

Overview

HP StorageWorks 400t and 400r All-in-One Storage Systems

Simple. Affordable. Reliable.

HP All-in-One Storage: Imagine having a single integrated solution that could provide shared storage for application servers (iSCSI Target), enhanced file serving for end-user clients (NAS), backup target services for network data, and data protection software to keep all of your data safe and secure; these are the key functions of HP All-in-One Storage and together, they allow businesses to lower costs, increase efficiencies, and respond to rapid data growth. HP StorageWorks All-in-One Storage Systems are radically simple, integrated, and affordable network storage solutions that enable small and midsize companies to easily manage, grow, and protect their data without requiring them to become storage experts. These systems are designed to be deployed and managed by IT generalists with no storage expertise and deliver everything you need to lower the cost and complexity of rapidly growing data storage environments.

The easy-to-use, All-in-One Storage Manager (ASM) interface reduces the time, expense, and expertise required to keep up with rapidly growing applications like Microsoft Exchange. Busy IT Managers do not have time to learn and manage complex storage technologies; ASM eliminates this barrier by handling all underlying storage tasks and presenting network storage in application-centric terms, giving administrators newfound levels of control. Data migration tools for Exchange 2003/2007 and SQL Server 2000/2005 include 'best practice' recommendations which allow any IT generalist to look like a storage expert. Tools for hosting 'user defined' applications enable flexible iSCSI deployment in many different environments including Windows, Linux, VMware ESX, or other standards-compliant iSCSI initiators.. Administrators can quickly and easily setup or expand data areas, migrate data from capacity constrained servers, manage disk based backup storage areas, implement disk and tape backup policies, and more. Finally, a simple, affordable, and reliable network storage solution that provides many of the management, consolidation, and data protection features typically reserved for higher-priced and more complex storage products.

NOTE: iSCSI performance varies by model and host application I/O characteristics. For best performance choose a system with a high number of drive spindles, and utilize SAS hard drives

About the AiO400t: This 4-drive entry-level tower solution built on the ProLiant ML110 G5 platform provides shared storage expansion for application servers (iSCSI Target), enhanced file serving for end-user clients (NAS), and comprehensive data protection features. The AiO400t is an affordable solution for small datacenter or branch office environments that need less than 1TB SATA or 584GB SAS total raw capacity.

About the AiO400r: This 4-drive entry-level rackmount solution built on the ProLiant DL160 G5 hardware platform provides shared storage expansion for application servers (iSCSI Target), enhanced file serving for end-user clients (NAS), and comprehensive data protection features. The AiO400r is an affordable solution for small datacenter or branch office environments that need less than 2TB SATA or 1.2TB SAS total raw capacity.

NOTE: Updates to the HP All-in-One Storage Manager (ASM) are posted to support links available on individual product pages from <http://www.hp.com/go/AiOStorage>. Some of the management features discussed in this document may require the installation of software updates depending on the version of ASM installed on your system. Be sure to check for updates to make sure you are using the latest version of the software. Critical updates for the Windows Storage Server 2003 R2 operating system can be implemented using standard Windows Update functionality but you should disable any auto-restart options to avoid complications with iSCSI connections. For other software components you should only update components as part of an All-in-One Storage System update. Do not separately download or install individual updates for Data Protector Express as this may adversely affect the management integration of these components.

Highlights

Benefits of HP StorageWorks All-in-One Storage Systems

Breakthrough simplicity that lowers the cost and complexity of data management

The intuitive All-in-One Storage Manager interface radically simplifies the growth, management, and protection of data by hiding complexity and enabling storage to be a turnkey resource. Designed for IT generalists with no storage expertise, these systems can be setup and actively serving files in minutes.

Integrated and adaptive storage solutions to enable business growth

A single storage solution that can respond to a wide variety of business needs. HP All-in-One Storage Systems offer an incredible degree of utility and flexibility by providing shared storage for multiple application servers, file serving for end-user clients, disk based backup capabilities, and data protection for both file and application data via snapshots and backup software.

Affordable and cost effective solution for growing application environments

Managed through a single interface, HP All-in-One Storage provides shared application storage (iSCSI Target), file serving (NAS), and data protection below the cost of separate products and without the need to change your infrastructure. **NOTE: A dedicated segment is recommended for your iSCSI traffic and can be implemented using standard Ethernet hardware you probably already have.**

Application-centric storage management simplifies operation and lowers costs

Easy to manage because it uses terms and functions familiar to application administrators. Includes end-to-end iSCSI management for Windows Servers plus iSCSI provisioning for other iSCSI initiators (Linux, VMWare ESX Server, etc.). Provides data migration wizards for Microsoft Exchange 2003/2007 and SQL Server 2000/2005.

'Best Practice' toolkit makes every IT Administrator look like a storage expert

HP All-in-One Storage Systems include tools to easily migrate and manage data using best practice settings. For example, iSCSI storage for a Microsoft Exchange Storage Group can be expertly setup and migrated in less than 10 mouse clicks, saving you time and reducing the risk to your business.

Shared storage for growing application servers (iSCSI SAN) enables efficient use of capacity

Sharing storage between servers is more efficient and costs less to manage over time when compared against adding additional drives to individual servers. Sharing storage means that you maximize investments in additional capacity while enabling easier growth and shorter backup windows. HP All-in-One Storage Systems utilize the Microsoft iSCSI Software Target to provide block-based access to network storage.

Enhanced file serving for end-user clients (NAS) to improve productivity and collaboration

Tuned for faster file serving performance (20% faster than standard Windows Server on the same hardware). Single Instance Storage (SIS) de-duplication features can improve capacity utilization by 30% or more by eliminating duplicate files within shared volumes. Full text search capabilities increase the speed of end-user search. Support for heterogeneous environments (CIFS/NFS) gives you the flexibility your changing business needs to serve multiple operating environments.

Comprehensive and integrated data protection to ensure easy roll-back and disaster recovery

Provides an easy mechanism to manage disk based snapshots for easy rollback, integrated data protection software for offsite and archive, hot plug disk drives (RAID), and hardware redundancy. Data can also be replicated to another system for enhanced disaster recovery. Utilize your All-in-One Storage pool as a disk based backup

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target for other systems in your environment and manage Data Protector Express virtual library objects direct from the All-in-One Storage Manager.

Easy to deploy and manage so you can focus on your core business

Uses standard tools and concepts familiar to server administrators to reduce learning curve and barriers to network storage. The industry standard iSCSI interface provides the benefits of shared SAN storage on a traditional TCP/IP network. HP ProLiant hardware ensures reliability, low TCO, and supportability. The All-in-One Storage Manager quickly walks administrators through all major setup and management tasks.

Award winning warranty, support and troubleshooting tools to ensure worry-free operation

HP All-in-One Storage Systems can send alerts for various events such as an impending disk failure reducing the potential for downtime while HP's world class support organization and partner network ensures that you can quickly recover in the case of a problem.

Available Product Configurations

HP StorageWorks 400t All-in-One Storage System (AiO400t)

This 4-drive entry-level tower solution built on the ProLiant ML110 G5 platform provides shared storage expansion for application servers (iSCSI Target), enhanced file serving for end-user clients (NAS), and comprehensive data protection features. The AiO400t is an affordable solution for small datacenter or branch office environments that need less than 1TB SATA or 584GB SAS total raw capacity.

- Sizing Guidelines: For Exchange environments, the AiO400 can be used for smaller Storage Groups with less than 100 mailboxes when using the Exchange ESRP implementation guidelines. Out of the box implementations should only use the AiO400 for very few users or archival Storage Groups unless using SAS HDDs. While it is certified for VMWare ESX iSCSI connectivity, the AiO400 is not recommended in VMFS environments due highly random read/write performance characteristics of VMFS.

HP StorageWorks 400r All-in-One Storage System (AiO400r)

This 4-drive entry-level rackable solution built on the ProLiant DL160 G5 hardware platform provides shared storage expansion for application servers (iSCSI Target), enhanced file serving for end-user clients (NAS), and comprehensive data protection features. The AiO400r is an affordable solution for small datacenter or branch office environments that need less than 2TB SATA or 1.2TB SAS total raw capacity.

- Sizing Guidelines: For Exchange environments, the AiO400 can be used for smaller Storage Groups with less than 100 mailboxes when using the Exchange ESRP implementation guidelines. Out of the box implementations should only use the AiO400 for very few users or archival Storage Groups unless using SAS HDDs. While it is certified for VMWare ESX iSCSI connectivity, the AiO400 is not recommended in VMFS environments due highly random read/write performance characteristics of VMFS.

HP StorageWorks 600 This mid-level tower/rack solution built on the ML350 G5 hardware

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All-in-One Storage System (AiO600)

platform provides shared storage expansion for application servers (iSCSI SAN), enhanced file serving for end-user clients (NAS), and comprehensive data protection features. The AiO600 is an excellent solution for customers looking for increased capacity, scalability, and hardware redundancy. The AiO600 is available in both SATA and Serial Attached SCSI (SAS) configurations.

- Sizing Guidelines: For Exchange environments, AiO600 SATA configurations are appropriate for storage groups with less than 500 mailboxes while AiO600 SAS configurations support up to 1,000 mailboxes when using the Exchange ESRP implementation guidelines. Out of the box implementations for the AiO600 will support approx 25% of these numbers. The AiO600 is certified with VMWare ESX for iSCSI connectivity; due to the highly random read/write performance characteristics of VMFS we recommend SAS HDDs and the AiO1200 SAS as the best performance option for use with VMWare ESX and VMFS.

HP StorageWorks 1200 All-in-One Storage System (AiO1200)

This high capacity and performance optimized solution built on the DL320s hardware platform provides shared storage expansion for application servers (iSCSI SAN), enhanced file serving for end-user clients (NAS), and comprehensive data protection features. The AiO1200 is an excellent solution for customers looking for increased performance and capacity from 12 internal drives and a high performance RAID controller. The AiO1200 is available in both SATA and Serial Attached SCSI (SAS) configurations.

- Sizing Guidelines: For Exchange environments, AiO1200 SATA configurations are appropriate for storage groups with less than 500 mailboxes while AiO1200 SAS configurations support up to 1,500 mailboxes when using the Exchange ESRP implementation guidelines. Out of the box implementations for the AiO1200 will support approx 25% of these numbers. The AiO1200 is certified with VMWare ESX for iSCSI connectivity; due to the highly random read/write performance characteristics of VMFS we recommend SAS HDDs for use with VMWare ESX and VMFS.

HP StorageWorks All-in-One SB600c Storage Blade (AiO SB600c)

This half-height all-in-one storage blade solution was designed for HP c-class BladeSystem environments and combines a BL460 server blade and SB40 storage blade. It provides shared storage expansion for blade servers (iSCSI SAN), enhanced file serving for end-user clients (NAS), and comprehensive data protection features. The AiO SB600c is an excellent solution for customers looking at c-3000 or c-7000 BladeSystem deployments. The AiO SB600c is available in a SAS configuration.

- Sizing Guidelines: For Exchange environments, AiO SB600c SAS configurations are appropriate for storage groups with less than 500 mailboxes. The AiO SB600c is certified with VMWare ESX for iSCSI connectivity.

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Software Feature Specifications for the HP All-in-One Storage Family

All-in-One Storage Management Interface

This single easy to use, integrated storage management tool can manage many aspects of the storage environment.

- Rapid startup tools for fast and easy installation and out-of-the box configuration
- Provides end-to-end management and provisioning of iSCSI storage for non-clustered 32-bit and 64-bit Windows Server 2003 hosts from the iSCSI Target all the way through to the host
- Provides management and provisioning of iSCSI storage for standards-compliant non-Windows iSCSI initiators such as VMWare, Linux, etc.
- Application data hosting and migration wizard using HP and Microsoft 'Best Practice' storage configurations for Microsoft Exchange 2003/2007 Storage Groups and Microsoft SQL Server 2000/2005 databases.
- Application data hosting and iSCSI Setup wizard for other 'User Defined' Applications (Oracle, mySQL, VMware ESX, etc...)
- File Share creation wizard with storage allocation and directory quota management.
- Data protection policy assignment (snapshots and backup) integrated into application migration and share creation wizards for data hosted on the system.
- Data Protector Express virtual library device provisioning and space management as well as support for Data Protector Express D2D2Any add-on option.
- Application-level capacity provisioning and online growth for shares, SQL Server and Exchange. SQL Server support includes data file and log directory provisioning and Exchange support includes Mailstore, Publicstore and log directory provisioning.
- Quota monitoring and alerting per share or application.
- Remote management via Microsoft Internet Explorer or Terminal Services. Support for iLO or Lights-Out 100 varies by platform.
- Support for setup and management of both internal storage as well as supported direct attached MSA storage enclosures
- Supports management of tiered storage environments where both SAS, parallel SCSI, or SATA hard drives are attached to the All-in-One Storage System either internally or on externally attached MSA storage enclosures.

Shared Application Storage (Microsoft iSCSI Software Target)

- Compliant with iSCSI industry standards and compatible with industry standard iSCSI initiators. Interoperability has been verified for Windows 2000, Windows Server 2003, VMware ESX Server 3, SUSE Linux Enterprise Server 10, RedHat Enterprise Linux 5, and Qlogic 40xx series iSCSI hardware HBAs. For additional information please visit <http://www.microsoft.com/storage>.
- MMC based console to setup iSCSI Target storage. This console can be used to setup advanced storage options. Basic iSCSI Target setup and management can be performed directly from the All-in-One Storage Manager.

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File/print serving (NAS Operating System - Windows Storage Server 2003 R2 Standard Edition)

- Support for advanced features such as TCP/IP offload with multi-function network adapters (requires Microsoft Scalable Network Pack (SNP) and multi-pathing (MPIO). **NOTE:** The HP iSCSI Acceleration Pack on HP multi-function NICs is not supported on the iSCSI Target but is supported on host servers as an iSCSI initiator.
- The Microsoft iSCSI Target can be used as target storage behind a Microsoft application cluster. For more information on this implementation read the whitepaper on this topic found at <http://www.hp.com/go/AiOStorage>.

- Native CIFS/SMB file serving support - Windows based file serving optimized for Windows clients
- Microsoft Services for Network File System (NFS) to enable heterogeneous file serving to non-Windows clients.
- HP Enhanced, File Server Management Console
- De-duplication via Single Instance Storage (SIS) to eliminate duplicate files and maximize available capacity; SIS can improve capacity utilization by 30% or more
- Full-text indexing to maximize productivity and allow for fast data retrieval.
- File Server Resource Manager for quotas, file screening and storage reporting
- Print Server management console with unlimited printer support
- Unlimited Client Access License (CAL) included
- Print Server support
 - Easy to use print management console
 - Unlimited printer support in Standard Edition

Integrated Data Protection

- RAID hard drive configurations (hot swappable drives)
- Disk-based snapshots for easy roll-back
 - Scheduled or ad-hoc by application
 - Managed through HP All-in-One Storage Manager
 - Exchange and SQL Server aware snapshots ensure consistent data sets for the applications.
 - 512 snapshots per independent iSCSI/Application volume. 64 snapshots for file share volumes. **(NOTE:** If iSCSI LUNs and file shares are on a common volume the iSCSI snapshot limit is 448.)
- A fully integrated copy of HP StorageWorks Data Protector Express software (v3.5) provides enhanced backup and recovery operations. **(NOTE:** This is the backup server LTU component of Data Protector Express and does not include any add-on licenses for features such as Bare Metal Recovery or Disk-to-Disk-to-Any functionality. If using the All-in-One Storage System as a backup server for a Data Protector Express backup domain all members of the domain should be running the same version of Data Protector Express)
 - Automatic discovery of tape devices
 - Software based Virtual Tape functionality
 - Disk-to-disk-to-any data protection
- Microsoft Distributed File System Replication (DFS-R) to

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enable replication of files to an alternate HP All-in-One Storage System, including

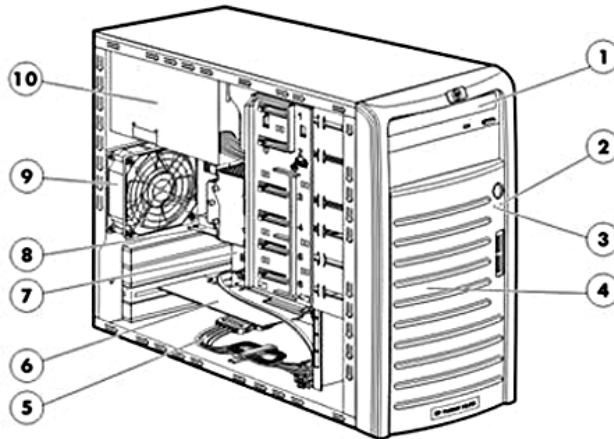
- DFS Management Console
- Configuration and Diagnostic Tools
- Support for HP StorageWorks Storage Mirroring v5 (AiO Edition) to enable replication and failover of both files and iSCSI LUNs.
 - A 60-day trial version of HP StorageWorks Storage Mirroring software is included on most systems or can be downloaded from <http://h18000.www1.hp.com/products/storage/software/sm/index.html>

Operating System

- Microsoft Windows Storage Server 2003 Release 2, Standard Edition

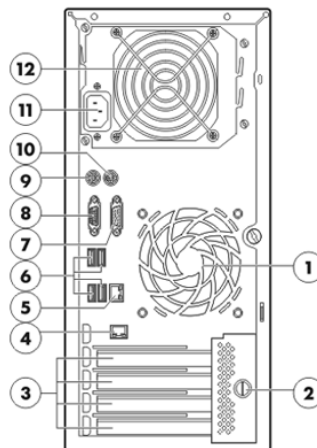
Highlights

400t All-in-One Storage System (AiO400t)



Front View:

- | | |
|-----------------------|--|
| 1. DVD-ROM Drive | 6. Smart Array E200 controller |
| 2. Power LED | 7. System Board |
| 3. Drive Activity LED | 8. HP LO 100c Management Card (Optional) |
| 4. Front Bezel | 9. System Fan |
| 5. SAS cable | 10. 365W Power Supply |



Rear View:

- | | |
|--|-------------------------|
| 1. System fan | 7. Serial Ports |
| 2. PCI slot cover retainer | 8. VGA Port |
| 3. PCI slot covers (one slot occupied by Smart Array E200 and one slot occupied by 360T NIC) | 9. PS/2 Keyboard Port |
| 4. HP LO 100c Management Port (Optional) | 10. PS/2 Mouse Port |
| 5. LAN Port (RJ-45) | 11. Power Supply Outlet |

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6. Rear USB 2.0 Ports

12. Power supply unit (PSU) fan

AiO400t Hardware Specifications

Processor	<ul style="list-style-type: none">Dual-Core Intel® Pentium® E2160 1.8 GHz with 1 x 1MB L2 cache
Memory	<ul style="list-style-type: none">2 GB of memory standard, expandable to 4 GBMemory Type: PC2-6400 unbuffered DDR2 ECC 800MHzMemory Protection: Unbuffered ECC
Operating System	<ul style="list-style-type: none">Windows Storage Server 2003 Release 2, Standard Edition
Storage Controller	<ul style="list-style-type: none">Smart Array E200/128MB Controller with BBWC
Internal Storage	<ul style="list-style-type: none">Four 3.5" (large form factor) non hot-plug drive bays<ul style="list-style-type: none">1TB SATA Model: 4 x 250GB 7200 RPM HDDs584GB SAS Model: 4 x 146GB 15,000 RPM HDDs
Storage Layout	<ul style="list-style-type: none">Factory RAID configuration: (1) RAID 5 Logical disk for OS on disks 0-3. (1) RAID 5 Logical disk for DON'T ERASE recovery partition on disks 0-3. (1) RAID 5 Logical disk for User Data and iSCSI LUNs on disks 0-3.
Optical Drive	<ul style="list-style-type: none">Half-Height Internal DVD-ROM
Expansion Slots	<ul style="list-style-type: none">(1) Full-height, half-length 32-bit/33MHz PCI at 3.3V slot(1) Full-height, half-length PCIe x1 slot (occupied by NC360T NIC)(1) Full-height, full-length PCIe x1 slot (x8 connector)(1) Full-height, full-length PCIe x8 slot (occupied by Smart Array E200/128MB controller)(1) Lights-out 100c option slot
Network Controller	<ul style="list-style-type: none">Embedded NC105i PCIe Gigabit Ethernet Server AdapterAdditional NC360T dual-port Gigabit Ethernet Server Adapter
Remote Manageability	<ul style="list-style-type: none">Remote system management User Interface (UI), Remote Desktop or TelnetRemote hardware management via optional Lights-

Highlights

Out 100

Form Factor

- Micro ATX Tower

Power and Cooling

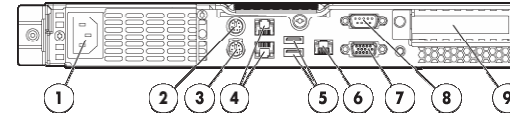
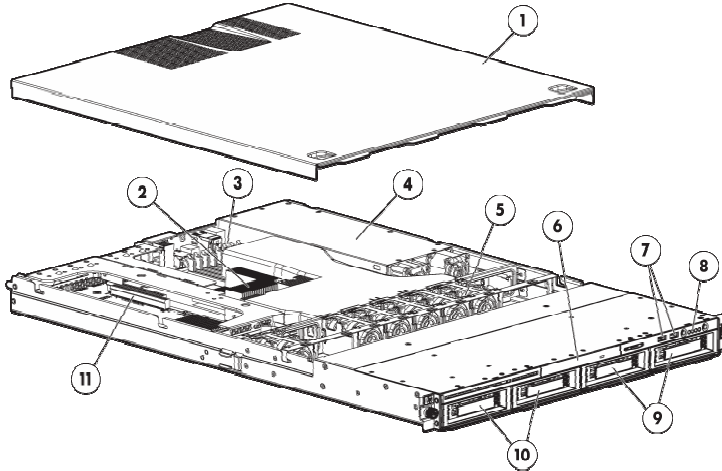
- Non-redundant system fans and power supply

Warranty

- Protected by HP Services and a worldwide network of resellers and service providers. The AiO400t comes with a standard 1-1-1 warranty (1 year parts exchange, 1 year labor, and 1 year onsite, next business day response) which can be upgraded to same day support through HP Care Packs. Certain restrictions and exclusions apply. SATA hard drives have a one-year warranty. Warranty also includes a 1 year Software Support Carepack.

Highlights

AiO400r All-in-One Storage System (AiO400r)



Front View:

1. Access panel
2. Quad-Core Intel® Xeon® 5405 2.00GHz processor (supports up to two)
3. Eight PC2-5300 (DDR2-667) fully buffered DIMM memory slots
4. Power supply (650 Watts)
5. System fans
6. DVD-ROM drive
7. Two USB ports
8. Power on/off & system LEDs
- 9., Four (4) 3.5" hot-plug SAS/SATA hard drive bays
- 10.
11. Two PCIe x16 expansion slots (one open)

Rear View:

1. Power Supply cable socket
2. PS/2 Mouse Port
3. PS/2 Keyboard Port
4. Two GbE LAN ports for NIC 1 and NIC 2 (1
5. Rear USB 2.0 Ports
6. Lights Out 100i port for remote managem
7. Video Port
8. Serial Port
9. Low Profile PCIe Slot Cover (x16 slot oper
10. Full-sized PCIe Slot (occupied by Smart A

AiO400r Hardware Specifications

Processor

- Quad-core Intel® Xeon® processor E5405 2.00GHz (One processor standard; up to 2 supported). 12MB (2 x 6MB) level 2 cache.

Memory

- 2 GB of memory standard, expandable to 4 GB. Type PC2-5300 Fully Buffered DIMMs (DDR2-667) w/ Advanced ECC Memory Protection. 8 DIMM Sockets
- Note: System memory in the All-in-One Storage System equates to read cache in a traditional storage array. Write cache is driven by the Storage Controller in the All-in-One Storage System.

Highlights

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|-----------------------------|--|
| Operating System | <ul style="list-style-type: none">• Windows Storage Server 2003 Release 2, Standard Edition |
| Storage Controller | <ul style="list-style-type: none">• Smart Array E200/128MB Controller with BBWC |
| Internal Storage | <ul style="list-style-type: none">• Four 3.5" (large form factor) front load, hot plug hard drives<ul style="list-style-type: none">○ 1TB SATA Model: 4 x 250GB 7,200 RPM HDDs○ 2TB SATA Model: 4 x 500GB 7,200 RPM HDDs○ 1.2TB SAS Model: 4 x 300GB 15,000 RPM HDDs |
| Storage Layout | <ul style="list-style-type: none">• Factory RAID configuration: (1) RAID 5 Logical disk for OS on disks 0-3. (1) RAID 5 Logical disk for DON'T ERASE recovery partition on disks 0-3. (1) RAID 5 Logical disk for User Data and iSCSI LUNs on disks 0-3. |
| Optical Drive | <ul style="list-style-type: none">• Slimline internal DVD-ROM |
| Expansion Slots | <ul style="list-style-type: none">• Full-length, full-height PCIe x16 slot (occupied by Smart Array E200/128MB controller)• Half-length, low-profile PCIe x16 slot |
| Network Controller | <ul style="list-style-type: none">• Embedded NC320i PCIe Dual Port Gigabit Server Adapter |
| Remote Manageability | <ul style="list-style-type: none">• Remote system management User Interface (UI), Remote Desktop or Telnet• HP ProLiant Lights Out 100i remote management – Advanced Pack included |
| Form Factor | <ul style="list-style-type: none">• 1U rack mount |
| Power and Cooling | <ul style="list-style-type: none">• Non-redundant system fans and power supply |
| Warranty | <ul style="list-style-type: none">• Protected by HP Services and a worldwide network of resellers and service providers. The AiO400t comes with a standard 1-1-1 warranty (1 year parts exchange, 1 year labor, and 1 year onsite, next business day response) which can be upgraded to same day support through HP Care Packs. Certain restrictions and exclusions apply. SATA hard drives have a one-year warranty. Warranty also includes a 1 year Software Support Carepack. |

Highlights

Optional Software to Enhance HP All-in-One Storage Systems

- **HP StorageWorks Storage Mirroring (AiO Edition)** - HP StorageWorks Storage Mirroring software enables remote replication over an IP LAN/WAN between multiple All-in-One Storage Systems for both file (NAS) and block (iSCSI) data. Key features include asynchronous replication that can be scheduled to a fine granular level, Logical Unit Number (LUN), file or byte level. Other features include multiple replication configuration options including peer-to-peer and many-to-one. In addition, Storage Mirroring is a very cost effective disaster recovery alternative from one host to another within a LAN, storage center, or between direct attached storage in metro offices and regional centers. Additional configurations allow replication from small office environments to ensure business continuity without an outside IT staff.

For more information:

<http://h18000.www1.hp.com/products/storage/software/sm/index.html>

- **HP Data Protector Express optional extensions** - Data Protector Express delivers class leading features and reliability without compromising its ease of use. Features such as open file backup, D2D2Any backup and recovery and bare metal disaster recovery minimize the impact of backup and recovery operations. The D2D2Any feature extends the scale and capability of the D2D backup (Virtual Library) to allow backups to be moved or copied from disk to other media such as tape for longer term retention. Agents are available for the protection of networked file servers, application servers, HP Data Protection Storage Server and Windows desktops. High performance is delivered through the Data Protector Express three-tier architecture - unique in this class of product - and self-tuning parallel backup streams that allows multiple jobs to run concurrently.

The HP All-in-One Storage System includes the backup server LTU which enables the backup and recovery of file and iSCSI data on the AiO and the setup and management of virtual libraries; you can consolidate the rest of your backup infrastructure and add advanced functionality by including any of the optional extensions such as D2D2Any, bare metal recovery, or network agents for backup of data stored locally on other servers.

For more information on Data Protector Express visit

<http://www.hp.com/go/dataprotectorexpress>. Click on the QuickSpec link for information on SKU's, options, and functional extensions.

- **HP Storage Essentials NAS Manager** - Provides comprehensive Network Attached Storage (NAS) management capabilities for HP All-in-One Storage Systems. Visualize your distributed HP All-in-One Storage Systems and centrally manage their capacity, performance, events, and dependencies to ensure availability and performance and unify SAN and NAS management. For more information on the complete line of HP Storage Essential products go to: <http://www.hp.com/go/storageessentials>

Service and Support, HP Care Pack, and Warranty Information

HP Care Pack Services offer upgraded service levels to extend and expand your standard product warranty with easy to buy, easy to use support packages that help you make the most of your hardware and software investments. They let you choose the support levels that meet your business requirements. They help you contain total cost of ownership.

HP Care Pack warranty extensions can be purchased along with HP products to cost-effectively upgrade or extend your warranty. For most HP products, including the AiO400t and AiO400r, post-warranty HP Care Pack Services are available when your original warranty has expired.

Why purchase an HP Care Pack service?

Your standard warranty protects against product defects during normal working hours. HP Care Pack Services help you extend this protection to more coverage hours and more days per week. This can increase uptime which can improve your productivity and profitability. These convenient service packages:

- Protect your investment in HP products
- Provide consistent, predictable levels of support across your entire department or business
- Ease budget planning with fixed-cost support that includes parts and labor
- Give you direct access to proven technical and problem-solving expertise
- Offer a choice of response-time and repair-time commitments
- Deliver prompt, measurable results
- Are available whenever and wherever you do business
- HP Care Pack availability may vary by country and product.

The breadth, depth, and quality of HP hardware and software support services can help you improve the performance of your IT support processes and resolve the complex software and hardware problems that tax user productivity. HP Care Pack services help you increase IT environment stability, efficiency, and agility from the desktop to the data center, and improve the productivity of your employees.

HP offers an optional migration service to assist the customer in moving to the newest product release. This may be in the form of a defined kit and service, or may alternatively be performed on a time & material basis.

HP Services allows the customer to leverage HP's experience in selecting and configuring the most widely used security features, and provides an environment that is immediately more available due to increased change control and significantly improved data security. For more information on these and other service options, please contact any of our worldwide sales offices or visit our web site at: <http://www.hp.com/hps/support>

Warranty and Services Included with the Product

HP basic Software warranty provides that the Software media will be free of physical defects for a period of ninety (90) days from delivery. In addition to this basic Software warranty HP also includes, as part of the product, a 1 year, Software Support Carepack that provides phone in support for 9hrs/day, 5 days/week for all the bundled software including the WSS2003 R2 operating system including the iSCSI functionality, the Data Protector Express software, and the enhanced All-in-One Storage Manager (ASM) GUI. This AiO400 product support can be uplifted to 24x7 for up to 5 years.

The HP AiO400t and AiO400r come with a 1-1-1 hardware warranty (1 years parts exchange, 1 year labor, and 1 year on-site, next business day response) for product hardware.

Available HP Care

Extend your product warranty with a choice of cost-saving support packages.

Service and Support, HP Care Pack, and Warranty Information

Pack Services

HP Care Pack Services are sold by HP and HP authorized enterprise and commercial resellers. Services for customers purchasing via direct and enterprise resellers are quoted using HP order configuration tools.

- HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage.
- HP Care Pack is not available for less than the product's warranty duration.
- HP Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required.
- HP Care Pack services are prepaid.

For additional information on Product Services and HP Care Pack, as well as orderable part numbers, please refer to the URL: <http://www.hp.com/hps/carepack/>.

If you have specific questions about availability or how to obtain services contact your local HP representative. Contact information for your local area can be found at: <http://www.hp.com/services>.

Installation Services

The Installation service deployment activities follow the AiO Quick Start Poster and include:

- Unpacking the product, performing initial inspection, rack mounting if required, and setting up product hardware and power connectivity and connecting customer provided cables
- Working with the customer to determine if access to the AiO will be DHCP or networking
- Configuring the AiO by running the Rapid Startup Wizard which sets such things as date, time, user name and password, setting up integrated Lights Out (iLO) and simple network management protocol (SNMP).
- The AiO "Create a Shared Folder" Wizard is run to configure the AiO to share files, and access is confirmed.

Finally, a product orientation of less than 10 minutes provides a brief overview of how the product was set up, as well as how to find information within the product documentation.

Support Plus 24 CarePack

HP Support Plus 24 provides all the benefits of the regular Support Plus Care Pack, but HP Services engineers are available to work with your IT team to deliver onsite hardware support and over-the-phone software support around-the-clock 365 days per year. Three years of HP Support Plus 24 x 7

- Improve coverage hours from 9x5 to 24x7
- Improve HW response time from warranty of next business day to 4hrs same day
- Extend coverage from 1 year to 3 years
- Includes both AiO hardware and software
- Improve the productivity of system managers and operators
- Improve system performance and reduce downtime due to software defects
- Expedite problem resolution through expert-level technical resources
- Enjoy consistent service coverage across geographically dispersed sites
- Access to patches for HP and selected third-party software and firmware

In short you enjoy all the benefits of HP Support Plus at any time or on any day you may need

Service and Support, HP Care Pack, and Warranty Information

them. Choose Support Plus 24 when you not only need all of the benefits of Support Plus, but also require responsive hardware and software services available anytime.

Support Plus CarePack

HP Support Plus helps you increase the performance and availability of your IT infrastructure with comprehensive, consistent hardware and software services. HP Services engineers deliver onsite hardware support and over-the-phone software support 13 hours per day, 5 days per week.

Three years of HP Support Plus 13x5

- Extend basic coverage from 1 year to 3 years
- Improve HW response time from warranty of next business day to 4hrs same day
- Improve coverage hours from 9x5 to 13x5 (due to improved response time)
- Includes both AiO hardware and software
- Improve the productivity of system managers and operators
- Improve system performance and reduce downtime due to software defects
- Expedite problem resolution through expert-level technical resources
- Enjoy consistent service coverage across geographically dispersed sites
- Access to patches for HP and selected third-party software and firmware

Our Service coverage encompasses the HP AiO400t and AiO400r products, selected multi-vendor hardware and provides trouble-shooting software problems which in turn range from the Windows Storage Server 2003 operating system up to the available utilities. And Support Plus provides recovery and re-configuration assistance of the base HP AiO400t and AiO400r using the Quick Recovery disk and your saved configuration file (application recovery not included).

Choose Support Plus when you need to:

- Improve uptime with responsive hardware and software services.
- Enjoy consistent service coverage across geographically dispersed sites.
- Update HP and selected third-party software with tested and certified patches.

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit <http://www.hp.com/support>

Service and Support, HP Care Pack, and Warranty Information

Education Services

HP offers a variety of training methods to fit your needs including traditional instructor-led courses at one of our 120 training centers worldwide, onsite training customized to your needs, in your facility, or even Remotely Assisted Instruction Learning that combines the best of traditional classroom training (including its live instructor and labs) with the best of online training (no traveling required). And if you like learning on your own schedule, at your own pace, make use of e-learning opportunities on the award-winning HP IT Resource Center, a "learning community" with extensive on-demand resources that can be accessed 24x7. For more information on these services, contact your HP sales representative or visit: <http://www.hp.com/learn> and click on "HP StorageWorks".

Financial Services

HP Financial Services provides innovative financing and financial asset management programs to help customers cost-effectively acquire, manage, and ultimately retire their HP solutions. For more information on these services, please contact your HP sales representative or visit: <http://www.hp.com/go/hpfinancialservices>

Additional Specifications

In the following steps you will be guided through a series of steps to help you configure the best solution for your environment. You will also be supplied with information about complementary products that can be ordered at the same time. It is important to note that HP StorageWorks All-in-One Storage Systems include all of the software features and benefits listed above as standard features; this means that there are no expensive upgrades or options required to achieve this integrated storage functionality and data management.

NOTE: The steps outlined below are intended only as a guide for the options available. All options chosen are not factory integrated or configured and ship as separate components.

Step 1 - Order the desired HP All-in-One Storage System based on form factor, power cord localization (AiO400t), capacity, performance, scalability, and redundancy requirements.

HP StorageWorks 400t All-in-One Storage System

AiO400t common specifications	Processor	Dual-Core Intel® Pentium® E2160 1.8 GHz with 1 x 1MB L2 cache
	Memory	2 GB of memory standard (2 x 1GB), expandable to 4 GB
	Operating System	Windows Storage Server 2003 Release 2, Standard Edition
	Storage Controller	Smart Array E200/128MB Controller with BBWC
	Internal Storage	Varies by model – select model below depending on needs. Capacity points listed are total raw capacity. Hard drives are non hot-pluggable.
	Optical Drive	Half-Height Internal DVD-ROM
	Network Controller	Embedded NC105i PCIe Gigabit Ethernet Server Adapter plus Additional NC360T dual-port Gigabit Ethernet Server Adapter
	Form Factor	Micro ATX Tower
	Power and cooling	Non-redundant system fans and power supply
	Remote Management	Remote management User Interface (UI), Remote Desktop, or Telnet. Remote hardware management via optional Lights-Out 100
	File Serving Protocol Support	SMB/CIFS, NFS, NCP, AppleTalk, HTTP, FTP
	iSCSI Initiator Support	Compliant with iSCSI industry standards and compatible with industry standard iSCSI initiators. Interoperability has been verified for Windows 2000, Windows Server 2003, VMware ESX Server 3, SUSE Linux Enterprise Server 10, RedHat Enterprise Linux 5, and Qlogic 40xx series iSCSI hardware HBAs. For additional information please visit http://www.microsoft.com/storage .

Additional Specifications

AiO400t 1TB SATA Model AK296A (Amer) AK297A (Asia) AK298A (Euro) AK299A (China) AK300A (Aust)	Internal Storage	4 x 250GB front loading, 7200 RPM SATA HDDs
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AiO400t 584GB SAS Model AK291A (Amer) AK292A (Asia) AK293A (Euro) AK294A (China) AK295A (Aust)	Internal Storage	4 x 146GB front loading 15,000 RPM SAS HDDs
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HP StorageWorks 400r All-in-One Storage System

AiO400r common specifications	Processor	Quad-Core Intel® Xeon® processor E5405 (2.00GHz, 80W, 1333MHz FSB) (One processor standard; up to 2 supported)
	Memory	2 GB of memory standard (2 x 1GB), expandable to 4 GB
	Operating System	Windows Storage Server 2003 Release 2, Standard Edition
	Storage Controller	Smart Array E200/128MB Controller with BBWC
	Internal Storage	Varies by model – select model below depending on needs. Capacity points listed are total raw capacity.
	Optical Drive	Slimline internal DVD-ROM
	Network Controller	Embedded NC320i PCIe Dual Port Gigabit Server Adapter
	Form Factor	1U rack mount
	Power and cooling	Non-redundant system fans and power supply
	Remote Management	Remote management User Interface (UI), Remote Desktop, or Telnet. HP ProLiant Lights Out 100i remote management – Advanced Pack included
	File Serving Protocol Support	SMB/CIFS, NFS, NCP, AppleTalk, HTTP, FTP
	iSCSI Initiator Support	Compliant with iSCSI industry standards and compatible with industry standard iSCSI initiators. Interoperability has been verified for Windows 2000, Windows Server 2003, VMware ESX Server 3, SUSE Linux Enterprise Server 10, RedHat Enterprise Linux 5, and Qlogic 40xx series iSCSI hardware HBAs. For additional information please visit http://www.microsoft.com/storage .

Additional Specifications

AiO400r 1TB SATA Model AK224A	Internal Storage	4 x 250GB front loading, hot-plug, 7,200 RPM SATA HDDs
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AiO400r 2TB SATA Model AK225A	Internal Storage	4 x 500GB front loading, hot-plug, 7,200 RPM SATA HDDs
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AiO400r 1.2TB SAS Model AK226A	Internal Storage	4 x 300GB front loading, hot-plug, 15,000 RPM SAS HDDs
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Step 2 - Select expansion options based on system choice: AiO400t or AiO400r

Step 2a: AiO400t options

Additional Memory **NOTE:** Every HP All-in-One 400t Storage System comes standard with 2 GB of memory and is expandable to OS limit of 4 GB. All models have a total of four DIMM sockets. See 'Memory' section of QuickSpecs below for more information on memory configuration

2048 MB Unbuffered ECC PC2-6400 DDR2 (1x2048 MB)	450260-B21
1024 MB Unbuffered ECC PC2-6400 DDR2 (1x1024 MB)	450259-B21
512 MB Unbuffered ECC PC2-6400 DDR2 (1x512 MB)	450258-B21

Network Adapters	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21

Lights Out Management Card	HP ProLiant ML110 G5 Lights-Out 100 Remote Management Card	445513-B21
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Storage HBAs	SAS HBAs	
	HP SC44Ge Host Bus Adapter	416096-B21
	HP SC40Ge Host Bus Adapter	449176-B21

NOTE: Please see the HBA QuickSpecs for additional information:
http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html
(SC44Ge HBA)

Storage HBAs	SCSI HBAs	
	HP SC11Xe Host Bus Adapter (PCI-e)	412911-B21
	HP U320e SCSI Host Bus Adapter	AH627A

Additional Specifications

NOTE: Please see the following QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.HTML
 (SC11Xe HBA)

Step 2b: AiO400r options

Additional Processor **NOTE:** The AiO400r supports a total of 2 processors so you may add one additional processor if desired.
 Quad-Core Intel® Xeon® processor E5405 (2.00GHz, 80W, 1333MHz FSB) Option Kit 446077-B21

Additional Memory **NOTE:** Every HP All-in-One 400r Storage System comes standard with 2 GB of memory and is expandable to OS limit of 4 GB. All models have a total of four DIMM sockets. See 'Memory' section of QuickSpecs below for more information on memory configuration

1 GB FBD PC2-5300 2X512 Kit	397409-B21
2 GB FBD PC2-5300 2X1GB Kit	397411-B21
4 GB FBD PC2-5300 2X2GB Kit	397413-B21

NOTE: The AiO400r has ONE have one low-profile PCI Express x16 slot available for one of the following: additional network ports, a backup HBA, or external storage expandability. Chose only one expansion card.

Network Adapters

HP NC110T PCI Express Gigabit Server Adapter	434905-B21
HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
HP NC510C PCIe 10 Gigabit Server Adapter	414129-B21
NOTE: A minimum of 1 gigabyte (1 GB) of server memory is required per each NC510C adapter.	
HP NC510F PCIe 10 Gigabit Server Adapter	414126-B21
NOTE: A minimum of 1 gigabyte (1 GB) of server memory is required per each NC510F adapter.	

Storage Controllers

HP Smart Array E500/256MB Controller	435129-B21
HP Internal SAS/SATA 4-Port Cable	457692-B21
NOTE: The purchase of a SAS Storage Controller requires the purchase of HP SAS/SATA 4-Port Cable	

Storage HBAs **SAS HBAs**

HP SC44Ge Host Bus Adapter	416096-B21
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NOTE: Please see the HBA QuickSpecs for additional information:
http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html
 (SC44Ge HBA)

Additional Specifications

SCSI HBAs

HP SC11Xe Host Bus Adapter (PCI-e)	412911-B21
HP U320e SCSI Host Bus Adapter	AH627A

NOTE: Please see the following QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.HTML
 (SC11Xe HBA)

Step 3 - add optional software

Data Protector Express extensions

NOTE: HP All-in-One Storage Systems ship with the HP StorageWorks Data Protector Express Backup server LTU. No functional extensions are required to backup file or iSCSI block data but the following extensions can be added for advanced functionality. (**NOTE:** This is the backup server LTU component of Data Protector Express and does not include any add-on licenses for features such as Bare Metal Recovery or Disk-to-Disk-to-Any functionality)

Additional extensions are available if you are enabling network backup from clients or servers to the AiO as a backup target. For more information on HP Data Protector Express please visit <http://www.hp.com/go/dataprotectorexpress>

HP StorageWorks Data Protector Express D2D2Any LTU	BB130AA
HP StorageWorks Data Protector Express Drive Expansion (1incremental drive) LTU	BB133AA

Storage Mirroring replication software

T5446A

HP StorageWorks Storage Mirroring software enables remote replication over an IP LAN/WAN between multiple All-in-One Storage Systems for both file (NAS) and block (iSCSI) data. Key features include asynchronous replication that can be scheduled to a fine granular level, Logical Unit Number (LUN), file or byte level. Other features include multiple replication configuration options including peer-to-peer and many-to-one. In addition, Storage Mirroring is a very cost effective disaster recovery alternative from one host to another within a LAN, storage center, or between direct attached storage in metro offices and regional centers. Additional configurations allow replication from small office environments to ensure business continuity without an outside IT staff.

Step 4 - add external storage enclosure for additional capacity (AiO400r only)

NOTE: The HP All-in-One Storage Manager (ASM) software supports management of both internal storage on the All-in-One Storage System as well as direct attached MSA storage enclosures. ASM also supports management of tiered storage environments where both SCSI/SAS or SATA hard drives are attached to the All-in-One Storage System.

External storage enclosure support matrix for HP All-in-One Storage Systems

System	Enclosure	Physical Max / Recommended Max	Host Controller or Adapter
AiO400r	MSA60	4 (1+3 cascade) / 1	SmartArray E500
	MSA50, MSA70	2 (1+1 cascade)/ 1	SmartArray E500

NOTE: For more information on storage enclosures from HP, including product QuickSpecs, please visit http://h18006.www1.hp.com/storage/disk_storage/msa_diskarrays/drive_enclosures/index.html

Additional Specifications

External Storage Enclosures	HP StorageWorks Modular Smart Array 50 Enclosure (MSA50) NOTE: Rack-mountable 10 drive (2.5" SAS/SATA) 1U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.	364430-B21
	HP StorageWorks 60 Modular Smart Array (MSA60) NOTE: Rack-mountable 12 drive (3.5" SAS/SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.	418408-B21
	HP StorageWorks 70 Modular Smart Array (MSA70) NOTE: Rack-mountable 25 drive (2.5" SAS/SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies.	418800-B21

Step 5 - add tape backup solution

NOTE: The following sizing recommendations are based on backing up the available raw capacities in the All-in-One Storage System. If adding external attached MSA Storage Enclosures or utilizing the All-in-One Storage System as a backup server for other systems on the network, you may need to select a faster or higher capacity tape backup option. For a complete list of supported tape options please visit www.hp.com/go/tape.

For more information on the complete HP StorageWorks tape backup portfolio, please visit <http://www.hp.com/go/tape>. For an up-to-date listing of the latest O/S and software support details for HP Ultrium tape drives, please visit: <http://www.hp.com/go/connect>. Please consult the EBS connectivity matrix at <http://www.hp.com/go/ebs> for detailed connectivity information.

Recommended tape backup solutions for All-in-One Storage Systems

Model	Recommendation			Lowest Cost			Highest Performance		
	Tape Solution	4 full backups, total TB	Full Backup Time in Hours	Tape Solution	2 full backups, total TB	Full Backup Time in Hours	Tape Solution	4 full backups, total TB	Full Backup Time in Hours
AiO 400r									
1 TB SATA	1/8 G2	4	1.16	1/8 G2	2	1.16	1/8 G2	4	1.16
2 TB SATA	2024(1)	8	2.33	1/8 G2	4	2.33	2024(2)	8	1.16
1.2 TB SAS	1/8 G2	4.8	1.40	1/8 G2	2.4	1.40	1/8 G2	4.8	1.40
AiO 400t									
1 TB SATA	1/8 G2	4	1.16	1/8 G2	2	1.16	1/8 G2	4	1.16
584 GB SAS	1/8 G2	2.336	0.68	1/8 G2	1.168	0.68	1/8 G2	2.336	0.68

Specifications for recommended configurations

	1/8 G2	2024(1)	2024(2)
Standard SKU	AK377A	AK378A	AK380A
Additional SAS drive	NA	NA	AK383A
Drives	1	1	2

Additional Specifications

Ncapacity TB	6.4	19.2	19.2
Ncapacity TB (2:1)	12.8	38.4	38.4
Nthruput TB/Hr	0.86	0.86	1.72

Tape Solutions

HP StorageWorks 1/8 G2 Ultrium 1760 SAS Autoloader	AK377A
HP StorageWorks MSL2024 1 Ultrium 1760 SAS Tape Library	AK378A
HP StorageWorks MSL8096 2 Ultrium 1760 SAS Tape Library	AK380A

NOTE: Please reference the Tape Autoloader and Library QuickSpecs at <http://www.hp.com/go/automation> for additional information.

Step 6 - add HP CarePack services

AiO400t CarePacks	HP 1y Support Plus AiO400r/t StorSys SVC	UH165E	
	HP 1ySupportPlus24 AiO400r/t StorSys SVC	UH166E	
	HP 3y Support Plus AiO400r/t StorSys SVC	UH167E	
	HP 3ySupportPlus24 AiO400r/t StorSys SVC	UH168E	
	HP 1y PWSupportPlusAiO400r/t StorSys SVC	UH169PE	
	HP 1yPWSupportPlus24AiO400r/tStorSys SVC	UH170PE	
	HP Installation	UF285E	
	AiO400r CarePacks	HP 1y Support Plus AiO400r/t StorSys SVC	UH165E
		HP 1ySupportPlus24 AiO400r/t StorSys SVC	UH166E
HP 3y Support Plus AiO400r/t StorSys SVC		UH167E	
HP 3ySupportPlus24 AiO400r/t StorSys SVC		UH168E	
HP 1y PWSupportPlusAiO400r/t StorSys SVC		UH169PE	
HP 1yPWSupportPlus24AiO400r/tStorSys SVC		UH170PE	
HP Installation		UF285E	

Additional Specifications

AiO400t Additional Specifications	Dimensions (HxWxD) (with feet)	14.5 x 6.9 x 16.8 in (36.7 x 17.5 x 42.6 cm)		
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	39 lb (17.5 kg)	
		Minimum (one hard drive, power supply, and processor installed)	23.81 lb (10.8 kg)	
	Input Requirements (per power supply)	Rated Line Voltage	90 to 132 VAC, 180 to 264 VAC	
		Rated Input Current	6 A (at 100 VAC), 3 A (at 200 VAC)	
		Rated Input Frequency	47 to 63 Hz	
		Rated Input Power	600 W (at 100 VAC), 600 W (at 200 VAC)	
	Power Specifications	To review typical system power ratings use the Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls		
	Power Supply Output (per power supply)	- Click on the system of interest. Example: DL380 G5 - Follow the instructions of the next screens.		
		Rated Steady-State Power	365 W (at 100 VAC), 365 W (at 200 VAC)	
Maximum Peak Power		385 W (at 100 VAC), 385 W (at 200 VAC)		
System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).		
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).		
Relative Humidity (non-condensing)	Operating	10% to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.		
	Non-operating	5% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.		
Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).		

Additional Specifications

Non-operating

9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

Additional Specifications

AiO400R Additional Specifications	Dimensions (H x W x D) (with bezel)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.20 cm)	
	Weight (approximate)	All hard drives, power supplies, and processors installed 37.00 lb (16.78 kg)	
	Input Requirements (per power supply)	Rated Line Voltage	90 to 140 VAC 180 to 264 VAC
		Rated Input Current	7.31A at 115VAC 3.6A at 230VAC
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	855W (at 100 VAC), 840.72W (at 200 VAC)
	Power Specifications	To review typical system power ratings use the Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls - Click on the system of interest. Example: DL380 G5 - Follow the instructions of the next screens.	
	Power Supply Output (per power supply)	Rated Steady-State Power	653.10W (at 100 VAC), 653.08W (at 200 VAC)
	System Inlet Temperature	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 305 m) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
		Non-operating	40° to 140° F (-40° to 60° C) Maximum rate of change is 36°F/hr (20°C/hr).
Relative Humidity (non-condensing)	Operating	10% to 85% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.	
	Non-operating	10% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.	
Altitude	Operating	10,000 ft (3050 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).	
	Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).	
Acoustic Noise	Listed are the declared A-Weighted sound power levels (L _{WAd}) and declared average bystander position A-Weighted sound pressure		

Additional Specifications

levels (L_{pAm}) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).

Idle

L_{WA_d}	6.86
L_{pAm}	52.36dBA

Operating

L_{WA_d}	6.89
L_{pAm}	52.60dBA

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