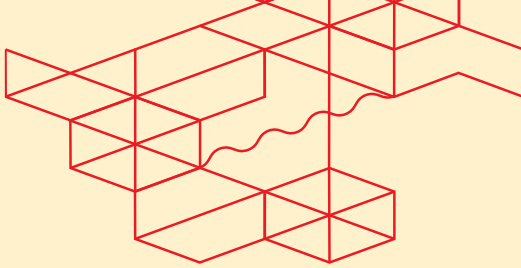
# Managed Private Cloud - User Guide

Version 1.0, July 2024

## Contents







# 1. Introduction

Welcome to Managed Private Cloud (MPC), the Infrastructure as a Service platform of Equinix Managed Solutions. MPC is using the Operational Console to control and manage your resources like vApps, virtual machines and networks.

This quick start guide explains how to access the MPC Operational Console and manage your organization user accounts. Next to that it will give you guidelines and best practices for controling your IT environment with the functions available.

Please refer to MPC Service Description for a full list of features and information.

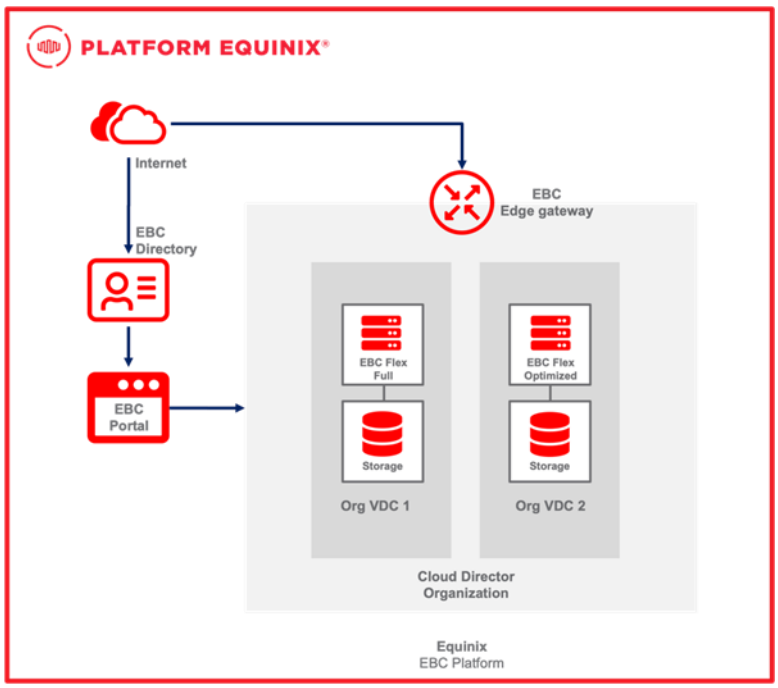



*Figure 1 Overview MPC*

# 2. Concepts

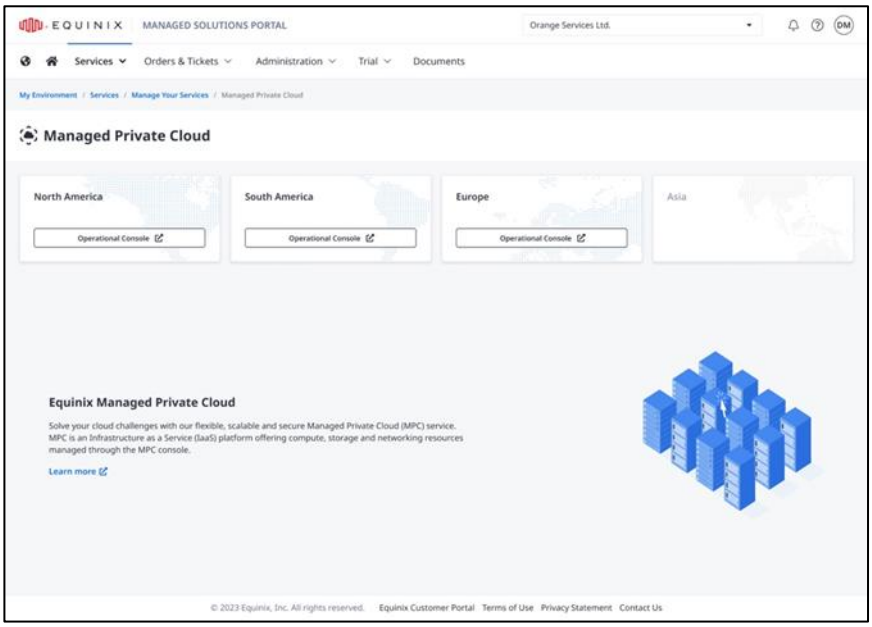
To gain a good understanding of the names and terms used later on in in this document, they will be explained first.

## 2.1 Equinix Customer Portal and Managed Solutions Portal

The Equinix Customer Portal (ECP) is the portal where the user management for the users who need access to the Operational console is performed. Part of the ECP is the Managed Solutions Portal (MSP) where you can raise tickets, services requests and get insights in the usage of the MPC service. On the ECP you will find the Product page where you can access the Operational Console.

## 2.2 Operational Console

The Operational Console is the portal where all the tasks for managing your MPC environment can be performed. The Operational Console gives you access to MPC in a certain region, MPC has four Regions, e.g. South America, North America, Europe and Asia. If you have an MPC in a specific region, the Operational Console will be accessable via one of the four buttons on the page.




## 2.3 Organization

An Organization (Org) defines the customer within the Operational Console. The Org can be viewed as a container that groups together all MPC resources like virtual datacenters (compute, storage, networking) users and libraries located in a MPC region.

The name of the Org is needed when logging into the MPC Operational Console. Use the Org name when this quick start guide mentions “<organization name>”.

## 2.4 Organization Virtual Datacenter (OVDC)

Customer compute, storage and networking resources are grouped in a Organizational Virtual Datacenter (OVDC). A customer can have multiple OVDC's with different characteristics such as the geographic location of an Equinix IBX (Amsterdam, London or Ashburn) or with different compute performance. If the existing capacity is not sufficient, you can contact your Service Delivery Manager or Account Manager.

## 2.5 Tenant Roles

In the Operational Console, three pre-defined roles have been defined that can be assigned to users

- Tenant Admin
- Tenant User
- Tenant Viewer

When Equinix performs the initial deployment for a new MPC customer, the first user that is configured is the customer administrator account. This account is created by Equinix during the onboarding process and is based on the name and email provided by the customer.

The first customer administrator account added is automatically added to the "Tenant Admin" group. Being a member of this group assigns the account all the permissions in the Operational Console.

### 2.5.1 Tenant Admin

Permissions:

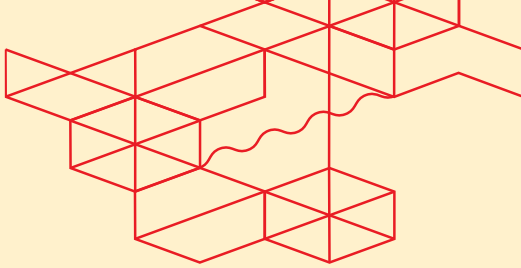
- Access VM Console
- Create and delete Snapshots
- Create and delete personal API Tokens
- Create, change and delete Organization wide Service Accounts
- Create, change and delete VMs in tenant scope
- Create, change and delete vApp's in tenant scope
- Create, change and delete Networks in tenant scope
- Create, change and delete Content Libraries and Content in tenant scope
- Configure Edge Gateways in tenant scope
- Set Affinity Rules
- View Tasks and Event Logs in tenant scope

### 2.5.2 Tenant User

The Tenant User rol permissions:

- Access VM Console
- Create and Delete Snapshots
- Create and delete personal API Tokens
- Start / Stop VM in tenant scope
- Start / Stop vApp in tenant scope
- Update VM Tools in tenant scope
- View Tasks and Event Logs in tenant scope



### 2.5.3 Tenant Viewer

The Tenant Viewer rol permissions:

- View everything the Tenant-User can, except for:
  - No VM and vApp Create / Change / Update / Delete (CRUD) permissions
  - No Console Access

# 3. Onboarding

During the MPC onboarding process you receive the following information:

- Organization name
- One or more customer accounts with one of the above roles assigned
- The ordered compute, storage and networking resources that are provisioned to one or more Organization Virtual Datacenters (OVDC), according to the design
- Information about the connectivity to Internet, Cloud Service Providers, Colocation and/or WAN providers

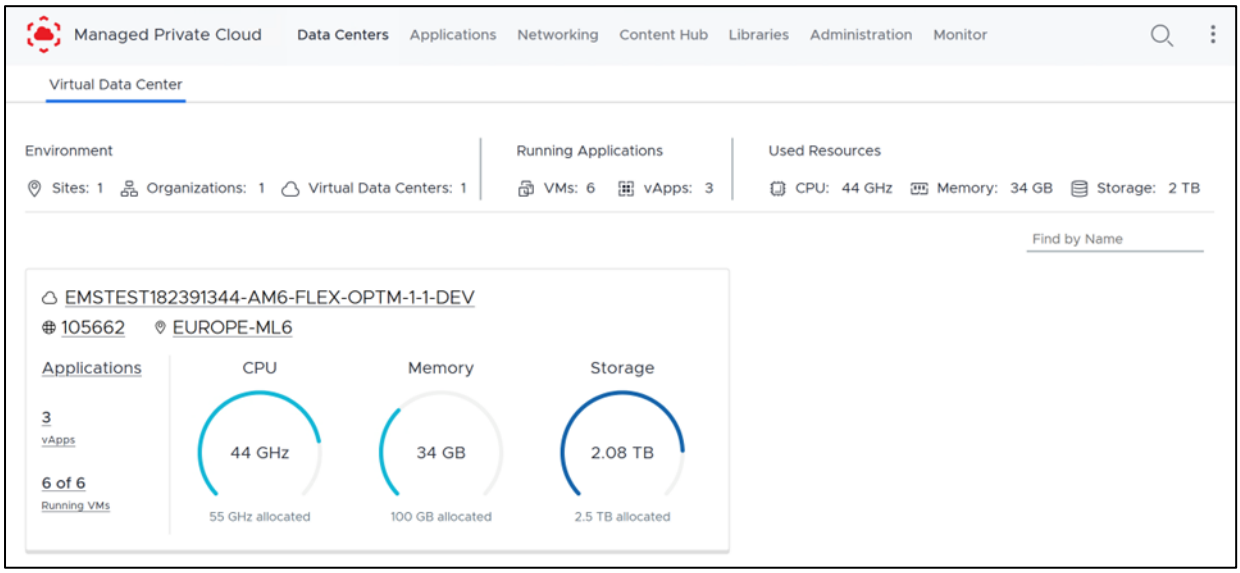


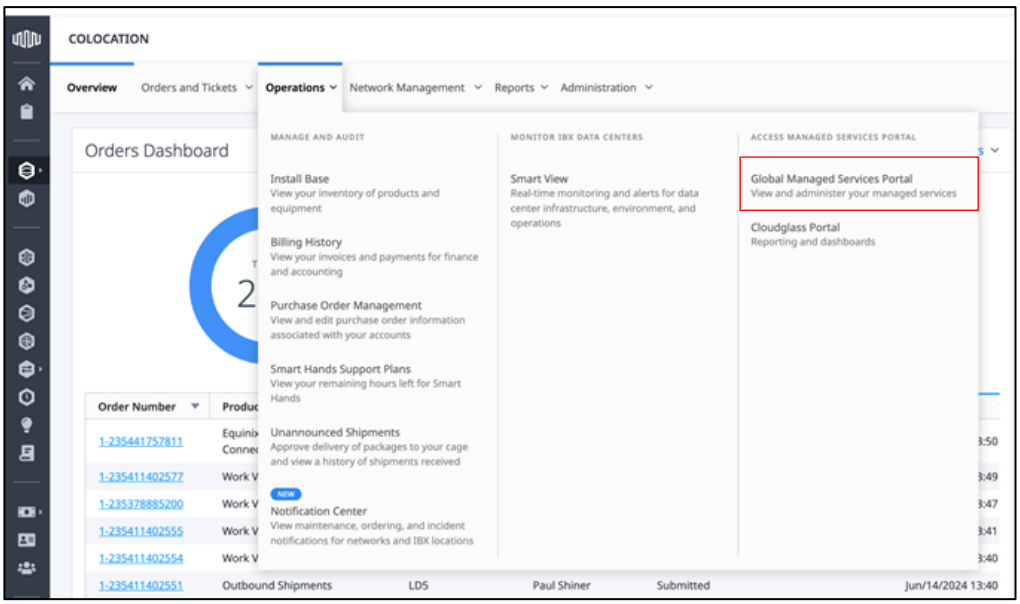

*Figure 2: Example of MPC environment after onboarding*

# 4. User Management and SSO

## 4.1 User Management

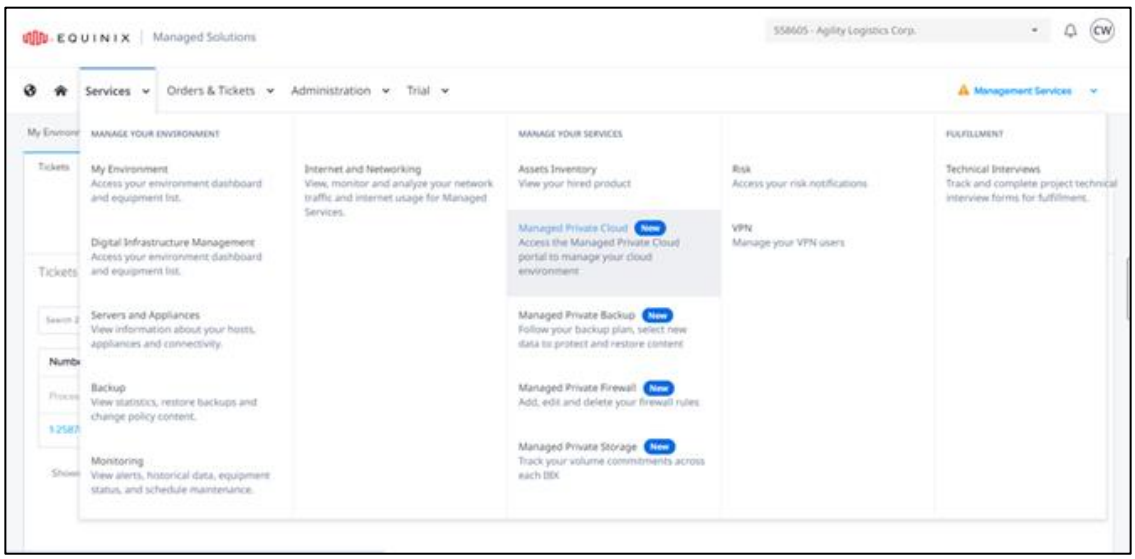
Users of the Operational Console are managed at the ECP, you can find the documentation on User Management and Password management at the following link.



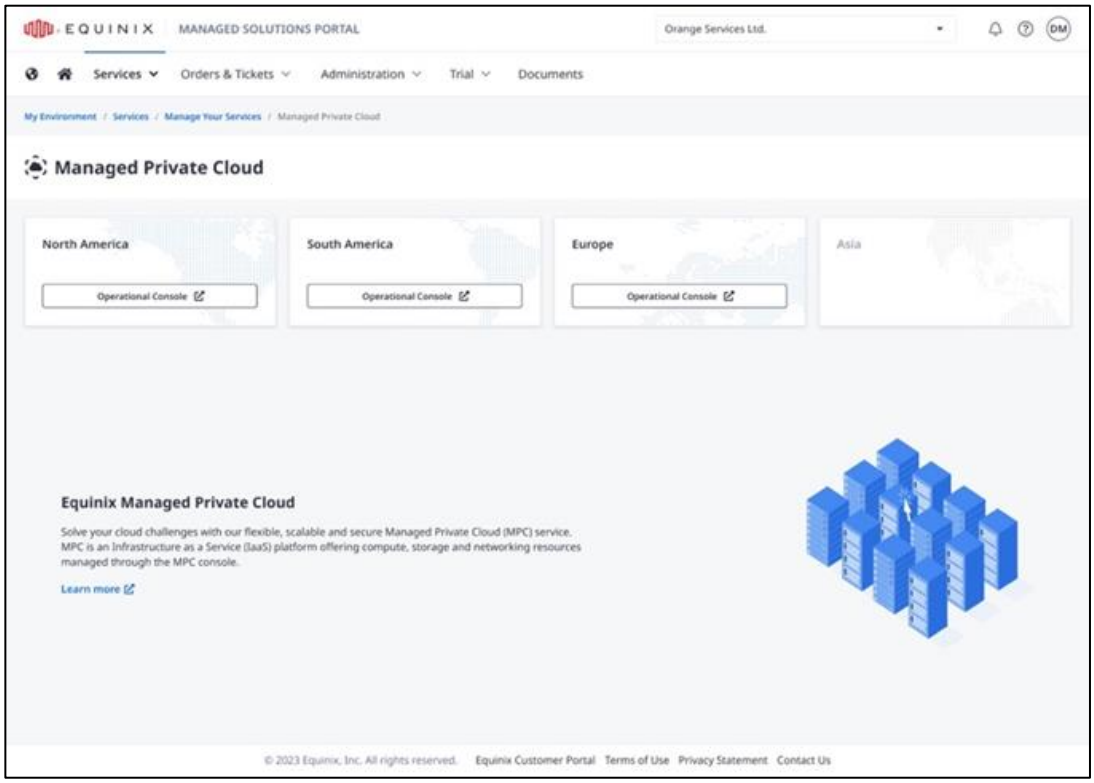

Once the users have been added to the ECP customer can raise a Service Request to assign a MPC Tenant role to the new user. Use the link to find the userguide for raising a service request in the Managed Solutions Portal.

## 4.2 Login To The Operational Console

When logged into the ECP you navigate to the product page via the Managed Solutions Portal/ Services/ Managed Private Cloud from here you can login to the Operational Console in the region of your choice.






When you access direct from the URL of the Operational Console and click “Sign In”, you will be redirected to ECP where you can enter your ECP credentials.


## 4.3 Using a Different Identity Source

In the ECP you can configure federation to your own identity provider so you can use your company credentials to login to the Operational Console, you can find the instructions about federation at docs.equinix.com

## 4.4 API Access

Access to the MPC Operational Console API is mainly needed for programmatic access or automation purposes. Examples of automation tools which can be used are: Terraform, Ansible, Python or just plain XML / JSON based calls.

For authentication to the API, customers need to generate an access tokens within the Operational Console, which supports two access methodes each serving a different purpose.

| METHOD | INTENDED USE |
|---|---|
| **API TOKENS** | • API access to the Operational Console on behalf of ECP or Federated user accounts for personal programmatic access<br>• Can be configured by all ECP or Federated user accounts |
| **SERVICE ACCOUNTS** | • API access to the Operational Console based on standalone accounts that are intended for Organization wide automation and third-party applications / tools<br>• Can only be configured by members of the Tenant-Admin role<br>• Can be assigned one of the supported roles<br>• Only supports API access |

### 4.4.1 Terraform Automation

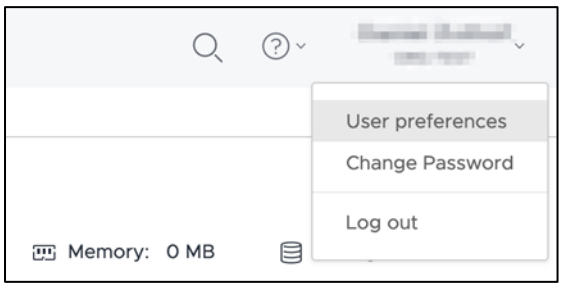
Terraform is the preferred infrastructure as code tool that lets you define both cloud and on-prem resources in human-readable configuration files that you can version, reuse, and share. You can then use a consistent workflow to provision and manage all of your infrastructure throughout its lifecycle. Terraform can manage low-level components like compute, storage, and networking resources.

Most of the functions in the Operation Console are available via the API or via Terraform. You can find the Terraform documentation at the Terraform website:
https://www.terraform.io/docs/providers/vcd/index.html

### 4.4.2 API Tokens

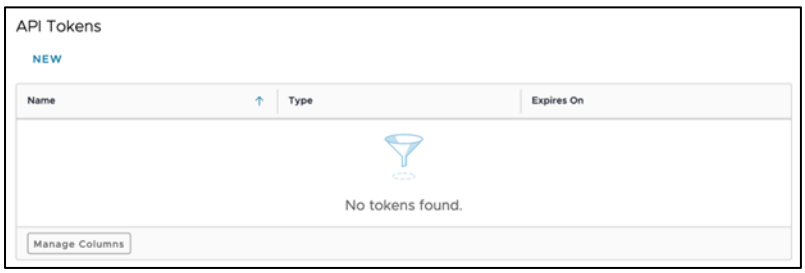
API Tokens can be configured by every ECP or Federated user account in the Operational Console.

To configure the personal API Token:
1: Login to the Operational Console and access the “User preferences” in the top right menu.

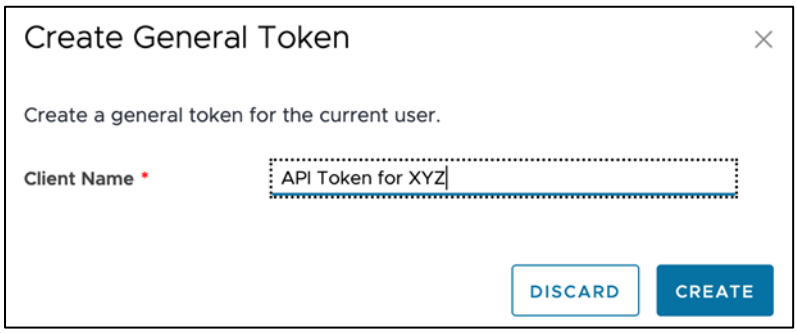


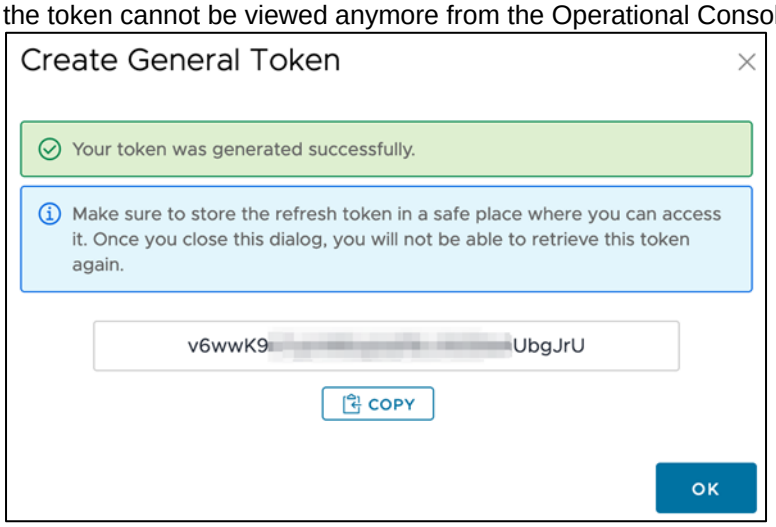
2: Go to the API Token section and click “New”



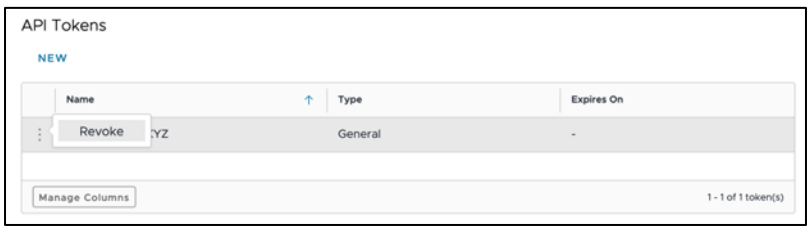

3: Give token a suitable name and click “Create”




4: The API Token is generated. Make sure to store the token in a safe place. After closing this screen, the token cannot be viewed anymore from the Operational Console and must be re-generated.




5: When the token is created, it’s visible in the Operational Console and can be removed when needed.



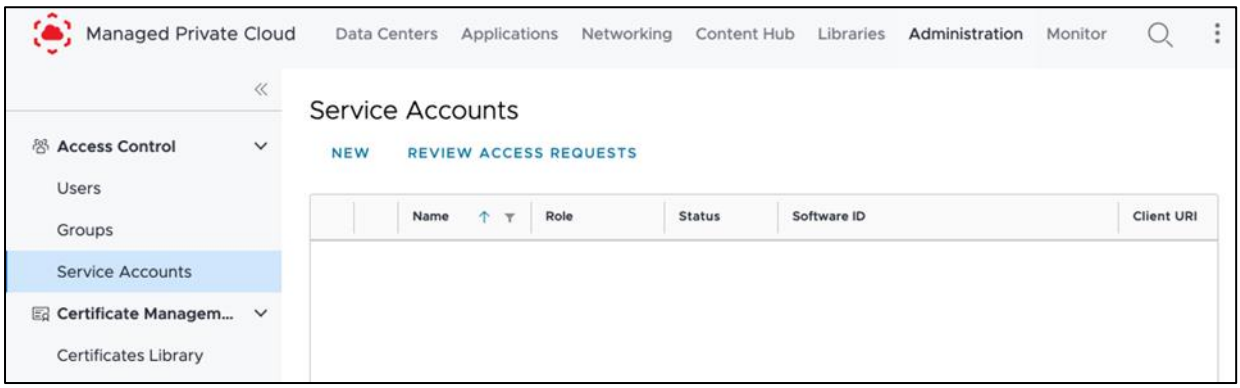

  

### 4.4.3 Service Accounts

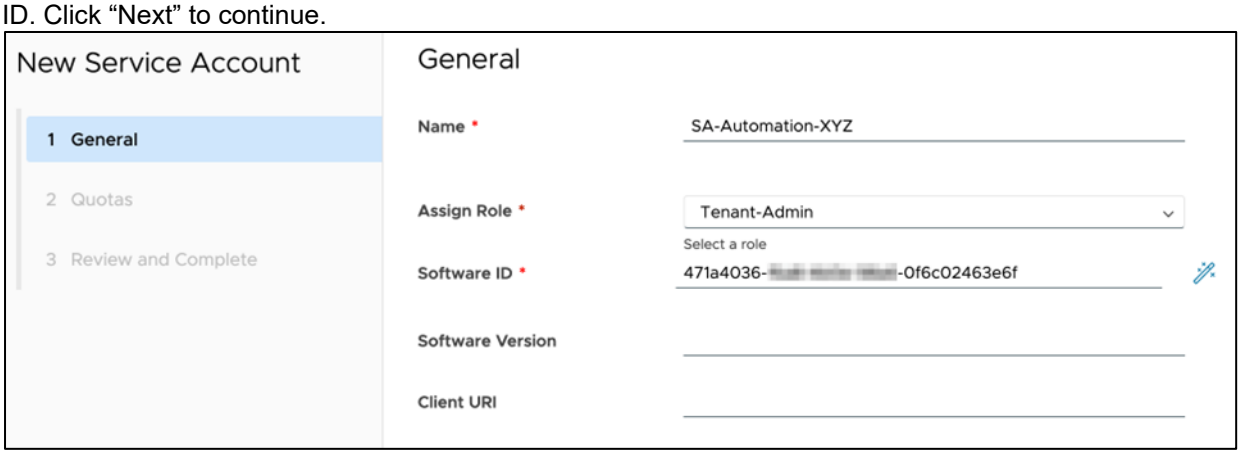
Service Accounts can be created / viewed an deleted by members of the “Tenant-Admin” roles only due to the sensitive nature of these accounts.
*Note:The Service Account will be the owner of its created objects in the Operational Console.*

To configure a Service Account:

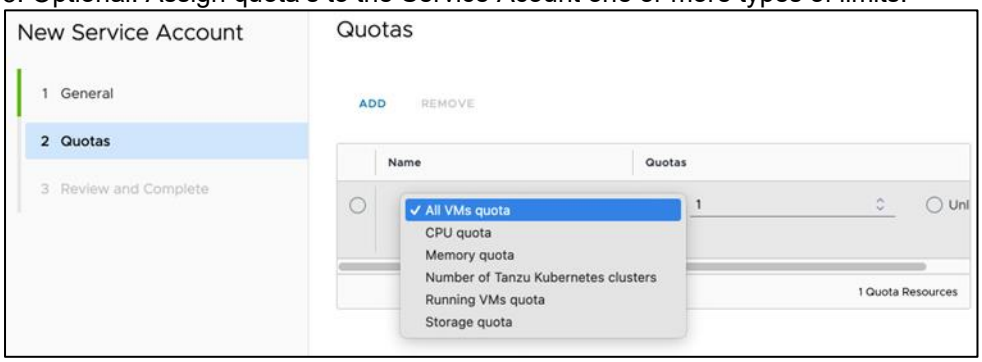
1: Login to the Operational Console and access the “Service Accounts” option in the “Administration” section and click “New”.




2: Give the Service Account a suitable name, assign a role and use the magic wand to generate unique ID. Click “Next” to continue.

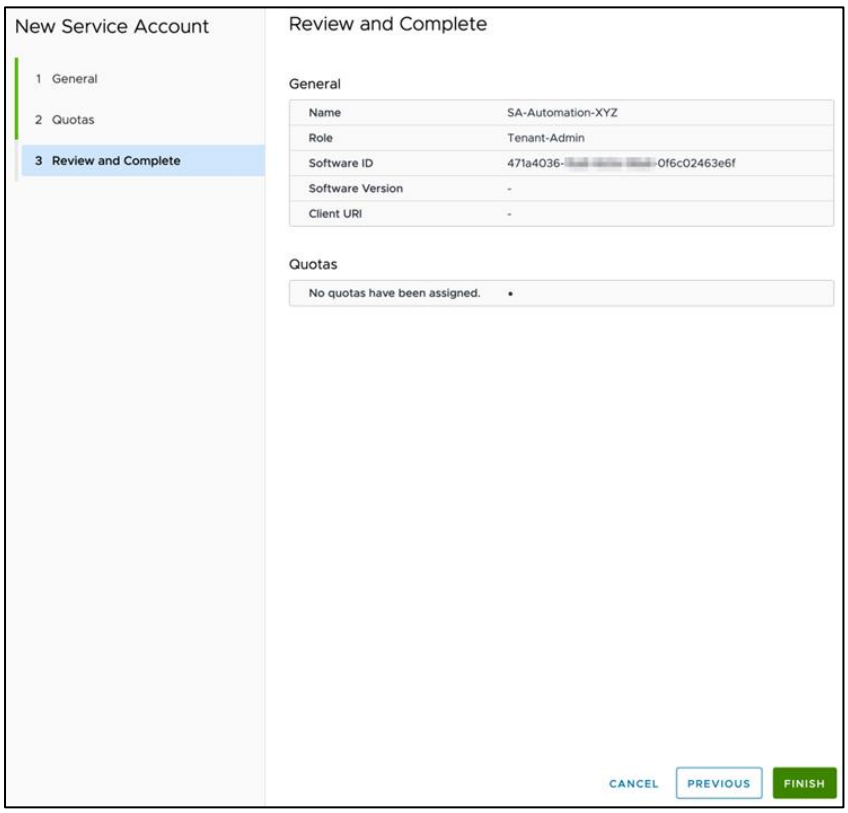



3: Optional: Assign quota’s to the Service Acount one or more types of limits.

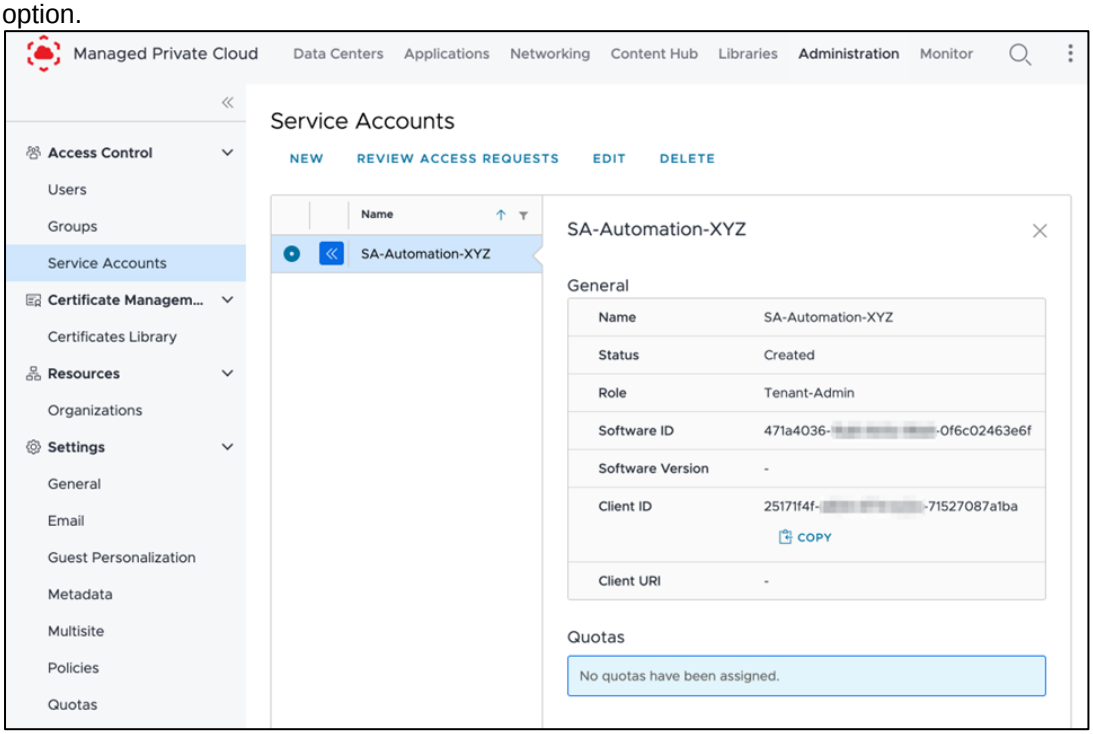


4: Click “Finish” to create the Service Account.




5: After the Service Account is created, the API key can always viewed in the “Client ID” field when opening its properties. Most settings of the Service Account can be modified afterwards via the “Edit” option.

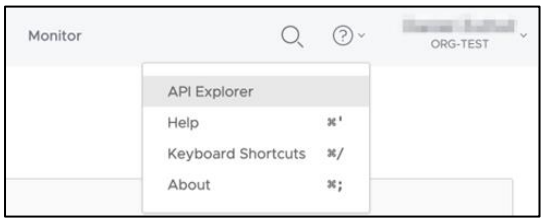


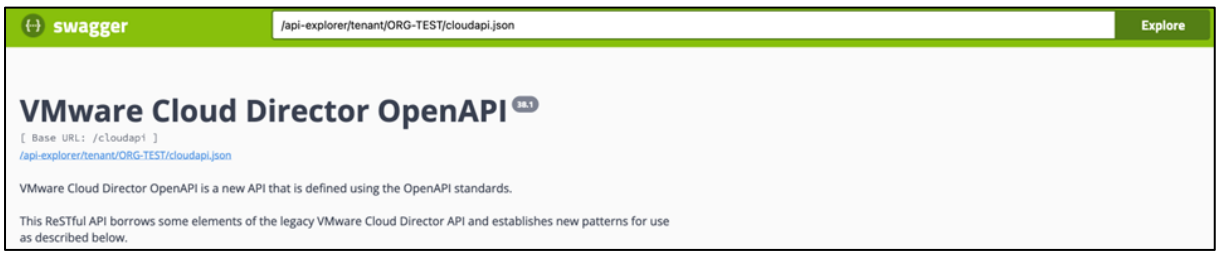
### 4.4.4 API Explorer

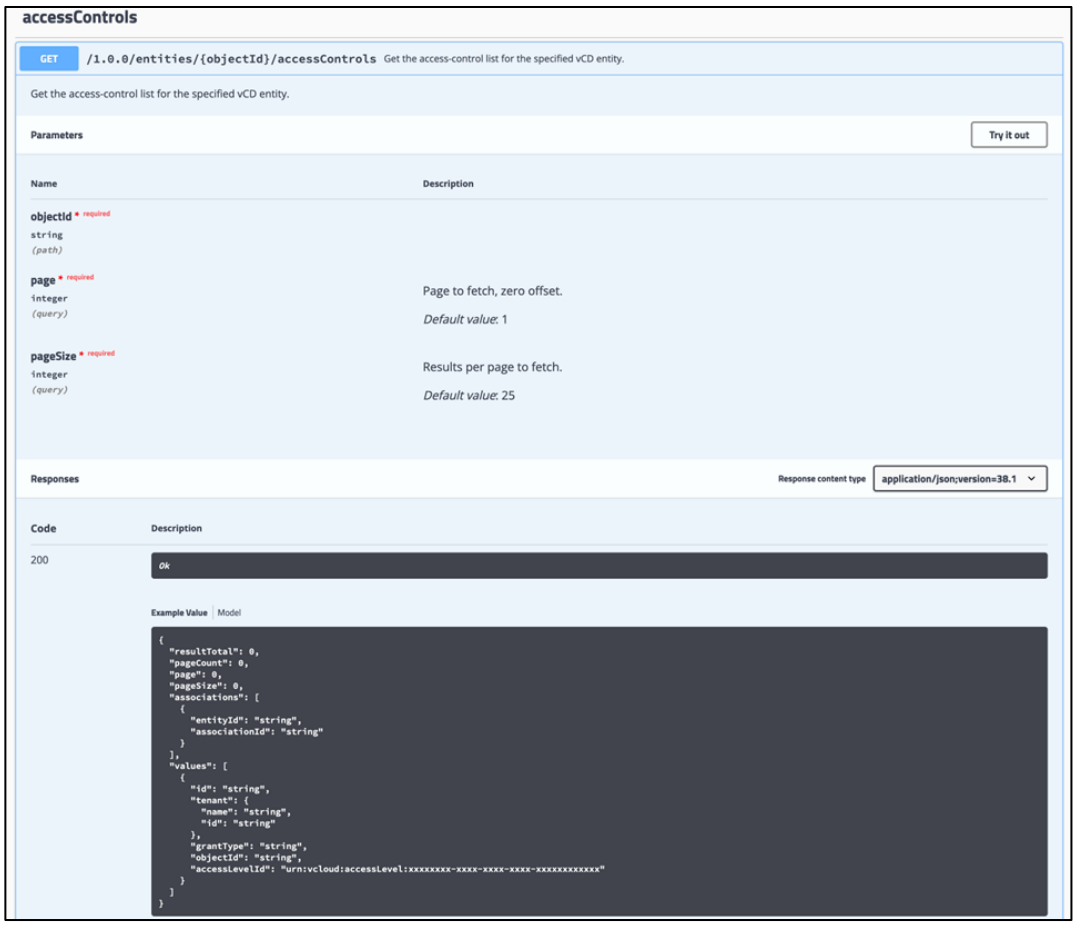
To graphically view, test and execute API calls the API Explorer is accessible via the Operational Console.

1: Go to “API Explorer “ in the top right menu under the “Help” section.




2: The API Explorer provides access to the Swagger based JSON API on behalf of the logged-in user account.



# 5. Use of the Operational Console

From the Operational console you can execute the actions to create VMs, networks and security rules below you will find topics related to applications, Virtual Machines, Snap shots and networking.

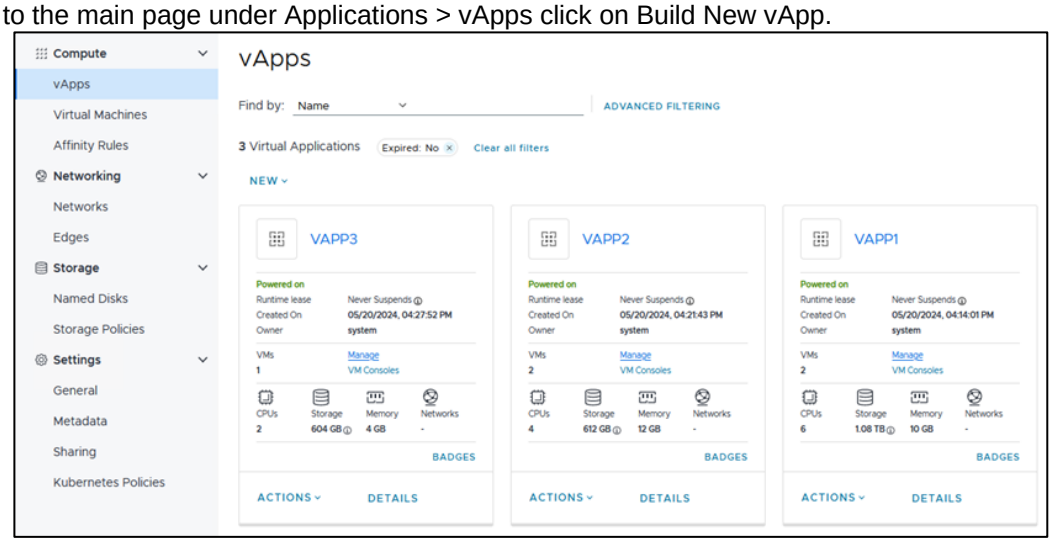
## 5.1 VAPP

A vApp is a set or group of virtual machines within the virtual data center, for example an application landscape. You can manage the machines as a set, for example taking a snapshot or restarting it. Of course it is also possible to manage the individual virtual machines as vApp. VMs and vApps can get a lease, that is, they are cleaned up automatically after a period of time, the default is set to never expire.

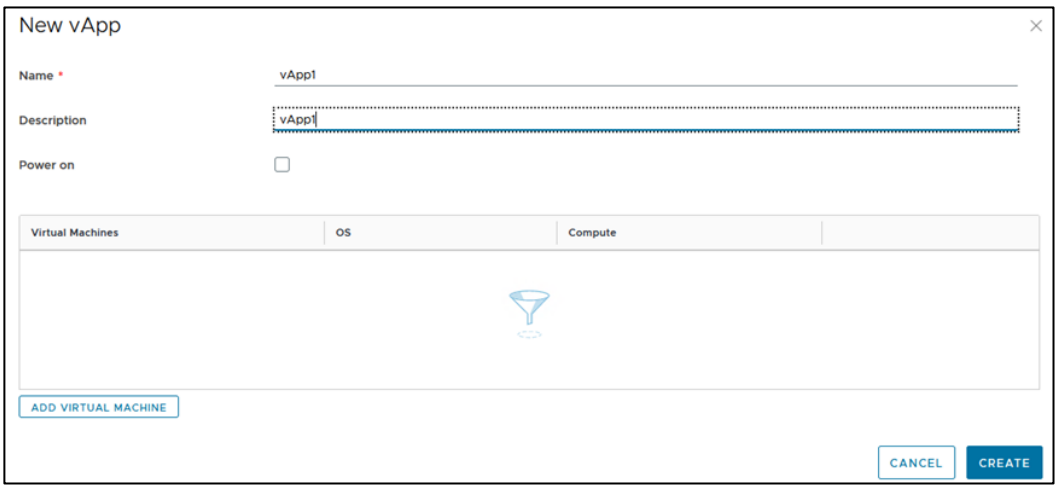
### 5.1.1 Create a new vApp

A vApp can initially be created with or without virtual machines. Creating a vApp without VMs is for example usefull if you want to create the network within the vApp before creating the virtual machines.

1: Go to the main page under Applications > vApps click on Build New vApp.




Give a name and description to the vApp and click on build. Wait for the proces to finish.



2: Options in the vApp window

- Click on power to turn on the vApp, shut it down, restart it or pause it. This will only work if there is a virtual machine in the vApp.
- Click on more to add or remove a VM to/from a vApp
- Click on details if you want to find or change additional information.

## 5.2 Virtual Machines

Virtual machines can be created in two ways, as part of a vApp or as a separate virtual machine. Equinix advices to create a VM always as part of a vApp, a vApp can contain up to 100 VMs. Afterwards a VM can always be moved to another vApp. It is also possible to create a network between two VMs in different vApps.

Advantages of creating a VM as part of a vApp are:

- The ability to group VMs for task, function or backup / archive retention.
- Configure the VM startup and shutdown sequence.
- Better insight into VM network configuration through vApp “Network diagram” function.
- Apply delegated management by granting rights.

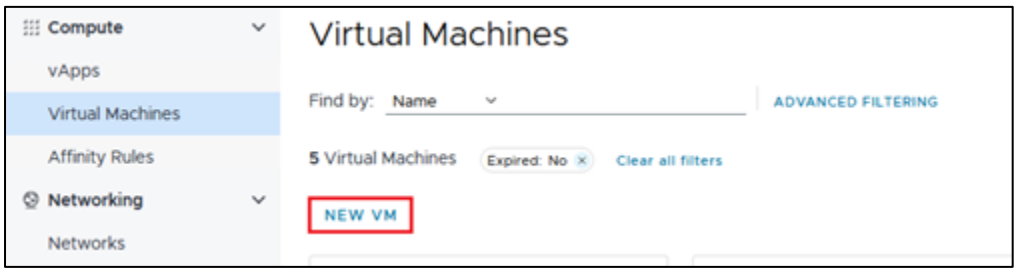
The allocated storage resources and the amount of GBRam of a VM counts as used storage for the allocated Storage Policy. When you start a VM, the compute resource are subtracted from the compute quota of the OVDC.

When creating a new VM, the most common OS installation options are:

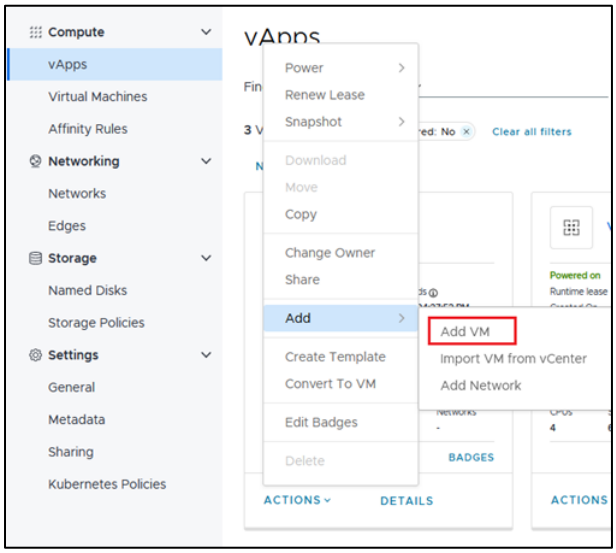
1. A new VM is created, after which an ISO file is chosen from the own private catalog (see 5.3 Catalogs), or from the shared Equinix catalog. When you turn on the VM, it starts from the ISO file and the installation can be started.
2. A new VM including vApp is created from an OVF / OVA file that exists at the administrator's workstation as part of the creation procedure.

### 5.2.1 Creating a virtual machine

1: Go to the main page under Applications > Virtual Machines click on Create VM or click on more at an vApp and choose Add VM.

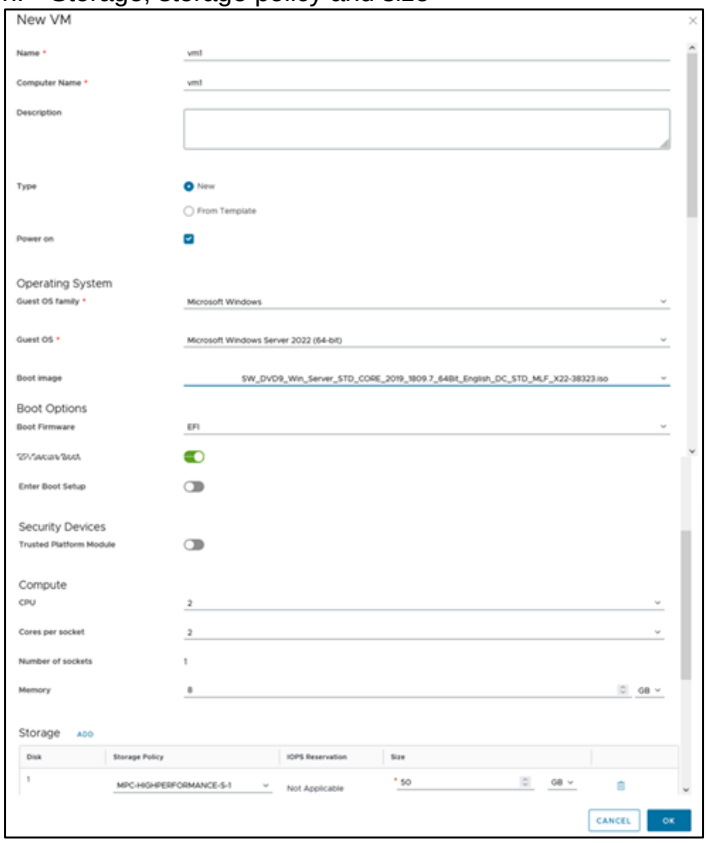




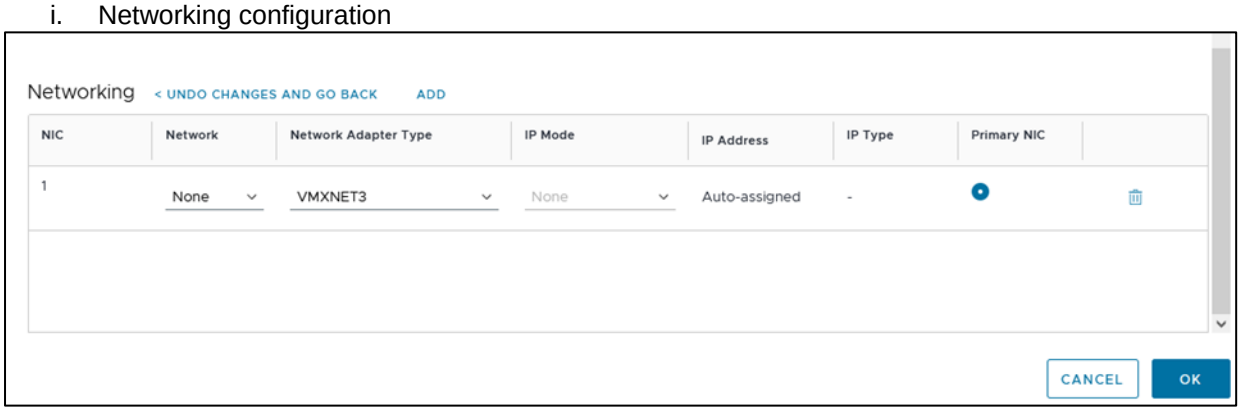

2: Follow the steps in the dialog and click on OK and wait for the creation of the VM.

a. Choose a name and computername and enter.
b. Choose New at Type.
c. Choose or the VM has to start directly after creation.
d. Choose OS family, Guest OS, Boot image
e. Boot option, EFI Secure Boot, enter Boot setup
f. Trusted Platform Module
g. Compute, CPU, cores, Memory
h. Storage, storage policy and size



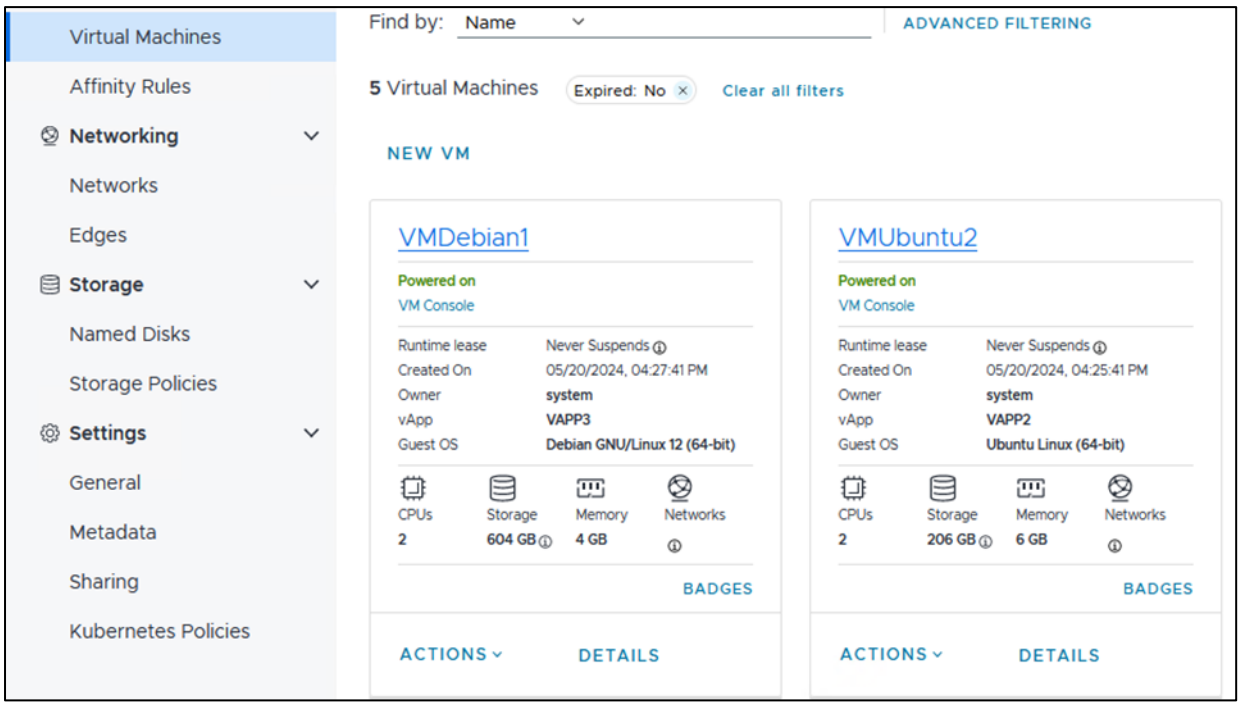

  

i. Networking configuration




3: In the Virtual Machines screen

1. Click Power to turn on, turn off, restart, or pause the VM. This is only possible if there are VMs in the vApp.
2. Click More to mount installation media, work with snapshots to open the console or to delete.
3. Click on View and / or change details or additional matters

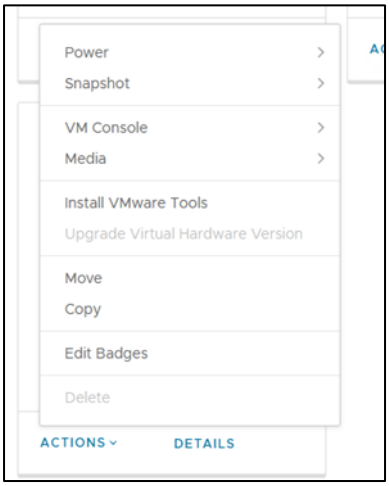



### 5.2.2 Link installation media from catalog to a VM

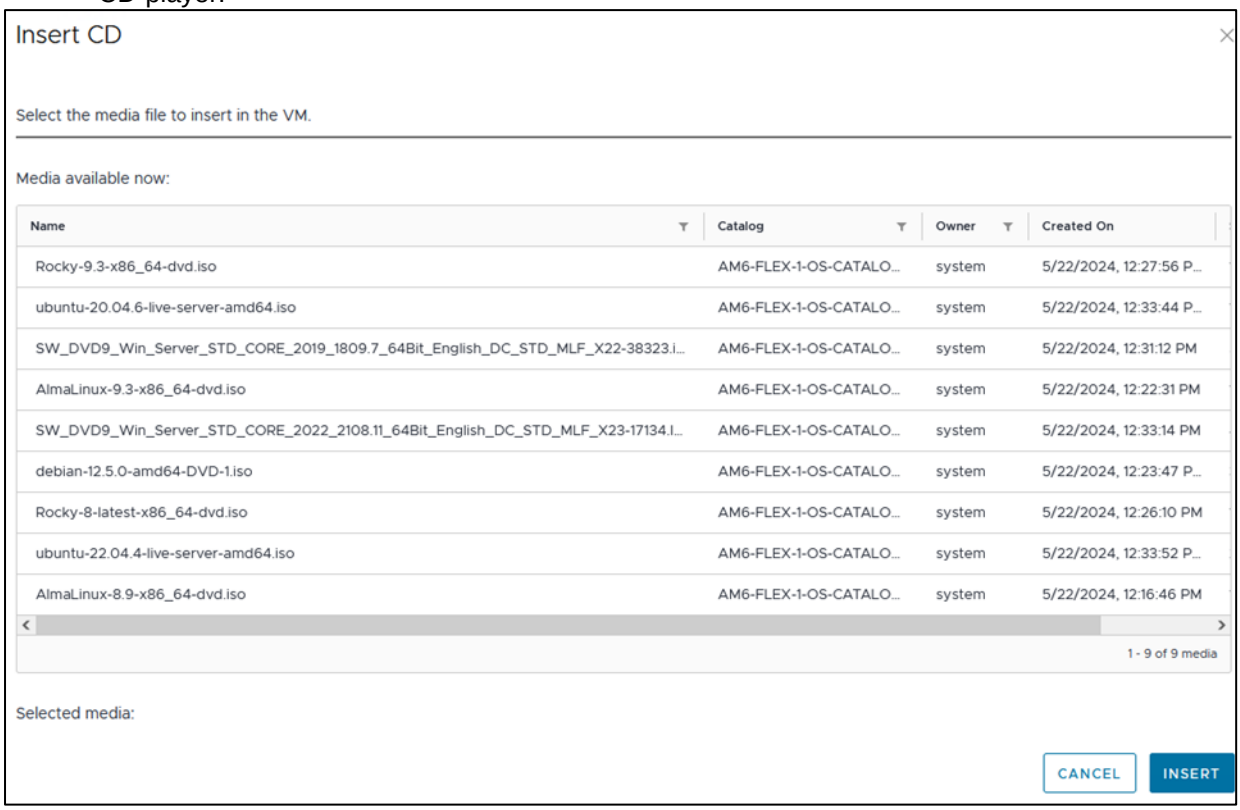
If a catalog is already present and installation media has been uploaded, it can be linked to the VM.

1. Find the VM and click on More.




2. Choose Insert Media and select the installation file, this is going to be connected as a virtual CD-player.




3. As soon as the job is finished it is adviced to decouple the installation file via Eject Media

### 5.2.3 VM Console

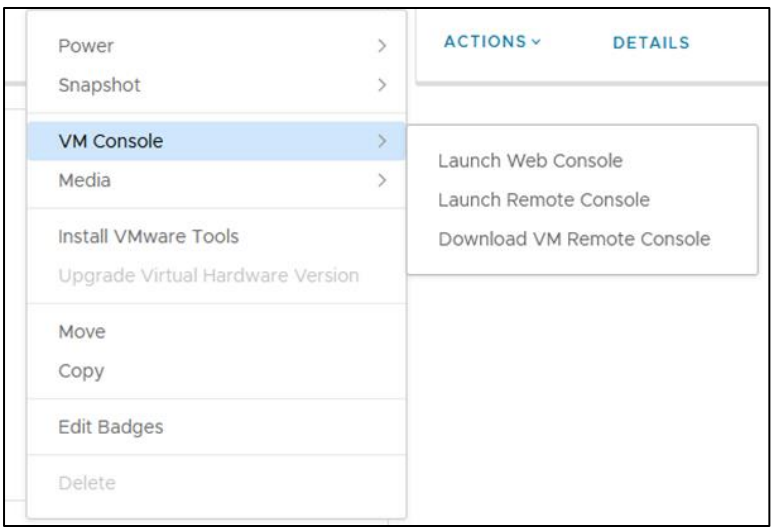
A virtual machine can be managed via the Operational Console at any time. There are 2 different VM consoles:

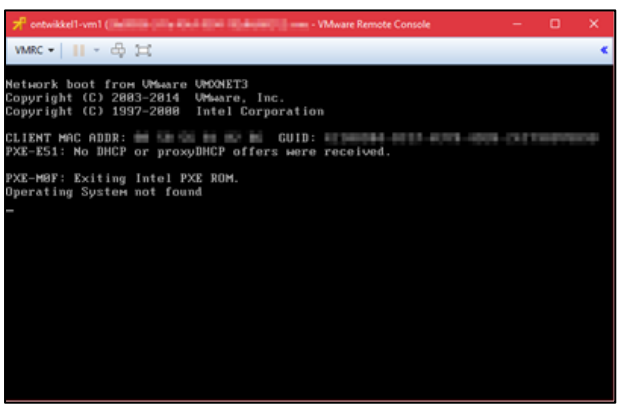
- the Web Console which works from your browser.
- the VM Remote Console which requires installing a plug-in.

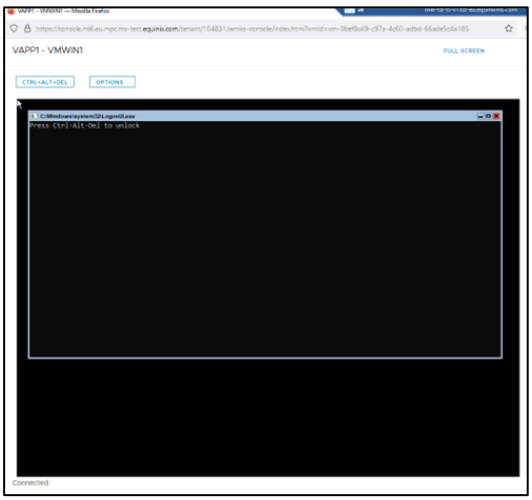
Using (installation) media (ISO) directly from your device to boot or install a VM is not possible. The media should first be uploaded to the catalog.

The VM Remote Console plug-in for Windows devices is available in the shared catalog. For MacOS and Linux (incl. Windows), VMRC functionality is respectively part of VMware Fusion Pro and Workstation Pro when the. Both are available in two licensing models, which are commercial (licensed) and personal use (free) and are not part of MPC nor are provided by Equinix.

1. Find the VM from the vApp or the Virtual Machines overview.
2. Click on More and choose the console type you want to use, the web console where no plugin is needed or the VM Remote Console where this is necessary.



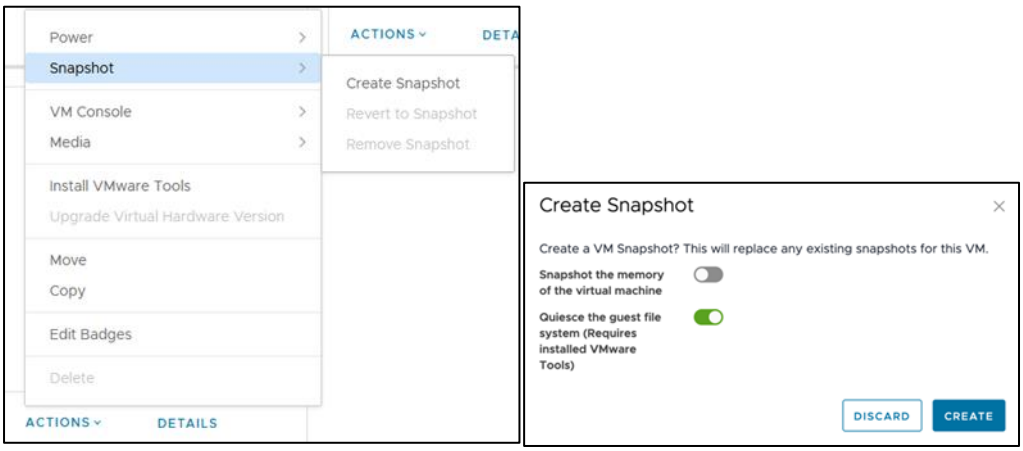

  

### 5.2.4 Snapshots

A snapshot is a mechanism for taking a snapshot of the complete VM or vApp before an action. Operational Console provides the ability to take only one snapshot with or without the active memory state. The snapshot mechanism will double the storage usage of the VM or vApp.

Snapshots can impact the performance of the VM. It is recommended to save a Snapshot for a maximum of 2 or 3 days, after a week the Snapshot will be automatically removed.
If the state of the VM needs to be saved longer, create a clone or make a backup of the VM or vApp.

1. Find the VM or vApp and click on Actions, Snapshot and choose Create Snapshot and confirm.




2. To go back to the stored status of the VM in the snapshot, choose Revert to Snapshot and confirm.
3. To remove the snapshot choose Remove Snapshot and confirm

Notes

- When a new Snapshot is created from a VM with an existing Snapshot the old Snapshot will be removed.
- To have access to all the Snapshot options, the VMware tools needs to be installed in the VM.

## 5.3 Catalogs

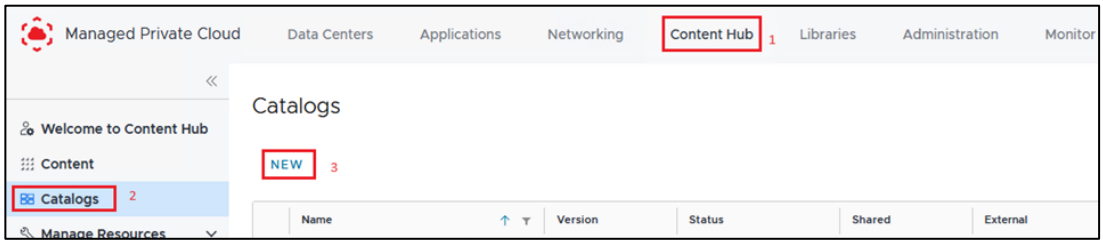
The catalog in Operational Console is where vApps, virtual machines and other media files (ISOs, for example) are stored. Equinix provides a shared Catalog with a number of ISOs to get you started. The shared catalog is tied to the OVDC or, more precisely, metro of your environment. You can also create your own private catalog to store installation media or templates, you can upload files yourself or save them as a template based on previously created virtual machines or vApps. The files stored in the private catalog are part of the storage quota of your OVDC. All software uploaded needs to be licensed according to the vendors and Equinix policies, next to that the catalog may only be used for ISO's and OVF's.

### 5.3.1 Creating a catalog

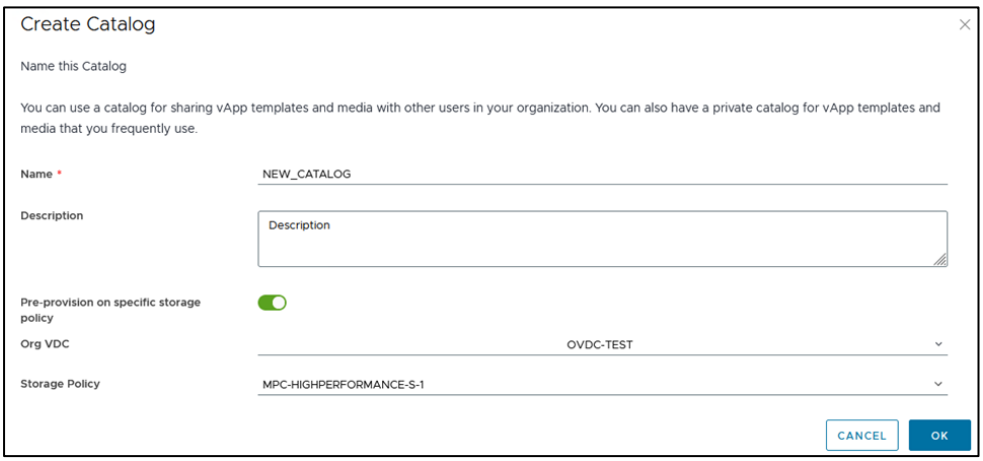
1. In order to store the installation media or templates, a catalog must first be created

Go on the home screen to the three horizontal stripes (see diagram below).



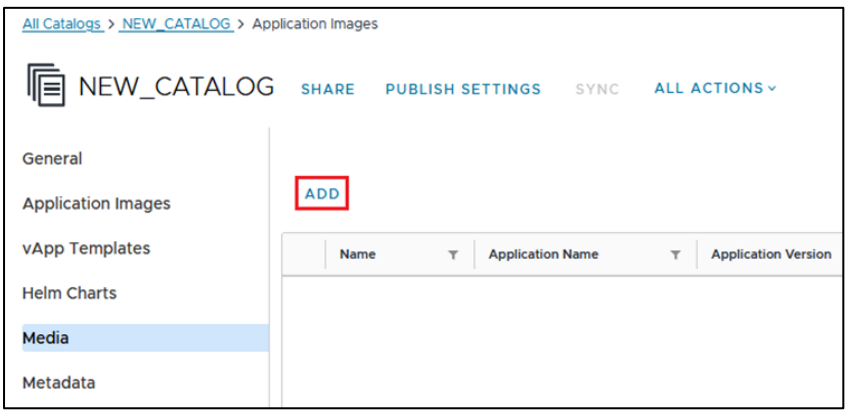

2. In the Content Hub screen go to Catalogs and choose New.
3. Give a name and description to the catalog. You can store the catalog on the available storage profiles. By default the fastest profile is chosen. To choose a profile, turn on the Pre-provision on specific storage policy select the ORGOVDC and choose the specific storage policy.




### 5.3.2 Adding installation media

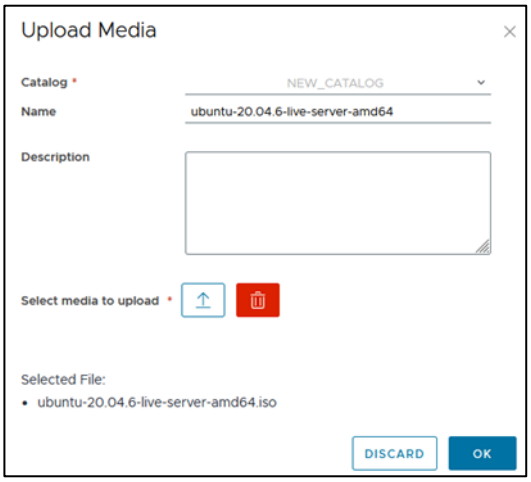
When the catalog is available, you can upload installation media to it.

1. Go to Content Libraries > Media & Other en choose Add.

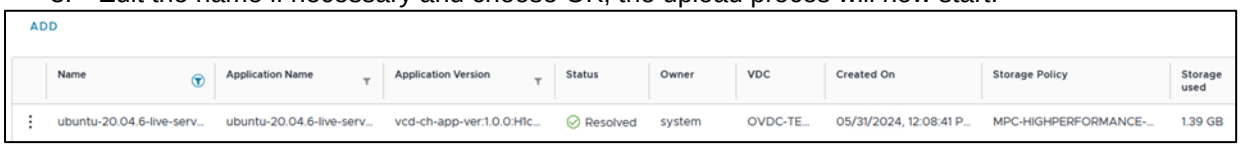



2. Select the catalog in the new opened screen and click on the icon with the arrow upwards to start the dialog to the file browser. Select the installation file and click on ok.




3. Edit the name if necessary and choose OK, the upload proces will now start.



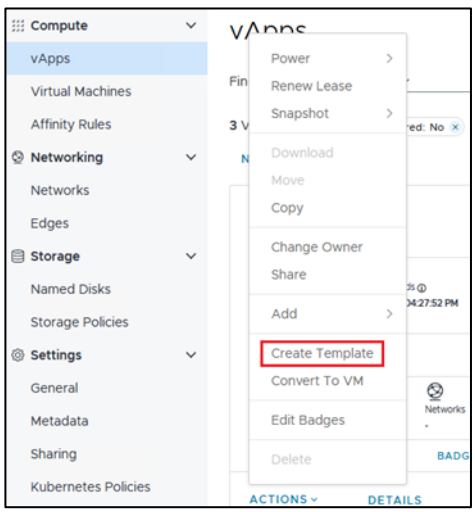

In the overview screen of Media & Other there will be a rotating circle at status as long as the upload is in progress. When the upload is complete there will be a green check mark. The file is now ready to use.

4. If you click on the three dots in front of the name, you can choose to delete the file or download it back to the workplace.

### 5.3.3 Create a vApp Template

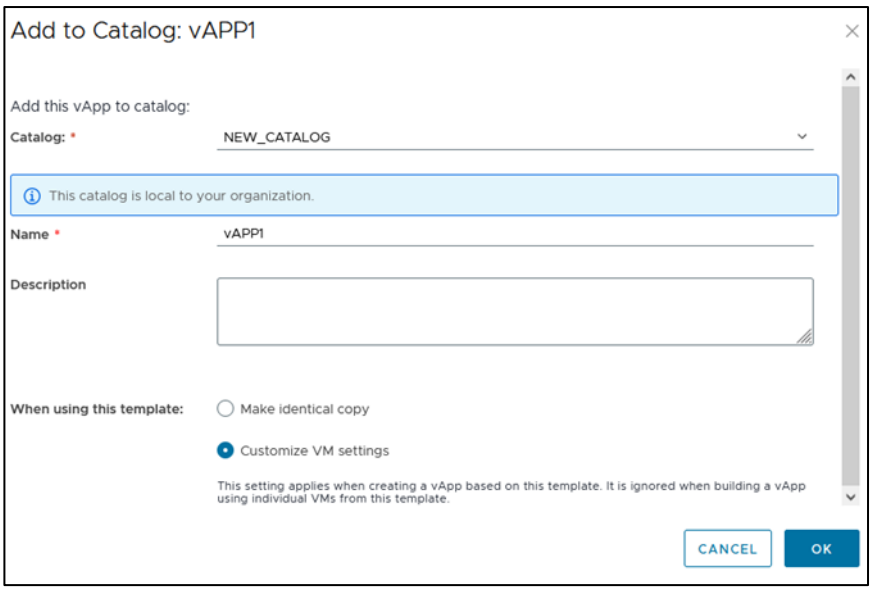
A vApp template can be created based on an upload from a local workstation or based on a already existing vApp. If a template must be created for a single VM based on vApp, it is only possible if it is the only VM in the vApp.

1. Find the vApp what the template should be made of and click on More en choose Add to Catalog.



Choose the catalog where the template should land and enter a name. You can choose to make a exact copy but you can also choose to have VM settings adjusted. This only works if VMWare tools are installed before the template is created.



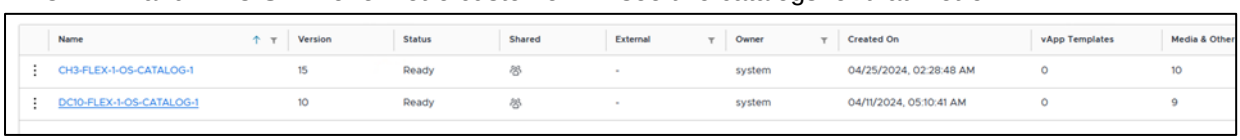

2. To access the vApp template gto to Content Hub > Catalogs > open the catalog.


Once available, the template can be used to roll out new machines. See the work instruction "Working with vApps and VMs".

### 5.3.4 Shared Catalogs

Equinix offers a catalog (* OS-CATALOG-1) per MPC metro containing a number of OS variants. Choose the catalog with the location where the Virtual Machine will reside.

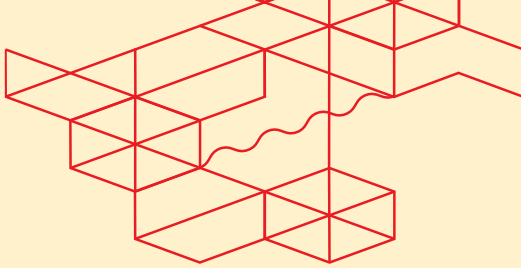
The shared catalog is associated with your PMC variant (FLEX, ST) per metro, so if a customer is using MPC FLEX and MPC ST in one Metro customer will see two catalogs for that Metro.




## 5.4 Connectivity

The Operational Console offers a number of ways in which you can connect and access your services



with your organization or the rest of the world. Depending on your choice an OVDC is created with Bridging (MPC Connectivity Customer Routed in your order) or Routing (MPC Connectivity Routed in your order).

## 5.5 Networks

Depending on your choice for Customer Routed or Routed the network functions in your Console will differ.

In the operational Console 2 types of networks can be created in Self Service, isolated and routed:

- An isolated (internally connected) network is a network that only exists for VMs within the OVDC. Creation of isolated networks is described in How to create an isolated OVDC network.
- A routed network (externally connected) provides access to networks outside the OVDC via the edge gateway. Creation of routed networks is decribed in How to create a routed OVDC network.

| MPC CONNECTIVITY TYPE | ISOLATED | ROUTED |
|---|---|---|
| **BRIDGING** | Yes | No |
| **ROUTING** | Yes | Yes |

From here you can start building your VMs or change the configuration.
In the next sections we give a brief introduction about commonly used network task in the MPC Operational Console:

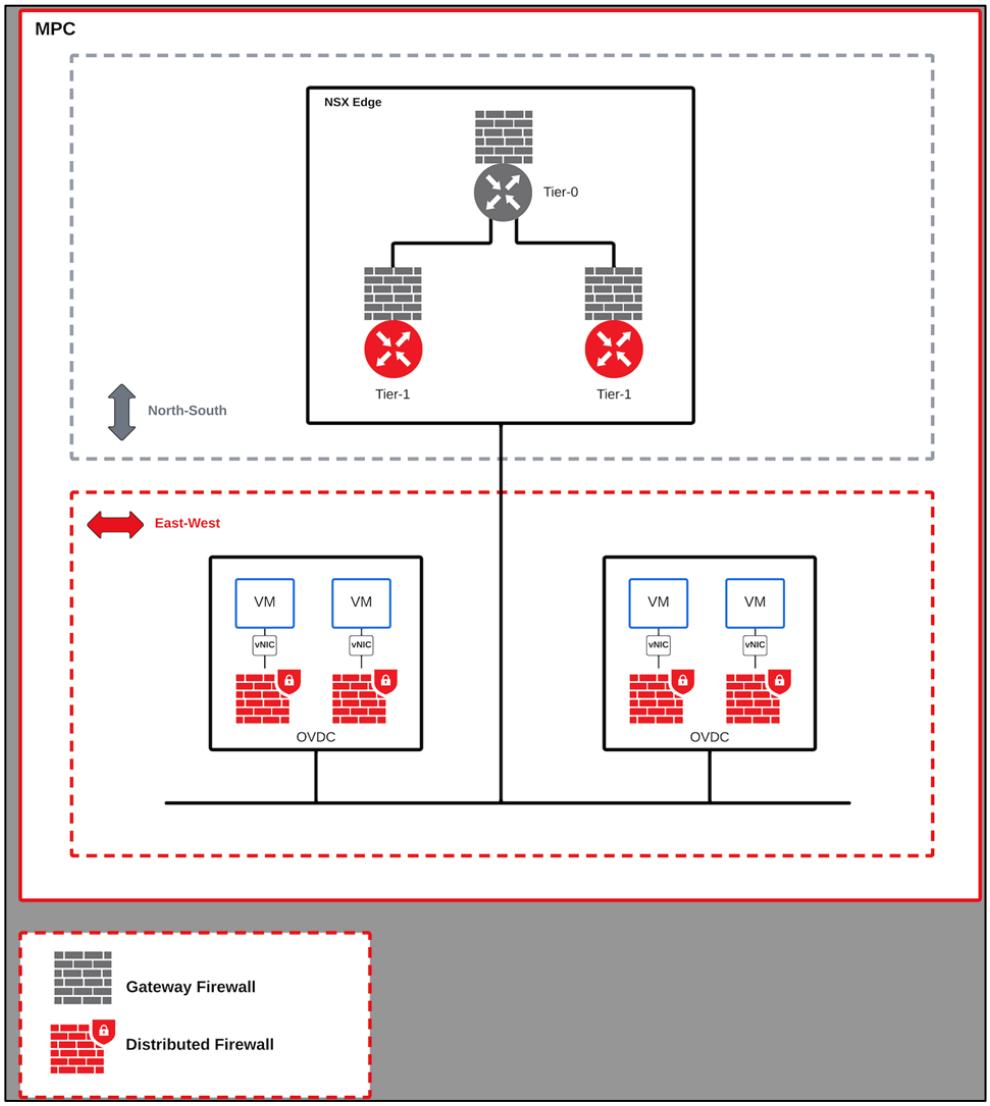
- MPC Firewall Architecture
- How to create an isolated OVDC network
- How to create a routed OVDC network
- How to create firewall rules
- How to create NAT rules
- How to configure IPsec VPN
- How to create Distributed Firewall Rules (we need Datacenter Group here)

### 5.5.1 MPC Gateway Firewall Architecture

The MPC Firewall design includes two types or layers of firewalls, Gateway Firewalls and the Distributed Firewall.

Gateway Firewalls are North-South Firewalls that are designed to protect the MPC's perimeters or boundaries, whereas Distributed Firewalls are East-West Firewalls that protect workloads at the vNIC level.




### 5.5.2 How to create an isolated OVDC network

**Overview**

An organization virtual data center network enables its virtual machines (VMs) to communicate with each other or to provide access to external networks. A single OVDC can have multiple networks.

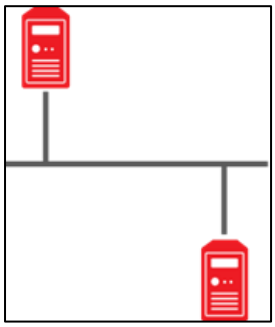
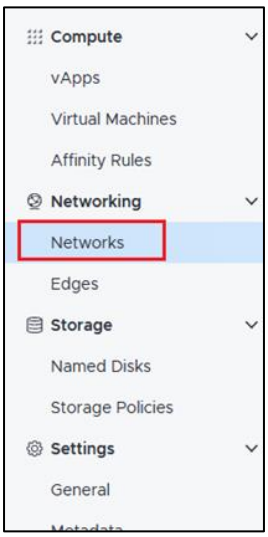


*Figure 3 Isolated Network*

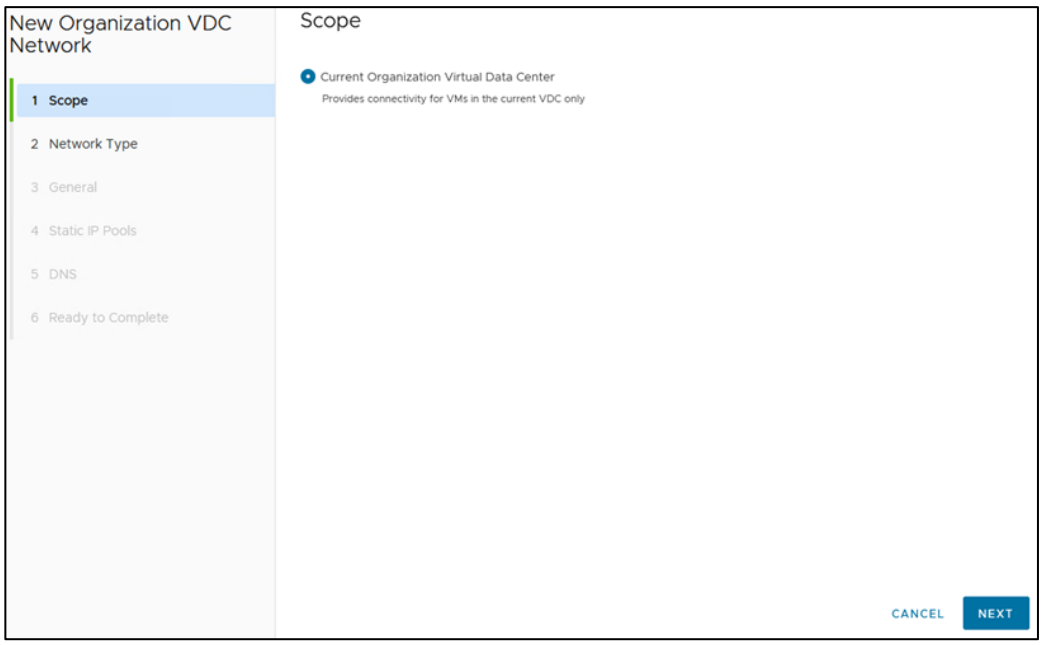
**Creating an isolated network..**

1. In the Operational Console Virtual Datacenters dashboard, select the OVDC in which you want to create the network.
2. In the left navigation panel, select Networks.



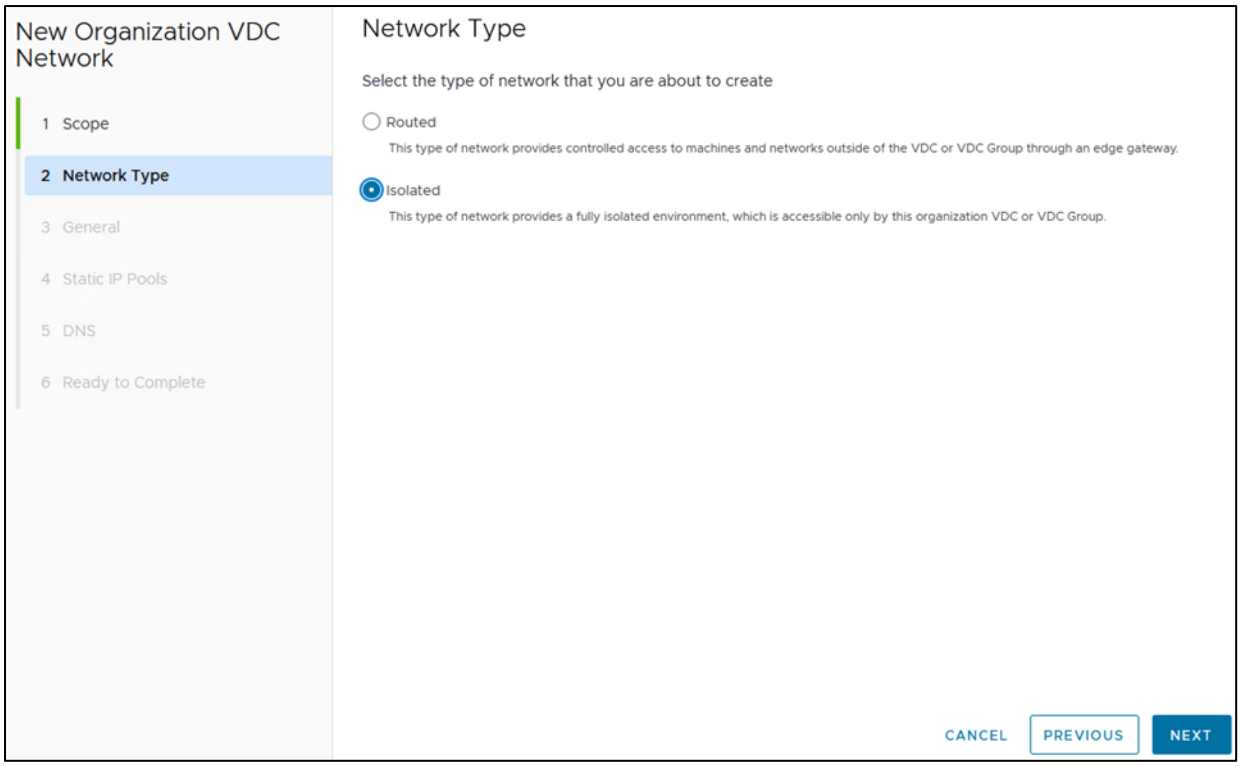

3. Click New


4. Scope, we select the current OVDC for current isolated network

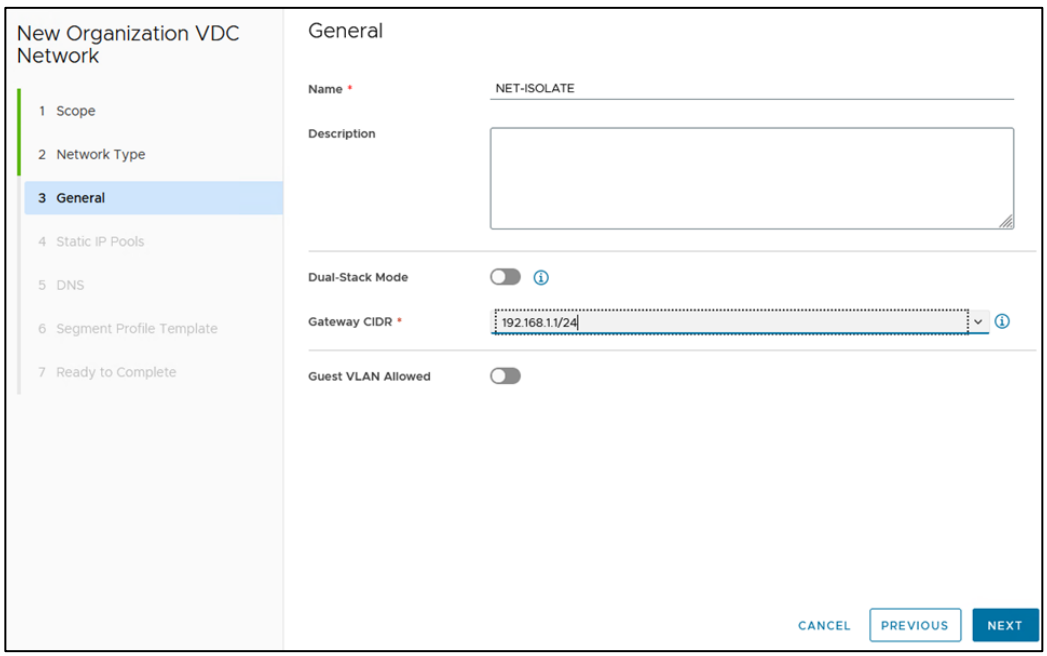


5. In the Network Type page of the New Organization VDC Network dialog box, select Isolated then click Next.




6. In the *General* page, enter a **Name** and **Description** for the network
7. In the **Gateway CIDR** field, select the ip-space for the network from the drop down list. The list of gateways is pre-populated by Equinix based on customer input during deployment.
8. **Dual Stack** can be switched on when IPv6 is used
9. **Guest VLAN Allowed** can be switched on multiple VLAN's within connected VMs

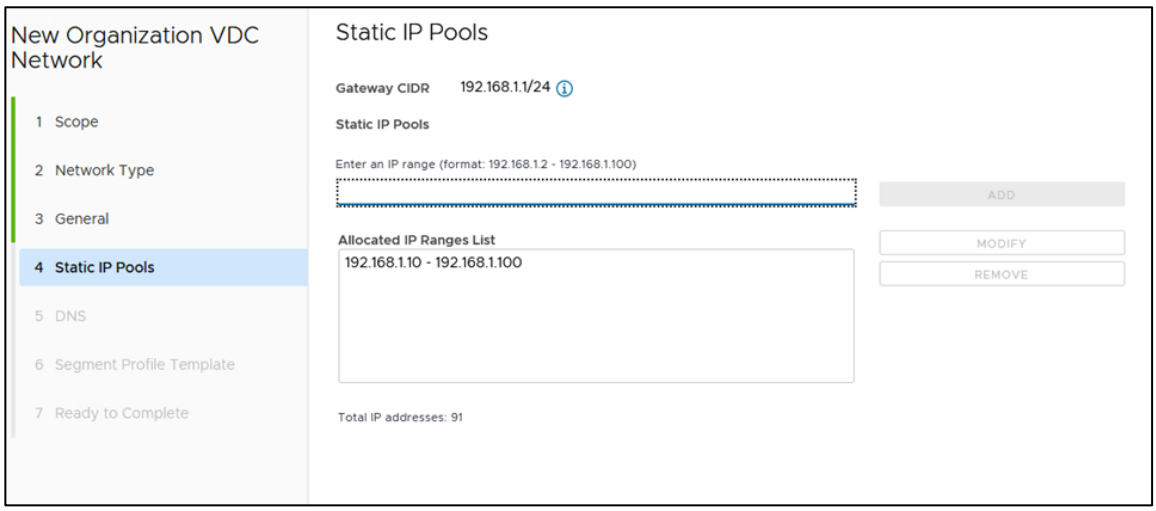


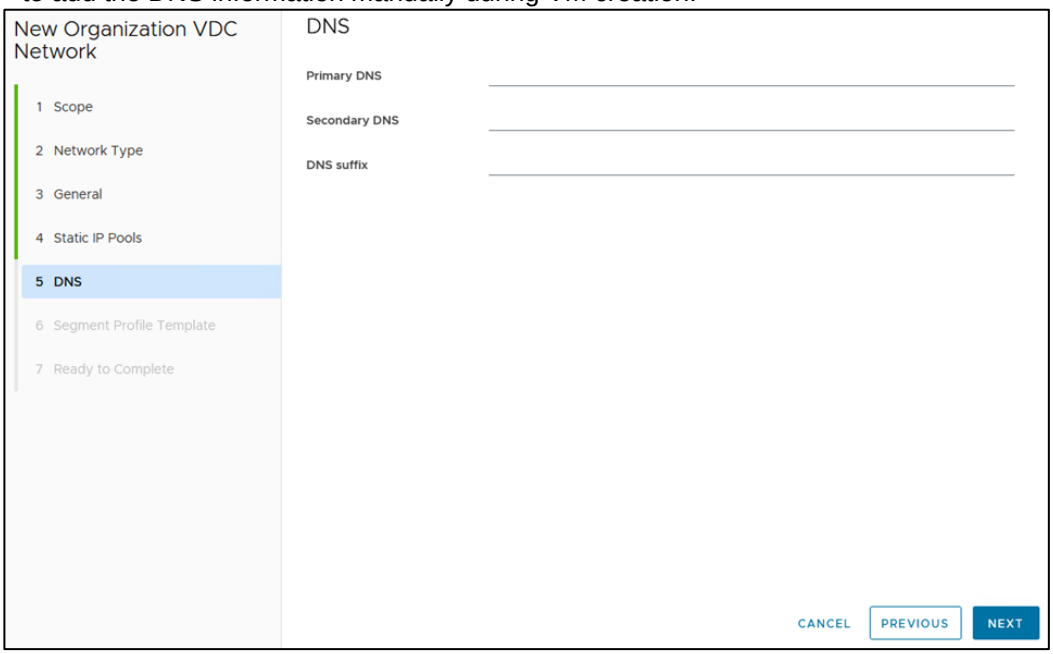
10. Click **Next.**
11. Optional: In the **Static IP Pools** field, enter a range of addresses to be consumed by the VMs connecting to the network, then click Add. In this way the Operational Console will automaticly select a IP-address when creating a VM, otherwise you need to add the IP-address manually during VM creation.

As an example, if you give the gateway address as 192.168.1.1/24, you may then want to create a **Static IP Pool** of 192.168.1.10-192.168.1.100. This will give you a pool of 91 IP addresses to assign to machines within your network. You can always increase this later if needed.

You can add multiple IP pools.

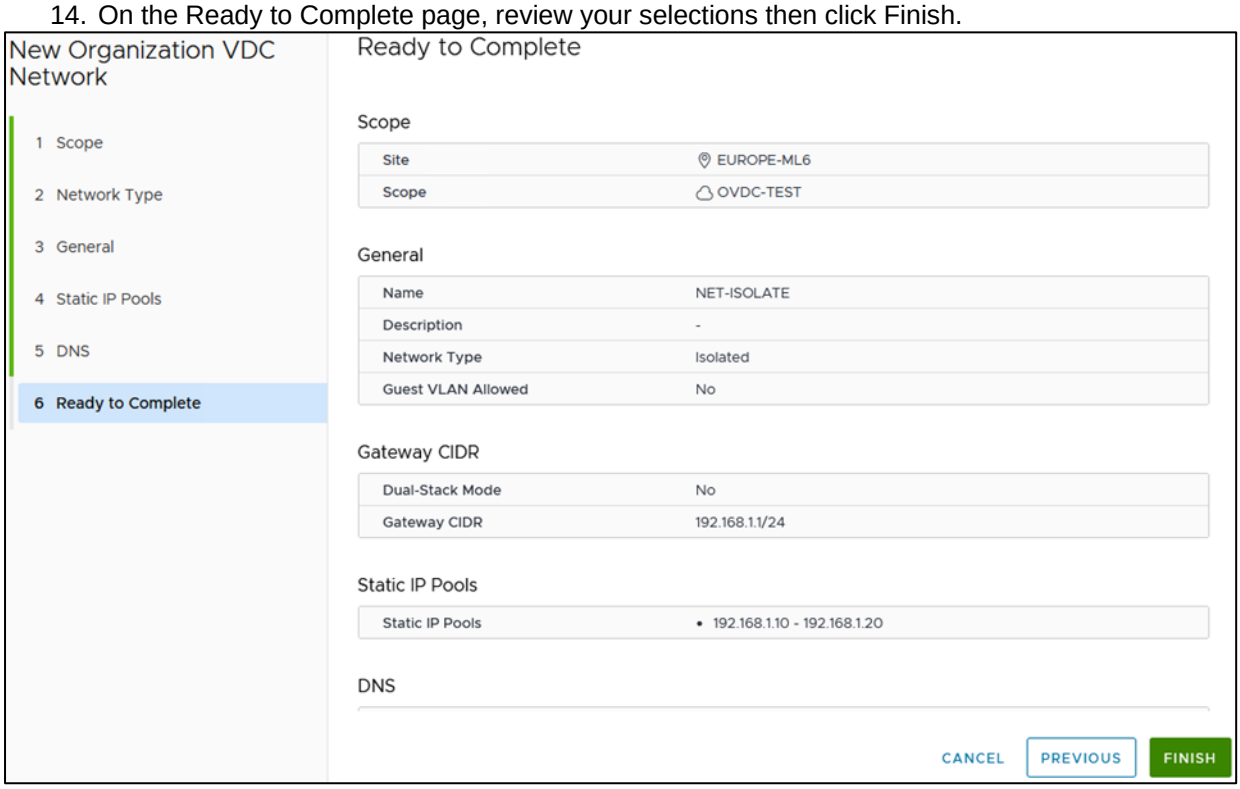



12. When you're done, clieck Next.
13. Optional: In the DNS page, enter the DNS information then click Next. In this way the Operational Console will configure the DNS settings when creating a VM, otherwise you need to add the DNS information manually during VM creation.



14. On the Ready to Complete page, review your selections then click Finish.




### 5.5.3 How to create a touted OVDC network

**Overview**

A routed OVDC network enables its virtual machines (VMs) to communicate with each other or to provide routed (L3) connectivity to external networks. A single OVDC can have multiple routed networks. The process is different based on the use of Distributed Firewall functionality for the network yes or no.

Note:

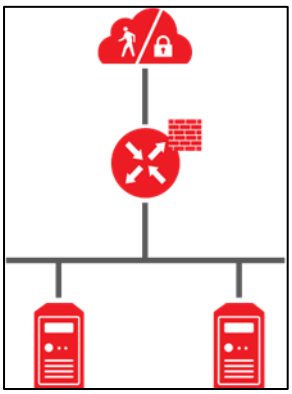
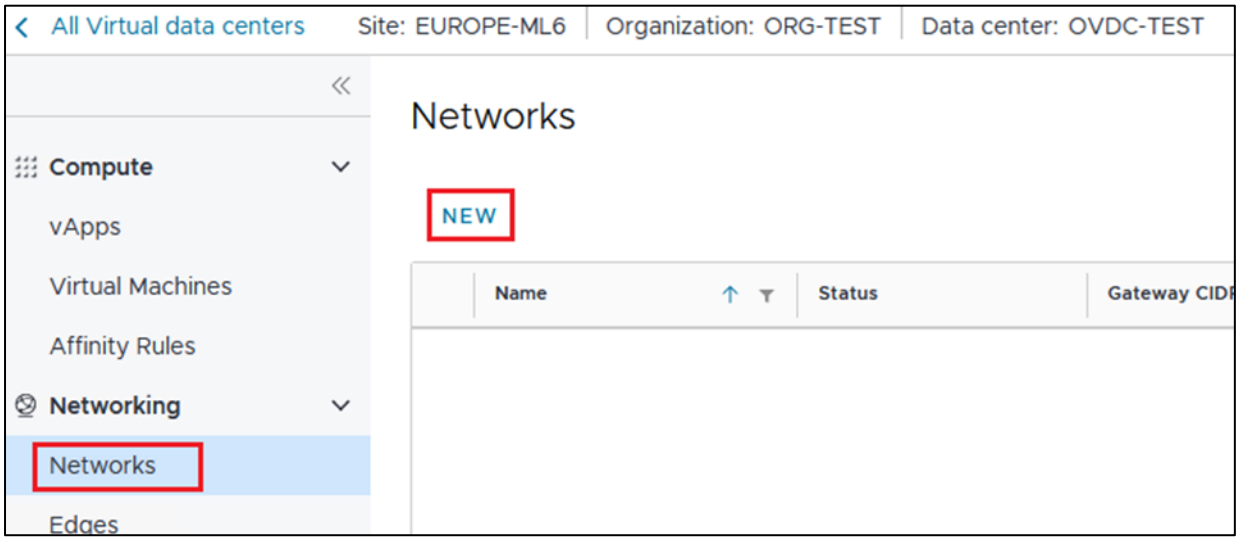


*Figure 4 Routed Network*

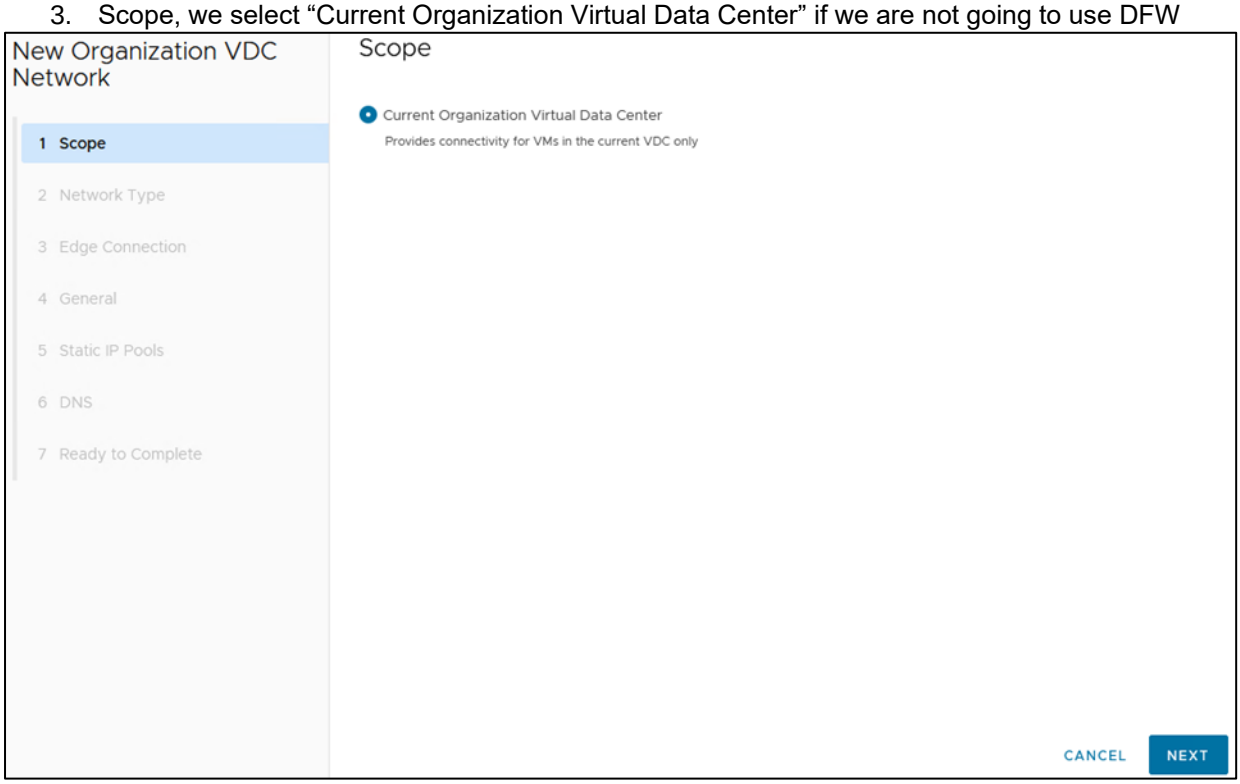
**Creating a routed network**

1. In the Operational Console Virtual Datacenters dashboard, select the OVDC in which you want to create the network.
2. In the left navigation panel, select Networks/New

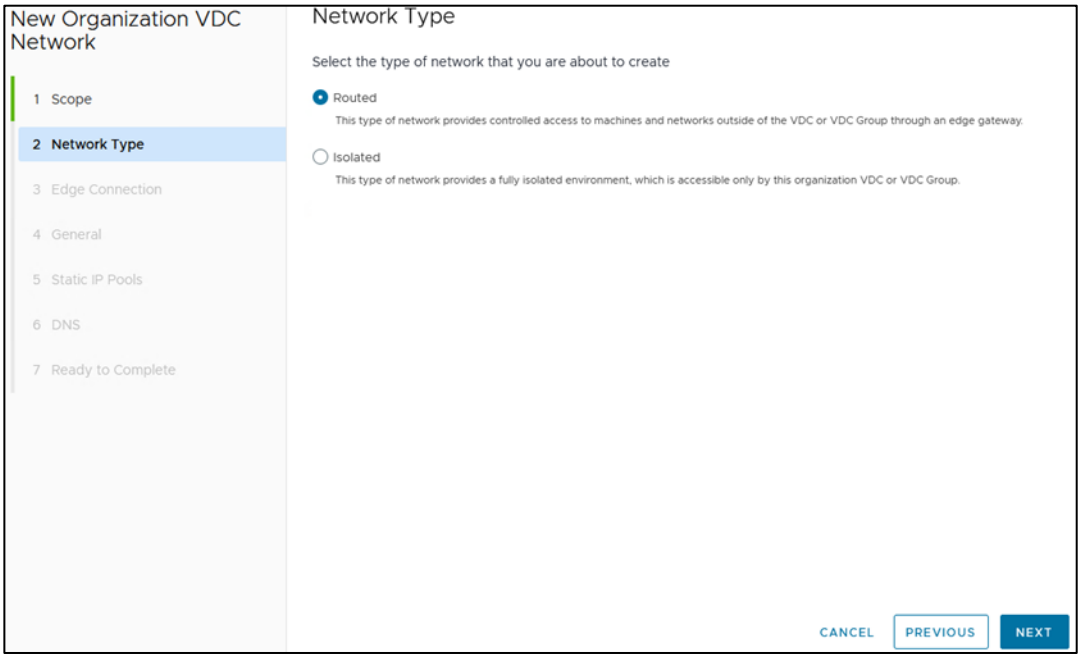



3. Scope, we select “Current Organization Virtual Data Center” if we are not going to use DFW

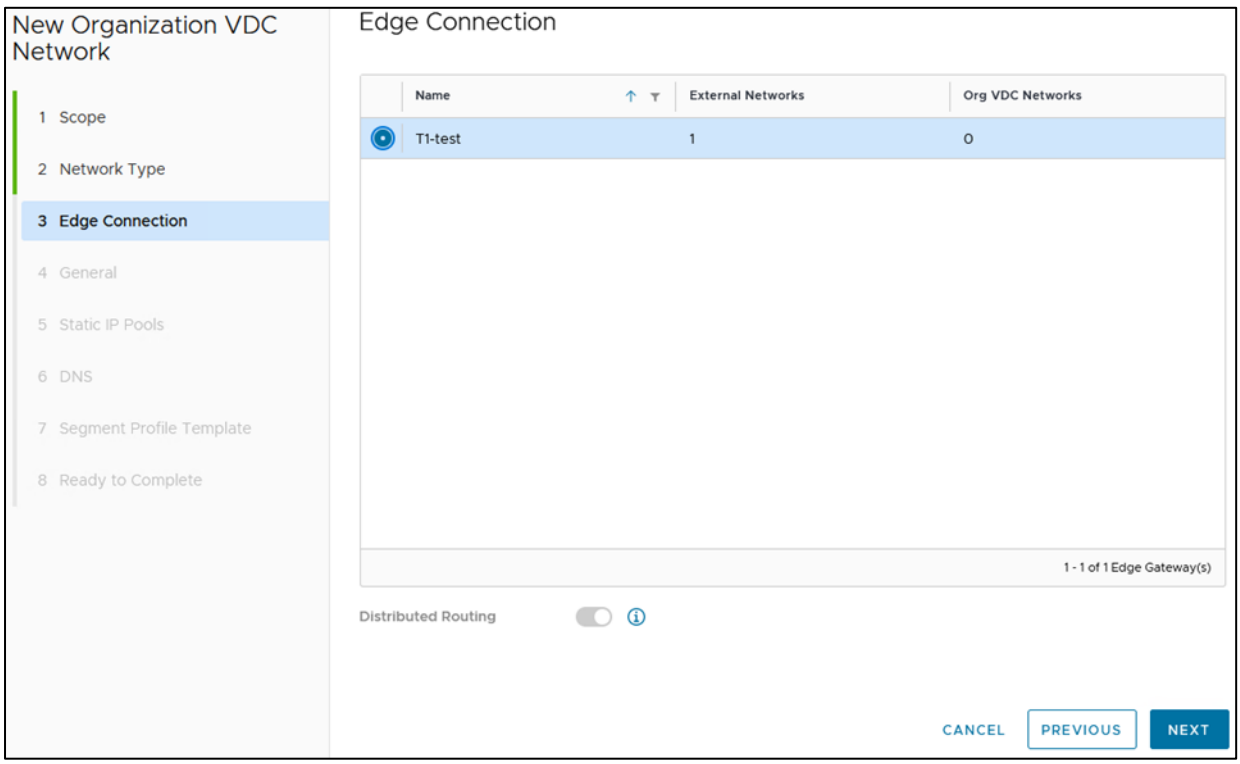



4. In the Network Type page of the New OVDC Network dialog box, select **Routed** then click **Next**.




5. Edge connection, we have to select Edge gateway which you want to connect the routed segment.

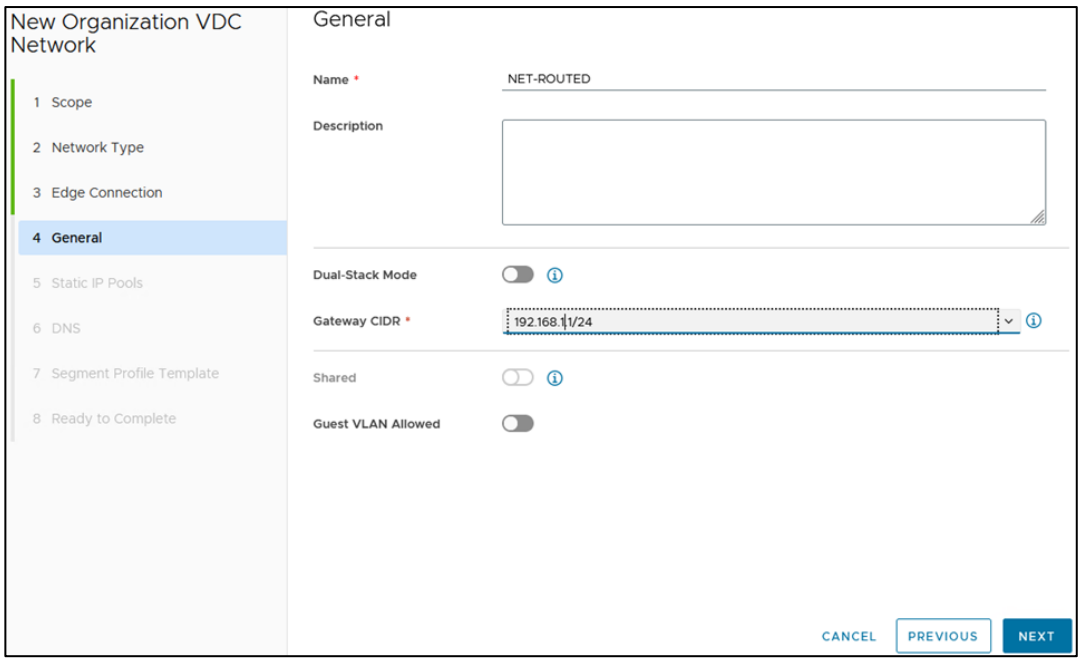



6. In the General page, enter a **Name** and **Description** for the network.
7. In the **Gateway CIDR** field, select the ip-space for the network from the drop down list. The list of gateways is pre-populated by Equinix based on customer input during deployment.
8. **Dual Stack** can be switched on when IPv6 is used

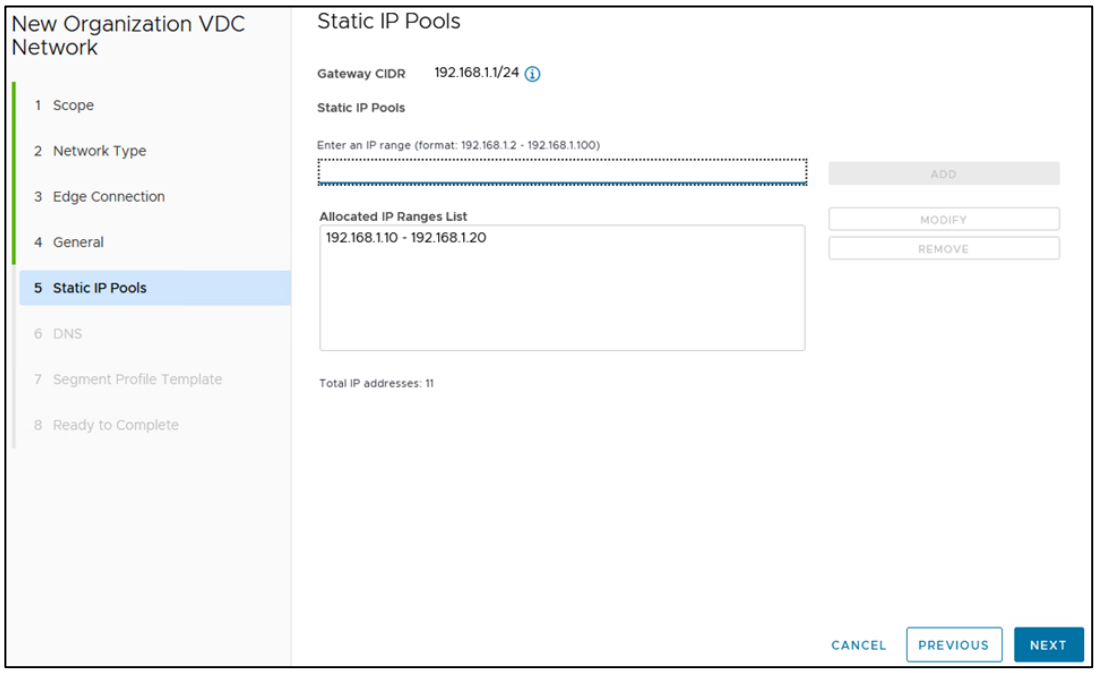
  

9. **Guest VLAN Allowed** can be switched on multiple VLAN's within connected VMs

Note: If Distributed Routing is switched on, Gateway firewalling on this routed network is not possible, in that case Distributed Firewall can be used and North South Firewalling is still possible. When switched off, only Gateway firewalling is possible on this routed network.




10. Click Next.

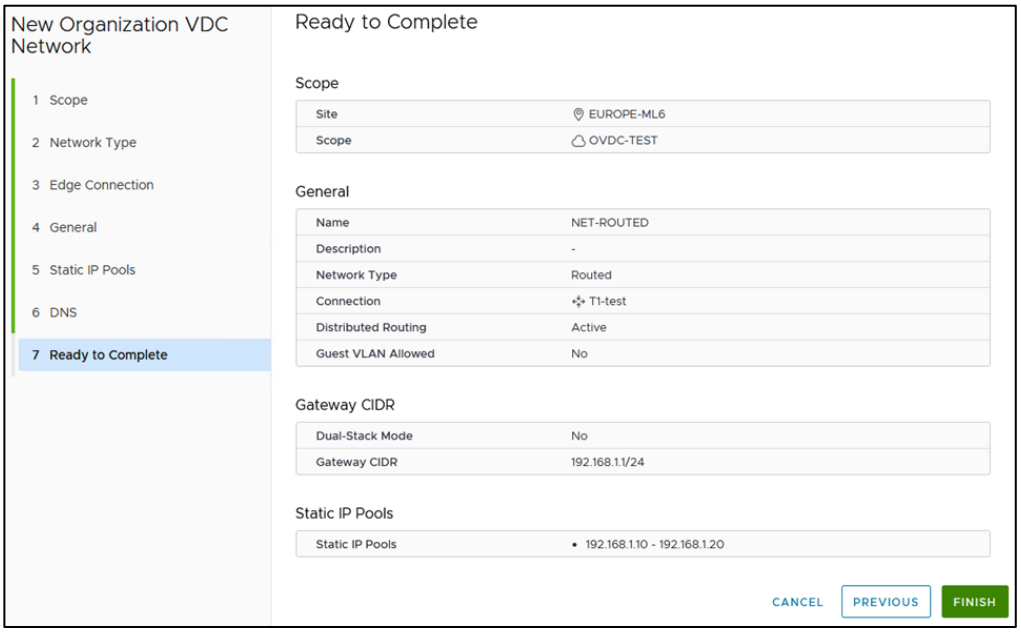



Optional: In the DNS page, enter the DNS information then click Next. In this way the Operational Console will configure the DNS settings when creating a VM, otherwise you need to add the DNS

information manually during VM creation.

11. Select **Finish**



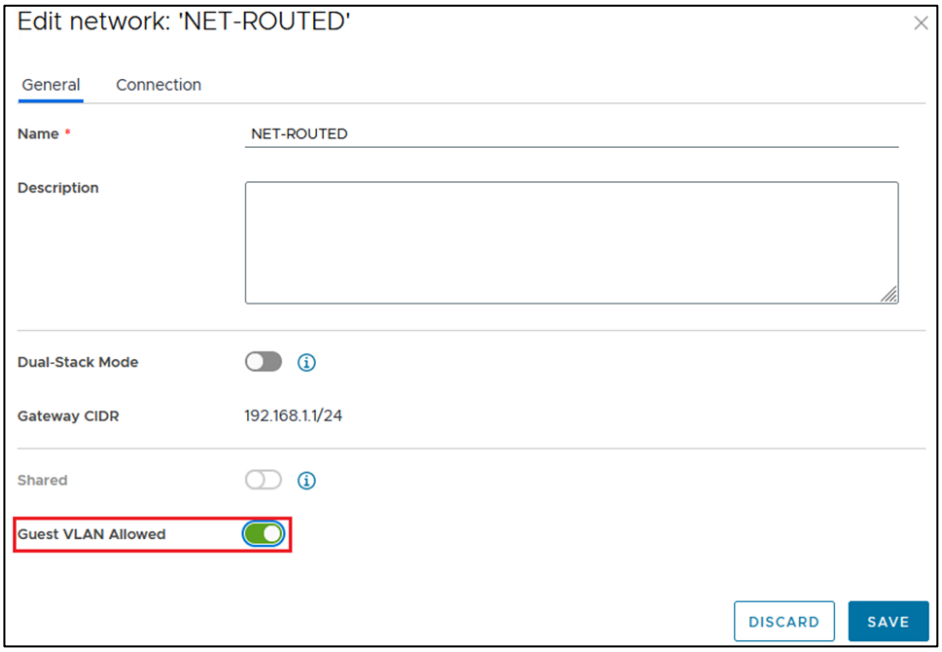

Note: When using the Distributed type of routed network, firewalling network traffic between Distributed networks is only possible by using Distributed Firewalling since traffic does not passes the Edge Gateway. Traffic to and from Internal or External network will pass the Edge Gateway and can (also) be firewalled there.

Using the Distributed Firewalling requires the “MPC Service Option for “Distributed Firewall”, this option can be ordered as part of your MPC contract.

Guest VLAN Allowed

Enabling this option allows you to configure TAGs on the network interfaces of the VMs and allows you to have several VLANs on same network.




12. On the *Ready to Complete* page, review your selections then click **Finish**.

Now you've created your network to connect your OVDC with the outside world, you may want to configure your edge gateway to control what traffic is allowed into and out of your OVDC.

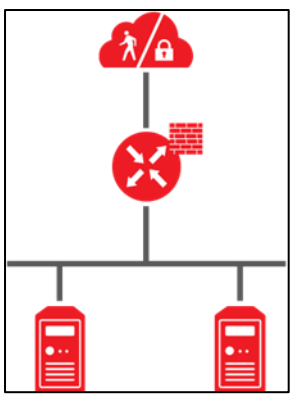
### 5.5.4 How to create Gateway Firewall Rules

**Overview**

The Operational Console provides a fully featured layer 4 firewall to control transit from inside to outside security boundaries, and within the various OVDC networks you create.

When you specify networks or IP addresses, you can use:

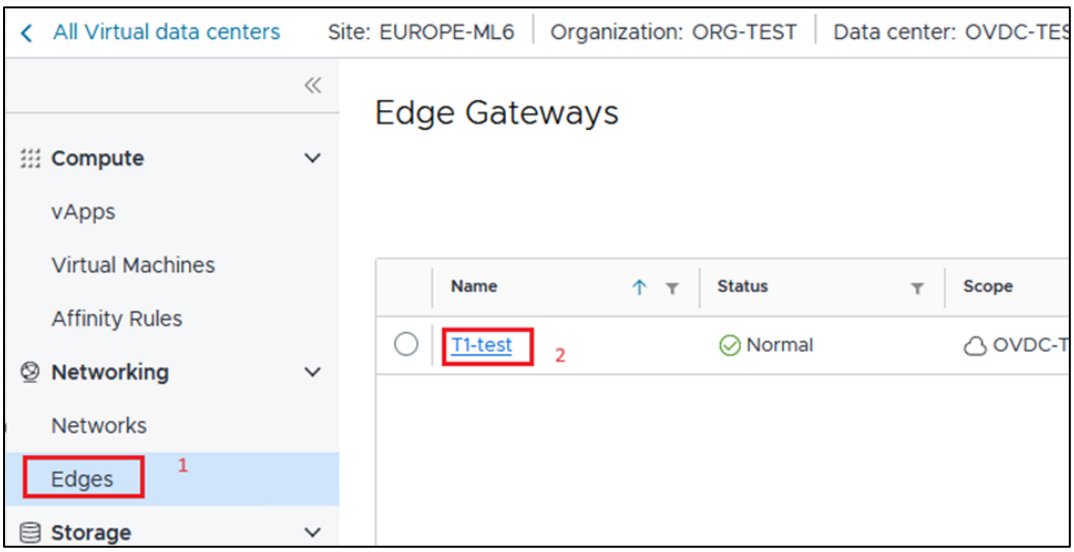
- An individual IP address
- IP ranges separated by a dash (-)
- A CIDR, for example, 192.168.2.0/24
- The keywords internal, external or any



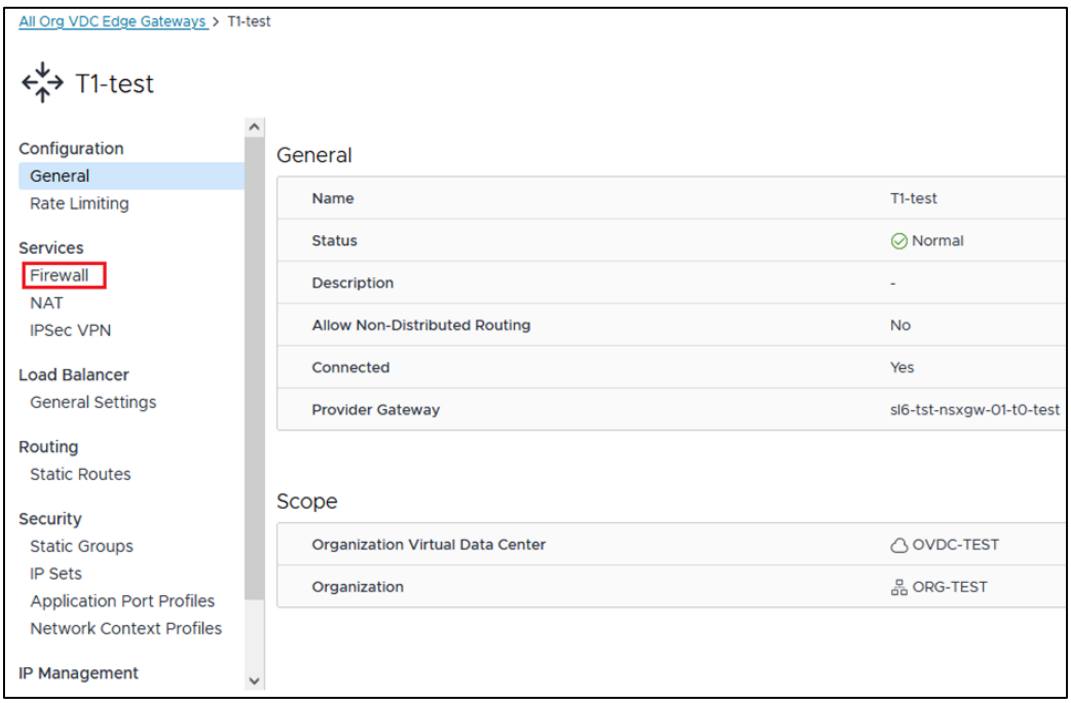
  

### Creating firewall rules

1. In the Operational Console Virtual Datacenters dashboard, select the OVDC that contains the edge gateway in which you can create the firewall rules.
2. In the left navigation panel, click **Edges**, and on the right you could see the Edge gateway

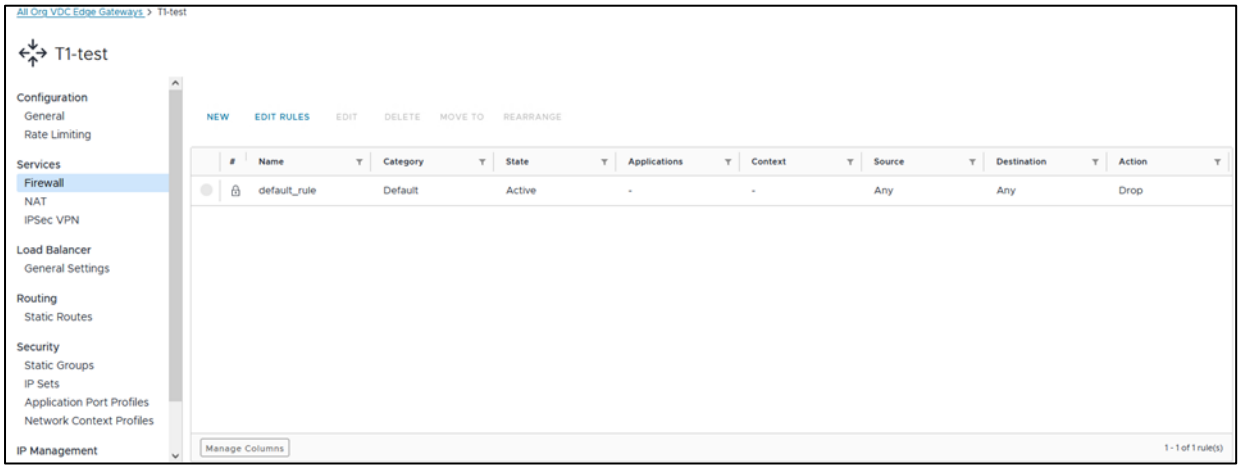



3. Select the edge that you want to configure and select firewall tab.

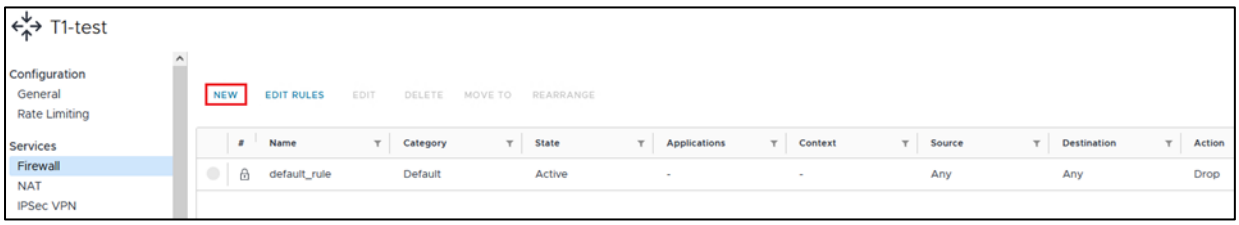



4. In the **Firewall** tab, you can create firewall rules.



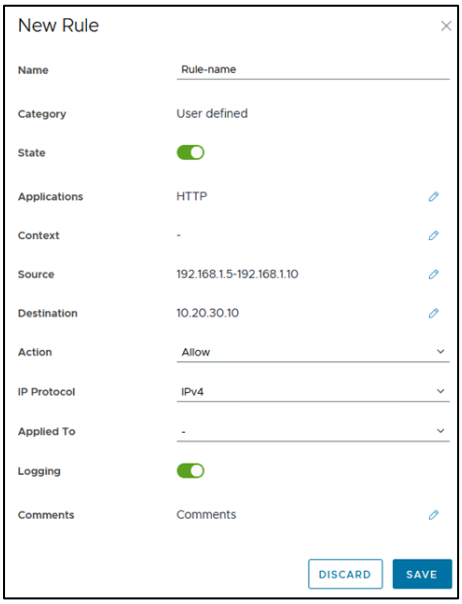

5. Click the NEW option to add a new rule




6. For the **New Rule**, specify:

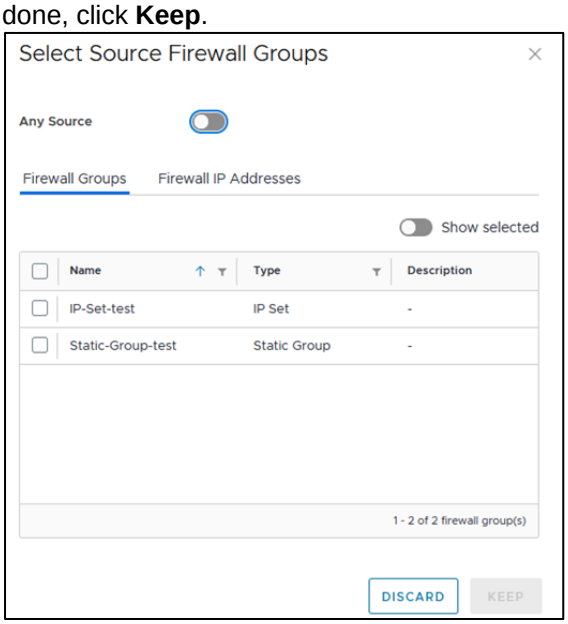
- **Name**
- Applications
- Context
- Source (IP address, IP sets, Static Groups)
- Destination (IP address, IP sets, Static Groups)
- Action (Allow, Drop, Reject)
- Protocol (IPv4, IPv6 or both)
- Login
- Comments



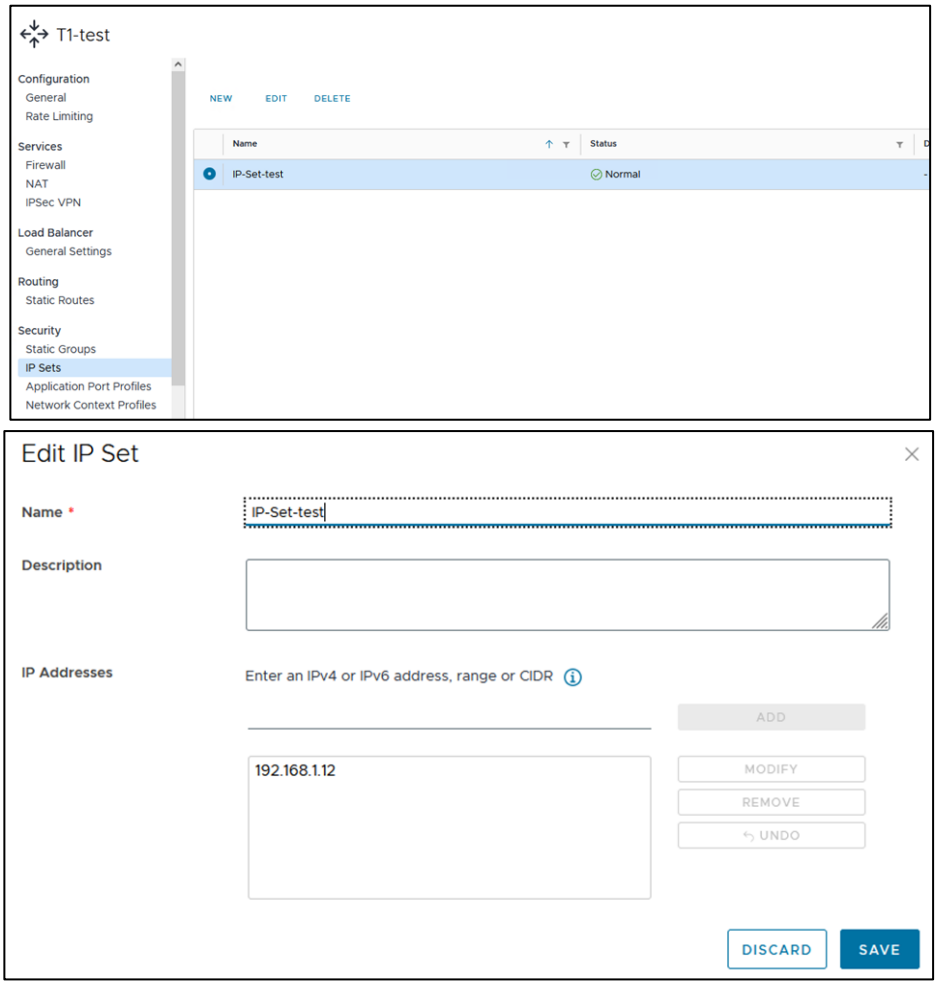

7. In the **Source** and **Destination** fields, specify the source and destination addresses for the firewall rule.

- To specify an IP address or range, click **IP** and enter the appropriate **Value**. When you're done, click **Keep**.

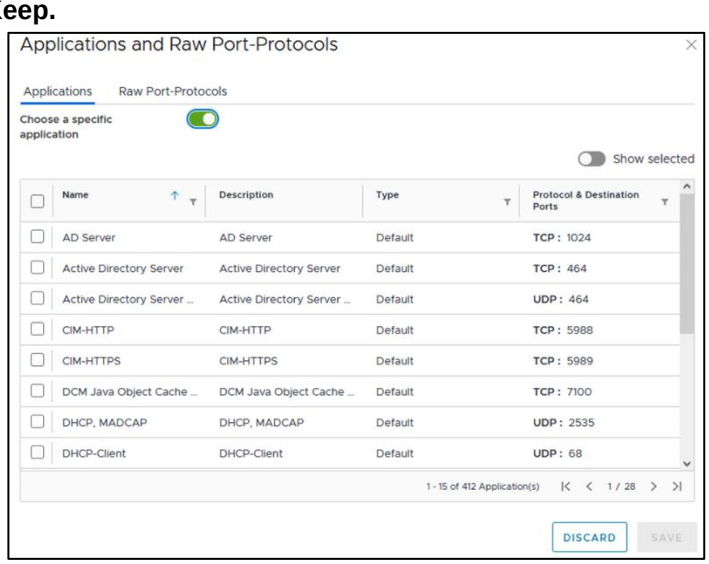



If you're likely to reuse a group of the same source or destination IP addresses in multiple rules, select the **Grouping Objects** tab and click + to create an IP set. You can then select this IP set in the Select objects dialog box.

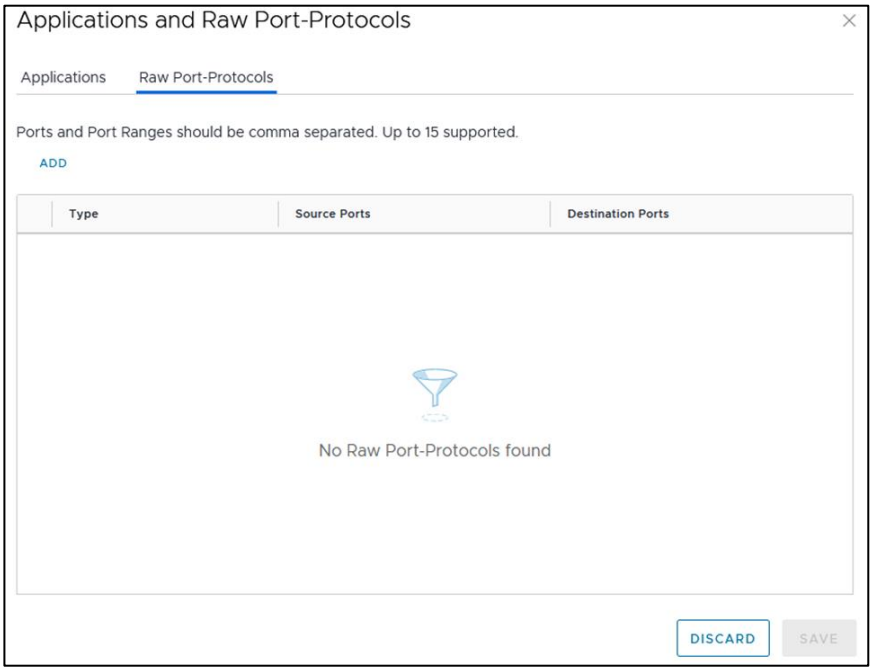
  



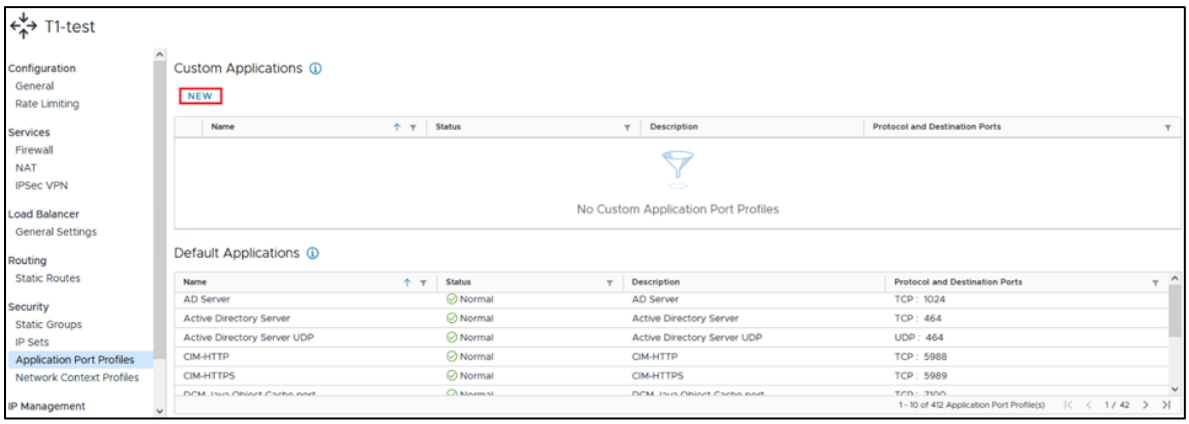

8. In the **Application** field, click + and, in the Add Service dialog box, specify the Protocol, **Source Port** and **Destination Port** for the rule or you can define a custom port protocol. When you're done, click **Keep.**

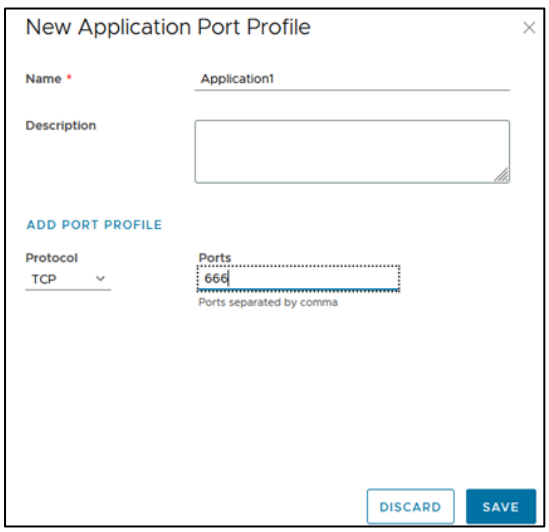





You can create Custom applications in advance and apply in the firewall rule.



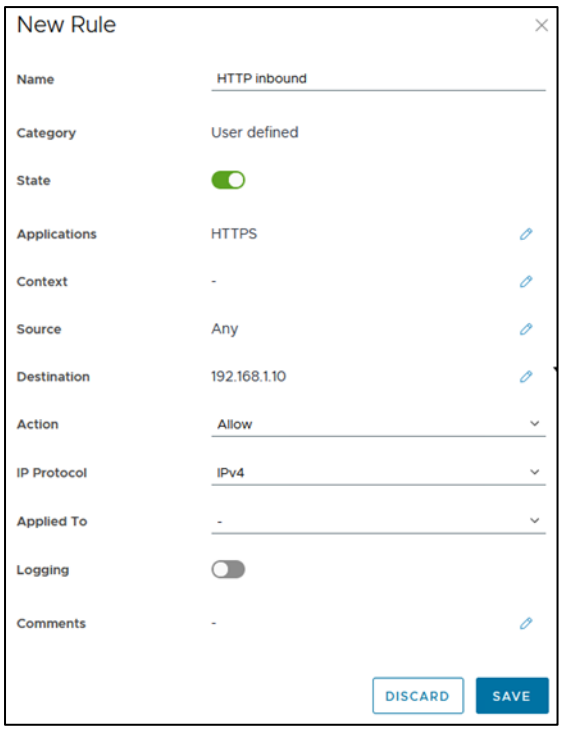

  

9. Select whether the rule is an **Accept** or **Deny** rule.
10. If you have a syslog server configured, select the **Enable logging** check box.
11. Click **Save changes.**

**Example**

A common use case for a firewall rule is to allow HTTPS through from the internet. The following example uses allocated public IP addresses.

In the example below, the source is any (any IP address within the OVDC). The source port is also any. The destination is a private IP address and the destination port is 443 for HTTPS.




For this to work you need an DNAT configuration. See the next section “How to create NAT rules”.

### 5.5.5 How to create NAT rules

**Overview**

Network Address Translation (NAT) allows the source or destination IP address to be changed to enable traffic to transition through a router or gateway.

This guide explains the most common types of NAT within your edge gateway:

- Destination NAT (DNAT) - changes the destination IP of the packet.
- Source NAT (SNAT) - changes the source IP of the packet.

Other options are:

- NO DNAT
- NO SNAT
- REFLEXIVE

For a virtual machine (VM) to access an external network resource from its OVDC, the IP address of its network can need NAT in certain use cases, in that case use:

- The public internet IP addresses provided by Equinix.
- The private networks via MPC Connect.

**Note**

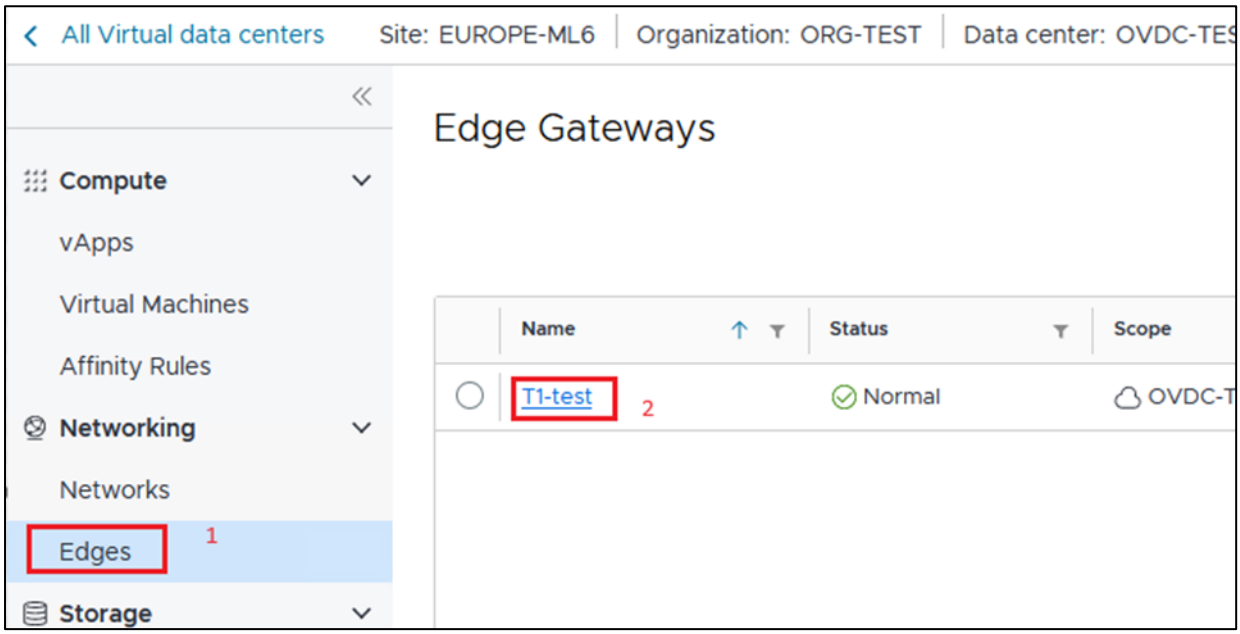
- This functionality is mostly applicable if the Edge Gateway is configured with Public IP's while the VMs are using Private IP's.
- NAT rules only work if the firewall is enabled. For security reasons, you should ensure that the firewall is always enabled.

**Creating a DNAT rule**

DNAT changes the destination IP address of a packet and performs the reverse function for any replies. You can use DNAT to publish a service located in a private network on a public IP address.

To create a DNAT rule:

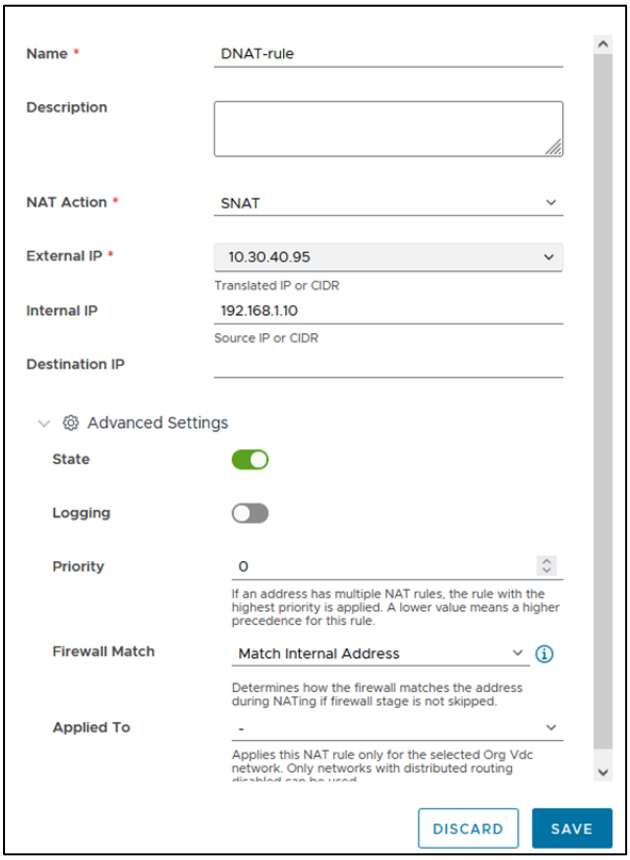
1. In the Operational Console Virtual Datacenters dashboard, select the OVDC that contains the edge gateway in which you to create the DNAT rule.
2. In the left navigation panel, click **Edges.**



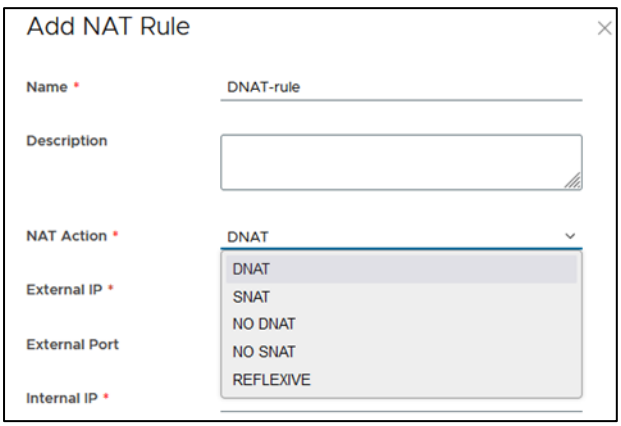

Select Nat tab and add a NEW NAT rule

3. In the NAT section, click **+ DNAT Rule.**




4. In the NAT Action select the type of NAT rule




5. Enter an External IP. For example 10.30.40.95
6. Enter an External Port. For example 443
7. Enter Internal IP. For example 192.168.1.10
8. Application
9. Advance Setting

- State: it is to enable the rule or disable
- Logging: To log the rule

- Priority: A lower value means a higher priority. 0 is the default Value
- Firewall Match:
  - Match Internal Address
  - Match External Address
  - Bypass
- Applied To, leave blank

10. If you have a syslog server configured, select the Enable logging option.
11. When you're done, click Keep then Save changes.

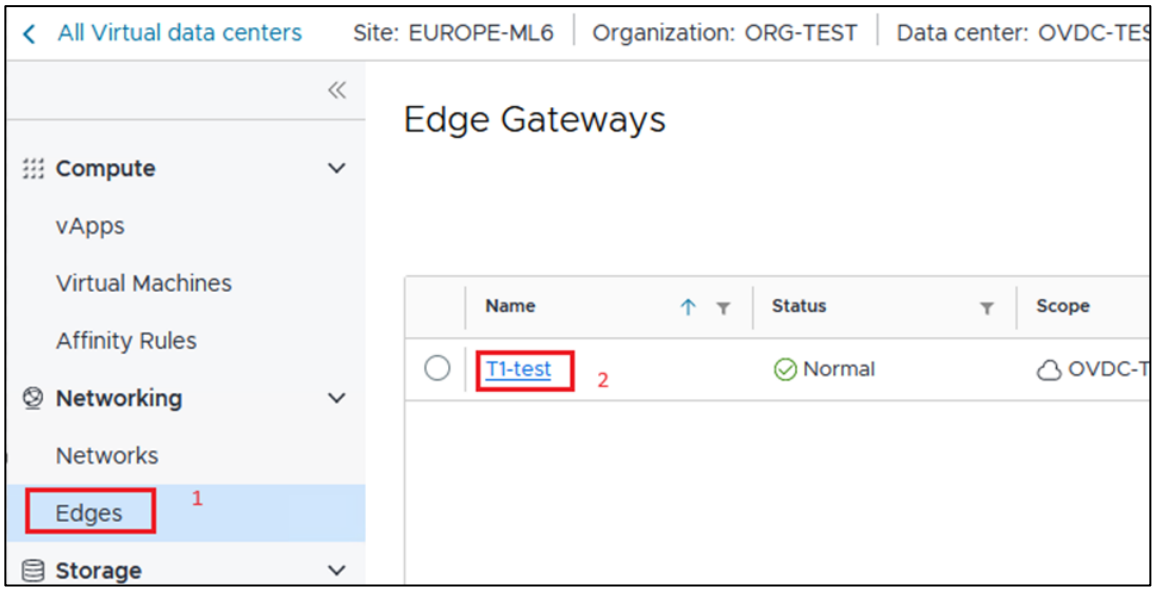
For more information also see the VMware Product documentation

**Creating an SNAT Rule**

SNAT changes the source IP address of a packet and performs the reverse function for any replies. When connecting to an external network, such as the internet, to access services (for example, DNS), you need to define an SNAT rule to translate your internal address into something available on the external network.

To create an SNAT rule:

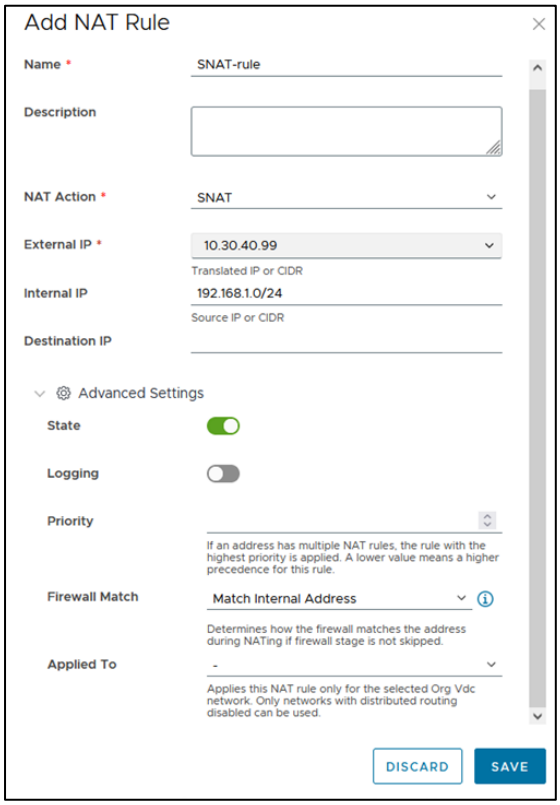
1. In the Operational Console Virtual Datacenters dashboard, select the OVDC that contains the edge gateway in which you to create the SNAT rule.
2. In the left navigation panel, click Edges.



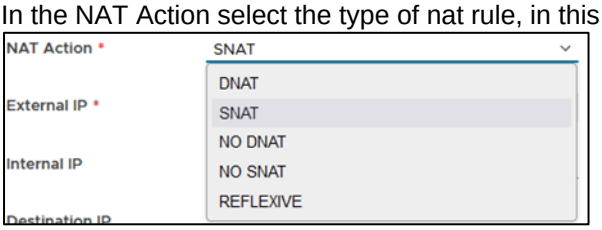

Select Nat tab and add a NEW NAT rule

3. In the NAT Section, click **+SNAT Rule**




4. In the NAT Action select the type of nat rule, in this case SNAT




5. External IP, this will be the external network (usually named *VCD_CUSTOMER_WAN).
6. Internal IP, this will be the network or Ip which it is nated to the internet.
7. Advance Setting

- State: it is to enable the rule or disable
- Login: To log the rule
- Priority: A lower value means a higher priority. 0 is the default Value
- Firewall Match:
    - Match Internal Address
    - Match External Address
    - Bypass
- Applied To, leave blank

8. When you're done, click Keep then Save changes.

For more information on SNAT see the VMware Product documentation

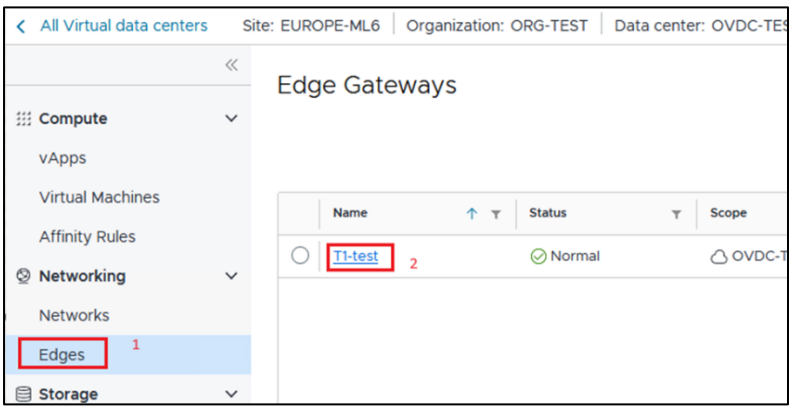
  

### Creating an NO SNAT Rule

No-SNAT rules exist to negate existing SNAT rules. So we can create a NO SNAT rule when we want to avoid a SNAT rule for a specific Destination IP. To do that, we will configure a Priority in Advanced setting for this NO SNAT that should be lower than the SNAT rule. The default priority is 0 and this will be the highest priority.

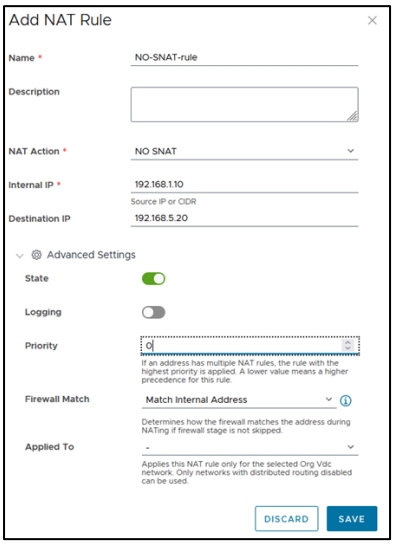
To create an No SNAT rule:

1. In the Operational Console Virtual Datacenters dashboard, select theOVDC that contains the edge gateway in which you to create the No SNAT rule.
2. In the left navigation panel, click Edges.




Select Nat tab and add a NEW NAT rule


3. In the *NAT* section, click **+ No SNAT Rule**



### 5.5.6 How to configure IPsec VPN

**Overview**

Operational Console supports the following types of site-to-site VPN:

- Another edge gateway in the same organization
- An edge gateway in another organisation (Equinix or another vCloud service provider)
- A remote network offering IPsec VPN endpoint capability like Cloud Service providers or your Colocation environment

Depending on the type of connection required, you'll need to complete IP addressing for both ends, together with a shared secret, and indicate which OVDC networks are allowed to connect to the VPN link.

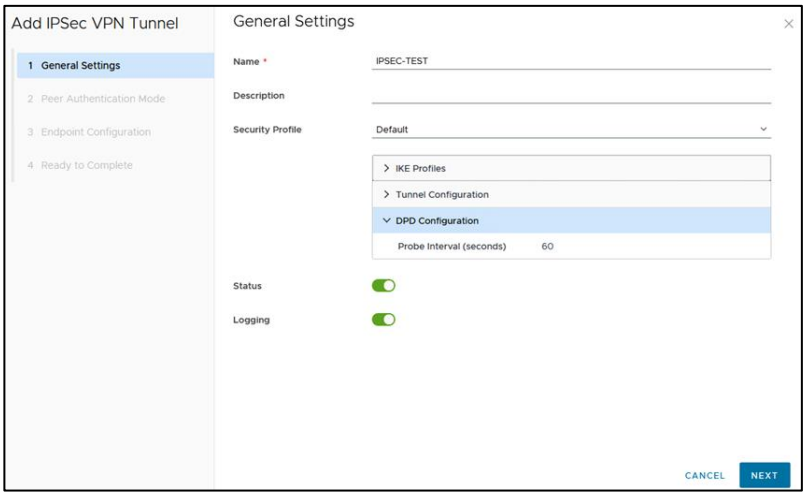
**Before you begin**

Before you start configuring IPsec VPN settings, you'll need to make a note of the IP address of your edge gateway to use as your tunnel endpoint address:

1. In the Operational Console Virtual Datacenters dashboard, select theOVDC that contains the edge gateway you want to configure.
2. In the left navigation panel, click **Edges**.
3. On the Edges page, select the edge that you want to configure.
4. Within the Services tab we can see the IPSec VPN option, and to create a new IPSec VPN, we have to select "NEW"


**Configuring edge gateway IPsec VPN settings**

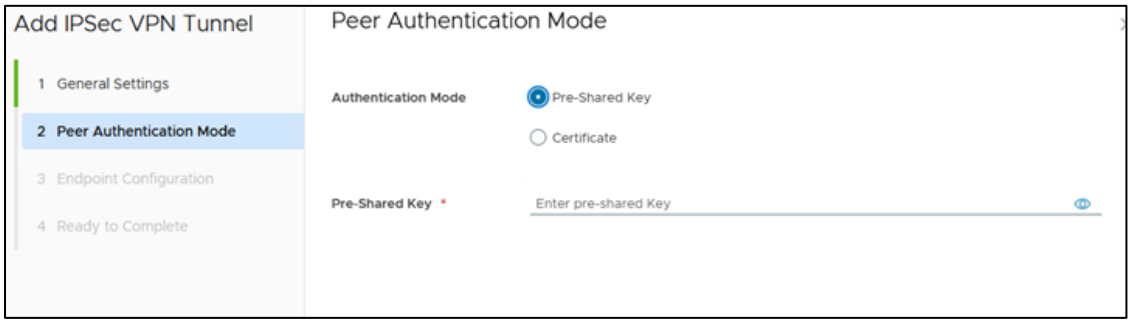
1. We need to configure a name, enable the Login if you want to check the logs and we leave the rest of the options by default



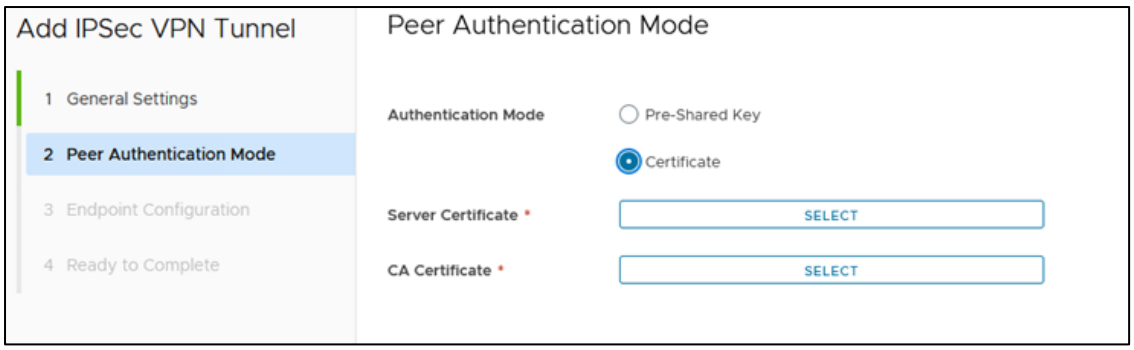

  

2. Peer Authentication Mode

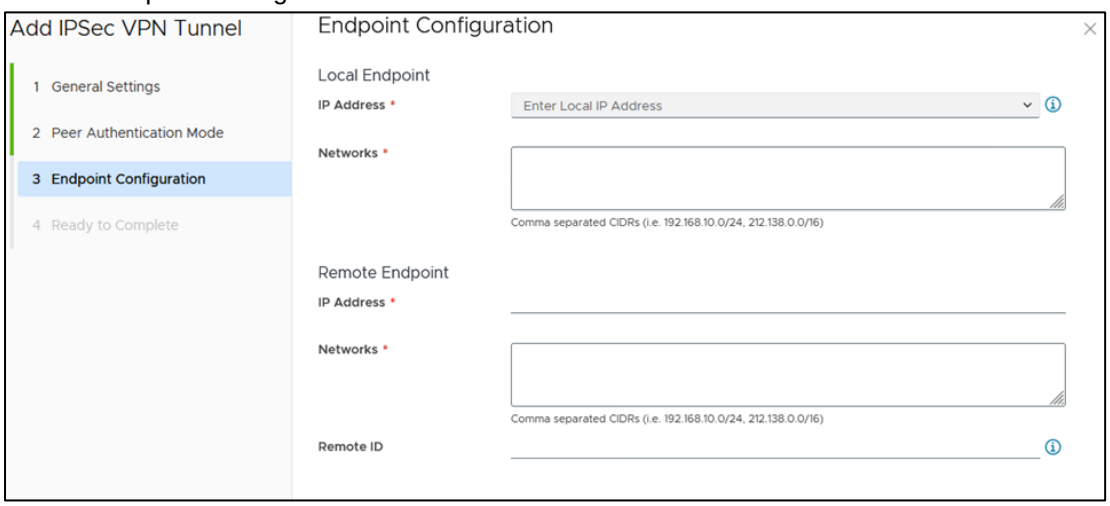
- Pre-Shared Key: The shared secret used to authenticate and encrypt the connection. It must be an alphanumeric string between 32 and 128 characters that includes at least one uppercase letter, one lowercase letter and one number. This must be the same on both sites.




- Certificate: To use a certificate, you will have to upload the certificate and the CA certificate.



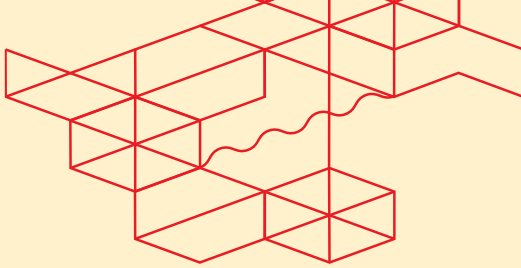

3. Endpoint Configuration




**Local Endpoint**

- IP Address: The external IP of your edge gateway (refer to the first steps of this procedure for more information).
- Networks: Enter the organisation networks that can access the VPN (separate multiple local subnets with commas).



**Remote Endpoint**

- IP Address: The external IP of your remote site or on-premises firewall or edge where VPN is being set up.
- Networks: This is the subnet on your on-premises network that you want to make accessible from your OVDC. For example, if your on-premises networks sit inside the 172.20.0.0/16 range, you could enter 172.20.0.0/16 here or limit your entry to a smaller subnet of that, for example 172.20.0.0/25.
- Remote ID:
- This remote ID uniquely identifies the peer site and depends on the authentication mode for the tunnel. If you do not set it, the remote ID defaults to the remote IP address.
- Pre-shared Key - The pre-shared key depends on whether NAT is configured. If you configure NAT on the remote ID, enter the private IP address of the remote site. Otherwise, use the public IP address of the remote device terminating the VPN tunnel.
- Certificate - The remote ID must match the certificate SAN (Subject Alternative Name), if available, or the distinguished name of the certificate used to secure the remote endpoint.

**NOTE**

The remote ID must match the SAN (Subject Alternative Name) of the remote endpoint certificate, if available. If the remote certificate does not contain a SAN, the remote ID must match the distinguished name of the certificate that is used to secure the remote endpoint, for example, C=US, ST=Massachusetts, O=VMware,OU=VCD, CN=Edge1.

4. When you're done, click **Keep** to create the edge end of the VPN tunnel then click **Save changes.**

**Creating the second VPN gateway**

You now need to create the endpoint of the VPN tunnel. If this is a differentOVDC, go through the steps described above again to create the tunnel. When you've done that, you can change your firewall settings and validate the connection (see below).

If you're connecting to an external data center, you'll need to set up the tunnel on that premises.

**Creating an external data center VPN gateway**

Although we can't provide specific instructions on setting up an external data centre gateway to connect to the edge gateway, we've provided information about some configuration requirements below.

*IKE Phase 1 and Phase 2*

IKE is a standard method for arranging secure, authenticated communications.

*Phase 1 parameters*

Phase 1 sets up mutual authentication of the peers, negotiates cryptographic parameters, and creates session keys. The supported Phase 1 parameters are:

- Main mode
- AES/AES256/AES-GCM (user configurable)
- Diffie-Hellman Group
- Pre-shared secret (user configurable)
- SA lifetime of 28800 seconds (eight hours) with no kbytes rekeying
- ISAKMP aggressive mode disabled

*Phase 2 parameters*

IKE Phase 2 negotiates an IPSec tunnel by creating keying material for the IPSec tunnel to use (either by using the IKE phase 1 keys as a base or by performing a new key exchange). The supported IKE Phase 2 parameters are:

- AES/AES256/AES-GCM (Will match the Phase 1 setting)
- ESP tunnel mode
- Diffie-Hellman Group
- Perfect forward secrecy for rekeying (only if it was turned on in both endpoints)
- SA lifetime of 3600 seconds (one hour) with no kbytes rekeying
- Selectors for all IP protocols, all ports, between the two networks, using IPv4 subnets

**Configuring the edge gateway firewall for VPN**

When the VPN tunnel is up and running, you'll need to create firewall rules on the edge gateway for any traffic passing over the tunnel. For how to do this, see How to create firewall rules.

Key points to note:

- You need to create a firewall rule for both directions, that is, from data center toOVDC and fromOVDC to data center.
- For data center to OVDC, set:
    - Source as the source IP range for your external OVDC/data center network
    - Destination as the destination IP range for your OVDC network
- ForOVDC to data center, set:
    - Source as the source IP range for your OVDC network
    - Destination as the destination IP range for your data center/VDC network

**Validating the tunnel**

When you've configured both ends of the IPSec tunnel, the connection should start without any issues.

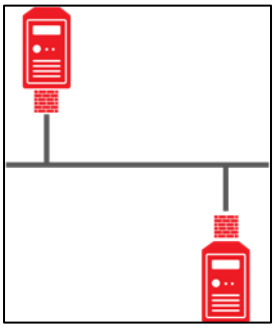
To verify the tunnel status in Operational Console:

1. On the Edges page, select the edge that you want to configure and click Configure Services.
2. Select the Statistics tab and then the IPsec VPN tab.
3. For each configured tunnel, if you can see a tick, the tunnel is up and running and operational. If any other status is shown, you'll need to review your configuration and any firewall rules.
4. You should now be able to send traffic via the VPN.

**NOTE**

It can take up to two minutes after the tunnel is established to show that the VPN connection is active.

### 5.5.7 How to create OVDC Distributed Firewall Rules



**Overview**

On the OrgOVDC level it is possible to use the OrgOVDC distributed firewall to make use of the Micro Segmentation capabilities in Operational Console.

**NOTE**

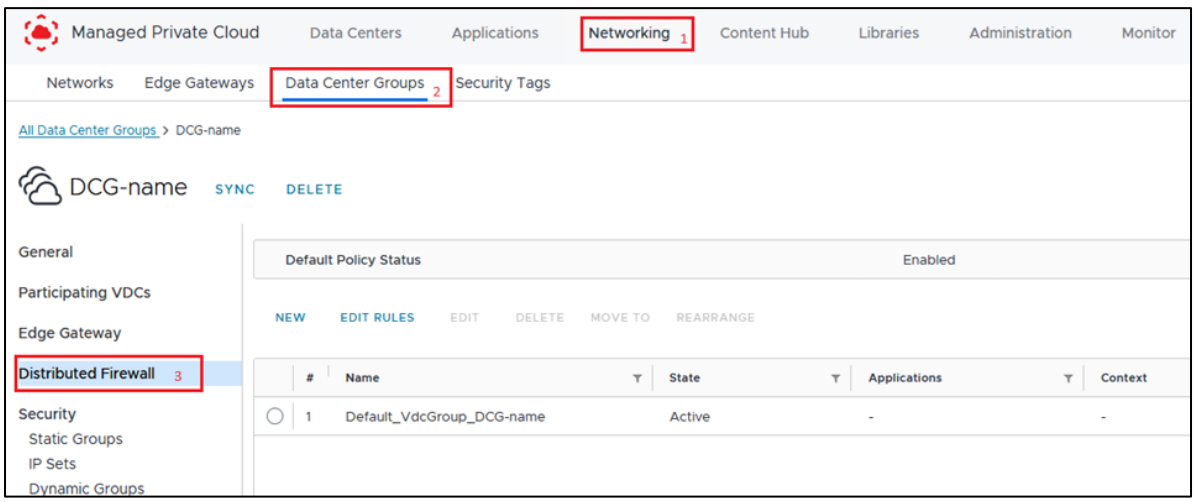
Using Distributed Firewalling requires the MPC Service Option “Distributed Firewall” to be contracted.

Before you begin

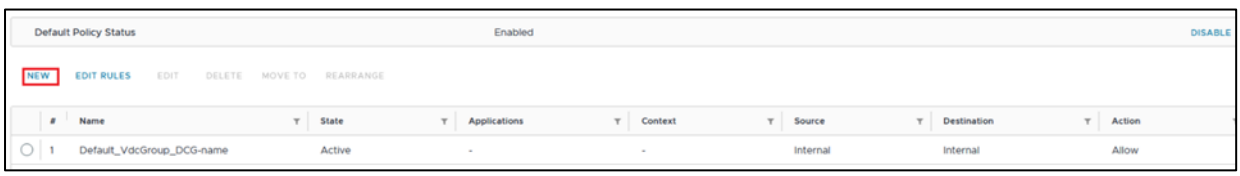
- **IP set**, as a source or destination in a rule, Create an IP Set for Use in Firewall Rules and DHCP Relay Configuration. IP Sets are often used to group resources outside of the VCD Organization, like the Internet of comapny WAN. In that case IP addresses or subnets are the only way to group them.
- **Static Group**, When using a static groups, a group is created to which one or more networks are added. When using the static group in a DFW rule, the rule applies to all VMs that are attached to the networks in the group.
- **Dynamic Groups** are used to group VM based on VM Name, Security Tag or both. When creating a Dynamic Group, by default it has single criteria and rule. When needed it can be extended up to 3 criteria, with 4 rules each.

**Creating distributed firewall rules**

1. In the Operational ConsoleOperational Console Virtual Datacenters dashboard, select theOVDC that contains the distributed you want to configure.
2. In the left navigation panel, click **Networking/Datacenter Groups/Distributed Firewall.**

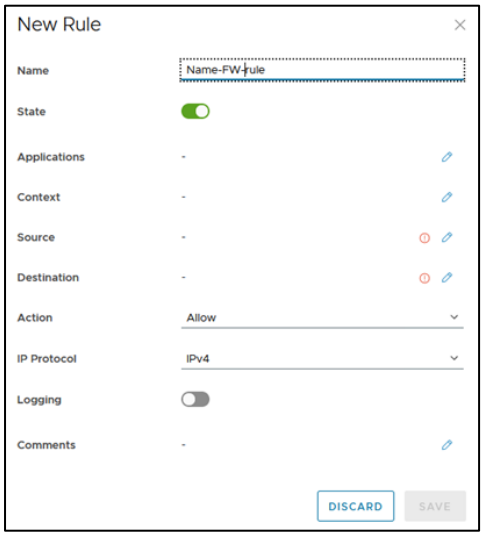



3. Click the + button to add a new row to the firewall rules table.



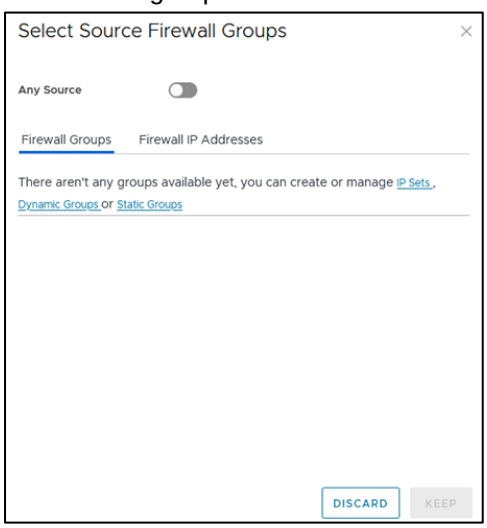

4. For the **New Rule**, specify a **Name.**

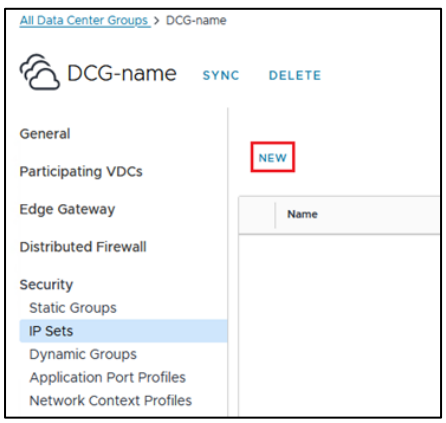



5. In the Source and Destination fields, specify the source and destination addresses for the firewall rule.

- Firewall groups

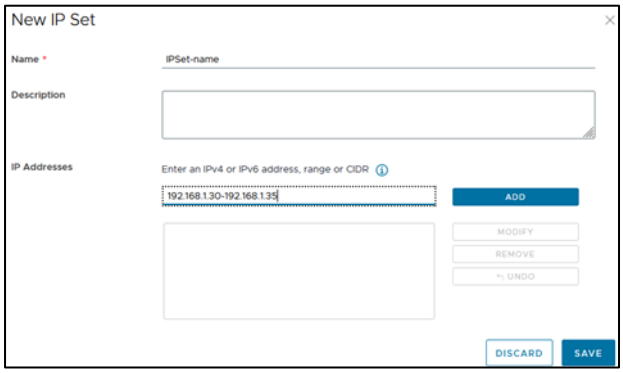



- **IP sets**, select NEW.

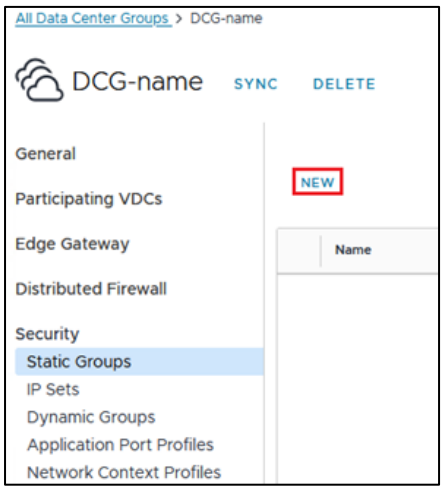


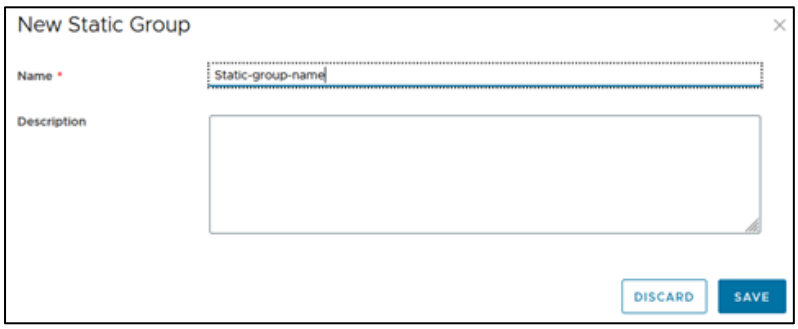
Name, description, IP range or CIDR



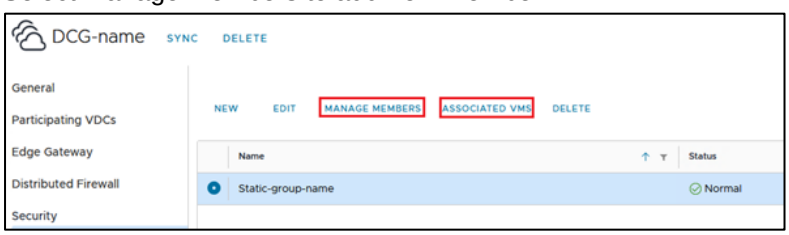

- **Static Groups,** select NEW.




We add a name, and **Save**

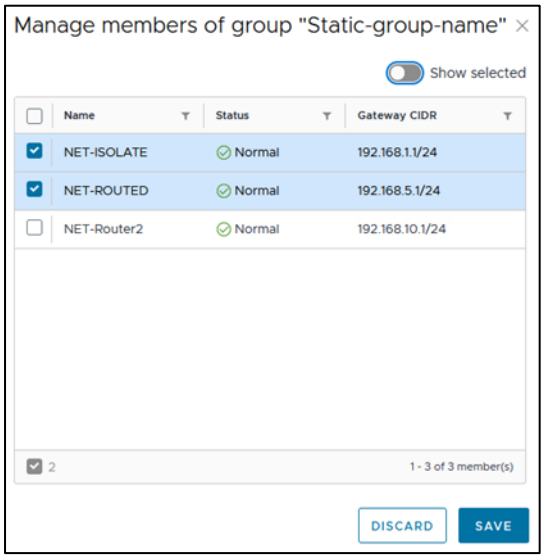



Select Manage members to add new member

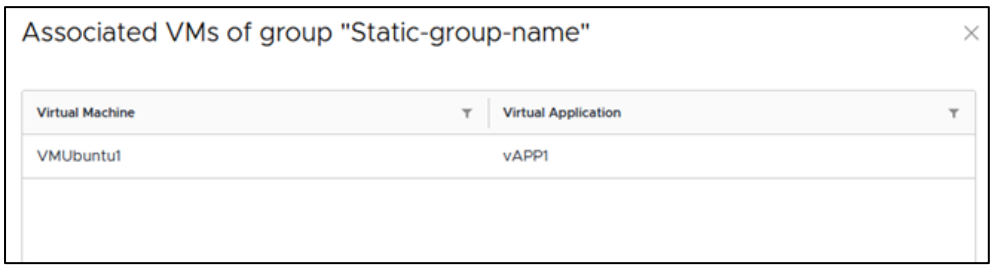


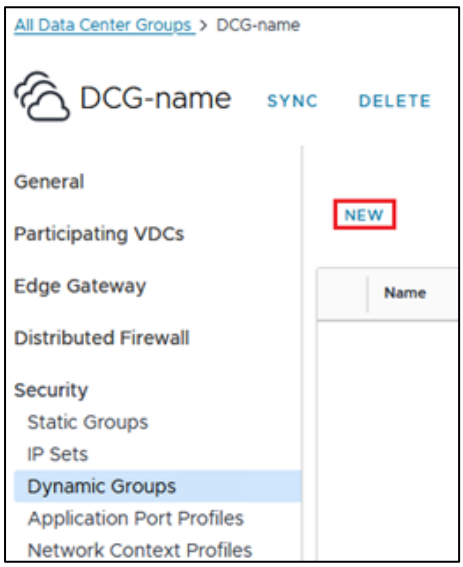
Select a network to add to the static group




In Associated VM, you will be able to see which VMs are connected to the networks attached

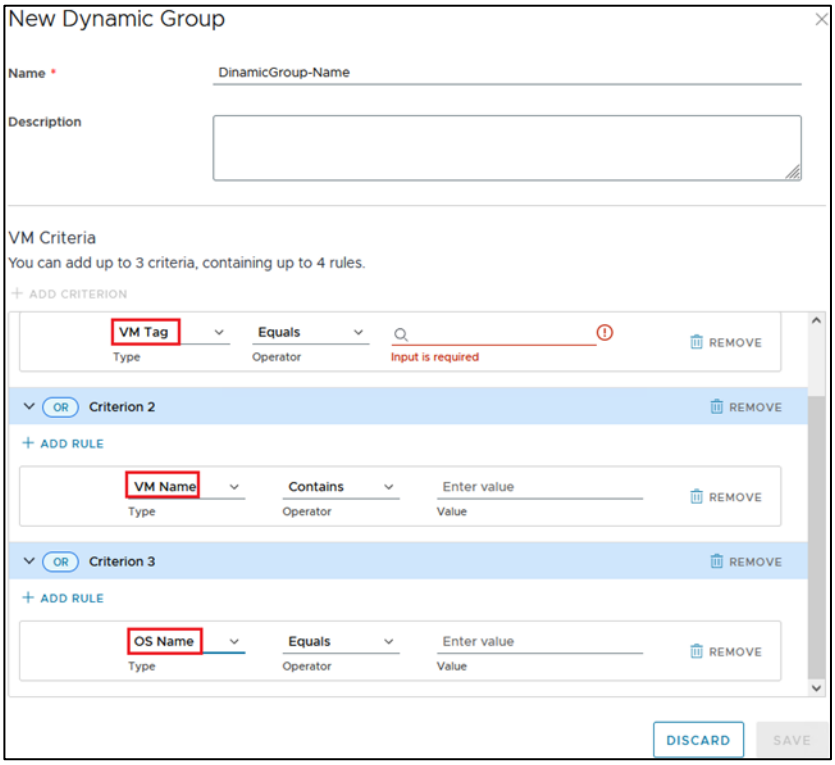



- **Dinamic Groups**, select NEW.

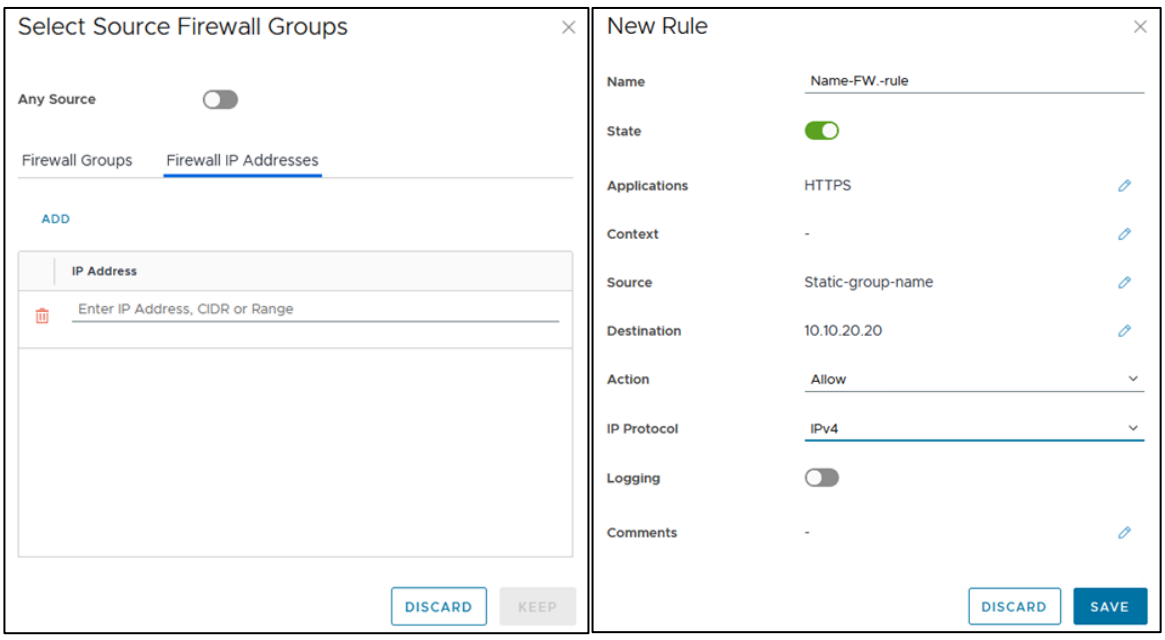



Give a name to the Dynamic group, and select the type of criteria you want to use.




- **Firewall IP Addresses**, you can add an IP, CIDR or Range and select Keep




1. Select **Action** (Allow/Drop/Reject
2. **Ip Protocol** (IPV4, IPv6 or both)
3. **Loggin**
4. Select **Save**

## Other documentations

### Where to find Service Description?

You will find the most up to date service description on docs.equinix.com website.

### Where to find EMS policy?

You will find it on our website.

### Where to find official VMware documentation?

You will find it on https://docs.vmware.com

## How to ask for help

Please make sure to open a ticket every time you need help. This is your guarantee that the right team has received your request and will work on that under the expected SLAs.