

## White Paper

# Network Backup Solution Using VERITAS Net Backup with SuperSync Enterprise Backup

### *NETWORK BACKUP OF VOS DATA STORED ON EMC SYMMETRIX USING VERITAS NET BACKUP FACILITY AND SuperSync ENTERPRISE BACKUP:*

#### **Introduction:**

Many VOS users currently have enterprise backup solutions such as Tivoli, VERITAS, or IBM's ADSM to back up systems such as IBM, HP, Sun, Compaq, Dell, and other host computers. Many would like to be able to use these systems to back up their VOS data stored on EMC Symmetrix as well. VERITAS provides a rich set of tools and functionality that will be familiar to these users. However, these products are not VOS file aware and therefore cannot normally be used to back up VOS data.

SuperSync Enterprise Backup provides seamless connectivity between VOS hosts and network backup servers. SuperSyncs can be attached to Continuums via SCSI or Fibre Channel and to V Series processors via Fibre Channel.

#### **General Concept of VOS Network Backups:**

DRA uses VOS disks mounted as raw disk partitions on EMC Symmetrix RAID systems and on DRA's SuperSync Disk Arrays. This feature eliminates operating systems-specific attributes of the partition thereby allowing an Enterprise Backup Server to recognize the VOS partition as a raw disk. VERITAS and several other Enterprise Backup facilities such as Tivoli and ADSM, are able to recognize such raw partitions and to back them up as raw disk images. These backups are then handled by the Enterprise Backup Server in the same automated fashion as they handle data generated by other systems for which they are file aware, with the exception that files are stored at the disk image level only. Thus VOS data can be stored and accessed on the enterprise tape silo via the Enterprise Backup Server.

Once the raw disk images are backed up, they can be restored at the disk image level to any reserved raw partition selected by the user, provided that it is of the exact size as the original partition. Disk image restoration does not require operating system intervention the way a restore of a file level save does, so restores occur at hardware speeds. Once restored, the disk images can be accessed as active disks. Searches are accomplished using the same OS facilities as any other disk on the system.

## **SuperSync Disk Arrays Provide Reserve Disk Capacity for Restoring Network Backups:**

DRA's approach to network backups provides the required reserve data capacity on which to store the restored disk images once they are retrieved from the Enterprise Backup Server. This is done by using DRA's SuperSync Enterprise Backup. The SuperSync is mounted on the Stratus as up to 12 (SCSI) or 14 (fiber) virtual Stratus disks.

If it were not for this additional disk capacity, it would otherwise be necessary to overwrite an existing partition on the Symmetrix or SuperSync in order to gain access to the restored data. Since most users want to view the restored data while continuing to access their active VOS data, it would be intolerable to overwrite active data in order to view restored data.

## **The SuperSync Advantage for restoration of Network Backups:**

Two features of the SuperSync, which are not present in standard hard disks, permit the SuperSync to fulfill this function:

- SuperSync's Operating System is capable of running the VERITAS Client software.
- SuperSync's Gigabit Ethernet port allows network access between the SuperSync and the Network Backup Server.

## **Time Stamping of Network Backups:**

As with VOS Saves, the integrity of the files contained in a system backup is affected by the state of the application at the time the backup occurs. Important factors include operations that occur in main memory, application data, system data, and disk caching.

The only certain way to time-stamp backups to guarantee the integrity of all files used in the application is to shut down the application. However, a number of less drastic measures provide an acceptable level of integrity for most users. These include:

- Dismounting a disk
- Closing a file
- Performing backups at times of low I/O activity

## **General Concept of VOS Network Backups:**

Backups are accomplished in two phases. The first backup phase, called the VOS Backup Phase (B1), consists of a standard VOS Save routed to disk in lieu of tape, thereby creating VOS Save files (a VOS Save set) on disk. The second backup phase, called the Network Backup Phase (B2), consists of a Network Backup of the raw disk partition(s) on which the VOS Save files are stored.

Restores occur in the opposite sequence. The first restore phase, called the Network Restore Phase (R1), consists of a Network Restore of the raw disk partition on which the VOS Save files reside.

The second restore phase, called the VOS Restore Phase (R2), consists of a standard VOS restore operation which restores the VOS Save files to VOS file status on a VOS-mounted SuperSync disk.

Note: B2 (Network Backup) and R1 (Network Restore) require a copy of VERITAS Backup Client software running on the SuperSync. This software is generally acquired more cost effectively by the customer through the customer's master license with IBM and is, therefore, not included in DRA quotes. The customer supplies the software to DRA and DRA loads it on the SuperSync prior to shipment.

**B1: VOS Save Phase:** Using standard VOS features, it is feasible to attach a VOS-mounted disk (in this case a SuperSync disk partition configured as a VOS disk) to a VOS Save operation, in lieu of a VOS tape device. By using this feature, a standard VOS Save can thus be routed as a streaming save set to a SuperSync disk partition which is mounted as a VOS disk. Alternatively, the user can forego the use of VOS Saves and simply copy a file to the SuperSync disk. Furthermore, some third party products also create Save sets that can also be attached to disk in lieu of tape, thereby making them compatible with a SuperSync-based Network Backup solution.

VOS Save operations can be performed on command automatically scheduled using a simple VOS command Macro. Many customers have created such macros on their own. For customers who do not have their own macros, DRA provides a template called the SuperSync Scheduler.

The primary requirement of the saves is that they must be completed before the commencement of Phase B2, which will occur automatically at times agreed to by the VOS administrator and the VERITAS administrator.

Disks mounted on one Stratus module can be saved to a SuperSync mounted on another Stratus module through the use of StrataLink. StrataLink can present a bottleneck for module-to-module saves of very large capacities. In some instances, users will need to use additional SuperSync units to avoid this bottleneck.

The following diagram depicts the save paths that occur during B1, the VOS Backup Phase:

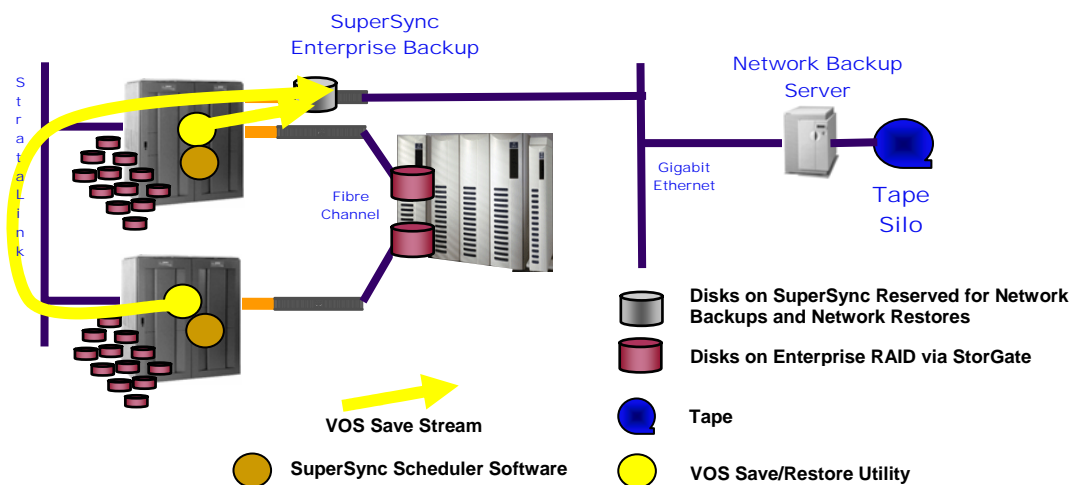


Figure 1: Sample Configuration during B1: VOS Backup Phase

**B2: Network Backup Phase:** Once VOS Save sets are stored on SuperSync disk, the disk partitions on which they reside are amenable to features not normally available to a standard VOS disk. The reason is that DRA uses VOS disks mounted as raw disk partitions on the SuperSync systems. This feature eliminates some of the Operating System specific attributes of the partition thereby allowing a VERITAS Client and VERITAS Backup Server to recognize the VOS partition as a raw disk. VERITAS, and several other Network Backup facilities such as Tivoli and ADSM, are able to recognize such raw partitions and to back them up as raw disk images. The VERITAS Backup Server handles these backups in the same automated fashion as they handle data generated by other systems for which they are file aware, with the exception that files are stored at the disk image level only. There is no file level access until the disk images are restored to disk.

B2 can commence immediately after B1 completes. The customer determines when this occurs. This is accomplished automatically by the VERITAS scheduler which is part of the VERITAS Client and VERITAS Backup Server software. The VERITAS Administrator will schedule Network Backups at a time agreed upon by the Stratus Administrator and the VERITAS Administrator. No further effort is required. The Network Backup occurs without the involvement of the Stratus computer or the StorGates used to access the EMC Symmetrix.

Disk images of the SuperSync disks that contain the VOS Save sets are thereby restored and mounted on VOS without interfering with the ongoing application operations. The live data is not affected. All Network Backups and Network Restores occur at hardware speeds. Continuum host cycles are not used in either of these operations (B2 and R1).

The following diagram depicts the save paths that occur during B2, the Network Backup Phase:

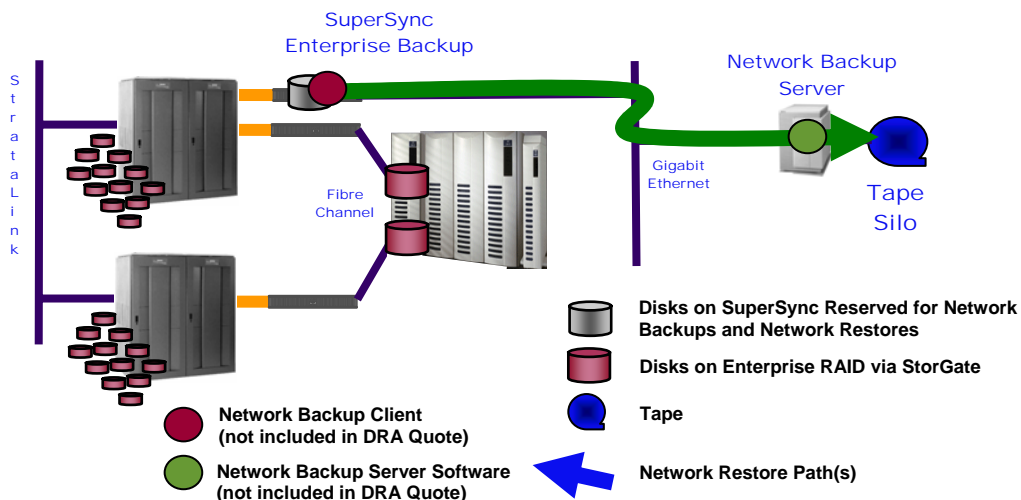


Figure 2: Sample Configuration during B2: Network Backup Phase

**R1: Network Restore Phase:** Once the raw disk images are backed up, they can be restored at the disk image level to any reserved SuperSync raw partition selected by the user. Disk image restoration does not require operating system intervention the way a restore of a file level save does. At hardware speeds, restores occur very quickly. Once restored, the disk images can be accessed as active disks. Searches are accomplished using the same OS facilities as any other disk on the system, and VOS Restore can operate on the save sets as it would on any save set stored on tape.

An advantage of the SuperSync architecture is that the save sets can be pre-restored to disk where they can be accessed immediately if a VOS Restore becomes necessary.

The following diagram depicts the restore paths that occur during R1, the Network Restore Phase:

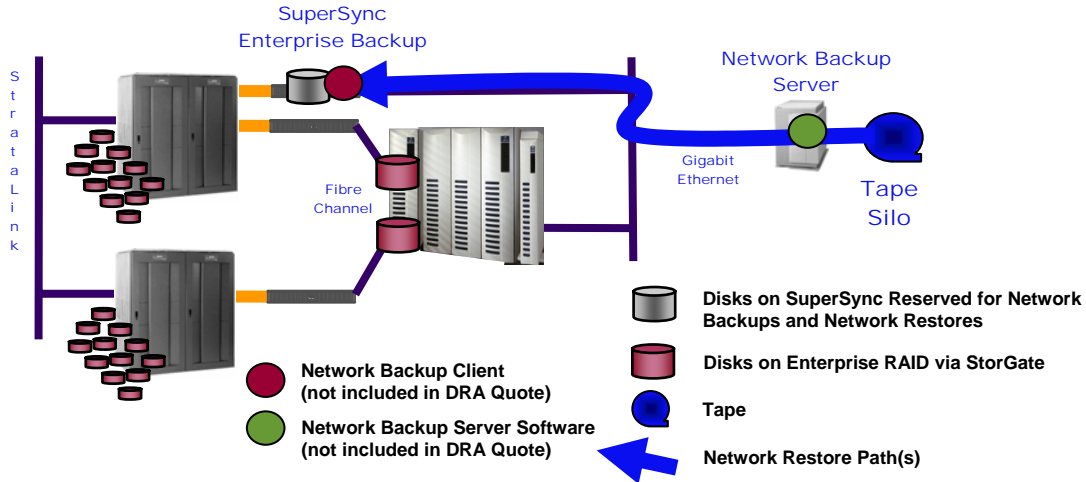


Figure 3: Sample Configuration during R1: Network Restore Phase

**R2: VOS Restore Phase:** After the restoration of the disk image is complete, the files that reside on the restored partitions thus contain standard VOS Save sets. VOS can restore these save sets as it would restore a tape. Once restored via VOS Restore facility, the restored files can be accessed and operated on in the same manner as any other VOS file. Files restored to one Stratus module can be copied or moved to other Stratus modules through the use of StrataLink. StrataLink can present a bottleneck for the movement of very large files. In some instances users will need to use additional SuperSyncs to avoid this bottleneck.

The following diagram depicts the restore paths that occur during R2: the VOS Restore Phase:

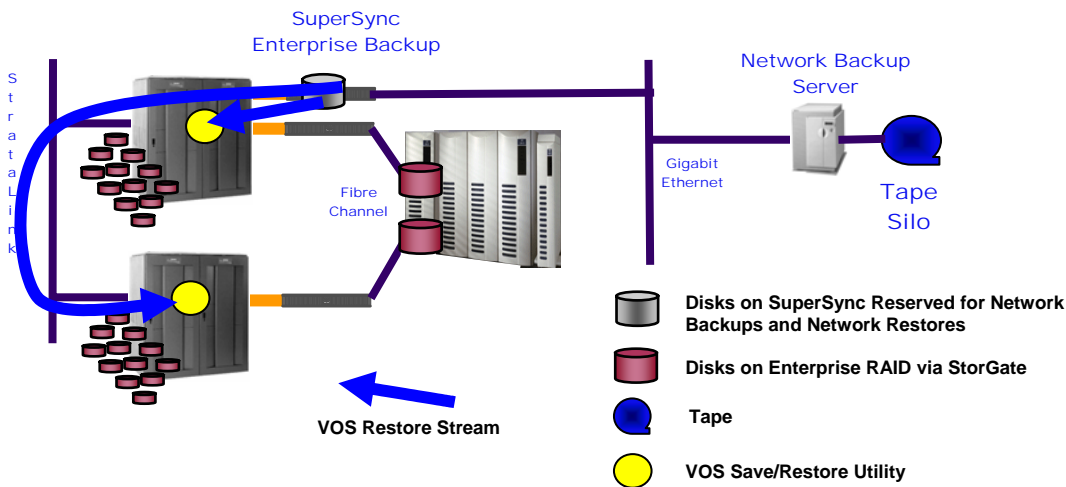


Figure 4: Sample Configuration during R2: VOS Restore Phase

**Other Features of Network Backups:**

The proposed backup solution relies upon the use of existing network backup facility infrastructure at the customer site. If the network backup facility infrastructure supports bi-directional, site-to-site (cross) backup for other platforms, the proposed backup solution will also support that functionality for the VOS platforms. This is solely a matter of network configuration under control of the VERITAS Administrator.

**Time Stamping:**

When using this method of backup, time stamping is generally not an issue because VOS users can handle this via the timing of their VOS Saves.

**Summary:**

SuperSync enables VOS users to include VOS data in their Network Backup solution thereby streamlining operations and reducing costs. SuperSync provides the brains to make Varitas, Tivoli, and ADSM VOS file aware and, therefore, able to back up VOS data.