Pinpoint Preference Center

AWS Implementation Guide

David Lemons

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About this guide

This implementation guide describes architectural considerations and configuration steps for deploying Pinpoint Preference Center in the Amazon Web Services (AWS) Cloud. It includes links to a [AWS CloudFormation](http://aws.amazon.com/cloudformation/) template that launches and configures the AWS services required to deploy this solution using AWS best practices for security and availability.

The guide is intended for IT architects, developers, DevOps, data analysts, and marketing technology professionals who have practical experience architecting in the AWS Cloud.

# Overview

**Why did we build this solution?**

Before the [Preference Center] Solution, customers currently had no mechanism to collect end-user preferences. Customers would need to develop their own preference centers or work to extract preference data from other systems which resulted in costly custom development.

**What problems does this solution solve?**

Setting up a preference center is a non-trivial complex task that is recommended for all customers of Amazon Pinpoint to better segment their end-users. Many customers do not have the bandwidth, team knowledge, or budget to set this up correctly. The [Preference Center] Solution allows for teams to deploy a custom preference center very quickly without being distracted by the implementation details and best practices.

**Who should use this solution?**

The guide is intended for IT architects, developers, DevOps, data analysts, and marketing technology professionals who have practical experience architecting in the AWS Cloud.

This guide provides infrastructure and configuration information for planning and deploying the Pinpoint Preference Center in the AWS Cloud.

## Cost and licenses

You are responsible for the cost of the AWS services used while running this solution. As of the date of publication, the estimated cost for running the Pinpoint Preference Center for 10,000 visitors a day and default settings in the US East (N. Virginia) Region is as shown in the table below. This includes estimated charges for Amazon API Gateway, AWS Lambda, Amazon CloudFront, Amazon DynamoDB, and Amazon S3 storage.

|  |  |
| --- | --- |
| AWS Service | Total Cost |
| Amazon API Gateway | $5.00 |
| AWS Lambda | $0.50 |
| Amazon CloudFront | $20.00 |
| Amazon S3 | $0.00 |
| Amazon DynamoDB | $2.50 |

This cost estimate does not account for Amazon S3 PUT and GET requests, which can vary per scenario because modified images are cached in CloudFront. Prices are subject to change. For full details, see the pricing webpage for each AWS service you will be using in this solution.

## Architecture overview

Deploying this solution with the default parameters builds the following environment in the AWS Cloud.

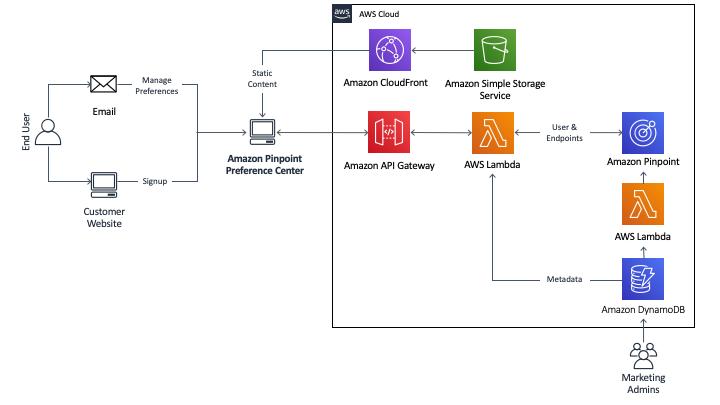


Figure 1: Pinpoint Preference Center architecture on AWS

Example content: The AWS CloudFormation template deploys the [AWS Lambda](https://aws.amazon.com/lambda), Amazon API Gateway, Amazon CloudFront, Amazon Simple Storage Service (Amazon S3), and Amazon DynamoDB tables necessary to set up a fully functional Amazon Pinpoint Preference Center in your account.

The template creates an Amazon S3 bucket and static HTML, Javascript, and Cascading Style Sheet (CSS) files for the static website. The static files are served through Amazon CloudFront so they can be cached and served from edge locations nearest to the end user.

Amazon API Gateway is also configured along with an AWS Lambda function to provide a REST API to read and save user information in Amazon Pinpoint.

Finally, an Amazon DynamoDB table is created to contain metadata that describes the content to be displayed on the Preference Center. As the metadata is modified an AWS Lambda triggered by an Amazon DynamoDB Stream will update information within Amazon Pinpoint.

# <Additional introductory sections>

# Solution components

## Web interface

This solution deploys a fully-functional mobile-optimized web page that allows end-users to manage their communication preferences and attributes. All content can be easily modified by updating a JSON Document stored in Amazon DynamoDB. Please review [Appendix B: Metadata Layout](#__Appendix_B:_Metadata) for more details.

The preference center supports collecting User Attributes such as First Name, Last Name, Email Address, Mobile Number, Communication Preference (Email or SMS), etc. A Customer can also deploy multiple preference centers per account to support multiple brands and/or languages.

# Design considerations

## Customization

The preference center has been designed to be highly customizable. The site uses simple HTML, CSS, and JavaScript allowing for easy customization by Developers or Marketing Agencies. To learn more please review [Appendix A: Customization](#_Appendix_A:_Customizing)

## Regional deployments

This solution uses the Amazon Pinpoint service, which is not currently available in all AWS Regions. You must launch this solution in an AWS Region where Amazon Pinpoint is available. For the most current availability by Region, refer to the [AWS Service Region Table](https://aws.amazon.com/about-aws/global-infrastructure/regional-product-services/).

# AWS CloudFormation template<s>

This solution uses AWS CloudFormation to automate the deployment of the Pinpoint Preference Center in the AWS Cloud. It includes the following CloudFormation template<s>, which you can download before deployment:

**View template**

**<Template\_name>:** Use this template to launch the solution and all associated components. The default configuration deploys <list of AWS services deployed>, but you can customize the template to meet your specific needs.

# Automated deployment

Before you launch the solution, review the architecture, configuration, network security, and other considerations discussed in this guide. Follow the step-by-step instructions in this section to configure and deploy the solution into your account.

**Time to deploy:** Approximately 10 Minutes

## Deployment overview

Use the following steps to deploy this solution on AWS. For detailed instructions, follow the links for each step.

Step 1. Launch the stack

* Launch the AWS CloudFormation template into your AWS account.
* Review the other template parameters, and adjust if necessary.

Step 2. Post-launch tasks, as needed

* List of tasks, as necessary.

## Step 1. Launch the stack

This automated AWS CloudFormation template deploys Pinpoint Preference Center in the AWS Cloud.

**Note**: You are responsible for the cost of the AWS services used while running this solution. For more details, visit to the [Cost](#_Cost) section in this guide, and refer to the pricing webpage for each AWS service used in this solution.

**Launch   
Solution**

1. Sign in to the AWS Management Console and use the button to the right to launch the <template\_name> AWS CloudFormation template. Optionally, you can [download the template](file:///C:\Users\sindona\AppData\Local\Temp\need) as a starting point for your own implementation.
2. The template launches in the US East (N. Virginia) Region by default. To launch the solution in a different AWS Region, use the Region selector in the console navigation bar.

**Note**: This solution uses the <AWSServiceName> service, which is not currently available in all AWS Regions. You must launch this solution in an AWS Region where <AWSServiceName> is available. For the most current availability by Region, refer to the [AWS Service Region Table](https://aws.amazon.com/about-aws/global-infrastructure/regional-product-services/).

1. On the **Create stack** page, verify that the correct template URL is in the **Amazon S3 URL** text box and choose **Next**.
2. On the **Specify stack details** page, assign a name to your solution stack. For information about naming character limitations, see [IAM and STS Limits](https://docs.aws.amazon.com/IAM/latest/UserGuide/reference_iam-limits.html) in the *AWS Identity and Access Management User Guide*.
3. Under **Parameters**, review the parameters for this solution template and modify them as necessary. This solution uses the following default values.

|  |  |  |
| --- | --- | --- |
| Parameter | Default | Description |
| Pinpoint Project ID | <Optional input> | An Amazon Pinpoint Project (Application) ID if one already exists. If specified the Preference Center will be tied to this Pinpoint Project ID. If left blank, then a new Pinpoint Project will be created for you. |
| Pinpoint Project Name | My pinpoint Project with a sample Preference Center | If no Pinpoint Project ID is specified above, then this will be used for the name of the project. |
| Preference Center Name | Preference Center | The name of the Preference Center displayed in <title> HTML tag |
| Primary CSS Color | #862389 | The Primary CSS color used primarily for Button colors. |
| Secondary CSS Color | #862389 | The Secondary CSS color used for input borders and other highlights. |

1. Choose **Next**.
2. On the **Configure stack options** page, <choose **Next** or specify an action.…>.
3. On the **Review** page, review and confirm the settings. Check the box acknowledging that the template will create AWS Identity and Access Management (IAM) resources.
4. Choose **Create stack** to deploy the stack.

You can view the status of the stack in the AWS CloudFormation Console in the **Status** column. You should receive a CREATE\_COMPLETE status in approximately 10 minutes.

**Note:** In addition to the primary AWS Lambda function <function(s)..>, this solution includes the solution-helper Lambda function, which runs only during initial configuration or when resources are updated or deleted.

When you run this solution, you will notice both Lambda functions in the AWS console. Only the <function> function is regularly active. However, you must not delete the solution-helper function, as it is necessary to manage associated resources.

## Step 2. <Post-configuration tasks>

Use the following procedure to…XYZ. List of tasks as necessary.

# Security

When you build systems on AWS infrastructure, security responsibilities are shared between you and AWS. This shared model reduces your operational burden because AWS operates, manages, and controls the components including the host operating system, the virtualization layer, and the physical security of the facilities in which the services operate. For more information about AWS security, visit the [AWS Security Center](http://aws.amazon.com/security/).

## IAM Roles

AWS Identity and Access Management (IAM) roles enable customers to assign granular access policies and permissions to services and users on the AWS Cloud. This solution creates IAM roles that grant the solution’s AWS Lambda functions access to create Regional resources.

## Amazon CloudFront

This solution deploys a web console [hosted](https://docs.aws.amazon.com/AmazonS3/latest/dev/WebsiteHosting.html) in an Amazon Simple Storage Service (Amazon S3) bucket. To help reduce latency and improve security, this solution includes an Amazon CloudFront distribution with an origin access identity, which is a CloudFront user that provides public access to the solution’s website bucket contents. For more information, see [Restricting Access to Amazon S3 Content by Using an Origin Access Identity](https://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/private-content-restricting-access-to-s3.html) in the *Amazon CloudFront Developer Guide*.

# Additional resources

**AWS services**

* [Amazon API Gateway](https://docs.aws.amazon.com/apigateway/index.html)
* [AWS CloudFormation](http://aws.amazon.com/documentation/cloudformation/)
* [Amazon DynamoDB](https://docs.aws.amazon.com/dynamodb/)
* [AWS Lambda](https://aws.amazon.com/documentation/lambda/)
* [Amazon Simple](https://aws.amazon.com/documentation/lambda/) Storage [Service](https://docs.aws.amazon.com/s3/)

# Appendix A: Customizing

The following instructions assume some level of knowledge of web design and development. Please work with your IT Developer or Marketing Agency if needed.

[Amazon S3 File Versioning](https://docs.aws.amazon.com/AmazonS3/latest/dev/Versioning.html) is enabled by default for this solution. If modifications to the files below produce undesirable results, you can roll back to a previous version.

## Visual Styling

The Preference Center uses basic HTML and CSS styling. CSS Styles can by modified by updating the CSS file(s) located in the S3 bucket deployed as part of this solution. To provide a basic mobile-first design, [Milligram.io](https://milligram.io/) is used as a lightweight css framework.

All HTML elements are marked with CSS IDs and Classes. This allows for easy customization by modifying the **main.css** file located in the **css** folder in S3:

[S3 Bucket]/css/main.css

## Page Layout

The layout of the page can be adjusted by modifying the **index.html** file found in the Amazon S3 bucket created by the solution. To simplify development the page makes use a common web templating engine called [Handlebars.JS](https://handlebarsjs.com/).

# Appendix B: Metadata Layout

All content, user attributes, and preferences can be customized by modifying a JSON metadata document hosted in Amazon DynamoDB. The following tables describe the layout of the file. A complete example is also attached.

## Preference Center Metadata

### Root Level

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Type | Required | Description |
| projectID | String | Required | The PinpointProjectID associated with this preference center |
| preferenceCenterID | String | Required | A preference center ID that allows you to have multiple preference centers for a Pinpoint Project/Application. This could be used to support multiple brands and/or languages. This is also passed as a querystring parameter (pcid). If not specified then the preference center will pull 'default' |
| description | String | Optional | A description of the preference center. Not displayed anywhere and just used to help describe the preference center. For example, if you had multiple brands and languages, you could say: "Japanese Preference Center for Way Cool Brand B" |
| websiteURL | String | Optional | The website url to link to when the Logo Image is clicked |
| unsubscribe | [Unsubscribe](#_Unsubscribe_Object) | Required | The Unsubscribe object which specifies the Unsubscribe options to display on the page. |
| Categories | Category[] | Optional | A collection of Categories to display for publications. |

### Unsubscribe Object

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Type | Required | Description |
| enabled | Boolean | Optional | If true will render Unsubscribe from all checkbox at bottom of page. |
| surveyEnabled | Boolean | Optional | If true will render an unsubscribe survey and record responses as custom pinpoint events |
| surveyQuestions | String Array | Required if surveyEnabled is true | A collection of responses to render in the Unsubscribe Survey. i.e. [ "I no longer want to receive these emails",  "I never signed up for this mailing list",  "The emails are inappropriate", "The emails are spam and should be reported",  "Other (fill in reason below)" ] |

# Appendix C: Uninstall the solution

To uninstall the Pinpoint Preference Center solution, you must … Use this procedure to uninstall the solution.

## Using the AWS Management Console

1. Sign in to the [AWS CloudFormation console](https://console.aws.amazon.com/cloudformation/home?).
2. Select this solution’s installation stack.
3. Choose **Delete**.

## Using AWS Command Line Interface

Determine whether the AWS Command Line Interface (AWS CLI) is available in your environment. For installation instructions, see [What Is the AWS Command Line Interface](https://docs.aws.amazon.com/cli/latest/userguide/cli-chap-welcome.html) in the *AWS CLI User Guide*. After confirming that the AWS CLI is available, run the following command.

$ aws cloudformation delete-stack --stack-name <*installation-stack-name*>

## Uninstalling manually

Example text: To manually uninstall this solution, navigate to…

# Appendix D: Collection of operational metrics

This solution includes an option to send anonymous operational metrics to AWS. We use this data to better understand how customers use this solution and related services and products. When enabled, the following information is collected and sent to AWS:

* **Solution ID:** The AWS solution identifier
* **Unique ID (UUID):** Randomly generated, unique identifier for each Pinpoint Preference Center deployment
* **Timestamp:** Data-collection timestamp
* **Instance Data:** Count of the state and type of instances that are managed by the EC2 Scheduler in each AWS Region

Example data:

Running: {t2.micro: 2}, {m3.large:2}

Stopped: {t2.large: 1}, {m3.xlarge:3}

AWS owns the data gathered though this survey. Data collection is subject to the [AWS Privacy Policy](https://aws.amazon.com/privacy/). To opt out of this feature, complete the following task.

Modify the AWS CloudFormation template mapping section as follows:

"Send" : {  
"AnonymousUsage" : { "Data" : "Yes" }  
},

to

"Send" : {  
"AnonymousUsage" : { "Data" : "No" }  
},

# Source code

Visit the <solution GitHub repository link> to download the templates and scripts for this solution, and to share your customizations with others.

# Revisions

|  |  |
| --- | --- |
| Date | Change |
| August 2020 | Initial release |
| August 2020 | *Brief description of documentation changes OR “For a detailed description of the changes from version 1.0 to version 1.0.1, see <GitHub link>”* |

**Notices**

Customers are responsible for making their own independent assessment of the information in this document. This document: (a) is for informational purposes only, (b) represents current AWS product offerings and practices, which are subject to change without notice, and (c) does not create any commitments or assurances from AWS and its affiliates, suppliers or licensors. AWS products or services are provided “as is” without warranties, representations, or conditions of any kind, whether express or implied. The responsibilities and liabilities of AWS to its customers are controlled by AWS agreements, and this document is not part of, nor does it modify, any agreement between AWS and its customers.

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# Style Guide

**Resources**

* [AWS Style Guide](https://alpha-docs-aws.amazon.com/awsstyleguide/latest/styleguide/Welcome.html)
* [AWS Service Names](https://w.amazon.com/bin/view/AWSDocs/editing/service-names)
* [Architecture Icons](https://aws.amazon.com/architecture/icons/)

**Bullet lists**

* Use the **List Bullet** style instead of using the bullets control on the Word ribbon.
* Use the **List Paragraph** style for additional paragraphs under the bullet.
* Use nested bullet lists sparingly.
* Use the **List Bullet 2** style for second-level bulleted lists.
* Keep both first- and second-level lists short (3 to 7 items).

**Numbered lists for procedures**

1. Use a numbered list only when describing a sequence of actions.
2. Use the **List Number** style instead of using the numbered list control on the Word ribbon.
3. Use the **List Paragraph** style for additional paragraphs under the number.
4. Use nested lists sparingly.
5. Use the **List Number 2** style for second-level numbered lists.

**Tips, Notes, Warnings, Important**

Use the **Note** style, which provides the following formatting. Change “Note” to “Tip”, “Warning”, or “Important” as necessary.

**Note:** You are responsible for the cost of the AWS services used while running this solution. For more details, visit to the [Cost](#_Cost) section in this guide, and refer to the pricing webpage for each AWS service this solution uses.

**Figures**

* Use the **Picture** style, which centers the illustration.
* Below the figure, add the figure caption using the **Caption** style. Specify the number in the format Figure *n*: Caption.

**Tables**

* Create a table in Word (**Insert** > **Table**), and apply the **AWS** table style from the menu on the **Table Tools**, **Design** tab. There’s also an **AWS wide** style if you need a wider table.
* Use the **Table text** style for the contents of the table.
* Add bold for headings.
* Turn on the **Repeat Header Rows** option on the **Table Tools**, **Layout** tab.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | January | February | March | April |
| North | Red | Green | Blue | Black |
| South | Red | Green | Blue | Black |
| East | Red | Green | Blue | Black |
| West | Red | Green | Blue | Black |

**References**

* Use the **Hyperlink** style.
* Use the title of the paper or website as link text.
* You can shorten link text and weave it into the sentence. For example, “Create a [key pair](http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html) in your preferred region.”
* Don’t display the URL in text.
* Don’t plagiarize. Site your sources. Use short quotations if necessary. It’s OK to use exact text from the AWS documentation.
* Replaceable text: Pinpoint Preference Center

**Code**

Use the **Code Snippet** style, which looks like this:

// Hello1.cs

public class Hello1

{

public static void Main()

{

System.Console.WriteLine("Hello, World!");

}

}