

# QUICKSPECS

Compaq *SANworks* Data Replication Manager for the Fibre Channel RAID Array 8000(RA8000), Enterprise Storage Array 12000 (ESA12000) storage subsystems and MA8000/EMA12000 storage solutions is a storage-based data replication and disaster tolerance solution for Tru64 UNIX V5.0a.

## This solution provides:

- On-line, real-time local and remote data replication (storage system to storage subsystem)
- Data replication over the Fibre Channel Storage Area Network (SAN).
- Cloning at Initiator and Target sites.
- Snapshot support at Target site.
- Switch Zoning support.
- Asynchronous and synchronous disaster tolerant mirroring.
- Write History Logging and "MiniMerge" reconstruction.
- "Tru Cluster 5.0 with Memory Channel

## Remote Replication

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Compaq *SANworks* Data Replication Manager provides the ability to replicate data online and real time to a local or remote location over a Fibre Channel Storage Area Network (SAN).

## Disaster Tolerance

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In the event of a disaster, Compaq *SANworks* Data Replication Manager assures an on-line copy of data is available at the alternate site to support rapid resumption of critical processing at the alternate site. Resumption can usually occur within seconds or minutes, instead of hours or days, as with other disaster recovery plans.

## Storage Based

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Data replication is performed at the storage subsystem level and is totally transparent to the host, alleviating unnecessary host cycles to perform the data mirroring function.

## High-Performance

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Replication of data functionality is performed at full fibre channel speeds (100 MB/second) across the Storage Area Network. Dual-active controller design provides extra processing power to service host I/O requests. A unique read-ahead cache mechanism can increase performance 30 to 40 percent for applications that sequentially read data.

## Synchronous and Asynchronous Copy Operations

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Data Replication Manager offers either synchronous or asynchronous data transfer options. Synchronous data transfers offer the highest levels of data protection. With synchronous operations, both the local and remote copies are identical and concurrent at all times. Synchronous mirroring ensures that data copies are always identical, to prevent critical data loss in the event of a failure or disaster. In this mode, data is written simultaneously to the cache of the local storage system and the remote storage system, in real time, before the application I/O is completed, thus ensuring the highest possible data consistency. Synchronous replication is appropriate when exact consistency is critical to the business application.

As opposed to synchronous data transfers, local and remote copy sets are created but are not identical and concurrent at all times. Asynchronous mode provides the highest level of performance advantage, while maintaining very high levels of disaster tolerance protection. Asynchronous data transfers writes data to the source storage system, acknowledges and completes the I/O prior to synchronizing data with the target storage system. The number of unsynchronized write operations that are outstanding ("in-flight") at any given time are pre-determined by the customer depending on their level of tolerance to lost data. Subsequent write operations will not be accepted until the target has been synchronized. Asynchronous replication is appropriate when longer distances are required for remote replication and a high level of storage performance is needed locally.

## Platform Support

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- Array Controller Software – ACS 8.5P in multibus mode is supported with Data Replication in the Tru64 UNIX environment.
- Operating system support - The RA8000/ESA12000 and MA8000/EMA12000 subsystems in a Compaq *SANworks* Data Replication Manager is supported with Tru64 UNIX 4.0f and 5.0a.

## Multi-Platform Support

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In addition to the RA8000/ESA12000, DRM supports the new MA8000/EMA12000, a family of fully integrated Fibre Channel storage solutions. It is the outgrowth of years of StorageWorks experience, successfully delivering quality solutions into applications with mission-critical requirements.

The MA8000/EMA12000 is the upgrade for the RA8000/ESA12000 storage solutions to the new StorageWorks packaging. MA8000/EMA12000 maintains the support of the HSG80 controller and associated features and adds the benefits of universal drive support, higher density of drives per enclosure, flexible configurations and higher capacity per cabinet.

The MA8000/EMA12000 is designed for the data center where there is a need to configure high-capacity systems having application-specific demands for high performance. MA8000/EMA12000 components provide the flexibility to configure solutions to provide unlimited capacity and scalable performance in a small footprint. The solutions include built-in and optional features for multi-vendor operating environments, and stringent data center availability requirements.

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## Extended SANs over direct Fibre Channel – 10KM, 40KM, and now up to 100 KM

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Data Replication Manager now provides the capability to replicate data over direct fibre channel over distances of up to 100 km or more via the Very Long Distance GBIC . Data replication can also be performed at full fibre channel speeds over distances of up to 40km (approximately 25miles) over direct fiber channel links with optical link extenders. The optical link extenders are an ideal solution for remote storage or disaster recovery spanning large campus or metropolitan environments.

## Extended SANs using Wave Division Multiplexing Technologies

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Now the *SANworks* Data Replication Manager supports Wave Division Multiplexing (WDM) and Dense Wave Division Multiplexing (DWDM) optical networks. WDM and DWDM provide high bandwidth connectivity of enterprise level SANs over a metropolitan area via private or public fiber optic networks. Remote replication via WDM and DWDM is ideal when customers already have existing fiber optic cables between the two sites but are unable to install additional cables. WDM and DWDM maximize the existing fiber optic infrastructure.

## Write History Logging “MiniMerge” Reconstruction

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With **Write History Logging**, if the local and remote copy sets become out of sync due to link failures, etc., then the target member does not need to incur a full copy when the a link is restored. Rather, only those incoming host writes while the links are down are re-issued (referred to as “mini-merged”) to the target to resynchronize the data in the same order in which they were received. The writes that would have gone to the target are logged (referred to as “write history logging”) to the assigned log unit. Write History Logging has the benefit of substantially reduced resynchronization times.

## High Availability

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A dual-active controller architecture ensures continuous data availability to host applications in the event of a controller failure.

## No-Single-Point-Of-Failure

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Dual host bus adapter (HBA) failover software and redundant component architecture eliminate single points-of-failure from server to local storage to remote storage. Even in a failover state to the remote site, DRM offers the highest levels of data availability with no SPOF.

## Scalability

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A choice of 4 GB, 9 GB, 18 GB and now 36 GB, 1.6 inch Ultra-SCSI drives in modular 24 drive array enclosures allows up to 2.5 TB (72 x 36 GB) of critical storage capacity in a disaster tolerant configuration. Up to 4 storage arrays per site can be utilized for a total of 10 TB of remote mirroring capacity. Up to 6 HBAs per host , 12 hosts per storage system, and cascaded switches are now supported.

## Hot-Swappable Components

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Hot-swappable component architecture allows failed components to be replaced without impacting system operations.

## Manageability

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*SANworks* Command Console (SWCC) provides a graphical user interface (GUI) to setup/configure, monitor, and troubleshoot the entire storage subsystem and configuration.

## Minimum Configuration

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- Two ESA12000 or RA8000 subsystems – one at the target site and one at the initiator site
- Two Fibre Channel switches at each target and initiator site
- Two Fibre Channel or ATM links between sites using Single Mode Fiber Optic cables
- Two Host Bus Adapters per host with multiple-bus failover capability

## Zoning

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Zoning provides the ability to partition the switched fabric into multiple zones and limits visibility of a controller to a particular zone. You can increase the number of servers per SAN and dedicate a zone for a specific purpose, for example, a dedicated backup zone, thus allowing re-utilization of hardware in the SAN.

## Bootless Failover

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Upon failover initiation, the bootless failover procedure allows the server to dynamically recognize LUNs (failed over remote copy sets, snapshots, or clones) without rebooting the server.

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## Clone and Snapshot

*SANworks* Data Replication Manager now supports clone capability at both the initiator and target sites, and snapshot capability at the target site. Clone and Snapshot are point-in-time copy functions that can be used to minimize downtime required for system backups and data migration activities. This ensures business continuance by allowing parallel processing, and is designed for customers who cannot disrupt their computing operations for management activities.

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## Non-Remote Copy Sets

Remote copy sets or non-remote copy sets can now exist on the same subsystem at both the initiator and target sites. This provides added LUN support and configuration flexibility, i.e., since the remote copy sets and non-remote copy sets may be different at the initiator and target sites, not all data has to be disaster tolerant.

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## Service & Support, CarePAQ and Warranty Information

### Software Product Services

- Standalone telephone support
- Rights to new license version
- Media and documentation updates

### Hardware Product Services

- Installation services
- On-site maintenance (includes warranty support)
- Response time upgrades during the warranty period
- Post-warranty coverage
- RAID setup and performance consulting via statement of work

For additional hardware installation and maintenance information, please refer to the URLs listed below:

[http://www.compaq.com/services/hardware/hw\\_installation.html](http://www.compaq.com/services/hardware/hw_installation.html)

[http://www.compaq.com/services/hardware/hw\\_maintenance.html](http://www.compaq.com/services/hardware/hw_maintenance.html)

Please note these Web sites are available in English only.

### Warranty Upgrade Options

- Response - Upgrade on-site response from next business day to same day 4 hours
- Coverage - Extend hours of coverage from 9 hours x 5 days to 24 hours x 7 days
- Duration - Select duration of coverage for a period of 1, 3, or 5 years

### CarePAQ Information

Sample part numbers:

- FM-**\*\***XHW-36, 3 year, uplift to 5 x 9, Next Day Response
- FM-**\*\***4HR-36, 3 year, uplift to 5 x 9, 4-hour Response
- FM-**\*\***724-36, 3 year, uplift to 7 x 24, 4-hour Response

**\*\*** represents a two digit product specific code

- CarePAQ is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage.
- CarePAQ is not available for less than the product's warranty duration.
- CarePAQ is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required.
- CarePAQ services are prepaid.

For additional CarePAQ (hardware & software) information, as well as orderable part numbers, please refer to the URL listed below:

<http://www.compaq.com/services/carepag/index.html>

Please note this Web site is available in English only.

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## Service & Support, CarePAQ and Warranty Information *(continued)*

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### Components

The following brick level options/components do not have individual CarePAQs. These items will be included in product CarePAQs into which they are installed.

Disk Drives	Tape Drives	CD/DVD ROM	SCSI Hubs in SBBs	Adapters
Bus Converters	Backplane RAID Controllers	Power Supplies	Cabling	Fans

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## Ordering Information

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**DATA REP MGR HSG80 SW V8.5P LIC/PCM**  
*128698-B21*

**DRM SOL KIT TRU64 LIC/CDRM**  
*128693-B21*