

Installing vThunder ADC using VMware Template 1.1.0

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Introduction

The A10 Thunder[®] Application Delivery Controller (ADC) is a high-performance solution designed to accelerate and optimize critical applications, ensuring their reliable and efficient delivery.

vThunder is a fully operational, software-based Application Delivery Controller (ADC) solution that can run on VMware ESXi. vThunder provides a robust, flexible, and easy-to-deploy application delivery and server load balancing service.

Figure 1 shows vThunder operating on commodity servers (that are running on VMware ESXi hypervisor).

	vCenter Server			
vThunder	vThunder	Thunder Observability Agent	vRealize Operations Manager	vRealize Log Insight
	ESXi Hypervisor			
	Physical Server			

Figure 1 : vThunder for VMware ESXi

This documentation assists you in deploying Thunder[®] ADC instances on the VMware using VMware templates.

The following steps provide a high-level overview of the deployment process:



1. Provision the VMware Aria automation infrastructure.

The deployment process needs infrastructure to be setup before the deployment. User needs to create Cloud account, Cloud zone, Projects, Flavor mappings, Image mappings and Network profile; if it already exists, it can be reused.

Aria Automation Cloud Assembly is a cloud-based service that you use to create and deploy machines, applications, and services to your cloud infrastructure.

As a cloud administrator, you can:

- Configure the cloud vendor infrastructure to which your users deploy their cloud templates.
- Set up projects to link the service users with the infrastructure resources.
- Delegate the user management and deployment infrastructure to project managers, freeing you up to focus on your cloud resources.

As a cloud template developer, you can:

- Create and iterate on templates until they meet your development needs.
- Deploy templates to the supporting cloud vendors based on your project membership.
- Manage the deployed resources throughout the development life cycle.

For more information on Cloud account, Cloud zone, Projects, Flavor mappings, Image mappings and Network profile, see <u>Setup vRealize automation Cloud</u> <u>Assembly for VMware templates</u>.

For more information on other prerequisites, see Prerequisites.

2. Create Thunder virtual machine/s on the VMware.

There are custom templates available for creating Thunder virtual machines (VMs) on VMware. Various templates are available for different deployment requirements.

For more information on the specific use-cases, see <u>Deployment Templates</u>.

3. Configure Thunder.

There are custom Python scripts available to apply the new Thunder configurations. Different scripts are available for various configuration needs.

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For more information, see <u>ADC Configuration Templates</u>.

Terminology

- **ESXi** A Bare Metal hypervisor in the VMware vSphere virtualization platform to create and run virtual machines.
- Global Server Load Balancing (GSLB) A process to distribute incoming network traffic across multiple servers or data centre's located in different geographical locations.
- **High Availability (HA)** A capability to remain operational and accessible for a significantly high percentage of the time.
- **Hybrid Cloud** A cloud computing model that combines private cloud and public cloud services within the same seamless infrastructure.
- **Python3** The latest major version of the Python programming language.
- vThunder An A10 Thunder instance for virtual machine.
- vSphere Client The VMware vSphere Client is a web-based application that connects to the vCenter Server so IT administrators can manage installations and handle inventory objects in a vSphere deployment. vSphere Client is a part of VMware's comprehensive product line.

Prerequisites

To create and configure Thunder virtual machine on the VMware cloud using VMWare template, you must ensure that the following prerequisites are met:

- 1. Download A10 custom VMware templates from GitHub.
- 2. ESXi host with a valid subscription. For more information, see <u>VMware ESXi</u> <u>Installation and Setup</u>.
- 3. Download and access VMware vSphere client to access Thunder virtual machine.
- 4. Access VMware Aria Automation Assembler to create Thunder virtual machine using VMware templates.
- 5. Sign up <u>here</u> to get Thunder Trial license.





6. Download the required vThunder OVA image version https://support.a10networks.com/support/axseries.

Send a request to <u>A10 Networks Support</u> for A10 vThunder login default user credentials.

- 7. Download the Linux ISO image ubuntu-22.04.2-desktop-amd64.iso.
- 8. Download Python 3.x, see Install Python3.
- Setup vRealize automation Cloud Assembly for VMware templates. For more information, see <u>Setup vRealize automation Cloud Assembly for VMware</u> <u>templates</u>.

For any queries, reach out to A10 Networks Support.

Image Repository

<u>Table 1</u> provides the list of ACOS versions and modules that support the VMware templates:

Table 1 : Supported ACOS versions

ACOS Version	ADC	CGN	SSLi	TPS
64-bit Advanced Core OS (ACOS) version 6.0.3-P1	٧	Х	Х	Х
64-bit Advanced Core OS (ACOS) version 6.0.3	٧	Х	Х	Х
64-bit Advanced Core OS (ACOS) version 6.0.2	٧	Х	Х	Х
64-bit Advanced Core OS (ACOS) version 6.0.1	٧	Х	Х	Х
64-bit Advanced Core OS (ACOS) version 5.2.1-P9	٧	Х	Х	Х
64-bit Advanced Core OS (ACOS) version 5.2.1-P8	٧	Х	Х	Х
64-bit Advanced Core OS (ACOS) version 5.1.0-P7	٧	Х	Х	Х
64-bit Advanced Core OS (ACOS) version 5.2.1-P6	٧	Х	Х	Х

This section helps you in provisioning a new Thunder virtual machine on the VMware cloud.

Before proceeding, it is recommended to review the Prerequisites.

To provision a new virtual Thunder ADC instance on VMware cloud, perform the following steps:

- Create <u>Cloud Account</u>, <u>Cloud Zone</u>, <u>Projects</u>, <u>Flavor Mappings</u>, <u>Image Mappings</u>, and <u>Network Profile</u>. It is not mandatory to create new resources, the existing resources can be used in deployment and configuration.
- 2. Select an appropriate template for deploying vThunder ADC on VMware cloud according to your use case.

The following table provides a list of various use cases along with their respective supported VMware templates.

Use Case	Templat e Name	Number of Thunder/ s	Numbe r of NICs	Data- in NIC VI P	Description
Standalone Thunder ADC	Thunder- <u>3NIC-</u> <u>1VM</u>	1	3	Private	 Creates one vThunder instance with one management and two data NIC (data-in), see Figure 1. Applies additional

Table 2: Supported VMware Templates

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Use Case	Templat e Name	Number of Thunder/ s	Numbe r of NICs	Data- in NIC VI P	Description
					configuration on vThunder as required: Change Password Basic Server Load Balancer A10 License SSL Certificat e Backend Autoscale
Thunder ADC in High Availability mode with Private VIP.	Thunder- <u>3NIC-</u> <u>2VM-</u> <u>PVTVIP</u>	2	3	Private	 Creates two vThunder instances with HA setup and each vThunder has one management and two data NICs (data-in and data-out), see Figure 7. Configures

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e Name	of Thunder/ s	r of NICs	in NIC VI P	
				data-in network interface card (NIC) with Private IP on VIP.
				 Applies additional configuration on vThunder as required: Change
				 Password Basic Server Load Balancer
				 <u>A10</u> <u>License</u> <u>SSL</u> <u>Certificat</u> <u>e</u>
				• <u>High</u> <u>Availabili</u> <u>ty</u> • Paskond
				When one

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Use Case	Templat e Name	Number of Thunder/ s	Numbe r of NICs	Data- in NIC VI P	Description
					 instance becomes unavailable, another instance seamlessly handles the request without requiring manual intervention. High availability can be configured within the same or different availability zone within a
Thunder ADC in High Availability mode with Public VIP.	Thunder- 3NIC- 2VM- PUBVIP	2	3	Public	 Creates two vThunder instances with HA setup and each vThunder has one management and two data



Use Case	Templat e Name	Number of Thunder/ s	Numbe r of NICs	Data- in NIC VI P	Description
					NICs (data-in and data-out), see <u>Figure 13</u> .
					 Configures data-in network interface card (NIC) with Public IP on VIP.
					 Applies additional configuration on vThunder as required:
					 <u>Change</u> <u>Password</u>
					 <u>Basic</u> <u>Server</u> <u>Load</u> <u>Balancer</u>
					• <u>A10</u> <u>License</u>
					 <u>SSL</u> <u>Certificat</u> <u>e</u>
					∘ <u>High</u> <u>Availabili</u> <u>ty</u>

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Use Case	Templat e Name	Number of Thunder/ s	Numbe r of NICs	Data- in NIC VI P	Description
					 Backend <u>Autoscale</u> When one instance becomes unavailable, another instance seamlessly handles the request without requiring manual intervention. High availability can be configured within the same or different availability zone within a same region.
Thunder ADC with GSLB (Disaster Recovery Site in a cross-region	<u>Thunder-</u> <u>3NIC-</u> <u>3VM</u>	3	3	Public	 Creates three vThunder instances each vThunder has



Use Case	Templat e Name	Number of Thunder/ s	Numbe r of NICs	Data- in NIC VI P	Description
or hybrid cloud environmen t)					one management and two data NICs (data-in and data-out) in the same region1 and zone1, see Figure 19. These three vThunder instances are referred as Master Controller (Active), Site1 and Site2. • Applies additional configuration on vThunder as required: • <u>Change</u> <u>Password</u> • <u>A10</u> <u>License</u> • <u>SSL</u> <u>Certificat</u> <u>e</u> • <u>Hybrid</u>

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Use Case	Templat e Name	Number of Thunder/ s	Numbe r of NICs	Data- in NIC VI P	Description
					<u>Cloud</u> <u>GSLB</u>
					The identical set of vThunder resources should be deployed in region2 zone1 using the same template. The three vThunder instances in region2 zone1 are referred as the Member Controller (Standby), Site1, and Site2. When region1 experiences an outage, region2 seamlessly handles all requests through DNS switch over.



After completing the deployment process, proceed to configure your setup. For more information, see <u>ADC Configuration Templates</u>.

Thunder-3NIC-1VM

This template creates a new virtual machine with pre-loaded Thunder instance and attaches three new network interface cards (NICs).

For more information, see Create Thunder Virtual Machine.



Figure 1 : Standalone Thunder ADC



Additional Thunder configurations are available that can be applied as needed:

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- <u>Change Password</u>
- Basic Server Load Balancer
- A10 License
- SSL Certificate
- Backend Autoscale

Various templates are available for different deployment needs.

For more information, see <u>Deployment Templates</u>.

The following topics are covered:

Create Thunder Virtual Machine	
Access Thunder Virtual Machine	
Create and Configure Server and Client Machine	
Configure Thunder	
Verify Deployment	
Verify Traffic Flow	

Create Thunder Virtual Machine

The A10-vThunder-3NIC-1VM template is used to create a Thunder virtual machine with three network interface cards.

Before deploying this template, it is recommended to review the Prerequisites.

To deploy the A10-vThunder-3NIC-1VM template using VMware Aria automation, perform the following steps:

- 1. Download A10-vThunder-3NIC-1VM template.
- 2. Login <u>VMware Aria Automation</u> > Services, click Assembler.
- 3. From the VMware Aria Automation Assembler > Design > Templates, select Upload from NEW FROM dropdown window.

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Figure 2 : VM ware Aria Automation Assembler

Vmw VMware Aria Automation Assembler	\odot		vraadmin vraadm 문 VRIDM ~	
Resources Design Infrastructure Extensibility Tenant Management Migration			🕅 GUIDE	D SETUP
K Templates Oten Templates Templates CONE Ø [®] CEPLOY ↓ DOWNLOAD × DELETE	C	Q Filter		C
Blank canvas Source Control Read-only Project Last Updated	Updated By		Released Versions	
Custom Resources Feraform Upload No Templates found No Templates found				≥ SUPPORT
Manage Columns			0 Templa	stes

- 4. Enter or select the appropriate values in the **Upload Template** fields:
 - Name: Enter your VMware Template name.
 - **Description**: Provide description for the VMware template.
 - **Project**: Select the available project.
 - Upload file: Select the VMWARE_TMPL_3NIC_1VM.yaml file.



Figure 3 : Upload Template window

Upload Template	\times
Name *	A10-VMware-3NIC-1VM
Description	A10-VMware-3NIC-1VM Deployment
Project *	Q VMware-Templates
	Template sharing in Service Broker
	Share only with this project
	 Allow an administrator to share with any project in this organization
Upload file *	SELECT FILE VMWARE_TMPL_3NIC_1VM.y
	CANCEL

5. Click **UPLOAD**.

6. After template gets successfully uploaded, click the uploaded template name and configure the following parameters as appropriate in editor window:

Resource Name	Description
Virtual Specify a virtual machine name for vThunder.	
wachine	name: vth-inst1
Size	Specify a suitable size for the vThunder instance that supports at least 2 NICs which is available in Flavor mappings.

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Resource Name	Description				
	flavor: medium				
Image	Specify the desired vThunder Image name which is available in Image mappings.				
	image: ACOS-521-P6-OVA				
Folder	Specify the folder name under which virtual machine to be created				
Nume	folderName: vRA Deployments				

7. Click **TEST** to validate the template. Once validation is successful then click **DEPLOY**.

Figure 4 :	Edit template window
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vmw VMware Aria Automation	n Assembler						© (
Resources Design Infrastru	cture Extensibility	Tenant Management	Migration					D GUIDED SE	TUP
A10-VMware-3NIC-	-1VM settings	VERSION HISTORY	ACTIONS ~						
*					· · · · Ø 📼	$f \hookrightarrow f \to \underline{\mathbb{A}} \oplus f \oplus f \oplus f$	μ 7 ≫ μ ⁷	Code Properties Inputs	
C e.g. Machine Search Resource Types							1 fo 2 in 3 * re 4 * 1 5 6 * 7	<pre>mattersion: 1 puts: {} Sources: Cloud_vSphere_Nachine_1: type: Cloud_vSphere_Nachine properties: image: ACOS-521-P6-OVA</pre>	•
 Cloud Agnostic 							9	name: vth-inst1 flavor: madium folderName: v8A Deployments	
🔁 Machine							11	Total mane. The peptojnents	
≪8 Load Balancer									QRT
Network									SUPF
 Security Group 							16 - E		~
Volume							11		
 Allocation Helpers 				Cloud_vSpher					
🐁 Compute Helper									
🍓 Flavor Helper							- H.		
🍖 Image Helper									
🐁 Network Helper							11.		
🚸 Security Group Helper									
🕤 Storage Helper									
v Kubernetes 💌	-						4	•	-
DEPLOY TEST VERSION	N CLOSE Last :	saved a few seconds ago							

- 8. Enter or select the appropriate values in the **Deployment Type** fields:
 - Select Create a new deployment in the dropdown.
 - **Deployment Name**: Enter your VMware deployment name.
 - Template Version: Select the cloud template version.
 - **Description**: Provide description for the VMware deployment.



Figure 5 : Deployment Type window

Deploy A10-VMware-3NI	Deployment Type			\times
1 Deployment Type	Create a new deployment	v		
	Deployment Name *	3NIC-1VM-Template	-	
	Template Version *	Q Current Draft	_	
	Description	A10-VMware-3NIC-1VM Deployment		
			<u>«</u>	
			CANCEL	DEPLOY

- 9. Click **DEPLOY**
- 10. Go to **Resources** > **Deployments**, click the deployment name (3NIC-1VM-Template) provided during the deployment.
- 11. Wait till the deployment gets completed.
- 12. Once deployment gets successfully completed, login into VMware vSphere client and check created vThunder resource.

Figure 6 : vThunder instance

vSphere Client	Q Search in a	II environments				C
> the vth-inst1-mcn Summary Monitor	m2773-242 Configure	820070124 Permissions	4 D 🗆 📑 Datastores N	الله في المحتودة (ACTIONS etworks Snapshots Updates		
Guest OS	::	Virtual Ma	chine Details	ACTIONS ¥	 Usage Last updated: 10/11/23, 8:58 PM	
			Power Status	Powered On	CPU	
.Chadar lagini	floater tapts _		Guest OS	🔥 CentOS 7 (64-bit)	🗍 10.425 GHz used	
		۲H	VMware Tools	Running, version:2147483647 (Guest Managed) (Memory	
			DNS Name (1)	vThunder	💯 491 MB used	
LAUNCH REMOTE CO			IP Addresses (6)	10.64.25.170 10.0.2.7 AND 4 MORE	Storage	
			Encryption	Not encrypted	28.33 GB used	
LAUNCH WEB CON			Δ		VIEW STATS	

13. Click Launch Web Console.



14. Log in to vThunder and manually configure management public IP using below commands:

```
vThunder>en
Password:
vThunder#config
vThunder(config)#interface management
vThunder(config-if:management)#ip address 10.64.25.176 /24
vThunder(config-if:management)#ip default-gateway 10.64.25.1
vThunder(config-if:management)#write memory
Building configuration...
Write configuration to default primary startup-config
[OK]
vThunder(config-if:management)#
```

NOTE: The management public IP address and ethernet IP address are not configured automatically during the deployment. Hence, the management public IP address should be configured manually and the ethernet IP address will be configured with Basic Server Load Balancer script.

Access Thunder Virtual Machine

The Thunder virtual machine can be accessed using any of the following ways:

- Access vThunder using CLI
- Access vThunder using GUI

Create and Configure Server and Client Machine

This section applies only if you do not have a server and client machine already set up. If you haven't created the server and client machines yet, please refer to the provided link for instructions on how to set them up.

Create a Virtual Machine and Install Linux (vmware.com)

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Configure Thunder

The following configurations can be applied to the deployed vThunder instance:

- <u>Change Password</u>
- A10 License
- SSL Certificate
- Basic Server Load Balancer
- <u>Backend Autoscale</u>

Verify Deployment

To verify vThunder deployment, perform the following steps:

1. Run the following command on the vThunder instance to verify SLB configuration:

vThunder(config)**#show running-config**

If the deployment is successful with basic SLB, HTTP template, and Persist-cookie template configuration, the following output is displayed:



```
interface management
 ip address 10.64.25.176 255.255.2
 ip default-gateway 10.64.25.1
interface ethernet 1
 enable
 ip address 10.0.2.6 255.255.255.0
interface ethernet 2
 enable
 ip address 10.0.3.6 255.255.255.0
1
slb server server1 10.0.3.10
 port 53 udp
   health-check-disable
 port 80 tcp
   health-check-disable
 port 443 tcp
   health-check-disable
slb server server2 10.0.3.41
 port 53 udp
   health-check-disable
 port 80 tcp
   health-check-disable
 port 443 tcp
   health-check-disable
slb service-group sg443 tcp
 member server1 443
 member server2 443
slb service-group sg53 udp
 member server1 53
 member server2 53
1
```



```
slb service-group sg80 tcp
 member server1 80
 member server2 80
slb template persist cookie persist-cookie
 expire 60
 encrypt-level 0
 name al0-cookies
 match-type service-group
slb template http hostname-test
 host-switching contains s1 service-group sg80
1
slb template http url-test
 url-switching regex-match s1 service-group sg80
T.
slb virtual-server vip 10.0.2.6
 port 53 udp
   source-nat auto
   service-group sg53
 port 80 http
   source-nat auto
   service-group sg80
   template persist cookie persist-cookie
   template http url-test
 port 443 https
   source-nat auto
   service-group sg443
   template persist cookie persist-cookie
   template http url-test
1
end
```

2. Run the following command on the vThunder instance to verify SSL configuration:

vThunder(config)#**show pki cert**

If the deployment is successful, the following SSL configuration is displayed:

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3. Run the following command on the vThunder instance to verify GLM configuration:

```
vThunder(config)#show license-info
```

If the GLM is successfully applied on vThunder, the following GLM configuration is displayed:

```
: 5DCB01EC264BECCCFECB3C2ED42E02384EE8C527
Host ID
USB ID
            : Not Available
Billing Serials: A10f771cecbe0000
Token
          : A10f771cecbe
Product
            : ADC
Platform
            : vThunder
Burst
            : Disabled
GLM Ping Interval In Hours : 24
_____
Enabled Licenses Expiry Date
                                   Notes
_____
                        _____
                                       _____
SLB None
CGN None
GSLB None
RC None
DAF None
WAF
     None
AAM None
FP None
WEBROOT N/A
               Requires an additional Webroot license.
THREATSTOP N/A
                     Requires an additional ThreatSTOP license.
QOSMOS N/A
                 Requires an additional QOSMOS license.
WEBROOT TI N/A
                     Requires an additional Webroot Threat Intel
license.
CYLANCE N/A
                  Requires an additional Cylance license.
IPSEC VPN N/A
                    Requires an additional IPsec VPN license.
25 Mbps Bandwidth 21-December-2022
```



Verify Traffic Flow

To verify the traffic flow from client machine to server machine through vThunder instance, perform the following:

1. Select your client instance from the Virtual machine list.

Here, vth-client is the client instance name.

2. SSH your client machine and run the following command to verify the traffic flow:

curl <vThunder instance datain-nic private ip>

Example

curl 10.0.2.6

Verify if a response is received from client server (For example: Apache Index page).

3. SSH your client machine and run the following command to verify the HTTP template traffic flow:

```
curl <vThunder_instance_datain-nic_private_ip>:<port_number>/<host-
match-string or url-match-string>/
```

Example

curl 10.0.2.6:80/s1/

Verify if a response is received from client server (For example: Apache Index page).

- 4. SSH your client machine and run the following commands to verify the Persist cookie template traffic flow:
 - a. Verify the current cookie configuration:

curl --head <vThunder_instance_datain-nic_private_ip>

b. Run the following commands to save the cookies in the cookie.txt file:

```
curl -b cookie.txt -c cookie.txt <vThunder_instance_datain-nic_
private_ip>
cat cookie.txt
```

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Example

```
curl --head 10.0.2.6
curl -b cookie.txt -c cookie.txt 10.0.2.6
cat cookie.txt
```

5. Run the following command on the vThunder instance to view the persistence load-balancing statistics:

vThunder(config)#**show slb persist**

If the deployment is successful, the following summary persistence statistics is displayed:

	Total
URL hash persist (pri)	0
URL hash persist (sec)	0
URL hash persist fail	0
SRC IP persist ok	0
SRC IP persist fail	0
SRC IP hash persist(pri)	0
SRC IP hash persist(sec)	0
SRC IP hash persist fail	0
DST IP persist ok	0
DST IP persist fail	0
DST IP hash persist(pri)	0
DST IP hash persist(sec)	0
DST IP hash persist fail	0
SSL SID persist ok	0
SSL SID persist fail	0
Cookie persist ok	1
Cookie persist fail	0
Persist cookie not found	2
Persist cookie Pass-thru	0
Enforce higher priority	0

If the Persist-cookie configuration is successful, a value is displayed for the Cookie persist ok parameter else the value is 0.



Thunder-3NIC-2VM-PVTVIP

This template creates two vThunder instances with HA setup and each vThunder has one management and two data NICs (data-in and data-out). It configures data-in network interface card (NIC) with Private IP on VIP.

If one instance goes down, other instance takes the request without any manual intervention.

For more information, see Create Thunder Virtual Machines.

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Figure 7 : SLB Thunder ADC in High Availability mode with Private VIP



*Note: New resources will be provisioned by template Architecture shows end to end flow.

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Feedback



Additional Thunder configurations are available that can be applied as needed:

- <u>Change Password</u>
- A10 License
- <u>SSL Certificate</u>
- Basic Server Load Balancer
- High Availability
- Backend Autoscale

Various templates are available for different deployment needs.

For more information, see <u>Deployment Templates</u>.

The following topics are covered:

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Verify Deployment	37

Create Thunder Virtual Machines

The A10-vThunder-3NIC-2VM template is used to create two Thunder virtual machines with three network interface cards each and configure the data-in network interface card with Private IP on VIP.

Before deploying this template, it is recommended to review the Prerequisites.

vThunder instances should have the same versions; otherwise, traffic flow will be disrupted.

To deploy the A10-vThunder-3NIC-2VM template using VMware Aria automation, perform the following steps:



- 1. Download A10-vThunder-3NIC-2VM template.
- 2. Login <u>VMware Aria Automation</u> > Services, click Assembler.
- 3. From the VMware Aria Automation Assembler > Design > Templates, select Upload from NEW FROM dropdown window.

Figure 8 : VM ware Aria Automation Assembler

vmw VMware Aria Automation Assembler	\odot		vraadmin vraadm 옲 VRIDM 🎽	
Resources Design Infrastructure Extensibility Tenant Management Migration				O SETUP
A Templates	<u>Q</u>	Filter		C
Importing Groups Blank canvas Source Control Read-only Project Last Updated Up	odated By		Released Versions	
Custom Resources Terraform No Templates found				A SUPPORT
Manage Columns			0 Templa	ites

- 4. Enter or select the appropriate values in the **Upload Template** fields:
 - Name: Enter your VMware Template name.
 - **Description**: Provide description for the VMware template.
 - **Project**: Select the available project.
 - Upload file: Select the VMWARE_TMPL_3NIC_2VM.yaml file.



Figure 9: Upload Template window

Upload Template	×
Name *	A10-VMware-3NIC-2VM
Description	A10-VMware-3NIC-2VM Deployment
Project *	Q VMware-Templates
	Template sharing in Service Broker
	 Share only with this project
	○ Allow an administrator to share with
	any project in this organization
Upload file *	SELECT FILE VMWARE_TMPL_3NIC_2VM_
	CANCEL

- 5. Click on **UPLOAD**.
- 6. After template gets successfully uploaded, click on upload template name and configure the following parameters as appropriate in editor window for both vThunder details:

Resource Name	Description
Virtual Machine	Specify a virtual machine name for vThunder.
	name: vth-inst1

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Resource Name	Description
	name: vth-inst2
Size	Specify a suitable size for the vThunder instance that supports at least 3 NICs which is available in Flavor mappings.
	flavor: medium
Image	Specify the desired vThunder Image name which is available in Image mappings.
	image: ACOS-521-P6-OVA
Folder Name	Specify the folder name under which virtual machine to be created.
	folderName: vRA Deployments

7. Click **TEST** to validate the template. Once validation is successful then click **DEPLOY**.

Figure 10 : Edit template window

vmw VMware Aria Automation Assembler	٢	? vraadmin vraadm & VRIDM ✓					
Resources Design Infrastructure Extensibility Tenant Management Migration			囗 GUID	ED SETUP			
A10-VMware-3NIC-2VM settings version history actions-							
≪	ર ⊮"	» u ²	Code Properties Inputs				
Q, e.g. Machine C Search Resource Types C		1 2 3 - 4 - 5 6 -	formatVension: 1 inputs: {} resources: Cloud_vSphere_Machine_2: type: Cloud_vSphere.Machine properties:	•			
✓ Cleud Agnostic @ Machine		7 8 9 10 11 =	image: ACOS-521-P6-OVA name: vth-insti flavor: medium folderName: vRA Deployments cloud_vSphere_Muchine_1: type: Cloud_vSphere_Muchine				
eq Lead Balancur ⊗ Network		12 13 * 14 15 16 17	 properties: image: ACOS-521-P6-OVA name: vth-inst2 flavor: medium folderHame: vRA Deployments 	SUPPORT			
O Security Group		18		~			
Allocation Helpers & Compute Helper							
tag Plavor Holper tage Helper							
Aletwork Helper Scurthy Group Helper							
ty storage Helper		4		• •			
DEPLOY TEST VERSION CLOSE Last saved a few seconds ago							

- 8. Enter or select the appropriate values in the **Deployment Type** fields:
 - Select Create a new deployment in the dropdown.
 - **Deployment Name**: Enter your VMware deployment name.
 - Template Version: Select the cloud template version.



×

• **Description**: Provide description for the VMware deployment.

Figure 11 : Deploymen	t Type window			
Deploy A10-VMware-3NI	Deployment Type			
1 Deployment Type	Create a new deployment	~		
	Deployment Name *	3NIC-2VM-Template		
	Template Version *	Q Current Draft		
	Description	A10-VMware-3NIC-2VM Deployment		
			CANCEL	PLC

- 9. Click **DEPLOY**.
- 10. Go to Resources > Deployments, click the deployment name (3NIC-2VM-Template) provided during the deployment.
- 11. Wait till the deployment gets completed.
- 12. Once deployment gets successfully completed, Log in to VMware vSphere client and check created vThunder resource.

Figure 12 : vThunder instance



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.



13. Click Launch Web Console.

14. Log in to both vThunder and manually configure management public IP using below command:

Active vThunder:

```
vThunder>en
Password:
vThunder#config
vThunder(config)#interface management
vThunder(config-if:management)#ip address 10.64.25.176 /24
vThunder(config-if:management)#ip default-gateway 10.64.25.1
vThunder(config-if:management)#write memory
Building configuration...
Write configuration to default primary startup-config
[OK]
vThunder(config-if:management)#
```

Standby vThunder:

```
vThunder>en
Password:
vThunder#config
vThunder(config)#interface management
vThunder(config-if:management)#ip address 10.64.25.177 /24
vThunder(config-if:management)#ip default-gateway 10.64.25.1
vThunder(config-if:management)#write memory
Building configuration...
Write configuration to default primary startup-config
[OK]
vThunder(config-if:management)#
```

NOTE: The management public IP address and ethernet IP address are not configured automatically during the deployment. hence manually configuring management public IP address and ethernet IP address will get configured with Basic Server Load Balancer script.


Access Thunder Virtual Machine

The Thunder virtual machine can be accessed using any of the following ways:

- Access vThunder using CLI
- <u>Access vThunder using GUI</u>

Create and Configure Server and Client Machine

This section applies only if you do not have a server and client machine already set up. If you haven't created the server and client machines yet, please refer to the provided link for instructions on how to set them up.

Create a Virtual Machine and Install Linux (vmware.com)

Configure Thunder

The following configurations can be applied to the deployed vThunder instance:

- Change Password
- A10 License
- <u>SSL Certificate</u>
- Basic Server Load Balancer
- High Availability
- Backend Autoscale

Verify Deployment

To verify deployment using the VMware template, perform the following steps:

 Run the following command on the active vThunder instance: vThunder-Active(config)#show running-config

If the deployment is successful with basic SLB, HA, HTTP template, and Persistcookie template configuration, the following output is displayed:

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Deployment Templates



```
vrrp-a common
  device-id 1
  set-id 1
  enable
L
terminal idle-timeout 0
1
ip dns primary 8.8.8.8
1
interface management
  ip address 10.64.25.176 255.255.255.0
  ip default-gateway 10.64.25.1
1
interface ethernet 1
  enable
 ip address 10.0.2.7 255.255.255.0
T.
interface ethernet 2
  enable
 ip address 10.0.3.20 255.255.255.0
vrrp-a vrid O
 floating-ip 10.0.3.23
 blade-parameters
   priority 100
vrrp-a peer-group
 peer 10.0.2.7
 peer 10.0.2.8
L.
ip route 0.0.0.0 /0 10.0.2.1
1
slb server server-ubuntu 10.0.3.10
 port 53 udp
   health-check-disable
  port 80 tcp
    health-check-disable
```



```
port 443 tcp
   health-check-disable
slb service-group sg443 tcp
 health-check-disable
 member server-ubuntu 443
slb service-group sg53 udp
 health-check-disable
 member server-ubuntu 53
slb service-group sg80 tcp
 health-check-disable
 member server-ubuntu 80
slb template persist cookie persist-cookie
 expire 60
 encrypt-level 0
 name al0-cookies
 match-type service-group
slb template http hostname-test
 host-switching contains s1 service-group sg80
T.
slb template http url-test
 url-switching regex-match s1 service-group sg80
slb virtual-server vip 10.0.2.16
 port 53 udp
   source-nat auto
   service-group sg53
 port 80 http
   source-nat auto
   service-group sg80
   template persist cookie persist-cookie
   template http url-test
 port 443 https
```

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```
source-nat auto
service-group sg443
template persist cookie persist-cookie
template http url-test
!
end
```

2. Run the following command on active vThunder instance to verify the SSL Certificate configuration:

vThunder-Active(config)#**show pki cert**

If the deployment is successful, the following SSL configuration is displayed:

3. Run the following command on active vThunder instance to verify the GLM License Provision configuration:

vThunder-Active(config)#**show license-info**

If the GLM is successfully applied on vThunder, the following GLM configuration is displayed:



4. Run the following command on the standby vThunder instance: vThunder-Standby(config)#show running-config

If the deployment is successful with basic SLB, HA, HTTP template, and Persistcookie template configuration, the following output is displayed:



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Deployment Templates



```
vrrp-a common
  device-id 2
  set-id 1
  enable
L
terminal idle-timeout 0
1
ip dns primary 8.8.8.8
1
interface management
  ip address 10.64.25.177 255.255.255.0
  ip default-gateway 10.64.25.1
1
interface ethernet 1
  enable
 ip address 10.0.2.8 255.255.255.0
T.
interface ethernet 2
  enable
 ip address 10.0.3.21 255.255.255.0
vrrp-a vrid O
 floating-ip 10.0.3.23
 blade-parameters
   priority 100
vrrp-a peer-group
 peer 10.0.2.7
 peer 10.0.2.8
L.
ip route 0.0.0.0 /0 10.0.2.1
1
slb server server-ubuntu 10.0.3.10
 port 53 udp
   health-check-disable
  port 80 tcp
    health-check-disable
```



```
port 443 tcp
   health-check-disable
slb service-group sg443 tcp
 health-check-disable
 member server-ubuntu 443
slb service-group sg53 udp
 health-check-disable
 member server-ubuntu 53
slb service-group sg80 tcp
 health-check-disable
 member server-ubuntu 80
slb template persist cookie persist-cookie
 expire 60
 encrypt-level 0
 name al0-cookies
 match-type service-group
slb template http hostname-test
 host-switching contains s1 service-group sg80
T.
slb template http url-test
 url-switching regex-match s1 service-group sg80
slb virtual-server vip 10.0.2.16
 port 53 udp
   source-nat auto
   service-group sg53
 port 80 http
   source-nat auto
   service-group sg80
   template persist cookie persist-cookie
   template http url-test
 port 443 https
```

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```
source-nat auto
service-group sg443
template persist cookie persist-cookie
template http url-test
!
end
```

5. Run the following command to force stop the active vThunder instance and make the standby vThunder instance as active device:

vThunder-Active(config)#vrrp-a force-self-standby enable vThunder-ForcedStandby(config)#

6. Run the following command to disable the active standby vThunder instance: vThunder-ForcedStandby(config)#vrrp-a force-self-standby disable vThunder-Active(config)#

. . : : : : : : : : : : :



Verify Traffic Flow

To verify the traffic flow from client machine to server machine via vThunder, perform the following:

1. SSH your client machine and run the following command using the copied VIP address to verify the traffic flow:

curl <vThunder instance datain-nic private vip>

Example

curl 10.0.2.16

Verify if a response is received.

- 2. After the switchover, vThunder instance 2 is active, copy the VIP address of the vThunder instance 2.
- 3. SSH your client machine and run the following command to verify the traffic flow: curl <vThunder_instance_datain-nic_private_vip>

Example

curl 10.0.2.16

Verify if a response is received.

SSH your client machine and run the following command to verify the HTTP template traffic flow:

```
curl <vThunder_instance_datain-nic_private_vip>:<port_number>/<host-
match-string or url-match-string>/
```

Example

curl 10.0.2.16:80/s1/

Verify if a response is received from client server (For example: Apache Index page).

5. SSH your client machine and run the following commands to verify the Persist cookie template traffic flow:



- a. Verify the current cookie configuration: curl --head <vThunder instance datain-nic private ip>
- b. Run the following commands to save the cookies in the cookie.txt file: curl -b cookie.txt -c cookie.txt <vThunder_instance_datain-nic_ private_ip> cat cookie.txt

Example

```
curl --head 10.0.2.16
curl -b cookie.txt -c cookie.txt 10.0.2.16
cat cookie.txt
```

6. Run the following command on the active vThunder instance to view the persistence load-balancing statistics: vThunder(config)#show slb persist

If the deployment is successful, the following summary persistence statistics is displayed:



	Total
URL hash persist (pri)	0
URL hash persist (sec)	0
URL hash persist fail	0
SRC IP persist ok	0
SRC IP persist fail	0
SRC IP hash persist(pri)	0
SRC IP hash persist(sec)	0
SRC IP hash persist fail	0
DST IP persist ok	0
DST IP persist fail	0
DST IP hash persist(pri)	0
DST IP hash persist(sec)	0
DST IP hash persist fail	0
SSL SID persist ok	0
SSL SID persist fail	0
Cookie persist ok	1
Cookie persist fail	0
Persist cookie not found	2
Persist cookie Pass-thru	0
Enforce higher priority	0

If the Persist-cookie configuration is successful, a value is displayed for the Cookie persist ok else the value is 0.

Thunder-3NIC-2VM-PUBVIP

This template creates two vThunder instances with HA setup and each vThunder has one management and two data NICs (data-in and data-out). It configures data-in network interface card (NIC) with Public IP on VIP.

High availability can be configured within the same or different availability zone within a same region. If one instance goes down, other instance takes the request without any manual intervention.

For more information, see Create Thunder Virtual Machines.

Figure 13 : SLB Thunder ADC in High Availability mode with Public VIP

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Additional Thunder configurations are available that can be applied as needed:

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- <u>Change Password</u>
- A10 License
- SSL Certificate
- Basic Server Load Balancer
- High Availability
- Backend Autoscale

Various templates are available for different deployment needs.

For more information, see **Deployment Templates**.

The following topics are covered:

Create Thunder Virtual Machines	
Access Thunder Virtual Machine	
Create and Configure Server and Client Machine	
Configure Thunder	
Verify Deployment	
Verify Traffic Flow	62

Create Thunder Virtual Machines

The A10-vThunder-3NIC-2VM template is used to create two Thunder virtual machines with three network interface cards each and configure the data-in network interface card with Public IP on VIP.

vThunder management and Data-IN interfaces should be public interface to get traffic response on Public VIP.

Before deploying this template, it is recommended to review the Prerequisites.

vThunder instances should have the same versions; otherwise, traffic flow will be disrupted.

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To deploy the A10-vThunder-3NIC-2VM template using VMware Aria automation, perform the following steps:

- 1. Download <u>A10-vThunder-3NIC-2VM</u> template.
- 2. Login <u>VMware Aria Automation</u> > Services, click Assembler.
- 3. From the VMware Aria Automation Assembler > Design > Templates, select Upload from NEW FROM dropdown window.

Figure 14 : VM ware Aria Automation Assembler

vmw VMware Aria Automation Assembler	٢		vraadmin vraadm 응 VRIDM ~		
Resources Design Infrastructure Extensibility Tenant Management Migration			🖽 GUIDE	D SETU	P
Templates Ottems V					
A Templates	0	Filter		C	
Import groups Blank canvas Source Control Read-only Project Last Updated	Updated By		Released Versions		
© Custom Resources Terraform No Templates found					SUPPORT
Manage Columns			0 Tempi	ates	

- 4. Enter or select the appropriate values in the **Upload Template** fields:
 - Name: Enter your VMware Template name.
 - **Description**: Provide description for the VMware template.
 - **Project**: Select the available project.
 - Upload file: Select the VMWARE_TMPL_3NIC_2VM.yaml file.



Figure 15 : Upload Template window

Upload Template	×
Name *	A10-VMware-3NIC-2VM
Description	A10-VMware-3NIC-2VM Deployment
Project *	Q VMware-Templates
	 Template sharing in Service Broker Share only with this project Allow an administrator to share with any project in this organization
Upload file *	SELECT FILE VMWARE_TMPL_3NIC_2VM_
	CANCEL

5. Click UPLOAD.

6. After template gets successfully uploaded, click on upload template name and configure the following parameters as appropriate in editor window for both vThunder details:

Resource Name	Description
Virtual Machine	Specify a virtual machine name for vThunder.
	name: vth-inst1

.

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Resource Name	Description
	name: vth-inst2
Size	Specify a suitable size for the vThunder instance that supports at least 3 NICs which is available in Flavor mappings.
	flavor: medium
Image	Specify the desired vThunder Image name which is available in Image mappings.
	image: ACOS-521-P6-OVA
Folder	Specify the folder name under which virtual machine to be created.
Name	folderName: vRA Deployments

7. Click **TEST** to validate the template. Once validation is successful then click **DEPLOY**.

Figure 16 : Edit template window

vmw VMware Aria Automation Assembler	9 (Vraadmin vraadm & VRIDM ~	
Resources Design Infrastructure Extensibility Tenant Management Migration		囗 GUIDED	D SETUP
A10-VMware-3NIC-2VM settings version history actions -			
 ※ % %	» ⊮ ^π	Code Properties Inputs	
Q, e.g. Machine C Search Resource Types	1 ton 2 inp 3 - res 4 - C 5 6 -	matversion: 1 uts: {} ources: loud_vSphere_Machine_2: type: Cloud.vSphere.Machine properties:	•
v Cloud Agnostic	9 10 11 - C	name: vth-insti flavor: medium folderName: vRA Deployments loud_vSphere_Machine_1:	
up Housen	12 13 * 14 15 16	type: Cloud.vSphere.Machine properties: image: ACOS-521-P6-0WA name: vth-inst2 flavor: medium	IPPORT
g remove) Security Group (bad visiter, 1)	17 18	folderName: vRA Deployments	ж К
Allocation Helpers Compute Helpers			
the second seco			
ng nungernepen ∲Network Helper			
- 6) Security Group Helper (1) Storage Helper			Ŧ
V Kubernetes VERSION CLOSE Last saved a few seconds ago	4		•

- 8. Enter or select the appropriate values in the **Deployment Type** fields:
 - Select Create a new deployment in the dropdown.
 - **Deployment Name**: Enter your VMware deployment name.
 - **Template Version**: Select the cloud template version.



• **Description**: Provide description for the VMware deployment.

Figure 17 : Deployment Type window

Deploy A10-VMware-3NI	Deployment Type			\times
1 Deployment Type	Create a new deployment	3NIC-2VM-Template		
	Deployment name			
	Template Version *	Q Current Draft		
	Description	A10-VMware-3NIC-2VM Deployment	<i></i>	
			CANCEL	LOY

- 9. Click **DEPLOY**.
- 10. Go to **Resources** > **Deployments**, click the deployment name (3NIC-2VM-Template) provided during the deployment.
- 11. Wait till the deployment gets completed.
- 12. Once deployment gets successfully completed, login into VMware vSphere client and check created vThunder resource.

Figure 18 : vThunder instance

vSphere Client	Q Search in a						C
> the theorem of the term of	m2773-242 Configure	82007012 Permissions	4 D 🗆 🛃 Datastores N	etworks Snapshots Updates			
Guest OS	#	Virtual Ma	chine Details	ACTIONS V	H	Usage Last updated: 10/11/23, 8:58 PM	**
Pade light .		Ŧ	Power Status Guest OS VMware Tools	 Powered On CentOS 7 (64-bit) Running, version:2147483647 (Guest Managed) ① 		CPU 10.425 GHz used Memory	
LAUNCH REMOTE CC	DNSOLE (1)		DNS Name (1) IP Addresses (6)	vThunder 10.64.25.170 10.0.2.7 AND 4 MORE		Storage	
LAUNCH WEB CON	ISOLE		Encryption	Not encrypted		VIEW STATS	



13. Click Launch Web Console.

14. Log in to both vThunder and manually configure management public IP using below command:

Active vThunder:

```
vThunder>en
Password:
vThunder#config
vThunder(config)#interface management
vThunder(config-if:management)#ip address 10.64.25.176 /24
vThunder(config-if:management)#ip default-gateway 10.64.25.1
vThunder(config-if:management)#write memory
Building configuration...
Write configuration to default primary startup-config
[OK]
vThunder(config-if:management)#
```

Standby vThunder:

```
vThunder>en
Password:
vThunder#config
vThunder(config)#interface management
vThunder(config-if:management)#ip address 10.64.25.177 /24
vThunder(config-if:management)#ip default-gateway 10.64.25.1
vThunder(config-if:management)#write memory
Building configuration...
Write configuration to default primary startup-config
[OK]
vThunder(config-if:management)#
```

NOTE: The management public IP address and ethernet IP address are not configured automatically during the deployment. hence manually configure management public IP address and ethernet IP address will get configured with Basic Server Load Balancer script.



Access Thunder Virtual Machine

The Thunder virtual machine can be accessed using any of the following ways:

- Access vThunder using CLI
- <u>Access vThunder using GUI</u>

Create and Configure Server and Client Machine

This section applies only if you do not have a server and client machine already set up. If you haven't created the server and client machines yet, please refer to the provided link for instructions on how to set them up.

Create a Virtual Machine and Install Linux (vmware.com)

Configure Thunder

The following configurations can be applied to the deployed vThunder instance:

- Change Password
- A10 License
- SSL Certificate
- Basic Server Load Balancer
- High Availability
- <u>Backend Autoscale</u>

Verify Deployment

To verify deployment using the VMware template, perform the following steps:

 Run the following command on the active vThunder instance: vThunder-Active(config)#show running-config

If the deployment is successful with basic SLB, HA, HTTP template, and Persistcookie template configuration, the following output is displayed:

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```
vrrp-a common
  device-id 1
  set-id 1
  enable
1
terminal idle-timeout 0
1
ip dns primary 8.8.8.8
1
interface management
  ip address 10.64.25.176 255.255.255.0
  ip default-gateway 10.64.25.1
1
interface ethernet 1
  enable
 ip address 10.64.25.140 255.255.255.0
T.
interface ethernet 2
  enable
 ip address 10.0.3.20 255.255.255.0
vrrp-a vrid O
 floating-ip 10.0.3.23
 blade-parameters
   priority 100
vrrp-a peer-group
 peer 10.64.25.140
 peer 10.64.25.142
1
ip route 0.0.0.0 /0 10.64.25.1
1
slb server server-ubuntu 10.0.3.10
 port 53 udp
   health-check-disable
  port 80 tcp
    health-check-disable
```



```
port 443 tcp
   health-check-disable
slb service-group sg443 tcp
 health-check-disable
 member server-ubuntu 443
slb service-group sg53 udp
 health-check-disable
 member server-ubuntu 53
slb service-group sg80 tcp
 health-check-disable
 member server-ubuntu 80
slb template persist cookie persist-cookie
 expire 60
 encrypt-level 0
 name al0-cookies
 match-type service-group
slb template http hostname-test
 host-switching contains s1 service-group sg80
T.
slb template http url-test
 url-switching regex-match s1 service-group sg80
slb virtual-server vip 10.64.25.141
 port 53 udp
   source-nat auto
   service-group sg53
 port 80 http
   source-nat auto
   service-group sg80
   template persist cookie persist-cookie
   template http url-test
 port 443 https
```

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```
source-nat auto
service-group sg443
template persist cookie persist-cookie
template http url-test
!
end
```

2. Run the following command on active vThunder instance to verify the SSL Certificate configuration:

vThunder-Active(config)#**show pki cert**

If the deployment is successful, the following SSL configuration is displayed:

3. Run the following command on active vThunder instance to verify the GLM License Provision configuration:

vThunder-Active(config)#**show license-info**

If the GLM is successfully applied on vThunder, the following GLM configuration is displayed:

```
Host ID
            : 5DCB01EC264BECCCFECB3C2ED42E02384EE8C527
USB ID
            : Not Available
Billing Serials: A10f771cecbe0000
Token
            : A10f771cecbe
Product
            : ADC
            : vThunder
Platform
Burst
            : Disabled
GLM Ping Interval In Hours : 24
_____
Enabled Licenses Expiry Date
                                    Notes
-----
SLB None
CGN None
GSLB None
RC None
DAF None
WAF None
AAM None
FP None
WEBROOT N/A Requires an additional Webroot license.
THREATSTOP N/A
                     Requires an additional ThreatSTOP license.
QOSMOS N/A
                 Requires an additional QOSMOS license.
WEBROOT TI N/A
                      Requires an additional Webroot Threat Intel
license.
CYLANCE N/A
                   Requires an additional Cylance license.
IPSEC VPN N/A
                     Requires an additional IPsec VPN license.
25 Mbps Bandwidth 21-December-2022
```

4. Run the following command on the standby vThunder instance: vThunder-Standby(config)#show running-config

If the deployment is successful with basic SLB, HA, HTTP template, and Persistcookie template configuration, the following output is displayed:





Feedback



```
vrrp-a common
  device-id 2
  set-id 1
  enable
1
terminal idle-timeout 0
1
ip dns primary 8.8.8.8
1
interface management
  ip address 10.64.25.177 255.255.255.0
  ip default-gateway 10.64.25.1
1
interface ethernet 1
  enable
 ip address 10.64.25.142 255.255.255.0
T.
interface ethernet 2
  enable
 ip address 10.0.3.21 255.255.255.0
vrrp-a vrid O
 floating-ip 10.0.3.23
 blade-parameters
   priority 100
vrrp-a peer-group
 peer 10.64.25.140
 peer 10.64.25.142
1
ip route 0.0.0.0 /0 10.64.25.1
1
slb server server-ubuntu 10.0.3.10
 port 53 udp
   health-check-disable
  port 80 tcp
    health-check-disable
```



```
port 443 tcp
   health-check-disable
slb service-group sg443 tcp
 health-check-disable
 member server-ubuntu 443
slb service-group sg53 udp
 health-check-disable
 member server-ubuntu 53
slb service-group sg80 tcp
 health-check-disable
 member server-ubuntu 80
slb template persist cookie persist-cookie
 expire 60
 encrypt-level 0
 name al0-cookies
 match-type service-group
slb template http hostname-test
 host-switching contains s1 service-group sg80
T.
slb template http url-test
 url-switching regex-match s1 service-group sg80
slb virtual-server vip 10.64.25.141
 port 53 udp
   source-nat auto
   service-group sg53
 port 80 http
   source-nat auto
   service-group sg80
   template persist cookie persist-cookie
   template http url-test
 port 443 https
```



```
source-nat auto
service-group sg443
template persist cookie persist-cookie
template http url-test
!
end
```

5. Run the following command to force stop the active vThunder instance and make the standby vThunder instance as active device:

```
vThunder-Active(config)#vrrp-a force-self-standby enable
vThunder-ForcedStandby(config)#
```

6. Run the following command to disable the active standby vThunder instance: vThunder-ForcedStandby(config)#vrrp-a force-self-standby disable vThunder-Active(config)#

Verify Traffic Flow

To verify the traffic flow from client machine to server machine via vThunder, perform the following:

 SSH your client machine and run the following command using the copied VIP address to verify the traffic flow:

curl <vThunder_instance_datain-nic_public_vip>

Example

curl 10.64.25.141

Verify if a response is received.

- 2. After the switchover, vThunder instance 2 is active, copy the VIP address of the vThunder instance 2.
- 3. SSH your client machine and run the following command to verify the traffic flow: curl <vThunder instance datain-nic public vip>

Example

curl 10.64.25.141

Verify if a response is received.



4. SSH your client machine and run the following command to verify the HTTP template traffic flow:

curl <vThunder_instance_datain-nic_public_vip>:<port_number>/<hostmatch-string or url-match-string>/

Example

curl 10.64.25.141:80/s1/

Verify if a response is received from client server (For example: Apache Index page).

- 5. SSH your client machine and run the following commands to verify the Persist cookie template traffic flow:
 - a. Verify the current cookie configuration: curl --head <vThunder instance datain-nic public ip>
 - b. Run the following commands to save the cookies in the cookie.txt file: curl -b cookie.txt -c cookie.txt <vThunder_instance_datain-nic_ public_ip> cat cookie.txt

Example

```
curl --head 10.64.25.141
curl -b cookie.txt -c cookie.txt 10.64.25.141
cat cookie.txt
```

6. Run the following command on the active vThunder instance to view the persistence load-balancing statistics:

vThunder(config) #show slb persist

If the deployment is successful, the following summary persistence statistics is displayed:



	Total
URL hash persist (pri)	0
URL hash persist (sec)	0
URL hash persist fail	0
SRC IP persist ok	0
SRC IP persist fail	0
SRC IP hash persist(pri)	0
SRC IP hash persist(sec)	0
SRC IP hash persist fail	0
DST IP persist ok	0
DST IP persist fail	0
DST IP hash persist(pri)	0
DST IP hash persist(sec)	0
DST IP hash persist fail	0
SSL SID persist ok	0
SSL SID persist fail	0
Cookie persist ok	1
Cookie persist fail	0
Persist cookie not found	2
Persist cookie Pass-thru	0
Enforce higher priority	0

If the Persist-cookie configuration is successful, a value is displayed for the Cookie persist ok else the value is 0.

Thunder-3NIC-3VM

This template creates three new virtual machine with pre-loaded Thunder instance in the same region and zone and attaches three new network interface cards (NICs). These three vThunder instances are referred as Master Controller (Active), Site1 and Site2. Same template can be used to install identical number of resources in another region. The three vThunder instances in another region are referred as Member Controller, Site1 and Site2.

This template is used to setup disaster recovery site in a cross-region or hybrid cloud environment.

For more information, see Create Thunder Virtual Machines.



.....

Figure 19 : Thunder ADC with GSLB



Additional Thunder configurations are available that can be applied as needed:

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- Change Password
- A10 License
- SSL Certificate
- Hybrid Cloud GSLB

Various templates are available for different deployment needs.

For more information, see <u>Deployment Templates</u>.

The following topics are covered:

Create Thunder Virtual Machines	66
Access Thunder Virtual Machine	
Create and Configure Server and Client Machine	
Configure Thunder	
Verify Deployment	
Verify Traffic Flow	

Create Thunder Virtual Machines

The A10-vThunder-3NIC-3VM template is used to create three Thunder virtual machines with three network interface cards each.

Before deploying this template, it is recommended to review the Prerequisites.

To deploy the A10-vThunder-3NIC-3VM template using VMware Aria automation, perform the following steps:

- 1. Download <u>A10-vThunder-3NIC-3VM</u> template.
- 2. Login <u>VMware Aria Automation</u> > Services, click Assembler.
- 3. From the VMware Aria Automation Assembler > Design > Templates, select Upload from NEW FROM dropdown window.



Figure 20 : VM ware Aria Automation Assembler

vmw VMware Aria Automa	ion Assembler				vraadmin vraadm 옲 VRIDM ~	
Resources Design Infras	ructure Extensibility Tenant Management Migration				🖽 GUIDEI	D SETUP
Resources Design Infrat € Templates (ii) Property Groups © Custom Resources Ø Ø Resource Actions	ructure Extensibility Tenant Management Migration Templates Otens	Y DELETE Project Last Updated No Templates found	Q Updated By	Filter	()) GVIDEI	
	Manage Columns				O Tempu	tes

- 4. Enter or select the appropriate values in the **Upload Template** fields:
 - Name: Enter your VMware Template name.
 - **Description**: Provide description for the VMware template.
 - **Project**: Select the available project.
 - Upload file: Select the VMWARE_TMPL_3NIC_3VM.yaml file.



Figure 21: Upload Template window

Upload Template	×		
Name *	A10-VMware-3NIC-3VM		
Description	A10-VMware-3NIC-3VM Deployment		
Project *	Q VMware-Templates		
	Template sharing in Service Broker		
	• Share only with this project		
	O Allow an administrator to share with		
	any project in this organization		
Upload file *	VMWARE_TMPL_3NIC- SELECT FILE 3VM.yaml		
	CANCEL		

5. Click **UPLOAD**.

6. After template gets successfully uploaded, click on upload template name and configure the following parameters as appropriate in editor window for all three vThunders:

Resource Name	Description
Virtual Machine	Specify a virtual machine name for vThunder.
	name: vth-inst1

Resource Name	Description
	name: vth-inst2 name: vth-inst3
Size	Specify a suitable size for the vThunder instance that supports at least 3 NICs which is available in Flavor mappings.
	flavor: medium
Image	Specify the desired vThunder Image name which is available in Image mappings.
	image: ACOS-521-P6-OVA
Folder Name	Specify the folder name under which virtual machine to be created.
	folderName: vRA Deployments

Feedbac

7. Click **TEST** to validate the template. Once validation is successful then click **DEPLOY**.

Figure 22 : Edit template window

vmw VMware Aria Automation	Assembler		C	9	vraadmin vraadm ਨੂੰ ਪਸ਼ਹਮ	
Resources Design Infrastruc	ure Extensibility Tenant Management Migration				🖽 GUIDED SI	ETUP
A10-VMware-3NIC-	WM SETTINGS VERSION HISTORY ACTIONS~					
*		<i>後</i> 🔲 か ぐ 🛎 🕀 G	e en o	≥ ₂ 7 Code	Properties Inputs	_
Q. e.g. Machine C				2 inputs: { 3 - resources	Coheren Marchine 1.	-
Search Resource Types				5 type 6 - prope	<pre>cloud.vSphere.Hachine enties: </pre>	
 Cloud Agnostic 				8 nat 9 fla	ne: vth-insti wor: medium idenlame: v80 Denloyments	
@ Machine				11 - Cloud_v 12 type: 13 - propo	Sphere_Machine_2: : Cloud.vSphere.Nachine	
≪ Load Balancer				14 ina 15 nat 16 fla	age: ACOS-521-P6-OVA me: vth-inst2 avor: medium	IPPORT
Security Group				17 fol 18 • Cloud_v 19 type	lderName: vRA Deployments /Sphere_Machine_3: : Cloud,vSphere_Machine	> SL
Volume	Cloud_vSpher.	Gloud_vSpher.		20 - prope 21 ina 22 nat	erties: age: ACOS-521-P6-OVA ne: vth-inst3	
✓ Allocation Helpers				23 fla 24 fol 25	avor: medium LderName: vRA Deployments	
🐁 Compute Helper						
 Flavor Helper Image Helper 						
Network Helper						
n Security Group Helper						
Storage Helper						Ŧ
✓ Kubernetes				4	•	
DEPLOY TEST VERSION	CLOSE Last saved a few seconds ago					

- 8. Enter or select the appropriate values in the **Deployment Type** fields:
 - Select Create a new deployment in the dropdown.
 - Deployment Name: Enter your VMware deployment name.



- **Template Version**: Select the cloud template version.
- **Description**: Provide description for the VMware deployment.

Figure 23 : Deployment Type window

Deploy A10-VMware-3NI	Deployment Type			\times
1 Deployment Type	Create a new deployment Deployment Name *	SNIC-3VM-Template	_	
	Template Version * Description	Q Current Draft A10-VMware-3NIC-3VM Deployment	_	
			ł	
			CANCEL DEPLO	Ŷ

- 9. Click **DEPLOY**.
- 10. Go to **Resources** > **Deployments**, click the deployment name (3NIC-3VM-Template) provided during the deployment.
- 11. Wait till the deployment gets completed.
- 12. Once deployment gets successfully completed, login into VMware vSphere client and check created vThunder resource.



Figure 24 : vThunder instance

\equiv vSphere Client Q Search in a	ll environments		C	4
>	820070124 D 🗆 🖫 Permissions Datastores I	📱 🖗 🔞 <mark>: астюля</mark> Networks Snapshots Updates		
Guest OS II	Virtual Machine Details	ACTIONS ~ II	Usage III Last updated: 10/11/23, 8:58 PM	
	Power Status	Powered On	CPU	
. Consider displacing	Guest OS	👌 CentOS 7 (64-bit)	🗍 10.425 GHz used	
	VMware Tools	Running, version:2147483647 (Guest Managed) (1)	Memory	
	DNS Name (1)	vThunder	91 MB used	
LAUNCH REMOTE CONSOLE	IP Addresses (6)	10.64.25.170 10.0.2.7 AND 4 MORE	Storage	
	Encryption	Not encrypted	20.33 GB used	
	Δ		VIEW STATS	

- 13. Click Launch Web Console.
- 14. Log in to vThunder and manually configure management public IP using below command:

vth-inst1:

```
vThunder>en
Password:
vThunder#config
vThunder(config)#interface management
vThunder(config-if:management)#ip address 10.64.25.176 /24
vThunder(config-if:management)#ip default-gateway 10.64.25.1
vThunder(config-if:management)#write memory
Building configuration...
Write configuration to default primary startup-config
[OK]
vThunder(config-if:management)#
```

vth-inst2:



```
vThunder>en
Password:
vThunder#config
vThunder(config)#interface management
vThunder(config-if:management)#ip address 10.64.25.177 /24
vThunder(config-if:management)#ip default-gateway 10.64.25.1
vThunder(config-if:management)#write memory
Building configuration...
Write configuration to default primary startup-config
[OK]
vThunder(config-if:management)#
```

vth-inst3:

```
vThunder>en
Password:
vThunder#config
vThunder(config)#interface management
vThunder(config-if:management)#ip address 10.64.25.178 /24
vThunder(config-if:management)#ip default-gateway 10.64.25.1
vThunder(config-if:management)#write memory
Building configuration...
Write configuration to default primary startup-config
[OK]
vThunder(config-if:management)#
```

NOTE: The management public IP address and ethernet IP address are not configured automatically during the deployment. hence manually configuring management public IP address and ethernet IP address will get configured with Basic Server Load Balancer script/ Hybrid Cloud GSLB Script.

Access Thunder Virtual Machine

The Thunder virtual machine can be accessed using any of the following ways:

- <u>Access vThunder using CLI</u>
- <u>Access vThunder using GUI</u>

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Create and Configure Server and Client Machine

This section applies only if you do not have a server and client machine already set up. If you haven't created the server and client machines yet, please refer to the provided link for instructions on how to set them up.

Create a Virtual Machine and Install Linux (vmware.com)

Configure Thunder

The following configurations can be applied to the deployed vThunder instance:

- <u>Change Password</u>
- A10 License
- SSL Certificate
- Hybrid Cloud GSLB

Verify Deployment

To verify ARM template deployment using CLI, perform the following steps:

1. Verify SLB configuration on the following vThunder instances:

CONTROLLER 1 - Master configuration

Run the following command:

vThunder-gslb:Master(config)(NOLICENSE)#**show running-config**

If the deployment is successful, the following controller and site configuration is displayed on vThunder master controller:



```
no system geo-location load iana
system geo-location load GeoLite2-City
1
T.
interface management
 ip address 10.64.25.176 255.255.255.0
 ip default-gateway 10.64.25.1
interface ethernet 1
 enable
 ip address 10.0.2.20 255.255.255.0
interface ethernet 2
 enable
 ip address 10.0.3.20 255.255.255.0
!
1
ip route 0.0.0.0 /0 10.0.2.1
1
slb virtual-server gslb-server 10.64.25.165
 port 53 udp
   gslb-enable
gslb service-ip vsl 10.0.2.9
 external-ip 10.64.25.161
 port 80 tcp
gslb service-ip vs2 10.0.2.10
 external-ip 10.64.25.162
 port 80 tcp
gslb service-ip vs3 10.0.2.15
 external-ip 10.64.25.163
 port 80 tcp
gslb service-ip vs4 10.0.2.16
 external-ip 10.64.25.164
```



```
port 80 tcp
1
gslb group default
 enable
 priority 255
gslb site eastus 1
  geo-location "North America, United States"
  slb-dev slb1 10.64.25.177
   vip-server vs1
gslb site eastus 2
 geo-location "North America, United States"
  slb-dev slb2 10.64.25.178
   vip-server vs2
gslb site eastus2_1
 geo-location "North America.United States.California.San Jose"
 slb-dev slb3 10.64.25.180
   vip-server vs3
gslb site eastus2 2
 geo-location "North America.United States.California.San Jose"
  slb-dev slb4 10.64.25.181
   vip-server vs4
gslb policy a10
 metric-order health-check geographic
 dns server authoritative
gslb zone gslb.a10.com
 policy al0
 service 80 www
   dns-a-record vsl static
   dns-a-record vs2 static
   dns-a-record vs3 static
   dns-a-record vs4 static
```



! gslb protocol status-interval 1 ! gslb protocol enable controller ! ! end

CONTROLLER 2 - Member configuration

Run the following command:

vThunder-gslb:Member(config)(NOLICENSE)#**show running-config**

If the deployment is successful, the following controller and site configuration is displayed on vThunder member controller:

...:::::::



```
interface management
1
interface management
 ip address 10.64.25.179 255.255.255.0
 ip default-gateway 10.64.25.1
interface ethernet 1
 enable
 ip address 10.0.2.30 255.255.255.0
interface ethernet 2
 enable
 ip address 10.0.3.30 255.255.255.0
!
1
ip route 0.0.0.0 /0 10.0.2.1
!
slb virtual-server gslb-server 10.64.25.166
 port 53 udp
   gslb-enable
gslb service-ip vsl 10.0.2.9
 external-ip 10.64.25.161
 port 80 tcp
gslb service-ip vs2 10.0.2.10
 external-ip 10.64.25.162
 port 80 tcp
1
gslb service-ip vs3 10.0.2.15
 external-ip 10.64.25.163
 port 80 tcp
gslb service-ip vs4 10.0.2.16
 external-ip 10.64.25.164
 port 80 tcp
!
```

```
gslb group default
 enable
 primary 10.64.25.176
gslb site eastus 1
  geo-location "North America, United States"
  slb-dev slb1 10.64.25.177
   vip-server vsl
gslb site eastus_2
 geo-location "North America, United States"
 slb-dev slb2 10.64.25.178
   vip-server vs2
gslb site eastus2 1
  geo-location "North America.United States.California.San Jose"
  slb-dev slb3 10.64.25.180
   vip-server vs3
gslb site eastus2 2
  geo-location "North America.United States.California.San Jose"
  slb-dev slb4 10.64.25.181
   vip-server vs4
gslb policy a10
 metric-order health-check geographic
  dns server authoritative
gslb zone gslb.a10.com
 policy al0
 service 80 www
   dns-a-record vs1 static
   dns-a-record vs2 static
   dns-a-record vs3 static
   dns-a-record vs4 static
gslb protocol status-interval 1
```



! gslb protocol enable controller ! ! end!

SITE1 REGION1 configuration

Run the following command:

vThunder(config)(NOLICENSE)#**show running-config**

If the deployment is successful, the following controller and site configuration is displayed on vThunder site1 region1:



```
interface management
 ip address 10.64.25.177 255.255.255.0
 ip default-gateway 10.64.25.1
interface ethernet 1
 enable
 ip address 10.0.2.31 255.255.255.0
interface ethernet 2
 enable
 ip address 10.0.3.32 255.255.255.0
!
ip route 0.0.0.0 /0 10.0.2.1
!
slb server vth-server1 10.0.3.9
  health-check disable
 port 80 tcp
health-check disable
!
slb service-group sg tcp
 member vth-server1 80
!
slb virtual-server vsl 10.0.2.9
  port 80 tcp
    source-nat auto
    service-group sg
!
!
gslb protocol enable device
!
```

SITE2 REGION1 configuration

Run the following command:

```
vThunder(config)(NOLICENSE)#show running-config
```

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If the deployment is successful, the following controller and site configuration is displayed on vThunder site1 region2:

```
interface management
  ip address 10.64.25.178 255.255.255.0
 ip default-gateway 10.64.25.1
1
interface ethernet 1
  enable
 ip address 10.0.2.34 255.255.255.0
L
interface ethernet 2
 enable
 ip address 10.0.3.34 255.255.255.0
 !
 ip route 0.0.0.0 /0 10.0.2.1
 !
 slb server vth-server1 10.0.3.10
  health-check disable
  port 80 tcp
health-check disable
 !
 slb service-group sg tcp
  member vth-server1 80
 !
 slb virtual-server vs1 10.0.2.10
  port 80 tcp
    source-nat auto
    service-group sg
 !
 !
 gslb protocol enable device
 !
```

SITE1 REGION2 configuration

Run the following command:



```
vThunder(config)(NOLICENSE)#show running-config
```

If the deployment is successful, the following controller and site configuration is displayed on vThunder site1 region2:

```
interface management
 ip address 10.64.25.180 255.255.255.0
 ip default-gateway 10.64.25.1
1
interface ethernet 1
 enable
 ip address 10.0.2.35 255.255.255.0
1
interface ethernet 2
 enable
 ip address 10.0.3.35 255.255.255.0
!
ip route 0.0.0.0 /0 10.0.2.1
!
slb server vth-server1 10.0.3.11
  health-check disable
 port 80 tcp
health-check disable
!
slb service-group sg tcp
  member vth-server1 80
!
slb virtual-server vsl 10.0.2.15
  port 80 tcp
    source-nat auto
    service-group sg
!
!
gslb protocol enable device
!
```

SITE2 REGION2 configuration



Run the following command:

vThunder(config)(NOLICENSE)#**show running-config**

If the deployment is successful, the following controller and site configuration is displayed on vThunder site2 region2:

```
interface management
  ip address 10.64.25.181 255.255.255.0
  ip default-gateway 10.64.25.1
interface ethernet 1
  enable
  ip address 10.0.2.36 255.255.255.0
interface ethernet 2
  enable
 ip address 10.0.3.37 255.255.255.0
 1
 ip route 0.0.0.0 /0 10.0.2.1
 !
 slb server vth-server1 10.0.3.12
  health-check disable
  port 80 tcp
 health-check disable
 !
 slb service-group sg tcp
  member vth-server1 80
 !
 slb virtual-server vs1 10.0.2.16
  port 80 tcp
    source-nat auto
    service-group sg
 !
 !
 gslb protocol enable device
 !!
 gslb protocol enable device
```



2. Verify the GSLB group information on the following vThunder instances:

CONTROLLER - Master configuration

Run the following command:

vThunder-gslb:Master(config)(NOLICENSE)#**show gslb group**

If the deployment is successful, the following configuration is displayed:

```
Pri = Priority, Attrs = Attributes
                  S-Cfg = Secure Config
                  S-State = Secure Status
                      D = Disabled, L = Learn
                      P = Passive, * = Master
                      E = Enabled, EF = Enable-Fallback
                      Unsec = Unsecure, Unkwn = Unknown
                      Estng = Establishing, Estd = Established
Group: default, Master: local
Member
                            Sys-ID Pri Attrs Status S-Cfg
S-State Address
------
_____
local
                            c14da456 255 L*
                                              OK
                            f5fba456 100 PL
vThunder
                                             Synced
                                                         D
Unsec 10.64.25.179
```

CONTROLLER - Member configuration

Run the following command:

vThunder-gslb:Member(config)(NOLICENSE)#**show gslb group**

If the deployment is successful, the following configuration is displayed:



Verify the GSLB protocol information on the following vThunder instances:
 CONTROLLER - Master configuration

Run the following command:

vThunder-gslb:Master(config)(NOLICENSE) **#show gslb protocol**

If the deployment is successful, the following configuration is displayed:





```
GSLB site: eastus 1
  SLB device: slb1 (10.64.25.176:17244) Established
 Session ID: 2869
 Secure Config:
                                   Disable |Current SSL State:
Unsecure
 Connection succeeded:
                                          1 |Connection failed:
1
                                          1 |Open packet received:
 Open packet sent:
1
 Open session succeeded:
                                          1 |Open session failed:
0
 Sessions Dropped:
                                          0 |Update packet received:
7346
 Keepalive packet sent:
                                       123 |Keepalive packet
received:
                          122
 Notify packet sent:
                                          0 |Notify packet received:
0
Message Header Error:
                                          0 |Protocol RDT(ms):
40
 GSLB Protocol Version:
                                          2 |Peer ACOS Version:
5.2.0 Build 155
 Secure negotiation Success:
                                         0 |Secure negotiation
Failures:
                           0
 SSL handshake Success:
                                          0 |SSL handshake Failures:
0
GSLB site: eastus_2
 SLB device: slb2 (10.64.25.176:9478) Established
 Session ID: 7186
 Secure Config:
                                   Disable |Current SSL State:
Unsecure
 Connection succeeded:
                                          1 |Connection failed:
1
 Open packet sent:
                                          1 |Open packet received:
1
 Open session succeeded:
                                          1 |Open session failed:
0
 Sessions Dropped:
                                          0 |Update packet received:
```



7344 Keepalive packet sent: 123 |Keepalive packet 122 received: Notify packet sent: 0 |Notify packet received: 0 0 |Protocol RDT(ms): Message Header Error: 32 GSLB Protocol Version: 2 |Peer ACOS Version: 5.2.0 Build 155 Secure negotiation Success: 0 |Secure negotiation Failures: 0 SSL handshake Success: 0 |SSL handshake Failures: 0 GSLB site: eastus2 1 SLB device: slb3 (10.64.25.176:7604) Established Session ID: 1353 Secure Config: Disable |Current SSL State: Unsecure Connection succeeded: 1 |Connection failed: 0 Open packet sent: 1 |Open packet received: 1 Open session succeeded: 1 |Open session failed: 0 Sessions Dropped: 0 |Update packet received: 7346 Keepalive packet sent: 123 |Keepalive packet received: 122 Notify packet sent: 0 |Notify packet received: 0 Message Header Error: 0 |Protocol RDT(ms): 20 GSLB Protocol Version: 2 |Peer ACOS Version: 5.2.0 Build 155 Secure negotiation Success: 0 |Secure negotiation 0 Failures: SSL handshake Success: 0 |SSL handshake Failures:

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••••



```
0
GSLB site: eastus2 2
  SLB device: slb4 (10.64.25.181:7604) Established
 Session ID: 46932
 Secure Config:
                                    Disable |Current SSL State:
Unsecure
 Connection succeeded:
                                          1 |Connection failed:
0
 Open packet sent:
                                          1 |Open packet received:
1
 Open session succeeded:
                                          1 |Open session failed:
0
 Sessions Dropped:
                                          0 |Update packet received:
7348
 Keepalive packet sent:
                                       124 |Keepalive packet
received:
                           123
 Notify packet sent:
                                          0 |Notify packet received:
0
 Message Header Error:
                                          0 |Protocol RDT(ms):
20
 GSLB Protocol Version:
                                          2 |Peer ACOS Version:
5.2.0 Build 155
 Secure negotiation Success:
                                         0 |Secure negotiation
Failures:
                           0
 SSL handshake Success:
                                         0 |SSL handshake Failures:
0
```

GSLB protocol is disabled for site devices.

CONTROLLER - Member configuration

Run the following command on vThunder to verify the GSLB protocol information:

vThunder-gslb:Member(config)(NOLICENSE) **#show gslb protocol**

If the deployment is successful, the following configuration is displayed:

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```
GSLB site: eastus 1
 SLB device: slb1 (0.0.0.0:0) GroupControl
Session ID: Not Available
Secure Config:
                                      None |Current SSL State:
None
Connection succeeded:
                                          0 |Connection failed:
0
                                          0 |Open packet received:
Open packet sent:
0
Open session succeeded:
                                         0 |Open session failed:
0
Sessions Dropped:
                                          0 |Update packet received:
0
                                         0 |Keepalive packet received:
Keepalive packet sent:
0
Notify packet sent:
                                          0 |Notify packet received:
0
Message Header Error:
                                         0 |Protocol RDT(ms):
0
GSLB Protocol Version:
                                          2
Secure negotiation Success:
                                         0 |Secure negotiation
Failures:
                          0
SSL handshake Success:
                                         0 |SSL handshake Failures:
0
GSLB site: eastus 2
 SLB device: slb2 (0.0.0.0:0) GroupControl
Session ID: Not Available
Secure Config:
                                      None |Current SSL State:
None
Connection succeeded:
                                          0 |Connection failed:
0
Open packet sent:
                                          0 |Open packet received:
0
Open session succeeded:
                                          0 |Open session failed:
0
                                          0 |Update packet received:
Sessions Dropped:
```

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0 Keepalive packet sent: 0 |Keepalive packet received: 0 Notify packet sent: 0 |Notify packet received: 0 0 |Protocol RDT(ms): Message Header Error: 0 GSLB Protocol Version: 2 Secure negotiation Success: 0 |Secure negotiation Failures: 0 SSL handshake Success: 0 |SSL handshake Failures: 0 GSLB site: eastus2 1 SLB device: slb3 (0.0.0.0:0) GroupControl Session ID: Not Available Secure Config: None |Current SSL State: None Connection succeeded: 0 |Connection failed: 0 Open packet sent: 0 |Open packet received: 0 Open session succeeded: 0 |Open session failed: 0 Sessions Dropped: 0 |Update packet received: 0 Keepalive packet sent: 0 |Keepalive packet received: 0 Notify packet sent: 0 |Notify packet received: 0 0 |Protocol RDT(ms): Message Header Error: 0 GSLB Protocol Version: 2 Secure negotiation Success: 0 |Secure negotiation Failures: 0 SSL handshake Success: 0 |SSL handshake Failures: 0

••••



```
GSLB site: eastus2 2
 SLB device: slb4 (0.0.0.0:0) GroupControl
Session ID: Not Available
Secure Config:
                                       None |Current SSL State:
None
Connection succeeded:
                                          0 |Connection failed:
0
Open packet sent:
                                          0 |Open packet received:
0
Open session succeeded:
                                          0 |Open session failed:
0
Sessions Dropped:
                                          0 |Update packet received:
0
Keepalive packet sent:
                                          0 |Keepalive packet received:
0
Notify packet sent:
                                          0 |Notify packet received:
0
Message Header Error:
                                          0 |Protocol RDT(ms):
0
GSLB Protocol Version:
                                          2
Secure negotiation Success:
                                          0 |Secure negotiation
Failures:
                            0
SSL handshake Success:
                                          0 |SSL handshake Failures:
0
GSLB protocol is disabled for site devices.
```

Verify Traffic Flow

The traffic flow can be tested using the following:

- DNS Lookup
- WGET

DNS Lookup

To verify the traffic flow from via vThunder, perform the following:



1. Perform a DNS lookup on client machine using the master controller's client-side data interface public IP in the following command:

\$ dig @master_controller_data_secondary_public_IP www.gslb.a10.com

The following response is received:

```
$ dig @10.64.25.165 www.gslb.a10.com
; <<>> DiG 9.11.4-P2-RedHat-9.11.4-26.P2.el7 9.8 <<>> @10.64.25.165
www.gslb.a10.com
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 11393
;; flags: qr rd; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1
;; WARNING: recursion requested but not available
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1400
;; QUESTION SECTION:
;www.gslb.a10.com.
                                 ΙN
                                         Α
;; ANSWER SECTION:
                                                 10.64.25.161
www.gslb.a10.com.
                        10
                                 ΙN
                                         А
www.gslb.a10.com.
                         10
                                 ΙN
                                         А
                                                 10.64.25.162
www.gslb.a10.com.
                                                 10.64.25.163
                         10
                                 ΙN
                                         А
www.gslb.a10.com.
                                                 10.64.25.164
                         10
                                 ΙN
                                         А
;; Query time: 82 msec
;; SERVER: 10.64.25.165#53(10.64.25.165)
;; WHEN: Wed Aug 31 00:11:40 PDT 2022
;; MSG SIZE rcvd: 125
```



```
2. Stop the site1 of region1 and then perform the DNS lookup again.
    $ dig @10.64.25.165 www.gslb.a10.com
    ; <<>> DiG 9.11.4-P2-RedHat-9.11.4-26.P2.el7 9.8 <<>> @10.64.25.165
   www.gslb.a10.com
    ; (1 server found)
    ;; global options: +cmd
    ;; Got answer:
    ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 11393
    ;; flags: qr rd; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1
    ;; WARNING: recursion requested but not available
    ;; OPT PSEUDOSECTION:
    ; EDNS: version: 0, flags:; udp: 1400
    ;; QUESTION SECTION:
    ;www.gslb.a10.com.
                                    ΙN
                                             Α
    ;; ANSWER SECTION:
                                                     10.64.25.162
    www.gslb.a10.com.
                            10
                                    ΙN
                                             Α
                                                     10.64.25.163
    www.gslb.a10.com.
                            10
                                    ΙN
                                             Α
                                                     10.64.25.164
    www.gslb.a10.com.
                            10
                                    ΙN
                                             А
    www.gslb.a10.com.
                            10
                                    ΙN
                                                     10.64.25.161
                                             А
    ;; Query time: 82 msec
    ;; SERVER: 10.64.25.165#53(10.64.25.165)
    ;; WHEN: Wed Aug 31 00:11:46 PDT 2022
    ;; MSG SIZE rcvd: 125
```

The response is received with shuffled server IP addresses.

WGET

To verify the traffic flow on the load balancer, perform the following:

 Run the following command in the Terminal window of the server1 of region1 instance to create an Apache Server virtual machine:
 \$ sudo apt install apache2



While the Apache server is getting installed, you get a prompt to continue further. Enter 'Y' to continue. After the installation is complete, a newline prompt is displayed.

2. Run the following command on the client machine:
 \$ wget site_device_secondary_data_private_ip

The following response is received:

This section guides you in applying new Application Delivery Controller (ADC) configurations on Thunder using Python scripts. These Python scripts make Thunder aXAPI calls over the HTTPS protocol.

Python is required to execute the Python script. For more information, see <u>Prerequisites</u>.

<u>Table 2</u> provides an overview of the different supported Thunder configurations. These configurations are optional. You can choose to apply them based on your specific use cases. For more information, see <u>Deployment Templates</u>.

Configuration	Description		
<u>Change</u> Password	Applies a new vThunder instance password.		
	NOTE: After the deployment of vThunder instance, it is highly recommended to change the default password for admin user.		
Basic Server Load Balancer	Applies an SLB configuration for inbound traffic, outbound traffic, policies, server grouping, and routing to destination virtual servers.		
A10 License	Applies an A10 license to the vThunder instance.		
	NOTE: A10 Thunder is proprietary software that requires either a trial or BYOL (Bring Your Own License) subscription.		
<u>SSL</u> <u>Certificate</u>	Applies a server connection certificate configuration. An SSL certificate is a digital certificate that authenticates a website's identity and enables an encrypted connection. SSL stands for Secure Sockets Layer, a security protocol that creates an encrypted link between a web server and a web browser. Applies server connection certificate configurations. A Secure Sockets Layer (SSL) certificate is a digital certificate that verifies a website's identity and facilitates an encrypted connection. SSL		

Table 2 : Supported Thunder configurations



Configuration	Description		
	is a security protocol that establishes an encrypted link between a web server and a web browser.		
<u>High</u> Availability	Applies a high availability configuration. These configurations automatically synchronize Thunder configurations between the active and standby Thunder instances. In the event of a failover, it designates the other Thunder instance as active to ensure uninterrupted traffic routing. For this functionality, it is essential for both Thunder instances to have identical resources and configurations.		
Server Load Balancer on Backend Autoscale	Applies an SLB configuration automatically whenever backend app/web servers are autoscaled. When the backend web/app servers are in an autoscale group within the VMware Cloud, autoscale-in or autoscale-out of the server triggers the AutoScale logs for applying or removing SLB server configuration in Thunder.		
Hybrid Cloud GSLB	Applies a disaster recovery configuration using a global server load balancer across any two regions or locations, whether same cloud, hybrid-cloud or on-premise. It requires a minimum of two Thunder instances in each region or location — one acting as the master controller and the other as a site device.		
	Multiple site devices can be configured but it is recommended to have minimum of three site devices for seamless failover and effective disaster recovery.		
	For a configuration with three Thunders instances, the recommended setup includes one as the master controller and the other two as a site device.		
	Ensure that both regions have identical set of resources.		
	To create and install three thunder instances in one region use <u>Thunder-3NIC-3VM</u> template. Same template can be used to install in another region.		



Change Password

After provisioning the vThunder instance, you can change the vThunder instance password at any given time.

NOTE: It is highly recommended to change the default password. For default password, see <u>Support Information</u>.

To change the password of the deployed vThunder instance, perform the following steps:

- Download A10-vThunder_ADC-CONFIGURATION > CHANGE-PASSWORD template from <u>GitHub</u>.
- 2. From Start menu, open command prompt and navigate to this downloaded folder.
- 3. Open the CHANGE_PASSWORD_CONFIG_PARAM.json with a text editor.
- 4. Configure the following parameter:

Resource Name	Description
vThunder instance/s details	Specify the Public IP address of one or more vThunder instance/s (comma separated) depending on the deployed template.
	<pre>{ "publicIpList":["X.X.X.X"] }</pre>

Table 3 : JSON Parameters

5. From Start menu, open cmd and navigate to this downloaded folder to run the following command:

```
C:\Users\TestUser\A10-VMware_ADC-CONFIGURATION\CHANGE-PASSWORD> python ./CHANGE_PASSWORD_CONFIG.py
```

A message is prompted displaying the primary conditions for password validation:



Primary conditions for password validation, user should provide the new password according to the given combination: Minimum length of 9 characters Minimum lowercase character should be 1 Minimum uppercase character should be 1 Minimum number should be 1 Minimum special character should be 1 Should not include repeated characters Should not include more than 3 keyboard consecutive characters.

6. Provide the vThunder instance's Host/IP, username, current, and new password when prompted:

```
Enter vThunder [x.x.x.x] password: ***
Enter vThunder new password: ********
Confirm new password: *******
```

- **NOTE:** The default password is provided by the A10 Networks Support. The new password should meet the default password policy criteria. For more information, see <u>Default Password Policy</u>.
- 7. If the password is changed successfully, the following message is displayed:

```
vThunder [x.x.x.x] Password changed successfully.
Password change configurations saved on partition: shared
```

Basic Server Load Balancer

This template configures vThunder instance as a Server Load Balancer (SLB) to evenly distribute the traffic across a set of predefined servers and requires manual scaling.

To configure vThunder as an SLB, perform the following steps:

- Download A10-vThunder_ADC-CONFIGURATION > BASIC-SLB template from GitHub.
- 2. From Start menu, open command prompt and navigate to this downloaded folder.

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3. Open the SLB_CONFIG_PARAM.json with a text editor.

4. Configure the following parameters:

Table 4 : JSON Parameters

Resource Name	Description				
vThunder instance username	Specify a 'Read/Write/HM' privilege username.				
	"vth_username": "admin",				
	NOTE: The vThunder instance user should have 'Read/Write/HM' privilege to configure vThunder as an SLB.				
Data Interface	Specify the number of data NICs. The value should be 1 for 2 NICs and 2 for 3 NICs.				
Count	"data_interface_count":2,				
Host IP addresses	Specify the Public IP address of one or more vThunder instance/s depending on the deployed template.				
	"publicIpList": ["X.X.X.X","X.X.X.X"],				
Ethernet IP addresses	Specify the ethernet 1 & 2 Private IP addresses of one or more vThunder instance/s depending on the deployed template.				
	NOTE: For 3NIC-2VM-PUBVIP the ethernet1 address should be public on both vThunder to configure public VIP.				
	"vthunder1-address-list": {				
	"ethernet1-addresses" : [
	{ "ipv4-address": "X X X X".				
	"ipv4-netmask": "255.255.255.0"				
	}				

NOTE: Each parameter has a default value mentioned in the parameter file which can be modified as required.

Feedback

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Table 4 : JSON Parameters

Resource Name	Description				
	1				
], "ethernet2-addresses" . [
	ethernetz-addresses : [
	"ipv4-address": "X.X.X.X",				
	"ipv4-netmask": "255.255.255.0"				
	}				
]				
	},				
	"vthunder2-address-list": {				
	"ethernet1-addresses" : [
	{				
	"ipv4-address": "X.X.X.X",				
	"ipv4-netmask": "255.255.255.0"				
	}				
],				
	"ethernet2-addresses" : [
	"ipv4-address": "X.X.X.X",				
	1pv4-netmask . 255.255.255.0				
	,				
	}.				
Tananlata					
Template	Specify the value as 1 if you want to configure the HTTP template.				
нир	For more information on SLB HTTP template, see Command Line				
	Interface Reference.				
	"template-http": 0,				
	NOTE: By default, the template HTTP value is 0.				
Template	Specify the value as 1 if you want to configure the Persist-Cookie				
Persist	template. For more information on SLB persist cookie template,				
Cookie	see Command Line Interface Reference.				
	cempiale-persist-cookie : 0,				



Table 4 : JSON Parameters

Description				
NOTE: By default, the template Persist-Cookie value is 0.				
Specify name and host IP address or domain name of one or more SLB servers.				
The SLB server host value is the datain NIC's private IP address instance acting as the server.				
<pre>"server_details": { "value": [{ "server-name": "server1", "pvt-ip-address": "X.X.X.X" }, { "server-name": "server2", "pvt-ip-address": "X.X.X.X" } } } }</pre>				
<pre>Specify the SLB Server ports details. "slbServerPortList": { "value": [{ "port-number": 53, "protocol": "udp", "health-check-disable":1 }, { "port-number": 80, "protocol": "tcp", "health-check-disable":1 }, { "protocol": "tcp", "health-check-disable":1 }, { [[</pre>				

.....



Table 4 : JSON Parameters

Resource	Description					
Name						
	"protocol": "tcp",					
	"health-check-disable":1					
	}					
	1					
	},					
	NOTE: For 3NICs, the health-check-disable value is					
	recommended to be 1.					
Service	Specify the SLB Service group.					
Group						
List	"serviceGroupList": {					
	"value": [
	{					
	"name": "sg443",					
	"protocol": "tcp" },					
	{					
	"name": "sg53",					
	"protocol": "udp"					
	},					
	{					
	"name": "sg80",					
	"protocol": "tcp"					
	}					
	1					
	},					
HTTP	Specify the HTTP template details if $t_{emplateHTTP} = 1$.					
Template						
• • • • •						



Table 4 : JSON Parameters

Resource	Description					
Name						
	"httpList": {					
	"value": [
	{					
	"name":" <host-switching-template-name>",</host-switching-template-name>					
	"host-switching": [
	{					
	"host-switching-type":"contains",					
	"host-match-string":"s1",					
	"host-service-group":"sg80"					
	}					
]					
	},					
	{					
	"name":" <url-switching-template-name>",</url-switching-template-name>					
	"url-switching": [
	{					
	"url-switching-type":"regex-match",					
	"url-match-string":"s1",					
	"url-service-group":"sg80"					
	}					
]					
	}					
]					
	},					
Persist	Specify the Persist Cookies template details if					
Cookie	templatePersistCookie = 1.					
Template						
	"cookie-list":{					
	"value": [
	1 "name". " <pre>// "name".</pre>					
	"expire": 60.					
	"cookie-name": " <cookie-template-name>",</cookie-template-name>					
	"encrypt-level": 0,					

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Table 4 : JSON Parameters

Resource Name	Description					
	<pre>"match-type": 1, "service-group":1</pre>					
	}					
]},					
Virtual	Specify virtual server details.					
Server						
	The virtual server default name is "vip".					
	NOTE: The vin address is not generated dynamically after					
	deploying the VMware template. So user needs to					
	configure available IP address within ethernet 1 IP range in					
	case of 3NIC-2VM. It can be private or public as per the					
	requirement					
	If you want to configure an HTTP template (template-http= 1),					
	If you want to configure a Persist-Cookie template (template- lf you want to configure a Persist-Cookie template (template-					
	persist-cookie= 1), provide the Persist-Cookie template name in					
	the template-persist-cookie parameter.					
	"virtualServerList": {					
	"virtual-server-name": "vip",					
	"eth1-ip-address": "x.x.x.x",					
	"metadata": {					
	"description": "specify ethernet 1 primary					
	private IP address in case of SLB without High					
	Availability and secondary private IP address in case of					
	SLB with High Availability."					
	},					
	"value": [
	{					
	"port-number": 53,					
	"protocol": "udp",					
	"auto": 1,					
	"service-group": "sg53"					

ADC Configuration Templates



Table 4 : JSON Parameters

Resource Name	Description			
	<pre>}, { "port-number": 80, "protocol": "http", "auto": 1, "service-group": "sg80", "template-http":"<host-switching-template- name="" or="" url-switching-template-name="">", "template-persist-cookie": "<persist-cookie- template-name="">" }, { </persist-cookie-></host-switching-template-></pre>			
	<pre>"port-number": 443, "protocol": "https", "auto": 1, "service-group": "sg443", "template-http": "<host-switching-template- name or url-switching-template-name>", "template-persist-cookie": "<persist-cookie- template-name>"</persist-cookie- </host-switching-template- </pre>			
	}] },			
	NOTE: Either host-switching-template-name Of url-switching- template-name can be used in the template-http. For 3NICs, the ha-conn-mirror value is recommended to be 1. The ha-conn-mirror works on 14 vport only.			

5. Verify if all the configurations in the SLB_CONFIG_PARAM.json file are correct and save the changes.

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6. From Start menu, open cmd and navigate to this downloaded folder to run the following command to configure the vThunder instance/s as an SLB:

```
C:\Users\TestUser\A10-VMware_ADC-CONFIGURATION\BASIC-SLB> python ./SLB_
CONFIG.py
```

7. Provide password for the vThunder instances/s whose IP address is mentioned in the SLB_CONFIG_PARAM.json file.

If SLB is configured successfully for 3NIC-1VM, the following message is displayed:

```
Enter vThunder [x.x.x.x] Password:

[{'ipv4-address': 'x.x.x.x', 'ipv4-netmask': '255.255.255.0'}]

configured ethernet- 1 ip

configured ethernet- 2 ip

Successfully configure service group.

Do you want to configured SLB Server? [yes/no]yes

Successfully Configured server server1

Successfully Configured server server2

Successfully logged out from vThunder.

Successfully configured http template.

Successfully logged out from vThunder.

Successfully configured slb persist cookie.

Successfully configured virtual servers.

Configurations are saved on partition: shared

Successfully logged out from vThunder.
```

The above configuration has two servers, an HTTP template, and a Persist-Cookie template configured for 3NIC-1VM.

SSL Certificate

This template applies Certificate Authority SSL Certificate to the vThunder instance. This certificate establishes an encrypted link between a server and your browser, ensuring that all data transferred between them remains private and secure.

To configure SSL certificate for a vThunder instance, perform the following steps:

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- 1. Download A10-vThunder_ADC-CONFIGURATION > SSL-CERTIFICATE template from GitHub.
- 2. From Start menu, open command prompt and navigate to this downloaded folder.
- 3. Open the SSL_CONFIG_PARAM.json with a text editor.

NOTE:	Each parameter has a default value mentioned in the parameter file
	which can be modified as required.

4. Configure the following parameters:

Resource Name	Description		
SSL	Specify SSL details.		
Configuration			
	55		
		"requestTimeOut": 40,	
		"path": " <absolute file="" of<="" path="" td=""></absolute>	
	certificate	file>",	
		"file": " <certificate file="" name="">",</certificate>	
		"certificationType": " <certificate file<="" td=""></certificate>	
	type>"		
		},	
	NOTE:	By default, SSL configuration is disabled i.e. no	
		SSL configuration is applied.	
	Example		
	The sample v below:	alues for the SSL certificate are as shown	

Table 5 : JSON Parameters



Table 5 : JSON Parameters

Resource Name	Description
	<pre>"sslConfig": { "requestTimeOut": 40, "Path": "C:\\ \\server.pem", "Eile" "secord"</pre>
	"File": "server", "CertificationType": "pem" }
vThunder instance/s details	Specify Public IP address of one or more vThunder instance/s depending on the deployed template.
	"publicIpList": ["X.X.X.X", "X.X.X.X"],

- 5. Verify if the configurations in the SSL_CONFIG_PARAM.json file are correct and then save the changes.
- 6. From Start menu, open cmd and navigate to this downloaded folder to run the following command to apply SSL configuration on the vThunder instance/s:

```
C:\Users\TestUser\A10-VMware_ADC-CONFIGURATION\SSL-CERTIFICATE>python
SSL_CONFIG.py
```

7. Provide password for the vThunder instances/s whose IP address is mentioned in the SSL_CONFIG_PARAM.json file:

```
Configuring vThunder with ip x.x.x.x
Enter vThunder Password: ********
```

8. If the SSL certificate is uploaded successfully, the following message is displayed:

```
Successfully configured SSL.
Configurations are saved on partition: shared
Successfully logged out from vThunder.
```

A10 License

This template applies GLM license to the vThunder instance for legal compliance, security, all feature access, and support.


To configure GLM license for vThunder instance, perform the following steps:

- 1. Download A10-vThunder_ADC-CONFIGURATION > GLM-LICENSE from GitHub.
- 2. From Start menu, open command prompt and navigate to this downloaded folder.
- 3. Open the GLM_CONFIG_PARAM.json with a text editor.

NOTE:	Each parameter has a default value mentioned in the parameter file
	which can be modified as required.

4. Configure the following parameters:

Table 6 : JSON Parameters

Resource Name	Description
Entitlement Token	Specify the entitlement token.
	"entitlementToken": {
	"value": " <license entitlementtoken="">"</license>
	},
vThunder details	Specify and the Public IP address of one or more vThunder instance/s depending on the deployed template.
	"publicIpList":["X.X.X.X","X.X.X.X"],
	"dns": {
	"value": "8.8.8.8"
	}

- 5. Verify if the configurations in the GLM_CONFIG_PARAM.json file are correct and then save the changes.
- 6. From Start menu, open cmd and navigate to this downloaded folder to run the following command to apply GLM license on the vThunder instance/s:

```
C:\Users\TestUser\A10-VMware_ADC-CONFIGURATION\GLM-LICENSE>python GLM_
CONFIG.py
```

7. Provide password for the vThunder instances/s whose IP address is mentioned in the GLM_CONFIG_PARAM.json file.



Configuring vThunder with ip x.x.x.x Enter vThunder password: ********

If the GLM license is applied successfully, a message 'BASE License successfully updated' is displayed.

Successfully configured primary DNS. Successfully configured GLM Entitlement token in vThunder. GLM license request send successfully. Configurations are saved on partition: shared Successfully logged out from vThunder.

High Availability

This template applies high availability configuration to the Thunder instances. It automatically synchronizes Thunder configurations between the active and standby Thunder instances. In the event of a failover, it designates the other Thunder instance as active to ensure uninterrupted traffic routing. For this functionality, it is essential for both Thunder instances to have identical resources and configurations.

To configure HA for Thunder instances, perform the following steps:

- Download A10-vThunder_ADC-CONFIGURATION > HIGH-AVAILABILITY template from GitHub.
- 2. From Start menu, open command prompt and navigate to this downloaded folder.
- Navigate to this downloaded folder and open the HA_CONFIG_PARAM.json with a text editor.

NOTE: Each parameter has a default value mentioned in the parameter file which can be modified as required.

4. Configure the following parameters:



Table 7 : JSON Parameters

Resource Name	Description
DNS	Specify a domain namespace.
	"dns": { "value": "8.8.8.8" },
Network	Specify a Network Gateway IP.
Gateway IP	The default value of network gateway IP address is 10.0.2.1 as this is the first IP address of the data subnet 1 configuration.
VRRP-A	<pre>"rib-list": [{ "ip-dest-addr":"0.0.0.0", "ip-mask":"/0", "ip-nexthop-ipv4": [{ "ip-next-hop":"10.0.2.1"</pre>
	"vrrp-a": { "set-id":1 },
Terminal Idle Timeout	Specify the interval in minutes for closing connection when there is no input detected. The value '0' means never timeout.
	"idle-timeout":0 },
VRID	Specify the VRID details.
details	The default value of vrid is 0. The default priority for vThunder-1 is

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Table 7 : JSON Parameters

Resource Name	Description		
	100, and for vThunder-2 is 99 (100-1). The floating ip address value is generated dynamically after deploying the template. Therefore, its default value under vrid-list should be replaced, see Get FIP address.		
	<pre>"vrid-list": [{ "vrid-val":0, "blade-parameters": { "priority": 100 }, "floating-ip": { "ip-address-cfg": [{</pre>		
vThunder Host IP	Specify the Public IP address of one or more vThunder instance/s depending on the deployed template.		

NOTE: ha-conn-mirror does not work on port 80 and 443.

- 5. Verify if all the configurations in the HA_CONFIG_PARAM.json file are correct and save the changes.
- 6. From Start menu, open cmd and navigate to this downloaded folder to run the following command to configure HA:

```
C:\Users\TestUser\A10-VMware_ADC-CONFIGURATION\HIGH-AVAILABILITY>python
HA_CONFIG.py
```



7. Provide password for the vThunder instances/s whose IP address is mentioned in the HA_CONFIG_PARAM.json file.

If HA is configured successfully, the following message is displayed:

```
Configuring vThunder with ip x.x.x.x
Enter vThunder password: ********
Successfully configured Primary DNS.
Successfully configured IP Route.
Successfully configured Vrrp-A Common.
Successfully configured Idle Timeout.
Successfully configured Vrrd Rid.
Successfully configured Peer Group.
Configurations are saved on partition: shared
Successfully logged out from vThunder.
_____
Configuring vThunder with ip x.x.x.x
Enter vThunder password: ********
Successfully configured Primary DNS.
Successfully configured IP Route.
Successfully configured Vrrp-A Common.
Successfully configured Idle Timeout.
Successfully configured Vrrd Rid.
Successfully configured Peer Group.
Configurations are saved on partition: shared
Successfully logged out from vThunder.
```

Server Load Balancer on Backend Autoscale

The Back-Auto scripts allow users to configure scale-out and scale-in operations for the application servers running on VMware vSphere ESXi, located behind the vThunder. This solution leverages the VMware vCenter's monitoring metrics and alert feature to trigger scale-out or scale-in operations based on the CPU usage by the application server VMs.

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This template configures vThunder instance as a Server Load Balancer (SLB) to automate the scaling process and allow dynamic adjustment of servers based on the workload.

Architectural References

Refer to the following for architectural reference:

• Server Load Balancer on Backend Autoscale

Figure 25 : Server Load Balancer on Backend Autoscale



Prerequisites

To configure a Backend Autoscale Server, ensure that the following prerequisites are met:

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- Thunder Instance
- AutoScale Folder Creation
- <u>Source-Server Creation</u>
- vCenter VM Configuration/Setup

Thunder Instance

Thunder instance/instances with either two network interfaces (one for management and one for data) or three network interfaces (one for management and two for data), along with a basic SLB (Server Load Balancer) configuration. Refer to <u>VMware templates</u> for Thunder deployment and <u>Configurations</u> for SLB configuration.

AutoScale Folder Creation

AutoScale Folder refers to a folder within vCenter Server where virtual machines (VMs) are organized and managed by the Back-Auto scripts. The AutoScale folder contains the following servers:

- a. Source-Server Source-Server is the original server or the VM that is used as a template or source for creating new instances. Back-Auto scripts copy this server to create a Clone-Server.
- b. Clone-Server Clone server is replica of source server. The copy of Source-Server is automatically created. This server always remain in the shut-down state.
- c. Scaled-out servers Scaled-out servers are additional instances created from clone-server to handle increased demand. They are created and deleted dynamically depending on the CPU usage thresholds configured for the Back-Auto.
- **NOTE:** For more details on creating Scaled-out servers, refer <u>Create</u> <u>Inventory Folder</u>.

Source-Server Creation

The Source-Server or Application Server is the original server or VM that is used as a template or source for creating new instances. If there are multiple source-

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servers, you must specify the server name you want to use as the Source-Server.

NOTE:

- 1. Source-Server should have at least one network interface.
- 2. To enable Back-Auto in application servers, ensure that the following Source-Server details are readily available:
 - a. Source-Server Name.
 - b. Source-Server Id.
 - c. Source-Server interface-name.
 - d. Source-Server's IPv4 address.
 - e. Source-Server Username.
 - f. Source-Server Password.
 - g. Source-Server DNS address.
 - h. Clone-Server name (name you want to give to the machine which will be used for creating [cloning] the scale out machine from Clone-Server.

Following are the prerequisites and the packages required for the Source VM.

- Ensure that the service port is allowed in the firewall, for example for web server the HTTPS/HTTP port should be allowed.
- Ensure that the Open-VM-Tool is installed on Source VM as it plays a crucial role in optimizing the performance, management, and integration of virtual machines running on VMware platforms.
- Install nmcli for network configuration if it is not already installed.
 - On Ubuntu

sudo apt-get install network-manager

• On CentOS

sudo yum install NetworkManager



vCenter VM Configuration/Setup

A vCenter v8.0+ is required for deploying this template. The vCenter VM must be reachable from the server VMs.

For details, refer to Setup vCenter VM.

Configuring vThunder on Backend Autoscale

To configure vThunder as an SLB on Backend Autoscale, perform the following steps:

- 1. Install a10_vcenter_backauto_plugin in vCenter VM
- 2. <u>Configure Clone-Server in vCenter [One Time Step]</u>
- 3. Configure Source Server in vThunder
- 4. Create Alarm for Scale Out and Scale In
- 5. <u>Configure Multiple Application Servers</u>
- 6. <u>AutoScale Folder Creation</u>

Install a10_vcenter_backauto_plugin in vCenter VM

To install a10_vcenter_backauto_plugin in vCenter VM, perform the following steps:

- 1. Download A10-vThunder_ADC-CONFIGURATION > CONFIG-SLB_ON_BACKEND-AUTOSCALE template from GitHub.
- 2. Navigate to **a10_vcenter_backauto_plugin**, open the **vcenter.ini** file in a text editor, and configure the following parameters:

Table 8 : vCenter Key Value pair

Кеу	Value
Directory name	Specify vCenter directory name where you want to place the scaling scripts.
	The directory name should not contain spaces.
	Here, the directory name is provided as alonetworks.
	<pre>installation_dir = /a10networks</pre>



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i able 8 :	vcenter	кеу	value	pair

Кеу	Value
Server IP address or FQDN	Specify the server IP address or FQDN of the required vCenter VM.
	<pre>vcenter_server_ip = x.x.x.x</pre>
vCenter Server SSH	Provide the vCenter server SSH values.
values	<pre>vcenter_server_ssh_username - <vcenter pre="" ssh<=""></vcenter></pre>
	username>
	<pre>vcenter_server_ssh_password - <vcenter pre="" ssh<=""></vcenter></pre>
	password>
vCenter Server UI values	Provide the vCenter server UI values.
	vcenter_server_ui_username - < vCenter UI
	username>
	vcenter_server_ui_password - < vCenter UI
	password>

3. Navigate to CONFIG-SLB_ON_BACKEND-AUTOSCALE > a10_vcenter_backauto_ plugin > apps > app1, open the config.ini file in a text editor, and configure the following parameters:

Resource Name	Description
Clone VM name	Name to be given to the cloned powered-off VM which will be used as a cloning source during scale-out.
	clone vm_name = cloning_vm
Clone VM ID	ID of the cloned server. This field is filled automatically by the script. There is no need to specify a value.
	clone vm_id = vm-18079
Source VM name	Specify App Server reference VM name, which can also be used as a prefix for the newly created VMs.
	source_vm_name = pd-ubuntu

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Resource Name	Description		
Source VM OS	Specify the source VM Operating System type: 'CentOS/Ubuntu/rhel'.		
	source_vm_os = ubuntu		
Source VM ID	Specify the application server source VM ID. To get this ID, click the source VM name and in the browser URL VM-ID will be displayed.		
	https:// <vcenter- FQDN>/ui/app/vm;nav=v/urn:vmomi:VirtualMachine:<vm-< b=""> ID>:e62e1ec9-8a34-4bf1-bdaa-93026523ae8d/summary</vm-<></vcenter- 		
	Example URL:		
	https:// <vcenter- FQDN>/ui/app/vm;nav=v/urn:vmomi:VirtualMachine:vm- 5165:e62e1ec9-8a34-4bf1-bdaa-93026523ae8d/summary</vcenter- 		
	<pre>source_vm_id = vm-5165</pre>		
Source	Specify the Source VM SSH values.		
VM SSH Login	 source_vm_username - <source_vm_username></source_vm_username> 		
Credential	 source_vm_password - <source_vm_password></source_vm_password> 		
Server Subnet	Specify the data subnet for the application server.		
	NOTE: This must be used for auto-scale application server only.		
	server_subnet = X.X.X.X/24		
Source	Specify a temporary IP address to the newly created server.		
Transit IP	source_transit_ip = X.X.X.X		
Source	Specify the primary DNS of the source server.		



Resource Name	Description
Server	<pre>source_dns = X.X.X.X</pre>
DNS	
Source VM	Specify the application server source VM interface name. For steps, refer to <u>Retrieve Active Interface Name</u> .
Name	<pre>source_interface_name = ens192</pre>
Service Ports	Specify the list of the ports on which your services will be running on the server to verify their running status prior to configuring them on Thunder.
	services_ports = 5004, 80
VMware vSphere vCenter	Specify the VMware vSphere vCenter cluster ID. To get this ID, click the cluster name and in the browser URL CLUSTER-ID will be displayed.
cluster ID	https:// <vcenter-< td=""></vcenter-<>
	FQDN>/ui/app/cluster;nav=h/urn:vmomi:ClusterComputeReso
	urce: <cluster-id>:e62e1ec9-8a34-4bf1-bdaa-</cluster-id>
	93026523ae8d/
	Example:
	https:// <vcenter-< td=""></vcenter-<>
	FQDN>/ui/app/cluster;nav=h/urn:vmomi:ClusterComputeReso
	urce:domain-c8:e62e1ec9-8a34-4bf1-bdaa-93026523ae8d/
	cluster_id = domain-c8
Attached Datastore ID	Specify the VMware vSphere Attached Datastore ID. To get this ID, click the datastore name and in the browser URL DATASTORE-ID will be displayed.



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Resource Name	Description		
	<pre>https://<vcenter- fqdn="">/ui/app/datastore;nav=s/urn:vmomi:Datastore: <datastore-id>:e62e1ec9-8a34-4bf1-bdaa- 93026523ae8d/files</datastore-id></vcenter-></pre>		
	Example:		
	https:// <vce FQDN>/ui/app datastore-1</vce 	enter- p/datastore;nav=s/urn:vmomi:Datastore: 7:e62e1ec9-8a34-4bf1-bdaa-93026523ae8d/files	
	datastore_io	d = datastore-17	
Folder ID	Specify the VMware vSphere Folder ID. To get this ID, click the folder name and in the browser URL FOLDER-ID will be displayed.		
	NOTE:	This must be used for auto-scale application server only.	
	<pre>https://<vcenter- fqdn="">/ui/app/folder;nav=v/urn:vmomi:Folder:<folder- id="">:e62e1ec9-8a34-4bf1-bdaa-93026523ae8d/ Example: https://<vcenter- fqdn="">/ui/app/folder;nav=v/urn:vmomi:Folder:group- v2014:e62e1ec9-8a34-4bf1-bdaa-93026523ae8d/</vcenter-></folder-></vcenter-></pre>		
	folder_id =	group-v2014	
Minimum Replica	Specify the m be available i	inimum number of application servers that need to ncluding the source VM.	
	minimum_rep:	lica = 1	
Maximum	Specify the m	aximum number of application servers that need	



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Resource Name	Description	
Replica	to be scaled out including the source VM.	
	maximum_replica = 10	
Cool	Specify the time between two scaling operations in seconds.	
Down	cool_down = 200	
Graceful scale-in time	Specify the wait time duration for which a system or service allows processes to close active connections during scale-in operation in seconds.	
	graceful_scale_in_time = 600	
	NOTE: If active connections do not get closed within specified graceful_scale_in_time, then scale-in operation will be aborted.	
Service up	Specify the time duration for service running on specified ports	
timeout	on server in seconds.	
	service_up_timeout = 60	
Thunder IP	Specify the list of the management IPs of Thunder VMs where app server will be configured.	
	thunder_ip = 'X.X.X.X'	
Thunder	Specify the Thunder VM credentials:	
VM Credential	 thunder_vm_username - <thunder_username></thunder_username> 	
S	 thunder_vm_password - <thunder_password></thunder_password> 	
Thunder	Specify the active partition name.	
Active Partition	The default partition is 'shared'	
Name	thunder_partition_name = shared	



- **NOTE:** If the source VM user is not root then disable non- root user password for sudo commands. For more information, refer <u>Enable</u>root user.
- 4. Navigate to CONFIG-SLB_ON_BACKEND-AUTOSCALE > a10_vcenter_backauto_ plugin > apps > app1, open app_servers.ini in a text editor, and enter all the IP addresses from the server subnet, that are already in use.

These IPs include Data Out interface IP, Reference server IP, Source transit IP, vCenter Data Out IP, and more.

```
[AppServer]
last_scaling_timestamp = 0
# add vThunder instances data out interface ip addresses, reference
server ip address, source_transit_ip, vcenter data out ip and any ip
address which is already in use from server subnet.
assigned_ip_addr = {'X.X.X.X', 'X.X.X.X', 'X.X.X.X', 'X.X.X.X',
'X.X.X.X'}
```

5. Navigate to **CONFIG-SLB_ON_BACKEND-AUTOSCALE**, locate the **setup.py** file, and execute the following commands to execute the setup.py file:

```
pip install -r requirements.txt
python setup.py
```



6. If the clone VM is configured successfully, the following message will be displayed:

```
Cloning source vm...
Remote folder '/al0networks/al0_vcenter_Back-Auto_plugin' does not
exist.
Creating...
Uploading package into vcenter...
Uploaded.
Granting read, write, and execute permissions...
```



```
Done.
Setup virtual environment...
Done.
```

7. Log in to the vCenter VM and execute the following command on the console to verify if the folders are created with the required permissions:

ls -lrt
<pre>root@localhost [/]# cd / root@localhost [/]# ls a10networks</pre>
<pre>root@localhost [/a10networks/a10_vcenter_backauto_plugin]# ls apps plugins requirements.txt vcenter.ini root@localhost [/a10networks/a10_vcenter_backauto_plugin]# ls -lah total 24K drwxr-xr-x 4 vpxd root 4.0K Feb 29 04:06 . drwxr-xr-x 3 vpxd root 4.0K Jan 11 12:39 drwxr-xr-x 8 vpxd root 4.0K Mar 1 12:25 apps drwxr-xr-x 6 root root 4.0K Feb 29 04:02 plugins -rwxr-r-x - 1 vpxd root 4.0K Jan 11 12:39 requirements txt</pre>
<pre>-rwxr-r-r 1 vpxd root 446 Jan 12 11:32 vcenter.ini root@localhost [/a10networks/a10_vcenter_backauto_plugin/apps/app1]# ls app_servers.ini config config.ini root@localhost [/a10networks/a10_vcenter_backauto_plugin/apps/app1]# ls -lah total 20K drwxr-xr-x 3 vpxd root 4.0K Jan 23 02:59 . drwxr-xr-x 8 vpxd root 4.0K Mar 1 12:25rwxrr 1 vpxd root 485 Mar 5 09:51 app_servers.ini drwxr-xr-x 2 vpxd root 4.0K Jan 15 17:13 config -rwxrr 1 vpxd root 3.0K Jan 23 02:59 config.ini</pre>
<pre>root@localhost [/a10networks/a10_vcenter_backauto_plugin/apps/app1/config]# ls scale_in.py scale_out.py root@localhost [/a10networks/a10_vcenter_backauto_plugin/apps/app1/config]# ls -lah total 40K drwxr-xr-x 2 vpxd root 4.0K Mar 21 08:54 . drwxr-xr-x 3 vpxd root 4.0K Jan 23 02:59rwxrr 1 vpxd root 8.1K Jan 15 17:13 scale_in.py -rwxrr 1 vpxd root 17K Jan 11 12:39 scale_out.py</pre>

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ADC Configuration Templates

/a10networks/a10_vcenter_backauto_plugin]# cd plugins/ ot@localhost oot@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins]# ls oot@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins]# cd thunder/ root@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins/thunder]# ls thunder.py oot@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins/thunder]# ls -lah total 28K drwxr-xr-x 3 root root 4.0K Feb 29 04:12 drwxr-xr-x 6 root root 4.0K Feb 29 04:02 rwxr--r-- 1 root root 0 Feb 29 04:02 _.py drwxr-xr-x 2 root root 4.0K Mar 5 09:22 __pycache_ -rwxr--r-- 1 root root 14K Feb 29 04:12 thunder.py root@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins/thunder]# cd ../vcenter/ root@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins/vcenter]# ls config_manager.py session_manager.p root@localhost [/a10networks/a10 vćenter backauto plugin/plugins/vcenter]# ls -lah total 20K Jrwxr-xr-x 3 root root 4.0K Feb 29 04:16
drwxr-xr-x 6 root root 4.0K Feb 29 04:02 -rwxr--r-- 1 root root 2.7K Feb 29 04:14 config_manager.py -rwxr--r-- 1 root root 0 Feb 29 04:02 drwxr-xr-x 2 root root 4.0K Mar 5 09:22 -rwxr--r-- 1 root root _.ру rwxr--r-- 1 root root 1.8K Feb 29 04:16 session manager.py root@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins/vcenter]# cd ../utils/ root@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins/utils]# ls _init__.py logger.py __pycache__ virtual_machine.py root@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins/utils]# ls -lah total 20K drwxr-xr-x 3 root root 4.0K Feb 29 04:13 drwxr-xr-x 6 root root 4.0K Feb 29 04:02 rwxr--r-- 1 root root 0 Feb 29 04:02 rwxr--r-- 1 root root 1.2K Feb 29 04:02 logger.py drwxr-xr-x 2 root root 4.0K Mar 5 09:22 rwxr--r-- 1 root root 1.9K Feb 29 04:13 virtual machine.py oot@localhost [/a10networks/a10_vcenter_backauto_plugin/plugins/utils]# 📕

Configure Clone-Server in vCenter [One Time Step]

You need to configure Clone-Server so that the scale-out script will use Clone-Server to create new application servers at the time of scale-out. To configure Clone-Server in vCenter, perform the following steps:

1. Log in to vCenter UI using your vCenter server IP address or FDQN.

https://vcenter_server_ip_address_or_fqdn

- Navigate to the <u>inventory folder</u> previously created for back-auto application servers.
- 3. Right click the VM that was previously cloned and click Edit Settings.
- 4. On the Edit Settings page, under the Virtual Hardware tab, expand the **Network Adapter 1** dropdown, uncheck [Connect at Power On] option, and click OK.

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Figure 26 : Edit Settings - Virtual Hardware

			ADD NEW DEVICE
> CPU	2 v (i)		
> Memory	4	✓ GB ∨	
> Hard disk 1	16	GB 🗸	:
> SCSI controller 0	VMware Paravirtual		:
\sim Network adapter 1*	Data-Out 🗸 🔲 Co	nnected	:
Status	Connect At Power On		
Adapter Type	VMXNET 3	~	
DirectPath I/O	Enable		
MAC Address	00:50:56:a4:d7:0d	Automatic 🗸	

5. Navigate to the inventory folder, right click **cloning_vm**, and click **Power > Power ON** to turn on the clone VM.

The **LAUNCH WEB CONSOLE** button present under the "Summary" tab is enabled.

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Figure 27 : Launch Web Console - Enabled

Summary Monitor Configure	Permissions Datastores Networks Snapshots Updates	
Guest OS II	Virtual Machine Details	Usage :: 🐼 Last updated: 4/30/24, 3:49 PM
	Power Status Powered On	CPU
K. (2020), provide registration K. (2020), provide registration K. (2020), registration of an annual constraint and K. (2020), registration development K. (2020), registration of an annual constraint and K. (2020), registration of an annual constraint an an annual constraint an	Guest OS 🔬 Ubuntu Linux (64-bit)	O MHz used
b. 110000 Table 1 and 10000 Table 1 and 10000 Table 1 8. 110000 Table 2 and 1000 Table 2 and 1000 particular parameterized attachment 8. 120000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 120000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 120000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 and 10000 Table 2 and 10000 Table 2 8. 420000 Table 2 8	VMware Tools Not running, version:12389 (Guest Managed) ①	Memory
B. (1994) up Bought og 1 mak.] Offs B. (1994) updet i Nur Ingleid pribager 1 B. (1994) updet i Nur I d 2 primares attracted INTVLAN BagetHill R. (1994) Anfragin: Intlational B. (1994) Anfragin: Intlational B. (1994) Anfragin: Intlational B. (1994) Anfragin: Intlational	DNS Name	C MB used
A set of the set	IP Addresses Encryption Not encrypted	Storage 20.08 GB used
LAUNCH WEB CONSOLE	42 CO	VIEW STATS

6. Click **LAUNCH WEB CONSOLE** to log in to the Clone-Server VM. Log in using the root credentials.

A terminal window is displayed.

Figure 28 : Terminal



7. Invoke the nmtui tool, select Edit a connection, and press Enter.



Figure 29 : Edit a Connection



8. Select the interface you want to configure (in this case **ens192**), select **<Edit...>**, and press **Enter**.



Figure 30 : Edit - ens192

Installing vThunder ADC using VMware Template 1.1.0

ADC Configuration Templates



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9. Provide transit IP x.x.x./24 inside IPV4 CONFIGURATION, select OK, and press Enter.

Figure 31 : IPV4 CONFIGURATION

10. Select **BACK** and press **Enter**.

Figure 32 : Back - ens192

ens192	<pre>^ <add></add></pre>
	<edit></edit>
	<delete></delete>

11. Select **QUIT** and press **Enter**.



Figure 33 : Quit

NetworkManager TUI Please select an option Edit a connection Activate a connection Set system hostname
Radio Quit <ok></ok>

- 12. Execute the command nmtui in the terminal again, select Edit a connection, and press Enter.
- 13. Select Activate a connection and press Enter.

Figure 34 : Activate a connection

NetworkManager TUI Please select an option Edit a connection Activate a connection Set system hostname Radio	
Quit	
<0K>	



14. Select your interface name, select **Deactivate**, and press **Enter**.

i igui e JJ . Deactivate	Figure	35 :	Deactivate
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Wired ↑ ★ ens192	<deactivate></deactivate>
	<back></back>
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- 15. Navigate to the vCenter, right click the cloned VM, and click **Edit Settings**.
- 16. Expand the **Network Adapter 1** dropdown, select **[Connect at Power On]**, and **Connected** checkboxes.



Figure 36 : Virtual Hardware

			ADD NEW DEVICE
CPU	2 × (1)		
Memory	4	✓ GB ∨	
Hard disk 1	16	GB v	:
SCSI controller 0	VMware Paravirtual		:
Network adapter 1 *	Data-Out 🗸 🔽 Co	nnected	1
			42
Status	Connect At Power On		
Status Adapter Type	Connect At Power On	<u>~</u>	
Status Adapter Type DirectPath I/O	Connect At Power On VMXNET 3	<u>~</u>	
Status Adapter Type DirectPath I/O MAC Address	Connect At Power On VMXNET 3 C Enable 00:50:56:a4:d7:0d	✓ Automatic ∽	

- 17. Click **OK** to save the configurations.
- 18. In the **Summary** section of the Clone-Server VM confirm that IP Address assigned is transit-ip x.x.x.x.



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 Finally, right click cloning_vm, and click Power > Power OFF to turn off the clone VM.

Configure Source Server in vThunder

To configure the Source-Server in a vThunder instance, perform any of the following steps:

- 1. Refer the steps from the **Basic Server Load Balancer**
- 2. From Start menu, open command prompt, and configure the following:

Consider the following table as an example for basic SLB configurations on vThunder.

Resource Name	Description
Source Server	Specify source server with its IP address. For Example: The source server's name is "nginx-app"
	slb server nginx-app X.X.X.X
Port List	Specify the ports that are in use from the server subnet
	health-check ping
	port 53 udp
	health-check ping
	port 80 tcp
	health-check ping
	port 443 tcp
	health-check ping
Service	Specify the service groups for each port
Group	!
	slb service-group nginx-app-server-sg443 tcp
	member nginx-app 443
	1
	slb service-group nginx-app-server-sg53 udp
	member nginx-app 53
	!



Table 10: JSON Parameters

Resource Name	Description
	slb service-group nginx-app-server-sg80 tcp member nginx-app 80 !

NOTE:

- vThunder must have a network adaptor with Data-Out port group.
- vThunder must be configured with service groups and virtual server.

Create Alarm for Scale Out and Scale In

Creating an alarm is required for the proactive resource management. To create an alarm for scale out and scale in, perform the following steps:

1. Log in to vCenter UI using your vCenter server IP address or FDQN.

https://vcenter_server_ip_address_or_fqdn

- 2. Navigate to the <u>inventory folder</u> previously created for back-auto application servers.
- 3. Click the inventory folder.

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4. Click **Configure** tab, navigate to **Alarm Definitions**, and click **Add** to add a scale out alarm. **New Alarm Definition** page is displayed.

Figure 38 : Configur	e			
Summary Monitor	Configure Permiss	sions Datastores	Networks Snapshot	s Updates
Settings 🗸 🗸	Alarm Definitions			
VM SDRS Rules vApp Options	ADD EDIT	ENABLE/DISABLE DEL	ETE	
Alarm Definitions	Alarm Name		Object type	Tefined In
Scheduled Lasks	Diskchain U	Jsing Mixed Keys Alarm	Virtual Machine	@ 10.64.2
VMware EVC	○ > Timed out	starting Secondary VM	Virtual Machine	伊 10.64.2
Guest User Mappings	○ > Virtual Mac	hine Locked Alarm	Virtual Machine	@ 10.64.2
	○ > VSphere H	A virtual machine monit	Virtual Machine	伊 10.64.2



5. In the **Name and Targets** tab, enter all the required details, and click **Next**. **Alarm Rule 1** page is displayed.

Figure 39 : Name and Targets

Edit Alarm Definition	Name and Targets			×
1 Name and Targets	Alarm Name *	Scale-out		
2 Alarm Rule 1	Description	1		
3 Reset Rule 1				1.
4 Review	Target type *	Virtual Machines		
	Targets	All Virtual Machines on 🗋 pd-backauto-rhel		
			CANCEL	NEXT

6. Select a trigger and severity as per your requirements.

Figure 40 : Alarm Rule 1

Edit Alarm Definition	Alarm Rule 1	×
Name and Targets Alarm Rule 1 Reset Rule 1	IF VM CPU Usage is below 20 % for	
4 Review	5 min ADD ADDITIONAL TRIGGER THEN	
	Trigger the alarm and * Show as Warning Send email notifications	
	ADD ANOTHER RULE DUPLICATE RULE REMOVE RULE	
	CANCEL BACK	IEXT

- 7. Enable Run script and select Repeat.
- 8. Enter the scale_out.py path in the **Run this Script** section and click **Next**:



Example: /a10networks/a10_vcenter_backauto_
plugin/apps/app1/config/scale out.py

Reset Rule 1 page is displayed.

Figure 41 : Alarm Rule 1		
Edit Alarm Definition	Alarm Rule 1	×
1 Name and Targets	IF	
2 Alarm Rule 1	VM CPU Usage is below	
3 Reset Rule 1	20% for	
4 Review	S MIN	-1
	THEN	
	Trigger the alarm and * Show as Warning	
	Send email notifications	
	ADD ANOTHER RULE DUPLICATE RULE REMOVE RULE	
	CANCEL BACK	NEXT

- 9. Click Next. Review page is displayed.
- 10. Choose 5 minutes if you want to execute scale_out script every 5 minutes. Ensure the alarm is enabled.

Figure 42 : Review			
Edit Alarm Definition	Review		×
1 Name and Targets	Alarm Name	Scale-out	
2 Alarm Rule 1	Description		
3 Reset Rule 1	Targets	All Virtual Machines on 🗀 app1	
4 Review	Alarm Rules	IF VM CPU Usage is above 80 % for 5 min THEN Trigger the alarm as ① Critical Run this script : /a10networks/a10_vcenter_backauto_plugin/apps/app1/config/scale_out.py and repeat enabled	
	Reset Rules	IF the warning or critical conditions/states are no longer met THEN Trigger the alarm as 💮 Normal	
	Repeat actions e	every <u>5</u> minute(s) until acknowledged or reset to green	
	Enable this alarm	CANCEL BACK SAVE	



11. Click CREATE.

12. Click **Configure** tab, navigate to **Alarm Definitions**, and click **Add** to add a scale in alarm.

Figure 43 : Configu	re
---------------------	----

Summary Monitor Configure Permissions Datastores Networks Snapshots Updates Settings Alarm Definitions ADD EDIT ENABLE/DISABLE DELETE Object type Vertual Machine Indextree Indextree Virtual Machine Indextree Virtual Machine Virtual Machine Indextree Virtual Machine Virtual Machine Note: Note: Virtual Machine Note: Note: Virtual Machine Note: Note: Virtual Machine Note: <l< th=""><th></th><th></th><th></th><th></th><th>1</th><th></th><th></th><th></th><th></th><th></th></l<>					1					
Settings Alarm Definitions VM SDRS Rules EDIT ENABLE/DISABLE DELETE VApp Options EDIT ENABLE/DISABLE DELETE Alarm Definitions Alarm Name Object type Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Diskchain Using Mixed Keys Alarm Virtual Machine 10.64.2 Policies Scheduled User Mappings Virtual Machine Locked Alarm Virtual Machine 10.64.2 Schedules User Mappings Virtual Machine Locked Alarm Virtual Machine 10.64.2	Summary	Monitor	Conf	figure	Permissions	Datastores	Networks	Snapshots	Updates	
VM SDRS Rules EDIT ENABLE/DISABLE DELETE VApp Options Alarm Definitions Alarm Name Object type Defined In Scheduled Fasks > Diskchain Using Mixed Keys Alarm Virtual Machine 10.64.2 Policies > Diskchain Using Secondary VM Virtual Machine 10.64.2 VMware EVC > Virtual Machine Locked Alarm Virtual Machine 10.64.2 > > Virtual Machine Locked Alarm Virtual Machine 10.64.2 > > Virtual Machine Locked Alarm Virtual Machine 10.64.2 > > Virtual Machine Locked Alarm Virtual Machine 10.64.2 > > Virtual Machine monit Virtual Machine 10.64.2	Settings	~	Alaı	rm D	efinitions					
Alarm Definitions Alarm Name Object type Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In Policies Scheduled Lasks Scheduled Lasks Image: Defined In VMware EVC Scheduled Lasks Scheduled Lasks Image: Defined In Guest User Mappings Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In VMware EVC Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled Lasks Scheduled Lasks Scheduled Lasks Image: Defined In Scheduled La	VM SDRS vApp Opt	Rules	AD	D	EDIT ENABLE	/DISABLE DEL	ETE			
Scheduled Fasks > Diskchain Using Mixed Keys Alarm Virtual Machine Diskchain Using Mixed Keys Alarm	Alarm Defi	nitions			Alarm Name	٢	Object type	•	Ŧ	Defined In
Policies Ymmed out starting Secondary VM Virtual Machine Interd out starting Secondary VM Virtual Machine Virtual Machine Virtual Machine Virtual Machine Virtual Machine 	Scheaulea	lasks	0	>	Diskchain Using M	ixed Keys Alarm	Virtual Ma	ichine		@ 10.64.2
Guest User Mappings Virtual Machine Locked Alarm Virtual Machine Virtual Machine 10.64.1 Virtual Machine 	Policies	IC	\bigcirc	>	Timed out starting	Secondary VM	Virtual Ma	ichine		P 10.64.2
○ > vSphere HA virtual machine monit Virtual Machine @ 10.64.2	Guest User	Mappings	\bigcirc	>	Virtual Machine Lo	cked Alarm	Virtual Ma	ichine		🗗 10.64.2
			\bigcirc	>	vSphere HA virtua	I machine monit	Virtual Ma	ichine		P 10.64.2

13. New Alarm Definition page is displayed. In the Name and Targets tab, enter all the required details, and click Next.

Figure 44 : Name and Targets

Edit Alarm Definition	Name and Targets			×
1 Name and Targets	Alarm Name *	Scale-in		
2 Alarm Rule 1	Description			
3 Reset Rule 1				1.
4 Review	Target type *	Virtual Machines		
	Targets	All Virtual Machines on 🗋 pd-backauto-rhel		
			CANCEL	NEXT

14. Alarm Rule 1 page is displayed. Select a trigger and severity as per your requirements.



Figure 45 : Alarm Rule 1

Edit Alarm Definition	Alarm Rule 1	×
Name and Targets Alarm Rule 1 Reset Rule 1	IF VM CPU Usage is below 20 % for	
4 Review	5 min ADD ADDITIONAL TRIGGER THEN	-
	Trigger the alarm and * Show as Warning Send email notifications Image: Comparison of the send email of the send em	
	CANCEL BACK	NEXT

15. Enable Run script and select Repeat.

16. Enter the scale_in.py path in the **Run this Script** section:

Example: /a10networks/a10_vcenter_backauto_
plugin/apps/app1/config/scale_in.py

Reset Rule 1 page is displayed.



- 17. Click Next. Review page is displayed.
- 18. Choose 5 minutes if you want to execute scale_in script every 5 minutes. Ensure the alarm is enabled.



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Figure 47 : Review

Edit Alarm Definition	Review	×
1 Name and Targets	Alarm Name	Scale-in
2 Alarm Rule 1	Description	
3 Reset Rule 1	Targets	All Virtual Machines on 🗋 app1
4 Review	Alarm Rules	IF VM CPU Usage is below 20 % for 5 min THEN Trigger the alarm as A Warning Run this script :/al0networks/al0_vcenter_backauto_plugin/apps/app1/config/scale_in.py and repeat enabled
	Reset Rules	IF the warning or critical conditions/states are no longer met THEN Trigger the alarm as ⊘ Normal
	Repeat actions	every <u>5</u> minute(s) until acknowledged or reset to green
	Enable this alarr	CANCEL BACK SAVE

19. Click CREATE.

The alarms have been created successfully for scale in and scale out. You can see the created alarms under the **Alarm Definitions** section.

Figure 48	:	Alarm	Definitions	s
-----------	---	-------	-------------	---

Alaı	rm l	Definitions				
AD	D	EDIT DISABLE DELETE				
		Alarm Name T	Object type	T Defined In T	Enabled	▼ Last modified
0	>	vSphere HA virtual machine failove	Virtual Machine	@ 10.64.25.71	Enabled	08/23/2023, 3:20:5
0	>	VM storage compliance alarm	Virtual Machine	伊 10.64.25.71	Enabled	08/23/2023, 3:20:5
0	>	Virtual machine CPU usage	Virtual Machine	@ 10.64.25.71	Enabled	08/23/2023, 3:20:54
0	>	Virtual machine Fault Tolerance st	Virtual Machine	伊 10.64.25.71	Enabled	08/23/2023, 3:20:5
0	>	vSphere HA virtual machine monit	Virtual Machine	@ 10.64.25.71	Enabled	08/23/2023, 3:20:5
0	>	Virtual machine encryption integrit	Virtual Machine	伊 10.64.25.71	Enabled	08/23/2023, 3:20:5(
0	>	Virtual machine Consolidation Nee	Virtual Machine	伊 10.64.25.71	Enabled	08/23/2023, 3:20:5
\odot	>	Scale-out	Virtual Machine	🛅 This Object	Enabled	03/15/2024, 7:45:37
0	>	vSphere HA virtual machine monit	Virtual Machine	伊 10.64.25.71	Enabled	08/23/2023, 3:20:5!

Configure Multiple Application Servers

In the current release, setting up Multiple Application Servers requires manual configuration. The separate Inventory Folder in vCenter for each application server

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has to be manually created and then the Back-Auto scripts have to be copied in the application folder.

To configure Multiple Application Servers, perform the following steps:

1. Log in to vCenter UI using your vCenter server IP address or FDQN.

https://vcenter_server_ip_address_or_fqdn

- 2. Create Inventory folder for each source VM separately. For more information, refer Create Inventory Folder.
- 3. Log in to the vCenter VM and execute the following commands to copy backauto configurations scripts in different folder:

```
cd /a10networks/a10_vcenter_Back-Auto_plugin/apps/
cp -a app1/ app2
```

- **NOTE:** Each source VM has a different application folder. Eg. Ubuntu source VM will have app1 folder and RHEL source VM will have app2 folder.
- 4. Create a Clone-Server VM manually from the existing Source-Server VM for app2. For steps, refer to <u>Clone a Virtual Machine</u>.
 - **NOTE:** If the source VM user is not root then disable non root user password for sudo commands. For steps, refer to Enable root user.
- 5. Use the vi command to open and update the config.ini file for each source VM as shown below:

```
vi app1/config.ini
vi app2/config.ini
```

Update the following details in app2/config.ini:

```
clone_vm_name
clone_vm_id
```

6. Similarly, update the assigned IP addresses for each source VM using the following command:



```
vi app1/app_servers.ini
vi app2/app_servers.ini
Example:
[AppServer]
last_scaling_timestamp = 0
assigned_ip_addr = {'X.X.X.X', 'X.X.XX', 'X.X.X.X', 'X.X.X.X',
'X.X.X.X'}
```

7. Create alarms for scale out and scale in for app2 folder. For steps, refer to Create Alarm for Scale Out and Scale In

Configure AutoScale logs

AutoScale logs for all application folders are available at the following location:

/var/log/vmware/vpxd/autoscale.log

Hybrid Cloud GSLB

A hybrid cloud configuration as a Global Server Load balancer (GSLB) between two regions residing in same or different cloud or on-premise environments. It provides flexibility to implement disaster recovery site.

It requires atleast two Thunder instances in each region or location. One instance serves as the master controller, while the other functions as the site device. It is possible to configure multiple site devices, but it is recommended to have a minimum of three site devices to ensure seamless failover and effective disaster recovery.

Both regions should maintain an equivalent number of resources, whether hosted in the cloud or on-premise.

To create and install three thunder instances in any one region use <u>Thunder-3NIC-</u> <u>3VM</u> template. Same template can be used to install in another region.

Architectural References

Refer to the following for architectural reference:

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• On-Premise-to-On-Premise (any)

Region1 and Region2 are on-premises.

Figure 49 : On-Premise-to-On-Premise



GSLB Deployment Topology

Figure 1 shows the GSLB deployment topology having two regions, Region1 and Region2. Both the regions must have identical number of resources:

• One GSLB controller

This Thunder instance act as a DNS server that directs client to reach the active load balancer.

GLSB controller of Region1 is considered as 'Master' and Region2 is considered as 'Member'.

• Two site devices

These Thunder instances act as a load balancer and sends traffic to the server. Each site device may have multiple app or web servers configured and route the traffic accordingly.



Figure 50 : Hybrid Cloud GSLB Deployment Topology



Configure Hybrid Cloud GSLB

Hybrid Cloud GSLB configuration requires two regions and each region should host three Thunder instances.

Python3 should be installed on your machine from where the scripts are executed to run the Hybrid Cloud GSLB configuration. For more information, see Install Python3.

To configure hybrid cloud GSLB, perform the following:

- 1. Create three vThunder instances if not already created. For more information, see <u>Thunder-3NIC-3VM</u>.
- Download A10-vThunder_ADC-CONFIGURATION > HYBRID-CLOUD-GSLB folder from GitHub.
- 3. From Start menu, open command prompt and navigate to this downloaded folder.
- 4. Open the HYBRID_CLOUD_CONFIG_GSLB_PARAM.json with a text editor.

NOTE: Each parameter has a default value mentioned in the parameter file which can be modified as required.

5. Configure the following parameters:



• • • •

	Table	11:	JSON	Parameters
--	-------	-----	------	------------

Resource Name	Description		
Master controller ethernet IP addresses	Specify the ethernet 1 & 2 Private IP addresses of master controller vThunder instance.		
	<pre>"master-controller-address-list": { "ethernet1-addresses" : [/</pre>		
	"ipv4-address":		
	"x.x.x.x", "ipv4-netmask":		
	"255.255.255.0"		
	}		
],		
	"ethernet2-addresses" : [
	"ipv4-address": "		
	x.x.x.x",		
	"10V4-netmask": "255.255.255.0"		
	}		
	},		
Site 1 region 1 ethernet IP addresses	Specify the ethernet 1 & 2 Private IP addresses of Site 1 region 1 vThunder instance.		
	"site1-address-list-reg1": {		
	"ethernet1-addresses" : [
	{ "inv4-address"·		
	"x.x.x.x",		
	"ipv4-netmask":		
	"255.255.255.0" }		
], "ethernet2-addresses" : [



Table 11 : JSON Parameters

Resource Name	Description		
	{ "ipv4-address": "x.x.x", "ipv4-netmask": "255.255.255.0" }] },		
Site 2 region 1 ethernet IP addresses	Specify the ethernet 1 & 2 Private IP addresses of Site 2 region 1 vThunder instance. "site2-address-list-reg1": {		
	<pre>"ethernet1-addresses" : [{</pre>		
	"ipv4-netmask": "255.255.255.0" }		
], "ethernet2-addresses" : [{ "ipv4-address":		
	"x.x.x.x", "ipv4-netmask": "255.255.255.0"		
) },		
Member controller ethernet IP addresses	Specify the ethernet 1 & 2 Private IP addresses of member controller vThunder instance.		
	"member-controller-address-list": { "ethernet1-addresses" : [{		



Table 11 : JSON Parameters

Resource Name	Description		
	"ipv4-address":		
	"x.x.x",		
	"ipv4-netmask":		
	"255.255.255.0"		
	}		
],		
	"ethernet2-addresses" : [
	{		
	"ipv4-address": "		
	x.x.x",		
	"ipv4-netmask":		
	"255.255.255.0"		
	}		
]		
	},		
Site 1 region 2 ethernet	Specify the ethernet 1 & 2 Private IP addresses of		
IP addresses	Site 1 region 2 vThunder instance.		
	"site1-address-list-reg2": {		
	"ethernet1-addresses" : [
	{		
	"ipv4-address":		
	"x.x.x.x",		
	"ipv4-netmask":		
	"255.255.255.0"		
	}		
],		
	"ethernet2-addresses" : [
	{		
	"ipv4-address":		
	"x.x.x.x",		
	"ipv4-netmask":		
	"255.255.255.0"		
	}		



Resource Name	Description		
]		
	},		
Site 2 region 2 ethernet IP addresses	Specify the ethernet 1 & 2 Private IP addresses of Site 2 region 2 vThunder instance.		
	"site2-address-list-reg2": {		
	"ethernet1-addresses" : [
	{		
	"ipv4-address":		
	"x.x.x",		
	"ipv4-netmask":		
	"255.255.255.0"		
	}		
],		
	"ethernet2-addresses" : [
	{		
	"ipv4-address":		
	"x.x.x.x",		
	"ipv4-netmask":		
	"255.255.255.0"		
	}		
	1		
	},		

5. Configure Master Controller for Region1.

Master Controller is the first vThunder instance in Region1 and it could be any vThunder instance.

- a. Collect Master Controller Parameter Details information.
- b. Update this information under masterConfigDetails section of the //CONFIGURATIONS/HYBRID-CLOUD-GSLB/HYBRID_CLOUD_CONFIG_GSLB_ PARAM.json file.



6. Configure Site1 for Region1.

Site1 is the second vThunder instance in Region1 and it could be any vThunder instance.

- a. Collect <u>Site Details</u> information.
- b. Update this information under siteList1 section of the //CONFIGURATIONS/HYBRID-CLOUD-GSLB/HYBRID_CLOUD_CONFIG_GSLB_ PARAM.json file.
- 7. Configure Site2 for Region1.

Site2 is the third vThunder instance in Region1 and it could be any vThunder instance.

- a. Collect <u>Site Details</u> information.
- b. Update this information under siteList2 section of the //CONFIGURATIONS/HYBRID-CLOUD-GSLB/HYBRID_CLOUD_CONFIG_GSLB_ PARAM.json file.
- 8. Configure Member Controller for Region2.

Member Controller is the first vThunder instance in Region2 and it could be any vThunder instance.

- a. Collect Member Controller Parameter details information.
- b. Update this information under memberConfigDetails section of the //CONFIGURATIONS/HYBRID-CLOUD-GSLB/HYBRID_CLOUD_CONFIG_GSLB_ PARAM.json file.
- 9. Configure Site1 for Region2.

Site1 is the second vThunder instance in Region2 and it could be any vThunder instance.

- a. Collect <u>Site Details</u> information.
- b. Update this information under siteList3 section of the //CONFIGURATIONS/HYBRID-CLOUD-GSLB/HYBRID_CLOUD_CONFIG_GSLB_ PARAM.json file.



10. Configure Site2 for Region2.

Site2 is the third vThunder instance in Region2 and it could be any vThunder instance.

- a. Collect Site Details information.
- b. Update this information under siteList4 section of the //CONFIGURATIONS/HYBRID-CLOUD-GSLB/HYBRID_CLOUD_CONFIG_GSLB_ PARAM.json file.
- 11. Verify if all the configurations in the HYBRID_CLOUD_CONFIG_GSLB_PARAM.json file are correct and save the changes.
- 12. From Start menu, open cmd and navigate to this downloaded folder to run the following command to configure GSLB:

C:\Users\TestUser\A10-VMware_ADC-CONFIGURATION\HYBRID-CLOUD-GSLB> python HYBRID_CLOUD_CONFIG_GSLB.py

13. If the Hybrid cloud is configured successfully, the following message is displayed:

```
Gathering public and private ip address for site devices.
               ______
[{'ipv4-address': 'x.x.x', 'ipv4-netmask': '255.255.255.0'}]
configured ethernet- 1 ip
configured ethernet- 2 ip
Configuring slb server for site: site1
Successfully Configured slb server for site: site1
Configuring service group for site: site1
Successfully Configured service group for site:site1
Successfully Configured virtual server for site: site1
Successfully Configured gslb site: site1
Successfully Configured default route:site1
Configurations are saved on partition: shared
       _____
[{'ipv4-address': 'x.x.x', 'ipv4-netmask': '255.255.255.0'}]
configured ethernet- 1 ip
configured ethernet- 2 ip
Configuring slb server for site: site2
Successfully Configured slb server for site: site2
```



Configuring service group for site: site2 Successfully Configured service group for site:site2 Successfully Configured virtual server for site: site2 Successfully Configured gslb site: site2 Successfully Configured default route:site2 Configurations are saved on partition: shared _____ [{'ipv4-address': 'x.x.x', 'ipv4-netmask': '255.255.255.0'}] configured ethernet- 1 ip configured ethernet- 2 ip Configuring slb server for site: site3 Successfully Configured slb server for site: site3 Configuring service group for site: site3 Successfully Configured service group for site:site3 Successfully Configured virtual server for site: site3 Successfully Configured gslb site: site3 Successfully Configured default route:site3 Configurations are saved on partition: shared _____ [{'ipv4-address': 'x.x.x', 'ipv4-netmask': '255.255.255.0'}] configured ethernet- 1 ip configured ethernet- 2 ip Configuring slb server for site: site4 Successfully Configured slb server for site: site4 Configuring service group for site: site4 Successfully Configured service group for site:site4 Successfully Configured virtual server for site: site4 Successfully Configured gslb site: site4 Successfully Configured default route:site4 Configurations are saved on partition: shared



```
Configuring controller devices
[{'ipv4-address': 'x.x.x.x', 'ipv4-netmask': '255.255.255.0'}]
configured ethernet- 1 ip
configured ethernet- 2 ip
Successfully Configuring gslb server for controller: masterController
Successfully Configured ServiceIp for site: masterController
Successfully Configured site information for: masterController
Successfully Configured qslb policy for: masterController
Successfully Configured gslb zone for: masterController
Successfully Configured gslb controller and status interval:
masterController
Successfully Configured gslb controller group: masterController
Successfully Configured geo location: masterController
Successfully Configured default route:masterController
Configurations are saved on partition: shared
[{'ipv4-address': 'x.x.x.x', 'ipv4-netmask': '255.255.255.0'}]
configured ethernet- 1 ip
configured ethernet- 2 ip
Successfully Configured gslb server for controller: memberController
Successfully Configured gslb controller group: memberController
Successfully Configured default route:memberController
Configurations are saved on partition: shared
```

Master Controller Parameter Details

Table 12 : Master Controller Parameter details

Parameter	Description	Sample value
controllerMngmtPublicIp	Public IP of Management Interface of Region1 Controller.	10.64.25.176
controllerPassword	vThunder instance Login password of Region1 Controller.	***

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Parameter	Description	Sample value	
controllerSecPrivatelpData1	Secondary Private IP of Data Interface Subnet1 of Region1 Controller.	10.64.25.165	
site1MngmtPublicIp	Public IP of Management Interface of Region1 Site1.	10.64.25.177	
site1Password	vThunder instance Login password of Region1 Site1 .	***	
site2MngmtPublicIp	Public IP of Management Interface of Region1 Site2.	10.64.25.178	
site2Password	vThunder instance Login password of Region1 Site2 .	***	
site1SecPrivatelpData1	Secondary Private IP of DataSubnet1 of Region1 Site1 vThunder.	10.0.2.9	
site1SecPubliclpData1	Secondary Public IP of DataSubnet1 of Region1 Site1 vThunder.	10.64.25.161	
site2SecPrivatelpData1	Secondary Private IP of DataSubnet1 of Region1 Site2 vThunder.	10.0.2.10	
site2SecPubliclpData1	Secondary Public IP of DataSubnet1 of Region1 Site2 vThunder.	10.64.25.162	
server1Privatelp	Private IPv4 address of Server1 of Region1.	10.0.3.9	
server2Privatelp	Private IPv4 address of Server1 of Region1.	10.0.3.10	

Member Controller Parameter Details

Table 13 : Member Controller Parameter details

Parameter	Description	Sample value
controllerMngmtPublicIp	Public IP of Management Interface	10.64.25.179

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Parameter	Description	Sample value
	of Region2 Controller.	
controllerPassword	vThunder instance Login password of Region2 Controller.	***
controllerSecPrivatelpData1	Secondary Private IP of Data Interface Subnet1 of Region2 Controller.	10.64.25.165
site1MngmtPublicIp	Public IP of Management Interface of Region2 Site1.	10.64.25.180
site1Password	vThunder instance Login password of Region2 Site1 .	***
site2MngmtPublicIp	Public IP of Management Interface of Region2 Site2.	10.64.25.181
site2Password	vThunder instance Login password of Region2 Site2 .	***
site1SecPrivatelpData1	Secondary Private IP of DataSubnet1 of Region2 Site1 vThunder.	10.0.2.15
site1SecPublicIpData1	Secondary Public IP of DataSubnet1 of Region2 Site1 vThunder.	10.64.25.163
site2SecPrivatelpData1	Secondary Private IP of DataSubnet1 of Region2 Site2 vThunder.	10.0.2.16
site2SecPublicIpData1	Secondary Public IP of DataSubnet1 of Region2 Site2 vThunder.	10.64.25.164
server1Privatelp	Private IPv4 address of Server1 of Region2.	10.0.3.11
server2Privatelp	Private IPv4 address of Server1 of Region2.	10.0.3.12

Site Details



Table 14 : Site details

Site Name	VIP Name	Device Name	GEO Location
eastus_1	vs1	slb1	North America, United States
eastus_2	vs2	slb2	North America, United States
eastus2_ 1	vs3	slb3	North America.United States.California.San Jose
eastus2_ 2	vs4	slb4	North America.United States.California.San Jose

IP Routes

Table 15 : IP routes

RIB List Of Region	Destination IP Address	Subnet Mask	Next Hop
Region1	0.0.0.0	/0	10.0.2.1
Region2	0.0.0.0	/0	10.0.2.1

Troubleshooting



Troubleshooting

Common Errors

While deploying the templates, you might encounter some errors or issues. The common error is listed below:

Not getting response from curl request:

Make sure all the configurations are valid. If yes, then traffic issue is due to below problems.

- VIP/server is down. Sometimes VIP/server is not stable. It keeps changing its status between up and down.
- Check with below command if VIP and server are up.
 - For server: show slb server
 - For VIP: show slb virtual-server

Default Password Policy

The default password policy has the following criteria:

- The password should be at least nine characters in length.
- The password should contain at least one number, an uppercase letter (English), a lowercase letter (English), and a special character.
- The password should have at least one letter or number different from the previous password.
- The password should not contain its corresponding username with the same capitalization of letters.
- The password should not contain repeated characters of the same letter or number with the same capitalization of letters.
- The password should not contain the sequential row keyboard input of four letters or numbers with the same capitalization of letters.

Create a Template from the ACOS OVF or OVA file

- 1. Download OVA or OVF file onto your local machine from https://support.a10networks.com/support/axseries
- 2. Go to the ESXI host and login.



Figure 51 : VM ware GUI

← → C A Not secure https://10.64.25.52/ui/#/login	12 ☆
vm ware [®]	
User name root Password Log in Log in	

3. Right click on virtual machines and click **Create/Register VM**.

Figure 52 : Virtual Machines window

vm ware [,] ESXi ^{,,}							root@10.64.25.52 🗸	Help 🗕 (Q Searc
1 Navigator		🚯 localhost.pxe.exampl	e.com - Virtual Machines						
✓ ☐ Host Manage		指 Create / Register V	M 📝 Console 🕨 Po	wer on 📕	Power off 🔡 Suspe	nd 🧲 Refresh 🔅	Actions	Q Sear	ch
Monitor		Virtual machine	~	Status v	Used space v	Guest OS 🗸 🗸	Host name v	Host CPU V	Host m
▼ as a virtual Machines	61	C An vRealize-Ope	rations-Cloud-Proxy-8.6.3	📀 Nor	84 GB	Other 3.x or later Linu	Unknown	0 MHz	0 MB
▼ → nsx-unified-applia	Virtua	l machines	lize-Log-Insight-8.8	📀 Nor	385.37 GB	Other 3.x or later Linu	Unknown	0 MHz	0 MB
Monitor	Creat	te/Register VM	7	🕑 Nor	20.08 GB	CentOS 7 (64-bit)	Unknown	5 MHz	420 ME
More VMs	🛅 Open	n in new window	er	🕑 Nor	32 GB	CentOS 7 (64-bit)	Unknown	0 MHz	0 MB
> 🗐 Storage	3	O. 🗗 DEV4-Windov	NS	📀 Nor	98.08 GB	Microsoft Windows S	Unknown	13 MHz	6 GB
Networking	14	🗆 👘 DEV5-vThund	ler	📀 Nor	36.08 GB	CentOS 7 (64-bit)	vThunder	986 MHz	2.15 GE
		🗆 🚰 QA2-vThunde	er	🕑 Nor	80 GB	CentOS 7 (64-bit)	Unknown	0 MHz	0 MB
		🗆 🎒 WIN2016-DH	CP	📀 Nor	15.09 GB	Microsoft Windows S	Unknown	0 MHz	0 MB
		Quick filters	~						
		Pacant tasks							
		Task	V Target	v In	itiator y Queu	ed y Started	Pacult .		× C0
		Idon	- laiget	· 11		Started	- Result 🔺		- 00

4. Select deploy a virtual machine from an OVF or OVA file, click **Next**.



Figure 53 : Select Creation Type

1 Select creation type	Select creation type	
2 Select OVF and VMDK files	How would you like to create a Virtual Machine?	
3 Select storage 4 License agreements 5 Deployment estions	Create a new virtual machine	This option guides you through the process of creating a
6 Additional settings	Deploy a virtual machine from an OVF or OVA file	virtual machine from an OVF and VMDK files.
7 Ready to complete	Register an existing virtual machine	
vinware		

5. Select/drag OVF or OVA file from your local machine.

Figure 54 : Select OVF and VMDK files tab

1	New virtual machine - ACOS_vThur	ider_521_image	
~	1 Select creation type 2 Select OVF and VMDK files 3 Select storage 4 License agreements 5 Deployment options	Enter a name for the virtual machine. ACOS_vThunder_521_image Virtual machine names can contain up to 80 characters and they must be unique within each ESXi instance.	
	6 Additional settings 7 Ready to complete	Click to select files or drag/drop	
		Back Next Finish Cancel	



. . : : : : : : : : :



Figure 55 : Select OVF and VMDK files tab

🖂 📑 localhost.pxe.example.c	om - Virtual Machines
🔁 New virtual machine - ACOS_vThun	ider_521_image
 1 Select creation type 	
2 Select OVF and VMDK files	Enter a name for the virtual machine.
3 Select storage	ACOS_vThunder_521_image
4 License agreements	Virtual machine names can contain up to 80 characters and they must be unique within each ESXi instance.
5 Deployment options	
6 Additional settings	
7 Ready to complete	
	× 📼 ACOS vThunder 5 2 1-P6 74 img ova
vm ware [®]	
	Back Next Finish Cancel

6. Choose storage.

Figure 56 : Select Storage tab

New virtual machine - ACOS_5_2_1	_ova_image					
 1 Select creation type 2 Select OVF and VMDK files 3 Select storage 4 License agreements 5 Deployment options 6 Additional settings 7 Ready to complete 	Select storage Select the storage type and datastore Standard Persistent Memory Select a datastore for the virtual machine's	configuration fil	es and all of its	' virtual disks.		
	Name	Capacity 🗸	Free ~	Туре 🗸	Thin pro 🗸	Access 🗸
	4TB	3.64 TB	1.29 TB	VMFS6	Supported	Single
	Data2	930.75 GB	15.61 GB	VMFS6	Supported	Single
	datastore1	765.5 GB	37.45 GB	VMFS6	Supported	Single
						3 items
vm ware [®]						
				Back	Next Fi	nish Cance

7. Click I agree and click Next.



Figure 57 : License agreements Tab

New virtual machine - ACOS_5_2_1	_ova_image
 1 Select creation type 2 Select OVF and VMDK files 3 Select storage 4 License agreements 5 Deployment options 6 Additional settings 7 Ready to complete 	 a) transfer, assign or sublicense its license rights to any other person or entry, or use the softwape or decompile, decrypt, disassemble or otherwise reduce the Software to human read disclose, provide, or otherwise make variable trade secrets contained within the Software and Do deploy, install and/or use in any way this Software and Documentation if you are employee or agen Software, Upgrades and Additional Products or Copies. For purposes of this Agreement, "Software" and "Pro OTHER PROVISIONS OF THIS AGREEMENT: a) CUSTOMER HAS NO LICENSE OR RIGHT TO USE ANY ADDITIONAL COPIES OR UPGRADES UNLESS CUSTOMER, AT THE b) USE OF UPGRADES IS LIMITED TO A10 NETWORKS SOFTWARE AND EQUIPMENT FOR WHICH CUSTOMER IS THE ORIGI C) THE MAKING AND USE OF ADDITIONAL COPIES IS LIMITED TO NECESSARY BACKUP PURPOSES ONLY. Term and Termination. This Agreement and the license granted herein shall remain effective until terminat Export. Software and Documentation jackness, the A10 logo, ACLOUD, ACOS, AFLEX, AFLOM, AGALAXY, AVCS, AXAPI, IDACCESS, IDSEN Patents Protection. A10 Networks products including all AX Series products are protected by one or more o Limited Warranty Disclaimer of Liabilities. REGARDLESS OF ANY REMEDY SET FORTH FAILS OF ITS ESSENTIAL PURPOSE OR OTHERWISE In no event shall A10 Networks' or its suppliers' or licensors' liability to Customer, whether in contrac Customer agrees that the limitations of liability and disclaimers set forth herein will apply regardless The Warranty and the End User License shall be governed by and construed in accordance with the laws of t
vm ware*	I agree
	Back Next Finish Cancel

8. Select network mappings from the available networks.

Figure 58 : Deployment Options tab

New virtual machine - ACOS_5_2_1	_ova_Image	
 1 Select creation type 2 Select OVF and VMDK files 3 Select storage 	Deployment options Select deployment options	
 4 License agreements 5 Deployment options 6 Additional settings 7 Ready to complete 	Network mappings	Mgmt VM Network Ethernet 1 Data1 Network Ethernet 2 Data_1 Network VM Network
	Disk provisioning Power on automatically	Thin O Thick
vm ware [®]		
		Back Next Finish Cancel

9. Provide the values in the **Additional Settings** fields as appropriate.

NOTE: Click ① for description of each corresponding parameter.

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Figure 59 : Additional Settings Tab

1 Select creation type 2 Select OVF and VMDK files	Additional settings Additional properties for the VM		
3 Select storage 4 License agreements 5 Deployment entione	✓ eth0.label		
6 Additional settings	eth0.label	management_network	i
7 Ready to complete	✓ eth0.connectivityType		
	eth0.connectivityType	management	0
	✓ eth0.ipAllocationType		
	eth0.ipAllocationType	static	6
	✓ eth0.ipAddress		
	eth0.ipAddress	10.64.25.187	G
	✓ eth0.subnetMask		
	eth0.subnetMask	255.255.255.0	6
	✓ eth0.gatewayAddress		
vm ware	eth0.gatewayAddress	10.64.25.1	6
	▼ eth1.label		

10. Review details and click Finish.

Figure 60 : Ready to complete Tab

 1 Select creation type 2 Select OVF and VMDK files 3 Select storage 	Ready to complete Review your settings selection before	e finishing the wizard
 4 License agreements 5 Deployment options 6 Additional settings 	Product VM Name	vThunder_5.2.1-P6.74 ACOS 5 2 1 ova image
✓ 7 Ready to complete	Files	ACOS_vThunder_5_2_1-P6_74-disk1.vmdk
	Datastore	Data2
	Provisioning type	Thin
	Network mappings	Mgmt: VM Network,Ethernet 1: Data1 Network,Ethernet 2: Data_1 Network
	Guest OS Name	Unknown
	Properties	Click to expand
vm ware	Do not refresh your b	rowser while this VM is being deployed.

11. Virtual machine created, user can check in VMware vSphere client.

.



Figure 61 : VM ware vSphere client

← → C ▲ Not secure https://10.64.25.71/ui/app/vm;na	av=v/urn:vmomi:VirtualMachine:vm-159:e62e	e1ec9-8a34-4bf1-bdaa-93026523ae8d/summary	୍ ର ଜ
	③ New vCenter server updates are available v	VIEW UPDATES	
vSphere Client Q Search in all environments		C	Administrator@VSPHERE
<	ACOS_5_2_1_ova_image ▷ □ ⊈ Summary Monitor Configure Permissions Date	් ණී ổ <mark> : ACTIONS</mark> atastores Networks Snapshots Updates	
	Guest OS 🗄 Virtual Machi	ine Details ACTIONS - II	Usage Last updated: 9/7/23, 4:20 PM CPU
 ∂ ACOS.5.2.1.ova_imsge ∂ avi-controller ∂ bitnami-ngim-124-124.0-r0-debian-11-amd64 ∂ edge-01-old ∂ edge-02-old 	Powered Off DP	Jest OS John Other 2.6 x Linux (64-bit) Mware Tools Not running, not installed Image: Constalled Constalled NS Name Addresses Constalled Constalled Constalled Constalled	O MHZ used Memory
静 ESXI01 静 ESXI02 ティングの		Icryption Not encrypted	Storage OB used

12. Right click on this virtual machine, select Template, and then select convert to template.

Figure 62 : Select Template tab

	New vCenter server updates are available VIEW UPDATES	
= vSphere Client Q Search in all environments		
	ACOS_5_2_1_ova_image トロ 日 毎 稔 : Actions Summary Monitor Configure Permissions Datastores Networks Snapshots Updates	
	Guest OS II Virtual Machine Details Actions II Powered Off	Usage Last updated: 9/7/23, 4:20 Ph CPU
TXCOS_5_2_Lova_mage Trans_relation_controller Trans_r	Powered Off Powered Powere	Memory
ଡି) edge-02-old ଡି) ESXIO1 Template > ଡି) ESXIO2 Compatibility >	B ² Convert to Template CONSOLE CONSOLE CONSOLE	Storage
伊 ESX03 伊 Grafana-Ubuntu 伊 server1 御 ubuntu-2004-efi-kube-v1.		VIEW STATS

13. Move created template into the images folder.

Figure 63 : VM ware GUI

- Images
 - ACOS_vThunder_521_image
 - ACOS_vThunder_6_0_1_150_image
 - 問 ubuntu-18.04
- 14. Now users can user these templates in the vRealize automation cloud assembly cloud templates.



Setup vRealize automation Cloud Assembly for VMware templates

1. Visit URL <u>https://vra.a10networks.com</u>.

The VMware vRealize Automation window is displayed.

2. Click GO TO LOGIN PAGE.

Workspace ONE login window is displayed. Enter your credentials and click "SIGN IN"

Figure 64 : vRealize Automation GUI

\leftrightarrow \rightarrow G	A Not secure https://vra.a10networks.com	Q 🖻 🖈 🛛
vmw VMware A	Aria Automation Assembler	© ⊘ ^{vraadmin vraadm_}
	VMware vRealize Automation Speed up the delivery of infrastructure and application resources through a policy-based self- service portal, on-premises and in the public cloud. Version 8.10.0.26552 (20566543)	



Username vraadmin Password System Domain	<u>()</u>
Username vraadmin Password System Domain Sign in Forgot Password? Change to a different domain	Workspace ONE"
Password System Domain Sign in Forgot Password? Change to a different domain	Username vraadmin
System Domain Sign in Forgot Password? Change to a different domain	Password
Sign in Forgot Password? Change to a different domain	System Domain
Forgot Password? Change to a different domain	Sign in
Change to a different domain	Forgot Password?
L CON L (D KO)	Change to a different domain

3. The VMware vRealize Automation - Cloud Service Console window is displayed. Click **Cloud Assembly** .

Figure 66 : vRealize Automation - Cloud Service Console

vmw VMware Aria Automation Assemb	© 💿 vraadmin v	rraadm_ ஃ VRIDM ~ 🔛		
≪ 88 Services ☆ Identity & Access Management ~ Active Users	My Services	🔊 Code Stream	O Orchestrator	
Enterprise Groups	() Ouickstart	Service Broker	VRA Migration Assistant	

- 4. Select the **Infrastructure** tab.
- 5. Create and configure the following properties:

.



- <u>Cloud Account</u>
- <u>Cloud Zone</u>
- Projects
- Flavor Mappings
- Image Mappings
- <u>Network Profile</u>

Cloud Account

Cloud accounts allow you to bring your public cloud and on-prem data centers under management.

1. Click Add Cloud Account on the cloud accounts window.

Figure 67 : vRealize Automation - Cloud Assembly

vmw VMware Aria Automation As	ssembler - Cloud Assembly		vraadmin vraadm 🖧 VRIDM 🗡	
Resources Design Infrastru	ucture Extensibility Tenant Management Migration		🖽 GUIDED S	
Resources Design Infrastru « Network Informes Storage Profiles Cluster Plans Pricing Cards Terraform Versions Tags O Onboarding Resources Compute Networks Security Storage Kubernetes	Extensibility Tenant Management Migration Cloud Accounts Items + ADD CLOUD ACCOUNT Image: Conter_acc Image: Conter_accc Image: Conter_acc <th><u>Q</u> Filer</th> <th>© suber :</th> <th></th>	<u>Q</u> Filer	© suber :	
Requests				
Requests				
Connections ∨				
Cloud Accounts				

2. The "**Cloud Account Types**" window is displayed. Select the account type you would like to add. For cloud formation template click on vCenter Server.



Figure 68 : Cloud Account Types

Cloud Accoun Select a cloud account type	t Types			
Amazon Web Services	Google Cloud Platform	Microsoft Azure	NSX-T Manager	NSX-V Manager
VCenter Server	VMware Cloud Director	VMware Cloud Foundation	VMware Cloud on AWS	

3. Enter cloud account name, vCenter Server Credentials and click Validate.

Untrusted Certificate found pop-up window is displayed.

Figure 69 : New Cloud Account

😂 New Cloud Account						
Name *	vcenter_acc					
Description						
vCenter Server Cred	entials					
vCenter Server IP address / FQDN *	10.64.25.71	1				
Username *	administrator@vsphere.local					
Password *	······					
	VALIDATE					
Capabilities						
Capability tags	Q Enter capability tags		í			
ADD CANCEL						

4. For untrusted certificate found, click **Accept**.



Figure 70 : Untrusted Certificate found pop-up

	Untrusted C	Certificate Found		
~	\triangle	Certificate thumbprint	EB:9E:32:52:FC:E2:82:30:16:5D:B3:A7:A8:	CF:45:5E:B8:30:E9:F4
		Common name	10.64.25.71	
		Issued by	CA	
		Expires	Aug 23, 2025, 3:16:14 AM	
				CANCEL ACCEPT
~	Capability tags			U

5. After validating credentials, allow provision to datacenter.

Figure 71 : Credentials

Configuration				
Allow provisioning to these	Datacenter			
datacenters *	Create a cloud zone for the selected datacenters			
NSX Manager	Q Search for cloud accounts			
Site Associations Croud accounts	+ ADD X REMOVE			
	Name Bidirectional	Status	klentifier	Туре
	No associations assigned			
				O cloud accounts
Capabilities				
Capability tags	Q, Enter capability tags		0	
ADD				

6. Click on **ADD**

Cloud Zone

Cloud zones associate computer resources with projects and account/regions to form the basis of deployable virtual machines. In addition, they enable you to define capabilities that Cloud Assembly matches with cloud template constraints to define where and how resources are configured for deployments.

 Create new cloud zone or use one of the existing cloud zones. Click "New Cloud Zone" on the cloud zones window

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Resources Design	Infrastru	cture Extensibility	Tenant Management	Migration	🖽 GUII
	*	Cloud Zone	S 1items		
答 Administration	~	+ NEW CLOUD ZONE		N	Q Filter
Projects		<u> </u>			
Users and Groups			cc / Datacenter		
Custom Roles			cc / Datacenter		
Custom Names		Account / region	🙀 vcenter_acc / D		
Secrets		Compute Projects	0 2		
Onfigure	~				
Cloud Zones					
Virtual Private Zones	5				
Kubernetes Zones		OPEN DELETE			

2. Select an account/region and enter a name and description.

Path: Infrastructure -> Configure -> Cloud zones then click on NEW CLOUD ZONE

3. Select a placement policy that defines how provisioned resources are distributed among hosts in this cloud zone.

Figure 73 : Cloud Zones - Summary Tab

()	<pre> % vcenter_acc / % % % % % % % % % % % % % % % % % % %</pre>	Datacenter DELETE				
Projects	Summary Compute Projects					
Users and Groups	A cloud zone defines a set of comp	A cloud zone defines a set of compute resources that can be used for provisioning				
Custom Roles						
Custom Names	Account / region *	😥 vcenter_acc / Datacenter				
Secrets	Name *	vcenter_acc / Datacenter				
Onfigure	Description					
Cloud Zones		<i>h</i>				
Virtual Private Zones	Placement policy *	DEFAULT V				
Kubernetes Zones	Folder	Q. CloudNative-vRealize				
Flavor Mappings						
Image Mappings						
Network Profiles	Canabilities					
Storage Profiles	Capabilities					
Cluster Plans	Capability tags are effectively appli	ied to all compute resources in this cloud zone, but only in the context of this cloud zone.				
Pricing Cards	Capability tags	account:vcenter_acc / Datacenter-1 X) Q Enter capability tags	1			
Terraform Versions						
Tags	SAVE CANCEL					
③ Onboarding						

4. Click the Compute tab and view the compute resources in this cloud zone. If you don't want to use all the compute resources, add a tag to the compute resources that you want, and then enter that tag in the filter.



5. Click add and add the available account/region.

Figure 74 : Cloud Zones - Compute Tab

《 答 Administration ~	Summary Compute Projects	DELETE		
Users and Groups	All compute resources listed apply to this cloud zone. Us	e the filter to add or remove resources from the list	. Only compute resources that are not assigned to a	another zone can be used.
Custom Roles Custom Names	Manually select compute 🛛 🕐			
Secrets	+ ADD REMOVE			
Onfigure	Name	Account / Region	Туре	Tags
Cloud Zones	10.64.25.52	🙀 vcenter_acc / Datacenter	Host	
Virtual Private Zones				
Kubernetes Zones				
Flavor Mappings	SAVE CANCEL			
Image Mappings				

6. Click Create.

Projects

Projects links user and cloud zones. Think of projects as groups that control who can use what cloud resources. Create projects that support the goals of your organization, ensuring that users have access to the appropriate zones.

Figure 75 : VMware Aria Automation Assembler - Projects Tab





- 1. Click **New Project** on the Projects window.
- 2. Enter project information on the Summary tab.

Figure 76 : VMware Templates - Summary Tab

r Short Short Sho	ware-	Templa	ates delete
Summary	Users	Provisioning	Kubernetes Provisioning Integrations
Name * Description			Mware-Templates
			/

3. Click the Users tab and add one or more users. Mark the deployment sharing option.

Figure 77 : VMware Templates - Users Tab

Resources Design Infrastruc	cture Extensibility Tenant M	anagement Migration			<u>ت</u> ا (
Administration	路 VMware-Temp	plates delete			
Projects Users and Groups	Deployment sharing	Compared by the provisioning integrations Deployments are shared between all users in the project			
Custom Roles	User roles	Specify the users and groups related to this project.			
Custom Names		+ ADD USERS + ADD GROUPS × REMOVE		Q Search users or groups	
Secrets		Name	Account	Role	
Settings					
Configure			No users or groups assigned		
Cloud Zones		Manage Columns			1 - 10 of 0 users
Virtual Private Zones					1 10 01 0 0001
Kubernetes Zones	SAVE				

4. Click the Provisioning tab and add one or more zones. The selected zones must have the appropriate infrastructure resources to support the project goals. If you are just getting started, ignore Constraints and Custom Properties for now. You can go back and add them later if necessary.

Figure 78 : VMware Templates - Provisioning Tab

Resources Design	Infrastr	ucture Extensibility Tenant Ma	nagement M	Migration						۵U -	GUIDED SE
	«	602 \/\Auvora Tamp	latas								
(2) Administration		C viviware-Temp	lates be	LETE							
© Administration	Ň.	Summary Users Provisionin	g Kubernet	es Provisioning Integrations							
Projects	- 11										
Users and Groups	- 1	Zones									
Custom Roles	11	Specify the zones that can be used	when users pro	vision deployments in this proje	ct. 🚺						
Custom Names											
Secrets	11	+ ADD ZONE~ X REMOVE									
Settings	11	Name	Status	Description	Priority ↑	Instances	Memory Limit (MB)	CPU Limit	Storage Limit (GB)	Capability Tags	
② Configure	~	vcenter_acc/ Datacente		Created by Quick Start wizard.	0	Unlimited	Unlimited	Unlimited	Unlimited	account:10.64.25.71 / Datacen	iter-1
Cloud Zones		Manage Columns								1-10	d 1 zones
Virtual Private Zones	5										



5. Click Create.

Flavor Mappings

Cloud vendors use flavors, or instance types, to express standard deployment sizes such as small (1 CPU,2 GB RAM) or large (2 CPU, 8 GB RAM) for compute resources. When you build a cloud template, you pick a flavor that fits your needs. Map a flavor name to a value for each account/region.

Figure 79 : vRealize Automation - Cloud Assembly- Flavor Mappings Tab

Resources Design Infrastruc	cture Extensibility Tenant Management	Migration	D GUIDED SETUR
Administration v Projects	Flavor Mappings 4 Items	VIEW	by name → _ Q. Filter ① C \=
Users and Groups Custom Roles	flavor_map	arge	En medium
Custom Names	Account / regions 1	Account / regions 1	Account / regions 1
Secrets	OPEN DELETE	OPEN DELETE	OPEN DELETE
Cloud Zones Virtual Private Zones Kubernetes Zones	ப் small		
Flavor Mappings	Account / regions 1		
Image Mappings Network Profiles	OPEN DELETE		
Storage Profiles			

- 1. Click New Flavor Mapping on the Flavor Mappings window.
- 2. Enter a new Flavor name, such as small, medium, or large.
- 3. Specify the number of CPUs for e.g. 2 and Memory for e.g. 8 GB.



Figure 80 : Infrastructure Tab

Resources Design Infra	astructure Extensibility	Tenant Management Migratic	n		🗊 GUIDED SETUP
《 答 Administration ~	. 테 New Flav	vor Mapping			
Projects Users and Groups	Define one or many flav define flavors for a spec	ors for a specific name. Flavors ac cific region.	t as upper limits if machine propertie	s are overriden in the cloud template. You c	an also (🤅
Custom Roles	Flavor name *	medium			
Custom Names	Configuration *	Account / Region	Value		
Secrets		Q 🔯 vcenter_acc / Datacenter	Number of CPUs	Memory GB 🗸 🕒 🔂	
Cloud Zones	CREATE	-			
Kubernetes Zones					

- 4. Click (+) to add another flavor map row of the same size for each available cloud account/region.
- 5. Click Create.

Image Mappings

Cloud vendors use images to configure a VM based on OS settings, such as an ubuntu-16 configuration. When you build a cloud template, you pick an image that fits your needs. Map an image name to a value for each account/region. You can also add constraints and configuration scripts to further control resource placement. Map an image name to a value for each account/region.

NOTE:Before proceeding to Image mappings creation, please create a
template from a ACOS image file. Refer Create a Template from the
ACOS OVF or OVA file



Figure 81 : Image Mappings Tab

Resources Design Infi	rastructure Extensibility Tenant Management	Migration	D GUIDED SETUP
谷 Administration V Projects	Image Mappings 2 Items	VIE	w by name 🗸 _ Q. Filter ① C =
Users and Groups Custom Roles	ACOS-521-P6-OVA	E Linux	
Custom Names	Account / region 1	Account / region 1	
Secrets	OPEN DELETE	OPEN DELETE	
Cloud Zones			
Virtual Private Zones			
Kubernetes Zones			
Flavor Mappings			
Image Mappings			
Network Profiles			
Storage Profiles			

- 1. Click New Image Mapping on the Image Mappings window.
- 2. Enter a new Image name.

Figure 82 : Image Mappings - Infrastructure Tab

Resources Design	Infrastructu	re Extensibility	Tenant Management Migrati	on		🖽 GUIDED SET
答 Administration 、	× ^ ۴	acos-52	1-P6-OVA delete			
Projects	All	lows you to define ima	iges or machine templates by nar	ne in a cloud-agnostic way. 🚺		
Users and Groups	Im	age name *	ACOS-521-P6-OVA			
Custom Roles						
Custom Names	Co	onfiguration *	Account / Region	Image	Constraints	Cloud Configuration
Secrets			Q 🕞 vcenter_acc / Datacente	Q ACOS_vThunder_5_2_1-P6	Q Example: !license:none:hi	+ ADD
Users and Groups Custom Roles Custom Names Secrets	lm Co	age name *	ACOS-521-P6-OVA Account / Region Q 🔯 vcenter_acc / Datacente	Image Q_ACOS_vThunder_5_2_1-P6	Constraints Q Example: !license:none:h	Cloud Configuration

- 3. Click in Account/Region and select one of the available cloud account/regions.
- Select one of the available ACOS images configurations to complete the first map row. If you are just getting started, ignore Constraints and CloudConfig for now. You can go back and add them later if necessary.



Figure 83 : Image Mappings - Infrastructure Tab

Resources Design Infras	structure Extensibility Tenant Management	Migration	D GUIDED SETUP
≪ Administration ✓ Projects	Image Mappings (2 Items) + NEW IMAGE MAPPING	VIE	ew by name 🗸 Q. Filter
Users and Groups Custom Roles	ACOS-521-P6-OVA	Linux	
Custom Names	Account / region 1	Account / region 1	
Secrets	OPEN DELETE	OPEN DELETE	
Cloud Zones			
Virtual Private Zones			
Kubernetes Zones			
Flavor Mappings			
Image Mappings			
Network Profiles			
Storage Profiles			

- 5. Click (+) to add another image map row for an ubuntu-16 image for each available cloud account/region.
- 6. Click Create.

Network Profile

- 1. Click **New network profile** on the Network Profiles window.
- 2. Enter the Account/ region name which was created earlier. And name of the network profile.
- 3. Enter the capability tags.



Figure 84 : Network Profiles

Resources Design Infras	tructure Extensibility Tena	ant Management Migration	
《 各dministration ~	Gatal Delete Summary Networks M	Network Policies	
Users and Groups	A network profile defines a gr	oup of networks and network settings used when machines are provisioned.	
Custom Roles	Account / region	🙀 vcenter_acc / Datacenter	
Custom Names Secrets	Name *	data1	
Onfigure	Description		
Cloud Zones			
Virtual Private Zones	Capabilities		
Kubernetes Zones	Capability tags listed here are	matched to constraint tags in the cloud template	
Flavor Mappings	Capability tags listed here are	mached to constraint tags in the cloud template.	
Image Mappings			
Network Profiles	Capability tags	account.vcenter_acc / Datacenter-1 X) Q Enter capability tags	í
Storage Profiles			
Cluster Plans	SAVE CANCEL		
Pricing Cards			
Terraform Versions			

4. Click on add network.

Figure 85 : New Network Profile

		etwork F	Profile	è											
Summary	Hethe	ind include													
etworks liste	ed here work	are used when	provisioni ⊘ managi	ng to E IP R <i>I</i>	existing, on	REMOV	d, or put	olic ne	tworks. (j)						
Name -	↑ [▼]	Account / Region	Zone	Ŧ	Network Domain	Ŧ	CIDR	Ψ	Support Public	τ	Default for Zone	Ψ	Origin	Tags	Ŧ
						No ne	tworks	assig	ned		-		·		
														0 netv	works
CREATE	CAN	CEL													



Figure 86 : Networks List

Appendix

Name ↑ 🍸	Account / Region	Zone	 Network Domain 	T CIDR	▼ Support Public IP	T Default for Zone	▼ Origin	Tag
VM Network	vcenter_acc / Datacenter		VM Netwo	rk			$\bigcirc d^{\text{Discovere}}$	

- 5. Select VM Network and Click on Add Network.
- 6. Add Name of the network. And Account/ region name which was created earlier.
- 7. Add IPV4 CIDR and default gateway.
- 8. Also add DNS servers.

Figure 87 : VM Network

VM Network			
Name	VM Network		
Account / region	🛱 vcenter_acc / Datacenter		
Network domain	VM Network	١	
Domain		(i)	
IPv4 CIDR	10.64.25.0/24	(i)	
IPv4 default gateway	10.64.25.1		
IPv6 CIDR		(1)	
IPv6 default gateway		_	
DNS servers	172.20.8.51 8.8.8.8		

9. Click on manage ip ranges and add.

CANCEL



Figure 88 : VM Network - Networks Tab

≪ Administration ✓ Projects	Summary Network Policies
Users and Groups Custom Roles	Networks listed here are used when provisioning to existing, on-demand, or public networks. + ADD NETWORK TAGS MANAGE IP PANGES X REMOVE
Custom Names	🔽 Name 🕆 Y Account / Region Zone Y Network Domain Y CIDR Y Support Public (P Y Default for Zone Y Origin Tagt
Secrets	VM Network @vcenter_acc/ VM Network 10.64.25.0/24 🛆 Discovered
Cloud Zones	
Virtual Private Zones	
Kubernetes Zones	
Flavor Mappings	
Image Mappings	I 1 1
Network Profiles	

Figure 89 : VM Network

<u> </u>								
ition V S	mgmt_ip_ranges						\times	
Groups	246 addresses capacity						•	
iles	Name *	mgmt_ip_ranges						
	Description		li				н.	overed
✓	Network	+ ADD NETWORK 🚫 TAGS	× REMOVE				L	
ate Zones		□ Name ↑ ▼ A	Account / Region	CIDR	₹ Tags	т		
s Zones		VM Network	vcenter_acc / Datacenter	10.64.25.0/24				
ppings					1 - 1 of 1 ne	tworks		
pings Profiles	Start IP address *	10.64.25.5						
ofiles	End IP address *	10.64.25.250						
ns ds						CANCEL	VE	

10. Click create

Figure 90 : Network Profiles

答 Administration v Projects	Network Profiles (5 Items)		Q Filter
Users and Groups Custom Roles Custom Names Secrets	Status Marning Account / region R vcenter_acc / D Existing networks 1	Status \u03c6 Warning Account / region Existing networks 1	mgmt network:primary Status Account / region Ky venter_acc / D.
 Configure Cloud Zones Virtual Private Zones Kubernetes Zones 			Existing networks 1
Flavor Mappings	OPEN DELETE	OPEN DELETE	OPEN DELETE
Network Profiles			


11. Similarly do it for Data-IN and Data-Out network profiles.

Delete the resources

To delete the resources, perform the following steps:

 From the VMware ESXi console, go to Navigator > Virtual Machines for the selected host.
 select the resource to be deleted.

select the resource to be deleted.

2. Click on **Power-off** then from **Action**, click on **Delete** so resource will get deleted.



The resource is stopped when do Power-off.

Install Python3

Depending on your operation system, install Python (3.8.5 or higher):

CentOS

To install latest Python3 from OS repository, perform the following steps:

yum install -y python3

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. . .



Linux/Ubuntu

To install Python3, perform the following steps:

```
apt update
apt-get install python3.10
apt install python3-pip
```

Supported VM Sizes

The following is the minimum VM size compatible with the VMware template.

Table 16 : Supported VM sizes

CPU	RAM	Hard Disc
2	4	32

Access vThunder using CLI

Access vThunder using CLI

To access vThunder using CLI, perform the following steps:

- 1. Open any SSH client and provide the following to establish a connection:
 - Hostname: Public IPv4 address Here, Public IP of vth-inst1.
 - Username: *admin*
 - Password: <recent_password>
- 2. Connect to the session.



3. In the active SSH session, login with the recently configured user credentials.

```
login as: admin
Using keyboard-interactive authentication.
Password: xxxxxxxx <---Enter your password--->
Last login: Day MM DD HH:MM:SS from a.b.c.d
System is ready now.
[type ? for help]
vThunder> enable <---Execute command--->
Password:<---just press Enter key--->
vThunder#config <---Configuration mode--->
```

The vThunder instance is ready to use.

Access vThunder using GUI

Access vThunder using GUI

To access vThunder using GUI, perform the following steps:

- 1. Open any browser.
- 2. Enter *https://<vthunder_public_IP>/gui/auth/login/* in the address bar.

	vThunder Series
A10	Username
	Password
	CA10 Networks, all rights reserved



3. Enter the recently configured user credentials. The home page gets displayed.

Figure 91 : Home page

A10 @	Dashboard 🗮 ADC 🔮 GSLB 🛡 Sect	urity 🛅 AAM 🚨 CGN 📥 Network 🌞 System 📢 Sha	red Objects 👁 Log 🔬 📽 S 🕻	9 8 9 9
System ADC C	CGN Services Map		vThunde	er 5.2.1-P6, build 74
Dashboard / Syste	em			0
I System Info		B Realtime Memory Usage	📠 Data CPUs	
Product Type: vThunder HD Primary: ACOS: GUI: HD Secondary ACOS: GUI: LIN Timo:	ADC 52.1-P6, build 74 52.1-P6, build 74 (*) 52.1-P6.52.1-P6, build 10 52.1-P6.52.1-P6, build 10 52.1-P6.52.1-P6, build 74 odws 2 bec 50 mine	40 60 € 53.2%	1008 508 08	DATA 1 DATA 2 1/0 1
I Device Info		B Control CPU	Let Data CPU Statistics	
CPU Count/Statu	s: 4 /All ok	40 60	100	=
Memory:	7.3 GB Free / 16.0 GB Total	Ф Ф СРИ 1	50	- DATA 1 - DATA 2 - 1/0 1
Disk:	10.30 GB Free/ 20 GB Total	15%	0 - 16:55 12:00 12:05 12:10 12:15 1	7:20

Create Inventory Folder

To create an inventory folder, perform the following steps:

1. Log in to vCenter UI using your vCenter server IP address or FDQN.

https://vcenter_server_ip_address_or_fqdn

2. Click **Inventory**, x.x.x.x in the left navigation pane to expand it.

Figure 92 : Inventor	У		
\equiv vSphere Client $$ Q Searc			· © @
	Cloud-Builder-' x.x.x.x > Summary Monitor Configure Permissions Date	istores Networks Snapshots Updates	ţ
 Recent Tasks Alarms 			~



3. Right click **Datacentre**. In the **Actions - Datacenter** menu, click **New Folder**, and click **New VM and Template Folder**.

Figure 93 : Datacenter								
vSphere Client Q Search in all environments				C			٢	
	🖌 🗈 Datacenter	ACTIONS						
	Summary Monitor	Configure Permission:	s Hosts & Clusters	VMs Datastores	Networks Upd	ates		
Control Contro Control Control Control Control Control Control Control Control Co	efinitions ed Tasks	Alarm Definitio	ns					
C Object New Cluster	Protocol Profile	S ADD EDIT E	ENABLE/DISABLE DELETE	E				
BackAutoApps New Polder CloudNative-De Distributed Swarp	Pt New Ho	st and Cluster Folder	т	Object type	T Define	d In Y Enabled	т	Last m
> CloudNative-Q	New Ne	twork Folder	S is not supported on a	Datastore Cluster	@ 1	0.64.25.71 Enabled		08/23
Discovered virt deploy OVF Template	Pt New Sto	rage Folder	S recommendation	Datastore Cluster	@ 10	0.64.25.71 Enabled		08/23
> 🗅 Images	Pt New VM	and Template Folder	in multiple datacenters	Datastore Cluster	@ 1	0.64.25.71 Enabled		08/23

4. On the New Folder dialog box, enter the folder name, and click **OK**.

Figure 94 : New Folder		
New Folder Datacenter		×
Enter a name for the folder: app1	_	
	CANCEL	ок

5. Verify the created folder.



Setup vCenter VM

To setup a vCenter VM, perform the following steps:



1. Log in to vCenter UI using your vCenter server IP address or FDQN.

https://vcenter_server_ip_address_or_fqdn

 Select the vCenter VM. Navigate to Action button present at the top and click Edit Settings.



3. Click **ADD NEW DEVICE** on the **Edit Settings** page and select **Network Adapter** from the list of Devices.

.



Figure 97 : List of Devices

ADD NEW DEVICE ~	
Disks, Drives and Storage	I
Hard Disk	I
Existing Hard Disk	I
RDM Disk	l
Host USB Device	l
CD/DVD Drive	
Controllers	l
NVMe Controller	
SATA Controller	
SCSI Controller	
USB Controller	
Other Devices	
PCI Device	
Serial Port	
Network	
Network Adapter	
	I

4. Choose Data-Out port group in the added Network Adapter.

Figure 98 : Edit Settings

Edit Settings 🛛 v	Mware vCenter Server 8	
Virtual Hardware VM O	otions Advanced Parameters	
		ADD NEW DEVICE ~
> CPU	<u>2 v</u> (j)	
> Memory	14 💙 GB 🗸	
> Hard disks	17 total 586.47 GB	
> SCSI controller 0	LSI Logic Parallel	:
> SCSI controller 1	LSI Logic Parallel	:
> SCSI controller 2	LSI Logic Parallel	:
> Network adapter 1	VM Network \vee 🔽 Connected	:
> Network adapter 2	Data-Out 🗸 🗹 Connected	÷ .

5. Click **OK**.



6. Log in to the vCenter VM and execute the following command to assign IP address to the added network adaptor.

The IP address must be from the application server subnet.

```
ifconfig <interface name> <IP address> netmask <netmask>
ifconfig
```

root@local	.host [~]# ifconfig
eth0	Link encap:Ethernet HWaddr 00:0c:29:ba:db:25
	<pre>inet addr:10.64.25.71 Bcast:10.64.25.255 Mask:255.255.255.0 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:24043982 errors:0 dropped:454829 overruns:0 frame:0 TX packets:6322354 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:8021840511 (8.0 GB) TX bytes:6385441879 (6.3 GB)</pre>
eth1	Link encap:Ethernet HWaddr 00:50:56:a4:1f:a4 inet addr:10.0.3.253 Bcast:10.0.3.255 Mask:255.255.255.0 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:17506658 errors:0 dropped:454829 overruns:0 frame:0 TX packets:15717 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:1127072559 (1.1 GB) TX bytes:4735864 (4.7 MB)

NOTE: For each application a new network adaptor must be added into vCenter VM, and IP from a new subnet must be configured into this adaptor.

Enable root User

To enable a root user, perform the following steps:

1. Log in to vCenter UI using your vCenter server IP address or FDQN.

https://vcenter_server_ip_address_or_fqdn

2. Click the VM for which you need to enable the root user.



Figure 99 : Launch Web Console

Summary Monitor Configure	Permissions Datastores Networks Snapshots Updates	
Guest OS 💠	Virtual Machine Details	Usage III 🔅 Last updated: 4/30/24, 3:49 PM
	Power Status 🔂 Powered On	CPU
8.112004 generik sugitsprit 8.12004 sahe resk	Guest OS 👌 Ubuntu Linux (64-bit)	O MHz used
a. 110000 tipular (marching loss discussion) with the second	VMware Tools Not running, version:12389 (Guest Managed) (1)	Memory
0.421001 august UP 3 Converting Advance Win Inguise data 3 0.212012 august Design 5 Audu 2 Chin 0.212012 august Park Inguise primary - 3 0.212014 august The Inguise Parkages - 3 0.212014 august The Inguise Parkages - 3 0.212014 august The Inguise Advance - 3 0.212014 august The Inguise - 3 0.212014 august The Ingust The In	DNS Name	TO MB used
 A. [1944] A. [1]. We highlight ACT ACT and region has toled limited distributions. Here is a set of the set of	IP Addresses	Storage
LAUNCH REMOTE CONSOLE	Encryption Not encrypted	
LAUNCH WEB CONSOLE	ā 🔕	
		VIEW STATS

3. Click Launch Web Console to log in to the Clone-Server VM. Log in using login details other than the root credentials.

A terminal window is displayed.

4. Execute the following command to set a new password:

```
sudo passwd root
[sudo] password for XXXX:
New password:
Retype new password:
Passwd: password updated successfully.
```

5. Execute the following command to install vim, if it is not already installed:

sudo apt install vim

6. Execute the following command to open the config file:

sudo vi /etc/ssh/sshd_config

The following window is displayed.



Figure 100 : Root User

#HostKey /etc/ssh/ssh_host_ecdsa_key #HostKey /etc/ssh/ssh_host_ed25519_key	
# Ciphers and keying #RekeyLimit default none	
# Logging #SyslogFacility AUTH #LogLevel INFO	
# Authentication:	
#LoginGraceTime 2m #PermitRootLogin prohibit-password <mark>#</mark> StrictModes yes #MaxAuthTries 6 #MaxSessions 10	
<pre>#PubkeyAuthentication yes</pre>	
<pre># The default is to check both .ssh/authorized_keys # but this is overridden so installations will only AuthorizedKeysFile .ssh/authorized_keys</pre>	and .ssh/authorized_keys2 check .ssh/authorized_keys
	41.1 24%

7. Uncomment PermitRootLogin and change the status to yes



8. Execute the following command to restart the VM:

sudo systemctl restart ssh

9. Verify the VM using the root credentials.

Retrieve Active Interface Name

To get the active interface name, perform the following steps:

- 1. Log in to the vCenter VM.
- 2. Execute the below command:

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nmcli con show --active root@cloudnative-virtual-machine:/home/cloudnative# nmcli con show --active NAME UUID TYPE DEVICE ens160 92d58fb8-1c5f-31f8-b4ac-bfecd21b582c ethernet ens160 root@cloudnative-virtual-machine:/home/cloudnative#

The active interface name ens160 is displayed.

Change Interface Name

To change the interface name, perform the following steps:

- 1. Log in to the vCenter VM.
- 2. Invoke the nmtui tool.

nmtui

The NetworkManager TUI window is displayed.

3. Select Edit a connection and press Enter

Figure 101 : Edit a Connection

4. Select the required connection, select Edit, and press Enter.



Figure 102 : Select a connection



5. Edit the profile name and click **OK**



Figure 103 : Edit Profile Name

Edit Connection						
Profile name Wired connection 1						
Device ens160 (00:50:56:A4:82:29)						
<pre>= ETHERNET = IPv4 CONFIGURATION = IPv6 CONFIGURATION [X] Automatically co [X] Automatically co</pre> Shared	<show> <show> <show></show></show></show>					
[X] Available to all						
	<cancel> <ok></ok></cancel>					

- 6. Close the NetworkManager TUI window.
- 7. Execute the following command to check interface name.

nmtui con show -active

.

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For any issues or queries related to VMware templates, open a case at <u>A10</u> <u>Networks Support</u> or reach out to <u>support@a10networks.com</u> and mention "A10vmware-templates" in the subject line.

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1.1.0

This release has the following enhancements for Thunder[®] Application Delivery Controller (ADC):

- Added GLM, HA, SLB, SSL, and Backend Autoscale vThunder configuration.
- Introduced two new SLB templates, SLB HTTP and Persist Cookie to enhance the functionality and performance of the Server Load Balancer (SLB) by optimizing HTTP traffic distribution and implementing efficient cookie persistence.
- Introduced vThunder instance as a Server Load Balancer (SLB) to automate the scaling process allowing dynamic adjustment of servers based on the workload.
- Added new hybrid cloud GSLB configuration to optimize performance, reliability, and ease of use in hybrid cloud environments.
- Separated the deployment and configuration parameters to ensure a clear distinction between the resources needed for initial deployment and those required for subsequent configuration and customization.
- Added support for Thunder Observability Agent (TOA) to collect, process and publish Thunder metrics and syslogs.
- Added the following deployment templates:
 - A10-VMware_ADC-3NIC-1VM
 - A10-VMware_ADC-3NIC-2VM-HA-GLM-PUBVIP
 - A10-VMware_ADC-3NIC-2VM-HA-GLM-PVTVIP
 - A10-VMware_ADC-3NIC-3VM

1.0.0

The VMware Templates 1.0.0 offers the following monitoring capabilities for Thunder[®] Application Delivery Controller (ADC):



- Configure vRealize Log Insight (vRLI) dashboard to view vThunder logs using the data collected by the Thunder Observability Agent (TOA).
- For more information on Thunder logs, see Supported Thunder Logs.
- Configure vRealize Operations (vROps) dashboard to view vThunder metrics using the data collected by the Thunder Observability Agent (TOA).
- For more information on Thunder logs, see Supported Thunder Metric.
 - Create/Import a Dashboard in vROps
 - Create/Import an Alert in vROps
 - Create/Import a Notification in vROps
 - View Thunder Metrics in vROps



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