Application Migration Service

User Guide

Application Migration Service: User Guide

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Table of Contents

What Is Application Migration Service? 1
Document History 2
Getting Started 3
- Mandatory First-Time Setup for Beta Users 3
  - AWS Account Permissions Required for Application Migration Service 12
- Accessing the Application Migration Service Console - Private Beta 16
- Using the Application Migration Service Console 16
  - Source Servers page 20
- Migration Workflow 29
- Best Practices 29
  - Planning 29
  - Testing 29
  - Successful Implementation 29
  - Best Practices for Ensuring Project Success 30
- Quick start guide 30
  - First time setup 30
  - Adding source servers 37
  - Configuring launch settings 38
  - Launching a Test instance 38
  - Launching a Cutover instance 49

Settings 60
- Replication Settings 60
  - Template vs individual server settings 60
  - Replication Server settings 69
- Tags 93

Network Requirements 95
- Network Setting Preparations 95
  - Staging Area Subnet 95
  - Network Requirements 95
  - Operational Subnets 95
- Network Requirements 95
  - Communication over TCP Port 443 96
  - Communication Between the Source Servers and Application Migration Service over TCP Port 443 96
  - Communication Between the Staging Area Subnet and Application Migration Service over TCP Port 443 98
  - Communication between the Source Servers and the Staging Area Subnet over TCP Port 1500 99

Source Servers 100
- Adding Source Servers 100
  - Installation Requirements 100
  - AWS Replication Agent installation instructions 104
  - Supported Operating Systems 125
- Source Servers page 127
  - Interracting with the Source servers page 129
  - Command Menus 141
  - Filtering 159
- Server Details 162
  - Migration dashboard 166
  - Server details 206
  - Tags 208
  - Disk settings 211
  - Replication settings 215
  - Launch Settings 217

Launching Test and Cutover instances 220

Preparing for Test and Cutover instance launch ... 220
Launch settings ... 220
General launch settings ... 223
EC2 Launch Template ... 234
Launching Test instances ... 247
Ready for testing indicators ... 248
Starting a Test ... 248
Reverting or Finalizing a Test ... 252
Launching Cutover instances ... 258
Ready for cutover indicators ... 258
Starting a Cutover ... 258
Reverting or Finalizing a Cutover ... 262
Launch History ... 268
Overview ... 270
Job Details ... 276
Help Panel Content ... 285
Source Servers page ... 285
Replication Settings Overview ... 285
Replication Server instance type ... 285
Subnet ... 286
EBS Volume Type ... 286
Security groups ... 286
Data routing and throttling ... 286
Use private IP for data replication ... 286
Route control data via proxy ... 287
Network data bandwidth throttling ... 287
Replication resources tags ... 287
Launch Settings ... 287
Instance type right-sizing ... 288
Start instance upon launching ... 288
Copy private IP ... 288
Transfer server tags ... 289
OS Licensing ... 289
EC2 Launch Template ... 289
Launch History Page ... 290
Server Details View ... 290
Migration dashboard ... 290
Server details tab ... 290
Tags tab ... 291
Disk settings tab ... 291
Replication settings tab ... 291
Launch settings tab ... 291
Security ... 292
Overview ... 292
Identity and access management ... 293
Policy structure ... 293
Resilience ... 293
Infrastructure security ... 294
Compliance validation ... 294
API ... 296
Actions ... 296
Job ... 296
Launch Configuration ... 296
Replication Configuration ... 296
Replication Configuration Template ... 297
Source Server ... 297
Tags ... 298

AWS glossary 299

What Is Application Migration Service?

Welcome to AWS Application Migration Service! AWS Application Migration Service enables users to quickly and easily rehost complete servers to EC2 instances. The service is highly automated and all AWS resources required for the service to work are automatically created and destroyed as needed (EC2, EBS, security groups, etc). Users use the AWS console to configure and monitor the service, and to launch converted EC2 instances for testing or cutover purposes. Application Migration Service is one of a group AWS migration services that help customers throughout their migration journey. CloudEndure is part of the Migration Services group, a part of the Migration, Marketplace & Control Services(MMCS) organization. Application Migration Service is used by customers during the execution phase of the migration journey (other phases are discovery, business case assessment, and post migration optimization).

Document History for User Guide

The following table describes the documentation for this release of Application Migration Service.

- **API version: latest**
- **Latest documentation update:** Month DD, YYYY

update-history-change	update-history-description	update-history-date

Getting Started with Application Migration Service

Topics

- Mandatory First-Time Setup for Beta Users (p. 3)
- Accessing the Application Migration Service Console - Private Beta (p. 16)
- Using the Application Migration Service Console (p. 16)
- Migration Workflow (p. 29)
- Best Practices (p. 29)
- Quick start guide (p. 30)

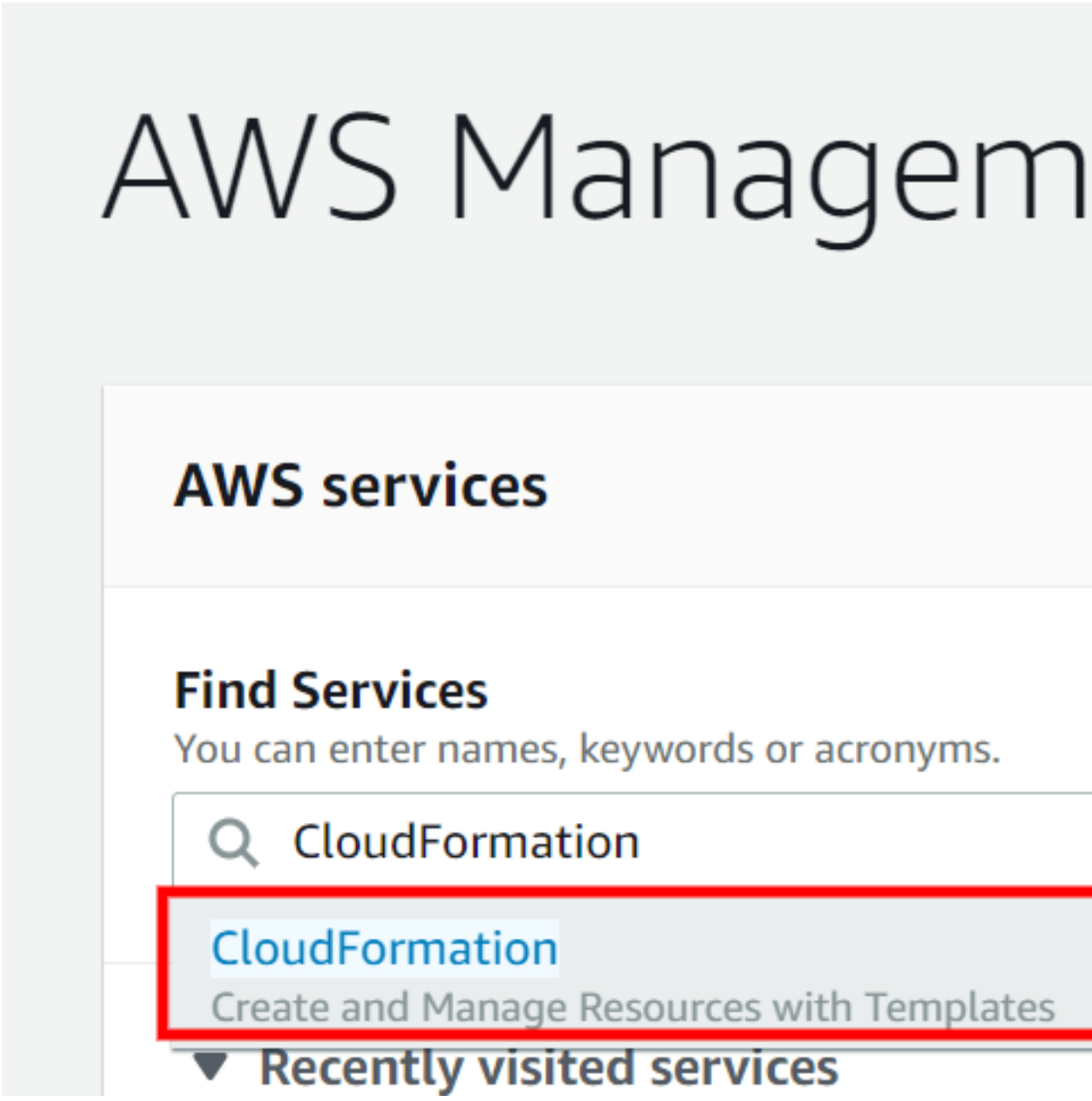
Mandatory First-Time Setup for Beta Users

Important
In order to be able to use Application Migration Service, you must first create a CloudFormation stack and attach the relevant Application Migration Service Script to the stack. This script will configure the necessary AWS Roles and Policies needed for you to be able to use Application Migration Service. Learn more about the exact permissions the script grants. (p. 12)

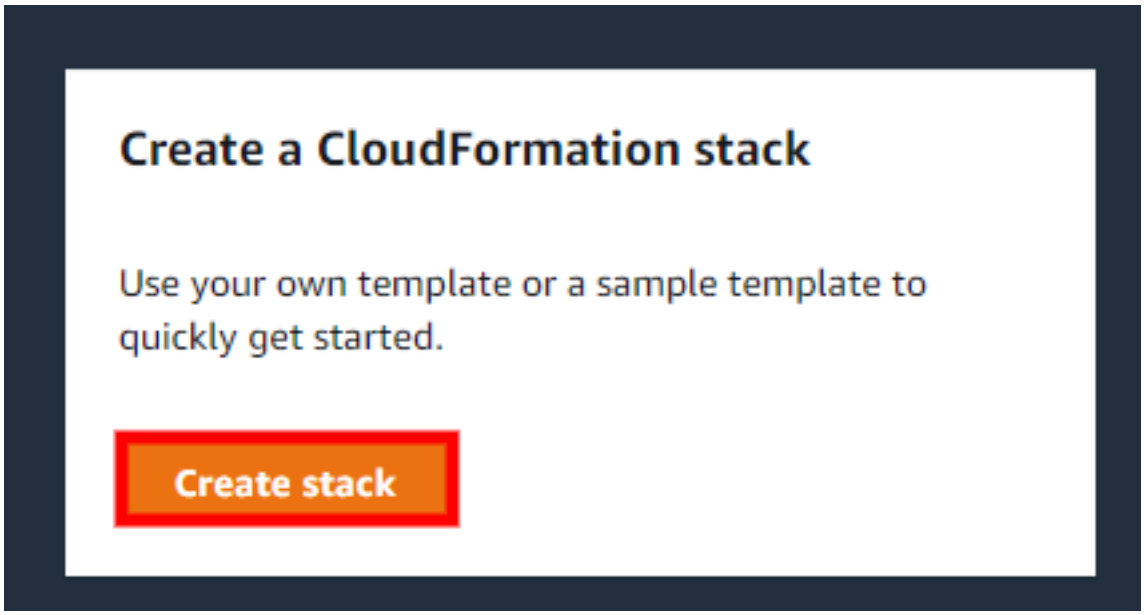
Note
You can create the CloudFormation stack in any region. The region in which the stack is created will have no effect on its functionality.

Important
The beta version of Application Migration Service is only available in US East, N. Virginia (us-east-1)

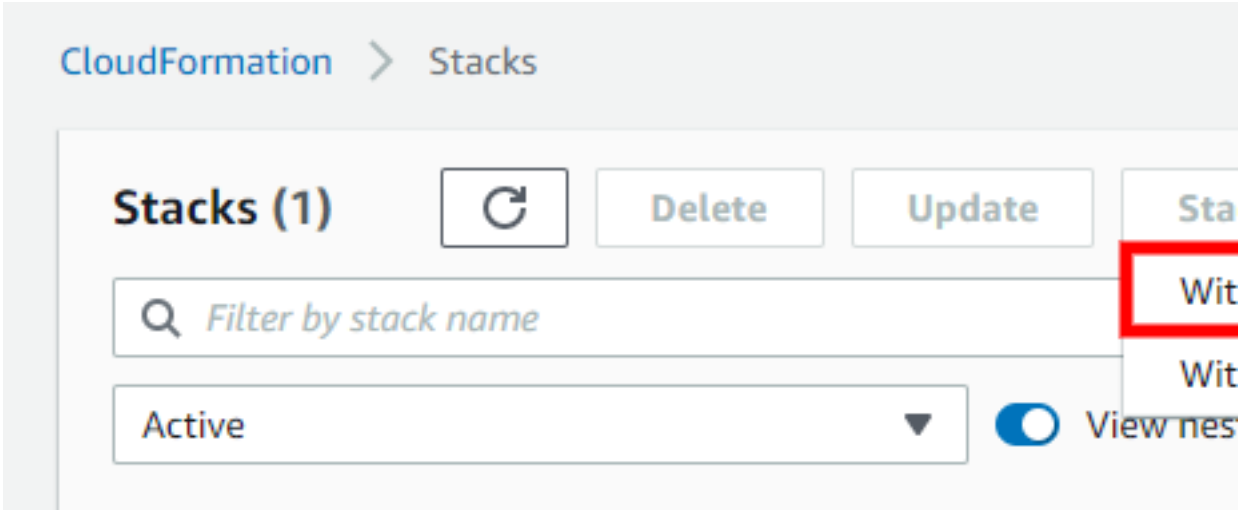
1. Open the AWS Management Console and search for CloudFormation under **Find Services**. Select **CloudFormation**.



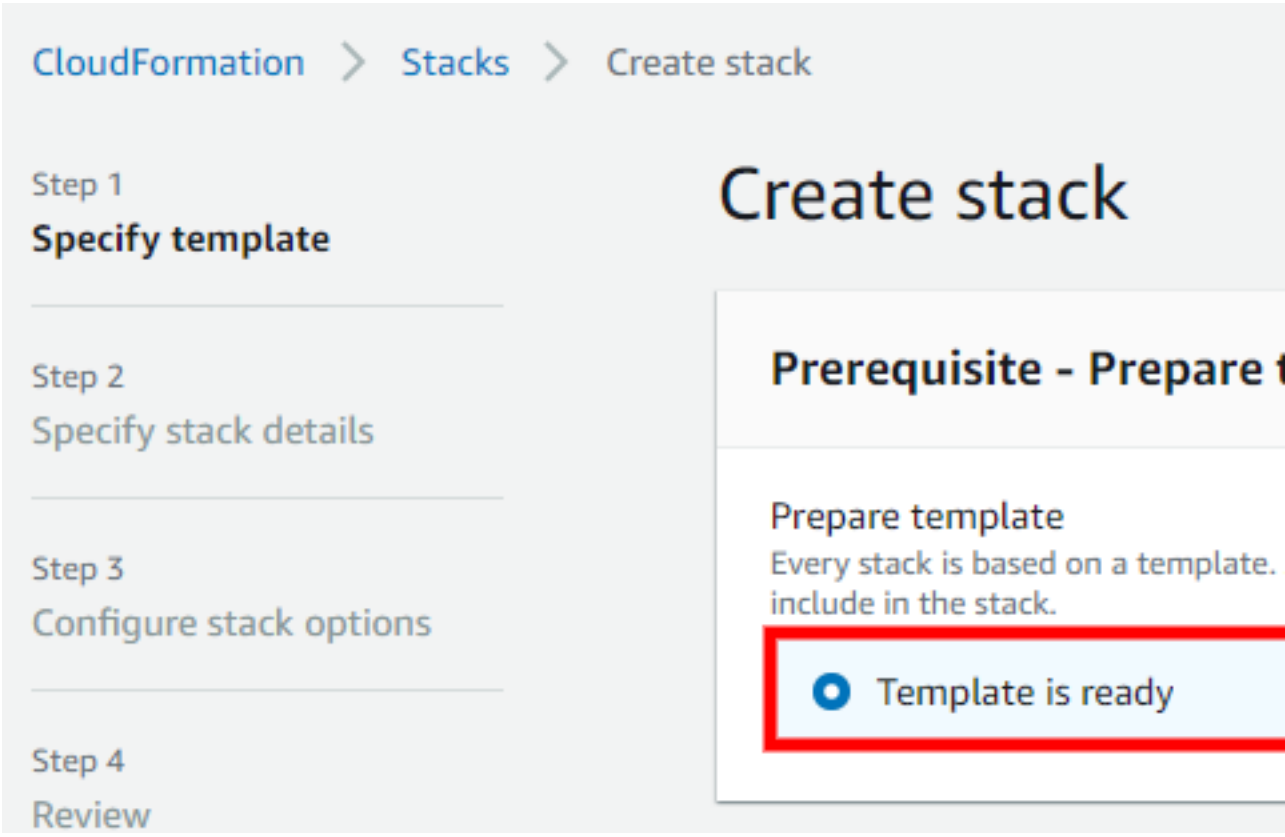
2. Choose **Create stack**



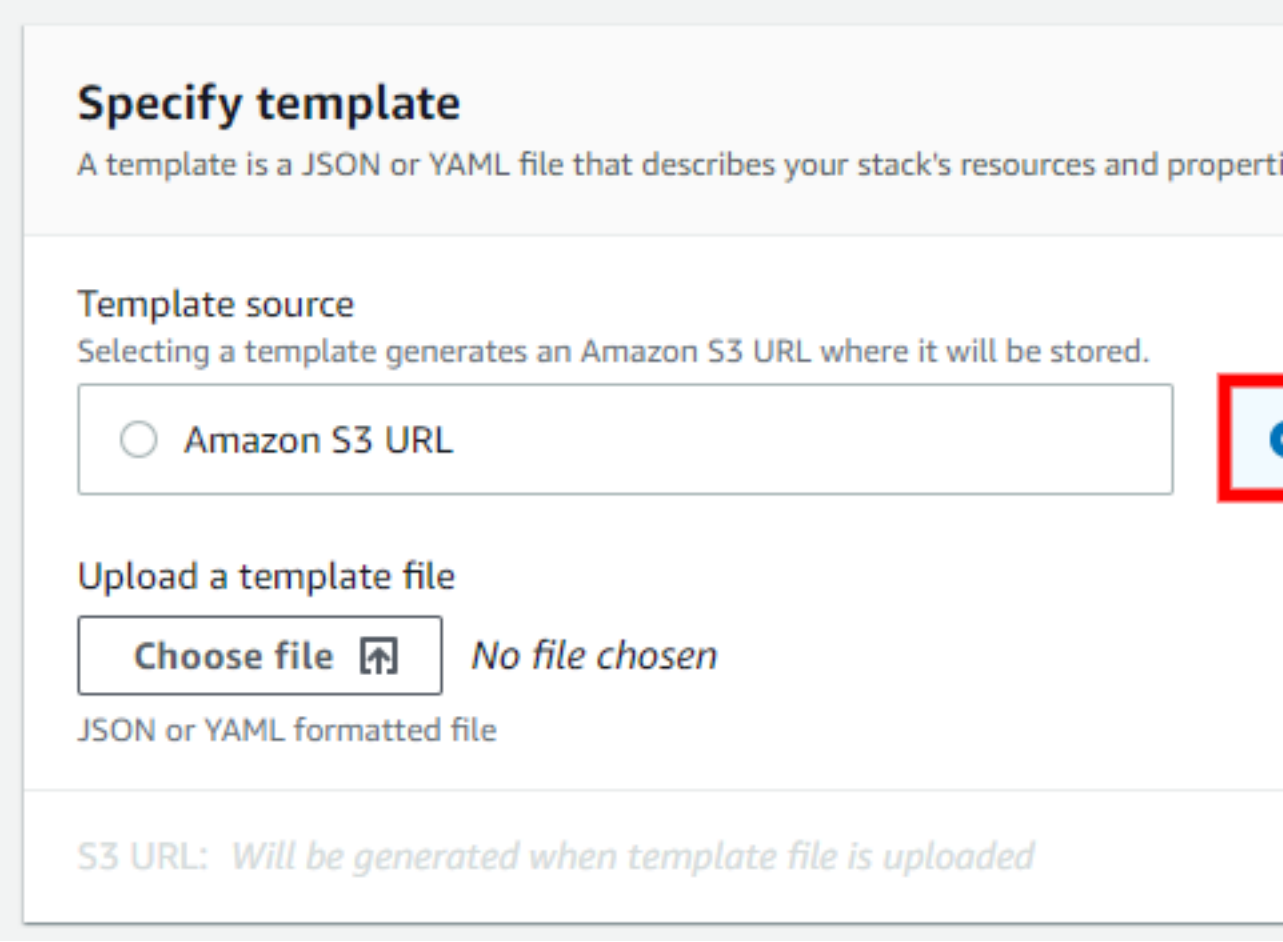
Note
If you already have CloudFormation stacks, you will see a different view. Choose **Create stack** and then choose the **With new resources (standard)** option.



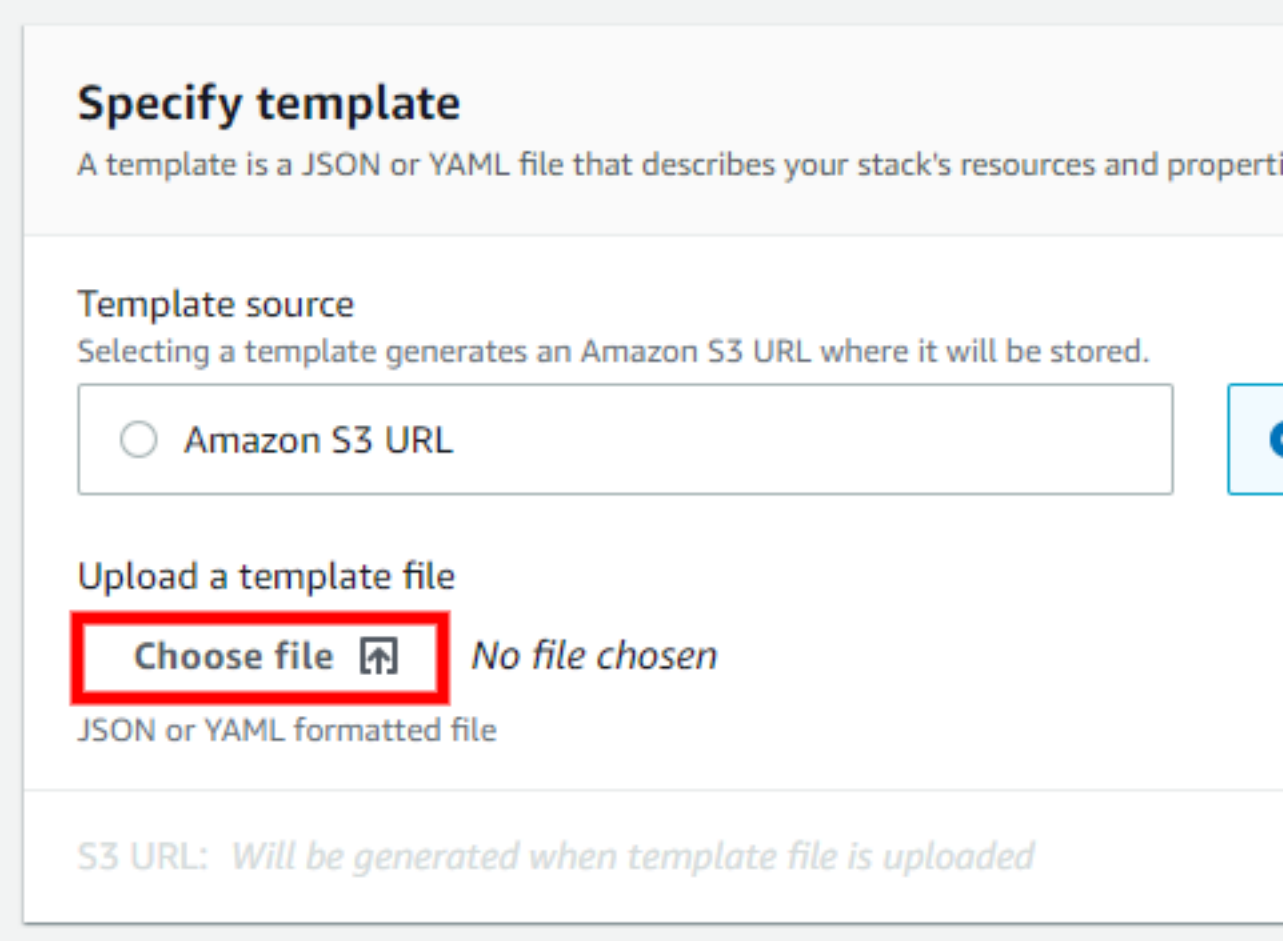
3. Download the Application Migration Service script CloudFormation template. Extract the mgn-private-beta-clouedformationiam-resources-template.json file from the zip.
4. On the Create stack CloudFormation view under **Prerequisite - Prepare template**, select the **Template is ready** option.



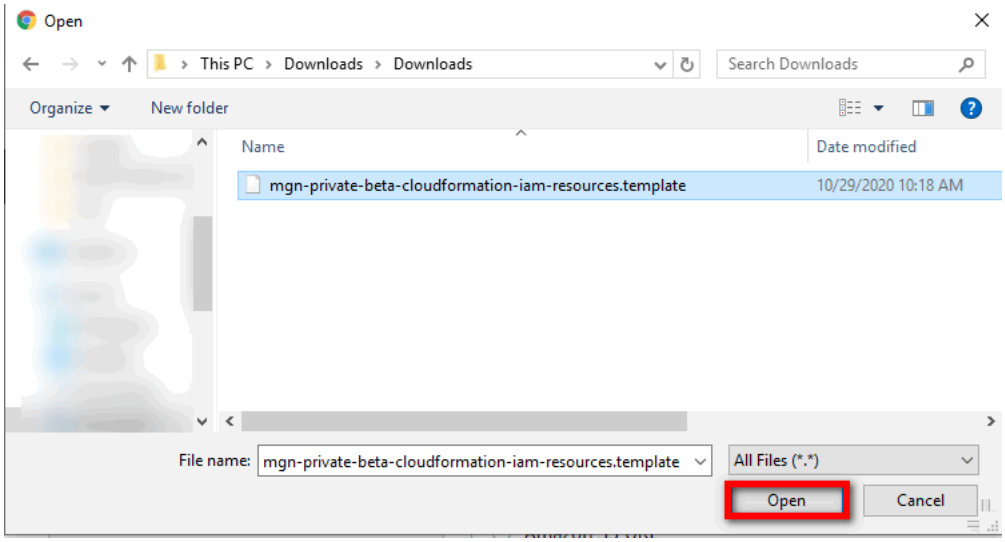
5. Under Specify Template, select the **Upload a template file** option.



6. Select Choose file and browse to the location where you extracted the Application Migration Service script template JSON.

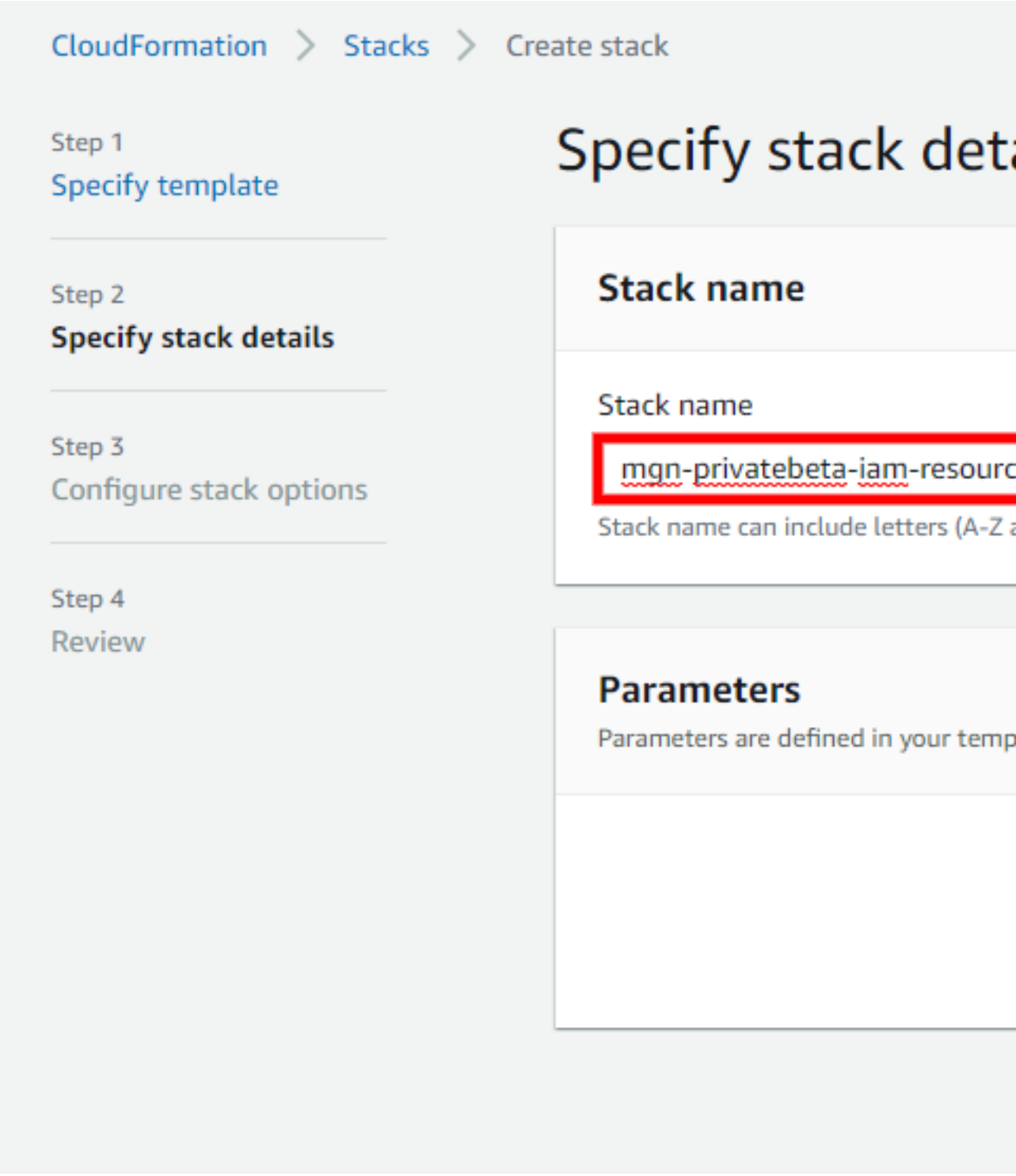


Select the template and choose **Open**.

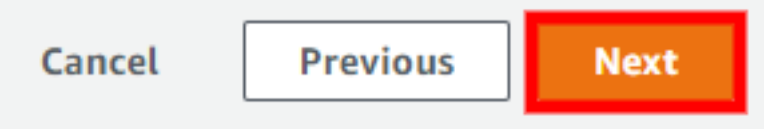


7. Choose **Next** at the bottom of the page.

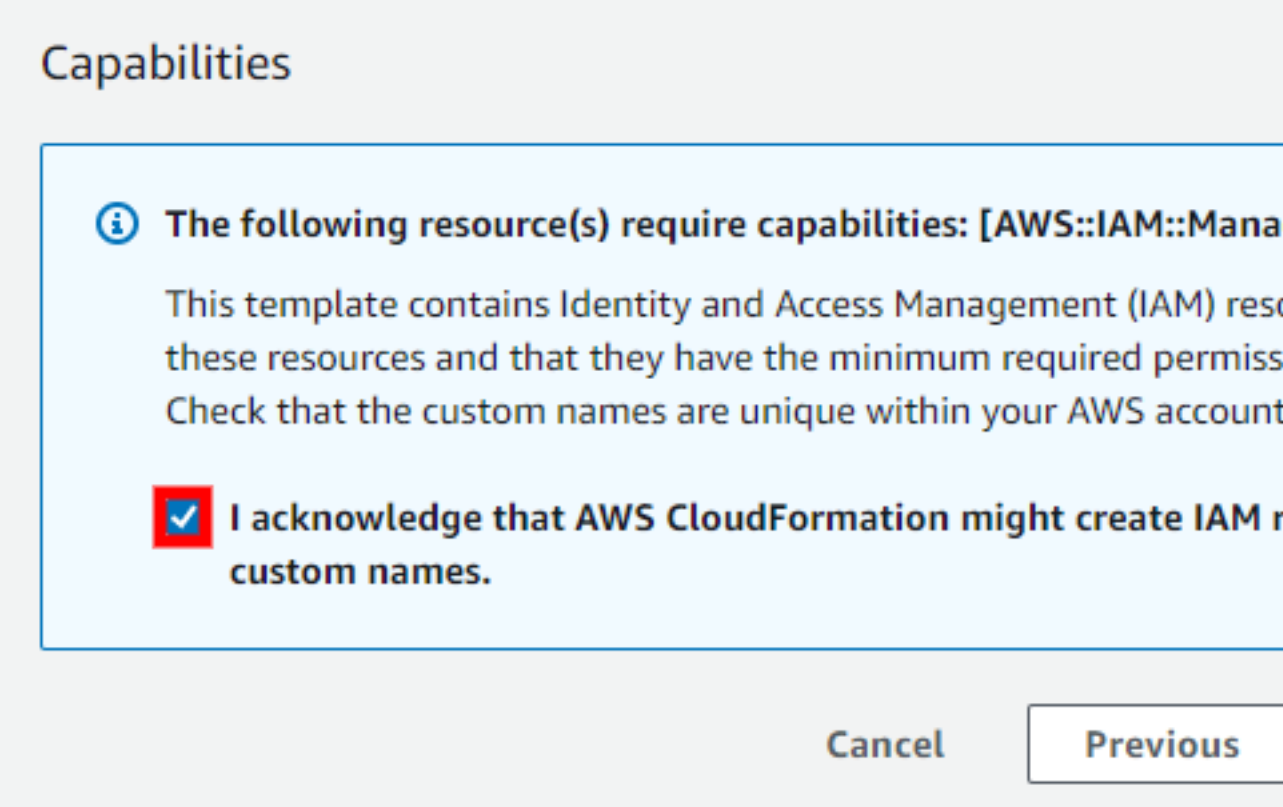
8. On the Specify stack details page, give the stack a unique **Stack name**. We recommend naming it "mgn-privatebeta-iam-resources". You do not need to define any parameters. Choose **Next**.



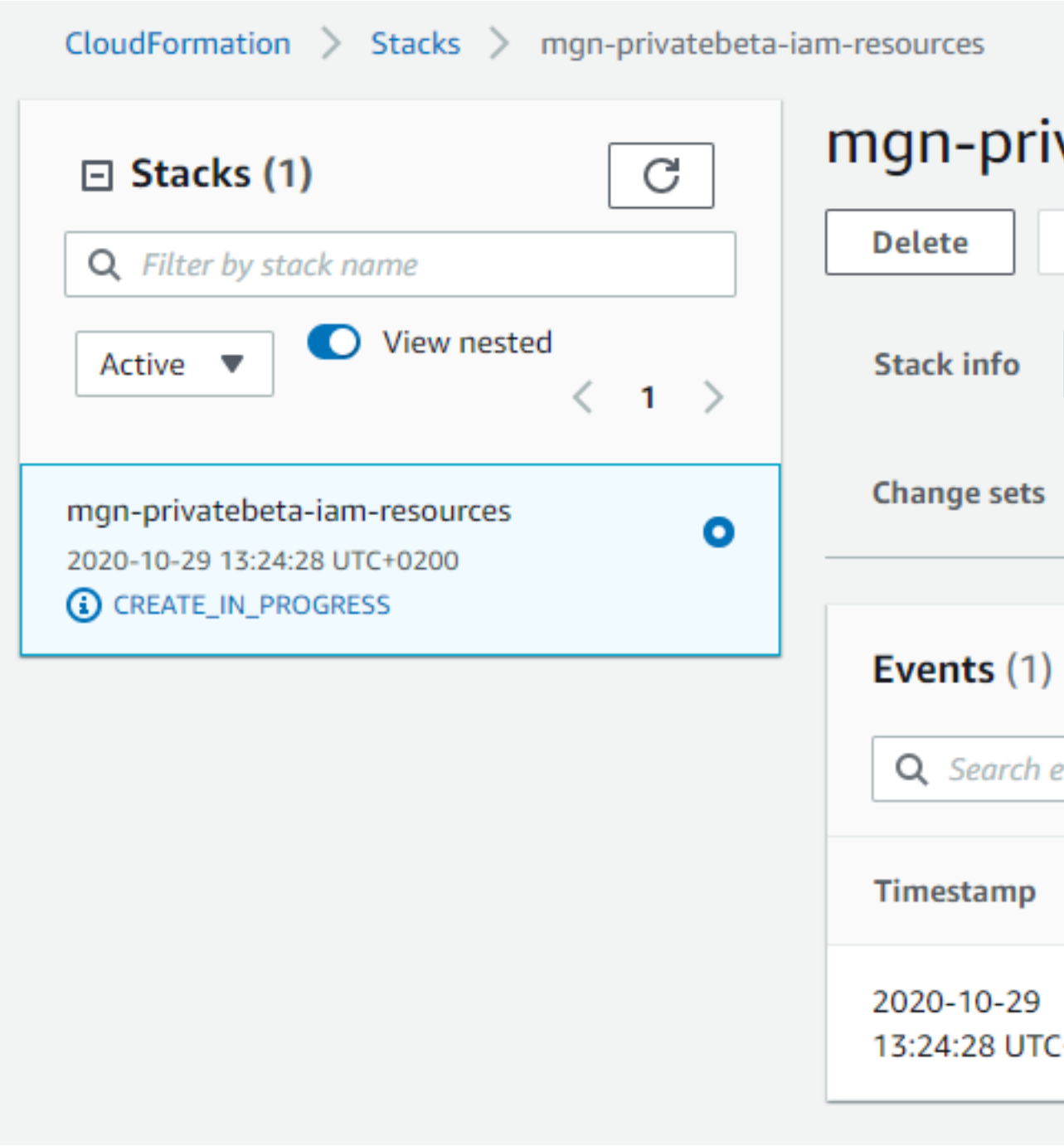
9. You do not need to configure anything on the **Configure stack options** page. Scroll down and choose **Next**.



10. On the **Review <Stack name>** page, scroll down to **Capabilities** at the bottom of the page and select the box to the left of **I acknowledge that AWS CloudFormation might create IAM resources with custom names.** Choose **Create stack**.



11. Your stack will be created. Once the creation process is complete, you will be able to access Application Migration Service. Log into the URL in the Accessing the Application Migration Service Console (p. 16) step below and follow the Getting Started steps.



AWS Account Permissions Required for Application Migration Service

The following are permissions required for using Application Migration Service. The CloudFormation template script automatically grants all of these permissions.

"mgn:SendClientMetrics",

"mgn:SendClientLogs"

"mgn:GetChannelCommands",

"mgn:SendChannelCommandResult"

"mgn:GetAgentSnapshotCredits",

"mgn:DescribeReplicationServerAssociations",

"mgn:DescribeSnapshotRequests",

"mgn:BatchDeleteSnapshotRequest",

"mgn:NotifyAgentAuthentication",

"mgn:BatchCreateVolumeSnapshotGroup",

"mgn:UpdateAgentReplicationProcessState",

"mgn:NotifyAgentReplicationProgress",

"mgn:NotifyAgentConnected",

"mgn:NotifyAgentDisconnected"

"ec2:DescribeInstances",

"ec2:DescribeSnapshots"

"ec2:CreateSnapshot"

"ec2:CreateSnapshot"

"ec2:CreateTags",

"ec2:CreateAction": "CreateSnapshot"

"mgn:SendClientMetrics",

"mgn:SendClientLogs"

"mgn:RegisterAgent",

"mgn:GetSignedCertificate",

"mgn:GetAgentStartupConfiguration",

"mgn:UpdateAgentSourceProperties",

"mgn:UpdateAgentReplicationInfo",

"mgn:UpdateAgentConversionInfo",

"mgn:GetAgentInstallationAssets",

"mgn:GetAgentCommand",

"mgn:GetAgentConfirmedResumeInfo",

"mgn:GetAgentRuntimeConfiguration",

"mgn:UpdateAgentBacklog",

"mgn:GetAgentReplicationInfo"

"mgn:SendClientMetrics",

"mgn:SendClientLogs"

"mgn:GetChannelCommands",

"mgn:SendChannelCommandResult",

"mgn:TagResource",

"mgn:ListTagsForResource"

"mgh:AssociateCreatedArtifact",

"mgh:CreateProgressUpdateStream",

"mgh:DisassociateCreatedArtifact",

"mgh:GetHomeRegion",

"mgh:ImportMigrationTask",

"mgh:NotifyMigrationTaskState",

"mgh:PutResourceAttributes"

"ec2:DescribeAccountAttributes",

"ec2:DescribeAvailabilityZones",

"ec2:DescribeImages",

"ec2:DescribeInstances",

"ec2:DescribeInstanceTypes",

"ec2:DescribeInstanceAttribute",

"ec2:DescribeInstanceStatus",

"ec2:DescribeLaunchTemplateVersions",

"ec2:DescribeLaunchTemplates",

"ec2:DescribeSecurityGroups",

"ec2:DescribeSnapshots",

"ec2:DescribeSubnets",

"ec2:DescribeVolumes"

"ec2:RegisterImage",

"ec2:DeregisterImage"

"ec2:DeleteSnapshot"

"ec2:CreateLaunchTemplateVersion",

"ec2:ModifyLaunchTemplate",

"ec2:DeleteLaunchTemplate",

"ec2:DeleteLaunchTemplateVersions"

"ec2:DeleteVolume"

"ec2:StartInstances",

"ec2:StopInstances",

"ec2:TerminateInstances",

"ec2:ModifyInstanceAttribute",

"ec2:GetConsoleOutput",

"ec2:GetConsoleScreenshot"

"ec2:RevokeSecurityGroupEgress",

"ec2:AuthorizeSecurityGroupIngress",

"ec2:AuthorizeSecurityGroupEgress"

"ec2:CreateVolume"

"ec2:CreateSecurityGroup"

"ec2:CreateSnapshot"

"ec2:DetachVolume",

"ec2:AttachVolume"

"ec2:ResourceTag/AWSApplicationMigrationServiceManaged": "*"

"ec2:RunInstances"

"arn:aws:iam::*:role/ReplicationServerRole",

"arn:aws:iam::*:role/ConversionServerRole"

"arn:aws:ec2:*:*:launch-template/*",

"arn:aws:ec2:*:*:security-group/*",

"arn:aws:ec2:*:*:volume/*",

"arn:aws:ec2:*:*:snapshot/*",

"arn:aws:ec2:*:*:instance/*"

Accessing the Application Migration Service Console - Private Beta

For the Private Beta, you can only access the Application Migration Service Console with an AWS Account that is part of the internal preview whitelist through the following link:

https://console.aws.amazon.com/mgn/home?region=us-east-1

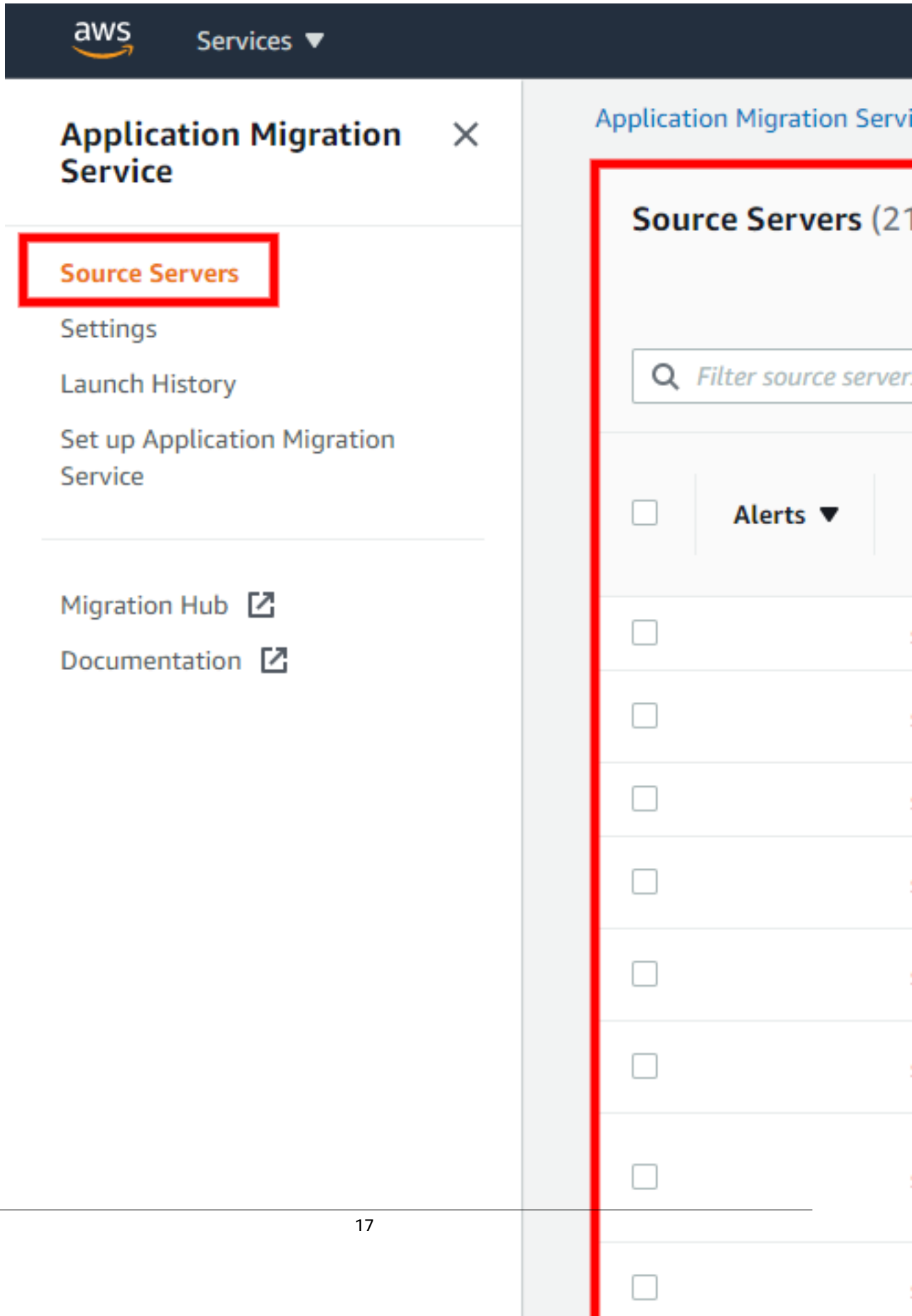
The following is the internal preview and beta API endpoint:

https://private-beta.mgn.us-east-1.amazonaws.com

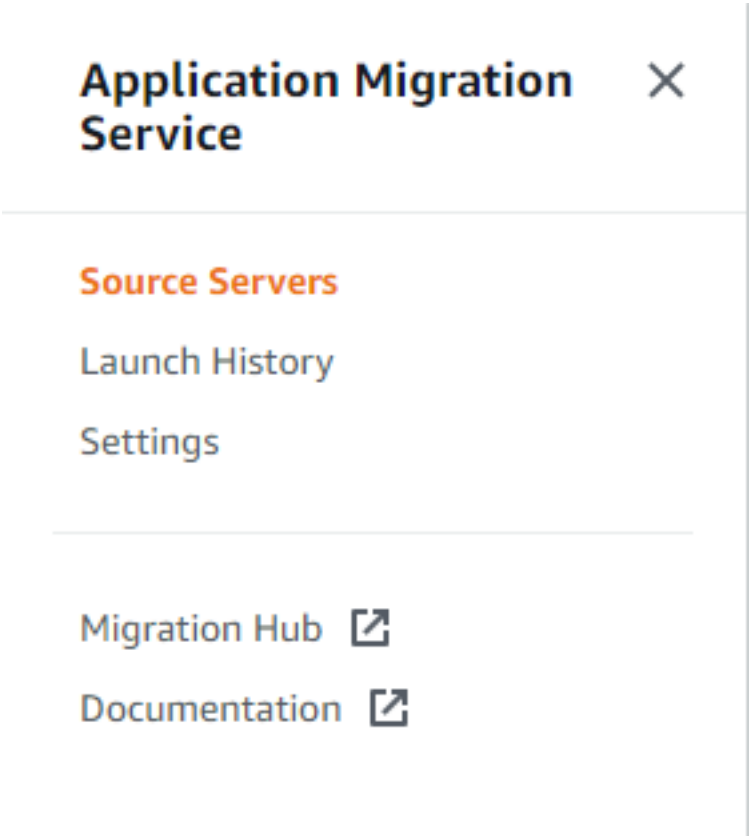
Using the Application Migration Service Console

Application Migration Service is region-specific. Ensure that you select the correct region from the AWS Region selector when utilizing Application Migration Service, just like you would do with other region-specific services such as EC2, etc.

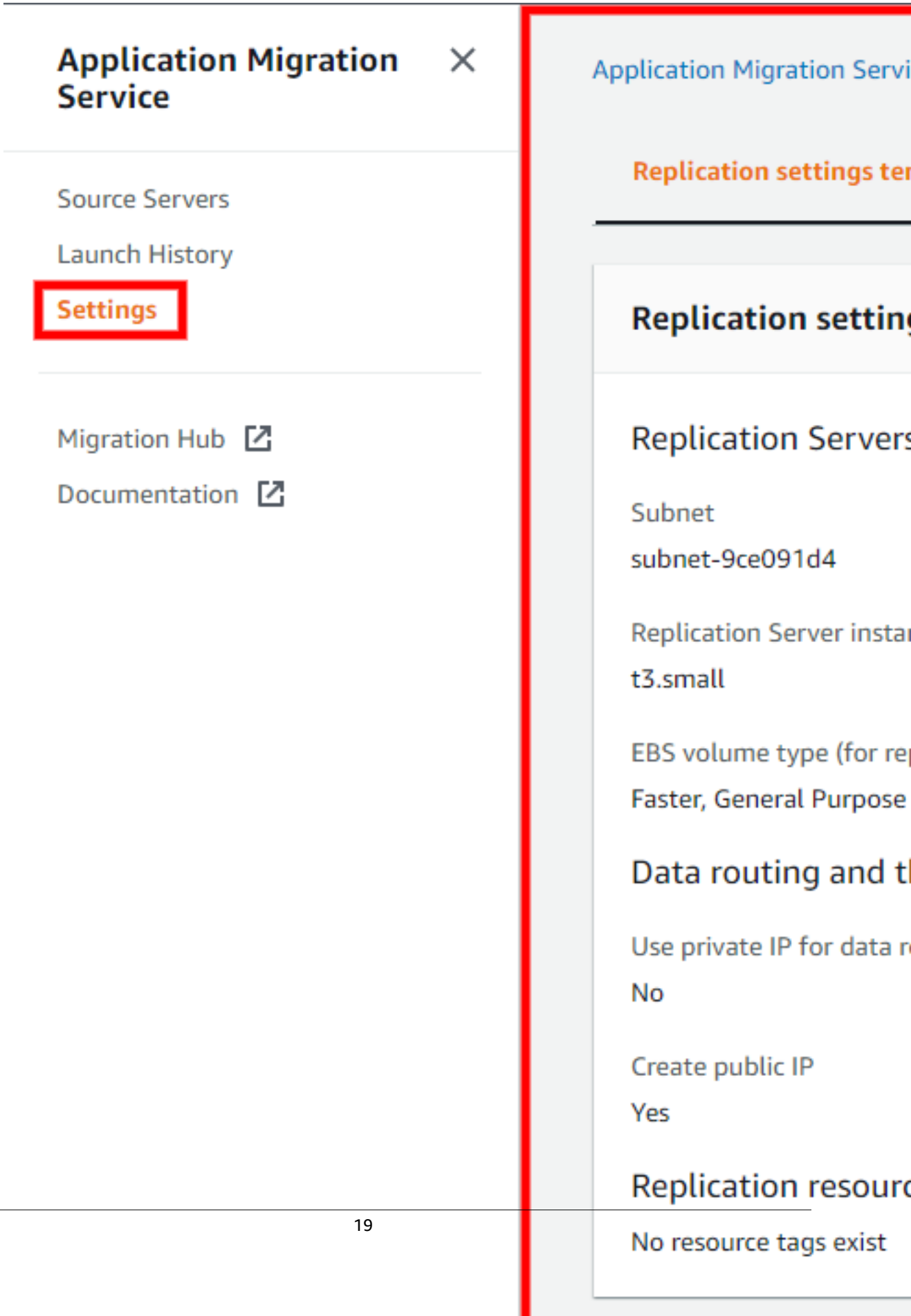
Application Migration Service is divided into several primary pages. Each page contains additional tabs and actions. The default view for the Application Migration Service Console is the **Source Servers** page. This page automatically opens every time you open Application Migration Service.


aws
Services
Application Migration Service
Source Servers
Settings
Launch History
Set up Application Migration Service
Migration Hub
Documentation
Application Migration Servi
Source Servers (21
Filter source server
Alerts

You can navigate to other Application Migration Service pages through the left-hand Application Migration Service navigation menu. You can also access the AWS Migration Hub and the Application Migration Service Documentation through this menu.

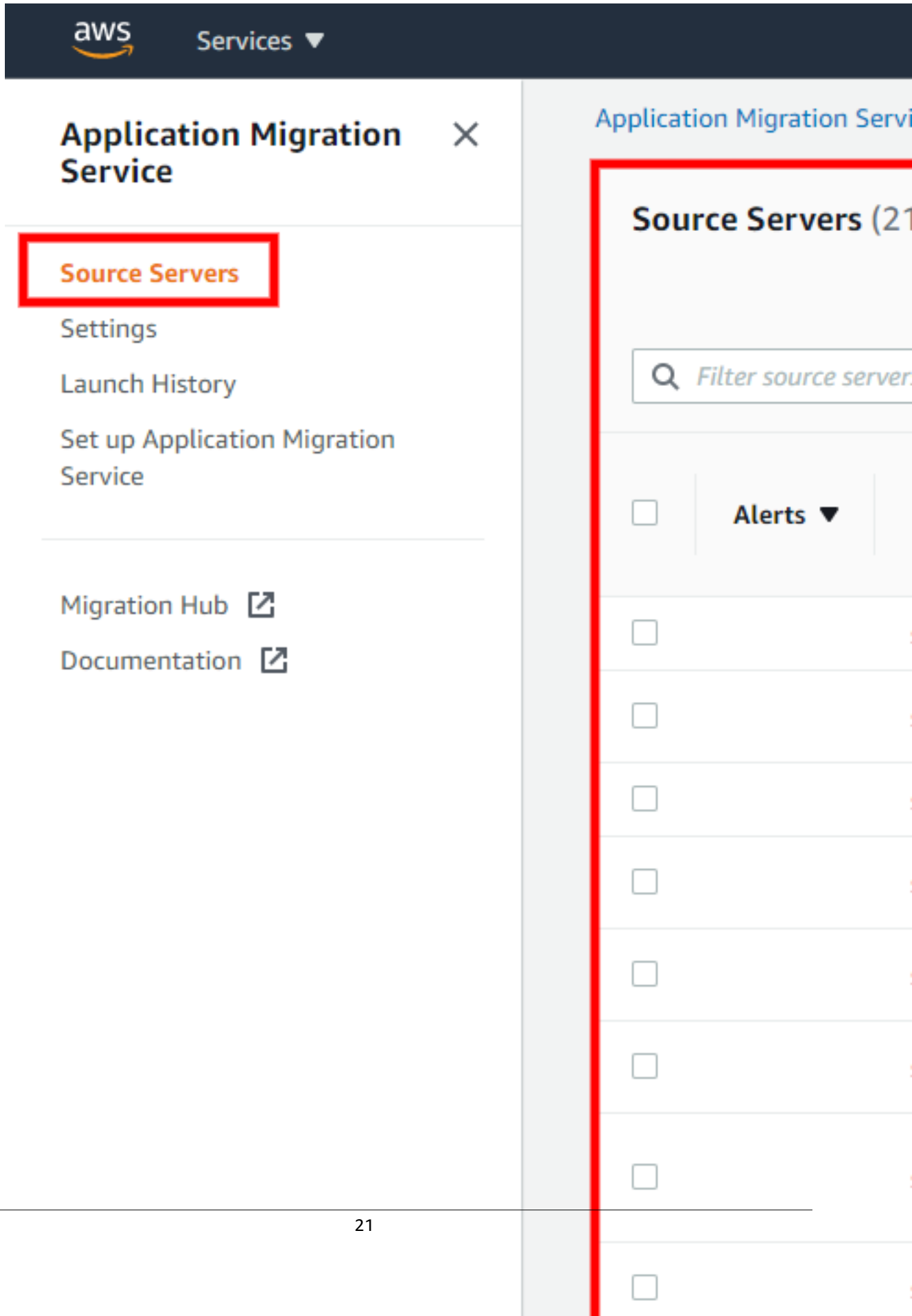


Each Application Migration Service page will open in the right-hand main view. Here, you can interact with the various tabs, actions, and settings on the page.

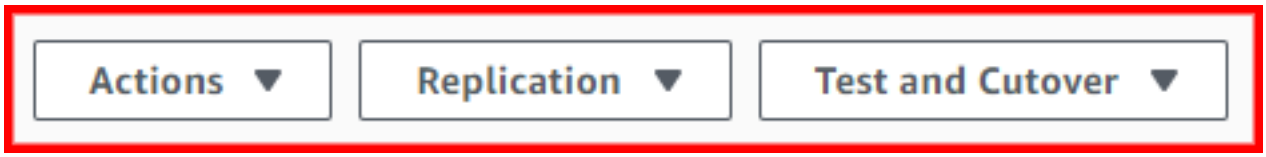

Application Migration Service
Source Servers
Launch History
Settings
Migration Hub
Documentation
Application Migration Servi
Replication settings ter
Replication setting
Replication Servers
Subnet
subnet-9ce091d4
Replication Server instar
t3.small
EBS volume type (for re
Faster, General Purpose
Data routing and t
Use private IP for data r
No
Create public IP
Yes
Replication resourc
No resource tags exist

Source Servers page

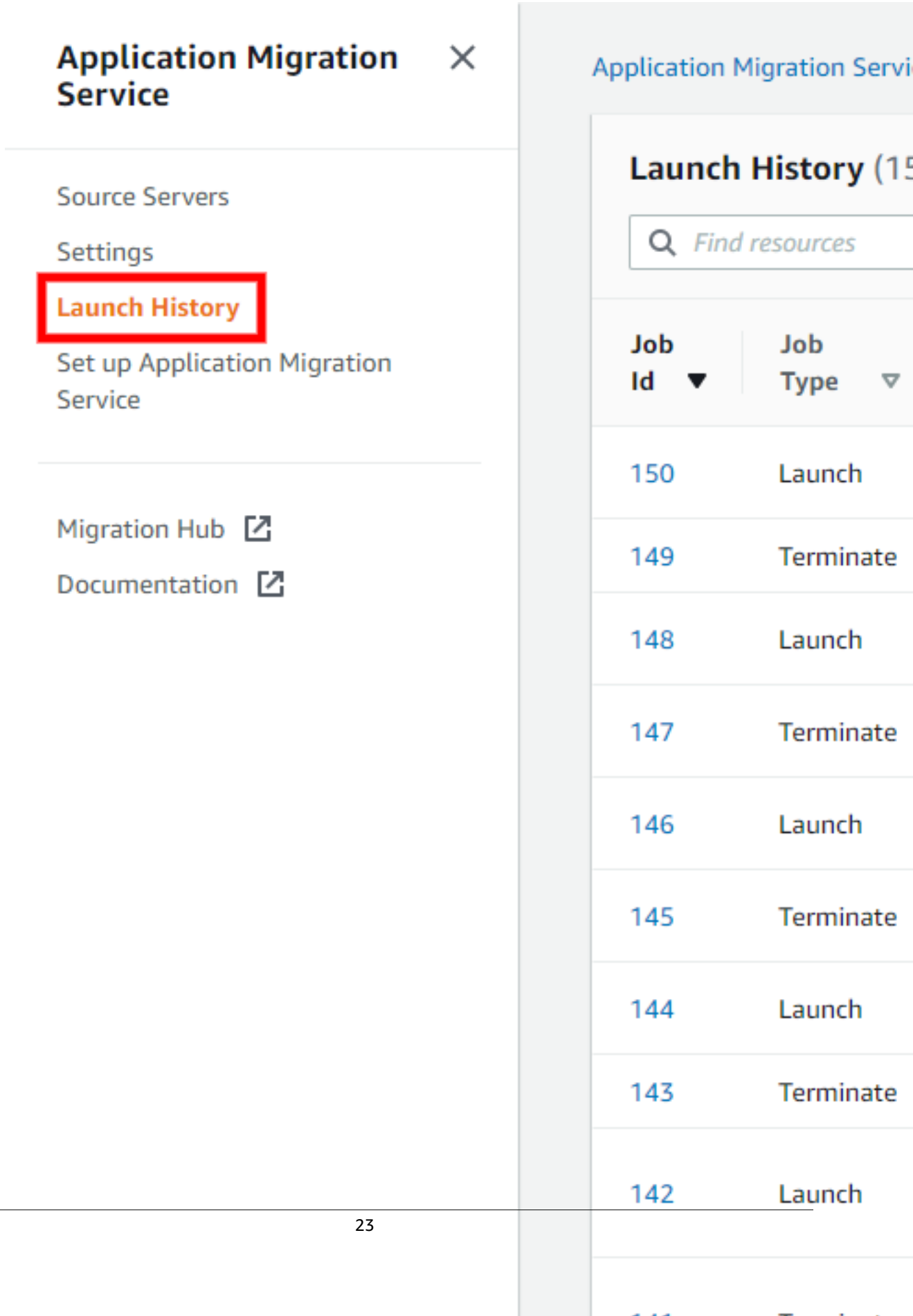
The Source Servers page lists all of the source servers you added to Application Migration Service and allows you to interact with your servers and perform a variety of crucial actions. Learn more about the Source Servers page. (p. 127) (p. 100)


aws
Services
Application Migration Service
Source Servers
Settings
Launch History
Set up Application Migration Service
Migration Hub
Documentation
Application Migration Servi
Source Servers (21
Filter source server
Alerts

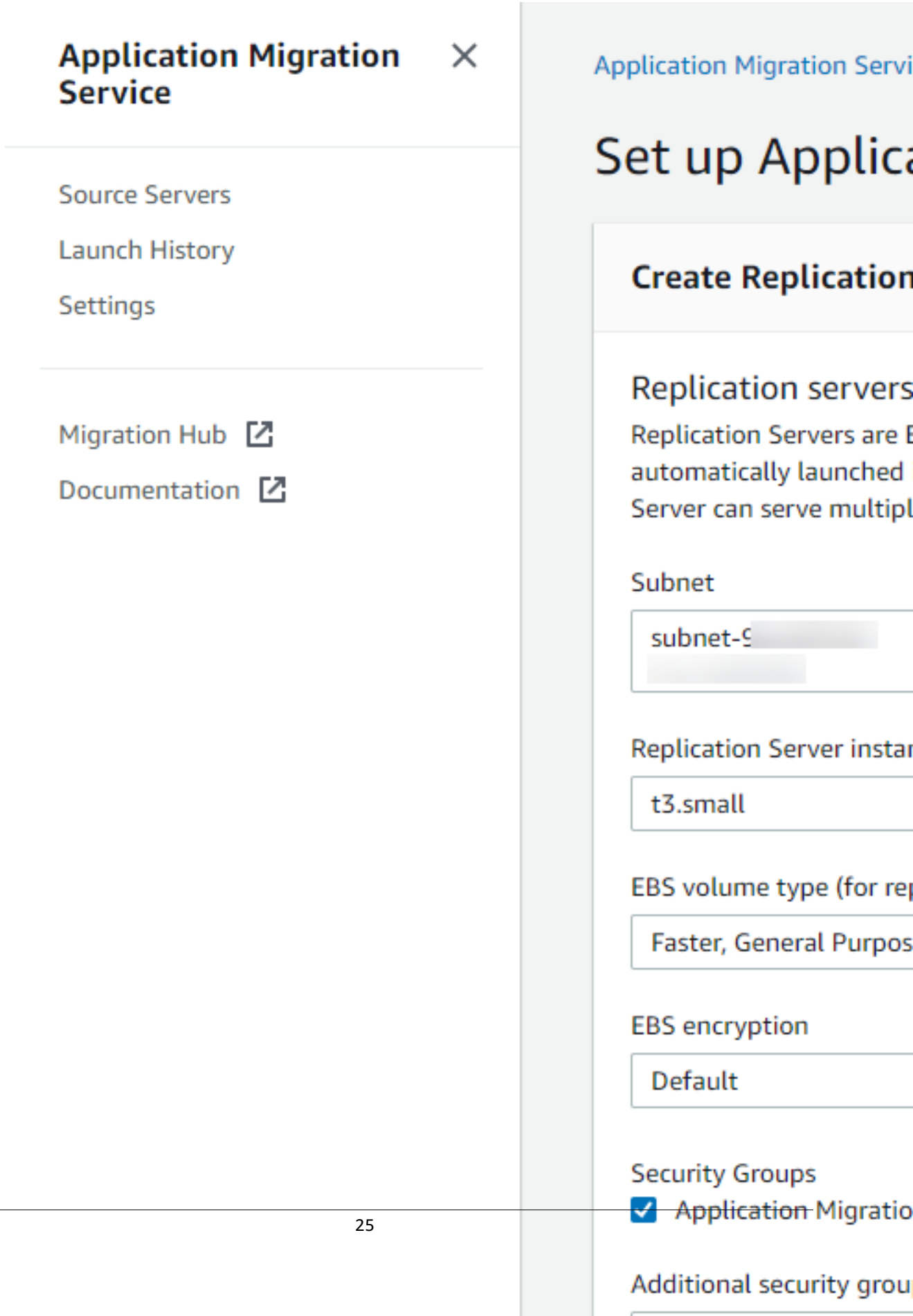
You can control your source servers within Application Migration Service through the **Actions, Replication**, and **Test/Cutover** menus.



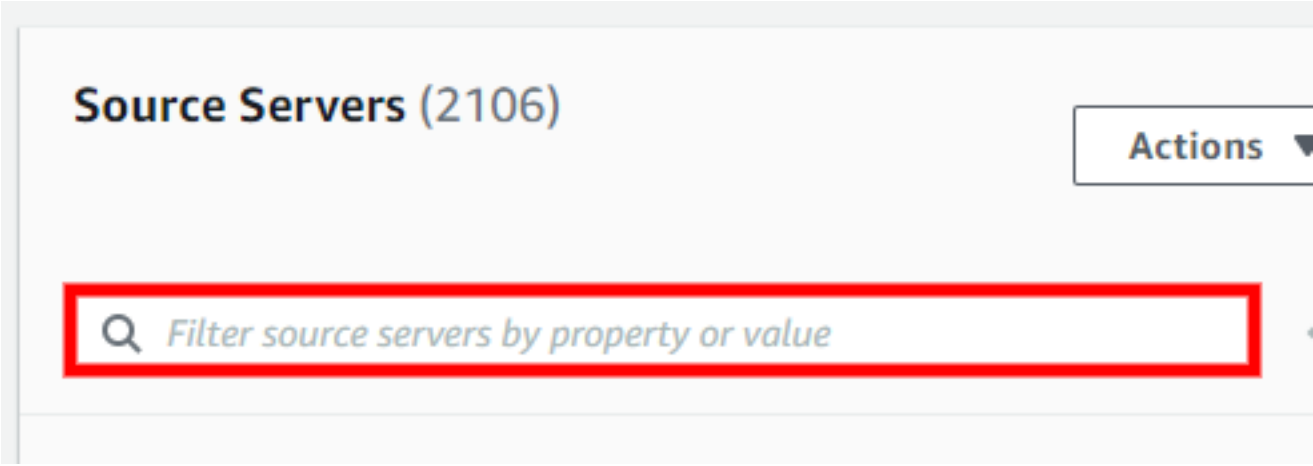
You can review the progress of all commands through the **Launch History** tab. Learn more about Launch History. (p. 268)


Application Migration Service
Source Servers
Settings
Launch History
Set up Application Migration Service
Migration Hub
Documentation
Application Migration Servi
Launch History (15
Find resources
Job Id
Job Type
150 Launch
149 Terminate
148 Launch
147 Terminate
146 Launch
145 Terminate
144 Launch
143 Terminate
142 Launch

The commands within these menus specifically influence the source servers you have selected. You can select a single or multiple source servers for any command by checking the box to the left of the server name.

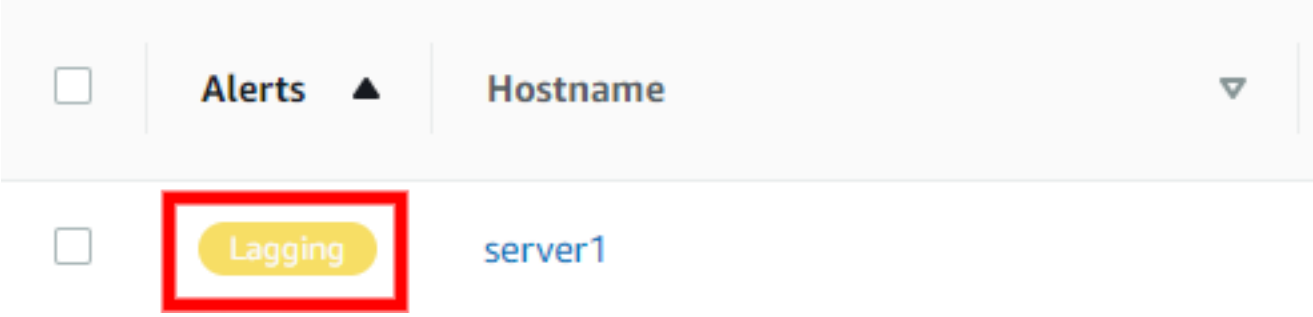

Application Migration Service
Source Servers
Launch History
Settings
Migration Hub
Documentation
Application Migration Servi
Set up Applica
Create Replication
Replication servers
Replication Servers are E
automatically launched
Server can serve multipl
Subnet
subnet-9
Replication Server instar
t3.small
EBS volume type (for rep
Faster, General Purpos
EBS encryption
Default
Security Groups
Application Migratio
Additional security grou

You can use the **Filter servers** box to filter servers based on a variety of parameters.

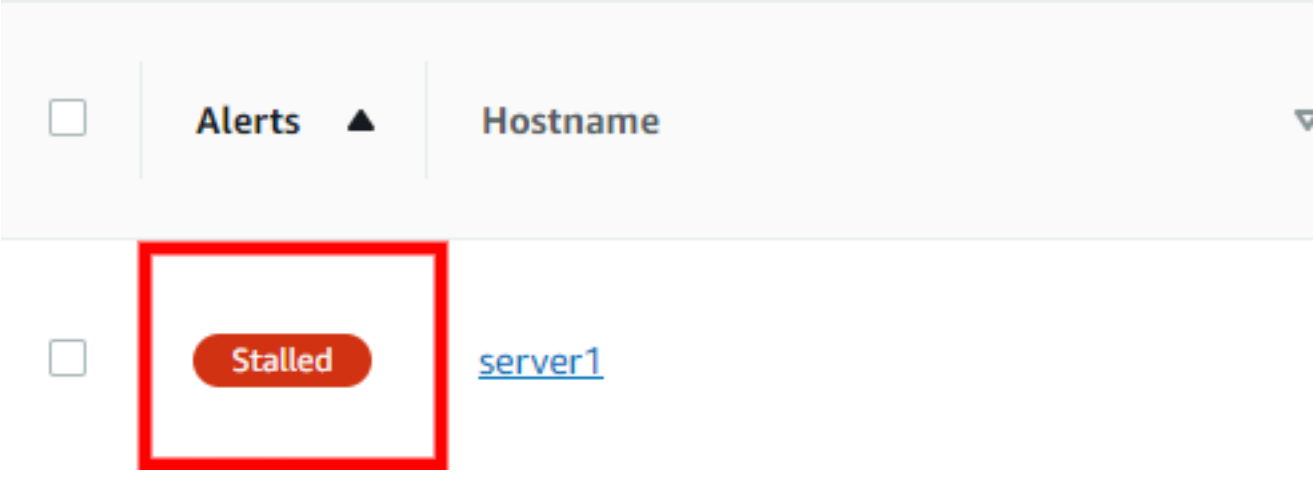


Application Migration Service color codes the state of each source server. Use the **Alerts** column to easily determine the state of your server.

A yellow box indicates that the server is experiencing temporary issues. The nature of the issue will be described within the box (ex. "Lagging")



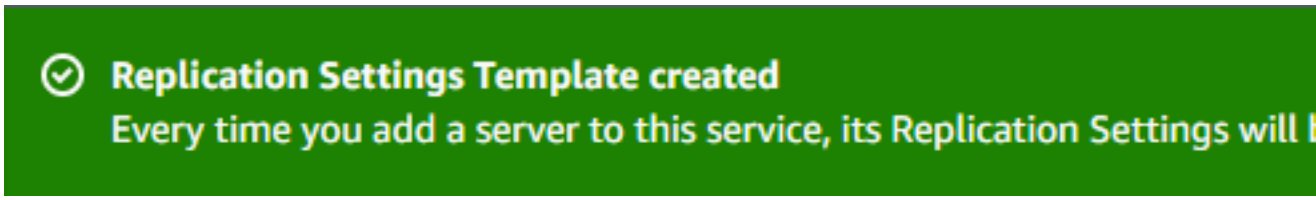
A red box indicates that the server is experiencing significant issues that need to be addressed before replication can resume. The nature of the issue will be described within the box (ex. "Stalled")



When various commands are initiated, Application Migration Service will display information messages at the top of the **Source servers** page. Application Migration Service color codes these messages for clarity.

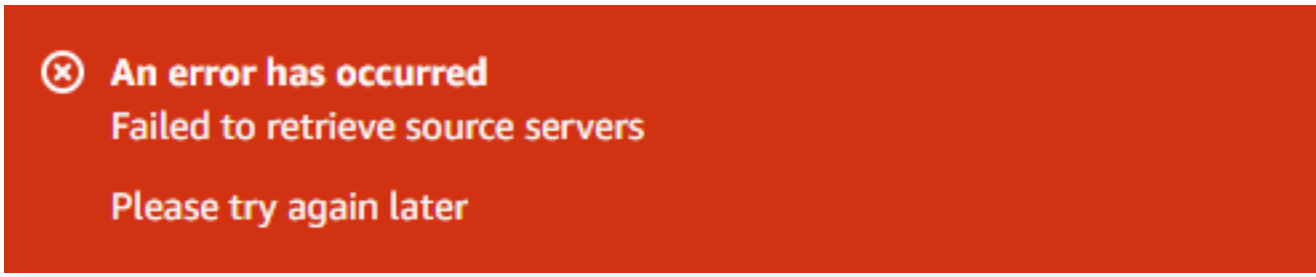
A green message means that a command was completed successfully.

Ex.



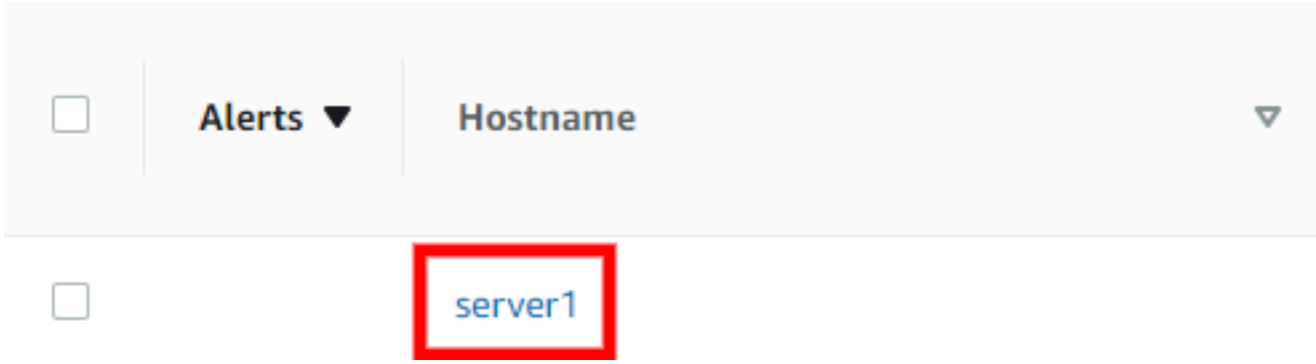
A red message means that a command was not completed successfully.

Ex.



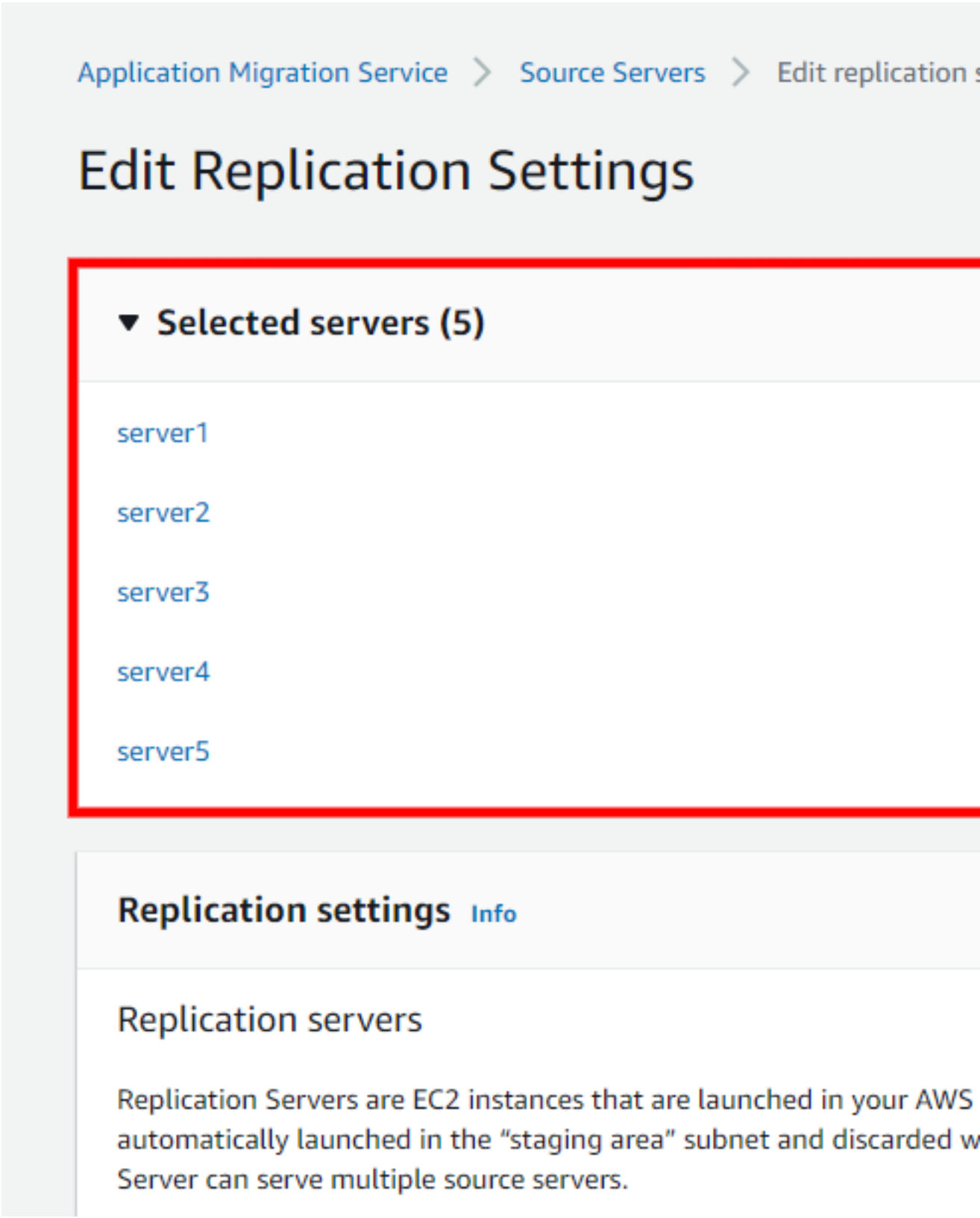
Each message shows details and links off to supplemental information.

Application Migration Service allows you to interact with and manage each individual server. Click on the server name to be redirected to the Server Details view.



This tab shows the specific details for each individual server. From here, you can review the server's migration lifecycle and health, view various technical details, manage tags, manage disks, edit the server's individual replication settings, and edit the server's launch settings through the various tabs. Learn more about the Server Details View (p. 162).

Certain Application Migration Service commands, such as editing the replication settings, allow you to interact with multiple source servers at once. When multiple servers are selected by checking the box to the left of the server name and the **Replication > Edit replication settings** option is chosen, Application Migration Service will indicate exactly which servers are being edited.


Application Migration Service
Source Servers
Edit replication
Edit Replication Settings
Selected servers (5)
server1
server2
server3
server4
server5
Replication settings
Info
Replication servers
Replication Servers are EC2 instances that are launched in your AWS
automatically launched in the "staging area" subnet and discarded w
Server can serve multiple source servers.

In order for any setting changes you have made in the Application Migration Service Console to take effect, you have to choose the Save option at the bottom of each settings page.

Migration Workflow

The general process is:

1. Install the AWS Replication Agent on the source server.
2. Wait until Initial Sync is finished.
3. Launch Test instances.
4. Perform acceptance tests on the servers, once the Test instance is tested successfully, finalize the Test and delete the Test instance.
5. Wait for the Cutover window.
6. Confirm that the Lag is None.
7. Stop all operational services on the source server.
8. Launch a Cutover instance.
9. Confirm that the Cutover instance was launched successfully and then finalize the Cutover.
10. Decommission the source server.

Best Practices

Planning

1. Plan your Migration project prior to installing machines.
2. Do not perform any reboots on the Source servers prior to a Cutover.

Testing

1. Perform a Test at least one week before you plan to migrate your Source servers. This time frame is intended for identifying potential problems and solving them, before the actual Cutover takes place. After performing the test launch, validate connectivity to your Test instances (using SSH for Linux or RDP for Windows), and perform acceptance tests for your application.
2. Ensure that you perform a Test prior to performing a Cutover.

Successful Implementation

The following are the required steps to complete a successful Migration implementation with Application Migration Service:

1. Deploy Application Migration Service Agents on your Source servers.
2. Confirm replication reaches Continuous Data Replication mode.
3. Test the launch of Test instances a week before the actual Cutover.
4. Address any issues that come up, such as Launch setting misconfiguration and potential AWS limits. .
5. Launch Cutover instances for the servers on the planned date.

Best Practices for Ensuring Project Success

1. Train a field technical team & assign a Application Migration Service SME.
2. Share project timelines with Application Migration Service.
3. Monitor data replication progress and report any issues in advance.
4. Perform a test for every server in advance, and report issues to Application Migration Service.
5. Coordinate Cutover windows with Application Migration Service in advance.

Quick start guide

This section will guide you through the first time Application Migration Service setup, including:

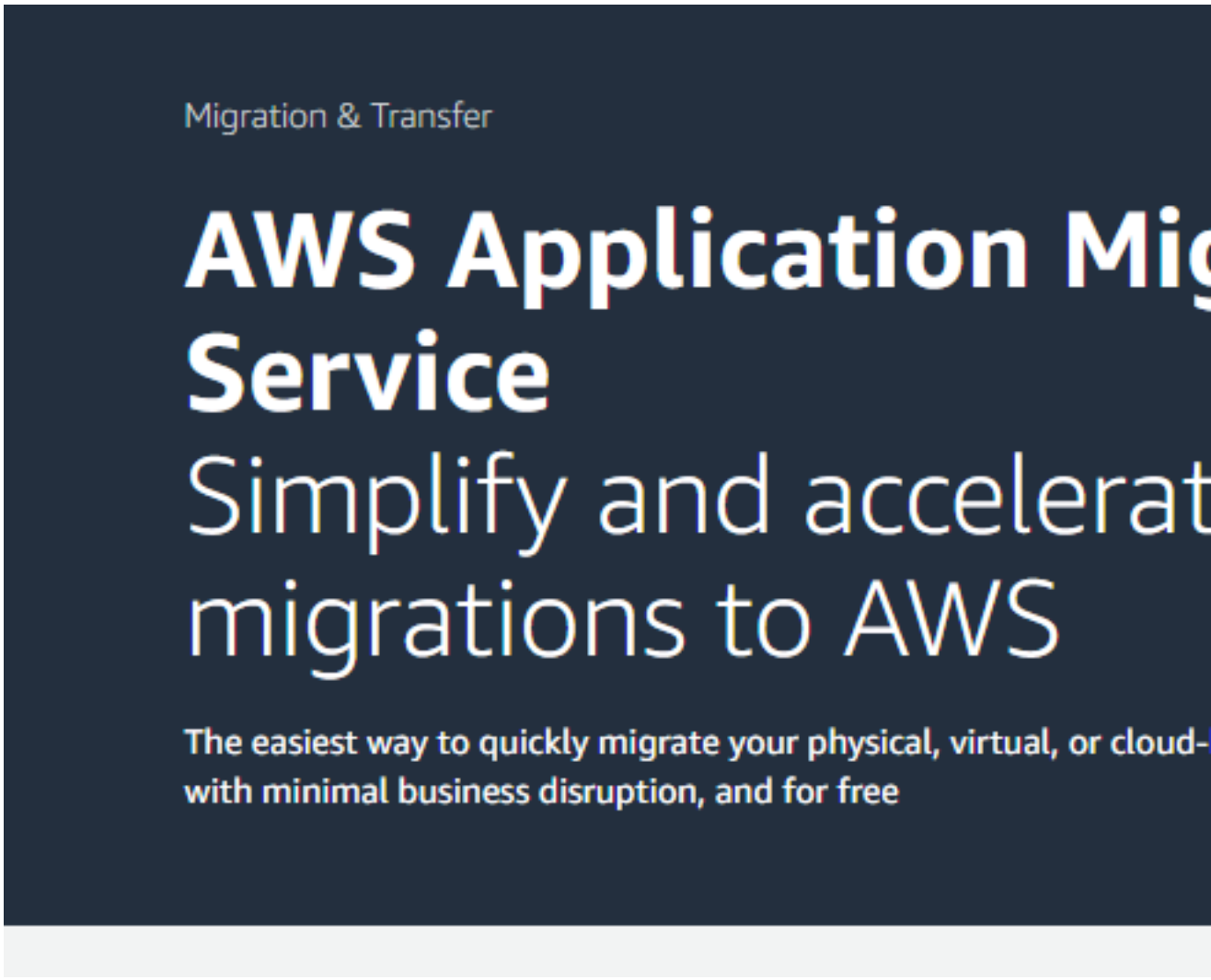
Topics

- First time setup (p. 30)
- Adding source servers (p. 37)
- Configuring launch settings (p. 38)
- Launching a Test instance (p. 38)
- Launching a Cutover instance (p. 49)

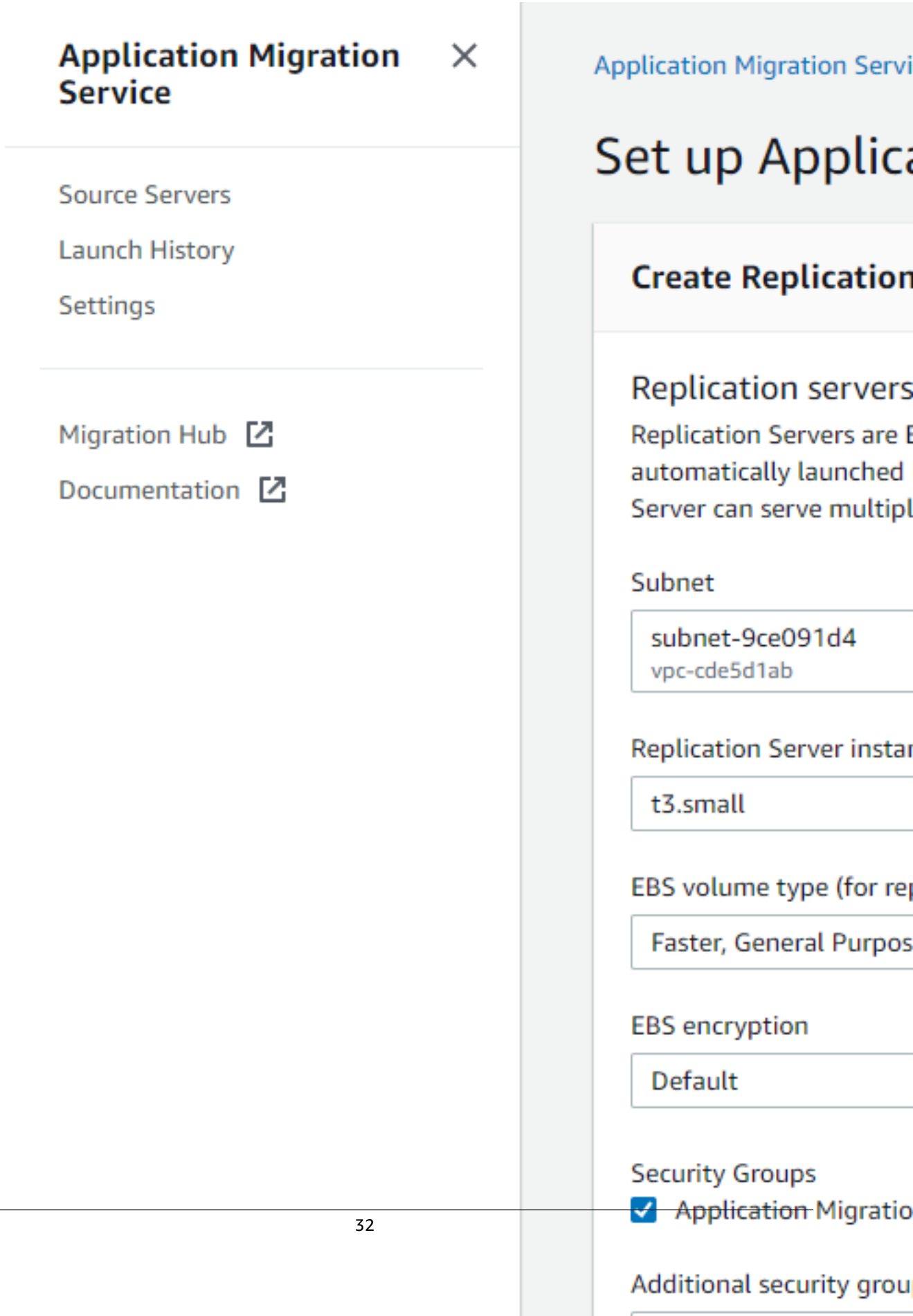
First time setup

The first step of using Application Migration Service is creating the Replication Settings Template.

Choose **Get started** on the main AWS Application Migration Service landing page.



You will be automatically prompted to create the template the first time to log into Application Migration Service. This template will determine how Data Replication will work for each newly added source server.


Application Migration Service
Source Servers
Launch History
Settings
Migration Hub
Documentation
Application Migration Servi
Set up Applica
Create Replication
Replication servers
Replication Servers are E
automatically launched
Server can serve multipl
Subnet
subnet-9ce091d4
vpc-cde5d1ab
Replication Server instar
t3.small
EBS volume type (for rep
Faster, General Purpos
EBS encryption
Default
Security Groups
Application Migratio
Additional security grou

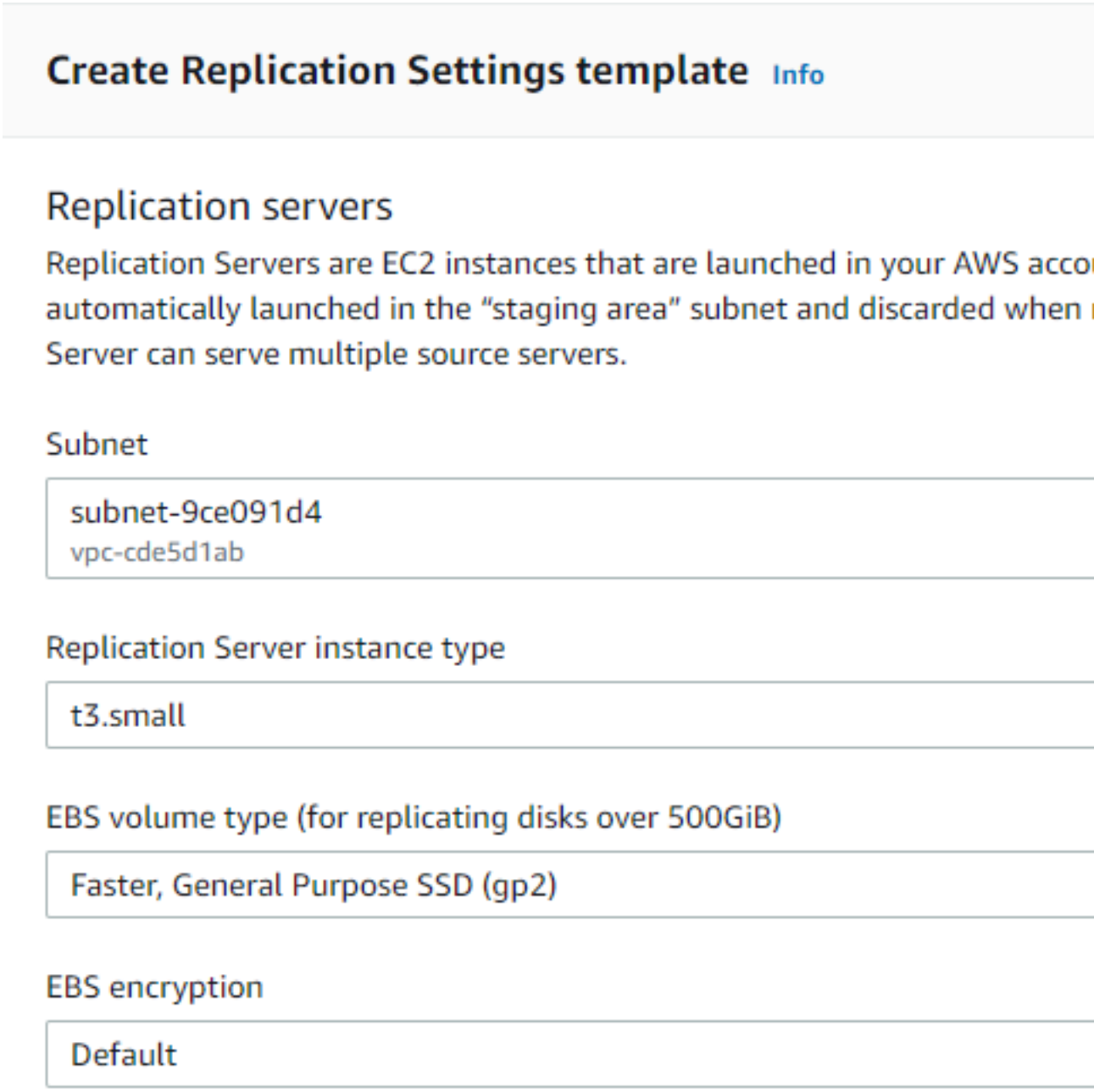
Important
Prior to configuring your Replication Settings template, ensure that you meet the Network Requirements for running Application Migration Service (p. 95).

The settings configured in this template will be applied to each newly added source server. The configured replication settings can later be changed at any time for any individual source server or group of source servers. Learn more about Replication Settings. (p. 60)

Learn more about changing individual server and multiple server replication settings. (p. 60)

The Replication Settings Template is made up of the following sections:

- Replication Servers - Replication Servers are lightweight EC2 instances that are used to replicate data between your source servers and AWS. Replication Servers are automatically launched and terminated as needed. You can start using Application Migration Service with the default Replication Server values or you can configure your own settings.

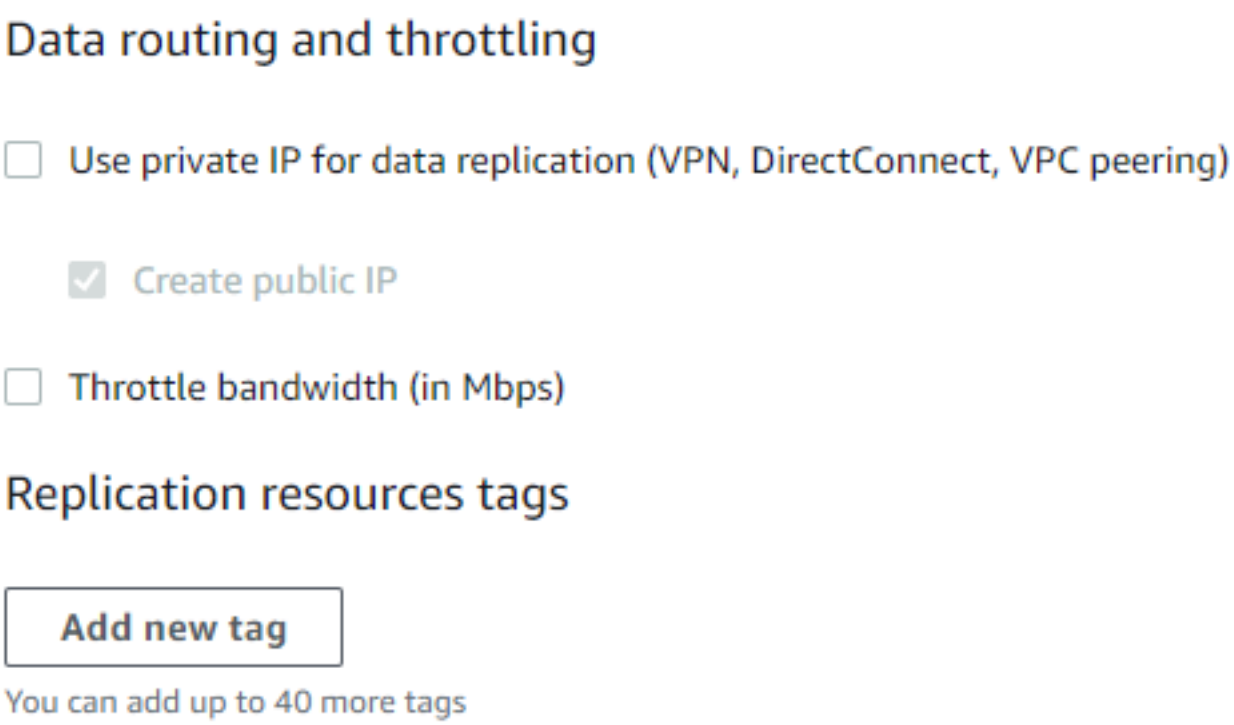


Configurable Replication Server settings include:

- The Subnet within which the Replication Server will be launched
- Replication Server instance type
- EBS volume types
- EBS encryption
- Security groups

- Data routing and throttling - Application Migration Service gives you multiple options to control how data is routed from your source servers to the Replication Servers on AWS. You can start using

Application Migration Service with the default data routing and throttling options or you can configure your own settings.



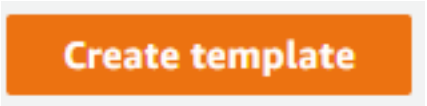
Configurable data routing and throttling settings include:

- Use Private IP
- Network data bandwidth throttling.

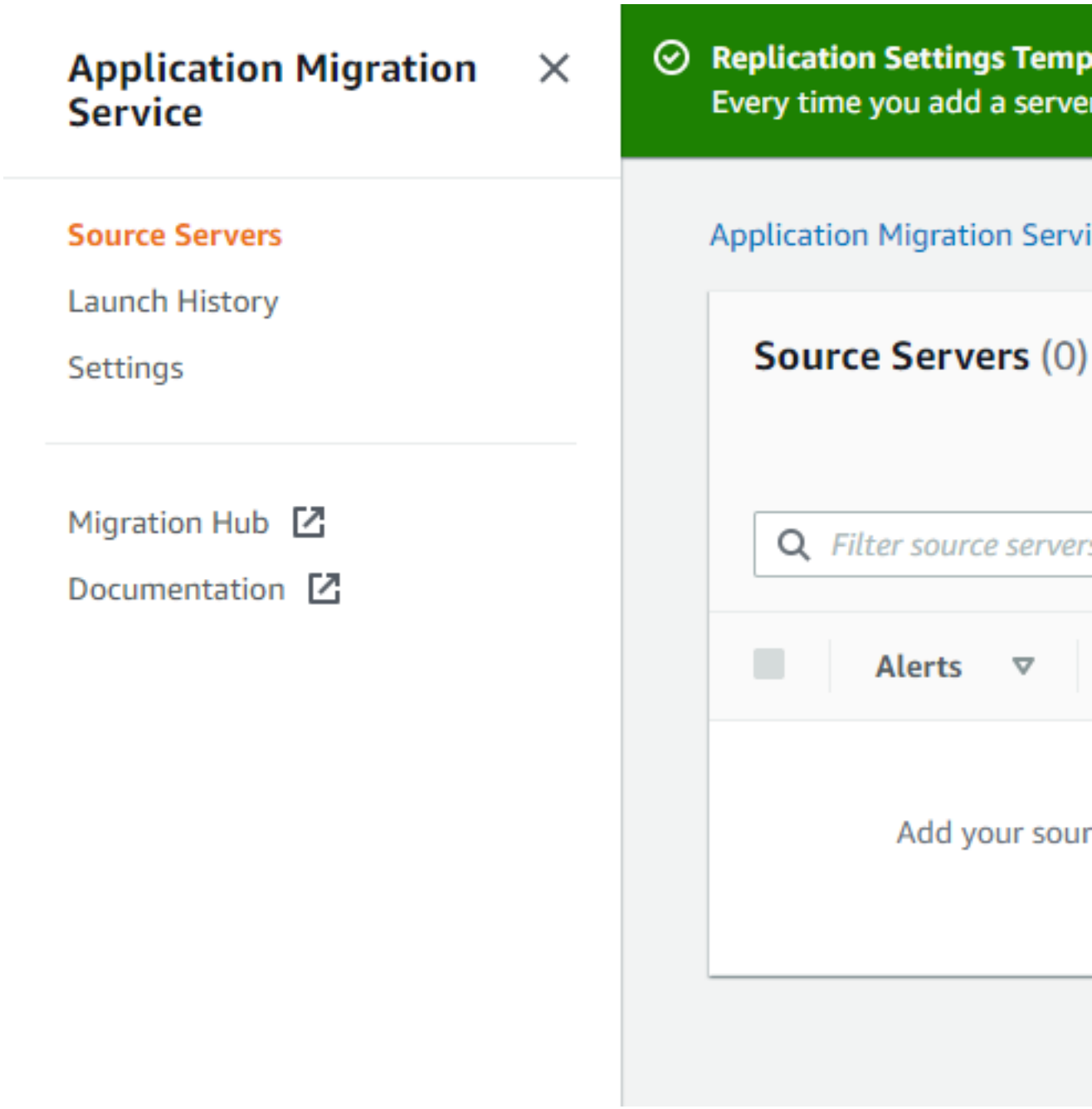
- Replication resource tags - Replication resource tags allow you to add custom Tags to your Application Migration Service resources.

Saving and editing Replication Settings

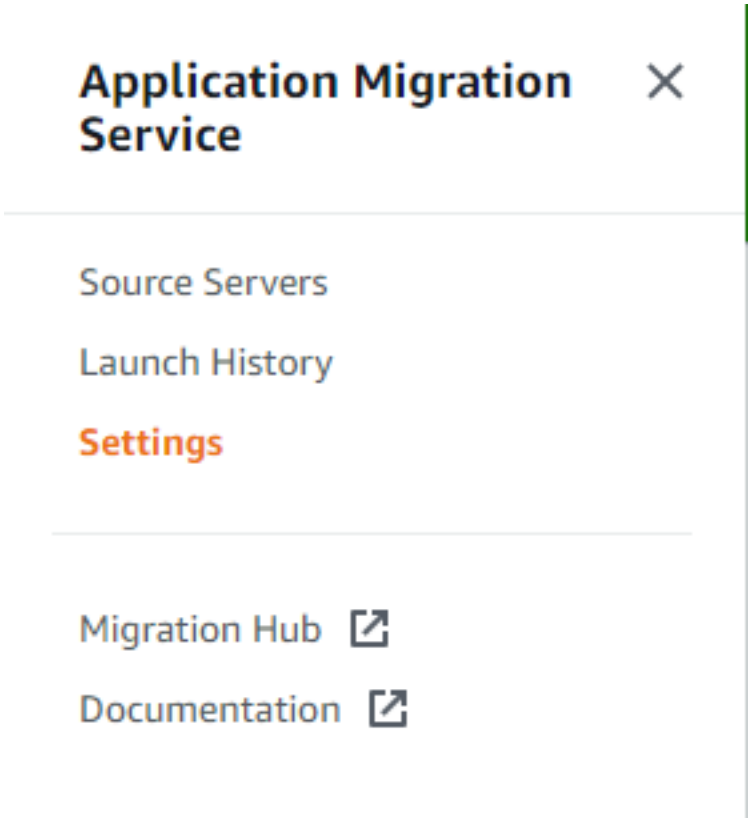
Once you have configured your template, click the orange **Create template** button.



Your Replication Settings template will be saved and you'll be redirected into the Application Migration Service Console **Source Servers** page.



You can always edit your Replication Settings template by clicking on **Settings** on the left-hand navigation menu. You will be able to edit individual server replication settings after adding your source servers to Application Migration Service.



The next step to the setup process is adding your source servers to Application Migration Service.

Adding source servers

Add source servers to Application Migration Service by installing the AWS Replication Agent (also referred to as "the Agent") on them. The Agent can be installed on both Linux and Windows servers. Learn more about adding source servers. (p. 100)

Prior to adding your source servers, ensure that you meet all of the Network Requirements (p. 95).

Migration Lifecycle

Once the source server has been added to Application Migration Service, it will undergo the Migration Lifecycle steps.

The Migration Lifecycle shows the current state of each machine within the migration framework. Lifecycle states include:

- Not ready - The server is undergoing the Initial Sync process and is not yet ready for testing. Data Replication can only commence once all of the Initial Sync steps have been completed.
- Ready for testing - The server has been successfully added to Application Migration Service and Data Replication has started. Test or Cutover instances can now be launched for this server.
- Test in progress - A Test instance is currently being launched for this server.
- Ready for cutover - This server has been tested and is now ready to launch a Cutover instance.
- Cutover in progress - A Cutover instance is currently being launched for this server.
- Cutover - This server has been cutover. All of the data on this server has been migrated to the AWS Cutover instance.

Learn more about the Migration Lifecycle states. (p. 168)

Once the Initial Sync process has been completed successfully, Data Replication will start automatically.

Configuring launch settings

Once you have added your source servers into the Application Migration Service Console, you will need to configure the launch settings for each server. The launch settings are a set of instructions that determine how an Test or Cutover instance will be launched for each source server in AWS. You must configure the launch settings prior to launching Test or Cutover instances. You can use the default settings or configure the settings to fit your requirements.

> **Note**
> You can change the launch settings after a Test or Cutover instance has been launched. You will need to launch a new Test or Cutover instance for the new settings to take effect.

You can access the launch settings by clicking on a source server on the **Source Servers** page.

Within the individual server view, navigate to the **Launch settings** tab.

Here you can see your default launch settings. Click the **Edit** button to edit your Launch settings.

Launch settings are composed of the following:

- Instance right-sizing - The Instance right-sizing feature allows Application Migration Service to launch a Test or Cutover instance type that best matches the hardware configuration of the source server. When enabled, this feature overrides the instance type selected in the EC2 Launch Template.
- Start instance upon launch - Choose whether you want to start your test and cutover instances automatically upon launch or whether you want to start them manually through the EC2 Console.
- Copy private IP - Choose whether you want Application Migration Service to ensure that the private IP used by the Test or Cutover instance matches the private IP used by the source server.
- Transfer server tags - Choose whether you want Application Migration Service to transfer any user-configured custom tags from your source servers onto your Test or Cutover instance.
- OS Licensing - Choose whether you want to Bring Your Own Licenses (BYOL) from the source server into the Test or Cutover instance.
- EC2 Launch Template - Application Migration Service automatically creates an EC2 Launch Template for each new source server. Application Migration Service bases the majority of the instance launch settings based on this template. You can edit the template to fit your needs.

Learn more about Launch settings. (p. 220)

Launching a Test instance

Once you have added all of your source servers and configured their launch settings, you are ready to launch a Test instance. It is crucial to test the migration of your source servers into AWS prior to initiating a Cutover in order to verify that your source servers function properly within the AWS environment.

> **Important**
> It is a best practice to perform a test at least one week before you plan to migrate your source servers. This time frame is intended for identifying potential problems and solving them, before the actual Cutover takes place. After launching Test instances, use either SSH (Linux) or RDP (Windows) to connect to your machine and ensure that everything is working correctly.

You can test one source server at a time, or simultaneously test multiple source servers. For each source server, you will be informed on the success or failure of the test. You can test your source server as many times as you want. Each new test first deletes any previously launched Test instance and dependent

resources. Then, it launches a new Test instance that reflects the most up-to-date state of the source server. After the test, Data Replication continues as before. The new and modified data on the source server is transferred to the Staging Area, and not to the Test instances that were launched following the test.

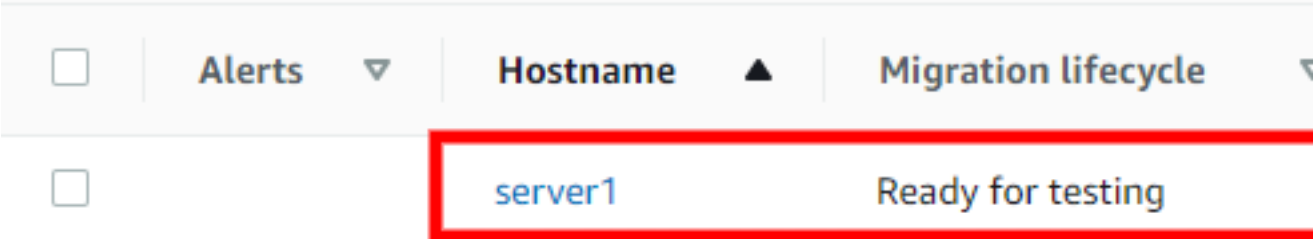
Note
Windows Source machines need to have at least 2 GB of free space to successfully launch a Test instance.

Note
Take into consideration that once a Test instance is launched, actual resources will be used in your AWS account and you will be billed for these resources. You can terminate the operation of launched Test instances once you verified that they are working properly without any impact in order to Data Replication.

Ready for testing indicators

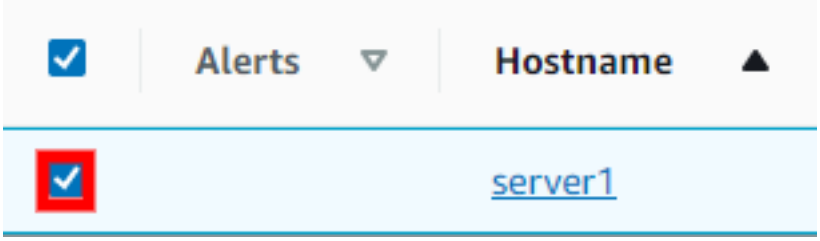
Prior to launching a Test instance, ensure that your source machines are ready for testing by looking for the following indicators on the **Source servers** page:

1. Under the **Migration lifecycle** column, the server should show **Ready for testing**
2. Under the **Data Replication status** column, the server should show the **Healthy** status.
3. Under the **Next step** column, the server should show **Start testing**



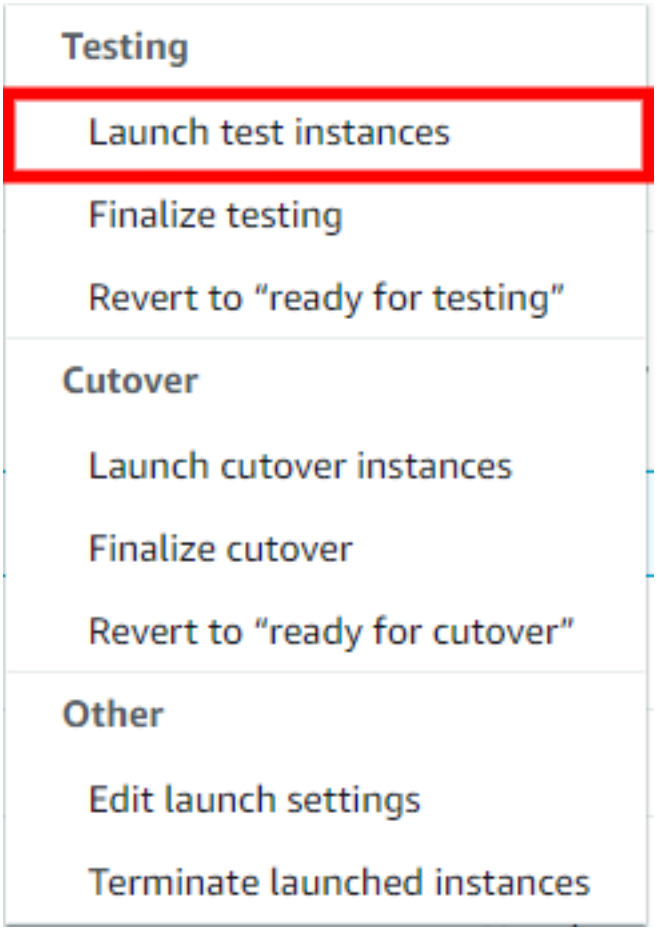
Starting a Test

To launch a Test instance for a single or multiple source servers, on the **Source Servers** page check the box to the left of each server you want to test.

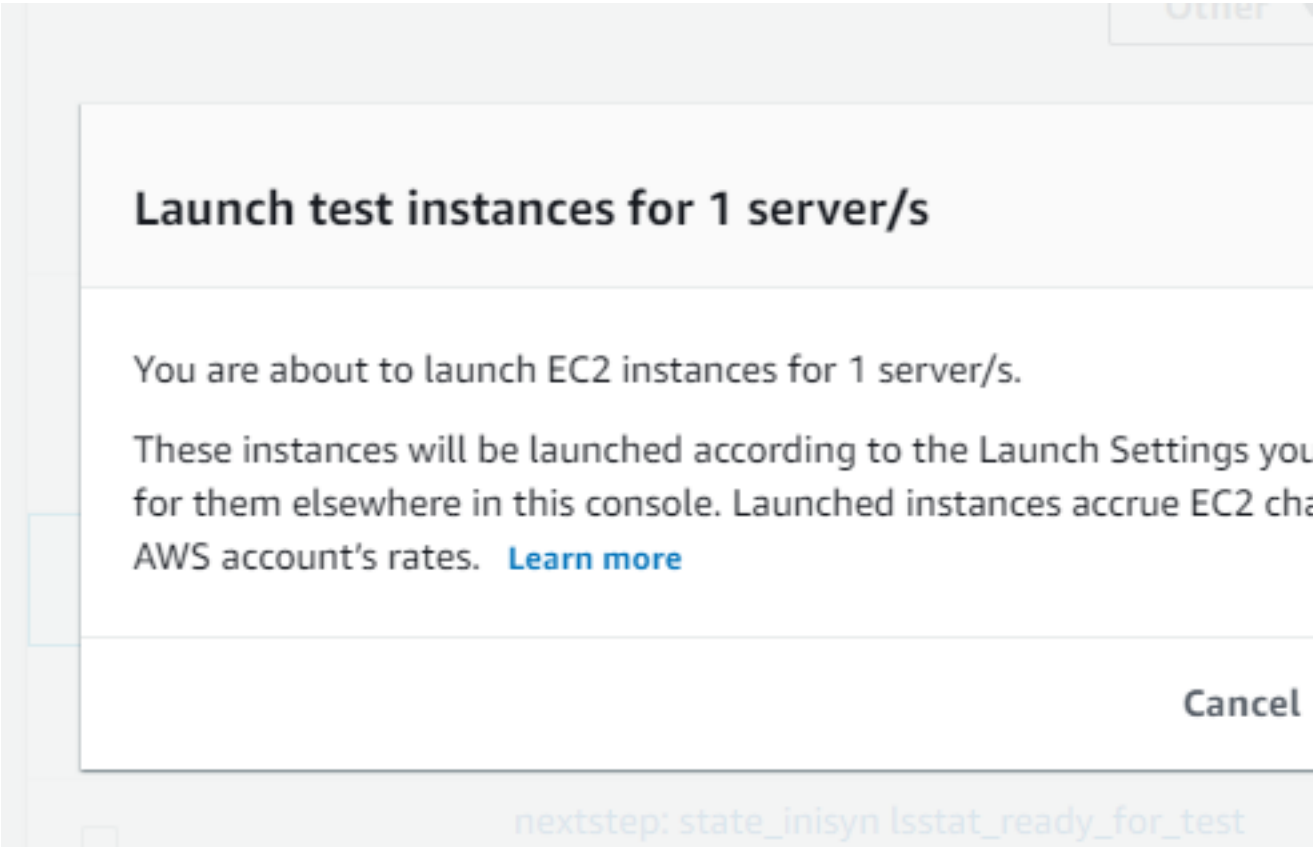


Open the **Test and Cutover** menu.

Under **Testing**, choose the **Launch test instances** option to launch a test instance for this server.

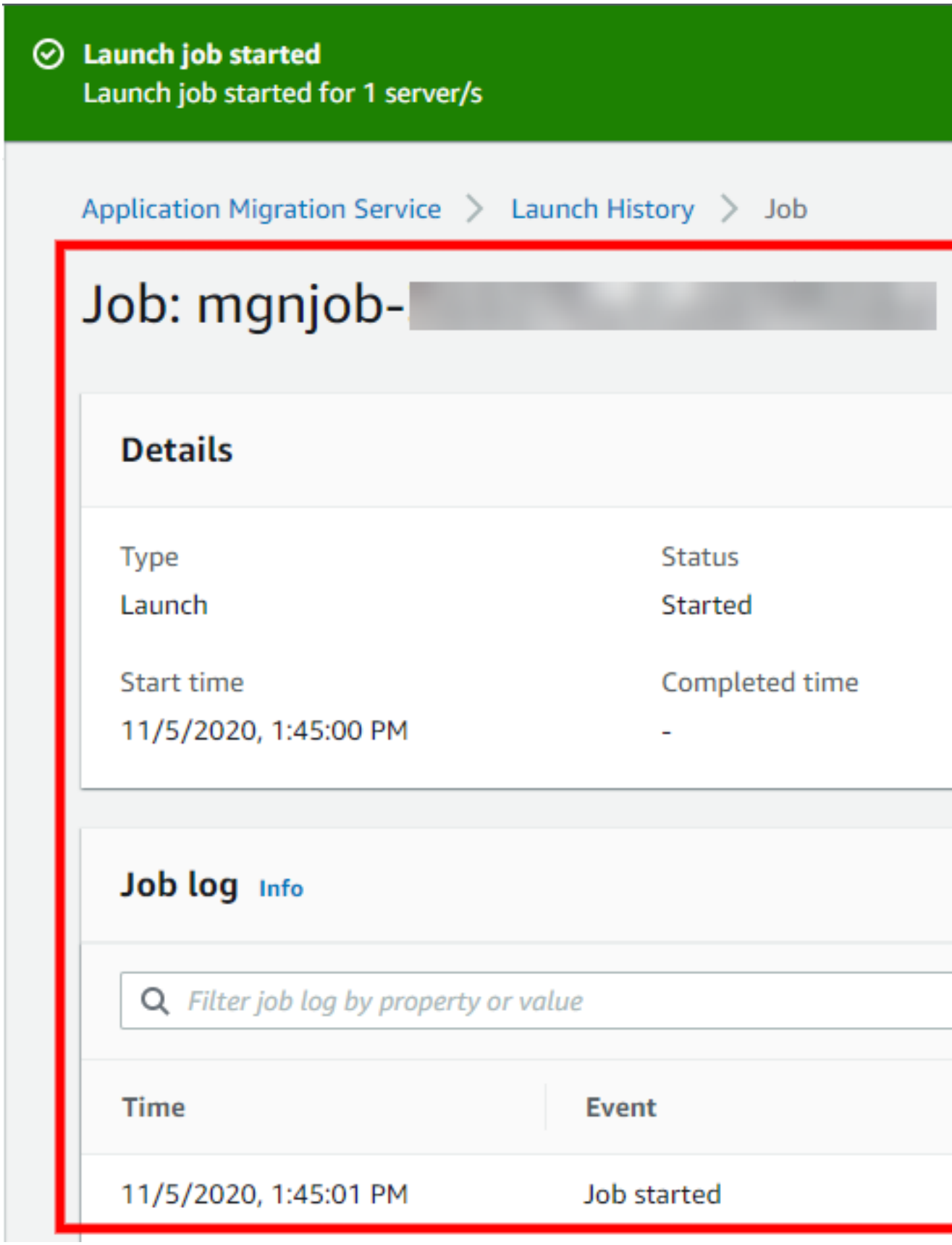


The **Launch test instances for X** servers dialog will appear. Choose **Launch** to begin the test.



The Application Migration Service Console will indicate **X launch job started** once the test has been started.

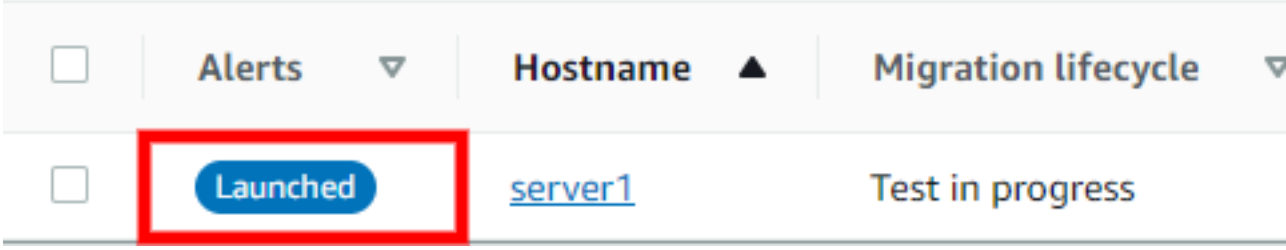
Choose **View job details** on the dialog to view the specific Job for the test launch in the Launch History.


Launch job started
Launch job started for 1 server/s
Application Migration Service
Launch History
Job
Job: mgnjob-
Details
Type
Launch
Status
Started
Start time
11/5/2020, 1:45:00 PM
Completed time
-
Job log
Info
Filter job log by property or value
Time
Event
11/5/2020, 1:45:01 PM
Job started

Successful test launch indicators

You can tell that the Test instance launch was started successfully through several indicators on the **Source Servers** page.

1. The Alerts column will show the **Launched** status, indicating that a Test instance has been launched for this server.
2. The **Migration lifecycle** column will show **Testing in progress**.
3. The **Next step** column will show **Complete testing**.



Reverting or Finalizing a Test

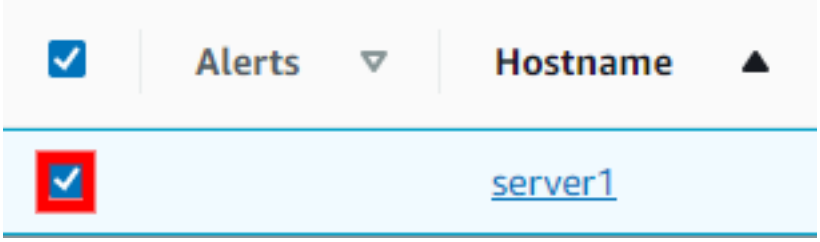
Once you have launched your Test instances, open the EC2 Console and SSH or RDP into your Test instances in order to ensure that they function correctly. Validate connectivity and perform acceptance tests for your application.

Reverting a Test

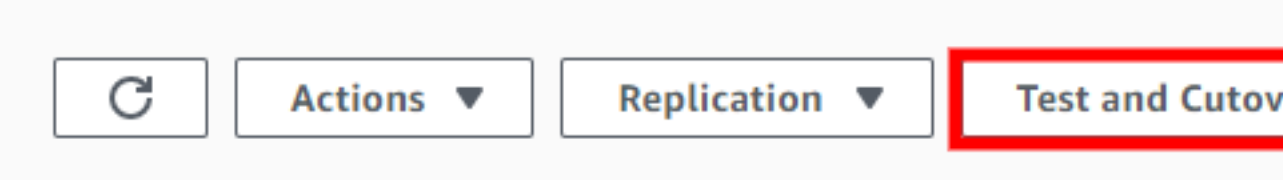
If you encounter any issues and want to launch new Test instances, or if you are performing a scheduled test and plan to perform additional tests prior to cutover, then you can revert the test. This will revert your source servers' **Migration lifecycle** to the **Ready for testing** status, indicating that these servers still require additional testing before they are ready for cutover. During a revert, you will also have the option to delete your Test instances for cost saving purposes.

To revert a Test:

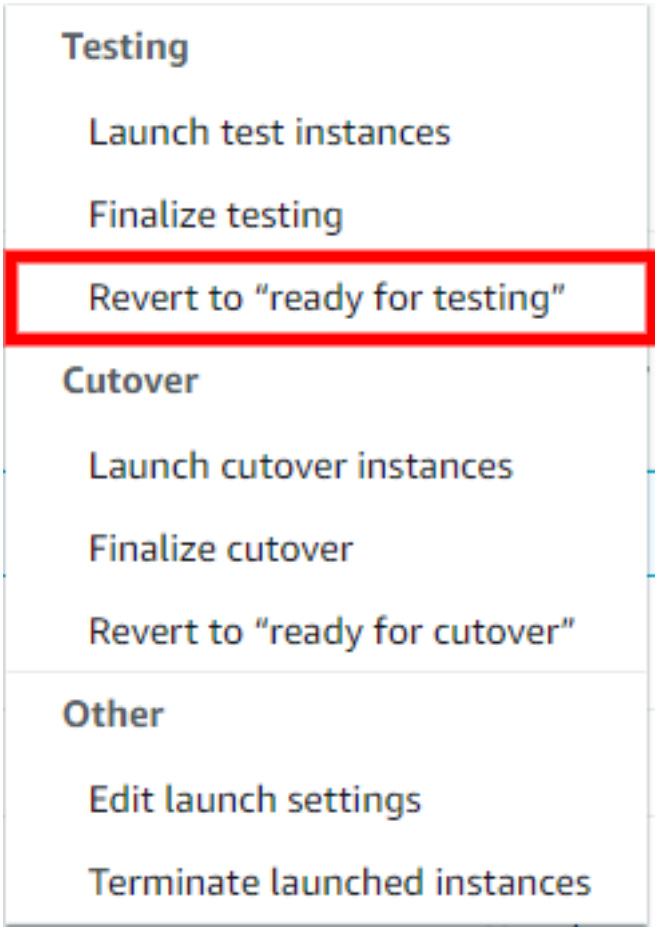
1. Check the box to the left of every source server that has a launched Test instance for which you want to revert the test.



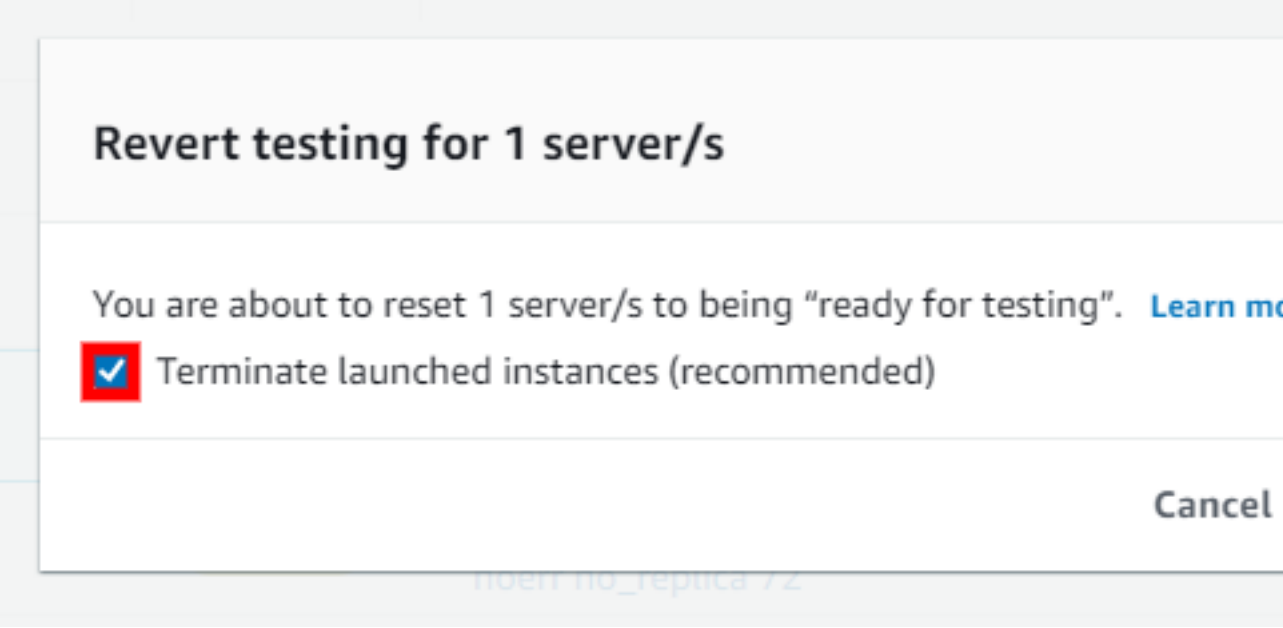
2. Open the **Test/Cutover** menu.



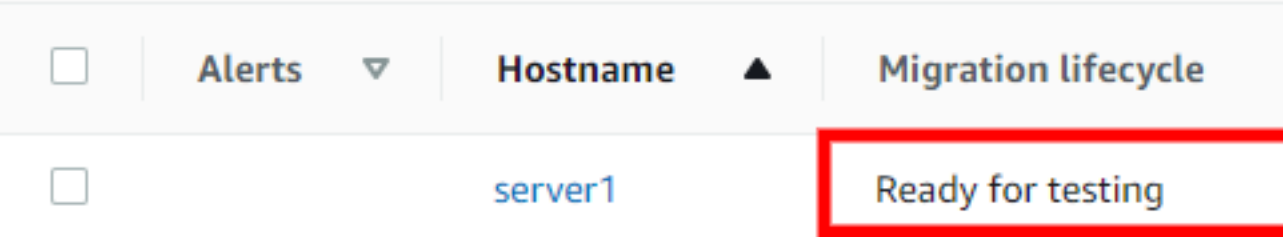
3. Under **Testing**, choose **Revert to "ready for testing"**



4. The **Revert testing for X servers** dialog will appear. Select whether you want to terminate the launched instances used for testing. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Revert**.



The Application Migration Service Console will indicate that testing has been reverted. The selected source servers' **Migration lifecycle** column will show the **Ready for testing** status, the Next step column will show **Start testing** and the launched Test instances will be deleted if that option was selected.

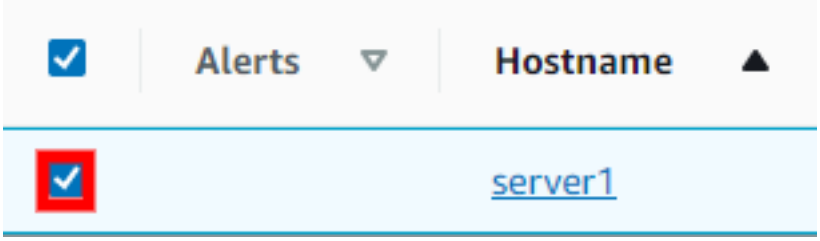


Finalizing a Test

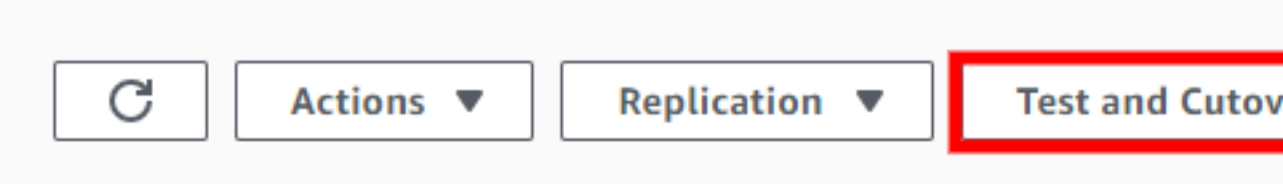
If you are completely done with your testing and are ready for Cutover, you can finalize the test. This will change your source servers' **Migration lifecycle** status to **Ready for cutover**, indicating that all testing has been complete and that these servers are now ready for cutover. You will also have the option to delete your Test instances for cost saving purposes.

To finalize a Test:

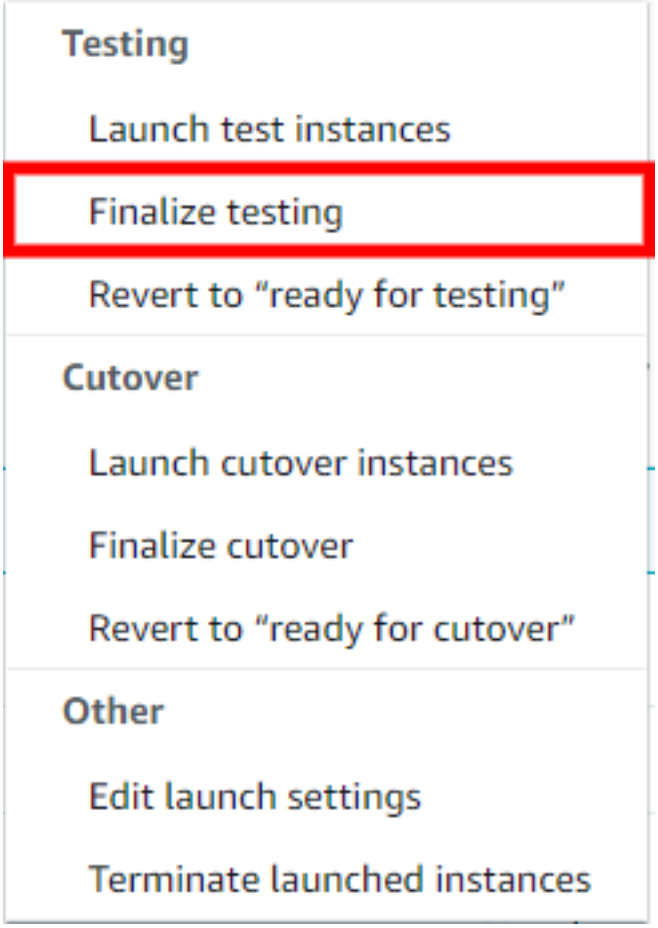
1. Check the box to the left of every source server that has a launched Test instance for which you want to finalize the test.



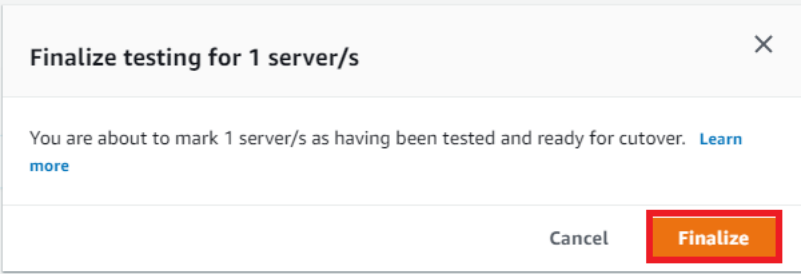
2. Open the **Test/Cutover** menu.



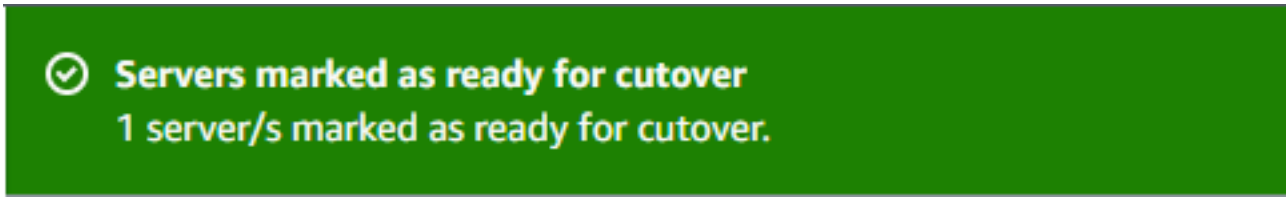
3. Under **Testing**, choose **Finalize testing**



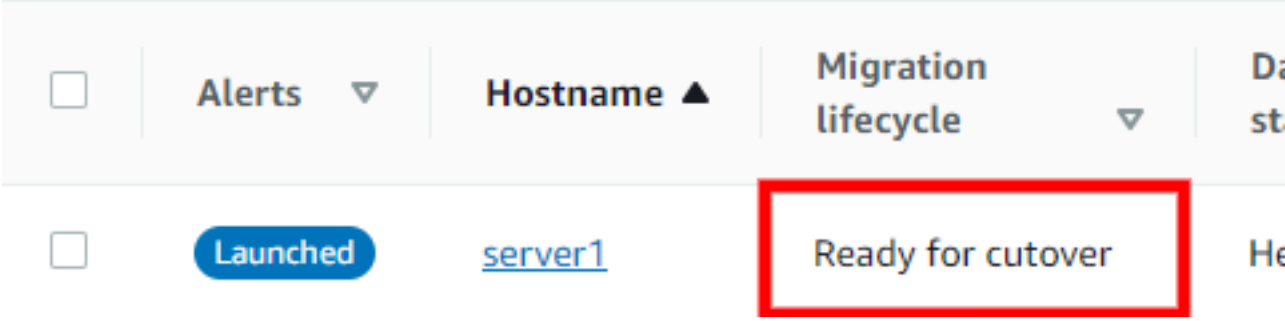
4. The **Finalize testing for X servers** dialog will appear. Select whether you want to terminate the launched instances used for testing. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Finalize**.



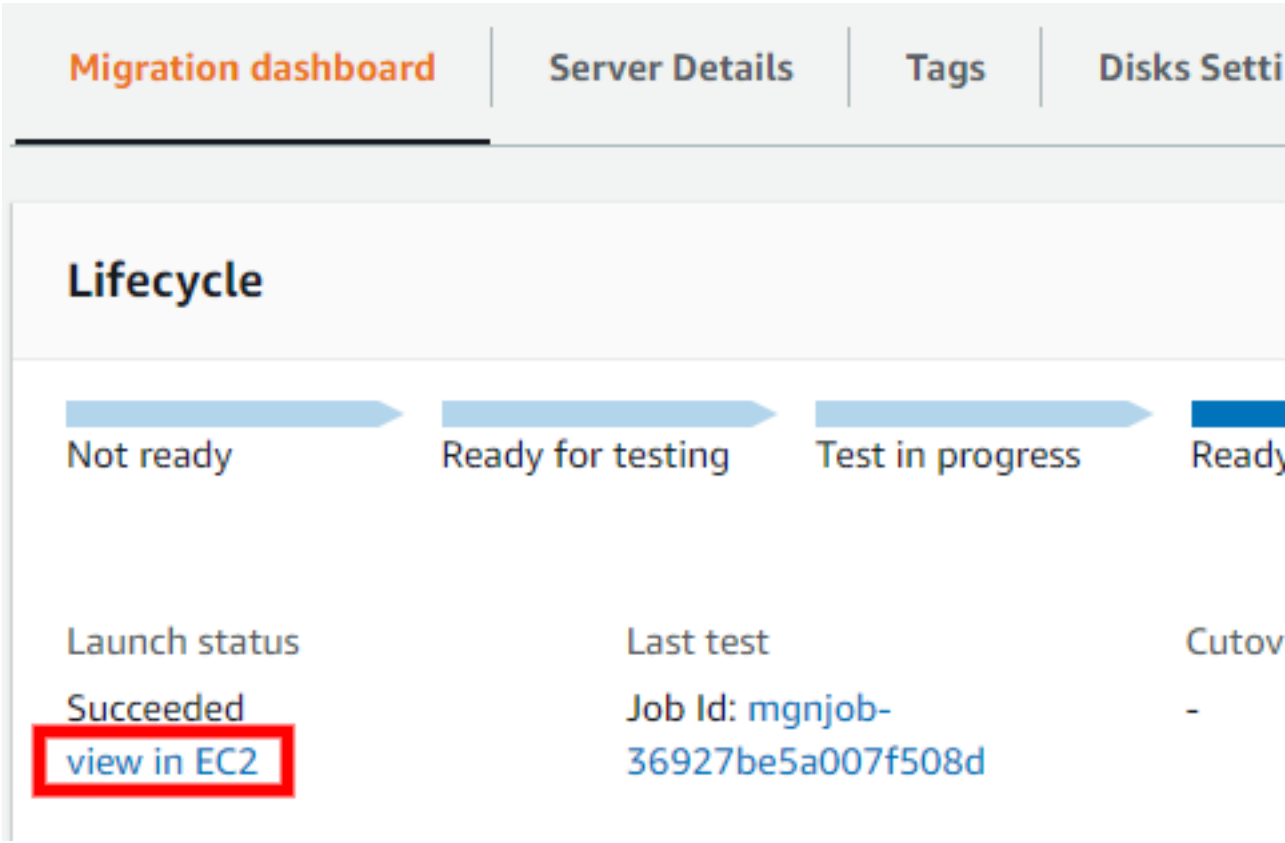
The console will confirm that the servers were marked as ready for cutover.



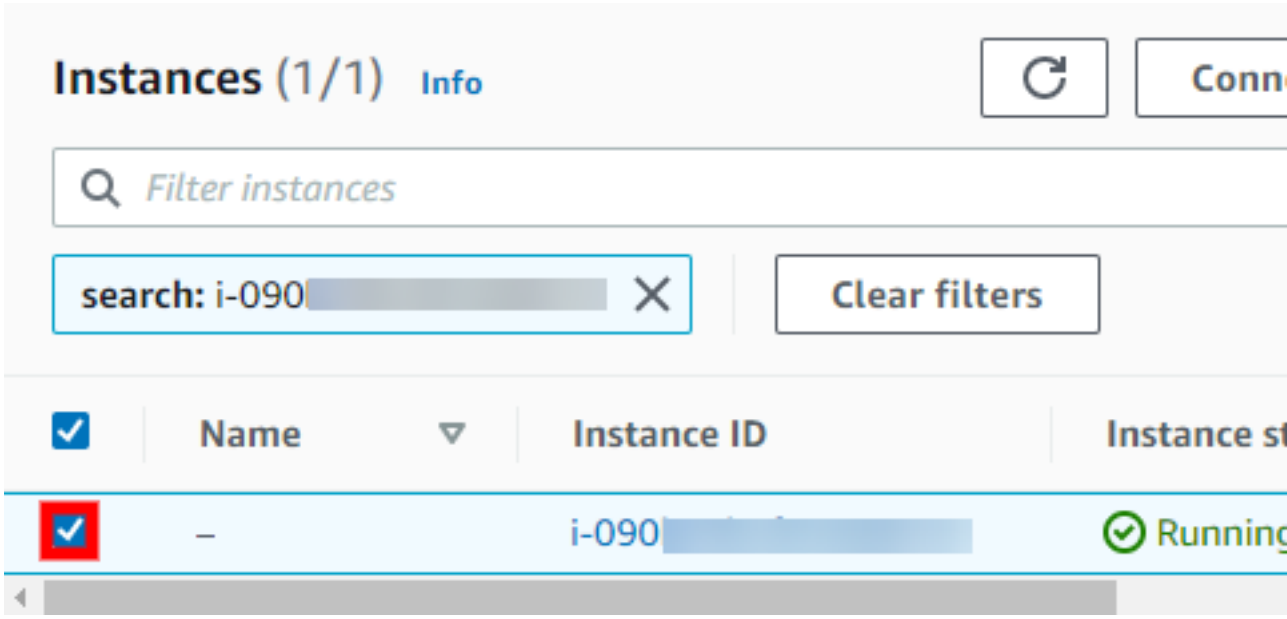
The Application Migration Service Console will indicate that testing has been finalized. The selected source servers' **Migration lifecycle** column will show the **Ready for cutover** status and the launched Test instances will be deleted if that option was selected. The Next step column will show **Terminate test instance; Start cutover**.



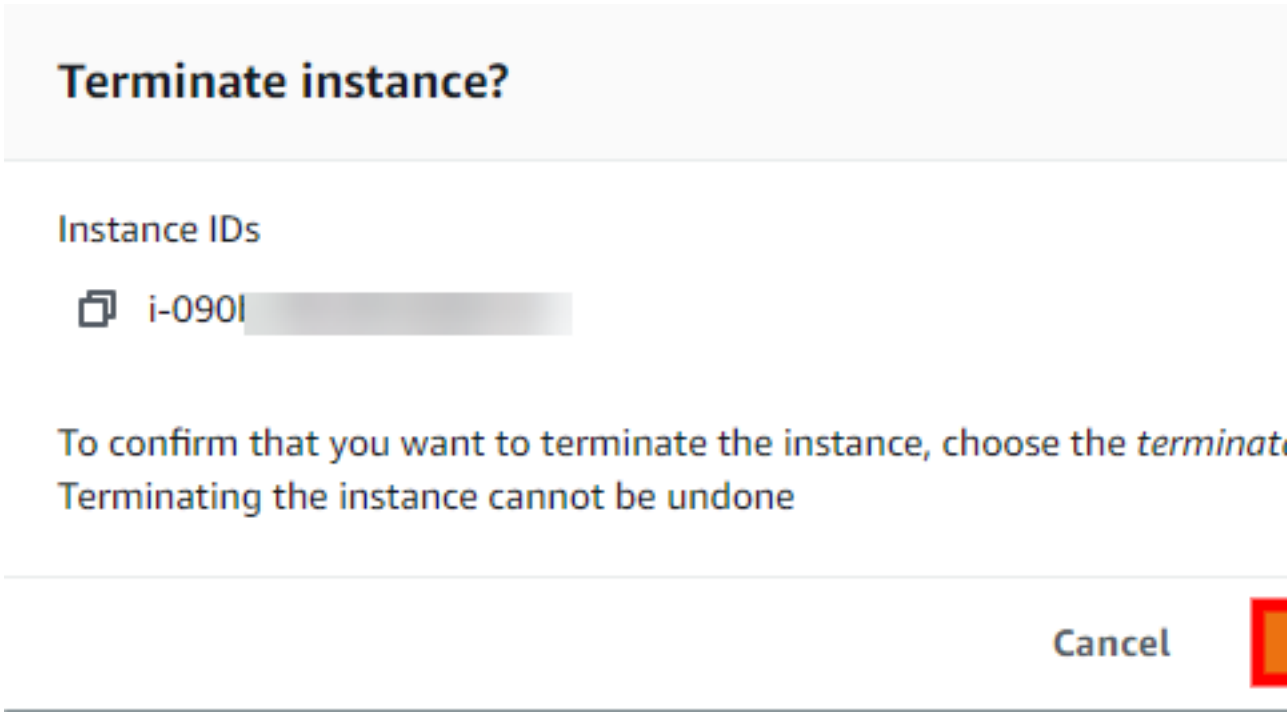
You can now terminate the launched test instance directly from the EC2 Console as that instance is no longer needed. You can quickly access the test instance by navigating to the specific servers > **Server Details > Migration Dashboard > Lifecycle > Launch status** and choosing **view in EC2.**



The EC2 Console will automatically search for and display the test instance. Select the instance, open the **Instance state** menu, and choose **Terminate instance**.



Choose **Terminate**.



Launching a Cutover instance

Once you have finalized the testing of all of your source servers, you are ready for cutover. You should perform the cutover at a set date and time. The cutover will migrate your source servers into the Cutover instances on AWS.

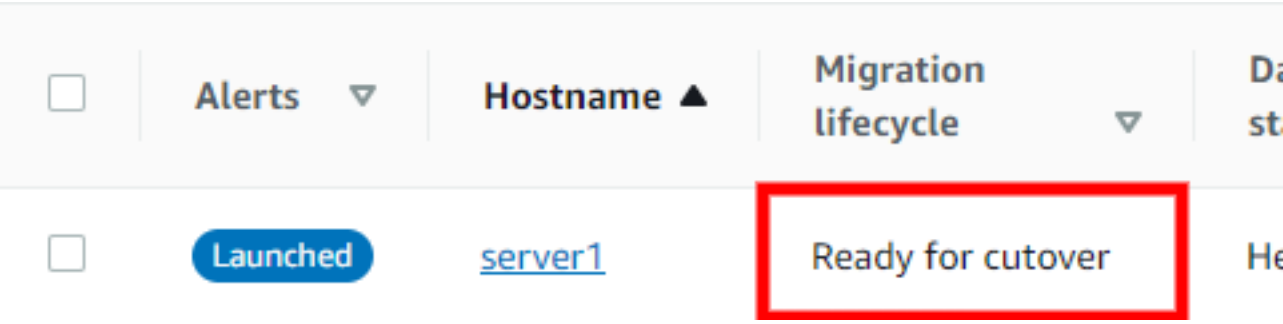
> **Important**
> It is a best practice to perform a test at least one week before you plan to migrate your Source machines. This time frame is intended for identifying potential problems and solving them, before the actual Migration takes place. After launching Test instances, use either SSH (Linux) or RDP (Windows) to connect to your machine and ensure that everything is working correctly.

You can cutover one source server at a time, or simultaneously cutover multiple source servers. For each source server, you will be informed on the success or failure of the cutover. Each new cutover first deletes any previously launched Test instance and dependent resources. Then, it launches a new Cutover instance that reflects the most up-to-date state of the source server. After the cutover, Data Replication continues as before. The new and modified data on the source server is transferred to the Staging Area Subnet, and not to the Cutover instances that were launched following the cutover.

Ready for cutover indicators

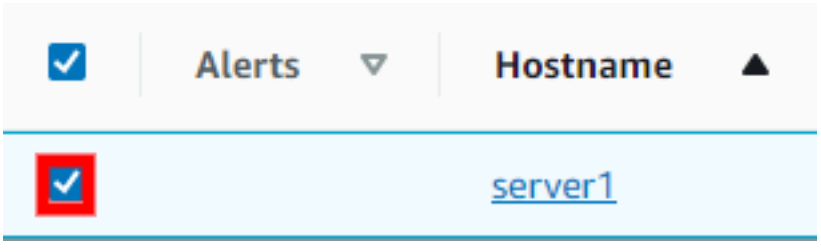
Prior to launching a Cutover instance, ensure that your source machines are ready for cutover by looking for the following indicators on the **Source servers** page:

1. Under the **Migration lifecycle** column, the server should show **Ready for cutover** .
2. Under the **Data Replication status** column, the server should show the **Healthy** status.
3. Under the **Next step** column, the server should show **Terminate test instance; Start cutover**.



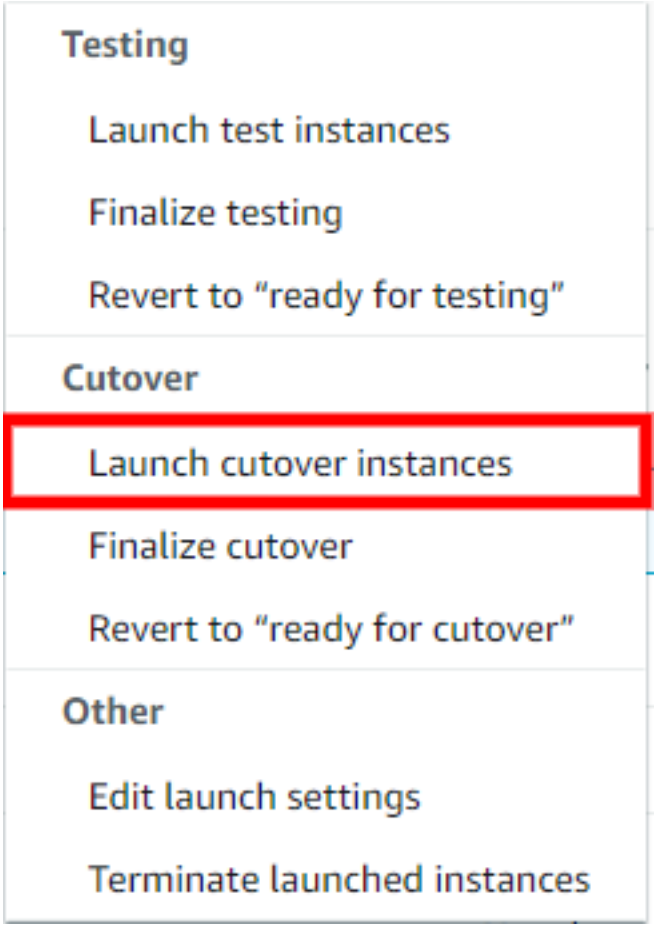
Starting a Cutover

To launch a Cutover instance for a single or multiple source servers, on the **Source servers** page check the box to the left of each server you want to cutover.

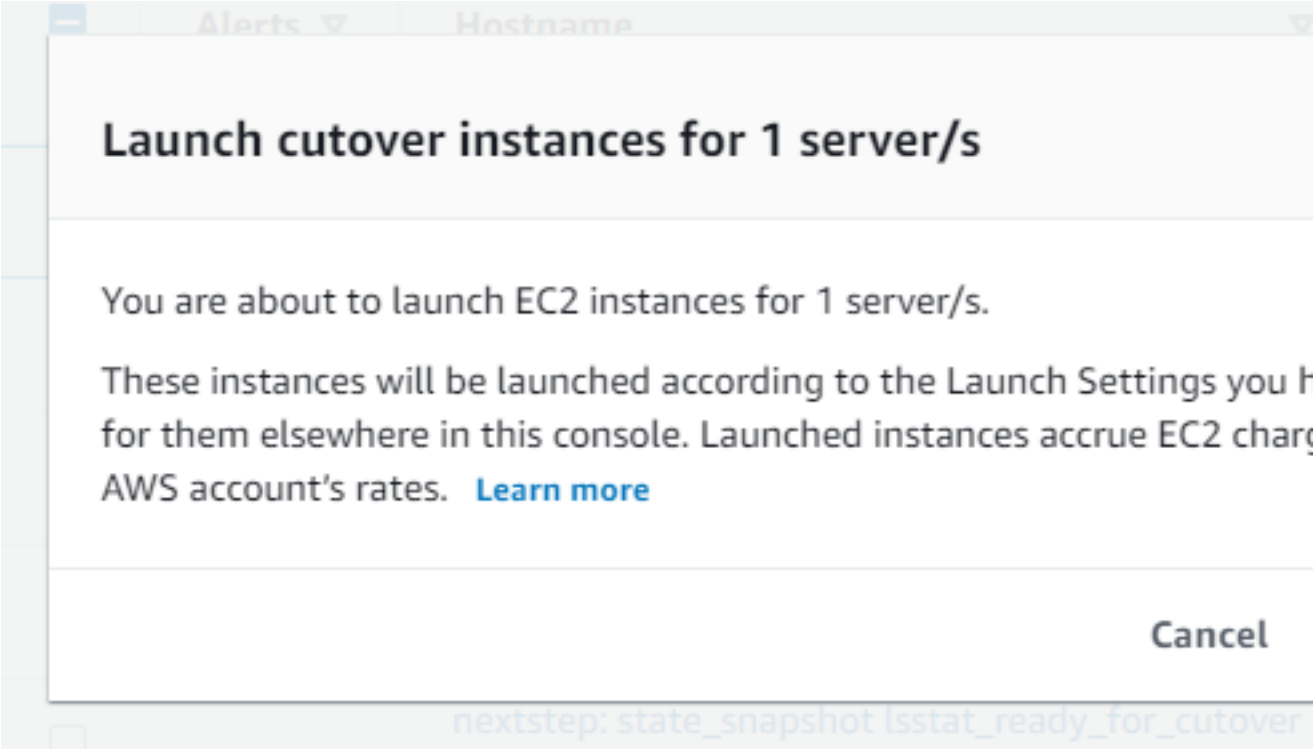


Open the **Test and Cutover** menu.

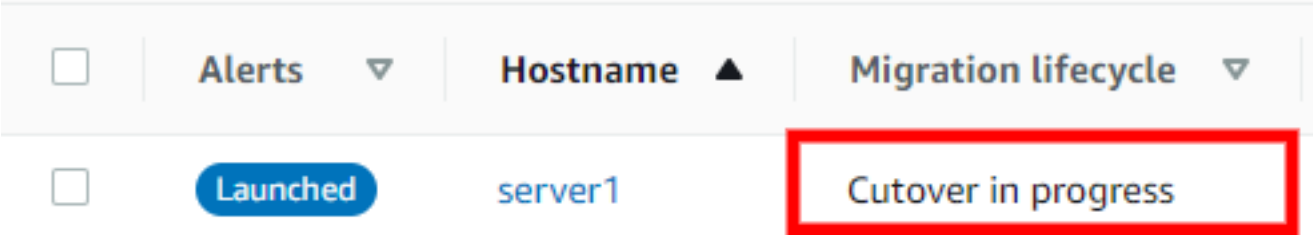
Under **Cutover**, choose the **Launch cutover instances** option.



The **Launch cutover instances for X** servers dialog will appear. Choose **Launch** to begin the cutover.

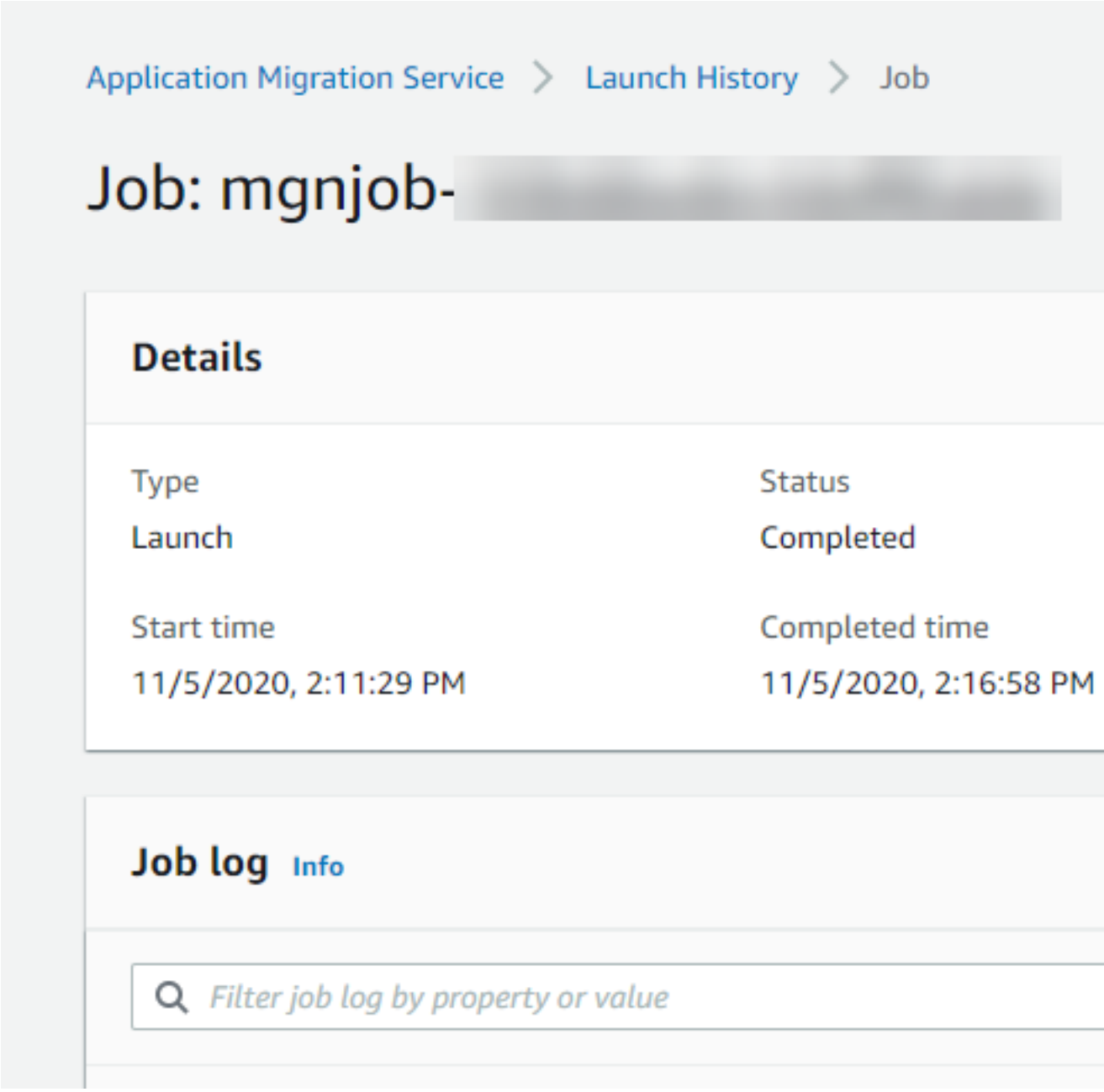


On the **Source Servers** page, the **Migration lifecycle** column will show **Cutover in progress** and the **Next step** column will show **Complete the cutover**.



The Application Migration Service Console will indicate **X launch job started** once the test has been started.

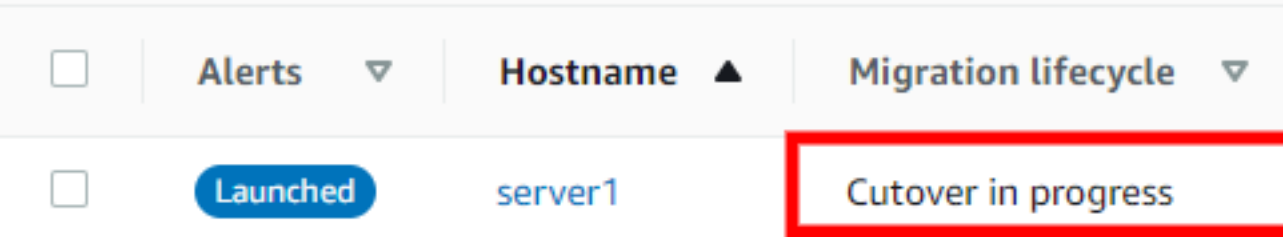
Choose **View job details** on the dialog to view the specific Job for the test launch in the Launch History.



Successful cutover launch indicators

You can tell that the Cutover instance launch was started successfully through several indicators on the **Source servers** page.

1. The **Migration lifecycle** column will state **Cutover in progress**.
2. The **Data replication status** will state **Healthy**.
3. The **Next step column** will state **Complete the cutover**.



Reverting or Finalizing a Cutover

Once you have launched your Cutover instances, open the EC2 Console and SSH or RDP into your Test instances in order to ensure that they function correctly. Validate connectivity and perform acceptance tests for your application.

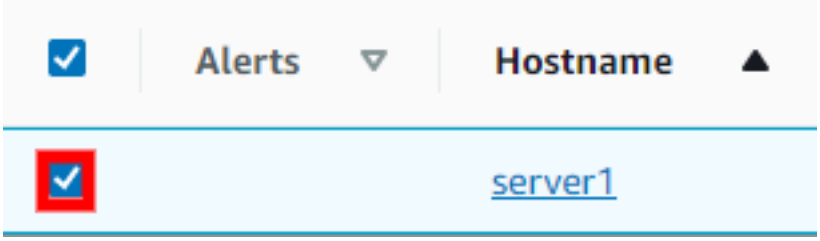
> **Note**
> You should turn on Termination Protection after you have completed your testing and before you are ready to finalize the Cutover. Learn more about enabling termination protection in this EC2 article .

Reverting a Cutover

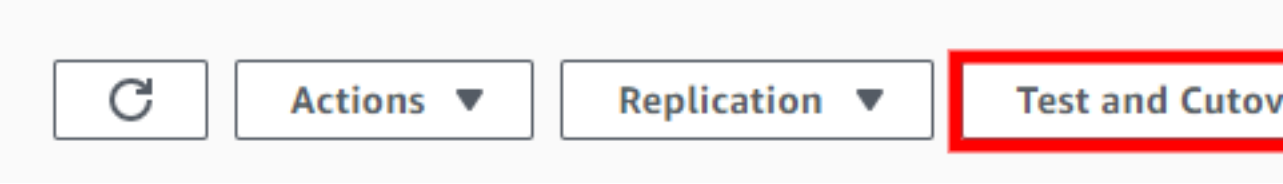
If you encounter any issues and want to launch new Cutover instances, then you can revert the cutover. This will revert your source servers' **Migration lifecycle** to the **Ready for cutover** status, indicating that these servers have not undergone cutover. During a revert, you will also have the option to delete your Cutover instances for cost saving purposes.

To revert a Cutover:

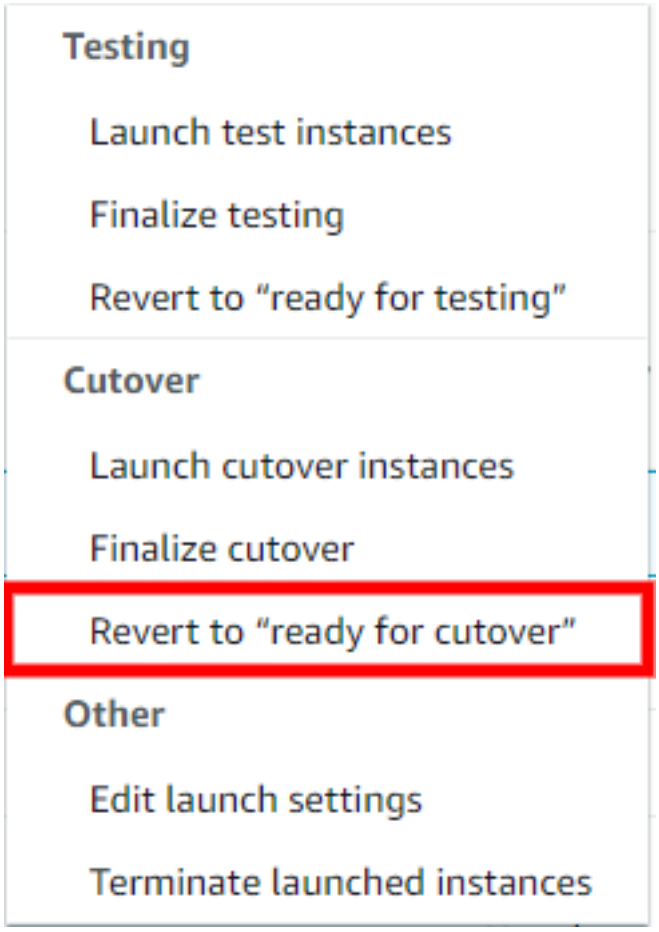
1. Check the box to the left of every source server that has a launched Cutover instance for which you want to revert the cutover.



2. Open the **Test/Cutover** menu.

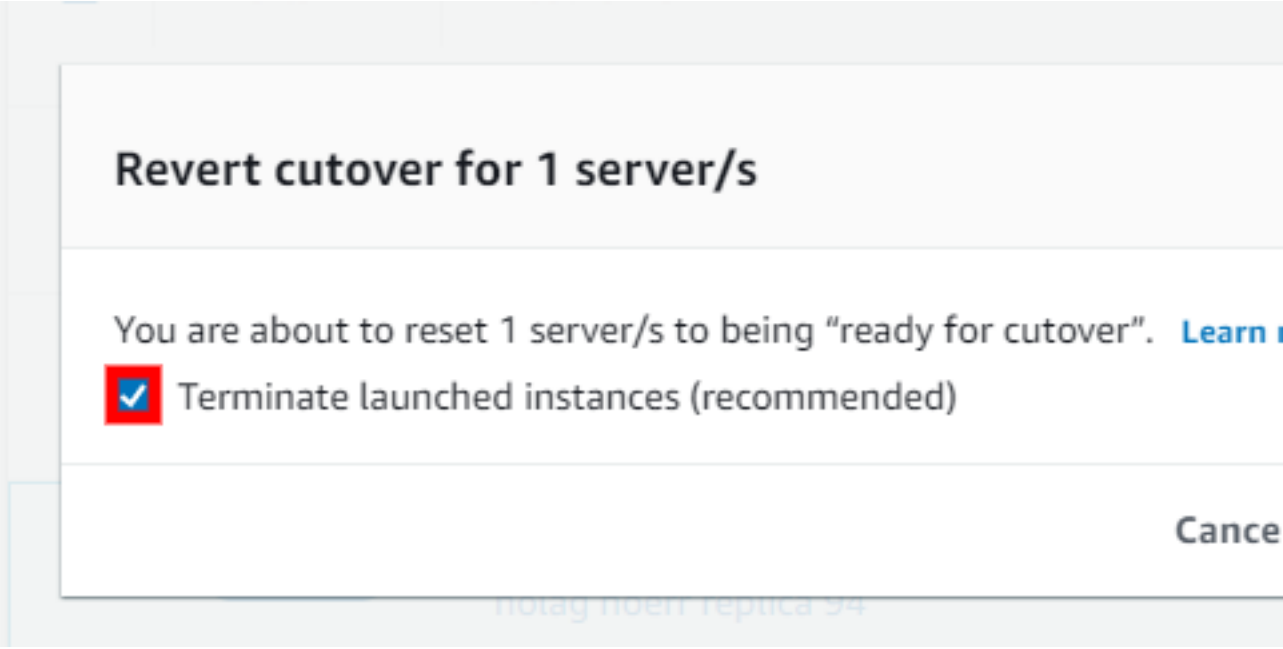


3. Under **Cutover**, choose **Revert to "ready for cutover"**



4. This will revert your source servers' **Migration lifecycle** to the **Ready for cutover** status, indicating that these servers have not undergone cutover. During a revert, you will also have the option to delete your Cutover instances for cost saving purposes.

   The **Revert cutover for X servers** dialog will appear. Select whether you want to terminate the launched instances used for cutover. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Revert**.

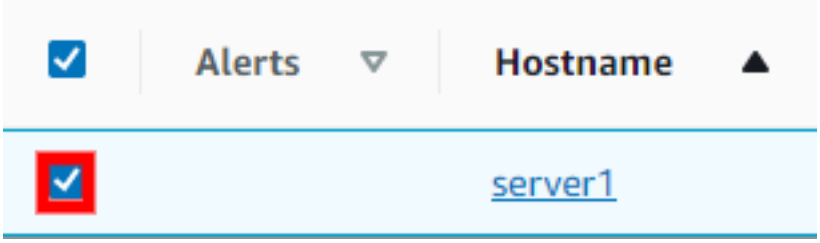


Finalizing a Cutover

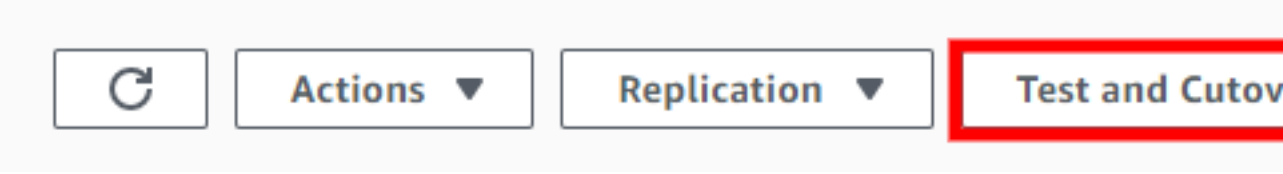
If you are completely done with your Migration and performed a successful cutover, you can finalize the cutover. This will change the your source servers' **Migration lifecycle** status to **Cutover complete**, indicating that the cutover has been complete and that the migration has been performed successfully. In addition, this will stop Data Replication and cause all replicated data to be discarded. All AWS resources used for Data Replication will be terminated.

To finalize a Cutover:

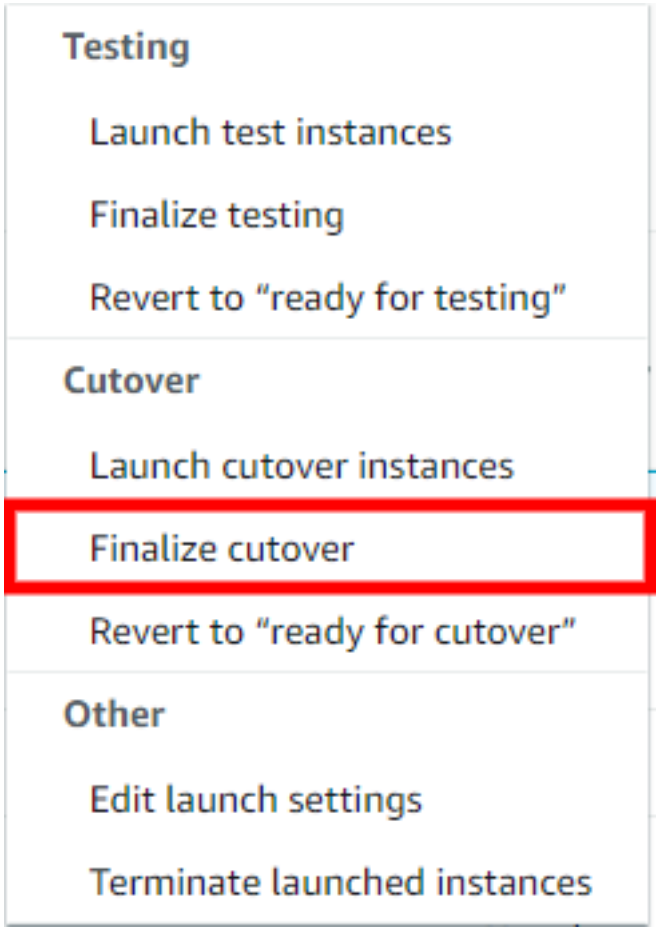
1. Check the box to the left of every source server that has a launched Cutover instance for which you want to finalize the cutover.



2. Open the **Test/Cutover** menu.

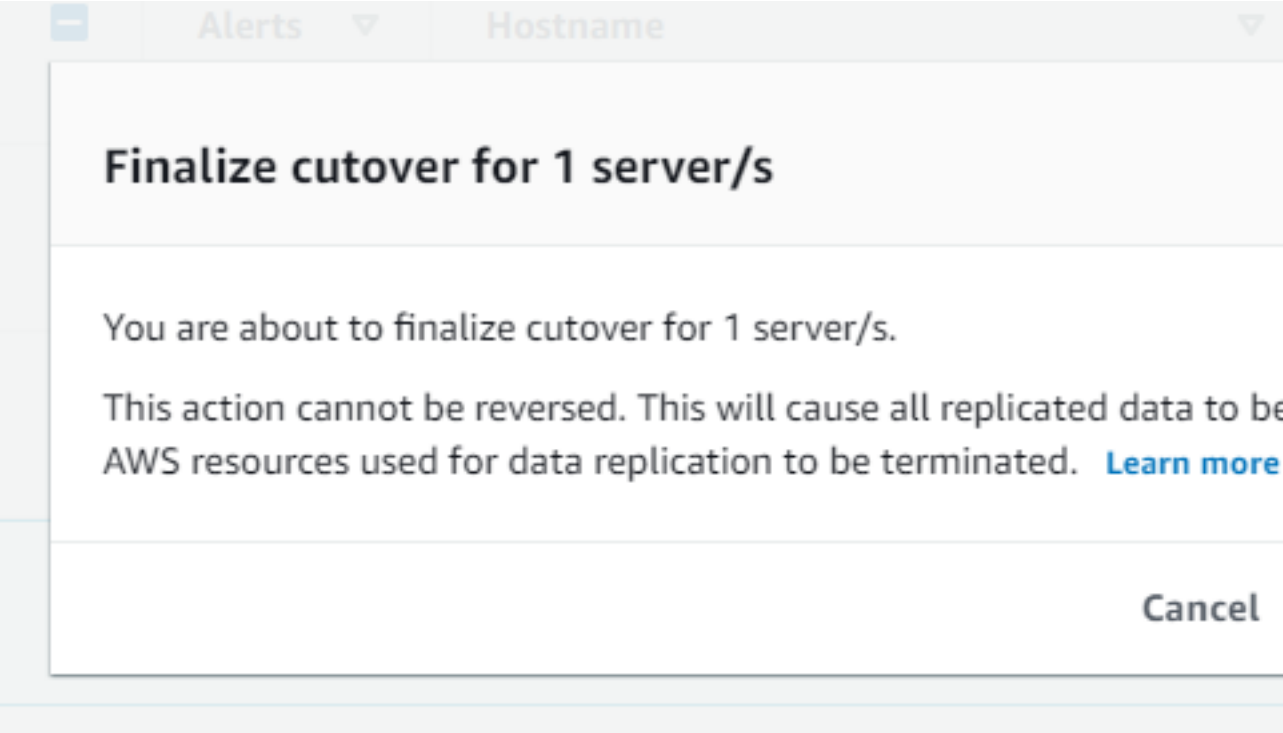


3. Under **Cutover**, choose **Finalize cutover**

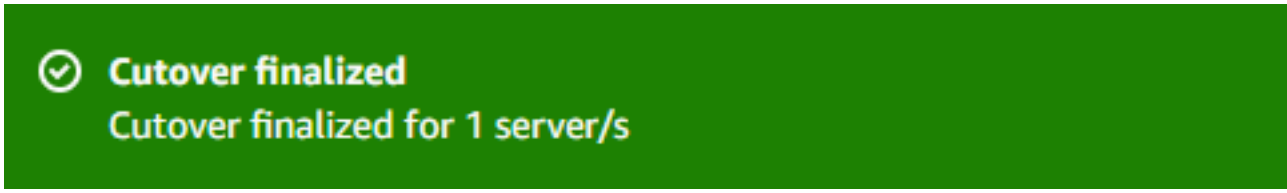


4. The **Finalize cutover for X servers** dialog will appear. Choose **Finalize**.
5. This will change the your source servers' **Migration lifecycle** status to **Cutover complete**, indicating that the cutover has been complete and that the migration has been performed successfully. In addition, this will stop Data Replication and cause all replicated data to be discarded. All AWS resources used for Data Replication will be terminated.

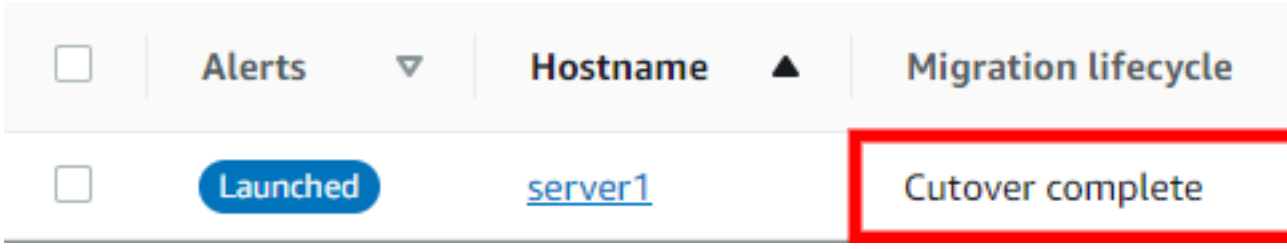
   The **Finalize cutover for X servers** dialog will appear. Choose **Finalize**.



The Application Migration Service Console will indicate **Cutover finalized** once the cutover has been completed successfully.



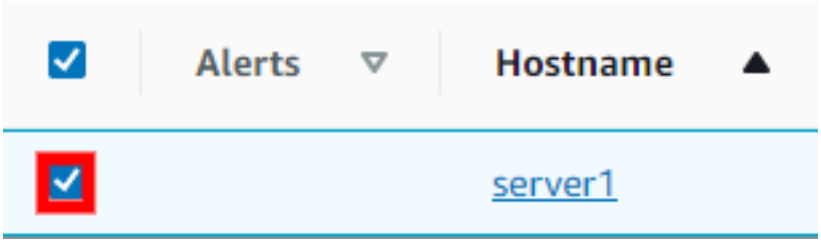
The Application Migration Service Console will automatically stop Data Replication for the cutover source servers in order to save resource costs. The selected source servers' **Migration lifecycle** column will show the **Cutover complete** status, the **Data replication** column will show **Disconnected** and the **Next step** column will show **Archive**. The source servers have now been successfully migrated into AWS.



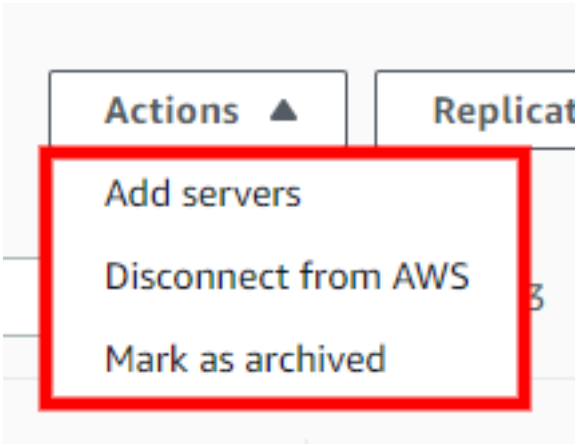
6. You can now archive your source servers that have launched Cutover instances. Archiving will remove these source servers from the main **Source Servers** page, allowing you to focus on source servers that have not been cutover. You will still be able to access the archived servers through filtering options.

   To archive your cutover source servers:

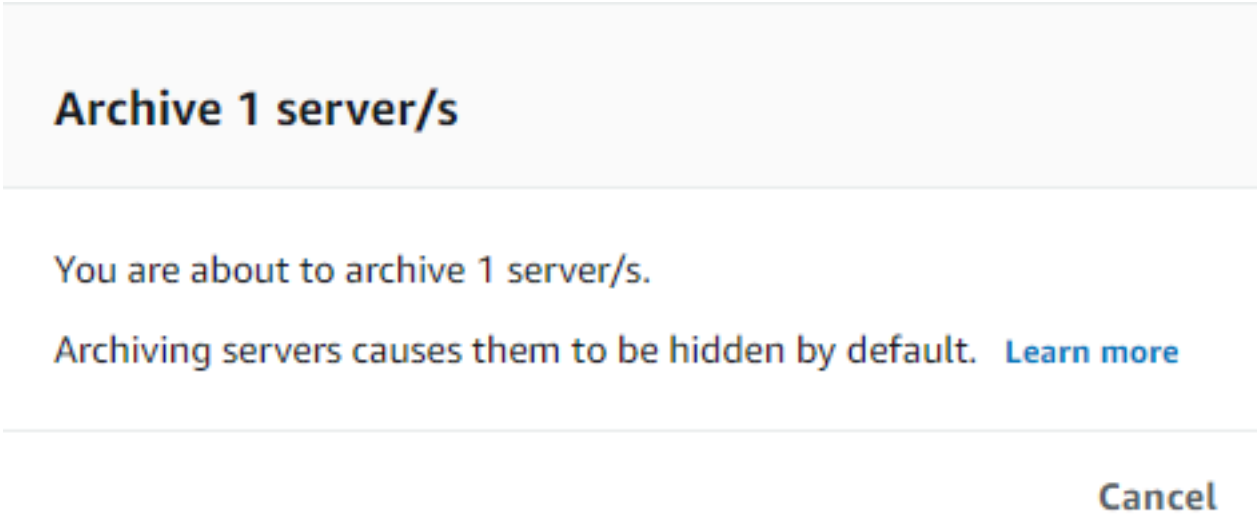
   a. Check the box to the left of the of each source server whose **Migration lifecycle** column states **Cutover complete**.



b. Open the **Actions** menu and choose **Mark as archived**.

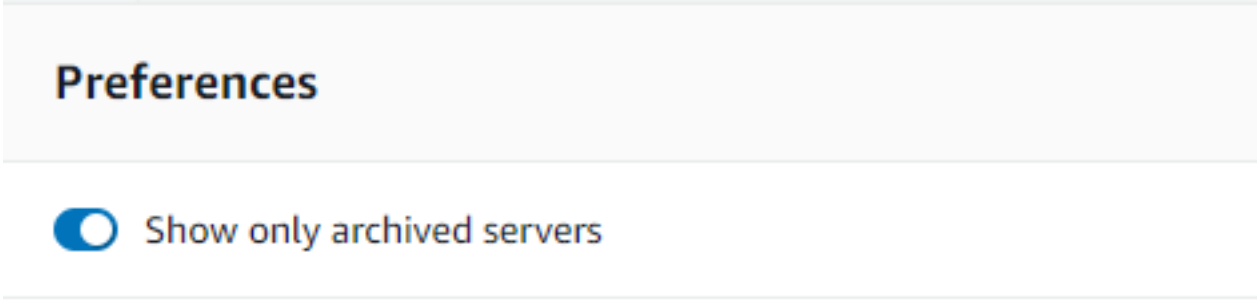


c. The Archive X server/s dialog will appear. Choose **Archive**.



d. To see your archived servers, open the **Preferences** menu by choosing the gear button.

Select the **Show only archived servers** option and choose **Confirm**.



You will not be able to see all of your archived servers. Repeat the step above to see your live servers.

Settings

Topics

- Replication Settings (p. 60)
- Tags (p. 93)

Replication Settings

Replication Settings determine how data will be replicated from your source servers to AWS. Your Replication Settings are governed by the Replication Settings Template, which you must configure before adding your source servers to Application Migration Service and which you can later edit at any point. The settings configured in the Replication Settings template are then transferred to each newly added server.

You can edit the Replication Settings for each server or group of servers after they have been added to Application Migration Service.

In addition, you can control a variety of other source server settings through the **Settings** tab, including **Tags**.

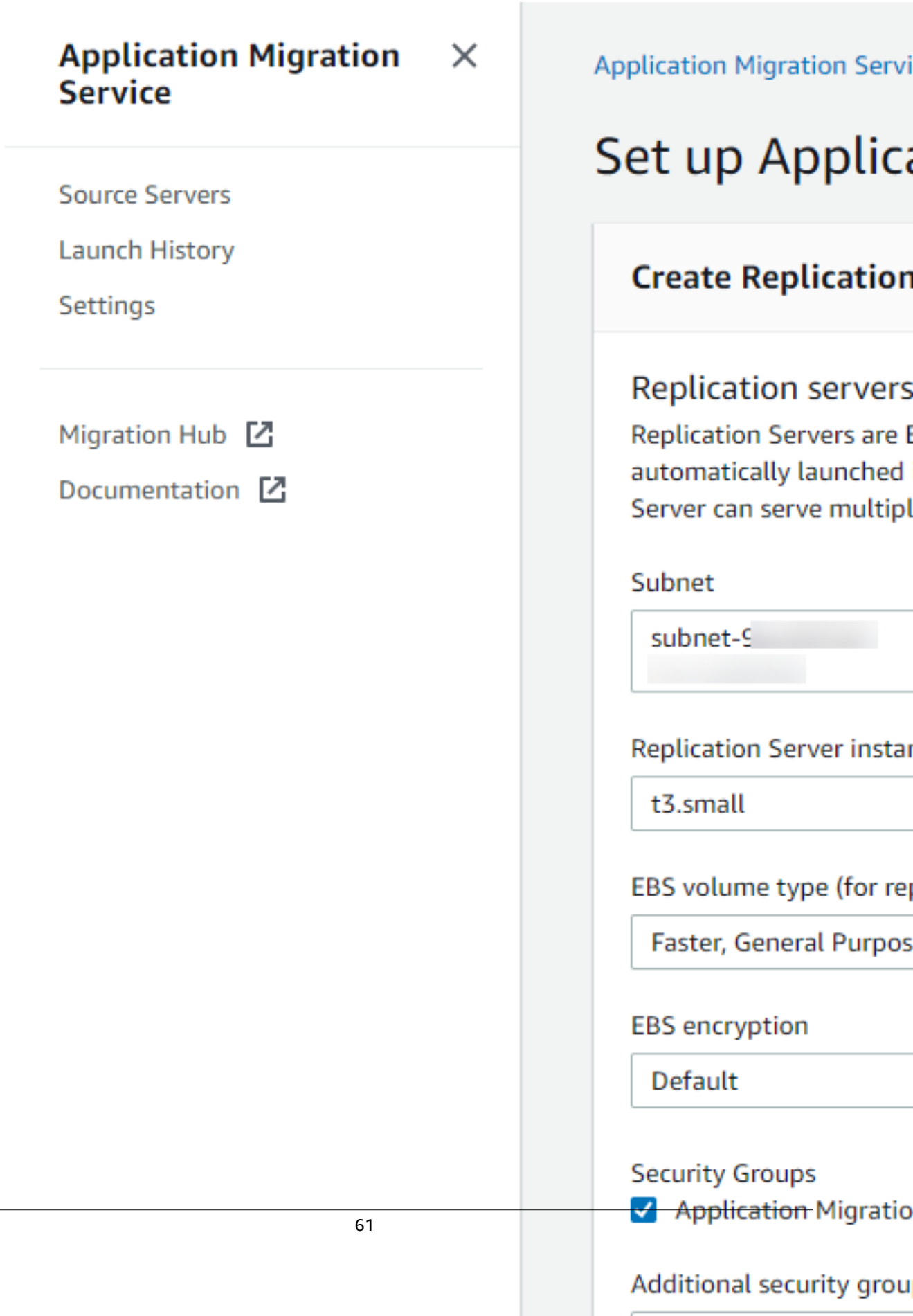
> **Important**
> The beta version of Application Migration Service is only available in US East, N. Virginia (us-east-1)

Topics

- Template vs individual server settings (p. 60)
- Replication Server settings (p. 69)

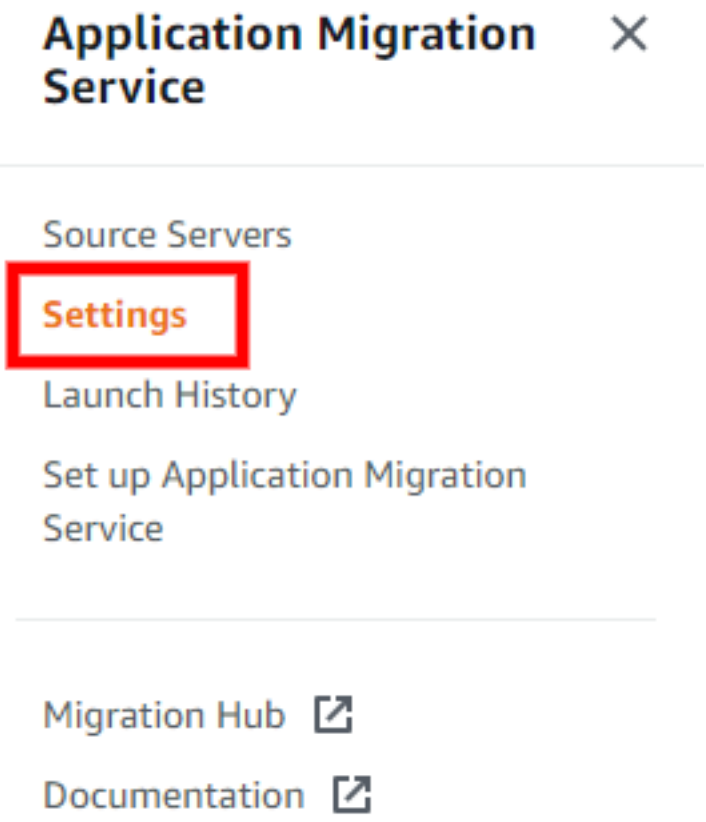
Template vs individual server settings

The Replication Settings template will determine how Data Replication will work for each new server you add to Application Migration Service. The settings configured in this template will be applied to each newly added source server. You will be prompted to configure your Replication Settings Template upon your first use of Application Migration Service.

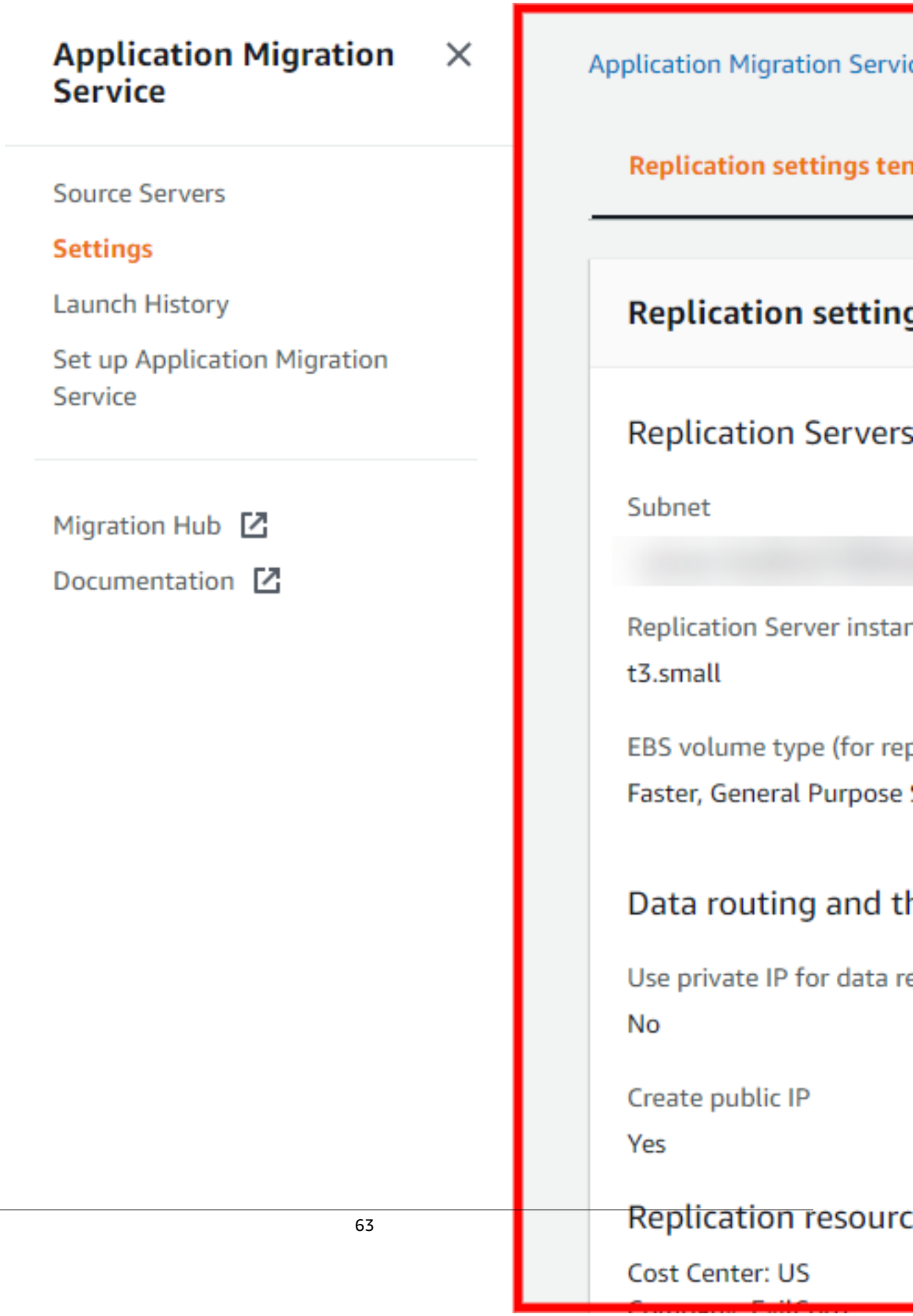

Application Migration Service
Source Servers
Launch History
Settings
Migration Hub
Documentation
Application Migration Servi
Set up Applica
Create Replication
Replication servers
Replication Servers are E
automatically launched
Server can serve multipl
Subnet
subnet-9
Replication Server instar
t3.small
EBS volume type (for rep
Faster, General Purpos
EBS encryption
Default
Security Groups
Application Migratio
Additional security grou

The configured replication settings can later be changed at any time for any individual source server or group of source servers. The changes made will only affect the server or group of servers selected and will not affect the Replication Settings template. Learn more about configuring your initial Replication Template settings. (p. 30)

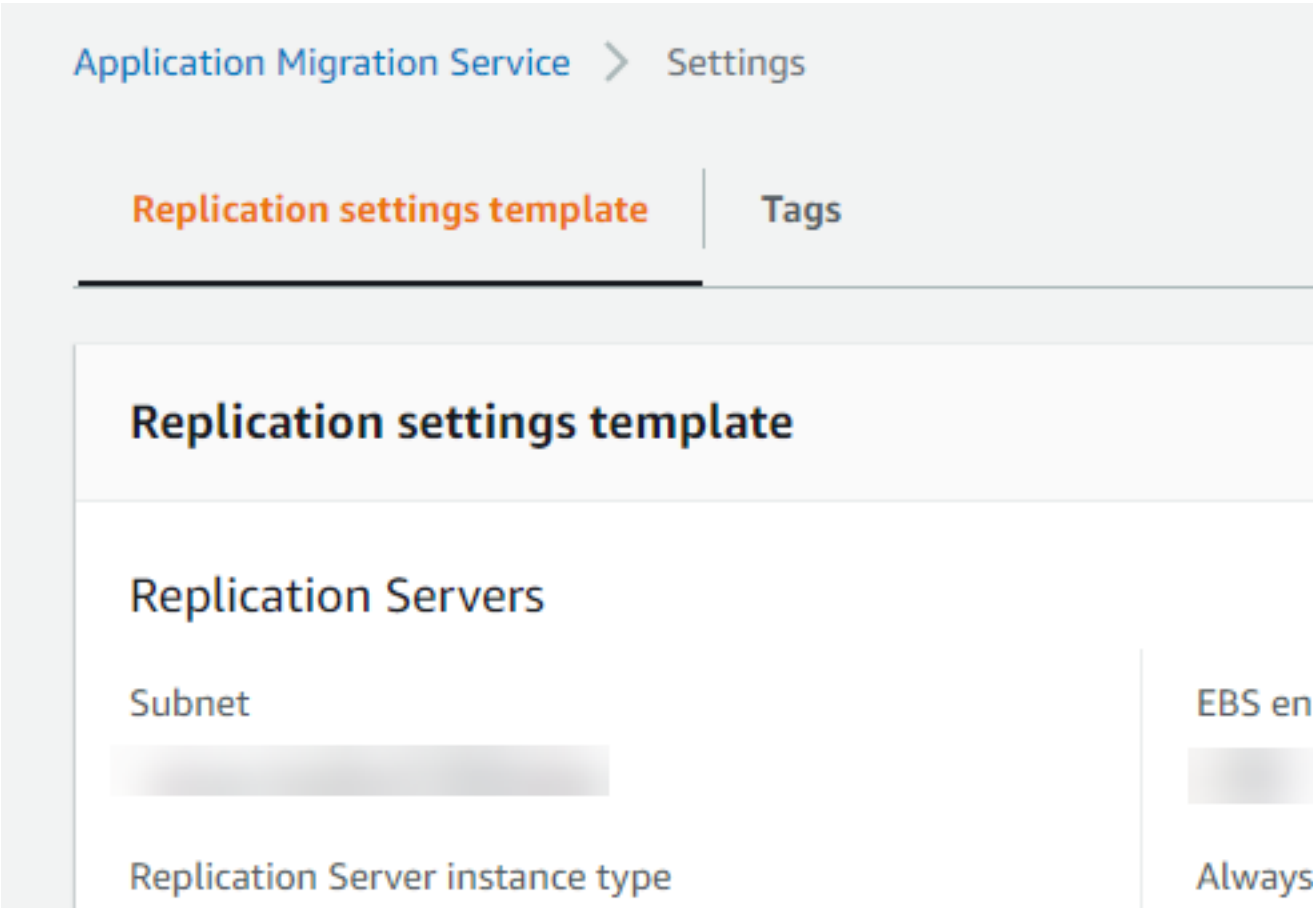
To edit the settings for your entire account, you will need to edit your Replication settings template. Choose **Settings** from the left-hand navigation menu.



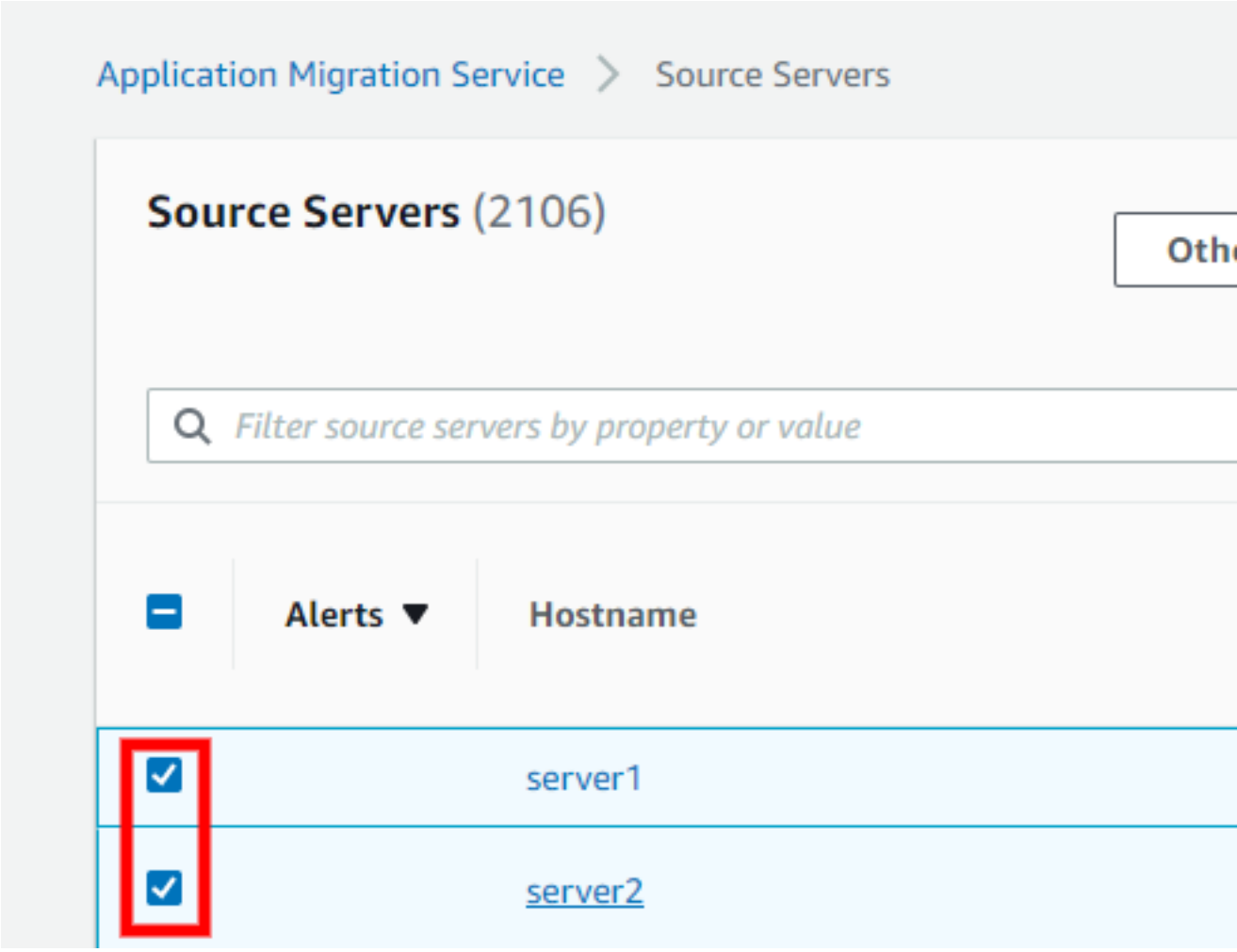
This will open the **Replication settings template** view.


Application Migration Service
Source Servers
Settings
Launch History
Set up Application Migration Service
Migration Hub
Documentation
Application Migration Servic
Replication settings ten
Replication setting
Replication Servers
Subnet
Replication Server instan
t3.small
EBS volume type (for rep
Faster, General Purpose
Data routing and th
Use private IP for data re
No
Create public IP
Yes
Replication resourc
Cost Center: US

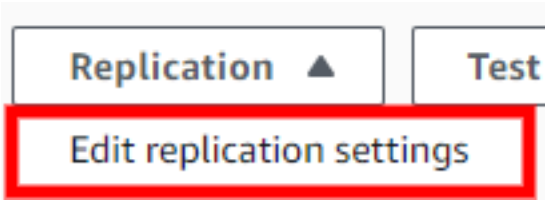
Click **Edit template** to edit your account-wide replication settings. These setting changes will be applied to each newly added server but will not affect servers that have already been added to Application Migration Service.



To edit the settings for an individual server or group of servers, select the box to the left of each server name on the **Source Servers** page.

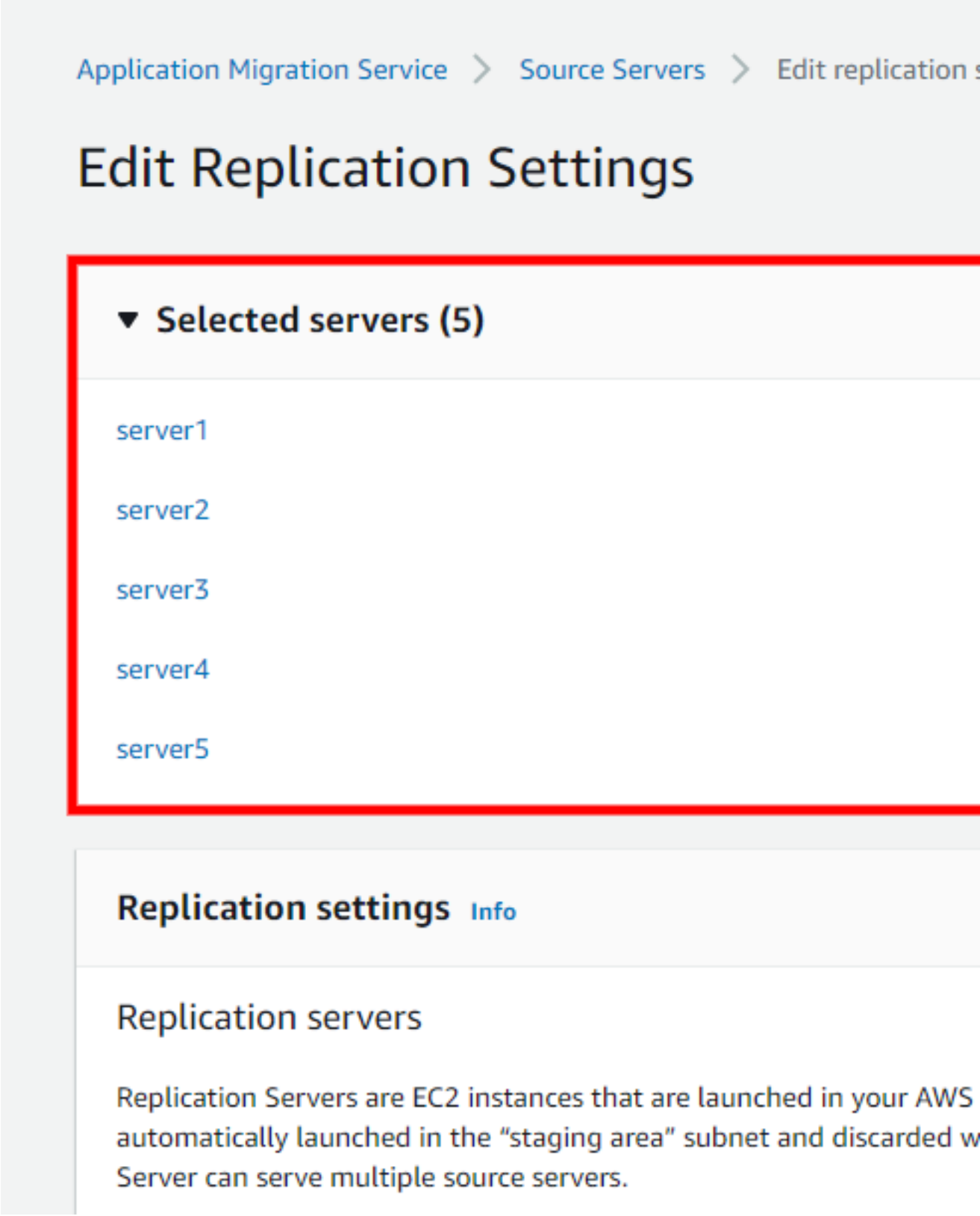


Open the **Replication** menu and choose **Edit replication settings**

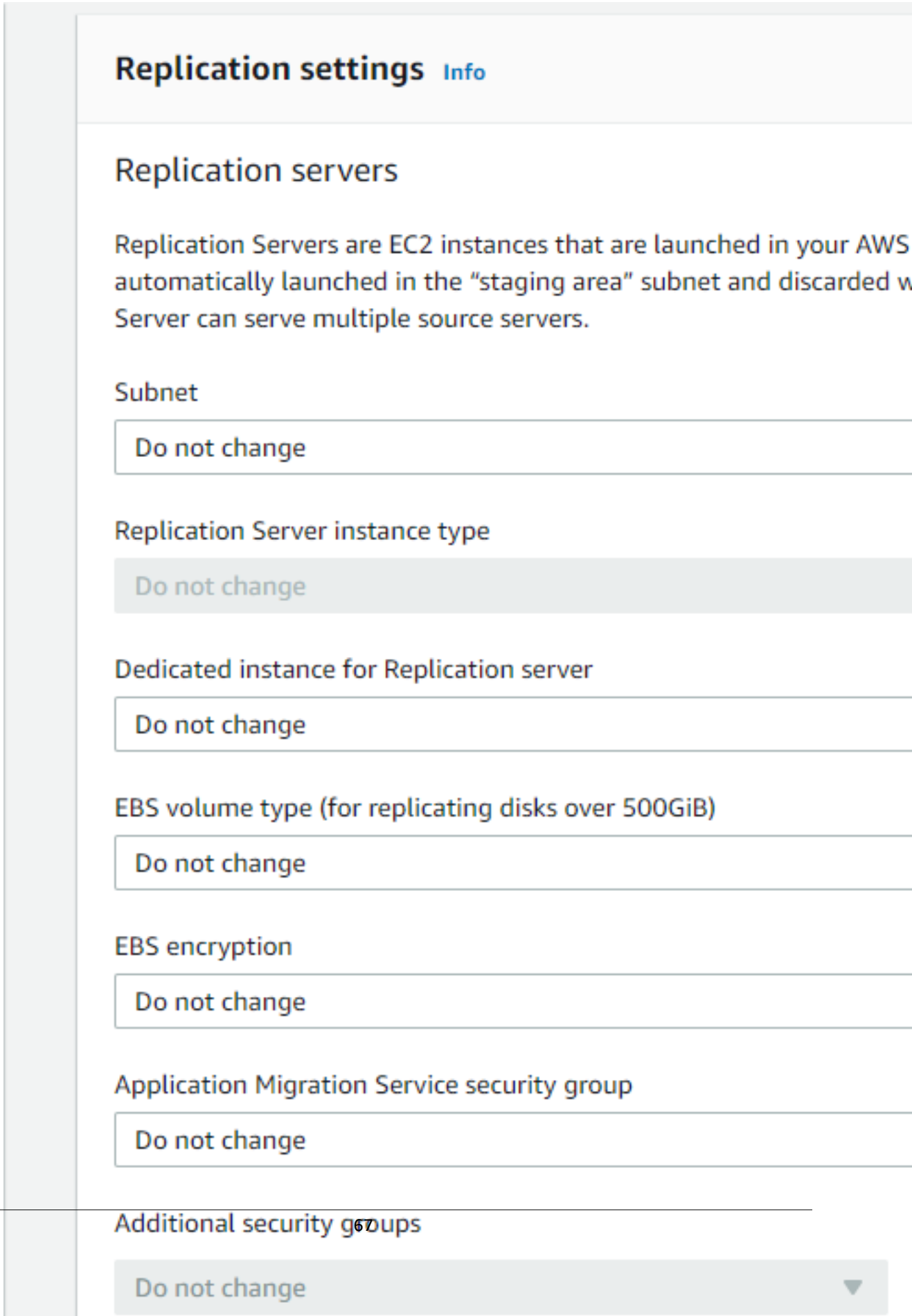


You will be redirected to the **Edit Replication Settings** tab.

The names of the servers that you are editing the replication settings for will appear under the **Selected servers** dropdown.



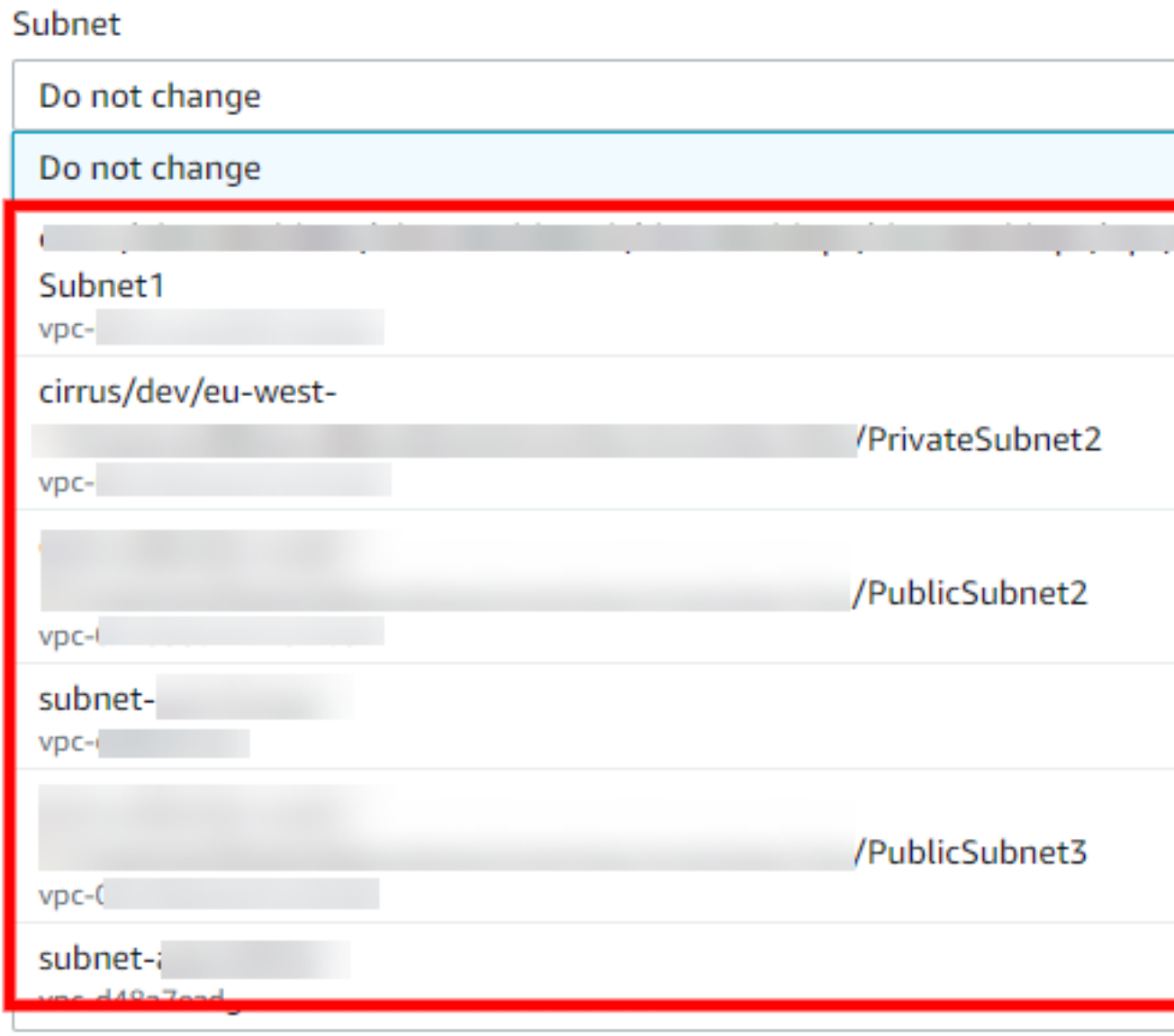
You can edit individual replication settings under the **Replication settings** category.


Replication settings Info
Replication servers
Replication Servers are EC2 instances that are launched in your AWS
automatically launched in the “staging area” subnet and discarded w
Server can serve multiple source servers.
Subnet
Do not change
Replication Server instance type
Do not change
Dedicated instance for Replication server
Do not change
EBS volume type (for replicating disks over 500GiB)
Do not change
EBS encryption
Do not change
Application Migration Service security group
Do not change
Additional security groups
Do not change

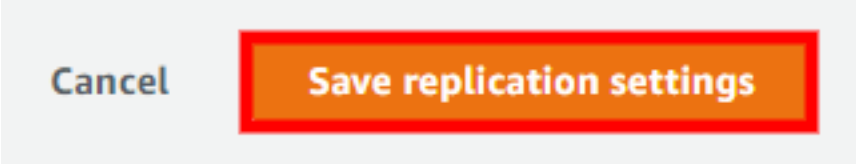
Choose **Reset to match Replication Settings Template** to reset the settings for the selected servers to match the settings in the Replication Settings Template. IMAGE

If you want to choose different settings for the selected servers than those set in the Replication Settings Template, then edit them individually. For clarity, each setting that has not been changed is labeled with the **Do not change** option.

For any setting that you want to change, choose the correct setting option for the dropdown under each setting category.



Choose **Save Replication Settings** to save your changes.



The individual settings are explained in the following sections.

Replication Server settings

Replication Servers are lightweight EC2 instances that are used to replicate data between your source servers and AWS. Replication Servers are automatically launched and terminated as needed. You can

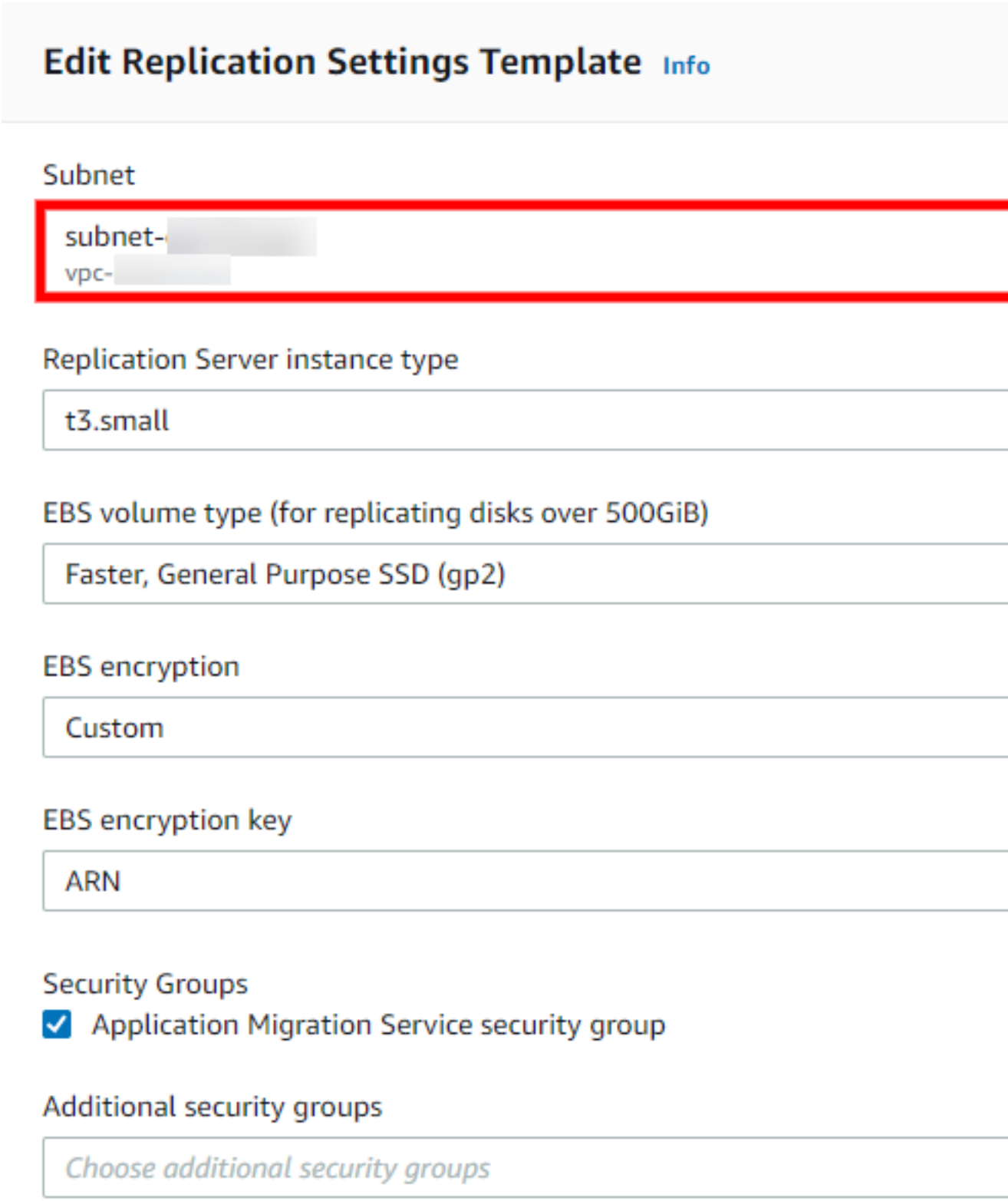
modify the behavior of the Replication Servers by modifying the settings for a single or multiple servers. Alternatively, you can run Application Migration Service with the default Replication Server settings.

You can configure a variety of Replication Server options, including:

- The Subnet within which the Replication Server will be launched
- Replication Server instance type
- EBS volume types
- EBS encryption
- Security groups

Subnet

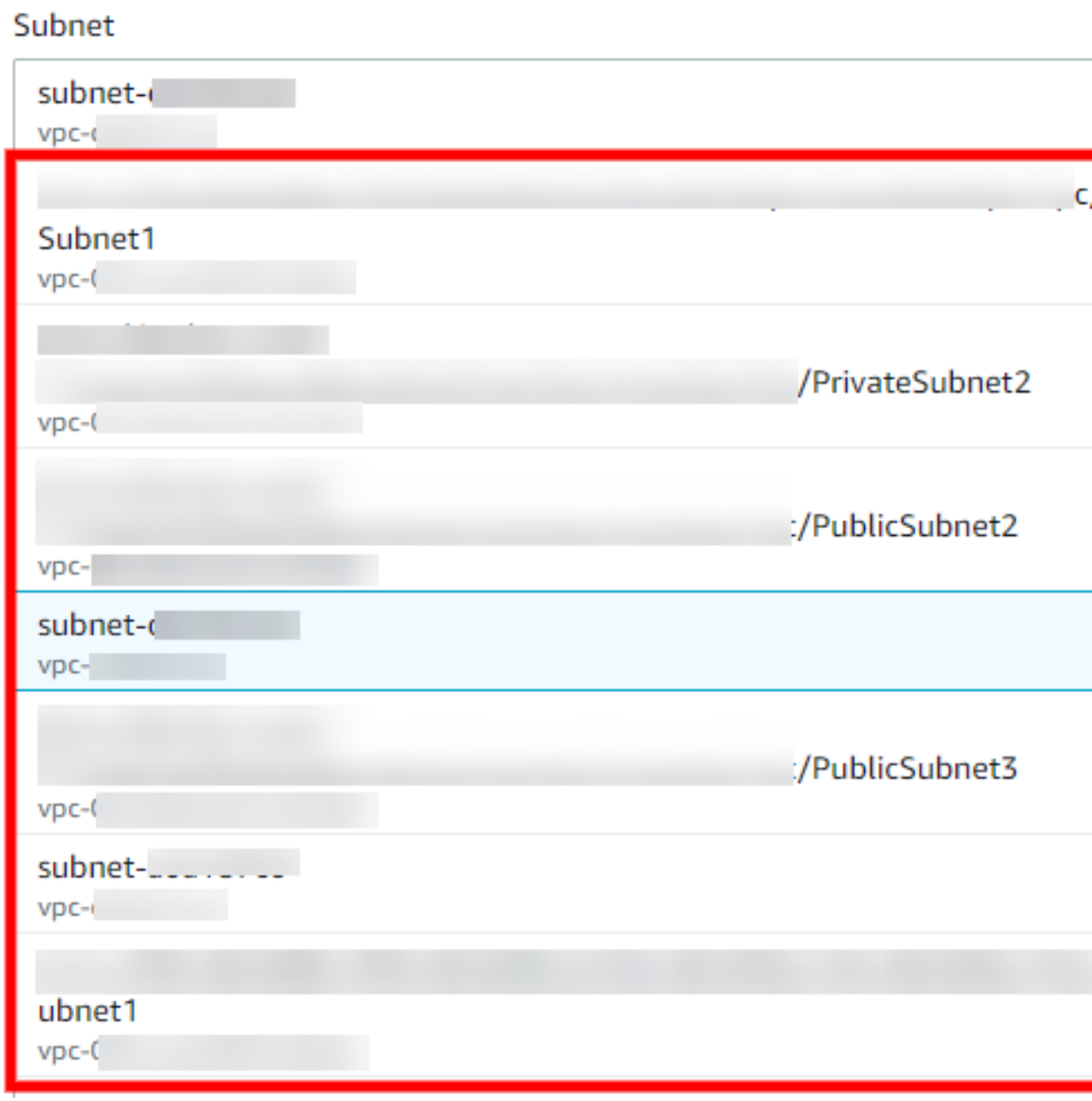
Choose the **Subnet** that you want to allocate to serve as the Staging Area subnet for all of your Replication Servers.


Edit Replication Settings Template Info
Subnet
subnet-
vpc-
Replication Server instance type
t3.small
EBS volume type (for replicating disks over 500GiB)
Faster, General Purpose SSD (gp2)
EBS encryption
Custom
EBS encryption key
ARN
Security Groups
Application Migration Service security group
Additional security groups
Choose additional security groups

The best practice is to create dedicated single separate subnet for all of your migration waves using this AWS Account. Learn more about creating Subnets in this AWS VPC article.

The Staging Area Subnet is the Subnet within which Replication Servers and Conversion Servers are launched. By default, Application Migration Service will use the default Subnet on your AWS Account. This is the Subnet that is created for the VPC when you first create your account. Learn more about the default Subnet in this AWS VPC article.

If a default subnet does not exist, select a specific subnet. The drop-down contains a list of all the subnets are available in the current AWS Region.



Note
Changing the Subnet does not significantly interfere with ongoing data replication, though there may be a minor delay of several minutes while the relevant servers are moved from one subnet to the other.

Using Multiple Subnets

The best practice is to use a single Staging Area Subnet for all of your migrations within a single AWS Account. You may want to use multiple subnets in certain edge cases, such as the migration of thousands of servers.

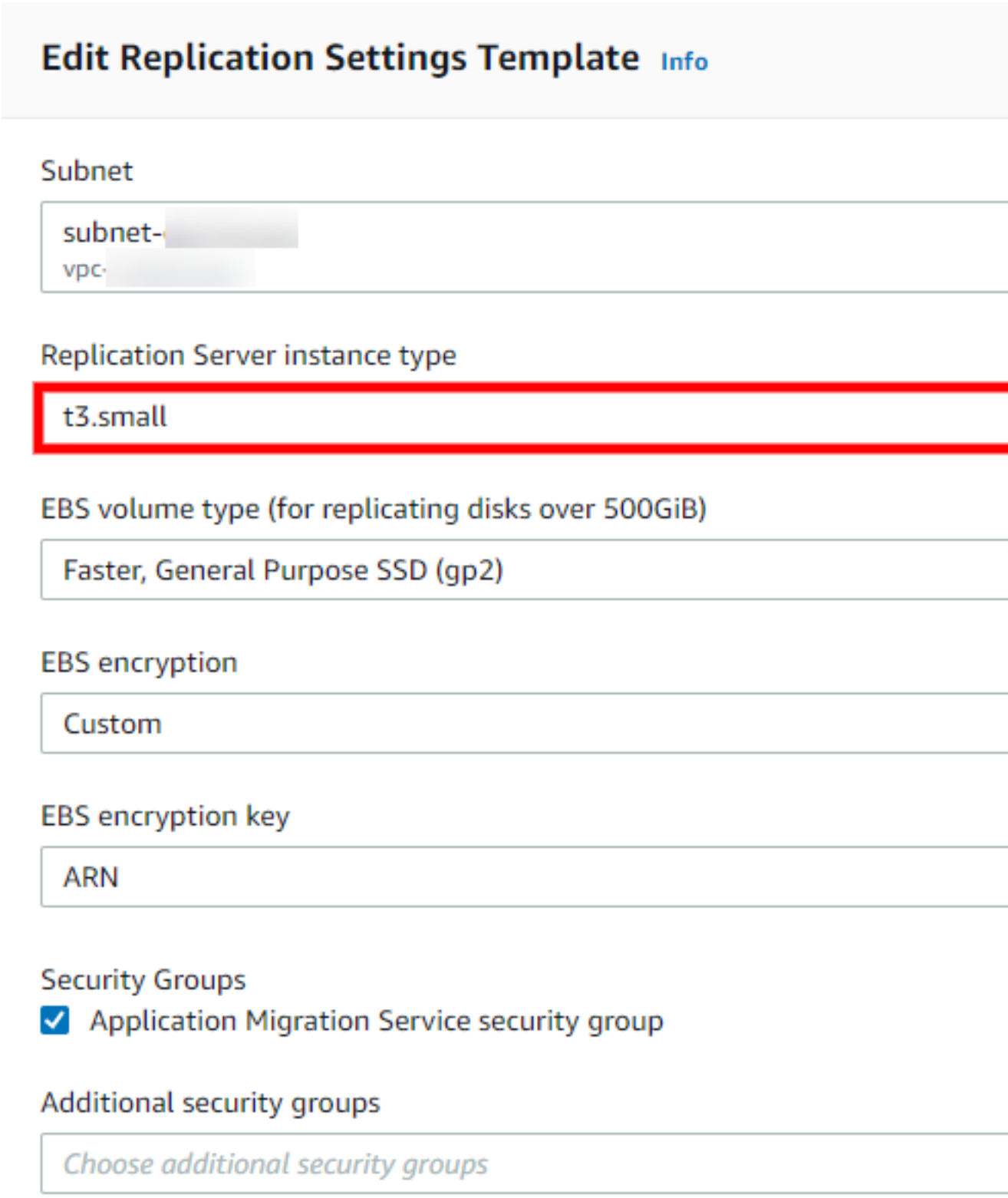
Note
Using more than one Staging Area Subnet could potentially result in higher compute consumption as more Replication Servers will be needed.

Launching Replication Servers in Availability Zones

If you want your Replication Servers to be launched in a specific Availability Zone, then select or create a subnet in that specific Availability Zone. Learn more about using Availability Zones in this EC2 article.

Replication Server instance type

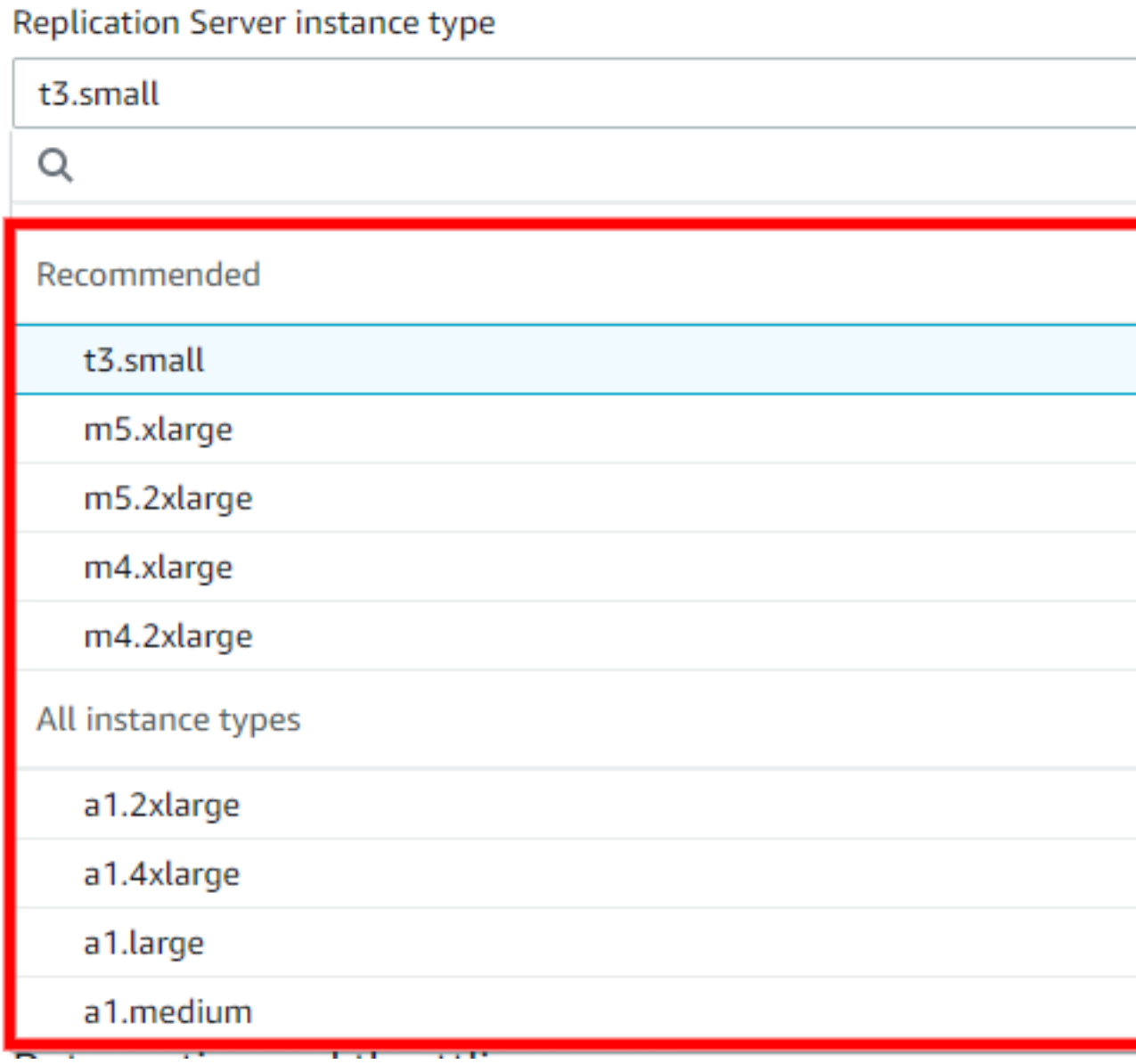
Choose the **Replication Server instance type**. This will determine the instant type and size that will be used for the launch of each individual Replication Server.


Edit Replication Settings Template Info
Subnet
subnet-
vpc-
Replication Server instance type
t3.small
EBS volume type (for replicating disks over 500GiB)
Faster, General Purpose SSD (gp2)
EBS encryption
Custom
EBS encryption key
ARN
Security Groups
Application Migration Service security group
Additional security groups
Choose additional security groups

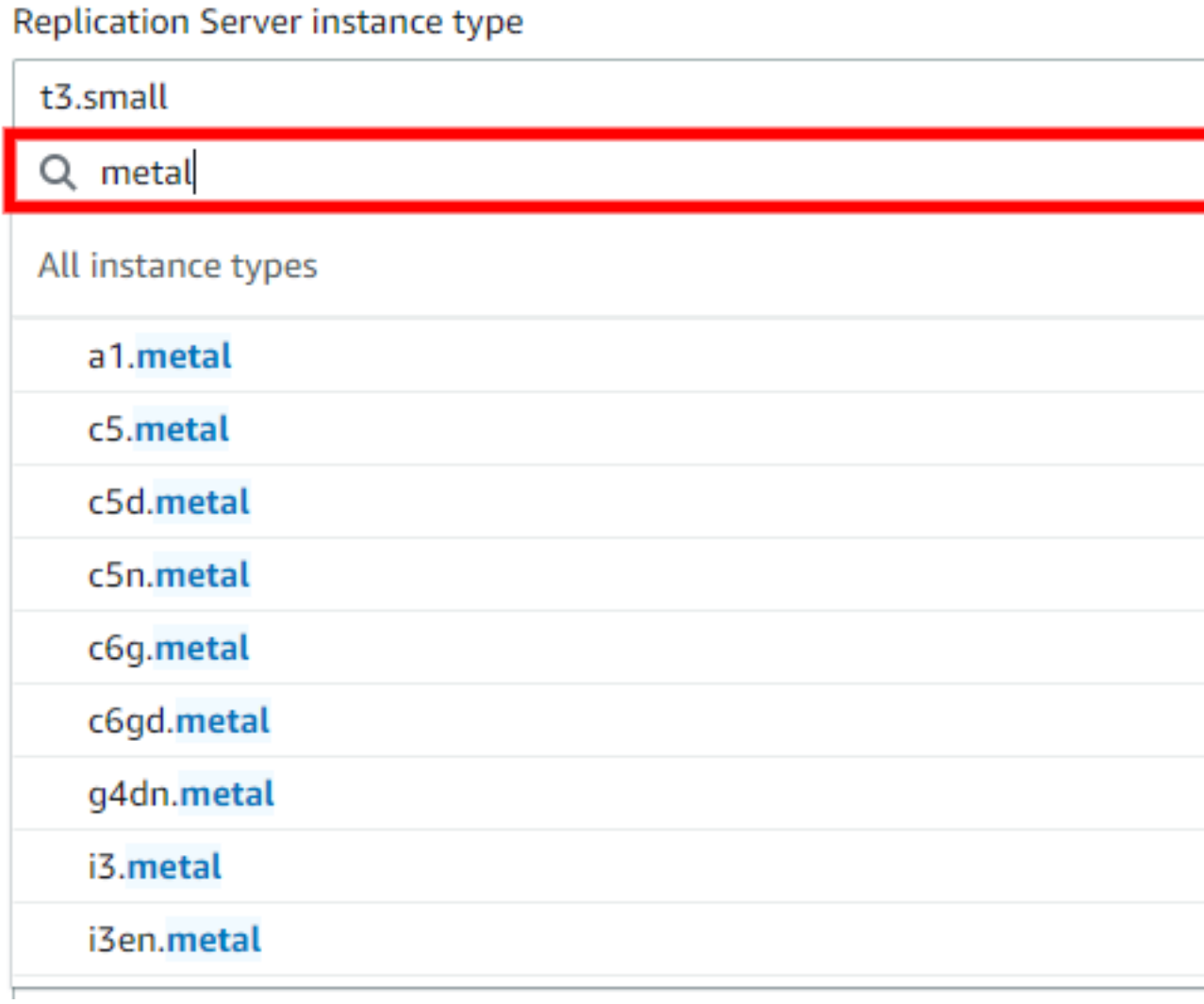
The recommended best practice is to not change the Replication Server instance type unless there is a business need for doing so.

By default, Application Migration Service utilizes the t3.small instance type. This is the most cost effective instance type and should work for most common workloads. You can change the Replication Server instance type to speed up the initial sync of data from your source servers to AWS. Changing the instance type will likely lead to increased compute costs.

You can change the replication server instance type to any type you wish. The dropdown menu contains all available instance types. Recommended and commonly used instance types are displayed first.



You can search for a specific instance type within the search box.



Customers usually change the Replication Server instance type for servers that are replications too slowly or servers that don't work well by being constantly busy or experiencing frequent spikes. These are the most common changes that are made:

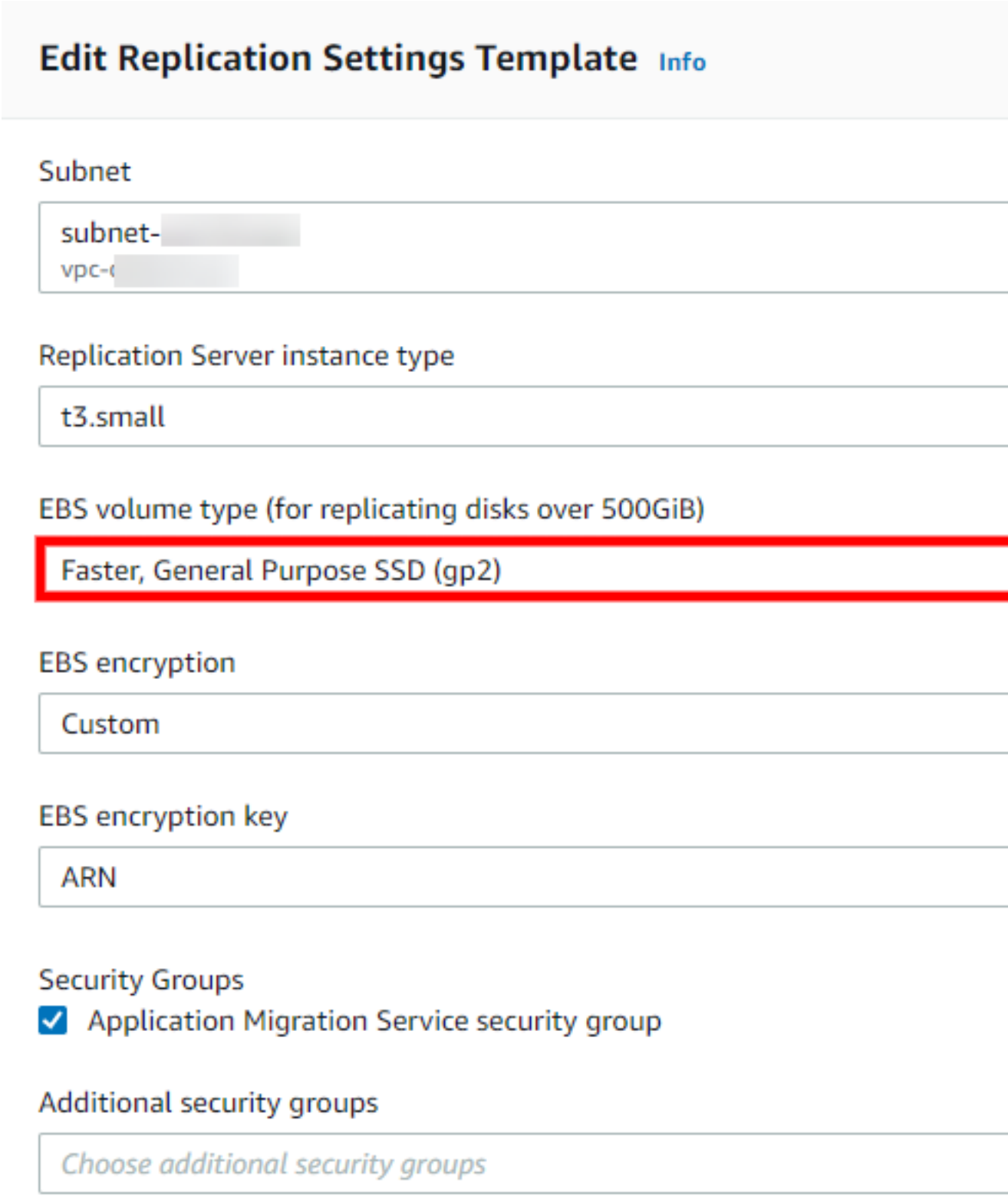
- Machines with less than 26 disks - Change the instance type to m5.large. Increase the instance type to m5.xl or higher as needed.
- Machines with more than 26 disks (or machines in regions that do not support M5 instance types) - Change the instance type to m4.large. Increase to m4.xlarge or higher as needed.

Note
Changing the Replication Server instance type will not affect replication. Replication will automatically continue using the new instance type from where it left off.

Note
By default, Replication Servers are automatically assigned a public IP address from Amazon's public IP space.

EBS volume type

Choose the default EBS volume type to be used by the Replication Servers for large disks.

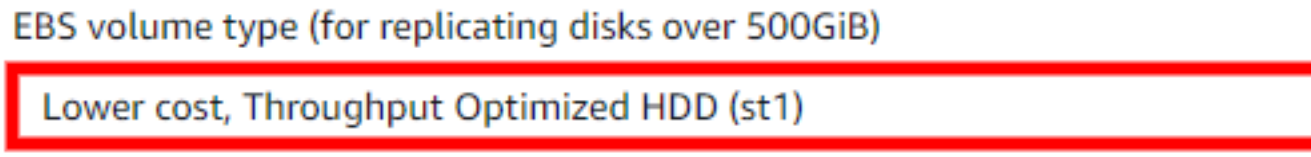


Each disk has minimum and maximum sizes and varying performance metrics and pricing. Learn more about Amazon EBS volume types in this EC2 article.

The best practice is to not change the EBS volume type unless there is a business need for doing so.

> **Note**
> This option only affects disks over 500 GiB (by default, smaller disk always use Magnetic HDD volumes)

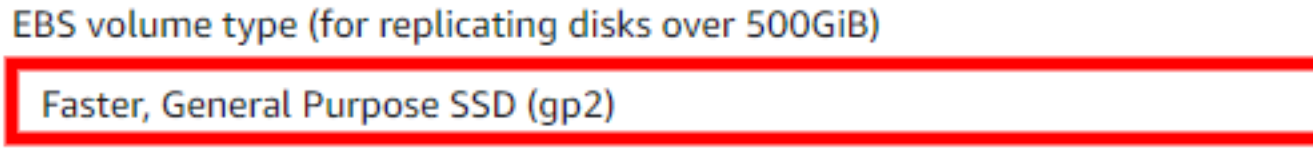
The default **Lower cost, Throughput Optimized HDD (st1)** option utilizes slower, less expensive disks.



You may opt to use this option if:

- You want to keep costs low
- Your large disks do not change frequently
- You are not concerned with how long the Initial Sync process will take

The **Faster, General Purpose SSD (gp2)** option utilizes faster, but more expensive disks.



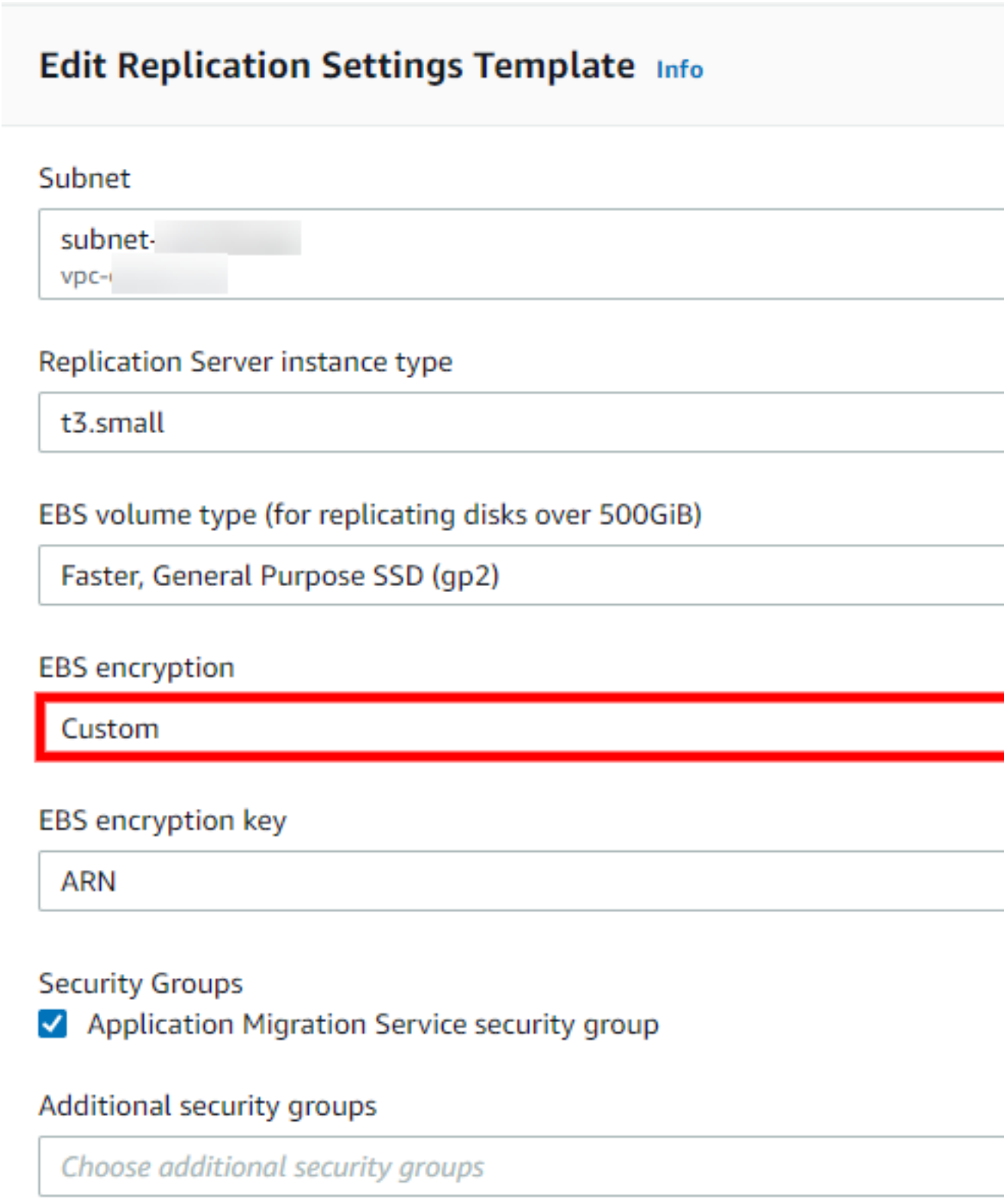
You may opt to use this option if:

- Your source server has disks with a high write rate or if you want faster performance in general
- You want to speed up the Initial Sync process
- You are willing to pay more for speed

> **Note**
> You can customize the EBS Volume type used by each disk within each individual source server within the individual source server settings. Learn more about changing individual volume types. (p. 212)

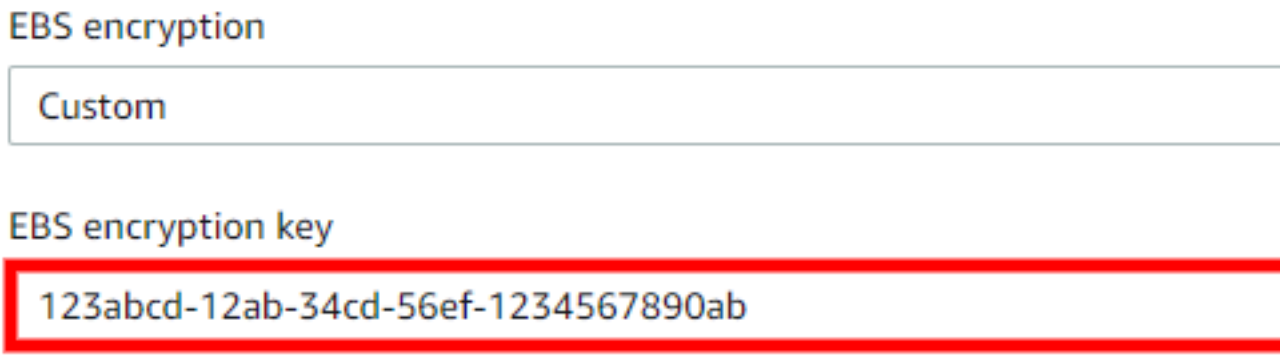
EBS encryption

Choose whether you would like to enable **EBS encryption**. This option will encrypt your replicated data at rest on the Staging Area disks and the replicated disks.


Edit Replication Settings Template
Info
Subnet
subnet-
vpc-
Replication Server instance type
t3.small
EBS volume type (for replicating disks over 500GiB)
Faster, General Purpose SSD (gp2)
EBS encryption
Custom
EBS encryption key
ARN
Security Groups
Application Migration Service security group
Additional security groups
Choose additional security groups

Choose whether you would like to not use EBS encryption, use the default Volume Encryption Key, or enter a custom customer-managed key (CMK) in the regular key ID format. If you choose the **Default** option, the default key is used (which can be an EBS-managed key or a CMK).

If the **Custom** option is chosen, the EBS encryption key box will appear. Enter the ARN or key ID of a customer managed CMK from your account or another AWS account. Enter the encryption key (such as a cross-account KMS key) in the regular key ID format (KMS key example: 123abcd-12ab-34cd-56ef-1234567890ab)



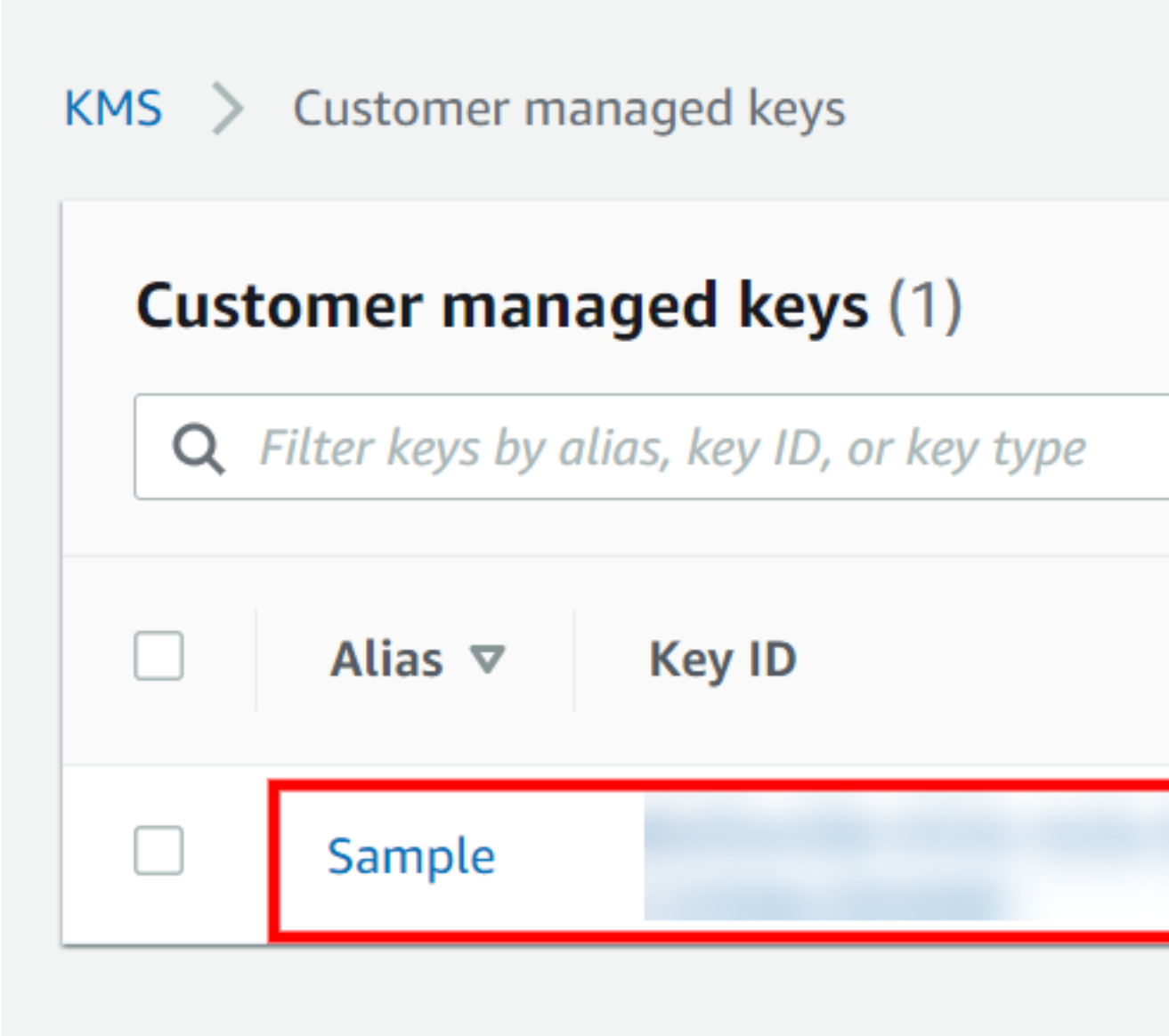
Learn more about EBS Volume Encryption in this EC2 article.

Important
Reversing the encryption option after Data Replication has started will cause Data Replication to restart from the beginning.

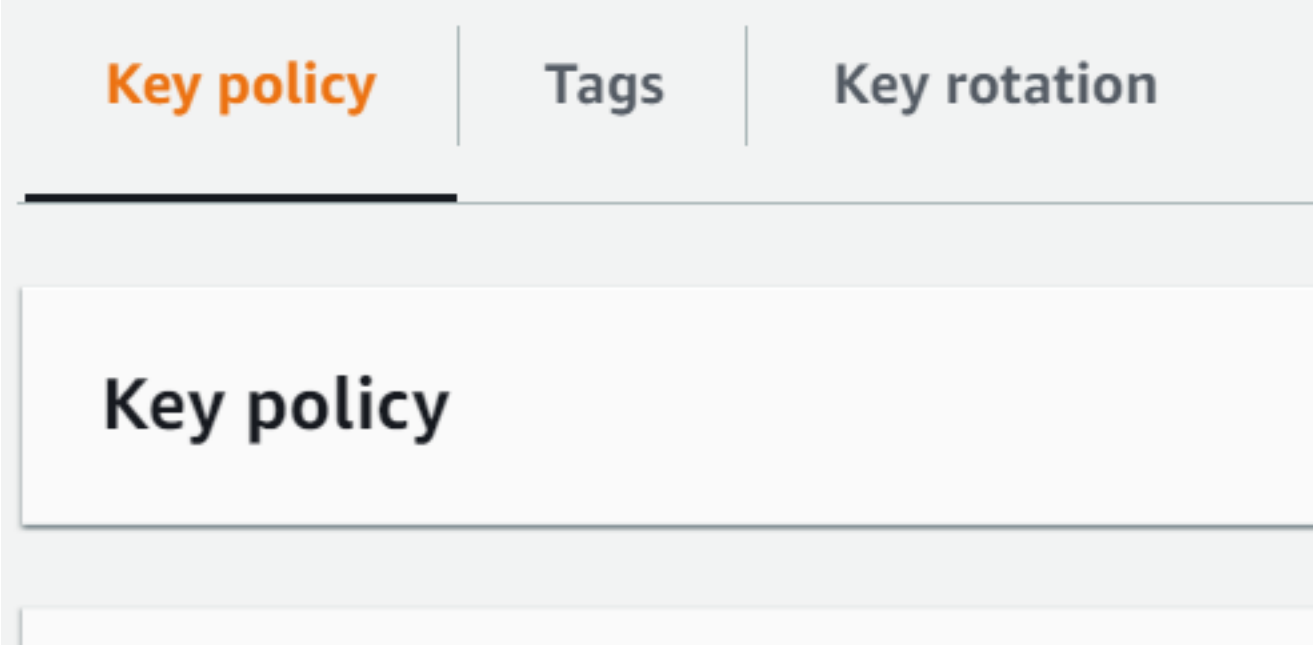
Using a customer managed KMS key

If you decide to use a customer-managed key, or if you default EBS encryption key is a CMK, you will need to add permissions in order to give the key EC2 access under the **Statement** field of your KMS key policy.

Navigate to the Key Management Service (KMS) Console and select the KMS key you plan to use with MGN.



Scroll to **Key policy** and click **Switch to policy view**.



Click **Edit** and add the following JSON under the **Statement** field.

Important
For the `kms:CallerAccount: "[account id]"` field, replace "account id" with your Account ID.

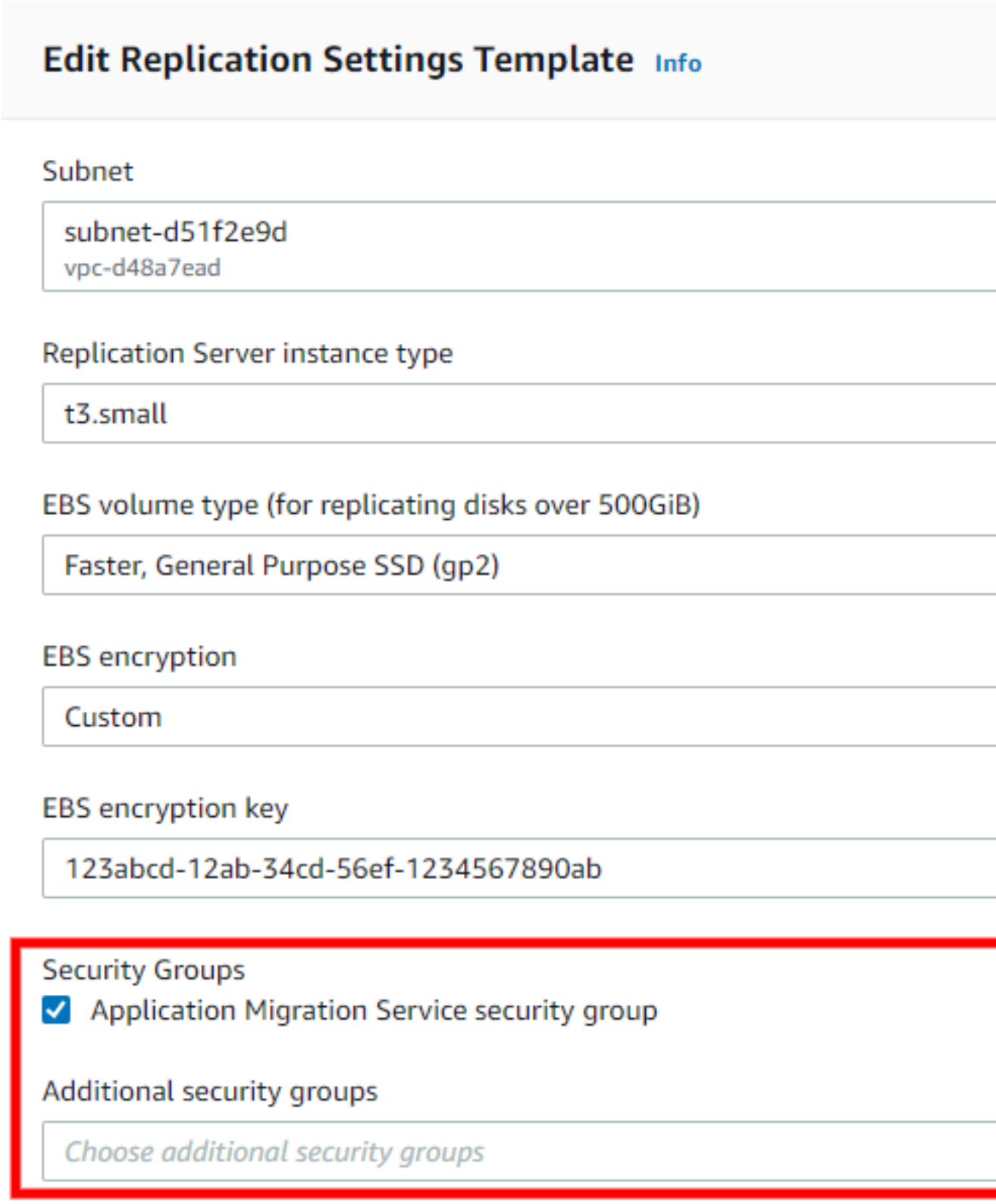
Important
For the `kms:ViaService: "ec2.[region_code].amazonaws.com"` field, replace "region_code" with the code of the region you are using.

```
{
            "Sid": "Allow access through EBS for all principals in the account that are
 authorized to use EBS",
            "Effect": "Allow",
            "Principal": {
                "AWS": "*"
            },
            "Action": [
                "kms:Encrypt",
                "kms:Decrypt",
                "kms:ReEncrypt*",
                "kms:GenerateDataKey*",
                "kms:CreateGrant",
                "kms:DescribeKey"
            ],
            "Resource": "*",
            "Condition": {
                "StringEquals": {
                    "kms:CallerAccount": "[account id]",
                    "kms:ViaService": "ec2.[region_code].amazonaws.com"
                }
            }
        }
```

Click **Save changes**.

Security Groups

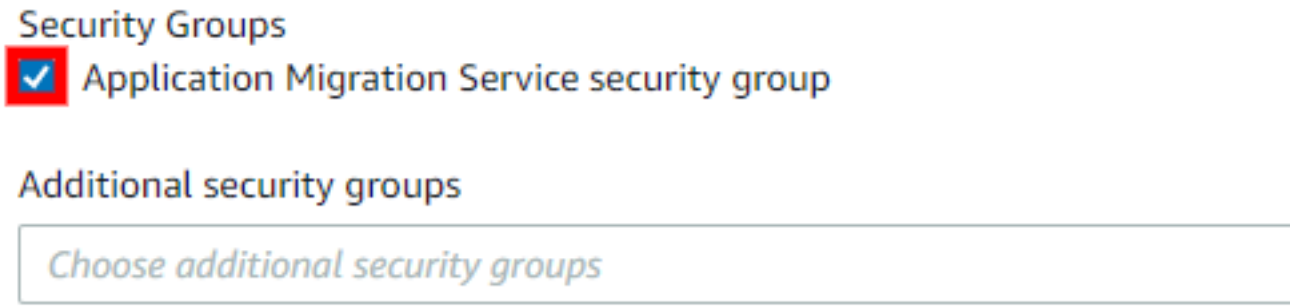
Choose the **Security Groups** you want to attach to the Replication Servers. A Security Group acts as a virtual firewall, which controls the inbound and outbound traffic of the Staging Area.



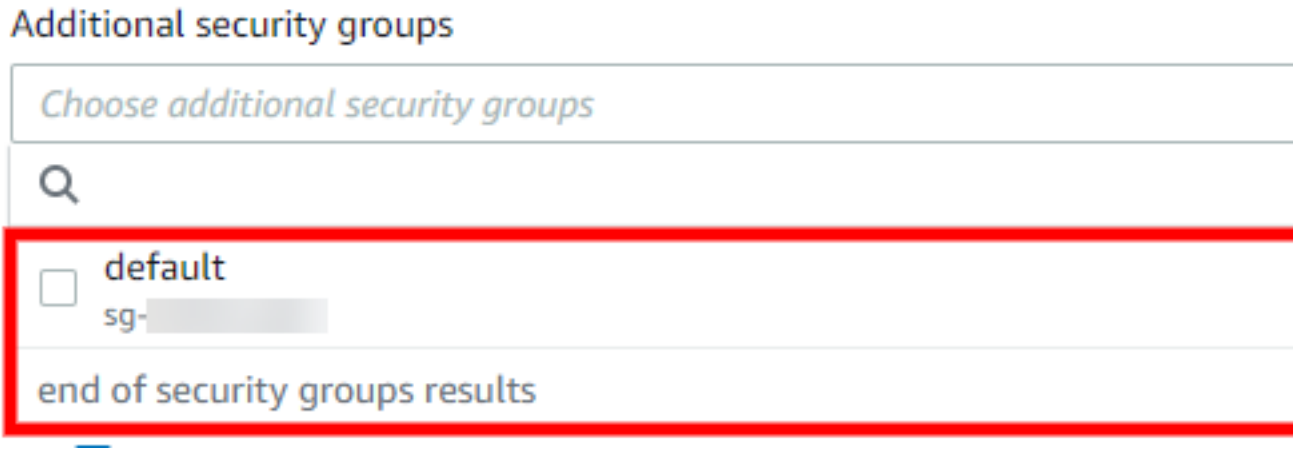
The best practice is to have Application Migration Service automatically attach and monitor the default Application Migration Service Security Group. This group opens inbound TCP Port 1500 for receiving the

transferred replicated data. When the default Application Migration Service Security Group is enabled, Application Migration Service will constantly monitor that the rules within this security group are enforced in order to ensure that Data Replication is never interrupted. If these rules are ever altered, Application Migration Service will automatically fix the issue.

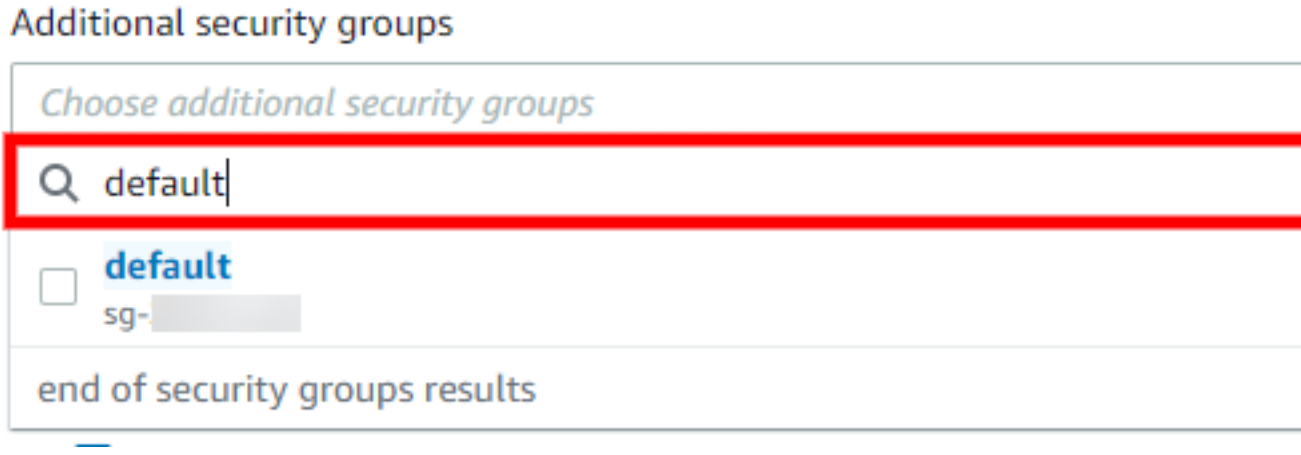
Select the **Application Migration Service security group** option to ensure that data can flow from your source servers to the Replication Servers and that the Replication Servers can communicate their state to the Application Migration Service Servers.



Additional security groups can be chosen from the Additional security groups dropdown. The list of available Security Groups changes according to the **Subnet** you selected.



You can search for a specific instance type within the search box.

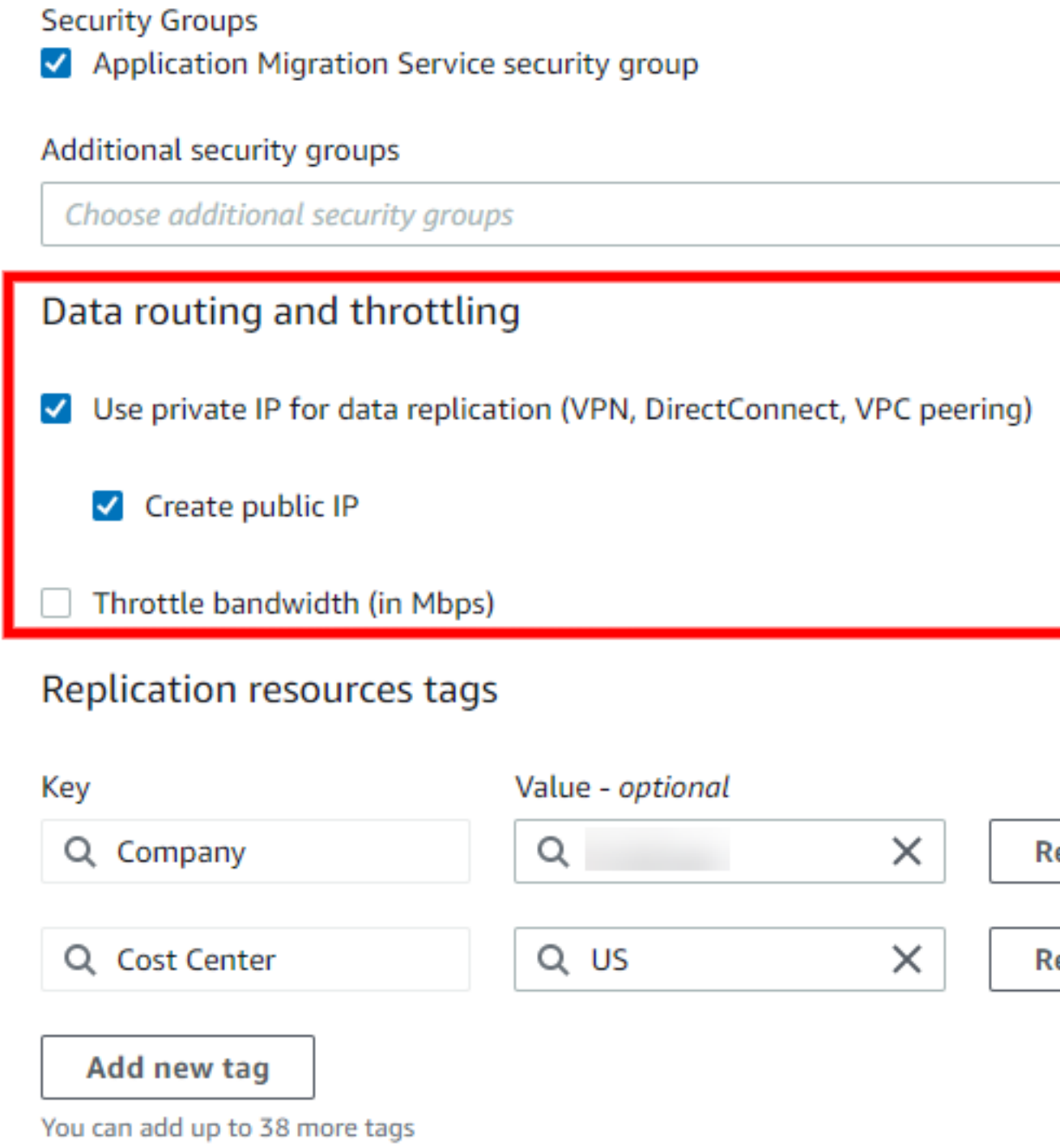


You can add Security Groups via the AWS console, and they will appear on the Security Group drop-down list in the Application Migration Service Console. Learn more about AWS security groups in this VPC article.

You can use the default Application Migration Service security group, or you can select another Security Group. However, take into consideration that any selected Security Group that is not the default, will be added to the Default group, since the default Security Group is essential for the operation of your solution.

Data routing and throttling

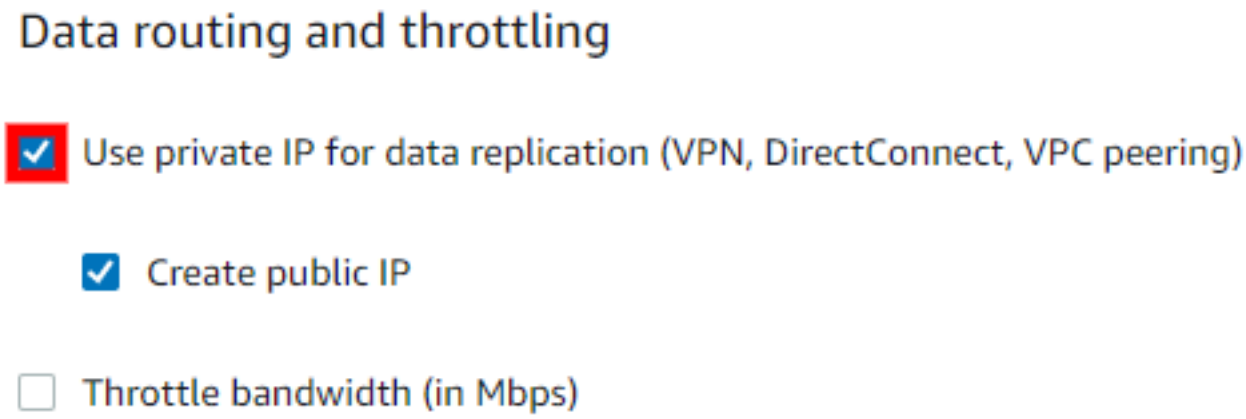
Application Migration Service lets you control how data is routed from your source servers to the Replication Servers on AWS through the data routing and throttling settings.



By default, data is sent from the source servers to the Replication Servers over the public internet, using the public IP that was automatically assigned to the Replication Servers. Transferred data is always encrypted in transit.

Use private IP for data replication

Select the **Use private IP for data replication** option if you want to route the replicated data from your source servers to the Staging Area through a private network with a VPN, DirectConnect, VPC peering or another type of existing private connection.



Important
Data Replication will not work unless you have already set up VPN / DirectConnect / VPC peering in the Amazon Web Services console.

Note
If you selected the Default Subnet, then it's highly unlikely that Private IP is enabled for that Subnet. Ensure that Private IP (VPN, DirectConect, or VPC peering) are enabled for your chosen Subnet if you wish to use this option.

Note
You can safely switch between a private connection and a public one in individual machine Settings by checking or clearing the **Use private IP...** box, even after replication has begun. This switch will only cause a short pause in replication, and will not have any long-term effect on the replication.

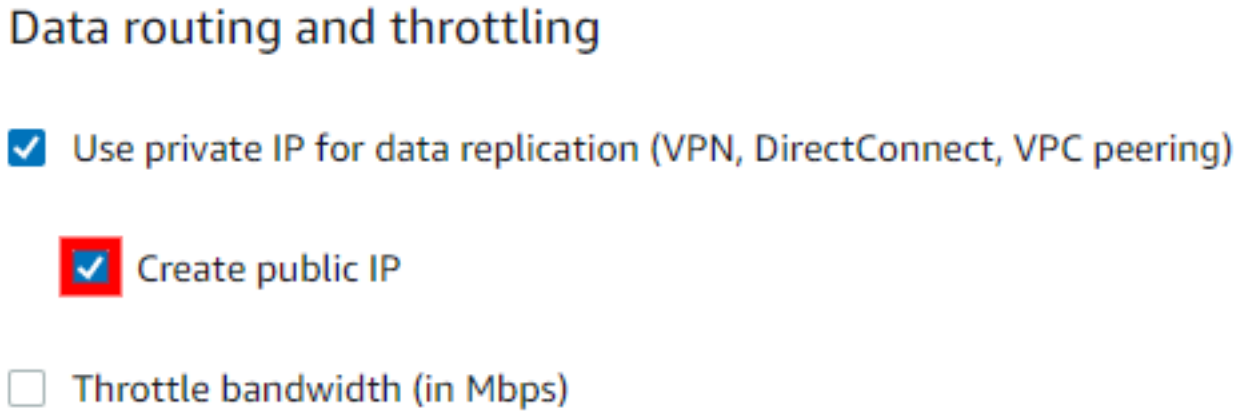
Note
Selecting this box will not create a new private connection.

You should use this option if you want to:

- Allocate a dedicated bandwidth for replication;
- Use another level of encryption;
- Add another layer of security by transferring the replicated data from one private IP address (Source) to another private IP address (Target).

Create public IP

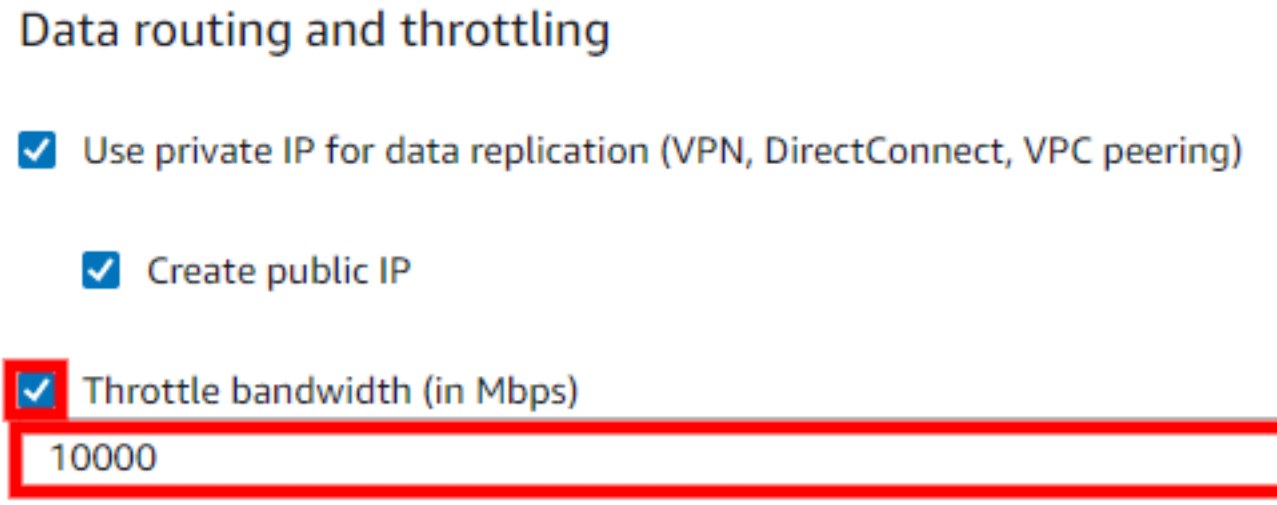
When the **Use Private IP...** option is selected, you will have the option to create a public IP. Public IPs are enabled by default. Unselect this option if you do not wish to use a public IP.



Throttle bandwidth

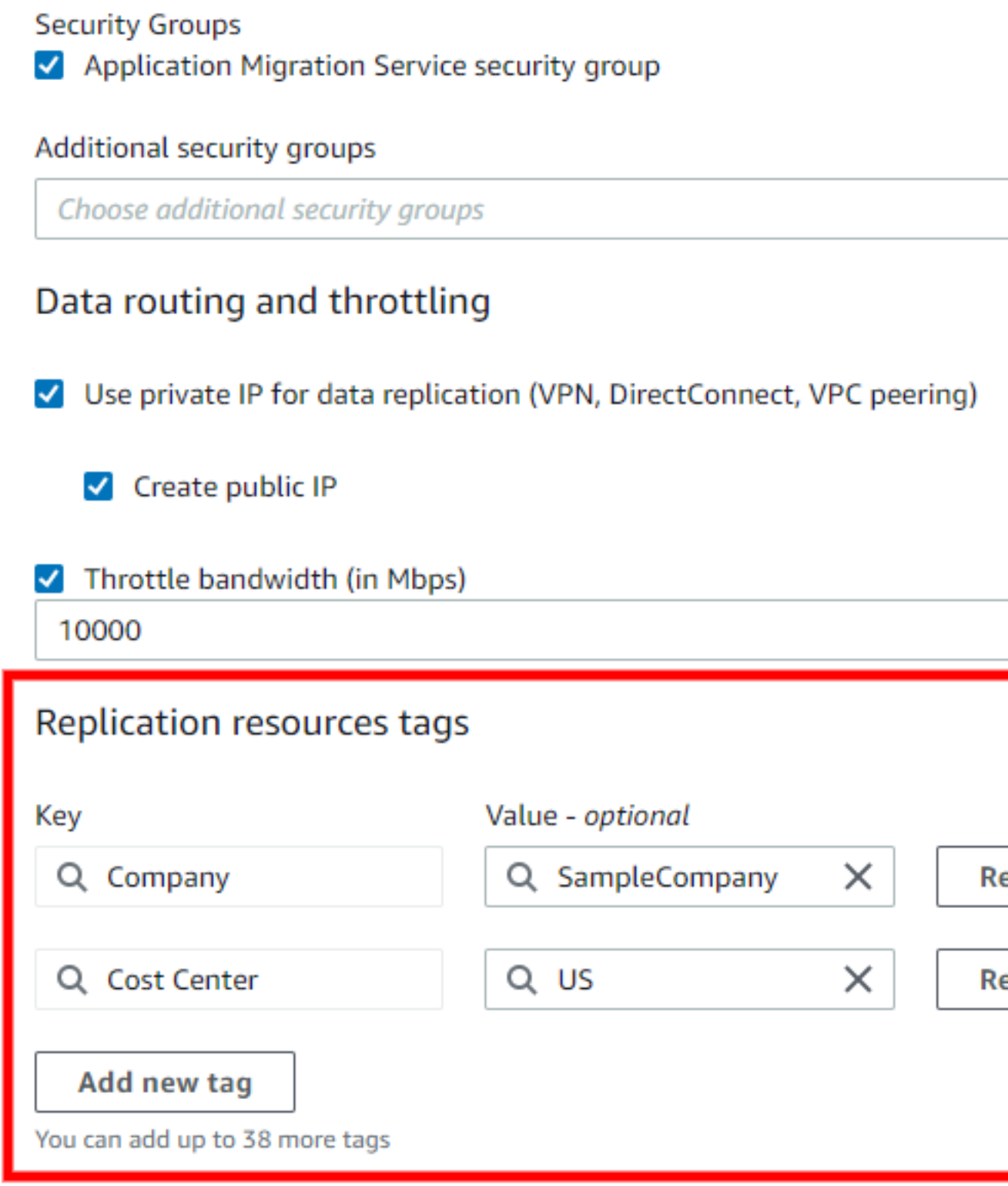
You can control the amount of network bandwidth used for data replication per server. By default, Application Migration Service will use all available network bandwidth utilizing five concurrent connections.

Select the **Throttle bandwidth (in Mbps)** option if you want to regulate control the transfer rate of data sent from your source servers to the Replication Servers over TCP Port 1500. Enter your desired bandwidth in Mbps.



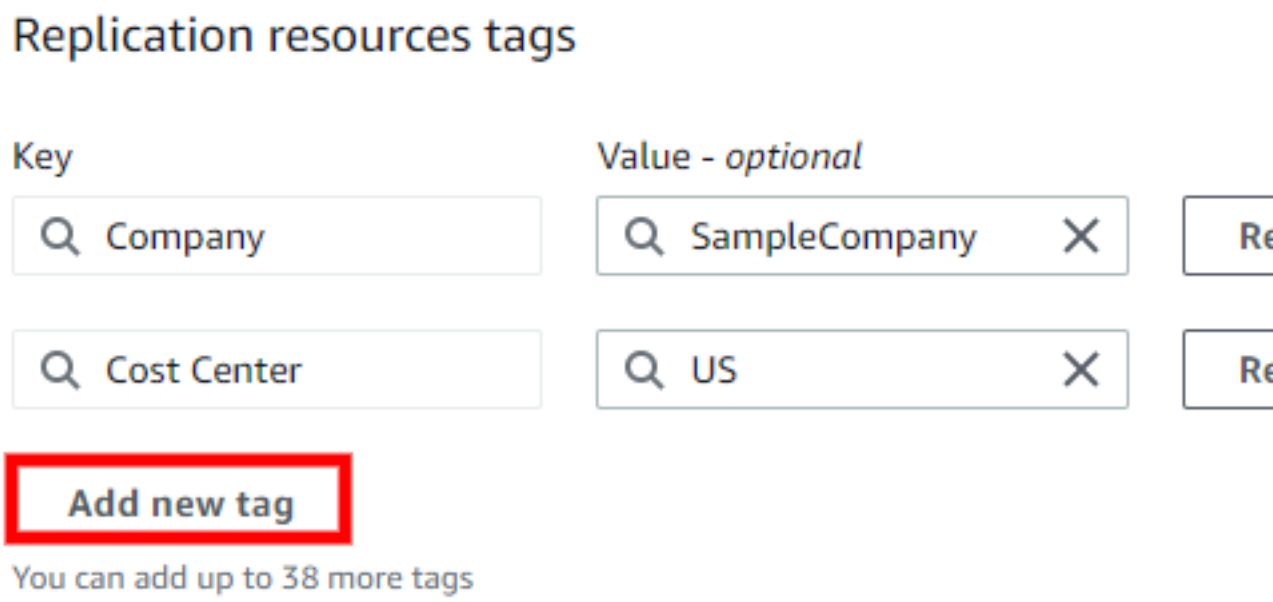
Replication resources tags

Add custom **Replication resources tags** to resources created by Application Migration Service in your AWS account.

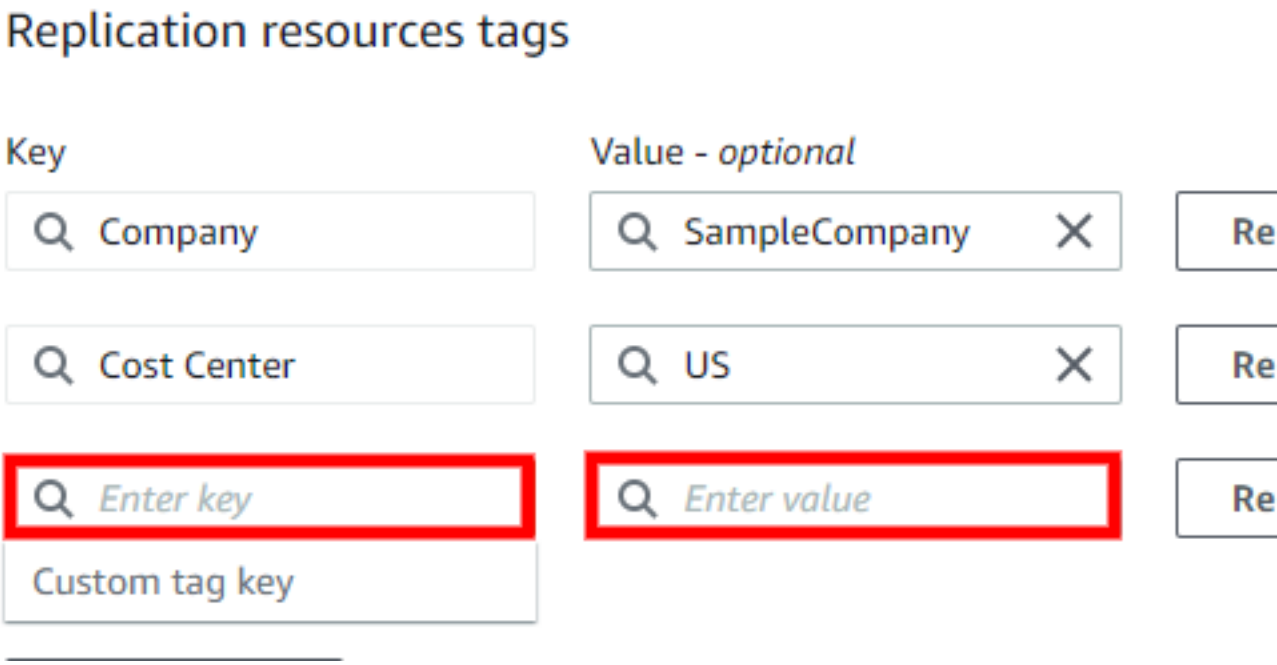

Security Groups
Application Migration Service security group
Additional security groups
Choose additional security groups
Data routing and throttling
Use private IP for data replication (VPN, DirectConnect, VPC peering)
Create public IP
Throttle bandwidth (in Mbps)
10000
Replication resources tags
Key
Value - optional
Company
SampleCompany
Cost Center
US
Add new tag
You can add up to 38 more tags

These are resources required to facilitate data replication, testing and cutover. Each tag consists of a key and an optional value. You can add custom tag to all of the AWS resources that are created on your AWS Account during the normal operation of Application Migration Service.

Choose **Add new tag** to add a new tag.



Enter a custom tag key and an optional tag value.



Note
You can add up to 40 tags.

Note
Application Migration Service already adds tags to every resource it creates, including service tags and user tags.

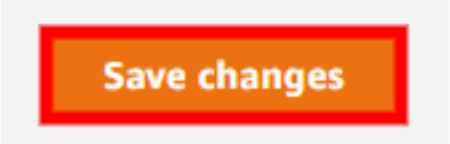
These resources include:

- EC2 instances
- EC2 Launch Templates
- EBS volumes
- Snapshots
- Security groups (optional)

Learn more about AWS Tags in this EC2 article.

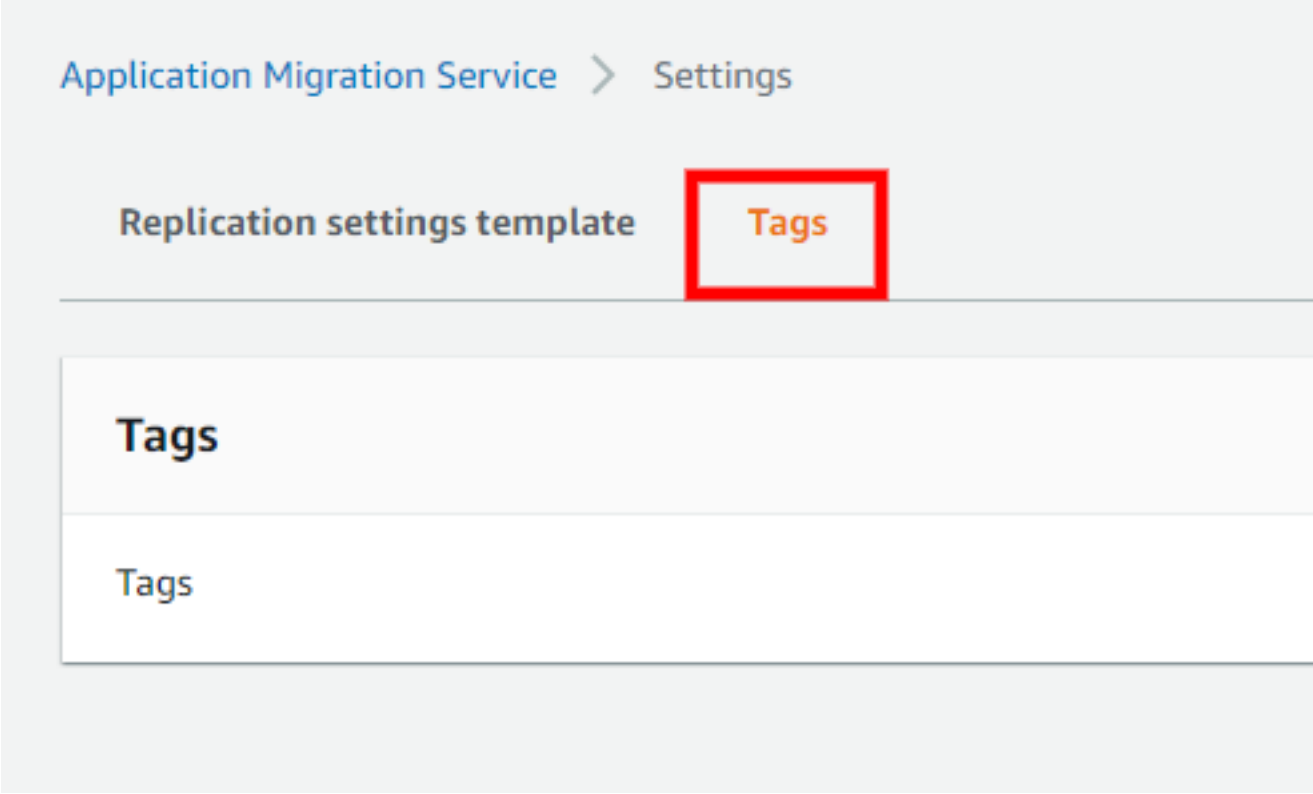
Saving and editing Replication Settings

Once you have finalized your changes, click the orange **Save changes** button on the bottom right of the page.



Tags

The Tags tab contains a list of all tags that are associated with all servers in your Account.



Learn more about adding Tags (p. 90).

Network Requirements

Topics

- Network Setting Preparations (p. 95)
- Network Requirements (p. 95)

Network Setting Preparations

Topics

- Staging Area Subnet (p. 95)
- Network Requirements (p. 95)
- Operational Subnets (p. 95)

Staging Area Subnet

Before setting up Application Migration Service you should create a subnet which will be used by Application Migration Service as a staging area for data replicated from your source servers. You must specify this subnet in the Replication Settings Template and can override this for specific source servers in the Replication Settings. While you can use an existing subnet, we recommend creating one dedicated for this purpose. Learn more about Replication Settings. (p. 60)

Network Requirements

The Replication Servers launched by Application Migration Service in your Staging Subnet need to be able to send data over TCP port 443 to the service's API endpoint at http://mgn.{region}.amazonaws.com/. Replace "{region}" with the region code to which you are replicating, for example "us-east-1" .

> **Important**
> The beta version of Application Migration Service is only available in N. Virgina (us-east-1).

The source servers on which the AWS Replication Agent is installed need be able to send data over TCP port 1500 to the Replication Servers in the Staging Area Subnet. They also need to be able to send data to the service's API endpoint at http://mgn.{region}.amazonaws.com/.

Operational Subnets

Test and Cutover instances are launched in a subnet you specify in the EC2 Launch Template associated with each source server. The EC2 Launch Template is created automatically when you add a source server to Application Migration Service.

Learn more about launching test and cutover instances (p. 38).

Learn more about how EC2 Launch Templates are used (p. 234).

Network Requirements

To prepare your network for running Application Migration Service's solutions, you need to set the following connectivity settings:

Communication over TCP Port 443:

Topics

- Communication over TCP Port 443 (p. 96)
- Communication Between the Source Servers and Application Migration Service over TCP Port 443 (p. 96)
- Communication Between the Staging Area Subnet and Application Migration Service over TCP Port 443 (p. 98)
- Communication between the Source Servers and the Staging Area Subnet over TCP Port 1500 (p. 99)

Communication over TCP Port 1500:

- Between the Source Machines and the Staging Area Subnet

Communication over TCP Port 443

Add the following IP addresses and URLs to your firewall:

The Application Migration Service region-specific User Console address:

- (mgn.<region>.amazonaws.com *ex. mgn-eu-west-1.amazonaws.com*)
- Your Private Link VPC endpoint (if you are using one). Learn more about using an endpoint. (p. 114)

Amazon S3 service URLs (required for downloading Application Migration Service software)

> **Important**
> The beta version of Application Migration Service is only available in N. Virgina (us-east-1).

- s3.amazonaws.com
- s3.us-east-1.amazonaws.com
- The specific s3 bucket URL of the region you are using with Application Migration Service.

AWS specific (required for customers using AWS)

The Replication Server requires outbound access to the EC2 endpoint of its AWS region.

TCP port 443 is used for two communication routes:

1. Between the Source Machines and Application Migration Service.

2. Between the Staging Area and Application Migration Service.

Communication Between the Source Servers and Application Migration Service over TCP Port 443

Each Source server that is a part of Application Migration Service must continuously communicate with Application Migration Service (mgn.<region>.amazonaws.com) over TCP port 443.

The following are the main operations performed through TCP port 443:

- Downloading the AWS Replication Agent through tonto the source servers.
- Upgrading installed Agents.
- Connecting the source servers to the MGN Console, and displaying their replication status.

- Monitoring the source servers for internal troubleshooting and the use of resource consumption metrics (CPU, RAM).
- Reporting source server-related events (for example, removal of disk, resizing of a disk).
- Transmit source server-related information to the Console (including hardware information, running services, installed applications and packages, etc.)
- Preparing the source servers for Test or Cutover.

Important
Make sure that your corporate firewall allows connections over TCP Port 443.

Solving Communication Problems over TCP Port 443 between the Source Servers and Application Migration Service

If there is no connection between your Source machines and Application Migration Service, make sure that your corporate firewall enables connectivity from the source machine to Application Migration Service over TCP Port 443. If the connectivity is blocked, enable it.

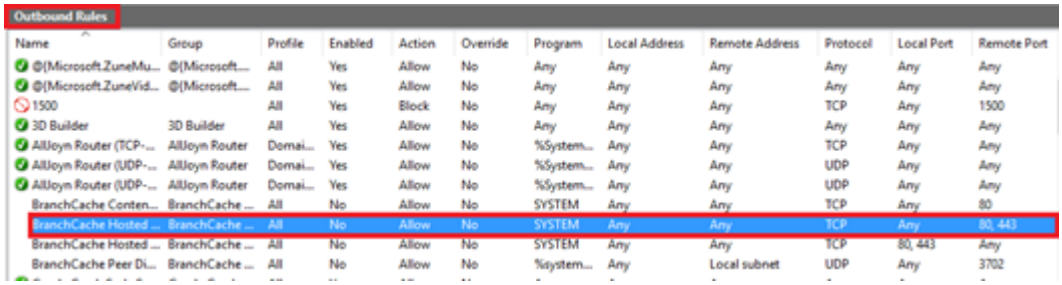
Enabling Windows Firewall for TCP Port 443 Connectivity

Important
The information provided in this section is for general security and firewall guidance only. The information is provided on "AS IS" basis, with no guarantee of completeness, accuracy or timeliness, and without warranty or representations of any kind, expressed or implied. In no event will Application Migration Service and/or its subsidiaries and/or their employees or service providers be liable to you or anyone else for any decision made or action taken in reliance on the information provided above or for any direct, indirect, consequential, special or similar damages (including any kind of loss), even if advised of the possibility of such damages. Application Migration Service is not responsible for the update, validation or support of security and firewall information.

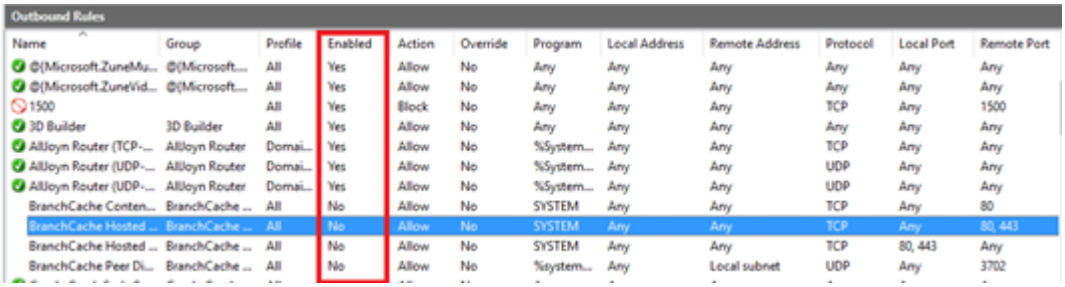
Note
Enabling Windows Firewall for TCP Port 443 connectivity will allow your machines to achieve outbound connectivity. You may still need to adjust other external components, such as firewall blocking or incorrect routes, in order to achieve full connectivity.

Note
These instructions are intended for the default OS firewall. You will need to consult the documentation of any third-party local firewall you use to learn how to enable TCP Port 443 connectivity.

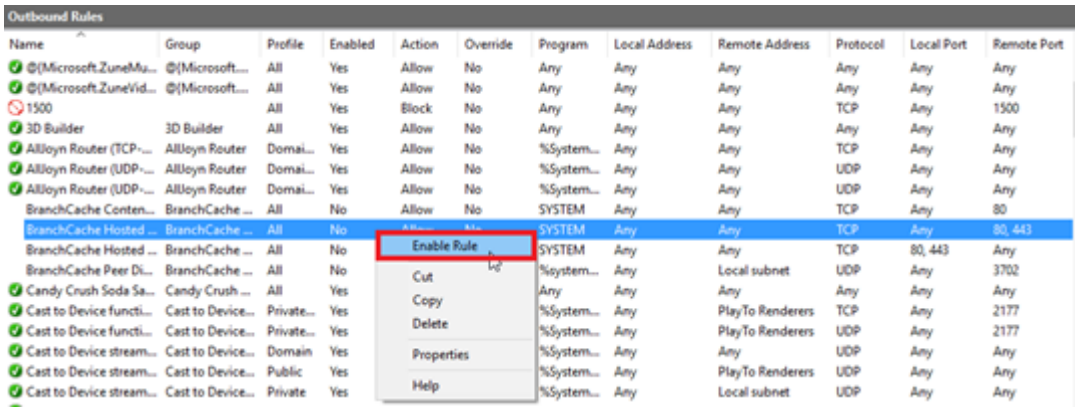
1. On the Source machine, open the **Windows Firewall** console.
2. On the console, select the **Outbound Rules** option from the tree.



3. On the **Outbound Rules** table, select the rule that relates to the connectivity to Remote Port - 443. Check if the **Enabled** status is **Yes**.



4. If the Enabled status of the rule is **No**, right-click it, and select E**nable Rule** from the pop-up menu.



Enabling Linux Firewall for TCP Port 443 Connectivity

1. Enter the following command to add the required Firewall rule:

   sudo iptables -A OUTPUT -p tcp --dport 443 -j ACCEPT

2. To verify the creation of the Firewall rule, enter the following commands:

   sudo iptables -L

   Chain INPUT (policy ACCEPT)

   target prot opt source destination

   Chain FORWARD (policy ACCEPT)

   target prot opt source destination

   Chain OUTPUT (policy ACCEPT)

   target prot opt source destination

   ACCEPT tcp -- anywhere anywhere tcp dpt:443

Communication Between the Staging Area Subnet and Application Migration Service over TCP Port 443

The Replication Servers on the Staging Area Subnet must continuously communicate with Application Migration Service over TCP Port 443. The main operations that are performed through this route are:

Downloading the Replication Software by the Replication Servers.

- Connecting the Replication Servers to Application Migration Service, and displaying their replication status.
- Monitoring the Replication Servers for internal troubleshooting use and resource consumption metrics (CPU, RAM).
- Reporting replication-related events.

Configuring Communication over TCP Port 443 between the Staging Area Subnet and Application Migration Service

You can establish communication between the Staging Area and Application Migration Service over TCP Port 443 directly.

There are 3 ways to establish direct connectivity to the Internet for the VPC of the Staging Area, as described in the VPC FAQ.

1. Public IP address + Internet gateway

2. Private IP address + NAT instance

3. Private IP address + NAT instance

Communication between the Source Servers and the Staging Area Subnet over TCP Port 1500

Each source server with an installed AWS Replication Agent continuously communicates with the Application Migration Service Replication Servers in the Staging Area Subnet over TCP Port 1500. TCP Port 1500 is needed for the transfer of replicated data from the source servers to the Staging Area Subnet.

The replicated data is encrypted and compressed when transferred over TCP Port 1500. Prior being moved into the Staging Area Subnet, the data is encrypted on the source infrastructure. The data is decrypted once it arrives at the Staging Area subnet and before it is written to the disks.

TCP Port 1500 is primarily used for the Replication Server Data Replication stream.

Establishing Communication over TCP Port 1500

Important: To allow traffic over TCP Port 1500, make sure that your corporate firewall enables this connectivity.

Source Servers

Topics

- Adding Source Servers (p. 100)
- Source Servers page (p. 127)
- Server Details (p. 162)

Adding Source Servers

Add source servers to Application Migration Service by installing the AWS Replication Agent (also referred to as "the Agent") on them. The Agent can be installed on both Linux and Windows servers.

> **Important**
> The beta version of Application Migration Service is only available in N. Virgina (us-east-1).

Topics

- Installation Requirements (p. 100)
- AWS Replication Agent installation instructions (p. 104)
- Supported Operating Systems (p. 125)

Installation Requirements

Before installing the AWS Replication Agent on your source servers, ensure that they meet the following requirements:

Topics

- General Requirements (p. 100)
- Source Server requirements (p. 100)
- Linux Installation Requirements (p. 101)
- Windows Installation Requirements (p. 103)

General Requirements

- Ensure that the source server operating system is supported by AWS. Learn more about supported operating systems. (p. 125)
- Ensure that your setup meets all networking requirements. Learn more anout network requirements. (p. 95)
- Ensure MAC address stability - ensure that the MAC addresses of the source servers do not change upon a reboot or any other common changes in your network environment. Application Migration Service calculates the unique ID of the source server from the MAC address. When a MAC address changes, Application Migration Service is no longer able to correctly identify the server. Consequently, replication will stop. If this happens, you will need to re-install the AWS Replication Agent and restart replication from the beginning.

Source Server requirements

The following are universal requirements for both Linux and Windows source servers:

- Root directory - Verify that your source server has at least 2 GB of free disk on the root directory (/) .
- RAM - Verify that your source server has at least 300 MB of free RAM to run the AWS Replication Agent.

Note
Application Migration Service does not support Paravirtualized source servers.

Note
The AWS Replication Agent installer supports multipath.

Linux Installation Requirements

Ensure that your Linux source server meets the following installation requirements prior to installing the AWS Replication Agent:

- Python is installed on the server – Python 2 (2.4 or above) or Python 3 (3.0 or above).
- Verify that you have at least 2 GB of free disk on the root directory (/) of your source server for the installation. To check the available disk space on the root directory, run the following command: *df -h /*
- Free disk space on the */tmp* directory – for the duration of the installation process only, verify that you have at least 500 MB of free disk on the */tmp* directory. To check the available disk space on the /tmp directory run the following command: *df -h /tmp*

  After you have entered the above commands for checking the available disk space, the results will be displayed as follows:

```
ubuntu@Linux-1:~$ df -h /
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvda1      7.8G  1.4G  6.0G  19% /
ubuntu@Linux-1:~$ df -h /tmp
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvda1      7.8G  1.4G  6.0G  19% /tmp
```

- The active bootloader software is GRUB 1 or 2.
- Ensure that /tmp is mounted as read+write.
- Ensure that /tmp is mounted with the exec option. Verify that the /tmp directory is mounted in a way that allows you to run scripts and applications from it.

  To verify that the /tmp directory is mounted without the noexec option, run the following command: sudo mount | grep '/tmp'

  If the result is similar to the following example, it means that the issue exits in your OS: /dev/xvda1 on /tmp type ext4 (rw,noexec)

  |To fix and remove the noexec option from the mounted /tmp directory, run the following command: sudo mount -o remount,exec /tmp

  The following example illustrates the troubleshooting procedure:

```
ubuntu@Linux-1:~$ sudo mount | grep '/tmp'
/dev/xvda1 on /tmp type ext4 (rw,noexec)
ubuntu@Linux-1:~$ sudo mount -o remount,exec /tmp
ubuntu@Linux-1:~$ sudo mount | grep '/tmp'
/dev/xvda1 on /tmp type ext4 (rw)
```

- The Application Migration Service user needs to be either a root user or a user in the sudoers list.
- Ensure that the dhclient package is installed. If not, please install the package. (run yum install dhclient in CMD)
- Verify that you have kernel-devel/linux-headers installed that are exactly of the same version as the kernel you are running.

  The version number of the kernel headers should be completely identical to the version number of the kernel. To handle this issue, follow these steps:

1. Identify the version of your running kernel.

   To identify the version of your running kernel, run the following command:

   uname -r

   ```
   [root@ip-172-31-1-164 ~]# uname -r
   4.4.41-36.55.amzn1.x86_64
   [root@ip-172-31-1-164 ~]#
   ```

   The 'uname -r' output version should match the version of one of the installed kernel headers packages (kernel-devel-<version number> / linux-headers-<version number).

2. Identify the version of your kernel-devel/linux-headers.

   To identify the version of your running kernel, run the following command:

   On RHEL/CENTOS/Oracle/SUSE:

   rpm -qa | grep kernel

   ```
   [root@ip-172-31-1-164 ~]# rpm -qa | grep kernel
   kernel-tools-4.4.41-36.55.amzn1.x86_64
   kernel-4.4.41-36.55.amzn1.x86_64
   kernel-headers-4.4.41-36.55.amzn1.x86_64
   [root@ip-172-31-1-164 ~]#
   ```

   Note
   This command looks for kernel-devel.
   On Debian/Ubuntu: apt-cache search linux-headers

   ```
   ubuntu@Linux-1:~$ apt-cache search linux-headers
   linux-headers-3.13.0-24 - Header files related to Linux kernel version
    3.13.0
   linux-headers-3.13.0-24-generic - Linux kernel headers for version 3.1
   3.0 on 64 bit x86 SMP
   linux-headers-3.13.0-24-lowlatency - Linux kernel headers for version
   3.13.0 on 64 bit x86 SMP
   ```

3. Verifying that the folder that contains the kernel-devel/linux-headers is not a symbolic link.

   Sometimes, the content of the kernel-devel/linux-headers, which match the version of the kernel, is actually a symbolic link. In this case, you will need to remove the link before installing the required package.

   To verify that the folder that contains the kernel-devel/linux-headers is not a symbolic link, run the following command:

   On RHEL/CENTOS/Oracle/SUSE:

   ls -l /usr/src/kernels

   On Debian/Ubuntu:

   ls -l /usr/src

   ```
   ubuntu@Linux-1:~$  ls -l /usr/src
   total 8
   lrwxrwxrwx  1 root root   41 May 29 15:40 3.13.0-116-generic -> /usr/src/linux-
   headers-3.13.0-116-generic
   drwxr-xr-x 24 root root 4096 Apr  5 20:43 linux-headers-3.13.0-116
   drwxr-xr-x  7 root root 4096 Apr  5 20:43 linux-headers-3.13.0-116-generic
   ubuntu@Linux-1:~$
   ```

   In the above example, the results show that the linux-headers are not a symbolic link.

4. [If a symbolic link exists] Delete the symbolic link.

If you found that the content of the kernel-devel/linux-headers, which match the version of the kernel, is actually a symbolic link, you need to delete the link. Run the following command: rm /usr/src/<LINK NAME>

For example: rm /usr/src/linux-headers-4.4.1

5. Install the correct kernel-devel/linux-headers from the repositories.

   If none of the already installed kernel-devel/linux-headers packages match your running kernel version, you need to install the matching package.

   Note
   You can have several kernel headers versions simultaneously on your OS, and you can therefore safely install new kernel headers packages in addition to your existing ones (without uninstalling the other versions of the package.) A new kernel headers package does not impact the kernel, and does not overwrite older versions of the kernel headers.

   Note
   For everything to work, you need to install a kernel headers package with the exact same version number of the running kernel.
   To install the correct kernel-devel/linux-headers, run the following command:
   On RHEL/CENTOS/Oracle/SUSE:

   sudo yum install kernel-devel-`uname -r`

   On Debian/Ubuntu:

   sudo apt-get install linux-headers-`uname -r`

6. [If no matching package was found] Download the matching kernel-devel/linux-headers package.

   If no matching package was found on the repositories configured on your machine, you can download it manually from the Internet and then install it.

   To download the matching kernel-devel/linux-headers package, navigate to the following sites:

   RHEL, CENTOS, Oracle, and SUSE package directory

   Debian package directory

   Ubuntu package directory

Windows Installation Requirements

Note
Ensure that your source server operating system is supported. Learn more about supported operating systems. (p. 125)

Note
Ensure that your source server meets the agent installation hardware requirements, including:

- At least 2 GB of free disk space on the root directory (/)
- At least 300 MB of free RAM
- (Linux only) At least 500 MB of free disk space on the /tmp directory

Learn more about AWS Replication Agent installation hardware requirements. (p. 100)

AWS Replication Agent installation instructions

You must install the AWS Replication Agent on each Source Server that you want to add to Application Migration Service. Agent installation is composed of the following steps:

Topics

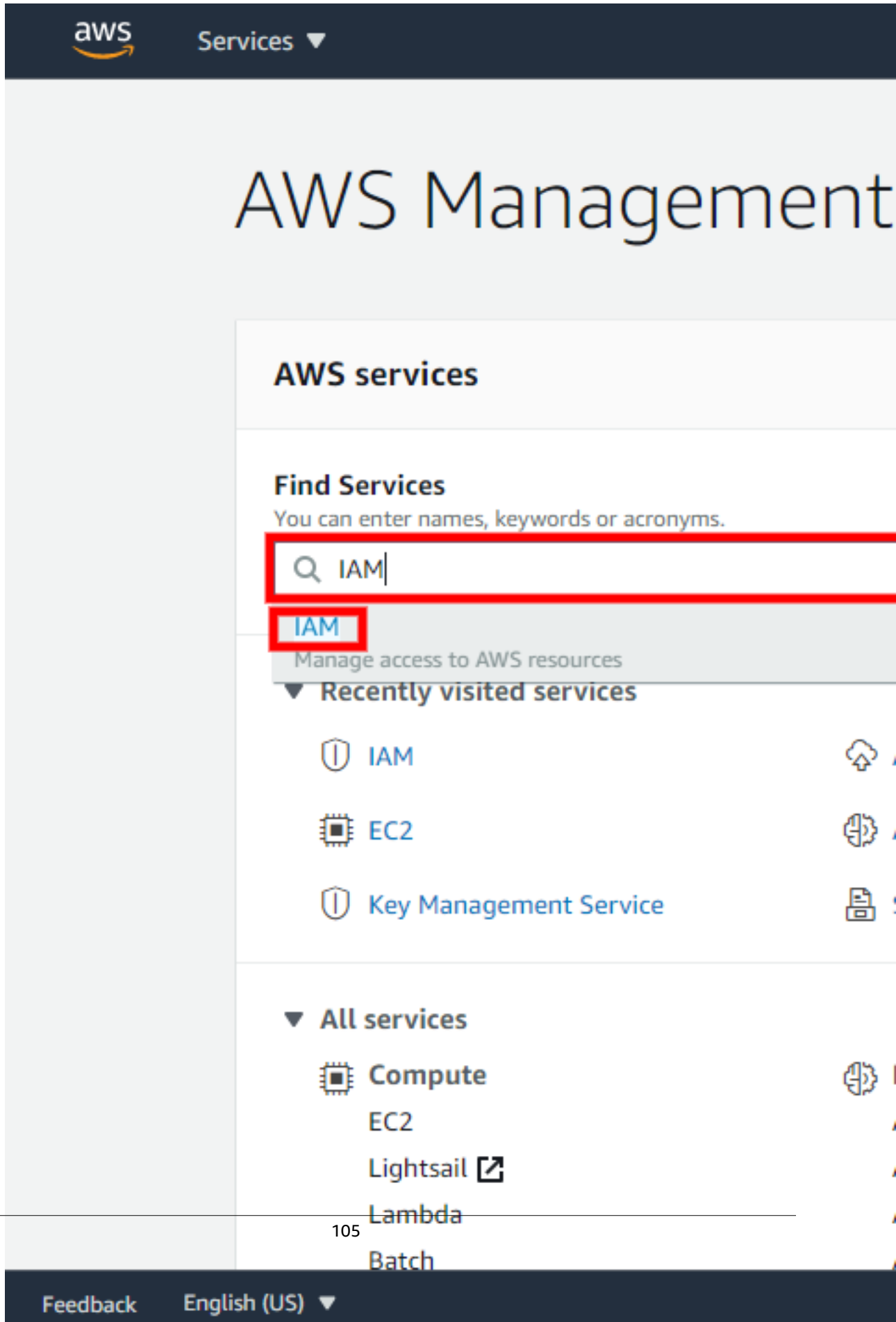
- Generating the required AWS credentials (p. 104)
- Installation Instructions (p. 114)
- Uninstalling the Agent (p. 124)

Generating the required AWS credentials

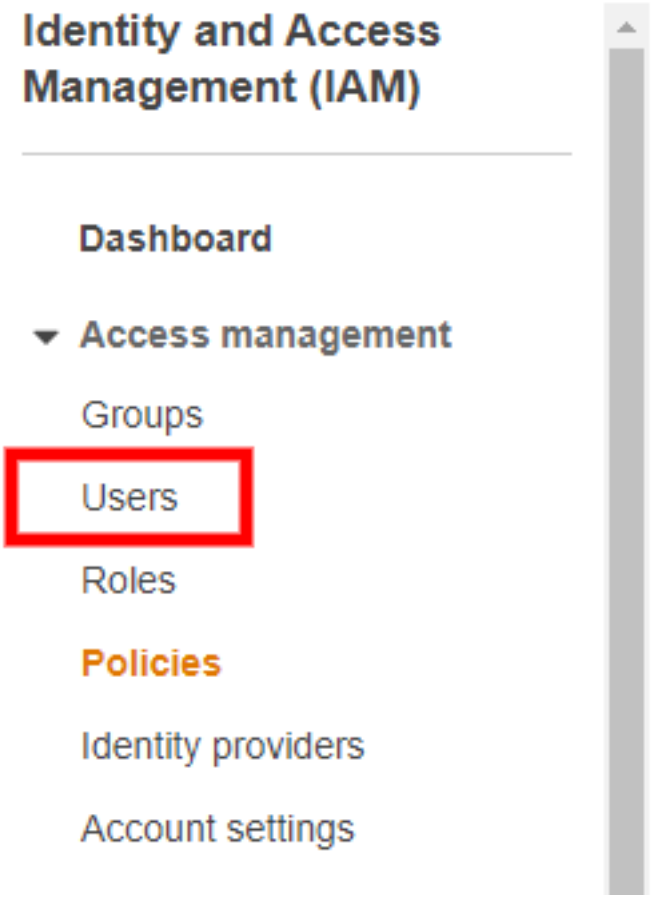
In order to install the AWS Replication Agent, you must first generate the required AWS credentials. You will need to create at least one AWS Identity and Access Management (IAM) user, and assign the proper permission policy to this user. You will obtain an Access key ID and Secret access key, which you will need to enter into the Agent installation prompt in order to begin the installation.

> **Note**
> You can use the same credentials to install multiple Agents.

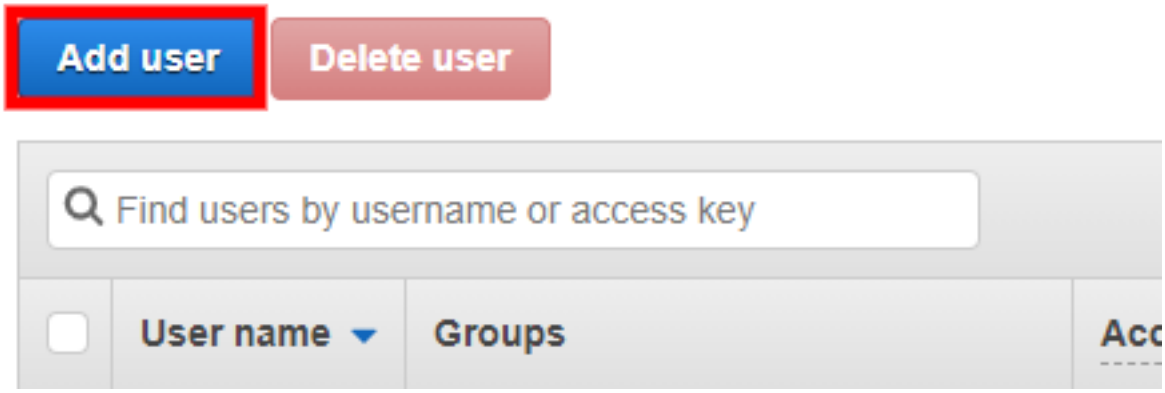
1. Open the **AWS Management Console** and look for **IAM** under **Find Services**.


aws
Services
AWS Management
AWS services
Find Services
You can enter names, keywords or acronyms.
IAM
IAM
Manage access to AWS resources
Recently visited services
IAM
EC2
Key Management Service
All services
Compute
EC2
Lightsail
Lambda
Batch
Feedback
English (US)

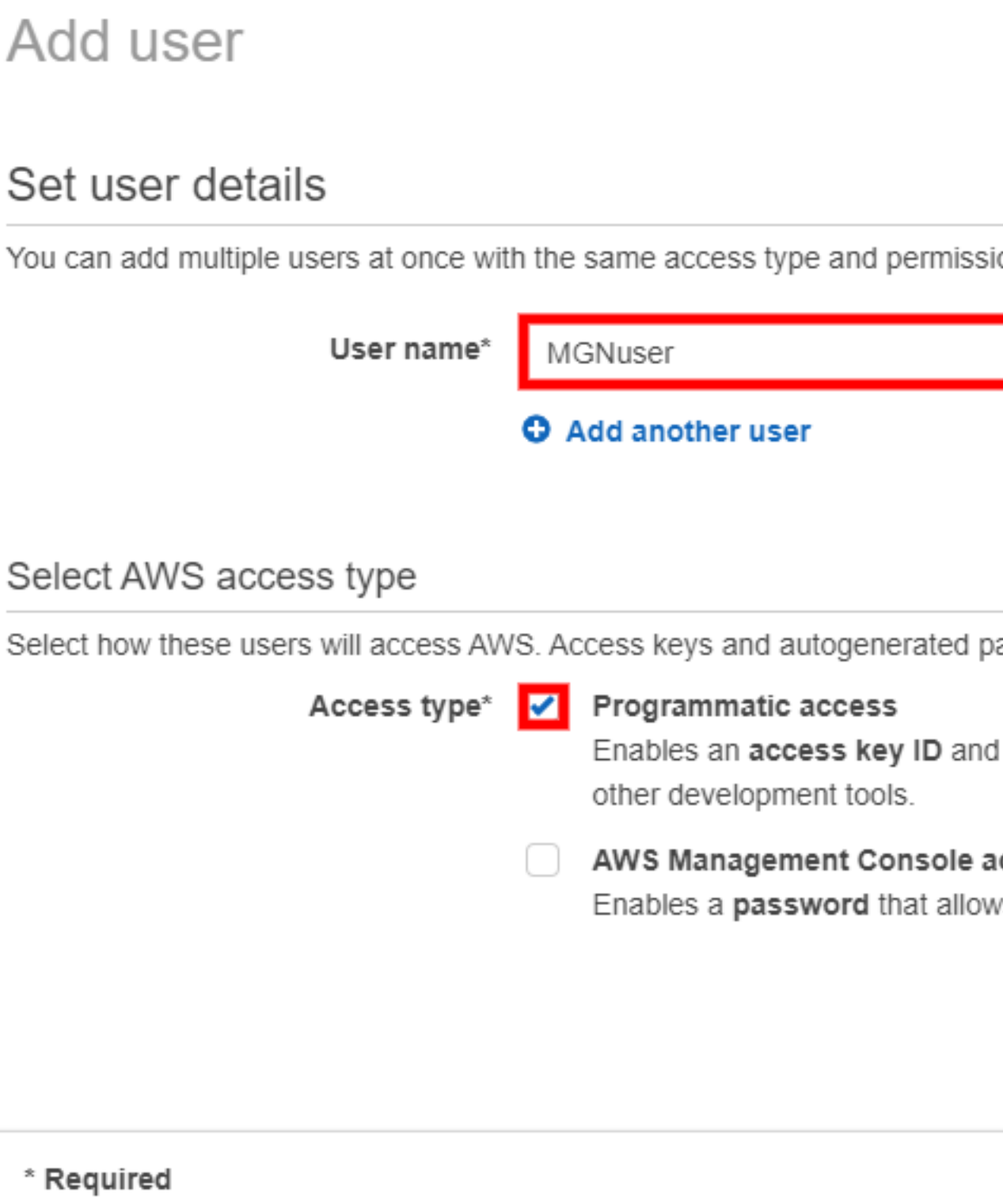
2. From the **IAM** main page, choose **Users** from the left-hand navigation menu.



3. You can either select an existing user or add a new user. We will be adding a new user specifically for Application Migration Service. Choose **Add user**.

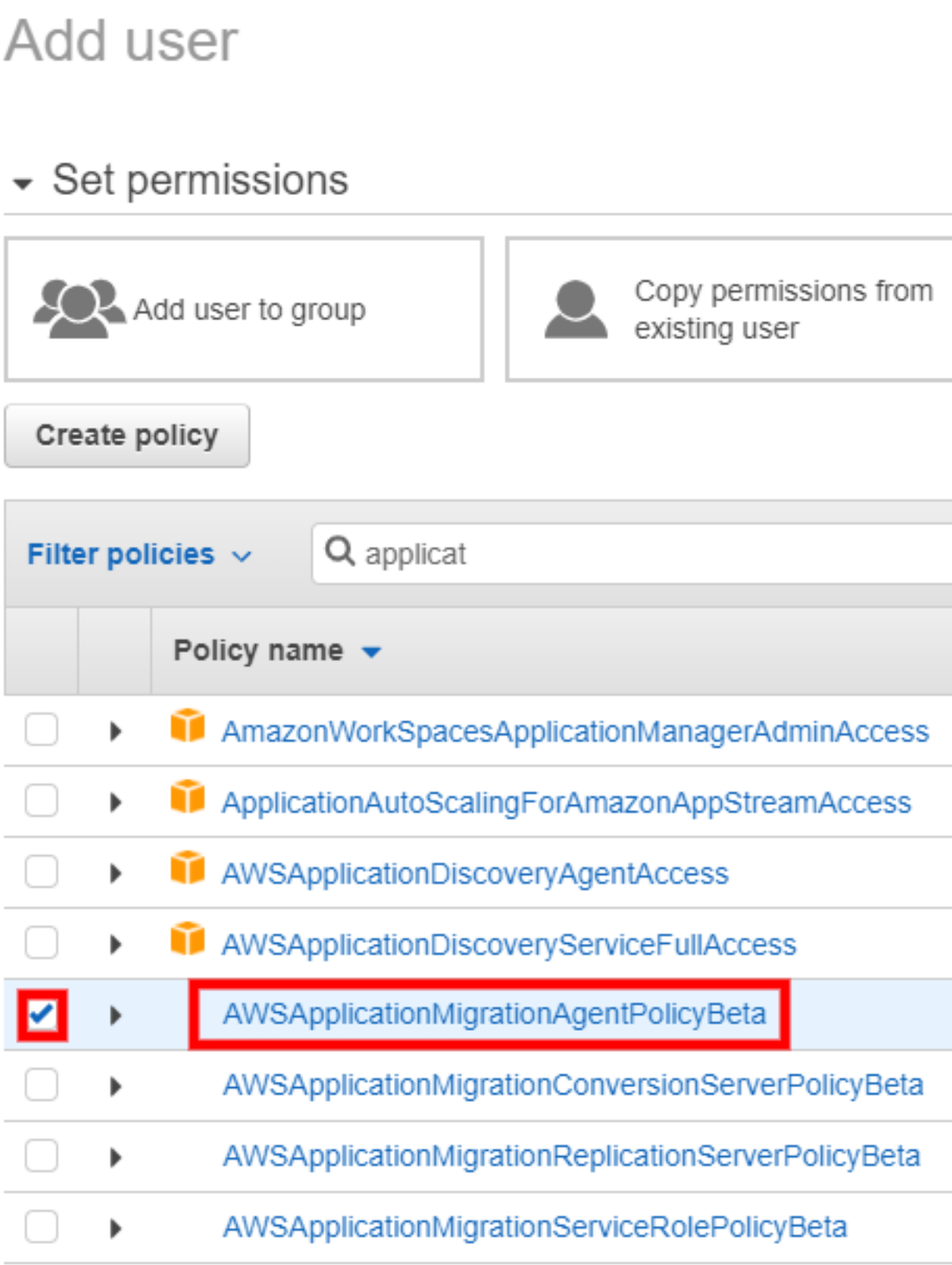


4. Give the user a **User name** and select the **Programmatic access** access type. Choose **Next: Permissions**.

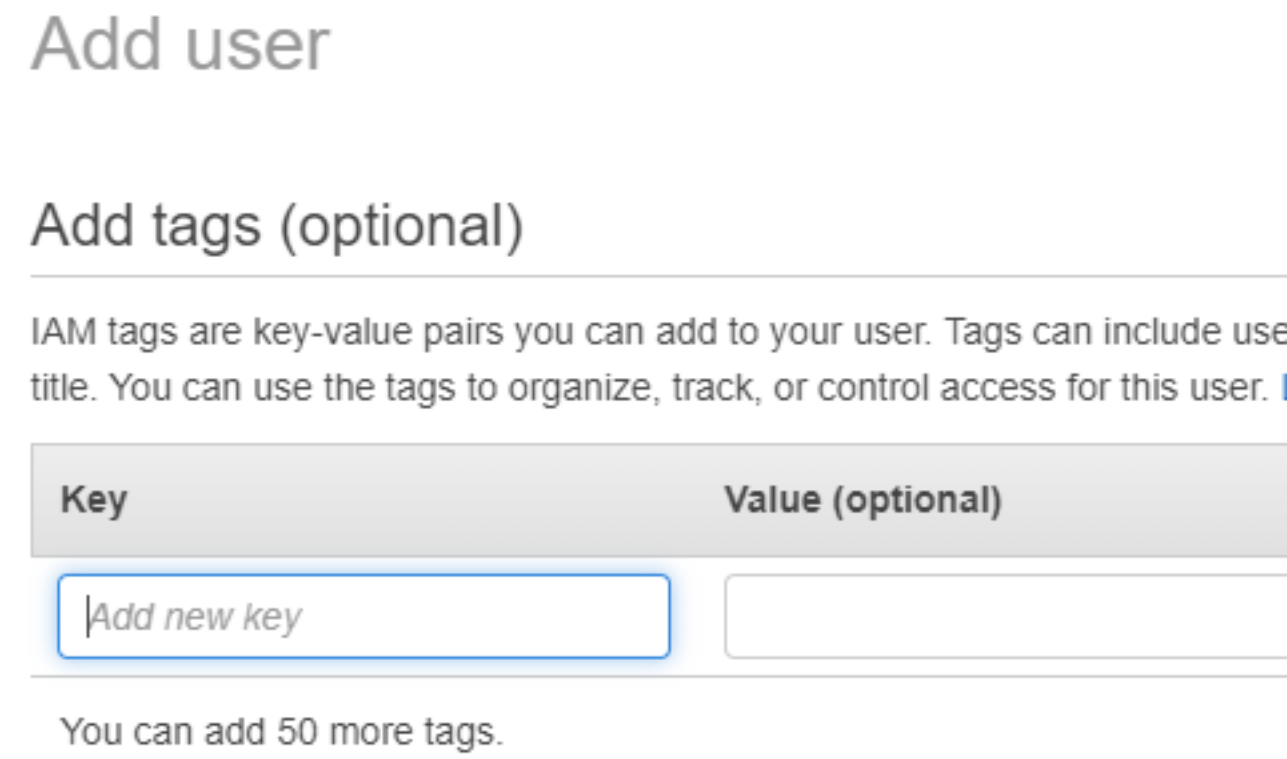


5. Choose the **Attach existing policies directly** option. Search for **AWSApplicationMigrationAgentPolicyBeta**. Select the policy and choose **Next: Tags.**

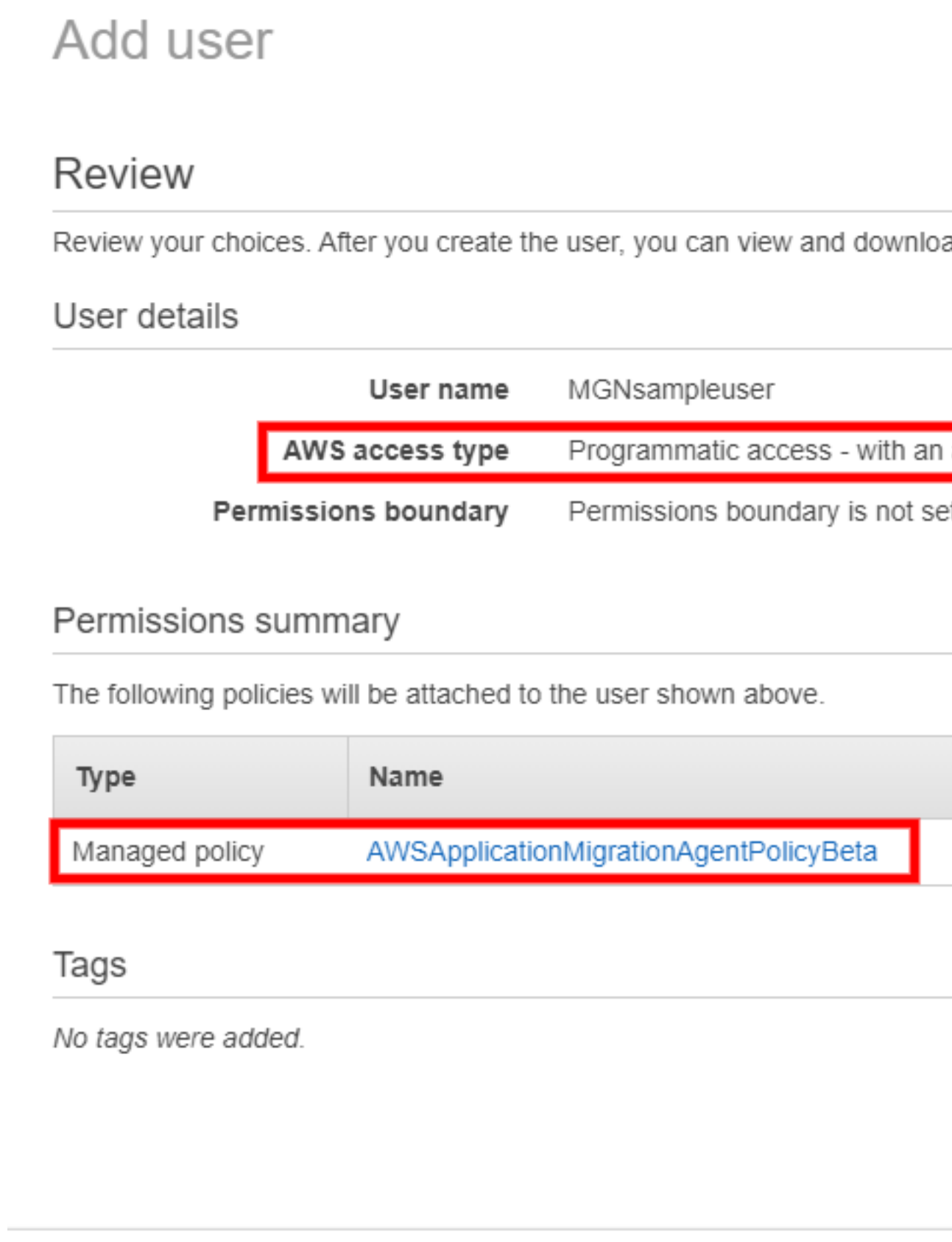
This policy will only be available if you completed the mandatory Cloudformation setup steps (p. 3).


Add user
Set permissions
Add user to group
Copy permissions from existing user
Create policy
Filter policies
applicat
Policy name
AmazonWorkSpacesApplicationManagerAdminAccess
ApplicationAutoScalingForAmazonAppStreamAccess
AWSApplicationDiscoveryAgentAccess
AWSApplicationDiscoveryServiceFullAccess
AWSApplicationMigrationAgentPolicyBeta
AWSApplicationMigrationConversionServerPolicyBeta
AWSApplicationMigrationReplicationServerPolicyBeta
AWSApplicationMigrationServiceRolePolicyBeta

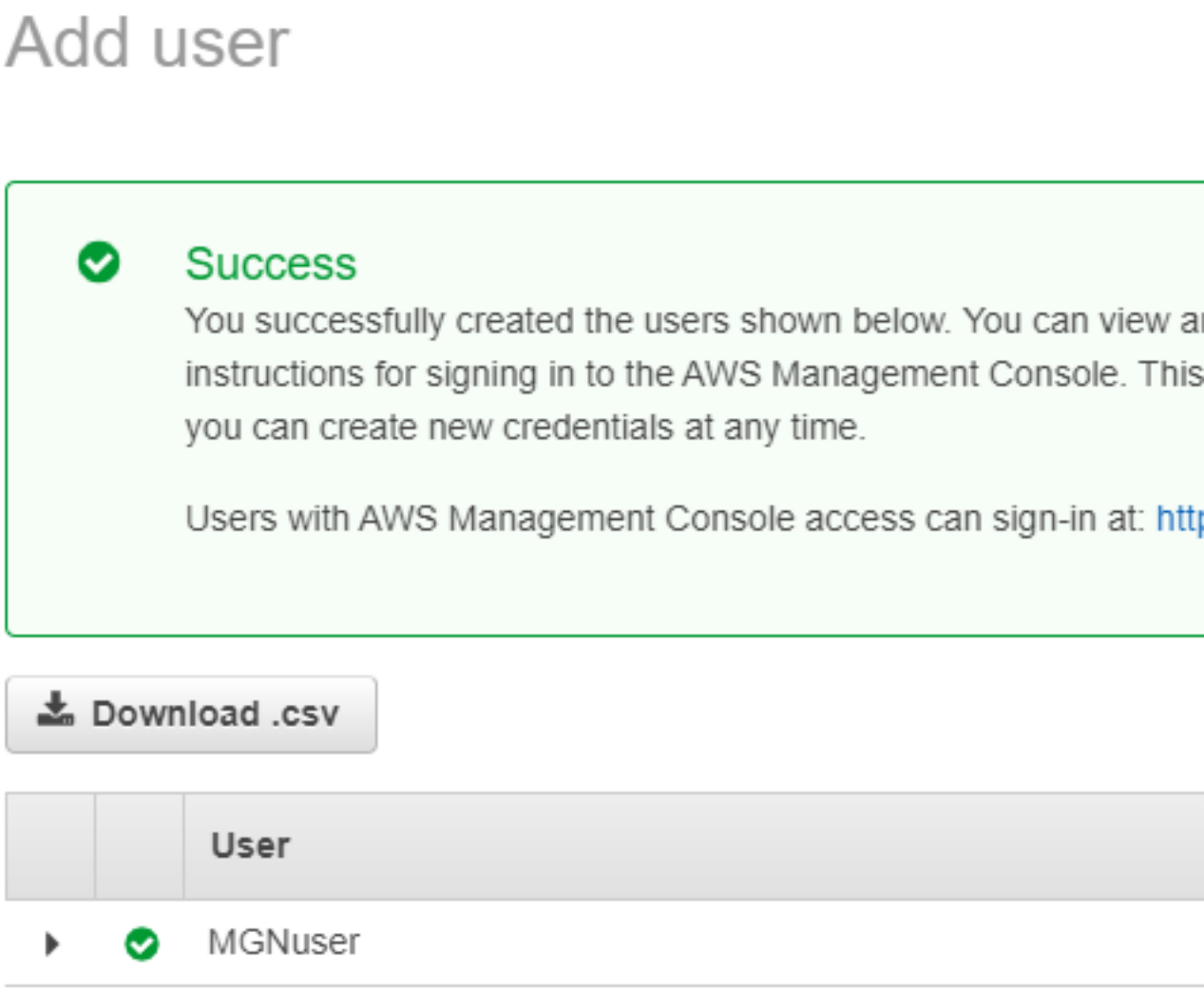
6. Add tags if you wish to use them. Tags are optional. We will not be adding tags in these instructions. Choose **Next: Review.**



7. Review the information. Ensure that the **Programmatic access** type is selected and that the correct policy is attached to the user. Choose **Create user**.

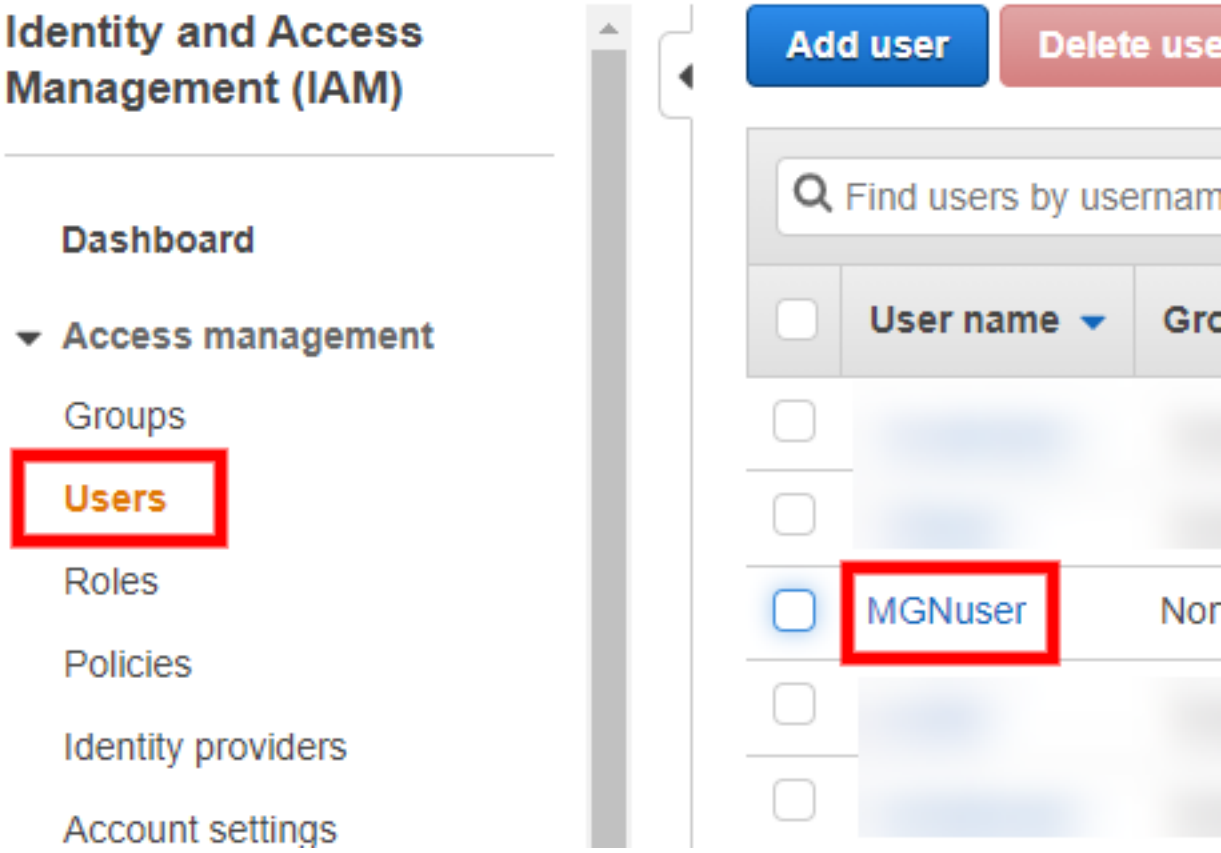

Add user
Review
Review your choices. After you create the user, you can view and downloa
User details
User name
MGNsampleuser
AWS access type
Programmatic access - with an
Permissions boundary
Permissions boundary is not se
Permissions summary
The following policies will be attached to the user shown above.
Type
Name
Managed policy
AWSApplicationMigrationAgentPolicyBeta
Tags
No tags were added.

8. The AWS Management Console will confirm that the user has been successfully created and will provide you with the **Access key ID** and **Secret access key** that you will need in order to install the AWS Replication Agent.

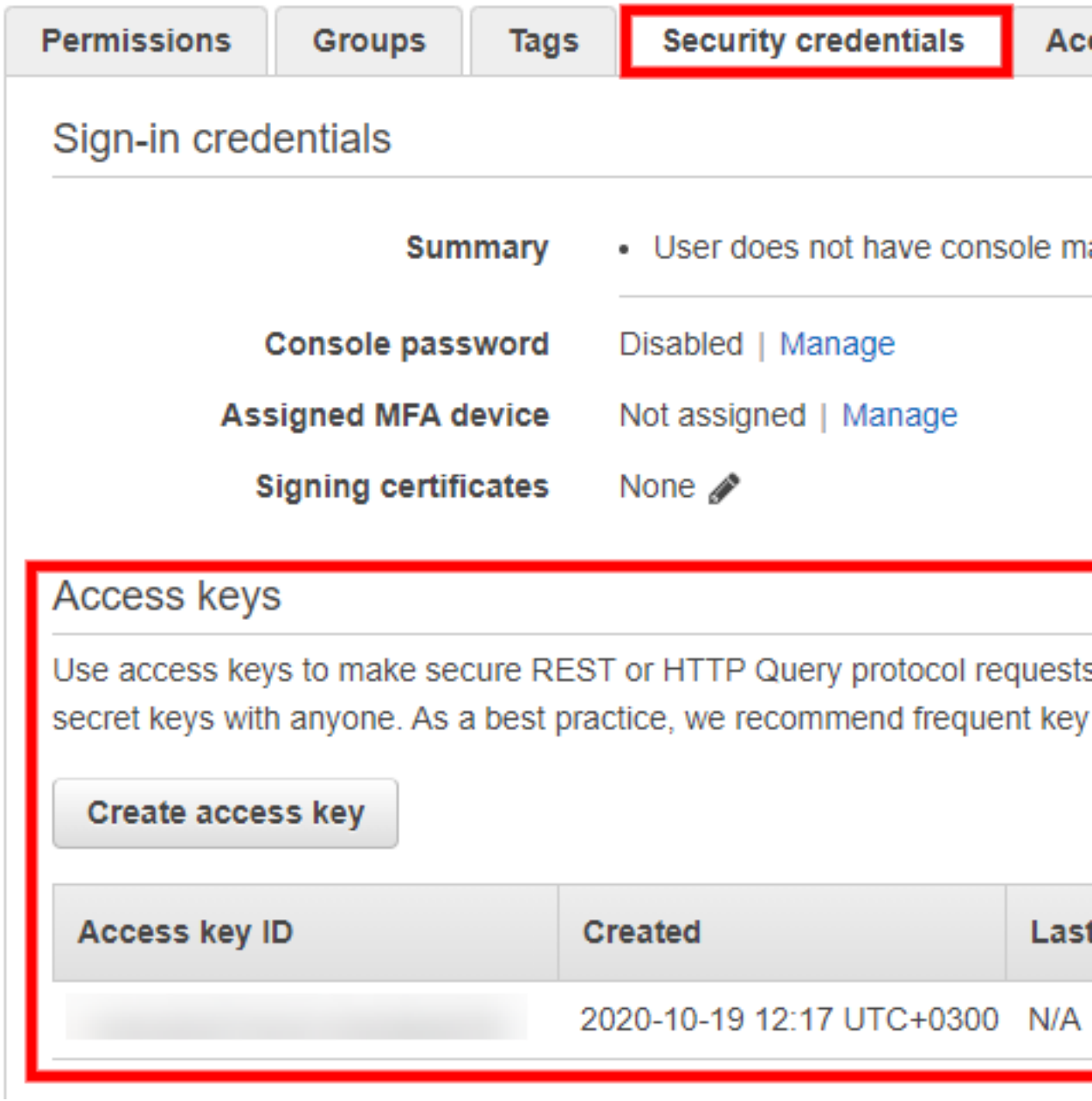


You need the Access key ID and secret access key in order to install the AWS Replication Agent on your Source servers. You can save this information as .csv file by choosing the **Download .csv** option.

You can also access this information and re-generate your security credentials by navigating to **IM > Users > Your user**.



Open the **Security credentials** tab and scroll down to **Access keys**. Here you can manage your access keys (create, delete, etc).



Installation Instructions

Once you have generated the required AWS credentials, you can install the AWS Replication Agent on your Source servers. There are separate installation instructions for Linux and for Windows. Each operating system has its own installer and various installation options and parameters.

Topics

- Linux (p. 115)
- Windows (p. 122)

Linux

1. Download the agent installer with the wget command into the powershell command line on your Linux source server. This wget comamnd will download the Agent installer file - aws-replication-installet-init.py onto your machine.

   ```
   wget -O ./aws-replication-installer-init.py https://aws-application-migration-service-pb-us-east-1.s3.amazonaws.com/latest/linux/aws-replication-installer-init.py
   ```

   The command line will indicate when the installer has been successfully downloaded.

   Important
   You need root privileges to run the Agent Installer file on a Linux machine. Alternatively, you can run the Agent Installer file with sudo permissions.

   Important
   If you need to validate the installer hash, the correct hash can be found here: https://aws-application-migration-service-pb-us-east-1.amazonaws.com/mgn-preview/latest/linux/aws-replication-installer-init.py.sha512

   Note
   The Linux installer creates the "Application Migration Service" group and "Application Migration Service" user within that group. The Agent will run within the context of the newly created user. Agent installation will attempt to add the user to "sudoers". Installation will fail if the Agent is unable to add the newly created "Application Migration Service" user to "sudoers" .

2. Once the Agent installer has successfully downloaded, copy and input the installer command into the powershell command line on your Source server in order to run the installation script.

   ```
   sudo python3 aws-replication-installer-init.py
   ```

   You can add a variety of parameters to the installation script in order to manipulate the way the Agent is installed on your server. Add the parameters to the end of the installation script.

   Available parameters include:

   - --no-prompt

     This parameter will run a silent installation.

   - --devices

     This parameter specifies which specific disks to replicate. This parameter does not function when your Source servers are located in AWS.

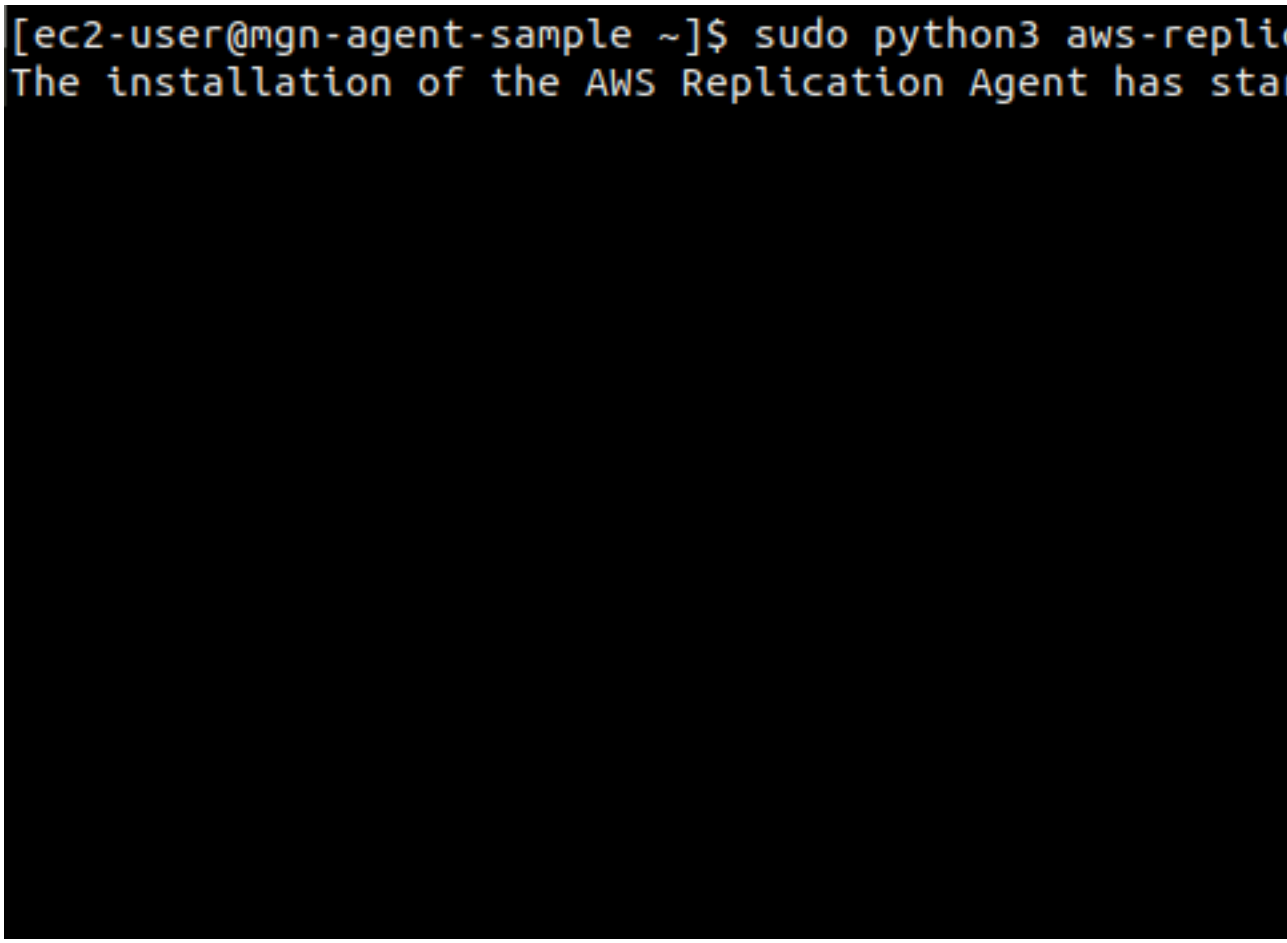
   - --force-volumes

     This parameter must be used with the --no-prompt parameter. This parameter will cancel the automatic detection of physical disks to to replicate. You will need to specify the exact disks to replicate using the --devices parameter. This parameter should only be used as a troubleshooting tool in case the --devices parameter fails to identify the disks correctly. This parameter does not function when your Source servers are located in AWS.

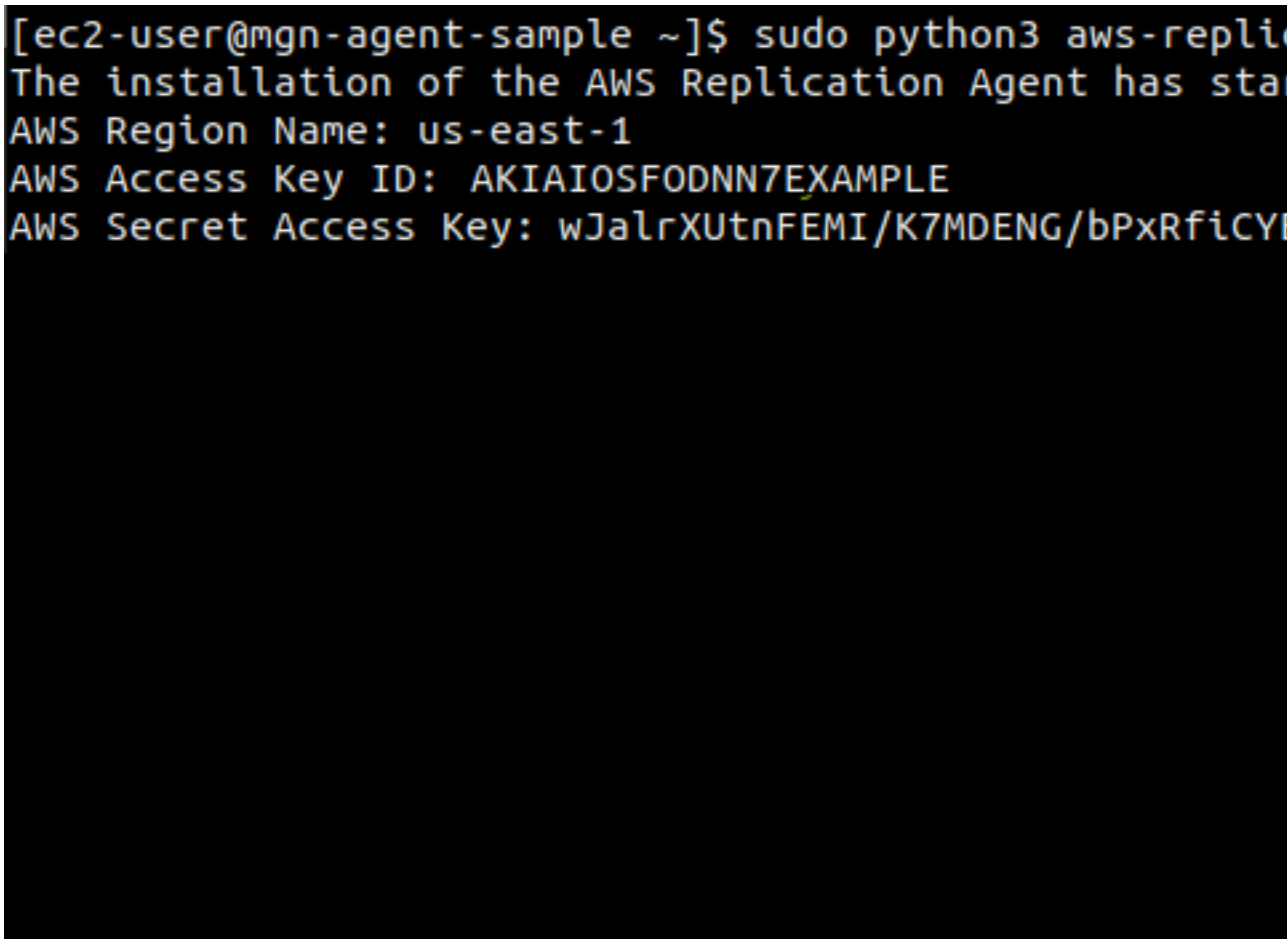
   - --tags

     Use this parameter to add resource tags to the Source server. Use a space to separate each tag (ex. --tags tag1 tag2 tag3)

   The installer will confirm that the installation of the AWS Replication Agent has started.

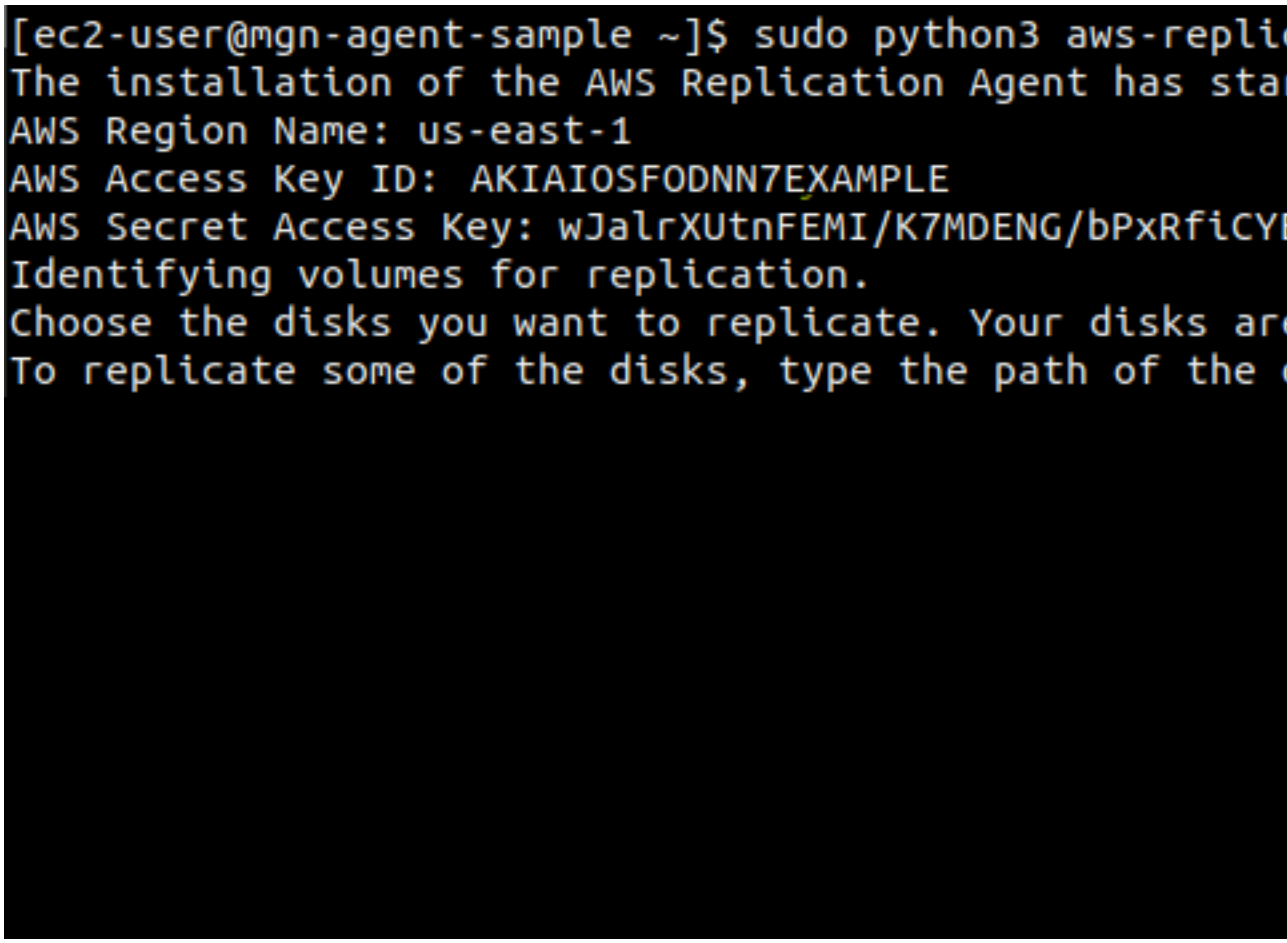


3. The installer will prompt you to enter your **AWS Region Name** and the **AWS Access Key ID** and **AWS Secret Access Key** that you previously generated. Enter the complete Region name (ex. eu-central-1), and the full AWS Access Key ID and the full AWS Secret Access Key.

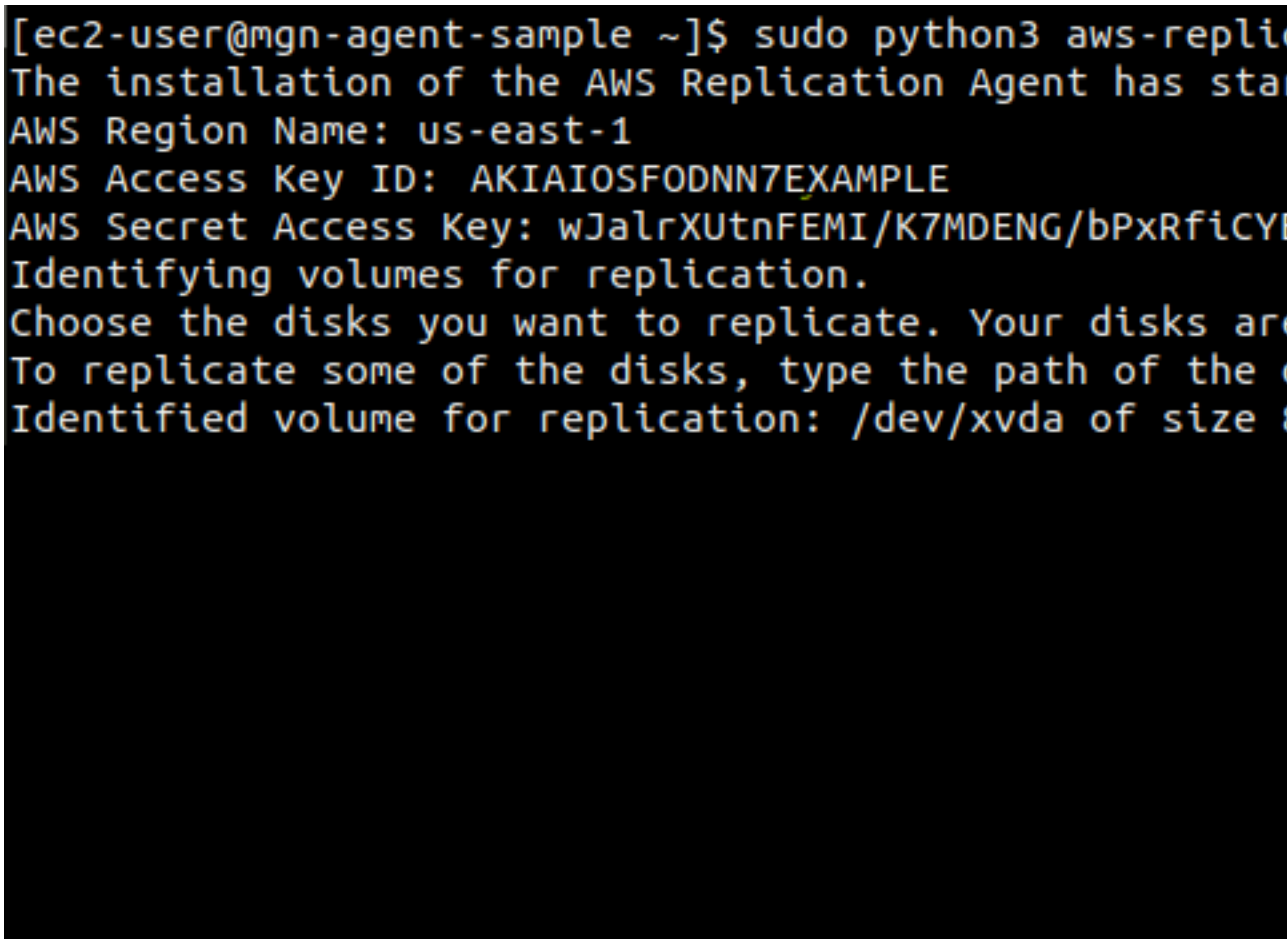


Note
You can also enter these values as part of the installation script command parameters. If you do not enter these parameters at part of the installation script, you will be prompted to enter them one by one as described above. (ex. `sudo python3 aws-replication-installer-init.py --region regionname --aws-access-key-id AKIAIOSFODNN7EXAMPLE --aws-secret-access-key wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY`)

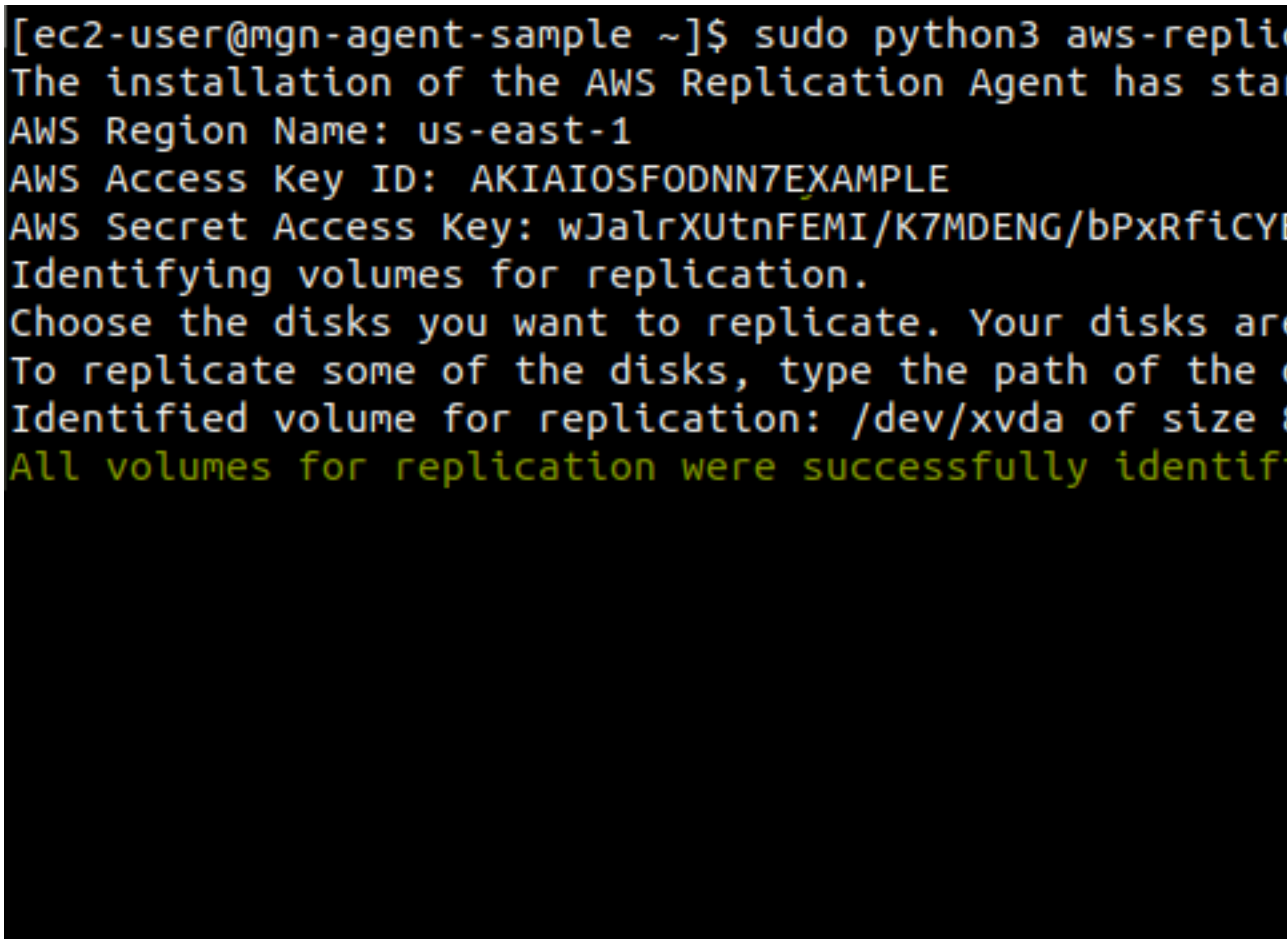
4. Once you have entered your credentials, the installer will identify volumes for replication. The installer will display the identified disks and prompt you to choose the disks you want to replicate.



To replicate some of the disks, type the path of the disks, separated by a comma, as illustrated in the installer (ex. /dev/sda, /dev/sdb, etc). To replicate all of the disks, press Enter. The installer will identify the selected disks and print their size.



The installer will confirm that all disks were successfully identified.

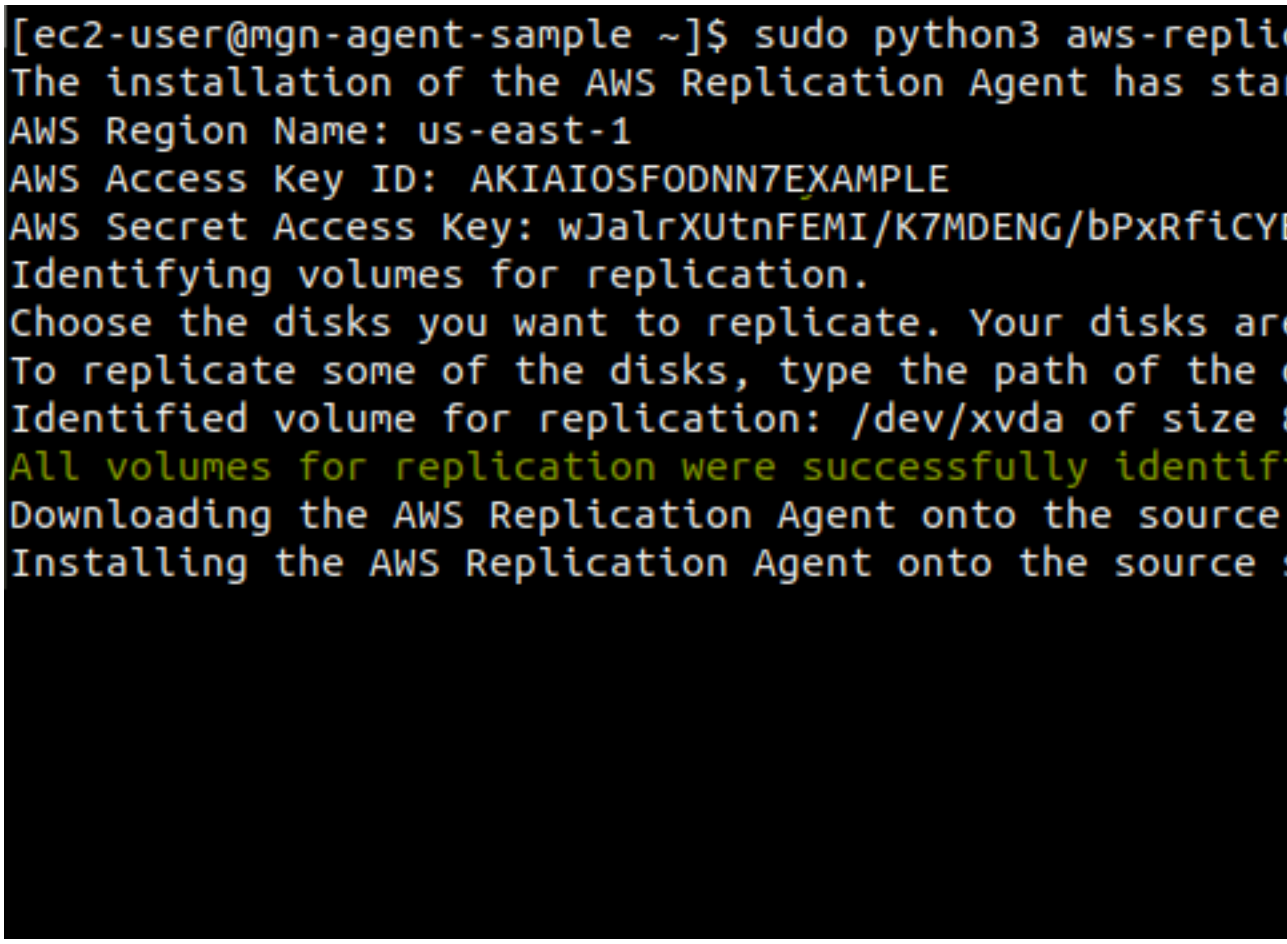


Note
When identifying specific disks for replication, do not use apostrophes, brackets, or disk paths that do not exist. Type only existing disk paths. Each disk you selected for replication is displayed with the caption Disk to replicate identified. However, the displayed list of identified disks for replication may differ from the data you entered. This difference can due to several reasons:

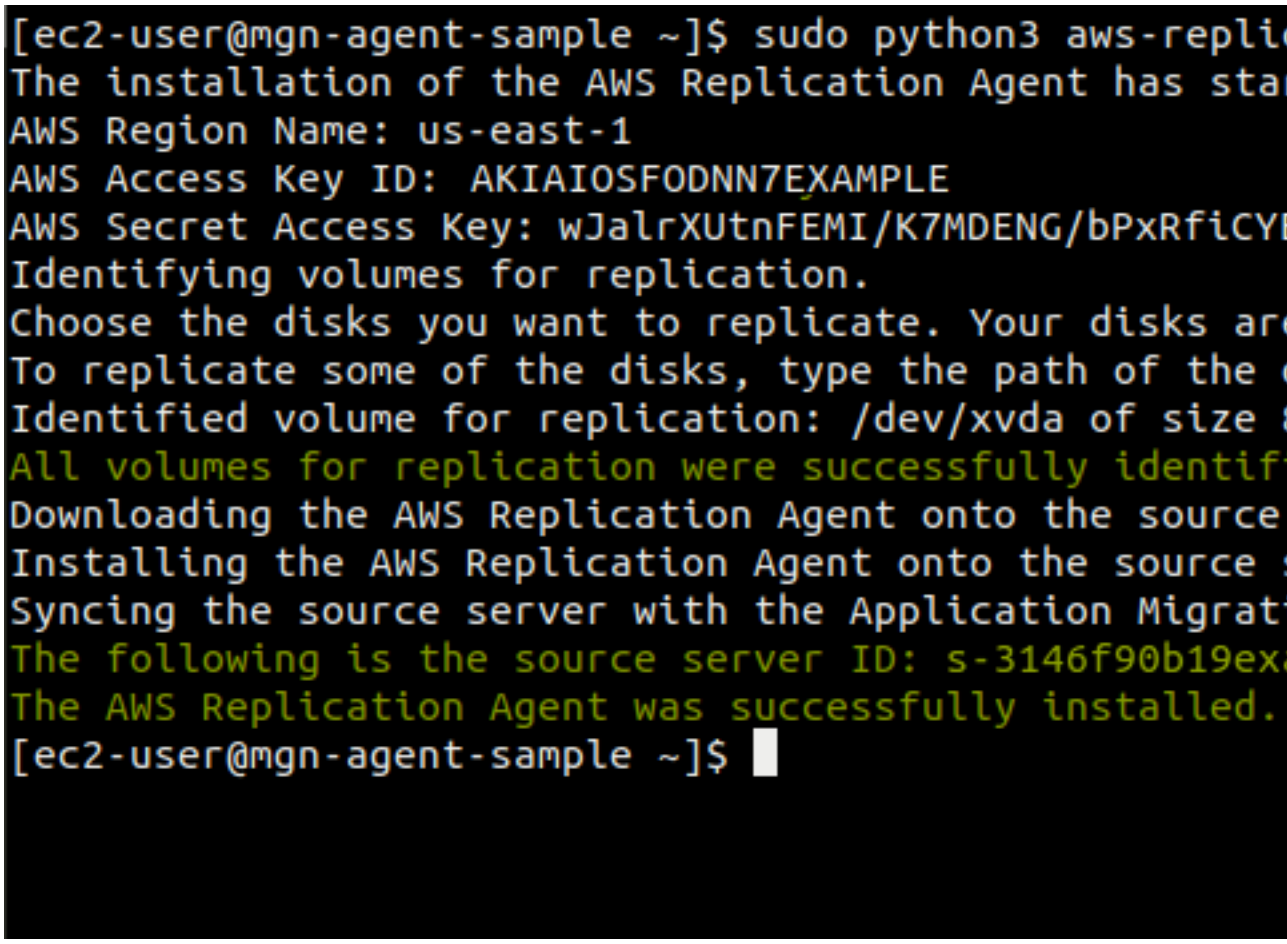
- The root disk of the Source server is always replicated, whether you select it or not. Therefore, it always appears on the list of identified disks for replication.
- Application Migration Service replicates whole disks. Therefore, if you choose to replicate a partition, its entire disk will appear on the list and will later be replicated. If several partitions on the same disk are selected, then the disk encompassing all of them will only appear once on the list.
- Incorrect disks may be chosen by accident. Ensure that the correct disks have been chosen.

Important
If disks are disconnected from a server, Application Migration Service can no longer replicate them, so they are removed from the list of replicated disks. When they are re-connected, the AWS Replication Agent cannot know that these were the same disks that were disconnected and therefore does not add them automatically. To add the disks after they are reconnected, rerun the AWS Replication Agent installer on the server.
Note that the returned disks will need be replicated from scratch. Any disk size changes will be automatically identified, but will also cause a resync. Perform a test after installing the Agent to ensure that the correct disks have been added.

5. After all of the disks that will be replicated have been successfully identified, the installer will download and install the AWS Replication Agent onto the source server.



6. Once the AWS Replication Agent is installed, the server will be added to the Application Migration Service Console and will undergo the initial sync process. The installer will provide you with the Source server's ID.



You can review this process in real time on the **Source Servers** page. Learn more about the initial sync process (p. 173).

Windows

1. Download the agent installer (AWSReplicationWindowsInstaller.exe)**.** Copy or distribute the downloaded agent installer to each Windows source server you want to add to Application Migration Service.

   https://aws-application-migration-service-pb-us-east-1.s3.amazonaws.com/latest/windows/AwsReplicationWindowsInstaller.exe

   Important
   You need to run the Agent Installer file as an Administrator on each Windows machine.

   Important
   If you need to validate the installer hash, the correct hash can be found here: https://aws-application-migration-service-pb-us-east-1.amazonaws.com/mgn-preview/latest/windows/AwsReplicationWindowsInstaller.exe.sha512

2. Run the agent installer file - AWSReplicationWindowsInstaller.exe - as an Administrator. The CMD will open. Run the installation command.

   You can add a variety of parameters to the installation script in order to manipulate the way the Agent is installed on your server. Add the parameters to the end of the installation script.

Available parameters include:

- --no-prompt

  This parameter will run a silent installation.

- --devices

  This parameter specifies which specific disks to replicate. This parameter does not function when your Source servers are located in AWS.

- --force-volumes

  This parameter must be used with the --no-prompt parameter. This parameter will cancel the automatic detection of physical disks to replicate. You will need to specify the exact disks to replicate using the --devices parameter. This parameter should only be used as a troubleshooting tool in case the --devices parameter fails to identify the disks correctly. This parameter does not function when your Source servers are located in AWS.

- --tags

  Use this parameter to add resource tags to the Source server. Use a space to separate each tag (ex. --tags tag1 tag2 tag3)

The installer will confirm that the installation of the AWS Replication Agent has started.

3. The installer will prompt you to enter your **AWS Region Name** and the **AWS Access Key ID** and **AWS Secret Access Key** that you previously generated. Enter the complete Region name (ex. eu-central-1), and the full AWS Access Key ID and the full AWS Secret Access Key.

   Note
   You can also enter these values as part of the installation script command parameters. If you do not enter these parameters at part of the installation script, you will be prompted to enter them one by one as described above. (ex. `AwsReplicationWindowsInstaller.exe ----region regionname --aws-access-key-id AKIAIOSFODNN7EXAMPLE --aws-secret-access-key wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY`)

4. Once you have entered your credentials, the installer will verify that the Source server has enough free disk space for Agent installation and identify volumes for replication. The installer will display the identified disks and prompt you to choose the disks you want to replicate.

   To replicate some of the disks, type the path of the disks, separated by a comma, as illustrated in the installer (ex. C:, D:, etc). To replicate all of the disks, press **Enter**. The installer will identify the selected disks and print their size.

   The installer will confirm that all disks were successfully identified.

   Note
   When identifying specific disks for replication, do not use apostrophes, brackets, or disk paths that do not exist. Type only existing disk paths. Each disk you selected for replication is displayed with the caption Disk to replicate identified. However, the displayed list of identified disks for replication may differ from the data you entered. This difference can due to several reasons:

   - The root disk of the Source server is always replicated, whether you select it or not. Therefore, it always appears on the list of identified disks for replication.
   - Application Migration Service replicates whole disks. Therefore, if you choose to replicate a partition, its entire disk will appear on the list and will later be replicated. If several

partitions on the same disk are selected, then the disk encompassing all of them will only appear once on the list.

- Incorrect disks may be chosen by accident. Ensure that the correct disks have been chosen.

Important
If disks are disconnected from a server, Application Migration Service can no longer replicate them, so they are removed from the list of replicated disks. When they are re-connected, the AWS Replication Agent cannot know that these were the same disks that were disconnected and therefore does not add them automatically. To add the disks after they are reconnected, rerun the AWS Replication Agent installer on the server.
Note that the returned disks will need be replicated from scratch. Any disk size changes will be automatically identified, but will also cause a resync. Perform a test after installing the Agent to ensure that the correct disks have been added.

5. After all of the disks that will be replicated have been successfully identified, the installer will download and install the AWS Replication Agent onto the source server.

6. Once the AWS Replication Agent is installed, the server will be added to the Application Migration Service Console and will undergo the initial sync process. The installer will provide you with the Source server's ID.

   You can review this process in real time on the **Source Servers** page. Learn more about the initial sync process (p. 173).

Uninstalling the Agent

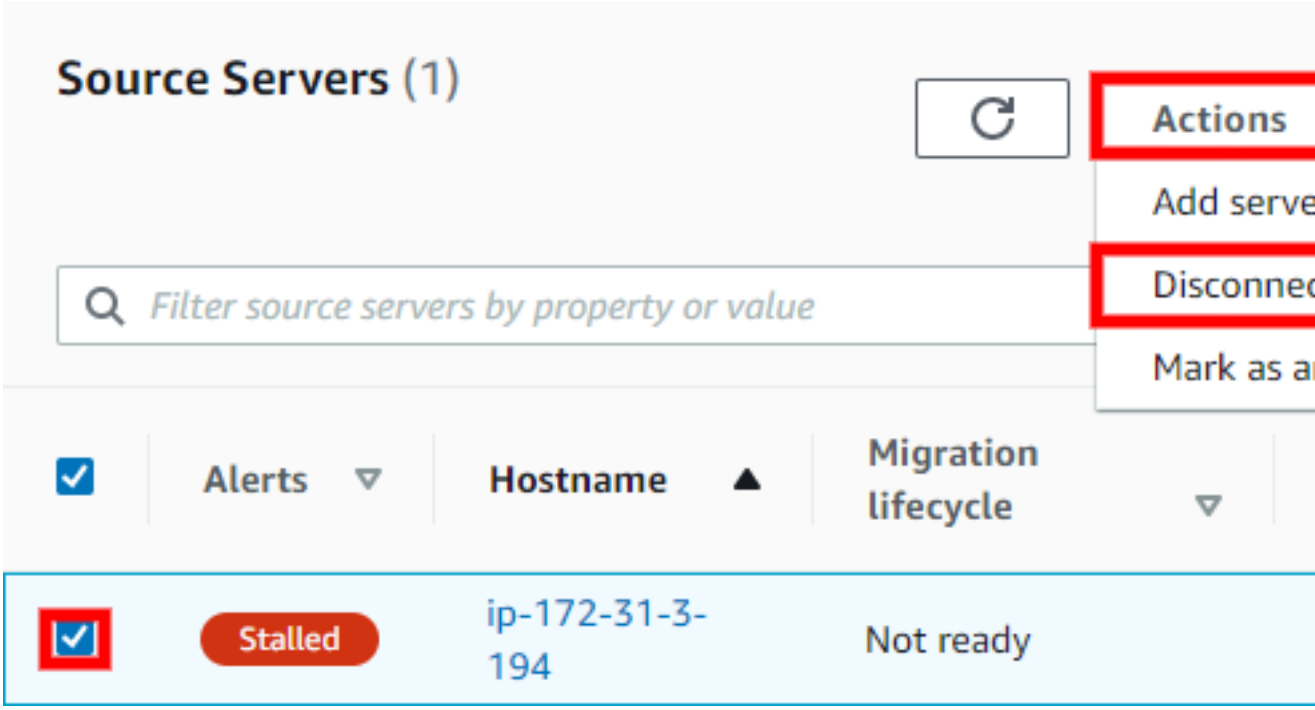
Uninstalling the AWS Replication Agent from a source server stops the replication of that server. Uninstalling the AWS Replication Agent will remove the source server from the Application Migration Service Console.

Uninstalling the Agent through the Application Migration Service Console

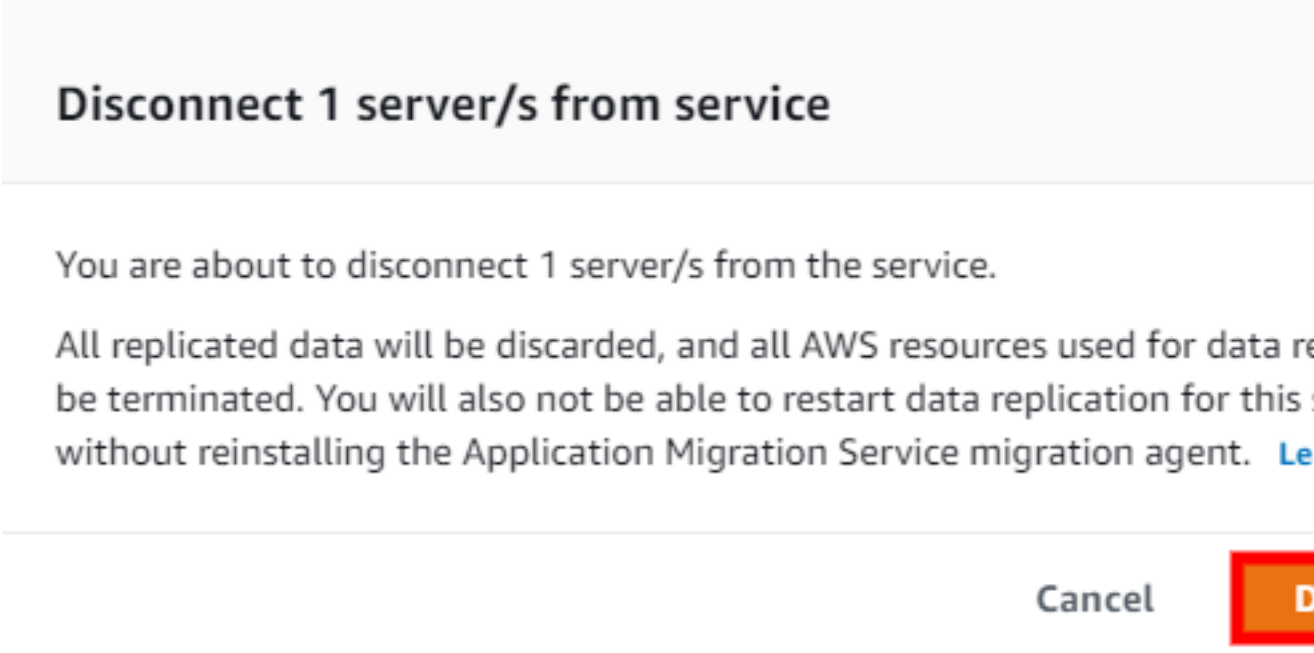
To uninstall the AWS Replication Agent though the Application Migration Service Console.

Navigate to the **Source Servers** page.

Check the box to the left of each server that you want to disconnect from Application Migration Service (by uninstalling the AWS Replication Agent), open the **Actions** menu, and choose the **Disconnect from AWS** option to disconnect the selected server from Application Migration Service and AWS.



On the **Disconnect X server/s from service** dialog, choose **Disconnect**.



The AWS Replication Agent will be uninstalled from all selected source servers. You will then be able to archive the servers. Learn more about archiving. (p. 142)

Supported Operating Systems

Application Migration Service allows the replication of any Source machine, whether physical, virtual or cloud-based into the AWS cloud for a large variety of operating systems.

Windows Notes

Note
It is recommended to install all available Windows Updates on the machine.

Note
Windows Source machines need to have at least 2 GB of free space in order to launch a Target machine successfully.

Linux Notes

Note
Application Migration Service does not support 32 bit versions of Linux.

Note
Ensure that you have Python installed on the machine (version 2.4+, version 3.0+) for Agent installation.

Note
Only machines using the GRUB bootloader are supported.

Note
Kernel versions earlier than 2.6.18-164 are not supported by AWS and Application Migration Service. Therefore, machines that run these kernel versions cannot be replicated by Application Migration Service.

General Notes

Note
Application Migration Service does not support Paravirtualized Source machines.

Windows

The following Windows operating systems are supported:

- Microsoft Windows Server 2008 R2 64 bit (patched) *See notes 3 and 6 below
- Microsoft Windows Server 2012 64 bit *See note 6 below
- Microsoft Windows Server 2012 R2 64 bit *See notes 3 and 6 below
- Microsoft Windows Server 2016 64 bit *See notes 3 and 6 below
- Microsoft Windows Server 2019 64 bit *See notes 3 and 6 below

Linux

The following Linux operating systems are supported:

- SUSE Linux (SLES) 12 and higher. *SP4 and higher
- Debian Linux 9 and higher *See note 2 below
- Ubuntu 12.04 and higher *See note 2 below
- Red Hat Enterprise Linux (RHEL) 6.0 and higher *See notes 1, 3, and 4 below
- Oracle Linux 6.0 and higher *Oracle Linux 6.0+ running Unbreakable Enterprise Kernel Release 3 or higher or Red Hat Compatible Kernel only
- CentOS 6.0 and higher *See notes 3 and 4 below

Notes

Note 1: According to AWS requirements, machines running Red Hat Enterprise Linux (RHEL) must have Cloud Access (BYOL) licenses to be copied to AWS.

Note 2: Only Kernel 3.x or above are supported for Debian/Ubuntu with AWS.

Note 3: The C5 and M5 family types will work with RHEL 7.0+ or CentOS 7.0+ in AWS in a Linux environment and with Windows Server 2008 R2, Windows Server 2012 R2, Windows Server 2016, and Windows Server 2019 in a Windows environment.

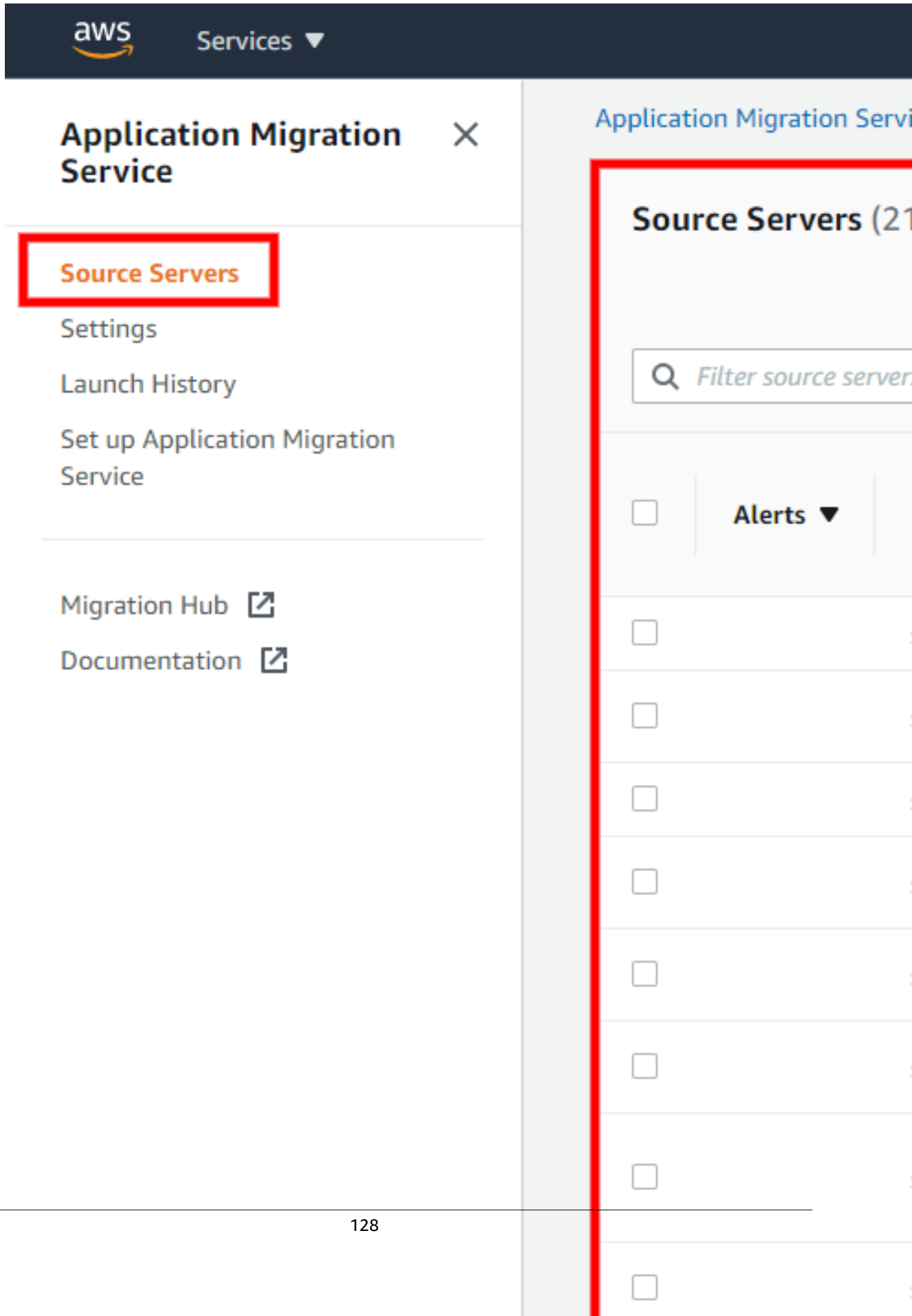
Note 4: Kernel versions 2.6.32-71 is not supported in RHEL 6.0 and CentOS 6.0 in AWS.

Note 5: Kernel versions earlier than 2.6.18-164 are not supported by Application Migration Service. Therefore, machines that run these kernel versions cannot be replicated by Application Migration Service.

Note 6: Microsoft Windows Server versions 2008 R2 and above require .Net Framework version 4.5 or above to be installed.

Source Servers page

The **Source Servers** page lists all of the source servers that have been added to Application Migration Service. The **Source Servers** page allows you to manage your source servers and perform a variety of commands for one or more servers (such as controlling replication and launching test and cutover instances). The **Source Servers** page is the "main" page of Application Migration Service and you will most likely interact with Application Migration Service predominantly through this page.

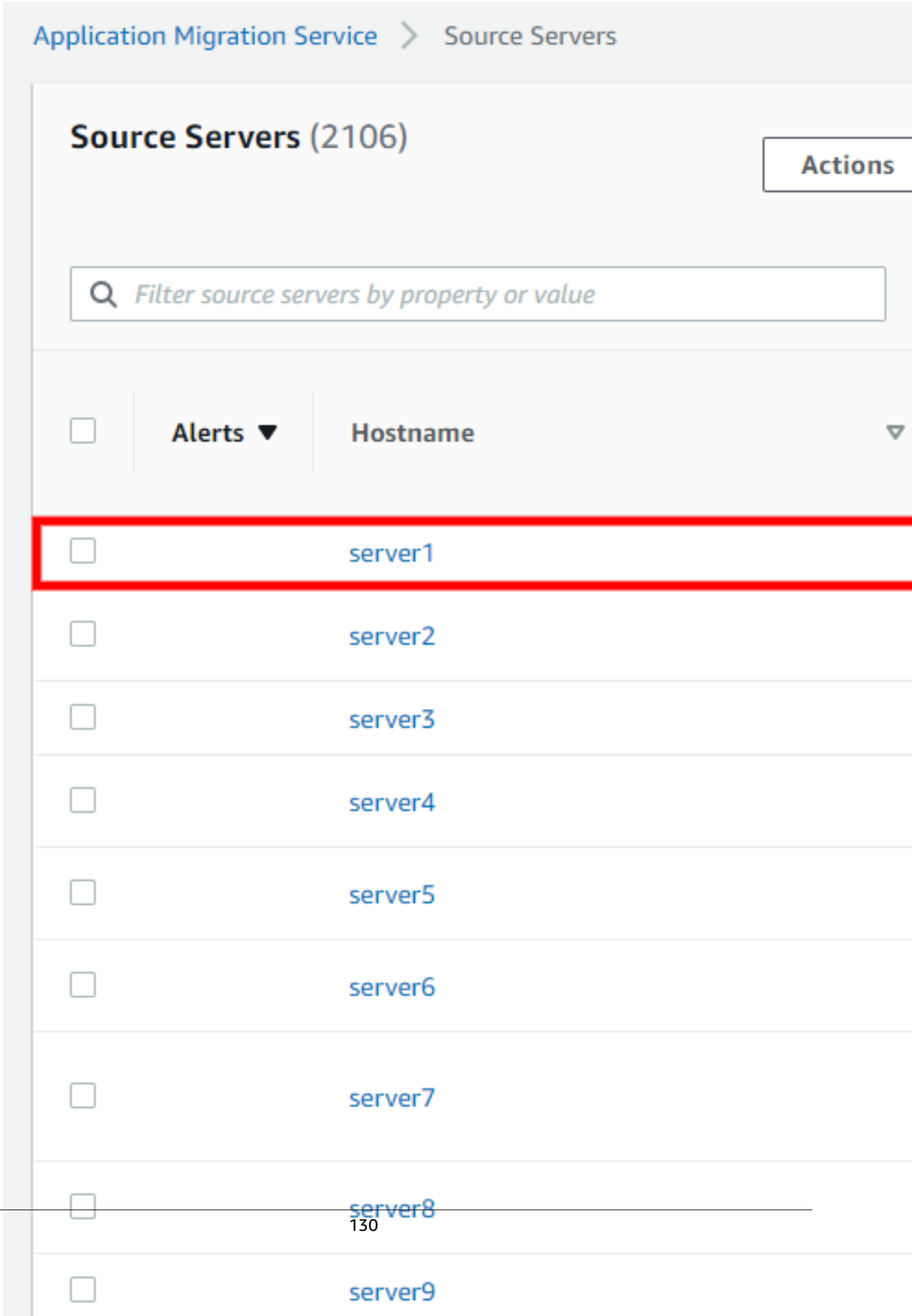

aws
Services
Application Migration Service
Source Servers
Settings
Launch History
Set up Application Migration Service
Migration Hub
Documentation
Application Migration Servi
Source Servers (21
Filter source server
Alerts

Topics

- Interracting with the Source servers page (p. 129)
- Command Menus (p. 141)
- Filtering (p. 159)

Interracting with the Source servers page

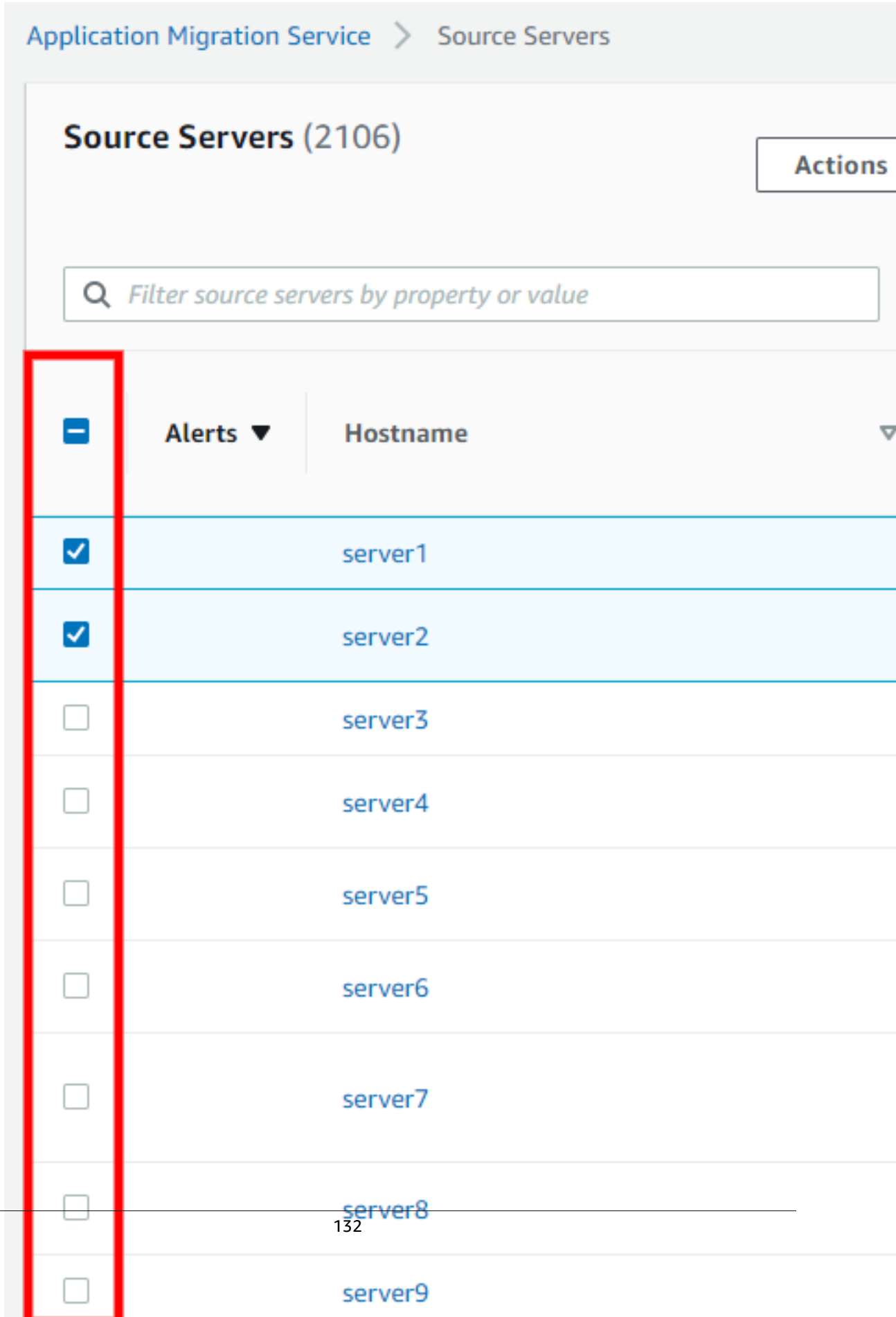
The **Source Servers** page shows a list of source servers. Each individual row on the list represents a single server.


Application Migration Service
Source Servers
Source Servers (2106)
Actions
Filter source servers by property or value
Alerts
Hostname
server1
server2
server3
server4
server5
server6
server7
server8
server9

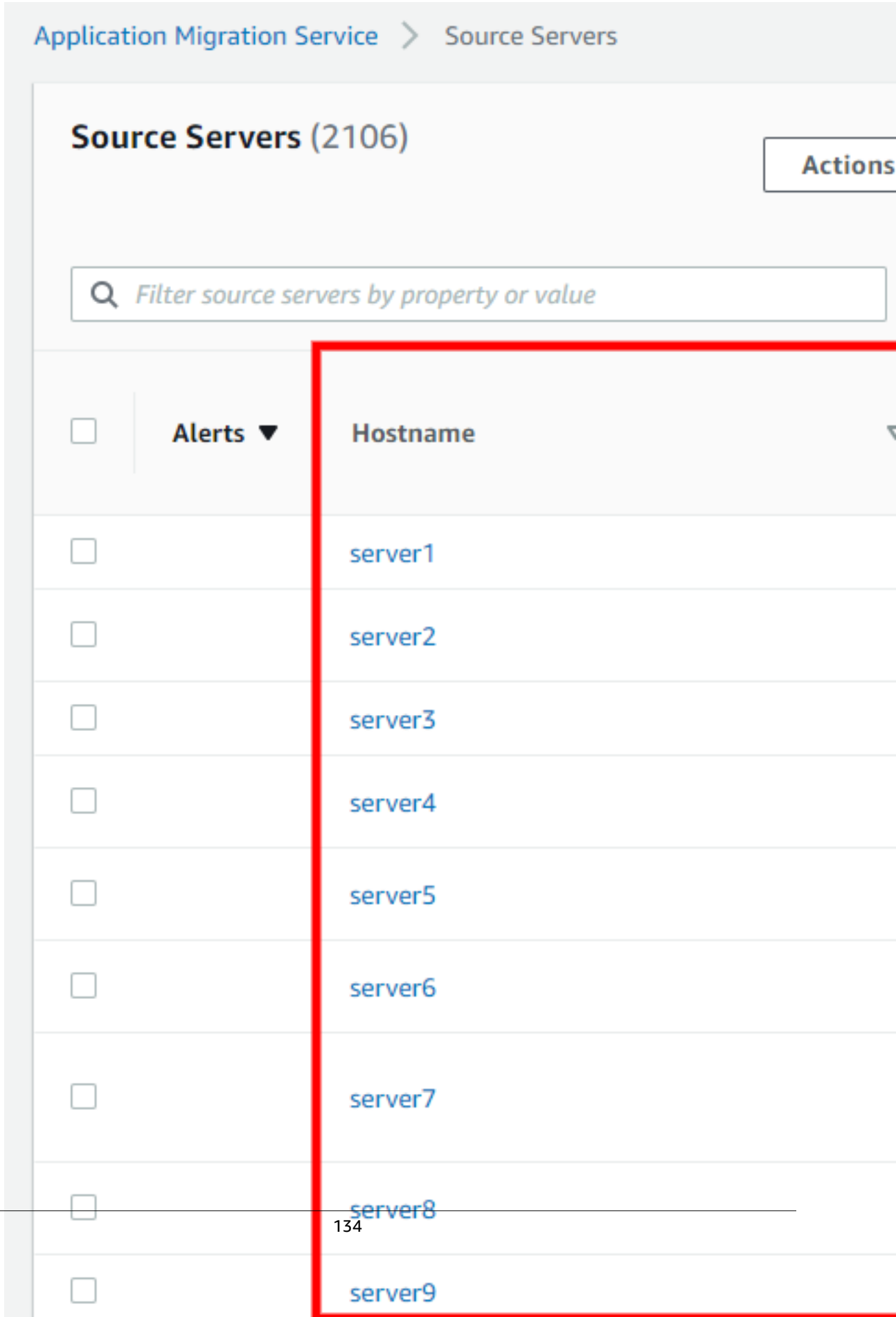
The **Source Servers** page provides key information for each individual source server through each of the columns on the page.

The columns include:

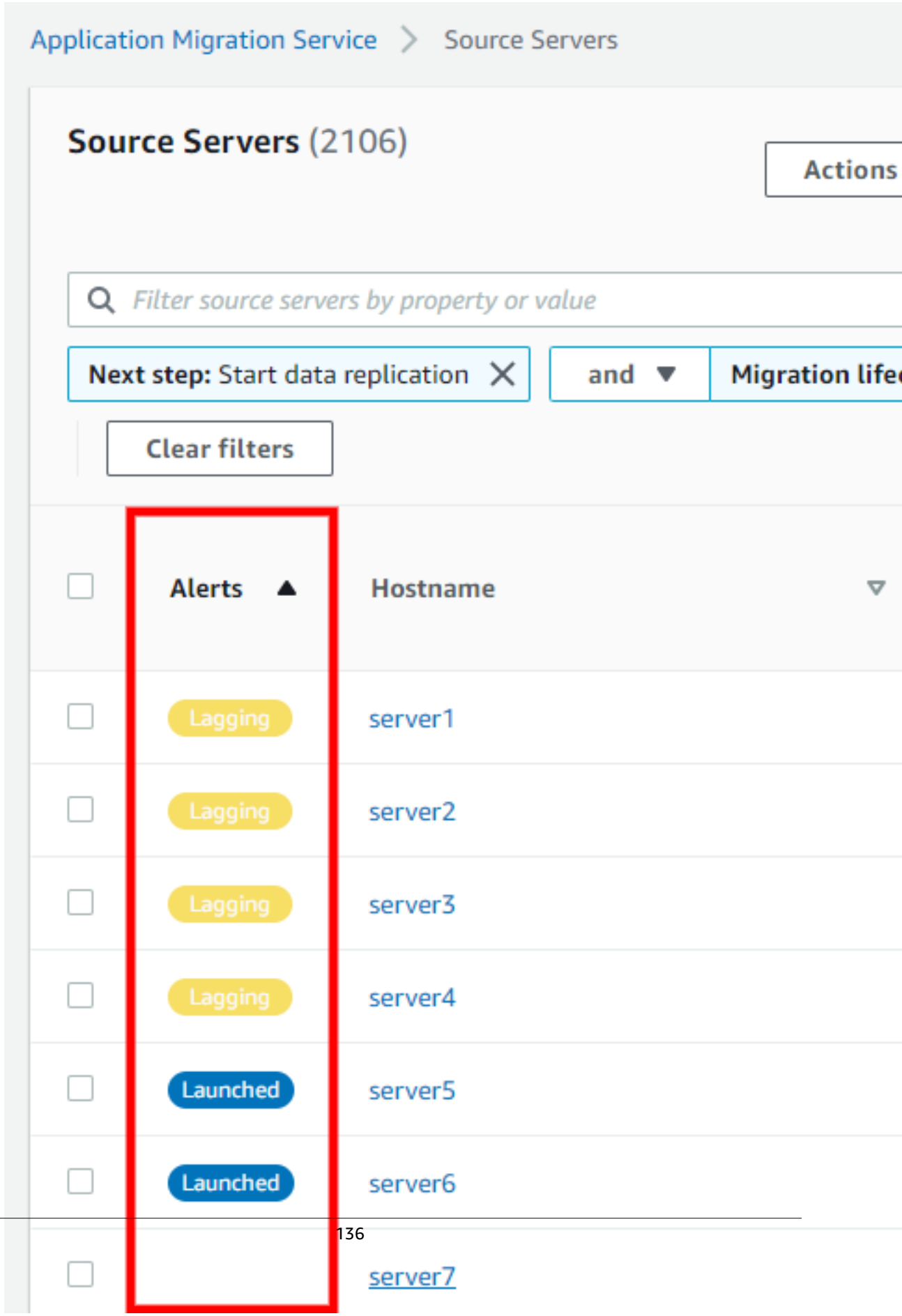
- **Selector column** - This blank checkbox selector column allows you to select one or more source machines. Once a machine is selected, you can interact with the machine through the **Actions**, **Replication** and **Test and Cutover** menus.


Application Migration Service
Source Servers
Source Servers (2106)
Actions
Filter source servers by property or value
Alerts
Hostname
server1
server2
server3
server4
server5
server6
server7
server8
server9

- **Hostname** - This column shows the unique server hostname for each source server.


Application Migration Service
Source Servers
Source Servers (2106)
Actions
Filter source servers by property or value
Alerts
Hostname
server1
server2
server3
server4
server5
server6
server7
server8
server9

- **Alerts** - This column shows whether any alerts exist for the server. Alerts are color coded - blue (healthy server - launched target), yellow (unhealthy server - temporary issue), and red (unhealthy server - significant issues.


Application Migration Service
Source Servers
Source Servers (2106)
Actions
Filter source servers by property or value
Next step: Start data replication
and
Migration life
Clear filters
Alerts
Hostname
Lagging
server1
Lagging
server2
Lagging
server3
Lagging
server4
Launched
server5
Launched
server6
server7

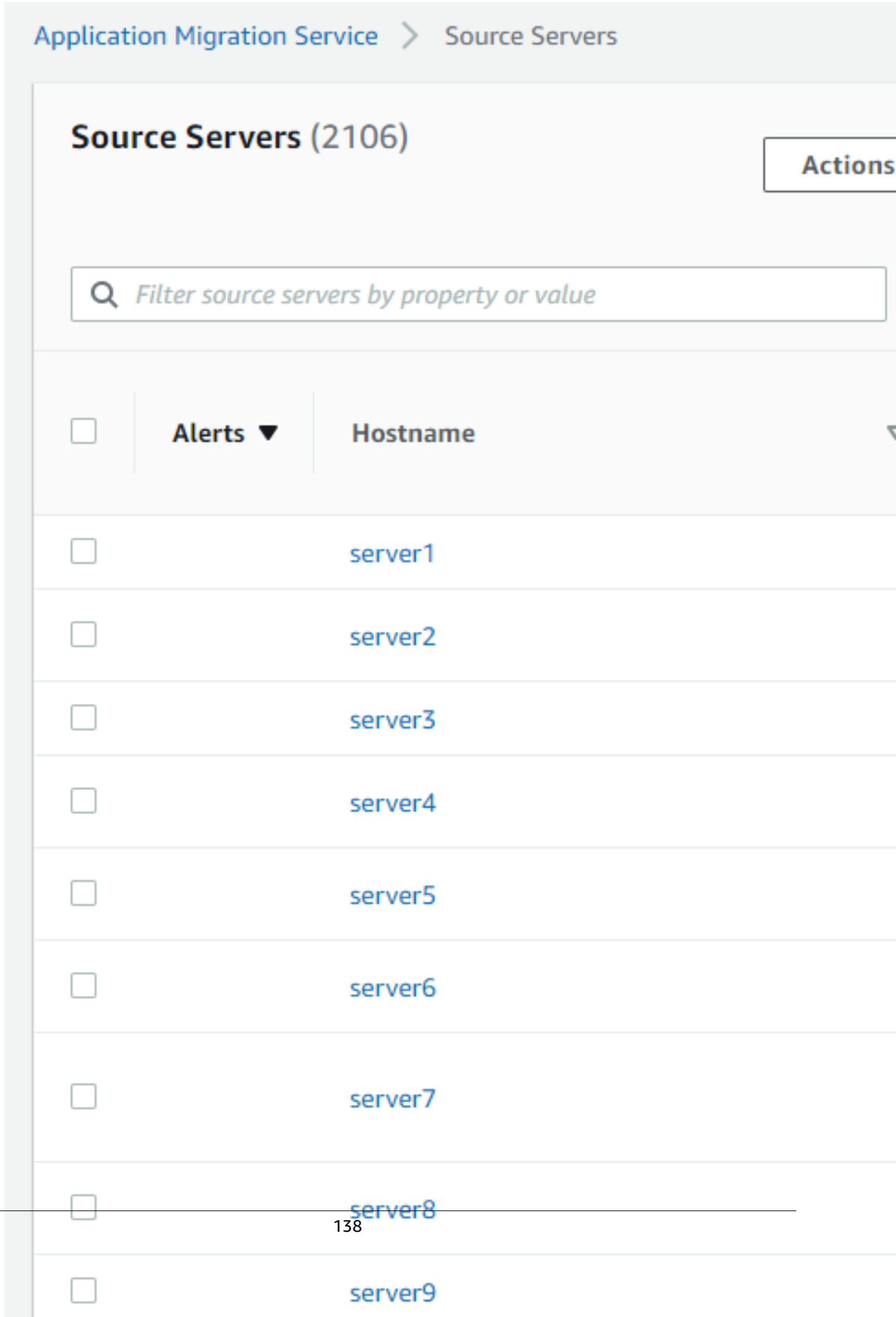
A healthy server shows will show no indicators.

A healthy server for which a target server has been launched in AWS will show a blue Launched indicator.

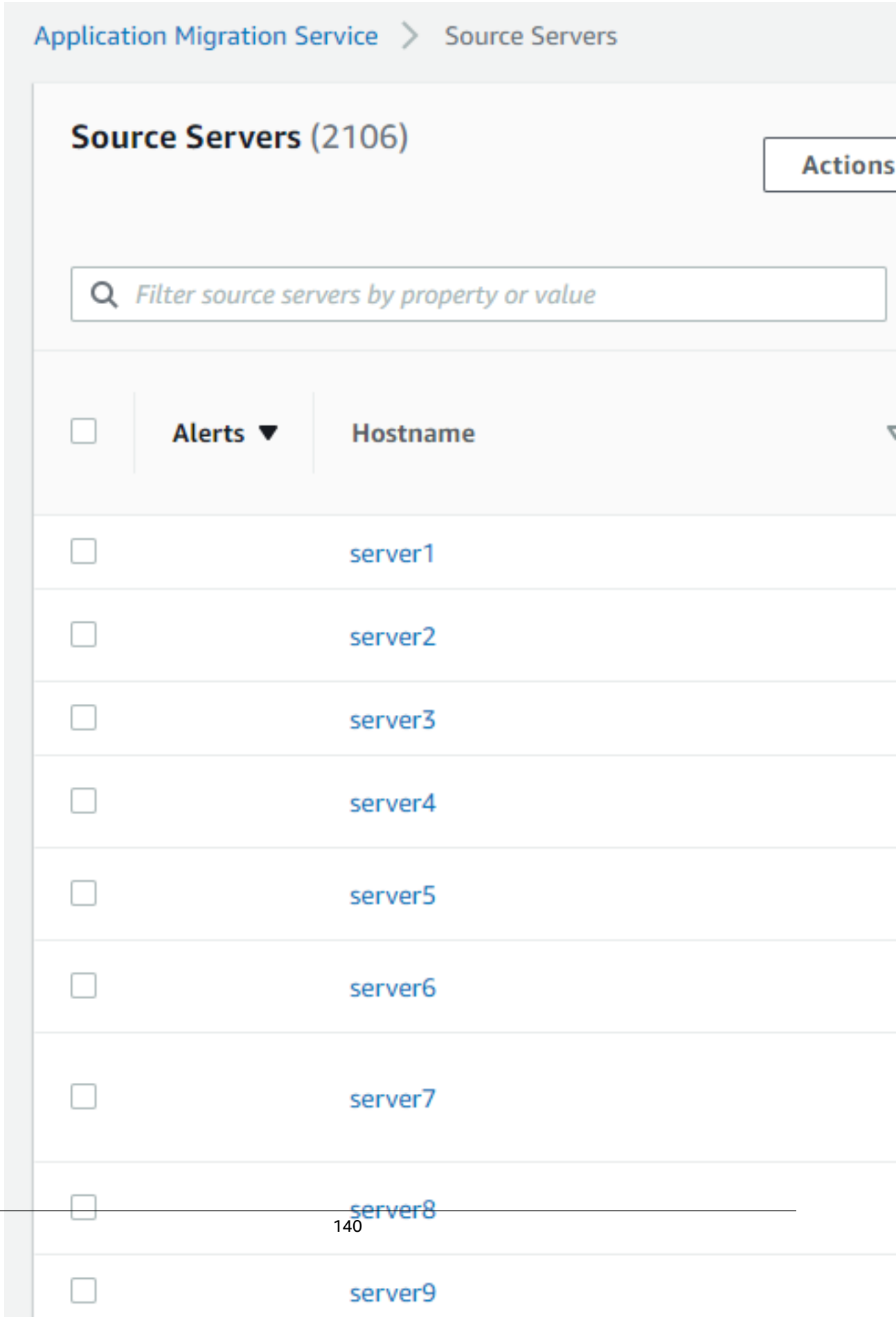
A server that is experiencing a temporary issue such as Lag or Backlog will show a yellow warning box.

A server that is experiencing significant issues, such as a Stall, will show a red warning box.

- **Migration lifecycle** - This column shows the Migration lifecycle state for each source server. This way you can easily know which lifecycle step the server is currently undergoing. Migration lifecycle steps include the following. Learn more about Migration lifecycle steps (p. 168) (p. 173).


Application Migration Service
Source Servers
Source Servers (2106)
Actions
Filter source servers by property or value
Alerts
Hostname
server1
server2
server3
server4
server5
server6
server7
server8
server9

  - Not ready
  - Ready for testing
  - Test in progress
  - Ready for cutover
  - Cutover in progress
  - Cutover
- **Data replication status -** This column shows the current status of data replication for the server. The information presented in this column changes based on the server's Migration lifecycle state and whether the server is experiencing any issues.


Application Migration Service
Source Servers
Source Servers (2106)
Actions
Filter source servers by property or value
Alerts
Hostname
server1
server2
server3
server4
server5
server6
server7
server8
server9

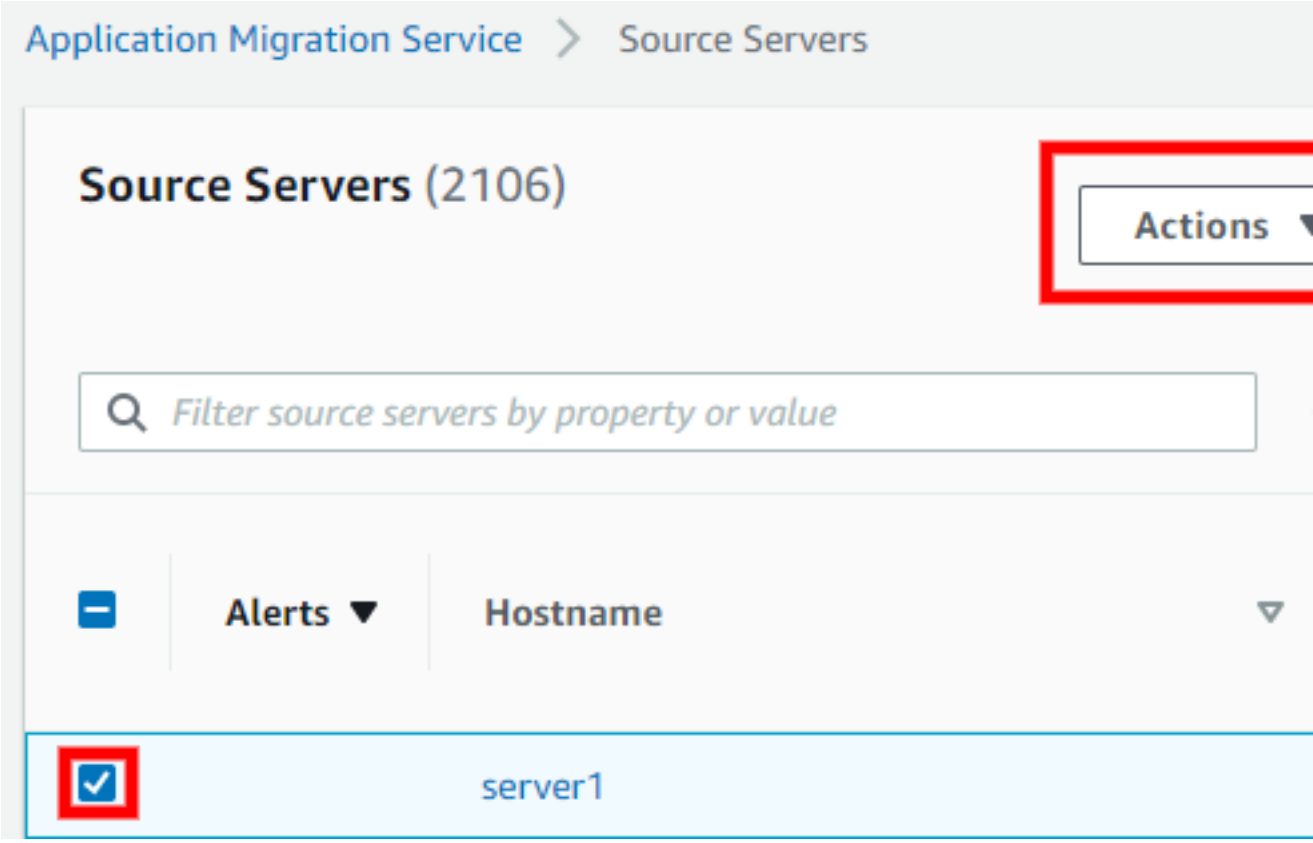
This column will show a variety of information, including:

- Not started - Data replication has not started.
- Paused - Data replication has been paused.
- Healthy - The server is healthy and ready for test/cutover instance launch.
- Done - The server has been successfully cutover and data replication has been stopped as a result.
- Percentage complete - The percentage of the server's storage that was successfully replicated if the server is undergoing initial sync or a rescan.
- Lag - Whether server is experiencing any lag. If so - the lag time.
- Backlog - Whether there is any backlog on the server (in MiB)

- **Next step** - This column shows the next step that needs to be undertaken in order to successfully complete a cutover for the server. The information presented in this column changes based on the server's Migration lifecycle state and whether the server is experiencing any issues. This column will show a variety of next steps, including: IMAGE
  - Start data replication - Data replication has not been started or is paused.
  - Start test - The server is ready to launch a test instance.
  - Finalize or revert test - The server has launched a test instance that needs to be reverted or finalized.
  - Start cutover - The server has had a test instance launched and finalized and now is ready to launch a cutover instance.
  - Finalize or revert cutover - The server has launched a cutover instance that needs to be reverted or finalized.
  - Resolve data replication error - The server is experiencing significant issues such as a Stall that need to be addressed.
  - Wait for lag to disappear, then X. - The server is experiencing temporary Lag. Wait for the Lag to disappear and then perform the indicated action.
  - Blank (-) - The column will show a blank field during ongoing operations, such as an Initial sync or a Rescan.

Command Menus

You can perform a variety of actions, control data replication, and manage your testing and cutover for one or more source servers through the command menu buttons. Select one or more servers on the Source Servers page and choose the **Actions**, **Replication**, or **Test and Cutover** menu to control your source servers.

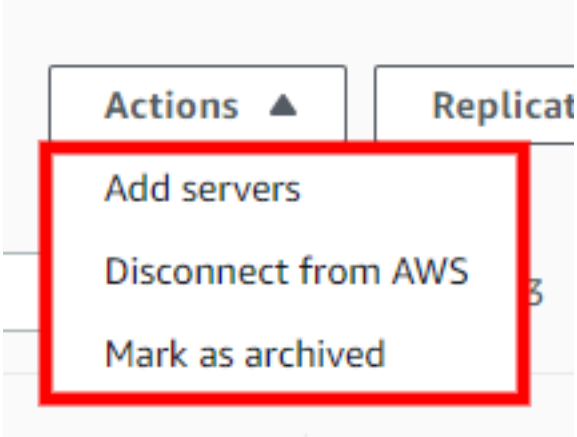


Topics

- Actions Menu (p. 142)
- Replication Menu (p. 143)
- Test and Cutover Menu (p. 144)

Actions Menu

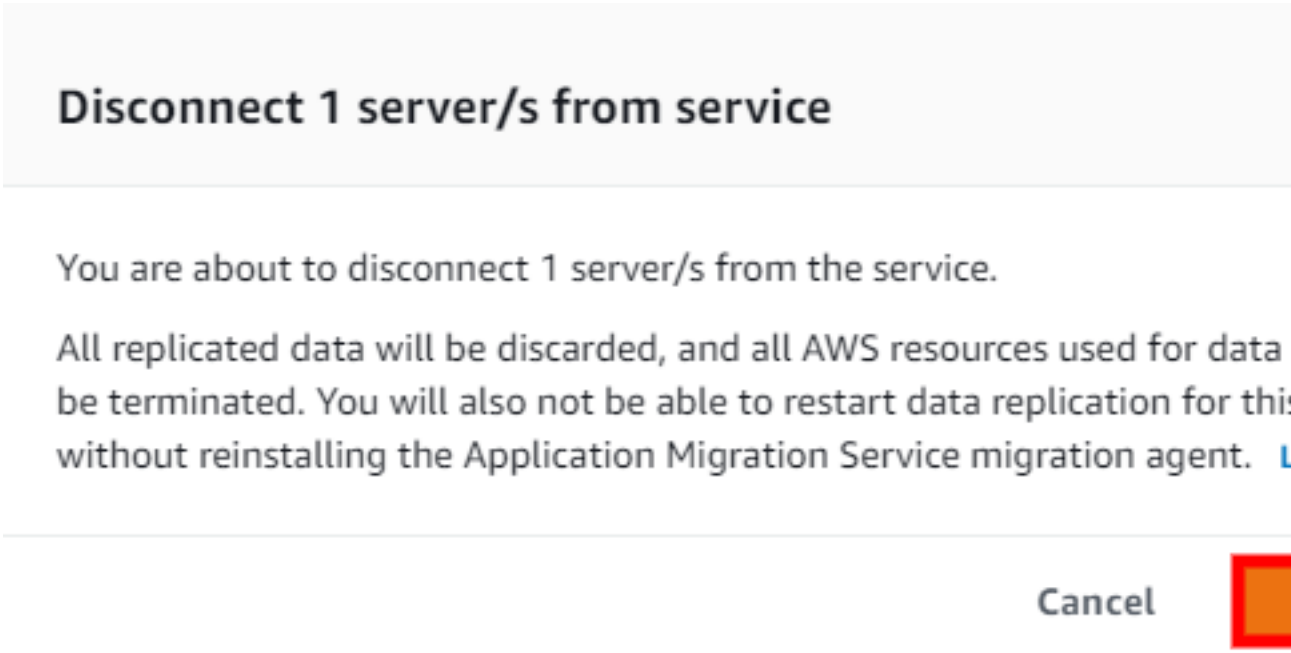
The **Actions** menu allows you to perform the following actions:



- **Add servers** - Choosing the **Add servers** option will redirect you to the MORE

- **Disconnect from AWS** - Choose the **Disconnect from AWS** option to disconnect the selected server from Application Migration Service and AWS.

  On the **Disconnect X server/s from service** dialog, choose **Disconnect**.

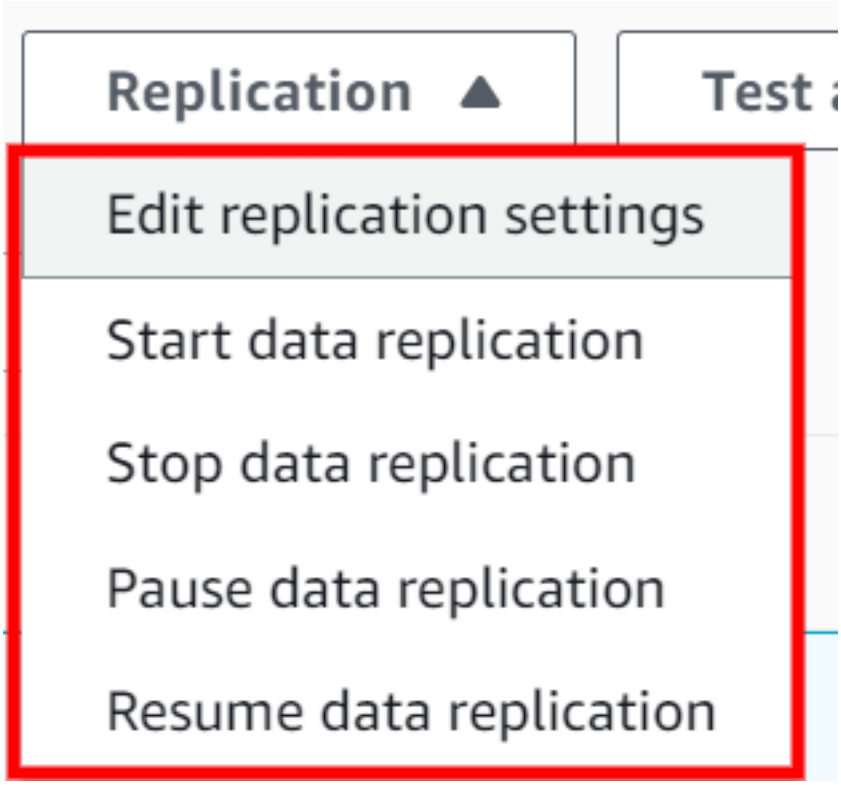


  Important
  This will uninstall the AWS Replication Agent from the source server and data replication will stop for the source server. This action will not affect any test or cutover instances that have been launched for this source server, but will you no longer be able to identify which source servers your EC2 instances correspond to.

- **Mark as archived** - Choose the **Mark as archived** option in order to archive the server. You should only archive servers for which you have already performed a cutover. Archived servers will be removed from the main Source servers page, but can still be accessed through filtering options.

Replication Menu

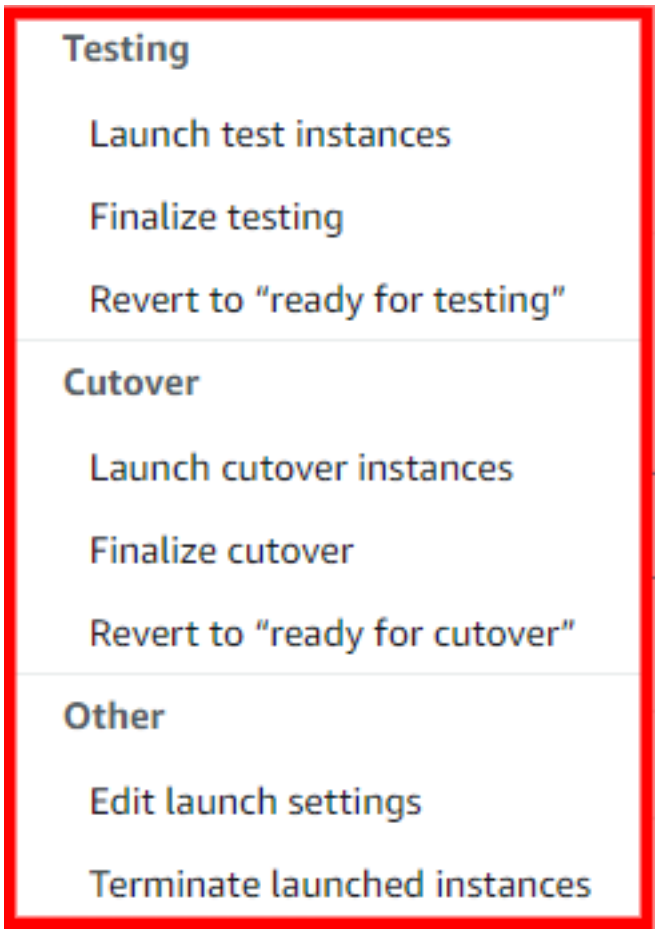
The Replication menu allows you to manage data replication for the source server through the following actions:



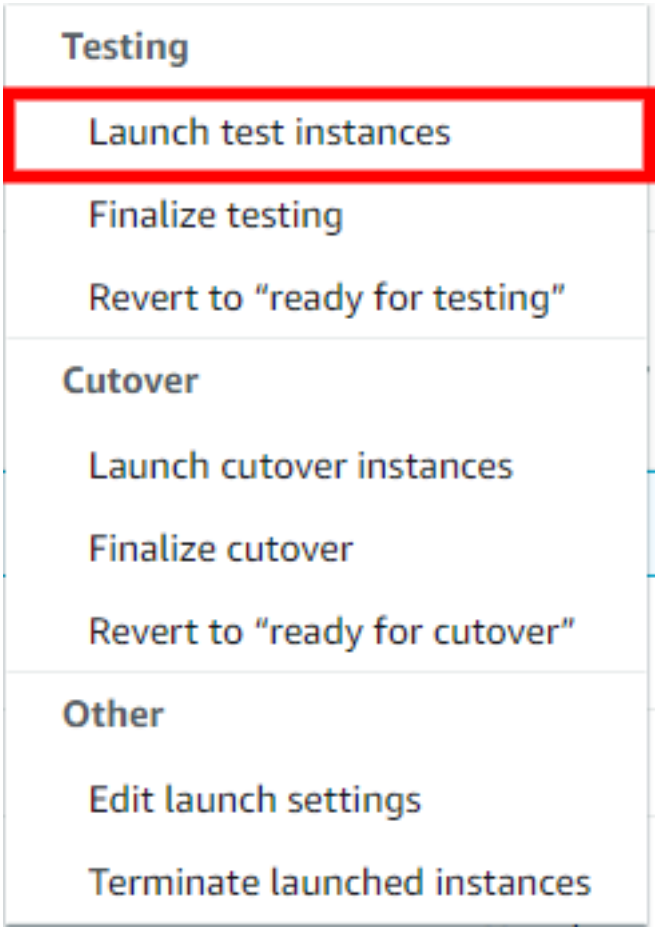
- **Edit replication settings** - Choosing the **Edit replication settings** option will redirect you to the **Replication setting** tab, where you can edit the specific replication settings for the selected source server. Learn more about editing replication settings. (p. 60)
- **Start data replication** - To start data replication for a source server on which data replication has previously been stopped, reinstall the AWS Replication Agent on the server.
- **Stop data replication** - To stop data replication for a source server, open the Actions menu and choose **Disconnect from AWS**. This will uninstall the AWS Replication Agent from the source server and therefore stop data replication.
- **Pause data replication** - To pause data replication, stop the flow of data between the Source server and Application Migration service by closing TCP Port 1500 outbound on your firewall or by closing TCP Port 1500 inbound in the Replication Server Security Group.
- **Resume data replication** - To resume data replication, undo the change you made to pause data replication (either re-open TCP Port 1500 outbound on your firewall or open TCP Port 1500 inbound in the Replication Server Security Group.

Test and Cutover Menu

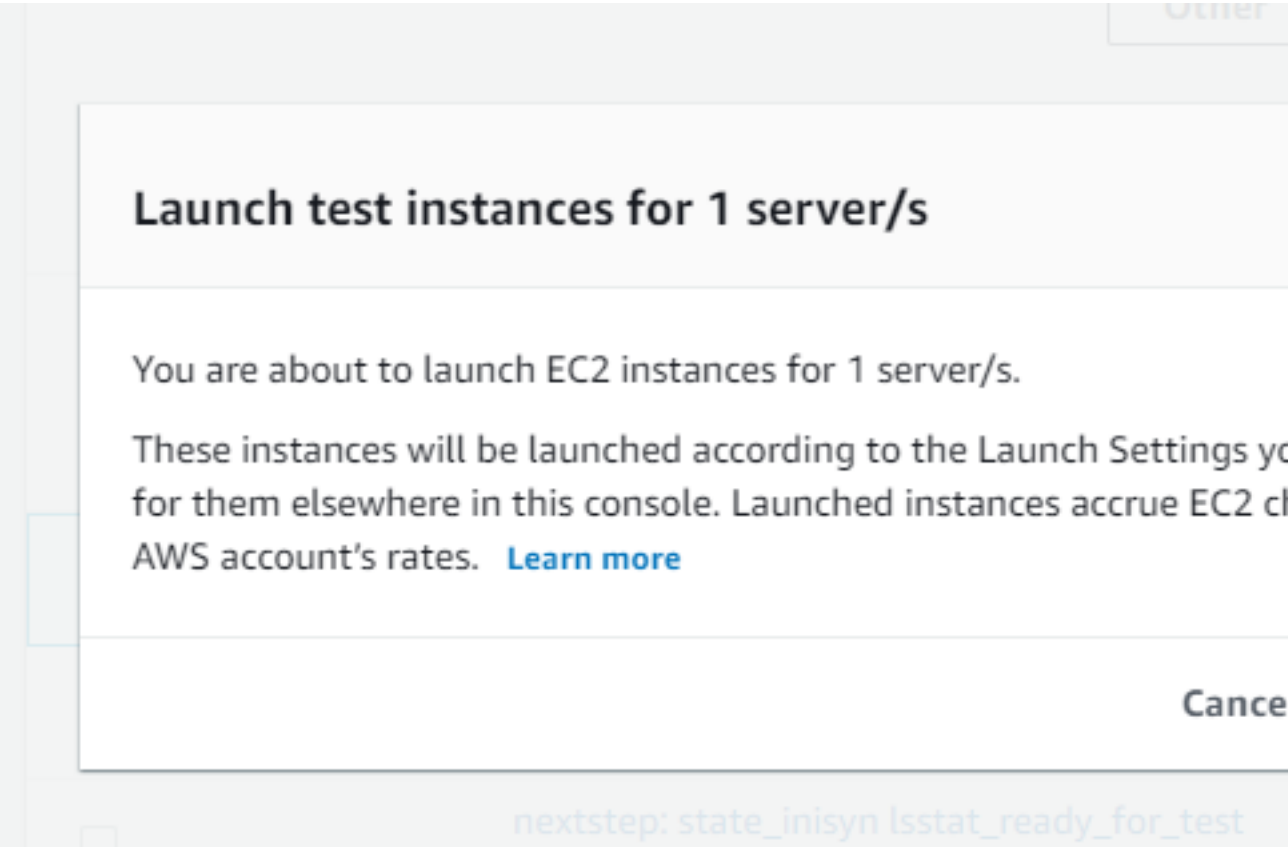
The Test and Cutover menu allows you to manage Test and Cutover instances.



- **Launch test instances**- Choose the **Launch test instances** option to launch a test instance for this server.

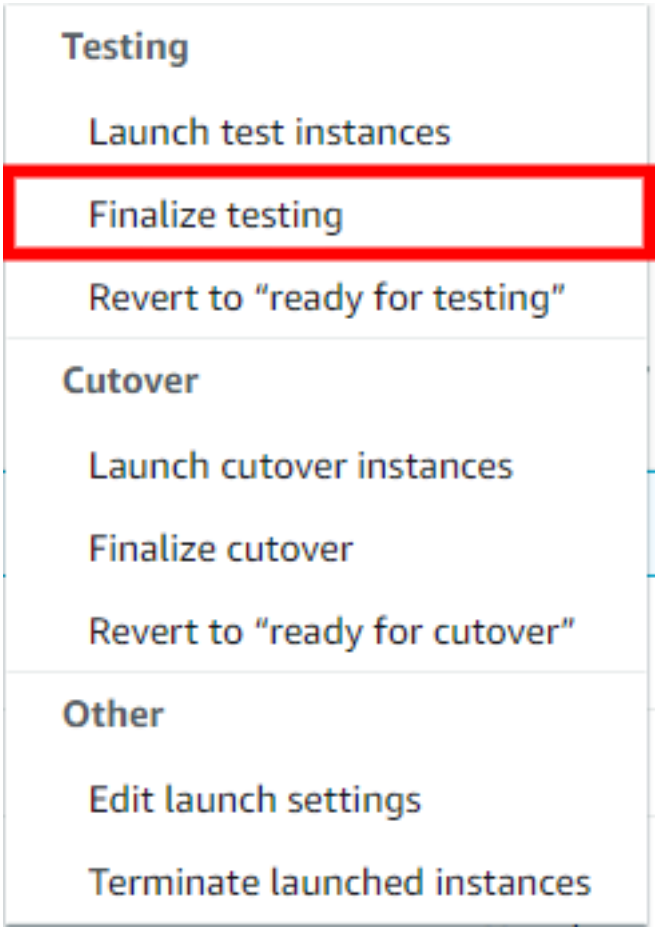


The **Launch test instances for X** servers dialog will appear. Choose **Launch** to begin the test.

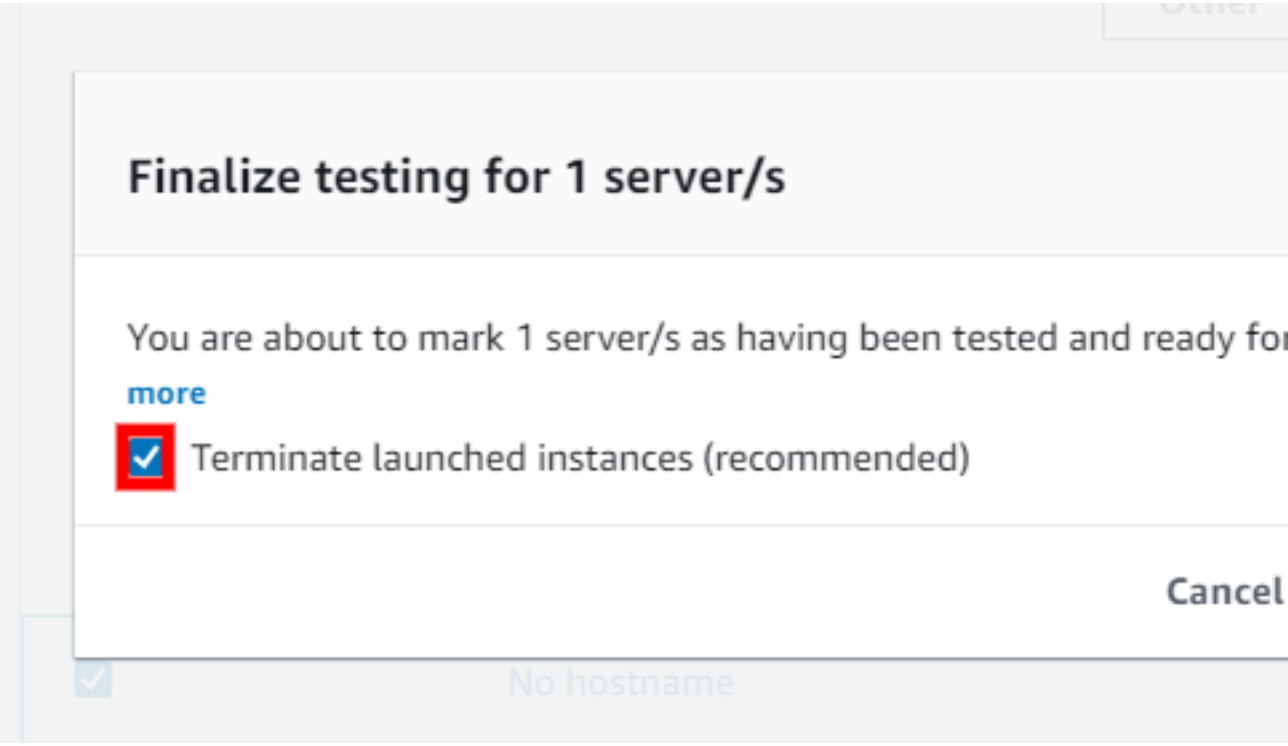


The Application Migration Service Console will indicate **1 launch job complete** once the test has been completed successfully.

- **Finalize testing** - Choose the **Finalize testing** option to finalize testing for this server after you have completed all of the necessary tests in preparation for cutover.

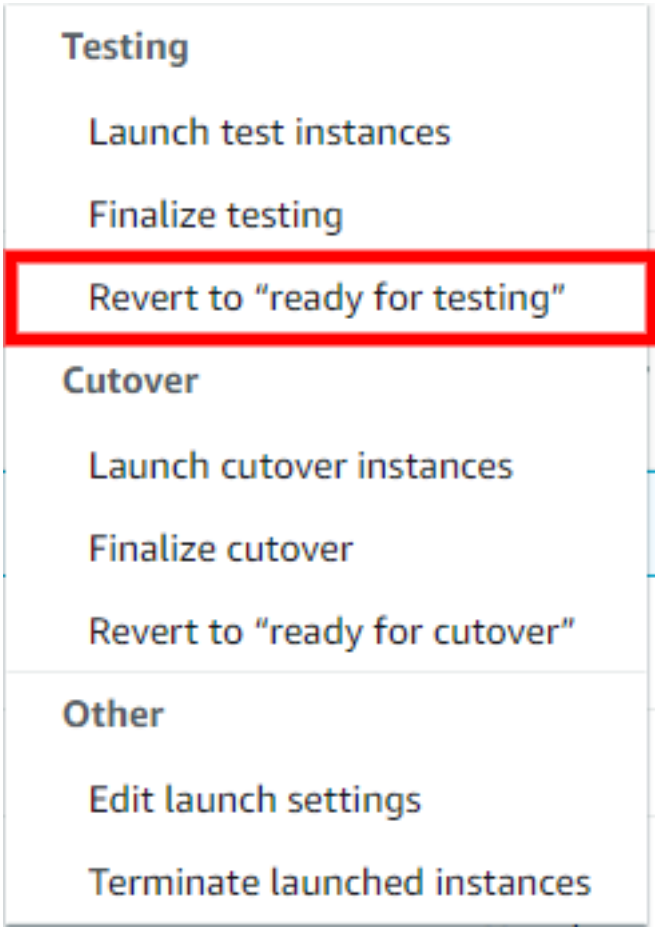


The **Finalize testing for X servers** dialog will appear. Select whether you want to terminate the launched instances used for testing. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Finalize**.

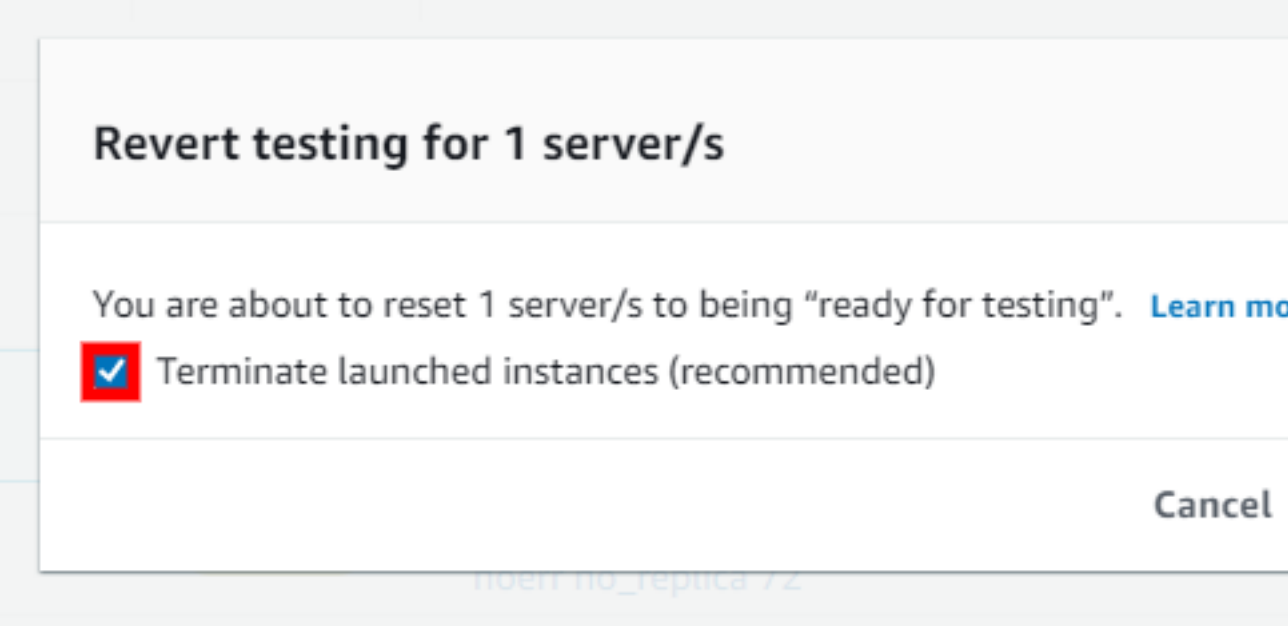


The Application Migration Service Console will indicate that testing has been finalized. The selected source servers' **Migration lifecycle** column will show the **Ready for cutover** status and the launched Test instances will be deleted if that option was selected.

- **Revert to "ready for testing"**- Choose the **Revert to "ready for testing"** option to revert a finalized test for this server if you want to run further tests prior to initiating a cutover.

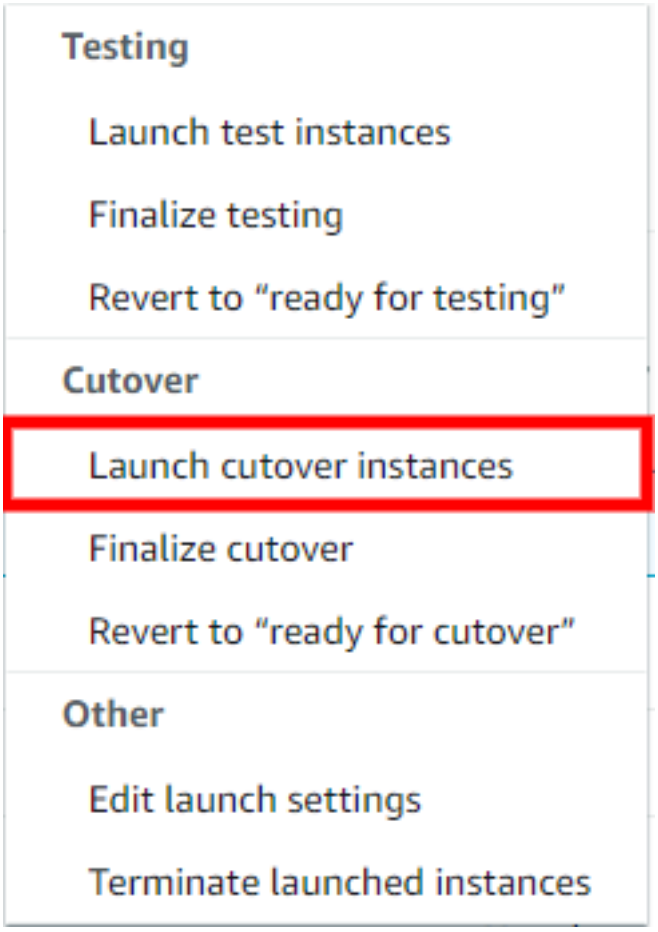


The **Revert testing for X servers** dialog will appear. Select whether you want to terminate the launched instances used for testing. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Revert**.

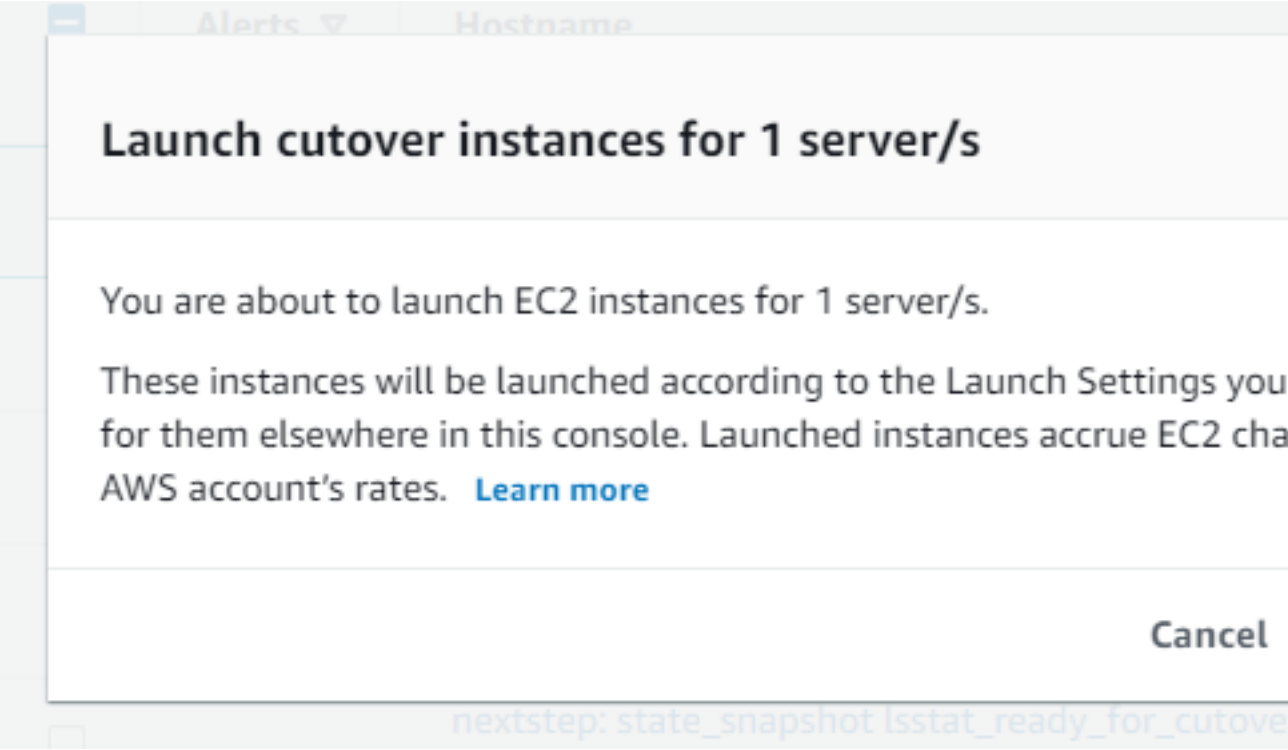


The Application Migration Service Console will indicate that testing has been reverted. The selected source servers' **Migration lifecycle** column will show the **Ready for testing** status and the launched Test instances will be deleted if that option was selected.

- **Launch cutover instances** - Choose the **Launch cutover instances** option to launch a cutover instance for this server after you have finalized all of your testing and are ready to initiate a cutover.

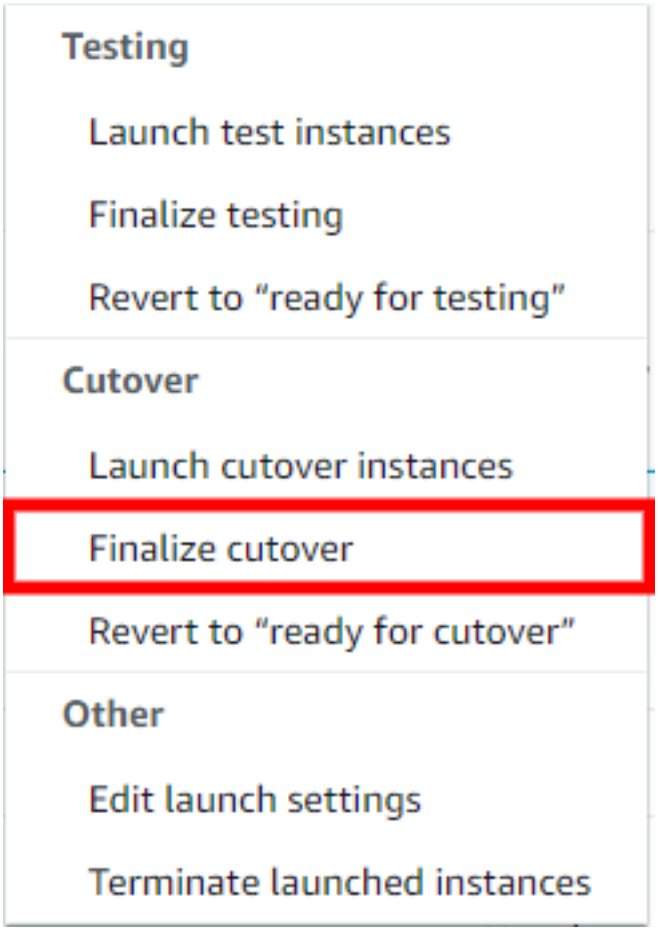


The **Launch cutover instances for X servers** dialog will appear. Choose **Launch** to begin the cutover.



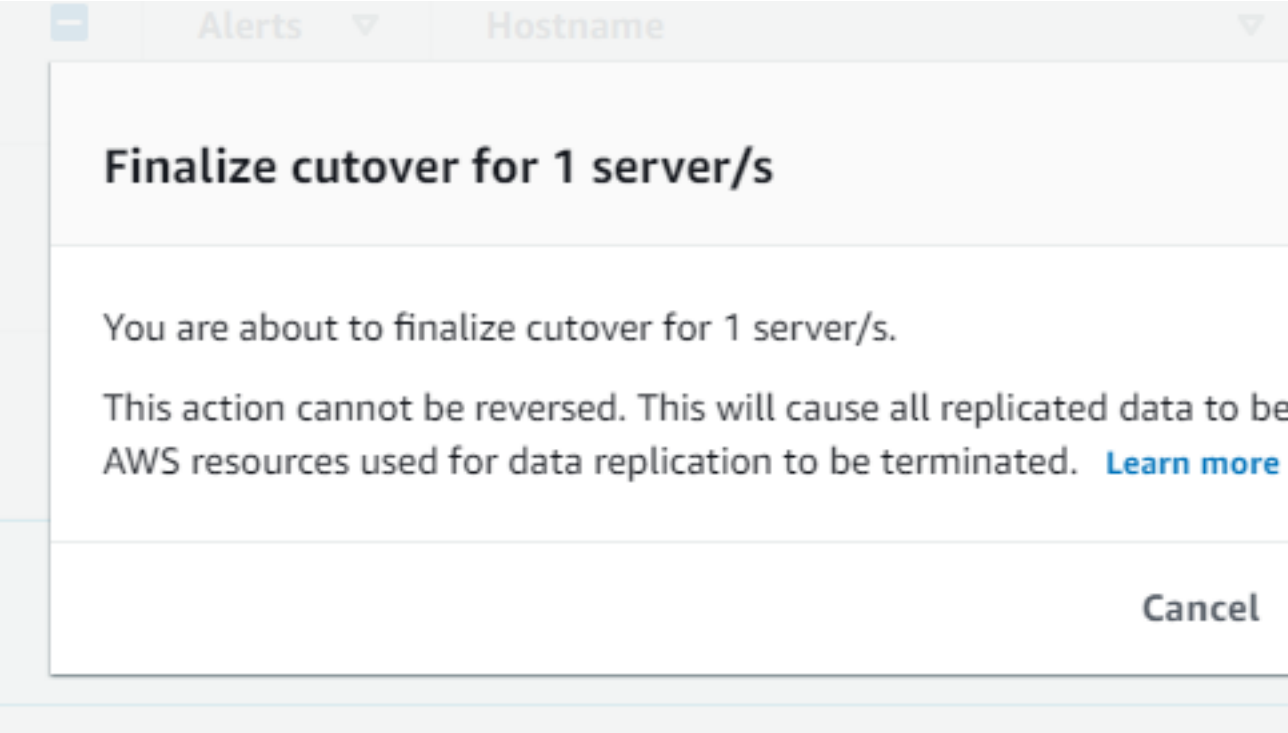
The Application Migration Service Console will indicate **1 launch job complete** once the cutover has been completed successfully. IMAGE

- **Finalize cutover** - Choose the **Finalize cutover** option to finalize the cutover for this server after you have successfully performed a cutover.



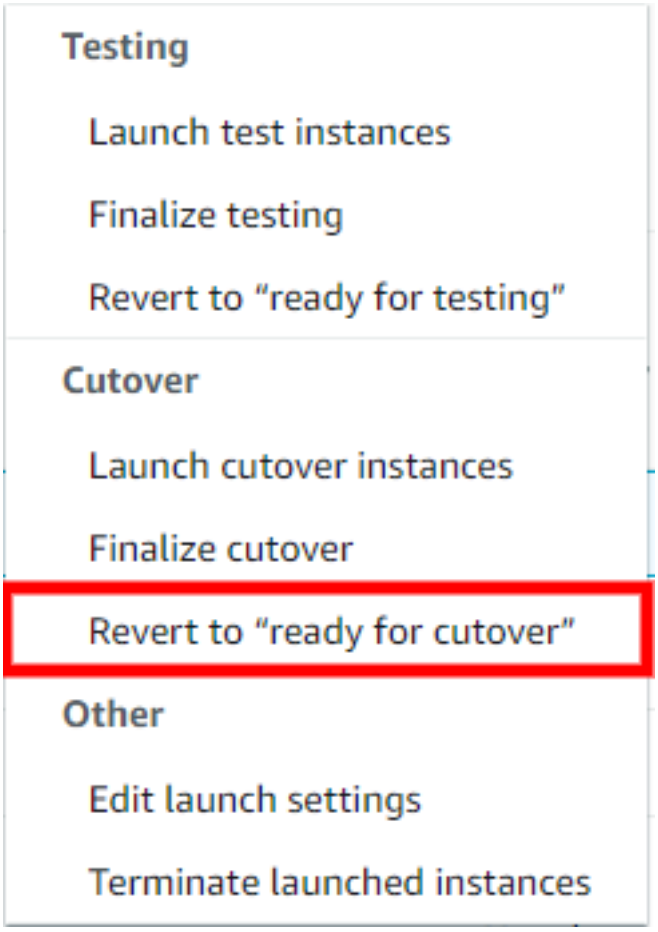
This will change your source servers' **Migration lifecycle** status to **Cutover**, indicating that the cutover has been complete and that the migration has been performed successfully. In addition, this will stop Data Replication and cause all replicated data to be discarded. All AWS resources used for Data Replication will be terminated.

The **Finalize cutover for X servers** dialog will appear. Choose **Finalize**.



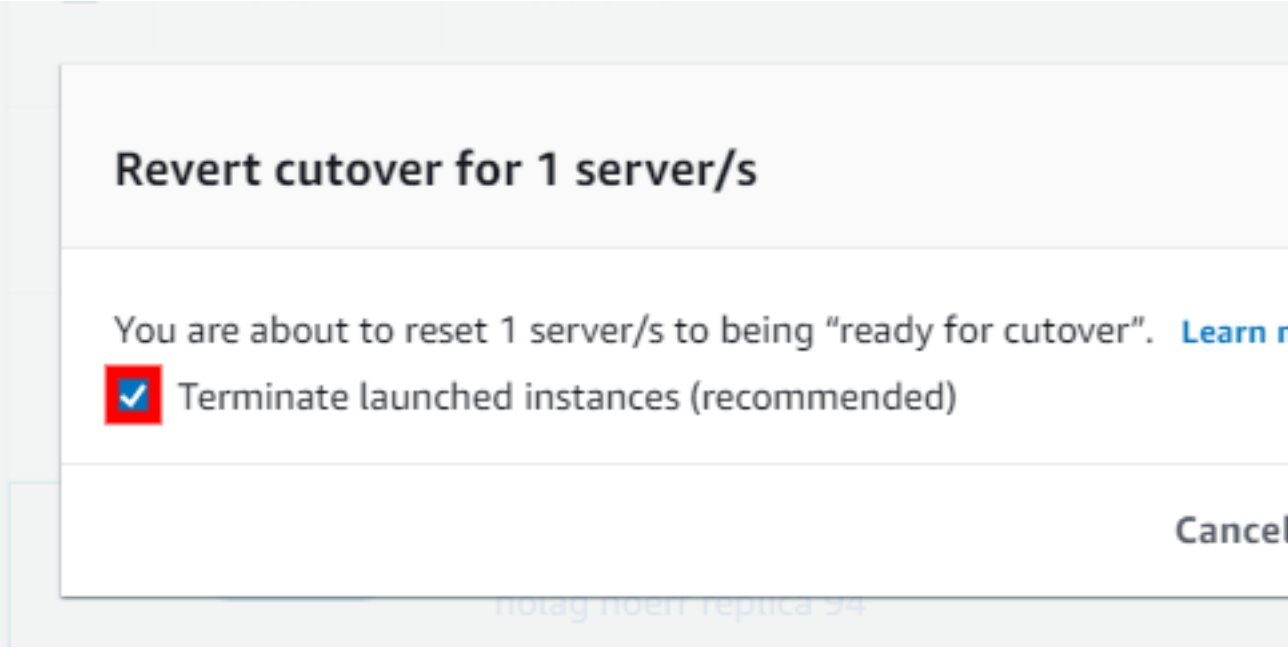
The Application Migration Service Console will indicate **X servers cutover. Data replication has bee stopped for servers** once the cutover has been completed successfully. The Application Migration Service Console will automatically stop Data Replication for the cutover source servers in order to save resource costs. The selected source servers' **Migration lifecycle** column will show the **Cutover** status, the **Data replication** column will show **Stopped** and the **Next step** column will be blank. The source servers have now been successfully migrated into AWS. IMAGE

- **Revert to "ready for cutover"** - Choose the Revert cutover option to revert a finalized cutover for this server if you encounter any issues or want to reverse the cutover for any reason.

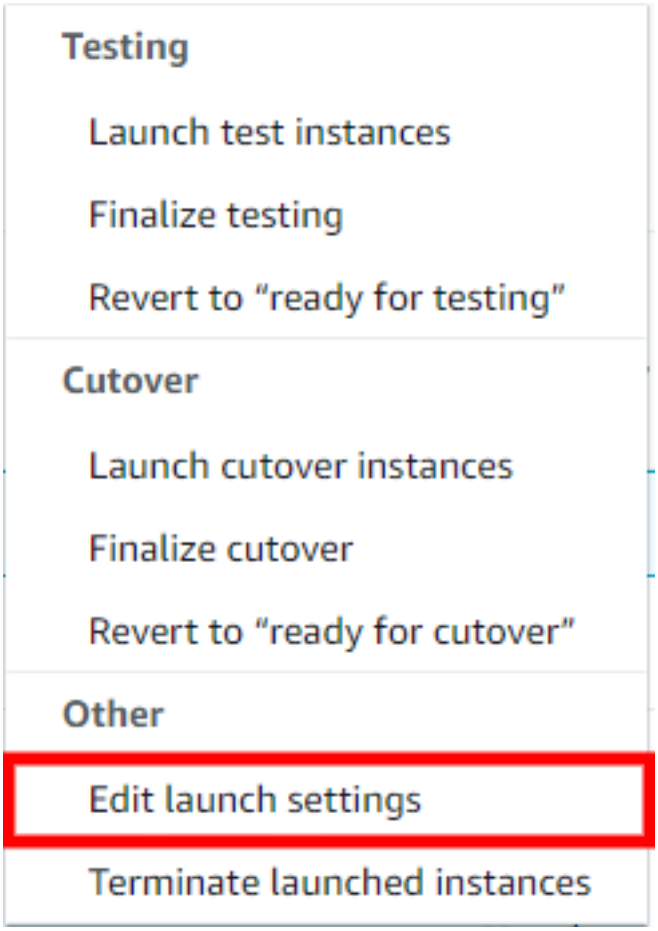


This will revert your source servers' **Migration lifecycle** to the **Ready for cutover** status, indicating that these servers have not undergone cutover. During a revert, you will also have the option to delete your Cutover instances for cost saving purposes.

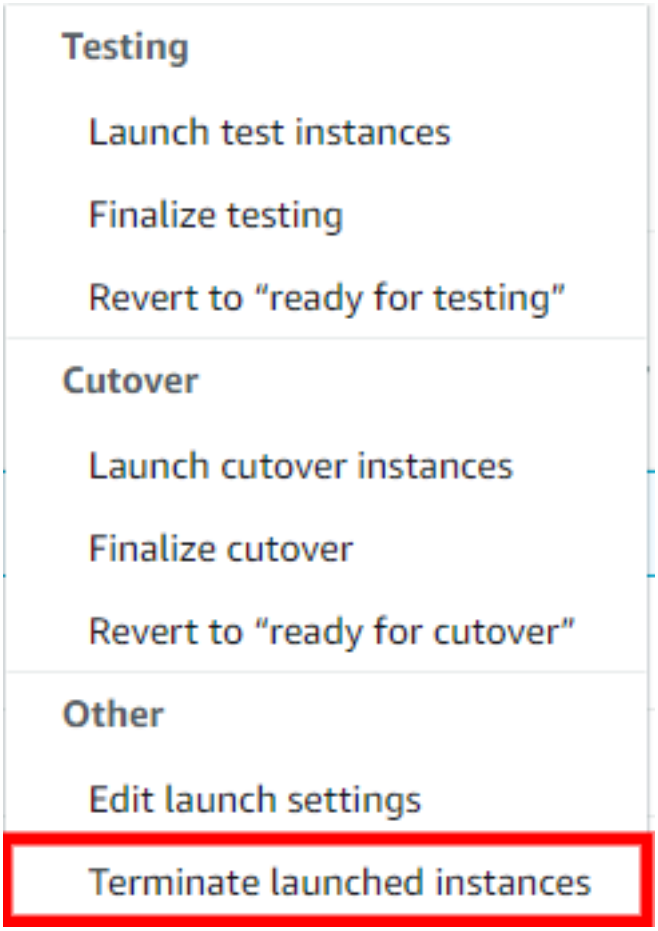
The **Revert cutover for X servers** dialog will appear. Select whether you want to terminate the launched instances used for cutover. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Revert**.



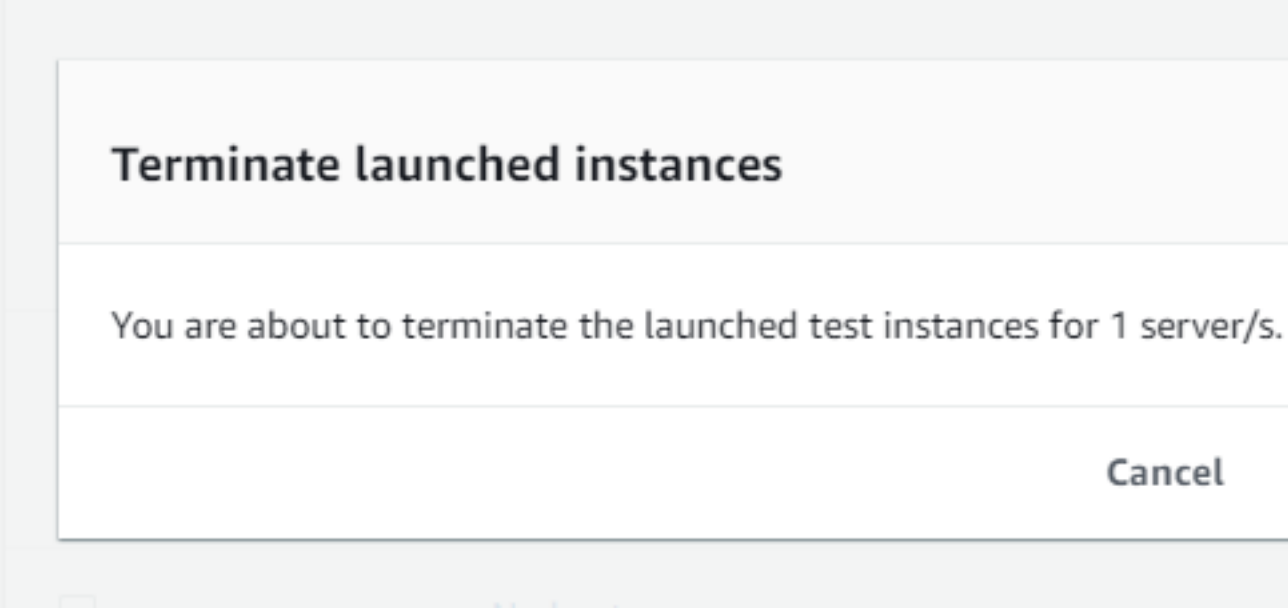
- **Edit launch settings** - Choose the **Edit launch settings** option to edit the launch settings for this server. This will redirect you to the **Launch settings** tab.



- **Terminate launched instance** - Choose the **Terminate launched instance** option if you want to delete your test or cutover instance for any reason at any point. This option can only be selected for a server that launched a test or cutover instance.



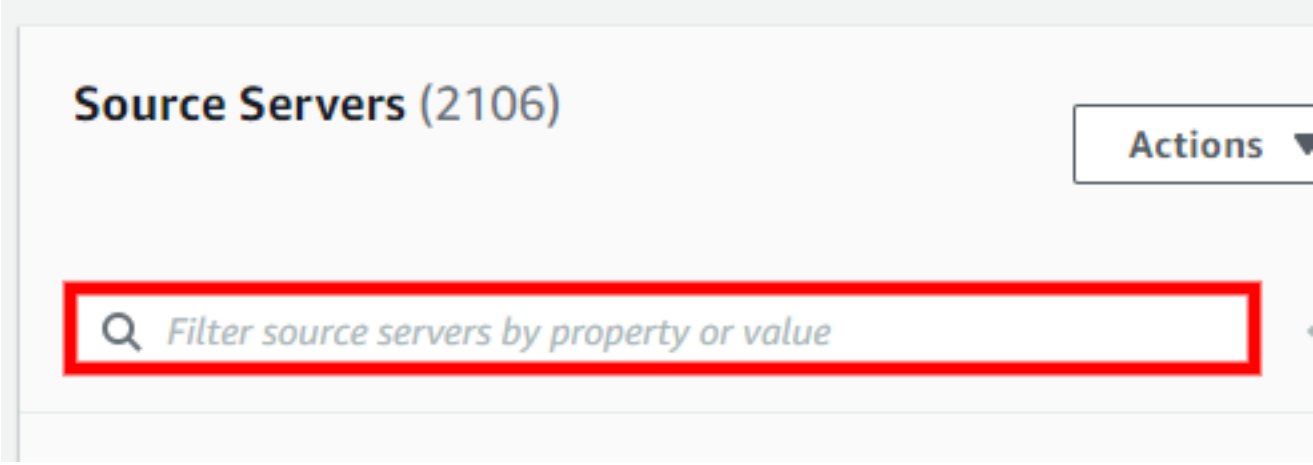
The **Terminate launched instance** dialog will appear. Click **Terminate**.



Filtering

You can customize the **Source Servers** page through filtering. Filtering allows you to easily filter your servers by one or multiple properties.

Click within the **Filter servers** field and choose the filtering property from the **Properties** menu.

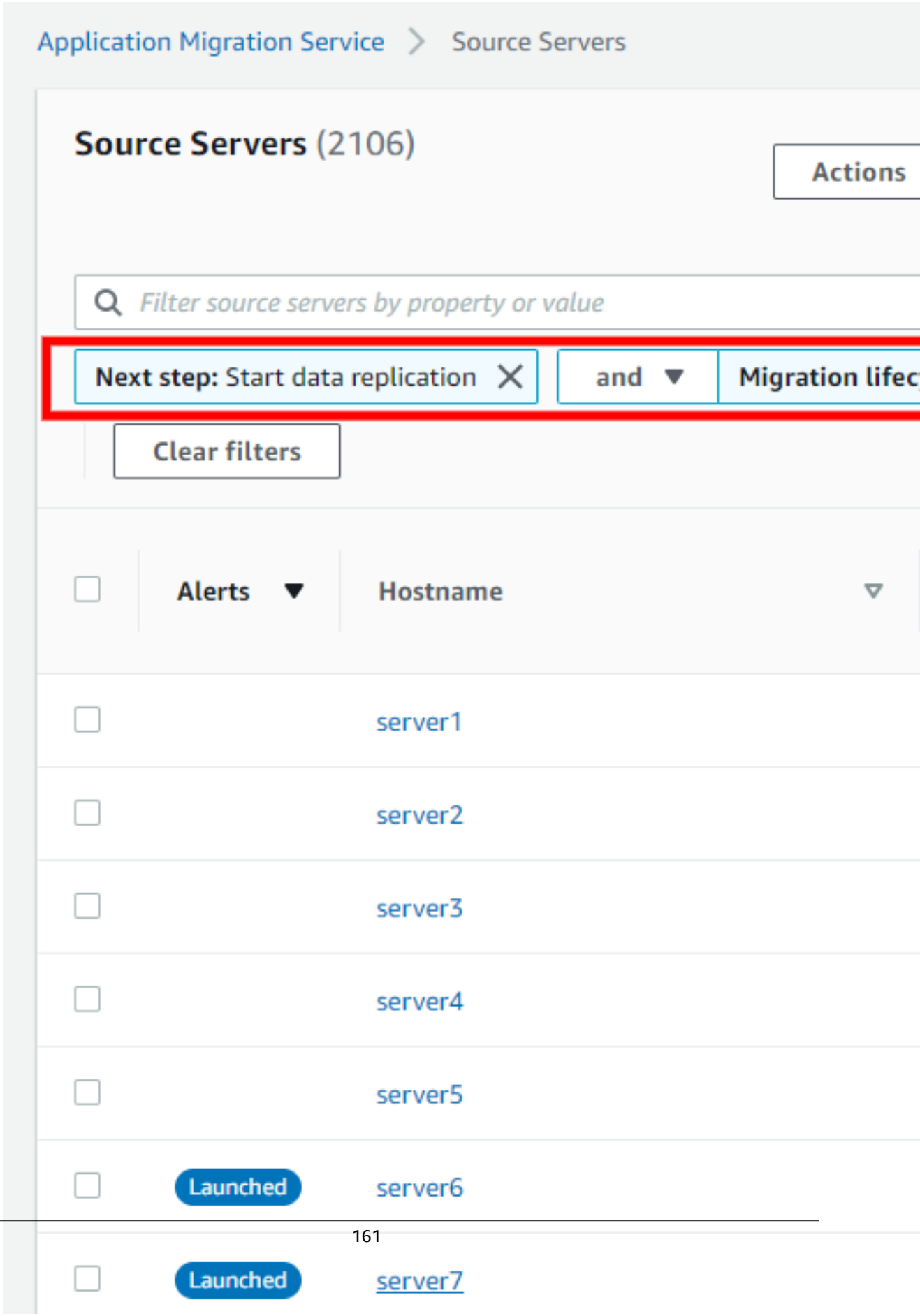


You can filter by a variety of properties, including:

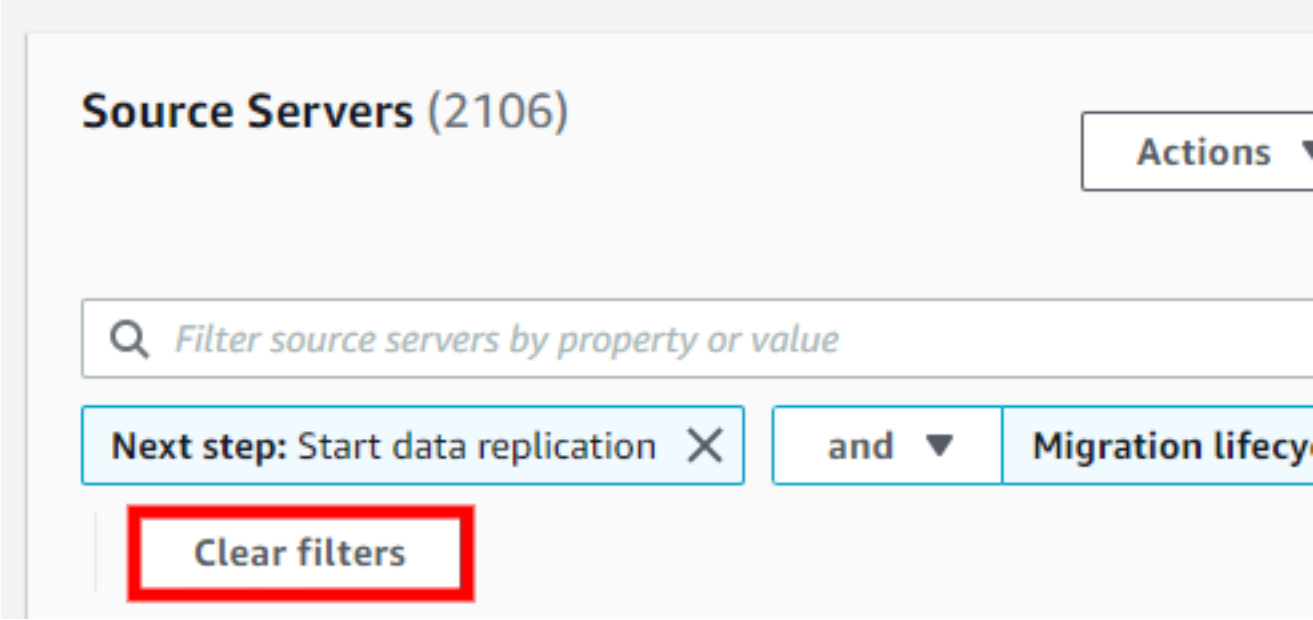
- Server identifier - Filter by a specific server identifier or a specific string of characters.
- Migration lifecycle - Filter by the Migration lifecycle state.
- Data replication - Filter by the data replication status
- Launch status - Filter by the launch status of each server
- Health - Filter by health status
- Tag key - Filter by a specific tag key.
- Tag value - Filter by a specific tag value.

You can filter by multiple properties at once in order to narrow down your results.

Ex. Here you see an example of us filtering our Source servers list by several properties.

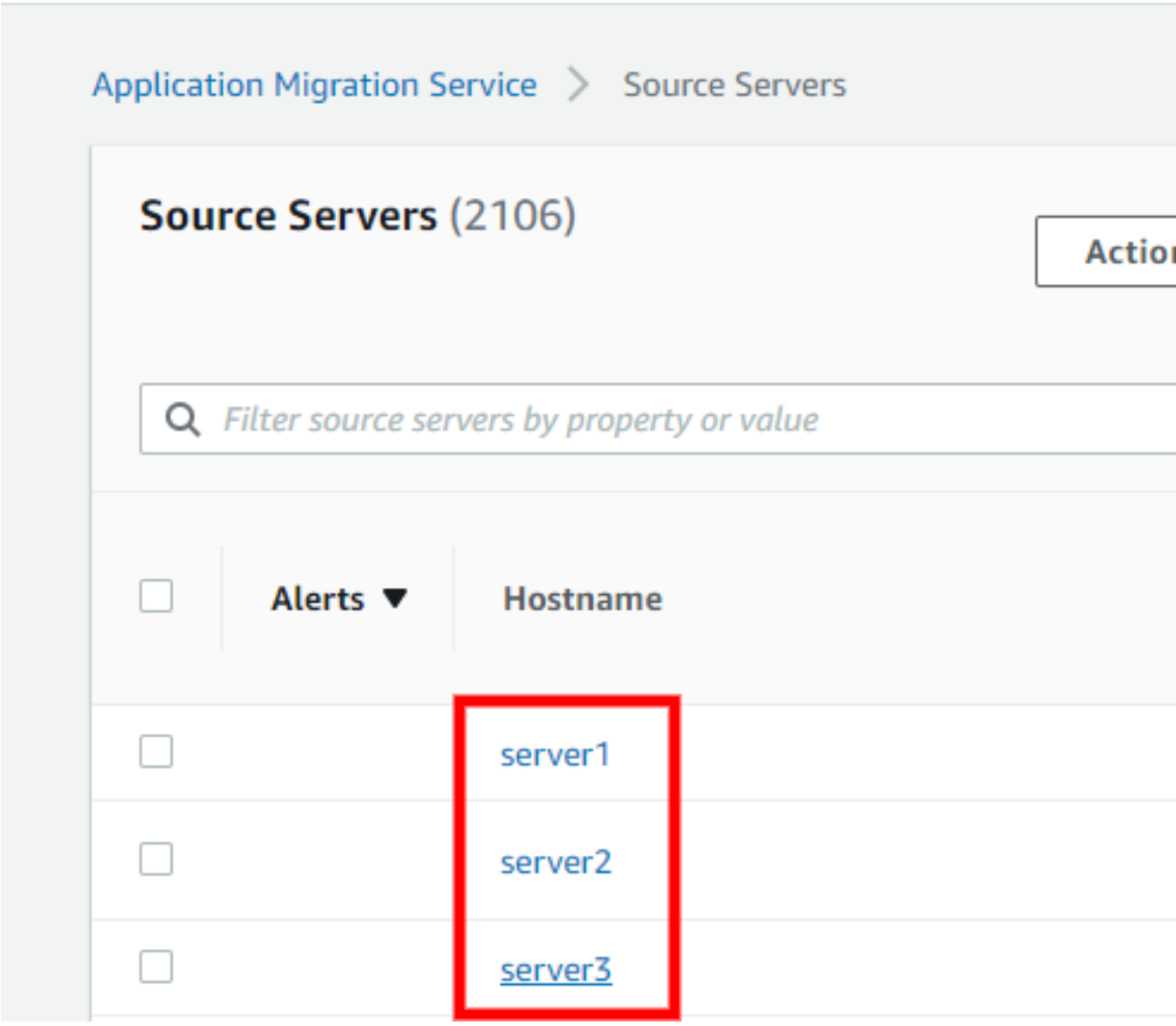

Application Migration Service
Source Servers
Source Servers (2106)
Actions
Filter source servers by property or value
Next step: Start data replication
and
Migration lifec
Clear filters
Alerts
Hostname
server1
server2
server3
server4
server5
Launched
server6
Launched
server7

Choose **Clear filters** to clear the current filtering propertiers selected.

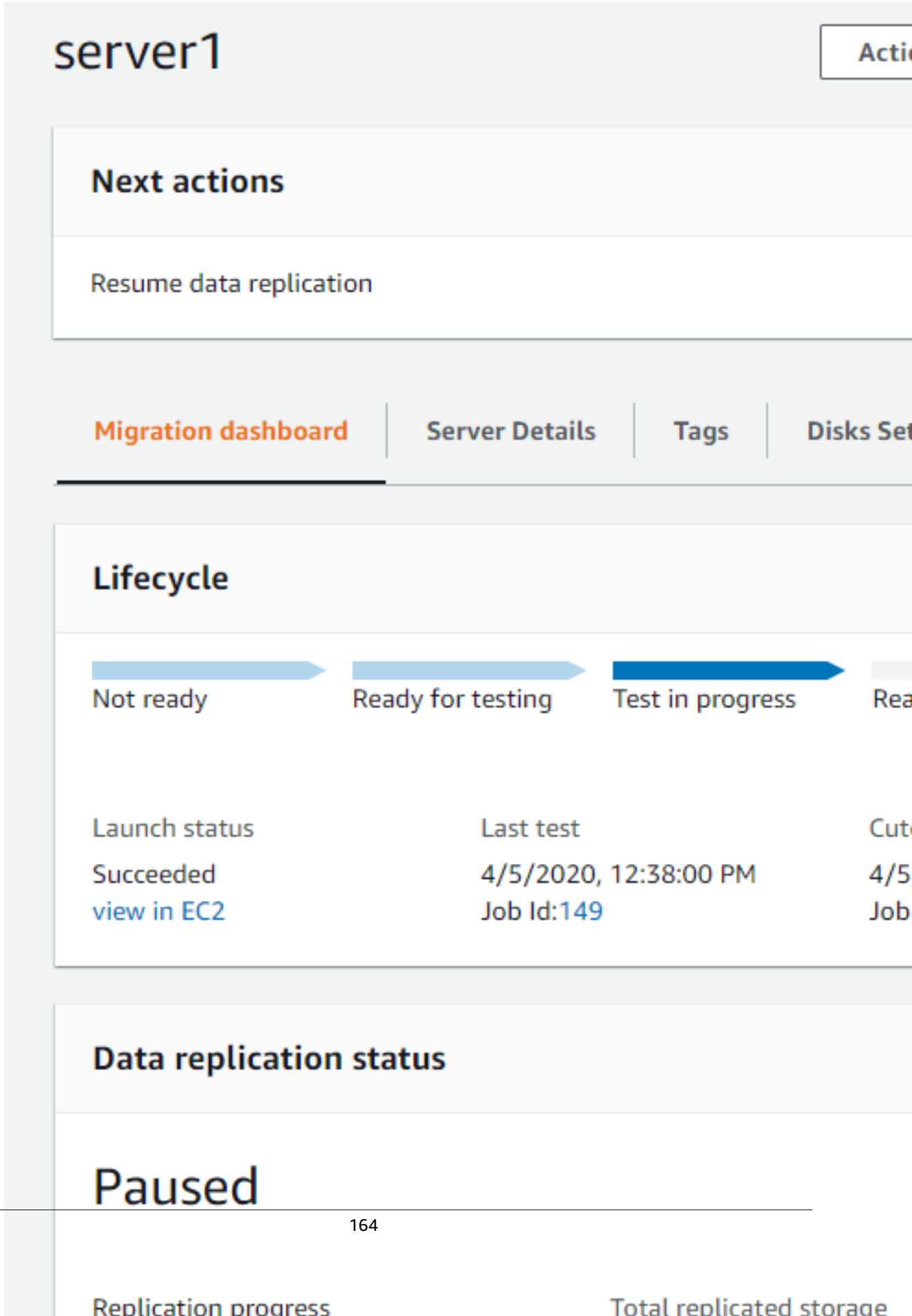


Server Details

You can access the server details view by clicking on the Hostname of any server on the **Source Servers** page.

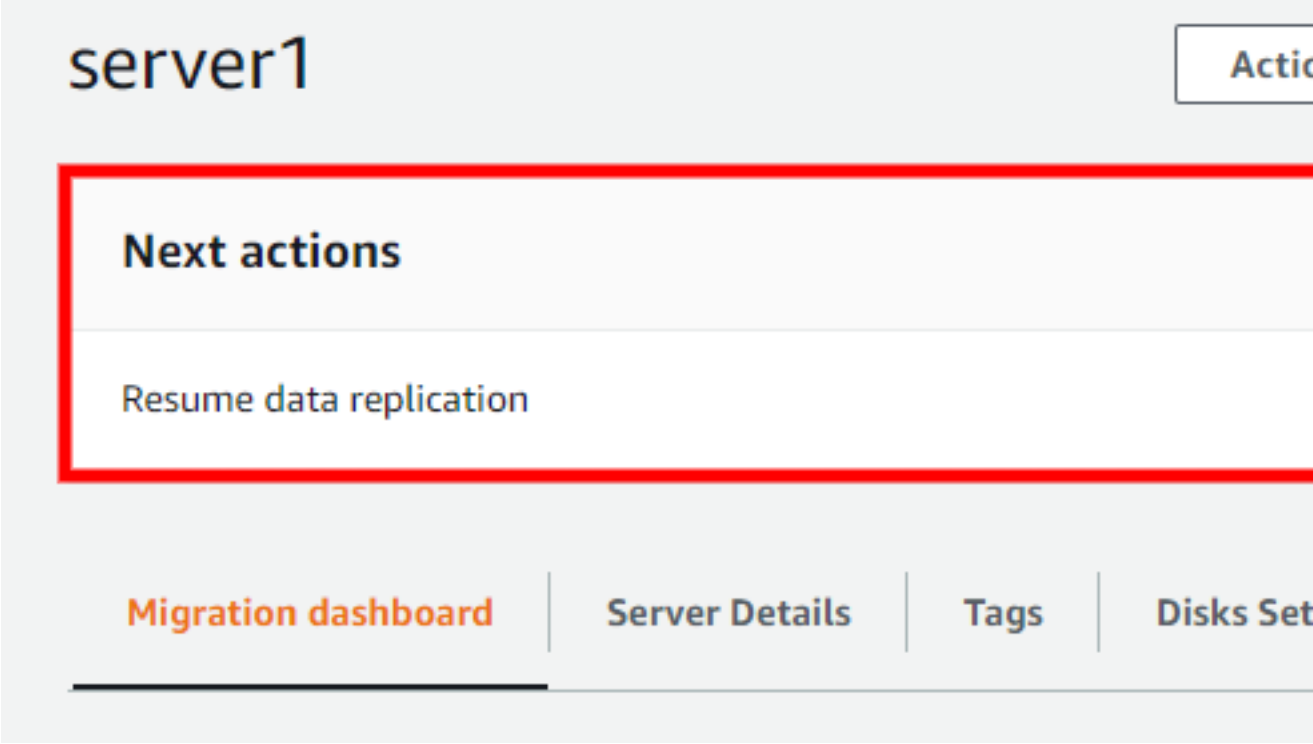


The server details view shows specific information and options for the individual machine. Here, you can fully control and monitor the individual server.

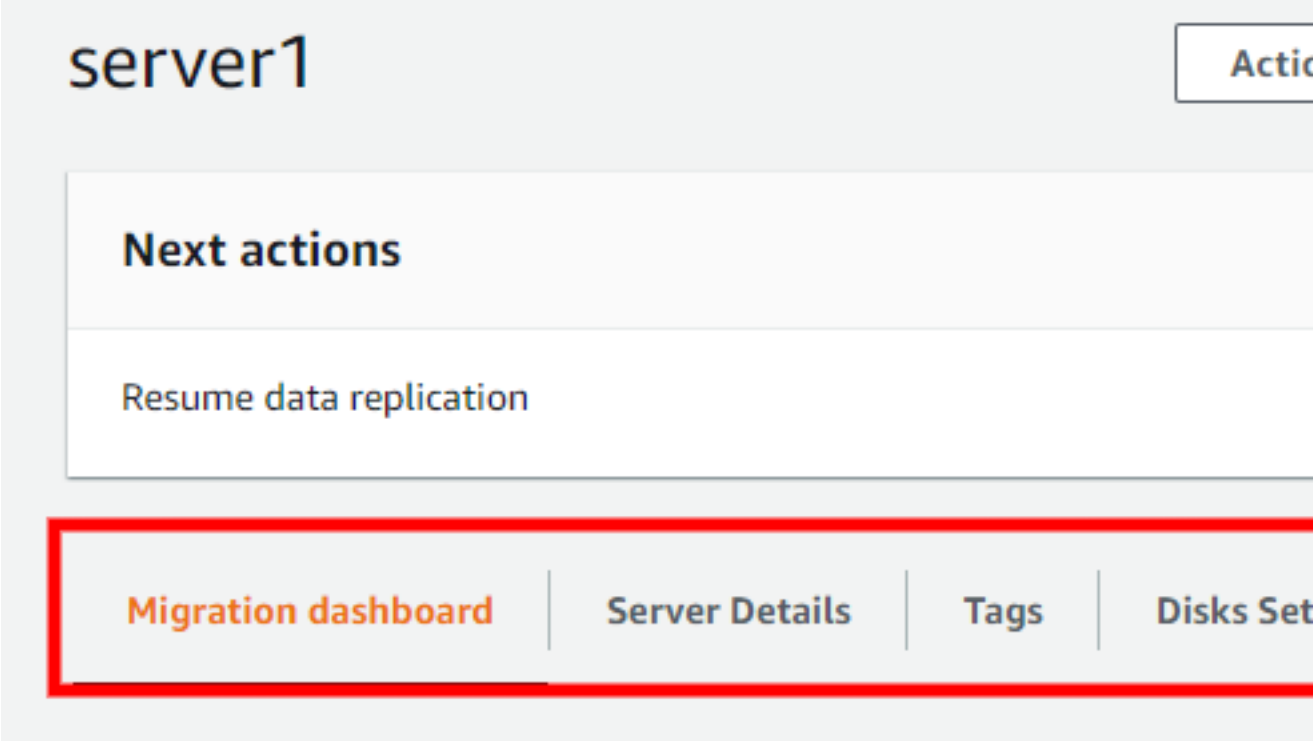

server1
Acti
Next actions
Resume data replication
Migration dashboard
Server Details
Tags
Disks Set
Lifecycle
Not ready
Ready for testing
Test in progress
Rea
Launch status
Succeeded
view in EC2
Last test
4/5/2020, 12:38:00 PM
Job Id:149
Cut
4/5
Job
Data replication status
Paused
Replication progress
Total replicated storage

You can also perform a variety of actions, control replication, and launch test and cutover instances for the individual server from the server details view.

The **Next actions** box servers as a helpful guide to the state of the server and the next steps you need to take in order to complete the migration process for the server.



The server details view is divided into several tabs, including:

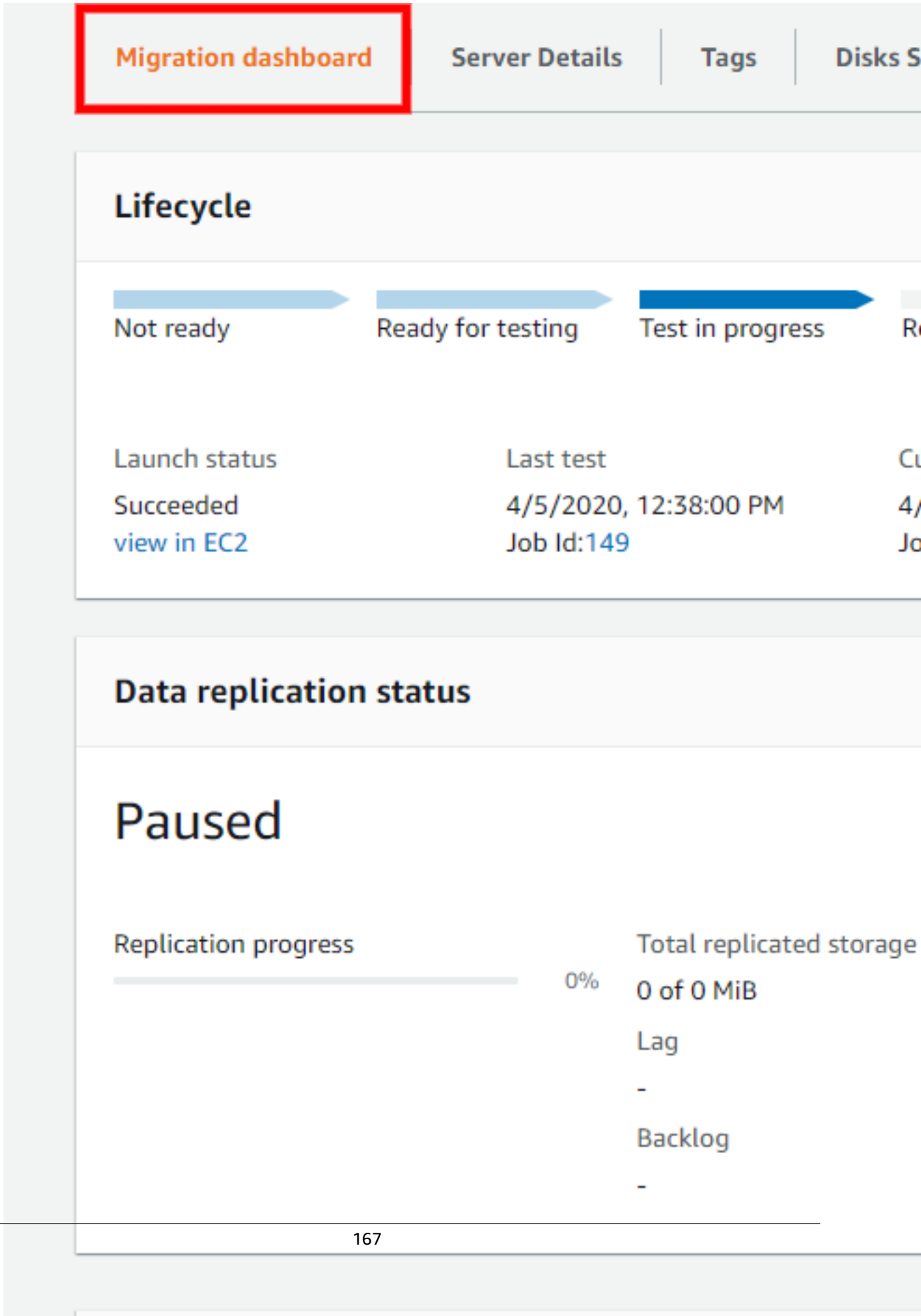


Topics

- Migration dashboard (p. 166)
- Server details (p. 206)
- Tags (p. 208)
- Disk settings (p. 211)
- Replication settings (p. 215)
- Launch Settings (p. 217)

Migration dashboard

The **Migration dashboard** tab allows you to monitor the machine in relation to the migration lifecycle.


Migration dashboard
Server Details
Tags
Disks S
Lifecycle
Not ready
Ready for testing
Test in progress
Launch status
Succeeded
view in EC2
Last test
4/5/2020, 12:38:00 PM
Job Id:149
Data replication status
Paused
Replication progress
0%
Total replicated storage
0 of 0 MiB
Lag
-
Backlog
-

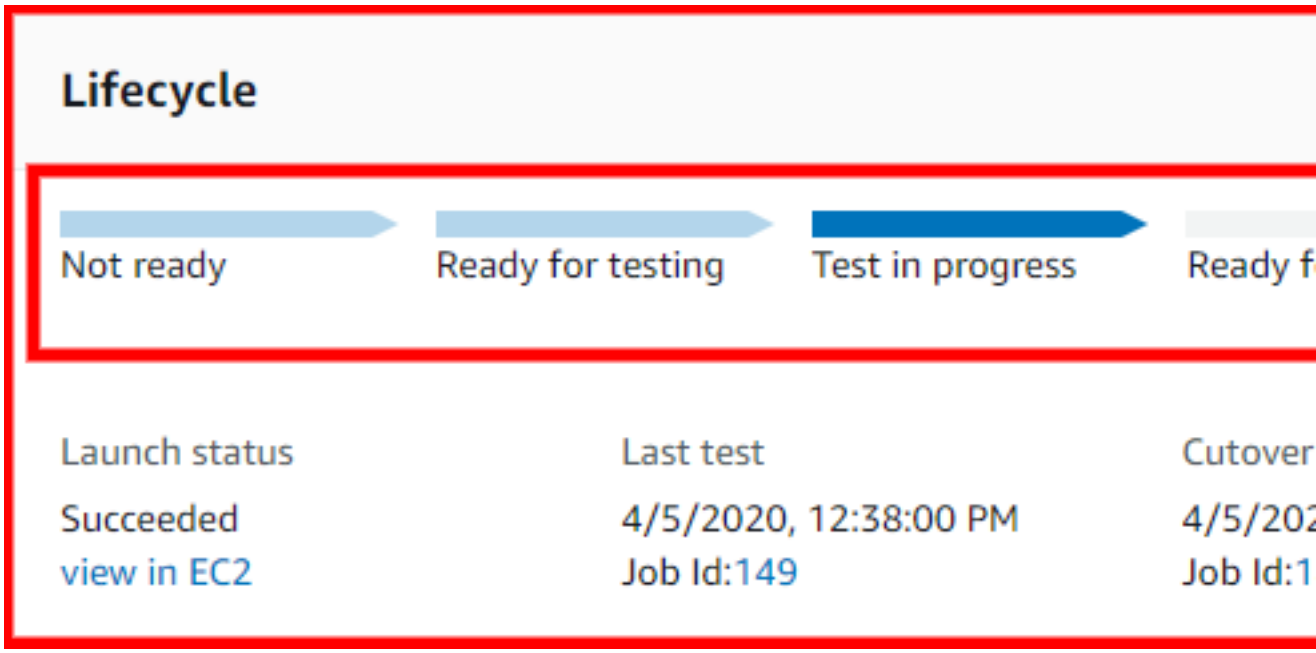
Here, you can see on which lifecycle state the source server is currently on, a detailed overview of the data replication status of the source server, and any events that the source server has undergone (in CloudTrail.) You can use the Migration dashboard to monitor the status of your source server and to troubleshoot migration and data replication issues.

Topics

- Lifecycle (p. 168)
- Data replication status (p. 184)
- Events and metrics (p. 184)
- Server Actions and Replication Control (p. 185)

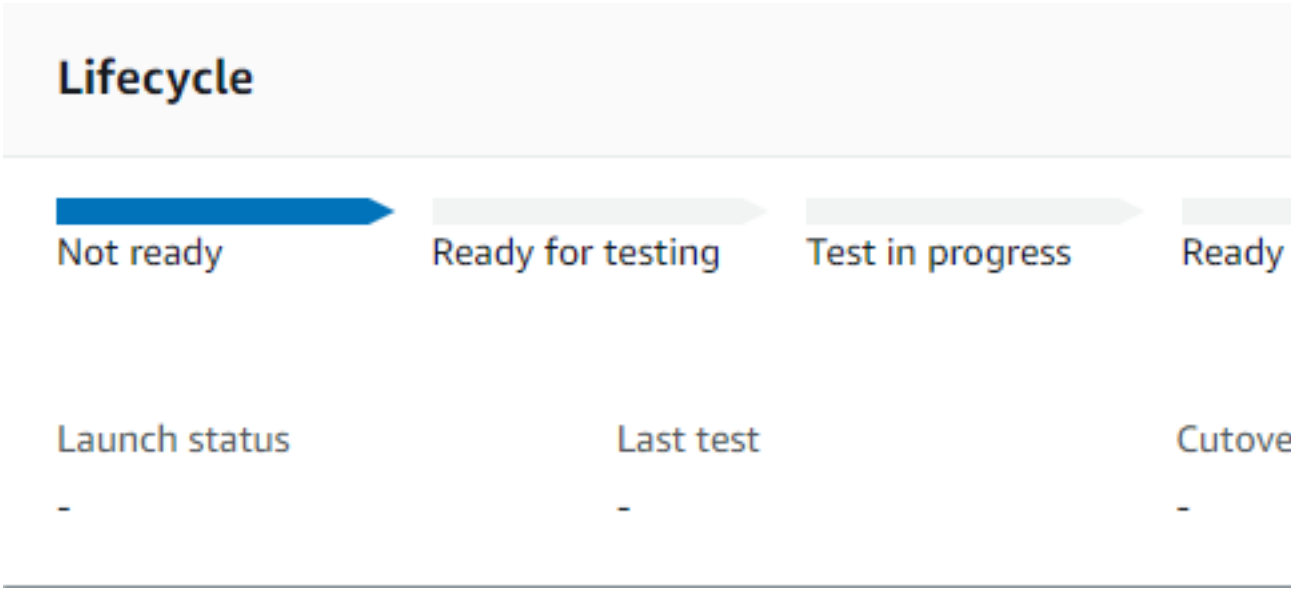
Lifecycle

The Migration Lifecycle shows the current state of each server within the migration framework.

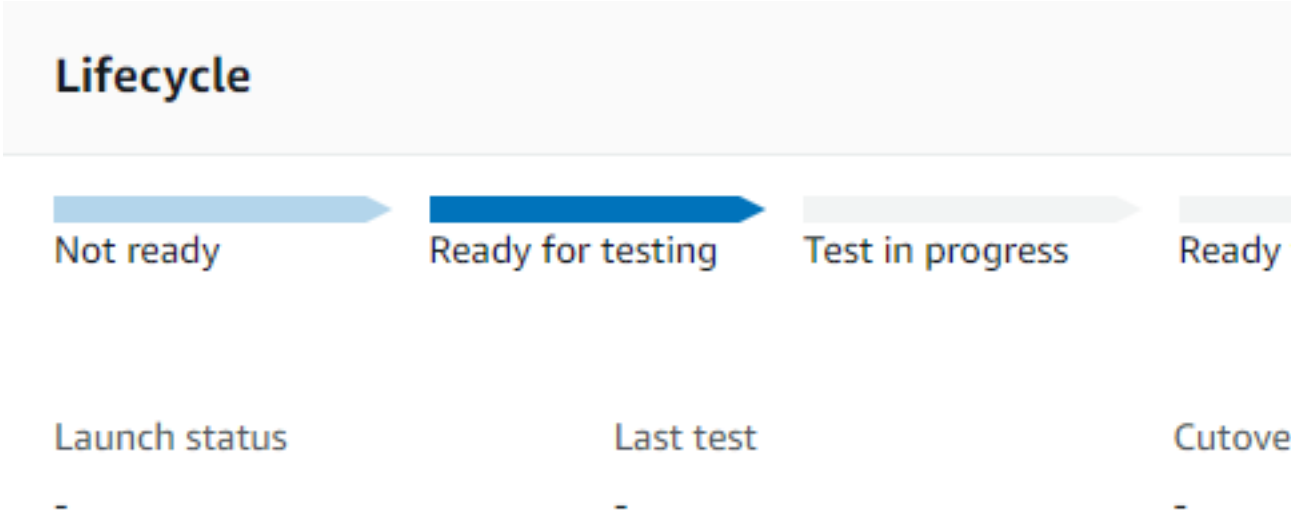


Lifecycle states include:

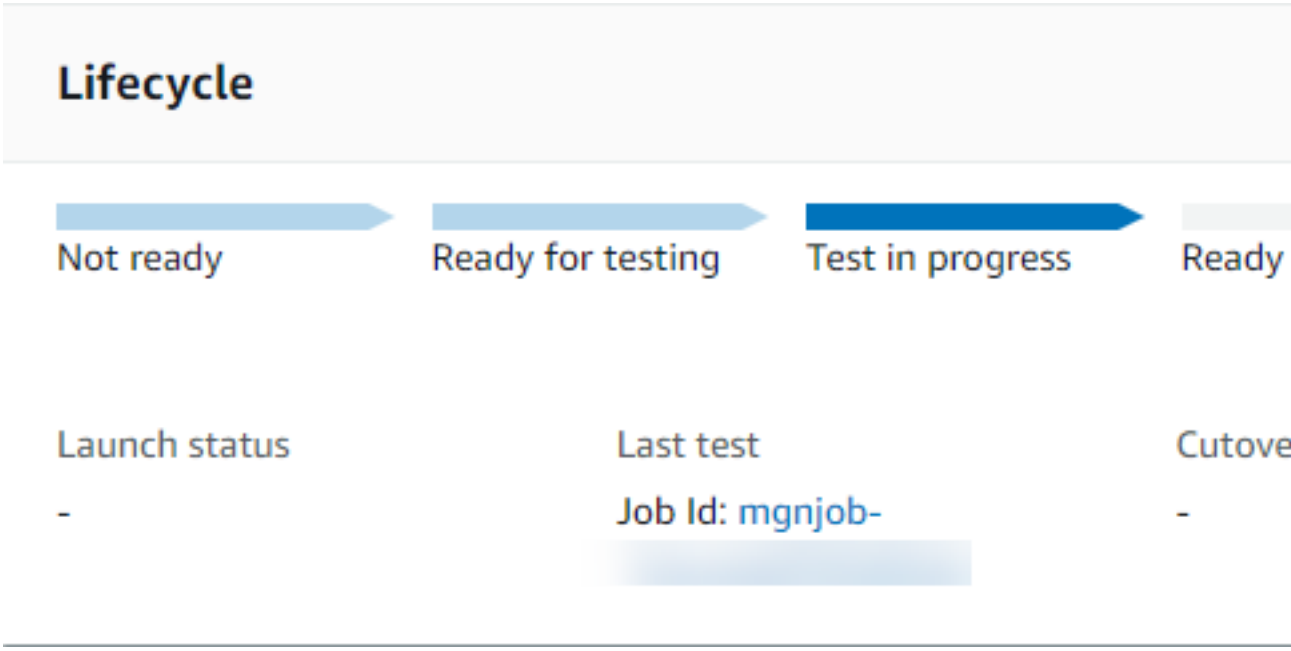
- Not ready - The server is undergoing the Initial Sync process and is not yet ready for testing. Data Replication can only commence once all of the Initial Sync steps have been completed.



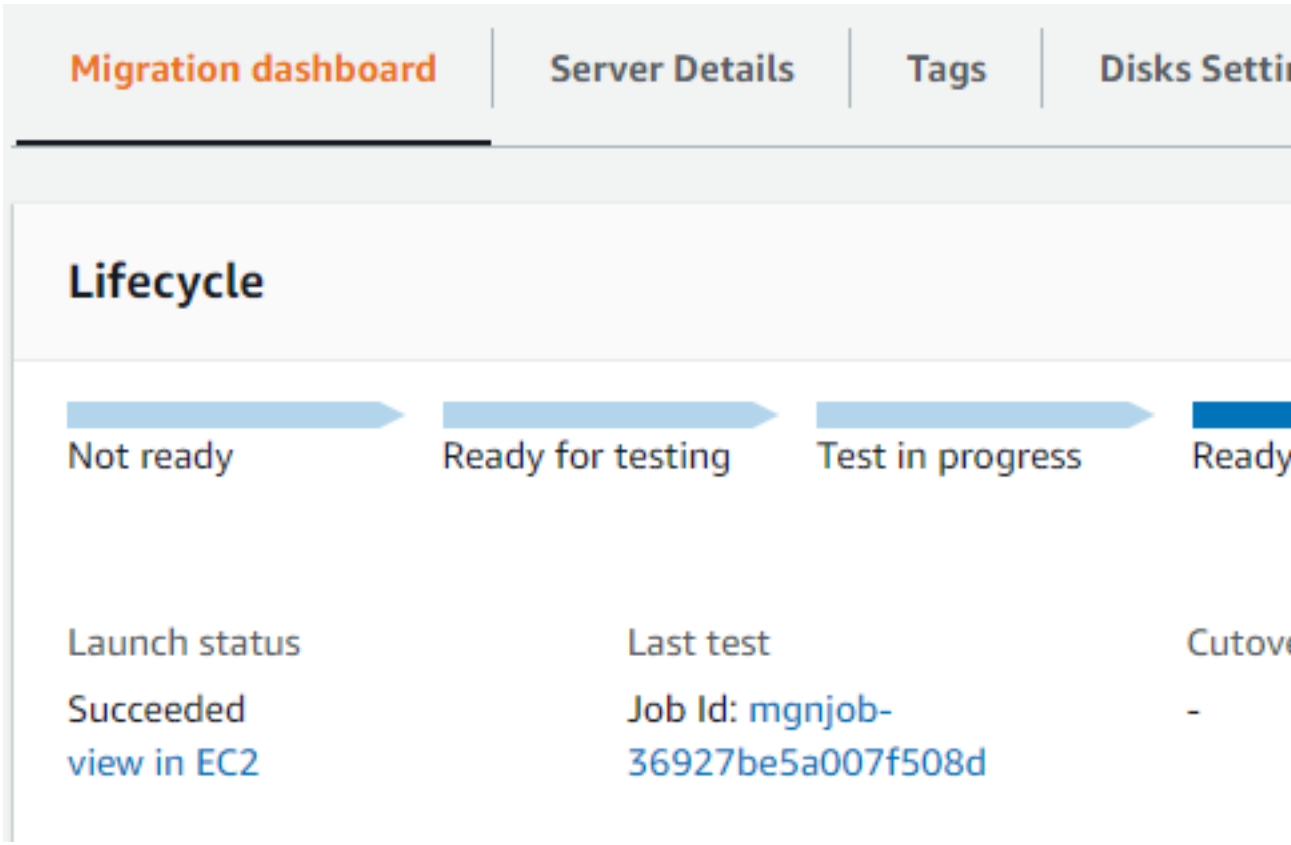
- Ready for testing - The server has been successfully added to Application Migration Service and Data Replication has started. Test or Cutover instances can now be launched for this server.



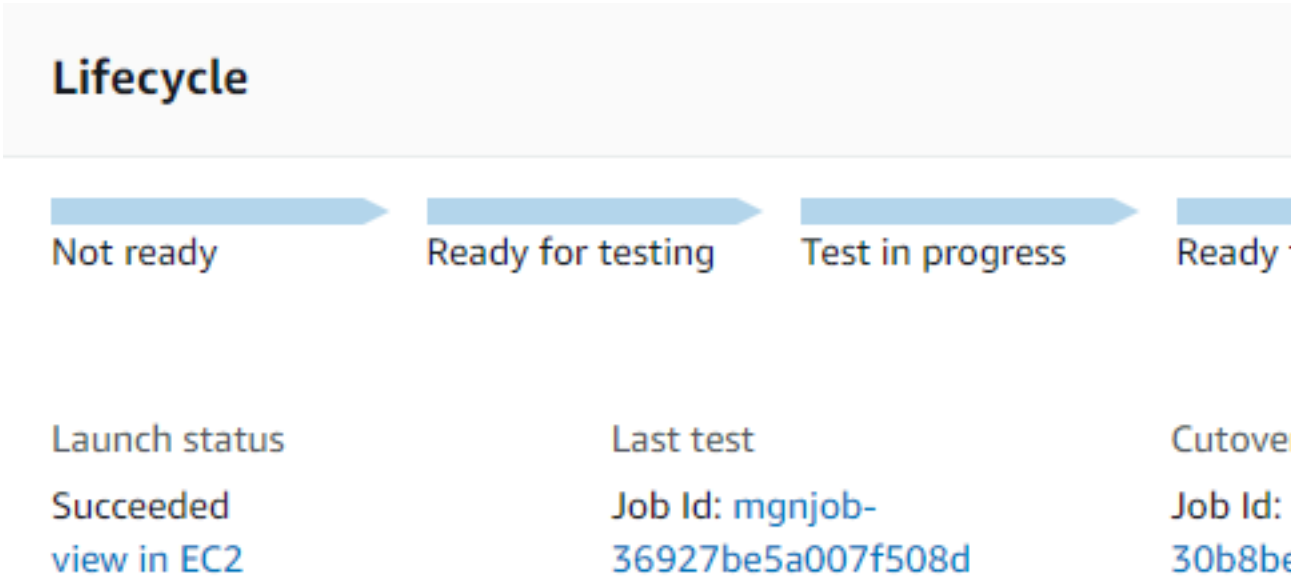
- Test in progress - A Test instance is currently being launched for this server.



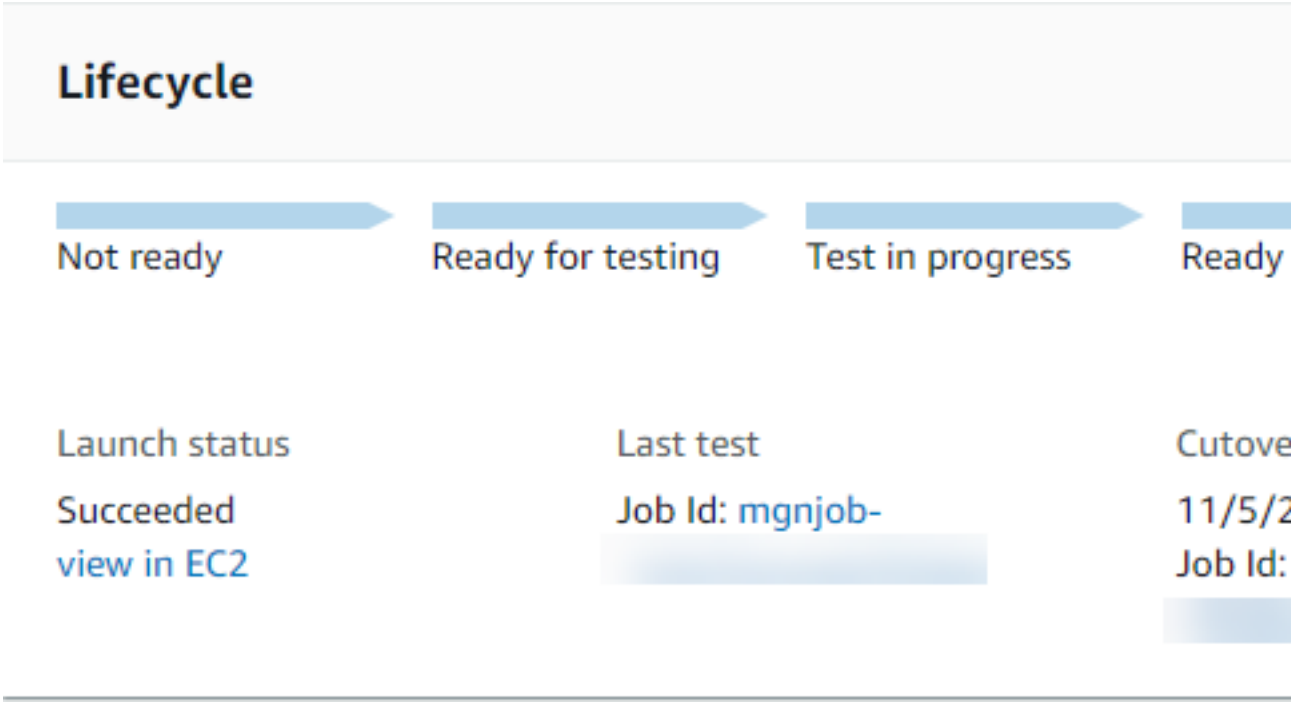
- Ready for cutover - This server has been tested and is now ready to launch a Cutover instance.



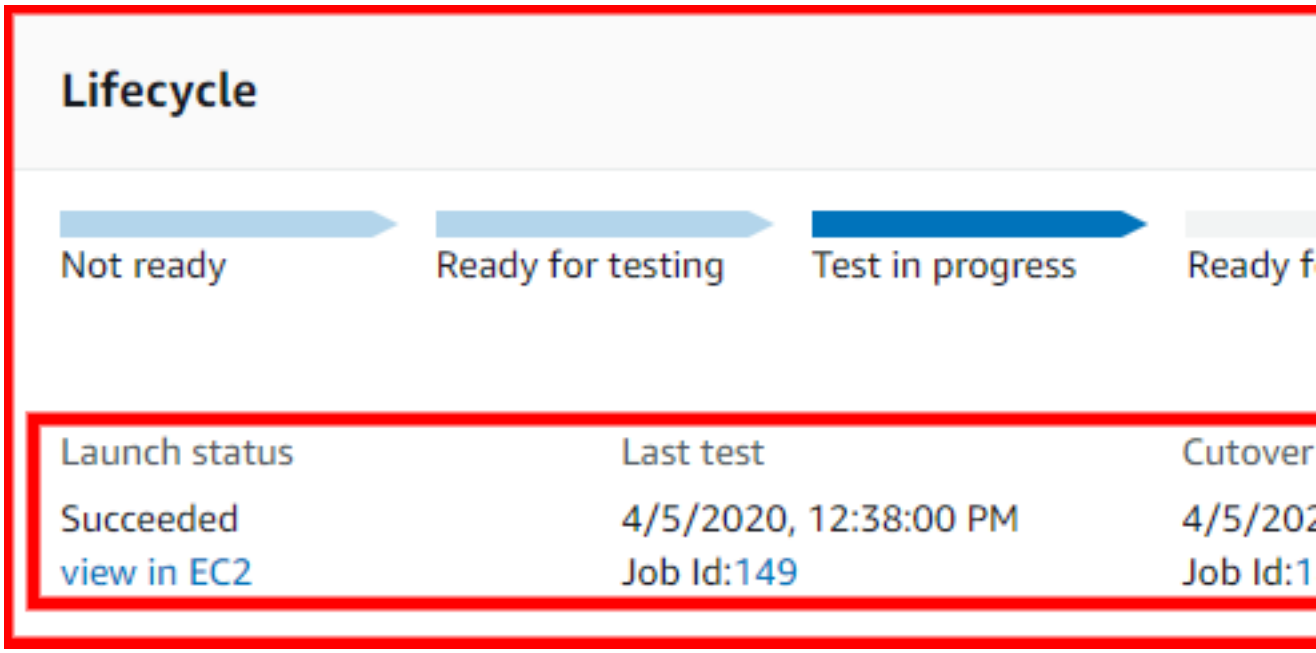
- Cutover in progress - A Cutover instance is currently being launched for this server.



- Cutover Complete - This server has been cutover. All of the data on this server has been migrated to the AWS Cutover instance.



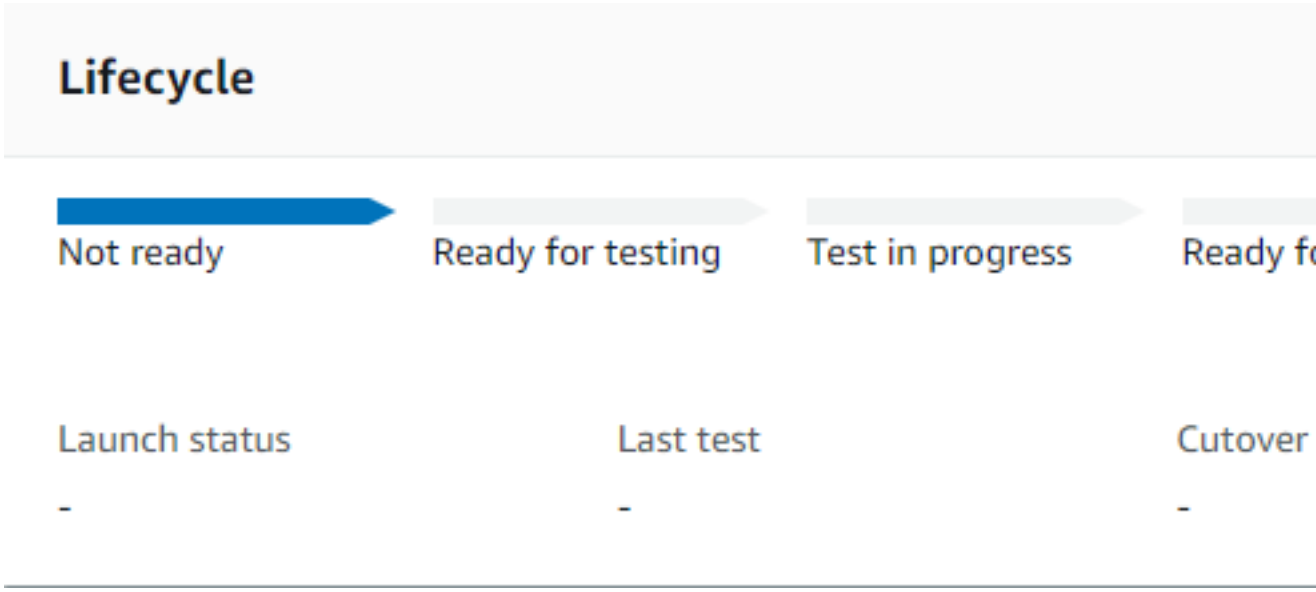
The Lifecycle always displays the **Launch status**, **Last test**, and **Cutover status** of the server.



Topics

- Not ready (p. 172)
- Ready for testing (p. 175)
- Test in progress (p. 177)
- Ready for cutover (p. 180)
- Cutover in progress (p. 181)
- Cutover complete (p. 182)

Not ready



The **Not ready** Lifecycle state represents several possible scenarios:

Topics

- Server undergoing Initial Sync (p. 173)
- Unable to complete initiation (p. 175)

Server undergoing Initial Sync

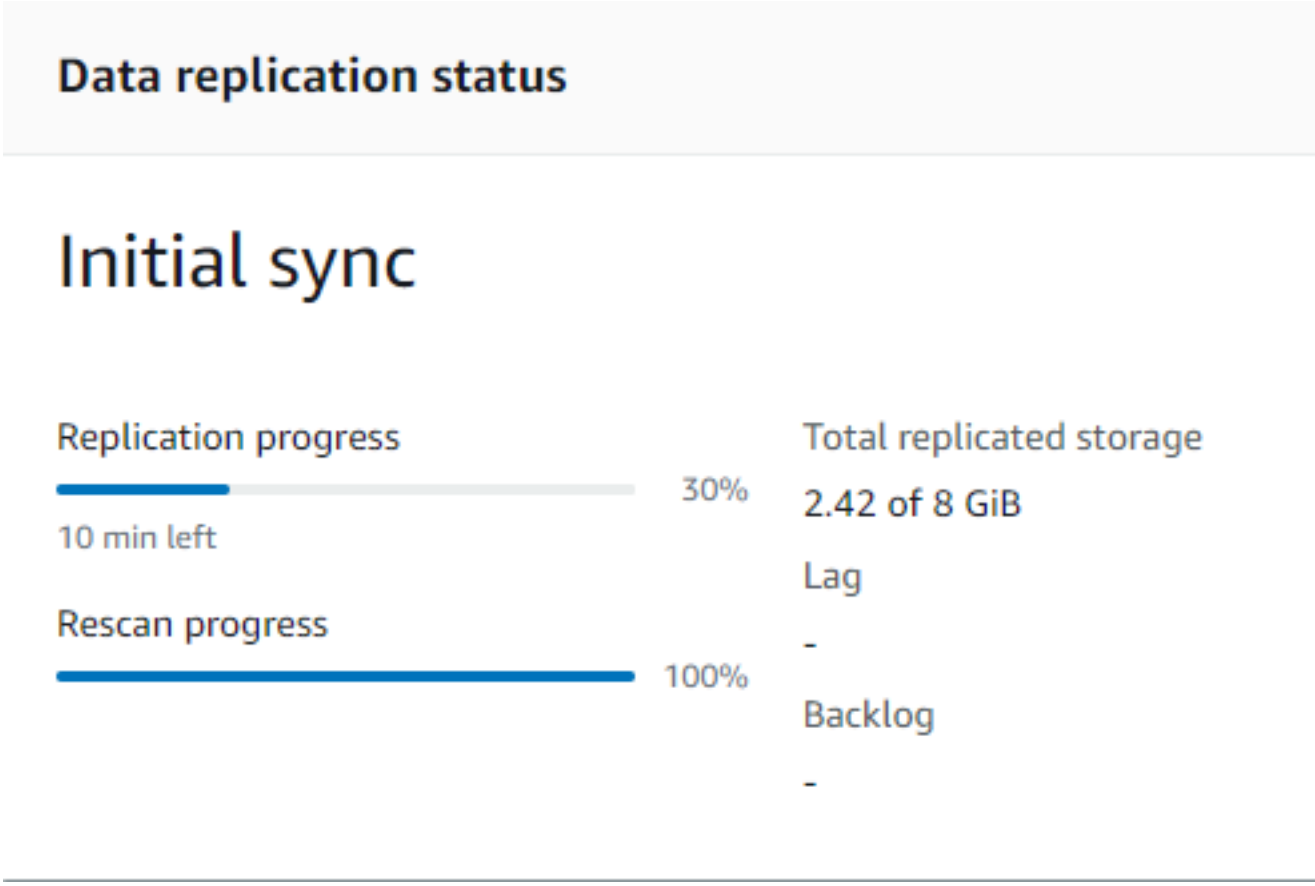
A source server that has been added to Application Migration Service will automatically begin the Initial Sync process after AWS Replication Agent installation.

Data Replication can only commence once all of the Initial Sync steps have been completed. The server will be in the **Not ready** Lifecycle state until Initial Sync has been successfully completed.

Initial sync steps include:

- Initiation
  - Creating Firewall Rules
  - Creating Replication Server
  - Booting Replication Server
  - Resolving Service Manager Address
  - Authenticating with the Service Manager
  - Downloading Replication Software
  - Creating Staging Disks
  - Pairing Replication Server with Agent
  - Establishing Communication between AWS Replication Agent and Replication Server
- Sync (0% to 100%)
- Flush backlog (if any)
- Create first launchable snapshot

You can review the overall progress of the Initial Sync process under the **Data replication status** column.

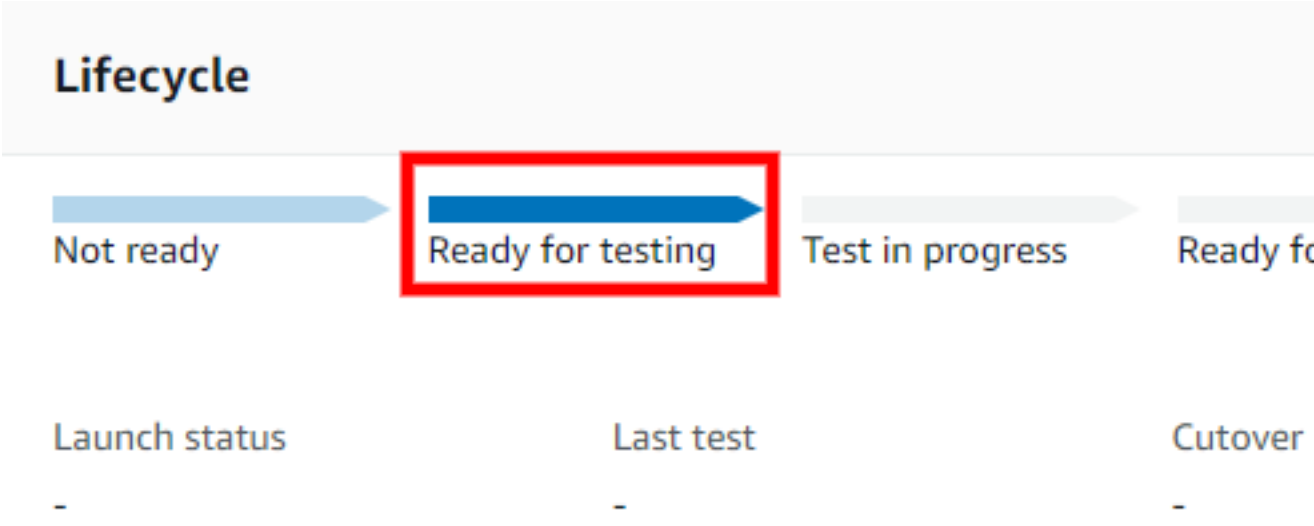


Here you can see the exact percentage of completion as well as the time left until initial sync is finished or whether there are any issues (such as a stall).

You can tell that a server has successfully completed the Initial Sync process through several indicators on the main **Source Servers** page as well as in the **Migration dashboard** tab for an individual server.

On the main **Source Servers** page, a newly added server that has completed Initial Sync for the first time will show **Ready for testing** under the **Migration lifecycle** column and **Healthy** under the **Data replication status** column.

On the individual server view, under the **Migration dashboard** tab, the **Lifecycle** section will show the **Ready for testing** status. The **Data replication status** section will show the **Healthy** status.



Note
Servers will automatically undergo Initial Sync every time there is a network disconnect.

Unable to complete initiation

The server will be in the **Not ready** Lifecycle state until Initial Sync has been successfully completed.

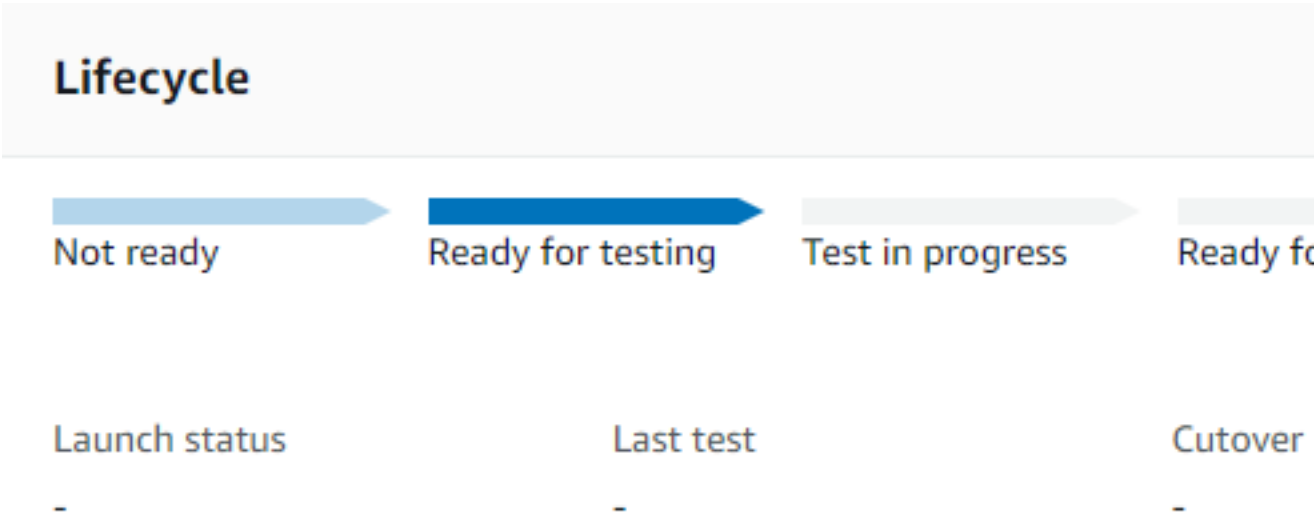
If the Initial Sync process is stalled for any reason, the **Data replication status** section will indicate that replication has been stalled.

Click on **View details** in order to open up a list of Initial Sync initiation steps. The step on which Initial Sync failed will be marked with a red "x".

You will have to fix the issue before the Initial Sync process can continue. You will not be able to migrate your server and the server will remain in the **Not ready** state until the issue has been fixed.

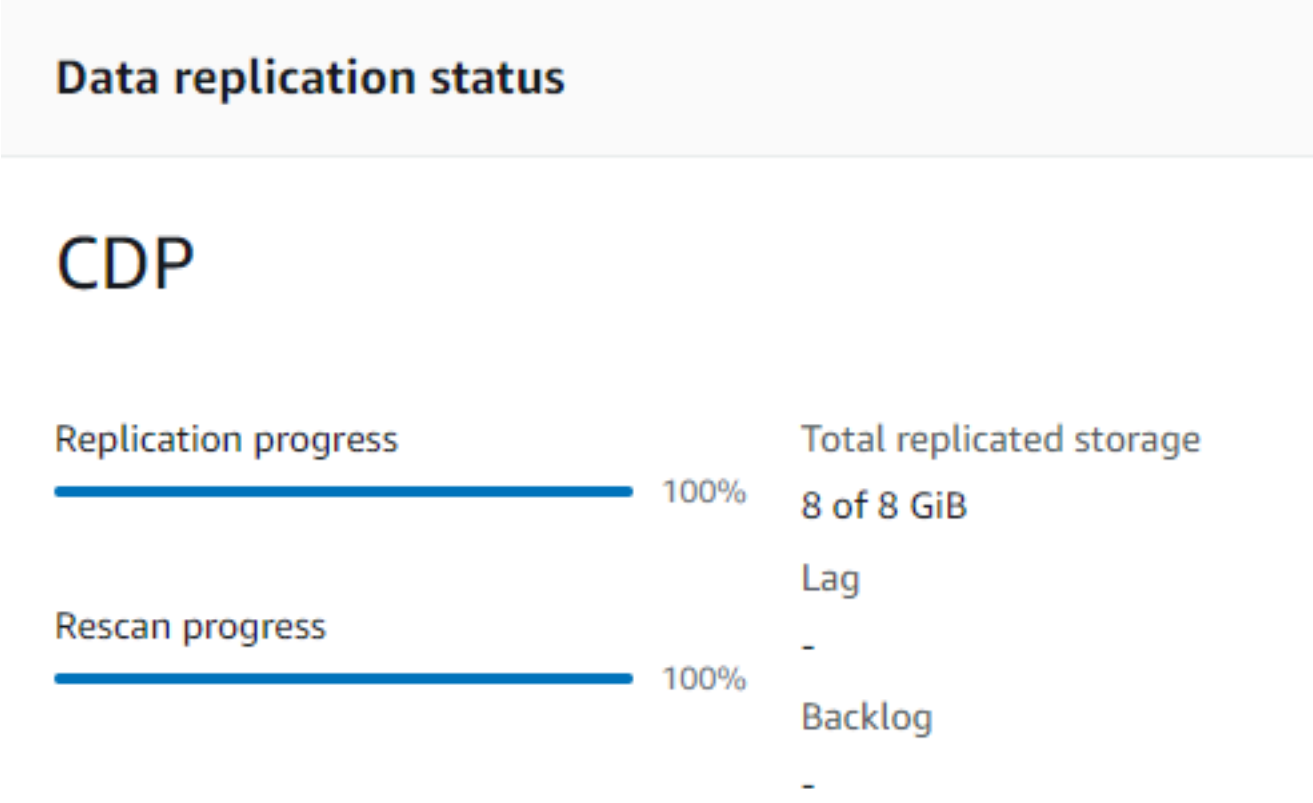
Each step has unique troubleshooting methods.

Ready for testing



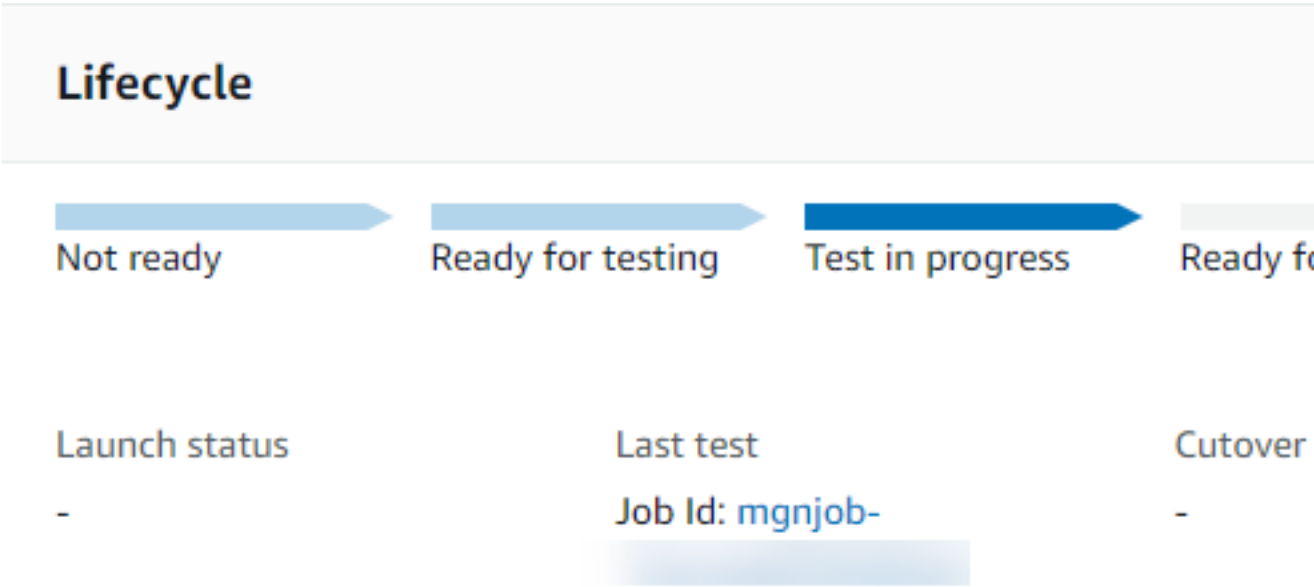
Once the server has successfully completed the Initial Sync process, it will enter the **Ready for testing** Lifecycle state.

The **Data replication status** box will show a **CDP** (Continuous Data Protection) state, indicating that the server is healthy.



You can now launch a test instance for this server. The server will stay in the **Ready for testing** Lifecycle state until you launch a test instance for the server.

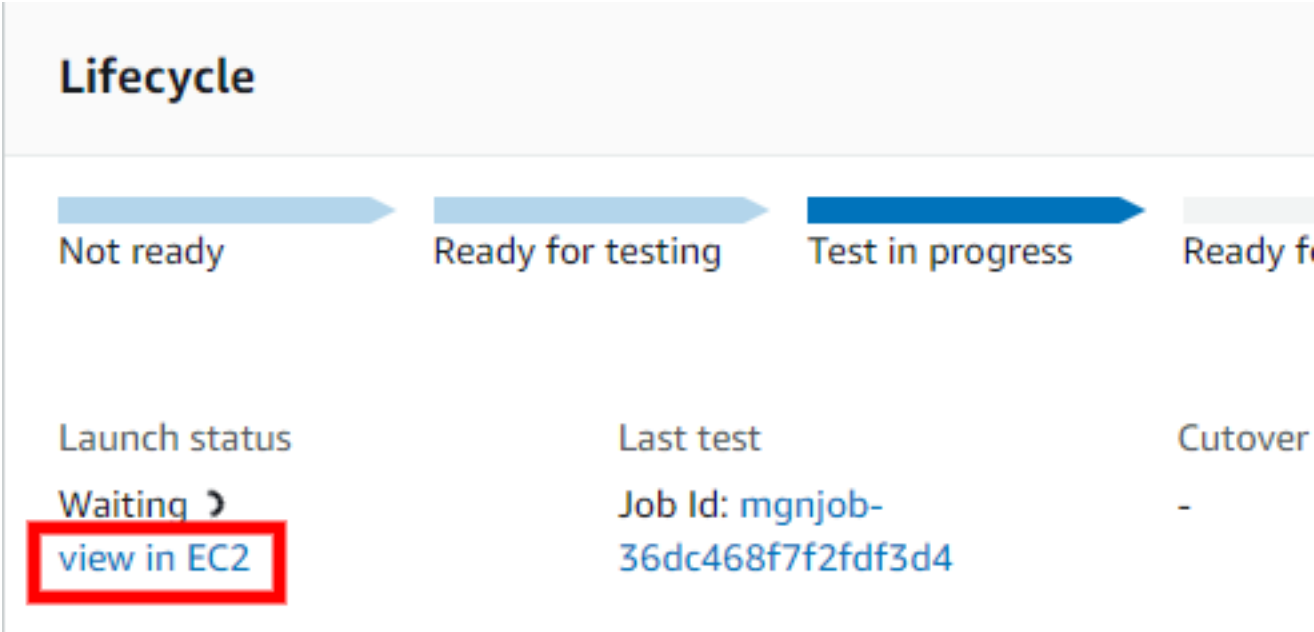
Test in progress



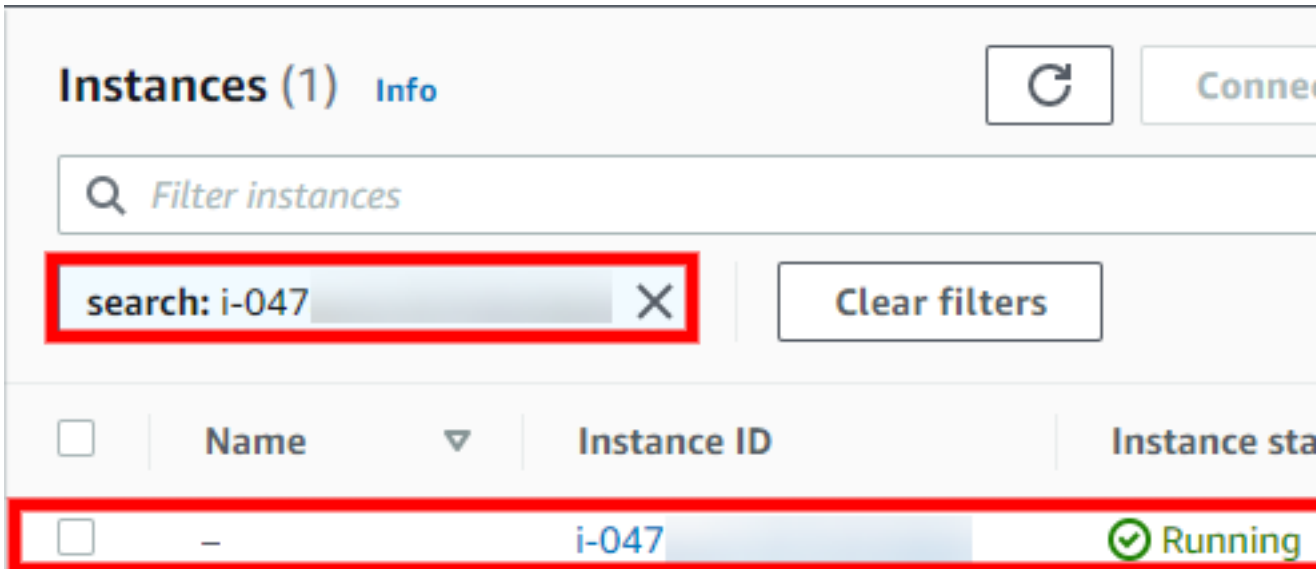
Once you have launched a test instance for your server, the Migration dashboard will show the **Test in progress** Lifecycle state.

Within the **Lifecycle** box, you can review the **Launch status** and **Last test** information fields for the test instance.

The **Launch status** field will show the time of test launch. Click on the **View in EC2** link to open the EC2 Console in a new tab in order to view and monitor your launched test instance.

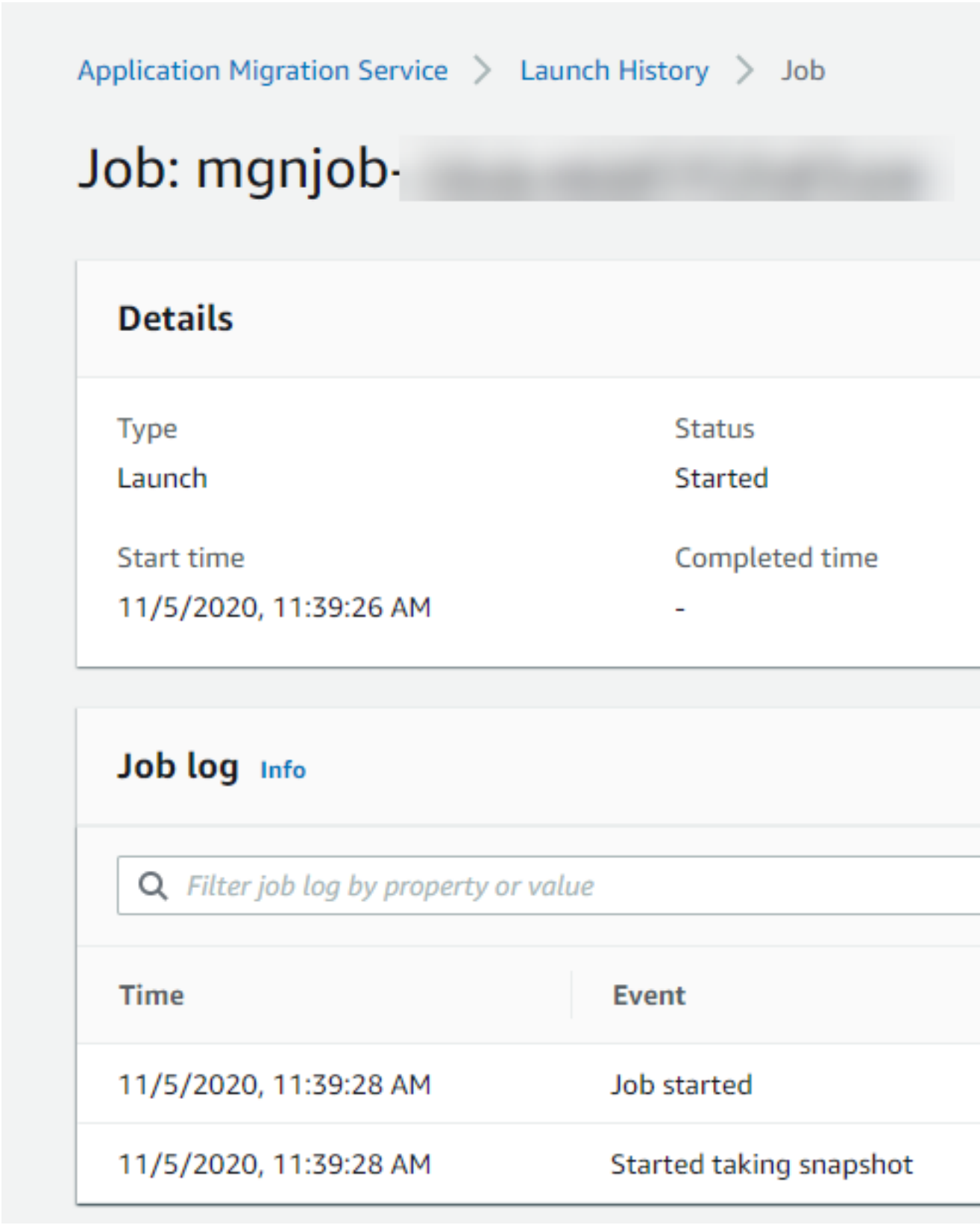


The EC2 console will open in a new tab and will automatically search for and display your test instance.

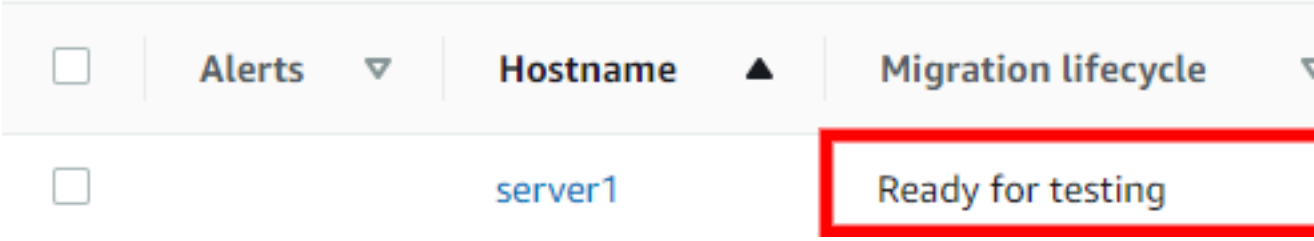


The **Last test** field will show the date of the last test. You can review the test launch details by clicking on the **Job ID**.

This will open the relevant Job within the **Launch History** page in a new tab.


Application Migration Service
Launch History
Job
Job: mgnjob-
Details
Type
Launch
Status
Started
Start time
11/5/2020, 11:39:26 AM
Completed time
-
Job log
Info
Filter job log by property or value
Time
Event
11/5/2020, 11:39:28 AM
Job started
11/5/2020, 11:39:28 AM
Started taking snapshot

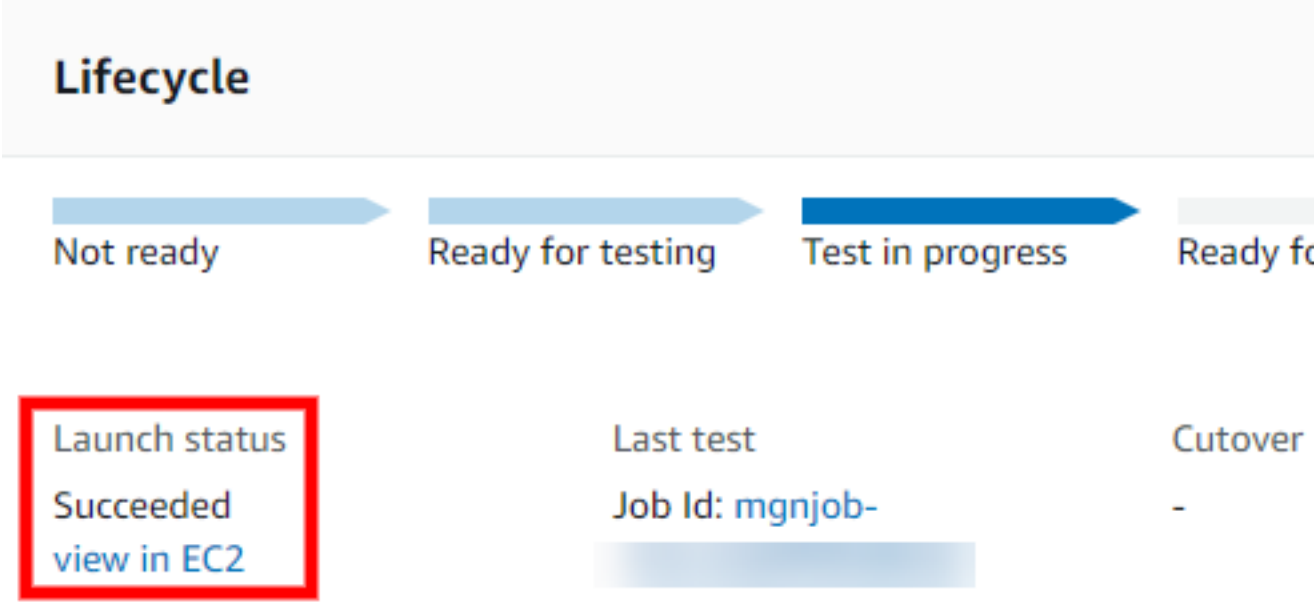
On the main **Source Servers** page, the **Migration lifecycle** column will show **Ready for testing** and the **Next step** column will show **Start testing**.



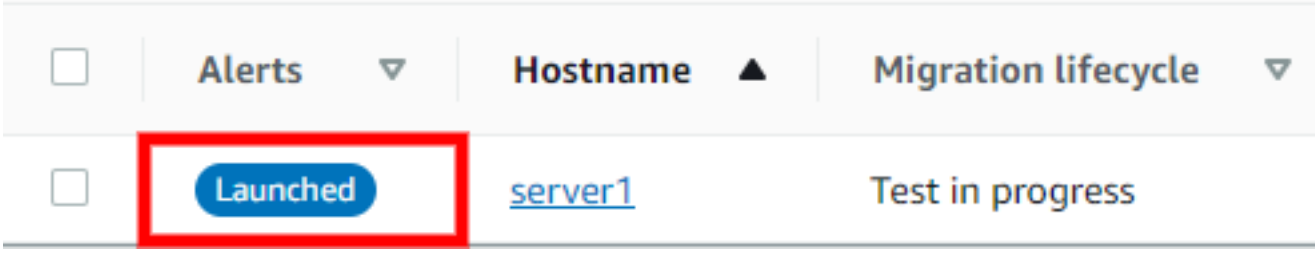
The server will stay in the **Test in progress** Lifecycle state until you finalize your testing.

You can tell that the test instance was successfully launched through several indicators:

On the **Server Details > Lifecycle** pane, the Launch status will state **Succeeded**.

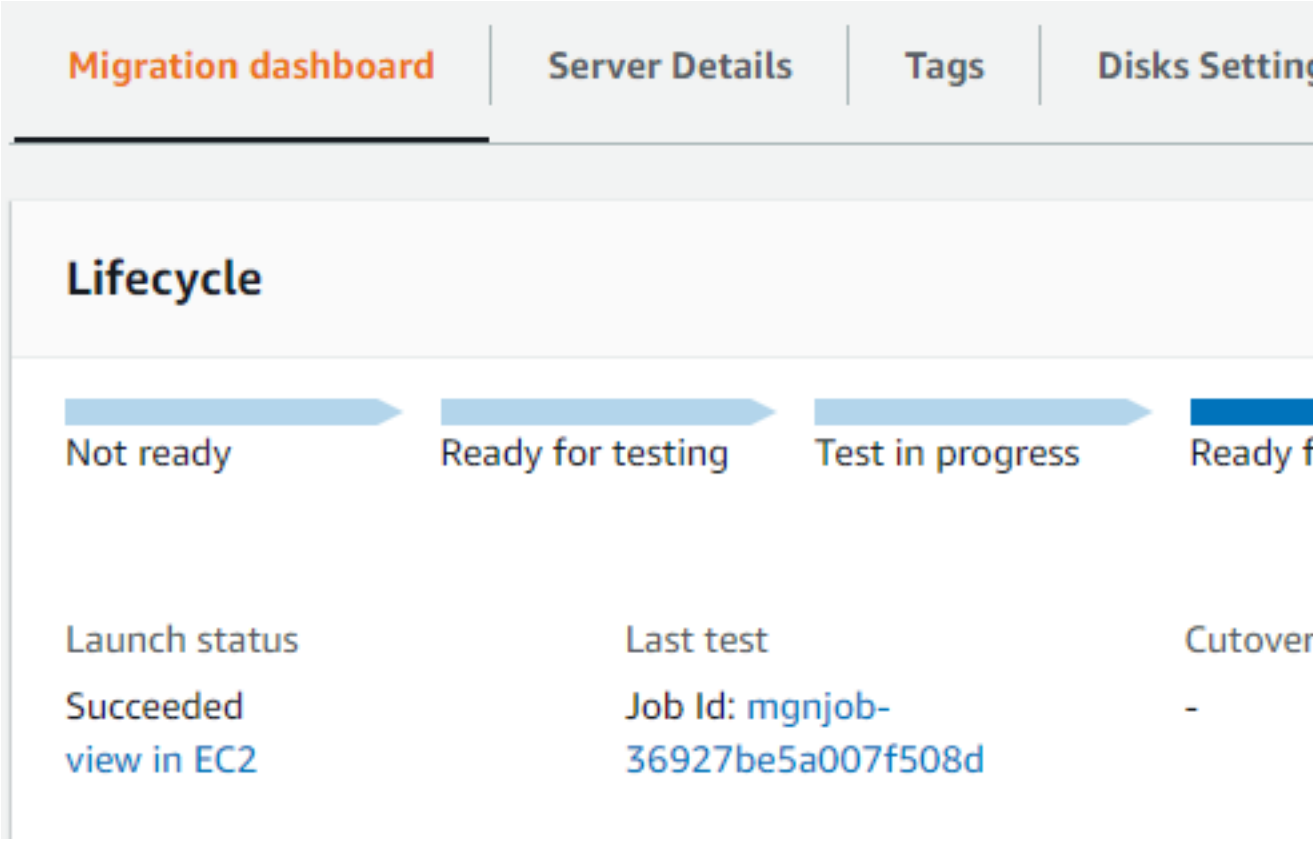


On the main **Source Servers** page, the **Alerts** column will show the **Launched** status.



Ready for cutover

Once you have finalized your testing, the Migration dashboard will show the **Ready for cutover** Lifecycle state.

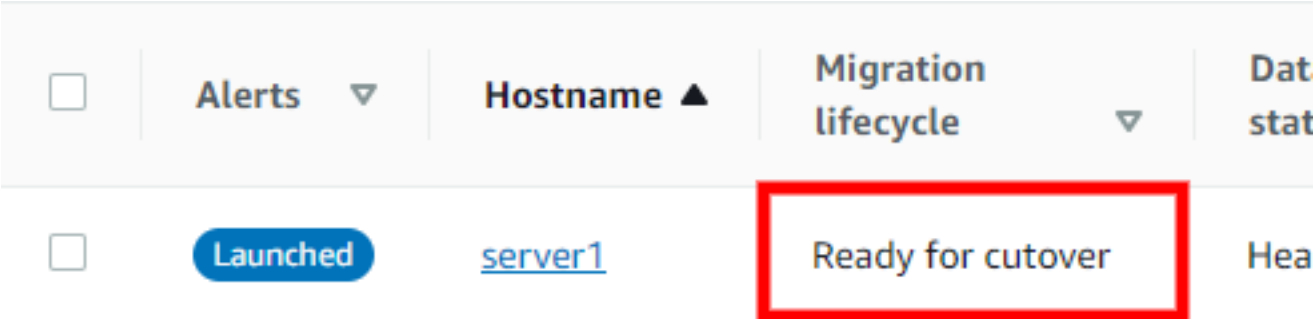


The **Launch status** field will show the last time of test launch. Click on the **View in EC2** link to open the EC2 Console in a new tab in order to view and monitor your launched test instance.

The **Last test** field will show the date the last test was finalized. You can review the test launch details by clicking on the **Job ID**. This will open the relevant Job.

The **Cutover** field will show the date of last cutover instance launch, if any. You can review the cutover launch details by clicking on the **Job ID**. This will open the relevant Job.

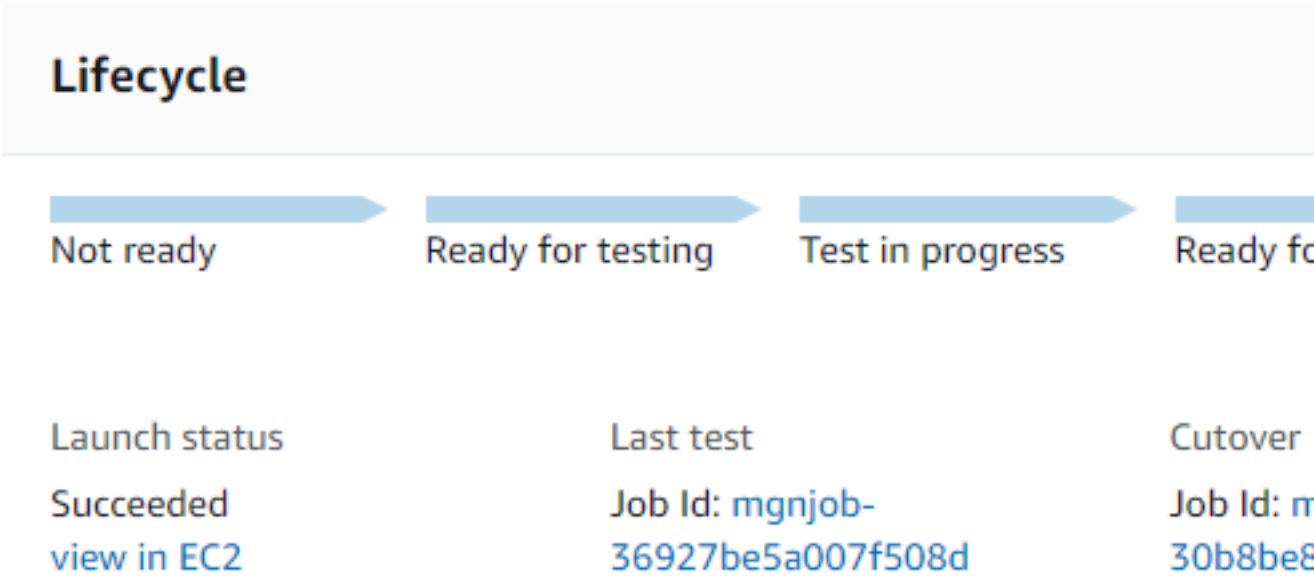
On the **Source Servers** page, the **Migration lifecycle** column will show **Ready for cutover** and the **Next step** column will show **Terminate test instance; Start cutover**.



The server will stay in the **Ready for cutover** Lifecycle state until you launch a cutover instance.

Cutover in progress

Once you have launched a cutover instance for your server, the Migration dashboard will show the **Cutover in progress** Lifecycle state.

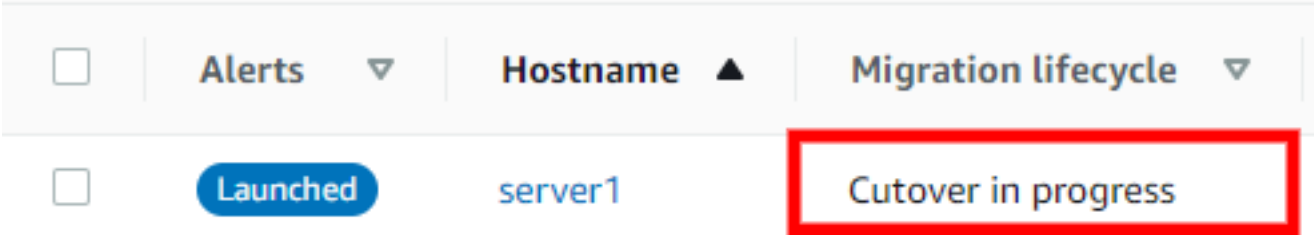


The **Launch status** field will show the last time of cutover launch. Click on the **View in EC2** link to open the EC2 Console in a new tab in order to view and monitor your launched cutover instance.

The **Last test** field will show the date the last test was finalized. You can review the test launch details by clicking on the **Job ID**. This will open the relevant Job.

The **Cutover** field will show the date of last cutover instance launch. You can review the cutover launch details by clicking on the **Job ID**. This will open the relevant Job.

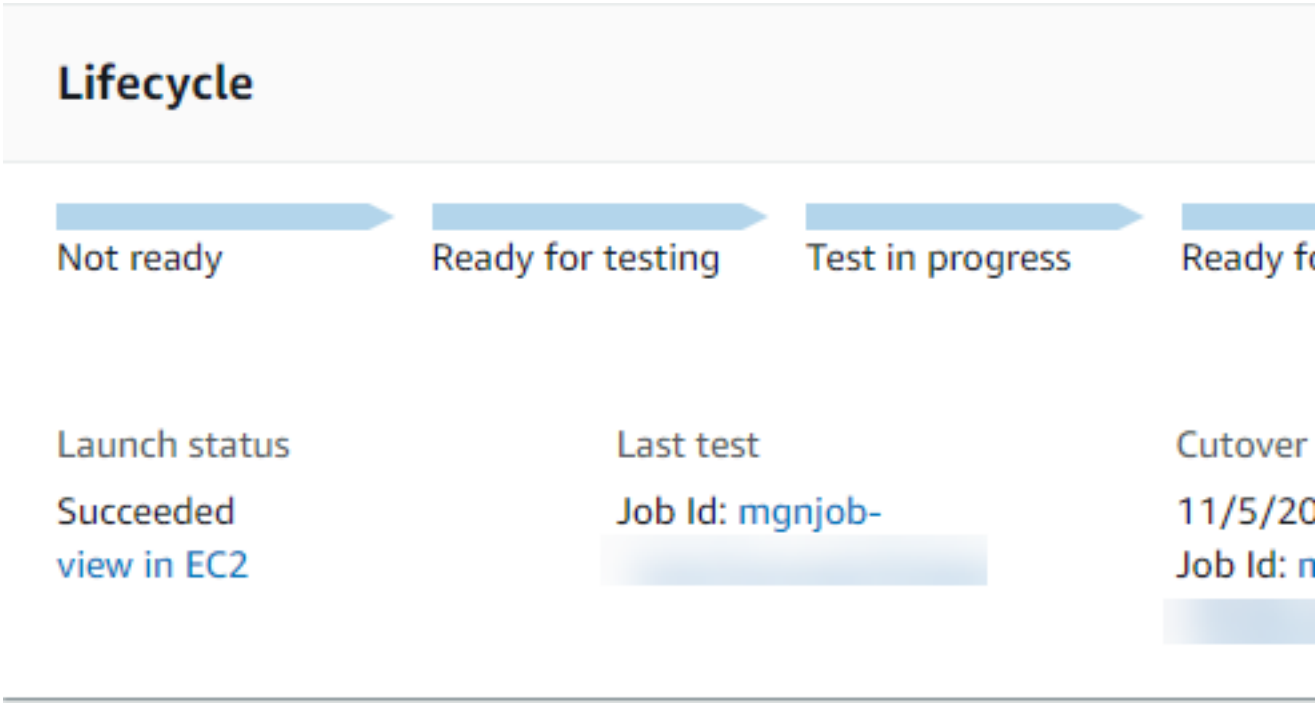
On the **Source Servers** page, the **Migration lifecycle** column will show **Cutover in progress** and the **Next step** column will show **Complete the cutover**.



The server will stay in the **Cutover in progress** Lifecycle state until you finalize the cutover.

Cutover complete

Once you have finalized your cutover instance launch for your server, the Migration dashboard will show the **Cutover Complete** Lifecycle state. This is the final state in the Migration Lifecycle. This state indicates that you have successfully migrated your source server to AWS.

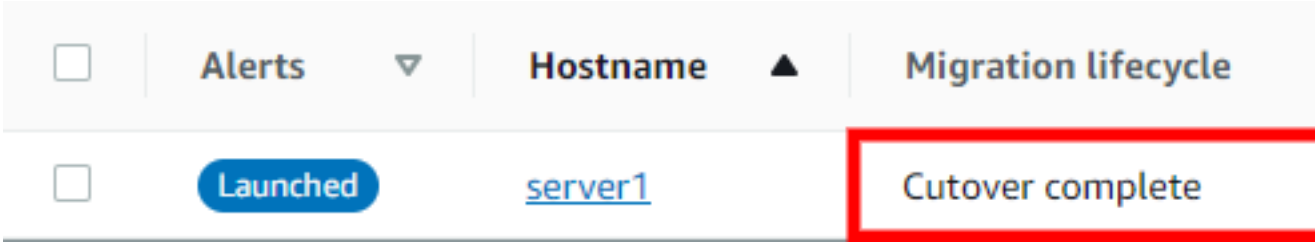


The **Launch status** field will show **Succeeded**. Click on the **View in EC2** link to open the EC2 Console in a new tab in order to view and monitor your launched cutover instance.

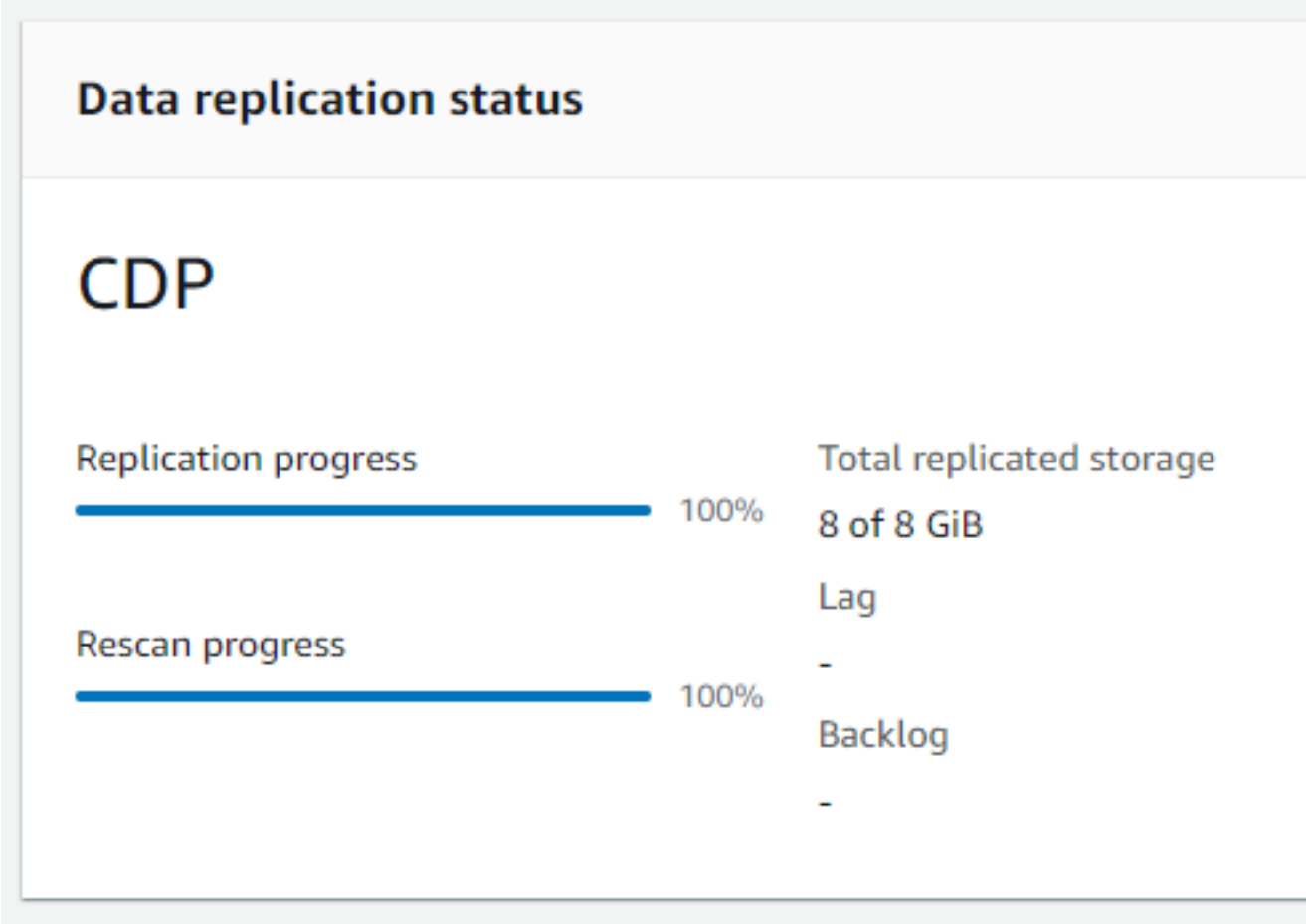
The **Last test** field will show the date the last test was finalized. You can review the test launch details by clicking on the **Job ID**. This will open the relevant Job.

The **Cutover** field will show the date when you finalized your cutover instance launch. You can review the cutover launch details by clicking on the **Job ID**. This will open the relevant Job.

The Application Migration Service Console will automatically stop Data Replication for the cutover source servers in order to save resource costs. On the **Source Servers** page, the selected source servers' **Migration lifecycle** column will show the **Cutover complete** status, the **Data replication** column will show **Disconnected** and the **Next step** column will show **Archive**.



Data replication status

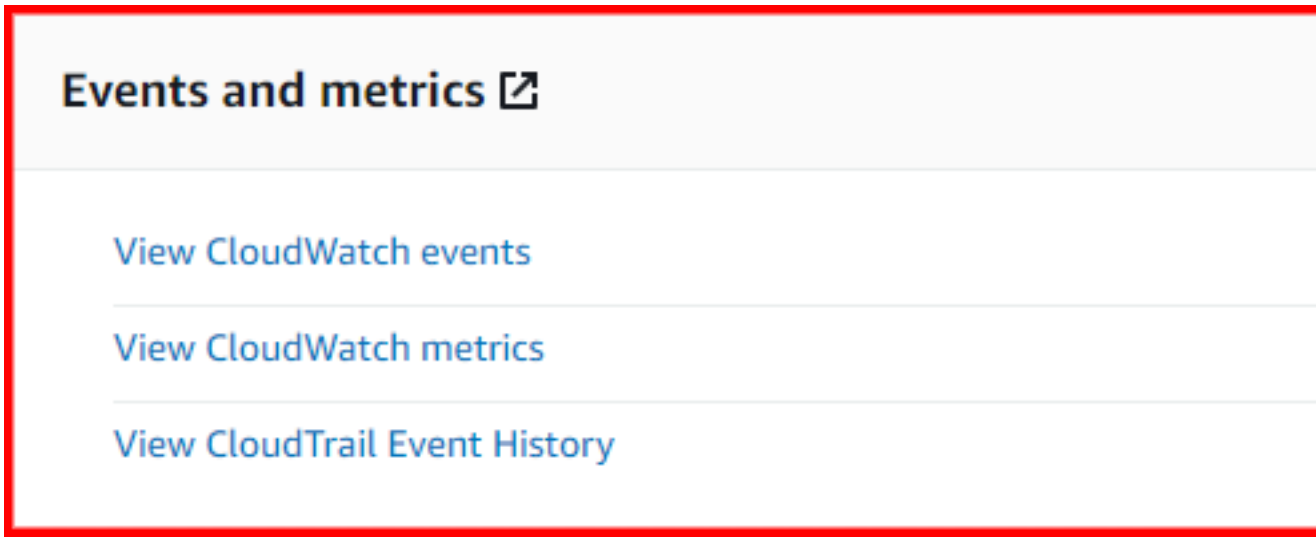


The **Data replication status** section provides a complete overview of the overall status of the machine. Including:

- Replication progress - The percentage of the server's storage that was successfully replicated.
- Rescan progress - The percentage of the server's storage that was rescanned (in the case of a rescan)
- Total replicated storage - The total amount of storage replicated (in GiB).
- Lag - Whether server is experiencing any lag. If so - the lag time.
- Backlog - Whether there is any backlog on the server (in MiB)
- Elapsed replication time - Time elapsed since replication first began on the server.
- Last seen - The last time the server successfully connected to Application Migration Service.
- Replication start time - The data and time replication first began on the server.

Events and metrics

You can review Application Migration Service events and metrics in CloudWatch and CloudTrail. Click on **View CloudWatch events**, **View CloudWatch metrics**, or **View CloudTrail Event** History to open CloudWatch or CloudTrail in a new tab.



Learn more about using CloudWatch metrics in the AWS CloudWatch user guide.

Learn more about CloudWatch events in the AWS CloudWatch user guide.

Learn more about CloudTrail events in the AWS CloudTrail user guide.

Server Actions and Replication Control

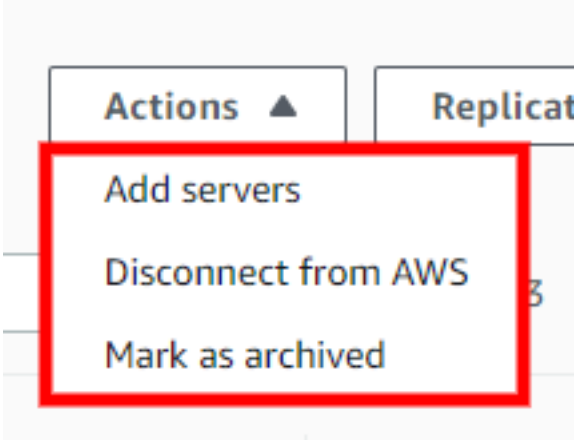
You can perform a variety of actions, control data replication, and manage your testing and cutover for the individual server from the server details view.

Topics

- Actions Menu (p. 185)
- Replication Menu (p. 187)
- Test and Cutover Menu (p. 187)
- Alerts and Errors (p. 205)

Actions Menu

The **Actions** menu allows you to perform the following actions:



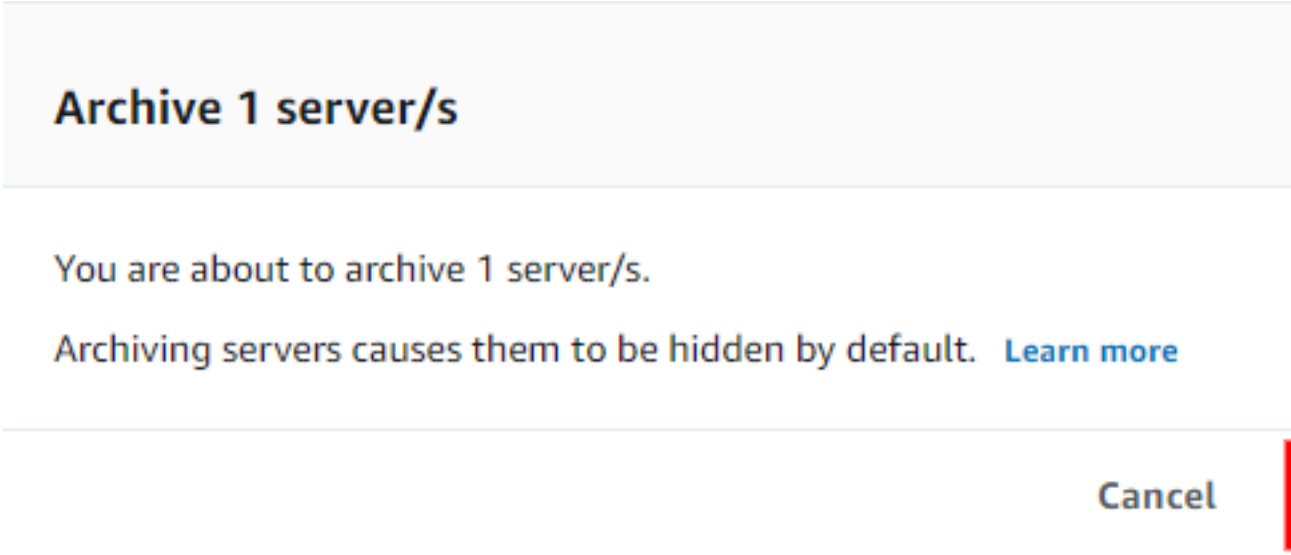
- **Add servers** - Choosing the **Add servers** option will redirect you to the MORE

- **Disconnect from AWS** - Choose the **Disconnect from AWS** option to disconnect the selected server from Application Migration Service and AWS.

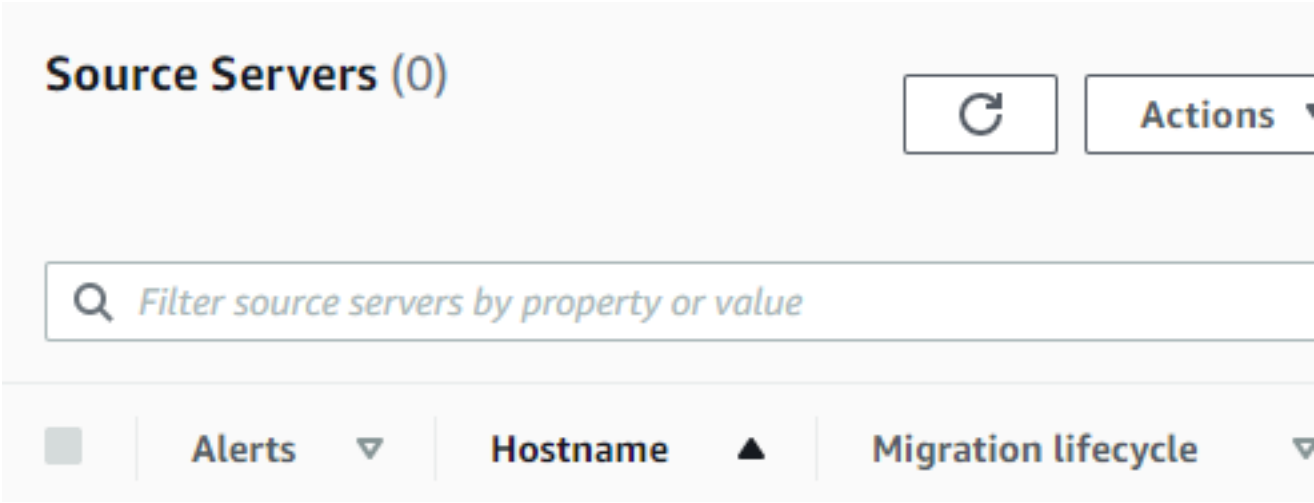
  Important
  This will uninstall the AWS Replication Agent from the source server and data replication will stop for the source server. This action will not affect any test or cutover instances that have been launched for this source server, but will you no longer be able to identify which source servers your EC2 instances correspond to.

- **Mark as archived** - Choose the **Mark as archived** option in order to archive the server. You should only archive servers for which you have already performed a cutover. Archived servers will be removed from the main Source servers page, but can still be accessed through filtering options.

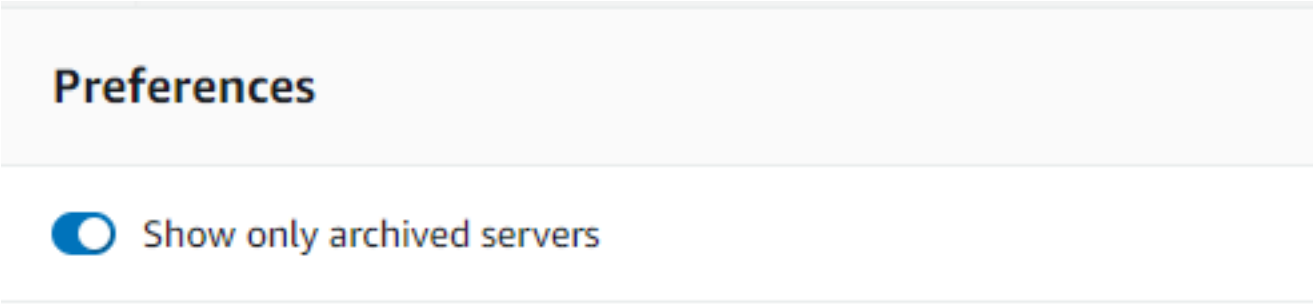
  The Archive X server/s dialog will appear. Choose **Archive**.



To see your archived servers, open the **Preferences** menu by choosing the gear button.



Select the **Show only archived servers** option and choose **Confirm**.



You will not be able to see all of your archived servers. Repeat the step above to see your live servers.

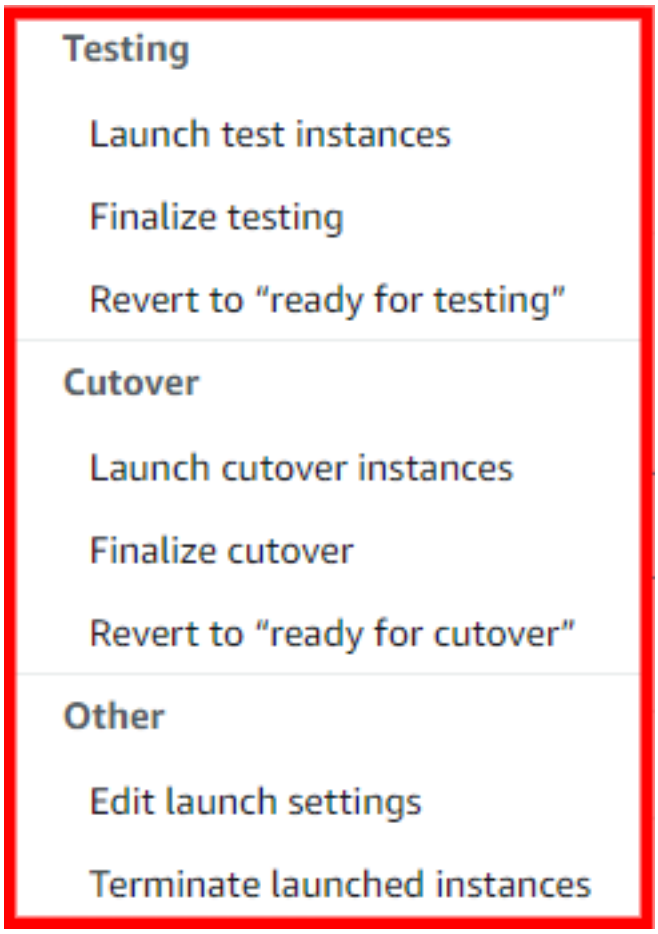
Replication Menu

The Replication menu allows you to manage data replication for the source server through the following actions:

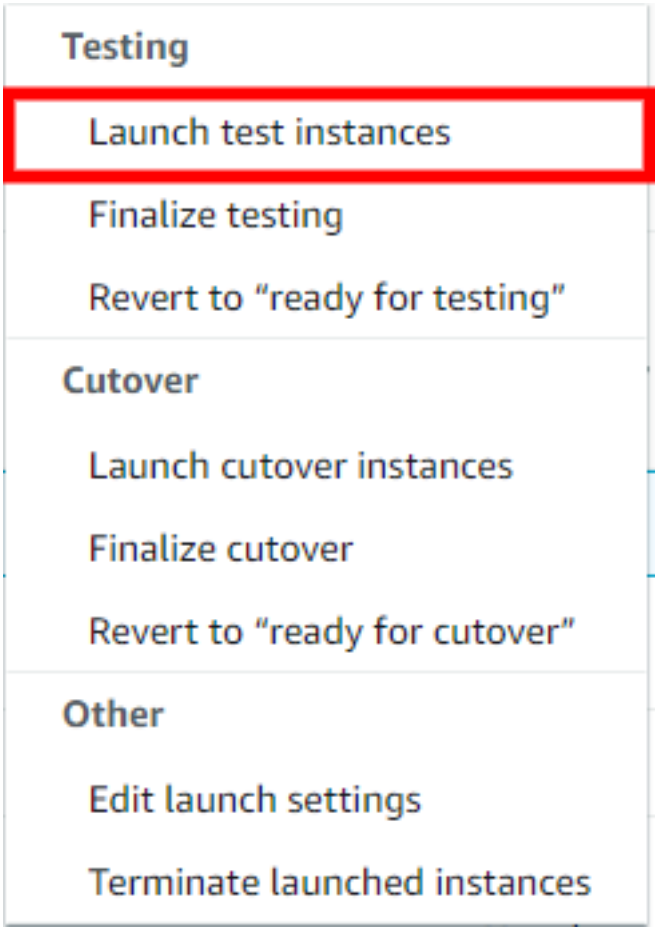
- **Edit replication settings** - Choosing the **Edit replication settings** option will redirect you to the **Replication setting** tab, where you can edit the specific replication settings for the selected source server. Learn more about editing replication settings. (p. 60)

Test and Cutover Menu

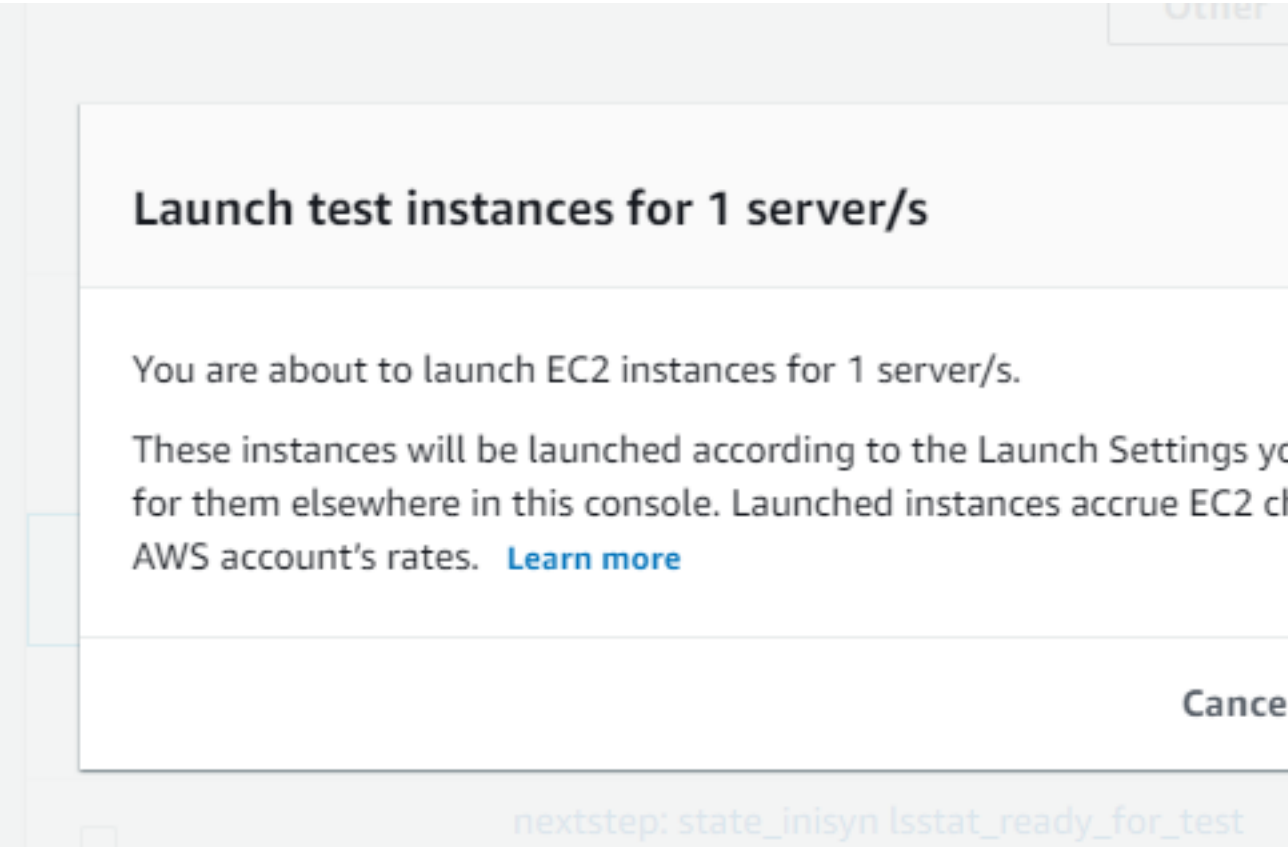
The Test and Cutover menu allows you to manage Test and Cutover instances.



- **Launch test instances**- Choose the **Launch test instances** option to launch a test instance for this server.

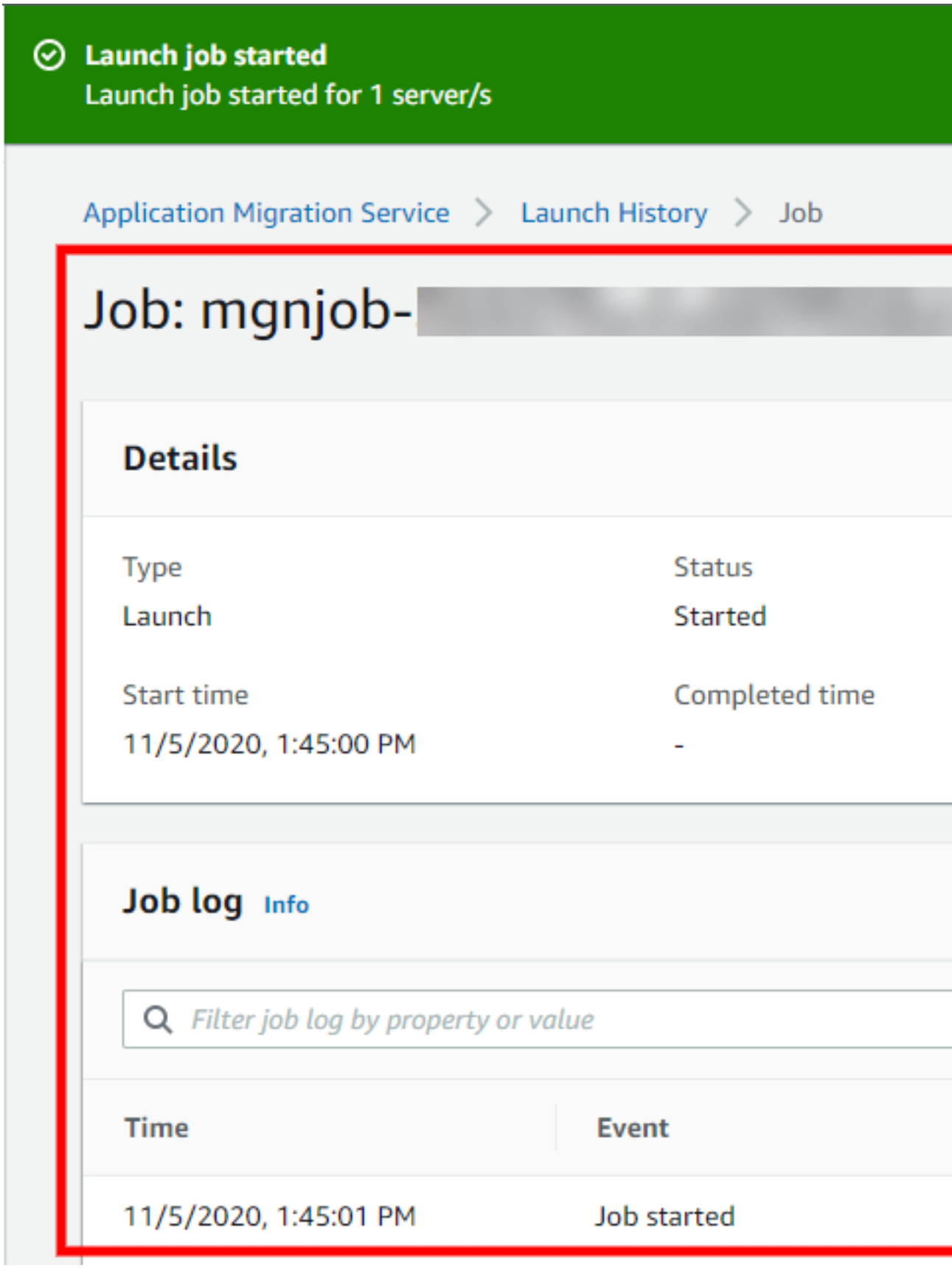


The **Launch test instances for X** servers dialog will appear. Choose **Launch** to begin the test.

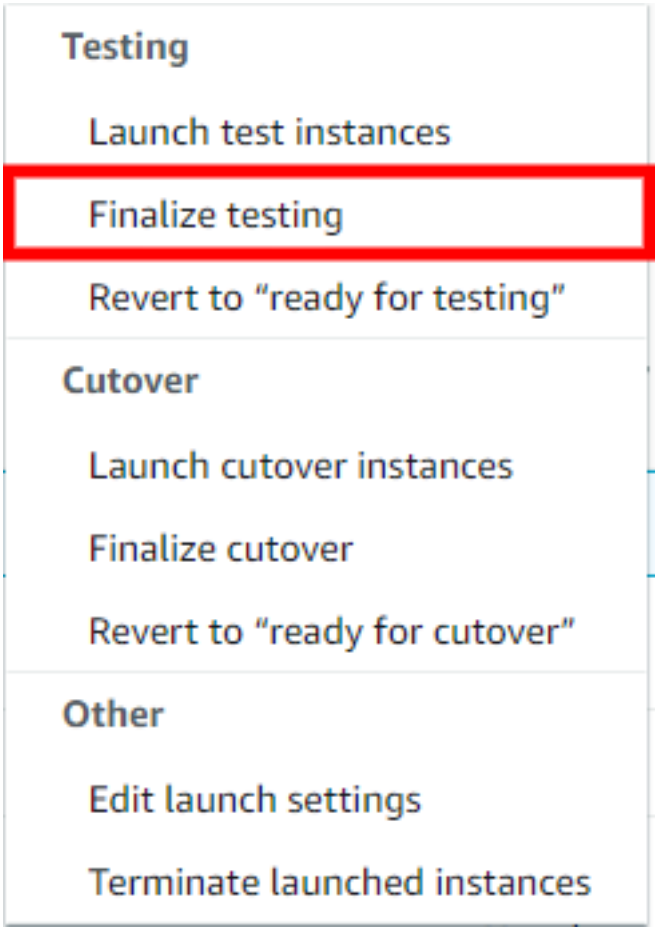


The Application Migration Service Console will indicate **X launch job started** once the test has been started.

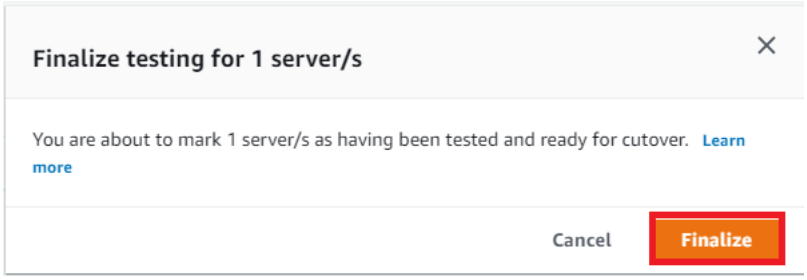
Choose **View job details** on the dialog to view the specific Job for the test launch in the Launch History.


Launch job started
Launch job started for 1 server/s
Application Migration Service
Launch History
Job
Job: mgnjob-
Details
Type
Launch
Status
Started
Start time
11/5/2020, 1:45:00 PM
Completed time
-
Job log
Info
Filter job log by property or value
Time
Event
11/5/2020, 1:45:01 PM
Job started

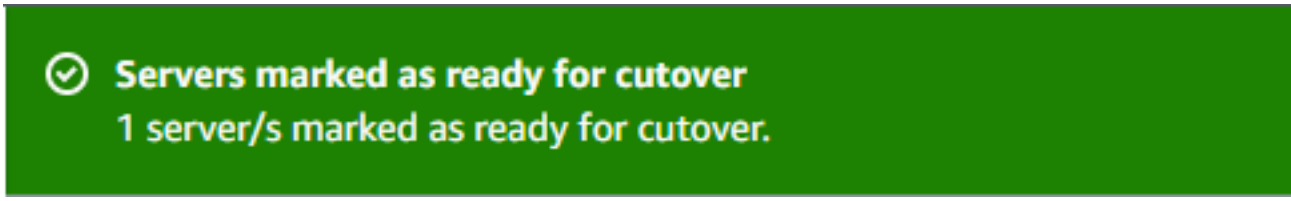
- **Finalize testing** - Choose the **Finalize testing** option to finalize testing for this server after you have completed all of the necessary tests in preparation for cutover.



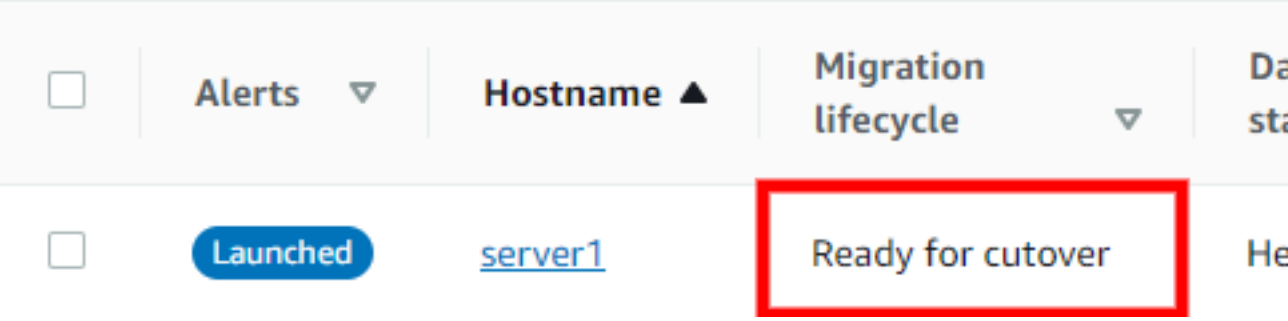
The **Finalize testing for X servers** dialog will appear. Select whether you want to terminate the launched instances used for testing. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Finalize**.



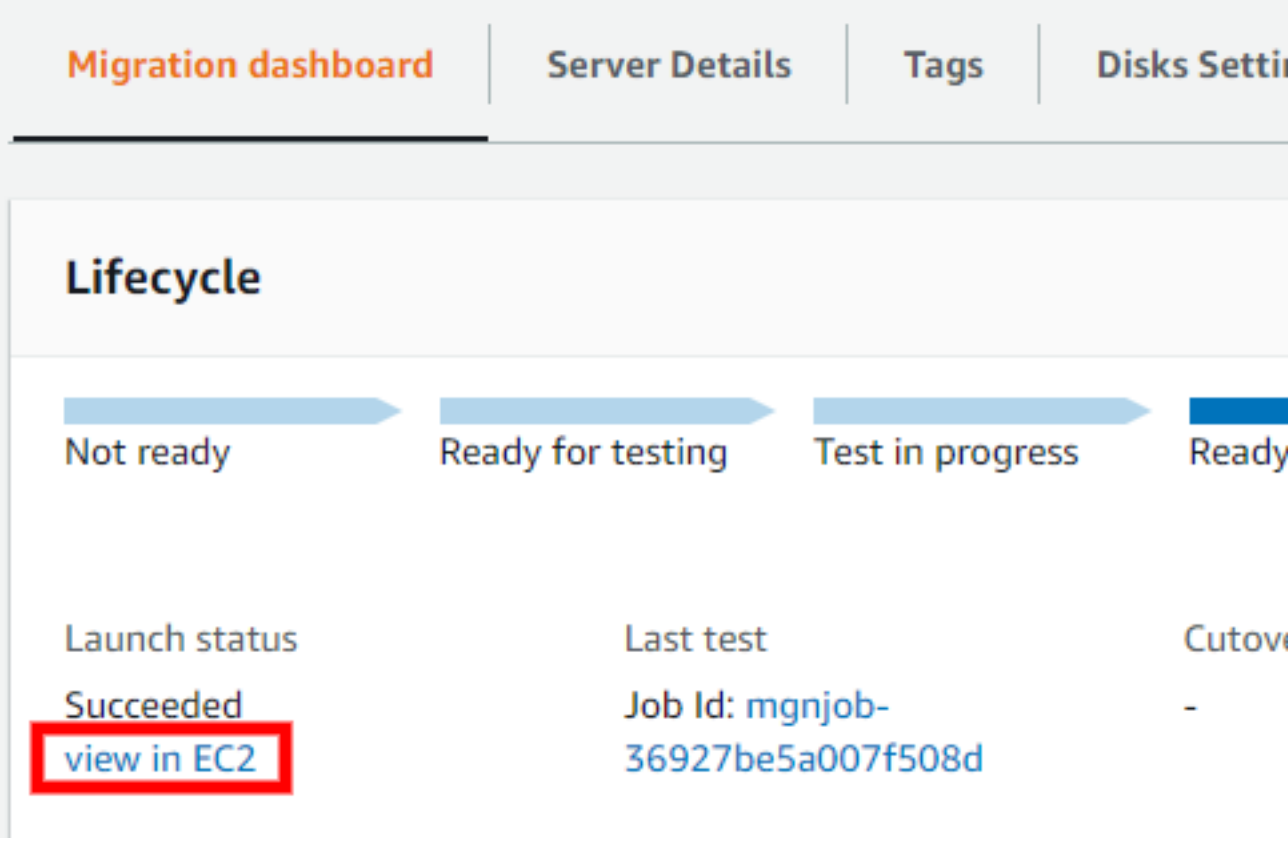
The console will confirm that the servers were marked as ready for cutover.



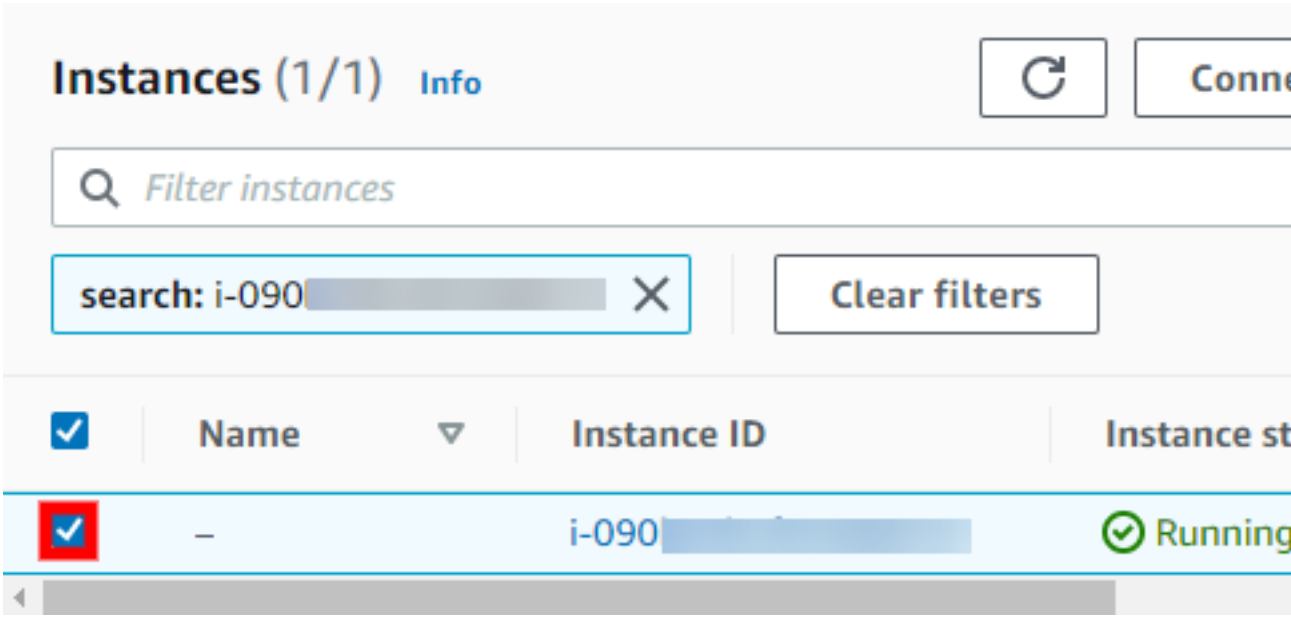
The Application Migration Service Console will indicate that testing has been finalized. The selected source servers' **Migration lifecycle** column will show the **Ready for cutover** status and the launched Test instances will be deleted if that option was selected. The Next step column will show **Terminate test instance; Start cutover**.



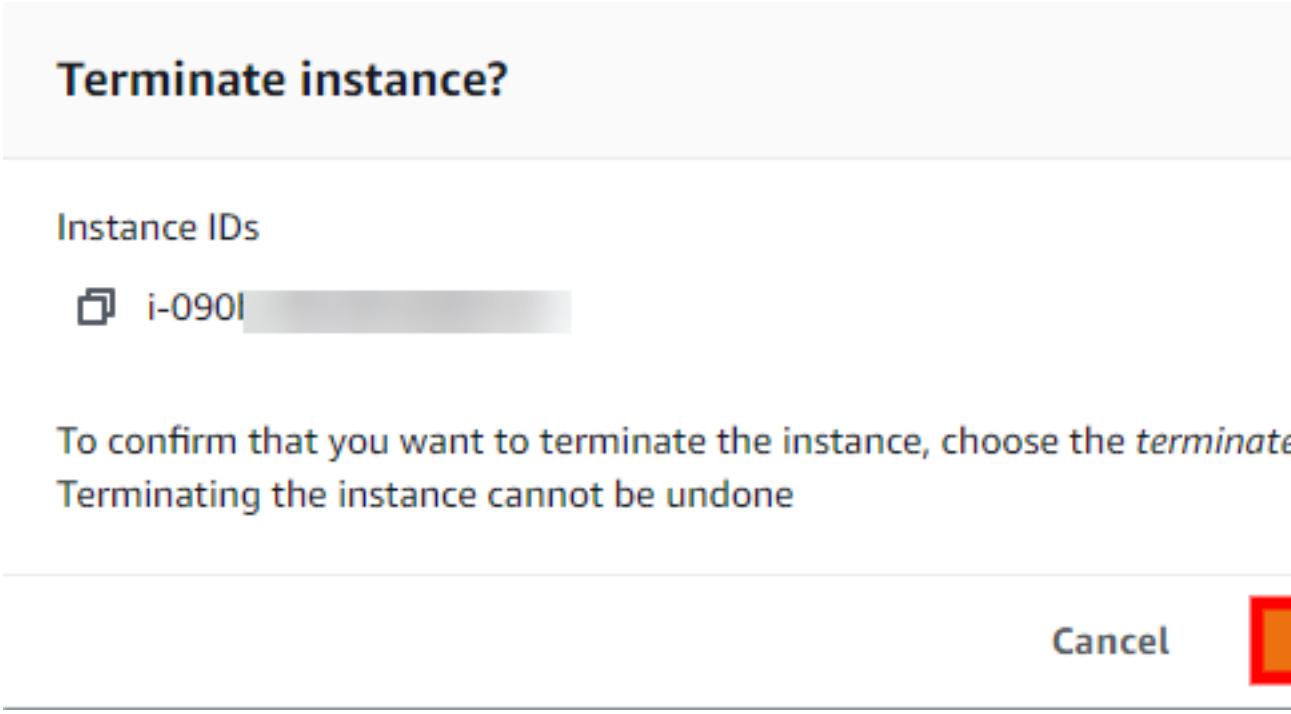
You can now terminate the launched test instance directly from the EC2 Console as that instance is no longer needed. You can quickly access the test instance by navigating to the specific servers > **Server Details > Migration Dashboard > Lifecycle > Launch status** and choosing **view in EC2.**



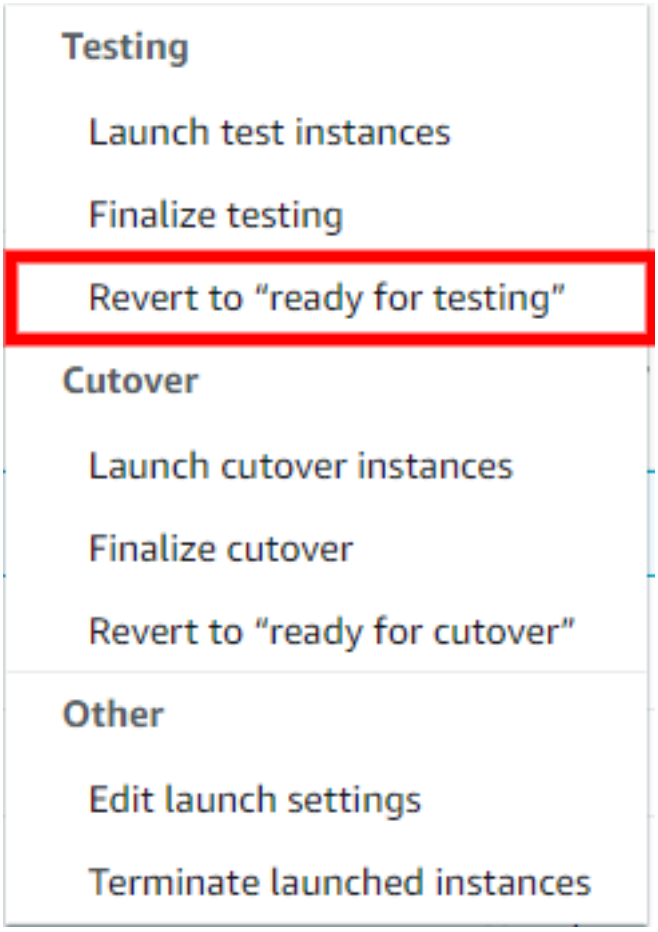
The EC2 Console will automatically search for and display the test instance. Select the instance, open the **Instance state** menu, and choose **Terminate instance**.



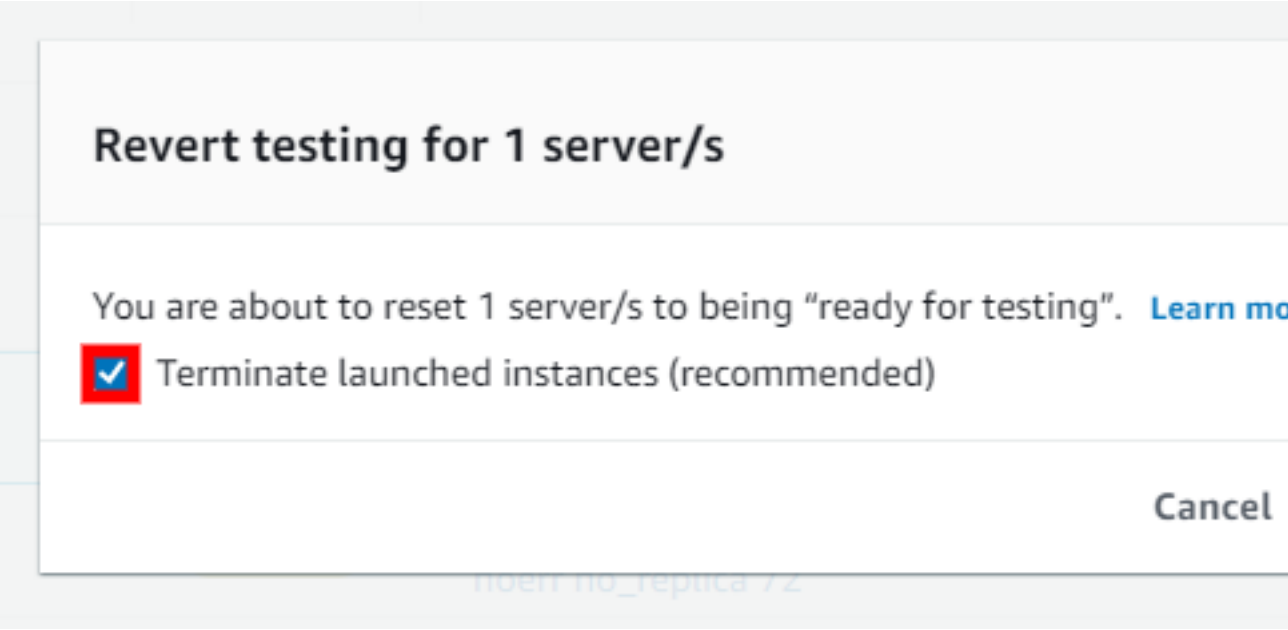
Choose **Terminate**.



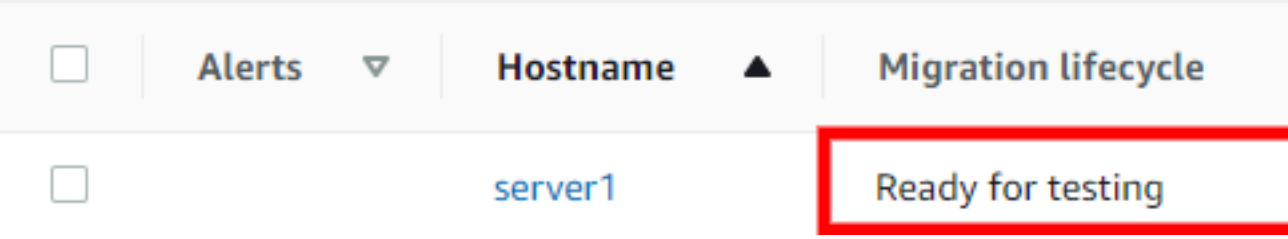
- **Revert to "ready for testing"**- Choose the **Revert to "ready for testing"** option to revert a finalized test for this server if you want to run further tests prior to initiating a cutover.



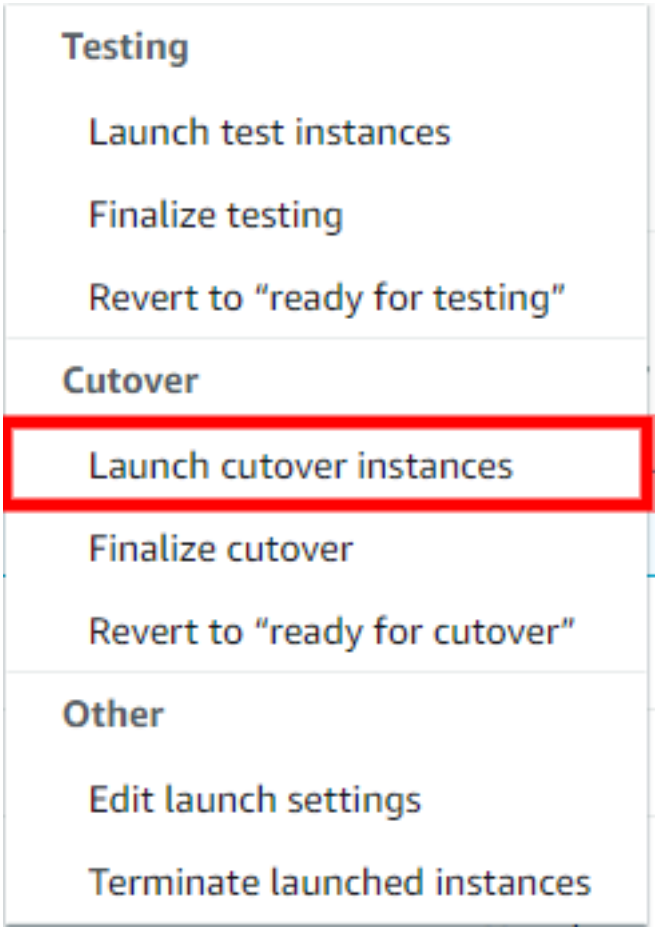
The **Revert testing for X servers** dialog will appear. Select whether you want to terminate the launched instances used for testing. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Revert**.



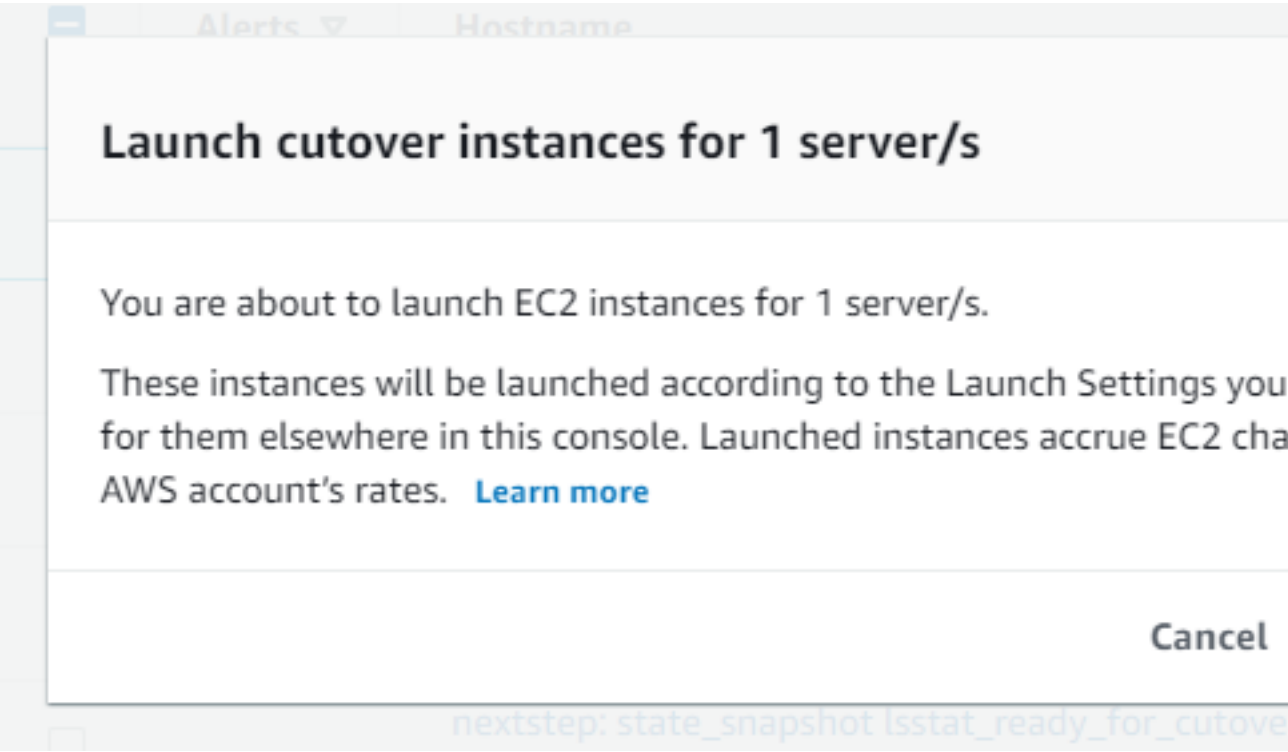
The Application Migration Service Console will indicate that testing has been reverted. The selected source servers' **Migration lifecycle** column will show the **Ready for testing** status, the **Next step** column will show **Start testing** and the launched Test instances will be deleted if that option was selected.



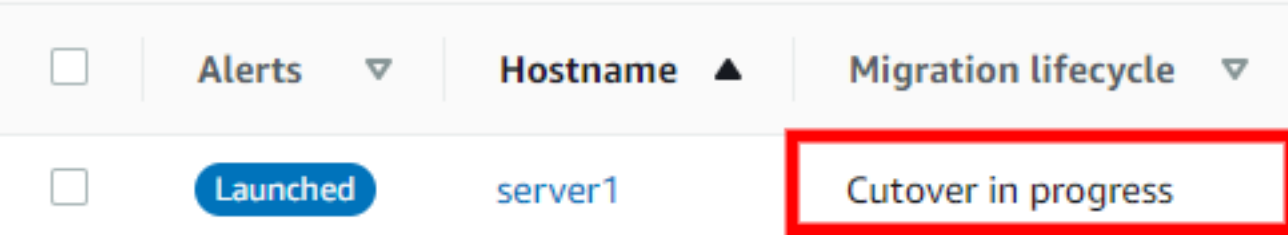
- **Launch cutover instances** - Choose the **Launch cutover instances** option to launch a cutover instance for this server after you have finalized all of your testing and are ready to initiate a cutover.



The **Launch cutover instances for X servers** dialog will appear. Choose **Launch** to begin the cutover.

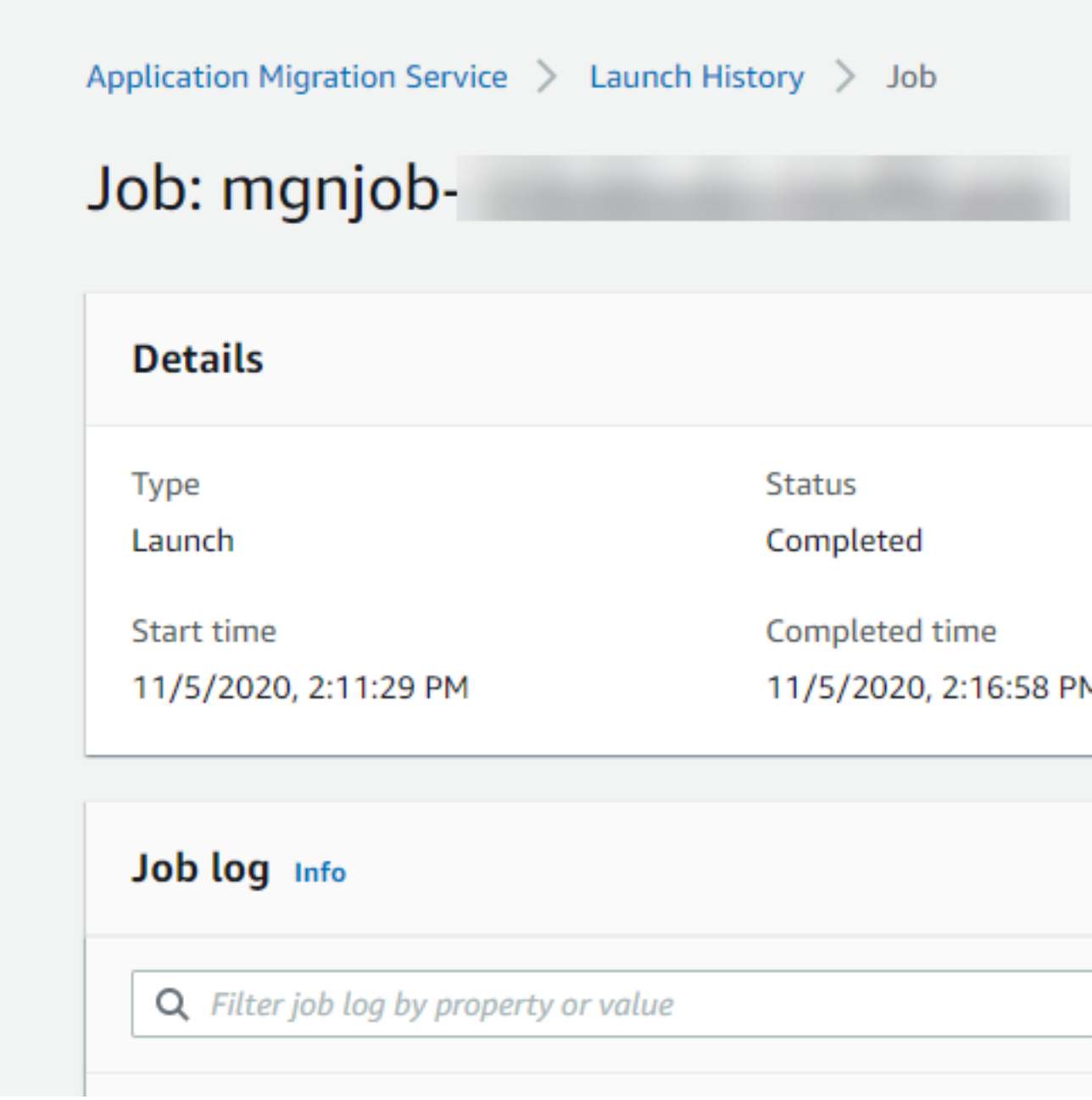


On the **Source Servers** page, the **Migration lifecycle** column will show **Cutover in progress** and the **Next step** column will show **Complete the cutover**.

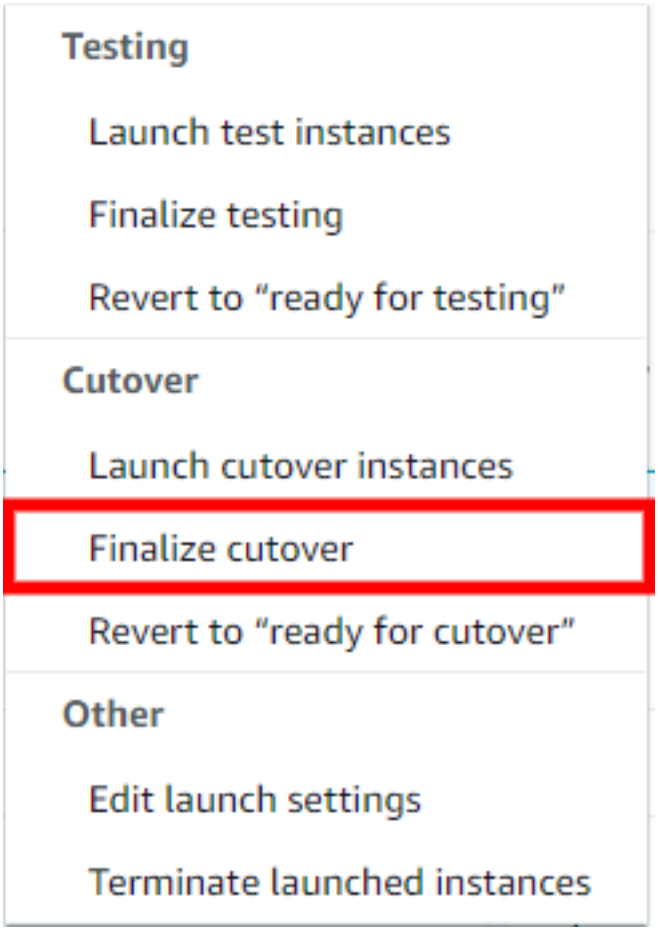


The Application Migration Service Console will indicate **X launch job started** once the test has been started.

Choose **View job details** on the dialog to view the specific Job for the test launch in the Launch History.

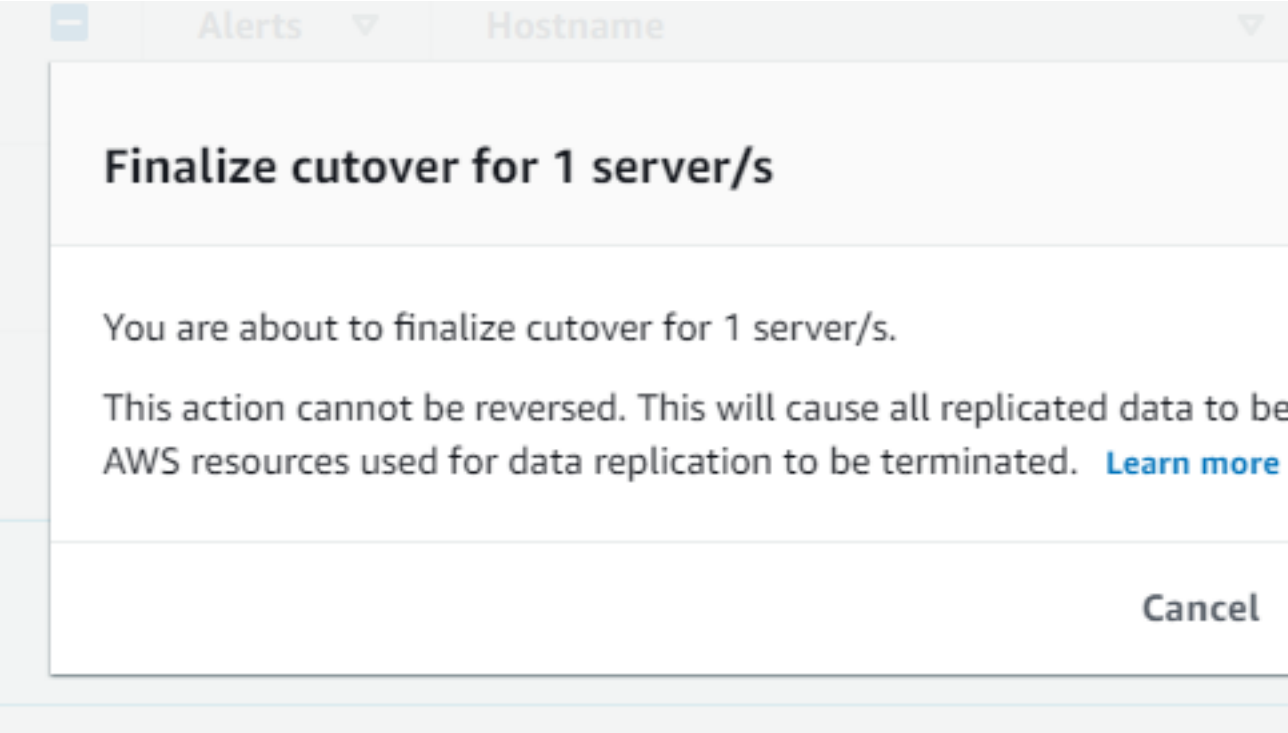


- **Finalize cutover** - Choose the **Finalize cutover** option to finalize the cutover for this server after you have successfully performed a cutover.

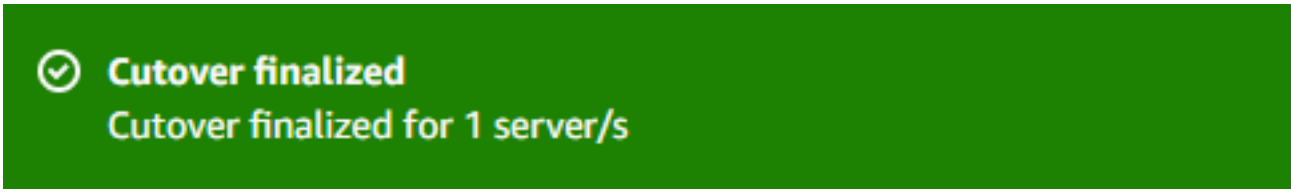


This will change your source servers' **Migration lifecycle** status to **Cutover complete**, indicating that the cutover has been complete and that the migration has been performed successfully. In addition, this will stop Data Replication and cause all replicated data to be discarded. All AWS resources used for Data Replication will be terminated.

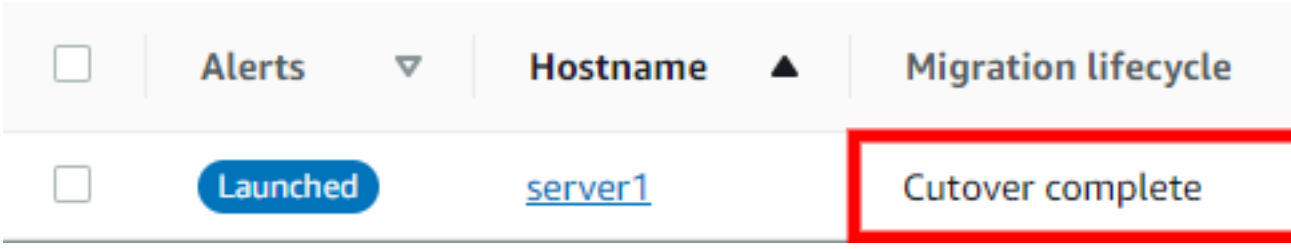
The **Finalize cutover for X servers** dialog will appear. Choose **Finalize**.



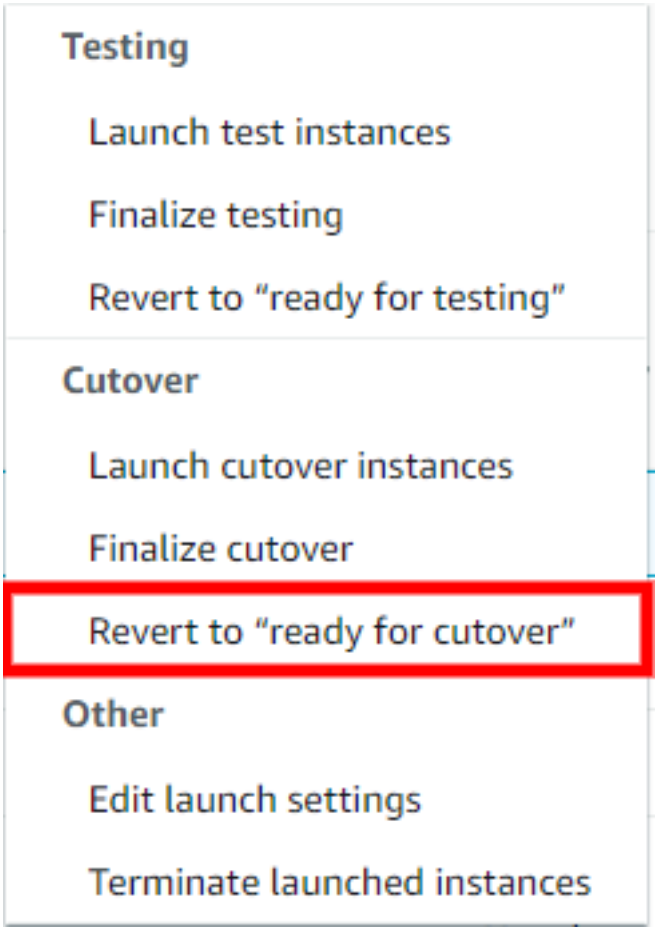
The Application Migration Service Console will indicate **Cutover finalized** once the cutover has been completed successfully.



The Application Migration Service Console will automatically stop Data Replication for the cutover source servers in order to save resource costs. The selected source servers' **Migration lifecycle** column will show the **Cutover complete** status, the **Data replication** column will show **Disconnected** and the **Next step** column will show **Archive**. The source servers have now been successfully migrated into AWS.

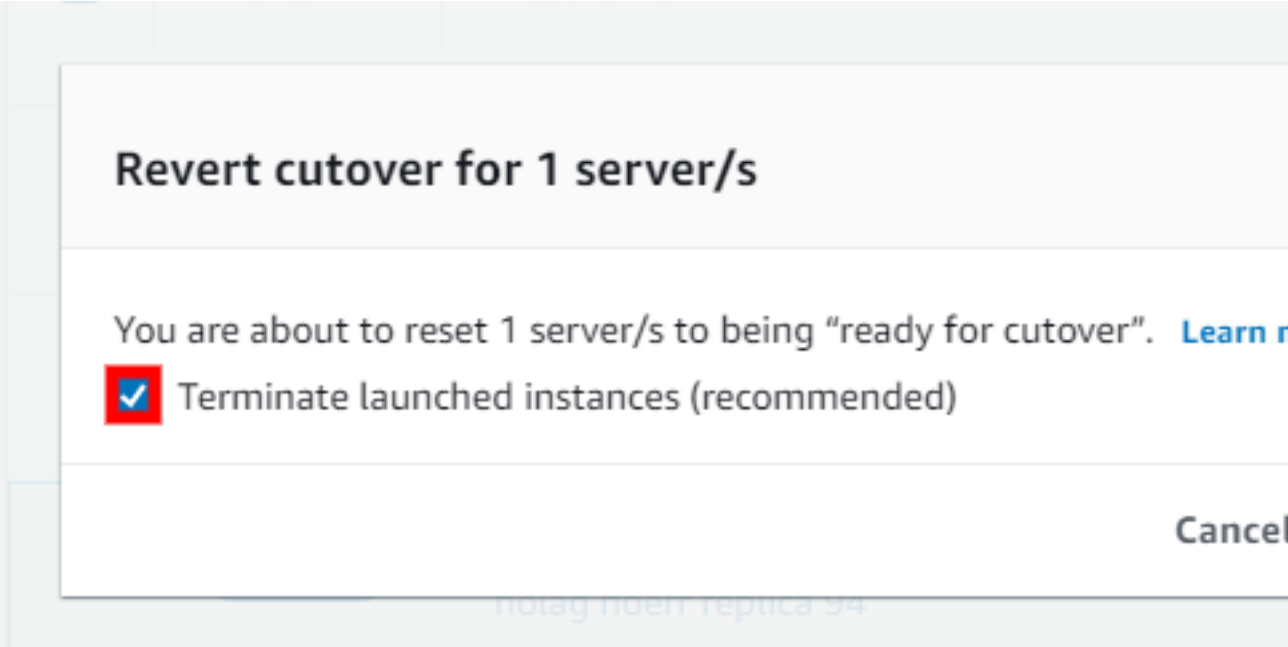


- **Revert to "ready for cutover"** - Choose the Revert cutover option to revert a finalized cutover for this server if you encounter any issues or want to reverse the cutover for any reason.

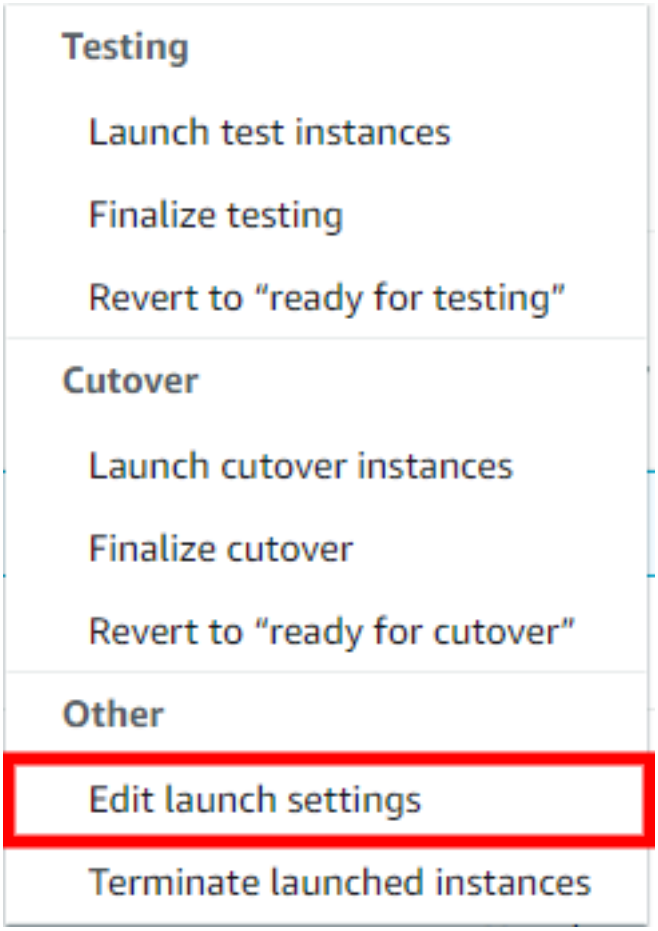


This will revert your source servers' **Migration lifecycle** to the **Ready for cutover** status, indicating that these servers have not undergone cutover. During a revert, you will also have the option to delete your Cutover instances for cost saving purposes.

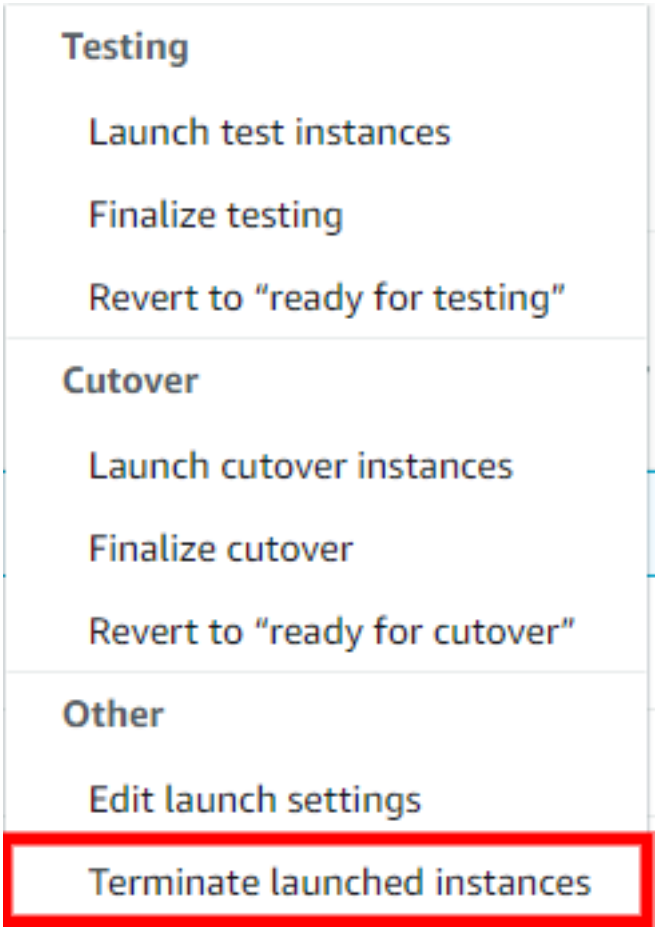
The **Revert cutover for X servers** dialog will appear. Select whether you want to terminate the launched instances used for cutover. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Revert**.



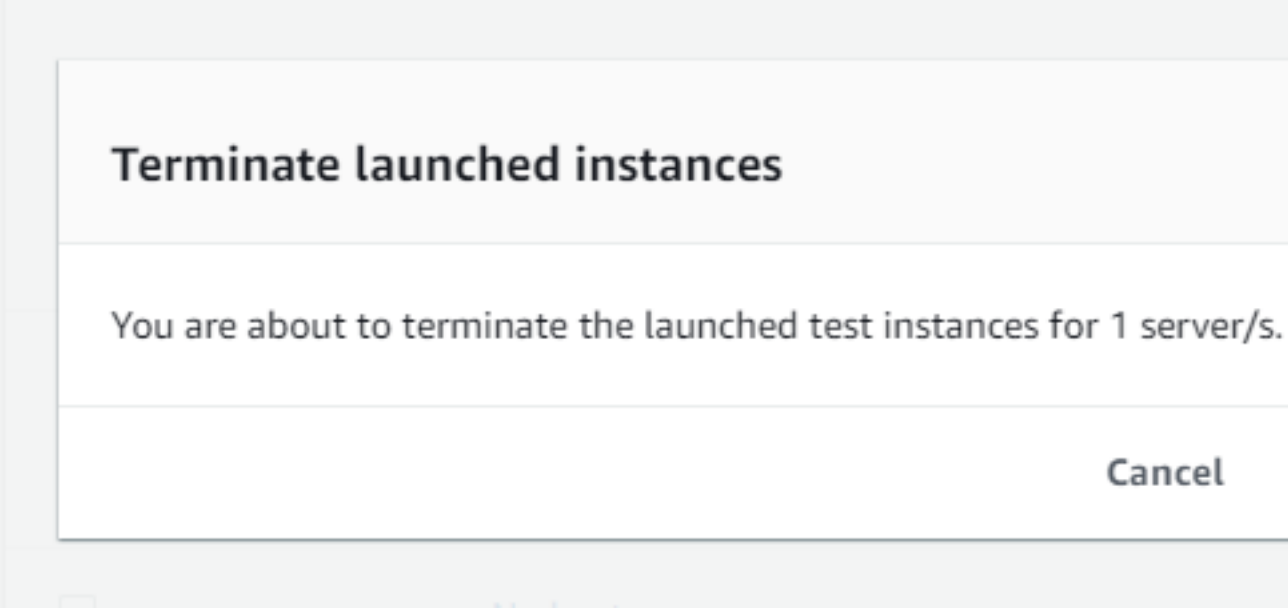
- **Edit launch settings** - Choose the **Edit launch settings** option to edit the launch settings for this server. This will redirect you to the **Launch settings** tab.



- **Terminate launched instance** - Choose the **Terminate launched instance** option if you want to delete your test or cutover instance for any reason at any point. This option can only be selected for a server that launched a test or cutover instance.



The **Terminate launched instance** dialog will appear. Click **Terminate**.



Alerts and Errors

You can easily distinguish between healthy machines and machines that are experiencing issues on the Migration dashboard in several ways.

The entire Application Migration Service Console is color-coded for ease of use.

Healthy servers with no errors are characterized by the color blue. Both the **Lifecycle** and **Data replication** status boxes will display all steps and information in blue if the servers is healthy.

Servers that are experiencing temporary issues will be characterized by the color yellow. These sorts of issues include Lag or a rescan. These issues will not break replication, but may delay replication or point towards a bigger problem.

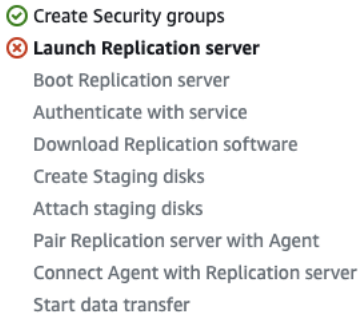
The **Next actions** box will always detail the exact problem.

Servers that are experiencing serious issues will be characterized by the color red. These issues may include a loss of connection, a stall, or other isues. You will have to fix these issues in order for data replication to resume.

The **Next actions** box will always detail the exact issue.

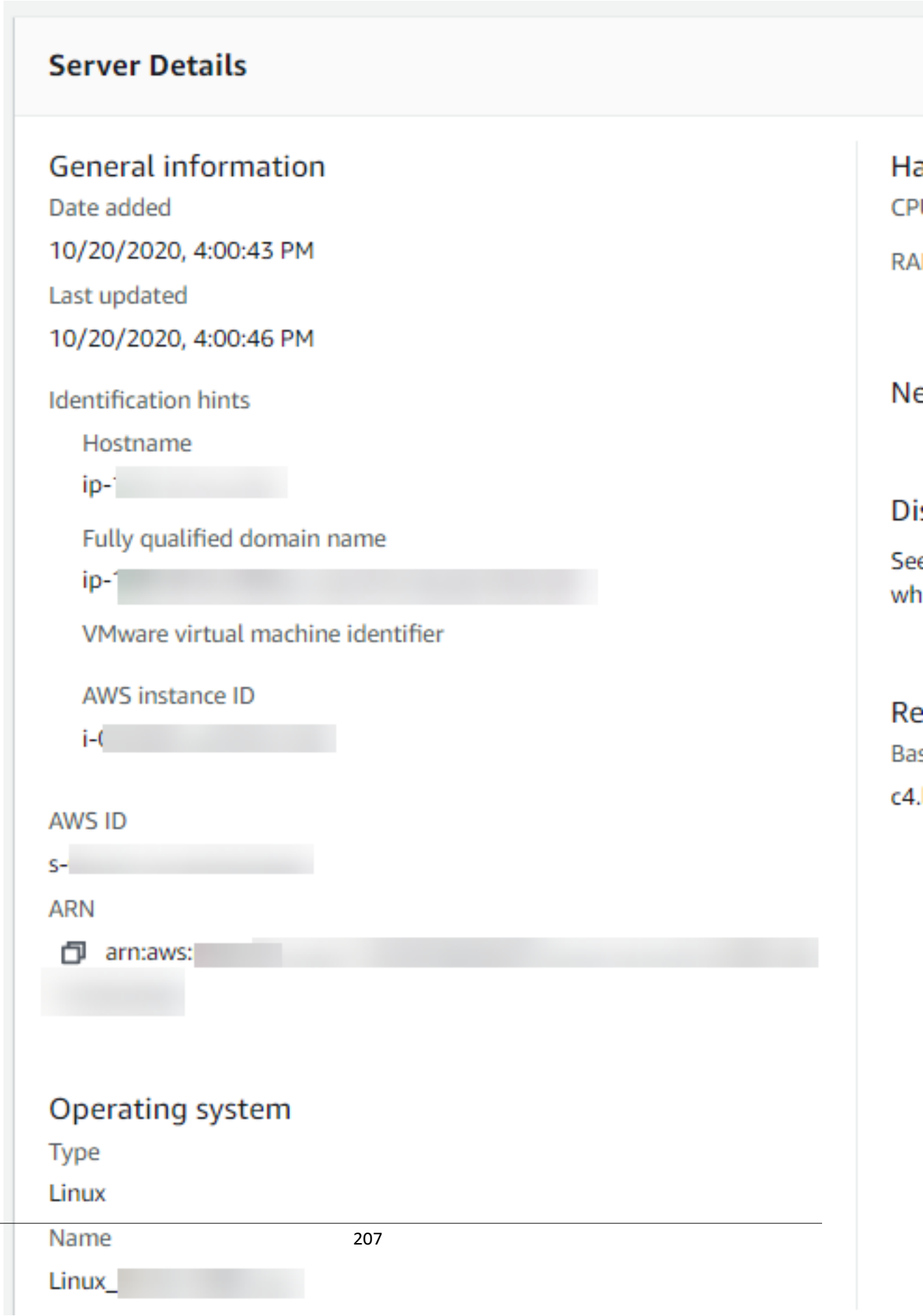
The **Data replication status** box will include details of the issue.

Click the **View details** link to open a list of initiation steps. The exact step upon which the issue arose will be marked with a red "x".



Server details

The Server details tab shows a variety of relevant server general, hardware and network information.

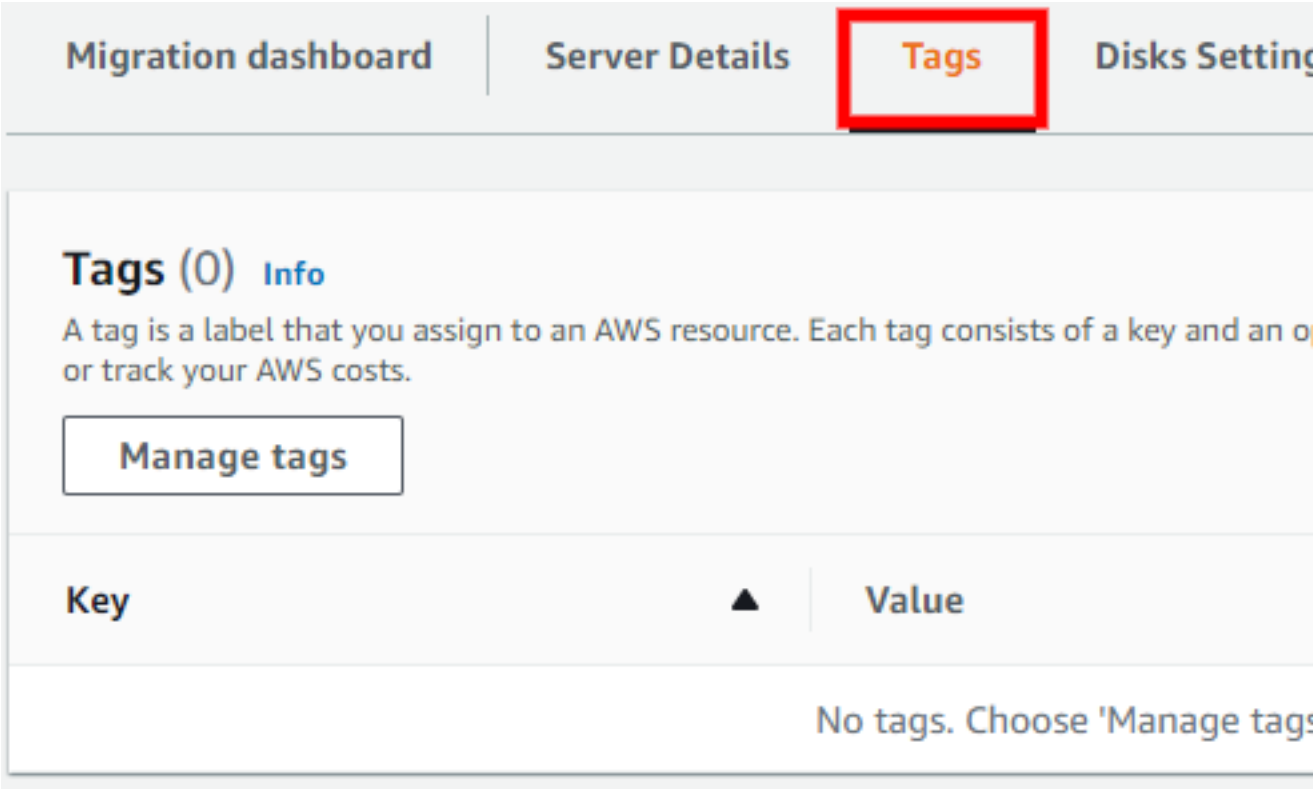

Server Details
General information
Date added
10/20/2020, 4:00:43 PM
Last updated
10/20/2020, 4:00:46 PM
Identification hints
Hostname
ip-
Fully qualified domain name
ip-
VMware virtual machine identifier
AWS instance ID
i-
AWS ID
s-
ARN
arn:aws:
Operating system
Type
Linux
Name
Linux_

Information shown includes:

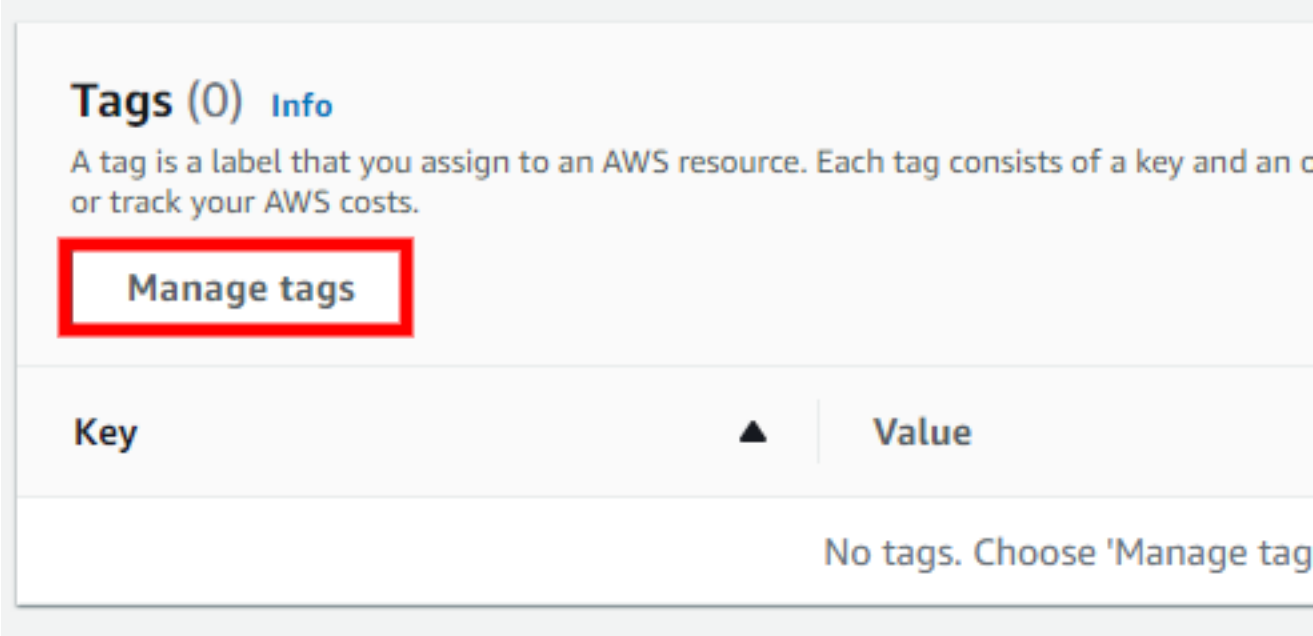
- Date added
- Last updated
- Hostname
- Fully qualified domain name
- VMware virtual machine identifier (if relevant)
- AWS instance ID
- ARN
- Operating system information
- CPUs
- RAM
- Network interfaces
- Recommended instance type

Tags

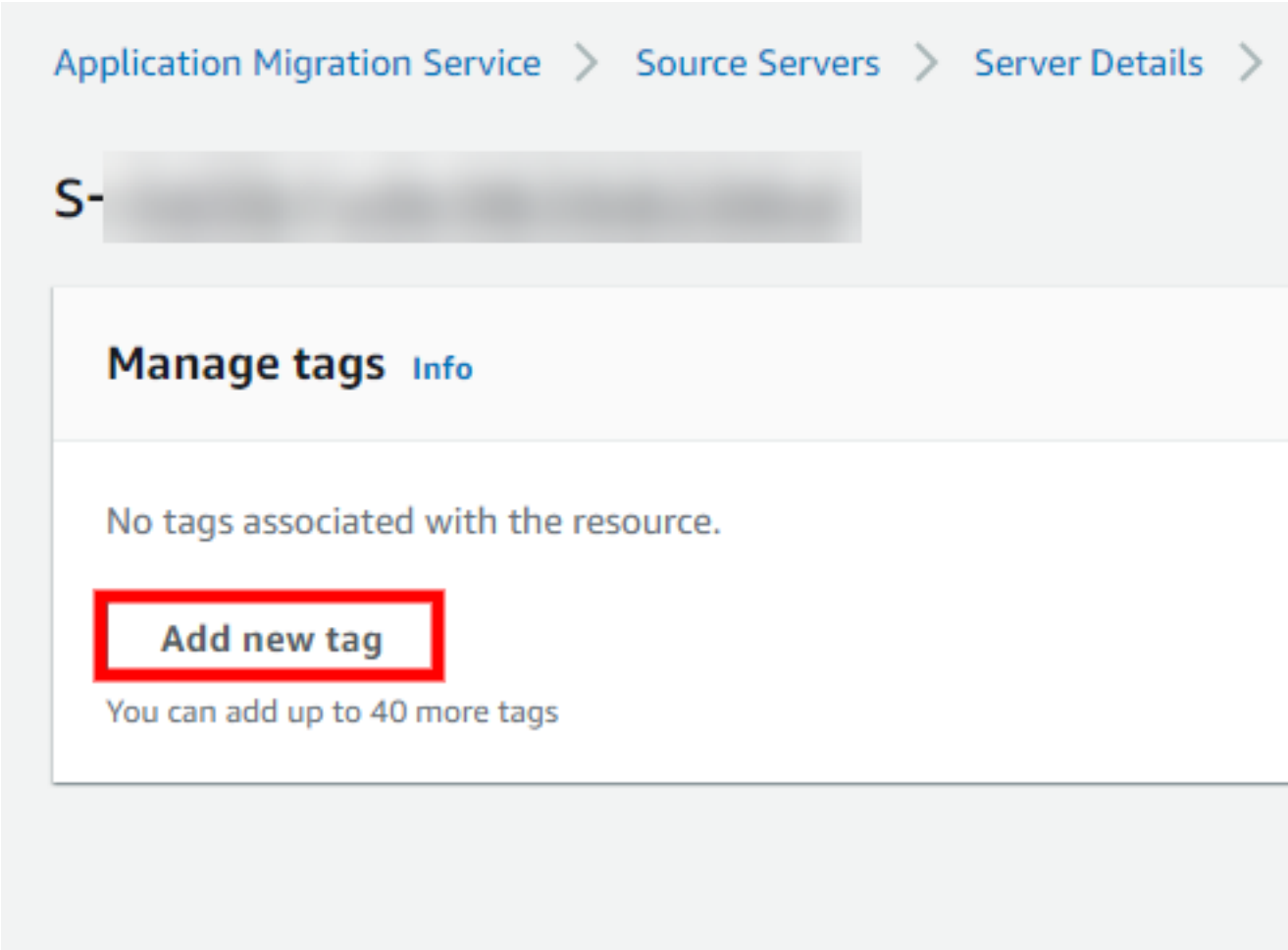
The Tags section shows any tags that have been assigned to the server. A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs. Learn more about AWS tags in this EC2 article.



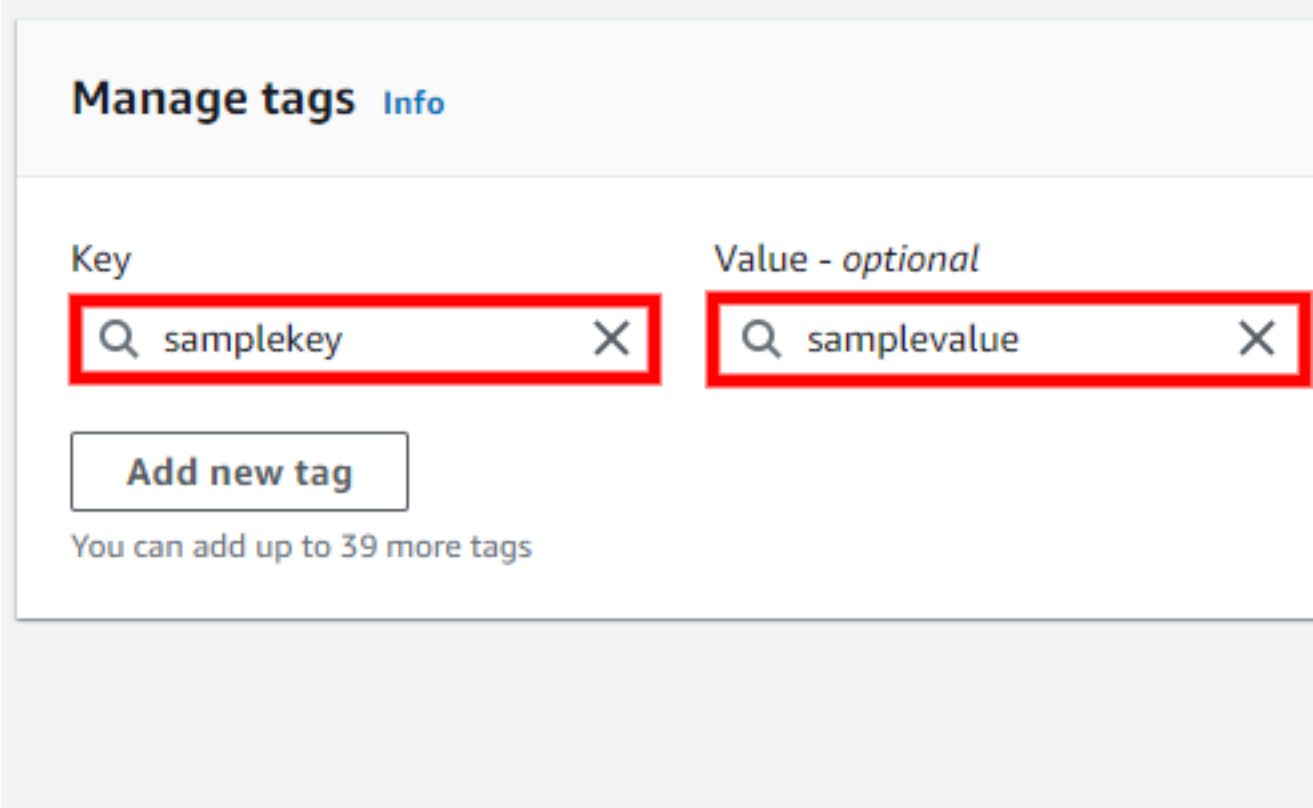
Choose **Manage tags** to add and remove tags.



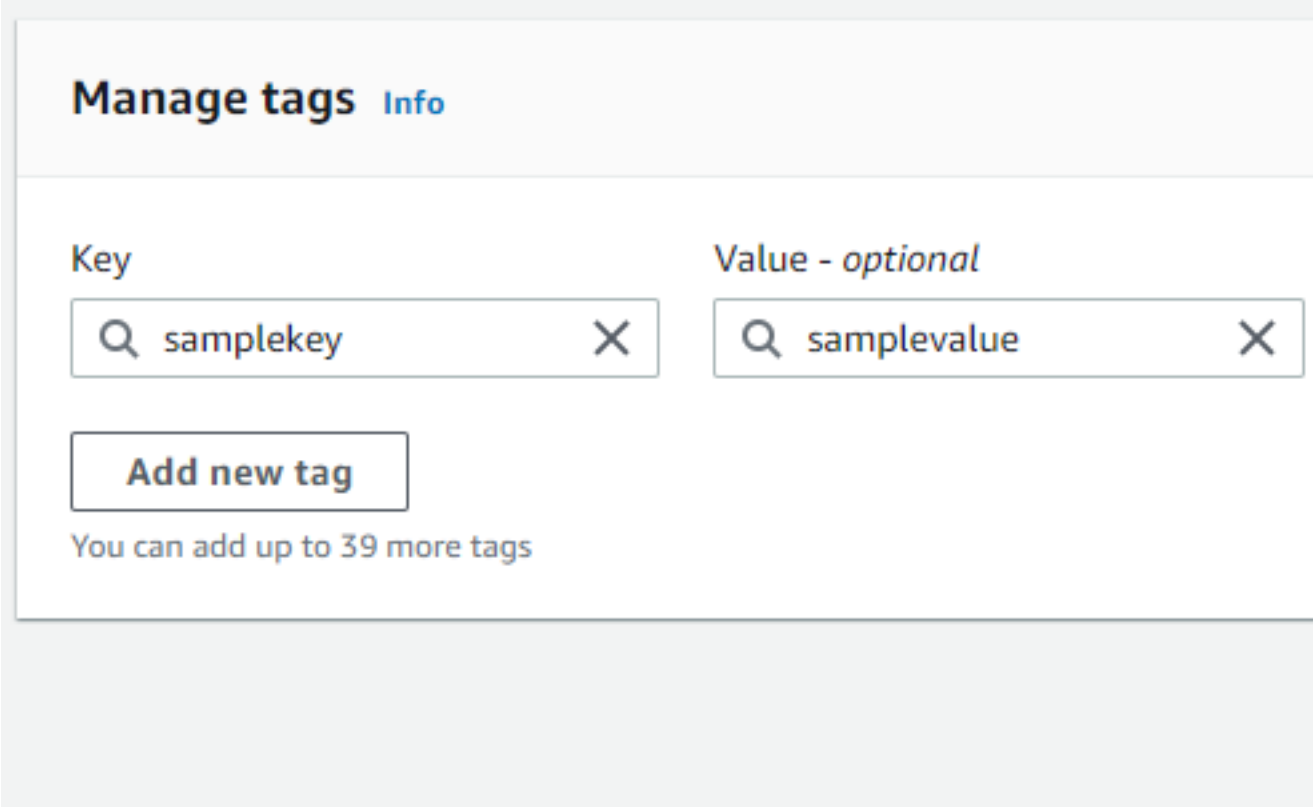
The Manage tags page will open. Choose Add new tag to add a new tag.



Add a tag **Key** and an optional tag **Value**. Choose **Save** to save your added tags.

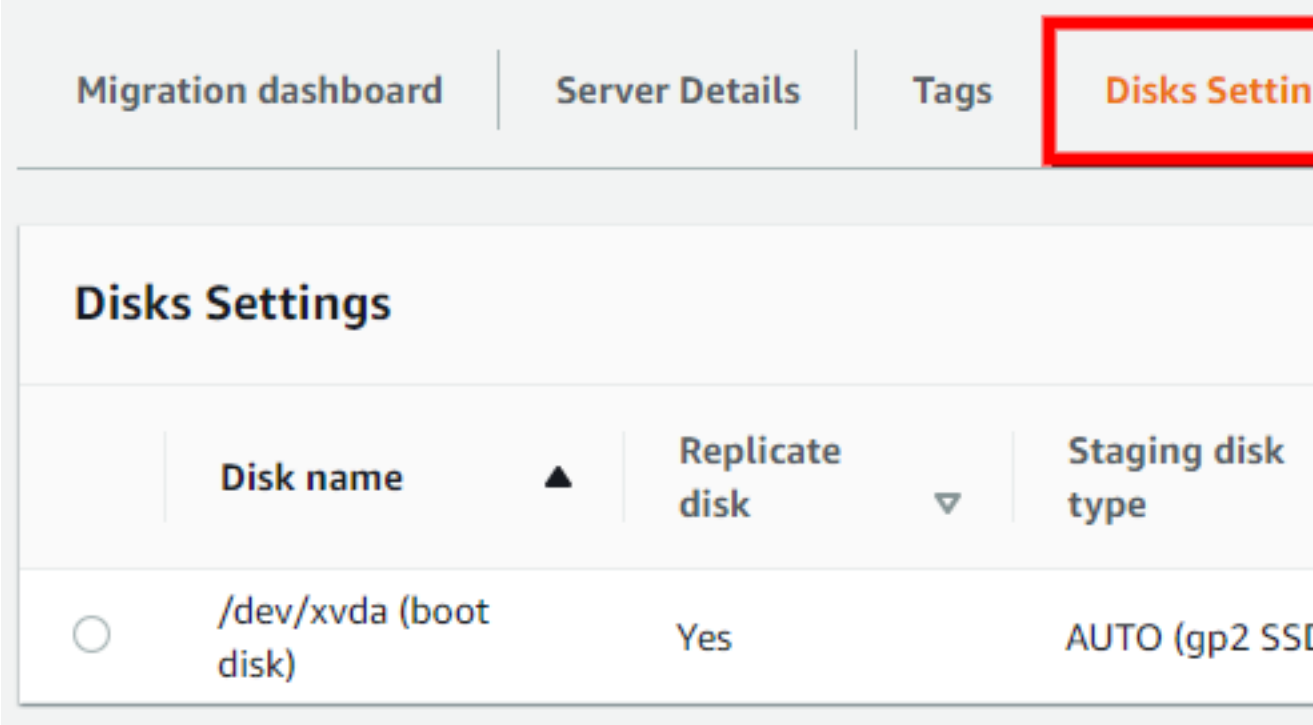


To remove a tag, choose **Remove** to the right of the tag you want to remove and choose **Save**.



Disk settings

The Disk settings tab shows a list of all of the disks on the source server and relevant information for each disk.



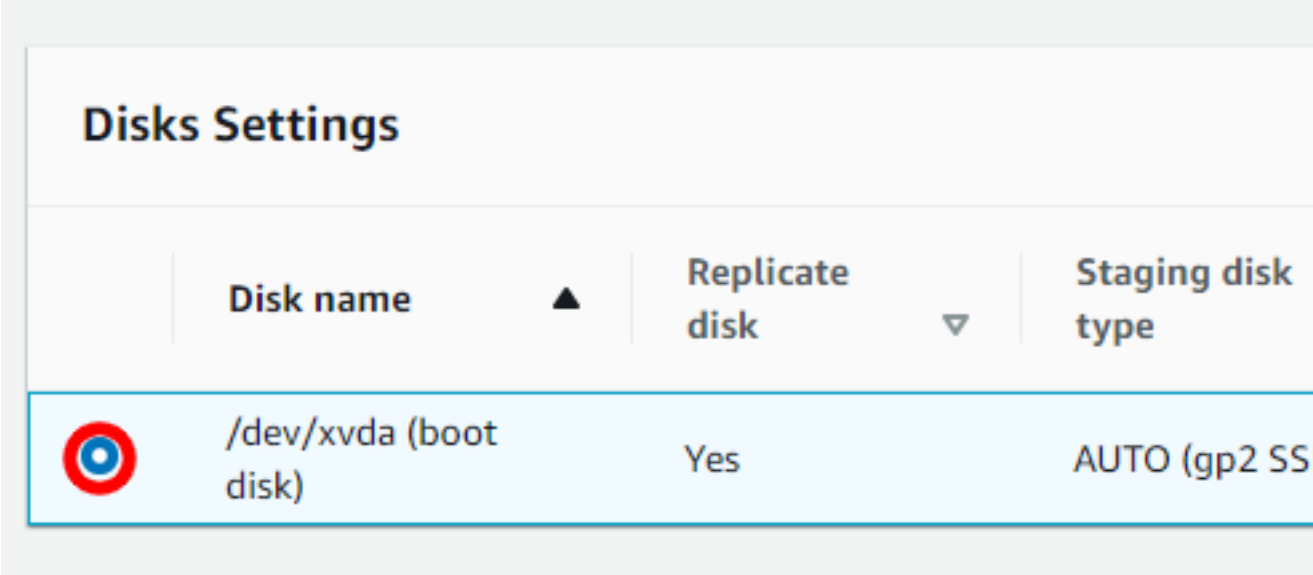
Disk settings include:

- Disk name
- Replicate disk - Whether the disk is being replicated.
- Staging disk type - The corresponding EBS Volume disk type that is being used for the individual disk.
- Replicated storage - The amount of storage that has been replicated from the disk onto the Replication Server.
- Total storage - The total storage capacity of the disk.

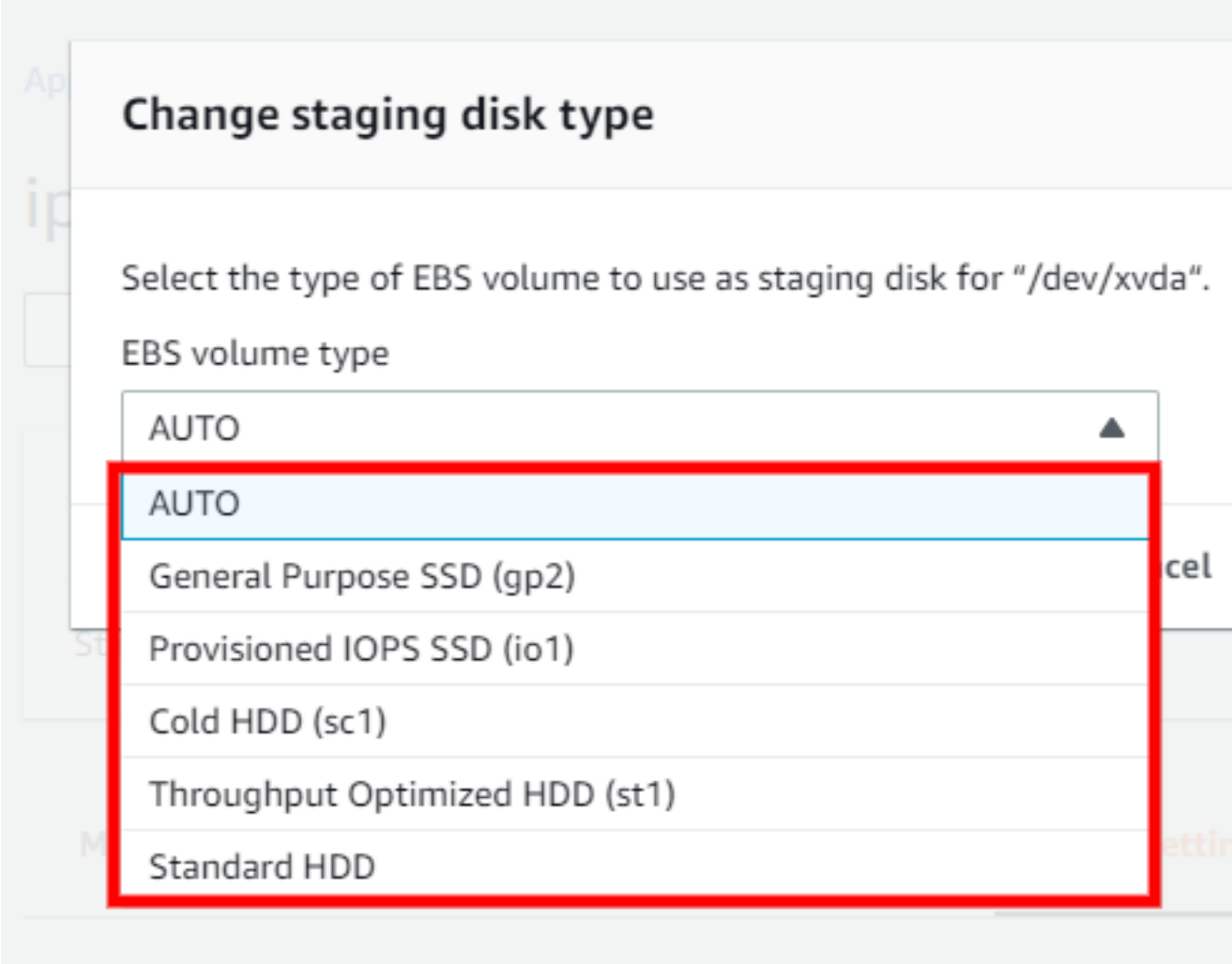
Change staging disk type

You can change the EBS Volume disk type for each individual disk or group of disks.

To change the EBS Volume disk type, select the circle to the left of each disk name and choose **Change staging disk type**.



On the **Change staging disk type** dialog, select the type of EBS volume to use for the disk or group of disks.



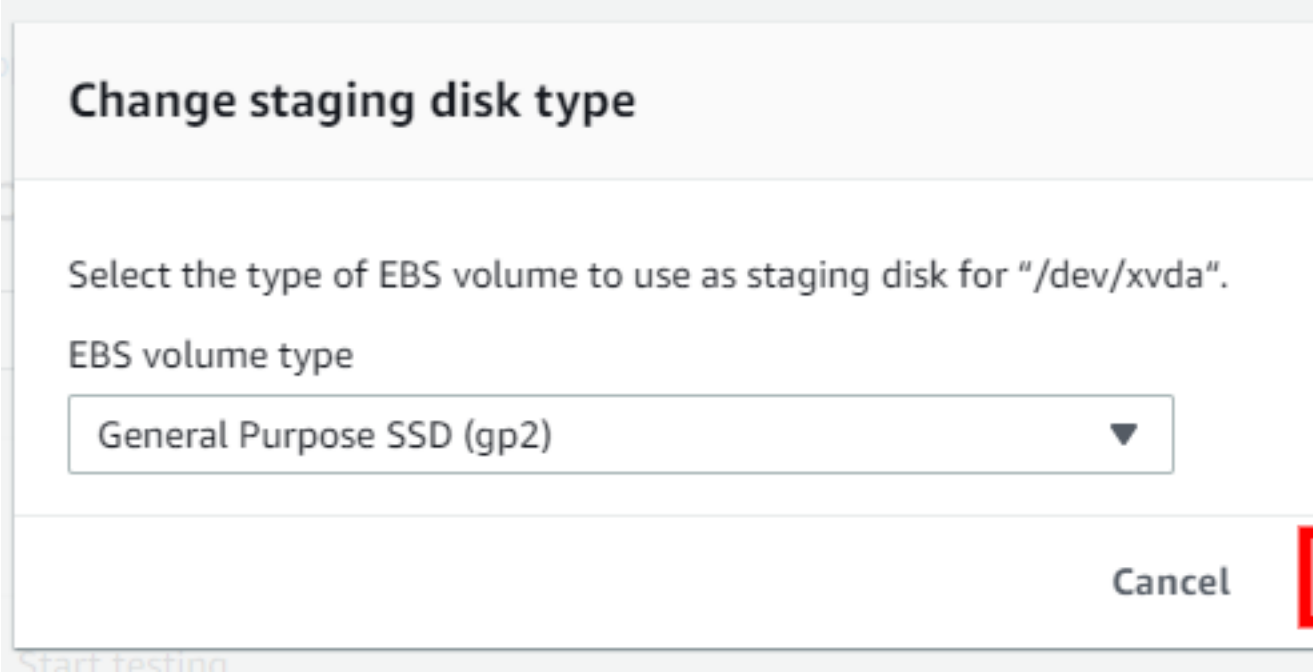
Select the **Auto** option, if you want Application Migration Service to automatically select the best and most cost-effective EBS Volume disk type for each individual disk based on the disk size and type based on the option you defined in the **Replication settings** - either the default **Lower cost, Throughput Optimized HDD (st1)** option or the **Faster, General Purpose SSD (gp2)** s.

Application Migration Service uses a single Replication Server per 15 source disks. Selecting the **Auto** option will ensure that the least amount of replication servers are used, resulting in increased cost savings.

> **Note**
> Application Migration Service will always use EBS Magnetic volumes for disks that are under 500 GiB in size, no matter which option is selected.

If you do not want Application Migration Service to automatically select a disk, you can select a disk manually. Select the disk type from the**EBS volume type** EBS volume type menu.

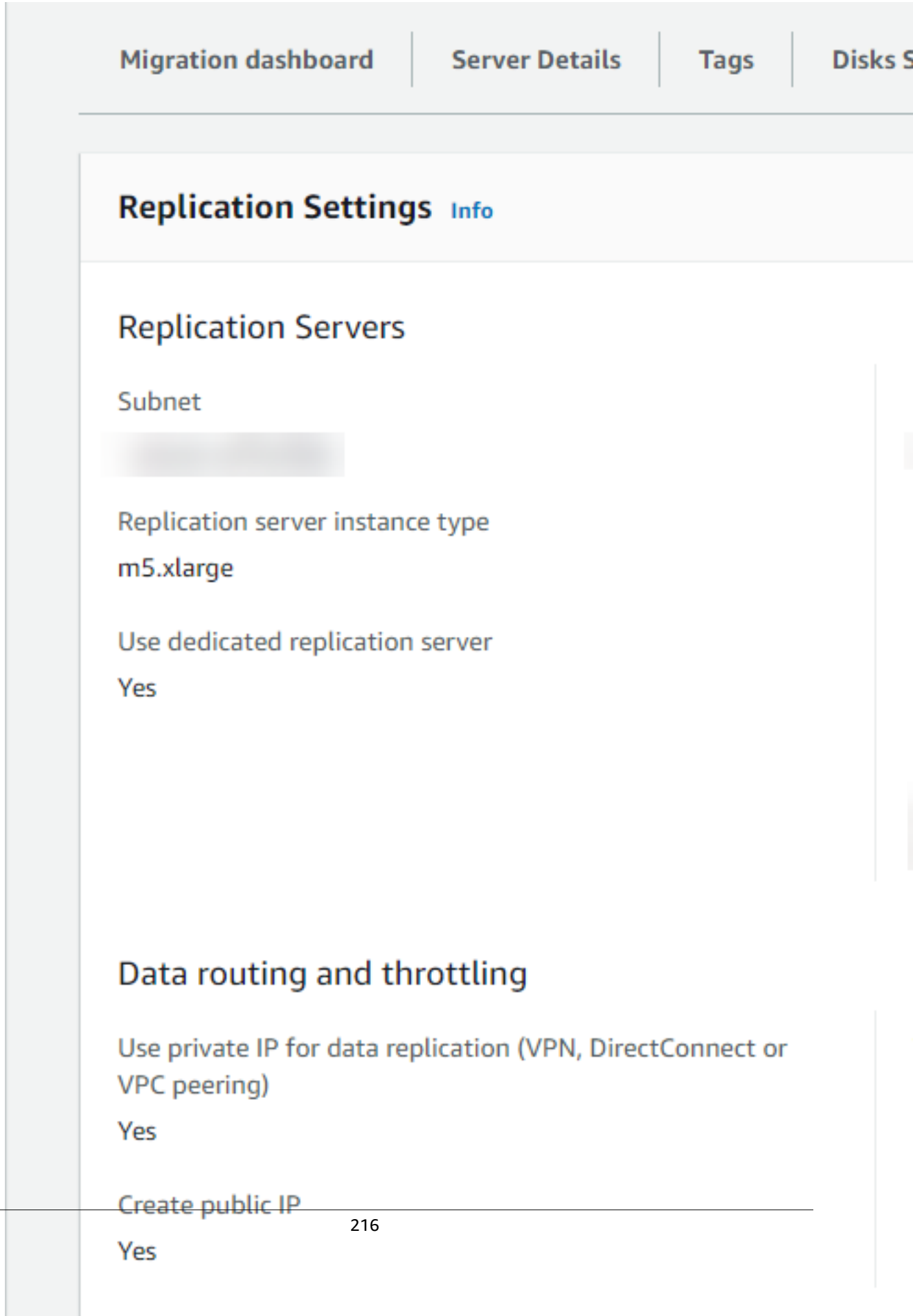
For certain disks, once selected, you can configure the amount of IOPS to be allocated per GB of disk space under **IOPS**. You can allocate up to 50 IOPS per GB. 64,000 IOPS are available for Nitro-based instances. Other instances are guaranteed up to 32,000 IOPS. The maximum IOPS per instance is 80,000.



Choose **Change** to confirm the change.

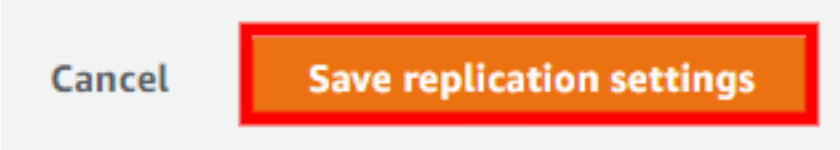
Replication settings

The **Replication settings** tab allows you to edit the Replication settings for the individual source server.


Migration dashboard
Server Details
Tags
Disks S
Replication Settings Info
Replication Servers
Subnet
Replication server instance type
m5.xlarge
Use dedicated replication server
Yes
Data routing and throttling
Use private IP for data replication (VPN, DirectConnect or VPC peering)
Yes
Create public IP
Yes

Once the source server is added to Application Migration Service, the Replication settings that are defined in the **Replication Settings Template** are automatically applied to the server. You can later edit them for a single or multiple servers through the Replication settings tab.

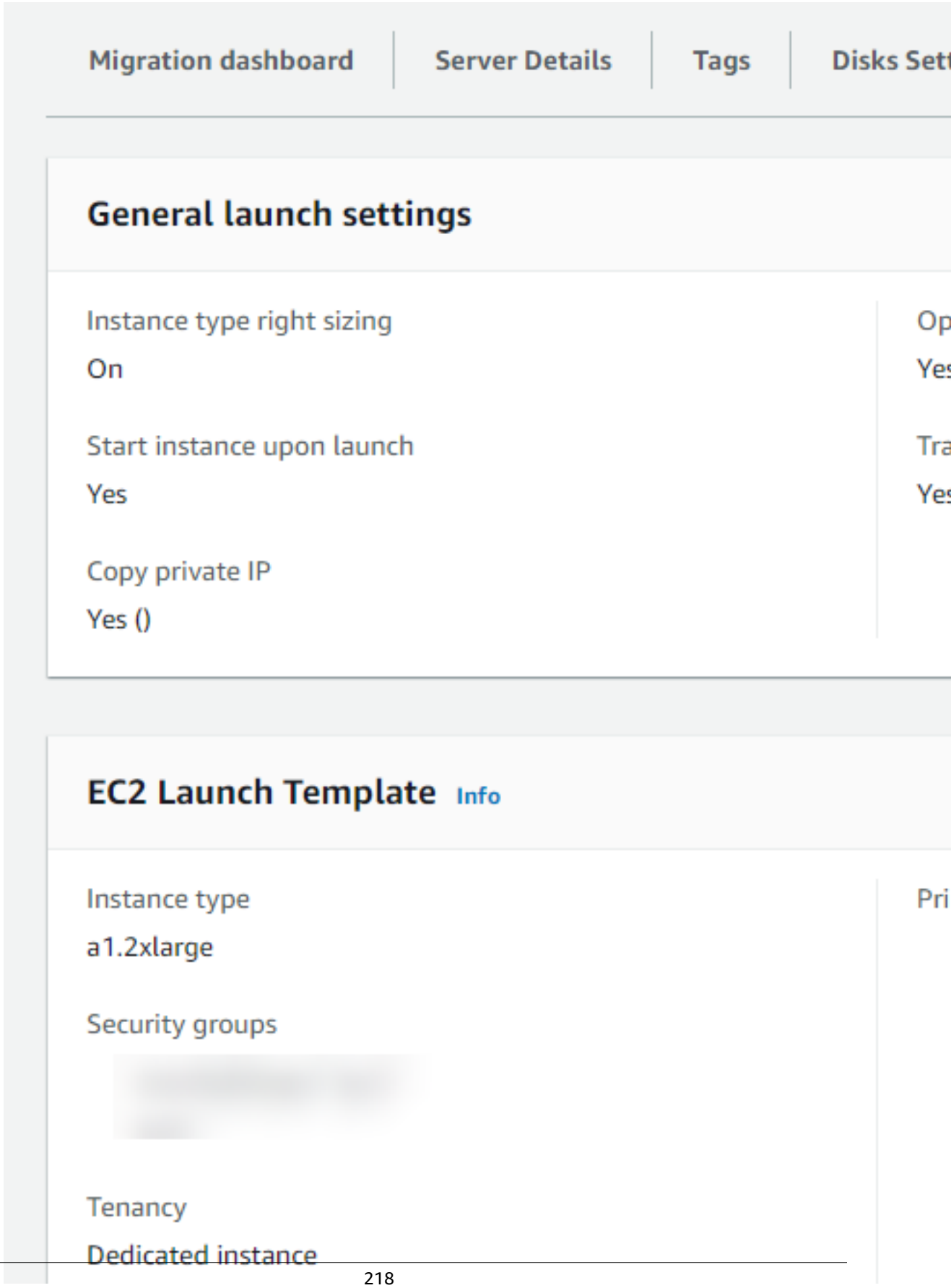
Edit each setting as required and then choose **Save replication settings.**



Learn more about Replication settings. (p. 60)

Launch Settings

The launch settings are a set of instructions that are comprised of a EC2 launch template and other settings that determine how a Test or Cutover instance will be launched for each source server in AWS.


Migration dashboard
Server Details
Tags
Disks Sett
General launch settings
Instance type right sizing
On
Start instance upon launch
Yes
Copy private IP
Yes ()
EC2 Launch Template
Info
Instance type
a1.2xlarge
Security groups
Tenancy
Dedicated instance

Launch settings, including the EC2 launch template, are automatically created every time you add a Server to Application Migration Service.

The Launch settings can be modified at any time, including before the source servers has even completed its initial sync.

Learn more about indivdiual launch settings. (p. 220)

Launching Test and Cutover instances

Application Migration Service allows you to launch Test and Cutover instances in AWS. Prior to launching instances, you must configure your Launch settings.

Topics

- Preparing for Test and Cutover instance launch (p. 220)
- Launch settings (p. 220)
- Launching Test instances (p. 247)
- Launching Cutover instances (p. 258)
- Launch History (p. 268)

Preparing for Test and Cutover instance launch

Prior to launching your instances, you must ensure that your environment is set up properly to ensure successful launches. Check the following prior to continuing:

- Prepare your Subnets for launch - Plan which subnets you will use to launch your Test and Cutover instances. You will use these subnets in your EC2 Launch Template when you configure Launch settings.
- Create Security groups within the subnets - Create the Security groups you want to use within your prepared Subnets. You will set these Security groups in your EC2 Launch template when you configure Launch settings.

> **Note**
> Customers that want to run a proof of concept can skip this step. Application Migration Service will automatically use the default Subnet and Security groups. Ensure that you have not deleted your default Subnet.

Launch settings

The launch settings are a set of instructions that are comprised of two sections: General launch settings and the EC2 Launch Template that determine how a Test or Cutover instance will be launched for each source server in AWS.

Launch settings, including the EC2 Launch Template, are automatically created every time you add a source server to Application Migration Service.

The Launch settings can be modified at any time, including before the source server has completed its initial sync.

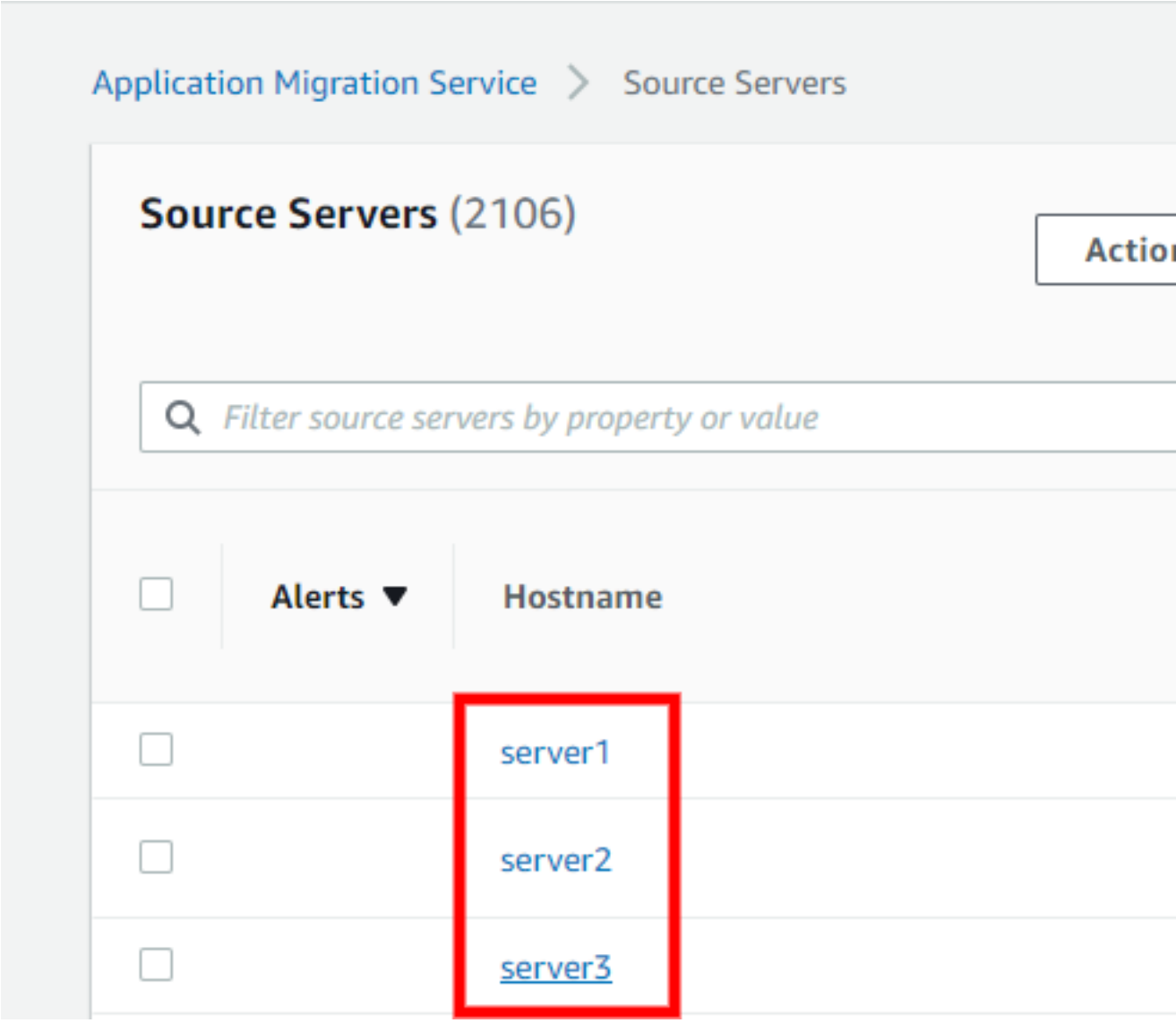
Note
Any changes made to the Launch settings will only affect newly launched Test and Cutover instances.

Note
For many customers, there is no need to modify the Launch Settings or the EC2 Launch Template in order to launch test or cutover instances.

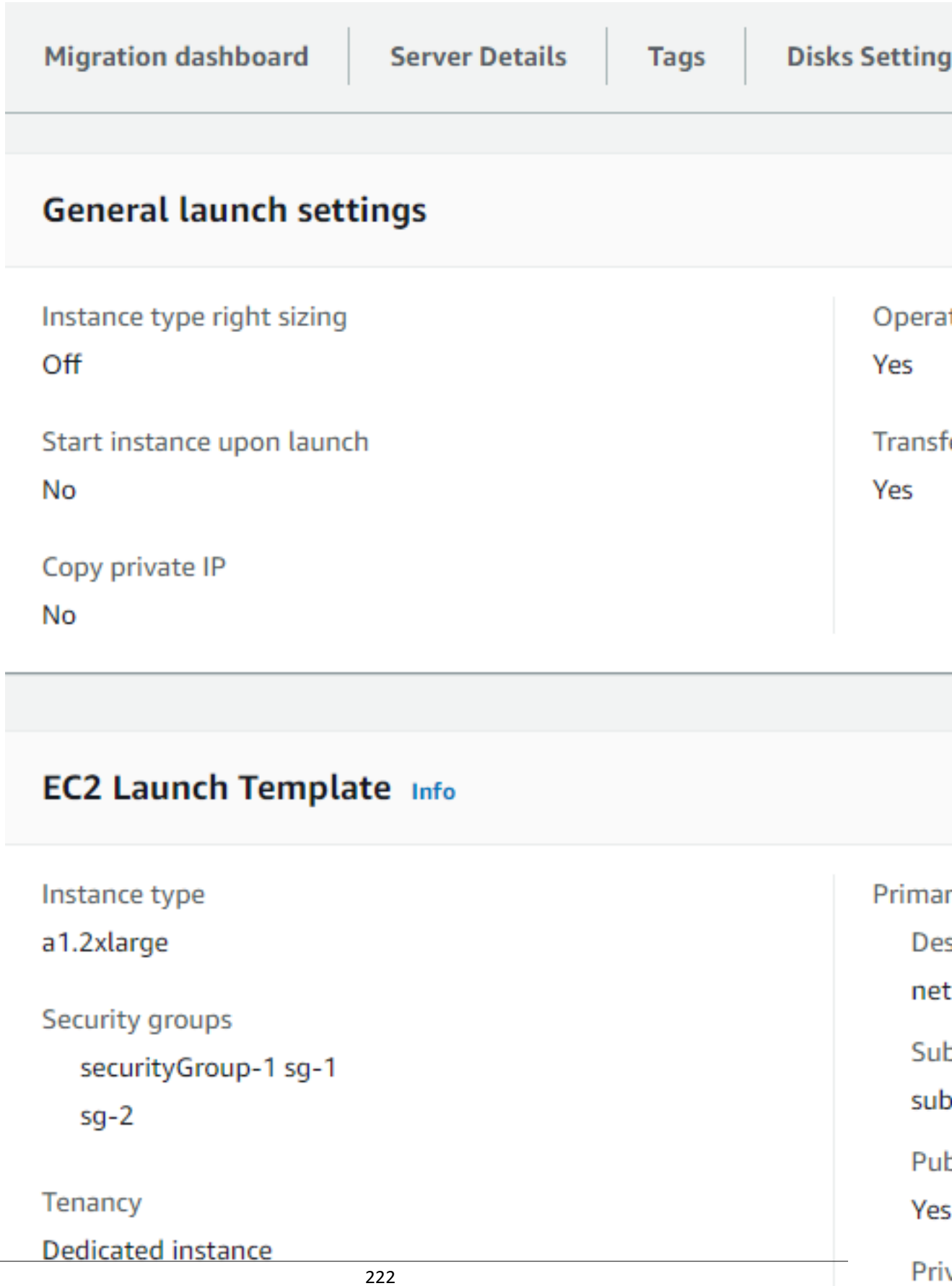
Launch settings can only be changed for one server at a time though the Application Migration Service Console.

Note
You can modify launch settings for multiple servers at a time by using the Application Migration Service API.

You can access the launch settings of a specific source server by choosing its Hostname from the **Source Servers** page.



Within the individual server view, navigate to the **Launch settings** tab.


Migration dashboard
Server Details
Tags
Disks Setting
General launch settings
Instance type right sizing
Off
Start instance upon launch
No
Copy private IP
No
Operat
Yes
Transf
Yes
EC2 Launch Template Info
Instance type
a1.2xlarge
Security groups
securityGroup-1 sg-1
sg-2
Tenancy
Dedicated instance
Placement group name
Primar
Des
net
Sub
sub
Pub
Yes
Priv

The **Launch Settings** tab is divided into two sections:

- General launch settings
- EC2 Launch Template

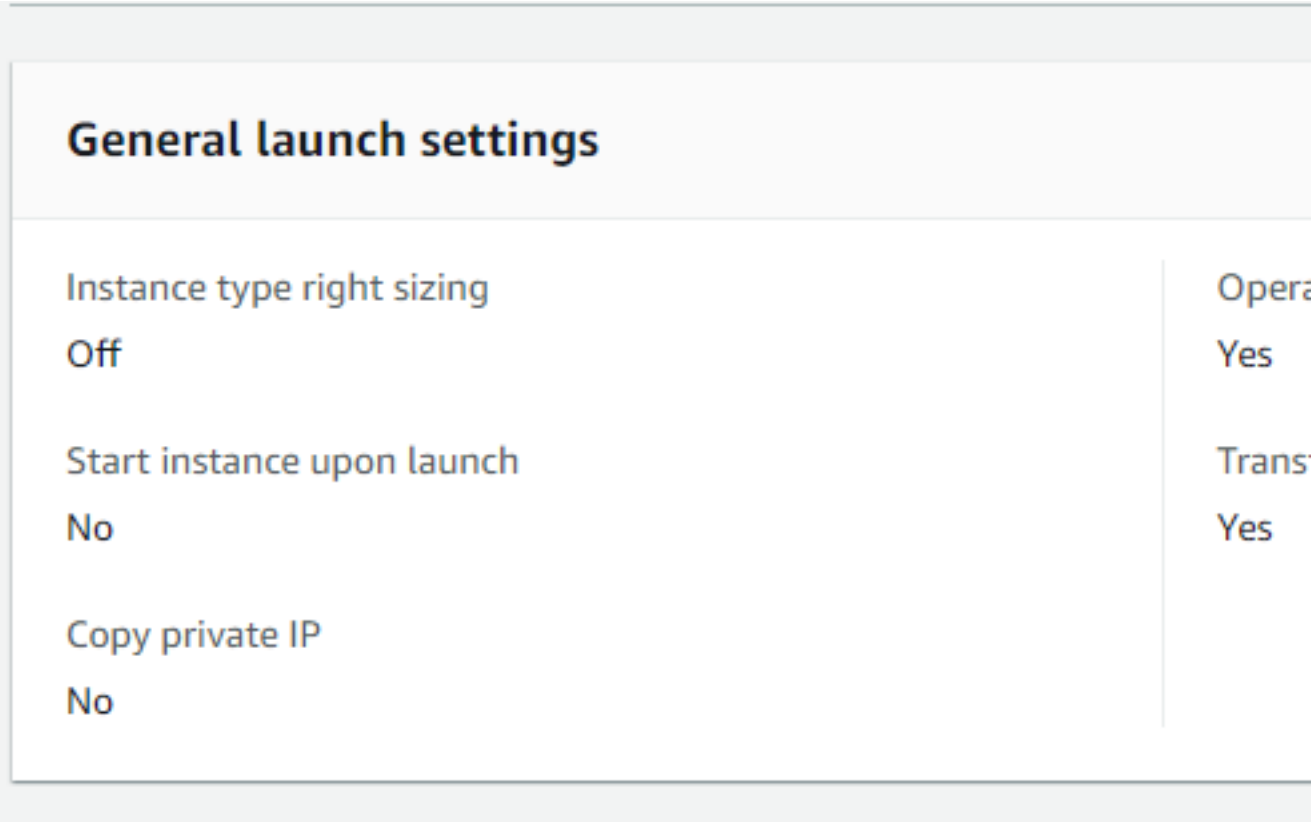
We will discuss each launch setting category in detail in the following sections:

Topics

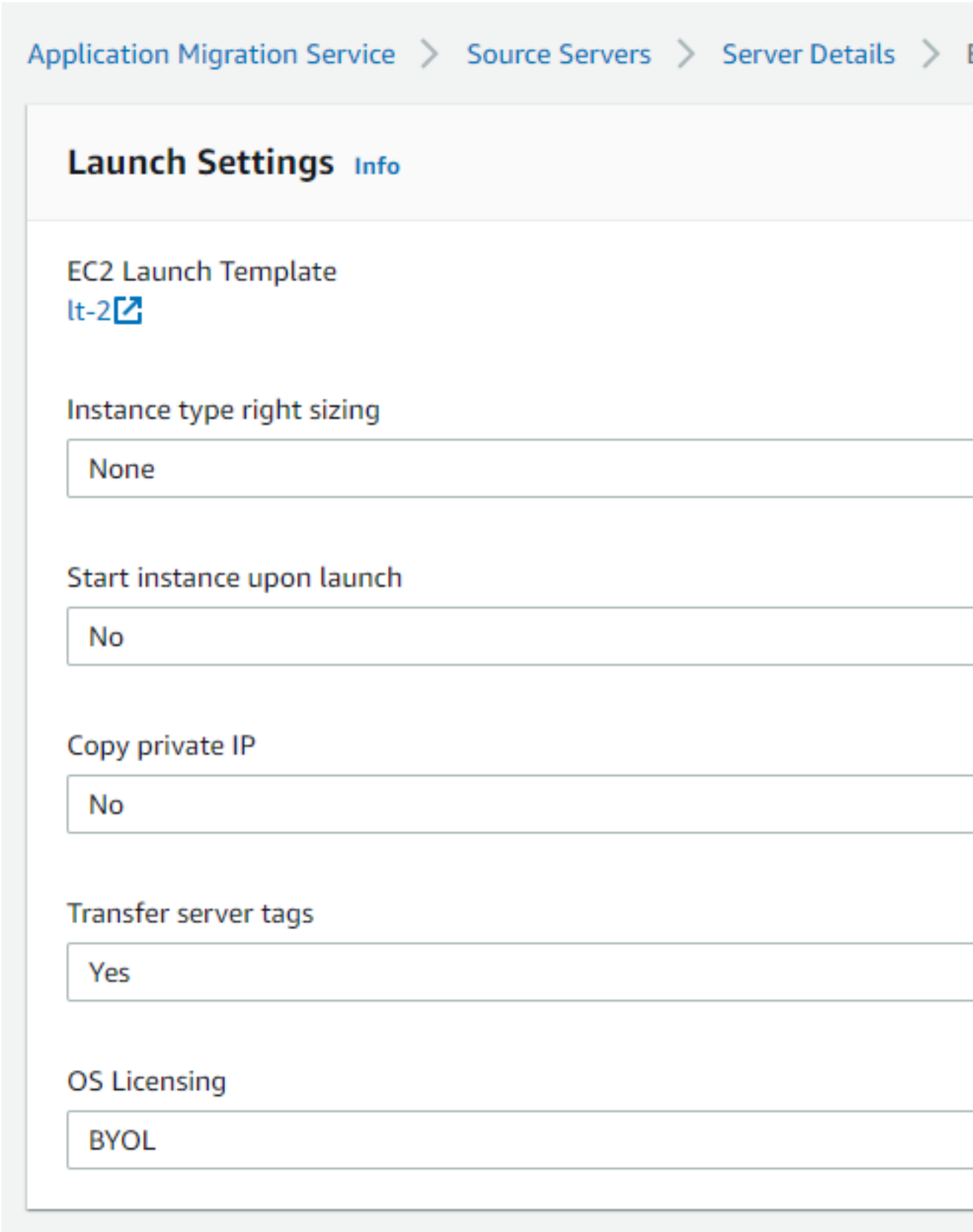
- General launch settings (p. 223)
- EC2 Launch Template (p. 234)

General launch settings

The **General launch settings** section allows you to control a variety of server-specific settings. Choose **Edit** to edit the general settings.



Make your changes and then choose **Save settings** to save your changes.

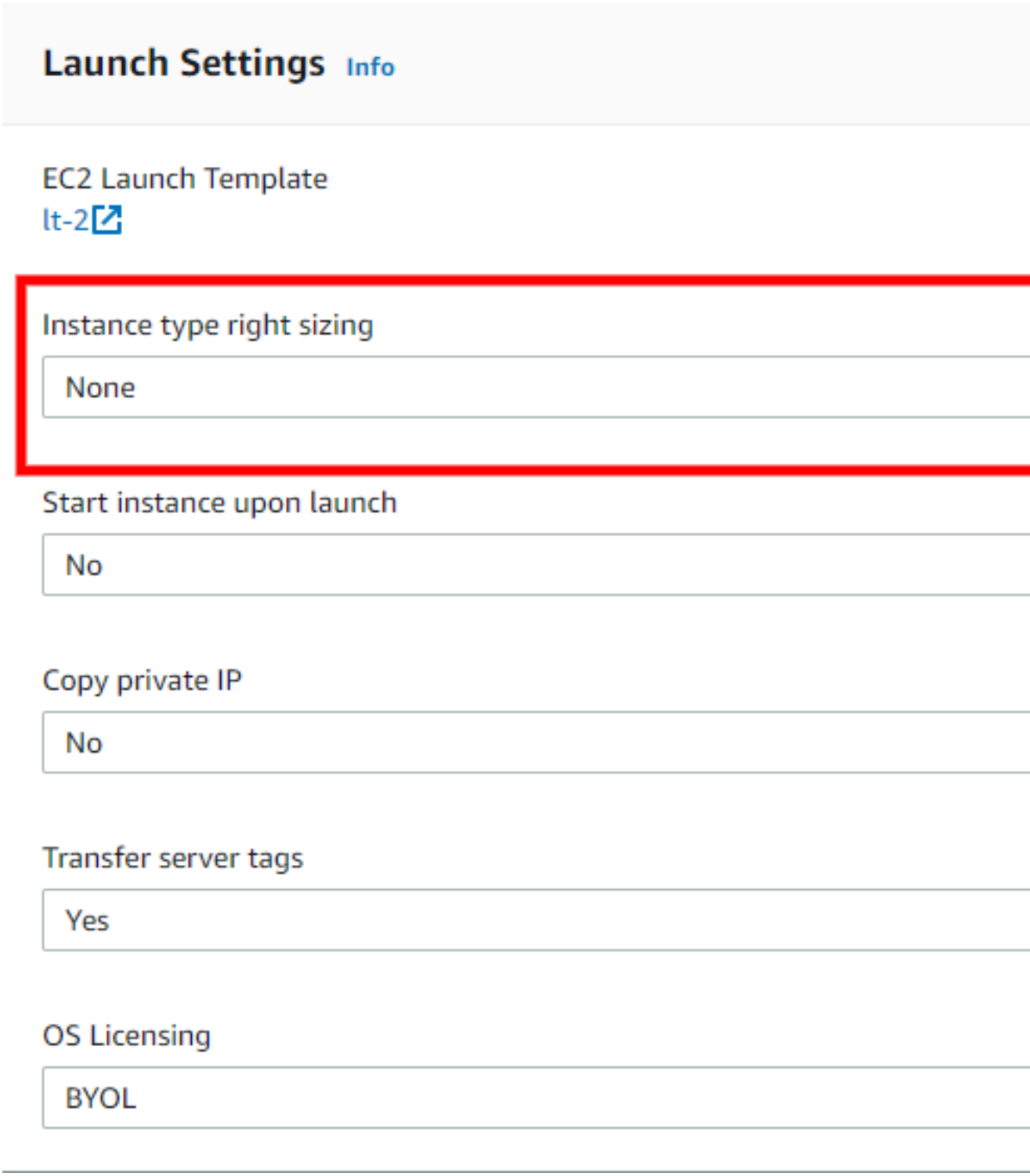

Application Migration Service
Source Servers
Server Details
Launch Settings
Info
EC2 Launch Template
lt-2
Instance type right sizing
None
Start instance upon launch
No
Copy private IP
No
Transfer server tags
Yes
OS Licensing
BYOL

Topics

- Instance type right-sizing (p. 225)
- Start instance upon launching (p. 227)
- Copy Private IP (p. 229)
- Transfer server tags (p. 230)
- OS licensing (p. 232)

Instance type right-sizing

The Instance type right-sizing feature allows Application Migration Service to launch a Test or Cutover instance type that best matches the hardware configuration of the source server.



If you select the **Basic** option, Application Migration Service will launch a Test or Cutover AWS instance type that best matches the OS, CPU, and RAM of your source server.

Application Migration Service will launch a new instance type after every change of configuration on the source server (ex. added/removed disks, added/removed RAM)

Important
The AWS instance type selected by Application Migration Service when this feature is enabled will overwrite the instance type defined in your EC2 launch template.

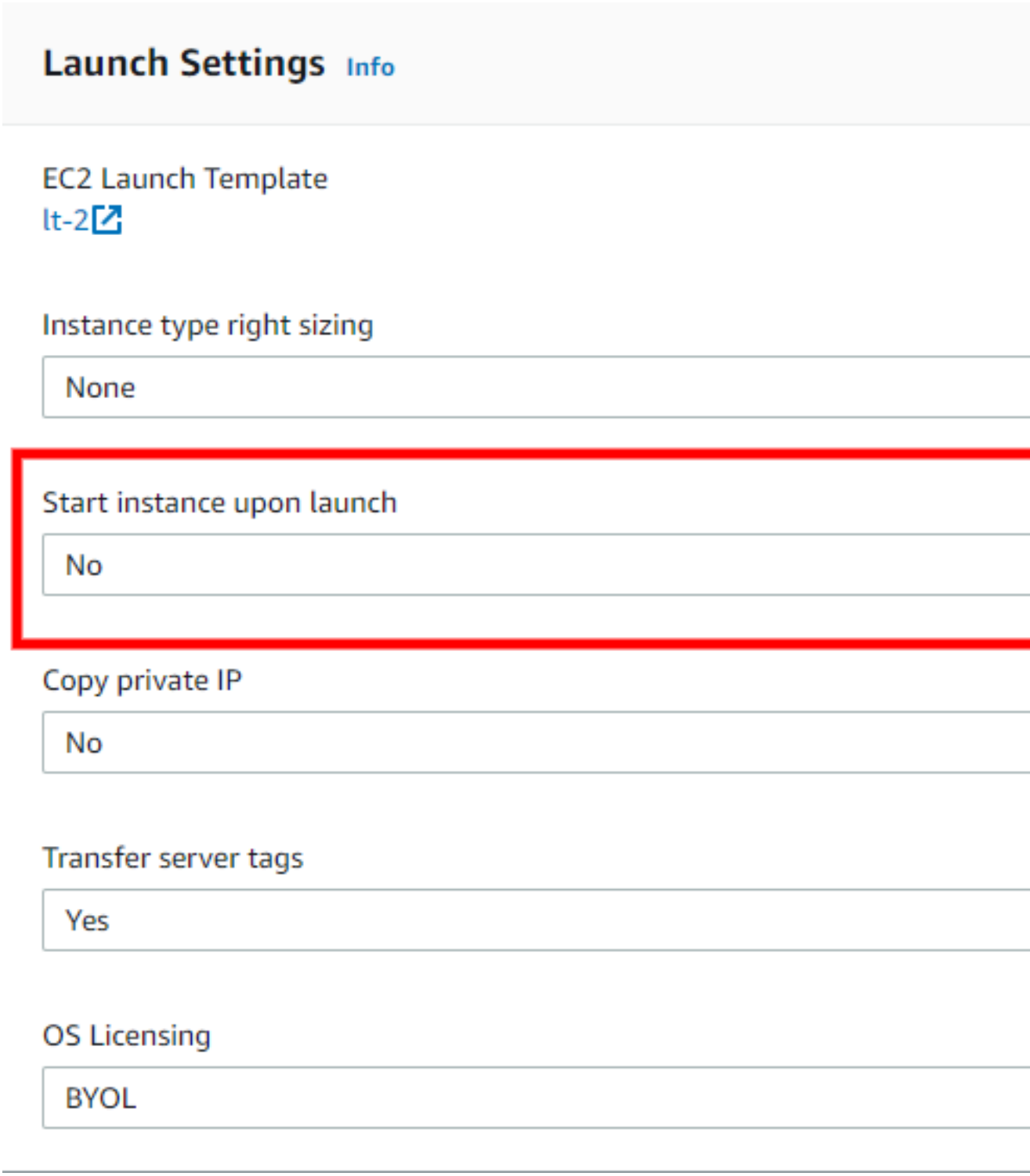
Note
Hardware changes and the resulting AWS instance type change may take up to 90 minutes to be processed by Application Migration Service.

If you select the **None** option, Application Migration Service will launch the AWS instance type as configured in your EC2 launch template. You should select this option if you want to determine the instance type that will be launched in AWS for all your Test or Cutover servers.

The right-sizing instance type selected by Application Migration Service will show on the **Server details** tab.

Start instance upon launching

Choose whether you want to start your test and cutover instances automatically upon launch or whether you want to launch them in a stopped state.

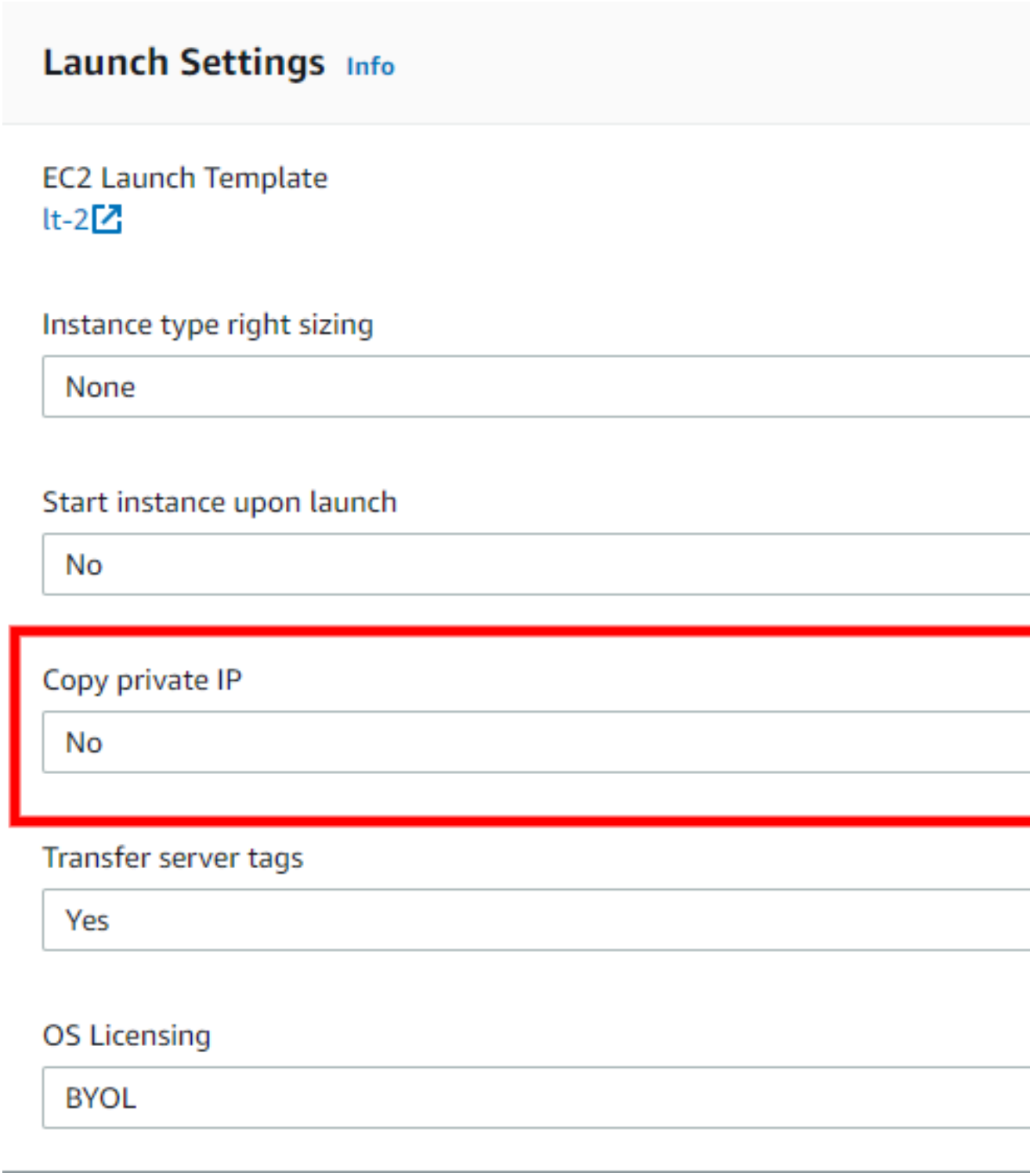


If you choose the **Yes** option, then the Test or Cutover AWS instance will be launched and started automatically upon Test or Cutover launch.

If you choose the **No**, then the instances will be launched in a stopped state and you will have to start the Test or Cutover AWS instance manually from the EC2 Console.

Copy Private IP

Choose whether you want Application Migration Service to ensure that the private IP used by the Test or Cutover instance matches the private IP used by the source server.



Application Migration Service will monitor the source server on an hourly basis to identify the Private IP. Application Migration Service will use the private IP of the primary network interface.

The **No** option is chosen by default. Choose the **No** option if you do not want the private IP of the Test or Cutover instance to match that of the source machine.

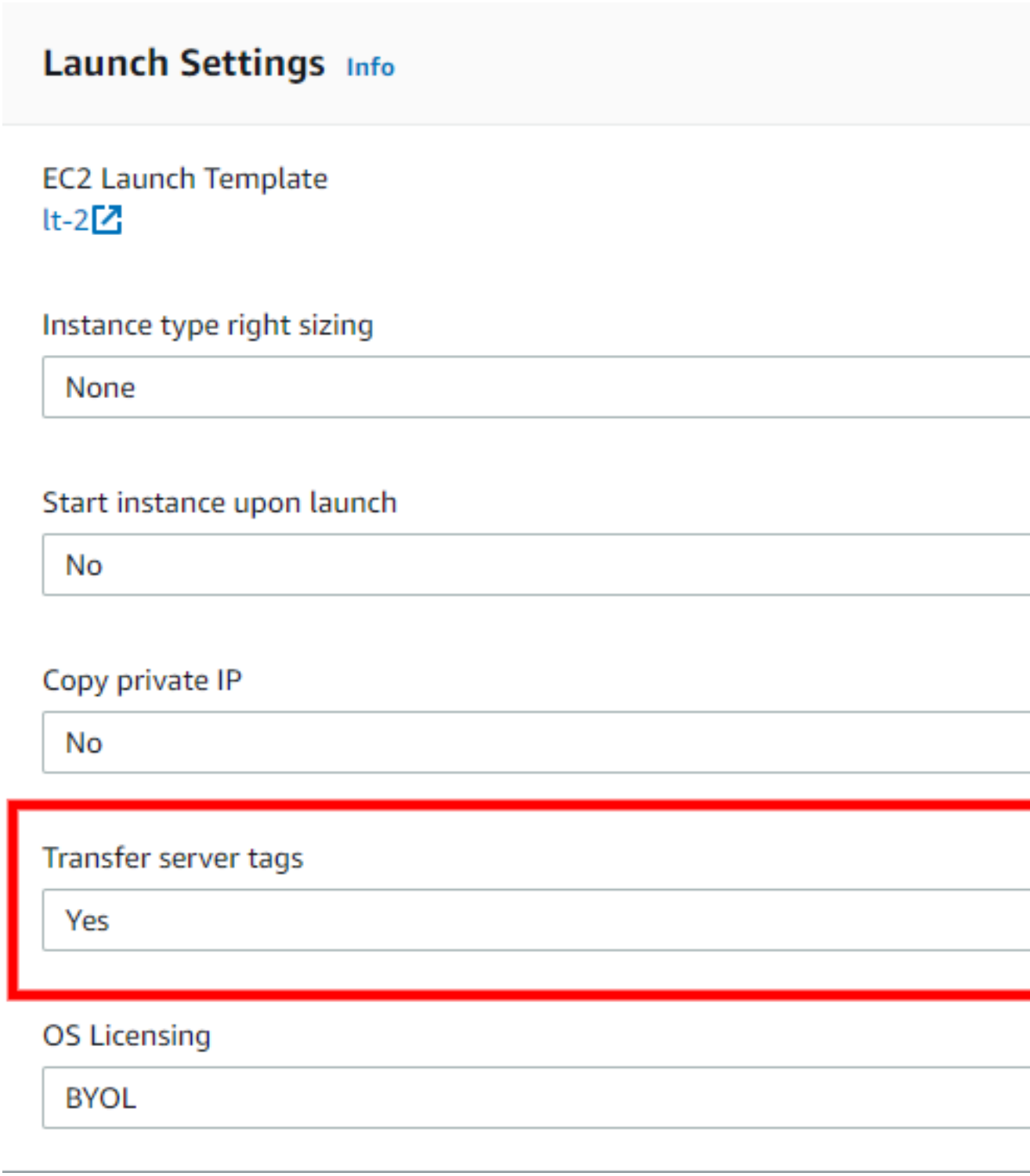
Choose the **Yes** option if you want to use a Private IP. The IP will be shown in brackets next to the option.

Note
If you chose the **Yes** option, ensure that the IP range of the Subnet you set in the EC2 Launch Template includes the Private IP address.

Note
If the both the source server and the Test or Cutover instance share the same Subnet though a VPN, then the source private IP is already in use, and the Copy private IP option should not be used.

Transfer server tags

Choose whether you want Application Migration Service to transfer any user-configured custom tags from your source servers onto your Test or Cutover instance.



If you choose the **Yes** option, server tags will be transferred. These tags are attached to all source servers, all launched Test and Cutover instances, and all of the ephemeral resources that are created on your AWS Account during the normal operation of Application Migration Service. These resources include:

- EC2 instances
- Conversion groups
- Security groups
- EBS volumes
- Snapshots

> **Note**
> Application Migration Service automatically adds system tags to all resources.

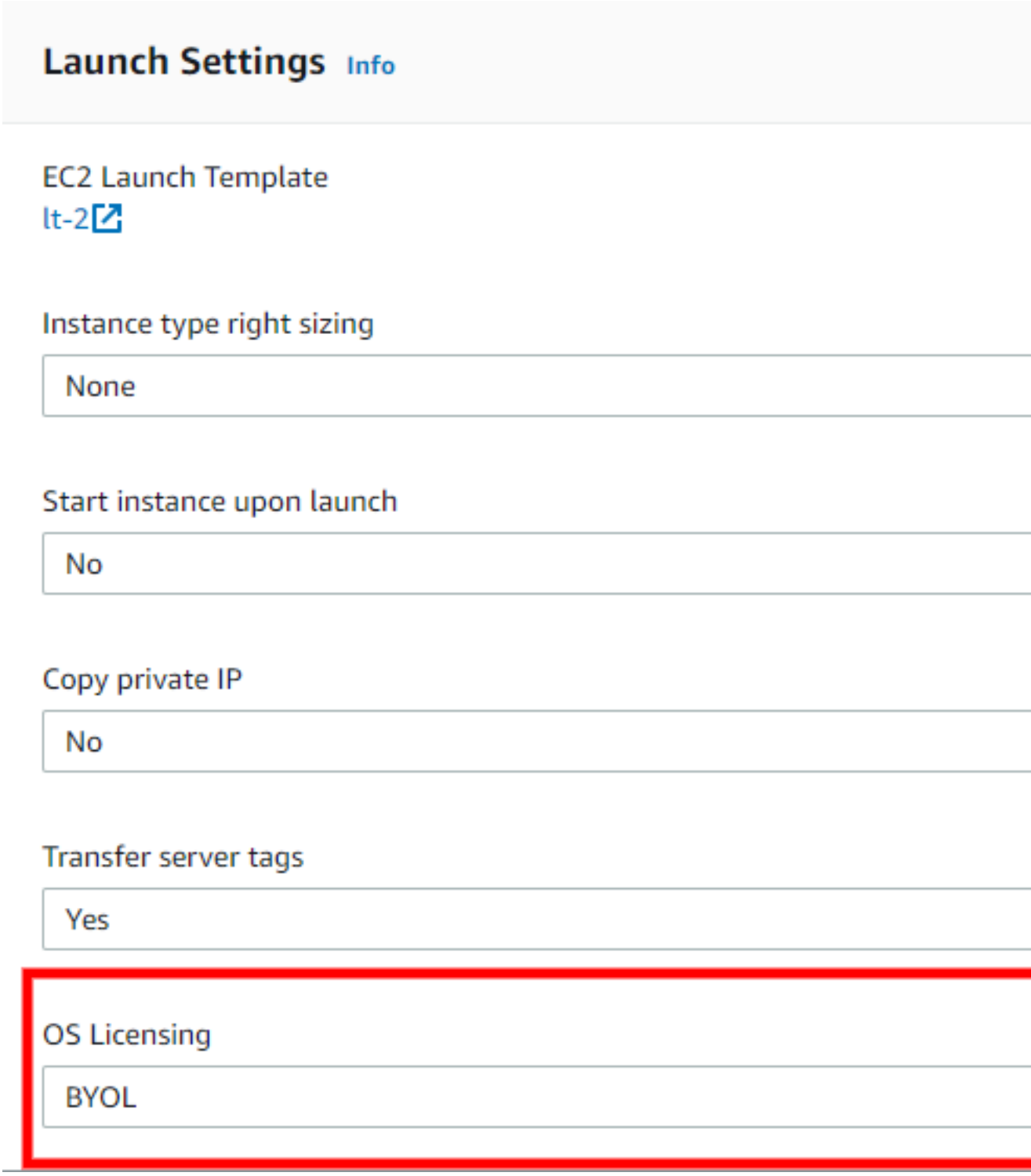
If you choose the **No** option, server tags will not be transferred. You can always add tags from the AWS EC2 Console as described in this EC2 article.

> **Note**
> Tags that are added on the EC2 launch template will take precedence over tags that are transferred directly from the source server.

OS licensing

Choose whether you want to Bring Your Own Licenses (BYOL) from the source server into the Test or Cutover instance.

> **Note**
> The Public Beta version of Application Migration Service does not support launching Test and Cutover instances using Windows BYOL.



The **Use default** option will use the default licensing mechanism for your operating system.

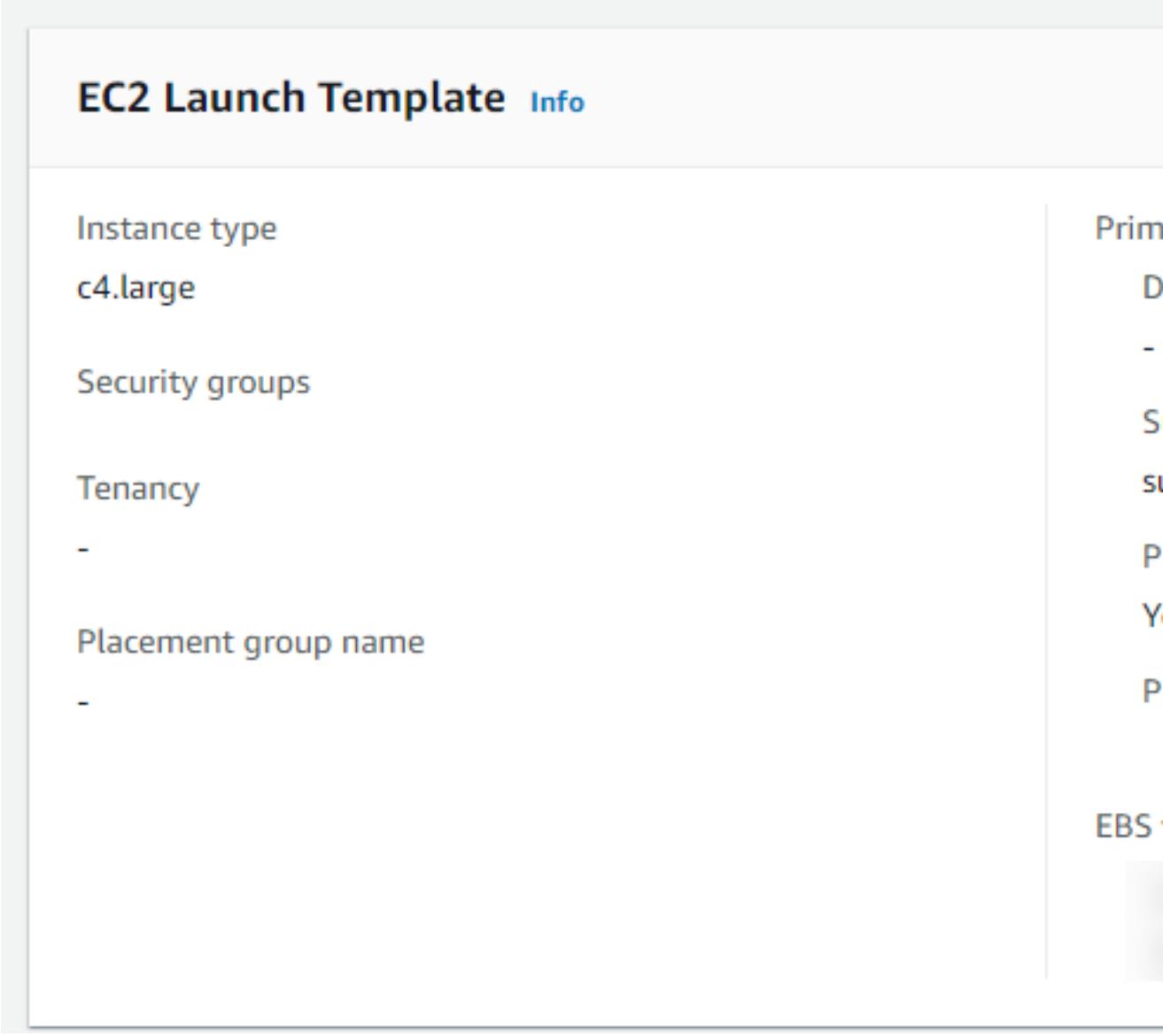
Choose the **BYOL** option if you are migrating a Linux server. All Linux licenses are BYOL by default. Any RHEL, SUSE or Debian licenses will be transferred in their current form to the migrated instance. Make sure to ensure that the terms of your licenses allow this license transfer.

Choose the **BYOL** option if you want to BYOL your Windows licenses. This will set up a dedicated host through which all the licenses from the Windows source server will be automatically transferred to the Test or Cutover instance.

Important
If you enable BYOL licensing for Windows, you have to change the **Placement.tenancy** type in the EC2 launch template to **Host**. Otherwise, instance launch will fail.

EC2 Launch Template

Application Migration Service utilizes EC2 launch templates to launch test and cutover EC2 instances for each source server.



The EC2 launch template is created automatically for each Source server that is added to Application Migration Service upon the installation of the AWS Replication Agent.

Note
The EC2 launch template does not need to be edited for most use cases.

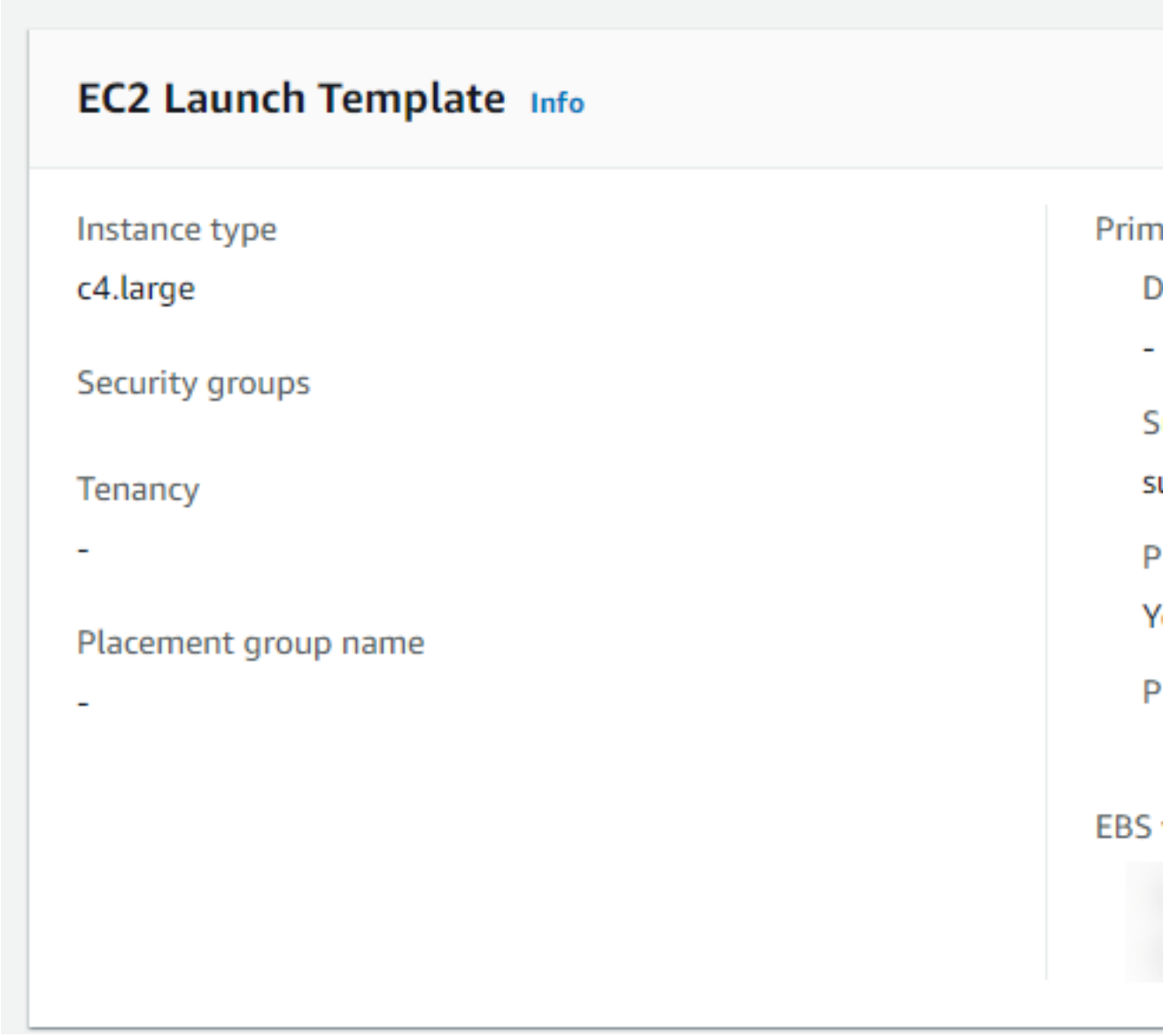
Note
You cannot use the same template for multiple servers.

Note
The Launch template can only be edited from EC2.

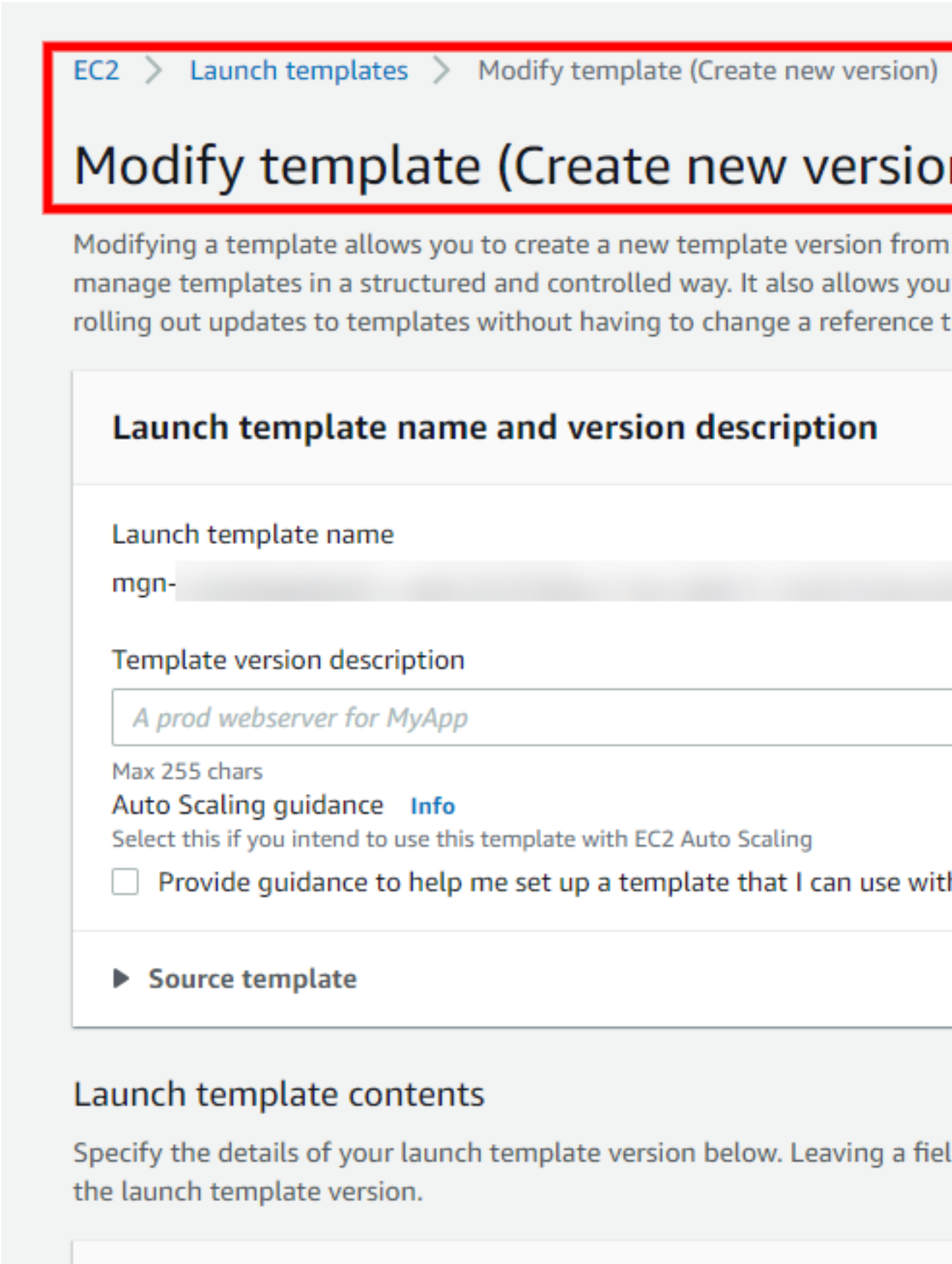
Note
Many EC2 launch template settings can be changed, but some may not be used by the Application Migration Service launch process and some may interfere with the Application Migration Service launch process. Learn more about individual launch template settings. (p. 239)

Important
You must set the EC2 launch template you want to use with Cirrus as the **default** launch template.

The Application Migration Service EC2 launch template panel shows a summary of the key template values; to view all the values or to change any of them, choose **Edit**.



This will redirect you to **EC2 > Launch templates > Modify template** in a new tab, where you'll be able to make any necessary changes.


EC2 > Launch templates > Modify template (Create new version)
Modify template (Create new versio
Modifying a template allows you to create a new template version from
manage templates in a structured and controlled way. It also allows you
rolling out updates to templates without having to change a reference t
Launch template name and version description
Launch template name
mgn-
Template version description
A prod webserver for MyApp
Max 255 chars
Auto Scaling guidance Info
Select this if you intend to use this template with EC2 Auto Scaling
Provide guidance to help me set up a template that I can use with
Source template
Launch template contents
Specify the details of your launch template version below. Leaving a fiel
the launch template version.

Learn more about EC2 launch template settings and configuration options in this EC2 article.

Working with EC2 launch templates

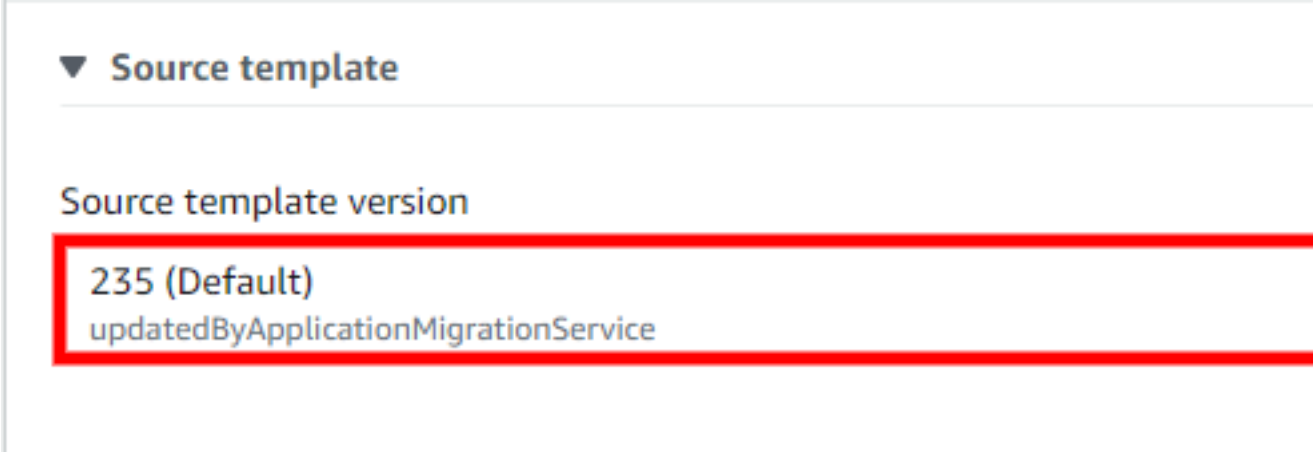
Topics

- Selecting the default template (p. 238)
- Launch template cleanup and fixing (p. 238)
- Launch template key considerations (p. 238)
- Full launch template setting review (p. 239)
- Saving your EC2 launch template (p. 247)

Selecting the default template

Application Migration Service uses the version of the Launch template that is marked as default.

In order to select the default launch template, on the **Modify template (Create new version)** page, under the **Launch template name and version description** category, open the **Source template** menu and choose the EC2 launch template you want to use as the default template from the dropdown menu.



Every time you modify the Launch template, a new version of the launch template is created. Once you have made changes to the Launch template, save your changes and choose your newly saved template as the default. It's a good practice to delete versions of the Launch template that you no longer need.

Launch template cleanup and fixing

Application Migration Service runs a mechanism every hour to ensure that the settings selected are correct. This mechanism can fix issues such as an incorrect instance type, but it cannot fix other settings and augmentations. Ensure that you follow the instructions in the following sections and do not change or edit any fields that should not be changed.

If you encounter any issues with the launch template, you can negate all of your changes and fix all issues rapidly by choosing the original default launch template that was first automatically created by Application Migration Service upon Agent installation.

Launch template key considerations

There are several key considerations when configuring your EC2 launch template. Review these key considerations as well as the full launch settings (p. 239) before creating your launch template.

1. **Instance Type** - Ensure that you select an instance type that matches the hardware requirements of your source server. Application Migration Service always utilizes the instance type that is set on the EC2 launch template unless the **Instance right-sizing** feature is enabled.

   Note
   If you change your instance type and do not disable to the Instance right-sizing feature, then Application Migration Service will use the instance type determined by the **Instance Right-Sizing** feature and not the instance type you chose in the EC2 launch template. Application Migration Service verifies the instance type once per hour, as a result, if you did not disable the Instance right-sizing feature, the first time instance launch may still utilize the instance type you set in the EC2 launch template, but any subsequent launches will utilize the right-sizing instance.
2. **Subnet** - You can select an existing Subnet or create a new subnet.
3. **Private IP** - If you enable the **Copy Private IP** feature, then do not add your own IP to the EC2 launch template.
4. **Private IP and Subnet**- Each subnet contains a CIDR block of IP ranges. If you enable the **Copy Private IP** feature, then ensure that this IP is included in the CIDR block range. Otherwise, instance launch will fail.
5. **Private IP and ENI** - Ensure that you disable the **Copy Private IP** feature if you wish to define an ENI to use on the EC2 launch template.
6. **Network interfaces** - The EC2 launch template only supports two network interfaces. If you require more than two network interfaces, you will need to define them after the Test or Cutover instance has been launched. This can be done through a postboot script.

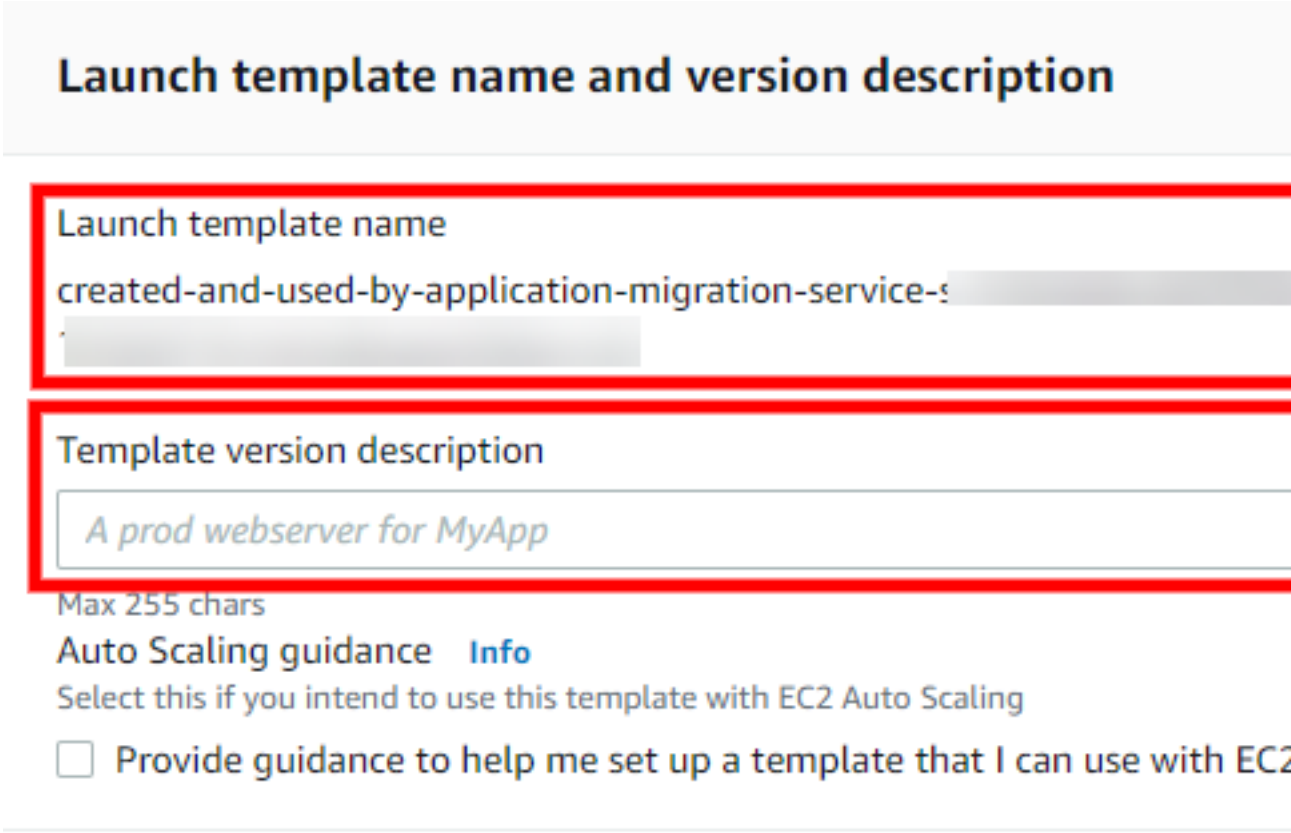
   If you wish to use an Elastic IP, you must create an ENI to specify the IP and then edit the Network interfaces to use the ENI. Learn more about working with Amazon Elastic Inference in this Developer Guide article.
7. **Networking platform** - Application Migration Service only supports **Virtual PRivate Cloud (VPC)**. EC2-Classic is **NOT** supported. Do **NOT** add any Security groups under the network platform.
8. **Custom device name** - Do not alter this field. Application Migration Service uses the device name as defined on the source server in order to map disks on the test or cutover instance. You can use this field to identify your disks.
9. **Disks** - You cannot add disks to the EC2 launch template. Any disks that are added that do not exist on the source machine will be ignored by Application Migration Service.
10. **Launch template name** - Do not alter this field. Application Migration Service automatically names this field.
11. **System tag** - Do not alter this field. Application Migration Service automatically adds system tags that match the EC2 launch template to the specific source server. You can recognize which source server the launch template is matched with by the **ID** field.
12. **Automatic cleanup** - Application Migration Service deletes the EC2 launch template and launch configuration for machines that have been disconnected from Application Migration Service or machines for which the Cutover has been finalized 90 minutes after disconnect or cutover finalization. This aids in ensuring that your account does not surpass the AWS 5000 EC2 launch template limit.

    Note
    If you wish to set a KMS key, you should do so through the EBS Encryption (p. 79)section of the Replication Settings within the Application Migration Service Console.

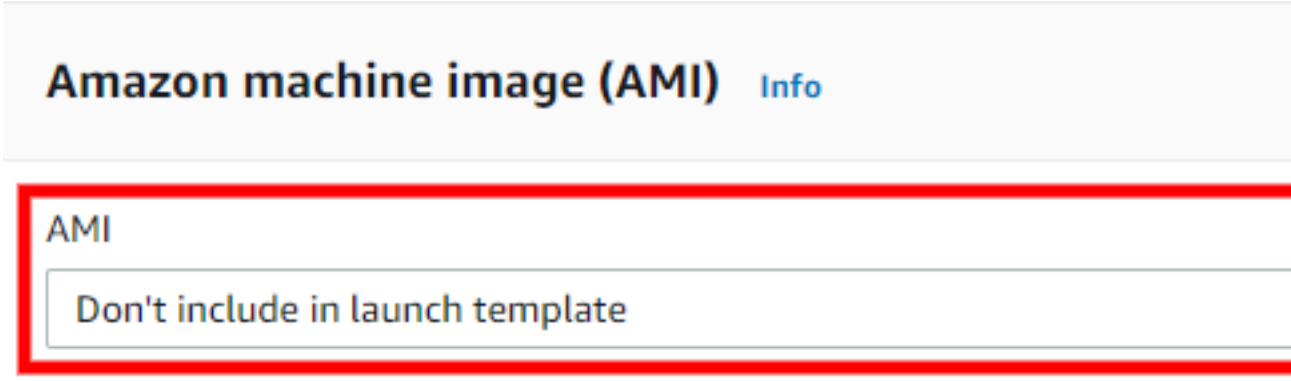
Full launch template setting review

This section reviews the entire EC2 launch template and identifies which fields should and should not be changed in order for the EC2 launch template to work with Application Migration Service. Editing or changing any fields that are marked as "do not edit" or "do not change" can cause Application Migration Service to not function.

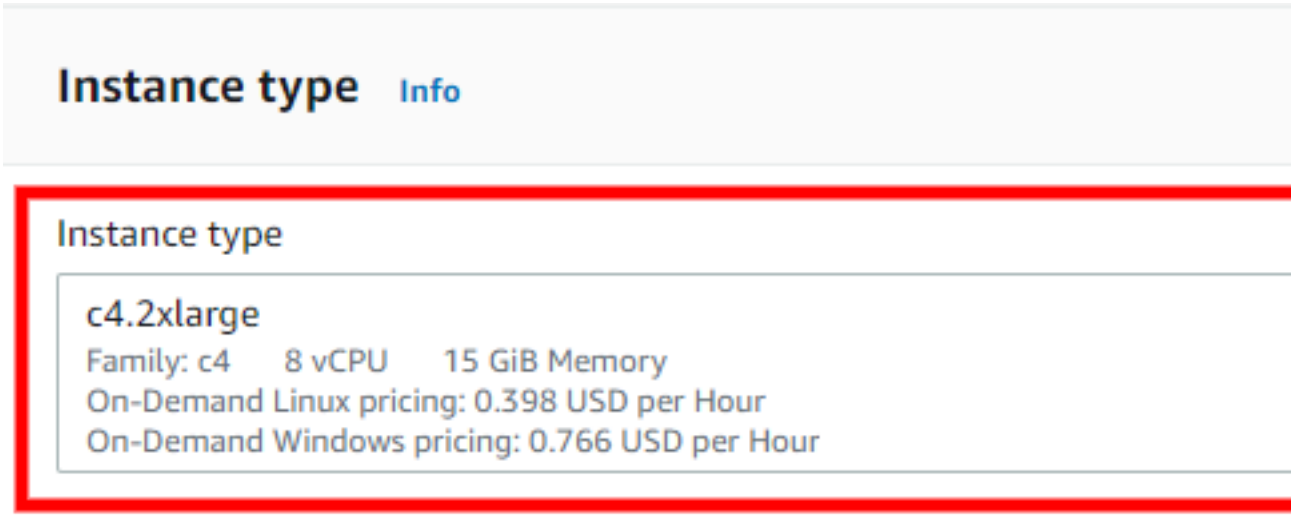
- **Launch template name** - This name is automatically generated when the template is first created upon Agent installation. The name cannot be changed.
- **Template version description** - You can give the template any description you wish.



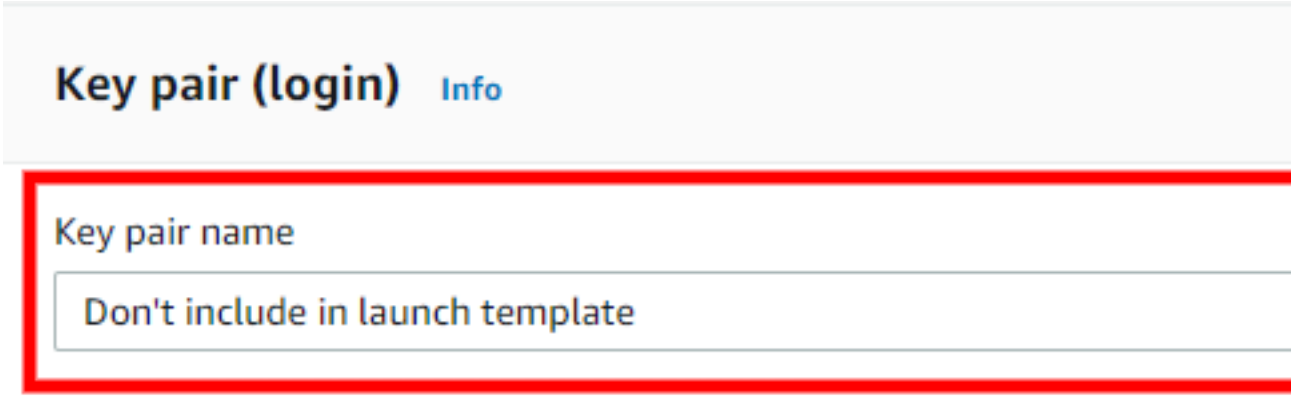
- **AMI** - Customers do not typically choose a specific AMI to include in the launch template. If you edit the launch template to use an existing AMI, the contents of the AMI will not be used by Application Migration Service. If the AMI is not configured properly (licensing, flags, etc), then this may prevent the Test or Cutover instance launched from booting correctly or from being properly licensed.



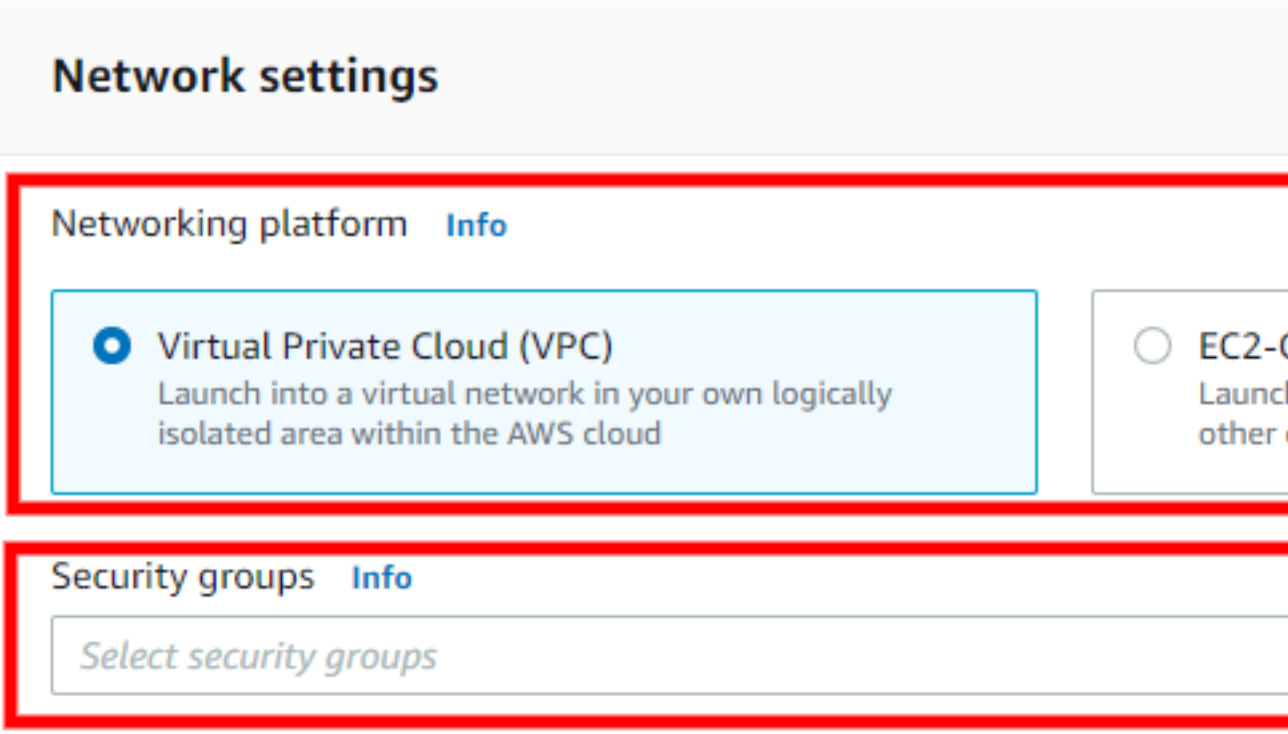
- **Instance type** - You can select any instance type you want. The launch template will show the instance type suggested by Application Migration Service.



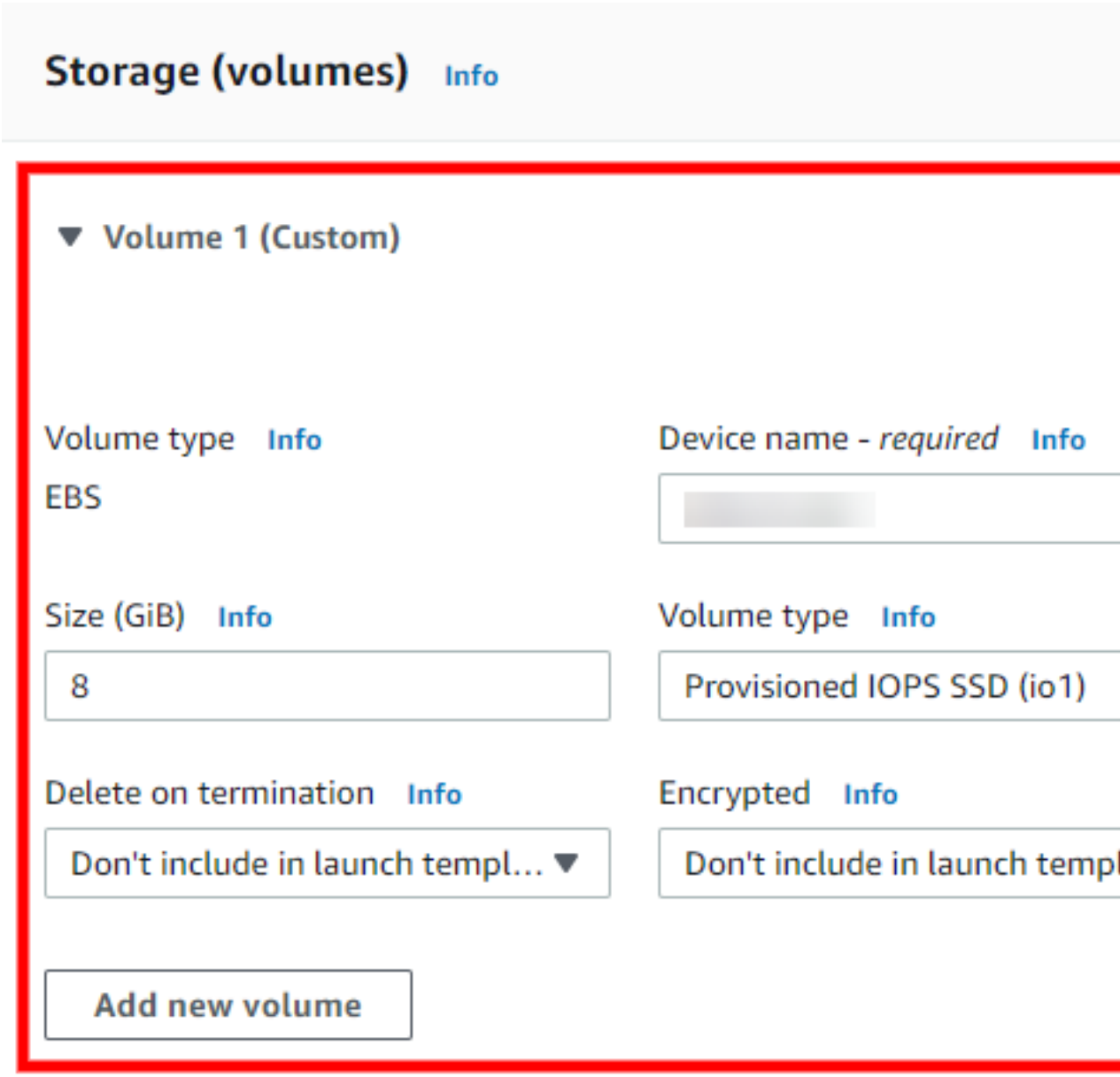
- **Key pair (login)** - Do **NOT** alter this fieled. Do not include a key pair with the launch template.



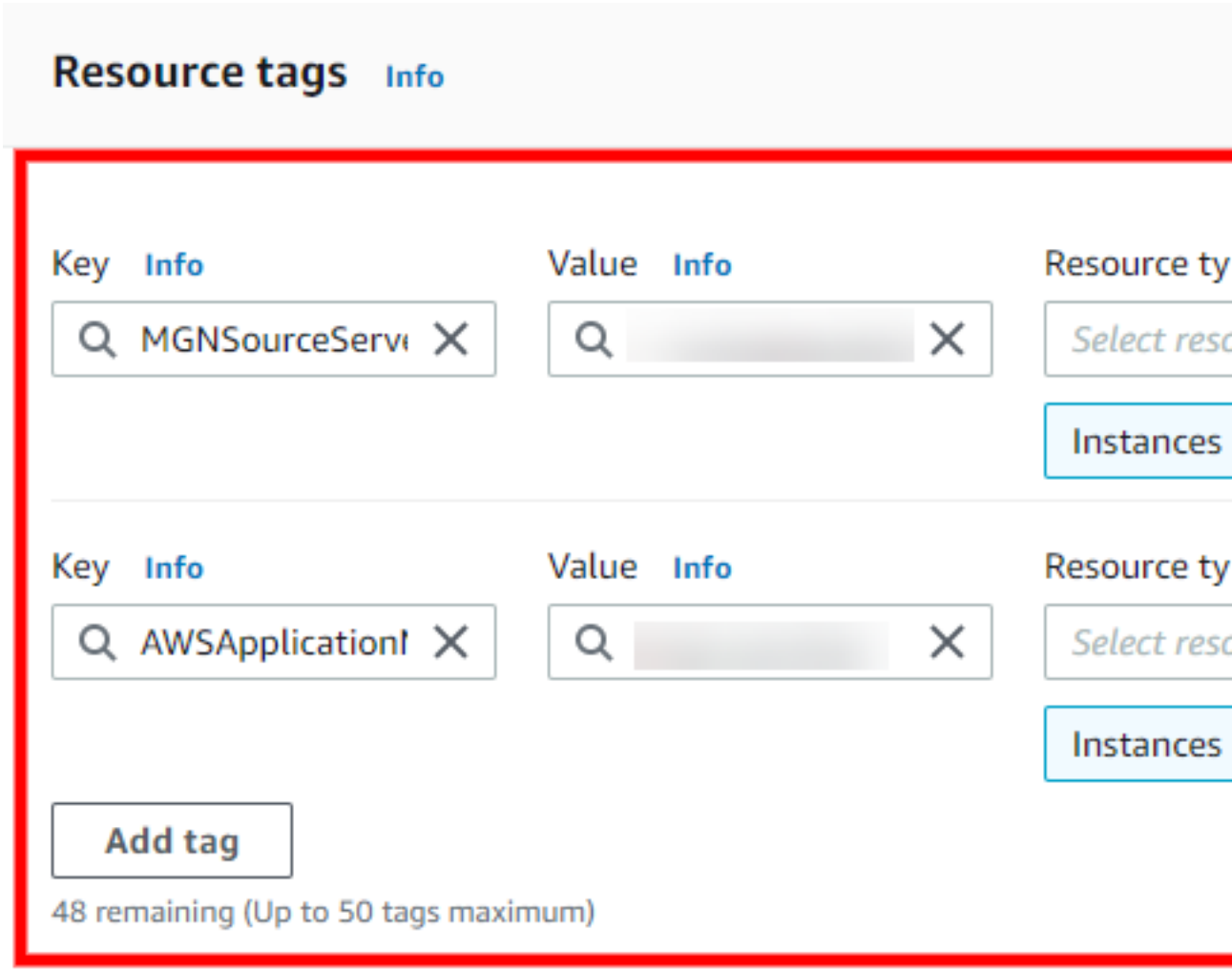
- **Networking platform** - Ensure that you select **Virtual Private Cloud (VPC)**. **EC2-Classic** is **NOT** supported.
- **Security groups** - Do **NOT** add Security group here. This field should remain blank. You can add security groups later under **Network interface**.



- **Storage (volumes)** - This section will show all of the disks that you chose to replicate from your source server upon AWS Replication Agent installation. Each disk is composed of the following fields:
  - **Volume type** - Shows the default volume type (EBS). This cannot be changed.
  - **Device name** - Do **NOT** change or edit this field. The device name shown here corresponds to the disk name on the source server. This field allows you to identify which disk is which.
  - **Snapshot** - Do **NOT** change or edit this field. Snapshots should not be included in the launch template.
  - **Size** - Do **NOT** change or edit this field.
  - **Volume type** - You can select any volume type you want to use. Application Migration Service automatically sets **Provisioned IOPS SSD (io1)** as the default. We recommend not changing the volume type for test instances, as the io1 volume ensures that tests are performed as quickly as possible. You may want to change the volume type for cutover in order to save costs.
  - **IOPS** - Set the number of I/O operations per second that the volume can support. You can select any number as long as it matches the guidelines. For Provisioned IOPS SSD volumes, you can provision up to 50 IOPS per GiB for io1, and 500 IOPS per Gib for io2. For General Purpose SSD volumes, baseline performance is 3 IOPS per GiB, with a minimum of 100 IOPS and a maximum of 16000 IOPS. General purpose SSD volumes under 1000 GiB can burst up to 3000 IOPS.
  - **Delete on termination** - Do **NOT** change or edit this field. This should not be included in the launch template.
  - **Encrypted** - Do **NOT** change or edit this field. This should not be included in the launch template.
  - **Key** - Do **NOT** change or edit this field. This should not be included in the launch template.
  - **Add volume** - Do **NOT** use this functionality. You cannot add volumes to the source server through the launch template.

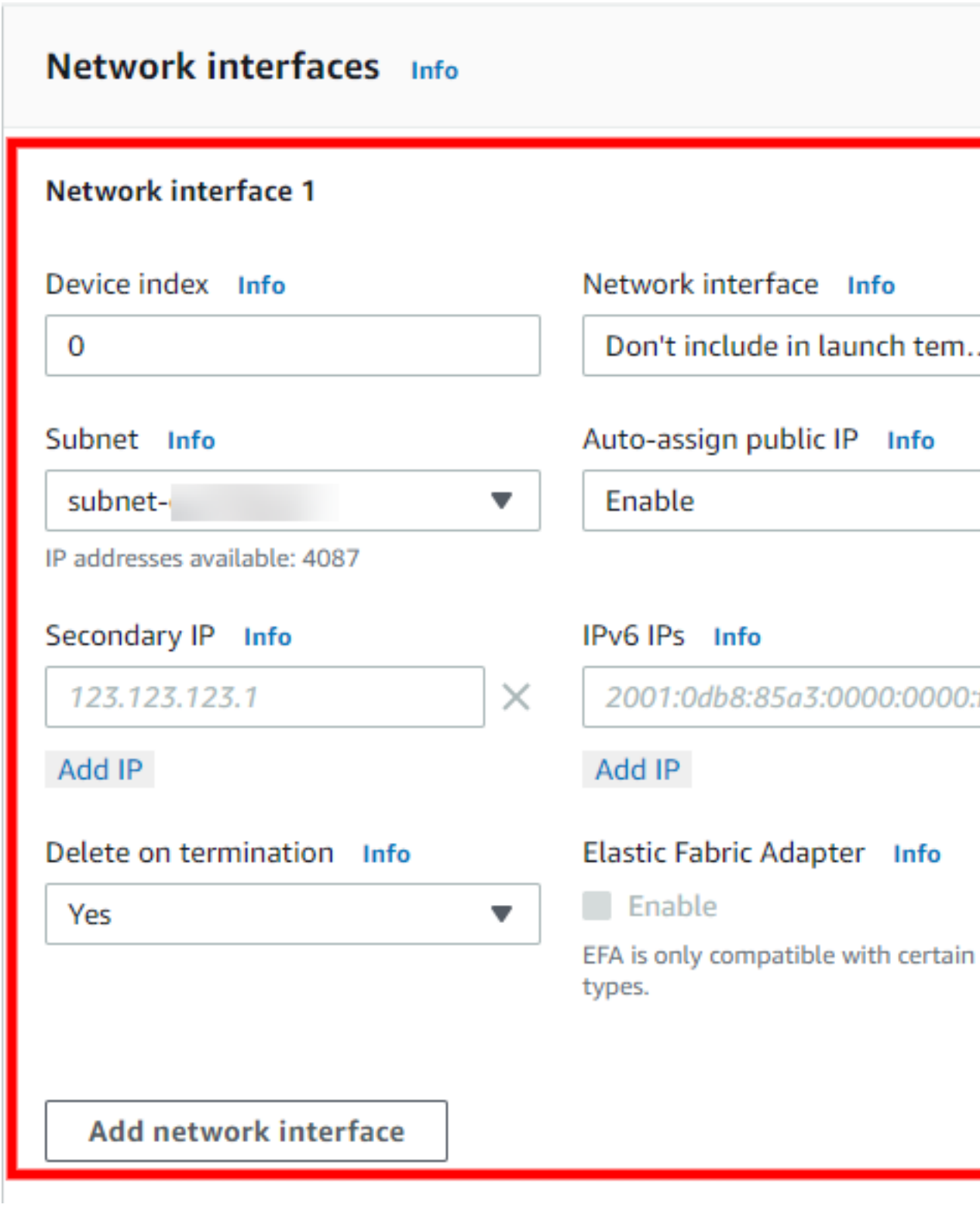


- **Resource tags** - You can add up to 50 tags. These will be transferred to your test and cutover instances. Note that these tags may interfere with other tags that have already been added to the source server. Launch template tags always take precedence over other tags.



- **Network interfaces** - The network interface is created by default based on your Replication Settings Template. The network interface section is composed of the following fields:
  - **Device index** - Do **NOT** change or edit this field. The value should alwasys be "**0**".
  - **Network interface** - Use this option only if you want use a pre-existing ENI (Elastic Network Interface). The Launch Template will overwrite certain ENI settings. Use this if you want to add an Elastic IP. You will have to attach the Elastic IP to the ENI.
  - **Description** - Add an optional description for the network interface (if chosen).
  - **Subnet** - Choose the subnet. This is the subnet within which the network interface is located and the Test or Cutover instance will be launched. Application Migration Service selects the default VPC subnet by default (if one exists).
  - **Auto-assign public IP** - Choose whether you want the public IP to be auto-assigned.
  - **Primary IP** - Use this field if you wish to utilize a Private IP. The Private IP you set in the **Copy private IP** field in the MGN Launch Settings will be copied to this field.
  - **Secondary IP** - Define a secondary IP, if needed.
  - **IPv6 IPs** - Define IPv6 IPs, if needed.
  - **Security groups** - Choose a security group. If no security group is chosen, then the default VPC security group will be used by default.

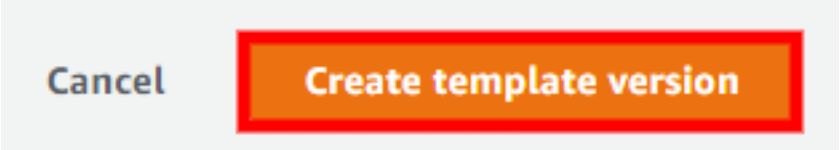
- **Delete on termination** - We suggest choosing "**Yes**". Choosing "**No**" will make this network interface a permanent ENI, which will accrue additional costs if not connected to a running instance.
- **Elastic Fabric Adapter** - Do **NOT** change or edit this field.
- **Network card index** - Do **NOT** change or edit this field.
- **Add network interface** - Note that the EC2 launch template only supports two network interfaces. If you require more than two network interfaces, you will need to define them after the Test or Cutover instance has been launched. This can be done through a postboot script.


Network interfaces Info
Network interface 1
Device index Info
0
Network interface Info
Don't include in launch tem..
Subnet Info
subnet-
IP addresses available: 4087
Auto-assign public IP Info
Enable
Secondary IP Info
123.123.123.1
Add IP
IPv6 IPs Info
2001:0db8:85a3:0000:0000:
Add IP
Delete on termination Info
Yes
Elastic Fabric Adapter Info
Enable
EFA is only compatible with certain types.
Add network interface

- **Advanced details** - In this section, we will focus on the fields you should **NOT** change or edit in order to Application Migration Service to function properly. Do **NOT** change or edit any of the following fields:
  - RAM disk ID
  - Kernel
  - Nitro Enclave
  - Metadata accessible

Saving your EC2 launch template

Once you have finished editing your template, save it by choosing **Create template version** at the bottom of the template.



Launching Test instances

Once you have added all of your source servers and configured their launch settings, you are ready to launch a Test instance. It is crucial to test the migration of your source servers into AWS prior to initiating a Cutover in order to verify that your source servers function properly within the AWS environment.

> **Important**
> It is a best practice to perform a test at least one week before you plan to migrate your source servers. This time frame is intended for identifying potential problems and solving them, before the actual Cutover takes place. After launching Test instances, use either SSH (Linux) or RDP (Windows) to connect to your machine and ensure that everything is working correctly.

You can test one source server at a time, or simultaneously test multiple source servers. For each source server, you will be informed on the success or failure of the test. You can test your source server as many times as you want. Each new test first deletes any previously launched Test instance and dependent resources. Then, it launches a new Test instance that reflects the most up-to-date state of the source server. After the test, Data Replication continues as before. The new and modified data on the source server is transferred to the Staging Area, and not to the Test instances that were launched following the test.

> **Note**
> Windows Source machines need to have at least 2 GB of free space to successfully launch a Test instance.

> **Note**
> Take into consideration that once a Test instance is launched, actual resources will be used in your AWS account and you will be billed for these resources. You can terminate the operation of launched Test instances once you verified that they are working properly without any impact in order to Data Replication.

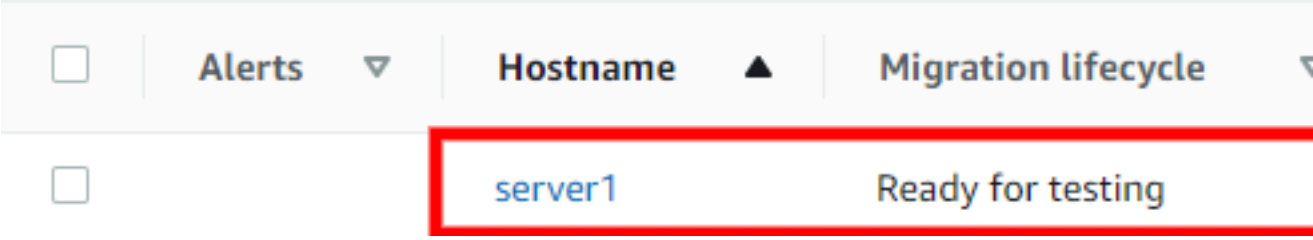
Topics

- Ready for testing indicators (p. 248)
- Starting a Test (p. 248)
- Reverting or Finalizing a Test (p. 252)

Ready for testing indicators

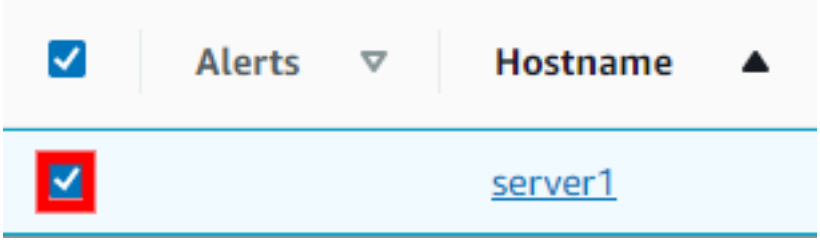
Prior to launching a Test instance, ensure that your source machines are ready for testing by looking for the following indicators on the **Source servers** page:

1. Under the **Migration lifecycle** column, the server should show **Ready for testing**
2. Under the **Data Replication status** column, the server should show the **Healthy** status.
3. Under the **Next step** column, the server should show **Start testing**



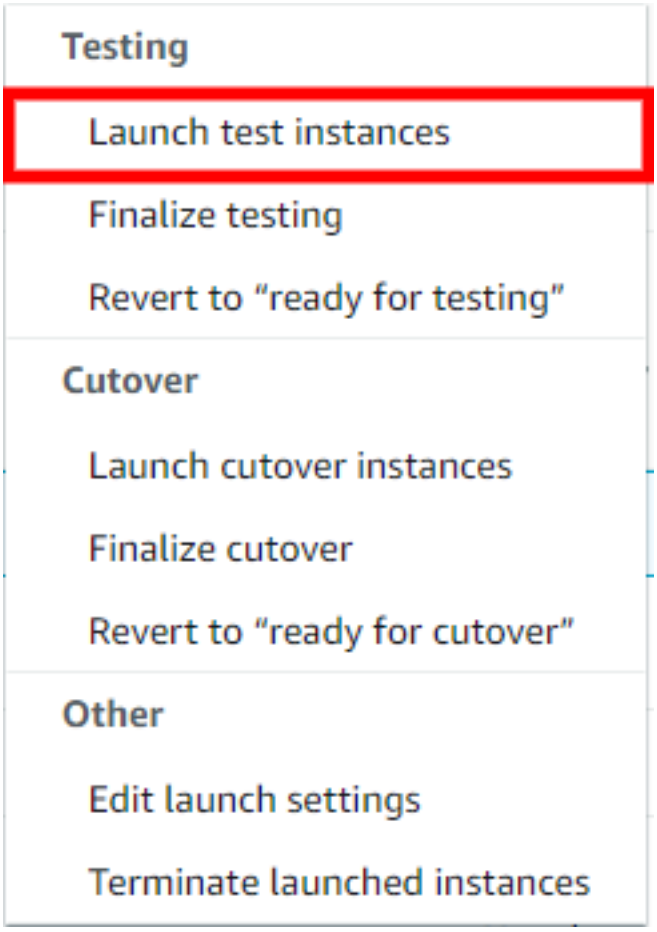
Starting a Test

To launch a Test instance for a single or multiple source servers, on the **Source Servers** page check the box to the left of each server you want to test.

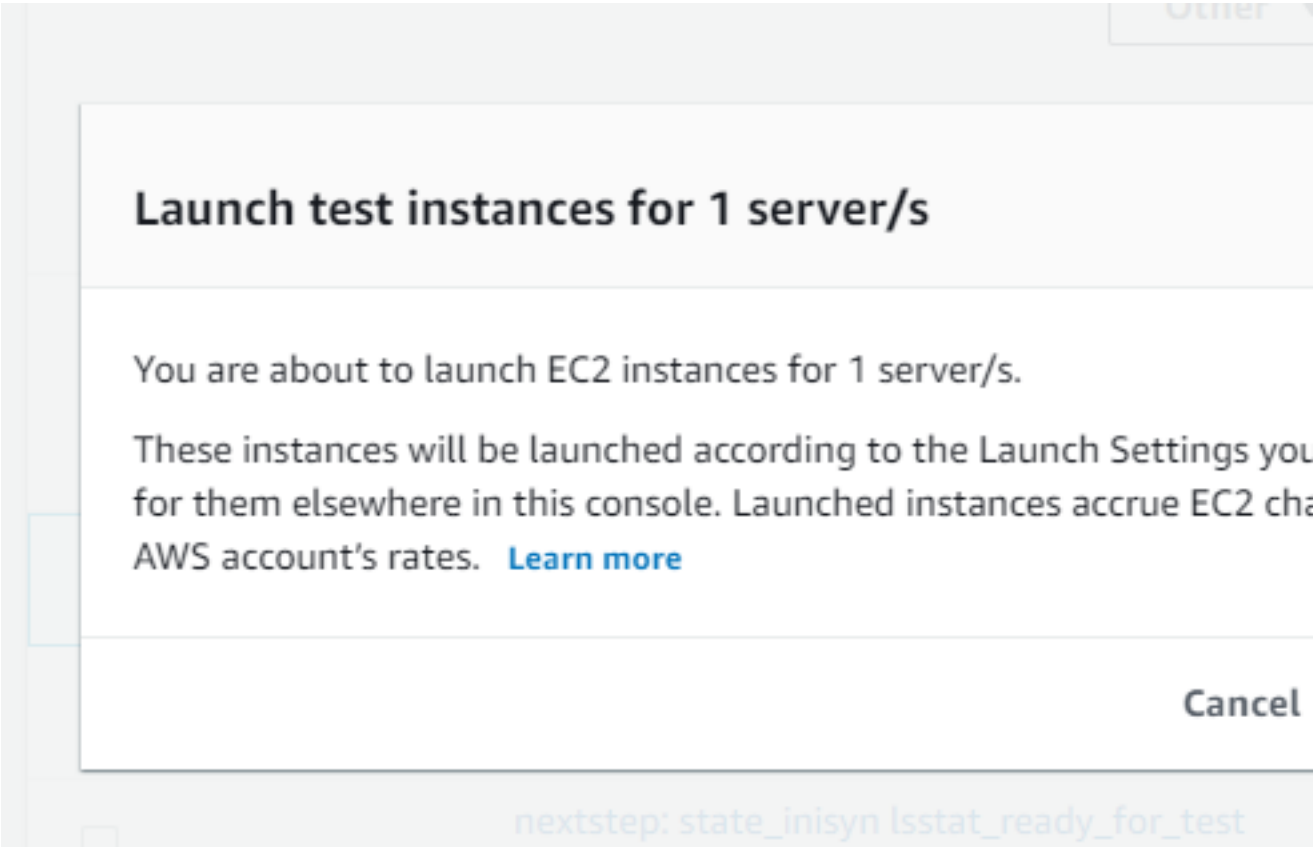


Open the **Test and Cutover** menu.

Under **Testing**, choose the **Launch test instances**option to launch a test instance for this server.

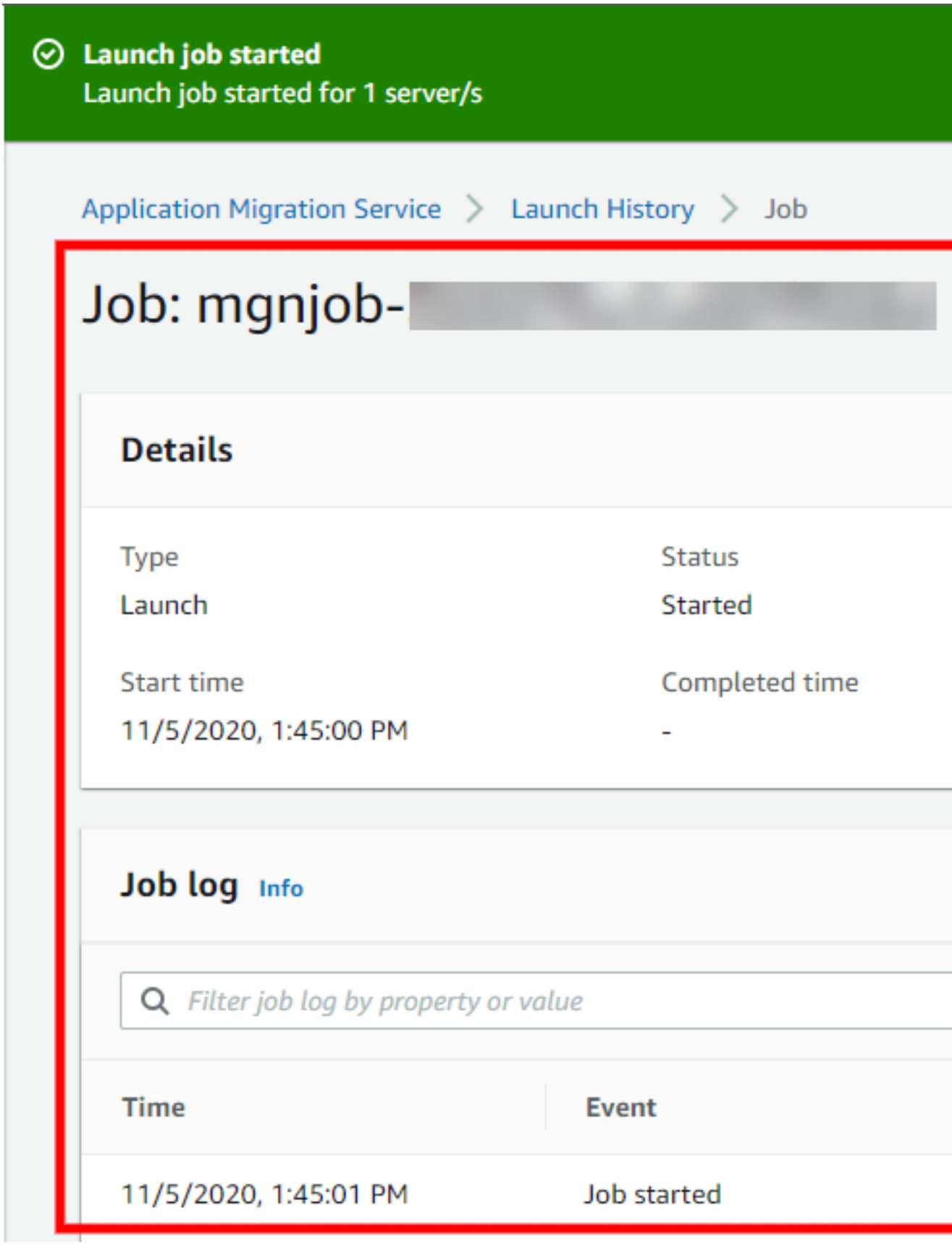


The **Launch test instances for X** servers dialog will appear. Choose **Launch** to begin the test.



The Application Migration Service Console will indicate **X launch job started** once the test has been started.

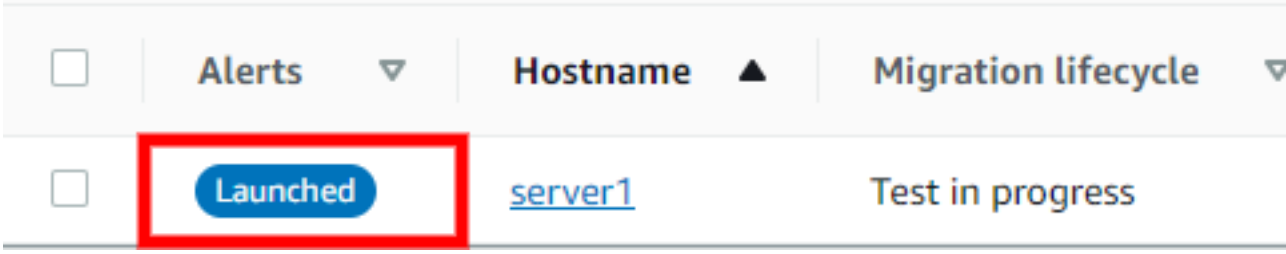
Choose **View job details** on the dialog to view the specific Job for the test launch in the Launch History.


Launch job started
Launch job started for 1 server/s
Application Migration Service
Launch History
Job
Job: mgnjob-
Details
Type
Launch
Status
Started
Start time
11/5/2020, 1:45:00 PM
Completed time
-
Job log
Info
Filter job log by property or value
Time
Event
11/5/2020, 1:45:01 PM
Job started

Successful test launch indicators

You can tell that the Test instance launch was started successfully through several indicators on the **Source Servers** page.

1. The Alerts column will show the **Launched** status, indicating that a Test instance has been launched for this server.
2. The **Migration lifecycle** column will show **Testing in progress**.
3. The **Next step** column will show **Complete testing**.



Reverting or Finalizing a Test

Once you have launched your Test instances, open the EC2 Console and SSH or RDP into your Test instances in order to ensure that they function correctly. Validate connectivity and perform acceptance tests for your application.

Topics

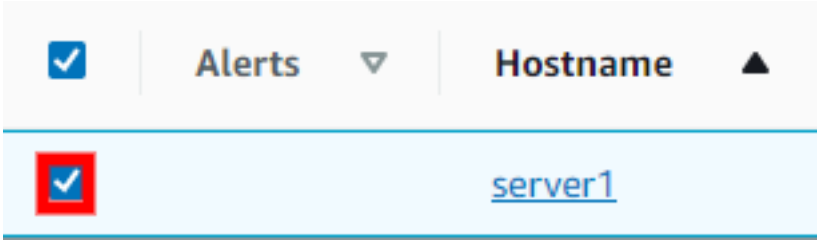
- Reverting a Test (p. 43)
- Finalizing a Test (p. 254)

Reverting a Test

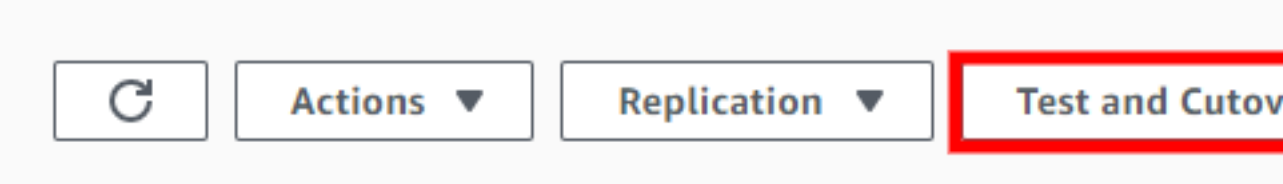
If you encounter any issues and want to launch new Test instances, or if you are performing a scheduled test and plan to perform additional tests prior to cutover, then you can revert the test. This will revert your source servers' **Migration lifecycle** to the **Ready for testing** status, indicating that these servers still require additional testing before they are ready for cutover. During a revert, you will also have the option to delete your Test instances for cost saving purposes.

To revert a Test:

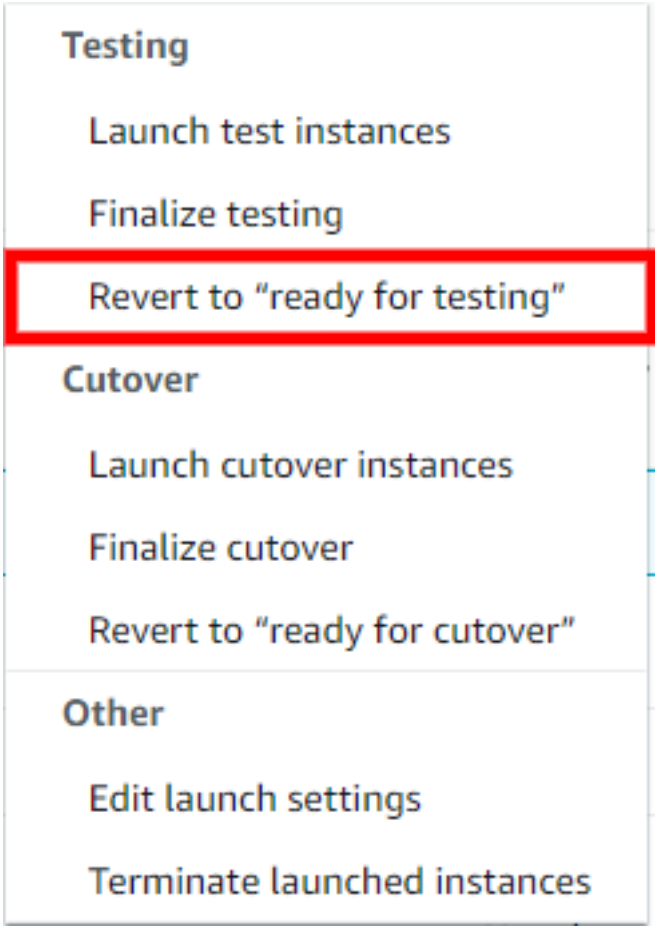
1. Check the box to the left of every source server that has a launched Test instance for which you want to revert the test.



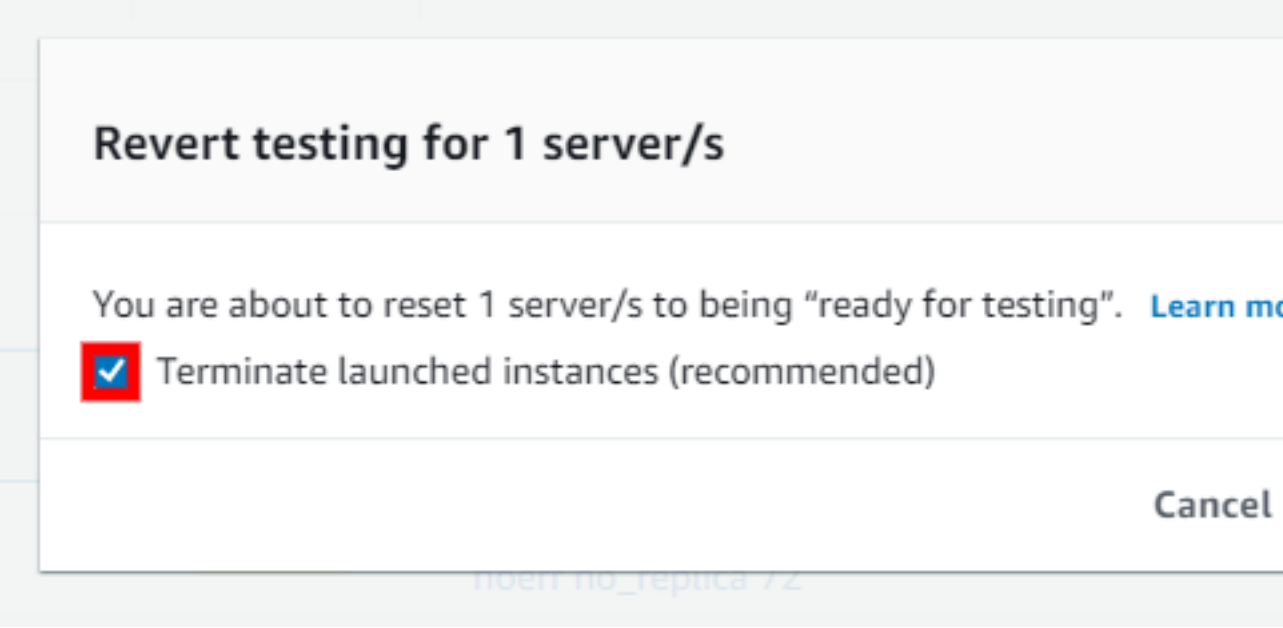
2. Open the **Test/Cutover** menu.



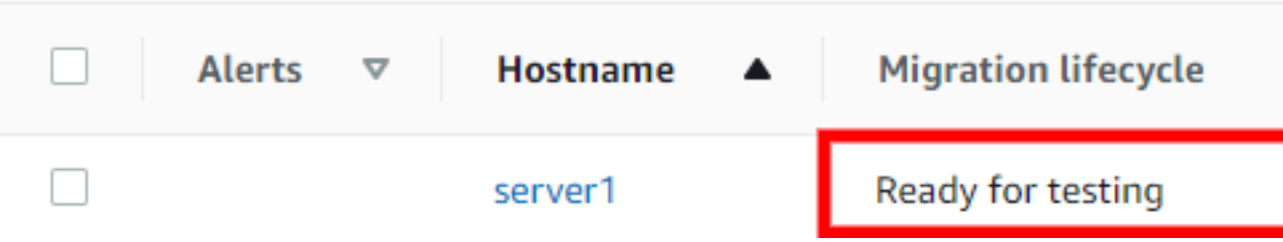
3. Under **Testing**, choose **Revert to "ready for testing"**



4. The **Revert testing for X servers** dialog will appear. Select whether you want to terminate the launched instances used for testing. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Revert**.



The Application Migration Service Console will indicate that testing has been reverted. The selected source servers' **Migration lifecycle** column will show the **Ready for testing** status, the Next step column will show **Start testing** and the launched Test instances will be deleted if that option was selected.

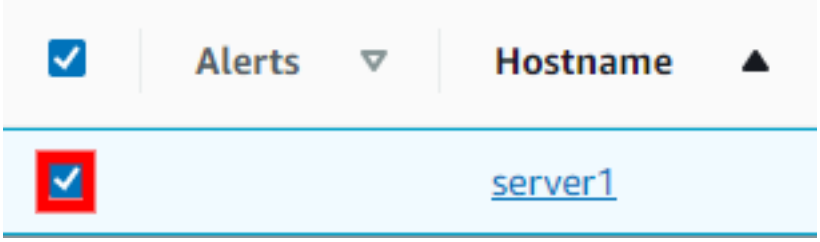


Finalizing a Test

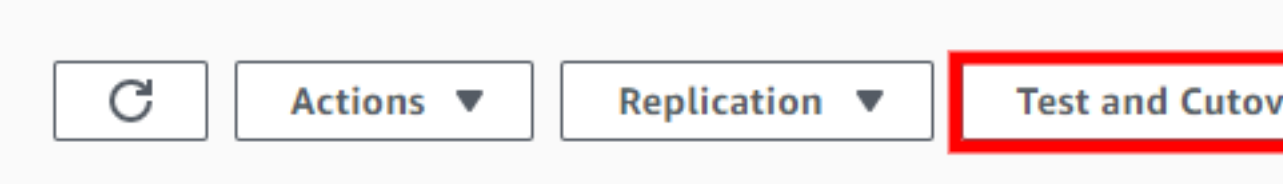
If you are completely done with your testing and are ready for Cutover, you can finalize the test. This will change the your source servers' **Migration lifecycle** status to **Ready for cutover**, indicating that all testing has been complete and that these servers are now ready for cutover. You will also have the option to delete your Test instances for cost saving purposes.

To finalize a Test:

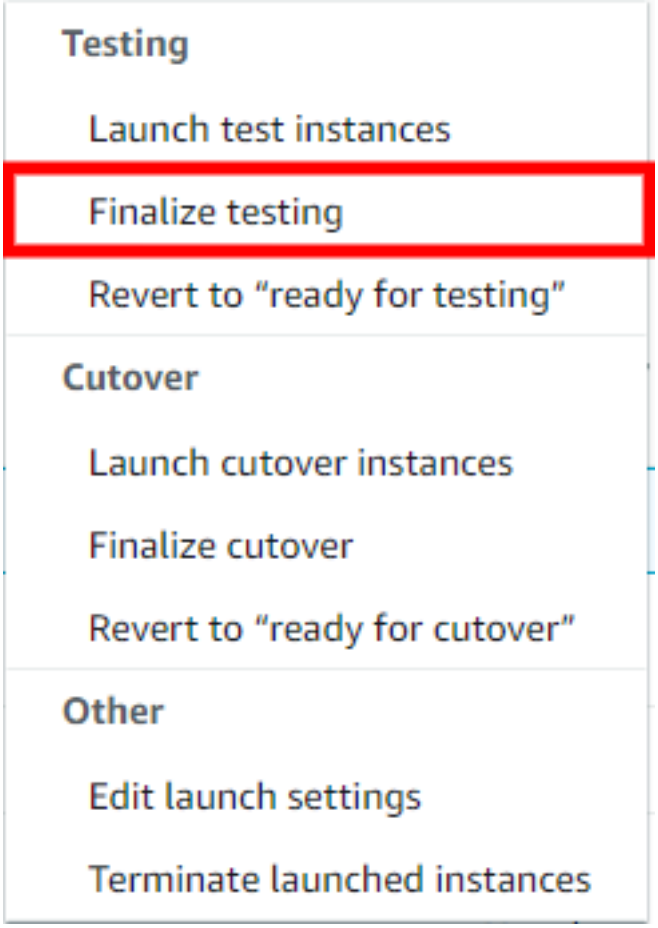
1. Check the box to the left of every source server that has a launched Test instance for which you want to finalize the test.



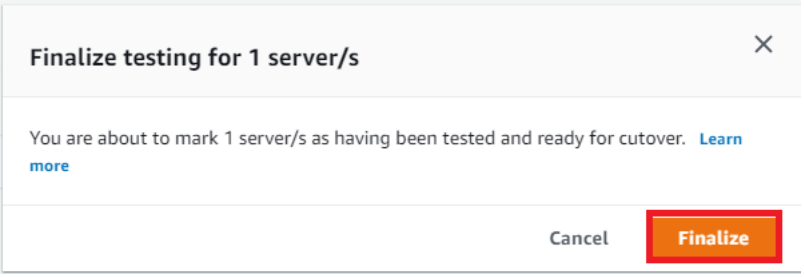
2. Open the **Test/Cutover** menu.



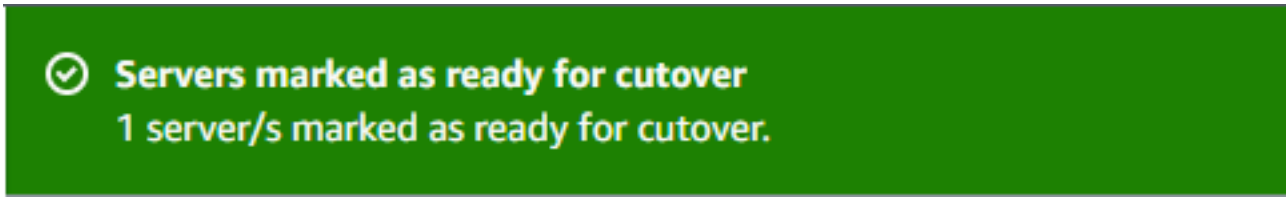
3. Under **Testing**, choose **Finalize testing**



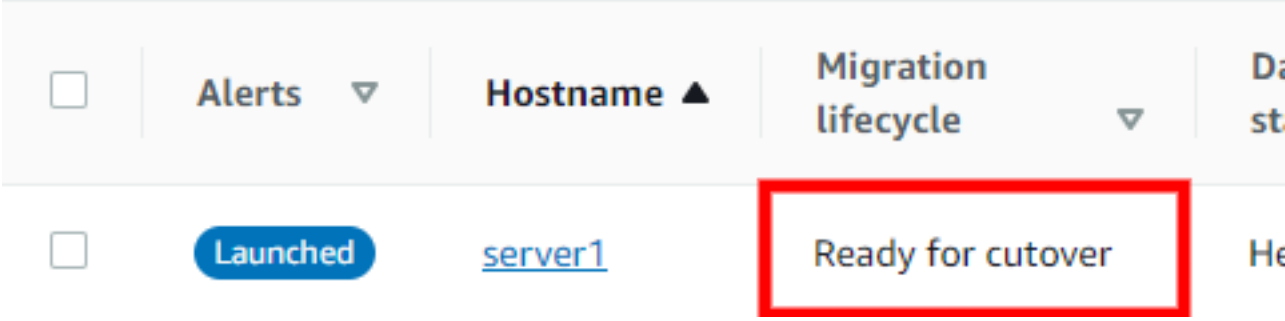
4. The **Finalize testing for X servers** dialog will appear. Select whether you want to terminate the launched instances used for testing. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Finalize**.



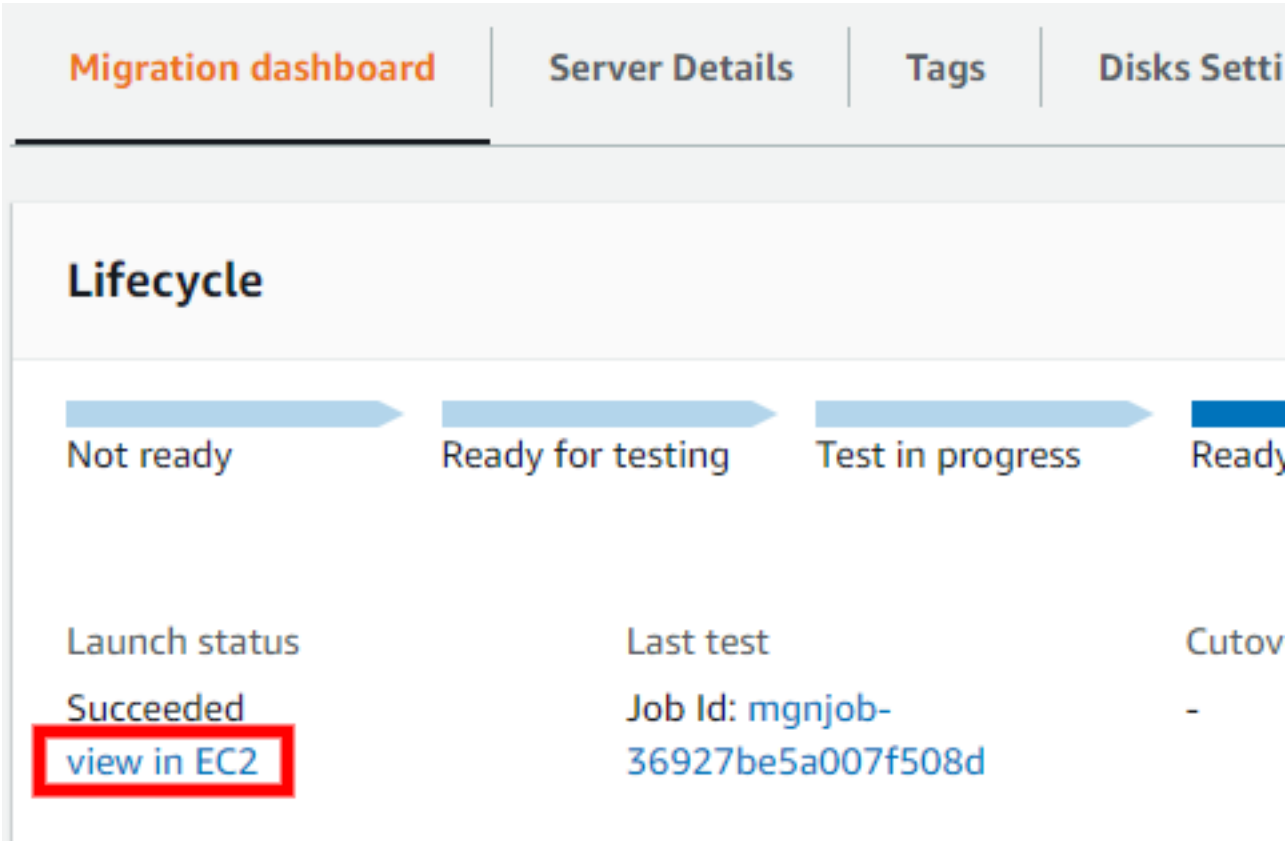
The console will confirm that the servers were marked as ready for cutover.



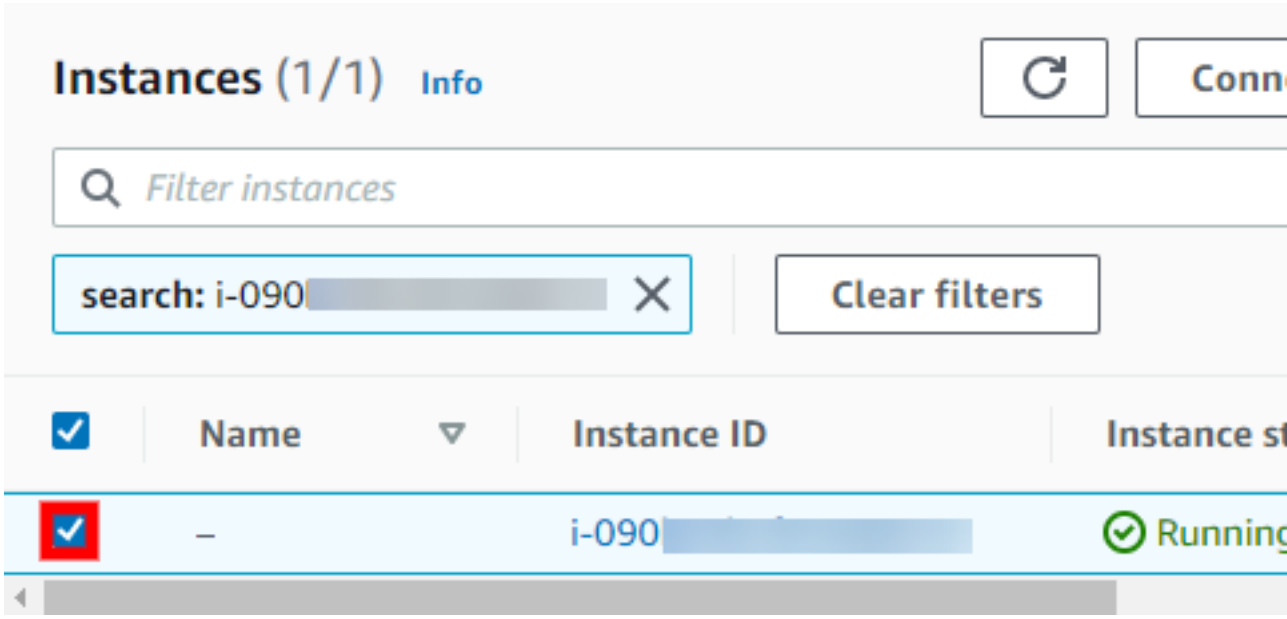
The Application Migration Service Console will indicate that testing has been finalized. The selected source servers' **Migration lifecycle** column will show the **Ready for cutover** status and the launched Test instances will be deleted if that option was selected. The Next step column will show **Terminate test instance; Start cutover**.



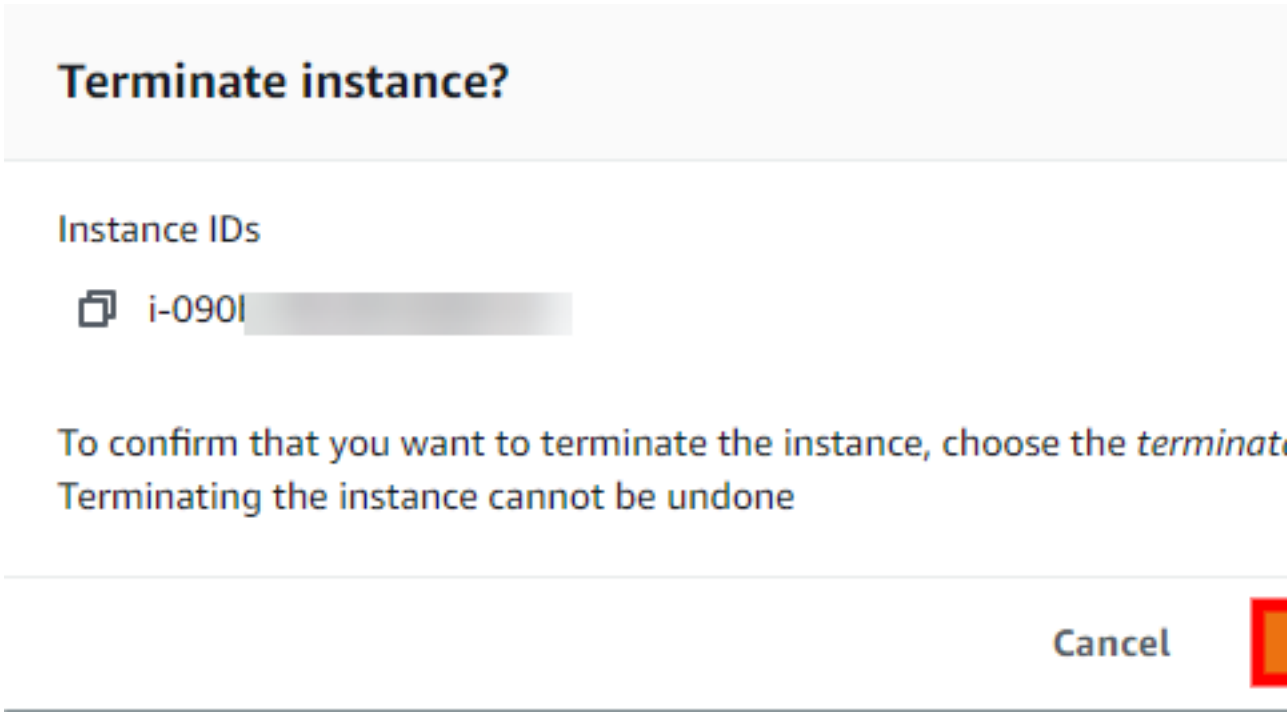
You can now terminate the launched test instance directly from the EC2 Console as that instance is no longer needed. You can quickly access the test instance by navigating to the specific servers > **Server Details > Migration Dashboard > Lifecycle > Launch status** and choosing **view in EC2.**



The EC2 Console will automatically search for and display the test instance. Select the instance, open the **Instance state** menu, and choose **Terminate instance**.



Choose **Terminate**.



Launching Cutover instances

Once you have finalized the testing of all of your source servers, you are ready for cutover. You should perform the cutover at a set date and time. The cutover will migrate your source servers into the Cutover instances on AWS.

> **Important**
> It is a best practice to perform a test at least one week before you plan to migrate your Source machines. This time frame is intended for identifying potential problems and solving them, before the actual Migration takes place. After launching Test instances, use either SSH (Linux) or RDP (Windows) to connect to your machine and ensure that everything is working correctly.

You can cutover one source server at a time, or simultaneously cutover multiple source servers. For each source server, you will be informed on the success or failure of the cutover. Each new cutover first deletes any previously launched Test instance and dependent resources. Then, it launches a new Cutover instance that reflects the most up-to-date state of the source server. After the cutover, Data Replication continues as before. The new and modified data on the source server is transferred to the Staging Area Subnet, and not to the Cutover instances that were launched following the cutover.

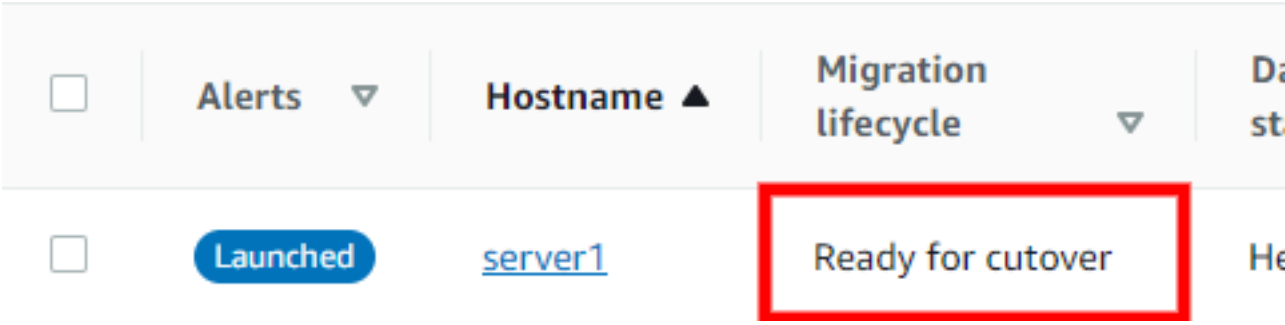
Topics

- Ready for cutover indicators (p. 258)
- Starting a Cutover (p. 258)
- Reverting or Finalizing a Cutover (p. 262)

Ready for cutover indicators

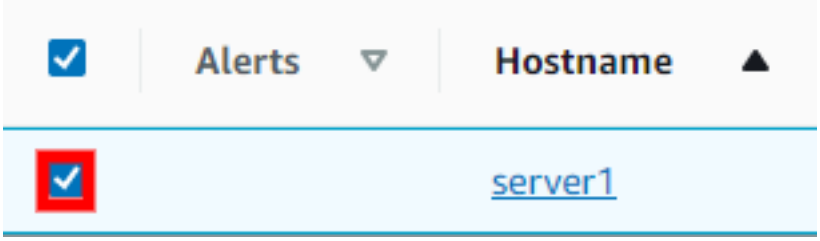
Prior to launching a Cutover instance, ensure that your source machines are ready for cutover by looking for the following indicators on the **Source servers** page:

1. Under the **Migration lifecycle** column, the server should show **Ready for cutover**.
2. Under the **Data Replication status** column, the server should show the **Healthy** status.
3. Under the **Next step** column, the server should show **Terminate test instance; Start cutover**.



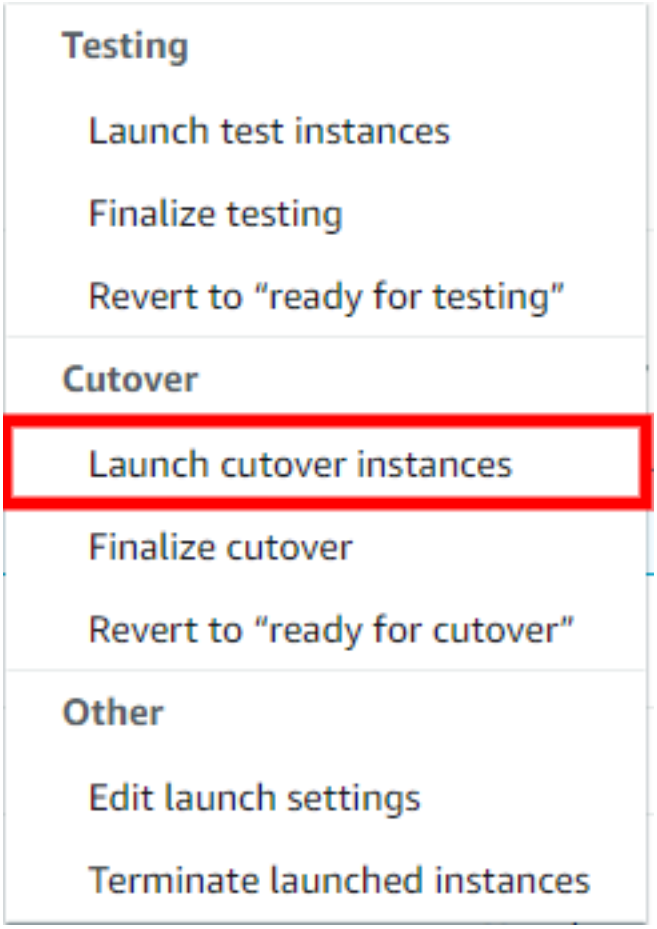
Starting a Cutover

To launch a Cutover instance for a single or multiple source servers, on the **Source servers** page check the box to the left of each server you want to cutover.

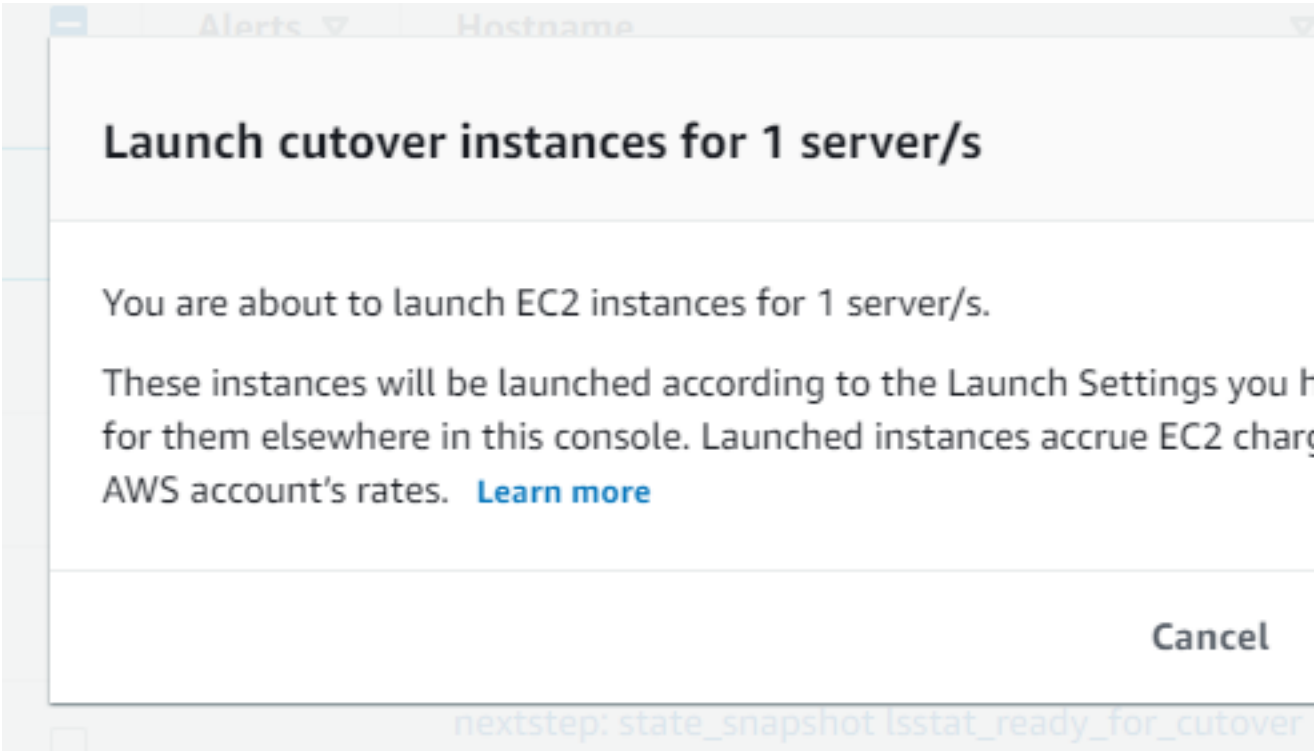


Open the **Test and Cutover** menu.

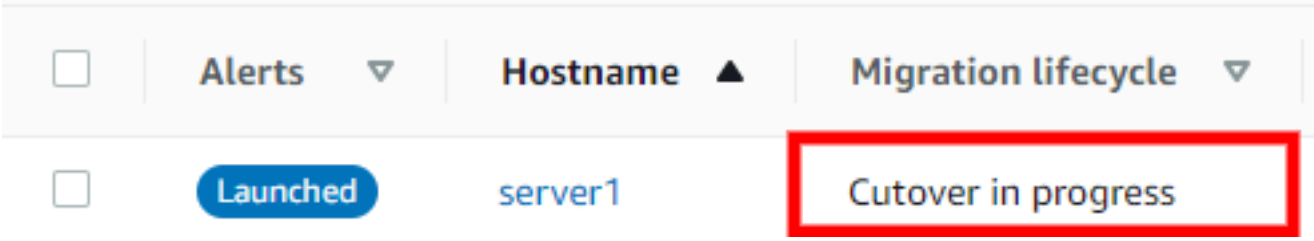
Under **Cutover**, choose the **Launch cutover instances** option.



The **Launch cutover instances for X** servers dialog will appear. Choose **Launch** to begin the cutover.

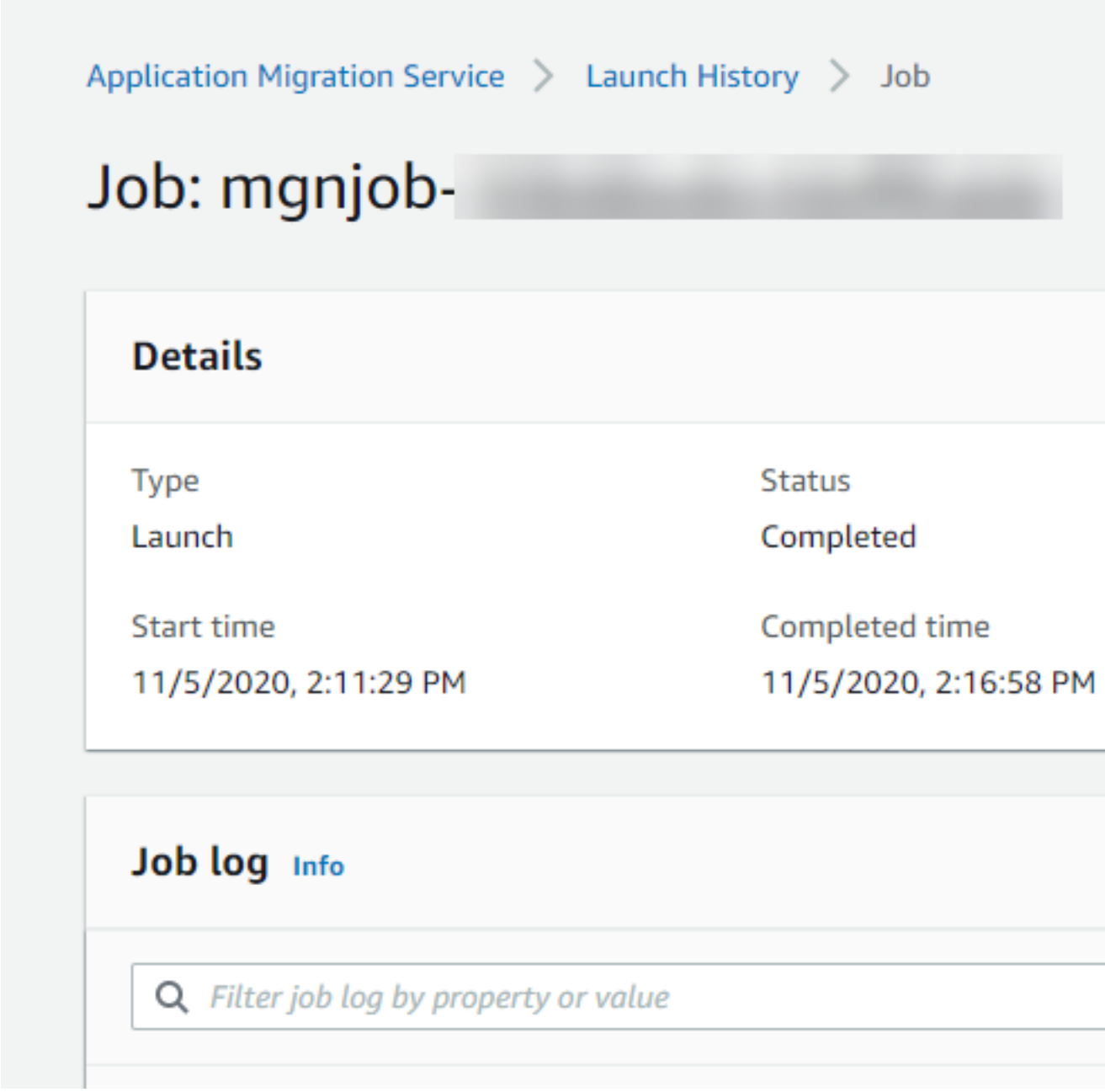


On the **Source Servers** page, the **Migration lifecycle** column will show **Cutover in progress** and the **Next step** column will show **Complete the cutover**.



The Application Migration Service Console will indicate **X launch job started** once the test has been started.

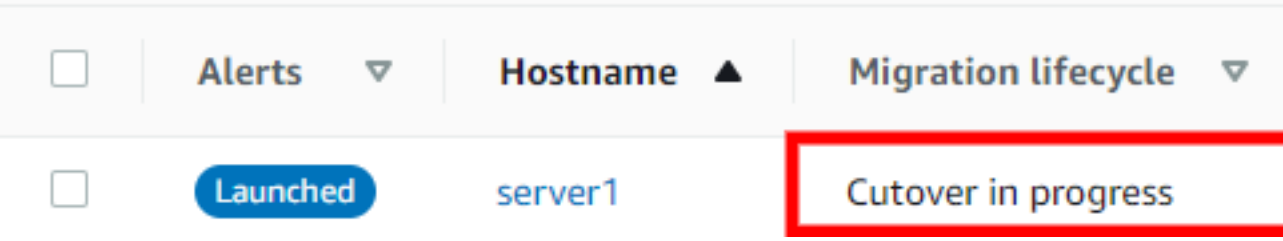
Choose **View job details** on the dialog to view the specific Job for the test launch in the Launch History.



Successful cutover launch indicators

You can tell that the Cutover instance launch was started successfully through several indicators on the **Source servers** page.

1. The **Migration lifecycle** column will state **Cutover in progress**.
2. The **Data replication status** will state **Healthy**.
3. The **Next step column** will state **Complete the cutover**.



Reverting or Finalizing a Cutover

Once you have launched your Cutover instances, open the EC2 Console and SSH or RDP into your Test instances in order to ensure that they function correctly. Validate connectivity and perform acceptance tests for your application.

> **Note**
> You should turn on Termination Protection after you have completed your testing and before you are ready to finalize the Cutover. Learn more about enabling termination protection in this EC2 article .

Topics

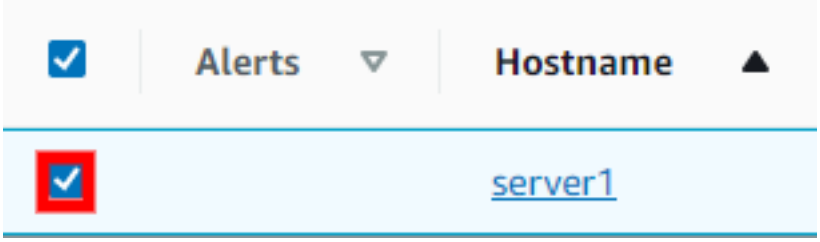
- Reverting a Cutover (p. 262)
- Finalizing a Cutover (p. 264)

Reverting a Cutover

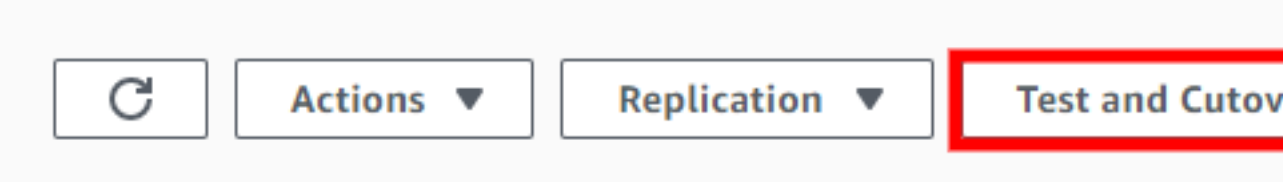
If you encounter any issues and want to launch new Cutover instances, then you can revert the cutover. This will revert your source servers' **Migration lifecycle** to the **Ready for cutover** status, indicating that these servers have not undergone cutover. During a revert, you will also have the option to delete your Cutover instances for cost saving purposes.

To revert a Cutover:

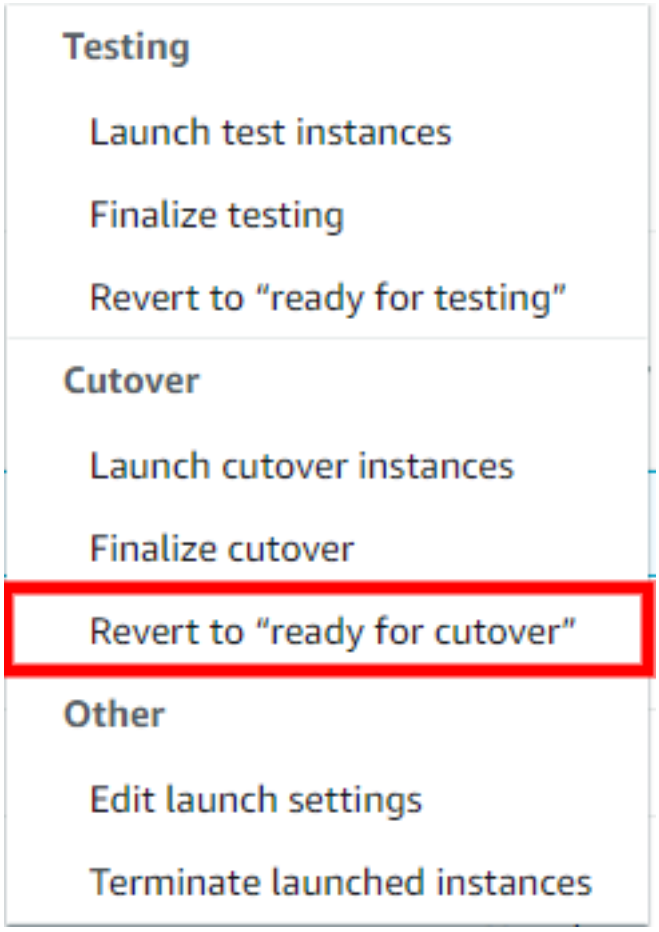
1. Check the box to the left of every source server that has a launched Cutover instance for which you want to revert the cutover.



2. Open the **Test/Cutover** menu.

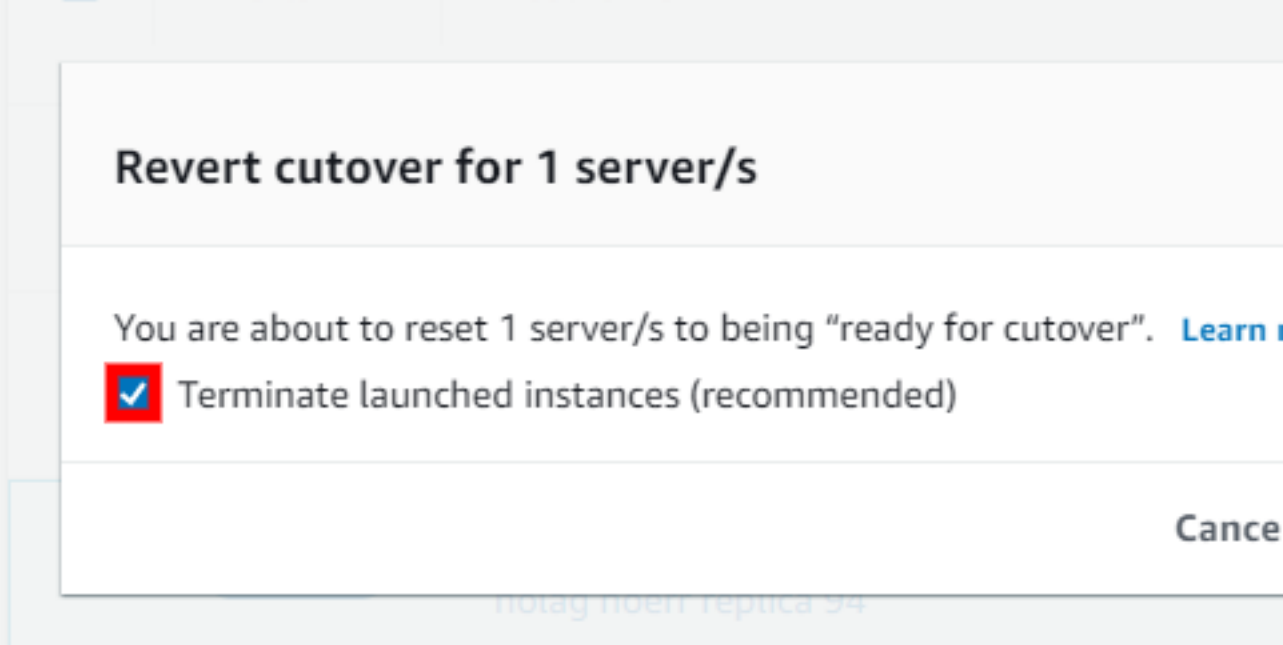


3. Under **Cutover**, choose **Revert to "ready for cutover"**



4. This will revert your source servers' **Migration lifecycle** to the **Ready for cutover** status, indicating that these servers have not undergone cutover. During a revert, you will also have the option to delete your Cutover instances for cost saving purposes.

   The **Revert cutover for X servers** dialog will appear. Select whether you want to terminate the launched instances used for cutover. It is recommended to terminate these instances, as you will be charged for them even though you will no longer need them. Check the **Terminate launched instances (recommended)** box and choose **Revert**.

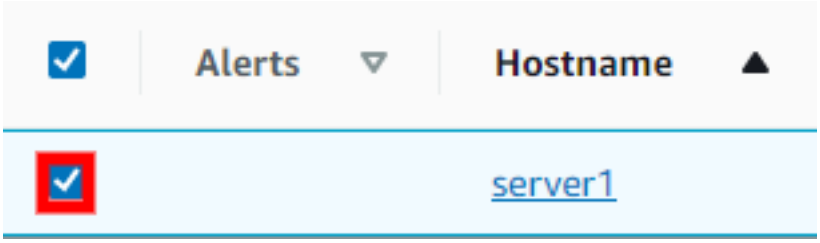


Finalizing a Cutover

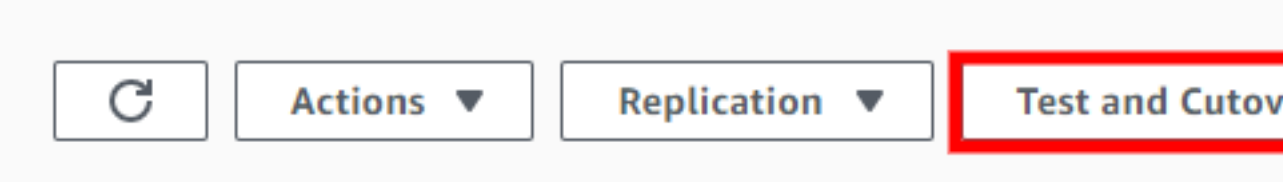
If you are completely done with your Migration and performed a successful cutover, you can finalize the cutover. This will change the your source servers' **Migration lifecycle** status to **Cutover complete**, indicating that the cutover has been complete and that the migration has been performed successfully. In addition, this will stop Data Replication and cause all replicated data to be discarded. All AWS resources used for Data Replication will be terminated.

To finalize a Cutover:

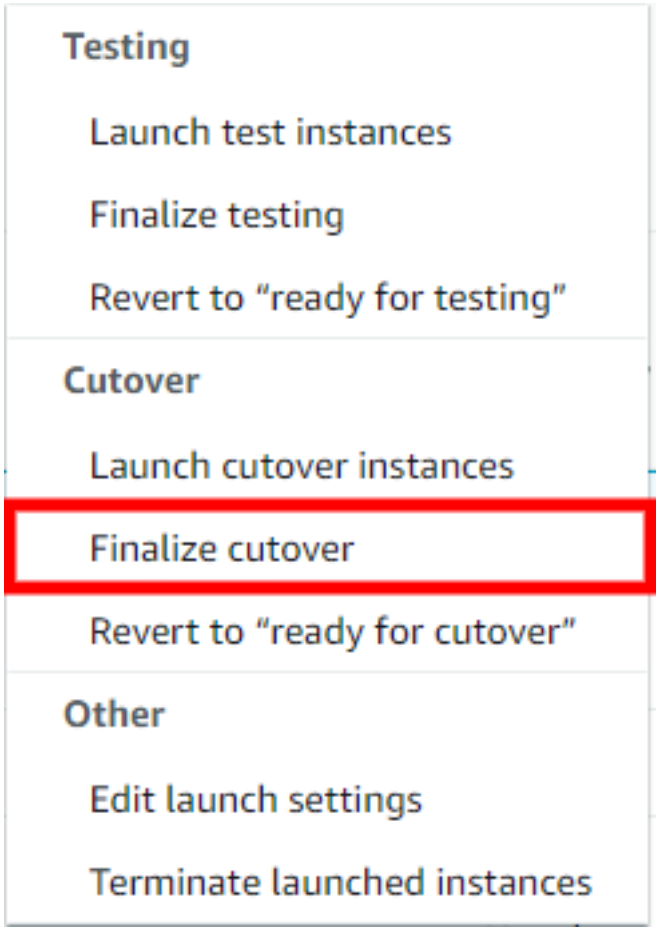
1. Check the box to the left of every source server that has a launched Cutover instance for which you want to finalize the cutover.



2. Open the **Test/Cutover** menu.

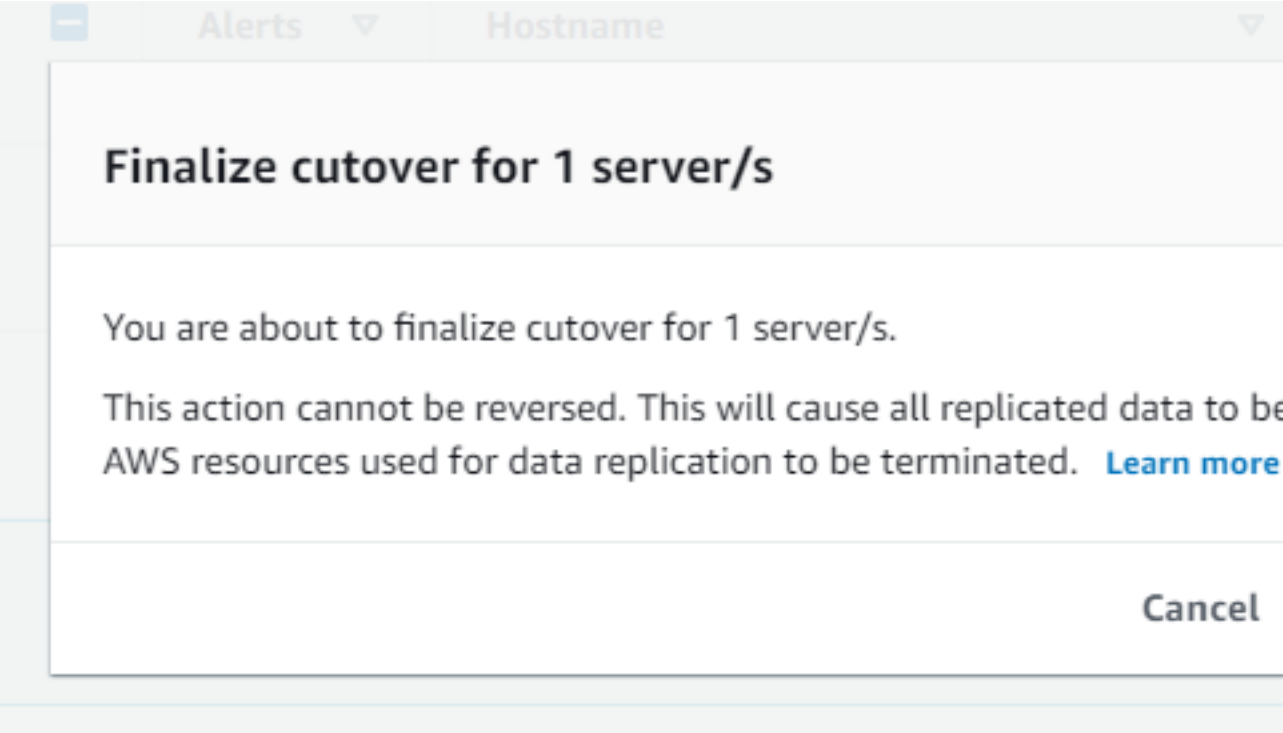


3. Under **Cutover**, choose **Finalize cutover**

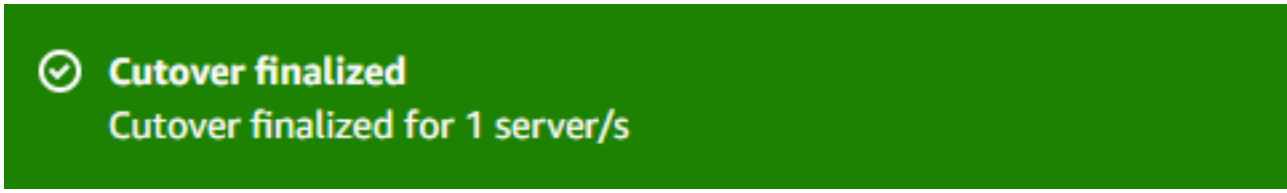


4. The **Finalize cutover for X servers** dialog will appear. Choose **Finalize**.
5. This will change the your source servers' **Migration lifecycle** status to **Cutover complete**, indicating that the cutover has been complete and that the migration has been performed successfully. In addition, this will stop Data Replication and cause all replicated data to be discarded. All AWS resources used for Data Replication will be terminated.

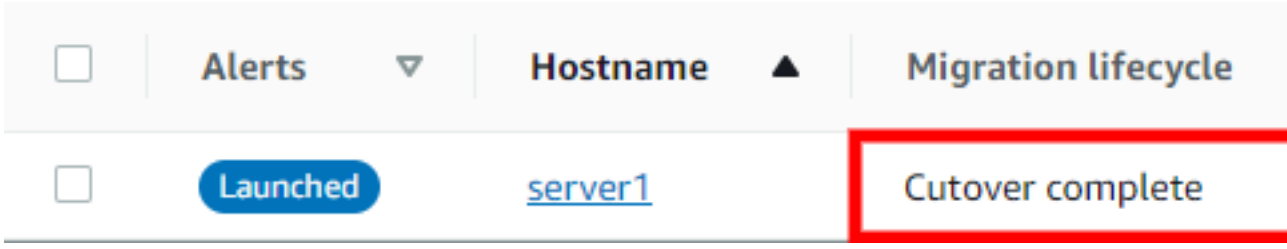
   The **Finalize cutover for X servers** dialog will appear. Choose **Finalize**.



The Application Migration Service Console will indicate **Cutover finalized** once the cutover has been completed successfully.



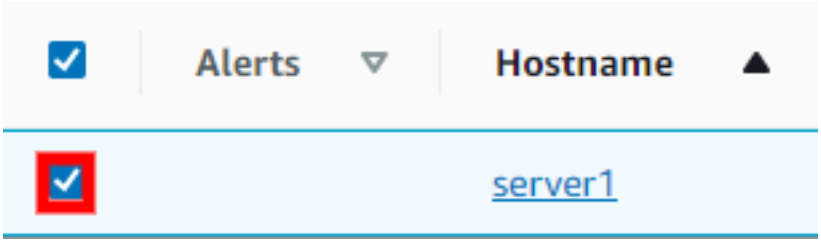
The Application Migration Service Console will automatically stop Data Replication for the cutover source servers in order to save resource costs. The selected source servers' **Migration lifecycle** column will show the **Cutover complete** status, the **Data replication** column will show **Disconnected** and the **Next step** column will show **Archive**. The source servers have now been successfully migrated into AWS.



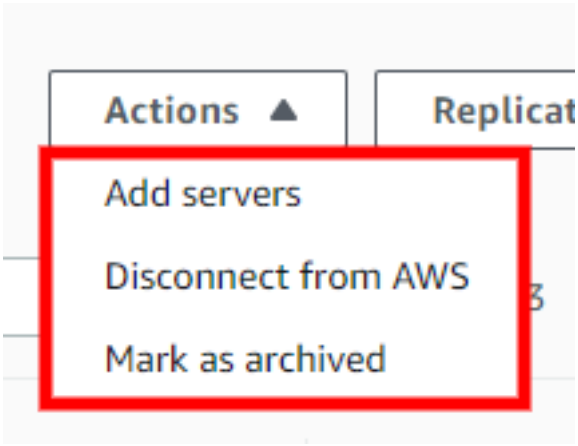
6. You can now archive your source servers that have launched Cutover instances. Archiving will remove these source servers from the main **Source Servers** page, allowing you to focus on source servers that have not been cutover. You will still be able to access the archived servers through filtering options.

   To archive your cutover source servers:

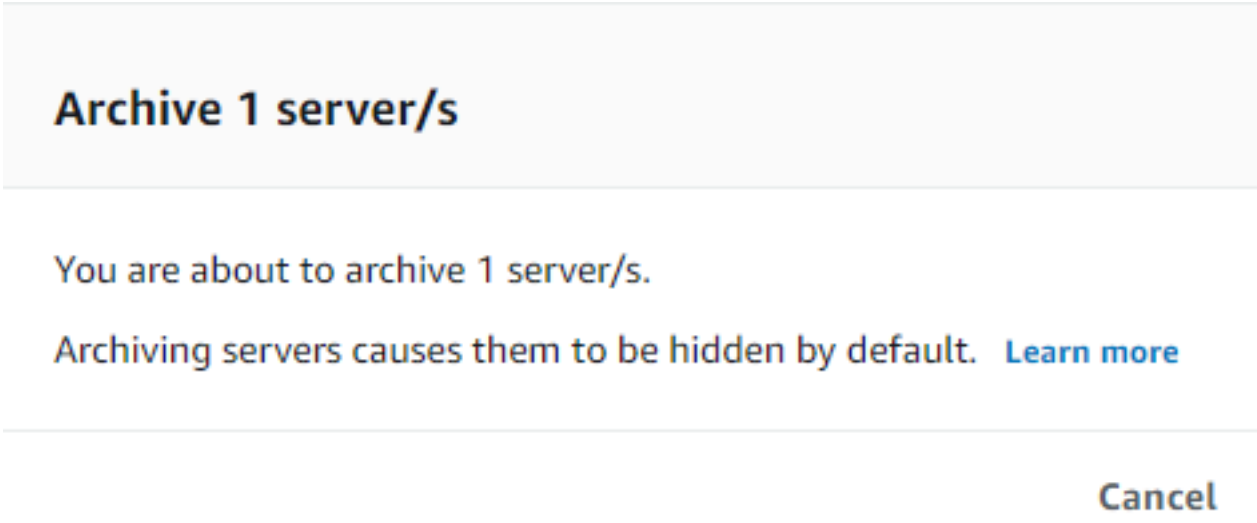
   a. Check the box to the left of the of each source server whose **Migration lifecycle** column states **Cutover complete**.



b. Open the **Actions** menu and choose **Mark as archived**.

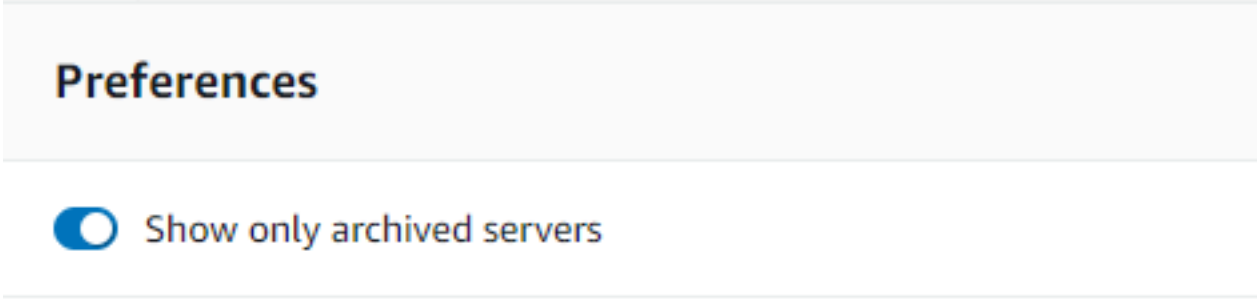


c. The Archive X server/s dialog will appear. Choose **Archive**.



d. To see your archived servers, open the **Preferences** menu by choosing the gear button.

Select the **Show only archibed servers** option and choose **Confirm**.

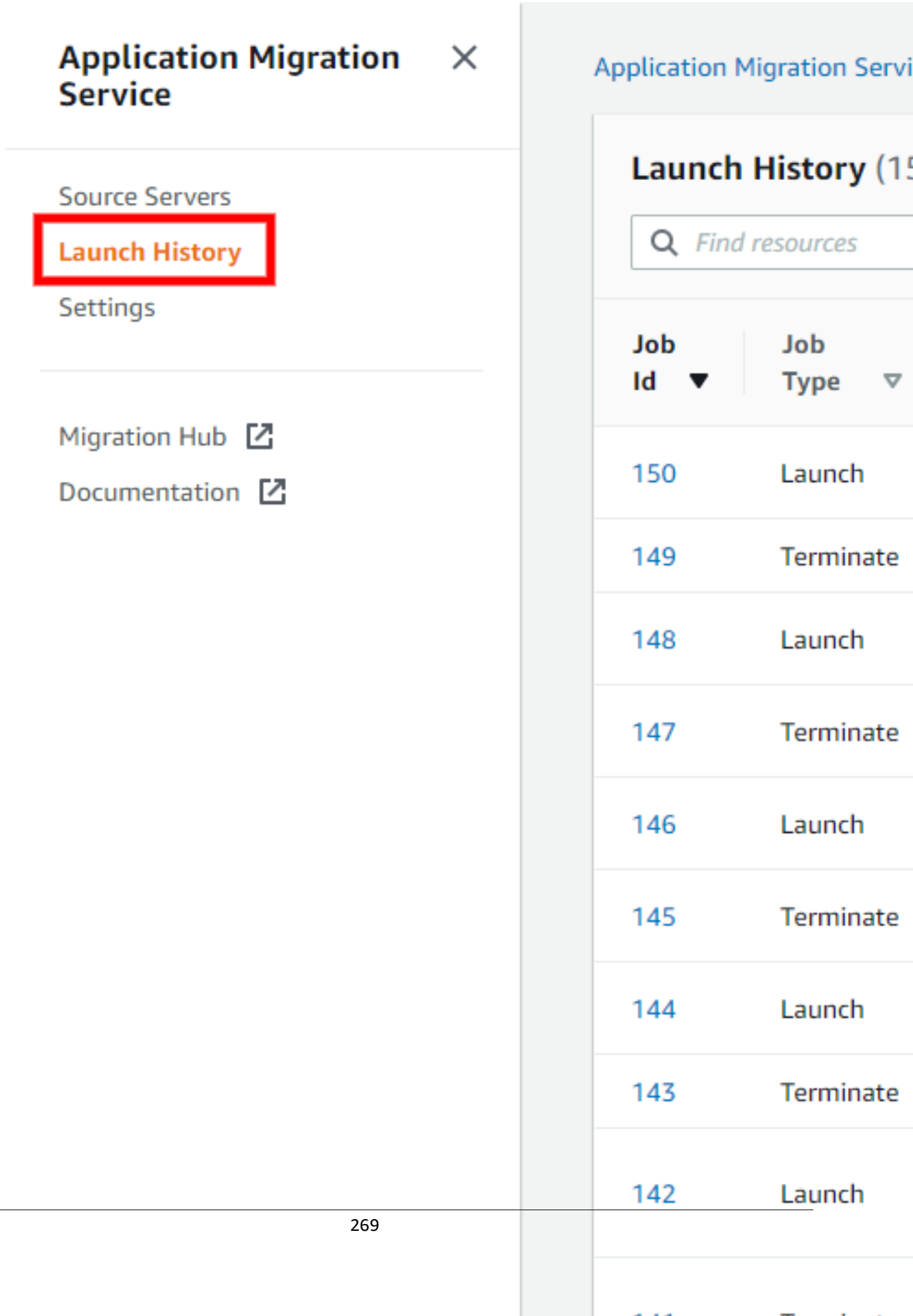


You will not be able to see all of your archived servers. Repeat the step above to see your live servers.

Launch History

The **Launch History** tab allows you to track and manage all of the operation performed in Application Migration Service.

You can access the Launch History by choose **Launch History** on the left-hand navigation menu.


Application Migration Service
Source Servers
Launch History
Settings
Migration Hub
Documentation
Application Migration Servi
Launch History (15
Find resources
Job Id
Job Type
150 Launch
149 Terminate
148 Launch
147 Terminate
146 Launch
145 Terminate
144 Launch
143 Terminate
142 Launch

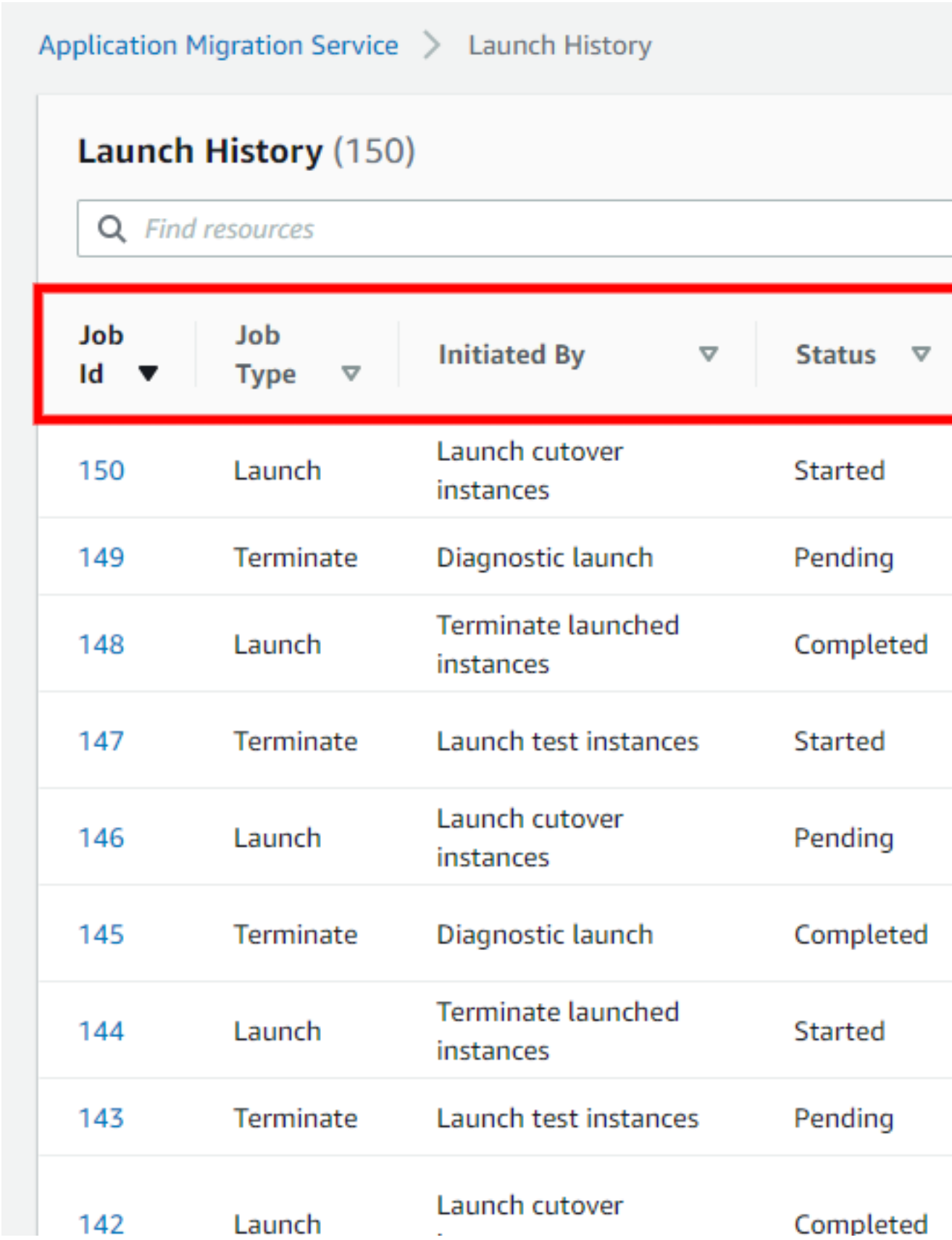
Topics

- Overview (p. 270)
- Job Details (p. 276)

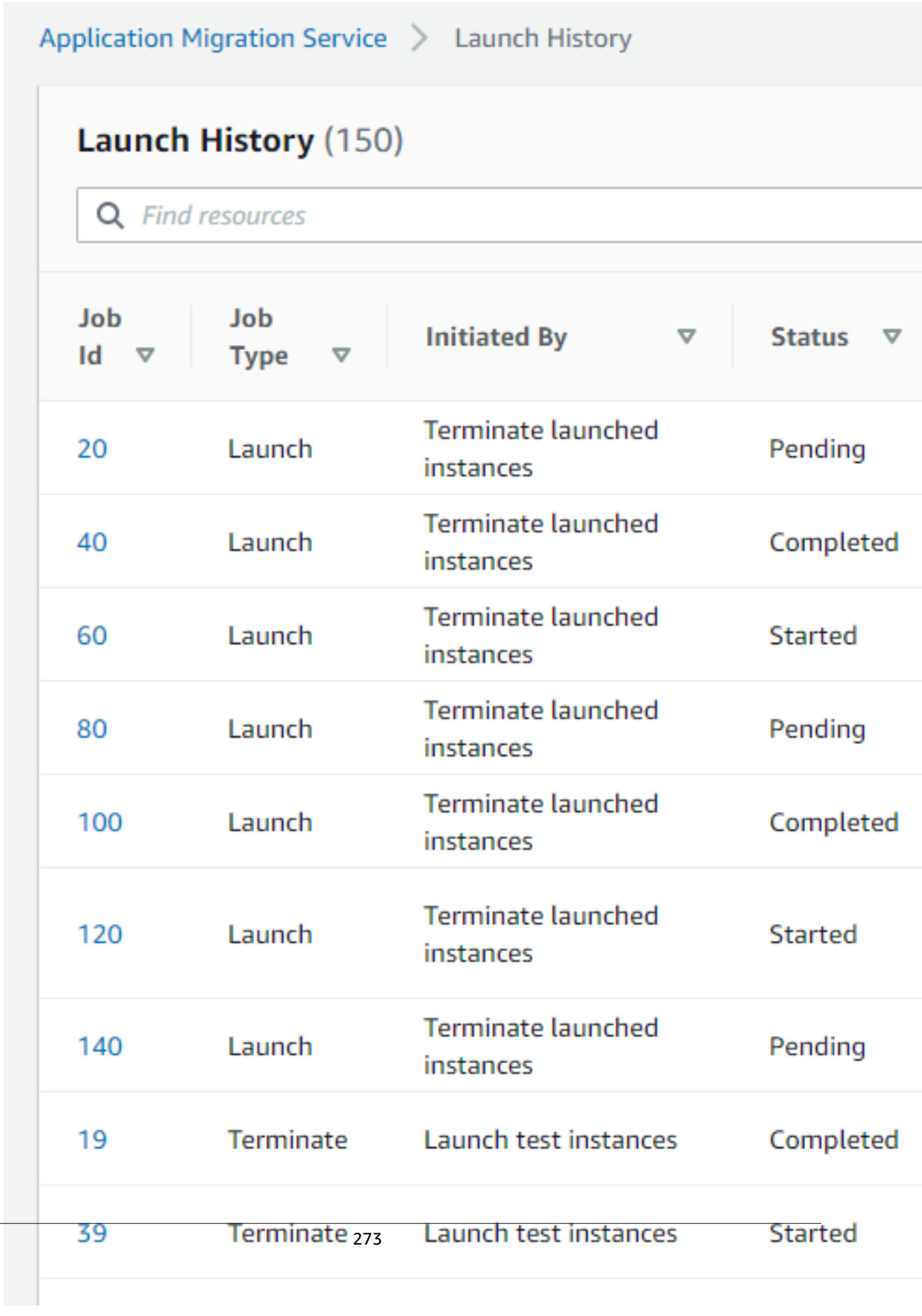
Overview

The Launch History tab shows all of the operations (referred to as "Jobs") performed on your account. Each Job corresponds to a single operation (ex. Launch cutover instance, Launch test instance, etc.) Each Job is composed of one or more servers. The main Launch History view allows you to easily identify all key Job parameters, including:

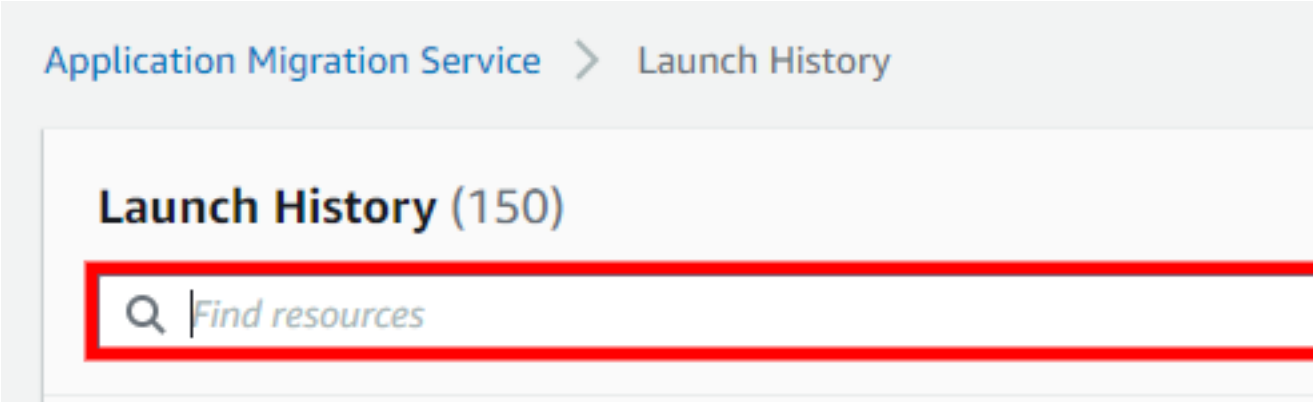
- **Job ID** - The unique ID of the Job.
- **Job Type** - The type of Job (Launch or Terminate)
- **Initiated By** - The command or action that initiated the Job (ex. Launch cutover instances or Terminate launched instances)
- **Status** - The status of the Job (Pending, Completed, or Started)
- **Number of Servers** - The number of servers that are included in the Job.
- **Start Time** - The time the job was started.
- **Completed Time.** - The time the Job was completed (blank if the job was not completed)


Application Migration Service
Launch History
Launch History (150)
Find resources
Job Id
Job Type
Initiated By
Status
150 Launch Launch cutover instances Started
149 Terminate Diagnostic launch Pending
148 Launch Terminate launched instances Completed
147 Terminate Launch test instances Started
146 Launch Launch cutover instances Pending
145 Terminate Diagnostic launch Completed
144 Launch Terminate launched instances Started
143 Terminate Launch test instances Pending
142 Launch Launch cutover Completed

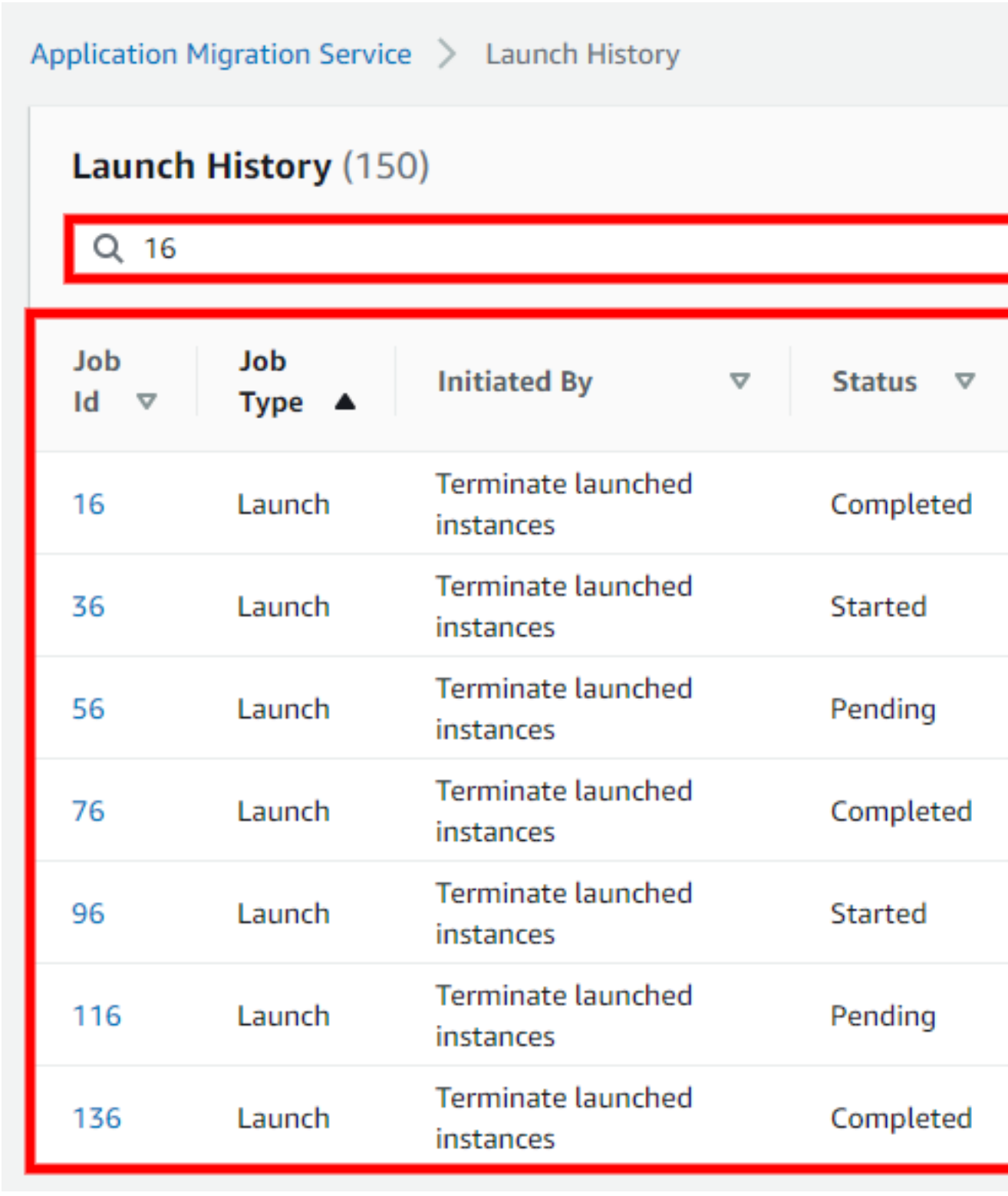
You can sort the Launch History by any column by clicking the column header. (ex. sorting by **Number of Servers**)


Application Migration Service
Launch History
Launch History (150)
Find resources
Job Id
Job Type
Initiated By
Status
20 Launch Terminate launched instances Pending
40 Launch Terminate launched instances Completed
60 Launch Terminate launched instances Started
80 Launch Terminate launched instances Pending
100 Launch Terminate launched instances Completed
120 Launch Terminate launched instances Started
140 Launch Terminate launched instances Pending
19 Terminate Launch test instances Completed
39 Terminate Launch test instances Started

You can search for specific Jobs by any of the available fields within the **Find resources** search bar.

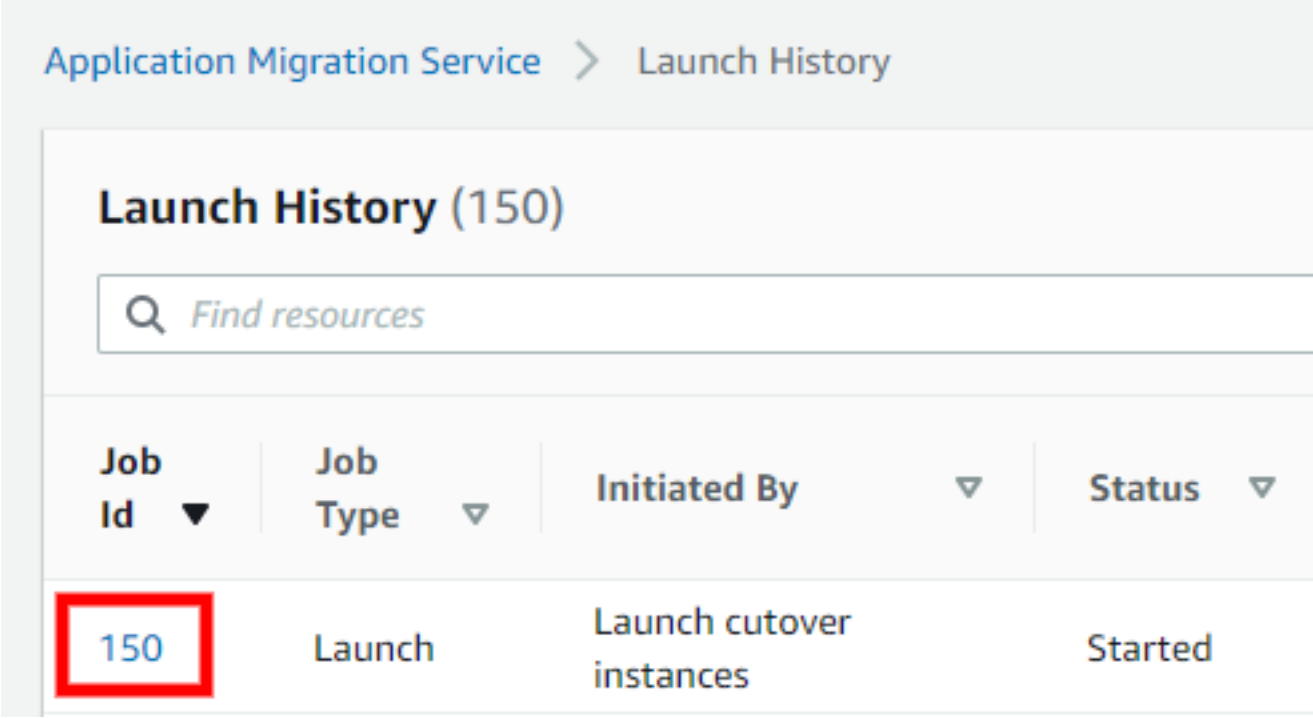


Ex. Filtered search for the value "16", only showing Job ID 16 and Jobs that have 16 servers.


Application Migration Service
Launch History
Launch History (150)
16
Job Id
Job Type
Initiated By
Status
16 Launch Terminate launched instances Completed
36 Launch Terminate launched instances Started
56 Launch Terminate launched instances Pending
76 Launch Terminate launched instances Completed
96 Launch Terminate launched instances Started
116 Launch Terminate launched instances Pending
136 Launch Terminate launched instances Completed

Job Details

You can view a detailed breakdown of each individual job by choosing the Job ID. Click on the Job ID of any Job to open the Job details view.



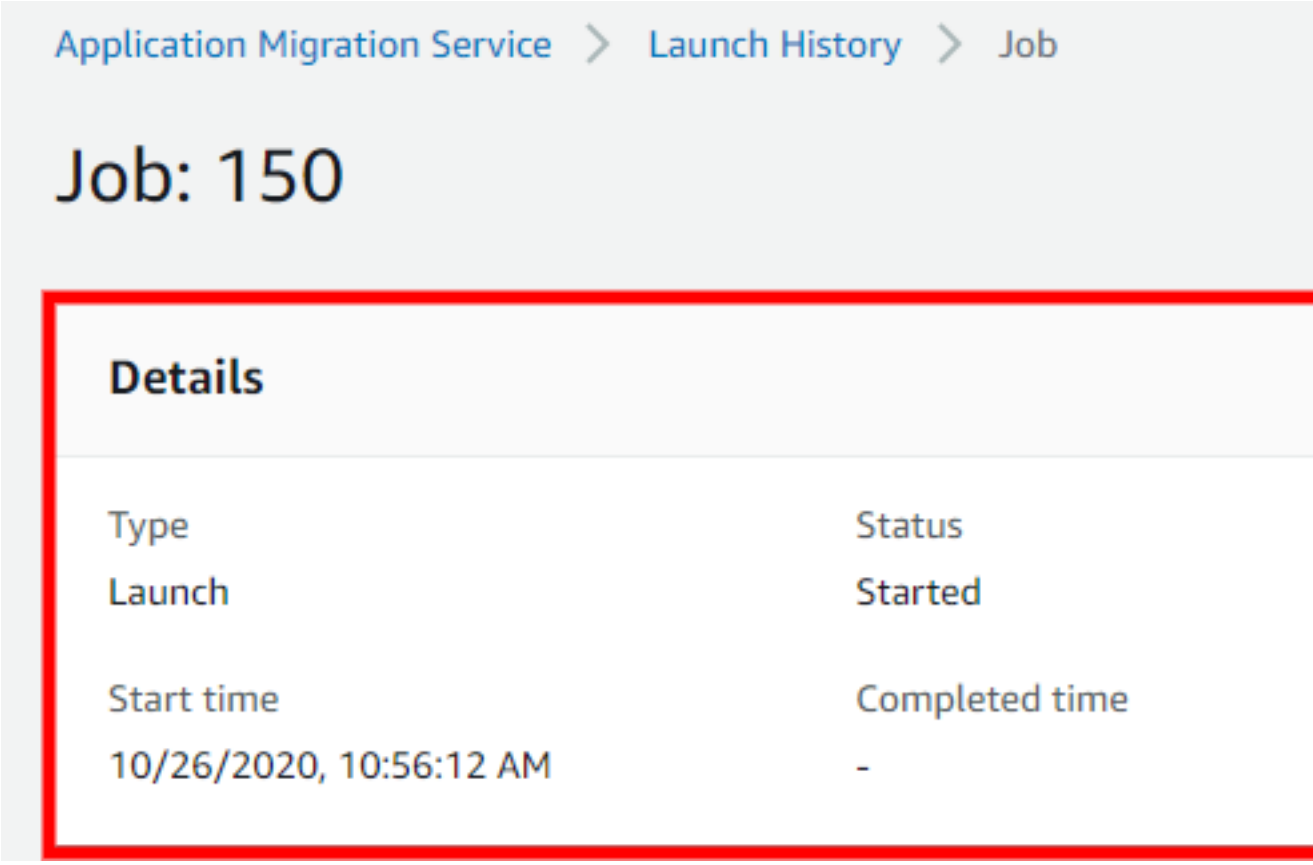
The Job details view is composed of three sections:

Topics

- Details (p. 276)
- Job log (p. 277)
- Jobs - Source servers (p. 281)

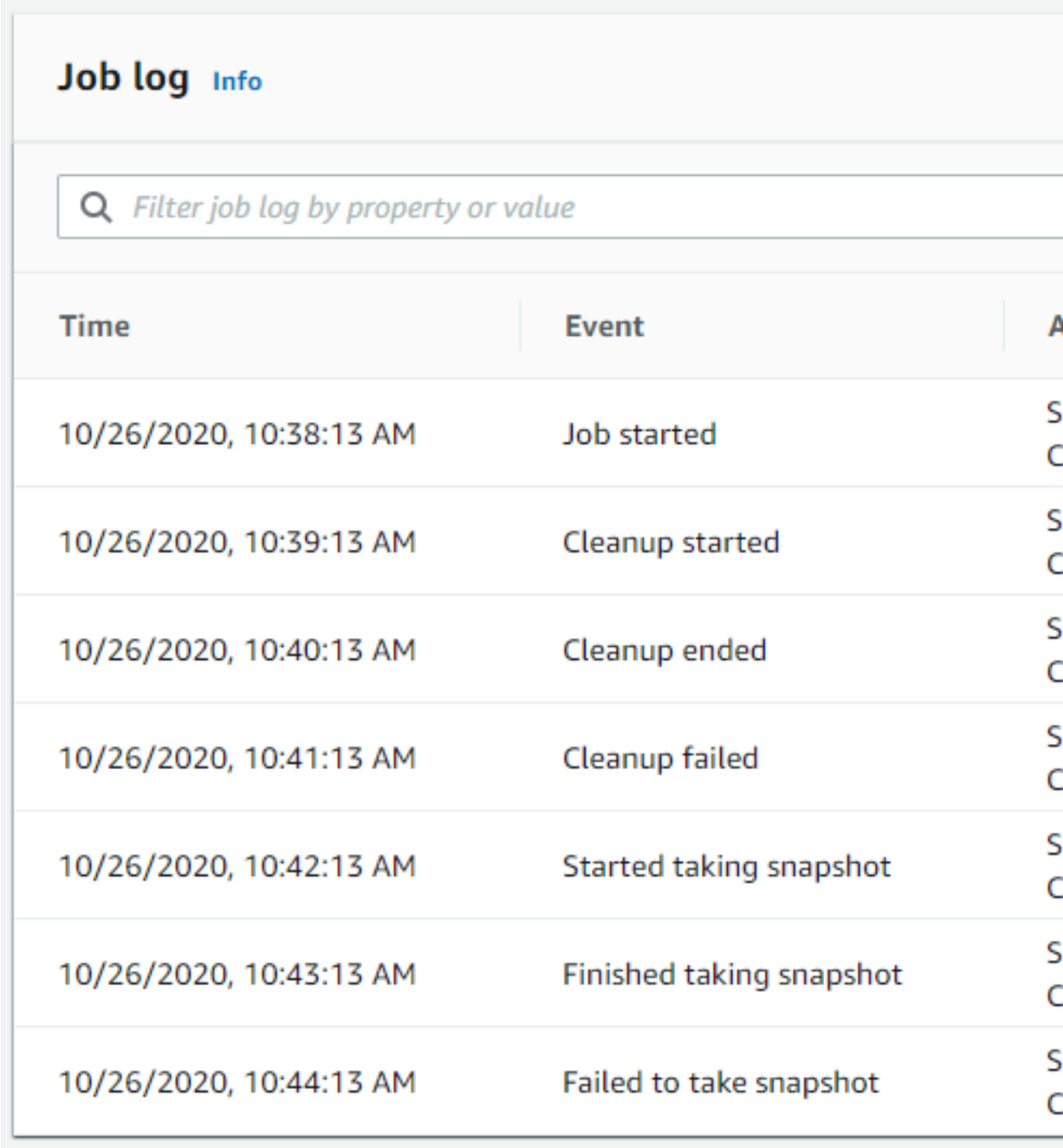
Details

The **Details** section shows the same information as the main Job log page, including the **Type, Status, Initiated By, Start time,** and **Completed time**.



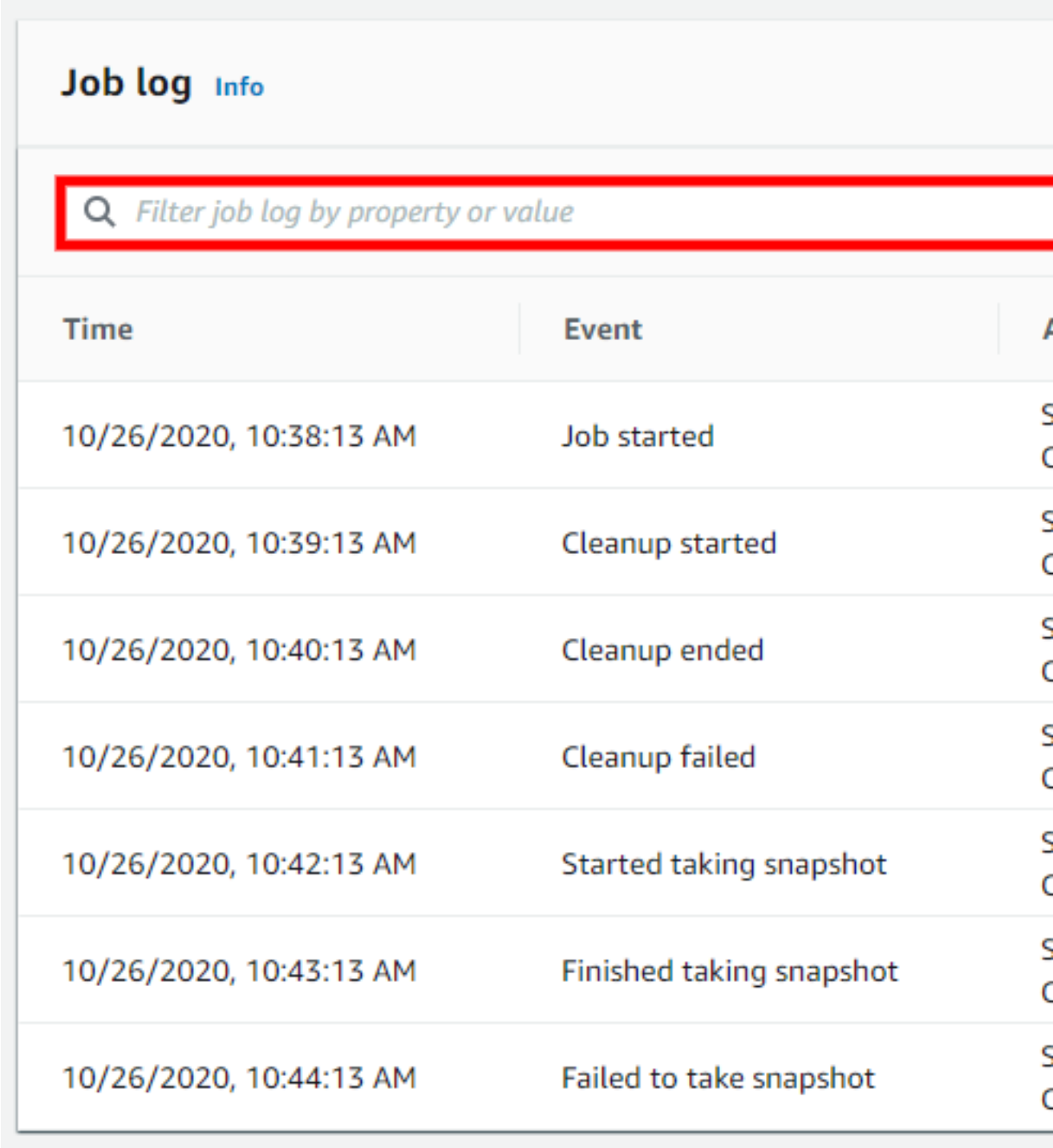
Job log

The Job log section shows a detailed log of all of the operations performed during the Job.

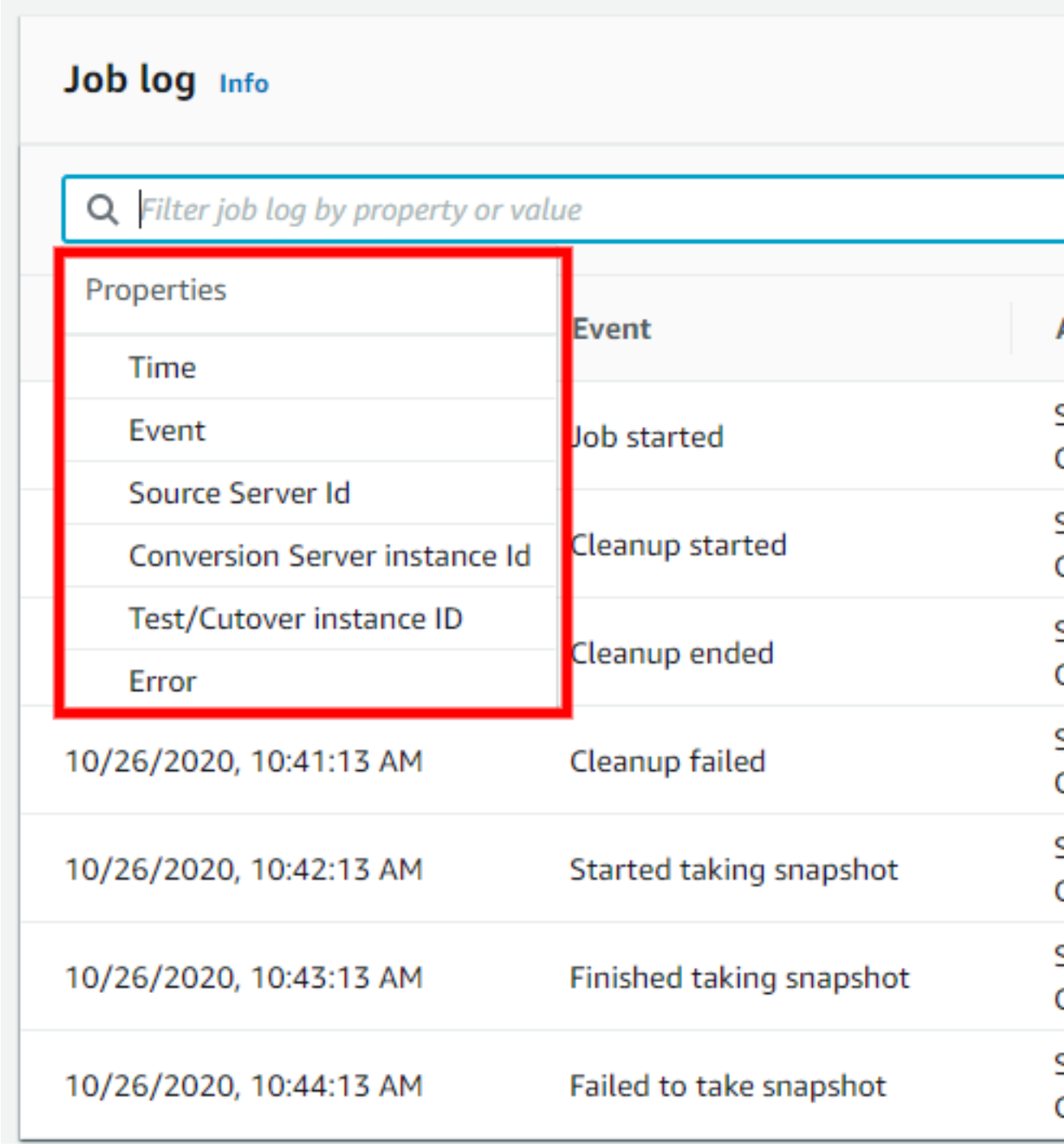


You can use this section to troubleshoot any potential issues and determine in which step of the launch process they occurred.

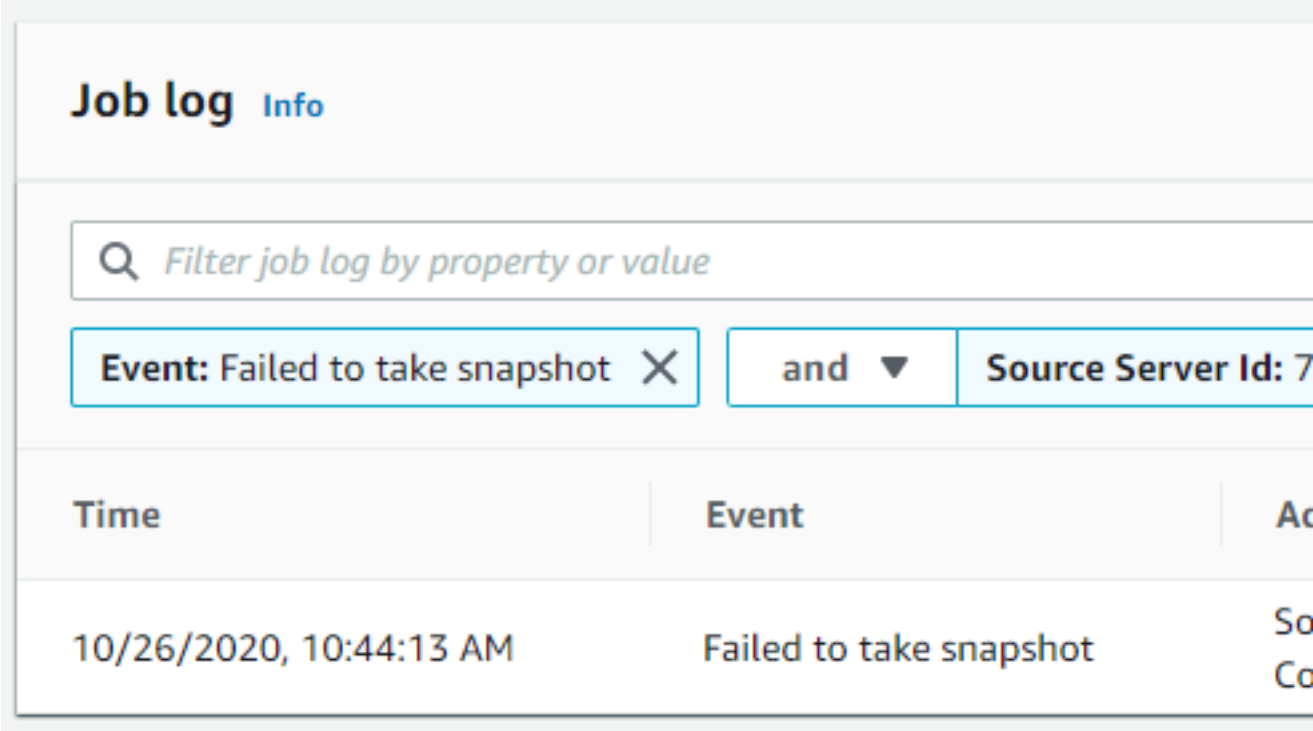
You can use the **Filter job log by property or value** search bar to filter the Job log.



You can filter by a variety of properties, including **Time, Event, Source Server Id, Conversion Server instance Id, Test/Cutover instance ID,** and **Error.**

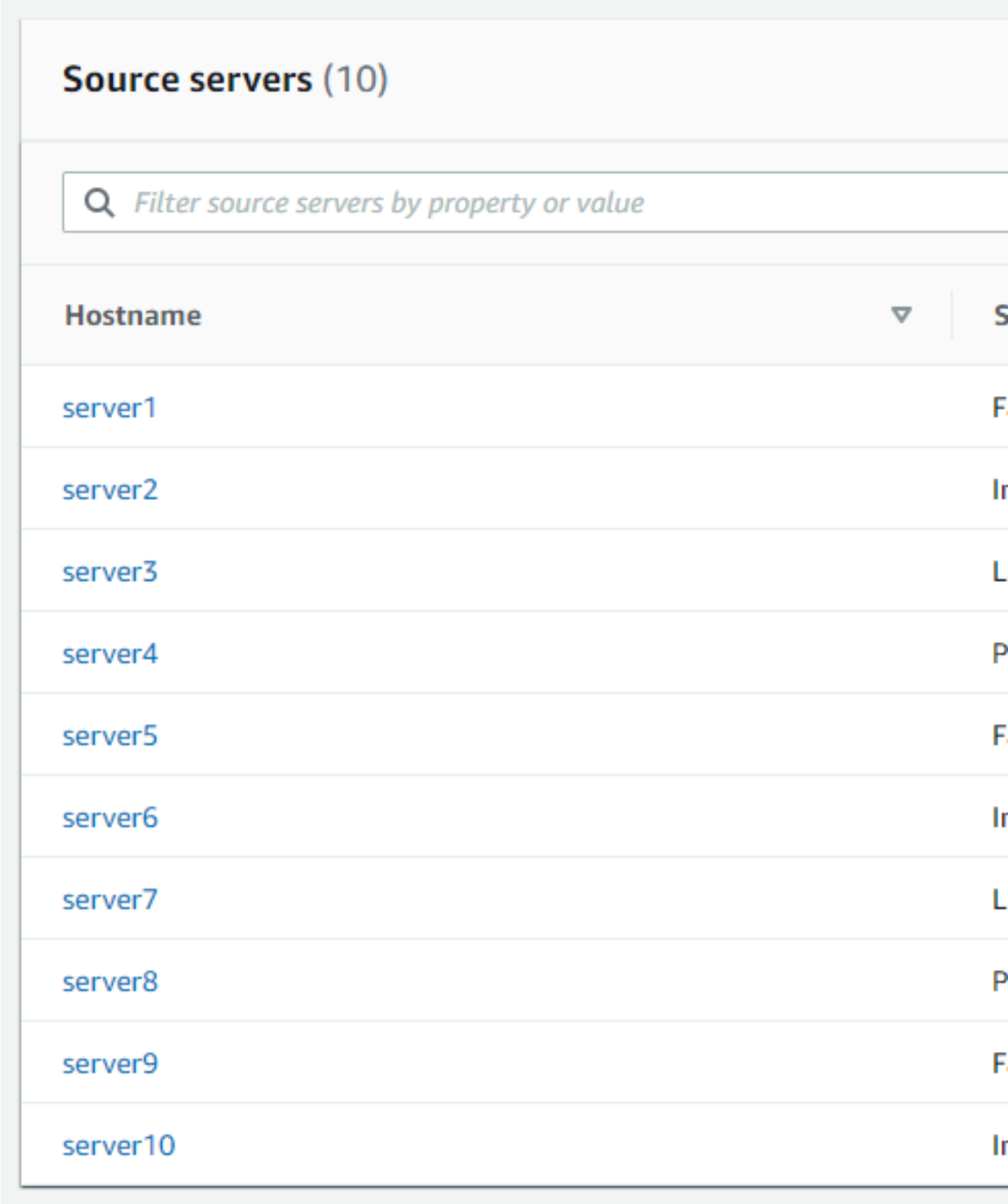


You can filter by multiple values at once. (ex. Job log filtered by **Event: Failed to take snaphot** and a specific **Source Server Id: 7**)

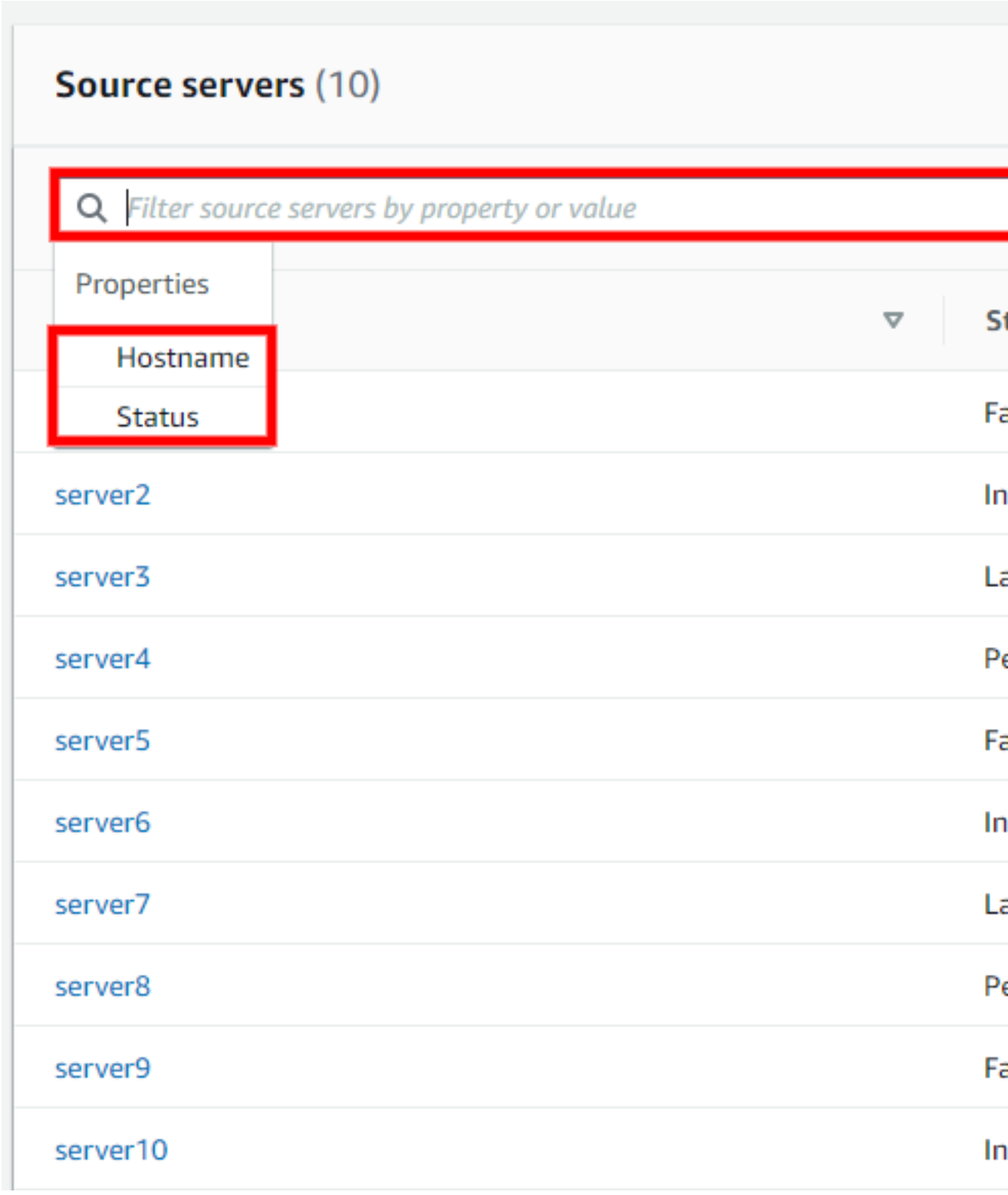


Jobs - Source servers

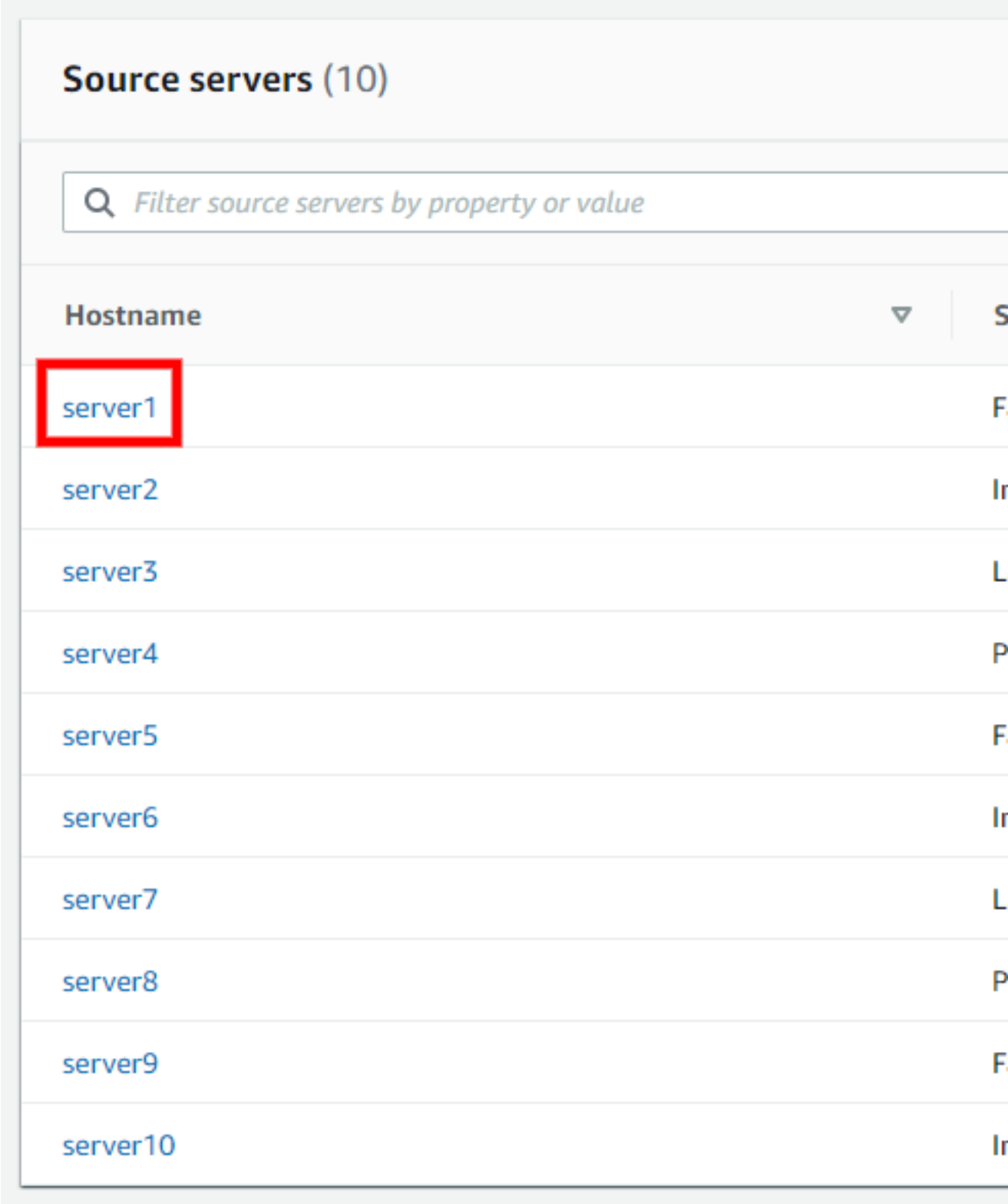
The Source servers section shows a list of all source servers involved in the Job and their status.



You can use the **Filter source servers by property or value** search bar to filter by **Hostname** or **Status**.



Choose the Hostname of any of Source server from the list to open the Server Details view for that server. Learn more about Server Details (p. 162)


Source servers (10)
Filter source servers by property or value
Hostname
server1
server2
server3
server4
server5
server6
server7
server8
server9
server10

Help Panel Content

This is the content that will appear in the Application Migration Service Help Panels. The purpose of this content is to help users understand how to navigate through MGN and how each section connects to the other.

Topics

- Source Servers page (p. 285)
- Replication Settings Overview (p. 285)
- Launch Settings (p. 287)
- Launch History Page (p. 290)
- Server Details View (p. 290)

Source Servers page

The Source Servers page lists all of the source servers that have been added to Application Migration Service. Use the Source Servers page to manage your Source servers and to perform a variety of commands for one or more servers (such as controlling replication and launching test and cutover instances). The Source Servers page is the "main" page of Application Migration Service and you will most likely interact with Application Migration Service predominantly through this page. Learn more. (p. 127)

Replication Settings Overview

Replication Settings determine how data will be replicated from your source servers to AWS. Your Replication Settings are governed by the Replication Settings Template, which you must configure before adding your source servers to Application Migration Service and which you can later edit at any point. The settings configured in the Replication Settings template are then transferred to each newly added server. You can edit the Replication Settings for each server or group of servers after they have been added to Application Migration Service.

Learn more. (p. 60)

Replication Server instance type

Choose the Replication Server instance type. This will determine the instant type and size that will be used for the launch of each individual Replication Server.

The recommended best practice is to not change the Replication Server instance type unless there is a business need for doing so.

By default, Application Migration Service utilizes the t3.small instance type. This is the most cost effective instance type and should work for most common workloads.

You can change the Replication Server instance type to speed up the initial sync of data from your source servers to AWS. Changing the instance type will likely lead to increased compute costs.

Learn more. (p. 69)

Subnet

Choose the Subnet that you want to allocate to serve as the Staging Area subnet for all of your Replication Servers.

The best practice is to create dedicated single separate subnet for all of your migration waves using this AWS Account.

The Staging Area Subnet is the Subnet within which Replication Servers and Conversion Servers are launched. By default, Application Migration Service will use the default Subnet on your AWS Account. This is the Subnet that is created for the VPC when you first create your account.

Learn more. (p. 70)

EBS Volume Type

Choose the default EBS Volume type to be used by the Replication Servers for large disks. Each disk has minimum and maximum sizes and varying performance metrics and pricing.

The best practice is to not change the EBS volume type unless there is a business need for doing so.

Learn more. (p. 77)

Security groups

Choose the security groups you want to attach to the Replication Servers.

A Security Group acts as a virtual firewall, which controls the inbound and outbound traffic of the Staging Area.

The best practice is to have Application Migration Service automatically attach and monitor the default Application Migration Service Security Group. This group opens inbound TCP Port 1500 for receiving the transferred replicated data.

Select the **Always use the default Application Migration Service security group** option to ensure that data can flow from your source servers to the Replication Servers and that the Replication Servers can communicate their state to the Application Migration Service Servers.

Learn more. (p. 84)

Data routing and throttling

Application Migration Service lets you control how data is routed from your source servers to the Replication Servers on AWS through the data routing and throttling settings.

By default, data is sent from the source servers to the Replication Servers over the public internet, using the public IP that was automatically assigned to the Replication Servers. Transfered data is alsways encrypted in transit.

Learn more. (p. 87)

Use private IP for data replication

Select the **Use private IP for data replication** option if you want to route the replicated data from your source servers to the Staging Area through a private network with a VPN, DirectConnect, or another type of existing private connection.

Important
Data Replication will not work unless you have already set up VPN / DirectConnect in the Amazon Web Services console.

Learn more. (p. 89)

Route control data via proxy

Select the **Route control data via proxy** option if you want to connect to Application Migration Service via a proxy server.

Once this option is selected, enter the hostname or IP of the proxy server in the **Address** field. You can also enter the **Port**, **Username**, and **Password** if your setup uses these values.

Learn more.

Network data bandwidth throttling

You can control the amount of network bandwidth used for data replication per server. By default, Application Migration Service will use all available network bandwidth utilizing five concurrent connections.

Select the **Network data bandwidth throttling** option if you want to regulate control the transfer rate of data sent from your source servers to the Replication Servers over TCP Port 1500.

Learn more. (p. 90)

Replication resources tags

Add custom Tags to resources created by Application Migration Service in your AWS account. These are resources required to facilitate data replication, testing and cutover. Each tag consists of a key and an optional value.

You can add custom tag to all of the AWS resources that are created on your AWS Account during the normal operation of Application Migration Service.

Note
Application Migration Service already adds tags to every resource it creates, including service tags and user tags.

Learn more. (p. 90)

Launch Settings

Use the Launch settings to determine how Test and Cutover instances will be launched on AWS for your Source server.

The launch settings are a set of instructions that are comprised of two sections: General launch settings and the EC2 Launch Template that determine how a Test or Cutover instance will be launched for each source server in AWS.

Launch settings, including the EC2 Launch Template, are automatically created every time you add a source server to Application Migration Service.

Learn more (p. 223).

Topics

- Instance type right-sizing (p. 288)
- Start instance upon launching (p. 288)
- Copy private IP (p. 288)
- Transfer server tags (p. 289)
- OS Licensing (p. 289)
- EC2 Launch Template (p. 289)

Instance type right-sizing

The Instance type right-sizing feature allows Application Migration Service to launch a Test or Cutover instance type that best matches the hardware configuration of the source server.

If you select the **Basic** option, Application Migration Service will launch a Test or Cutover AWS instance type that best matches the OS, CPU, and RAM of your source server.

Application Migration Service will launch a new instance type after every change of configuration on the source server (ex. added/removed disks, added/removed RAM)

If you select the **None** option, Application Migration Service will launch the AWS instance type as configured in your EC2 launch template. You should select this option if you want to determine the instance type that will be launched in AWS for all your Test or Cutover servers.

> **Important**
> The AWS instance type selected by Application Migration Service when this feature is enabled will overwrite the instance type defined in your EC2 launch template.

Learn more. (p. 225)

Start instance upon launching

Choose whether you want to start your test and cutover instances automatically upon launch or whether you want to launch them in a stopped state.

If you choose the **Yes** option, then the Test or Cutover AWS instance will be launched and started automatically upon Test or Cutover launch.

If you choose the **No**, then the instances will be launched in a stopped state and you will have to start the Test or Cutover AWS instance manually from the EC2 Console.

Learn more. (p. 227)

Copy private IP

Choose whether you want Application Migration Service to ensure that the private IP used by the Test or Cutover instance matches the private IP used by the source server. Application Migration Service will monitor the source server on an hourly basis to identify the Private IP. Application Migration Service will use the private IP of the primary network interface.

The **Yes** option is chosen by default.

Choose the **No** option if you do not want the private IP of the Test or Cutover instance to match that of the source machine.

Learn more. (p. 229)

Transfer server tags

Choose whether you want Application Migration Service to transfer any user-configured custom tags from your source servers onto your Test or Cutover instance.

If you choose the **Yes** option, server tags will be transferred. These tags are attached to all source servers, all launched Test and Cutover instances, and all of the ephemeral resources that are created on your AWS Account during the normal operation of Application Migration Service.

Learn more. (p. 230)

OS Licensing

Choose whether you want to Bring Your Own Licenses (BYOL) from the source server into the Test or Cutover instance.

The **Use default** option will use the defaut licensing mechanism for your operating system.

Choose the **BYOL** option if you are migrating a Linux server. All Linux licenses are BYOL by default. Any RHEL, SUSE or Debian licenses will be transferred in their current form to the migrated instance. Make sure to ensure that the terms of your licenses allow this license transfer.

Choose the **BYOL** option if you want to BYOL your Windows licenses. This will set up a dedicated host through which all the licenses from the Windows source server will be automatically transferred to the Test or Cutover instance.

> **Important**
> If you enable BYOL licensing for Windows, you have to change the **Placement.tenancy** type in the EC2 launch template to **Host**. Otherwise, instance launch will fail.

Learn more. (p. 232)

EC2 Launch Template

Application Migration Service utilizes EC2 launch templates to launch test and cutover EC2 instances for each source server.

The EC2 launch template is created automatically for each Source server that is added to Application Migration Service upon the installation of the AWS Replication Agent.

> **Note**
> The EC2 launch template does not need to be edited for most use cases.

> **Note**
> You cannot use the same template for multiple servers.

> **Note**
> The Launch template can only be edited from EC2.

> **Note**
> Many EC2 launch template settings can be changed, but some may not be used by the Application Migration Service launch process and some may interfere with the Application Migration Service launch process.

> **Important**
> You must set the EC2 launch template you want to use with Cirrus as the **default** launch template.

The Application Migration Service EC2 launch template panel shows a summary of the key template values; to view all the values or to change any of them, choose **Edit**.

Learn more. (p. 234)

Launch History Page

The Launch History page allows you to track the Jobs that are created after launching a Test or Cutover instance or after initializing the deletion of a Test or Cutover instance. Each Job corresponds toa single Source server and indicates whether the launch or deletion of the Test or Cutover instance for the specific server was successful. The detailed Job log allows you to dive deep and see all of the step of every job. This is especially useful for understanding the reason for a launch or delete failre. You can filter the detailed Job log by a variety of fields in order to quickly locate a particular Source server, or Job ID.

Learn more. (p. 268)

Server Details View

The Server details view shows all relevant information for a single Source server. You can access the Server details view by choosing the hostname of any server on the Source Servers page. The Server details biew consists of multiple tabs that provide you with a complete overview of the Source server's health, migration status, disks, launch settings, and other configurations. The Server details view is used to monitor the Source server, to troubleshoot migration problems, to manage disks, and to configure the launch settings for Test and Cutover instasnces launched for the Source server.

Learn more. (p. 162)

Topics

- Migration dashboard (p. 290)
- Server details tab (p. 290)
- Tags tab (p. 291)
- Disk settings tab (p. 291)
- Replication settings tab (p. 291)
- Launch settings tab (p. 291)

Migration dashboard

The Migration dashboard shows where the server currently is on the migration lifecycle: not started, initial sync, ready for testing, test in progress, ready for cutover, cutover in progress, and cut over. The Migration dashboard is color-coded for ease of use. Gray indicates a step not yet reached. Blue indicates a healthy state. Yellow indicates that data replication is lagging and may require attention. Red indicates data replication is stalled and requires your attention in order to return to a healthy state. The Migration dashboard also helps you monitor exactly what percentage of the server has been replicated. This section can also help you troubleshoot initial sync, replication issues, and links off to CloudWatch and CloudTrail where you can further monitor events and metrics.

Learn more. (p. 166)

Server details tab

The Server details tab shows a variety of relevant server general, hardware and network information. Use this tab to quickly access key Source server information, such as the hostname, the AWS instance ID, OS, and hardware specifications.

Learn more. (p. 206)

Tags tab

The Tags tab shows any tags that have been assigned to the server. A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. Use this tab to add and manage tags. You can use tags to search and filter your resources or track your AWS costs. Learn more about AWS tags in this EC2 article.

Learn more. (p. 208)

Disk settings tab

The Disk settings tab shows a list of all of the disks on the source server and relevant information for each disk and allows you to change the EBS volume disk type for each individual disk or group of disks. Use this section to manage disks and to change the EBS volume disk type used by disks in order to increase replication speed or save costs.

Learn more. (p. 211)

Replication settings tab

The Replication settings tab allows you to edit the Replication settings for the individual source server. Once the source server is added to Application Migration Service, the Replication settings that are defined in the Replication Settings Template are automatically applied to the server. Use this tab if you want to use different replication settings for the specific Source server or group of Source servers than those defined in your Replication Settings Template.

Learn more. (p. 215)

Launch settings tab

Use the Launch settings to determine how Test and Cutover instances will be launched on AWS for your Source server.

The launch settings are a set of instructions that are comprised of two sections: General launch settings and the EC2 Launch Template that determine how a Test or Cutover instance will be launched for each source server in AWS.

Launch settings, including the EC2 Launch Template, are automatically created every time you add a source server to Application Migration Service.

Learn more. (p. 217)

Security in Application Migration Service

Topics

- Overview (p. 292)
- Identity and access management for Application Migration Service (p. 293)
- Resilience in Application Migration Service (p. 293)
- Infrastructure security in Application Migration Service (p. 294)
- Compliance validation for Application Migration Service (p. 294)

Overview

Cloud security at AWS is the highest priority. As an AWS customer, you benefit from a data center and network architecture that is built to meet the requirements of the most security-sensitive organizations.

Security is a shared responsibility between AWS and you. The shared responsibility model describes this as security of the cloud and security in the cloud:

- **Security of the cloud** – AWS is responsible for protecting the infrastructure that runs AWS services in the AWS Cloud. AWS also provides you with services that you can use securely. Third-party auditors regularly test and verify the effectiveness of our security as part of the AWS Compliance Programs. To learn about the compliance programs that apply to Application Migration Service (Application Migration Service), see AWS Services in Scope by Compliance Program.
- **Security in the cloud** – Your responsibility is determined by the AWS service that you use. You are also responsible for other factors including the sensitivity of your data, your company's requirements, and applicable laws and regulations

This documentation helps you understand how to apply the shared responsibility model when using Application Migration Service. It shows you how to configure Application Migration Service to meet your security and compliance objectives. You also learn how to use other AWS services that help you to monitor and secure your Application Migration Service resources.

The customer is responsible for making sure that no mis-configurations are present during and after the migration process, including:

1. The replication server should be accessed only from the CIDR range of the source servers. Proper security groups rules should be assigned to the replication server after it is created.
2. After the migration, the customer should make sure that only allowed ports are exposed to the public internet.
3. Hardening of OS packages and other software deployed in the servers is completely under the customer's responsibility and we recommend the following:
   a. Packages should be up to date and free of known vulnerabilities.
   b. Only necessary OS/application services should be up and running.
4. Enabling the Anti-DDOS protection (AWS Shield) in the customer's AWS Account to eliminate the risk of denial of service attacks on the replication servers as well as the migrated servers.

Identity and access management for Application Migration Service

AWS Identity and Access Management (IAM) is an AWS service that helps an administrator securely control access to AWS resources. IAM administrators control who can be authenticated (signed in) and authorized (have permissions) to use AWS resources. IAM enables you to create users and groups under your AWS account. You control the permissions that users have to perform tasks using AWS resources. You can use IAM for no additional charge.

By default, IAM users don't have permissions for Application Migration Service (Application Migration Service) resources and operations. To allow IAM users to manage Application Migration Service resources, you must create an IAM policy that explicitly grants them permissions, and attach the policy to the IAM users or groups that require those permissions.

When you attach a policy to a user or group of users, it allows or denies the users permission to perform the specified tasks on the specified resources. For more information, see Policies and Permissions in the *IAM User Guide* guide.

Policy structure

An IAM policy is a JSON document that consists of one or more statements. Each statement is structured as follows.

```
{
  "Statement": [
    {
      "Effect": "effect",
      "Action": "action",
      "Resource": "arn",
      "Condition": {
        "condition": {
          "key":"value"
        }
      }
    }
  ]
}
```

There are various elements that make up a statement:

- **Effect:** The effect can be `Allow` or `Deny`. By default, IAM users don't have permission to use resources and API actions, so all requests are denied. An explicit allow overrides the default. An explicit deny overrides any allows.
- **Action**: The action is the specific Application Migration Service API action for which you are granting or denying permission.
- **Resource**: The resource that's affected by the action. For Application Migration Service, you must specify "*" as the resource.
- **Condition**: Conditions are optional. They can be used to control when your policy is in effect.

Resilience in Application Migration Service

The AWS global infrastructure is built around AWS Regions and Availability Zones. Regions provide multiple physically separated and isolated Availability Zones, which are connected through low-latency,

high-throughput, and highly redundant networking. With Availability Zones, you can design and operate applications and databases that automatically fail over between zones without interruption. Availability Zones are more highly available, fault tolerant, and scalable than traditional single or multiple data center infrastructures.

For more information about AWS Regions and Availability Zones, see AWS Global Infrastructure.

Infrastructure security in Application Migration Service

As a managed service, Application Migration Service is protected by the AWS global network security procedures that are described in the Amazon Web Services: Overview of Security Processes whitepaper.

You use AWS published API calls to access Application Migration Service through the network. Clients must support Transport Layer Security (TLS) 1.0 or later. We recommend TLS 1.2 or later. Clients must also support cipher suites with perfect forward secrecy (PFS) such as Ephemeral Diffie-Hellman (DHE) or Elliptic Curve Ephemeral Diffie-Hellman (ECDHE). Most modern systems such as Java 7 and later support these modes.

All parties involved in the communication authenticate each other using TLS, IAM policies and tokens. The communication between the Agents and the replication server are based on TLS 1.2 only with the the highest standard of cipher suite (PFS, ECDHE. Requests between the Agent and Application Migration Service as well as between the replication server and Application Migration Service are signed using an access key ID and a secret access key that is associated with an IAM principal.

Additionally, requests must be signed using an access key ID and a secret access key that is associated with an IAM principal. Or you can use the AWS Security Token Service (AWS STS) to generate temporary security credentials to sign requests.

Compliance validation for Application Migration Service

Third-party auditors assess the security and compliance of Application Migration Service as part of multiple AWS compliance programs. Currently MGN is compliany with HIPPA. MGN is in the process of becoming complaint with SOC, PCI, FedRAMP and others.

For a list of AWS services in scope of specific compliance programs, see AWS Services in Scope by Compliance Program. For general information, see AWS Compliance Programs.

You can download third-party audit reports using AWS Artifact. For more information, see Downloading Reports in AWS Artifact.

Your compliance responsibility when using Application Migration Service is determined by the sensitivity of your data, your company's compliance objectives, and applicable laws and regulations. AWS provides the following resources to help with compliance:

- Security and Compliance Quick Start Guides – These deployment guides discuss architectural considerations and provide steps for deploying security- and compliance-focused baseline environments on AWS.
- Architecting for HIPAA Security and Compliance Whitepaper – This whitepaper describes how companies can use AWS to create HIPAA-compliant applications.

- AWS Compliance Resources – This collection of workbooks and guides might apply to your industry and location.
- Evaluating Resources with Rules in the *AWS Config Developer Guide* – AWS Config; assesses how well your resource configurations comply with internal practices, industry guidelines, and regulations.
- AWS Security Hub – This AWS service provides a comprehensive view of your security state within AWS that helps you check your compliance with security industry standards and best practices.

API

The following is a basic list of Application Migration Service public APIs. This list will be replaced by full API documentation in the future.

Topics

- Actions (p. 296)

Actions

The following actions are supported:

Topics

- Job (p. 296)
- Launch Configuration (p. 296)
- Replication Configuration (p. 296)
- Replication Configuration Template (p. 297)
- Source Server (p. 297)
- Tags (p. 298)

Job

1. *DescribeJobs*

   Returns a list of Jobs. Use the JobsID and fromDate and toData filters to limit which jobs are returned. The response is sorted by creationDataTime - latest date first. Jobs are normaly created by the batchStartTest, batchStartCutover, and batchTerminateTargetInstances APIs. Jobs are also created by DiagnosticLaunch and TerminateDiagnosticInstances, which are APIs available only to *Support* and only used in response to relevant support tickets.
2. *DescruibeJobLogItems*

   Retrieves detailed Job log with paging.

Launch Configuration

1. *UpdateLaunchConfiguration*

   Updates multiple LaunchConfigurations by Source Server ID.
2. *GetLaunchConfiguration*

   Lists all LaunchConfigurations available, filtered by Source Server IDs.

Replication Configuration

1. *UpdateReplicationConfiguration*

Allows you to update multiple ReplicationConfigurations by Source Server ID.

2. *GetReplicationConfiguration*

   Lists all ReplicationConfigurations, filtered by Source Server ID.

Replication Configuration Template

1. *CreateReplicationConfigurationTemplate*

   Creates a new ReplicationConfigurationTemplate.

2. *DescribeReplicationConfigurationTemplates*

   Lists all ReplicationConfigurationTemplates, filtered by Source Server IDs.

3. *UpdateReplicationConfigurationTemplate*

   Updates multiple ReplicationConfigurationTemplates by ID.

Source Server

1. *DescribeSourceServers*

   Retrieves all SourceServers or multiple SourceServers by ID.

2. *MarkAsArchived*

   Archives specific Source Servers by setting the SourceServer.isArchived property to true for specified SourceServers by ID. This command only works for SourceServers with a lifecycle.state which equals DISCONNECTED or CUTOVER.

3. *DisconnectFromService*

   Disconnects specific Source Servers from Application Migration Service. Data replication is stopped immediately. All AWS resources created by Application Migration Service for enabling the replication of these source servers will be terminated / deleted within 90 minutes. Launched Test or Cutover instances will NOT be terminated. If the agent on the source server has not been prevented from communciating with the Application Migration Service service, then it will receive a command to uninstall itself (within approximately 10 minutes). The following properties of the SourceServer will be changed immediately: dataReplicationInfo.dataReplicationState will be to DISCONNECTED; The totalStorageBytes property fo each of dataReplicationInfo.replicatedDisks will be set to zero; dataReplicationInfo.lagDuration and dataReplicationInfo.lagDurationwill be nullified.

4. *RetryDataReplication*

   Causes the data replication initiation sequence to begin immediately upon next Handshake for specified SourceServer IDs, regardless of when the previous initiation started. This command will not work if the SourceServer is not stalled or is in a DISCONNECTED or STOPPED state.

5. *ChangeServerLifeCycleState*

   Allows the user to set the SourceServer.LifeCycle.state property for specific Source Server IDs to one of the following: READY_FOR_TEST or READY_FOR_CUTOVER. This command only works if the Source Server is already launchable (dataReplicationInfo.lagDuration is not null.)

6. *FinalizeCutover*

   Finalizes the cutover immediately for specific Source Servers. All AWS resources created by Application Migration Service for enabling the replication of these source servers will be terminated / deleted within 90 minutes. Launched Test or Cutover instances will NOT be terminated. The AWS Replication

Agent will receive a command to uninstall itself (within 10 minutes). The following properties of the SourceServer will be changed immediately: dataReplicationInfo.dataReplicationState will be to DISCONNECTED; The SourceServer.lifeCycle.state will be changed to CUTOVER; The totalStorageBytes property fo each of dataReplicationInfo.replicatedDisks will be set to zero; dataReplicationInfo.lagDuration and dataReplicationInfo.lagDurationwill be nullified.

7. *BatchStartTest*

   Lauches a Test Instance for specific Source Servers. This command starts a LAUNCH job whose initiatedBy property is StartTest and changes the SourceServer.lifeCycle.state property to TESTING.

8. *BatchStartCutover*

   Launches a Cutover Instance for specific Source Servers. Lauches a Test Instance for specific Source Servers. This command starts a LAUNCH job whose initiatedBy property is StartCutover and changes the SourceServer.lifeCycle.state property to CUTTING_OVER.

9. *BatchTerminateTargetInstances*

   Starts a job that terminates specific launched EC2 Test and Cutover instances. This command will not work for any Source Server with a lifecycle.state of TESTING, CUTTING_OVER, or CUTOVER.

Tags

1. *ListTagsForResource*

   List all tags for your Application Migration Service resources.

2. *TagResource*

   Adds or overwrites only the specified tags for the specified Application Migration Service resource or resources. When you specify an existing tag key, the value is overwritten with the new value. Each resource can have a maximum of 50 tags. Each tag consists of a key and optional value. Tag keys must be unique per resource.

3. *UntagResource*

   Deletes the specified set of tags from the specified set of Application Migration Service resources.

AWS glossary

For the latest AWS terminology, see the AWS glossary in the *AWS General Reference*.