IxChariot Endpoint Amazon EC2 Deployment Guide

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Prerequisites

The IxChariot Endpoint is a software agent used to generate network traffic and measure networking metrics for the Ixia IxChariot and Hawkeye products.

This document assumes you already deployed an instance of IxChariot or Hawkeye Server in AWS or another Cloud System.

To learn more about IxChariot, refer to https://www.ixiacom.com/products/ixchariot.

To learn more about Hawkeye, refer to https://www.ixiacom.com/products/hawkeye.

Creating a New IxChariot Endpoint Instance in Amazon EC2

When deployed in the Amazon cloud, an IxChariot Endpoint runs in a virtual server known as an EC2 instance.

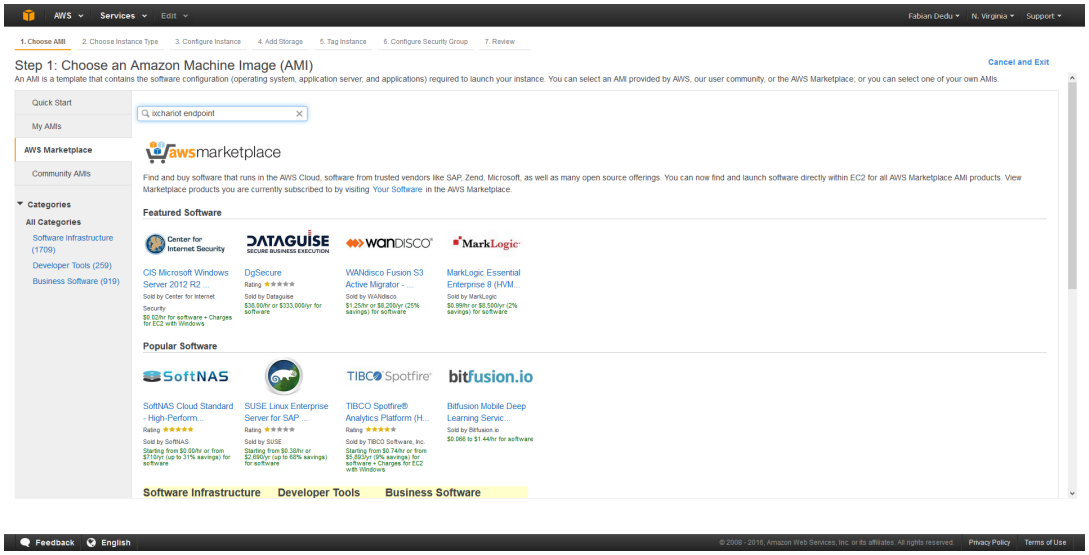
There are two methods used to deploy the IxChariot Endpoint into the Amazon Cloud:

- The first method is recommended if you are familiar with the AWS EC2 interface, but requires more manual steps to configure the AWS Firewall and register the IxChariot Endpoint to IxChariot/Hawkeye Server. For more details, refer to Launching an IxChariot Endpoint Instance from AWS Marketplace.
- The second method is recommended if you are familiar with AWS CloudFormation. This method automatically configures the AWS Firewall and the Endpoint registration to IxChariot/Hawkeye Server, based on your input parameters. This method simplifies the configuration process, especially if you want to create multiple Endpoint instances at once. For more details, refer to Launching an IxChariot Endpoint Instance from AWS CloudFormation.

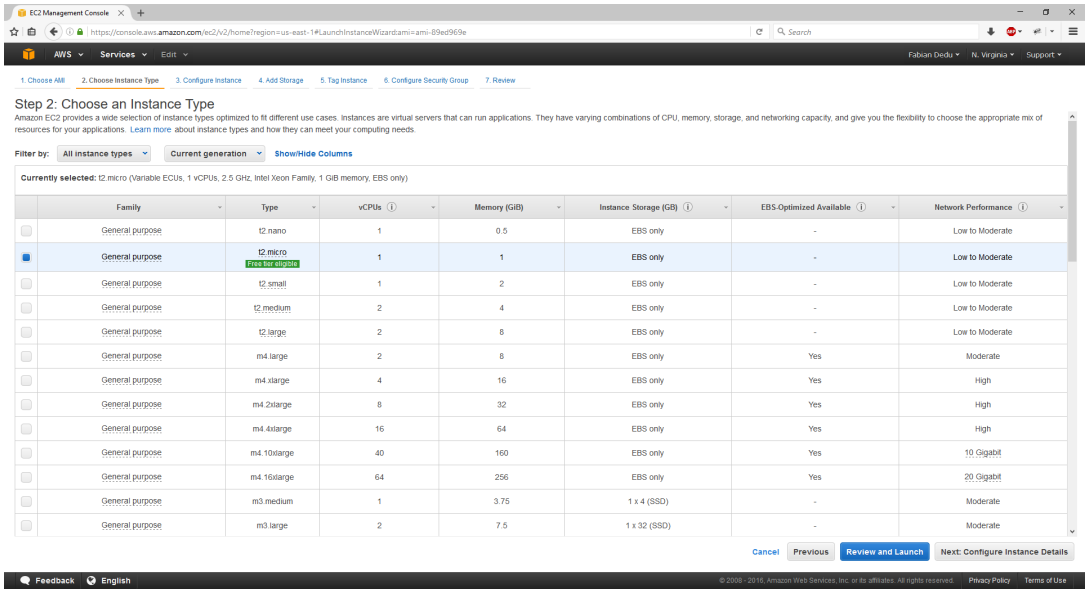
Launching an IxChariot Endpoint Instance from AWS Marketplace

To create a new instance, follow these steps:

1. Log in to the AWS EC2 console dashboard.
2. Go to the Instances menu and click **Launch Instance**.
3. Select the AWS Marketplace page and search for the IxChariot Endpoint AMI image.

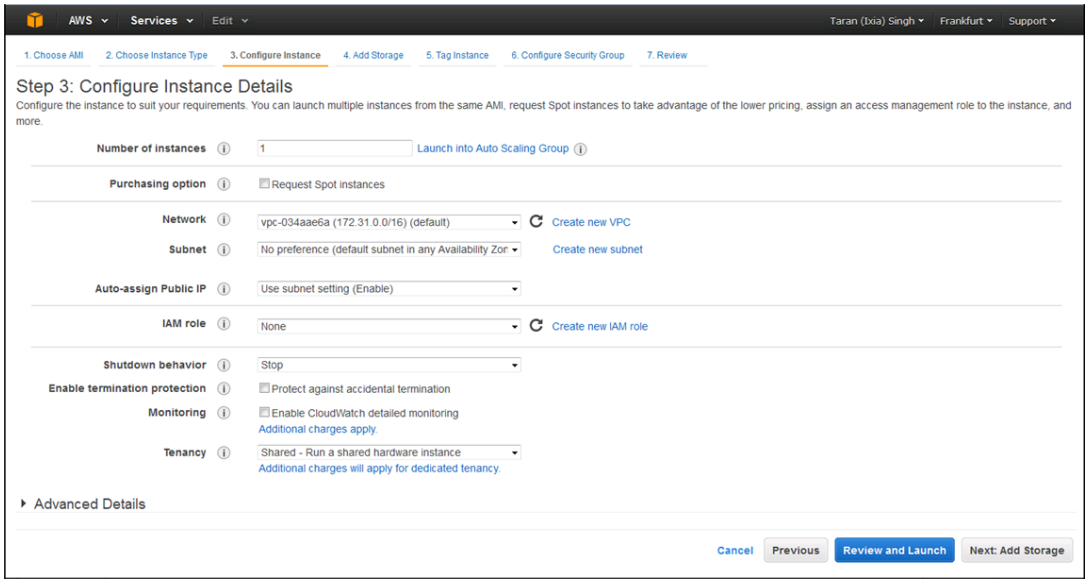


4. Select the instance type, which is the type of EC2 virtual server that runs the application. Different types have varying hardware capabilities, such as number of CPUs, RAM and networking capabilities. For example, you can choose the *t2.micro* instance, which is free under certain conditions.



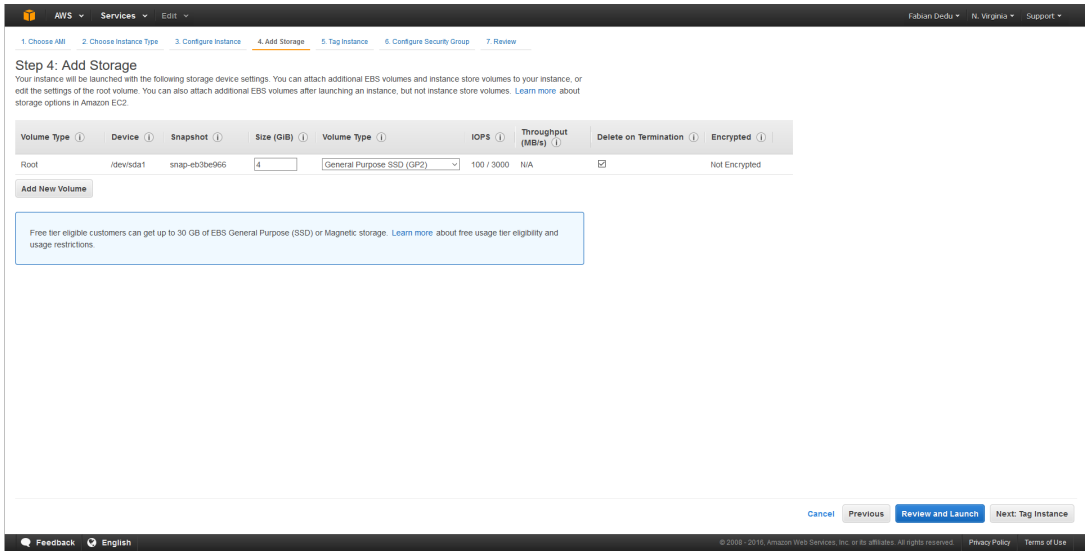
Click **Next: Configure Instance Details**.

5. On the Configure Instance Details page, you can choose to create one or more End-point instances. Leave all the other parameters to the default values.



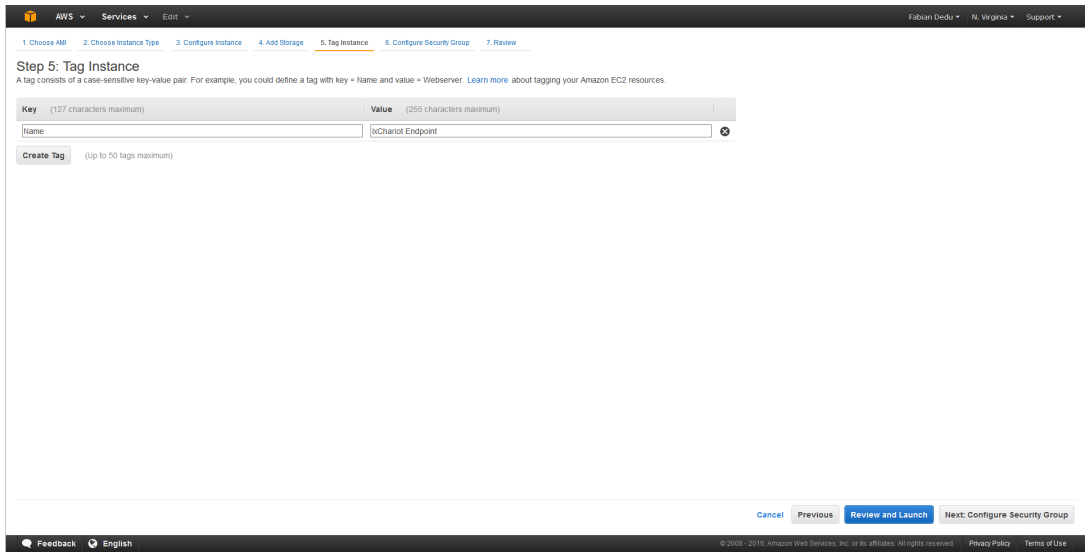
Click **Next: Add Storage**.

6. On the Add Storage page, enable **Delete on Termination** and leave everything else to the default values.



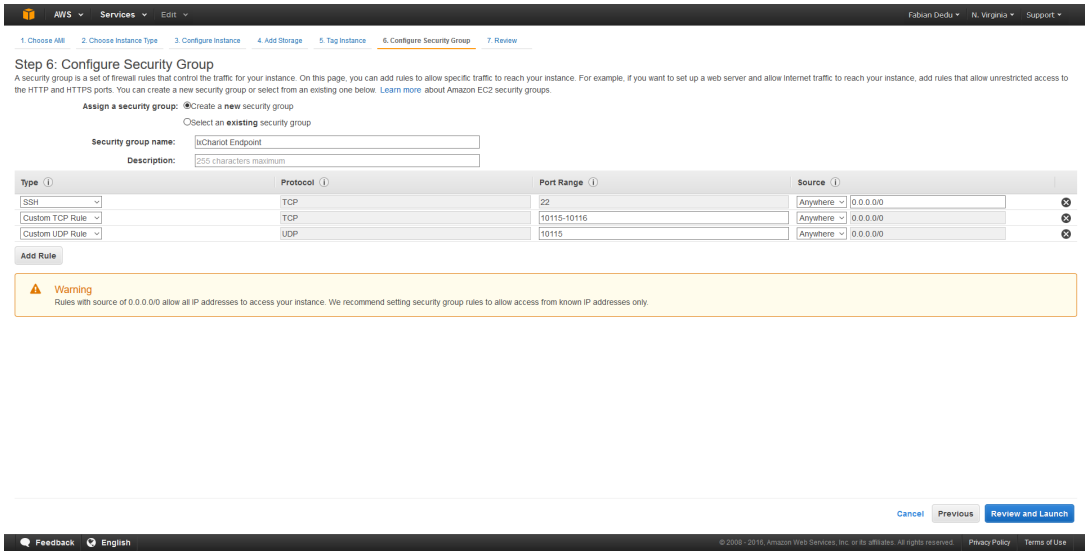
Click **Next: Tag Instance**.

7. Tag the instance using a meaningful name.



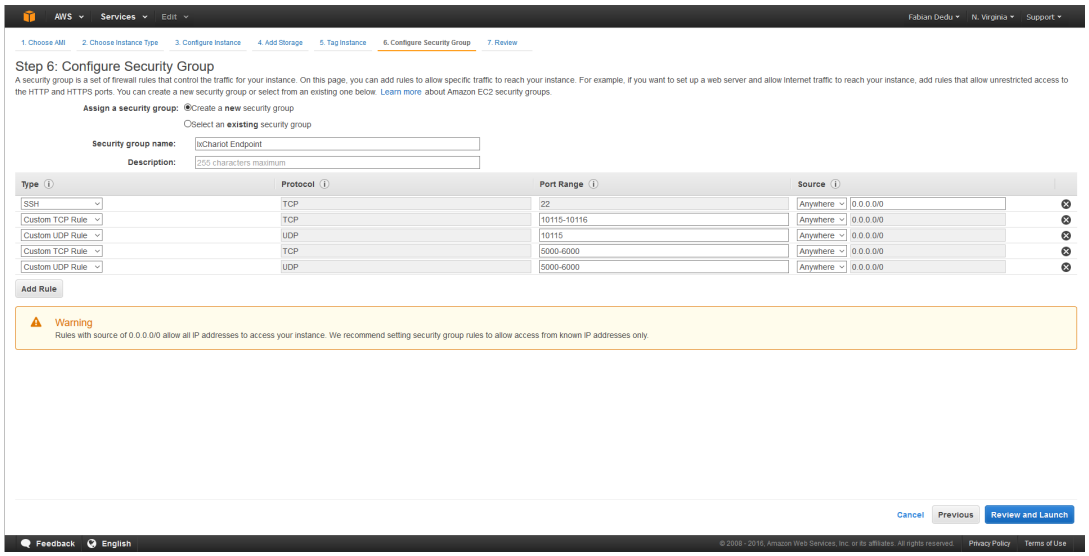
Click **Next: Configure Security Group**.

8. A security group is created automatically to allow access through the AWS firewall to the IxChariot Endpoint instance. The security group opens by default the SSH port and few TCP and UDP ports used for Endpoint internal traffic.



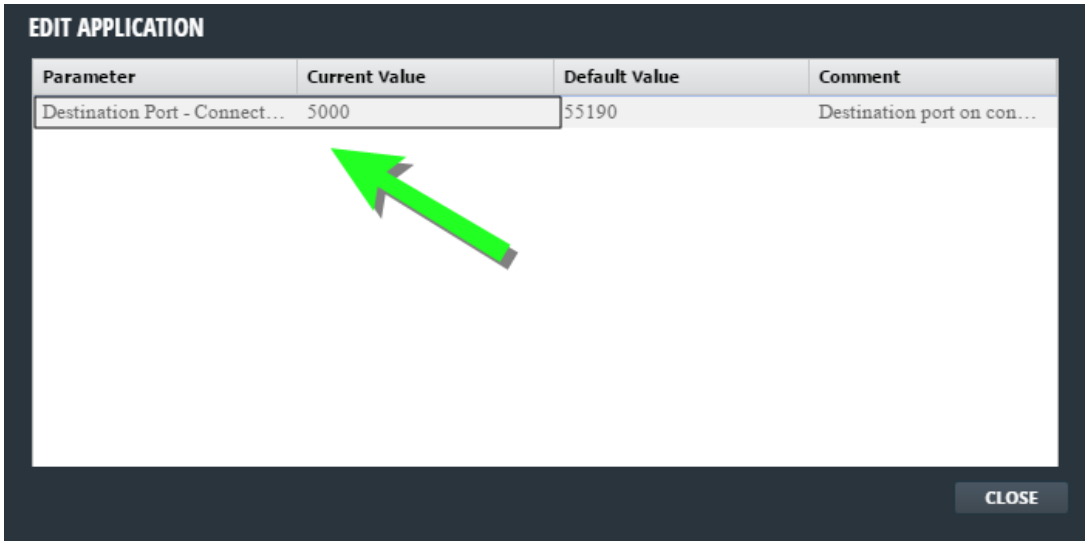
In addition, you must add one or several ranges of TCP and UDP ports to be used as destination ports for the test traffic initiated towards this Endpoint by another End-point. You can add all these port ranges as new firewall rules for the AWS Security Group:

- When using the Endpoint with the IxChariot product, you can choose any range of TCP and UDP ports for the test traffic, as shown in the example below.

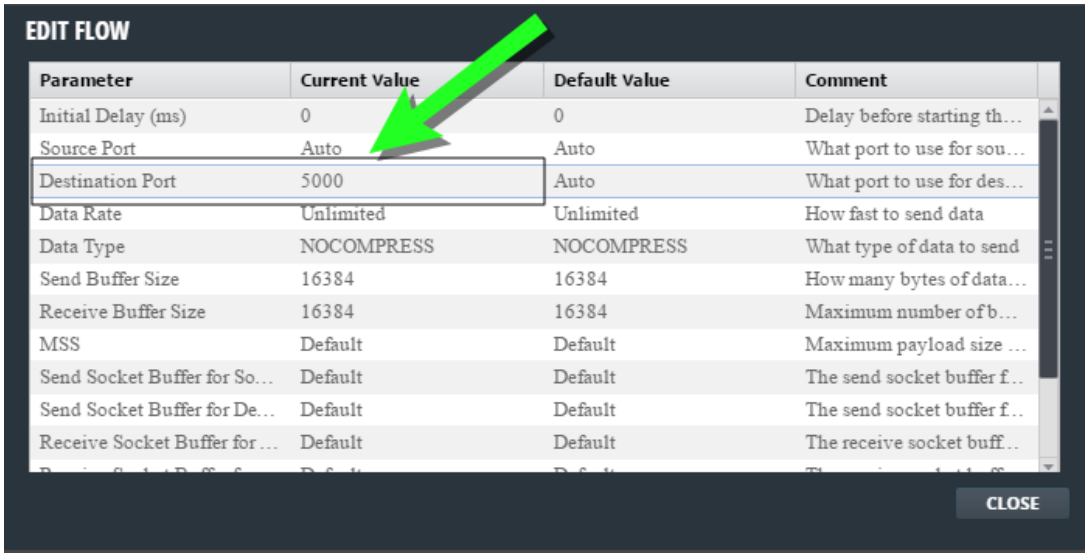


You also have to configure the IxChariot application to use ports from these ranges for the test traffic.

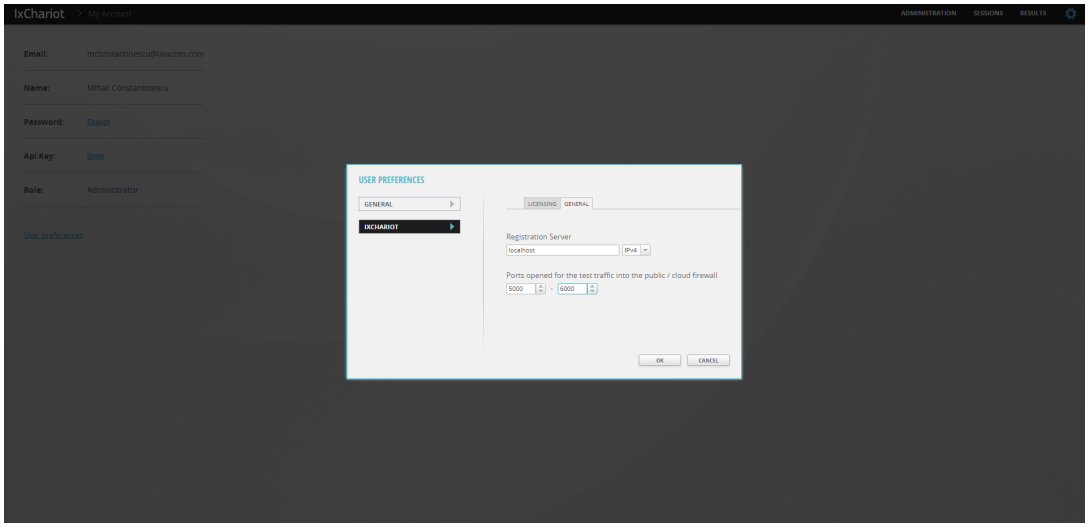
When you use Application Mixes, after adding applications to the mix, you have to edit each application and set the destination ports to a port from the TCP ranges that you configured in the Security Group.



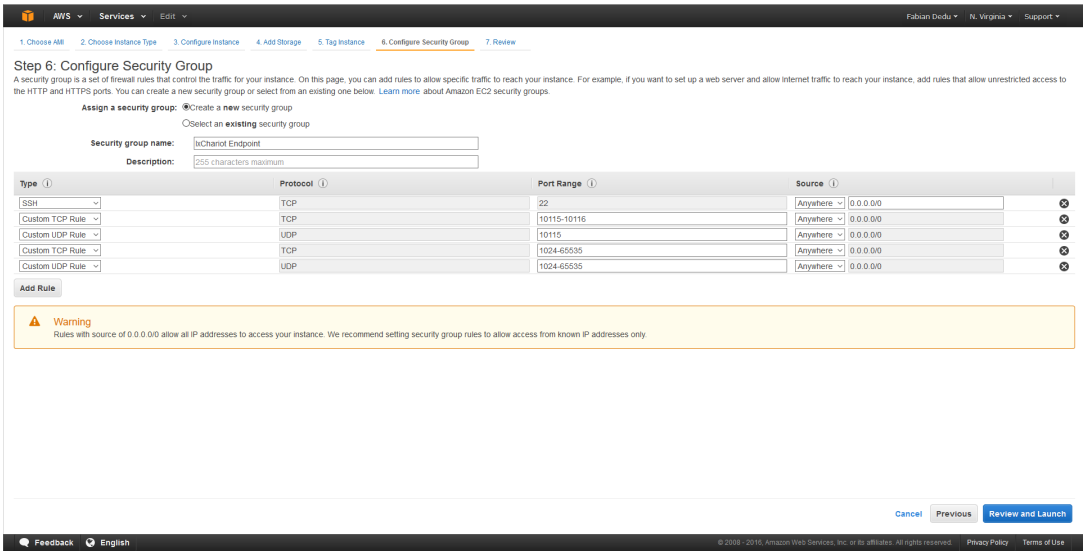
When you use Flow Groups or Multicast Groups, after adding flows to the group, you have to edit each flow and set the destination port to a port from the TCP/UDP ranges that you configured in the Security Group.



If you have configured a single ports range for both TCP and UDP, it is recommended to configure it in IxChariot at ⚙ **> My Account > User Preferences > IxChariot > Ports opened for the test traffic into the public / cloud firewall**. This removes the need to configure the destination port for each flow. This way, you can leave the flows destination port to the default value (**Auto**) and IxChariot automatically picks a port from the configured ports range.



- When you use the Endpoint with the Hawkeye product, you must set the TCP and UDP ports range to 1024-65535. No additional configuration is required on the Hawkeye application.



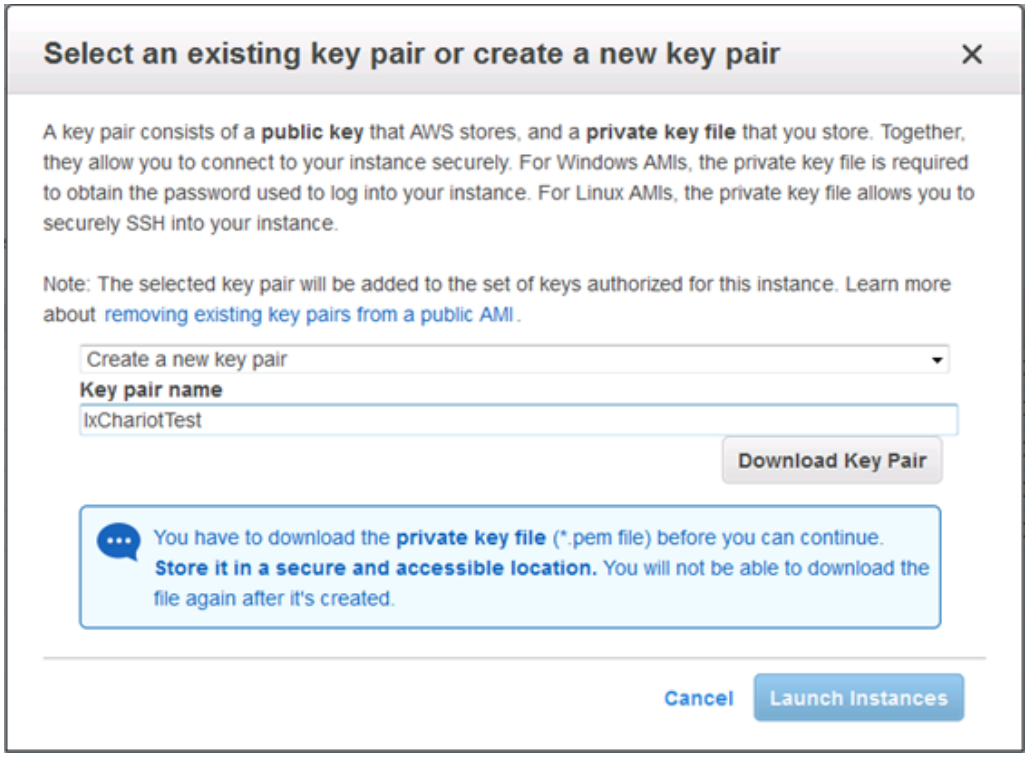
NOTE

By default the security group allows access to your instance from *all* IP addresses (0.0.0.0/0). It is recommended that you adjust the security group rules so as to allow only a specific address or range of addresses to access your instance.

Click **Review and Launch**.

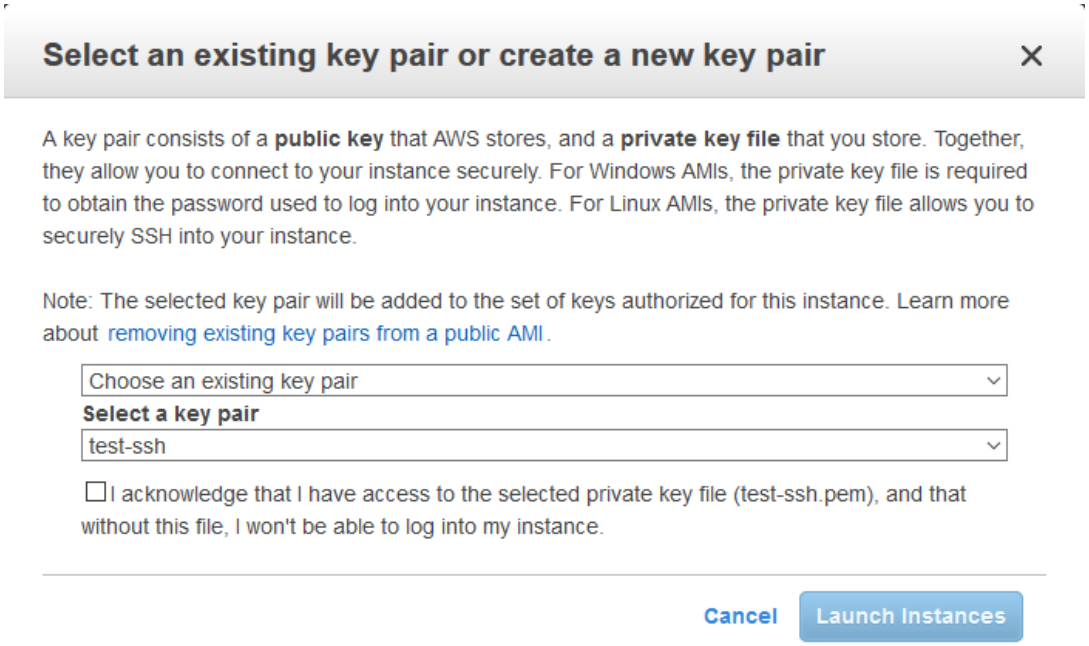
9. Finally review all settings and click **Launch**.
10. Before the instance is created and launched, you need to create a new key pair or to select an existing key pair. The key pair is used to connect to the instance via SSH.

    In order to create a new key pair, choose **Create a new key pair** and type in a name in the key pair generation window.



After you create the new key pair, click **Download Key Pair**. Make sure you store the private key in a secure place, as you will not be able to download it a second time.

In order to use an existing key pair, select the **Choose an existing key pair** option from the drop-down list and choose the key pair that you want to use.



11. Click **Launch Instances**.

    The Instances window is displayed. Note that the public IP assigned to the instance is also displayed.

12. As an optional, but recommended, configuration step you can associate your instance with a special type of address called Elastic IP address. See Assign an Elastic IP Address to the Instance.

13. Register your new instance of IxChariot Endpoint to the Registration Server, which is running on the same machine as the IxChariot or Hawkeye Server. To do so, follow these steps:
    - Log in to your newly created IxChariot Endpoint instance via SSH. See Logging via SSH to the Linux OS on the IxChariot Endpoint Instance.
    - Edit the `/usr/local/Ixia/endpoint.ini` file, search for the **REGISTRATION_SERVER_ADDRESS** token and replace the placeholder `rs_address` with the public address of the IxChariot or Hawkeye Server.
    - Reboot the IxChariot Endpoint instance.
    - Make sure that the Endpoint has registered correctly. See Validate the Endpoint Registration.

Assign an Elastic IP Address to the Instance

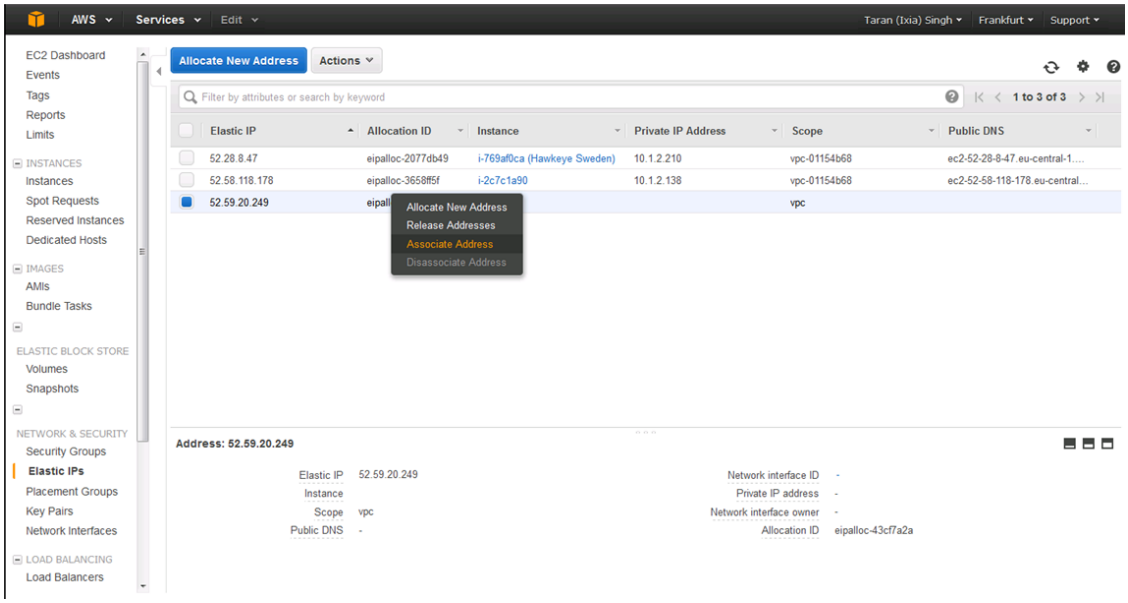
This is optional, but recommended configuration step.

To connect to the IxChariot Endpoint, it is recommended that you use an elastic IP, instead of the instance public IP/hostname. The Elastic IP is a static IP which does not change when the AMI instance is restarted or moved.

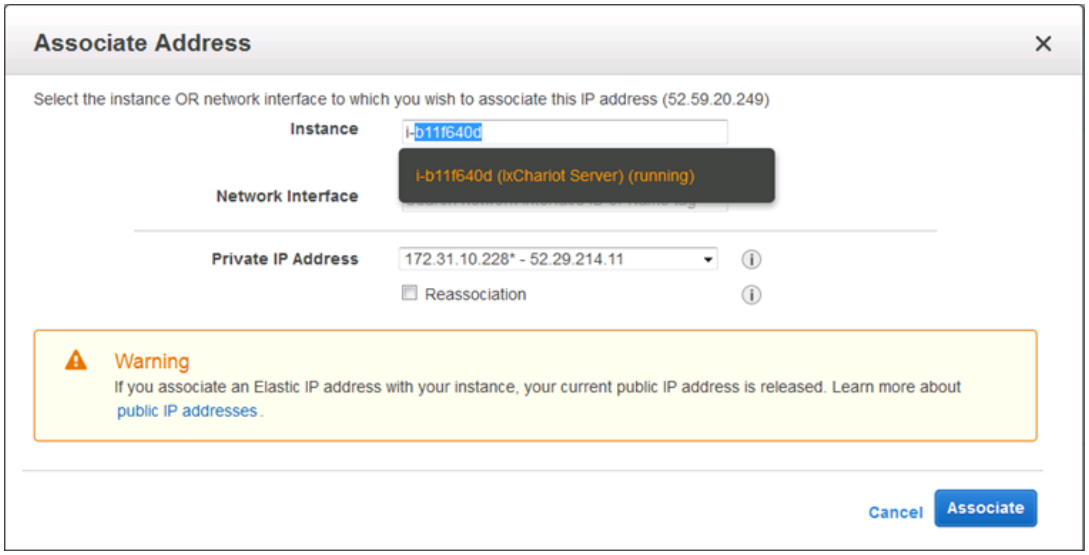
Before you configure the Elastic IP address, make sure the IxChariot Endpoint instance is running.

1. In the Elastic IPs section click **Actions** > **Allocate New Address**.

   A new address is created, but it is not allocated to any instance.
2. Select the new elastic IP, and choose the **Associate Address** option.



3. From the pop-up window that appears, select the recently created instance.



4. Click **Associate**.

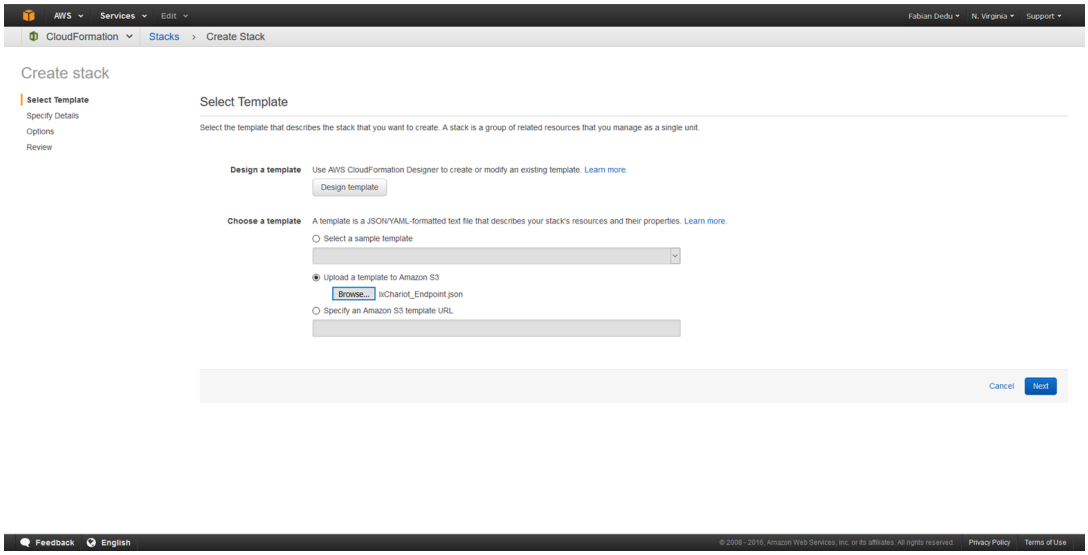
Launching an IxChariot Endpoint Instance from AWS CloudFormation

Before you start with the CloudFormation template, you must have an Amazon EC2 key pair. This key pair is required to gain SSH access to your Endpoint instances after they are created. If you do not have a key pair, you can create one by following the steps at http://-docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html#having-ec2-create-your-key-pair. For details on using the Key Pair to SSH to your Endpoint instance, refer to Logging via SSH to the Linux OS on the IxChariot Endpoint Instance.

The CloudFormation template can only be used in AWS accounts that have a default VPC created by Amazon. Only the AWS accounts created after December 4, 2013 have a default VPC. To validate that you have a default VPC, log in to the AWS EC2 console dashboard and check on the Account Attributes section (top-right corner of the screen) for the **Default VPC**. If you do not have a default VPC, the CloudFormation template cannot be used.

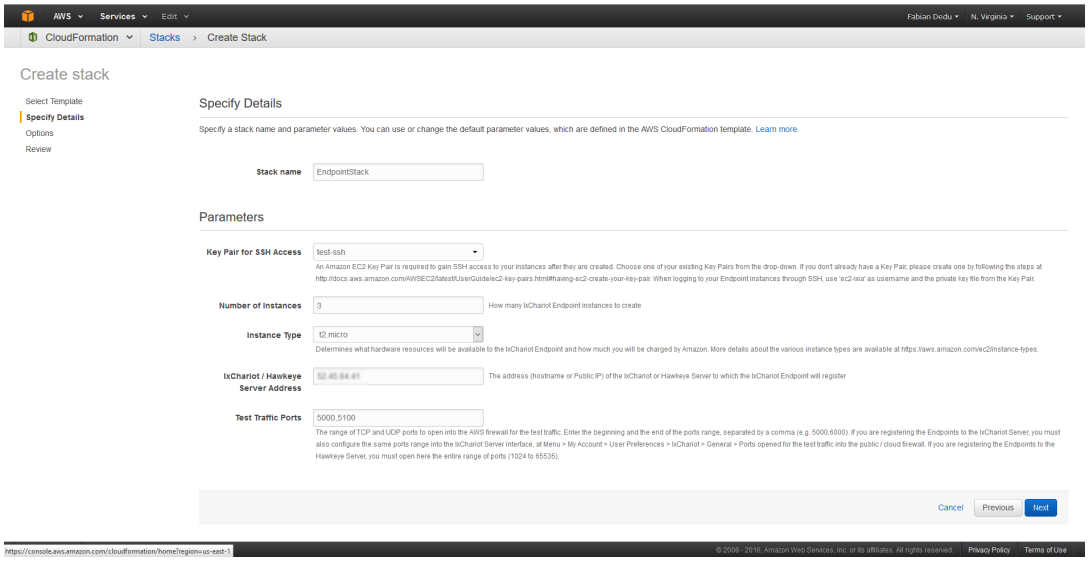
To create a new instance, follow these steps:

1. Download the CloudFormation template from http://-downloads.ixiacom.com/products/ixchariot/endpoint_library/9.4/IxChariot_Endpoint.json.
2. Go to AWS CloudFormation at https://console.aws.amazon.com/cloudformation/.
3. Click **Create Stack**.
4. On the Choose a template section, select **Upload a template to Amazon S3**, click **Browse** and upload the CloudFormation template. Click **Next**.



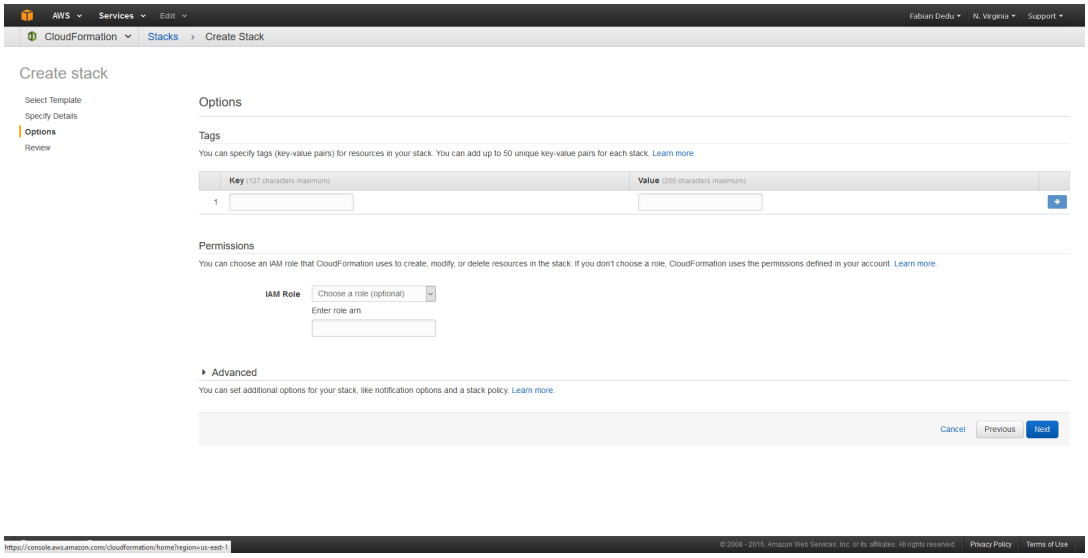
5. Fill in the name of the stack and set values for the rest of the parameters, as shown in the example below. All parameters are mandatory.

Parameter	Description
Key Pair for SSH Access	Allows you to select a key pair from the drop-down list.
Number of Instances	Allows you to select the number of IxChariot Endpoint instances you want to create.
Instance Type	Determines what hardware resources will be available to the IxChariot Endpoint and how much you will be charged by Amazon. More details about the various instance types are available at https://aws.amazon.-com/ec2/instance-types.
IxChariot / Hawkeye Server Address	The address (hostname or Public IP) of the IxChariot or Hawkeye Server to which the IxChariot Endpoint will register.
Test Traffic Ports	The range of TCP and UDP ports to open into the AWS firewall for the test traffic. Enter the beginning and the end of the ports range, separated by a comma (e.g. 5000,6000). If you are registering the Endpoints to the IxChariot Server, you must also configure the same ports range into the IxChariot Server interface, at ⚙ **> My Account > User Preferences > IxChariot > Ports opened for the test traffic into the public / cloud firewall**. If you are registering the Endpoints to the Hawkeye Server, you must open here the entire range of ports (1024 to 65535).

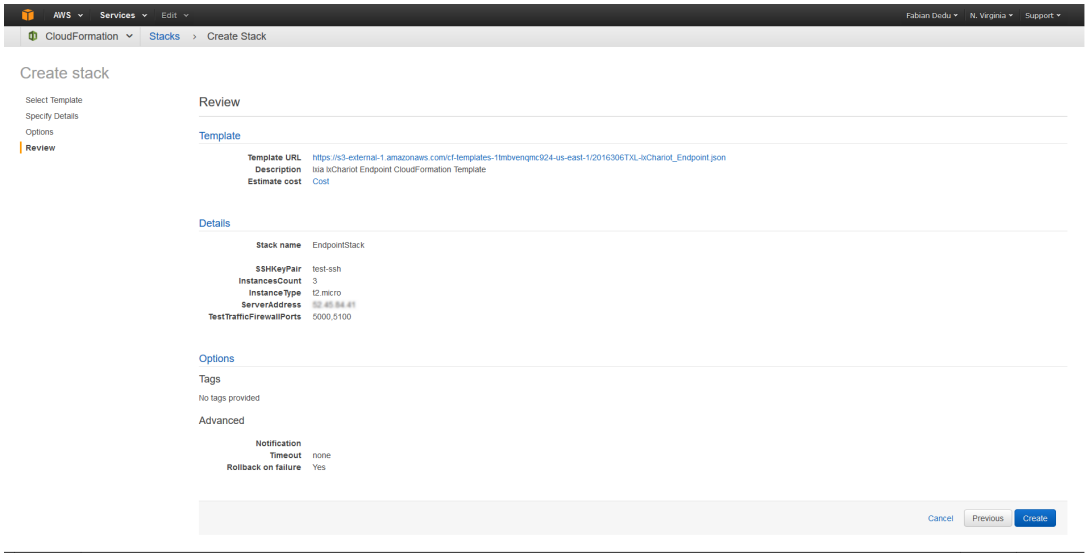


Click **Next**.

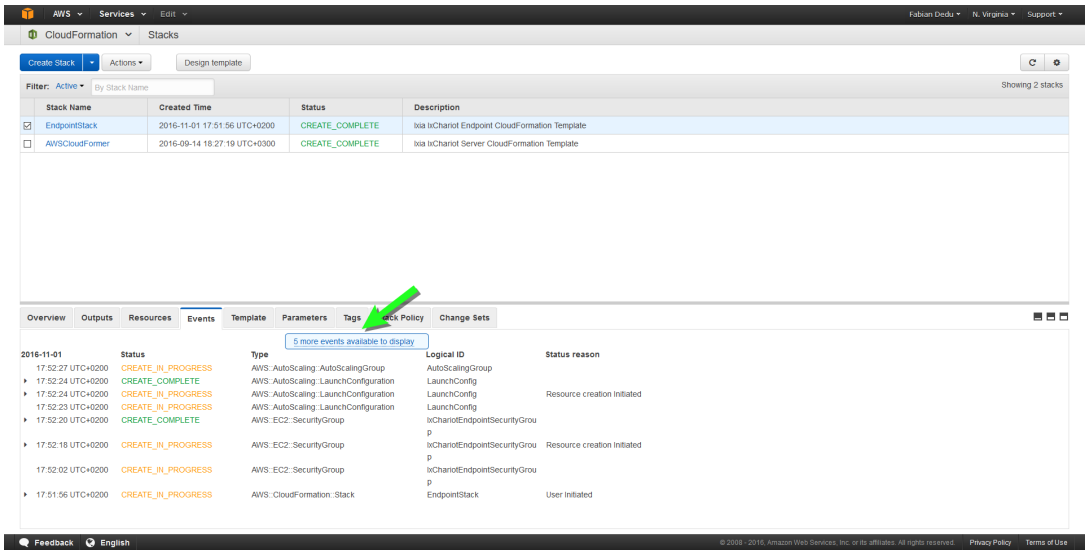
6. On the Options page, leave everything to default values and click **Next**.



7. On the Review page, click **Create**.

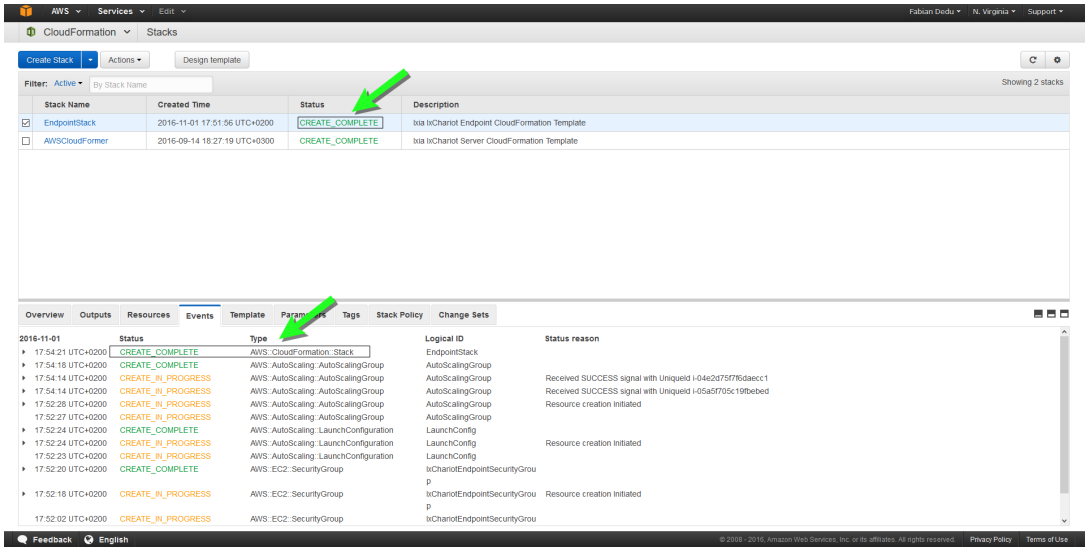


8. On the next page, the **Events** tab is automatically selected. On this tab you receive, periodically, notifications that new events are available for display. Click the link to display the new events.

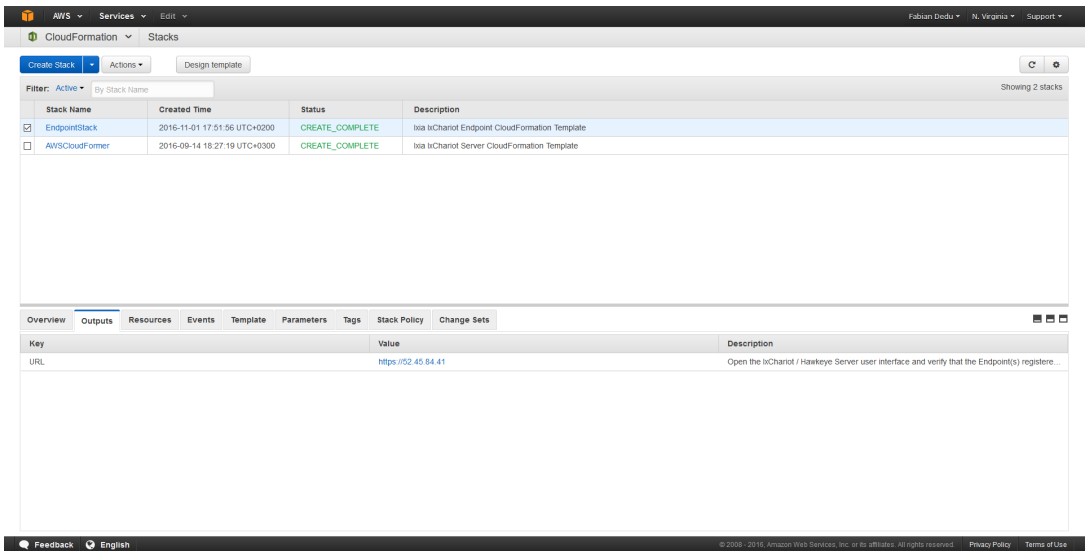


NOTE The stack creation process can take up to several minutes to complete.

To determine if the stack is completed, check the status of the creation process. When completed, the status changes as in the example shown below.



9. When the entire stack is completed, click the **Outputs** tab and then, click the URL to open the IxChariot/Hawkeye interface. At this point, you can validate that the Endpoint registered successfully. For details, refer to Validate the Endpoint Registration.



The CloudFormation template creates several AWS EC2 resources:

- One or several Instances for the IxChariot Endpoints
- A Security Group
- A Launch Configuration
- An Auto Scaling Group

If you want to delete the IxChariot Endpoints, it is recommended to delete the stack from AWS CloudFormation to make sure that all these resources are deleted.

The CloudFormation template creates the Endpoint instances as part of an Auto Scaling Group. If you are trying to manually delete an Endpoint instance, the Auto Scaling Group will automatically recreate the instance. This is why it is recommended to delete the Auto Scaling Group or the Stack from AWS CloudFormation.

Troubleshooting

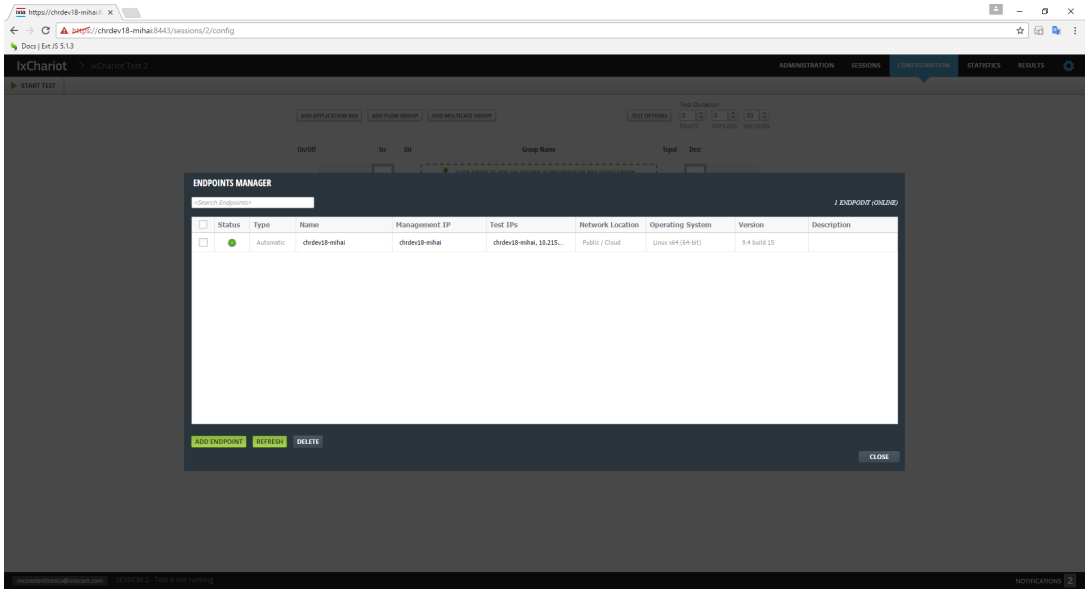
The most common error messages displayed when working with the CloudFormation template are:

Error Message	Cause
Parameter validation failed: parameter value for parameter name SSHKeyPair does not exist. Rollback requested by user.	No Key Pair was selected. For details, refer to Launching an IxChariot Endpoint Instance from AWS CloudFormation.
The specified instance type can only be used in a VPC. A subnet ID or network interface ID is required to carry out the request. Launching EC2 instance failed.	There is no Default VPC and the CloudFormation template cannot be used. For more details, refer to Launching an IxChariot Endpoint Instance from AWS CloudFormation.

Validate the Endpoint Registration

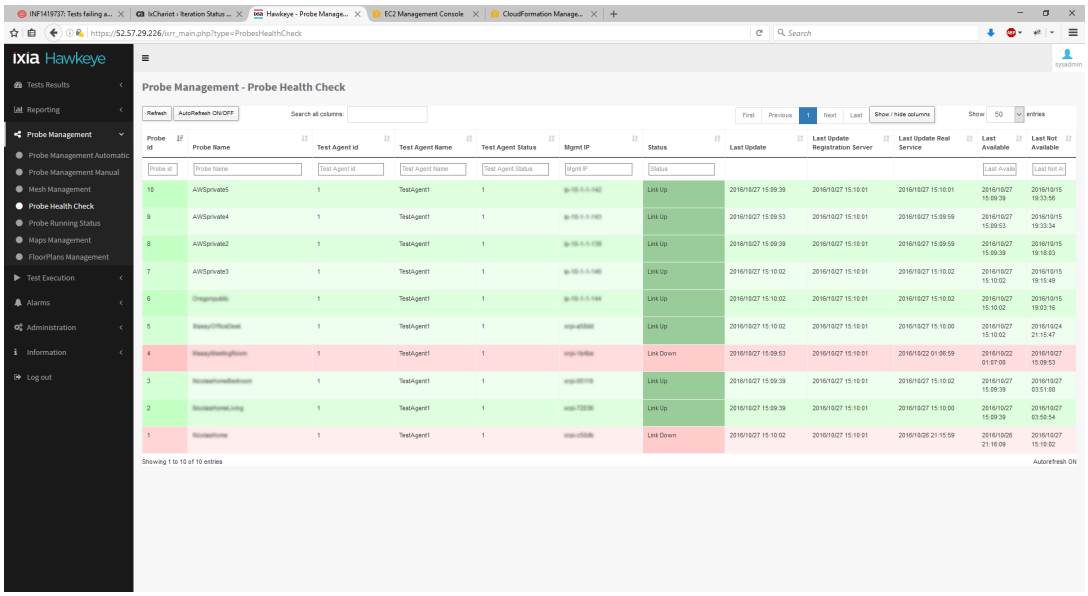
In order to validate that the Endpoint has registered correctly, follow these steps:

- Log in to the IxChariot web interface and select ⚙ **> Manage Endpoints**. The newly created Endpoint is displayed on the Endpoints Manager window.



or

- Log in to the Hawkeye Server web interface and select **Probe Management > Probe Health Check**.



Logging via SSH to the Linux OS on the IxChariot Endpoint Instance

The SSH login to the Linux OS on IxChariot Endpoint requires the private key which is part of an AWS key pair. This key pair is associated with an AWS instance when the instance is created. For more details, refer to Launching an IxChariot Endpoint Instance from AWS Marketplace or Launching an IxChariot Endpoint Instance from AWS CloudFormation.

When you log in via SSH use *ec2-ixia* as the username and the private key.

For additional information on how to connect to the IxChariot Endpoint EC2 instance refer to the following Amazon documents:

- Documentation for keypair management: http://-docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html
- Connecting from a Windows client with Putty: http://-docs.aws.amazon.com/AWSEC2/latest/UserGuide/putty.html
- Connecting from a Linux client with SSH: http://-docs.aws.amazon.com/AWSEC2/latest/UserGuide/AccessingInstancesLinux.html

Upgrading the IxChariot Endpoint Instance

You can upgrade the IxChariot Endpoint instance by using one of the following methods:

1. You can delete the old instance and create a new instance with the new version. This method is safe to use because the IxChariot Endpoint instance does not store any relevant information. This means that when you delete the old instance no useful information is lost.

or

2. You can perform an in-place upgrade, as follows:
   - Download the new version of the IxChariot Endpoint for Linux 64-bit from https://support.ixiacom.com/support-links/ixchariot/endpoint-library/platform-endpoints.
   - Copy the Endpoint to your instance (the username is *ec2-ixia*).
   - Finish the upgrade by using the instructions from the *readme* file.

Deploying IxChariot Endpoints outside of AWS

After deploying an IxChariot Endpoint instance in AWS, you can deploy other IxChariot Endpoints in your enterprise network, in order to run networking tests between them.

You can download the Endpoints for free, from the following URL: http://www.ixiacom.com/products/ixchariot/endpoint-library/platform-endpoints. They are available for Windows, Linux, macOS, Android or iOS operating systems.

It is required to register the endpoints to the Registration Server hosted by the IxChariot or Hawkeye Server. Each endpoint must be configured with the address of the Registration Server, which is the public address of the IxChariot or Hawkeye Server.

Depending on the endpoint type, Windows, Linux, or macOS, installation is done as follows:

- Windows endpoints prompt you for the Registration Server address during installation. Windows endpoints automatically start after system reboot.
- Linux endpoints prompt you for the Registration Server address when using the `.tar.gz` installation method. They do not start automatically after system reboot, but automatic start can be configured, for example, by adding the following line to the `/etc/rc.local` file:
  `/usr/local/Ixia/endpoint 1>>/var/local/endpoint.console 2>&`
- macOS endpoints do not prompt you for the Registration Server address during the installation. The Registration Server address can be configured from the `endpoint.ini` file, by updating the **REGISTRATION_SERVER_ADDRESS** field, followed by the endpoint restart.

For details, including how to configure the endpoint to automatically start after system reboot, refer to the *Performance Endpoints Guide* that is available on the Ixia website.