

IBM Client Center Montpellier

Cloud on Power

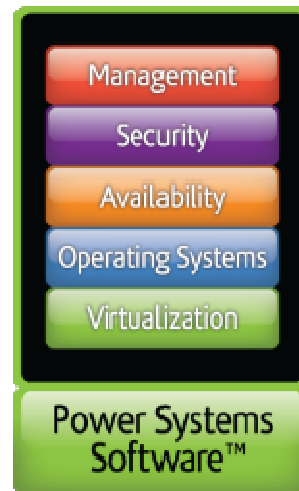
[Thierry Huche](#)


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Agenda


- **HMC V8.8.20 new features**
- Power Virtualization Console
- IBM Cloud Manager with OpenStack



Cloud Management 


Infrastructure as a Service with IBM Cloud Manager

- End-user self-service provisioning of IaaS with SCE
- Service catalog with virtual systems and applications
- Subscriber and account management (multi-tenancy)
- Delivered as Entry, Provisioning and Orchestration

Virtualization Management 

Virtualization Management with PowerVC

- Leadership Virtual Systems Management for PowerVM
- Virtual Image Management and Deployment
- Resource Pooling and Dynamic VM Placement
- On-going optimization and VM resilience

Platform Management 

Power Systems Hardware Management Console

- PowerVM Configuration – Virtualization Setup
- Hardware and firmware management for Power
- Hardware and firmware configuration and controls
- Service, support and update management



Providing comprehensive and consistent management experience for rack server, blades and PureFlex

- Console Management
 - Classic or Enhanced
- Introduce new features and enhancements
 - HMC V8.820 New GUI Tech Preview
- PowerVM management
- LPAR management/Templates
- Performance and Capacity Monitor





Templates enablement – [HMC 8.10 SP1 9/2014](#)

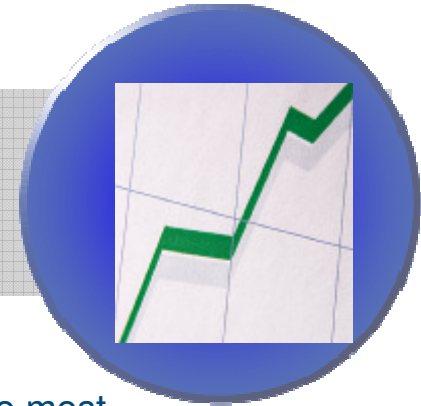
Enable template capture and deploy for quick 'best practice' system and partition deploy. Allows for simplified / automated initial system deploy.

One-Touch VIOS Deploy [HMC 8.10 SP1 9/2014](#)

Simplify deploy of a VIOS. Aligned with System Templates, this allows automated system deploy.

Integrated Performance & Capacity Metrics [HMC 8.10 SP1 9/2014](#)

Provide full PowerVM performance and capacity metrics via a single touch-point (HMC).



Initial PowerVM REST-API - [HMC 7.8 8/2013](#)

Additional REST-APIs in HMC V8 providing rich access to most PowerVM function – including the VIOS



No-Touch VIOS Management – Full APIs [HMC 8.10 SP1 9/2014](#)

Full API-Based management interfaces for the VIOS.
Removes need for VIOS inventory polling.

- **Deploy System Template**
 - ✓ Capture system virtualization configuration in a template from existing system
 - ✓ HMC V8.820 system virtualization starter template library

- **Deploy Partition Template**
 - ✓ Use a starter partition template from the HMC template library
 - ✓ Capture partition configuration from an existing partition and deploy on system

- **Manage PowerVM**
 - ✓ Create a new virtual IO server
 - ✓ View all virtual networks and create a new internal or bridged network
 - ✓ View the virtual network diagram mapping physical devices through virtual networks to partitions

- **Manage Partition**
 - ✓ Modify partition properties (general, memory, processor, physical IO)
 - ✓ View all virtual network connections and add new connection
 - ✓ View all virtual storage and add new device (virtual SCSI, FC)

- **Performance and Capacity Monitoring**
 - ✓ View the current system capacity and utilization (server trend, processor, and memory) (including partitions and virtual IO servers)
 - ✓ View the virtual network and storage utilization

ATSHMC2 Resources > All Systems

All Partitions
All Virtual I/O Servers

IBM Hardware Management Console

ATSHMC2 Resources > All Systems ATS_E880A Partitions

Partitions

View and monitor the state, health, and capacity information of all the partitions on the selected system.

Select All | Actions Total: 4 Selected: 0

Partition Name	Status	Allocated	Used	Free
a052rsb	Running	4 GB	64%	32%
a051rsb	Running	4 GB	76%	46%
i116rsb	Running	8 GB	10%	0%
i050rsb	Running	6 GB	54%	0%

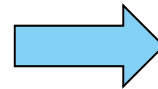
HMC Management

- Console Settings
- Console Management
- Template Library
- Updates
- System Actions
- Partitions
- Partitions **4**
- Properties
- General Properties
- Other Properties...
- Power VM
- Virtual I/O Servers **3**
- Virtual Networks
- Virtual Storage
- Hardware Virtualized I/O
- Reserved Storage Pool

HMC 790 or earlier

The screenshot shows a terminal window with various performance monitoring commands and their outputs. At the bottom, there is a table listing LPARs and their associated servers.

A	B	C	D	E	F	G	H	I	
LPAR name	Slot	State	Required	Type	Remote LPAR	Remote Slot	Managed System Name	Managed System Serial	
1	VIOS1-750e	21	On	False	server	axi1-NIM1SD	21	750e-8233-EBB-SN1003BP	1003CBP
2	VIOS1-750e	10	On	False	server	axi1-NIM1SD	21	750e-8233-EBB-SN1003BP	1003CBP
3	VIOS1-750e	10	On	False	server	axi1-NIM1SD	21	750e-8233-EBB-SN1003BP	1003CBP
4	VIOS1-750e	14	On	False	server	axi1-NIM1SD	21	750e-8233-EBB-SN1003BP	1003CBP
5	VIOS1-750e	14	On	False	server	axi1-NIM1SD	21	750e-8233-EBB-SN1003BP	1003CBP
6	VIOS1-750e	13	On	False	server	axi1-nimisd-2	13	750e-8233-EBB-SN1003BP	1003CBP
7	VIOS1-750e	12	On	False	server	axi1-nimisd-2	13	750e-8233-EBB-SN1003BP	1003CBP
8	VIOS1-750e	11	On	False	server	axi1-nimisd-2	13	750e-8233-EBB-SN1003BP	1003CBP
9	AXI-MON1	7	On	False	client	VIOS1-750e	10	750e-8233-EBB-SN1003BP	1003CBP
10	axi1-nimisd-2	13	On	True	client	VIOS1-750e	10	750e-8233-EBB-SN1003BP	1003CBP
11	axi1-nim0	14	On	False	client	VIOS1-750e	10	750e-8233-EBB-SN1003BP	1003CBP
12	axi1-nim02	2	On	False	client	VIOS1-750e	10	750e-8233-EBB-SN1003BP	1003CBP
13	axi1-NIM1SD	21	On	True	client	VIOS1-750e	21	750e-8233-EBB-SN1003BP	1003CBP
14	deb7	11	Off	False	client	VIOS1-750e	10	750e-8233-EBB-SN1003BP	1003CBP
15	06-AD10A	7	Off	True	server	sls11m01	13	Server-8406-70Y-SN06AD10A	06AD10A
16	06-AD10A	14	Off	True	server	sls11m01	13	Server-8406-70Y-SN06AD10A	06AD10A
17	06-AD10A	34	Off	True	server	sls11m01	13	Server-8406-70Y-SN06AD10A	06AD10A
18	06-AD10A	12	Off	True	server	sls11m01	13	Server-8406-70Y-SN06AD10A	06AD10A
19	06-AD10A	33	Off	True	server	sls11m01	13	Server-8406-70Y-SN06AD10A	06AD10A
20	06-AD10A	11	Off	False	server	sls11m01	13	Server-8406-70Y-SN06AD10A	06AD10A
21	prov1	2	Off	True	client	06-AD10A	11	Server-8406-70Y-SN06AD10A	06AD10A
22	sls11m01	13	Off	True	client	06-AD10A	7	Server-8406-70Y-SN06AD10A	06AD10A
23	dr633	4	Off	False	client	06-AD10A	34	Server-8406-70Y-SN06AD10A	06AD10A



HMC 810

The screenshot shows the HMC 810 Performance Monitoring interface for server saturn3. It includes a 'Current Resource Utilization' bar chart, a 'Capacity Distribution' table, and a 'Top Resource Consumers' chart. The interface is integrated and visual.

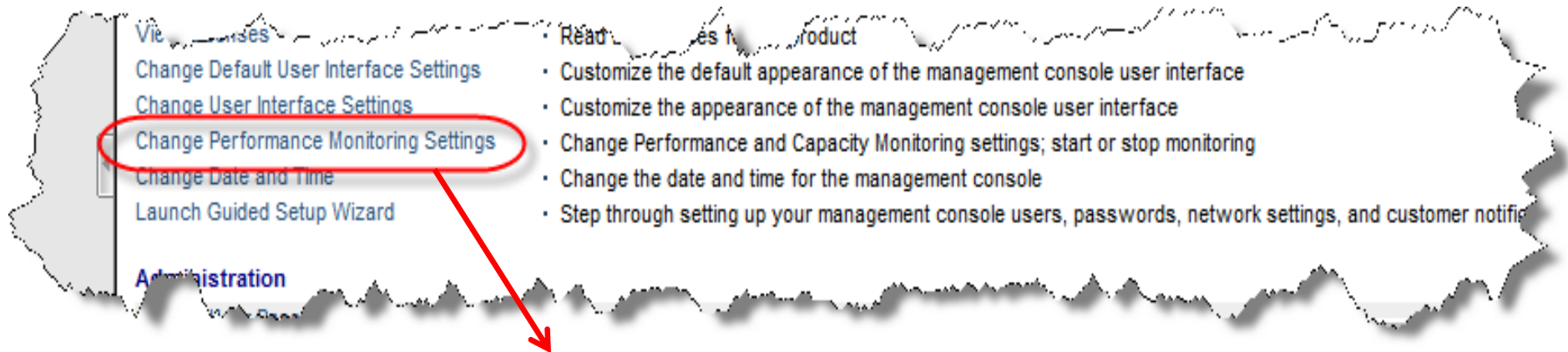
Partition / VIOS	Environment	Utilized Processor in C
slx_57_1	axlinux	0.01
slx_57_3	axlinux	0.01
slx_57_3_NPTV	axlinux	0.01
l1m01_100	axlinux	0.0



- ✓ Disjointed set of tools (lslparutil, lshwres, nmon, topasm, iDoctor)
- ✓ Multiple agents need to be installed in OS
- ✓ Minimal or Lack of built in Visualization
- ✓ Gaps in instrumentation for vital metrics

- ✓ Integrated Visual Monitor in HMC
- ✓ Standard set of Interfaces (REST APIs) for external applications to consume data

- Provides utilization monitoring of resources in Power Systems via a single touch-point (HMC)
- Data collection and aggregation of performance metrics from Hypervisors (PHYP & VIOS) to provide Systems utilization view
 - ✓ New instrumentation to provide useful metrics of measurement for all resources
- Provides REST API(WEB APIs) for seam-less upward integration
 - ✓ Easy out-of-box access to the utilization data for monitoring tools e.g. PowerVC, Tivoli, third party
- Trending of the utilization data
- Assists in first level of performance analysis & capacity planning



Settings for Performance Monitoring

Select the servers for which you want to collect Performance and Capacity Monitoring(PCM) data. Specify the number of days to retain PCM data.

Performance Data Storage

Number of days to store performance data (maximum 366):

Performance Monitoring Data Collection for Managed Servers

Server	Collection
ATS_S824	<input checked="" type="checkbox"/>
8205-E6DATS_740D	<input checked="" type="checkbox"/>


Performance Monitoring ATS_S824

Data Collection On

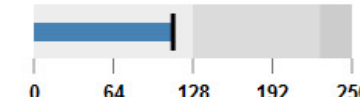
Current Resource Utilization Jul 17, 2014 4:34:56 PM to Jul 17, 2014 4:44:56 PM

Auto-update in 10 Minutes

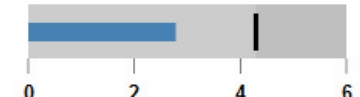
Processor Usage/Peak in CPU Cores



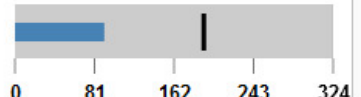
Memory Assignment in GB



Network Traffic in KB/s



Storage Traffic in KB/s



Server Overview Jul 17, 2014 12:45:00 PM to Jul 17, 2014 4:45:00 PM

Capacity Distribution

By Processor in % (number) of Partitions


High	Medium	Low
33.33%(2)	0.0%(0)	66.67%(4)

By Memory

Dedicated	High	Low
100.0%(6)	0.0%(0)	%(0)

Top Resource Consumers - Processor by Partitions

Cores



Resource Utilization

All in Averages Filter by Partition / VIOS ...

Partition / VIOS	Environment	Utilized Processor in CPU Cores	Utilized Memory in GB	Shared Network in KB/s

Views

- Server
- Server Overview
- Processor
- Processor Utilization Trend
- Memory
- Memory Utilization Trend
- Network
- Network Utilization Trend
- Storage
- Storage Utilization Trend

31 March 2015

IBM Client Center Montpellier

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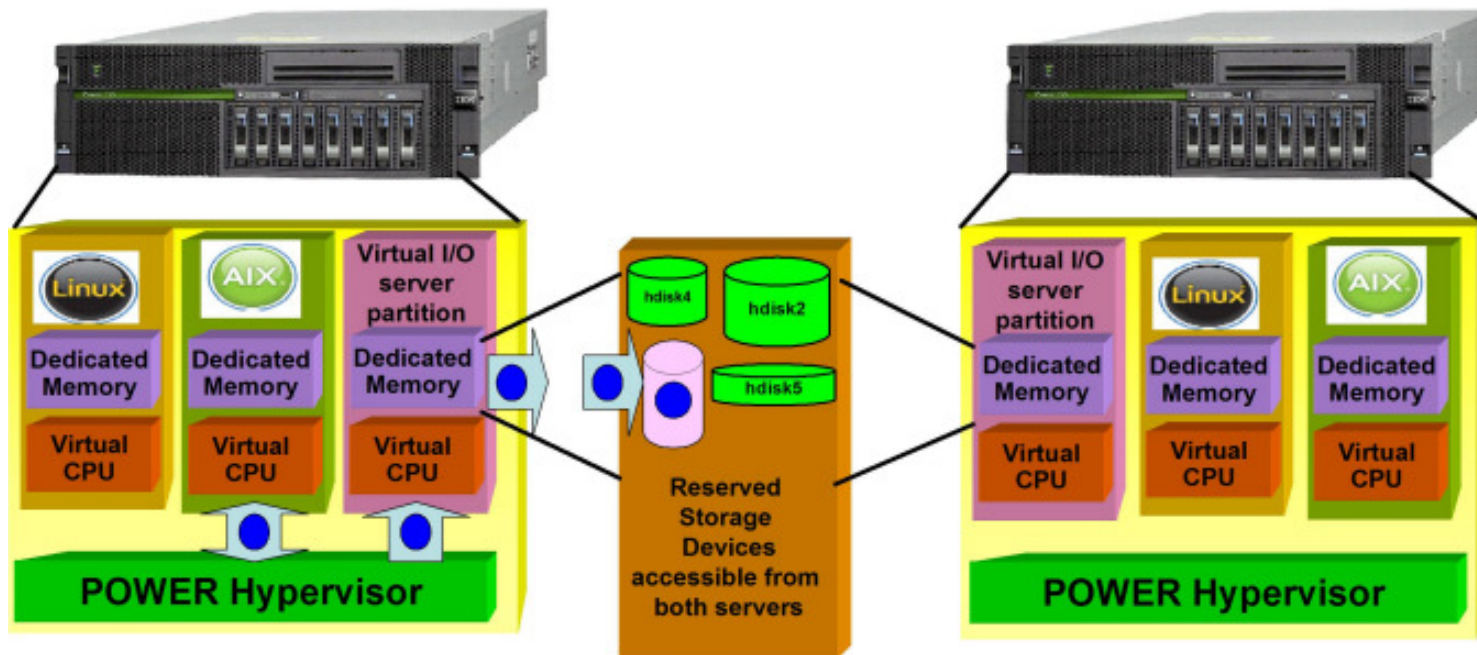
- A mechanism to recover a partition on another server when its original host server (PHYP) fails.
- High Availability function on POWER VM Enterprise Edition
- **NOTE: Partition is restarted (rebooted) on the target server.**
- User model:
 - HMC – Use to create Simplified Remote Restart capable partition
 - HMC – Use to remote restart the partition on a capable target server
- The source and target servers should be connected to the same HMC

Hardware Management Console



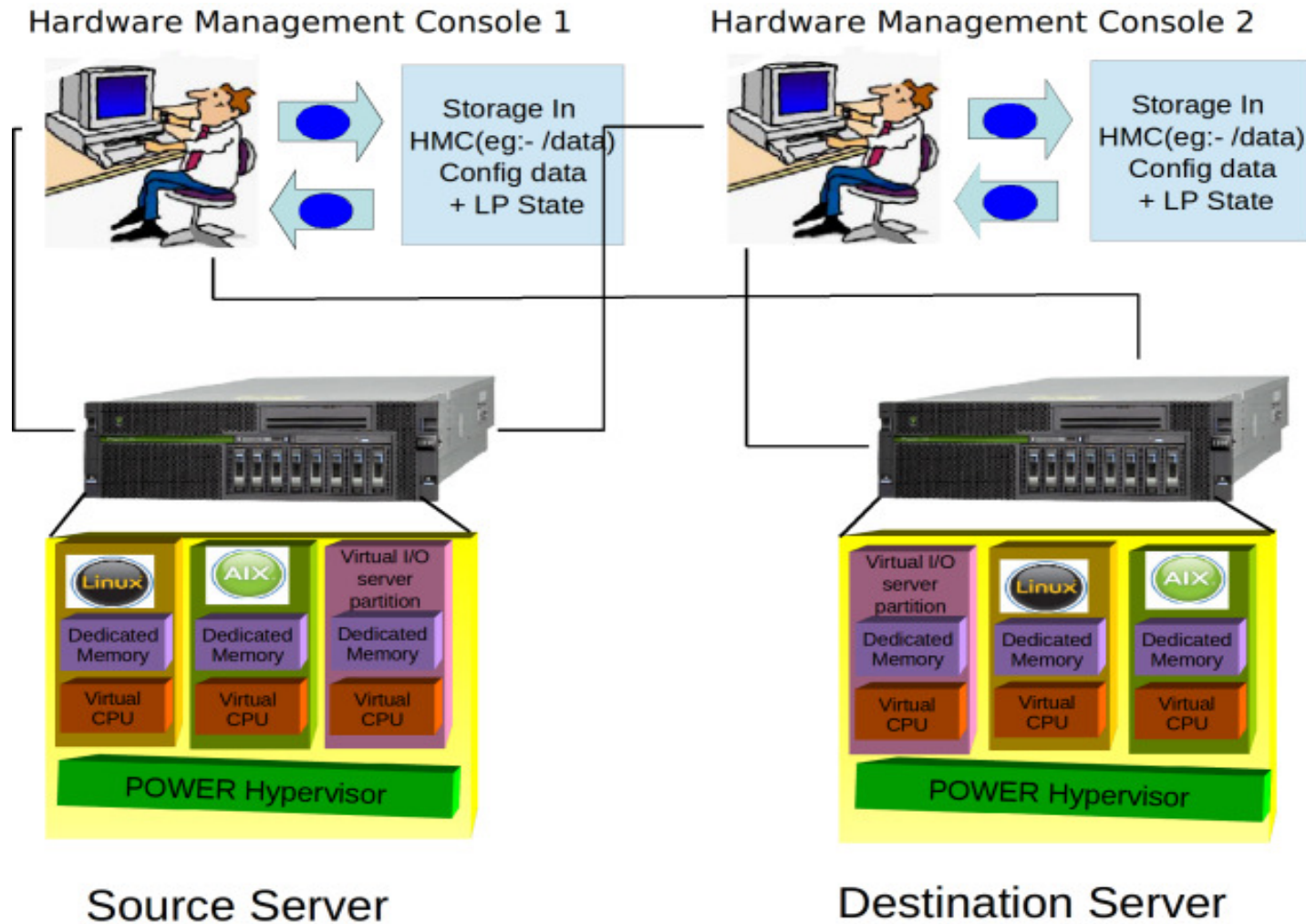
Source Server

Destination Server

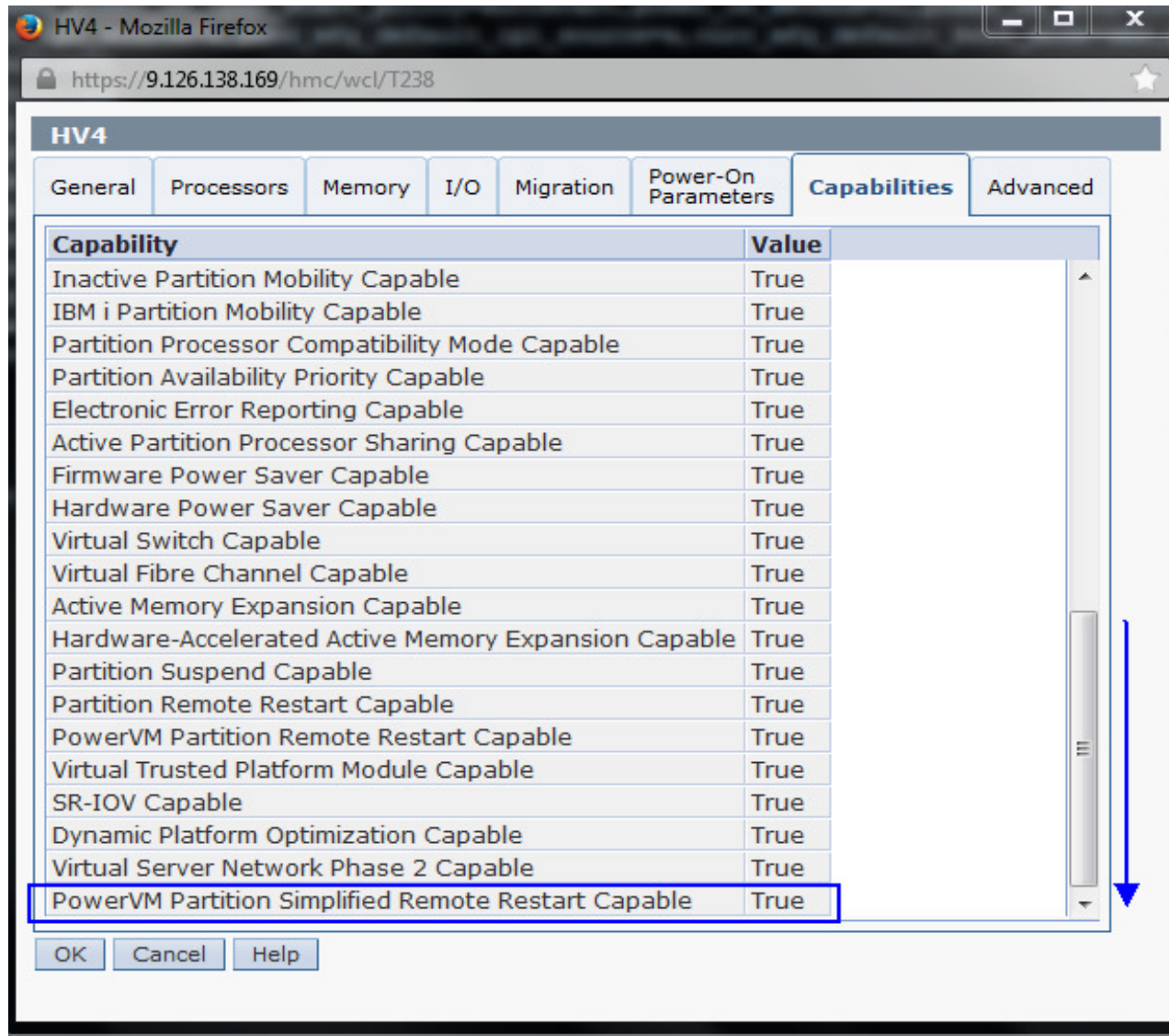


● — Configuration data of the partition

PowerVM Remote Restart



- Configuration data of the partition



HV4

General Processors Memory I/O Migration Power-On Parameters **Capabilities** Advanced

Capability	Value
Inactive Partition Mobility Capable	True
IBM i Partition Mobility Capable	True
Partition Processor Compatibility Mode Capable	True
Partition Availability Priority Capable	True
Electronic Error Reporting Capable	True
Active Partition Processor Sharing Capable	True
Firmware Power Saver Capable	True
Hardware Power Saver Capable	True
Virtual Switch Capable	True
Virtual Fibre Channel Capable	True
Active Memory Expansion Capable	True
Hardware-Accelerated Active Memory Expansion Capable	True
Partition Suspend Capable	True
Partition Remote Restart Capable	True
PowerVM Partition Remote Restart Capable	True
Virtual Trusted Platform Module Capable	True
SR-IOV Capable	True
Dynamic Platform Optimization Capable	True
Virtual Server Network Phase 2 Capable	True
PowerVM Partition Simplified Remote Restart Capable	True

OK Cancel Help

Create Lpar Wizard : HV4-216

- **Create Partition**
- Partition Profile
- Processors
- Processing Settings
- Memory Settings
- I/O
- Virtual Adapters
- Logical Host Ethernet Adapters (LHEA)
- SNI Adapters
- HCA
- Optional Settings
- Profile Summary

Create Partition

This wizard helps you create a new logical partition and a default profile for it. You can use the partition properties or profile properties to make changes after you complete this wizard.

To create a partition, complete the following information:

System name : HV4-216

Partition ID :

Partition name :

Allow this partition to be suspended.

Allow this partition to be remote restartable(**Simplified**)

Allow this partition to be vTPM capable

Sync Current configuration Capability

- **Show Server or VM**
 - ✓ Properties
 - ✓ Capacity

- **Dynamic VM change (DLPAR)**

- **Manage VM**
 - ✓ Add Network connection
 - ✓ Add vscsi
 - ✓ Show Storage mapping

- **Create a virtual machine (VM) via templates**

- **Virtual Networking Diagram**

- **Performance Monitoring**



- HMC V8.8.20 new features
- **Power Virtualization Console**
- IBM Cloud Manager with OpenStack





- ✓ *Improve resource utilization to **reduce capital expense and power consumption***
- ✓ ***Increase agility** and execution to quickly respond to changing business requirements*
- ✓ ***Increase IT productivity** and responsiveness*
- ✓ ***Manage scalability** without adding complexity*
- ✓ ***Dynamically adjusts** workloads to ease burden on systems management*

PowerVC 1.2.3 Announcement Content

- ✓ *Protects current investment with simple path to new technology*
- ✓ *Accelerates development*
- ✓ *Better hardware support and an open framework for customers and ISVs*

- Multi-disk Capture / Deploy
- Remote restart (manual)
- Advanced placement (affinity/anti-affinity)
- Redundant HMC Support
- Host aggregates
- Cloud-init on AIX
- Memory and CPU capacity based scheduling

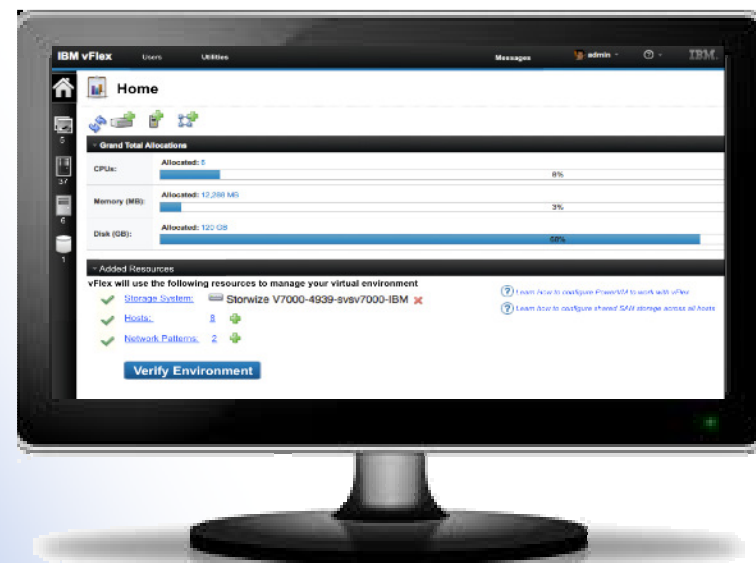
Using IBM Power Virtualization Center, you can do the following:

- ✓ Register physical hosts, a storage system, and network resources and use them to create a virtual environment.
- ✓ Create, resize, and attach volumes to virtual machines.
- ✓ Monitor the utilization of the resources that are in your environment.
- ✓ Migrate virtual machines while they are running (hot migration).
- ✓ Capture a virtual machine that is configured just the way you want it to be. When you capture the virtual machine, an image is created that can be deployed multiple times in your environment.
- ✓ Deploy images quickly to create new virtual machines that meet the demands of your ever-changing business needs.

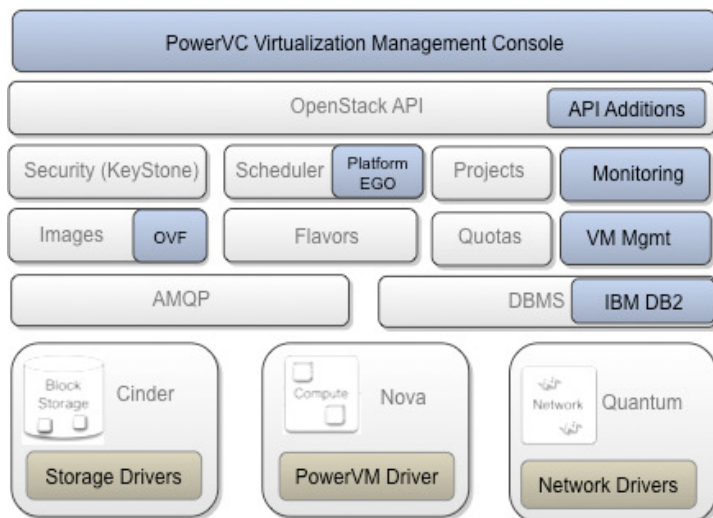


A graphical user interface targeting the IT administrator

- Simple, Intuitive and Appealing
- Progressive Disclosure of Details
- Tasks Tuned for Power Management
- Built on top of the OpenStack API



Virtualization Management Console



Simple, Intuitive with a Focus on Time to Value...

1. Add Storage to be managed...

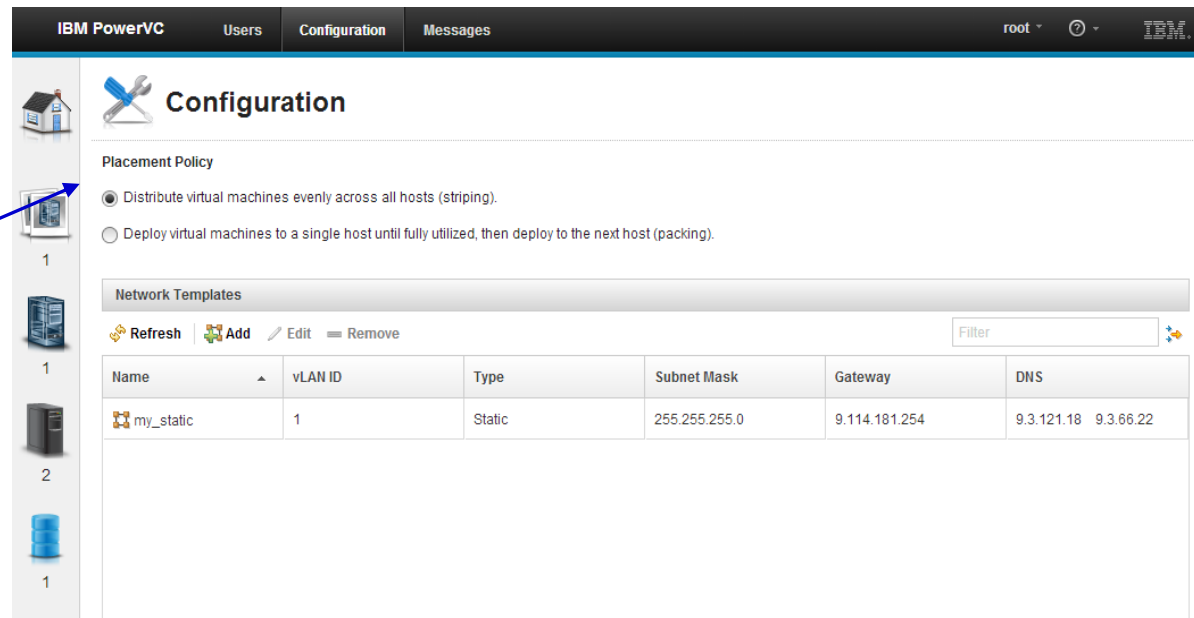
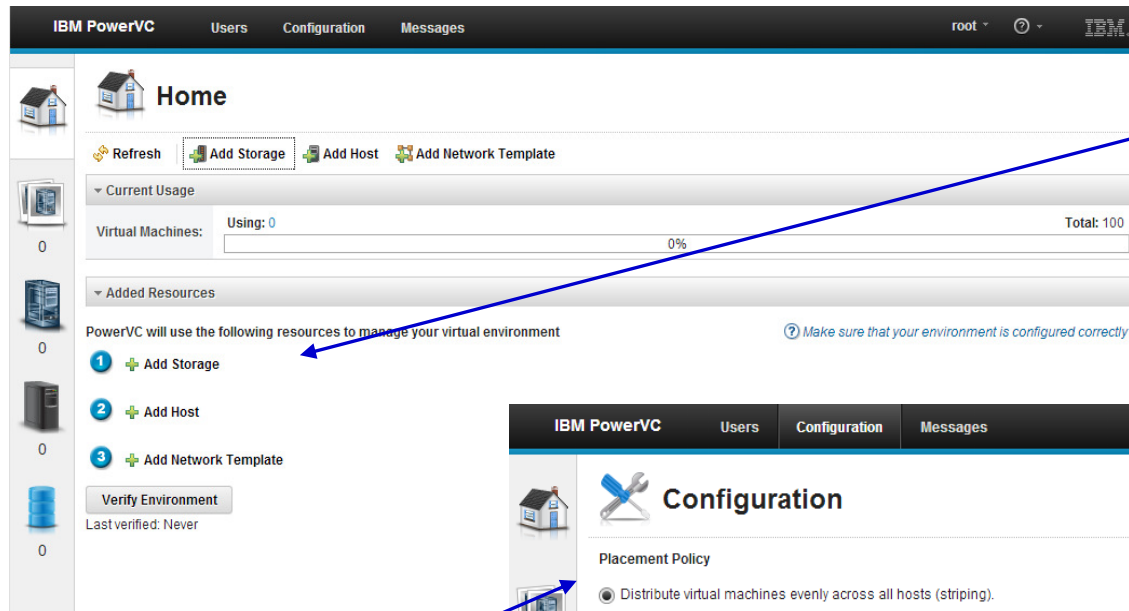
- Provide IP address
- Provide user-id & password

2. Add Servers to be managed...

- Provide IP address of IVM/HMC
- Provide user-id & password

3. Add Network Template...

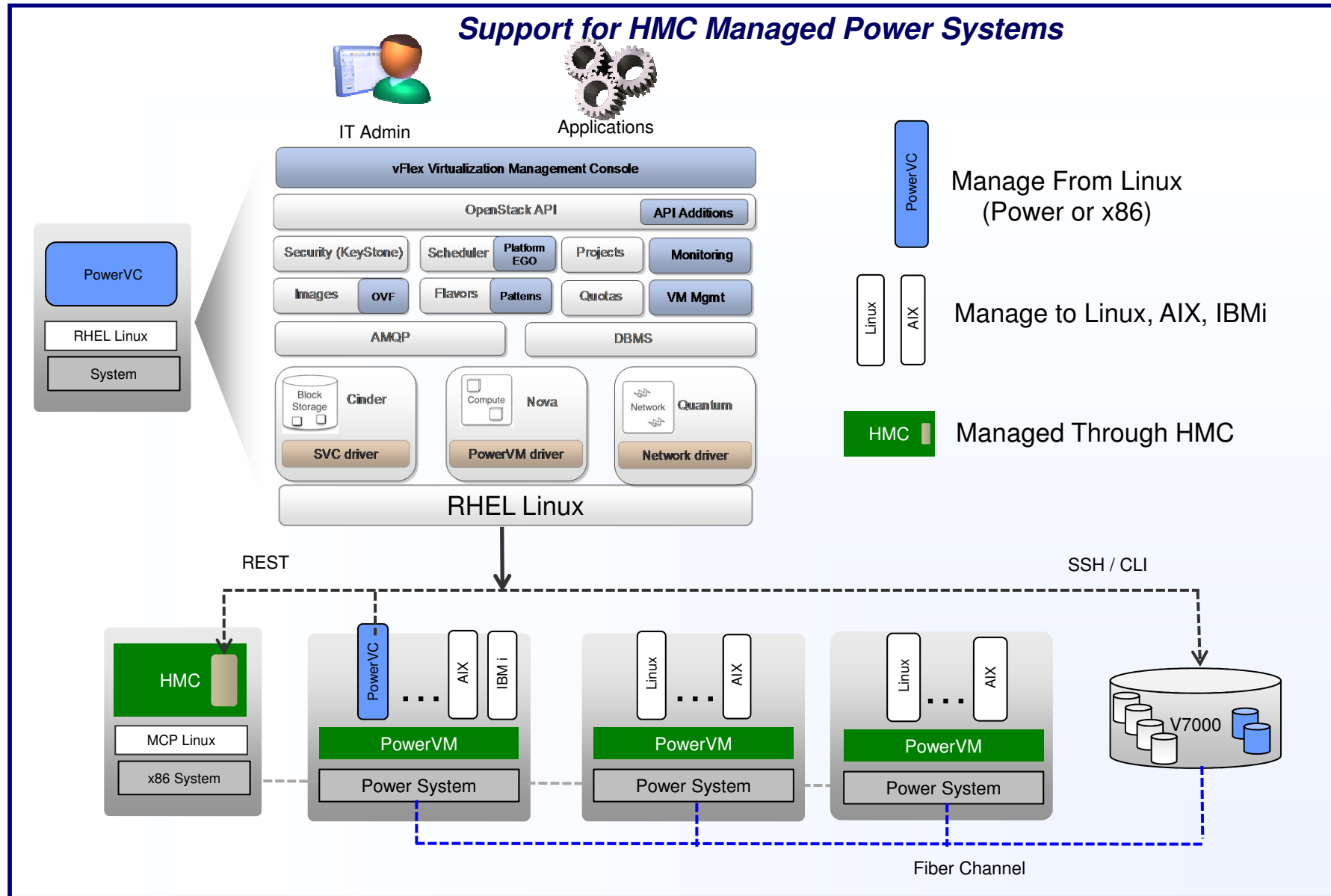
- Provide VLAN ID
- Provide IP Configuration



Configuration Placement Policies...

- **Stripe Virtual Machines**
- **Pack Virtual Machines**





- **Deploy a virtual machine (VM)**
- **Start & stop a VM**
- **Dynamic VM change (DLPAR)**
- **Capture a VM**
- **Add a disk to a VM**
- **Remove a VM**



- HMC V8.8.20 new features
- Power Virtualization Console
- **IBM Cloud Manager with OpenStack**



IBM Cloud Manager with OpenStack is an easy to deploy, simple to use **Private and Hybrid** cloud management software offering **based on OpenStack with open cloud APIs**. Importantly, we include **IBM enhancements** that feature improved ROI through superior **resource scheduling** and a self-service portal for **workload provisioning, virtual image management, and monitoring**. It's an innovative, cost-effective approach that also includes **automation, metering and security**.

Cloud solution supporting Heterogeneous Compute, Storage & Network

- Single point management across multiple domains & hypervisors
- x86, all IBM server architectures & major hypervisors supported

Additional features enabling more efficient use of Cloud resources

- Dashboards show Cloud admin resource capacity & VM utilization
- Metering/Billing and reports, Resource expiration & project approval policies, Network configuration & mapping

Seamless Hybrid Enablement & Multi-cloud Federation

- Federation to multi instances of OpenStack and Hybrid Clouds
- Hybrid Clouds on and off premise options & SoftLayer support



- **Accelerate Time to Market:** Time to market improvement for new applications
- **Integrated Management:** Approvals, metering, billing, users and projects through a single 'pane of glass'
- **Flexible, modular design:**
Based upon OpenStack IaaS
Access to OpenStack APIs
Extensible via REST API allowing partners to easily customize the UI

**Open
Simple
Innovative**

- The transition to cloud has empowered end users to perform tasks previously restricted to admins
- A distinct cloud admin role has emerged (separate from virtual/physical resource management)
- Skilled virtual resource management is required for virtual compute, storage and network infrastructure
- As always, skilled physical resource managers (either offsite or on-premise) are as critical as ever

IBM Cloud Manager with Openstack supports these user types



End users

• Self-service IT requests via mobile & Web clients

• Manage cloud workloads, users and environment



Cloud manager

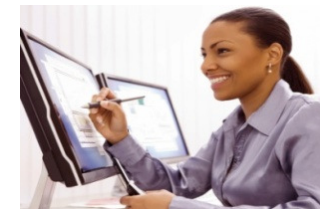
Platform manager



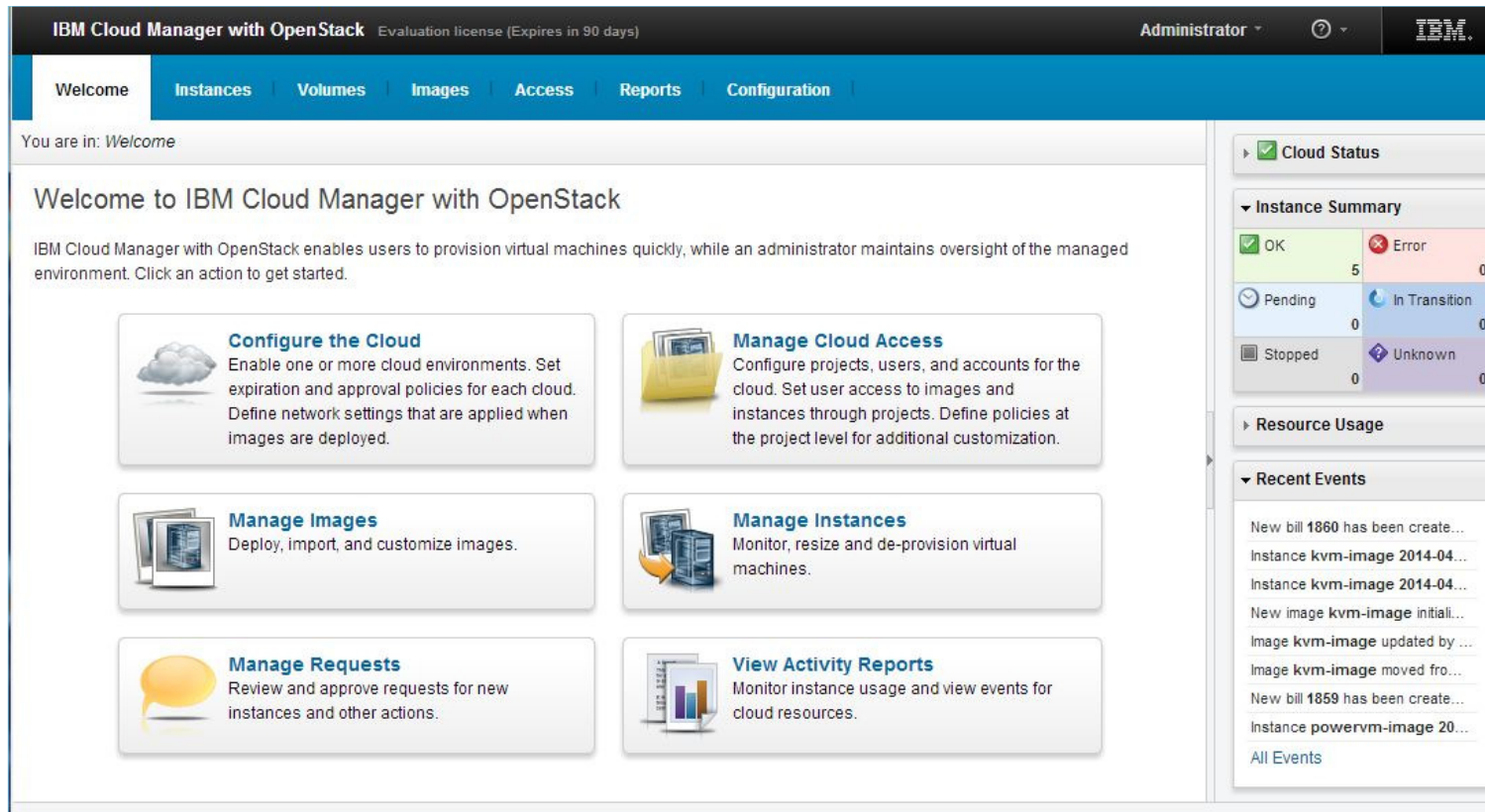
• Manage physical resources (servers, storage and networking)

• Manage virtualized resources (servers, storage and networking)

Virtualization manager



IBM Cloud Manager delivers cloud usage benefits to end users



IBM Cloud Manager with OpenStack Evaluation license (Expires in 90 days) Administrator ? IBM

Welcome Instances Volumes Images Access Reports Configuration

You are in: Welcome

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, users, and accounts 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, resize and de-provision virtual machines.

Manage Requests
Review and approve requests for new instances and other actions.

View Activity Reports
Monitor instance usage and view events for cloud resources.

Cloud Status

Instance Summary

OK	Error
5	0
Pending	In Transition
0	0
Stopped	Unknown
0	0

Resource Usage

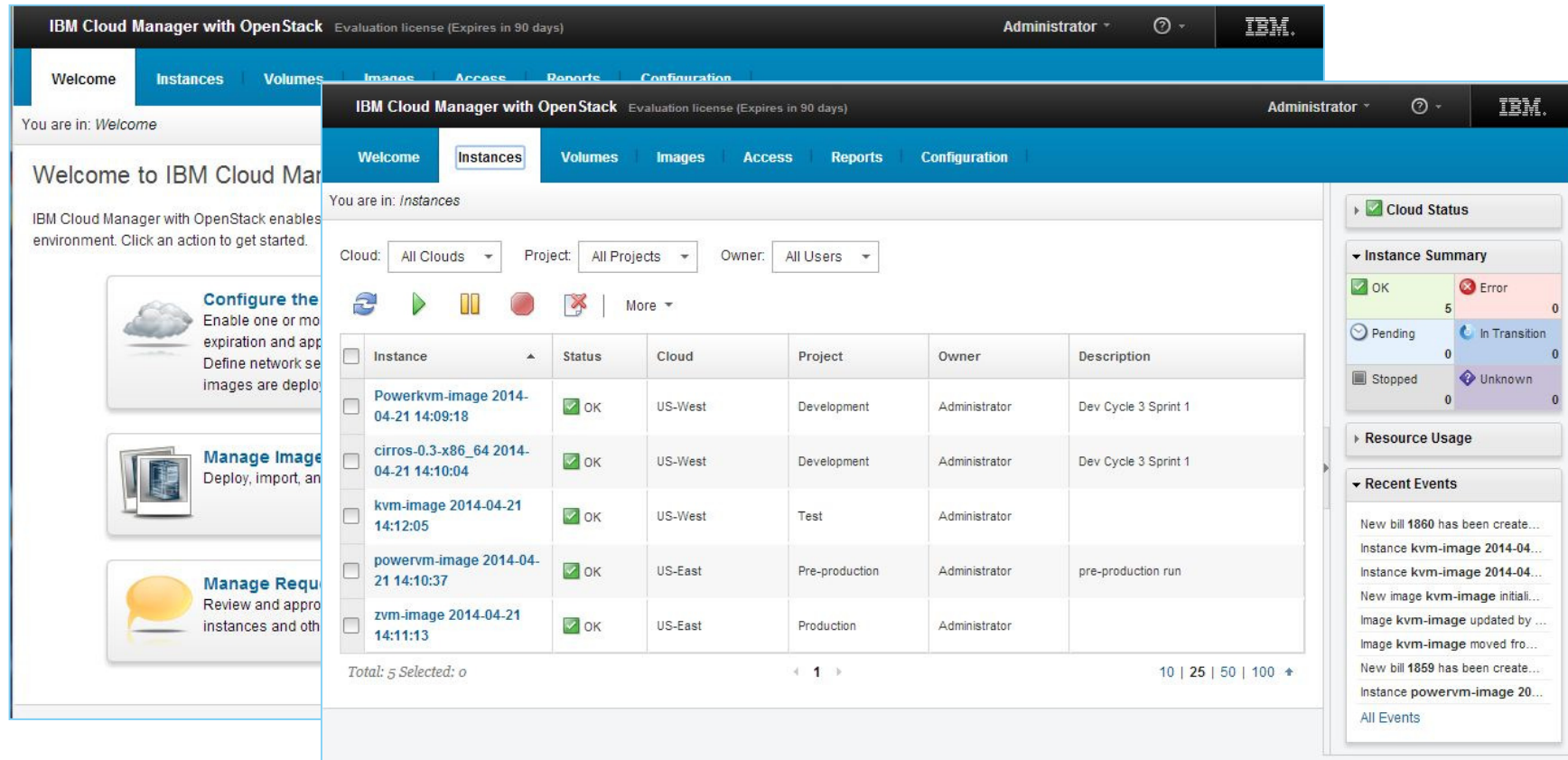
Recent Events

- New bill 1860 has been create...
- Instance kvm-image 2014-04...
- Instance kvm-image 2014-04...
- New image kvm-image initiali...
- Image kvm-image updated by ...
- Image kvm-image moved fro...
- New bill 1859 has been create...
- Instance powervm-image 20...

[All Events](#)

- Easy to access, easy to use Service Request Catalog
- Hides underlying infrastructure from user, shifts focus to services delivered
- Enables the ability to provide standardized and lower cost services

IBM Cloud Manager delivers cloud admin benefits to managers



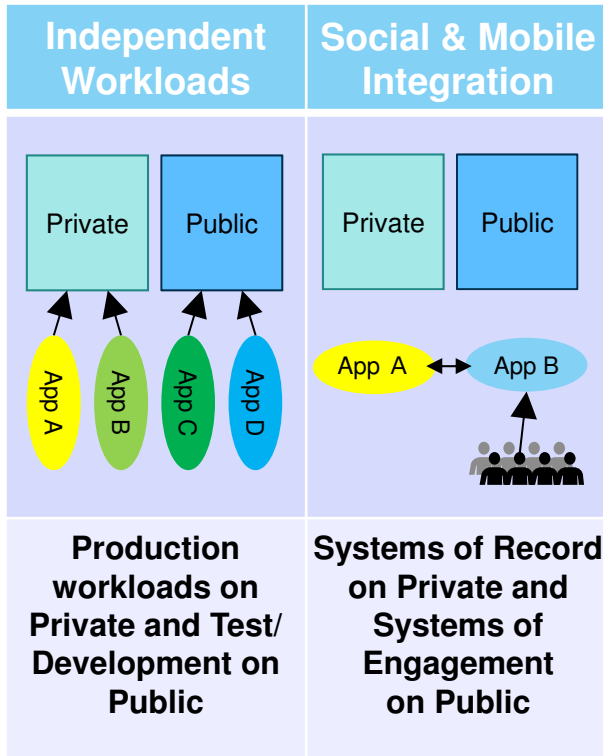
The screenshot shows the IBM Cloud Manager interface. The top navigation bar includes 'Welcome', 'Instances', 'Volumes', 'Images', 'Access', 'Reports', and 'Configuration'. The 'Instances' page is active, showing a table of instances. The table has columns for Instance, Status, Cloud, Project, Owner, and Description. The instances listed are:

Instance	Status	Cloud	Project	Owner	Description
Powerkvm-image 2014-04-21 14:09:18	OK	US-West	Development	Administrator	Dev Cycle 3 Sprint 1
cirros-0.3-x86_64 2014-04-21 14:10:04	OK	US-West	Development	Administrator	Dev Cycle 3 Sprint 1
kvm-image 2014-04-21 14:12:05	OK	US-West	Test	Administrator	
powervm-image 2014-04-21 14:10:37	OK	US-East	Pre-production	Administrator	pre-production run
zvm-image 2014-04-21 14:11:13	OK	US-East	Production	Administrator	

The right sidebar shows 'Cloud Status' with a summary of instance states: OK (5), Error (0), Pending (0), In Transition (0), Stopped (0), and Unknown (0). Below this is 'Resource Usage' and 'Recent Events'.

- Tailor workload options for users and groups
- Monitor usage with workload metering
- Provides project level customization

Combine with SoftLayer & implementation services to enable Hybrid clouds



IBM Systems

Your choice of IT infrastructure matters

SOFTLAYER

an IBM Company

- Self-service portal, monitoring & metering
- OpenStack based VM and image provisioning
- Private and public OpenStack cloud management
- All IBM server architectures and major hypervisors
 - System z
 - Power Systems: Linux, AIX
 - PureFlex PowerVM, PowerKVM
 - PureFlex x86, Hyper-V, VMware, KVM
- Enables IT department to monitor / approve all public and private deployments of VMs
- Lower cost of ownership by deploying workloads on the best optimized environment
- Provides existing operational capabilities while enhancing their competitiveness (Time-to-Value).
- Open technologies approach provides flexibility to extend capabilities and protect investments (Open APIs, extensive hypervisor and OS support, etc.)

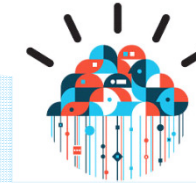
On Premise



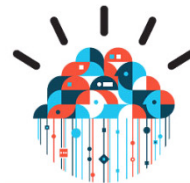
Off Premise



IBM Cloud Orchestrator



Cloud Manager with OpenStack



Advanced Cloud

- Self-service Portal with image catalog
- Capacity Management & Advanced usage metering/accounting
- Virtual system and application patterns
- Runbook Automation
- Manages Hybrid Private/Public Clouds

Basic Cloud

- Self-Service Portal with Process Automation
- Metering and Billing of Usage
- Catalog of VMs and Images
- Open access to OpenStack APIs
- Manages Hybrid Private Clouds

PowerVC Advanced Virtualization Management

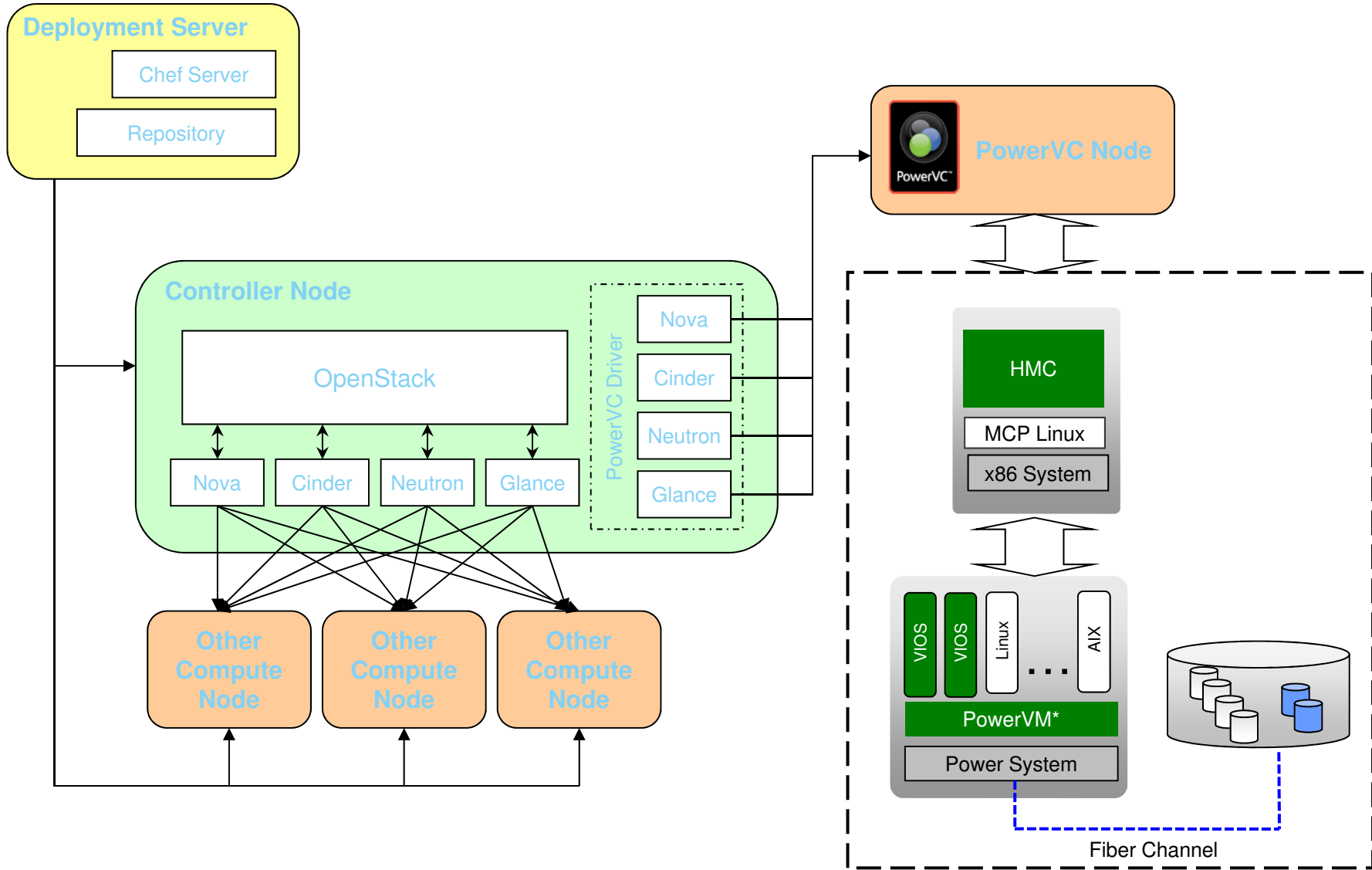


Manage Virtualization

- Simple UI and Setup
- Resize VMs and Migration
- Capture & Deploy VMs
- Policies for placement
- Manages PowerVM & PowerKVM

Increasing business Options

Increasing Automation & Function



- **Create user/project**
- **Create a virtual machine (VM) in project**
- **Show request**
- **Show billing**
- **Start & stop a Server or VM**
- **Create a Volume**



THANK YOU!



Thierry Huché

Cloud on Power Specialist
Software Defined Environments
IBM Systems & Technology Group

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