

IxChariot Endpoint Amazon EC2 Deployment Guide

IxChariot 9.4, February 2017



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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.

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	General purpose	m4.large	2	8	EBS only	Yes	Moderate
	General purpose	m4.xlarge	4	16	EBS only	Yes	High
	General purpose	m4.2xlarge	8	32	EBS only	Yes	High
	General purpose	m4.4xlarge	16	64	EBS only	Yes	High
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Click Next: Configure Instance Details.

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

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Click Next: Add Storage.

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

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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.

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								Cancel	Previous	Review and Launch

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 Endpoint. You can add all these port ranges as new firewall rules for the AWS Security Group:

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• 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.

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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.

EDIT FLOW			
Parameter	Current Value	Default Value	Comment
Initial Delay (ms)	0	0	Delay before starting th 🔺
Source Port	Auto	Auto	What port to use for sou
Destination Port	5000	Auto	What port to use for des
Data Rate	Unlimited	Unlimited	How fast to send data
Data Type	NOCOMPRESS	NOCOMPRESS	What type of data to send
Send Buffer Size	16384	16384	How many bytes of data
Receive Buffer Size	16384	16384	Maximum number of b
MSS	Default	Default	Maximum payload size
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			CLOSE

If you have configured a single ports range for both TCP and UDP, it is recommended to configure it in IxChariot at **O** > **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.

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• 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.

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ity group is a set of firewall rules that co	ntrol the traffic for your instance. On this page, you can add rules to a	allow specific traffic to reach your instance. For example, if you want to set up a	web server and allow Internet traffic to reach your instance, add rules that all	llow unrestricted access to
P and HTTPS ports. You can create a r Assign a security group:	ew security group or select from an existing one below. Learn more a @Create a new security group.	bout Amazon EC2 security groups.		
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			Cancel Previous	Review and Launch
Feedback Q English			Gancel Previous 0 2016 -2014, 4-razze tites Benders, K., or its officies - All poin reserved.	Review and Launch

Click **Review and Launch**.

9. Finally review all settings and click Launch.

to access your instance.

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.

Select a	n existing key pair or create a new key pair	×
A key pair co they allow yo to obtain the securely SSH	onsists of a public key that AWS stores, and a private key file that you store ou to connect to your instance securely. For Windows AMIs, the private key file password used to log into your instance. For Linux AMIs, the private key file a H into your instance.	. Together, is required llows you to
Note: The set about remov	elected key pair will be added to the set of keys authorized for this instance. Lea ring existing key pairs from a public AMI.	arn more
IxChariot	tTest	
	Download Ke	y Pair
	You have to download the private key file (*.pem file) before you can continue Store it in a secure and accessible location. You will not be able to downlo file again after it's created.	e. ad the
	Cancel Launch In	stances

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.

A k the to c sec	ey pair consists of a public key that AWS stores, and a private key file that you store. To y allow you to connect to your instance securely. For Windows AMIs, the private key file is obtain the password used to log into your instance. For Linux AMIs, the private key file allow urely SSH into your instance.	ogether, required ws you to
Not abo	e: The selected key pair will be added to the set of keys authorized for this instance. Learn but removing existing key pairs from a public AMI.	n more
	Choose an existing key pair	~
	Select a key pair	
	test-ssh	~

Cancel Launch Instances

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 <u>Assign an Elastic IP</u> <u>Address to the Instance</u>.

- 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 <u>Logging</u> 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 <code>rs_address</code> with the public address of the IxChariot or Hawkeye Server.
 - Reboot the IxChariot Endpoint instance.
 - Make sure that the Endpoint has registered correctly. See <u>Validate the Endpoint</u> <u>Registration</u>.

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.

- 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.

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EC2 Dashboard	Allocate New Address Actio	ons v				Ð	¢
Tags	Q Filter by attributes or search by	keyword				Ø K < 1 to 3 of 3	3 > >
Reports Limits	Elastic IP	Allocation ID		Private IP Address	Scope	- Public DNS	Ŧ
INSTANCES	52.28.8.47	eipalloc-2077db49 i-	769af0ca (Hawkeye Sweden)	10.1.2.210	vpc-01154b68	ec2-52-28-8-47.eu-central	l-1
Instances	52.58.118.178	eipalloc-3658ff5f i-	2c7c1a90	10.1.2.138	vpc-01154b68	ec2-52-58-118-178.eu-cer	ntral
Spot Requests	52.59.20.249	eipall Allocate New Ad	dress	,	vpc		
Reserved Instances		Release Address	es				
Dedicated Hosts		Associate Addre	ss				
= IMAGES		Disassociate Ad	dress				
AMIs			_				
Bundle Tasks							
ELASTIC BLOCK STORE							
Volumes							
Snapshots							
NETWORK & SECURITY							
Security Groups	Address: 52.59.20.249						
Elastic IPs	Elastic IP	52.59.20.249		Network interfa	ace ID -		
Placement Groups	Instance			Private IP ad	idress -		
Key Pairs	Scope	vpc		Network interface	owner -		
Network Interfaces	Public DNS	-		Allocat	tion ID eipalloc-43cf7a2a		
LOAD BALANCING							
Load Balancers							

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

Associa	ate Address		×
Select the in	stance OR network interface to whic	h you wish to associate this IP address (52.59.20.249)	
	Instance	I- <u>b11f640d</u>	
	Network Interface	i-b11f640d (IxChariot Server) (running)	
	Private IP Address	172.31.10.228* - 52.29.214.11 • (j)	
		Reassociation	
A V 11	Warning f you associate an Elastic IP address public IP addresses .	with your instance, your current public IP address is released. Learn more about	
		Cancel	ate

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://edocs.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.
- On the Choose a template section, select Upload a template to Amazon S3, click Browse and upload the CloudFormation template. Click Next.

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CloudFormation ~ Stacks	 Create Stack 									
Create stack										
Select Template	Select Template									
Specity Details Options Review	Select the template that descrit	the template that describes the stack that you want to create. A stack is a group of related resources that you manage as a single unit.								
	Design a template	Use AVS CoudFormation Designer to create or modify an existing template. Learn more. Design template								
	Choose a template	A template is a JSON/VAML-formaticed text file that describes your stack's resources and their properties. Learn more. O Select a sample template								
		Upload a template to Amazon S3								
		Browse WcTharlot, Endpoint joon O Specify an Amazon S3 template URL								
				Cancel	Next					

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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 <u>https://aws.amazon</u> <u>com/ec2/instance-types</u> .
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 pub- lic / cloud firewall.
	Hawkeye Server, you must open here the entire range of ports (1024 to 65535).

AWS V Services V Edit V	Create Steak		Fabian Dedur 👘 N. Virginia 👻 Support 👻
Create stack	· Oreate Stack		
Select Template	Specify Details		
Options Review	Specify a stack name and para	meter values. You can use or change the defau	It parameter values, which are defined in the AWS CloudFormation template. Learn more.
	Stack name	EndpointStack	
	Parameters		
	Key Pair for SSH Access	test-ssh -	
		An Amazon EC2 Key Pair is required to gain SSH acc http://docs.aws.amazon.com/AWSEC2/latest/UserGu	ess to your instances after they are created. Choose one of your existing Koy Pairs from the dop-down. If you don't aiready have a Koy Pairs please create one by following the steps at dedec2-key-pairs htm#thaving-ec2-create-your-key-pair. When logging to your Endpoint instances through SEH, use 'ec2-bita' as usemame and the private key Nie from the Key Pair.
	Number of Instances	3	How many bCharlot Endpoint Instances to create
	Instance Type	12.micro v Determines what hardware resources will be availab	e to the luChariot Endpoint and how much you will be charged by Amazon. Nore details about the various instance types are available at https://sws.amazon.com/ec2/instance-types.
	lxCharlot / Hawkeye Server Address	52 45 84 41	The address (hostname or Public IP) of the InCharlot or Hawkeye Berver to which the InCharlot Endpoint will register
	Test Traffic Ports	5000,5100 The range of TCP and UCP ports to open into the AW also configure the same ports range into the biChario Hawkeye Server, you must open here the entire range	Grewall for the test fulfic. Enlist the beginning and the end of the ports range, separated by a comma (e.g. 5000,5000), if you are registering the Endpoints the InChantid Server, you must Grewall for the test fulfice, at their - 19 Account - User Professor - Chantid - Ceneral - Ports operated for the test fulfic ratio the public / double Terror are registering the Endpoints to the or ports (1024 to 65556).
			Cancel Previous Rest
nttps://console.aws.amazon.com/cloudformation/home?regio	n=us-east-1		© 2008 - 2015, Amazon Web Services, Inc. or its attiliates All rights reserved. Privacy Policy Terms of Use

Click Next.

https://

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

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CloudFormation V Stacks	Create Stack	
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	Permissions You can choose an IAM role that CloudFormation uses to create, modify, or deter resources in the stack. If you don't choose IAM Role Choose a role (optional) w Enter role an	ose a role. CloudFormation uses the permissions defined in your account. Learn more.
	Advanced You can set additional options for your stack, like notification options and a stack policy. Learn more.	
		Cancel Previous Mest

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

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CloudFormation V Stacks	> Create Stack	
Create stack Select Template Specify Details Options Review	Review Template Template URL https://s3-entenai-1.amazonaws.com/c1/emplates-1mb/vengnc/924-us-easi-1/2016306TXL-biChanot_Endpoint.gon Description List bichanot Endpoint Courd-ormation Template Estimate cost Codi	
	Details	
	Stack name EndpointStack SH4(weyain test-sh InstancesCount 3 InstanceType 12 micro ServerAndress TestTratticFirewaitPorts 5000.5100	
	Options Tags I to tays provided	
	Advanced Notification Timeout none Rollback on failure Yes	
		Cancel Previous 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.

Virtual	ter: Active - By Stack Na	ame					Showing 2 stacks
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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.

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٥	CloudFormation	n 🖌 Stacl	ks								
Crei	ate Stack 🔹 A	ctions -	Design ter	mplate							C O
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 1 	7:54:14 UTC+0200	CREATE IN F		AWS::Aut	toScaling: Autos	ScalingGroup	 - A	AutoScalingGroup	Received SUCCESS signal with Uniqueld I-05a5f705c19fbebed		
 15 	7:52:28 UTC+0200	CREATE IN F	PROGRESS	AWS::Aut	toScaling::AutoS	ScalingGroup	5 A	AutoScalingGroup	Resource creation Initiated		
15	7:52:27 UTC+0200	CREATE IN F	PROGRESS	AWS::Aut	toScaling::AutoS	ScalingGroup	5 A	AutoScalingGroup			
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15	7:52:23 UTC+0200	CREATE_IN_F	PROGRESS	AWS::Aut	toScaling::Laun	chConfigurati	tion L	aunchConfig			
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1	7:52:02 UTC+0200	CREATE_IN_F	PROGRESS	AWS::EC	2::SecurityGrou	ip	Þ	, «ChariotEndpointSecurityGrou			~

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 <u>Validate the Endpoint Registration</u>.

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CloudFormation ~	Stacks			
Create Stack Actions	Design template			C O
Filter: Active - By Stack Name				Showing 2 stacks
Stack Name	Created Time	Status	Description	
EndpointStack	2016-11-01 17:51:56 UTC+0200	CREATE_COMPLETE	Ixia txChariot Endpoint CloudFormation Template	
AWSCloudFormer	2016-09-14 18:27:19 UTC+0300	CREATE_COMPLETE	Ixia IxChariot Server CloudFormation Template	
	ň., ř., ř.			
Overview Outputs Reso	urces Events lemplate P	arameters lags stack P	olicy change sets	
Key		Value		Description

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	No Key Pair was selected. For details, refer
not exist. Rollback requested by user.	from AWS CloudFormation.
<i>The specified instance type can only be used in a VPC. A subnet ID or network interface</i>	There is no Default VPC and the CloudForm- ation template cannot be used. For more
<i>ID is required to carry out the request.</i> <i>Launching EC2 instance failed.</i>	details, refer to <u>Launching an IxChariot End</u> - point 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.

😂 INF1419737: Tests failing a 🗙	Câ lxChariot - I	teration Status × 📴 Hawkeye - Pr	obe Manage 🗙 🧯 EG	2 Management Console	× 😑 CloudFormation I	Manage × +					-	σ	×	
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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 <u>Launching an IxChariot Endpoint Instance from AWS Marketplace</u> or <u>Launching an IxChariot Endpoint Instance from AWS CloudFormation</u>.

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: <u>http://-</u> <u>docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html</u>
- Connecting from a Windows client with Putty: <u>http://-</u> docs.aws.amazon.com/AWSEC2/latest/UserGuide/putty.html
- Connecting from a Linux client with SSH: <u>http://-</u> 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://sup-port.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: <u>http://www.ixi</u>-<u>acom.com/products/ixchariot/endpoint-library/platform-endpoints</u>. 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.