

DriveScale SAS Adapter

The DriveScale Composable Platform automates the creation of high-scale, high-performance clusters of commodity, heterogeneous disk-lite server, storage and network fabric elements enabling IT to compose optimized cluster configurations for each workload from an intelligent software platform. This enables the quick provisioning of compute and storage in a cluster, the flexible re-allocation of compute and storage capacity, and the ability to assign additional compute or storage resources on demand. Compute can be upgraded separately from storage to optimize spend and take advantage of processor performance updates without having to upgrade disk at the same time. With DriveScale, resources can be more fully utilized eliminating wasted spend.

DriveScale eliminates the constraints and high costs of direct-attached storage (DAS) servers and appliances by disaggregating compute and storage elements and connecting them to a standard Ethernet network. With high network interface speeds and network bandwidth available today, it is now possible to attach storage directly to the network and provide similar performance to an integrated server chassis. DriveScale and third-parties provide both SAS to Ethernet and NVMe to Ethernet adapters to attach storage to an Ethernet network. Here we describe the DriveScale SAS Adapter.

DriveScale SAS Adapter

The DriveScale SAS Adapter is a high performance, fully redundant SAS-to-Ethernet bridge which enables any hard disk drive (HDD) or set of drives to be mounted to any server over a standard Ethernet network. The 1RU SAS Adapter connects to servers via a 10GbE top-of-rack switch and to commodity, third-party JBODs or JBOFs (Just a Bunch of Disks or Flash) via 12G SAS ports on the adapter. The SAS Adapter chassis holds four adapter units, each capable of supporting access to 20 drives with equivalent performance to direct-attached storage. Each module implements two 10GbE ports and two 12Gb Mini-SAS HD interfaces.

Core to the design of the DriveScale SAS Adapter is a high availability, high performance, low-latency, and secure architecture. The high availability design increases accessibility of your data and enables quick resolution of disk and compute node failures through a software interface. The DriveScale SAS Adapter Software provides storage resources and disk intelligence to the DriveScale Composable Platform. The software runs on standard Linux and exports the SAS drives from a shared pool of HDDs or SSDs to be presented to the compute nodes as local SCSI block devices.

SAS Adapter Features

- **SAS to Ethernet:** DriveScale creates a software stack that bridges SAS to Ethernet and enables seamless connectivity of disk drives to the Ethernet network. Putting disk on the network (via JBODs) enables an optimal number of drives to be attached to servers eliminating over provisioning, lowering costs and improving utilization.
- **High performance:** The Adapter Software supports DriveScale's near line-rate network performance delivering direct-attached drive performance for drives attached via the DriveScale Composable Platform.
- **Security:** The Adapter Software enables authentication of servers and drives when directed by the DriveScale Composer. Drives attached to a server cannot be accessed by other servers.
- **Inventory management and monitoring:** The Adapter Software monitors and reports the full SAS/PCIe connection tree including bandwidth, multiple paths, and shared



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connections. In addition, it reports network connectivity and retrieves and reports SMART and temperature information on the drive for failure detection.

- **Load balancing:** The patented load balancing capability provides continuous load balancing capabilities between adapter modules, network path and interfaces for data transfer based on the current data load, interface link status, and congestion.

DriveScale SAS Adapter Chassis

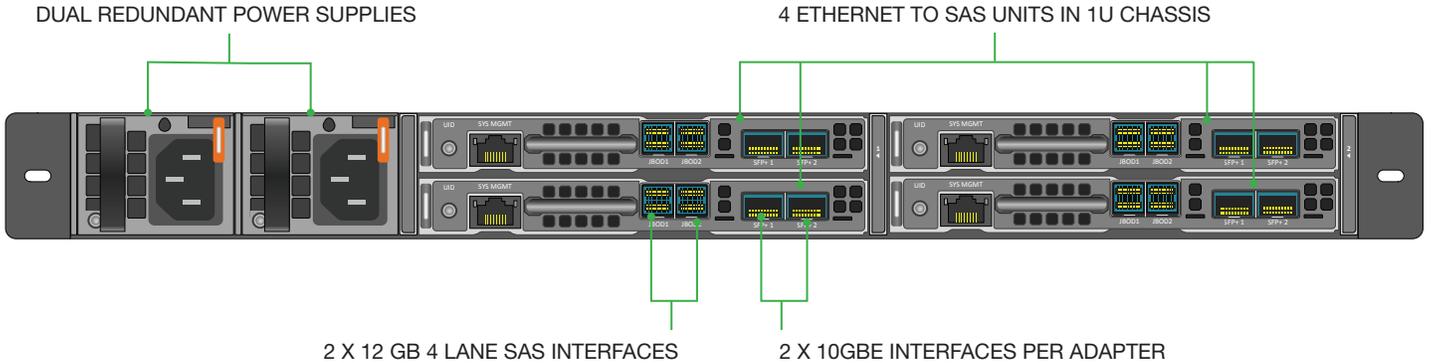


Figure 1: DriveScale SAS Adapter

DriveScale SAS Adapter Chassis

Features	Description
Form factor	1RU chassis
Number of adapter units	4
Adapter unit	Dual 10Gb Ethernet SFP+ ports and dual Mini-SAS HD SFF-8644 connectors. SFP+ ports support direct-attached copper cables as well as multi-mode and single-mode fiber optic transceivers.
Dual redundant power supplies	Yes
Hot swappable	Power supplies and adapter units
Dimensions	43.18 x 67.31 x 4.32 cm (17.00 x 26.50 x 1.7 in)
Weight	14.2kg
Input power	90–264V, 50Hz/60Hz at 0.95 power factor, 300W AC power, IEC320-C14 power receptacle
Operating temperature	5°C to 35°C (41°F to 95°F) sea level to 3000 feet; derate 1°C (1.8°F) for every 1000 feet of elevation
Operating humidity	10% to 80% non-condensing
Regulatory approvals	RoHS, FCC Class A, CE, BSMI, UL, VCCI, KC, CB, CCC
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