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Synopsis

Networked attached storage (NAS) implementation is all about moving your current file data from multiple locations to fewer locations. Current file locations could be a Windows or Unix server with direct or fibre channel attached storage or could be other NAS systems. In either case you can gain better control over this data by centralizing and consolidating it. Oftentimes by doing so you provide better performance and data availability by utilizing newer and faster NAS system capabilities.

There are five types of systems used to support file data: NAS gateways, Integrated NAS boxes, Cluster and/or Parallel file systems, wide area file services (WAFS), and network file manager (NFM) or NAS aggregators.

- Integrated NAS boxes and gateways are the more traditional approaches, available from major vendors, and span from small to enterprise class customers.
- Cluster-Parallel file systems generally are niche products for extra-high performance needs but may have limitations with respect to OS and/or protocol support.
- Wide area file services are used to support and coordinate file activity at remote locations to a central site presenting a single image of the file data to all locations.
- NAS aggregators or Network File Managers (NFM) have a useful role when consolidating file data across different vendor products.

Accordingly, capabilities to look for in vendor products include: snapshot or point-in-time replication of file data, volume copy, remote data mirroring, network data management protocol (NDMP) support, and both Windows and UNIX (CIFS and NFS) file access protocol support. In addition, file size, file system size, and maximum backend NAS storage supported are also worth considering. Finally as you consolidate more file data into fewer systems performance must also be well understood.

The remainder of this briefing describes the five NAS product types used for file services, the main features available for NAS products, and NAS product performance. In the NAS Product Features section we provide feature availability for over 40 current product offerings. In the NAS performance section we show NFS product performance for multiple NAS NFS and CIFS product offerings.

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NAS Product Types

NAS Gateways

NAS gateways are available from Network Appliance (NetApp), EMC, HP, IBM, SUN, OnStor, BlueARC, DELL, Lefthand Networks, IBM, HDS, and probably others[1] and typically include a NAS server box which has 2 or more front-end gigabit Ethernet (GigE) interfaces and 2 or more backend fibre channel ports. A gateway, theoretically allows a customer to upgrade the storage or gateway hardware independently. Gateways are typically used where storage area network (SAN) infrastructures are already present that can support the backend storage. There are three types of gateways: windows storage server based gateways, hardware gateways, and system gateways

- Windows Storage Server (WSS) gateways are available from DELL, IBM, NEC, Lefthand Networks, and HP. They share base functionality supplied by Microsoft's WSS software and run on any Intel PC server platform. WSS supports NFS, CIFS, FTP, iSCSI, WebDAV, NetWare, Apple Talk, and HTTP[2] file access protocols. The main ones to look at are NFS and CIFS. By supporting this they can support over 80% of all Windows and UNIX server access to file data.
- Hardware gateways use special purpose hardware/chips to speed up file I/O activity. The most prominent version of this is BlueARC, which has designed special NAS hardware to speed up NAS processing. OnStor is also using some unique hardware to pull together their NAS products.
- System gateways generally use embedded microprocessors in special packages to implement file services. Some of these have file server operating systems specifically designed for NAS operations. Many of these may have select hardware at the front or back-end to speed up this activity as well. What differentiate system gateways from hardware gateways are their focus on software functionality and the use of off the shelf microprocessors.

There are some "pure" software NAS gateways which are available from a number of vendors e.g., PolyServe, Red Hat GFS, Ibrix, ADIC, Veritas, and others. With these packages you purchase the software, install it on your hardware, attach some backend storage and you have a NAS system. WSS software can act in this same fashion as well. You can purchase Windows Server 2003 software directly from Microsoft and run WSS on your hardware. As much of these systems capabilities depend mainly on what hardware you use to implement them we will not be

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