



# System Management Tool for OpenPOWER

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# Neu Cloud Oriental System Technology Co., Ltd

- Leading High Performance Server Manufacturer in China, Invested By IBM
- Teamsun's Holdings Subsidiary

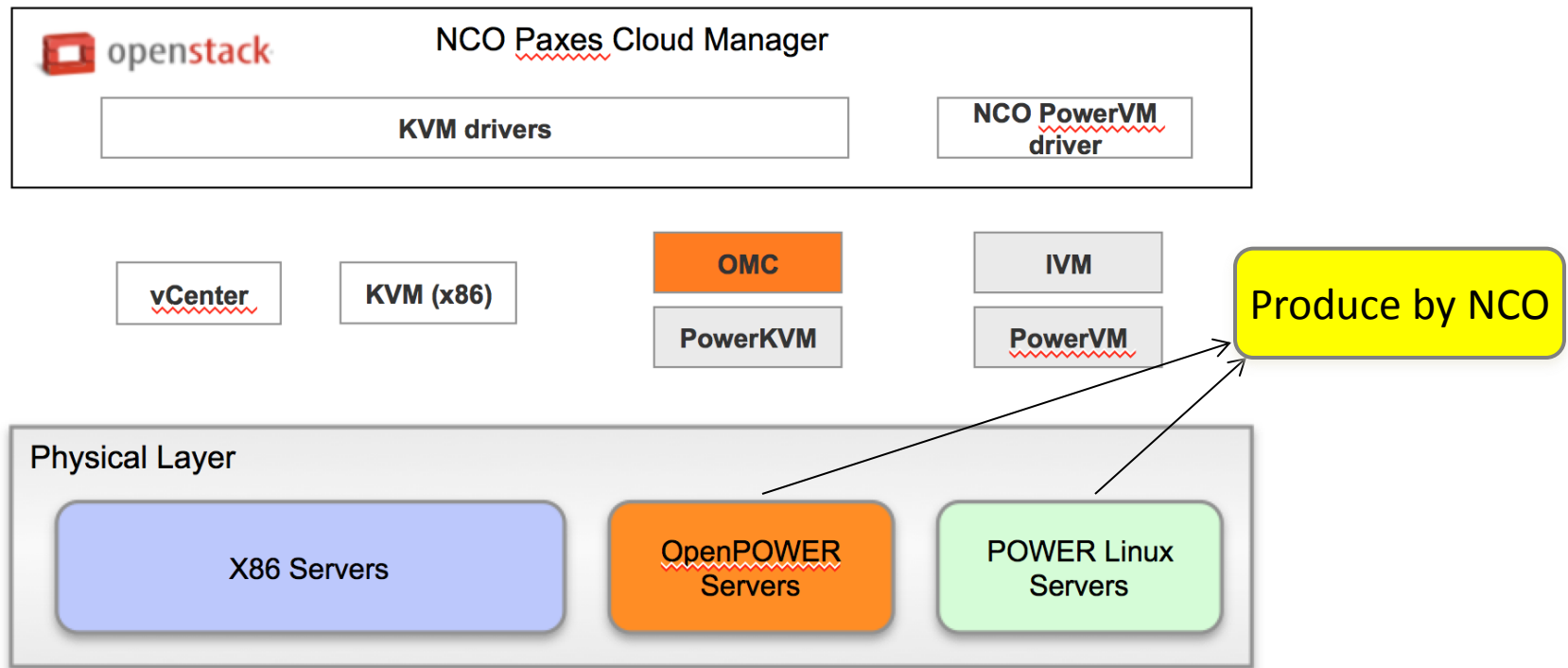


Neu Cloud is committed to the events focusing on the IBM POWER servers manufacturing, the localization, the well matched platform and ecological system. Owing to establish a comprehensive ecological system and manufacturing chain, Neu Cloud infuses substantial R&D into the domains of server, database, middleware, virtualization, cloud computing and big data. What's more, joint great efforts with leading enterprises by reaching agreements to chart a promising future.



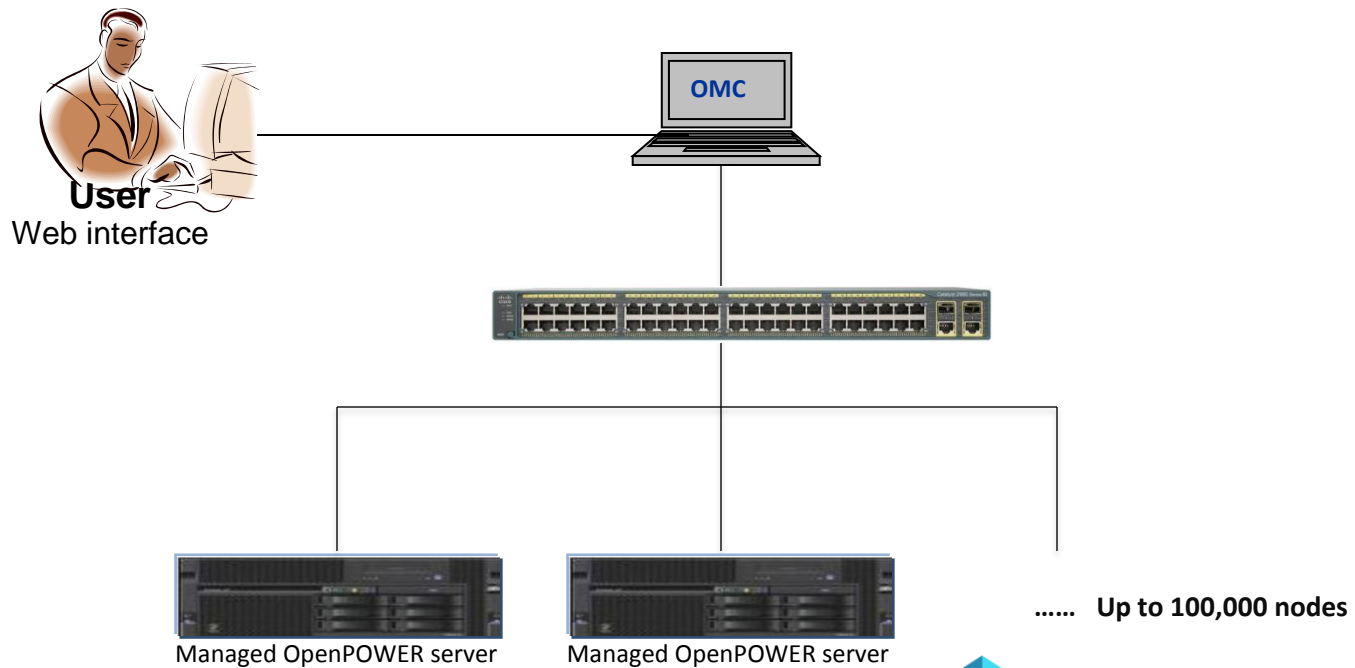
# OpenPOWER in NCO Cloud Solution

- NCO IAAS cloud manager: Paxes, base on OpenStack development
- Paxes has been released
- NCO OpenPOWER server is on the way



# OMC OverView

- Market demand
- IBM&NCO joint development
- Product name: OpenPOWER Management Console(OMC)
- Manage hardware and virtualization



# Why?

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## I have OpenStack

- Cloud only
- Limited hardware management capabilities

## I have Kimchi

- KVM management only
  - No hardware management capabilities
  - No OS and applications management capabilities

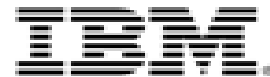
## I have x86 system management tool

- Different system management characteristics:
  - BMC
  - PowerKVM
  - Bootloader
  - FRUs, sensors, event logs and alerts

## I have HMC for PowerVM servers

- HMC manages PowerVM through FSP, but FSP is not an option for OpenPOWER servers

# OpenPOWER System Management Characteristics



## Service processor

- Different BMC vendors, even build from the ground up
- Significantly affect the hardware management capabilities

## RAID

- Different HW raid vendors
- Automatic RAID configuration
- Software RAID requirement

## Intelligent frame

- Share the power, Ethernet
- IBM Power 795 like frame?

## Energy management

- On-chip Power Management Micro-controller
- Integrated Per-core VRM
- Critical Path Monitors

## Integrated PCIe Gen 3 & CAPI

- Native PCIe Gen 3 Support
- Transport Layer for CAPI Protocol
  - Coherently Attach Devices connect to processor via PCIe

## Virtualization vs Baremetal

- PowerKVM and PowerNV
- Petiboot
- Ubuntu, RHEL, SLES, CentOS

## GPU

- GPU enablement & management
- NVlink



**OpenPOWER™**

# Known OpenPOWER System Management Products



## xCAT(Extreme Cloud/Cluster Administration Toolkit)

- Open source on SourceForge <http://xcat.sf.net>
- X86 and OpenPOWER
- CLI & RestAPI only
- No monitoring
- Announced at <http://openpowerfoundation.org/technical/technical-resources/software/>



## PCM(IBM Platform Cluster Manager)

- IBM licensed
- Using xCAT as backend
- X86, IBM Power and OpenPOWER
- GUI & CLI & RestAPI

## OpenPOWER Management Console

## OpenPOWER Management Console

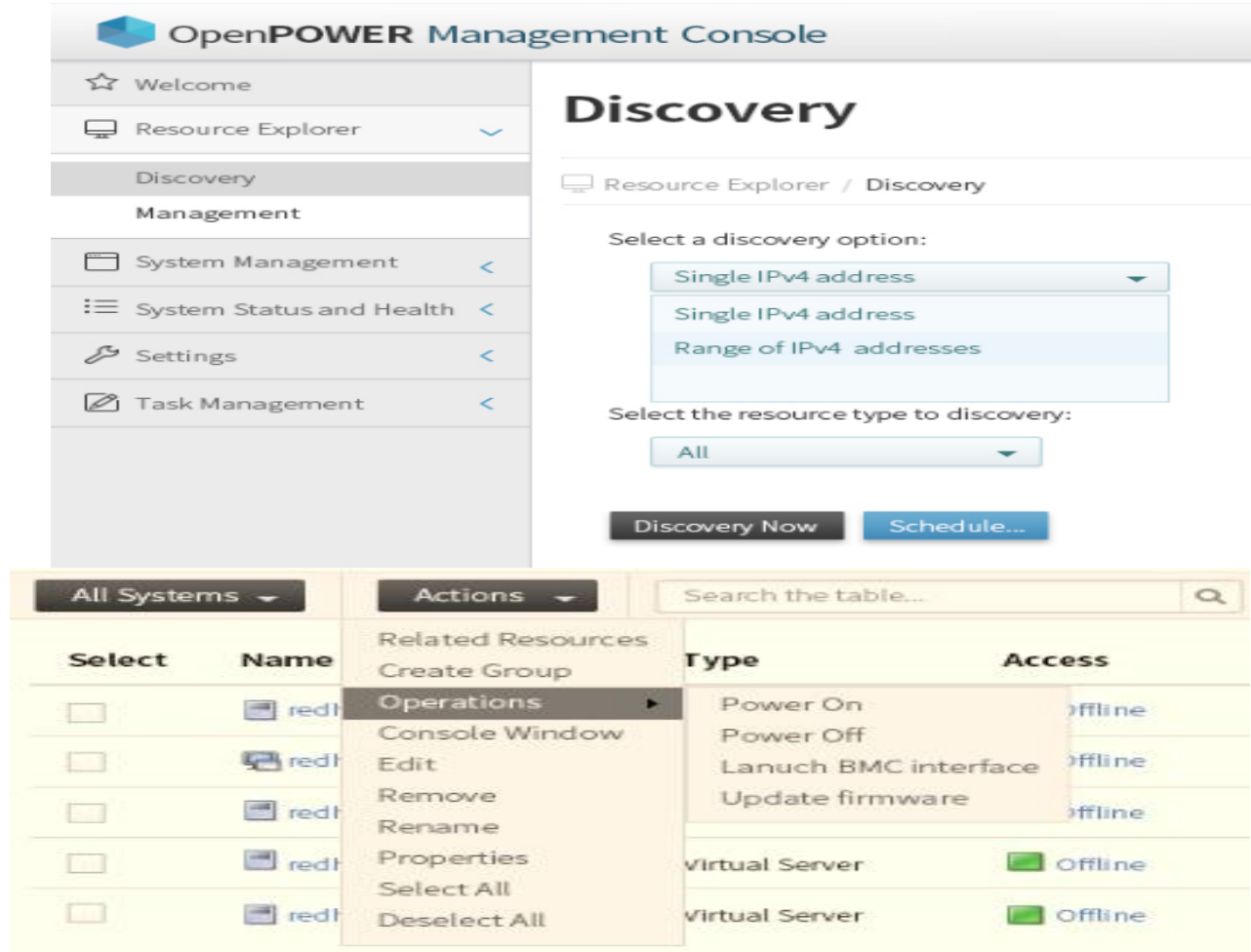
- IBM & Teamsun joint-development
- Using xCAT as backend
- Complete features set
- Hardware appliance
- OpenStack plugin

# System Management Features (1/7)

## Hardware management



- ☐ Hardware discovery
- ☐ Hardware initialization
- ☐ Remote power, remote console
- ☐ Hardware inventory
- ☐ Hardware vitals
- ☐ Energy management
- ☐ Remote destiny control
- ☐ SNMP alters processing
- ☐ Firmware update
- ☐ Service processor configuration



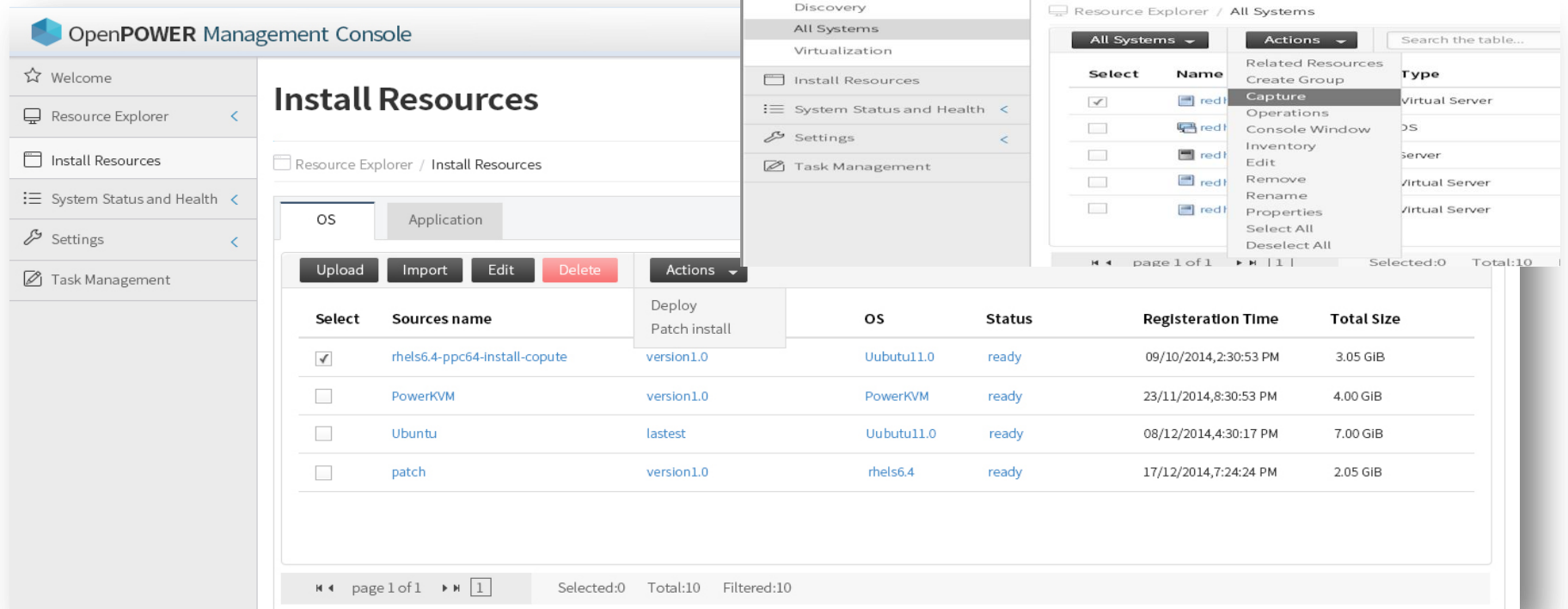
The screenshot shows the OpenPOWER Management Console interface. The left sidebar contains a navigation menu with the following items: Welcome, Resource Explorer, Discovery, Management, System Management, System Status and Health, Settings, and Task Management. The main content area is titled 'Discovery' and shows a 'Resource Explorer / Discovery' breadcrumb. It includes a 'Select a discovery option:' dropdown menu with options: 'Single IPv4 address' (selected), 'Single IPv4 address', and 'Range of IPv4 addresses'. Below this is a 'Select the resource type to discovery:' dropdown menu with the option 'All'. At the bottom of the discovery section are two buttons: 'Discovery Now' and 'Schedule...'. Below the discovery section is a table with columns: 'All Systems', 'Actions', 'Search the table...', 'Select', 'Name', 'Related Resources', 'Type', and 'Access'. The table lists several systems, each with a checkbox in the 'Select' column and a red icon in the 'Name' column. The 'Actions' column for each system includes a dropdown menu with options: 'Create Group', 'Operations', 'Console Window', 'Edit', 'Remove', 'Rename', 'Properties', 'Select All', and 'Deselect All'. The 'Type' column lists 'Power On', 'Power Off', 'Launch BMC interface', 'Update firmware', 'Virtual Server', and 'Virtual Server'. The 'Access' column lists 'Offline', 'Offline', 'Offline', 'Offline', 'Offline', and 'Offline'.



# System Management Features (2/7)

## Unattended operating system provisioning

- Os native automatic installers: RedHat kickstart, SuSE autoyast, Ubuntu preseeding, AIX NIM and Windows WinPE
- Imaging/cloning – block device, file system
- Diskful, diskless, remote media
- Operating system updates and patches management



The image displays two screenshots of the OpenPOWER Management Console. The left screenshot shows the 'Install Resources' page with a table of OS resources. The right screenshot shows the 'All Systems' page with a table of installed systems and an open actions menu.

**OpenPOWER Management Console - Install Resources**

Select	Sources name	Deploy Patch install	OS	Status	Registration Time	Total Size
<input checked="" type="checkbox"/>	rhels6.4-ppc64-install-copute	version1.0	Uubutu11.0	ready	09/10/2014,2:30:53 PM	3.05 GIB
<input type="checkbox"/>	PowerKVM	version1.0	PowerKVM	ready	23/11/2014,8:30:53 PM	4.00 GIB
<input type="checkbox"/>	Ubuntu	lastest	Uubutu11.0	ready	08/12/2014,4:30:17 PM	7.00 GIB
<input type="checkbox"/>	patch	version1.0	rhels6.4	ready	17/12/2014,7:24:24 PM	2.05 GIB

**OpenPOWER Management Console - All Systems**

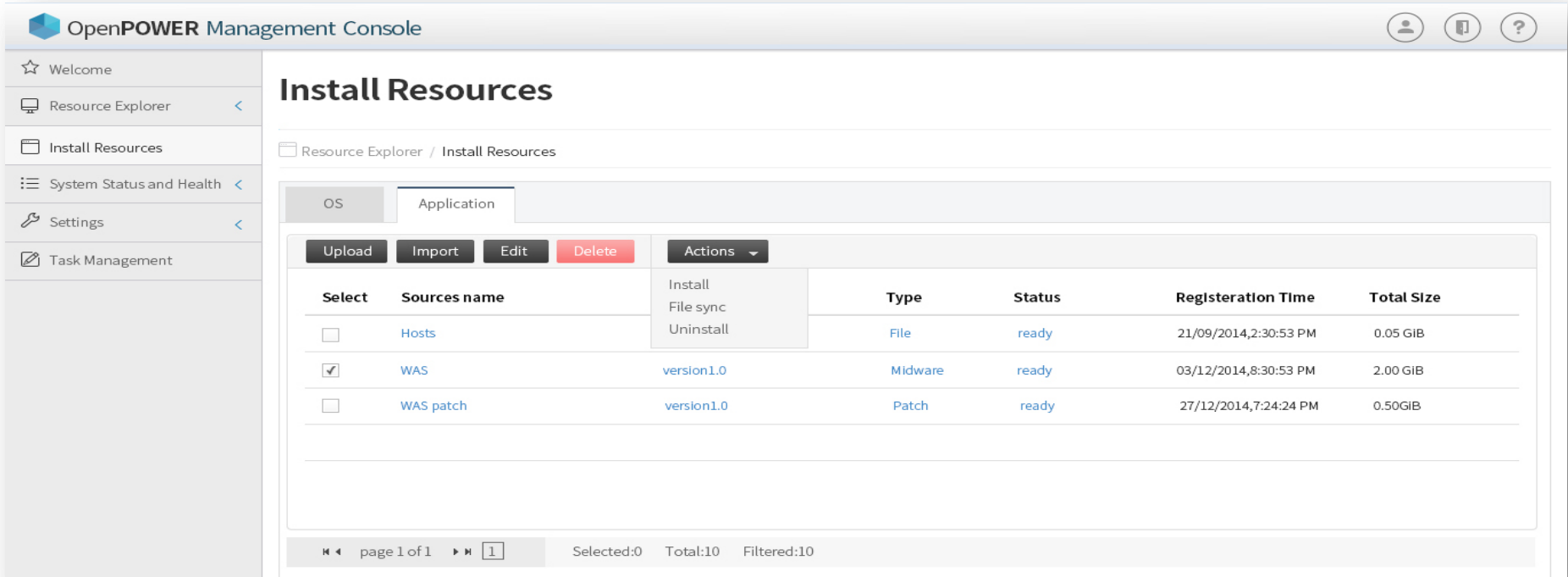
Select	Name	Type
<input checked="" type="checkbox"/>	red1	Virtual Server
<input type="checkbox"/>	red2	OS
<input type="checkbox"/>	red3	Server
<input type="checkbox"/>	red4	Virtual Server
<input type="checkbox"/>	red5	Virtual Server

Actions menu options: Related Resources, Create Group, Capture, Operations, Console Window, Inventory, Edit, Remove, Rename, Properties, Select All, Deselect All.

# System Management Features (3/7)

## Configuration management

- Applications enablement: installation, configuration, patches and updates
- File sync
- Distributed shell



OpenPOWER Management Console

Install Resources

Resource Explorer / Install Resources

OS Application

Upload Import Edit Delete Actions

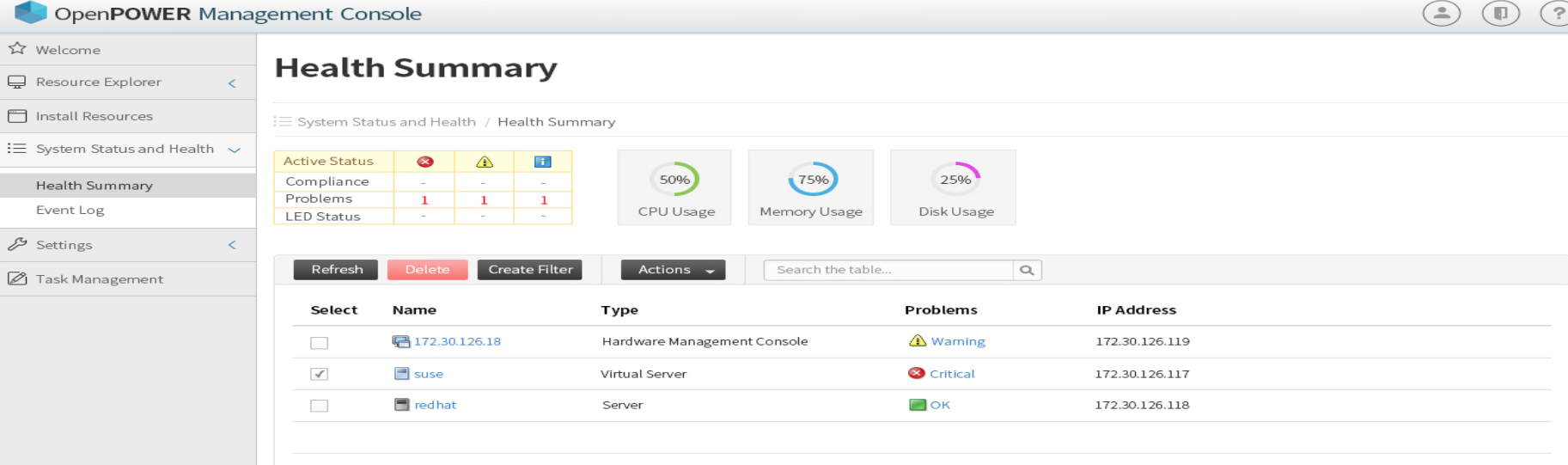
Select	Sources name	Actions	Type	Status	Registration Time	Total Size
<input type="checkbox"/>	Hosts	Install File sync Uninstall	File	ready	21/09/2014,2:30:53 PM	0.05 GiB
<input checked="" type="checkbox"/>	WAS	version1.0	Middleware	ready	03/12/2014,8:30:53 PM	2.00 GiB
<input type="checkbox"/>	WAS patch	version1.0	Patch	ready	27/12/2014,7:24:24 PM	0.50 GiB

page 1 of 1 Selected:0 Total:10 Filtered:10

# System Management Features (4/7)

## Monitoring

- Hardware monitoring: power status, vitals, eventlogs, SNMP alters, LEDs, service events
- Operating systems monitoring: performance, events
- Applications monitoring
- Push vs pull



The screenshot shows the OpenPOWER Management Console interface. The left sidebar contains navigation links: Welcome, Resource Explorer, Install Resources, System Status and Health (selected), Health Summary (active), Event Log, Settings, and Task Management. The main content area is titled 'Health Summary' and shows system status and health metrics. It includes a table for Active Status, Compliance, Problems, and LED Status. Below this are three circular progress indicators for CPU Usage (50%), Memory Usage (75%), and Disk Usage (25%). At the bottom, there is a table with columns for Select, Name, Type, Problems, and IP Address, listing three resources: Hardware Management Console, Virtual Server, and Server.

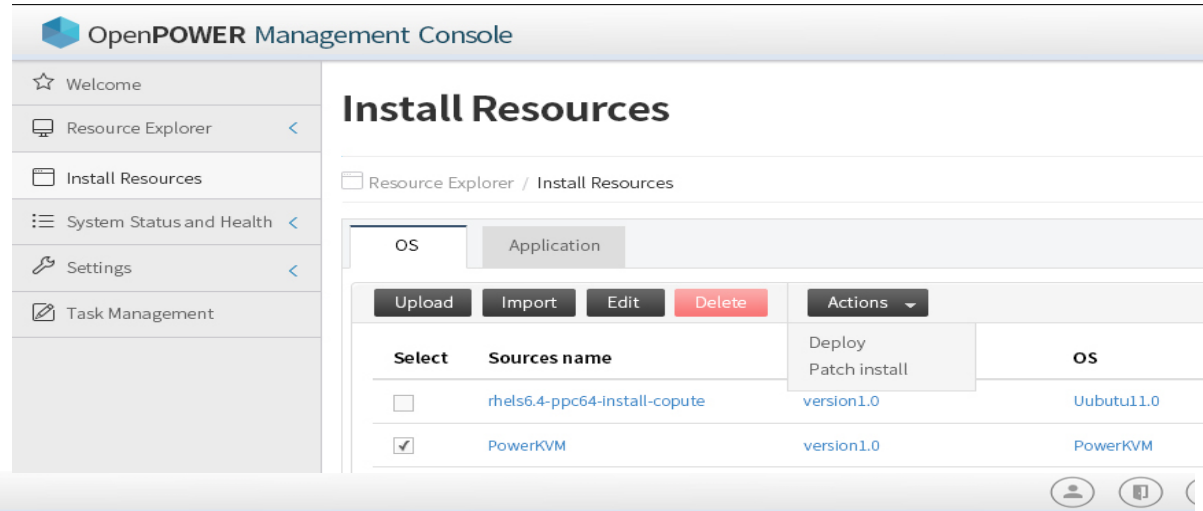
Active Status	Compliance	Problems	LED Status
-	-	-	-
1	1	1	-
-	-	-	-

Select	Name	Type	Problems	IP Address
<input type="checkbox"/>	172.30.126.18	Hardware Management Console	Warning	172.30.126.119
<input checked="" type="checkbox"/>	suse	Virtual Server	Critical	172.30.126.117
<input type="checkbox"/>	redhat	Server	OK	172.30.126.118

# System Management Features (5/7)

## Virtualization management

- Hypervisor provisioning and configuration
- VM lifecycle management
- Storage/network management



**OpenPOWER Management Console**

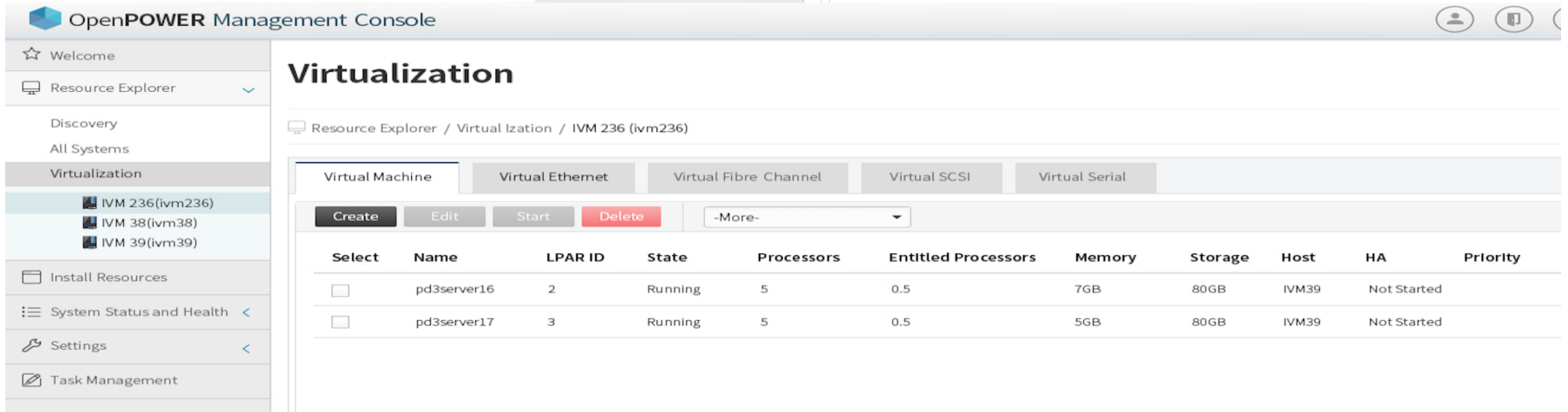
Install Resources

Resource Explorer / Install Resources

OS Application

Upload Import Edit Delete Actions

Select	Sources name	version	OS
<input type="checkbox"/>	rhels6.4-ppc64-install-copute	version1.0	Uubutu1.0
<input checked="" type="checkbox"/>	PowerKVM	version1.0	PowerKVM



**OpenPOWER Management Console**

Virtualization

Resource Explorer / Virtual IZation / IVM 236 (ivm236)

Virtual Machine Virtual Ethernet Virtual Fibre Channel Virtual SCSI Virtual Serial

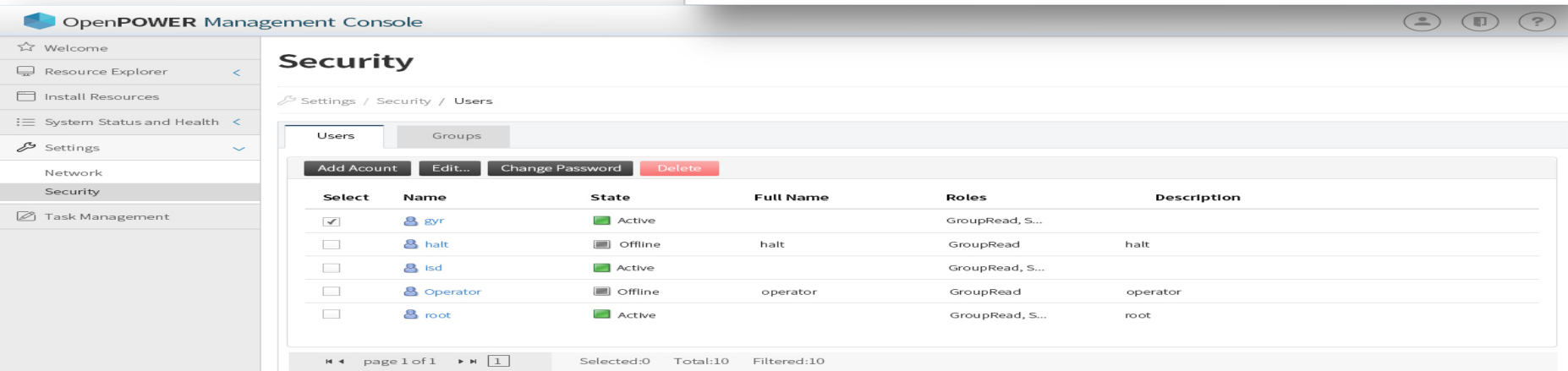
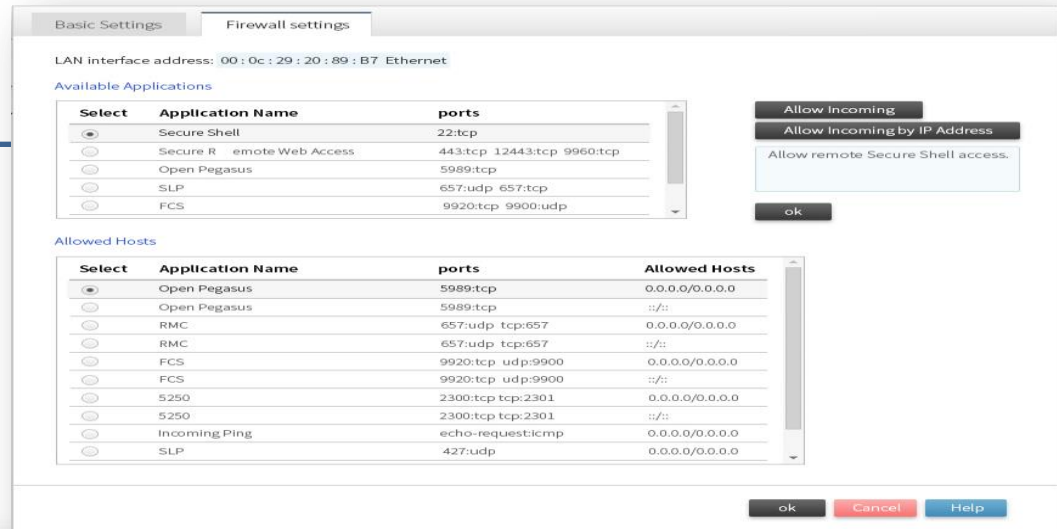
Create Edit Start Delete -More-

Select	Name	LPAR ID	State	Processors	Entitled Processors	Memory	Storage	Host	HA	Priority
<input type="checkbox"/>	pd3server16	2	Running	5	0.5	7GB	80GB	IVM39	Not Started	
<input type="checkbox"/>	pd3server17	3	Running	5	0.5	5GB	80GB	IVM39	Not Started	

# System Management Features (6/7)

## Security & HA

- Users management
- TCP/UDP ports
- Encrypted communication
- High available management node



# System Management Features (7/7)

## Scalability

- How many servers could it manage
- Load balance, Hierarchy

## UI

- CLI, GUI, REST API

## Delivery

- Standalone
- Virtual appliance: vm image, docker image, etc.
- Hardware appliance

***Thank You !***



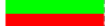
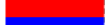

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# Backup



# BMC features comparison

Function	BMC on Tyan OpenPOWER	BMC on IBM Power	BMC on x86	
<b>1. BMC Access</b>				
1.1 IPMI				
In Band	1			
Out of Band				
1.2 SSH				
1.3 Telnet				
1.4 SNMP	2			
<b>2. Hardware</b>				
2.1 Setup username/password and network configuration (ip, netmask, gateway, vlan) for BMC				
2.2 Enable (configure) /Disable SNMP	3			
2.3 Firmware (flash)	3			
<b>3. Hardware Control</b>				
3.1 Power on/off/status/reset				
3.2 IPMI SOL support				
3.3 Configure boot order for the host OS				
Just for next boot				
Persistently				
3.4 Turn on/off/blink beacon in the front panel				
<b>4. Hardware Inventory</b>				
4.1 MTMS		Haven't verify		
4.2 Physical slots information				
4.3 Processors information				
4.4 Memory information				
4.5 Firmware information				
4.6 Power supply				
4.7 Manufacture				
4.8 VPD information				
4.9 MAC addresses of Host system				
<b>5. Hardware Vitals</b>				
5.1 Power/system status		Haven't verify		
5.2 CPU temperature and memory temperature				
5.3 PCI slots temperature				
5.4 voltage				
5.5 LED				
5.6 Fan speed				
<b>6. Energy Management</b>				
<b>7. System Event Log</b>				
7.1 List the event log				
7.2 Clear the event log entries				
<b>8. Support to use SLP to discover the bmc</b>	4			
<b>9. Remote media</b>	5			

 Support
  Don't support
  Need to confirm

Note :  
 1. For in-band of IPMI, The IBM version to support Open Power will be released on 2015-10, and for Tyan version(which also means Softlayer version) will be 2015-06.  
 2. For SNMP related configuration, not got any information yet.  
 3. For firmware update, only HTTP/HTTPS(which means out of band) is supported. For IBM Open POWER, in-band(using update\_flash in host OS, powerKVM and PowerNV) is supported.  
 4. SLP won't be support for Tyan Open POWER BMC which is really important to do hardware discovery.  
 5. The "Virtual Media Devices" function on Tyan Open POWER BMC can be used to mount a local ISO file as a virtual disk or cdrom.