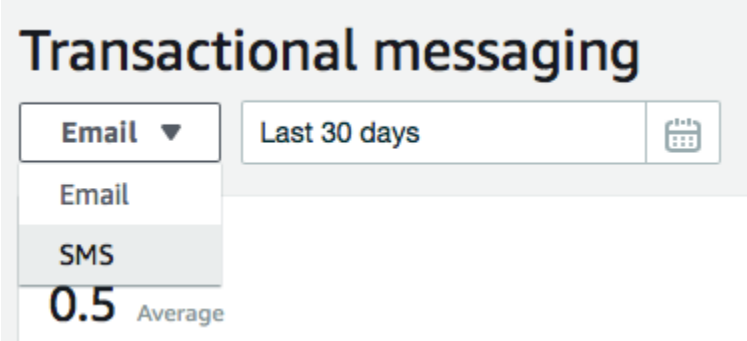
> **Important**
>
> KPI calculations are performed on hourly partitioned data due to the volume of events. Under certain circumstances, events that are close to the beginning or end of an hour can be written into the previous or next hour partition. This can cause KPIs to be off by around one percent.

Viewing the transactional messaging charts

Complete the following steps to view the **Transactional messaging** charts and metrics on the Amazon Pinpoint console. You can filter the data by channel and by date.

To view and filter the transactional messaging charts and metrics

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to view transactional messaging data for.
3. In the navigation pane, under **Analytics**, choose **Transactional messaging**.
4. Use the menu at the top of the page to choose whether to display data for transactional **Email** or **SMS** messages, as shown in the following image:



5. (Optional) To apply a filter that displays the data for a specific date or range of dates, use the date selector at the top of the page to choose the dates for the time period that you want. After you choose new dates, the page updates to show the data for the selected time period.

Chart descriptions

The **Transactional messaging** page contains several charts and metrics that provide information about how recipients have responded to the transactional email and SMS messages that you sent during the selected time period.

For SMS messages, this page also provides information about the number and price of the message parts that you sent. A *message part* is a portion of an SMS message. If an SMS message contains more than the maximum number of characters that are allowed by mobile phone carriers, Amazon Pinpoint automatically splits the message into multiple message parts. Each message part contains some additional information about the part of the message that came before it. When a recipient's device receives messages that are separated in this way, it uses this additional information to join the incoming message parts into one message.

Transactional SMS charts

When you use the channel selector to display the data for transactional SMS messages, you see the following charts and metrics:

Messages sent

Shows the number of messages that you sent:

- Average – The average number of messages that were sent each day of the selected time period.
- Total – The total number of messages that were sent during the selected time period.
- Change over period – The percentage of change between the number of messages that were sent on the first and last days of the selected time period. If this value is an em dash (—), no messages were sent on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

The chart shows the total number of messages that were sent on each day of the selected time period.

Message parts sent

Shows the number of message parts that you sent:

- Average – The average number of message parts that were sent each day of the selected time period.
- Total – The total number of message parts that were sent during the selected time period.

- Change over period – The percentage of change between the number of message parts that were sent on the first and last days of the selected time period. If this value is an em dash (—), no message parts were sent on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

The chart shows the total number of message parts that were sent on each day of the selected time period.

Deliveries

Shows the number of messages that were delivered to recipients:

- Average – The average number of messages that were delivered each day of the selected time period.
- Total – The total number of messages that were delivered during the selected time period.
- Change over period – The percentage of change between the number of messages that were delivered on the first and last days of the selected time period. If this value is an em dash (—), no messages were delivered on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

The chart shows the total number of messages that were delivered on each day of the selected time period.

There are several factors that could cause these values to differ from the average and total number of messages that were sent. For example, if you send an SMS message to a phone number that doesn't exist, it is counted as sent, but not delivered.

Delivery rate

Shows the average percentage of messages that were sent and delivered to recipients during the selected time period. Amazon Pinpoint calculates the average delivery rate by first calculating the daily delivery rate for each day of the time period. (The daily delivery rate is the number of messages that were delivered on a certain day divided by the number of messages that were sent on that day.) Amazon Pinpoint then calculates the sum of the daily delivery rates, and divides the sum by the number of days in the time period.

This section also shows the percentage of change between the daily delivery rates for the first and last days of the selected time period. If this value is an em dash (—), no messages were delivered on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero percent (0%) for the first day of the time period.

The chart shows the delivery rate for each day of the selected time period.

Messages by country or region

Lists all the countries that you sent messages to during the selected time period. For each country, this table shows the number of messages that you sent to recipients in that country (**Messages sent**), the number of message parts that you sent to recipients in that country (**Message parts sent**), the number of messages that were delivered to recipients in that country (**Messages delivered**), and the average price that you paid for each message part that you sent to a recipient in that country (**Average price per part**).

Message delivery errors

Shows the number of errors that occurred because of the messages that you sent during the selected time period. To view a list of all the types of errors that occurred, expand the **Show all SMS errors** section. For each error, this section shows the number of times that the error occurred during the selected time period (**Total over period**), the average number of times that the error occurred for each day (**Average over period**), and the percentage of change between the number of errors that occurred on the first and last days of the time period (**Change over period**).

Transactional email charts

When you use the channel selector to view the data for transactional email messages, you see the following charts and metrics:

Sends

Shows the number of messages that were sent:

- Average – The average number of messages that were sent each day of the selected time period.
- Total – The total number of messages that were sent during the selected time period.
- Change over period – The percentage of change between the number of messages that were sent on the first and last days of the selected time period. If this value is an em dash (—), no messages were sent on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

The chart shows the total number of messages that were sent on each day of the selected time period.

Deliveries

Shows the number of messages that were delivered to recipients:

- Average – The average number of messages that were delivered each day of the selected time period.
- Total – The total number of messages that were delivered during the selected time period.
- Change over period – The percentage of change between the number of messages that were delivered on the first and last days of the selected time period. If this value is an em dash (—), no messages were delivered on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

The chart shows the total number of messages that were delivered on each day of the selected time period.

There are several factors that could cause these values to differ from the average and total number of messages that were sent. For example, if a message bounces, it is counted as sent, but not delivered.

Opens

Shows the number of messages that were opened by recipients:

- Average – The average number of messages that were opened each day, of the messages sent during the selected time period.
- Total – The total number of messages that were opened, of the messages sent during the selected time period.
- Change over period – The percentage of change between the number of messages that were opened on the first and last days of the selected time period. If this value is an em dash (—), no messages were opened on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

The chart shows the total number of messages that were opened on each day of the selected time period.

Amazon Pinpoint adds a very small, transparent image to the end of each transactional message that you send. When a recipient opens a message that contains one of these images, their email client downloads the image from our servers. If a message is opened once or opened multiple times within the same hour, it will be counted as one open. Multiple opens taking place

at different hours will be counted as separate opens. For example, if a message is opened at 8:30 AM and 8:45 AM, it will count as one open but if the messaged is opened at 8:30 AM and 9:05 AM, it will count as two opens because the hour has changed.

Clicks

Shows the number of times that recipients clicked links in the messages:

- Average – The average number of clicks that occurred each day of the selected time period.
- Total – The total number of clicks that occurred during the selected time period.
- Change over period – The percentage of change between the number of clicks that occurred on the first and last days of the selected time period. If this value is an em dash (—), no clicks occurred on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

The chart shows the total number of clicks that occurred on each day of the selected time period.

When you send a message that contains links, Amazon Pinpoint replaces those links with links that refer to our servers. When a recipient clicks one of these links, we redirect the recipient to the intended location, and count the click. If a message recipient clicks multiple links in a message or clicks the same link more than once, those clicks will be counted as one click if they occur within the same hour. Multiple clicks taking place at different hours will be counted as separate clicks. For example, if a link is clicked at 8:30 AM and 8:45 AM, it will count as one click but if the link is clicked at 8:30 AM and 9:05 AM, it will count as two clicks because the hour has changed.

Complaints

Shows the number of messages that were reported as spam by recipients:

- Average – The average number of messages that were reported as spam on each day of the selected time period.
- Total – The total number of messages that were reported as spam during the selected time period.
- Change over period – The percentage of change between the number of messages that were reported as spam on the first and last days of the selected time period. If this value is an em dash (—), no messages were reported as spam on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (0) for the first day of the time period.

The chart shows the total number of messages that were reported as spam on each day of the selected time period.

When a recipient applies **Mark as Spam** or a similar function to a message by using their email client, the recipient's email provider notifies us that the message was reported as spam.

Delivery rate

Shows the average percentage of messages that were sent and delivered to recipients during the selected time period. Amazon Pinpoint calculates the average delivery rate by first calculating the daily delivery rate for each day of the time period. (The daily delivery rate is the number of messages that were delivered on a certain day divided by the number of messages that were sent on that day.) Amazon Pinpoint then calculates the sum of the daily delivery rates and divides the sum by the number of days in the time period.

This section also shows the percentage of change between the daily delivery rates for the first and last days of the selected time period. If this value is an em dash (—), no messages were delivered on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero percent (`0%`) for the first day of the time period.

Bounce rate

Shows the average percentage of messages that bounced during the selected time period. Amazon Pinpoint calculates the average bounce rate by first calculating the daily bounce rate for each day in the time period that you selected. (The daily bounce rate is the number of messages that bounced on a certain day divided by the number of messages that were sent on that day.) Amazon Pinpoint then calculates the sum of the daily bounce rates and divides the sum by the number of days in the time period.

This section also shows the percentage of change between the daily bounce rates for the first and last days of the selected time period. If this value is an em dash (—), no messages bounced on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero percent (`0%`) for the first day of the time period.

Complaint rate

Shows the average percentage of messages that were reported as spam by recipients during the selected time period. Amazon Pinpoint calculates the average complaint rate by first calculating the daily complaint rate for each day in the time period that you selected. (The daily complaint rate is the number of messages that were reported as spam on a certain day divided by the number of messages that were sent on that day.) Amazon Pinpoint then calculates the sum of the daily complaint rates and divides the sum by the number of days in the time period.

This section also shows the percentage of change between the daily complaint rates for the first and last days of the selected time period. If this value is an em dash (—), no messages were reported as spam on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero percent (`0%`) for the first day of the time period.

Unique user events

Shows the number of unique recipients who opened messages (**Unique message opens**) and clicked links in messages (**Unique message clicks**):

- Average – The average number of open or click events that occurred on each day of the selected time period.
- Total – The total number of open or click events that occurred during the selected time period.
- Change over period – The percentage of change between the number of open or click events that occurred on the first and last days of the selected time period. If this value is an em dash (—), no open or click events occurred on the first day of the time period. Amazon Pinpoint can't calculate the percentage of change if the value is zero (`0`) for the first day of the time period.

The chart shows the total number of unique recipients that opened messages and clicked links in messages on each day of the selected time period.

Unlike the **Opens** and **Clicks** metrics, these metrics show the number of unique recipients who opened messages or clicked links in messages, as opposed to the total number of messages that were opened and click events that occurred. In other words, if a single user opens a message five times, the **Opens** chart would show five open events, but this chart would show only one open event.

Bounce and complaint events

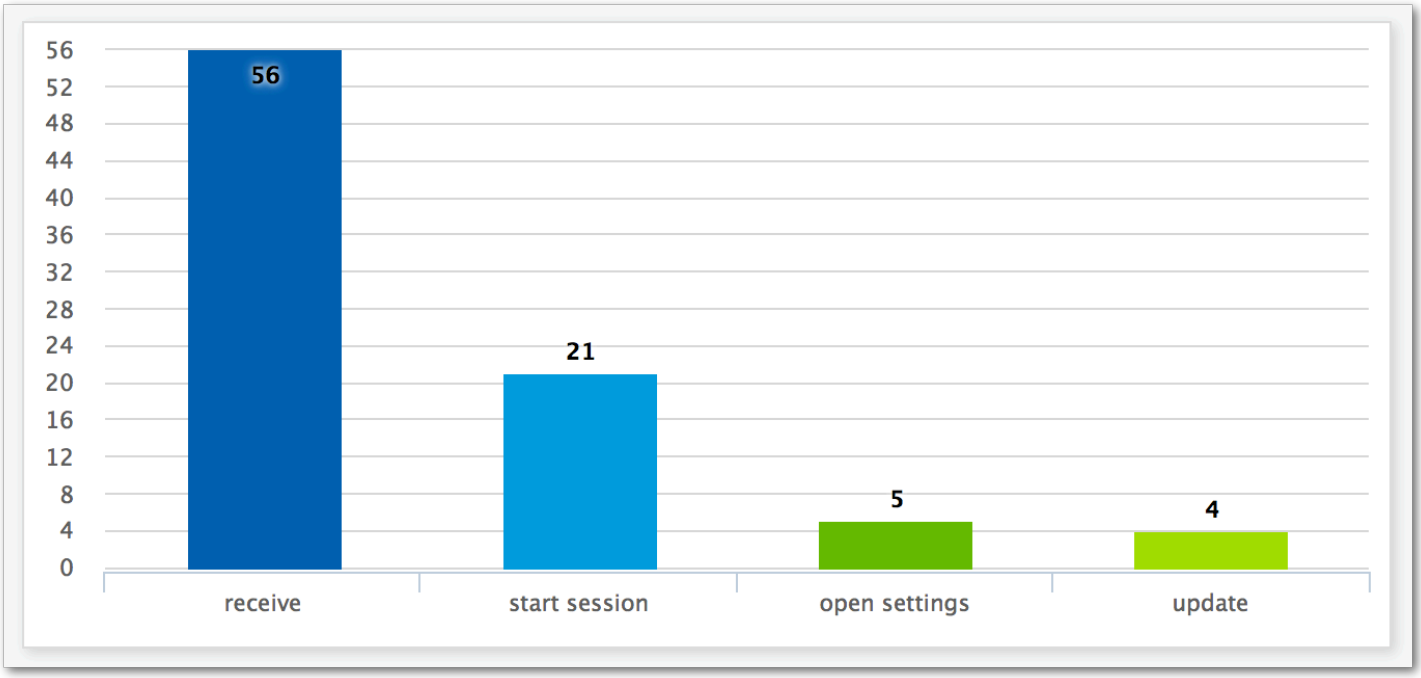
Shows the number of soft bounces, hard bounces, and complaints that occurred on each day of the selected time period. Soft bounces are usually temporary in nature. For example, if the recipient's inbox is full or their mail server is temporarily offline when we attempt to deliver a message, we count it as a soft bounce. Hard bounces are permanent. For example, if a recipient's email address doesn't exist or their mail server doesn't accept messages from your domain, we count it as a hard bounce.

Creating funnel charts with Amazon Pinpoint

You can use Amazon Pinpoint to analyze *funnels*, which are charts that show how many users complete each of a series of steps. For example, the series of steps in a funnel can be a conversion process that results in a purchase (as in a shopping cart), or some other intended user behavior.

By monitoring funnels, you can assess whether conversion rates have improved because of changes to your app or because of an Amazon Pinpoint campaign.

After you specify which steps belong in your funnel, the **Create a funnel** page displays a chart like the following example:



This example chart shows the percentage of users who completed each step in the process of updating an app. By comparing the values between columns, you can determine the drop-off rates between steps. In this example, there is a 35 percent drop-off between users who receive a notification and those who start an app session. Then there is a 19 percent drop-off between users who start a session and those who open the app settings page.

To create a funnel, you specify each event that's part of the conversion process that you want to analyze. When you add events to your funnel, you can choose any event that's reported by your app. Your app can report the following types of events:

- Standard events – These include events that automatically report when an app session starts or stops. The names of event types for standard events are denoted with an underscore prefix,

as in `_session.start`. Standard events also include monetization events that report in-app purchases.

- Custom events – These are defined by you to monitor activities that are specific to your app. Some examples are completing a level in a game, posting to social media, or setting particular app preferences.

For information about configuring your app to report events, see the section called “Streaming event data”.

Enabling funnels

We hide the funnels reports if you haven't used them in the past 90 days.

If the funnels page shows a message stating that the funnels reports are hidden, choose **Enable funnels**. When you do, we begin restoring the funnels for your account in the current AWS Region. Depending on the amount of data that's associated with your account, this process can take up to 72 hours to complete.

Creating funnels

If the funnels data for your Amazon Pinpoint account has already been loaded, you can start creating new funnels.

To create a funnel

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to create a funnel for.
3. In the navigation pane, under **Analytics**, choose **Funnels**.
4. Choose **Create a funnel**.
5. For **Funnel name**, enter a name for the funnel.
6. Choose the events that you want to add to the funnel chart. For each event, specify the following:

   - **Series name** – A name for the event chart.
   - **Event** – The type of event that's reported to Amazon Pinpoint.
   - **Attributes** – The attribute-value pairs that are assigned to the events that you want to add to the chart.

7. To add more events, choose **Create another series**. You can also copy an event by choosing **Duplicate this series**.

Streaming events with Amazon Pinpoint

Amazon Pinpoint can stream engagement and application usage data, known as *event data*, to supported AWS services that provide more options for analysis and storage. *Event data* can be used to troubleshoot issues by viewing individual events or to view individual customer events, see Streaming Amazon Pinpoint events to Kinesis in the *Amazon Pinpoint Developer Guide*.

After you integrate your application with Amazon Pinpoint, it reports events, such as the number of sessions started by users. Amazon Pinpoint provides this data in the analytics charts and metrics for that application in the console. The analytics data also shows campaign events generated by Amazon Pinpoint, such as the number of devices that a campaign sent messages to.

Amazon Pinpoint retains this data for 90 days. To keep this data for an indefinite period of time or to analyze it with custom queries and tools, you can configure Amazon Pinpoint to send event data to Amazon Kinesis.

Topics in this section:

- About Amazon Kinesis
- Streaming Amazon Pinpoint events to Kinesis

About Amazon Kinesis

The Kinesis platform offers services that you can use to load and analyze streaming data on AWS. You can configure Amazon Pinpoint to send application, campaign, and journey events to Amazon Kinesis Data Streams or Amazon Data Firehose. By streaming your events, you enable more flexible options for data analysis, such as:

- Converging the events from multiple applications into one stream so that you can analyze this data as a collection.
- Analyzing events with AWS query services. For example, you can use Amazon Managed Service for Apache Flink to run SQL queries against streaming data.

About Amazon Kinesis Data Streams

Amazon Kinesis Data Streams is a service that you can use to build custom applications that process or analyze your streaming data. For example, streaming your events to Kinesis Data Streams is useful if you want to use event data in custom dashboards, generate alerts based on events, or dynamically respond to events.

For more information, see the Amazon Kinesis Data Streams Developer Guide.

About Amazon Data Firehose

Amazon Data Firehose is a service that you can use to deliver your streaming data to AWS data stores, including Amazon Simple Storage Service (Amazon S3), Amazon Redshift, or Amazon OpenSearch Service (OpenSearch Service). For example, streaming your events to Firehose is useful if you want to:

- Use your own analytics applications and tools to analyze events in Amazon S3, Amazon Redshift, or OpenSearch Service.
- Send your events to Amazon S3 so that you can write SQL queries on this data with Amazon Athena.
- Back up your event data for long-term storage in Amazon S3.

For more information, see the Amazon Data Firehose Developer Guide.

Streaming Amazon Pinpoint events to Kinesis

The Kinesis platform offers services that you can use to load and analyze streaming data on AWS. You can configure Amazon Pinpoint to send application, campaign, and journey events to Amazon Kinesis Data Streams for processing by external applications or third-party analytics tools. You can also configure Amazon Pinpoint to stream this event data to AWS data stores (such as Amazon Redshift) using Amazon Data Firehose.

Prerequisites

Before you complete the procedure in this section, create an Amazon Kinesis stream or a Firehose delivery stream in the same account in which you use Amazon Pinpoint. To learn more about creating Kinesis streams, see Creating and updating data streams in the *Amazon Kinesis Data Streams Developer Guide*. To learn more about creating Firehose delivery streams, see Creating an Amazon Data Firehose delivery stream in the *Amazon Data Firehose Developer Guide*.

You can optionally create an IAM role that grants permission to send data to your stream. If you don't create this role, Amazon Pinpoint can create one for you. For more information about creating this policy manually, see IAM role for streaming events to Kinesis in the *Amazon Pinpoint Developer Guide*.

Setting up event streaming

Complete the following steps in Amazon Pinpoint to set up event streaming.

> **Note**
>
> If you haven't already created an Amazon Kinesis stream, go to the Amazon Kinesis console at https://console.aws.amazon.com/kinesis. For more information about creating streams, see the Amazon Kinesis Data Streams Developer Guide or the Amazon Data Firehose Developer Guide.
> Verify you have the permissions to setup and send to the stream. For more information about permissions see IAM role for streaming events to Kinesis

To set up event streaming

1. Sign in to the AWS Management Console and open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. On the **All projects** page, choose the project that you want to set up data streaming for.
3. In the navigation pane, under **Settings**, choose **Event stream**.
4. In the **Services** section, choose **Edit**.
5. Choose **Stream to Amazon Kinesis**.
6. Under **Choose a stream type**, choose one of the following options:
   - **Send events to an Amazon Kinesis Data Stream** – Choose this option if you want to send Amazon Pinpoint event data to an external application for analysis.
   - **Send events to an Amazon Data Firehose stream** – Choose this option if you want to send event data to an AWS data store, such as Amazon Redshift.
7. For **Amazon Kinesis stream**, choose the Amazon Kinesis stream that you want to use to export the data.

> **Note**
>
> If you haven't already created an Amazon Kinesis stream, go to the Amazon Kinesis console at https://console.aws.amazon.com/kinesis. For more information about creating streams, see the Amazon Kinesis Data Streams Developer Guide or the Amazon Data Firehose Developer Guide.

8. Under **IAM role**, choose one of the following options:

   - **Use an existing role** – Choose this option to have Amazon Pinpoint assume an IAM role that already exists in your account. The role that you select must allow the `firehose:PutRecordBatch` action. For an example of a policy that allows this action, see Permissions Policies in the *Amazon Pinpoint Developer Guide*.
   - **Automatically create a role** – Choose this option to automatically create an IAM role with the required permissions. This role authorizes Amazon Pinpoint to send data to the stream that you chose in step 7.

9. Choose **Save**.

As Amazon Pinpoint receives events for your project, it sends this data to your Kinesis stream. For information about the data that Amazon Pinpoint sends for an event, see Streaming Amazon Pinpoint Events to Kinesis in the *Amazon Pinpoint Developer Guide*.

Amazon Pinpoint message templates

If you frequently design and send a certain type of message, such as a weekly newsletter or an appointment reminder, you can create and save it as a message template. You can then use the template as a starting point each time you need to send that type of message, instead of designing and writing the message again.

A *message template* is a set of content and settings that you can create, save, and then reuse in messages that you send for any of your Amazon Pinpoint projects. When you create a template, you specify the content that you want to reuse in various components of messages that are based on the template.

These components are referred to as *template parts*. They can contain static text, personalized content, images, and other design elements, depending on the type of template. A template part can also contain channel-specific settings. For example, a template part in a push notification template can specify a custom sound to play or an image to display when a recipient receives a push notification that's based on the template.

When you create a message, you can choose a template to use for the message. If you choose a template, Amazon Pinpoint populates the message with the content and settings in the template.

You can design the following types of message templates in Amazon Pinpoint:

- **Email templates** for email messages that you send from campaigns or journeys, or to a limited audience as direct or test messages.
- **Push notification templates** for push notifications that you send from campaigns, or to a limited audience as direct or test messages.
- **SMS templates** for SMS text messages that you send from campaigns, or to a limited audience as direct or test messages.
- **Voice templates** for voice messages that you send as direct or test messages.

In addition to supporting multiple types of message templates, Amazon Pinpoint supports versioning for message templates. Versioning provides a way for you to design and change a template over time, while also creating and maintaining a history of the template. Versioning also provides a way for you to specify which version of a template can be used in messages. To learn more about template versions, see Managing versions of message templates.

The topics in this chapter explain how to create and manage message templates for your Amazon Pinpoint account.

Topics

- Creating email templates
- Creating in-app templates
- Creating push notification templates
- Creating SMS templates
- Creating voice templates
- Adding personalized content to message templates
- Using message template helpers
- Managing message templates
- Managing versions of message templates

Creating email templates

An *email template* is a type of message template that contains content and settings that you want to create, save, and reuse in email messages that you send for any of your Amazon Pinpoint projects. You can use an email template in any type of email message that you create and send by using Amazon Pinpoint.

When you create an email template, you specify the content and settings that you want to reuse in various components of email messages that are based on the template. These components, referred to as *template parts*, can be the message subject, the message body, or both. The content can be static text, personalized content, images, or other design elements. A template part can also be a setting, such as the message body to use if a recipient's email application doesn't display HTML content.

When you create an email message that's based on a template, Amazon Pinpoint populates the message with the content and settings that you defined in the template.

To create an email template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.

3. Choose **Create template**.
4. Under **Channel**, choose **Email**.
5. Under **Template details**, for **Template name**, enter a name for the template. The name must begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
6. (Optional) For **Version description**, enter a brief description of the template. The description can contain up to 500 characters.
7. Under **Email details**, use the following options to specify the content for messages that use the template:

   - For **Subject**, enter the text that you want to display in the subject line of the message.
   - For **Message**, enter the content that you want to display in the body of the message.

   > **Tip**
   >
   > For the message body, you can enter the content by using either the HTML or Design view. In the HTML view, you can manually enter HTML content, including formatting, links, and other features that you want to include in the message. In the Design view, you can use a rich text editor to enter the content. Use the formatting toolbar to apply formatting and add links and other features to the content. To switch views, choose **HTML** or **Design** from the view selector above the message editor.
   > You can also include personalized content in the subject and body of the template. To do this, add message variables that refer to specific attributes that you or Amazon Pinpoint created, such as an attribute that stores a user's first name. By using message variables, you can display different content for each recipient of a message that uses the template. To use a message variable, choose the name of an existing attribute from the **Attribute finder**. Amazon Pinpoint creates a message variable for the attribute and copies it to your clipboard. Paste the variable in the location that you want. For more information, see Adding personalized content to message templates.

8. > **Note**
   >
   > You must set up an email orchestration sending role before you can use email headers. For more information, see Creating an email orchestration sending role in Amazon Pinpoint.

Under **Headers**, choose **Add new headers**, to add up to 15 headers for the email message. For a list of supported headers see Amazon SES header fields in the Amazon Simple Email Service Developer Guide.

- For **Name**, enter the name of the header.
- For **Value**, enter the value of the header.

(Optional) To add a One-click unsubscribe link, to a promotional email, add the following two headers:

1. Create a header with `List-Unsubscribe` for **Name** and set **Value** to your unsubscribe link. The link must support HTTP POST requests to process the recipients unsubscribe request.
2. Create a header with `List-Unsubscribe-Post` for **Name** and set **Value** to `List-Unsubscribe=One-Click`.

9. (Optional) Under **Plain text version**, enter the content that you want to display in the body of messages that use the template and are sent to recipients whose email applications don't display HTML content.
10. If you added personalized content to the template by using message variables, specify a default value for each variable. If you do this, Amazon Pinpoint replaces the variable with the value that you specify, if a corresponding value doesn't exist for a recipient. We recommend that you do this for each variable in the template.

    To specify default values for variables, expand the **Default attribute values** section. Then enter the default value that you want to use for each variable. If you don't specify a default value and a value doesn't exist for a recipient, Amazon Pinpoint does not send the message.
11. When you finish entering content and settings for the template, choose **Create**.

To test the template before you use it in an email message that you send to users, you can send a test message that uses the template. If you do this, make sure that you first complete step 9 to specify default values for all the variables in the template. Otherwise, the message might not be sent or it might not render correctly.

Including unsubscribe links in message templates

Including an unsubscribe link in your email is a best practice, and in some countries it's a legal requirement. In your unsubscribe links, you can include a special attribute, `ses:tags="unsubscribeLinkTag:value"`, where *value* is any value that you define. If a recipient clicks a link that contains this special attribute, Amazon Pinpoint counts it as an opt-out event for analytics purposes (for example, in the Opt-out rate metric on the Analytics overview page). The following example shows the syntax for this type of link:

```
<a ses:tags="unsubscribeLinkTag:optout" href="https://www.example.com/
preferences">Unsubscribe</a>
```

If your template includes a link with this attribute, you must still develop a system for handling opt-out requests. For an example of a system that processes opt-out requests, see the Amazon Pinpoint Preference Center solution in the AWS Solutions Library.

> **Note**
>
> The Amazon Pinpoint Preference Center solution is now guidance. The solution can no longer be deployed but the architectural diagram and code have been left as a reference.

Creating in-app templates

An *in-app template* is a template for messages that you send from Amazon Pinpoint to users of your application. Use in-app templates to create, save, and reuse settings and content for your in-app messages.

When you create an in-app template, you specify the settings and content that you want to reuse in the body of the in-app messages that use the template. When you create a message using the template, Amazon Pinpoint populates the message with the settings and content that you defined.

In-app messages are highly customizable. They can include buttons that open websites or take users to specific parts of your app. You can configure background and text colors, position the text, and add images to the notification. You can send a single message, or create a *carousel* that contains up to five unique messages that your users can scroll through.

To create an in-app template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. Choose **Create template**.
4. Under **Channel**, choose **In-app messaging**.
5. Under **Template details**, for **Template name**, enter a name for the template. The name must begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
6. (Optional) For **Version description**, enter a brief description of the template. The description can contain up to 500 characters.
7. In the **In-app message details** section, under **Layout**, choose the type of layout for the message template. You can choose from the following options:

   - **Top banner** – a message that appears as a banner at the top of the page.
   - **Bottom banner** – a message that appears as a banner at the bottom of the page.
   - **Middle banner** – a message that appears as a notification in the middle of the page.
   - **Full screen** – a message that covers the entire screen.
   - **Modal** – a message that appears in a window in front of the page.
   - **Carousel** – a scrollable layout of up to five unique messages.
8. Under **Header**, configure the title that appears at the beginning of the message. If you created a Carousel message, you must create the first message for the Carousel, which includes the header.

   a. For **Header text** to display in the banner. You can enter up to 64 characters.

   b. For **Header text color**, choose the text color for the header. You can optionally enter RGB values or a hex color code.

   c. For **Header alignment**, choose whether you want the text to be **Left**, **Center**, or **Right** justified.
9. Under **Message**, configure the body of the message.

   a. For **Message**, enter the body text for the message. The message can contain up to 150 characters.

   b. For **Text color**, choose the text color for the message body. You can optionally enter RGB values or a hex color code.

c. For **Text alignment**, choose whether you want the text to be **Left**, **Center**, or **Right** justified.

10. (Optional) Change the background color of the message. Under **Background** , choose a background color for the message. You can optionally enter RGB values or a hex color code.
11. (Optional) Add an image to the message. Under **Image URL**, enter the URL of the image that you want to appear in the message. Only .jpg and .png files are accepted. The dimensions of the image depend on the message type:

    - For a **Banner**, the image should be 100 pixels by 100 pixels, or a 1:1 aspect ratio.
    - For a **Carousel**, the image should be 300 pixels by 200 pixels, or a 3:2 aspect ratio.
    - For a **Fullscreen** message, the image should be 300 pixels by 200 pixels, or a 3:2 aspect ratio.

12. (Optional) Add a button to the message. Under **Primary button**, do the following:

    a. Choose **Add primary button**.

    b. For **Button text**, enter the text to display on the button. You can enter up to 64 characters.

    c. (Optional) For **Button text color**, choose a color for the button text. You can optionally enter RGB values or a hex color code.

    d. (Optional) For **Background color**, choose a background color for the button. You can optionally enter RGB values or a hex color code.

    e. (Optional) For **Border radius**, enter a radius value. Lower values result in sharper corners, while higher numbers result in more rounded corners.

    f. Under **Actions**, choose the event that occurs when the user taps the button:

       - **Close** – Dismisses the message.
       - **Go to URL** – Opens a website.
       - **Go to deep link** – Opens an app or opens a particular place in an app.

       If you want the button behavior to be different for different device types, you can override the default action. Under **Action**, use the tabs to choose the device type that you want to modify the button behavior for. For example, choose **iOS** to modify the button behavior for iOS devices. Next, choose **Override the default actions**. Finally, specify an action.

13. (Optional) Add a secondary button to the message. Under **Secondary button**, choose **Add secondary button**. Follow the procedures in the preceding step to configure the secondary button.
14. (Optional) Add custom data to the message. Custom data are key-value pairs delivered with your message. For example, you might want to pass a promotional code along with your message. If you're sending a carousel message, you can add custom data to each of the carousel messages. To add custom data, do the following:

    a. Under **Custom data**, choose **Add new item**.

    b. Enter a **Key**. For example, this might be *`PromoCode`*.

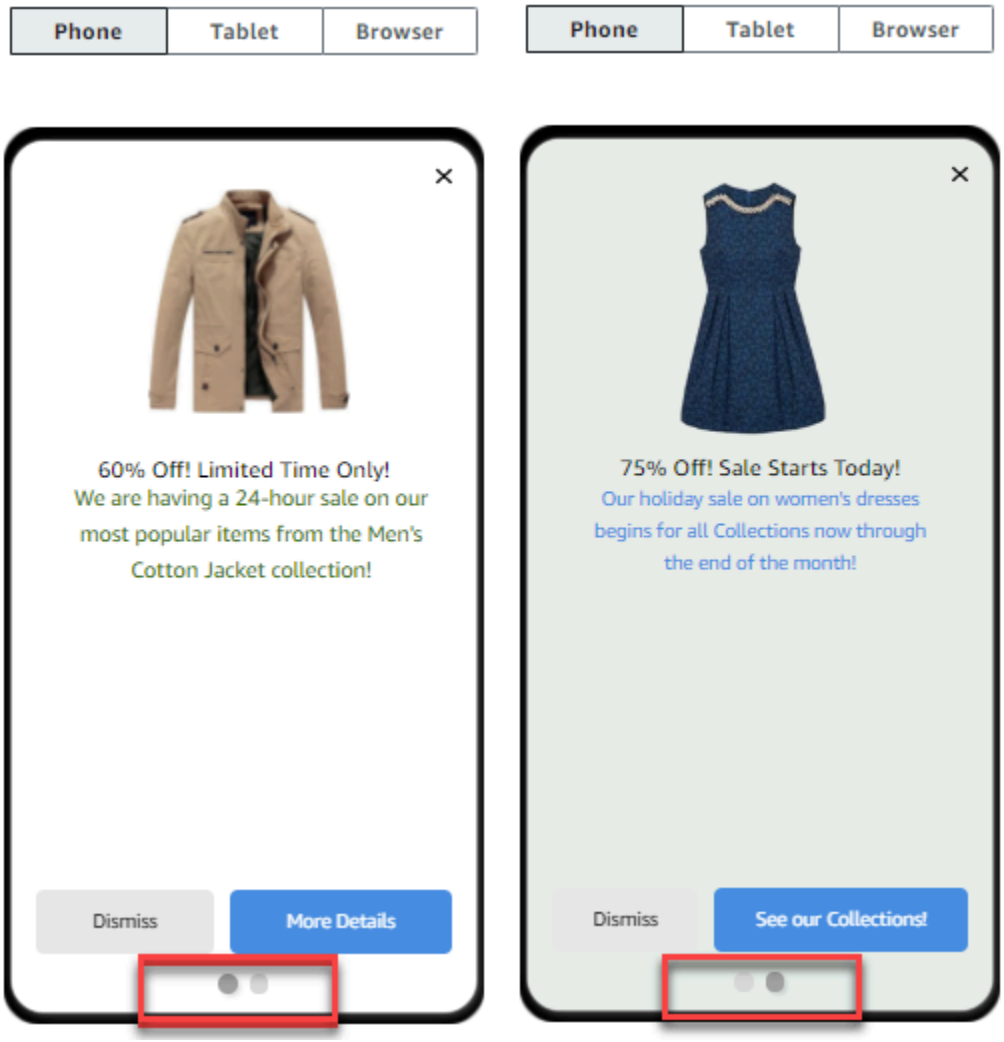
    c. Enter a **Value** for the key. Your *`PromoCode`* might be *`12345`*.

    d. When the message is sent, the code *`12345`* is included in your message.

    e. To add more key-value pairs, choose **Add new item**. You can add up to 10 key-value pairs to the message. When you finish adding custom data, proceed to the next step.
15. If your message is a carousel, you can add up to four more unique messages. To add messages to a carousel, expand the **Carousel overview** section. Next, choose **Add new message**. Repeat the preceding steps to configure the message.

    As you add messages to the carousel, the **Preview** page updates by displaying icons at the bottom of the page showing the number of messages included in the carousel.

    The following image shows a carousel with two messages:



16. When you finish, choose **Create**.

Creating push notification templates

A *push notification template* is a message template that contains content and settings that you can use with your Amazon Pinpoint projects. When you use a template to send a push notification, Amazon Pinpoint populates the notification with the content and settings that you defined in the template.

When you create a push notification template, you specify the content and settings that you want to reuse in various components of push notifications that are based on the template. These components, referred to as *template parts*, can contain text (such as the title or body of a notification) or settings (such as a custom sound to play when a recipient receives a notification).

To customize a template for specific push notification channels, you can create multiple sets of template parts in each template—a default set, and optionally one or more service-specific sets. The default set contains the content and settings that you want to use by default for any push notification channel. A service-specific set contains any content and settings that you want to use for a specific notification service, such as Apple Push Notification service or Firebase Cloud Messaging. By adding service-specific settings to a template, you can tailor your notifications to display content that is unique to each recipient's device type.

You can also create templates that contain raw message data. This option is more advanced, but is helpful if you want to specify settings for a specific channel that aren't present in the standard Amazon Pinpoint push notification template.

Creating a standard push notification template

Complete this procedure to specify the basic message content, such as the title, message body, image, and action. To specify the raw message content, complete the procedure in Creating a push notification template with raw message data instead.

To create a push notification template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. Choose **Create template**.
4. Under **Channel**, choose **Push notifications**.
5. Under **Template details**, for **Template name**, enter a name for the template. The name must begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
6. (Optional) For **Version description**, enter a brief description of the template. The description can contain up to 500 characters.
7. Under **Push notification details**, do the following:
   - For **Notification type**, choose **Standard message**.
   - For **Title**, enter the title that you want to display above the message body.
   - For **Body**, enter the text that you want to display in the body of the notification message.

> **Tip**
>
> You can include personalized content in the title and body of the template. To do this, add message variables that refer to specific attributes, such as an attribute that stores a user's first name. By using message variables, you can display different content for each recipient of a push notification that uses the template.
> To use a message variable, choose the name of an existing attribute from the **Attribute finder**. Amazon Pinpoint creates a message variable for the attribute and copies it to your clipboard. Paste the variable in the location that you want. For more information, see Adding personalized content to message templates.

- For **Custom alert sound**, enter the name of the audio file that contains the custom sound that you want to play when a recipient receives the push notification. This name must match the name of an audio file on a recipient's device.
- For **Action**, choose what you want a recipient's device to do if the recipient taps the push notification:
  - **Open your app** – Open your app or bring it to the foreground if it was sent to the background.
  - **Go to a URL** – Open the default browser on the recipient's device and load a specific webpage. If you choose this option, enter the URL of the webpage in the **Destination URL** box.
  - **Open a deep link** – Open your app and display a specific user interface in the app. If you choose this option, enter the URL of the interface in the **Destination URL** box.

8. (Optional) To customize the template for specific push notification services, choose the appropriate service tab under **Customize content for individual push services**. Then choose the options that you want for that service.

   If you select the **Override default push content** check box on the tab for a service, Amazon Pinpoint automatically replaces the default content and settings that you chose in the preceding step with the options that you choose on the tab. If you want to keep the default content and settings and just customize the template to use additional channel-specific settings, don't select this checkbox.

Apple

Use these options to specify custom content and settings for push notifications that you send through the Apple Push Notification service (APNs) channel to apps that are running on iOS devices.

In addition to the standard content and settings, you can include a custom image or video in push notifications that use the template. To do this, enter the URL for the image or video file in the **iOS media** box. The URL must be publicly accessible. Otherwise, the recipient's device won't be able to display the image or video.

Google

Use these options to specify custom content and settings for push notifications that you send through the Google Firebase Cloud Messaging (FCM) channel to apps that are running on Android devices.

In addition to the standard content and settings, you can choose the following options to display custom images in push notifications that use the template:

- **Android image** – Enter the URL of the image to display in the body of the push notification.
- **Android icon** – Enter the URL of the large icon image to display in the content view of the push notification.
- **Android small icon** – Enter the URL of the small icon image to display in the status bar and in the content view of the push notification.

Amazon

Use these options to specify custom content and settings for push notifications that you send through the Amazon Device Messaging (ADM) channel to apps that are running on Amazon devices, such as Kindle Fire tablets.

In addition to the standard content and settings, you can choose the following options to display custom images in push notifications that use the template:

- **Android image** – Enter the URL of the image to display in the body of the push notification.
- **Android icon** – Enter the URL of the large icon image to display in the content view of the push notification.

- **Android small icon** – Enter the URL of the small icon image to display in the status bar and in the content view of the push notification.

Baidu

Use these options to specify custom content and settings for push notifications that you send through the Baidu channel to apps that use the Baidu Cloud Push platform.

In addition to the standard content and settings, you can choose the following options to display custom images in push notifications that use the template:

- **Android image** – Enter the URL of the image to display in the body of the push notification.
- **Android icon** – Enter the URL of the large icon image to display in the content view of the push notification.
- **Android small icon** – Enter the URL of the small icon image to display in the status bar and in the content view of the push notification.

9. If you added personalized content to the template by using message variables, specify a default value for each variable. If you do this, Amazon Pinpoint replaces the variable with the value that you specify, if a corresponding value doesn't exist for a recipient. We recommend that you do this for each variable in the template.

   To specify default values for variables, expand the **Default attribute values** section. Then enter the default value that you want to use for each variable. If you don't specify a default value and a value doesn't exist for a recipient, Amazon Pinpoint does not send the message.

10. When you finish entering content and settings for the template, choose **Create**.

Creating a push notification template with raw message data

Complete this procedure to specify the raw message payload manually. You only need to specify the raw message payload if you want to use a feature of a specific push notification service that Amazon Pinpoint doesn't allow you to configure. If you don't need to specify the raw message content, you should complete the procedure in Creating a standard push notification template instead.

An example of a use case that requires you to use a raw message template is when you want to send messages to users of the desktop Safari web browser. In this case, you must include a specific

attribute in the raw message payload. For more information, see Sending a message in the *AWS End User Messaging Push User Guide*.

To create a push notification template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. Choose **Create template**.
4. Under **Channel**, choose **Push notifications**.
5. Under **Template details**, for **Template name**, enter a name for the template. The name must begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
6. (Optional) For **Version description**, enter a brief description of the template. The description can contain up to 500 characters.
7. Under **Push notification details**, for **Notification type**, choose **Raw message**. The message editor displays an outline of the code to use for the template. In the message editor, enter the settings that you want to use for each push notification service, including any optional settings—such as images, sounds, and actions—that you want to specify for the template. For more information, see the documentation for the push notification services that you use.
8. When you finish entering the raw message content, choose **Create**.

To test the template before you use it in a push notification that you send to users, you can send a test notification that uses the template. If you do this, make sure that you first complete step 10 to specify default values for all the variables in the template. Otherwise, the push notification might not be sent or it might not render correctly.

Creating SMS templates

An *SMS template* is a type of message template that contains content and settings that you want to create, save, and reuse in SMS text messages that you send for any of your Amazon Pinpoint projects. You can use an SMS template in text messages that you send from campaigns, or to a limited audience as direct or test messages.

When you create an SMS template, you specify the settings and content that you want to reuse in the body of text messages that are based on the template. When you create a message that's

based on the template, Amazon Pinpoint populates the message with the settings and content that you defined in the template.

To create an SMS template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. Choose **Create template**.
4. Under **Channel**, choose **SMS**.
5. Under **Template details**, for **Template name**, enter a name for the template. The name must begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
6. (Optional) For **Version description**, enter a brief description of the template. The description can contain up to 500 characters.
7. Under **SMS details**, for **Message**, enter the content that you want to display in the body of messages that use the template. The message body can contain up to 1,600 characters.

   > **Tip**
   >
   > You can include personalized content in the body of the template. To do this, add message variables that refer to specific attributes that you or Amazon Pinpoint created, such as an attribute that stores a user's first name. By using message variables, you can display different content for each recipient of a message that uses the template.
   >
   > To use a message variable, choose the name of an existing attribute from the **Attribute finder**. Amazon Pinpoint creates a message variable for the attribute and copies it to your clipboard. Paste the variable in the location that you want. For more information, see Adding personalized content to message templates.

8. If you added personalized content to the template by using message variables, specify a default value for each variable. If you do this, Amazon Pinpoint replaces the variable with the value that you specify, if a corresponding value doesn't exist for a recipient. We recommend that you do this for each variable in the template.

   To specify default values for variables, expand the **Default attribute values** section. Then enter the default value that you want to use for each variable. If you don't specify a default value and a value doesn't exist for a recipient, Amazon Pinpoint does not send the message.

9. When you finish entering content and settings for the template, choose **Create**.

To test the template before you use it in a message that you send to users, you can send a test message that uses the template. If you do this, make sure that you first complete step 8 to specify default values for all the variables in the template. Otherwise, the message might not be sent or it might not render correctly.

Creating voice templates

A *voice template* is a type of message template that contains content and settings that you want to create, save, and reuse in voice messages that you send for any of your Amazon Pinpoint projects. You can use a voice template in voice messages that you send as direct or test messages.

When you create a voice template, you specify the content and settings that you want to reuse in various components of voice messages that are based on the template. These components are referred to as *template parts*. They can contain the text of the message script or settings, such as the voice to use when delivering the message. The message script can include static text and, optionally, personalized content that you define.

When you create a voice message that's based on a template, Amazon Pinpoint populates the message with the content and settings that you defined in the template.

To create a voice template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. Choose **Create template**.
4. Under **Channel**, choose **Voice**.
5. Under **Template details**, for **Template name**, enter a name for the template. The name must begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
6. (Optional) For **Version description**, enter a brief description of the template. The description can contain up to 500 characters.
7. Under **Voice message details**, for **Message**, enter the text that you want to use as the message script for messages that use the template. The script can contain up to 10,000 characters and has to be in plaintext format.

> **Tip**
>
> You can include personalized content in the message script. To do this, add message variables that refer to specific attributes that you or Amazon Pinpoint created, such as an attribute that stores a user's first name. By using message variables, you can play different content for each recipient of a message that uses the template.
> To use a message variable, choose the name of an existing attribute from the **Attribute finder**. Amazon Pinpoint creates a message variable for the attribute and copies it to your clipboard. Paste the variable in the location that you want. For more information, see Adding personalized content to message templates.

8. For **Language and region**, choose the language that the text of the message script is written in. Amazon Pinpoint uses this setting to determine which phonemes and other language-specific settings to use when it converts the text of the script to speech.
9. For **Voice**, choose the voice that you want to speak the message to recipients. Each voice is created using native language speakers, so there are variations from voice to voice, even within the same language. Therefore, it's a good idea to test each voice with your script.

   The list of voices changes based on the language that you choose in step 8. In most cases, the list includes at least one male and one female voice. In some cases, only one voice is available. We continually add support for additional languages and create voices for supported languages.
10. Choose **Play message** to test how the message will sound when it's delivered to recipients. Adjust the content and settings until the template has the design that you want.
11. If you added personalized content to the template by using message variables, specify a default value for each variable. If you do this, Amazon Pinpoint replaces the variable with the value that you specify, if a corresponding value doesn't exist for a recipient. We recommend that you do this for each variable in the template.

    To specify default values for variables, expand the **Default attribute values** section. Then enter the default value that you want to use for each variable. If you don't specify a default value and a value doesn't exist for a recipient, Amazon Pinpoint does not send the message.
12. When you finish entering content and settings for the template, choose **Create**.

Adding personalized content to message templates

To deliver dynamic, personalized content in messages that use a template, add *message variables* to the message template. A *message variable* is a placeholder that refers to a specific attribute that you or Amazon Pinpoint created to store information about your users. Each attribute typically corresponds to a characteristic of a user, such as a user's first name or the city where they live. By adding message variables to templates, you can use these attributes to deliver custom content to each recipient of a message that uses a template.

If a template contains message variables, Amazon Pinpoint replaces each variable with the current, corresponding value of the attribute for each recipient. It does this each time it sends a message that uses the template. This means that you can send personalized content to each recipient without creating multiple, customized versions of a message or message template. You can also feel confident that the message contains the latest information that you have for a recipient.

For example, if your project is a fitness application for runners and it includes attributes for each user's first name, preferred activity, and personal record, you could use the following text and message variables in a template:

```
Hi {{User.UserAttributes.FirstName}}, congratulations
on your new {{User.UserAttributes.Activity}} record of
{{User.UserAttributes.PersonalRecord}}!
```

When you send a message that uses the template, Amazon Pinpoint replaces the variables with the current value of each attribute for each recipient. The following examples show this.

Example 1

```
Hi Sofia, congratulations on your new half marathon record of 1:42:17!
```

Example 2

```
Hi Alejandro, congratulations on your new 5K record of 20:52!
```

If an attribute value doesn't exist for a recipient, Amazon Pinpoint can replace a variable with a default value that you specify for the variable. For example, if a user of your fitness application hasn't chosen their preferred activity, you could use `running` as a default value for the `{{User.UserAttributes.Activity}}` variable. In this case, Amazon Pinpoint replaces the variable as shown in the following examples:

Example 1

```
Hi Jane, congratulations on your new running record of 1:42:17!
```

Example 2

```
Hi John, congratulations on your new running record of 20:52!
```

If you don't specify a default value and a value doesn't exist for a recipient, Amazon Pinpoint omits all text for the variable when it sends a message to that recipient. For example:

```
Hi Mary, congratulations on your new record of 20:52!
```

As a best practice, we recommend that you specify a default value for each variable that you include in a template.

Adding message variables

You can add message attributes to a new template you create or to an existing template. If you add variables to an existing template, Amazon Pinpoint doesn't necessarily apply the changes to messages that use the template and haven't been sent yet, such as campaign messages that are scheduled to be sent at a later time. This depends on the version of the template that you add variables to and how you configured the messages that use the template. For more information, see Managing versions of message templates.

> **Note**
>
> In-app messaging templates don't support the use of message variables.

To add a message variable to a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, do one of the following:

   - To create a new template and add a message variable to it, choose **Create template**. Then, on the template page, enter a name for the template and, optionally, a description of the template.

- To add a message variable to an existing template, choose the template that you want to add a variable to. Then, on the template page, choose **Edit**. Under **Template details**, use the version selector to choose the version of the template that you want to use as a starting point. If you choose the most recent version, you can save your changes directly to that version of the template. Otherwise, you can save your changes as a new version of the template.

4. In the message details section, determine where you want to add a message variable. You can add a variable to the body of any type of template. For email and push notification templates, you can also add a variable to the message subject or title.
5. In the **Attribute finder**, expand the section for the type of attribute that you want to add a message variable for. You can choose from the following types of attributes:

   Standard attributes

   These are attributes that Amazon Pinpoint creates automatically for any project. This means that you can use them in messages that you send for any project. For detailed information about each of these attributes, see Supported attributes.

   To add a variable for a standard attribute, choose the attribute from the list.

   Custom attributes

   These are attributes that you can optionally create for individual projects. Because these attributes might not be available for some of your projects, Amazon Pinpoint might not be able to replace the variable with a value for every recipient of a message that uses the template. To help you avoid this issue, Amazon Pinpoint provides options to help you choose an attribute that exists for specific projects or all of your projects.

   To add a custom attribute:

   1. Choose **Custom attributes**, and then choose **Load custom attributes**. In the window that appears, Amazon Pinpoint lists all the projects you created. As you choose each project, the attributes common to the selected projects display in the right-hand navigation pane. If no attributes display, then there are no common attributes between those projects.
   2. Do one of the following:
      - To use all attributes common to the selected projects, choose **Load custom attributes**.
      - To use a specific attribute from the list, enter any portion of the attribute name in the search field. Attributes matching the entered text display. Choose **Load custom**

attributes when the attribute you want to use displays. **Attribute finder** displays the newly added custom attributes.

> **Note**
>
> You can't add common attributes from different sets of projects, or you modify the **Custom attributes** section of the **Attribute finder**. To change custom attributes, choose **X** to clear the **Attribute finder,** and then start again.

3. In the **Attribute finder**, choose the attribute that you want to add a variable for.

Recommended attributes

These are attributes that you optionally create for your account when you configure Amazon Pinpoint to retrieve personalized recommendations from a recommender model. For information about using recommender models, see Machine learning models. You can add variables for this type of attribute to email templates, push notification templates, and SMS templates. You can't add them to voice templates.

To add a variable for a recommended attribute, choose the attribute from the list. If the **Attribute finder** doesn't list any recommended attributes, you must first connect the template to a recommender model.

To add a recommended attribute:

1. Choose **Connect model**.
2. Select the model that you want to retrieve recommendations from when you send messages that use the template.
3. Choose **Connect model**.

6. When you choose an attribute from the **Attribute finder**, Amazon Pinpoint creates a message variable for the attribute and copies it to your clipboard. Paste the variable in the location that you want. If you have a long list of attributes, enter search text to narrow down the list. Choose **X** to clear the search field.

   After you paste the variable, Amazon Pinpoint displays it as the name of the associated attribute, enclosed in two sets of curly braces—for example, `{{User.UserAttributes.FirstName}}`.

7. Repeat steps 4–6 for each message variable that you want to add.

8. To specify a default value for a message variable, expand the **Default attribute values** section. Then, in the list of variables, enter the default value that you want to use for the variable.

   > **Note**
   >
   > We recommend that you do this for each variable in the template. Otherwise, Amazon Pinpoint might not be able to send a message that uses the template or the message might display in unexpected or unwanted ways.

9. When you finish, do one of the following:

   - If you added message variables to a new template, choose **Create**.
   - If you added message variables to an existing template and you want to save your changes as a new version of the template, choose **Save as new version**.
   - If you added message variables to an existing template and you want to save your changes as an update to the most recent version of the template, choose **Update version**. This option is available only if you opened the most recent version of the template in step 3.

Supported attributes

Each project can have standard attributes and custom attributes. Standard attributes are attributes that Amazon Pinpoint creates automatically for any project. Custom attributes are attributes that you optionally create for a project. There are three types of custom attributes:

- **User attributes** – These attributes describe a user—for example, a user's first name, last name, and birth date. A *user* is an individual who has a unique user ID for a project.
- **Endpoint attributes** – These attributes describe a specific endpoint for a user. An *endpoint* is a destination that you can send messages to—such as an email address, phone number, or mobile device. Each user can be associated with one or more endpoints. For example, if you communicate with a user by email, SMS, and phone, the user could be associated with three endpoints—one for the user's email address, another for the user's mobile phone number, and another for the user's home (landline) phone number.
- **Metric attributes** – These attributes are numeric metrics that your application reports to Amazon Pinpoint for individual endpoints, such as the number of sessions for a mobile app or the number of items left in a cart.

- **Pinpoint attributes** – These attributes are unique identifiers for your application, campaign, or journey.

In addition to custom and standard attributes that you or Amazon Pinpoint creates for your projects, Amazon Pinpoint supports *recommended attributes*. A *recommended attribute* is an attribute that temporarily stores personalized recommendations for users or endpoints. Amazon Pinpoint retrieves these recommendations from recommender models that you configure it to use. Recommended attributes aren't associated with specific projects. Instead, they're associated with your Amazon Pinpoint account. For information about using recommender models, see Machine learning models.

You can use any standard, custom, or recommended attribute in a message variable. The following table indicates the text that appears in the message variable for each supported attribute, and it describes each attribute. In the table, *`custom_attribute`* indicates text that appears in a variable for a custom attribute. In those cases, replace *`custom_attribute`* with the name of the custom attribute. For example, if your project stores users' first names in a custom user attribute named `FirstName` and you add a variable for that attribute, the text for the variable is `{{User.UserAttributes.FirstName}}`.

Attribute	Description
`Address`	The destination address for messages or push notifications that you send to the endpoint—for example, an email address, phone number, or device token.
`Pinpoint.ApplicationId`	The unique identifier for the application.
`Attributes.` *`custom_attribute`*	A custom endpoint attribute that describes the endpoint.
`Pinpoint.CampaignId`	The unique identifier for the campaign.
`ChannelType`	The channel to use when sending messages or push notifications to the endpoint. For example:

Attribute	Description
	• APNS – For an endpoint that can receive push notifications that you send through the Apple Push Notification service (APNs) channel to apps that are running on iOS devices. • EMAIL – For an endpoint that can receive email messages. • GCM – For an endpoint that can receive push notifications that you send through the Firebase Cloud Messaging (FCM) channel to apps that are running on Android devices. • SMS – For an endpoint that can receive SMS text messages. • VOICE – For an endpoint that can receive voice messages.
CreationDate	The date and time when the endpoint was added to the project, in ISO 8601 format. For example, 2019-06-30T11:45:25.220Z for 11:45 AM UTC June 30, 2019.
Demographic.AppVersion	The version number of the application that's associated with the endpoint.
Demographic.Locale	The locale of the endpoint, in the following format: the ISO 639-1 alpha-2 code, followed by an underscore (_), followed by an ISO 3166-1 alpha-2 value. For example, en_US is the English language locale for the United States.
Demographic.Make	The manufacturer of the endpoint device, such as apple or samsung.

Attribute	Description
`Demographic.Model`	The model name or number of the endpoint device, such as `iPhone` or `SM-G900F`.
`Demographic.ModelVersion`	The model version of the endpoint device.
`Demographic.Platform`	The operating system on the endpoint device, such as `ios` or `android`.
`Demographic.PlatformVersion`	The version of the operating system on the endpoint device.
`Demographic.Timezone`	The endpoint's time zone, as a tz database value. For example, `America/Los_Angeles` for Pacific Time (North America).
`EffectiveDate`	The date and time when the endpoint was last updated, in ISO 8601 format. For example, `2019-08-23T10:54:35.220Z` for 10:54 AM UTC August 23, 2019.
`EndpointId`	The unique identifier for the endpoint.
`EndpointStatus`	Whether to send messages or push notifications to the endpoint: `ACTIVE`, send messages to the endpoint, or, `INACTIVE`, don't send messages to the endpoint.
`Id`	The unique identifier for the endpoint.
`Pinpoint.JourneyId`	The unique identifier for the journey.
`Location.City`	The city where the endpoint is located.
`Location.Country`	The two-character code, in ISO 3166-1 alpha-2 format, for the country or region where the endpoint is located. For example, US for the United States.

Attribute	Description
`Location.Latitude`	The latitude coordinate of the endpoint's location, rounded to one decimal place.
`Location.Longitude`	The longitude coordinate of the endpoint's location, rounded to one decimal place.
`Location.PostalCode`	The postal or ZIP code for the area where the endpoint is located.
`Location.Region`	The name of the region, such as a state or province, where the endpoint is located.
`Metrics.`*`custom_attribute`*	A custom, numeric metric that your applicati on reports to Amazon Pinpoint for the endpoint.
`OptOut`	Whether the user opted out of receiving messages and push notifications from you: `ALL`, the user opted out and doesn't want to receive any messages or push notifications, or, `NONE`, the user hasn't opted out and wants to receive all messages and push notifications.
`RecommendationItems`	A standard recommended attribute that stores one recommendation for the endpoint or user. This attribute contains text that's provided directly by a recommender model.

Attribute	Description
`RecommendationItems.[#]`	A standard recommended attribute that stores an ordered list of 2–5 recommendations for the endpoint or user. This attribute contains text that's provided directly by a recommender model. The numeric placeholder (.[#]) indicates that the attribute contains multiple values. A message variable for this attribute can refer to a specific value in the list.
`Recommendations.` *`custom_attribute`*	A custom recommended attribute that stores one recommendation for the endpoint or user. This attribute contains content that's provided by a recommender model and enhanced by an AWS Lambda function.
`Recommendations.` *`custom_attribute`* `.[#]`	A custom recommended attribute that stores multiple recommendations for the endpoint or user. This attribute contains content that's provided by a recommender model and enhanced by an AWS Lambda function. The numeric placeholder (.[#]) indicates that the attribute contains multiple values. A message variable for this attribute can refer to one of those values specifically.
`RequestId`	The unique identifier for the most recent request to update the endpoint.
`User.UserAttributes.` *`custom_attribute`*	A custom user attribute that describes the user.
`User.UserId`	A unique identifier for the user.

Using message template helpers

With Amazon Pinpoint templates, customers can create reusable message templates based on the Handlebars.js language. Helpers provide a variety of features like formatting a price to a specific Region's currency or adding a time zone-based location. A helper can use a specific string or integer for the value or a specific Amazon Pinpoint message variable.

These are the categories of helpers, described in the following sections:

Default helpers

This section describes the **built-in** helpers provided by Handlebars. For the full list, see Built-in Helpers at handlebarsjs.com. These are the built-in helpers:

- `each` – Iterates a list.

> **Note**
>
> The maximum list size is 15 items.

- `if` – Evaluates a statement.

each

Iterates a list. This helper uses only a block statement. You can optionally:

- Pass `@index` in the request to reference the current loop index.
- Use the `this` helper to reference the current element being iterated.
- Return the helper response in a list, using the `<li>` tag.

Usage

```
{{#each value}}

Value at position {{@index}} is {{this}}.

{{else}}

Condition is false.

{{/each}}
```

`each` must be prefaced with a pound sign (#) and conclude with a closing `{{/each}}` in the block statement.

Example

In this example, `each` is used to return a list of a user's favorite colors. For a `false`, an `else` statement is returned. If the request is this:

```
{{#each User.UserAttributes.FavoriteColors}}

<li>{{this}}</li>

{{else}}

You have no favorite colors.
```

`{{/each}}` returns

- *red*
- *blue*
- *yellow*

for a true statement.

if

Evaluates whether something is true and returns a response based on the evaluation.

Usage

```
{{#if value}}

Value isn't undefined

{{else}}

Value is undefined

{{/if}}
```

`if` must be prefaced with a pound sign (#) and conclude with a closing `{{/if}}` in the block statement.

Example

In this example, the `if` helper is used to evaluate whether a user's first name. If the name is found, a greeting is returned that passes the user's first name in the response. Otherwise, the `else` statement returns an alternative greeting.

```
{{#if User.UserAttributes.FirstName.[0]}}

Hello {{User.UserAttributes.FirstName.[0]}},

{{else}}

Hello,

{{/if}}
```

returns *Hello, Jane* if the `if` helper is true.

Conditional helpers

This section describes the **conditional helpers**.

Conditional helpers can be used on either a single line or in a block statement. You can customize the response regardless of which helper method you use. You can pass additional conditional helpers within both single line and block statements. The following conditional helpers show usage first for a single line and then a block statement using an optional `else` clause. These are the conditional helpers:

- `and` – Compares whether all passed elements are equal.
- `eq` – Tests whether two elements are equal.
- `gt` – Tests whether one element is greater than another.
- `gte` – Tests whether one element is greater than or equal to another.
- `if` – Evaluates whether something is true.
- `lt` – Tests whether one element is less than another.
- `lte` – Tests whether one element is less than or equal to another.
- `neq` – Evaluates whether two elements are not equal.
- `not` – Inverts the response of a Boolean operation.

- `or` – Compares whether any of the elements in the argument are equal.

and

Compares whether *all* elements passed in an argument are equal, and then returns the response based on the result. This helper can be used for non-Boolean values. You must pass at least two elements for the condition.

Usage

- `{{and valuea valueb valuec valued yes='y' no='n'}}`

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.

- `{{#and valuea valueb}}`

  Condition is true.

  `{{else}}`

  Condition is false.

  `{{/and}}`

  and must be prefaced with a pound sign (#) and conclude with a closing `{{/and}}` in the block statement.

Example

In this example, `eq` is used within the `and` block statement to determine whether both strings passed for the `Location.City` and `Location.Country` attributes are true. If both conditions are equal, then a true statement is returned. If either of those attributes are false, then an `else` statement is returned.

```
{{#and (eq Location.City "Los Angeles") (eq Location.Country "US")}}

You live in Los Angeles and the US.

{{else}}

You don't live in Los Angeles and the US.
```

```
{{/and}}
```

eq

Tests whether two elements are equal or if the value of one element is equal to a passed string.

Usage

- `{{eq valuea valueb yes='y' no='n'}}`

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.
- `{{#eq valuea valueb}}`

  Condition is true.

  `{{else}}`

  Condition is false.

  `{{/eq}}`

  eq must be prefaced with a pound sign (#) and conclude with a closing `{{/eq}}` in the block statement.

Example

In this example, `eq` is used to evaluate whether the value of `User.UserAttributes.FavoriteColors.[0]` is *Red*. If the response is `true`, a true statement is returned. If the response is `false`, then an `else` statement is returned.

```
{{#eq User.UserAttributes.FavoriteColors.[0] "red"}}

Your favorite color is red.

{{else}}

You don't like red.

{{/eq}}
```

gt

Tests whether the value of one element is greater than another.

Usage

- `{{gt valuea valueb yes='y' no='n'}}`

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.

- `{{#gt valuea valueb}}`

  Condition is true.

  `{{else}}`

  Condition is false.

  `{{/gt}}`

  `gt` must be prefaced with a pound sign (#) and conclude with a closing `{{/gt}}` in the block statement.

Example

In this example, the helper compares the value of `User.UserAttributes.UserAge.[0]` attribute against a string *17*, to verify whether the user's age is greater than 17. If the response is `true`, a true statement is returned. If the response is `false`, then an `else` statement is returned.

```
{{#gt User.UserAttributes.UserAge.[0] "17"}}

You are old enough to rent a car.

{{else}}

You are not old enough to rent a car.

{{/gt}}
```

gte

Tests whether the value of one element is greater than or equal to another.

Usage

- `{{gte valuea valueb yes='y' no='n'}}`

You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.

- `{{#gte valuea valueb}}`

  Condition is true.

  `{{else}}`

  Condition is false.

  `{{/gte}}`

  `get` must be prefaced with a pound sign (#) and conclude with a closing `{{/gte}}` in the block statement.

Example

In this example, the helper compares the `User.UserAttributes.UserAge.[0]` attribute against a string *18*, to verify whether the user's age is greater than or equal to 18. If the response is `true`, a true statement is returned. If the response is `false`, then an `else` statement is returned.

```
{{#gte User.UserAttributes.UserAge.[0] "18"}}

You are old enough to rent a car.

{{else}}

You are not old enough to rent a car.

{{/gte}}
```

if

Evaluates whether something is true and returns a response based on the evaluation.

Usage

- `{{#if value}}`

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.

- `{{#if value}}`

  Condition is true.

  `{{else}}`

  Condition is false.

  `{{/if}}`

  `if` must be prefaced with a pound sign (#) and conclude with a closing `{{/if}}` in the block statement.

Example

In this example, the helper is used to evaluate whether a user's first name. If the name is found, a greeting is returned that passes the user's first name in the response. Otherwise, the else statement returns an alternative greeting.

```
{{#if User.UserAttributes.FirstName.[0]}}

Hello {{User.UserAttributes.FirstName.[0]}},

{{else}}

Hello,

{{/if}}
```

returns `Hello Jane,` if the helper is true.

lt

Tests whether the value of one element is less than the value of another.

Usage

- `{{lt valuea valueb yes='y' no='n'}}`

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.

- `{{#lt valuea valueb}}`

  Condition is true.

`{{else}}`

Condition is false.

`{{/lt}}`

`lt` must be prefaced with a pound sign (#) and conclude with a closing `{{/lt}}` in the block statement.

Example

In this example, the helper compares the `User.UserAttributes.UserAge.[0]` attribute against a string *18* , to verify whether the user's age is less than 18. If the response is `true`, a true statement is returned. If the response is `false`, then an `else` statement is returned.

```
{{#lt User.UserAttributes.UserAge.[0] "18"}}

You are not old enough to rent a car.

{{else}}

You are old enough to rent a car.

{{/lt}}
```

lte

Tests whether the value of an element is less than or equal to another.

Usage

- `{{lte valuea valueb yes='y' no='n'}}`

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.
- `{{#lte valuea valueb}}`

  Condition is true.

  `{{else}}`

  Condition is false.

  `{{/lte}}`

`lte` must be prefaced with a pound sign (#) and conclude with a closing `{{/lte}}` in the block statement.

Example

In this block statement, the helper compares the `User.UserAttributes.UserAge.[0]` attribute against a string *17*, to verify whether the user's age is equal to 17 or younger. If the response is `true`, a true statement is returned. If the response is `false`, then an `else` statement is returned.

```
{{#lte User.UserAttributes.Age.[0] "17"}}

You are not old enough to rent a car.

{{else}}

You are old enough to rent a car.

{{/lte}}
```

neq

Test whether two elements are *not* equal.

Usage

- `{{neq valuea valueb yes='y' no='n'}}`

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.
- `{{#neq valuea valueb}}`

  Condition is true.

  `{{else}}`

  Condition is false.

  `{{/neq}}`

  neq must be prefaced with a pound sign (#) and conclude with a closing `{{/neq}}` in the block statement.

Example

In this block statement, the `User.UserAttributes.FavoriteColors.[0]` attribute is checked against a string *Red*. If the response is `true`, a true statement is returned. If the response is `false`, then an `else` statement is returned.

```
{{#neq User.UserAttributes.Favorite.Colors.[0] "red"}}

You do not like red.

{{else}}

You like red.

{{/neq}}
```

not

Inverts the response of a Boolean operation, so that if `not` is a positive comparison, then a `true` statement is returned. If the response is false, then an else statement is returned.

Usage

- `{{not value yes='y' no='n'}}`

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition.

- `{{#not value}}`

  Condition is true.

  `{{else}}`

  Condition is false.

  `{{/not}}`

  `not` must be prefaced with a pound sign (#) and conclude with a closing `{{/not}}` in the block statement.

Example

In this block statement, the `User.UerAttributes.FavoriteColors.[0]` attribute is checked against a string *red*, using the `eq` helper. The `not` helper then returns the opposite of

the eq helper. If the response returns any color other than *red*, a true a statement is returned. If the response returns *red*, then an else statement is returned indicating a false statement.

```
{{#not (eq User.UserAttributes.Favorite.Colors.[0] "red")}}

You do not like red.

{{else}}

You like red.

{{/not}}
```

Example

In this example,

```
{{not (eq User.UserAttributes.FavoriteColors.[0] "red")}}
```

returns false if User.UserAttributes.FavoriteColors.[0] is *red*.

or

Compares whether *any* of the elements in the argument are equal, and then returns a response based on the result. This helper can be used for non-Boolean values.

Usage

- {{or *valuea valueb valuec valued* yes='*y*' no='*n*'}}

  You can replace *y* and *n* with other values, such as *yes* and *no*, or any other string you want returned, depending on the condition. You must pass at least two elements for the condition.
- {{#or *valuea valueb*}}

  Condition is true.

  {{else}}

  Condition is false.

  {{/or}}

  or must be prefaced with a pound sign (#) and conclude with a closing {{/or}} in the block statement.

Example

In this `or` block statement, two strings for the `Location.City` attribute are compared additionally using the `eq` helper. If either of the attributes are `true`, then a true statement is returned. If one or more of the responses are `false`, then an `else` statement is returned.

```
{{#or (eq Location.City "Los Angeles") (eq Location.City "Seattle")}}

You live on the West Coast of the United States.

{{else}}

You do not live on the West Coast of the United States.

{{/or}}
```

String helpers

This section describes the following **string** helpers:

- `abbreviate` – Truncates a value.
- `capitalize` – Capitalizes each word between white spaces.
- `capitalizeFirst` – Capitalizes the first character of a value.
- `center` – Centers a value.
- `cut` – Cuts a value.
- `dateFormat` – Sets the date style.
- `inflect` – Returns a singular or plural string based on the count.
- `join` – Joins an array, iterator, or an iterable object.
- `ljust` – Justifies a value to the left margin.
- `lower` – Converts a value to lower case.
- now – Prints the current date.
- `ordinalize` – Ordinalizes a numeric value.
- `replace` – Replaces one string with another.
- `rjust` – Justifies a value to the right margin.
- `slugify` – Converts a value to lower case and removes non-word characters, converts spaces to hyphens, and removes trailing white space.

- `stripTags` – Strips [X]HTML tags from a value.
- `substring` – Returns a new string as a substring of a passed value.
- `upper` – Converts the passed value to upper case.

- `yesno` – Replaces true, false, and no with Yes, No, and Maybe.

abbreviate

Truncates a value if the value exceeds the number specified. White spaces are included in the length count. An ellipsis displays in the response to indicate a truncated value. The ellipsis counts towards the truncated value in the response. This type of helper is useful if you have a large table and minimal space. Truncating values in a cell allows you to have a more uniform look to the table.

Usage

`{{abbreviate value X}}`, replacing *X* with a numeric value indicating the number of characters to keep. Negative numbers are not supported.

Example

In this example, `abbreviate` is used to truncate `User.UserAttributes.LastName.[0]` to six (6) characters. The response includes an ellipsis, the dots of which count towards the six-character total.

`{{abbreviate User.UserAttributes.LastName.[0] 6}}` returns

Ale... if *Alejandro* is the value of `[0]`.

capitalize

Capitalizes each word between white spaces.

Usage

`{{capitalize value}}`

Example

In this example, initial capitalization is applied to each word for the `Attributes.description.[0]` entry.

`{{capitalize Attributes.description.[0]}}`

If `Attributes.description.[0]` returns

My First Post, if the value of `Attributes.description.[0]` is *my first post*.

capitalizeFirst

Capitalizes the first character in a value.

Usage

`{{capitalizeFirst value}}`

Example

In this example, capitalization is applied to the first character of the first word of the `Attributes.description.[0]` entry.

`{{capitalizeFirst Attributes.description.[0]}}` returns

My first post, if the value of *Attributes.description.[0]* is *my first post*.

Example

center

Centers the value in a field of a given width by the number specified. You can optionally pass a character to display for the padding or leave the field blank. If no character is passed a white space is used.

Usage

`{{center value size=X [pad=" "}}` , replacing *X* with a numeric value.

If `pad` is kept blank, white space is used as the padding in the response. If you pass a character, that character displays in each space of the padding. Negative numbers are not supported.

Example

In this example, the value of `Location.City` is centered with a size of *19*.

`{{center Location.City size=19}}` returns

" Los Angeles " If `Location.City` is *Los Angeles*. Note that the quotes displayed in the example output are provided for emphasis only.

cut

Removes the specified value from a string.

Usage

`{{cut value [" "]}}`, replacing the space within the quotes parameter with the value to cut. If no parameter value is passed, a white space is used.

Example

This example removes the letter *e* from the `Location.City` attribute.

`{{cut Location.City "e"}}` returns

Los Angls if `[Location.City` is *Los Angeles*.

dateFormat

Sets the default date style for the date in any response. For a list of the time zone IDs, see https://en.wikipedia.org/wiki/List_of_tz_database_time_zones.

Usage

```
{{dateFormat date [inputFormat="format1"] [outputFormat="format2"]
[tz=timeZoneId] [locale=localeID]}}
```

The `format` parameter must be one of:

- "`full`": full date format. For example: *Tuesday, September 19, 2020*
- "`long`": long date format. For example: *September 19, 2020*
- "`medium`": medium date format. For example: *Sept 19, 2020*
- "`short`": short date format. For example: *9/19/20*
- "`pattern`": uses a custom date pattern format. For more information about date patterns, see https://docs.oracle.com/javase/8/docs/api/java/text/SimpleDateFormat.html.

"`locale`": uses a date format based on a given locale. For more information about locales, see https://commons.apache.org/proper/commons-lang/apidocs/org/apache/commons/lang3/LocaleUtils.html#toLocale-java.lang.String-.

If a format is not passed, then `medium` is used by default.

Example

In this example, the `[0]` entry for *`User.UserAttributes.StartDate.[0]`* is **`09/19/2020`** and a message is sent to a user using the `full` date format based on the *`America/Los_Angeles`* time zone.

`We can meet with you any time on {{dateFormat User.UserAttributes.StartDate.[0] inputFormat="MM/dd/yyyy" outputFormat="full" tz=America/Los_Angeles}}.` returns

`We can meet with you any time on Tuesday, September 19, 2020.`

inflect

Returns a singular or plural string based on the count value.

Usage

`{{inflect` *`count singular plural`* `[includeCount=false]}}`

- Enter the singular and plural forms of the string you want to pass in the argument.
- If `includeCount` is set to `false`, no count is returned in the response. If set to `true`, the `count` is included in the response.

Example

The following examples show the inflection for a purchase of apples, with and without `includeCount`.

`Thank you for your purchase of {{inflect` *`3 apple apples`* `includeCount=`*`false`*`}}.` returns:

`Thank you for your purchase of apples.`

If `includeCount` is set to `true`, then the response is

`Thank you for your purchase of 3 apples.`

join

Joins an array, iterator, or an iterable object. The response returns a list, with each value in the list concatenated by the character you pass in the `join`. For example, you might separate values using a comma (`,`). The value in this helper must be a list without an attribute position index. For example, this might be `Attributes.custom_attribute`.

Usage

`{{join value " // " [prefix=""] [suffix=""]}}`

Example

In this example, a list of colors is returned, with the list separated by a comma and a space (", "):

`{{join Attributes.favorite_colors ", "}}` returns

`blue, red, green` if `Attributes.favorite_colors` is the list `blue,red,green`.

ljust

Justifies the value to the left margin and adds space to the right so that the length of the value matches the number. Negative numbers are not supported.

You can optionally pass a character to display for the `pad` or leave the field blank. If you leave the `pad` value blank, the default value is a white space.

Usage

`{{ljust value size=X [pad=" "]}}`, where `X` is the total length of the value, including white space.

Example

In this example, a left justification value of `15` is applied to the Location.City.

`{{ljust Location.City size=15}}` returns

`"Los Angeles     "` if the value of `Location.City` is `Los Angeles`. Note that the quotes displayed in the example output are provided for emphasis only.

lower

Converts a value to all lower case.

Usage

`{{lower value}}`

Example

In this example, the `[0]` entry for `User.UserAttributes.LastName.[0]` is changed to lower case.

`{{lower User.UserAttributes.LastName.[0]}}` returns

`santos` if `Santos` is the value of `[0]`.

now

Prints out the current date based on the passed time zone ID. For a list of the time zone IDs, see https://en.wikipedia.org/wiki/List_of_tz_database_time_zones.

Usage

```
{{now [format="format"] [tz=timeZoneId] [locale=localeID]}}
```

The `format` parameter must be one of:

- "`full`": full date format. For example: `Tuesday, September 19, 2020`
- "`long`": long date format. For example: `September 19, 2020`
- "`medium`": medium date format. For example: Sept 19, 2020
- "`short`": short date format. For example: 9/19/20
- "`pattern`": a date pattern. For more information about date patterns, see https://docs.oracle.com/javase/8/docs/api/java/text/SimpleDateFormat.html.

"`locale`": uses a date format based on a given locale. For more information about locales, see https://commons.apache.org/proper/commons-lang/apidocs/org/apache/commons/lang3/LocaleUtils.html#toLocale-java.lang.String-.

If a format is not passed, then `medium` is used by default.

Example

In this example, the current date in Los Angeles is returned with a `medium` format.

`{{now "medium" tz=America/Los_Angeles}}` returns

`Sept 19, 2020`.

ordinalize

Ordinalizes the numeric value passed in the argument. For example, `1` is ordinalized as `1st` and `2` as `2nd`. Only numeric values are supported.

Usage

```
{{ordinalize [number]}}
```

Example

In this example, the `[0]` entry of `User.UserAttributes.UserAge` is ordinalized and returned, along with a message.

`Congratulations on your {{ordinalize User.UserAttributes.UserAge.[0]}} birthday!` returns *22* ordinalized as *22nd*.

`Congratulations on your 22nd birthday!`

replace

Replaces one string with another string. A string or numeric value must be literal. Wildcard characters are not supported.

Usage

`{{replace` *`stringToReplace replacementValue`*`}}`

Example

In this example, an underscore (_) replaces a white space.

`{{replace` *`Location.City " " "_"`*`}}` returns

`Los_Angeles` if the `Location.City` is *`Los Angeles`*.

rjust

Justifies the value to the right margin and adds space to the left so that the length of the value matches the number. Negative numbers are not supported.

You can optionally pass a character to display for the `pad` or keep the field blank. If you keep the `pad` value blank, the default value is a white space.

Usage

`{{rjust` *`value`* `size=`*`X`* `[pad=" "]}}`, where *X* is the total length of the value, including white space.

Example

In this example, a right justification value of *15* is applied to the `Location.City` attribute.

`{{rjust` *`Location.City`* `size=`*`15`*`}}` returns

" Los Angeles" . if the `Location.City` is *Los Angeles*. Note that the quotes displayed in the output are provided for emphasis only.

slugify

Converts the passed value to lowercase, removes non-word characters (alphanumeric and underscore), converts spaces to hyphens, and removes any leading or trailing white space.

Usage

`{{slugify` *value*`}}`

Example

In this example, slugify is performed for the `Location.City` attribute.

`{{slugify` *Location.City*`}}` returns

los-angeles if `Location.City` is *Los Angeles*.

stripTags

Strips [X]HTML tags from a value.

Usage

`{{stripTags` *value*`}}`

Example

In this example, the HTML tags for the User.UserAttributes.interest.[0] are removed.

`{{stripTags` *User.UserAttributes.interests.[0]*`}}` returns

Art, if `User.UserAttributes.interests.[0]` is `<h1>Art</h1>`.

substring

Returns a new string as a substring of the passed value. The length and position are determined by the `startOffset` and `endOffset` parameters, which must be integers. Negative numbers are not supported. If an `endOffset` is not passed, the substring uses the original ending value of the string.

Usage

`{{substring` *value startOffset [endOffset]*`}}`

Example

In this example, an offset of 4 and endOffset of 9 are applied to the Location.City attribute.

`{{substring Location.City 4 9}}` returns

Angel if Los Angeles is the value of `Location.City` is *Los Angeles*.

upper

Converts the passed value to upper case.

Usage

`{{upper value}}`

Example

In this example, the `[0]` entry for the `User.UserAttributes.LastName` attribute is converted to all upper case.

`{{upper User.UserAttributes.LastName.[0]}}`returns

ROE if the `User.UserAttributes.LastName.[0]` value is *Roe*.

yesno

Replaces `true`, `false`, and `NULL` with `Yes`, `No`, and `Maybe`.

Usage

`{{yesno value [yes="yes"] [no="no"] maybe=["maybe"]}}`

Example

In this example, the `IsUserSubscribed` attribute returns whether a user is subscribed to a particular list.

`{{yesno Attributes.IsUserSubscribed}}` returns

yes if `Attributes.IsUserSubscribed` is *true*.

Math and encoding helpers

This section describes the **math and encoding** helpers.

- `add` – Returns the sum of two numbers.
- `ceiling` – Rounds an integer to its mathematical ceiling.
- `decode64` – Decodes a base64 encoded value to a string.
- `divide` – Returns the quotient of two numbers.
- `encode64` – Encodes a string using base64.
- `floor` – Rounds an integer to its mathematical floor.
- `md5` – Hashes a passed string using the MD5 algorithm.
- `modulo` – Returns the remainder of two numbers using floating points.
- `multiply` – Returns the product of two numbers.
- `round` – Rounds a decimal to the nearest whole number.
- `sha256` – Hashes a passed string using SHA-256.
- `sha512` – Hashes a passed string using SHA-512.
- `subtract` – Returns the difference of two numbers.
- `uuid` – Randomly generates a UUID in a 128-bit format.

add

Returns the sum of two numbers along with floating points.

Usage

```
{{add arg1 arg2}}
```

Example

`{{add 5 2.3}}` returns

```
7.3
```

ceiling

Rounds an integer to its mathematical ceiling, which is the highest whole number closest to the passed value.

Usage

```
{{ceiling value}}
```

Example

`{{ceiling 5.23}}` returns

`6`

decode64

Decodes a base64 encoded value to a string.

Usage

`{{decode64 "string"}}`

Example

`{{decode64 "SGVsbG8gd29ybGQ="}}` returns

`Hello World`

divide

Returns the quotient of two numbers, including floating points.

Usage

`{{divide arg1 arg2}}`

Example

`{{divide 5 2.3}}` returns

`2.17391304`

encode64

Encodes the string passed in the argument using base64.

Usage

`{{encode64 "string"}}`

Example

`{{encode64 "Hello World"}}`

`SGVsbG8gd29ybGQ=`

floor

Rounds an integer to its mathematical floor, which is the lowest whole number closest to the passed value.

Usage

```
{{floor value}}
```

Example

`{{floor 5.23}}` returns

```
5
```

md5

Hashes a passed string using the MD5 algorithm.

Usage

```
{{md5 "string"}}
```

Example

```
{{md5 "Hello World"}}
```

```
3e25960a79dbc69b674cd4ec67a72c62
```

modulo

Returns the remainder of two numbers using floating points.

Usage

```
{{modulo arg1 arg2}}
```

Example

`{{modulo 7 2}}` returns

```
1
```

multiply

Returns the product of two numbers, with any floating points.

Usage

`{{multiply arg1 arg2}}`

Example

`{{multiply 5 2.3}}` returns

`11.5`

round

Rounds a decimal place up or down to the nearest whole number.

Usage

`{{round value}}`

Example

`You spent an average of {{round 19.21}} minutes on our website each day.` returns:

`You spent an average of 19 minutes on our website each day.`

sha256

Hashes a passed string using SHA-256 cryptographic security.

Usage

`{{sha256 "string"}}`

Example

`{{sha256 "Hello World"}}` returns

`a591a6d40bf420404a011733cfb7b190d62c65bf0bcda32b57b277d9ad9f146e`

sha512

Hashes a passed string using SHA-512 cryptographic security.

Usage

`{{sha512 "string"}}`

Example

`{{sha512 "Hello World"}}` returns

2c74fd17edafd80e8447b0d46741ee243b7eb74dd2149a0ab1b9246fb30382f27e853d8585719e

subtract

Returns the difference of two numbers, with any floating points.

Usage

`{{subtract arg1 arg2}}`

Example

`{{subtract 5 2.3}}` returns

2.7

uuid

Randomly generates a UUID in a standard 128-bit format. No value needs to be passed in the argument.

Usage

`{{uuid}}`

Example

`{{uuid}}` returns

95f36680-152c-4052-99ec-cc3cdf7ca594

Inline partials

While technically not a helper, inline partials are Handlebars way to streamline templates that include repeated strings, which is better for reuse. For more information, see Inline partials at handlebarsjs.com.

Usage

```
{{#* inline "inlineName"}}Content to reuse{{/inline}}
```

To reference the content of the inline partial elsewhere, use:

```
{{> inlineName}}
```

Example

The following example creates an inline partial that includes the recipient's first name, and, if it's available, last name, by adding the following code to the beginning of the template:

```
{{#* inline "fullName"}}

{{User.UserAttributes.FirstName.[0]}} {{#if User.UserAttributes.LastName.[0]}} {{User.UserAttributes.LastName.[0]}} {{/if}}

{{/inline}}
```

After creating the `fullName` partial, you can include it anywhere in your template by preceding the name of the partial with a > (greater than) symbol, followed by a space, as in the following example: `{{> fullName}}`.

```
Hello {{> fullName}}
```

returns the user's first and last name if true – for example, *`Hello Jane Doe`*. Otherwise, if no last name is found, *`Hello Jane`* is returned.

Handlebars include additional features beyond those documented here. For more information, see handlebarsjs.com.

Using variables with message template helpers

Amazon Pinpoint custom attributes, such as `User.UserAttributes.LastName`, are stored as a list, regardless of whether there's a single item or multiple items. When passing a list in a helper that expects a string, you must specify the attribute index value along with the attribute name. This attribute index value indicates the position of a value from the attribute list: `.[0]` for the first entry in the list, `.[1]` for the second, `.[2]` for the third, and so on. For example, let's say you're using the `upper` helper to convert the first (`[0]`) entry of `User.UserAttributes.LastName` to all upper case. The helper usage is `{{upper value}}`, and the attribute formatted as `User.UserAttributes.LastName`. Replace *`value`* with the attribute name and attribute index value *`.[0]`* as follows: `{{upper User.UserAttributes.LastName.[0]}}`. The response then returns the `[0]` entry from the list, formatted in all upper case. For example, if the value of `[0]` is *`Santos`*, the response returns *`SANTOS`*.

Amazon Pinpoint custom attributes names support spaces. To have a custom attribute called `"Last Name"`, you must format the attribute as `User.UserAttributes.[Last Name]`. To

access the first entry in the attribute index list the format is `User.UserAttributes.[Last Name].[0]`.

A custom attribute name can contain up to 50 characters. An attribute value can contain up to 100 characters. When you define the name of a custom attribute, avoid using the following characters: number sign (#), colon (:), question mark (?), backslash (\), and slash (/). The Amazon Pinpoint console can't display attribute names that contain these characters. This restriction doesn't apply to attribute values.

Using nested helpers

You can nest multiple message template helpers within each other. The following example shows how to format two helpers: `{{ first helper (second helper)}}`. The second helper is processed first, followed by the first helper. Remember that the first helper always determines the output. Subsequent helpers must be nested within the previous helper as follows: `{{ first helper (second helper (third helper) )}}`.

The following example shows how to nest two helpers to change **`JANE`** to **`Jane`**: `{{capitalizeFirst (lower "JANE")}}`. `lower` first converts **`JANE`** to **`jane`**. Then `capitalizeFirst` converts **`jane`** to **`Jane`**.

Managing message templates

The **Message templates** page on the Amazon Pinpoint console provides a single location for you to create, view, and manage all the message templates for your Amazon Pinpoint account in the current AWS Region. By using this page, you can manage your message templates as a single collection. This can help you design consistent messages and reuse content more easily and effectively. You can use this page to perform management tasks such as viewing and editing templates, and copying, deleting, and creating templates.

Topics

- Viewing your collection of message templates
- Opening a message template
- Editing a message template
- Copying a message template
- Deleting a message template

- Adding a tag to a template
- Removing a tag from a template

For information about creating a message template, see Creating email templates, Creating push notification templates, Creating SMS templates, or Creating voice templates, depending on the type of template that you want to create.

For information about viewing and managing versions of templates, see Managing versions of message templates.

Viewing your collection of message templates

The **Message templates** page displays a list of all the message templates for your Amazon Pinpoint account in the current AWS Region. To browse the list or find specific templates quickly, you can sort and filter the list, choose which columns to display, and change other display settings for the list.

To view your collection of message templates

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**. The **Message templates** page opens and displays the number of templates in your collection and a list of those templates.
3. To customize the list or find a specific template quickly, choose any of the following options:

   - To sort the list by a specific type of value, select the column heading for that value. To change the sort order from ascending to descending or the other way around, select the column heading again.
   - To apply a filter that displays only a specific type of template, use the channel selector at the top of the page to choose the channel. To remove the filter, choose **All message channels** from the channel selector.
   - To apply a filter that displays only those templates whose names contain specific text, enter the text in the **Search** box above the list. To remove the filter, choose **X** in the **Search** box.
   - To change the number of templates that are displayed in the list, choose the settings icon at the top of the page. Then, for **Page size**, choose the number of templates that you want to display, and choose **Save changes**.
   - To add or remove columns from the list, choose the settings icon at the top of the page. Then, for **Choose visible columns**, turn each column on or off, and choose **Save changes**.

Opening a message template

By using the **Message templates** page, you can quickly find and open a specific message template to view the contents of the template and information about the template. For example, you can view current and previous versions of the template, and determine when the template was last updated. After you open a template, you can also edit the template.

To open a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template that you want to open. The template page opens and displays information about the template. It also displays the contents of the active version of the template.
4. To view a different version of the template, use the version selector under **Template details** to choose the version that you want to view.

Editing a message template

You can open a message template for editing in two ways: while you're authoring a message that uses the template, and by using the **Message templates** page. This topic explains how to open and edit a template by using the **Message templates** page.

If you edit a template, Amazon Pinpoint might apply your changes to existing messages that use the template and haven't been sent yet, such as campaign messages that are scheduled to be sent at a later time. This depends on whether you edit the active version of the template and how you configured the messages that use the template. For more information, see Managing versions of message templates.

To edit a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template that you want to edit. The template page opens and displays information about the template. It also displays the contents and settings for the active version of the template.
4. Choose **Edit**.

5. Under **Template details**, use the version selector to choose the version of the template that you want to use as a starting point for your changes. If you choose the most recent version of the template, you can save your changes directly to that version of the template. Otherwise, you can save your changes as a new version of the template.
6. Make the changes that you want. You can change any of the template's content or settings, except the name of the template. To change the name of the template, you can create a copy of the template, save the copy with the name that you want, and then optionally delete the original template.
7. When you finish making changes, do one of the following:
   - To save your changes as a new version of the template, choose **Save as new version**. To help make sure that your changes don't affect any existing messages, we recommend that you choose this option.
   - To save your changes as an update to the most recent version of the template, choose **Update version**. This option is available only if you chose the most recent version of the template in step 5. If you choose this option, your changes might affect existing messages that use the template.

Copying a message template

To quickly create a new message template that's similar to an existing template, you can create a copy of the template. You can then edit the template copy without changing the original template.

To copy a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, select the check box next to the template that you want to copy.
4. On the **Actions** menu, choose **Duplicate**.
5. For **Template name**, enter a name for the template copy. The name has to begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
6. When you finish entering the name, choose **Duplicate template**. The template page opens and displays all the content and settings for the active version of the template that you copied.

7. (Optional) To change the template copy, choose **Edit**, make the changes that you want, and then choose **Save as new version**.

Deleting a message template

If you want to remove a message template from Amazon Pinpoint completely, you can delete the template. If you delete a template, it doesn't affect any existing messages that use the template, such as campaign messages that are scheduled to be sent at a later time.

> **Warning**
>
> If you delete a template, Amazon Pinpoint deletes all versions, content, and settings for the template. In addition, the template becomes unavailable for all future messages. You can't recover a template after you delete it.

To delete a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, select the check box next to each template that you want to delete.
4. On the **Actions** menu, choose **Delete**.

Adding a tag to a template

A tag is a label that you can define and associate with AWS resources, including certain types of Amazon Pinpoint resources.

Adding a tag to a template can help you categorize and manage templates in different ways, such as by purpose, owner, environment, or other criteria. You can use tags to quickly find existing templates, or to control which users can access specific templates. You can add at most 50 key-value pairs, with each key being unique.

To add a tag

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.

2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template that you want to add a tag to.
4. Under **Tags**, choose **Manage tags**.
5. Choose **Add new tag**.
6. Enter the tag key and value pair that you want to add.
7. (Optional) To add additional tags, choose **Add new tag**.
8. When you finish, choose **Save tags**.

Removing a tag from a template

If you no longer need a tag to apply to a template, you can remove it through the console.

To remove a tag

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template that you want to remove a tag.
4. Under **Tags**, choose **Manage tags**.
5. Next to the tag you want to remove, choose **Remove**.
6. Choose **Save tags**.

For more information on how to use tags in IAM policies see Managing tags.

Managing versions of message templates

To help you manage the development and use of individual message templates, Amazon Pinpoint supports versioning for all types of message templates. Versioning provides a way for you to create a history of changes to a template—each version is a snapshot of a template at a certain point in time. Versioning also provides a way for you to control the contents and settings of messages that use a template.

Each time you change a template, you can specify whether you want to save your changes as a new version of the template or as an update to the most recent, existing version of the template. As you design, develop, and refine a template, each of these versions serves as a snapshot that can help

you track the progress and status of the template. That is to say, you can use versioning to store, track, and manage a template as it changes over time. You can:

- **Track the history of a template** – For each template, Amazon Pinpoint provides a list of versions of the template. This list displays the name of each version, and it indicates when each version was last changed. The list is sorted in descending chronological order with the most recent version listed first.
- **View and compare versions of a template** – By using the version list, you can browse previous versions of a template. If you choose a version from the list, Amazon Pinpoint displays the contents and settings that are stored in that version.
- **Restore a previous version of a template** – If you find issues in the most recent version of a template, you can open and edit a previous version that doesn't contain the issues. You can then save that previous version as a new version of the template. The new version then becomes the most recent version of the template.

You can also use versioning to control which version of a template can be used in messages. You do this by designating a specific version as the *active version* of a template. The *active version* is typically the version that's been most recently reviewed and approved for use in messages, depending on your organization's workflow for developing and managing templates.

When you designate a version as the active version, you enable that version for use in messages. As a template changes over time, you can designate a different version as the active version, and you can change that designation multiple times.

> **Note**
>
> If you need to edit a template that is actively being used we recommend you create a new version of the template.

Topics

- How versioning works
- Viewing versions of a message template
- Viewing the active version of a message template
- Designating the active version of a message template
- Editing the active version of a message template

How versioning works

In a typical development workflow, a message template has many versions. These versions extend from the start of design and development through testing, review, and, ultimately, approval for use in messages. In some cases, you might create and approve additional versions after the initial approval, as you refine and update a template. For example, you might add links or change the layout of a template in response to analytics data for a campaign that uses the template.

Version numbering

When you create a template, there is only one version of the template—*Version 1*. Each time you subsequently change a template, you specify whether you want to save your changes as a new version of the template, or as an update to the most recent version of the template.

If you save your changes as a new version, Amazon Pinpoint automatically increments the version number by 1 and assigns that version number to the version—*Version 1* for the first version, *Version 2* for the second version, *Version 3* for the third version, and so on. Version numbers are never reused. You can save as many as 5,000 versions of a template.

If you save your changes as an update to the most recent version, Amazon Pinpoint overwrites the most recent version to include your changes. To make sure that you have an accurate view of a template's history, you can overwrite only the most recent version of a template by using the Amazon Pinpoint console. You can't overwrite any earlier versions of a template by using the console.

Latest and active versions

To support long-term, continuous development of templates, two versions of a template can be current at the same time. They are: the *latest* version, which is the version that was most recently changed, and the *active* version, which is the version that can be used in messages.

Depending on your organization's workflow, the active version is typically the version that's been most recently reviewed and approved for use in messages. It isn't necessarily the latest version of a template. In addition, any version other than the active version is considered a draft or archival version of a template. This means that you can use only the active version of a template in messages that you create by using the Amazon Pinpoint console.

For example, you might create several versions of a template as you design and develop the template. When the latest version of the template is complete and approved for use in messages, you can designate that version as the active version of the template. You can then use that active

version of the template in messages. If you later decide to change the template, you can create additional versions for those changes, without affecting the active version of the template or any existing messages that use the template.

Of all the versions of a template, one version has to be designated as the active version of the template. As a template changes over time, you can designate a different version as the active version, and you can change that designation multiple times.

Version settings for messages

To use a specific version of a template in a message, the version must be the active version of the template when you create the message or when Amazon Pinpoint sends the message. This depends on how you configure a message to use a template. When you create a message and choose a template for it, you have two options:

- **Use the version that's currently active** – If you choose this option, Amazon Pinpoint always sends the same message content and settings, as specified in the version of the template that's active when you create the message. This means that the message remains the same, regardless of any changes that you make to the template later.
- **Use the version that's active when the message is sent** – If you choose this option, Amazon Pinpoint automatically updates the message content and settings to match whichever version of the template is active when it sends the message. This means that the message changes if you designate a different version as the active version after you create the message.

For example, if you do the following:

1. Create *Version 1* of a template.
2. Designate *Version 1* as the active version of the template.
3. Create a message that uses the template and schedule that message to be sent at a later time.
4. Change the template several times.
5. Designate a new version (*Version 5*) as the active version of the template.

Amazon Pinpoint does the following for each option when it sends the message:

- **Use the version that's currently active** – If you chose this option for the message, Amazon Pinpoint uses the content and settings specified by *Version 1* of the template. It does this because *Version 1* was the active version of the template when the message was created.

- **Use the version that's active when the message is sent** – If you chose this option for the message, Amazon Pinpoint automatically updates the message to use the content and settings specified by *Version 5* of the template. It does this because *Version 5* is the active version of the template when the message is sent.

If you want to make sure that changes to a template don't affect any existing messages that you haven't sent yet, we recommend that you configure your messages to use the version of the template that's active when messages are created, not sent. Alternatively, if you want to continue to develop a template after you start using it in messages, you can create a copy of the template, and then edit and use the template copy in new messages.

Viewing versions of a message template

By using the **Message templates** page, you can quickly find and open a specific message template. You can then view a list of the versions that exist for the template. From that list, you can choose a specific version to view the contents and settings for that version of the template.

To view versions of a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template whose versions you want to view. The template page opens and displays information about the template. It also displays the contents and settings for the active version of the template.
4. Under **Template details**, open the version selector to display a list of versions for the template.
5. To view the contents and settings for a specific version, use the version selector to choose the version. After you choose a version, Amazon Pinpoint displays the contents and settings for that version of the template.

Viewing the active version of a message template

You can view the active version of a message template in two ways: while you're creating a message that uses the template, and by using the **Message templates** page. To view the active version of a template while you're creating a message, choose the template for the message. Amazon Pinpoint automatically displays a preview of the active version of the template.

To view the active version of a template by using the **Message templates** page, follow the steps in this topic.

To view the active version of a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template whose active version you want to view. The template page opens and displays information about the template. It also displays the contents and settings for the active version of the template. Under **Template details**, note that **ACTIVE VERSION** appears (in green) next to the version name in the version selector.
4. To view a different version of the template, use the version selector under **Template details** to choose the version that you want. To view the active version again, use the version selector to choose the version that displays **ACTIVE VERSION** (in green) next to the version name.

Designating the active version of a message template

When you create a message template, Amazon Pinpoint automatically designates the first version of the template as the active version of the template. As you create and develop subsequent versions of a template, you can designate a different version as the active version of the template, and you can change that designation multiple times.

Before you designate a version as the active version of a template, it's a good idea to verify that all the content and settings in the proposed active version are complete and ready for use.

It's also a good idea to verify that the differences between the current and proposed active versions won't affect existing messages in unexpected or unwanted ways. If you designate a different version as the active version, Amazon Pinpoint might apply your change to existing messages that use the template and haven't been sent yet. This depends on how you configured the messages that use the template. For more information, see the section called “Version settings for messages”.

If the template is being used in messages that haven't been sent yet, compare the version that's currently active to the version that you want to make active. Also, review any journey activities and campaigns that use the template. Then, edit the template as necessary to address any issues that you find before you designate a different version as the active version.

If you're concerned about the effects of designating a different version as the active version, you can create a copy of the template instead. You can then edit and use the template copy in new messages.

To designate the active version of a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template that you want to designate the active version for. The template page opens and displays information about the template. It also displays the contents and settings for the version that's currently the active version of the template.
4. Under **Template details**, use the version selector to choose the version that you want to designate as the active version. After you choose a version, Amazon Pinpoint displays the contents and settings for that version of the template.
5. Choose **Make active version**.

The new active version of the template is now available for use in new messages. In addition, it's used in any existing messages that haven't been sent yet and are configured to use the version of the template that's active when the message is sent.

Editing the active version of a message template

Before you edit the active version of a template, it's important to remember that only the active version of a template can be used in messages that you create by using the Amazon Pinpoint console. For this reason, it's a good idea to first verify that your changes are complete and ready for use.

It's also a good idea to verify that your changes won't affect existing messages in unexpected or unwanted ways. Amazon Pinpoint might apply your changes to existing messages that use the template and haven't been sent yet. This depends on how you configured the messages that use the template. For more information, see the section called “Version settings for messages”.

To determine how your changes might affect existing messages, review the contents and settings for the version of the template that's currently active. Also, review any journey activities and campaigns that use the template. Then, consider the changes that you plan to make and make sure that your changes align with your goals for existing messages that use the template.

Finally, if you're concerned about the effects of editing the active version of the template, you can create a copy of the template instead. You can then edit and use the template copy in messages that you create later.

To edit the active version of a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template whose active version you want to edit. The template page opens and displays information about the template. It also displays the contents and settings for the version that's currently designated as the active version of the template.
4. Choose **Edit**.
5. Under **Template details**, use the version selector to make sure that you're editing the active version of the template. **ACTIVE VERSION** appears (in green) next to the name of the active version.
6. Make the changes that you want, and then choose **Save as new version**.
7. Under **Template details**, use the version selector to choose the version of the template that you created in the preceding step.
8. Choose **Make active version**.

The new active version of the template is now available for use in new messages. In addition, it's used in any existing messages that haven't been sent yet and are configured to use the version of the template that's active when the message is sent.

Machine learning models in Amazon Pinpoint

A *machine learning (ML) model* is a mathematical representation of a real-world problem. An ML model finds patterns in data and generates predictions based on the patterns that it finds. These predictions typically improve over time, as an ML model receives more data and people retrain or tune the model to refine and optimize the model's analysis of data.

In Amazon Pinpoint, you can connect to a certain type of ML model, referred to as a *recommender model*, to predict which items a user will interact with and to send those items to message recipients as personalized recommendations. A *recommender model* is an ML model that's designed to answer the question, "What will a user like or be interested in?" It predicts what a particular user will prefer from a given set of products or items, and it provides that information as a set of recommendations for the user. By using recommender models with Amazon Pinpoint, you can send personalized recommendations to message recipients based on each recipient's attributes and behavior.

To use a recommender model with Amazon Pinpoint, start by working with your data science team to create and deploy the model as an Amazon Personalize campaign. Next, configure Amazon Pinpoint to use recommendation data from the Amazon Personalize campaign. You do this by setting up a connection between Amazon Pinpoint and the Amazon Personalize campaign. When you set up the connection, you specify how you want to retrieve and use data from the Amazon Personalize campaign.

After you set up the connection to the Amazon Personalize campaign, you can start adding recommendations to messages. To do this, create a message template. In the template, add message variables for the recommendations that you want to use. You can add these variables to the following types of templates:

- Email templates, for email messages that you send from campaigns or journeys.
- Push notification templates, for push notifications that you send from campaigns.
- SMS templates, for SMS text messages that you send from campaigns.

Then, create a campaign or journey to send messages that use the template. When you send the messages, Amazon Pinpoint retrieves the latest data from the Amazon Personalize campaign, and replaces each variable with values that your model recommends for each message recipient.

This feature is available in the following AWS Regions:

- US East (N. Virginia)
- US West (Oregon)
- Asia Pacific (Mumbai)
- Asia Pacific (Sydney)
- Asia Pacific (Seoul)
- Asia Pacific (Singapore)
- Asia Pacific (Tokyo)
- Europe (Ireland)
- Canada (Central)

The topics in this chapter explain how to configure Amazon Pinpoint to use recommendation data from an Amazon Personalize campaign. They also explain how to include that data in messages.

Topics

- How recommendations work in Amazon Pinpoint
- Preparing to use a recommender model with Amazon Pinpoint
- Setting up a recommender model in Amazon Pinpoint
- Using recommendations in messages
- Managing machine learning models in Amazon Pinpoint

How recommendations work in Amazon Pinpoint

In a typical workflow, your team performs a series of activities to create and use a recommender model with Amazon Pinpoint. In general, those activities are:

1. In Amazon Personalize, create a solution for the model and deploy it as an Amazon Personalize campaign. Then train, evaluate, and update the model in a continuous cycle to refine the predictions and recommendations that it makes.
2. Configure Amazon Pinpoint to connect to the Amazon Personalize campaign. Use the configuration settings for the connection to specify how you want to retrieve and process data from the Amazon Personalize campaign.
3. Create one or more email, push notification, or SMS message templates. Design those templates to include message variables that refer to recommended attributes. A *message variable* is a

placeholder that refers to a specific attribute. A *recommended attribute* is an attribute that temporarily stores data that Amazon Pinpoint retrieves from an Amazon Personalize campaign.

4. Create one or more Amazon Pinpoint campaigns that use the message templates. Or, if you created email templates in the preceding activity, create one or more journey activities that use those templates.

After your team performs these activities, Amazon Pinpoint does the following each time it sends a message that includes recommendations from the model:

1. Evaluates the settings and contents of the message and message template.
2. Determines that you connected the message template to a recommender model.
3. Checks the configuration settings that you entered for using the recommender model.
4. Finds one or more message variables for recommended attributes that you created for the recommender model.
5. Connects to the Amazon Personalize campaign that you specified in the configuration settings for the recommender model.
6. For each message recipient:
   a. Retrieves recommendations from the Amazon Personalize campaign.
   b. Adds the recommendations to the recommended attributes that you created for the recommender model.
   c. Replaces each message variable with the corresponding value of the recommended attribute. If you configured the model to enhance recommendations by using an AWS Lambda function, Amazon Pinpoint uses that function as part of this step.
7. Sends a version of the message that contains the personalized recommendations for each message recipient.

Preparing to use a recommender model with Amazon Pinpoint

To work with Amazon Pinpoint, a recommender model must be deployed as an Amazon Personalize campaign. In addition, certain AWS Identity and Access Management (IAM) roles and policies must be in place. If you want to enhance the recommendations that Amazon Pinpoint receives from the model, an AWS Lambda function also must be in place to process the recommendations.

Before you set up a recommender model in Amazon Pinpoint, work with your data science and development teams to design and create these resources. Also, work with those teams to make sure that the model meets certain technical requirements to work with Amazon Pinpoint. After you create these resources, work with your administrator to make sure that you and Amazon Pinpoint can access them. As you take these steps, gather the information that you will need to set up the model in Amazon Pinpoint.

Topics

- Amazon Personalize campaigns
- AWS Identity and Access Management roles and policies
- AWS Lambda functions

Amazon Personalize campaigns

Amazon Personalize is an AWS service that's designed to help you create machine learning (ML) models that provide real-time, personalized recommendations for customers who use your applications. Amazon Personalize guides you through the process of creating and training a machine learning model, primarily by using a combination of data and a recipe. A *recipe* is an algorithm that's configured to support a specific use case, such as predicting items that a person will like and interact with.

This combination of data and a recipe is referred to as a *solution*. After a solution is trained, it becomes a *solution version*. The solution version is then tested, refined, and prepared for use. When a solution version is ready for use, it's deployed as an Amazon Personalize campaign. The campaign is then used to provide real-time, personalized recommendations. To learn more about Amazon Personalize, see the Amazon Personalize Developer Guide.

For Amazon Pinpoint to retrieve recommendations from an Amazon Personalize campaign, the campaign and its components have to meet the following requirements:

- The recipe has to be a *USER_PERSONALIZATION* recipe. It can use any supported algorithm settings (hyperparameters) for this type of recipe. For information about this type of recipe, see Using predefined recipes in the *Amazon Personalize Developer Guide*.
- The solution has to be trained using user IDs that can be correlated with endpoint IDs or user IDs in Amazon Pinpoint projects. Amazon Pinpoint uses the `userId` field in Amazon Personalize to correlate data between users in Amazon Personalize and endpoints or users in Amazon Pinpoint projects.

- The solution has to support use of the GetRecommendations operation of the Amazon Personalize Runtime API.
- The campaign has to use the solution version that you want to retrieve recommendations from.
- The campaign has to be deployed and have a status of *active*.
- The campaign has to be running in the same AWS Region as the Amazon Pinpoint projects that will use recommendations from it. Otherwise, Amazon Pinpoint won't be able to retrieve recommendations from the campaign, which could cause an Amazon Pinpoint campaign or journey activity to fail.

In addition to these requirements, we recommend configuring the campaign to support at least 20 provisioned transactions per second.

As you work with your team to implement an Amazon Personalize campaign that meets the preceding requirements, also be sure to answer the following questions:

Which campaign?

To set up the model in Amazon Pinpoint, you will need to know the name of the Amazon Personalize campaign to retrieve recommendations from. Later, if you work with your administrator to manually configure access to the campaign, you will also need to know the Amazon Resource Name (ARN) of the campaign.

Which type of ID?

When you set up the model in Amazon Pinpoint, you choose whether to associate users in the Amazon Personalize campaign with endpoints or users in your Amazon Pinpoint projects. This enables the model to provide recommendations that are truly specific to a particular message recipient.

In an Amazon Personalize campaign, each user has a user ID (`userId` or `USER_ID`, depending on the context). This is a sequence of characters that uniquely identifies a particular user in the campaign. In an Amazon Pinpoint project, a message recipient can have two types of IDs:

- **Endpoint ID** – This is a sequence of characters that uniquely identifies a destination that you can send messages to—such as an email address, mobile phone number, or mobile device.
- **User ID** – This is a sequence of characters that uniquely identifies a particular user. Each user can be associated with one or more endpoints. For example, if you communicate with a user by email, SMS, and a mobile app, the user could be associated with three endpoints—one for

the user's email address, another for the user's mobile phone number, and another for the user's mobile device.

When you choose the type of Amazon Pinpoint ID to associate with Amazon Personalize user IDs, choose the type that you use most consistently in your Amazon Pinpoint projects. If you or your application hasn't assigned an ID to an endpoint or user, Amazon Pinpoint can't retrieve recommendations for the endpoint or user. This might prevent Amazon Pinpoint from sending messages to the endpoint or user. Or, it might cause Amazon Pinpoint to send messages that display in unexpected or unwanted ways.

How many recommendations?

Each time Amazon Pinpoint retrieves recommendations, Amazon Personalize returns an ordered list of recommendations for each recipient of a message. You can configure Amazon Pinpoint to retrieve 1–5 of these recommendations for each recipient. If you choose one recommendation, Amazon Pinpoint retrieves only the first item from the list for each recipient—for example, the most highly recommended movie for a recipient. If you choose two recommendations, it retrieves the first and second items from the list for each recipient—for example, the top two recommended movies for a recipient. And so on.

Your choice for this setting depends primarily on your goals for messages that include recommendations from the model. However, it might also depend on how your team designed the solution and your team's evaluation of the solution's performance. For this reason, work with your team to make sure that you choose an appropriate number for this setting.

What does a recommendation contain?

When Amazon Pinpoint retrieves recommendations, Amazon Personalize returns an ordered list of 1-5 recommended items, depending on how many recommendations you choose to retrieve for each message recipient. Each item consists only of text, such as a product ID or a movie title. However, the nature and contents of these items can vary from one Amazon Personalize campaign to another, based on the design of the underlying solution and the campaign.

Therefore, it's a good idea to ask your team exactly what content the campaign provides for recommended items. Their answer will probably affect how you design messages that use recommendations from the campaign. If you want to enhance the content that the campaign provides, you might also choose to implement an AWS Lambda function that can perform this task.

AWS Identity and Access Management roles and policies

AWS Identity and Access Management (IAM) is an AWS service that helps administrators control access to AWS resources. To learn more about IAM and how it works with Amazon Pinpoint, see Identity and access management for Amazon Pinpoint in the *Amazon Pinpoint Developer Guide*.

When you set up a recommender model in Amazon Pinpoint, you specify which Amazon Personalize campaign you want to retrieve recommendations from. To choose the campaign, your administrator must first allow you to view the campaigns for your organization's AWS account. Otherwise, the campaign won't appear in the list of campaigns that you can choose from. If you don't see the campaign in the list, ask your administrator to provide you with this access.

In addition, you or your administrator must create an IAM role and policy that allows Amazon Pinpoint to retrieve recommendations from Amazon Personalize campaigns. When you set up a recommender model, you can choose to have Amazon Pinpoint create this role and policy for you automatically. Another option is for you or your administrator to create this role and policy manually, before you set up the recommender model in Amazon Pinpoint. To learn how to do this, see IAM role for retrieving recommendations in the *Amazon Pinpoint Developer Guide*.

AWS Lambda functions

For some models, you might want to enhance the recommendations that Amazon Pinpoint receives from Amazon Personalize. For example, instead of including only a single recommended value (such as a product name) in messages, you might want to include additional content (such as a product's name, description, and image) in messages. You can do this by working with your team to design and create an AWS Lambda function that transforms recommendation data into the content that you want.

AWS Lambda is an AWS service that's designed to help people run code without provisioning or managing servers. You or your team develops and packages code, and uploads it to AWS Lambda as a Lambda function. AWS Lambda then runs the function each time the function is invoked by an application or service, such as Amazon Pinpoint. To learn more about AWS Lambda, see the AWS Lambda Developer Guide.

When you set up a recommender model in Amazon Pinpoint, you specify how you want Amazon Pinpoint to process the recommendations that it receives. One option is to use a Lambda function. If you want to use a Lambda function, work with your team to:

- Define what the function does.

- Define the custom recommended attributes that you want the function to use when it processes recommendations. This includes the number of attributes, and the name and purpose of each one. A Lambda function can use as many as 10 custom attributes for each message recipient. You will need to enter information about these attributes when you set up the recommender model in Amazon Pinpoint.
- Make sure that the function is hosted in the same AWS Region as the Amazon Pinpoint projects that will use it. Otherwise, Amazon Pinpoint won't be able to send recommendation data to the function, which could cause an Amazon Pinpoint campaign or journey activity to fail.

Finally, work with your administrator to create a policy that allows Amazon Pinpoint to invoke the Lambda function each time it sends messages that include recommendations from the model.

For detailed information about using a Lambda function to process recommendations, see Customizing recommendations with AWS Lambda in the *Amazon Pinpoint Developer Guide*.

Setting up a recommender model in Amazon Pinpoint

A *recommender model* is a type of machine learning (ML) model that's designed to predict what a particular user will prefer from a given set of products or items. It provides that information as a set of recommendations for the user. In Amazon Pinpoint, you can use these models to send personalized recommendations to message recipients based on each recipient's attributes and behavior.

Before you can use a recommender model in this way, you must set up a connection between Amazon Pinpoint and the Amazon Personalize campaign that has the model to use. When you set up the connection, you specify how you want to retrieve and use recommendations from the Amazon Personalize campaign. You also add settings for attributes that temporarily store recommendations from the campaign.

Before you begin

Before you set up a recommender model in Amazon Pinpoint, review the information in Preparing to use a recommender model with Amazon Pinpoint. This will help you gather the resources and information that you need to set up the model in Amazon Pinpoint.

Step 1: Set up the model

For this step, you specify which Amazon Personalize campaign you want to retrieve recommendations from. You also choose settings that specify how you want to retrieve and use those recommendations.

To set up a recommender model

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Machine learning models**.
3. On the **Machine learning models** page, choose **Add recommender model**.
4. Under **Model details**, for **Recommender model name**, enter a name for the model in Amazon Pinpoint. The name must begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
5. (Optional) For **Recommender model description**, enter a brief description of the model. The description can contain up to 128 characters. The characters can be letters, numbers, spaces, or the following symbols: underscores (_), semicolons (;), parentheses (), commas (,), and hyphens (-).
6. Under **Model configuration**, for **IAM role**, choose the AWS Identity and Access Management (IAM) role that authorizes Amazon Pinpoint to connect to and retrieve recommendations from the Amazon Personalize campaign that uses the model. You have the following options:

   - **Use an existing role** – Choose this option to use an IAM role that already exists for your AWS account. Then, from the list of roles, choose the role that you want.
   - **Automatically create a role** – Choose this option to automatically create an IAM role that has the required permissions. Then, enter a name for the role.

   Another option is to work with your administrator to create the role manually. For information about creating the role manually, see IAM role for retrieving recommendations in the *Amazon Pinpoint Developer Guide*.
7. For **Recommender model**, choose the Amazon Personalize campaign that you want to retrieve recommendations from.

   This list displays all the Amazon Personalize campaigns that you're allowed to access with your AWS account in the current AWS Region. If the list doesn't include the campaign that you want, ask your administrator to give you access to the campaign and verify that you chose the

correct IAM role in the preceding step. Also, verify that the campaign exists in the current AWS Region.

8. Under **Settings**, for **Identifier to use for recommendations**, specify whether you want to associate unique users in the Amazon Personalize campaign with endpoints (**Endpoint ID**) or users (**User ID**) in your Amazon Pinpoint projects.
9. For **Number of recommendations per message**, choose the number of recommended items that you want to retrieve for each endpoint or user in your Amazon Pinpoint projects, depending on your choice in the preceding step.

   This setting determines how many recommendations Amazon Pinpoint retrieves and you can add to individual messages. You can retrieve as many as five recommended items. If you choose **1**, Amazon Pinpoint retrieves only the first item from the list of recommendations for each message recipient—for example, the most highly recommended movie for a recipient. If you choose **2**, it retrieves the first and second items from the list for each recipient—for example, the top two recommended movies for a recipient. And so on, for as many as five recommendations.
10. For **Processing method**, choose one of the following options to specify how you want Amazon Pinpoint to process the recommendations that it retrieves:

    - **Use the value returned by the model** – With this option, messages display the exact text of the recommendations that are provided by the Amazon Personalize campaign. In addition, all the recommendations for each endpoint or user are temporarily stored in one standard recommended attribute for each endpoint or user.
    - **Use a Lambda function** – With this option, messages can display enhanced recommendations instead of or in addition to the text of the recommendations that are provided by the Amazon Personalize campaign. If you choose this option, Amazon Pinpoint sends recommendations to an AWS Lambda function for additional processing, before it sends a message that includes the recommendations. In addition, you can temporarily store recommendations in as many as 10 custom recommended attributes for each endpoint or user.

      If you choose this option, also use the **Lambda function** list to choose the function that you want to use. This list displays all the Lambda functions that you're allowed to access with your AWS account in the current AWS Region. If the list doesn't include the function that you want, ask your administrator to give you access to the function. If the function doesn't exist yet, choose **Create new Lambda function**, and work with your development team to create

the function. For more information, see Customizing recommendations with AWS Lambda in the *Amazon Pinpoint Developer Guide*.

11. When you finish entering these settings, choose **Next** to proceed to the next step—adding attribute settings for the recommender model.

Step 2: Add attributes to the model

After you choose settings for connecting to and retrieving recommendations from the Amazon Personalize campaign, you're ready to enter settings for the attributes that will store the recommendation data. These options vary depending on the processing method that you chose in the preceding step:

Use the value returned by the model

If you chose this option, recommendations are temporarily stored in one attribute. This is a standard recommended attribute for each endpoint or user, depending on the option that you chose for the **Identifier to use for recommendations** setting in the preceding step. The underlying name of this attribute is `RecommendationItems`.

For **Display name**, enter a descriptive name for the attribute. This name will appear in the **Attribute finder** in the template editor when you add a variable for the attribute to a message template. The name can contain up to 25 characters. The characters can be letters, numbers, spaces, underscores (_), or hyphens (-).

Use a Lambda function

If you chose this option, you can use as many as 10 attributes to store data for each recommendation. These are custom recommended attributes for each endpoint or user, depending on the option that you chose for the **Identifier to use for recommendations** setting in the preceding step. For example, if you retrieve one product recommendation for each endpoint or user, the Lambda function can process the recommendation and add the results to three custom attributes for the recommendation—product name, price, and image.

For each custom attribute that you want to add, choose **Add attribute**, and then do the following:

- For **Attribute name**, enter a name for the attribute. This name, preceded by the `Recommendations` prefix, will appear in the template editor after you add a variable for the attribute to a message template. The name has to match the name of an attribute that the Lambda function uses to store recommendation data.

An attribute name has to start with a letter or number and it can contain up to 50 characters. The characters can be letters, numbers, underscores (_), or hyphens (-). Attribute names are case sensitive and must be unique.

- For **Display name**, enter a descriptive name for the attribute. This name will appear in the **Attribute finder** in the template editor when you add a variable for the attribute to a message template. The name has to start with a letter or number and it can contain up to 25 characters. The characters can be letters, numbers, spaces, underscores (_), or hyphens (-).

When you finish entering attribute settings, choose **Next** to proceed to the next step—reviewing and publishing the configuration settings for the recommender model.

Step 3: Review and publish the model

After you finish entering all the settings for connecting to and using the recommender model, you're ready to review the settings.

When you finish reviewing the settings, choose **Publish** to save them. Amazon Pinpoint then checks the settings to verify that they're correct. If any settings are missing or incorrect, it displays a message for each error to help you determine which setting to fix. If you need to fix a setting, use the navigation pane to go directly to the page that contains the setting.

After you publish the settings, you can start using recommendations in messages.

Using recommendations in messages

To add dynamic, personalized recommendations to messages, create and use message templates that include message variables for recommended attributes. A *message variable* is a placeholder that refers to a specific attribute that you or Amazon Pinpoint created to store information about your users. A *recommended attribute* is an attribute that temporarily stores recommendations for your users. Amazon Pinpoint retrieves these recommendations from a recommender model that you deployed as an Amazon Personalize campaign and configured Amazon Pinpoint to use.

If a template contains message variables, Amazon Pinpoint replaces each variable with the current, corresponding value of the attribute for each recipient. For recommendations, this process includes retrieving the latest recommendations for each recipient from an Amazon Personalize campaign. Amazon Pinpoint does this each time it sends a message that uses the template. This means that you can feel confident that the message contains the latest recommendations for a recipient.

For example, if your project is an application that recommends movies and TV shows to users, you might have the following attributes for each user:

- The user's first name.
- The rating that the user most recently submitted.
- The title of the movie or show that the user most recently rated.
- The titles of the top three movies and shows that the model recommends for the user.

For this project, you could use the following text and message variables in a template:

```
Hi {{User.UserAttributes.FirstName}}, based on your recent
{{User.UserAttributes.LatestRating}}-star rating for
{{User.UserAttributes.LatestRatedTitle}}, we think you might also
enjoy: {{RecommendationItems.[0]}}, {{RecommendationItems.[1]}}, and
{{RecommendationItems.[2]}}.
```

When you send a message that uses the template, Amazon Pinpoint replaces the variables with the current value of each attribute for each recipient. The following examples show this.

Example 1

> Hi Sofia, based on your recent 5-star rating for *The Marvelous Mrs. Maisel – Season 3*, we think you might also enjoy: *Fleabag*, *Late Night*, and *Catastrophe*.

Example 2

> Hi Alejandro, based on your recent 4-star rating for *Tom Clancy's Jack Ryan – Season 2*, we think you might also enjoy: *Hanna*, *Hunters*, and *Agatha Christie's The ABC Murders*.

If you configured a recommender model to enhance recommendations by using an AWS Lambda function, a template and the resulting message might use additional variables and recommended attributes. For example, they might also use variables for attributes that provide an image and a URL for each recommended movie or show.

For more information about using message variables in templates, see Adding personalized content to message templates.

Adding recommendations to messages

To add personalized recommendations to messages, create and use message templates that include message variables for the recommendations that you want to use. You can add these variables to the following types of message templates:

- Email templates, for email messages that you send from campaigns or journeys.
- Push notification templates, for push notifications that you send from campaigns.
- SMS templates, for SMS text messages that you send from campaigns.

Each template can use variables and recommended attributes from one recommender model at a time.

You can add the variables to a new template when you create the template, or to an existing template. If you add variables to an existing template, Amazon Pinpoint doesn't necessarily apply the changes to messages that use the template and haven't been sent yet, such as campaign messages that are scheduled to be sent at a later time. This depends on the version of the template that you add variables to and how you configured the messages that use the template. For more information, see Managing versions of message templates.

To add recommendations to a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, do one of the following:
   - To create a new template and add recommendations to it, choose **Create template**. Then, on the template page, enter a name for the template and, optionally, a description of the template.
   - To add recommendations to an existing template, choose the template that you want. Then, on the template page, choose **Edit**. Under **Template details**, use the version selector to choose the version of the template that you want to use as a starting point. If you choose the most recent version, you can save your changes directly to that version of the template. Otherwise, you can save your changes as a new version of the template.
4. In the **Attribute finder**, expand the **Recommended attributes** section.

If you haven't selected a recommender model for the template yet, choose **Connect model**. Next, select the model that you want to retrieve recommendations from when you send messages that use the template. Then choose **Connect model**.

5. Under **Recommended attributes**, choose the attribute that you want to add a message variable for. Amazon Pinpoint creates a variable for the attribute and copies it to your clipboard. Then, in the message editor, paste the variable where you want the recommendation to appear in messages.

   After you paste the variable, Amazon Pinpoint displays it as the name of the associated attribute, enclosed in two sets of curly braces—for example, `{{RecommendationItems}}`.

6. If the recommender model provides more than one recommended attribute, repeat the preceding step for each additional attribute that you want to add a variable for.

   You can also add variables for other types of attributes. To do this, expand other sections in the **Attribute finder**, choose each additional attribute that you want, and then paste the variable in the location that you want. To learn about using variables for other types of attributes, see Adding personalized content to message templates.

7. To specify a default value for a message variable, expand the **Default attribute values** section. Then, in the list of variables, enter the default value that you want to use for the variable. We recommend that you do this for each variable in the template.

8. When you finish, do one of the following:

   - If you added message variables to a new template, choose **Create**.
   - If you added message variables to an existing template and you want to save your changes as a new version of the template, choose **Save as new version**.
   - If you added message variables to an existing template and you want to save your changes as an update to the most recent version of the template, choose **Update version**. This option is available only if you opened the most recent version of the template in step 3.

You can now use the template to include personalized recommendations in messages that you send from campaigns and journeys.

Note that you can't include recommendations in messages that you send to a limited audience as direct or test messages. Although you can use templates in these messages more generally, Amazon Pinpoint can't correlate recommendations from a model with recipients of a direct or test message. To test the appearance and formatting of a template that uses recommendations, specify

a default value for each message variable that refers to a recommended attribute, and then send a test message that uses the template.

Removing recommendations from messages

To remove personalized recommendations from messages, update the message template that the messages use. When you update the template, remove all or only some message variables for recommendations.

If you remove recommendations from a template, Amazon Pinpoint doesn't necessarily apply the changes to messages that use the template and haven't been sent yet, such as campaign messages that are scheduled to be sent at a later time. This depends on the version of the template that you remove recommendations from and how you configured the messages that use the template. For more information, see Managing versions of message templates.

To remove recommendations from a message template

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Message templates**.
3. On the **Message templates** page, choose the template that you want to remove recommendations from. Then, on the template page, choose **Edit**.
4. Under **Template details**, use the version selector to choose the version of the template that you want to use as a starting point. If you choose the most recent version, you can save your changes directly to that version of the template. Otherwise, you can save your changes as a new version of the template.
5. In the message editor, delete all the text of the message variable for each recommended attribute that you want to remove. Each message variable consists of two sets of curly braces and the name of the associated attribute—for example, `{{RecommendationItems}}`.

   To remove the recommender model from the template completely, delete all the variables for recommended attributes that the model provides. Then, in the **Attribute finder**, expand the **Recommended attributes** section and choose **X** next to the name of the model.
6. When you finish, do one of the following:

   - To save your changes as a new version of the template, choose **Save as new version**.
   - To save your changes as an update to the most recent version of the template, choose **Update version**. This option is available only if you chose the most recent version of the template in step 4.

Managing machine learning models in Amazon Pinpoint

The **Machine learning models** page on the Amazon Pinpoint console provides a single location for you to view, change, and manage Amazon Pinpoint configuration settings for all the machine learning (ML) models that you've connected to your Amazon Pinpoint account in the current AWS Region. By using this page, you can perform management tasks such as viewing, changing, and deleting configuration settings for connections to ML models. You can also configure Amazon Pinpoint to connect to and use data from additional ML models.

Topics

- Viewing your collection of models
- Viewing the settings for a model
- Changing the settings for a model
- Copying a model
- Deleting a model

To learn how to add and configure a connection to a model, see Setting up a recommender model in Amazon Pinpoint.

Viewing your collection of models

The **Machine learning models** page displays a list of all the configurations that you created to enable Amazon Pinpoint to connect to and use data from specific ML models for your account. To browse the list or find specific configurations quickly, you can sort and filter the list, choose which columns to display, and change other display settings for the list.

To view your collection of ML models

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Machine learning models**. The **Machine learning models** page opens and displays the number of configurations in your collection and a list of those configurations.
3. To customize the list or find a specific configuration quickly, choose any of the following options:

   - To sort the list by a specific type of value, click the column heading for that value. To change the sort order from ascending to descending or vice versa, click the column heading again.

- To apply a filter that displays only those configurations whose names contain specific text, enter the text in the **Search** box above the list. To remove the filter, choose **X** in the **Search** box.
- To change the number of configurations that are displayed in the list, choose the settings icon at the top of the page. Then, for **Page size**, choose the number of configurations that you want to display, and choose **Save changes**.
- To add or remove columns from the list, choose the settings icon at the top of the page. Then, for **Choose visible columns**, turn each column on or off, and choose **Save changes**.

Viewing the settings for a model

By using the **Machine learning models** page, you can quickly find and open a specific configuration to view its settings and other information. For example, you can view a list of the attributes that the model provides for use in messages. After you open a configuration to view its settings, you can also change the settings for the configuration.

To view the settings for an ML model

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Machine learning models**.
3. On the **Machine learning models** page, choose the configuration whose settings you want to view.

The configuration page opens and displays the current settings for the configuration.

Changing the settings for a model

Before you change the configuration settings for an ML model, it's important to note that Amazon Pinpoint automatically applies your changes to message templates that use the model. (It applies the changes to both the active and latest versions of the template.) This means that your changes also affect any messages that use those templates and haven't been sent yet, such as campaign messages that are scheduled to be sent at a later time.

For this reason, your changes might prevent Amazon Pinpoint from sending messages that use the configuration and haven't been sent yet. Or, your changes could cause those messages to display in unexpected or unwanted ways. This depends on the configuration settings that you change. It also depends on how you designed the templates that use the model.

If you change the configuration settings for an ML model, be sure to also review and make the appropriate changes to any templates that use the current configuration for the model. For example, if you delete an attribute, be sure to also remove or replace that attribute in every template that uses the attribute. Also, be sure to make those changes to the appropriate versions of each message template. For more information, see Editing a message template.

If you don't want to apply your changes to existing templates and messages, you can create a copy of the configuration, and save the copy with the changes that you want. You can then use the configuration copy in new templates, or update existing templates to use the configuration copy.

To change the settings for an ML model

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Machine learning models**.
3. On the **Machine learning models** page, choose the configuration that you want to change. The configuration page opens and displays the current settings for the configuration.
4. Choose **Edit model**.
5. On the **Set up model** page, make your changes. You can change any of the settings, except the name of the configuration. To change the name of the configuration, you can create a copy of the configuration, save the copy with the name that you want, and then optionally delete the original configuration.
6. When you finish changing these settings, choose **Next**.
7. On the **Add attributes** page, make your changes, and then choose **Next**.
8. On the **Review and publish** page, review the new settings and make sure that they're what you want. If they are, choose **Publish** to save your changes.

Copying a model

To quickly create a new configuration that's similar to an existing configuration for an ML model, you can create a copy of the configuration. You can then change settings for the configuration copy, without changing the original configuration.

To copy an ML model

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Machine learning models**.

3. On the **Machine learning models** page, select the check box next to the configuration that you want to copy.
4. On the **Actions** menu, choose **Duplicate**.
5. For **Recommender model name**, enter a name for the configuration copy. The name has to begin with a letter or number. It can contain up to 128 characters. The characters can be letters, numbers, underscores (_), or hyphens (-).
6. When you finish entering the name, choose **Duplicate model**. The configuration page opens and displays the current settings for the configuration that you copied.
7. (Optional) To change the configuration copy, choose **Edit model**, and then make your changes. When you finish, choose **Publish**.

Deleting a model

If you want to remove the configuration for an ML model from Amazon Pinpoint completely, you can delete the configuration. When you delete a configuration, Amazon Pinpoint deletes all settings for the configuration and the configuration becomes unavailable for use in both new and existing message templates. You can't recover a configuration after you delete it.

> **Warning**
>
> If you delete a configuration, Amazon Pinpoint won't be able to send messages that use the configuration and haven't been sent yet, such as campaign messages that are scheduled to be sent at a later time. Before you delete a configuration, review and update the contents and settings for message templates that use the configuration. Also, review any campaigns and journey activities that use those templates, and update them as necessary.

If you delete a configuration, Amazon Pinpoint doesn't delete any resources or data that's used by the configuration and stored in other AWS services. This includes Amazon Personalize solutions and campaigns, and any AWS Lambda functions.

To delete an ML model

1. Open the Amazon Pinpoint console at https://console.aws.amazon.com/pinpoint/.
2. In the navigation pane, choose **Machine learning models**.

3. On the **Machine learning models** page, select the check box next to each configuration that you want to delete.
4. On the **Actions** menu, choose **Delete**.
5. In the window that appears, enter **`delete`** to confirm that you want to delete the selected configurations, and then choose **Delete models**.

Amazon Pinpoint settings

Note

We have updated our documentation by consolidating and moving the following topics. Each link takes you to the topic's new location.
The following topic's under **General settings** have been moved:

- General settings
- Configuring default settings for a project
- Deleting a project

The following topic's under **Email settings** have been moved:

- Email settings
- Viewing details about email usage
- Enabling and disabling the email channel
- Verifying identities
- Creating an email orchestration sending role in Amazon Pinpoint

The following topic's under **SMS and voice settings** have been moved:

- SMS and voice settings
- Managing SMS and voice settings

The following topic's under **Mobile and web app analytics settings** have been moved:

- Mobile and web app analytics settings

The following topic's under **Event stream settings** have been moved:

- Event stream settings

Generally, you configure settings for each project, and these settings apply by default to all the campaigns and journeys in the project. If you want to tailor an individual campaign or journey to meet specific needs, you can change certain settings for the campaign or journey. Your changes then override the default settings for the project, and the campaign or journey uses the custom settings that you chose.

In addition to the settings that are specific to an individual project, campaign, or journey, there are also some account-level settings. These account-level settings apply to all the projects for your Amazon Pinpoint account and, in some cases, other AWS services. These settings include:

- Production access and sending quotas for channels.
- SMTP credentials and other settings for sending email by using the Amazon Pinpoint SMTP interface.
- Dedicated phone numbers for sending SMS and voice messages, and for receiving SMS messages.
- Verified identities for sending email and SMS messages.
- SMS information such as short codes, long codes, 10DLC, keywords, and registered sender IDs for sending SMS messages.

To view all the settings for your Amazon Pinpoint account, open an Amazon Pinpoint project, choose **Settings** in the navigation pane, and then choose the type of setting that you want to view.

Monitoring Amazon Pinpoint with Amazon CloudWatch

You can use Amazon CloudWatch to collect, view, and analyze several important metrics related to your Amazon Pinpoint account and projects. When you configure CloudWatch for Amazon Pinpoint, you gain insight into the delivery of your Amazon Pinpoint campaigns, and the status of your endpoint registrations and import jobs. You can also use CloudWatch to create alarms that notify you when certain metrics exceed values that you define. For example, you can create an alarm that automatically sends you an email if a certain number of campaign messages fail within a specific time period.

For information about how to stream events and logs see Streaming Amazon Pinpoint events to Kinesis in the Amazon Pinpoint Developer Guide.

Topics in this chapter:

- Amazon Pinpoint metrics that are exported to CloudWatch
- View Amazon Pinpoint metrics in CloudWatch
- Create CloudWatch alarms for Amazon Pinpoint metrics

Amazon Pinpoint metrics that are exported to CloudWatch

The following topics describe the metrics that Amazon Pinpoint exports to CloudWatch.

Topics in this section:

- Metrics related to message delivery
- Metrics related to endpoints
- Metrics related to import jobs
- Metrics related to one-time passwords
- Metrics related to events

Metrics related to message delivery

Metric	Description
`DirectSendMessagePermanentFailure`	The number of messages that weren't sent because of a permanent issue. This type of issue usually occurs when an endpoint is expired or invalid. When this type of issue occurs, Amazon Pinpoint doesn't attempt to redeliver the message. Units: *Count* Dimensions: ApplicationId, Channel
`DirectSendMessageTemporaryFailure`	The number of direct messages that failed to send because of a temporary issue. This type of issue usually indicates that an internal issue with the Amazon Pinpoint service prevented the message from being sent. When this type of issue occurs, Amazon Pinpoint doesn't attempt to redeliver the message. Units: *Count* Dimensions: ApplicationId, Channel
`CampaignSendMessagePermanentFailure`	The number of campaign messages that weren't sent because of a permanent issue. This type of issue usually occurs when an endpoint token is expired or invalid. Units: *Count* Dimensions: ApplicationId, Channel

Metric	Description
CampaignSendMessageTemporaryFailure	The number of messages that a campaign attempted to send, but that weren't sent because of a temporary issue. This type of issue usually indicates that an internal issue with the Amazon Pinpoint service prevented the message from being sent. When this type of issue occurs, Amazon Pinpoint doesn't attempt to redeliver the message. Units: *Count* Dimensions: ApplicationId, Channel
DirectSendMessageThrottled	The number of direct messages that weren't sent because your account's ability to send messages was throttled. Units: *Count* Dimensions: ApplicationId, Channel
CampaignSendMessageThrottled	The number of campaign messages that weren't sent because your account's ability to send messages was throttled. Units: *Count* Dimensions: ApplicationId, Channel
CampaignSendMessageLatency	The amount of time, in seconds, that passed between the time when the campaign started running and the time when it finished running. Units: *Count* Dimensions: ApplicationId, Channel

Metrics related to endpoints

Metric	Description
`EndpointRegistrationFailure`	The number of endpoint registrations submitted through an AWS SDK or the Amazon Pinpoint API that couldn't be imported. This type of issue usually occurs when an incoming endpoint record is invalid. Units: *Count* Dimensions: ApplicationId

Metrics related to import jobs

Metric	Description
`ImportedEndpointFailure`	The number of endpoints in an import job that couldn't be imported because they were invalid. Units: *Count* Dimensions: ApplicationId
`ImportJobFailure`	The number of import jobs that couldn't be completed for any reason. Units: *Count* Dimensions: ApplicationId
`ImportJobDuration`	The amount of time, in seconds, that elapsed between the beginning and the end of each import job.

Metric	Description
	Units: *Count* Dimensions: ApplicationId

Metrics related to one-time passwords

Metric	Description
`OTPVerificationSuccess`	The number of One-Time Password (OTP) verification requests that succeeded. Units: *Count* Dimensions: ApplicationId
`OTPVerificationAttempt`	The total number of attempts to verify an OTP. Units: *Count* Dimensions: ApplicationId
`OTPVerificationFailure`	The total number of OTP verification requests that failed. Units: *Count* Dimensions: ApplicationId
`OTPVerificationFailureFinal Attempt`	The total number of OTP verification requests that failed on the final attempt. Units: *Count* Dimensions: ApplicationId

Metrics related to events

Metric	Description
`TotalEvents`	The total number of events that Amazon Pinpoint recorded. This metric includes events that were recorded by AWS SDKs or by the Amazon Pinpoint API. Units: *Count* Dimensions: ApplicationId
`ExportedEvents`	The total number of events that were successfully written to the event stream for exporting. Units: *Count* Dimensions: ApplicationId
`ExportEventErrors`	The total number of errors that occurred after writing to the event stream. These errors can include issues that aren't related to Amazon Pinpoint. For example, this error could occur when the volume of events that you stream to Firehose exceeds your provisioned throughput. Units: *Count* Dimensions: ApplicationId, ErrorCode

View Amazon Pinpoint metrics in CloudWatch

You can monitor metrics for Amazon Pinpoint by using the Amazon CloudWatch console or the Amazon CloudWatch API. The following procedure explains how to view the metrics by using the CloudWatch console.

To view metrics by using the CloudWatch console

1. Open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
2. In the navigation pane, choose **Metrics**.
3. On the **All metrics** tab, choose **Pinpoint**.
4. Select the type of metric that you want to view.
5. Select a metric to add it to the chart.

You can also use CloudWatch to create alarms that send you notifications about changes in these metrics. For more information, see Create CloudWatch alarms for Amazon Pinpoint metrics.

Create CloudWatch alarms for Amazon Pinpoint metrics

In Amazon CloudWatch, you can create an alarm that sends a notification when the value of a certain metric is within or outside a threshold that you define. For example, you can create an alarm that notifies you if more than a certain number of campaign messages weren't sent due to a temporary issue. In this example, the alarm sends a notification if the value of the **CampaignSendMessageTemporaryFailure** metric is greater than the value that you specify.

This topic explains how to create an alarm for an Amazon Pinpoint metric by using the CloudWatch console. For more information about creating alarms, including detailed information about alarm configuration settings, see Using Amazon CloudWatch alarms in the *Amazon CloudWatch User Guide*.

To create an alarm for an Amazon Pinpoint metric

1. Open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
2. In the navigation pane, choose **Alarms**.
3. Choose **Create alarm**.
4. Choose **Select metric**.
5. On the **All metrics** tab, choose **Pinpoint**, and then choose the type of metric that you want to create an alarm for. The types of available metrics depend on the Amazon Pinpoint features that you use.
6. Select the metric that you want to create an alarm for, and then choose **Select metric**. The **Specify metric and conditions** page appears, showing a graph and other information about the metric.

7. Under **Conditions**, complete the following steps:

   - For **Threshold type**, choose **Static**.
   - For **Whenever `metric` is**, specify whether you want the value of the metric to be greater than, greater than or equal to, less than, or less than or equal to the threshold to trigger the alarm. Then, under **than**, enter the threshold value that you want to trigger the alarm.

8. Under **Additional configuration**, complete the following steps:

   - For **Datapoints to alarm**, enter the number of evaluation periods (datapoints) during which the metric value must meet the threshold conditions to trigger the alarm.
   - For **Missing data treatment**, choose what you want the alarm to do if some data is missing.

9. Choose **Next**.
10. Under **Notification**, complete the following steps:

    - For **Whenever this alarm state is**, choose **in Alarm**.
    - For **Select an SNS topic**, choose or create an Amazon Simple Notification Service (Amazon SNS) topic that you want the alarm notification to be sent to.

11. Choose **Next**.
12. Enter a name and, optionally, a description for the alarm, and then choose **Next**.
13. Under **Preview and create**, review and confirm that the alarm settings are what you want, and then choose **Create alarm**.

Troubleshooting

Note

The following troubleshooting topics have been moved:

- Troubleshooting segments
- Troubleshooting campaigns
- Troubleshooting journeys
- Troubleshooting the SMS channel
- Troubleshooting the voice channel
- Troubleshooting the push channel
- Troubleshooting the email channel

Become familiar with troubleshooting information and possible solutions to help resolve issues when using Amazon Pinpoint.

Monitoring and logging

As a best practice, consider logging events in Amazon Pinpoint by:

- Turning on Events Streams through Amazon Kinesis Data Streams following the instructions in Streaming events with Amazon Pinpoint.
- Using a custom logging solution. For more information, see Digital User Engagement Events Database. Multiple services are involved and additional costs are incurred.
- Using Amazon CloudWatch metrics supported by Amazon Pinpoint. For more information, see Monitoring Amazon Pinpoint with Amazon CloudWatch.
- Using Amazon Pinpoint API calls logged in CloudTrail. For more information, see Logging Amazon Pinpoint API calls with AWS CloudTrail in the *Amazon Pinpoint Developer Guide*.

Topics

- CLI examples of common tasks

CLI examples of common tasks

The following examples are common CLI commands for Amazon Pinpoint.

- Get Endpoint Data: get-endpoint CLI

```
aws pinpoint get-endpoint –application-id AppId –endpoint-id EndpointId
```

In the preceding command, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.
- Replace *EndpointId* with the ID of an existing endpoint that you're retrieving.

- Get User Data: get-user-endpoints CLI

```
aws pinpoint get-user-endpoints –application-id AppId –user-id UserId
```

In the preceding command, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.
- Replace *UserId* with the ID of the user.

- Update or Create New Endpoint: update-endpoint CLI

```
aws pinpoint update-endpoint –application-id AppId –endpoint-id EndpointId
 –endpoint-request '{"ChannelType":"SMS","Address":"+12345678","Location":
{"Country":"USA"},"User":{"UserId":"UserId"}}'
```

In the preceding command, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.
- Replace *EndpointId* with the ID of an existing endpoint that you're creating or updating.
- Replace *UserId* with the ID of the user.

- Delete Endpoint: delete-endpoint CLI

```
aws pinpoint delete-endpoint –application-id AppId –endpoint-id EndpointId
```

In the preceding command, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.

- Replace *EndpointId* with the ID of an existing endpoint that you're deleting.

- Validate a phone number: phone-number-validate CLI

```
aws pinpoint phone-number-validate –number-validate-request PhoneNumber=+12065550100
```

In the preceding command, make the following changes:

- Replace *+12065550100* with the phone number that you want to validate.

- send-messages Examples CLI: SMS to a number

```
aws pinpoint send-messages --application-id AppID --message-request
 '{"MessageConfiguration": {"SMSMessage":{"Body":"This is a test
 message"}},"Addresses": {"DestinationPhoneNumber": {"ChannelType":"SMS"}}}‘
```

In the preceding command, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.
- Replace *DestinationPhoneNumber* with the phone number that you want to send to.

- send-messages Examples CLI: origination number to SMS

```
aws pinpoint send-messages --application-id AppID --message-request
 '{"MessageConfiguration": {"SMSMessage":{"Body":"hello, how are
 you?","OriginationNumber": "OriginPhoneNumber"}},"Addresses":
 {"DestinationPhoneNumber": {"ChannelType":"SMS"}}}‘
```

In the preceding command, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.
- Replace *OriginPhoneNumber* with the phone number that you want to send the message from.
- Replace *DestinationPhoneNumber* with the phone number that you want to send to.

- send-messages Examples CLI: SMS to an endpoint

```
aws pinpoint send-messages –application-id AppID  –message-request
 '{"MessageConfiguration": {"SMSMessage":{"Body":"This is a test
 message"}},"Endpoints": {"EndPointId": {}}}'
```

In the preceding command, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.
- Replace *EndPointId* with the ID of an existing endpoint that you're sending to.

- send-messages Examples CLI: SMS to a userId

```
aws pinpoint send-users-messages –application-id AppID –send-users-message-request
 '{"MessageConfiguration": {"SMSMessage":{"Body":"This is a test"}},"Users":
 {"UserId": {}}}'
```

In the preceding command, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.
- Replace *UserId* with the ID of the user.

- Campaign Creation With Amazon Pinpoint message templates create-campaign CLI

```
aws pinpoint create-campaign –application-id AppId –write-campaign-request file://
campaignclirequest.json

file://campaignclirequest.json
{
 "Description": "CLITestCampaign",
 "HoldoutPercent": 0,
 "MessageConfiguration":
 {
  "DefaultMessage":
  {
   "Body": "TestFromCLI"
  }
 },
 "Name": "TestingCLICampaign",
 "Schedule":
 {
  "StartTime": "IMMEDIATE"
 },
 "TemplateConfiguration":
  {
  "EmailTemplate":
   {
   "Name": "TemplateName",
   "Version": "Version"
```

```
    }
   },
  "SegmentId": "SegmentID",
  "SegmentVersion": 1
}
```

In the preceding command and file, make the following changes:

- Replace *AppId* with the ID of the Amazon Pinpoint project that contains the endpoint.
- Replace *TemplateName* with the name of the template.
- Replace *Version* with the version of the template.
- Replace *SegmentID* with the ID of the segment to target.

Document history for Amazon Pinpoint

The following table describes important changes in each release of the *Amazon Pinpoint User Guide* after December 2018. For notification about updates to this documentation, you can subscribe to an RSS feed.

- **Latest documentation update:** November 16, 2023

Change	Description	Date
End of support notice	**End of support notice:** On October 30, 2026, AWS will end support for Amazon Pinpoint. After October 30, 2026, you will no longer be able to access the Amazon Pinpoint console or Amazon Pinpoint resources (endpoints, segments, campaigns, journeys, and analytics). For more information, see Amazon Pinpoint end of support. **Note:** APIs related to SMS, voice, mobile push, OTP, and phone number validate are not impacted by this change and are supported by AWS End User Messaging.	May 20, 2025
Amazon Pinpoint has updated their user guide documentation	To get the latest information regarding how to create, configure, and manage your Push resources, see the new End User Messaging Push User Guide.	July 24, 2024

Email Headers	You can add email headers to your email templates and messages. For more information, see Creating email templates.	May 7, 2024
Email Orchestration	Amazon Pinpoint has updated how it uses your Amazon SES resources to send email. For more information, see Email channel.	April 30, 2024
Email message size	Amazon Pinpoint has updated the maximum size for an email that wasn't generated by an email template. For more information, see Configure the message.	April 9, 2024
Amazon Pinpoint has updated their user guide documentation	SMS and Voice resource management topics are now redirected to the *AWS End User Messaging SMS User Guide*. For more information, see *AWS End User Messaging SMS User Guide*.	February 6, 2024
SMS Sandbox	You are charged for SMS verification messages after the first verification message is sent. For more information, see About the Amazon Pinpoint SMS sandbox.	November 28, 2023

Amazon Pinpoint has updated their user guide documentation	To get the latest information regarding how to create, configure, and manage your AWS End User Messaging SMS and voice resources, see the new *AWS End User Messaging SMS User Guide*.	November 16, 2023
US toll-free number registration requirements and process	US mobile carriers have changed their policies, and require that all toll-free numbers (TFNs) are registered prior to being able to send any messages. You can find more information at US toll-free number registration requirements and process	November 8, 2023
Supported countries and regions (SMS channel)	Updated the table of Supported Countries and Regions for the SMS channel for the United States territories of Puerto Rico, Guam, American Samoa Islands and Virgin Islands, a dedicated number such as a 10DLC or a Toll Free Number is required. You can find more information at Supported countries and regions (SMS channel)	August 30, 2023

Token Credentials	Push notification authentication has been updated to support Token Credentials. You can find more information at Managing mobile push channels with Amazon Pinpoint.	July 28, 2023
Create a journey	Directions have been updated for using time zone estimation. You can find more information at Create a journey.	June 26, 2023
Troubleshooting	New section added. You can find more information at Troubleshooting.	April 13, 2023
Registering a 10DLC campaign	Directions have been updated for registering a 10DLC campaign and along with two new 10DLC campaign statues. You can find more information at Registering a 10DLC campaign.	April 11, 2023
Set up a contact center activity	Directions have been to show a maximum quota of three Contact Center activities per journey. You can find more information at SMS template registration.	April 4, 2023

SMS template registration	Directions have been added to request SMS template approval. You can find more information at SMS template registration.	March 15, 2023
10DLC company registration	If you have issues registering your 10DLC company registration, you can edit the registration to fix it any errors. You can find more information at Editing a 10DLC company registration.	March 3, 2023
10DLC campaign registration rejection reasons	If you have issues registering your 10DLC campaign, you can use the table to determine why the registration was rejected and how to fix it. You can find more information at 10DLC campaign registration rejection reasons.	February 27, 2023
Registering your Sender ID for Singapore	Starting **2023–01–30** you will need to register your Sender ID through the Singapore SMS Sender ID Registry (SSIR). If you do not register your ID by **2023–01–30** any message sent using a Sender ID will have its ID changed to **LIKELY-SCAM** per regulatory agency rules. You can find more information at Special requirements for Singapore.	January 10, 2023

SMS character limits in Amazon Pinpoint	If an SMS message exceeds the supported character limit then Invalid Message Exception is returned instead of the message being truncated to exclude any characters past the supported limit. You can find more information at SMS character limits in Amazon Pinpoint.	December 15, 2022
Understanding SMS billing and usage reports for Amazon Pinpoint	How to read your Amazon Pinpoint bill for Outbound SMS. You can find more information at Understanding SMS billing and usage reports for Amazon Pinpoint.	December 2, 2022
Registering a 10DLC campaign	The Opt-in workflow field for registering a 10DLC campaign will be required starting on 2022-11-17. You can find more information about registering a 10DLC campaign at Registering a 10DLC campaign.	November 14, 2022

Deactivated phone numbers report	The deactivation reports contain a current list of deactivated phone numbers from mobile networks. These reports help keep your SMS sending list current and in compliance. You can find more information about SMS deactivation reports at Handling deactivated phone numbers.	October 31, 2022
Phone number pool	A pool is a collection of phone numbers and Sender IDs. When you create a pool, you can configure a specified origination identity. This identity includes keywords, message type, opt-out list, two-way configuration, and self-managed opt-out configuration. You can find more information about phone number pools at Managing Pools in Amazon Pinpoint.	October 27, 2022
Regional availability	Amazon Pinpoint is now available in this Region: US East (Ohio) Region.	October 5, 2022

US toll-free number registration	US mobile carriers have recently changed their policies, and will require that all toll-free numbers (TFNs) complete a registration process before 9/30/2022. You can find more information about registering a toll-free number at US toll-free number registration requirements and process.	August 1, 2022
Pinpoint journey schedule for more precise communication delivery	Amazon Pinpoint has added two new journey sending limits to help customers control the volume of communications sent to a user. Amazon Pinpoint journeys are multi-step campaigns that send users on communication paths based on their actions or attributes. For more information, see Set up a contact center activity.	May 22, 2022

Journey contact center re-evaluation	The behavior of journeys that contain a **Send through a contact center** activity was modified. When a journey participant arrives on a contact center activity, all of the preceding decisions that led them to that activity are re-evaluated before the call is placed. For more information, see Set up a contact center activity.	January 13, 2022
Safari web push	You can now send push notifications to users of the Safari browser on macOS laptop and desktop computers.	November 18, 2021
SMS simulator	Added an SMS simulator, which you can use to send test SMS messages to real phone numbers, and receive realistic success or failure events.	November 18, 2021
Email suppression list changes	The email suppression list is now managed through the Amazon SES console. For more information, see Managing the email suppression list.	November 3, 2021
In-app messaging	You can use campaigns and journeys to send in-app notifications.	October 28, 2021

10DLC company vetting	You can now request vetting of your 10DLC company registration. Vetting can help you achieve higher SMS throughput rates.	October 25, 2021
Connect Customer call center integrations	You can now configure journeys to include a step that sends messages through a call center.	September 27, 2021
India regulatory settings	If you send messages to recipients in India, you can now specify Entity ID and Template ID values for Indian local routes in campaigns and journeys.	September 17, 2021
Segmentation	You can use advanced segmentation features to further refine a target audience in Amazon Pinpoint. See Building segments.	January 14, 2021
Message templates	You can use template helpers to customize message templates in Amazon Pinpoint. See Using template helpers to personalize messages.	November 16, 2020
Journeys	You can now create an event-triggered journey in Amazon Pinpoint. See Create a journey.	September 30, 2020

Custom attributes	Amazon Pinpoint now supports up to 250 custom attributes for email messaging templates.	September 18, 2020
India regulatory requirements	Steps to register with the TRAI have changed. See Special requirements for sending SMS messages to recipients in India.	September 15, 2020
Regional availability	Amazon Pinpoint is now available in these Regions: Asia Pacific (Tokyo) Region, Europe (London) Region, and Canada (Central) Region. Note that the Amazon Pinpoint SMS and Voice API is not available in these Regions.	September 10, 2020
Regional availability	Amazon Pinpoint is now available in the Asia Pacific (Tokyo) Region. Note that the Amazon Pinpoint SMS and Voice API does not support Voice in this Region.	September 2, 2020
Shared short codes	US carriers no longer support shared short codes. You can no longer request shared short codes in Amazon Pinpoint.	August 20, 2020

Regional availability	Amazon Pinpoint is now available in the Asia Pacific (Seoul) Region. You can't use the Amazon Pinpoint API to send SMS messages in this Region.	July 31, 2020
Regional availability	Amazon Pinpoint is now available in the AWS GovCloud (US) Region.	April 30, 2020
Custom channels	Your campaigns can now send messages using custom channels.	April 23, 2020
Machine learning	You can now use machine learning models with message templates to add dynamic, personalized recommend ations to messages that you send from campaigns and journeys.	March 4, 2020
Templates	You can now create, view, and manage versions of message templates.	December 20, 2019
Templates	You can now create, view, and manage message templates for voice messages. You can also specify default values for message variables that you use in any type of message template.	November 18, 2019

Journeys	Your Amazon Pinpoint projects can now include journeys—multi-step campaign messaging workflows.	October 31, 2019
Templates	You can now create, view, and manage all the message templates for your Amazon Pinpoint account from a single location. You can use these templates in messages that you send for any of your Amazon Pinpoint projects.	October 7, 2019

Analytics	For campaigns that send email, push notifications, or SMS messages, we replaced the endpoints messaged metric with metrics and charts that show the number of unique endpoints that a campaign was sent to in a 24-hour period. For campaigns that send push notifications, we replaced the event count metrics for sessions per unique endpoint and purchases per unique endpoint with metrics and charts that show the number of times an app was opened and the number of units that were purchased in a 24-hour period after a campaign was sent. All the new metrics and charts are available for both standard and A/B test campaigns.	July 25, 2019
Deliverability dashboard	The Deliverability dashboard now includes deliverability for individual campaigns. It also lets you easily create alarms that notify you when your bounce, complaint, inbox placement, or IP blocklist rates reach specific values.	June 13, 2019

Regional availability	Amazon Pinpoint is now available in the AWS Asia Pacific (Mumbai) and Asia Pacific (Sydney) Regions.	April 25, 2019
General settings	Added information about using the Amazon Pinpoint console to delete a project.	January 10, 2019

Earlier updates

The following table describes important changes in each release of the *Amazon Pinpoint User Guide* through December 2018.

Change	Description	Date
Regional availability	Amazon Pinpoint is now available in the AWS US West (Oregon) and Europe (Frankfurt) Regions.	December 21, 2018
Deliverability dashboard	Amazon Pinpoint now includes a deliverability dashboard, which you can use to identify issues that could impact the delivery of emails that you send by using Amazon Pinpoint.	December 3, 2018
Event triggers	You can now configure campaigns to be sent when specific events occur. For example, if a customer adds an item to their cart but doesn't purchase it, you can send them an email. To learn more about configuring	November 19, 2018

Change	Description	Date
	campaigns to be sent when specific events occur, see Schedule the campaign.	
Voice channel	You can use the new Amazon Pinpoint voice channel to create voice messages and deliver them to your customers over the phone. Currently, you can only send voice messages by using the Amazon Pinpoint SMS and Voice API. For more informati on, see Amazon Pinpoint voice channel.	November 15, 2018
Transactional email	You can now use Amazon Pinpoint to send email directly to individual recipient s, without having to create segments or campaigns first. For more information about sending transactional email, see Sending email in Amazon Pinpoint. For more informati on about setting up the email channel, see Email settings.	November 5, 2018
Europe (Ireland) availability	Amazon Pinpoint is now available in the AWS Europe (Ireland) Region.	October 25, 2018

Change	Description	Date
New console design	The Amazon Pinpoint console has been completel y redesigned to make it easier to use. We've also streamlined the project creation process so that you can create projects directly on the Amazon Pinpoint console, rather than having to create them in AWS Mobile Hub.	October 4, 2018
Advanced segmentation	Added the ability to create dynamic segments that include advanced logic and comparisons.	October 4, 2018
Monitoring with CloudWatch	You can now use Amazon CloudWatch to monitor and analyze metrics related to your Amazon Pinpoint account.	October 4, 2018
Analytics chart references	The **Analytics** section now includes several new and updated reports. We've added documentation that gives you additional information about each metric.	June 12, 2018
Testing campaigns	You can now test your messages by sending them to a segment or to a list of individual recipients.	May 7, 2018

Change	Description	Date
Define segments by importing user IDs	Define a segment by importing a file that contains a list of user IDs. When you send a message to the segment, the potential destinations include each endpoint that's associated with each user ID in the file.	May 7, 2018
Self-managed opt-outs and dashboard exports	You can configure your SMS account settings so that you can manage SMS opt-outs outside of Amazon Pinpoint. You can also export Amazon Pinpoint dashboards for further analysis.	March 28, 2018
Email project creation and identity verification	Added information about creating email projects and verifying identities used to send email.	March 21, 2018
SMS best practices	Added a best practices guide that contains tips and information related to SMS campaigns.	February 23, 2018
Requesting support for SMS use cases	Contact Support to request support for your SMS use case if you want to increase your spending quota, reserve an origination number, or reserve a sender ID.	February 21, 2018

Change	Description	Date
Segment import documentation	Amazon Pinpoint can now create an IAM role for you automatically.	February 6, 2018
Two-way SMS support by country	Updated the to list the countries and regions that support 2-way SMS.	February 5, 2018
Time to Live value for mobile push	On the Amazon Pinpoint console, you can specify a Time to Live (TTL) value when you write a mobile push message for a campaign.	December 22, 2017
Removal of Amazon S3 export documentation	The ability to export Amazon Pinpoint event data directly to Amazon S3 has been deprecated. Instead, you can use Amazon Data Firehose to send event data to Amazon S3, Amazon Redshift, and other AWS services. For more information, see the section called “Streaming event data”.	December 18, 2017
Segment import documentation	Importing segments includes updated information about how to create endpoint files, the attributes you can use within these files, and how to create an IAM role for importing.	October 26, 2017

Change	Description	Date
APNs token authentication and APNs sandbox support	The APNs channel settings accept a .p8 signing key so that Amazon Pinpoint can construct authentication tokens for your push notifications. Use the APNs channel to send notifications to production and sandbox environments.	September 27, 2017
ADM and Baidu mobile push	Enable mobile push channels for Amazon Device Message and Baidu Cloud Push in your projects.	September 27, 2017
User analytics with Amazon Cognito user pools	To enable analytics about users and authentication, use Amazon Cognito user pools to manage user sign-in.	September 26, 2017
Account settings	Use the SMS settings page on the console to manage account-level SMS settings that take effect for all of your projects.	September 11, 2017
Users analytics	Users charts on the Amazon Pinpoint console provide metrics about app usage and user authentication.	August 31, 2017
Direct email messages	You can send email messages directly, to a limited audience, without creating a campaign or engaging a segment.	July 05, 2017

Change	Description	Date
New channels: email and SMS	In addition to the mobile push channel, you can enable email and SMS channels as part of your Amazon Pinpoint projects. With these channels enabled, you can send emails or text messages with your campaigns.	June 08, 2017
Direct messaging	You can send push notifications and text messages directly, to a limited audience, without creating a campaign or engaging a segment.	June 08, 2017
Revenue charts	You can view revenue charts on the Amazon Pinpoint console to see the revenue that's generated by your app and the number of items purchased by users.	March 31, 2017
Event streams	You can configure Amazon Pinpoint to send your app and campaign events to a Kinesis stream.	March 24, 2017
Amazon Pinpoint general availability	This release introduces Amazon Pinpoint.	December 1, 2016