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Dell's iSCSI SAN Is a Boon for SME Storage

Review: Ease of implementation benefits, excellent performance and transparent operation make the PowerVault MD3000i a good bet for sites with emerging storage needs.

By Wayne Rash

Dell's new PowerVault MD3000i SAN isn't the first time Dell has shipped a storage area network. In fact, it's not the first time the company has shipped an iSCSI SAN.

What's new about the MD3000i is that it's the first time the company has shipped one without the name of its partner EMC. The PowerVault MD3000i is purely a Dell product, and for that it's a first.

This does not mean that Dell has abandoned its partnership with EMC. In fact, the MD3000i fits neatly into a niche between the partnership's AX and CX series SANs. As such it's a moderately priced storage solution designed for the small and medium enterprise market—the PowerVault MD3000i, which became available on September 10, starts at a base price of \$7,120. The unit I tested was priced at \$15,514.

Equally important, Dell has intended this product for SME's that have limited expertise with storage solutions, which means that it includes software that makes integrating the SAN easy, and because it's an iSCSI solution it can fit into an existing IP network (although that capability depends a lot on your network).

These ease of implementation benefits, coupled with excellent performance and transparent operation, make the PowerVault MD3000i a good bet for a lot of users with emerging storage needs.

I looked at the Dell PowerVault MD3000i shortly before the company released it, so the hardware and software were in pre-release versions. In addition to the base MD3000i, which would be delivered with a pair of drives and a single dual-port controller, the tested unit included a total of fifteen 15000 rpm 73 GB SAS (server-attached storage) drives, and a pair of dual-port con-

trollers. The tested unit also included Dell's Disk Storage Manager SAN management software, snapshot software and volume or "shadow" copy software that lets you keep client and server backups current.

Dell uses Microsoft's iSCSI Initiator software for connecting Windows machines to the SAN. Dell didn't include the Windows software with the SAN, but it is available for download from Microsoft. The MD3000i also works with some later distributions of Linux that now ship with iSCSI software.

Dell's Disk Storage Manager Summary screen is designed to give you a visual snapshot of the current status of the SAN. Other tasks are available on tabbed pages that expose links to various functions. While only the Summary page is actually graphical, the links on each page are grouped logically, and are easy to figure out. Those links either invoke a wizard that leads you through the chosen process, or to a form that you will need to fill out to invoke the chosen function, such as modifying your disk array's.

Setting up the SAN

The Dell MD3000i SAN server weighs in at 78 pounds for just the device, not counting the rack mounting kit, sliding rails, power cords or anything else. This is not a job for one person. The tested version included redundant power supplies and dual control units. As a result, there are six Ethernet connections and two power connections on the rear of the device. Four of the six Ethernet connections are for your storage network. The other two are for redundant access to out-of-band management. There's also a serial connection on the rear of the device if you want to manage it that way.

An important consideration if you're installing the MD3000i SAN (or any other iSCSI SAN for that matter) is that this device needs its own dedicated network. This network can share the switching infrastructure with the rest of your network, but it must be on its own VLAN (virtual LAN). In addition, it must have a full gigabit of bandwidth for each data channel. To accomplish this on the test network, I installed a Dell PowerConnect 2708 Gigabit Ethernet switch.

The Dell switch gave me four ports for the MD3000i, plus a pair of Ethernet ports for the HP DL385 Opteron-based server running Windows 2003 Server, a connection to the main lab network and a connection to an IBM x346 Xeon-based server. Primary testing was done using the HP DL385 server which was equipped with a six-disk RAID 5 array of Ultra 320 SCSI disks. This allowed comparisons between the file transfer rates to both types of storage, and between the RAID array and the SAN on the same server.

In addition to setting up VLANs, or an actual separate network for the SAN, you'll need to assign IP addresses to each port on the storage controllers, and to the management ports. Most enterprises will connect the management ports to a separate network from the storage network, which is what I did. While I used a separate switch for the storage network in this test, it's possible to simply set up VLANs on a managed Gigabit Ethernet switch as long as the VLAN is given sufficient bandwidth to support the storage traffic.

Once the physical installation is complete, you must complete additional tasks so that you have the IP addresses set for the ports, configure the logical drives, download and install the iSCSI Initiator

and then configure the logical disks so that they appear as disks attached to Windows. Once you have the SAN addressing and disk configuration taken care of, you can attach to the SAN from multiple servers. In this case I had the fifteen disks appear as a virtual disk with a terabyte of capacity.

Once the disks are set up and available to Windows, you can have access to the storage using Windows file services, you can make them available to your database server, or as storage for applications. You can also create a number of separate logical volumes. At different points during testing I had the MD3000i appear as a single volume, four volumes, five volumes or as a drive array with spare drives. Dell's included configuration software makes changing from one to another very straightforward.

Using the SAN

Most of the SAN testing involved moving large files around from one drive array on the HP server to another, or in transferring files either as file copies or as backup jobs from clients and servers to the SAN. While these are hardly formal benchmarks, I did discover that in every case the SAN was a lot faster than the SCSI array, usually taking about two-thirds the time.

Once the SAN is up and running it's mostly a background operation. If you're using Windows file services, for example, it's just another drive on the server. The primary limitation during the first phases of testing was related more to operator error than anything else. But once I went back

and followed the instructions, the SAN was quick and transparent. You should note that the instructions aren't complex and the documentation is clear, but you do have to actually pay attention. This isn't a single click installation.

I should add, however, that Dell does include an automatic configuration wizard. This wizard takes you through the steps that need to be accomplished from the management console, but you'll still need to configure the iSCSI Initiator. Dell also includes a manual configuration capability that gives you more control, but which is still very easy to use.

Expansion

The MD3000i that I tested for this review had 15 SAS hard disks with 73 gigabytes each. Using up to two expansion MD1000 chassis can support another 15 drives each and each drive can be up to 300 gigabytes. The MD3000i can be ordered with support for either SAS or SATA (Serial ATA) drives. With two controllers, you can connect up to 16 servers through a switch. You can support two servers if they're directly connected. The power supplies are redundant and either supply will run the device.

According to information provided by Dell, the PowerVault MD3000i uses the same disk drives as the company's PowerEdge servers. This is intended to simplify your spare parts stocking. Dell lists a high-availability version of the MD3000i that can support redundant servers and features a battery backed gigabyte cache that's

good for up to 72 hours. The disks included in the tested version of the MD3000i are hot swappable.

As you'd expect, Dell has a wide variety of options available for the PowerVault iSCSI SAN devices. These options include the disk drives in excess of two, the second controller, and the background copying software. One thing that's standard is Dell's remote setup service which allows an engineer to perform the setup for you while you provide the necessary information over the phone. I used this method for the first attempt at installing the SAN and it's clearly the method of choice for enterprises that don't plan to train SAN experts.

Still, your network management staff will have to configure the network to work with the SAN. This means making sure your Ethernet switch can be set up with a VLAN for the storage network, and making sure that the network has enough bandwidth available to support the resulting traffic. You may find, as I did, that this really means using a separate switch.

What's important, however, is that Dell has made a real effort to make setting up and using the PowerVault MD3000i something that most small and medium enterprises can accomplish. You're probably not going to need to send your staff out for training, and you may not need to buy new infrastructure to support your storage needs. Instead, Dell has produced a storage solution that you can actually use without spending a lot of unbudgeted money on training to infrastructure.

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