

# HP NonStop Modular I/O subsystem

Data sheet



HP NonStop Modular I/O components are the next-generation I/O building blocks of high-performance, high-availability HP NonStop servers.

## Key features and benefits

These components create an I/O subsystem that far outstrips the performance of HP NonStop ServerNet technology-based solutions to date, offering

- Outstanding performance
- Configuration flexibility
- Industry-standard racking
- Industry-standard interfaces

NonStop Modular I/O components allow ServerNet technology-based NonStop S-series systems to connect to Fibre Channel Storage devices, storage area networks, and Gigabit Ethernet networks.

# The modularity of these products allows them to be configured to exactly meet the needs of a given application.

Designed to meet the requirements of the most demanding solutions, these products can be installed in an HP modular cabinet or in an industry-standard 19-inch rack. As a business grows and I/O demand increases, additional units can be added to a system as needed, in small or large increments.

Modular I/O components, and the software that supports them, are compatible with NonStop S-series processors and provide a migration path to the future Intel® Itanium® microprocessor-based NonStop servers (when they become available).

## NonStop Modular I/O subsystem: General description

NonStop Modular I/O subsystem components include

- I/O Adapter Module (IOAM) enclosure
- Fiber Channel ServerNet adapter (FCSA)
- Multiport Ethernet ServerNet adapter (G4SA)
- Modular cabinet with built-in power distribution unit (PDU)
- Uninterruptible power supply (UPS)
- Extended Runtime Module (ERM)

Modular components provide the capability to upgrade individual pieces of technology as newer versions become available. This flexibility means enhanced capabilities can be swapped into the subsystem for either NonStop S-series or future HP NonStop Advanced Architecture servers. For more information about the NonStop Advanced Architecture, visit [http://h71033.www7.hp.com/page/Itanium\\_Tech.html](http://h71033.www7.hp.com/page/Itanium_Tech.html).

Modular I/O components are standards based:

- The modular cabinet is an industry-standard 19-inch rack.
- The Modular I/O adapters are industry-standard Fibre Channel and Gigabit Ethernet products.
- The UPS and ERM are standard components from another division of HP.

## I/O Adapter Module enclosure

The I/O Adapter Module (IOAM) enclosure is a new subsystem for ServerNet based NonStop servers. The IOAM enclosure provides infrastructure (I/O paths, power, and physical slots) for modular form factor I/O adapters. Two types of adapters are available to install in an IOAM enclosure: Fibre Channel ServerNet adapter (FCSA), and Multiport Ethernet ServerNet adapter (G4SA).

The IOAM enclosure

- Supports up to 10 ServerNet adapters
- Supports fiber-optic-connected ServerNet II and ServerNet III
- Is 11U in height or 19.25 inches (1U = 1.75 inches)
- Is 19-inch rack mountable
- Provides dual fault zones for high availability
- Provides dual power supplies for each of the two fault zones
- Provides X and Y ServerNet fabric interconnects
- Provides dual fabrics to all ServerNet adapters



- Provides switching services to and from ServerNet adapters
- Provides maintenance services to ServerNet adapters

#### **Connecting an IOAM enclosure to a NonStop S-series system**

The IOAM enclosure operates much like an I/O expansion enclosure on a NonStop S-series server. That is, it connects to a NonStop S-series system enclosure via fiber-optic cables from a pair of Modular ServerNet Expansion Board (MSEB) units (product number 6750M). These cables carry the ServerNet traffic to and from the IOAM enclosure via ServerNet interfaces. The older SEB units (product number 6750) are not compatible with the IOAM enclosure.

The IOAM enclosure has an interface for both the X and Y ServerNet fabrics. The interface accepts either ServerNet II or ServerNet III signals. NonStop S-series machines using MSEB units supply ServerNet II to the IOAM enclosure. Future Itanium processor-based NonStop servers will connect to each IOAM enclosure via four ServerNet III signals per fabric.

#### **ServerNet distribution inside the IOAM enclosure**

The ServerNet interfaces inside the IOAM enclosure use ServerNet routers to distribute the ServerNet traffic to all 10 slots. All 10 ServerNet adapter positions inside the IOAM enclosure are multiported. That is, each and every adapter position is connected to both X and Y ServerNet fabrics via four ports per fabric. These ports can be either ServerNet II or ServerNet III, depending on the connection at the external ServerNet ports. Adapters are not required to use all ports at each slot. For fault tolerance, adapters must use at least one port from each ServerNet fabric.

#### **IOAM enclosure: Fault-tolerant features**

The IOAM enclosure has separate backplanes for each of two modules inside the enclosure to ensure a power failure will not bring down an entire IOAM enclosure. There are dual power supplies for each of the two modules of the IOAM enclosure, as well as ServerNet interfaces for both the X and Y ServerNet fabrics. All adapter slots of the enclosure are multiported. Pairs of ServerNet adapters should be configured with one in each of the two fault zones. See the *HP NonStop S-series Servers Ordering and Configuration Guide* for more information.

#### **Fibre Channel ServerNet adapter (FCSA)**

The Fibre Channel ServerNet adapter (FCSA) can be used to attach several different kinds of I/O devices to the NonStop system host. Two storage products shipping with the IOAM enclosure and the FCSA are the HP StorageWorks XP1024 Disk Array and the HP StorageWorks XP128 Disk Array. These enterprise-class storage solutions offer maximum scalability, industry-leading performance, and unmatched data protection. These storage solutions have the potential to enhance significantly the performance and operations capabilities of NonStop solutions. For more information on these products, see the data sheet for the HP StorageWorks XP at <http://h18006.www1.hp.com/storage/enterprisestorage.html>.

The most important benefits of the FCSA are

- Conformance to the NonStop Modular I/O subsystem: the FCSA fits in one of the 10 IOAM slots
- Conformance to the Fibre Channel IEEE standard

- Dual 2-gigabit-per-second Fibre Channel (FC) ports for redundant FC fabric availability
- Dual 2-gigabit-per-second ServerNet ports for redundant ServerNet fabric availability
- Dual FCSA adapters in different IOAM enclosure fault zones for availability
- Connection to existing NonStop S-series and future Itanium processor-based NonStop servers via the IOAM enclosure
- Co-existence with other Modular I/O ServerNet adapters in Modular I/O configurations

#### **FCSA key features**

The high-performance FCSA is a new generation of ServerNet I/O adapters that

- Connects dual ServerNet fabrics to PCI-X interface bus
- Provides dual Fibre Channel interfaces for Fibre Channel storage subsystems and devices such as tape drives
- Interfaces with the IOAM enclosure; the FCSA is not compatible with NonStop S-series I/O enclosures
- Is a field replaceable unit (FRU)

The FCSA features include

- High performance, a powerful embedded RISC processor
- Very large number of concurrent I/Os
- High-bandwidth I/O performance
- Two X and two Y ServerNet fabric connections (two redundant, complex ServerNet III ports)

- Dual ServerNet III to PCI-X bridge ASICs
- 2 × 128-megabyte on-board memory buffer
- Industry-standard Fibre Channel plug-in card
- Single PCI-X 1.0 expansion slot
- 64-bit, 100-megahertz PCI
- 2 × 2-gigabit-per-second Fibre Channel ports
- A common ServerNet I/O baseboard, which is also used for other adapters
- Common storage and networking code

## **Multiport Ethernet ServerNet adapter (G4SA)**

The Multiport Ethernet ServerNet adapter (G4SA) is a high-bandwidth I/O adapter for NonStop servers that meets the stringent requirements of NonStop servers, and offers continuous availability, scalability, and mission-critical capabilities. The G4SA is based on the Modular I/O form factor and fits in one of the slots available in the IOAM enclosure.

The G4SA complies with the Ethernet standards, including Gigabit Ethernet. It is designed to address the need of NonStop server customers for increased connectivity and performance by providing

- Flexibility of connectivity based on speed and cabling option.
- Increased scalability for demanding TCP/IP environments.



- Enhanced application performance, particularly for disaster recovery applications such as HP NonStop Remote Data Facility (NonStop RDF) software and backup/restore environments.
- Reduced cost per port, particularly for ports operating at Fast Ethernet or Gigabit Ethernet speed.
- Clean and easy integration of the NonStop server into any newly adopted Gigabit Ethernet strategy for campus backbone networks.
- Simplified system configuration by consolidating slower Ethernet adapters into a fewer number of higher-speed M8800 adapters.
- Flexible wiring options in the same adapter, thus reducing the cost of purchasing cabling-specific models of the adapters. In fact, the M8800 adapter offers both unshielded twisted pair (UTP) and multimode fiber cabling in the same adapter.

#### **Key features and benefits**

The following are key features and benefits of the G4SA:

- One model for a variety of configuration and cabling options
- Dynamic adjustment to network traffic characteristics
- Enhanced TCP/IP/PL support with up to 80,000 UDP/TCP connections per adapter (a more than threefold increase over the 3865 Gigabit Ethernet adapter)
- Configurable MAC to override auto-negotiation settings (UTP cabling only)

- Application compatible with previous Ethernet adapters for a smooth migration
- Support for multiple protocols (TCP/IP, IPX/SPX, Expand/IP, PAM, and SNAX over Ethernet)

## **Modular I/O cabinet**

The modular cabinet features

- Industry-standard 19-inch rack
- 42U height
- Power distribution unit (PDU)
  - Two PDUs per cabinet
  - 14 outlets per PDU
  - Two fuses per
  - Ceiling or floor power input
- Vertical Cable Management System
- Other separate, optional components:
  - Side panels
  - Baying kit

The modular I/O cabinet is “full height” and uses the image of the future Itanium based servers. Full height means it comes in one size and does not stack on other units or have other units stack on top of it. The modular components described above mount inside this cabinet, as will the Itanium based NonStop servers. Because the PDU is integrated with the rack, there are five models, depending on the intended geographic region and power input desired.

## Uninterruptible power supply (UPS)

Modular I/O was architected to accept either an internal UPS or site UPS. This means that customers need only buy the internal UPS for installation in the modular I/O cabinet if their site does not have a UPS to support continuous operation of the NonStop server components. HP recommends using an internal UPS if a site UPS is not available.

## Extended Runtime Module

The UPS for Modular I/O subsystems supports the addition of a battery pack that extends the runtime when power is lost. This battery pack also installs into the modular I/O cabinet.

## Technical specifications

For technical specifications of NonStop S-series servers, refer to the *HP NonStop S-series Servers Ordering and Configuration Guide*. Compatibility or configuration restrictions and limitations are also included in that document.

## Ordering information

For ordering information of NonStop S-series servers, refer to the *HP NonStop S-series Servers Ordering and Configuration Guide*.

## For more information

For more information about NonStop S-series servers, visit [www.hp.com/go/nonstop](http://www.hp.com/go/nonstop).

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