



# PowerVC 1.2 Q4 2013 Power Systems Virtualization Center

“At last a simple tool to spin-off  
Power Virtual Machines with very little effort”



Nigel Griffiths  
IBM Power Systems  
Advanced Technology Support, Europe

Version 7

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Man-Power  
& Costs



Flexibility



User  
Demands



Responsiveness

Move from a “hand crafted” cottage industry

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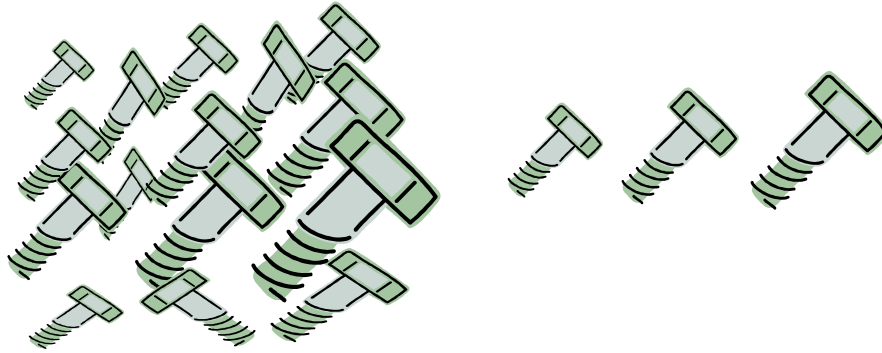


... to a streamlined factory floor

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## Hand-made Solution versus Standard Sizes



## Two Classes of Workload

### 1. Production

- High Performance
- High I/O rates
- Careful Specification, Sizing, Layout & Tuning



## Two Classes of Workload

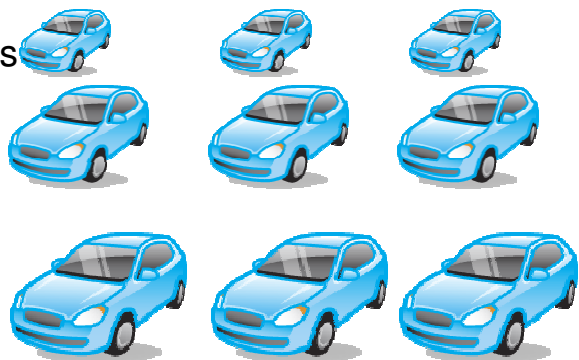
### 1. Production

- High Performance
- High I/O rates
- Careful Specification, Sizing, Layout & Tuning

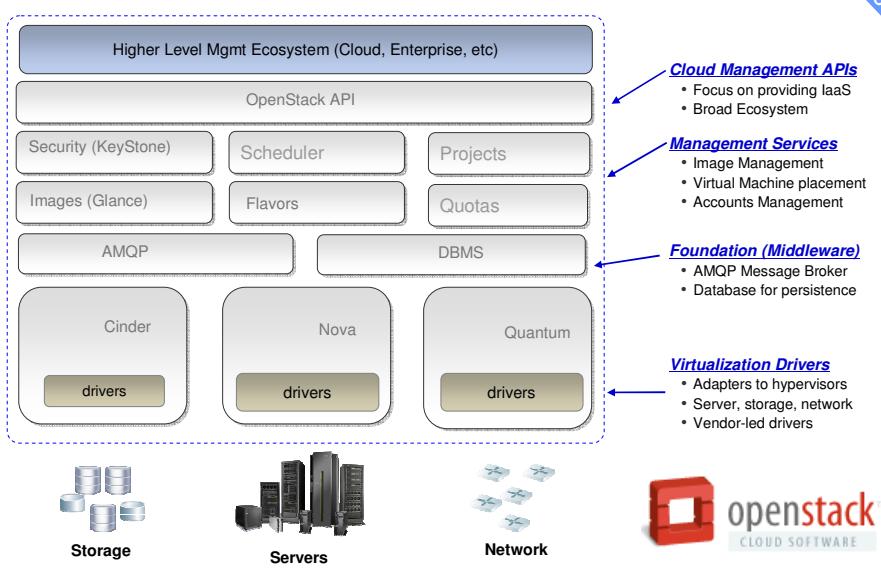


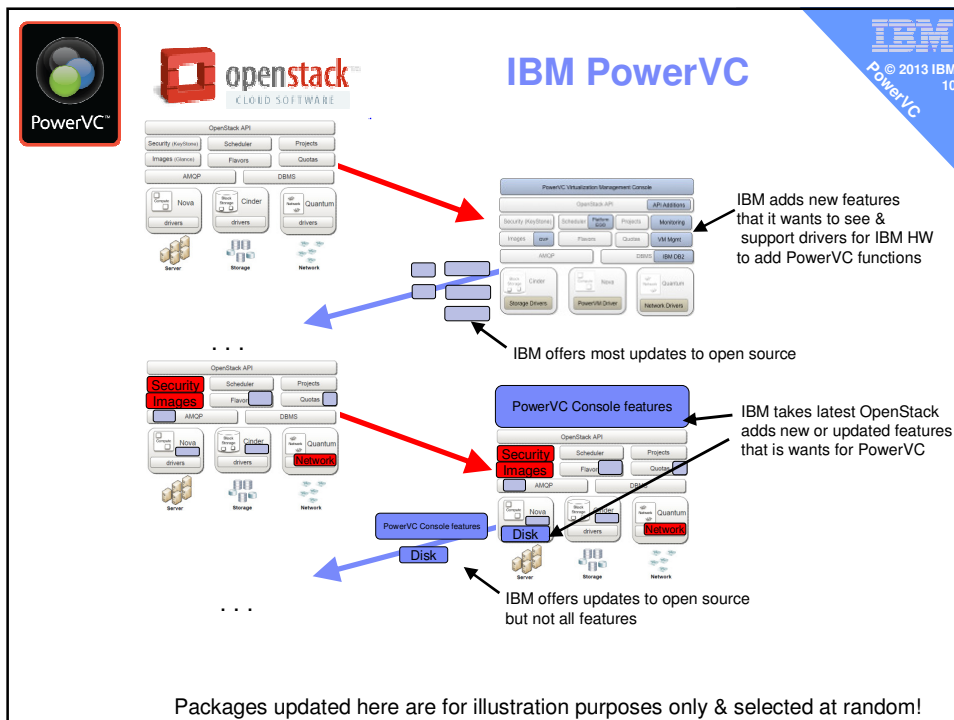
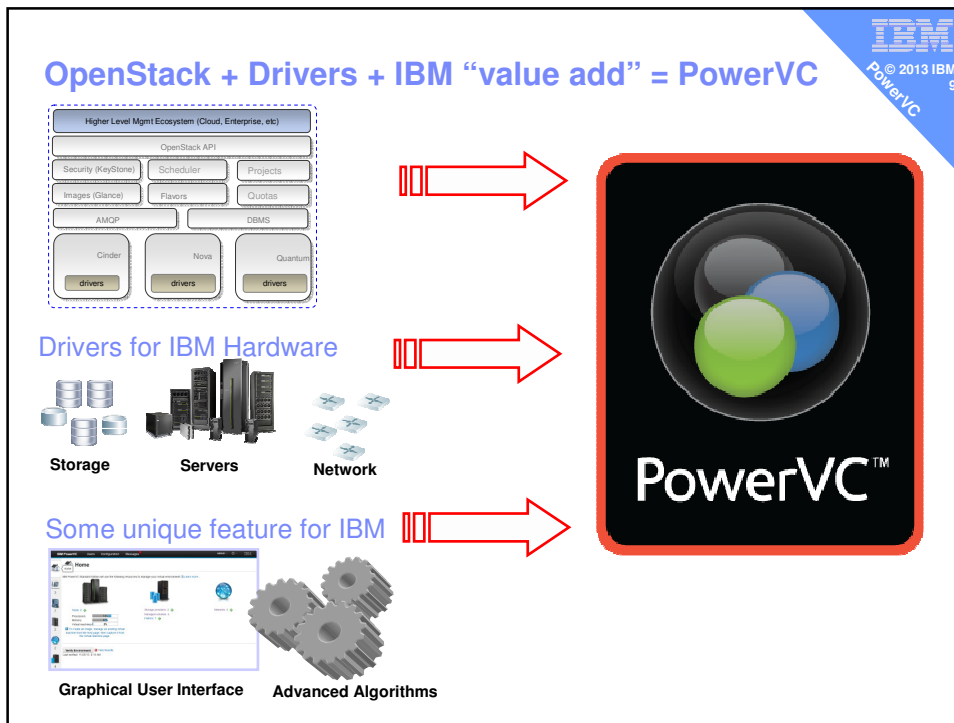
### 2. Regular workloads

- Small
- Medium
- Large
- then monitor to check the fit



## OpenStack Infrastructure Management Software

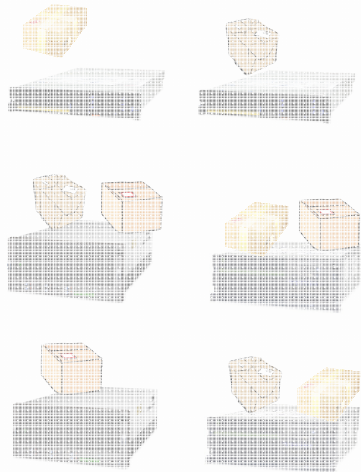




## Separate "islands" of Resources



## Separate "islands" of Resources



Single set of Resources with PowerVC



## PowerVC so far ...



### Releases

- Limited release 1.1 in China for Power Linux machines with IVM ~May 2013
- First release 1.2 is available from 6<sup>th</sup> December 2013

### PowerVC 1.2 Editions:

- **Express** Edition is for IVM
  - Small tier machines: PowerBlades, Power 710 to 750 + 7R1, 7R2 & 7R4
- **Standard** Edition is for HMC
  - As above plus Power Medium & Large tier machines
  - PureFlex nodes controlled by a HMC
- Further releases expected in 2014 to expand on initial 1.2 features



## Supported HW and OS



### PowerVC runs on:

- Red Hat RHEL 6.4 running on Power Server - - or - - x86
- You are responsible for sourcing, licensing and S/W maintenance of RHEL 6.4 (Red Hat offers a 60 day trial)

### PowerVC controls Virtual Machines running

- AIX 6 TL9 & 7 TL3
- Red Hat RHEL 6.4+ & SUSE SLES 11 SP3+ on Power
- Statement of direction for IBM i

### Server Hardware it will control

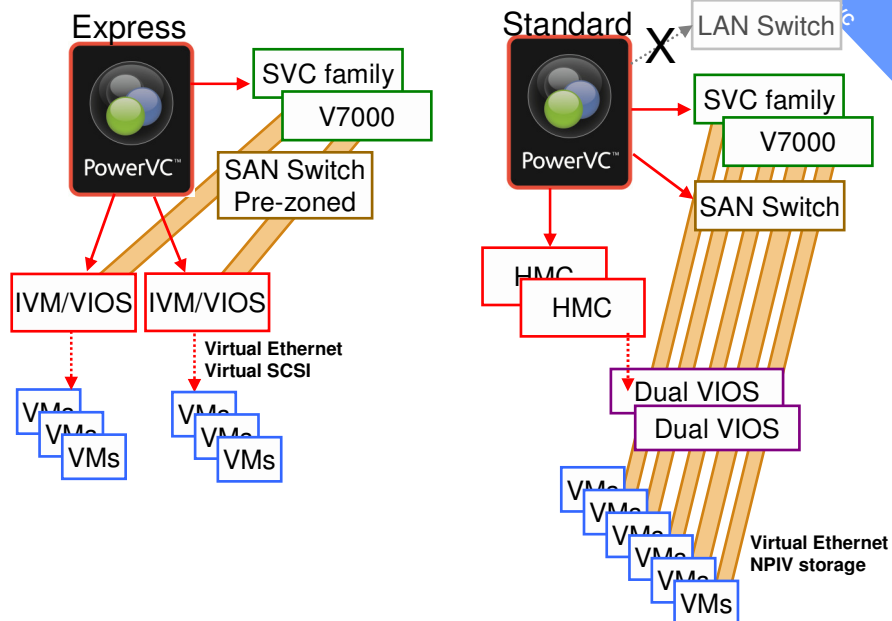
- PowerVC Express: POWER7/7+
- PowerVC Standard: POWER7/7+ and POWER6/6+



## Pre-requisites Details

1. Red Hat RHEL 6.4 for **Power** or **x86**
  - Clean install no other workloads
  - CPU x86 → 2 CPUs with 2+ GHz
  - CPU Power → 2 VP, uncapped, Entitled=1.0 (2 recommended)
  - 8 GB memory
  - 40 GB of disk  
Express: more disk space, if you will be importing many ISO images
2. IBM SVC-family Storage
  - SVC/V7000/V3700/V3500 with V6.4+ firmware
3. PowerVC server must have network access to:
  - HMC / IVM, SAN storage, SAN fabric/switch (Standard Edition)
4. VIOS already installed and configured
  - PowerVC does not install VIOS or IVM

## PowerVC Architecture







## Requisites – Express Edition specific



- IVM → VIOS V2.2.1.5 or later
- LUN over Virtual SCSI only
  - Storage must be pre-zoned
  - No SAN switch [Fabric] connectivity required
- POWER7/7+ Express servers with 780 firmware
  - Older firmware will work with loss of functionality
- Limits
  - 5 managed hosts running IVM
  - Maximum of 100 LPARs
- Images
  - Boot from AIX, RHEL or SLES DVD install media
  - Boot from mkysyb burnt to DVD
  - Capture using ActivationEngine (AE)




## Requisites - Standard Edition specific

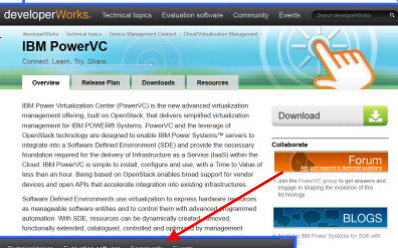


- HMC V7.7.8 or later → CR5/C08 or later
- VIOS V2.2.3 or later
- NPIV-only
  - Fabric connectivity required
  - Brocade SAN switch only or IBM version of this
- Limit of
  - 10 managed hosts
  - 40 LPARs per host
  - Maximum of 400 LPARs
  - Maximum of one managed storage subsystem
- Images
  - Manual create NPIV LPAR/VM install OS then capture using ActivationEngine (AE)

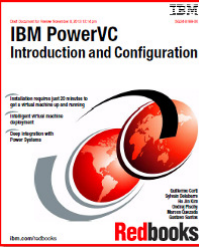
**Info:** <http://tinyurl.com/IBMPowerVcwebsite>



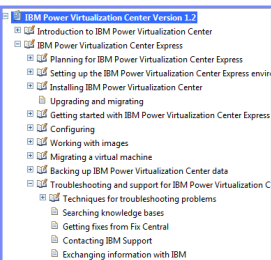
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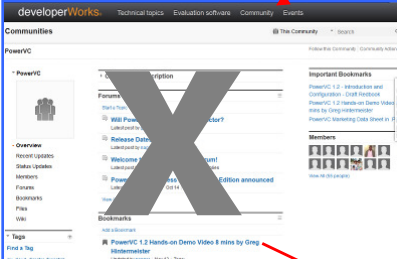
**IBM PowerVC Introduction and Configuration**



<http://tinyurl.com/IBMPowerVCredbook>



<http://tinyurl.com/IBMPowerVCmanual12>



<http://tinyurl.com/IBMPowerVCforum>

**YouTube Videos**

**Info:** <http://www.linkedin.com> **Group: PowerVC**



**Jay Kruemcke** 1st  
Program Executive - Client Collaboration...

**Jay has detailed many features which are high on the priority list for this year ... or so.**

**The place for discussion, hints and tips & requesting new features. Resent topics include warm standby for HA and backups/ recovery**

**Info:** <http://www.youtube.com/user/nigelargriffiths>

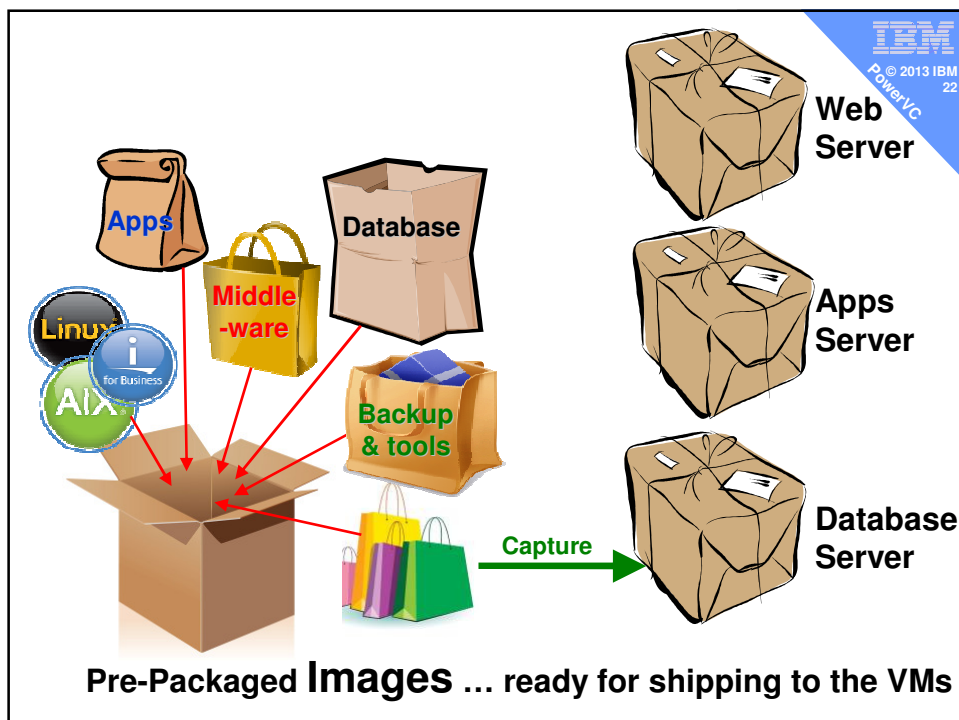
**Four hands-on videos: User Interface, Configuring, VM Capture, VM Deploy**  
**More to come on: Install, resize, migrate (LPM), life cycle, advanced topics**

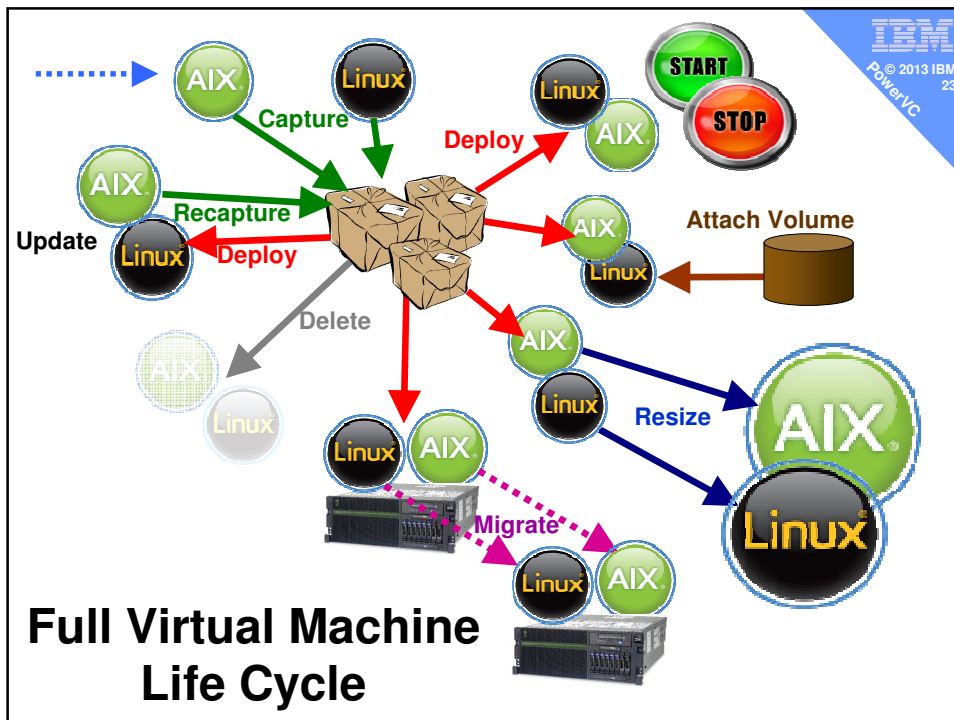
## Installation – Redbook chapter 3



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- Install Red Hat RHEL 6.4 on Power or x86 →20 mins
    - Setup date, time
    - Put on your network: IP, DNS, hostname, gateway ...
    - Don't install anything else – **except nmon** 😊
    - Set SELinux to “permissive”
  - Setup yum RPM repositories: →10 mins
    - install media & for RH updates plus IBM extras for Power
  - PowerVC load media: DVD or file.tar.gz unpacked → 20 mins
    - cd to media
    - ./install
    - Once done browse to <https://<your-PowerVC-machine>.com>
- Log file /opt/ibm/powervc/log/powervc\_install\_[install date].log





## Full Virtual Machine Life Cycle

**PowerVC Pricing**

**Pricing Stand Alone**

- PowerVC Express Edition is \$60 per managed core for Small tier machines controlled by IVM
- PowerVC Standard Edition is \$80 / \$120 / \$160 per managed core for Small/medium/large machines controlled by HMC

**PowerVC will be included in**

- SWMA for SmartCloud Entry Bundle in Power (5765-SB3)
- SWMA for AIX Enterprise Edition
- SWMA for System Director VMControl
- SWMA for System Director Standard Edition or Enterprise Edition

These List prices are in US Dollars on 8<sup>th</sup> Oct 2013. They may be different in other countries or not available. Please ask your IBM Representative for a quote in your country.

SWMA = Software Maintenance

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# Demonstration



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## Call to Action

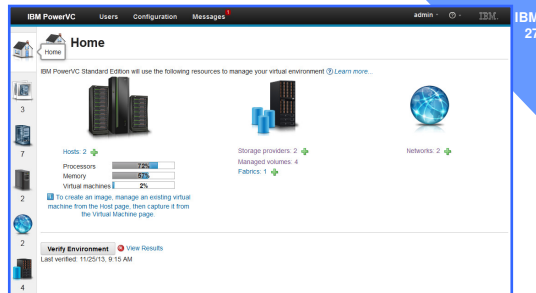
- **Decide:**
  - How much system admin time that PowerVC will save you & the value of rapid responses to users & consistent VMs
  
- **Run a test project**
  - Read up on PowerVC
  - Get Red Hat RHEL6.4
  - Allocate Machine resources
  - Prepare suitable software stacks
  
- **Purchase/“blag” a copy of PowerVC & Get Started**

**Resources:**

<http://tinyurl.com/IBMPowerVCwebsite>  
<http://tinyurl.com/IBMPowerVCredbook>  
<http://tinyurl.com/IBMPowerVC>  
<http://tinyurl.com/IBMPowerVCforum>  
[LinkedIn PowerVC group](#)



## PowerVC - Briefly



### PowerVC Highlights:

- Quick to install & setup (~20 mins)
- Connects to your HMC/IVM, SVC/Storwiz disks & switches
- Simple to learn & fast to use Graphical User Interface
- Install Image & Virtual Machine (VM) Management
- Resource Pooling across host machines
- VM Capture with software stack in a few minutes
- VM Deploy with policy based placement in a few minutes
- VM sizing simplification through config templates
- VM life cycle operations:
  - capture, deploy, start, stop, delete, resize, migrate
- Dynamic CPU, RAM, Disk Management (DLPAR)
- Live VM Mobility / Relocation (LPM)
- Health status checks of the virtualized environment

PowerVC has generated lots of customer interest as:  
*"At last a simple tool to spin-off Power Virtual Machines with no effort"*

## Screen Shots

## Home screen showing Resource Summary



IBM PowerVC Users Configuration Messages <sup>1</sup> admin

### Home

IBM PowerVC Standard Edition will use the following resources to manage your virtual environment [Learn more...](#)

Hosts: 2 +

Processors:  72%

Memory:  57%

Virtual machines:  2%

Storage providers: 2 +

Managed volumes: 4

Fabrics: 1 +

Networks: 2 +

**To create an image, manage an existing virtual machine from the Host page, then capture it from the Virtual Machine page.**

**Verify Environment** ✖ [View Results](#)

Last verified: 11/25/13, 9:15 AM

## Configured Storage showing 2 Storwize V7000



IBM PowerVC Users Configuration Messages <sup>1</sup> admin

### Storage


Volumes **Storage Providers** Fabrics

[Refresh](#) [+ Add Storage](#) [Edit Storage](#) [Remove Storage](#)



Name	Available Capacity	State	Health	Type
V7000 Dun	14222.75 GB	Running	OK	Storwize family
V7000 Tan	15804.25 GB	Running	OK	Storwize family

Storage Volumes (4)





# Configured Networks




  
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## Networks

 Refresh   
  Add Network   
  Edit Network   
  Remove Network   
 Filter



	Name	VLAN ID	Type	Virtual Machine Usage	Subnet Mask	Gateway	DNS
3	 ATS 9.137.62.X network	137	Static	4	255.255.255.0	9.137.62.1	9.137.62.2
7	 Imported Network f VLAN 137 - ETHERNET0(Defa	137	DHCP	3			


  
 Networks (2)

# Configured Physical Machines






  
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
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## Hosts

Hosts    HMC Connections

 Refresh   
  Add Host   
  Remove Host   
  Manage Existing Virtual Machines   
 Filter

	Name	Virtual Machines	State	Health	HMC Connection
3	 green-8231-E2B-SN06FC44P	6	 Operating	 OK	HMC12
7	 purple-9117-MMB-SN100525P	1	 Operating	 OK	HMC12


  
 Hosts (2)



# Pre-Packaged Images of Software Stacks



IBM PowerVC Users Configuration Messages admin

## Images

Refresh Deploy Delete Filter

Name	State	Operating system	Volume	Storage Provider	Last updated
Images (3) AIX7_TL3_SP0	Active	aix	Image AIX7_TL3_SP0	V7000 Dun	November 20, 2013 at 4:44:02 PM GMT Standard Time
Red_Hat_RHEL64	Active	rhel	Image Red_Hat_RHEL64	V7000 Dun	November 21, 2013 at 2:44:52 PM GMT Standard Time
SLES_11_3	Active	rhel	Image SLES_11_3	V7000 Dun	November 22, 2013 at 4:04:03 PM GMT Standard Time

# Images + Deploy → Size Template



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## Deploy AIX7\_TL3\_SP0

General

Virtual machine name: AIX7\_TL3\_SP0 Instances: 1

Host: Selected by placement policy Storage connectivity group: Any host, all VIOS

Compute template: 2 - Small

Processors: 1  
 Processor units: 0.5  
 Memory (MB): 2,048  
 Disk size (GB): 16

Storage template: V7000 Dun default

Network

Primary network (system default gateway): -- Select a network --

Deploy Cancel

Current and projected use:

Your projected usage based on your selections is shown in this color.

Resource	Usage	Total
Virtual machines (7)	2%	400 Total
Processor units (32.8)	75%	44 Total
Memory (112,256 MB)	57%	196,608 MB Total
Disk size (3,370 GB)	19%	17,592.25 GB Total

## Created Virtual Machines

IBM PowerVC Users Configuration Messages admin

### Virtual Machines

Refresh Start Stop Delete Capture Resize Migrate Attach Volume Filter

Name	Host	IP	State	Health	Task
SLES_11_2	green-8231-E2B-SN06FC44P	9.137.62.126 (Static)	Active	OK	
green2	green-8231-E2B-SN06FC44P		Active	OK	
green3	green-8231-E2B-SN06FC44P		Active	OK	
green4	green-8231-E2B-SN06FC44P	9.137.62.79 (Static)	Active	OK	
green5	green-8231-E2B-SN06FC44P	9.137.62.125 (Static)	Active	Warning	
wp24	green-8231-E2B-SN06FC44P	9.137.62.24 (Static)	Active	Warning	
purple4-NPIV	purple-9117-MMB-SN100525P		Active	Pending	

## Backup Charts

## Adding Users

- As root user on the PowerVC hosting server
- `useradd -c "Nigel Griffiths" -g admin -m nag`
  - `-c` add name to the `/etc/passwd`
  - `-g admin` = the Linux user group for PowerVC admin
  - `-m nag` = user name
- Set the users password
  - `passwd nag`
- Now nag can login to PowerVM

## Backup

- Default backup directory `/var/opt/ibm/powervc/backups`
- `/opt/ibm/powervc/bin/powervc-backup --targetDir /backup`
- If you have a PowerVC problem → restore the backup

### High Availability

- Only 1 PowerVC to manage each machine
- More is not supported

### Warm Standby

- Copy backup files to a warm stand-by PowerVC box
  - Just OS and PowerVC installed but NOT used
- If you get a PowerVC disaster ...
  - Restore the backup file and it will start PowerVC
  - Then don't use the original PowerVC copy

## Using PowerVC Standard Edition with HMC



- Create a pure virtual LPAR
  - Using a NPIV disk via the VIOS – mandatory for 1.2 release
  - Using a virtual network via the VIOS
- Install the OS
  - Current AIX, RHEL or SUSE
- Regular post install setup
- Install your applications etc.

## Pre-Capture Checklist



- Date, time & timezone
- IP address & full hostname OK
- Remove junk files from /tmp etc. & old / large logs
- Set filesystem to sensible sizes
- Remove old user accounts or unused apps / tools
- ulimit set
- Installed OS updates/fixes
- Installed generally useful tools
- Know the root passwd
  
- Cleanly reboots

Any other house keeping  
you don't want to do after  
every subsequent Deploy?

## Activation Engine

Best info in the  
PowerVC Manual pages

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/opt/ibm/powervc/activation-engine/vmc.vsae.tar  
~10MB

### ■ Install

- tar xvf vmc.vsae.tar
- AIX: export JAVA\_HOME=/usr/java5/jre ; ./aix-install.sh
- Linux: See manual then run ./linux-install.sh

### ■ Prepare

- Check Redbook/ Manual for extra Linux prepare steps
- rm /opt/ibm/ae/AP/\*
- cp /opt/ibm/ae/AS/vmc-network-restore/resetenv  
/opt/ibm/ae/AP/ovf-env.xml

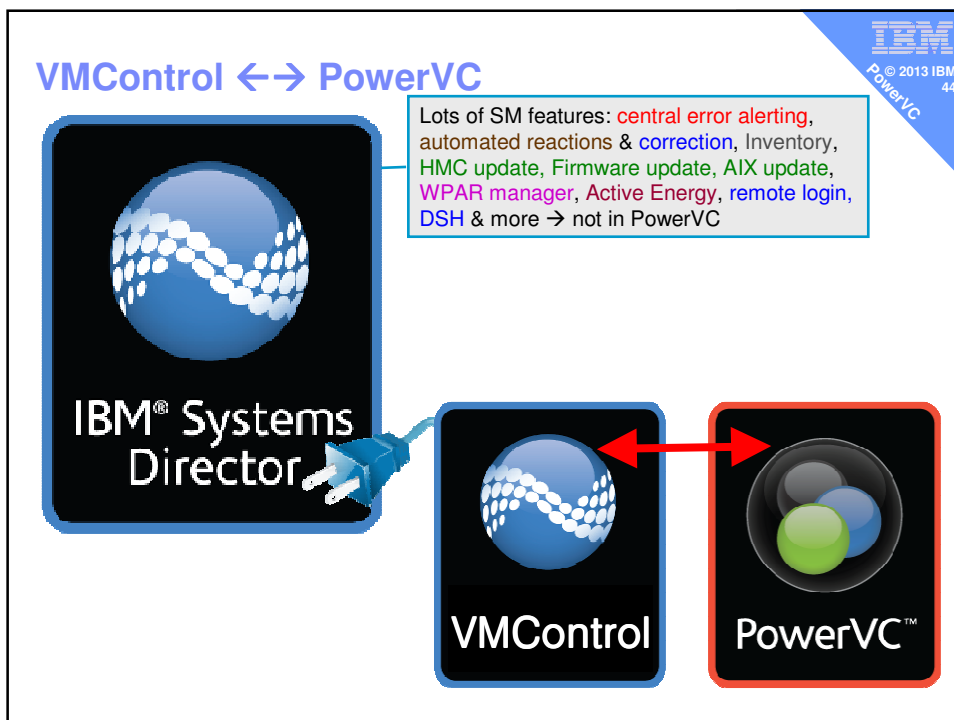
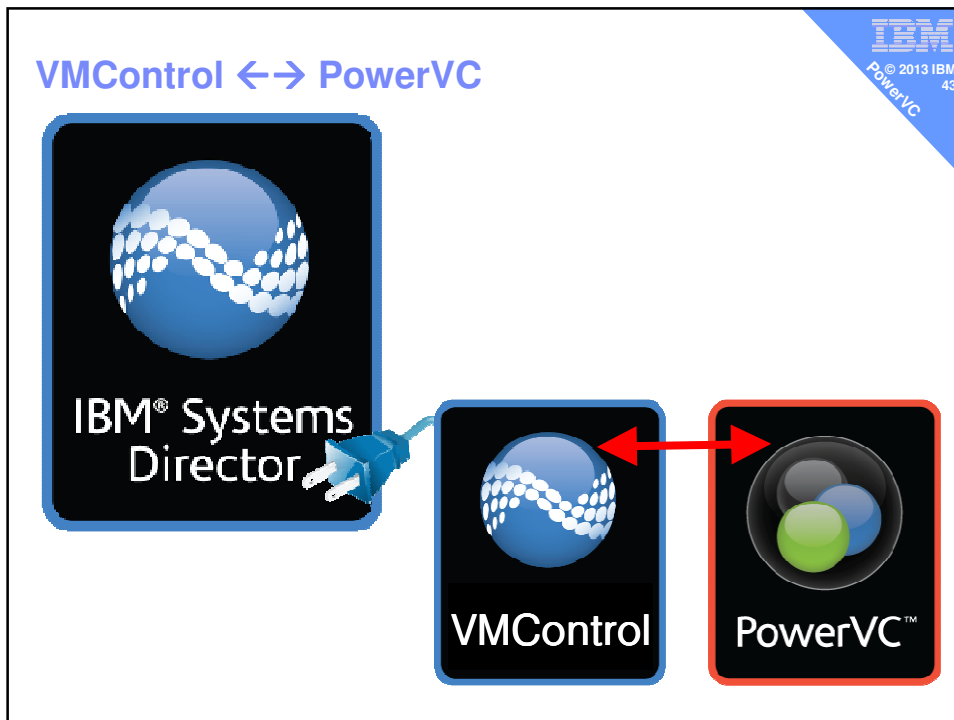
### ■ Do

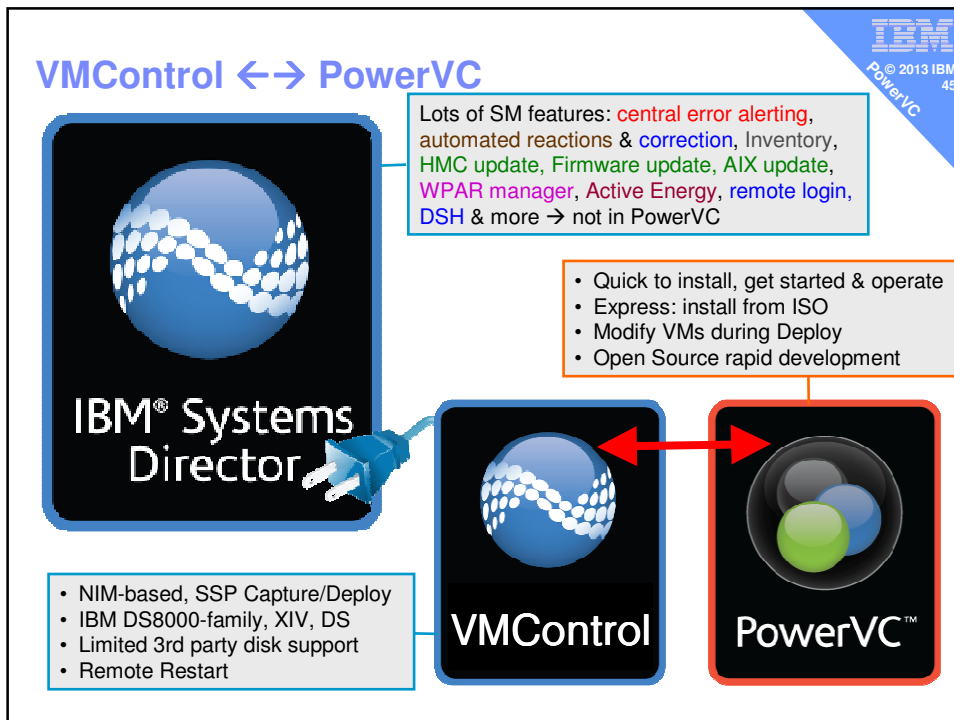
- /opt/ibm/ae/AE.sh -R

## Systems Director and PowerVC!!

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**FAQ – Nigel’s Opinions**

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- Can I run PowerVC on AIX?
  - No and no plans. That would cost serious money to port/support, would you pay say 100’s of Dollars more per core for AIX option?
- Can one PowerVC do both HMC & IVM? **Not currently.**
- When is the next release?
  - When will SSP be supported?
  - What is in the next release?
  - When will my “xxxxxxx” disks be supported?
    - I expect more than one release a year.
- Can I add other OpenStack modules to PowerVC? **No**
- PowerVC High Availability?
  - PowerVC dynamically gets status info, so low private data
  - Simple backup command takes a few minutes.
  - You can have warm PowerVC’s ready for backup restore
  - You can fall back to IVM/HMC/VIOS etc
- User control
  - LDAP or Linux user groups: admin / deployer / viewer
- SmartCloud products like SCE?
  - SCE3.2 can now control ISD+VMControl - - or - - PowerVC

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