

Software Product Description

PRODUCT NAME: Compaq SANworks Virtual Replicator – Version 2.0

SPD: 70.41.02

DESCRIPTION

Compaq SANworks Virtual Replicator combines a rich set of innovative capabilities that enhances and simplifies storage management for Windows NT and Windows 2000 environments. Through virtualization, online volume growth, snapshot and management features, the software complements the standard capabilities within the operating system. SANworks Virtual Replicator utilizes industry-standard server, storage, and network-interconnect components, protecting an organization's current and future storage investments.

CUSTOMER BENEFITS

- Provides maximum flexibility when configuring Windows NT and Windows 2000 storage through virtualization.
- Allows easy expansion of existing storage capacity on Windows 2000 for quick response to evolving storage requirements
- Enables minimal downtime for backup since backups are performed against the snapshot, leaving the production volume available to support normal business operations
- Facilitates fast-restores through the ability to keep snapshots online and use to quickly recover lost or damaged files.
- Provides quick and efficient volume copies that are created in seconds and only use storage capacity when production data changes.
- Reduces system administration of data and storage with easy-to-use and automated management to increase productivity of IT staff.

Definitions

The following terms are used frequently throughout this SPD:

- Storage unit --- a storage unit is the underlying storage entity that is used to create a storage pool. A storage unit may be a physical disk, a logical disk created by a storage adapter or controller, or a collection of disks bound into a storage controller or adapter-based RAID array. Once a storage unit has been bound into a storage pool it is no longer directly accessible by application software. A storage unit cannot be created using host-based, software RAID.
- Storage pool --- A storage pool is created when one or more storage units are bound together into a single aggregation of disk space.
- Virtual disk --- A virtual disk is created by allocation of a section of a storage pool. The allocation size is arbitrary, but cannot exceed the size of the storage pool. A virtual disk functions identically to an ordinary disk.

Compaq SANworks Virtual Replicator V2.0 SPD 70.41.02

- A Snapshot --- A snapshot is an instant, virtual-replica of a target virtual disk. At creation, a snapshot contains identical data to its parent, virtual disk. Snapshot creation is very fast, and is performed without the requirement to physically copy data. A snapshot functions identically to an ordinary disk.
- Network disk --- A network disk is accessed by a SANworks Virtual Replicator client system. It is functionally identical to a locally connected disk, but is served across a TCP/IP network by a SANworks Virtual Replicator storage server.
- System --- A system is an individual computer, either not clustered (standalone) or a member of a Microsoft Cluster Server cluster.

Storage Features

- **Virtualization:** Allows companies to respond quickly to rapidly changing storage capacity requirements. With storage virtualization, multiple storage arrays can be grouped into a pool of disk space for individual or clustered systems to use. Multiple virtual disks, up to 1 terabyte in size, can be created from a pool for users and their applications. System administrators can tailor disk space to specific requirements.
- **Online volume growth:** Enables easy, non-disruptive growth for Windows 2000 with zero downtime. Online Volume Growth allows a system administrator to grow an existing volume on a SANworks Virtual Replicator virtual disk and also a Windows 2000 basic disk. The system will remain online, and the data on the volume will remain intact.
- **Snapshots:** Enable the instant creation of multipurpose virtual replicas of production data without the requirement of a physical copy. Snapshots function identically to ordinary physical disks with both read and write capability. Whenever a quick copy of production data is needed, snapshots can be used with minimal disruption to running applications. For example, the snapshot can be the source for backup using standard backup tools. Snapshots can remain online for restore operations, testing, and data mining.
- **Management:** Simplification through easy-to-use interfaces using Microsoft Management Console or a command line. Interactive wizards are available to guide the administrator through all management tasks and create automatic schedules of operations.

Cluster Features

SANworks Virtual Replicator can be used in Microsoft Cluster Server (MSCS) environments. SANworks Virtual Replicator defines the following four MSCS failover resources:

- Storage Disk Unit -- All storage devices that comprise a pool are failed-over to a surviving system in the event of a server shutdown or failure.
- Storage Pool -- When a storage pool fails-over, all of its associated virtual disks and snapshots also failover.
- Network Disk Server -- All disks served by the network disk serving capability are defined as MSCS failover resources. Disks that are being served by one system in an MSCS cluster will automatically be moved to another system during failover activities. This failover is invisible to client applications; outstanding I/O operations are automatically restarted and no errors are returned to client applications.
- Network Disk Client -- Disks being accessed by the network disk client software are defined as MSCS resources, and failed over to a surviving MSCS system in the event of client failure or shutdown.

CONFIGURATION RULES

- The maximum number of storage units in a pool is 8.
- The number of pools that may be configured on a system is unlimited, but will be constrained by the number of storage units available.
- The maximum number of virtual disks that may be created in a pool is 8.
- The largest virtual disk that can be created is one Terabyte.
- The smallest virtual disk that can be created is 10 Megabytes.
- The maximum number of snapshots and snapshots-of-snapshots of a virtual disk is 12.

Compaq SANworks Virtual Replicator V2.0 SPD 70.41.02

- The maximum number of network disks a system (or cluster) may serve is 23 (drive letters D-Z).
- The maximum number of served network disks that a network disk client system (or cluster) may connect to is 23 (drive letters D-Z).
- All virtual disks, snapshots, and network disks must have only one partition, which must be formatted with the NTFS file system.
- A system cannot be configured as both a network disk server and a network disk client. Additionally, when the network disk capability is used in an MSCS cluster configuration, all the systems in the cluster must be configured equivalently -- all network disk servers, or all network disk clients.
- A storage unit must not be any of the following devices:
 - Removable disks, including CD-ROMs and Jaz drives.
 - System or quorum disks.
 - Mirror, stripe and volume sets created by Windows NT Disk Administrator (FTDISK).
 - Network disks served from a remote system.
- A storage unit can be a member of only one pool.
- For each Network Disk, the architecture of the Network Disk Client and Server systems must be the same (both must be Alpha or both must be Intel).
- In MSCS cluster configurations all storage units that comprise a storage pool must be configured on a shared access interconnect (such as SCSI or Fibre Channel).
- Dynamic RAID array expansion is not supported. Do not increase the amount of storage in a storage pool by adding more physical disks to an existing RAID array. Instead, create a new RAID array and logical unit from the physical disks, and then add the new logical unit to the storage pool.

Recommendations

- If any storage unit in a pool fails, access to the entire pool -- all virtual disks and snapshots -- is lost. Therefore, in commercial configurations, it is very strongly recommended that all storage units in a pool be configured using storage controller or adapter-based RAID capabilities. All storage units in a pool should be configured to the same RAID level, since the total availability of the pool is limited by the availability of its weakest storage unit.
- See the product release notes included with the product for a complete explanation of known limitations.

HARDWARE SUPPORT

CPU Support

SANworks Virtual Replicator is supported on any Intel, Pentium-class, CPU, as documented in the Microsoft Windows NT/Windows 2000 Hardware Compatibility List.

Peripheral Option and Storage Controller Support

Any disk and associated I/O subsystem supported by the Windows NT or Windows 2000 operating system can be used to provide storage units for inclusion in a pool.

SOFTWARE REQUIREMENTS

Microsoft Operating Systems

SANworks Virtual Replicator is supported on Microsoft Windows NT, Version 4. Service pack 4, 5, or 6 must be installed.

SANworks Virtual Replicator is supported on Microsoft Windows 2000; Professional, Server and Advanced Server editions

Compaq SANworks Virtual Replicator V2.0 SPD 70.41.02

Clustering Environment

SANworks Virtual Replicator is supported in any valid Microsoft Cluster Server configuration, as defined in the Microsoft Cluster Server HCL.

Internet Explorer

Internet Explorer V5.0 or later is required.

GROWTH CONSIDERATIONS

The minimum hardware and software requirements for any future version of this product may be different than the requirements for the current version.

DISTRIBUTION MEDIA

SANworks Virtual Replicator is available on CD ROM distribution media. 60-day evaluation kits are available from the *SANworks* web site.

ORDERING INFORMATION

SANworks Virtual Replicator is orderable as follows:

Part Numbers

1 Lic, Media, & Doc	91802-B21
5 Lic, Media, & Doc	91807-B21
10 Lic, Media, & Doc	191803-B21
25 Lic, Media, & Doc	191804-B21
50 Lic, Media, & Doc	191805-B21
100 Lic, Media, & Doc	191806-B21

Upgrade Part Numbers

1 License Upgrade	191796-B21
5 License Upgrade	191801-B21
10 License Upgrade	191797-B21
25 License Upgrade	191798-B21
50 License Upgrade	191799-B21
100 License Upgrade	191800-B21

Services Part Numbers

QB-66M**.**	QT-66M**.**
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Installation and Telephone Support services available

For additional information on available licenses, services, and media, refer to the appropriate price book.

DOCUMENTATION

The SANworks Virtual Replicator *System Administrator's Guide* is provided as hardcopy documentation. Documentation is also provided on the distribution CD in PDF format. You may print the electronic software

Compaq SANworks Virtual Replicator V2.0 SPD 70.41.02

documentation accompanying the software as reasonably necessary to exercise your license to use the software.

SOFTWARE LICENSING

This software is furnished under the licensing provisions of Compaq Computer Corporation's Standard Terms and Conditions. For more information about Compaq's licensing terms and policies, contact your local Compaq office.

Product Licensing

All *SANworks* Virtual Replicator functionality is licensed per system. The only exception is the management GUI, for which a single license grants the right to install the software on multiple systems. Increment Licenses, or multiple licenses sold together, are available in denominations of 5, 10, 25, 50 and 100. New versions of *SANworks* Virtual Replicator are available by purchasing upgrades.

Components:

- Pools/Virtual Disks/Snapshots -- Licensed per system.
- Network Disk Server -- Licensed per system.
- Network Disk Client -- Licensed per system.
- Management GUI -- A single license grants the right to install the software on multiple systems.

Note that a single license grants the use of multiple components on a single system.

SOFTWARE PRODUCT SERVICES

Services for *SANworks* storage management software products include telephone support services and installation services. Access to bug fixes and maintenance releases will be included in the telephone support service. When new versions of *SANworks* products become available, existing customers can purchase upgrades. There are no update services available for new versions of *SANworks* products. For more information, contact your local Compaq office. For Services part numbers see 'ordering information'.

SOFTWARE WARRANTY

Compaq provides this software with a 90-day conformance warranty in accordance with the Compaq warranty terms applicable to the license purchase.

The above information is valid at time of release. Contact your local Compaq office for the most up-to-date information.

YEAR 2000 STATEMENT

This product is capable of accurately processing, providing, and/or receiving date-data from, into and between the twentieth and the twenty-first centuries, and the years 1999 and 2000, including leap year calculations, when used in accordance with the associated product documentation and provided that all hardware, firmware and software used in combination with the product properly exchange accurate date data with the product.