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Shared Storage For SMB Server Bundles

The combination of cost-effective SMB server bundles and a shared storage system allows SMBs to move to the next level of compute infrastructure

A joint white paper between Drobo and Storage Switzerland



Introduction

As small businesses grow they eventually reach a point at which the demands of the business require a specific IT server application such as an email server, file server, database server, or a web server. Operating system (OS) vendors like Microsoft and Apple are making this transition easier by providing preconfigured, cost-effective versions of their server OSs targeted for small business. This leads SMBs to move to server-hosted applications faster than in the past. As a result they are more likely to need a storage device that can be shared among several servers at the same time.

What Are SMB Server Bundles?

SMB server bundles are turnkey versions of the respective operating systems preinstalled on server hardware. They often preconfigure many of the more complicated networking settings for users and provide step-by-step wizards to complete the installation. They will include the common core applications that a small business needs as it first moves to a server-hosted environment. The setup of these applications is also wizard driven, allowing SMBs to bring them online without a great deal of expertise.

RAID vs. Backup

Many small business use RAID (Redundant Array of Independent Disks) as their backup to protect from a data loss. If a drive fails, RAID allows them to keep operations going until a new drive can be added to the system.

However, RAID does not cover two important SMB needs. First, the ability to store a copy offsite to protect against flood or fire is not met with RAID alone. And, although RAID is a great place to store backup copies, having an archive of data in case a previous version of a file is needed is not built into RAID.

The SMB server bundles are offered at very aggressive pricing, but the number of users is often restricted to, for example, up to 10 users. Those initial licenses are often a sufficient starting point for most SMBs, and they usually don't need all of the functionality that would otherwise cost much more in unlimited versions of the OS or if the software pieces were purchased separately.

Another limitation of these preconfigured hardware platforms is that they often lack sophisticated connectivity for attaching to shared storage. Most do, however, include at least one Gigabit Ethernet (GbE) port and many include two. This is an ideal use case for iSCSI DAS storage like DroboPro or Drobo® SAN for Business, as they do not require additional hardware to be installed in the server. In the case of a single onboard GbE port, users can include a dual-port GbE NIC preinstalled with the purchase of small business server hardware for under \$200.

Shared Storage Drivers For SMBs

Since these bundles encourage SMBs to move into a server-hosted environment sooner, they also hasten the need for shared storage as well. Shared storage is a system of one or more hard disk drives that exist on a network, allowing for access by multiple computers. There are typically three key drivers for buyers of SMB server bundles to quickly add shared storage.

- First is a simple case of additional capacity. Most of the servers that are included in these bundles are physically small in size and as a result are limited by the amount of internal hard drive capacity that they can support. Often they only have room for two hard drives. Also because of the dense packaging of these systems, getting inside the systems to add a hard drive may be too much effort. Shared storage via an iSCSI connection through one of the 1GbE ports is a simple way to add capacity without the headache of opening and reconfiguring the server.
- Second, as the server quickly becomes a critical asset to the organization, making sure that the data remains available becomes vital. Unlike the laptop or desktop environments that they are transitioning from, multiple users are counting on that server to be up and running all the time—some external as in the case of a web application,. Of course, this is one of the reasons that the server is implemented in the first place, to provide a dedicated machine to a specific task that needs greater availability and access within the organization. Consequently, it makes sense that the storage device is up to the task.
- One of the most likely components to fail in a server is the hard drive itself. Internal storage systems can only do so much to provide protection. The servers used in these bundles are almost always configured with basic desktop-class hard drives, which have lower reliability and performance than their enterprise-grade equivalents. It's important to understand that these are the initial steps in building an IT infrastructure, and it makes sense that those steps are made with high quality drive technology.

Enterprise-class hard disk drives are still susceptible to failure. If a drive does fail, the time it takes to replace it and recover data from a backup may be too long. Data recovery is always a challenge, even in large companies. But the effort required is even greater for the SMB IT person who has multiple hats to wear and a hundred other things to do. The answer is to provide a level of drive redundancy, but the server hardware often used in these bundles are limited in the number of drives they support.

In many cases small business server hardware can only provide drive mirroring (data kept identical on two drives), which reduces available capacity by 50% and makes future internal expansion complicated. Shared storage systems that are externally attached via an iSCSI connection, like those from Drobo, can provide advanced RAID protection across up to 8 drives. These storage arrays can be configured to provide access to data even if two drives fail at the same time—without sacrificing as much drive capacity to the protection process as is needed for drive mirroring.

Finally and potentially most important, is the ability for SMBs to leverage server virtualization, for which shared storage is a key enabler. Once SMBs implement their first server, the expansion to a second, third, and maybe even fourth server is relatively quick. Server virtualization allows SMBs to host those four servers on just two physical systems to keep costs down. In fact, most of the servers used in SMB operating system bundles are usually capable of handling five or six virtual servers, with each running a specific SMB-class application.

Shared storage enables SMBs to achieve higher levels of application availability by enabling them to move server resources between the two physical systems for server maintenance or even in the event of a failure. It also provides an excellent platform for scaling server growth without having to continuously purchase additional server hardware. Virtual server mobility between two physical servers requires shared storage.

For more details on the advantages of shared storage and server virtualization for SMBs, see: “No Compromise, Cost Effective, VMware Storage for SMB.” [link to http://info.drobo.com/vmware_storage_report]

Management Simplicity

While initially direct-attached storage looks less expensive and easier to use, as the environment grows it becomes more challenging to manage. These challenges include making sure there is enough storage capacity on each server. In a SAN, capacity is shared from a common pool.

The other challenge is expanding the capacity of a server using direct-attached storage. Extending a mirror or even an array group is complex and time consuming, the potential for a mistake that leads to significant downtime or even data loss is high. With a SAN, especially one with advanced data management capabilities, expansion is automatic as drives are added to the system. Simple networking setup with a SMB storage device can make it nearly as easy to deploy as DAS.

What SMBs Need In a Shared Storage Solution

As stated earlier, an SMB IT administrator is often a single person wearing multiple hats with a long to-do list every day, and often some of those hats aren't even related to IT. The solution is a shared storage system that's similar to the server bundles that it will support, in other words, cost effective, simple to operate, and easy to expand.

For a modest additional upfront investment, purchasing a SAN for the small business server enables expansion to multiple servers without the need to purchase additional storage. A direct-attached storage (DAS) array can provide the RAID protection needed by the small business server better than internal hard drives alone, but DAS cannot be shared between servers, and does not support virtual server mobility. It may be difficult to justify an additional \$2000 for a starter SAN, but that upfront investment is immediately paid back when it comes time to add the next server.

A key requirement is to leverage the storage connectivity likely to be configured on the SMB server. In almost every case this means using the Ethernet port. The storage protocol designed specifically for that port is called iSCSI. It allows storage I/O commands to travel over an Ethernet connection. SMBs can set up and configure their first storage network using the same Ethernet network that they are using for networking the servers themselves. Drobo makes getting started with iSCSI even easier by providing an installation disk with a turnkey implementation. The amount of IP network configuration is reduced to an absolute minimum and users can quickly create volumes and assign them to servers.

Another key requirement is the ability to add capacity automatically without having to reconfigure the storage or the attached servers. Both of these tasks can be very complicated with a traditional storage system. At the server level, most entry-level storage systems “hard-provision”+ storage to the server, which means that the assigned capacity can’t be more than the actual capacity available, making reassignment of capacity almost impossible. An enterprise feature called “thin provisioning” allows the storage to be “over-allocated” to the connecting servers. Then, as storage is added to the system, the connected servers can take advantage of the additional capacity, as needed without interruption. This feature is ideal for SMBs as well. Systems like those from Drobo with BeyondRAID™ provide thin provisioning that does not require setup or administration.

A big challenge for many storage systems, whether designed for large or small business, is adding storage. Many just can’t add storage because the process is physically complex and for others it’s software complexity. For traditional RAID, drives of the same size are required to expand. In most cases the additional capacity is available only from the vendor and runs specific firmware, which means more time to get the storage and greater expense to purchase.

The technique that Drobo uses in its systems, which is a part of their BeyondRAID technology, is the exception to the rule. Any off-the shelf SATA hard disk works with Drobo. Although we recommend using higher-quality, higher-performing drives, these are usually reasonably priced at local computer electronics stores. You simply install drives in the front of the unit, and you don’t even need a screwdriver to do it. Within a few minutes the additional capacity is available. Finally the unit supports thin provisioning, so that capacity becomes available to the servers, as they need it.

For SMB servers, this type of shared storage implementation is ideal. It provides the needed capacity, data protection, and sharing (key capabilities for SMBs), while controlling costs and keeping storage management as simple as possible. The combination of cost-effective SMB server bundles and a shared storage system like Drobo allows SMBs to move to the next level of compute infrastructure to give them a competitive advantage in the market.