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## Product Description

### SHADOW<sup>®</sup> for OpenVMS

#### Description

The SHADOW<sup>®</sup> Disk Mirroring system for OpenVMS allows a VMS System Manager to maintain redundant databases for the survival of media failures.

A *shadow set* consists of a master-disk device and one or more shadow members. User applications issue I/O operations to the master disk, which is a Files-11-mounted device. Write operations are performed for all available members within the shadow set. Read operations are balanced within the shadow set. An additional feature allows a user to specify a preferred drive for reading.

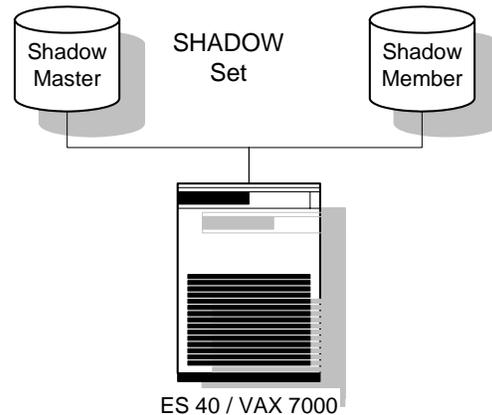
SHADOW offers an automatic and transparent rollover on a member failure within the shadow set. As long as a single member within the set remains available for I/O operations, SHADOW does not pass back any notification of the failure to the user program. All modifications to shadow-set status are logged to the operator console and journaled to a disk file for audit purposes. When a hardware error is detected on a shadow-set device, that device is “removed” from the shadow set.

SHADOW offers users the ability to create and/or delete shadow sets and to add, modify, and/or remove a member within a shadow set with no interruption or loss of service. When you want to add a member to a shadow set, SHADOW offers an optimized, on-line-disk copy facility to ensure that all volumes within the shadow set reflect the same data. This on-line copy is further optimized by selectively copying only those sectors which have been allocated under the Files-11 structure.

The SHADOW user-interface program is invoked in the DCL-command style with qualifiers and parameters for program input. SHADOW uses the normal VMS privileges required for manipulating disk volumes.

The MONITOR program uses a windows-oriented approach to display shadow-set information on one or more nodes within the DECnet network. MONITOR also allows the entry of all SHADOW commands for your additional convenience.

**Figure 1**  
**SHADOW on a Local System**



#### FileSHADOW Option

The FileSHADOW Option provides the added capabilities of:

- Shadowing selected critical files
- Shadowing dissimilar (heterogeneous) disks

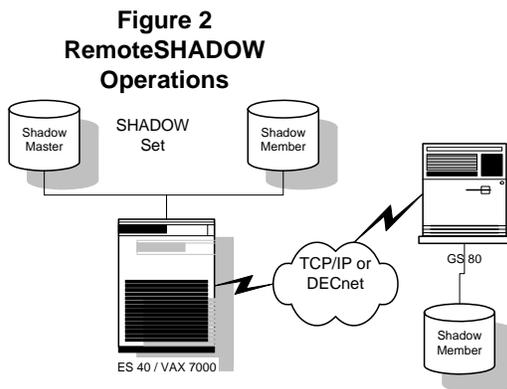
Shadowing selected files can significantly reduce the overall disk storage requirements which other shadowing systems can consume. A performance enhancement can also be realized since read I/O's are balanced and only the critical files you designate have their write I/O's mirrored. To shadow one or more critical files, you create a virtual disk of specified size, into which you place your files. This virtual disk can then be shadowed to either a real physical disk or another virtual disk.

Shadowing a physical disk to a virtual disk is the underlying concept behind *dissimilar disk* shadow support. The real disk may be an RZ26 while the virtual disk resides on the unused portion of an RZ28. This allows an RZ26 to be shadowed to a portion of an RZ28, and the remaining free space can be used for any other purpose.

The FileSHADOW option is a layered product of SHADOW and is separately priced.

### RemoteSHADOW Option

With the RemoteSHADOW<sup>®</sup> Option (RSO), the strategy for coping with media failures can be expanded to include local-site failures. The RemoteSHADOW Option provides the capability for continuing access to and availability of your data, even when your local-computer site is down. This option means that your high-availability applications can continue to operate from a contingency site using today's data.



The RemoteSHADOW Option allows a VMS System Manager to designate one or more shadow-set members as *remote* volumes. RSO uses a high-speed network for remote communications and supports the concept of *out-of-sync tolerance*. When a shadow set specifies no out-of-sync tolerance, all Write operations must complete on local and remote systems together. In this manner both the local and remote systems are in synchronization. When the disk I/O traffic and rates exceed the network-communications throughput, a shadow set *may* specify an out-of-sync tolerance. Specified in time (seconds), an out-of-sync tolerance means that insufficient network bandwidth should not impact the local system and that the remote

system is to be updated asynchronously after the local system. Thus, the local and remote systems can be out of synchronization. The maximum out-of-sync tolerance is user-specifiable. For example, 600 seconds would allow a remote system to be a maximum of ten (10) minutes behind a local system. RSO does endeavor to stay in-sync as much as is possible. All Read operations are performed from faster local drives, regardless of out-of-sync tolerance.

The RemoteSHADOW Option also provides a communications-network-restart feature that allows a recovery from temporary-network failures without the need for a volume catchup.

For improved-network utilization, RSO provides a data-compression feature that, depending upon user data, can significantly reduce the raw amount of transmitted data. RSO also supports a network-data-encryption feature that, when enabled, encrypts all transmitted and/or received data. This feature ensures that your proprietary and sensitive data never becomes viewable over a communication line.

The RemoteSHADOW option is a layered product of SHADOW and is separately priced. (The FileSHADOW Option is included with the RemoteSHADOW Option).

### Minimum Hardware Supported

This product requires a valid OpenVMS configuration. SHADOW is warranted for use with Compaq's MASSBUS, UNIBUS, QBUS, DSA, DSSI, BI, XMI and SCSI disks, used in conjunction with any Compaq HP-disk controller. SHADOW fully supports the VMSccluster environment.

SHADOW also works with all third-party controllers and disk drives that use unmodified, Compaq disk-device drivers.

### Prerequisite Software

SHADOW V2.6 runs on any OpenVMS processor, using VMS VAX Version 5.4 or later, or OpenVMS AXP V6.1 or later. For execution within a VMSccluster, ASCI highly recommends an OpenVMS DECnet Full-Function license.

The RemoteSHADOW Option supports OpenVMS DECnet and/or TCP-IP (Cisco's Multinet, Process Software TCPware and Compaq's TCP/IP Services for OpenVMS are currently supported).

## Optional Software

The *FileSHADOW Option* as described in this Software Product Description.

The *RemoteSHADOW Option* as described in this Software Product Description.

*VIRTUOSO*<sup>®</sup> *Virtual Disk and Disk Caching system* can be combined with SHADOW to allow the shadowing of partial, rather than full volumes. VIRTUOSO also provides Data Caching, Disk Striping, Encryption and other features that improve the performance, reliability, and security of disk data.

## Software Installation

Installation of the SHADOW product set is subject to the terms of the ASCI Standard Software Product License Agreement. SHADOW is designed to be Customer installable and uses Compaq's VMSINSTAL facility.

## Warranty Information

SHADOW is sold through ASCI's Software Product License Agreement which warrants the product for ninety (90) days from the date of purchase. Warranty services include telephone-remedial support and product upgrades.

## Customer Support Information

After the initial product warranty expires, ASCI offers a twelve-month customer support plan for the SHADOW family of products. This includes remedial support, product upgrades as they become available. The annual customer support plan is separately priced.

## Ordering Information

ASCI normally distributes all material via web downloads. However, ASCI honors requests for other magnetic media for a minimal charge, but you must indicate these in your letter and/or purchase order. The current prices are available upon request. Multi-CPU and Educational-Institution discounts are available.

SHADOW is licensed under HP's License Management Facility (LMF). A Product Authorization Key (PAK) is required prior to product installation and execution.

SHADOW consists of a distribution of software (1), User's Manual (1), Software Product License Agreement, Software Product Description, and Warranty Registration Certificate.

The RemoteSHADOW Option consists of a distribution of software (1) and Addendum (1).

SHA\_150\_LIC - SHADOW License and Distribution Media

SHA\_151\_LIC - RemoteSHADOW Option License and Distribution Media

SHA\_152\_LIC - File SHADOW Option License and Distribution Media

SHA\_150\_RTC - SHADOW-Right-to-Copy License

SHA\_151\_RTC - RemoteSHADOW Option Right-to-Copy License

SHA\_152\_RTC - FileSHADOW Option Right-to-Copy License

AD\_150\_SHA - SHADOW User's Guide

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