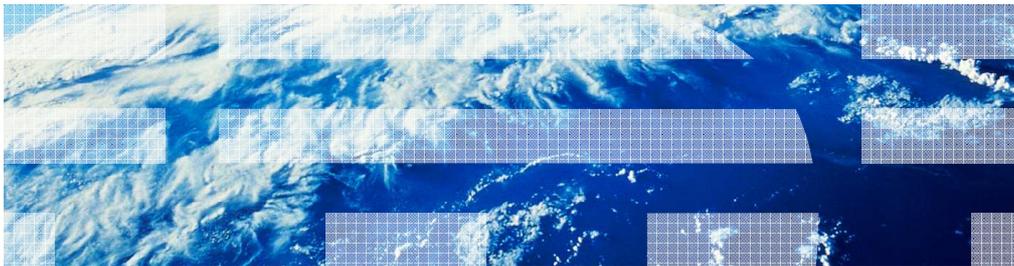


IBM WebSphere CloudBurst Appliance

PowerVM configuration



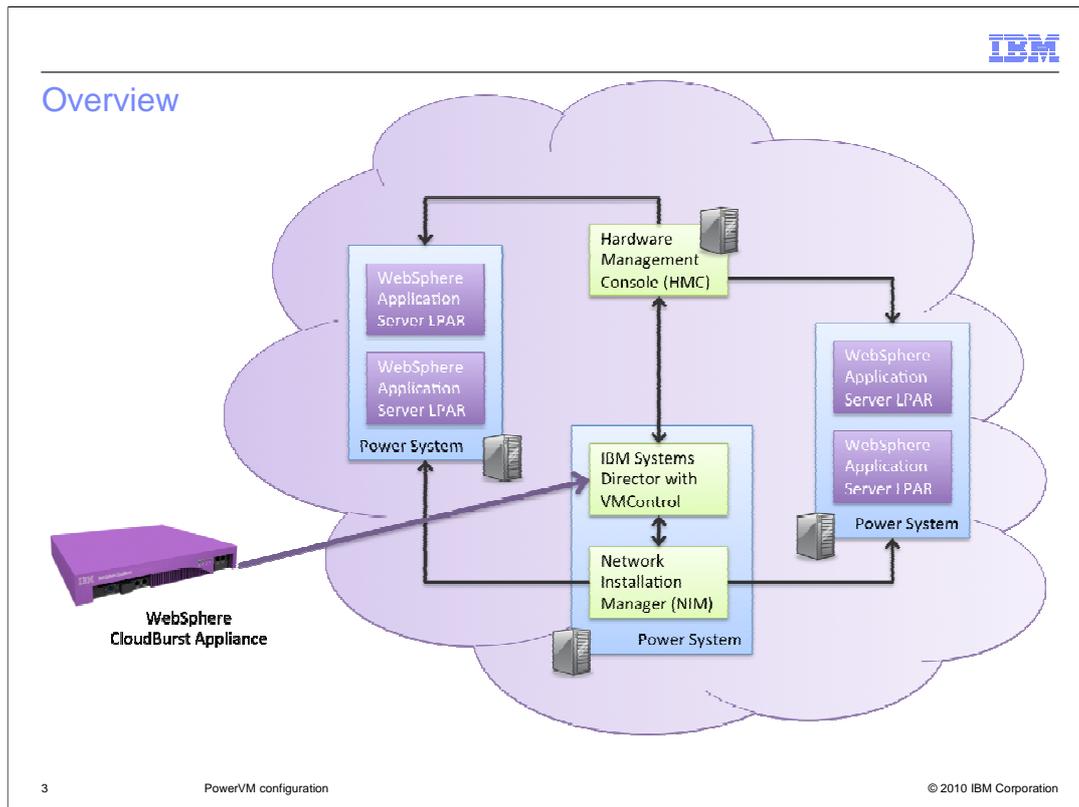
This presentation will provide an overview of the PowerVM configuration that is required for use with the IBM WebSphere CloudBurst Appliance.

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- PowerVM configuration overview
- Installing and configuring the PowerVM environment
- Helpful commands

The first section of the presentation gives an overview of the PowerVM environment and the steps that are required to install and configure it. The second section gives details about the configuration process, including required hardware and software levels. Finally, the presentation covers some helpful commands to gather information about the different components of the PowerVM environment.

Overview



IBM WebSphere CloudBurst Appliance works with some versions of PowerVM hypervisors. PowerVM hypervisors, in WebSphere CloudBurst, are defined within cloud groups that are managed by IBM Systems Director VMControl. The diagram here shows a sample topology for using PowerVM with WebSphere CloudBurst. In this environment, the appliance communicates with IBM Systems Director using the VMControl plug-in to deploy and interact with virtual systems. VMControl coordinates with the Network Installation Manager (NIM) and the Hardware Management Console (HMC) to deploy virtual systems into the PowerVM cloud. Each virtual system is an LPAR running AIX 6.1.3 and WebSphere Application Server Hypervisor Edition.

Overview of installation steps

- Network configuration
- Update and configure HMC
- Update firmware on all Power systems in CEC
- Install and configure VIOS
- Install AIX on the NIM and Systems Director LPARs
- Install and configure NIM
- Install and configure IBM Systems Director
- Install VMControl

The PowerVM installation and configuration for the WebSphere CloudBurst environment will require at least three days of effort. You must ensure your network is ready for the PowerVM components and for the large images that are moved across the network. You must update and configure the HMC to the required level. The firmware on all Power systems will likely need to be updated, all to the same firmware level. You must install and configure VIOS and the IBM Systems Director to the required level. Additionally, you will need to install the correct level of the VMControl plug-in for IBM Systems Director.

Installing and configuring the PowerVM environment

This section describes how to install and configure the components of the PowerVM environment.

Network configuration

- Network: 1GBit network switch speed
- DNS registration is required for all components
 - All DNS entries must be searchable by forward and reverse lookup
 - To test DNS:
 - ***nslookup < host name >***
 - Should return IP address
 - ***nslookup < ip address >***
 - Should return fully-qualified host name

Since the WebSphere CloudBurst appliance dispenses large images, it is important that the network is fast. A 1GBit network is highly recommended for optimum speed.

Domain name server (DNS) registration is required for all WebSphere CloudBurst-related network-addressable components, including all PowerVM components, (VIOS, NIM, Director), VMWare servers and VMWare license servers, the reserved target IP addresses and target host names, the WebSphere CloudBurst appliance itself, and for the HMC. The entries within DNS for all the PowerVM systems must be resolvable by host name and by IP address. Failure to have DNS properly set up can create difficult-to-diagnose failures in WebSphere CloudBurst functionality.

To test entries in the DNS, issue these commands:

nslookup <host name> - should return IP address

nslookup <ip address> - should return fully-qualified host name

Information Center

- Product information center
 - Authoritative source for latest:
 - HMC model recommendations
 - Power firmware levels
 - Component levels
- IBM WebSphere CloudBurst V2 Information Center – PowerVM requirements
 - http://publib.boulder.ibm.com/infocenter/wsclocloudb/v2r0/topic/com.ibm.websphere.cloudburst.doc/gs/gsr_powvmtsp.html
- IBM Workload Deployer V3 Information Center – PowerVM requirement
 - http://publib.boulder.ibm.com/infocenter/worlodep/v3r0m0/index.jsp?topic=/com.ibm.worlodep.doc/gs/gsr_powvmtsp.html
- Review the subsequent WebSphere Cloudburst V1.1 slides for general information
- Consult the product information center for your specific requirements

In subsequent slides, you will see the original PowerVM prerequisites for WebSphere CloudBurst V1.1. Because it is revised with the latest information, the product information center is the authoritative source for the latest information about PowerVM prerequisites, including HMC model requirements, Power firmware levels, and component levels. Press “stop” on this slide to copy the links to PowerVM requirements in the information center for the IBM CloudBurst V2 and for the IBM Workload Deployer V3. Then click “play” to review the subsequent slides for general information about the components that comprise the PowerVM environment. Consult the product information center for your specific requirements.

HMC and Power firmware (original V1.1 levels)

- HMC
 - Models 7310-CR4 or 7042-CR4 preferred
 - 3GB RAM required
 - HMC V7.3.4.0.3 or V7.3.5
 - For V7.3.4.0.3, fixes MH01152, MH01187, and MH01190 are required
 - For V7.3.5, fixes MH01195 and MH01197 are required
 - RMC connectivity
- Firmware levels
 - Power 6 – EL340_095
 - Power 5 – SF240_382
- Refer to the product information center for the latest HMC and firmware level information

The Hardware Management Console must be a dual-core model, such as a 7310-CR4 or 7042-CR4, if you plan to do more than trivial testing. A minimum of 3GB RAM is required. The firmware level of the HMC must be 7.3.4.0.3 or 7.3.5. For 7.3.4.0.3, the fixes MH01152, MH01187 and MH01190 are required. For 7.3.5, the fixes MH01195 and MH01197 are required. You must have RMC (Resource Monitoring and Control) connectivity between the HMC and the PowerVM system components, such as Systems Director, NIM, and VIOS. You can check for RMC connectivity using the HMC by checking for the existence of the “Mobility” options in the Operations popup for your NIM or Systems Director LPARs. The “Mobility” option is not present if RMC is not established. The Power Information Center has information about enabling RMC connections.

The recommended firmware levels for AIX processors are EL340_095 for Power 6 and SF240_382 for Power 5.

Component levels – VIOS and AIX

- VIOS
 - Level 2.1.1.10-FP21
 - Use “ioslevel” command to view
 - IZ52851 if running ToolTalk
- AIX – 6.1 +TL3 +SP1
 - Level 6100-03-01-0921
 - Use “oslevel –s” command to view
 - IZ52851 if running ToolTalk
 - dsm.core – a required fileset but not installed by default
 - Available on the AIX installation CDs or in lpp_source
- Refer to the product information center for the latest component level information

VIOS must be at level 2.1.1.10-FP21. Confirm this level by using the ***ioslevel*** command. In addition, IZ52851 must be installed if ToolTalk is installed.

AIX must be at level 6.1, plus Technology Level 3, plus Service Pack 1, which displays using ***oslevel –s*** as 6100-03-01-0921. IZ52851 must be installed if you have installed ToolTalk. Note that dsm.core fileset is required but is not installed by default and is available on the AIX installation CDs or in lpp_source.

Component levels – NIM

- NIM – 6.1.3
 - NIM Master 6.1.3 and NIM Client 6.1.3 come as part of TL3; if NIM is installed during TL3 installation, it is automatically upgraded
 - DSM 6.1.3 (or higher)
 - The settings **ulimit –n unlimited** and **ulimit –f unlimited** are required
 - Set these globally by editing file /etc/security/limits
 - CAS 6.1.1.1
 - If you discover that the Java 5 32-bit JDK that comes on the AIX media did not install, install the latest JDK version, available here:
 - https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?source=dka&S_PKG=aix32j5b&S_TACT=105AGX05&S_CMP=JDK
 - After you install CAS 6.1.0.3, upgrade it within the IBM Systems Director to CAS 6.1.1.1 using:
 - **Navigate Resources / <Select NIM Operating System> / Actions / Release Management / Show needed updates**

- Refer to the product information center for the latest component level information

NIM Master and NIM Client must be 6.1.3, which is a part of Technology Level 3, so if NIM is installed when TL3 is applied, the NIM Master and NIM Client are upgraded to 6.1.3. DMS level 6.1.3 or higher must be installed on the NIM server (for the VMControl agent), and CAS level 6.1.1.2. IZ52851 must be installed if ToolTalk is installed on the system. The ulimit setting for the maximum number of file descriptors must be set to unlimited. Also, the ulimit setting for maximum file size must be set to unlimited. You can set these globally by editing the file /etc/security/limits.

Regarding the CAS installation for NIM, you begin by ensuring that CAS 6.1.0.3 is installed, including all its prerequisites. CAS is not automatically installed or upgraded when upgrading from AIX 6100-TL2 to 6100-TL3. One of the necessary components for CAS - the Java 5 32-bit JDK that comes on the media - might not install. If the installation logs indicate that the JDK did not install, download the latest JDK version from the address shown here and install it. Then install CAS V6.1.0.3. Once CAS V6.1.0.3 is installed, it can be upgraded later from 6.1.0.3 to 6.1.1.1 using the IBM Systems Director, using “Show needed updates.”

Component levels – Director

- IBM Systems Director – 6.1.1.2
 - IZ52851 if running ToolTalk
 - Create property file to set max.cli.threads
 - Create the property file:
<sysdir_installation_root>/lwi/conf/overrides/**OIDOutput.properties**
 - Add these two lines
 - **com.ibm.director.im.rf.nim.deploynew.outputOID=true**
 - **max.cli.threads=17**
 - If the IBM Systems Director is running, stop and start it to activate the new settings
 - The /tmp file system must contain free space at least as large as the largest image size you will ever deploy to the PowerVM system
 - The settings **ulimit –n unlimited** and **ulimit –f unlimited** are required
 - Set these globally by editing file /etc/security/limits
- Refer to the product information center for the latest component level information

IBM Systems Director must be at level 6.1.1.2. IBM Systems Director is currently a free downloadable product, but you must purchase a support agreement for service. IZ52851 is required if ToolTalk is installed. You must install the latest Systems Director fixes provided by IBM for use with WebSphere CloudBurst. You must also set max.cli.threads to 17, the maximum value, within an lwi configuration override property file. One technique to do this is to create an OIDOutput.properties file and add the two lines into the new property file, as documented in this slide. Since the deployed images for PowerVM are first staged in the /tmp directory on the IBM Systems Director, ensure that the free space in the /tmp file system is as large as the largest image you will ever attempt to deploy to PowerVM. If you are unsure of a size, then a suggested starting value is 15GB. The ulimit setting for the maximum number of file descriptors must be set to unlimited. Also, the ulimit setting for maximum file size must be set to unlimited. You can set these globally by editing the file /etc/security/limits.

Component levels – VMControl

- VMControl (Systems Director plug-in) – 2.1
 - From VMControl, install the VMControl agent into the common agent services (CAS) on the NIM server
- From Systems Director:
 - Run discovery and inventory on the NIM server
 - Run discovery and inventory on the HMC, managed systems (CECs), VIOS
- Refer to the product information center for the latest component level information

VMControl is a plug-in extension for IBM Systems Director and must be at level 2.1. You can install a free trial license version of VMControl but before the trial license expires, you must purchase and install the licensed version of VMControl. After VMControl is installed, you need to use it to install the VMControl agent into the common agent services running on the NIM server.

Once all of these components are in place, use Systems Director to discover them and collect inventories. First, run discovery and take an inventory of the NIM server; it will show up as repository in VMControl. Then, you also need to run discovery and take an inventory of the HMC, the managed systems – which are all of the CECs in your environment, and the VIOS.

Helpful commands

This section presents some commands that might be helpful to you.

Helpful commands for AIX

- Show technology and service pack level

```
# oslevel -s  
6100-03-01-0921
```

- List installed software for <component>

```
# lspp -L all | grep -i <component>  
openssl.base          0.9.8.801  C  F  Open Secure Socket  
Layer  
openssl.license      0.9.8.801  C  F  Open Secure Socket License  
openssl.man.en.US    0.9.8.801  C  F  Open Secure Socket Layer
```

These commands might prove helpful on the NIM, VIOS, IBM Systems Director, and target partitions. Use the **oslevel -s** to determine the AIX operating system's release, technology level, and Service Level. Use the **lspp -L** command to look at installed software.

Helpful commands for VIOS

- Show installation and fix pack level

```
$ ioslevel
2.1.1.10-FP21
```

- List storage pools and backing devices

```
$ lssp
Pool          Size      Free(mb)  Alloc  Size(mb)BDs  Type
rootvg       285696   202752   512                2  LVPOOL
TgtPool      856856   752384   256                4  LVPOOL

$ lssp -bd -sp TgtPool
Name          Size      VTD              SVSA
lp2vd1       26112     None             None
lp2vd2       27136     vtscsi0 vhost2
```

Issue these commands when logged onto the VIOS partition. The ***ioslevel*** command shows you the maintenance level for VIOS. The ***lssp*** command can be useful if you suspect problems with the management of storage pools on VIOS. The first example shows all of the storage pools. TgtPool is the storage pool of interest for the WebSphere CloudBurst configuration, so the second command displays additional information about the TgtPool storage pool.

Helpful commands for IBM Systems Director

- Start the IBM Systems Director
 - # **smstart**
- Stop the IBM Systems Director
 - # **smstop**
- Display status while starting
 - # **smstatus -r**
 - Type ctrl-C once “Active” to terminate shell

The IBM Systems Director is started automatically when the partition is started. Use the **smstop** command to stop the IBM Systems Director. This might be necessary when, for example, you apply maintenance to the IBM Systems Director. Use the **smstart** command to start the IBM Systems Director. Since it might take several minutes to start, use the **smstatus -r** command to monitor IBM Systems Director’s progress starting. Once the status shows **Active**, type Ctrl-C to exit the smstatus shell.

Summary

The next section provides a summary of this presentation.

Summary

- Configuring the PowerVM environment requires hardware and software setup
 - Network configuration
 - HMC and Power system updates
 - Installing the operating system, VIOS, NIM, Systems Director, VMControl

The PowerVM environment that is used with WebSphere CloudBurst, requires specific hardware and software configuration steps. The networking environment needs to be configured at a level that will support large file transfers and reverse DNS lookup for all components. The HMC and Power systems need to be updated to the required firmware and maintenance levels, and the operating system, VIOS, NIM, and Systems Director components need to be loaded on the appropriate Power systems.

References

- HMC
 - <http://www.ibm.com/developerworks/wikis/display/virtualization/HMC>
- VIOS (now in IBM Support Portal)
 - [http://www-947.ibm.com/support/entry/portal/Overview/Software/Software_support_\(general\)](http://www-947.ibm.com/support/entry/portal/Overview/Software/Software_support_(general))
- IBM Systems Director
 - <http://www-03.ibm.com/systems/management/director/>
- VMControl
 - <http://www.ibm.com/systems/management/director/plugins/syspools/index.html>
- Step-by-step movie demos
 - <http://www.ibm.com/developerworks/wikis/display/WikiPtype/Movies>
- YouTube channel
 - http://www.youtube.com/results?search_query=WebSphereClouds&aq=f
- WebSphere CloudBurst Support
 - <http://www-01.ibm.com/software/webservers/cloudburst/support/>
- IBM WebSphere CloudBurst V2 Information Center – PowerVM requirements
 - http://publib.boulder.ibm.com/infocenter/wscloudb/v2r0/topic/com.ibm.websphere.cloudburst.doc/gsr_powvmtsp.html
- IBM Workload Deployer V3 Information Center – PowerVM requirement
 - http://publib.boulder.ibm.com/infocenter/worlodep/v3r0m0/index.jsp?topic=/com.ibm.worlodep.doc/gsr_powvmtsp.html

Here are some references for more information about the PowerVM environment.



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