Creating A More Reliable System

Many users have already been experiencing diminished hardware support from HP. It is only natural, as HP has less incentive to train their Customer Engineers (CE's) on the MPE/iX operating system environment. While they may know the hardware, they won't know VOLUTIL.

You can help yourself be less susceptible to hardware failures, and therefore less reliant on HP's hardware support. In this, and future issues, we'll show you how.

In future issues of the Resource 3000 Newsletter, we will continue this theme of providing you with information about what you can do to ensure your disk drives, printers, and other hardware devices are maintained and operational. This issue addresses one of the most important aspects of your system – the data stored on your disk drives.

Hot-Swappable Disk Drives

Our CE's know the MPE/iX operating system. Other CE's may not. The key to minimizing the impact from CE's with minimal knowledge the e3000 is to reduce the complexity of swapping out bad disk drives.

The easiest way to do this is to replace your non-hot swappable disk drives with hot swappable disk drives in a RAID environment. RAID is short for "Redundant Array of Independent (or Inexpensive) Disks". It is a category of disk drives that employ two or more drives in combination for fault tolerance and performance. These drives are typically "hot swappable", which means you can swap out a bad disk on the fly, easily and without a lot of background in computer hardware.

With the proliferation of inexpensive hot swappable RAID Arrays now available in the used market place, this is a very cost-effective solution.

The major benefits to you are:

- You can swap out the bad drive yourself
- No need to place a service call and risk an inexperienced CE
- Swapping is immediate, limiting your down time
- Your service contract will provide a new disk drive

Remarketed disk arrays are readily available at a good price. Two we recommend are the A3549A Model 20 SP620 Deskside Array and A3550A Model 20 SP620 Rackmount Array. Known also as the "Nike" arrays, they are readily available and support both RAID 1 (mirroring) and RAID 5 (data striping). Be sure to purchase an array with dual phoenix (SP620) controllers and redundant power supplies to maximize disk availability.

You will also need two dedicated FWD controllers installed on your server. (Call us if you have questions)

The Nike disk array is controlled by what is called a "flare code." You don't need to know what this is or how it is used, but you do need to make sure your remarketed Nike disk array does have the latest version of flare code, or it will be in an unusable state. When you purchase your array, tell them you want "1 each boot disk with the latest version of flare code."

Flare code 9.55.01 (or later) and PROM code 0173 (or later) are required for the array controller. Do not let anyone sell you a Nike array without a boot disk!

The support for RAID drives on your system will depend on your version of MPE/iX. MPE/iX 6.0 supports 9 GB and 18 GB disk drives. However, the 9 GB and 18 GB drives are supported as RAID 1 only, not as RAID 5, since this would exceed the 18 GB volume limit currently in effect.

RAID 1 provides data mirroring, while RAID 5 provides data striping at the byte level and also stripe (track) error correction information. This results in excellent performance and good fault tolerance.

To manage your Nike Array, there is a built in utility called "Grid Manager." To access Grid Manager you will need an ASCII terminal configured as VT100(EM100) or Reflections with VT100 emulation to connect to the controller console port.

From Grid Manager you can configure your disks, run offline diagnostics and examine an events log to diagnose problems. Make sure your 28696A FWD adapters are running firmware revision 3728 or later. LDEV 1 is supported as a boot drive on the Nike with SP620 (PHOENIX) controllers.

LDEV 1 capacity however is limited to 4 Gbytes (due to NIO IODC limits).

The SureStore Model E Disk Array 12H

The SureStore Model E Disk Array 12H, also known as the Model 12H Autoraid Array, is supported on MPE as both a boot device and a user volume. AutoRaid 12H usage rules are:

- Model 12H AutoRAID is supported using firmware revision 56
- Controller Mode should be set to Normal
- X Controller to be connected to the e3000, Y controller unconnected and terminated
- Rebuild priority should be set to High • Logical Unit Number (LUN) (0) must be configured
- HBA 28696A FWD adapter firmware release 3728 or better
- Support will only be allowed on a dedicated SCSI bus, with no other types of devices (homogeneous bus environment)
- Daisy chaining of two or more model 12H is supported within the recommended SCSI configuration

Our recommended SCSI Configuration For optimal system performance, we recommend a maximum of 8 LDEVs per SCSI bus. Having nine or more LDEVs configured will cause performance degeneration under high I/O loads.

The single X controller is the only connection to the HP e3000 supported. We recommend that you purchase the second Y controller to avoid total controller failure. The second controller will be able to take over when swapped into place because it maintains a copy of the current firmware and disk maps. If your 12H contains 12-18Gb disk drives, we recommend configuring each of the LUNs for 11Gb of storage.

This configuration has given the best performance versus capacity. This capacity allows for RAID1 and available space for two hot spare disks. Total capacity of the LUNs should not exceed 90Gb to ensure optimum performance.

We also recommend that you set Data Resiliency Mode "Normal."

However, some users have reported very slow Restore speeds with Normal mode. To correct this problem, set the Data Resiliency Mode to "Performance Mode" only during the restore. Remember to reset the mode back to Normal when your large restore is completed.

Set Rebuild Priority to High. This may cause some degradation in your online transaction response times (probably not noticeable), but will reduce the likelihood of encountering a disk mechanical failure while the system is still recovering from a previous disk mechanical failure.

We hope this information helps you to improve your confidence in your system. For additional information or questions, contact us. Resource3000 is dedicated to ensuring the continuation of your significant investment in the HP3000 platform.

(download pdf version of paper)