Power Systems

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IBM Client Center Montpellier

Cloud on Power

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Power Systems

Agenda

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

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PowerVM Management Stack

Power Systems

IBM

Infrastructure as a Service with IBM Cloud Manager

Cloud Management — **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 with PowerVC

Virtualization Management — **PowerVC**

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

Power Systems Hardware Management Console

Platform Management — **HMC**

- 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

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HMC

- 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

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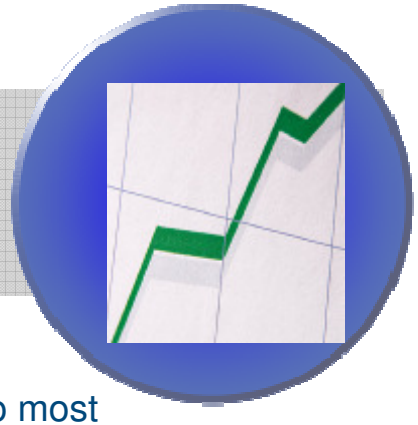
Key Elements to Enhance Usability

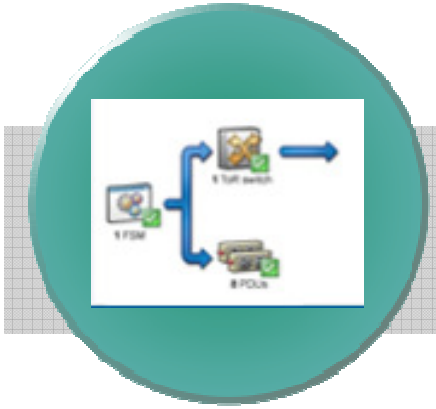
Templates enablement – HMC 8.10 SP1 9/2014
Enable template capture and deploy for quick 'best practice' system and partition deploy. Allows for simplified / automated initial system deploy.

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.

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HMC New features

- **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

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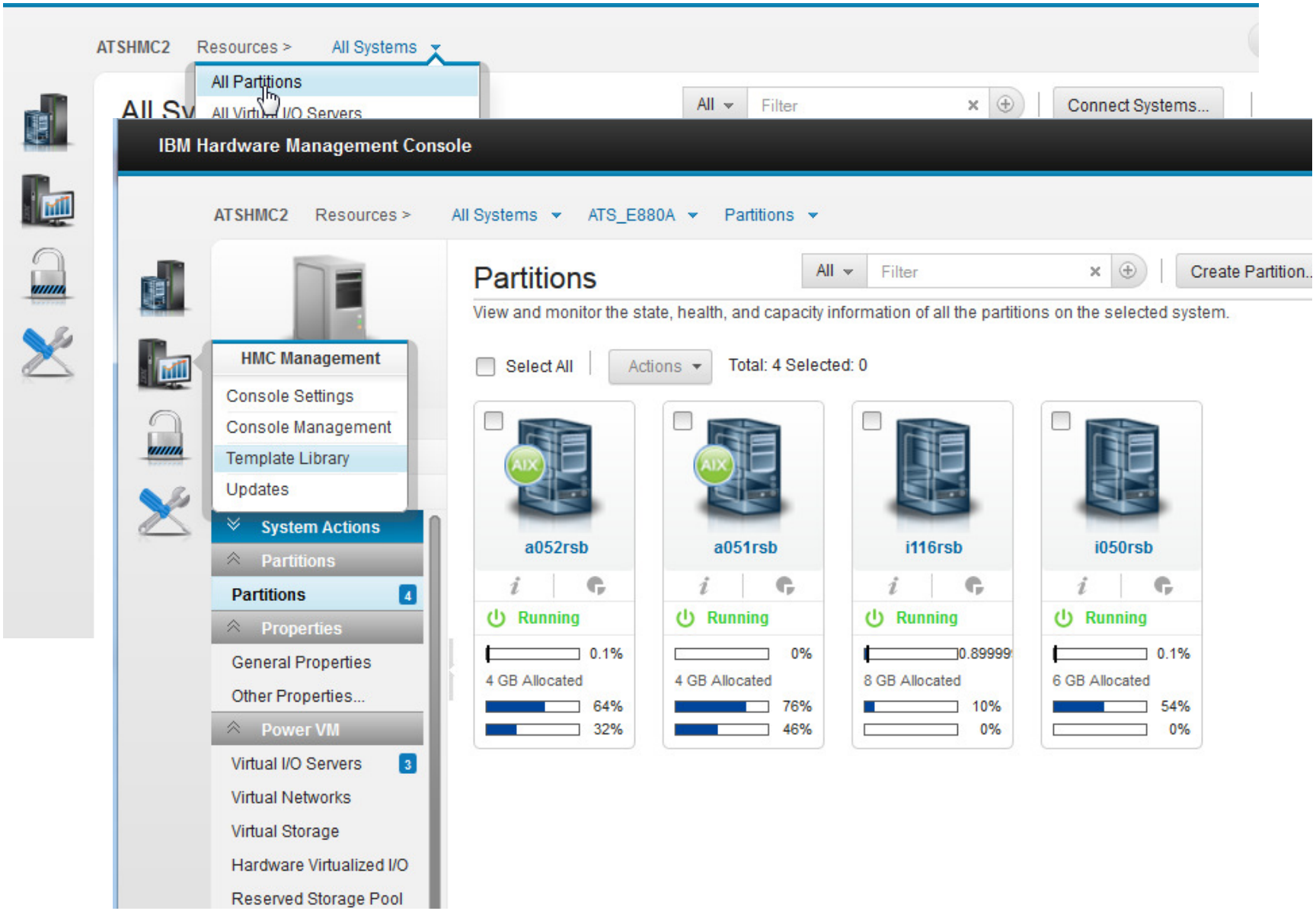
Power Systems HMC V8.820 - Enhanced Tech Preview



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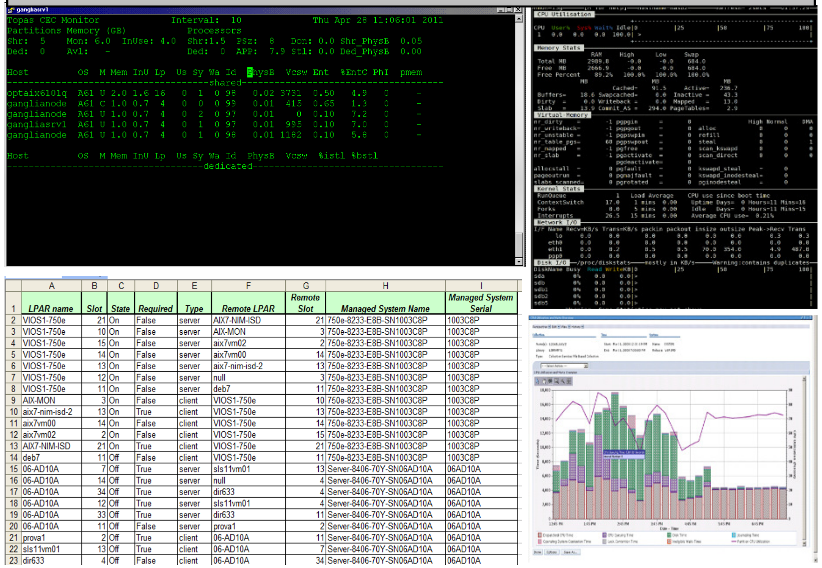
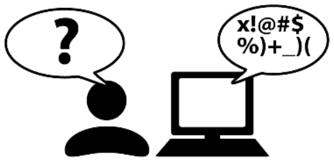
Performance Monitoring

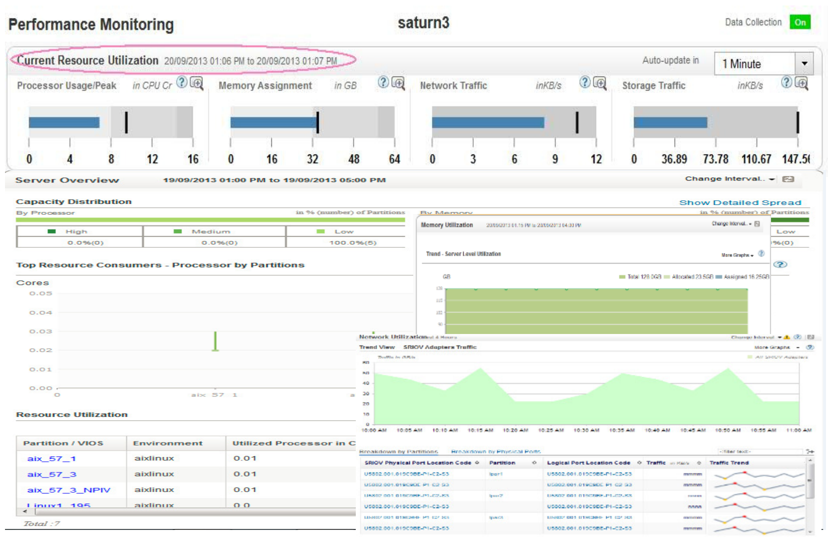
HMC 790 or earlier





- 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

HMC 810



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

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Performance Monitoring

- 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

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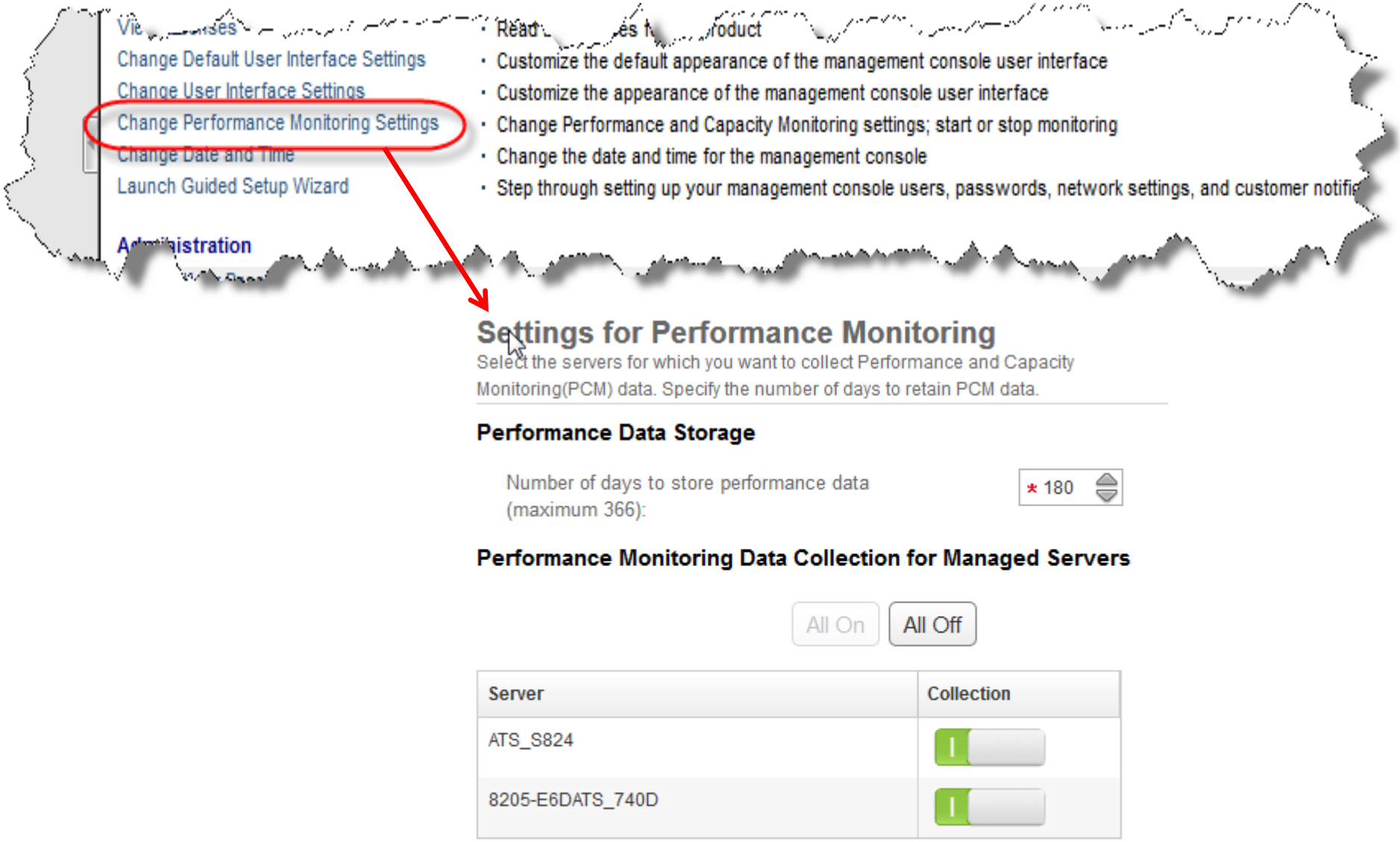
Enable Performance Monitoring



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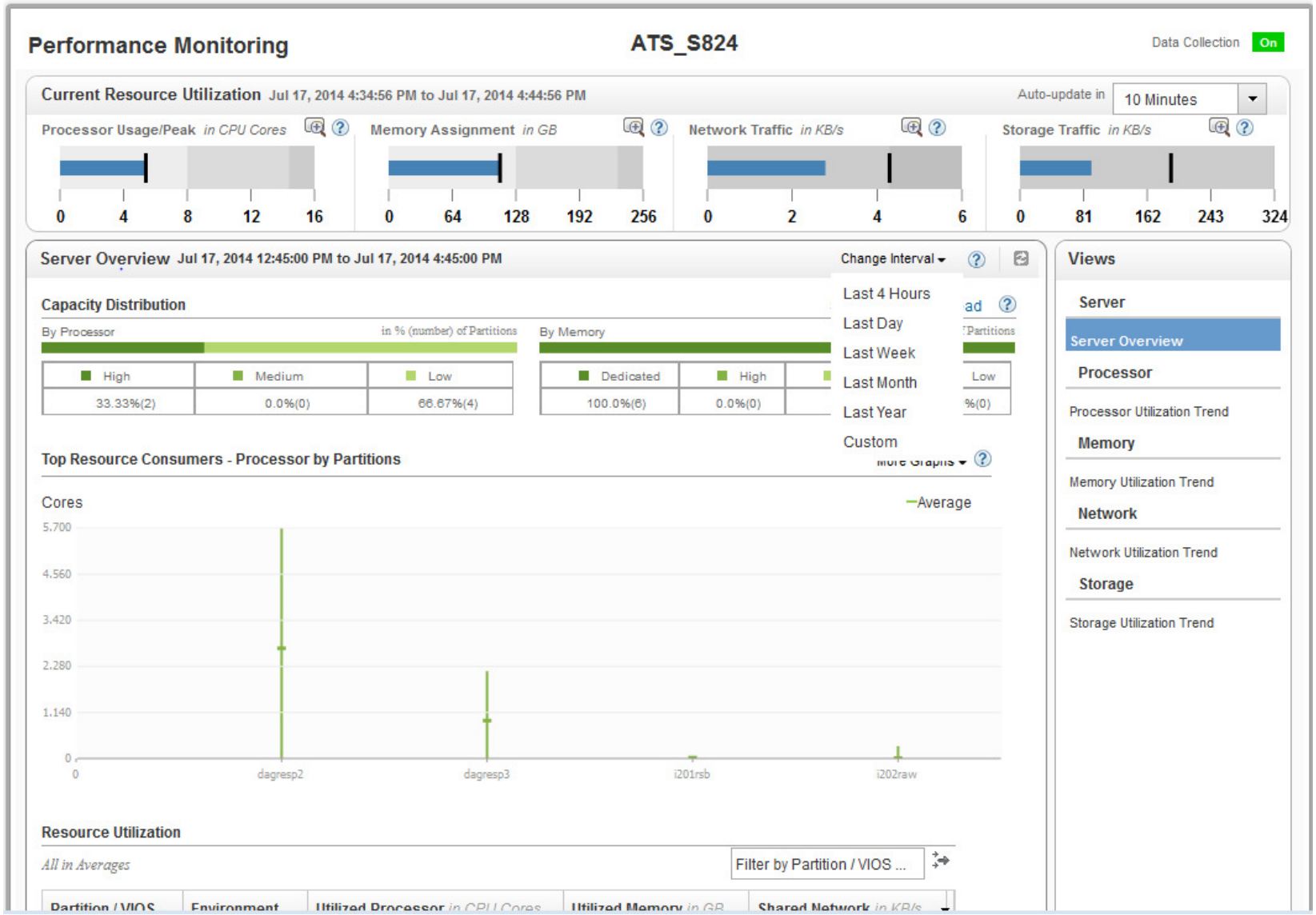
Current Usage (CPU, Memory, I/O)



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Remote Restart

- 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

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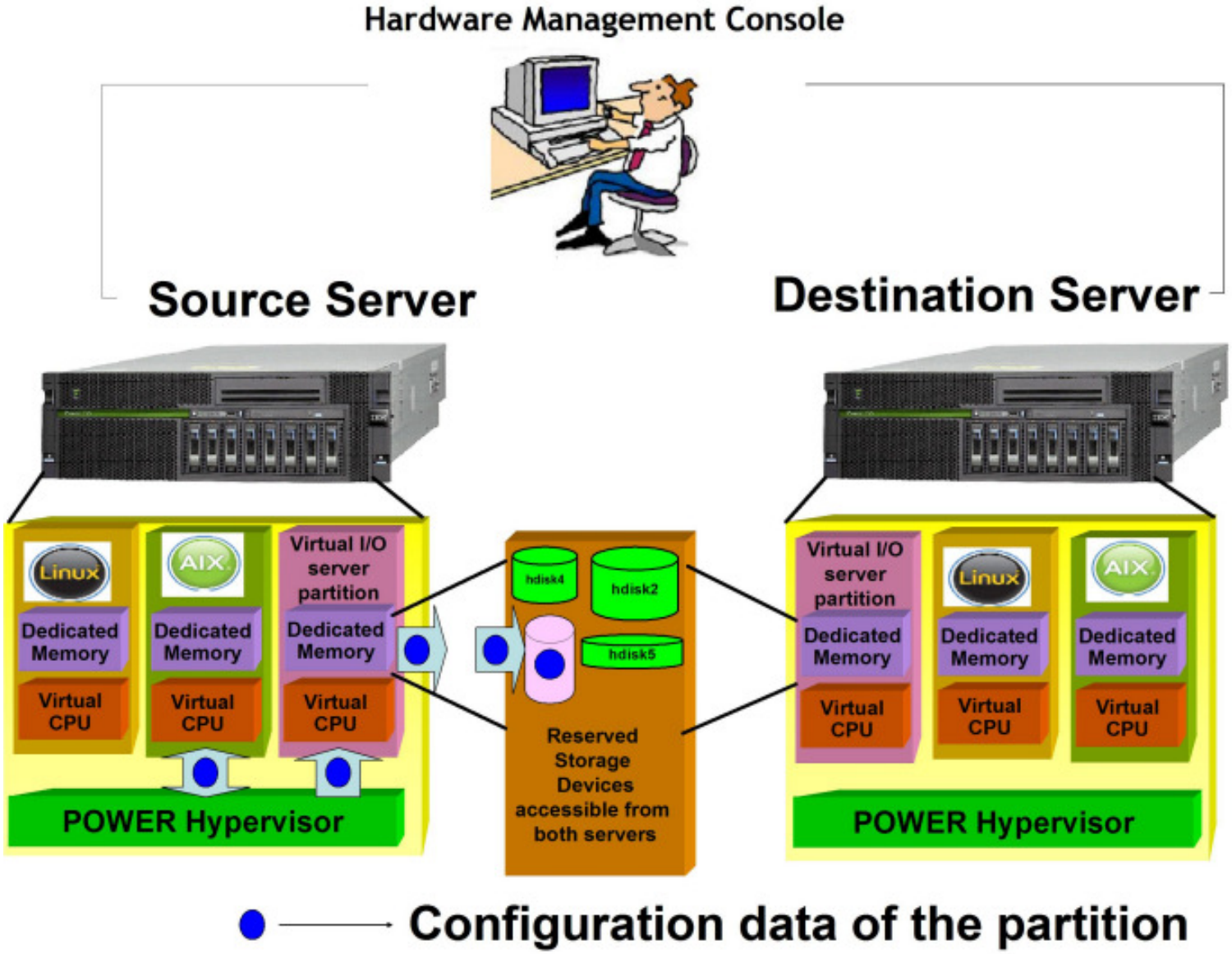
PowerVM Remote Restart



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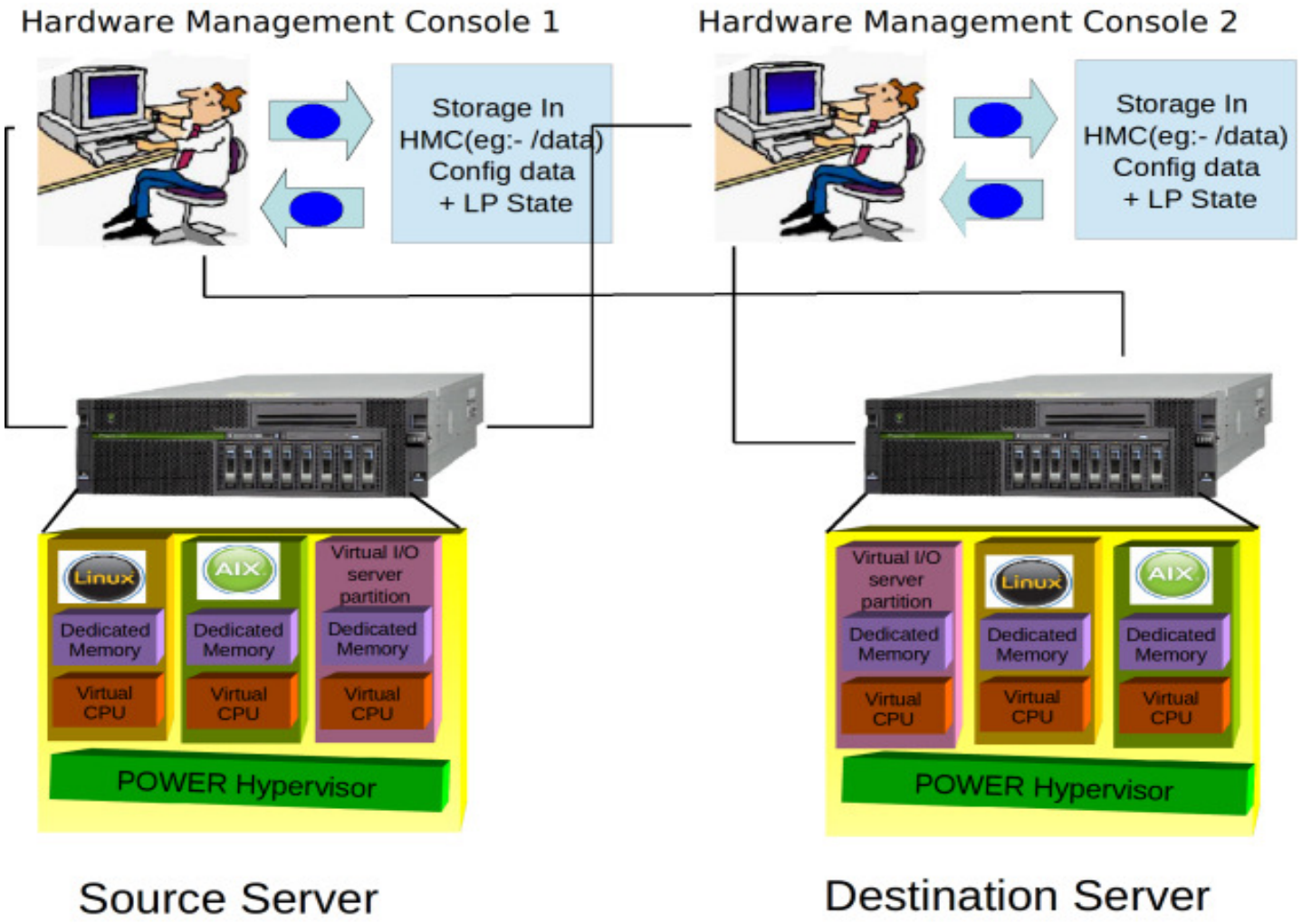
PowerVM Remote Restart



- Configuration data of the partition

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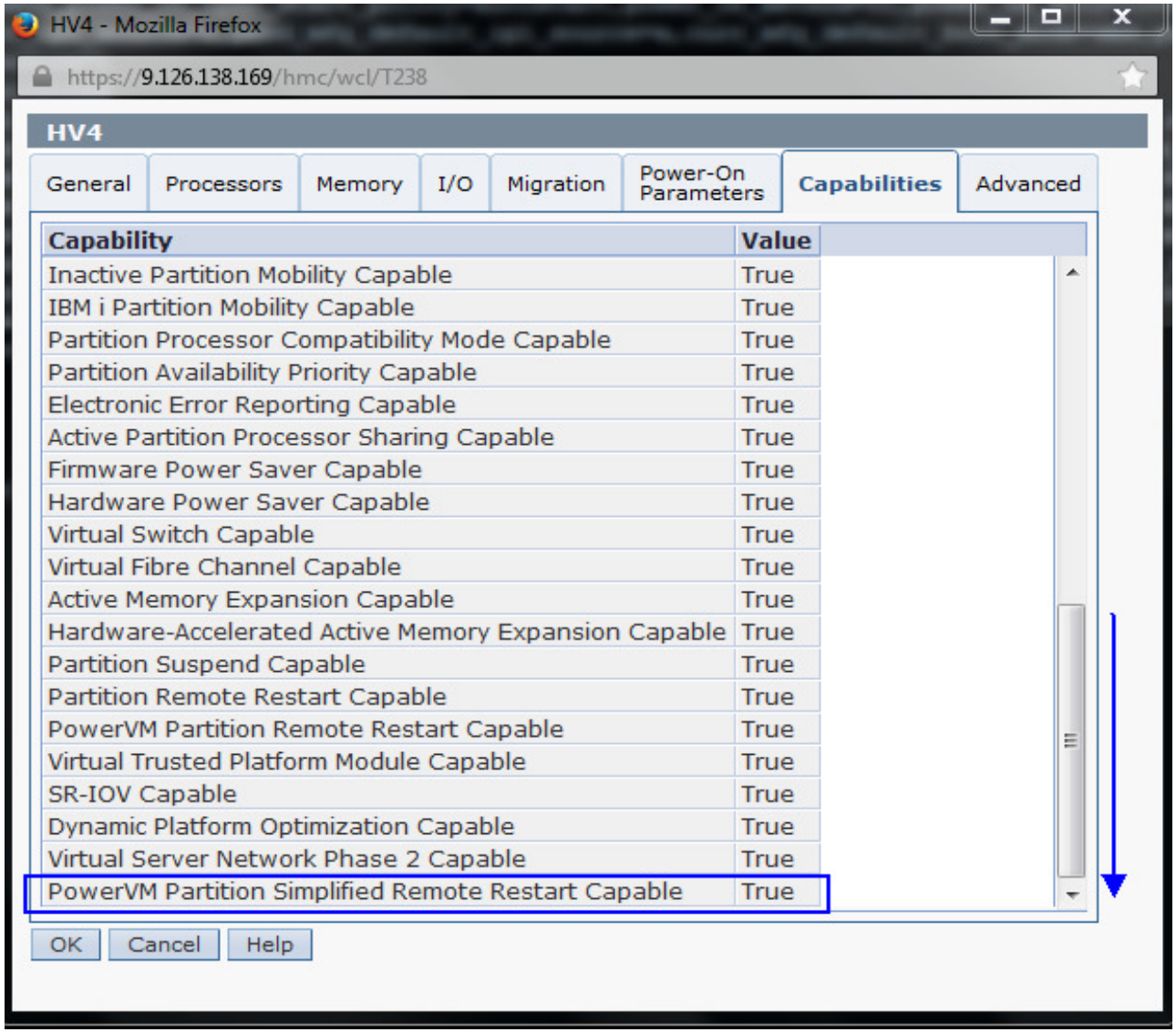
SSR capability



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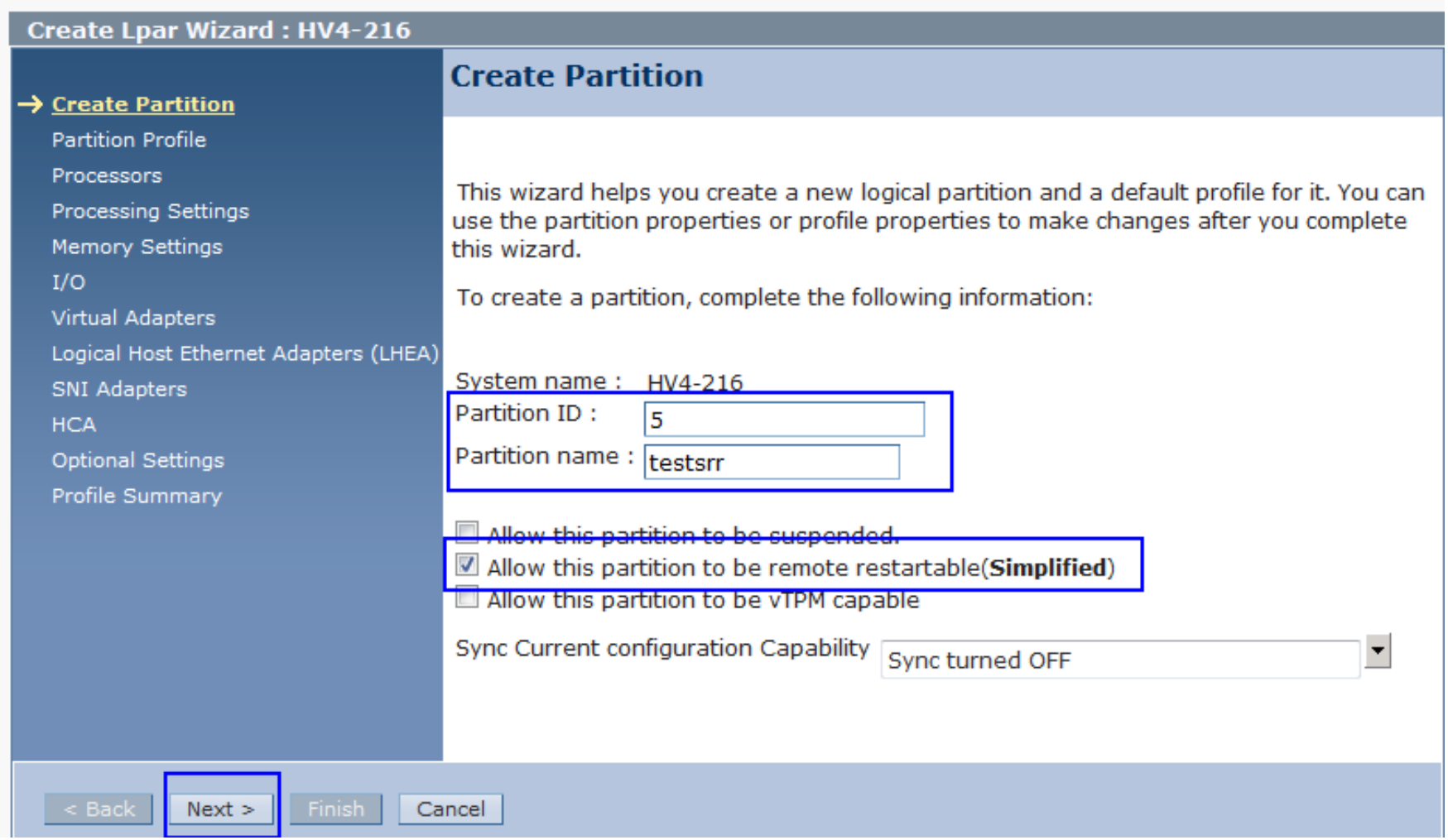
SSR LPAR creation



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Demonstration HMC

- **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**

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Power Systems

Agenda

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

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PowerVC v1.2 – Virtualization Center

- ✓ *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

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Advanced virtualization management

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.

PowerVC™

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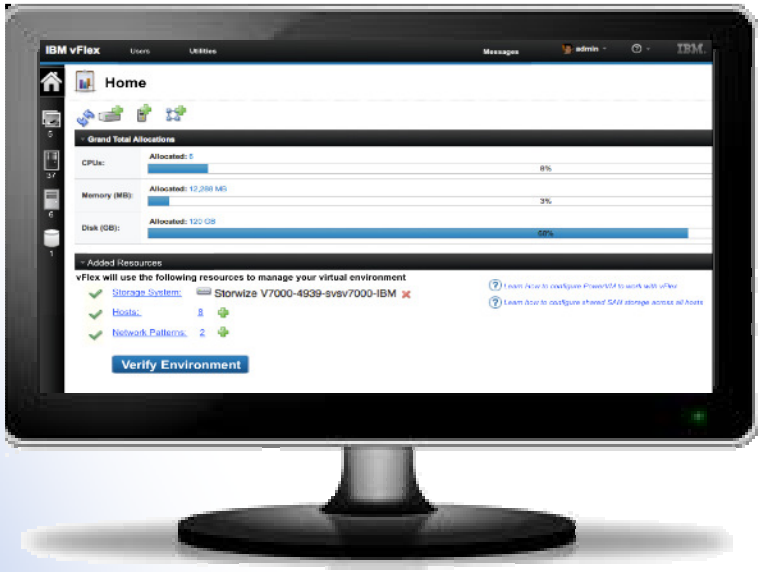
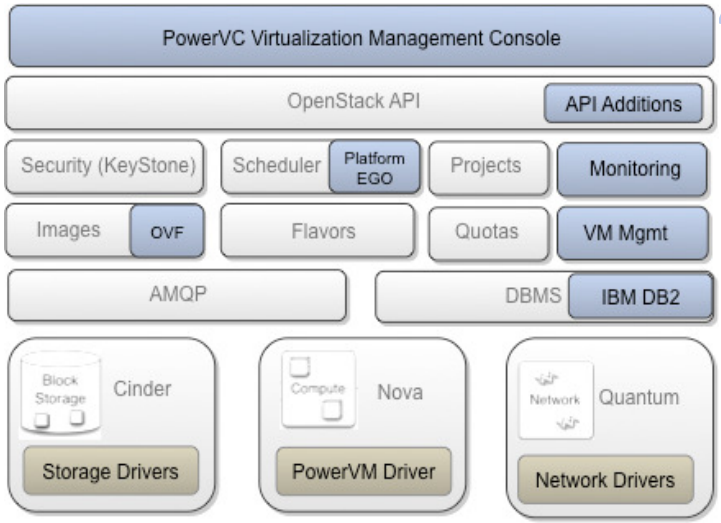
PowerVC Virtualization Management Console

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



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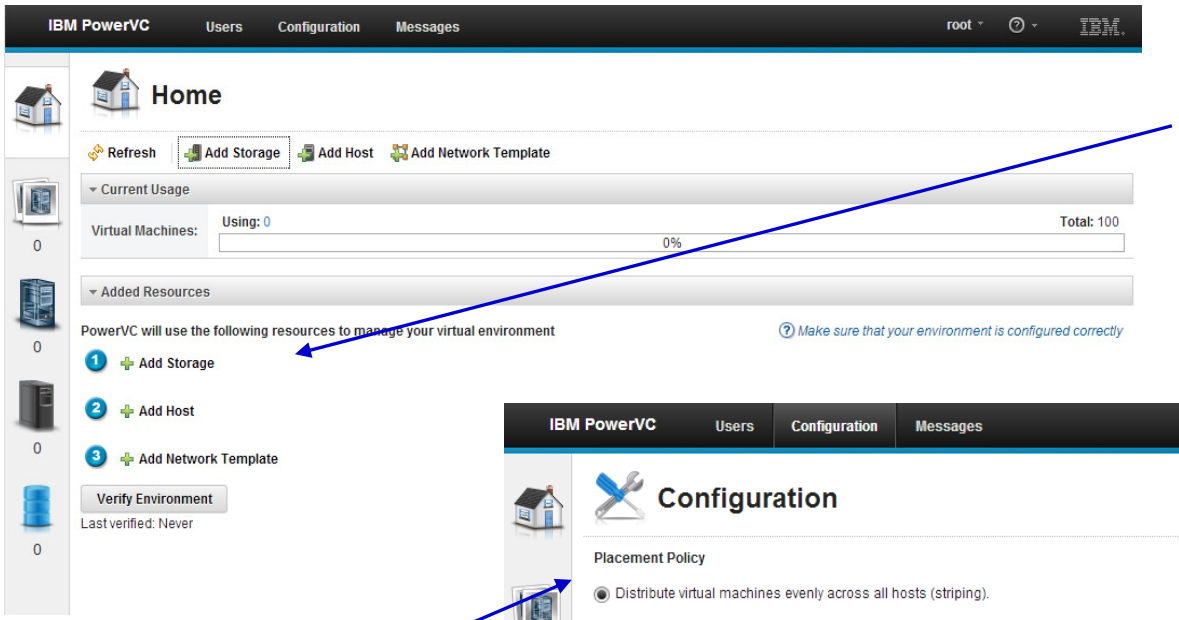
PowerVC Setup and Configuration

Simple, Intuitive with a Focus on Time to Value…



1. Add Storage to be managed…

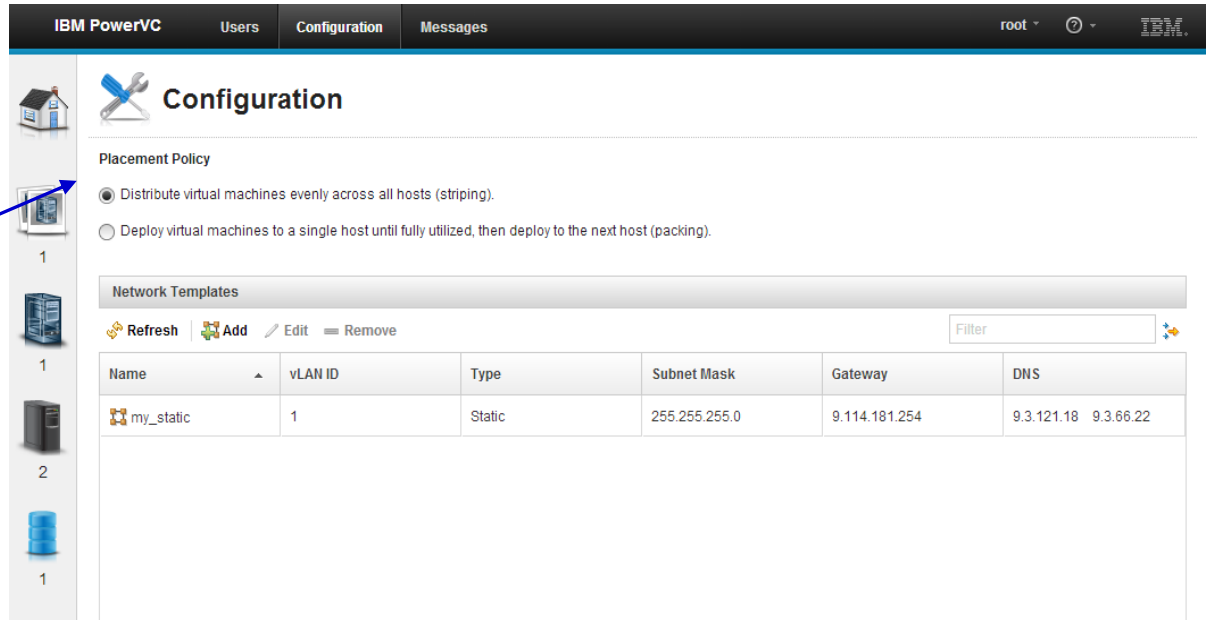
- **Provide IP address**
- **Provide user-id & password**

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**

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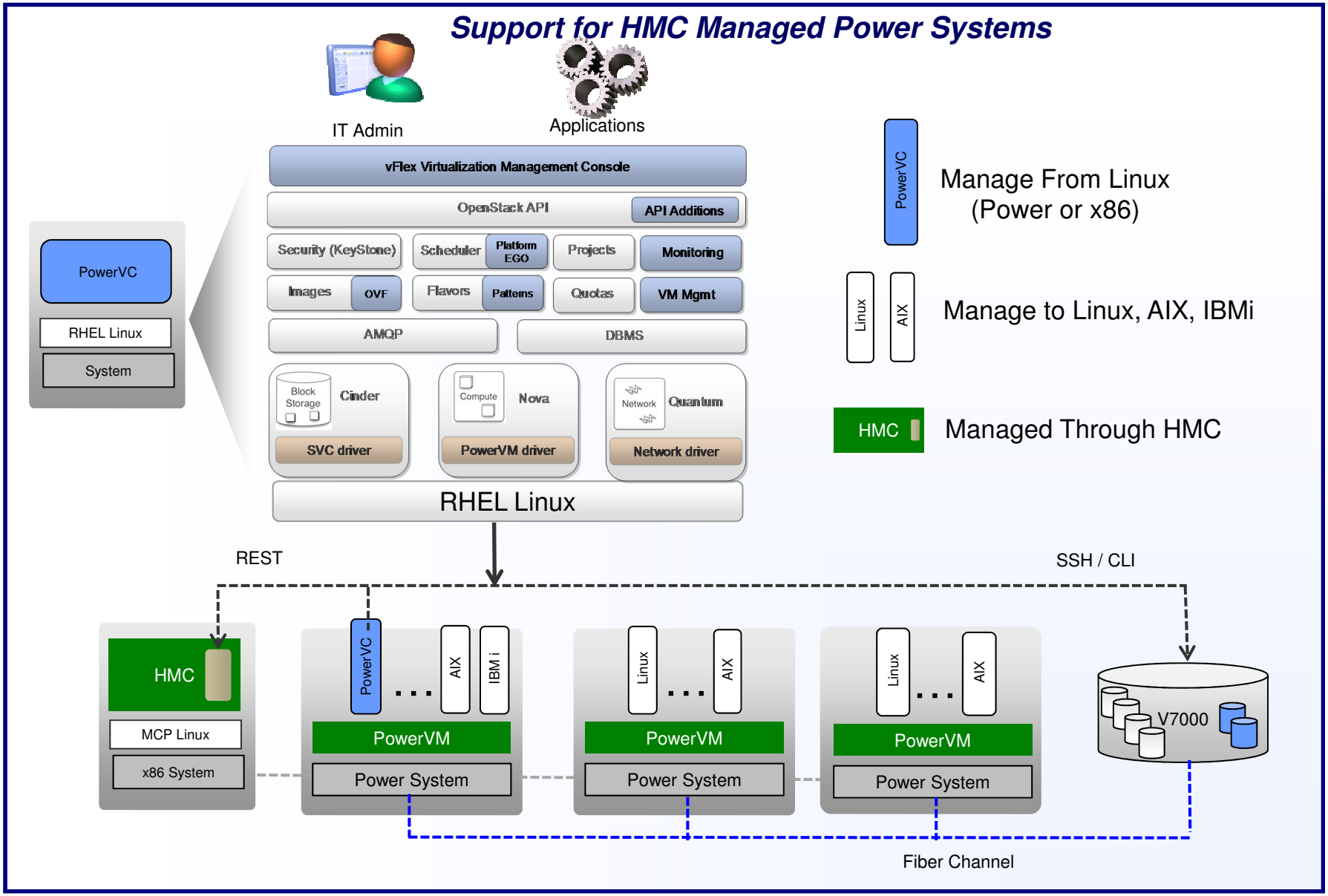
PowerVC Topology

Support for HMC Managed Power Systems



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PowerVC Demonstration

- 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

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Power Systems

Agenda

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

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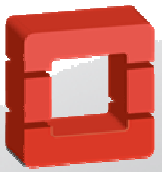
IBM Cloud Manager with OpenStack, v4.2

IBM

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

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Support of multiple user roles

- 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

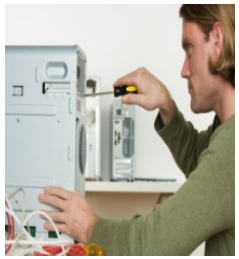
IBM Cloud Manager with Openstack supports these user types

End users

• Self-service IT requests via mobile & Web clients	• Manage cloud workloads, users and environment
• Manage physical resources (servers, storage and networking)	• Manage virtualized resources (servers, storage and networking)

Cloud manager

Platform manager



Virtualization manager

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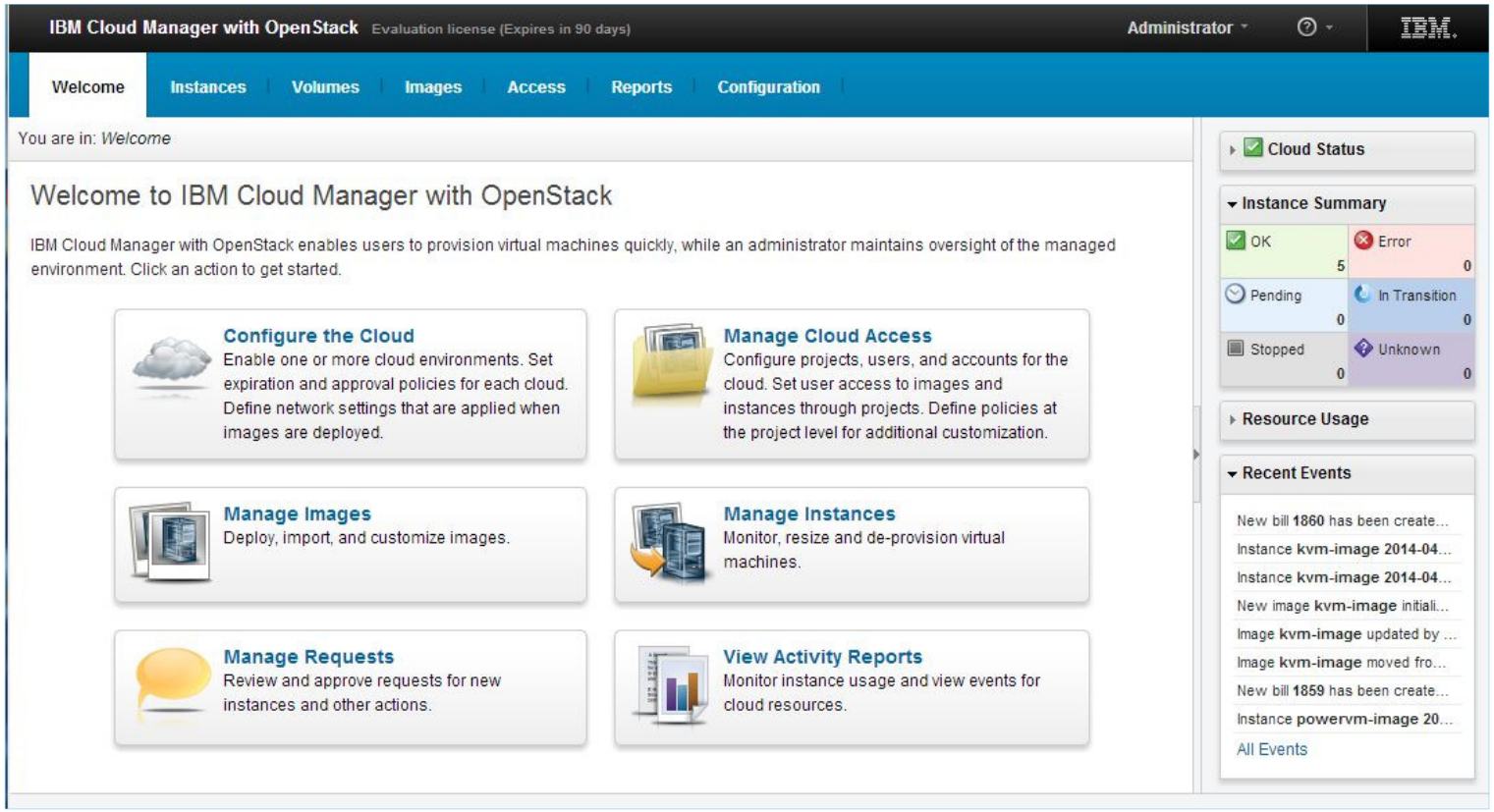
IBM Cloud Manager

IBM Cloud Manager delivers cloud usage benefits to end users



- 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

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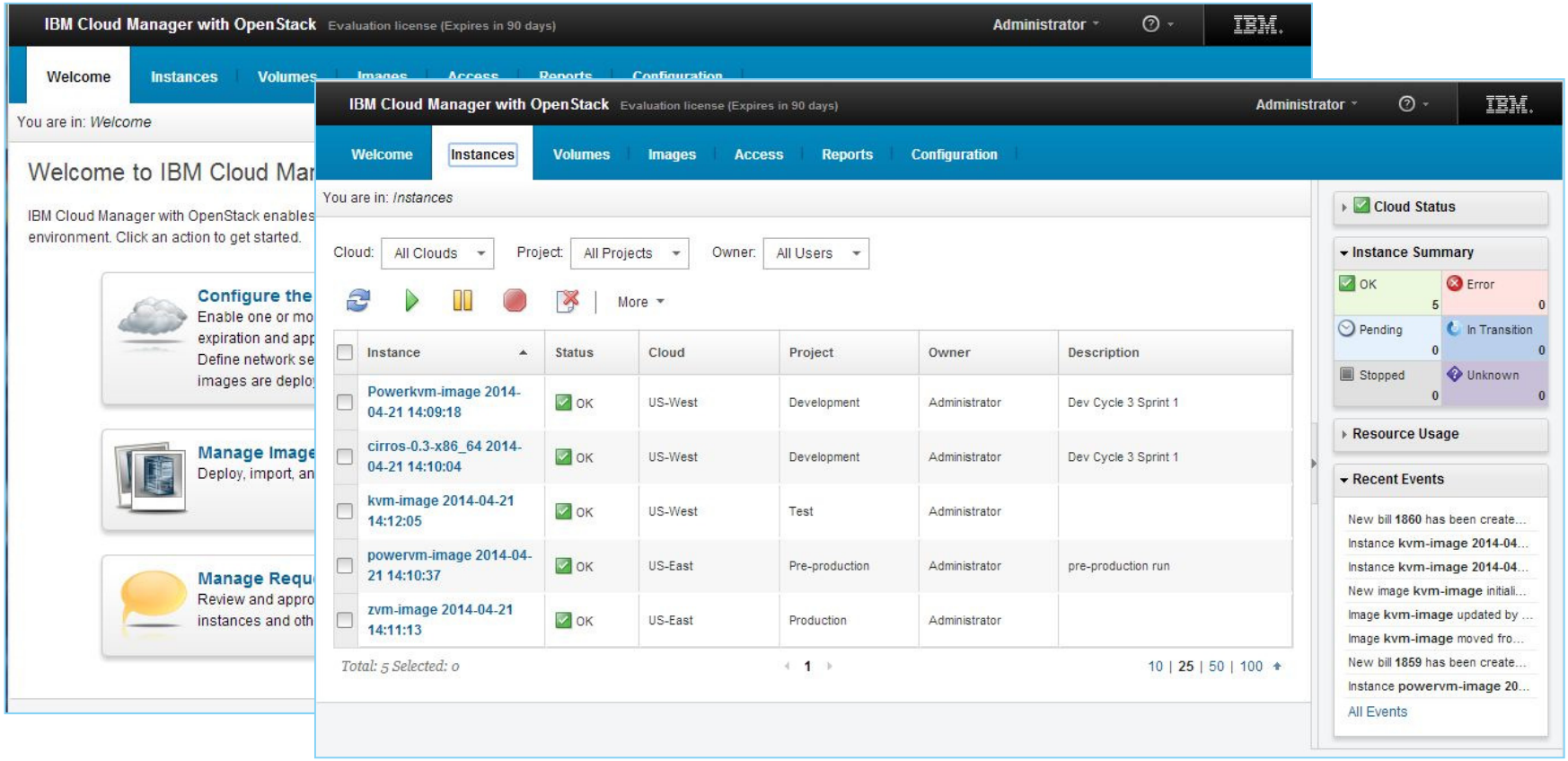
IBM Cloud Manager

IBM Cloud Manager delivers cloud admin benefits to managers



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

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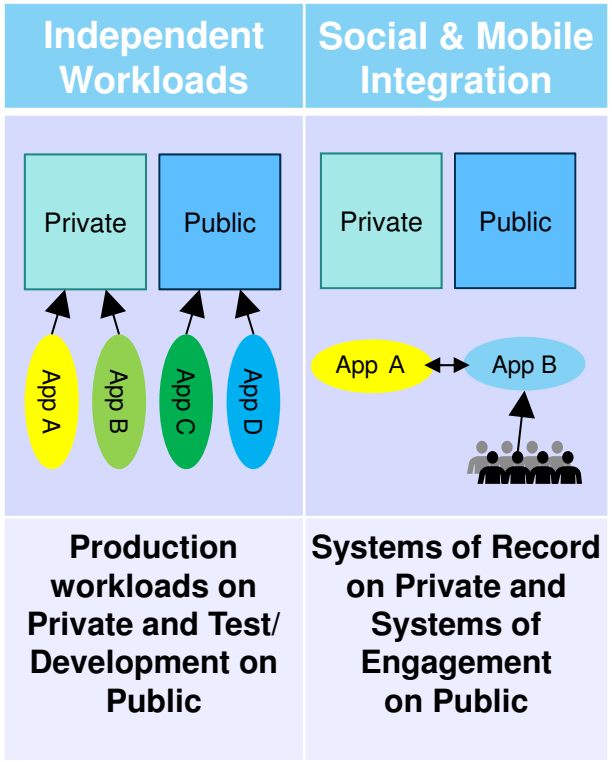
IBM Cloud Manager Hybrid Capabilities

Combine with SoftLayer & implementation services to enable Hybrid clouds



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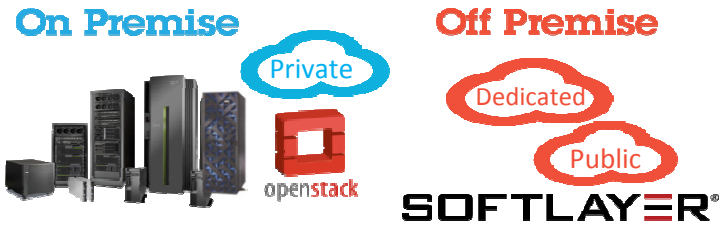
Your choice of IT infrastructure matters

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.)



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Virtualization/Cloud Management

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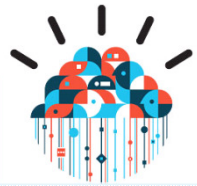
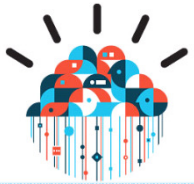
IBM Cloud Orchestrator



Cloud Manager with OpenStack



PowerVC Advanced Virtualization Management

Manage Virtualization

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

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

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

Increasing business Options

Increasing Automation & Function

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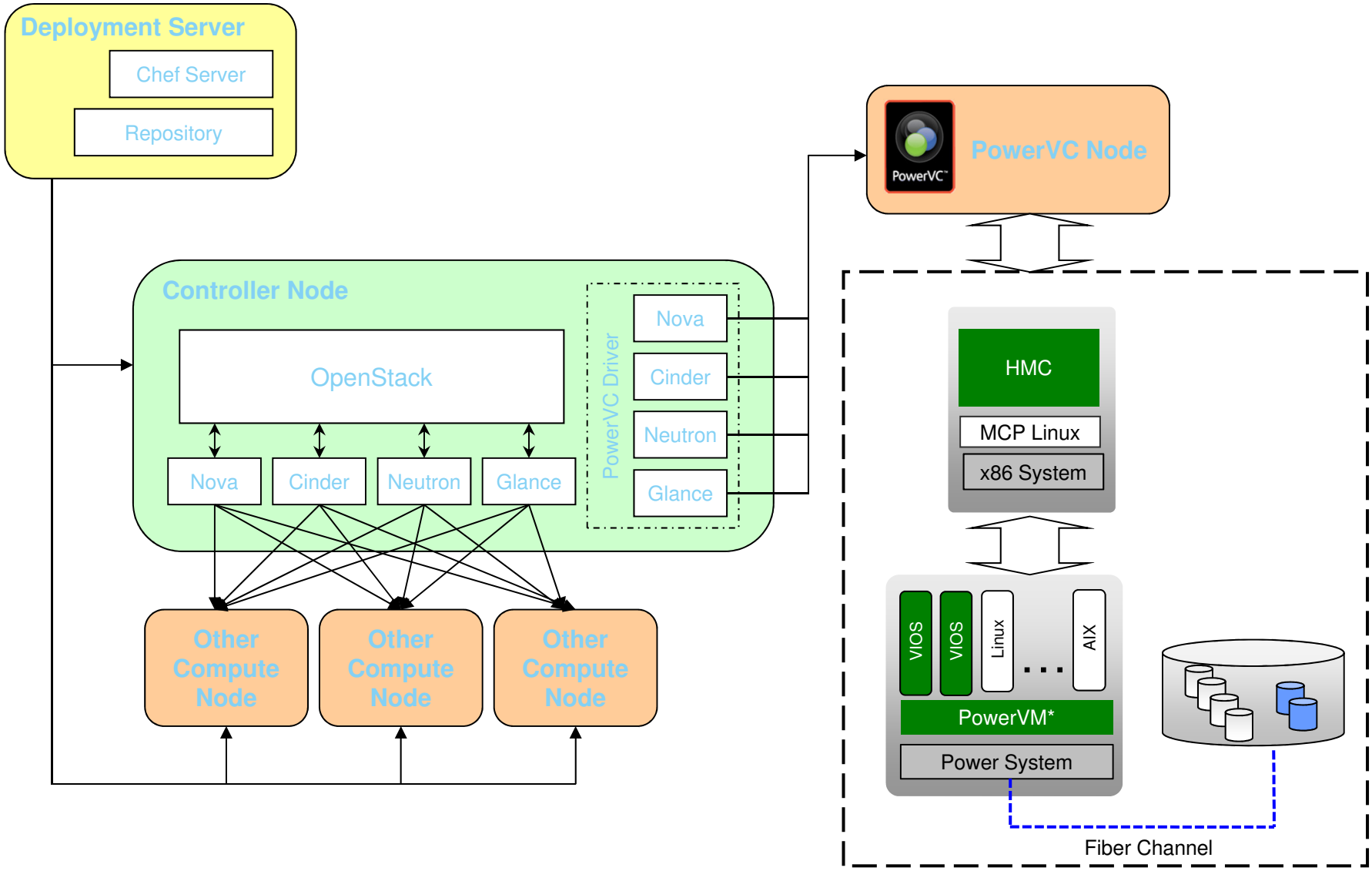
Topology for PowerVC Support in ICM



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Demonstration

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

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THANK YOU!

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