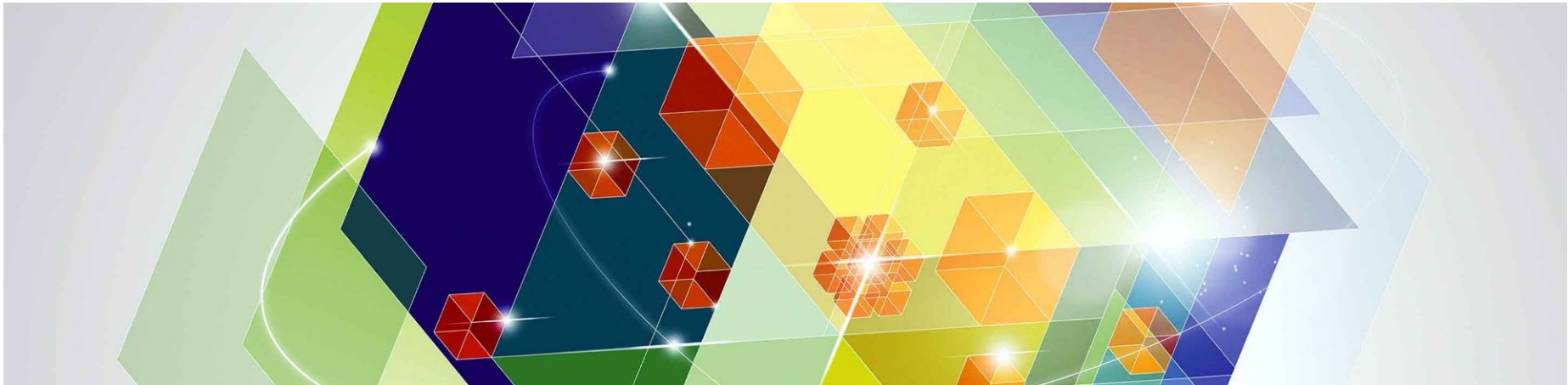# Cloud Computing with xCAT on z/VM

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What is cloud computing?

- A <u>service</u> to deliver the computing power for what you need
- Hardware and software resources are pooled together over the network
    - Scale up or down as needed
    - Users access these resources through a self-service interface
    - Resource usage is metered and billed
- <u>Virtualization</u> is the key to cloud computing

Where does xCAT fit in?

- It provides the <u>tools</u> you need to administer your cloud

  - Automate redundant steps, e.g. Linux installation

  - Monitor virtual machines

  - Manage virtual resources

- xCAT is <u>not</u> a cloud operating system

  - You still need to tell xCAT what to do

  - You still need a system administrator

- xCAT is a <u>toolkit</u>

  - Equivalent to virt-manager or virsh for KVM

  - Tool to manage, provision, and monitor physical and virtual machines on IBM System x®, IBM System p®, and IBM System z®

  - Provides <u>rudimentary</u> cloud functionality

How can xCAT help me build a cloud?

- xCAT provides most of what you already need to administer a cloud
  - Provisioning
  - Monitoring
- You just need to tie it all together to
  - Automate provisioning and de-provisioning of virtual resources
  - Improve monitoring of virtual resources
  - Add billing and metering
  - Enhance it to provide a self-service interface (partly done)

How does it work?
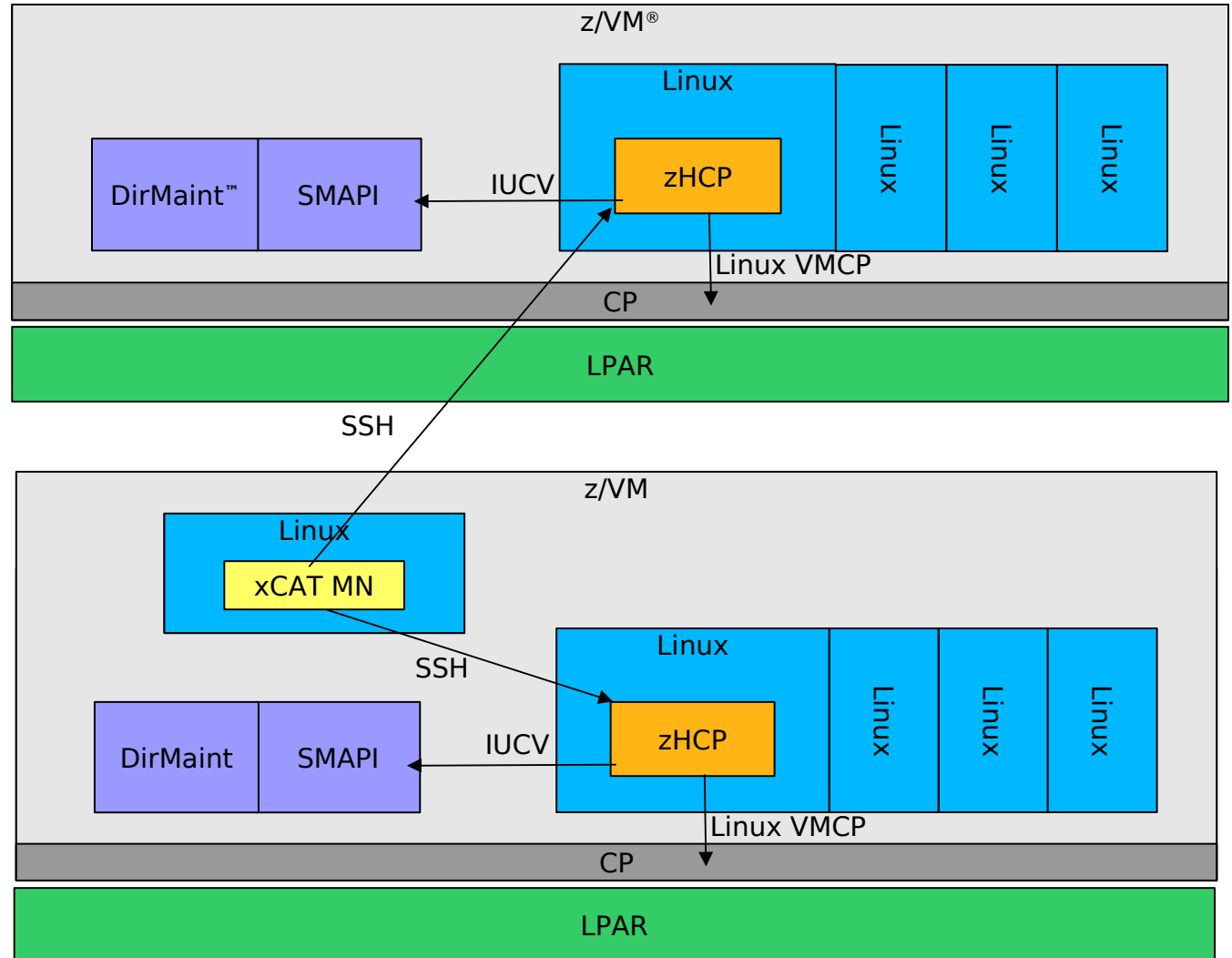
xCAT MN: Central management server running on normal Linux®

zHCP: Runs on privileged VM and manages other VMs via SMAPI and CP

What can xCAT do?

Feature	Description
Lifecycle management	- Power on or off any virtual machine (VM) - Create VM based on a user directory entry or specified CPU, memory, disk, user profile, etc. - Edit the user directory entry of an existing VM - Delete any VM - Migrate a VM between any z/VM hosts within an SSI cluster - Evacuate every VM off of a z/VM host onto another z/VM host
Inventory	- Collect the software (OS version and z/VM host) and hardware inventory (CPUs, disks, and networks) of any VM or z/VM host - Collect the inventory of resources available for any z/VM, such as the networks available and the disks available in any disk pool
Image management	- Clone any Linux VM - Install a brand new Linux on any VM using AutoYast or Kickstart - Create new Linux VM based on a shared NFS read-only root filesystem

What more can xCAT do?

Feature	Description
Network management	▪ Add or delete network devices from any VM ▪ Create or delete virtual switches or virtual network LANs on any z/VM host ▪ Supports layer 2 and 3 QDIO Guest LAN, VSWITCH, and HiperSockets™
Storage management	▪ Add or delete ECKD™, FBA, or native SCSI/FCP disks from a disk pool ▪ Add or delete ECKD, FBA, or native SCSI/FCP disks from VM ▪ Attach or detach ECKD, FBA, or native SCSI/FCP disks from a z/VM
Operating system (OS) management	▪ Upgrade the Linux OS ▪ Add, update, or delete software packages on any Linux VM ▪ Includes basic xCAT features, such as remote shell, post-scripts, rsync, etc.
Monitoring	▪ Monitor any Linux VM, gathering network, disk, CPU load, and memory usage via Ganglia

What can xCAT do in the future?

Feature	Description
Image management	▪ Capture (snapshot) and deploy (restore) any Linux VM
Storage management	▪ Support copying SCSI/FCP devices
Monitoring	▪ Monitor z/VM and Linux VMs via Performance Toolkit for VM™
Security	▪ Integrated SELinux and RACF support

![IBM]

What does xCAT support?

z/VM version 5.4/6.2

Red Hat Enterprise Linux (RHEL) 5.4/5.5/5.6/6.0/6.1/6.2/6.3

SUSE Linux Enterprise Server (SLES) 10.3/10.4/11.0/11.1/11.2

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Who works with xCAT?

Adaptive COMPUTING
Moab® Cloud Suite

- Intelligent cloud management end-to-end platform
  - Intelligent decision-automation system
    - Auto-response to events and incidents
    - Auto-VM migration to maximize utilization
    - Auto-power management
  - Self-service portal
  - Integrated accounting
  - And more!

What is the value of xCAT?

- Scalability (manages hundreds of virtual machines running Linux on System z)

- Performance (minimal overhead)

- Lightweight (download size of 100 MB)

- Cross-platform (supports IBM System x, System p, and System z)

- Open source (EPL) and free!

Where do I find help?

- xCAT wiki for z/VM: http://sourceforge.net/apps/mediawiki/xcat/index.php?title=XCAT_zVM

    - Information on setting up and using xCAT

- xCAT YouTube channel: http://www.youtube.com/user/xcatuser

    - Demonstrations of how you can manage your systems through xCAT user interface

Where can I find live help?

- Post questions on the xCAT user mailing list: xcat-user@lists.sourceforge.net

- Purchase an IBM Support contract:
  http://www-03.ibm.com/systems/software/xcat/support.html

Try xCAT today!