



White Paper

StorGateTM/Symmetrix Technical Overview

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Introduction to StorGate

The StorGate™/Symmetrix product provides seamless connectivity between the Stratus Continuum or V Series, and the EMC Symmetrix.

When data is written, the StorGate/Symmetrix emulates standard Stratus D9xx series disk drives and converts the format of the data to a form the Symmetrix supports. When the data is read back by the Stratus, the StorGate/Symmetrix requests the proper data from the Symmetrix and converts the data back to a format compatible with the Stratus. The data is then returned to the Stratus. All data integrity information (checksum, CRC, etc.) used by Stratus VOS is retained with the data and stored on the Symmetrix. It is then used by VOS when the data is returned to the Stratus to ensure the proper data was returned and contains no errors.

StorGate is designed to work as a "black box" and is intended to operate without customer control or input once the unit has been set up and configured by DRA. DRA installs all software components at the time of the StorGate/Symmetrix installation and any additional components as deemed appropriate thereafter via dial-in telnet/ssh sessions

Software installation is not an end user function and is provided by DRA at no cost to end users who are under standard maintenance. The only exception to this is when the unit is set up as part of a disaster recovery solution. In this configuration the StorGate/Symmetrix must have different configuration files and they must be enabled when conditions change. These configuration changes are accomplished with a utility provided to switch the configuration between Normal, Recovery, and Disaster modes. There are no files or programs the user needs to monitor or change. All necessary software updates and upgrades are provided and installed by DRA via scheduled periodic dial-in telnet/ssh sessions at no additional charge to customers under standard maintenance. Unauthorized modification of any file or program may result in failure of the unit and/or data loss.

Disaster Recovery Capability

Many customers use StorGate as part of their corporate disaster recovery strategy. Because StorGate allows VOS data to be stored on an enterprise storage facility, corporate methods of disaster recovery protection such as instantaneous site-to-site replication of data can be extended to the Stratus platform. Identical disk images are thus available at the production and backup site. In the event of a failure at the production site, a Stratus machine at the backup site can resume operations by simply mounting the replicated disks.

Due to the complexities of individual configurations a full disaster recovery plan requires a specific site study with customer input. Consulting services for this purpose are available from Stratus Technologies.

Optional Feature: PowerPath Facility

The optional StorGate PowerPath Facility allows Stratus users to take advantage of EMC's PowerPath, a host-based software that works with the storage system to intelligently manage I/O paths.

PowerPath supports multiple paths to a logical device, enabling PowerPath to provide automatic failover in the event of a hardware failure. PowerPath automatically detects path failure and redirects I/O to another path.

PowerPath also provides dynamic multi-path load balancing for many storage platforms. PowerPath distributes I/O requests to a logical device across all available paths, thus improving I/O performance and reducing management time and downtime by eliminating the need to configure paths statically across logical devices. Check with your EMC representative for support of load balancing on your storage platform.

PowerPath is loaded onto the StorGate system at the time of installation under an EMC license provided by the customer. The PowerPath serial number must be made available at the time of installation.

The facility runs automatically and without administration required. PowerPath is enabled through a dual port fiber card as opposed to the single port fiber card that comes standard with StorGate. The dual fiber port is located on the back of the StorGate unit as shown below.

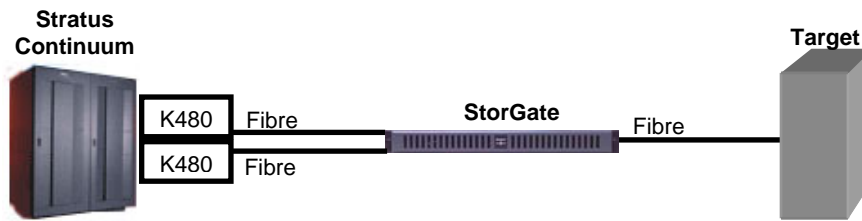
Dual Fiber for PowerPath Facilitation



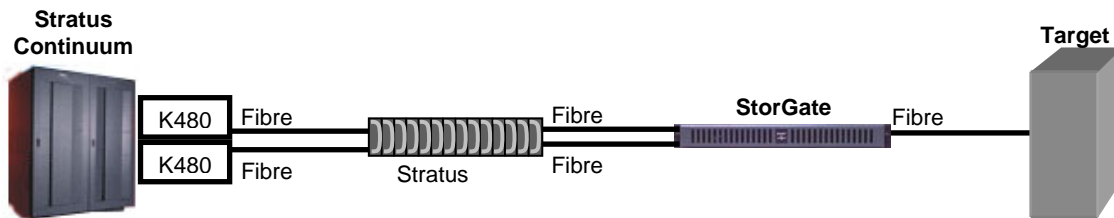
Dual Port Fiber Card for PowerPath Facility

Physical Connections

The StorGate/Symmetrix connects directly into the data path between a Stratus VOS Continuum or V Series host and a RAID target storage array (EMC Symmetrix) as shown in Figures 1 and 2 below. The VOS Continuum or V Series host sees the StorGate/Symmetrix as one or more standard Stratus disks, and the target storage array sees the StorGate/Symmetrix as a standard, target-supported host.

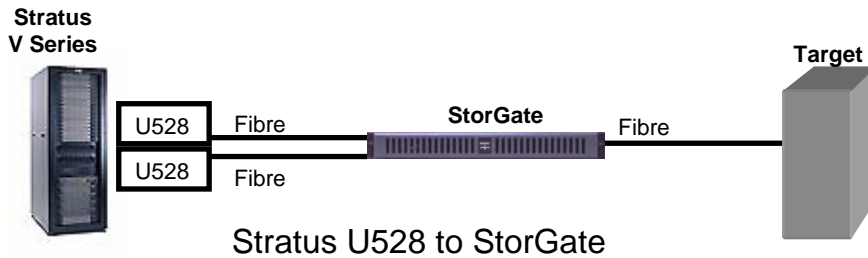
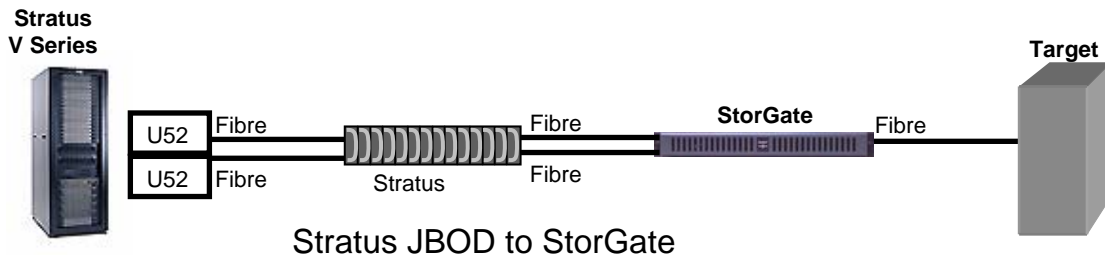


Stratus K480 to StorGate



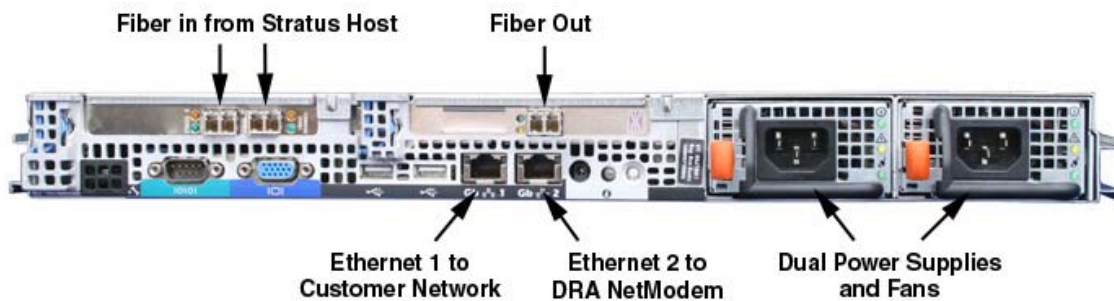
Stratus JBOD to StorGate

StorGate/Symmetrix Connection Between a Stratus VOS Continuum K480 or JBOD Port and an EMC Symmetrix



StorGate/Symmetrix Connection Between a Stratus V Series U528 or JBOD Port and an EMC Symmetrix

The StorGate/Symmetrix connects via Fibre Channel to the Symmetrix as shown below. The StorGate/Symmetrix features dual fiber connections in from the Stratus and dual power supplies. For maximum protection, each fiber port should be connected to separate duplexed fiber cards on the Stratus. Both power supplies should be connected to receptacles on separate circuits with uninterruptible power supplies.



StorGate/Symmetrix Back Panel with Fibre Channel Interface

Configuration Options

StorGate/Symmetrix stores VOS data on the Symmetrix target as one or more virtual Stratus disk types. VOS D913 and D914 disks are currently supported on StorGates. Stratus no longer sells D913 disks, but the D913 disk type remains in VOS. Therefore, StorGates can be configured as D913s. If a StorGate is partnered to another StorGate, users may choose to use the D913 disk type, depending on their capacity needs. However, for most users it will no longer be practical to partner StorGates to Stratus D913 disks.

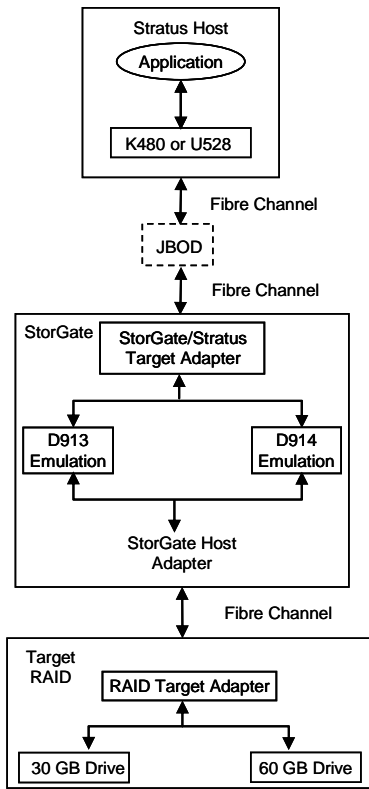
From the VOS host perspective these virtual disks behave identically to the physical disk type. The virtual disk types match so exactly the equivalent Stratus physical disk type that a virtual disk on the Symmetrix target can be duplexed with an equivalent physical Stratus disk. This allows a variety of possible configurations, which include:

- VOS disks duplexed with StorGate/Symmetrix virtual disks
- StorGate/Symmetrix virtual disks duplexed with each other
- Multiple VOS hosts accessing one EMC Symmetrix
- Two StorGate/Symmetrix units are required to provide true VOS duplexing between VOS virtual disks on the EMC target storage array.

Internal Operation

StorGate/Symmetrix acts as a translator between the VOS I/O subsystem and the EMC Symmetrix target I/O host interface as illustrated below. When a VOS application issues an I/O request the VOS I/O subsystem converts it to a physical I/O command. The K480 on the Continuum, the I/O module on the V Series, or the JBOD then passes this command to StorGate/Symmetrix over the Stratus Fibre Channel bus.

StorGate/Symmetrix responds to each VOS physical I/O command exactly as a standard disk (D913 or D914) would respond. In order to accomplish this disk emulation, StorGate/Symmetrix converts the Stratus disk address into an address for the corresponding data on the target, performs the appropriate I/O operations on the target, then converts data and status returned by the target into an appropriate response for the K480, U528, or JBOD.



StorGate/Symmetrix as Translator Between Stratus Host and EMC Symmetrix