



> RESILIENT, AVAILABLE AND AFFORDABLE DESKTOP SWITCHING

NORTEL

Product Brief

Nortel Ethernet Routing Switch 4500 Series

The Nortel Ethernet Routing Switch 4500 product family is a stackable system which provides the high-performance, convergence-ready, secure and resilient Ethernet connectivity required by today's application- and competition-

driven enterprise networks. The Ethernet Routing Switch 4500 delivers 10/100 and 10/100/1000 switching with Power over Ethernet models for simplified network deployments, driving lower Total Cost of Ownership.

Nortel Ethernet Routing Switch 4500 Series

Model	Port configurations
ERS4526FX	4526FX with 24 100BaseFX ports plus 2 combo 10/100/1000 SFP ports, HiStack ports and RPS slot
ERS4550T	4550T with 48 10/100 BaseTX ports plus 2 combo 10/100/1000 SFP ports, HiStack ports and RPS slot
ERS4548GT	4548GT with 48 10/100/1000 BaseTX ports and 4 shared SFP ports, plus HiStack ports and RPS slot
ERS4548GT-PWR	4548GT-PWR with 48 10/100/1000 802.3af PoE ports and 4 shared SFP ports, plus HiStack ports and RPS connector
ERS4550T-PWR	4550T-PWR with 48 10/100 802.3af PoE ports plus 2 combo 10/100/1000 SFP ports, HiStack ports and RPS connector

All switches include built-in Hi-Stack stacking ports that can deliver up to 320 Gbps performance, plus redundant power support. Additionally, each model can be stacked in any combination with other Ethernet Routing Switch 4500 models to form a stack up to eight units high — enabling you to choose port configurations based on your unique requirements.



Ethernet Routing Switch 4500 Series

Nortel Ethernet Routing Switch 4500 highlights

- Power to IP phones, wireless access points, network cameras, security, lighting and access control devices through Power over Ethernet
- High-density desktop connectivity, supporting up to 400 10/100 ports or 384 10/100/1000 ports — all managed as a single entity
- Higher network uptime through high-resiliency features such as fail-safe stacking, DMLT and power redundancy
- Investment protection with flexible mix-and-match stacking capabilities

Stackable: a mix-and-match solution that fits all

Switch stacks can be made up of any models within the Ethernet Routing Switch 4500 family, making this an ideal solution for enterprises with fast Ethernet or Gigabit users — or a combination of both. As a single stacked entity, all switches are managed via a single IP address and offer the same high resiliency and common feature set simplifying management and deployment across the network.

Convergence-ready

The ERS 4550T-PWR and ERS 4548GT-PWR provide IEEE 802.3af standards-compliant Power over Ethernet. This standard interoperability enables the switch to power multiple devices — including IP phones, wireless access points, network cameras, security devices and access control devices — regardless of product vendor.

Deployment in converged networks is greatly simplified through dynamic power management of the PoE ports, with load sharing and redundant power offered by Nortel's RPS 15 Power Supply Unit. Combined, these features are designed to ensure that devices requiring PoE can be added to the network — without power ever becoming an issue.

The Ethernet Routing Switch 4500 uses standards-based DSCP and 802.1p priority queuing to prioritize mission-critical traffic — such as voice over IP (VoIP). Through this quality of service functionality, the switch can forward packets in priority order on a per-port basis and support four queues for the classification and prioritization of network traffic, ensuring high levels of voice and video quality across the network during high data traffic periods across the network.

The Ethernet Routing Switch 4500 family also uses IEEE standard 802.1AB for auto discovery of 802.1AB devices, such as IP phones. Each 802.1AB-supporting device learns the identification, configuration and capabilities of

neighboring devices, and provides these details to the network management system. This ensures that the system has the most up-to-date physical view of the network, and can find and correct communication configuration mismatches quickly.

HiStack stacking for scalability, resilience and performance

Nortel continues to evolve its resilient stacking technology with the introduction of HiStack stacking on the Ethernet Routing Switch 4500, delivering reliable wiring closet connectivity for customer networks.

HiStack stacking uses the two built-in stack ports on each switch and a combination of technologies to deliver High Resiliency combined with High Performance stacking bandwidth of up to 320 Gbps. Furthermore, through its ability to form a stack in any combination of up to eight units, the ERS 4500 Series can deliver up to 400 ports, meeting almost any customer's requirements of scalability and port speed flexibility.

Additionally, HiStack is designed to provide improved network uptime by maintaining the operation of the stack should a stacking cable or unit in the stack fail. HiStack also provides optimum bandwidth within the stack by utilizing intelligent bi-directional traffic flows between switches to ensure the highest performance and most efficient paths are used.

Simplified stack management

The ERS 4500 stack can be managed as a unified entity through a single IP address to simplify network operations. In the event that a unit is added into an existing stack, software on the new units is automatically synchronized with that of the stack. In the unlikely event of a switch failure, the failed unit can be swapped out while the rest of the units in the stack remain operational and the configuration of the failed unit is automatically applied to the replacement unit.

Resilience and performance through bandwidth aggregation

Nortel empowers customers to simply and efficiently add bandwidth to links in the network using either Nortel Multi-Link Trunking (MLT) or standards-based 802.3ad Link Aggregation. These technologies allow customers to bundle multiple connections into a single network trunk to provide increased bandwidth and resiliency. In the event that a link should fail within the aggregation or trunk, network resiliency can be significantly improved as fail-over to the remaining active links is not dependent on slow converging networking protocols.

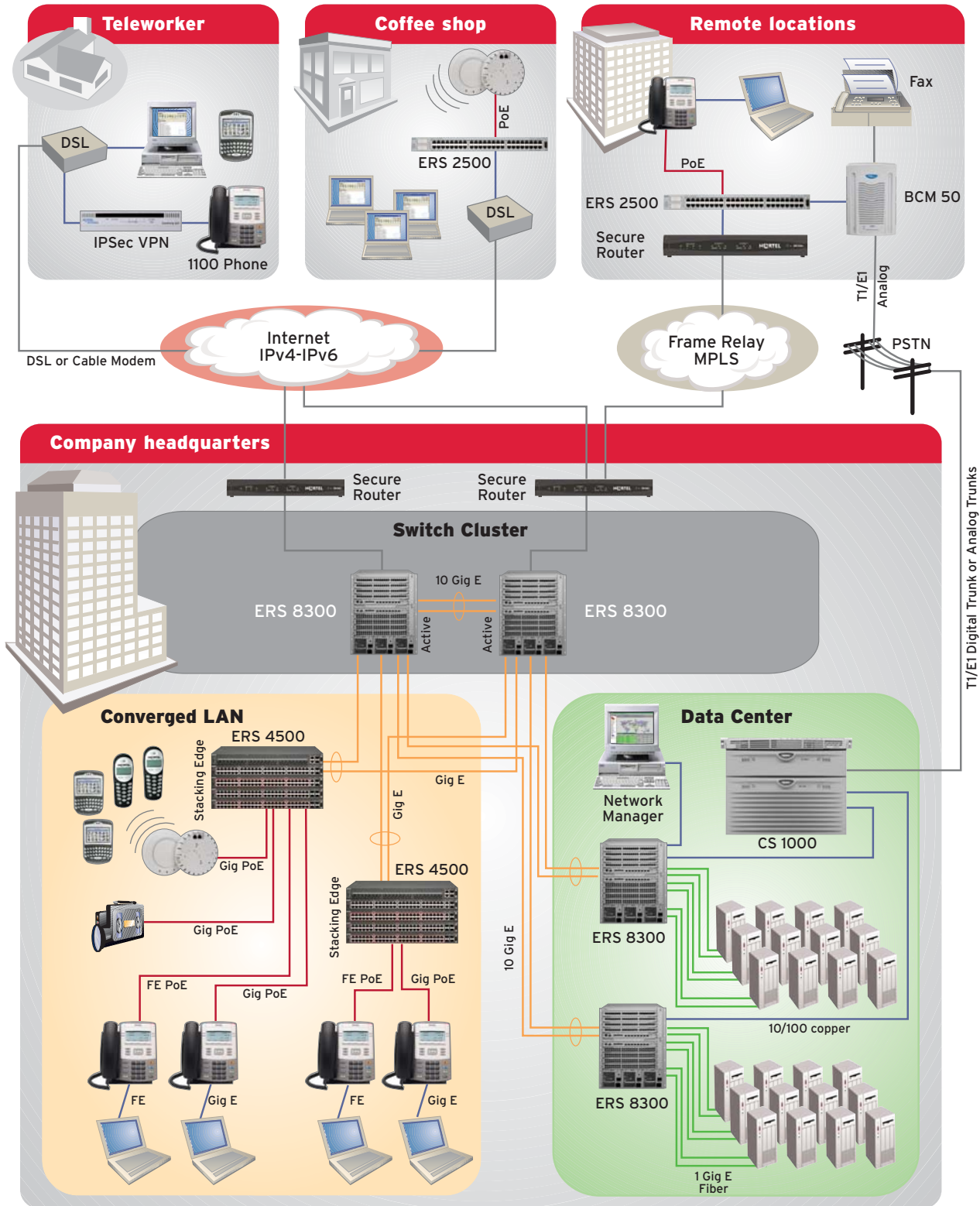
Resiliency can be further enhanced with uplinks being distributed across multiple switches, ensuring that if a switch in the stack should fail, the remaining uplink links continue to provide network connectivity to users connected to the remaining units. Furthermore, higher levels of network resiliency can be introduced if this Distributed Multi-Link Trunking (DMLT) or Distributed Link Aggregation (DLAG) are used in combination with Nortel's Split Multi-Link Trunking (SMLT). SMLT enables the links of an MLT, DMLT or DLAG to be terminated on two interconnected core switches (such as the Ethernet Routing Switch 1600, 5500, 8300 or 8600) for increased resilience and performance from the edge to the core of the network.

In combination, HiStack and the multi-link technologies MLT, DMLT and 802.3ad Link Aggregation enable customers to continue to provide network services with the Ethernet Routing Switch 4500 in the unlikely event of the failure of a switch in a stack, network uplinks or even core switches with minimal to no network operations intervention. This can all be achieved without the added complexity and slow recovery times of legacy protocols on the network, thus simplifying management and ensuring that the network is continually accessible.

Figure 1. Ethernet Routing Switch 4500 as part of a complete Nortel solution

End-to-end Nortel enterprise solutions

Deployments of end-to-end solutions are made simple by allowing customers to choose the products that best fit their network requirements. From Voice over IP to wireless connections, the Ethernet Routing Switch 4500 supports the features to ensure seamless inter-connectivity of products all from a single vendor.



Securing access at the edge

The Ethernet Routing Switch 4500 enables customers to provide multiple levels of network security to ensure that not only access to the network can be authenticated and controlled, but that actions can be taken to limit the propagation of harmful traffic on the network from the edge in the wiring closet.

The Ethernet Routing Switch 4500 supports the IEEE 802.1x based security (also known as Extensible Authentication Protocol - EAP) which can limit access to the network based on user credentials. A user is required to “login” to the network using a username/password before access is granted to the network. Additional functionality of MAC address-based security and intrusion detection allow the Ethernet Routing Switch 4500 to further increase the level of security that can be provided for customer networks.

The powerful filtering capabilities of the Ethernet Routing Switch 4500 that are often used for Quality of Service to ensure mission-critical traffic is prioritized can also be used to block certain types of network traffic with support for advanced packet classification and deep packet filtering up to 128 bytes into a packet.

Nortel's Ethernet Routing Switch 4500 also supports robust switch management security with the support of management access control lists, Simple Network Management Protocol (SNMPv3), Secure Shell (SSHv2) and RADIUS authentication for management connection to the switch or stack.

Simplified network management

The Ethernet Switch Software supports all Ethernet Routing Switch 4500 models. Single image software simplifies network operations and provides the flexibility of stacking different switches in the same stack. Loading the image to different switches is also considerably simplified. The image is loaded only to the base unit of the stack which automatically loads it to other switches in the stack. Additionally, by using the on-board USB port, network administrators are able to quickly and easily upload or download an ASCII configuration file onto a USB stick, thus allowing the same configuration to either be deployed across several switches, making configuration of new switches seamless or serving as a backup in case a switch were to go down.

Redundant power support

With connectivity to Nortel's RPS15 Power Supply Unit, the Ethernet Routing Switch 4500 delivers the redundant power supply support that's crucial in today's mission-critical environments. The unit can have up to three 600-watt power supply modules. Each power module can provide redundant power supply support to one Ethernet Routing Switch 4500 PWR or up to four Ethernet Routing Switch 4500 switches.*

Summary

With more than 100 years in telecommunications, Nortel is uniquely positioned to provide an end-to-end solution for your converged network. Let us show you how the Ethernet Routing Switch 4500 family, along with other Nortel products, can increase your profitability, streamline your business operations, increase productivity and help you gain a competitive edge.

* A DC cable connector cable is required to connect from an Ethernet Routing Switch 4500 to an RPS 15 power supply; for non-PoE models, a DC-DC converter is also required.

Ordering information

Switch versions

Order code	Description
AL4500*01-E6	Ethernet Routing Switch 4526FX with 24 100BaseFX ports plus 2 combo 10/100/1000 SFP ports, Hi-Stack ports and RPS slot. Includes Base Software License Kit and 46cm stack cable.
AL4500*02-E6	Ethernet Routing Switch 4550T with 48 10/100 BaseTX ports plus 2 combo 10/100/1000 SFP ports, Hi-Stack ports and RPS slot. Includes Base Software License Kit and 46cm stack cable.
AL4500*04-E6	Ethernet Routing Switch 4548GT with 48 10/100/1000 BaseTX ports and 4 SFP ports, plus Hi-Stack ports and RPS slot. Includes Base Software License Kit and 46cm stack cable.
AL4500*12-E6	Ethernet Routing Switch 4550T PWR with 48 10/100 802.3af PoE ports plus 2 combo 10/100/1000 SFP ports, Hi-Stack ports and RPS connector. Includes Base Software License Kit and 46cm stack cable.
AL4500*14-E6	Ethernet Routing Switch 4548GT PWR with 48 10/100/1000 802.3af PoE ports and 4 SFP ports, plus Hi-Stack ports and RPS connector. Includes Base Software License Kit and 46cm stack cable.

Cables and SFPs

Order code	Description
AA1419074-E6	1-port 100 Base-FX Small Form-Factor Pluggable (connector type: MT-RJ) for use in ERS4500 Series.
AA1419013-E5	1-port 1000Base-SX Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC).
AA1419014-E5	1-port 1000Base-SX Small Form Factor Pluggable GBIC (mini-GBIC, connector type: MT-RJ).
AA1419015-E5	1-port 1000Base-LX Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC).
AA1419025-E5	1-port 1000BaseCWDM Small Form Factor Pluggable Transceiver (mini-GBIC, connector type: LC) - 1470nm Wavelength, 40km.
AA1419026-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1490nm Wavelength, 40km.
AA1419027-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1510nm Wavelength, 40km.
AA1419028-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1530nm Wavelength, 40km.

Cables and SFPs — continued

Order code	Description
AA1419029-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1550nm Wavelength, 40km.
AA1419030-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1570nm Wavelength, 40km.
AA1419031-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1590nm Wavelength, 40km.
AA1419032-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1610nm Wavelength, 40km.
AA1419033-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1470nm Wavelength, 70km.
AA1419034-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1490nm Wavelength, 70km.
AA1419035-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1510nm Wavelength, 70km.
AA1419036-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1530nm Wavelength, 70km.
AA1419037-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1550nm Wavelength, 70km.
AA1419038-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1570nm Wavelength, 70km.
AA1419039-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1590nm Wavelength, 70km.
AA1419040-E5	1-port 1000BaseCWDM Small Form Factor Pluggable GBIC (mini-GBIC, connector type: LC) - 1610nm Wavelength, 70km.
AL4511001-E6	Ethernet Routing Switch 4500 Rack Mount Kit (Spare).
AL4518001-E6	4500-SSC Hi-Stack Stacking Cable 46cm (1.5ft) for Ethernet Routing Switch 4500 series (for use as spare).
AL4518002-E6	4500-SSC Hi-Stack Stacking Cable 1.5m (5ft) for Ethernet Routing Switch 4500 series (spare or for use as return cable for resiliency).
AL4518003-E6	4500-SSC Hi-Stack Stacking Cable 3m (10ft) for Ethernet Routing Switch 4500 series (spare or for use as return cable for resiliency).
AL4518004-E6	4500-SSC Hi-Stack Stacking Cable 5m (16.4ft) for Ethernet Routing Switch 4500 series (spare or for use as return cable for resiliency).

Redundant Power Supply

Order number	Description
AA0005017-E5	Ethernet Routing Switch RPS 15 Chassis (up to three RPS 15 modules can be installed in the chassis).
AA0005*19-E5	Ethernet Routing Switch RPS 15 600-watt RPS module (1 DC cable per RPS module required).
AA0005018-E6	Redundant Power Supply 15 - Connecting Cable (6ft / 1.8m) for a single ERS4550T PWR or ERS4548T PWR.
AL1904007-E6	-48 V DC-to-DC converter for use with RPS 15. (For use with ERS4526FX, ERS4550T or 4548GT.)
AA0005020-E6	Redundant Power Supply 15 - Long Connecting Cable (7.6m/25ft) for up to 4 x ERS4526FX, ERS4550T or 4548GT.
AA0005021-E6	Redundant Power Supply 15 - Short Connecting Cable (3m/10ft) for up to 4 x ERS4526FX, ERS4550T or 4548GT.

Maintenance Services

Order number	Description
GE5300xxx	Technical Support Service
GL5300xxx	Return & Replace Service
GF5300xxx	Managed Spares Services Pack - Next Business Day
GG5300xxx	Managed Spares Second Business Day
GH5300xxx	Managed Spares Services Pack - 4 Hour 7x24
GJ5300xxx	Managed On-Site with Spares Services Pack - Next Business Day
GK5300xxx	Managed Onsite with Spares SBD Svc Pack
GN5300xxx	Managed On-Site with Spares Services Pack - 4 Hour 7x24

* The seventh character (*) of the switch order number must be replaced with the proper code to indicate desired product nationalization:

"A" - No power cord included

"B" - Includes European "Schuko" power cord common in Austria, Belgium, Finland, France, Germany, The Netherlands, Norway, and Sweden

"C" - Includes power cord commonly used in the United Kingdom and Ireland

"D" - Includes power cord commonly used in Japan

"E" - Includes North American power cord

"F" - Includes Australian power cord, also commonly used in New Zealand and the People's Republic of China

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