

Hands-on tutorials

# Send Messages Between Distributed Applications



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# Send Messages Between Distributed Applications: Hands-on tutorials

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# Send Messages Between Distributed Applications

<b>Cost to Complete</b>	Free Tier
<b>Services Used</b>	<a href="#">Amazon SQS</a>
<b>Sending Messages on AWS Requires an Account</b>	<p>AWS Free Tier includes 1,000,000 requests of Amazon Simple Queue Service.</p> <p><a href="#">View AWS Free Tier Details »</a></p> <p><a href="#">Create a Free Account in Minutes</a></p>

## Overview

In this tutorial, you will learn how to set up asynchronous messaging with [Amazon Simple Queue Service \(Amazon SQS\)](#). Amazon SQS is the AWS service that allows application components to communicate in the cloud. You will use the Amazon SQS console to create and configure a message queue, send a message, receive and delete that message, and then delete the queue.

The AWS services you use in this tutorial are within the [AWS Free Tier](#).

## Implementation

### Step 1: Open the Amazon SQS console

1. Launch the AWS Management Console

When you [click here](#), the AWS Management Console will open in a new browser window, so you can keep this step-by-step guide open. When the screen loads, enter your user name and password to get started. Then type **queue** in the search bar and select **Simple Queue Service** to open the console.

The screenshot shows the AWS Management Console interface. At the top, there are navigation tabs for 'Services' and 'Resource Groups'. A search bar is visible with the text 'queue' entered. A red arrow points to the search bar. Below the search bar, the search results are displayed, showing 'Simple Queue Service' and 'SQS Managed Message Queues'. The 'Simple Queue Service' is highlighted. To the right of the search results, there are sections for 'Helpful tips', 'Explore AWS', 'Build Applications with AWS Lambda', 'Amazon DynamoDB', 'AWS Marketplace', and 'Have feedback?'. The 'Build a solution' section is also visible, showing various solutions like 'Launch a virtual machine', 'Build a web app', 'Host a static website', 'Connect an IoT device', 'Start a development project', and 'Register a domain'. The 'Learn to build' section is also visible, showing various learning paths like 'Websites', 'DevOps', 'Backup and recovery', 'Big data', 'Databases', and 'Mobile'.

## 2. Start the Amazon SQS Console

If the SQS console landing page appears, as shown on by the screenshot, click **Get Started Now**. If you don't see this page, skip to the next step.

Services Resource Groups

Your Name Ohio Support

**Simple Queue Service**

Amazon Simple Queue Service (SQS) is a reliable, scalable, fully-managed message queuing service.

[Get Started Now](#)

[Learn more about AWS SQS](#)

**Ensure high availability**

Amazon SQS uses a distributed architecture within Amazon's high-availability data centers, so queues will be available whenever applications need them. To prevent messages from being lost, all messages are stored redundantly across multiple servers and data centers.

**Scale with your business**

Amazon SQS enables an unlimited number of services to read and write an unlimited number of messages at any time. Amazon SQS is used by some of the most highly-scaled applications in the world, such as [Netflix](#).

**Reduce your cost**

Amazon SQS is a fully-managed service, with no up-front costs or fixed expenses. Pay only for what you use, with a small charge for each API request and data transfer.

[AWS SQS Documentation and Support](#)

[Developer Guide](#) | [API Reference](#) | [Forum](#)

Feedback English

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## Step 2: Create an Amazon SQS Queue

In this step, you will create and configure an Amazon SQS queue. A queue is a reliable, highly-scalable buffer that stores messages as they travel between distributed applications or microservices. Queues help to decouple applications, connect microservices, batch tasks, or store notifications.

Our use case for this tutorial will simulate the storage of incoming orders from an e-commerce application.

### 1. Enter a queue name

First, we will create a simple queue that stores orders that are placed on the store. Enter **Orders** in the **Queue Name** field.

Services Resource Groups

Your Name Ohio Support

Create New Queue

What do you want to name your queue?

Queue Name

Region

What type of queue do you need?

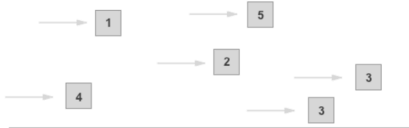
Standard Queue

FIFO Queue

**High Throughput:** Standard queues have nearly-unlimited transactions per second (TPS).

**At-Least-Once Delivery:** A message is delivered at least once, but occasionally more than one copy or a message is delivered.

**Best-Effort Ordering:** Occasionally, messages are delivered in an order different from which they were sent.




Send data between applications when the throughput is important, for example:

- Decouple live user requests from intensive background work: let users upload media while resizing or encoding it.
- Allocate tasks to multiple worker nodes: process a high number of credit card validation requests.
- Batch messages for future processing: schedule multiple entries to be added to a database.

**First-in-First-out Delivery:** The order in which messages are sent and received is strictly preserved.

**Exactly-Once Processing:** A message is guaranteed to be delivered at least once, but all duplicates of the message are removed.

**Limited Throughput:** 300 transactions per second (TPS).



Send data between applications when the order of events is important, for example:

- Ensure that user-entered commands are executed in the right order.
- Display the correct product price by sending price modifications in the right order.
- Prevent a student from enrolling in a course before registering for an account.

Feedback English

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## 2. Choose a queue type

For this tutorial, we do not require strict ordering, so we won't make any changes to the queue type. Leave **Standard Queue** selected.

Services Resource Groups

Your Name Ohio Support

Create New Queue

What do you want to name your queue?

Queue Name

Region

What type of queue do you need?


Standard Queue

FIFO Queue

**High Throughput:** Standard queues have nearly-unlimited transactions per second (TPS).

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Feedback English

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### 3. Create the queue

You can configure your queue to modify settings such as retention period, maximum message size and delivery delays. For this tutorial, we will keep the default parameters. Choose **Quick-Crete Queue**.

Orders

Region US East (Ohio)

What type of queue do you need?

**Standard Queue**

**High Throughput:** Standard queues have nearly-unlimited transactions per second (TPS).

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**FIFO Queue**

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Send data between applications when the order of events is important, for example:

- Ensure that user-entered commands are executed in the right order.
- Display the correct product price by sending price modifications in the right order.
- Prevent a student from enrolling in a course before registering for an account.

For more information, see the [Amazon SQS FAQs](#) and the [Amazon SQS Developer Guide](#).

You are now ready to create your new queue. You can also configure parameters by clicking on the configure queue button.

Cancel Configure Queue **Quick Create Queue**

### 4. Verify queue creation

Your new queue is created and selected in the queue list.

The screenshot shows the AWS Management Console interface for an Amazon SQS Queue. At the top, there are navigation tabs for 'Services' and 'Resource Groups'. Below that, there are buttons for 'Create New Queue' and 'Queue Actions'. A search bar labeled 'Filter by Prefix: Enter Text...' is present. A table lists the queue details, with the 'Orders' queue highlighted in blue and a red border around it. The table has columns for Name, Queue Type, Content-Based Deduplication, Messages Available, Messages in Flight, and Created. Below the table, there are tabs for 'Details', 'Permissions', 'Redrive Policy', 'Monitoring', and 'Encryption'. The 'Details' tab is active, showing the following information:

<b>Name:</b> Orders	<b>Default Visibility Timeout:</b> 30 seconds
<b>URL:</b> <a href="https://sqs.us-east-2.amazonaws.com/586534329928/Orders">https://sqs.us-east-2.amazonaws.com/586534329928/Orders</a>	<b>Message Retention Period:</b> 4 days
<b>ARN:</b> arn:aws:sqs:us-east-2:586534329928:Orders	<b>Maximum Message Size:</b> 256 KB
<b>Created:</b> 2017-08-10 11:03:28 GMT-07:00	<b>Receive Message Wait Time:</b> 0 seconds
<b>Last Updated:</b> 2017-08-10 11:03:28 GMT-07:00	<b>Messages Available (Visible):</b> 0
<b>Delivery Delay:</b> 0 seconds	<b>Messages in Flight (Not Visible):</b> 0
<b>Queue Type:</b> Standard	<b>Messages Delayed:</b> 0
<b>Content-Based Deduplication:</b> N/A	

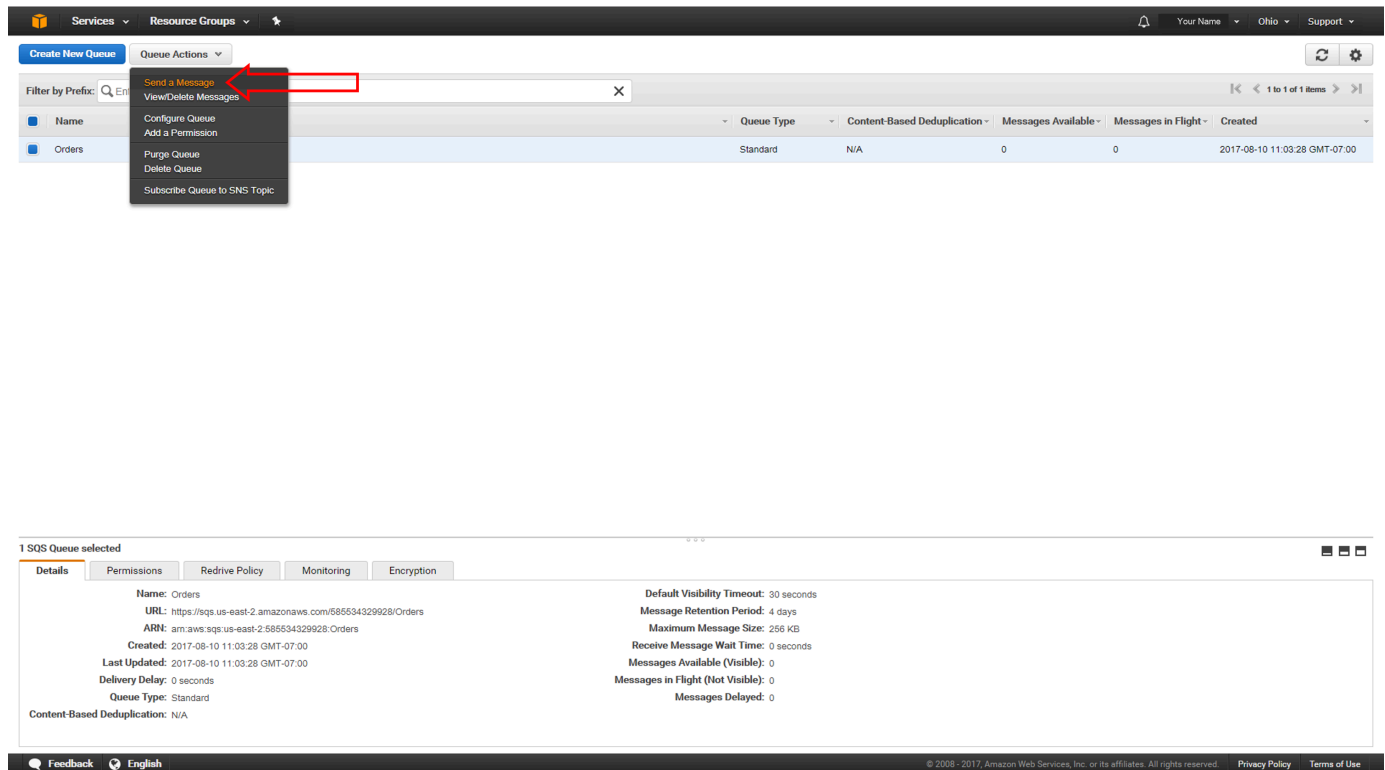
At the bottom of the console, there are links for 'Feedback', 'English', and a copyright notice: '© 2008 - 2017, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use'.

### Step 3: Send messages to the Queue

Once you have created your queue, it is ready to receive messages from the online store that capture the details of each new order.

#### 1. Send a message

Your queue is already selected in the list. From **Queue Actions**, select **Send a Message**. The **Send a Message to Orders** dialog box is displayed.



The screenshot shows the AWS Management Console interface for an Amazon SQS queue. The top navigation bar includes 'Services', 'Resource Groups', and user information. A 'Queue Actions' dropdown menu is open, with 'Send a Message' highlighted by a red arrow. The main area displays a table with one queue entry: 'Orders', 'Standard' type, 'N/A' deduplication, 0 messages available, 0 in flight, and created on 2017-08-10 11:03:28 GMT-07:00.

Below the table, the 'Details' tab for the 'Orders' queue is shown. It displays the following information:

- Name: Orders
- URL: <https://sqs.us-east-2.amazonaws.com/585534329928/Orders>
- ARN: <arn:aws:sqs:us-east-2:585534329928:Orders>
- Created: 2017-08-10 11:03:28 GMT-07:00
- Last Updated: 2017-08-10 11:03:28 GMT-07:00
- Delivery Delay: 0 seconds
- Queue Type: Standard
- Content-Based Deduplication: N/A
- Default Visibility Timeout: 30 seconds
- Message Retention Period: 4 days
- Maximum Message Size: 256 KB
- Receive Message Wait Time: 0 seconds
- Messages Available (Visible): 0
- Messages in Flight (Not Visible): 0
- Messages Delayed: 0

## 2. Enter message content

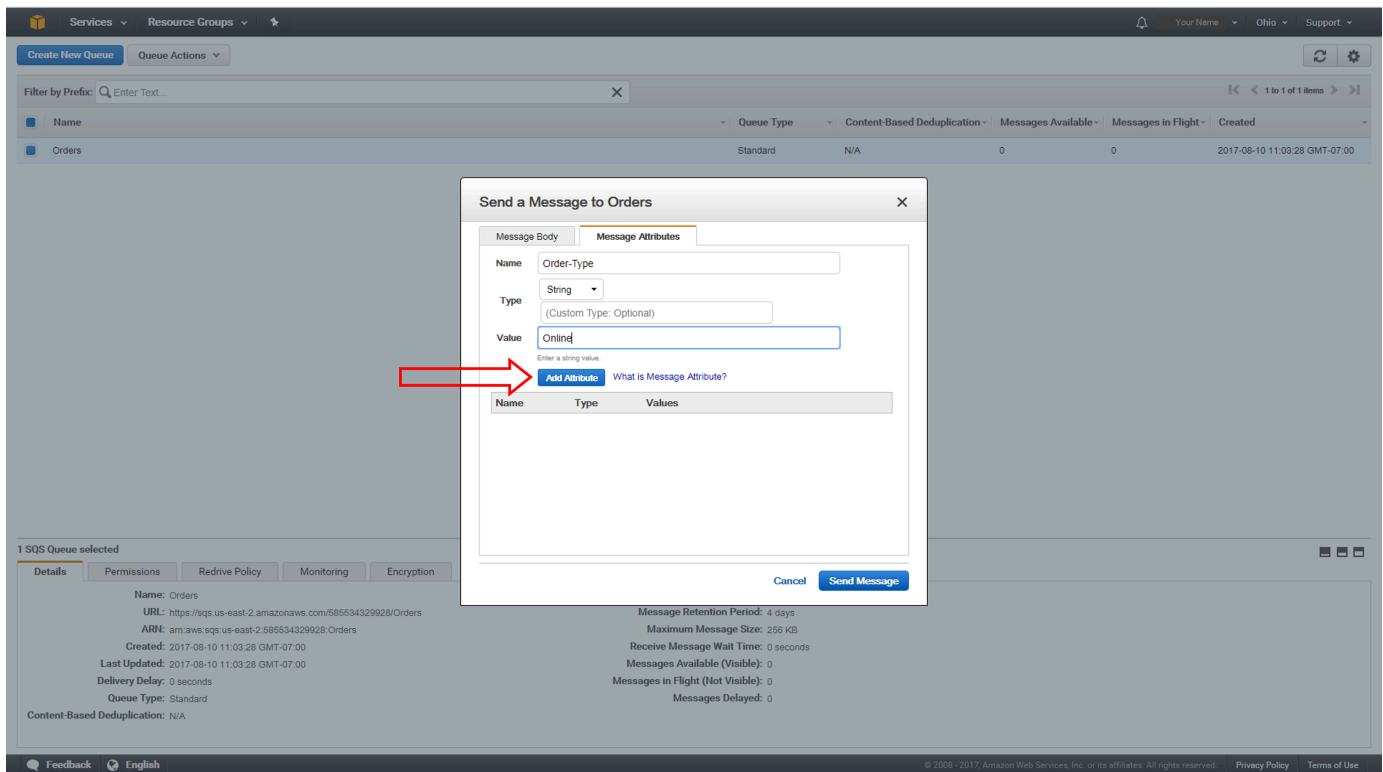
The **Send a Message to Orders** dialog box is displayed. On the **Message Body** tab, enter the following text to represent a sample order:

**1 x Widget @ \$29.99 USD 2 x Widget Cables @ \$4.99**

The screenshot displays the AWS Management Console interface for sending a message to an Amazon SQS queue. The main window shows a table of queues, with the 'Orders' queue selected. A modal dialog titled 'Send a Message to Orders' is open, featuring two tabs: 'Message Body' and 'Message Attributes'. The 'Message Body' tab is active, and a red arrow points to the text input field containing the message content: '1 x Widget @ \$29.99 USD' and '2 x Widget Cables @ \$4.99'. Below the input field is a 'Delay delivery of this message by' dropdown set to 0 seconds. The background shows a table of SQS queues with columns for Name, Queue Type, Content-Based Deduplication, Messages Available, Messages in Flight, and Created. The 'Orders' queue is selected.

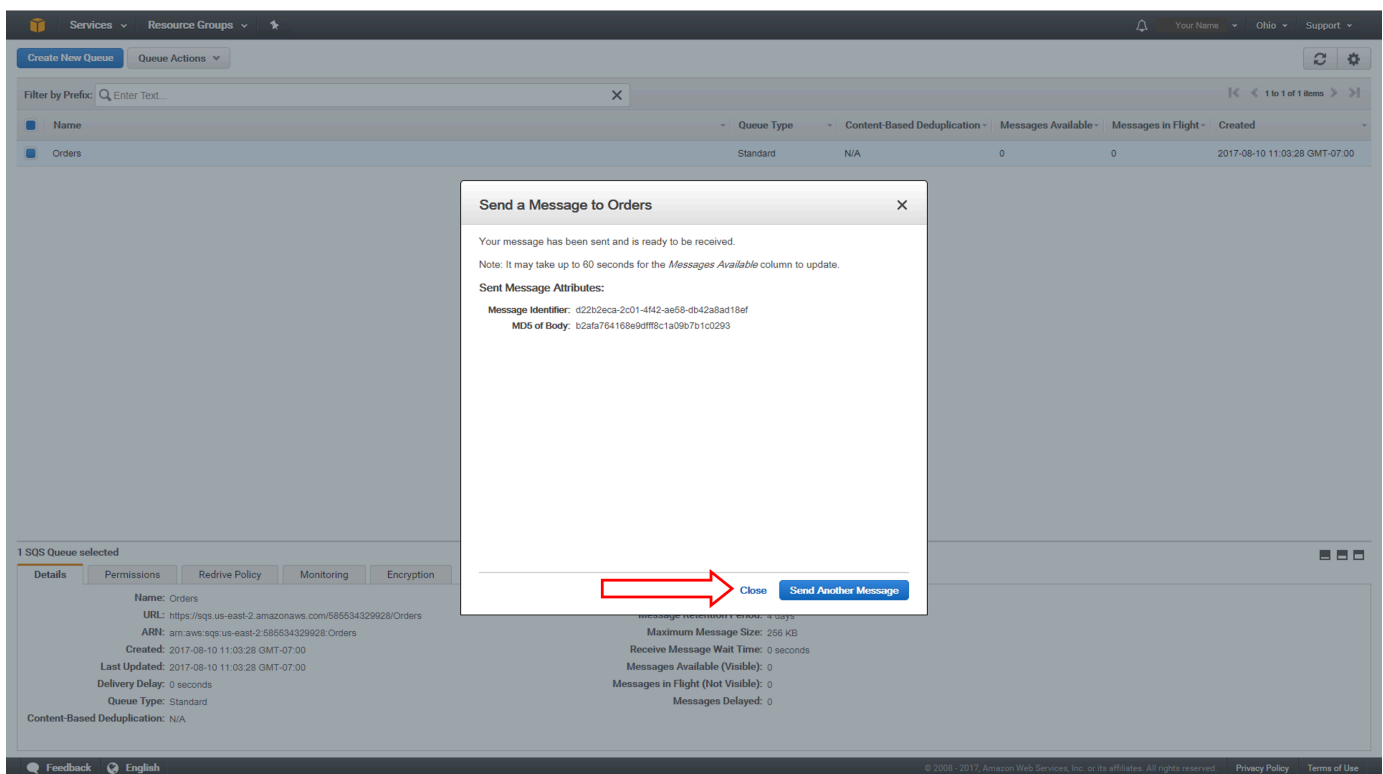
### 3. Enter message attributes

Select the **Message Attributes** tab to add some optional metadata about this message for easy processing. Let's add an order type to the order. Enter **Order-Type** in the **Name** field, **String** in the **Type** field, and **Online** in the **Value** field. Click **Add Attribute**.



#### 4. Send message

To send the message immediately, click **Send Message**. Confirmation that your message was sent is displayed in the **Send a Message to Orders** dialog box. Click **Close**.

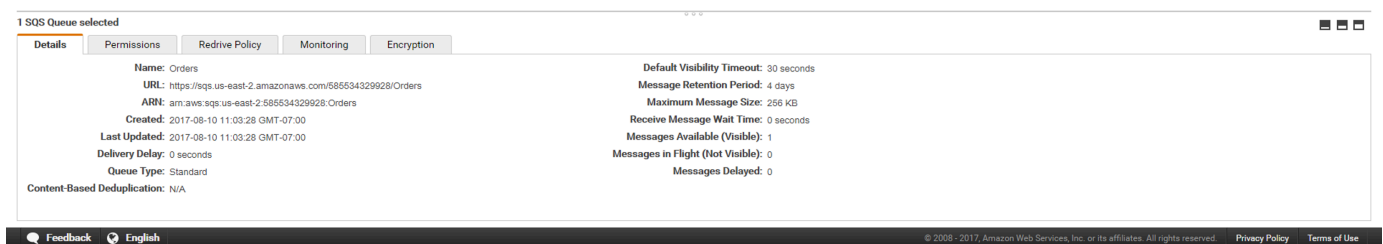
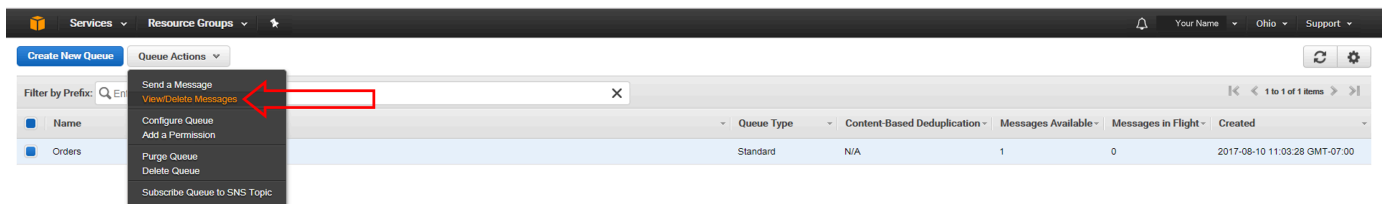


## Step 4: Retrieve and Delete a Message

After you send a message to a queue, another application can consume it from the queue and do something with it. In this example, you will simply retrieve the message to view the order, and then delete it.

### 1. View or delete messages

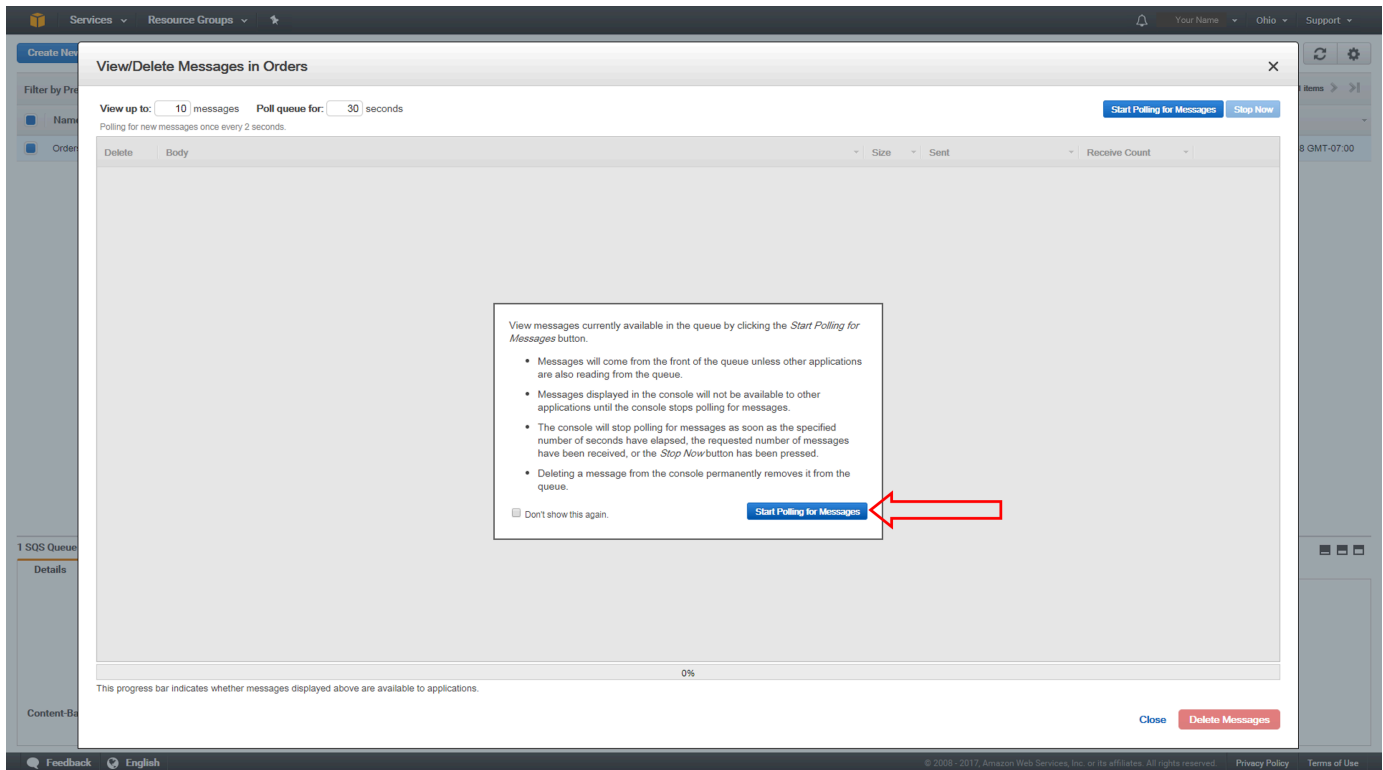
Ensure that your **Orders** queue is selected in the queue list. Next, from **Queue Actions**, select **View/Delete Messages**.



### 2. Poll for messages

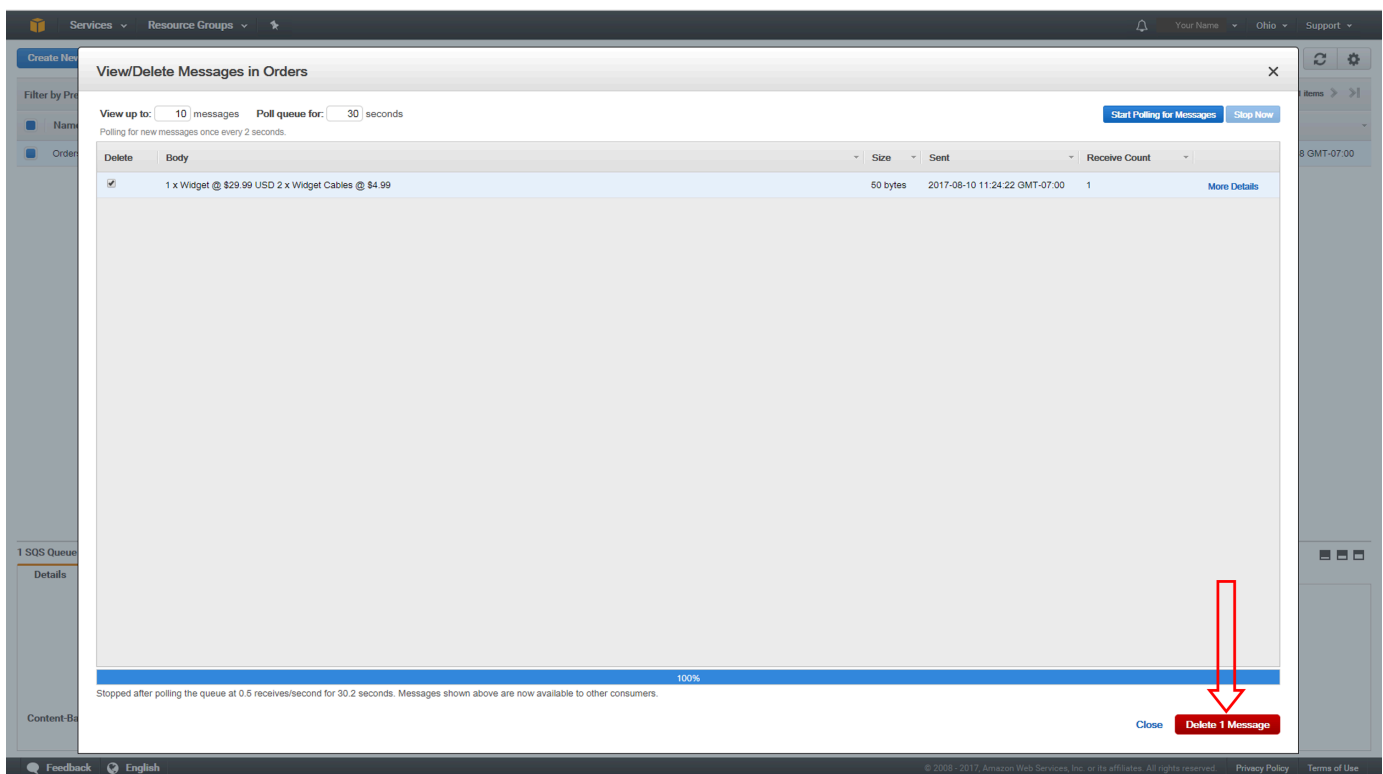
The **View/Delete Messages in Orders** dialog box is displayed. When you request a message from a queue, you don't specify request a specific message. Instead, you specify the maximum number of messages (up to 10) that you want to retrieve.

Click **Start Polling for messages** to retrieve messages from the queue.



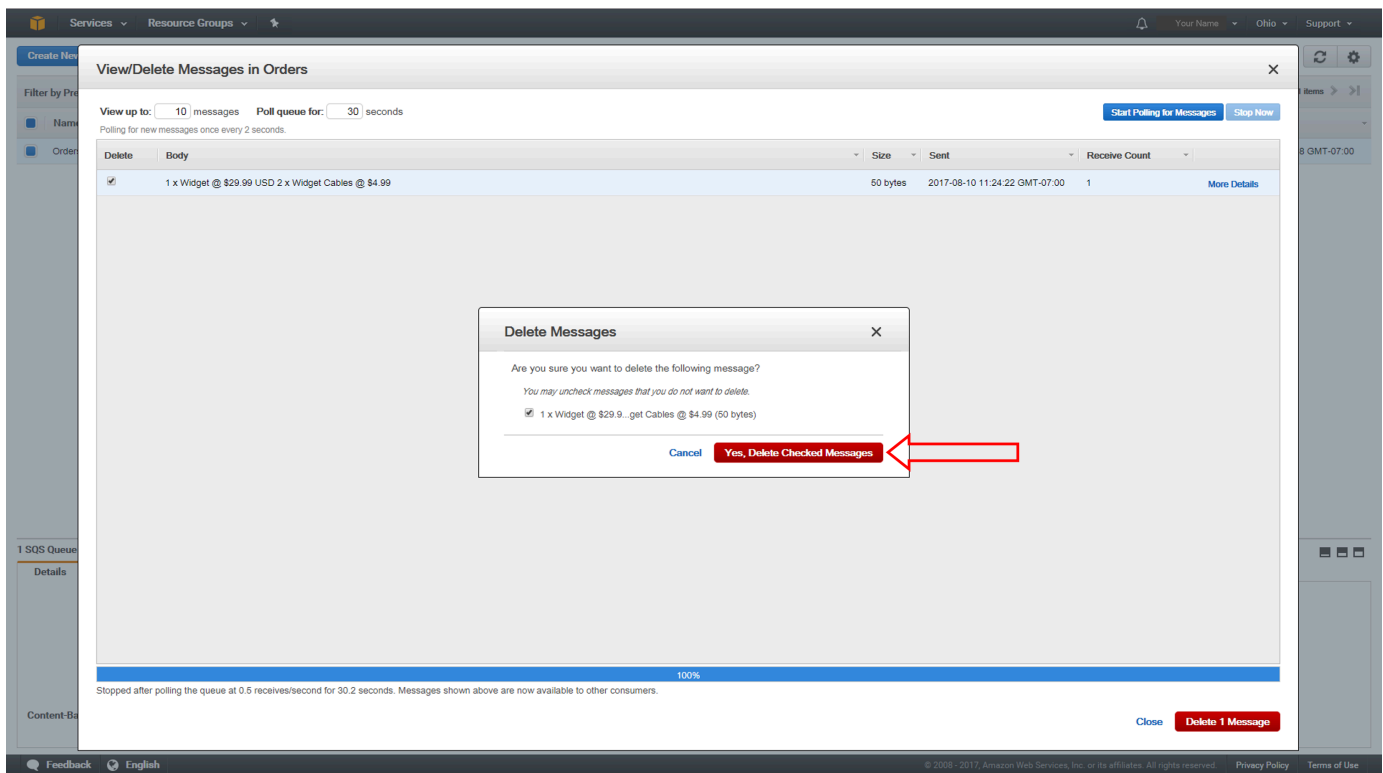
### 3. Select and delete the message

Once a consumer has received and processed a message, it can be deleted from the queue. Select the message that you want to delete and then choose **Delete 1 Message**.



## 4. Confirm deletion

The **Delete Messages** dialog box is displayed. Check the box next to the message and click **Yes, Delete Checked Messages**. The selected message is deleted. Choose **Close**.

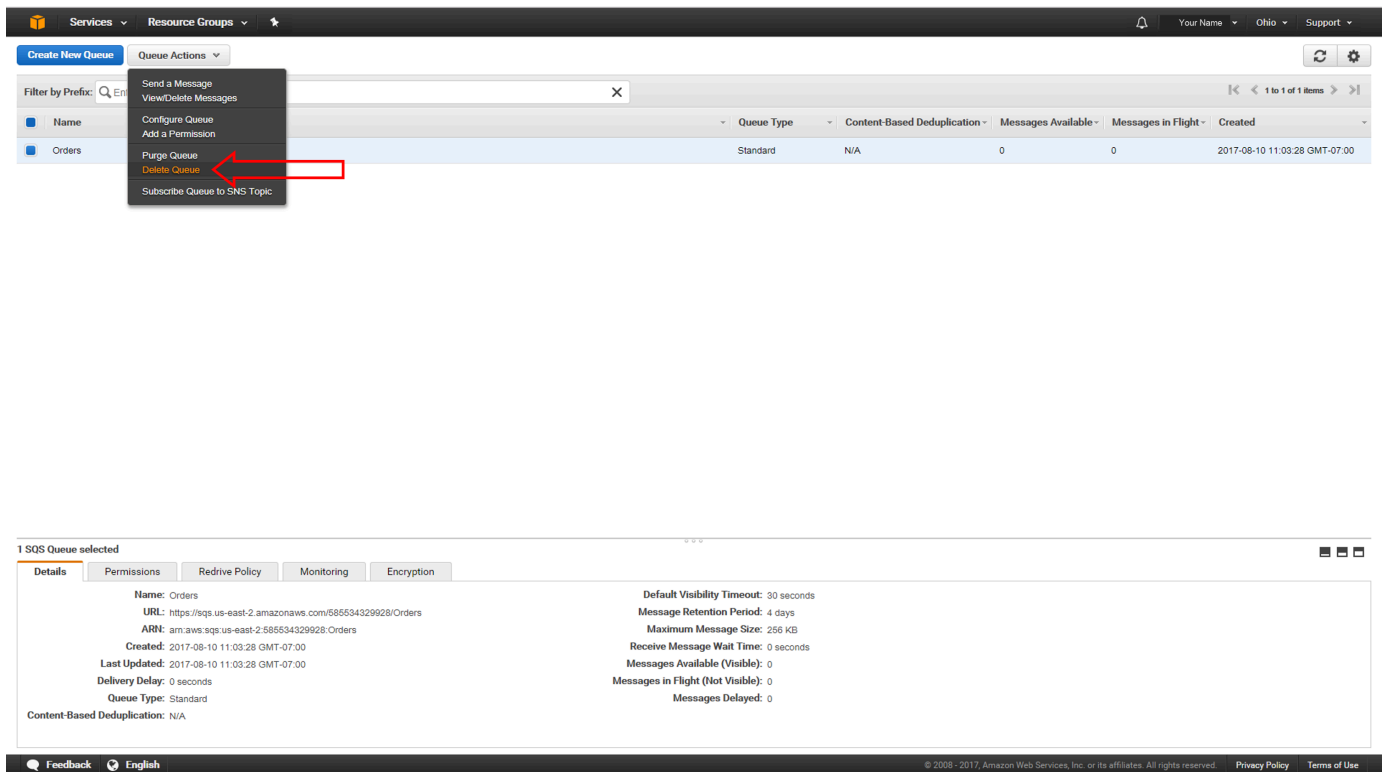


## Step 5: Clean Up Resources

When you no longer need to use an Amazon SQS queue, we recommend that you delete the queue as a best practice.

### 1. Select and delete queue

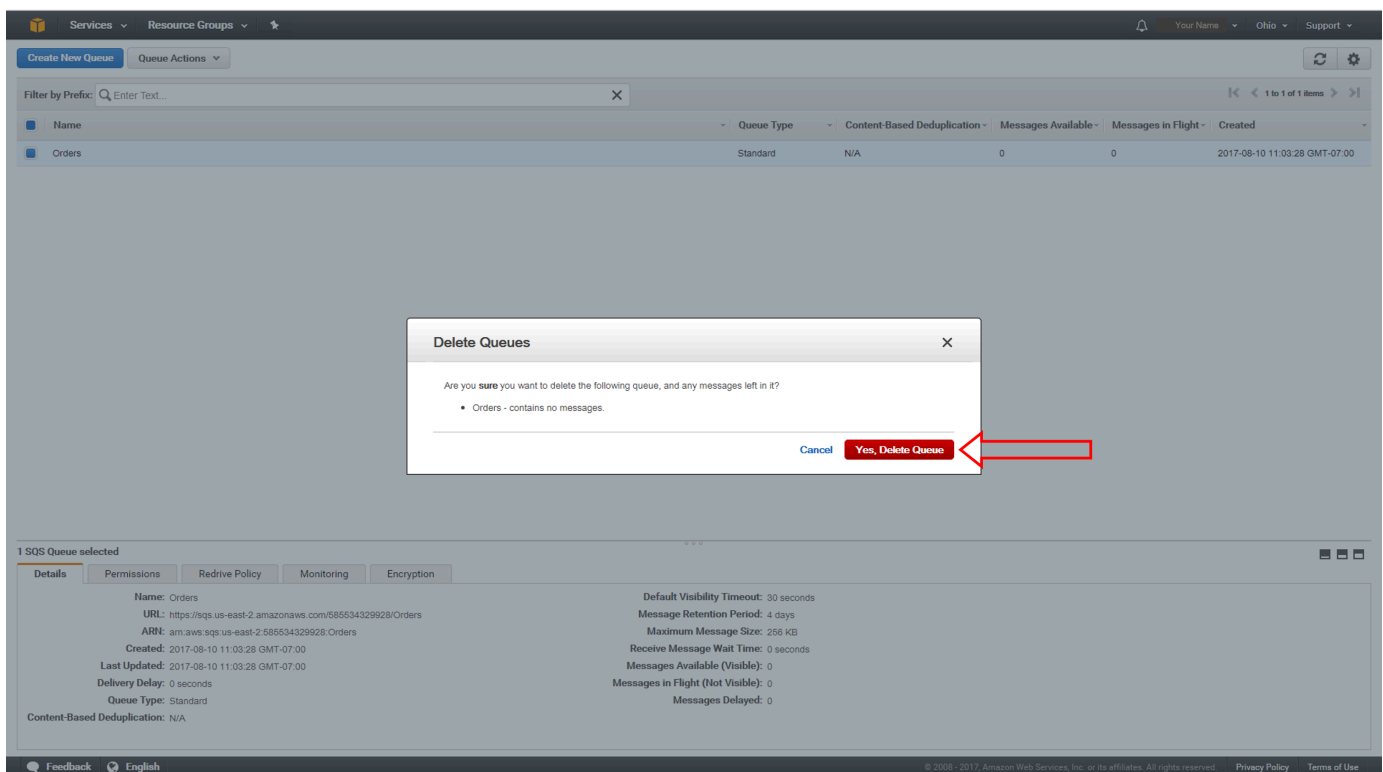
In the queue list, select the **Orders** queue. Then, from **Queue Actions**, select **Delete Queue**.



The screenshot shows the AWS IAM console interface. At the top, there are navigation tabs for 'Services' and 'Resource Groups'. Below this, there's a 'Queue Actions' dropdown menu with options: 'Send a Message', 'View/Delete Messages', 'Configure Queue', 'Add a Permission', 'Purge Queue', 'Delete Queue' (highlighted with a red arrow), and 'Subscribe Queue to SNS Topic'. Below the menu is a table with columns: 'Name', 'Queue Type', 'Content-Based Deduplication', 'Messages Available', 'Messages in Flight', and 'Created'. A single row is visible with 'Orders' as the name, 'Standard' as the queue type, 'N/A' for deduplication, and '0' for both messages available and in flight. Below the table, there's a '1 SQS Queue selected' section with tabs for 'Details', 'Permissions', 'Redrive Policy', 'Monitoring', and 'Encryption'. The 'Details' tab is active, showing information for the 'Orders' queue, including its URL, ARN, creation date, and various configuration parameters like 'Default Visibility Timeout' and 'Message Retention Period'.

## 2. Confirm deletion

The **Delete Queues** dialog box is displayed. You can still delete your queue, even though you still have messages in it. Choose **Yes, Delete Queue**. The queue is deleted.



This screenshot shows the same AWS IAM console interface as above, but with a 'Delete Queues' dialog box open in the center. The dialog box has a title bar 'Delete Queues' and a close button 'X'. The main text asks: 'Are you **sure** you want to delete the following queue, and any messages left in it?'. Below this, there's a list item: '• Orders - contains no messages.' At the bottom right of the dialog, there are two buttons: 'Cancel' and 'Yes, Delete Queue' (highlighted with a red arrow).

## Conclusion

You have created your first Amazon Simple Queue Service (Amazon SQS) message queue, sent messages to your queue, retrieved and deleted messages, and then deleted the queue. You are now ready to use Amazon SQS queues to store and move data between distributed application components and microservices.