



Configuring and Using File-Backed Virtual SCSI Devices

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Agenda

- Describe and configure new file-backed virtual devices
- Answer questions as time permits
 - email me with any questions
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Configuring Virtual Storage

- 3 parts:
 1. Create virtual SCSI adapters in partitions from the HMC
 2. Assign physical adapters to the VIO server
 3. Create virtual target devices from the VIO server to associate physical storage with virtual SCSI adapters

Virtual SCSI Adapters Configuration

- Define virtual SCSI server in VIO Server partition and client adapter in AIX or Linux partition

Virtual SCSI Adapter Properties: VIOS

Virtual SCSI adapter Adapter : 12

Type of adapter : server

This adapter is required for partition activation.

Any client partition can connect

Only selected client partition can connect

Client partition : lpar1(3)

Client adapter ID : 3

OK Cancel Help

Virtual SCSI Adapter Properties: lpar1

Virtual SCSI adapter Adapter : 12

Type of adapter : Client

This adapter is required for partition activation.

Server partition : VIOS(2) [System VIOS Info...](#)

Server adapter : 12

OK Cancel Help

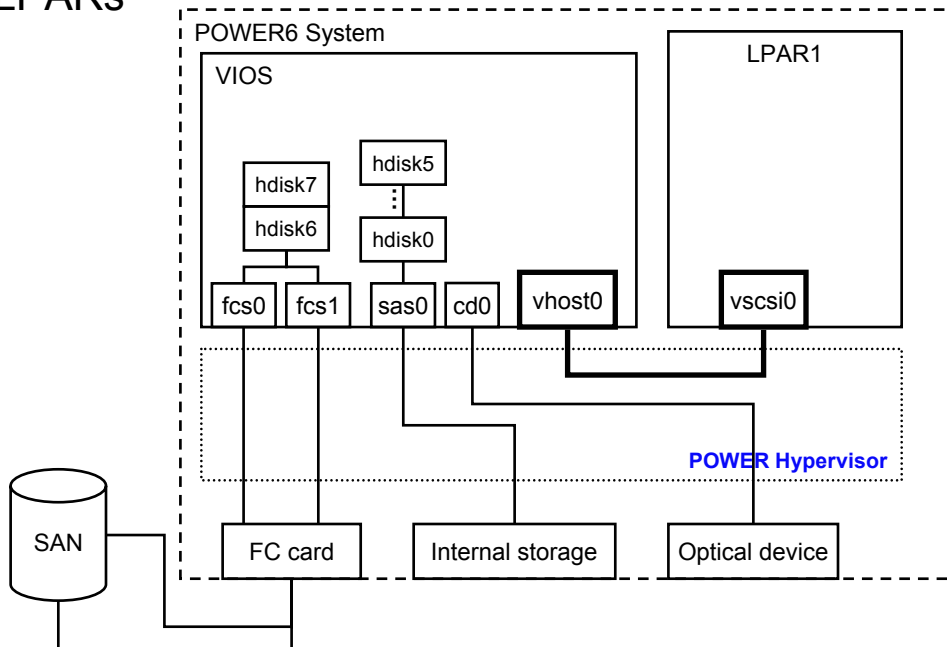
- Check availability of virtual SCSI server adapters on VIO Server:

```
$ lsdev -virtual
```

name	status	description
vasi0	Available	Virtual Asynchronous Services Interface (VASI)
vhost0	Available	Virtual SCSI Server Adapter
vsa0	Available	LPAR Virtual Serial Adapter

Create vSCSI Adapters Demonstration

- Create virtual SCSI adapters on the VIOS and AIX LPARs



File-Backed Virtual Devices

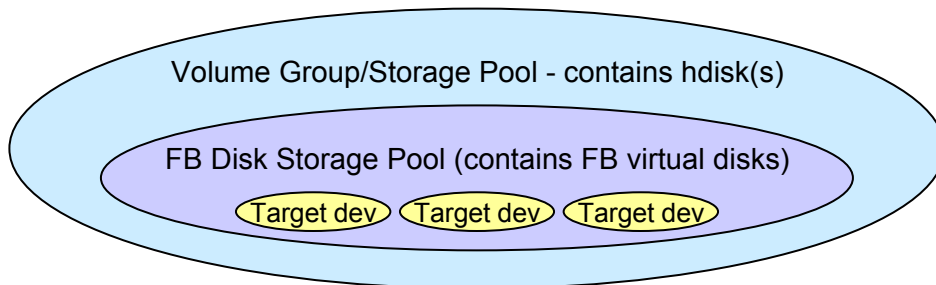
- File-back (FB) virtual device types:
 - File-backed disk devices
 - Files created in storage pools can be used as hdisk on client
 - File-backed optical media devices
 - Create a Virtual Media Repository which can be stocked with DVD-ROM/RAM media
 - Clients can use images stored in repository as cd0 devices with media

- FB virtual device characteristics:
 - Read-only FB devices can be shared by multiple clients
 - Bootable FB devices appear in SMS
 - Reside in FB storage pools
 - Mount Directory = /var/vio/storagepools/<FBSP_Name>
 - LV_NAME = <FBSP_Name>
 - Granularity as small as 1MB or as large as parent Logical Volume

FB virtual devices are new as of Virtual I/O Server V1.5

Creating File-Backed Virtual Disks

- Files on the virtual I/O Server can be used as backing storage:
 1. Create a volume group (**mkvg**) or storage pool (**mksp -f**)
 2. Create a FB disk storage pool (**mksp -fb**) inside volume group/storage pool
 3. Create a device in the pool (**mkbdsp**) and map to a vadapter
 4. The client associated with that vadapter sees new FB device as an hdisk



Create FB Virtual Disks Example (1 of 2)

- Create new volume group/logical volume storage pool:

```
$ mkvg -vg stpool1 hdisk1 OR mksp -f stpool1 hdisk1
```

New storage pool
(*stpool1*)

- Create new FB storage pool in the logical volume storage pool:

```
$ mksp -fb fbpool -sp stpool1 -size 10g
fbpool
File system created successfully.
10444276 kilobytes total disk space.
New File System size is 20971520
```

New FB storage pool
(*fbpool*) that is 10 GB
inside of *stpool1*

- Create new file device with a certain size, create the VTD, and map to vhost adapter:

```
$ mkbdsp -sp fbpool 30m -bd fb_disk1 -vadapter vhost3
Creating file "fb_disk1" in storage pool "fbpool".
Assigning file "fb_disk1" as a backing device.
vtscsi3 Available
fb_disk1
```

Create new 30 MB file called *fb_disk1*

Resulting VTD is named *vtscsi3*
and is mapped to *vhost3*

Create FB Virtual Disks Example (2 of 2)

- View mapping with new backing device:

```
$ lsmmap -vadapter vhost3
```

```
SVSA          Physloc          Client Partition
  ID
-----
```

```
--
```

```
vhost3        U8203.E4A.10CD1F1-V1-C15    0x00000000
```

```
VTD          vtscsi3
Status       Available
LUN          0x8100000000000000
Backing device /var/vio/storagepools/fbpool/fb_disk1
Physloc
```

Create FB Virtual Optical Device (1 of 2)

- Optional: create volume group/logical volume storage pool to hold the Virtual Media Repository:

```
$ mkvg -vg medrep hdisk4 OR mksp -f medrep hdisk1
```

- Could put the media repository in the VIOS rootvg instead

- What to do with all that freespace in the VIOS rootvg? Since the repository holds static images, it is a better candidate to use some of that free space than logical volumes that will provide virtual disks for running client LPARs

- Create 10 GB Virtual Media Repository in the LV pool:

```
$ mkrep -sp medrep -size 10G
```

- You can increase the size of the repository later if necessary with `chfs`

- Create media (*aixopt1*) in repository from a file:

- Media could be blank, loaded from `cd#` device, or a file

- Make it read-only to allow multiple clients to access it simultaneously

```
$ mkvopt -name aixopt1 -file dvd.product.iso -ro
```

Create FB Virtual Optical Device (2 of 2)

- View repository and its contents:

```
$ lsrep
```

Size(mb)	Free(mb)	Parent	Pool	Parent	Size	Parent
Free						
10198	6532	medrep			69888	
59648						
Name	File	Size	Optical	Access		
aixopt1		3666	None	ro		

- Create FB virtual optical device and map to vhost adapter:

```
$ mkvdev -fbo -vadapter vhost4
```

```
vtopt0 Available
```

- You can create multiple virtual optical devices for each client if desired
- Name them with the `-dev` flag
- Load the image into the media device:


```
$ loadopt -vtd vtopt0 -disk aixopt1
```

 - Use the `unloadopt` command to unload
 - You can perform multi-cd installs by loading subsequent volumes by reloading the virtual optical device with `loadopt -f`

FB Device Command Examples (1 of 2)

- List the repository and any contents:

```
$ lsrep
Size(mb) Free(mb) Parent Pool          Parent Size      Parent Free
    10198     6532 medrep                69888            59648
Name                               File Size Optical      Access
aixopt1                             3666 vtopt0            ro
```

- List the storage pools:

– Notice both LVPOOL and FBPOOL types:

```
$ lssp
Pool          Size(mb)  Free(mb)  Alloc Size(mb)  BDs Type
rootvg        69888     44544     128             1 LVPOOL
stpool1       69888     59648     64              0 LVPOOL
medrep        69888     59648     64              0 LVPOOL
fbpool        10199     6072      64              2 FBPOOL
```

- List out volume groups/storage pools (LVPOOL type only):

```
$ lsvg
rootvg
stpool1
medrep
```

FB Device Command Examples (2 of 2)

- List FBPOOL details:

```
$ lssp -bd -sp fbpool
```

Name	Size(mb)	VTD	SVSA
fb_disk1	30	vtscsi3	vhost3
fb_disk2	4096	vtscsi4	vhost3

- Show all mounts including FB devices:

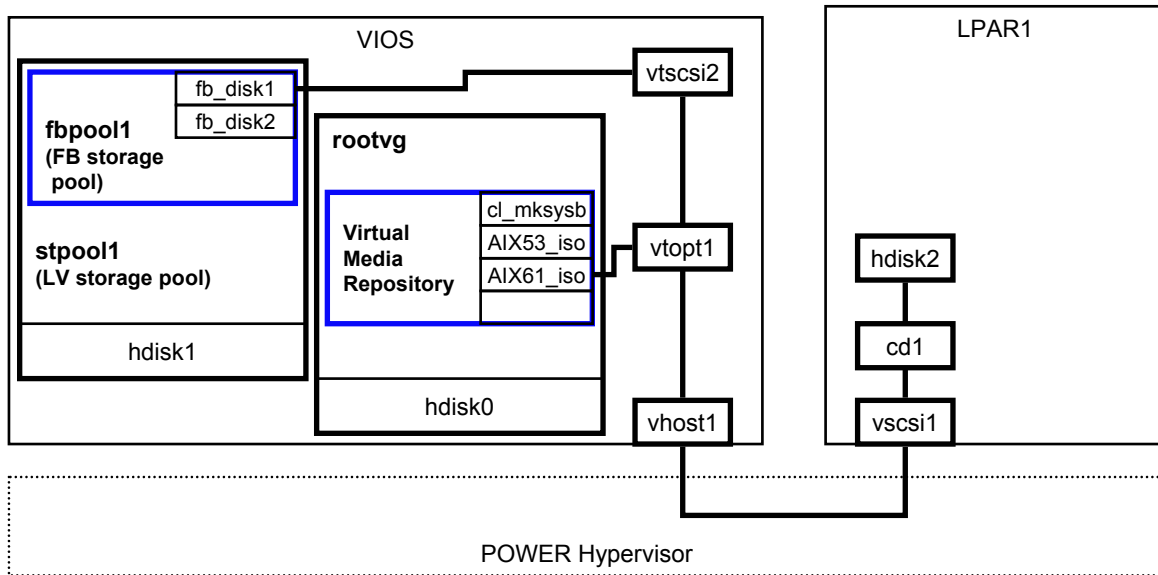
```
$ mount
```

mounted	mounted over	vfs	date	options
/dev/hd4	/	jfs2	Apr 18 13:01	rw,log=/dev/hd8
/dev/hd2	/usr	jfs2	Apr 18 13:01	rw,log=/dev/hd8
/dev/hd9var	/var	jfs2	Apr 18 13:01	rw,log=/dev/hd8
/dev/hd3	/tmp	jfs2	Apr 18 13:01	rw,log=/dev/hd8
/dev/hd1	/home	jfs2	Apr 18 13:01	rw,log=/dev/hd8
/proc	/proc	procfs	Apr 18 13:01	rw
/dev/hd10opt	/opt	jfs2	Apr 18 13:01	rw,log=/dev/hd8
/dev/fbpool	/var/vio/storagepools/fbpool	jfs2	Apr 28 12:04	rw,log=INLINE
/dev/VMLibrary_LV	/var/vio/VMLibrary	jfs2	Apr 28 14:36	rw,log=INLINE

(First column of mount output was removed to fit output on slide. All filesystems are locally mounted.)

File-Backed Virtual Devices Demonstration

- Configure a file-backed virtual disk and file-backed virtual optical device



Installing Over File-Backed Devices

- By placing install media in the Virtual Media Repository and assigning clients file-backed virtual optical devices, you can achieve a fast, secure client install
 - Use `mkcd` to create bootable ISO images from `mksysbs` or AIX media
 - Create media files as read-only to install multiple clients concurrently
 - Use `loadopt` to load media and additional volumes for install
- This install occurs entirely over the Hypervisor and is very fast and secure (smart man's NIM)

Conclusion

- File-backed virtual disks and optical devices provide even more flexibility in storage allocation
 - Ability to use files on the VIOS as disks or DVD media on client partitions
- Virtual Media Repository on VIOS allows you to store client install media and backup install images
 - Smart man's NIM for VIO client installs