

# Installing vThunder on Amazon Web Services (AWS)

September, 2023

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## **Getting Started**

vThunder for AWS is a software version of the ACOS Series Application Delivery Controller (ADC), IPsec, Convergent Firewall (CFW), and an SSL Insight (SSLi) solution that runs on the Amazon Web Services (AWS) Cloud. vThunder is a virtual appliance, similar in functionality to the hardware-based ACOS appliances. vThunder is configurable by ACOS CLI, GUI, AXAPI, and Harmony Controller. For more information, see <u>Virtual Instances in Harmony Controller</u>.

The following topics are covered:

| Overview of AWS                  |  |
|----------------------------------|--|
| Supported Instance Types         |  |
| AWS Architecture and Terminology |  |
| Feature Support                  |  |
| Interfaces                       |  |
| Limitations                      |  |



## **Overview of AWS**

AWS is a cloud computing platform that enables businesses to move their network infrastructure to the cloud. Enterprises can set up virtual servers (or "instances"), and other computing resources, in the AWS cloud platform. You can set up vThunder as a virtual instance in the AWS cloud and configure it to provide a robust load balancing solution.

The maximum throughput of vThunder for AWS is variable and depends on the vThunder software license and an instance type used. For more information, see <a href="http://docs.aws.amazon.com">http://docs.aws.amazon.com</a>.

## Supported Instance Types

List of supported instance types are as follows:

| Instance Type     | vCPU | Architecture | Memory<br>(MiB) | Storage<br>(GB) | Storage<br>Type |
|-------------------|------|--------------|-----------------|-----------------|-----------------|
| With ixgbevf supp | ort  |              |                 |                 |                 |
| c4.xlarge         | 4    | x86_64       | 7680            | -               | -               |
| c4.4xlarge        | 16   | x86_64       | 30720           | -               | -               |
| c4.8xlarge        | 36   | x86_64       | 61440           | -               | -               |
| d2.xlarge         | 4    | x86_64       | 31232           | 6144            | hdd             |
| d2.2xlarge        | 8    | x86_64       | 62464           | 12288           | hdd             |
| d2.4xlarge        | 16   | x86_64       | 124928          | 24576           | hdd             |
| d2.8xlarge        | 36   | x86_64       | 249856          | 49152           | hdd             |
| m4.xlarge         | 4    | x86_64       | 16384           | -               | -               |
| m4.2xlarge        | 8    | x86_64       | 32768           | -               | -               |
| m4.4xlarge        | 16   | x86_64       | 65536           | -               | -               |
| m4.10xlarge       | 40   | x86_64       | 163840          | -               | -               |

Table 1 : List of Supported Instance Type



| Table 1 : | List | of Sup | ported | Instance | Туре |
|-----------|------|--------|--------|----------|------|
|-----------|------|--------|--------|----------|------|

| Instance Type    | vCPU | Architecture | Memory<br>(MiB) | Storage<br>(GB) | Storage<br>Type |
|------------------|------|--------------|-----------------|-----------------|-----------------|
| i2.xlarge        | 4    | x86_64       | 31232           | 800             | ssd             |
| i2.2xlarge       | 8    | x86_64       | 62464           | 1600            | ssd             |
| i2.4xlarge       | 16   | x86_64       | 124928          | 3200            | ssd             |
| i2.8xlarge       | 32   | x86_64       | 249856          | 6400            | ssd             |
| With ENA support | :    |              |                 |                 |                 |
| c5d.large        | 2    | x86_64       | 4096            | 50              | ssd             |
| c5d.9xlarge      | 36   | x86_64       | 73728           | 900             | ssd             |
| c5d.2xlarge      | 8    | x86_64       | 32768           | 200             | ssd             |
| c5d.4xlarge      | 16   | x86_64       | 73728           | 400             | ssd             |
| C5d.9xlarge      | 36   | x86_64       | 73728           | 900             | ssd             |
| c5.xlarge        | 4    | x86_64       | 8192            | -               | -               |
| c5.2xlarge       | 8    | x86_64       | 16384           | -               | -               |
| c5.4xlarge       | 16   | x86_64       | 32768           | -               | -               |
| c5.9xlarge       | 36   | x86_64       | 73728           | -               | -               |
| g3.4xlarge       | 16   | x86_64       | 124928          | -               | -               |
| g3.8xlarge       | 32   | x86_64       | 249856          | -               | -               |
| i3.large         | 2    | x86_64       | 15616           | 475             | ssd             |
| i3.xlarge        | 4    | x86_64       | 31232           | 950             | ssd             |
| i3.2xlarge       | 8    | x86_64       | 62464           | 1900            | ssd             |
| i3.4xlarge       | 16   | x86_64       | 124928          | 3800            | ssd             |
| i3.8xlarge       | 32   | x86_64       | 249856          | 7600            | ssd             |
| m5d.large        | 2    | x86_64       | 8192            | 75              | ssd             |
| m5d.xlarge       | 4    | x86_64       | 16384           | 150             | ssd             |
| m5d.2xlarge      | 8    | x86_64       | 32768           | 300             | ssd             |
| m5d.4xlarge      | 16   | x86_64       | 65536           | 600             | ssd             |
| m5.large         | 2    | x86_64       | 8192            | -               | -               |

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| Table 1 : Lis | t of Supported | Instance Type |
|---------------|----------------|---------------|
|---------------|----------------|---------------|

| Instance Type | vCPU | Architecture | Memory<br>(MiB) | Storage<br>(GB) | Storage<br>Type |
|---------------|------|--------------|-----------------|-----------------|-----------------|
| m5.xlarge     | 4    | x86_64       | 16384           | -               | -               |
| m5.2xlarge    | 8    | x86_64       | 32768           | -               | -               |
| m5.4xlarge    | 16   | x86_64       | 65536           | -               | -               |
| r5d.large     | 2    | x86_64       | 16384           | 75              | ssd             |
| r5d.xlarge    | 4    | x86_64       | 32768           | 150             | ssd             |
| r5d.2xlarge   | 8    | x86_64       | 65536           | 300             | ssd             |
| r5d.4xlarge   | 16   | x86_64       | 131072          | 600             | ssd             |
| r5.large      | 2    | x86_64       | 16384           | -               | -               |
| r5.xlarge     | 4    | x86_64       | 32768           | -               | -               |
| r5.2xlarge    | 8    | x86_64       | 65536           | -               | -               |
| r5.4xlarge    | 16   | x86_64       | 131072          | -               | -               |
| r4.large      | 2    | x86_64       | 15616           | -               | -               |
| r4.xlarge     | 4    | x86_64       | 31232           | -               | -               |
| r4.2xlarge    | 8    | x86_64       | 62464           | -               | -               |
| r4.4xlarge    | 16   | x86_64       | 124928          | -               | -               |
| r4.8xlarge    | 32   | x86_64       | 249856          | -               | -               |
| t3.medium     | 2    | x86_64       | 4096            | -               | -               |
| t3.large      | 2    | x86_64       | 8192            | -               | -               |
| t3.xlarge     | 4    | x86_64       | 16384           | -               | -               |
| t3.2xlarge    | 8    | x86_64       | 32768           | -               | -               |
| z1d.large     | 2    | x86_64       | 16384           | 75              | ssd             |
| z1d.xlarge    | 4    | x86_64       | 32768           | 150             | ssd             |
| z1d.2xlarge   | 8    | x86_64       | 65536           | 300             | ssd             |
| z1d.3xlarge   | 12   | x86_64       | 98304           | 450             | ssd             |
| z1d.6xlarge   | 24   | x86_64       | 196608          | 900             | ssd             |



## AWS Architecture and Terminology

The following are some common terms used in AWS deployments.

- Amazon Elastic Compute Cloud (Amazon EC2) An Amazon technology that helps to launch virtual servers in the AWS cloud. Amazon EC2 is scalable to suit the requirements of the network.
- Amazon Machine Image (AMI) An AMI contains a pre-defined configuration including the operating system, applications, and so on and is a type of image template for AWS. The vThunder instance created in AWS uses an AMI. In the AWS marketplace, vThunder is available as an AMI image.
- Virtual Private Cloud (VPC) A virtual network is built on AWS and inherits its scalability. To access the vThunder instance by using SSH configure a VPC and specify a subnet. The subnets are used for grouping of the vThunder instances based on the requirements of the network.
- Elastic IP address An IP address that is associated with your AWS account. These IP addresses are elastic as they can be attached and detach the IP address from the vThunder instances. Unlike traditional static IP addresses, Elastic IP addresses can get remapped to another instance at run time.



Figure 1 : vThunder for AWS



## Feature Support

vThunder for AWS supports many of the same features as the Thunder Series hardware-based models, but the exact set of supported features varies based on whether vThunder is running as an ADC, CFW, or as an SSLi solution.

Refer to the <u>vThunder Software for Virtual and Cloud Infrastructure Data Sheet</u> for a complete summary of supported features.

## Interfaces

A vThunder for AWS can be deployed with two or more interfaces. The following are the interfaces:

- Ethernet 0—Dedicated management interface
- Ethernet (1-n)—Data interface

### Important Guidelines for AWS Data and Management Ports

The following is a list of important guidelines for data and management ports:

- For SLB configuration using a single data port, source NAT must be configured.
- If AWS is configured with two data interfaces with DHCP, the AWS instance has two default routes. Configure static IP addressing on the incoming data interface to maintain the traffic.
- The auto-assigning of public IP addresses feature is disabled if there are multiple interfaces in an AMI instance.
- For one management port and 3 data ports, the total number of CPUs required is either four or eight.
- For one management port and seven data ports, the total number of CPUs required is more than eight.



## Limitations

The following is a list of limitations for running vThunder in AWS:

- vThunder for AWS requires that the management port be configured on a separate interface (eth0). Configure the management interface to access the ACOS GUI and CLI.
- After an IP is assigned to the vThunder management port, subsequent changes to this IP are not supported.
- LACP and Static trunk groups are not supported in vThunder.
- Port Mirror is not supported.
- RIP (v1 and v2), OSPF, and ISIS routing protocols are not supported.
- VLAN, Tagged VLAN, and Virtual Ethernet (VE) interfaces are not supported.
- Layer 2 Switching (VLAN) is not supported.
- Maximum interface (32) is not supported.
- Layer 2 deployment is not supported.
- Bridge Protocol Data Unit (BPDU) Forward Group is not supported.
- AWS cannot be configured as a CGN device or a TPS device.
- Interfaces cannot be set in promiscuous mode in AWS. For more information on Installing vThunder on Amazon Web Services (AWS), see the "system promiscuous mode" command of CLI Guide.
- The maximum binding limitations are as follows:
  - For vTPS 3.2.x and 5.0.x, maximum vCPU is 48.
  - For ACOS 5.2.1-Px, maximum vCPU is 96.
- vThunder launched using 5.1.0 release AMI cannot be downgraded with releases before 5.1.0. The following error message is displayed:

```
# vThunder(config)(NOLICENSE)#upgarde hd pri local <ACOS Upgrade Image
(.upg)>
Password []?
Do you want to reboot the system after the upgrade?[yes/no]:yes
```



```
Getting upgrade package ...
.....
Done (0 minutes 47 seconds)
Decrypt upgrade package ...
.....
Done (0 minutes 18 seconds)
Checking integrity of upgrade package ...
.. Upgrade file integrity checking passed (0 minutes 3 seconds)
Expand the upgrade package now ...
......Failed to downgrade, due to unsupported previous version of image
found, pls contact support team for more information.
```

**NOTE:** To launch the AWS instance successfully, launch an instance using any older release build (lesser than 5.1.0 version) and then upgrade to the required build version.

This section provides the step-by-step procedures to launch vThunder on AWS.

NOTE: After buying software, customers launch Amazon Machine Images (AMIs) by using the <u>Manage Subscriptions</u> option in AWS Marketplace. Or launch it by setting up an account by using the AWS management tools, including the AWS Management Console, the Amazon EC2 console, Amazon EC2 APIs, or the AWS Cloud Formation console.

The following topics are covered:

| Creating an AWS Account              | 14 |
|--------------------------------------|----|
| Creating and Configuring a VPC       |    |
| Assigning a Subnet to the VPC        |    |
| Creating a Security Group            |    |
| Launching a vThunder Instance on AWS |    |
| Manage Subscriptions                 |    |

## Creating an AWS Account

Before installing vThunder, the user first set up an account with AWS. Creating this account enrolls the user into standard AWS services, such as EC2 and VPC. The user creates an AWS account with Amazon by navigating to the following URL and following the on-screen instructions: <u>http://aws.amazon.com.</u>

**NOTE:** Details, including billing, availability of resources, and so on, is dependent on the selected region.

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# Creating and Configuring a VPC

Configure a VPC for the vThunder instance enables the user to use the Amazon VPC wizard to create a VPC, subnets, gateways, and routing tables. Alternatively, for manually creating a VPC and subnets users have to manually add gateways and routing tables.

# To create an empty VPC using the Amazon VPC console and assign an IPv4 CIDR block (a range of private IPv4 addresses) perform the following:

- 1. Log in to AWS console at <a href="https://console.aws.amazon.com/vpc">https://console.aws.amazon.com/vpc</a>.
- 2. In the navigation pane, select the **VPC Dashboard** menu option. From the dashboard, click on the **Launch VPC Wizard** tab.



Figure 2 : VPC Dashboard window

#### NOTE:

Do not select **Your VPCs** in the navigation pane; a user cannot access the VPC wizard using the Create VPC button on that page.

3. Select the option for the configuration to implement, for example, VPC with a Single Public Subnet, and then click on the **Select** button on the Select a VPC Configuration window.



| Figure 3 : Step 1: Select a | VPC Configuration window |
|-----------------------------|--------------------------|
|-----------------------------|--------------------------|

| /PC with a Single Public<br>Subnet  | Your instances run in a private, isolated section of the AWS cloud with<br>direct access to the Internet. Network access control lists and security | Internet, S3,                               |
|---|---|---|
| /PC with Public and<br>Private Subnets  | groups can be used to provide strict control over inbound and outbound<br>network traffic to your instances.  | SQS, etc.                                   |
| (PC with Public and<br>Trivate Subnets and<br>Hardware VPN Access<br>/PC with a Private Subnet<br>Jnly and Hardware VPN<br>Access | A /16 network with a /24 subnet. Public subnet instances use Elastic IPs<br>or Public IPs to access the Internet.                                   | Public Subnet<br>Amazon Virtual Private Clo |

4. On the configuration page, enter a name for the VPC in the **VPC name** field; for example, A10-Bangalore, and enter a name for the subnet in the **Subnet name** field. This helps you to identify the VPC and subnet in the Amazon VPC console after it is created.

Figure 4 : Step2: VPC with a Single Public Subnet window

| Step 2: VPC with a Sin      | gle Public Subnet                                      |
|-----------------------------|--|
| IPv4 CIDR block:*           | 10.0.0/16 (65531 IP addresses available)               |
| IPv6 CIDR block:            | ® No IPv6 CIDR Block @ Amazon provided IPv6 CIDR block |
| VPC name:                   |  |
| Public subnet's IPv4 CIDR:* | 10.0.0.0/24 (251 IP addresses available)               |
| Availability Zone:*         | No Preference Y  |
| Subnet name:                | Public subnet  |
|                             | You can add more subnets after AWS creates the VPC.    |
| Service endpoints           |  |
|                             | Add Endpoint   |
| Enable DNS hostnames:*      | ® Yes ◎ No   |
| Hardware tenancy:*          | Default  |
| Enable ClassicLink:*        | ◎ Yes ® No   |
|                             | Cancel and Exit Back Create VPC                        |

5. (Optional) If you prefer, modify the configuration settings as follows:

Table 2 : Fields and description

| Fields               | Description   |
|----------------------|---|
| IPv4 CIDR block      | Displays the IPv4 address range that is used for your VPC. Default value is 10.0.0/16). |
| Public subnet's IPv4 | Displays the IPv4 address range that is used for the                                    |

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| Fields                  | Description   |  |  |  |  |  |
|-------------------------|---|--|--|--|--|--|
| CIDR                    | subnet. Default value is 10.0.0.0/24.   |  |  |  |  |  |
| Availability Zone       | Enables to select the Availability Zone in which to create the subnet. If it left as No Preference to, then AWS chooses an Availability Zone.                         |  |  |  |  |  |
| Service endpoints       | Enables to select a subnet in which to create a VPC endpoint to Amazon S3 in the same region.   |  |  |  |  |  |
| Enable DNS<br>hostnames | Enables to set the DNS hostname. When set to Yes, it<br>ensures that instances that are launched into your<br>VPC receive a DNS hostname.                             |  |  |  |  |  |
| Hardware tenancy        | Enables to select whether instances launched into your VPC are run on shared or dedicated hardware.   |  |  |  |  |  |
|                         | <b>NOTE:</b> Selecting a dedicated tenancy incurs additional costs.   |  |  |  |  |  |
| Enable ClassicLink      | Displays the default VPC and the new VPC that is<br>created. The VPC that is created is a non-default VPC,<br>therefore the default VPC column<br>displays No option. |  |  |  |  |  |

6. Click on the Create VPC button.

#### To create a VPC using the console manually, perform the following steps:

- 1. Launch the Amazon VPC console at <a href="https://console.aws.amazon.com/vpc/">https://console.aws.amazon.com/vpc/</a>.
- 2. In the navigation pane, Select **Your VPCs**. Take note of the name and the ID of the VPC that you created (look in the Name and VPC ID columns). This information helps to identify the components that are associated with your VPC.



#### Figure 5 : Your VPCs window

| aws Serv                         | vices 🗸 | Resourc   | e Groups      | ~ <b>%</b>              |         |           |              | 4                       | × 1              | N. California 👻 Support 👻                                 |
|----------------------------------|---------|-----------|---------------|-------------------------|---------|-----------|--------------|-------------------------|------------------|---|
| VPC Dashboard<br>Filter by VPC:  | Ť.      | Create VP | c Action      | IS ¥                    |         |           |              |                         |                  | ⊕ <b>♦ (</b>  |
| Q Select a VPC                   | 17      | Q, Filter | by tags and a | attributes or search by | keyword |           |              |                         |                  | $ \langle \langle 1 \text{ to 10 of 10} \rangle \rangle $ |
| VIRTUAL PRIVATE                  |         | Nar       | ne -          | VPC ID                  | -       | State -   | IPv4 CIDR    | IPv6 CIDR               | DHCP options set | Main Route table  |
| Your VPCs                        |         |           |               | -                       | )       | available | 5 CIDRs      | e e                     | dopt-cff99ba6    | rtb-023451fc2b3b3   |
| Subnets                          |         |           |               |                         |         | available | 40.30.0.0/16 | 2600:1f1c:234:1300::/56 | dopt-cff99ba6    | rtb-04ba8063   Kalp                                       |
| Route Tables                     |         |           |               |                         |         | available | 3 CIDRs      | 5                       | dopt-cff99ba6    | rtb-35d91e52  |
| Internet Gateways                |         |           |               |                         |         | available | 20.20.0.0/16 | <u>ت</u>                | dopt-cff99ba6    | rtb-08b27a6f  |
| Egress Only Internet<br>Gateways |         |           |               |                         |         | available | 172.31.0     | ÷                       | dopt-cff99ba6    | rtb-39b1535c  |
| DHCP Options Sets                |         |           |               |                         |         | available | 5 CIDRs      | -                       | dopt-cff99ba6    | rtb-30a65955  |
| Flastic IPs                      |         |           |               |                         |         | available | 192.168.1    |                         | dopt-cff99ba6    | rtb-e78b4482  |
| Endpoints                        |         |           |               |                         |         | available | 39.0.0/16    | -                       | dopt-cff99ba6    | rtb-f633b792   inter                                      |
| Endpoint Services                |         |           |               |                         |         | available | 10.0.0/16    | -                       | dopt-cff99ba6    | rtb-cdf99ba4  |
| NAT Gateways                     |         | <         | 5 10.10       | 1000001200              |         | available | 10.15.0.0/16 |                         | dopt-cff99ba6    | rtb-81badfe4  |
| Peering Connections              |         |           |               |                         |         |           |              |                         |                  | 880   |

3. Click on the **Create VPC** tab. The Create VPC window is displayed.

Figure 6 : Create VPC window

| aws Services - Res   | source Groups 👻 🐐  |   | <u></u> ب   | N. California 👻 Support 👻                   |
|--|--|---|---|---|
| VPCs > Create VPC  |  |   |   |   |
| Create VPC   |  |   |   |   |
| A VPC is an isolated portion of the AWS cl<br>Inter-Domain Routing (CIDR) block; for exa | oud populated by AWS objects, such as Amazon EC2 in<br>ample, 10.0.0.0/16. You cannot specify an IPv4 CIDR blo | stances. You must specify an IPv4 a<br>ck larger than /16. You can optional | ddress range for your VPC. Specify the<br>ly associate an IPv6 CIDR block with th | IPv4 address range as a Classless<br>e VPC. |
| Name tag   | VPC 10.0   | 0   |   |   |
| IPv4 CIDR block*   | 10.0.0/16  | 0   |   |   |
| IPv6 CIDR block  | No IPv6 CIDR Block     Amazon provided IPv6 CIDR block   |   |   |   |
| Tenancy  | Default  | 0   |   |   |
| * Required   |  |   |   | Cancel                                      |

4. Specify the following VPC details as necessary as:

| Table 3 : Fields and Descriptions |  |
|-----------------------------------|--|
|-----------------------------------|--|

| Fields          | Description  |
|-----------------|--|
| Name tag        | Optionally specify a name for the VPC. It creates a tag with a key of $\ensuremath{\mathtt{Name}}$ and the value   |
| IPv4 CIDR block | Specify an IPv4 CIDR block for the VPC. It is recommended<br>to specify a CIDR block from the private (non-publicly<br>routable) IP address ranges.<br>For example, 10.0.0/16 or 192.168.0.0/16. |
| IPv6 CIDR block | Optionally associate an IPv6 CIDR block with your VPC by   |

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. . . . . . . .



#### Table 3 : Fields and Descriptions

| Fields  | Description   |
|---------|---|
|         | choosing one of the following options:  |
|         | <ul> <li>Amazon-provided IPv6 CIDR block: It requests an IPv6<br/>CIDR block from Amazon's pool of IPv6 addresses.</li> </ul>   |
|         | <ul> <li>IPv6 CIDR owned by me: The (BYOIP) Allocates an IPv6<br/>CIDR block from your IPv6 address pool. For Pool, select<br/>the IPv6 address pool from which to allocate the IPv6<br/>CIDR block.</li> </ul> |
| Tenancy | Select a tenancy option. Dedicated tenancy ensures that your instances run on single-tenant hardware.   |

5. Click **Create** button to save the changes.

#### To add a CIDR Block to your VPC, perform the following steps:

- 1. In the navigation pane, choose Your VPCs.
- 2. Select the VPC, and select **Actions > Edit CIDRs** option.
- 3. Select Add IPv4 CIDR, and enter the CIDR block to add; for example, 10.2.0.0/16. select the tick icon.
- 4. Click the **Close** tab.

## Assigning a Subnet to the VPC

To add a new subnet to the VPC, specify an IPv4 CIDR block for the subnet from the range of the VPC. It is recommended to specify the Availability Zone in which a user wants the subnet to reside. Users can have multiple subnets in the same Availability Zone.

Optionally specify an IPv6 CIDR block for your subnet if an IPv6 CIDR block is associated with the VPC.

To add a subnet to your VPC using the console, perform the following:

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1. Navigate to VPC Dashboard > Virtual Private Cloud > Subnet menu option.

| aws Service          | s ≁     | Reso    | urce Group    | s ~ 1 <del>.</del>                 |    |           |                        | ₽ |              | N                | . California 👻 🦇 | Support |     |     |
|----------------------|---------|---------|---------------|------------------------------------|----|-----------|------------------------|---|--------------|------------------|------------------|---------|-----|-----|
| VPC Dashboard        |         | Create  | subnet        | Actions 👻                          |    |           |                        |   |              |                  |                  | 0       | ¢   | 0   |
| Q Select a VPC       | <b></b> | Q, Filt | ter by tags a | nd attributes or search by keyword |    |           |                        |   |              |                  | < < 1 to 5       | 0 of 61 | > : | ×   |
| VIRTUAL PRIVATE      |         |         | Name          | <ul> <li>Subnet ID</li> </ul>      | *  | State 👻   | VPC                    | * | IPv4 CIDR    | Available IPv4.* | IPv6 CIDR        |         |     | Av  |
| Your VPCs            | 1.5     |         |               | subnet-004226ab0d5aaeb0e           |    | available |                        |   | 10.1.1.0/24  | 250              |                  |         |     | us, |
| Subnets              |         |         |               | subnet-00c81ebf706af82c8           |    | available |                        |   | 10.12.1.0/24 | 251              | 4                |         |     | us  |
| Route Tables         |         |         |               | subnet-00cf3a26145f2cec4           |    | available |                        |   | 10.1.2.0/24  | 249              | <i>a</i>         |         |     | us  |
| Internet Gateways    |         |         |               | subnet-013496a543a270b65           |    | available |                        |   | 10.11.3.0/24 | 245              | -                |         |     | us- |
| Egress Only Internet |         |         |               | subnet-015b2dd4e296f28f0           |    | available |                        |   | 10.12.4.0/24 | 250              | e                |         |     | us- |
| DHCP Ontions Sets    |         |         |               | subnet-034294fdc182be825           |    | available |                        |   | 10.11.1.0/24 | 247              | 2                |         |     | us- |
| Elastic IPs          |         |         |               | subnet-035315138179c53e6           |    | available |                        |   | 10.12.0.0/24 | 249              | e                |         |     | us- |
| Endpoints            |         |         | -             | subnet-0393bb9e560350e64           |    | available |                        |   | 10.10.1.0/24 | 251              | -                |         |     | us- |
| Endpoint Services    |         | te      | est-51        | subnet-0451afe7004a07411           |    | available | vpc-6e47b40b   Support |   | 51.1.1.0/24  | 247              |                  |         |     | uş- |
| NAT Gateways         | 4       | -       | KOI7 sub      | subnet-045398ba4b6003359           | ý. | available | vnc-01ada94a23fed980a1 |   | 10 13 3 0/24 |                  |                  |         | +   |     |
| Peering Connections  |         |         |               |                                    |    |           |                        |   |              |                  |                  |         |     |     |

2. Click **Create subnet** tab. The Create subnet window is displayed.

Figure 8 : Create subnet window

| AWS Services - Res  | source Groups 👻 🛠                                       | ۵                                       | N. California 👻 Support                                       |        |
|---|---|---|---|--------|
| Subnets > Create subnet   |   |   |   |        |
| Create subnet   |   |   |   |        |
| Specify your subnet's IP address block in must be a /64 CIDR block. | CIDR format; for example, 10.0.0.0/24. IPv4 block sizes | must be between a /16 netmask and /28 n | netmask, and can be the same size as your VPC. An IPv6 CIDR I | block  |
| Name tag  | Subnet2   | 0                                       |   |        |
| VPC*  | -   | 0                                       |   |        |
| Availability Zone   | No preference -   | 0                                       |   |        |
| VPC CIDRs   | CIDR  | Status                                  | Status Reason   |        |
|   | 10.0.0/16   | associated                              |   |        |
| IPv4 CIDR block*  |   | 0                                       |   |        |
| * Required  |   |   | Cancel  | Create |

3. On the configuration page, enter a **Name tag** for the subnet, choose your **VPC** and

Availability Zone, and IPV4 CIDR block details.

• The **IPv4 CIDR block** displays the IPv4 address range that is used for the VPC (10.0.0/16), and the Public subnet's IPv4 CIDR field displays the IPv4 address range that is used for the subnet (10.0.0/24).



- The **Availability Zone** list enables users to select the Availability Zone in which to create the subnet.
- (Optional) If an IPv6 CIDR block is associated with your VPC, then select Specify a custom IPv6 CIDR. it is recommended to specify the hexadecimal pair value for the subnet or leave the default value.
- 4. Click **Create** button to save. The confirmation message window with Subnet ID is displayed.

Figure 9 : Create subnet- Confirmation message window

| aws                | Services ~ Resource Gro  | ups 🗸 🏌               | ¢ | -     | N. California 👻 | Support 👻 |
|--------------------|--------------------------|-----------------------|---|-------|-----------------|-----------|
| Subnets > Create s | ibnet                    |                       |   |       |                 |           |
| Create su          | onet                     |                       |   |       |                 |           |
| The foll           | owing Subnet was created |                       |   |       |                 |           |
|                    | Subnet ID sub            | net-0fe169e5f077ce06d |   |       |                 |           |
|                    |                          |                       |   |       |                 |           |
|                    |                          |                       |   | Close |                 |           |

# **NOTE:** A public subnet is a subnet that has access to the Internet through an Internet gateway.

The subnets enable group vThunder instances based on the requirements of the network. This configuration of a VPC for vThunder instance is also accessed by using SSH.

**NOTE:** A single subnet is sufficient to launch a vThunder instance. (Optional) If required, repeat the steps above to create more subnets in your VPC.

#### To associate an IPv6 CIDR block with a subnet using the console:

The subnet must not have an existing IPv6 CIDR block associated with it.

- 1. In the navigation pane, choose **Subnets**.
- 2. Select your **Subnet**, and select **Actions > Edit IPv6 CIDRs**.
- Select Add IPv6 CIDR. Specify the hexadecimal pair for the subnet (for example, 00) and confirm the entry by selecting the tick icon.
- 4. Click on the **Close** tab to save.

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## Creating a Security Group

The VPC is also configured with a default security group, which acts as a firewall for all instances associated with the security group. To use a security group, the inbound rules are added to control incoming traffic to the instance, and outbound rules to control the outgoing traffic from the user's instance. To associate a security group with an instance, it recommended specifying the security group when the instance is launched.

NOTE: The VPC comes with a default security group. Any instance, not associated with another security group during the launch is associated with the default security group. specify this security group when you launch an instance into your VPC.

To create a new security group and associate with the vThunder image, perform the following:

1. Navigate to VPC Dashboard > Security > Security Groups menu option.

| Figure 10 : Security Groups window |  |
|------------------------------------|--|
|                                    |  |

| aws Services ~       | Resource Groups 👻 🔭                              |                   |          | ۵       | Ν.                   | California 👻 S | Support 🗸 |   |
|----------------------|--|-------------------|----------|---------|----------------------|----------------|-----------|---|
| VPC Dashboard        | Create security group Actions 👻                  |                   |          |         |                      |                | 0 ¢       | 0 |
| Q Select a VPC       | Q. Filter by tags and attributes or search by ke | yword             |          |         |                      | I< ≤ 1 to 50   | of 237 >  | ж |
| VIRTUAL PRIVATE      | Name Group ID                                    | Group Name 👻      | VPC ID ~ | Туре    | Description *        | Owner          |           | - |
| Your VPCs            | sg-0016c667                                      | launch-wizard-85  |          | EC2-VPC | launch-wizard-85     |                |           | * |
| Subnets              | sg-003a0cf848c9e                                 | launch-wizard-120 |          | EC2-VPC | launch-wizard-120    |                |           |   |
| Route Tables         | sg-0074af67                                      | Ubuntu Server 14  |          | EC2-VPC | This security grou   |                |           |   |
| Internet Gateways    | sg-00754cebaeec                                  | launch-wizard-152 |          | EC2-VPC | launch-wizard-152    |                |           |   |
| Egress Only Internet | sg-00c37dbb0998                                  | launch-wizard-129 |          | EC2-VPC | launch-wizard-129    |                |           |   |
| Gateways             | sg-00e93565                                      | launch-wizard-29  |          | EC2-VPC | launch-wizard-29     |                |           |   |
| Elastic IPs          | sg-0107c065                                      | launch-wizard-69  |          | EC2-VPC | launch-wizard-69     |                |           |   |
| Endpoints            | sg-012ca5a5ac96                                  | launch-wizard-121 |          | EC2-VPC | launch-wizard-121    |                |           |   |
| Endpoint Services    | sg-01b5e571fafbfc                                | launch-wizard-114 |          | EC2-VPC | launch-wizard-114    |                |           |   |
| NAT Gateways         | sq-01dbe4a0e29d                                  | Akira-seo         |          | EC2-VPC | Akira security aroun | -              |           | * |
| Peering Connections  |  |                   |          |         |                      |                |           |   |
| SECURITY             |  |                   |          |         |                      |                |           |   |
| Network ACLs         |  |                   |          |         |                      |                |           |   |
| Security Groups      |  |                   |          |         |                      |                |           |   |

2. Click on the **Create security group** tab. The Create security group window is displayed.



#### Figure 11 : Create security group window

| AWS Services × Res                            | ource Groups 👻 🔭   | ₽          |               | N. California 👻 | Support 👻 |
|---|--|------------|---------------|-----------------|-----------|
| Security Groups > Create security group       |  |            |               |                 |           |
| Create security group                         | )  |            |               |                 |           |
| A security group acts as a virtual firewall f | or your instance to control inbound and outbound traffic. To create a new security group f | ill in the | fields below. |                 |           |
| Security group name*                          | A10_Bangalore_Security_Group   |            | 0             |                 |           |
| Description*                                  | Port must be allowed   |            | 0             |                 |           |
| VPC   | vpc-cbf99ba2   | •          | 0             |                 |           |
| * Required                                    |  |            |               | and I           |           |
|   |  |            |               | Cancel          | Create    |

- 3. In the Security group name field, enter the name of the security group, and provide a description.
- 4. Select the ID of the above created VPC from the VPC drop-down list.
- 5. Click **Create** button to save the changes. The confirmation message window with Security Group ID is displayed.

Figure 12 : Confirmation message window

| AWS Services × Resource Groups × 🖈      | ♪ N. California ▾ Support ▾ |
|---|-----------------------------|
| Security Groups > Create security group |                             |
| Create security group                   |                             |
|   |                             |
| Security Group ID sg-0ec36e93bdd3380dc  |                             |
|   |                             |
|   | Close                       |

6. Filter the security group ID, and navigate to **Actions > Edit Inbound rules** option. The Edit inbound rules info window is displayed.





Figure 13 : Edit Inbound rules window

| bound rules Info |          |                 |                   |                             |        |
|------------------|----------|-----------------|-------------------|-----------------------------|--------|
| pe Info          | Protocol | Port range Info | Source Info       | Description - optional Info |        |
| Custom TCP 🔻     | ТСР      | 80              | Custom ▼ Q.       | <                           | Delete |
| Custom TCP       | ТСР      | 443             | Custom V Q        | <pre></pre>                 | Delete |
| Custom TCP 💌     | ТСР      | 8080            | Custom <b>v</b> Q | <                           | Delete |
| Add rule         |          |                 |                   |                             |        |

- 7. Select and enter the **Type**, **Protocol**, **Port Range**, **Source**, and **Description** for the inbound rule.
- 8. Click the **Add Rule** button to add more or new Inbound rules for the Security Group ID.
  - NOTE: Add a rule that allows SSH access from any IPv6 address. Specify all IP addresses or range of addresses that users want to access for the instance.
- 9. Click Save rules or Preview Changes button to preview the edited inbound rules.

Figure 14 : Preview actions window

| dit inhound rules. I                  | Proview actions              |          |            |         |                        |
|---------------------------------------|------------------------------|----------|------------|---------|------------------------|
| eview the actions we will take when n | nodifying your inbound rules |          |            |         |                        |
| Action                                | Туре                         | Protocol | Port range | Source  | Description - optional |
| Oreate 3 inbound rules                | HTTP                         | TCP      | 80         | 0.0.0/0 | -                      |
|                                       | HTTPS                        | TCP      | 443        | 0.0.0/0 | -                      |
|                                       | Custom TCP                   | TCP      | 8080       | 0.0.0/0 |                        |

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10. Click the **Confirm** button to save and confirm the changes. The confirmation message is displayed.

Figure 15 : Confirmation Message window

| <ul> <li>Inbound security group rules successfully modified on security group (<u>sg-Oec36e93bdd3</u>)</li> <li>Details</li> </ul> | 380dc   A10_Bangalore_Security_Group) | ×  |
|--|---------------------------------------|----|
| EC2 > Security Groups  |                                       |    |
| Security Groups (1/1) Info   | C Actions  Create security group      |    |
| Q Filter security groups   | < 1 > ©                               |    |
| Security group ID: sg-Oec36e93bdd3380dc X Clear filters  |                                       |    |
| Security group ID $\bigtriangledown$ Security group name $\bigtriangledown$ VPC ID   |                                       |    |
| sg-Oec36e93bdd3380dc A10_Bangalore_Securi vpc-cbf99ba2   | Port must be allowed 93985019         | 68 |
| 4  |                                       | +  |

11. Navigate to Services > Compute > EC2 Dashboard> Network& Security > Key Pairs menu option.

Figure 16 : Key pairs window

| New EC2 Experience<br>Tell us what you think | Ke | y pairs (78)            | C Actions V Create key pair  |
|--|----|-------------------------|--|
| AMIs *                                       | 0  | Filter key pairs        | < 1 2 3 4 5 6 7 8 > 💿  |
| Bundle Tasks                                 |    | Name                    |  |
| STORE  |    |                         | TableTerr was cheft to share the effect  |
| Volumes<br>Snapshots                         |    | Manage 1                | Concerning and the concerning states of the states   |
| Lifecycle Manager                            |    | 1017 Mar.               | that all this is private that the county stands in   |
| NETWORK &<br>SECURITY                        |    |                         | and the contract of the second second  |
| Security Groups New                          |    | a10support              | 6b:94:d0:2e:t  |
| Elastic IPs New                              |    | No. of Concession, Name |  |
| Placement Groups New Key Pairs New           |    | -                       | Bar 1, 00, 01 (2000) (2000) (2000) (2000)  |
| Network Interfaces                           |    | 10,000                  | to be all all to their technological and the second s |
| LOAD BALANCING                               |    | Second Second           | A REAL PROFESSION AND ADDRESS OF A DRIVE   |
| Load Balancers                               |    |                         |  |

12. Click Create key pair tab. The Create key pair window is displayed.



Figure 17 : Create key pair window

| aws Services - Resource Groups - *  | ₽ | nkumar @ 9398-5019-6882 🔹 | N. California 👻 | Support 👻 |
|---|---|---------------------------|-----------------|-----------|
| EC2 > Key pairs > Create key pair   |   |                           |                 |           |
| Create key pair   |   |                           |                 |           |
| Create key pair   |   |                           |                 |           |
| Key pair  |   |                           |                 |           |
| A key pair, consisting of a private key and a public key, is a set of security credentials that you use to prove your identity when connecting to<br>an instance. |   |                           |                 |           |
| Name  |   |                           |                 |           |
| A10_Bangalore_Key_Pair  |   |                           |                 |           |
| The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.   |   |                           |                 |           |
| File format   |   |                           |                 |           |
| For use with OpenSSH  |   |                           |                 |           |
| ppk     For use with PuTTY  |   |                           |                 |           |
| Cancel Create key pair  |   |                           |                 |           |

- 13. Enter the Name of the Key pair.
- 14. Select the File format radio button.
- 15. Click **Create key pair** button to save the changes. The Key pairs window is displayed with generated <Name>.pem file, save the file.

Figure 18 : Key pairs-<Name>.pem file window

| Key pairs (1/1)                |               | C Actions <b>v</b> | Create key pair |
|--------------------------------|---------------|--------------------|-----------------|
| <b>Q</b> Filter key pairs      |               |                    | < 1 > ③         |
| Name: A10_Bangalore_Key_Pair 🗙 | Clear filters |                    |                 |
| Name                           | ▼ Fingerprint |                    | ~               |

If a user already has a VPC, and intend to start the vThunder AMI in that VPC, refer to the next sections.

## Launching a vThunder Instance on AWS

The launching of a vThunder Instance on AWS workflow consists of the following steps:

The following topics are covered:

26



| Step 1. Choose AMI                       | 27 |
|--|----|
| Step 2. Choose Instance Type             | 30 |
| Step 3. Configure the Instance           | 30 |
| Step 4. Add Storage                      | 33 |
| Expanding Virtual Hard Disk Size         | 34 |
| Step 5. Add Tags                         | 35 |
| Step 6. Configure Security Group         | 36 |
| Step 7. Review the Configuration Changes | 37 |

NOTE:

If you prefer a 1-click AWS deployment, see Manage Subscriptions section.

### Step 1. Choose AMI

To create a vThunder AMI instance, perform the following:

 Access AWS and log in using your standard credentials. The AWS Management Console - AWS services window is displayed.

Figure 19 : AWS Management Console window

| aws se          | rvices 👻 Resource Grou   | ıps 🗸 🍾  |  | Ω N. California ◄   | Support 👻 |
|-----------------|--|--|--|---|-----------|
| AV              | VS Manag   | ement Co   | nsole  |   |           |
| AW              | /S services  |  |  | Access resources on the go  |           |
| Fin<br>You<br>Q | d Services<br>can enter names, keywords or acro<br>Example: Relational Databas               | nyms.<br>se Service, database, RDS   |  | Access the Management Console using the AWS<br>Console Mobile App. Learn more [2]   |           |
| •               | Recently visited services  |  |  | Explore AWS   |           |
| Ŧ               | All services Compute EC2 Liphtsail [2]   | eee Blockchain<br>Amazon Managed<br>Blockchain                                     | Security, Identity, &<br>Compliance<br>IAM   | Amazon Redshift<br>Fast, simple, cost-effective data warehouse that can extend<br>queries to your data lake. Learn more 💈                             |           |
|                 | Lambda<br>Batch<br>Elastic Beanstalk<br>Serverless Application<br>Repository<br>AWS Outposts | <ul> <li>Satellite<br/>Ground Station</li> <li>Quantum<br/>Technologies</li> </ul> | Resource Access<br>Manager<br>Cognito<br>Secrets Manager<br>GuardDuty<br>Inspector | Run Serverless Containers with AWS Fargate<br>AWS Fargate runs and scales your containers without having<br>to manage servers or clusters. Learn more |           |

2. Select the EC2 menu option (under Compute) as shown in Figure 19.



The EC2 dashboard window is displayed, with a list of your resources.

| Figure | 20: | FC2 | Dashboard |
|--------|-----|-----|-----------|
| inguic | 20. | LUZ | Dashboard |

| aws Services                                 | s ~ R | Resource Groups    | × *                         |                 |                     | Ą                |                 | N State      | I. Calif | ornia 👻 Si   | upport · | ¥ <sup>0</sup> |
|--|-------|--------------------|-----------------------------|-----------------|---------------------|------------------|-----------------|--------------|----------|--------------|----------|----------------|
| New EC2 Experience<br>Tell us what you think | Lau   | Inch Instance      | Connect                     | ; •             |                     |                  |                 |              |          | Δ            | 0        | ¢ 0            |
| EC2 Dashboard New                            | Q     | Filter by tags and | attributes or search by key | word            |                     |                  |                 | 0            | <        | < 1 to 50 d  | of 153   | > н            |
| Events New                                   | 60    | Name               | Instance ID 🔺               | Instance Type 👻 | Availability Zone - | Instance State 👻 | Status Checks 👻 | Alarm Status | s        | Public DNS ( | IPv4)    | - 1            |
| Tags   |       | 6025-AWS-A         | i-00094febb6a6268ba         | m4.xlarge       | us-west-1b          | stopped          |                 | None         | 20       |              |          | <u>*</u>       |
| Reports                                      | 0     |                    | i-00c397d30395c6a7c         | t2.micro        | us-west-1b          | stopping         |                 | None         | 10       |              |          | 1              |
| Limits                                       |       |                    | i-00c83ddbd230f17ae         | m4.4xlarge      | us-west-1b          | running          | 2/2 checks      | None         | 10       |              |          |                |
| V INSTANCES                                  |       |                    | i-00fbd3db90b84da12         | t3.xlarge       | us-west-1b          | stopped          |                 | None         | 20       |              |          |                |
| Instances                                    |       |                    | i-011d257e377f88a69         | m4.xlarge       | us-west-1b          | stopped          |                 | None         | 20       |              |          |                |
| Instance Types                               |       |                    | i-012acb8dee4ace2a3         | m4.16xlarge     | us-west-1b          | stopped          |                 | None         | 70       |              |          |                |
| Launch Templates                             |       |                    | i-016697c37ca69b64d         | m4.xlarge       | us-west-1b          | stopped          |                 | None         | 20       |              |          |                |
| Spot Requests                                |       |                    | i-0181499a22186c2db         | m4.xlarge       | us-west-1b          | stopped          |                 | None         | 20       |              |          |                |
| Savings Plans                                |       | -                  | i-019648ce943d077b6         | m4.4xlarge      | us-west-1b          | running          | 2/2 checks      | None         | 20       |              |          | 5              |
| Reserved Instances                           |       | Kalpana-lice       | i-019b2fcc20571278d         | m4.xlarge       | us-west-1b          | stopped          |                 | None         | 10       |              |          | •              |
| Dedicated Hosts New                          | Sele  | ect an instance ab | ove                         |                 |                     |                  |                 |              |          |              |          |                |

3. In the EC2 Dashboard, click on the Instance > Launch Instance as shown above. Step 1: Choose an Amazon Machine Image (AMI) window is displayed.

| aws Serv   | rices ~ Resour                                | ce Groups 👻 📍                                | *  |                                    | 4                        |                          | N. California 👻     | Support 👻  |
|--|---|--|--|------------------------------------|--------------------------|--------------------------|---------------------|------------|
| 1. Choose AMI 2. Choose                              | e Instance Type 3.                            | Configure Instance                           | 4. Add Storage 5. Add Ta                 | gs 6. Configure Security Group     | 7. Review                |                          |                     |            |
| Step 1: Choose                                       | an Amazon                                     | Machine Im                                   | nage (AMI)                               |                                    |                          |                          | Cance               | l and Exit |
| An AMI is a template that<br>community, or the AWS M | contains the softwar<br>arketplace; or you ca | e configuration (ope<br>n select one of your | erating system, application<br>own AMIs. | server, and applications) required | I to launch your instanc | e. You can select an AMI | provided by AWS, ou | r user 🔶   |
| O Search for an AMI by                               | antaring a coarch tor                         | m o g "Windowo"                              |  |                                    |                          |                          |                     | ~          |
| Ci, Search for all Alwin by                          | entering a search ter                         | nre.g. windows                               |  |                                    |                          |                          |                     | ^          |
| Quick Start  |   |  |  |                                    |                          | K                        | < 1 to 40 of 40 Al  | MIs > >    |
| My AMIs  |   | Response on                                  |  |                                    |                          |                          |                     |            |
| AWS Marketplace                                      |   |  |  |                                    |                          |                          |                     | -          |
| Community AMIs                                       |   |  |  |                                    |                          |                          |                     |            |
| Free tier only (i)                                   |   | Anna an                                      |  | Strength and the second            |                          |                          |                     |            |
|  | 1.000   | h  |  |                                    |                          |                          |                     | -          |
|  |   |  |  |                                    |                          |                          |                     |            |
|  |   | factory for                                  |  | Colors by accelerate               | -                        |                          | -                   | -          |
|  |   |  |  |                                    |                          |                          |                     |            |

Figure 21 : Choose an Amazon Machine Image (AMI) window

4. From the left-most column, under **Quick Start**, click the select **My AMIs** tab as shown in Figure 22



Figure 22 : Quick Start - My AMIs window



5. Select a vThunder AMI based on your requirements.

Figure 23 : Step1- Choose an Amazon Machine Image (AMI) window

| tep 1: Choose an  | Amazon M                                 | achine Image (AMI)  | Cancel and Exit               |
|---|--|---|-------------------------------|
| n AMI is a template that contain<br>ommunity, or the AWS Marketpl | ns the software co<br>ace; or you can so | nfiguration (operating system, application server, and applications) required to launch your instance. You can select an lect one of your own AMIs. | AMI provided by AWS, our user |
| C Search for an AMI by enterin                                    | g a search term e                        | g. "Windows"  | ;                             |
| Quick Start   |  |   | K ≤ 1 to 50 of 285 AMIs >     |
| My AMIs   |  | Mark 10.1 A Million of Contraction of   | -                             |
| AWS Marketplace   |  |   | 10100-000                     |
| Community AMIs  |  | vThunder-500-P1_b_73_1gbps - ami-001b3ecef201b9940  | Select                        |
| Ownership   | Δ  | 1 gbps image  | 64-bit (x86)                  |
| Owned by me Shared with me  | <br>                                     | Root device type: ebs Virtualization type: hvm Owner: 939850196882 ENA Enabled: Yes   |                               |
| Architecture  |  | BIRLIN, PR. MR. 1.1. (House Law and Distance)   |                               |

- 6. Optionally, select AWS Marketplace from the Quick Start menu option. In the Search AWS Marketplace Products field, enter A10 Networks and press Enter.
- **NOTE:** BYOL is a permanent license. This option is recommended if you prefer to own the license rather than being charged licensing fees on an hourly basis. Contact <u>sales@a10networks.com</u> for more information about the different pricing structures, or if you wish to purchase a permanent license.



## Step 2. Choose Instance Type

After you select a vThunder AMI, determine the instance type. The instance type defines the CPU, memory, storage, networking capacity, and performance. Each vThunder AMI has a recommended instance type highlighted.

After the vThunder AMI is selected, the Choose an Instance Type window is displayed.

# **NOTE:** In general, A10 Networkds recommends that you select an instance type with a minimum of 4 vCPUs, such as **m4.xlarge**.

Figure 24 : Step 2: Choose an Instance Type window:

| 1. Choose AMI          | 2. Choose Instance Type | 3. Configure Instance | 4. Add Storage | 5. Add Tags | 6. Configure Security Group | 7. Review |                  |     |
|------------------------|-------------------------|-----------------------|----------------|-------------|-----------------------------|-----------|------------------|-----|
| Step 2: <mark>C</mark> | hoose an Insta          | nce Type              | 8              | 32          | EBS ONLY                    | Yes       | ир то ти відавіт | Yes |
|                        | General purpose         | m5.4xlarge            | 16             | 64          | EBS only                    | Yes       | Up to 10 Gigabit | Yes |
|                        | General purpose         | m5.8xlarge            | 32             | 128         | EBS only                    | Yes       | 10 Gigabit       | Yes |
|                        | General purpose         | m5.12xlarge           | 48             | 192         | EBS only                    | Yes       | 10 Gigabit       | Yes |
|                        | General purpose         | m5.16xlarge           | 64             | 256         | EBS only                    | Yes       | 20 Gigabit       | Yes |
|                        | General purpose         | m5.24xlarge           | 96             | 384         | EBS only                    | Yes       | 25 Gigabit       | Yes |
|                        | General purpose         | m5.metal              | 96             | 384         | EBS only                    | Yes       | 25 Gigabit       | Yes |
|                        | General purpose         | m4.large              | 2              | 8           | EBS only                    | Yes       | Moderate         | Yes |
|                        | General purpose         | m4.xlarge             | 4              | 16          | EBS only                    | Yes       | High             | Yes |
|                        | General purpose         | m4.2xlarge            | 8              | 32          | EBS only                    | Yes       | High             | Yes |
|                        | General purpose         | m4.4xlarge            | 16             | 64          | EBS only                    | Yes       | High             | Yes |

### Step 3. Configure the Instance

You can configure the new vThunder instance details as follows:

1. After the instance type is selected, click **Next: Configure Instance Details** button. The Configure Instance Details window is displayed.



Figure 25 : Step 3: Configure Instance Details window

| 1. Choose AMI                                     | 2. Choose Instance Type                               | 3. Co | nfigure Instance               | 4. Add Storage                   | 5. Add Tags     | 6. Config   | jure S | ecurity Group  | 7. Review   |               |                 |                          |                     |
|---|---|-------|--------------------------------|----------------------------------|-----------------|-------------|--------|----------------|-------------|---------------|-----------------|--------------------------|---------------------|
| Step 3: Co<br>Configure the in<br>instance, and m | onfigure Instan<br>stance to suit your requir<br>ore. | ce D  | etails<br>You can launch i     | multiple instance                | es from the sam | e AMI, requ | Jest   | Spot instances | to take adv | vantage of th | ne lower pricir | ng, assign an access mar | agement role to the |
| 5   | Number of instances                                   |       | 1                              |                                  | Launch into A   | uto Scalin  | g Gro  | oup (j)        |             |               |                 |                          |                     |
|   | Purchasing option                                     | 1     | Request Sp                     | ot instances                     |                 |             |        |                |             |               |                 |                          |                     |
|   | Network   | 1     | vpc-6e47b40b                   | Support                          |                 | \$          | С      | Create new VP  | с           |               |                 |                          |                     |
|   | Subnet  |       | subnet-14262<br>247 IP Address | 34d   TAC_subne<br>ses available | t   us-west-1b  | \$          |        | Create new su  | bnet        |               |                 |                          |                     |
|   | Auto-assign Public IP                                 |       | Enable                         |                                  |                 | \$          |        |                |             |               |                 |                          |                     |
|   | Placement group                                       | ()    | Add instanc                    | e to placement g                 | roup            |             |        |                |             |               |                 |                          |                     |
|   | Capacity Reservation                                  |       | Open                           |                                  |                 | \$          | C      | Create new Ca  | pacity Res  | ervation      |                 |                          |                     |
|   | IAM role  |       | None                           |                                  |                 | \$          | C      | Create new IAI | / role      |               |                 |                          |                     |
|   |   |       |                                |                                  |                 |             |        |                |             | Cancel        | Previous        | Review and Launch        | Next: Add Storage   |

 Retain the default values that appear in the window, except for the Network, Subnet, and setting Auto-assign Public IP to "enable." It is recommended to select the correct VPC.

The VPC and subnet must already be set up when the instance was created. For more information, see <u>Creating and Configuring a VPC</u>.

When you select a value for the Network and Subnet, a separate set of fields are displayed, which allow you to configure eth0 (the management interface), as shown in Figure 26.

**NOTE:** Make sure all the interfaces are in different subnets. Make sure the primary interface (eth0) is in the public Internet-facing subnet for management.



Figure 26 : Configure the Instance Details - Network interface window

| Device | Network Interface   | Subnet  | Primary IP   | Secondary IP addresses  |         |  |
|--------|---|---|--|---|---------|--|
| ethO   | New network interface $\checkmark$                        | subnet-b12a54c€ ∨                                     | Auto-assign  | Add IP  |         |  |
| eth1   | New network interface $\checkmark$                        | subnet-b12a54cf 🗸                                     | Auto-assign  | Add IP  | 8       |  |
| 0      | We can no longer as                                       | sign a public IP add                                  | dress to your instar                                 | nce   |         |  |
|        | The auto-assign public IP a<br>instances with one network | ddress feature for this ir<br>interface. To re-enable | istance is disabled beca<br>the auto-assign public I | use you specified multiple network interfaces. Public IPs can only be assig<br>address feature, please specify only the eth0 network interface. | ined to |  |

- 3. Click the **Add Device** button. The options for configuring "eth1" are displayed.
  - a. Select the network interface and subnet in the associated VPC.
  - b. The ethO should use a different subnet than eth1.
  - c. In the **Primary IP** field, enter the IP, which should be in your designated subnet.

Although DHCP is used to assign an IP address to the network interfaces, by entering a specific IP address in this field, you can ensure that the DHCP server assigns the same IP address every time the vThunder instance is rebooted. Doing this helps avoid having to rewrite the aXAPI scripts, which contain IP addresses that could keep changing.

4. Click **Advanced Details** to provision the vThunder instance.



Figure 27 : Configure the Instance Details - Advanced Details window

| 1. Choose AMI 2. Choose Instance Type | 3.0  | onfigure Instance   | 4. Add Storage                   | 5. Tag instance  | 6. Configure Security Group | 7. Review |                   |                  |
|---------------------------------------|------|---|----------------------------------|------------------|-----------------------------|-----------|-------------------|------------------|
| Step 3: Configure Instan              | ce D | etails  |                                  |                  |                             |           |                   |                  |
| Monitoring                            | •    | Enable Clou<br>Additional char  | fWatch detailed in<br>tes apply. | nonitoring       |                             |           |                   |                  |
| EBS-optimized instance                | ٢    | Launch as E<br>Additional char  | BS-optimized inst<br>es apply.   | ance             |                             |           |                   |                  |
| Link to VPC (ClassicLink)             |      |   |                                  |                  |                             |           |                   |                  |
| Advanced Details                      |      |   |                                  |                  |                             |           |                   |                  |
| Kernel ID                             | •    | Use default   |                                  |                  | ~                           |           |                   |                  |
| RAM disk ID                           | 1    | Use default   |                                  |                  | ~                           |           |                   |                  |
| User data                             | •    | ● As text ○ As  | file Input is al                 | ready base64 enc | oded                        |           |                   |                  |
|                                       |      | a30_blob:  <br>ITEST<br>ip dhs pri 8.8.8<br>g/m use-mgmt-<br>g/m token vTML<br>g/m enzable-reg<br>g/m send licens<br>wr mem | 8<br>port<br>cents<br>e-request  |                  |                             |           |                   |                  |
|                                       | L    |   |                                  |                  | Cance                       | Previous  | Review and Launch | Next: Add Storad |

- a. Accept the defaults for Kernel ID and RAM disk ID.
- b. Edit the following cloud-init configuration as appropriate:

```
al0_blob: |
!TEST
ip dns pri 8.8.8.8
glm use-mgmt-port
glm token vThxxxxxxx
glm enable-requests
glm send license-request
wr mem
```

- c. Copy and paste the configuration as text in the blank field.
- Click Next: Add Storage button. The Add Storage window is displayed.

### Step 4. Add Storage

- 1. In the Add Storage window, accept the default values.
  - **NOTE:** By default, the Add Storage value is 40GB. Enter the value in GB if more storage is required.

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Figure 28 : Step 4- Add Storage" window

| Volume Type ①       Device ①       Snapshot ①       Size (GiB) ①       Volume Type ①       IOPS ①       Throughput<br>(MB/s) ①       Delete on<br>Termination       Encryption         Root       /dev/sda1       snap-05d7471f454b12ef1       40       General Purpose SSD (gp2) •       120 / 3000       N/A       Image: Comparison of the comparison of | ep 4: Add s<br>r instance will be<br>the settings of th<br>age options in An | Storage<br>launched with the fo<br>le root volume. You c<br>hazon EC2. | llowing storage device sett<br>an also attach additional E | ings. You can attach add<br>BS volumes after launch | ditional EBS volumes and instance<br>ing an instance, but not instance | e store volumes to you<br>store volumes. Learn | rr instance, or<br>more about |                          |                |
|---|--|--|--|---|--|--|-------------------------------|--------------------------|----------------|
| Root /dev/sda1 snap-05d7471f454b12eft 40 General Purpose SSD (gp2)  120 / 3000 N/A Ø Not Encrypt Add New Volume Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. Learn more about free usage tier eligibility and   | lume Type (  | Device (j)   | Snapshot ()  | Size (GiB) (i)                                      | Volume Type (1)  | IOPS (j)                                       | Throughput<br>(MB/s) (i)      | Delete on<br>Termination | Encryption (i) |
| Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. Learn more about free usage tier eligibility and   | ot<br>Id New Volume  | /dev/sda1  | snap-05d7471f454b12e                                       | f1 40   | General Purpose SSD (gp2)  | <ul> <li>120 / 3000</li> </ul>                 | N/A                           |                          | Not Encrypt 🔻  |
| usage restrictions.   | Free tier eligible c<br>usage restriction                                    | customers can get up<br>s.   | o to 30 GB of EBS General F                                | Purpose (SSD) or Magne                              | tic storage. Learn more about fre                                      | e usage tier eligibility a                     | and                           |                          |                |

- 2. Check the **Delete on Termination** box.
- Click Next: Add Tags button. The Tag Instance window is displayed.

#### Expanding Virtual Hard Disk Size

The virtual Hard disk size in a vThunder can be expanded, even after the creation of the VM.

To expand the virtual hard disk size follow the following steps:

- 1. Navigate to **AWS** > **Services** > **Instances** option from the list of a menu option. The Launch instance window is displayed.
- 2. Select VM from instance window and power **OFF** the selected VM.



#### Figure 29 : Block Device window

| aWS Services           | 🗸 Resource Groups 🤟 🔭                                       | Д. ▼ N. Celfornia × Support ×  |
|------------------------|---|--|
| EC2 Dashboard *        | Launch Instance  Connect Actions                            | ∆ ⊖ ♦ Ø  |
| Tags 4                 | Q. Filter by tags and attributes or search by keyword       |  |
| Reports                | Name - Instance ID - Instance Type - Availability 2         | Zone - Instance State - Status Checks - Alarm Status Public DNS (IPv4) |
| Limits                 | vivek_20GB i-00ed56745acce36be m4.16xlarge us-west-1b       | 🥥 running 🛛 Ø 2/2 checks None 🍡  |
| INSTANCES              | vivek_20GB i-06ec7ef78c4af75df m4.16xlarge                  | None 🍃   |
| Instances              | vivek 20GB I-0a3c2df8b3e9d1f5d m4.16xlarg Block Device /dev | /isds1 None 🍾 👻  |
| Launch Templates       |   | FDD ID   |
| Spot Requests          | IAM role - Boot -   | EBS ID 901-04004008032403320   |
| Reserved Instances     | Key pair name vivek_test Altact                             | hment time 2019-07-  |
| Dedicated Hosts        | ClassicLink -   | 22T08:16:54.000Z   |
| Canacity Reservations  | Diviner 939650196662 Block de                               | rvice status attached  |
| Capacity Robol rations | Launch time 300y 22, 2019 at 1140.53 Delete on t            | termination True   |
| IMAGES                 | Termination protection False                                | Root device /devisita1   |
| AMIs                   | Lifecycle normal  | Block devices (dev/sda1  |
| Bundle Tasks           | Monitoring basic  |  |
| ELASTIC RLOCK          | Alarm status None   |  |
| STORE .                | Kemel ID -  | Capacity Reservation -   |

- Navigate to the bottom of the Instance window, and select Root Device > EBS ID > Actions.
- 4. On Action window choose the Modify Volume option and then provide the size.
- 5. Click the **Modify** tab to save the changes.
- 6. Power **ON** the VM. The virtual hard disk size in a vThunder is expanded and it gets reflected in "show hardware" command of vThunder CLI.

CAUTION:

The size of the virtual disk can only be expanded but cannot be decreased.

### Step 5. Add Tags

1. In the **Tag Instance** window, you can assign a name to the instance or other aspects of the vThunder instance.

For example, enter a name for this instance in the Value field to make this instance easier to find from many instances.

**NOTE:** This is an optional setting and is intended for better user experience.



#### Figure 30 : Tag the Instance window

| Instances (j) | Volumes 1          |
|---------------|--------------------|
| Instances (j) | Volumes (i)<br>☑ 🐼 |
| ×             | × 0                |
|               | -                  |
|               |                    |
|               |                    |
|               |                    |
|               |                    |

2. Click **Next: Configure Security Group** button. The Configure Security Group window is displayed.

## Step 6. Configure Security Group

- 1. User can configure the security group settings in one of the following ways:
  - Choose a pre-configured (default) security group.
  - Create a security group.

Figure 31 : Configure Security Group

| an ta0 tan0h dafault                   |                                     |                      |   |                 |     |
|--|-------------------------------------|----------------------|---|-----------------|-----|
| Jog-4e04cezu deladit                   | vinent 407                          | delaul               | wineed 407 second 0040 04 05T440000                     | 7 400 05-00     |     |
| sg-0291710c4648ea510 launch-           | wizaru-127                          | launch               | I-wizaru-127 created 2019-01-25114:32:2                 | 7.423-03.00     |     |
| sg-uucarappuaaspassaaniaunch-          | wizard-129                          | launch               | 1-Wizard-129 created 2019-01-28110:17:00                | 0.949-05:00     |     |
| sg-0747e198af72afdb8 launch-wizard-136 |                                     |                      | launch-wizard-136 created 2019-12-13T14:50:50.799+08:00 |                 |     |
| sg-0fd4080627cdea0d2 launch-wizard-137 |                                     |                      | launch-wizard-137 created 2019-12-17T23:17:56.138-08:00 |                 |     |
| sg-0acd86cb12396a7eelaunch-            | wizard-138                          | launch               | n-wizard-138 created 2019-12-17T23:22:5                 | 2.281-08:00     |     |
| sg-0d75339600e631a45launch-            | wizard-139                          | launch               | n-wizard-139 created 2019-12-18T01:28:0                 | 1.959-08:00     |     |
| sg-02737545fd90d62d2 launch-wizard-140 |                                     |                      | launch-wizard-140 created 2019-12-18T01:31:08.463-08:00 |                 |     |
| sg-0f19d734828c3e9ec launch-wizard-141 |                                     |                      | launch-wizard-141 created 2019-12-18T17:45:24.183+08:00 |                 |     |
|  |                                     |                      |   |                 |     |
| ibound rules for sg-0747e198af7        | 2afdb8 (Selected security groups: s | g-0747e198af72afdb8) | <b>0</b>  | Description (1) | 880 |
| lype ()                                | Protocol ()                         | Port Hange ()        | source ()   | Description (1) |     |
| ITTP                                   | TCP                                 | 80                   | 123.127.103.0/24  |                 |     |
|  |                                     |                      |   |                 |     |

2. If creating a new security group, it is recommended that you use the following settings:
Launching vThunder on AWS



| Туре (ј)          | Protocol (j) | Port Range (j) | Source (j)           |   |
|-------------------|--------------|----------------|----------------------|---|
| SSH 🗸             | TCP          | 22             | Anywhere V 0.0.0/0   | 8 |
| HTTP V            | TCP          | 80             | Anywhere V 0.0.0/0   | 8 |
| HTTPS 🗸           | TCP          | 443            | Anywhere V 0.0.0/0   | 8 |
| Custom TCP Rule 🗸 | TCP          | 8080           | Anywhere V 0.0.0/0   | 8 |
| Custom TCP Rule 🗸 | TCP          | 8443           | Anywhere V 0.0.0/0   | 8 |
| Custom TCP Rule 🗸 | TCP          | 4149           | Anywhere V 0.0.0/0   | 8 |
| Custom UDP Rule V | UDP          | 161            | Anywhere V 0.0.0.0/0 | 8 |

Click Review and Launch to proceed.
 The Review Instance Launch window is displayed.

### Step 7. Review the Configuration Changes

1. In the **Review Instance Launch** window as shown in <u>Figure 32</u>, verify the settings, and if everything appears in order, click the **Launch** button to launch the vThunder instance.



Figure 32 : Review Instance Launch - Settings for this vThunder Instance

|   |   | ,  | election, instance type, configuration o  | ptions, or storage devices. Learn more abo   | Don't show me this and  |
|---|---|--|---|--|---|
| stances' s<br>pe accessibl<br>dditional por | ecurity. Your<br>e from any IP ad<br>ts in your securi                                  | security group, laune<br>Idress. We recommend tha<br>ty group to facilitate acces  | ch-wizard-136, is open to the w<br>you update your security group rules t<br>s to the application or service you're ru  | rorld.<br>o allow access from known IP addresses o<br>nning, e.g., HTTP (80) for web servers. Edit   | nly.<br>security groups   |
| P1_b_73_1ç                                  | jbps - ami-001  | b3ecef201b9940   |   |  | Edi   |
| os Virtualizat                              | ion type: hvm   |  |   |  | Edit instance   |
| ECUs  | vCPUs   | Memory (GiB)   | Instance Storage (GB)   | EBS-Optimized Available  | Network Performance   |
| 26  | 8   | 32   | EBS only  | Yes  | High  |
|   |   |  |   |  | Edit security g   |
|   | Nam   | 10   | Descrip   | tion   |   |
|   | launct  | n-wizard-136   | launch-wi   | zard-136 created 2019-12-13T14:50:50.799   | +08:00  |
| inbound rul                                 | es  |  |   |  |   |
|   | Protocol (i)  |  | Port Range (i)  | Source (i)   | Description (i)   |
|   | TCP   |  | 80  | 123.127.103.0/24   |   |
|   | Echo Reply  |  | N/A   | 0.0.0/0  |   |
|   | All   |  | All   | 0.0.0/0  |   |
|   | TCP   |  | 22  | 123.127.103.0/24   |   |
|   |   |  |   |  | Edit instance d   |
|   |   |  |   |  |   |
|   | tances' s<br>e accessible<br>Iditional por<br>P1_b_73_1(<br>e virtualizat<br>ECUs<br>26 | tances' security. Your<br>excessible from any IP ad<br>Iditional ports in your securi<br>PI_b_73_1gbps - ami-001<br>Virtualization type: hvm<br>ECUs VCPUs<br>26 8<br>26 8<br>Virtualization type: hvm<br>ECUs VCPUs<br>26 8<br>Virtualization type: hvm<br>ECUs VCPUs<br>VCPUs<br>ECUs VCPUs<br>VCPUs<br>Nam<br>Iuncr<br>Inbound rules<br>Virtualization type: hvm<br>CCP<br>Virtualization type: hvm<br>Virtualization type: hvm<br>Virtualization type: hvm<br>ECUs VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VCPUs<br>VC | tances' security. Your security group. laum<br>excessible from any IP address. We recommend that<br>Iditional ports in your security group to facilitate access<br>P1_b_73_1gbps - ami-001b3ecef201b9940<br>a virtualization type: hvm<br>ECUs vCPUs Memory (GiB)<br>26 8 32<br>ECUs I aunch-wizard-136<br>I aunch-wizard-136<br>I aunch-wizard-136<br>I boomd rules<br>FCP Fortacel I FOP<br>Echo Reply All<br>TCP | tances' security. Your security group, launch-wizard-136, is open 10 the w<br>excessible from any IP address. We recommend that you update your security group rules to the application or service you're ru<br>bidrional ports in your security group to facilitate access to the application or service you're ru<br>PI_b_73_1gbps - ami-001b3ecef201b9940<br>a Virtualization type: hm<br>ECUs VCPUs Memory (GIB) Instance Storage (GB)<br>26 8 32 EBS only<br>EDUS UNA BESS UNA BESS ON BE | tances' security. Your security group, launch-wizard-136, is open to the world.<br>we accessible from any IP address. We recommend that you update you security group rules to allow access from known IP addresses of<br>tiditional ports in your security group to facilitate access to the application or service you're running. e.g., HTTP (80) for web servers. Edit<br>P1.b.73.1gbps - ami-001b3ccef201b9940<br>a Vinualization type hum:<br>ECUs VCPUs Memory (GiB) Instance Storage (GB) EBS-optimized Available<br>26 8 32 EBS only Ves<br>ECUs Launch-witzard-136 Isaunch-witzard-136 reated 2019-12-13T14 50.50.799<br>Launch-witzard-136 Isaunch-witzard-136 Isaunch-witzard-136 reated 2019-12-13T14 50.50.799<br>Linbound rules<br>ECUS TOP 80 123.127.103.0/24<br>Echo Reply N/A 0.0.0.0/0<br>All All All 0.0.0.0/0 |

- In the Select an existing key pair or create a new key pair window as shown in <u>Figure 33</u>. Click the drop-down menu and select one of the following options from the drop-down menu:
  - Choose an existing key pair
  - Create a new key pair
    - Enter a name in the **Key pair name** field.
    - Click **Download Key Pair**.
  - Proceed without a Key Pair.

If you have questions about setting up the key pairs, or if you have trouble using the SSH key to log in, review the EC2 documentation about key pairs at <a href="http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html">http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html</a>.



Figure 33 : Select an existing Key Pair or create a new Key pair window

| Security Group ID                  |          | Select an existing key pair or create a new key pair ×  |                   |
|------------------------------------|----------|---|-------------------|
| sg-0747e198af72afdb8               |          | A key pair consists of a public key that AWS stores, and a private key file that you store. Together, they  | 50.799+08:00      |
| All selected security groups inbou | nd rules | allow you to connect to your instance securely. For Windows AMIs, the private key file is required to<br>obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to<br>securely CSM into your instance. |                   |
| Туре ()                            | Pro      |   | Description (i)   |
| HTTP                               | тс       | Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more<br>about removing existing key pairs from a public AMI  |                   |
| Custom ICMP Rule - IPv4            | Ech      | Obacce se existing key parts non a public Awr.  |                   |
| All traffic                        | All      | Select a key pair   |                   |
| SSH                                | TC       | A10_Bangalore_Key_Pair  |                   |
| instance Details                   |          | I acknowledge that I have access to the selected private key file<br>(A10_Bangalore_Key_Pair.pem), and that without this file, I won't be able to log into my<br>instance.  | Edit instance det |
| Storage                            |          |   | Edit stor         |
| logo                               |          | Cancel Launch Instances   | Tab.              |

- 3. Check the Acknowledgment statement box.
- 4. Click Launch Instance.

The Launch Status - Initiating Instance Launches window is displayed.

Figure 34 : Launch Status window

| Launch Status                   |   |
|---------------------------------|---|
| Init<br>Please do<br>Crr<br>Aut | iating Instance Launches<br>not close your browser while this is loading<br>rating security groups Successful<br>horizing inbound rules Successful<br>Initiating Launches |

When finished launching, the **Launch Status** window offers a confirmation message similar to that shown in Figure 35.





Figure 35 : Launch Status – Confirmation Message window

| Laun      | rch Status  |                |  |  |  |  |  |
|-----------|---|----------------|--|--|--|--|--|
| ۰         | Your instances are now launching The following instance launches have been initiated: I+02b30a86734c94-c6d. Vew launch log  |                |  |  |  |  |  |
| 0         | Get notified of estimated charges     Create billing alers to per an email notification when estimated charges on your ANS bill exceed an amount you define (for example, if you exceed the free usage tee).  |                |  |  |  |  |  |
| How to    | to connect to your instances  |                |  |  |  |  |  |
| Your inst | stances are launching, and it may take a few minutes until they are in the running state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances. |                |  |  |  |  |  |
| Click Vie | we instances to monitor your instances' status. Once your instances are in the running state, you can connect to them from the instances screen. Find out how to connect to your instances.   |                |  |  |  |  |  |
|           | re are some helpful resources to get you started  |                |  |  |  |  |  |
| . How     | x to connect to your Linux instance + Amazon EC2: User Guide  |                |  |  |  |  |  |
| • Learn   | m about AWS Free Usage Tier + Amazon EC2: Discussion Forum  |                |  |  |  |  |  |
| While yr  | our instances are launching you can also  |                |  |  |  |  |  |
| Creat     | ate status check alarms to be notified when these instances fail status checks. (Additional charges may apply)  |                |  |  |  |  |  |
| Creat     | ste and attach additional EBS volumes (Additional charges may apply)  |                |  |  |  |  |  |
| Mana      | lage security groups  |                |  |  |  |  |  |
| ĺ         |   | View Instances |  |  |  |  |  |

- 5. Click **View Instance** button to view the launched instance in the Instance page.
  - **NOTE:** Select the instance, and view its details in the **Description** tab. The Private IPs field displays the private IP address that 's assigned to the created instance from the range of IP addresses in the subnet.

## Manage Subscriptions

The launching AWS image with manage subscriptions option allows users to quickly review, modify, and then launch a single instance of the software with settings recommended by the software seller.

For the launching AWS image, perform the following:

- 1. Access the AWS website at <a href="https://aws.amazon.com/console/">https://aws.amazon.com/console/</a>.
- Click the Sign In to Console button on the upper-left corner or navigate to My Account> AWS Management Console option from the list of available options.



#### Figure 36 : AWS Management Console window

| Products Solutions Pricing Documentation         | Learn Partner Network AWS Market           | Contact Sales Support + E<br>place Customer Enablement Events | nglish  My Account  Sign In to the Console Explor AWS Management Console |
|--|--|---|--|
| AWS Management Console Overvie                   | ew Features FAQs                           |   | Account Settings<br>Billing & Cost Management                            |
|  | You are now                                | logged out.   | Security Credentials<br>AWS Personal Health<br>Dashboard                 |
|  | Create a n                                 | ew account  |  |
|  |  |   |  |
| Explore databases on AWS                         |  |   |  |
| +          |  | + + + + +   |  |
| Amazon Aurora<br>Accelerate app development with | Amazon Managed Apache<br>Cassandra Service | MongoDB compatibility)  | Amazon uynamous<br>Is your app slowing you down? Try                     |

3. Sign in to the Amazon console with valid **Account Id (12 digits) or account alias**, **IAM user name** and **Password**. For more information, see <u>Creating an AWS</u> <u>Account</u>

Figure 37 : Sign in window

| Sign in as IAM user                     |   |
|---|---|
| Account ID (12 digits) or account alias | Scale your data warehouse<br>compute and storage  |
| IAM user name                           | independently<br>Upgrade your analytics with the new Amazon<br>Bedshift RA3 4XL and RA3 16XL nodes with |
| Password                                |   |
| Sign in Sign in using root user email   |   |
| Forgot password?                        | aws C   |



- 4. On the AWS Management Console page, navigate to All services> AWS Cost Management > AWS Market Subscriptions option. The AWS Marketplace > Manage subscriptions window is displayed. Do one of the following:
  - From the right pane, click the **Discover products** link under the **AWS Marketplace** to Search AWS marketplace products.
  - From the right pane, click the **Product Support Connection** link under the **AWS Marketplace** to learn more about the AWS Marketplace product support connection. The AWS Marketplace Product Support Connection window is displayed.

Figure 38 : Manage subscription window

| AWS Services ~ Res  | ource Groups   AWS Marketplace   Manage subscriptions                                  | <ul> <li>✓ Global ✓ Support ✓</li> </ul>                |
|---|--|---|
| Manage subscriptions Discover products Product Support Connection | Manage subscriptions   | Actions  Billing  |
|   | Your subscriptions         All delivery methods  | Cost explorer<br>Create budget                          |
|   | CentOS 7.4 Minimal HVM<br>By Technology Leadership Corporation<br>Anazon Mathine Image | works vThunder HVM - 1<br>vorks<br>ine image            |
|   | Launch new instance Manage   | Launch new instance Manage                              |
| 🗨 Feedback 🔇 English (US)   | © 2008 - 2020, Amazon Web Services, Inc. or its affil                                  | iates. All rights reserved. Privacy Policy Terms of Use |

NOTE: The manage subscription option launches pre-configured software with just a few clicks, and choose software solutions in AMI, SaaS, and other formats. Users can also browse and subscribe to data products. Flexible pricing options include free trial, hourly, monthly, annual, multi-year, and BYOL, and get billed from one source. AWS handles billing and payments, and charges appear on customers' AWS bill.



Figure 39 : AWS Marketplace Product Support Connection window

| 👯 aws n      | narketplace                   |  |   |   |  | Q  | Hello,                   |
|--------------|-------------------------------|--|---|---|--|--|--------------------------|
| Categories 👻 | Delivery Methods 👻            | Solutions 👻  | Migration Mapping Assistant   | Your Saved List   | Partners   | Sell in AWS Marketplace  | Amazon Web Services Home |
|              | AWS                           | Marketpl   | lace Product Sup<br>y products in AWS Marketplace<br>products for which you can add                         | pport Connection<br>e entitle customers to higher tiers of cur<br>d up to five support contacts each.                             | stomer support directly from   | v <b>endors.</b> Below is a list o                             | f                        |
|              | Your                          | Pleas<br>of yo   | e note that any additions, edits,<br>ur information will be used for<br>mtacts                              | or deletions may take up to one business<br>r sales purposes.   | day before being recognized by   | r the associated vendor. <b>No</b>                             | one                      |
|              | You a<br>conta                | re not currently sub   | scribed to any products which a ubscribed to a participating pro  | are Product Support Connection enabled<br>oduct.  | l. You may return to this page   | to edit your support   |                          |
|              | Red prod<br>for you to        | uct listings do not have<br>o receive support from                     | e a registered support contact. Whil<br>this vendor. Click the 🖉 to edit the                                | le support contacts for products are completel<br>e affected product listing or click the "Share ye                               | y optional, not having a contact li<br>our contact details for a product" l  | sted may make it more difficu<br>outton to add a support conta | ilt<br>ict.              |
|              | How can<br>and such<br>commun | n sellers use my dat<br>h information is shan<br>nication from a selle | ta? Information you provide und<br>red with sellers solely for the pu<br>er that is unrelated to product su | der AWS Marketplace Product Support Co<br>urpose of providing support for your soft<br>upport, please contact us to share your fo | onnection will only be shared<br>tware subscriptions. If you fee<br>eedback. | with the sellers you specif<br>I you have received             | y,                       |
|              | How do<br>delete a            | I delete my suppor<br>Il your support cont                             | rt contacts? You can either dele<br>tacts by clicking here.   | te individual contacts by clicking the $\otimes$  | mark in the far right column c   | f each support contact, o                                      |                          |
|              | y AWS                         | Marketplace on Twitte  | er 🔲 AWS Marketplace Blo  | ng 🔊 RSS Feed   |  |  |                          |

- 5. (Optional) From the right pane, click the **Discover products** link under the AWS Marketplace to Search AWS marketplace products.
- 6. In the search box, enter A10 Networks.

A list of Search results - AWS images published by A10 Networks is displayed.

| aws Services - Re                         | source Groups 👻 🛠  | ↓ Global - Support -   |
|---|--|--|
| AWS Marketplace $\times$                  | AWS Marketplace > Discover produc  | ets >> Search results  |
| Manage subscriptions<br>Discover products | Refine results   | Search AWS Marketplace products  |
| Product Support Connection 🗹              | Categories   | Q A10 Networks X   |
|   | Categories<br>Infrastructure Software<br>DevOps<br>Pricing plans<br>  Hourly<br>  Annual<br>  Bring Your Own License<br>  By Units<br>Free trial<br>  Free Trial<br>  Delivery methods<br>  Amazon Machine Image<br>  SaaS | < 1 2 > @  |
|   |  | A10 Networks (12 results) showing 1 - 10   |
|   |  | A10 Networks vThunder HVM - BYO<br>By A10 Networks   Ver 4.1.4 GR1<br>Linux/Unix, Other 4.1.4 GR1 - 64-bit Amazon Machine Image (AMI)  |
|   |  | A10 Networks' vThunder Amazon Machine Image (AMI) is purpose-built for<br>high performance, flexibility, and easy-to-deploy application delivery and<br>server lead balancer collutions within amazon Web Services (AWS) |
|   |  | deployments. vThunder AMI offers comprehensive feature set across<br>advanced L4-L7 server   |
|   |  | A10 Networks vThunder HVM - 500Mbps [2]<br>By A10 Networks   Ver vThunder 4.1.4 GR1-AWS  |
|   | Vendors A10 Networks Radware   | Linux/Unix, Other 4.1.4 GRI - 64-bit Amazon Machine Image (AMI) Free Trial Starting from \$1.16/hr or from \$7,795.00/yr (23% savings) for software + AWS usage fees   |

Figure 40 : Search results window

 Click the required AWS Image link. The product details window is displayed.



Figure 41 : Product Details window

| 👯 aws m      | arketplace   |  |  |  |  | <mark>Q</mark>  | Hello,   |         |
|--------------|--|--|--|--|--|---|--|---------|
| Categories 💌 | Delivery Methods -   | Solutions  Migrat A10 Netty By: A10 Networks' deploy applicat Show more Linux/Unix Nyot  | on Mapping Asistant Your Saved I<br>WORKS VThunder HUV<br>Ints 양 Latest Version: 4.1.4 GR<br>VThunder AMI is purpose-built for<br>tion delivery and server load balar<br>아마아아아 0 AWS reviews   1   | At A BYOL  | ty, and easy-to-   | Sell in AWS Marketplace<br>Continue to Subsc<br>Save to List<br>Typical Total Price<br>Total pricing per instance for<br>hosted on m4.starge in US E<br>Virginia, View Details                        | Anazon Web Services Ho<br>ribe<br>e<br>r services<br>aat (M. | me Help |
|              | Overview   | v  | Pricing  | Usage  | Support  | Rev   | views  |         |
|              | Product<br>Drawner, fike<br>balancer solutions<br>AMI offers compro<br>balancing and app<br>withinder with the<br>activate with the<br>activa | Overview<br>hunder Anazon Machine<br>hilbity, and easy-to-deploy<br>within Amazon Web Servi<br>humania fature set arros<br>anazon Web Services in<br>computing and a set of the<br>computing of the set of the<br>hunder Servis and AX Set<br>all-in-one inclusive featur<br>hunder Servis and AX Set<br>all-in-one inclusive featur<br>hunder Servis and AX Set<br>all-in-one inclusive featur<br>cos with minimal manage<br>cess (BYOL) is available<br>er channels from A10 Net | Image (AMI) is purpose-built for h<br>vapplication delivery and server la<br>vices (AWS) deployments. vThunds<br>advanced L4.17 server load<br>advanced L4.17 server load<br>frastructure ensures feature parti-<br>frastructure ensures feature parti-<br>es ADCs. vThunder for AWS is<br>res set, withhout any feature licensis<br>ment efforts.<br>for customers with current license<br>works. | Igh<br>Boad<br>er<br>5 Consistent<br>9 Accelorate<br>9 Accelorate<br>9 Accelorate<br>9 On the EC2<br>2 Achieve his<br>disaster res<br>9 active his<br>disaster res | feature set: Same applic<br>tatures across public and<br>d time to value: vThunde<br>mance, flexible, easy-to<br>d server load balancers of<br>vinzaon Machine Image<br>cloud.<br>her availability: GSLB fe<br>covery and failove, optim<br>ts, traffic migration of tr<br>maintenance or outage | ation services and<br>private datacenters<br>if is a purpose-built<br>deptoy application<br>alution. Launch<br>AMU within minutes<br>ature enables<br>nizes multi-site<br>affic across multiple<br>s. |  |         |
|              | ву   |  | Show other versio  | ns<br>2*   |  |   |  |         |
|              | Categories   |  | Network Infrastructure<br>Security   | 2  |  |   |  |         |
|              | Operating Syste  | em   | Linux/Unix, Other 4.1.4 G  | R1   |  |   |  |         |
|              | Delivery Metho   | ds   | Amazon Machine Ima   | ge   |  |   |  |         |

8. Click **Continue to Subscribe** tab. The Subscribe to this software window is displayed.

Figure 42 : Subscribe to this software-1 window

| <b>/s</b> marketplace  |  |   |  | Q                            | Hello,                   |      |
|--|--|---|--|------------------------------|--------------------------|------|
| <ul> <li>Delivery Methods - Solutions -</li> </ul>   | Migration Mapping Assistant  | Your Saved List   | Part   | mers Sell in AWS Marketplace | Amazon Web Services Home | Help |
| A10 A10  | Networks vThunde   | er HVM - BYOL   |  | Continue to Con              | nfiguration              |      |
| < Product Detail Subscribe   |  |   |  |                              |                          |      |
| Subscribe to th  | is software  |   |  |                              |                          |      |
| You're subscribed to this soft configure your software.  | ware. Please see the terms a   | nd pricing details below or   | click the button above to  |                              |                          |      |
| Terms and Conditions   |  |   |  |                              |                          |      |
| A10 Networks Offer   |  |   |  |                              |                          |      |
| You have subscribed to this s<br>and the seller's End User Lice<br>transaction (including your p<br>applicable, in accordance wit<br>Customer Agreement? or ot | oftware and agreed that you<br>nse Agreement (EULA) C. Yo<br>ayment terms) with the resp<br>n the AWS Privacy Notice C.<br>her agreement with AWS go | r use of this software is sub<br>ou agreed that AWS may sh<br>ective seller, reseller or und<br>Your use of AWS services n<br>verning your use of such se | ject to the pricing terms<br>are information about this<br>erlying provider, as<br>emains subject to the AWS<br>vices. |                              |                          |      |
| Product  | Effective date   | Expiration date   | Action   |                              |                          |      |
| A10 Networks vThunder HVM -  | BYOL 9/9/2016  | N/A   | <ul> <li>Show Details</li> </ul>   |                              |                          |      |

9. Click the **Continue to Configuration** tab. The Configure this software window is displayed.

Figure 43 : Configure this software - 2 window



- 10. Confirm that the settings under the following fields are correct.
  - Fulfillment Option
  - Software Version
  - Region
- 11. Click **Continue Launch** to create the AWS instance.

If the field is grayed out, review your settings; there might be an invalid value assigned to one of the fields. The Launch this software window is displayed.

Figure 44 : Launch this software window

| A10 Netwo                                 | orks v1      | hund                    | er HVM - BYOL  |                     |
|---|--------------|-------------------------|--|---------------------|
| < Product Detail Subscribe Configure      | aunch        |                         |  |                     |
| Launch this software                      | e            |                         |  |                     |
| Review your configuration and choose      | how you      | wish to l               | aunch the software.  |                     |
| Configuration Details                     |              |                         |  |                     |
| Fulfillment Option                        | 64-bit (x    | 86) Amazo               | n Machine Image (AMI)  |                     |
|   | A10 Network  | works vThu<br>m4.xlarge | under HVM - BYOL   |                     |
| Software Version                          | vThunde      | r 4.1.0 P3-             | AWS  |                     |
| Region                                    | US East (    | N. Virginia             | )  |                     |
| Usage Instructions                        |              |                         |  |                     |
|   |              |                         |  |                     |
| Choose Action                             |              |                         |  |                     |
| Launch from Website                       |              |                         | Choose this action to launch from this website                             |                     |
|   |              |                         |  |                     |
| EC2 Instance Type                         |              |                         |  |                     |
| m4.xlarge                                 |              | •                       | CPU: 13 EC2 Compute Units (4 Virtual cores wi<br>Storage: EBS storage only | th 3.25 Units each) |
|   |              |                         | Network Performance: High  |                     |
|   |              |                         |  |                     |
| VPC Settings                              |              |                         |  |                     |
| * indicates a default vpc                 |              |                         |  |                     |
| vpc-7331751e                              | *            | 2                       |  |                     |
| Create a VPC in EC2                       |              |                         |  |                     |
| Subnet Settings                           |              |                         |  |                     |
| subnet-f631759b (us-east-1d)              | *            | 0                       | IPv4 CIDR block: 20.20.20.0/24   |                     |
| Create a subnet in EC2 🗗                  |              |                         |  |                     |
| (Ensure you are in the selected vec above | =)           |                         |  |                     |
|   |              |                         |  |                     |
| Security Group Settings                   | otrols the t | traffic allow           | wed to reach one or more instances. You o                                  | an create a new     |
| security group based on seller-recommen   | ided settin  | gs or choo              | se one of your existing groups. Learn mor                                  | e                   |
| Select a security group                   | *            | 0                       |  |                     |
| Create New Based On Seller Setting        | js           |                         |  |                     |
|   |              |                         |  |                     |
| Key Pair Settings                         |              |                         |  |                     |
| To ensure that no other person has acce   | ss to your s | software, t             | he software installs on an EC2 instance w                                  | ith an EC2 key pair |
| that you created.                         |              | ~                       |  |                     |
| Create a key pair in EC2                  | v            | ~                       |  |                     |
| (Ensure you are in the region you wish to | o launch yo  | our softwa              | re)  |                     |
|   |              |                         |  |                     |
|   |              |                         |  | Launch              |
| AWS Marketplace on Twitter                | 🔳 AWS        | Marketplace             | Blog 🔊 RSS Feed  |                     |

••••



12. Click on the **Launch** button to launch the selected software with the set configuration.

The AWS instance is created and a Thank you message window is displayed.

Figure 45 : Thank you message window

| Thank you for launching A10 Networks vThunder HVM - BYOL<br>An instance of this software is now deploying on EC2.<br>You can check the status of this instance on EC2 Console. You can also view all instances on Your Software page.<br>Software and AWS hourly usage fees apply when the instance is running and will appear on your monthly bill. |  |                                  |   |  |  |  |  |
|--|--|----------------------------------|---|--|--|--|--|
| Next 9   | Steps:                                       |                                  | Related Links                                     |  |  |  |  |
| The st   | The software will be ready in a few minutes. |                                  | AWS Management Console                            |  |  |  |  |
|  |  |                                  | Your Software                                     |  |  |  |  |
| Softw  | vare Installation D                          | etails                           | Continue shopping on AWS Marketplace              |  |  |  |  |
|  | Product                                      | A10 Networks vThunder HVM - BYOL | Service Catalog                                   |  |  |  |  |
|  |  | 1                                | Click here for instructions to deploy Marketplace |  |  |  |  |
|  | Version                                      | vThunder 4.1.1 P3-AWS            | products in AWS Service Catalog.                  |  |  |  |  |
|  |  |                                  |   |  |  |  |  |

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# **Post-Installation Tasks**

This section provides information about the post-installation tasks required for monitoring and configuring the vThunder instance.

The following topics are covered:

| Monitoring and Configuring the vThunder Instance | 48 |
|--|----|
| Accessing vThunder                               |    |
| Elastic IP Address                               |    |
| Associating an Elastic IP Address                | 49 |
| Login to vThunder Instances                      |    |
| Login through CLI                                |    |
| Login through GUI                                | 53 |
| Configuring DHCP and the VIP in vThunder         |    |
| Changing Source or Destination Checks            |    |
| Disabling Change Source or Destination Checks    |    |





# Monitoring and Configuring the vThunder Instance

To monitor the vThunder instance you just created, scroll to the bottom right and click the **View Instances** button. <u>Figure 46</u> shows the new vThunder instance just created.

Figure 46 : Monitor the New vThunder Instance

| aws Services                                 | <ul> <li>Resource Gr</li> </ul> | oups 🗸 🖈                |                              |                            |                         | ۵.             |               |                    | •                            | N. Cali             | fornia 👻               | Suppor    | t •  |    |
|--|---------------------------------|-------------------------|------------------------------|----------------------------|-------------------------|----------------|---------------|--------------------|------------------------------|---------------------|------------------------|-----------|------|----|
| New EC2 Experience<br>Tell us what you think | Launch Instanc                  | e 🔻 Connect             | Actions ¥                    |                            |                         |                |               |                    |                              |                     | 2                      | 0         | ¢    | 0  |
| EC2 Dashboard New                            | Q Filter by tag                 | gs and attributes or se | arch by keyword              | ł                          |                         |                |               |                    |                              | ØK                  | < 1 to                 | 50 of 13  | в >  | н  |
| Events <sub>New</sub><br>Tags                | Name                            | - Instance ID           | -   In                       | stance Type                | Availability Zone       | Instance State | Status Che    | ecks -             | Alarm Sta                    | itus 🗤              | Public [               | NS (IPv4) |      | -  |
| Reports                                      | a10suppo                        | rt-I i-0bc1fee87        | ca1a385d m4                  | 1.large                    | us-west-1b              | running        | 2/2 che       | cks                | None                         | >>                  |                        |           |      |    |
| Limits                                       | Production                      | n s i-a0b61237          | t2.                          | small                      | us-west-1c              | running        | 2/2 che       | cks                | None                         | >>                  | ec2-13-5               | 2-66-87.u | s-we | -1 |
| ▼ INSTANCES<br>Instances                     | Instance: i-0b                  | c1fee87ca1a385d (       | a10support-log               | jin-v2-serve               | er) Elastic IP. 13.56.0 | 50.225         |               |                    |                              | ~                   |                        |           | 80   | 1  |
| Instance Types                               | Description                     | Status Checks           | Monitoring                   | Tags                       |                         |                |               |                    |                              |                     |                        |           |      |    |
| Launch Templates                             |                                 | Instance ID             | i-0bc1fee87ca                | 1 a 385 d                  |                         | Public         | DNS (IPv4)    |                    |                              |                     |                        |           |      |    |
| Spot Requests                                |                                 | Instance state          | running                      |                            |                         | IF             | v4 Public IP  | 13.56.6            | 0.225                        |                     |                        |           |      |    |
| Savings Plans                                |                                 | Instance type           | m4.large                     |                            |                         |                | IPv6 IPs      | 1                  |                              |                     |                        |           |      |    |
| Reserved Instances                           |                                 | Finding                 | You may not h<br>AWS Compute | ave permissi<br>Optimizer. | ion to access           |                | Elastic IPs   | 13.56.6            | 0.225*                       |                     |                        |           |      |    |
| Dedicated Hosts New                          |                                 | Private DNS             | 121                          |                            |                         | Avai           | lability zone | us-west            | -1b ඔ                        |                     |                        |           |      |    |
| Capacity Reservations                        |                                 | Private IPs             | 39.0.1.172                   |                            |                         | Sec            | urity groups  | A10 Sup<br>inbound | oport Login<br>I rules. viev | V2 Secu<br>v outbou | rity Group<br>nd rules | . view    |      |    |
| ▼ IMAGES                                     | Se                              | condary private IPs     |                              |                            |                         | Schee          | duled events  | No sche            | duled ever                   | nts                 |                        |           |      |    |

From the above-mentioned window, view the information about all instances or establish a connection to the instance. Select a vThunder instance and click on any of the tabs near the bottom of the window for information about the instance. The tabs are described as follows:

- **Description** View details about an instance.
- Status Checks Create a status check.
- Monitoring Set up an alarm that is based on CPU utilization rates, disk usage, or other parameters.
- Tags Edit the tags for an instance.

Now that the vThunder instance is launched, you can access the instance by using either the GUI or CLI.



# Accessing vThunder

The following are the prerequisite to access vThunder by using either the CLI or the GUI:

- The default management IP address is the Elastic IP associated with the IP of the first interface (eth0). To assign the elastic IP, refer to Elastic IP Address.
- SSH access is enabled by default on the management interface only and disabled by default on all data interfaces. SSH access uses the key-pair defined in <u>Step 7</u>.
   <u>Review the Configuration Changes</u>. Configure your SSH client accordingly for CLI access.

**NOTE:** For accessing GUI, the instance ID is the default password.

## **Elastic IP Address**

Once the VPC instance is launched into a public subnet — a subnet that has a route to an Internet gateway. However, the instance in the subnet also needs a public IPv4 address to be able to communicate with the Internet.

**NOTE:** By default, an instance in a non-default VPC is not allocated to a public IPv4 address.

#### Associating an Elastic IP Address

To allocate an Elastic IP address to the account, and then associate it with the above created instance, perform the following:

 In the Services navigation pane, navigate to Networking & Content Delivery > VPC > Elastic IPs menu open.



Figure 47 : Elastic IPs window

| The by VFG.          |    |                        |                            |                   |                  |                      |          | <u> </u>           |        |
|----------------------|----|------------------------|----------------------------|-------------------|------------------|----------------------|----------|--------------------|--------|
| Q Select a VPC       | Ε. | Q Filter by tags and a | ttributes or search by key | word              |                  |                      |          | I< ≤ 1 to 11 of 11 | > >    |
| VIRTUAL PRIVATE      |    | Name -                 | Elastic IP *               | Allocation ID 🔹   | Instance 👻       | Private IP address - | Scope -  | Association ID 🔹   | Netwo  |
| Your VPCs            |    |                        | 13.52.63.73                | eipalloc-082f6100 | i-01b62045459bfa | 40.30.20.141         | vpc      | eipassoc-04fd73b   | eni-26 |
| Subnets              |    |                        | 13.52.65.41                | eipalloc-0e308961 | i-049119ad1071f2 | 40.30.10.98          | vpc      | eipassoc-0ca7a51   | eni-C1 |
| Route Tables         |    |                        | 13.52.66.87                | eipalloc-05db71b3 | i-a0b61237       | 10.0.7.157           | vpc      | eipassoc-0c17f4e   | eni-21 |
| Internet Gateways    |    |                        | 13.56.25.131               | eipalloc-00e644ed | i-07aa45c1b71d2  | 40.30.20.7           | vpc      | eipassoc-0b55e29   | eni-CO |
| Egress Only Internet |    |                        | 13.56.60.225               | eipalloc-1448d429 | i-0bc1fee87ca1a3 | 39.0.1.172           | vpc      | eipassoc-067b8ae   | eni-C5 |
| DHCP Ontions Sets    |    |                        | 13.57.170.111              | eipalloc-03223b4c | i-0577463072ef2f | 40.30.10.82          | vpc      | eipassoc-0b651a2   | eni-C3 |
| Elastic IPs          |    |                        | 184.169.168.205            |                   | -                |                      | standard | 1.71               |        |
| Endpoints            |    |                        | 50.18.211.232              | eipalloc-dbfd9fb2 | i-06579a7241ebe  | 40.30.10.12          | vpc      | eipassoc-08410bf   | eni-Oc |
| Endpoint Services    |    |                        | 52.52.31.97                | eipalloc-0a98416d | i-07c7297c5716d  | 40.30.10.27          | vpc      | eipassoc-05ea8ae   | eni-0t |
| NAT Gateways         |    | 1                      | 52 8 166 231               | einalloc-d1dd9ceb | i-0931f6576a40b0 | 172 16 1 45          | VOC      | einassoc-06ba5c2   | entr   |

2. Select the Allocate new address tab, then Allocate.

Figure 48 : Allocate new address window

| Addresses > Allocate new address               |                                      |  |
|--|--------------------------------------|--|
| Allocate new address                           |                                      |  |
| Allocate a new Elastic IP address by selecting | g the scope in which it will be used |  |
| Scope  | VPC Classic                          |  |
| IPv4 address pool 🕚                            | Amazon pool<br>Owned by me           |  |
| * Required                                     | Cancel Allocate                      |  |

- **NOTE:** If the user account supports EC2-Classic, first choose VPC.
- 3. Select the **Elastic IP address** from the Elastic IP list page, select the **Actions** tab, and then select the **Associate Address**. The Associate Address window is displayed.



#### Figure 49 : Associate address window

| Addresses > Associate address                 |   |                            |                  |  |
|---|---|----------------------------|------------------|--|
| Associate address                             |   |                            |                  |  |
| Select the instance OR network interface to   | o which you want to associate this Elastic IP address (1  | 3.57.170.111)              |                  |  |
| Resource type                                 | Instance  |                            |                  |  |
|   | Network interface   |                            |                  |  |
| Instance                                      | i-0577463072ef2f4bb                                       | С                          |                  |  |
| Private IP                                    | 40.30.10.82   | C 0                        |                  |  |
| Reassociation                                 | Allow Elastic IP to be reassociated if already attach     | ed 🚯                       |                  |  |
| Warning     If you associate an Elastic IP ac | ddress with your instance, your current public IP address | s is released. Learn more. |                  |  |
|   |   |                            |                  |  |
| * Required                                    |   |                            | Cancel Associate |  |

- 4. For the Resource type, ensure that **Instance** is selected. Select the **Instance** from the Instance list.
- 5. Select the corresponding private IP address.
- 6. Click the **Associate** tab to save and to associate the elastic IP address.
- **NOTE:** An Elastic IP address is a public IPv4 address that the user allocates to their account. It is associated with and from instances as required, and it's allocated to the user's account until the user chooses to release it.

#### Login to vThunder Instances

ACOS devices provide advance features for securing management access to the vThunder instances through:

- Login through CLI
- Login through GUI

**NOTE:** A10 Networks recommends that the basic security settings are done before assessing vThunder devices.

#### Login through CLI

To log into the CLI by using SSH, perform the following steps:



On a PC connected to a network that can access the vThunder management interface, open an SSH client.

- 1. On a PC connected to a network that can access the vThunder management interface, open an SSH client.
- 2. Locate the private key that you created in <u>Step 7. Review the Configuration</u> <u>Changes</u>.

The wizard automatically detects the key you used to launch the instance.

3. Use the following command to change the permissions on the file so that only the root user can read the key:

chmod 400 vThunderkp.pem

4. Connect to the AWS instance by using the elastic IP you associated in <u>Associating</u> an Elastic IP Address.

For example, if the elastic IP address is **10x.xx.xx.xxx**, run the following command:

ssh -i "vthunderkp.pem" admin@10x.xx.xx.

5. Generally, if this is the first time the SSH client has accessed the vThunder instance, the SSH client displays a security warning. Read the warning carefully, then acknowledge the warning to complete the connection. Press **Enter**.

The command prompt for the User EXEC level of the CLI is displayed:

vThunder(NOLICENSE)>

The User EXEC level allows you to enter a few basic commands, including some show commands as well as ping and traceroute.

- **NOTE:** The vThunder prompt indicates that the vThunder instance is not licensed.
- 6. To access the Privileged EXEC level of the CLI and allow access to all configuration levels, enter the enable command.

At the Password: prompt, press enter.

The command prompt for the Privileged EXEC level of the CLI is displayed as follows:

vThunder(NOLICENSE)#



7. To access the global configuration level, enter the configure command. The following command prompt is displayed:

vThunder(config)(NOLICENSE)#

### Login through GUI

Web access to the vThunder instance is supported on the Web browsers listed in <u>GUI</u> <u>Browser Support</u>.

Table 4 : GUI Browser Support

| Browser                              | Windows   | Linux     | MAC       |
|--------------------------------------|-----------|-----------|-----------|
| IE 10.0 and<br>higher                | Supported | N/A       | N/A       |
| Firefox 40.0.3<br>and higher         | Supported | Supported | N/A       |
| Chrome<br>45.0.2454.93<br>and higher | Supported | Supported | Supported |

A screen resolution of at least 1024x768 is recommended.

To access the vThunder instance by using the GUI, perform the following steps:

- 1. Open a supported web browser.
- 2. In the URL field, enter the IP address of the management interface of the vThunder instance.
- 3. If the browser displays a certificate warning, select the option to continue.

```
NOTE: To prevent the certificate warning from appearing in the future, you can install a certificate signed by a Certificate Authority.
```

A login page is displayed as shown in <u>Figure 50</u>. The name and appearance of the dialog depend on the browser you are using and the specific device which you are trying to access.

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Figure 50 : Example GUI Login Dialog

|   | Thunder Series |       |
|---|----------------|-------|
|   | Usemame        |       |
|   | Password       |       |
| a | _              | Login |

4. Enter your default username admin and default password and click Login. The default password is the instance-id as shown in Figure 51 below.

Figure 51 : Default GUI Password

| Instance: i-0185ef049c28c | De29 (VRRP-server) Elastic IP: 107.23.78.181      | 0.00                  |                         |
|---------------------------|---|-----------------------|-------------------------|
| Description Status Che    | cks Monitoring Tags                               |                       |                         |
| Instan                    | e ID i-0185ef049c28c0e29 the default GUI password | Public DNS (IPv4)     | terrer and a second     |
| Instance                  | tate remained                                     | IPv4 Public IP        | 107.23.78.181           |
| Instance                  | type c3.large                                     | IPv6 IPs              | -                       |
| Elasti                    | IPs 107.23.78.181*                                | Private DNS           | -                       |
| Availability              | one us-east-1d                                    | Private IPs           | 10.0.11.43, 10.0.10.118 |
| Security gr               | ups QA-Verify .view inbound rules                 | Secondary private IPs |                         |
| Scheduled ev              | ents No scheduled events                          | VPC ID                | vpc-70064b1b            |

The Dashboard is displayed as shown in Figure 52, showing at-a-glance information for your vThunder instance. You can access this page again at any time while using the GUI by selecting the **Dashboard**. Refer to the GUI online help for detailed information about this and all other GUI screens.



#### Figure 52 : Dashboard

| ysielli Abo o   | and the and the approximately and the second s |                       |   |  |   |
|---|--|-----------------------|---|--|---|
| ashboard >> Syste   | em   |                       |   | Edit 🖸   | Help  |
| System Info   | ×  | Realtime Memory Usage | × | Data CPUs  | ×   |
| AX5100 4<br>HD Primary: 4<br>HD Secondary: 2<br>Up Time: 4<br>Last Configured: 7<br>Serial Number: 4<br>aFlex Version: 2<br>Emmuser Version: 4                        | 4.1.0 build 125<br>4.1.0 Build 125(*)<br>2.6.1-GR1-P7 Build<br>10 days, 2 hrs, 46 n<br>Aug-3-2015, 19:17<br>AX51051110360016<br>2.0.0<br>0 26  | 60.7%                 |   | 100%<br>50%<br>0% 1Sec 5Sec 10Sec 30Sec 60Sec 11/4 | atal<br>ata2<br>ata3<br>ata4<br>ata4<br>ata5<br>4 V |
|   | 4.2.0  |                       |   |  |   |
| Device Info   | <b>X</b>   | Control CPU           | × | Front Bezel  | 3   |
| Device Info<br>CPU Count/Status:<br>CPU Temperature:<br>Memory:<br>Disk:<br>Fan Status:<br>System Voltage:<br>Power Supply:   | 16 /All ok           40C / 104F           9.4 GB Free / 24.1           50.55 GB Free / 55           6 fans are down           All Voltage OK           1 power supply is c   | Control CPU           | × |  |   |
| Device Info<br>CPU Count/Status:<br>CPU Temperature:<br>Memory:<br>Disk:<br>Fan Status:<br>System Voltage:<br>Power Supply:<br>Memory Usage                           | X<br>16 /All ok<br>40C / 104F<br>9.4 GB Free / 24.1<br>50.55 GB Free / 55<br>6 fans are down<br>All Voltage OK<br>1 power supply Is c  | Control CPU           | × | Front Bezsl  | 3   |
| Device Info<br>CPU Count/Status:<br>CPU Temperature:<br>Memory:<br>Disk:<br>Fan Status:<br>System Voltage:<br>Power Supply:<br>Memory Usage<br>15.2G<br>15.1C<br>15.C | x<br>16 /All ok<br>40C / 104F<br>9 4 GB Free / 24 1<br>50.55 GB Free / 24 1<br>50.55 GB Free / 55<br>6 fans are down<br>All Voltage OK<br>1 power supply is c  | Control CPU           | × | Front Bezel  | pul<br>pu2<br>pu3<br>pu4<br>pu5                     |

**NOTE:** GUI management sessions are not automatically terminated when user closes the browser window. The session remains in effect until it times out. To immediately terminate a GUI session, click the Sign Out icon in the menu bar.

### Configuring DHCP and the VIP in vThunder

To configure DHCP and the VIP for the vThunder Instance, perform the following:

- 1. SSH to the Elastic IP of the vThunder instance.
- 2. Use the following CLI commands to force the interfaces to use the private IP that was assigned by DHCP:

```
interface ethernet 1
    ip address dhcp
interface ethernet 2
    ip address dhcp
```



3. Use the following commands to configure the vThunder to use the private IP (assigned to the interface by DHCP) as the VIP:

```
slb virtual-server v1 <IP>
port 80 tcp
service-group http-sg1
```

In this case, the IP address that is configured here needs to be added as the "secondary IP address" from the AWS GUI.

- 4. To configure additional private IPs, (which are necessary for adding VIPs to your vThunder instance), do the following:
  - a. In the AWS management console, add additional private IPs on the client-side interface. Right-click the instance, and then select Manage Private IP addresses from the drop-down menu.
  - b. Associate the Elastic IPs with the recently-added private IPs.
  - c. From within vThunder, directly configure the private IP as a VIP by using the following CLI commands:

```
slb virtual-server v2 10.0.1.11
port 80 tcp
service-group http-sg2
```

# **Changing Source or Destination Checks**

By default, each EC2 instance performs source or destination checks for all instances. For any instance has the source or destination of any traffic that it sends or receives. However, a NAT instance enables one to send and receive traffic when the source or destination is not itself. Therefore, disable the source/destination checks on the NAT instance.

### **Disabling Change Source or Destination Checks**

Disabling source and destination checking are required to make EC2 ignore the checks while operating as NAT type of interface.

To disable source or destination checking using the console, perform the following:

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- 1. Navigate to the EC2 dashboard (at left) and then scroll down and click the **Network Interfaces** link.
- 2. Select the required Elastic Network Interface (ENI) and then click the **Actions** drop-down button and select **Change Source/Dest Check**, as shown below.

| aws Services                                 | 🗸 Resource Groups 🖌 🛧                 |                                     |                    |                          | Δ  | ~ I                | N. California 👻 Suppor                     | t •                                      |
|--|---------------------------------------|-------------------------------------|--------------------|--------------------------|--|--------------------|--|--|
| New EC2 Experience<br>Tell us what you think | Create Network Interface Atta         | ch Detach Delete Act                | tions 👻            |                          |  |                    | ∆ ≎  | ¢ 0                                      |
| Volumes 🔺                                    | Q. Filter by tags and attributes or s | search by keyword                   |                    |                          |  | 6                  | K < 1 to 50 of 39                          | o > >                                    |
| Snapshots<br>Lifecycle Manager               | Name - Network in                     | nterfi + Subnet ID - VPC            | C ID 👻             | Zone -                   | Security groups                          | Description -      | Instance ID                                | Status                                   |
| VETWORK &                                    | eni-00251a                            | 708                                 | -                  | us-west-1b<br>us-west-1c | vthunder-ha1-Secur<br>tomi-vpc           | Primary netwo      | i-09a7b66e944210dbc<br>i-0931f6576a40b0c3d | <ul> <li>indus</li> <li>indus</li> </ul> |
| Security Groups New                          | SUM_CI_AX eni-0027a                   | Attach                              | 5b32242            | us-west-1b               | -SecurityGr                              | ataf-iface         |  | 🔵 avai                                   |
| Elastic IPs New                              | eni-003300                            |                                     | 13eebf5            | us-west-1b               | vthunder-ha1-Secur                       | nkumar_data        |  | 🔵 avai                                   |
| Placement Groups New                         | eni-00371                             | Delete                              | 13eebf5            | us-west-1b               | vthunder-ha1-Secur                       |                    | i-0e71f4a5668de2346                        | 🔵 in-us                                  |
| Key Pairs New                                | eni-004490                            | Associate Address                   | e47b40b            | us-west-1b               | yun-internal                             | test-vthunder      | i-0b2119b3b481c3c54                        | in-us                                    |
| Network Interfaces                           | eni-004591                            |                                     | 13eebf5<br>5b32242 | us-west-1b               | vthunder-ha1-Secur<br>Kalpanai-SecurityG | Primary netwo      | i-03b3b6bb589d64cc9                        | in-us                                    |
| ▼ LOAD BALANCING                             | 1                                     | Change Security Groups              | 1 222 12           |                          | K I O I O                                |                    |  | - t                                      |
| Load Balancers                               | Network Interface: eni-0027ad48       | Change Source/Dest. Check           |                    |                          |  |                    |  |  |
| Target Groups                                | Details Flow Logs Tags                | Add/Edit Tags<br>Change Description |                    |                          |  |                    |  | - 1                                      |
| AUTO SCALING     Launch Configurations       | Network interface ID                  | Create flow log                     |                    |                          | Subnet ID                                | subnet-0c9a86116be | 457fb5                                     |  |
| Auto Scaling Groups                          | VPC ID                                | vpc-25b32242                        |                    |                          | Availability Zone                        | us-west-1b         |  | -  |

Figure 53 : Select the ENI

The selected Elastic Network Interfaces are displayed in a dialog box, as shown below.

Figure 54 : Change Source/Dest Checking (Disabled)

| Network Interface  | eni-0027ad48e9987486c |
|--------------------|-----------------------|
| Source/dest. check | ○ Enabled             |
|                    | Disabled              |

- 3. For the selected ENI, select the **Disabled** radio button for **Source/Dest Check**.
  - **NOTE:** There are two elastic interfaces associated with this instance. A10 Networks recommends disabling the **Source/Destination Check** for both of them.

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4. Click **Save** to save the changes.

Starting from ACOS 4.1.4-P2, configuring vThunder in High Availability (HA) mode is supported for AWS. HA is supported within the availability zone.

High availability refers to systems that are durable and likely to operate continuously without failure for a long time. vThunder already supports VRRP to make it highly available. It requires a minimum of two network nodes as VRRP creates one master (active) instance and at least one backup/ standby instance. VRRP-A determines the Active or Standby status based on received weight priority information. When an active vThunder instance has fail-over, then VRRP-A determines the Active or Standby status based on received weight information. The AWS cloud's elastic IP address (EIP) is mapped to the secondary IP address (VIP) of the data interface. During fail-over, the EIP and the VIP move from the active vThunder instance to the standby vThunder instance, making it the new active instance.

Configuring vThunder for HA in an AWS environment requires access to the <u>AWS</u> Access Key ID and Secret Access Key.

The following topics are covered:

| AWS Access Key ID and Secret Access Key        | 60 |
|--|----|
| Importing AWS Access Key and Secret Access Key | 60 |
| AWS HA Architecture                            | 61 |
| Configuring HA                                 | 63 |



# AWS Access Key ID and Secret Access Key

The AWS Access Key ID and AWS Secret Access Key are special tokens that enable AWS to connect to a customer account by using a secure REST or Query protocol API.

Perform the following steps to locate the keys:

- 1. Log in to your AWS Management Console.
- 2. Click on the user name at the top right of the page and then click the **Security Credentials** link from the drop-down menu.
- 3. In the Access Credentials section, copy the latest Access Key ID.
- 4. Click on the **Show** link and copy the Secret Access Key.
- 5. Save both of the keys in the following format in a file:

```
[default]
aws_access_key_id = <Access Key ID>
aws secret access key = <access key>
```

### Importing AWS Access Key and Secret Access Key

Each vThunder instance requires a copy of the AWS Access Key and AWS Secret Access Key. User with administrative privilege can perform the following steps:

- 1. Log into the vThunder instance.
- 2. Go to the config mode.

```
vThunder> enable
Password:
vThunder#config
```

3. Go to the admin mode.

```
vThunder(config)#admin ?
   admin
   NAME<length:1-31> System admin user name
vThunder(config)#admin admin
```



4. Import the AWS Access key by using any of the recommended file transfer methods.

```
vThunder(config-admin:admin)#aws-accesskey import ?
use-mgmt-port Use management port as source port
tftp: Remote file path of tftp: file system(Format:
tftp://host/file)
ftp: Remote file path of ftp: file system(Format: ftp://
[user@]host[:port]/file)
scp: Remote file path of scp: file system(Format: scp://
[user@]host/file)
sftp: Remote file path of sftp: file system(Format: sftp://
[user@]host/file)
```

#### For example

vThunder(config-admin:admin)#aws-accesskey import scp://john@40.30.20.166:/home/john/credentials latest

**NOTE:** To delete the AWS Access key, use the aws-accesskey delete command. This feature is available form ACOS 4.1.4-P3 release onwards.

# AWS HA Architecture

High Availability for vThunder instances in AWS is supported only for the same availability zone. In a sample HA architecture, launch two vThunder instances in the same availability zone. Both the vThunder instances require at least one management interface and one data interface.

#### To achieve HA the following configurations are required:

- Ensure to select the re-assignment option while creating the secondary IP address so that the IP address can be directly assigned to a standby VM during fail-over without explicitly un-assigning it from the active vThunder.
- **NOTE:** Inactive vThunder, a secondary IP address is for the client-facing data interface.



- Assign the elastic IP address to the management interface and to the secondary IP address assigned to the data interface (VIP). Also, assign the elastic IP address to the management IP address of the standby vThunder.
- Select the "Re-association" option, while associating an elastic IP address to the secondary interface to allow the association of the IP address even when it is already associated to some other VM.
- Additionally, each vThunder instance requires a copy of the AWS Access Key and AWS Secret Access Key. For more information, see <u>Importing AWS Access Key and</u> <u>Secret Access Key</u>.
- NOTE: In ACOS 5.2.1-P7 and later releases, the ip control-apps-use-mgmtport command controls the outgoing interface for vThunder device API calls. If this command is enabled, API uses the management interface. Otherwise, it uses the data interface. In the previous releases, the outgoing interface used the route settings for API calls.

The following is an architectural representation of the HA architecture and how the migration happens from an active HA instance to a standby HA instance.

In <u>Figure 55</u>, for the red box which is the data port of the active vThunder, there is also a secondary IP address assigned, and the EIP is mapped to the secondary IP address. The VIP is a logical name for these IP addresses.

| Se                             | rver Network  |  |
|--------------------------------|---------------|--|
|                                | _             |  |
| _                              | VRRP          |  |
| Active vThunder                | Mgmt          | Standby vThunder   |
| Secondary IP / VIP/ Elastic IP | Client Networ | k State Stat |
|                                |               | Migration using AWS API  |

Figure 55 : AWS HA Architecture



# Configuring HA

The example discussed in this section uses two vThunders for HA. Each vThunder instance is configured to run a simple SLB configuration. Make appropriate changes in the steps if the vThunders are running a different configuration.

Perform the following steps:

- Create two vThunders in a VPC.
   Each vThunder must have one management interface and one or more data interfaces.
   For more information, refer to Launching vThunder on AWS.
- Create a secondary IP address and assign it to the client-facing data interface on the active vThunder. Ensure that you select the **re-assignment** option. To assign a secondary private IPv4 address to a network interface:
  - a. Open the Amazon console.
  - b. Select **Network Interfaces**, and then select the network interface attached to the instance and configured as the data interface.
  - c. Select Actions > Manage IP Addresses.
  - d. Under IPv4 Addresses, select Assign new IP.
  - e. Enter a specific IPv4 address which is within the subnet range for the instance.
  - f. Select Allow reassignment.
  - g. Select Yes, Update.
- 3. Assign an elastic IP (EIP) to the secondary network interface. Select the **Re**-association option.

To associate an elastic IP address with a secondary private IPv4 address:

- a. Open the Amazon EC2 console.
- b. In the navigation pane, select Elastic IPs.
- c. Select Actions > Associate address.
- d. Select the network interface, and then select the secondary IP address from



the Private IP list.

- e. Select Associate.
- Associate the Elastic IP address with both the management interfaces of the active and standby vThunders. To associate an elastic IP address with a secondary private IPv4 address:
  - a. Open the Amazon EC2 console.
  - b. In the navigation pane, select **Elastic IPs**.
  - c. Select Actions > Associate address.
  - Select the network interface, and then select the management IP address from the private IP list.
  - e. Select Associate.
- 5. Complete the SLB configuration on both the vThunder instances. This configuration includes:
- Creating a real server with L4 port and protocol defined.
- Creating a service group with the already created virtual server as a member.
- Create a virtual server referencing the service group with a VIP IP address defined. The VIP IP address is the secondary IP address created on the data interface.
- Completing the VRRP configuration on both the vThunder instances to use unicastbased VRRP.
- **NOTE:** For more information on the ACOS configuration of the vThunder instances, see <u>Sample ACOS Configuration for Active vThunder</u> and <u>Sample ACOS Configuration for Standby vThunder</u>.
- Under admin user (admin XYZ), use the aws-accesskey import <file path> command to import the keys to each vThunder instance.

#### Sample ACOS Configuration for Active vThunder

The following is the consolidated ACOS configuration for the active vThunder with VRRP and SLB configured.

vrrp-a common



```
device-id 1
 set-id 1
 enable
1
interface ethernet 1
 enable
 ip address dhcp
T.
vrrp-a vrid O
 floating-ip 10.0.2.229
1
vrrp-a peer-group
 peer 10.0.2.41
 peer 10.0.2.22
T.
ip route 0.0.0.0 /0 10.0.1.1
slb server s1 10.0.2.230
 health-check-disable
 port 80 tcp
 health-check-disable
slb service-group sg1 tcp
health-check-disable
member s1 80
L.
slb virtual-server vip 10.0.2.228
 port 80 http
 source-nat auto
 service-group sgl
```

#### Sample ACOS Configuration for Standby vThunder

The following is the consolidated ACOS configuration for the standby vThunder with VRRP and SLB configured.

```
vrrp-a common
device-id 2
set-id 1
enable
```



```
!
interface ethernet 1
 enable
ip address dhcp
1
vrrp-a vrid O
floating-ip 10.0.2.229
!
vrrp-a peer-group
peer 10.0.2.41
peer 10.0.2.22
!
ip route 0.0.0.0 /0 10.0.1.1
1
slb server s1 10.0.2.230
health-check-disable
port 80 tcp
 health-check-disable
slb service-group sg1 tcp
health-check-disable
member s1 80
1
slb virtual-server vip 10.0.2.228
port 80 http
 source-nat auto
 service-group sg
```

This section provides information about the initial vThunder configuration.

The following topics are covered:

| About Licensing the vThunder Instance         | 68 |
|---|----|
| Changing the Admin Password                   |    |
| Saving the Configuration Changes—Write Memory |    |
| Configuring vThunder on AWS as an SLB         | 69 |



# About Licensing the vThunder Instance

A10 Networks offers different types of licenses for your vThunder instance. If you opted for a BYOL license, contact A10 Sales for more information.

The GLM is the master licensing system for A10 Networks. The GLM is managed by A10 Networks and is the primary portal to view licensing information, device status, and data usage for the ACOS devices. The GLM collects information from ACOS devices and issues licenses upon request. The GLM provides a GUI view and manages advanced licensing functions. Creating a GLM account is optional. Users can use the CLI to license the ACOS devices. However, a GLM account enables us to perform advanced licensing functions. The GLM GUI is available at <a href="https://glm.a10networks.com">https://glm.a10networks.com</a>.

## Changing the Admin Password

A10 Networks recommends changing the admin password immediately for security.

vThunder(config)# admin admin password newpassword
vThunder(config)#

**NOTE:** The vThunder is now network accessible for configuration under the new IP address and admin password.

## Saving the Configuration Changes—Write Memory

Configuration changes must be saved to system memory to take effect the next time the vThunder is powered on. Otherwise, the changes are lost if the vThunder virtual machine or its host machine is powered down.

To write the current configuration to system memory, run the following command:

```
vThunder(config)# write memory
Building configuration...
[OK]
```

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# Configuring vThunder on AWS as an SLB

The following image is a simple topological example of configuring vThunder on AWS as an SLB. In this example, the vThunder device is inserted directly between the gateway router and the real servers. Requests from clients for virtual server 10.0.10.100 are routed by the Layer 3 router to the vThunder device, which then selects a real server and sends the request to that server. The server reply passes back through the vThunder device to the client.

To configure the vThunder instance on AWS as an SLB, perform the following:

- Creating the vThunder Instance
- Configuring the Interfaces
- Configuring the vThunder ACOS

#### Creating the vThunder Instance

Follow the procedure in Launching a vThunder Instance on AWS to create the vThunder instance. While creating the instance, create three interfaces. Follow the procedure in Step 3. Configure the Instance to create the following three interfaces required for this SLB solution:

- eth0 is the management interface.
- eth1 and eth2 are the data interfaces connected to the real servers.

## Configuring the Interfaces

Make sure all the interfaces are in different subnets. Make sure the primary interface (eth0) is in the public Internet-facing subnet for management.

To create each extra interface, click **Add Device**. For each interface, you can specify the primary IP address and a secondary IP address.

After the vThunder instance is created, you can now associate an elastic IP address to the vThunder instance. This is the IP address that is presented to the Internet by the SLB solution. Additionally, there is also the private IP address for the vThunder instance. In this example, this is 10.0.10.100. After assigning the elastic IP address,



you can associate the private IP address and the elastic IP address. For more information, see <u>Elastic IP Address</u>.

## Configuring the vThunder ACOS

Perform the following steps on the vThunder device by using the CLI.

1. Enable the interfaces that connect the real servers to the vThunder by performing the following commands:

```
ACOS(config)# interface ethernet 1
ACOS(config-if:ethernet:1)# enable
ACOS(config-if:ethernet:1)# ip address dhcp
ACOS(config-if:ethernet:1)# exit
ACOS(config)#
ACOS(config)# interface ethernet 2
ACOS(config-if:ethernet:2)# enable
ACOS(config-if:ethernet:2)# ip address dhcp
ACOS(config-if:ethernet:1)# exit
```

2. Configure the real servers and ports by performing the following commands:

```
ACOS(config)# slb server sl 10.0.20.2

ACOS(config-real server)# port 22 tcp

ACOS(config-real server-node port)# port 80 tcp

ACOS(config-real server)# exit

ACOS(config)real server)# exit

ACOS(config)#

ACOS(config)# slb server s2 10.0.20.3

ACOS(config-real server)# port 22 tcp

ACOS(config-real server-node port)# port 80 tcp

ACOS(config-real server-node port)# exit

ACOS(config-real server)# exit

ACOS(config-real server)# exit

ACOS(config-real server)# exit
```

3. Configure the service group and add the real servers by performing the following commands:

```
ACOS(config)# slb service-group sg-http tcp
ACOS(config-slb svc group)# health-check Check.txt
ACOS(config-slb svc group)# member sl 80
```

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```
ACOS(config-slb svc group-member:80)# member s2 80
ACOS(config-slb svc group-member:80)# exit
ACOS(config-slb svc group)# exit
```

4. Configure the virtual server by performing the following commands:

```
ACOS(config)# slb virtual-server VIP-1 10.0.10.100
ACOS(config-slb vserver)# port 80 http
ACOS(config-slb vserver-vport)# source-nat auto
ACOS(config-slb vserver-vport)# service-group sg-http
ACOS(config-slb vserver-vport)# exit
ACOS(config-slb vserver)# exit
```

This section provides an overview of installing and configuring AWS GovCloud.

The following topics are covered:

| Overview                     |    |
|------------------------------|----|
| Features                     | 73 |
| Running vThunder in GovCloud |    |


### Overview

According to the AWS website: "AWS GovCloud (US) is an AWS region designed to allow US government agencies at the federal, state and local level, along with contractors, educational institutions and other US customers to run sensitive workloads in the cloud by addressing their specific regulatory and compliance requirements. Beyond the assurance programs applicable to all AWS regions, the AWS GovCloud (US) region allows customers to adhere to U.S. International Traffic in Arms Regulations (ITAR) regulations, the Federal Risk and Authorization Management Program (FedRAMP) requirements and Department of Defense (DoD) Cloud Computing Security Requirements Guide (SRG) Levels 2 and 4."

For more information about AWS GovCloud (US), see <a href="https://aws.amazon.com/govcloud-us/faqs/">https://aws.amazon.com/govcloud-us/faqs/</a>

vThunder for AWS GovCloud is an AMI that is available through AWS. Customers can use this AMI for load balancing traffic in the AWS GovCloud region. The vThunder for AWS GovCloud instance helps facilitate the collaboration of GovCloud (US) stakeholders at the federal, state, and local levels by increasing the speed and reliability of sensitive workloads in the cloud.

# Features

The following are the features for AWS GovCloud:

- Licensing vThunder for AWS GovCloud supports a BYOL licensing model. Unlike the AWS marketplace, GovCloud does not support an hourly rental model.
- Supported ACOS Releases vThunder for AWS GovCloud is supported from ACOS 4.1.0-P3 onwards.
- Supported Regions AWS GovCloud is only available for US government agencies.

# Running vThunder in GovCloud

There are several steps involved in the process of running vThunder in the AWS GovCloud, listed as follows:

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Step 1. Launch the vThunder AMI

Step 2. Apply for the vThunder BYOL license

Step 3. Configure the vThunder instance.

#### Step 1. Launch the vThunder AMI

Launch the vThunder Amazon Machine Image (AMI), which is available as a public image from the EC2 dashboard, as shown in Figure 56.

Figure 56 : Search EC2 Dashboard for keywords: "vThunder AMI image"

| EC2 Dashboard<br>Events | Launch Actions *        |                                      |              |                  |                  |                  | 0 ¢       |
|-------------------------|-------------------------|--------------------------------------|--------------|------------------|------------------|------------------|-----------|
| lags                    | Public images v Q searc | h : vthunder 💿 Add filter            |              |                  | •                |                  | 1 of 1 >  |
| Limits                  | Namo                    | AMI Namo                             | AMUD         | Source           | Owner            | Visibility       | Status    |
| INSTANCES               | Name                    | Ami Name                             | - AMILID     | Source           | Owner            | visibility       | Status    |
| Instances               | A10-vThunder-410-P3-38  | A10-vThunder-410-P3-38               | ami-affc44ce | 215214268367/    | 215214268367     | Public           | available |
| Reserved Instances      |                         |                                      |              |                  |                  |                  |           |
| Dedicated Hosts         |                         |                                      |              |                  |                  |                  |           |
| MAGES                   |                         |                                      |              |                  |                  |                  |           |
| AMIs                    |                         |                                      |              |                  |                  |                  |           |
| Bundle Tasks            | Image: ami-affc44ce     |                                      |              |                  |                  |                  |           |
| ELASTIC BLOCK STORE     | Details Permissions     | Tags                                 |              |                  |                  |                  |           |
| Volumes                 | AMI ID                  | ami-affc44ce                         |              | AMI Name         | A10-vThunder-410 | -P3-38           |           |
| Snapshots               | Owner                   | 215214268367                         |              | Source           | 215214268367/A1  | 0-vThunder-410-I | P3-38     |
| NETWORK & SECURITY      | Status                  | available                            |              | State Reason     | -                |                  |           |
| Security Groups         | Creation date           | October 12, 2016 at 2:47:07 PM UTC-7 |              | Platform         | Other Linux      |                  |           |
| Elastic IPs             | Architecture            | x86_64                               |              | Image Type       | machine          |                  |           |
| Placement Groups        | Virtualization type     | hvm                                  |              | Description      | A10-vThunder-410 | -P3-38           |           |
| Key Pairs               | Root Device Name        | /dev/sda1                            |              | Root Device Type | ebs              |                  |           |
| Network Interfaces      | RAM disk ID             | -                                    |              | Kernel ID        | -                |                  |           |

### Step 2. Apply for the vThunder BYOL license

Procure a vThunder BYOL license from the A10 Networks sales channel.

#### Step 3. Configure the vThunder instance.

The basic configuration for a vThunder instance is the same for AWS GovCloud as a regular vThunder instance. For more information about basic configurations, see <u>Monitoring and Configuring the vThunder Instance</u> and <u>Initial vThunder</u> <u>Configuration</u>.

# Advanced vThunder Configuration

This section describes advanced vThunder configuration for AWS.

#### The following topics are covered:

| About Shared Polling Mode                   | .76  |
|---|------|
| About Jumbo Frames                          | 79   |
| Dynamic Interface Attachment and Detachment | . 80 |
| Memory Support                              | 82   |

••••



# About Shared Polling Mode

ACOS release 4.1.4-GR1-P1 and later only supports shared polling mode<sup>1</sup> for deployments having a total number of CPUs less than four. From ACOS release 5.2.0 onwards, this support is also provided for deployments having a total number of CPUs greater than four.

When shared polling mode is enabled, both I/O and data processing both are performed by all the vCPUs except the control CPU. If there is no I/O and data processing task in the queue, then the system automatically switches the CPU to idle mode to conserve CPU cycles.

**NOTE:** This mode is only preferred when performance or latency is not the key criterion for the success and the user wants to maximize host CPU utilization due to multiple VMs running on it.

Table 5 : ACOS Modes and Selection Criteria

| Mode            | Behavior   | Criteria  | Additional<br>Requirements             | Performance         |
|-----------------|--|---|--|---------------------|
| Polling<br>Mode | In polling<br>mode, both I/O<br>and Data<br>threads<br>continuously<br>poll for the<br>packet and<br>process it.<br>This mode<br>always<br>consumes 100%<br>of the allotted<br>CPU cycles. | High<br>performance +<br>low latency<br>required,<br>combined with<br>SR-IOV. | Configure<br>CPU pinning<br>with NUMA. | High<br>Performance |

<sup>1</sup>This support is available on BareMetal and vThunder on KVM, ESXi, Hyper V, AWS, Azure, and OpenStack.



| Table 5 : ACOS Modes a | nd Selection Criteria |
|------------------------|-----------------------|
|------------------------|-----------------------|

| Mode                      | Behavior  | Criteria  | Additional<br>Requirements   | Performance                                     |
|---------------------------|---|---|--|---|
|                           | Note: System<br>poll mode is<br>default for<br>more than 4<br>vCPUs.  |   |  |   |
| Shared<br>Polling<br>Mode | When the<br>shared poll<br>mode is<br>enabled, I/O<br>and data<br>processing are<br>both<br>performed on<br>all cores except<br>the control<br>CPU. | Maximum<br>utilization of<br>CPU resources<br>with some<br>compromise on<br>latency and<br>performance. | The host<br>needs to<br>share physical<br>CPUs with<br>multiple VMs. | Lower CPU<br>cycles<br>consumed by<br>the host. |

# **NOTE:** The shared polling mode feature is supported for ACOS 5.2.0 and later versions.

#### Enabling Shared Polling Mode

By default, shared polling mode is disabled. The following procedure has to be followed to enable Shared Polling mode:

1. Use the following CLI command from global config mode:

vThunder(config)#system shared-poll-mode enable

2. Exit global config mode and reload the vThunder instance using the following command:

```
vThunder(config)#exit
vThunder#reload
```

After vThunder finishes reloading, Shared Polling Mode will be enabled.



3. To verify Shared Polling Mode is enabled on the vThunder instance, check the output from the "show system shared-poll-mode" command.

vThunder(config) # show system shared-poll-mode

#### For example,

```
A2# show system shared-poll-mode
Shared poll mode is enabled
A2#
```

4. CPU distribution can be viewed, with the "show cpu" command as shown below. From the output, it can be observed that no CPU does IO processing exclusively.

| vThunder#show cpu |             |      |       |       |  |  |  |
|-------------------|-------------|------|-------|-------|--|--|--|
| Time: Mar-2-2     | 2019, 01:39 |      |       |       |  |  |  |
|                   | lSec        | 5Sec | 10Sec | 30Sec |  |  |  |
| 60Sec             |             |      |       |       |  |  |  |
|                   |             |      |       |       |  |  |  |
|                   |             |      |       |       |  |  |  |
| Control1          | 15%         | 15%  | 14%   | 18%   |  |  |  |
| 18%               |             |      |       |       |  |  |  |
|                   |             |      |       |       |  |  |  |
| Datal             | 0%          | 0 %  | 08    | 0 %   |  |  |  |
| 0%                |             |      |       |       |  |  |  |
| Data2             | 0 %         | 0%   | 0%    | 0%    |  |  |  |
| 0%                |             |      |       |       |  |  |  |
| Data3             | 0 %         | 0%   | 0 %   | 0 %   |  |  |  |
| 0 %               |             |      |       |       |  |  |  |

#### For example,

#### **Disabling Shared Polling Mode**

The following procedure is followed to disable Shared Polling mode:

1. Use the following command from global config mode to **disable** shared polling mode:

For example:

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vThunder(config)#system shared-poll-mode disable

2. Exit global config mode and reload the vThunder instance using the following command:

```
vThunder(config)#exit
vThunder#reload
```

After vThunder finishes reloading, Shared Polling Mode will be disabled.

3. CPU distribution can be viewed, when shared poll mode is disabled with the "show cpu" command as shown below. From the output, it can be observed that some CPUs are designated for IO processing.

| vThunder(config)#show cpu<br>Time: Mar-2-2019, 01:37 |      |      |       |       |  |  |
|--|------|------|-------|-------|--|--|
|  | 1Sec | 5Sec | 10Sec | 30Sec |  |  |
| 60Sec  |      |      |       |       |  |  |
|  |      |      |       |       |  |  |
| Control1   | 20%  | 21%  | 21%   | 21%   |  |  |
| 220  |      |      |       |       |  |  |
| Data1<br>0%  | 0%   | 0%   | 0%    | 0%    |  |  |
| Data2  | 0%   | 0%   | 0%    | 0%    |  |  |
| 1/01   | 0%   | 0%   | 0%    | 0%    |  |  |
| _  |      |      |       |       |  |  |

#### For example:

**NOTE:** For one vCPU, the control and data usage are shown separately, but both share the same vCPU. The actual usage of the CPU is cumulative of control and data usage.

#### **About Jumbo Frames**

A jumbo frame is an Ethernet frame with a payload greater than the standard maximum transmission unit (MTU) of 1,500 bytes. This modification improves

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vThunder throughput and performance. Additional advantages of enabling jumbo frames include reduced interrupts and lower RAM utilization. For vThunder, jumbo frames are supported on ACOS 2.7.x, 2.8.x, 4.x, 5.x versions, and non-FTA platforms.

The following is a list of limitations and requirements for running jumbo frames for the vThunder-Intel and ENA devices:

- The vThunder instance must be running on top of an Intel 10Gb Ethernet Controller.
- Jumbo frames are not supported on 1Gb NICs.
- Supported jumbo frame packet types include: ICMP, UDP, and TCP.
- vThunder can support jumbo frame packets up to a maximum size of 9216 bytes.

### Enabling Jumbo Frames for vThunder

By default, jumbo frame support is disabled. Use the following appropriate CLI command to enable jumbo frame support on a vThunder data interface:

- For ACOS version 2.7.X: enable-jumbo
- For ACOS version 4.1.X: system-jumbo-global enable-jumbo

Set the MTU size on the vThunder data interface to a value ranging from 1500 to 9216 bytes. The configured value must be larger than any jumbo packet expected to arrive on that data interface. To disable Jumbo Frames, run the command no system-jumbo-global enable-jumbo.

# **Dynamic Interface Attachment and Detachment**

In virtualization and cloud platforms, dynamic interface detection is required to make the vThunder deployment easier. ACOS supports interface attachment and detachment when the VM is running and does not require a reboot.

The following are supported:

- Attaching or detaching one or more interfaces at the same time.
- Dynamic interface attachment and detachment is only for data interfaces.



• No impact on the existing interface functionality.

### **Platforms Supported**

Dynamic interface attachment is supported only on Openstack, AWS, and OCI platforms.

#### Known Issues or Limitations

- Hypervisor must support interface detachment.
- Management interface detachment is not supported.
- Users must clean the existing configuration of the detached interface.
- Detachment impacts ongoing data traffic on the network interface.
- Interface detachment must be followed by vThunder reload.
- There is a mapping between interface and pci-address. As the pci-addresses are sequential, if there are any gaps or holes, when the interfaces are added the pci-address gaps or holes are filled first.

#### Configuration

ACOS configuration supports the following:

- Remove and clean-up the information of the detached interface on vThunder.
- A reload of vThunder is required to make ACOS ready after the interface removal.

#### Attaching or Detaching Network Interface

To attach or detach a network interface, perform the following:

- 1. Select a VM that is in Running State.
- 2. Attach or detach a network interface from running vThunder using the hypervisor tool.
- 3. Run the following command to detect the attached or detached interface:



system probe-network-devices

4. Run the following command to reload vThunder:

reload

5. Run the following command to verify the newly added interface:

show interface brief

### **Memory Support**

vThunder devices support 128 GB memory and provision the resources to satisfy the high number of users and their throughput in a virtualized environment.

Both NUMAs inside the compute host are used for provisioning the resources. Memory allocation is 64 GB from NUMA0 and 64 GB from NUMA1. This feature supports all platforms with 2 NUMA, 128 GB memory, and 35 virtual CPUs.

**NOTE:** The memory allocation limits change according to available memory.

### Configuring vThunder on SLB or CGN

To configure vThunder and validate 128 GB memory support, perform the following:

1. Configure the vThunder on SLB or CGN.

For example

Configure vThunder with SLB as:

```
slb server s1 <Server-IP>
port 80 tcp
slb server s2 <Server-IP>
port 80 tcp
slb service-group sg1 tcp
member s1 80
member s2 80
```





```
slb virtual-server Platform-vip <VIP>
port 80 tcp
source-nat auto
service-group sg1
```

#### Configure vThunder with CGN as:

```
interface ethernet {cli}
enable
ip address <Datal-IP> <net mask>
ip nat inside
interface ethernet {srv}
enable
ip address <Data2-IP> 2xx.xxx.xx.0
ip nat outside
class-list cgn_test
<cli_subnet> lsn-lid 1
cgnv6 lsn inside source class-list cgn_test
cgnv6 nat pool lsn-pool {pool} netmask /<net-mask>
cgnv6 lsn-lid 1
source-nat-pool lsn-pool
```

- 2. Verify 128 GB memory support for each vThunder instance in terms of vCPUs and increased application resources such as fixed-NAT public IP addresses, private users count, etc, perform the following:
  - a. Launch the vThunder system with 128GB memory and 35 vCPUs ACOS image.
  - b. Verify the limits using show system resource-usage and show cgvn6 resource-usage command.

```
vThunder(NOLICENSE)#sh system resource-usage
Resource Current Default Minimum
Maximum
```

Advanced vThunder Configuration



| 14-session-count                  | 12582912 | 12582912 | 3145728 |
|-----------------------------------|----------|----------|---------|
| 201326592                         |          |          |         |
| nat-pool-addr-count               | 10       | 10       | 10      |
| 15000                             |          |          |         |
| class-list-ipv6-addr-count        | 524288   | 524288   | 524288  |
| 1048576                           |          |          |         |
| class-list-ac-entry-count         | 65536    | 65536    | 65536   |
| 9216000                           |          |          |         |
| auth-portal-html-file-size        | 20       | 20       | 4       |
| 120                               |          |          |         |
| auth-portal-image-file-size       | 6        | 6        | 1       |
| 80                                |          |          |         |
| max-aflex-file-size               | 32       | 32       | 16      |
| 256                               |          |          |         |
| aflex-table-entry-count           | 102400   | 102400   | 102400  |
| 15728640                          |          |          |         |
| max-aflex-authz-collection-number | 512      | 512      | 256     |
| 4096                              |          |          |         |
| radius-table-size                 | 12000000 | 12000000 | 2000000 |
| 1200000                           |          |          |         |
| monitored-entity-count            | 32960    | 32960    | 32816   |
| 800288                            |          |          |         |
| authz-policy-number               | 128      | 128      | 32      |
| 2000                              |          |          |         |
| ram-cache-memory-limit            | 27648    | 27648    | 6912    |
| 27648                             |          |          |         |
| ipsec-sa-number                   | 30000    | 30000    | 120     |
| 30000                             |          |          |         |

#### cgn resource-usage

| vThunder#show cgn resource-usage |         |         |         |
|----------------------------------|---------|---------|---------|
| Resource                         | Current | Default | Minimum |
| Maximum                          |         |         |         |
|                                  |         |         |         |
|                                  |         |         |         |
| lsn-nat-addr-count               | 2048    | 2048    | 2048    |
| 20000                            |         |         |         |

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| fixed-nat-ip-addr-count     | 20480   | 20480   | 20480   |
|-----------------------------|---------|---------|---------|
| 512000                      |         |         |         |
| fixed-nat-inside-user-count | 256000  | 256000  | 256000  |
| 800000                      |         |         |         |
| radius-table-size           | 8000000 | 8000000 | 2000000 |
| 800000                      |         |         |         |
| vThunder#                   |         |         |         |

- c. Configure the maximum fixed-NAT IPs and inside users per the default limits and verify that they can be achieved. The default value is 30720k.
- d. Change the system resource for L4 sessions and reach the count.

**NOTE:** The accumulative L4 session count should be lesser than the current value. Every value don't exceed the current configured value.

e. Verify that the configured limits take effect only after reboot.

| NOTE: For some of the parameter update, reboot is not required<br>example<br>- auth-portal-html-file-size<br>- auth-portal-image-file-size<br>- max-aflex-file-size | . For |
|---|-------|
|---|-------|

- f. On reboot configure the Minimum maximum number of fixed-NAT IPs and inside *"User/RADIUS/IP-List"* value between pre-defined range (Min-Max).
- g. Reboot or reload the system to view the updated value.

The A10 Thunder Observability Agent is introduced to monitor A10 Thunder<sup>®</sup> Application Delivery Agent (ADC) performance metrics and syslogs.

There are two types of A10 Thunder Observability Agent available:

- Internal Thunder Observability Agent (iTOA)
- External Thunder Observability Agent (TOA)

**NOTE:** It is recommended to configure any one TOA at a time.

### Internal Thunder Observability Agent (iTOA)

This is an in-built Python plugin within ACOS which is configured using ACOS Command Line Interface (CLI) or aXAPI.

You can use iTOA for the following:

- For ACOS v6.0.1 or later.
- For configuring vThunder using aXAPI or CLI to publish the 14 performance metrics on AWS CloudWatch directly from vThunder with outbound internet connectivity.
- For configuring vThunder using aXAPI or CLI to publish the syslogs on:
  - AWS CloudWatch directly from vThunder with outbound internet connectivity.
  - Azure Log Analytics Workspace directly from vThunder with outbound internet connectivity to access '\*.microsoftonline.com' and '\*.azure.com'.
  - VMware vRealize Log Insight (vRLI) which is accessible from vThunder.
- For managing the data collection, processing, aggregation, and publishing internally for configured L3V partitions.
- For supporting maximum 20 partitions per vThunder instance.
- For publishing metrics or logs every 1 minute.



To configure the Internal Thunder Observability Agent for a vThunder deployed on AWS, see Internal Thunder Observability Agent.

# External Thunder Observability Agent (TOA)

This external plugin can be installed on Linux, CentOS, and Ubuntu platforms as a Python Plugin installation package and Docker containerization.

You can use TOA:

- For any ACOS deployment platform.
- For any ACOS software version.
- For a Thunder with outbound internet connectivity restrictions.

In this case, TOA can have outbound internet connectivity. It can collect data from Thunder and then publish the metrics and syslogs on the cloud monitoring tool through internet.

To install the external Thunder Observability Agent on AWS, see <u>External Thunder</u> <u>Observability Agent</u>.



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