

### Overview

The HP Medical Archive solution (MAS) is a specialized archiving platform to help global healthcare providers of all sizes address exploding medical image retention requirements. With MAS, healthcare providers can strengthen their focus on improving patient care and adhering to strict compliance regulations by ensuring fast-growing medical image data are securely indexed, preserved, and continuously accessible. The grid architecture satisfies the scalability and performance requirements of healthcare providers at a price point any customer can afford.

HP MAS is registered with the U.S. Food and Drug Administration (FDA) as a Class 1 Medical Device, which mandates that HP follow the FDA's good manufacturing practices (GMP) to ensure that product functionality is consistently maintained in accordance with HP's go-to-market messaging and strategies. HP MAS is designed specifically to manage medical fixed content, ranging from large, multi-dimensional medical images and movies to smaller electronic patient records. MAS is an expandable appliance composed of integrated HP disk storage and ProLiant servers with indexing and policy management software to provide long-term retention of medical data. What differentiates MAS in the market is its ability to improve care delivery and facilitate compliance by providing high availability for safe, secure storage of images while reducing the cost and management of medical fixed content by consolidating historical data from multiple sources to lower cost media. The latter feature, bolstered by the native ability to enable information management (IM) policy-based migration across storage tiers, helps providers continuously align the business value of images and studies with appropriate retention policies.

The HP MAS modular appliance is composed of Infrastructure Nodes/components and Storage Nodes, which form a unified archive based on a grid architecture. Each node consists of multiple software services operating on a server that manages a fixed capacity storage resource. MAS nodes can be configured together and tailored to a customer's deployment requirements for single site (SS), single site plus disaster recovery site (SS+DR), multi-site or multi-site hub and spoke topologies.

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## What's New

The new HP MAS platform is based on a single suite of 2U nodes built on HP ProLiant servers. All Infrastructure Nodes (Admin/Gateway, Gateway, and Control), and the SAS and SATA Storage Nodes, including Combo Nodes, leverage the ProLiant DL320s storage server platform. Storage Area Network (SAN) and Tape Storage Nodes leverage the ProLiant DL380 G5 server platform. The compact nature of the node backbone enables an impressive rack density increase, which translates to a reduction in deployment size, as well as a decrease in power, cooling, and floor space requirements in customer data centers.

### Platform

- Single suite of 2U nodes based on HP ProLiant servers (DL320s and DL380 G5)
- 6.0 TB bundle (sku change) composed of one (1) Admin/Gateway Node (DL320s) and two (2) unique 3.0 TB SATA

### Control/Storage Combo Nodes

- 10.0 TB SATA Storage Nodes using 1.0 TB SATA drives
- SAN-attached Storage Node expansion up to 32 TB per node (includes a grid server with software, Host Bus Adapter (HBA), and a 2.5 TB License to Use (LTU) to incorporate part of local SAN arrays into the grid. Variable size from 2.5 TB through 32 TB
- SAS Storage Nodes (using 450 GB SAS drives to replace SCSI Storage Nodes) with 3.0 TB and 4.5 TB of storage
- SAS Combo Nodes (Control/Storage Nodes) with 2.4 TB and 3.6 TB of storage
- SATA Combo Nodes (Control/Storage Nodes) with 2.0 TB, 4.0 TB, 6.0 TB and 8.0 TB of storage
- Ability to integrate four storage tiers (SAN, SAS, SATA, and tape) into a single, centrally-managed archive

### Functionality and Performance

- Increased storage density enables improved data center efficiency with reduced power and cooling



## Overview

- Security enhancements for enterprise grids
- Manage more images with less infrastructure: Gateway Node scalability: 200 million objects managed per Gateway Node replication group (two Gateway Nodes) and enhanced management of objects up to 60 GB in size

## Deployment, service and support

- Comprehensive factory racking for all storage and infrastructure nodes
- Single point of software installation for all configurations via the Admin Node
- Online secondary file system gateway (FSG) during backup process to maintain continuous access to the grid

## Operating System (OS), Software, and System enhancements

- Integration of HP Systems Insight Manager (SIM) and Network Node Manager hardware and software monitoring agents into the MAS OS for direct exposure of hardware status and simple network message protocol (SNMP) alerts on all building block nodes in a grid configuration.

### Models and Options

**NOTE:** Storage Node and solution capacities are expressed as redundant array of independent disks (RAID-5)-6 Terabytes available for image and study data.

<b>HP Medical Archive solution Bundle</b>	HP 6.0 TB Medical Archive Solution	AJ769A
<b>HP Medical Archive Solution Infrastructure Components and Cabinet</b>	HP Medical Archive Solution WAN Connectivity Kit	AJ771A
	HP Medical Archive Solution Cabinet Connectivity Kit	AG769A
	HP Medical Archive Solution Infrastructure Cabinet	AJ770A
<b>HP Medical Archive Solution SAN Storage and Combo Nodes</b>	HP C2500 Storage Node (2.5 TB SAN)	AJ788A
	HP C2500 Medical Archive Solution Combo Node (2.5 TB SAN)	AJ789A
<b>HP Medical Archive Solution SAS Storage and Combo Nodes</b>	HP B3000CL Medical Archive Solution Storage Node (3.0 TB SAS)	AJ784A
	HP B4500CL Medical Archive Solution Storage Node (4.5 TB SAS)	AJ785A
	HP B2400CL Medical Archive Solution Combo Node (2.4 TB SAS)	AJ786A
	HP B3600CL Medical Archive Solution Combo Node (3.6 TB SAS)	AJ787A
<b>HP Medical Archive Solution SATA Storage and Combo Nodes</b>	HP A2500CL Medical Archive Solution Storage Node (2.5 TB SATA)	AJ776A
	HP A5000CL Medical Archive Solution Storage Node (5.0 TB SATA)	AJ777A
	HP A7500CL Medical Archive Solution Storage Node (7.5 TB SATA)	AJ778A
	HP A10000CL Medical Archive Solution Storage Node (10.0 TB SATA)	AJ779A
	HP A2000CL Medical Archive Solution Combo Node (2.0 TB SATA)	AJ780A
	HP A4000CL Medical Archive Solution Combo Node (4.0 TB SATA)	AJ781A
	HP A6000CL Medical Archive Solution Combo Node (6.0 TB SATA)	AJ782A
	HP A8000CL Medical Archive Solution Combo Node (8.0 TB SATA)	AJ783A
	HP Medical Archive Solution D1010 Tape Node	AJ775A
<b>HP Medical Archive Infrastructure Nodes</b>	HP Medical Archive solution infrastructure nodes are available to enhance and expand existing deployed configurations as well as create new installations.	
	HP Medical Archive Solution Admin/Gateway Node	AJ772A
	HP Medical Archive Solution GN2000CL Gateway Node	AJ773A
	HP Medical Archive Solution GN6000CL Gateway Node	AJ774A
	HP Medical Archive Solution CN100CL Control Node	AJ792A
<b>HP Medical Archive Solution Software Options</b>	HP Medical Archive Solution DICOM Option Software	384777-B21
	HP C500 Medical Archive Solution SAN LTU (500 GB)	T5420A

### Features and Benefits

**HP Medical Archive Solution Components and Nodes** The HP MAS architecture provides a secure, reliable, and high performance solution for the storage and distribution of very high volumes of medical fixed content within a data center, an optional disaster recovery site, and/or co-located with data sources or clinical sites.

HP MAS is composed of Infrastructure Nodes (Admin/Gateway, Gateway, and Control Nodes) and various types/capacities of Storage Nodes. In addition, combined Control/Storage (Combo) Nodes can be used at smaller sites. A single MAS grid can accommodate various types/capacities of SAN, SAS, SATA, and Tape Storage Nodes (or Combo Nodes) to enable the development of an HP-supported multi-tier archive. Native IM policy-based migration allows the automated movement of medical images between storage tiers to optimize the existing storage infrastructure and align the business value of images with the right media tiers over time.

Within a given facility, all nodes are interconnected using standard TCP/IP networking, and communicate with local medical imaging applications, such as Picture Archive Communication Systems (PACS), workstations, and modalities. Wide area network (WAN) links extend the grid, enabling off-site replication of content for disaster recovery.

HP MAS deployments rely on open standards for interoperability with external hospital systems. Exchange of clinical data with external imaging applications, including PACS, viewing workstations, and modalities, takes place over standardized network file system protocols (NFS/CIFS) or (optionally) via established imaging protocols, including Digital Communication in Medicine (DICOM).

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**HP Medical Archive Solution Components and Nodes** The HP MAS 6.0 TB bundle (single sku) is composed of one (1) Admin/Gateway Node and two (2) unique 3.0 TB SATA Control/Storage/Gateway Combo Nodes. A base MAS configuration has the functionality of one (1) Gateway Node (or 1 Admin/Gateway Node), two Control Nodes, and a minimum of two Storage nodes; however, this can change depending on customer requirements. In some cases Combo Nodes are used instead, so the type and number of nodes in a grid can vary according to imaging environment requirements. The various components and nodes are described below.

- **MAS Infrastructure Cabinet**
  - Base or expansion cabinet required for housing the Infrastructure Nodes/components and Storage Nodes. The cabinets can host a variable number of Storage, Control, Gateway, Admin/Gateway and Combo Nodes depending on the specific configuration.
  - Functions and configuration details:
    - Includes the physical 42U rack and all power, communication, and management infrastructure that may be used in an installation. The cabinet has predefined locations for each infrastructure component and storage node.
- **MAS Cabinet Connectivity Kit (CCK)**
  - The CCK consists of two switch routers for redundancy.
  - In SS configurations: Required to interconnect the base cabinet with the first expansion cabinet only (Quantity 2 required for this configuration).
  - In SS+DR configurations: Required to interconnect the base cabinet at both sites only (Quantity 2 required for this configuration).
- **MAS WAN Connectivity Kit (WCK)**
  - The WCK is used to interconnect the two base MAS racks in a SS+DR or enterprise configuration via a private network instead of using a local customer network. It consists of two routers that are installed in the base cabinet at each site and are connected to the routers in the CCKs.
  - It is not required in SS configurations.

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- The WCK requires installation of the CCK.
- MAS Storage Nodes replicate data across the grid. At the level of the Storage Node (any mode or model), encryption provides secure data storage and transmission (via an internal HTTP API) to ensure that image transfers across the grid are secure. Multiple Storage Nodes of any mode/model can be added to the MAS grid depending on capacity requirements, the need for redundancy, and performance/configuration guidelines for best practices.
- **MAS SAN Storage and Combo Nodes**
  - SAN Storage and Combo Nodes are composed of a server with SAS hard drives for the Linux OS, Storage Node software, and (not included) a local SAN array for object storage. SAN Combo Nodes also have Control Node software in addition to the aforementioned components.
  - A single SAN-attached Storage Node supports from 2.5 TB to 32TB of SAN storage in a local SAN array.
- **MAS SAS Storage and Combo Nodes**
  - SAS Storage Nodes consist of a server with SAS hard drives for the Linux OS, Storage Node software and embedded disk for object storage. SAS Combo Nodes also have Control Node software in addition to the aforementioned components.
  - SAS Storage Nodes support either 3.0 or 4.5 TB of effective capacity depending on the mode and model.
  - SAS Combo Nodes support 2.4 TB or 3.6 TB of effective capacity depending on the mode and model.
- **MAS SATA Storage and Combo Nodes**
  - SATA Storage Nodes consist of a server with SAS hard drives for the Linux OS, Storage Node software and embedded disk for object storage. SATA Combo Nodes also have Control Node software in addition to the aforementioned components.
  - SATA Storage Nodes support between 2.5 TB and 10.0 TB of effective capacity depending on the mode and model.
  - SATA Combo Storage Nodes support between 2.0 TB and 8.0 TB of effective capacity depending on the mode and model.
- **MAS Tape Node**
  - The MAS Tape Node consists of a server with SAS hard drives for the Linux OS, Storage Node software, an Ultra320 HBA, a 4.0 GB Fibre-Channel HBA, and a network interface to connect to a local middleware (tape software) server and tape library for object storage.
  - A single Tape Storage Node interfaces to a separately-provided middleware server that can interface to any external tape library
- **MAS Control Node**
  - The Control Node consists of a server with SAS drives for the Linux OS, Control Node software, and SQL server database (DB) operation. It provides object management (an object is a single medical study, comprised of many images), indexes, manages, replicates, and synchronizes object metadata, and acts as the "brains" behind object replication.
  - The Control Node manages storage policies and internal grid communications and provides policing and authentication.
  - At the level of the Control Node the GE Optimized Storage (GEOS) feature can be deployed to enhance a dual GE Enterprise Archive (EA) version 3.0 or later imaging application environment. This included HP MAS software feature ensures that each MAS unit integrated with an EA server only stores one (1) copy of all data. Additionally, HP MAS rebuilds lost or corrupt data behind either of the two EAs without requiring EA manual or automatic involvement.
  - Best Practices: The minimum deployment in an HP MAS grid is two Control Nodes (or two Control/Storage Combo Nodes of any mode/capacity) to provide database redundancy. Additional Control (or Combo) Nodes can be added for grid resiliency in a distributed environment to control local access and storage with limited or unreliable WAN or to

### Features and Benefits

extend the number of objects supported on the grid for larger systems.

#### **MAS Gateway Node**

- The Gateway Node consists of a server with SAS hard drives for the Linux OS, Gateway Node software, and SAS drives for Gateway cache. CIFS and NFS mounts provided by the Linux OS services are managed by HP MAS software within the Gateway Node.
- The GN6000CL Gateway Node contains Storage Node software in addition to the features listed above to provide a larger local cache to a remote site. The GN2000CL does not contain this additional software.
- The Gateway Node acts as interface to the MAS grid for client systems (e.g., PACS) and presents the MAS grid to client systems as a near-limitless network mounted drive. The archiving application only has to deposit the file in the CIFS/NFS interface with immediate response from the MAS grid.
- The Gateway Node can be utilized as fast file-cache for remote sites (up to 2.0 TB of cache for objects up to 60 GB in size, and manages up to 200 million objects per Gateway Node replication group (two Gateway Nodes).
- The Parallel Fetch software feature (included and applied on the Gateway Node) will streamline retrieval of additional images within a given study when the first image is retrieved to speed up viewing exams for some PACS applications. This is advantageous for PACS which do not containerize all images in a study prior to archival. Also, the Selective WORM feature enables flexibility to select which data types require WORM (file or path name-based) and the ability to enhance WORM duration. Both Parallel Fetch and Selective WORM software features are included, giving customers the choice to deploy them.
- Best Practice: The minimum deployment in an HP MAS grid is typically two Gateway Nodes to provide interface redundancy to the imaging (e.g., PACS) application. Additional Gateway Nodes can be added for resiliency. In a distributed environment, Gateway Nodes can provide the interface to the local PACS (or other imaging application), cache the inbound data, and then communicate to the appropriate Storage Node for archival storage.

#### ● **MAS Admin/Gateway Node**

- This node consists of a server with SAS hard drives for the Linux OS and Admin Node software, and it provides centralized management, an administrative interface, and user access security.
- The Admin/Gateway Node collects real-time and historical data for alerts, reporting, troubleshooting, auditing and analysis.
- Best Practice: Only one Admin/Gateway Node is needed for the MAS grid, although one (1) per monitoring site is recommended for redundancy.

#### ● **SAN LTU**

- This LTU extends the SAN Storage Node to incorporate local SAN storage in 500 GB increments up to a total of 32 TB SAN storage per node.

#### ● **MAS DICOM Option Software**

- This optional software adds DICOM interface connectivity for:
  - Multi-PACS environments.
  - Pre-PACS environments where modalities and DICOM workstations connect to the archive.
- It can be purchased initially or added at a later date after installation.
- It provides the following DICOM functionality for medical imaging exams and associated objects:
  - Storage Class Provider (SCP) - Storage of imaging exams by external devices.
  - Storage Class User (SCU) - Retrieval of imaging exams.
  - Query Provider (QRP) - Allow external devices to query for specific exams.
  - Complete details of the DICOM specification are available in the HP MAS DICOM

## Features and Benefits

- Conformance statement.

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<b>C2500 SAN Storage Node - AJ788A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● 2.5 TB capacity license SAN Storage Node (expandable)</li><li>● HP DL380 G5, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply (DL380 G5)</li><li>● 146GB, 3G SAS 10k SFF Hard Drive - Quantity 2</li><li>● StorageWorks LC/LC 15m FC cables - Quantity 2</li><li>● HP Medical Archive solution Storage Node software</li></ul>
<b>C2500 SAN Combo Node - AJ789A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● 2.5 TB expandable SAN Storage Node</li><li>● HP DL380 G5, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply</li><li>● 146GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 8</li><li>● StorageWorks LC/LC 15m FC cables - Quantity 2</li><li>● HP Medical Archive solution Control and Storage Node software</li></ul>
<b>B3000CL 3.0 TB SAS Storage Node - AJ784A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● 3.0 TB SAS Storage Node</li><li>● HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply</li><li>● 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2</li><li>● 300GB 15K SAS 3.5" Hard Drive - Quantity 12</li><li>● HP Medical Archive solution Storage Node software</li></ul>
<b>B4500CL 4.5 TB SAS Storage Node - AJ785A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● 4.5 TB SAS Storage Node</li><li>● HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply</li><li>● 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2</li><li>● 450GB 15K SAS 3.5" Hard Drive - Quantity 12</li><li>● HP Medical Archive solution Storage Node software</li></ul>
<b>B2400CL 2.4 TB SAS Combo Node - AJ786A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● 2.4 TB SAS Combo Node</li><li>● HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply</li><li>● 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2</li><li>● 300GB 15K SAS 3.5" Hard Drive - Quantity 10</li><li>● 450GB 15K SAS 3.5" Hard Drive - Quantity 2</li><li>● HP Medical Archive solution Control and Storage Node software</li></ul>
<b>B3600CL 3.6 TB SAS Combo Node - AJ787A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● 3.6 TB SAS Combo Node</li><li>● HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply</li><li>● 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2</li><li>● 450GB 15K SAS 3.5" Hard Drive - Quantity 12</li><li>● HP Medical Archive solution Control and Storage Node software</li></ul>

### System Contents

#### A2500CL 2.5 TB SATA Specifications Storage Node - AJ776A

- 2.5 TB SATA Storage Node
- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 250GB 7.2K SATA 3.5" Hard Drive - Quantity 12
- HP Medical Archive solution Storage Node software

#### A5000CL 5.0 TB SATA Specifications Storage Node - AJ777A

- 5.0 TB SATA Storage Node
- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 500GB 7.2K SATA 3.5" Hard Drive - Quantity 12
- HP Medical Archive solution Storage Node software

#### A7500CL 7.5 TB SATA Specifications Storage Node - AJ778A

- 7.5 TB SATA Storage Node
- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 750GB 7.2K SATA 3.5" Hard Drive - Quantity 12
- HP Medical Archive solution Storage Node software

#### A10000CL 10.0 TB SATA Specifications Storage Node - AJ779A

- 10.0 TB SATA Storage Node
- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 1.0TB 7.2K SATA 3.5" Hard Drive - Quantity 12
- HP Medical Archive solution Storage Node software

#### A2000CL 2.0 TB SATA Specifications Combo Node - AJ780A

- 2.0 TB SATA Combo Node
- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 450GB 15K SAS 3.5" Hard Drive - Quantity 2
- 250GB 7.2K SATA 3.5" Hard Drive - Quantity 10
- HP Medical Archive solution Control and Storage Node software

#### A4000CL 4.0 TB SATA Specifications Combo Node - AJ781A

- 4.0 TB SATA Combo Node
- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 450GB 15K SAS 3.5" Hard Drive - Quantity 2
- 500GB 7.2K SATA 3.5" Hard Drive - Quantity 10
- HP Medical Archive solution Control and Storage Node software

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#### A6000CL 6.0 TB SATA Combo Node - AJ782A Specifications

- 6.0 TB SATA Combo Node
- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 450GB 15K SAS 3.5" Hard Drive - Quantity 2
- 750GB 7.2K SATA 3.5" Hard Drive - Quantity 10
- HP Medical Archive solution Control and Storage Node software

#### A8000CL 8.0 TB SATA Combo Node - AJ783A Specifications

- 8.0 TB SATA Combo Node
- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 450GB 15K SAS 3.5" Hard Drive - Quantity 2
- 1.0TB 7.2K SATA 3.5" Hard Drive - Quantity 10
- HP Medical Archive solution Control and Storage Node software

#### D1010 MAS Tape Storage Node - AJ775A Specifications

- HP DL380 G5, 2.67 GHz dual core Xeon processor, 2GB DIMM, CD-RW/DVD
- Hot Plug AC Redundant Power Supply (DL380 G5)
- 146GB, 3G SAS 10k SFF Hard Drive - Quantity 8
- NC360T PCI-E Dual Port Gigabit Server Adapter - Quantity 2
- 40 ft CAT5e customer network cable
- HP Medical Archive solution Tape Node software

#### MAS Infrastructure Cabinet - AJ770A Specifications

- 10642 G2 (42U) Rack Cabinet with Shock Pallet
- HP ProCurve Switch 2810 - Quantity 2 (for data network)
- HP ProCurve Switch 2610 - Quantity 1 (for management network)
- TFT7600RKM (all-in-one monitor/keyboard) and KVM Switch.
- HP Power distribution Units
- Network cabling and cable management harness

#### MAS Cabinet Connectivity Kit - AG769A Specifications

- ProCurve 3500yl-24G Switch - Quantity 2
- CAT5e system network cables

#### MAS WAN Connectivity Kit - AJ771A Specifications

- ProCurve 7102dl - Quantity 2
- CAT5e system network cables
- 40 ft CAT5e customer network cable - Quantity 2

#### MAS GN2000CL Gateway Node - AJ773A Specifications

- HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM
- Hot Plug AC Redundant Power Supply
- 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2
- 250GB, 7.5k SATA 3.5" SP Hard Drive - Quantity 10
- NC360T PCI-E Dual Port Gigabit Server Adapter - Quantity 2
- HP Medical Archive solution Gateway Node software

### System Contents

<b>MAS GN6000CL Gateway Node - AJ774A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply</li><li>● 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2</li><li>● 750GB, 7.2k SATA 3.5" DP Hard Drive - Quantity 10</li><li>● NC360T PCI-E Four Port Gigabit Server Adapter - Quantity 1</li><li>● HP Medical Archive solution Gateway Node software</li></ul>
<b>MAS CN100CL Control Node - AJ792A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply</li><li>● 72GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 2</li><li>● 146GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 6</li><li>● HP Medical Archive solution Control Node software</li></ul>
<b>MAS Admin/Gateway Node - AJ772A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● HP DL320s, 2.67 GHz dual core Xeon processor, 4GB RAM</li><li>● Hot Plug AC Redundant Power Supply</li><li>● 146GB, 3G SAS 15k 3.5" DP Hard Drive - Quantity 8</li><li>● NC360T PCI-E Four Port Gigabit Server Adapter - Quantity 1</li><li>● HP Medical Archive solution Admin and Gateway Node software</li></ul>
<b>6.0 TB Medical Archive Solution bundle-AJ769A</b>	<b>Specifications</b>	<ul style="list-style-type: none"><li>● S10614 G1 (14U) rack cabinet with shock pallet</li><li>● HP ProCurve Switch 2810 - Quantity 2 (for data network)</li><li>● HP ProCurve Switch 2610 - Quantity 1 (for management network)</li><li>● TFT7600RKM (all-in-one monitor/keyboard) and KVM Switch</li><li>● HP Power distribution Units (PDUs)</li><li>● Network cabling</li><li>● Admin/Gateway Node - Quantity 1</li><li>● 3.0 TB SATA Control/Storage/Gateway Combo Node - Quantity 2</li><li>● HP Medical Archive solution Storage Node software</li><li>● HP Medical Archive solution Control Node software</li><li>● HP Medical Archive solution Gateway Node software</li><li>● HP Medical Archive solution Admin Node software</li></ul>

### Service and Support, HP Care Pack, and Warranty Information

#### Service and Support

- HP Services will provide product support which gives the customer access to HP's experienced technical support resources as well as access to HP's Information Services database for support on a variety of multi-vendor/multi-platform software products. Product support includes escalations and problem coordination with the appropriate engineering groups.
- Product Warranty: The first year warranty includes both hardware (HW) and software (SW) support to reflect the total solution value of HP MAS. This includes 9 x 5 coverage, as well as 4 hour response for HW related calls along with 9 x 5 telephone assistance for SW related calls.
- Installation & Startup: This applies to the base HP MAS deployment as well as to each building block (component and/or node) and is based on the size and number of nodes in the deployment. The HP specialist will initially collect needed network information to configure HP MAS. HP specialists will go on site to unpack and test the hardware components, and then install and verify the HP MAS software. Finally, the specialists will provide a customer orientation.
  - HP Software Professional Services Organization (HPSW PSO) is responsible for the Installation and Startup service. To utilize this PSO service the customer will be provided with a statement of work (SOW) for their installation.
- Support Warranty: HP CarePack Services offer upgraded service levels to extend and expand your extended 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 and help you optimize total cost of ownership.
  - The SupportPlus service improves the support coverage window to 13 x 5 and can be applied to the first year and/or extended for 3 years. The SupportPlus 24 service improves the support coverage window to 24 x 7 and can be applied to the first year and/or extended for 3 years. Additionally, 4- and 5-year CarePacks can be sold only after approval from the Software Deal Desk (required to book).
- Software Upgrade Service: The HP MAS SW Upgrade Service is performed by HPSW PSO to help ensure the updates are properly installed. Starting with this MAS 3.5 release a warranty upgrade service is no longer bundled with the product. Using a SOWHPSW PSO will schedule and execute upgrades as required. The cost of this upgrade service is based on the configuration, size of the grid, and distance between sites.
- Custom Services: Additional, customized, SOW services are available from HPSW PSO to assist in whatever area of expertise is required. This can range from advanced design and implementation of multi-site MAS deployments, or advanced usage and implementation of data policies for efficient data management.

**NOTE:** For more information on HP MAS, contact your local sales representative or visit our worldwide Web site on the internet at: <http://www.hp.com/go/mas>; HP Software Information Management: <http://h18006.www1.hp.com/products/software/im/index.html>.

**NOTE:** For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/carepack>.

**NOTE:** For more information on Software Support offers contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/software/>.

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## Technical Specifications

C2500 SAN Storage Node - AJ788A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	62 lbs (28.12 kg)
		Shipping	85 lbs (38.55 kg)
	Power/Cooling Requirements	Power	1170 W max; 0.9A observed
		Voltage	208-240 V
		Cooling	3990 BTU max (at 260V)

C2500 SAN Combo Node - AJ789A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	62 lbs (28.12 kg)
		Shipping	85 lbs (38.55 kg)
	Power/Cooling Requirements	Power	1170 W max; 0.9A observed
		Voltage	208-240 V
		Cooling	3990 BTU max (at 260V)

B3000CL 3.0 TB SAS Storage Node - AJ784A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

B4500CL 4.5 TB SAS Storage Node - AJ785A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

# QuickSpecs

## Technical Specifications

B2400CL 2.4 TB SAS Combo Node - AJ786A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

CB3600CL 3.6 TB SAS Combo Node - AJ787A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

A2500CL 2.5 TB SATA Storage Node - AJ776A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

A5000CL 5.0 TB SATA Storage Node - AJ777A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max



# QuickSpecs

## Technical Specifications

A7500CL 7.5 TB SATA Storage Node - AJ778A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

A10000CL 10.0 TB SATA Storage Node - AJ779A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

A2000CL 2.0 TB SATA Combo Node - AJ780A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

A4000CL 4.0 TB SATA Combo Node - AJ781A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	63 lbs (28.13 kg)
		Shipping	86 lbs (38.39 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max



## Technical Specifications

A6000CL 6.0 TB SATA Combo Node - AJ782A	Dimensions	Installed	2U rack space	
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)	
	Weight	Operating	63 lbs (28.13 kg)	
		Shipping	86 lbs (38.39 kg)	
	Power/Cooling Requirements	Power	575 W max; 1.5A observed	
		Voltage	208-240 V	
		Cooling	1243 BTU max	
	A8000CL 8.0 TB SATA Combo Node - AJ783A	Dimensions	Installed	2U rack space
			Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
Weight		Operating	63 lbs (28.13 kg)	
		Shipping	86 lbs (38.39 kg)	
Power/Cooling Requirements		Power	575 W max; 1.5A observed	
		Voltage	208-240 V	
		Cooling	1243 BTU max	
D1010 MAS Tape Storage Node - AJ775A		Dimensions	Installed	2U rack space
			Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	62 lbs (28.12 kg)	
		Shipping	85 lbs (38.55 kg)	
	Power/Cooling Requirements	Power	1170 W max (0.9A observed)	
		Voltage	208-240 V	
		Cooling	3990 BTU max (at 260V)	
	MAS Infrastructure Cabinet - AJ770A	Dimensions	Cabinet	78.7 x 39.7 x 24 in (199.9 x 100.8 x 60.96 cm)
			Shipping	86.2 x 48 x 32 in (218.95 x 121.92 x 81.28 cm)
Weight		Operating	499 lb (226.34 kg)	
		Shipping	540 lb (244.94 kg)	
		Static loading	1754 lb (797 kg)	
		Dynamic loading	1754 lb (797 kg)	
Power Requirements		<b>Americas/Japan</b>		
		Connector		NEMA L6-30P plugs - Quantity 4
		Voltage		200-240 V
		<b>EMEA / ROW</b>		
		Connector		IEC 309-32A - Quantity 2 (all options)
Connector		Country Specific - Quantity 2 (all options)		
Voltage		200-240 V		

## Technical Specifications

Cooling Requirements	1xx Options (MSA20)	30,270 BTU / hour
	2xx Options (MSA30)	23,526 BTU / hour
Color	Doors/side panels	Graphite Metallic
	Frame	Carbon

MAS Cabinet Connectivity Kit - AG769A	Dimensions	Installed	2U rack space
		Shipping	38 x 22.5 x 21.5 in (17.24 x 10.21 x 9.75 cm)
Weight	Operating		35 lbs (15.88 kg)
	Shipping		46 lbs (20.87 kg)
Power/Cooling Requirements	Power		180 W
	Voltage		200-240 V
	Cooling		614 BTU/hour

MAS WAN Connectivity Kit - AJ771A	Dimensions	Installed	2U rack space
		Shipping	38 x 22.5 x 21.5 in (17.24 x 10.21 x 9.75 cm)
Weight	Operating		40 lbs (18.14 kg)
	Shipping		52 lbs (23.59 kg)
Power/Cooling Requirements	Power		300 W
	Voltage		200-240 V
	Cooling		1022 BTU/hour

MAS GN2000CL Gateway Node - AJ773A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
Weight	Operating		63 lbs (28.13 kg)
	Shipping		86 lbs (38.39 kg)
Power/Cooling Requirements	Power		575 W max; 1.5A observed
	Voltage		208-240 V
	Cooling		1243 BTU max

MAS GN6000CL Gateway Node - AJ774A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
Weight	Operating		63 lbs (28.13 kg)
	Shipping		86 lbs (38.39 kg)
Power/Cooling Requirements	Power		575 W max; 1.5A observed
	Voltage		208-240 V
	Cooling		753 BTU/hour

## Technical Specifications

MAS CN100CL Control Node - AJ792A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	49 lbs (21.88 kg)
		Shipping	72 lbs (32.14 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
		Cooling	1243 BTU max

MAS Admin/Gateway Node - AJ772A	Dimensions	Installed	2U rack space
		Shipping	15.75 x 23.5 x 35.25 in (40 x 59.69 x 89.54 cm)
	Weight	Operating	49 lbs (21.88 kg)
		Shipping	72 lbs (32.14 kg)
	Power/Cooling Requirements	Power	575 W max; 1.5A observed
		Voltage	208-240 V
Cooling		1243 BTU max	

6.0 TB Medical Archive Solution bundle-AJ769A	Dimensions	Cabinet	28.5 x 39.7 x 23.6 in (43.9 x 61.1 x 36.3 cm)
		Shipping	34 x 44 x 30.5 in (52.4 x 67.8 x 47.0 cm)
	Weight	Operating	453 lb (202.23 kg)
		Shipping	508 lb (226.79 kg)
		Static loading	282 lb (128 kg)
		Dynamic loading	282 lb (128 kg)
	Power Requirements	<b>Americas/Japan</b>	
		Connector	IEC 320-C19/C20
		Voltage	200-240 V
		<b>EMEA / ROW</b>	
	Cooling Requirements (loaded)	Connector	IEC 320-C19/C20 - Quantity 2
		Voltage	200-240 V
	Color		3429 BTU / hour
Doors/side panels		Graphite Metallic	
	Frame	Carbon	

## Technical Specifications

HP Medical Archive Solution shipped in Infrastructure cabinet (per cabinet)	Dimensions (HxDxW)	Total Cabinet Area	78.25 x 39.50 x 23.25 in (198.28 x 100.65 x 58.57 cm)
		Shipping (with packaging materials)	43 x 39.75 x 16 in (109.22 x 100.97 x 40.64 cm)
	Weight	Operating	(depends on configuration)
		Shipping	(depends on configuration)
	Power Requirements	Connector	(depends on configuration)
		Voltage	200-240 V
	Color	Door/Side Panels	Graphite Metallic
		Frame	Carbon

## Environmental Specifications

When choosing a location for the rack, ensure that the operating environment meets the following specifications:

Temperature Range	All temperature ratings shown are for sea level. An altitude derating of 1 C° per 300 m (1.8 FR per 1000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Operating 50° to 95° F (10° to 35° C)
Relative Humidity (non-condensing)	40% to 60%
Maximum wet bulb temperature	28° C (82.40° F)

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