vMX-Nutanix Quick Start Guide

Rev #	Date	Revised by	Comments
1.0	04/20/18	Pratik Maru	Initial Draft for vMX support on Nutanix AHV

Table of Contents

Introduction

The purpose of this document is to help users in launching vMX on Nutanix AHV cluster.

The document doesn't detail into configurations required to bring up Nutanix cluster and an assumption has been made that a working Nutanix cluster is up and running, and accessible via Prism web GUI and 'acropolis' cli.

This document will be updated with relevant information as needed.

Test Setup Details

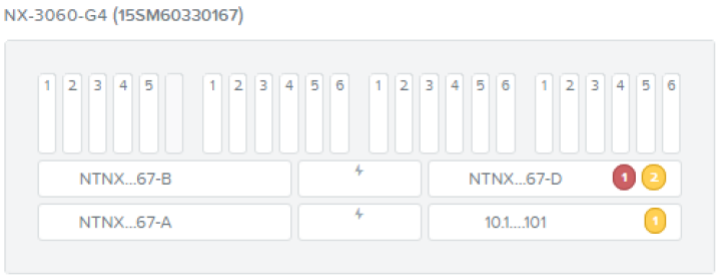
For our testing, we have used Nutanix AHV 5.5 (hypervisor based on KVM) cluster provided by Nutanix team. This cluster has 4 host, with total of 23 SSD drives. These hosts are connected via TOR switch.

For Networking, this cluster is using OVS, and provisions VLAN based networks. For traffic from a given network to flow across the nodes, a specific VLAN used by that network has to be configured and allowed on TOR switch.

We have tested vMX in Lite mode using VirtIO, but we should be able to deploy vMX in performance mode with VirtIO given the availability of RAM and CPU cores.
Currently, we have NOT tested SRIOV, and we are in discussion with Nutanix team about supporting SRIOV.

For all out tests, we have tested the traffic between VMs. We have NOT tested traffic between vMX and Physical machines, as didn't have resources to test this scenario.

Hardware Diagram and Summary



Summary

HARDWARE SUMMARY	
Blocks	1
Hosts	4
Total Memory	1.48 TiB
Total CPU Capacity	220.77 GHz
Disks	SSD: 23 disks
Network Switches	0

Important Links

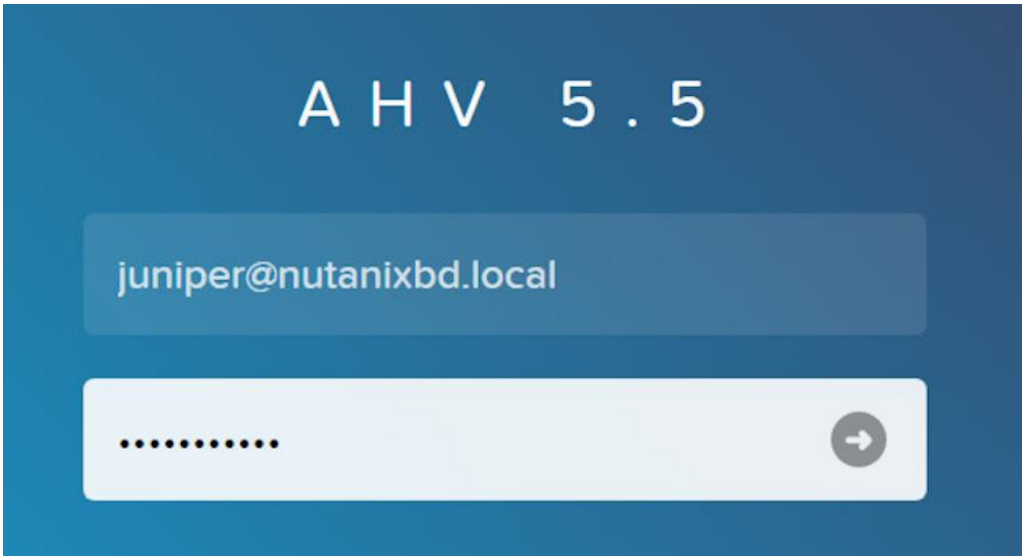
- Link to Nutanix Bible, this guide has complete details about Nutanix cluster. http://nutanixbible.com/

Login into Nutanix setup

- I was provided remote access to windows machine in Nutanix lab. Details about enabling the remote access are captured in the document provided by Nutanix team. Will attach the same document.

  I am not specifying the details about accessing here, as these details may change as per the setup configurations.

- Once logged into remote windows machine, I was able to access the Nutanix Prims Enable using web browser. Will provide login details separately.



- After providing login details, we will land up on home screen for Nutanix prism.

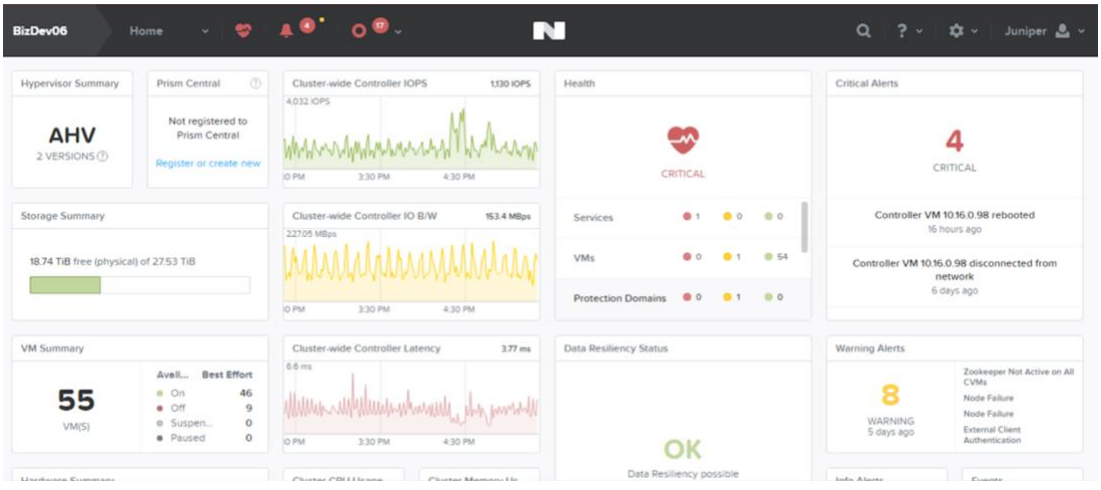


Image Creation

Before starting with Image creation, copy the images in local machine from where it can be accessed by Nutanix Prism Element. After copying, locally source the images from Prism GUI.

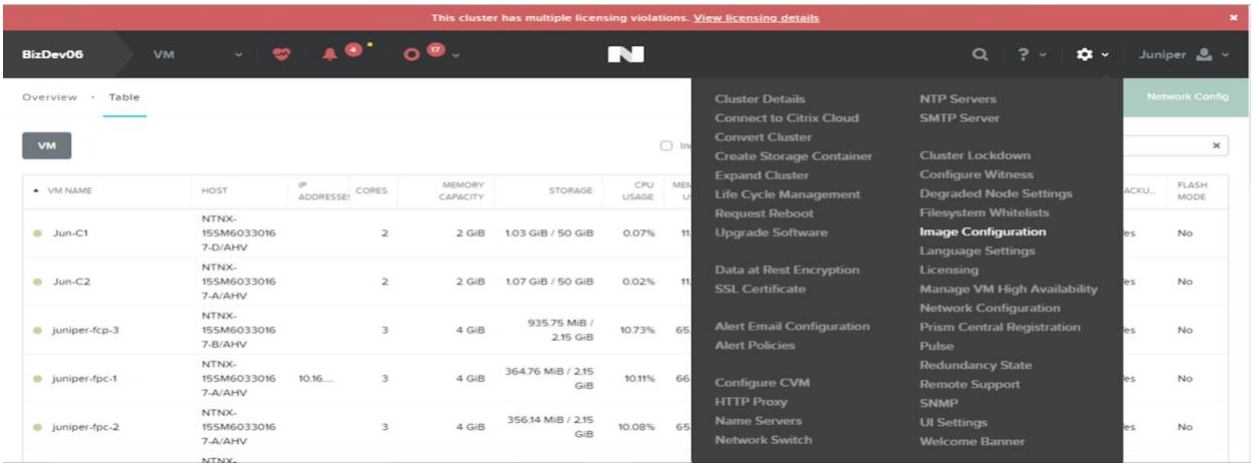
All the required images are available in vmx-bundle, once you copy and untar the vmx bundle on local machine, you should be able to execute below steps to upload the image in Nutanix.

For bringing up vMX Chassis, we need to upload three image as mentioned below.

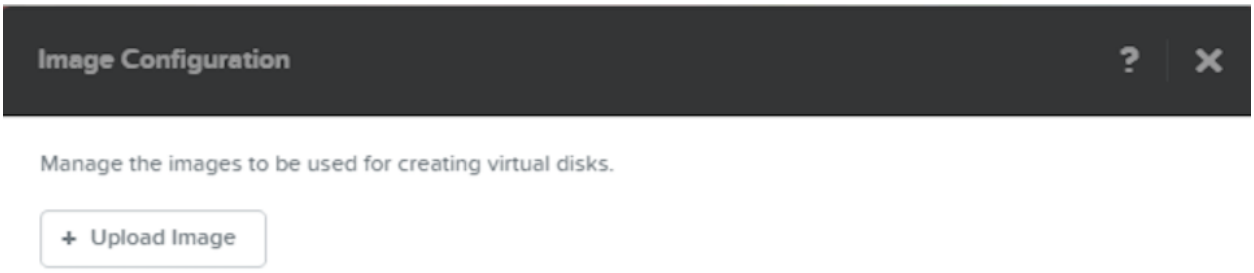
- vMX RE Image
- vMX Metadata Image
- vMX FPC Image

RE Image

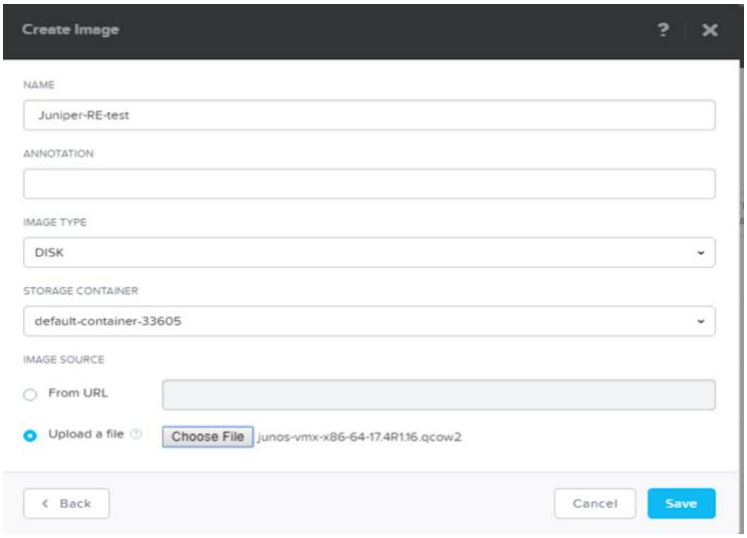
- Go to ‘Image configuration’ from tool knob on top-left corner.



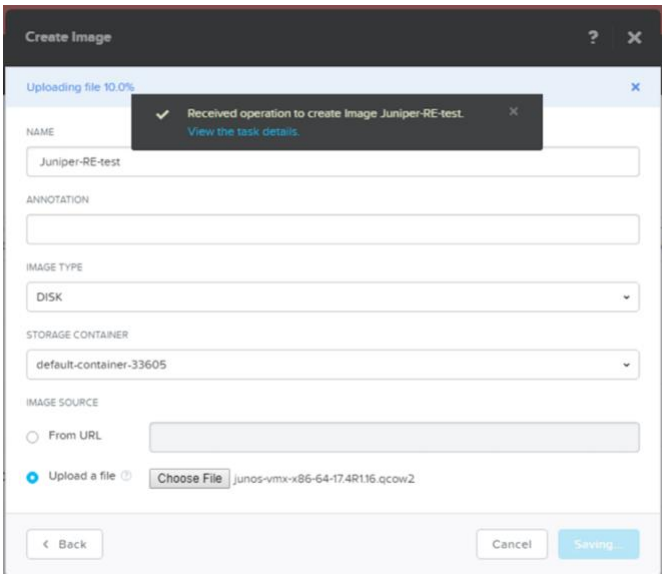
- Click on ‘Upload Image’ tab



- Enter RE image details as shown in below screeshot. Please provide local file path under “Image source”.

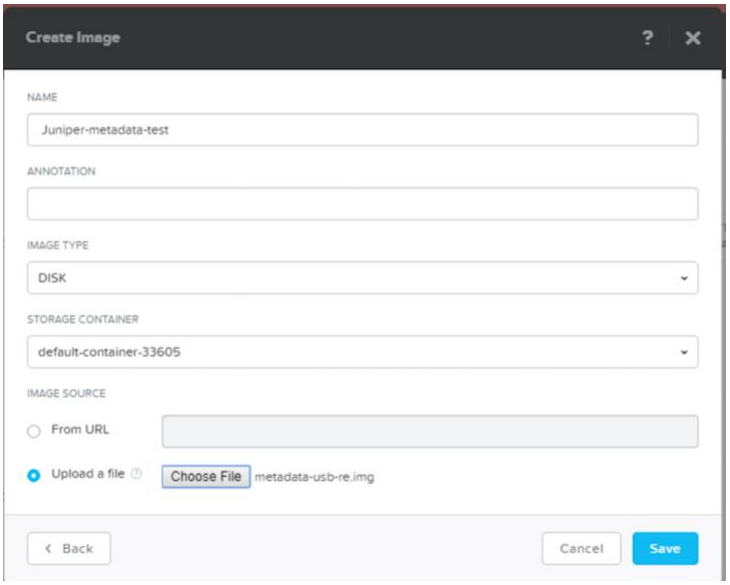


- Wait for Image file to get successfully uploaded 100%.



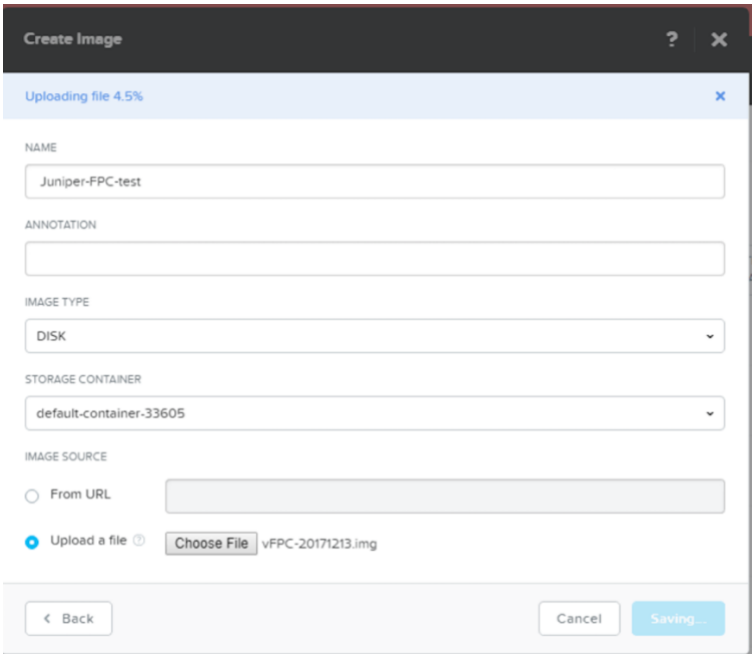
Metadata Image

- Similarly upload metadata image



FPC Image

- Similarly upload FPC Image



Network

To deploy vMX, below is list of bare minimum networks we attach to a give VM

- RE – 2 networks
  - Mgmt Interface (fxp0)
  - RE-FPC Internal network (em1).

- FPC – Minimum 3 networks
  - Mgmt Interface (ext)
  - RE-FPC Internal network (int)
  - JUNIPER_WAN1 (ge-0/0/0)

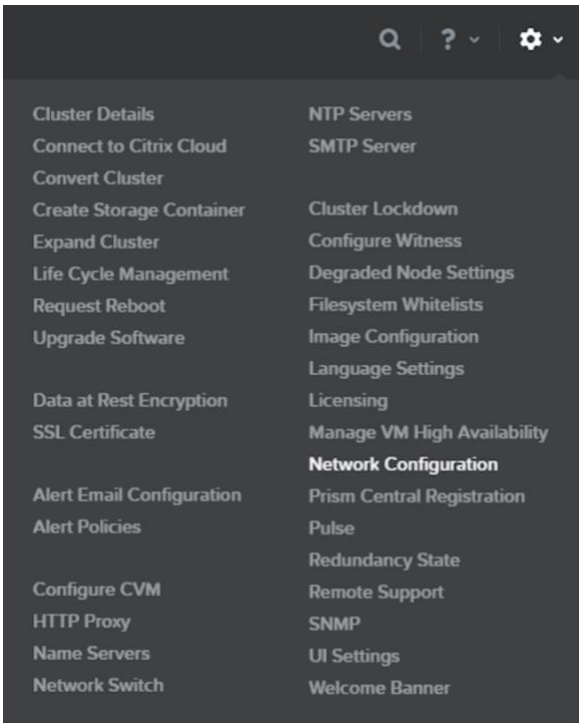
Depending on requirements, you can increase the number of WAN ports.

The mgmt network we used was provided to us by Nutanix Team, with a range of routable IPs to use on these networks. We did not create this network.

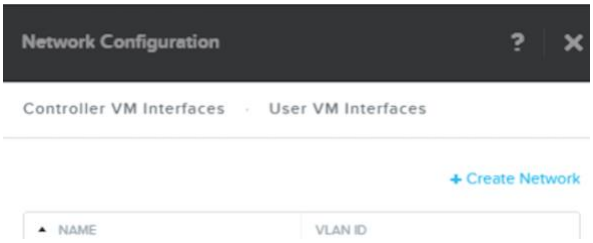
Network Creation Steps

The RE-FPC Internal network was created (or any other network we created) using below steps.

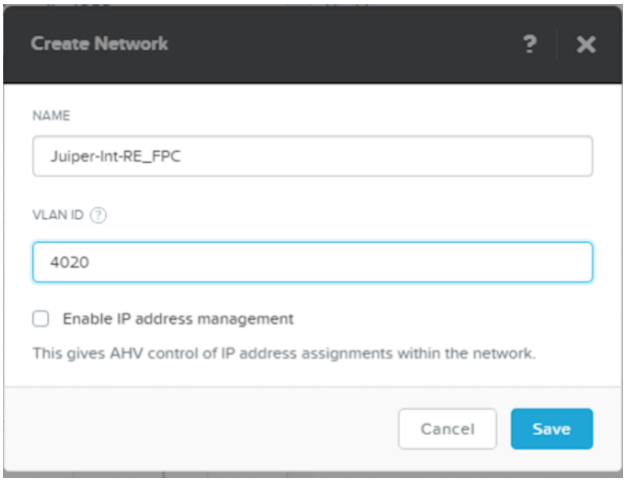
- Go to “Network Configuration” from tool know on top-right corner.



- Click on ‘Create Network’ button.



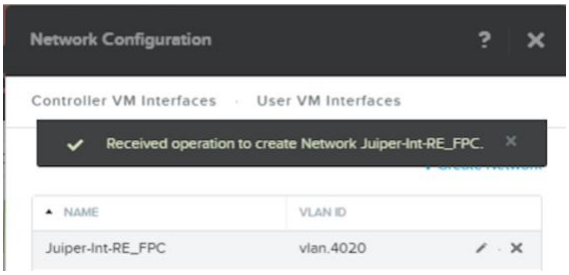
- Creating Internal network for RE-FPC communication.



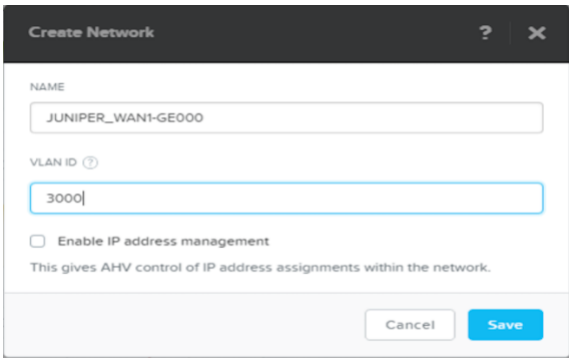
Note:
All the networks created on Nutanix setup were VLAN based networks. So, in case you are deploying RE and FPC on different host (compute nodes), the vlan which has been used by the RE-FPC-Internal networks should be part of allowable vlan range configured on TOR switch connecting the two machines.

Though, we have tested the use case where RE and FPC were deployed on different hosts, but for all our other tests we have deployed RE and FPC on the same host, as we had limited set of switches vlans.

- Successful creation of RE-FPC internal network



- Creating WAN network

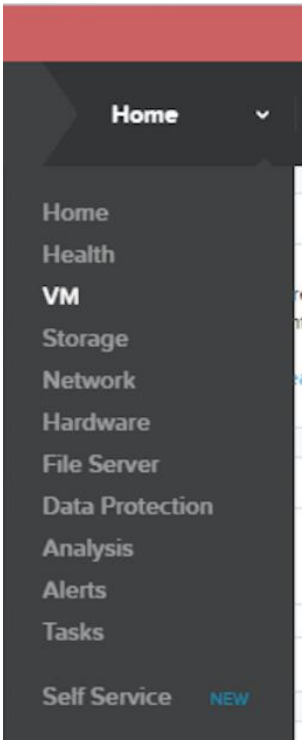


Note:
For creating WAN port (ge-*) networks, please ensure that vlan configured on these ports are part of allowed vlan range configured on switch, otherwise, traffic across nodes won't pass.

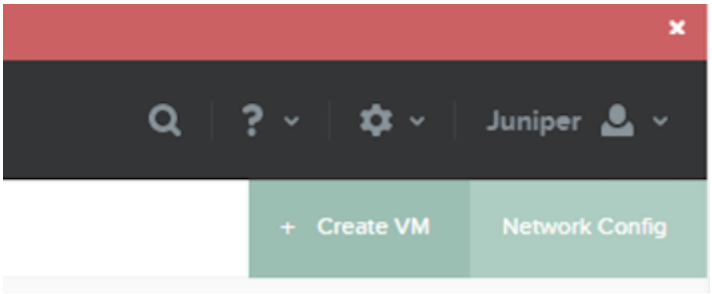
In this case, I have used vlan 3000, as this configured on TOR switch, connecting various hosts.

Deploying vMX

- Go to ‘VM’ option under ‘Home’ tab (top-left corner)

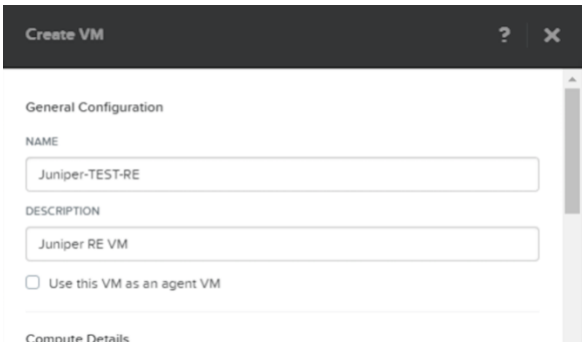


- Create VM (Click ‘Create VM’ top right)

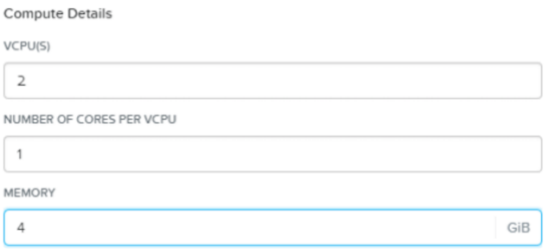


RE VM Creation

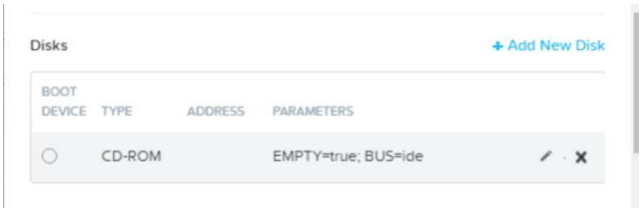
- RE VMs configuration details, starting with Name and Description

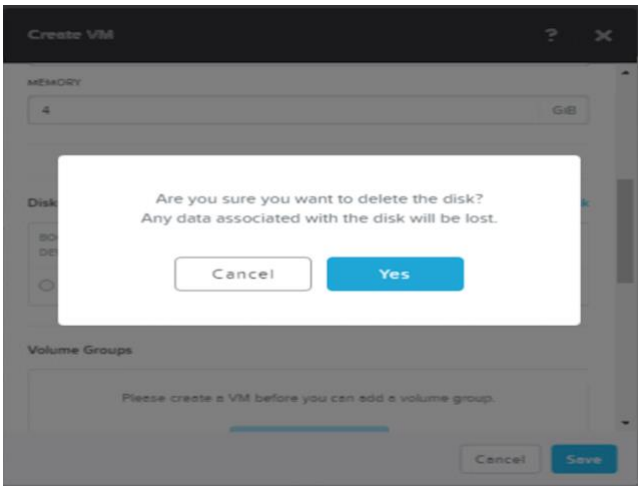


- RE Compute details

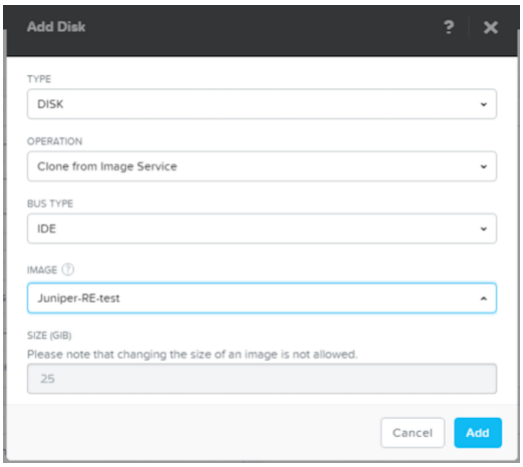


- RE VM will require two disks to be added. One is main Junos image and another disk contains metadata information. Before adding, delete the default CD-ROM disk. Use below steps to do the same.

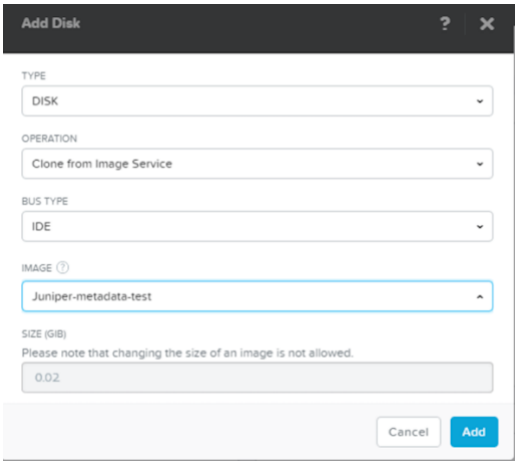




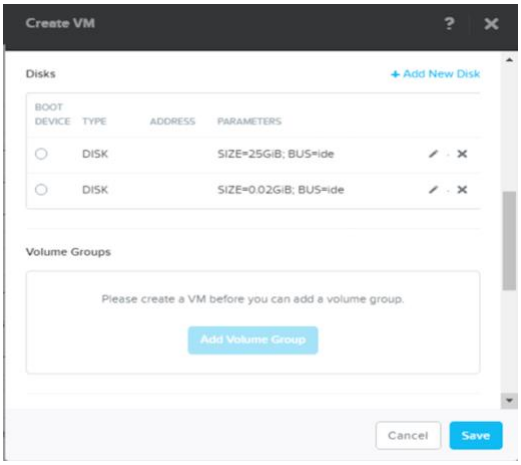
- Adding Junos disk to RE VM



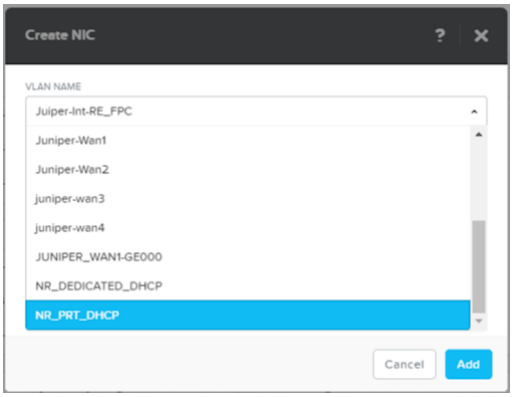
- Adding metadata disk to RE VM

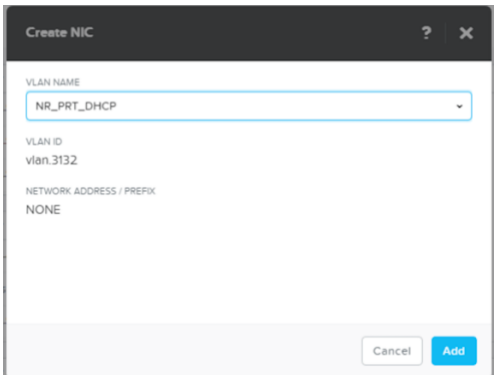


- After adding disks, it should look like below

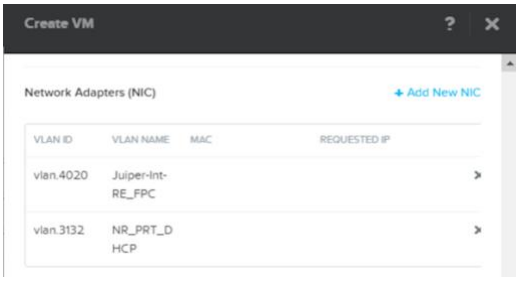


- Add NICs to RE VM. The NIC networks should be added in the order of NICs appear inside guest. For example, fxp0 should be first one to be added.
  Creating NIC for fxp0

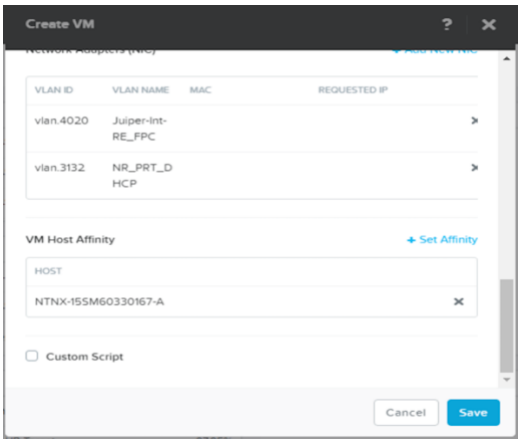




- Order of NICs seen in ‘Create VM’.
  Note: order seen here will be reverse of appearance of NICs inside guest VM.

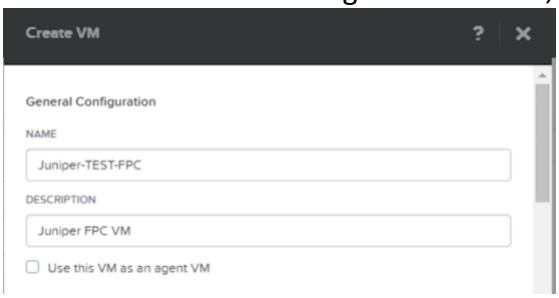


- If host affinity needed, setting the affinity to appropriate host and click on ‘save’ to create VM.

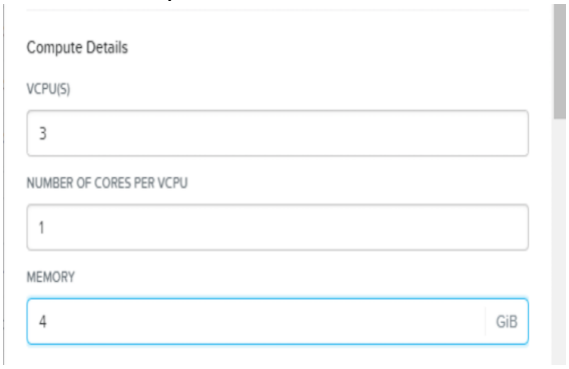


FPC VM Creation

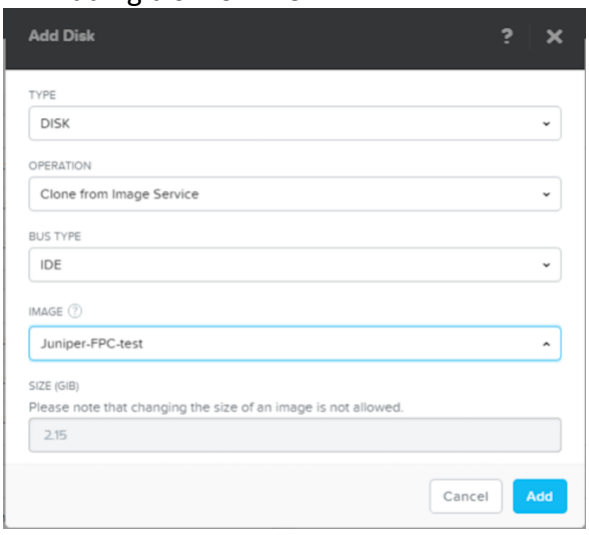
- Provide FPC VMs configuration details, starting with Name and Description

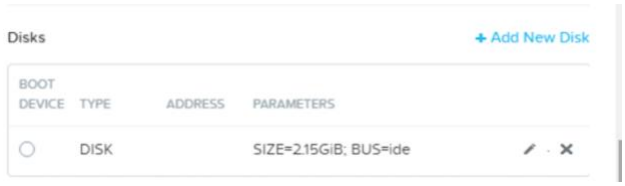


- FPC Compute details

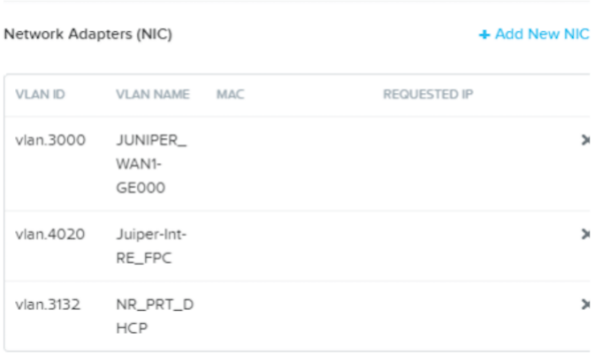


- Adding disk for FPC VM

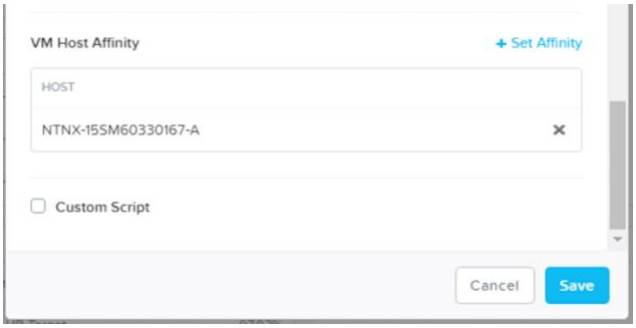




- Add NICs for FPC VM

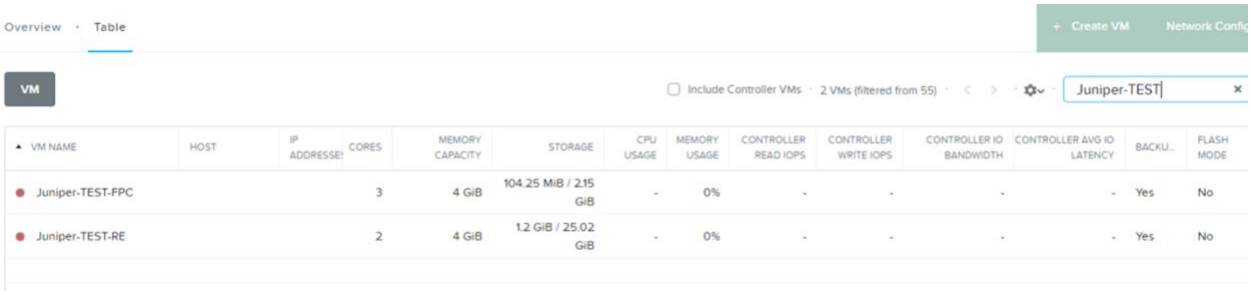


- If host affinity needed, setting the affinity to appropriate host and click on ‘save’ to create VM.

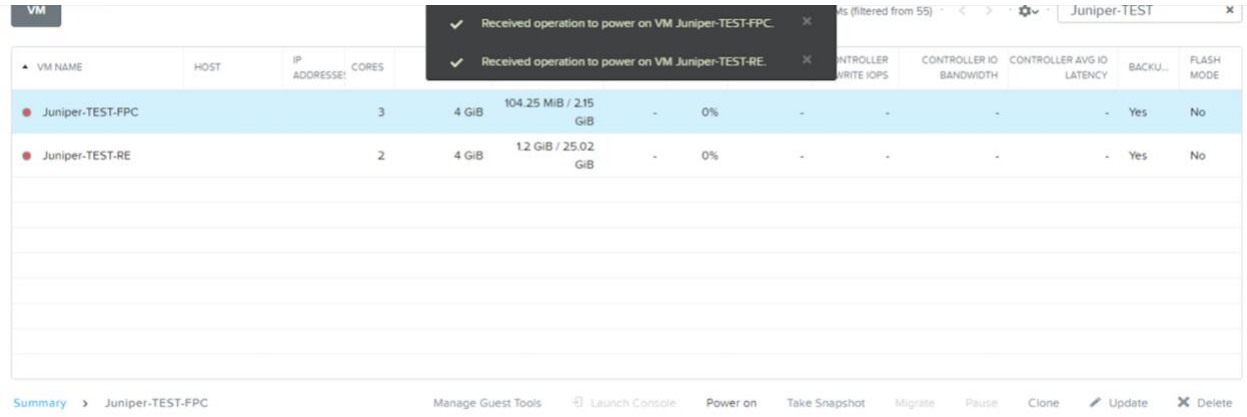


Powering ON VMs

- Search for VM's under "Table"

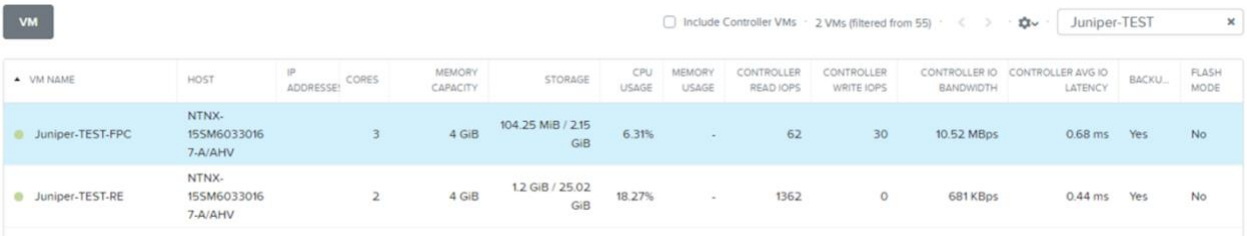


- Apply "Power on" button (seen at the bottom of below screenshot) for each VM



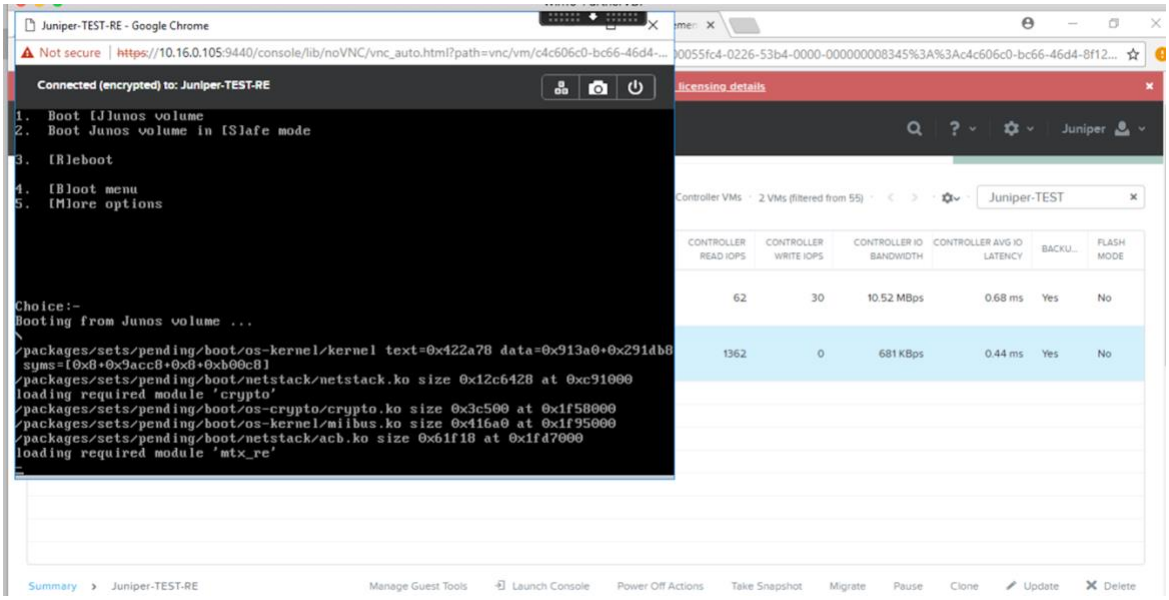
- Notice all the VMs turning ON

  "Host" column in below screenshot tells about the hosts the VM are launched on. As, we have set affinity to Host A while launching these VMs, both the RE and FPC VMs are launched on Host A.



VM Console

- VM Console can be launched by using “Launch Console” button seen at the bottom of below Screenshot. After RE VM is up, you should be able to see FPC/PICs and Interfaces Online.



Note: Upon boot Junos won’t be having mgmt interface configured, so for now, you have to configure the mgmt interface from the provided subnet after that you should be able to reach the VM from that network.

VLAN and Multicast

To make VLAN and Multicast (OSPF) work on Nutanix setup, you have to configure ports in kTrunk and KDirect mode.

Steps to configure the same are provided below:

- Login to Nutanix Controller VM (IP can found from setup details).
- Once inside the controller VM, execute “acli” to swtich to acropolis cli.
- To change the port configuration from KAccess (AHV Default) to kTrunked

```
vm.nic_update <vm-name> <mac of the interface>
update_vlan_trunk_info=true vlan_mode=kTrunked
trunked_networks=2900
```

Note: Above 2900 is the vlan tag we are trying to pass from the Guest VM (Junos). This tag could be anything but Native vlan configured for that network. In our case, we have configured Native vlan as 3000 for Juniper_WAN1-GE000

- To change the port nic type from kNormal (Default) to kDirect

```
vm.nic_update <vm_name> <mac of interface> type=kDirectNic
```

Note: Multicast will work when both the VMs communicating via multicast are on different nodes with kNormalNic configuration. If both the components are on same node then the VM interface has to be made kDirectNic. This is open issue with Nutanix and being addressed (Ref: https://jira.nutanix.com/browse/TH-99)

VM-Network Diagram

- The various networks and their connections among VMs can be visualized using “Network” tab (Top Left). Select given network and search for VMs.

  For example, in below case, we can see VMs are connected to Juniper-Int-RE_FPC and searching for “Juniper-TEST*” VMs. Similarly, we can also VM connections to various WAN ports.