EDUCLOUD SERVER

User Guide

v10.6.0.1

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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.

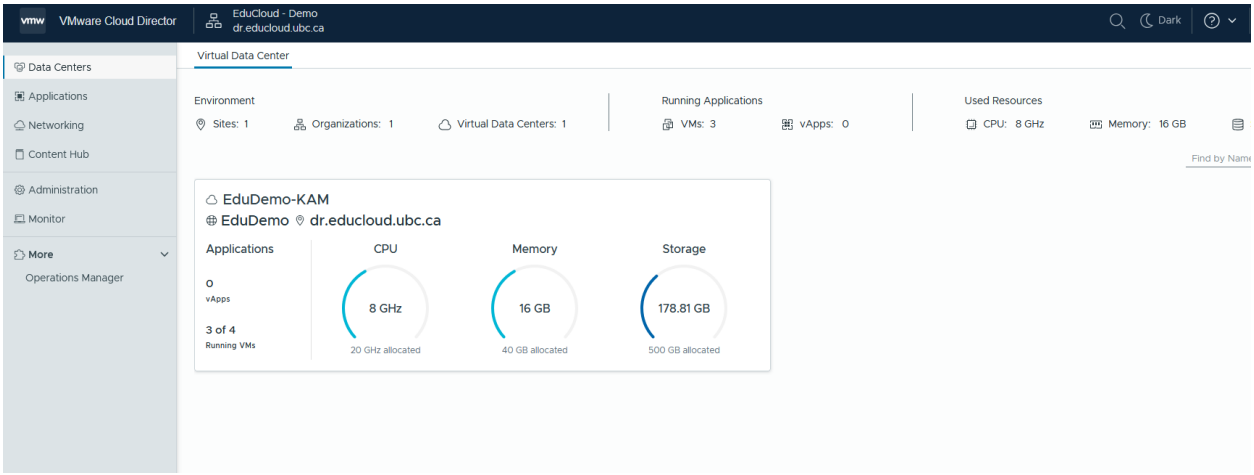
1. Open a Web browser and navigate to:
   `https://bcnet.educloud.ubc.ca/tenant/<OrganizationCode>`.
   The **`<OrganizationCode>`** was provided during the onboarding process. For example, the University of British Columbia IT department could have an access URL similar to:
   https://bcnet.educloud.ubc.ca/tenant/ubc-it/

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** on the left and the **Virtual Data Centers** display in a card view.

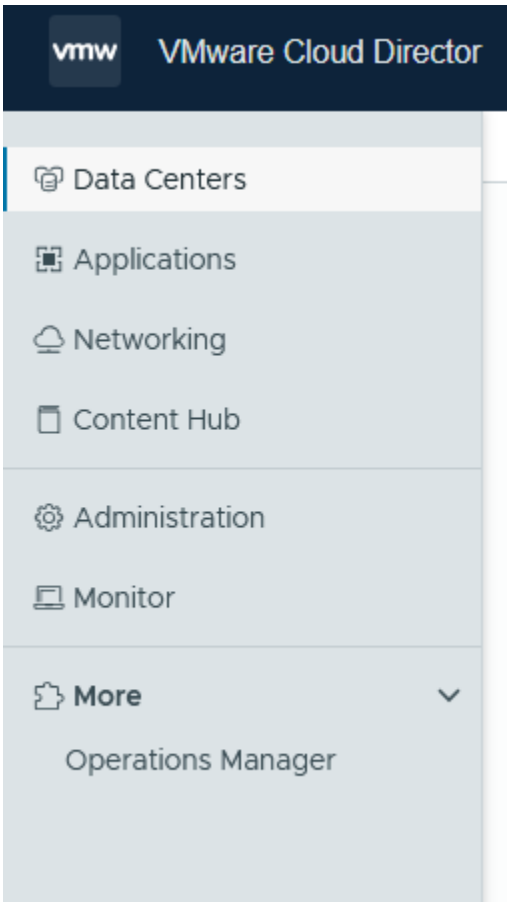
Data Centers - Virtual Data Center Dashboard



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

Navigation

Main Menu



Datacenters

Virtual Data Centers and Data Center Groups

Applications

Virtual Applications (vApps) and Virtual Machines (VMs)

Networking

Networks and Edge Gateways

Content Hub

Managing Templates, Catalogues, and Media (ISOs, etc)

Administration

General Settings, User and Group management

Monitor

Tasks and Events

Operations Manager

Dashboard view of health and performance

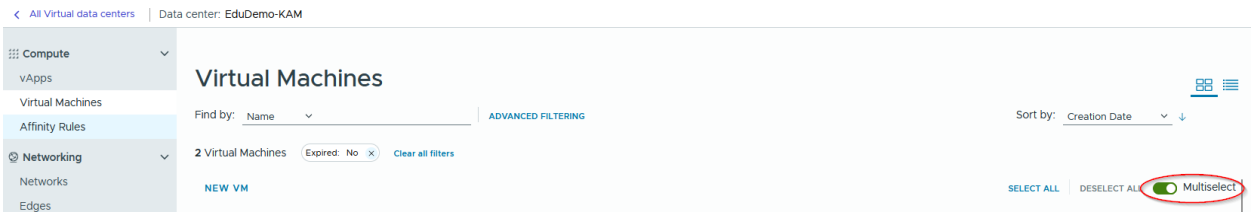
Navigating VDCs

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.

Multiselect Option

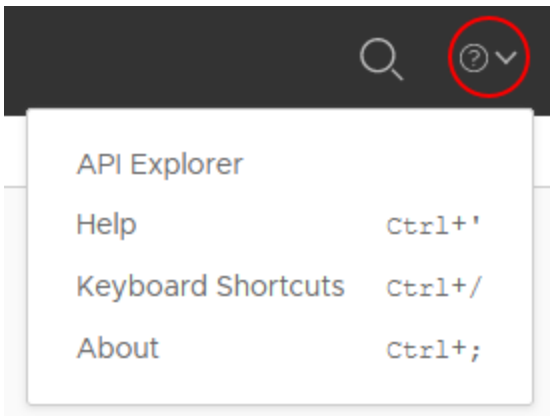
This option allows you to perform operations on multiple VMs or vApps simultaneously.



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's on-line vCloud Director Tenant Portal documentation.



Create vApp/VM from Template

Data Centers → Appropriate VDC Card → New (option shows up if there are existing vApps) vApps → Add vApp from Catalog

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

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

Snapshot vApp/VM

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

Note: You can only have 1 snapshot at a time. Snapshots should not be kept for more than a week and should NOT be used as a backup. Snapshots negatively impact VM performance and backups. Network information is not captured by a snapshot.

Upload an OVF (Open Virtualization Format) or ISO

Content Hub → Media → ADD

Restore a vApp or VM

Submit 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 Catalogues that you have access to; either standard EduCloud templates, or a catalog created in your Organization. vApps can also be created from OVF (Open Virtualization Format) or an Install Disk/ISO.

vApp Creation

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

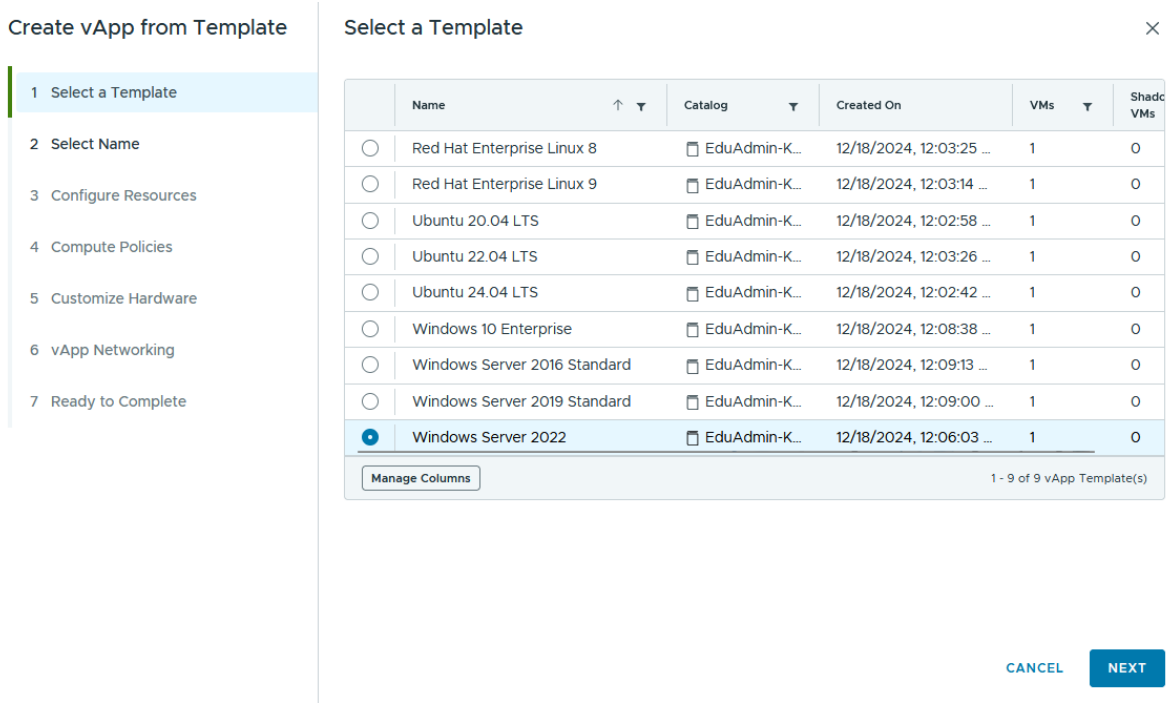
- vApp Name
- VM Name
- VM Computer Name – this will be used as the host name
- Network Information
- VM Stop Action – Shutdown OS / Halt VM
- vApp Sharing

vApp Creation from Standard Template

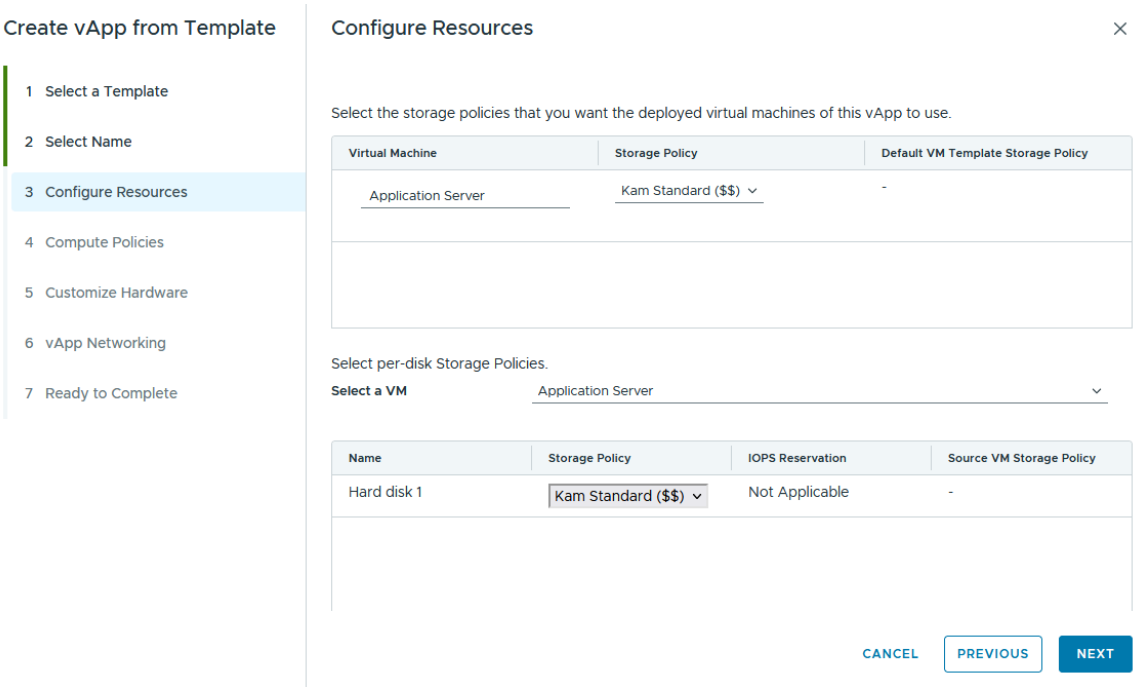
Create vApp

1. vApps → NEW → Add vApp From Catalog

2. Choose the template based on the OS and the Catalogue and click Next.

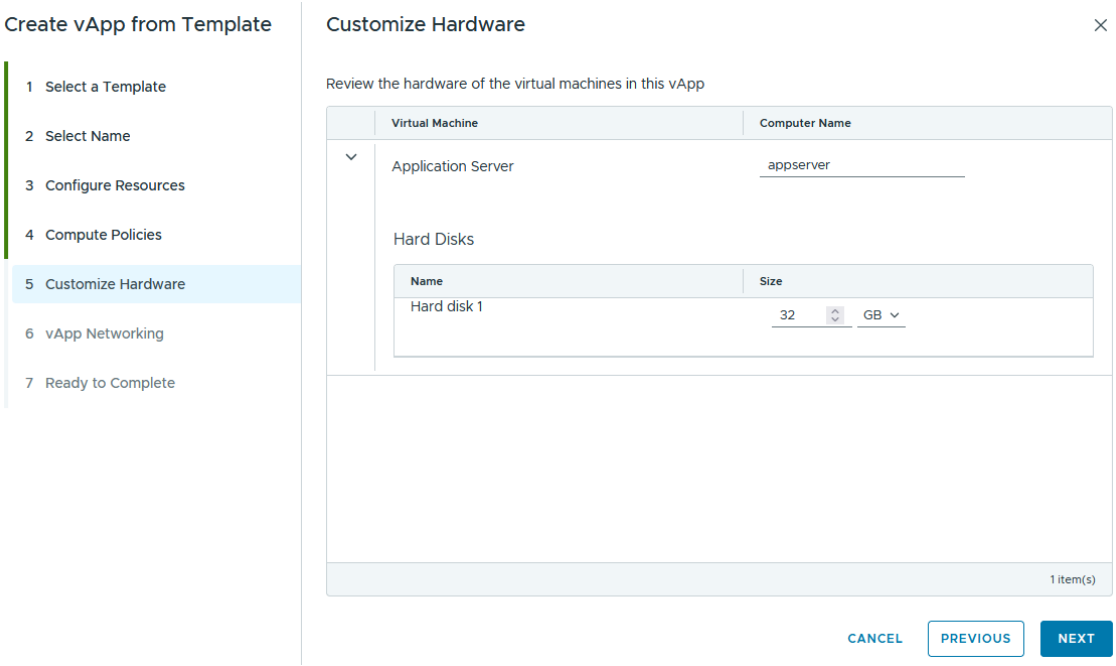


3. Enter a vApp name (Description is optional) → Next
4. Enter a VM Name → Next



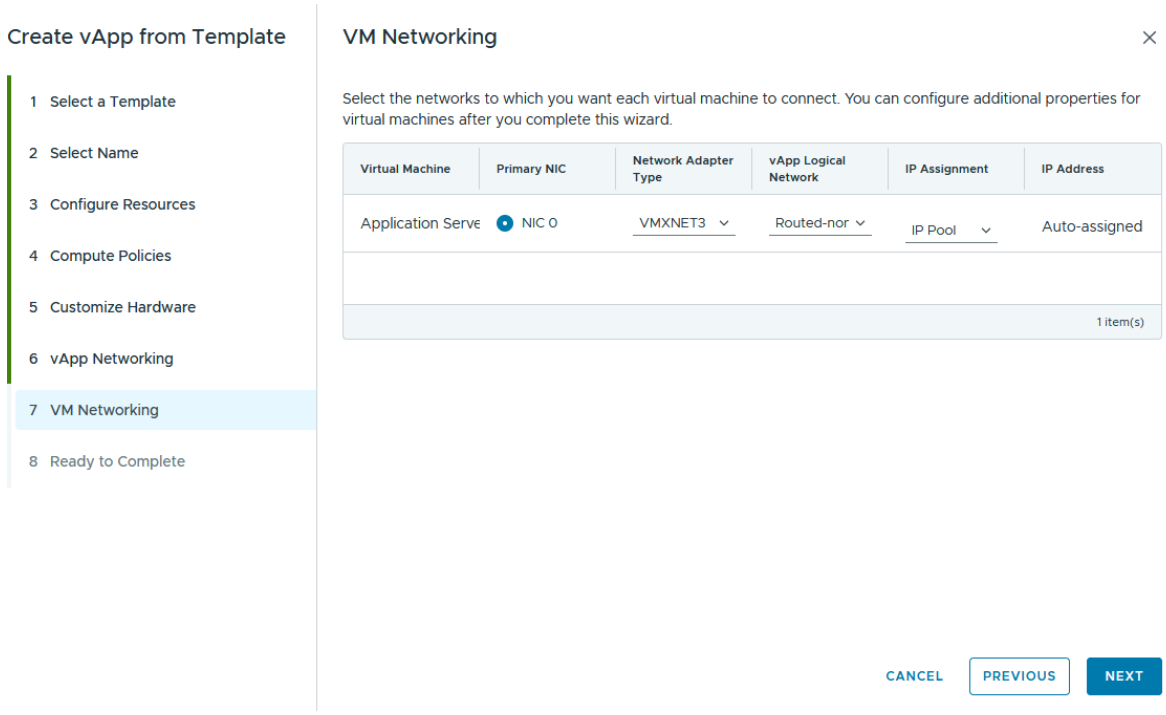
5. Enter the desired number of virtual CPUs and memory → Next

6. Enter the desired Computer Name and Hard Disk size → Next
   If required, you will be able to add additional disks once the VM is provisioned



7. Select the desired network from the Network dropdown menu → Next
   If you wish more advanced customization, select **Configure VM Networking**

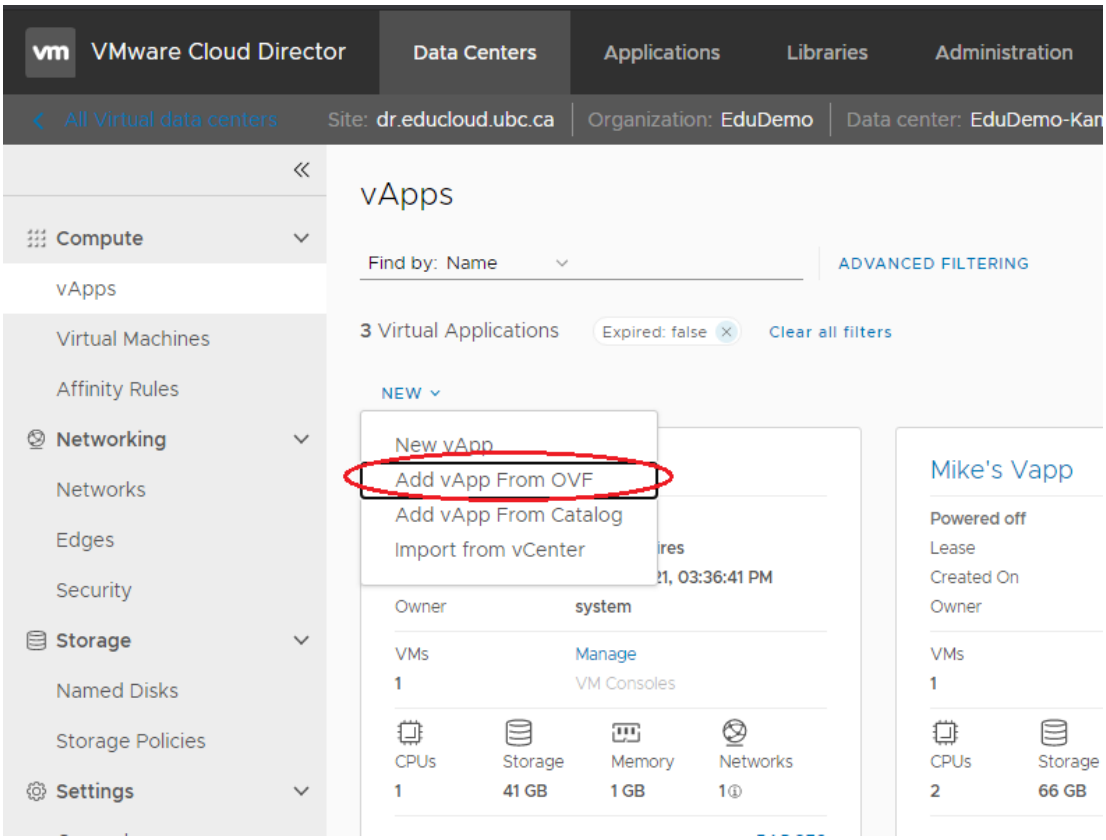
8. If you selected Configure VM Networking, the next screen will allow you specify additional VM Networking details. Click **Next** when done.



9. Review the details and click **FINISH**

vApp Creation from OVF

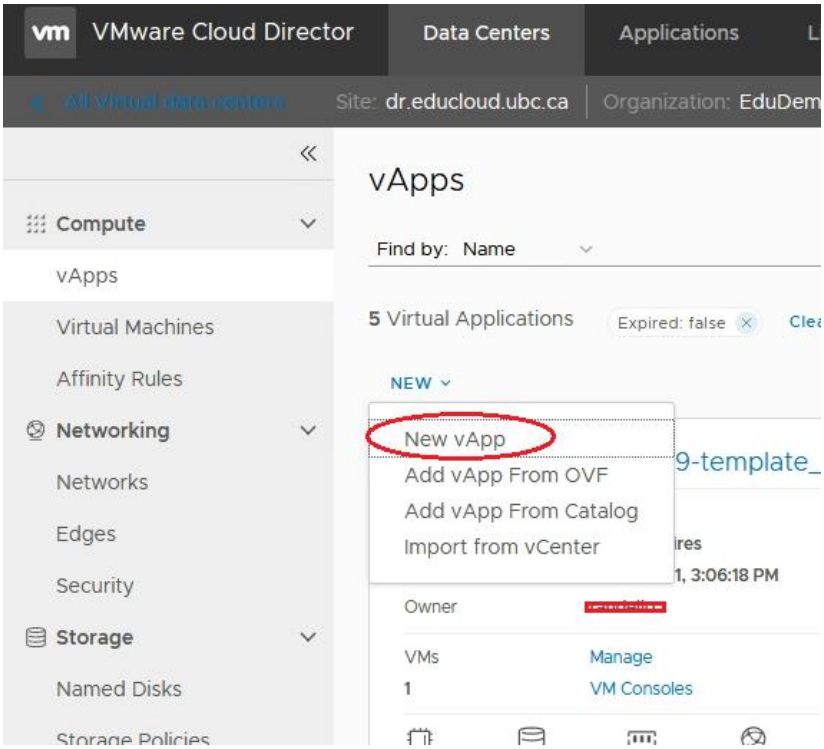
1. If you have more than one VDC (Virtual Data Centre), choose the Data Center you wish **Data Centers** → Select the **Data Center** desired.
2. From the **Compute** menu choose **vApps**
3. Click on the **NEW** dropdown → **Add vApp From OVF**



4. Under **Select Source, Browse** to select your OVF package → Next
5. **Review Details** → **Next**
6. **Accept Licenses**, if applicable → Next
7. **Enter vApp Name** → **Next**
8. **Configure Resources**; Set VM Name, Computer Name, and Storage Policy → Next
9. **VM Networking**: Set network settings → Next
10. **Customize Hardware**: Select the desired CPU and memory resources → Next
11. **Network Mapping**: select a network mapping if applicable → Next
12. **Ready to Complete**: Review and click **Finish**

vApp Creation from Install Disk

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



3. Enter a vApp **Name** then **ADD VIRTUAL MACHINE**
4. Enter a VM **Name**, a **Computer Name** and choose Type **New** and other options as appropriate
5. Select Operating System details from the drop down menus
6. Select a previously uploaded ISO as the Boot Image
7. Select Boot Options
8. Enter Compute details – CPU and memory
9. Enter the size of the hard disk
10. Select network and other networking details
11. Click **OK**
12. Click Create
13. Power On the VM
14. Use the Console to interact with the Install
15. 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

Guest OS Customization

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

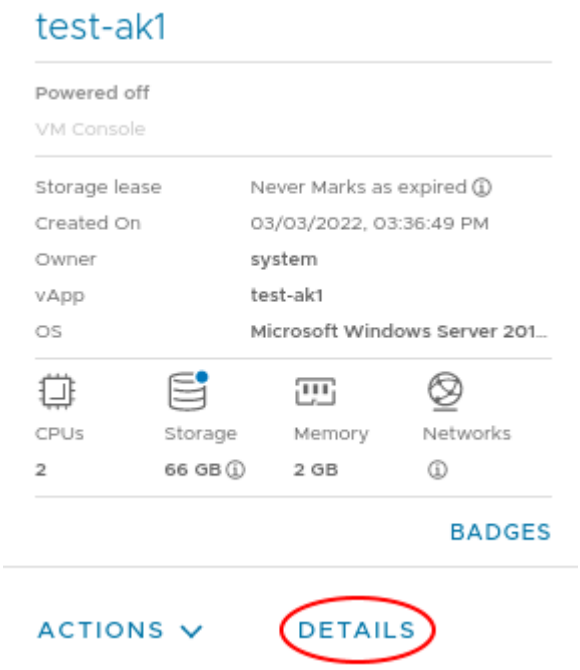
The customization process can update the administrator/root password, hostname, and network settings based on the information entered in the VM properties. It also ensures there are no hostname, IP, and MAC address conflicts.

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

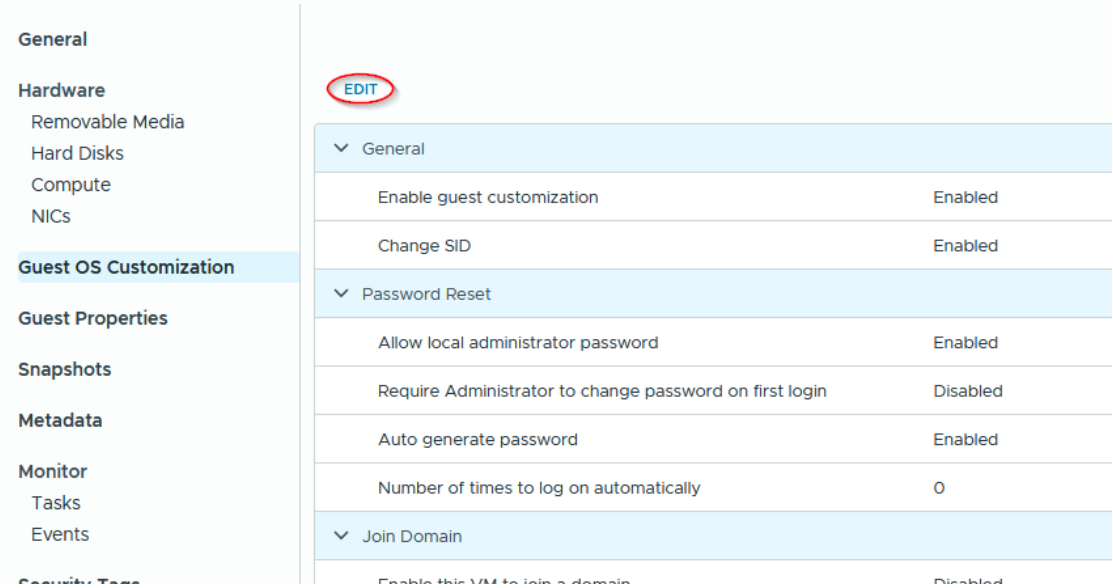
- change the administrator/root password
- reset the host name
- reset the network settings

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

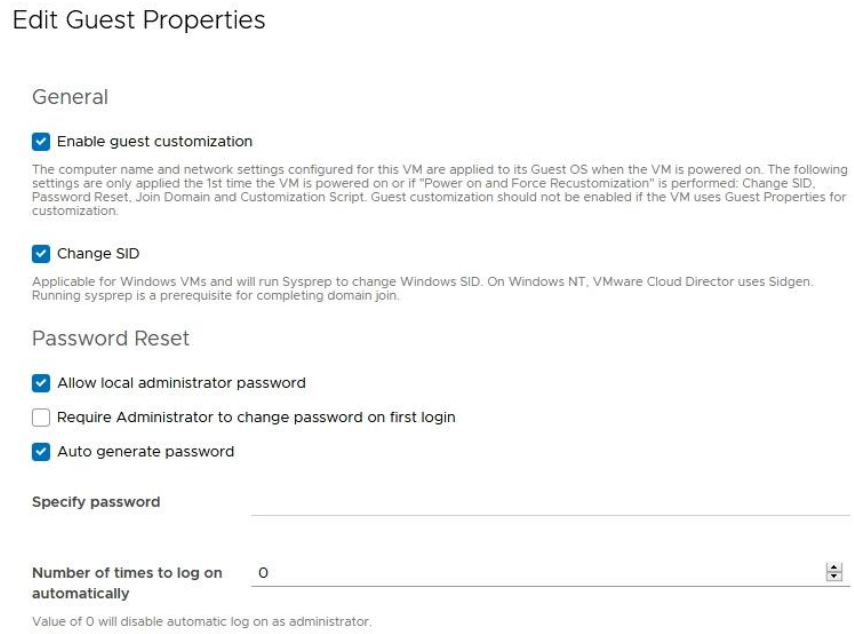
1. In the appropriate **Virtual Datacenter** → **Compute** menu, choose **Virtual Machines**
2. Find the **VM** you wish to modify
   You can also navigate to the **VM** via the **vApp**
3. Click **DETAILS**



4. Select **Guest OS Customization → Edit**

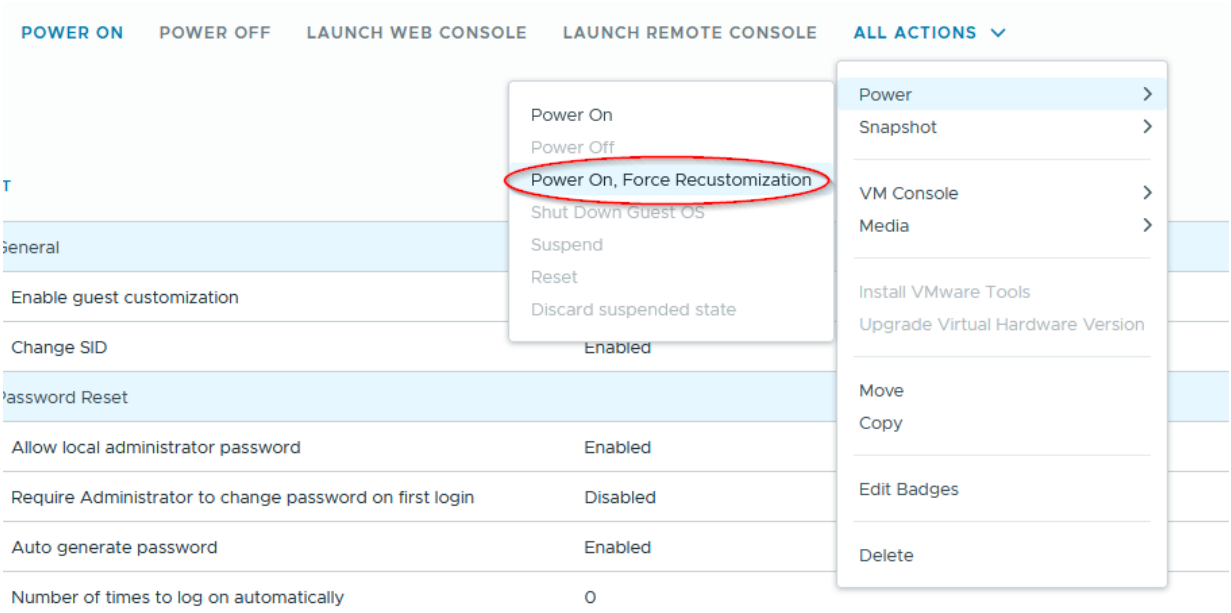


5. To change the administrator/root password, ensure that the following are selected:
   - Enable guest customization
   - Allow local administrator password
   - Auto generate password or specify a password



6. Then click **Save**
7. Shut down the VM if it is still running

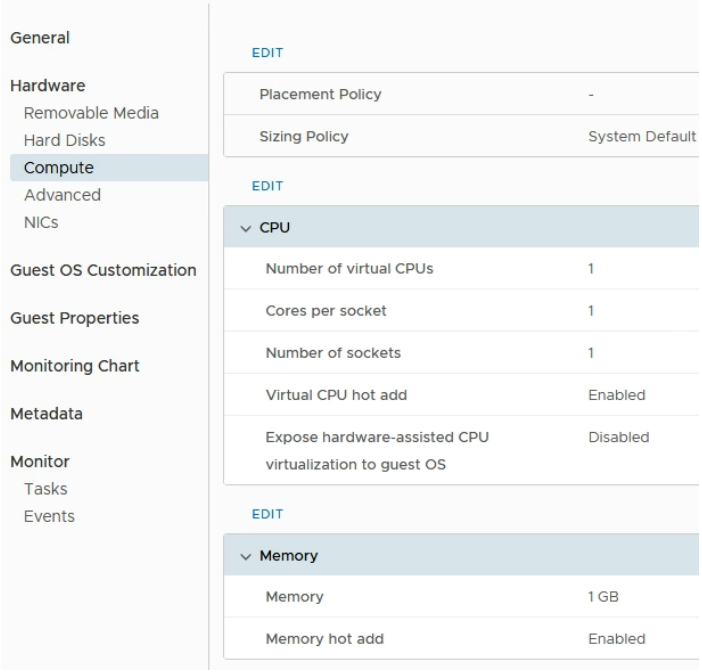
8. From the **ALL ACTIONS** dropdown select **Power On, Force Recustomization**



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

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

9. In the appropriate Virtual Datacenter → **Compute** menu, choose **Virtual Machines**
10. Find the VM you wish to modify
    You can also navigate to the VM via the vApp
11. Click **DETAILS**
12. Under **Hardware**



13. Modify as required:
    - Virtual CPUs and cores
    - Total memory
    - Add disk and/or modify current disks
    - Add NIC and/or modify current NICs
14. 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 templates in the public catalogues.

The hot-add options allow you to increase 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.

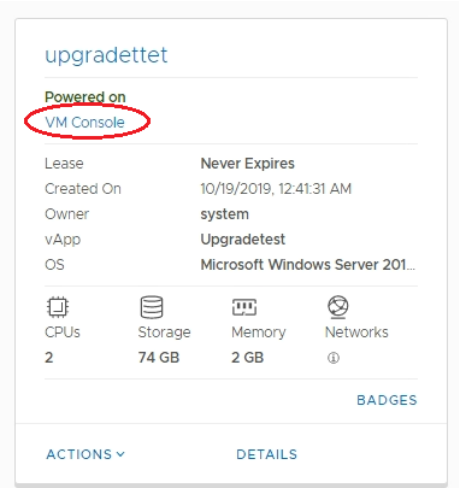
15. In the appropriate Virtual Datacenter select the **Compute** menu
16. Choose **Virtual Machines**

17. Find the VM you wish to modify
    You can also navigate to the VM via the vApp
18. **Details→ Hardware →** Compute **→ Edit** the CPU / Memory settings
19. 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 VM 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, first click on **ACTIONS** and choose **Power On**.

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

Once completed you will see your operating system logon prompt:

Affinity Rules

Affinity and anti-affinity rules allow some control over how VMs are distributed across hosts in the physical 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. This feature is often used for a group of VMs 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 Affinity Rules section, click **NEW**.
- Type a **Name** for the new 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.
- Select virtual machines to add to the affinity rule
- 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
- (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
- Select virtual machines to add to the anti-affinity rule
- 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 required
- Click **SAVE** to apply the changes to the rule

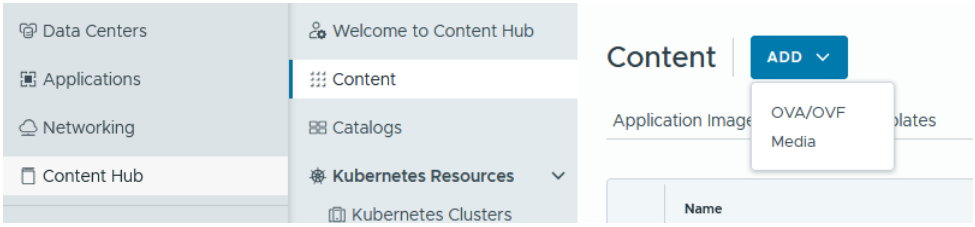
Delete an Affinity or Anti-Affinity Rule

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

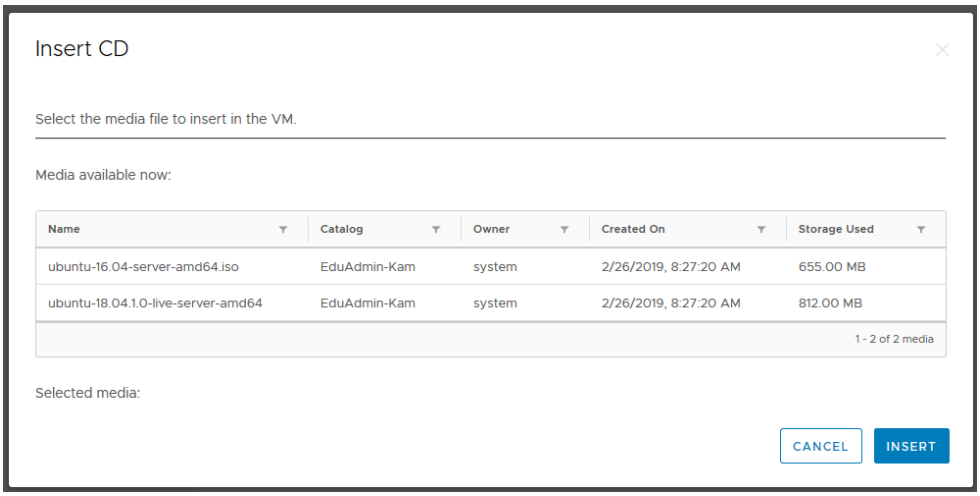
Mount ISO

If you need to mount an ISO image:

1. Upload the ISO if you have not already:
   Content Hub → Content → Media tab → ADD → Media



2. Mount the ISO to the VM:
   a. **Datacenters → Compute** Menu → **Virtual Machines →** find the VM
   b. ACTIONS → Media → Insert Media
   c. Click the desired ISO and then click **INSERT**



Install a Guest Operating System

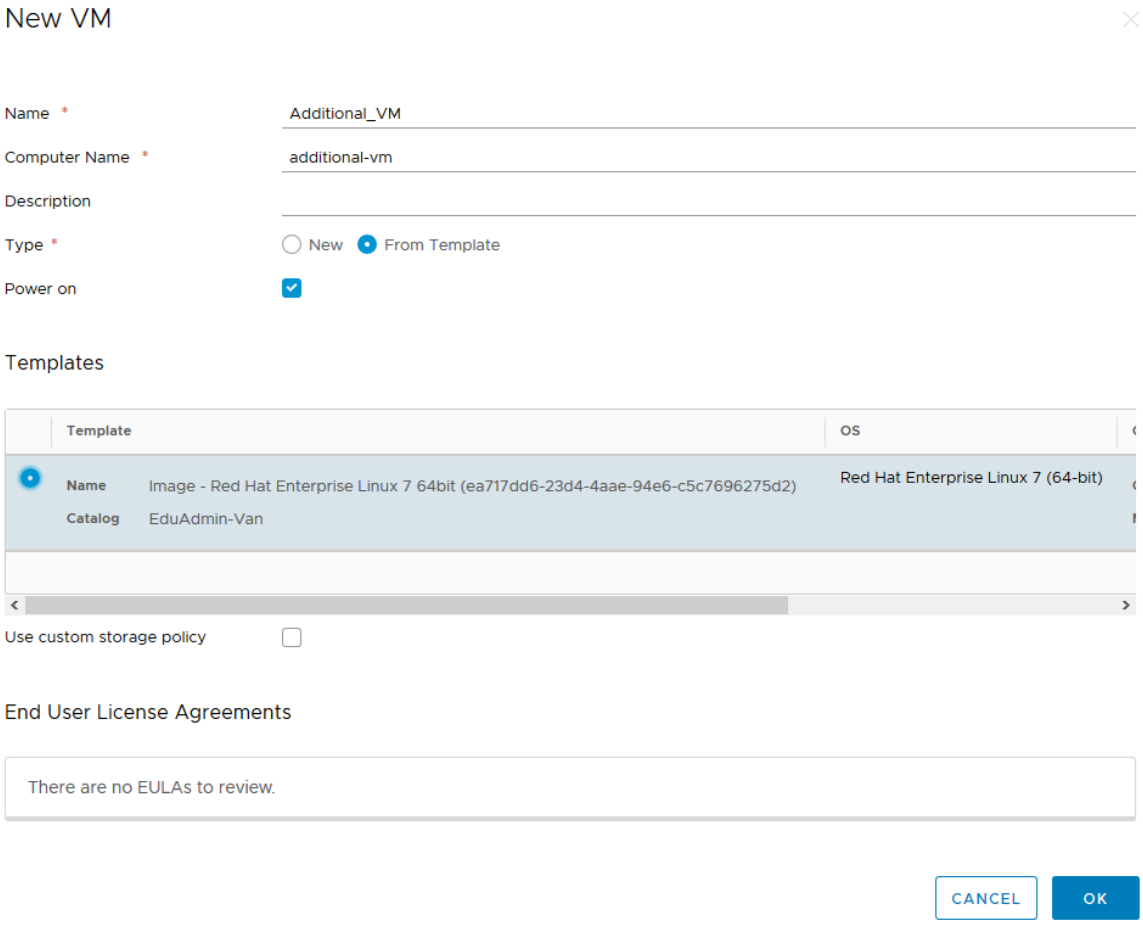
If the Public catalogues do not have a required image you have the option to install a Guest OS directly.

- Create a Blank VM
- Mount the OS Install ISO as in the previous section
- Power up the VM (ACTIONS → Power On)

- Complete the installation using the Console (ACTIONS → Launch Web Console)
- Ensure that VMware Tools or open-vm-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** → **Add VM**
- Click the **Add Virtual Machine** button
- Enter a **Name** , **Computer Name**, and if using a template, choose the template

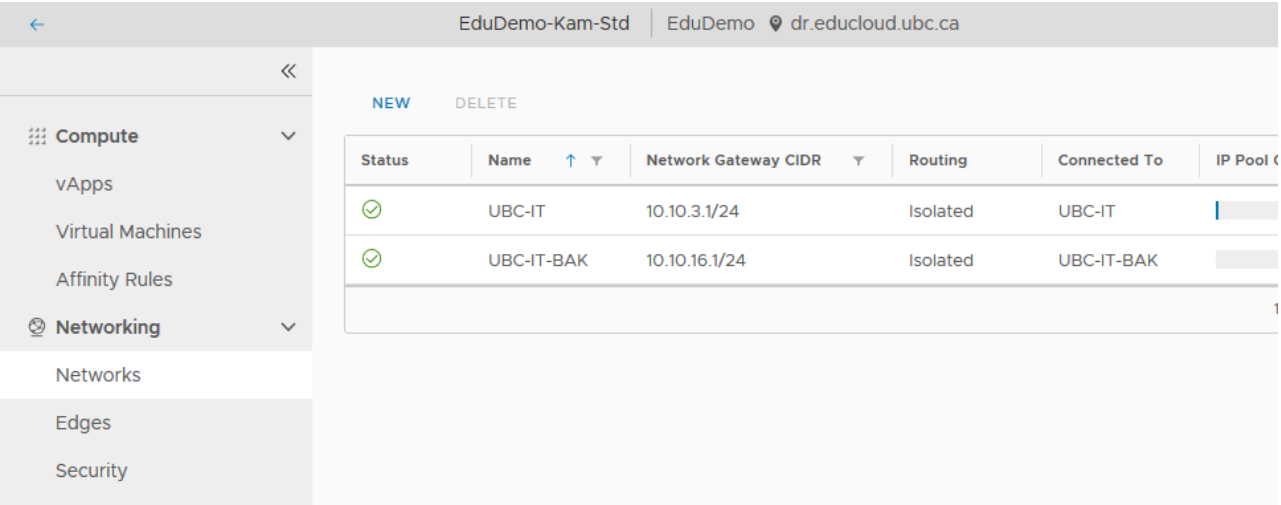


- Click OK

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 Organization.



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:

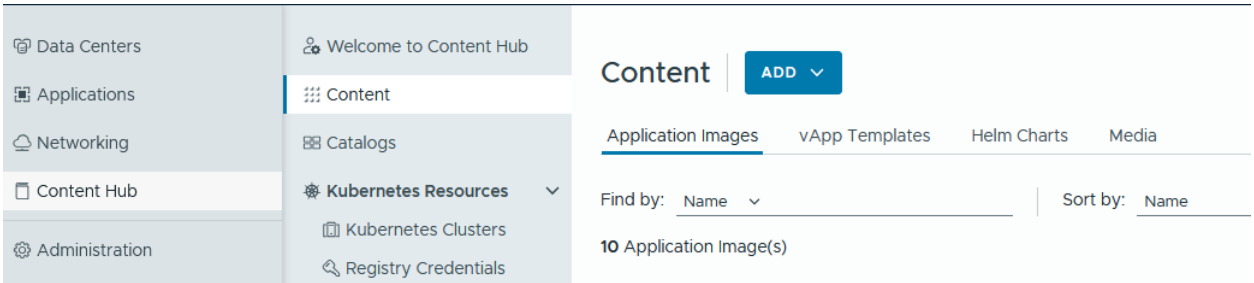
- Primary NIC – indicates the primary NIC for traffic
- Connected – indicates whether the NIC is enabled
- Network – the network connected to this NIC
- IP Mode
    - DHCP – if you have configured and are using DHCP
    - Static IP Pool – EduCloud will assign an IP from the Network selected
    - Static Manual – allows you manuall specify an IP Address
- MAC Address – assigned to the NIC. To reset, clear the field and Save

Content Hub

EduCloud has various ways of deploying pre-built operating system images. You can also create your own templates and/or upload media as necessary, depending on the roles assigned to your account.

Navigation

Content Hub -> Content



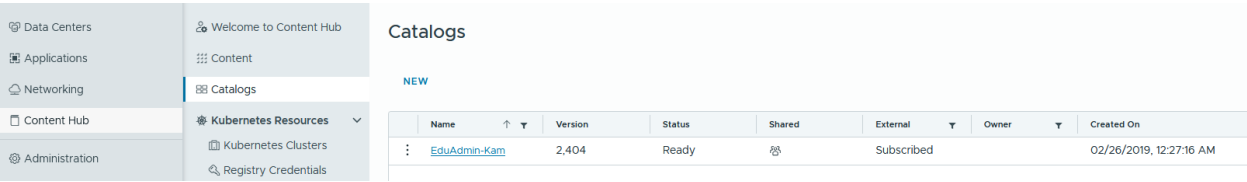
From the Content section, choose:

- **vApp Templates**
  - to view vApp Templates in Catalogs
- **Media**
  - to view/upload/delete ISOs and other media in Catalogs

Catalogs

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

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



To view catalogues and create new vApps:

- **Content Hub -> Catalogs**

To view vApp Templates directly

- **Content Hub → Content →vApp Templates**

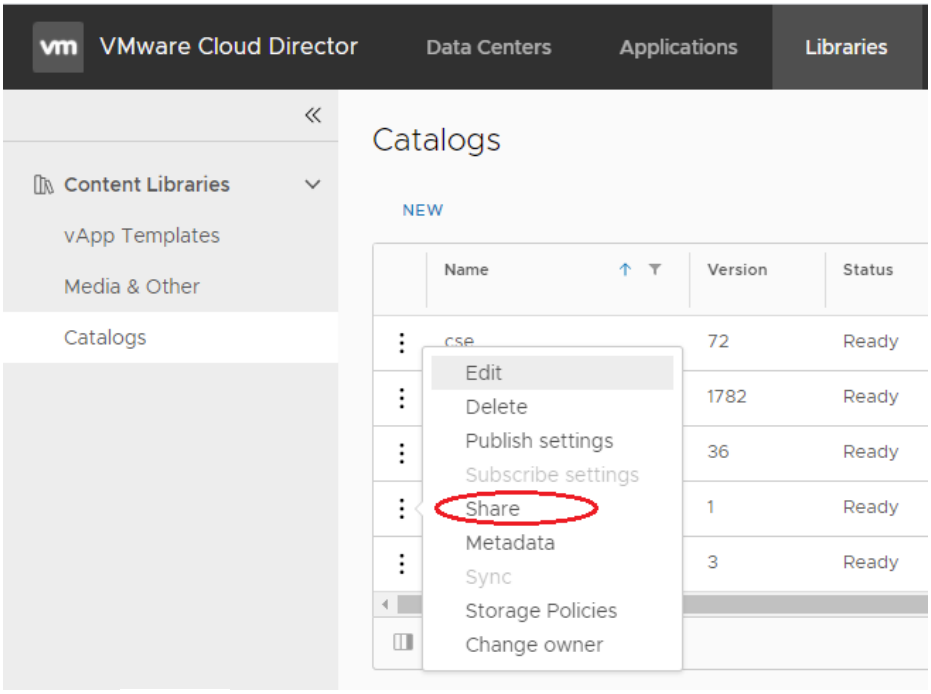
Public Catalogues will be in a catalogs named **EduAdmin-*location***
e.g.: EduAdmin-Van

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

Create a Catalog

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



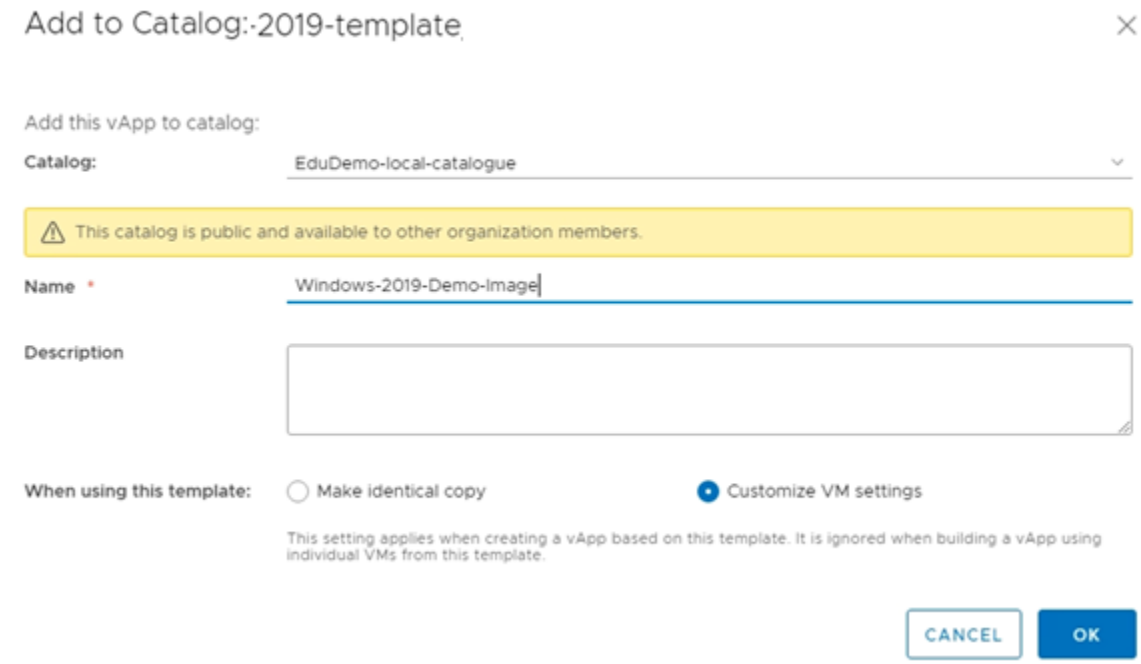
- Click the +ADD button
- Share as required

Create a vApp Template

From vApp

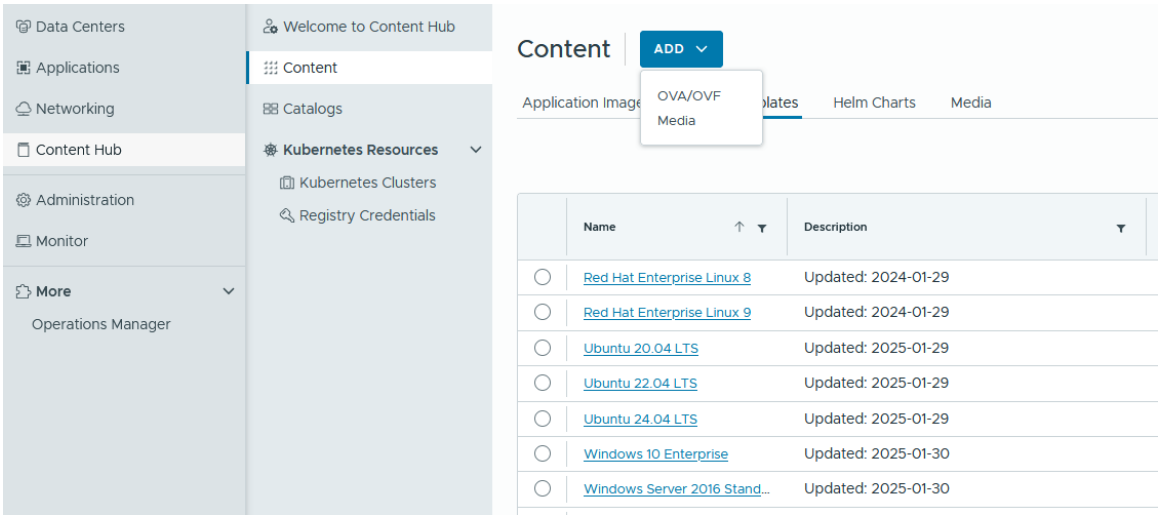
- Create a vApp configured and customized as per your requirements
- **Datacenters → vApps →**Find vApp → **ALL ACTIONS → Create Template**

- Select the Catalog and any other options and click **OK**



From OVF or ISO

- **Content Hub → Content → vApp Templates → ADD**

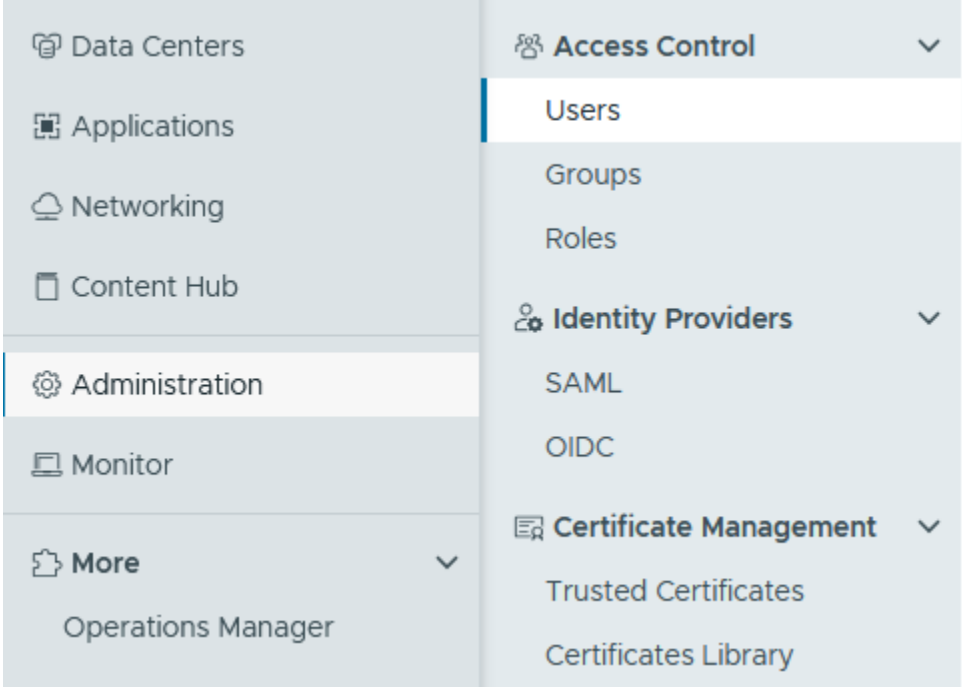


- Select OVA/OVF or Media (if uploading an .iso file)
- Select the source ISO or OVA/OVF; Review Details
- Enter a vApp Template Name and select the Catalog
- **FINISH**

User and Group Management

General

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 Organization are managed here.

Import Users and 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 from the Search text box
- Select the user(s) from the search result
- Assign the appropriate role for the user(s)
- Click **SAVE**

Add Groups

- **Administration → Access Control → Users**

- **IMPORT GROUPS**
- Search for the group from the Search text box
- Select the group(s) from the search result
- 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 **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, and password management.
  However, there is no access to manage resources.
  Primarily used for shared Organizations and/or allowing access to users for limited management of specific VMs in an Organization
- **Catalog Author**
  Rights to create and manage vApps, Vms, and Catalogues
  Limited Org management
- **Organization Administrator**
  Rights to most Organization management except inter-org and VDC Management
- **vApp User**
  Rights to use vApps created by other users.
  Fewer rights than the Administrator – Limited role

VMware Tools and open-vm-tools

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 you are running the latest version of the tools.

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 halted)

VMware Tools

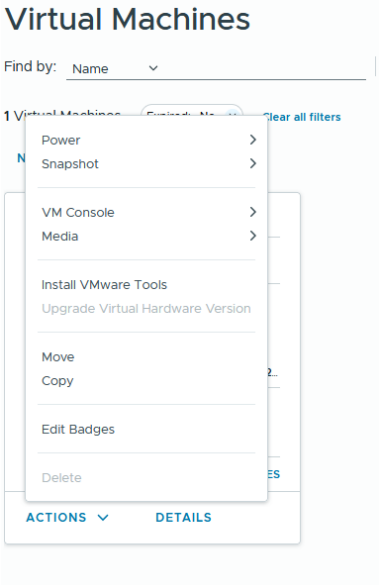
VMware Tools are the official, commercial versions of the guest system utilities from VMware and consist of a suite of virtualization utilities that improve the functionality, administration, and management of virtual machines within a VMware environment.

VMware tools enable 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.

Note: the VM must be powered on to install VMware Tools

Installation on a Windows Guest

- In the appropriate Datacenter → **Compute** → **Virtual Machines** → find the appropriate **VM -> Actions** → select **Install VMware Tools**



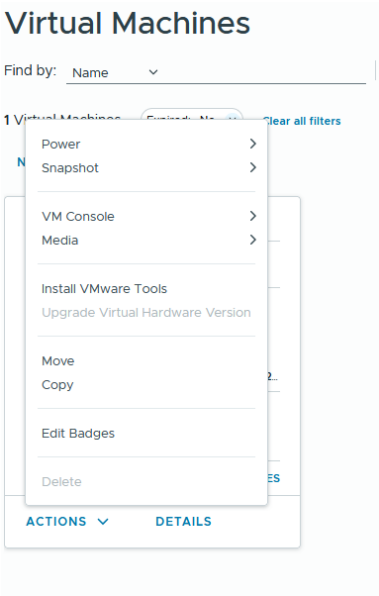
- Follow the prompts in the guest OS to complete the installation wizard

- Click **Finish**
- Restart the virtual machine

Install on a Linux Guest

Check to see whether open-vm-tools is more appropriate for the OS you are working with. If so, use the steps on the Open VM Tools section, below.

- In the appropriate Datacenter → **Compute** → **Virtual Machines** → find the appropriate **VM -> Actions** → select **Install VMware Tools**



- Login to the VM via the console or remote
- If using a GUI 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 VM 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 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).

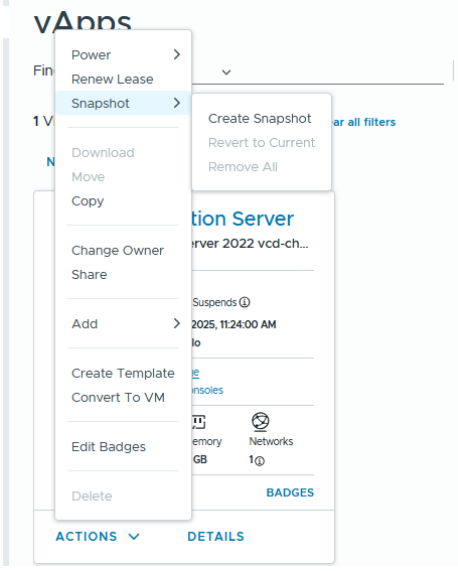
Snapshots should not be kept for longer than a week. The snapshot file will continue to grow as it ages. This may cause the snapshot storage location to run out of space, reduced system performance, and/or problems with regular backups.

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.

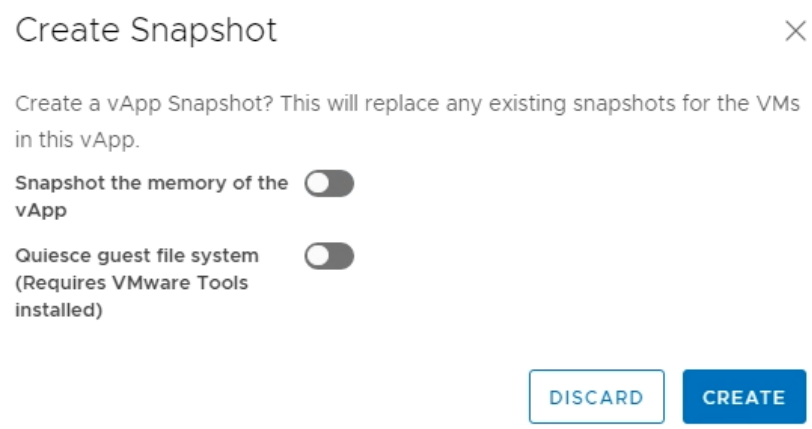
vApp snapshot

- In the appropriate Datacenter → **Compute** → **vApps** → find the appropriate **vApp**

- **ACTIONS → Snapshot →Create Snapshot**



- A window may 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. A quiesce operation ensures that a snapshot disk represents a consistent state of the guest file systems.

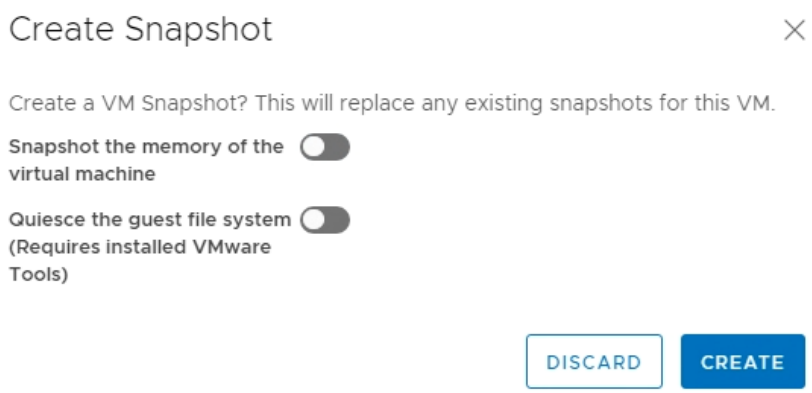


This may take some time depending on how many VMs are contained in the vApp, their size and whether they are powered on.

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** → **Snapshot** → **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. 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** → **Snapshot** → **Revert to Current**
- 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** → **Snapshot** →**Remove All**
- 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** → **Snapshot** →**Remove All**
- 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