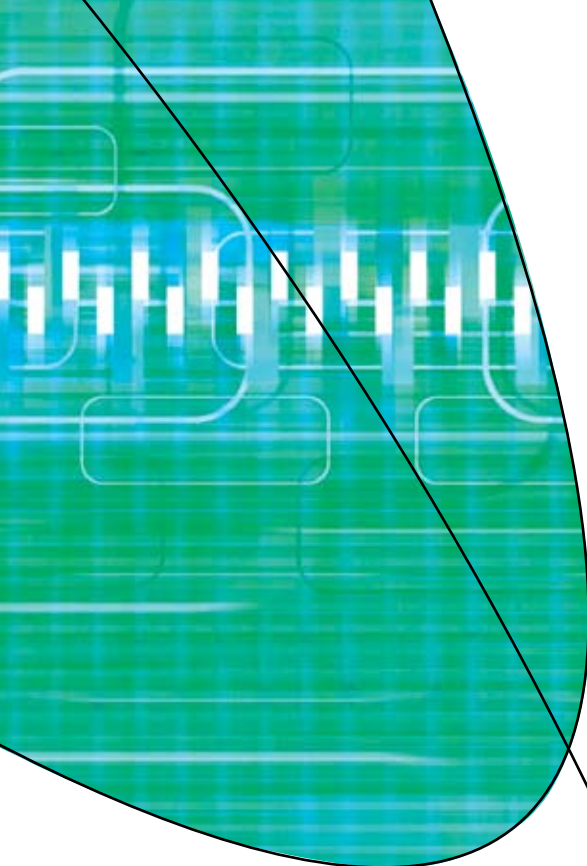
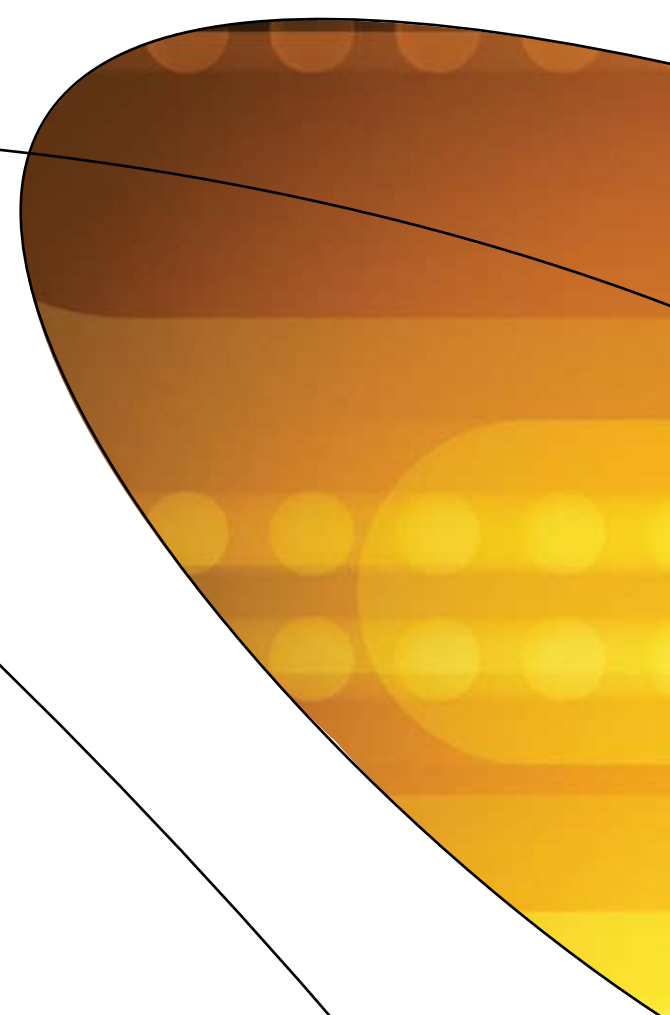
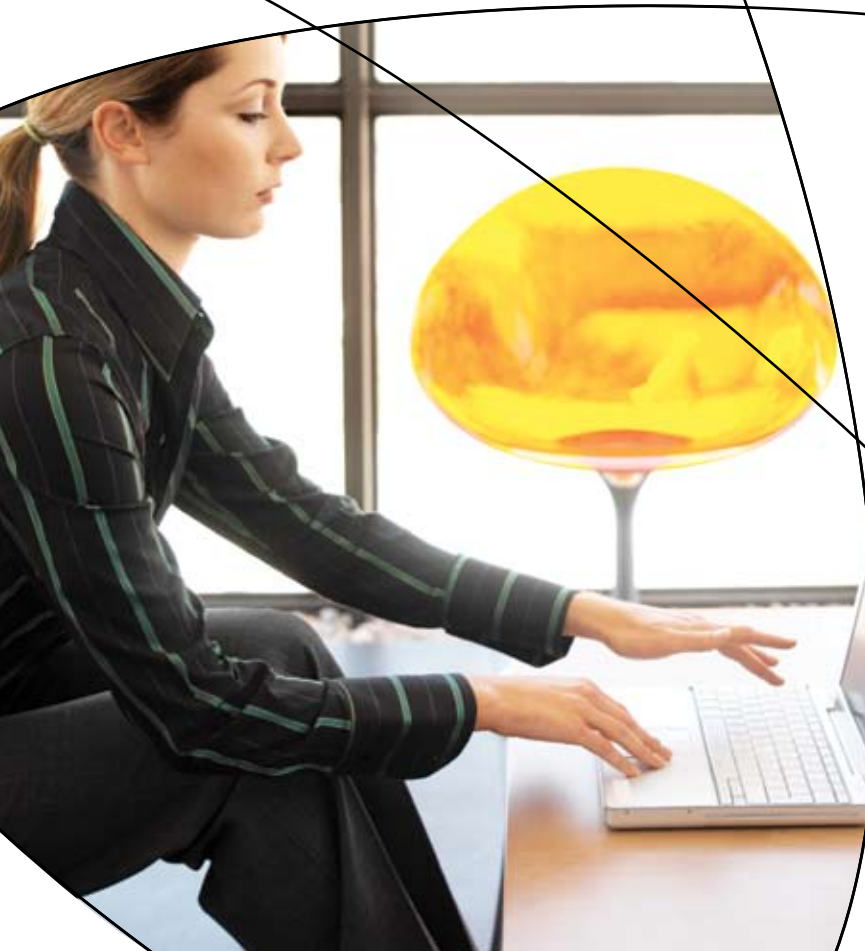


Hitachi HiCommand® Storage Services Manager Software

Partner Beyond Technology



By auto-discovering the storage environment and illuminating the path from each application through the SAN to the storage system, Hitachi HiCommand® Storage Services Manager software provides a comprehensive, end-to-end management platform for your heterogeneous storage infrastructure.

Hitachi HiCommand® Storage Services Manager Software

Storage Services Manager software provides the foundation of discovery, reporting, chargeback, path provisioning, and policy-based automation for multivendor infrastructures. This ensures application quality of service, maximizes storage resource utilization, and reduces operational costs.



Rising Storage Management Complexity and Costs

As more business applications are migrated to networked storage, IT administrators are challenged to manage this growing storage environment. The storage management complexity accelerates rapidly, further burdening storage practices that were already labor-intensive and inefficient, placing the most important corporate asset—information—at risk.

Maintaining application availability and storage capacity requirements is difficult when storage administrators do not have a complete understanding of all the interdependencies within the storage environment, specifically the paths between the application servers and the storage systems. Administrators find it difficult to create an accurate inventory of the existing servers, switches, and storage systems within their network.

Compounding the complexity of administering heterogeneous storage networks is the need to use multiple point tools to manage all the various storage components from different vendors. This demands additional administration resources, training, and maintenance contracts, further adding to the rising costs of managing storage.

HiCommand Storage Services Manager Software—Application Availability, IT Efficiency, Maximized Resource Usage, and Reduced Costs

HiCommand Storage Services Manager software is the main Hitachi console for storage infrastructure and storage resource management, providing a centralized platform to effectively manage a growing heterogeneous storage network. Storage Services Manager software provides the discovery, monitoring, reporting, active management, and automation capabilities required to ensure application availability and performance, improve IT efficiency, maximize storage resource utilization, and reduce operational and capital costs.

By utilizing storage management industry standards, Storage Services Manager software provides global management of a multivendor storage environment, eliminating the need to use vendor-specific tools to administer all your SAN resources. The management of the entire storage infrastructure, from application to disk, can be consolidated under this unified platform to simplify the administrative complexity while rapidly delivering the storage services that your users require.

By auto-discovering the complete storage infrastructure, Storage Services Manager software can locate all the available storage assets, regardless of vendor, effectively replacing manual tracking processes. By analyzing all the paths and interdependencies—from leading enterprise applications, through hosts, host bus adapters (HBAs), and storage switches, to storage systems—this software delivers a detailed graphical topology. The relationships between all the components can be rendered for the entire network, which provides a solid foundation for Application Optimized Storage™ solutions from Hitachi Data Systems.

Storage Services Manager features enable highly proactive management. Track capacity usage by application to quickly identify which applications run the risk of running out of disk space. Drill down to determine how much capacity is being used compared to how much disk space was allocated for the application. Easily locate wasted or underutilized capacity so it can be reallocated to address capacity needs elsewhere, helping you to fully utilize existing resources and protect your existing storage investments. Leverage historical capacity data to properly track and forecast future needs so you will only purchase additional storage when it is needed.

When application problems are reported to the help desk, administrators must first try to isolate whether the bottleneck originates in the application, host, network, switch, or storage system. Storage Services Manager software can quickly determine which device in the path between the application and the storage system could be the cause of the problem, aiding in the rapid isolation and resolution of the issue, and facilitating the maintenance of high application-level service requirements.

Centralized management provides a common base for automating storage administration tasks, such as performance monitoring, event management, reporting, and policy-based practices to be applied across the various storage resources within your infrastructure. With a flexible, scalable architecture, Storage Services Manager software can scale the management needs of expanding heterogeneous storage environments, from a single data center to a distributed storage network with multiple locations. Storage Services Manager software provides the consolidated storage infrastructure and storage resource management required to ensure optimal capacity and availability is maintained for all business-critical applications in today's multivendor storage networks.

HiCommand Software— Built on Standards

All HiCommand modules leverage the heterogeneous storage network management industry standard, Storage Management Initiative Specification (SMI-S), based on the Common Information Model (CIM) and Web-Based Enterprise Management (WBEM). This powerful standard results in fast, low-risk implementations, without the complexity or high costs of maintenance associated with other solutions. Noncompliant devices are “wrapped” with a CIM interface for simplified, normalized management. By supporting SMI-S and noncompliant devices in the same fashion, HiCommand Storage Services Manager software protects existing and future investments, and provides the flexibility to use new technologies and devices from different vendors. With the SMI-S agent-light architecture, Storage Services Manager software utilizes host agents that can be deployed quickly and easily because they leverage CIM providers already resident on storage components and host operating systems. Centralized storage management employing a standards-based platform such as Storage Services Manager software can greatly simplify the management of a growing storage environment while lowering its cost.

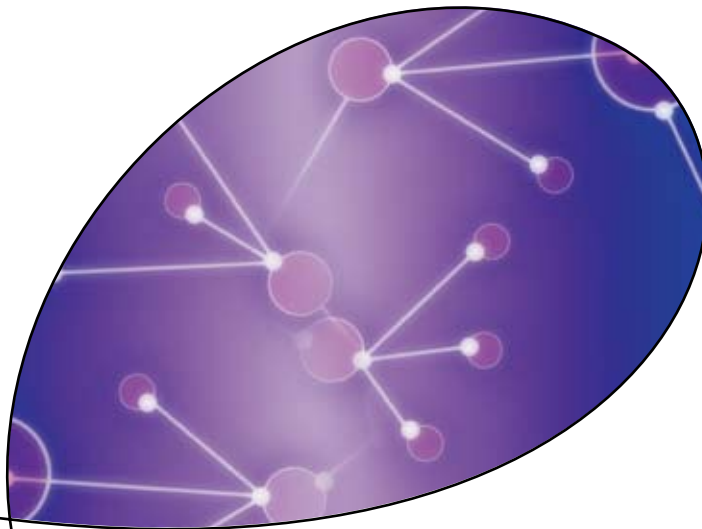
Integrated Storage Management Platform

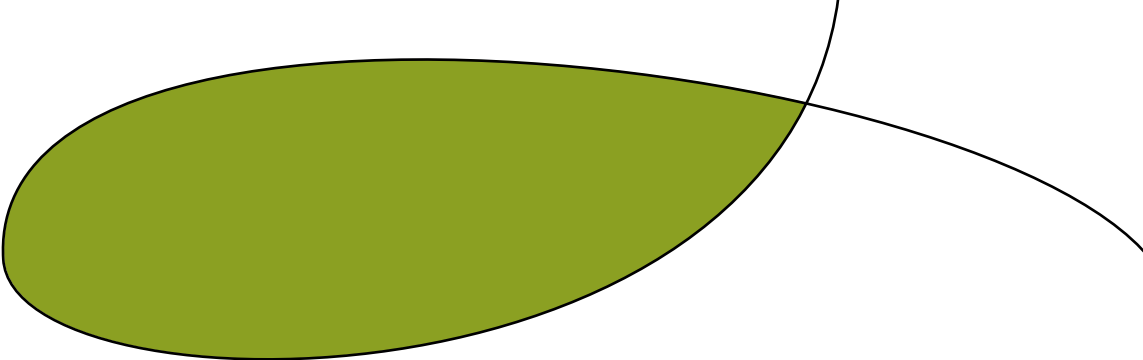
With its comprehensive view of the storage infrastructure, HiCommand Storage Services Manager software provides a solid starting point to build advanced storage management practices across your enterprise, ensuring the quality of service demanded by your users. Storage Services Manager storage operations and business application modules can deliver higher-level, efficient storage management services that further automate labor-intensive administrative tasks.

Integrating with and building on Storage Services Manager software's central data repository of physical and logical storage resource information, **HiCommand Chargeback software** provides the ability to define asset-based and storage-based chargeback models on your infrastructure for budgeting purposes. With customized chargeback values, asset tracking information, and departmental groupings, HiCommand Chargeback software enables you to quickly automate the tracking and reporting of associated costs with the quality and quantity of storage utilized by different business units.

Storage Services Manager software incorporates storage provisioning with **HiCommand Path Provisioning software**, which automates the time-consuming, complicated process of provisioning storage resources to support new applications. By enabling a common interface for provisioning tasks at the host, switch, and storage system layers, it simplifies heterogeneous storage provisioning, improves operational efficiency, and helps ensure that your applications never run out of capacity. With HiCommand Path Provisioning software, provisioning templates can be applied to secure and “error-proof” the provisioning process.

For multiple data center environments, **HiCommand Global Reporter software** can collect and summarize storage statistics from distributed Storage Services Manager servers to centrally manage enterprise-wide storage operations. Utilizing HiCommand Global Reporter software provides aggregated storage information required to implement strategic IT initiatives, such





as global capacity planning and data center storage consolidation. Global Reporter reports, which cover your total storage infrastructure, can be run from any Storage Services Manager server in the network.

HiCommand QoS for File Servers software integrates multivendor storage resource management (SRM) with traditional file scanning and reporting of your file servers to the storage management capabilities of Storage Services Manager software. It auto-discovers file servers and charts their dependencies to the rest of the storage infrastructure while scanning large volumes of data. HiCommand QoS for File Servers software collects and reports on a broad set of file-level and user-consumption statistics to properly monitor and manage your file server environment.

HiCommand Storage Services Manager for NetApp software extends Storage Services Manager software's management capabilities to include all NetApp storage environments. By providing full topology visualization of NetApp devices while monitoring capacity, health, and dependency information, HiCommand Storage Services Manager for NetApp software ensures the availability and performance of NetApp-based storage under a common management platform.

Storage Services Manager software integrates heterogeneous storage infrastructure management with mission-critical business applications based on Oracle, Sybase, Microsoft SQL Server, and Microsoft Exchange, delivering on the Application Optimized Storage strategy from Hitachi Data Systems. By monitoring and analyzing these applications and their dependencies with respective hosts, storage fabrics, and storage systems, Storage Services Manager software can correlate application capacity and performance with the supporting storage infrastructure to enable the proper alignment of storage resources to your business objectives.

Business Benefits

Ensure Application Availability and Performance

- :: Deliver end-to-end storage capacity management for leading enterprise applications.
- :: Reduce downtime of revenue-generating systems and applications.
- :: Predict capacity outage conditions before they occur.
- :: Provide faster root-cause analysis and correction of application availability and performance issues.

Improve Administrative Efficiency

- :: Centralize heterogeneous storage management utilizing a unified, standards-based platform.
- :: Reduce time spent managing large-scale storage networks.
- :: Automate time-consuming, tedious storage management tasks, allowing more focus on strategic projects.
- :: Collect storage capacity information from distributed data centers for global storage consolidation.

Reduce Operational and Capital Costs

- :: Discover the complete multivendor storage infrastructure automatically to fully account for existing storage assets.
- :: Manage ever-increasing storage capacity without increasing IT resources.
- :: Identify unused or wasted resources that can be re-allocated to defer additional capital investments.
- :: Ensure existing storage infrastructure and resources are optimally utilized.

Feature Highlights

Auto-discovery and Topology Rendering

- :: View an easy-to-understand representation of the complete network infrastructure, a result of auto-discovery of the entire storage infrastructure and graphic rendering of both the logical and physical topology.
- :: Zoom in or out from the application perspective to specific device details of the hosts, switches, and storage systems on which an application depends. Navigate information in context to correlate individual actions to their impact on the overall environment.
- :: Export the topology to an external Microsoft Office Visio file to be used as a common map of your existing storage infrastructure that can be shared within the enterprise.

Path and Dependency Management

- :: Review automatic visualization of path connections from applications down through hosts, HBAs, and switches, to the individual storage systems, identifying multilevel dependencies between hosts and the supporting storage infrastructure elements.
- :: Easily determine which applications will be affected by planned and unplanned downtime of storage infrastructure resources, in addition to which resources to bring online first to ensure a prioritized return-to-service for critical applications in the event of an unplanned outage.
- :: Quickly address help desk calls by isolating where on the application path the problem resides, eliminating the storage network as the root cause, or validating a storage related bottleneck so it can be resolved promptly.



End-to-end Capacity Management and Planning

- :: Access current and historical capacity snapshots system-wide for:
 - :: Hosts: storage capacity used and available
 - :: Switches: ports used and available
 - :: Volumes: storage capacity allocated and unallocated
 - :: Storage volumes and pool: storage capacity used, available, exported, unexported, and unused raw
- :: Conduct trend analysis utilizing historical data to properly project future capacity needs and avoid over-investing in new storage capacity.
- :: Manage enterprise-wide storage operations when used with HiCommand Global Reporter software, providing aggregated storage capacity statistics across multiple data centers.

Real-time Performance Management

- :: Monitor a wide range of application, host, HBA, switch, and storage system performance statistics to trigger threshold alerts and allow correlated analysis to aid in root-cause determination and correction.
- :: Chart a graphical representation of the performance or trend for a managed element with adaptive reporting periods and frequencies.

Event Management

- :: Centrally monitor events and event details generated by managed elements from multiple vendors.
- :: View, sort, and filter events based on various attributes, such as element type, event severity, or time.
- :: Configure SNMP (Simple Network Management Protocol) traps to be generated from events and sent to a common IT event monitoring system within your enterprise.

Policy-based Automation

- :: Leverage the policy engine to monitor configuration and utilization levels, user-defined business rules and thresholds, and event triggers to automatically send e-mail messages, alert pagers, or run an external program.
- :: Automate tedious and time-consuming tasks, including updating firmware, replacing HBAs, managing global changes, and identifying unallocated capacity available to an application or host using existing zone sets.
- :: Automatically trigger storage resource provisioning when additional capacity is needed, such as when integrating with HiCommand Path Provisioning software.

Role-based Security

- :: Group users based on roles-based security for: executives, SAN architects, storage administrators, IT administrators, application administrators, or help-desk staff.
- :: Define hierarchical organizations to specify which elements users can access. For example, a business unit organization could be defined where users can only access the hosts and storage systems within that specific business unit.
- :: Integrate user security with existing Active Directory and LDAP (Lightweight Directory Access Protocol) authentication systems.

Comprehensive Reporting

- :: Choose from an extensive set of out-of-the-box reports, including capacity management and planning, performance management, asset management, and chargeback.
- :: Display reports in a variety of formats: HTML, PDF, Excel, and XML.
- :: Send reports by e-mail or set up a schedule to automatically e-mail reports on a regular basis.

Host Agent Administration

- ❑ Employ remote agent administration to provide centralized agent monitoring, operations, and troubleshooting tasks.
- ❑ Automate agent upgrades utilizing the native installer of the host operating system to simplify maintenance for deployments with large numbers of host servers.

Business Tools Customization

- ❑ Enable customization of Storage Services Manager capabilities to meet specific requirements using powerful scripts and command line interface (CLI).
- ❑ Leverage the Advisor scripts included with Storage Services Manager software, which provide detailed information about your network, such as non-compliant HBA firmware or reachable storage accessible from a selected host.

- ❑ Automate certain tasks with built-in Automators, enabling such activities as remote updating of firmware or notification of a replaced HBA card.

Prerequisites

Hitachi HiCommand Device Manager Software

HiCommand Device Manager software is an optimized platform that can stand alone to centrally manage, configure, and monitor Hitachi storage as well as Sun StorageTek storage. HiCommand Storage Services Manager software requires Device Manager software to access the Device Manager CIM-based interface for detailed information regarding both Hitachi and Sun StorageTek storage systems.

Quick Start Service for Hitachi HiCommand Storage Services Manager Software

This required service helps you with project planning, installation, and configuration of HiCommand Storage Services Manager software. Through a collaborative, hands-on approach, Hitachi Data Systems consultants provide knowledge transfer to enable your technical personnel to roll out the software's capabilities across your enterprise storage environment.

System Requirements and Support Matrix

For a complete list of system requirements and the extensive hardware/software platforms supported, please visit: <http://www.hds.com/go/hicommandrequirements>

Complementary Solutions

HiCommand Chargeback Software

HiCommand Chargeback software provides powerful asset management and chargeback capabilities, which help align storage infrastructure with business objectives and enable IT organizations to deliver storage to business units in a utility model.

HiCommand Global Reporter Software

HiCommand Global Reporter software joins HiCommand Storage Services Manager capabilities with powerful rollup reporting capabilities that provide aggregated views of distributed data center storage for enterprises with multiple instances of HiCommand Storage Services Manager software.

HiCommand Path Provisioning Software

HiCommand Path Provisioning software automates provisioning of hosts, SAN switches, and disk storage systems, which speeds the deployment of new storage resources and ensures mission-critical applications have the storage capacity they need to deliver business value.

HiCommand QoS for File Servers Software

HiCommand QoS for File Servers software integrates storage resource management with active SAN management to deliver end-to-end capacity, performance, and user consumption management for file servers.

HiCommand QoS for Microsoft Exchange Software

HiCommand QoS for Microsoft Exchange software delivers end-to-end capacity and performance management for Microsoft Exchange and correlates Exchange performance, capacity, and availability with the supporting storage infrastructure.

HiCommand QoS for Microsoft SQL Server Software

HiCommand QoS for Microsoft SQL Server software automatically maps the path from SQL Server databases through hosts, HBAs, SAN switches, and disk storage systems, providing end-to-end capacity and performance management.

HiCommand QoS for Oracle Software

HiCommand QoS for Oracle software extends integrated Hitachi SAN management, storage resource management, and storage operations management capabilities "inside" Oracle databases, helping to ensure the availability and performance of Oracle-based applications.

HiCommand QoS for Sybase Software

HiCommand QoS for Sybase software correlates SQL server performance, capacity, and availability with the supporting storage infrastructure, enhancing the management of Sybase-based applications for quick response to help desk calls and effective planning for future storage growth.

HiCommand Storage Services Manager for NetApp Software

HiCommand Storage Services Manager for NetApp software extends the full range of Storage Services Manager software's capabilities to all NetApp primary, nearline, and gateway network storage solutions.

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