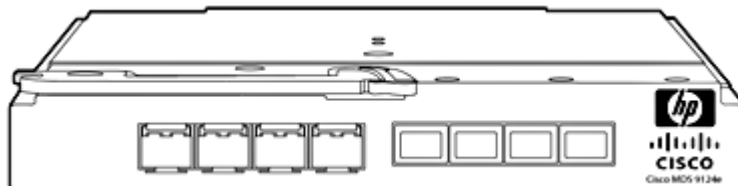


Overview

The Cisco MDS 9124e Fabric Switch for HP c-Class BladeSystem delivers a high performance 4 Gbps embedded Fibre Channel switch option for HP BladeSystem c-Class customers deploying storage area networks in their enterprise. The integrated design frees up rack space, enables a reduction of components such as cables and SFPs, and utilizes shared power and cooling within the BladeSystem enclosure. This results in space and cost savings as well as higher levels of availability through fewer points of failure. A hot-pluggable design, as well as support for non-disruptive software upgrades and the unique ability to automatically and statefully restart failed processes, further enhances the availability features of the overall solution. The Cisco MDS 9124e Fabric Switch supports VSAN, an industry standard for fabric virtualization enabling more efficient network use by creating hardware-based isolated environments within a single physical SAN fabric or switch. In addition, advanced traffic management features such as PortChannels, virtual output queuing, Fabric Shortest Path First (FSPF) simplify deployment while optimizing the fabric. Management is simplified with a broad range of integrated tools that range from a consistent Cisco MDS 9000 family Command Line Interface (CLI) to Cisco Fabric Manager and an industry-standard API that includes support for SNMP and SMI-s for integration with third-party and user-developed tools. In addition, switch management is integrated with HP BladeSystem management tools including HP Onboard Administrator for BladeSystem, HP Systems Insight Manager, and HP Storage Essentials create a unique and tightly integrated experience for server and storage administrators.

The Cisco MDS 9124e Fabric Switch combines value and performance in an embedded SAN switch, enabling increased productivity and substantial cost savings benefiting organizations with limited dedicated IT staff.



Cisco MDS 9124e Fabric Switch for HP c-Class BladeSystem

Key Features and Benefits

The Cisco MDS 9124e Fabric Switch for HP c-Class BladeSystem

| | |
|--------------------------------|---|
| Integrated design | The Cisco MDS 9124e Fabric Switch hot-plugs into the back of the HP BladeSystem c-Class enclosure, freeing up rack space. Interconnect for servers and switches internal to the BladeSystem reduces cabling, SFPs and associated costs. Shared power and cooling resources further reduces cost and additional points of failure. |
| 4 Gbps SAN connectivity | Employs high speed technology for storage networking. Up to eight external facing ports auto-sense lower bandwidth components for greater flexibility and investment protection (4, 2, or 1 Gbps). |
| High availability | Designed for environments where downtime is not an option. Up to six FC switches are supported in the BladeSystem enclosure. Hot-pluggable design supports non-disruptive upgrades, VSANs for fault isolation, and PortChannels for ISL resiliency. |
| Flexible licensing | Dynamic and growing businesses require the flexibility to manage their investment wisely. Designed to scale as business needs dictate with the option of a 12-port model and a 12-port upgrade license. |
| Traffic management | Simplifies deployment while optimizing core edge fabrics with support for virtual output queuing, flexible buffer credit allocation, PortChannels, Fabric Shortest Path First (FSPF), and more. |
| VSAN support | Support for up to 16 VSANs per switch that can be zoned as its own fabric enables efficiency, lower cost through shared usage, the flexibility of independent configuration control, and increased security through isolation of devices on the same physical SAN. |
| Long distance support | Individual ports can be configured with short-range, medium range, or long-rangelength SFP optics for connectivity of up to 500 meters, 4 kilometers and 10 kilometers, respectively. |

Overview

| | |
|--|---|
| Broad range of management options | Simple and consistent with support by the Cisco MDS 9000 family management tools including a CLI, Cisco Fabric Manager and a standards-based API supporting SNMP and SMI-s. Also supported by HP unified server and storage management tools including HP Onboard Administrator, HP SIM, and HP Storage Essentials. |
| Comprehensive security | Offers an extensive security framework to protect highly sensitive data crossing today's enterprise networks. |

Models

| | | |
|---|---------------------------------------|--------|
| Cisco MDS 9124e Fabric Switch for HP c-Class BladeSystem | Cisco MDS 9124e 12-port Fabric Switch | AG641A |
| | Cisco MDS 9124e 24-port Fabric Switch | AG642A |

Product Highlights

| | |
|---|--|
| Configuration support | Please see the following Web site for configuration support at: http://h18000.www1.hp.com/products/storageworks/san/documentation.html |
| Cost Effective Intelligent Storage networking | Powered by Cisco MDS 9000 SAN-OS Software, offers intelligent storage networking capabilities such as Virtual SANs (VSANs), PortChannels, quality of service (QoS), and security for cost-effective design, deployment, and management of enterprise SANs. |
| Highly available platform for mission-critical deployments | Designed for environments where downtime is not an option. It offers nondisruptive software upgrades, VSANs for fault isolation, and PortChannels for Inter-Switch Link (ISL) resiliency. |
| Flexibility | <p>Offers up to 24 4/2/1-Gbps auto-sensing Fibre Channel ports with 4Gbps of dedicated bandwidth to each port, and an aggregate platform bandwidth of 192 Gbps. Starts with a base configuration of 12 ports (8 internal and 4 external ports) with flexibility to upgrade in the field to 24 ports using 12-port upgrade activation license.</p> <p>New N-Port Virtualizer feature (SAN-OS v3.2(1a) and later) employs industry-standard N-Port Virtualization technology to eliminate domain count concerns and enable fabric interoperability.</p> <p>There can be a total of 16 internal ports for connectivity to 16 server blades and 8 front panel ports for connectivity to the SAN, server, or storage devices.</p> |
| Simplified storage management | Includes built-in storage network management, with all features available through a command-line interface (CLI) or integrated with HP Storage Essentials or Cisco Fabric Manager |
| Comprehensive security framework | Supports RADIUS and TACACS+, port security, fabric binding, Fibre Channel Security Protocol (FC-SP) host-to-switch and switch-to-switch authentication, Secure FTP (SFTP), Secure Shell Version 2 (SSHv2) and Simple Network Management Protocol Version 3 (SNMPv3) implementing Advanced Encryption Standard (AES), VSANs, hardware-enforced zoning, broadcast zones, and per-VSAN role-based access control (RBAC). |
| Sophisticated diagnostics | Industry-leading intelligent diagnostics such as Fibre Channel Ping, Fibre Channel Traceroute, Switched Port Analyzer (SPAN), Cisco Fabric Analyzer, and integrated call-home capability enhance reliability, facilitate faster problem resolution, and reduce service costs. |
| Interoperability | Common platform architecture and the use of Cisco MDS 9000 SAN-OS Software intelligent storage-networking services across all Cisco MDS 9000 family switches reduces ongoing operating expenses by providing a consistent set of provisioning, management, and diagnostic capabilities. Offers compatibility with a broad range of HP servers and operating systems, as well as storage devices; see current compatibility matrix. |

Product Highlights

Software Components, Included

| | |
|-----------------------------|---|
| SAN-OS | Cisco MDS 9000 SAN-OS delivers numerous advanced storage networking capabilities for the Cisco MDS 9000 Family of Multilayer Intelligent Directors and Fabric Switches. |
| Cisco Fabric Manager | Provides integrated, comprehensive management of larger SAN environments allowing administrators to perform vital tasks such as topology, discovery, fabric configuration and verification, provisioning, monitoring, and fault resolution. |

Software Components, Optional

| | |
|--|--|
| Cisco Fabric Manager Server Package | The Cisco Fabric Manager Server (FMS) package extends Cisco Fabric Manager by providing historical performance monitoring for network traffic hot-spot analysis, centralized management services, and advanced application integration. All standard Cisco Fabric Manager features and functions are fully integrated with the Cisco FMS capabilities. |
| Cisco Enterprise Package | The Cisco MDS switch also has a set of additional advanced traffic engineering and advanced security features recommended for all Enterprise SANs. The additional features listed below are bundled together in the Cisco MDS 9000 Enterprise package. <ul style="list-style-type: none">● Quality of Service (QoS) levels● Switch-Switch and Host-Switch Authentication● Host to LUN Zoning● Read-Only Zoning● Individual Port Security● VSAN Based Access Control |

BladeSystem compatibility

NOTE: The Cisco MDS 9124e Fabric Switch for HP c-Class BladeSystem must be deployed with the BladeSystem c-Class infrastructure and will only work with the HP BladeSystem c-Class Enclosures.

| | |
|--|---|
| ProLiant Servers | ProLiant BLc server blades |
| Integrity Servers | Integrity BLc server blades |
| ProLiant BL c-Class Server Blade Enclosures | HP BladeSystem c7000 and c3000 Enclosures |

Product Highlights

Switch interoperability

HP StorageWorks C-Series Switches, Directors, and Routers

HP StorageWorks C-Series Multilayer Directors (4Gb capable)

- Cisco MDS 9513 Multilayer Director Switch
- Cisco MDS 9509 Multilayer Director Switch
- Cisco MDS 9506 Multilayer Director Switch

HP StorageWorks C-Series Multilayer Fabric Switches (4Gb capable)

- Cisco MDS 9216A Multilayer Fabric Switch
- Cisco MDS 9216i Multilayer Fabric Switch

HP StorageWorks 4Gb C-Series Fabric Switches

- Cisco MDS 9134 Fabric Switch
- Cisco MDS 9124 Fabric Switch
- Cisco MDS 9020 Fabric Switch

HP StorageWorks 2Gb C-Series Fabric Switches

- Cisco MDS 9120 Fabric Switch
- Cisco MDS 9140 Fabric Switch

Service and Support, HP Care Pack and Warranty Information

Warranty (1-1-1) Hardware Warranty - One-year on-site warranty, normal business hours, next business day response, installation not included.
NOTE: The hardware warranty covers firmware and embedded non-saleable software.

Software Product Services

- Stand-alone telephone support
- Rights to new license version
- Media and documentation updates

Hardware Product Services

- Installation services
- On-site maintenance (includes warranty support)
- Response time upgrades during the warranty period
- Post-warranty coverage

NOTE: The embedded SAN switches for HP BladeSystem c-Class are not covered under the BladeSystem c-Class Enclosure Care Packs; the SAN switches carry separate Care Packs. SAN Switch Care Pack service level support should always be uplifted to match existing storage or server service levels.

NOTE: The HP Care Pack service part numbers below covers both the Cisco MDS 9124e 12-port Fabric Switch & Cisco MDS 9124e 24-port Fabric Switches

Hardware Services On-site Service

| | |
|--|--------|
| Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic | UF313E |
| 4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic | UF972E |
| 4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic | UF973E |
| 6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic | UF974E |
| Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 4 Years, Electronic | UF975E |
| 4-Hour On-site Service, 5-Day x 13-Hour Coverage, 4 Years, Electronic | UF976E |
| 4-Hour On-site Service, 7-Day x 24-Hour Coverage, 4 Years, Electronic | UF977E |
| 6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 4 Years, Electronic | UF978E |
| Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 5 Years, Electronic | UF979E |
| 4-Hour On-site Service, 5-Day x 13-Hour Coverage, 5 Years, Electronic | UF980E |
| 4-Hour On-site Service, 7-Day x 24-Hour Coverage, 5 Years, Electronic | UF981E |
| 6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 5 Years, Electronic | UF982E |
| Hardware Installation, Electronic | U5988E |

Additional Services Implementation service, SAN Architecture service. For more information on service options, please visit our Web site at: <http://www.hp.com/go/san>.

Service and Support, HP Care Pack and Warranty Information

HP Service Warranty and Support Options HP Service & Warranty Support Additional Warranty protection and/or HP Installation packages can be purchased.

NOTE: Certain restrictions and exclusions apply. Consult the Customer Support Center for details. HP provides a one-year, hardware limited warranty, fully supported by a worldwide network of resellers and service providers.

In addition, available service offerings include a full range of HP Care Pack packaged hardware and software services:

- Installation
- Extended coverage hours and enhanced response times
- System management and performance services

For more information on warranty and support options, please visit our Web site at:

<http://www.hp.com/hps/tech/storage/supp/>.

HP Care Pack Services Warranty Upgrade Options

Service offerings include a full range of Customer HP Care Pack services for both hardware and software services:

- Response - Upgrade on-site response from next business day to same day 4-hours
- Coverage - Extend hours of coverage from 5 days x 9 hours to 7 days x 24 hours
- Duration - Select duration of coverage for a period of 1, 3, 4, or 5 years

Additional Warranty protection and/or HP Installation packages can be purchased.

NOTE: Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details

HP Care Pack Information HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage.

- HP Care Pack is not available for less than the product's warranty duration.
- HP Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required.
- HP Care Pack services are prepaid.

For additional HP Care Pack (hardware & software) information, as well as orderable part numbers, please refer to the URL listed below:

<http://h20219.www2.hp.com/services/cache/11170-0-0-225-121.html>

Service and Support, HP Care Pack and Warranty Information

Family Comparison Chart

| | Cisco MDS 9513 w/Dual Supervisor 2 | Cisco MDS 9222i | Cisco MDS 9509 w/Dual Supervisor 2 | Cisco MDS 9506 w/Dual Supervisor 2 |
|-----------------------------|---|---|---------------------------------------|---|
| Introduction Date | May 2006 | November 2007 | May 2006 | May 2006 |
| Switch Type | Multilayer Director | Multilayer Fabric Switch | Multilayer Director | Multilayer Director |
| Maximum ports | 528 Fibre Channel, 58 IP ports | 18 fixed auto-sensing 4/2/1-Gbps Fibre Channel ports, 4 1-Gb Ethernet ports | 336 Fibre Channel, 50 IP ports | 192 Fibre Channel, 26 IP ports |
| Number of slots per chassis | Thirteen | | Nine | Six |
| | Cisco MDS 9216i | Cisco MDS 9216A | Cisco MDS 9124 | Cisco MDS 9124e Fabric Switch for HP c-Class BladeSystem |
| Introduction Date | May 2006 | Dec 2005 | March 2007 | Feb 2007 |
| Switch Type | Multilayer Fabric Switch | Multilayer Fabric Switch | Fabric Switch | Embedded Switch |
| Maximum ports | 64, up to 62 Fibre Channel, 10 IP ports | 64 FC, up to 16 FC and 8 IP ports | Up to 24 Fibre Channel ports | Up to 24 Fibre Channel ports |
| Number of slots per chassis | Two | Two | N/A, Fixed FRU | N/A |

NOTE: Please Refer to SAN Design Guide pointer:
<http://www.hp.com/go/sandesignhor> <http://www.hp.com/go/sandesignguide>.

Configuration Information

Step 1 – Base Configuration

Select one:

| Model Number | Model Description | Part Number |
|---------------------------------------|--|-------------|
| Cisco MDS 9124e 12-port Fabric Switch | (1) 4Gb SAN Switch; 12 ports enabled (8 internal, 4 external); two (2) short range 4Gb SFPs; SAN-OS; eight (8) port dust covers; documentation | AG641A* |
| Cisco MDS 9124e 24-port Fabric Switch | (1) 4Gb SAN Switch; 24 ports enabled (16 internal, 8 external); four (4) short range 4Gb SFPs; SAN-OS; eight (8) port dust covers; documentation | AG642A* |

* #OD1 will appear after this part number on your sales order when factory integration is indicated.

Step 2 – Additional Options

Hardware:

| Model Name | Model Description | Part Number |
|---------------------------------|---|-------------|
| 4Gb Optical Transceivers (SFPs) | Cisco MDS 9000 4Gb FC SFP, Short Range Transceiver 500m, (4 Pack) | AE379A |
| | Cisco MDS 9000 4 Gb FC SFP 4km Medium Range Transceiver | AE494A |
| | Cisco MDS 9000 4 Gb FC SFP 10km Long Range Transceiver | AE380A |

NOTE: Additional SFPs are optional and must be ordered separately. Fibre Channel ports on the MDS 9124e Fabric Switch may be configured to accept either Short Range SFP or Long Range SFP optic transceivers. However, when ordering the MDS 9124e Fabric Switch, ports must be populated with above SFP optical transceiver options only (no substitutes allowed). Using other transceivers may void product warranty.

Optical cables

LC-LC for between 2/4Gb and 2/4Gb Fibre Channel devices

| | |
|---|------------|
| 2 m LC-LC Multi-Mode Fibre Channel Cable | 221692-B21 |
| 5 m LC-LC Multi-Mode Fibre Channel Cable | 221692-B22 |
| 15 m LC-LC Multi-Mode Fibre Channel Cable | 221692-B23 |
| 30 m LC-LC Multi-Mode Fibre Channel Cable | 221692-B26 |
| 50 m LC-LC Multi-Mode Fibre Channel Cable | 221692-B27 |

LC-SC for between a 1Gb and 2/4Gb Fibre Channel devices

| | |
|---|------------|
| 2 m LC-SC Multi-Mode Fibre Channel Cable | 221691-B21 |
| 5 m LC-SC Multi-Mode Fibre Channel Cable | 221691-B22 |
| 15 m LC-SC Multi-Mode Fibre Channel Cable | 221691-B23 |
| 30 m LC-SC Fibre Channel Cable | 221691-B26 |
| 50 m LC-SC Fibre Channel Cable | 221691-B27 |

Accessories

| | |
|--------------------------------|--------|
| MDS 9000 Port Analyzer Adapter | A7430A |
|--------------------------------|--------|

Software:

| Optional Software | | | Part Number |
|-------------------------------------|---------------------|--|-------------|
| Cisco MDS 9124e 12-port Upgrade LTU | Licensed per switch | | T5169A |
| Cisco Fabric Manager Server Package | Licensed per switch | | A7512A |
| Cisco Enterprise Package | Licensed per switch | | A7515A |

Step 3 – Installation Service Option

<http://www.hp.com/hps/support>

For more information on HP SAN switches, contact any of our worldwide sales offices or visit our Web site at:

<http://www.hp.com/go/san>.

Technical Specifications

| | | |
|--|---|---|
| Fibre Channel ports | <p>Cisco MDS 9124e 12-port Fabric Switch model 8 internal 4Gb internal ports and 4 external 4 Gbps auto-sensing ports (ships with two (2) 4 Gbps short range SFPs)</p> <p>Cisco MDS 9124e 24-port Fabric Switch model 16 internal 4Gb internal ports and 8 external 4 Gbps auto-sensing ports (ships with four (4) 4 Gbps short range SFPs)</p> | |
| Device support and Scalability guidelines | <p>http://h18006.www1.hp.com/products/storageworks/san/documentation.html</p> | |
| Performance | 4 Gb/sec line speed, full duplex | |
| Certified maximum | <p>Certified maximum information available at: http://h18006.www1.hp.com/products/storageworks/san/documentation.html</p> | |
| Switch core | Non-blocking | |
| Maximum frame size | 2112-byte payload | |
| Classes of service | Class 2, Class 3, Class F (inter-switch frames) | |
| Port types | FL_Port, F_Port, and E_Port; self-discovery based on switch type (U_Port) | |
| Data traffic types | Fabric switches supporting unicast and broadcast | |
| Media types | Small Form-Factor Pluggable (SFP) laser. 1/2/4Gb short range up to 500 m (1,640 ft.), 1/2/4Gb medium range up to 4 km and 1/2/4Gb long range up to 10 km. | |
| Laser | Short-range, medium range, and long-range transceivers (SFP's) | |
| Fabric services | Name server, registered state change notification (RSCN), login services, public loop, broadcast, in-order delivery, name-server zoning | |
| Options | SFP media, upgrade licensing, management software | |
| Supported software | Telnet, SNMP (FE MIB, FC Management MIB), HP Systems Insight Manager, HP Storage Essentials, HP Onboard Administrator for BladeSystem, Fabric Manager, Fabric Manager Server, Enterprise Package | |
| Management access | In-band via HP On-Board Administrator for BladeSystem | |
| Diagnostics | Power-on self test (POST) diagnostics, online diagnostics, internal loopbacks, SPAN, Fibre Channel traceroute, Fibre Channel Ping, Fibre Channel Debug | |
| Dimensions | Depth | 11.00 in. (with handle protrusion) |
| | Height | 1.25 in. |
| | Width | 7.75 in. |
| | Weight | Approx. 2.83 lb - without media |
| Environment | System Inlet Temperature | <p>Operating 10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305m (1.8°F per every 1000ft) above sea level to a maximum of 3050m (10,000ft), no direct sustained sunlight. Maximum rate of change is 10°C/Hr (18°F/Hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).</p> <p>Non-operating -30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/Hr (36°F/Hr).</p> |
| | Relative Humidity | <p>Operating 10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.</p> |

Technical Specifications

| | | | |
|--|---|---|---|
| | | Non-operating | 5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing. |
| | Altitude | Operating | 3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min). |
| | | Non-operating | 9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min). |
| Vibration | Operating | 1 G, 10-500 Hz, 60 minutes per axis | |
| | Non-operating | 2 G, 10-500 Hz, 30 minutes | |
| Shock | Operating | Half-sine-wave shock, 40 G, 2 ms duration, in each direction of three mutually perpendicular axes. | |
| | Non-operating | Half-sine-wave shock, 140 G, 2 ms duration, in each direction of three mutually perpendicular axes; and square-wave shock up to 80 G, 180 inches/s velocity change, in each direction of three mutually perpendicular axes. | |
| EMI | CFR 47 Subpart B of Part 15 of the FCC Rules, Class A level CISPR22 Class A EN55022 Class A VCCI Class A ITE AS/NZS 3548 Class A CNS 13438 Class A EMC Directive (89/336/EEC) for CE Marking in European Union | | |
| Safety | Underwriters Laboratories, UL60950 Canadian Standards Association, CSA60950 TUV Rheinland of North America, EN60950 Nemko, EN60950 Low Voltage Directive (73/23/EEC) for CE Marking in European Union | | |
| Fibre Channel Standards And Revisions | <ul style="list-style-type: none"> ● FC-PH, Revision 4.3 ● FC-PH-2, Revision 7.4 ● FC-PH-3, Revision 9.4 ● FC-GS-2, Revision 5.3 ● FC-GS-3, Revision 7.01 ● FC-FLA, Revision 2.7 ● FC-FG, Revision 3.5 ● FC-SW-2, Revision 5.3 ● FC-AL, Revision 4.5 ● FC-AL-2, Revision 7.0 ● FC-PLDA, Revision 2.1 ● FC-VI, Revision 1.61 ● FCP, Revision 12 ● FCP-2, Revision 7 ● FC-SB-2, Revision 2.1 ● FC-BB, Revision 4.7 ● FC-FS, Revision 1.9 ● FC-PI, Revision 13 ● FC-MI, Revision 1.99 ● FC-Tape, Revision 1.17 | | |

Technical Specifications

- IP over Fibre Channel (RFC 2625)
 - Extensive IETF-standards-based TCP/IP, SNMPv3, and Remote Monitoring (RMON) MIBs
 - Class of service: Class 2, Class 3, Class F
 - Fibre Channel standard port types: E, F, FL
 - Fibre Channel enhanced port types: SD, TE
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