

NAS PROTECTION

With release 4.1 Unitrends is announcing support for server-less NAS protection via direct NAS attach using CIFS or NFS.

Unitrends supports not only heterogeneous platforms and operating systems but also heterogeneous storage types. These storage types include DAS (Direct Attached Storage), SANs (Storage Attached Networks), and NASs (Network Attached Storage.) DAS support and SAN support are a function of the platform and the operating system residing upon that platform; in other words, the DAS and SAN storage is used as a low-level "block-level" device with a "personality" completely driven by the platform and operating system using the storage. NAS support is different; NAS is a "file-level" device which is accessed as a free-standing file system.

Protecting a NAS device is more complicated than protecting a DAS or SAN device because it in essence operates as an embedded server offering higher-level file services. There are primarily three mechanisms typically employed to protect NAS devices:

- **Client-Based NAS Attach:** The NAS is attached to the client (which is the customer's computer in this case) which is attached to the Unitrends DPU (Data Protection Unit.) The protocol used to communicate between the NAS and client, and between the client and the DPU, is either CIFS or NFS. CIFS (Common Internet File System) is a protocol originally developed by Microsoft while NFS (Network File System) is a protocol originally developed by Sun Microsystems. The primary disadvantages of this approach is that performance is decreased because data must be copied from the NAS to the client and then from the client to the DPU and that the client suffers performance degradation itself due to the intermediate copying of data.

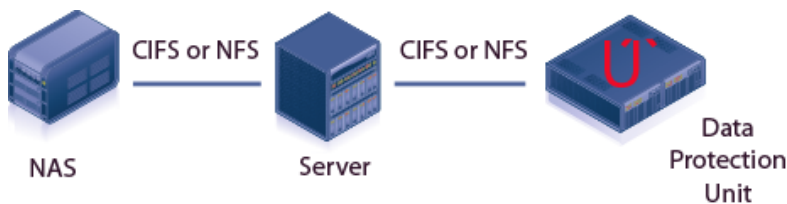


Figure 1: Client-Based NAS Attach

This is depicted in figure 1.

- **Direct NAS Attach:** The NAS is attached to both the client and the DPU. The protocol used to communicate is CIFS or NFS. The primary advantage of this approach that the disadvantages to the client-based NAS approach are negated: performance is increased and the client's performance is not affected.

This is depicted in figure 2.

- **NDMP (Network Data Management Protocol):** A protocol invented by NetApp and Legato specifically for transport of data between NASs and tape devices. Just as in direct NAS attach, the NAS is attached directly to both the client and the DPU. This approach offers the same performance improvement as the direct NAS attach method.

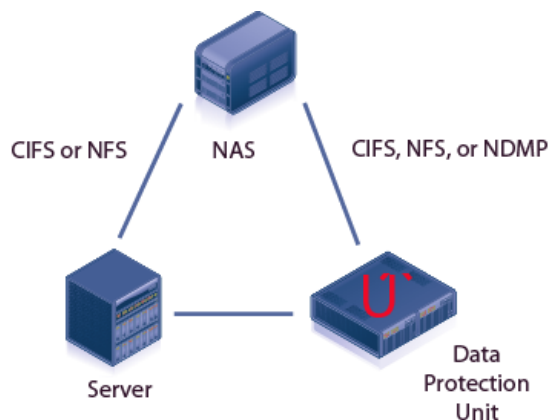


Figure 2: Direct NAS Attach and NDMP

This is depicted in figure 2.

These three primary mechanisms used to protect NAS devices are depicted in the table below:

Protection Method	Advantages	Disadvantages
Client-Based NAS Attach	<ul style="list-style-type: none"> • Supports backup and subsequent restores to different NASs. • Supports concurrent backups for higher performance. • May use native CIFS or NFS. 	<ul style="list-style-type: none"> • Indirect protection; increases load on customer's computer. • Indirect protection; decreases performance. • With CIFS or NFS extended ownership and permission attributes may not be supported. • Does not offer Microsoft VSS-level open file protection.
Direct NAS Attach	<ul style="list-style-type: none"> • Direct protection; no load on customer's computer. • Direct protection; faster performance due to direct D2D copy. • Supports backup and subsequent restores to different NASs (no vendor-proprietary lock-in.) • Supports concurrent D2D backups for higher performance. • May use native CIFS or NFS. 	<ul style="list-style-type: none"> • With CIFS or NFS extended ownership and permission attributes may not be supported. • Does not offer Microsoft VSS-level open file protection.
NDMP	<ul style="list-style-type: none"> • Direct protection; no load on customer's computer. • Direct protection; faster performance due to direct D2D or tape copy. • May use native NDMP; extended ownership and permission attributes may be supported. 	<ul style="list-style-type: none"> • Does not support backup and subsequent restores to different NASs (vendor proprietary-lock-in.)+ • Does not support concurrent D2D backups for higher performance (designed for tape.) • Does not offer Microsoft VSS-level open file protection.

With release 4.1 Unitrends offers direct NAS attach protection.¹ We offer this method because it offers the most advantages with the fewest disadvantages versus client-based NAS attach and NDMP when used for D2D (Disk-to-Disk) protection.²

¹ Some Unitrends customers use client-based NAS attach; Unitrends does not recommend that approach.

² We have some customers who "open" or "crack" their NASs such that they put Unitrends agents directly onto their NAS-based operating system. This has the same advantages as supporting a general-purpose computer with DAS (Direct Attached Storage); however, this is not recommended as a general-purpose technique unless the specific NAS operating system has been certified with the appropriate Unitrends agent.