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Dell Perc RAID
Growing the OS Disk

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1. OVERVIEW

This doc will describe how to change from one OS sized partition/disk to another size under Win2K for Dell Servers.

Requirements:

- This assumes you are using a Dell Power Edge Server with a Perc controller.
- This assumes you are using Windows 2000 or NT4.0.
- This assumes your System Disk is NOT a Dynamic Disk. Not that it won't work, it just hasn't been tested as of this writing.

You will need the following:

- Symantec Ghost v7.5
- XX0352 Perc Driver Upgrade Procedure
- XX0351 Perc Firmware Upgrade Procedure
- XX0353 Upgrading Array Manager
- A WinXP or WinME boot floppy.
- Blank floppy for Ghost75

Perc and Ghost related files can be found in:
http://techplanet.creo.com/software_solutions/workflow_hardware/raid/nav/dell_perc

Floppy Boot files can be found in:

http://techplanet.creo.com/software_solutions/workflow_hardware/dell_platforms/nav/2600/downloads.htm

2. BRINGING THINGS UP TO DATE:

It is important to have a consistent interface and feature set for doing any kind of Perc RAID work. If a given firmware version is wrong you will not be able to guarantee consistent results with this procedure. If your driver is wrong you could have compatibility issues with your firmware. Array Manager also needs to be current since it is the common interface to all Perc family RAIDs.

All Perc and Array Manager Software / Documentation can be found at
http://techplanet.creo.com/software_solutions/workflow_hardware/raid/nav/dell_perc

1) **Label ALL Disks** in your Server with their slot locations. You will be removing and moving Disks around. Don't get them mixed up!!!

2) Copy **Ghost75.exe** to a **blank floppy disk**.

3) Check your Perc Driver

   a) From **Device Manager / SCSI** right click **Dell Perc / Properties / Driver**.

   b) Refer to Tech Planet and check that your Perc Driver is up to date with what is on the site.

   c) Refer to doc XX0352 for upgrading your driver.

4) Check your Perc Firmware

   a) Reboot your server and check the version of the Perc Firmware during the bootup. Check this against the most recent version from Tech Planet and upgrade using doc XX0351 as necessary.

5) Check your version of Array Manager

   a) If Array Manager is not installed on your system follow the document Upgrading Array Manager to remove old programs and setup Array Manager.

   b) If Array Manager is installed, open Array Manager and select **Help / About**. Check that your version is the same or better then that on Tech Planet.

3. BACKUP YOUR LOCAL PERC DISKS:

You should do a full backup of all partitions of your system disk including registry in the unlikely event catastrophe occurs.

1) Determine which disks are on your Perc Controller.

   a) Under **Computer Management** select **Storage / Disk Management** and select the **Disk View** tab.

   b) For **each Disk** in the left margin of the Disk View window right click the disk and select **Properties**.

c) If it says **Perc** or **Dell Container** note all the logical drives on that disk. You will be adding these to your backup.

d) Close Disk Management.

2) Stop all applications. Disconnect anyone remotely attached to the server.

3) In Services stop all Oracle, Prinergy, Impact service. Stop File Server for Mac. Stop IIS.

4) Start **Win2K Backup** and select the **Backup** tab.

5) Select all the drives on your Perc controller. Should include **C:, D:** and **E:** at a minimum.

6) Select **System State**.

7) Select **Start Backup / Advanced**. Sect **Backup Type** to **Normal** and **Verify Data after backup** to **Enabled**.

8) Start the backup.

9) Check the logs and ensure that nothing significant has been skipped.

4. UPGRADING YOUR PARTITION SIZE

Most of the work here is going to be done from the Perc BIOS. Since Percs have different families and come from different suppliers we will have to breakdown the procedure Server by Server. This procedure will assume you are growing your OS partition by replacing the OS disks with larger disks. This procedure will also work if you are simply changing the partition size of the disk.

4.1 Perc 2/DC and Perc 3/DC (PE6400, PE6600):

1) Record your existing configuration.

a) Reboot the Server and hit **<ctrl>M** to get into the Perc BIOS.

b) Select **Objects / Physical Drive**. You will notice the disks will be labeled **ONLIN Ax-y** where **x=LUN**, **y=Disk ID in LUN**. You should notice that your OS LUN consists of disks A0-0 and A0-1 in channel 0.

c) For each disk note the disk location (**Channel - ID**) and which LUN it is assigned (**Ax-y**). Write this information down and save it.

d) Hit **<Esc>**.

e) Under the **Objects** menu select **Logical Drive** (Logical Drive = LUN).

f) For each Logical Drive select **Logical Drive / View Update Parameters** and note the following:

i) RAID Level

ii) StripeSize

2) Exit Perc BIOS.

3) Add the new OS Disk

a) Power down the Server and remove all Disks except Disk 0:0 (top slot). Also, disconnect any external attached storage devices.

b) Insert the new larger disk into the bottom slot (Disk 0:1) and power up the Server.

c) When prompted for the Perc BIOS hit **<ctrl>M**.

d) Select **Configure / Clear Configuration / Yes**.

e) Select **View Add Configuration**. You should see 2 disks **0:0** and **0:1** and both should show **ready**.

f) For LUN A0 (Your OS Drive) do the following.

i) Use the arrow keys to highlight **Disk 0:0** and select it by hitting the **<Space>** bar.

ii) Hit **<Enter>** to complete your selection of **Disk 0:0**.

iii) Select **Disk 0:1** and hit **<Space>** and then **<Enter>**. You should now have

Disk 0:0	A0-0
Disk 0:1	A1-0

g) Hit **<F10>** to configure the LUNs.

h) Note: LD=LUN for Perc2DC, Axx=LUN for Perc3DC.
Note: For Perc3/DC, LUN is selected when it turns grey, unselected is turquoise.
You will be prompted to configure each of the 2 LUNs starting from LUN-0 (your old OS Drive). Do the following.

i) For Perc 3/Dc:

(1) Select the LUN. The highlighted LUN should turn **Grey** in color. Only 1 LUN should be selected at a time.

(2) Hit **<space>** to accept the LUN. It should say **Span-x**.

(3) Hit **<F10>** to configure.

ii) For both Perc 2/Dc and Perc 3/Dc

RAID		0
Size		Default
Advanced		
	Stripe Size	LUN 0: What was recorded for LUN 0 before.
		LUN 1: 128KB
	Write Policy	WRBACK
	Read Policy	READAHEAD
	Cache Policy	Cached IO

iii) Hit **<Esc>**

iv) Hit **Accept**.

i) Hit **Accept / Yes** to complete your configuration.

4) Ghost over to the larger OS Disk

a) Insert your **Boot Floppy** and reboot your Server.

b) Put in your Ghost floppy and Start **Ghost75.exe** and hit **OK**.

c) Select **Local / Disk / To Disk**.

d) Select your **Top Disk** (Original OS Drive) as your source and hit **OK**.

e) Select you **Bottom Disk** (New OS Drive) as your destination and hit **OK**.

f) You will be prompted with the partition layout table. Note! Use <Tab> to move around the selection window. Enter the following:

i) **Partition x** (last partition on the disk, **should be partition 4**). Set the **New Size** to **0** and hit **<Tab>**. The New Size will change to the minimum size that can fit the data existing on the partition.

ii) **Partition 1** (No Name) is your Dell Partition. Set the **New Size** identical to the **Old Size**.

iii) **Partition 2** (Boot). Set the **New Size** identical to the **Old Size**.

iv) **Partition 3** (System) is your System Partition. Set the **New Size** to your desired size in MB. Set to a value **not to exceed NewSizeTotal – NewSizePart1 – NewSizePart2 – (NewSizePartX * 1.3)** Ghost will resize to an appropriate number afterwards.

v) **Partition x** (other partitions on the disk). Set to a value **not to exceed NewSizePartX + NewSizeFree - OldSizeFree** Ghost will resize to an appropriate number afterwards.

vi) **NewSizeFree** should be approximately equal to **OldSizeFree**.

g) Hit **OK / Yes** to start the Ghost. This should take about 18min for a completely full 18GB disk to ghost over to a 36GB disk.

5) Starting up your system with New Resized OS Drive:

a) Power down your Server. Remove ALL disks other then the new OS Drive.

b) Move the **New OS Drive to the top slot** (0:0) and put your Old OS Drive in a safe place.

c) Power up your Server and when prompted for the Perc BIOS hit **<ctrl>M**.

d) Select **Configure / Clear Configuration / Yes**.

e) Select **View Add Configuration**. You should see **1 Disk only**.

f) Use the arrow keys to highlight **Disk 0:0** and select it by hitting the **<Space>** bar and hit **<Enter>** to complete your selection.

g) Hit **<F10>** to configure the LUNs.

h) You will be prompted to configure LD-0 (your New OS Drive). Do the following.

i) For Perc 3/Dc:

(1) Select the LUN. The highlighted LUN should turn **Grey** in color. Only 1 LUN should be selected at a time.

(2) Hit **<space>** to accept the LUN. It should say **Span-1**.

(3) Hit **<F10>** to configure.

ii) For both Perc2 and Perc3

RAID	0
Size	Default
Advanced	
Stripe Size	128KB
Write Policy	WRBACK
Read Policy	READAHEAD
Cache Policy	Cached IO

iii) Hit **<Esc>** and then **Accept**.

i) Hit **Accept / Yes / Yes**.

j) Hit **<Esc>** all the way back and Exit Perc BIOS.

k) Reboot the Server.

l) In Win2K you will be prompted to reboot with the discovery of new hardware, reboot now.

6) Re-install the other disks to the Server.

a) Power down the Server and add the other non OS disks, both internal and external, back onto the Server. Boot the Server.

b) When prompted for the Perc BIOS hit **<ctrl>M**.

c) Select **Configure / View Add Configuration**.

d) You will see your OS Mirror already configured as A0-0 and A0-1. This will not be touched. The other disks showing as Ready will be reconfigured. For each **LUN** other then A0 you had noted from your original configuration notes above do the following.

i) Use the arrow keys to highlight the 1st disk in the LUN noted above. Select it by hitting the <**space**> bar.

ii) Chose the next disk in the LUN and hit **<space>**. Continue this for all the disks in that LUN.

iii) Once all the disks for the LUN have been selected hit **<Enter>** to complete the selection.

e) Hit **<F10>** to configure the LUNs.

f) You will be prompted to configure each LUN starting from LD-1. Do the following.

i) For Perc 3/Dc:

(1) Select the LUN. The highlighted LUN should turn **Grey** in color. Only 1 LUN should be selected at a time.

(2) Hit **<space>** to accept the LUN. It should say **Span-1**.

(3) Hit **<F10>** to configure.

ii) For both Perc2 and Perc3

RAID	What ever was originally recorded for that LUN before
Size	Default
Advanced	

Stripe Size	What ever was originally recorded for that LUN before
Write Policy	WRBACK
Read Policy	READAHEAD
Cache Policy	Cached IO

iii) Hit **<Esc> / Accept**.

iv) Hit **Accept / Yes** to accept the new configuration.

v) Hit **<Esc>** all the way and exit Perc BIOS.

g) Reboot the Server.

7) Creating the new Mirrored OS

a) Log into **Administrator** and start **Array Manager**.

b) Insert your second (New OS **Mirror**) disk into **the bottom slot 0:1** and wait a minute.

c) In **Array Manager** right click **Arrays / Perc Subsystem / Perc xDC / Backplane 0** and select **Rescan**. You should see the second disk show up. If not, wait a little bit (no more then a couple minutes) and retry. If it still doesn't show up, do a reboot.

d) Under **Arrays / Perc Subsystem / Perc xDC / Array Group 0** right click **Virtual Disk 0** and select **Add Member**.

e) Select **Array Disk 0:1** and hit **Add Disk**. Disk 0:1 should now appear in the New Array Disks window.

f) Under **Virtual Disk Type** choose **RAID 1** and hit **OK** and **Yes** to the no other activity prompt. You should now see 2 disks (0:0 and 0:1) under Array Group 0 / Virtual Disk 0.

g) Select **Array Group 0**. You should see in the window Virtual Disk 0's status as Reconstructing. Progress will show the % complete. Leave the set rebuild. This will take about 3 hrs for a 36GB 10K rpm Mirror Disk.

h) In the Events tab a notification will be a record displaying that Reconfiguration Completed.

i) Close Array Manger.

8) Check consistency. To ensure that nothing had broken during the ghost process we will run a CHKDSK on each of the resized volumes. For each volume for the OS Disk type the following:

CHKDSK x: /F /R

Where x: is the drive letter.

Note: For the OS Partition (and maybe others depending on your configuration) you will be prompted to run next time your boot. Hit **'Y'** and reboot only after running the command for all the drives.

4.2 Perc 2/Si (PE2400):