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
ICM Agenda

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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 SCSi 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

*ICMwO* - IBM Cloud Manager with OpenStack

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
ICM example in 2 way SSI
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ICM Installation- Requirements and Planning

Requirements

- z/VM 6.3 + PTFs
- 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 z/VM user ID */
XCAT_User = "XCAT"
/* XCAT IP Address */
XCAT.Addr = "172.110.111.201"
/* XCAT hostname */
XCAT.Host = "xcat1"
/* xCAT domain name */
XCAT.Domain = ".pdl.pok.ibm.com"
/* xCAT vswitch name */
XCAT_vswitch = "ZHCPNET"
/* xCAT address for xCAT */
XCAT_OSAdev = "NONE"
/* Notify when xCAT started */
XCAT_notify = "OPERATOR"
/* Network gateway IPv4 address */
XCAT_gateway = ""
/* Default network mask */
XCAT_netmask = "255.255.255.0"
/* xCAT management node IP address */
XCAT_MN_Addr = "172.110.100.201"
/* xCAT MN vswitch name */
XCAT_MN_vswitch = "NET172A"
/* OSA address for xCAT MN */
XCAT_MN_OSAdev = "NONE"
/* Notify when xCAT started */
XCAT_MN_gateway = "172.110.100.1"
/* Default network mask */
XCAT_MN_Mask = "255.255.255.0"
/* MN administrator userid */
XCAT_MN_admin = "mnadmin"
/* MN admin password */
XCAT_MN_pw = "zlinux"
/* (if NOLOG, userid cannot */
/* ssh into XCAT MN) */

/** ZHCP server defaults */
/* zhcp z/VM user ID */
ZHCP_User = "ZHCP"
/* zhcp IP ADDRESS */
ZHCP.Addr = "172.110.111.211"
/* zhcp hostname */
ZHCP.Host = "zhcpp1"
/* zhcp domain name */
ZHCP_domain = ".pdl.pok.ibm.com"
/* Network gateway IPv4 address */
ZHCP_gateway = ""
/* Default network mask */
ZHCP_netmask = "255.255.255.0"
/* zhcp vswitch name */
ZHCP_vswitch = "ZHCPNET"
/* OSA address for zhcp */
ZHCP_OSAdev = "NONE"
/* none */
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_OSAdapter = "NONE" /* OSA address for xCAT */
XCAT_zvmsysid = "POKLBS2" /* xCAT z/VM system id */
XCAT_notify = "OPERATOR" /* Notify when xCAT started */

//****************************************************************************
/* 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_OSAdapter = "NONE" /* OSA address for zhcp */

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

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
VMSES Local Modification Example – DMSSICMO #1

/******************************************************************************
/* CMO User Configurable Settings                                       */
******************************************************************************
cmo_admin_password = "zlinux"
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

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

Welcome to IBM Cloud Manager with OpenStack

IBM Cloud Manager with OpenStack enables users to provision virtual machines quickly, while an administrator maintains oversight of the managed environment. Click an action to get started.

- **Configure the Cloud**: Enable one or more cloud environments. Set expiration and approval policies for each cloud. Define network settings that are applied when images are deployed.
- **Manage Cloud Access**: Configure projects and users for the cloud. Set user access to images and instances through projects. Define policies at the project level for additional customization.
- **Manage Images**: Deploy, import, and customize images.
- **Manage Instances**: Monitor, restore and de-provision virtual machines.
- **Manage Requests**: Review and approve requests for new instances and other actions.
- **View Activity Reports**: View recent events for cloud resources.

• ICM UI via administrator login

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

IBM Cloud Manager with OpenStack

You are in: Clouds > 9.12.22.218

Clouds
Network
LDAP
License

9.12.22.218
Status: OK

Edit

Name: 9.12.22.218
Description: No data provided
Type: OpenStack
Region: ZCloud
Host name: 9.12.22.218
Port: 5671
Secure cloud connection using SSL
Cloud timeout (minutes): 1
Security certificate: Trusted Remove...

Message Queue Settings
User ID: qpidclient
Message queue type: QPID
Virtual host: No data provided

» Flavors: 5
» Expiration Policies: Disabled
» Approval Policies: Disabled

Close

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

Groups

- General
  - zVM UserID: ZHCP
  - zVM Hypervisor: ECS1
  - xCAT Hypervisor Node: unknown
  - Operating System:
    - Architecture: s390x
    - Uptime: 0 days min
    - CPU Used Time: 8274116085 uS

- Hardware
  - Privileges
    - Currently: G
    - Directory: G
  - Total Memory: 1G
  - Processors
    | Type | Address | ID        | Base | Dedicated | Affinity |
    |------|---------|-----------|------|----------|----------|
    | CP   | 01      | FF14750928178000 | false | false | ON |
    | CP   | 00      | FF14750928178000 | true  | false | ON |
  - Disks
Validating xCAT access to SMAPI via ZHCP

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

```
IDENTITY ZHCP AUTOONLY 1G 1G G
BUILD ON ECS1 USING SUBCONFIG ZHCP-1
BUILD ON ECS2 USING SUBCONFIG ZHCP-2
BUILD ON ECS3 USING SUBCONFIG ZHCP-3
BUILD ON ECS4 USING SUBCONFIG ZHCP-4
CPU 00 BASE
CPU 01
MACHINE ESA 4
OPTION LNKNOPAS
CONSOLE 0009 3215 T
SPOOL 00C 2540 READER *
SPOOL 00D 2540 PUNCH A
SPOOL 00E 1403 A
* END IDENTIT ZHCP
```

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

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Installation & Customization – Neutron

[mnadmin@xcat1 neutron] $ neutron net-create mgmtnet --provider:network_type flat --provider:physical_network mgmtnet
Created a new network:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>admin_state_up</td>
<td>True</td>
</tr>
<tr>
<td>id</td>
<td>f8476e34-8818-471e-83c6-5bdb0882fcb0</td>
</tr>
<tr>
<td>name</td>
<td>mgmtnet</td>
</tr>
<tr>
<td>provider:network_type</td>
<td>flat</td>
</tr>
<tr>
<td>provider:physical_network</td>
<td>mgmtnet</td>
</tr>
<tr>
<td>provider:segmentation_id</td>
<td></td>
</tr>
<tr>
<td>router:external</td>
<td>False</td>
</tr>
<tr>
<td>shared</td>
<td>False</td>
</tr>
<tr>
<td>status</td>
<td>ACTIVE</td>
</tr>
<tr>
<td>subnets</td>
<td></td>
</tr>
<tr>
<td>tenant_id</td>
<td>57d48413ddfc432db983b192bf9e2bdf</td>
</tr>
</tbody>
</table>

- 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

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>allocation_pools</td>
<td>{&quot;start&quot;: &quot;172.110.150.20&quot;, &quot;end&quot;: &quot;172.110.150.45&quot;}</td>
</tr>
<tr>
<td>cidr</td>
<td>172.110.150.0/24</td>
</tr>
<tr>
<td>dns_nameservers</td>
<td></td>
</tr>
<tr>
<td>enable_dhcp</td>
<td>True</td>
</tr>
<tr>
<td>gateway_ip</td>
<td>172.110.150.1</td>
</tr>
<tr>
<td>host_routes</td>
<td></td>
</tr>
<tr>
<td>id</td>
<td>c5892167-7934-4181-96a4-d8e116c21cb7</td>
</tr>
<tr>
<td>ip_version</td>
<td>4</td>
</tr>
<tr>
<td>ipv6_address_mode</td>
<td></td>
</tr>
<tr>
<td>ipv6_ra_mode</td>
<td></td>
</tr>
<tr>
<td>name</td>
<td></td>
</tr>
<tr>
<td>network_id</td>
<td>f8476e34-8818-471e-83c6-5bdb0882fcb0</td>
</tr>
<tr>
<td>tenant_id</td>
<td>57d48413ddfc432db983b192bf9e2bcf</td>
</tr>
</tbody>
</table>

[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

<table>
<thead>
<tr>
<th>Id</th>
<th>Binary</th>
<th>Host</th>
<th>Zone</th>
<th>Status</th>
<th>State</th>
<th>Updated_at</th>
<th>Disabled Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>nova-cert</td>
<td>ecs1</td>
<td>internal</td>
<td>enabled</td>
<td>up</td>
<td>2015-04-03T02:50:44.000000</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>nova-conductor</td>
<td>ecs1</td>
<td>internal</td>
<td>enabled</td>
<td>up</td>
<td>2015-04-03T02:50:43.000000</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>nova-console</td>
<td>ecs1</td>
<td>internal</td>
<td>enabled</td>
<td>up</td>
<td>2015-04-03T02:50:46.000000</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>nova-consoleauth</td>
<td>ecs1</td>
<td>internal</td>
<td>enabled</td>
<td>up</td>
<td>2015-04-03T02:50:37.000000</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>nova-scheduler</td>
<td>ecs1</td>
<td>internal</td>
<td>enabled</td>
<td>up</td>
<td>2015-04-03T02:50:37.000000</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>nova-compute</td>
<td>ecs1</td>
<td>nova</td>
<td>enabled</td>
<td>up</td>
<td>2015-04-03T02:50:41.000000</td>
<td>-</td>
</tr>
</tbody>
</table>

[mnadmin@xcat1 zvm] $
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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 ephemeral 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

- 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 Image Capture – Run Script

#### Groups

**all**

hosts

+ Add node

#### Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
<th>Power</th>
<th>Monitor</th>
<th>Comments</th>
<th>Arch</th>
<th>Groups</th>
<th>Hcp</th>
<th>Hostname</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clone</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delete</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power on</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power off</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run script</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shutdown</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Double-click on a cell to edit a node’s properties. Click outside the table to save changes. Hit the Escape key to ignore changes.

Finding pools and networks... Done.

Complete your session evaluations online at [www.SHARE.org/Orlando-Eval](http://www.SHARE.org/Orlando-Eval)
Virtual Server Image Capture - mkdef

Summary:

Load a script to run against this node range.

Virtual Machine:

Target node range: xcat1

Script:

Remote file: Browse... No file selected. Load

/script/bin/mkdef -t node -o ecrhelm1
userid=ecrhelm1 hcp=zhcp1.ecs.ibm.com mgt=zvm
groups=all

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
Virtual Server Image Capture - chtab

- **Virtual Machine**

  Target node range: xcat1

- **Script**

  Remote file: 

  ![Browse...](No file selected.)  ![Load](Load)

  ```
  /opt/xcat/sbin/chtab_node=ecrhelm1
  hosts.ip="172.110.150.125"
  hosts.hostnames="ecrhelm1.ecs.ibm.com"
  node expressly.boot=zvm
  node.nodeType.os=rhel6.5
  node.nodeType.arch=x86_64
  node.nodeType.profile=rh65m1
  node.nodeType.provmethod=netboot
  ```

  Script:

  ```
  ...
  ```
### Virtual Server Image Capture - chtab

**Nodes**

<table>
<thead>
<tr>
<th>Node</th>
<th>Status</th>
<th>Power</th>
<th>Monitor</th>
<th>Comments</th>
<th>Arch</th>
<th>Groups</th>
<th>hcp</th>
<th>hpc</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecrhelm1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>s390x</td>
<td>all</td>
<td>zhcp1.ecs.ibm.com</td>
<td>ecrhelm1</td>
</tr>
<tr>
<td>xcat1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>s390x</td>
<td>all</td>
<td>zhcp1.ecs.ibm.com</td>
<td>xcat1</td>
</tr>
<tr>
<td>zhcp1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>s390x</td>
<td>all</td>
<td>zhcp1.ecs.ibm.com</td>
<td>zhcp1</td>
</tr>
<tr>
<td>zhcp2</td>
<td>noPing</td>
<td></td>
<td></td>
<td></td>
<td>s390x</td>
<td>all</td>
<td>zhcp2.ecs.ibm.com</td>
<td>zhcp2</td>
</tr>
<tr>
<td>zhcp3</td>
<td>noPing</td>
<td></td>
<td></td>
<td></td>
<td>s390x</td>
<td>all</td>
<td>zhcp3.ecs.ibm.com</td>
<td>zhcp3</td>
</tr>
<tr>
<td>zhcp4</td>
<td>noPing</td>
<td></td>
<td></td>
<td></td>
<td>s390x</td>
<td>all</td>
<td>zhcp4.ecs.ibm.com</td>
<td>zhcp4</td>
</tr>
</tbody>
</table>

**Summary**

- Double-click on a cell to edit a node's properties. Click outside the table to save changes. Hit the Escape key to ignore changes.

**Actions**

- **Refresh**

---

**Complete your session evaluations online at [www.SHARE.org/Orlando-Eval](http://www.SHARE.org/Orlando-Eval)**
<table>
<thead>
<tr>
<th>hostnames</th>
<th>ip</th>
<th>mgt</th>
<th>netboot</th>
<th>os</th>
<th>postbootscripts</th>
<th>postscript</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecrhel1.ecs.ibm.com</td>
<td>172.110.150.125</td>
<td>zvm</td>
<td></td>
<td>rhel6.5</td>
<td>otherpkgs</td>
<td>syslog,remoteshell,</td>
</tr>
<tr>
<td>xcat1.ecs.ibm.com</td>
<td>9.12.22.218</td>
<td>zvm</td>
<td></td>
<td>rhel6.5</td>
<td>otherpkgs</td>
<td>syslog,remoteshell,</td>
</tr>
<tr>
<td>zhcp1.ecs.ibm.com</td>
<td>172.110.150.211</td>
<td>zvm</td>
<td></td>
<td>rhel6.5</td>
<td>otherpkgs</td>
<td>syslog,remoteshell,</td>
</tr>
<tr>
<td>zhcp2.ecs.ibm.com</td>
<td>172.110.150.212</td>
<td>zvm</td>
<td></td>
<td>rhel6.5</td>
<td>otherpkgs</td>
<td>syslog,remoteshell,</td>
</tr>
<tr>
<td>zhcp3.ecs.ibm.com</td>
<td>172.110.150.213</td>
<td>zvm</td>
<td></td>
<td>rhel6.5</td>
<td>otherpkgs</td>
<td>syslog,remoteshell,</td>
</tr>
<tr>
<td>zhcp4.ecs.ibm.com</td>
<td>172.110.150.214</td>
<td>zvm</td>
<td></td>
<td>rhel6.5</td>
<td>otherpkgs</td>
<td>syslog,remoteshell,</td>
</tr>
</tbody>
</table>
Virtual Server Image Capture – unlock server
Virtual Server Image Capture – root password

Give the root password for this node range to setup its SSH keys.

Virtual Machine

Target node range: ecrhelm1
Password: ********

Unlock
Virtual Server Image Capture – unlock success

/usr/bin/ssh setup is complete.
return code = 0

Give the root password for this node range to setup its SSH keys.

Virtual Machine

Target node range: ecrhelml
Password: ********
Load a script to run against this node range.

**Virtual Machine**

Target node range: xcat1

**Script**

Remote file: /opt/xcat/bin/imgcapture ecrhelml --profile rh65m1profile

Script: 

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
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
Virtual Server Image Capture - imgexport

**Summary**

Load a script to run against this node range.

**Virtual Machine**

Target node range: `xcat1`

**Script**

Remote file: [Browse... No file selected.](/opt/xcat/bin/imgexport rhel6.5-s390x-netboot-mh5m1profile -remotehost nova@9.12.22.218)

Script:

```
...`
```

Run
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

Exporting rhel6.5-s390x-netboot-rhe65mlprofile to novag9.12.22.218...
Inside /install/imgexport.56447.2kGvM.
Compressing rhel6.5-s390x-netboot-rhe65mlprofile bundle. Please be patient.
Done!
Moving the image bundle to the remote system location rhel6.5-s390x-netboot-rhe65mlprofile.tgz

Load a script to run against this node range.

- Virtual Machine

Target node range: xcat1

- Script

Remote file: Browse... No file selected. Load

```
/opt/xcat/bin/imgexport rhel6.5-s390x-netboot-rhe65mlprofile -remoteshost novag9.12.22.218
```

Script:
Virtual Server Image Capture – Import Images

IBM Cloud Manager with OpenStack

Welcome | Instances | Volumes | Images | Access | Reports | Configuration

You are in: Images

Cloud: All Clouds
Project: All Projects
Architecture: All Architectures

Cloud Status
Instance Summary
Resource Usage
Recent Events

No items to display

Total: 0 Selected: 0

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

Import Image
An image can be imported from an image file or a URL.

Import type:
- URL
- File

* Image URL:
  http://9.12.22.218/install/netboot/thel6.5/s390x/rh65/m1profile/0100.img

* Image name:
  echelm1

* Cloud:
  9.12.22.218

* Project:
  Public

* Disk format:
  RAW

* Container format:
  BARE

* Hypervisor type:
  Z/VM

Architecture:
  s390x

* Operating system:
  RedHat Enterprise Linux 6.5

Minimum memory (MB):
Virtual Server Image Capture – Import Details

Import Image

An image can be imported from an image file or a URL.

Import type:
- URL
- File

* Image URL:
  http://9.12.22.216/install/redbook/reel6.5/sg390vhr65m1profile/0100.img

* Image name:
  echelm1

* Cloud:
  9.12.22.216

* Project:
  Public

* Disk format:
  RAW

* Container format:
  BARE

* Hypervisor type:
  ZVM

Architecture:

Operating system:

RedHat Enterprise Linux 6.5

Minimum memory (MB):

1024

Minimum storage (GB):

0

Import  Cancel
Virtual Server Image Capture - Importing

IBM Cloud Manager with OpenStack

Welcome | Instances | Volumes | Images | Access | Reports | Configuration

- Image ecrlh1 has been queued for creation.

Cloud: All Clouds  Project: All Projects  Architecture: All Architectures

- ecrlh1
  Status: Importing
  Cloud: 9.12.22.218
  Project: Public
  Architecture: z
  Version: 
  Description: Image created for an imported image ecrlh1 started on 4/2/15 10:10 PM.

Total: 1  Selected: 0

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
**Virtual Server Image Capture - Imported**

![Image of IBM Cloud Manager with OpenStack interface]

You are in: **Images**

<table>
<thead>
<tr>
<th>Image</th>
<th>Status</th>
<th>Cloud</th>
<th>Project</th>
<th>Architecture</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecrhelm1</td>
<td>OK</td>
<td>9.12.22.218</td>
<td>Public</td>
<td>z</td>
<td></td>
<td>Image created for an imported image ecrhelm1 started on 4/2/15 10:19 PM.</td>
</tr>
</tbody>
</table>

Total: 1 Selected: 0

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
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
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        |   1 |
|   2 | m1.small |  2048    |   20    |     0    |     1  |     1.0  |   True        |   1 |
|   3 | m1.medium|  4096    |   40    |     0    |     2  |     1.0  |   True        |   1 |
|   4 | m1.large |  8192    |   80    |     0    |     4  |     1.0  |   True        |   1 |
|   5 | m1.xlarge| 16384    |  160    |     0    |     8  |     1.0  |   True        |   1 |

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
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 ~] $ 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       |
+--------+--------+-----------+------+-----------+------+-------+------------+----------+
```

Complete your session evaluations online at [www.SHARE.org/Orlando-Eval](http://www.SHARE.org/Orlando-Eval)
Deploy – Predeploy state

<table>
<thead>
<tr>
<th>Groups</th>
<th>Summary</th>
<th>Nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hosts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Add node</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Actions**

<table>
<thead>
<tr>
<th>node</th>
<th>status</th>
<th>power</th>
<th>monitor</th>
<th>comments</th>
<th>arch</th>
<th>groups</th>
<th>hcp</th>
<th>hcp</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecrhelm1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>xcat1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zhcp1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zhcp2</td>
<td>no ping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zhcp3</td>
<td>no ping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zhcp4</td>
<td>no ping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*) Double-click on a cell to edit a node’s properties. Click outside the table to save changes. Hit the Escape key to ignore changes.*

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

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

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

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

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

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

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

Deployment log reports completion in about 3 minutes

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
### 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             |
| user_id                             | ae64606ae4104d1a9215531dd736e6e              |
```
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
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  - 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 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

```c
#include <stdio.h>

int main() {
  printf("Cinder\n\nSample DMSSICMO with Cinder information included\nPublic/private key pair are RSA keys not DSA or ECSDA\nPrivate key in the home directory of mnadmin\n\n\*/

  printf("CMO User Configurable Settings\n\*/\n
  cmo_admin_password = "zlinux"
  cmo_data_disk = "EC501C EC5011"
  openstack_system_role = "controller"
  openstack_controller_address = "192.168.1.71"
  openstack_zvm_diskpool = "FBA:LINUXXP"
  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"

  return 0;
}
```

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
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 uploaded to the V7000 user for Cinder
- The private key is configured in z/VM and the ICM server

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
A new volume can easily be created via a single command

```
[mnadmin@xcat1 cinder] $ nova volume-create 1
```

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>attachments</td>
<td>[]</td>
</tr>
<tr>
<td>availability_zone</td>
<td>nova</td>
</tr>
<tr>
<td>bootable</td>
<td>false</td>
</tr>
<tr>
<td>created_at</td>
<td>2015-04-29T19:01:05.939180</td>
</tr>
<tr>
<td>display_description</td>
<td>-</td>
</tr>
<tr>
<td>display_name</td>
<td>-</td>
</tr>
<tr>
<td>encrypted</td>
<td>False</td>
</tr>
<tr>
<td>id</td>
<td>e4cef13a-70d4-4800-be21-0c18473d4b1d</td>
</tr>
<tr>
<td>metadata</td>
<td>{}</td>
</tr>
<tr>
<td>size</td>
<td>1</td>
</tr>
<tr>
<td>snapshot_id</td>
<td>-</td>
</tr>
<tr>
<td>source_volid</td>
<td>-</td>
</tr>
<tr>
<td>status</td>
<td>creating</td>
</tr>
<tr>
<td>volume_type</td>
<td>None</td>
</tr>
</tbody>
</table>

```
[mnadmin@xcat1 cinder] $ nova volume-list
```

<table>
<thead>
<tr>
<th>ID</th>
<th>Status</th>
<th>Display Name</th>
<th>Size</th>
<th>Volume Type</th>
<th>Attached to</th>
</tr>
</thead>
<tbody>
<tr>
<td>e4cef13a-70d4-4800-be21-0c18473d4b1d</td>
<td>available</td>
<td>-</td>
<td>1</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>
Volumes can be queried or managed from the ICM UI
Adding a new volume is relatively simple
- Name, cloud, type, and size
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
Whether volumes are added from the UI or command line the information is available

```bash
mnadmin@xcat1 cinder] $ cinder list
+----------------------------------+-+--------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+
<table>
<thead>
<tr>
<th>ID</th>
<th>Status</th>
<th>Display Name</th>
<th>Size</th>
<th>Volume Type</th>
<th>Bootable</th>
<th>Attached to</th>
</tr>
</thead>
<tbody>
<tr>
<td>e4cef13a-70d4-4800-be21-0c18473d4b1d</td>
<td>available</td>
<td>testvol1</td>
<td>1</td>
<td>None</td>
<td>false</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>------</td>
<td>-------------</td>
<td>----------</td>
<td>------------</td>
</tr>
</tbody>
</table>

[mnadmin@xcat1 cinder] $ cinder list --all-tenants
+----------------------------------+-+--------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+
<table>
<thead>
<tr>
<th>ID</th>
<th>Tenant ID</th>
<th>Status</th>
<th>Display Name</th>
<th>Size</th>
<th>Volume Type</th>
<th>Bootable</th>
<th>Attached to</th>
</tr>
</thead>
<tbody>
<tr>
<td>87b9869f-1e76-414c-8d35-0610f227f83f</td>
<td>823746c44d35</td>
<td>available</td>
<td>testvol2</td>
<td>2</td>
<td>None</td>
<td>false</td>
<td></td>
</tr>
<tr>
<td>e4cef13a-70d4-4800-be21-0c18473d4b1d</td>
<td>823746c44d35</td>
<td>available</td>
<td>testvol1</td>
<td>1</td>
<td>None</td>
<td>false</td>
<td></td>
</tr>
<tr>
<td>ecebfa79-ac55-4966-a17c-823746c44d35</td>
<td>823746c44d35</td>
<td>available</td>
<td>testvol3</td>
<td>1</td>
<td>None</td>
<td>false</td>
<td></td>
</tr>
</tbody>
</table>

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

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Chef Server

- Minimally change that default password for the admin userid !!
A number of cookbooks and recipes are already installed:

- apache2, aws, db2, git, iptables, logrotate, mysql, ntp, yum, and more

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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 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 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 INFO: Adding certificate for Chef server: xcat1
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 Running handlers complete
172.110.100.51 Chef Client finished, 0/0 resources updated in 2.842187415 seconds
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 Running handlers:
rgylxsp3 Running handlers complete
rgylxsp3 Chef Client finished, 0/1 resources updated in 12.760859464 seconds
bash-4.1#
Chef clients with recipe - git installed

rgylxsp3:~ # git
        [-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:~ #

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ICM Resources and References

- Enabling z/VM for OpenStack

- z/VM Service for ICM

- z/VM Service for xCAT

- z/VM 6.3 March 2015 SMAPI

- ICM 4.2 Knowledge Center

- OpenStack Command Line Reference
  - http://docs.openstack.org/cli-reference/content
Thank you for attending!

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Team Lead

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