

[close window](#)

Web Exclusive

Print 

A Closer Look at the IBM PowerVM 3.1 Update

December 2018 | by [Jaqui Lynch](#)

IBM's PowerVM virtualization software has been at the AIX 6.1 level for many years. On November 9, 2018, IBM made PowerVM 3.1 available and this level has a base of AIX 7.2 TL3. PowerVM 3.1 is a major update that includes an updated hypervisor, a new VIO server version and a new NovaLink agent. It includes significant improvements in performance, resilience, security and I/O.

Supported Levels

It should be noted that if you are running PowerVM 2.2.4 or earlier then your VIO servers are out of support. 2.2.5 is supported for most of 2019 and 2.2.6 is supported until at least 2021. 2.2.6 is withdrawn from marketing as of September 30, 2020. The latest level prior to v3.1 is 2.2.6.32.

What are the Enhancements?

VIOS 3.1 adds support for iSCSI (network storage) virtualization for AIX and Linux workloads, storage multi-pathing and USB flash drive installation. It also provides native compatibility mode for POWER8 and POWER9. LPM is updated to use the POWER9 on-chip compression/encryption functionality to encrypt and compress LPARs during LPM operations. This can significantly improve LPM performance on POWER9. The iSCSI supports allows iSCSI disks to be exported to client LPARs as vSCSI disks. This is supported on v3.1 of the VIO and requires FW 860.20 or later (POWER8 and POWER9). However, booting from an iSCSI disk and using SSP on iSCSI devices are still not supported. iSCSI client LPARs can run either AIX or Linux.

There are many other changes within v3.1, but one important change is that this level no longer supports IVM (integrated virtualization manager).

Getting the Code

The base code is downloaded from the IBM entitled software site. When you go to download it from your entitled software you will see it listed as 5765-VE3 PowerVM Enterprise ED V3 or 5765-VS3 PowerVM Standard Edition or 5765-VL3 PowerVM Linux Edition. Technology levels and service packs are downloaded from Fix Central as per normal and, as of November 15, 2018, there is a service pack for 3.1.0.10 available.

Prerequisites

The absolute minimum requirement for memory is 4GB with 30GB of disk space for rootvg. I highly recommend additional memory and disk space—I normally provide at least 8GB of memory (if no SSPs) and 16GB (if using SSPs) and 100GB of disk space, plus extra disk space if I plan to use FBO (file backed optical).

V3.1 is supported on POWER7+, POWER8 and POWER9. For the POWER7+ servers this means the D model servers and some of the Flex nodes. It does not include the BladeCenter blades.

If you plan to use NIM to maintain your VIO servers then your NIM server will need to be at AIX 7.2 TL3 or higher. Right now, the latest AIX is 7.2 TL3 SP2 and this is the minimum level required for NIM if you are running VIO v2.2.6.32 or v3.1.0.10.

Finally, if you use LVs (logical volumes) in your VIO server to provide rootvg volumes to client LPARs these are not backed up by viosbr and they are not copied over by VIOS viosupgrade. There are steps that you need to take to preserve those LVs. In those cases, I would recommend using an alternate disk for the install.

Alternate Disk

If you plan to use an alternate disk (highly recommended) for your install then you'll need to have an extra disk in the VIO server that you can perform the install against. That disk needs to be available and not assigned to any other volume group. You also need to ensure you do not have a volume group named `altinst_rootvg` already. When the viosupgrade is run it will try to create that volume group. If you do have a disk with that name and you need to keep it then you should rename it by using `exportvg` to export it and then `importvg` to import it with a different volume group name.

Installing the Code

A fresh install can be done in multiple ways. You can burn the code to DVD (if you have a DVD drive on your server). There are two DVDs that you will need to load. You can also install from USB or you can upload the code to the HMC and install from there over the network. To install from a USB stick you will need to download the image from the entitled system support website that has the word FLASH in its name. This is a single volume image designed specifically for Flash drives. The flash drive must have at least 16GB free. The v3.1.0 readme has instructions for writing the image out to the USB drive. If you plan to use NIM there are three `mksysb` images across the two base 3.1.0 DVDs that will need to be concatenated together into one large `mksysb` image which will become the NIM resource.

Once the installation method has been chosen the LPAR gets booted into SMS mode and is installed the same way you would normally install a VIO server.

Upgrading from v2.2

Typically upgrades have taken place using the `updateios` command. However, `updateios` only supports upgrades for technology levels and service packs and other patches. In order to upgrade to v3.1 it is necessary to use the `viosupgrade` tool. I highly recommend upgrading your VIO servers to 2.2.6.31 prior to upgrading to v3.1. That will allow you to use `viosupgrade` with alternate disk install and that means significantly less risk. Keep in mind that this is a version upgrade so it will create a clean rootvg. It's highly

recommended that full backups are taken prior to the update including using `viosbr` to backup meta-data. I would also save any non-VIO server application data to a remote location. The metadata should be backed up using `viosbr` and those files should be copied to a remote location. An automatic backup can be set up to keep the last 7 copies by using:

```
viosbr -backup -file vioservername -frequency daily -numfiles 7
```

Using NIM

VIO servers from v2.2.x.x can be upgraded to v3.1 using the `viosupgrade` command on the NIM master. The `viosupgrade` command becomes available at AIX 7.2 TL3 SP1 on the NIM server. On the VIO server it becomes available at VIO 2.2.6.30. This allows you to do a `bosinst` install from NIM to upgrade the VIO server or you can use the `altdisk` option so that the upgrade goes to an alternate disk on the VIO server. An example of this would be:

```
viosupgrade -t altdisk -n vios1 -m vios_3.1.0.0 -p vios_3.1.0.0_spot -a hdisk1
```

The above tells the system to do an alternate disk upgrade of `vios1` to `hdisk1` and to update it to v3.1.0. You can then reboot the `vio` from `hdisk1` when you are ready to try the upgrade. You can monitor the upgrade using:

```
viosupgrade -q vios1
```

You can get help on the command using: `viosupgrade -h`

`viosupgrade` with `bosinst` from the NIM server is supported for upgrading VIO servers that are at 2.2.4.x or higher. The `-t altdisk` option is not available until you are at 2.2.6.30 on the VIO servers.

Without NIM

If the VIOS is at 2.2.6.30 or higher then the `viosupgrade` command can be used directly on the VIO server. Follow the instructions to create a `mksysb` image from the 3.1 DVDs, then use `viosupgrade` to do an alternate disk install to a different disk (in this case `hdisk1`):

```
viosupgrade -l -l vios31.mksysb -a hdisk1
```

If you are using SSPs (shared storage pools) be sure to follow the instructions that are specific to the SSPs. And in all cases don't forget to run `viosbr` to back up the virtual information and take a `mksysb`. Copy the `viosbr` output file to a remote location just in case.

There are two different `viosupgrade` commands—the one on the NIM server has a different syntax to the one on the VIO server.

Post v3.1.0 Install

Once v3.1.0 base is installed you should then apply the service pack 3.1.0.10. The service pack requires that the LPAR is at 3.1.0 prior to the update being applied. The update is applied using the `updateios` command.

Summary

PowerVM v3.1 is the long awaited version of the VIO server that is based on AIX 7.2. The best and cleanest method to upgrade is to do a fresh install after migrating all LPARs off the server. However, if this isn't an option then you should upgrade your VIO servers to 2.2.6.32 and your NIM LPAR to 7.2 tl3 sp2 so that you can take advantage of the `viosupgrade` command to an alternate disk (with or without NIM). If you are like me and you prefer to wait till there are a couple of service packs out, then upgrading to these levels leaves you positioned for the v3.1 upgrade when the service packs come out. I would also highly recommend that you download the presentation given by Nigel Griffiths on November 21 to the UK PowerVM user group and check the updates on his AIXpert blog. Lastly, make sure to read the readme

documents for the v3.1.0 base and the v3.1.0.10 service pack. Careful preparation and lots of backups should make this a very smooth installation and/or upgrade. Finally, you should check with FLRT (the fix level reporting tool) to make sure the specific combination of HMC, server, vios and client LPARs is a supported configuration.

References

For more information on PowerVM 3.1, check out the following reading materials:

IBM Powervm 3.1 Announcement

https://www-01.ibm.com/common/ssi/rep_ca/6/897/ENUS218-346/ENUS218-346.PDF

PowerVM 3.1.0 Base Readme

https://www.ibm.com/support/knowledgecenter/POWER9/p9eeo/p9eeo_ipeeo_main.htm

PowerVM 3.1.0.10 Service Pack readme

<https://www-01.ibm.com/support/docview.wss?uid=ibm10738523>

Fix Central

<https://www-945.ibm.com/support/fixcentral/>

Entitled Software

<https://www.ibm.com/servers/eserver/ess/index.wss>

Upgrading the VIO server (non-SSP)

https://www.ibm.com/support/knowledgecenter/POWER9/p9hb1/p9hb1_vios_migrate_nonssp_cluster.htm

VIOSUPGRADE command

https://www.ibm.com/support/knowledgecenter/POWER9/p9hb1/p9hb1_vios_migrate_viosupgrade.htm?view=embed

AIXPERT Blog

https://www.ibm.com/developerworks/community/blogs/aixpert?lang=en_us

PowerVM UK User Group – Nigel Griffiths Presentation on Upgrading to VIOS 3.1 in action

http://public.dhe.ibm.com/systems/power/community/aix/PowerVM_webinars/80_Upgrading_to_VIOS31_in_Action.pdf

http://public.dhe.ibm.com/systems/power/community/aix/PowerVM_webinars/80_Upgrading_to_VIOS31_in_Action.mp4

FLRT (Fix level reporting tool)

<http://www14.software.ibm.com/webapp/set2/flrt/home>

IBM Systems Magazine is a trademark of International Business Machines Corporation. The editorial content of IBM Systems Magazine is placed on this website by MSP TechMedia under license from International Business Machines Corporation.

©2019 MSP Communications, Inc. All rights reserved.