Getting Started with ICM 4.2 on z Systems

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ICM Session Agenda

- IBM Cloud Manager and OpenStack
- Architecture on z Systems
- Installation and Customization
  - DMSSICNF and DMSSICMO
  - Appliance
- Virtual Server Requirements
- Virtual Server Image Capture
- Virtual Server Deployment
- SMTP Notifications
- LDAP Authentication
- Cinder

- Chef Server, Client, Recipes
- Resources and References

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IBM Cloud Manager and OpenStack

- IBM Cloud Manager 4.2 is the current release on z Systems
- Is uniquely delivered as an appliance on z. No concerns about which distribution, level, or mix of “other” software used.
- Can manage ICM on other platforms from z Systems
- Conversely System z ICM could be managed from ICM on other platforms
- ICM – IBM Cloud Manager (previously CMO)
- Today is the only IBM Cloud tooling supporting z/VM Single System Image and Live Guest Relocation
- Today is the only IBM Cloud tooling supported in a “Manage from z” mode
- Fee for S&S

IBM Cloud Manager and OpenStack

What is OpenStack?

- A set of software tools for Cloud Computing
- Manages process, network and storage resources (and more)
- Began as a joint venture between NASA and Rackspace
- More than 200 companies are now part of the project
- Has a Web UI, command line, and rest-API interface
- Key components have code names: Nova (compute), Neutron (network), Glance (Images), Block Storage (cinder) and more...
- For more https://www.openstack.org/

• Currently only V7000 SCSIs LUNs are supported with Cinder on z. (ECKD and SCSI via EDEV support is without Cinder driver)

• Juno is the current OpenStack level System z and ICM 4.2 are using

IBM Cloud Manager and Openstack

Some OpenStack Terminology

- **Flavor** – Virtual hardware template where defined resource sizes are specified for: Processors, memory, disk (ephemeral virtual root disk), ephemeral disk, swap, and other specifications. It has a name and an ID number
- **Persistent disk** – Potentially lives beyond the life of any one server because it is independent of any one server. Can be attached to different servers, but not at the same time.. It is composed of two types: Object or Block. LVM support is in the block storage space, but may not be all block storage
- **Ephemeral disk** – Associated with a virtual server and does not live beyond the life of that server.
- **Root/boot disk** – Ephemeral disk that the captured Linux image is copied in to. Typically allocated on a GB boundary. Size 0, means exact same size/cylinders as the source volume.

ICM – How resources are provisioned

- **Disks**
  - GB quantity via flavor definition
  - ECKD – Allocated via a DIRMAINT extent control group
  - SCSI – Raw luns allocated via Cinder driver. Currently only V7000 storage is supported. EDEVs allocated via DIRMAINT not Cinder.
- **Network Interfaces** – Via neutron network definitions you make. These will point to a vswitch you have defined and possibly VLAN information. You can have more than one
- **IP address** – From the range(s) you define in the neutron network definitions
- **Virtual CPs** – Via the flavor definitions you define and select
- **Virtual Memory** – Via the flavor definitions you define and select

- ICM has no direct integration with RACF, you need to enable the RACF DIRMAINT interfaces and it is recommended to user exit DVHXUN to tailor the operation.

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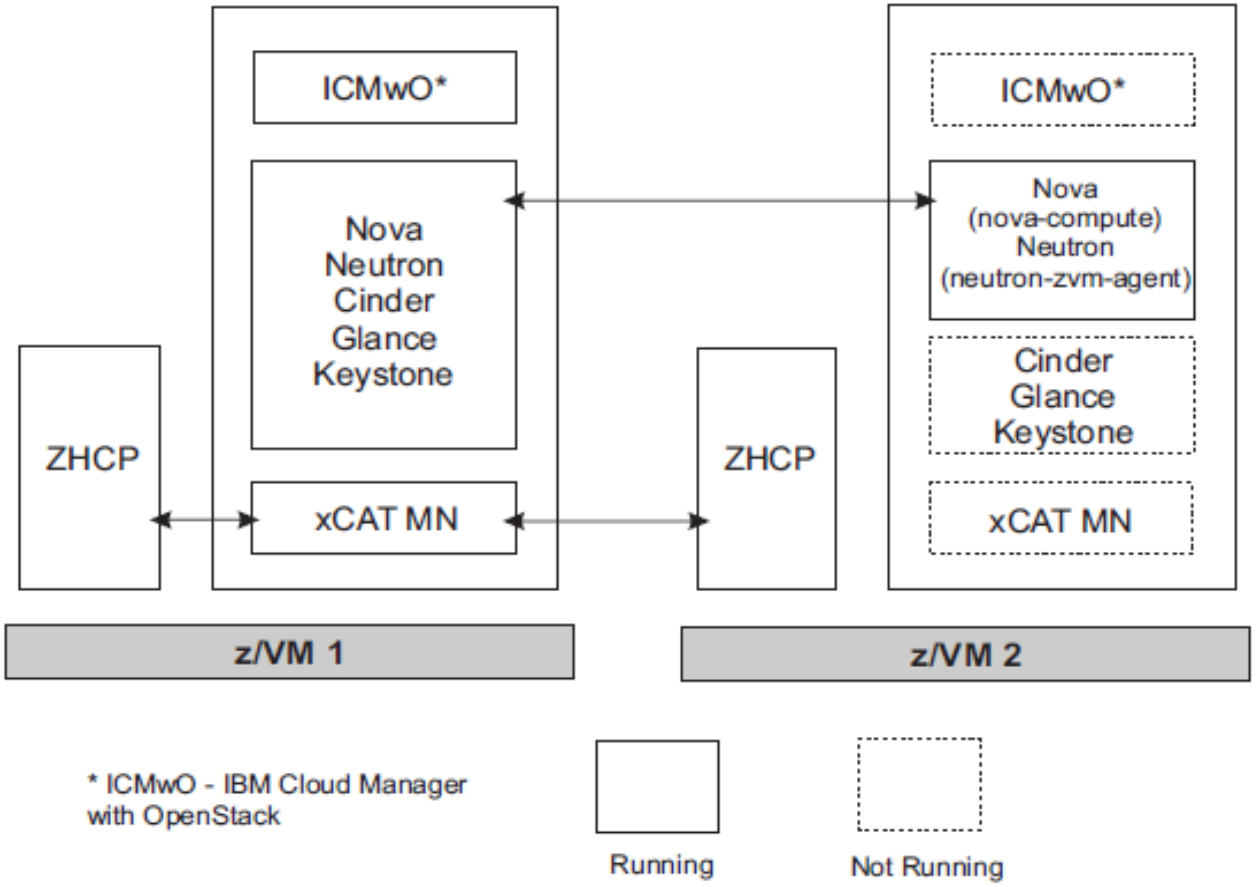
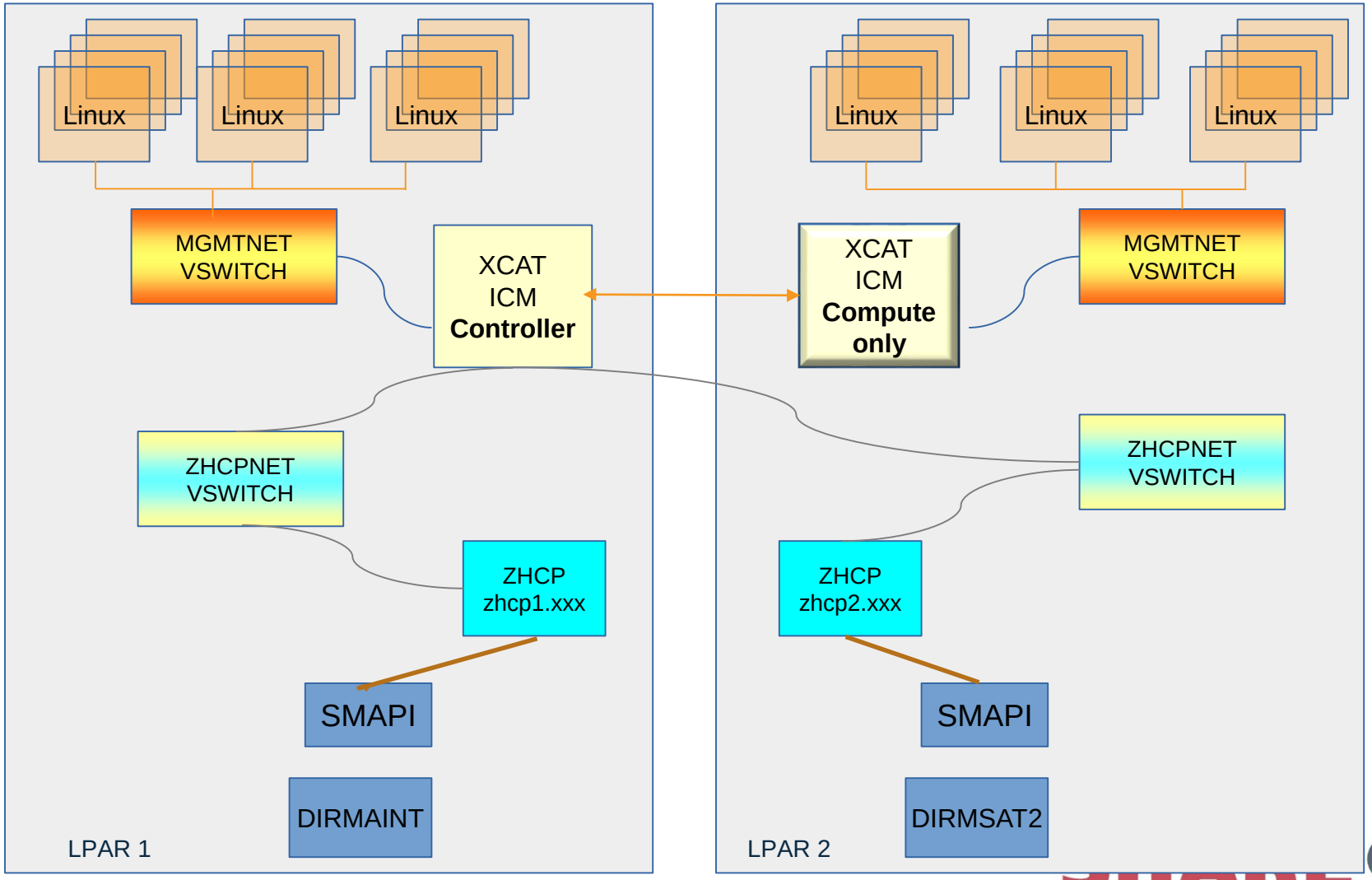
ICM Architecture on z Systems

- ICM has the concept of a Controller node and one or more compute only nodes.
- The ICM controller can talk to the compute nodes directly
- ICM controller sends request to xCAT which forwards to zHCP, SMAPI and DIRMAINT
- ICM compute only nodes do NOT talk to zHCP or SMAPI directly
- For xCAT to zHCP connectivity, an OSA-less vswitch may be used in single LPAR configurations, but with multiple LPARs or CECs this is NOT possible.
- ICM support multiple networks, virtual switches, VLANs (or networks without VLAN tagging), and subnets.
- ICM does not directly interact with z/VM RACF
- All ICM deployed virtual servers live in guest with a user-definable guest name prefix
- Has a default set of XCATVS* virtual switches, but names can be changed
- Advanced configurations could be “multi-region”. Multi-region architectures are separate deployments with a common keystone server (authentication) and could include different hypervisors or different platforms managed thru a single UI

ICM Architecture on z Systems



ICM example in 2 way SSI



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ICM Installation- Requirements and Planning

Requirements

- z/VM 6.3 + PTFs
  - See http://www.vm.ibm.com/sysman/xcmntlvl.html (xCAT related maintenance) and http://www.vm.ibm.com/sysman/osmntlvl.html (OpenStack related maintenance)
- A few disks
  - Two model 3 volumes of capacity in MAINT630
  - One 3390 model 3 of capacity for EACH XCAT for system root disk purposes
  - Additional capacity for the ICM LVM (recommend at least ~ 40GB to start)
  - These are in addition to the base xCAT and ZHCP requirements
- Network connectivity and IP addresses
  - At least two virtual switches
  - Two or three IP address per z/VM instance (different subnets)
- Supporting Infrastructure
  - DIRMAINT (or equivalent)
  - SMAPI

ICM Installation – Requirements and Planning

Requirements continued

- ICM 4.2 code from Fix Central
  - Copied two MAINT630 disks and then restored to XCAT 101 disk
  - Later remaining component copied to running appliance

- cloud-init and supporting software on “prepared” Linux image per “Enabling z/VM for Openstack Guide (Juno Release Level)” before capturing the virtual server
- Note: cloud-init is retrieved from the internet

ICM Installation – General Steps

- Follow initial instructions in CMOINFO / CMA42 file (MAINT 400 disk)
  - Define new minidisk on MAINT630 and XCAT
  - Install ICM 4.2 code on MAINT630 Minidisks
  - Upload the compressed code to MAINT630 Minidisk
  - Decompress the code to the other minidisk
  - DDR restore the code to the XCAT 101 minidisk

- Customize the DMSSICNF and DMSSICMO via VMSES localmod process
- ALL CMO LVM disks must be CP formatted from beginning to end
- Start the appliance
- Validate the appliance
- Once the appliance is running complete the upload the cmwo420_cma_install.tar and complete the install of it. This only need to be done on the controller node.
- Complete customization of the ICM appliance
- Install and customize the controller first, then add each compute only node from the other SSI members

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VMSES Local Modification Example – DMSSICNF #1

```
/*********************************************************************/
/* XCAT server defaults                                              */
/*********************************************************************/
XCAT_User     = "XCAT"                  /* xCAT z/VM user ID         */
XCAT_Addr     = "172.110.111.201"       /* XCAT IP Address           */
XCAT_Host     = "xcat1"                 /* xCAT hostname             */
XCAT_Domain   = ".pdl.pok.ibm.com"      /* xCAT domain name          */
XCAT_vswitch  = "ZHCPNET"               /* xCAT Vswitch name         */
XCAT_OSAdev   = "NONE"                  /* OSA address for xCAT      */
XCAT_zvmsysid = "POKLBS1"               /* xCAT z/VM system id       */
XCAT_notify   = "OPERATOR"              /* Notify when xCAT started  */
XCAT_gateway  = ""                      /* Network gateway IP addr.  */
XCAT_netmask  = "255.255.255.0"         /* Default network mask      */
XCAT_vlan     = "NONE"
XCAT_iso = ""
XCAT_MN_Addr    = "172.110.100.201"     /* xCAT mgmt node IP address */
XCAT_MN_vswitch = "NET172A"             /* xCAT MN Vswitch name      */
XCAT_MN_OSAdev  = "NONE"                /* OSA address for xCAT MN   */
XCAT_MN_gateway = "172.110.100.1"       /* Network gateway IP addr.  */
XCAT_MN_Mask    = "255.255.255.0"       /* Netmask for xCAT MN       */
XCAT_MN_vlan    = "NONE"
XCAT_MN_admin = "mnadmin"               /* MN administrator userid   */
XCAT_MN_pw    = "zlinux"                /* MN admin password         */
                                        /* (if NOLOG, userid cannot  */
                                        /*  ssh into XCAT MN)        */
/*********************************************************************/
/* ZHCP server defaults                                              */
/*********************************************************************/
ZHCP_User    = "ZHCP"                   /* zhcp z/VM user ID         */
ZHCP_Addr    = "172.110.111.211"        /* zhcp IP ADDRESS           */
ZHCP_Host    = "zhcp1"                  /* zhcp hostname             */
ZHCP_Domain  = ".pdl.pok.ibm.com"       /* zhcp domain name          */
ZHCP_gateway  = ""                      /* Network gateway IP addr.  */
ZHCP_netmask  = "255.255.255.0"         /* Default network mask      */
ZHCP_vswitch = "ZHCPNET"                /* zhcp Vswitch name         */
ZHCP_OSAdev  = "NONE"                   /* OSA address for zhcp      */
ZHCP_vlan    = "NONE"
```

- SSI member #1 and controller
- This xCAT talks to all zHCPs

VMSES Local Modification Example – DMSSICNF #2

```
/*****************************************************************/
/* XCAT server defaults                                          */
/*****************************************************************/
XCAT_User     = "XCAT"                  /* xCAT z/VM user ID         */
XCAT_Addr     = "172.110.111.201"       /* XCAT IP Address           */
XCAT_Host     = "xcat2"                 /* xCAT hostname             */
XCAT_Domain   = ".pdl.pok.ibm.com"      /* xCAT domain name          */
XCAT_vswitch  = "ZHCPNET"               /* xCAT Vswitch name         */
XCAT_OSAdev   = "NONE"                  /* OSA address for xCAT      */
XCAT_zvmsysid = "POKLBS2"               /* xCAT z/VM system id       */
XCAT_notify   = "OPERATOR"              /* Notify when xCAT started  */
XCAT_gateway  = ""                      /* Network gateway IP addr.  */
XCAT_netmask  = "255.255.255.0"         /* Default network mask      */
XCAT_vlan     = "NONE"
XCAT_iso = ""
XCAT_MN_Addr    = "172.110.100.202"     /* xCAT mgmt node IP address */
XCAT_MN_vswitch = "NET172A"             /* xCAT MN Vswitch name      */
XCAT_MN_OSAdev  = "NONE"                /* OSA address for xCAT MN   */
XCAT_MN_gateway = "172.110.100.1"       /* Network gateway IP addr.  */
XCAT_MN_Mask    = "255.255.255.0"       /* Netmask for xCAT MN       */
XCAT_MN_vlan    = "NONE"
XCAT_MN_admin = "mnadmin"               /* MN administrator userid   */
XCAT_MN_pw    = "zlinux"                /* MN admin password         */
                                        /* (if NOLOG, userid cannot  */
                                        /*  ssh into XCAT MN)        */
/*****************************************************************/
/* ZHCP server defaults                                          */
/*****************************************************************/
ZHCP_User    = "ZHCP"                   /* zhcp z/VM user ID         */
ZHCP_Addr    = "172.110.111.212"        /* zhcp IP ADDRESS           */
ZHCP_Host    = "zhcp2"                  /* zhcp hostname             */
ZHCP_Domain  = ".pdl.pok.ibm.com"       /* zhcp domain name          */
ZHCP_gateway  = ""                      /* Network gateway IP addr.  */
ZHCP_netmask  = "255.255.255.0"         /* Default network mask      */
ZHCP_vswitch = "ZHCPNET"                /* zhcp Vswitch name         */
ZHCP_OSAdev  = "NONE"                   /* OSA address for zhcp      */
ZHCP_vlan    = "NONE"
```

- SSI member #2 and compute only
- This xCAT talks to NO zHCPs
- It communicates only with the ICM controller

VMSES Local Modification Example – DMSSICMO #1

```
/*********************************************************************/
/* CMO User Configurable Settings                                    */
/*********************************************************************/
cmo_admin_password                  = "zlinux"
cmo_data_disk = "LS9F26 LS9F27 LS9F28 LS9F29 LS9F68 LS9F69 LS9F4C"
openstack_system_role               = "controller"
openstack_controller_address        = "172.110.100.201"
openstack_zvm_diskpool              = "ECKD:LIN9F"
openstack_instance_name_template    = "cmo%05x"
openstack_zvm_fcp_list              = "NONE"
openstack_zvm_timeout               = "300"
openstack_zvm_scsi_pool             = "NONE"
openstack_zvm_zhcp_fcp_list         = "NONE"
openstack_san_ip                    = "NONE"
openstack_san_private_key           = "NONE"
openstack_storwize_svc_volpool_name = "NONE"
openstack_storwize_svc_vol_iogrp    = "NONE"
openstack_zvm_image_default_password = "zlinux"
openstack_xcat_mgt_ip               = "NONE"
openstack_xcat_mgt_mask             = "NONE"
openstack_zvm_xcat_master           = "xcat1"
openstack_zvm_vmrelocate_force      = "NONE"
```

VMSES Local Modification Example– DMSSICMO #2

```
/*--------------------------------------------------------------------*/
/* CMO User Configurable Settings                                     */
/*--------------------------------------------------------------------*/
cmo_admin_password                  = "zlinux"
cmo_data_disk                       = ""
openstack_system_role               = "compute"
openstack_controller_address        = "172.110.100.201"
openstack_zvm_diskpool              = "ECKD:LIN9F"
openstack_instance_name_template    = "cmo%05x"
openstack_zvm_fcp_list              = "NONE"
openstack_zvm_timeout               = "300"
openstack_zvm_scsi_pool             = "NONE"
openstack_zvm_zhcp_fcp_list         = "NONE"
openstack_san_ip                    = "NONE"
openstack_san_private_key           = "NONE"
openstack_storwize_svc_volpool_name = "NONE"
openstack_storwize_svc_vol_iogrp    = "NONE"
openstack_zvm_image_default_password = "zlinux"
openstack_xcat_mgt_ip               = "NONE"
openstack_xcat_mgt_mask             = "NONE"
openstack_zvm_xcat_master           = "xcat1"
openstack_zvm_vmrelocate_force      = "NONE"
```

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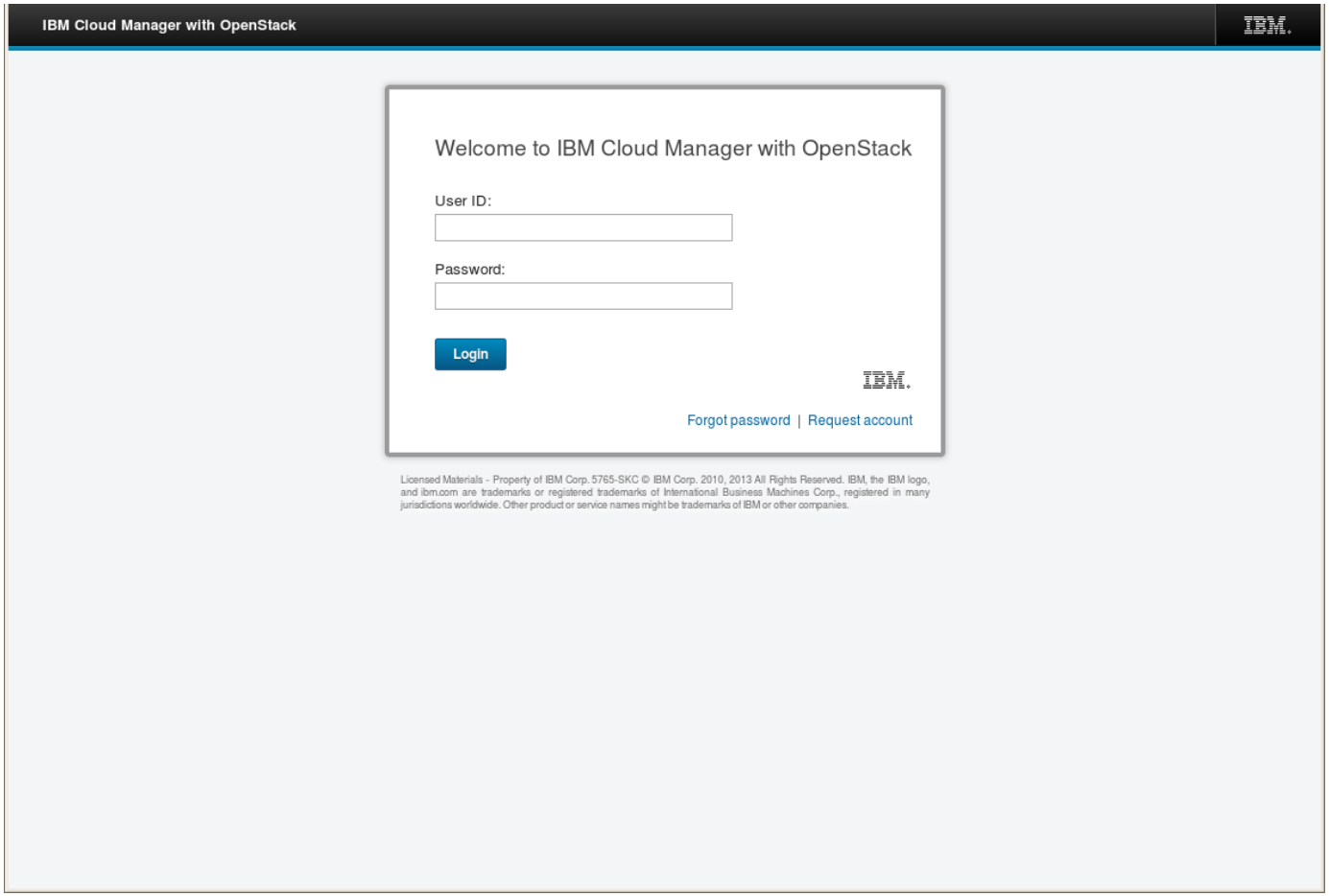
Installation & Customization – Starting the Appliance

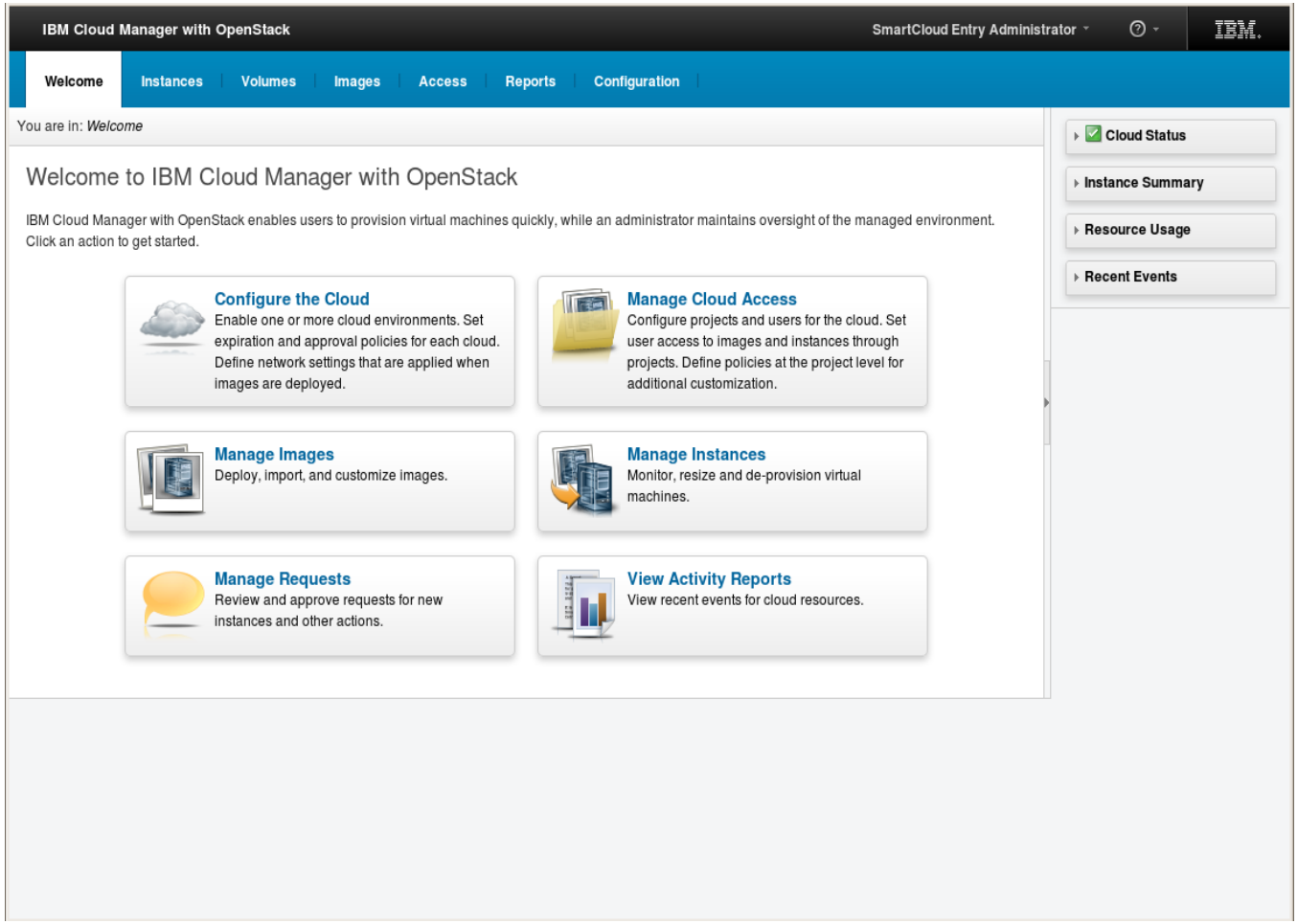
- Started automatically by SMAPI
- In a Controller + Compute Node configuration, always start the controller first
- XAUTOLOG VSMGUARD
- Suggest capturing the console output via your preferred method
- First controller start can take some time as it formats and adds each volume to the LVM in the ICM appliance
- ssh in to the appliance and validate the LVM exists with all the disks you defined
- Validate the IP configuration and VSWITCH connectivity is as you intended

Installation & Customization – Configure Cloud



- IBM Cloud Manager UI
- https://<<IP>>:18443/cloud/web/login.html

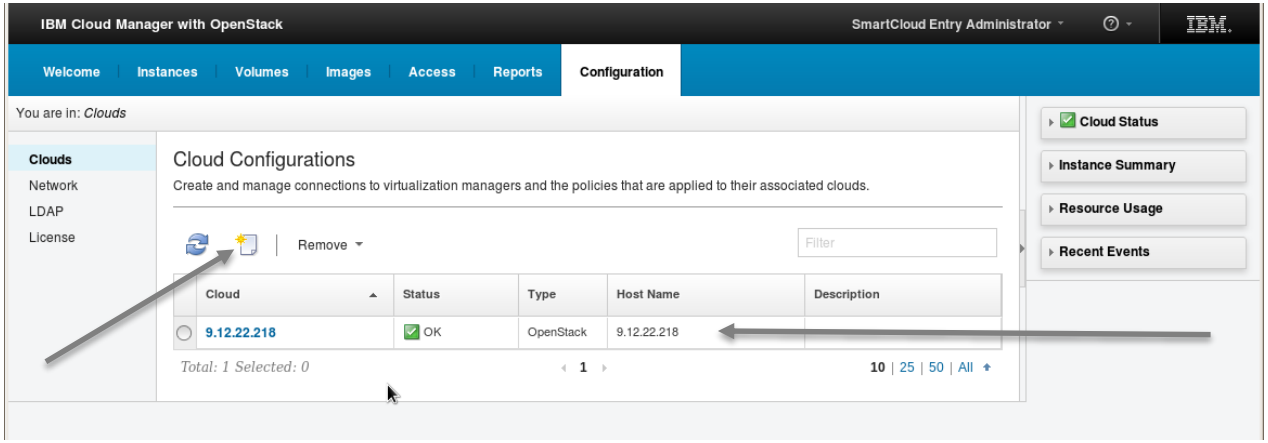
Installation & Customization



- ICM UI via administrator login

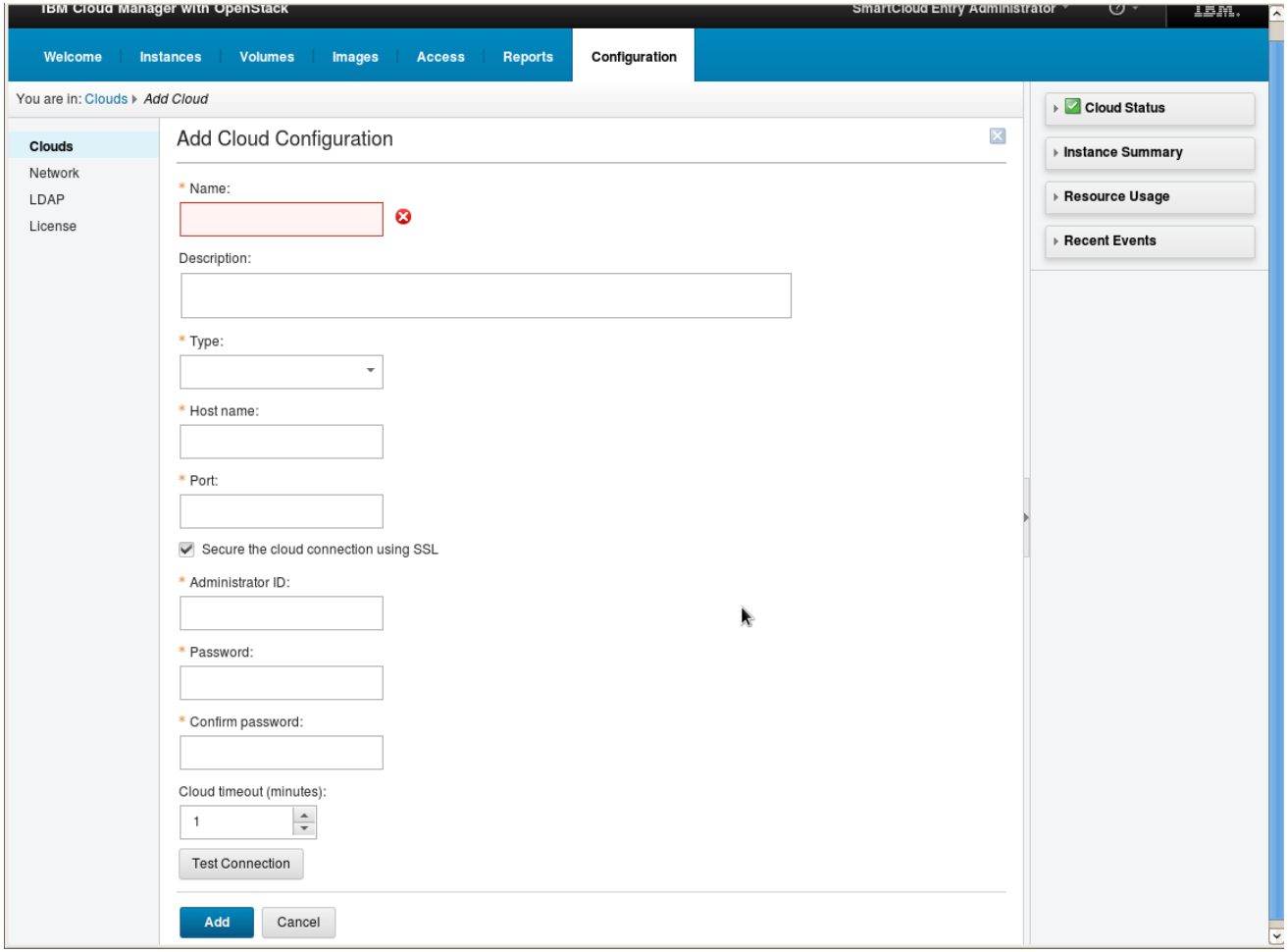
Installation & Customization

- One of the first steps is to define a “cloud configuration”
- An already defined “cloud configuration” is shown below
- To define a cloud configuration, click on the add “cloud configuration” icon

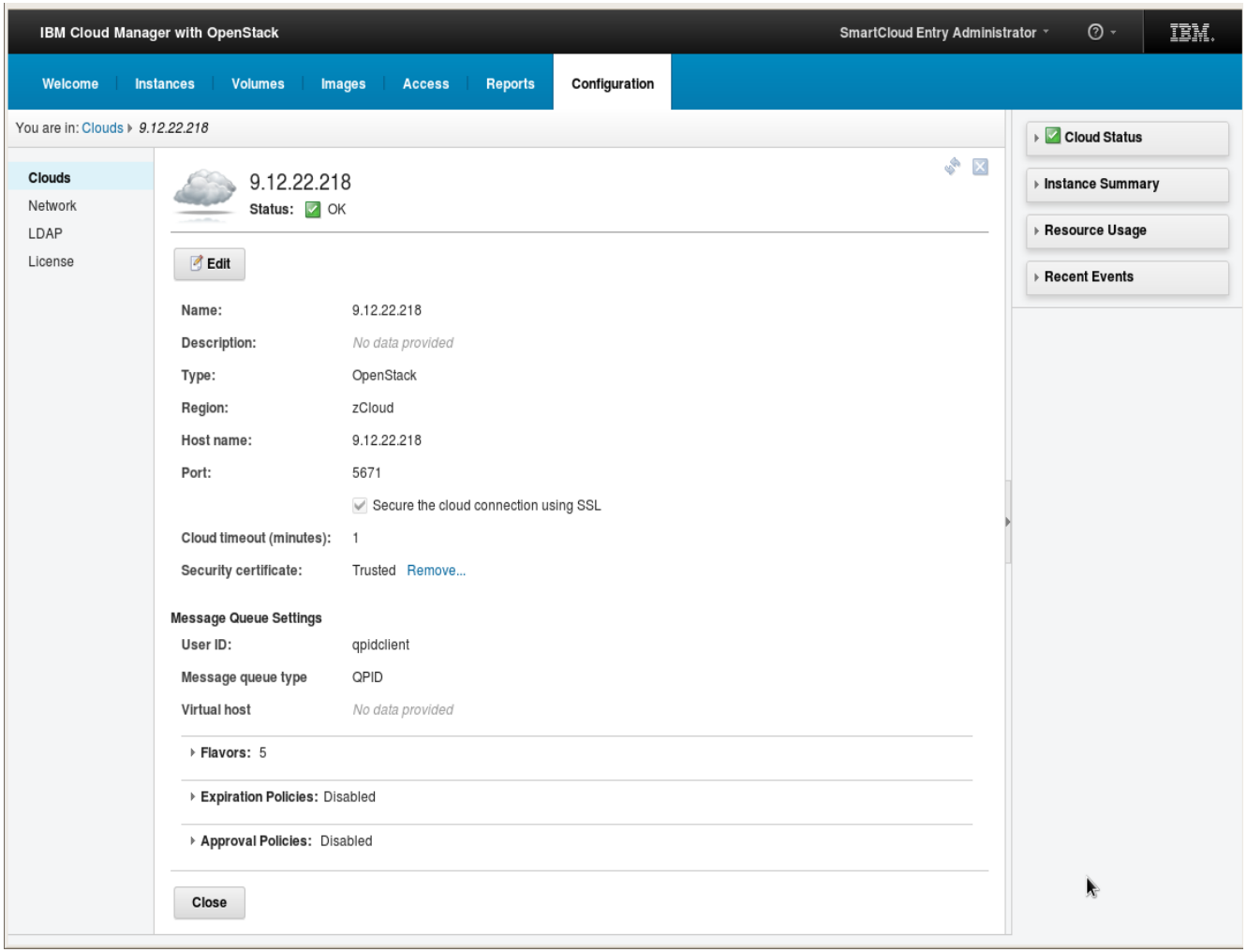


Installation & Customization

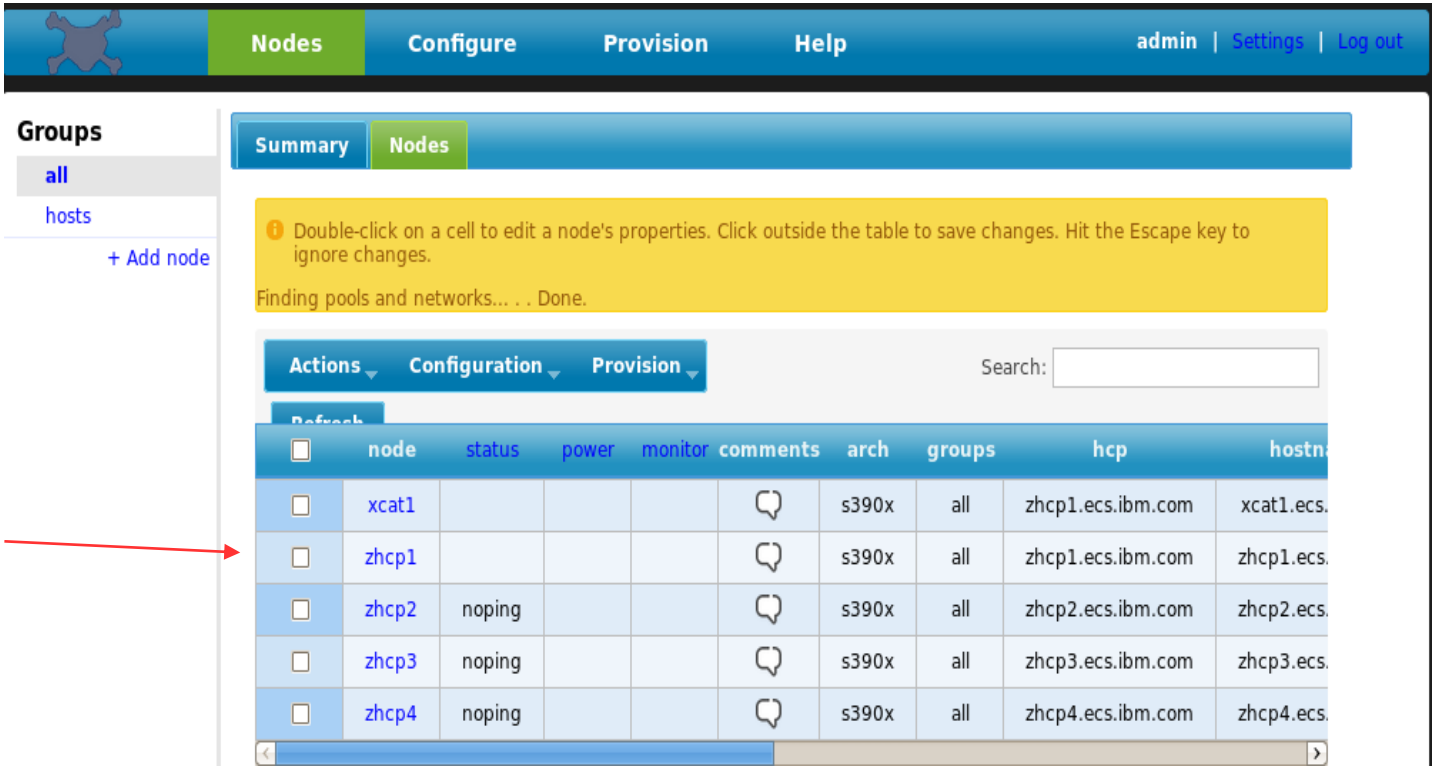
- An empty “cloud configuration”



Installation & Customization

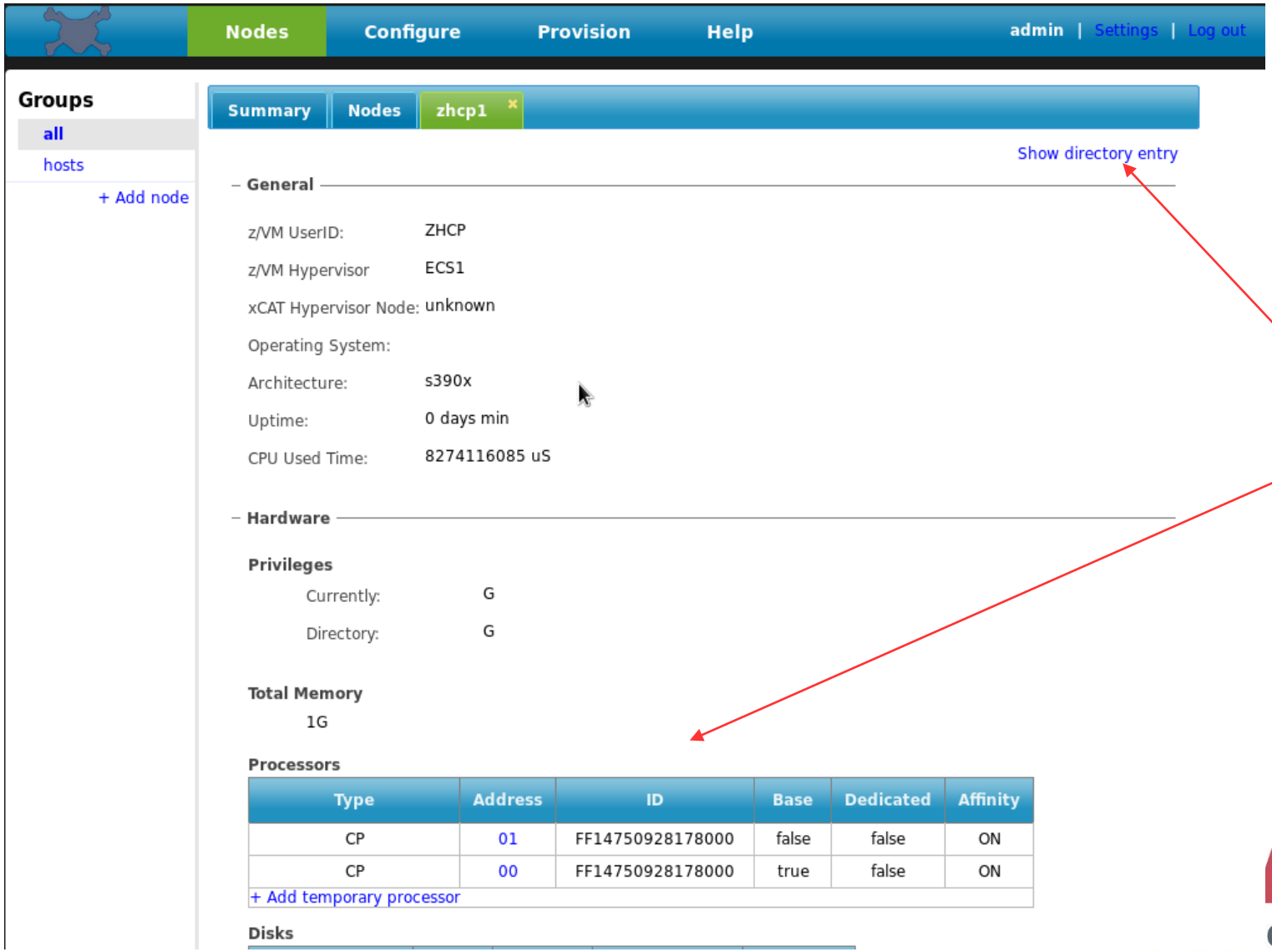


Installation & Customization - xCAT



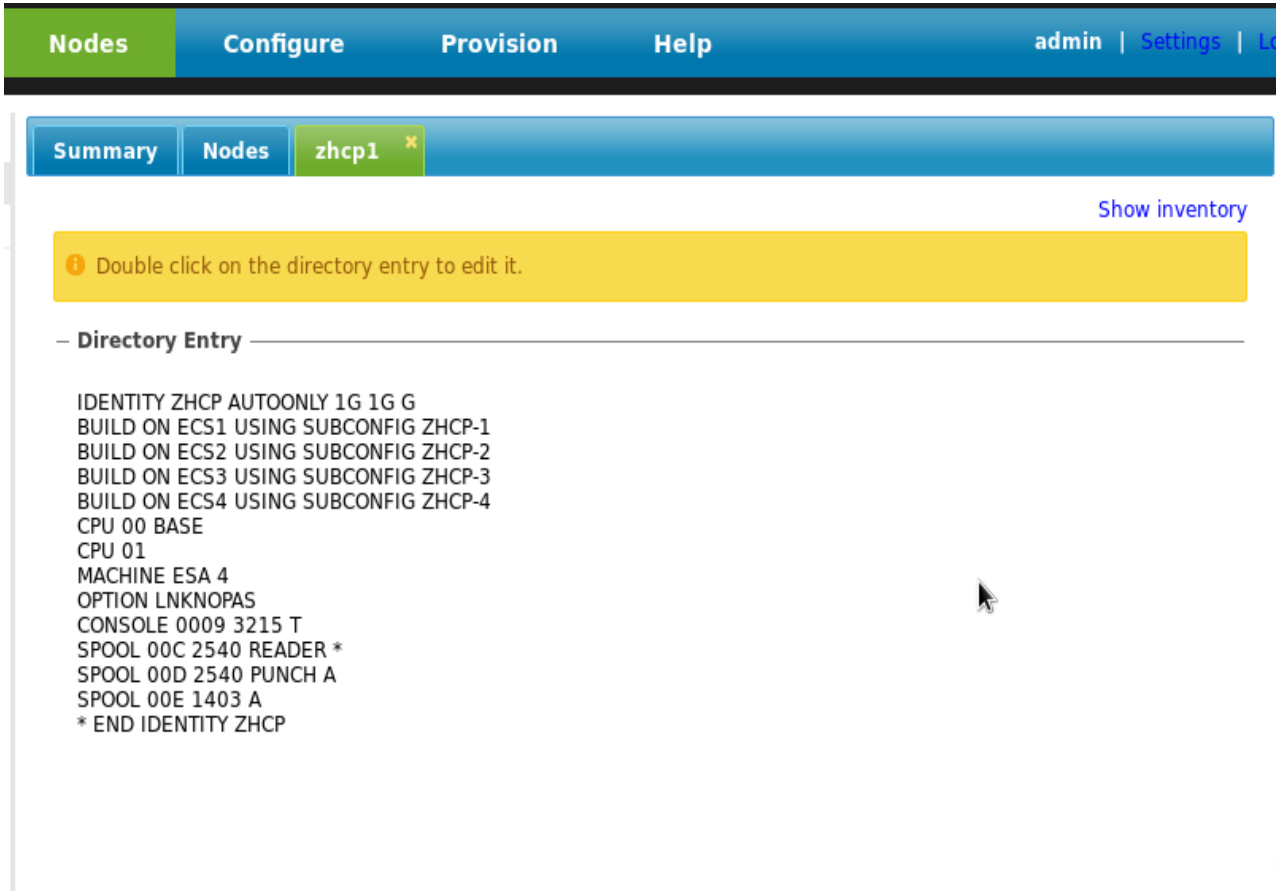
- For a single system, the xCAT and zHCP entries are prepopulated via DMSSICNF
- A multi system configuration requires some additional xCAT definitions
- 4 Way SSI Example, 1 Controller Node, 3 Compute Nodes
- Test SMAPI connectivity by clicking on each zhcp
- Steps to define all systems in xCAT are not shown here, but must be performed

Validating xCAT access to SMAPI via ZHCP



Validating xCAT access to SMAPI via ZHCP

- Successful retrieval of directory entry indicates you are communicating with SMAPI and DIRMAINT



Installation & Customization – Neutron

- Polling interval may need to be increased, maximum is 600 seconds, defaults is 5 seconds. Development recommends no more than 400.
- zVM xCAT password should be updated (xCAT HTTP password). When changing the xCAT HTTP password you must also update the reference in the neutron file(s)
- One or more networks and subnets must be defined

```
[mnadmin@xcat1 zvm] $ pwd
/etc/neutron/plugins/zvm
[mnadmin@xcat1 zvm] $ sudo vi neutron_zvm_plugin.ini
```

Installation & Customization – Neutron

```
[AGENT]
zvm_xcat_server = 9.12.22.218
zvm_xcat_username = admin
zvm_xcat_password = 50fK7FcjDjvR.
zvm_host = ecs1
xcat_zhcp_nodename = zhcp1
polling_interval = 5
zvm_xcat_timeout = 300
# (StrOpt) xCat REST API username, default value is admin.
# zvm_xcat_username = admin
# Example: zvm_xcat_username = guest


# (StrOpt) Password of the xCat REST API user, default value is admin
# zvm_xcat_password = admin
# Example: zvm_xcat_password = passw0rd


# (StrOpt) xCat MN server address, IP address or host name
# zvm_xcat_server = YourxCATMNServerAddress
# Example: zvm_xcat_server = 10.0.0.1


# (StrOpt) xCat zHCP nodename in xCAT, default value is zhcp
# xcat_zhcp_nodename = zhcp
# Example: xcat_zhcp_nodename = myzhcp1


# (StrOpt) The compute node name neutron-zvm-agent work on, same as 'host'in nova.conf
# zvm_host = opnstk1
# Example: zvm_host = opnstk1


# (IntOpt) Agent's polling interval in seconds, default value is 2 seconds
# polling_interval = 2
# Example: polling_interval = 5
```

Complete your session evaluations online at www.SHARE.org/Orlando-Eval

Installation & Customization – Neutron

```
[mnadmin@xcat1 neutron] $ neutron net-create mgmtnet --provider:network_type
flat --provider:physical_network mgmtnet
Created a new network:
+---------------------------+--------------------------------------+
| Field                     | Value                                |
+---------------------------+--------------------------------------+
| admin_state_up            | True                                 |
| id                        | f8476e34-8818-471e-83c6-5bdb0882fcb0 |
| name                      | mgmtnet                              |
| provider:network_type     | flat                                 |
| provider:physical_network | mgmtnet                              |
| provider:segmentation_id  |                                      |
| router:external           | False                                |
| shared                    | False                                |
| status                    | ACTIVE                               |
| subnets                   |                                      |
| tenant_id                 | 57d48413ddfc432db983b192bf9e2bcf     |
+---------------------------+--------------------------------------+
[mnadmin@xcat1 neutron] $
```

- VSWITCH from DMSSICNF
- You could have more than one but it must be defined to neutron
- Linux guest must be reachable from XCAT over the network

Installation & Customization – Neutron

```
[mnadmin@xcat1 neutron] $ neutron subnet-create --allocation-pool
start=172.110.150.20,end=172.110.150.45 --gateway 172.110.150.1 mgmtnet
172.110.150.0/24
Created a new subnet:
+-------------------+-------------------------------------------------------+
| Field             | Value                                                 |
+-------------------+-------------------------------------------------------+
| allocation_pools  | {"start": "172.110.150.20", "end": "172.110.150.45"} |
| cidr              | 172.110.150.0/24                                      |
| dns_nameservers   |                                                       |
| enable_dhcp       | True                                                  |
| gateway_ip        | 172.110.150.1                                         |
| host_routes       |                                                       |
| id                | c5892167-7934-4181-96a4-d8e116c21cb7                  |
| ip_version        | 4                                                     |
| ipv6_address_mode |                                                       |
| ipv6_ra_mode      |                                                       |
| name              |                                                       |
| network_id        | f8476e34-8818-471e-83c6-5bdb0882fcb0                  |
| tenant_id         | 57d48413ddfc432db983b192bf9e2bcf                      |
+-------------------+-------------------------------------------------------+
[mnadmin@xcat1 neutron] $
```

Installation & Customization – Neutron

- If neutron.conf was modified, restart the appliance
- After the appliance is restarted validate all of your services are “UP”

```
[mnadmin@xcat1 zvm] $ nova service-list
+----+------------------+------+----------+---------+-------+----------------------------+-----------------+
| Id | Binary           | Host | Zone     | Status  | State | Updated_at                 | Disabled Reason |
+----+------------------+------+----------+---------+-------+----------------------------+-----------------+
| 1  | nova-cert        | ecs1 | internal | enabled | up    | 2015-04-03T02:50:44.000000 | -               |
| 2  | nova-conductor   | ecs1 | internal | enabled | up    | 2015-04-03T02:50:43.000000 | -               |
| 3  | nova-console     | ecs1 | internal | enabled | up    | 2015-04-03T02:50:46.000000 | -               |
| 5  | nova-consoleauth | ecs1 | internal | enabled | up    | 2015-04-03T02:50:37.000000 | -               |
| 6  | nova-scheduler   | ecs1 | internal | enabled | up    | 2015-04-03T02:50:37.000000 | -               |
| 7  | nova-compute     | ecs1 | nova     | enabled | up    | 2015-04-03T02:50:41.000000 | -               |
+----+------------------+------+----------+---------+-------+----------------------------+-----------------+

[mnadmin@xcat1 zvm] $
```

ICM Session Agenda

- IBM Cloud Manager and OpenStack
- Architecture on z Systems
- Installation and Customization
  - DMSSICNF and DMSSICMO
  - Appliance
- **Virtual Server Requirements**
- Virtual Server Image Capture
- Virtual Server Deployment
- SMTP Notifications
- LDAP Authentication

- Chef Server, Client, Recipes
- Resources and References

Virtual Server Requirements

- Per Enabling z/VM for Openstack Guide
  - RHEL 6.2 – RHEL 6.5 and SLES 11 SP2 – SP3 are officially supported
- Root disk of type ECKD or FBA for snapshot / spawn
- When deploying a new server with an emphemeral disk, both the root disk and ephemeral disk will be of type specified in zvm_diskpool
- Sizes no larger than 5 GB are strongly recommended (but did not observe an issue with larger sizes)
- Root filesystem must NOT be a logical volume
- Root filesystem on a non-full pack minidisk (no cyl 0)
- Must use virtual device 100 to boot
- Should support ssh keys for accessing the server
- Should be an exact full GB size multiple (except for flavor size zero)
- Can not deploy to a smaller disk
- Follow the steps to “Make a deployable z/VM Image”
  - Packages, including xcatconf4z, cloud-init
  - Define in xCAT

ICM Session Agenda

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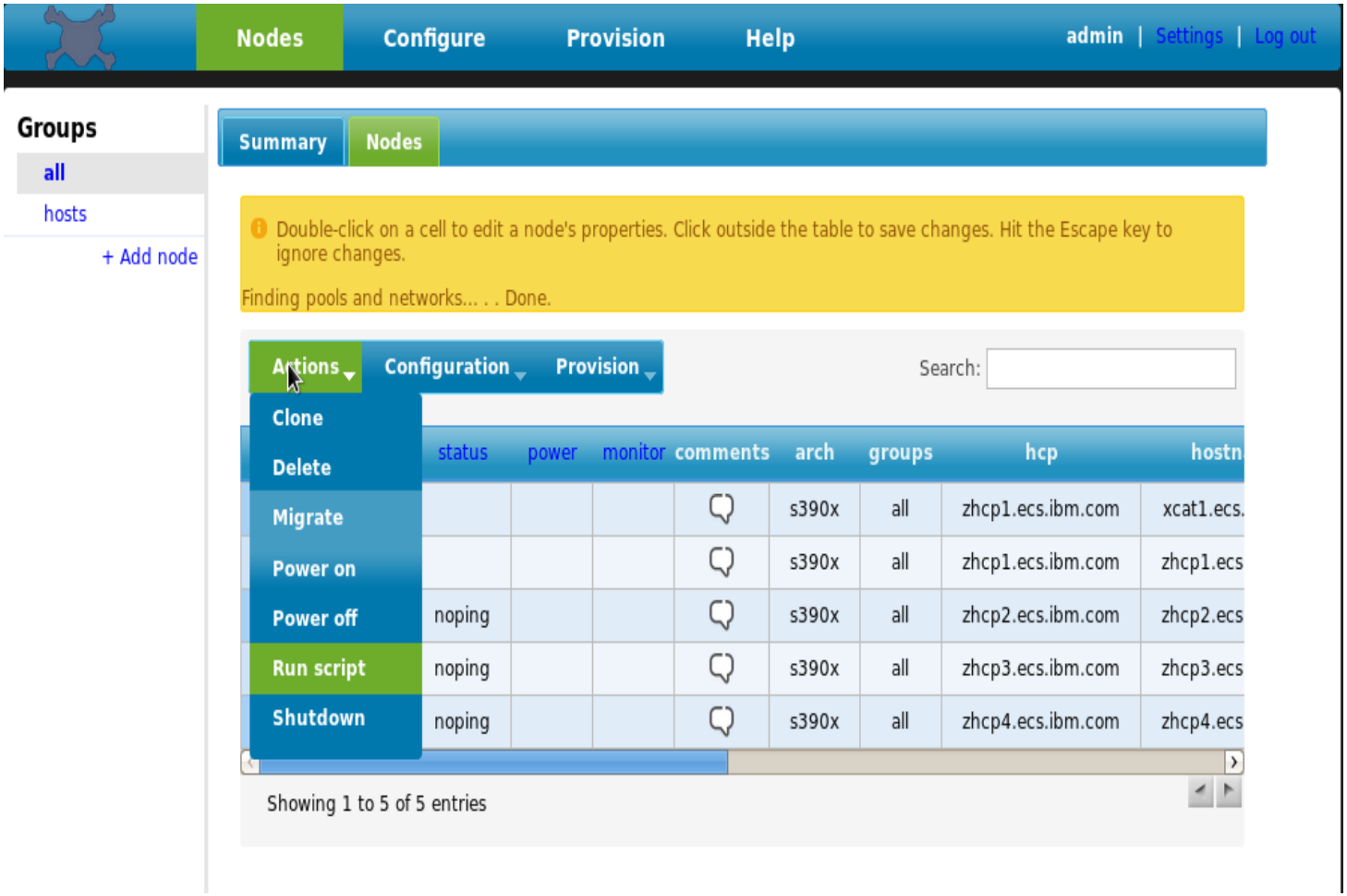
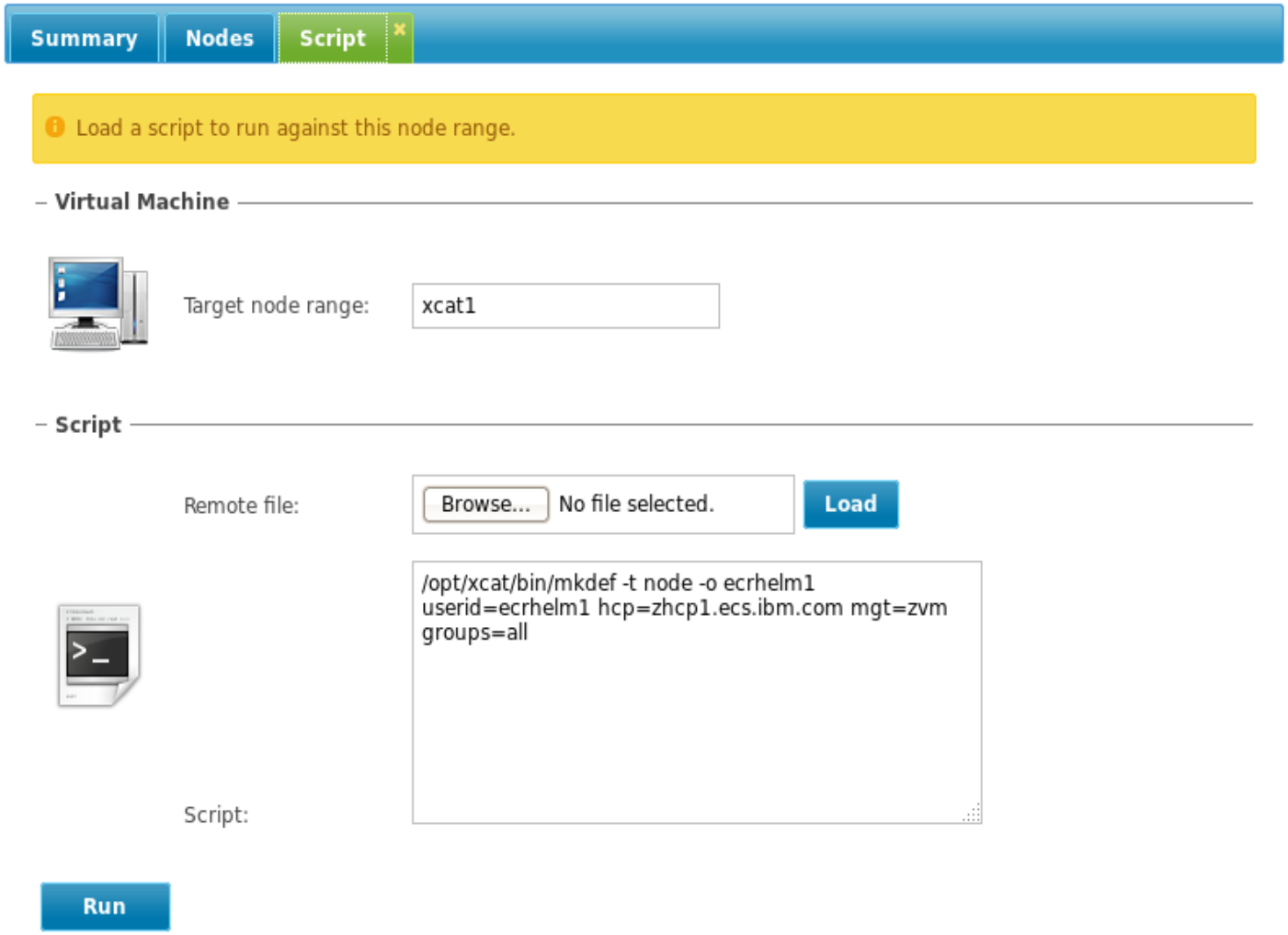
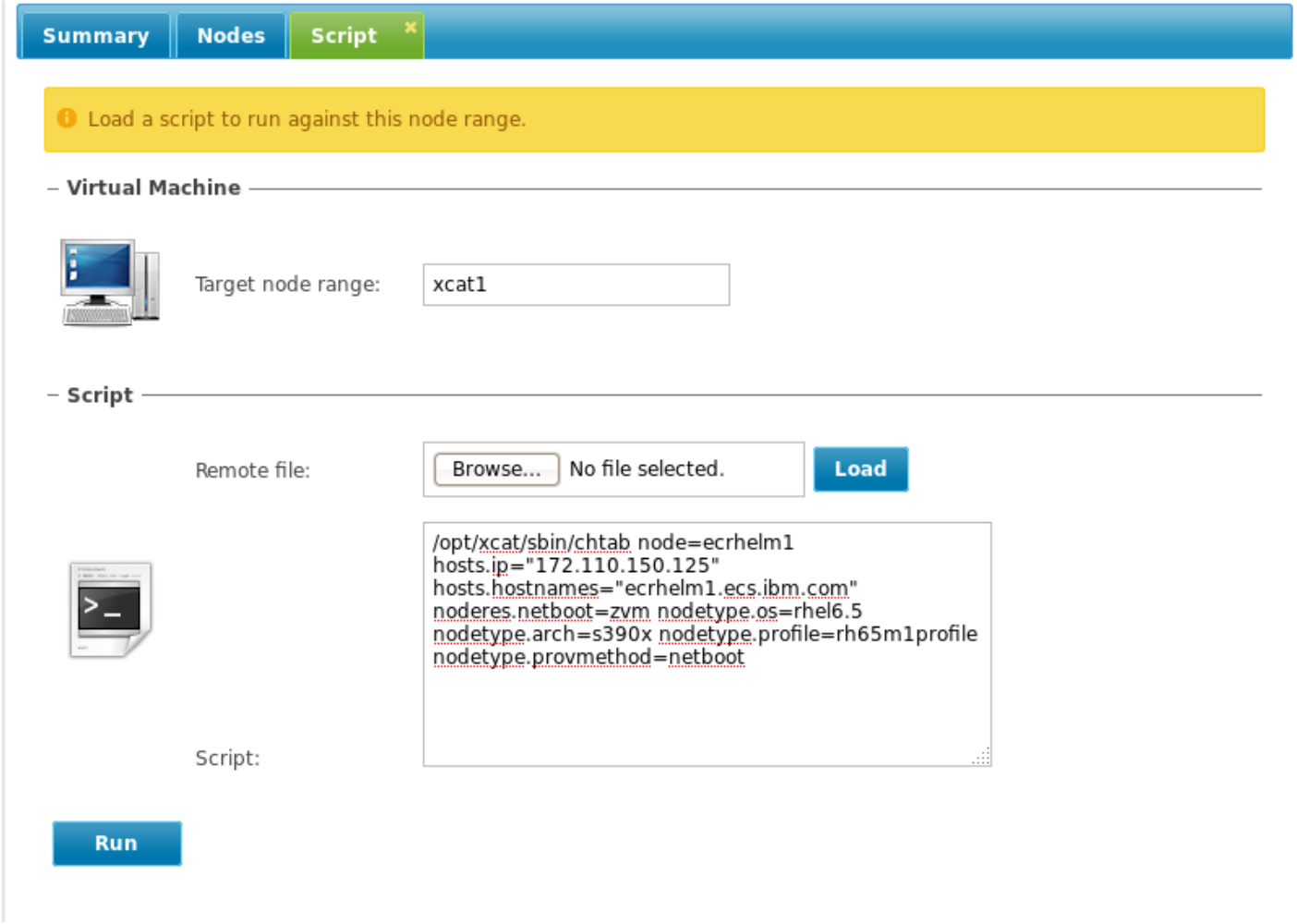
Virtual Server Image Capture – Run Script



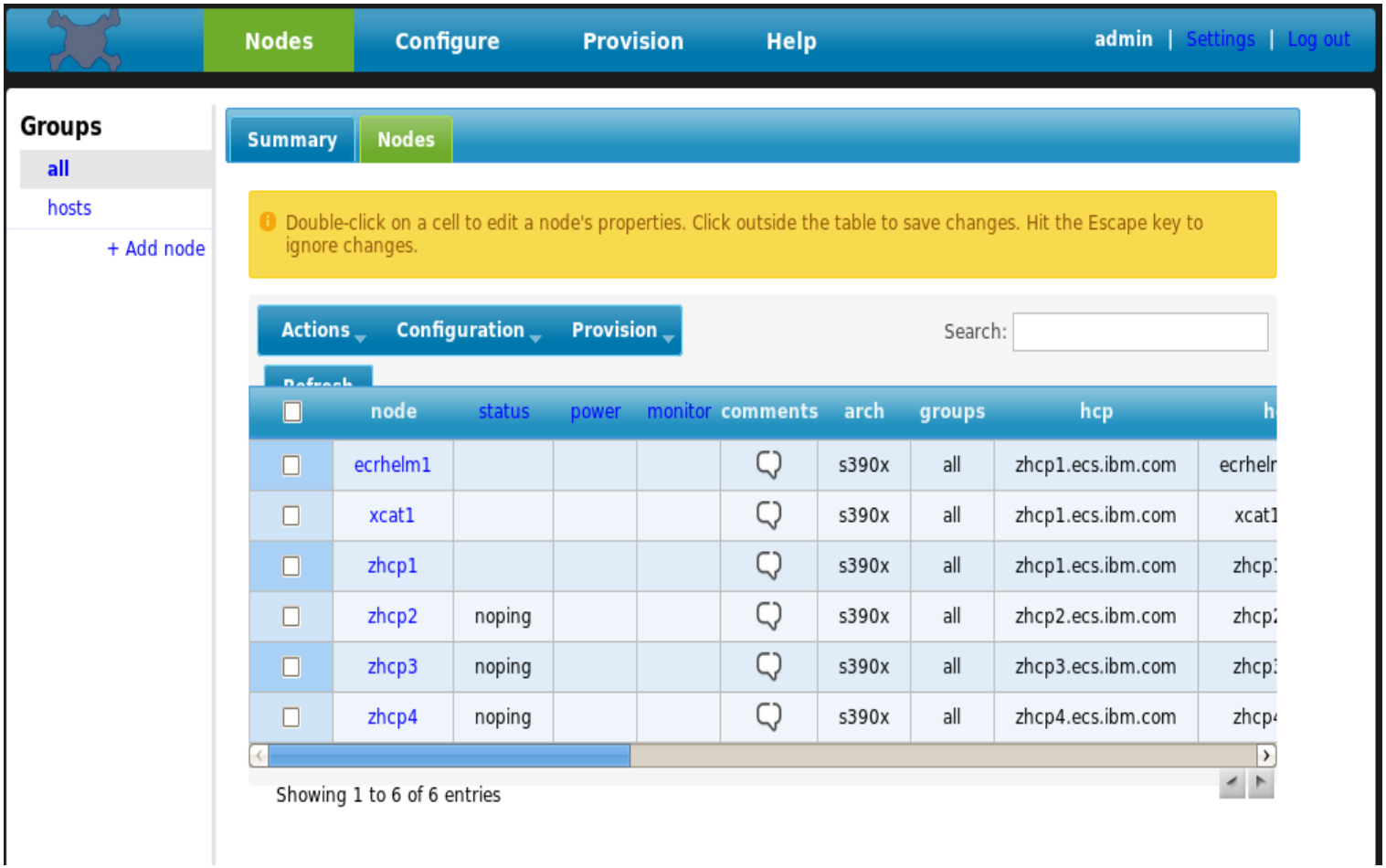
Virtual Server Image Capture - mkdef



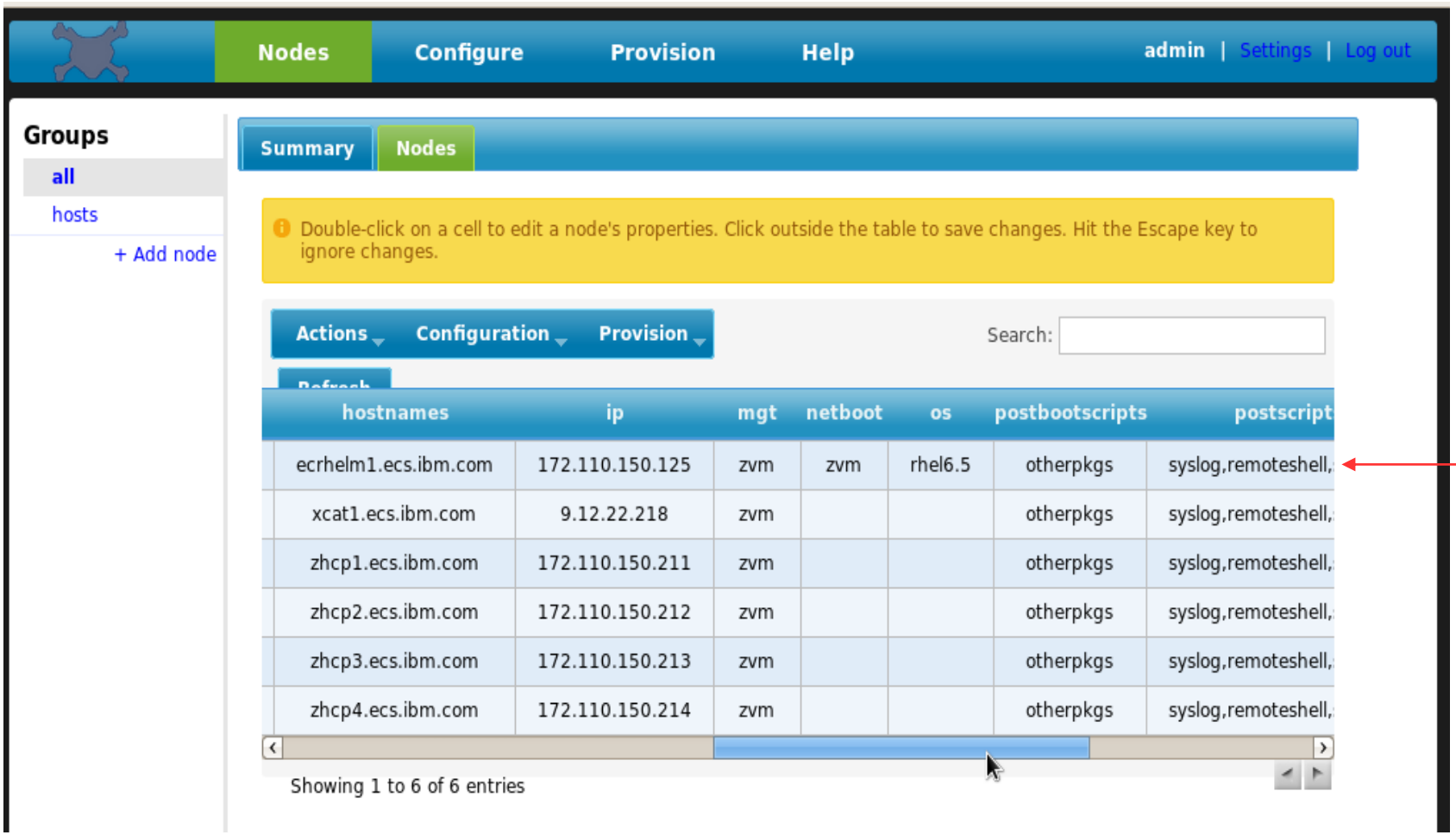
Virtual Server Image Capture - chtab



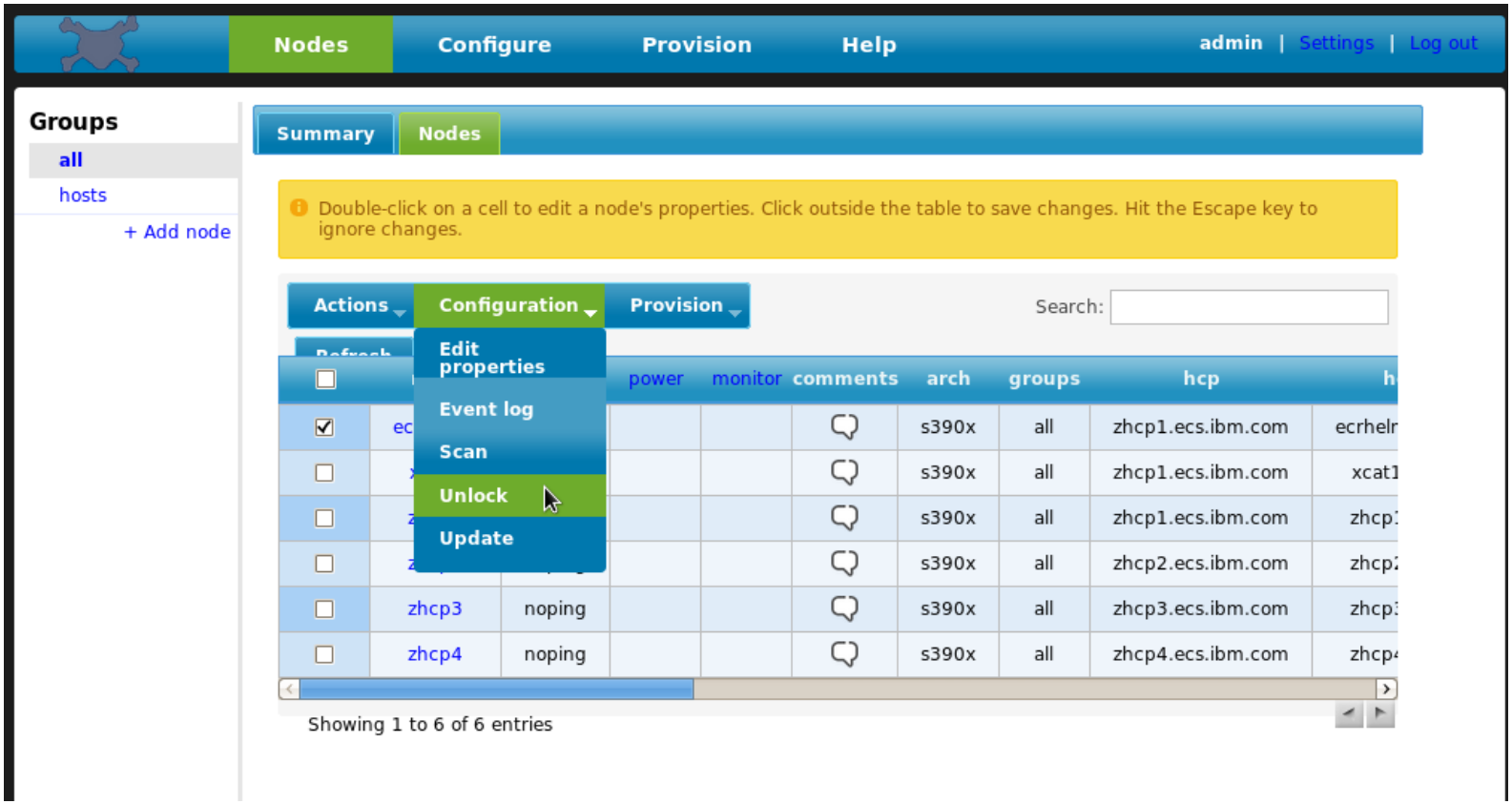
Virtual Server Image Capture - chtab



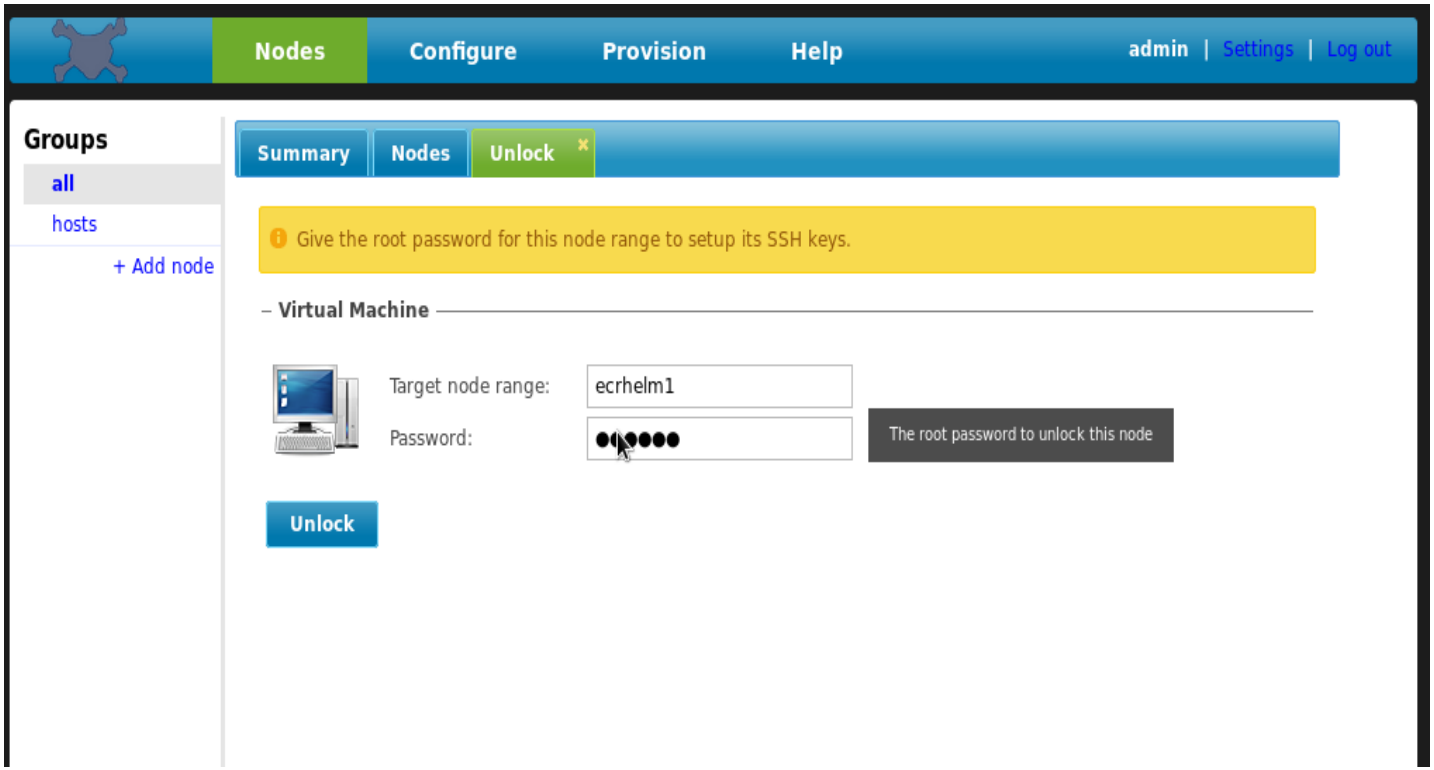
Virtual Server Image Capture - chtab



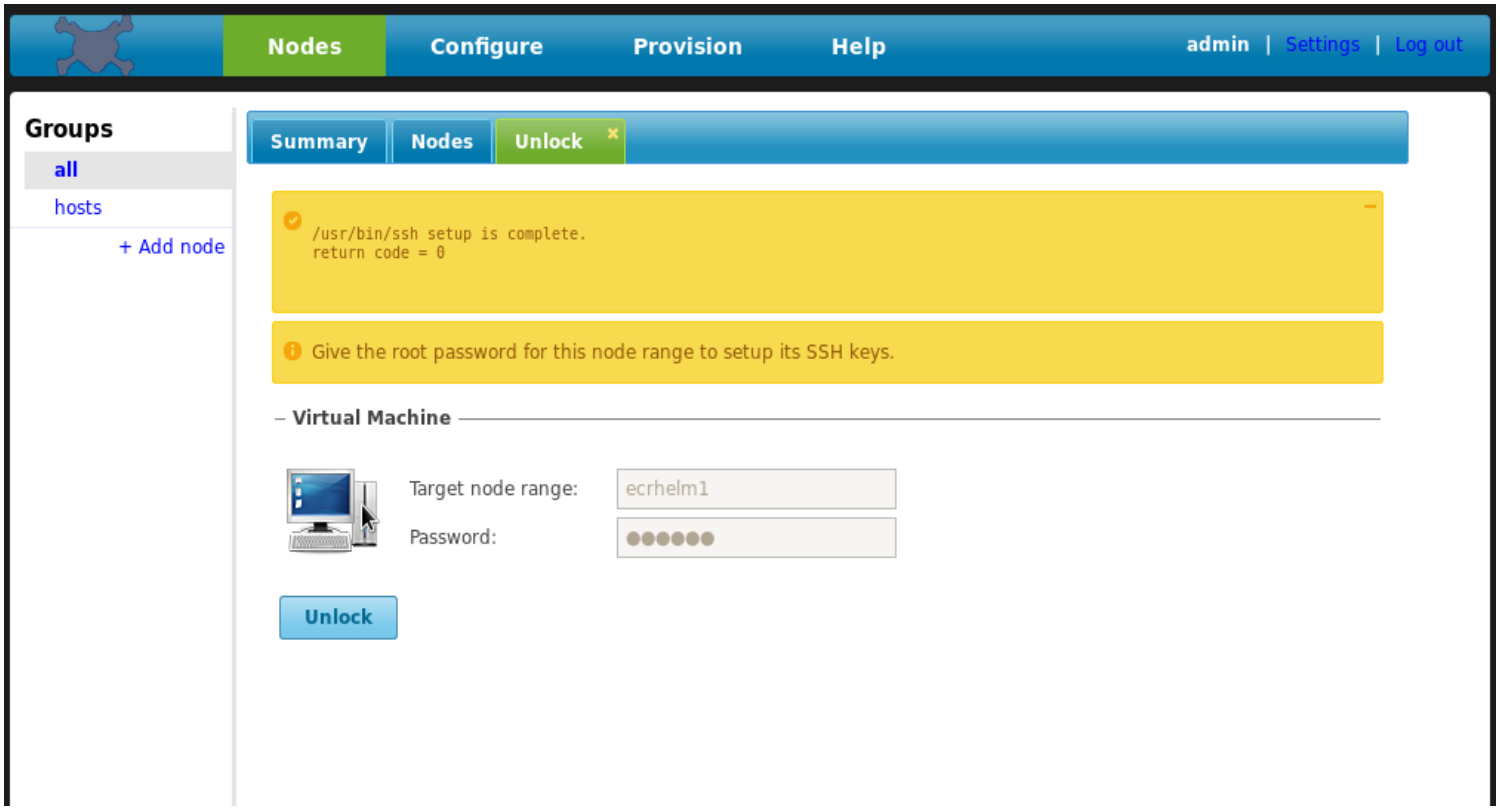
Virtual Server Image Capture – unlock server



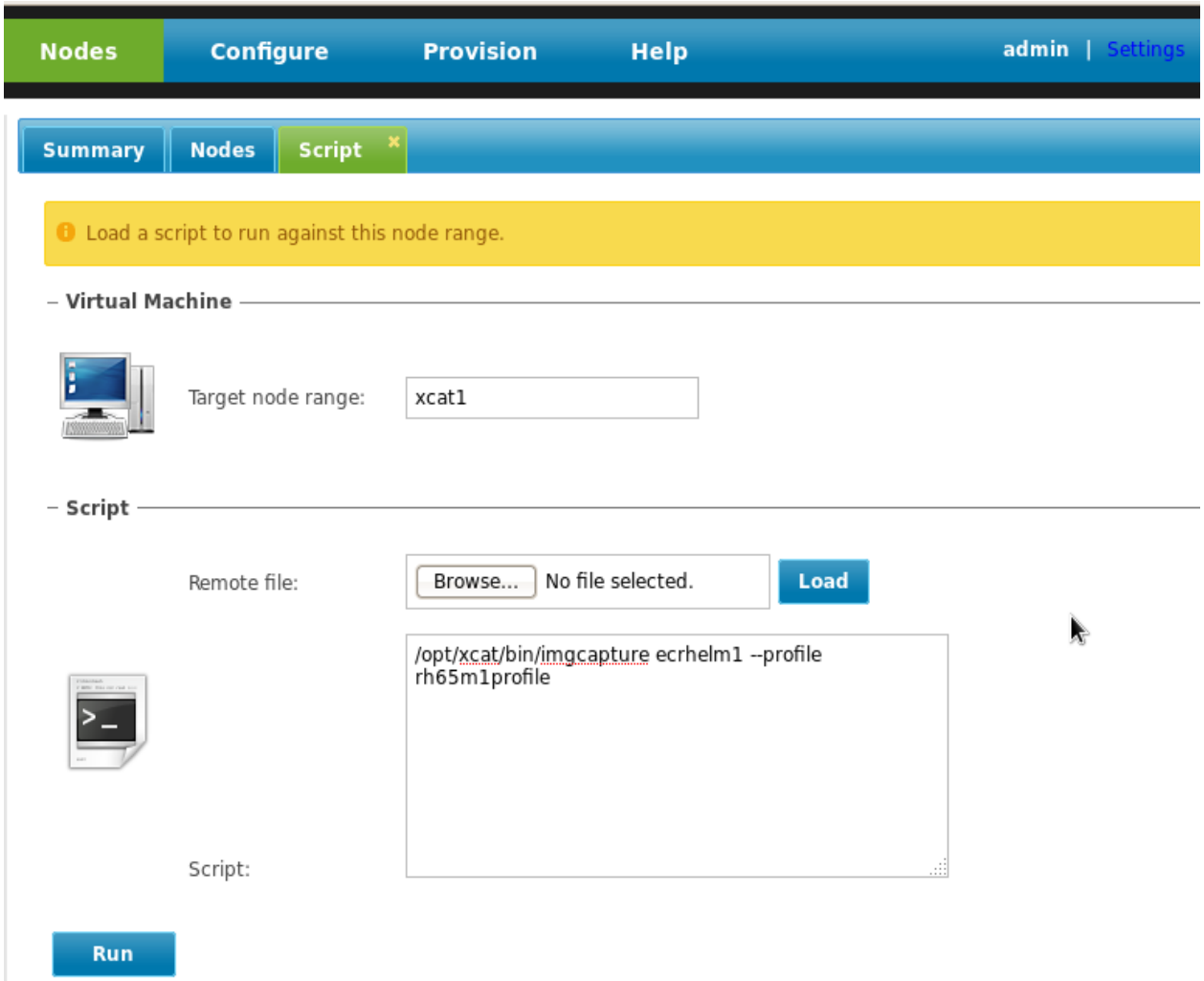
Virtual Server Image Capture – root password



Virtual Server Image Capture – unlock success



Virtual Server Image Capture - imgcapture



Virtual Server Image Capture

- Guest to capture must be up
- Image capture process will shut it down

Virtual Server Image Capture – imgcapture results

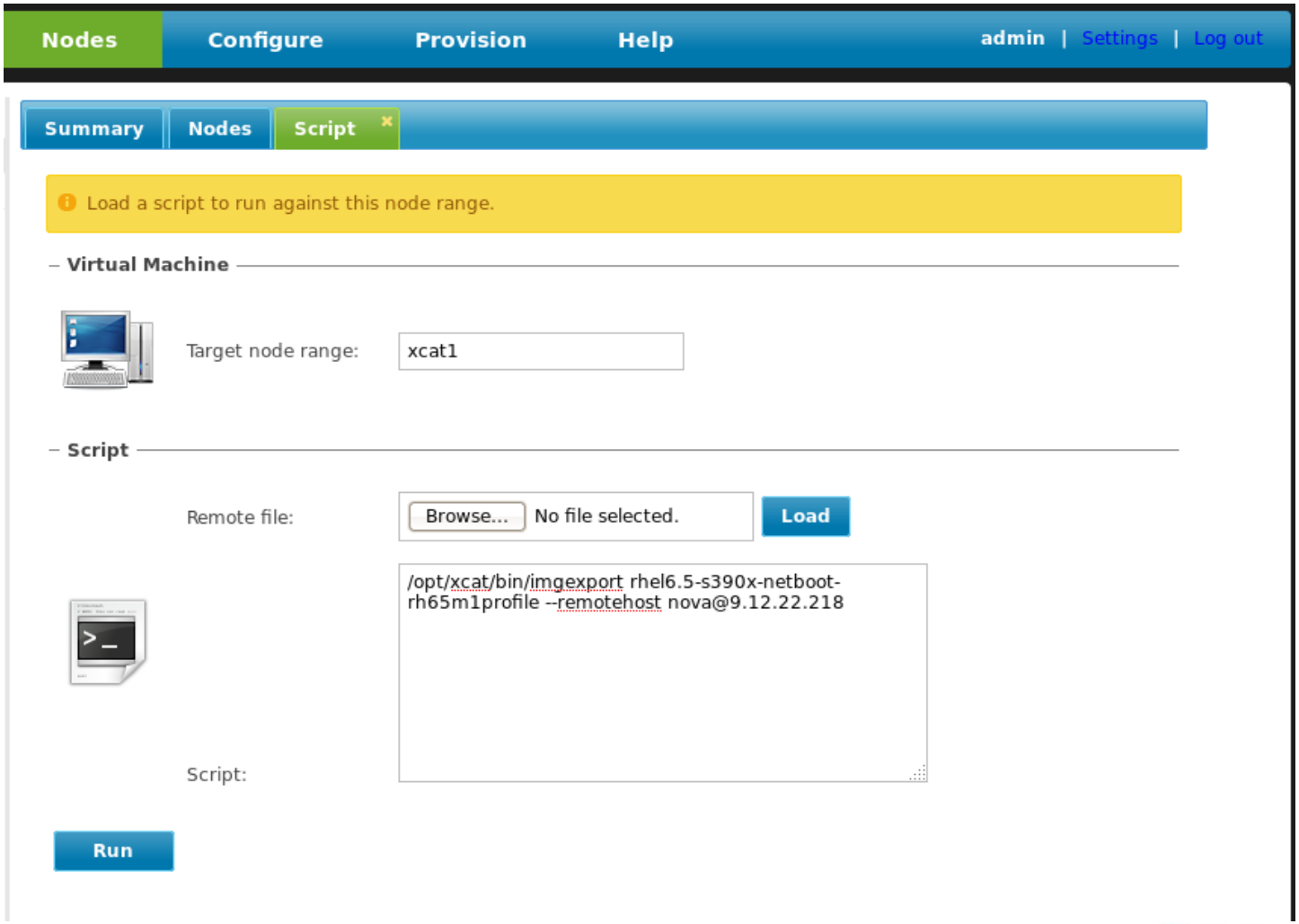
```
 ecrhelm1: Capturing the image using zHCP node
 ecrhelm1: creatediskimage start time: 2015-04-03-02:01:32.913
 SOURCE USER ID: "ECRHELM1"
 DISK CHANNEL:   "0100"
 IMAGE FILE:
"/mnt/xcat1.ecs.ibm.com/install/staging/rhel6.5/s390x/rh65m1profile/0100.img"
 COMPRESSION:    "6"

 Creating 0100.img image file for ECRHELM1's disk at channel 0100 with disk size 8730 CYL.
 Compression level: 6
 Image creation successful.
 creatediskimage end time: 2015-04-03-02:05:54.493

 ecrhelm1: Moving the image files to the deployable directory:
/install/netboot/rhel6.5/s390x/rh65m1profile
 ecrhelm1: Completed capturing the image(rhel6.5-s390x-netboot-rh65m1profile) and stored at
/install/netboot/rhel6.5/s390x/rh65m1profile

0
```

Virtual Server Image Capture - imgexport

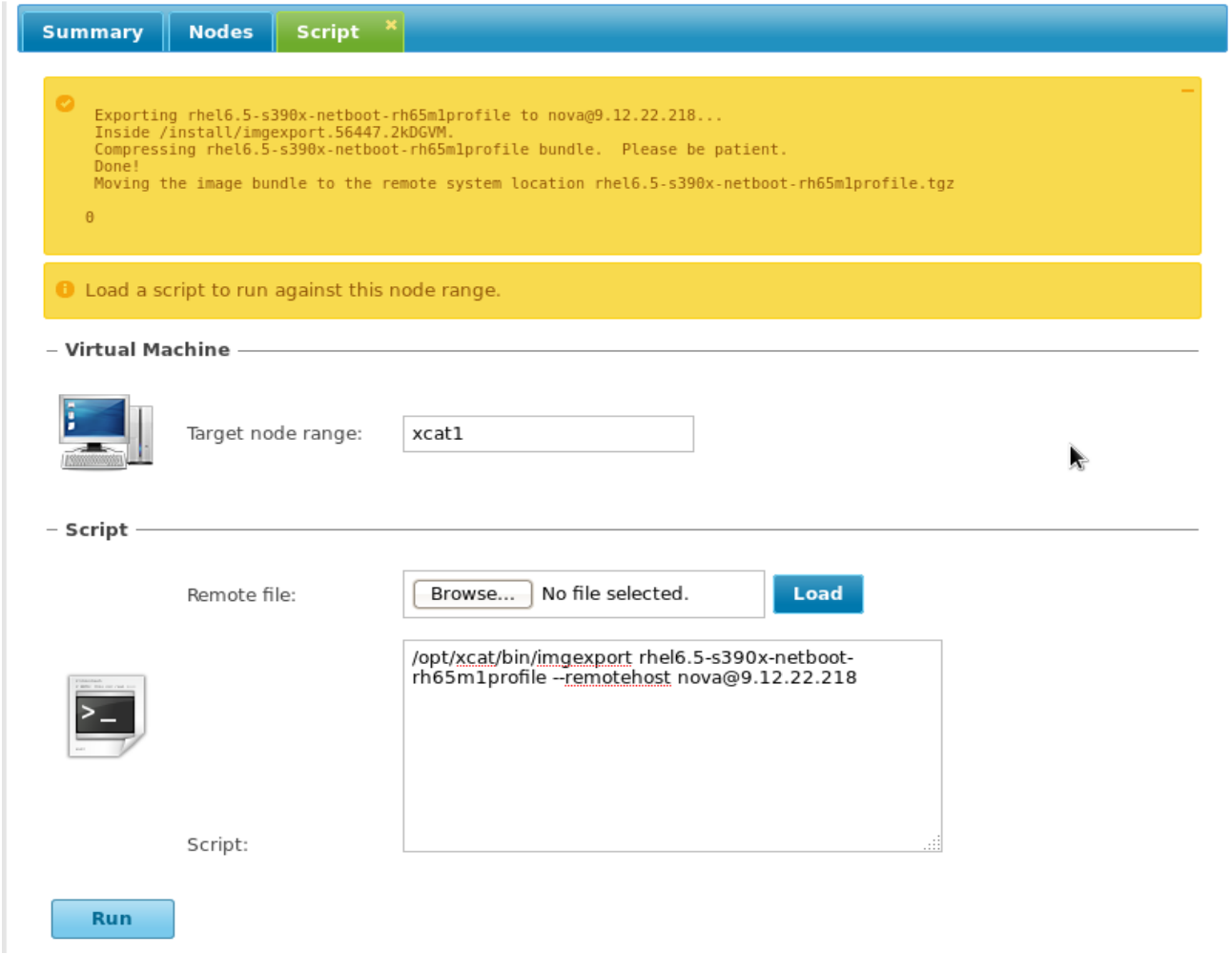


Virtual Server Image Capture – imgexport results

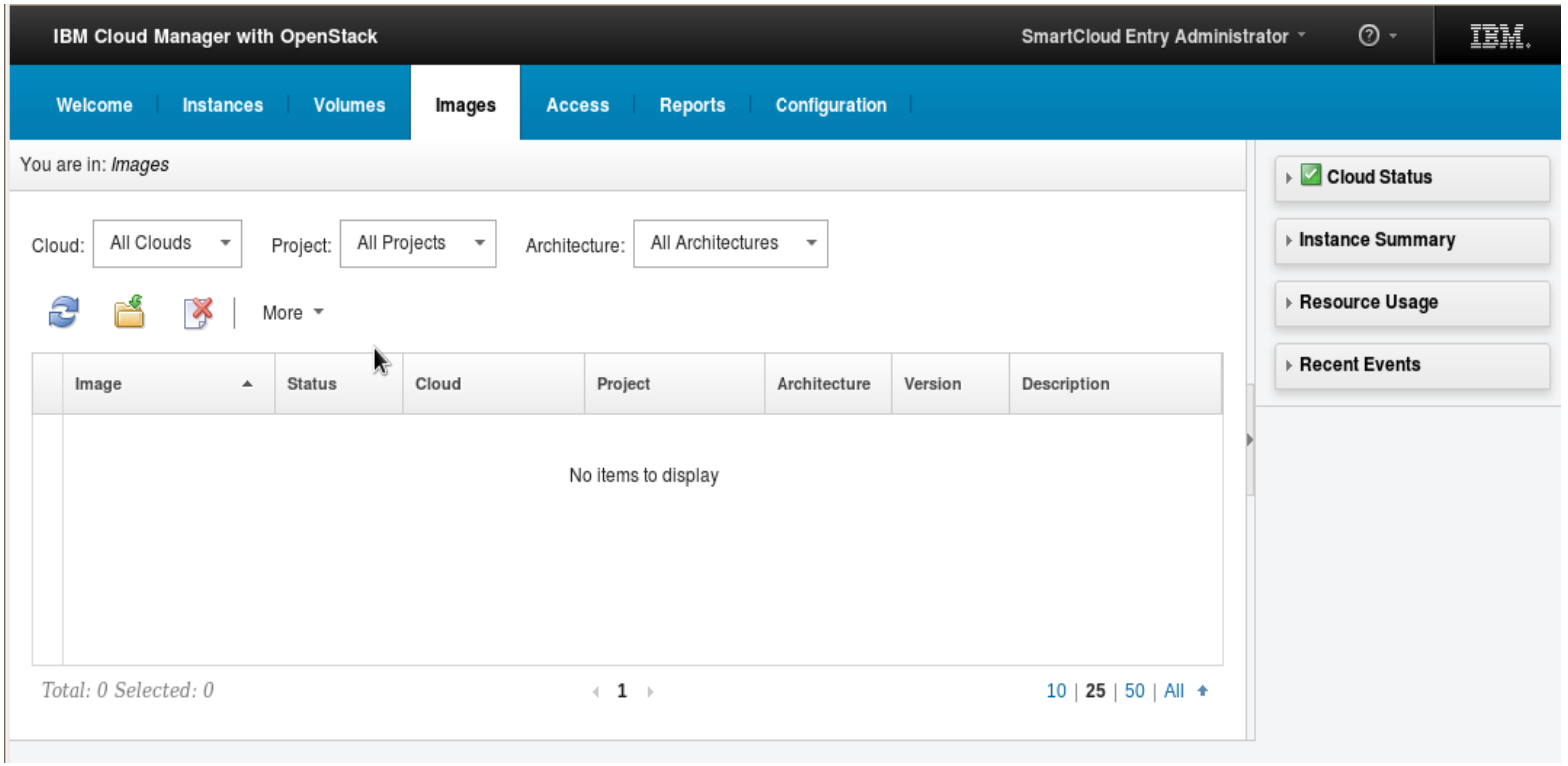
```
 Exporting rhel6.5-s390x-netboot-rh65m1profile to nova@9.12.22.218...
 Inside /install/imgexport.56447.2kDGVM.
 Compressing rhel6.5-s390x-netboot-rh65m1profile bundle.  Please be patient.
 Done!
 Moving the image bundle to the remote system location rhel6.5-s390x-netboot-
rh65m1profile.tgz

0
```

Virtual Server Image Capture – imgexport



Virtual Server Image Capture – Import Images

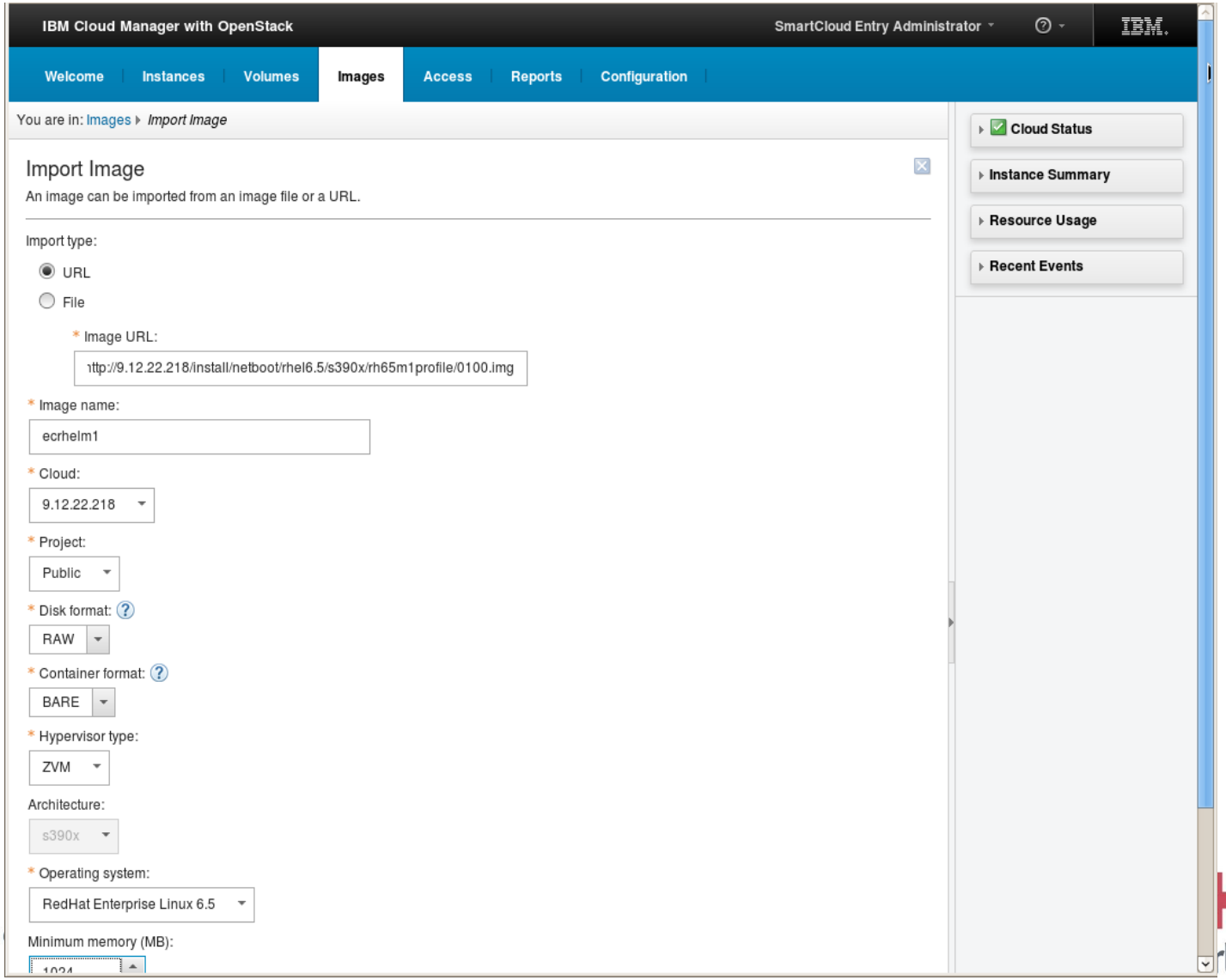


Virtual Server Image Capture -

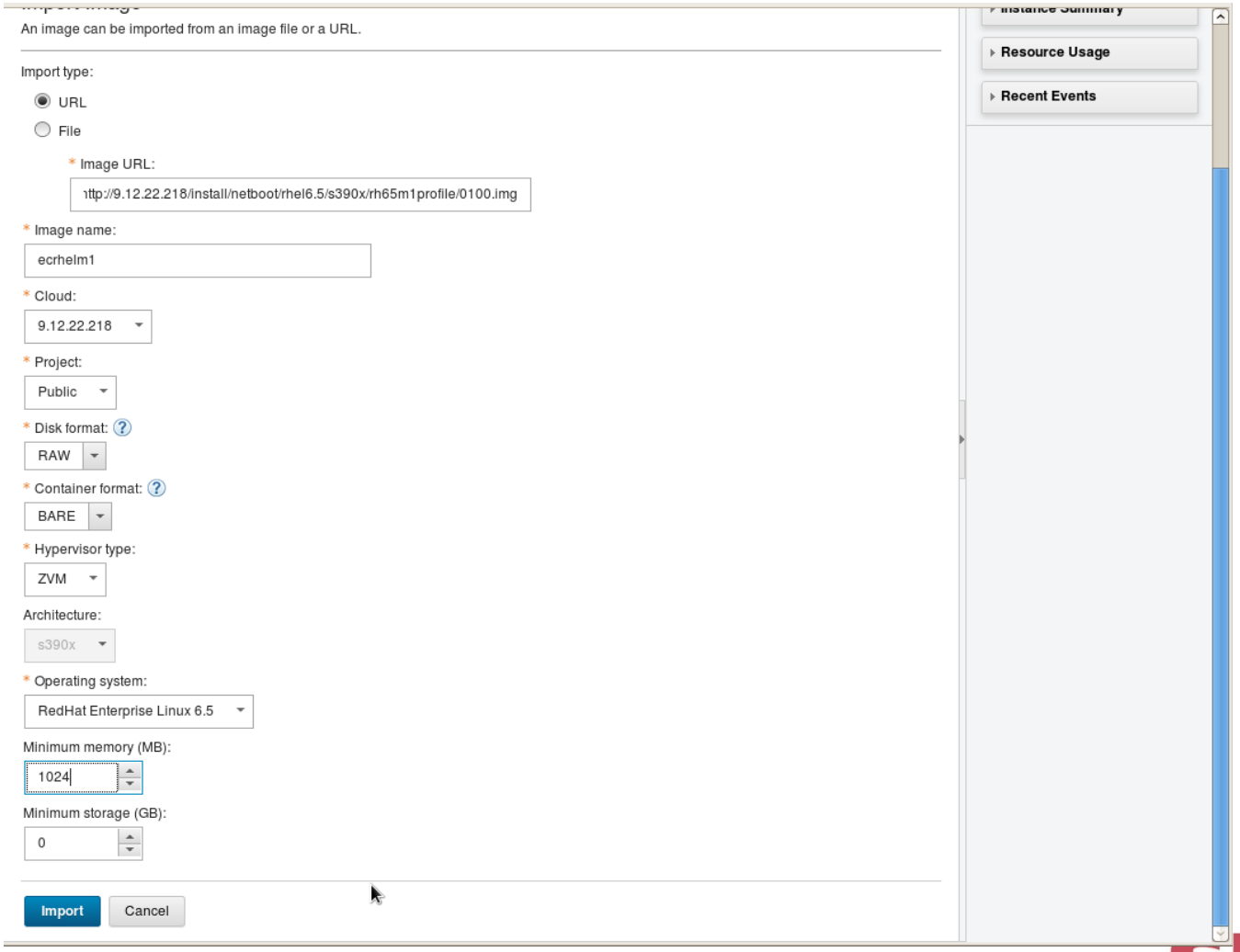
- Format of image import URL

http://<<xcat ip>>/install/netboot/rhel6.5/s390x/rh65m1profile/0100.img

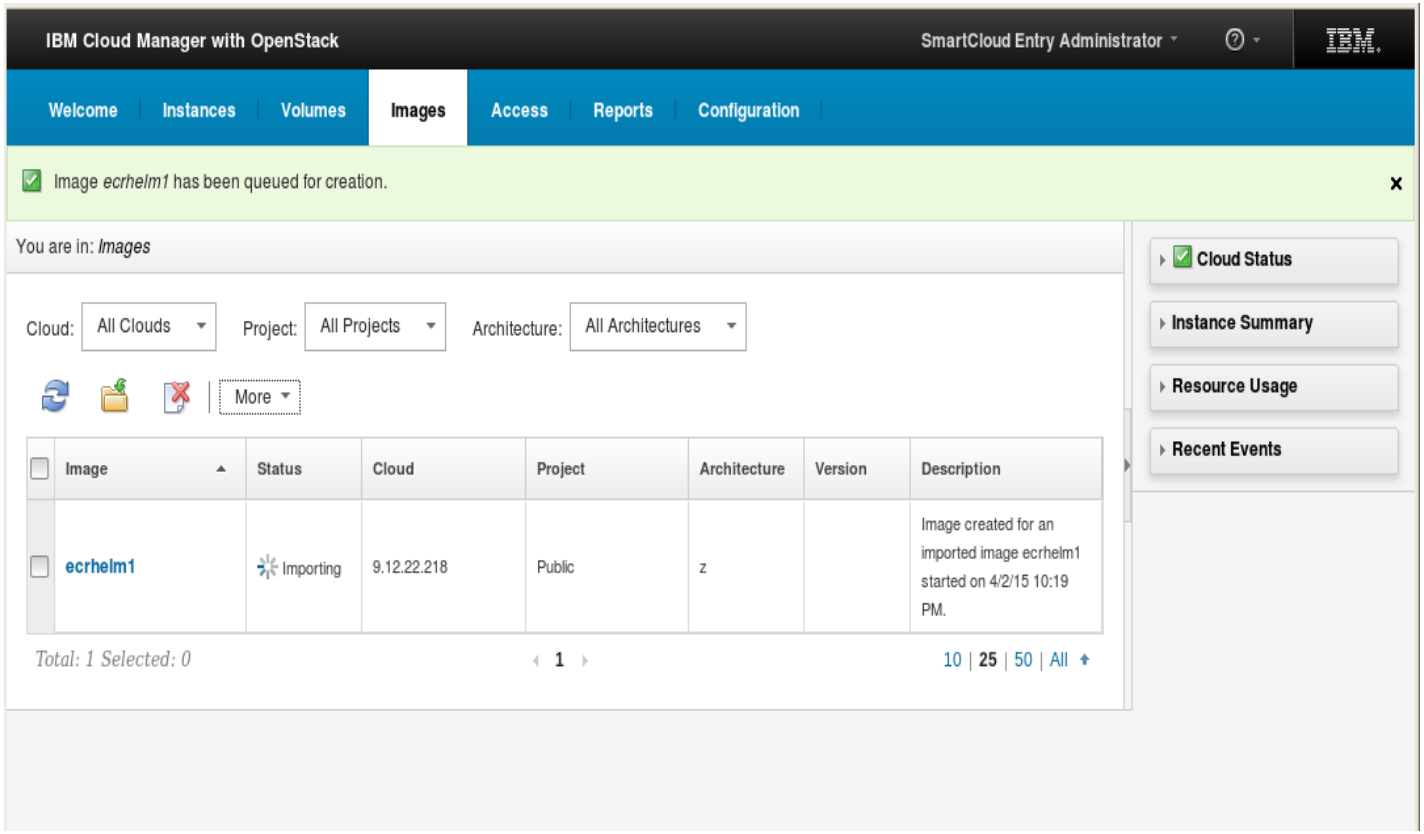
Virtual Server Image Capture – Import Details



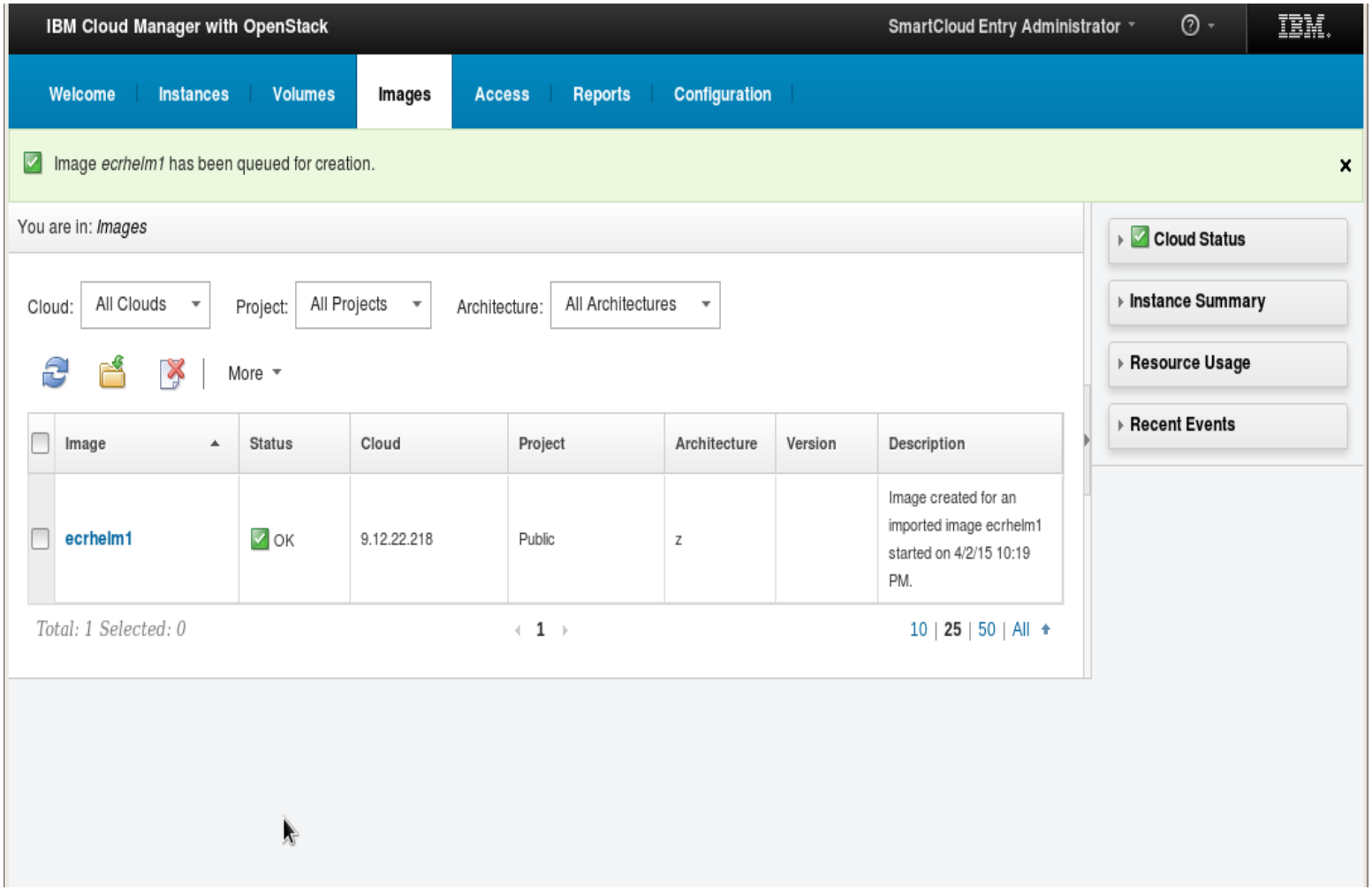
Virtual Server Image Capture – Import Details



Virtual Server Image Capture - Importing



Virtual Server Image Capture - Imported



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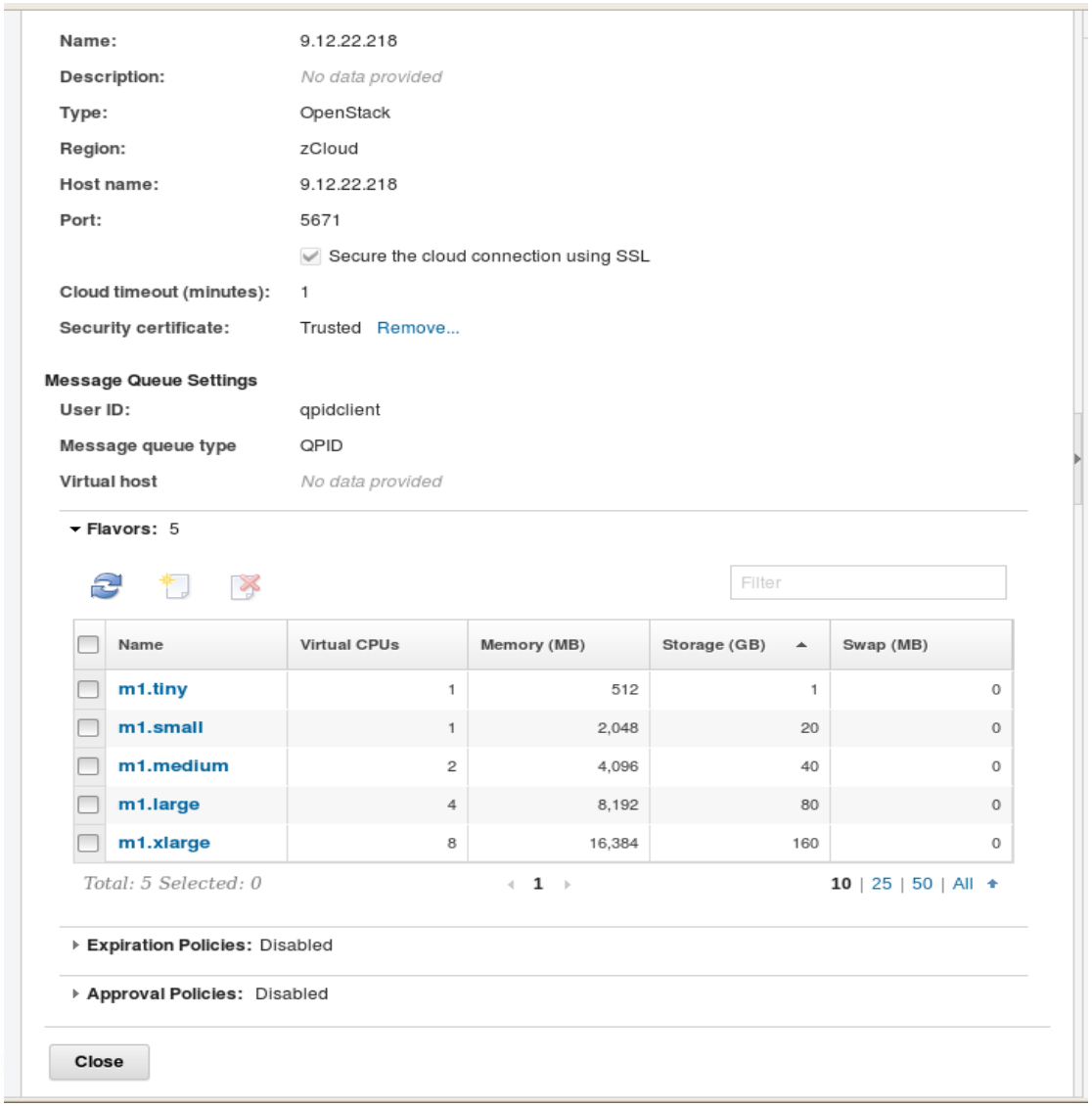
Installation & Customization – Flavors

- Default flavors
- Defined/modified via Web UI or command line
- Plan to define your own flavors

```
[ryoung@localhost ~]$ ssh mnadmin@9.12.22.218
mnadmin@9.12.22.218's password:
Last login: Thu Apr  2 13:27:48 2015 from 172.110.150.1
[mnadmin@xcat1 ~] $ source openrc
[mnadmin@xcat1 ~] $ nova flavor-list
+----+-----------+-----------+------+-----------+------+-------+-------------+-----------+
| ID | Name      | Memory_MB | Disk | Ephemeral | Swap | VCPUs | RXTX_Factor | Is_Public |
+----+-----------+-----------+------+-----------+------+-------+-------------+-----------+
| 1  | m1.tiny   | 512       | 1    | 0         |      | 1     | 1.0         | True      |
| 2  | m1.small  | 2048      | 20   | 0         |      | 1     | 1.0         | True      |
| 3  | m1.medium | 4096      | 40   | 0         |      | 2     | 1.0         | True      |
| 4  | m1.large  | 8192      | 80   | 0         |      | 4     | 1.0         | True      |
| 5  | m1.xlarge | 16384     | 160  | 0         |      | 8     | 1.0         | True      |
+----+-----------+-----------+------+-----------+------+-------+-------------+-----------+
```

Installation & Customization – Flavors

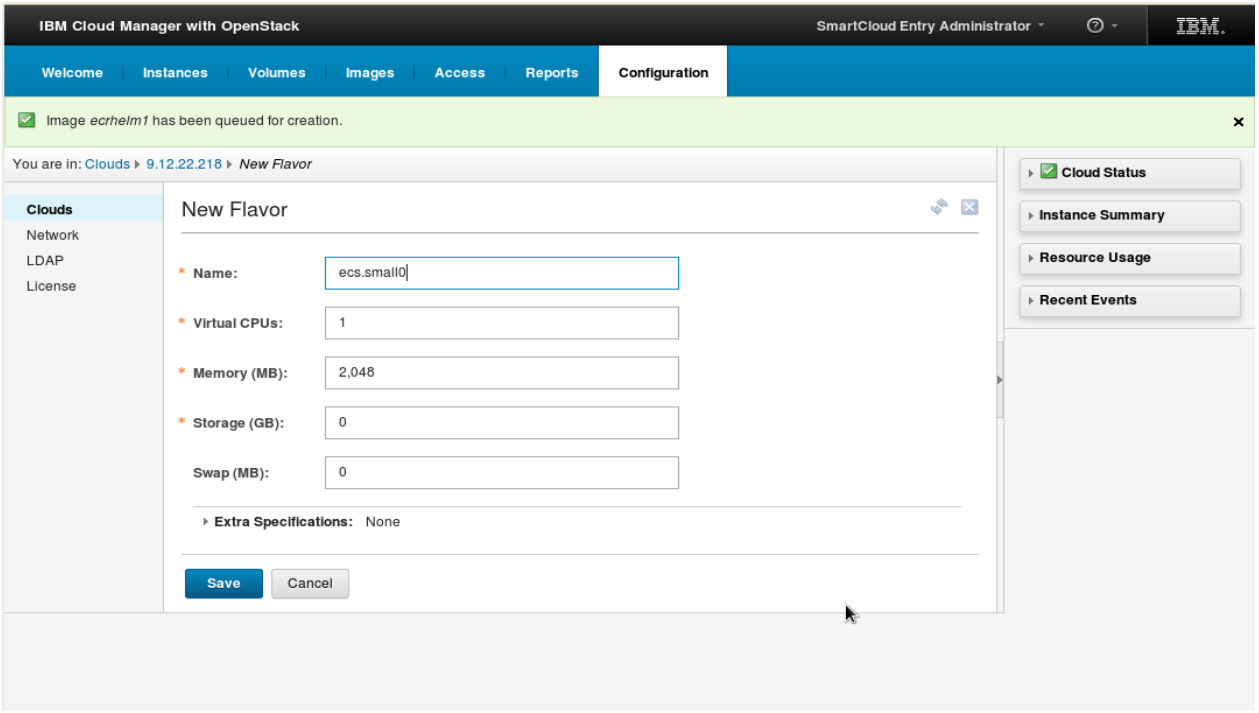


Flavor information available both via command interface and ICM UI

Must enable “edit” on the top of the page before the flavors can be modified

Installation & Customization – Flavors

- Flavor definition from ICM Web UI



Installation & Customization – Flavors

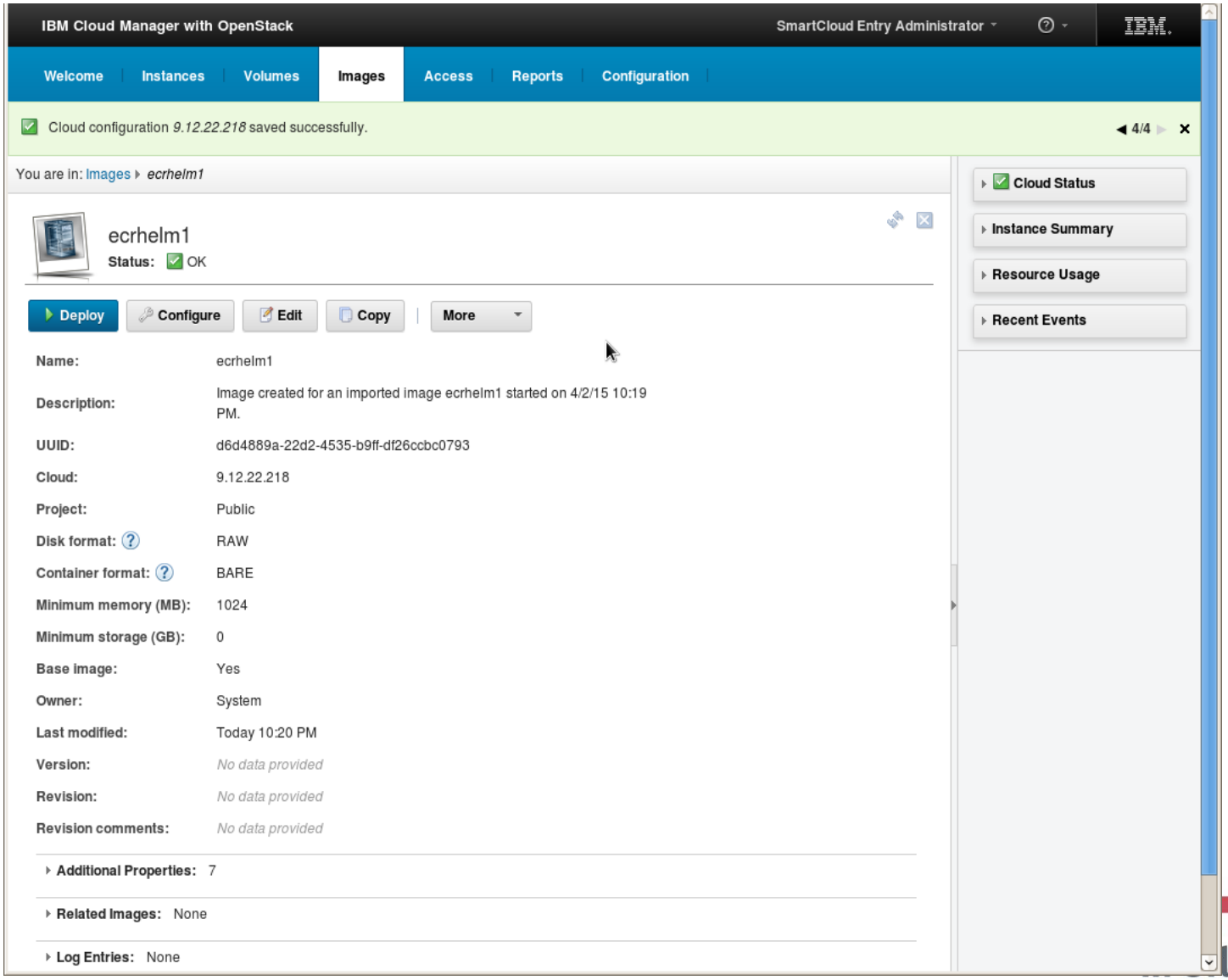
- Flavors defined in ICM UI are accessible via OpenStack CLI

```
[mnadmin@xcat1 ~] $ nova flavor-list
+--------------------------------------+------------+-----------+------+-----------+------+-------+-------------+-----------+
| ID                                   | Name       | Memory_MB | Disk | Ephemeral | Swap | VCPUs | RXTX_Factor | Is_Public |
+--------------------------------------+------------+-----------+------+-----------+------+-------+-------------+-----------+
| 1                                    | m1.tiny    | 512       | 1    | 0         |      | 1     | 1.0         | True      |
| 2                                    | m1.small   | 2048      | 20   | 0         |      | 1     | 1.0         | True      |
| 3                                    | m1.medium  | 4096      | 40   | 0         |      | 2     | 1.0         | True      |
| 4                                    | m1.large   | 8192      | 80   | 0         |      | 4     | 1.0         | True      |
| 5                                    | m1.xlarge  | 16384     | 160  | 0         |      | 8     | 1.0         | True      |
| 942605d2-12a6-4427-bc49-2374f3f1c1d3 | ecs.small0 | 2048      | 0    | 0         |      | 1     | 1.0         | True      |
+--------------------------------------+------------+-----------+------+-----------+------+-------+-------------+-----------+
[mnadmin@xcat1 ~] $
```

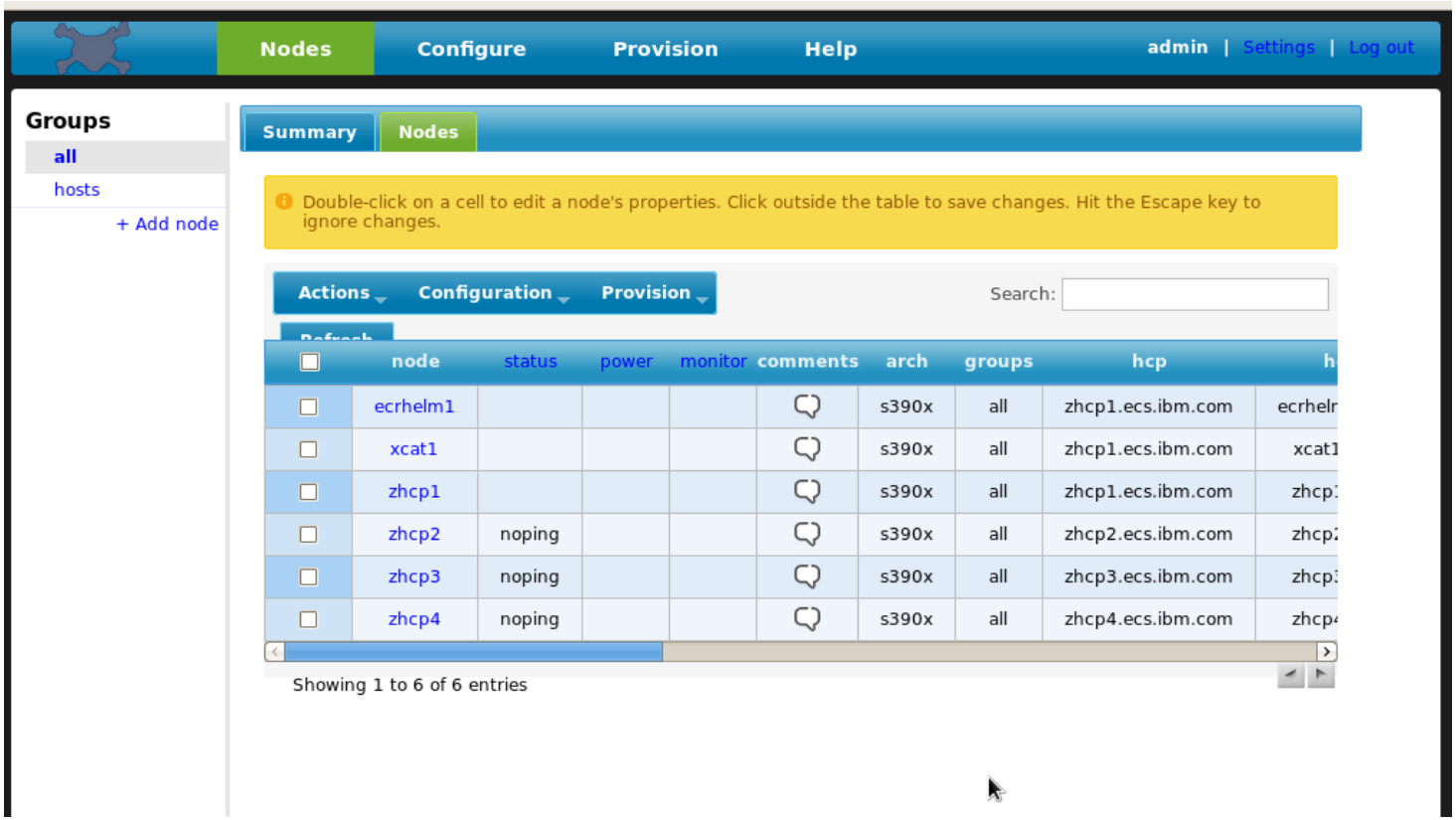
Installation & Customization – Flavors

```
[mnadmin@xcat1 ~] $ nova flavor-list
+--------------------------------------+------------+-----------+------+-----------+------+-------+-------------+-----------+
| ID                                   | Name       | Memory_MB | Disk | Ephemeral | Swap | VCPUs | RXTX_Factor | Is_Public |
+--------------------------------------+------------+-----------+------+-----------+------+-------+-------------+-----------+
| 1                                    | m1.tiny    | 512       | 1    | 0         |      | 1     | 1.0         | True      |
| 2                                    | m1.small   | 2048      | 20   | 0         |      | 1     | 1.0         | True      |
| 3                                    | m1.medium  | 4096      | 40   | 0         |      | 2     | 1.0         | True      |
| 4                                    | m1.large   | 8192      | 80   | 0         |      | 4     | 1.0         | True      |
| 5                                    | m1.xlarge  | 16384     | 160  | 0         |      | 8     | 1.0         | True      |
| 942605d2-12a6-4427-bc49-2374f3f1c1d3 | ecs.small0 | 2048      | 0    | 0         |      | 1     | 1.0         | True      |
+--------------------------------------+------------+-----------+------+-----------+------+-------+-------------+-----------+
[mnadmin@xcat1 ~] $
[mnadmin@xcat1 ~] $ nova flavor-create ecs.medium0 7 4096 0 2
+----+-------------+-----------+------+-----------+------+-------+-------------+-----------+
| ID | Name        | Memory_MB | Disk | Ephemeral | Swap | VCPUs | RXTX_Factor | Is_Public |
+----+-------------+-----------+------+-----------+------+-------+-------------+-----------+
| 7  | ecs.medium0 | 4096      | 0    | 0         |      | 2     | 1.0         | True      |
+----+-------------+-----------+------+-----------+------+-------+-------------+-----------+
[mnadmin@xcat1 ~] $ nova flavor-list
+--------------------------------------+-------------+-----------+------+-----------+------+-------+-------------+-----------+
| ID                                   | Name        | Memory_MB | Disk | Ephemeral | Swap | VCPUs | RXTX_Factor | Is_Public |
+--------------------------------------+-------------+-----------+------+-----------+------+-------+-------------+-----------+
| 1                                    | m1.tiny     | 512       | 1    | 0         |      | 1     | 1.0         | True      |
| 2                                    | m1.small    | 2048      | 20   | 0         |      | 1     | 1.0         | True      |
| 3                                    | m1.medium   | 4096      | 40   | 0         |      | 2     | 1.0         | True      |
| 4                                    | m1.large    | 8192      | 80   | 0         |      | 4     | 1.0         | True      |
| 5                                    | m1.xlarge   | 16384     | 160  | 0         |      | 8     | 1.0         | True      |
| 7                                    | ecs.medium0 | 4096      | 0    | 0         |      | 2     | 1.0         | True      |
| 942605d2-12a6-4427-bc49-2374f3f1c1d3 | ecs.small0  | 2048      | 0    | 0         |      | 1     | 1.0         | True      |
+--------------------------------------+-------------+-----------+------+-----------+------+-------+-------------+-----------+
[mnadmin@xcat1 ~] $
```

Imported Image

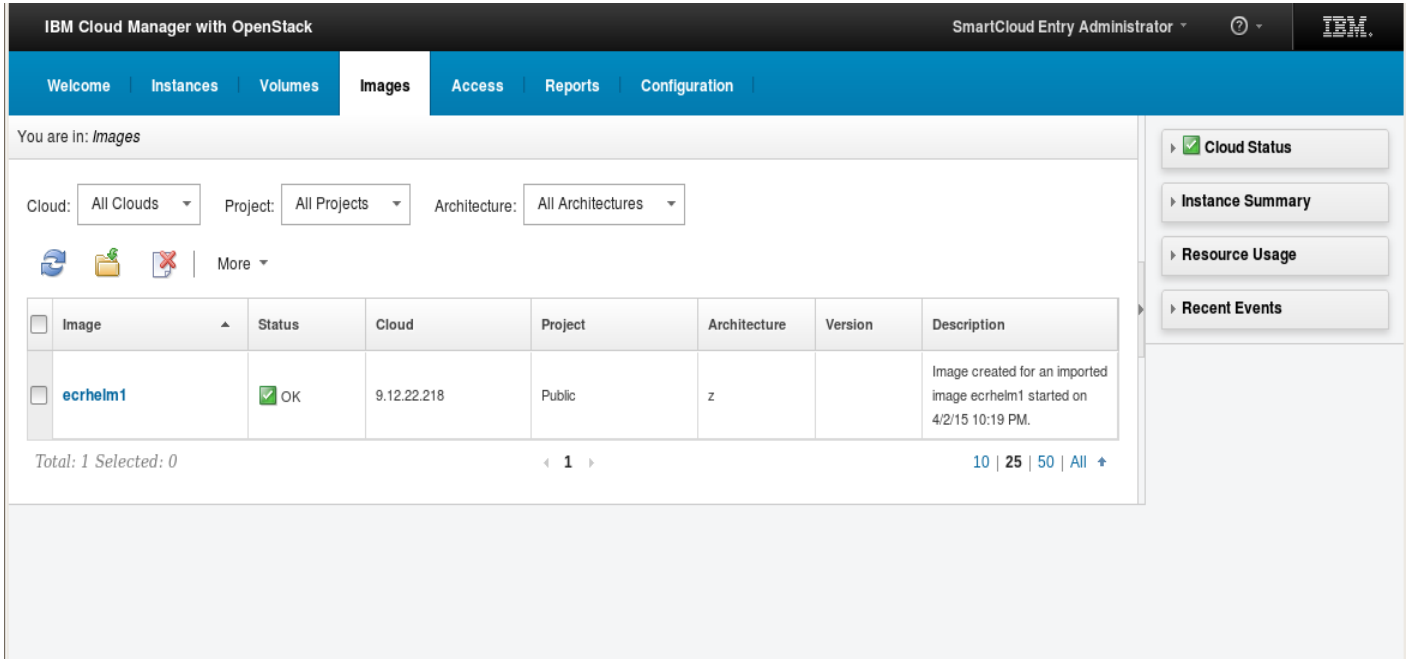


Deploy – Predeploy state

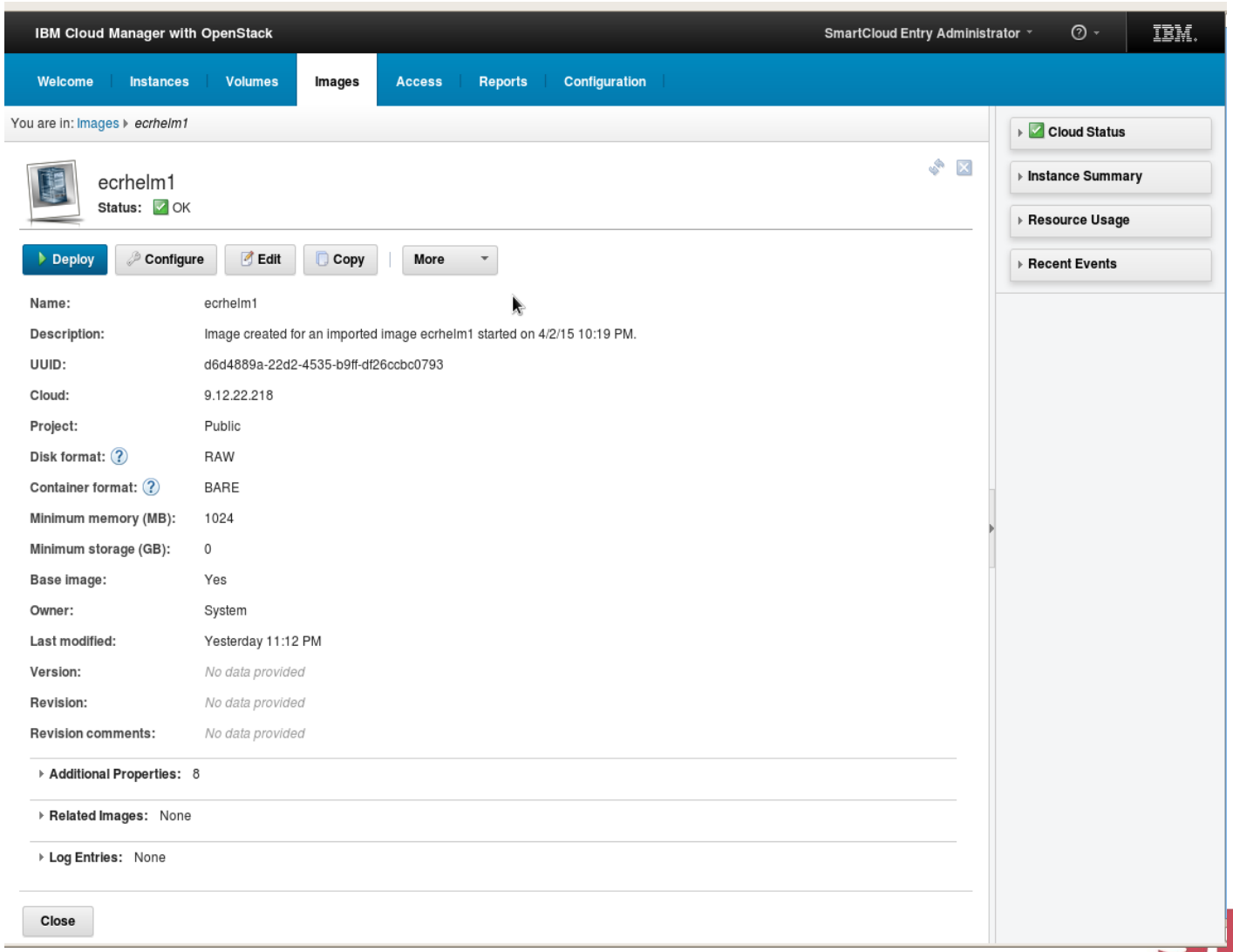


Deploy – Select image to be deploy

- Double click on image you want to deploy

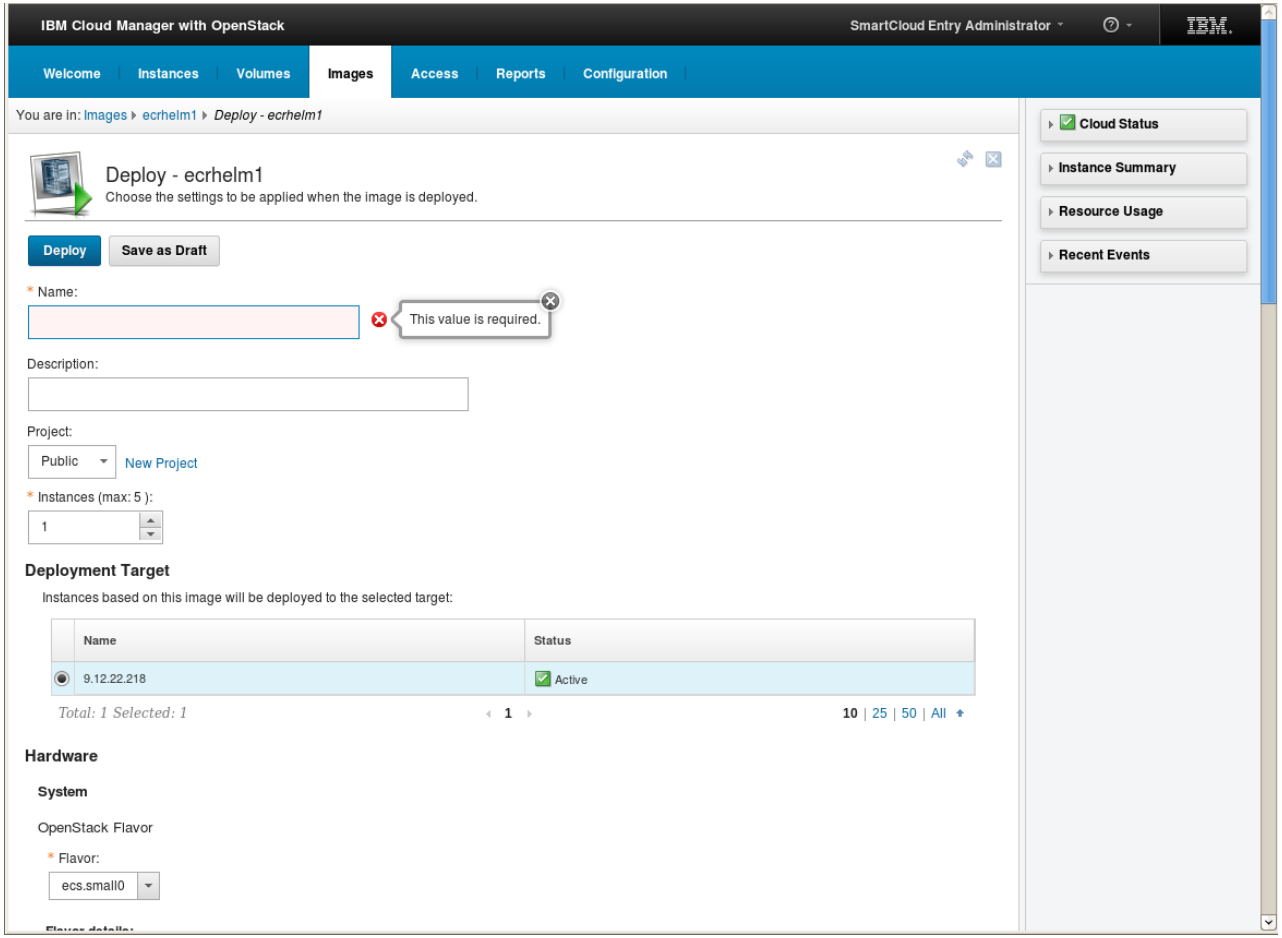


Deployment



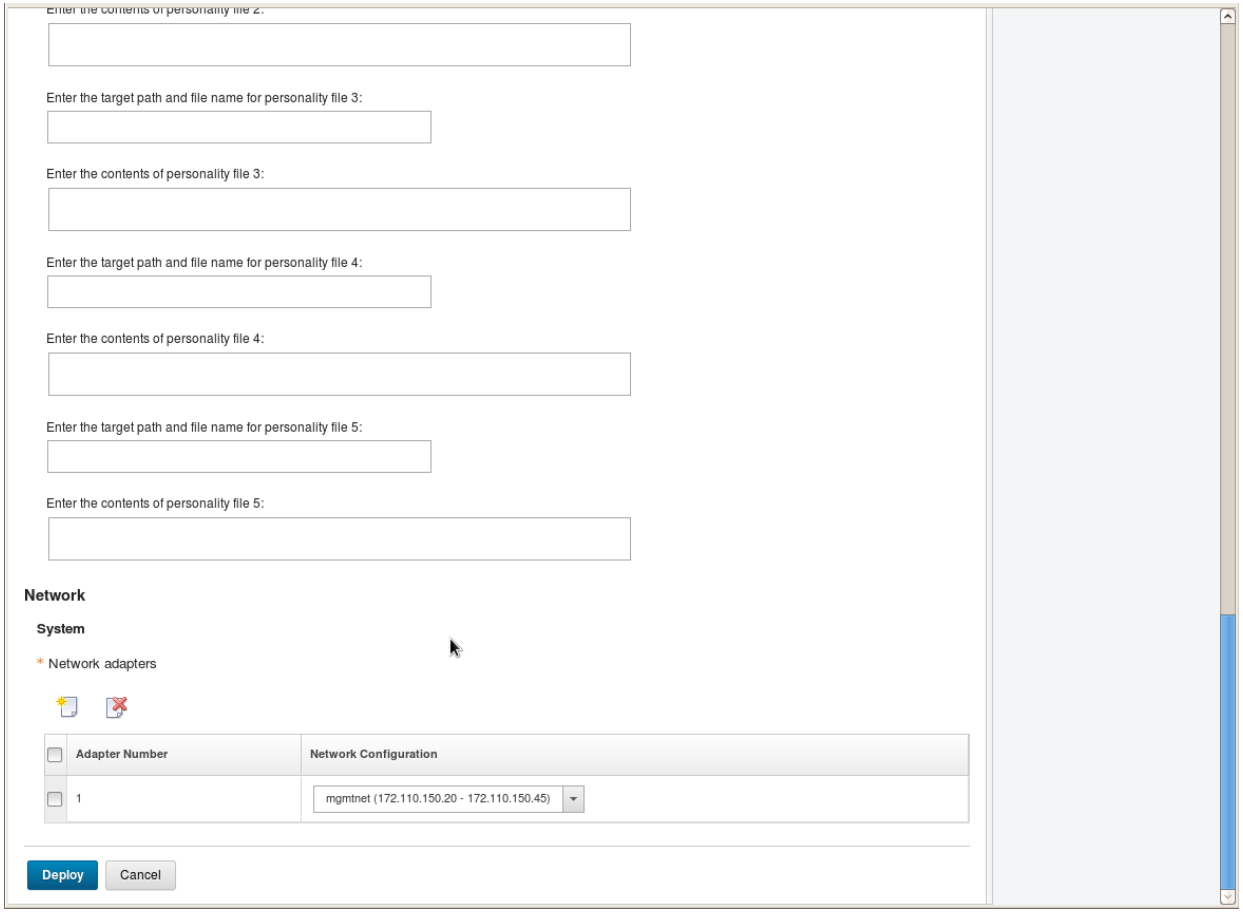
Either use “Deploy” button or “Advanced Deploy” under “More” button

Deployment



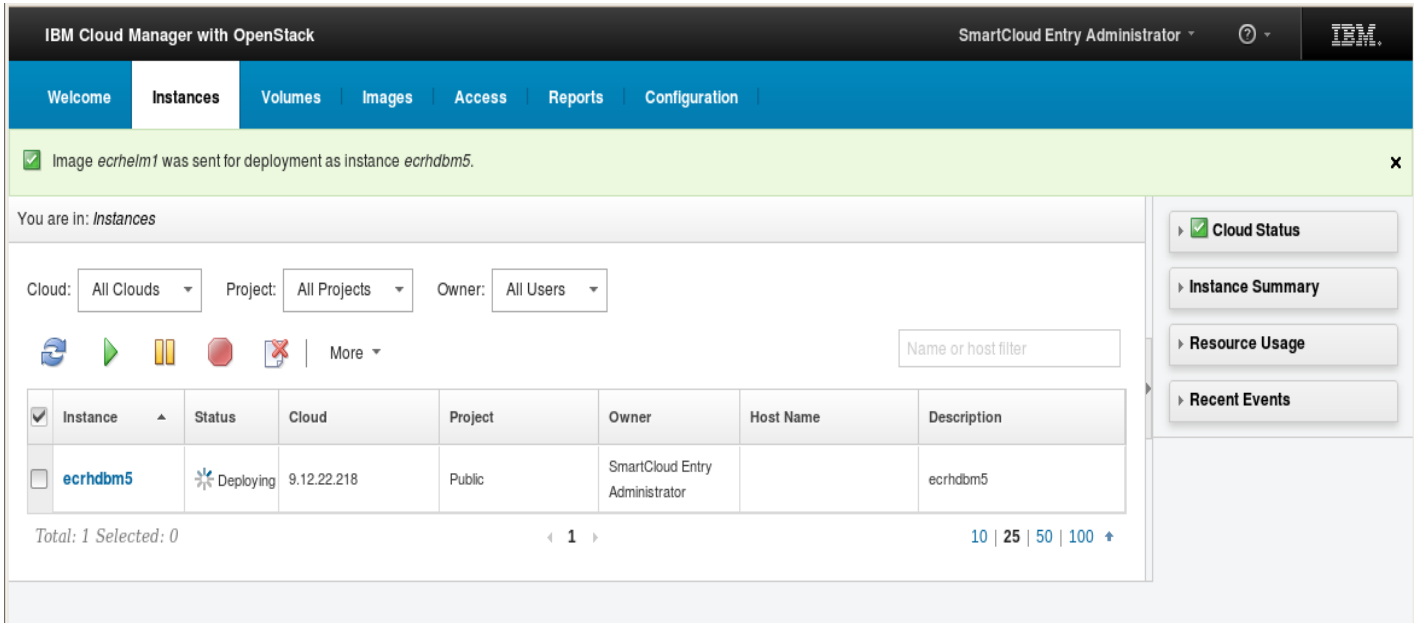
- Name used here will NOT be guest name.
- Guest name is a prefix with an increment suffix
- Select the desired flavor and network(s)

Deployment



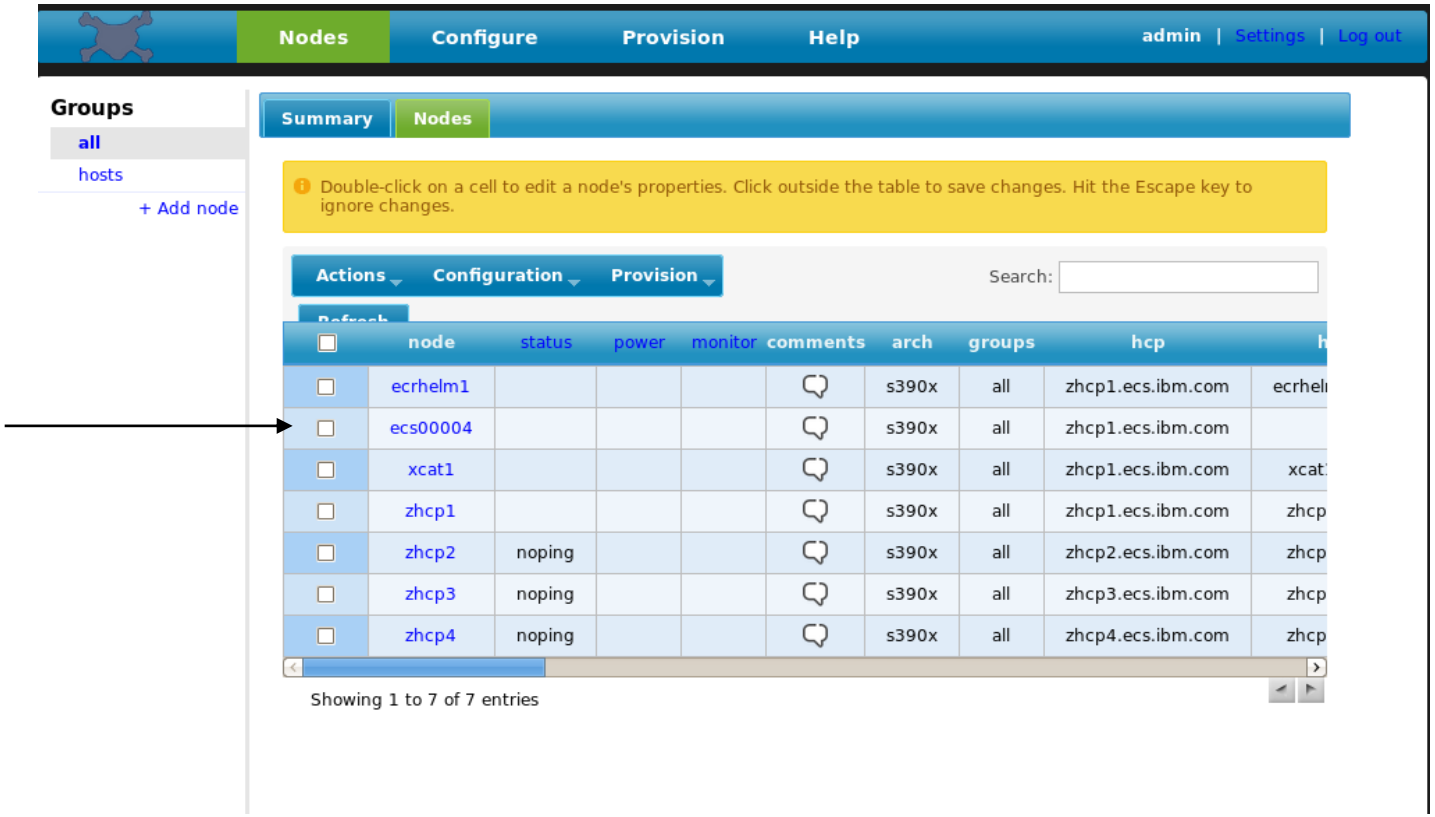
- You can add additional network adapters
- Select the desired subnet range

Deploy – Deployment in Progress



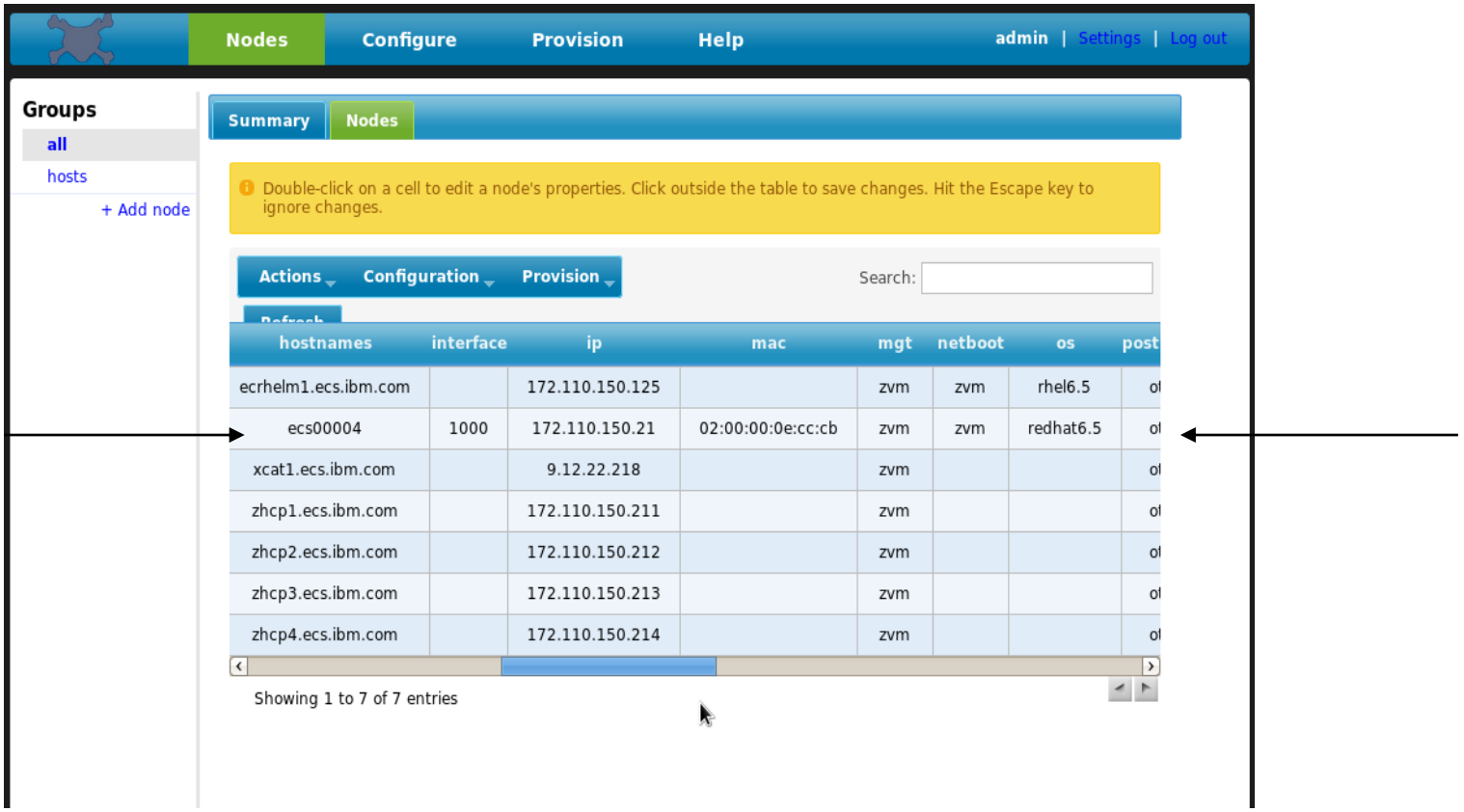
When you submit your deployment you are taken to the instances screen where you can track the progress (Click refresh button)

Deploy – Deployment in Progress



When a directory entry is crated you can see the new guest in the xCAT UI

Deploy – Deployment in Progress



You can see the IP and MAC details once the guest is started, before that the disk image is being installed

Deploy – Deployment in Progress

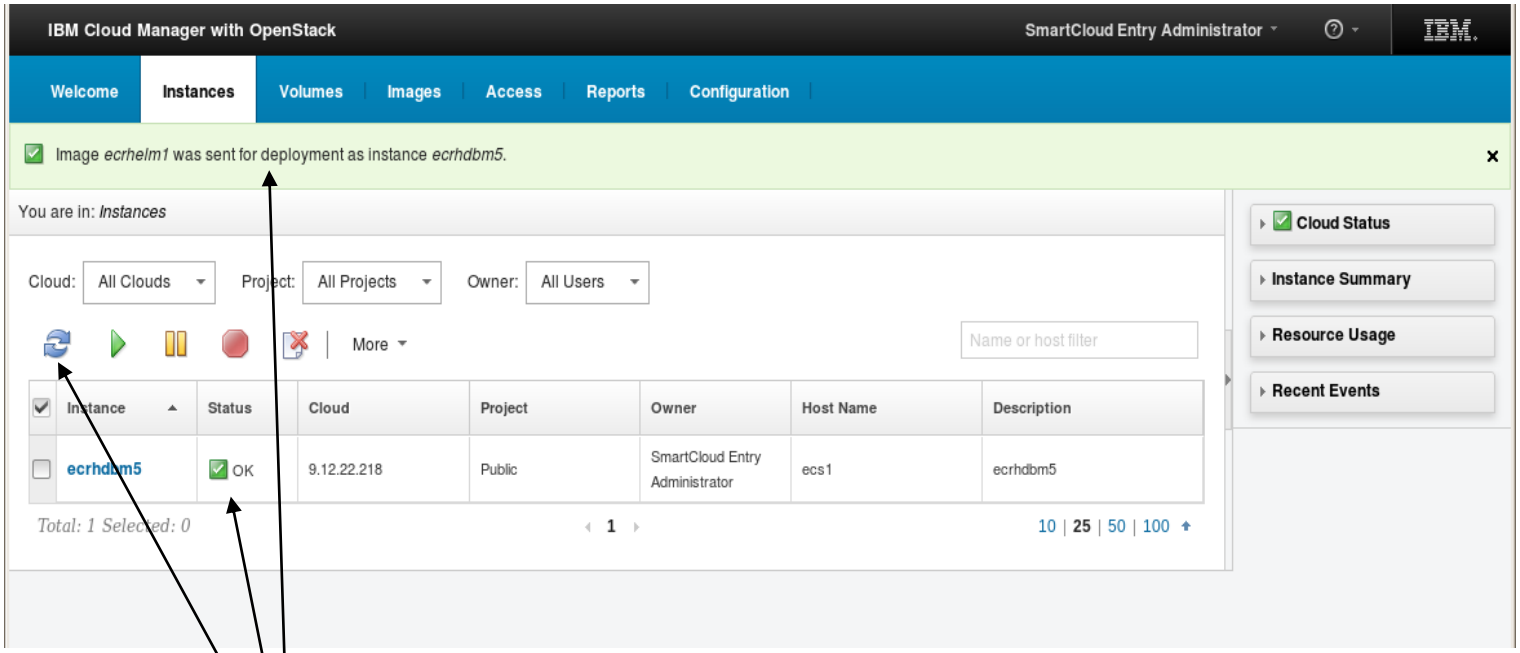
```
q ecs00004
HCPCQU045E ECS00004 not logged on
Ready(00045); T=0.01/0.01 19:52:47
rac lu ecs00004
USER=ECS00004  NAME=UNKNOWN  OWNER=DIRMAINT  CREATED=15.093
 DEFAULT-GROUP=LINUX    PASSDATE=00.000 PASS-INTERVAL=254 PHRASEDATE=N/A
 ATTRIBUTES=NONE
 REVOKE DATE=NONE   RESUME DATE=NONE
 LAST-ACCESS=UNKNOWN
 CLASS AUTHORIZATIONS=NONE
 NO-INSTALLATION-DATA
 NO-MODEL-NAME
 LOGON ALLOWED   (DAYS)          (TIME)
 ---------------------------------------------
 ANYDAY                          ANYTIME
  GROUP=SYS1      AUTH=USE      CONNECT-OWNER=DIRMAINT  CONNECT-DATE=15.093
    CONNECTS=    00  UACC=NONE     LAST-CONNECT=UNKNOWN
    CONNECT ATTRIBUTES=NONE
    REVOKE DATE=NONE   RESUME DATE=NONE
  GROUP=LINUX     AUTH=USE      CONNECT-OWNER=DIRMAINT  CONNECT-DATE=15.093
    CONNECTS=    00  UACC=NONE     LAST-CONNECT=UNKNOWN
    CONNECT ATTRIBUTES=NONE
    REVOKE DATE=NONE   RESUME DATE=NONE
SECURITY-LEVEL=NONE SPECIFIED
CATEGORY-AUTHORIZATION
 NONE SPECIFIED
SECURITY-LABEL=NONE SPECIFIED
Ready; T=0.01/0.01 19:53:12
                                                          RUNNING   ECS1
                                  MA                                043/004
```

You can use the DVHXUN user exit to assign a RACF group to a given guest name prefix.

In my example, that is how I grant access to the proper virtual switch

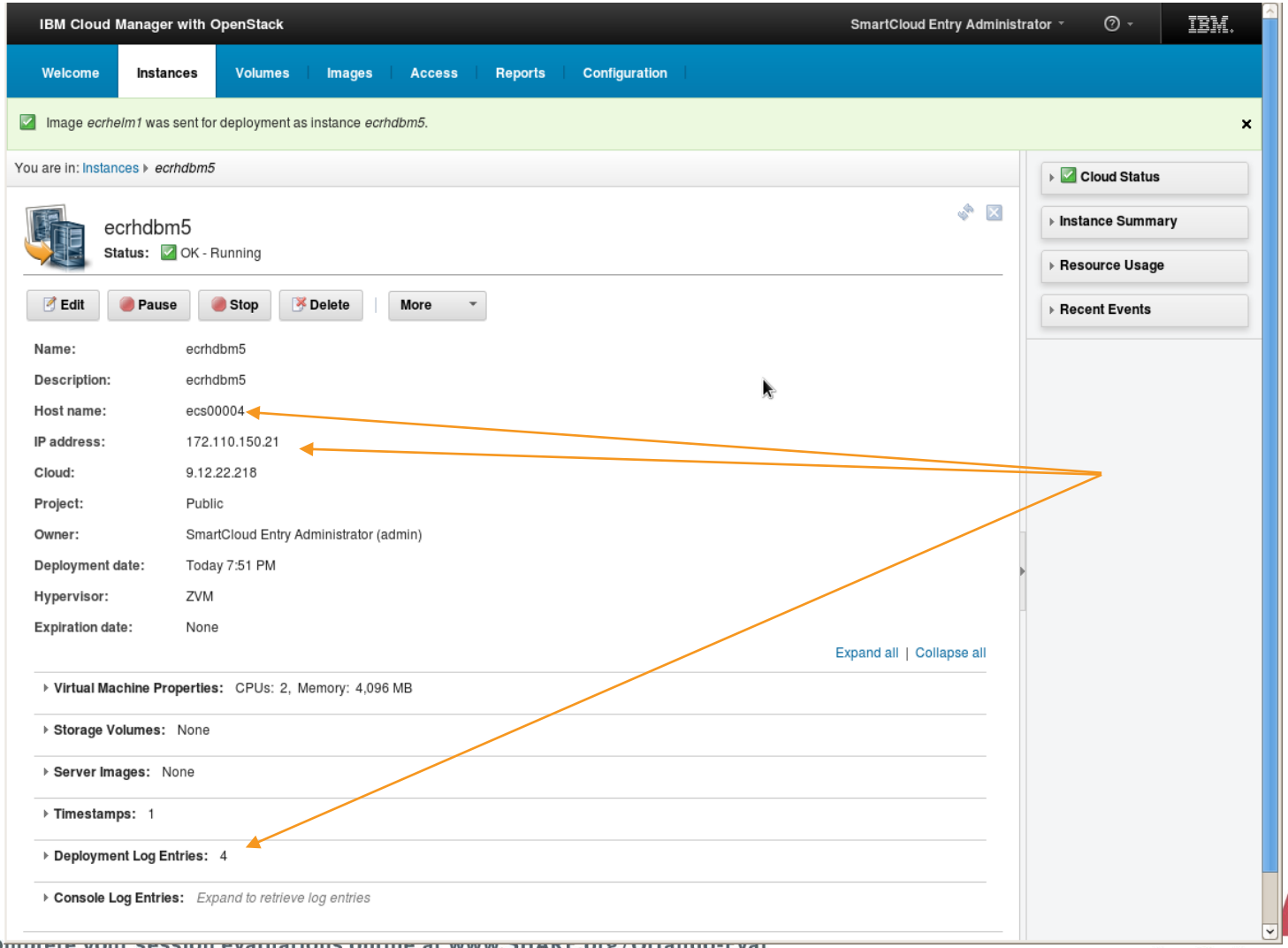
ICM, ICO, Wave have no direct RACF integration

Deploy – Deployment Complete



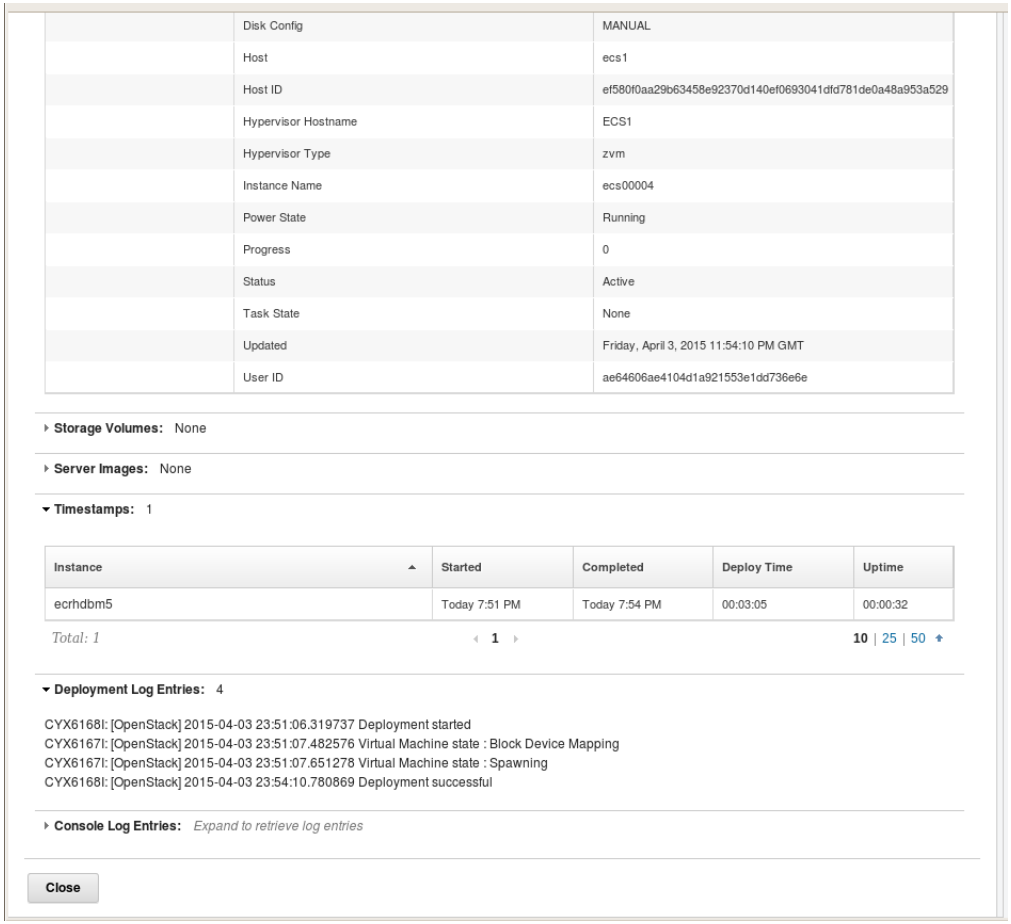
- ICM does not autorefresh the instance page.
- When you deployment is finished it should look similar to what you see here

Deploy – Deployment Complete



Complete your session evaluations online at www.SHARE.org/Orlando-Eval

Deploy – Deployment Complete



Disk Config	MANUAL
Host	ecs1
Host ID	ef580f0aa29b63458e92370d140ef0693041dfd781de0a48a953a529
Hypervisor Hostname	ECS1
Hypervisor Type	zvm
Instance Name	ecs00004
Power State	Running
Progress	0
Status	Active
Task State	None
Updated	Friday, April 3, 2015 11:54:10 PM GMT
User ID	ae64606ae4104d1a921553e1dd736e6e

Storage Volumes: None

Server Images: None

Timestamps: 1

Instance	Started	Completed	Deploy Time	Uptime
ecrhdbm5	Today 7:51 PM	Today 7:54 PM	00:03:05	00:00:32

Total: 1 1 **10** | 25 | 50

Deployment Log Entries: 4

CYX6168I: [OpenStack] 2015-04-03 23:51:06.319737 Deployment started
CYX6167I: [OpenStack] 2015-04-03 23:51:07.482576 Virtual Machine state : Block Device Mapping
CYX6167I: [OpenStack] 2015-04-03 23:51:07.651278 Virtual Machine state : Spawning
CYX6168I: [OpenStack] 2015-04-03 23:54:10.780869 Deployment successful

Console Log Entries: *Expand to retrieve log entries*

Close

Deployment log reports completion in about 3 minutes

Deploy – Deployment Complete – OS CLI Details

```
[mnadmin@xcat1 nova] $ nova list --all-tenants
+--------------------------------------+----------+--------+------------+-------------+------------------------+
| ID                                   | Name     | Status | Task State | Power State | Networks               |
+--------------------------------------+----------+--------+------------+-------------+------------------------+
| 87535582-063c-4256-895b-fc16135b9352 | ecrhdbm5 | ACTIVE | -          | Running     | mgmtnet=172.110.150.21 |
+--------------------------------------+----------+--------+------------+-------------+------------------------+
[mnadmin@xcat1 nova] $ nova show  87535582-063c-4256-895b-fc16135b9352
+--------------------------------------+----------------------------------------------------------------+
| Property                             | Value                                                          |
+--------------------------------------+----------------------------------------------------------------+
| OS-DCF:diskConfig                    | MANUAL                                                         |
| OS-EXT-AZ:availability_zone          | nova                                                           |
| OS-EXT-SRV-ATTR:host                 | ecs1                                                           |
| OS-EXT-SRV-ATTR:hypervisor_hostname  | ECS1                                                           |
| OS-EXT-SRV-ATTR:instance_name        | ecs00004                                                       |
| OS-EXT-STS:power_state               | 1                                                              |
| OS-EXT-STS:task_state                | -                                                              |
| OS-EXT-STS:vm_state                  | active                                                         |
| OS-SRV-USG:launched_at               | 2015-04-03T23:54:10.000000                                     |
| OS-SRV-USG:terminated_at             | -                                                              |
| accessIPv4                           |                                                                |
| accessIPv6                           |                                                                |
| config_drive                         | True                                                           |
| created                              | 2015-04-03T23:51:05Z                                           |
| flavor                               | ecs.medium0 (7)                                                |
| hostId                               | ef580f0aa29b63458e92370d140ef0693041dfd781de0a48a953a529       |
| id                                   | 87535582-063c-4256-895b-fc16135b9352                           |
| image                                | ecrhelm1 (d6d4889a-22d2-4535-b9ff-df26ccbc0793)                |
| key_name                             | -                                                              |
| metadata                             | {"dsmode": "local", "description": "ecrhdbm5"}                 |
| mgmtnet network                      | 172.110.150.21                                                 |
| name                                 | ecrhdbm5                                                       |
| os-extended-volumes:volumes_attached | []                                                             |
| progress                             | 0                                                              |
| security_groups                      | default                                                        |
| status                               | ACTIVE                                                         |
| tenant_id                            | a473b51628ad40b9a739be3a08957ca9                               |
| updated                              | 2015-04-03T23:54:10Z                                           |
| user_id                              | ae64606ae4104d1a921553e1dd736e6e                               |
+--------------------------------------+----------------------------------------------------------------+
```

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SHARE in Orlando 2015

ICM Session Agenda

- IBM Cloud Manager and OpenStack
- Architecture on z Systems
- Installation and Customization
  - DMSSICNF and DMSSICMO
  - Appliance
- Virtual Server Requirements
- Virtual Server Image Capture
- Virtual Server Deployment
- **SMTP Notifications**
- LDAP Authentication

- Chef Server, Client, Recipes
- Resources and References

ICM Appliance Notification

- Email notifications possible via SMTP
- General distinction between admins and users
- Update email address for the default “admin” userid
- Notifications sent for a variety of conditions
  - Deployment start
  - Deployment succeeded or failed
  - LDAP user logged in the first time (auto registered)

ICM appliance email notification setup

- ssh to virtual appliance
- sudo vi /data/sce/
- Enter SMTP server IP and port
- Validate TCPIP connectivity
- Restart appliance

- Emails notifications for events such as:
  - New LDAP User
  - Virtual Server Start
  - Deployment Completed

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ICM Directory Configuration

- LDAP directory configuration
- Support for users and administrators
- Provisions for anonymous and authenticated directory searches
- Configuration directly against the ldap.xml is deprecated
- Preferred method of configuration is the web UI
- All features can NOT be configured via the Web UI

- ssh in to the virtual appliance
- sudo vi /data/sce/ldap.xml

ICM Directory Configuration

sudo vi /data/sce/ldap.xml

```
<?xml version="1.0" encoding="UTF-8"?><config>
   <host>ldap://192.168.4.10:389</host>
   <userNameCaseSensitive>true</userNameCaseSensitive>
   <enableSecureConnection>false</enableSecureConnection>
   <step>
      <searchFilter>(|(notesShortName={FILTER}))</searchFilter>
      <searchContext>ou=bluepages,o=ibm.com</searchContext>
      <outputs>
         <output attribute="email">
            <get>mail</get>
         </output>
         <output attribute="fullname">
            <get>callupname</get>
         </output>
         <output attribute="shortname">
            <get>notesShortName</get>
         </output>
      </outputs>
   </step>
   <step>
      <authDN>{PERSON_DN}</authDN>
   </step>
</config>
```

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Cinder

- Cinder can eliminate the need to go to a storage administrator for every LUN requested and save days in the server provisioning process
- For Linux on z, cinder can automatically define and authorize guest access to LUNs in a Storewise V7000 storage pool (predefined)
- These LUN definitions are independent of any guest allocation when created
- Defined LUNs can be attached/detach to/from guests
- Cinder defined LUNs can be expanded as needed
- LUNs made available via DEDICATED FCP devices are NOT EDEVs
- It uses FCP devices from a pool defined in DMSSICMO
- Additional information in DMSSICMO is copied to /etc/cinder/cinder.conf
- NPIV SAN switch zoning must still be performed manually, but that can be a one time up front effort independent of individual server allocations

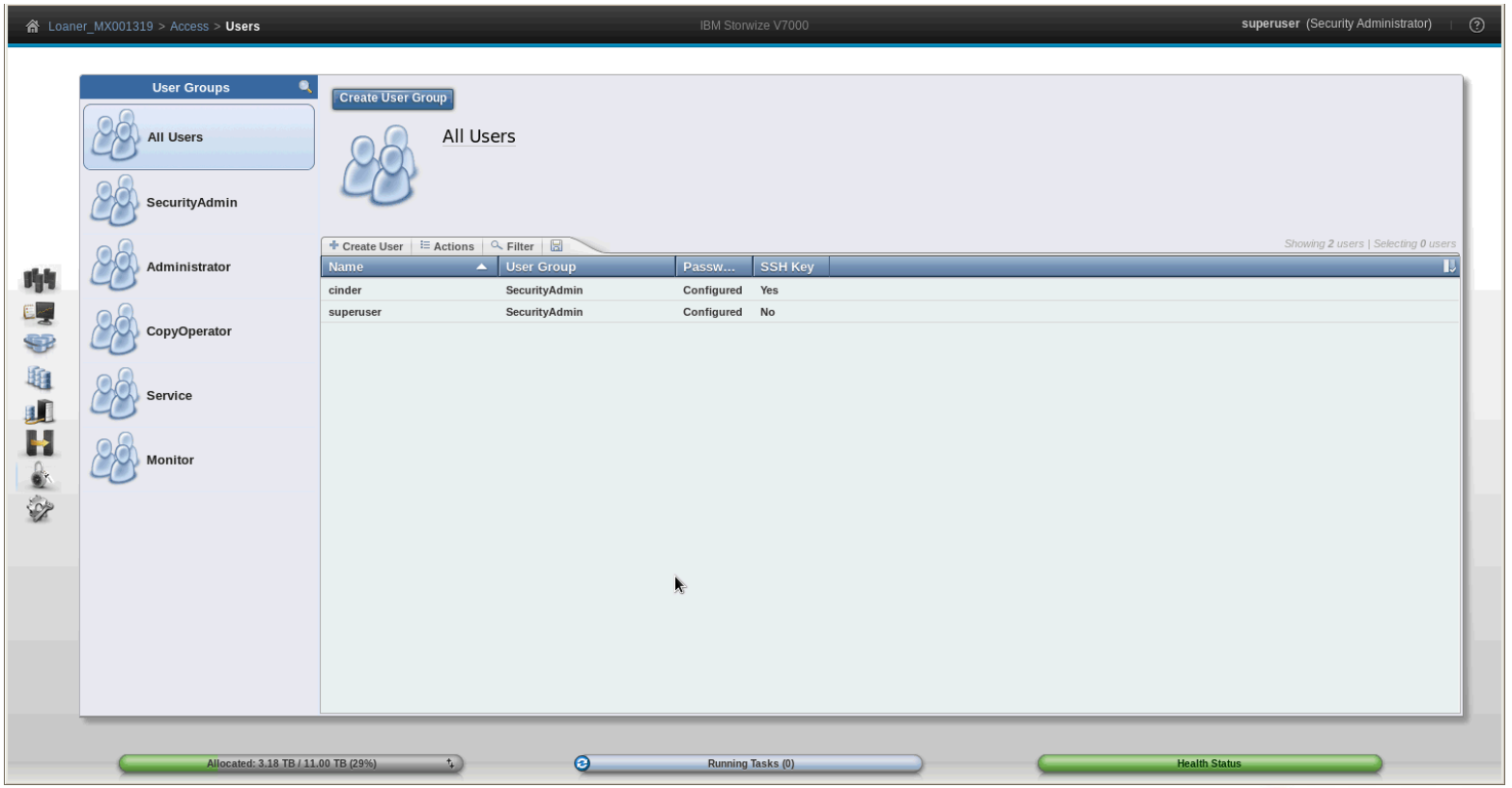
Cinder

- Sample DMSSICMO with Cinder information included
- Public/private key pair are RSA keys not DSA or ECSDA
- Private key in the home directory of mnadmin

```
/*********************************************************************/
/* CMO User Configurable Settings                                    */
/*********************************************************************/
cmo_admin_password                  = "zlinux"
cmo_data_disk                       = "EC501C EC5011"
openstack_system_role               = "controller"
openstack_controller_address        = "192.168.1.71"
openstack_zvm_diskpool              = "FBA:LINUXP"
openstack_instance_name_template    = "ecs%05x"
openstack_zvm_fcp_list              = "EA01-EA1E"
openstack_zvm_timeout               = "999"
openstack_zvm_scsipool               = "NONE"
openstack_zvm_zhcp_fcp_list         = "EA1F"
openstack_san_ip                    = "192.168.1.31"
openstack_san_private_key           = "id_rsa"
openstack_storwize_svc_volpool_name = "cinderflash"
openstack_storwize_svc_vol_iogrp    = "0"
openstack_zvm_image_default_password = "zlinux"
openstack_xcat_mgt_ip               = "NONE"
openstack_xcat_mgt_mask             = "NONE"
openstack_zvm_xcat_master           = "ecsvm1"
openstack_zvm_vmrelocate_force      = "NONE"
```

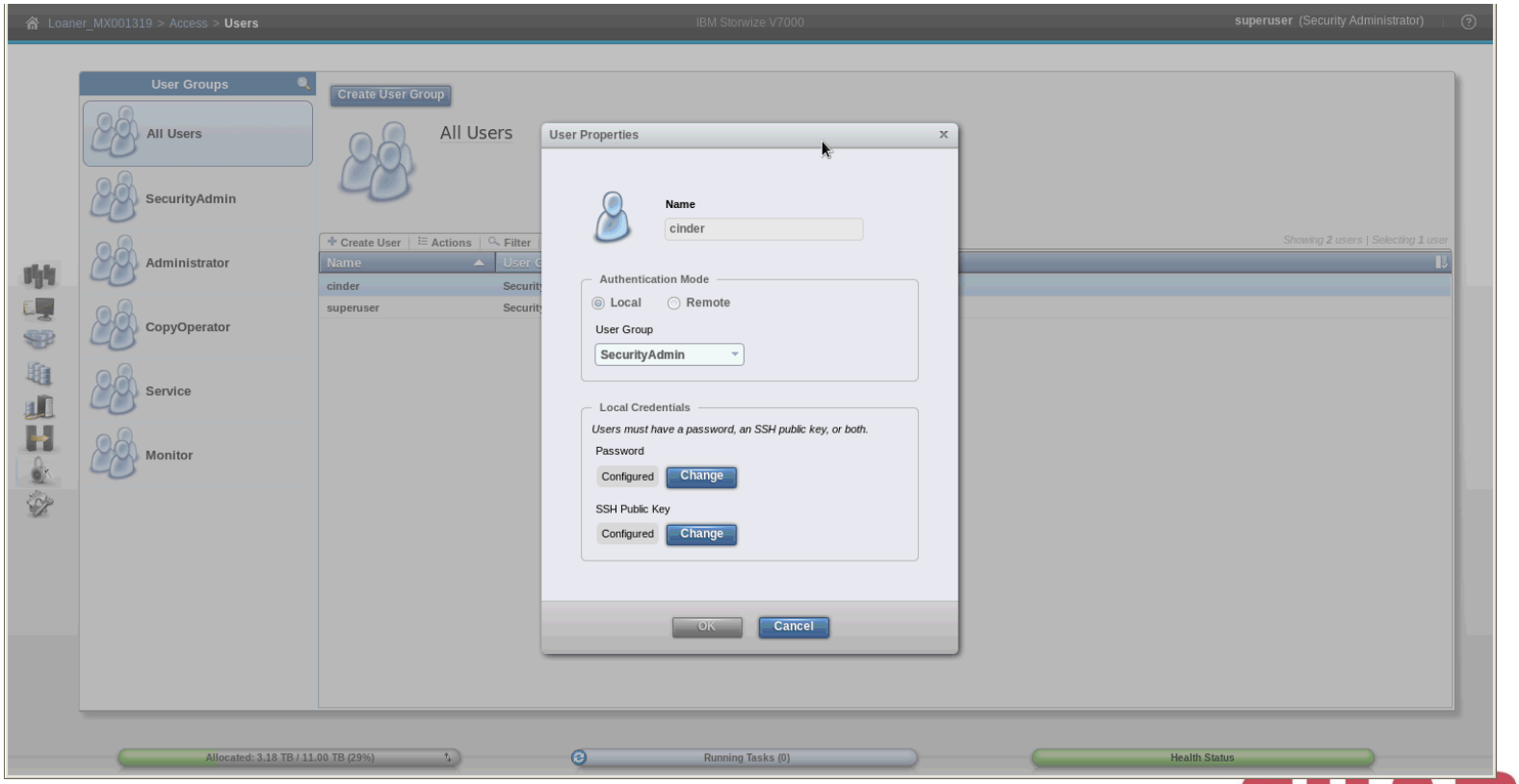
Cinder

- Requires a userid setup in the V7000 for Cinder
- Here we defined one called “cinder”



Cinder

- A public private key pair is used for authentication by ICM/Cinder and V7000
- The public key needs to be upload to the V7000 user for Cinder
- The private key is configured in z/VM and the ICM server



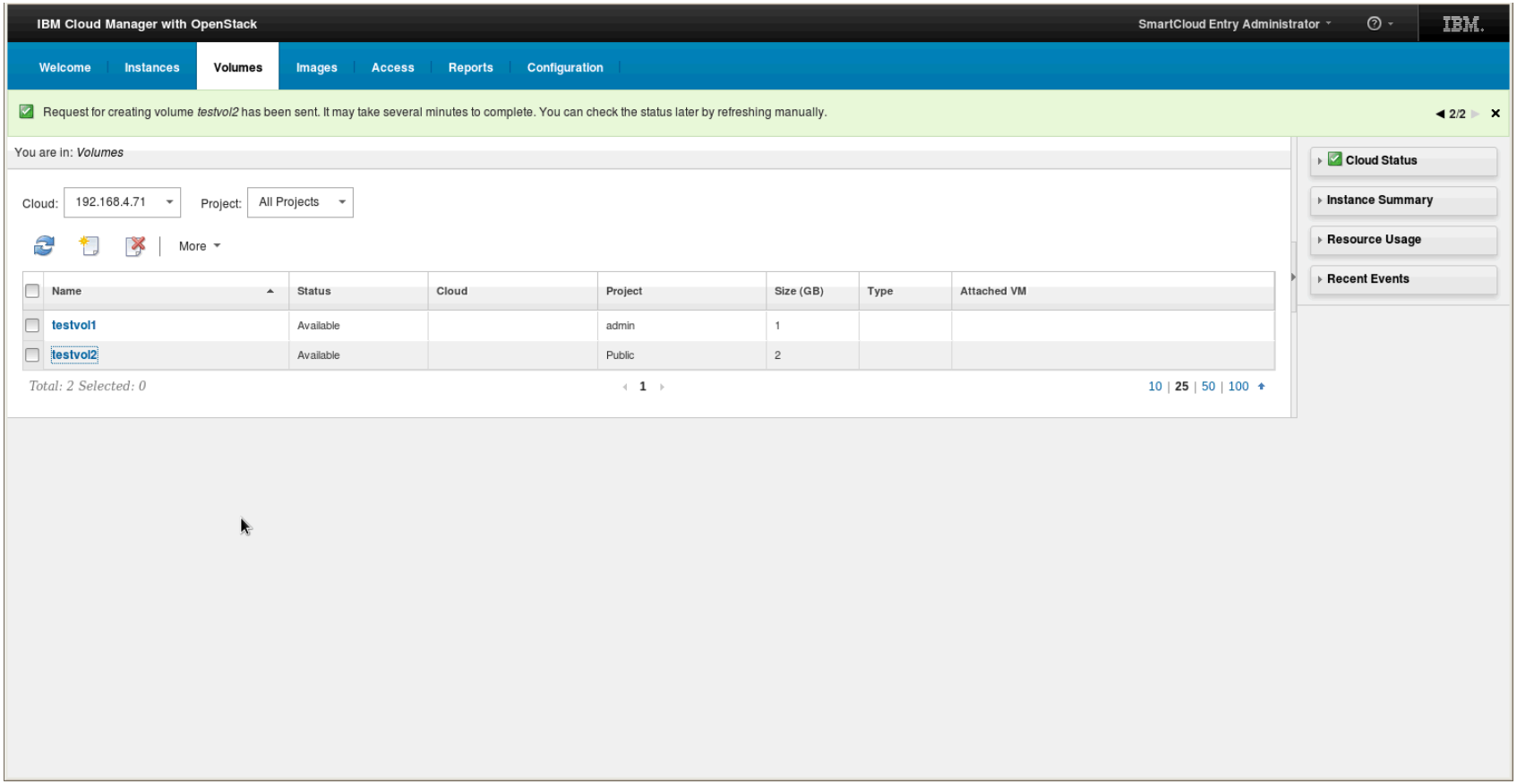
Cinder

- A new volume can easily be created via a single command

```
[mnadmin@xcat1 cinder] $ nova volume-create 1
+---------------------+--------------------------------------+
| Property            | Value                                |
+---------------------+--------------------------------------+
| attachments         | []                                   |
| availability_zone   | nova                                 |
| bootable            | false                                |
| created_at          | 2015-04-29T19:01:05.939180           |
| display_description | -                                    |
| display_name        | -                                    |
| encrypted           | False                                |
| id                  | e4cef13a-70d4-4800-be21-0c18473d4b1d |
| metadata            | {}                                   |
| size                | 1                                    |
| snapshot_id         | -                                    |
| source_volid        | -                                    |
| status              | creating                             |
| volume_type         | None                                 |
+---------------------+--------------------------------------+
[mnadmin@xcat1 cinder] $ nova volume-list
+--------------------------------------+-----------+--------------+------+-------------+-------------+
| ID                                   | Status    | Display Name | Size | Volume Type | Attached to |
+--------------------------------------+-----------+--------------+------+-------------+-------------+
| e4cef13a-70d4-4800-be21-0c18473d4b1d | available | -            | 1    | None        |             |
+--------------------------------------+-----------+--------------+------+-------------+-------------+
```

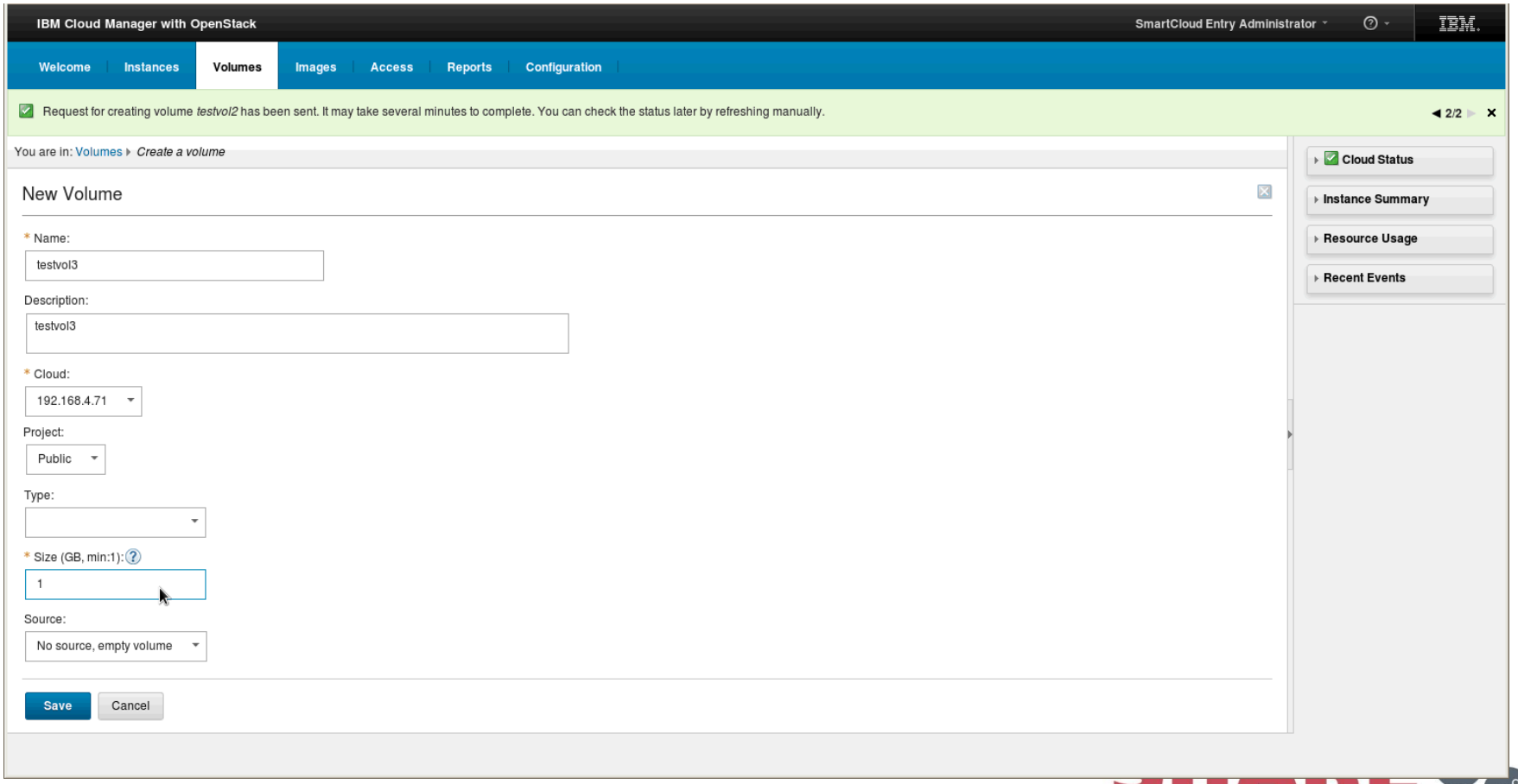
Cinder

- Volumes can be queried or managed from the ICM UI



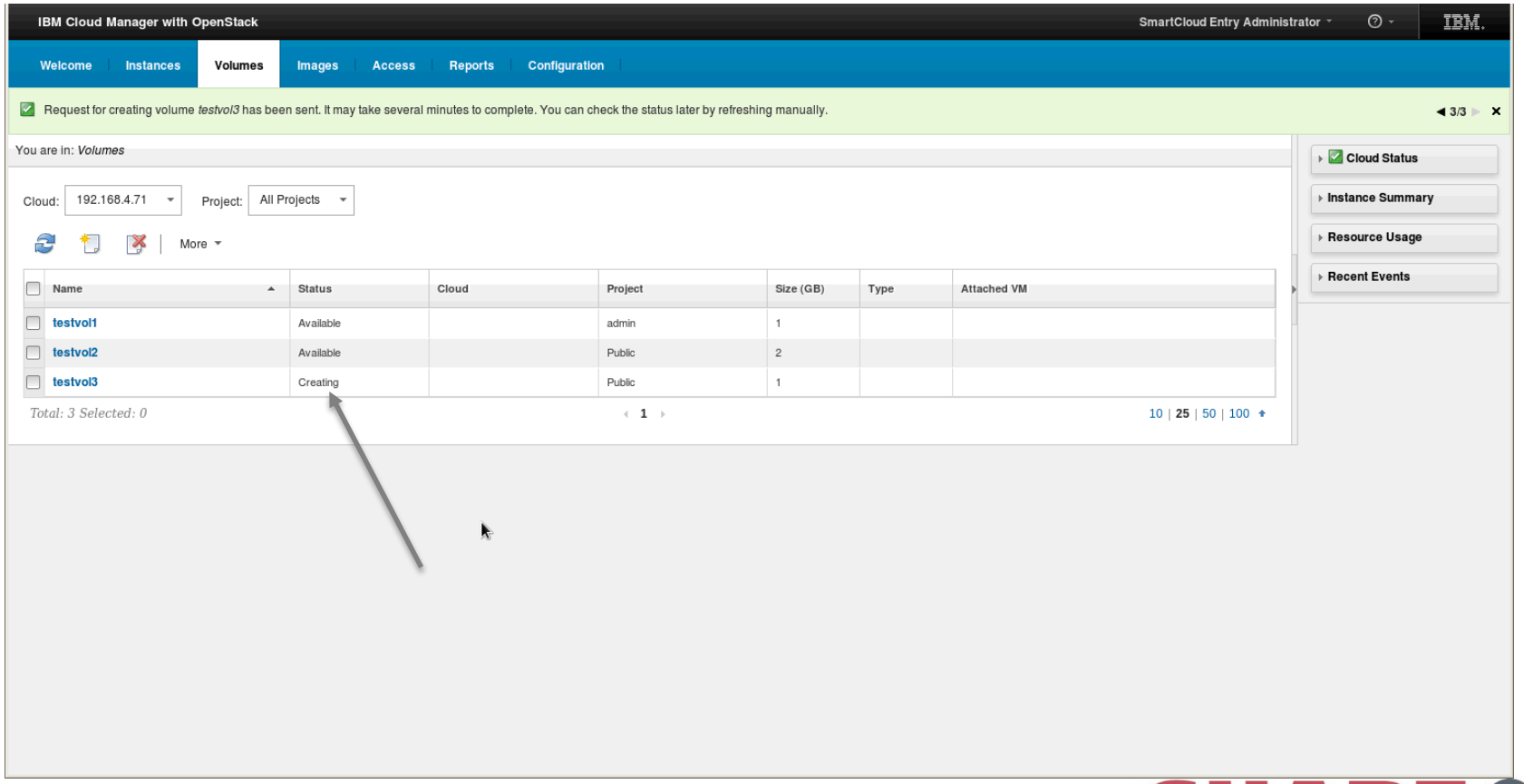
Cinder

- Adding a new volume is relatively simple
  - Name, cloud, type, and size



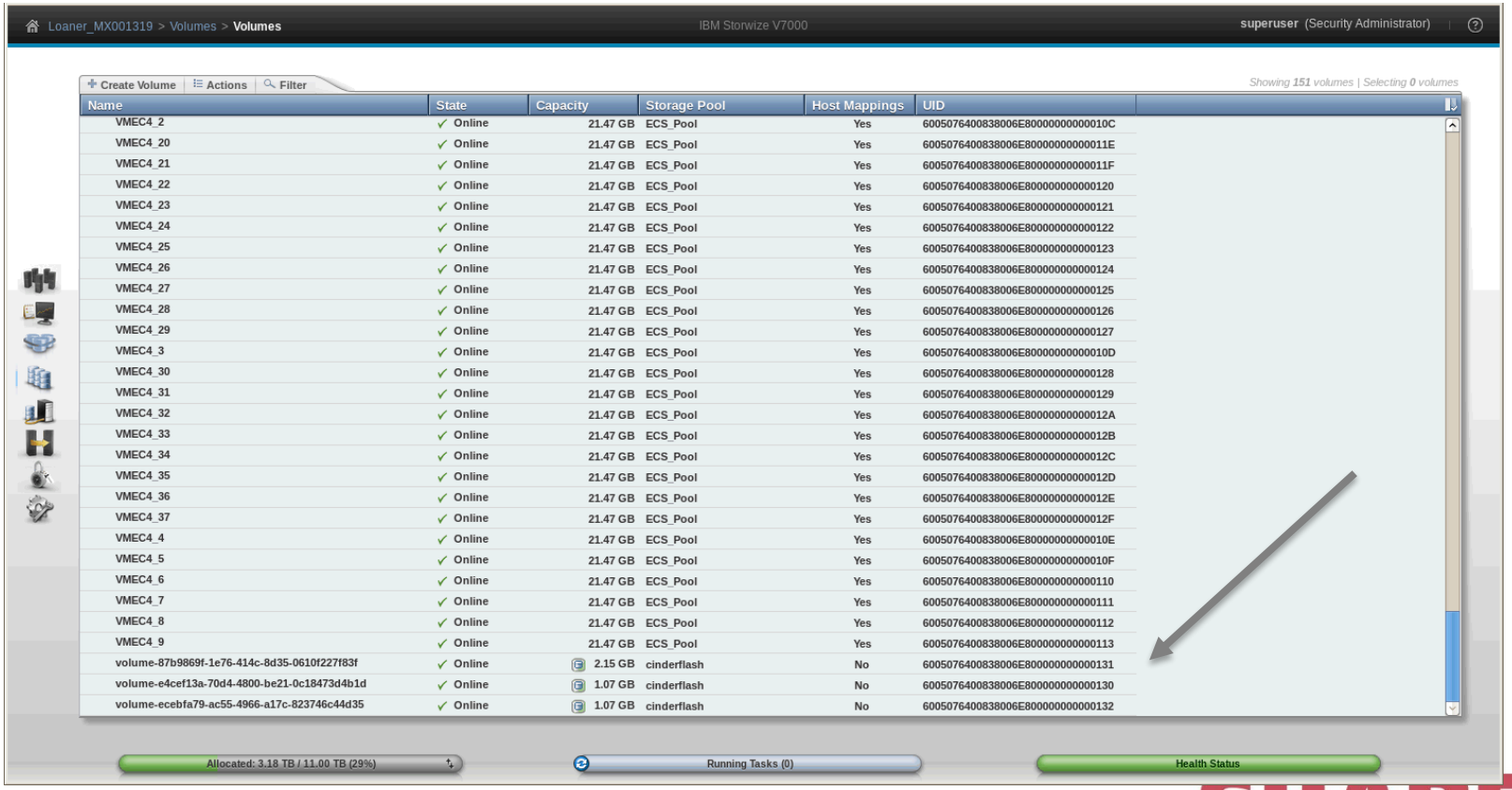
Cinder

- Provisioning of the new volume is complete in just a couple of seconds



Cinder

- New volumes are visible in the V7000
- The names consist of a numeric string



Cinder

- Whether volumes are added from the UI or command line the information is available

```
mnadmin@xcat1 cinder] $ cinder list
+--------------------------------------+-----------+--------------+------+-------------+----------+-------------+
|                  ID                  |   Status  | Display Name | Size | Volume Type | Bootable | Attached to |
+--------------------------------------+-----------+--------------+------+-------------+----------+-------------+
| e4cef13a-70d4-4800-be21-0c18473d4b1d | available |   testvol1   |  1   |     None    |  false   |             |
+--------------------------------------+-----------+--------------+------+-------------+----------+-------------+
[mnadmin@xcat1 cinder] $ cinder list --all-tenants
+--------------------------------------+----------------------------------+-----------+--------------+------+-------------+----------+-------------+
|                  ID                  |            Tenant ID             |   Status  | Display Name | Size | Volume Type | Bootable | Attached to |
+--------------------------------------+----------------------------------+-----------+--------------+------+-------------+----------+-------------+
| 87b9869f-1e76-414c-8d35-0610f227f83f | 31817e552167474ea5979699fe72af69 | available |   testvol2   |  2   |     None    |  false   |             |
| e4cef13a-70d4-4800-be21-0c18473d4b1d | 188b8c82bc044bbd8661d0bc42946e76 | available |   testvol1   |  1   |     None    |  false   |             |
| ecebfa79-ac55-4966-a17c-823746c44d35 | 31817e552167474ea5979699fe72af69 | available |   testvol3   |  1   |     None    |  false   |             |
+--------------------------------------+----------------------------------+-----------+--------------+------+-------------+----------+-------------+

[mnadmin@xcat1 cinder] $ cinder show ecebfa79-ac55-4966-a17c-823746c44d35
+---------------------------------------+-----------------------------------------------+
|                Property               |                     Value                     |
+---------------------------------------+-----------------------------------------------+
|              attachments              |                       []                      |
|           availability_zone           |                      nova                     |
|               bootable                |                     false                     |
|              created_at               |          2015-04-29T19:13:19.000000           |
|          display_description          |                    testvol3                   |
|              display_name             |                    testvol3                   |
|               encrypted               |                     False                     |
|                   id                  |     ecebfa79-ac55-4966-a17c-823746c44d35      |
|               metadata                |                       {}                      |
|         os-vol-host-attr:host         | xcat1.zcloud.net#Loaner_MX001319_cinderflash |
|     os-vol-mig-status-attr:migstat    |                     None                      |
|     os-vol-mig-status-attr:name_id    |                     None                      |
|      os-vol-tenant-attr:tenant_id     |       31817e552167474ea5979699fe72af69        |
|   os-volume-replication:driver_data   |                     None                      |
| os-volume-replication:extended_status |                     None                      |
|                  size                 |                      1                        |
|              snapshot_id              |                     None                      |
|              source_volid             |                     None                      |
|                 status                |                   available                   |
|              volume_type              |                     None                      |
+---------------------------------------+-----------------------------------------------+
```

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- **Chef Server, Client, Recipes**
- Resources and References

Chef

- ICM 4.2 Appliance on z, ships with a Chef server included
- Chef is an automation framework
- Chef can be used to deploy OS configs or middleware products.
- Chef uses cookbooks and recipes to accomplish this
- You should logon change the default password
- The default “admin” password is p@ssw0rd1
- Chef server @ https://<<appliance ip>>:14443/user/admin/edit

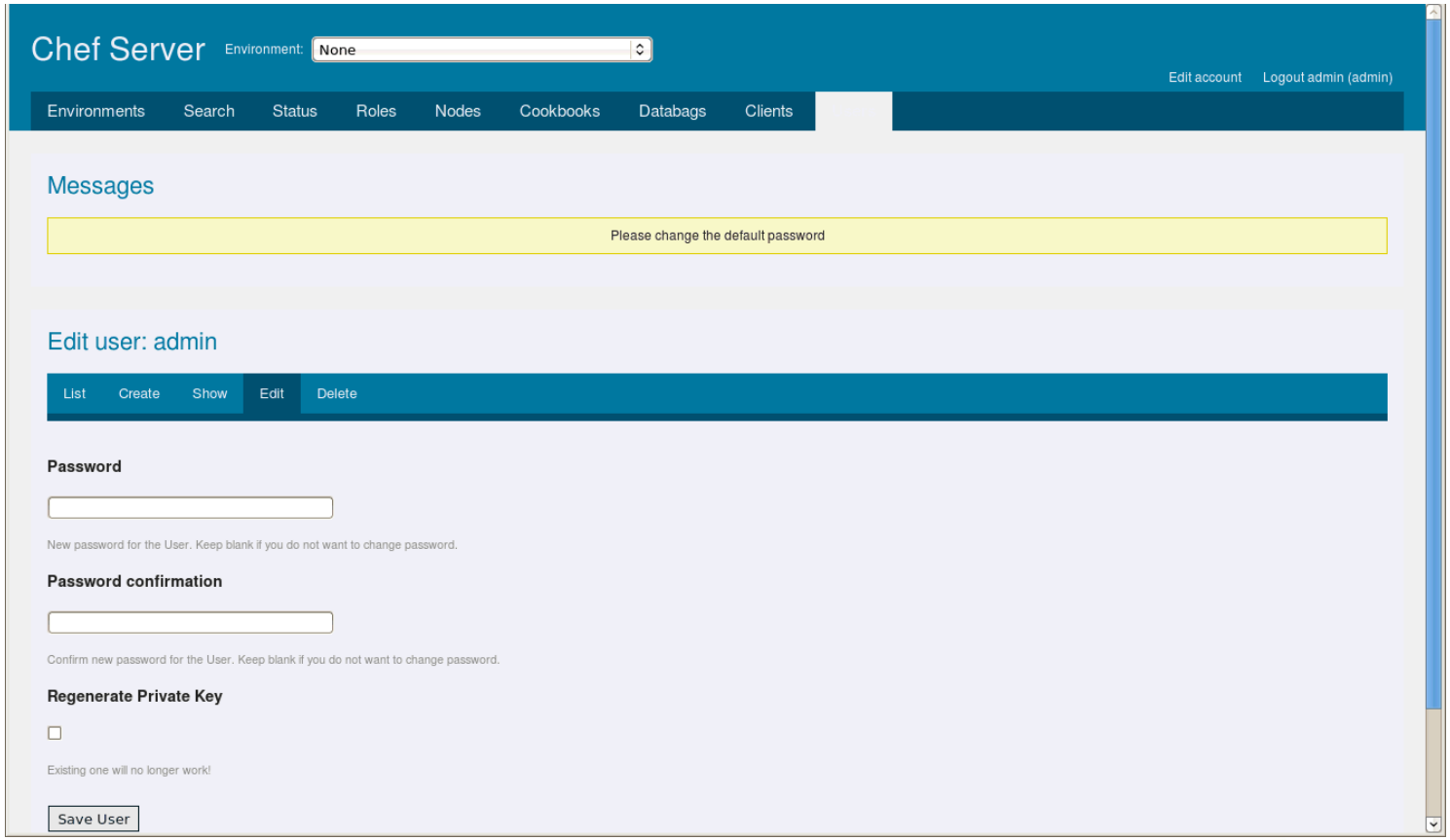
- A Chef client RPM must be installed on all client you intend to use Chef on

- Check the status of your Chef server:

```
[mnadmin@xcat1 ~] $ sudo chef-server-ctl status
run: bookshelf: (pid 3459) 65803s; run: log: (pid 3458) 65803s
run: chef-expander: (pid 3457) 65803s; run: log: (pid 3453) 65803s
run: chef-server-webui: (pid 3454) 65803s; run: log: (pid 3452) 65803s
run: chef-solr: (pid 3451) 65803s; run: log: (pid 3450) 65803s
run: erchef: (pid 3449) 65803s; run: log: (pid 3448) 65803s
run: nginx: (pid 3456) 65803s; run: log: (pid 3447) 65803s
run: postgresql: (pid 3465) 65803s; run: log: (pid 3455) 65803s
run: rabbitmq: (pid 3472) 65803s; run: log: (pid 3471) 65803s
```

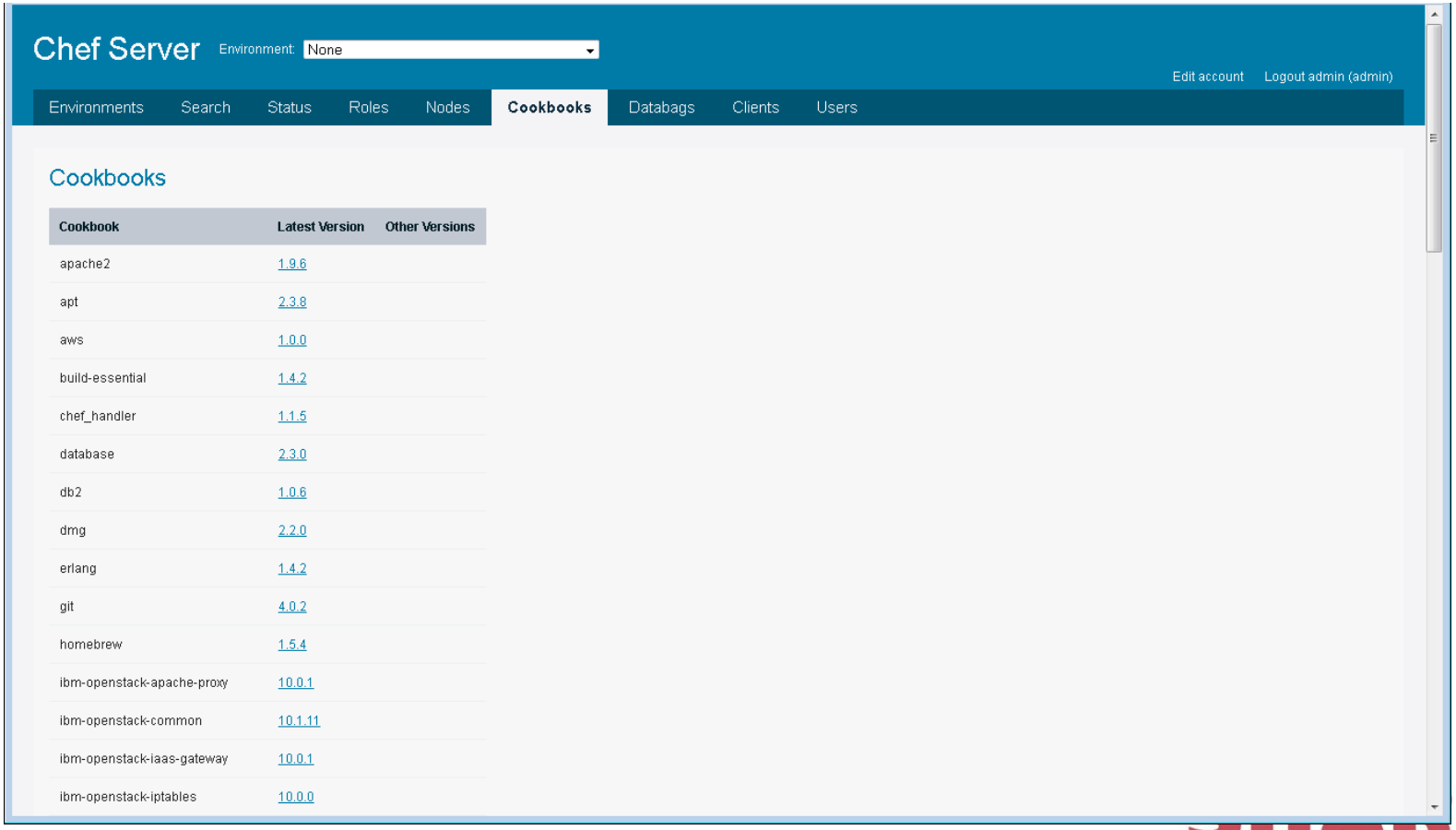
Chef Server

- Minimally change that default password for the admin userid !!



Chef Server

- A number of cookbooks and recipes are already installed
  - apache2, aws, db2, git, iptables, logrotate, mysql, ntp, yum, and more



Chef - Recipes

- Chef recipes can be found in a variety of places
- For some IBM products such as WebSphere check the Passport Advantage site
- Also available on github
  - https://github.com/wasdev
- Thousands of cookbooks at https://supermarket.chef.io/cookbooks-directory
- You can also build your own!

Chef /var/log/chef-server

- Customize the log rotation to avoid of space condition
- May see “erchef” subdirectory fill
- Logs are event driven, not by size or days
- /etc/chef-servern/chef-server.rb
- opscode_erchef[“log_directory”]
- opscode_erchef[“log_rotation”]
- `chef-server-ctl reconfigure` to activate changes

Chef clients

- Can add a Chef client with knife bootstrap
- Need to be able to perform name resolution for Chef server/client

Chef clients – client installation

bash-4.1# **sudo knife bootstrap 172.110.100.51 -x myuserid -P mypassword -V**
Connecting to 172.110.100.51
172.110.100.51 INFO: Adding certificate for Chef server: xcat1:14443
172.110.100.51 depth=0 C = US, ST = WA, L = Seattle, O = YouCorp, OU = Operations, CN = xcat1, emailAddress = you@example.com
172.110.100.51 verify error:num=18:self signed certificate
172.110.100.51 verify return:1
172.110.100.51 depth=0 C = US, ST = WA, L = Seattle, O = YouCorp, OU = Operations, CN = xcat1, emailAddress = you@example.com
172.110.100.51 verify return:1
172.110.100.51 DONE
172.110.100.51 INFO: Installing chef client version 11.12.8 for platform el6 and architecture s390x
172.110.100.51 INFO: Chef client install source URL: https://xcat1:14443/yum-repo/chef/s390x/chef-11.12.8-1.el6.s390x.rpm
172.110.100.51 --2015-05-08 17:36:18-- https://xcat1:14443/yum-repo/chef/s390x/chef-11.12.8-1.el6.s390x.rpm
172.110.100.51 Resolving xcat1... 172.110.100.201
172.110.100.51 Connecting to xcat1|172.110.100.201|:14443... connected.
172.110.100.51 WARNING: cannot verify xcat1's certificate, issued by
"/C=US/ST=WA/L=Seattle/O=YouCorp/OU=Operations/CN=xcat1/emailAddress=you@example.com":
172.110.100.51 Self-signed certificate encountered.
172.110.100.51 HTTP request sent, awaiting response... 200 OK
172.110.100.51 Length: 45178367 (43M) [application/x-redhat-package-manager]
172.110.100.51 Saving to: "/tmp/tmp.TDHsb2jruH"
172.110.100.51 100%[=====================================>] 45,178,367 44.4M/s in 1.0s
172.110.100.51 172.110.100.51 2015-05-08 17:36:19 (44.4 MB/s) - "/tmp/tmp.TDHsb2jruH" saved [45178367/45178367]
172.110.100.51 172.110.100.51 Preparing... ### [100%]
172.110.100.51 1:chef ### [100%]
172.110.100.51 patching file /opt/chef/embedded/lib/ruby/gems/2.1.0/gems/ohai-7.0.4/lib/ohai/plugins/linux/platform.rb
172.110.100.51 patching file /opt/chef/embedded/lib/ruby/gems/2.1.0/gems/ohai-7.0.4/lib/ohai/plugins/linux/cpu.rb
172.110.100.51 patching file /opt/chef/embedded/lib/ruby/gems/2.1.0/gems/ohai-8.0.0/lib/ohai/plugins/linux/platform.rb
172.110.100.51 patching file /opt/chef/embedded/lib/ruby/gems/2.1.0/gems/ohai-8.0.0/lib/ohai/plugins/linux/cpu.rb
172.110.100.51 Thank you for installing Chef!
172.110.100.51 INFO: Adding trusted certificate for Chef server: xcat1
172.110.100.51 Starting Chef Client, version 11.12.8
172.110.100.51 Creating a new client identity for rgylxr64.pdl.pok.ibm.com using the validator key.
172.110.100.51 resolving cookbooks for run list: []
172.110.100.51 Synchronizing Cookbooks:
172.110.100.51 Compiling Cookbooks...
172.110.100.51 [2015-05-08T17:36:33-04:00] WARN: Node rgylxr64.pdl.pok.ibm.com has an empty run list.
172.110.100.51 Converging 0 resources
172.110.100.51 Running handlers:
172.110.100.51 Running handlers complete

172.110.100.51 Chef Client finished, 0/0 resources updated in 2.842187415 seconds

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Chef clients with recipe – installing git via recipe

```
bash-4.1#   knife  bootstrap rgylxsp3   -x myuserid -P mypasswd -V -r recipe[git]
Connecting to rgylxsp3
rgylxsp3 INFO: Adding trusted certificate for Chef server: xcat1
rgylxsp3 Starting Chef Client, version 11.12.8
rgylxsp3 resolving cookbooks for run list: ["git"]
rgylxsp3 Synchronizing Cookbooks:
rgylxsp3   - git
rgylxsp3   - dmg
rgylxsp3   - build-essential
rgylxsp3   - windows
rgylxsp3   - chef_handler
rgylxsp3   - runit
rgylxsp3   - yum
rgylxsp3   - yum-epel
rgylxsp3 Compiling Cookbooks...
rgylxsp3 Converging 1 resources
rgylxsp3 Recipe: git::default
rgylxsp3   * package[git] action install (up to date)
rgylxsp3
rgylxsp3 Running handlers:
rgylxsp3 Running handlers complete
rgylxsp3
rgylxsp3 Chef Client finished, 0/1 resources updated in 12.760859464 seconds
bash-4.1#
```

Chef clients with recipe - git installed

```
rgylxsp3:~ # git
usage: git [--version] [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
           [-p|--paginate|--no-pager] [--no-replace-objects] [--bare]
           [--git-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
           [-c name=value] [--help]
           <command> [<args>]

The most commonly used git commands are:
   add        Add file contents to the index
   bisect     Find by binary search the change that introduced a bug
   branch     List, create, or delete branches
   checkout   Checkout a branch or paths to the working tree
   clone      Clone a repository into a new directory
   commit     Record changes to the repository
   diff       Show changes between commits, commit and working tree, etc
   fetch      Download objects and refs from another repository
   grep       Print lines matching a pattern
   init       Create an empty git repository or reinitialize an existing one
   log        Show commit logs
   merge      Join two or more development histories together
   mv         Move or rename a file, a directory, or a symlink
   pull       Fetch from and merge with another repository or a local branch
   push       Update remote refs along with associated objects
   rebase     Forward-port local commits to the updated upstream head
   reset      Reset current HEAD to the specified state
   rm         Remove files from the working tree and from the index
   show       Show various types of objects
   status     Show the working tree status
   tag        Create, list, delete or verify a tag object signed with GPG

See 'git help <command>' for more information on a specific command.
rgylxsp3:~ #
```

ICM Agenda

- IBM Cloud Manager and OpenStack
- Architecture on z Systems
- Installation and Customization
  - DMSSICNF and DMSSICMO
  - Appliance
- Virtual Server Requirements
- Virtual Server Image Capture
- Virtual Server Deployment
- SMTP Notifications
- LDAP Authentication
- Cinder

- Chef Server, Client, Recipes
- **Resources and References**

ICM Resources and References

- Enabling z/VM for OpenStack
  - http://www.vm.ibm.com/sysman/openstk.html
- z/VM Service for ICM
  - http://www.vm.ibm.com/sysman/osmntlvl.html
- z/VM Service for xCAT
  - http://www.vm.ibm.com/sysman/xcmntlvl.html
- z/VM 6.3 March 2015 SMAPI
  - http://publibz.boulder.ibm.com/epubs/pdf/hcsl8c23.pdf
- ICM 4.2 Knowledge Center
  - http://www.ibm.com/support/knowledgecenter/SST55W_4.2.0/liaca/liaca_kc_welcome.html
- OpenStack Command Line Reference
  - http://docs.openstack.org/cli-reference/content

Thank you for attending!

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