

**A Comprehensive Solution for Managing HP-UX Storage from
VERITAS™ and Hewlett-Packard©**

**VERITAS Foundation
Suite™ and Volume
Manager™ 3.5 for HP-UX**

A Comprehensive Solution for
Managing HP-UX Storage



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INTRODUCTION

VERITAS Software and Hewlett-Packard continue their long partnership and product integration through tighter integration between VERITAS' storage management solutions and the HP UX 11i operating system. VERITAS Foundation Suite™, which includes VERITAS Software's industry leading virtualization technology, VERITAS Volume Manager™ (VxVM) version 3.5 released in September 2002, now manages boot disks for HP-UX 11i releases. This capability (referred to as 'rootability') means that IT organizations can use a single storage management solution on all of their HP-UX systems, from small workgroup servers to the most data-intensive, critical servers. The product supports a wide variety of storage devices, and presents the same look and feel for managing storage across Unix and Windows platforms. This simplifies system administration while providing superior performance and availability for critical data.

The different functions of the base version of the product that ships with the HP-UX 11i operating system, known as Base VxVM, and the full version of VxVM are described in greater detail in this document. Upgrade procedures for existing users are also summarized below.

UPGRADING TO VERITAS VOLUME MANAGER™ 3.5 WITH ROOT SUPPORT

During a fresh HP-UX 11i installation, VERITAS Volume Manager can be selected as the volume management tool. If Base VxVM is chosen, the root disk group can be mirrored with no extra charge. Upgrades to the full VxVM can easily be done at any time for additional functionality or full VxVM can be selected upon installation as the volume manager of choice. This works with regular or Ignite installations.

If an earlier version of HP-UX is being used, the two steps below must be followed to upgrade to the new root support in VxVM:

1. Upgrade the OS to HP-UX 11i SEPT 2002 or later.
2. Install VxVM 3.5 and convert the boot disk to be under VxVM control

Information on doing this is available in the user documentation at <http://support.veritas.com/>

BACKGROUND: DISK VIRTUALIZATION AND ROOT DISKS

VERITAS Volume Manager builds logical or 'virtual' storage devices (volumes) from various physical devices. This is often referred to as storage or disk virtualization. By combining physical storage resources into logical volumes, administrators can create volumes that span multiple devices, use mirroring to improve availability, and stripe data across devices for better I/O performance.

Storage virtualization has two key benefits. First, it abstracts the physical storage into entities with specific attributes or purposes, such as MirroredVolume or MailStorage, which greatly simplifies storage management and administration. Second, logical volumes can surpass the performance, capacity or availability characteristics of the individual devices that comprise them. For these reasons, logical volume managers are an essential operating system service.

VERITAS Volume Manager extends the basic premise of storage virtualization to enhance performance, availability, and manageability of storage in data-intensive environments. For example, VxVM allows storage to be reconfigured while it remains online and available, helping you meet service level expectations. If a device in a redundant storage volume fails (such as part of a mirrored volume), the product can automatically swap in a spare device to restore redundancy, quickly and automatically. And it offers a single management interface to manage storage devices from a wide range of vendors.

VxVM is the industry's leading storage virtualization software, with 79.9% market share according to Gartner¹, and is widely used on a variety of platforms including Windows, Solaris, Linux and AIX, in addition to HP-UX. HP offers VxVM as an option in its HP-UX 11i distribution.

ROOT DISK SUPPORT IN VXVM

VERITAS Volume Manager 3.5, when used with HP-UX 11i SEPT2002 or later, has true root disk support (rootability). This means that now you can manage all of your HP-UX installations with a single volume manager, or use a single interface to manage storage across multiple platforms.

The *root disk* (or boot disk) is the physical disk device on which the operating system is installed, and from which the system boots on startup. If the root disk fails, the system is unavailable. For this reason, most sites choose to mirror root disks, so that the failure of a single storage device does not compromise the system itself.

Many HP-UX system administrators have been using the native Logical Volume Manager (LVM) to manage the root disk. To mirror the device, they installed HP MirrorDisk/UX. At the same time, they often needed the VERITAS volume management solution to meet availability, manageability and performance requirements, for its database-specific support or as a foundation for replication and other value-add solutions. This meant many organizations maintained two logical volume management products on their systems.

As a result of integration efforts between VERITAS Software and HP, this is no longer necessary. The SEPT2002 release (or later) of HP-UX 11i is able to recognize and boot from root disk groups managed by VERITAS Volume Manager 3.5 or later. VxVM can automatically grow or shrink the root disk group as any other disk group, and will handle the failure of a single device in a mirrored volume automatically and appropriately. HP-UX administrators can use a single volume management solution to meet address their needs for *all* of their systems.

When installing a new HP-UX 11i system, administrators can choose between a basic version of the VERITAS product (Base VxVM) and the fully featured version. The basic version offers basic capabilities for smaller, less critical servers, while the full version provides industry-leading functionality. And both can manage and mirror root disks to protect the integrity and availability of the server. Both use the same basic graphical interface, and upgrading to the full VxVM is a simple license key upgrade.

This tight integration between VxVM and the operating system has several benefits for HP-UX sites:

- By selecting Base VxVM with the HP-UX operating system, you can mirror root disks for no additional cost. (Mirroring other disk groups requires an upgrade to the full VxVM 3.5.)
- If you have multiple HP-UX servers in-house and need the power of VxVM for critical servers, you use the same interface to manage all servers. Upgrading to the full VxVM is easy, and does not require changes to the root disk group.
- You can manage HP-UX, IBM AIX, Solaris, Linux, and Windows storage with the same graphical interface, simplifying administration and reducing cross-training requirements.

¹ Gartner "2001 Storage Management Software Market Share," Gartner, C. DiCenzo, March 27, 2002

WHEN TO UPGRADE FROM BASE VXVM TO THE FULL VERSION OF VERITAS VOLUME MANAGER

HP bundles a basic version of the VERITAS Volume Manager with the HP-UX 11i operating system at no extra cost. This version is called Base VxVM and creates and manages concatenated or striped logical volumes using a variety of physical devices. A graphical interface, the VERITAS Enterprise Administrator (VEA), offers a comprehensive view of available storage, with a similar look and feel across server platforms.

Starting with the HP-UX 11i SEPT2002 release, this Base version also mirrors the root disk group for enhanced system availability.

For some systems, Base VxVM may be sufficient. For others, you will want the fully functional VxVM product which can either be selected when ordering the system, or upgrade easily via a license key upgrade.

Upgrading to the full VxVM 3.5 enables access to a wide range of volume management features, including:

- Mirroring for non-root disk groups
- Additional volume configuration options, including striping + mirroring (RAID-1+0), mirrored strips (RAID-0+1) and RAID-5.
- Online relayout capabilities
- Hot spare/hot relocation, automatically restoring redundant volumes after a single device failure
- Snapshots
- Dynamic multi-pathing (spreading I/O across multiple controllers)

These features are essential if you have high service level obligations or data availability requirements. By taking advantage of online reconfiguration and hot spare/hot relocation, together with redundant storage configurations, you can significantly reduce any storage-related downtime.

The full VxVM product is also necessary if you want to leverage many of the VERITAS solutions for application-specific storage or disaster recovery, described in the following section.

BUILDING ON POWERFUL STORAGE MANAGEMENT CAPABILITIES

The VERITAS File System™ (Online JFS on HP-UX) is a high performance, fast-recovery file system. VERITAS File System integrated with VxVM is referred to as the *VERITAS Foundation Suite*™.

The Foundation Suite is integral part of the VERITAS Adaptive Software Architecture, an architecture designed to increase any organization's ability to remain competitive by adapting quickly to changes in technology or business imperatives. Eliminating dependence on specific hardware functionality enhances data center efficiency and reduces complexity.

VERITAS Software offers a number of storage-independent solutions that leverage the Foundation Suite's core capabilities.

VERITAS FlashSnap™, an option for VERITAS Foundation Suite, creates point-in-time copies for off-host processing, such as backups, reporting or analysis. These snapshots can also be used as on-disk backup images for fast data recovery. VERITAS FlashSnap simplifies the process of mirroring and splitting logical volume "snapshots" and then speeds resynchronization by writing only the changes that occurred while the volumes were split.

FlashSnap helps organizations maintain high availability and performance, and offers a fast alternative for recovering from logical errors. For organizations facing shrinking backup windows, the product creates a snapshot image for taking a backup to tape. Unlike split mirroring solutions from hardware vendors, VERITAS FlashSnap is array-independent, and can leverage existing disks and arrays as mirrored logical volumes.

VERITAS Volume Replicator™ (VVR) extends VxVM's logical volume capabilities to replicate data in real time to remote locations over any IP network. Volume Replicator is an important component of many disaster recovery configurations, replicating critical data to up to 32 secondary locations. It always maintains data consistency, whether using synchronous or asynchronous replication. VVR can replicate data between a variety of platforms and storage arrays, so you aren't dependent on a specific hardware vendor for your disaster recovery solution.

VERITAS Database Edition™ for Oracle simplifies Oracle administration without sacrificing performance. Using the Quick I/O feature, you can store databases in file systems while achieving raw partition I/O performance. Using online, point-in-time Storage Checkpoints, you can recover quickly from logical errors and reduce database downtime.

VERITAS SANPoint Control™ offers a single, consistent storage management interface that simplifies the tasks of managing a networked storage environment. It integrates performance and policy management, storage provisioning, and zoning capabilities, helping you optimize the efficiency of your storage infrastructure. It automatically discovers and visualizes resources managed by VERITAS Volume Manager, as well as other VERITAS software products, for a centralized view of storage resources as well as the applications driving data through the network.

VERITAS NetBackup™ is the industry's leading backup and recovery application, offering comprehensive data protection for Unix, Windows, Linux and NetWare environments. NetBackup provides database- and application-aware backup and recovery solutions for Oracle, SAP R/3, Informix, Sybase, Microsoft SQL Server, Microsoft Exchange Server, DB2 UDB, and Lotus Notes. Integration with VERITAS Volume Manager and FlashSnap offers fast, logical recovery capabilities.

SUMMARY

VERITAS and HP have maintained a strategic partnership since 1993, adding value to products, services and support. In addition to bundling VERITAS Volume Manager and VERITAS File System with HP-UX, the companies offer complementary SAN and backup solutions for UNIX and Windows environments. An Integrated Services and Support Agreement simplify support for customers running VERITAS solutions in HP environments.

Both VERITAS and HP will continue to work together to deliver collaborative solutions that simplify storage management in a complex world.