



Hardware User Guide

HGST Active Archive System SA-7000

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1 Document Summary

Topics:

- [Scope](#)
- [References](#)
- [Power Requirements](#)
- [Physical Dimensions](#)

The following chapter defines the *scope*, *intended audience*, and *references* related to the Active Archive System Hardware User Guide.

1.1 Scope

When there are hardware failures, it is often not necessary to replace a complete server. This document provides instructions for replacing parts of a server. It distinguishes between Customer Replaceable Units (CRU) and Field Replaceable Units (FRU): a CRU is a unit which can be replaced by the customer; a FRU is a unit which must be replaced by a vendor field engineer.

The intent of the HGST Active Archive System is to keep serviceability simple while minimizing customer downtime, system degradation, and time needed to make the replacement.

Tip: If you disconnect Ethernet or power cables during the replacement of CRU or FRU, ensure that you mark these cables (for example: "Left" and "Right"). This way you can avoid cabling issues during the re-connection.

Only replace the CRU and FRU of one node/switch at a time. This will avoid mixing up cables between the nodes.

1.2 References

- *FRU Replacement Guide*

1.3 Power Requirements

The power requirements of the Active Archive System are displayed in the following table:

Hardware	Power
Power Supply	Redundant intelligent PDUs
Power Consumption - typical	7,890 Watts
Power Consumption - maximum	10,484 Watts

Table 1: Active Archive System Power Requirements



PDU Type	Visual Representation	Plug Standard	Outlet Standard	Frequency	Phase	Amps (per phase)	Supply Range
Delta		NEMA L15-30P	L15-30R	50/60Hz	3-Phase	30A	200-240V
WYE		IEC 60309 16A 4P+E plug	IEC 60309 16A 4P+E outlet	50/60Hz	3-Phase	16A	380-415V

Table 2: Active Archive System Power Cords

1.4 Physical Dimensions

The following section provides a description of the physical dimensions.

1.4.1 Physical Dimensions and Weight

Rack:

The following table displays the dimensions of the Active Archive System:

Hardware	Dimensions and Weight
Active Archive System	(height x width x depth) 82.52 inches x 23.62 inches x 40.35 inches 2,041 millimeters x 600 millimeters x 1,025 millimeters
	(weight) 2,250 lbs. 1,020 kg.

Table 3: Active Archive System Dimensions

1.4.2 Weight

Rack:

The following table displays the weight of the Active Archive System:

Hardware	Weight
Active Archive System	2,250 lbs. 1,020 kg.

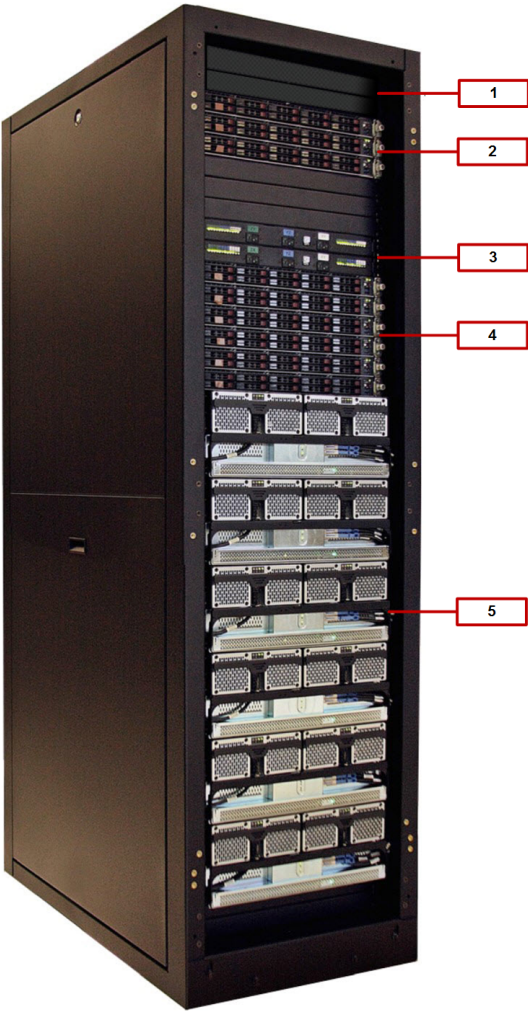
Table 4: Active Archive System Weight

Note: The weight mentioned previous is the total unpacked weight after delivery.

1.4.3 Active Archive System Configuration

The following table displays the configuration for the Active Archive System:

Figure 1: Active Archive System



Hardware	Details	Number of Product
(1) Storage Interconnect	Celestica D2020	2
(2) Controller Nodes	Supermicro 1028U-TR4T+	3
(3) Power Distribution Unit	Delta PDU: Chatsworth Horizontal mount PDU, 30A 200-208Vac, 3-Phase or WYE PDU: Chatsworth Horizontal mount PDU, 16A 380-415Vac, 3-Phase	2
(4) Storage Nodes	Supermicro SYS-1018R-WCOR	6

Hardware	Details	Number of Product
(5) Storage Enclosure Basic	For the basic configuration, there are 98 drives per Storage Enclosure Basic.	6

Table 5: Active Archive System Full Configuration

2 For More Information

Topics:

- [Points of Contact](#)

This chapter provides points of contact for the Active Archive System.

2.1 Points of Contact

For further assistance with the Active Archive System, contact Elastic Storage Platforms support. Please be prepared to provide the following information: serial number (S/N), product name, model number, and a brief description of the issue.

Telephone:

Region	Telephone Numbers	Support Hours and Additional Information
United States/International	1-408-717-7766	24 hours a day, 7 days a week
North America	1-844-717-7766	24 hours a day, 7 days a week Toll-free

Email:

support@hgst.com

Website:

www.hgst.com/support

3 Product Overview

Topics:

- [Introduction](#)
- [Controller Nodes, Storage Servers, and Storage Nodes](#)

This chapter provides a product overview of the Active Archive System.

3.1 Introduction

The Active Archive System is a unit that is vertically integrated with object storage software, networking, servers and storage in an industry standard 42U rack.

The Active Archive System is comprised of the following major components, all of which have a number of replaceable units:

- Storage Interconnect
- Controller Nodes
- Storage Nodes
- Storage Interconnect
- Power Distribution Units (PDUs)
- Storage Enclosure Basic Storage Arrays

Note: In addition to the major components, the system includes the rack, cables, rack panels, hardware, labels, power cords, and sleds.

3.2 Controller Nodes, Storage Servers, and Storage Nodes

The controller nodes run the HGST object-based storage file system which is responsible for the virtualization and management of the physical storage and all host related accesses. Each Active Archive System contains three controller nodes. The controller nodes interface to the external client network and internal data and management networks.

The Storage Server interfaces to the controller nodes and Storage Enclosure Basic storage arrays and is responsible for managing the physical storage contained in the Storage Enclosure Basic storage array, as well as, the monitoring and reporting of the status of the Storage Enclosure Basic storage enclosure components (for example, the fans, power supplies, drive FRUs, and so on).

A storage node consists of a single storage server and a single Storage Enclosure Basic storage array. There are six storage nodes in the Active Archive System.

3.2.1 Controller Node Configuration

The Controller Nodes are 1U servers. Each server used as Controller Node is configured as follows:

Storage	Quantity	Configuration
Intel E5-2650L v3 Haswell processor	2	
64GB of DDR4 2133MHz memory	4	Implemented as four 16GB DIMMS with two DIMMs populated per processor. This results in 32GB per processor.

Storage	Quantity	Configuration
PCIe Gen3 x8 riser cards	2	To support two PCIe add-in cards (AIC).
X520-DA2 SFP+ dual-port 10G NIC	2	Populated in one of the two x8 PCIe Gen 3 AIC slots mentioned previously. The port with high MAC address of each NIC will connect to the internal DATA VLAN on each of the two Celestica D2020 Redstone switches. One port with low MAC address of each NIC will connect to the external client network.
Local storage devices	6	<ul style="list-style-type: none"> Two 1TB enterprise class 6Gbps SATA HDD for the Controller Node O/S and application storage Four 240GB 6Gbps SATA SSDs for metadata storage.
1G RJ45 Ethernet management port	1	Connected to the baseboard management controller (BMC). This port is reserved for future use.
1G RJ45 on-board Ethernet ports	4	<ul style="list-style-type: none"> One of the 1G on-board Ethernet ports is reserved for connection to external management network. Two of the three Controller Nodes will connect to the external management network via the reserved port. One of the 1G on-board Ethernet ports is dual functioned for BMC/IPMI and standard TCP/IP traffic. This port is connected to management VLAN on one of the two Celestica D2020 Redstone switches. The remaining 1G on-board Ethernet ports are reserved for future use.
Ubuntu 12.04 Linux operating system	N/A	
HGST storage appliance application software.	N/A	

Table 6: Controller Node Configuration

3.2.2 Storage Server Configuration

The storage servers are based on 1U. Each server used as storage server is configured as follows:

Storage	Quantity	Configuration
Intel E5-2650L v3 Haswell processor	1	

Storage	Quantity	Configuration
64GB of DDR4 2133MHz memory	4	Implemented as four 16GB DIMMS with one DIMM populated per memory channel per processor to facilitate maximum memory bandwidth.
PCIe Gen3 x8 riser cards	2	To support two PCIe add-in cards (AIC).
X520-DA2 SFP+ dual-port 10G NIC	1	<p>Populated in one of the two x8 PCIe Gen 3 AIC slots mentioned previously.</p> <hr/> <p>Note: These ports will be connected to the DATA VLAN on the two Celestica D2020 Redstone switches.</p> <hr/>
LSI 12G SAS HBA LSI9300-8e	1	<p>Populated in the remaining x8 PCIe Gen 3 AIC slot.</p> <hr/> <p>Note: Both SAS ports of the HBA will connect to the miniSAS HD host ports of the associated HGST Storage Enclosure Basic storage enclosure.</p> <hr/>
500GB enterprise class 6Gbps SATA HDD	2	Local storage devices for the O/S and Storage Server software
1G RJ45 Ethernet management port	1	Connected to the baseboard management controller (BMC). This port is reserved for future use.
1G RJ45 on-board Ethernet ports	2	<ul style="list-style-type: none"> One of the 1G on-board Ethernet ports is dual functioned for BMC/IPMI and standard TCP/IP traffic. This port is connected to management VLAN on one of the two Celestica D2020 Redstone switches. The remaining 1G on-board Ethernet port reserved for future use.
Ubuntu 12.04 Linux operating system	N/A	
HGST storage appliance application software.	N/A	

Table 7: Storage Server Configuration

The following table summarizes the server configurations and the rack architecture and component interconnections:

Hardware	Controller Node	Storage Server
Processor	2x E5-2640 v3	1x E5-2650L v3
Memory	64GB DDR4 2133 Mhz	64GB DDR4 2133Mhz
Expansion slots	2x8 Gen3	2x8 Gen3
HDD	2x 1TB SATA 6Gbps	2x 500GB SATA 6Gbps
NIC	2x X520-DA2 SFP+	1x X520-DA2 SFP+
BMC/IPMI Managament Port	1G RJ45 BMC management port	1G RJ45 BMC management port
SSD	SSD Metadata 4x240GB SATA 6Gbps	N/A
SAS HBA	N/A	LSI 9300-8e x8 PCIe Gen3
Operating System	Ubuntu 12.04	Ubuntu 12.04

Table 8: Controller Node and Storage Server Configuration

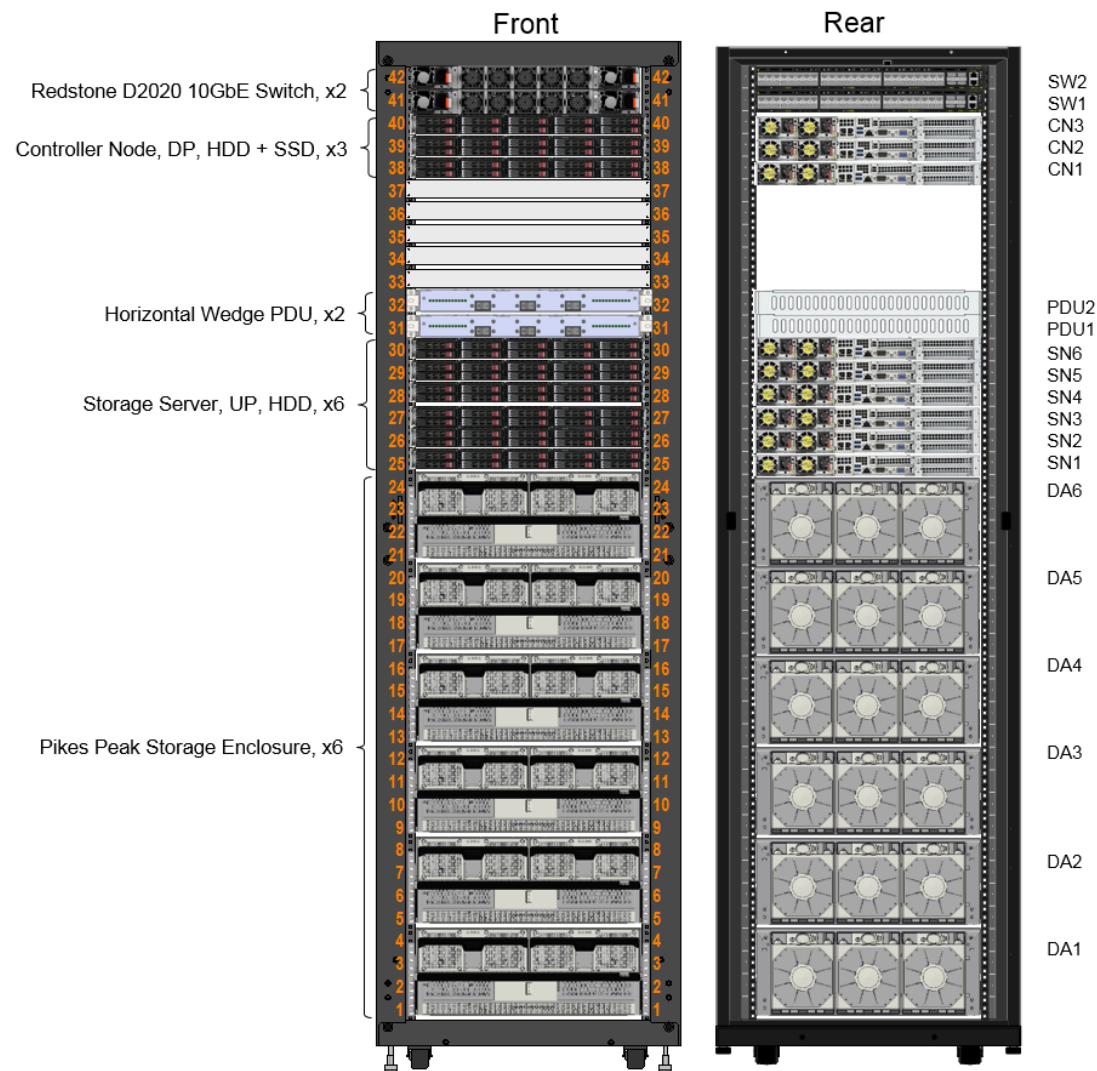
3.2.3 Switches

There are two Celestica Redstone D2020 10GE switches in a redundant configuration. There are 48 10GE ports and 4 40GE uplink ports on each switch. The 10GE ports on the switches are SFP+ and can be individually configured for copper or optical connections.

There are two VLANS configured on at least one switch: a Data VLAN and a Management VLAN. All data and data related control traffic between the Controller Nodes and Storage Nodes is routed over the data VLAN. All enclosure management data and related control traffic are routed over the Management VLAN.

The following figure displays the physical placement of the components in the Active Archive System rack. The two Redstone D2020 switches will be placed at top of the cabinet, followed by three 1U Controller Nodes, followed by 7U of reserved space, followed next by six Storage Servers, and lastly, six Storage Enclosure Basic storage arrays.

Figure 2: Active Archive System Layout Network



4 Disclaimers

Topics:

- [Regulatory Statement of Compliance](#)

The following chapter describes the Regulatory Statement of Compliance and Safety Compliance for the Active Archive System.

4.1 Regulatory Statement of Compliance

Product Name: **Active Archive System**

Regulatory Model: **SA-7000 series**

EMC Emissions: **Class A**

This product has been tested and evaluated as Information Technology Equipment (ITE) at accredited third-party laboratories for all safety, emissions and immunity testing required for the countries and regions where the product is marketed and sold. The product has been verified as compliant with the latest applicable standards, regulations and directives for those regions/countries. The suitability of this product for other product categories other than ITE, may require further evaluation.

The product is labeled with a unique regulatory model and regulatory type that is printed on the label and affixed to every unit. The label will provide traceability to the regulatory approvals listed in this document. The document applies to any product that bears the regulatory model and type names including marketing names other than those listed in this document.

4.1.1 Restricted Access Location

The Active Archive System is intended for installation in a server room or computer room where at least one of the following conditions apply:

- access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the restrictions applied to the location and about any precautions that shall be taken and/or
- access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

4.1.2 Safety Compliance

The following table outlines how the Active Archive System is being designed to pass the product safety requirements:

Country/Region	Authority or Mark	Standard
Australia/New Zealand	CB report, CB certificate	AS/NZS 60950.1
Canada/North America	NRTL	CSA C22.22 No. 60950-1-07
Customs Union/Russia, Kazakhstan, Belarus, Armenia	EAC	TR CU 004/2011
European Union	CE	EN 60950-1
International		IEC60950, CB report and Certificate to include all country national deviations
United States/North America	NRTL	UL 60950-1
Mexico	NYCE or NOM	NOM-019-SCFI-1998

Country/Region	Authority or Mark	Standard
Brazil	INMETRO	IEC 60950-1
Taiwan	BSMI	CNS14336
Ukraine	UKrTEST or equivalent	4467-1:2005
Moldova	INSM	SM SR EN60950-1
Serbia	KVALITET	SRPS EN60950:2010
India	BIS	IS 13252 (Part 1):2010

Table 9: Product Safety Compliance

4.1.3 Electromagnetic Compatibility Agency Requirements

The following table outlines how the Active Archive System is being designed to comply with the Electromagnetic Compatibility (EMC) agency requirements:

Country/Region	Authority or Mark	Standard	Status
Australia/New Zealand	C-tick or A-tick	AS/NZS CISPR22	Complete
Canada/North America	Industry Canada	ICES-003	Complete
Customs Union/Russia, Kazakhstan, Belarus, Armenia	EAC	TR CU 020/2011	Complete
European Union	CE	EN55022, EN55024 including EN61000-3-2, EN61000-3-3	Complete
International		CISPR22, CISPR24	Complete
Japan	VCCI	V-3:2014	Complete
United States/North America	FCC	FCC Part 15	Complete
Taiwan	BSMI	CNS13438	Complete
Korea	MSIP	KN22, KN24	Complete
Ukraine	UKrTEST or equivalent	4467-1:2005	Complete
Serbia	KVALITET	CISPR22	Complete
Brazil	INMETRO		Complete

Table 10: Product EMC/Immunity Compliance

5 Safety and Regulatory

Topics:

- [Optimizing Location](#)
- [Safety Warnings and Cautions](#)
- [Electrostatic Discharge](#)
- [Rackmountable Systems](#)
- [Power Connections](#)
- [Power Cords](#)
- [Safety and Service](#)

The following chapter provides safety and regulatory information for the Active Archive System.

5.1 Optimizing Location

Failure to recognize the importance of optimally locating your product and failure to protect against electrostatic discharge (ESD) when handling your product can result in lowered system performance or system failure.

Do not position the unit in an environment that has extreme high temperatures or extreme low temperatures. Be aware of the proximity of the unit to heaters, radiators, and air conditioners.

Position the unit so that there is adequate space around it for proper cooling and ventilation. Consult the product documentation for spacing information.

Keep the unit away from direct strong magnetic fields, excessive dust, and electronic/electrical equipment that generate electrical noise.

5.2 Safety Warnings and Cautions

To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following safety instructions and information. The following safety symbols may be used throughout the documentation and may be marked on the product and / or the product packaging.

CAUTION Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.

WARNING Indicates the presence of a hazard that may result in serious personal injury if the WARNING is ignored.



Indicates potential hazard if indicated information is ignored.



Indicates shock hazards that result in serious injury or death if safety instructions are not followed.



Indicates do not touch fan blades, may result in injury.



Indicates disconnect all power sources before servicing.

5.3 Electrostatic Discharge



CAUTION

Electrostatic discharge can harm delicate components inside HGST products.

Electrostatic discharge (ESD) is a discharge of stored static electricity that can damage equipment and impair electrical circuitry. It occurs when electronic components are improperly handled and can result in complete or intermittent failures.

Wear an ESD wrist strap for installation, service and maintenance to prevent damage to components in the product. Ensure the antistatic wrist strap is attached to a chassis ground (any unpainted metal surface). If possible, keep one hand on the frame when you install or remove an ESD-sensitive part.

Before moving ESD-sensitive parts placed it in ESD static-protective bags until you are ready to install the part.

5.4 Rackmountable Systems

CAUTION

Always install rack rails and storage enclosure according to applicable product documentation. Follow all cautions, warnings, labels and instructions provided with the product and the rackmount instructions.

Reliable earthing of rack-mounted equipment should be maintained.

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.

Observe the maximum rated ambient temperature, which is specified in the product documentation.

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

5.5 Power Connections

Be aware of the ampere limit on any power supply or extension cables being used. The total ampere rating being pulled on a circuit by all devices combined should not exceed 80% of the maximum limit for the circuit.

CAUTION The power outlet must be easily accessible close to the unit.



Always use properly grounded, unmodified electrical outlets and cables. Ensure all outlets and cables are rated to supply the proper voltage and current.



This unit has more than one power supply connection; both power cords must be removed from the power supplies to completely remove power from the unit. There is no switch or other disconnect device.

5.6 Power Cords



Use only tested and approved power cords to connect to properly grounded power outlets or insulated sockets of the rack's internal power supply.

If an AC power cord was not provided with your product, purchase one that is approved for use in your country.

CAUTION To avoid electrical shock or fire, check the power cord(s) that will be used with the product as follows:

- The power cord must have an electrical rating that is greater than that of the electrical current rating marked on the product.
- Do not attempt to modify or use the AC power cord(s) if they are not the exact type required to fit into the grounded electrical outlets.
- The power supply cord(s) must be plugged into socket-outlet(s) that is /are provided with a suitable earth ground.
- The power supply cord(s) is / are the main disconnect device to AC power. The socket outlet(s) must be near the equipment and readily accessible for disconnection.

5.7 Safety and Service



All maintenance and service actions appropriate to the end-users are described in the product documentation. All other servicing should be referred to a HGST-authorized service technician.



To avoid shock hazard, turn off power to the unit by unplugging both power cords before servicing the unit. Use extreme caution around the chassis because potentially harmful voltages are present.



When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the Storage Enclosure.



The power supply in this product contains no user-serviceable parts. Do not open the power supply. Hazardous voltage, current and energy levels are present inside the power supply. Return to manufacturer for servicing.



Use caution when accessing part of the product that are labeled as potential shock hazards, hazardous access to moving parts such as fan blades or caution labels.

6 Active Archive System Components

Topics:

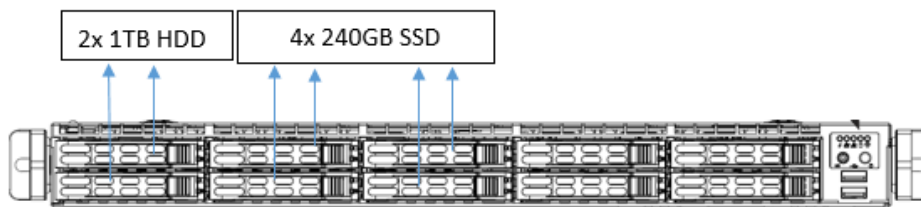
- [Controller Node](#)
- [Storage Node](#)
- [TOR Switch](#)
- [Storage Device](#)
- [Cables](#)

The following chapter provides a description of each of the Active Archive System components.

6.1 Controller Node

The controller node is a 1U. The main features include two Intel Haswell processors, 64GB DDR4 memory and 6x SATA HDD/SSD drives for the operating system, application, and metadata storage. The following figure displays the front view of controller node. The first two drive slots are populated with two 1TB SATA HDD. Four 240GB SSDs are populated in the following four slots.

Figure 3: Controller Node HDD Configuration



6.2 Storage Node

The storage node is a 1U. It is configured with a single Intel Haswell processor, 64GB DDR4 memory and 2x SATA drive for OS and storage server software. The following figure displays the storage server front view and the HDD configuration:

Figure 4: Controller Node HDD Configuration



6.3 TOR Switch

The TOR Switch uses the Storage Interconnect 10G Switch. Refer to the Storage Interconnect specification for detail information. The Storage Interconnect provides up to 48 SFP+ 10GbE ports and 4 QSFP+ 40GbE ports. The following figure displays the front view of Storage Interconnect Switch:

Figure 5: Storage Interconnect Front View



The following figure displays the rear view of D2020 Switch:

Figure 6: Storage Interconnect Switch Rear View



The Switch is intended to be rear mounted in the rack, such that the cables will come out from rear of the rack and the power will be situated in the front of the rack. This configuration facilitates simplified cable management within the rack.

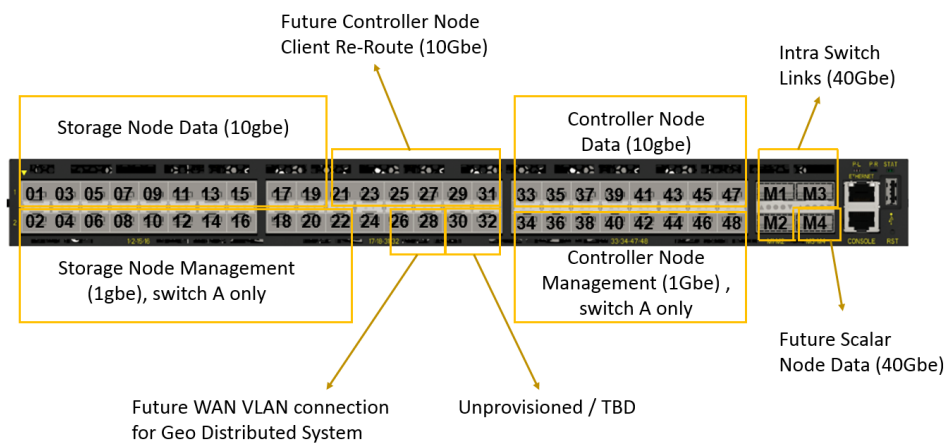
6.3.1 Port Reservations

This approach reserves port ranges on the switch for V1 as well as anticipating future port consumption:

- Allows for up to 10 Storage Nodes per rack – entire rack for storage nodes
- Allows for up to 8 Controller Nodes per rack – additional performance
- Allows for Amplidata Scalar Layer to be added including uplink and rerouting of controller nodes
- Provisions for 1Gbit management
- Provisions for WAN connection for Geo distributed use case

The following figure displays the details port reservations on switches:

Figure 7: Switch Port Reservations



6.4 Storage Device

Active Archive System is a ready out-of-the-box object storage system that transforms silos of data storage into cloud-scale active archives. For data that requires long-term retention with easy and fast retrieval, the Active Archive System provides unprecedented levels of accessibility and scalability.

6.5 Cables

The following table displays the approved cables for Active Archive System:

Description	Connection	Length	Quantity
10G SFP+ to SFP+ DAC Cable, 30AWG	Connect switch and 10G NIC on servers (controller node or storage server) for data network	1 and 1.5 meters	18
1G RJ45 Cable, CAT5E, 26AWG	Connect switch and BMC ports of servers (controller node and storage server) for management network Connect PDU management port to controller nodes	1 and 1.5 meters	9
12G miniSAS HD 4x external cable, 28 AWG	Connect Storage Enclosure Basic and miniSAS ports of storage servers	2.5 and 3 meters	12
IEC 60320 C14 to C13 Power Cord, 18AWG	Connect power inlets on PSUs of each devices to PDU outlets	1, 1.5, and 3 meters	34

Table 11: Approved Cables

7 Cabinet and Power Distribution Unit Specifications

Topics:

- [Power Distribution Unit Specification](#)

The following chapter provides a description of cabinet and power distribution unit specifications of the Active Archive System.

7.1 Power Distribution Unit Specification

The Active Archive System requires approximately 10KW of external power. The following table displays the estimated power budget:

Hardware	Description	Maximum Power (Watts)	Quantity	Amps (per)	Amps @ 208 (Volts)
Redstone	D2020, 10GbE Switch	220	2	1.06	2.1
Controller Node	Dual Socket Controller Node	540	3	2.60	7.8
Storage Server	Single Socket Storage Server	420	6	2.02	12.1
Storage Enclosure Basic	Storage Array	850	6	4.09	24.5
	Total	9,680			46.5

Table 12: Power Budget

8 Environmental Requirements

Topics:

- [Operating Environment](#)

The following chapter displays the operating and storage environmental requirements.

8.1 Operating Environment

The following table displays the operating conditions of the Active Archive System.

Operating	Active Archive System
Temperature	20° to 40°C de-rated 2% per 1,000 feet altitude increase
Humidity	8% to 90% (non-condensing)

Table 13: Operating Environment

9 Field Replaceable Units

Topics:

- [Controller Node Parts](#)
- [Storage Node Parts](#)
- [Storage Interconnect Parts](#)
- [Storage Enclosure Basic Field Replaceable Units](#)

9.1 Controller Node Parts

The Controller Node contains the following FRUs:

Field Replaceable Unit	Hot-Swapable
Server (containing NIC, CPU, memory, motherboard, and fan)	No
Hard Disk Drive (HDD)	Yes
Solid State Disk (SSD)	Yes
Power Supply Unit (PSU)	Yes

Table 14: Controller Node

9.2 Storage Node Parts

The Storage Node contains the following FRUs:

Field Replaceable Unit	Hot-Swapable
Server (containing NIC, CPU, memory, motherboard, and fan)	No
Hard Disk Drive (HDD)	Yes
Power Supply Unit (PSU)	Yes

Table 15: Storage Node

9.3 Storage Interconnect Parts

The Storage Interconnect contains the following FRUs:

Field Replaceable Unit	Hot-Swapable
Switch	No
Power Supply Unit (PSU)	Yes
Fan	Yes

Table 16: Controller Node

9.4 Storage Enclosure Basic Field Replaceable Units

The Storage Enclosure Basic storage appliance contains the following core hardware and contents:

Field Replaceable Unit	Hot-Swapable
Rear Fans	Yes
I/O Module	No
Power Supply Unit (PSU)	Yes
Sled	No
Hard Disk Drive (with drive carrier)	No
Sled Blank	No
Chassis	No
Rail Kit	No

Table 17: Controller Node

10 Installing the Active Archive System Hardware

Topics:

- [Moving the Active Archive System into Location](#)
- [Connecting to the Active Archive System](#)

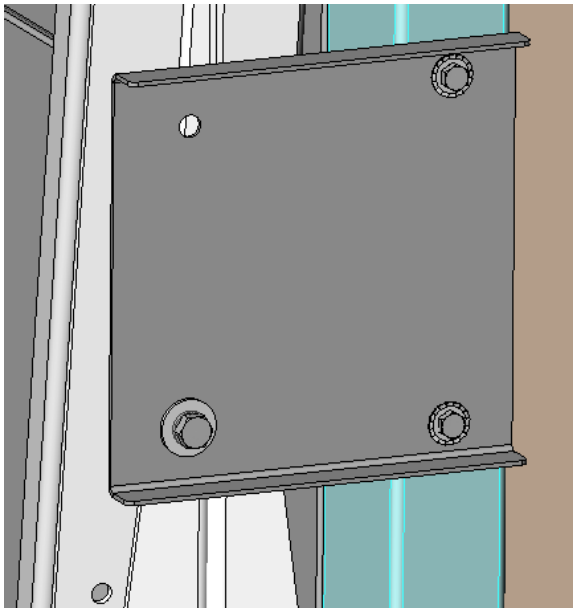
The following chapter provides instruction on how to install the Active Archive System hardware.

10.1 Moving the Active Archive System into Location

To move the Active Archive System into location, do the following:

1. Once the system has been remove from the pallet, identify the exact location you intend to install the system.
2. From the front of the system, firmly grip the rack frame and ramp mount brackets.

Figure 8: Ramp Mount Bracket



Note: It is much easier to navigate the system if you push from the front of the rack. This is due to the only casters with ability to turn being on the front of the system.

3. Carefully push the system into place.

Note: Ensure that you take necessary precaution so as not to damage any components on the system or any existing systems within the installation space.

4. Identify that all sources needing to connect to the system are within the correct distance.

10.2 Connecting to the Active Archive System

To connect power cords and fiber optic connections, do the following:

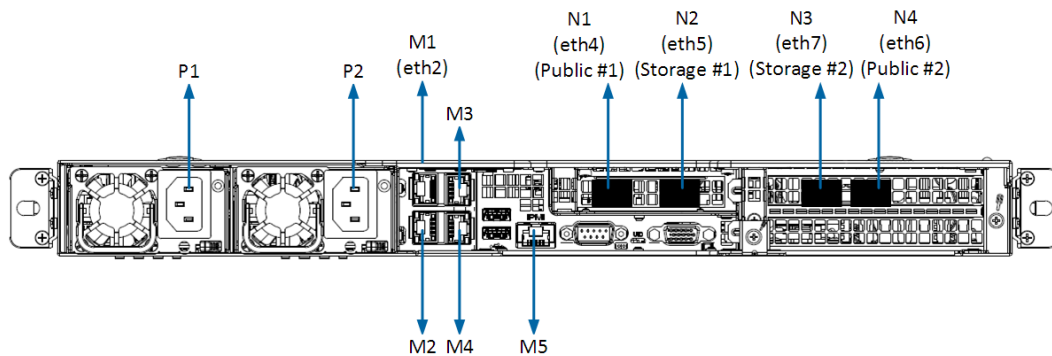
Note: Ensure the system has been bolted to the bracing in the floor and ceiling before connecting power cords and fiber optic connections.

1. From the ceiling cable guides, direct the fiber optic connections through the top of the rack.

Note: For more information on the approved fiber cables, see [Fiber Cables and Approved Power Cords](#).

2. Connect a fiber optic connector to each public network port on each Controller Node.
You must connect a total of six fiber optic connectors: two on each Controller Node. Connect the fiber optic connectors to the ports labeled **N1** (Public #1) and **N4** (Public #2) in the figure below, **on each Controller Node**.

Figure 9: Controller Node, Back, Public Network Ports



3. Once connected to the Controller Nodes, organize and strap fiber cables together.
4. From the rear of the rack, locate the two external power cords.

Note: The two power cords are wrapped and stored under the rack during shipment.

5. Connect the external power cords into two different NEMA power distribution networks.

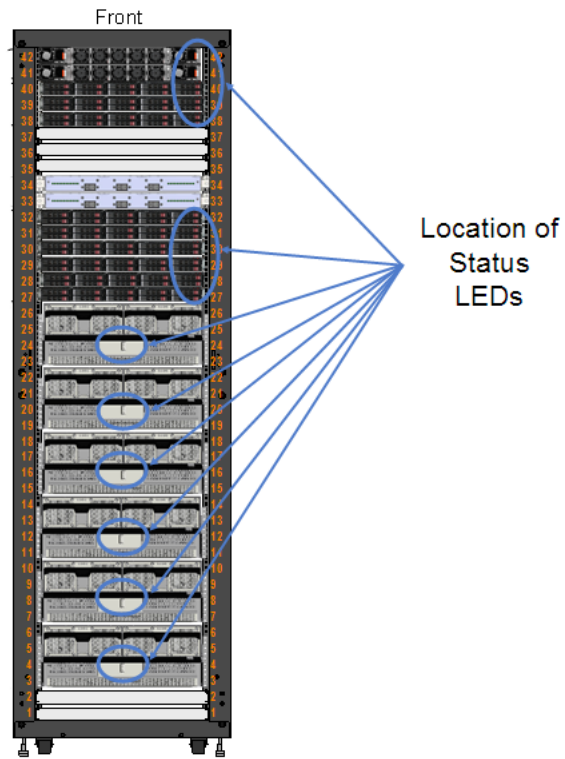
Note: For more information on the approved power cords, see [Fiber Cables and Approved Power Cords](#).

The system begins to power up automatically as soon as the power cords are connected. The intelligent PDUs control the power-on sequence. The power-on sequence takes approximately 2 minutes.

6. Confirm that all hardware components power up in the correct order.

Observe the status LEDs on the components illuminating in the following order. There is a gap (in seconds) between each segment.

Figure 10: Status Lights on the Active Archive System



- a) Storage Interconnect
- b) Controller Nodes
- c) Storage Enclosure Basic storage arrays
- d) Storage Nodes

The Active Archive System is fully powered on.

11 Appliance Configuration

Topics:

- [Active Archive System Configuration Resources](#)

The following chapter displays the resources for configuration of the Active Archive System.

11.1 Active Archive System Configuration Resources

To configure the Active Archive System storage appliance, refer to the following software documentation:

- *HGST Active Archive System Administration Guide*
- *HGST Active Archive System Installation Guide*

12 HGST Regulatory Statements

Topics:

- [FCC Class A Notice](#)
- [FCC Verification Statement \(USA\)](#)
- [ICES-003 Class A Notice—Avis NMB-003, Classe A](#)
- [CE Notices \(European Union\), Class A ITE](#)
- [Europe \(CE Declaration of Conformity\)](#)
- [Japanese Compliance Statement, Class A ITE](#)
- [Taiwan Warning Label Statement, Class A ITE](#)
- [KCC Notice \(Republic of Korea Only\), Class A ITE](#)

The following chapter provides regulatory statements for the Storage Enclosure Basic.

HGST Storage Enclosures are marked to indicate compliance to various country and regional standards.

Note: *Potential equipment damage:* Operation of this equipment with cables that are not properly shielded and not correctly grounded may cause interference to other electronic equipment and result in violation of Class A legal requirements. Changes or modifications to this equipment that are not expressly approved in advance by HGST will void the warranty. In addition, changes or modifications to this equipment might cause it to create harmful interference.

12.1 FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Any modifications made to this device that are not approved by HGST may void the authority granted to the user by the FCC to operate equipment.

12.2 FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates and can radiate radio frequency energy, and if not installed and used in accordance with the Storage Enclosure Basic User Guide, it may cause harmful interference to radio communications.

12.3 ICES-003 Class A Notice—Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

12.4 CE Notices (European Union), Class A ITE

Marking by the symbol indicates compliance of this system to the applicable Council Directives of the European Union, including the EMC Directive (2004/108/EC) and the Low Voltage Directive (2006/95/EC). A “Declaration of Conformity” in accordance with the applicable directives has been made and is on file at HGST Europe.

12.5 Europe (CE Declaration of Conformity)

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled “Digital Apparatus,” ICES-003 of the Canadian Department of Communications.

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: “Appareils Numériques”, NMB-003 édictée par le Ministre Canadian des Communications.

12.6 Japanese Compliance Statement, Class A ITE

The following Japanese compliance statement pertains to VCCI EMI regulations:

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

English translation:

This is a Class A product based on the Technical Requirement of the Voluntary Control Council for Interference by Information Technology (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take corrective actions.

12.7 Taiwan Warning Label Statement, Class A ITE

警告使用者:

此為甲類資訊技術設備，於居住環境中使用時，
可能會造成射頻擾動，在此種情況下，使用者會
被要求採取某些適當的對策。

English translation:

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

12.8 KCC Notice (Republic of Korea Only), Class A ITE

기종별	사용자안내문
A급 기기 (업무용 정보통신기기)	이 기기는 업무용으로 전자파허용등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

English translation:

Please note that this device has been approved for business purposes with regard to electromagnetic interference. If you find that this device is not suitable for your use, you may exchange it for a non-business device.

Active Archive System Glossary

A

AC

Alternating Current

ACMA

Australian Communications and Media Authority

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B

BIOS

Basic Input/Output System

BIS

Business Information System

BIST

Built-In Self-Test

BMC

Baseboard Management Controller

BOM

Bill of Materials

BSMI

Bureau of Standards, Metrology and Inspection

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C

CDB

Computer Data Bus

CLI

Command Line Interface

CS

Climate Saver

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D

DC

Direct Current

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E

EC

Engineering Change

EEPROM

Electrically Erasable Programmable Read-Only Memory

EMC

Electromagnetic Compatibility

EMI

Electromagnetic Interference

ESD

Electrostatic Discharge

EVPD

Enable Vital Product Data

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F

FCC

Federal Communications Commission

FRU

Field Replaceable Unit

FW

Firmware

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G

GBE

Gigabit Ethernet

GPIO

General-Purpose Input/Output

GUI

Graphical User Interface

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H

HD

Hard Drive

HDD

Hard Disk Drive

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I

ICT

In-circuit Test

IEC

International Electrotechnical Commission

I/O

Input/Output

IOC

Input/Output Controller

IOM

I/O Module

IPMI

Intelligent Platform Management Interface

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J

JBOD

Just a Bunch of Disks

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K

KVALITET

Spell out acronym here

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L

LED	Light-Emitting Diode
LPC	Low Pin Count
LPH	Low Profile Hybrid
LUN	Logical Unit Number

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M

MAC	Media Access Control
miniSAS	Mini Statistical Analysis System

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O

OS	Operating System
OUI	Organizationally Unique Identifier

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P

PCB	Printed Circuit Boards
PCI	Peripheral Component Interconnect
PDB	Power Distribution Board
PDU	Power Distribution Unit
PMBus	Power Management Bus
POST	Power On Self Test
PSU	Power Supply Unit
PHY	Physical Layer
PWM	Pulse-Width Modulation
PWR	Power

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R

ROC	Recovery Oriented Computing
RTC	Real Time Clock

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S

SAS

Serial Attached SCSI

SATA

Serial Advanced Technology Attachment

SBB

Storage Bridge Bay

SCSI

Small Computer System Interface

SDK

Software Development Kit

SEP

SCSI Enclosure Processor

SES

SCSI Enclosure Services

SMART

Self-Monitoring, Analysis and Reporting Technology

SMP

Server Message Block

SMB

Server Message Block

SPI

Serial Peripheral Interface

SSP

Serial SCSI Protocol

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T

TCA

Telecommunications Computing Architecture

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U

UART

Universal Asynchronous Receiver/Transmitter

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V

VBOD

Virtualized Bunch of Disks

VPD

Vital Product Data

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W

WOL

Wake On LAN

WOS

Wake On SAS

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X

XDP

XML Data Package

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