Project Specific: Deploying a Virtual Machine (Instance) using a Template via CloudStack UI in v4.9.x
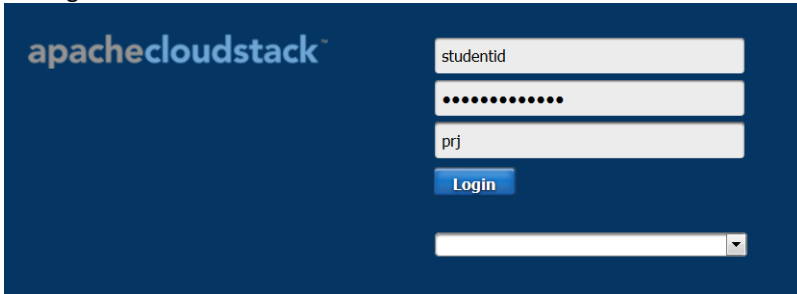
Access CloudStack web interface via:
Internal access links:
http://cloudstack.doc.ic.ac.uk   -> redirects to the below url
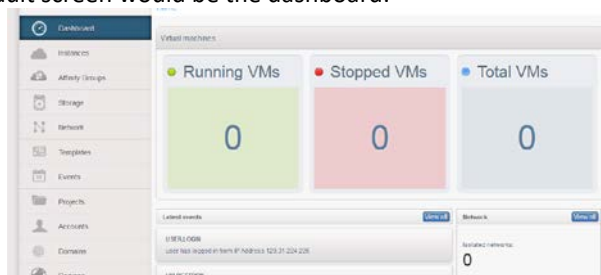https://cloudstack.doc.ic.ac.uk:8443/client

To login use your "**college authentication**" & domain as "**prj**". Everyone in DoC would have access to the Cloud Management Interface.

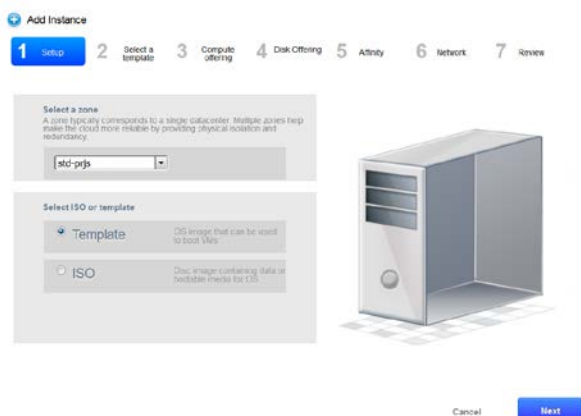
The default screen would be the dashboard:

To create an instance:
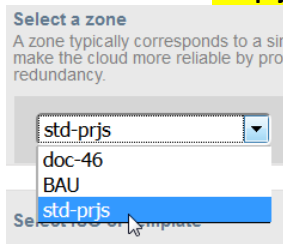Select the "Instances" tab and click "Add Instance"

Setup

You would be presented with a wizard providing you with an option to **select the zone** on which to create the Virtual Machine (VM) and the method of deployment either through a **Template** or **ISO.**

You should select "std-prjs" (via the dropdown list). *NOT* BAU/doc46

You have the option to select an ISO image or a Template.


Select a template

There are three tabs available, select a VM image either from the "**Featured**", "**Community**", "**My Templates**" tabs. The "**Featured**" tab consists of templates that have been uploaded by CSG and the **description** provides the default login details.

All the VMs created from a template available under the featured tab would reboot once after the initialization scripts are run, so please be patient. Packages and security updates are automatically initiated on these VMs and you might have to reboot your VM periodically to reflect the latest kernel image.

Note: Securing the VM is your responsibility, security tools such as fail2ban and sshguard are running on the Virtual Machine. Four incorrect attempts at login will block the IP of the machine you are trying to connect from. To request for external access to a specific port, please email us with the requirement and we will raise a call with ICT, the outcome of your request will depend on a security assessment of your current VM and expressed requirements.
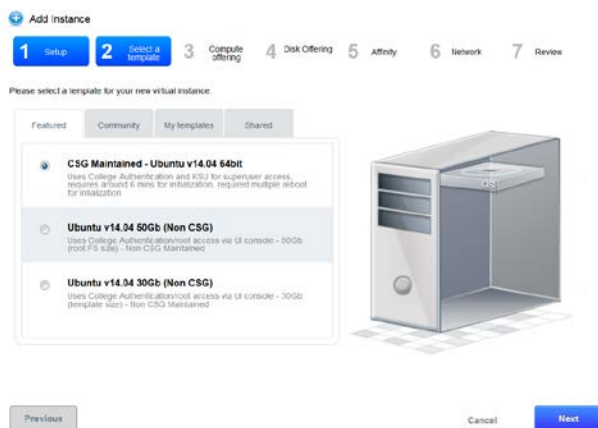
The "**CSG Maintained**" template named as "**CSG-Ubuntu v16.04(DD-Mon)**" uses college authentication and superuser/root access is obtained either via the command "**ksu**" or from the **console of the VM** (image displayed below) which provides a default root prompt. To request for "ksu" email us for which a Kerberos principal and password has to be created. This specific VM image provides access to DoC home directory via autofs. The default size of the image is 10Gb, excluding your home directory space, any additional storage device/disk offering added during deployment would be reflected as a separate filesystem mounted to /data during VM bootup. The VM after initial boot, would restart once, to initialise the DoC environment.
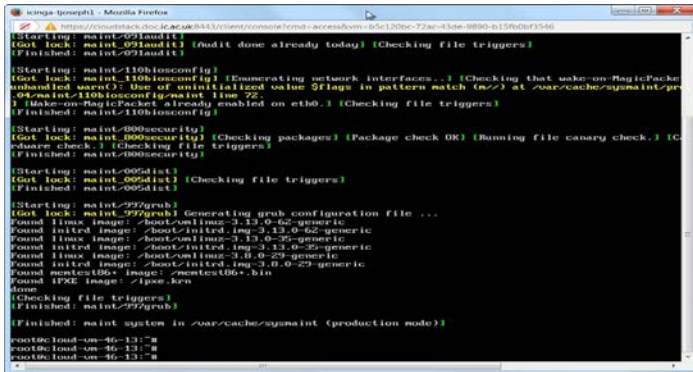
View of the console available from the CloudStack UI which provides a default root console.

Note: sudo access is not provided to switch to root and you "**will not**" be able to access your home directory which is mounted via NFS as the superuser (root). Any DoC user would be able to access/login to the VM, to lock it down update the last line of the file */etc/security/access.conf* with your username, e.g.
`-:ALL EXCEPT username (csg) :ALL`

For "**Non CSG**" VM images, use college authentication for login and initial root access is obtained via graphical VM console accessible in the CloudStack web interface wherein you are provided with a default root login prompt, a procedure similar to a CSG Maintained VM, as described above.
sudo access is obtained by running the command (also displayed via the MOTD of the VM):
`usermod  -G sudo username`
VM lock down:
`echo "pam_filter cn=username" >> /etc/ldap.conf`

Project VMs requiring multiple users, can be allowed using:
`echo "pam_filter | (cn=username) (cn=username)" >> /etc/ldap.conf`

The "Non CSG" VM image – "**Ubuntu v16.04(Non CSG – MM-Mon)**", with default template size as 8 Gb, any additional storage device/disk offering added during deployment would be reflected as a separate filesystem mounted to /data during VM bootup. Additional access to ICT home directory of 8Gb is available. Your ICT provided home directory would be initialized on your initial login with the creation of a file .pam_mount.conf.xml in your home directory, latter attempts at login would invoke this file to automount your ICT home directory (**/home/***username***/homedir**) data stored under this location would be backed up by ICT.

The "**Community**" tab lists VM images created by all users and which are available to the public. CSG does not maintain the passwords or security of these VMs, so please exercise sensible security precautions if you choose to use them.

Finally, the "**My Templates**" tab lists the VM images created by user who is currently logged (i.e. you) into the interface.

Ready to use templates for various distros are available at http://dl.openvm.eu use at your own risk.
Selecting the ISO option provides similar tabs, over here you would have to install a Virtual from scratch and the process is similar to installing a machine using a DVD.

Compute Offering

The next screen requests for a compute offering you can choose either the default offerings or create a custom offering.
Each template uploaded by CSG provides has a default size, if you require additional disk space you can add the same either at the "Disk Offering" stage or after the VM has been deployed. The current version of CloudStack, provides features such as disk resizing, you would have to stop the VM before resizing the disk. On VM bootup the disk would be automatically resized.
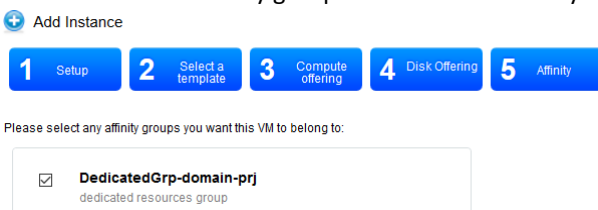
Disk offering
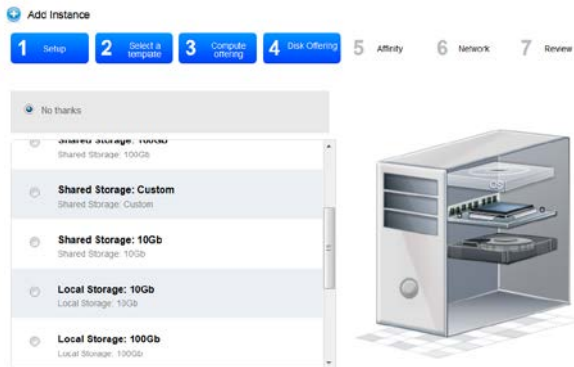
Any additional disk offerings would be presented to the Virtual Machine Operating System as a RAW device and automated shell scripts will create a separate filesystem and mount it to /data filesystem.

Affinity

Select the default affinity group else a VM restart may not work.
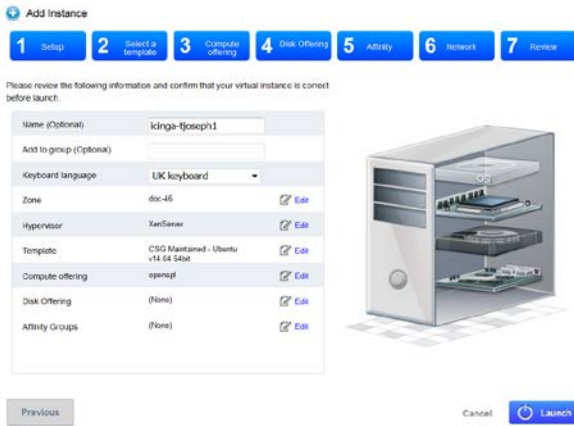

Network

Step 6 is irrelevant and can be skipped for the default setup. Assigning additional IPs is not possible in the current basic zone setup.


Review

Provide a meaningful name for the VM else CloudStack will assign a random 8-16 alphabet hostname.

Note: For templates available under the "Featured" list - The Fully Qualified Domain Name (FQDN/hostname) for the Virtual Machine is automatically assigned to "***cloud-vm-XX-YY.doc.ic.ac.uk***", where XX & YY refer to the last two octets of the IP address. Raise a request, if you want an alias to be set.

The VM status changes from "Creating" to "Running". It would take a few minutes for the image to be deployed depending on the network/disk/hypervisor IO latency at that moment in time.
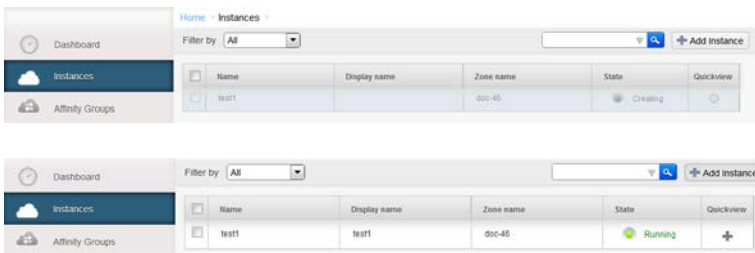
The "Details" tab provides admin access to the VM icons available for actions include (from left to right) stop, restart, VM snapshot, delete, reinstall, attach ISO, change password, change service offering, VM console.

Snapshots created from this view can be used to restore the VM in case of any issues during configuration or to revert to an earlier date/time.

**Reinstall**: Will work if the template is still available.

Attach ISO: To install new software or to rescue a broken VM.

Change Password: Doesn't work on the VM images provided by CSG as it connects to the college ldap server.

Change Service Offering: Use it to increase/decrease the system compute offerings. To decrease, the VM has to be in a stopped state. Increasing it when the VM is running requires Citrix XenServer PV drivers – "XenServer Tools" i.e. VM guest tools to be installed. The Featured templates have the VM guest tools installed.

To install VM guest tools on custom VMs:

       1 . Via CloudStack Management UI console - > VM Details

       2. Click on "Attach ISO" -> select "***xen-pv-drv-iso***" and click OK, as displayed in image below:
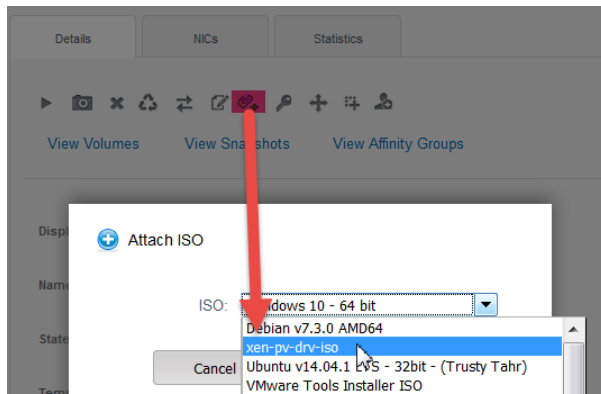
3. On the VM, as root, mount the drive
`mount /dev/sr0  /mnt ; cd /mnt/Linux`

4. Depending on the OS, manually install all the relevant *.deb/.rpm* packages, using tools such as:
dpkg/rpm/yum

5. Umount the drive, detach ISO via the cloudstack interface and reboot the VM.
`cd; umount /mnt/Linux; sync ; reboot ; exit`

The console of the VM can be accessed by clicking on the highlighted icon below:
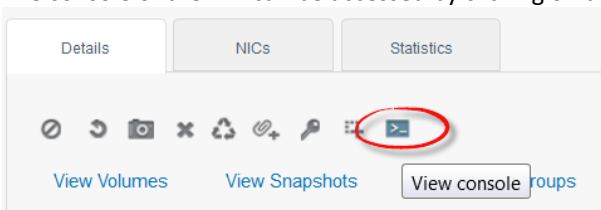
As we are currently not using an encrypted connection for accessing the VM console, the browser block has to be disabled.
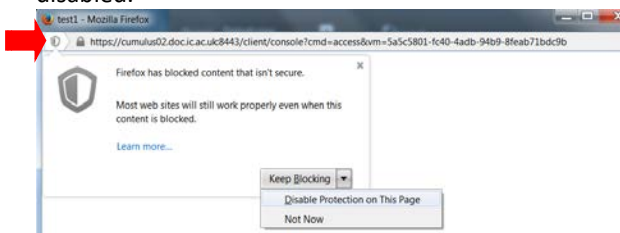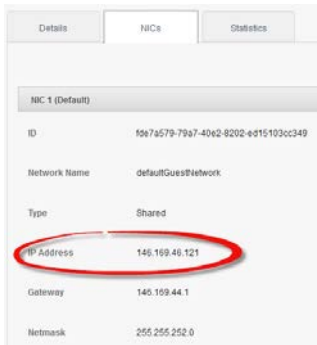

Disabling the browser protection enables a view of the console.
Note: The console view provides users with a default root login prompt and only accepts US keyboard mapping.
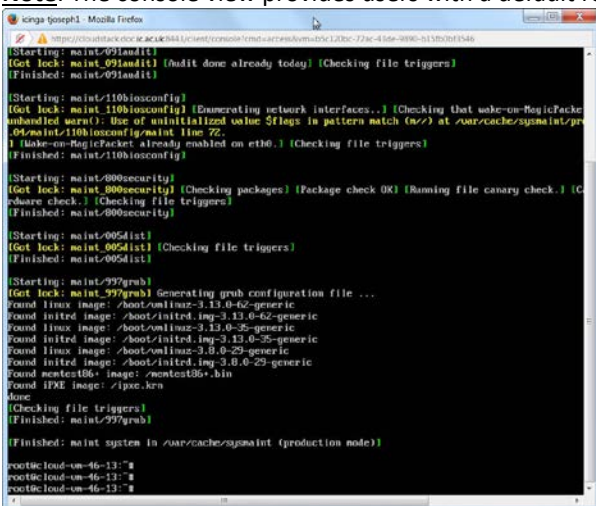
The "NICs" tab provides VM network information related to IP Address, Gateway & Netmask

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Linux command to view:

- IP address info: ***ip a s***
- Open ports/sockets: ***netstat -tlpan | grep -i LISTEN***

Accessing via ssh:

`ssh -K username@cloud-vm-XX-YY.doc.ic.ac.uk` (over the internet + college VPN)

ssh -K cloud-vm-XX-YY (via college n/w)

You can setup an alias for the same in your home directory file ~/.bashrc

echo "alias ssh='ssh -K'" >> ~/.bashrc ; source ~/.bashrc

To copy your ssh key to the VM:

1. Generate your ssh key, if you haven't already done it.
   ssh-keygen -t rsa
2. Copy the key to the VM
   ssh-copy-id cloud-vm-XX-YY

Terminal Applications available for connecting from Windows: PuTTY or Cygwin

Note: The VMs are not backed up, please use Gitlab or /vol/bitbucket to store your configs & data.

While requesting for help, please provide us with the related VM info. Graphical Interface/Login for the VMs are not available as part of the featured templates, users would have to install it independently, refer URL.

Creating Disk Templates:

To create disk snapshots/templates of the configured VM, select "**View Volumes**"
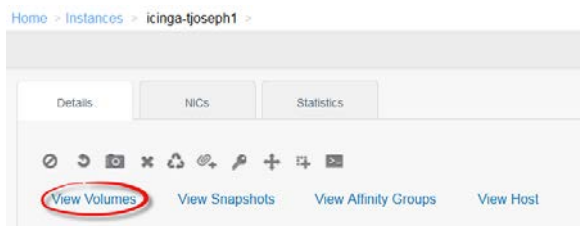

Note: Disk snapshots cannot be created if there are VM snapshots available.

Select the disk for which the template or snapshot is to be created:

If the VM is in a running state the template cannot be created directly, a snapshot needs to be created initially and then once complete, create a template from it. The snapshot status can viewed from the "View Snapshots" link.
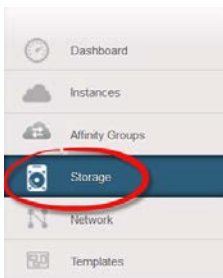
For a VM in running state:
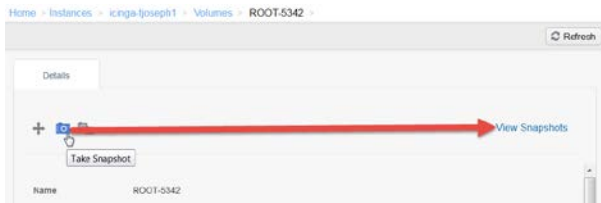
Stopped state:

Note: The "Create Template" icon is available when the VM is in a stopped state. "OS Type" option for Ubuntu v14.04 onwards should be either "Other (64-bit)", "Other Linux (64-bit)" or "Other Ubuntu (64-bit)"
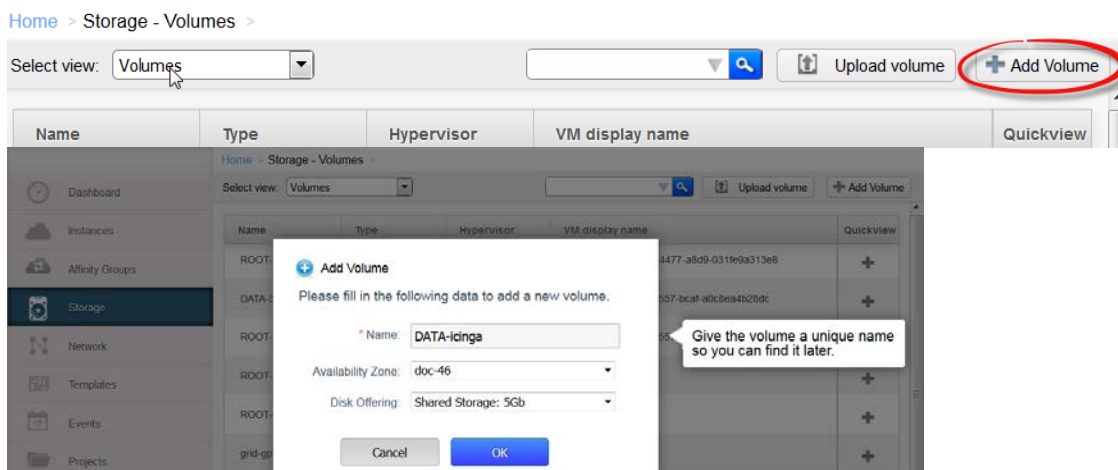

Adding Additional Storage/Volume:

Note: Additional Disks cannot be added if a VM snapshot is present.
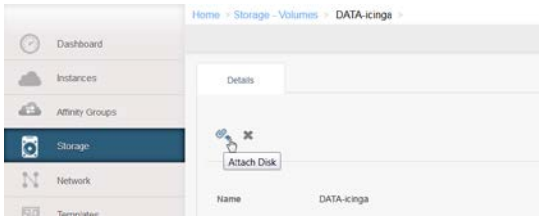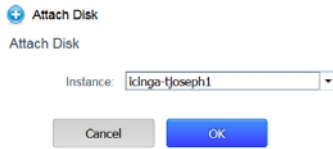Select the "Storage" tab:

Select "**Add Volume**"

Provide a unique name to the Volume, Availability Zone should reflect the zone in which the VM was created and the Disk Offering can be selected from the drop down menu.
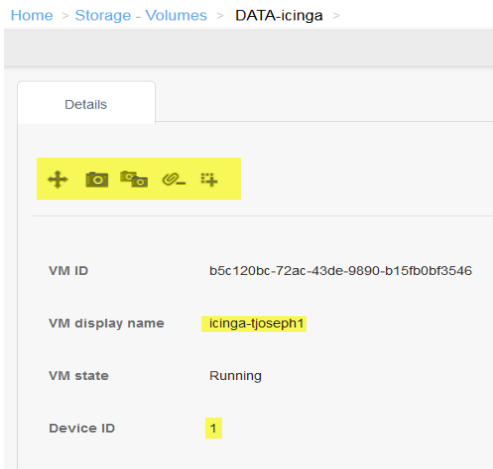
Select the Volume and click the "Attach Disk".

Attach Disk provides a drop down of all the VMs you own under the selected zone:

After the disk is attached to the VM, details tab of the disk is updated with the "VM display name" and "Device id".

As Device ID is 1, it would be likely named as xvdb.
On the VM console, user root:
display the device: `fdisk –l /dev/xvdb`
Refer to page 4 & 5 for instructions on creating/extending a Volume Group.

Resize Volume:

Before you try to resize a volume, consider the following:
- The VMs associated with the volume are stopped.
- The data disks associated with the volume are removed.
- When a volume is shrunk, the disk associated with it is simply truncated, and doing so would put its content at risk of data loss. Therefore, resize any partitions or file systems before you shrink a data disk so that all the data is moved off from that disk.

To resize a volume:
1. Log in to the CloudStack UI as a user or admin.
2. In the left navigation bar, click Storage.
3. In Select View, choose Volumes.
4. Select the volume name in the Volumes list, then click the Resize Volume button
5. In the Resize Volume pop-up, choose desired characteristics for the storage.
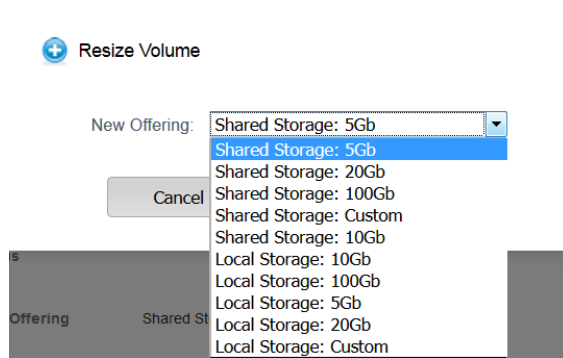
1. If you select Custom Disk, specify a custom size.
2. Click Shrink OK to confirm that you are reducing the size of a volume.
   This parameter protects against inadvertent shrinking of a disk, which might lead to the risk of data loss. You must sign off that you know what you are doing.
6. Click OK.

To resize the disk at the OS level, as root user: `pvresize /dev/xvdb`

Volume Deletion and Garbage Collection

The deletion of a volume does not delete the snapshots that have been created from the volume
When a VM is destroyed, data disk volumes that are attached to the VM are not deleted.

Creating a New Project

1. Log in to the CloudStack UI.
2. In the left navigation, click Projects.
3. In Select view, click Projects.
4. Click New Project.
5. Give the project a name and description for display to users, then click Create Project.
6. A screen appears where you can immediately add more members to the project. This is optional. Click Next when you are ready to move on.
7. Click Save.

Using the Project View

If you are a member of a project, you can use CloudStack's project view to see project members, resources consumed, and more. The project view shows only information related to one project. It is a useful way to filter out other information so you can concentrate on a project status and resources.

1. Log in to the CloudStack UI.
2. Click Project View.
3. The project dashboard appears, showing the project's VMs, volumes, users, events, network settings, and more. From the dashboard, you can:
   o Click the Accounts tab to view and manage project members. If you are the project administrator, you can add new members, remove members, or change the role of a member from user to admin. Only one member at a time can have the admin role, so if you set another user's role to admin, your role will change to regular user.

Ref:

1. [Cloudstack User API](#)
2. [CloudStack API Tool](#) - Cloudmonkey
3. [CloudStack Storage Overview](#)

4. <u>Projects Overview</u>

Note:

- Images presented in this document belong to a previous version of CloudStack.
- Please delete your VMs at the end of your project.
- Every User belonging to the same group in the project domain would be able to access each other's VM console via the CloudStack WebUI.