Veritas Velocity 7330 Appliance Product Description

Release 1.2.6

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Veritas Velocity 7330 Appliance Product Description

Release 1.2.6

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Contents

Velocity 7330 Appliance overview

This chapter includes the following topics:

- About the Veritas Velocity 7330 Appliance

- About the Velocity 7330 Appliance Primary Storage Shelf

- Best practices for rack installation

About the Veritas Velocity 7330 Appliance

The Veritas Velocity 7330 Appliance is a hardware and software storage system that provides 229TB of available storage capacity. It consists of a 2U Velocity 7330 Appliance compute node and one externally attached 4U Primary Storage Shelf.

The appliance compute node does not contain internal storage. As such, the system uses the Primary Storage Shelf as the data storage device. The Primary Storage Shelf uses RAID6 technology and uses Fibre channel (FC) cables to connect to the compute node.

See "About the Velocity 7330 Appliance Primary Storage Shelf" on page 16.

Velocity 7330 Appliance system features

Table 1-1

Feature	Description
Performance and capacity	■ Processor - two Intel Xeon 10-core 3.0 GHz E5-2690 v2 CPUs. ■ Supports the high-performance processors with low-power consumption. ■ Provides high-capacity intra-appliance switching bandwidth, along with high I/O throughput.
System memory configuration (DIMMs)	16 GB x 24; total RAM: 384 GB
RAID cache	24 GB
Space reduction	The deduplication engine provides up to 100 times reduction in storage.
Primary Storage Shelf capacity	229TB
High availability	Supports redundant hot-swappable disks and power modules in both the compute node and the Primary Storage Shelf.
Easy management	Provides separate out-of-band management network interfaces. You can remotely turn on, turn off, and reset appliances over the network. Supports reporting the disk information through the out-of-band management channel.
RAID levels	Supported RAID levels: ■ Velocity 7330 Appliance compute node system disks: RAID1 (striping and mirroring) ■ Primary Storage Shelf data storage disks: RAID6 (block level striping with double distributed parity)
Fibre Channel	The Velocity 7330 Appliance compute node includes two 8 Gb Fibre Channel (FC) HBA cards. Each card includes two standard Fibre Channel ports that are used to attach the Primary Storage Shelf to the compute node.

Table 1-1 *(continued)*

Feature	Description
Rear panel ports (built into the chassis)	One 1 Gb/s IPMI remote network port
	One VGA port
	Four 1 GbE network ports, with an RJ-45 connector, and link and activity LEDs. Two of the ports are reserved for private networks.
	Two 10 GbE network ports, with Small Form-factor Pluggable (SFP) modules, and link and activity LEDs.
	See " Velocity 7330 Appliance compute node rear panel" on page 11.

Velocity 7330 Appliance compute node disk drive configurations

The Velocity 7330 Appliance compute node contains eight 3TB SAS disk drives. Individual disk drive carriers hold each of the disk drives, and each disk drive carrier resides in a front panel disk drive slot. The disk drives are assigned numbers, which are based on the drive slot they occupy.

See Figure 1-1.

Figure 1-1 Velocity 7330 Appliance compute node front panel disk slot assignments

The Velocity 7330 Appliance compute node uses the following disk slot assignments and RAID disk assignments:

- Slot 0 - Disk0 of RAID1, Volume 0 (set as the Boot volume and contains the operating system)

- Slot 1 - Disk1 of RAID1, Volume 0 (set as the Boot volume and contains the operating system)

- Slot 2 - Hot spare disk

- Slot 3 - Disk0 of RAID1, Volume 1 (contains the swap file for the operating system, along with log files)

- Slot 4 - Disk1 of RAID1, Volume 1 (contains the swap file for the operating system, along with log files)
- Slot 5 - Hot spare disk
- Slot 6 - The disk drive in slot 6 is reserved for future use
- Slot 7 - The disk drive in slot 7 is reserved for future use

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Note: Slots 8, 9, 10, and 11 are intentionally empty for compute node cooling purposes.

See "Velocity 7330 Appliance compute node disk drive LED descriptions" on page 9.

Velocity 7330 Appliance compute node disk drive LED descriptions

Each disk drive module contains two LEDs on the left-hand side of each module.

The LEDs appear as follows:

- The LED on the top is solid amber when a disk drive fault occurs. This LED is not lit when there are no disk drive faults.
- The LED on the bottom is solid green when power is supplied to the disk drive. This LED flashes green when the disk drive is active.

Note that the disk drive modules that do not contain disk drives also have LEDs. Although there is no drive activity going on, some colored lights may still be seen through the disk modules

Figure 1-2　　　　　　　　　　　　Disk drive module LEDs

Amber Status LED ——
Green Activity LED ——

Table 1-2

LED color	Condition	Description/Behavior
Amber	Off	No access and no fault
Amber	Solid On	A hard drive fault has occurred
Amber	Blinking	A RAID rebuild is in progress (1 Hz), Identify (2 Hz)

Table 1-2   *(continued)*

LED color	Condition	Description/Behavior
Green	Power on with no drive activity	LED stays on
Green	Power on with drive activity	LED blinks off when processing a command
Green	Power on and drive spun down	LED stays off
Green	Power on and drive spinning up	LED blinks

Velocity 7330 Appliance compute node control panel information

The front panel of the Velocity 7330 Appliance compute node includes a small panel that is attached to the right side of the device. System information is shown on this panel.

Figure 1-3   Velocity 7330 Appliance compute node control panel

Table 1-3   LED panel descriptions

Label	Description
1	AC power button with integrated LED (executes a shutdown before turning off power)
2	Hard drive activity LED
3	ID button with integrated LED
4	Cold reset button (restarts the appliance instantly)
5	NIC4/eth3 activity LED (for public use)
6	NIC3/eth2 activity LED (for public use)
7	NMI button (recessed; a tool is required for use)
8	NIC1/eth0 activity LED (for public use)
9	NIC2/eth1 activity LED (for public use)
10	Status LED

Velocity 7330 Appliance compute node rear panel

The rear panel of a Veritas Velocity 7330 Appliance compute node has several access ports and other features, which are displayed in the following diagram and table.

Figure 1-4   Velocity 7330 Appliance compute node rear panel access ports and features
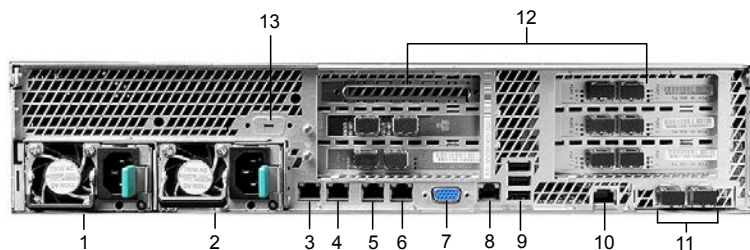
Table 1-4   Velocity 7330 Appliance compute node port functions

Number	Function
1, 2	Power Supply Modules #1, #2 (120/220 VAC)

Table 1-4   Velocity 7330 Appliance compute node port functions *(continued)*

Number	Function
3, 4	NIC1/eth0 and NIC2/eth1. NIC1/eth0 is reserved for use during the initial configuration of the appliance. However, after initial configuration is complete, both NIC1/eth0 and NIC2/eth1 can be used for public networks. Both are 1GB connectors.
5, 6	NIC3/eth2 and NIC4/eth3 - used for public networks. Both are 1GB connectors.
7	DB-15 VGA connector
8	RJ45 Serial-A port (reserved)
9	USB connectors
10	A NIC port for IPMI remote management
11	NIC5/eth4 and NIC6/eth5: 10Gb network connectors that can be used for public networks
12	Add-in PCIe adapter slots (10Gb Ethernet)
13	Serial-B port (reserved)

The ports on the rear panel are color-coded for easy identification.

Figure 1-5   Velocity 7330 Appliance compute node rear port colors
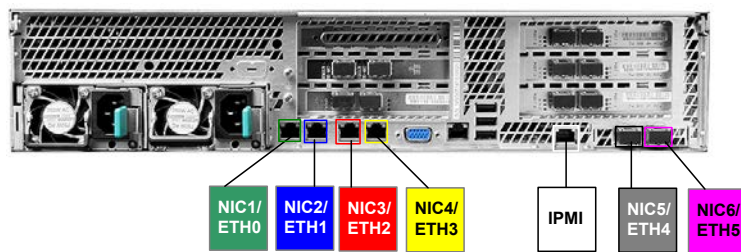
Velocity 7330 Appliance compute node PCIe slot configurations

The rear panel of the Veritas Velocity 7330 Appliance compute node contains six PCIe slots that are numbered 1 to 6. Slots 1, 2, and 3 are located in PCIe Riser Assembly 2. Slots 4, 5, and 6 are located in PCIe Riser Assembly 1.

Figure 1-6   PCIe slot configurations
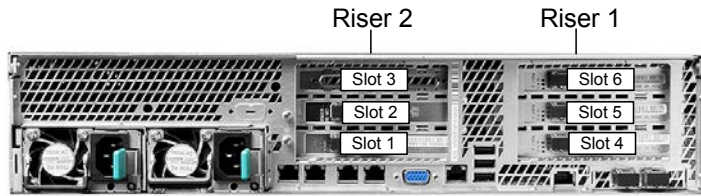
All PCIe slots are populated with an 8 Gb Fibre Channel (FC) host bus adapter
(HBA) card or a 10 Gb Ethernet network interface card (NIC). Slots 1 and 4 are
reserved exclusively for attachment to the Primary Storage Shelf.

Table 1-5 describes the PCIe slot configuration for the Velocity 7330 Appliance.

Table 1-5   PCIe slot configuration for the Velocity 7330 Appliance compute
node

Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
8 Gb FC HBA	10 GbE NIC	10 GbE NIC	8 Gb FC HBA	10 GbE NIC	10 GbE NIC

See "Velocity 7330 compute node Ethernet port configurations" on page 13.

Velocity 7330 compute node Ethernet port configurations

Veritas Velocity 7330 Appliances include the following Ethernet ports, which are
built in along the base of the rear panel:

- 1-GbE ports: eth0, eth1, eth2, and eth3

- 10-GbE ports: eth4 and eth5

In addition, the Veritas Velocity 7330 Appliance compute node also includes
additional PCIe card-based 10 Gb Ethernet ports.

The following picture shows the location of all Ethernet ports on the rear panel of
the compute node, including the PCIe card-based ports.

Figure 1-7   Ethernet port locations
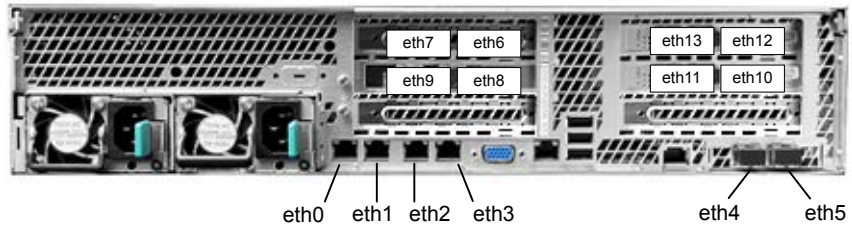
Velocity 7330 compute node PCIe card-based 10 Gb Ethernet port designations:

- Slot 2: eth8 (right), eth9 (left)

- Slot 3: eth6 (right), eth7 (left)

- Slot 5: eth10 (right), eth11 (left)

- Slot 6: eth12 (right), eth13 (left)

See "Dual-port 10 Gb Ethernet card with SFP+ transceiver ports specifications" on page 15.

Dual-port 8 Gb Fibre Channel Host Bus Adapter (FC HBA) specifications

The Fiber Channel (FC) host bus adapter ports are used to connect the appliance to a Primary Storage Shelf.

The technical specifications for the dual-port 8 Gb Fibre Channel Host Bus Adapter are as follows.

Figure 1-8   Dual-port 8 Gb Fibre Channel Host Bus Adapter locations

8 Gb FC HBA
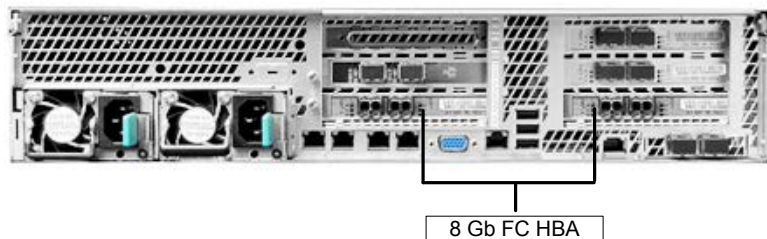
Table 1-6   Dual-port 8 Gb Fibre Channel Host Bus Adapter specifications

Item	Description
Dimensions	2.54 in x 6.6 in (6.4516 cm to 16.764 cm) (low profile PCIe cards)
Power consumption	Typical: 6.2 watts at 0°C to 55°C (32°F to 131°F)
Operating temperature	0°C to 55°C
Storage temperature	-40°C to +70°C (-40°F to +158°F)
Storage humidity	10% RH to 90% RH (operating, non-condensing) and 5% RH to 93% RH (non-operating, non-condensing)

Dual-port 10 Gb Ethernet card with SFP+ transceiver ports specifications

The technical specifications for the dual-port 10 Gb Ethernet card with SFP+ transceiver ports are as follows.

Table 1-7   Dual-port 10 Gb Ethernet card with SFP+ transceivers specifications

Item	Specification
Dimensions	2.54 in x 6.6 in (6.4516 cm to 16.764 cm) (low-profile)
Power consumption	Typical: 6.2 watts at 0°C to 55°C (32°F to 131°F)
Operating temperature	0°C to 55°C
Storage temperature	-40°C to +70°C (-40°F to +158°F)
Storage humidity	10% RH to 90% RH (operating, non-condensing) and 5% RH to 93% RH (non-operating, non-condensing)
System Interface Type	PCIe v3.0
Speed and slot width	8.0 GT/s (gigatransfers per second)

Table 1-7   Dual-port 10 Gb Ethernet card with SFP+ transceivers specifications *(continued)*

Item	Specification
Storage over Ethernet	Fibre Channel over Ethernet (FCoE), Network File System (NFS)
Data rate supported per port	Optical: 1GbE/10GbE Direct attach: 10GbE
LED indicators	LINK (solid) and ACTIVITY (blinking) LINK SPEED (green=10Gbps; yellow=1Gbps)
Certifications	FCC B, UL, CE, VCCI, BSMI, CTICK, KCC
Air Flow (minimum)	50 LFM (linear feet per minute)
Operating temperature	0 to 55 C (32 to 131 F))
Storage temperature	-40 to 70 C (-40 to 158 F)
Storage humidity	90% non-condensing relative at 35 C

See "Dual-port 8 Gb Fibre Channel Host Bus Adapter (FC HBA) specifications" on page 14.

About the Velocity 7330 Appliance Primary Storage Shelf

The Velocity 7330 Appliance Primary Storage Shelf is an external hard disk drive-based storage enclosure. It provides 229TB of available storage capacity.

Because the Velocity 7330 Appliance compute node does not contain internal storage, the Primary Storage Shelf is a required component of the Velocity 7330 Appliance system. The storage shelf uses RAID6 technology and connects to the compute node using Fibre Channel cables.

Note: To help reduce the weight of the units during shipment and installation, the disk drives are not factory-installed into the storage shelves. The disks are shipped in separate packages.

See " Velocity 7330 Appliance Primary Storage Shelf front panel" on page 17.

See " Velocity 7330 Appliance Primary Storage Shelf rear panel" on page 18.

Velocity 7330 Appliance Primary Storage Shelf front panel

The Velocity 7330 Appliance Primary Storage Shelf contains 60 SAS hard disk drives. The front panel of the Primary Storage Shelf contains five drawers. The drawers are numbered one through five, beginning with the top drawer. Each storage shelf drawer contains 12 disk drives.

Figure 1-9   Primary Storage Shelf front panel

The following illustration shows the front panel LEDs in detail.

Figure 1-10   Disk system front panel LEDs
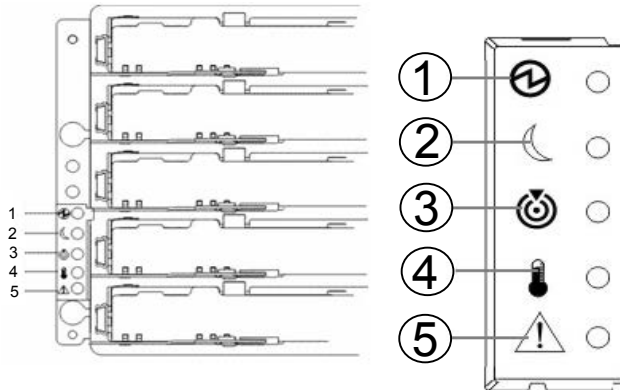
The following table describes LEDs available on the disk system front panel.

Table 1-8   Primary Storage Shelf front panel LED definitions

Number	Definition	Color
1	Power LED	Green
2	Standby Power LED	Green

Table 1-8   Primary Storage Shelf front panel LED definitions *(continued)*

Number	Definition	Color
3	Locate LED	White
4	Over-temperature LED	Amber
5	Service Action Required LED	Amber

As mentioned, each drawer in the Primary Storage Shelf contains slots for 12 disks. The slots are numbered as shown in the following diagram.

Figure 1-11   Drawer disk layout

Velocity 7330 Appliance Primary Storage Shelf rear panel

The Veritas Velocity 7330 Appliance Primary Storage Shelf includes two power cords that should be plugged into the appropriate external power source within a rack.

Note: When connecting power cables, wear an ESD-preventive wrist strap to prevent equipment damage.

The rear panel of both disk systems contains three types of canisters:

- RAID canisters

- AC power canisters (220VAC)

- Fan canisters

The Primary Storage Shelf has two RAID canisters, which are inserted in the central slots of the back panel. The power supplies are inserted at the top and bottom of the back panel, and the fans are on either side. The RAID canisters are attached to the compute node with fiber optic cables. The device must have at least one functioning RAID canister, one functioning power supply, and one functioning fan.

The following figure shows the Primary Storage Shelf rear panel.

**Figure 1-12**　　　　　　　　Primary Storage Shelf rear panel
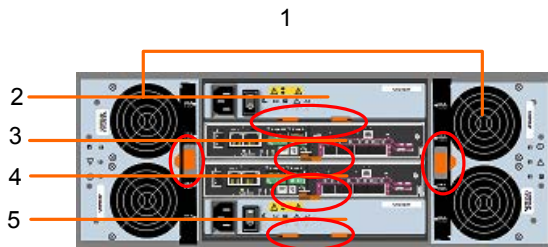
Note: Latches that let you remove the canisters are circled in red.

Table 1-9　　　　Primary Storage Shelf rear panel components

Number	Description
1	Fan canisters
2 and 5	Power canisters
3 and 4	RAID controller canisters

Each RAID canister has a set of LEDs which are defined in the following figure. The table describes the LEDs functions and colors. The LEDs labeled '1' track the data rate of the link. If both are off, the link is inactive, and if both are on, the data rate is 8 Gb per second. If only one LED is on, the LED on the left indicates a 2 Gb/s data rate, and the one on the right indicates a 4 Gb/s data rate. The canister also displays the ID of the Primary Storage Shelf, which is set to '99'.

Figure 1-13   RAID canister LEDs
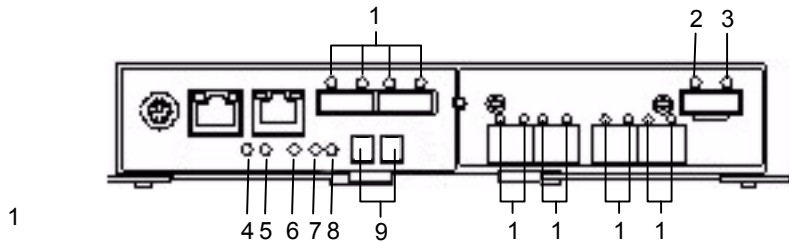
Table 1-10   RAID canister LEDs

Number	Description	Color
1	Data link activity	Green
2	SAS expansion fault	Amber
3	SAS expansion active	Green
4	Battery service action required	Amber
5	Battery charging	Green
6	RAID service system action allowed	Blue
7	RAID service system action required	Amber
8	Cache active	Green
9	Seven-segment display LEDs for system ID	Displays '99'

In the following figure, the seven-segment display LEDs show the storage system ID, once the device is turned on and recognized. The following diagram shows the location of this display on the rear panel of the Primary Storage Shelf, which is circled in red.

Figure 1-14   Primary Storage Shelf system ID locations
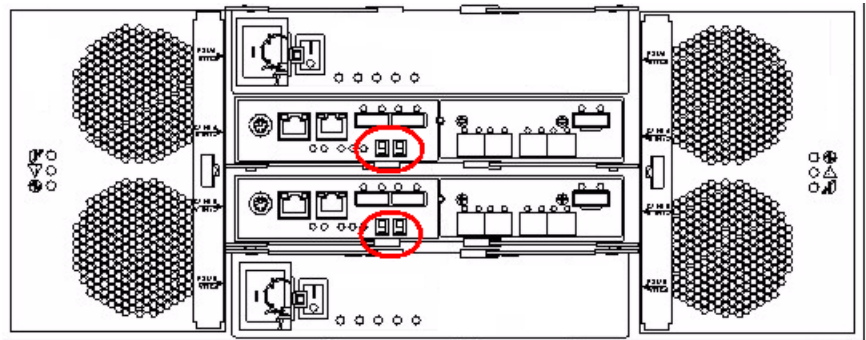
See " Velocity 7330 Appliance Primary Storage Shelf front panel" on page 17.

Best practices for rack installation

The heaviest equipment should be installed at the bottom of a rack. The heavy devices that are installed at the top of a rack make the rack "top-heavy", or unstable. Unstable racks jeopardize staff and equipment safety and are subject to risk.

When you install more than one device per rack, do the following:

■   Find out how much each device weighs.

Note: A storage device is heavier than an appliance and must always be installed under the appliance.

■   Determine device order and cabling limits.

■   Be aware of the depth of the guide rails and the devices. Ensure that the distance between cabinet posts accommodates the rails and devices.

   ■   The rack rails that are provided for the storage shelf are extensible to 36" (914mm). This distance is the maximum depth that is allowed between rack posts. If the distance between rack posts is longer than 36" (914mm) the rails and the appliance cannot be properly installed. The width of the storage shelf is 19" (482.6mm).
   If your rack dimensions do not conform to these requirements contact technical support.

Veritas Velocity 7330 Appliance cables

This chapter includes the following topics:

■ Power cables

■ Network cable

■ Multi-Mode fiber cable

Power cables

Each AC power module of the appliance and of the storage device is configured with one AC power cable. One end of the AC power cable is connected to the power socket on the appliance or the storage shelf. The other end of the cable is connected to the external power supply.

A power cable includes live line, neutral line, and grounding lines.

Figure 2-1   AC power cable

A	AC power connector (IEC-60320-C14) to an external Power Supply Distribution Unit (PDU) on a rack.
B	AC power connector (IEC-60320-C13) to an appliance or a storage device.

Note: If your power distribution unit is not compatible with the IEC-60320-C13 plug, then Veritas recommends that you purchase your power cable locally. Make sure the power cable meets or exceeds the indicated power rating.

See "Velocity 7330 Appliance system technical specifications" on page 26.
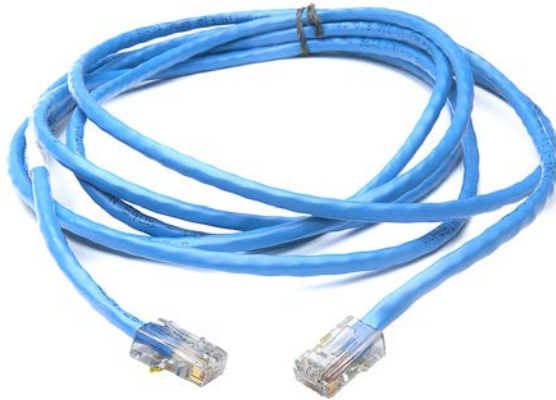
See "Network cable" on page 23.

Network cable

The Velocity 7330 Appliance communicates with the network through an Ethernet network cable. One end of the network cable connects to the management network port or service network port of the appliance. The other end of the cable connects to the network switch or an external gateway. Both ends of the cable are RJ-45 connectors.

Figure 2-2   Network cable

See "Power cables" on page 22.

Multi-Mode fiber cable

The Velocity 7330 Appliance communicates with the fibre channel switch through a multi-mode fiber optic cable. One end of the multi-mode fibre optic cable connects to the 10GE service network port or the fibre channel port. The other end of the cable connects to the fibre channel switch or other devices. The two ends of the multi-mode fiber optic cable are LC connectors.

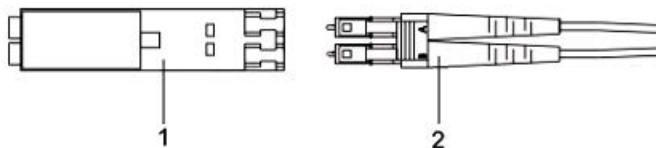**Figure 2-3**   Multi-Mode fiber cable

Fiber optic cables require Small Form-factor Pluggable (SFP+) transceivers, which are provided with each device having Fibre Channel ports. The diagram shows the SFP, labeled 1, and the fiber optic cable which is attached to it, labeled 2.

Supported SFPs are listed:

- Finisar
- JDSU

See "Power cables" on page 22.

See "Network cable" on page 23.

Specifications and standards

This chapter includes the following topics:

- Velocity 7330 Appliance system technical specifications

- Environmental specifications

- Protocol standards

- Regulatory, compliance, and certification information

Velocity 7330 Appliance system technical specifications

Table 3-1   Velocity 7330 Appliance specifications

Parameter	Description
Rack information	The rack installation height is the space occupied by an appliance in a rack cabinet. The rack height for the appliance is 2U (1U = 44.5 cm). Install the appliance in a rack cabinet that is 19 inches (1 inch = 2.54 cm) wide and 39.37 inches (100 cm) deep, or deeper.

Table 3-1   Velocity 7330 Appliance specifications *(continued)*

Parameter	Description
Weight **Note:** The maximum weight of the Velocity 7330 Appliance compute node includes the eight disk drive modules, eight disk drive carriers, and two power modules.	Weight: approximately 30 kg (66 lbs)
Dimensions	Height: 8.76 cm (3.45") (approximately 2U) Width: 43.8 cm (17.24") Depth: 69.59 cm (27.39")
Power consumption	750 watts maximum
AC power requirements	110 VAC or 220 VAC 100 - 110 VAC at 50/60 Hz 8.2 A 200 - 220 VAC at 50/60 Hz 4.4 A
AC power cable	Specification: IEC-60320-C14 to IEC-60320-C13, 10A/250V, Black, 4 ft The IEC-60320-C14 plugs into a Power Distribution Unit. The IEC-60320-C13 plugs into an appliance or storage shelf power supply. **Note:** If your power distribution unit is not compatible with the IEC-60320-C14 plug, then Veritas recommends that you purchase your power cable locally. Make sure the power cable meets or exceed the indicated power rating.
Inherent availability of the system	≥ 99.95%
Mean Time to Repair (MTTR)	1 hour
Operating temperature	+10°C to +35°C with the maximum rate of change not to exceed 10°C per hour
Non-operating temperature	-40°C to +70°C
Non-operating humidity	90%, non-condensing at 35°C

Table 3-1   Velocity 7330 Appliance specifications *(continued)*

Parameter	Description
Acoustic noise	Sound power: 7.0 dB in operating condition at typical office ambient temperature. (23°C +/- 2)
System Cooling Requirement	460 watts maximum – 1570 BTU/hour 750 watts maximum – 2559 BTU/hour

Note: The transportation weight is the sum of the maximum weight of a device and the maximum weight of the transportation materials.

The technical specifications for the Velocity 7330 Appliance Primary Storage Shelf are as follows.

Table 3-2   Primary Storage Shelf technical specifications

Parameter	Description
Rack information	4U
Weight **Note:** The maximum weight of the Primary Storage Shelf includes 60 disk drive slots, two power canisters, and two fan canisters.	Approximately 105.2 kg (232 lb) with the 60 disk drives installed Approximately 80 kg (176 lb) without the disk drives
Dimensions	Height: 82.55 cm (32.50") (approximately 4U) Width: 48.28 cm (19.00") Depth: 17.78 cm (7.00")
Overall maximum AC currents (agency ratings)	7.56 A at 200 VAC 6.3 A at 240 VAC
AC power requirements	Input voltage: 200 - 240 VAC Frequency: Range 50 Hz to 60 Hz Typical operating current: Range 4.9 A to 5.75 A Nameplate rating: Range 6.3 A to 7.56 A

Table 3-2   Primary Storage Shelf technical specifications *(continued)*

Parameter	Description
Power ratings and heat dissipation including two fan canisters, two power canisters, 60 disk drives, and two RAID canisters.	Watts: 1135 AC (typical)
	Watts: 1222 AC (maximum)
	Cooling BTU/hr: 3873 (typical)
	Cooling BTU/hr: 4180 (maximum)
Velocity 7330 Appliance compute node and a Primary Storage Shelf connected	Watts: 1595 watts (typical)
	Watts: 1972 watts (maximum)
	Cooling BTU/hr: 5442 (typical)
	Cooling BTU/hr: 6739 (maximum)
Sound levels	Sound power (standby operation): 6.5 bels
	Sound power (normal operation): 6.8 bels
	Sound pressure: 68 dB

Environmental specifications

The following table lists the requirements for the Veritas Velocity 7330 Appliance and the storage shelves.

Table 3-3   Environmental specifications

Component	Requirement
Operating temperature	10°C to 35°C (41°F to 95°F)
Storage temperature	-40°C to 70°C (-40°F to 158°F)
Transportation temperature	-40°C to 70°C (-40°F to 158°F)
Temperature gradient	10°C/h
Operating humidity	10%RH to 85%RH
Operating altitude	-30 meters to 3,000 meters
	In altitudes from -60 meters to +1,800 meters, the ambient temperature ranges from 5°C to 35°C. When the altitude ranges from 1,800 meters to 3,000 meters, the environment temperature decreases by 0.6°C when the altitude increases by 100 meters.

Table 3-3   Environmental specifications *(continued)*

Component	Requirement
Storage altitude	-30 meters to 3,000 meters
Noise	< 72 A-weighted decibel This value reflects the maximum noise of the appliance when the ambient temperature is 25°C.

Protocol standards

The following table provides standards with which the Veritas Velocity 7330 Appliance and storage shelves comply.

Table 3-4   Standards compliance

Standard	Version
IPMI 2.0	Intelligent Platform Management Interface Specification Second Generation v2.0, Document Revision 1.0
SMBIOS	System Management BIOS (SMBIOS) Reference Specification, Version 2.5
SAS	SAS- 2.1
ACPI	Advanced Configuration and Power Interface Specification, Revision 3.0, September 2
IP	RFC0791: Internet Protocol
FC	INCITS T11 (X3T9.3)
PCI Express	PCIe 3.0

Regulatory, compliance, and certification information

Refer to the *Veritas Velocity Appliance Safety and Maintenance Guide*, which you can find on the Veritas Velocity Appliance Documentation page.

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