Updating to VIO server v3.1

Jaqui Lynch
Jaqui Lynch Consulting
jaqui@circle4.com

Agenda

• Introduction
• VIOS 3.1 Prerequisites
• Installing VIOS 3.1
• Upgrading to VIOS 3.1
• Notes
Introduction

Stay Current

http://www14.software.ibm.com/webapp/set2/frt/liteTable?prodKey=vios

<table>
<thead>
<tr>
<th>VIOS Lifecycle</th>
<th>GA</th>
<th>EOM</th>
<th>EOS/EOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>11/07</td>
<td>2008</td>
<td>09/11</td>
</tr>
<tr>
<td>2.1</td>
<td>11/08</td>
<td>2010</td>
<td>09/12</td>
</tr>
<tr>
<td>2.2.0.0</td>
<td>10/11</td>
<td>2011</td>
<td>09/13</td>
</tr>
<tr>
<td>2.2.1</td>
<td>10/12</td>
<td>10/12</td>
<td>04/15</td>
</tr>
<tr>
<td>2.2.2</td>
<td>4Q13</td>
<td>10/13</td>
<td>09/16</td>
</tr>
<tr>
<td>2.2.3</td>
<td>2015</td>
<td></td>
<td>11/17</td>
</tr>
<tr>
<td>2.2.4</td>
<td>4/21/17</td>
<td></td>
<td>12/18</td>
</tr>
<tr>
<td>2.2.4.40</td>
<td>4Q16</td>
<td></td>
<td>12/18</td>
</tr>
<tr>
<td>2.2.5</td>
<td>11/12/16</td>
<td></td>
<td>11/17</td>
</tr>
<tr>
<td>2.2.5.10</td>
<td>4/14/17</td>
<td></td>
<td>11/19</td>
</tr>
<tr>
<td>2.2.5.20</td>
<td>11/30/17</td>
<td></td>
<td>11/2019</td>
</tr>
<tr>
<td>2.2.5.30</td>
<td>5/2/18</td>
<td></td>
<td>11/2019</td>
</tr>
<tr>
<td>2.2.5.40</td>
<td></td>
<td>9/30/2020</td>
<td>2021</td>
</tr>
<tr>
<td>CURRENT</td>
<td>10/27/17</td>
<td></td>
<td>get from ESS</td>
</tr>
<tr>
<td>2.2.6.10</td>
<td>10/27/17</td>
<td></td>
<td>get from ESS</td>
</tr>
<tr>
<td>2.2.6.20</td>
<td>3/20/2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.6.21</td>
<td>8/7/2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.6.23</td>
<td>9/21/2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.6.31</td>
<td>11/16/2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>11/9/2018</td>
<td></td>
<td>get from ESS</td>
</tr>
<tr>
<td>3.1.0.10</td>
<td>11/9/2018</td>
<td></td>
<td>Fix central</td>
</tr>
</tbody>
</table>

NOTE all levels prior to 2.2.5 are EOS as of December 2018
2.2.5 is end of service November 2019
2.2.6 is end of marketing September 2020 and end of service late in 2021
VIOS levels

VIOS 3.1 came out 11/9/2018 plus a minipack 3.1.0.10

Download 3.1.0 base from entitled software:
http://www-05.ibm.com/servers/eserver/ess/ProtectedServlet.wss

Download 3.1.0.10 update from Fix Central:
http://www-933.ibm.com/support/fixcentral/

Readme for 3.1.0.10
https://www.ibm.com/support/docview.wss?uid=ibm10738523

NIM Master needs to be at 7200-03-02-1846 at a minimum

Check required HMC and firmware levels

Minimum server level is POWER7+ (D model) and above


HMC levels

All HMC levels prior to v8.8.7 went out of service by November 2018
V8.8.7 goes out of service 8/31/2019
V9 goes out of service 3/31/2020

http://www14.software.ibm.com/webapp/set2/fltr/liteTable?prodKey=hmc

HMC latest version is v9R1M921 (MH01789) (11/16/2018) – prereq is v9R1.910.0 min.
Can upgrade to v9R1.910.0 from v8.8.6.0 or later

Latest patch is MH01808 for 7042 and MH01809 for 7063

Note – v9.1 is the last HMC release that will support x86 HMCs

V9.1 requires the HMC to be a CR7 or higher if Intel, or the new POWER HMC
V9.1 does not support any server prior to POWER7


NOTE – once HMC is at v9R1m920 you can upload VIOS and other images from flash drive to the HMC
# VIOS Release Lifecycle

Lists the PowerVM Virtual I/O Server (VIOS) release dates and end of service pack support (EoSPS) dates.

<table>
<thead>
<tr>
<th>VIOS Release</th>
<th>Release Date</th>
<th>End of Service Pack Support (EoSPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.0</td>
<td>November 2018</td>
<td>30 November 2021 (estimated)</td>
</tr>
<tr>
<td>2.2.6</td>
<td>October 2017</td>
<td>30 September 2020</td>
</tr>
<tr>
<td>2.2.5</td>
<td>November 2016</td>
<td>30 September 2019 (estimated)</td>
</tr>
<tr>
<td>2.2.4</td>
<td>December 2015</td>
<td>31 December 2018</td>
</tr>
<tr>
<td>2.2.3</td>
<td>November 2013</td>
<td>30 November 2017</td>
</tr>
<tr>
<td>2.2.2</td>
<td>November 2012</td>
<td>30 November 2015</td>
</tr>
<tr>
<td>2.2.1</td>
<td>October 2011</td>
<td>31 October 2014</td>
</tr>
<tr>
<td>2.2.0</td>
<td>September 2010</td>
<td>30 November 2013</td>
</tr>
</tbody>
</table>

The End of Service Pack Support (EoSPS) is the date when Fix Packs, Service Packs, Mini Packs, and other fixes will no longer be shipped for a release.

Use FLRT and check Prereqs

FLRT Home Page:  
https://www-304.ibm.com/support/customercare/flrt/

FLRT Lite  

VIOS to NIM Master Mapping:  

System Software Maps for VIOS:  
http://www-01.ibm.com/support/docview.wss?uid=ssm1platformvios

AIX/VIOS Security Tables:  

VIOS Hiper Tables:  

Also check MPIO driver versions as there are specific requirements for each VIO release

AIX Support Lifecycle  
https://www-01.ibm.com/support/docview.wss?uid=isg3T1012517

PowerVm 3.1  
Prerequisites
Minimum NIM Master Levels for VIOS Clients


If using NIM to backup, install or update a VIOS partition, the NIM master must be greater than or equal to the levels shown below.

<table>
<thead>
<tr>
<th>VIOS Release</th>
<th>VIOS Level</th>
<th>Minimum NIM master level</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIOS 3.1.0</td>
<td>v3.1.1.13</td>
<td>7200-03-02</td>
</tr>
<tr>
<td>VIOS 3.2.6</td>
<td>v3.2.6.20</td>
<td>AIX 6136-09-12</td>
</tr>
<tr>
<td>VIOS 3.2.6.31</td>
<td>v3.2.6.31</td>
<td>AIX 6136-09-12</td>
</tr>
<tr>
<td>VIOS 3.2.6.21</td>
<td>v3.2.6.21</td>
<td>AIX 6136-09-11</td>
</tr>
<tr>
<td>VIOS 3.2.6.19</td>
<td>v3.2.6.19</td>
<td>AIX 6136-09-10</td>
</tr>
<tr>
<td>VIOS 3.2.6.0</td>
<td>v3.2.6.0</td>
<td>AIX 6136-09-10</td>
</tr>
<tr>
<td>VIOS 3.2.5.40</td>
<td>v3.2.5.40</td>
<td>AIX 6136-09-10</td>
</tr>
<tr>
<td>VIOS 3.2.5.30</td>
<td>v3.2.5.30</td>
<td>AIX 6136-09-10</td>
</tr>
<tr>
<td>VIOS 3.2.5.29</td>
<td>v3.2.5.29</td>
<td>AIX 6136-09-10</td>
</tr>
<tr>
<td>VIOS 3.2.5.19</td>
<td>v3.2.5.19</td>
<td>AIX 6136-09-10</td>
</tr>
<tr>
<td>VIOS 3.2.5.0</td>
<td>v3.2.5.0</td>
<td>AIX 6136-09-10</td>
</tr>
</tbody>
</table>

For VIOS 3.1 this is AIX 7.2 tl3 sp2

PowerVM 3.1 Changes

- Just announced and went GA 11/9/2018
- Base order number changes to 5765-G34
- Native compatibility mode for POWER8 and POWER9
- Accelerated secure LPM for E950 and E980
- Based on AIX 7.2 TL3
- USB Flash drive install for VIOS
- IVM is removed so you must install a proper VIO server
- Database changes from Solid to Postgres for SSP management data
- Many old packages removed to clean up image
- Storage multipathing enhancements
- iSCSI support
  - Can export iSCSI disks to client LPARs using vSCSI (min FW860.20)
  - Enables MPIO support for iSCSI
  - iSCSI boot is not supported
  - iSCSI not supported for SSP (shared storage pools)
PowerVM 3.1 Prerequisites

- At least 1 core, 8GB memory (Nigel recommends at least 16GB if SSPs)
- At least 30GB for rootvg (I recommend 100GB)
- Add an extra disk to be used for alternate disk upgrades
- On one VIO it is helpful to have a 3rd disk to use for File Backed Optical if you use it – gets it out of rootvg
- NIM Master must be at AIX 7200-03-02-1846
- Must use VIO server - IVM is removed
- Only supports Power7+ (D models) and above
- No blades supported
- If need to have older servers around then use 2.2.6.32 VIO servers for those
- viosupgradecommand on VIO becomes available at 2.2.6.30 but if you have SSPs you must go to 2.2.6.32 before trying to upgrade
- V3.1 base is downloaded from ESS and comes as either 2 x DVDs or a flash drive image
- So server must have access to a NIM server, a DVD drive or be able to use a flash drive
- For flash drive install USB drive must be at least 16GB
- Latest link to VIOS Maintenance Strategy

PowerVM 3.1 SSP Important Changes

Important Changes in 3.1.0.X for SSP users

A database manager change has occurred for Shared Storage Pool (SSP). This change will have no direct impacts on behavior, however it does mean that non-disruptive upgrades of an SSP cluster to 3.1.0.10 requires that SSP nodes first are updated to the latest 2.2.6.X version available before upgrading to 3.1.0.0 or 3.1.0.10. As of the time of this writing, that is version 2.2.6.31.

Once all VIOS nodes in the cluster have been updated to the latest 2.2.6.X version, double check that rolling upgrade has completed. This can be done by checking the output of “cluster -status -verbose” while looed in as padmin on one of the VIOS nodes in the cluster. Then, check the output for each node, and check for this field:

Node Upgrade Status: 2.2.6.31 ON_LEVEL

If all nodes have 2.2.6.31 or newer, and all say that they are “ON_LEVEL,” then upgrades to the VIOS to 3.1.0.00 or newer can occur without disruption to the SSP cluster.

Additionally, backup and restore can be used to restore older versions of the SSP cluster to 3.1.0.X versions of the VIOS.

The above is from the readme. There are additional limitations spelled out in the readme file
3.1.0.10 readme: https://www-01.ibm.com/support/docview.wss?uid=ibm10738523
Get the files

- Latest ISO download is for VIOS 3.1.0
- Flash image ISO is VIOS 3.1.0.10 – use this and save a step

Go to ISS:
https://www-05.ibm.com/servers/eserver/ess/ProtectedServlet.wss
Sign in with your userid and password for IBM

At the left click on my entitled software.
Make sure to the right “brand selection” says AIX.

Once it says AIX click on software updates at the left.
It will prompt you for customer number and serial number for a system - use a valid one.
Then you will select PowerVM v3.1 (V761-vm3) and click on continue (NOTE v3 has a different program number).
Click on agree and then select I want to download now.

It will take you to software downloads - make sure category says AIX and v7.2 then click on continue.
Check the box that says V761-vm3 - PowerVM Enterprise IO v3 and click on continue.
Then check the powerbox box (this is really repetitive) and click on continue.
On the next page click on I agree and go to the bottom of the next page and click on “click here to use http”

There are 3 images to be downloaded:
- ISO, Virtual I/O Server v3.1.0.0 DVD 1 of 2 (11/2018)
  Virtual_IO_Server_Install_3.1.0.0_DVD_1_of_2_112018.iso
- ISO, Virtual I/O Server v3.1.0.0 DVD 2 of 2 (11/2018)
  Virtual_IO_Server_Install_3.1.0.0_DVD_2_of_2_112018.iso.ZIP
- ISO, Virtual I/O Server v3.1.0.10 Flash (11/2018)
  Virtual_IO_Server_Install_3.1.0.10_Flash_112018.iso

Download all 3 and burn them to DVD.
You can also burn the last one (with flash in its name) to a USB stick.
Install Options

- Download v3.1.0 from ESS
- Download 3.1.0.10 — I used this image
- Download the latest expansion pack from Fix Central

- Fresh install of VIOS 3.1 on a new server
  1. LPM off all LPARS then fresh install of VIOS 3.1 on old server
  2. Install from DVD or USB
  3. Use NIM to do VIO install to an alternate disk
  4. Install VIO from repository on HMC

- Use NIM viosupgrade to upgrade current server to an alternate disk
  If using NIM for bosinstall then VIOS IP cannot be on the SEA
  Can still install to altdisk though

**Use VIO viosupgrade to upgrade current server to an alternate disk (my preferred method)**

1. VIO viosupgrade requires VIOS to be at 2.2.6.30+, SSP requires 2.2.6.32
2. Use viosupgrade –l –q to monitor VIO upgrade status

- Read the readme/description files for all levels
- If you are using SSPs pay attention to the restrictions and rules around upgrades with SSPs in place

- Note if upgrading versus full install - you cannot use updateios for this upgrade – you must use the viosupgrade command

- Check Nigel’s AIXpert blog for update
  - [http://tinyurl.com/AIXpert](http://tinyurl.com/AIXpert)
  - [https://www.ibm.com/developerworks/community/blogs/aixpert/entry/Upgrading_to_VIOS_3_1](https://www.ibm.com/developerworks/community/blogs/aixpert/entry/Upgrading_to_VIOS_3_1)

Things to think about for Fresh Install

- It is not that different from any other VIO server fresh install
- Use viosbr to backup metadata and copy the files to a remote system
- Backup anything outside of rootvg on your VIOS to a remote location
  - See next slide
- Backup the VIOS itself or take a clone
- If using SSPs then perform the steps in the README for SSPs
- Install from the v3.1 DVD – for NIM use the combined mksysb from the DVDs
- If you can, use the flash image which is at 3.1.0.10
  - I was able to burn this iso to both a DVD and a flash drive
- Fresh Install can be an overwrite of current disk or to an alternate disk
  - Use the alternate disk if at all possible
- Restore the metadata and anything that was outside of rootvg
- Perform post install SSP steps

- Before doing any install or upgrade - check for compatibility between HMC, firmware and VIOS levels as well as client operating systems
Prior to install or Upgrade

- Check on your viosbr backups
  ```bash
  $ ls -al /home/padmin/vf/gbackups
  total 56
  drwxr-xr-x 2 padmin staff 256 Mar 27 10:40 .
  drwxr-x--- 8 padmin system 4096 Nov 27 13:47 ..
  -rw-r--r-- 1 padmin staff 7852 Mar 27 10:40 vio1m.01.tar.gz
  $ viosbr-view -list
  vio2m.01.tar.gz
  ```

- Backup anything outside of rootvg on your VIOS to a remote location
  - FBO Library
  - LVs or file backed disks to clients
  - I have my viosbr setup to run daily and keep the last 7 copies so I only have to copy across the most recent one
  - viosbr-backup -file viosname -frequency daily -numfiles 7
  - The above is run once to setup the copy

- Backup LVs for clients
  - viosbr does not back these up and viosupgrade does not copy them so back them up
  - Move LVs to a different VG than rootvg prior to upgrade
  - Migrate after backup then use cplv to copy them after the migration
  ```bash
  http://www-01.ibm.com/support/docview.wss?uid=isg3T1000167
  ```

- Backup the VIOS itself or take a clone
  - mount /backups
  - mkdir /backups/vio
  - umount /var/vio/VMLibrary
  - su - padmin -c "iosclibackupios -file /backups/vio -nomedialib"
  - su - padmin -c "iosclibackupios -file /usr/local/backups/vio2-previo31-mar2719.mksysb -nomedialib -mksysb"
  - mount /var/vio/VMLibrary

Full Install

- From DVD or USB – complete install – with PowerVM 3.1 you will be able to use USB
- Basically boot in SMS mode then tell it to boot from DVD, flash, NIM or HMC and follow instructions

- Using NIM
  ```bash
  http://www-01.ibm.com/support/docview.wss?uid=isg3T1011386
  ```

- Minimum NIM levels
  ```bash
  ```

- Using HMC - check vios install box
  ```bash
  ```

- GUI:
  ```bash
  http://ibmsystemsblog.blogs.com/aixchange/2013/05/vios-installation-via-gui.html
  ```

- Network between HMC and VIO LPAR must be alive and not aggregated (request an access port)

- From a mksysb
  ```bash
  -vios_backup_restore_file_nim.html
  ```

- After install fix the page spaces – depending on the version you will have 1 x 512MB and 1 x 1024MB or 2 x 1024MB on the same hdisk. Get rid of paging00 and make hd6 at least 4GB
VIOS and HMC – Import VIOS31 ISO Images

aix1nim:/software/powervm31> du -sg *
4.18 Virtual_IO_Server_Base_Install_3.1.0.0_DVD_1_of_2_112018.iso
1.27 Virtual_IO_Server_Base_Install_3.1.0.0_DVD_2_of_2_112018.iso
4.29 Virtual_IO_Server_Base_Install_3.1.0.10_Flash_112018.iso
So need 5.45GB minimum if not using the flash image

1. Check repository for space
2. Import the ISO images
3. Message importing
4. Import complete

If you want you can just upload the flash image and use that – it is more current (3.1.0.10) and works fine

VIOS and NIM

• Use of NIM to back up, install, and update the VIOS is supported.

• **Note**: For install, always create the SPOT resource directly from the VIOS mksysb image. Do **NOT** update the SPOT from an LPP_SOURCE.

• Use of NIM to update the VIOS is supported as follows:
  Ensure that the NIM Master is at the appropriate level to support the VIOS image.
  • **NIM Master must be at AIX 7200-03-02-1846**

  • On the NIM Master, use the operation **updateios** to update the VIOS Server.
  • "nim –o updateios –a lpp_source=lpp_source1 ... ..."

  • On the NIM Master, use the operation **alt_disk_install** to update an alternate disk copy of the VIOS Server.
  • "nim –o alt_disk_install –a source=rootvg –a disk=target_disk –a fix_bundle=(Value) ... ..."

  • If NIM is not used to update the VIOS, only the **updateios** or the **alt_root vg** command from the padmin shell can be used to update the VIOS.
**VIOS and NIM**

- Add VIOS partition as a NIM client
- Copy the VIOS mksysb image from the CD to your NIM master
  - On VIOS 3.1 media there are 3 images now across the two DVDs
  - Copy all 3 images individually to a directory and then use cat to combine them
    ```
    >/export/mksysb/nim_vios3.1mksysb
    ```
- OR save yourself time and use the flash image as it is just one mksysb image
  - I had a problem with the flash ISO – you can mount it on AIX using loopmount but you can’t copy the files
    - So I opened it on windows, extracted the mksysb and uploaded the mksysb to my NIM server and used it there
- Define mksysb resource to NIM master
- Define spot on NIM master
  - The source for the SPOT will be the combined mksysb
  - The SPOT CANNOT be created from an LPP_Sorce
- Copy the bosinst.data from the DVD and create a viosbosinst resource
- You can now use bos_inst to do a mksysb install once the partition profile is defined

**Cloning disks**

After installing VIO1, if you have all the disks in VIO1 you can take a clone to build VIO2
If your server has a split backplane then you can make a clone
Make sure the 4 disks are split (2 and 2) across the backplane
VIOS is using hdisk0 and hdisk1, hdisk2 and 3 are on the other adapter and will be used for VIO2
Put all the disks into VIO1 (both adapters)
Install VIO1 on hdisk0 – from NIM, DVD, USB, HMC.....
Now clone it to hdisk2
  ```
  alt_disk_copy -d hdisk2
  ```
Remove VIO2 hdisks from VIO1, Shutdown VIO1,
Remove VIO2 resources from VIO1 profile
Leave VIO1 down
Activate VIO2
Remove any disks, adapters, networks etc that show as defined on VIO2
Now cleanup VIO2 (see next slide)

It is best to make the clone before you have the network and fibre adapters attached to VIO1 – it makes the post-clone cleanup much easier
Cleaning up after cloning VIO

If you do not take these steps you will experience RMC issues

Cleanup VIO2:
stopsrc -g rsct_rm; stopsrc -g rsct

Clear Nodeid
chdev -l cluster0 -a node_uuid=00000000-0000-0000-0000-000000000000
OR
/usr/bin/odmdelete -o CuAt -q 'attribute=node_uuid'

Generate new nodeid
/usr/sbin/rsct/bin/mknodeid -f

lsattr -El cluster0
/usr/sbin/rsct/bin/lsnodeid
/usr/sbin/rsct/install/bin/recfgct

lspartition -dlpar
lssrc -g rsct_rm; lssrc -g rsct
You may have to start ctcas - startsrc -s ctcas

Cleanup old VIO1 resources (next slide)

Cleaning up after cloning VIO

CLEANUP on VIO2
These will vary depending on the server and I/O drawers, etc

rmdev all devices showing as defined (fcs, ent, hdisk, etc)
rmdev -dp hdisk0
rmdev -dl hdisk0
rmdev -dp pdisk0
rmdev -dl pdisk0
rmdev -dp sissas0
rmdev -dl sissas0
rmdev -dp pci0
rmdev -dp pci1
rmdev -dp pci2
rmdev -dp pci3
rmdev -dp pci4
rmdev -dl pci0
rmdev -dl pci1
rmdev -dl pci2
rmdev -dl pci3
rmdev -dl pci4
If ethernet adapters were in VIO1 when cloned then you may need to remove all those as well

Once VIO2 is cleaned up reboot it
Then activate VIO1

Clean up VIO1 removing any extra hdisks, pdisks, pci, sissas1, etc that now show as defined. Also remove the adapter definitions for them.
Reboot VIO1 to ensure changes are good
Maintenance and Upgrades

Upgrading VIOS

Run lsvopt and make sure no one is using the FBO devices
If using NPIV tape drives make sure they are not in use (or activated on IBM i)

1. Normally upgrade HMC first then firmware then VIOS and then AIX
2. BUT – check the readme for all of the above first to make sure there is not a different required order
3. Download the updates and cross-check compatibility using FLRT
4. Read the readmes again
5. Run errpt to check for problems, check there are no stale partitions, missing disks or paths, etc
   - lsvg rootvg checks for stale PPs and physical volumes.
   - lsvg -p rootvg looks for missing disks.
   - lspp - checks for missing paths.
   - errpt checks for errors.
6. Ensure all paths on clients are redundant so LPARs will stay up when this VIOS is rebooted
7. Run HMC Scanner or sysplan to document prior to changes
8. Backup the VIOS
9. Mount the NFS filesystem or DVD or FBO image to be used for update
10. If using SSPs there are specific additional steps outlined in the README
11. After upgrading and rebooting the first VIOS check that all your LPARs are back to dual paths (lsppath)
12. Only after that should you upgrade the second VIOS
Things to think about when Upgrading

- Migrating to VIO 3.1 is an upgrade not an update. You cannot use updateios

- Use viosbr to backup metadata and copy the files to a remote system
- Backup anything outside of rootvg on your VIOS
  - FBO library
  - LVs for filebacked disks to clients
- Backup the VIOS itself or take a clone
- If using SSPs then perform the steps in the README for SSPs
- Perform the upgrade
- Restore the metadata and anything that was outside of rootvg
- Perform post upgrade SSP steps

Upgrade

- Find a spare disk and clean it off
- As root use lspv -Cdisk

```bash
$ lspv
NAME           PVID             VG     STATUS
hdisk0         00f95d3a1b679a90 fbovg  active
hdisk2         00f95d3a42550d49 fbovg  active
hdisk3         00f95d3a0de356cd altinst_rootvg
hdisk1         00f95d3a42550ec9 rootvg  active
```

```bash
$ lspv -size | head
NAME           PVID             SIZE(megabytes)
hdisk0         00f95d3a1b679a90   51200
hdisk2         00f95d3a42550d49   51200
hdisk3         00f95d3a0de356cd  102400
hdisk1         00f95d3a42550ec9  102400
```

- Then as padmin look for free or unused disks

```bash
$ lspv -unused
$lspv -free
```

- Check for mappings

```bash
$ lsmap -all | grep hdisk
```

In the above nothing is mapped and all disks are assigned (none unused or free)
We also have altinst_rootvg which is not allowed
Forgot to clear the disk (VIO viosupgrade)

viosupgradetool.
Operation triggered for given node(s).
Broadcast message from root@vio2 (pts/0) at 15:59:29 ...
WARNING!!! VIOS Upgrade operation is in progress. Kindly Refrain from making any configuration changes...
Please wait for completion..
The provided disk 'hdisk3' is in use.

Go back and make sure lspv –free and lspv –unused show the disk you want to use as available

Get a disk

altinst_rootvg cannot exist so either export and reimport with a new name or delete it
#export vg altinst_rootvg
import vg -y rootvgcopy hdisk3
Or delete it:
export vg altinst_rootvg
Or delete it:
alt_rootvg_op -X altinst_rootvg

AFTER export:
# lspv
hdisk0 009fd3a1b6799900 fbovg active
hdisk2 009fd3a42550d40 fbovg active
hdisk3 009fd3a064556c0 None
hdisk1 009fd3a42550c9 rootvg active

Need to clear the ownership from it
# chpv -C hdisk3

# lspv
hdisk0 009fd3a1b6799900 fbovg active
hdisk2 009fd3a42550d40 fbovg active
hdisk3 009fd3a064556c0 None
hdisk1 009fd3a42550c9 rootvg active

$ lspv -free
NAME  PVID  SIZE(megabytes)
hdisk3 009fd3a064556c0 102400

OK NOW we can use hdisk3 for our upgrade
Images
My base install mksysb file is the mksysb file that I grabbed from the flash image iso file

My filestosave.txt consists of:

/etc/motd
/etc/netsvc.conf
/etc/inetd.conf
/etc/hosts
/etc/environment
/etc/profile
/etc/inetd.conf
/etc/hosts
/etc/resolv.conf
/etc/ntp.conf
/etc/group
/etc/passwd
/etc/security/passwd
/etc/security/limits
/etc/security/login.cfg
/etc/tunables/nextboot
/etc/tunables/rc-tunevio.sh

These will get saved to /home/padmin/backup_files

Backing up VIOS

• The VIO server version of viosupgradewill take an extra viosbr backup for you
• You may also want to use snap to grab other critical data
• Mount NFS filesystem to backup to (in my case /backups)
  • mkdir /backups/viosa
• Unmount /var/vio/VMLibrary if you are using the media library or your mksysb will be huge
• Then as padmin run backupios which automatically calls savevgstruct:
  • backupios -file /backups/viosa
• The above creates a nim_resources.tar package in that directory and it can be used to clone or restore VIO servers by NIM or installios (from HMC)
• You can also back it up as a mksysb file that is easy to restore
  • backupios -file /backups/viosa.mksysb –mksysb
• When the -mksysb flag is used, the NIMOL resources are not saved in the image.
• If the media library is large and is on rootvg, then you can add the –nomedialib flag but still unmount it
Backup

If you have set the system up to automatically do a daily viosbr backup then you don’t need to do it here

Create a daily backup once a day and keep up to 7 in /home/padmin/cfgbackups

su - padmin -c "ioscliviosbr -backup -file viobkup -frequency daily numfiles 7"

I usually do 2 backups
A regular mksysb
A backup that is for NIM

Both are done to an NFS mount

If you are using the file backed optical (media repository) there seems to be a bug where specifying nomedialib does not stop it backing up the media library. Since mine is over 100GB that is a problem so here is what I do

(vio2dir is a directory)

umount /var/vio/VMLibrary

su - padmin -c "iosclibackupios -file /usr/local/backups/vio2-previo31-mar2719.mksysb -mksysb -nomedialib"

su - padmin -c "iosclibackupios -file /usr/local/backups/vio2dir -nomedialib"

My backups are around 19GB but during the backup they can need as much as 32GB – don’t ask me why 😎

Once you are done you can mount /var/vio/VMLibrary

Check the virtual backup

viosbr -backup -file vio2m -frequency daily -numfiles 7
Backup of this node (vio2) successful

$ viosbr -view -list
vio2m.01.tar.gz

$ ls -al /home/padmin/cfgbackups
total 72
  drwxr-xr-x  2 padmin  staff  256 Mar 27 10:55 .
  drwxr-x---  7 padmin  system  4096 Nov 27 12:51 ..
  -rw-r--r--  1 padmin  staff  6960 Mar 27 10:55 vio2m.01.tar.gz
Document VIO Information – save-viostuff.sh

```bash
#!/bin/sh
#

day="`/bin/date +"%d"`"
month="`/bin/date +"%m"`"
year="`/bin/date +"%y"`"
set - Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
shift Smooth
lmonth="$1"
machine=`uname -n`
directory="`/bin/date +"%m%d%Y_%H%M"`"
machine_directory=`printf "%s_%s" $machine $directory`"
mkdir /home/padmin/saveit
cd /home/padmin/saveit
logit="/home/padmin/saveit/$machine"
logit1="/home/padmin/saveit/$machine"

su-padmin-c "ioscliioslevel" >>$logit1.ioslevel.txt
su-padmin-c "iosclilsdev-type disk" >>$logit1.viodisk.txt
su-padmin-c "iosclilsdev-type adapter" >>$logit1.vioadapter.txt
su-padmin-c "iosclilsdev-vpd" >>$logit1.viovpd.txt
su-padmin-c "iosclilsdev-slots" >>$logit1.vioslots.txt
su-padmin-c "iosclilsmap-all" >>$logit1.violsmapall.txt
su-padmin-c "iosclilsmap-all -npiv" >>$logit1.violsmapall.npiv.txt
su-padmin-c "iosclilsdev-virtual" >>$logit1.viovsdev.txt
su-padmin-c "iosclilsdev-virtual" >>$logit1.viovsdev.txt
su-padmin-c "iosclilsdev-virtual" >>$logit1.viovsdev.txt

oslevel-s >$logit1.oslevel.txt
getlvodm-C > $logit1.disktmp.txt

while read label line
do
echo "\n" >>$logit1.viodisks.txt
echo "Hdiskis $label" >>$logit1.viodisks.txt
   "" >>$logit1.viodisks.txt
   su-padmin-c "iosclilsdev-dev$label -attr" >>$logit1.viodisks.txt
done <"$logit1.disktmp.txt"

exit 0
```

Continue upgrade Backup

Back it up:
# ./save-viostuff.sh
mkdir: 0653-358 Cannot create /home/padmin/saveit.
/home/padmin/saveit: Do not specify an existing file.

# Is -l /home/padmin/saveit

total 824
rw-r--r-- 1 root staff 118 Jul 22 12:33 b740vio2.disktmp.txt
rw-r--r-- 1 root staff 24 Jul 22 12:33 b740vio2.ioslevel.txt
rw-r--r-- 1 root staff 16 Jul 22 12:33 b740vio2.oslevel.txt
rw-r--r-- 1 root staff 8038 Jul 22 12:33 b740vio2.vioadapter.txt
rw-r--r-- 1 root staff 4528 Jul 22 12:33 b740vio2.viodisk.txt
rw-r--r-- 1 root staff 59593 Jul 22 12:33 b740vio2.viodisks.txt
rw-r--r-- 1 root staff 8800 Jul 22 12:33 b740vio2.vio devisev.txt
rw-r--r-- 1 root staff 11967 Jul 22 12:33 b740vio2.violsmapall.npiv.txt
rw-r--r-- 1 root staff 19363 Jul 22 12:33 b740vio2.violsmapall.txt
rw-r--r-- 1 root staff 4595 Jul 22 12:33 b740vio2.violslots.txt
rw-r--r-- 1 root staff 227944 Jul 22 12:33 b740vio2.violdisk.txt
rw-r--r-- 1 root staff 0 Jul 22 12:33 entstat.txt
rw-r--r-- 1 root staff 240 Jul 22 12:33 firewall.txt
rw-r--r-- 1 root staff 652 Jul 22 12:33 hostmap.txt
rw-r--r-- 1 root staff 5970 Jul 22 12:33 optimize.txt
rw-r--r-- 1 root staff 713 Jul 22 12:33 routinfo.txt
rw-r--r-- 1 root staff 240 Jul 22 12:33 user.txt
rw-r--r-- 1 root staff 15071 Jul 22 12:33 view.txt
Upgrading VIOS to V3.1

You need to have your VIO at 2.2.6.30 or higher to use the VIO server viosupgradecommand.
If you are using SSPs then you have to be at 2.2.6.32.
I recommend going to 2.2.6.32 regardless and use that as a starting point.

As padmin run "updateios --commit" to ensure any uncommitted updates are committed.
Check to ensure there are no missing filesets prior to updates.
Check repository has nothing loaded.

$ ioslevel
2.2.6.32
$ cat /usr/ios/cli/ios.level
2.2.6.32

$ updateios -commit
All updates have been committed.

$ oem_setup_env
#/usr/sbin/emgr -P
There is no efix data on this system.
If there are any ifxes remove them.

Now run checks.

Upgrade – get the code

- You should already have downloaded the flash image for 3.1.0.10 from ESS (entitled software).
- It came down as H52175995.iso
- Open it on your windows desktop and extract the mksysb image.
- Upload the mksysb image as binary to your VIO or NIM server.
- I put it in /usr/local/soft/

- Normally I copy the files locally to the VIO in case I lose the network during the install.
What does the VIO viosupgrade command do?

It does the config backup for you
It builds vios 3.1 on the new disk
It migrates the config
It sets the bootlist
It will then reboot – you have 60 seconds to stop it

viosupgrade -l -i /usr/local/soft/vios31-flash-mksysb_image -a hdisk3 -g /home/padmin/filestosave.txt

Below is the syntax
viosupgrade -l -q
-Flags:
- l Specifies local Node Installation.
- i Specifies image file for the alternate disk installation.
- a Specifies alternate disk to install the provided image.
- c Specify if the node is part of the cluster.
- g Specifies the filename having the list of files to be copied to newly installed rootvg.
- q Queries the status of VIOS restore operation after booting
  the VIOS with newly installed image.

Upgrade 1

Now on the VIO:
updateios –commit

My first attempt at the upgrade:
viosupgrade -l -i/usr/local/soft/nim_powervm31_basemksysb -a hdisk3 -g /home/padmin/filestosave.txt

Welcome to viosupgrade tool.
Operation triggered for given node(s).
Broadcast message from root@vio2 (pts/0) at 16:04:34 ...
WARNING!!! VIOS Upgrade operation is in progress. Kindly Refrain from making any configuration changes...
Please wait for completion..
Initiating VIOS configuration backup.
VIOS configuration backup successful.
Initiating installation on alternate disk(s).
Installation on alternate disk(s) failed.

I checked the log at: /var/adm/ras/ioslogs/viosupg_global.log

Restoring mksysb image to alternate disk(s).
restore: 0511-110 There is an unpacking error.
restore: 0511-708 There is an internal unpacking error: decode failure
restore: 0511-108 There was an error during the unpacking of ./opt/IBM/ldap/V6.4/lib64/libibmldapn.a

Turns out I had messed up my mksysb image (initially I concatenated the 3 images on the 3.1.0 DVDs)
This is when I went and got the single image from the Flash ISO
Upgrade 2

Welcome to viosupgrade tool.
Operation triggered for given node(s).

Broadcast message from root@vio2 (pts/0) at 13:46:39 ...
WARNING!!! VIOS Upgrade operation is in progress. Kindly refrain from making any configuration changes...
Please wait for completion...

viosupgrade -l -i /usr/local/soft/vios31-flash-mksysb_image -a hdisk3 -g /home/padmin/filestosave.txt

Welcome to viosupgrade tool.
Operation triggered for given node(s).

Broadcast message from root@vio2 (pts/0) at 13:46:39 ...
WARNING!!! VIOS Upgrade operation is in progress. Kindly refrain from making any configuration changes...
Please wait for completion..

Initiating VIOS configuration backup.
VIOS configuration backup successful.
Initiating installation on alternate disk(s).
Installation on alternate disk(s) successful.

Copying files to altinst_rootvg.
Waking up altinst_rootvg successful.

Initiating VIOS configuration backup.
VIOS configuration backup successful.
Initiating installation on alternate disk(s).
Installation on alternate disk(s) successful.

Copying files to altinst_rootvg.
Waking up altinst_rootvg successful.

[lists of files unmounted and LV control blocks fixed]

VIOS will be rebooted after '60' seconds to boot from the newly installed disk.

Press contrl+c to terminate.

VIOS metadata restore (viosbr -restore) will be automatically resumed after the reboot.
VIOS may be rebooted once during this restore process. Kindly refrain from making any changes to the VIOS virtual configurations during the restore process.
You can verify the restore status using 'viosupgrade -l -q' command and resume your operation after the completion of the restore process.

I hit ctrl -c to stop the reboot

Check status

$ viosupgrade -l -q
Welcome to viosupgrade tool.
Getting status of node(s):

viosupgrade is in progress

Please see the viosupgrade status: 

Thu Mar 28 13:51:14 2019|TRIGGERED

Please see the viosbr restore status: 

$ viosbr -view -list
vio2_13303902.tar.gz
vio2_13959382.tar.gz
vio2m.01.tar.gz
vio2m.02.tar.gz

$ ls -alt cfgbackups
total 120
drwxr-x--- 7 padmin system 4096 Mar 28 13:50..
-rw-r--r-- 1 padmin staff 6925 Mar 28 13:50 vio2m.02.tar.gz
-rw-r--r-- 1 padmin staff 6922 Mar 27 16:05 vio2m.01.tar.gz

this is the image created by the upgrade I just did
Hold off on reboot

I was not ready to boot the upgrade until my maintenance window when I planned to completely redo the upgrade, so I did the following:

```
# bootlist -m normal -o
hdisk3 blv=hd5 pathid=0
hdisk3 blv=hd5 pathid=1
hdisk3 blv=hd5 pathid=2
hdisk3 blv=hd5 pathid=3
```

Set it back to the current disk:

```
# lspv
hdisk0           00f95d3a1b679a90                   fbovg active
hdisk2           00f95d3a42550d49                   fbovg active
hdisk3           00f95d3a0de366cd                    altinst_rootvg
hdisk1           00f95d3a42550e99                    rootvg active
```

```
# bootlist -m normal hdisk1
# bootlist -m normal -o
hdisk1 blv=hd5 pathid=0
hdisk1 blv=hd5 pathid=1
hdisk1 blv=hd5 pathid=2
hdisk1 blv=hd5 pathid=3
```

After reboot

I reran the process during my maintenance window to make sure I was up to date

A broadcast message is sent out

WARNING!!! VIOS Upgrade operation is in progress.
Kindly Refrain from making any configuration changes...

Then it reboots from the alternate disk

After the reboot it will require you to change your password (remember this is an overwrite install even if you upgrade)

Then you have to accept the license:

```
Indicate by selecting the appropriate response below whether you
accept or decline the software maintenance terms and conditions.
Accept (a) | Decline (d) | View Terms (v) > a
```

Now run the viosupgrade --l --q to check what happened

You should see started, triggered, restore, restore and then completed and it then shows the viosbr restore status
It shows the restore that happened and provides information on devices it could not restore

Now run all your post upgrade checks
Post Upgrade or install (after reboot)

• Fix page spaces if you have not already done so
• Update Java7 to 7.0.0.640 or the latest
• Install ssl-1.0.2.1601 or higher
• Install ssh 7.5.102.1600 or higher
• If you have Java6 then update it to 6.0.0.655 or the latest
• You get the Java updates from Fix Central
  • Run lspp –l | grep ava to find out what you have installed
• SSH and SSL are obtained from the Web Download Pack which has moved to:

POST Install Checks

$ ioslevel
3.1.0.10

$ oem_setup_env

# oslevel -s
Should show: 7200-03-02-1846
7200-03-02-1846

# instfix -i | grep ML
All filesets for 7.2.0.0_AIX_ML were found.
All filesets for 7200-00_AIX_ML were found.
All filesets for 7200-01_AIX_ML were found.
All filesets for 7200-02_AIX_ML were found.
All filesets for 7200-03_AIX_ML were found.

# lppchk -v
# lppchk -vm3
# oslevel -s -l 7200-03-02-1846
# errpt | more – check there are no errors

You should run flrtvc and will probably have to upgrade your openssl, openssh and Java to resolve security issues

Once all checks are passed and VIO2 is back up check your client LPARs that they see all their paths again
Then go do the same upgrade to VIO1
Log Files

On VIOS after viosupgrade command from VIOS
• viosupgrade command logs:  /var/adm/ras/ioslogs/*
  Look at the viosupg_global.log
• viosupgrade restore logs: /home/ios/logs/viosupg_restore.log
• viosupgrade restore logs: /home/ios/logs/viosupg_status.log
• viosbr backup logs: /home/ios/logs/backup_trace*
• viosbr restore logs: /home/ios/logs/restore_trace*

Updating - VIOS Problems

oem_setup_env
oslevel -s
6100-00-00-0000
or 7100-00-00-0000
instfix -i | grep ML
  All filesets for 6100-07_AIX_ML were found.
  All filesets for 6.1.0.0_AIX_ML were found.
  Not all filesets for 6100-08_AIX_ML were found.
This means there are missing filesets

Using vios 2.2.6 examples as so far no problems with 3.1 upgrade but this will give you the idea

# oslevel -sq
Known Service Packs

Top one should be: 6100-09-11-1810

# oslevel -s /6100-09-11-1810
Fileset Actual Level Service Pack Level
------------------- --------------- ---------------
bos.alt_disk_install.boot_images 6.1.8.0 6.1.8.15
bos.loc.utf.ES_ES 6.1.7.15 6.1.8.15
DirectorCommonAgent 6.3.3.1 6.3.5.0
DirectorPlatformsAgent 6.3.3.1 6.3.5.0
adde.v2.common.ddk 6.1.9.0 6.1.9.100
adde.v2.ethernet.ddk 6.1.9.15 6.1.9.300
adde.v2.rdma.ddk 6.1.9.100 6.1.9.300

These filesets should be corrected prior to updating
Either use updateiost to update them or to remove them
Remove or update problem filesets

DO NOT USE SMITTY – use updateios

Issues with bos.suma
updateios –remove bos.suma

# oslevel -s –l 6100-09-11-1810
Fileset Actual Level Service Pack Level
---------------------------------------
bos.alt_disk_install.boot_images 6.1.8.0 6.1.8.15
bos.loc.utf.ES_ES 6.1.7.15 6.1.8.15
updateios –remove bos.loc.utf.ES_ES

Upgrade alt disk
Copy images to be updated into a directory (/usr/local/soft/missing)
Run inutoc .

updateios –commit
Updateios -accept -install -dev /usr/local/soft/missing

Also remove efixes prior to updates:
/usr/sbin/emgr –P lists them

To remove:
# /usr/sbin/emgr -r -L <EFIX label>
emgr -r -i IV46869m3a

Notes on latest ISO download and SPs

• Latest ISO download is for VIOS 3.1.0
• Flash image ISO is VIOS 3.1.0.10

• Don’t forget to clean up inetd.conf and other files and then remirror rootvg once you are committed
Efifixes and ifixes

Many security patches are put on using efifixes or ifixes.
The VIO server also needs these to be applied—use FLRTVC to determine what fixes are needed.

If you run emgr –l and there are no fixes listed then you most likely have security holes that need patching, specifically Java, openssh and openssl. Use FLRTVC to determine if there are any patches you need.

You should see something like:

emgr -l shows:
1  S  102m_ifix 04/11/18 22:44:25 IFIX for Openssl CVE on 1.0.2m
2  S  I02915s9a 04/11/18 22:45:46 I02915 for AIX 6.1 TL9 SP09

It will vary by O/S level and SP. This was for 2.2.6.21

You can find out what fixes you need by downloading and running FLRTVC
You should do this on AIX LPARs too

/usr/sbin/emgr –l lists them
To apply a fix change into the directory it is in and then:
emgr -p -e 102m_ifix_180105.epkg.Z
Remove the –p and run again if it is successful

To remove:
# /usr/sbin/emgr -r -L <EFIX label>
emgr -r -L IV46869m3a

Thank you for your time

If you have questions please email me at: jaqui@circle4.com or jlynch@flagshipsg.com

Also check out:
http://www.circle4.com/movies/

And the Virtual User Group
USEFUL COMMANDS

Useful Commands

Command History
$ fc -l
 725  lsrep
 726  backupios -file /usr/local/backups/b750viobkp
 727  exit
 728  lsmap -vadapter vhost0
 729  fc –l

Global command log
$ lsgcl | grep "Aug 9 2013"
Aug 9 2013, 08:25:35 root  ioslevel
Aug 9 2013, 08:59:22 padmin  license
Aug 9 2013, 09:00:29 padmin  lsmap -vadapter vhost0
Aug 9 2013, 09:01:29 padmin  lsgcl

Redirecting output when running as padmin
lsmap –all –npiv | tee npivdata.txt
Useful Commands

**vSCSI Commands**
mkvdev -vdev hdisk2 -vadapter vhost0
mkvdev -fbo -vadapter vhost0

**NPIV**
Setup NPIV mappings
vfcmap -vadapter vfchost0 -fcpf fcs0
lsmap -npiv -all
lsmap -vadapter vfchost0 -npiv
lsdev -virtual
lsnports
lsdev -slots
lscfg -vpl vfchost0

$ lsdev -virtual

<table>
<thead>
<tr>
<th>name</th>
<th>status</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ent5</td>
<td>Available</td>
<td>Virtual I/O Ethernet Adapter (I-lan)</td>
</tr>
<tr>
<td>ent6</td>
<td>Available</td>
<td>Virtual I/O Ethernet Adapter (I-lan)</td>
</tr>
<tr>
<td>ent7</td>
<td>Available</td>
<td>Virtual I/O Ethernet Adapter (I-lan)</td>
</tr>
<tr>
<td>vasi0</td>
<td>Available</td>
<td>Virtual Asynchronous Services Interface (VASI)</td>
</tr>
<tr>
<td>vbsd0</td>
<td>Available</td>
<td>Virtual Block Storage Device (VBSD)</td>
</tr>
<tr>
<td>vfchost0</td>
<td>Available</td>
<td>Virtual FC Server Adapter</td>
</tr>
<tr>
<td>vfchost1</td>
<td>Available</td>
<td>Virtual FC Server Adapter</td>
</tr>
<tr>
<td>vhost0</td>
<td>Available</td>
<td>Virtual SCSI Server Adapter</td>
</tr>
<tr>
<td>vhost1</td>
<td>Available</td>
<td>Virtual SCSI Server Adapter</td>
</tr>
<tr>
<td>vsa0</td>
<td>Available</td>
<td>LPAR Virtual Serial Adapter</td>
</tr>
<tr>
<td>b740ios1_rv1</td>
<td>Available</td>
<td>Virtual Target Device - Logical Volume</td>
</tr>
<tr>
<td>b740i1_rv1</td>
<td>Available</td>
<td>Virtual Target Device - Logical Volume</td>
</tr>
<tr>
<td>vtop0</td>
<td>Available</td>
<td>Virtual Target Device - File-backed Optical</td>
</tr>
<tr>
<td>vtop1</td>
<td>Available</td>
<td>Virtual Target Device - File-backed Optical</td>
</tr>
<tr>
<td>vtscsi0</td>
<td>Available</td>
<td>Virtual Target Device - Disk</td>
</tr>
<tr>
<td>vtscsi1</td>
<td>Available</td>
<td>Virtual Target Device - Disk</td>
</tr>
<tr>
<td>vtscsi2</td>
<td>Available</td>
<td>Virtual Target Device - Disk</td>
</tr>
<tr>
<td>vtscsi3</td>
<td>Available</td>
<td>Virtual Target Device - Disk</td>
</tr>
<tr>
<td>ent8</td>
<td>Available</td>
<td>Shared Ethernet Adapter</td>
</tr>
</tbody>
</table>
Useful Commands

$ lsmap -vadapter vhost0

<table>
<thead>
<tr>
<th>SVSA</th>
<th>Physloc</th>
<th>Client Partition ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>vhost0</td>
<td>U8205.E6B.1093XXX-V1-C21</td>
<td>0x00000003</td>
</tr>
</tbody>
</table>

VTD: b7401_rv1
Status: Available
LUN: 0x8300000000000000
Backing device: lv_b7401
Mirrored: N/A

VTD: vtop0
Status: Available
LUN: 0x8200000000000000
Backing device: lv_b7401
Physloc: N/A

VTD: vtop1
Status: Available
LUN: 0x8100000000000000
Backing device: lv_b7401
Physloc: N/A

Useful Commands

$ lsmap -vadapter vfchost0 -npiv

<table>
<thead>
<tr>
<th>Name</th>
<th>Physloc</th>
<th>ClntID</th>
<th>ClntName</th>
<th>ClntOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>vfchost0</td>
<td>U8205.E6B.1093XXX-V1-C31</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Status: NOT_LOGGED_IN
FC name: fcs0
FC loc code: U78AA.001.WZSG8XX-P1-C5-T1
Ports logged in: 0
Flags: 4 NOT_LOGGED
VFC client name: VFC client DRC:

$ lsmap -vadapter vfchost4 -npiv

<table>
<thead>
<tr>
<th>Name</th>
<th>Physloc</th>
<th>ClntID</th>
<th>ClntName</th>
<th>ClntOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>vfchost4</td>
<td>U8205.E6B.1093XXX-V1-C36</td>
<td>8 b740nl1</td>
<td>AIX</td>
<td></td>
</tr>
</tbody>
</table>

Status: LOGGED_IN
FC name: fcs0
FC loc code: U78AA.001.WZSG8XX-P1-C5-T1
Ports logged in: 3
Flags: a LOGGED_IN, STRIP_MERGE
VFC client name: fcs0
VFC client DRC: U8205.E6B.1093XXX-V8-C36
Useful Commands

$ lsnports
name   physloc fabric tports aports swwpns awwpns
fcs0    U78AA.001.WZSG8XX-P1-C5-T1 1 64 63 2048 2041

$ lsdev-slots
# Slot          Description    Device(s)
HEA 1 Logical I/O Slot lhea0 ent0
U8205.E6B.1093XX-V1-C0 Virtual I/O Slot vsa0
U8205.E6B.1093XX-V1-C11 Virtual I/O Slot ent5
U8205.E6B.1093XX-V1-C12 Virtual I/O Slot ent6
U8205.E6B.1093XX-V1-C13 Virtual I/O Slot ent7
U8205.E6B.1093XX-V1-C21 Virtual I/O Slot vhost0
U8205.E6B.1093XX-V1-C22 Virtual I/O Slot vhost1
U8205.E6B.1093XX-V1-C23 Virtual I/O Slot vhost2
U8205.E6B.1093XX-V1-C31 Virtual I/O Slot vfchost0
U8205.E6B.1093XX-V1-C32 Virtual I/O Slot vfchost1
U8205.E6B.1093XX-V1-C33 Virtual I/O Slot vfchost2
U8205.E6B.1093XX-V1-C32769 Virtual I/O Slot vasi0
U8205.E6B.1093XX-V1-C32773 Virtual I/O Slot vasi1
U8205.E6B.1093XX-V1-C32774 Virtual I/O Slot vasi2
U8205.E6B.1093XX-V1-C32775 Virtual I/O Slot vasi3
U8205.E6B.1093XX-V1-C32776 Virtual I/O Slot vasi4
Documentation on VIOS 3.1 upgrades

• What’s new in Virtual I/O Server commands

• Virtual I/O Server release notes – include USB Memory/Flash key install
    • USB Memory/Flash key install
    • Duff minimum size for a VIOS

• VIOS viosupgrade command in VIOS 2.2.6.30

• NIM viosupgrade command on the NIM AIX 7.2 TL3 + sp
    • This one is buried in the AIX commands reference for AIX Commands of AIX 7.2

Useful Links

• Jaqui Lynch Articles
  • http://www.circle4.com/jaqui/eserver.html

• Nigel Griffiths AIXpert Blog

• Nigel Griffiths Twitter – mr_nmon
  • https://twitter.com/mr_nmon

• Gareth Coates Twitter – power_gaz
  • https://twitter.com/power_gaz

• Jaqui’s Movie Replays
  • http://www.circle4.com/movies

• IBM US Virtual User Group
  • http://www.tinyurl.com/ibmaixvug

• Power Systems UK User Group
  • http://tinyurl.com/PowerSystemsTechnicalWebinars
Useful Links

- HMC Scanner

- Performance Tools Wiki
  - AIX Performance Tools and Commands
  - Performance Monitoring Tips and Techniques

- Other Performance Tools
  - Includes new advisories for Java, VIOS, Virtualization
  - VIOS Advisor
    - [https://www.ibm.com/support/knowledgecenter/STI0002C/p8hcg/p8hcg_part.htm](https://www.ibm.com/support/knowledgecenter/STI0002C/p8hcg/p8hcg_part.htm)

References

- Technical Introduction and Overview Redbooks
  - Got to [http://www.redbooks.com](http://www.redbooks.com) and search for the above redbook for your server
  - As an example the E980 Redbook is:
- Processor Utilization in AIX by Saravanan Devendran
- SG24-7940 - PowerVM Virtualization - Introduction and Configuration
- SG24-7590 – PowerVM Virtualization – Managing and Monitoring
- SG24-8171 – Power Systems Performance Optimization including POWER8
Backup Slides