CloudStack 2.2.14  
Release Notes

Revised February 23, 2012 12:38 PM Pacific

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# Overview

These Release Notes provide a brief description of new features and known issues for the 2.2.14 release of CloudStack.

Please read Known Issues on page 37 before installing.

The Installation Guide provides step by step instructions for installation.

Upgrades from 2.2.0, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.2.12 and 2.2.13 to 2.2.14 are supported. See page 39.

Upgrades from 2.1.8, 2.1.9, and 2.1.10 to 2.2.4+ are now supported. Customers that are at a release prior to 2.1.8 will need to upgrade to 2.1.8 or later 2.1.x before upgrading to 2.2.4+. See page 41.

# Contacting ****Support****

**Open-source community**

A variety of channels are available for getting help with CloudStack, from forums to IRC chat and more. For details, see <http://cloudstack.org/discuss/>.

**Commercial customers**

The CloudStack support team is available to help commercial customers plan and execute their installations. To contact the support team, log in to the support portal at <https://na6.salesforce.com/sserv/login.jsp?orgId=00D80000000LWom> using the account credentials you received when you purchased your support contract.

# 2.2.14

## Issues Fixed in 2.2.14

The following table lists issues of interest that have been fixed in this version. This is not an exhaustive list of every bug fixed.

|  |  |
| --- | --- |
| 11319 | Refactored keyboard handling across guest OS, console proxy and console viewer |
| 11682 | KVM hosts now remain connected after management server restart |
| 11780 | Fixed issue with conflicting mail libraries so that emailed alerts work properly |
| 11860 | F5 network device can provide network usage data for larger total bytes sent |
| 11931 | Can create volume from snapshot of data volume with spaces in its name |
| 12001 | Resource limits can now be set to a particular number and then reset back to -1 |
| 12005 | XCP host no longer disconnects after restarting CloudStack |
| 12292 | Fresh installation and upgrades both have the correct values for netapp\_volume primary key |
| 12436 | Added new global configuration parameter external.network.stats.interval so virtual routers and external network devices (such as Juniper SRX) can have different settings for how frequently usage data is gathered |
| 12496 | Guest VMs can access the virtual router’s load balancing service |
| 12605 | KVM node in maintenance mode will no longer try to connect to the management server |
| 12606 | Can add a firewall rule whose ICMP type/ICMP code is identical with a previous rule |
| 12616 | Increased number of KVM host connection requests that the management server can handle without timing out |
| 12618 | Optimized processing of usage data requests on Juniper SRX device |
| 12649 | Show full domain path when creating accounts or domains |
| 12704 | On VMware: multiple public NICs in redundant router working |
| 12711 | On VMware, can add NFS Secondary Storage and it will not be incorrectly discovered as local storage when use.local.storage is enabled |
| 12718 | Optimization of listSecurityGroup API to handle larger numbers of security groups more efficiently |
| 12720 | Deleted snapshots are now properly removed from secondary storage |
| 12740 | Only root administrators and the system user are allowed to bypass ACL checking |
| 12790 | Ping timeout error no longer occurs when a host is automatically moved from one management server to another |
| 12850 | Accounts in child domains can create VMs in zones owned by their parent domain |
| 12854 | Improved security to defend against ARP spoofing between VMs |
| 12860 | Snapshot cleanup process for removed snapshots now works properly |
| 12897 | Improved robustness of API call updateHostPassword and restricted it to only XenServer hosts |
| 12938 | Improved security to defend against attacks originating in the VM |
| 12952 | Can view security groups tab on a running instance in Internet Explorer browser |
| 12957 | VM instances boot properly after deleting an existing data disk |
| 12973 | On Xen 5.6SP2 and 6.0 hosts, ingress/egress rules using ICMP protocol no longer cause host plugin failure |
| 12985 | Correct state of VM is now reported when Windows VM goes through sysprep upon reboot |
| 12994 | Volume creation from snapshot on VMware works |
| 13027 | Only ISOs that have successfully and completely downloaded will be available for creating new instances |
| 13082 | Socket timeout exception no longer causes delay in retry of port forwarding rule |
| 13091 | In KVM, data disks can now be included when creating VMs and will work properly |
| 13145 | Updated userdata is propagated to software router without having to reboot the router |
| 13319 | Fixed UI rendering issues that displayed incorrect data when configuring client VPN |
| 13375 | Can acquire or release additional IP addresses without erroneously changing static NAT IP of existing IP addresses |
| 13416 | Can cancel Maintenance Mode on a KVM host and the host will reconnect |
| 13418 | Resource limit on number of allowed volumes is checked during VM creation to ensure additional volumes above the limit are not created |
| 13425 | listSecurityGroups API call with pagesize returns security groups properly |

## New Features in 2.2.14

|  |  |
| --- | --- |
| 13138 | French language support in UI (Beta status) |
| 13139 | Portuguese language support in UI (Beta status) |

## API Changes in 2.2.14

|  |  |
| --- | --- |
| copyIso | New response field: details |
| copyTemplate | New response field: details |
| createDomain | New response field: path |
| createTemplate | New request parameter: details (optional) |
| listDomainChildren | New response field: path |
| listDomains | New response field: path |
| listHosts | New request parameter: details (optional) |
| listIsos | New response field: details |
| listTemplates | New response field: details |
| prepareTemplate | New response field: details |
| registerIso | New response field: details |
| registerTemplate | New request parameter: details (optional)  New response field: details |
| updateDomain | New response field: path |
| updateIso | New response field: details |
| updateTemplate | New response field: details |
| uploadCustomCertificate | New request parameters: id (optional), name (optional)  The privatekey request parameter is now optional. |

# 2.2.13

## Issues Fixed in 2.2.13

|  |  |
| --- | --- |
| 10294 | Guest OS preference for host can now be set back to “None”. |
| 11169 | Allow system VMs to be recreate-able if using local storage and the associated hypervisor node is under maintenance mode. |
| 11181 | Improved performance on the listVirtualMachine API call. |
| 11191 | Disable rp\_filter for virtual router on additional vNic(s) that are created per public VLAN. |
| 11336 | Improved performance and scalability when adding security group rules with large number of CIDRs. |
| 11428 | vSphere: Data disks can now be attached to VMs created from snapshots of root disk volumes. |
| 11476 | On management server restart, disconnected hosts will reconnect without delay. |
| 11531/11624 | vSphere: Fixed issues preventing the creation of concurrent snapshots. |
| 11545 | General HA for a VM now occurs in a timely fashion. |
| 11552 | HA now works properly on XenServer 5.6 SP2. |
| 11563 | Can download the ROOT disk volume of a VM. |
| 11583 | KVM: Virtual Router will now work with multiple public VLANs. |
| 11600 | The management server will now prevent the deletion of the disk volume while there are active snapshots being taken. |
| 11617 | VM deployment will now consider cluster aggregate capacity rather than simply first-fit host. |
| 11625 | Ipset rules are now properly cleaned up. |
| 11629 | Snapshots on secondary storage are now being properly cleaned up after it has been deleted on the management server. |
| 11664 | listVirtualMachine API will now return the name and instance name (generated by CS). |
| 11669 | KVM: Network usage is now properly returned. |
| 11709 | getVMPassword will now return the correct VM password. |
| 11770 | Events will now be properly returned even if the associated account has been removed. |
| 11774 | vSphere: Centos 5.4 64-bit OS type is now mapped correctly. |
| 11778 | Port Forwarding rules are now properly cleaned up after releasing an IP. |
| 11791 | Windows 2003 can now be properly created on Xenserver. |
| 11796 | Network Usage thread no longer exists on an XMLRpcException |
| 11835 | Firewall rules will no longer error out if they have already been physically removed on the Virtual Router but CS DB says otherwise. |
| 11860 | F5 network usage reporting has been fixed to support large network usage. |
| 11910 | Fixed issue with regards to ConcurrentOperationException when attempting to deploy a new virtual machine. |
| 11919 | Snapshots can now be taken on detached disk volumes. |
| 11924 | listIsos and listTemplates API commands will no longer return deleted ISOs or templates. |
| 11940 | vSphere: Can now deploy a new virtual machine with an attached data disk. |
| 11961 | Template usage now accounts for multiple secondary storages. |
| 11996 | Fixed a condition where the HostCapacityThread will terminate and capacities are no longer being reported. |
| 12014 | Snapshots in Error state can now be deleted via the API. |
| 12041 | vSphere: Snapshots on data disks now work properly. |

## New Features in 2.2.13

|  |  |
| --- | --- |
| 11302 | Support for XenServer SP2 + CSP (Cloud Supplemental Pack) |
| 11634 | KVM: Ability for admin to live migrate VM from one host to another is now supported. |
| <Many> | OVM: OVM 2.3 is now an officially supported hypervisor. |
| 11675 | XCP (Beta Support): XCP 1.1 is now recognized as a hypervisor. |
| 11800 | Cloudstack supports upgrading XenServer from 5.6 to FP1 or SP2. Please refer to the upgrade instructions. |
| 11808 | Non-default Virtual Guest Network can now be created via the CreateNetwork API. |

## API Changes in 2.2.13

|  |  |
| --- | --- |
| migrateSystemVm | New command. Moves a system virtual machine to a given host. Asynchronous.  Request Parameters   * hostid: destination Host ID to migrate VM to. Required. * virtualmachineid: the ID of the virtual machine. Required.   Response Parameters   * id: the ID of the system VM * hostid: the host ID for the system VM * name: the name of the system VM * role: the role of the system VM * state: the state of the system VM * systemvmtype: the system VM type |

# 2.2.12

## Issues Fixed in 2.2.12

|  |  |
| --- | --- |
| <many> | Management Server correctly ensures the deletion of resources once an account has been removed. |
| <many> | Security groups propagation has been refactored to improve both performance and scalability when processing large numbers of rules. |
| <many> | Improved KVM stability. |
| <many> | Management Server and Usage Server can now be successfully installed on Ubuntu. |
| 10528 | Templates created from a VM are deployable even if the original VM has been expunged. |
| 10974 | Searching for system VM or virtual appliances in the UI works. |
| 10986 | vSphere: Copying templates across zones works properly. |
| 11036 | Resource counting is more reliable. |
| 11134 | vSphere: Both host and storage maintenance mode properly stop the VM on vSphere when applicable. |
| 11190 | The ability to use the value -1 to indicate an "unlimited" resource limit has been restored. |
| 11225 | Resolved a bug that prevented VMs from being launched the first time. |
| 11246 | API: ID is returned by the createLoadBalancerRule command. |
| 11275 | Compute nodes can reconnect to a cluster as long as a single primary storage is active. |
| 11331 | Zone VLAN range can be extended. |
| 11372 | HAProxy can listen on multiple interfaces as configured. |
| 11404 | Management Server more gracefully handles VMs stuck in states caused by external issues (such as Management Server rebooting while VM was starting, etc.). |
| 11425 | Direct IP Addresses are no longer counted as part of the public IP address resource total. |
| 11438 | API: The “hypervisor” parameter is no longer required in the DeployVirtualMachine command. |
| 11468 | Duplicate root administrator accounts are no longer created as part of the initial installation process. Root admins can now log in successfully. |
| 11515 | vSphere: Port Forwarding and Load Balancer rules are not cleared when VPN is disabled. |
| 11518 | The password reset feature works after restarting network. |

## New Features in 2.2.12

There are no new features in 2.2.12.

## API Changes in 2.2.12

|  |  |
| --- | --- |
| listSSHKeyPair | Response tag name changed from <listkeypairresponse> to <listsshkeypairresponse> |
| createSSHKeyPair | Response tag name changed from <createkeypairresponse> to <createsshkeypairresponse> |
| deleteSSHKeyPair | Response tag name changed from <deletekeypairresponse> to <deletesshkeypairresponse> |
| registerSSHKeyPair | Response tag name changed from <registerkeypairresponse> to <registersshkeypairresponse> |
| destroyRouter | New command |
| listTemplates | New response parameter: templatetag |
| copyTemplate | New response parameter: templatetag |
| prepareTemplate | New response parameter: templatetag |
| updateTemplate | New response parameter: templatetag |
| createTemplate | New request parameter: templatetag (optional) |
| registerTemplate | New request parameter: templatetag (optional)  New response parameter: templatetag |
| addExternalLoadBalancer | New response parameter: inline |
| restartNetwork | New request parameter: cleanup (optional) |
| registerIso | New response parameter: templatetag |
| copyIso | New response parameter: templatetag |
| updateIso | New response parameter: templatetag |
| listIsos | New response parameter: templatetag |
| addHost | Removed request parameters cpunumber, cpuspeed, hostmac, and memory |

# 2.2.11

## Issues Fixed in 2.2.11

|  |  |
| --- | --- |
| 11316 | System VMs can now start properly when upgrading. |

## New Features in 2.2.11

|  |  |
| --- | --- |
| 9887 | Bare metal imaging: Image a root disk for an instance running on a bare metal host in order to create a template. |

# 2.2.10

## Issues Fixed in 2.2.10

|  |  |
| --- | --- |
| 10680 | Changing xen.guest.network.device in global configuration will now change existing hosts. |
| <many> | Template and volume download functionality is much more reliable. |
| 10750 | vSphere: a separate port group is used for the virtual router and the guests. This allows setting different bandwidth limits on the two. |
| 10763 | vSphere: the root disk size now shows correctly. |
| 10764 | vSphere: changing the service offering will keep the CPU cap in place. |
| 10766 | vSphere: a VM doing a clean shutdown will no longer be powered off. |
| 10843 | vSphere: the network statistics in the UI have been removed from the web UI. vSphere does not provide the data needed to provide this statistic. |
| 10844 | The outbound network traffic of statically NATed guests will correctly show the additional static NAT IP as the source. |
| 10922 | vSphere: attaching of additional disks is reliable. |
| 10907 | vSphere: the CloudStack uses vCenter more efficiently to avoid API timeouts. |
| 10489 | API calls to list large numbers of VMs have improved performance. |
| 11027 | Idle management servers will no longer lose a connection to MySQL. |

## New Features in 2.2.10

|  |  |
| --- | --- |
| 9953 | KVM: Beta support for RHEL 6.1 has been added. |
| 4706 | The API call to deploy a VM allows setting the guest IP address. |
| 9681 | The virtual router may be destroyed and recreated via the API using restartNetwork. |
| 10659 | In basic zones, an elastic load balancer function is available. |
| 10748 | The CloudStack's DNS service may be bypassed. With this set in global configuration the CloudStack's DHCP reply will send the guest to the external DNS server. |
| 10561 | Firewall Access Rules. Rules to selectively open firewall ports can be created separately from port forwarding rules via the API or by enabling a new UI tab. You can optionally specify one or more CIDRs to filter the source IPs. |
| 11260 | Allow different configuration of public network traffic for virtual routers via System Service Offerings |
| <many> | Improved VMware stability and performance. |

# 2.2.9

## Issues Fixed in 2.2.9

|  |  |
| --- | --- |
| 10860 | In upgrading to 2.2.8, it was possible for the premium upgrade to fail to run. This has been fixed. |
| 10714 | A limitation on the number of templates per zone (roughly 300) has been removed. |
| 10842 | vSphere: a bug that could prevent starting a VM with an attached disk has been fixed. |
| <many> | The CloudStack can manage up to 20,000 physical hosts. |
| 10681 | If a secondary storage unmount fails, the CloudStack will no longer delete secondary storage contents. |
| 10929 | Under some error circumstances, it was possible for VMs to transition to the Error state incorrectly. This could lead to the erroneous deletion of the VMs. This has been fixed. |
| 10867 | VPN support has been restored. |

## New Features in 2.2.9

There are no new features in 2.2.9.

# 2.2.8

## Issues Fixed in 2.2.8

|  |  |
| --- | --- |
| 8076 | KVM: Can process quoted strings in ifcfg-eth0 when setting up the CloudStack Agent. |
| 9866 | Copying a VHD from secondary storage now sets the size properly. |
| 9367 | listUsers will now return the API key and secret key. |
| 9371 | Multiple console proxies will not be started unnecessarily. |
| 9981 | The direct network behavior between XenServer and vSphere is now consistent. |
| 9507 | It is now possible to create a template from a snapshot of a deleted volume. |
| 9604 | Networks can now be renamed. |
| 9543 | Cloud-setup-management will no longer fail with updated sudoers file. |
| 8183 | sourceId and sourceType are set on volume creation. |
| 9445 | Host status is set to 'Storage down' when a storage failure occurs. |
| 9356 | Updating console proxy certificates works correctly. |
| 9519 | A performance problem with a large number of usage events has been fixed. |
| 9138 | Template limits now work correctly. |
| 10414 | Host status changes initiated from vCenter are tracked correctly. |
| 10513 | Disable accounts will work correctly. |
| 4387 | The agent protocol is more robust in the face of bad data. |
| 9059 | Host detail information now considers stopped VMs. |
| 9470 | Line breaks for events are now properly escaped. |
| 6442 | VMs that were transitioned during an HA event will have usage information tracked properly. |
| 9750 | listVolumes for the domain administrator will no longer return the virtual router's volume. |
| 10028 | When a host is removed the cluster capacity will be updated correctly. |
| 9959 | Special characters in passwords are handled properly in the UI. |
| 9182 | Newline characters in volume detach descriptions are handled properly. |
| 9920 | The SSVM properly handles a much larger amount of templates for a single user. |
| 9655 | The same subnet may be made available in multiple VLANs. |
| 9568 | On host restarts and in general the hosts are balanced across multiple management servers. |
| 9771 | Metadata is now available at the "standard" URL location. The previous location is still provided for backwards compatibility. |
| 9828 | Metadata is recreated when the virtual router is recreated. |

## New Features in 2.2.8

|  |  |
| --- | --- |
| 3224 | Multiple NFS servers may be used to provide secondary storage for a zone. |
| 4942 | Networking metering may be performed on direct networks. This is in conjunction with InMon Traffic Sentinel and sFlow/NetFlow enabled switches. |
| 6451 | XenServer host passwords may be changed using the CloudStack API. |
| 6873 | Clusters, Pods and Zones may be put into a maintenance mode. In this mode no new VM allocations will be made to them. Administrators can still create VMs on this hardware. |
| 7507 | KVM now supports local disk for primary storage. |
| 7553 | The virtual router is now sized according to a system VM service offering. This allows for increasing virtual hardware available to some users' routers. |
| 8115 | Source IP filtering is now available in the virtual router. |
| 8146 | SRX devices can be used in basic networking zones. |
| 8208 | The CloudStack supports bare metal provisioning. Images are placed on host disks without a hypervisor. |
| 8280 | SRX devices in advanced zones can use interface NAT. |
| 8350 | The software load balancer in the virtual router has been tuned for performance. |
| 8830 | The parent template ID is provided for templates created from snapshot. This allows for template usage tracking. |
| 8901 | The CloudStack UI will give indication that a snapshot is in progress. |
| 9109 | Japanese keymapping is supported for the console viewer. |
| 9158 | It is now possible to list instances that are associated with a particular primary storage. |
| 9250 | A new guest OS type "Other PV" is available for XenServer. These are other types of templates that are paravirtualized. |
| 9534 | In service offerings it is now possible to enforce a hard cap in CPU consumption. |
| 9579 | It is now possible to add a custom DNS suffix per direct network. |
| 9651 | Multiple cloud guest networks may be added. Then direct networks may be associated with the administrator's choice of guest network. |
| 9724 | The listEvents API has been extended to allow specifying hours and minutes on queries. |
| 10152 | XenServer 5.6 SP2 is supported, except when used with security groups. |

# 2.2.7

## Issues Fixed in 2.2.7

|  |  |
| --- | --- |
| 10456 | Create template from volume will work correctly. |
| 10334 | The default security group is assigned to VMs correctly. |

## New Features in 2.2.7

|  |  |
| --- | --- |
| 10435 | The VPN feature has been removed from the CloudStack. We expect to make the VPN feature available again in approximately one month. |

# 2.2.6

## Issues Fixed in 2.2.6

|  |  |
| --- | --- |
| <many> | Several upgrade bugs from 2.1.x were fixed. |
| 10093 | vSphere: Metadata now works correctly on guest VMs. |
| 10068 | vSphere: taking a snapshot will no longer break volume tracking. |
| 10091 | Volume deletion will correctly delete associated snapshots from primary storage. |
| 10094 | XenServer: HA may fail to restart some VMs when multiple hosts fail simultaneously or primary storage fails (causing multiple hosts to reboot simultaneously). |
| 10118 | vSphere: a guest shutdown request will be a clean shutdown if VMware tools are installed in the guest. |
| 10200 | vSphere: an attached data disk will be detached before VM destroy is processed. |
| 9896 | KVM: Windows 2008 R2 can now attach data disks. |

## New Features in 2.2.6

There are no new features in 2.2.6.

# 2.2.5

## Issues Fixed in 2.2.5

|  |  |
| --- | --- |
| 9873 | VMs are now assigned to the default security group. |
| 9891 | Upgrade from 2.2.3 to 2.2.4 no longer fails on usage\_stats. |
| Many | The upgrade from 2.2.1 to 2.2.2 then to 2.2.4 now works properly. |
| 9941 | After upgrade to 2.2.5, the UI will now show all available volumes. |
| Many | The detection and use of the cloud.version table now works correctly. This fixes many upgrade bugs. |
| 8990 | Upgrade when augeas 0.8 is installed now works. |

## New Features in 2.2.5

There are no new features in 2.2.5.

# 2.2.4

Important: the behavior of storage allocation is more conservative in 2.2.4 than in 2.1.7 and prior releases or 2.2.0-2.2.3. The CloudStack will no longer create volumes on primary storage resources that have a storage percentage used higher than that defined by "storage.capacity.threshold" in global configuration. Previously the CloudStack would allocate a primary storage resource up to 100% full. This space reservation is required as a fix to cases where snapshots of VMs could not be taken when the storage had been allocated to 100% full. The use of a threshold setting allows the administrator to reserve space for snapshots in progress for existing volumes. **Deployments with primary storage that is close to full should examine the value of this parameter before upgrading.** If all primary storage resources are more full than storage.capacity.threshold no new volumes can be created after upgrade.

## Issues Fixed in 2.2.4

|  |  |
| --- | --- |
| 9702 | KVM: VM live migration will work reliably. |
| 9152 | Space is reserved on each primary storage volume for snapshots. |
| 8103 | Attempts to remove a host with running VMs will correctly fail. |
| 8816 | Listing system VM IP addresses will distinguish link local from private IP addresses. |
| 8898 | The service offering upgrade option is now always shown to users. Attempts to upgrade the service offering for a running VM will fail with a clear error message. |
| 9079 | Login problems with Safari have been fixed. |
| 9087 | Attach/detach of a data disk in a multi-cluster deployment will work correctly. Previously the data disk could be deleted. |
| 9140 | ISOs that are not bootable may now be uploaded. |
| 8955 | KVM: Userdata and instance metadata now work correctly. |
| 8666 | The guest network CIDR must be a RFC1918 address. |
| 8959 | Port forwarding with the virtual router will now work with IP addresses from multiple VLANs. |
| 9106 | The VM's metered running time is now correct. |
| 9369 | IP address releases will not intermittently fail. |
| 9370 | XenServer: the network throttling values are now correctly applied. |
| 9460 | vSphere: a reboot of a guest VM will first attempt a soft shutdown. If that fails a hard shutdown (power off) will be performed. |
| 8802 | Windows password management scripts work correctly in the presence of external network elements. |
| 8911 | A security vulnerability that allowed download of some files from the console proxy VM has been fixed. |
| 8954 | End users are no longer allowed access to the console of their virtual router. |
| 9130 | Security groups are no longer present in the UI in Advanced Networking zones. |
| 9192 | Performance of the listVirtualMachines API call in the presence of many VMs has been improved significantly. |
| 9247 | vSphere: Attaching an ISO works correctly. |
| 9663 | A security issue that could allow end users to snapshot another user's volume has been fixed. |
| 9243 | XenServer: a stop VM request will forcefully stop the VM even if qemu has crashed on the XenServer host. |
| 7723 | Host tagging now works correctly. |
| 7935 | Usage clients have a path to determining the OS type of a guest booted from a blank VM. |
| 8532 | KVM: HA failover works correctly with OCFS2. |
| 8714 | Users may again create four parallel snapshot schedules. |
| 8967 | vSphere: network bandwidth limiting works correctly. |
| 8994 | vSphere: user data and instance metadata now work correctly. |
| 9180 | XenServer: local storage now works correctly. |
| 9539 | CPU over-provisioning now works correctly. |
| 8897 | Zone delete now works correctly. |
| 8902 | Cluster delete now works correctly. |
| Many | Several bugs around resource limit tracking have been fixed. |
| 9093 | Firefox 4 and IE 9 are supported browsers. |

## New Features in 2.2.4

|  |  |
| --- | --- |
| 7424 | Network throttling may be disabled altogether. |
| 8932 | The listTemplates API call will return an MD5 sum of the template. |
| 3316 | Virtual machines may be manually live-migrated by the administrator. The administrator may pick a VM and the host that the VM should be placed on. |
| 8831 | A network may be dedicated to a domain. Only users in that domain and its children will have access to the network. |
| 8945 | The global configuration parameter default.page.limit has been added. This sets the maximum number of results that will be returned by list\* API calls. Default is 500. |
| 9098 | The UI has been changed to provide clearer monitoring of snapshot progress. |
| 9635 | The Java process's heap size has been increased from 128 MB to 1024 MB. |
| 9653 | Tagged private network is now supported in VMware. The CloudStack private network will share the vCenter management network and inherit its configuration. If the vCenter management network is tagged through a VLAN, the CloudStack private network will be tagged as well. |

# 2.2.3

## Issues Fixed in 2.2.3

|  |  |
| --- | --- |
| 8951 | vSphere host capacity numbers now match the physical capacity of the host. |
| 8977 | The default route for the secondary storage VM will correctly use the public network gateway. |

## New Features in 2.2.3

There are no new features in 2.2.3.

# 2.2.2

## Issues Fixed in 2.2.2

|  |  |
| --- | --- |
| 8614 | The storage allocator now functions correctly. |
| 8731 | Console view of guests on vSphere hosts now works correctly. |
| 8865 | It is now possible to start VMs whose networks were shutdown when using 2.2.0. |
| 8635 | Direct network VM creation will work correctly in the CloudStack UI wizard. |
| 8514 | The OS type dropdown is correctly populated when creating a template from a volume. |
| 8892 | The DNS server for guests in direct tagged networks is now set properly. |
| 8912 | Password management scripts now work correctly with multiple NIC guests in all cases as well as external firewall configurations. |
| 8604 | Adding a second management server will work reliably. |
| 7935 | There is a mechanism to bill differently for guests of different hypervisor type when the guests are started from ISO images. |
| 8530 | Adding vSphere hosts to an existing cluster will work reliably. |
| 7762 | The snapshot and volume copy logic for vSphere hosts has been moved into the Secondary Storage VM. |
| 8806 | The set of hypervisors present in the cloud is now represented correctly by the API and UI. |
| Many | Several bugs in HA functionality across hypervisors and storage types have been fixed. |
| Many | Several bugs in internationalization and localization have been fixed. |
| 8632 | The dashboard view or domain administrators is now correct. |
| 8104 | If the secondary storage VM is down, booting a guest off ISO will work. |
| Many | Several logging improvements have been made. Logging is less verbose in some cases and more descriptive in others. |

## New Features in 2.2.2

|  |  |
| --- | --- |
| 8349 | Routers may be listed by network ID. |
| 8250 | KVM: Security groups will work with direct tagged networks. |
| 8664 | A maximum page size is enforced. This limits server memory impact from large queries. |
| 8263 | A domain specific zone may have its scope adjusted to be public. |

# 2.2.1

## Issues Fixed in 2.2.1

|  |  |
| --- | --- |
| 8574 | Account deletion could fail leaving resources orphaned. |
| 8631 | The DHCP server would not start in the case of external firewall integration. |

## New Features in 2.2.1

There are no new features in 2.2.1.

# New Features in 2.2

|  |  |
| --- | --- |
| **Issue Number** | **Issue Description** |
| 591 | Virtual Machines may have multiple NICs. |
| 6802 | Service offerings and disk offerings may be made private to a domain. |
| 1974 | The Virtual Router memory may be changed. |
| 2461 | A user may VPN into their virtual network using IPSec/L2TP. |
| 3120 | 1:1 NAT of public IPs is possible. |
| 3346 | There is a command line interface (CLI) tool for the CloudStack. It is called cloudadm. This tool is in a beta state and its syntax may change substantially in future releases. |
| 3386 | Zones may be dedicated to domains. This allows for hardware dedication and a higher level of isolation. |
| 3676 | Multiple hypervisor types may exist in the same CloudStack cloud. An individual cluster consists of nodes of the same hypervisor type. |
| 4286 | Templates may be extracted via HTTP download or HTTP POST. |
| 4774 | ISOs may be public. |
| 4836 | Limits may be set on a domain basis. This allows an administrator to prescribe aggregate limits that apply to a set of accounts. |
| 5060 | Disk offerings can have arbitrary sizes. |
| 5147 | Primary storage devices may be placed into a maintenance mode. Then they may be taken offline and later returned to service. |
| 5190,5191 | The URL used by the Console Proxy code and its associated SSL certificate may be configured and changed. |
| 5507 | VMware vSphere ESX/ESXi are supported as hypervisor types. The CloudStack can manage vCenter clusters or standalone nodes. |
| 5559 | Snapshots are supported for local disk storage. |
| 5592 | The DNS domain for guests may be configured. |
| 5688 | KVM CloudStack nodes now support VLANs for isolation. |
| 5784 | KVM CloudStack now supports snapshots. |
| 5800 | KVM CloudStack supports cluster functionality, analogous to vSphere and XenServer. |
| 6103 | The "look back period" for which the system considers a stopped VM to still be consuming resources is configurable. |
| 6994 | XenServer: administrators may add pre-existing SRs as primary storage to CloudStack. This enables support for FiberChannel storage. |
| 7871 | KVM: Shared mountpoint storage is available. This enables the use of clustered filesystems like OCFS2 as primary storage. |
| 8495 | Support Juniper SRX as a managed router for guest virtual networks. |
| 8496 | Support F5 load balancer as a managed device for load balancing in virtual networks. |
| <many> | There have been many API enhancements, including the ability to show the lineage of a volume, show a volume's attachment time, determine a cloud's capabilities, find the OS type of a virtual machine, search for deleted templates, and more. |

# API Changes from 2.1 to 2.2

The API had several enhancements for CloudStack 2.2. There are a large number of small changes to the API. The API was significantly improved and made more consistent. As a result, most applications developed using the 2.1 API will need to be adapted to be compatible with 2.2.

API documentation for version 2.2.14 will be published at the links below. Until it is available, you can substitute 2.2.13 for 2.2.14 in the URLs and refer to the differences described in API Changes in 2.2.14 on page 9.

Global Admin: http://download.cloud.com/releases/2.2.0/api\_2.2.14/TOC\_Root\_Admin.html

Domain Admin: http://download.cloud.com/releases/2.2.0/api\_2.2.14/TOC\_Domain\_Admin.html

User: http://download.cloud.com/releases/2.2.0/api\_2.2.14/TOC\_User.html

# Known Issues

|  |  |
| --- | --- |
| **Issue Number** | **Issue Description** |
| <Many> | When using the OVM hypervisor, the following functionality is not supported:   * Snapshots * System VMs must run on XenServer/KVM/VMware, not OVM * Security Groups on Basic Networking * Network throttling * FibreChannel on primary storage |
| 8105 | KVM: NFS v4 for primary storage may not work. Use v3. |
| 11397 | Creating template from volume isn't using the latest state of the volume |
| 11477 | Cloudstack does not properly clean up VDI when VMs failed to be deployed properly. |
| 11955 | Ubuntu 10.04 PV and HVM do not work properly after SP2 upgrade. |
| 11955 | CentOS 5.5 HVM with either “Other Linux 64-bit” or “Centos 5.5 64-bit” as the guest OS support does not work properly after SP2 upgrade. |
| 12061 | Snapshot stuck in backingUp state on MS restart, not allowing further snapshots. |
| 12382 | Secondary storage removed and re-added but snapshots table not updated |
| 12961 | Instance deployment and Template 'creation from volume' fails if a host in an VMware cluster has an expired license |
| 13025 | Recurring snapshot of Root Disk and Data Disk of the same VM at the same Time fail for one volume (Vmware) |
| 13122 | Management Server does not compute CPU Cap properly for XenServer |
| 13324 | XenServer Tools are not installed on System VM's as advertised by CloudStack Documentation |
| 13404 | Password reset does not work if vm has more than one nic |
| 13406 | Dashboard does not report storage usage correctly |
| 13457 | Account manager is not cleaning up resources deleted before restart of management server |
| 13535 | Deletion of Host does not result in the Local Storage being deleted. Manual deletion of local storage also fails. |

# Upgrade

**WARNING: The CloudStack upgrade does not preserve UI customizations. Customers with customizations should save altered files before applying the upgrade. Then create a script that will re-apply the changes after the upgrade. Any customizations should be tested on a staging environment prior to upgrade to a new version.**

## Upgrade from 2.2.x to 2.2.14

Perform the following to upgrade from 2.2.0, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.2.12, or 2.2.13 to 2.2.14.

1. Stop all Usage Servers if running. Run this on all Usage Server hosts.

# service cloud-usage stop

1. Stop the Management Servers. Run this on all Management Server hosts.

# service cloud-management stop

1. On the MySQL master take a backup of the MySQL databases. We recommend performing this step even in test upgrades. If there is an issue this will assist with debugging.

# mysqldump cloud > cloud-backup.dmp

# mysqldump cloud\_usage > cloud-usage-backup.dmp

1. The resource count table may have duplicate entries which will cause the upgrade to fail. You need to drop those duplicate entries for the same resource type before starting the upgrade. Enter mysql, then run the following command:

mysql>delete from cloud.resource\_count;

Exit mysql. You will generate a new resource count table later, in step 9.

1. Untar the tgz download and cd into the resulting directory.
2. Run the installation script to update the software on each Management Server.

# ./install.sh

Choose "U" to update the packages.

1. If you have made changes to your existing copy of the file components.xml in your previous-version CloudStack installation, the changes will be preserved in the upgrade. However, you need to do the following steps to further customize the file to be compatible with 2.2.14:
   1. Edit components.xml:

# vi /etc/cloud/management/components.xml

* 1. Remove the following entry:

<adapter name="GarbageCollecting"

class="com.cloud.storage.allocator.GarbageCollectingStoragePoolAllocator"/>

1. Start one Management Server. Do not start the other Management Servers.

# service cloud-management start

1. When the UI becomes accessible (at http://<your.management.server.ip>:8080/client), log in to the UI with the user ID “admin” and password “password.” Click Domains, then click the ROOT domain. In Actions, click Update Resource Count. This will generate the table deleted in step 4.
2. If upgrading from 2.2.8 or earlier and using vSphere, perform the following. Otherwise, skip to step 12.

The CloudStack 2.2.9 release added flexibility in naming the vCenter management network. This flexibility introduces two new global configuration parameters that must be configured to match the values in vCenter. In deployments with multiple vCenters, each vCenter must be configured with the same management network label. CloudStack defaults these configuration variables to match the defaults provided by vCenter. If you have changed the vCenter defaults, you will need to configure CloudStack with the correct values. CloudStack will assume a management network label of “Management Network” for all ESXi hosts and “Service Console” for all ESX hosts.  If you have configured a different name, change the global configuration parameters “vmware.management.portgroup” for ESXi hosts and “vmware.service.console” for ESX hosts to match your deployment's specific name.

1. If you modified configuration parameters in step 10, restart the Management Server.

# service cloud-management restart

1. Start the other Management Servers. Perform this on each Management Server host.

# service cloud-management start

Note: the CloudStack Management Server logs may contain warnings like the following. These will stop when the upgrade is completed.

java.io.IOException: SSL: Fail to init SSL! java.io.IOException: Connection closed with -1 on reading size

1. Start all Usage Servers (if they were running on your previous CloudStack version). Perform this on each Usage Server host.

# service cloud-usage start

1. (KVM only) Additional steps are required for each KVM host. These steps will not affect running guests in the cloud. These steps are required only for clouds using KVM as hosts and only on the KVM hosts.

On each KVM host:

* 1. Copy the 2.2.14 tgz download to the host, untar it, and cd into the resulting directory.
  2. Stop the running agent.

# service cloud-agent stop

* 1. Update the agent software.

# ./install.sh

Choose "U" to update the packages.

* 1. Start the agent.

# service cloud-agent start

* 1. Insert a valid username and password into the host\_details table on each KVM node.

1. In the CloudStack Administrator UI, check the status of the hosts. All hosts should come to Up state (except for those that you know to be offline). You may need to wait 20 or 30 minutes depending on the number of hosts you have. Do not proceed to the next step until the hosts show in Up state. If the hosts do not come to the Up state, contact support.
2. (VMware only) If you are upgrading from version 2.2.7 or earlier, and using VMware ESX hosts, you need to extend the range of firewall ports that the console proxy works with on those hosts. This is to enable the console proxy to work with VMware-based VMs. The default additional port range is 59000-60000. To extend the port range:
   1. In the CloudStack UI, choose Configuration – Global Settings, and set the following parameters:

* vmware.additional.vnc.portrange.size = 1000
* vmware.additional.vnc.portrange.start = 59000
  1. On each ESX host, log in to the VMware ESX service console and run the following commands:

esxcfg-firewall -o 59000-60000,tcp,in,vncextras

esxcfg-firewall -o 59000-60000,tcp,out,vncextras

1. Stop, then start, all Secondary Storage VMs, Console Proxy VMs, and virtual routers. A script is provided to implement this. Run the script once on one management server. The script requires the IP address of the MySQL instance, the MySQL user to connect as, and the password to use for that user. In addition to those parameters, provide the "-a" argument.

For example:

# nohup cloud-sysvmadm -d 192.168.1.5 -u cloud -p password -a > sysvm.log 2>&1 &

# tail -f sysvm.log

This might take up to an hour to run, depending on the number of accounts in the system.

## Upgrade from 2.1.8, 2.1.9, or 2.1.10 to 2.2.14

Important: **Upgrades from versions 2.1.0-2.1.7 directly to 2.2.14 will fail.** The CloudStack must first be upgraded to 2.1.8 or later. Please see the 2.1.8+ Release Notes for information about this procedure.

The database transformation between 2.1.x releases to 2.2.x releases is complex. In order to ensure your successful production upgrade, Cloud.com is offering all customers free professional services to assist with the upgrade. Cloud.com will, at no expense to the customer, assist with running the upgrade on the customer's production system. Assistance will be remote, provided from Cloud.com's offices. Please contact support@cloud.com if you would like to take advantage of this offer. You will be asked to make a production database dump (as in step 9 below) available to the support team. Cloud.com will run the database segment of the upgrade and report back to you. Any errors will be fixed and a patch will be implemented and provided to you to insure a successful production upgrade.

The steps to upgrade a 2.1.8, 2.1.9 or 2.1.10 system to 2.2.14 are as follows:

1. Schedule a time with Cloud.com support so that we are on alert when you attempt the production upgrade.
2. While running the 2.1.x system, make sure you will not encounter the effects of a bug from 2.1.x. After entering mysql, run this query:

mysql> select \* from ip\_forwarding where forwarding=1 and (private\_port!=concat('',

0+private\_port) or public\_port!=concat('', 0+public\_port));

This will return 0 or more rows. If there are 0 rows returned then you may proceed to the next step. If rows are returned, note the id of each returned row. Then, for each such id, delete it with this command:

mysql> DELETE from ip\_forwarding where id=<id>;

1. If you are using advanced networking zones, check the value of the global configuration parameter direct.attach.untagged.vlan.enabled. This value must be set to false for deployments with advanced zones. If this value is true and you have advanced zones, set it to false.
2. While running the 2.1.x system, add a new System VM template through the admin UI. Fields MUST be the following (do not change these):

Name: systemvm-xenserver-2.2.4

Display Text: systemvm-xenserver-2.2.4

URL: <http://download.cloud.com/releases/2.2.0/systemvm.vhd.bz2>

Zone: All Zones

OS Type: CentOS 5.4(64-bit)

Format: VHD

Password Enabled:no

Public: no

Featured: no

1. Watch the screen to be sure that the template downloads successfully. Do not proceed until this is successful.
2. Edit /etc/sudoers. Make sure that "default requiretty" is commented out. Do this by placing a "#" character at the beginning of the line with "default requiretty".
3. Enter mysql. Run the following SQL command.

mysql> select count(\*) from cloud.vm\_template where name='systemvm-xenserver-2.2.4' AND removed is null;

That command should return 1 as its result. If some other value is returned, cancel the upgrade and contact technical support. The upgrade will not succeed. Do not proceed until this command returns 1.

Exit mysql.

1. Stop all Usage Servers if running. Run this on all Usage Server hosts.

# service cloud-usage stop

1. Stop the Management Servers. Run this on all Management Server hosts.

# service cloud-management stop

1. On the MySQL master, take a backup of the mysql databases. We recommend performing this step even in test upgrades. If there is an issue, this will assist with debugging.

# mysqldump cloud > cloud-backup.dmp

# mysqldump cloud\_usage > cloud-usage-backup.dmp

1. The resource count table may have duplicate entries which will cause the upgrade to fail. You need to delete this table before starting the upgrade. Enter mysql, then run the following command:

mysql>truncate cloud.resource\_count;

Exit mysql. You will generate a new resource count table later, in step 16.

1. Untar the tgz download and cd into the resulting directory. Then update the software on each Management Server.

# ./install.sh

Choose "U" to update the packages.

1. If you have made changes to your existing copy of the file components.xml in your previous-version CloudStack installation, the changes will be preserved in the upgrade. However, you need to do the following steps to further customize the file to be compatible with 2.2.14:
   1. Edit components.xml:

# vi /etc/cloud/management/components.xml

* 1. Remove the following entry:

<adapter name="GarbageCollecting"

class="com.cloud.storage.allocator.GarbageCollectingStoragePoolAllocator"/>

1. Start one management server. Do not start other management servers. The database upgrade will run.

# service cloud-management start

This will take approximately 1 minute per 4000 rows in the vm\_instance table to run.

1. You will not be able to access the UI until the database upgrade finishes. Wait for the database upgrade to finish. Tail the management server log (/var/log/cloud/management/management-server.log) and look for errors. If the database upgrade fails, the server will exit.

**Important: if the database upgrade fails, contact support and provide the entire management server log. Do not proceed with the upgrade.**

1. Log in to the UI with the user ID “admin” and password “password.” Click Domains, then click the ROOT domain. In Actions, click Update Resource Count. This will generate the table deleted in step 11.
2. If you modified configuration parameters in step 3, restart the Management Server.

# service cloud-management restart

1. When you can access the UI, start the remaining management servers. These should start quickly.

# service cloud-management start

1. Start the usage servers.

# service cloud-usage start

1. (KVM only) Additional steps are required for each KVM host. These steps will not affect running guests in the cloud. These steps are required only for clouds using KVM as hosts and only on the KVM hosts.

On each KVM host:

* 1. Copy the 2.2.14 tgz download to the host, untar it, and cd into the resulting directory.
  2. Stop the running agent.

# service cloud-agent stop

* 1. Update the agent software.

# ./install.sh

Choose "U" to update the packages.

* 1. Start the agent.

# service cloud-agent start

* 1. Insert a valid username and password into the host\_details table on each KVM node.

1. In the CloudStack Administrator UI, check the status of the hosts. All hosts should come to Up state (except for those that you know to be offline). You may need to wait 20 or 30 minutes, depending on the number of hosts you have. Do not proceed to the next step until the hosts show in Up state. If the hosts do not come to the Up state, contact support.
2. Stop, then start, all Secondary Storage VMs, Console Proxy VMs, and virtual routers. A script is provided to implement this. Run the script once on one management server. The script requires the IP address of the MySQL instance, the MySQL user to connect as, and the password to use for that user. In addition to those parameters, provide the "-a" argument. For example:

# nohup cloud-sysvmadm -d 192.168.1.5 -u cloud -p password -a > sysvm.log 2>&1 &

# tail -f sysvm.log

This might take up to an hour to run, depending on the number of accounts in the system.

Important: in previous upgrades, this step could be delayed. In this upgrade, it is imperative that this step be done immediately.

1. You may need to edit your service offerings.  In 2.1.x, the service offerings included network as well as computing resources.  For example, you may have one service offering that is "small with direct networking" and another that is "small with virtual networking".  In 2.2.x, the choice of computing resource and network model is separated.  As a result, we recommend deleting one of a pair of service offerings when the only difference is the network type.  Then you may need to edit the description of the remaining service offering.  For example, in the case previously mentioned, delete "small with virtual networking" and rename "small with direct networking" to just "small".
2. You may need to edit global configuration values regarding limits. With the 2.2 series, there are global configuration values that are used as the default for resource limits consumed by users when there are no account-specific limits set. These values all default to "20". You should review these values. If you have users that are already consuming more than 20 of any of these, you should increase the corresponding value to something that will not impact their ability to provision new resources. The global configuration parameters for limits are shown in the following table.

|  |  |
| --- | --- |
| max.account.public.ips | The default maximum number of public IPs that can be consumed by an account. |
| max.account.snapshots | The default maximum number of snapshots that can be created for an account. |
| max.account.templates | The default maximum number of templates that can be deployed for an account. |
| max.account.user.vms | The default maximum number of user VMs that can be deployed for an account. |
| max.account.volumes | The default maximum number of volumes that can be created for an account. |

1. If you modified configuration parameters in step 23, restart the Management Server(s).

# service cloud-management restart

1. You may need to edit resource limits on domains. In CloudStack 2.1, the domain resource limits provide defaults for accounts in the domain. In 2.2, the domain resource limits are enforced on an aggregate limit. A domain's limit provides a maximum on the count of such resources on all accounts in that domain and all its subdomains. For example, if the ROOT domain has a VM limit of 20, the CloudStack will prohibit the creation of a 21st VM across the entire cloud. If you have implemented domain limits on 2.1 it is likely you will need to increase them, perhaps significantly. A limit of "-1" indicates that no limit is in place.

If a VM will not start after the upgrade, check global configuration, domain, and account resource limits.

1. You may need to edit the default virtual network offering. If your deployment uses only virtual networking or uses only basic zones (direct untagged), you may skip this step. If your deployment uses direct tagged networking, set the availability to optional. Go to Configuration -> Network Offerings -> DefaultVirtualizedNetworkOffering. In Actions, choose Edit, then change the Availability to Optional. You may also set Virtual Networking availability to "Unavailable". This is useful if you want to require that users create VMs on only direct tagged networks.

## Upgrading XenServer Versions

This section tells how to upgrade XenServer software on CloudStack hosts. The actual upgrade is described in XenServer documentation, but there are some additional steps you must perform before and after the upgrade. The following upgrades are supported:

* XenServer 5.6 to XenServer 5.6 FP1
* XenServer 5.6 to XenServer 5.6 SP2
* XenServer 5.6 FP1 to XenServer 5.6 SP2

1. Upgrade the database. On the Management Server node:
   1. Stop the management server and usage server:

# service cloud-usage stop

# service cloud-management stop

* 1. Back up the database:

# mysqldump -h <management-server-IPaddress> -u cloud -p cloud> cloud.backup.sql

  Enter password:   <enter>

# mysqldump --user=root --databases cloud\_usage > cloud\_usage.backup.sql

* 1. Upgrade the database (enter the command all on one line):

# mysql -h <management-server-IPaddress> -u cloud -p cloud < /usr/lib64/cloud/agent/scripts/vm/hypervisor/xenserver/xenserver56toxenserver56fp1.sql

  Enter password:   <enter>

* 1. Restart the management server and usage server:

# service cloud-management start

# service cloud-usage start

Note: you only need to do this once for all clusters.

1. Disconnect the XenServer cluster from CloudStack.
   1. Log in to the CloudStack UI as root.
   2. Navigate to the XenServer cluster, and click Actions – Unmanage.
   3. Watch the cluster status until it shows Unmanaged.
2. Log in to one of the hosts in the cluster, and run this command to clean up the VLAN:

# . /opt/xensource/bin/cloud-clean-vlan.sh

1. Still logged in to the host, run the upgrade preparation script:

# /opt/xensource/bin/cloud-prepare-upgrade.sh

Troubleshooting: If you see the error "can't eject CD," log in to the VM and umount the CD, then run the script again.

1. Upgrade the XenServer software on all hosts in the cluster. Upgrade the master first.
   1. Live migrate all VMs on this host to other hosts. See the instructions for live migration in the Administrator's Guide.

Troubleshooting: You might see the following error when you migrate a VM:

[root@xenserver-qa-2-49-4 ~]# xe vm-migrate live=true host=xenserver-qa-2-49-5 vm=i-2-8-VM

You attempted an operation on a VM which requires PV drivers to be installed but the drivers were not detected.

vm: b6cf79c8-02ee-050b-922f-49583d9f1a14 (i-2-8-VM)

To solve this issue, run the following:

# /opt/xensource/bin/make\_migratable.sh b6cf79c8-02ee-050b-922f-49583d9f1a14

* 1. Reboot the host.
  2. Upgrade to the newer version of XenServer (5.6 FP1 or SP2). Use the steps in XenServer documentation.
  3. After the upgrade is complete, copy the following files from the management server to this host, in the directory locations shown below:

|  |  |
| --- | --- |
| **Copy this Management Server file…** | **…to this location on the XenServer host** |
| /usr/lib64/cloud/agent/scripts/vm/hypervisor/xenserver/xenserver56fp1/NFSSR.py | /opt/xensource/sm/NFSSR.py |
| /usr/lib64/cloud/agent/scripts/vm/hypervisor/xenserver/xenserver56fp1/nfs.py | /opt/xensource/sm/nfs.py |
| /usr/lib64/cloud/agent/scripts/vm/hypervisor/xenserver/setupxenserver.sh | /opt/xensource/bin/setupxenserver.sh |
| /usr/lib64/cloud/agent/scripts/vm/hypervisor/xenserver/make\_migratable.sh | /opt/xensource/bin/make\_migratable.sh |
| /usr/lib64/cloud/agent/scripts/vm/hypervisor/xenserver/cloud-clean-vlan.sh | /opt/xensource/bin/cloud-clean-vlan.sh |

* 1. Run the following script:

# /opt/xensource/bin/setupxenserver.sh

* 1. Plug in the storage repositories (physical block devices) to the XenServer host:

# for pbd in `xe pbd-list currently-attached=false| grep ^uuid | awk '{print $NF}'`; do xe pbd-plug uuid=$pbd ; done

1. Repeat these steps to upgrade every host in the cluster to the same version of XenServer.
2. Run the following command on one host in the XenServer cluster to clean up the host tags:

# for host in $(xe host-list | grep ^uuid | awk '{print $NF}') ; do xe host-param-clear uuid=$host param-name=tags; done;

1. Reconnect the XenServer cluster to CloudStack.
   1. Log in to the CloudStack UI as root.
   2. Navigate to the XenServer cluster, and click Actions – Manage.
   3. Watch the status to see that all the hosts come up.
2. After all hosts are up, run the following on one host in the cluster:

# /opt/xensource/bin/cloud-clean-vlan.sh