

Getting Started with IxLoad for AWS

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Introduction

Ixia's CloudFormation templates, available in the AWS Marketplace enable deployment of IxLoad in the cloud. AWS uses these templates to quickly and reliably provision the services or applications (called "stacks"). Once deployed through CloudFormation templates, the services are available as IxVM instances in a new VPC. The CloudFormation templates are also available for download that you can modify to suit to your environment. Every newly-deployed VMone instance has one management network and one test network port, each with a private IP address.

IxLoad application performance test tool generates application traffic within the environment that you want to test or generate the traffic from that environment to some destination. By integrating IxLoad in the required environment and using the CloudFormation templates, you can configure and run the tests.

The following CloudFormation templates are available in AWS Marketplace:

- IxLoad-on-AWS-1-Arm-Add-On-Use-Case-CloudFormation on page 3
- IxLoad-on-AWS-1-Arm-Standalone-Use-Case-CloudFormation on page 4
- IxLoad-on-AWS-1-Arm-Use-Case-CloudFormation on page 5
- IxLoad-on-AWS-2-VMone-Add-On-Use-Case-CloudFormation on page 6
- IxLoad-on-AWS-2-VMone-Standalone-Use-Case-CloudFormation on page 7
- IxLoad-on-AWS-2-VMone-Use-Case-CloudFormation on page 8

In addition to the instances, the IxLoad CloudFormation template automatically creates the following AWS entities:

- One VPC with same name as given for Stack name.
- One public subnet and one private subnets for each of the test interface specified during stack creation.
- Two new routing tables named with the stack name. One table is for public routing and the other for private routing. All private subnets are associated with the private routing table.
- An internet gateway that is assigned to the public routing table and public subnet
- Two security groups named with the stack name. One group is the for management interface and the other is for the test interfaces.
- Two IAM roles, EC2ReadonlyRole and LambdaExecutionRole ,named with stack name. These roles are assigned to newly created virtual test appliance instances.

The image below shows the IxLoad AWS topology.

IxLoad AWS topology





IxLoad-on-AWS-1-Arm-Add-On-Use-Case-CloudFormation



IxLoad-on-AWS-1-Arm-Standalone-Use-Case-CloudFormation



IxLoad-on-AWS-1-Arm-Use-Case-CloudFormation



IxLoad-on-AWS-2-VMone-Add-On-Use-Case-CloudFormation



IxLoad-on-AWS-2-VMone-Standalone-Use-Case-CloudFormation



IxLoad-on-AWS-2-VMone-Use-Case-CloudFormation

IxLoad test topology

You can configure the client network with or without an Emulated Router (ER).

The image below shows an IxLoad client NetTraffic connected to a server NetTraffic through a DUT.



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Deployment

This section describes how to use the Ixia CloudFormation templates available in AWS Marketplace to deploy and configure IxVM virtual test appliance instances on AWS.

IxLoad application performance test tool focuses on network infrastructure and it generates application traffic within the environment that you want to test; be it within the public cloud or generating traffic from the public cloud to some other destination. By integrating IxLoad in the environment and using the CloudFormation templates directly from the AWS Marketplace, you can view and understand how IxLoad VE works in the public cloud.

Before you begin

Before you begin, you must:

- possess a valid Ixia license. The available option for licensing is only Buy Your Own License (BYOL), which is essential and is provided by your local sales team.
- have an AWS user ID that has IAM Role Creation and Lambda Execution privileges.
- create a key pair from AWS console.

After deploying the template, you must configure the secondary IP addresses of each instance, either manually or by using a script.

Deployment

The deployment of IxLoad process includes:

- Locating the Ixia Virtual Edition below
- Selecting the CloudFormation Template on the next page
- Creating a Stack on page 13

Locating the Ixia Virtual Edition

To locate the Ixia Virtual Edition in AWS Marketplace:

- 1. Log on to AWS console.
- Go to the AWS Marketplace web site (<u>https://aws.amazon.com/marketplace</u>). AWS Marketplace lists the different vendors, from where you can search and select the required product.
- 3. In the search box, type IxLoad.

The search result displays Ixia Virtual Edition (IxLoad VE and IxNetwork VE) as depicted in the following image:

Ixload (1 result) showing 1 - 1



Ixia Virtual Edition (IxLoad VE and IxNetwork VE)

Version 9.00 | Sold by IXIA

Now cloud-enabled, the market-proven IxLoad application offers cost- effective, elastic, and sharable virtualized test capabilities that you can quickly deploy and scale across Amazon public clouds.

4. Select the Ixia Virtual Edition (IxLoad VE and IxNetwork VE) link.

The information about the product appears that comprises the version, licensing, instance size options, fulfillment options, and support information.

Selecting the CloudFormation Template

You can use the fulfillment options by the cloud formation templates, which helps to get started with the deployment. The templates are available for download and allow you to quickly deploy the product. Once downloaded, you can go into greater detail, modify them, and make them useful for your environment. In addition, you not only get the Amazon Machine Image (AMI) listings, but also the actual working topology that can be used on other environments.

The available option for licensing is only Buy Your Own License (BYOL), which is essential and is provided by your local sales team. To procure appropriate license, contact the Ixia local sales team.

To select the appropriate CloudFormation template:

- 1. In the Ixia Virtual Edition (IxLoad VE and IxNetwork VE), select **Continue to Subscribe**.
 - The **Subscribe to this software** page displays.
- 2. In the **Subscribe to this software** page, accept the terms of the end user license agreement and select **Continue to Configuration**.

The **Configure this software** page displays.

3. In the **Configure this software** page, select the required CloudFormation template available in the **Fulfillment Option** list.

The **Fulfillment Option** is achieved by the CloudFormation templates, which are designed and developed based on the references of customer experience/usage.

There are two types of templates:

- 1-Arm templates—used as client only in the application traffic generation
 - IxLoad-on-AWS-1-Arm-Add-On-Use-Case-CloudFormation
 With these templates, you can add or attach an application, for example, IxLoad to your environment that has SUT/DUT.
 - IxLoad-on-AWS-1-Arm-Standalone-Use-Case-CloudFormation
 It is very similar to the basic template; but has more configuration parameters like VPC, IP addressing, and so on.

- IxLoad-on-AWS-1-Arm-Use-Case-CloudFormation
 - A basic template that has very few configuration parameters. The VPC, the IP addressing is all statically configured to get the system up and running.
- 2-VMone templates—Used as both client and server
 - IxLoad-on-AWS-2-VMone-Add-On-Use-Case-CloudFormation
 With these templates, you can add or attach an application, for example, IxLoad to your environment that has SUT/DUT.
 - IxLoad-on-AWS-2-VMone-Standalone-On-Use-Case-CloudFormation
 It is very similar to the basic template; but has more configuration parameters like VPC, IP addressing, and so on.
 - IxLoad-on-AWS-2-VMone-Use-Case-CloudFormation

A basic template that has very few configuration parameters. The VPC, the IP addressing is all statically configured to get the system up and running.

- 4. Verify the Software Version and select the required Region.
- 5. For the selected template, verify the pricing information for software and AWS infrastructure. The software pricing of Ixia Virtual Edition is Bring Your Own License (BYOL), whereas the infrastructure pricing for the selected template is provided by AWS.
- 6. Select **Continue to Launch**.
- 7. Review the **Configuration Details** and select **Launch**.

Creating a Stack

When you select and launch a CloudFront template, AWS automatically selects the S3 location as depicted in the following image.

Create stack				
Select Template	Select Template			
Specify Details Options Review	Select the template that describ	es 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 AWS CloudFormation Designer to create or modify an existing template. Learn more. Design template		
	Choose a template	A template is a JSON/YAML-formatted text file that describes your stack's resources and their properties. Learn more.		
		*		
		Choose File No file chosen		
		Specify an Amazon S3 template URL Intps://awsmp-tuttilment-cf-templates-prod s3-external-1 amazonaws.com/65a709a2-714e-45{ View/Edit template in Designer		
			Cancel	Next

To create a stack:

- 1. In the Create stack > Select Template tab, select Next.
- 2. In the **Specify Details** tab, provide the following information and select **Next**.

- Stack Name: Provide a meaningful stack name.
- User Email Tag: Optionally, provide a valid email ID.
- **Ixia Client Instance Type**: Select the required instance type for the IxLoad client, if you want to override the existing EC2 instance.
- **Ixia Client SSH Key**: Select the AWS key-value pair that you have generated from the AWS console.
- **VMone Instance Type**: Select the required instance type for VMone, if you want to override the existing EC2 instance. The default size is c4.4xlarge. In case you require higher throughput, select the size accordingly.
- **Inbound IPv4 CIDR Block**: Enter your IP address of the public internet. This is the IP address for inbound security group settings and not the IP address of the instances.
 - **Note:** If you are not aware of the IP address, then type what's my IP address in the google search box. Google displays your public facing IP address.

Create stack		
Select Template	Specify Details	
Options Review	Specify a stack name and parameter values. You can use or change the default parameter values, which are defined in the AWS CloudFormation template. Learn more.	
	Stack name KEYSIGHT-01-INSIGHT-2019-DLOAD	
	Parameters	
	User Tag Configuration	
	User Email Tag keysight_01@keysight.com Email address tag of user creating the stack	
	Ixia Client Instance Configuration	
	bxia Client Instance Type m4.xlarge Instance type of bia Client VM	
	Ixia Client SSH Key keysight-avs-dev-lsgscglobal-key-pair-u • Name of an existing EC2 KeyPair to enable SSH access	
	VMone Instance Configuration	
	VMone Instance Type C4.4xlarge	
	Security Group Configuration	
	Inbound IPv4 CIDR Block IP Address /32 or IP CIDR range connecting inbound to tota Client	
		Cancel Previous Next

 In the **Options** tab, enter a tag a (key-value pair) that you can use to identify the instance. Select **Next**.

Select Template	Options										
Options Review	Tags You can specify tags (key-value pairs) for resources in your stack. You can add up to 5	Tags You can specify tags (key-value pairs) for resources in your stack. You can add up to 50 unique key-value pairs for each stack. Learn more									
	Key (127 characters maximum)	Value (255 characters maximum)									
	1										
	Permissions										
	You can choose an IAM role that CloudFormation uses to create, modify, or delete resources in the stack. If you don't choose a role, CloudFormation uses the permissions defined in your account. Lean IAM Role Choose a role (optional)										
	Enter role am										
	 Rollback Triggers 										
	Rollback triggers enable you to have AWS CloudFormation monitor the state of your ap you've specified Learn more	plication during stack creation and updating, and to rollback that operation if the application breaches the threshold of any of the alarms									
	Monitoring Time 0 0-180 Minutes Minimum value of 0. Maximum value of 180.										
		Available triggers remaining: 5									
	Туре	ARN (Amazon Resource Name)									
	1 AWS::CloudWatch::Alarm										

4. In the **Review** tab, view the summary of configuration performed to create the stack. Select **I** acknowledge that AWS CloudFormation might create IAM resources check box.

5. Select Create.

AWS begins deploying the stack.

On the CloudFormation Stacks page, the stack deployment status is displayed as $\tt CREATE_IN_PROGRESS.$

You can select the **Events** tab to view the status of various sub-tasks.

Similarly, you can select the **Templates** tab to view the complete details about the CloudFormation template. For example, you can view the AMIs for IxLoad client, or AMIs for the VMones, and so on.

When the stack has been deployed, the stack status displays as CREATE COMPLETE.

aws	Servio	:es ∽ Resour	ce Group	os v 🍾							Ω kbiswas@ixiacom.com @ aws ▼ N. Virginia ▼ Support ▼
U CIOL	IdFormation	Stacks									
Create Sta	ack 🝷 A	ctions -	Design ter	mplate							C O
Filter: A	tive - By St	ack Name									Showing 4 stacks
Stacl	k Name		c	created Time		Sta	tus		Description		
🗹 ixia-v	irtual-test-appl	iance	2	018-05-24 12:5	55:03 UTC+0550	CR		RESS	Stack creating a	VPC and laund	nch EC2 instances within it. **WARNING** This template creates Amazon EC2 instances. You will be billed for the AWS resources used
Overview	/ Outputs	Resources	Events	Template	Parameters	Tags	Stack Policy	Chang	e Sets Rollba	ck Triggers	
Filter by:	Status • S										
018-05-24		Status		Туре				Logical ID		Status Re	eason
12:55:5	0 UTC+0550	CREATE_IN_PRC	GRESS	AWS	EC2::SubnetRout	eTableAs:	sociation	PublicSubr	etARouteTable	Resource	e creation Initiated
12:00:0	0.010+0550	CREATE_COMPL	CDERE	AVVSt	EC2::NetworkActE	nury aTablaAc	notistion	Privateneti Public Subr	orkAcientryEgres	5	
12:55:4	9 UTC+0550	CREATE COMPL	FTE	AWS: F	EC2::NetworkAcIE	intry	sociation	PrivateNet	orkAc/EntryIngre	is.	
12:55:4	8 UTC+0550	CREATE IN PRO	GRESS	AWS::E	EC2::Route	,		RouteToInt	ernet	Resource	e creation Initiated
12:55:4	7 UTC+0550	CREATE_IN_PRO	GRESS	AWS::E	EC2::Route			RouteToInt	ernet		
12:55:4	6 UTC+0550	CREATE_COMPL	ETE	AWS	EC2::Subnet			StackPublic	SubnetA		
12:55:4	4 UTC+0550	CREATE_COMPL	ETE.	AWS::E	EC2::VPCGatewa	yAttachm	ent	InternetGal	ewayAttachment		
12:55:3	4 UTC+0550	CREATE_IN_PRO	GRESS	AWS::E	EC2::NetworkAcIE	intry		PrivateNetv	vorkAcIEntryEgree	s Resource	e creation Initiated
12:55:3	3 UTC+0550	CREATE_IN_PRO	GRESS	AWS::E	EC2::NetworkAcIE	intry		PrivateNet	vorkAcIEntryIngre	is Resource	e creation Initiated
12:55:3	3 UTC+0550	CREATE_IN_PRC		AWS::E	EC2::NetworkAclE	intry		PrivateNet	vorkAcIEntryEgres	S	
12:55:3	3 UTC+0550	CREATE_IN_PRO	GRESS	AWS	EC2::NetWorkAciE	intry		Privateneti	/orkAciEntryingre	is December 2	
12:55:3	0 UTC+0550	CREATE_IN_PRO	ETE	AWS	EC2SecurityGro	up		Private Dou	teTable	Resource	e creation initiated
12:55:3	0 UTC+0550	CREATE COMPL	ETE	AWS	EC2::SecurityGro	un		TestNetwSe	curityGroup		
12:55:3	0 UTC+0550	CREATE IN PRO	GRESS	AWS.:	EC2::SecurityGro	up		Momtinstar	ceSecurityGroup		
12:55:3	0 UTC+0550	CREATE_COMPL	ETE	AWS::E	EC2::NetworkAcl			PrivateNet	/orkAcl		
12:55:3	0 UTC+0550	CREATE_COMPL	ETE	AWS::E	EC2::VPCDHCPO	ptionsAss	sociation	DhcpOption	nsAssociation		
12:55:2	9 UTC+0550	CREATE_COMPL	ETE.	AWS::E	EC2::RouteTable			PublicRout	eTable		
12:55:2	9 UTC+0550	CREATE_IN_PRO	GRESS	AWS::E	EC2::Subnet			StackPublic	SubnetA	Resource	e creation Initiated
12:55:2	9 UTC+0550	CREATE_IN_PRO	GRESS	AWS::E	EC2::VPCDHCPO	ptionsAss	sociation	DhcpOptio	nsAssociation	Resource	e creation Initiated
12:55:2	9 UTC+0550	CREATE_IN_PRO	GRESS	AWS::E	EC2::NetworkAcl			PrivateNetv	vorkAcl	Resource	e creation Initiated
12:55:2	9 UTC+0550	CREATE_IN_PRO		AWS::E	EC2::SecurityGro	up		restNetwSe	cuntyGroup	Resource	e creation initiated
12:55:2	9 01 C+0550	CREATE_IN_PRO		AWS::E	EC2::VPCDHCPO	puonsAss	sociation	OncpOption StackBublin	SubpotA		
12:00:2	9.010+0000	CREATE_IN_PRO	GRESS	AWS	EC2Sublet			SIGURPUDIK	Sublicia		

6. Go to AWS console and view the instances so created.

As an example, the below image depicts the network interface eth0 for VMONE1. The eth0 interface is the commanding control between the IxLoad client and VMone itself.

	Launch Instance	Connec	Actions Y								∆ ≎	٥	0
ĩ	Q. Instance St	tate : Running 💿	Add filter							0 K (1 to 4 of 4	> >	
	Name				Options -	Instance I~	Instance Type ~	Availability Zone	 Instance State ~ 	Status Checks	- Alam	h Status	
	armdupre_I	NSIGHT_2019_LIC	ENSE_SERVER_9.00_US_EA	ST_1	WEEK	I-0c0410	c4.large	us-east-1c	running	2/2 checks passed	None	,	5
	Ixia Virtual	Edition (IxLoad VE a	and IxNetwork VE)_IXLOAD_C	LIENT_9.00_US_EAST_1	MANUAL	i-0ca574	m4.xlarge	us-east-1c	running	a Initializing	None	,	5
	Ixia Virtual I	Edition (IxLoad VE a	and IxNetwork VE)_IXLOAD_V	MONE1_9.00_US_EAST_1	MANUAL	i-0eaf1b	c4.4xlarge	us-east-1c	running	2/2 checks passed	None	,	5
	bxia Virtual I	Edition (IxLoad VE a	and IxNetwork VE)_IXLOAD_V	MONE2_9.00_US_EAST_1	MANUAL	i-063cb0	c4.4xlarge	us-east-1c	running	2/2 checks passed	None		
			Network Interface eth0										
	Instance: i-0ea	f1b6000ecc02de Status Checks	Interface ID VPC ID Attachment Owner	<u>eni-00ae327165b931915</u> vpc-0930096f7b50c124c 541934583164								80	*
		Instance ID Instance state Instance type	Attachment Status Attachment Time Delete on Terminate Private IP Address	attached Fri Sep 20 12:52:36 GMT-40 false 10 0.10 11	00 2019				3-221-251-193.compute 1.251.193	-1.amazonaws.com			
		Elastic IPs	Private DNS Name	ip-10-0-10-11.ec2.internal					0-0-10-11.ec2.internal				L
		Availability zone	Public IP Address	3.221.251.193					10.11, 10.0.2.12		10		L
		Security groups Scheduled events AMI ID	Source/Dest. Check Description Security Groups Flastic Fabric Adapter	false bia Virtual Edition (bLoad V VE)_IXLOAD_VMONE1_9.0 KEYSIGHT-01-INSIGHT-20 Disabled	E and btNetwork I0_ETH0_US_EA 19-IXLOAD-KeyM	ST_1 IgmtSecurityGrou	up-TS1HA691UM53		2 13, 10.0.2 14, 10.0.2 2 20, 10.0.2 21 0930098f7b50c124c (bd _VPC_US_EAST_1) tet-0346768c290eee1c5	 10.0.2.16, 10.0.2.17, 10.0.2.18, 10.0.2 ia Virtual Edition (lxLoad VE and lxNetwork is (bia Virtual Edition (bxLoad VE and lxNetwork) 	vork		l
		Platform	-				Netwo	rk Interfaces	MGMT_SUBNET_US_	EAST_1)			ł
		IAM role					Source	/dest. check Fals	50				
		Key pair name					T2/	T3 Unlimited -					
		Owner	541934583164				E	S-optimized Fals	50				
		Launch time	September 20, 2019 at 12:52	2:36 PM UTC-4 (less than one	hour)		Roo	t device type ebs					
	Tern	nination protection	False					Root device /dev	v/sda1				

Similarly, the below image depicts the network interface eth1 for VMONE1. The eth1 is the network interface for the test port.

and a suffice	Connec										A 0	• •
Instance Sta	ate : Running 💿	Add filter								0 K	1 to 4 o	14 > >l
Name				Options -	Instance I+	Instance Type 👻	Availability Zon	e - Instance State -	Status Checks		- Ala	rm Status
armdupre_IM	NSIGHT_2019_LIC	ENSE_SERVER_9.00_US_EA	ST_1	WEEK	I-0c0410	c4.large	us-east-1c	running	2/2 checks passed		No	ne -
Ixia Virtual E	dition (IxLoad VE a	and IxNetwork VE)_IXLOAD_C	LIENT_9.00_US_EAST_1	MANUAL	i-0ca574	m4.xlarge	us-east-1c	running	X Initializing		No	ne l
Ixia Virtual E	dition (IxLoad VE a	and IxNetwork VE)_IXLOAD_V	MONE1_9.00_US_EAST_1	MANUAL	i-0eaf1b	c4.4xlarge	us-east-1c	running	2/2 checks passed		No	ne (
Ixia Virtual E	dition (IxLoad VE a	and IxNetwork VE)_IXLOAD_V	MONE2_9.00_US_EAST_1	MANUAL	i-063cb0	c4.4xlarge	us-east-1c	running	2/2 checks passed		No	ne -
	_											
ance: i-0eaf	f1b6000ecc02de	Network Interface eth1										
		Interface ID	eni-0ffd0cb0104f3034b									
scription	Status Checks	VPC ID	vpc-0930098f7b50c124c									
	1	Attachment Owner	541934583164					2 224 254 402				
	Instance ID	Attachment Status	attached					3-221-251-193.comput	e-1.amazonaws.com			
	Instance state	Attachment Time	Fri Sep 20 12:52:36 GMT-4	00 2019				1.251.195				
	Instance type	Delete on Terminate	faise					10.0.10.11.cc2.internal				
	Elastic IPs	Private IP Address	10.0.2.12					10-0-10-11.ec2.internal				
	Availability zone	Private DNS Name	ip-10-0-2-12.ec2.internal					0.10.11, 10.0.2.12	45 40 0 0 40 40 0 0 47 47		10	
	Security groups	Public IP Address	- false					2 20 10 0 2 21	2.15, 10.0.2.16, 10.0.2.17, 10	1.0.2.10, 10.0.2	.19,	
5	Scheduled events	Source/Dest. Check	Taise Jule Vietual Edition /Jul and)	E and beliebunde				0930098f7b50c124c (b	via Virtual Edition (IxLoad VE	and IxNetwork		
		Description	VE) IXLOAD VMONE1 9.	0 ETH1 US EAS	ST 1			VPC_US_EAST_1)				
	AMI ID	Security Groups	KEYSIGHT-01-INSIGHT-20	19-IXLOAD-KeyTe	st1SecurityGrou	p-1210SRNFHTR1	3	net-0346768c290eee1c	5 (bia Virtual Edition (bLoad	d VE and IxNet	work	
		Elastic Fabric Adapter	Disabled					MGMT_SUBNET_US	_EAST_1)			
	Platform							N				
	IAM role					Source	a/dest. check	Je				
	Key pair name					T2	T3 Unlimited -					
	Owner	541934583164				E	S-optimized Fa	alse				
	Launch time	September 20, 2019 at 12:52	:36 PM UTC-4 (less than one	hour)		Roo	t device type et	25				
	instian protection	False					Root device /d	ev/sda1				

Connecting to IxLoad Client

After creating the instances, you can connect to IxLoad client instance and configure the required tests. This section explains how to connect to the IxLoad client instance.

To connect to IxLoad client instance:

- 1. In the AWS console, select the IxLoad client instance.
- 2. Select Actions > Get Windows Password.

		Connect									-	<u>.</u>	+
Q Instance St	ate : Running 💿 A	Get Windown	s Password							0	< < 1 to	4 of 4	> >
Name		Create Temp Launch More	Like This	•	Options	• Instance I+	Instance Type ~	Availability Zo	one - Instance State -	Status Checks	*	Alarm	Status
armdupre_I	NSIGHT_2019_LICE	NS Instance Stat	te		WEEK	i-0c0410	c4.large	us-east-1c	running	2/2 checks passed		None	
bxia Virtual 8	Edition (IxLoad VE an	d Instance Sett	tings	US_EAST_1	MANUAL	i-0ca574	m4.xlarge	us-east-1c	running	2/2 checks passed		None	
bxia Virtual 8	Edition (IxLoad VE an	d Image		DUS_EAST_	1 MANUAL	i-0eaf1b	c4.4xlarge	us-east-1c	running	2/2 checks passed		None	
Ixia Virtual 8	dition (IxLoad VE an	Networking		D_US_EAST_	1 MANUAL	i-063cb0	c4.4xlarge	us-east-1c	running	2/2 checks passed		None	
stance: i-0ca	57477a43c92952 (Ixia Virtual Editio	on (IxLoad VE a	d IxNetwork VE	IXLOAD_CLIEN	T_9.00_US_EA	ST_1) Elastic I	P: 3.214.206.66					
Description	Status Checks	Monitoring	Tags Usage	Instructions									
	Instance ID	i-0ca57477a43c929	952				Publ	ic DNS (IPv4)	ec2-3-214-206-66.compute-	1.amazonaws.com			
	Instance state	running					1	Pv4 Public IP	3.214.206.66				
	Instance type	m4.xlarge						IPv6 IPs					
	Elastic IPs	3.214.206.66*						Private DNS	ip-10-0-10-121.ec2.internal				
	Availability zone	us-east-1c						Private IPs 1	10.0.10.121				
	Security groups	KEYSIGHT-01-INS TS1HA691UM53. v	SIGHT-2019-IXLO	AD-KeyMgmtSecur s. view outbound ru	ityGroup- les		Seconda	iry private IPs					
	Scheduled events	No scheduled even	nts					VPC ID	vpc-0930098f7b50c124c (lx VE)_VPC_US_EAST_1)	ia Virtual Edition (IxLoad VE and Ix	Network		
	AMI ID	IxLoad VE and IxNo 0c5d71a1cc29-ami	letwork VE Clients ii-0239fd421869dd	-9e662d1b-c3e5-4 d43.4 (ami-07d7ea	2a6-a7a0- 627462aff26)			Subnet ID	subnet-0346768c290eee1cf VE)_MGMT_SUBNET_US_	5 (Ixia Virtual Edition (IxLoad VE an EAST_1)	d IxNetwork		
	Platform	windows					Netw	ork interfaces	eth0				
	IAM role						Source	e/dest. check f	False				
	Key pair name	keysight-aws-dev-is	isgseglobal-key-pa	air-us-east-1			Τ2	/T3 Unlimited					
	Owner	541934583164					E	BS-optimized F	False				
	Launch time	September 20, 201	19 at 12:52:56 PM	UTC-4 (less than o	one hour)		Ro	ot device type	ebs				
Terr	notaction	False						Root device	/dev/sda1				

3. In the **Retrieve Default Windows Administrator Password** dialog box, provide the location of the Key Pair file or paste the contents of Key Pair in the text box. Select **Decrypt Password**.



- 4. Select the IxLoad client instance that you want to connect remotely, and then select **Connect**.
- 5. In the **Connect to Your Instance** dialog box, select **Get Password** to dynamically generate the windows administrator password for remotely connecting to the IxLoad instance.

Launch Instan	ce Connect	Actions ~										Δ
Q. Instance	State Running	Add filter										
Name				- (ptions		Instance -	Instance Type -	Availability Zone -	Instance State -	Status Checks	*
armdupre	INSIGHT_2019_LICE	NSE_SERVER	9.00_US_EAST_1	٧	VEEK		I-0c0410	c4 large	us-east-1c	running	2/2 checks passed	
📕 Ixia Virtua	al Edition (IxLoad VE ar	nd b:Network VE	_IXLOAD_CLIENT_9.00_US_EAST_1	ħ	IANUAL.		i-0ca574.	m4.xlarge	us-east-1c	🔮 running	2/2 checks passed	
bia Virtua	al Edition (IxLoad VE an	nd IxNetwork VE	IXLOAD_VMONE1_9 00_US_EAST_1	. N	IANUAL		i-Geaf1b	c4 4xlarge	us-east-1c	🥥 running	2/2 checks passed	
bda Virtua	al Edition (b:Load VE a	nd IxNetwork V	Connect To Your Insta	anc	е		C3		×	running	2/2 checks passed	
Description	Status Checks	Monitoring		Dow	nload Ren	note	Desktop File					
	Instance ID Instance state	i-0ca57477a43 running m4 xlarge	When prompted, connect to your in Public DNS User name	ec2 Adr	ce using the -3-214-206 ninistrator	e fol -66.	lowing details: compute-1.an	azonaws.com		214-206-66.compute- 206.66	1 amazonaws.com	
	Tanta IDa	2 244 200 200	Password	G	et Passwo	rd				10.121		
	Elastic IPs Availability zone Security groups	3 214 206 66" us-east-1c KEYSIGHT-01 TS1HA691UM	Password If you've joined your instance to a t instance. If you need any assistance connect	G direct	et Passwo ory, you ca o your insta	n us	e your director , please see o	ry credentials to con ur connection docu	nnect to your	1-10-121 ec2 internal 0 121		

- 6. Select **Download Remote Desktop File** to download and run the RDP shortcut file.
- 7. Enter the dynamically generated password to connect to the instance.

Q Instance S	tate : Running	Add filter								
Name					Options -	Instance I~	Instance Type ~	Availability Zone -	Instance State ~	Status Checks
armdupre_	INSIGHT_2019_LIC	ENSE_SERVER_	9.00_US_EAST_1		WEEK	i-0c0410	c4.large	us-east-1c	running	2/2 checks passed
lxia Virtual	Edition (IxLoad VE a	and IxNetwork VE	_IXLOAD_CLIENT_9.00	US_EAST_1	MANUAL	i-0ca574	m4.xlarge	us-east-1c	running	2/2 checks passed.
bxia Virtual	Edition (IxLoad VE a	and IxNetwork VE	_IXLOAD_VMONE1_9	00_US_EAST_1	MANUAL	i-0eaf1b	c4.4xlarge	us-east-1c	running	2/2 checks passed
bxia Virtual	Edition (IxLoad VE a	and bxNetwork V	Comment To	Western Frank				~ ~	running	2/2 checks passed
			Connect Io	windows security				^ X		
		_	You can connect to	Enter your	credentials			1 by		
istance: i-Oc	a57477a43c92952	(Ixia Virtual E	downloading and r	These credenti ec2-3-214-206	als will be used t i-66.compute-1.a	o connect to mazonaws.com				
Description	Status Checks	Monitoring		US-CYL-DC02	Administrator					
	Instance ID	i-0ca57477a4	When prompted, c	Password I			1		214-206-66.compute-	1.amazonaws.com
	Instance state	running					_		206.66	
	Instance type	m4.xlarge		More choices						
	Elastic IPs	3.214.206.66*		more choices					-10-121.ec2.internal	
	Availability zone	us-east-1c	If you've joined you		OK		Cancel	t to your	0.121	
	Security groups	KEYSIGHT-01	instance.			_				
	Schodulad quanta	TS1HA691UM	If you need any as		• •			ntation .	30098(7b50c124c //w	a Virtual Edition (IxLoad)
	Scheduled events	NO SCHEGOLEG						_	PC US EAST 1)	a vitual Editori (IXEORO
	AMI ID	IxLoad VE and						Close	-0346768c290eee1c5	(bia Virtual Edition (btLo
		0c5d71a1cc29							GMT_SUBNET_US_	EAST_1)
	Diations	Mind and					hlatu	Odto accordance atho		

Security groups

The CloudFormation template automatically creates security groups and configures the ports allowed for the inbound and outbound rules for both the management and the test interfaces.

Management interfaces

For the management interfaces, the ports allowed are:

Inbound rule:

TCP Ports	22, 80, 443, 111, 2601, 998-999, 1000, 1080, 2345, 3222, 3601, 4501, 4502, 4601, 5285, 5286, 5236, 5237, 5480, 5488, 5489, 6001-6005, 6665, 6967, 6978, 8021, 8022, 8881, 8989, 8990, 9101, 9102, 9613-9676, 10115, 10116, 10119, 17662, 17668-17777, 18765, 21123, 21653
UDP Ports	67, 68, 123, 161, 162, 605, 1000, 6004 ,10116
ICMP	<none></none>

Outbound rule:

ICMP <none>

Test interfaces

Inbound rule: All ports

Outbound rule: All ports

i Note:

IxLoad uses the boto3 python library to extract AWS-related information.

boto3 uses public IP addresses that vary by region to communicate with AWS. These IPs are listed on the following page:

https://ip-ranges.amazonaws.com/ip-ranges.json

You must manually add the required IPs to virtual test appliance's management security group manually.

For more information, see:

http://docs.aws.amazon.com/general/latest/gr/aws-ip-ranges.html

Configuring secondary IP addresses

By default, the CloudFormation template configures only one IP address per interface. If you need to use multiple IP addresses per interface, you must configure secondary IP addresses.

You can configure secondary IP addresses manually or automatically.

Manually

Refer to this page in the AWS documentation for the procedure on configuring secondary IP addresses: https://aws.amazon.com/premiumsupport/knowledge-center/secondary-private-ip-address/

Automatically

Create a python script to automatically configure secondary IP addresses.

- Configure the AWS CLI. Refer to this page in the AWS documentation: <u>https://docs.aws.amazon.com/cli/latest/userguide/awscli-install-linux.html#awscli-install-linux.html#awscli-install-linux.path</u>
- 2. Install boto3:
 - # pip install boto3 --user
- 3. After installing boto3, configure AWS CLI with the AWS configure command along with the AWS Access Key ID and AWS Secret Access Key.

[ec2	2-user@	ip-10-0	-0-5 ~]	\$ aws	configure
AWS	Access	Key ID	[*****	****	*****12BQ]
AWS	Secret	Access	Key [*	****	**********

- 4. Create a python script with content listed below.
- 5. Execute the script with required parameters: python createCustomPrivateIP.py [instance-id] [eth1/eth2/...] [start_ip] [stop_ ip] [Region Name]

Script

```
## USAGE : python createCustomPrivateIP.py [instance-id] [eth1/eth2/...] [start ip] [stop ip]
[Region Name]
## EXAMPLE: python createCustomPrivateIP.py i-0cba4998da080d95e eth1 10.0.1.37 10.0.1.39 us-
east-1
import sys
import boto3
from botocore.exceptions import ClientError
client = boto3.client('ec2', region name= sys.argv[5])
ec2 = boto3.resource('ec2', region name= sys.argv[5])
                         #start_ip = '172.31.15.171'
start_ip = sys.argv[3]
stop ip = sys.argv[4]
                          #stop ip = '172.31.15.174'
## Create IP-Address-Range
def undotIPv4 (dotted):
   return sum (int (octet) << ( (3 - i) << 3) for i, octet in enumerate (dotted.split ('.'))
)
def dotIPv4 (addr):
   return '.'.join (str (addr >> off & 0xff) for off in (24, 16, 8, 0) )
def rangeIPv4 (start, stop):
   for addr in range (undotIPv4 (start), undotIPv4 (stop) ):
       yield dotIPv4 (addr)
if (sys.argv[2] == 'eth1'):
    device_index=1
elif (sys.argv[2] == 'eth2'):
    device index=2
elif (sys.argv[2] == 'eth3'):
   device_index=3
elif (sys.argv[2] == 'eth4'):
    device index=4
elif (sys.argv[2] == 'eth5'):
    device_index=5
elif (sys.argv[2] == 'eth6'):
   device_index=6
elif (sys.argv[2] == 'eth7'):
    device index=7
else:
    device_index=8
try:
   vpc_instances = ec2.network_interfaces.filter(Filters=[{'Name': 'attachment.instance-
```

```
id','Values': [sys.argv[1]]}, {'Name': 'attachment.device-index','Values': [str(device_
index)]}])
    for interfaces in vpc_instances:
        for ip_list in rangeIPv4 (start_ip, stop_ip):
            response1 = client.assign_private_ip_addresses(NetworkInterfaceId=interfaces.id,
PrivateIpAddresses=[ip_list],)
            print(response1)
except ClientError as e:
        print(e)
```

Configuring an IxLoad test in AWS

After using the CFT to deploy your AWS instances, you can use them in an IxLoad test.

There are two ways to configure a test in IxLoad with AWS instances, depending on how you want to configure the MAC and IP addresses for the test:

- <u>Manual configuration</u>, in which you enter the MAC and IP addresses. With manual configuration, you can use a plain IP stack, IPsec, or GRE over IPsec stacks.
- <u>Automatic configuration</u>, in which IxLoad detects and learns the MAC and IP addresses. With automatic configuration, you can only use a plain IP stack.

Manually Configuring MAC and IP Addresses

To manually configure an IxLoad test in AWS:

- 1. Start IxLoad.
- Display the network configuration page, and add: one client NetTraffic one DUT NetTraffic one server NetTraffic
- 3. On the client NetTraffic, select the IP stack you want to use (IP,IPsec, or GRE over IPsec) and specify test port IP address for client traffic.



On the client-side NetTraffic, select the Emulated Router stack, and specify its IP address. Use the address that is configured on the Eth1 interface of the first VMone instance. You can find this address under VMONEINSTANCEDETAILS on the Outputs tab of the CloudFormation | Stacks page.

	Networks and Traffic - New Traffic Flow													
	Network1													
	Stack-1 IP-1 Image: Emulated Rout MAC/VLAN-1													
		Enabled	Name	Status	ІР Туре	Address	Mask	Increment	Count	Gateway	Gateway Step Size	Gateway Increment Mode	MSS	Autogenerate MAC
	▶ 1		ER-R1	Unconfigured	IPv4	10.0.1.102	16	0.0.0.1	1	0.0.0.0	0.0.0.0	Increment every subnet	1460	
:														

 Select the DUT config, and specify IP address. Use the address that is assigned to Eth1 IP of the DUT deployed by the CFT. You can find this address under DUTINSTANCEDETAILS on the Outputs tab of the CloudFormation | Stacks page.
 Networks and Trattic - New Trattic Flow

Traffic1	nt1	DUT1		Terminate Iteminate	letwork2 c2 HTTPServer1
DUT1					
Type of DUT Server Load Comment	Balancer (SLB) 🛛 🖂		× V		
Settings					
Server Load Balancer (SLB)	Options				
Ixia Server Network (if an	y) None				
🛉 💥 🔒 🕹 🖻	Check All 📴 Uncheck All				
Enable	IP or VIP	DSCP (decimal)			
I 1	10.0.1.241	None			

5. On the server NetTraffic, select the corresponding IP stack to match the stack on the client (

(IP,IPsec, or GRE over IPsec), and specify its IP address which is assigned to Eth2 of the 2nd VMone instance. For the gateway IP address, specify the address that is assigned to Eth2 IP of the DUT. You can find this address under VMONEINSTANCEDETAILS on the Outputs tab of the CloudFormation | Stacks page.

Network appunding O	s and Traffic	: - New Tri	affic Flow	×	HU H	DUT1				Teraffic2	vork2	
Network2	2	_										
:	Stack-2	_										
8	IP-2											
	MAC/VLAN-2	2										
	Enabled	Name	Status	IP Type	Address	Mask	Increment	Count	Gateway	Gateway Increment	Gateway Increment Mode	M
► 1		IP-R4	Unconfigured	IPv4	10.0.2.95	24	0.0.0.1	1	10.0.2.48	0.0.0.0	Increment every subnet	14

6. Click **Start** to start the test.

Automatically Configuring MAC and IP Addresses

Before you begin

Before you begin to configure a cloud test with automatic addresses, there are some aspects of IxLoad's behavior in a cloud configuration that you should be aware of:

- The Forcefully Update Network Configuration for Cloud option
- The Update Network For Cloud button
- How IxLoad distributes the automatically-learned addresses from cloud instances

These are described in this section

On the **Test Run | Test Options** window, there is a checkbox named **Forcefully Update Network Configuration for Cloud**.

d Test Options		>					
🛱 Test Ontions	Test Options						
U lest options	Test Run	Statistics					
🚮 StatViewer Options	Forcefully Take Ownership	CSV Polling Interval: 2 💭 Seconds					
	Reboot Ports Before Configuring						
	Release Configuration After Test	Throughput Stat Units: Kbps					
	Sourcefully Update Network Configuration For Cloud	Enable TCP Advanced Stats					
	Network	Enable Frame Size Distribution Stats					
		Enable Network Diagnostics					
		Show Diagnostics From Apply Config					
		Reset Diagnostics At Start Run					
	Seed For Random Behavior	Show Diagnostics After Run Stops					
	Seed Value: 0	Save Detailed Diagnostics in CSV					
	App Library	Enable QoE Detective					
	Auto update AppLib Flows to latest version	Per User Per IP Per VLAN					
	Auto downgrade AppLib Flows to latest valid version	QoE Detective Profiles					
	Comment:	Name Publish Events					
		+-/<					
		ОК					

Checking this control allows IxLoad to update the test configuration with information from the cloud instances. During the Apply Config phase of the test (when IxLoad is downloading the test configuration to the ports), the following happens:

When running a test from the GUI	When running a test from an automation script:
If Forcefully Update is enabled, IxLoad prompts you if the configuration should be automatically changed.	If Forcefully Update is enabled, IxLoad attempts to modify the configuration and then apply the configuration to the ports.
The prompt contains information about the changes that are going to be made	If Forcefully Update is disabled, IxLoad attempts to run with the existing configuration and any
Yes: If you choose "Yes", IxLoad will attempt to modify the configuration and then apply the configuration to the ports.	errors will be returned during the Apply Config phase.
No: If you choose "No", IxLoad will attempt to run with the existing configuration.	
Cancel: If you choose "Cancel", the test stops (it does not attempt to apply the configuration)	

When running a test from the GUI	When running a test from an automation script:
Apply: If you choose "Apply", IxLoad applies the automatic changes, but does not start the test.	
If Forcefully Update is disabled, IxLoad will attempt to run with the existing configuration, and any errors will be displayed during the Apply Config phase.	



Update Network for Cloud Button

On the Ribbon (on the Network tab and Port Tools tab, next to IP Assignments) there is button named Update Network For Cloud.

You can click Update Network For Cloud any time when the test is not running, and IxLoad will retrieve the addresses available from the cloud instances.

Apply: If you choose "Apply", IxLoad applies the automatic changes, but does not start the test.

Cancel: If you choose "Cancel", the test stops (it does not attempt to apply the configuration).



How IxLoad updates the Network Configuration

With an Emulated Router

IxLoad uses the first allowed IP address on each assigned port as the Connected IP address. The number of ranges of Emulated Router and the count of each range are not important.

After the addresses have been learned and the configuration updated, the number of Emulated Router ranges will equal the number of ports assigned and count=1 on each range. If there are not enough ranges, extra ranges are added. If there are more ranges than ports assigned, the extra ranges are removed.

The 'Autogenerate MAC' option is disabled on all the Emulated Router ranges.

MAC addresses are updated.

If the test has both IPv4 and IPv6 addresses. IxLoad does not update the MAC addresses to avoid a MAC overlap error. The test will work because promiscuous mode is disabled.

VLAN is disabled on all ranges.

Unconnected IP addresses are not changed.

Note: In case the traffic from the Device Under Test (DUT) does not reach the IxLoad server, then the AWS Network Interface Cards (NICs) for the instances where Emulated Router is set, must have the Change Source/Dest. Check option disabled as explained in the following steps:

- 1. In the AWS management console, go to **EC2 Service** > **Network Interfaces**.
- 2. Select the desired network interface attached to the instance.
- 3. Open the context menu for the selected network interface instance.
- 4. Disable the **Change Source/Dest. Check** option.

By default, the **Change Source/Dest. Check** is enabled and traffic is allowed only from the IP address provided by AWS.

Refer to the following image:

	🎁 Services 🗸	Resource Groups 🗸 🔸	
	EC2 Dashboard	Create Natural Interface Attach Datach Dalate Actions to	
	Events	Attach Detach Detect Actions	
	Tags	Q search : BPSVE Add filter	
	Deporto		
	Reports	Name Network interface ID	Subnet ID · VPC ID ·
	Limits	BPSVEVPCTomPBlade2Port2	subnet-1e5ffc53 vpc-8b9fd0e2
=	INSTANCES	BPSVEVPCTomPBlade2eth0 Detach	subnet-195ffc54 vpc-8b9fd0e2
	Instances	BPSVEVPCTomPBlade2Port1 Delete	subnet-1e5ffc53 vpc-8b9fd0e2
	Spot Requests	BPSVEVPCTomPBlade1eth0 Manage IP Addresses	subnet-195ffc54 vpc-8b9fd0e2
	Reserved Instances	Associate Address	subnet-195ffc54 vnc-8b9fd0e2
	Dedicated Hosts	Disassociate Address	subnet_1e5ffc53vnc_8b9fd0e2
	IMAGES	BISVEVICIONI Blade II of II Change Termination Behavior Change Security Crowns	aubrot 105ffc54 ypc-0b3fd0c2
-	AMIs	Change Security Groups	Subnet-1950C54 Vpc-obald0e2
	Bundle Tasks	Network Interface: eni-03b5f82b Add/Edit Tags	0.0.0
		Change Description	
=	ELASTIC BLOCK STORE	Details Flow Logs Tags Create Flow Log	
	Volumes	Network interface ID eni-03b5f82b	
	Snapshots	VPC ID vpc-8b9fd0e2	
	NETWORK &	MAC address 0a:ea:03:d3:ee:62	
=	SECURITY	Security groups BPS-VE-AWS-Stack-TomP-SGVPCTomP-HOG4H51XG	5LU, view inbound
	Security Groups	rules Status in uso	
	Elastic IPs	Private DNS (IPv4) ip-10-10-128-55 us-east-2 compute internal	
	Placement Groups	Secondary private IPv4 IPs 10.10.128.56, 10.10.128.57, 10.10.128.58, 10.10.128.59	, 10.10.128.60,
	Key Pairs	10.10.128.61, 10.10.128.62, 10.10.128.63, 10.10.128.64	, 10.10.128.65,
ï	Network Interfaces	10.10.128.66, 10.10.128.67, 10.10.128.68, 10.10.128.69	
1		Source/dest. check false	

Without an Emulated Router

The Random IP checkbox is automatically disabled during the update.

The 'Autogenerate MAC' option is left as it is on all the IP ranges.

IxLoad uses the first chunk of IPs with equal increment on each port.

For example if the cloud allows the following IP addresses:

1.1.1.11 1.1.1.12 1.1.1.13 1.1.1.16 1.1.1.17 1.1.1.20 1.1.1.22 1.1.1.24 the IPs that I

the IPs that IxLoad is going to use are startIP = 1.1.1.11, increment = 0.0.0.1, count = 3.

If the existing configuration has three ranges, IxLoad will use:

Range 1: startIP = 1.1.1.11, increment = 0.0.0.1, count = 3 Range 2: startIP = 1.1.1.16, increment = 0.0.0.1, count = 2 Range 3: startIP = 1.1.1.20, increment = 0.0.0.2, count = 3

IxLoad does not add or remove any IP ranges from the configuration. This means that some issues could occur.

For example, if multiple ports are assigned:

- If the per-port distribution type is IP Round Robin, the automatic update fails.
- If the per-port distribution type is Consecutive IPs, the automatic update fails if the existing ranges don't have an equal number of IPs.

If the per-port distribution type is Consecutive Ranges, there shouldn't be any issues, except the case when there are too many ranges in the original configuration.

The typical sequence that can come from Cloud is a counter or a list of counters. A counter is a sequence that can be described with start, increment and count.

Counters and ranges

In the example above, there is a list of 3 counters:

Counter1: start=1.1.1.11, increment=0.0.0.1, count=3 Counter2: start=1.1.1.16, increment=0.0.0.1, count=2 Counter3: start=1.1.1.20, increment=0.0.0.2, count=3

What happens if there are fewer counters than ranges?

Using the example above, assume that there are 4 ranges, and the total number of allowed IPs is 8.

First, the number of IPs is divided by the number of ranges: 8/4=2

This means that IxLoad first tries to allocate 2 IPs for each range.

If it fails, IxLoad tries again with 1 IP for each range.

IxLoad tries allocating 2 IPs for each range by taking IPs from each counter in chunks of 2.

If a counter remains with less than 2 IPs, IxLoad moves to the next range.

Therefore, using the example addresses above, IxLoad attempts to distribute the addresses as follows:

1.1.1.11 1.1.1.12	Range 1
1.1.1.13	skipped, moves to the next counter
1.1.1.16 1.1.1.17	Range 2
1.1.1.20 1.1.1.22	Range 3
1.1.1.24	skipped

At this pont, it gives up because there are no counters to continue with and cover the fourth range. This means that the attempt failed and it will try with 1 IP per range.

With 1 IP per range, it will allocate the addresses as follows:

1.1.1.11	Range 1
1.1.1.12	Range 2
1.1.1.13	Rrange 3
1.1.1.16	Range 4

Suppose there are 3 ranges instead of 4.

The number of IPs is divided by the number of ranges: 8/3=2

It tries with 2 IPs per range, and it succeeds:

1.1.1.11 and 1.1.1.12	Range 1
1.1.1.16 and 1.1.1.17	Range 2
1.1.1.20 and 1.1.1.22	Range 3

What happens if the sequence is not a counter or a list of counters?

There are situations in which the sequence may not be a counter or a list of counters

For example, this sequence:

1.1.1.1 1.1.1.2 1.1.1.3 1.1.2.1 1.1.2.2 1.1.1.3 1.1.3.1 1.1.3.2 1.1.3.3 ...

In these situations, IxLoad simply converts this sequence to a list of counters of 1 element each and applies the usual algorithm. Each range will receive a single IP.

What happens if a range is OK and doesn't need to be changed?

- All the IP addresses must be included in the sequence of the allowed IPs
- The prefix must be correct
- The gateway must be correct
- Random IP must be disabled

If the cloud allows the following sequence of IPs:

1.1.1.11

- 1.1.1.12
- 1.1.1.13
- 1.1.1.16
- 1.1.1.20
- 1.1.1.22
- 1.1.1.24

and the configuration has 3 ranges,

One range has IP = 1.1.1.12, increment = 0.0.0.4, count = 3

The other two ranges have bad configurations because they that do not match.

The good range will not be changed.

IP addresses 1.1.1.12, 1.1.1.16 and 1.1.1.20 will be removed from the sequence of allowed IPs as they are already used by this range:

 $1.1.1.11 \\ \frac{1.1.1.12}{1.1.1.13} \\ \frac{1.1.1.16}{1.1.1.17} \\ \frac{1.1.1.20}{1.1.1.22} \\ 1.1.1.24$

The remaining sequence will be represented as 3 counters:

Counter1: start=1.1.1.11, increment=0.0.0.2, count=2 Counter2: start=1.1.1.17, increment=0.0.0.5, count=2 Counter3: start=1.1.1.24, increment=0.0.0.0, count=1

Then the usual algorithm will be applied for the two remaining ranges:

Range1 will receive addresses 1.1.1.11 and 1.1.1.13 Range2 will receive addresses 1.1.1.17 and 1.1.1.22

Limitations

Automatic address learning has the following limitations:

- Only plain IP stacks (with or without emulated router) are updated.
- For Custom Mesh configurations, updates are not reflected in the Custom Mesh GUI.
- Only IP addresses in Stack Manager stacks are updated. IP addresses used in other areas of IxLoad (for example, as the destination for L4-7 traffic or on a virtual DUT) are not updated. These addresses must be updated manually.
- If the configuration has IPv6 enabled on any range but the port has no IPv6 addresses, the update will fail. The reverse is also true: if the port has only IPv6 addresses but IPv6 is disabled on the ranges, the update will also fail.

Configuring a test with automatic MAC and IP address learning

To automatically configure an IxLoad test in AWS:

- 1. Start IxLoad.
- 2. On the Test Run | Test Options window, check **Forcefully Update Network Configuration for Cloud** option.
- Display the network configuration page, and add: one client NetTraffic one DUT NetTraffic one server NetTraffic
- 4. Select the DUT config, and specify IP address.

Networks and	Traffic - New T	Traffic Flow					
	S Network1 affic1 I M HTTPClie	nt1	OUT1		Terminate	I Network2 Traffic2	
UT1							
Type of DUT	Server Load	Balancer (SLB)					
Comment							
Settings							
Server Load	Balancer (SLB)	Options					
Ixia Server	r Network (if an Direct Server R	y) None					
	1 🕂 🖉	Check All					
Enable		IP or VIP	DSCP (decimal)				
× •		10.0.1.211	None				

- 5. On the Ribbon (on the Network tab and Port Tools tab, next to IP Assignments), click **Update Network For Cloud**.
- 6. Click **Start** to start the test.

Deleting a stack

To delete a stack:

- 1. Display the CloudFormation page.
- 2. Select the stack
- 3. Click the "Actions" drop down list, then click Delete Stack.

AWS terminates all instances, and deletes all resources created during the stack creation process.



Known Limitations

- Delete stack operations can take more than 10 minutes.
- Instead of an elastic IP address, a public IP address is assigned to management interface of each instance.
- A maximum of 5 elastic IP addresses can be allocated per account / per region.
- A maximum of 5 VPCs can be created per account / per region.
- For instances based on the c3.8xlarge, c4.8xlarge, and similar instance types, a maximum of 8 interfaces can be created on each instance.
- For instances based on the c3.8xlarge, c4.8xlarge, and similar instance types, a maximum of 30 IP addresses (including secondary IPs) can be allocated per interface on each instance.
- Promiscuous mode must be disabled on all interfaces. All IP packets will use the interface MAC address.
- All Data protocols are supported on IxLoad AWS instances. Storage protocols are not supported.
- The IP versions (IPv4/IPv6) used on the VM port and in the IxLoad configuration must be compatible:
 - If the configuration has IPv6 enabled on any range, but the port has no IPv6 addresses, the update will fail. If the port has only IPv6 addresses but the configuration has no IPv6 ranges enabled, the update will fail
 - If the configuration has IPv4 enabled on any range, but the port has no IPv4 addresses, the update will fail. If the port has only IPv4 addresses, but the configuration has no IPv4 addresses ranges enabled, the update will fail.
- Automatic update of the MAC/IP addresses is supported only for the plain IP stack.



 \odot Keysight Technologies, 2018–2020

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