



hp NonStop SMF and
ASM software



a complete storage
management solution

a product description
from hp

features at a glance

- Flexible storage policies tailored to your requirements
- Location-independent naming and storage pools for better storage utilization
- Powerful reporting capabilities
- Complete integration with existing NonStop software and applications
- Quick and efficient installation, migration, and expansion

System storage requirements have soared in recent years. This explosion has been fueled by many factors, from the continuing rise in the volume of business information to the emergence of new stored material such as audio, graphics, and video. Fortunately, there has been a correspondingly steep decline in the cost per gigabyte of storage, resulting in dramatic price/performance gains that have enabled system managers to meet storage demands.

But as databases have grown from gigabytes of storage to multi-terabyte disk farms, a pressing need for better storage management has emerged. Trying to monitor manually every disk for excessive activity or full condition and trying to modify application programs to reflect changes in the location of data files require an extensive operations staff. Such a staff is often not possible with today's lean budgets. To overcome these obstacles, we offer HP NonStop™ Storage Management Foundation (NonStop SMF) software, and Integrated Research offers Automated Storage Manager (ASM) software, which form a complete storage management solution designed to help you get the most from your growing investment in storage.

These products combine to provide powerful, fully automated storage management (see figure 1). NonStop SMF software lays a solid foundation for managing your storage operations. It efficiently handles all low-level system calls, as well as interactions between your servers and storage subsystems, database management, and file system.

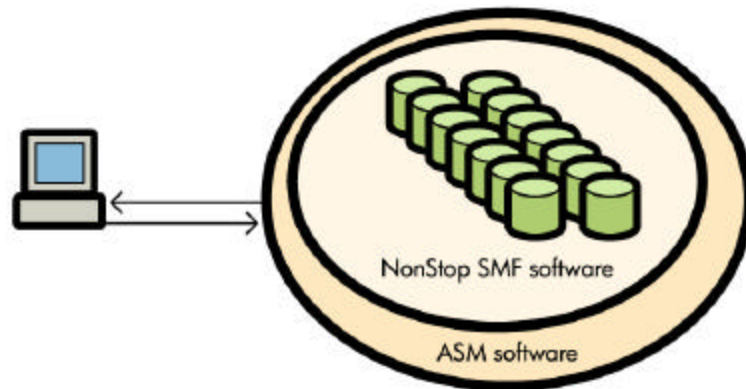


Figure 1. With the combination of these storage management products, you have the power to administer hundreds of disks from a single graphical console. You set the storage policy; NonStop SMF software manages your physical files, and ASM software ensures that the policy is upheld.

ASM software offers an easy way to establish and implement enterprisewide storage policies. Running on a PC, it provides an easy-to-use graphical user interface (GUI) that invokes powerful management utilities on the host system. This combination of an easy-to-use management console and powerful software on the host computer allows you to configure your storage solution quickly and efficiently, monitor systems for problems, and schedule management activities as desired.

Although you can use NonStop SMF software by itself, together these two products help you better use any size disks, enhance overall system performance and availability, streamline archiving and backup, and obtain accurate, up-to-date information for superior resource management.

flexible storage policies tailored to your requirements

The first step in successful storage management is to establish policies that govern how your storage resources are installed and used. Typically, these policies are based on various classifications such as application type or file size. For example, one set of policies might apply to performance-critical files, whereas another might be used for application source code files.

These two products offer flexible storage policies to tailor your storage management solutions to meet specific requirements. ASM software provides three default policies for file classifications: online transaction processing (OLTP), business intelligence solutions, and mixed applications. It also lets you customize policies to suit individual needs.

user-specified storage management

To implement these policies, the two products provide a set of user-specified rules. These enable effective placement of files across a given storage medium such as disks. For example, with ASM software, you might specify that files be moved from any disk that exceeds 75 percent full to a different disk that is only 25 percent full.

ASM software provides further flexibility by allowing you to change, add to, or to extend your storage management configuration to comply with new and changed storage policies. For instance, you can dynamically change a class of files on which a set of rules operate, add a new class of files to be governed by an existing rule, or implement other storage management actions or operations.

All storage management functions are integrated with database management activities at the file-system level, not at the application level as with other storage management products. This provides exceptional performance.

simplified operations and management

To achieve maximum performance and availability, you need to carefully analyze disk activity, fragmentation, and available space to place files effectively. As your storage requirements grow, so do the number of files and disks you need to manage. You need tools that maximize the effectiveness of your operations staff.

The NonStop SMF and ASM products offer you the ability to establish the basic rules for effective storage management. Then they monitor your system and move files in accordance with your storage policies. They can watch your system continuously, allowing operators to focus on other tasks. And the user interface provides a simple, yet complete, picture of any trouble spots.

location-independent naming and storage pools for better storage utilization

NonStop SMF and ASM software provide location-independent naming; they reference files by an external or virtual name instead of an actual physical location. This allows you to move files to a different physical disk without having to change any programs that reference the file. The NonStop SMF product automatically maps the logical name to the new physical location.

NonStop SMF also allows you to create storage pools, a grouping mechanism that lets you segregate information by user group or application or to meet other storage management objectives. Pools provide the ability to view space on all physical volumes within a pool as if it were on a single volume, and to manage the individual physical volumes as a single logical volume (see figure 2).

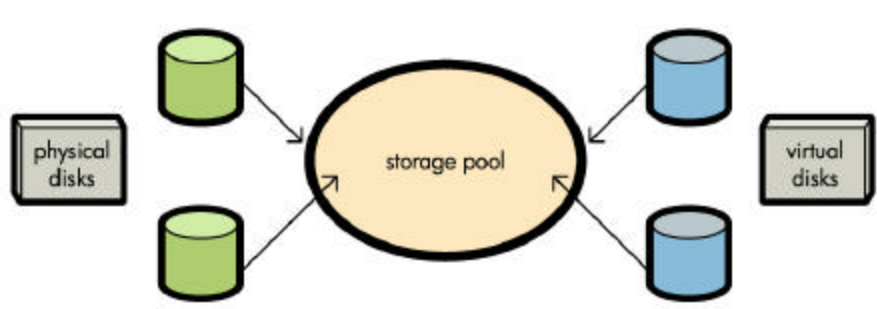


Figure 2. The NonStop SMF product allows you to group physical disks into a storage pool. Applications read and write to virtual disks associated with the storage pool, which appears to applications as if it were a single physical disk.

You no longer have to worry about the problems associated with an individual disk becoming too full. Because you can add disks to a storage pool, you can easily expand the space associated with a virtual disk. Existing programs continue to use the same name, even as you add more disks to the storage pool.

Storage pools are also ideal for managing scratch space and temporary table space in demanding business intelligence environments. Your database administrator can assign a single virtual disk to a storage pool and dynamically change the number of the disks in the pool as storage needs change. In this way, the system can be managed so that users never have a query fail because of a disk-full error.

Note that a single file cannot span physical disks even if there are multiple physical disks in a storage pool. Partitions of Format 1 files are still subject to the 2-gigabyte limit imposed by the HP NonStop SQL database and the 32-gigabyte limit imposed by Enscribe. Format 2 files have much larger limits.

Another benefit of location-independent naming is that it lets you fully utilize the storage capacity of today's larger disk drives even when the files are Format 1. For example, with NonStop SMF software, you can create multiple partitions (from a NonStop SQL database table, an index, or an Enscribe file) on each physical disk to fully utilize the storage capacity of a 36-gigabyte or larger drive.

automatic file relocation

One of the most important features of this solution is file relocation, which can be either manual or automatic. By automating the majority of your storage management tasks, you can greatly reduce the number of human errors that can lead to major problems for your organization.

improved availability and higher performance

ASM software monitors conditions that would threaten the availability of your system or degrade its performance. It then creates actions to alleviate the problem (see figure 3).

With NonStop SMF software, you schedule relocation actions for Enscribe files and SQL tables during normal maintenance hours.

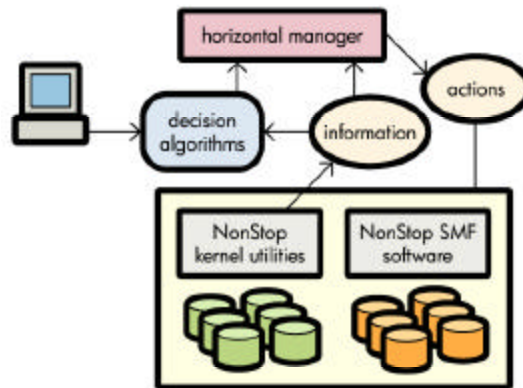


Figure 3. The ASM product implements your storage policies. It polls the NonStop system for information about files and disks, compares that information with the goals set, and, based on its decision algorithms, schedules actions to bring disk conditions back into compliance with your policies.

Because of location-independent naming, you can move Enscribe files and SQL partitions without changing file names, so there is no need to recompile SQL queries, and no new HP NonStop Transaction Management Facility (NonStop TMF) software online dumps are required.

powerful reporting capabilities

The Microsoft® Windows® operating system–based GUI of ASM software provides powerful reporting capabilities through graphic representations of your storage management environment at device, file, and metadata levels. And because this product uses Simple Network Management Protocol (SNMP), it can report to other system management applications as well.

complete integration with existing NonStop software and applications

These products are easily integrated with the NonStop database products and transaction processing facilities and require no changes to your existing applications when devices are added or deleted or when files are relocated.

This solution supports all storage objects currently residing on disks on NonStop systems, including Enscribe files; partitions, indexes, views, and files created under the NonStop SQL database; scratch and other temporary files; and audited and unaudited files (see figure 4). Nomadic and optical disks are not currently supported under

NonStop SMF software. You choose, by volume, which files to manage using these storage management products and which files to manage manually by your operations staff. Thus, you maintain ultimate control over your storage management policies and implementation.

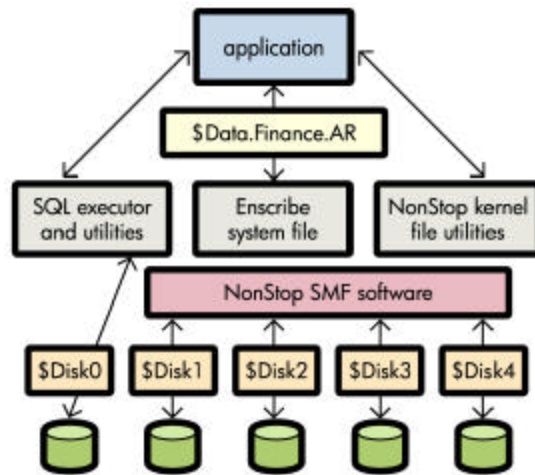


Figure 4. The NonStop SMF product works in conjunction with the NonStop SQL database, Enscribe, and various file utilities to translate a file name known by the application into a physical disk address.

Special features for high-performance, highly reliable transaction processing are also supported, including the scheduling of NonStop TMF online dumps and file recovery operations, automatic restore, relocation of SQL tables, and preservation of NonStop TMF online dumps across storage management operations—all with full database protection.

In addition, these storage management products deliver unsurpassed scalability to grow as your storage needs increase. Dynamic pool configuration allows you to add disks to accommodate more data at any time. And this solution can handle numerous large files with hundreds of partitions, without degrading system performance.

lower cost of ownership

What's more, these products work together to reduce your cost per gigabyte of usable storage. Because disk utilization can have a tremendous impact on a typical organization's cost of ownership for storage, this solution can reduce your costs through the better use of storage capacity alone.

To avoid outages caused by disk-full conditions, many system managers underutilize the space on disk. They may use only half or two-thirds of a disk's capacity to leave room for file growth and unexpected new files.

NonStop SMF software places files within a disk pool so that no disk becomes too full. ASM software continually monitors your disks and moves files as necessary to free space for critical applications. You can use more of your disk's capacity because these products continually monitor the disks.

In addition, the ASM product can substantially lower your operational costs by reducing the amount of time your operations personnel spend on storage management. The bottom line is that this solution provides efficient storage management to save you both hardware and personnel costs.

quick and efficient installation, migration, and expansion

NonStop SMF software is delivered on a site update tape (SUT) and is implemented on your system on a volume-by-volume basis. The ASM GUI and high-level monitoring processes can be ordered directly from Integrated Research of Sydney, Australia. You can contact Integrated Research through its website at www.ir.com. A special tool, SMCONVRT, migrates files on your existing systems to the NonStop SMF environment. Even complex volumes with large numbers of files can be migrated in less than an hour—again, with no changes to your existing applications and no recompilation of SQL objects or new NonStop TMF online dumps required.

Another special tool, SMREVERT, helps you revert to a preautomated storage management state at any time, should you choose. Earlier releases of the HP NonStop Kernel operating system (Release Versions D38, D42, G03, or later) can access systems where this storage management solution is now in use. And a mixture of virtual and actual physical files can be used in the same application.

Finally, as new volumes and files are added, they can be assimilated easily into your new storage management framework. Together, these products provide a complete storage management solution to help you get the most from your storage investment.

ordering information

<i>product ID</i>	<i>description</i>
SA26	NonStop SMF software ASM software, available from Integrated Research, is highly recommended as a companion to this product.

specifications

NonStop SMF software

hardware	Any NonStop server
software	NonStop Kernel operating system, any supported software release. Base supported versions are Release Versions D48, Release Version Update G06.03, or later releases. Release Version Updates (RVUs) are available to support NonStop Kernel system Release Versions D45–D47 and G05. NonStop TMF software installed (the NonStop SMF product uses NonStop TMF software to protect its internal data)

ASM software (available from Integrated Research)

hardware

Any 486-based or greater PC connected to the NonStop server via TCP/IP

software

Windows 3.1, Windows 95, or Windows NT® 3.51 or later

NonStop SMF software (on a NonStop server)

For more information, go to www.hp.com/go/nonstop.

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02-0604

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