EDUCLOUD SERVER

User Guide

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EduCloud Server User Guide

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Overview

This document provides basic instructions for using the EduCloud Server Service. Instructions for network tasks are in a separate document. More detailed information is available through VMWare documentation (click the help icon from EduCloud).

Getting Started with EduCloud Server

Log In to the Web Interface

Access the EduCloud Server user interface using a web browser.

- **Note:** You must have an account in order to access the EduCloud Server service. This account was specified when you initially ordered the EduCloud Server service and/or provided by your Org Administrator.

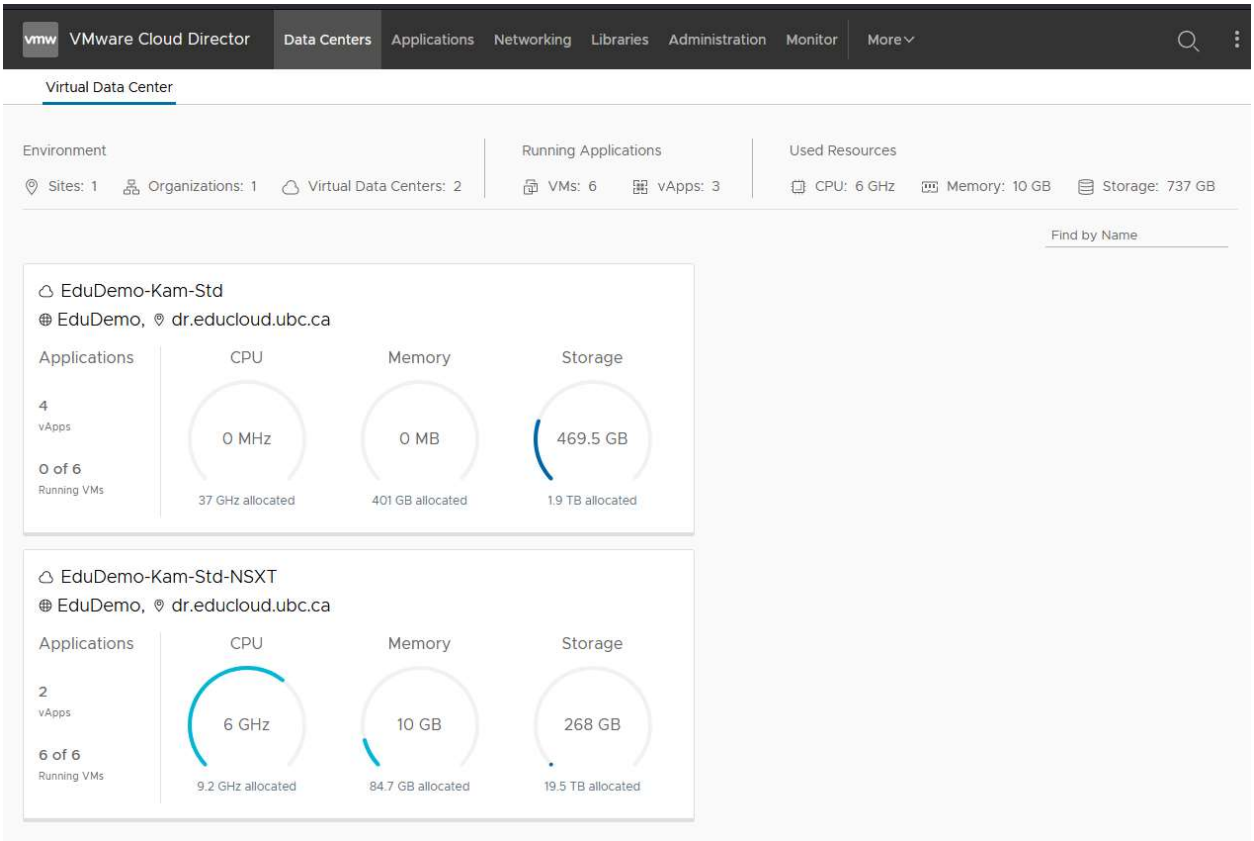
1. Open a Web browser and navigate to: **`https://bcnet.educloud.ubc.ca/tenant/<OrganizationCode>`**. The **`<OrganizationCode>`** was provided during the onboarding process. For example, the University of British Columbia IT department could have an access URL similar to: https://bcnet.educloud.ubc.ca/tenant/ubc-it/.

2. Type the user name and password provided during onboarding and click **LOGIN**.

- **Note:** If you are unable to log in after repeated attempts, ensure you have entered your organization code correctly in the URL. The web interface will always display a login screen – even for incorrect organization codes.

After successfully logging in, you will be brought to the Data Centers Dashboard screen which displays the **Navigation Menu** at the top, the **Summary Ribbon** below that, and the **Virtual Data Centers** display in a card view.

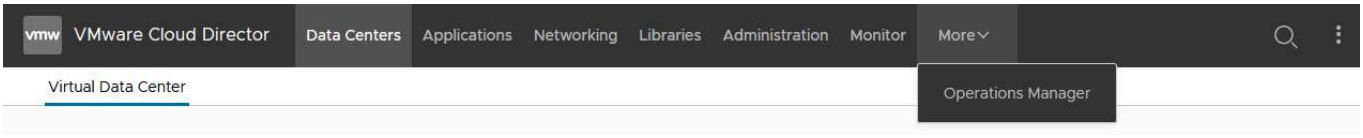
Data Centers - Virtual Data Center Dashboard



Note that depending on the role(s) your user is assigned, you may not see some items.

Navigation

From the main menu, navigate using the primary drop down menu.



Datacenters

Virtual Data Centers and Data Center Groups

Applications

Virtual Applications (vApps) and Virtual Machines (VMs)

Libraries

Managing Templates, Catalogues and Media (ISOs, etc)

Networking

Networks and Edge Gateways

Administration

User and Group management

Monitor

Tasks and Events

Operations Manager

Dashboard view of health and performance

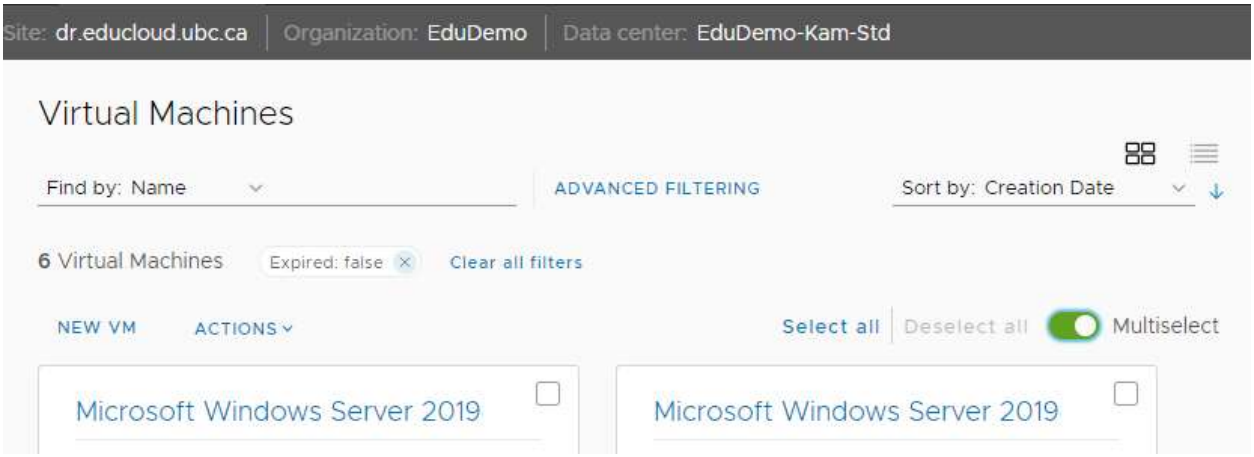
Navigating VDCs

When navigating to other menu items and returning to **Datacenters** you will see a list of VDCs. Even if you only have one VDC.

To bring up the side menu, click on the card for the virtual datacenter you are working with. If you only have one Datacenter, click on that one.

Multiselect Option

This option allows you to perform operations on multiple VMs or vApps simultaneously.



Common Tasks

Find Help

Use the slide out menu on the top right of the screen. Click on Help under the Help section. This links to the vendor on-line vCloud Director Tenant Portal documentation.

Create vApp/VM from Template

Libraries → vApp Templates → Click on the desired template → Create vApp

Create vApp/VM

Data Centers → Appropriate VDC Card → vApps → New → Add vApp from Catalog

Modify Virtual Machine Resources (CPU, RAM, Disks, NICs)

Data Centers → Appropriate VDC Card → Virtual Machines → Find VM → DETAILS → Hardware

Snapshot a vApp/VM

Data Centers → Appropriate VDC Card → vApp/Virtual Machines → Find vApp/VM → ACTIONS → Snapshot → Create Snapshot

Note that Snapshots should not be kept for more than a week. They may impact VM performance and backups. Network information is not captured by a Snapshot

Upload an OVF or ISO

Libraries → Media & Other → ADD

Restore a vApp or VM

Place a Service Request

vApps

A vApp is a collection of one or more virtual machines together with the associated networking. You can create a new vApp based on a vApp template from one of the Catalogs that you have access to, either standard EduCloud templates, or a catalog created in your Org. They can also be created from OVF or an Install Disk.

vApp Creation

There are a number of ways to create a vApp. To create a vApp, ensure that the following items are configured:

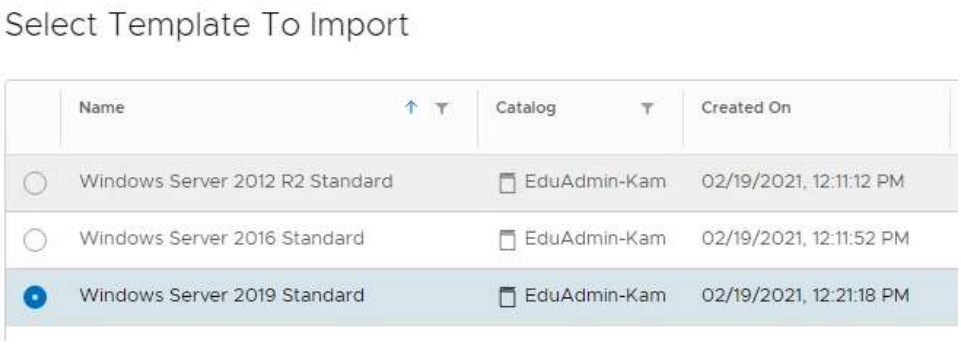
- vApp Name
- VM Name
- VM Computer Name – this will be used as the host name
- Network information
- VM Stop Action
- vApp Sharing

vApp Creation from Standard Template

Create vApp

- Ensure you are in the correct Virtual Data Center
- **vApps → NEW → Add vApp From Catalog**
- Select the template to import based on the OS and the Catalog, choose a template. Note the templates shown below are in a standard EduCloud Catalog in Kamloops (EduAdmin-

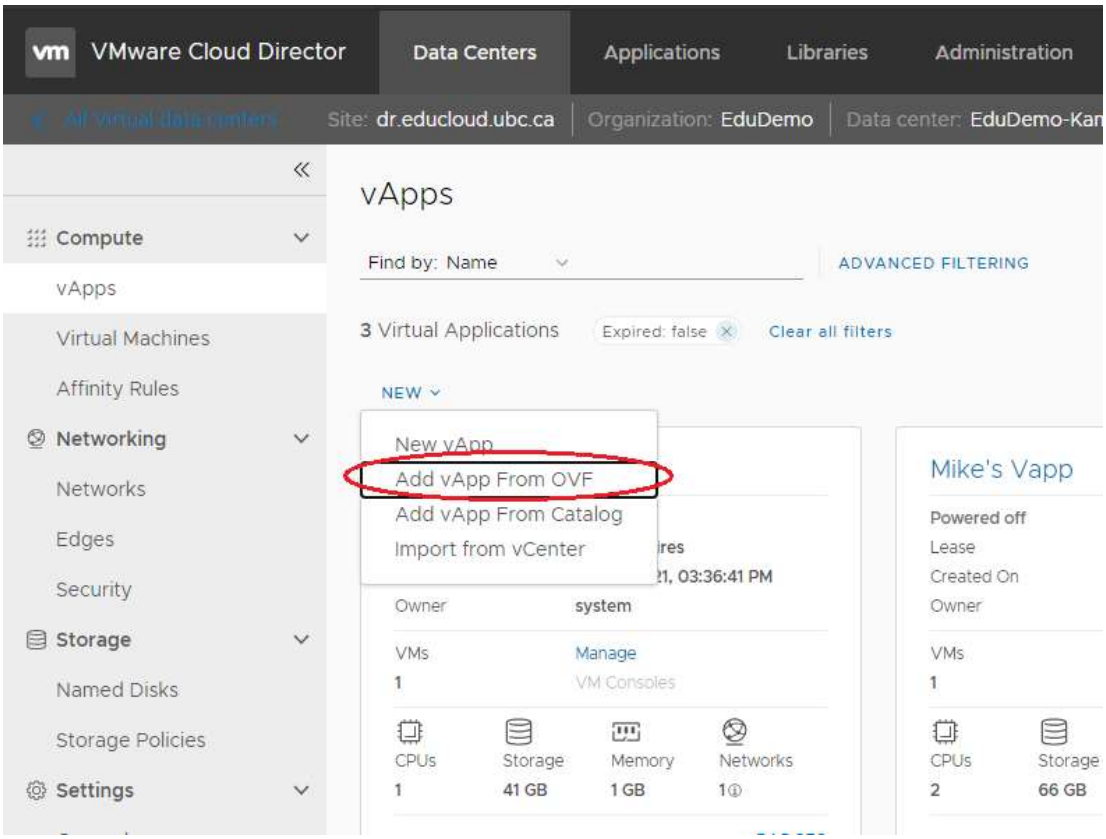
Kam) and would be appropriate for creating a vApp in a Kamloops Virtual Data Center → Next



- Enter a vApp name (Description is optional) → Next
- Enter a VM Name → Next
- Enter the desired number of CPUs and amount of memory → Next
- Enter the desired Hard Disk size → Next
- Enter the Computer name and elect the desired network from the Network dropdown menu → Next
- Review the details and click FINISH
- Configure VM

vApp Creation from OVF

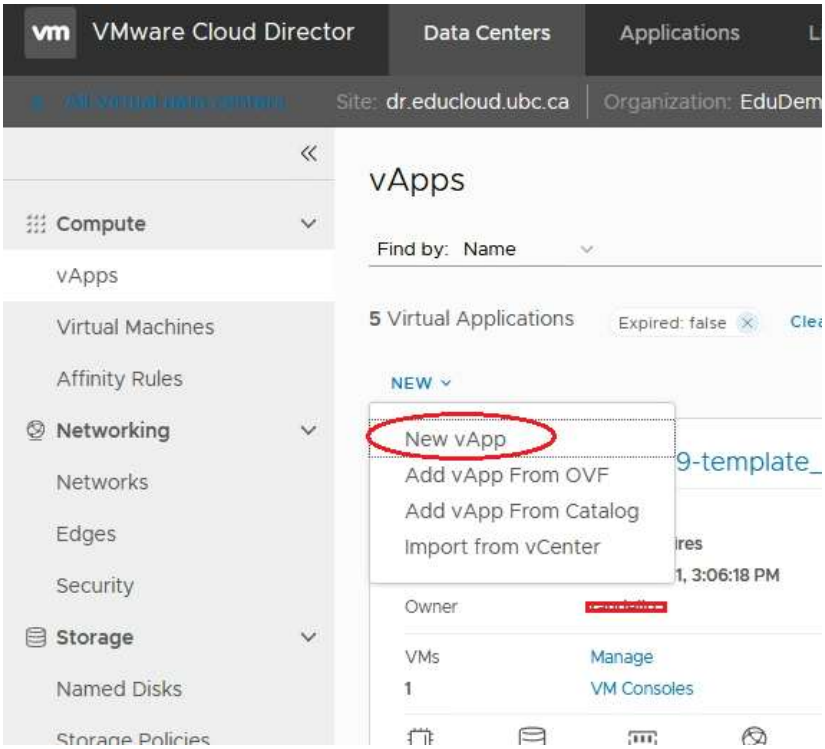
- If you have more than one VDC (Virtual Data Centre), choose the Data Center you wish **Data Centers** → Select the **Data Center** desired.
- From the **Compute** menu choose **vApps**
- Click on the **NEW** dropdown → **Add vApp From OVF**



- Under **Select Source, Browse** to select your OVF package → Next
- **Review Details → Next**.
- **Accept Licenses** if applicable → Next
- **Enter vApp Name. → Next**.
- **Configure Resources**. Set VM Name, **Computer Name** and **Storage Policy**. → Next
- **Select Network**:
  If you wish more advanced customization, check the box for **Switch to the advanced network workflow**
- **Select the Resources you wish**
- **Ready to Complete**: Review and click **Finish**.

vApp Creation from Install Disk

- Ensure you are in the correct Virtual Data Center
- From the **Compute** menu, choose **vApps → New → New vApp**



- Enter a vApp **Name** then **ADD VIRTUAL MACHINE**
- Enter a VM **Name**, a **Computer Name** and choose Type **New** and other options as appropriate
- Select a previously uploaded ISO as the Boot Image
- Enter the size of the hard disk
- Click **OK**
- Click Create
- Power On the VM
- Use the Console to interact with the Install
- After installing the guest OS, ensure that VMware tools, or open-vmware-tools is installed and running – see “VMware tools and open-vm-tools” section

Virtual Machines (VMs)

Guest OS Customization

Guest OS customization configures the guest operating system of a VM.

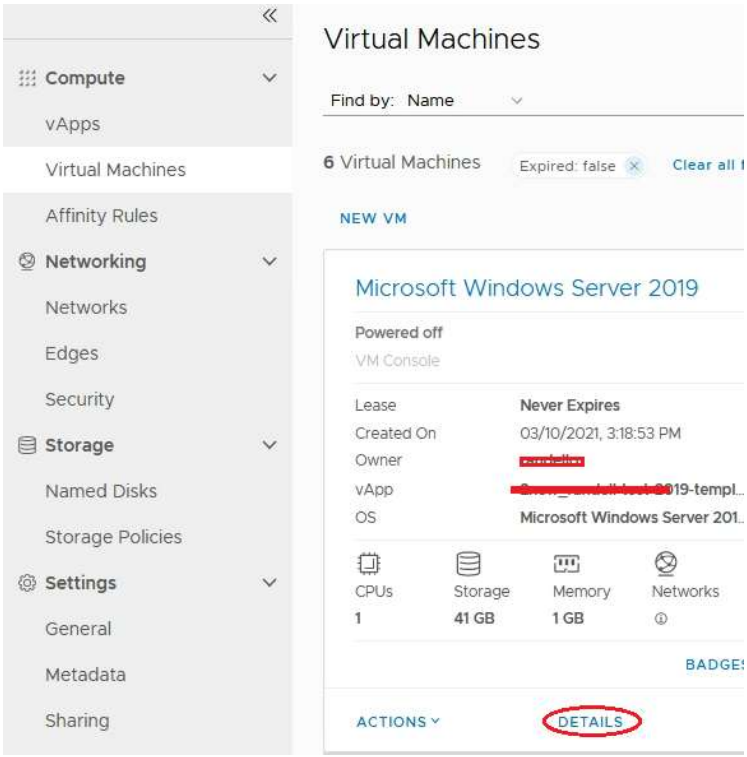
The customization process can update the administrator/root password, hostname, and network settings based on the information entered in the VM properties. It also ensures there are no hostname or network (IP address, MAC address) conflicts.

It is usually run after creating a VM or making configuration changes.
Run **Guest OS Customization** to:

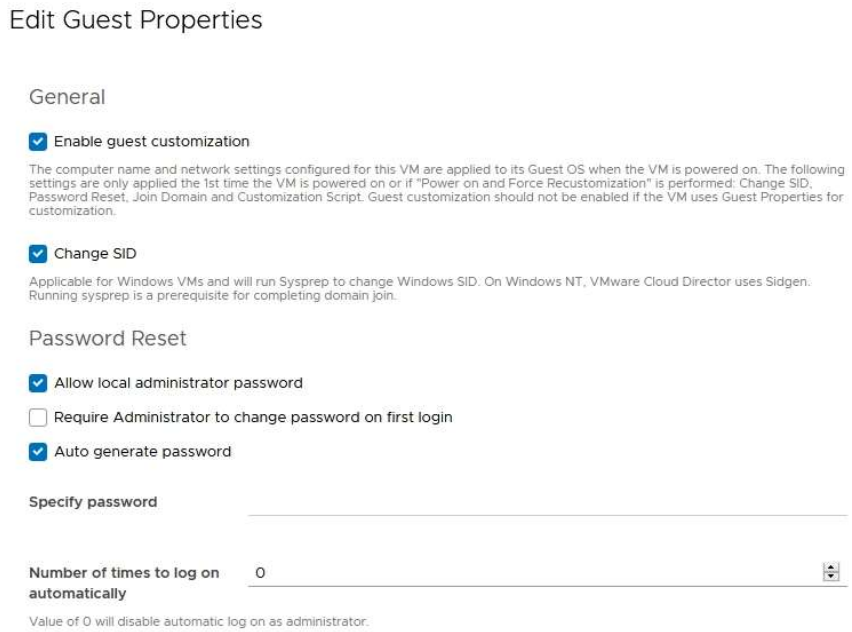
- change the administrator/root password
- reset the host name
- reset the network settings

The guest OS must have VMware tools or open-vm-tools installed in order for guest customization to work.

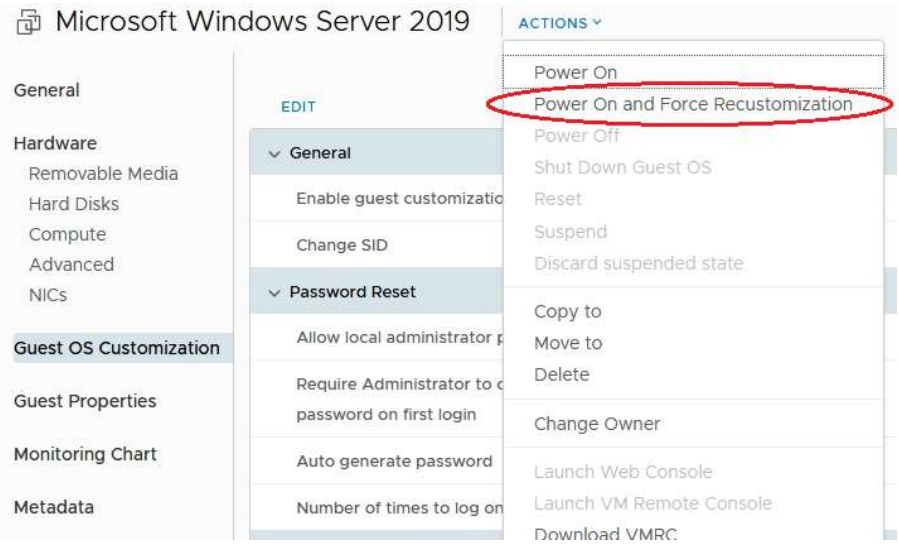
- In the appropriate **Virtual Datacenter → Compute** menu, choose **Virtual Machines**
- Find the **VM** you wish to modify
  You can also navigate to the **VM** via the **vApp**



- Click **DETAILS.** Under **Guest OS Customization → Edit**
- To change the administrator/root password, ensure that the following are selected:
    - Enable guest customization
    - Allow local administrator password
    - Auto generate password or specify a password



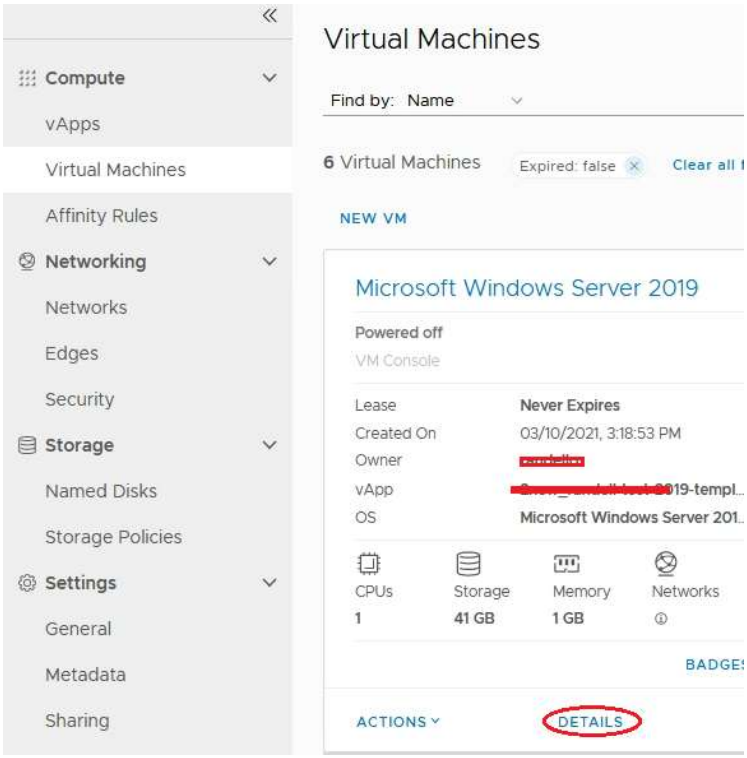
- Then click **Save**
- Shut down the VM if it is still running
- Then from the ACTIONS select Power on and Force Recustomization



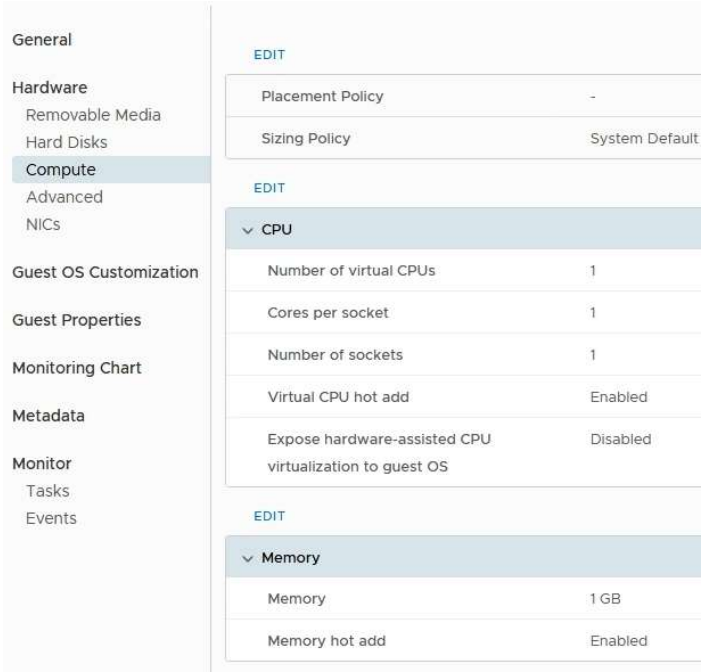
Host name, network info and (if selected) credentials will be changed.

Modify VM CPU Memory, Hard Disk and/or Network Resources

- In the appropriate Virtual Datacenter → **Compute** menu, choose **Virtual Machines**
- Find the VM you wish to modify
  You can also navigate to the VM via the vApp



- Click **DETAILS.** Under **Hardware**



- Modify as you wish.
    - Choosing virtual CPU's, cores
    - Total Memory
    - ADD Disk and/or modify current disks
    - ADD NIC and/or modify current NICs
- Depending on your change, run Guest OS Customization
  From **ACTIONS** select **Power on and Force Recustomization**

Enable Hot Add

These options are enabled by default on all EduCloud provided templates (i.e. the ones in the public catalogs).

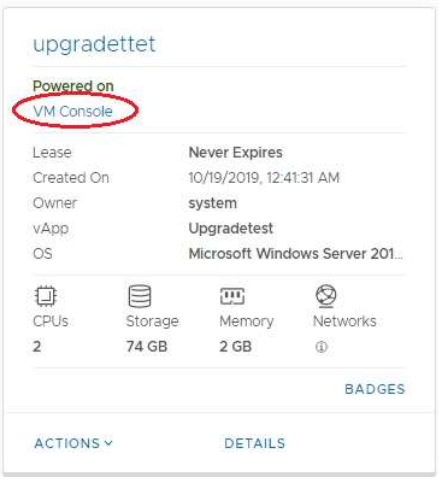
Hot-add options allow you to add additional CPU and memory resources to a VM that is powered on. This feature is only supported on certain guest operating systems and virtual machine hardware versions.

- In the appropriate Virtual Datacenter, **Compute** menu, choose **Virtual Machines**
- Find the VM you wish to modify
  You can also navigate to the VM via the vApp
- **Details→ Hardware →** Compute **→ Edit** the CPU / Memory settings
- Toggle the **Virtual CPU hot add** and/or **Memory hot add** as you wish

VM Console

Please note that browser pop-ups must be enabled to open a virtual machine console.

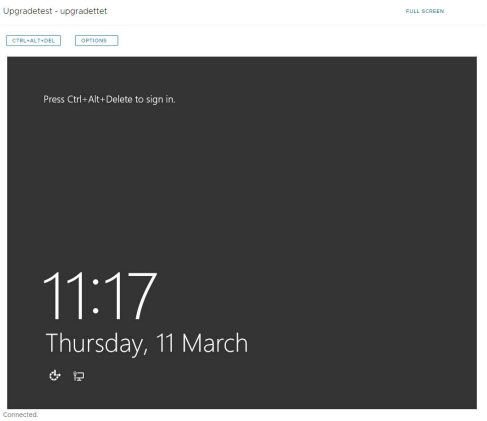
- In the appropriate Datacenter **→ Compute → Virtual Machines →** find the appropriate **VM** .
- Click on **VM Console**



Or, click on **ACTIONS** and choose **Launch Web Console or Launch Remote Console**
If the VM is not powered on, click on **ACTIONS** and choose **Power On** first.

You may see various setup messages first time the VM is powered on as EduCloud applies customization changes.

Once completed you will see the operating system logon prompt:



Affinity Rules

Affinity and anti-affinity rules allow some control over how VMs are distributed across hosts in the cluster/compute tier.

An Affinity Rule specifies that a group of VMs should be placed on the same host whenever possible. In some cases, this can improve performance by reducing network latency for communications between the VMs.

An Anti-affinity Rule specifies that a group of VMs should be placed on different hosts whenever possible, minimizing how many VMs are impacted when a single host fails. Often used for a group of VM's that are being load balanced.

View Affinity Rules

You can view existing affinity and anti-affinity rules and their properties including rules, status, and applicable virtual machines of each rule.

- In the appropriate Virtual Datacenter → **Compute** menu, choose **Affinity Rules**

Add an Affinity Rule

- In the appropriate Virtual Datacenter → **Compute** menu, choose **Affinity Rules**
- In the Affinity Rules section, click **NEW**.

- Type a **Name** for the new affinity rule.
- Select virtual machines to add to the affinity rule
- (Optional) Deselect **Enabled** to create the rule without enabling it.
- (Optional) Deselect **Required** to create a preferred rule, which means that the virtual machines added to the rule are powered on even when the rule is violated.
- Click **SAVE** to create the new rule.

Add Anti-Affinity Rule

- In the appropriate Virtual Datacenter → **Compute** menu, choose **Affinity Rules**
- In the Anti-Affinity Rules section, click **NEW**.
- Type a **Name** for the new anti-affinity rule.
- Select virtual machines to add to the anti-affinity rule
- (Optional) Deselect **Enabled** to create the rule without enabling it.
- (Optional) Deselect **Required** to create a preferred rule, and enable the cluster to power on the virtual machines even if the rule is violated.
- Click **SAVE** to create the new rule.

Edit Affinity or Anti Affinity Rule

- In the appropriate Virtual Datacenter → **Compute** menu, choose **Affinity Rules**
- Select the **Anti-Affinity** or **Affinity** rule you wish to edit
- Click **EDIT**.
- Edit as you wish
- Click **SAVE** to apply the changes to the rule.

Delete an Affinity or Anti-Affinity Rule

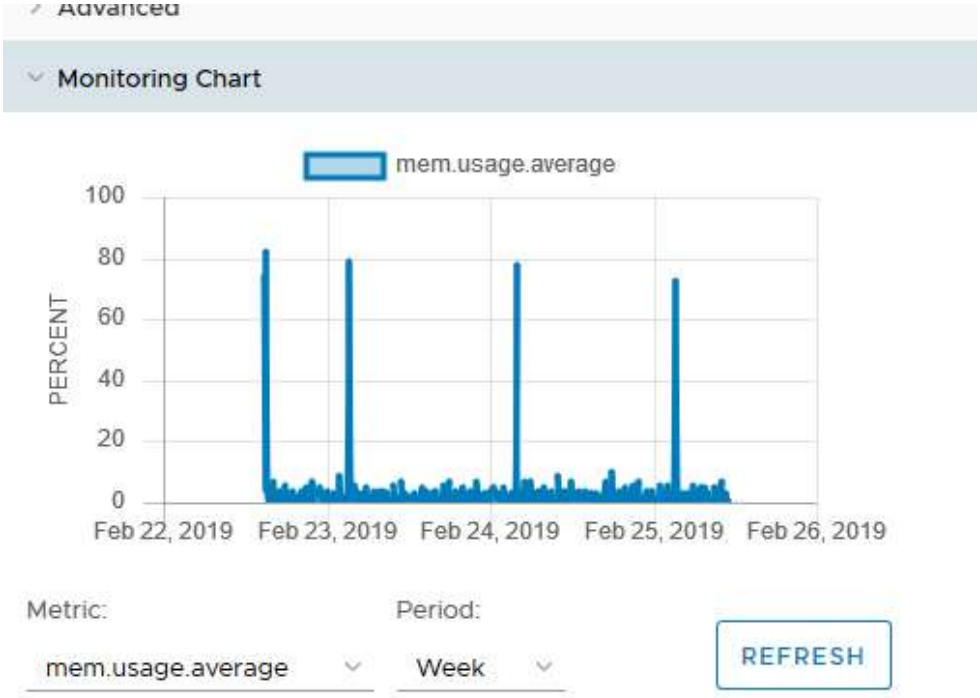
- In the appropriate Virtual Datacenter → **Compute** menu, choose **Affinity Rules**
- Select the **Anti-Affinity** or **Affinity** rule you wish to delete
- Click **DELETE**.

Monitoring Chart

Basic VM Statistics are available via the EduCloud interface.

- In the appropriate Virtual Datacenter → **Compute** menu, choose **Virtual Machines**
- Find the VM you wish to look at
  You can also navigate to the VM via the vApp
- Click on **Monitor Chart** in the menu on the left

- Choose a **Metric** and **Period**
  Note that not all metrics are supported

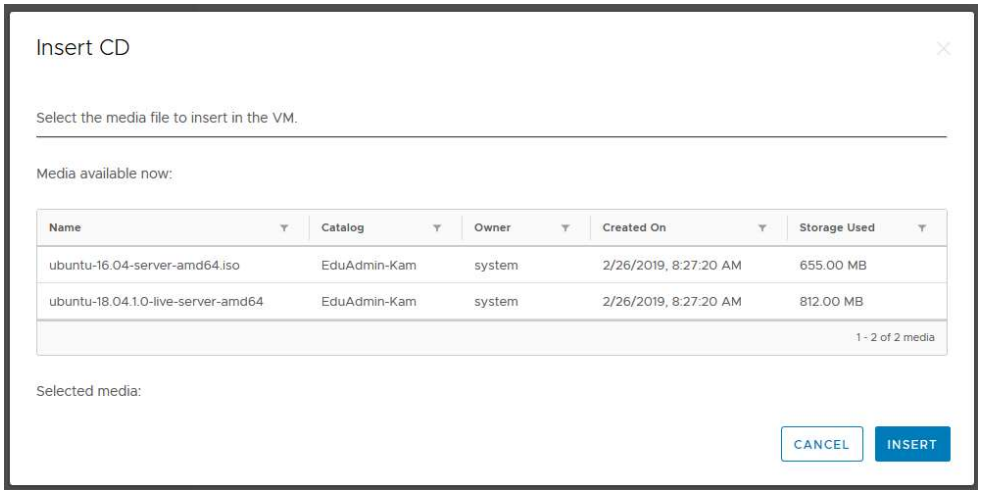


Mount ISO

If you need to mount an CD/DVD ISO image:

1. Upload the ISO if you have not already
   Libraries → Content Libraries Menu → **Media & Other → ADD**
2. Mount the ISO to the VM
   a. **Datacenters → Compute** Menu → **Virtual Machines →** find the VM
   b. ACTIONS → Insert Media

c. Choose the ISO you wish, then click on **INSERT**



Install a Guest Operating System

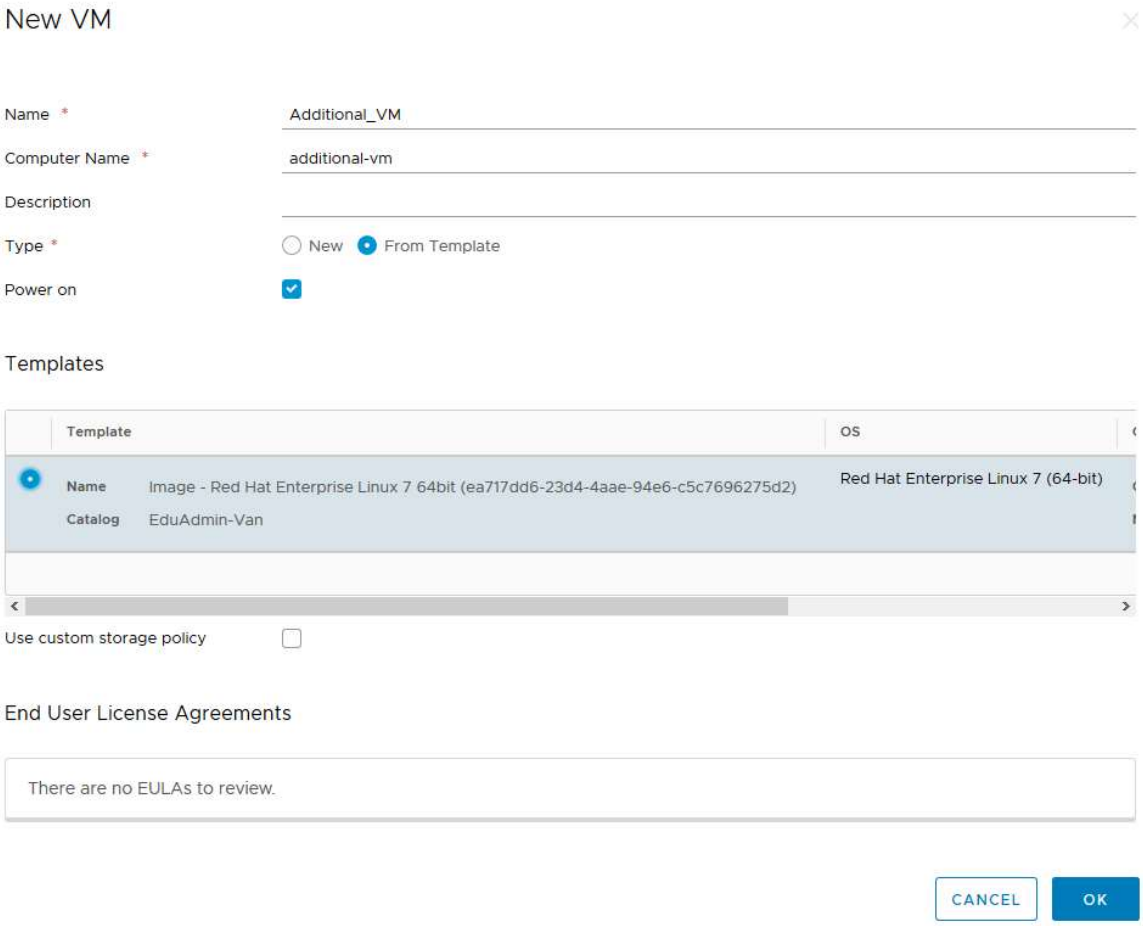
If the Public catalogs do not have an appropriate image, then you have the option to install a Guest OS directly.

- Create a Blank VM
- Mount the OS Install ISO as in the previous section
- Power up the VM (ACTIONS → Power On)
- Follow the Install on the Console (ACTIONS → Launch Web Console)
- Ensure that VMware tools or open-vmware-tools is installed in the Guest OS – see the "VMware Tools and open-vm-tools" section

Add Additional VMs to a vApp

- Datacenters → **vApps** → Find the vApp you created
- Click **ACTIONS → ADD VIRTUAL MACHINE**

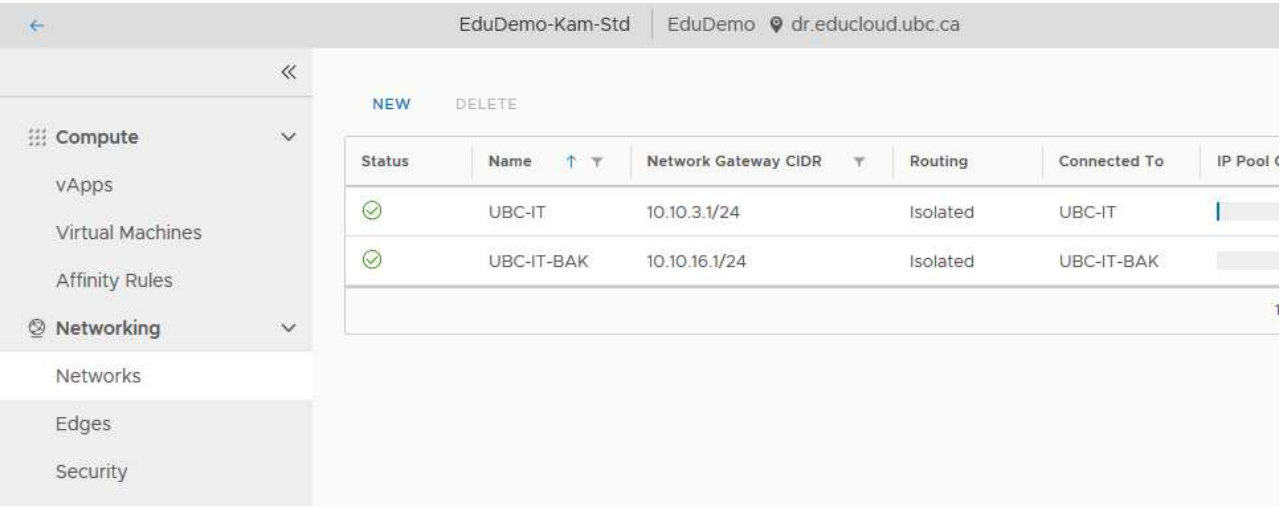
- Enter a **Name** , **Computer Name**, and if using a template, choose the Template and **OK**



Networking

This is a brief discussion of networking in EduCloud. See the more comprehensive "*EduCloud Networking and Security Guide*" for more information regarding networks and firewalls.

Datacenters → **Virtual Data Center** → Desired **VDC** → **Networking** Menu → **Networks** will show networks that have been added to and/or created in your Org.



Networks can be configured when creating a VM or can be added to a vApp (Compute → vApps → Find vApp → ACTIONS → **Add Network**) and then configured

Configuring a Network for a VM under **Hardware**, you will see the following:

Where:

- Primary NIC – indicates which is the primary NIC for traffic
- Connected – whether the NIC is enabled or not
- Network – the network chosen for this NIC
- IP Mode
    - DHCP – if you have configured and are using DHCP
    - Static IP Pool – EduCloud will assign an IP from the Network selected
    - Static Manual – allow you to enter a specific IP Address
- MAC Address – assigned to the NIC. To reset, clear the field and Save

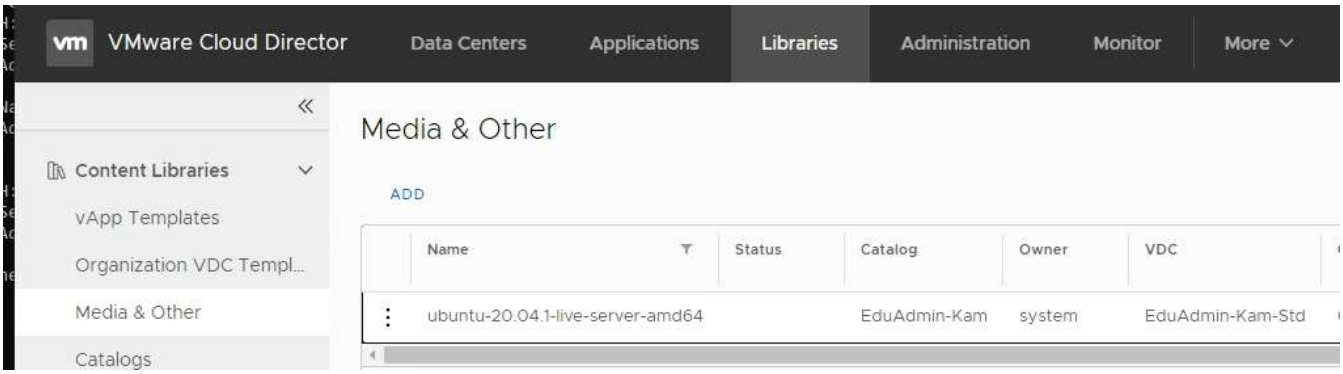
Catalogs

A catalog is a container for vApp templates and media files.

EduCloud has public catalogs containing pre-built operating system gold images or you can create your own Templates and/or upload media as necessary (Depending on roles assigned to your account).

Navigation

To view Catalogs and Media, go to **Libraries** in the top menu



On the left choose:

- **Catalogs**
  - to view Public catalogs and view/edit Org specific catalogs
- **vApp Templates**
  - to view vApp Templates in Catalogs
- **Media and Other**
  - to view/upload/delete ISOs and other media in Catalogs
-

Public Catalogs

EduCloud publishes catalogs containing vApp Templates built with recent versions of Microsoft Windows, Microsoft Windows Server, RedHat Linux and Ubuntu. You can use these templates to create vApps within your Org

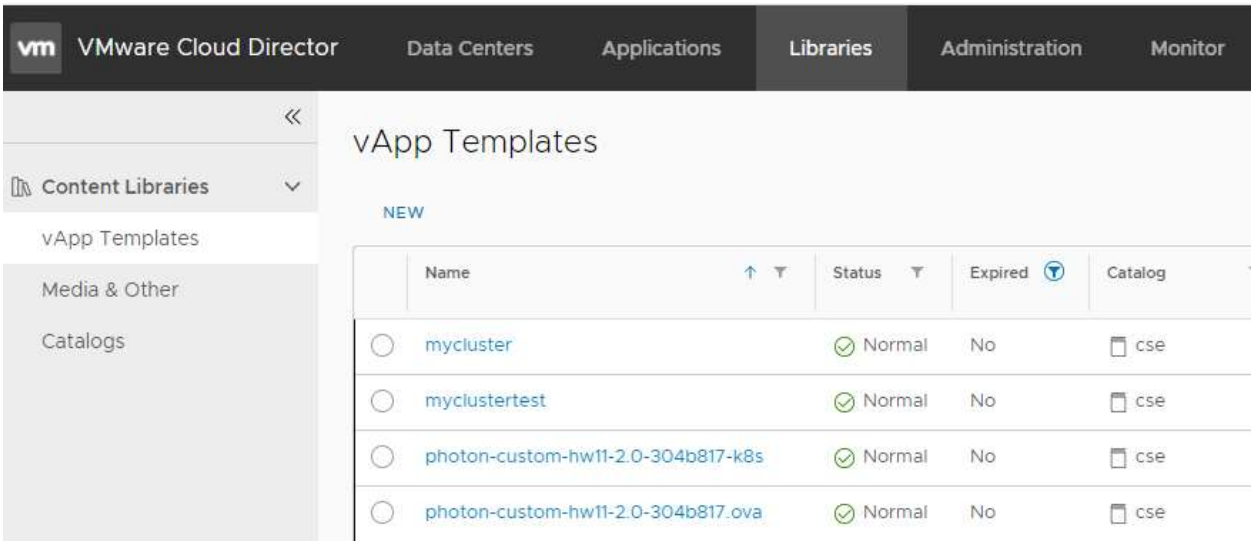
To view catalogs and create new vApps:

- **Libraries → Content Libraries** Menu →**Catalogs**

To view vApp Templates directly

- **Libraries → Content Libraries** Menu →**vApp Templates**

Public Catalogs will be in a catalog(s) named **EduAdmin-*location***
e.g.: EduAdmin-Van

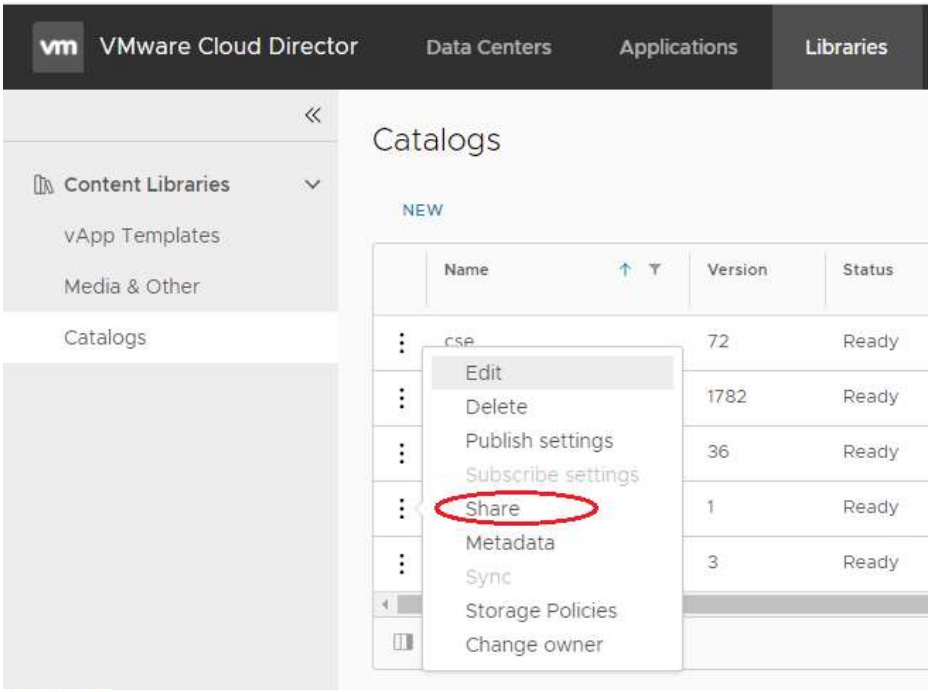


My Organization's Catalogs

As noted, you can create a catalog and publish its content to the users of your organization. Create a Catalog first, then add vApp Templates and Media (ISO's, etc.)

Create a Catalog

- **Libraries → Content Libraries** Menu →**Catalogs**
- Click **NEW**
- Enter a **Name**
- Click **OK**
- From the menu for the Catalog choose Share

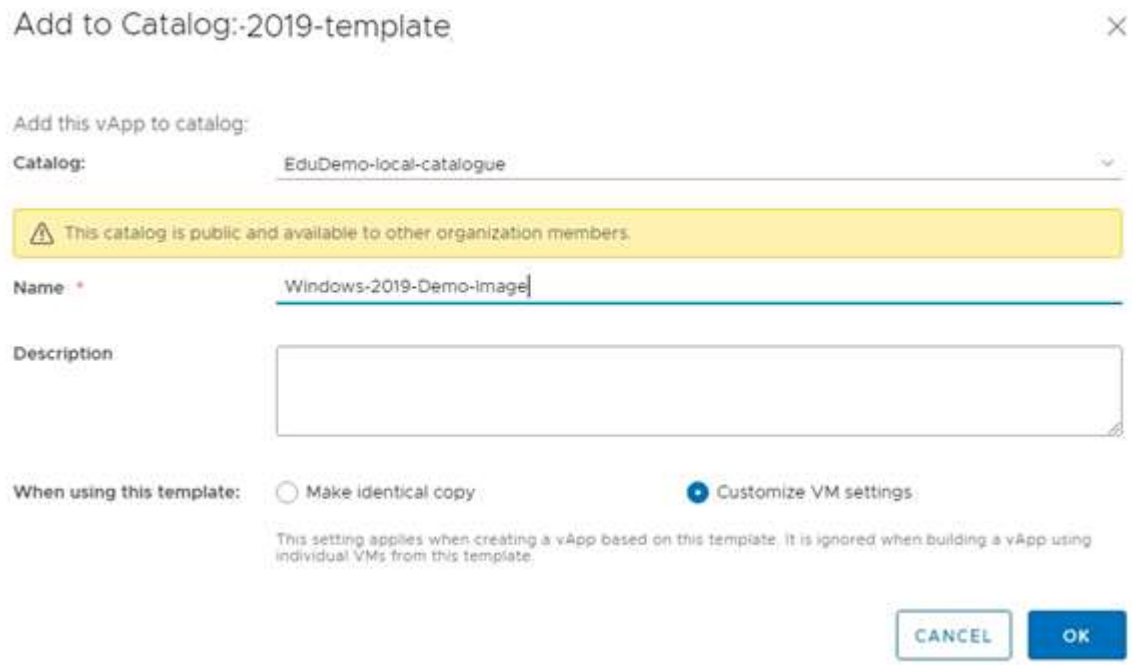


- And Share as required

Create a vApp Template

From vApp

- Create a vApp configured and customized as per your requirements
- **Datacenters → vApps →**Find vApp → **ACTIONS → Add to Catalog**
- Select the Catalog and any other options and click **OK**



From OVF

- **Libraries → Content Libraries** Menu → **vApp Templates → NEW**
- Select the source an OVF; Review Details
- Enter a vApp Template Name; Select the Catalog
- **FINISH**

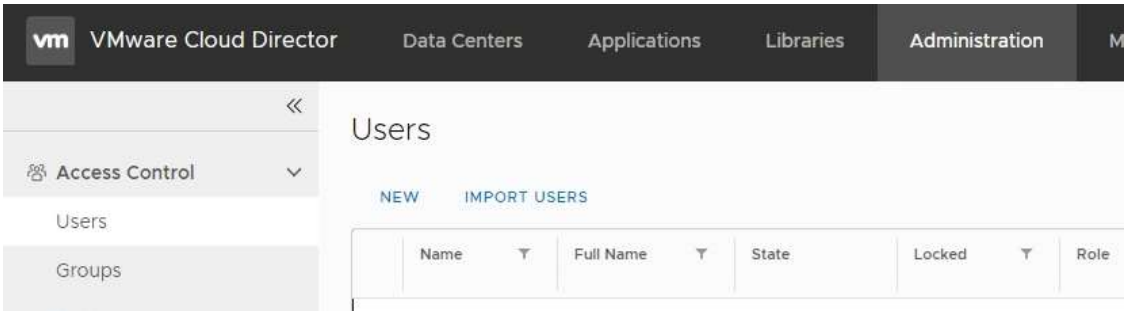
Add Media

- **Libraries → Content Libraries** Menu → **Media & Other**
- Click **ADD**
- Choose the Catalog to add to
- Enter a **Name**
- Select the media to upload
- Click **OK**

User and Group Management

General

The user, group and role management can be found in the **Administration** menu.



You need to be an organization administrator to view this section. Roles and rights for users and groups in your Org are managed here.

Import Users / Groups from Authentication Service

Import/Add users from your LDAP based authentication service (eg UBC CWL/EAD):

Add Users

- **Administration → Access Control → Users**.
- **IMPORT USERS**.
- Search for the username.
- Select the user(s) from those displayed.
- Assign the appropriate role for the user(s).
- Click **SAVE**.

Add Groups

- **Administration → Access Control → Users**.
- **IMPORT GROUPS**.
- Search for the group.
- Select the group(s) from those displayed.
- Assign the appropriate role for the group(s).
- Click **SAVE**.

Create Local User

For Users that are not in an LDAP Authentication System

Add Users

- **Administration → Access Control → Users**
- **NEW**.
- Create the user's **Credentials**, choose the **Role**, fill in the **Contact Info**, and select appropriate **Quotas**, or tick “Unlimited” where applicable
- Click **SAVE**.

Roles

The following Roles are commonly used in the EduCloud Server Service. A number of other roles are available to Organization Administrators as well

- **Administrator – Limited**
  Limited access allowing VM management; console access; powering on/off; snapshot management, password management.
  But no access to manage resources.
  Primarily used for shared Orgs and/or allowing access to users for limited management of specific VMs in an Org

- **Catalog Author**
  Rights to create and manage vApps, VMs and Catalogs.
  Limited Org management

- **Organization Administrator**
  Rights to most Organization management, except inter org and Virtual Data Center Management

- **vApp User**
  Rights to use vApps created by other users.
  Fewer rights than the Administrator – Limited role

VMware Tools and open-vm-tools

See the following for more information, but note that support for VMs not running current versions of VMware Tools or open-vm-tools may be restricted. If you are having VM issues, please ensure it is installed and that you are running the latest version.

Some of the features that will fail for a VM without VMware tools installed:

- Guest OS Customization
- Security Tags or Security groups referencing your VM
- Proper guest OS shutdown when VM or vApp is stopped (vm will be hard powered off)

VMware Tools

VMware Tools are the official, commercial versions of the guest system utilities from VMware and consist of a suite of virtualization utilities that improves the functionality, administration, and management of virtual machines within a VMware environment.

VMware tools enables features such as shared folders and cut and paste operations between the guest operating system and the machine from which you launch the vCloud Director Web console.

Install on a Windows Guest

- In the appropriate Datacenter → **Compute** → **Virtual Machines** → find the appropriate **VM** .
- In the left pane, click **VMs**
- **Actions** → select **Install VMware Tools**
- Follow the prompts in the guest OS to complete the installation wizard
- Click **Finish**
- Restart the virtual machine

Install on a Linux Guest

Check to see if open-vm-tools is more appropriate for the OS you are working with.

- In the appropriate Datacenter → **Compute** → **Virtual Machines** → find the appropriate **VM** .
- In the left pane, click **VMs**
- **Actions** → select **Install VMware Tools**
- Login to the VM via the console or remote
- In the guest OS, start the RPM installer

    - Double click the VMware Tools CD icon on your desktop and double click the RPM installer in the root of the CD-ROM
    - Double click the RPM installer in the file manager window
- Type the root password and click **OK**
- Click **Continue** when the package is ready
    - When VMware tools is installed, no confirmation or Finish button appears.
- At a terminal console, as root, run the **vmware-config-tools.pl** script to configure VMware Tools
- Press Enter to accept the default values
- After the upgrade is complete, enter **/etc/init.d/network restart** to restart the network
- Type **exit**
- To start the VMware Tools control panel, enter **vmware-toolbox &**

Open Virtual Machine Tools

open-vm-tools is the open source implementation of VMware Tools. The primary purpose for open-vm-tools is to enable operating system vendors and/or communities and virtual appliance vendors to bundle VMware Tools into their product releases.

VMware recommends using open-vm-tools redistributed by operating system vendors if available.

open-vm-tools is available with these operating systems:

- Fedora 19 and later releases
- Debian 7.x and later releases
- openSUSE 11.x and later releases
- Recent Ubuntu releases (12.04 LTS, 13.10 and later)
- Red Hat Enterprise Linux 7.0 and later releases
- CentOS 7 and later releases
- Oracle Linux 7 and later releases
- SUSE Linux Enterprise 12 and later releases

VMware Tools or open-vm-tools is already pre-installed on all EduCloud Server Public Catalog templates. For instructions on installing VMware Tools or open-vm-tools for a VM not deployed from one of the Public Catalog templates, please check http://partnerweb.vmware.com/GOSIG/home.html

Snapshots

Snapshots allow you to save the state of a vApp or VM. This allows an easy reversion to a previous state when working on a VM.

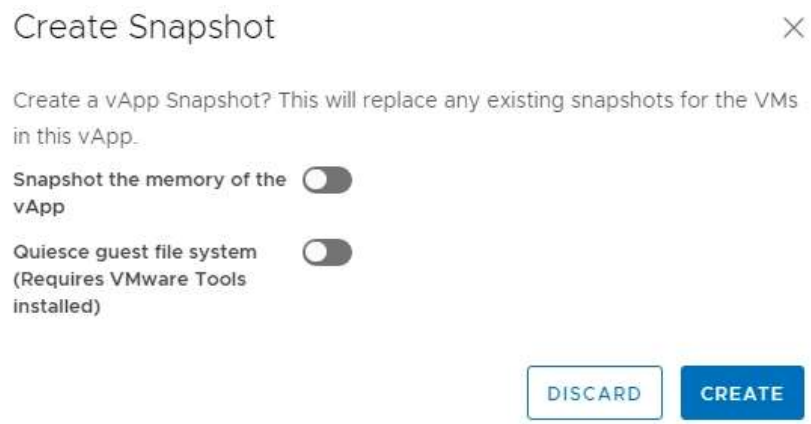
In EduCloud you can only create a single snapshot of a VM. This can be done either on a vApp level or a VM level. For example, you can snapshot all the VMs contained within a vApp by creating a vApp snapshot. Any subsequent VM snapshots will replace the previous snapshot (taken either on the vApp or VM level).

Snapshots should not be kept for longer than a week. The snapshot file will continue to grow as it ages. This may cause the snapshot storage location to run out of space, reduced system performance, and/or problems with regular backups.

Note that network information is not captured by a Snapshot – any networking changes made after the snapshot is taken will not be reverted if you roll back to a snapshot.

vApp snapshot

- In the appropriate Datacenter → **Compute** → **vApps** → find the appropriate **vApp**
- **ACTIONS** → **Create Snapshot**.
- A window will pop up with a warning that previous snapshots will be replaced. Click **CREATE** to proceed.
- (Optional) Select whether to snapshot the memory of the vApp. When you capture the vApp memory state, the snapshot retains the live state of the vApp and the virtual machines in the vApp.
- (Optional) Select whether to quiesce the guest file system. This operation requires that VMware Tools is installed on the virtual machines in the vApp. When you quiesce a virtual machine, VMware Tools quiesces the file system of the virtual machine. A quiesce operation ensures that a snapshot disk represents a consistent state of the guest file systems.

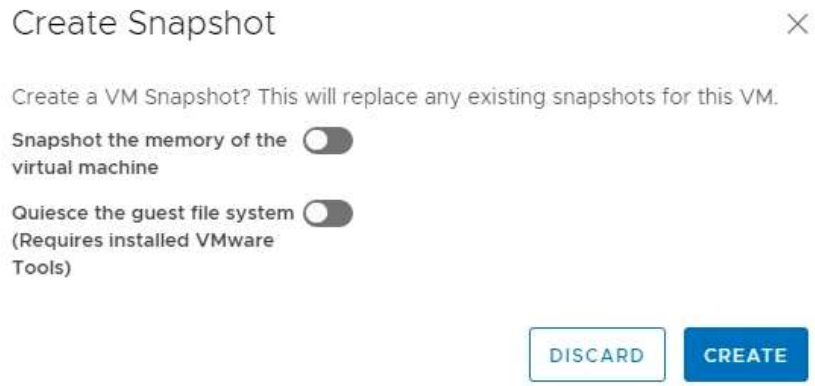


This may take some time depending on how many VMs are contained in the vApp, their size and whether they are powered on.

VM snapshot

Alternatively, you may only want to create a snapshot for a single virtual machine.

- In the appropriate Datacenter → **Compute** → **Virtual Machines** → find the appropriate **VM**.
- **ACTIONS** → **Create Snapshot**.
- Click **CREATE** button to create the snapshot.
- (Optional) Select whether to snapshot the memory of the virtual machine. When you capture the virtual machine's memory state, the snapshot retains the live state of the virtual machine.
- (Optional) Select whether to quiesce the guest file system. This operation requires that VMware Tools is installed on the virtual machine. When you quiesce a virtual machine, VMware Tools quiesces the file system of the virtual machine. A quiesce operation ensures that a snapshot disk represents a consistent state of the guest file systems.



Revert a vApp/VM to a Snapshot

You can revert a virtual machine to the state it was in when the snapshot was created. This can be done multiple times until the snapshot is deleted.

Remember that snapshots are intended for short term use and should not be kept for too long.

- In the appropriate Datacenter → **Compute** → **vApps** / **Virtual Machines** → find the appropriate **vApp** or **VM**.
- **ACTIONS** → **Revert to Snapshot**.
- Click **OK** button to create the snapshot

Remove a vApp/VM Snapshot

- In the appropriate Datacenter → **Compute** → **vApps** / **Virtual Machines** → find the appropriate **vApp** or **VM**
- **ACTIONS** → **Remove Snapshot**.
- Click **OK**

This will remove snapshots from all VMs in the vApp

Remove a Snapshot for a single VM

- In the appropriate Datacenter → **Compute** → **Virtual Machines** → find the appropriate **VM**.
- **ACTIONS** → **Remove Snapshot**.
- Click **OK** button to create the snapshot.

Appendix

Supported browsers

VMware Cloud Director is compatible with the current major and previous major release of the following browsers:

- Google Chrome
- Mozilla Firefox
- Microsoft Edge