



# Software Product Description

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**PRODUCT NAME:** Compaq Storage and Cluster Software Extensions for Windows NT  
SPD 70.41.01

## DESCRIPTION

Compaq Storage and Cluster Software Extensions for Windows NT (SCE) comprises a rich set of capabilities that can be used to improve the availability, scalability and manageability of a Microsoft Windows NT operating system environment. These capabilities are focused in three areas:

- Providing enhanced storage management. SCE provides logical volume management capabilities, with disk virtualization, snapshots, and TCP/IP-based disk serving.
- Providing enhanced clustering capabilities. Layered on top of Microsoft Cluster Server (MSCS), SCE takes full advantage of MSCS's high availability features.
- Providing enhanced system administration. SCE provides a unique, multi-system management utility that simplifies and centralizes the administration of large environments.

SCE can be deployed on any valid Windows NT system, server or workstation, clustered or not clustered, and is available for Intel x86 and Compaq Alpha architectures. Individual features can be installed and used separately, providing flexibility and simple customization.

### 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.

- 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.
- A Snapshot — A snapshot is created by SCE by replication of a 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 SCE client system. It is functionally identical to a locally connected disk, but is served across a LAN /WAN network by a SCE storage server.
- System — A system is an individual computer, either not clustered (standalone) or a member of a cluster.

### Storage Features

Compaq Storage and Cluster Software Extensions for Windows NT provides a logical volume management capability. The capability permits a group of storage units to be concatenated into a single, large storage pool. Multiple storage pools may be created. Multiple virtual disks can be created within a pool; virtual disk size is constrained only by the amount of unallocated space within the pool. Storage units can be added to a pool as needed, increasing the size of the pool.

Snapshots of virtual disks can be created at any time. Snapshots are exact copies of their parent, virtual disk at the time of creation. Snapshots operate as normal disks, and are readable and writeable. Snapshots may be taken of snapshots, permitting the creation of hierarchies of snapshots of a virtual disk. A virtual disk may be deleted at any time, provided that it does not have any derivatives (snapshots of virtual disks, or snapshots of snapshots). A snapshot may be deleted at any time, regardless of the presence of derivative snapshots.

The disk serving feature of SCE permits any disk — physical, virtual, or snapshot — to be made available to a remote system on a TCP/IP network. Served disks are not accessible by the serving system; served disks are fully accessible by the client system, operating identically to an ordinary disk.

Management of SCE storage capabilities is performed with an easy to use Microsoft Management Console snap-in GUI. Additionally, an MS-DOS command line interpreter based command line interface is provided, in order to simplify control of SCE functions within batch and command procedures. Both interfaces provide the ability to manage SCE operations on remote systems.

#### *Cluster Features*

Compaq Storage and Cluster Software Extensions for Windows NT can be used in Microsoft Cluster Server (MSCS) environments. SCE 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 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.

#### *Management Features*

Compaq Storage and Cluster Software Extensions for Windows NT includes a multi-system, real-time system monitoring capability — the Availability Manager.

Using the Availability Manager, a single Windows NT workstation can be used to monitor many other Windows NT systems (servers and workstations) distributed across a LAN. Monitoring of multiple systems is performed using a Java-based application. A range of system metrics are monitored, such as CPU and Memory utilization, disk space consumption, and I/O rates.

The Availability Manager comprises two distinct sub-components, the data collector and the data analyzer. The data collector is installed on every server or workstation that is to be monitored. The data analyzer is installed on the workstation that will perform monitoring operations.

The Availability Manager uses a private LAN protocol, so is able to continue monitoring activities in the event that standard network stacks, such as TCP/IP and NetBEUI, are non-functional.

#### **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 maximum number of snapshots and snapshots-of-snapshots of a virtual disk is 12.
- The maximum number of network disks a system may serve is 50.
- The maximum number of served disks that a network disk client may connect to is 23 (driver 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 Alpha or both 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).

#### *Recommendations*

If any storage unit in a pool fails, access to the entire pool — all virtual disks and snapshots — is lost. Therefore, in high availability configurations, it is 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.

The number of systems that the Availability Manager can monitor depends on several factors — the power of the monitoring system, the requested data update rate, and the utilization level and speed of the LAN. In general, a 200MHz Pentium-based Windows NT Workstation with 64 Mbytes of memory should be able to monitor approximately 25 Windows NT systems, using a standard Ethernet LAN. A 128 Mbyte system should be able to monitor 50-60 systems.

## **HARDWARE SUPPORT**

### *CPU Support*

Any Alpha or Intel CPU, as documented in the Microsoft Windows NT Hardware Compatibility List, is supported by SCE.

In Microsoft Cluster Server configurations, refer to the MSCS Hardware Compatibility List.

### *Peripheral Option and Storage Controller Support*

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

### *LAN Support*

The following interconnects can be used by SCE:

- Ethernet — normal (10Mb/sec), Fast (100Mb/sec) or Gigabit (1000Mb/sec)
- FDDI

## **SOFTWARE REQUIREMENTS**

### *Microsoft Windows NT Operating System*

Compaq Storage and Cluster Software Extensions for Windows NT is supported on Microsoft Windows NT, Version 4. Service pack 3, or later, must be installed.

### *Clustering Environment*

SCE is supported in any valid Microsoft Cluster Server configuration.

### *Internet Explorer*

The Storage components (pools, virtual disks, and snapshots) are managed using an MMC-compatible snap-in. This requires Internet Explorer V3.02 or later.

The Availability Manager component requires Internet Explorer V4.0 or later. It is recommended that the most up-to-date version of the Internet Explorer Java virtual machine be installed.

### *Microsoft® BackOffice® certification*

Compaq Storage and Cluster Software Extensions for Windows NT is certified by Microsoft to display the “Designed for BackOffice” logo.

## **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**

Compaq Storage and Cluster Software Extensions for Windows NT is available on CD-ROM distribution media.

## **ORDERING INFORMATION**

Compaq Storage and Cluster Software Extensions for Windows NT is orderable as follows:

<b>Compaq standard Order No.</b>	<b>Digital standard Order No.</b>	<b>Contents</b>
388931-001	QB-66MAA-SA	System License, CD-ROM, Documentation
388932-001	QM-66MAA-AA	System License

## DOCUMENTATION

The Compaq Storage and Cluster Software Extensions for Windows NT System Manager's Guide is provided as hardcopy documentation.

Documentation is also provided on the distribution CD-ROM in PDF format. You may print the electronic software 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*

Compaq Storage and Cluster Software Extensions for Windows NT is licensed as follows:

- Storage Software Components:
  - Network Disk Server — Licensed per system.
  - Pools/Virtual Disks/Snapshots — Licensed per system.
  - Network Disk Client — Licensed per system.
  - Management GUI — A single license grants the right to install the software on multiple systems.
- Availability Manager Component:
  - Data Analyzer — A single license grants the right to install the software on multiple systems.
  - Data Collector — 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

A variety of service options are available from Compaq. For more information, contact your local Compaq office.

## SOFTWARE WARRANTY

This software is provided by Compaq 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.

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