IBM Tivoli Storage Resource Manager V1.1 and IBM Tivoli Storage Area Network Manager V1.1 Provide Management of Your Storage Resources and Networked Environment

Overview
IBM Tivoli® Storage Resource Manager is a comprehensive SRM management solution for storage resources across the enterprise. It enables administrators to identify, manage, control, and predict storage usage.

The Tivoli Storage Resource Manager suite includes:
- IBM Tivoli Storage Resource Manager
- IBM Tivoli Storage Resource Manager for Databases
- IBM Tivoli Storage Resource Manager for Chargeback

Tivoli Storage Resource Manager offers extensive reporting capabilities, monitoring, alerts, and proactive policy-based management for a predictive self-healing approach to storage resource management. With Tivoli Storage Resource Manager, you can:
- Track storage usage and availability
- Automatically discover servers, disks, partitions, and shared directories
- Define which statistics to gather and how to correlate them
- Manage storage resources through user-defined resource groups
- Monitor disk health

Tivoli Storage Resource Manager for Databases enables administrators to discover problems in critical database applications, quickly pinpointing trouble spots, whether it’s an individual user or specific application tablespace.

Tivoli Storage Resource Manager for Chargeback uses the storage usage information gathered by Tivoli Storage Resource Manager and Tivoli Storage Resource Manager for Databases to generate invoices that charge back for storage usage.

IBM Tivoli Storage Area Network (SAN) Manager and IBM Tivoli Bonus Pack for SAN Management enable administrators to minimize costly inefficiencies and outages, while realizing better network performance and sustaining dependable information availability.

Tivoli SAN Manager and Tivoli Bonus Pack for SAN Management enable the achievement of these objectives through:
- Effective discovery and presentation of SAN physical and logical topologies for small to very large and complex SANs
- Multiple SAN views (physical, logical, zones)
- Continuous real-time monitoring and fault identification
- Support for open SAN standards

Key Prerequisites
Refer to the Hardware and Software Requirements section.

At a Glance
The IBM Tivoli Storage Resource Manager suite is a comprehensive storage resource management (SRM) solution that manages enterprise storage assets from a business application or an IT systems perspective.

The suite is comprised of IBM Tivoli Storage Resource Manager, IBM Tivoli Storage Resource Manager for Databases, and IBM Tivoli Storage Resource Manager for Chargeback. With this suite, you can:
- Track storage usage and capacity
- Get comprehensive enterprise reporting (over 300 reports)
- Monitor, get alerts, and Proactive Policy-Based Management
- Chargeback and give soft quotas
- Receive database and network attached storage (NAS) support

IBM Tivoli Storage Area Network Manager features:
- Automatic Resource Discovery — gives you a clear picture of the network storage infrastructure
- Real-Time Monitoring — lets you quickly determine where a problem is occurring
- Integration — lets you integrate with Tivoli Netview and Tivoli Enterprise™ Console to provide true end-to-end management of the enterprise

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IBM Tivoli Storage Resource Manager is a comprehensive SRM management solution for storage resources across the enterprise. It enables administrators to identify, manage, control, and predict storage usage. Tivoli Storage Resource Manager suite provides a set of tools that address multiple aspects of the storage infrastructure including capacity, asset, event, availability, and performance management.

The Tivoli Storage Resource Manager suite includes:
- IBM Tivoli Storage Resource Manager
- IBM Tivoli Storage Resource Manager for Databases
- IBM Tivoli Storage Resource Manager for Chargeback

Tivoli Storage Resource Manager is a prerequisite for both Tivoli Storage Resource Manager for Databases and Tivoli Storage Resource Manager for Chargeback.

Tivoli Storage Resource Manager provides a true consolidated view of storage, combining filesystem utilization with application utilization, across operating systems and storage devices. Drilling down inside the storage usage of applications provides insight beyond traditional SRM tools. Architected for efficiency and ease-of-use, Tivoli Storage Resource Manager uses a single agent per server to provide detailed information without high consumption of network bandwidth or CPU cycles. Tivoli Storage Resource Manager supports the most popular operating systems, including Windows®, Solaris, AIX®, HP-UX NetWare, and Linux, and also supports the metadata repository in your choice of databases: Oracle, MS SQL Server, DB2®/UDB, and Sybase.

**Tivoli Storage Resource Manager**

**Reporting**

Tivoli Storage Resource Manager provides over 300 reports that enable you to have a detailed or summary view of all your storage assets enterprise-wide or by age, operating system, computer, file system, database instance, tablespace, tablespace group, computer, computer group and/or user. You can easily forecast based on actual usage. Whether you’re viewing usage information enterprise-wide, by computer, by instance, or by user, you can graph usage trends and forecast future usage based on historical data. Tivoli Storage Resource Manager enables you to generate reports, in batch mode, selecting specific reports to run enterprise-wide, or by computer, or instance. Report output can also be exported into other applications. Tivoli Storage Resource Manager provides historical trending information of enterprise-wide storage information, space usage by user and/or instance or tablespace, and largest tablespaces and segments. Through reporting, you can identify and reclaim wasted space by identifying files that may not be needed, such as obsolete files or orphan files. Tivoli Storage Resource Manager provides the information you need to understand and optimize storage usage throughout your organization, so that you are effectively using the storage you have before you purchase more.

**Policy-Based Management**

Tivoli Storage Resource Manager enables you to define and enforce storage policies through user-defined alerts, quotas and constraints, notifying you via e-mail, pager, or to the event log or a systems management console for events such as when a quota has been exceeded or a constraint violated. However, we know that finding a problem is not enough. You need a way to find and fix problems — or potential problems — as they are discovered. Tivoli Storage Resource Managers Triggered Action Facility provides automated solutions through event management. Alerts and quotas that have been exceeded, or constraints that have been violated can result in notification or action, enabling you to fix or even prevent storage outages. For example, if Tivoli Storage Resource Manager discovers data that has not been accessed in more than a year, it can trigger an archive utility.

Sample action triggers:
- Free space falls below a user-defined value
- An unrecoverable file is discovered
- Storage usage exceeds a user-defined value
- A file that has not been accessed in a user-defined length of time is discovered
- A storage resource is added or removed from the network

**Archive, Backup, or Provision Using Any Tools**

Tivoli Storage Resource Manager enables organizations to use any third-party tools for actions such as archiving, backup, or provisioning making the tools you already have more effective. Actions are defined in scripts that are passed relevant parameters (such as computer name, user name, usage violation), by Tivoli Storage Resource Manager, at execution time. You choose the trigger and define the corresponding action. For example, you can also define actions to backup critical data. If Tivoli Storage Resource Manager finds a file that has not been backed up, it can trigger a backup job, using the third-party backup tool you already have.

**NAS Support**

According to industry analysts, the market for NAS appliances is expected to grow rapidly over the next several years. As the demand for network storage increases, the need for an effective way to manage that storage and its related costs increases. Tivoli Storage Resource Manager enables storage administrators to monitor, report on, and manage NAS resources. Tivoli Storage Resource Manager provides organizations with a universal view of direct attached and network attached storage, from a filesystem or application perspective.

For Network Appliance filers, Tivoli Storage Resource Manager will monitor, report on, and manage physical disk information such as total disk capacity and disk usage information. By providing this information as part of a universal view of enterprise storage, storage administrators can manage storage from a logical (filesystem) perspective as well as a physical (disk) perspective. Administrators can also view information for a single filer, a group of filers, a user or group of users, or all filers enterprise-wide, enabling them to manage all enterprise storage resources from a single Web-based interface, helping to reduce costs and increase availability by pinpointing and solving problems more effectively.

**Tivoli Storage Resource Manager for Databases**

Tivoli Storage Resource Manager for Databases enables you to discover problems in critical applications, quickly pinpointing the trouble spot, whether it’s an individual user or specific application tablespace.

The following databases are supported:
- Oracle

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• MS SQL Server
• Sybase

Tivoli Storage Resource Manager for Databases allows administrators to drill down from a single large file allocated to an application to the storage details associated with the underlying data structures. By providing this link from operating system to applications through a single Web-based interface, Tivoli Storage Resource Manager enables IT to pinpoint problems that would otherwise go undetected. For example, Tivoli Storage Resource Manager for Databases can prevent storage downtime by predicting tablespace failure due to space allocation problems.

With Tivoli Storage Resource Manager for Databases, you can:

• Understand storage usage details behind the single large file allocated to an application.
• Prevent storage downtime by predicting tablespace failure due to space allocation problems.
• Reduce unnecessary space usage by finding unused space and identifying fast-growing objects.
• Reduce the costs of wasted space by reporting on (Sybase) devices that may have reclaimable space due to deleted databases, then automatically triggering a reorg job to reclaim that space.
• Perform capacity planning by trending storage growth of specific objects.
• Identify the fastest-growing databases to better plan network migration or SAN projects.
• Monitor and manage heterogeneous storage enterprise-wide, by application database, or by user from a single Web-based interface.
• Enforce storage policies.
• Export storage data for import into any application, such as accounting, chargeback, or spreadsheet applications.

**Tivoli Storage Resource Manager for Chargeback**

IBM Tivoli offers an end-to-end system for collecting enterprise storage usage information and generating invoices for storage costs. Tivoli Storage Resource Manager for Chargeback allows administrators to provide usage information on a departmental, group or user level, making the data owners aware of, and accountable for, their data usage. This information can be used to redirect storage costs to the departments or business units generating the data. By integrating the capabilities of SRM and chargeback software, IBM Tivoli delivers the ability to appropriately distribute storage costs across an organization.

With Tivoli Storage Resource Manager for Chargeback, you can generate chargeback invoices or use the report-exporting feature to import storage data into your storage chargeback systems. Tivoli Storage Resource Manager for Chargeback uses the storage usage information gathered by Tivoli Storage Resource Manager and Tivoli Storage Resource Manager for Databases to generate these chargeback invoices. Tivoli Storage Resource Manager and Tivoli Storage Resource Manager for Databases collect detailed information about storage usage at intervals defined by the user. This information is used not only to charge back for storage usage, but also to perform asset reporting and capacity planning, to prevent storage-related downtime, and to enforce storage policies through alerts, quotas, and constraints. And through event management, Tivoli Storage Resource Manager can not only find problems, but also fix them.

With Tivoli Storage Resource Manager for Chargeback, you can create cost centers through the creation of user, computer, or tablespace groups, allowing you to charge back individual users or departments. Costs can be allocated by storage usage by user; disk capacity, by computer; tablespace; or filesystem/physical device. By associating different costs to different filesystems, Tivoli Storage Resource Manager for Chargeback enables you to accurately account for the wide price ranges of various physical devices.

**IBM Tivoli Storage Area Network Manager and IBM Tivoli Bonus Pack for SAN Management**

IBM Tivoli Storage Area Network Manager and IBM Tivoli Bonus Pack for SAN Management provides SAN management by performing a SAN topology discovery and rendering of the components and storage resources across the SAN. This discovery is done through a combination of both in-band (through the SAN network itself) and out-band using Simple Network Management Protocol (SNMP) capabilities through TCP/IP discovery mechanisms and then correlating the results. SAN management capabilities will focus on:

1. Utilization of storage industry-standard discovery techniques including:
   • SCSI commands
   • SNMP FC Management Information Base (MIB)
   • Fiber channel management standards such as:
     - Extended link services including Request Node Identification (RNID) and Request Topology Information (RTIN)
     - Name server queries
     - Management server queries

2. Selected vendor-specific interfaces including Brocade’s Application Program Interface (API)
   • This allows IBM Tivoli Storage Area Network Manager and IBM Tivoli Bonus Pack for SAN Management to support the wide range of vendors that support the legacy SCSI commands and the newer fibre channel SAN management industry standard.

SANs are used to connect systems to storage devices. It is imperative in this type of environment to confirm that the intended connections between systems and storage devices are established and non-intended connections do not exist. Tivoli Storage Area Network Manager and Tivoli Bonus Pack for SAN Management allows you to easily view the assignment of logical unit numbers (LUNs) and the zone configurations that enable access over the physical network.

Use of the Tivoli Bonus Pack for SAN Management is limited to one entitlement per customer enterprise for the management of up to 64 SAN ports. These 64 ports may be on more than one switch, but every port in a switch selected for entitlement management, must count as a port in the “up to” number, unless the entire entitlement (all 64 ports) are allocated to a single switch which has more than 64 ports. Customers can upgrade to support additional ports by purchasing the full Tivoli SAN Manager product.
Tivoli SAN Manager Agent Configuration Restrictions

The Tivoli SAN Manager agent should not be installed on any system that sends SCSI commands over a fibre channel to a removable media drive, except where the environment provides the required support. Removable media drives may not be able to queue commands sent by the Tivoli SAN Manager agent under normal operations and it is likely to result in the application, using the removable media drive, to time out. The work around to this restriction is to install the Tivoli SAN Manager agent on other systems on the SAN. This will allow Tivoli SAN Manager to provide management function for these systems, except to discover and display the LUNs available to them. Environments where this restriction does not apply include systems with AIX 5.1 or IBM tape devices, as listed at the end of the Hardware and Software Requirements section. For an updated list of environments where this restriction does not apply, go to:

http://www.tivoli.com/products/index/storage-san-mgr/

This restriction also applies to Tivoli Bonus Pack for SAN Management.

Migration

Tivoli Storage Area Network Manager will be the replacement for Tivoli Storage Network Manager, which will be withdrawn from marketing on January 10, 2003. Refer to Software Announcement 902-219, dated October 8, 2002. The LUN management and file system extension capabilities in Tivoli Storage Network Manager will not be included in Tivoli SAN Manager.

If you have purchased Tivoli Storage Network Manager, you will receive a no-charge upgrade to the replacement product, IBM Tivoli SAN Manager. You will be licensed to run Tivoli SAN Manager on the same managed servers as you were for Tivoli Storage Network Manager.

Accessibility by People with Disabilities

For software offerings:

Tivoli Storage Resource Manager, Tivoli Storage Resource Manager for Databases, Tivoli Storage Resource Manager for Chargeback, Tivoli SAN Manager, and Tivoli Bonus Pack for SAN Management have been reviewed for Accessibility Readiness, and an IBM accessibility checklist has been completed.

The following features support use by people with disabilities:

- Optional display of audio alerts for people with hearing impairment
- Use of Java™ SWING components to support the accessibility of the graphical user interface (GUI)
- Screen magnifiers tested for use by people with visual impairments when using the GUI

Product Positioning

The Tivoli Storage Resource Manager suite is a comprehensive SRM solution that provides a single, Web-based interface to monitor and manage heterogeneous enterprise storage assets from a business application or an IT systems perspective. Tivoli Storage Resource Manager is architected for efficiency and ease-of-use.

The Tivoli Storage Resource Manager suite is comprised of:

- IBM Tivoli Storage Resource Manager
- IBM Tivoli Storage Resource Manager for Databases
- IBM Tivoli Storage Resource Manager for Chargeback

IBM Tivoli Storage Resource Manager functionality includes:

- Comprehensive enterprise reporting (over 300 reports)
- Monitoring, alerts and Proactive Policy-Based Management
- Chargeback and soft quotas
- Database and NAS support

Tivoli Storage Resource Manager provides more than 300 reports to enable you to have a detailed or summary view of all of your storage assets, enterprise wide or by age, operating system, computer, file system and/or user. With Tivoli Storage Resource Manager reporting you can:

- Identify wasted space
- Confirm data is backed and available
- Schedule reports for batch execution
- Export report data online
- Charge back storage costs
- Track storage information over time, enterprise-wide
- Forecast based on actual usage

For Network Appliance filers, Tivoli Storage Resource Manager will monitor, report on, and manage physical disk information such as total disk capacity and disk usage information.

Tivoli Storage Resource Manager supports the most popular operating systems including Windows, Solaris, AIX, HP-UX NetWare, and Linux, and also supports the metadata repository in your choice of databases: Oracle, MS SQL Server, DB2/UDB, Sybase.

Tivoli Storage Resource Manager for Databases enables storage administrators to discover problems in critical applications, quickly pinpointing the trouble spot, whether it's an individual user or specific application tablespace. Tivoli Storage Resource Manager for Databases can prevent storage downtime by predicting tablespace failure due to space allocation problems. Tivoli Storage Resource Manager for Databases enables you to set usage quotas for specific users network-wide or by application, instance or tablespace, device, tablespace group, computer or computer group. Tivoli Storage Resource Manager for Databases enforces storage policy by alerting administrators and offenders when users exceed their quota.

Tivoli Storage Resource Manager for Chargeback uses the information gathered by Tivoli Storage Resource Manager and Tivoli Storage Resource Manager for Databases and generates invoices that charge back for storage usage. Tivoli Storage Resource Manager for Chargeback enables you to create cost centers through the creation of user, computer, or tablespace groups, allowing you to charge back individuals or departments for their storage usage. Costs can be allocated by storage usage by user or by disk capacity by computer, tablespace or filesystem/physical device. Tivoli Storage Resource Manager for Chargeback can also integrate with the chargeback systems you may already have in your enterprise.
With Tivoli Storage Resource Manager, you can:

- Improve your storage return on investment
- Improve storage utilization
- Reduce storage and administration costs
- Improve application availability

**IBM Tivoli Storage Area Network Manager** is a standards-based solution for managing heterogeneous SANs. Because it’s architected to industry standards, Tivoli SAN Manager allows you to choose best-of-breed products for your storage infrastructure. By performing a SAN topology discovery and rendering of the components and storage resources, Tivoli SAN Manager enables administrators to validate the intended connections between systems and storage devices. Tivoli SAN Manager provides SAN management capabilities by integrating Tivoli Storage Network Manager technology into the product offering.

Tivoli SAN Manager supports heterogeneous storage environments. In addition, Tivoli SAN Manager integrates with Tivoli Netview and Tivoli Enterprise Console (TEC).

**IBM Tivoli Bonus Pack for SAN Management** provides the same SAN management capabilities as Tivoli SAN Manager, for environments up to 64 SAN switch ports. These 64 ports may be on more than one switch, but every port on a switch, selected for entitlement management must count as a port in the “up to” number, unless the entire entitlement (all 64 ports) are allocated to a single switch which has more than 64 ports. If more than 64 SAN ports are required in an enterprise, you can purchase the full Tivoli SAN Manager product.

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**Reference Information**

For information on Tivoli Storage Network Manager V1.1, refer to Software Announcement 200-368, dated October 17, 2000.

For information on Tivoli Storage Manager V5.1, refer to Software Announcement 202-078, dated April 9, 2002.

For information on Tivoli Storage Manager V5.1.5, refer to Software Announcement 202-276, dated October 8, 2002.

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Training is available for many IBM Tivoli® products. Education is offered through IBM Learning Services, and through IBM Tivoli Systems. Worldwide information about education offerings is available on the IBM Learning Services home page at:

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For current information on IBM Tivoli Systems education, call 888-746-3331, or visit the IBM Tivoli Systems home page at:

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**Displayable Softcopy Publications**

English versions of the Tivoli Storage Resource Manager, Tivoli Storage Resource Manager for Databases, Tivoli Storage Resource Manager for Chargeback, Tivoli SAN Manager, and Tivoli Bonus Pack for SAN Management product manuals are offered in displayable softcopy form. All unlicensed manuals are included.

These displayable manuals can be used with the Adobe Acrobat Reader, or an HTML browser in any of the supported environments.

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The Tivoli Storage Resource Manager and Tivoli SAN Manager publications are available in HTML and PDF formats on the IBM Web site at:

- For Tivoli Storage Resource Manager, refer to: http://www.tivoli.com/products/index/storage-resource-mgr/
- For Tivoli SAN Manager, refer to: http://www.tivoli.com/products/index/storage-san-mgr/

### Technical Information

#### Specified Operating Environment

**Hardware and Software Requirements**

For the most up-to-date information on hardware and software requirements:

- For Tivoli Storage Resource Manager, refer to: http://www.tivoli.com/products/index/storage-resource-mgr/
- For Tivoli SAN Manager, refer to: http://www.tivoli.com/products/index/storage-san-mgr/

**IBM Tivoli Storage Resource Manager Products**

This section lists the hardware and software required to install and run the IBM Tivoli Storage Resource Manager components. Because Tivoli Storage Resource Manager is programmed in Java™, it can run under a number of operating systems, including:

- Windows NT® 4.0, or later and Service Pack 4.0, or later
- Windows® 2000 Server, Advanced Server, DataCenter Server, or Professional (no specific service packs required for Windows 2000)
- Windows 9x and ME (client UI only, and must be installed to a Web server)
- HP-UX 11.0
- Solaris 2.6, 7, or 8
- Red Hat Linux 6.2, 7.1, 7.2
- AIX® 4.3.3
- Novell NetWare 4.0, or later

Before attempting to install Tivoli Storage Resource Manager, make sure that your environment meets the following requirements.

**Windows System Requirements** — The requirements for installing and running Tivoli Storage Resource Manager on Windows are as follows:

**Server**

- Operating systems
  - Windows NT 4.0, or later and Service Pack 4.0, or later

- Windows 2000 Server, Advanced Server, DataCenter Server, or Professional (no specific service packs required for Windows 2000)

- RDBMSs for Enterprise Repository
  - Microsoft™ SQL Server 7.0, or later
  - Oracle 8i or 9i
  - Sybase SQL Server (Adaptive Server Enterprise) 12.5, or later
  - DB2®/UDB 7.1, 8.1, or later

- Software
  - If using Microsoft SQL Server for the repository, INet Sprinta2000 JDBC driver is required.

**Hardware**

- Pentium® 400 MHz processor, or above
- 128 MB of RAM
- Approximately 10 MB of hard disk space, and at least 100 MB for the Tivoli Storage Resource Manager Repository

**Agent**

- Operating systems
  - Windows NT 4.0, or later and Service Pack 4.0, or later
  - Windows 2000 Server, Advanced Server, DataCenter Server, or Professional (no specific service packs required for Windows 2000)

- RDBMSs
  - Microsoft SQL Server 7.0, or later
  - Oracle 8i or 9i
  - Sybase SQL Server (Adaptive Server Enterprise) 11.9.2, or later

- Software
  - If this agent is to monitor Microsoft SQL Server (Database component), INet Sprinta2000 JDBC driver, DataDirect JDBC driver, or Microsoft SQL Server 2000 JDBC driver, is required.

- Hardware
  - Pentium 400 MHz processor, or above
  - 128 MB of RAM
  - Approximately 20 MB of hard disk space

**Client**

- Operating systems
  - Windows NT 4.0, or later and Service Pack 4.0, or later.
  - Windows 2000 Server, Advanced Server, DataCenter Server, or Professional (no specific service packs required for Windows 2000).
  - Windows 95, 98, ME. The client interface can be run through a Web browser only. You must install it to a Web server to run it under these operating systems. You cannot run the client as a local application.

- Hardware
  - Minimum: Pentium 166 MHz processor; Recommended: Pentium 400 MHz processor or above
- Memory: Minimum: 64 MB; Recommended: 96 MB, or greater
- 800X600 resolution; Minimum 30 MB of hard disk space

UNIX® System Requirements — The requirements for installing and running Tivoli Storage Resource Manager on UNIX are as follows:

Server
- Operating systems
  - HP-UX 11.0 (32-bit or 64-bit)
  - Solaris 7 (32-bit or 64-bit) or 8 (32-bit or 64-bit)
  - AIX 4.3.3 (32-bit or 64-bit)
- RDBMSs for Enterprise Repository:
  - Microsoft SQL Server 7.0, or later
  - Oracle 8i or 9i
  - Sybase SQL Server (Adaptive Server Enterprise) 12.5, or later
  - DB2/UDB 7.1, 8.1, or later
- Hardware
  - Approximately 10 MB of hard disk space, and at least 100 MB for the Tivoli Storage Resource Manager Repository

Agent
- Operating systems
  - HP-UX 11.0 (32-bit or 64-bit)
  - Solaris 7 (32-bit or 64-bit) or 8 (32-bit or 64-bit)
  - AIX 4.3.3 (32-bit or 64-bit)
- RDBMSs
  - Microsoft SQL Server 7.0, or later
  - Oracle 8i or 9i
  - Sybase SQL Server (Adaptive Server Enterprise) 11.9.2, or later
- Hardware
  - Pentium 400 MHz processor or above
  - 128 MB of RAM
  - Approximately 20 MB of hard disk space

Client
- Operating systems
  - Red Hat Linux 6.2, 7.1, 7.2
- Software
  - X Windows
- Hardware
  - 800X600 resolution
  - Minimum 30 MB of hard disk space

Linux System Requirements — The requirements for installing and running Tivoli Storage Resource Manager on Windows are as follows:

Server
- Operating systems
  - Red Hat Linux 6.2, 7.1, 7.2
- RDBMSs for Enterprise Repository:
  - Microsoft SQL Server 7.0, or later
  - Oracle 8i or 9i
  - Sybase SQL Server (Adaptive Server Enterprise) 12.5, or later
  - DB2/UDB 7.1, 8.1, or later
- Hardware
  - Pentium 400 MHz processor, or above
  - 128 MB of RAM

Agent
- Operating system
  - Red Hat Linux 6.2, 7.1, 7.2
- RDBMSs
  - Microsoft SQL Server 7.0, or later
  - Oracle 8i or 9i
  - Sybase SQL Server (Adaptive Server Enterprise) 11.9.2, or later
- Hardware
  - Pentium 400 MHz processor or above
  - 128 MB of RAM
  - Approximately 10 MB of hard disk space, and at least 100 MB for the Tivoli Storage Resource Manager Repository

Novell NetWare System Requirements — The requirements for installing and running Tivoli Storage Resource Manager within a Novell NetWare environment are as follows:

Server — not applicable. You cannot install the Server component on a Novell NetWare device. Refer to the Windows System Requirements, UNIX System Requirements, and Linux System Requirements sections for information about requirements for installing the Server on different operating systems.

Agent — You must install the Tivoli Storage Resource Manager Agent on a machine that:
- Is running Windows 2000 or Windows NT 4.0, or later and Service Pack 4.0, or later. To use Tivoli Storage Resource Manager for retrieving storage information from the servers and volumes within NDS trees, you must install the Tivoli Storage Resource Manager Agent on a Windows machine where a Novell NetWare client is already located. Tivoli Storage Resource Manager gathers detailed storage information about NetWare servers and volumes using native NetWare calls from these Windows machines.
- Has an installed NetWare Client.
- Has access to the Novell NetWare servers and volumes within your environment.

Client — not applicable. You cannot install the Client component on a Novell NetWare device. Refer to the Windows System Requirements, UNIX System Requirements, and Linux System Requirements sections for information about requirements for installing the Client on different operating systems.

Novell NetWare — You must be running V4.0, or later of the Novell operating system. Tivoli Storage Resource Manager is optimized for NetWare V4.0, or later, which contains NDS.

NAS System Requirements — The requirements for installing and running Tivoli Storage Resource Manager within a NAS environment are as follows:

Server — not applicable. You cannot install the Server component on a NAS filer. Refer to the Windows System Requirements, UNIX System Requirements, Linux System Requirements sections for information about
requirements for installing the Server on different operating systems.

Agent — You must install the Tivoli Storage Resource Manager Agents on machines that have access to the NAS filers within your environment that you want to monitor. The Agent that is logging into and scanning the NAS filer is not required to be in the same domain as the user or the NAS filer. If you install the Agent to a different domain than the NAS filer it will scan, the domain of the Agent machine must trust the domain of the NAS filer.

You do not install Agents to the NAS filers themselves.

Client — not applicable. You cannot install the Client component to a NAS filer. Refer to the Windows System Requirements, UNIX System Requirements, Linux System Requirements sections for information about requirements for installing the Client on different operating systems.

NAS — The NAS filers within your environment must be visible to the machines where you install the Tivoli Storage Resource Manager. NAS filers have to be configured to be a member of a Windows domain.

Tivoli SAN Manager and Tivoli Bonus Pack for SAN Management Products

The following prerequisite software products will be shipped with Tivoli SAN Manager and Tivoli Bonus Pack for SAN Management:

- DB2 UDB Enterprise Edition V7.2 (English, French, German, Italian, Spanish, and Brazilian Portuguese) (requires Fixpak 6, downloaded separately)
- WebSphere® Application Server, Advanced Edition V4.0.1 for Windows NT and Windows 2000 (requires Fixpak 4, downloaded separately)
- Tivoli NetView® V7.1.1 (integrated into the Tivoli SAN Manager Installation CD)
- MQSeries® V5.2 (integrated into the Tivoli SAN Manager Installation CD)

Manager

The Tivoli SAN Manager requires the following hardware and software:

- Machine — PIII 1 GHz processor
- Minimum memory and space requirement to run:
  - RAM — 2 GB
  - Disk space — 1 GB
- Operating system — Windows 2000: Server or Advanced Server (both with SP2®)

SAN Manager Console

The SAN manager console requires the following hardware and software:

- Machine — PIII 400 MHz processor
- Minimum memory and space requirement to run:
  - RAM — 256 MB
  - Disk space — 500 MB
- Operating system — Windows 2000: Professional, Server, or Advanced Server (all with SP2)

Windows Agent

The Windows agent requires the following hardware and software:

- Machine — PIII 400 MHz processor
- Minimum memory and space requirement to run:
  - RAM — 256 MB
  - Disk space — 200 MB
- Operating system — one of the following:
  - Windows NT 4.0 (with SP6a)
  - Windows 2000: Professional, Server, or Advanced Server (all with SP2)

AIX Agent

The AIX agent requires the following hardware and software:

- Machine — Minimum Ultra 5S 360 MHz processor
  - RAM — 256 MB
  - Disk space — 200 MB
- Operating System — AIX 4.3.3 or 5.1 (with maintenance)

Sun Solaris Agent

The Sun Solaris agent requires the following hardware and software:

- Machine — Minimum 43P-150 375 MHz processor
  - RAM — 256 MB
  - Disk space — 200 MB
- Operating System — Sun Solaris V2.6 or 8

Tivoli SAN Manager Agent Configuration Restrictions

The Tivoli SAN Manager agent should not be installed on any system that sends SCSI commands over a fibre channel to a removable media drive, except where the environment provides the required support. Removable media drives may not be able to queue commands sent by the Tivoli SAN Manager agent under normal operations and it is likely to result in the application, using the removable media drive, to time out. The work around to this restriction is to install the Tivoli SAN Manager agent on other systems on the SAN. This will allow Tivoli SAN Manager to provide management function for these systems, except to discover and display the LUNs available to them. Environments where this restriction does not apply include systems with AIX 5.1 or IBM tape devices, as listed below. For an updated list of environments where this restriction does not apply, go to:

http://www.tivoli.com/products/index/storage-san-mgr/

Enterprise 3494 Tape Libraries with:

- 3590-E1A Fibre Channel Drives
- 3590-H1A Fibre Channel Drives

Stand-alone 3590 Drives:

- 3590-E11 Fibre Channel Drive
- 3590-H11 Fibre Channel Drive

The Fibre Channel feature number is 3510 for Field Install, or 9510 for Plant Install. These drives must be at a minimum firmware level of D01E_350. If an upgrade is required, it is recommended that drives are upgraded to
the current level. Contact your IBM representative for ordering information.

Ultrium 3584 UltraScalable Tape Libraries
- LTO Ultrium Fibre Channel Drive Sled (Feature Number 1456)
- LTO Ultrium Fibre Channel Drive (Feature Number 1466)

These drives must be at a minimum firmware level of 25D4. For 3584 Libraries containing these drives, it is highly recommended that they are upgraded to the current firmware level. This firmware can be downloaded from:

http://ssddom02.storage.ibm.com/techsup/webnav.nsf/support/3584

This restriction also applies to Tivoli Bonus Pack for SAN Management.

Limitations: Use of Tivoli Bonus Pack for SAN Management is limited to one entitlement per customer enterprise for the management of up to 64 SAN switch ports. These 64 ports may be on more than one switch, but every port on a switch selected for entitlement management must count as a port in the “up to” number, unless the entire entitlement (all 64 ports) are allocated to a single switch which has more than 64 ports.

Performance Considerations: IBM Tivoli Storage Resource Manager, Tivoli Storage Resource Manager for Databases, Tivoli Storage Resource Manager for Chargeback, Tivoli SAN Manager, and Tivoli Bonus Pack for SAN Management performance will vary depending upon a customer’s particular configuration, the client/server options, and customization.

Planning Information

Packaging

IBM Tivoli Storage Resource Manager is distributed with:
- International Program License Agreement (Z125-3301)
- CD-ROM with product code and publications (LCD7-0468)

IBM Tivoli Storage Resource Manager for Databases is distributed with:
- International Program License Agreement (Z125-3301)
- CD-ROM with product code and publications (LCD7-0468)

IBM Tivoli Storage Resource Manager for Chargeback is distributed with:
- International Program License Agreement (Z125-3301)
- CD-ROM with product code and publications (LCD7-0468)

IBM Tivoli SAN Manager is distributed with:
- International Program License Agreement (Z125-3301)
- IBM Tivoli Storage Area Network Manager Getting Started V1.1 (GC32-0954)
- CD-ROM Tivoli Storage Area Network Manager, including English publications (LCD7-0478)
- CD-ROM Tivoli Storage Area Network Manager, National Language Support (LCD7-0479)

IBM Tivoli Bonus Pack for SAN Management is distributed with:
- International Program License Agreement (Z125-3301)
- IBM Tivoli Storage Area Network Manager Getting Started V1.1 (GC32-0954)
- CD-ROM IBM Tivoli Bonus Pack for SAN Management, including English publications (LCD7-0471)
- CD-ROM IBM Tivoli Bonus Pack for SAN Management, National Language Support (LCD7-0472)
- IBM Tivoli Storage Area Network Manager, National Language publications (SCD7-0463) (available December 6, 2002)
- IBM DB2 Universal Database Enterprise Edition V7.2 (LCD7-0480) (English, French, German, Italian, Spanish, and Brazilian Portuguese)

These programs, when downloaded from a Web site, contain the applicable IBM license agreement, and License Information (LI) if appropriate, and will be presented for acceptance at the time of installation of the program. The license and LI will be stored in a directory such as LICENSE.TXT for future reference.

Security, Auditability, and Control

IBM Tivoli Storage Resource Manager, Tivoli Storage Resource Manager for Databases, Tivoli Storage Resource Manager for Chargeback, Tivoli SAN Manager, and Tivoli Bonus Pack for SAN Management use the security and auditability features of the operating system software.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering Information

New Licensees: Orders for new licenses will be accepted now.

Shipment will begin on the planned availability date.

Ordering Information for Passport Advantage (PA)

PA allows you to have a common anniversary date for Software Maintenance renewals, which can simplify management and budgeting for eligible new versions and releases (and for related technical support) for your covered products. The anniversary date, established at the start of your PA Agreement, recurs on an annual basis while your PA Agreement remains in effect. However, regardless of when Software Maintenance is acquired, the coverage period for Software Maintenance is always up to the anniversary date specified in the acquisition.
Refer to the IBM International Passport Advantage Agreement and to the IBM Software Maintenance Handbook for specific terms relating to, and a more complete description of, technical support provided through Software Maintenance.

The quantity to be specified for the PA part numbers in the following table is per processor and per client. A client is based on laptops, desktops, technical workstations. To order for PA, specify the desired part number and quantity.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>IBM Tivoli Storage Resource Manager Processors: License and Software Maintenance 1st Anniversary</td>
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<td>IBM Tivoli SAN Manager Processors: License and Software Maintenance 1st Anniversary</td>
<td>D51M0LL</td>
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<td>D51M4LL</td>
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<td>D51M2LL</td>
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Clients:
License and Software Maintenance 1st Anniversary | D51T5LL |
License and Software Maintenance 2nd Anniversary | D51T6LL |
Software Maintenance Renewal to Anniversary Date | E00JYLL |
Software Maintenance after License to Anniversary Date | D51T7LL |

IBM Tivoli Storage Resource Manager Processors for Databases:
License and Software Maintenance 1st Anniversary | D51SQLL |
License and Software Maintenance 2nd Anniversary | D51SRLL |
Software Maintenance Renewal to Anniversary Date | E00JTLL |
Software Maintenance after License to Anniversary Date | D51SSLL |

Clients:
License and Software Maintenance 1st Anniversary | D51SZLL |
License and Software Maintenance 2nd Anniversary | D51T0LL |
Software Maintenance Renewal to Anniversary Date | E00JWLL |
Software Maintenance after License to Anniversary Date | D51T1LL |

IBM Tivoli Storage Resource Manager for Chargeback Processors:
License and Software Maintenance 1st Anniversary | D51SMLL |
License and Software Maintenance 2nd Anniversary | D51SNLL |
Software Maintenance Renewal to Anniversary Date | E00JSLL |
Software Maintenance after License to Anniversary Date | D51SPLL |

IBM Tivoli Bonus Pack for SAN Management Processors:
License and Software Maintenance 1st Anniversary | D51TBLL |
License and Software Maintenance 2nd Anniversary | D51TCLL |
Software Maintenance Renewal to Anniversary Date | E00K0LL |
Software Maintenance after License to Anniversary Date | D51TDLL |

Clients:
License and Software Maintenance 1st Anniversary | D51TELL |
License and Software Maintenance 2nd Anniversary | D51TFLL |
Software Maintenance Renewal to Anniversary Date | E00K1LL |
Software Maintenance after License to Anniversary Date | D51TGLL |

To order a media pack or a documentation pack for Passport Advantage, specify the part number in the desired quantity from the following table:

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
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<tr>
<td>IBM Tivoli Storage Resource Manager V1.1 Media Pack — English</td>
<td>BJ08QIE</td>
</tr>
<tr>
<td>IBM Tivoli Storage Resource Manager for Databases V1.1 Media Pack — English</td>
<td>BJ08MIE</td>
</tr>
<tr>
<td>IBM Tivoli Storage Resource Manager for Chargeback V1.1 Media Pack — English</td>
<td>BJ08PIE</td>
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</tbody>
</table>
Ordering Information for:

5698-SRM, 5698-SRD, 5698-SRC, 5698-SRS, and 5698-SRE

To order a basic license, specify the program number and the feature number of the desired distribution medium. Also, specify the one-time charge feature number in the quantity desired (maximum quantity of 250).

The quantity to be specified for the features in the following table is per processor and per client. A client is based on laptops, desktops, technical workstations.

Use the following table to order the program products listed below:

<table>
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<td>5698-SRE</td>
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</table>

This software license includes Software Maintenance, previously referred to as Software Subscription and Technical Support.

Extending coverage for a total of three years from date of acquisition may be elected. Order the program number, feature number, and quantity to extend coverage for your software licenses. If maintenance has expired, specify the after license feature number.

IBM Tivoli Storage Resource Manager

Maintenance IASP PID 1 Year: 5698-RM1

Use authorizations (to be ordered in quantity):

- Software Maintenance No Charge Registration
- Software Maintenance 1 Year Renewal
- Software Maintenance 1 Year After License

- Software Maintenance 3 Year Registration
- Software Maintenance 3 Year Renewal
- Software Maintenance 3 Year After License

IBM Tivoli Storage Resource Manager for Databases

Maintenance IASP PID 3 Year: 5698-RM3

Use authorizations (to be ordered in quantity):

- Software Maintenance 3 Year
- Software Maintenance 3 Year Renewal
- Software Maintenance 3 Year After License

IBM Tivoli Storage Resource Manager

Maintenance IASP PID 1 Year: 5698-RD1

Use authorizations (to be ordered in quantity):

- Software Maintenance No Charge Registration
- Software Maintenance 1 Year Renewal
- Software Maintenance 1 Year After License
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IBM Tivoli Bonus Pack for SAN Management

Maintenance IASP PID 1 Year: 5698-RE1

**Description**  
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Maintenance IASP PID 3 Year: 5698-RE3

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**Software Maintenance**

Software Maintenance is included with each product authorization acquired. Software Maintenance provides an easy and effective way by which you have access, during the coverage period, to eligible new versions and releases and to remote technical support for your covered products.

The technical support included in Software Maintenance provides remote support during normal business hours in your country or location as well as access to escalation management 24 hours a day, 7 days a week, for mission-critical (Severity 1) problems.

With Software Maintenance, you receive the following technical support benefits:

- Telephone access and/or electronic access via the Web to an IBM Customer Support Center.
- Support for routine, short duration installation and usage (how-to) questions and code-related problems.

- Support during normal country business hours, namely prime shift hours, Monday through Friday, excluding national or statutory holidays.
- Support for mission-critical (Severity 1) problems during non-prime shift hours, namely all hours outside normal country business hours including national and/or statutory holidays.
- Two hour response time objective during prime shift for voice and electronic submission. The response objective for critical/emergency problems during offshift is also two hours.
- Access to hints, tips, and frequently asked questions.
- Access to escalation management 24 hours a day, 7 days a week.

Open Authorized Technical Caller list to submit problems to IBM Support Centers on your behalf. Open to any number of technical specialists within your IS organization. Each caller must be registered through the IBM problem submission Web site in order to submit problems. Problem submission is handled by the Site Technical Contact as listed on the PA enrollment form.

eCare for Software is an initiative designed to enhance your electronic support experience by providing the following advantages:

- Single view of IBM distributed software that includes easy/integrated access to the following information and functions:
  - Marketing
  - Technical
  - Developer
  - Business Partner
  - IBM Services
  - Downloads
  - Comprehensive electronic (via the Web) self-help capabilities available 24 hours a day, 7 days a week.
  - Advanced search capabilities.
  - A single interface to the IBM problem submission/management system for IBM distributed software.

Software Maintenance renewals offer you favorable pricing to continue your coverage without interruption. Passport Advantage allows you to have a common anniversary date for Software Maintenance renewals, which can simplify management and budgeting for eligible new versions and releases (and for related technical support) for your covered products. The anniversary date, established at the start of your PA Agreement, recurs on an annual basis while your PA Agreement remains in effect. However, regardless of when Software Maintenance is acquired, the coverage period for Software Maintenance is always up to the anniversary date specified in the acquisition.

Refer to the IBM International PA Agreement and to the IBM Software Maintenance Handbook for specific terms relating to, and a more complete description of, technical support provided through Software Maintenance.

**Basic Machine-Readable Material:** The distribution media features in the following table apply to the program numbers listed. To order, select the distribution medium feature for the desired program number.
Program Number | Description
--- | ---
5698-SRM | Tivoli Storage Resource Manager
5698-RM1 | SW Maintenance 1 Yr
5698-RM3 | SW Maintenance 3 Yr
5698-SRD | Tivoli Storage Resource Manager for Databases
5698-RD1 | SW Maintenance 1 Yr
5698-RD3 | SW Maintenance 3 Yr
5698-SRC | Tivoli Storage Resource Manager for Chargeback
5698-RC1 | SW Maintenance 1 Yr
5698-RC3 | SW Maintenance 3 Yr

### Feature Distribution

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The distribution media features in the following table apply to the program numbers listed. To order, select the distribution medium feature for the desired program number.

Program Number | Description
--- | ---
5698-SRS | Tivoli SAN Manager
5698-RS1 | SW Maintenance 1 Yr
5698-RS3 | SW Maintenance 3 Yr
5698-SRE | Tivoli Bonus Pack for SAN Management
5698-RE1 | SW Maintenance 1 Yr
5698-RE3 | SW Maintenance 3 Yr

### Feature Distribution

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### Terms and Conditions

**Agreement:** For orders under 5698-SRM, 5698-SRD, 5698-SRC, 5698-SRS, and 5698-SRE: IBM International Program License Agreement (IPLA), IBM International Agreement for Acquisition of Programs and Support (IIAAPS) and the IBM Attachment for Support, IBM Agreement for Acquisition of Support (IAAS), IBM Addendum for Support (Software Maintenance) for Selected Programs (Z125-6495), and an Order Form.

For orders under Passport Advantage: IBM International Program License Agreement (IPLA), IBM International Passport Advantage Agreement (PAA), and an IBM International Passport Advantage Agreement Enrollment Form.

**Transferrable:** Yes, except for programs acquired at a discount or allowance.

**Limited Warranty Applies:** Yes

**Guarantee:** 30 day money-back guarantee

**Usage Restriction:** Yes. Usage is limited to the quantity of processors and clients licensed.

**Volume Offering (IVO):** No

**Upgrade Protection Applies:** Covered as long as Software Maintenance is in effect.

### Educational Allowance Available

Yes, to qualified education institution customers

**Percentage:** 15%

### Licensed Program Materials Availability

- Restricted Materials of IBM: None
- Non-Restricted Source Materials: None
- Object Code Only (OCO): All

### Maintenance Applies

- Software Maintenance under Passport Advantage: Yes
- Software Maintenance for IBM Tivoli products: Yes

### Complementary Introductory Support

Not available

### Program Services and End of Support

Program services for an IBM Tivoli program are one year from the date IBM or your Business Partner makes the program available to you. The program services duration period shall be less than one year for programs acquired after the announcement of a program’s end-of-support (EOS) date.

EOS for programs or versions/releases of programs will be announced 12 months prior to the effective date.

### Software Maintenance for IBM Tivoli Products and Passport Advantage

Software Maintenance:

- Support Center applies: Yes. Access is available through the IBM Support Center, 800-237-5511.

**Availability of Software Maintenance:**

- The first year of Software Maintenance is included with the license at no additional charge. The first year starts when the product is shipped to the customer. For a fee, Software Maintenance can be extended until three years from the date of license acquisition.
- Software Maintenance is available for a one year and three year renewal for a fee as part of the IAAS, IIAAPS, or any equivalent agreement.

**Availability of Passport Advantage Software Maintenance:**

- Passport Advantage Software Maintenance is provided at no additional charge for each eligible program acquired until the first anniversary date. For an additional fee, a license can be acquired with maintenance to the second anniversary date.
- Passport Advantage Software Maintenance is provided for renewal for a fee at each anniversary date. Customers who do not renew their Software Maintenance will have to purchase the Maintenance after License option to renew their maintenance agreement when they require a new level of software code or remote technical support.

**Software Maintenance and Passport Advantage Software Maintenance are available until:** Twelve months after announcement of product discontinuance, (that is, end of life [EOL])
Software Maintenance and Passport Advantage

Software Maintenance are applicable to:
- The current release
- The immediate previous release for twelve months after the general availability of the current release

APAR Mailing Address:

**IBM Operational Support Services — Support Line:** No

**Product Web Site:** A complete list of products, terminology definitions, and licensing documents are available at the following Web site:

http://www.tivoli.com/products/licensing/

---

### Prices

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