Installation Guide

HGST Active Archive System SA-7000

September 2015

1ET0034

Revision 1.1

Long Live Data ™ | www.hgst.com

Copyright

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law: HGST a Western Digital company PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer or express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. HGST may make improvements or changes in any products or programs described in this publication at any time.

It is possible that this publication may contain reference to, or information about, HGST products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that HGST intends to announce such HGST products, programming, or services in your country.

Technical information about this product is available by contacting your local HGST representative or on the Internet at: www.hgst.com/support

HGST may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents.

HGST, a Western Digital company
3403 Yerba Buena Road
San Jose, CA 95135
Produced in the United States

Long Live Data™ is a trademark of HGST, Inc. and its affiliates in the United States and/or other countries.

HGST trademarks are authorized for use in countries and jurisdictions in which HGST has the right to use, market and advertise the brands.

Other product names are trademarks or registered trademarks of their respective owners.

One MB is equal to one million bytes, one GB is equal to one billion bytes, one TB equals 1,000GB (one trillion bytes) and one PB equals 1,000TB when referring to storage capacity. Usable capacity will vary from the raw capacity due to object storage methodologies and other factors.

References in this publication to HGST products, programs or services do not imply that HGST intends to make these available in all countries in which HGST operates.

Product information is provided for information purposes only and does not constitute a warranty.

Information is true as of the date of publication and is subject to change. Actual results may vary. This publication is for general guidance only. Photographs may show design models.

Contents

List of Figures

List of Tables

1 About this Guide

Topics:

The HGST Active Archive System is a fully integrated, tested, and assembled storage appliance in an industry-standard 42RU rack.

The Active Archive System can be deployed with minimal effort, integrated with your existing S3-aware applications, and easily expanded in one-rack increments. It provides a web-based GUI, a command-line interface, and a menu-driven interface for system management, monitoring, and analytics; and an S3-compatible API for user management.

This document provides installation instructions for single-rack systems. To add a rack, first install a single rack, then follow the *System Expansion* instructions in the *HGST Active Archive System Upgrade Guide*.

1.1 Conventions

Element	Sample Notation
OS shell or Q-Shell commands (user input)	`rm -rf /tmp`
OS shell or Q-Shell system output	`Installation successful!`
Commands longer than one line are split with "\"	`q.dss.manage.setPermissions('/manage', \ [....])`
User-supplied values	*`ManagementNodeVirtualIPAddress`* or `<ManagementNodeVirtualIPAddress>`
File and directory names	The file `aFile.txt` is stored in `/home/user`.
Any graphical user interface label	Click **OK**.
Keyboard keys and sequences	To cancel the operation, press `Ctrl+c`.
Menu navigation in a GUI	Navigate to **Dashboard** > **Administration** > **Hardware** > **Servers**.

1.2 Storage Notations

Convention	Prefix	Size (bytes)
KB	kilobyte	1,000
KiB	kibibyte	1,024
MB	megabyte	1,000,000
MiB	mebibyte	1,048,567
GB	gigabyte	1,00,000,000
GiB	gibibyte	1,073,741,824
TB	terabyte	1,000,000,000,000
TiB	tibibyte	1,099,511,627,776

- Sizes of disks are expressed with *SI prefixes* (kilo, mega, tera, peta, exa)
- Space, size of partitions and file systems are expressed with the *binary prefixes* (kibi, mebi, tebi, pebi, exbi)
- A comma (",") is used for digit grouping, for example 1,000 is 1 thousand.

- A period (".") is used as decimal mark, for example 12.5 %.

1.3 Admonitions

Type	Usage
Note:	Indicates extra information that has no specific hazardous or damaging consequences.
Tip:	Indicates a faster or more efficient way to do something.
Caution:	Indicates an action that, if taken or avoided, may result in hazardous or damaging consequences.
Warning:	Indicates an action that, if taken or avoided, may result in data loss or unavailability.

1.4 Related Documents

For more information about the Active Archive System, please consult the following documents:

- The *HGST Active Archive System Administration Guide* explains how to use the Active Archive System interfaces for executing system management, monitoring, and analytics tasks.
- The *HGST Active Archive System API Guide* provides a reference for the Active Archive System S3 API.
- The *HGST Active Archive System FRU Replacement Guide* provides procedures for replacing hardware components of the Active Archive System.
- The *HGST Active Archive System Installation Guide* provides instructions for the installation of the Active Archive System in the data center, and its initial bringup.
- The *HGST Active Archive System Release Notes* provide important information about changes, new features, and known limitations.
- The *HGST Active Archive System Site Requirements Document* contains data center requirements for the Active Archive System.
- The *HGST Active Archive System Troubleshooting Guide* provides help for issues you might encounter.
- The *HGST Active Archive System Upgrade Guide* provides instructions for software and firmware updates, and system expansion.

For the latest or online version of any of these documents, visit http://www.hgst.com/support.

1.5 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:

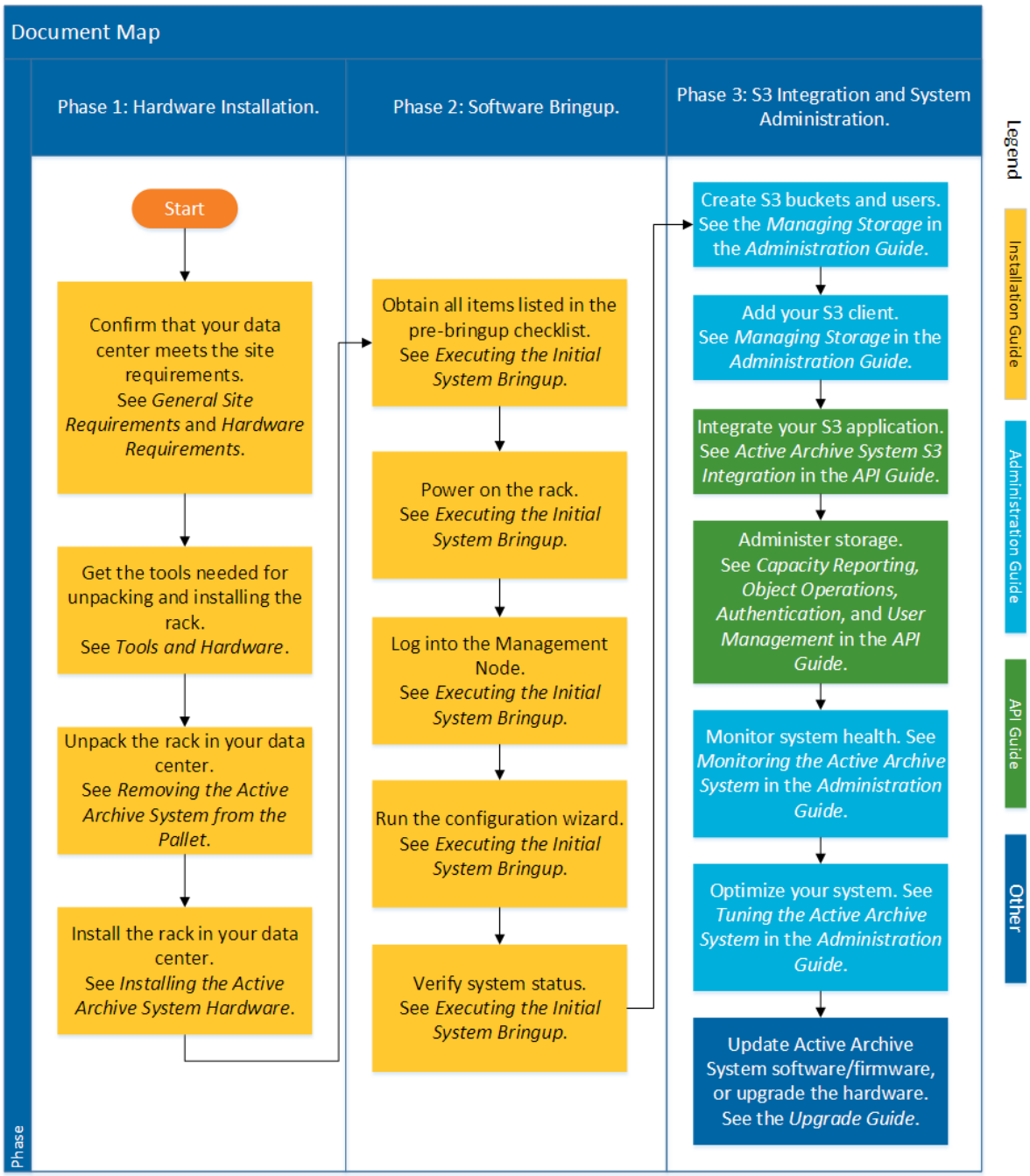
Region	Telephone Numbers	Support Hours and Additional Information
United States/International	1-408-717-7766	24 hours a day, 7 days a week
North America	1-844-717-7766	24 hours a day, 7 days a week Toll-free

Email:
support@hgst.com

Website:
www.hgst.com/support

1.6 Document Map

Figure 1: Document Map



2 Product Overview

Topics:

This chapter provides a product overview of the Active Archive System. For more information and a glossary of terms, see the *HGST Active Archive System Administration Guide*.

2.1 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.

2.2 Rack

An Active Archive System *cluster* contains 1-5 racks. Each rack is fully assembled and has the following specifications.

Component	SA-7000
Controller Nodes	3 (see HGST_CN on page 12)
External Interfaces (Public Network)	6
Internal Interfaces (Private Network)	2 (see Storage Interconnect on page 14)
Storage Nodes	6 (see HGST_S98_SN (for SA-7000) on page 13)
JBODs	6 with 7 sleds each, where each sled contains 14 drives.
Disk Drives per Storage Enclosure Basic array	98
Disk Drives per Rack	(98 * 6) + 30 (for OS and MetaStore) = 618

Component	SA-7000
Disk Drive Capacity per Rack (Object Storage Capacity, Raw)	(98 * 6) * 8TB = 4.7PB
Maximum Superblock Size	256MiB
Maximum Object Size	16TiB
Small File Size Policy	7/5 with a 512KiB threshold
Spread Width	18
Disk Safety	5
Storage Policy	18/5
Object Storage Capacity, Usable, Based on the HGST 18/5 Storage Policy	**2.9PB**
Maximum Number of Users	5,000,000

2.2.1 Configuration Summary

Specification	Default Value
Node Name	*SystemID*-DC*nn*-R*nn* Examples: *SystemID*-DC01-R03 is data center 1, rack 3. *SystemID*-DC01-R01 is data center 1, rack 1.
Default hostname (*SystemID*)	HGST-S3

2.2.2 Expansion Options

An Active Archive System *cluster* can be expanded to include up to five racks. For more information, see the *HGST Active Archive System Upgrade Guide*.

2.3 Controller Nodes

Controller Nodes are high-performance servers that are pre-packaged with the Active Archive System software, MetaStore, and management framework. They provide high-performance access over multiple network interfaces, and can serve data over the following protocols:

- HTTP/REST object interfaces
- S3

There are 3 Controller Nodes in every rack.

2.3.1 HGST_CN

2.3.1.1 Configuration Summary

Specification	Default Value
Node Name	*SystemID*-DC*nn*-R*nn*-CN*nn* Examples: *SystemID*-DC01-R03-CN02 is data center 1, rack 3, Controller Node 2.

Specification	Default Value
	SystemID-DC01-R01-CN02 is data center 1, rack 1, Controller Node 2. Node numbers are ascending from the bottom of the rack.
Operating System	DC-OS Linux
Default Username and Password	root/HGST, admin/HGST

2.3.1.2 Customer and Field Replaceable Units

The SSD, HDD, and power supply unit are customer replaceable units (CRU). Other components are field replaceable units (FRU). For more information, see the *HGST Active Archive System FRU Replacement Guide*.

2.3.1.3 Expansion Options

There are no expansion options for this component.

2.4 Storage Nodes

Storage Nodes provide high-density and power-efficient storage for the Active Archive System. Each Storage Node is paired with a Storage Enclosure Basic storage array. There are 6 Storage Nodes in every rack.

2.4.1 HGST_S98_SN (for SA-7000)

2.4.1.1 Configuration Summary

Each HGST_S98_SN Storage Node has a usable capacity of **2.9PB**, based on the HGST 18/5 storage policy.

Specification	Default Value
Node Name	*SystemID*-DC*nn*-R*nn*-SN*nn* Examples: *SystemID*-DC01-R03-SN02 is data center 1, rack 3, Storage Node 2. *SystemID*-DC01-R01-SN02 is data center 1, rack 1, Storage Node 2. Node numbers are ascending from the bottom of the rack.

2.4.1.2 Customer and Field Replaceable Units

The SSD, HDD, and power supply unit are customer replaceable units (CRU). Other components are field replaceable units (FRU). For more information, see the *HGST Active Archive System FRU Replacement Guide*.

2.4.1.3 Expansion Options

There are no expansion options for this component.

2.5 Management Node

The Management Node is a logical component. It is the designation of Controller Node 01 in Rack 01 (in other words, *SystemID*-DC01-R01-CN01). The Cloud Management Center (CMC) on page 14 is pre-installed on this node. The default IP address of the Management Node is 192.168.107.1.

2.6 Administrative Interfaces

The Active Archive System provides three interfaces for remote management and monitoring: the Cloud Management Center (CMC) on page 14, OSMI on page 14, and Q-Shell on page 14.

2.6.1 Cloud Management Center (CMC)

The Cloud Management Center (CMC) runs on the Management Node. For information on logging into the Cloud Management Center (CMC), see Verifying System Status on page 54.

2.6.2 OSMI

The Object Store Management Interface (OSMI) is a menu-based interface. It is pre-installed on each Controller Node. For more information about OSMI, see *Using the Administrator Interfaces* in the *HGST Active Archive System Administration Guide*.

2.6.3 Q-Shell

The Q-Shell is an interactive Python shell. It is pre-installed on each Controller Node. For more information about the Q-Shell, see *Using the Administrator Interfaces* in the *HGST Active Archive System Administration Guide*.

2.7 Client Interfaces

The Active Archive System client interface is an S3-compatible API.

2.7.1 S3

The Active Archive System provides an S3-compatible API. For more information on the S3-compatible API, see the *HGST Active Archive System API Guide*.

2.8 Storage Interconnect

The Storage Interconnect is the top-of-rack (TOR) switch. There are two Storage Interconnect switches per rack.

2.8.1 Configuration Summary

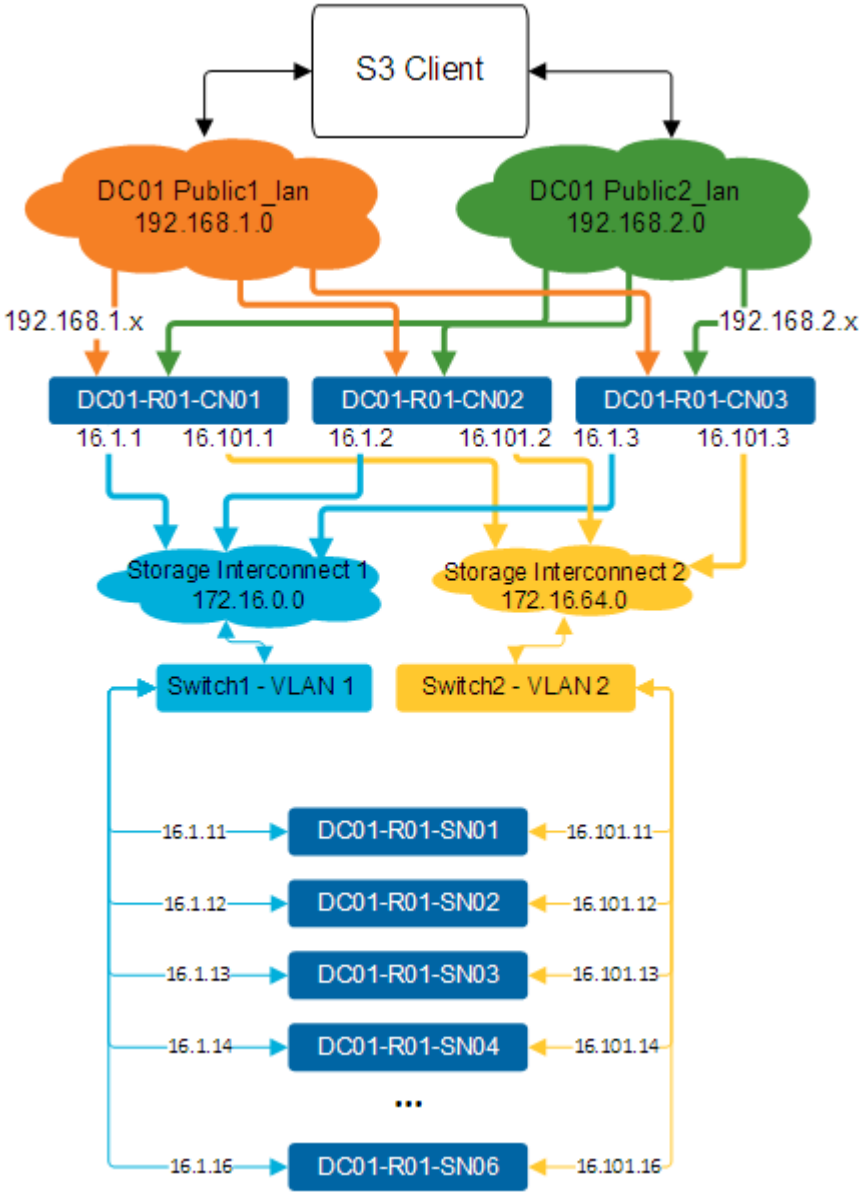
Specification	Default Value
Switch Name	*SystemID*-DC*nn*-R*nn*-SW*nn* Examples: *SystemID*-DC01-R03-SW02 is data center 1, rack 3, switch 2. *SystemID*-DC01-R01-SW01 is data center 1, rack 1, switch 1. Switch numbers are ascending from the bottom of the rack. In other words, the bottom switch is SW01. The top switch is SW02.
Default Username and Password	admin/HGSTdefault

2.8.2 Customer and Field Replaceable Units

For information about customer replaceable units (CRU) and field replaceable units (FRU), see the *HGST Active Archive System FRU Replacement Guide*.

2.9 Network Connectivity

Figure 2: Network Connectivity for Data Center 1 (DC01), Rack 1 (R01), with Default IP Addresses



3 Disclaimers

Topics:

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

3.1 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.

3.1.1 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.

3.1.2 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 1: Product Safety Compliance

3.1.3 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 2: Product EMC/Immunity Compliance

4 Safety and Regulatory

Topics:

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

4.1 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. For more information on ambient operating conditions and environment, see: General Site Requirements on page 24.

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.

4.2 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.

4.3 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.

4.4 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 (Tma) 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.

4.5 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.

4.6 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.

4.7 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 s upply 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.

5 HGST Regulatory Statements

Topics:

The following chapter provides regulatory statements for the Active Archive System.

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.

5.1 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.

5.2 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 Active Archive System User Guide, it may cause harmful interference to radio communications.

5.3 ICES-003 (Canada)

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.

English translation of the notice previous:

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.

5.4 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.

5.5 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.

5.6 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.

5.7 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.

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

기 종 별	사 용 자 안 내 문
A급 기기 (업무용 정보통신기기)	이 기기는 업무용으로 전자파적합등록을 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.

6 General Site Requirements

Topics:

The following chapter provides a general site requirements for the Active Archive System.

6.1 Enclosure Environmental Requirements

The enclosure based upon the drive maximum environmental specifications will be designed around the following environmental requirements:

Non-operating	Active Archive System
Temperature	-40°C to +66°C
Temperature Gradient	35°C per hour
Temperature De-rating	1°C per 300m above 3000m
Relative Humidity	8% to 90% (non-condensing)
Relative Humidity Gradient	30% per hour maximum
Altitude	-300m to 12,000m de-rated 300m per 1°C above 40°C
Altitude Gradient	22860m per hour maximum

Table 3: Non-operating Environmental Requirements

Operational	Active Archive System
Temperature	20° to 40°C de-rated 2% per 1,000 feet altitude increase
Temperature Gradient	20°C per hour
Temperature De-rating	1°C per 125m above 950m
Relative Humidity	Up to 95%
Relative Humidity Gradient	30% per hour maximum
Altitude	-300m to 3048m

Table 4: Operational Environmental Requirements

6.2 Site Environment

The Active Archive System is a fully configured rack system. The location of the system wiring room is an extremely important consideration for proper operation. Equipment placed too close together, inadequate ventilation, and

inaccessible panels, can cause malfunctions and shutdowns, and can make maintenance difficult. Plan for access to front, rear, and side panels of the system.

While planning your site layout and equipment locations, follow the precautions described in the Site Configuration section to help avoid equipment failures and reduce the possibility of environmentally caused problems.

Note: Improper operating environmental conditions could lead to anomalies in the system such as disk errors, marginal network connectivity and overall reduced mean time between failures.

6.3 Site Configuration

The following precautions will help you plan an acceptable operating environment for your system and will help you avoid environmentally caused equipment failures:

- Ensure that the room where your system operates has adequate air circulation. Electrical equipment generates heat. Without adequate air circulation, ambient air temperature may not cool equipment to acceptable operating temperatures.
- To avoid damage to the system, always follow ESD-prevention procedures described in the Preventing Electrostatic Discharge Damage section. Damage from static discharge can cause immediate or intermittent equipment failure.
- Once the system is installed into the data center or computer room location, ensure that the side panels are secure. The system is designed to allow cooling air to flow within it through specially designed configuration.

6.4 Airflow Consideration

The Active Archive System is designed to bring air in through the front rack system and vent through the rear of the system. The Active Archive System is required to generate up to 10484 Watts while running. The user needs to ensure both the front and rear of the Active Archive System stay clear from any materials that may block or disrupt the airflow in any way. Disrupting the airflow can cause the system to run the cooling fans at an excessive RPM, and in the worst case, start to shut down the system due to an overheating event.

The following rack airflow principles should be considered for best results:

- The appropriate conditioned air is presented at the equipment air intake
- The airflow in and out of the equipment must not be restricted

6.4.1 Cooling the Active Archive System

The Active Archive System has an advanced thermal algorithm that monitors all of the temperature sensors in the system. The six Storage Enclosure Basic contained within the system make adjustments to the fan speeds based upon the thermal sensors. The fan algorithm takes into account the component and the warning and critical threshold limits set by SES. If any temperature sensor gets to the warning limit, the fans speeds will increase to cool the component. If the critical threshold is crossed for a determinate amount of time, the system will begin to shut down components in order to prevent damage. If the enclosure encounters low temperatures, the system will reduce fan speed in an attempt to conserve power and not over-cool the system.

This algorithm is agnostic to effects of altitude and humidity. The algorithm simply works on temperatures within the system with emphasis on reducing power consumption.

6.5 Servicing Area

The servicing area in the front of the Active Archive System should allow for full racks to be installed and uninstalled with ease. In some cases, the space should be large enough for a pallet jack.

The serving area in the rear of the Active Archive System should allow enough space for a field person to service the system without moving it.

Note: The spacing should be sufficient for proper airflow. There should be airflow standards specific to the facility. The facility is responsible for determining the airflow spacing.

7 Hardware Requirements

Topics:

The following chapter provides the hardware requirements for the Active Archive System.

7.1 Physical Dimensions

The following section provides a description of the physical dimensions.

7.1.1 Packed System Dimensions

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

Package	Dimensions (height x width x depth)
Packed Active Archive System	89.5 inches x 36 inches x 45 inches 2,273.3 millimeters x 914.4 millimeters x 1,143 millimeters
Pallet	6.5 inches x 40.25 inches x 54 inches 165.1 millimeters x 1,022.35 millimeters x 1,371.6 millimeters

Table 5: Packaged Active Archive System Dimensions

Note: The route to the data center or computer room location should have a clearance of 96 inches (2,438.4 millimeters) high and 45 inches (1,143 millimeters) wide to allow for maneuverability.

7.1.2 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 6: Active Archive System Dimensions

7.1.3 Packed System Weight

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

Hardware	Dimensions (Width x Height x Depth)
Active Archive System	2,431 lbs. 1102 kg.

Table 7: Packaged Active Archive System Weight

Note: Ensure that the data center or computer room route and location have a floor rated at approximately 3,000 lbs to allow for adequate support.

7.1.4 Weight

Rack:

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

Hardware	Dimensions (Width x Height x Depth)
Active Archive System	2,250 lbs. 1,020 kg.

Table 8: Active Archive System Weight

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

Controller (SM 1028U-TR4T+):

The following table displays the weight of the Controller:

Hardware	Dimensions (Width x Height x Depth)
Controller	Net weight is 26lbs. Gross weight is 41 lbs **Note:** The gross weight of the controller is based on the combined weight of the server, accessories kit, rail kit, and packaging

Table 9: Active Archive System Weight

Storage (SM 1018R-WC0R):

The following table displays the weight of the Storage server:

Hardware	Dimensions (Width x Height x Depth)
Storage server	Net weight is 25lbs. Gross weight is 40lbs

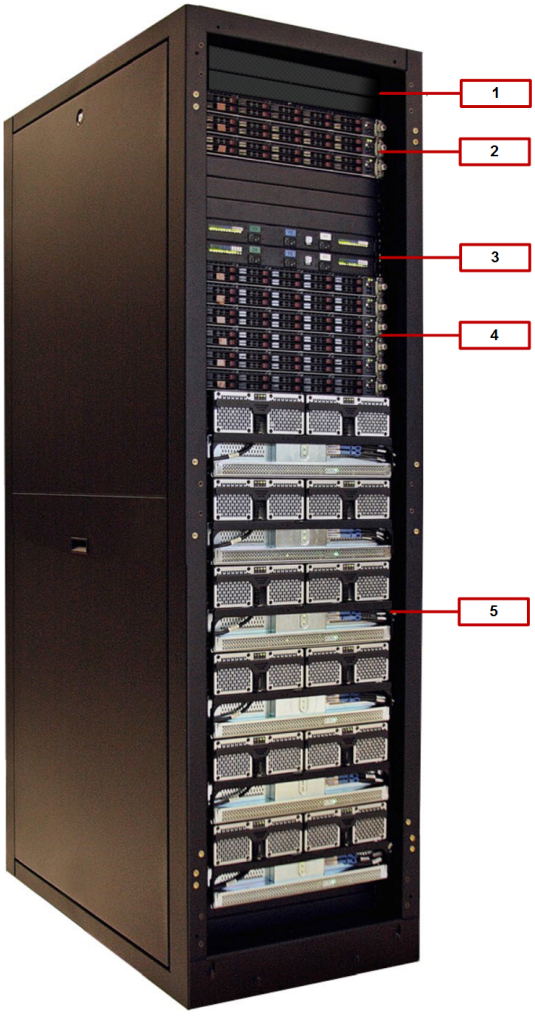
Hardware	Dimensions (Width x Height x Depth)
	Note: The gross weight of the storage server is based on the combined weight of the server, accessories kit, rail kit, and packaging

Table 10: Active Archive System Weight

7.1.5 Active Archive System Configuration

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

Figure 3: 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**	2

Hardware	Details	Number of Product
	WYE PDU: Chatsworth Horizontal mount PDU, 16A 380-415Vac, 3-Phase	
(4) Storage Nodes	Supermicro SYS-1018R-WCOR	6
(5) Storage Enclosure Basic	For the basic configuration, there are 98 drives per Storage Enclosure Basic.	6

Table 11: Active Archive System Full Configuration

7.1.6 Active Archive System Accessory Kit

Quantity	Description	Vendor	Vendor Part Number
4	40GBASE-SR QSFP+ Gen2 Optical Transceiver Module (up to 100M)	Avago	AFBR-79EQDZ
2	Straight 12 fiber Plenum MM 40Gb MTP/MPO standard female to MTP/ MPO standard female 5 meter optical Cable	Fibertronics Inc.	MPO-LL7EAP005MCS-2

Table 12: Active Archive System Accessory Kit

8 Tools and Hardware

Topics:

The following chapter provides information on tools and hardware that will be needed for unpacking the Active Archive System.

Note: The following tools are not provided by HGST. Please ensure that you have these tools before the delivery of the system.

8.1 Required Tools

The following tools will be required for removing the system from the pallet:

Note: The following tools are not provided by HGST

- Pallet jack

  Note: The pallet jack should be rated to handle greater than 3,000 lbs.

- Ladder
- Cordless drill or socket wrench
- Socket adapter for drill
- One 10 millimeter socket
- One 13 millimeter socket
- One 9/16 inch socket
- Crescent wrench
- Level
- Tape measure

8.2 Pallet Hardware

HGST provides the required hardware for the removal of the Active Archive System from the pallet (for example, ramps and lag bolts required to affix the ramps onto the pallet).

Note: HGST does not provide the hardware to bolt the Active Archive System to the data center floor or ceiling.

9 Removing the Active Archive System from the Pallet

Topics:

The following chapter provides instruction on how to remove the Active Archive System from the pallet.

Attention: For best results, follow the steps in the order they appear in this document.

9.1 Removing the Active Archive System from the Pallet

To remove the Active Archive System from the pallet, do the following:

None

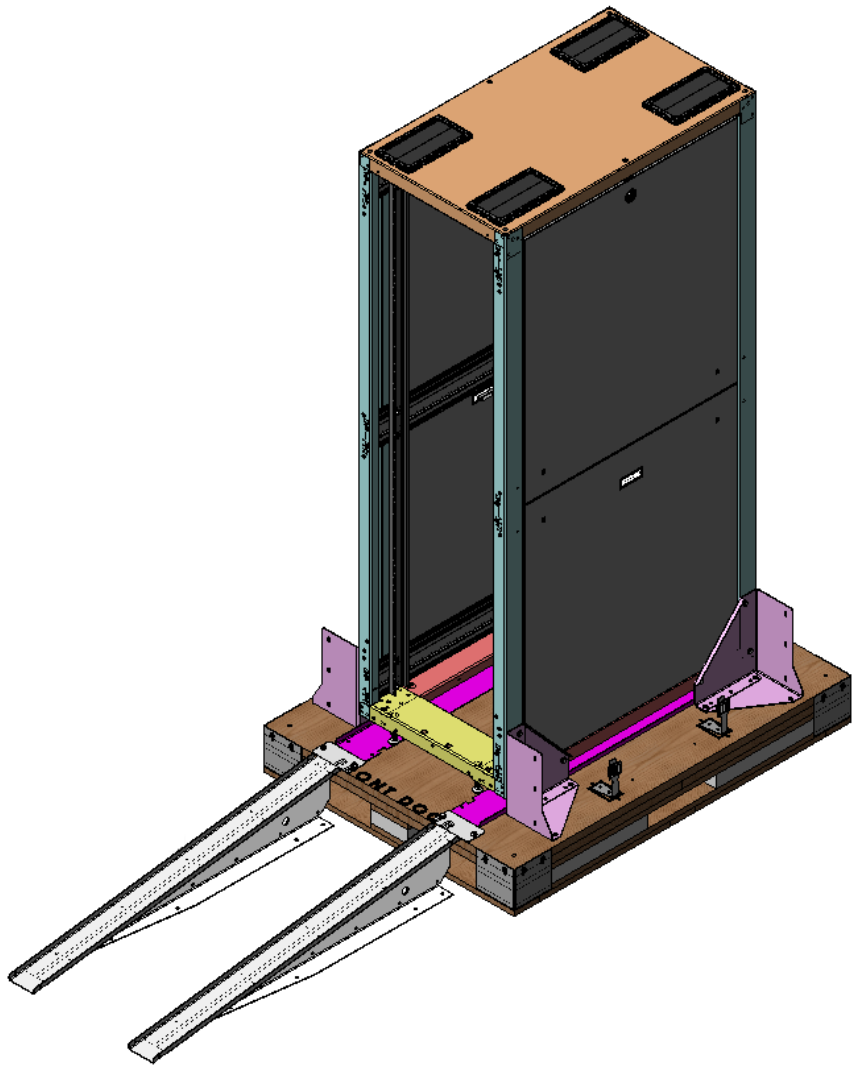
Table 13: Tools Required for this Task

Note:

- Ensure that the pallet is placed in a location that allows for enough space for both the unloading ramps and the system during the unloading process.

- It is recommended that you have four or more persons to assist with removing the system from the pallet.

Figure 4: Floor Anchor Brackets



1. From the side of the rack, unlock and remove the top side panels on either side of the rack.

   Note: This will ensure that you can maintain a good grip on the frame of the system.

2. At the rear of the rack, straighten the swivel casters.

Note: This is to ensure the system will not turn while being offloaded from the ramp.

Figure 5: Swivel Casters

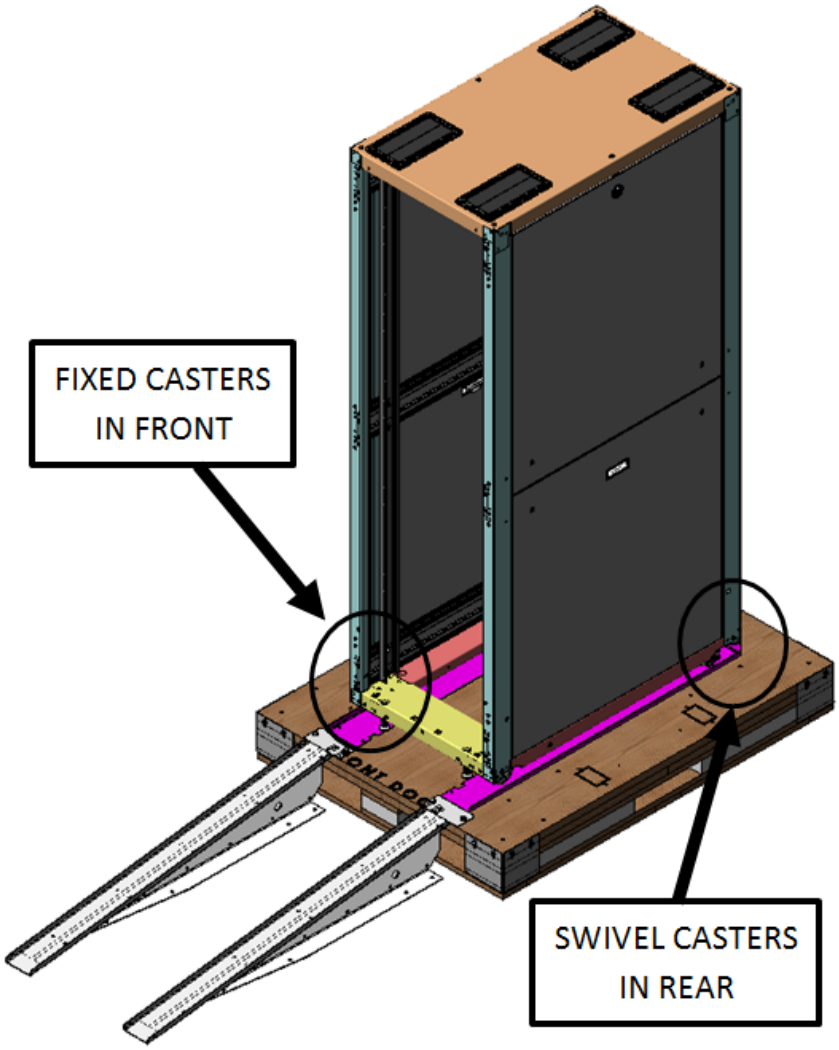
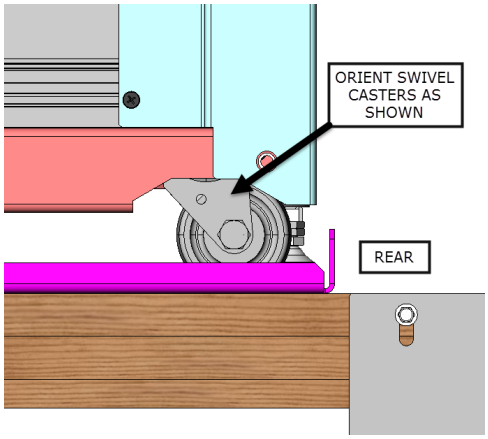


Figure 6: Swivel Casters Close View



3. Position one person on either side of the system.

Note: The persons at the side of the rack need to grip both the **ramp mount brackets** and the rack frame before moving.

4. Position **one or more** persons at the rear of the system.
5. Position **two** persons at the front of the system.
6. Carefully line up and push the system onto the ramp.

Note: At this point, the persons positioned around the system should safely and securely grasp the frame of the system.

7. Once all persons are ready, the person at the rear should push slowly and carefully on the system.
8. The persons at the bottom should brace for the weight of the system.
9. Carefully push the system down the ramp until it is clear of the ramps.

10 Installing the Active Archive System Hardware

Topics:

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

10.1 Fiber Cables and Approved Power Cords

Part	Type	Details
Fiber Cable	LC to LC Multimode Fiber patch cable,	50/125µm OM3 10Gb
Fiber Connecter	LC	N/A

Table 14: Approved Fiber Cables

10.2 Attaching the Floor Anchor Brackets to the System

To attach the floor anchor brackets to the system, do the following:

Attention: The Active Archive System is not designed to resist vigorous earthquakes. The floor anchor bracing mitigates potential damage caused by seismic activity, but does not guarantee full protection of the system and internal components.

Drill
Socket adapter for drill
13 millimeter socket
Crescent wrench
Level
Tape measure

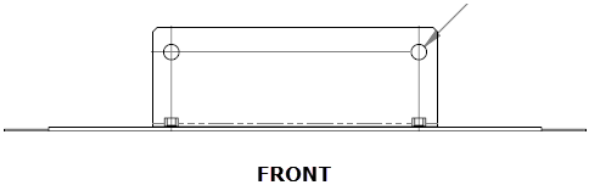
Table 15: Tools Required for this Task

Note: Locate the pair of floor anchor brackets that were removed from the system during the unloading process. The floor anchor brackets contain the combination of the angle brackets and flat plates connected by bolts. Ensure that you disassemble the angle brackets from the flat plates.

Attention: The data center is responsible for ensuring that the 1/2 inch threaded rods are installed to the specification mentioned in the Site Survey.

1. Using a **13 millimeter** socket, mount the front angle bracket to the data center floor with **2** M8 bolts.

Figure 7: Front of Rack Angle Bracket Position

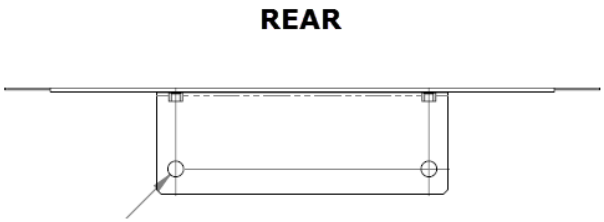


Note:

- The angle brackets should be facing towards the inside of the installation space.
- Bolts should be tightened to a torque value of 212 In-Lb or 24 N-M.

2. Using a **13 millimeter** socket, mount the rear angle bracket to the data center floor with **2** M8 bolts.

Figure 8: Rear of Rack Angle Bracket Position



Note:

- The angle brackets should be facing towards the inside of the installation space.
- Bolts should be tightened to a torque value of 212 In-Lb or 24 N-M.

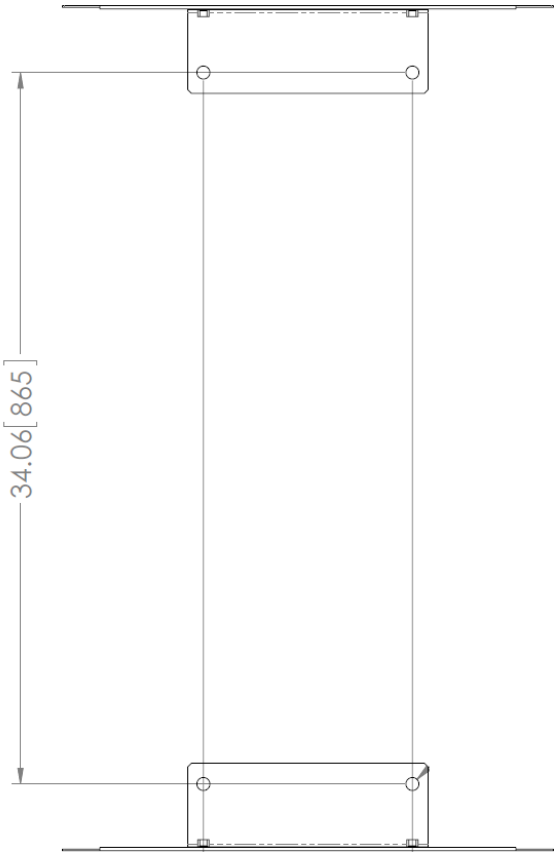
3. Move the rack into place over the angle brackets, ensuring that there is one angle bracket at the front and one at the rear of the rack.

Note:

- From the front of the system, firmly grip the rack frame and ramp mount brackets. 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.

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

Figure 9: Angle Brackets Position

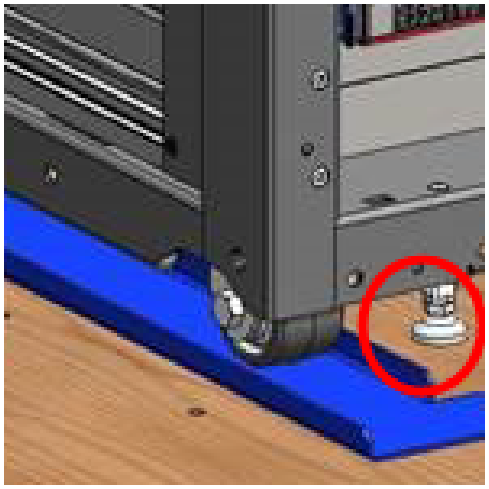


Note:

- From the front of the system, firmly grip the rack frame and ramp mount brackets. 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.
- Ensure that you take necessary precaution so as not to damage any components on the system or any existing systems within the installation space.

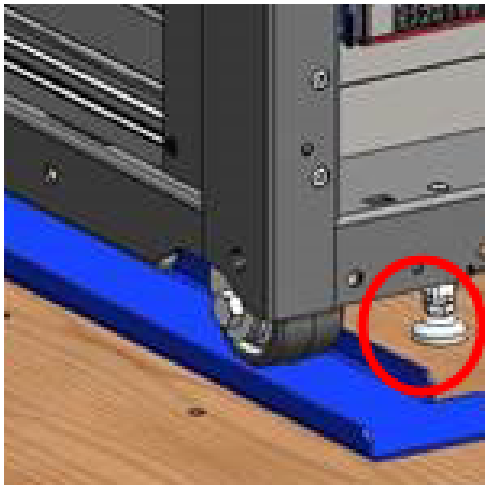
4. From the bottom front of the rack, using a crescent wrench, rotate one of the rack feet **clockwise**.

Figure 10: Rack Feet



5. Once the first caster is slightly off of the ground, repeat the previous step on the other side.
6. From the bottom rear of the rack, using a crescent wrench, rotate one of the rack feet **clockwise**.

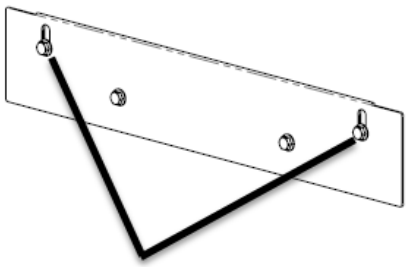
Figure 11: Rack Feet



7. Once the caster is slightly off of the ground, repeat the previous step on the other side.
8. Repeat the **4** previous steps until each caster is about 3/16 inch from the floor.
9. Using the level, verify the level of the rack.
10. Adjust the rack feet according to the level, keeping the distance from the bottom of the casters to the floor as close to 3/16 inch as possible.

11. Using a **13 millimeter** socket, mount the front flat plate to the system with **2** M8 bolts.

Figure 12: Flat Plate Attached (Front)

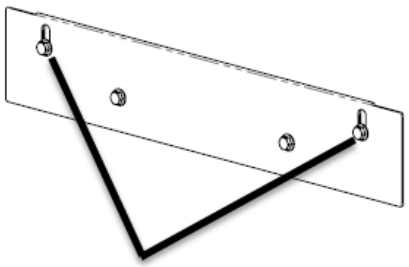


Note:

- The rack contains weld nuts that accept the flat plate bolts.
- Bolts should be tightened to a torque value of 212 In-Lb or 24 N-M.

12. Using a **13 millimeter** socket, mount the rear flat plate to the system with **2** M8 bolts.

Figure 13: Flat Plate Attached (Rear)

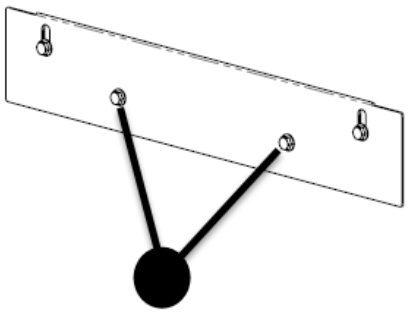


Note:

- The rack contains weld nuts that accept the flat plate bolts.
- Bolts should be tightened to a torque value of 212 In-Lb or 24 N-M.

13. Using a **13 millimeter** socket, connect the front flat plate to the angle bracket with **2** M8 bolts.

Figure 14: Flat Plate and Angle Bracket Attached (Front)

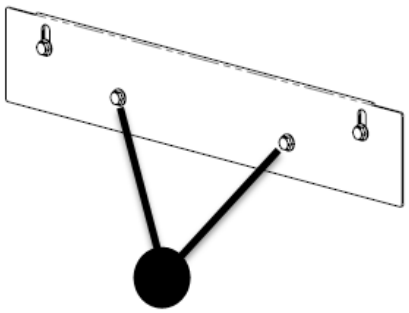


Note:

- The angle bracket contains weld nuts that accept the flat plate bolts.
- Bolts should be tightened to a torque value of 212 In-Lb or 24 N-M.

14. Using a **13 millimeter** socket, connect the rear flat plate to the angle bracket with **2** M8 bolts.

Figure 15: Flat Plate and Angle Bracket Attached (Rear)



Note:

- The angle bracket contains weld nuts that accept the flat plate bolts.
- Bolts should be tightened to a torque value of 212 In-Lb or 24 N-M.

10.3 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.

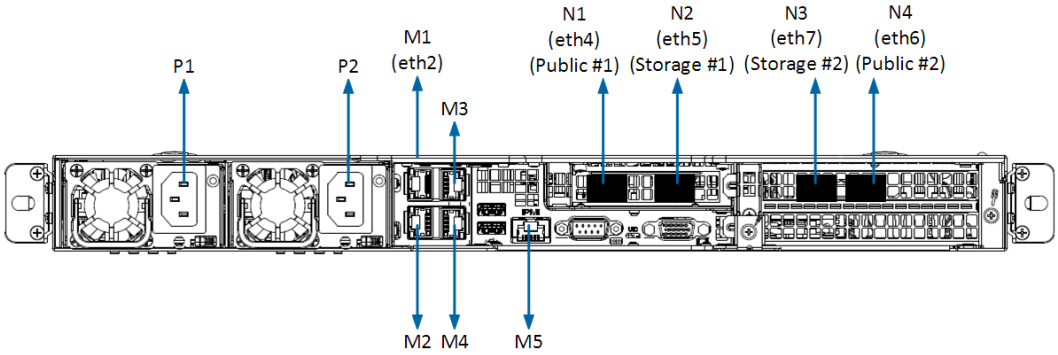
1. From the ceiling cable guides, direct the fiber optic connections through the top of the rack.

   Note: For more information on the approved fiber cables, see Fiber Cables and Approved Power Cords on page 36.

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 16: 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.

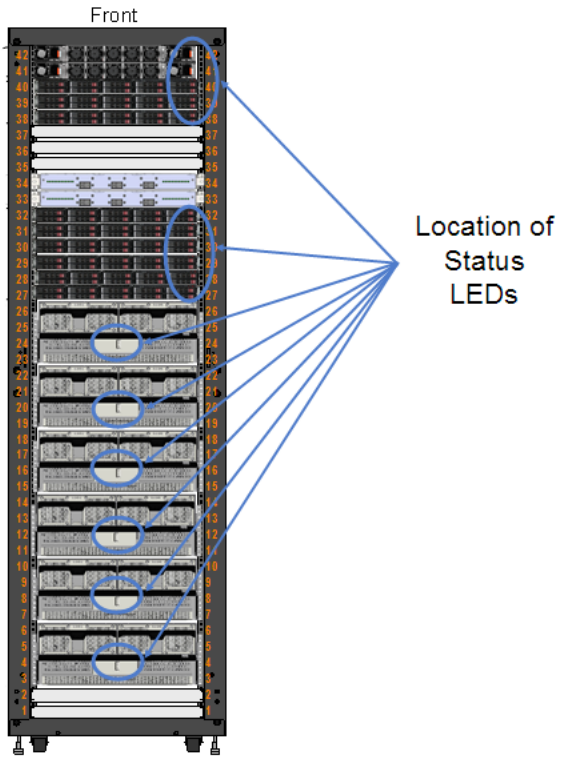
   Note: For more information on the approved power cords, see Fiber Cables and Approved Power Cords on page 36 .

   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 17: 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.

10.4 Powering Down the Active Archive System

To shut down the Active Archive System, do the following:

> **Important:** This shutdown procedure is only for shutting down an Active Archive System, if needed, after power testing. This procedure should only be used prior to running the configuration wizard; for example, if power-on testing is performed on the rack prior moving it into its final physical position.

1. Power down each of the Storage Nodes by pressing the red power button on the far right hand side of each Storage Node chassis.

   The Storage Nodes are located at positions U27 through U32 in the rack.
2. Wait 3 minutes for the Storage Nodes to power off.
3. Power down each of the Controller Nodes by pressing the red power button on the far right hand side of each Controller Node chassis.

   The Controller Nodes are located at positions U38 through U40 in the rack.
4. (Optional) Disconnect the two external power cords from the NEMA power distribution networks.

11 Executing the Initial System Bringup

Topics:

This chapter provides instructions for the initial bringup of the first Active Archive System rack in your data center. For instructions on adding additional racks, see the *HGST Active Archive System Upgrade Guide*.

Summary of Workflow

> **Warning:** The system must be completely powered off at this point. Do not power on any individual component. To power off the system, follow the instructions in Powering Down the Active Archive System on page 43.

1. Possess all data listed in the Pre-Bringup Checklist on page 44 on your laptop.
2. Power on the Active Archive System as instructed in Connecting to the Active Archive System on page 42.
3. Connect your laptop to the Management Node as instructed in Connecting to the Management Node on page 46.
4. Run the configuration wizard as instructed in Running the Configuration Wizard on page 48.
5. Verify that the Cloud Management Center (CMC) dashboard displays the expected status indicators as instructed in Verifying System Status on page 54.

11.1 Pre-Bringup Checklist

Bring a laptop with you to the data center. The laptop must have the following items:

- A CAT6 cable
- PuTTY version 0.63, MPutty version 1.6.0.176, or Xshell 4 build 0097 installed
- sftp protocol version 3 installed
- Adobe Flash Player 13.0.0.214 or lower installed
- A valid security certificate for uploading onto the Active Archive System (required only if you plan to enable SSL for the user interface)
- A text file containing your predetermined settings for the following items:

Setting	Notes
General Settings Enable telemetry collection? (Yes/No) Prefix to use for hostnames (System ID):	For more information on telemetry, see Collecting Telemetry on page 64
Security Settings Password for CMC `admin` account: Password for `root` account on all nodes: SSL enabled for CMC? (Yes/No) SSL port number for CMC	Many third party applications use port 443 for the HTTPS port for S3 traffic (client daemons). Consider using an alternative port for the CMC if you use such an application.
Location Settings Country: City: Address:	Country name must be in the exact format listed in Countries on page 68. Time zone must be in the exact format listed in Time Zones on page 69).

Setting	Notes
Time zone: NTP server (IP or FQDN):	
Notification Settings SMTP server (IP or FQDN): SMTP server username: SMTP server password: SMTP administrator email address: Send test email? (Yes/No) SNMP trap server (IP or FQDN): SNMP trap server port number: SNMP trap community string: Send test SNMP trap? (Yes/No) Poll for statistics from this environment using SNMP? (Yes/No)	The Active Archive System must be able to reach the SMTP server, otherwise configuration of the system fails.
S3 Settings S3 Domain name: Allow users to create their own buckets? (Yes/No)	
Network Settings for Public Network #1 Name of public network #1: Network address for public network #1: Subnet mask for public network #1: **Start IP** address for public network #1: **End IP** address for public network #1: Gateway IP address for public network #1: DNS IP address(es): Virtual IP address for Controller Node 01 on public network #1: IP address for Controller Node 01 on public network #1: IP address for Controller Node 02 on public network #1: IP address for Controller Node 03 on public network #1:	The configuration wizard uses the **Start IP** and **End IP** values as a sanity check on all IP addresses you give it. These values are the lower and upper (inclusive) bounds for all IP addresses for this public network. This boundary also applies to any virtual IP addresses you are prompted for within this public network. Therefore, the range between **Start IP** and **End IP** must accommodate all IP addresses for this public network (in other words, at least 4). If, at some point during the running of the configuration wizard, you enter an IP address outside of this boundary, the wizard eventually fails, and you must reconfigure the system by hand. For a visual representation of network configuration, see Network Connectivity on page 15.
Network Settings for Public Network #2 Name of public network #2: Network address for public network #2: Subnet mask for public network #2: Start IP address for public network #2: End IP address for public network #2: Gateway IP address for public network #2: DNS IP address(es): Virtual IP address for Controller Node 01 on public network #2: IP address for Controller Node 01 on public network #2: IP address for Controller Node 02 on public network #2: IP address for Controller Node 03 on public network #2:	See notes in **Network Settings for Public Network #1**, above.

Table 16: Your Predetermined Settings

11.2 Connecting to Power

Power on the Active Archive System as instructed in Connecting to the Active Archive System on page 42.

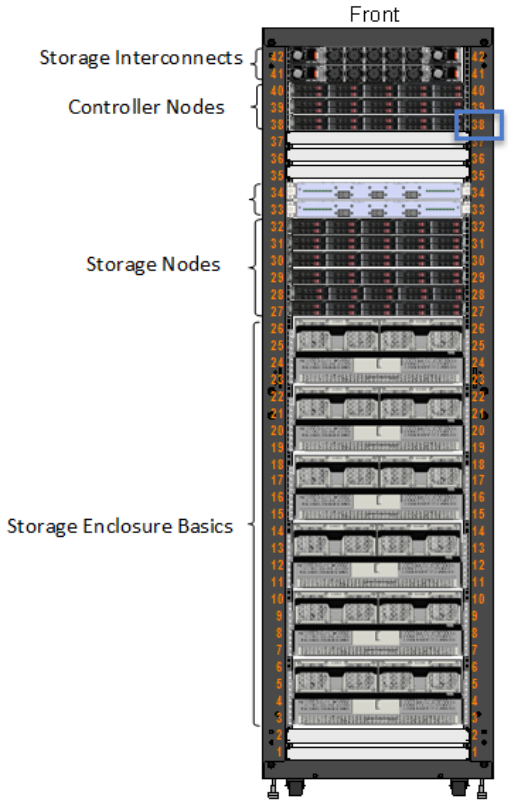
11.3 Connecting to the Management Node

For initial bringup, you must connect your laptop to the Management Node.

1. Identify the Management Node.

   The Management Node is the lowest Controller Node in rack 01, at location **U38**. Rack unit labels are only visible from the front of the rack. Refer to the figure below for help in identifying location **U38**.

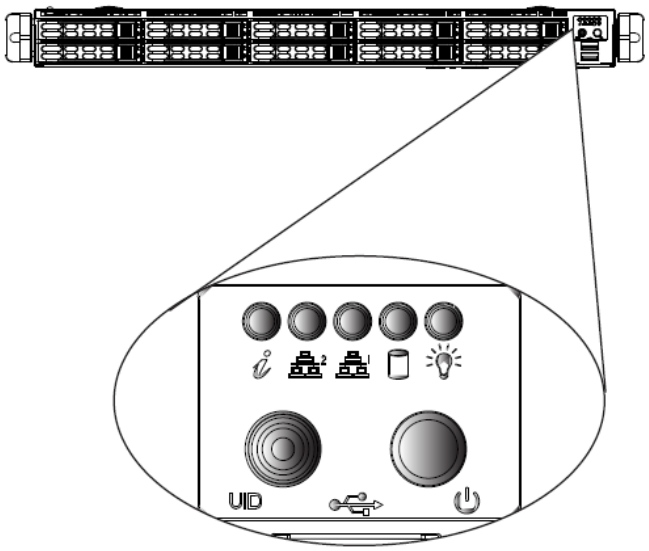
   Figure 18: Location of the Management Node in the Rack



   a) Press the unit identifier (UID) button on the front of the Management Node to illuminate a blue UID LED on both the front and back of the chassis. This will help you to identify the Management Node from the back of the rack in the next step.

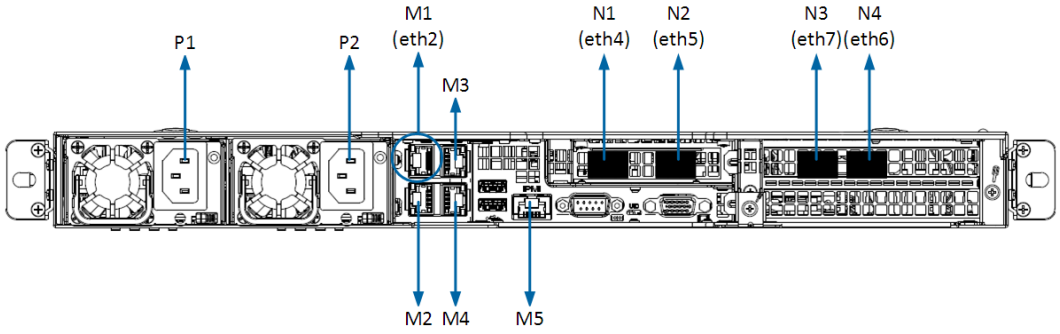
The Management Node is the lowest Controller Node in the rack, at location **U38**. Rack unit labels are only visible from the front of the rack. Refer to the figure below for help in identifying location **U38**.

Figure 19: Location of the UID Button on the Management Node



2. Log into the Management Node.
   a) Connect your CAT6 cable to your laptop's Ethernet port and to the port on the Management Node labeled **M1** in the figure below.

Figure 20: Controller Node, Back



   b) Give your laptop an IP address in the same range as the default IP address of the Management Node (Controller Node 01); in other words, `192.168.107.1/24`.

      Example:

      Laptop IP address: `192.168.107.20`
      Subnet mask: `255.255.255.0`
      Gateway: `192.168.107.1` (Use the default IP address of the Management Node (Controller Node 01), as the gateway).

   c) Ping the default IP address of the Management Node (Controller Node 01), `192.168.107.1/24`, to confirm that you can reach it.
   d) Start PuTTY on your laptop.
   e) In PuTTY, open an SSH session to the default IP address of the Management Node, `192.168.107.1`. The login prompt appears.
   f) Enter the default login credentials for the `root` user. (`root/HGST`).

The configuration wizard starts.

```
Welcome to the HGST Active Archive System version_number configuration utility.
 Press [ENTER] to continue:
Logs can be found in /mnt/sandboxtmp/logging/configuration_wizard_datestamp.log
End user license Settings:
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

In order to use this software, you need to accept the End User License Agreement.
 Press [ENTER] to view:
```

Now that the configuration wizard has started, press the unit identifier (UID) button on the front of the Management Node to turn it off.

If the configuration wizard does not start automatically, see Troubleshooting Installation Issues on page 57.

11.4 Running the Configuration Wizard

The configuration wizard starts as soon as you log into the Management Node when the Active Archive System is first powered on. For instructions on logging into the Management Node, see Connecting to the Management Node on page 46.

Tip: Press `Ctrl+c` to start any section of the configuration wizard over again.

1. Press `Enter` to view the end user license agreement (EULA).
   The end user license agreement (EULA) appears.
2. Accept the EULA.

   ```
   Do you accept the EULA [Default: Yes]:
   ```

   Type `Yes` or press `Enter` to accept the EULA. If you do not accept the EULA, the configuration wizard exits.
3. When prompted to **allow the system to send out system telemetry and logs**, type `No` to disable telemetry collection, or press `Enter` to accept the default (`Yes`).

   For more information, see Collecting Telemetry on page 64.

   ```
   This system is capable of sending system telemetry and logs periodically to enhance
    the HGST Support experience.
   Do you permit the system to send out system telemetry and logs? [Default: Yes]: Yes
   ```
4. When prompted to **configure security**, type `Yes`, or press `Enter`.

   Refer to the Pre-Bringup Checklist on page 44 for your predetermined settings.

   ```
   Currently configuring security. Proceed? [Default: Yes]: Yes
   ```

   a) When prompted to enter the *current password for the administrator account*, type the default password for the CMC `admin` account.

   The default password is `HGST`. You must enter a value at this prompt, even if you want to use the default value. If you want to use the default, you must type it in.

   ```
   Enter the current password for the administrator account:
   Re-enter password (for verification):
   ```

   b) When prompted to enter a *new password for the administrator account*, type your chosen password for the CMC `admin` account.

   You must enter a value at this prompt. Type your chosen password (or the default password, if you do not want to change it).

   ```
   Enter a new password for the administrator account:
   ```

```
Re-enter password (for verification):
```

c) When prompted to enter the *current password for the root account*, type the default password for the `root` account.

The default password is `HGST`. You must enter a value at this prompt, even if you want to use the default value. If you want to use the default, you must type it in.

```
Enter the current root password for the machines:
Re-enter password (for verification):
```

d) When prompted to enter the *new root password for the machines*, type your chosen password for the `root` account.

You must enter a value at this prompt. Type your chosen password (or the default password, if you do not want to change it).

```
Enter a new root password for the machines:
Re-enter password (for verification):
```

e) When prompted to use SSL for the user interface, type `Yes` to enable SSL for the CMC, or press `Enter` to accept the default (disabled).

> **Tip:** You will be prompted to upload your security certificate from your laptop to the Management Node. If you do not have one, do not enable SSL at this point.

```
Would you like to use SSL for the user interface [Default: No]:
```

If you typed `Yes`, do the following.

a. Type the port number on the destination machine to use for SSL. This value must be non-empty and numerical.

> **Warning:** Many third party applications use port 443 for the HTTPS port for S3 traffic (client daemons). Consider using an alternative port for the CMC if you use such an application.

```
Enter the port to use for SSL:
```

b. On your laptop, upload a valid certificate to the Management Node, using `sftp`. The security certificate must be valid. You cannot skip this step.

On your laptop, run `sftp` as follows:

```
sftp root@192.168.107.1
put security_certificate_filename
exit
```

c. On the Management Node, enter the path of the certificate.

You can press `Enter` if you want to accept the default path (`/root/`*`security_certificate_filename`*).

```
Enter the path of the certificate: /root/security_certificate_filename
```

5. When prompted to **configure location**, type `Yes`, or press `Enter`.

Refer to the Pre-Bringup Checklist on page 44 for your predetermined settings.

```
Currently configuring location. Proceed? [Default: Yes]: Yes
```

a) Type your country name in the exact format listed in Countries on page 68.

Example:

```
Enter your country: United States of America
```

b) Type your city name.

Example:

```
Enter your city: San Jose
```

c) Type your address.

Example:

```
Enter an address: 123 Sample Street
```

d) Type your time zone in the exact format listed in Time Zones on page 69.

Example:

```
Enter your time zone: America/Los_Angeles
```

e) Type the IP address or FQDN of your NTP server.

> **Warning:** The Active Archive System must be able to reach this destination, otherwise configuration of the system fails.

Example:

```
Enter an NTP server (IP or FQDN): 192.168.1.1
```

6. When prompted to **configure notification**, type `Yes`, or press `Enter`.

Refer to the Pre-Bringup Checklist on page 44 for your predetermined settings.

```
Currently configuring notification. Proceed? [Default: Yes]: Yes
```

a) Type the IP address or FQDN of your SMTP server.

> **Warning:** The Active Archive System must be able to reach this destination, otherwise configuration of the system fails.

Example:

```
Enter an SMTP server (IP or FQDN): 192.168.1.1
```

b) (Optional) Type a username and password for your SMTP server.

Example:

```
Would you like to specify an username / password for your SMTP server [Default:
 Yes]: Yes
Enter the username for the SMTP server: my_smtp_admin_username
Enter the password for the SMTP server: my_smtp_admin_password
Re-enter password (for verification): my_smtp_admin_password
```

c) Type the email address for the SMTP administrator.

Example:

```
Enter the administrator email
 address: my_smtp_admin_username@my_domain_name.com
```

d) When prompted to enable or disable the sending of a test email, type `Yes` or press `Enter` to accept the default (`No`).

Warning: Type `No`, unless you have an SMTP server set up already. Otherwise, the Active Archive System will have a failed job.

```
Would you like to send a test email after applying all settings [Default: Yes]:
```

e) When prompted to configure SNMP traps, type `Yes` or press `Enter` to accept the default (`No`).

```
Would you like to configure SNMP traps [Default: No]:
```

a.

Warning: The Active Archive System must be able to reach this destination, otherwise system configuration fails.

Example:

```
Enter an SNMP server (IP or FQDN): 192.168.1.1
```

b. Type the port number used by the destination SNMP trap server.

Example:

```
Enter an SNMP server (IP or FQDN): 3333
```

c. Type the community string.

Example:

```
Enter the community string: HGST-HT
```

d. Enable or disable the sending of a test SNMP trap.

Example:

```
Would you like to send a test SNMP trap after applying all settings [Default:
 Yes]: No
```

e. Enable or disable polling for statistics from this environment using SNMP.

Example:

```
Poll for statistics from this environment using SNMP [Default: No]: No
```

7. When prompted to **configure S3**, type `Yes`, or press `Enter`.

Refer to the Pre-Bringup Checklist on page 44 for your predetermined settings.

```
Currently configuring S3. Proceed? [Default: Yes]: Yes
```

a) Type your S3 domain name.

Example:

```
Enter the S3 domain name: s3.my_domain_name.com
```

b) Enable or disable the creation of S3 buckets by your users.

Type `Yes` or press `Enter` to accept the default (`No`).

Warning: The Active Archive System supports 100 buckets per user. Within each bucket, the Active Archive System supports an unlimited number of objects.

8. When prompted to **configure networking**, type `Yes`, or press `Enter`.

Refer to the Pre-Bringup Checklist on page 44 for your predetermined settings.

```
Currently configuring networking. Proceed? [Default: Yes]: Yes
```

Public Network #1

a) Type the name for public network #1, or press `Enter` to accept the default (`DC01 Public1_lan`).

```
Enter a name for public network 'DC01 Public1_lan' [Default: DC01 Public1_lan]:
```

b) Type the network address for public network #1.

```
Enter the network address for 'DC01 Public1_lan' [Default: 192.168.1.0]:
```

c) Type the subnet mask for public network #1.

```
Enter the subnet mask for 'DC01 Public1_lan' [Default: 255.255.255.0]:
```

d) Type the starting IP address for public network #1.

```
Enter the start IP for 'DC01 Public1_lan' [Default: 192.168.1.11]:
```

e) Type the ending IP address for public network #1.

```
Enter the end IP for 'DC01 Public1_lan' [Default: 192.168.1.100]:
```

f) Type the IP address of the gateway for public network #1.

Warning: Only enter a value for Gateway once, on the primary network (public network #1); for secondary networks, press `Enter`.

```
Would you like to specify a gateway for 'DC01 Public1_lan' [Default: No]: Yes
Enter the IP of the default gateway for 'DC01 Public1_lan' [Default: 192.168.1.1]:
```

g) Type the IP address of the DNS for public network #1.

```
Would you like to specify a DNS server for 'DC01 Public1_lan' [Default: No]: Yes
Enter the IP of the DNS server for 'DC01 Public1_lan' (comma separated) [Default:
 8.8.8.8]:
```

h) Type the public IP address to be used for Controller Node 01.

```
Enter IP for machine 'HGST-DC01-R01-CN01' within this network
 [Default: 192.168.1.11]:
```

i) Type the virtual IP address to be used for the Management Node.

Warning: For the virtual IP address, never specify an IP address already in use; if you do so, the configuration wizard eventually fails, and you must reconfigure this network from the Q-Shell.

```
Enter IP for machine 'HGST-DC01-R01-CN01' within this network (Virtual)
 [Default: 192.168.1.100]:
```

j) Type the public IP address to be used for Controller Node 02.

```
Enter IP for machine 'HGST-DC01-R01-CN02' within this network
 [Default: 192.168.1.12]:
```

k) Type the public IP address to be used for Controller Node 03.

```
Enter IP for machine 'HGST-DC01-R01-CN03' within this network
 [Default: 192.168.1.13]:
```

Public Network #2

a) Type the name for public network #2, or press `Enter` to accept the default (`DC01 Public2_lan`).

```
Enter a name for public network 'DC01 Public2_lan' [Default: DC01 Public2_lan]:
```

b) Type the network address for public network #2.

```
Enter the network address for 'DC01 Public2_lan' [Default: 192.168.2.0]:
```

c) Type the subnet mask for public network #2.

```
Enter the subnet mask for 'DC01 Public2_lan' [Default: 255.255.255.0]:
```

d) Type the starting IP address for public network #2.

```
Enter the start IP for 'DC01 Public2_lan' [Default: 192.168.2.11]:
```

e) Type the ending IP address for public network #2.

```
Enter the end IP for 'DC01 Public2_lan' [Default: 192.168.2.100]:
```

f) Do not enter an additional gateway IP address if you already entered one on the primary network (public network #1).

```
Would you like to specify a gateway for 'DC01 Public2_lan' [Default: No]:
```

g) Do not enter an additional DNS IP address if you already entered one on the primary network (public network #1).

```
Would you like to specify a DNS server for 'DC01 Public2_lan' [Default: No]:
```

h) Type the public IP address to be used for Controller Node 01.

```
Enter IP for machine 'HGST-DC01-R01-CN01' within this network
 [Default: 192.168.2.11]:
```

i) Type the virtual IP address to be used for the Management Node.

Warning: Never specify the same IP address as the one you used for Controller Nodes 01, 02, or 03; if you do so, the configuration wizard eventually fails, and you must reconfigure this network from the Q-Shell.

```
Enter IP for machine 'HGST-DC01-R01-CN01' within this network (Virtual)
 [Default: 192.168.2.100]:
```

j) Type the public IP address to be used for Controller Node 02.

```
Enter IP for machine 'HGST-DC01-R01-CN02' within this network
 [Default: 192.168.2.12]:
```

k) Type the public IP address to be used for Controller Node 03.

```
Enter IP for machine 'HGST-DC01-R01-CN03' within this network
 [Default: 192.168.2.13]:
```

9. When prompted to apply these changes, type `Yes` or press `Enter`.

Note: It takes 5-10 minutes to apply the settings.

```
Do you want to apply these changes [Default: Yes]:
Applying settings...
* Security... done
* Location... done
* Notification... done
```

```
* S3... done
* Networking... done
```

If the configuration wizard succeeds, the OSMI menu appears.

```
All changes applied successfully.
...
Object Store Management Interface

        1) Environment
        2) Policies and Namespaces
        3) Machines and services
        4) Users and permissions
        5) Events and logging
        0) Exit

Please make a selection >>
```

If the configuration wizard fails, see Troubleshooting Installation Issues on page 57.

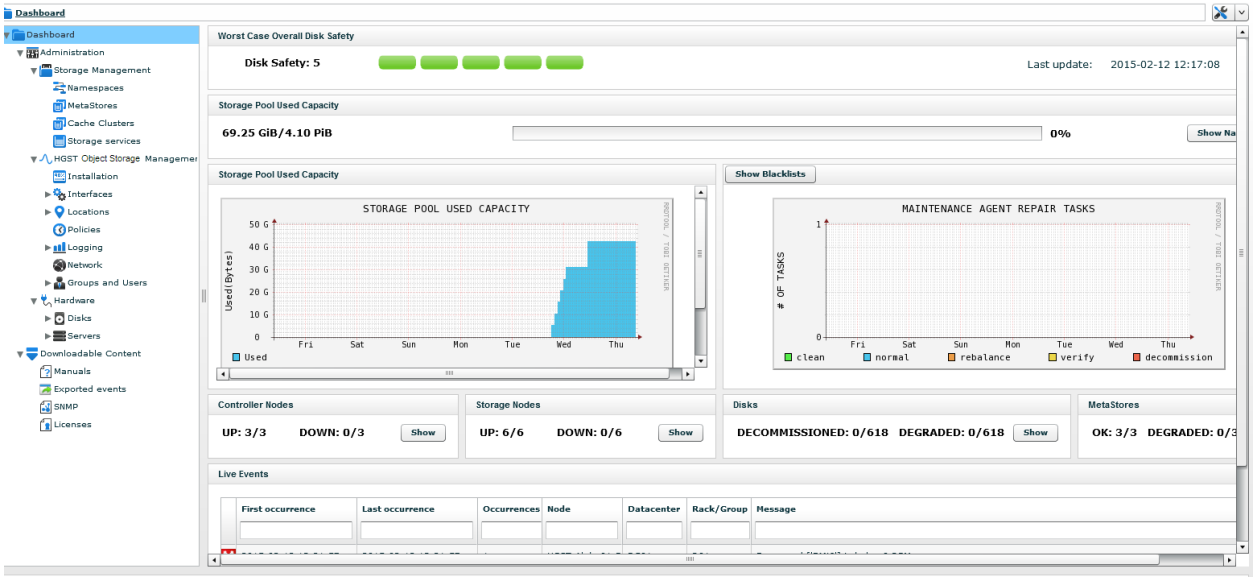
11.5 Verifying System Status

Verify the status of the Active Archive System as follows.

1. Install Adobe Flash Player 13.0.0.214 or lower on the computer you wish to use to connect to the CMC.
2. Connect your laptop to the same network as the network you just configured for the Active Archive System.
3. Use a web browser to navigate to `http://ManagementNodeVirtualIPAddress/flash/CMC/cmc.swf`.
4. Log into the CMC using the username and password you specified in the configuration wizard.
   The CMC dashboard is displayed in your web browser.
5. Verify that the CMC dashboard indicates that the system status is good:
   - **Disk Safety** is **5**
   - **Storage Pool Used Capacity** is **0%**
   - **Controller Nodes** indicate **UP: 3/3**
   - **Storage Nodes** indicate **UP: 6/6**
   - **MetaStores** indicate **OK: 3/3**
   - **Disks** displays the correct number for your rack (shown below), and none are degraded or decommissioned:
     - Active Archive System - Standard (SA-7000): 618 drives
   - No status indicator is red

The CMC dashboard for a one-rack installation looks similar to the image below.

Figure 21: CMC Dashboard After Initial Bring-Up



This completes the installation of the Active Archive System.

11.6 Re-Running the Configuration Wizard

To re-run the configuration wizard, do the following.

1. Open an SSH session to the Management Node using the IP address you assigned to the Management Node, (or its default IP address, `192.168.107.1`, if the configuration wizard failed the first time it was run).
   The login prompt appears.
2. Start the configuration wizard.

   ```
   /opt/qbase3/bin/python /opt/qbase3/apps/configuration_wizard/configuration_wizard.py
   ```

3. Proceed through any section of the configuration wizard that you want to change, and when prompted to save changes, type `Yes`.

12 Next Steps

Topics:

After the initial system bringup, here are the next steps for your storage administrator.

12.1 Post Installation Tasks

1. Add S3 users. For instructions, see *Managing Storage* in the *HGST Active Archive System Administration Guide*.
2. Connect an S3 client to the Active Archive System. For instructions, see *Managing Storage* in the *HGST Active Archive System Administration Guide*.
3. Create S3 buckets. For instructions, see *Managing Storage* in the *HGST Active Archive System Administration Guide*.
4. Integrate your S3 application with the Active Archive System. For information on the Active Archive System S3 implementation, see the *HGST Active Archive System API Guide*.
5. Set up metering. For instructions, see *Managing Storage* in the *HGST Active Archive System Administration Guide*.

A Troubleshooting Installation Issues

Topics:

This section provides tips for issues you might encounter during system installation and first bringup. For more troubleshooting tips, see the *HGST Active Archive System Troubleshooting Guide*.

A.1 Configuration Wizard

Problem	Recommended Action
The configuration wizard did not run; you ended up in the OSMI menu instead.	Check for the two most probable causes: • You are connected to a node that is not the Management Node. 1. Connect your laptop to the Management Node. 2. Re-run the configuration wizard. • There was an error in the configuration wizard. Re-run the configuration wizard by following the instructions in the *HGST Active Archive System Installation Guide*.
You want to restart the wizard in order to redo a section.	Press `Ctrl+c` to start any section of the configuration wizard over again.
The configuration wizard failed to save changes.	Check the log file, `/mnt/sandboxtmp/logging/configuration_wizard_`*`date`*`.log`, for details.
The configuration wizard returns an "authentication error."	If you re-run the configuration wizard but do not re-enter the username and password for the `admin` and `root` accounts, it does not save your changes. Re-enter your credentials each time you run the script.
The configuration wizard failed to configure networking.	If the configuration wizard displayed an error such as: `* Networking... Could not apply changes for section networking, check logs.` `...` `Exception: IP address '172.16.1.1' already exists` you have specified an IP address, already in use, for the Management Node virtual IP address. You must now manually configure your networks through the Q-Shell. For more information, contact HGST support.
The configuration wizard failed when initializing the network, with 502 proxy error.	The configuration wizard may fail with the signature `502 Proxy Error` while applying network changes. A condition could exist that causes all cloudAPI calls to timeout. Verify the problem exists with the following code before proceeding to the workaround. (Set machine_name to the hostname of the Management Node): `api = i.config.cloudApiConnection.find('main')` `machine_name = 'HGST-S3-DC01-R01-CN01'` `mguid = api.machine.find(name=machine_name)['result'][0]` `api.machine.get_ports_in_use(mguid, 22, 23)` If the problem exists, the code above fails with a timeout message. For example, `In [21]: api = i.config.cloudApiConnection.find('main')` `In [22]: machine_name = 'HGST-S3-DC01-R01-CN01'`

Problem	Recommended Action
	In [23]: mguid = api.machine.find(name=machine_name)['result'][0] In [24]: api.machine.get_ports_in_use(mguid, 22, 23) ***ERRORTRACEBACK*** Traceback (most recent call last): ~ File "/opt/qbase3/lib/python2.6/site-packages/IPython/iplib.py", line 2257, in runcode exec code_obj in self.user_global_ns, self.user_ns ~ File "<ipython console>", line 1, in <module> ~ File "/opt/qbase3/lib/pymonkey/extensions/cloud_api_client/client_machine.py", line 2068, in get_ports_in_use raise CloudApiException(ex) ~ CloudApiException: <Fault 8002: 'Exception: workflowengine.Exceptions.TimeOutException Message: Script '/opt/qbase3/apps/workflowengine/tasklets/actor/pmachine/get_ports_in_use/scripts/check_ports.rscript' on agent 'a1111111-30f7-4b99-a478-853a11583d99' for job 'a2e8154c-6b7f-47cf-b33b-979afd5b1efa' timed out. Script took longer than 60 seconds. Stacktrace: Traceback (most recent call last): File "/opt/qbase3/lib/python/site-packages/workflowengine/WFLAgentController.py", line 125, in __execute self.__agentController.killScript(agentguid, jobguid, 10) File "/opt/qbase3/lib/python/site-packages/workflowengine/AgentController.py", line 128, in killScript return self.__waitForScript(agentguid, jobguid, timeout) File "/opt/qbase3/lib/python/site-packages/workflowengine/AgentController.py", line 148, in __waitForScript self.__jobQueue.waitForJobToFinish(jobguid, timeout) File "/opt/qbase3/lib/python/site-packages/workflowengine/AgentController.py", line 260, in waitForJobToFinish raise TimeOutException(jobguid=jobguid, agentguid=job.agentguid, scriptpath=job.scriptpath, timeout=timeout) TimeOutException: Script '/opt/qbase3/apps/workflowengine/tasklets/actor/pmachine/get_ports_in_use/scripts/check_ports.rscript' on agent 'a1111111-30f7-4b99-a478-853a11583d99' for job 'a2e8154c-6b7f-47cf-b33b-979afd5b1efa' timed out. Script took longer than 10 seconds. '> ******************** ***ERROR*** <class 'cloud_api_client.Exceptions.CloudApiException'> <class 'cloud_api_client.Exceptions.CloudApiException'> <Fault 8002: 'Exception: workflowengine.Exceptions.TimeOutException Message: Script '/opt/qbase3/apps/workflowengine/tasklets/actor/pmachine/get_ports_in_use/scripts/check_ports.rscript' on agent 'a1111111-30f7-4b99-a478-853a11583d99' for job 'a2e8154c-6b7f-47cf-b33b-979afd5b1efa' timed out. Script took longer than 60 seconds. Stacktrace: Traceback (most recent call last): File "/opt/qbase3/lib/python/site-packages/workflowengine/WFLAgentController.py", line 125, in __execute self.__agentController.killScript(agentguid, jobguid, 10) File "/opt/qbase3/lib/python/site-packages/workflowengine/AgentController.py", line 128, in killScript return self.__waitForScript(agentguid, jobguid, timeout) File "/opt/qbase3/lib/python/site-packages/workflowengine/AgentController.py", line 148, in __waitForScript self.__jobQueue.waitForJobToFinish(jobguid, timeout) File "/opt/qbase3/lib/python/site-packages/workflowengine/AgentController.py", line 260, in waitForJobToFinish

Problem	Recommended Action

```
     raise TimeOutException(jobguid=jobguid, agentguid=job.agentguid,
 scriptpath=job.scriptpath, timeout=timeout)
 TimeOutException: Script
 '/opt/qbase3/apps/workflowengine/tasklets/actor/pmachine/get_ports_in_use/
scripts/check_ports.rscript' on agent
 'a1111111-30f7-4b99-a478-853a11583d99' for job 'a2e8154c-6b7f-47cf-
b33b-979afd5b1efa' timed out. Script took longer
 than 10 seconds.

 '> <traceback object at 0x2a5a878>

 Detailed logs, stacktrace & locals can be found at /opt/qbase3/var/log/
errors/qshell/backtrace_01_Jun_2015_21_11_58.log

ERROR HAPPENED, do you want the application to stop or continue (s=stop)
(t=getTrace):
```

Workaround

1. Open an SSH session to the Management Node, and exit the OSMI menu.
2. At the Linux prompt, start the Q-Shell:

```
/opt/qbase3/qshell
```

3. Run the following Q-Shell commands to restart the application server and Apache on the Management Node. This clears the error condition.

```
q.manage.applicationserver.restart() ; q.manage.apache.restart()
```

4. Run the following command and analyze the output to check that each system has the correct number of IP addresses.

```
api  = i.config.cloudApiConnection.find('main')
for mguid in api.machine.find(machinerole='CPUNODE')['result']:
    mobj = api.machine.getObject(mguid)
    mobj.name
    api.machine.listIpaddresses(mobj.guid)


## Example
In [2]: for mguid in api.machine.find(machinerole='CPUNODE')
['result']:
   ....:     mobj = api.machine.getObject(mguid)
   ....:     mobj.name
   ....:     api.machine.listIpaddresses(mobj.guid)
   ....:
   ....:
Out[2]: 'HGST-S3-DC01-R01-CN03'
Out[2]:
{'jobguid': None,
 'result': [{'address': '172.16.101.3',
             'description': 'PM-90:E2:BA:7C:35:29',
             'ipaddressguid':
 '3a1e5a71-52f2-4978-80f3-4d341ae8fb8e',
             'languid': '144b381f-ec6f-4468-acd8-0677067fa951',
             'machineguid':
 '5a6f035c-6149-4c2f-869c-73fa34aa0ad8',
             'machinename': 'HGST-S3-DC01-R01-CN03',
             'publicflag': 'f',
             'virtual': 'f'},
            {'address': '192.168.78.13',
             'description': 'PM-90:E2:BA:7C:35:29',
```

Problem	Recommended Action

```
                'ipaddressguid':
 'f73ffb7e-54d6-4428-81f2-06f2a3fdbd23',
                'languid': '11f81802-e922-4bd1-9e85-65e146757d6f',
                'machineguid':
 '5a6f035c-6149-4c2f-869c-73fa34aa0ad8',
                'machinename': 'HGST-S3-DC01-R01-CN03',
                'publicflag': 't',
                'virtual': 'f'},
               {'address': '172.16.1.3',
                'description': 'PM-90:E2:BA:7C:35:29',
                'ipaddressguid': '1af35bd3-a7bc-45a1-b266-
ed77c75c529d',
                'languid': '61a39965-25cd-4a08-8324-1b8855f09722',
                'machineguid':
 '5a6f035c-6149-4c2f-869c-73fa34aa0ad8',
                'machinename': 'HGST-S3-DC01-R01-CN03',
                'publicflag': 'f',
                'virtual': 'f'},
               {'address': '192.168.14.13',
                'description': 'PM-90:E2:BA:7C:35:29',
                'ipaddressguid':
 '1e5ce796-8e5e-494c-933c-1821826efa82',
                'languid': '1d4970b5-700c-4855-bdcc-716a6a1faea2',
                'machineguid':
 '5a6f035c-6149-4c2f-869c-73fa34aa0ad8',
                'machinename': 'HGST-S3-DC01-R01-CN03',
                'publicflag': 't',
                'virtual': 'f'}]}
Out[2]: 'HGST-S3-DC01-R01-CN01'
Out[2]:
{'jobguid': None,
 'result': [{'address': '172.16.101.1',
                'description': 'CPU node 1',
                'ipaddressguid': 'eeef3d02-a215-4657-
ba87-84dba17f2d71',
                'languid': '144b381f-ec6f-4468-acd8-0677067fa951',
                'machineguid': '411f22e3-2e04-431b-
adc7-2a952d2cadc6',
                'machinename': 'HGST-S3-DC01-R01-CN01',
                'publicflag': 'f',
                'virtual': 'f'},
               {'address': '172.16.127.254',
                'description': 'CPU node 1',
                'ipaddressguid': 'c26610fa-
b96d-405c-844f-35f95e03a563',
                'languid': '144b381f-ec6f-4468-acd8-0677067fa951',
                'machineguid': '411f22e3-2e04-431b-
adc7-2a952d2cadc6',
                'machinename': 'HGST-S3-DC01-R01-CN01',
                'publicflag': 'f',
                'virtual': 't'},
               {'address': '192.168.78.11',
                'description': 'CPU node 1',
                'ipaddressguid':
 '2c77ffee-49cf-4845-9f36-99f16b7c831a',
                'languid': '11f81802-e922-4bd1-9e85-65e146757d6f',
                'machineguid': '411f22e3-2e04-431b-
adc7-2a952d2cadc6',
                'machinename': 'HGST-S3-DC01-R01-CN01',
                'publicflag': 't',
```

Problem	Recommended Action

```
                'virtual': 'f'},
               {'address': '192.168.78.254',
                'description': 'CPU node 1',
                'ipaddressguid': '0fbcdbf3-e76e-4dae-9f26-
dd8a1f05510c',
                'languid': '11f81802-e922-4bd1-9e85-65e146757d6f',
                'machineguid': '411f22e3-2e04-431b-
adc7-2a952d2cadc6',
                'machinename': 'HGST-S3-DC01-R01-CN01',
                'publicflag': 't',
                'virtual': 't'},
               {'address': '172.16.1.1',
                'description': 'CPU node 1',
                'ipaddressguid': 'd27d581f-6a4c-4664-
aafd-749706b10efe',
                'languid': '61a39965-25cd-4a08-8324-1b8855f09722',
                'machineguid': '411f22e3-2e04-431b-
adc7-2a952d2cadc6',
                'machinename': 'HGST-S3-DC01-R01-CN01',
                'publicflag': 'f',
                'virtual': 'f'},
               {'address': '172.16.63.154',
                'description': 'CPU node 1',
                'ipaddressguid':
 '6f0d0078-1766-4be0-929f-98c26398862b',
                'languid': '61a39965-25cd-4a08-8324-1b8855f09722',
                'machineguid': '411f22e3-2e04-431b-
adc7-2a952d2cadc6',
                'machinename': 'HGST-S3-DC01-R01-CN01',
                'publicflag': 'f',
                'virtual': 't'},
               {'address': '192.168.14.11',
                'description': 'CPU node 1',
                'ipaddressguid': 'd2ad469c-29be-4b78-9be2-
f8edf59a9f57',
                'languid': '1d4970b5-700c-4855-bdcc-716a6a1faea2',
                'machineguid': '411f22e3-2e04-431b-
adc7-2a952d2cadc6',
                'machinename': 'HGST-S3-DC01-R01-CN01',
                'publicflag': 't',
                'virtual': 'f'},
               {'address': '192.168.14.254',
                'description': 'CPU node 1',
                'ipaddressguid': 'e9180cbe-bfd6-44e3-
b2e6-138ab93b1392',
                'languid': '1d4970b5-700c-4855-bdcc-716a6a1faea2',
                'machineguid': '411f22e3-2e04-431b-
adc7-2a952d2cadc6',
                'machinename': 'HGST-S3-DC01-R01-CN01',
                'publicflag': 't',
                'virtual': 't'}]}
Out[2]: 'HGST-S3-DC01-R01-CN02'
Out[2]:
{'jobguid': None,
 'result': [{'address': '172.16.101.2',
                'description': 'PM-90:E2:BA:7C:42:8D',
                'ipaddressguid': 'c347ddd0-2334-4995-
a532-8e927b8f66c7',
                'languid': '144b381f-ec6f-4468-acd8-0677067fa951',
```

Problem	Recommended Action

```
             'machineguid': '564ae355-f516-4f6e-
b41b-3d7959ecb7f5',
             'machinename': 'HGST-S3-DC01-R01-CN02',
             'publicflag': 'f',
             'virtual': 'f'},
            {'address': '192.168.78.12',
             'description': 'PM-90:E2:BA:7C:42:8D',
             'ipaddressguid': '352e3950-43b5-4b13-
bd88-3db98349a739',
             'languid': '11f81802-e922-4bd1-9e85-65e146757d6f',
             'machineguid': '564ae355-f516-4f6e-
b41b-3d7959ecb7f5',
             'machinename': 'HGST-S3-DC01-R01-CN02',
             'publicflag': 't',
             'virtual': 'f'},
            {'address': '172.16.1.2',
             'description': 'PM-90:E2:BA:7C:42:8D',
             'ipaddressguid': '82c0b044-
e54e-4342-84ac-95493adb5f31',
             'languid': '61a39965-25cd-4a08-8324-1b8855f09722',
             'machineguid': '564ae355-f516-4f6e-
b41b-3d7959ecb7f5',
             'machinename': 'HGST-S3-DC01-R01-CN02',
             'publicflag': 'f',
             'virtual': 'f'},
            {'address': '192.168.14.12',
             'description': 'PM-90:E2:BA:7C:42:8D',
             'ipaddressguid': 'a91ce749-ca37-49b1-9157-
e32874a9c1ba',
             'languid': '1d4970b5-700c-4855-bdcc-716a6a1faea2',
             'machineguid': '564ae355-f516-4f6e-
b41b-3d7959ecb7f5',
             'machinename': 'HGST-S3-DC01-R01-CN02',
             'publicflag': 't',
             'virtual': 'f'}]}
```

5. If there are missing IP addresses, run the following commands to add them back. (Set the values of `machine_name`, `new_ip`, `mac`, `lan_name`, and `virtual` as needed. The parameter `virtual` must be either `True` or `False` and is case sensitive):

```
api  = i.config.cloudApiConnection.find('main')

# Variables
machine_name = 'HGST-S3-DC01-R01-CN03'
new_ip = '192.168.2.13'
mac = '90:e2:ba:7d:97:94'
lan_name = 'Public2'
virtual = False

# Apply the details
lan_guid = api.lan.find(name=lan_name)['result'][0]
mguid = api.machine.find(name=machine_name)['result'][0]
mac = mac.upper()

api.ipaddress.create(name=new_ip, iptype='STATIC',
 ipversion='IPV4', languid=lan_guid, \
address=new_ip, virtual=virtual, executionparams={'description':
 'Creating IP address %s' % new_ip})
api.machine.addIpaddress(machineguid=mguid, macaddress=mac,
 languid=lan_guid, \
ipaddress=new_ip, initialize_network=False, \
```

Problem	Recommended Action
	`` executionparams={'description': 'Adding IP address %s to machine %s' % (new_ip, mguid)}) ``` **6.** Rerun the configuration wizard as normal.

B Collecting Telemetry

Topics:

B.1 About Telemetry Collection

The telemetry collection feature is installed on all nodes. It runs *telemetry collection agents* on all Controller and Storage Nodes. The *telemetry collection master*, running on the Management Node, aggregates telemetry from the telemetry collection agents, including the agent running on the Management Node, encrypts the data using asymmetric keys, and forwards it to an HGST destination every 24 hours, at 3:00 a.m., using SSL for transport.

What is Collected

The data collected includes:

- Storage Enclosure Basic metrics
- System level information:
  - Rack serial number
  - Hardware inventory data
  - Time series data for system metrics
- IPMI data
- Object storage metrics
- Telemetry agent configuration
- Log file (`/var/log/hawk/callhome.log`)

Where Data is Temporarily Stored

The telemetry collection master stores data from each telemetry collection agent in separate directories, named

`/mnt/hawk/callhome_data/`*`date`*`/`*`node_MAC_address`*`/`. In the HGST destination, the data is stored in separate *`date`*`/`*`node_MAC_address`*`/` directories.

How Long Data is Retained

All collected data is kept on all telemetry collection agents in `/mnt/hawk/callhome_data` for 7 days.

How Failovers are Handled

If a node is down when a telemetry collection agent is supposed to run:

- No data is collected for that node, and no directory for that node is created in the dated directory in the HGST destination.
- The telemetry collection master starts a disaster recovery script on all nodes.

If the Management Node goes down, the Active Archive System automatically initiates a failover to another Controller Node newly designated as the Management Node, and the telemetry collection master fails over to the new Management Node also. Since the virtual IP address for the Management Node stays the same after a failover, and all other nodes use this virtual IP address, nothing else changes.

B.2 Displaying Telemetry Collection Categories

To see what categories of data are collected, run the following command from the Linux prompt of the Management Node:

```
/mnt/hawk/callhome/callhome.py --list-metrics category
```

The `callhome.py` command has the following options:

Option	Description
`--list-metrics`	Display the categories of metrics collected. Valid values are: • `all`: display all categories of metrics collected. • `IPMI`: display categories of metrics collected from the Intelligent Platform Management Interface. • `LSHW`: display categories of metrics collected from the Hardware Lister. • `AD`: display categories of metrics collected from Active Archive System logs. • `COLLECTL`: display categories of metrics collected from server component performance statistics. • `JBOD`: display categories of metrics collected from Storage Enclosure Basic status and inventory data. If a value is omitted for this option, the category headings are displayed.

1. Log into the Management Node using SSH.
   The OSMI menu appears.
2. Exit the OSMI menu.
   The Linux prompt appears.
3. Run the `callhome.py` script:

   ```
   /mnt/hawk/callhome/callhome.py --list-metrics category
   ```

   For example:

   ```
   /mnt/hawk/callhome/callhome.py --list-metrics
   ['IPMI','LSHW','AD','COLLECTL','JBOD']
   ```

   ```
   /mnt/hawk/callhome/callhome.py --list-metrics all
   [IPMI]
   Temperature (CPU PCH System Peripheral VcpuVRM VmemABVRM VmemCDVRM) FAN
    status Power status
   Chassis status Disk status Memory status Network status
   [LSHW]
   System Bus Memory Processor Bridge Network Storage Disk Volume Input
    CommunicationDisplay Power
   [AD]
   {'Event Logs': 'Put events Get events',
   'Storage Nodes': 'Agents Daemons Network Partitions System',
   'Controller Nodes': 'Client Daemons MetaStore'}
   [COLLECTL]
   {'Network': 'RxPkt TxPkt RxKB TxKB RxErr RxDrp RxFifo RxFra RxCmp RxMlt
    TxErr TxDrp
   TxFifo TxColl TxCar TxCmp RxErrs TxErrs',
   'Disk': 'Name Reads RMerge RKBytes Writes WMerge WRBytes Request QueLen Wait
    SvcTim Util',
   ```

```
'NFS': 'ReadsS WritesS MetaS CommitS Udp Tcp TcpConn BadAuth BadClient
 ReadsC WritesC MetaC
CommitC Retrans AuthRef',
'CPU': 'Sys User Nice Wait IRQ Soft Steal Idle Totl Intrpt Intrpt/sec Ctx/
sec Proc/sec
ProcQue ProcRun L-Avg1 L-Avg5 L-Avg15',
'Memory': 'Tot Used Free Shared Buf Cached Slab Map Commit SwapTot SwapUsed
 SwapFree SwapIn
SwapOut Dirty Clean Laundry Inactive PageIn PageOut PageFaults PageMajFaults
 HugeTotal
HugeFre HugeRsvd SUnreclaim'}
[JBOD]
Vendor ID Product ID Product revision level Unit serial number Tick counter
 Monitor loop
counter Monitor loop recent latencey Monitor loop maximum latency Offline
 state reason mask
Power state PSU A AC failure counter PSU B AC failure counter PHY reset -
 last ID
PHY reset - event count BIST failure - event count Enclosure status
 Temperature sensors
Voltage sensors Current sensors
```

```
/mnt/hawk/callhome/callhome.py --list-metrics IPMI
Temperature (CPU PCH System Peripheral VcpuVRM VmemABVRM VmemCDVRM) FAN
 status
Power status Chassis status Disk status Memory status Network status
```

```
/mnt/hawk/callhome/callhome.py --list-metrics JBOD
Vendor ID Product ID Product revision level Unit serial number Tick counter
 Monitor loop
counter Monitor loop recent latencey Monitor loop maximum latency Offline
 state reason mask
Power state PSU A AC failure counter PSU B AC failure counter PHY reset -
 last ID
PHY reset - event count BIST failure - event count Enclosure status
 Temperature sensors
Voltage sensors Current sensors
```

```
/mnt/hawk/callhome/callhome.py --list-metrics AD
{'Event Logs': 'Put events Get events',
'Storage Nodes': 'Agents Daemons Network Partitions System',
'Controller Nodes': 'Client Daemons MetaStore'}
```

```
/mnt/hawk/callhome/callhome.py --list-metrics COLLECTL

{'Network': 'RxPkt TxPkt RxKB TxKB RxErr RxDrp RxFifo RxFra RxCmp RxMlt
 TxErr TxDrp
TxFifo TxColl TxCar TxCmp RxErrs TxErrs',
'Disk': 'Name Reads RMerge RKBytes Writes WMerge WRBytes Request QueLen Wait
 SvcTim Util',
'NFS': 'ReadsS WritesS MetaS CommitS Udp Tcp TcpConn BadAuth BadClient
 ReadsC WritesC MetaC
CommitC Retrans AuthRef',
'CPU': 'Sys User Nice Wait IRQ Soft Steal Idle Totl Intrpt Intrpt/sec Ctx/
sec Proc/sec
ProcQue ProcRun L-Avg1 L-Avg5 L-Avg15',
'Memory': 'Tot Used Free Shared Buf Cached Slab Map Commit SwapTot SwapUsed
 SwapFree SwapIn
```

```
SwapOut Dirty Clean Laundry Inactive PageIn PageOut PageFaults PageMajFaults
 HugeTotal
HugeFre HugeRsvd SUnreclaim'}
```

```
/mnt/hawk/callhome/callhome.py --list-metrics LSHW
System Bus Memory Processor Bridge Network Storage Disk Volume Input
 CommunicationDisplay Power
```

C Countries and Time Zones

Topics:

C.1 Countries

Afghanistan	Gabon	Norfolk Island
Albania	Gambia	North
Algeria	Georgia	Norway
American Samoa	Germany	Oman
Andorra	Ghana	Palau
Angola	Gibraltar	Panama
Anguilla	Greece	Paragu
Antarctica	Greenland	Peru
Antigua and Barbuda	Grenada	Philippines
Argentina	Guadeloupe	Pitcairn Islands
Armenia	Guam	Portugal
Aruba	Guatemala	Puerto
Australia	Guernsey	Qatar
Austria	Guinea	Romania
Azerbaijan	Guinea-Bissau	Russian Federation
Bahamas	Guyana	Rwanda
Bahrain	Haiti	Saint Helena
Bangladesh	Heard Island and McDonald	Saint Kitts and Nevis
Barbados	Islands	Saint Martin
Belarus	Holy See	Saint Vincen
Belgium	Honduras	Samoa
Belize	Hong Kong	San Marino
Benin	Hungary	Sao Tome and Principe
Bermuda	Iceland	Senegal
Bhutan	India	Serbia
Bolivia	Indonesia	Seychelles
Bosnia and Herzegovina	Iran	Sierra Leone
Botswana	Iraq	Singapore
Bouvet Island	Ireland	Slovenia
Brazil	Isle of Man	Solomon Islands
British Indian Ocean	Israel	South Africa
Territory	Italy	South Georgia and the So
British Virgin Islands	Jamaica	Spain
Brunei Darussalam	Japan	Sudan
Bulgaria	Jersey	Suriname
Burkina Faso	Jordan	Svalbard & Jan Mayen
Burundi	Kazakhstan	Islands
Cambodia	Kenya	Swaziland
Cameroon	Kiribati	Sweden
Canada	Korea	Switzerland
Cape Verde	Kuwait	Syrian Arab Republic
Cayman Islands	Lao Peoples Democratic	Taiwan
Central African Republic	Republic"	Tajikistan
Chad	Latvia	Tanzania
Chile	Lesotho	Thailand
China	Liberia	The Netherlands
Christmas Island	Liechtenstein	Timor-Leste
Cocos (Keeling) Islands	Lithuania	To
Colombia	Luxembourg	Togo
Comoros	Macedonia	Tokelau
Congo	Madagascar	Trinidad and Tobago
Cook Islands	Malaysia	Tunisia
Costa Rica	Maldives	Turkey

Cote dIvoire"	Malta	Turkmenistan
Croatia	Marshall Islands	Tuvalu
Cuba	Martinique	Ukraine
Cyprus	Mau	United Arab Emirates
Czech Republic	Mauritius	United Kingdom
Denmark	Mayotte	United States Minor Outlyin
Djibouti	Mexico	United States Virgin I
Dominica	Moldova	United States of America
Dominican Republic	Monaco	Uruguay
Ecuador	Mongol	Uzbekistan
Egypt	Montenegro	Venezuela
El Salvador	Montser	Vietnam
Equatorial Guinea	Morocco	Wallis and Futuna
Eritrea	Mozambique	Yemen
Estonia	Myanmar	Zambia
Ethiopia	Nauru	Zimbabwe
Falkland Islands	Ne	
Faroe Islands	Netherlands Antilles	
Fiji	New Caledonia	
Finland	Nicaragua	
France	Niger	
French Guiana	Nigeria	
French Polynesia	Niue	
French Southern Territories		

C.2 Time Zones

Africa/Abidjan	America/La_Paz	Asia/Rangoon
Africa/Accra	America/Lima	Asia/Riyadh
Africa/Addis_Ababa	America/Los_Angeles	Asia/Sakhalin
Africa/Algiers	America/Maceio	Asia/Samarkand
Africa/Antananarivo	America/Managua	Asia/Seoul
Africa/Asmara	America/Manaus	Asia/Shanghai
Africa/Bamako	America/Marigot	Asia/Singapore
Africa/Bangui	America/Martinique	Asia/Taipei
Africa/Banjul	America/Mazatlan	Asia/Tashkent
Africa/Bissau	America/Menominee	Asia/Tbilisi
Africa/Blantyre	America/Merida	Asia/Tehran
Africa/Brazzaville	America/Mexico_City	Asia/Thimphu
Africa/Bujumbura	America/Miquelon	Asia/Tokyo
Africa/Cairo	America/Moncton	Asia/Ulaanbaatar
Africa/Cape_Verde	America/Monterrey	Asia/Urumqi
Africa/Casablanca	America/Montevideo	Asia/Vientiane
Africa/Ceuta	America/Montreal	Asia/Vladivostok
Africa/Comoro	America/Montserrat	Asia/Yakutsk
Africa/Conakry	America/Nassau	Asia/Yekaterinburg
Africa/Dakar	America/New_York	Asia/Yerevan
Africa/Dar_es_Salaam	America/Nipigon	Australia/Adelaide
Africa/Djibouti	America/Nome	Australia/Brisbane
Africa/Douala	America/Noronha	Australia/Broken_Hill
Africa/El_Aaiun	America/North_Dakota/Center	Australia/Currie
Africa/Freetown	America/North_Dakota/	Australia/Darwin
Africa/Gaborone	New_Salem	Australia/Eucla
Africa/Harare	America/Panama	Australia/Hobart
Africa/Johannesburg	America/Pangnirtung	Australia/Lindeman
Africa/Kampala	America/Paramaribo	Australia/Lord_Howe
Africa/Khartoum	America/Phoenix	Australia/Melbourne
Africa/Kigali	America/Port-au-Prince	Australia/Perth
Africa/Kinshasa	America/Port_of_Spain	Australia/Sydney
Africa/Lagos	America/Porto_Velho	Eruope/Stanley
Africa/Libreville	America/Puerto_Rico	Europe/Amsterdam
Africa/Lome	America/Rainy_River	Europe/Andorra
Africa/Luanda	America/Rankin_Inlet	Europe/Athens
Africa/Lubumbashi	America/Recife	Europe/Azores
Africa/Lusaka	America/Regina	Europe/Belgrade
Africa/Mahe	America/Resolute	Europe/Berlin

Africa/Malabo
Africa/Maputo
Africa/Maseru
Africa/Mauritius
Africa/Mayotte
Africa/Mbabane
Africa/Mogadishu
Africa/Monrovia
Africa/Nairobi
Africa/Ndjamena
Africa/Niamey
Africa/Nouakchott
Africa/Ouagadougou
Africa/Porto-Novo
Africa/Reunion
Africa/Sao_Tome
Africa/St_Helena
Africa/Tripoli
Africa/Tunis
Africa/Windhoek
America/Adak
America/Anchorage
America/Anguilla
America/Antigua
America/Araguaina
America/Argentina/
Buenos_Aires
America/Argentina/Catamarca
America/Argentina/Cordoba
America/Argentina/Jujuy
America/Argentina/La_Rioja
America/Argentina/Mendoza
America/Argentina/
Rio_Gallegos
America/Argentina/Salta
America/Argentina/San_Luis
America/Argentina/Tucuman
America/Argentina/Ushuaia
America/Aruba
America/Asuncion
America/Atikokan
America/Bahia
America/Barbados
America/Belem
America/Belize
America/Blanc-Sablon
America/Boa_Vista
America/Bogota
America/Boise
America/Cambridge_Bay
America/Campo_Grande
America/Cancun
America/Caracas
America/Cayenne
America/Cayman
America/Chicago
America/Chihuahua
America/Costa_Rica
America/Cuiaba
America/Curacao
America/Danmarkshavn
America/Dawson
America/Dawson_Creek
America/Denver
America/Detroit
America/Dominica
America/Edmonton
America/Eirunepe
America/El_Salvador
America/Fortaleza
America/Rio_Branco
America/Santarem
America/Santiago
America/Santo_Domingo
America/Sao_Paulo
America/Scoresbysund
America/Shiprock
America/St_Barthelemy
America/St_Johns
America/St_Kitts
America/St_Lucia
America/St_Thomas
America/St_Vincent
America/Swift_Current
America/Tegucigalpa
America/Thule
America/Thunder_Bay
America/Tijuana
America/Toronto
America/Tortola
America/Vancouver
America/Whitehorse
America/Winnipeg
America/Yakutat
America/Yellowknife
Antarctica/Casey
Antarctica/Davis
Antarctica/DumontDUrville
Antarctica/Kerguelen
Antarctica/Mawson
Antarctica/McMurdo
Antarctica/Palmer
Antarctica/Rothera
Antarctica/South_Pole
Antarctica/Syowa
Antartica/South_Georgia
Asia/Aden
Asia/Almaty
Asia/Amman
Asia/Anadyr
Asia/Aqtau
Asia/Aqtobe
Asia/Ashgabat
Asia/Baghdad
Asia/Bahrain
Asia/Baku
Asia/Bangkok
Asia/Beirut
Asia/Bishkek
Asia/Brunei
Asia/Chagos
Asia/Choibalsan
Asia/Chongqing
Asia/Christmas
Asia/Cocos
Asia/Colombo
Asia/Damascus
Asia/Dhaka
Asia/Dili
Asia/Dubai
Asia/Dushanbe
Asia/Gaza
Asia/Harbin
Asia/Ho_Chi_Minh
Asia/Hong_Kong
Asia/Hovd
Asia/Irkutsk
Asia/Jakarta
Asia/Jayapura
Asia/Jerusalem
Europe/Bermuda
Europe/Bratislava
Europe/Brussels
Europe/Bucharest
Europe/Budapest
Europe/Canary
Europe/Chisinau
Europe/Copenhagen
Europe/Dublin
Europe/Faroe
Europe/Gibraltar
Europe/Guernsey
Europe/Helsinki
Europe/Isle_of_Man
Europe/Istanbul
Europe/Jersey
Europe/Kaliningrad
Europe/Kiev
Europe/Lisbon
Europe/Ljubljana
Europe/London
Europe/Longyearbyen
Europe/Luxembourg
Europe/Madeira
Europe/Madrid
Europe/Malta
Europe/Mariehamn
Europe/Minsk
Europe/Monaco
Europe/Moscow
Europe/Oslo
Europe/Paris
Europe/Podgorica
Europe/Prague
Europe/Reykjavik
Europe/Riga
Europe/Rome
Europe/Samara
Europe/San_Marino
Europe/Sarajevo
Europe/Simferopol
Europe/Skopje
Europe/Sofia
Europe/Stockholm
Europe/Tallinn
Europe/Tirane
Europe/Uzhgorod
Europe/Vaduz
Europe/Vatican
Europe/Vienna
Europe/Vilnius
Europe/Volgograd
Europe/Warsaw
Europe/Zagreb
Europe/Zaporozhye
Europe/Zurich
Pacific/Apia
Pacific/Auckland
Pacific/Chatham
Pacific/Easter
Pacific/Efate
Pacific/Enderbury
Pacific/Fakaofo
Pacific/Fiji
Pacific/Funafuti
Pacific/Galapagos
Pacific/Gambier
Pacific/Guadalcanal
Pacific/Guam
Pacific/Honolulu

America/Glace_Bay
America/Godthab
America/Goose_Bay
America/Grand_Turk
America/Grenada
America/Guadeloupe
America/Guatemala
America/Guayaquil
America/Guyana
America/Halifax
America/Havana
America/Hermosillo
America/Indiana/
Indianapolis
America/Indiana/Knox
America/Indiana/Marengo
America/Indiana/Petersburg
America/Indiana/Tell_City
America/Indiana/Vevay
America/Indiana/Vincennes
America/Indiana/Winamac
America/Inuvik
America/Iqaluit
America/Jamaica
America/Juneau
America/Kentucky/Louisville
America/Kentucky/Monticello

Asia/Kabul
Asia/Kamchatka
Asia/Karachi
Asia/Kashgar
Asia/Katmandu
Asia/Kolkata
Asia/Krasnoyarsk
Asia/Kuala_Lumpur
Asia/Kuching
Asia/Kuwait
Asia/Macau
Asia/Magadan
Asia/Makassar
Asia/Maldives
Asia/Manila
Asia/Muscat
Asia/Nicosia
Asia/Novosibirsk
Asia/Omsk
Asia/Oral
Asia/Phnom_Penh
Asia/Pontianak
Asia/Pyongyang
Asia/Qatar
Asia/Qyzylorda

Pacific/Johnston
Pacific/Kiritimati
Pacific/Kosrae
Pacific/Kwajalein
Pacific/Majuro
Pacific/Marquesas
Pacific/Midway
Pacific/Nauru
Pacific/Niue
Pacific/Norfolk
Pacific/Noumea
Pacific/Pago_Pago
Pacific/Palau
Pacific/Pitcairn
Pacific/Ponape
Pacific/Port_Moresby
Pacific/Rarotonga
Pacific/Saipan
Pacific/Tahiti
Pacific/Tarawa
Pacific/Tongatapu
Pacific/Truk
Pacific/Wake
Pacific/Wallis
UTC

Index

T

V

W