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USER MANUAL

AWS CFT TEMPLATE 2NIC-1VM

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# 

# Introduction to Installing vThunder on AWS

vThunder for Amazon Web Services is a fully operational, software-only version of the ACOS Series Server Load Balancer (SLB), or Application Delivery Controller (ADC) device. It is configurable by ACOS CLI, GUI, AXAPI, and Harmony Controller. For more information see Virtual Instances in Harmony Controller.

vThunder is a virtual appliance, yet it retains most of the functionality available on the hard- ware based ACOS appliances. Managing vThunder is the same as managing hardware based ACOS device, and vThunder has the same CLI configurations and GUI presentation.

The networking configuration for vThunder is also like hardware based ACOS devices.

A10 Networks brings Out-Of-Box template to deploy vThunder along with multiple features and functionality with pre-defined format into amazon cloud.

Please refer below section for more details.

* Two Network Card Interface (2NIC).
* TLS/SSL Certification (SSL).
* Server Load Balancer (SLB)

# Overview of AWS

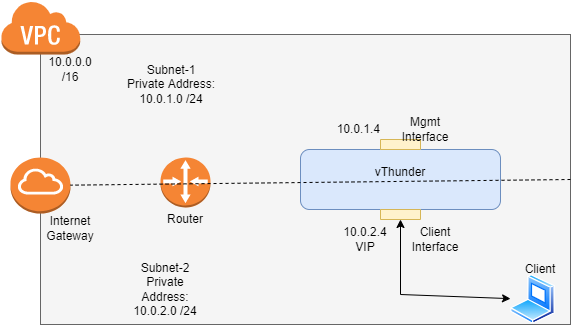
Amazon Web Services offers a broad set of global cloud-based products including compute, storage, databases, analytics, networking, mobile, developer tools, management tools, IoT, security, and enterprise applications: on-demand, available in seconds, with pay-as-you-go pricing. From data warehousing to deployment tools, directories to content delivery, over 200 AWS services are available. New services can be provisioned quickly, without the upfront fixed expense.

AWS uses the following tools to create and manage resources:

**AWS Portal** - A web console to create and monitor AWS resources. For more information: https://aws.amazon.com/console/

**AWS CLI—** The AWS CLI enables you to start running commands that implement functionality equivalent to that provided by the browser-based AWS Management Console from the command prompt in your terminal program:

* **Linux shells** – Use common shell programs such as [bash](https://www.gnu.org/software/bash/), [zsh](http://www.zsh.org/" \t "_blank), and [tcsh](https://www.tcsh.org/" \t "_blank) to run commands in Linux or macOS.
* **Windows command line** – On Windows, run commands at the Windows command prompt or in PowerShell.
* **Remotely** – Run commands on Amazon Elastic Compute Cloud (Amazon EC2) instances through a remote terminal program such as PuTTY or SSH, or with AWS Systems Manager. For more information: http//docs.aws.amazon.com/cli/index.html?nc2=h\_ql\_doc\_cli



# Aws Terminology

**Access control list (ACL):** A firewall/security layer on the subnet level. For more information <https://docs.aws.amazon.com/AmazonS3/latest/userguide/acls.html>

**CloudWatch:** Service that allows you to monitor various elements of your AWS account. For more information: <https://docs.aws.amazon.com/cloudwatch/index.html>

**Lambda:** Serverless computing that will replace EC2 instances, for the most part. For more information: <https://docs.aws.amazon.com/lambda/latest/dg/welcome.html>

**Security group (SG):** Firewall/security layer on the server/instance level. For more information <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-security-groups.html>

**Subnet:** A subsection of a network and generally includes all the computers in a specific location. For more information: <https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/aws-resource-ec2-subnet.html>

**Virtual Private Cloud (VPC):** A private subsection of AWS you control and in which you can place AWS resources. For more information: <https://docs.aws.amazon.com/vpc/latest/userguide/what-is-amazon-vpc.html>

# CloudFormation Template – 2NIC \_1VM

## Overview

CloudFormation template to create 2NIC 1 vThunder instance on AWS portal.

## Prerequisites

### AWS Account & Subscription.

Generate access\_key\_id and secret\_access\_key if you don’t have it. For more details visit:

<https://docs.aws.amazon.com/powershell/latest/userguide/pstools-appendix-sign-up.html>

### AWS Account and Environment Setup to Run CFT Template [One Time Step]

1. Download and install python setup using following link:

<https://www.python.org/ftp/python/3.8.5/python-3.8.5-amd64.exe>

1. To verify that Python is available on our local machine, we need to open the command line (in Windows search, type cmd and press Enter to open Command Prompt or right-click on the Start button and select Windows Command Prompt), type python, and press Enter.
2. If Python is properly installed, we will see a notification like the one below:

*Python 3.8.x (tags/v3.10.2:a58ebcc, Jan 17 2022, 14:12:15) [MSC v.1929 64 bit (AMD64)] on win32 Type "help," "copyright," "credits," or "license" for more information.*

1. To check if PIP is already installed on Windows, we should open the command line again, type pip, and press Enter.
2. If PIP is installed, we will receive a long notification explaining the program usage, all the available commands and options. Otherwise, if PIP is not installed, the output will be:

*'pip' is not recognized as an internal or external command, operable program or batch file.*

1. To install pip on window visit:

[https://pip.pypa.io/en/stable/installation](https://pip.pypa.io/en/stable/installation/)

1. Install all dependencies go to current working directory and use following command:

pip install -r requirements.txt

1. Locate and open /credentials in current working directory.
2. Change the access key as well as secret access key as per your aws account.

Text, letter

Description automatically generated

*Copy credentials file to C:\Users\<USERNAME>\.aws*

1. Locate and open /config in current working directory.
2. Change aws region details.

Graphical user interface, text

Description automatically generated with medium confidence

1. Copy AWS config file on your local system, located at:

*C:\Users\<USERNAME>\.aws*

**For linux, macOS, Unix**:

1. Locate and open /credentials.
2. Change the access key as well as secret access key as per your aws account.

Text, letter

Description automatically generated

*Copy credentials file to ~/.aws*

1. Locate and open /config
2. Change aws region details.

Graphical user interface, text

Description automatically generated with medium confidence

1. Copy AWS config file on your local system, located at:

*~/.aws*

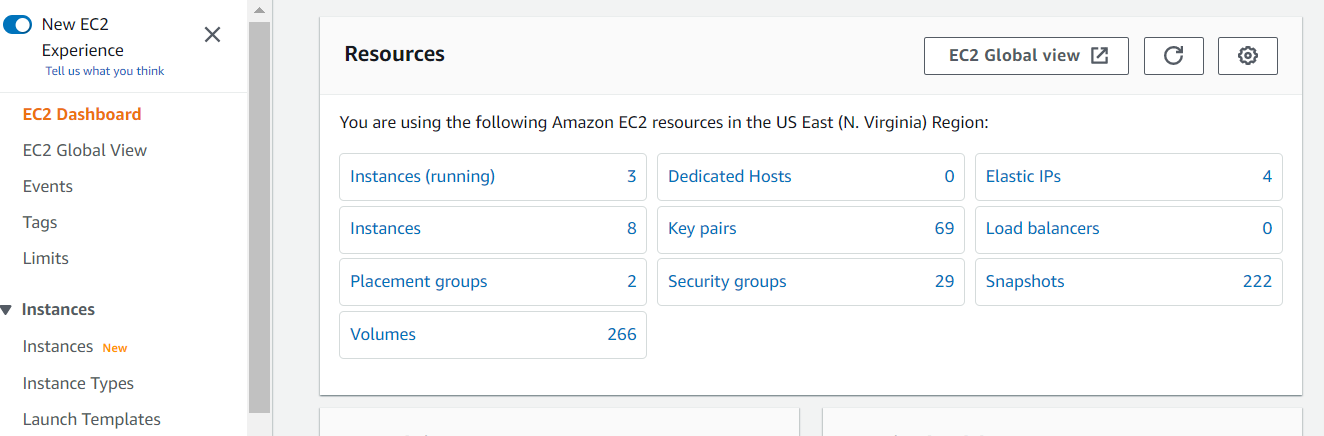
For more information: https://docs.aws.amazon.com/sdk-for-java/v1/developer-guide/setup-credentials.html

### AWS key-pairs to access ec2 instances.

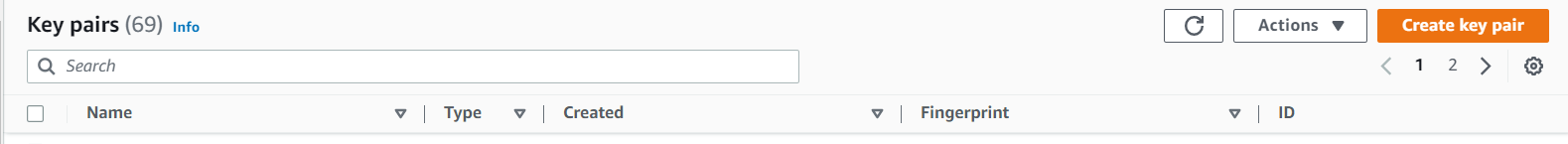
#### Steps to create a SSH key [Optional]

Note: You can use existing key pair if you have key pair already created.

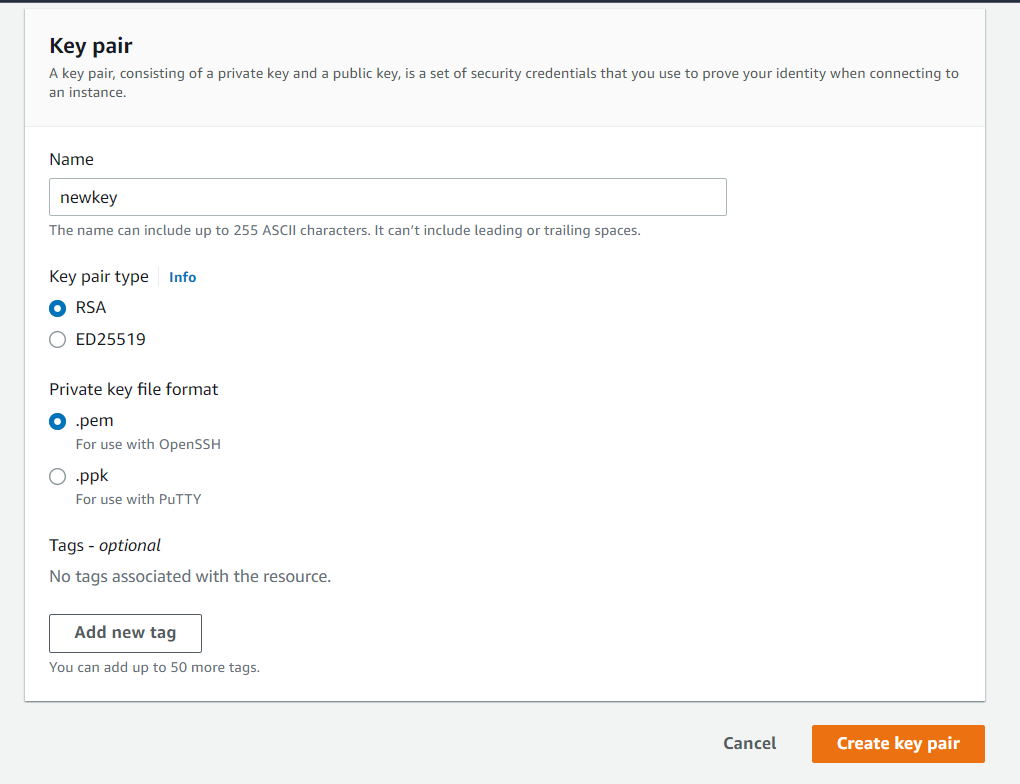
1. Go to the EC2 dashboard and click on key pairs.



1. Now click on create key pair at the top right.



1. Now name the key and select the key pair type as RSA and key file format as .pem.



## System Requirements

Below all AWS cloud resources will be created.

All templates come with default value it can be change while execution.

Stack: A new stack is created with the specified name and location.

Interfaces

1 management and 1 data interface will be created.

Default names:

|  |
| --- |
| *<vth>-inst1-mgmt-nic1* |
| *<vth>-inst1-data-nic1* |

Subnets

Total 2 subnets will be created.

Default names:

*<vth>-vpc-mgmt-subnet1*

*<vth>-vpc-data-subnet1*

Virtual Private Network

A virtual Private network will be created. Address prefix is 10.0.0.0/16.

Default name*: <vth>-vpc*

Elastic Public Ip

Elastic Public Ip will be created and attached to management interface of vThunder instance.

Default name:

*<vth>-inst1-mgmt-nic1-ip*

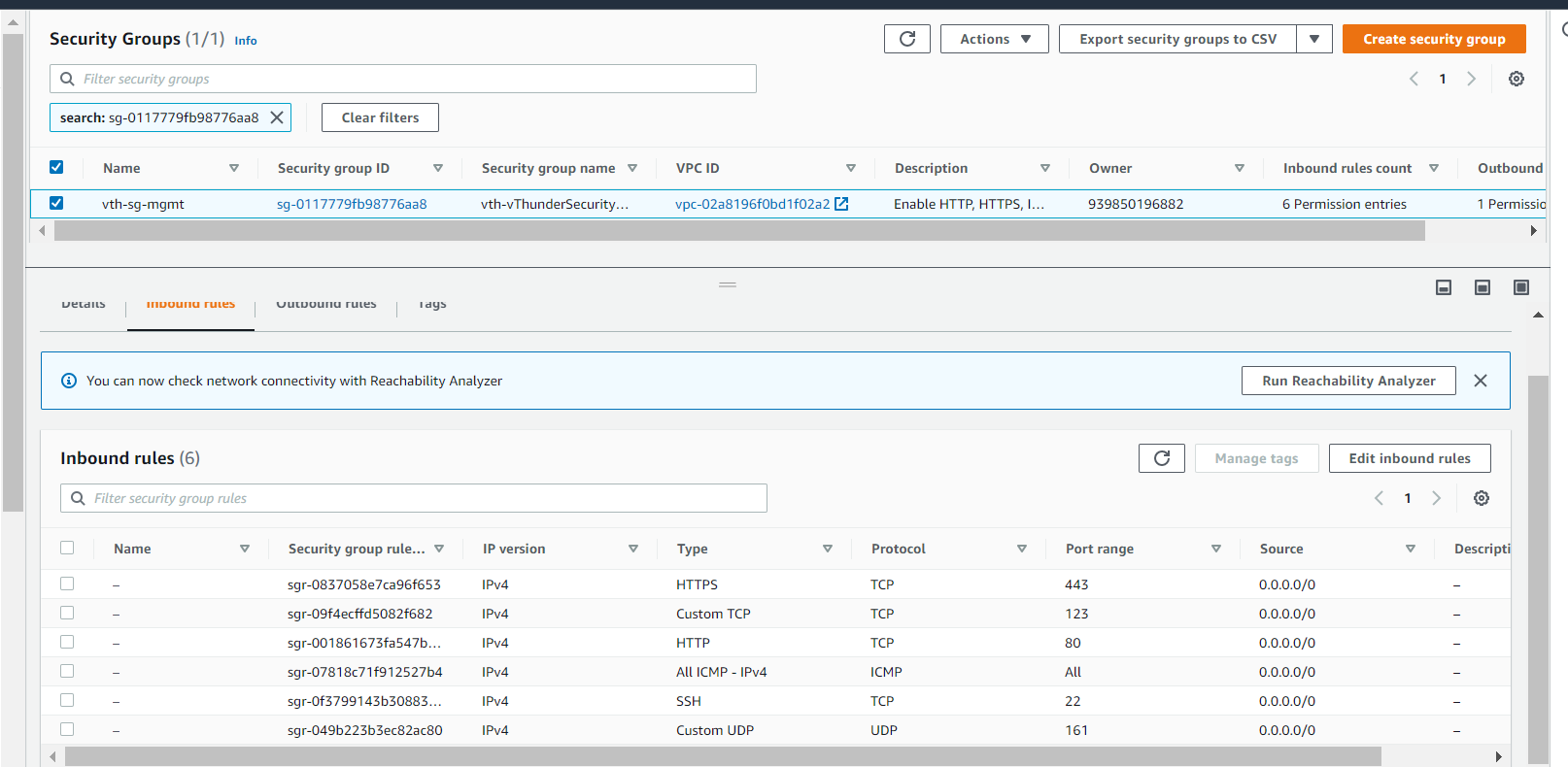
Security Group

2 Security Groups will be created and attached to management and data interface.

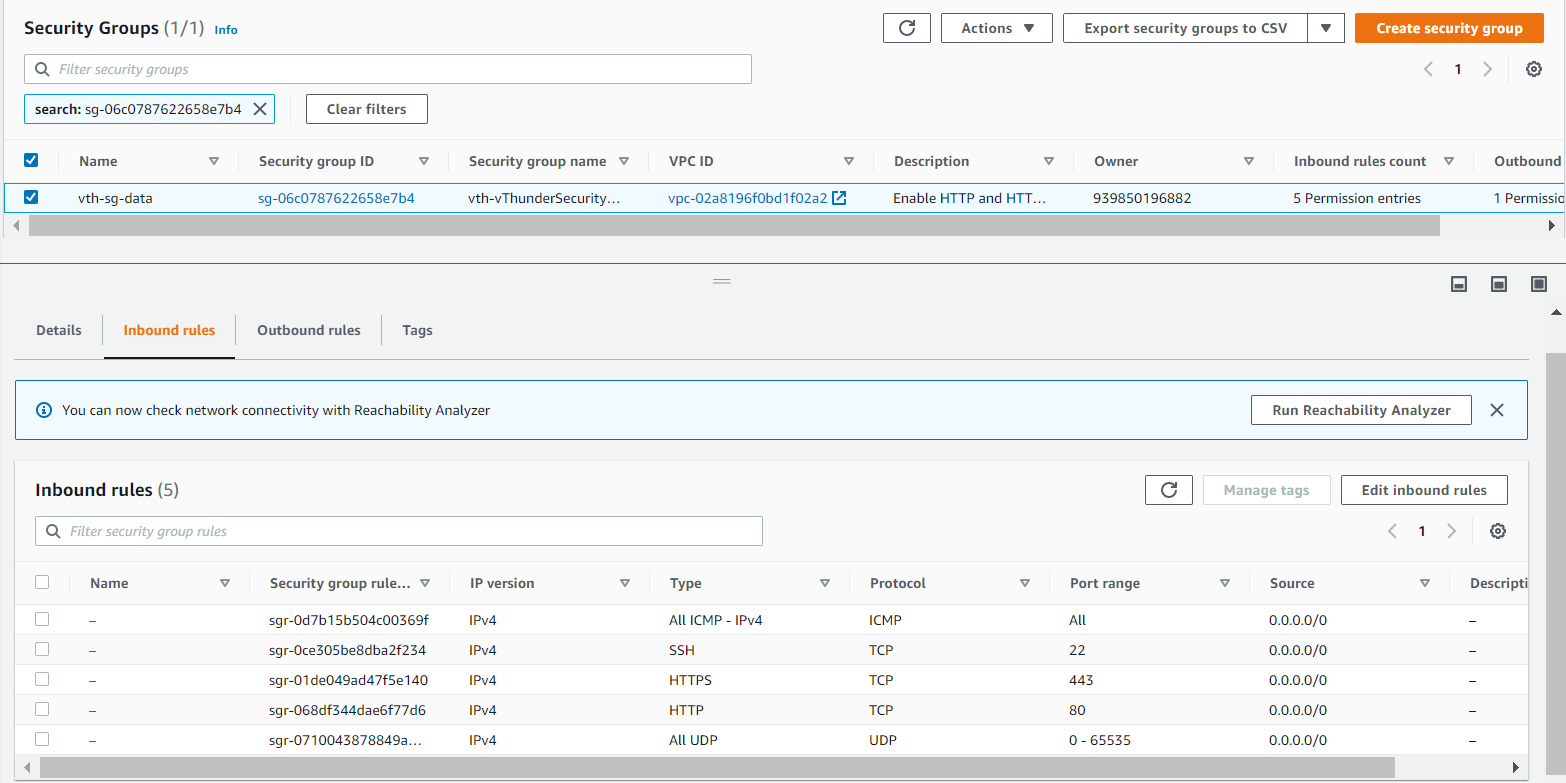
Default name: *<vth>-*sg-mgmt, *<vth>-*sg-data

Security Rules:

vth-sg-mgmt



vth-sg-data



vThunder Instance

1 vThunder ec2 instance will be created.

**Default Size**: m4.xlarge (40 Gb memory)

**Default name**: *<vth>-inst1*

# Chapter 1 – Install vADC

All resources will get created in AWS.

## Install

1. Navigate to AWS Console -> CloudFormation -> Stacks -> Create Stack
2. Select prepare template.
3. Select “Upload a template file”.
4. Choose file CFT\_TMPL\_2NIC\_1VM\_1.json
5. Go to next.
6. Provide stack name. For example: <vth>
7. Provide availability zone. For example: us-east-1a
8. Provide tagValue. For example: <a10-vthunder-adc>
9. Confirm default values.

Graphical user interface, text, application, email

Description automatically generated

1. Below listed sizes are verified for vThunder.

|  |  |  |  |
| --- | --- | --- | --- |
| **Instance** | **vCPU** | **Memory** | **Number of Network Interfaces** |
| c4.xlarge | 4 | 7680 | 4 |
| c4.4xlarge | 16 | 30720 | 8 |
| c4.8xlarge | 36 | 61440 | 8 |
| d2.xlarge | 4 | 31232 | 4 |
| d2.2xlarge | 8 | 62464 | 4 |
| d2.4xlarge | 16 | 124928 | 8 |
| d2.8xlarge | 36 | 249856 | 8 |
| m4.xlarge | 4 | 16384 | 4 |
| m4.2xlarge | 8 | 32768 | 4 |
| m4.4xlarge | 16 | 65536 | 8 |
| m4.10xlarge | 40 | 163840 | 8 |
| i2.xlarge | 4 | 31232 | 4 |
| i2.2xlarge | 8 | 62464 | 4 |
| i2.4xlarge | 16 | 124928 | 8 |
| i2.8xlarge | 32 | 249856 | 8 |
| c5d.large | 2 | 4096 | 3 |
| c5d.9xlarge | 36 | 73728 | 8 |
| c5d.2xlarge | 8 | 32768 | 4 |
| c5d.4xlarge | 16 | 73728 | 8 |
| c5.xlarge | 4 | 8192 | 4 |
| c5.2xlarge | 8 | 16384 | 4 |
| c5.4xlarge | 16 | 32768 | 8 |
| c5.9xlarge | 36 | 73728 | 8 |
| g3.4xlarge | 16 | 124928 | 8 |
| g3.8xlarge | 32 | 249856 | 8 |
| i3.large | 2 | 15616 | 3 |
| i3.xlarge | 4 | 31232 | 4 |
| i3.2xlarge | 8 | 62464 | 4 |
| i3.4xlarge | 16 | 124928 | 8 |
| i3.8xlarge | 32 | 249856 | 8 |
| m5d.large | 2 | 8192 | 3 |
| m5d.xlarge | 4 | 16384 | 4 |
| m5d.2xlarge | 8 | 32768 | 4 |
| m5d.4xlarge | 16 | 65536 | 8 |
| m5.large | 2 | 8192 | 3 |
| m5.xlarge | 4 | 16384 | 4 |
| m5.2xlarge | 8 | 32768 | 4 |
| m5.4xlarge | 16 | 65536 | 8 |
| r5d.large | 2 | 16384 | 3 |
| r5d.xlarge | 4 | 32768 | 4 |
| r5d.2xlarge | 8 | 65536 | 4 |
| r5d.4xlarge | 16 | 131072 | 8 |
| r5.large | 2 | 16384 | 3 |
| r5.xlarge | 4 | 32768 | 4 |
| r5.2xlarge | 8 | 65536 | 4 |
| r5.4xlarge | 16 | 131072 | 8 |
| r4.large | 2 | 15616 | 3 |
| r4.xlarge | 4 | 31232 | 4 |
| r4.2xlarge | 8 | 62464 | 4 |
| r4.4xlarge | 16 | 124928 | 8 |
| r4.8xlarge | 32 | 249856 | 8 |
| t3.medium | 2 | 4096 | 3 |
| t3.large | 2 | 8192 | 3 |
| t3.xlarge | 4 | 16384 | 4 |
| t3.2xlarge | 8 | 32768 | 4 |
| z1d.large | 2 | 16384 | 3 |
| z1d.xlarge | 4 | 32768 | 4 |
| z1d.2xlarge | 8 | 65536 | 4 |
| z1d.3xlarge | 12 | 98304 | 8 |
| z1d.6xlarge | 24 | 196608 | 8 |

11) Remain others as default.

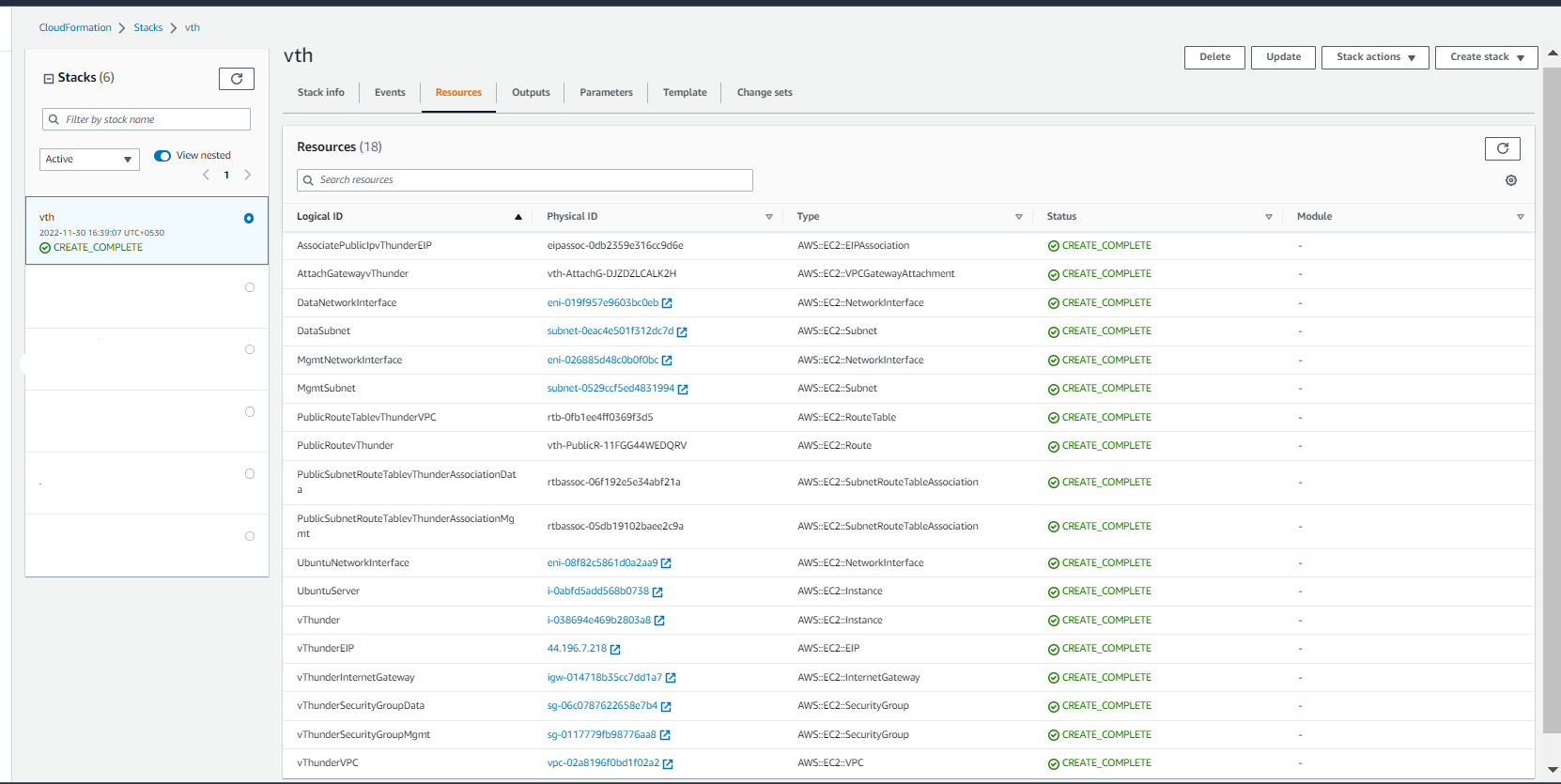
12) Go to next.

13) Review

14) Submit

***Set Back and Relax, it will take maximum 10 mins. 😊***

1. Go to AWS Console -> *CloudFormation-> Stacks-> {stack name}*



15) Verify all above resources created.

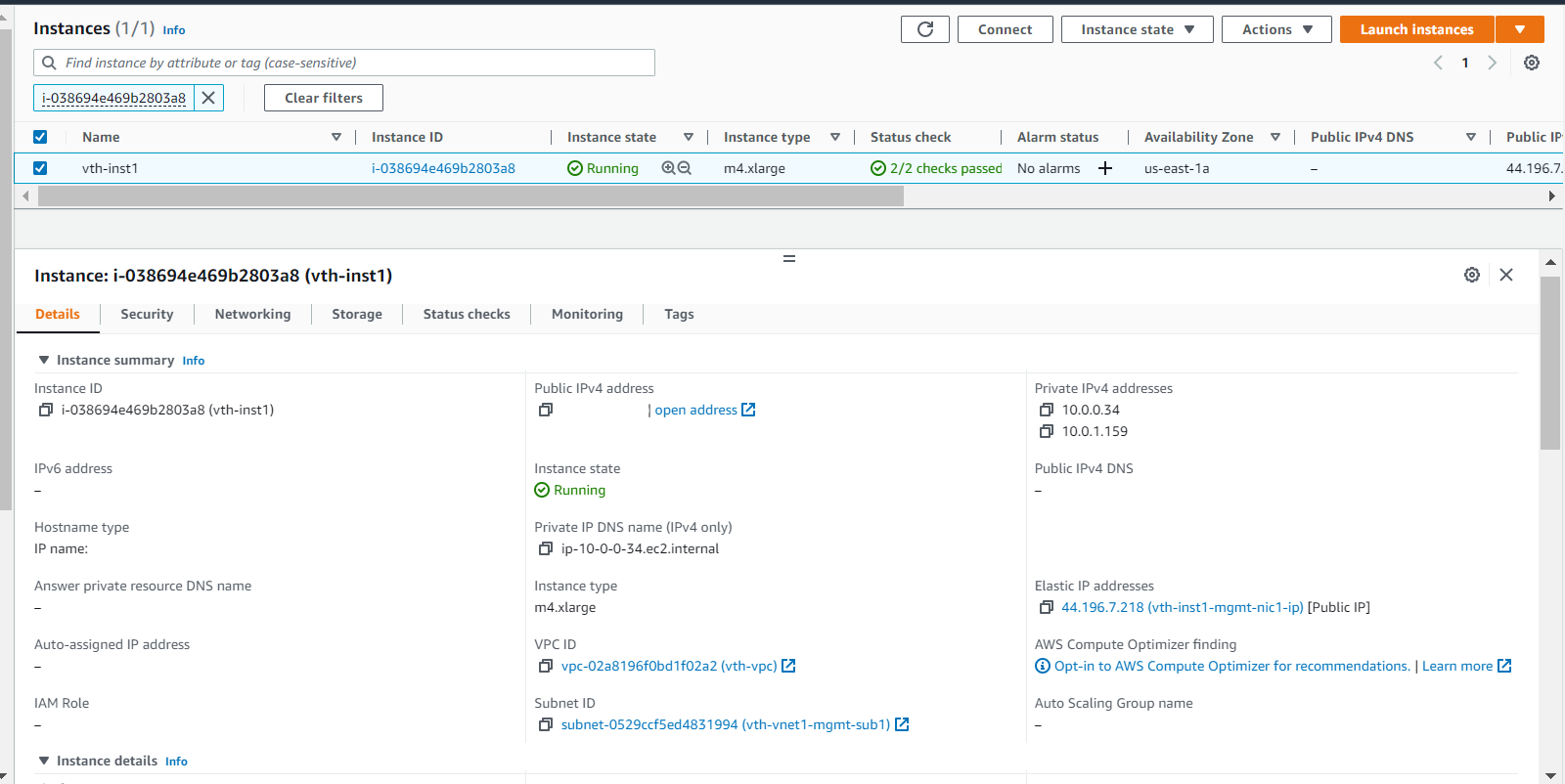
***Verify status check of vThunder instance we created.***

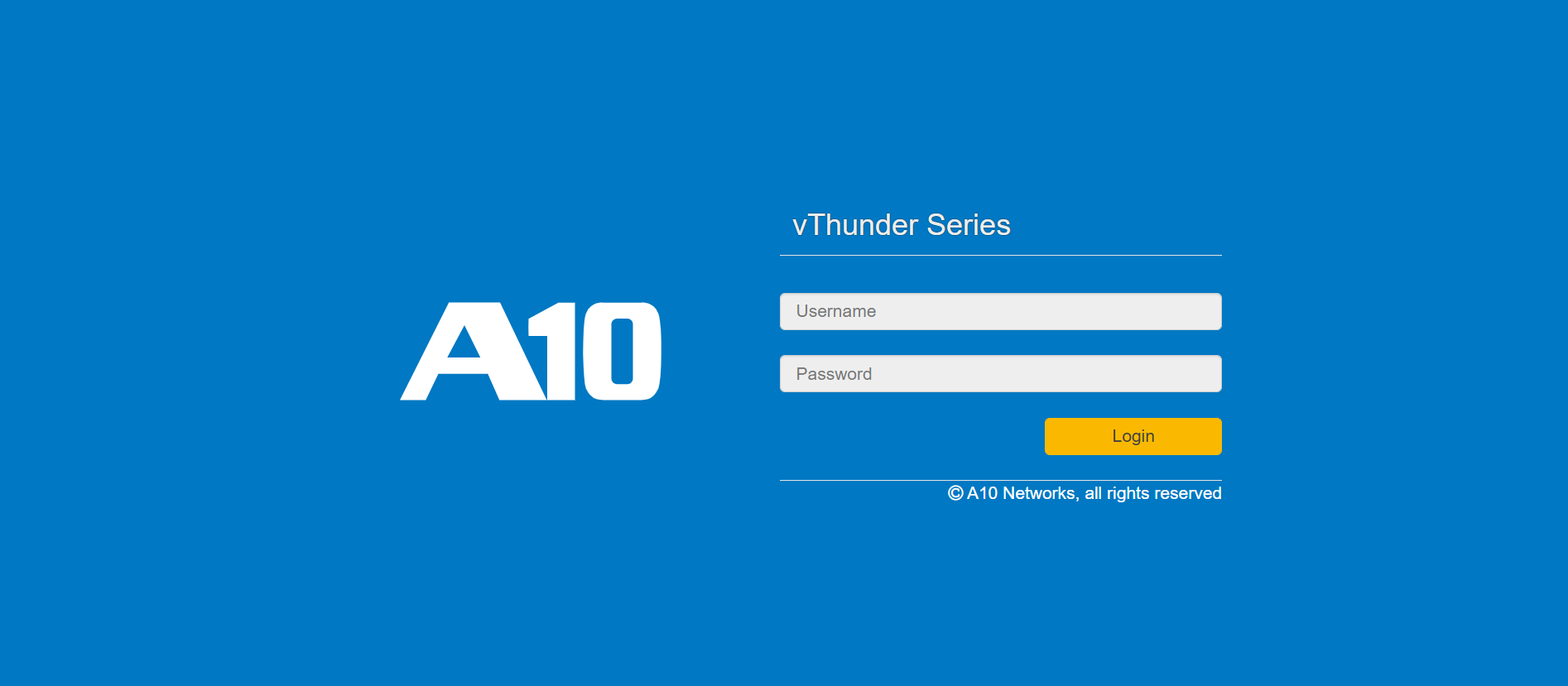
EC2-> Instances*-> <vth>-inst1*

Open any browser and type http://<vthunder\_public\_IP>

Enter username – admin

Enter Password – {ec2 instance id}





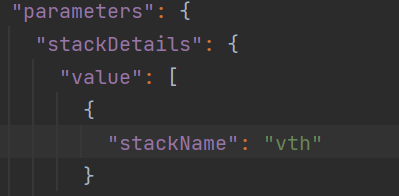
# Chapter 2 – Configure vThunder

Here we will run python script and which will configure SLB and SSL to vThunder.

## configure

1. In parameter file CFT\_TMPL\_2NIC\_1VM\_CONFIG\_SLB\_SSL\_PARAM*.json* add stack name which got created using CFT template.

Default Name: vth



**SSL parameters**

Path- Should be the absolute path of the file

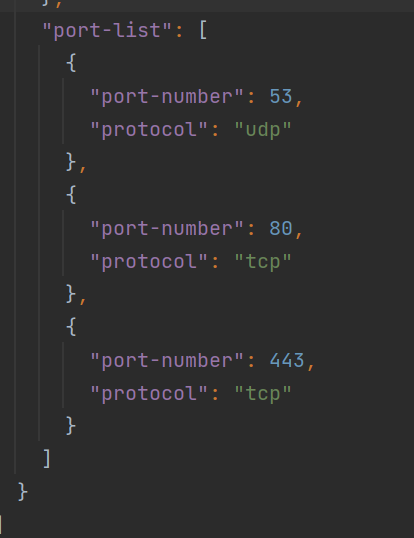
File- Name of the file



Note: Supported certification type *.pem*.

**SLB**

1. In case user want to add or remove ports he can do here.



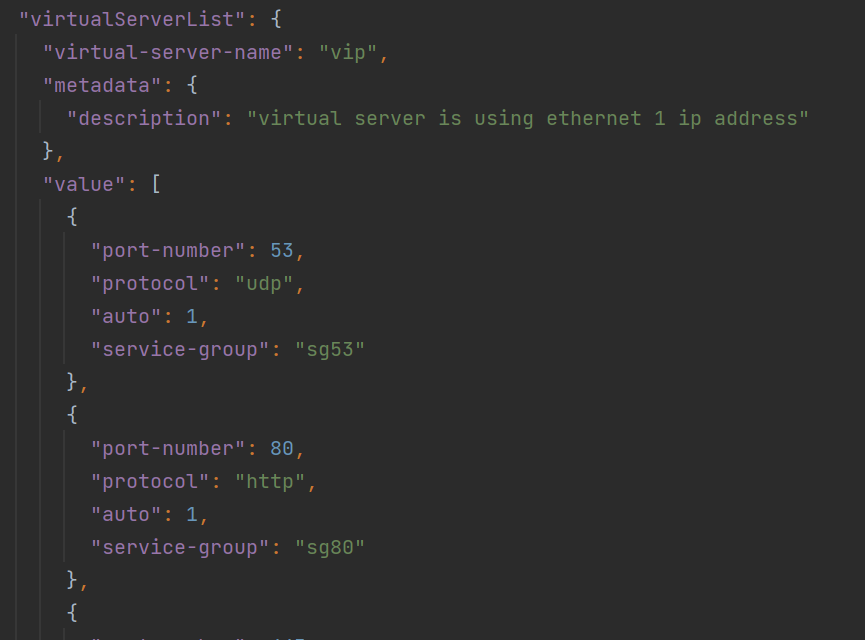
1. **Service Group List**
2. Default service group list

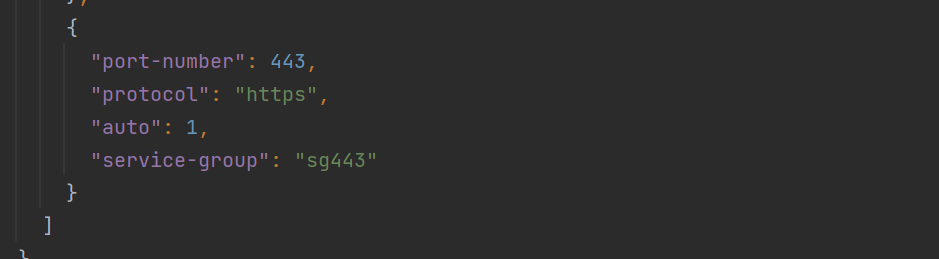
Note: Service group name by default is **“sg+port\_number”**, If you want to change service group name then after changing name do respective changes in Virtual servers also.





1. **Virtual Server**
2. Default of virtual server name is *VIP*. This is the private ip address of ethernet1.



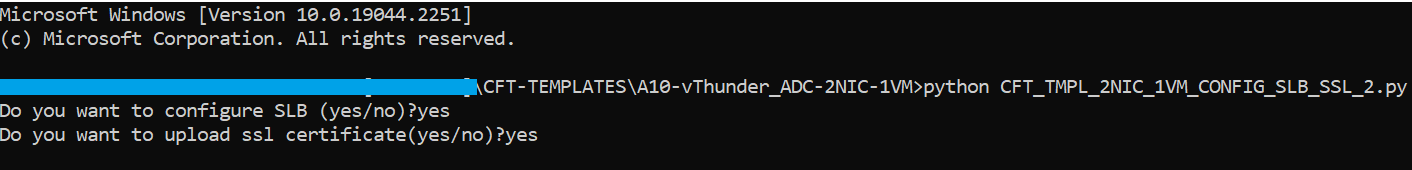


## Install

Open your CMD in current working directory.

Run : python ./CFT\_TMPL\_2NIC\_1VM\_CONFIG\_SLB\_SSL\_2.py

Provide below configuration params:



# Chapter 3- Install Client/Server VM

Client VM and Server VM is a temparatory vm which can be deleted later. This will help to test traffic. We can test traffic from client vm to server vm via vThunder.

## Install

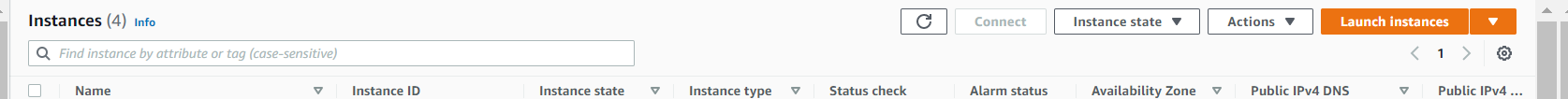
Apache Server VM:

Go to AWS Console -> *EC2 -> Instances - > Select <vth>-server -> connect -> EC2 instance connect -> Connect*

Run : sudo apt install apache2

Client VM:

1. Go to AWS Console -> *EC2 -> Instances -> Launch instances*



1. Provide instance name. For example: <vth-client>.
2. Select image as Ubuntu.
3. Select keypair as you created earlier.
4. Edit the network settings. Select VPC <vth-vpc>.
5. Select Data subnet. (e.g 10.0.1.0/24)
6. Edit Auto Assign Public IP to enable.
7. Edit Firewall (security groups) and select existing security group <vth-vThunderSecurityGroupData>.
8. Click on launch instance.
9. Wait for 5 min.

# Chapter 4 – Verify

In this chapter we will verify the vThunder’s configurations and traffic from client to server VM via vThunder.

## Login into vThunder via CLI

vThunder can be access by ssh.

SSH to vThunder Instance:

Get vThunder public IP: Go to AWS Console -> EC2 -> Instances -> vth-inst1 -> Details -> Copy Public IP.

Open putty and connect using [access key generated](#_AWS_key-pairs_to).

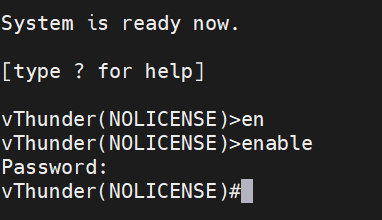
Username [Default]: admin

After login.

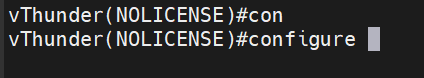
Execute Command ->

enable

Password -> <just press enter>

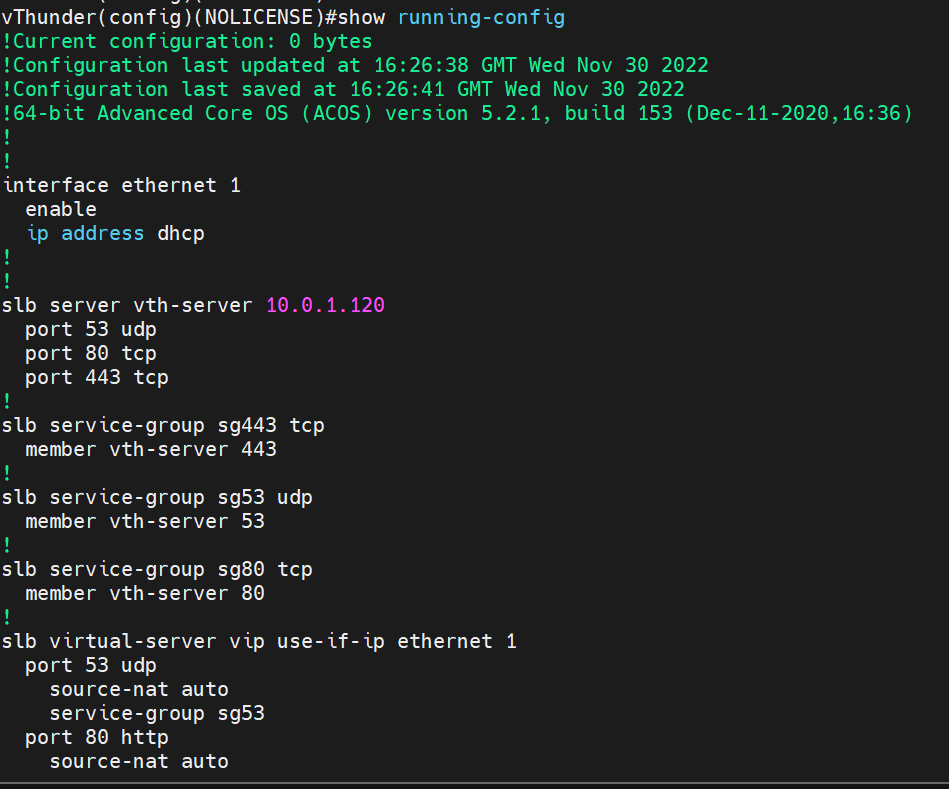


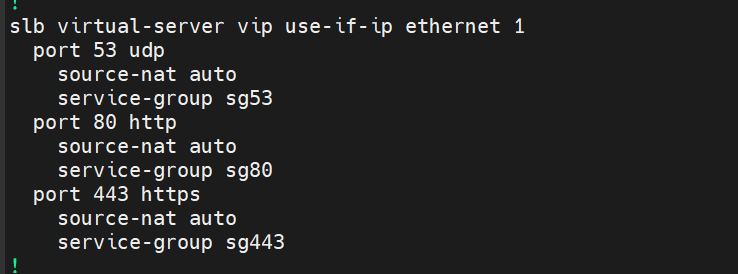
Execute Command -> configure



## Slb verification

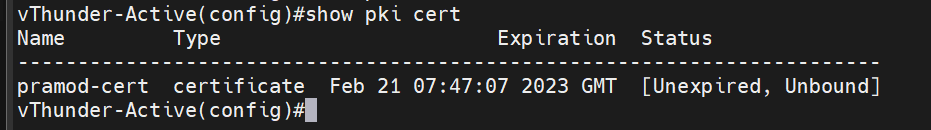
Execute Command -> show running-config





## SSL verification

Execute Command -> show pki cert



## Traffic Flow from Client to Server via vThunder

Login to Client machine.

Run command : curl <vThunder Secondary Private IP>

