

Evaluation of EMC[®] Celerra[®] NS20 Multi-Protocol Storage Platform

Report prepared under contract with EMC Corporation

Introduction

EMC Corporation commissioned Demartek to perform a hands-on evaluation of EMC's new entry-level Celerra NS20 multi-protocol storage platform. This evaluation included installing and deploying the NS20 and reviewing several features including multiple-protocol connectivity, Celerra Manager Wizards, snapshot integration, automated volume management, and thin provisioning. Demartek was especially interested in the ease of installation and ease-of-use of the NS20 and its rich feature set.

This report shows the actual steps taken to install and use the NS20 storage platform. Screen shots are included.

Evaluation Summary

We found that the EMC Celerra NS20 is an easy-to-use storage platform, especially given its full set of features. It is also a flexible solution, easily handling file sharing protocols such as NFS and CIFS and "block" protocols such as iSCSI and Fibre Channel. The NS20 is competitively priced, with several strong features included in the base price for which other vendors charge extra. With the Celerra NS20, EMC sets a new standard for file server and storage consolidation with an affordable, flexible, and easy-to-use platform.

Overview of the EMC Celerra NS20

The Celerra NS20 is EMC's entry-level multi-protocol storage platform providing file I/O services and block I/O services for installations or consolidated applications generally requiring less than 20 TB of IP storage capacity. Despite its "entry-level" designation, EMC has designed flexibility into the NS20 by providing a full set of file-serving and block I/O functions on top of a rich and scalable feature-set. This type of solution is suitable for file-oriented applications such as home directories and web applications, and for block-oriented applications such as Microsoft Exchange and Microsoft SQL Server. In addition, this storage platform is an excellent choice for consolidated applications running in the EMC VMware environment.



Figure 1 - NS20

The NS20 is available in single- or dual-blade implementations, with the dual-blade implementations providing high-availability. It can be populated with SATA disk drives that provide large capacity or Fibre Channel disk drives for increased performance. For those installations needing multiple tiers of storage, the disk drive types can be mixed SATA and Fibre Channel. Block I/O features include iSCSI support and, as an option, Fibre Channel SAN support.

The EMC Celerra NS20 can easily meet the file storage needs of a wide variety of host operating systems by providing NFS file shares and CIFS file shares. It supports NFSv2, NFSv3 and NFSv4. For Microsoft Windows environments, LDAP is used to join a CIFS server to a Windows domain, and the NS20 supports LDAP message signing for improved security and integrity.

Using the Celerra Manager software, storage administrators can easily perform many of the day-to-day functions using wizards. In addition, the NS20 supports automated volume management and thin provisioning to simplify provisioning and improve utilization.

Ease-of-Use

For many installations that would consider this type of storage solution, ease-of-use is frequently among the top considerations. The administrators who would typically manage the NS20 storage also perform server and possibly network management functions, and don't have time to become full-time storage management experts. The NS20 was designed for this situation. The wizard-based management functions make many of the daily storage management chores quite simple.

Although ease of installation is important, in our opinion, ease-of-use in the daily tasks is even more important because these tasks are performed many times, while installation, by comparison, is performed rarely.

Installation of the EMC Celerra NS20

EMC has designed the NS20 to be installed by EMC channel partners. With good planning for the customer requirements, the channel partner can install the NS20 and make it ready for use in the customer environment in short time period.

A number of details of the installation process have been designed to make installation simple and easy. The wooden shipping container holds the pre-configured/pre-loaded/pre-cabled NS20 components in the same orientation that they would be installed in a rack. The “placemat” provides the simple, numbered steps to physically install the NS20. The cables are custom-labeled from the factory to indicate which ends of each cable are plugged into the specific ports on the NS20.

The Celerra Startup Assistant (CSA) prompts the installer through the installation process (typically 15 minutes). After the installer has turned the NS20 over to the customer, the customer uses the Celerra Manager software to manage the NS20.

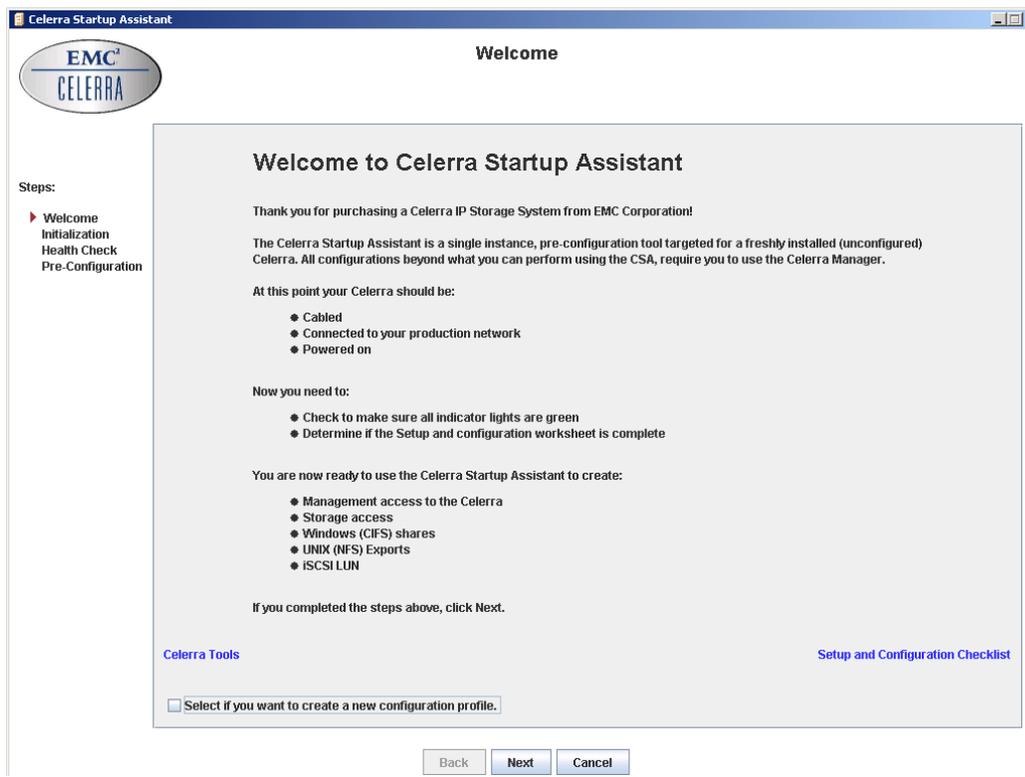


Figure 2 - Celerra Startup Assistant

During installation, the installer provides details such as hostname, IP addresses, time zone, system passwords and other related items. The installer also specifies which features have been licensed for this installation, including NFS, CIFS, iSCSI, SnapSure™ and the Advanced Manager. The Celerra Startup Assistant also performs a cable connectivity check and health check of the hardware.

The final, optional steps performed by the installer are to create NFS exports, CIFS shares and iSCSI LUNs for the customer. With the Celerra Startup assistant, the software installation only requires 10 screens, 7 inputs, and 15 minutes from power-up to sharing files.

Managing the Celerra NS20 Using Celerra Manager

EMC provides the Celerra Manager software to manage the NS20 and the other members of the Celerra product family. The Celerra Manager provides wizards to assist with many of the functions, making them easy to perform. In most cases, the wizards present a single screen of information that needs to be completed by the administrator in order to complete the function. This single-screen approach makes things simple for the administrator.

After becoming familiar with the wizards, an administrator may choose to bypass the wizards and directly access specific functions. This is easily done by right-mouse clicking on the main menu items on the left panel. The appropriate tasks for the selected functions are displayed.

For those unfamiliar with the Celerra Manager, the primary wizard screen is the best place to start. Here, each of the function wizards is listed. For this evaluation report we comment on a few of the basic functions, although all of them use the same one-screen approach for simplified management.

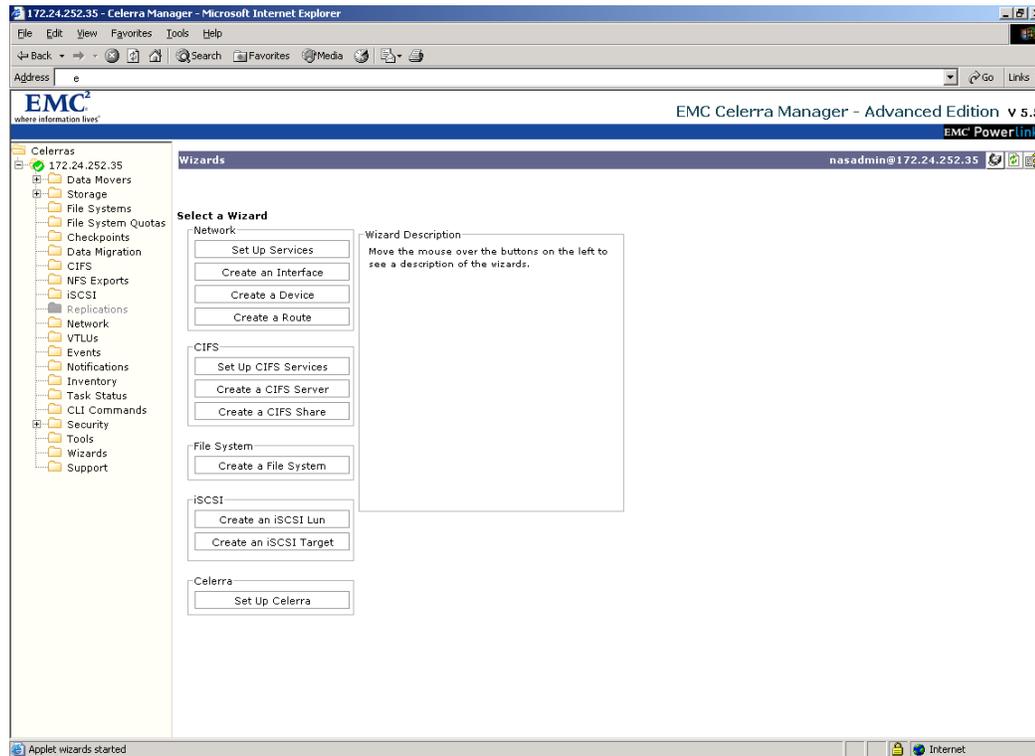


Figure 3 - Celerra Manager Wizards Screen

File Systems

One of the common storage management tasks is to create a file system. A file system can be made available for NFS exports, CIFS shares or can be allocated for use by iSCSI. With Automated Volume Management, this task is simple. The file system wizard prompts the administrator for the appropriate data, and then creates the file system. The file system can have a fixed size or can automatically grow to a maximum size that the administrator chooses. In addition, the file system can

be spread over several volumes in the storage pool. In the following screen shot, the administrator has chosen the name of the file system and the storage pool from which it is created. The file system is given a size of 50 GB (50000 MB) and is allowed to grow to 70 GB if needed. The automatic growth occurs when the file system size reaches the high watermark threshold specified, in this case 90%. The growth factor is based on the size of the file system. In this case, the file system would grow in 10 GB increments.

If virtual (“thin”) provisioning is enabled, the maximum size of the file system would be presented to the clients, but the actual space consumed would be based on the actual writes completed, which can be significantly less than the advertised size.

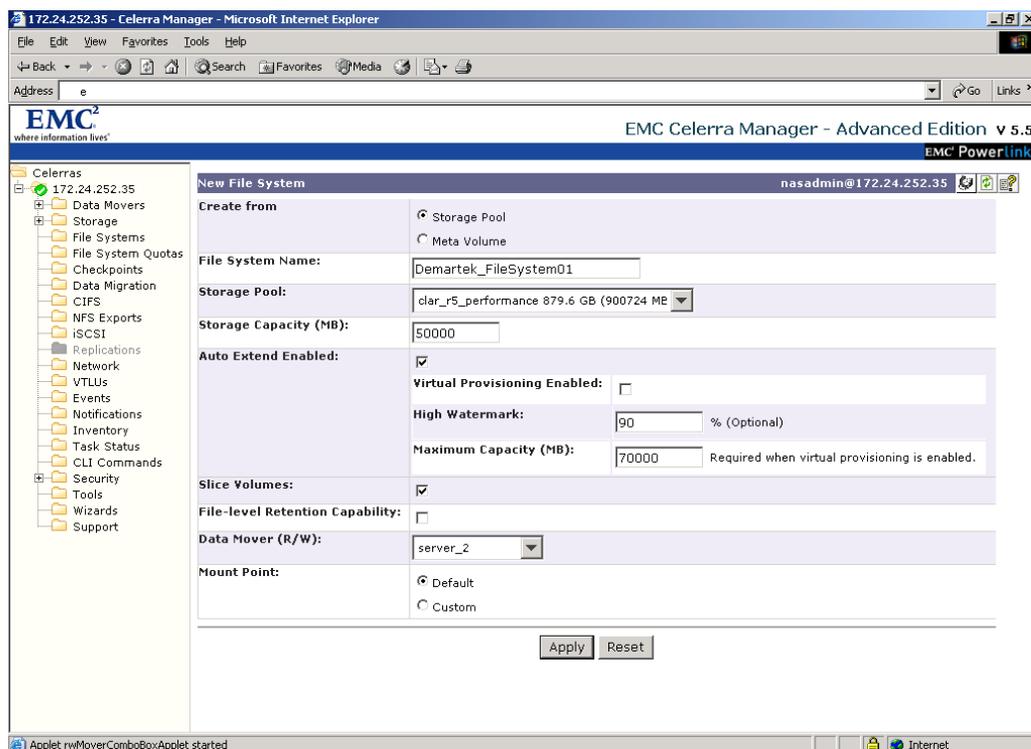


Figure 4 - Celerra Manager New File System Screen

When file systems need to be extended after their initial creation configuration, there is a separate wizard to extend an existing file system. The same simple type of wizard used to extend file systems is available for extending other items such as iSCSI LUNs, etc.

CIFS Servers and Shares

For Windows administrators, configuring CIFS servers and CIFS shares are common tasks. In order to have CIFS shares, one or more logical CIFS servers must be created. The wizards follow the same one-screen approach to each of these two tasks. The CIFS server screen prompts the administrator for the type of server, such as Windows NT 4, Windows 2000/2003 or standalone. The CIFS server name and Windows domain information can be set from the same screen.

After the CIFS server is created, the CIFS share can be easily created. The CIFS shares can be accessible from all logical CIFS servers or from selected logical CIFS servers and are linked to a file system that has already been created.

iSCSI Targets and LUNs

The creation of iSCSI targets and iSCSI LUNs is quite simple, as there is a wizard for each of these functions. iSCSI LUNs are implemented as files and up to 64 highly available iSCSI hosts can connect to one NS20.

Virtual (“Thin”) Provisioning

One of the more interesting features available on the NS20 is virtual provisioning. This feature allows the storage to appear bigger than it really is by only allocating storage when writes are actually performed. Volumes and file systems can be presented to the clients as larger than the actual space needed to contain them. With virtual provisioning, utilization is increased while ongoing management is decreased.

Snapshots

Another useful feature of the NS20 is EMC SnapSure. This feature allows read-only copies of file systems and read-write copies of iSCSI LUNs to be made for various purposes including backup and recovery of deleted files. SnapSure has been integrated with Microsoft Volume Shadow Copy Service (VSS) so Windows users can easily recover files directly from the Windows Explorer and Microsoft Office interfaces.

Multi-Protocol

The NS20 is a multi-protocol storage platform with support for NAS file systems (CIFS and NFS) and block access (iSCSI and Fibre Channel). The Fibre Channel block access is an optional feature that includes eight Fibre Channel ports on the NS20. The FC hosts can either be attached directly or through a SAN switch. NAS, iSCSI, and Fibre Channel connectivity in a single package gives customers both flexibility and investment protection.

Licensing the Celerra NS20 Features

In keeping with the simple and easy-to-use approach, the licensing model for the NS20 is also simple and straightforward. A standard license for the NS20 includes the following features at no extra charge:

- ◆ CIFS functions
- ◆ iSCSI connectivity and functions
- ◆ Snapshot functions
- ◆ Automated Volume Management
- ◆ Virtual (“thin”) provisioning

By providing all these features in the base price, EMC is making full-function, multi-protocol storage much more accessible and affordable.

Summary and Conclusion

We found that the EMC Celerra NS20 storage platform was easy-to-use and operate, and provided a flexible and rich base of features to handle a wide variety of storage needs. The wizards can make an administrator productive with the system almost immediately, and once comfortable with the system, the direct commands can be easily accessed.

This one storage platform can serve many needs due to its flexibility of supporting NFS, CIFS, iSCSI and Fibre Channel all under the management of one console. In addition, the rich features underneath these protocols such as automated volume management and thin provisioning allow the administrator to eliminate some of the annoying manual tasks that are so often required.

EMC has taken great pains to make sure this product meets the availability and ease-of-use requirements for the target market and the partner-based sales channel. With so many value-added features included in the base price, the NS20 provides industry leading price/performance. These major design philosophies make the NS20 affordable, flexible and easy-to-use, and present a compelling solution for this growing sector of the market. Customers should keep the Celerra NS20 high on their short-lists.

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