

# How to Maintain a Virtual I/O Server With FBO

October 2013 | by [Jaqui Lynch](#)

*Editor's Note: This is the second of a two-part series on Virtual I/O Server (VIOS) care and feeding.*

Part one discussed how to perform backups of the VIOS and update it. This installment offers a few tips and tricks that can help maintain a VIOS, including how to take advantage of file backed optical (FBO).

## Useful Commands and Tips

In production, a best practice is to run dual VIO servers. This allows for maximum redundancy for networking and storage while still having the flexibility to perform upgrades without an outage. Dual VIO servers allow the use of Link Aggregation Control Protocol (LACP) or other aggregation on the shared Ethernet adapter (SEA) without network interface backup (NIB). As long as each VIOS is connected to a separate network switch, full redundancy is provided with SEA failover. And the full bandwidth of the network adapters on the primary VIOS is now available for use.

SEA failover performance can be improved by setting portfast trunk on the switch ports and by activating dead gateway detection with a ping time of two seconds. (To learn more, see the PowerVM User Group session 5 on PowerVM Best Practices.)

SEA failover performance can be improved by setting portfast trunk on the switch ports and by activating dead gateway detection with a ping time of two seconds. (To learn more, see the PowerVM User Group session 5 on PowerVM Best Practices.)

When configuring the fibre channel (FC) adapters, `num_cmd_elems` and `max_xfer_size` might have to be tuned for each. For N-Port ID Virtualization (NPIV), the VIOS must be set to at least as high a value as any client LPARs. Keep in mind that the `padmin` account is able to gain root privileges, so ensure that the password is well protected. With root privileges the user has access to anything root can see. There's no need to become root to run the `topas` utility—simply type in `topas_nmon -f` or `topas_nmon -?` (the `-?` provides a list of options).

If asked to gather data for IBM, it will be necessary to set a debug mode to gather the data. The steps involved in capturing debug output from `padmin` for IBM are described here.

As `padmin`, it's possible to get a command history (using the `fc -l` command) as well as the contents of the global command log (`lsgcl`) so the actions taken can be reviewed.

```
$ fc -l
725     lsrep
726     backupios -file /usr/local/backups/b750viobkp
727     exit
728     lsmap -vadaptor vhost0
729     fc -l
```

```
$ lsgcl | grep "Aug  9 2013"
Aug  9 2013, 08:25:35 root      ioslevel
```

```
Aug 9 2013, 08:59:22 padmin license -swma
Aug 9 2013, 09:00:29 padmin lsmmap -vadapter vhost0
Aug 9 2013, 09:01:29 padmin lsgcl
```

For advice on a VIOS configuration, consider running the VIOS Advisor, which is now part of the latest VIOS but can also be downloaded [here](#).

Finally, there's an undocumented way to redirect output when running commands on a VIOS as padmin. The trick is to use tee:

```
lsmmap -all -npiv | tee npivdata.txt
```

## FBO

FBO is a great way to provide DVD access to LPARs without having to move the CD around. My VIOS normally boots from internal disk with two disks mirrored to each other in rootvg. I add a third disk and put it into its own volume group (VG), which I use as a repository. Whenever I get DVDs with software, I rip them to an ISO image that is then uploaded to the repository. Additionally, a mksysb image can be loaded and an LPAR can be booted from it.

So using hdisk2 as my third disk I create a VG:

```
mkvg -y datavg hdisk2
mkrep -sp datavg -size 10G
```

This can be increased later and creates:

```
/dev/VMLibrary 10.00 5.85 42% 7 1% /var/vio/VMLibrary
```

We can now load images into the repository from an ISO we have on NFS:

```
mkvopt -name rhelboot64 -file /usr/local/nfsmnt/rhel-64bit-basedvd.iso
```

This takes the ISO and copies it as follows:

```
$ ls -l /var/vio/VMLibrary
-rw----- 1 root staff 237981696 Jul 25 13:14 rhelboot64
```

To list the repository:

```
$ lsrep
Size(mb) Free(mb) Parent Pool Parent Size Parent Free
10199 5989 datavg 279552 157696
Name File Size Optical Access
rhelboot64 227 None rw
```

In order to use the repository, the virtual host has to be assigned a virtual SCSI FBO adapter; do so with:

```
mkvdev -fbo -vadapter vhost0
vtopt0 available
```

Multiple vtopt devices for a client can be created, if desired:

```
loadopt -vtd vtopt0 -disk rhelboot64
```

This example would mount rhelboot64 as if it were a local CD. To unmount it, use:

```
unloadopt -vtd vtopt0
```

Also, rmvopt removes an image; rmrep removes a repository; and lsvopt lists the state of the vtopts:

```
$ lsvopt
VTD           Media           Size(mb)
vtopt0       No Media           n/a
```

## Consistency and Discipline

Maintaining a VIOS isn't a difficult job. It just requires some consistency and a disciplined approach. The use of dual VIO servers makes maintenance far simpler because it allows for updating one VIOS at a time without taking an outage. A well-maintained VIOS will make a huge difference to the stability and success of the virtualized environment it supports. These tips should help ensure the VIOS is well maintained.

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.