NORTEL

Product Information

Nortel Ethernet Routing Switch 2500 Series demonstrates superior performance

In January 2007, Nortel conducted a series of tests to evaluate the switching performance of its Nortel Ethernet Routing Switch (ERS) 2500 portfolio — a new family of single rack-unit fixed configuration 10/100 switches that provides high-density 10/100 desktop connectivity to small and medium-sized enterprise customers' wiring closets.

Test highlights

- Exceptional performance of up to 9.523 Mpps and 11.606 Mpps of switching capacity using Nortel ERS 2526T/2526T-PWR and 2550T/2550T-PWR, respectively, when handling frame size of 64 bytes
- Wire-speed performance across 24 x 10/100BaseT ports and two 1-Gigabit Ethernet ports of a Nortel ERS 2526T/2526T-PWR, when handling Ethernet frame sizes of 64 through 1,518 bytes
- Wire-speed performance across 48 x 10/100BaseT ports and two 1-Gigabit Ethernet ports of a Nortel ERS 2550T/2550T-PWR, when handling Ethernet frame sizes of 64 through 1,518 bytes
- Nortel ERS 2500 Series switches achieve low latency and jitter, both of which are critical for handling Voice over IP (VoIP) traffic

The Ethernet Routing Switch 2500 Series

Convergence-ready, feature-rich and economically priced, the ERS 2500 Series offers outstanding value to enterprise businesses that want to enhance worker productivity and increase customer satisfaction. The series delivers 802.3af standards-based Power over Ethernet (PoE) to support IP Telephony and Wireless LAN access points.

The four-switch portfolio includes the ERS 2526T (24 x 10/100 Mbps + 2 Combo 10/100/1000 or SFP ports + 2 1000BaseT rear ports) and the ERS 2550T (48 x 10/100Mbps + 2 Combo 10/100/1000 or SFP ports + 2 1000BaseT rear ports).

Completing the series are the ERS 2526T-PWR and 2550T-PWR, which are ideal for businesses that want to take advantage of PoE capabilities.

Test configuration

Within a sophisticated lab environment, a Nortel ERS 2526T and Nortel ERS 2526T-PWR switch were connected to a Spirent 6000 series chassis. From the Spirent test tool, 24 10/100BaseT ports were connected to 24 Nortel ERS 2526T switch ports. Another 24 Spirent test ports were also connected to Nortel ERS 2526T-PWR switch ports.

Using Spirent SmartFlow — an industry-standard application that performs tests based on RFC 2544 — full mesh tests were conducted on all ports. Two Spirent 1-Gigabit Ethernet 10/100/1000 ports were connected to two ERS 10/100/1000 ports, on which full mesh tests ran as well. Note: A separate test was also conducted in which two 1G 10/100/1000BaseTs were replaced with two 1-Gigabit Ethernet fiber SFP ports.

Tests were also conducted on ERS 2550T/2550T-PWR switches. In these tests, one 2550T and one 2550T-PWR switch were connected to a Spirent 6000 series chassis. From the Spirent test tool, 48 10/100BaseT ports were connected to 48 ERS 2550T/2550T-PWR 10/100BaseT ports. As with the ERS 2526 switches, ports were given full mesh tests using Spirent SmartFlow application. Two Spirent 1-Gigabit Ethernet 10/100/1000 ports were connected to two ERS 10/100/1000 ports. These ports ran full mesh tests as well. Note: A separate test was also conducted in which two 1G 10/100/1000BaseT were replaced with two 1-Gigabit Ethernet fiber SFP ports.

Additionally, two Spirent 10/100/1000BaseT ports were connected to two ERS 10/100/1000BaseT rear ports. Full mesh tests were also run on these ports.

Nortel Ethernet Routing Switch 2500

- Enterprise-class features, convergence-ready functionality and high performance at a competitive price
- Power to IP phones, wireless access points, network cameras, security and lighting devices, and access control devices through Power over Ethernet
- Enterprise-class management with Command Line Interface, WebUI and Java Device Manager support
- High-density, flexible connectivity, supporting up to 52 user ports per switch, with 48 10/100BaseT ports and four Gigabit Ethernet ports
- Plug-and-play settings with simplified web-based configurations for data and power settings

Figure 1. Nortel Ethernet Routing Switch 2500 Series test network setup

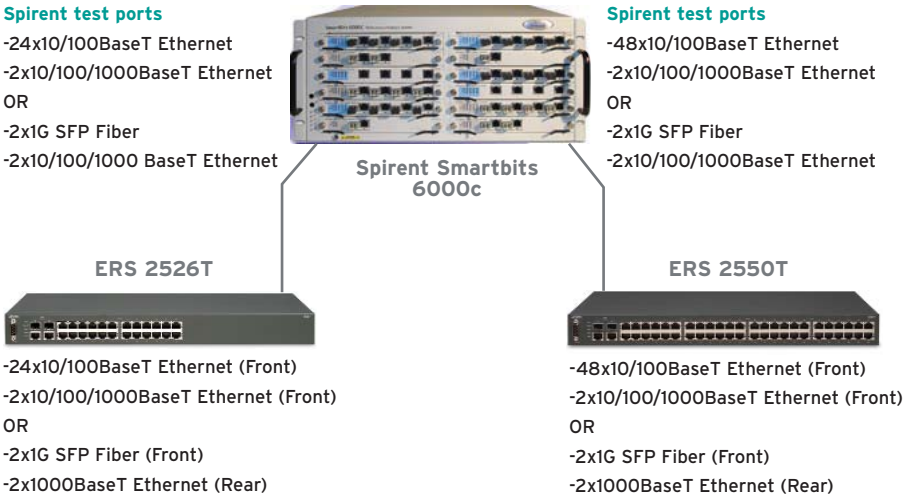
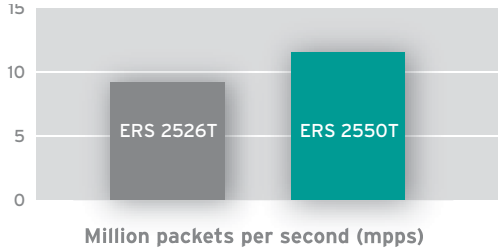


Figure 2. Nortel Ethernet Routing Switch 2500 Series performance test results (in millions of packets per second)



Million packets per second

When an ERS 2500 in standalone configuration was tested with Ethernet frame size of 64 bytes, all 10/100BaseT and Gigabit Ethernet ports achieved an industry-leading one million packets per second (Mpps) test. Engineers verified that the ERS 2526T and 2526T-PWR models deliver superior performance throughput of 9.523 Mpps, and that the 2550T and 2550T-PWR deliver 11.606 Mpps switching capacity for the Ethernet frame size of 64 bytes.

Zero-loss throughput

Tests were conducted to measure the zero-loss (<=0.001%) throughput (across all 10/100BaseT and Gigabit Ethernet ports) of an ERS 2500 handling frame sizes of 64, 128, 256, 512, 1,024, 1,280 and 1,518 bytes — once again in a standalone configuration.

Engineers verified that the ERS 2626T/2526T-PWR deliver wire-speed throughput. Results showed 6.4 Gbps of zero-loss throughput using 24 10/100BaseT, two 1-Gigabit Ethernet front and two 1-Gigabit Ethernet rear ports for Ethernet frame sizes of 64, 128, 256, 512, 1,024, 1,280 and 1,518 bytes.

Engineers also verified that the ERS 2650-T/2550T-PWR provides wire-speed throughput, recording 7.8 Gbps of zero-loss throughput using 24 10/100BaseT, two 1-Gigabit Ethernet front and one 1-Gigabit Ethernet rear ports for Ethernet frame sizes of 64,128, 256, 512, 1,024, 1,280 and 1,518 bytes.

Low jitter and latency

Within the same standalone configuration, engineers measured the average latency and its standard deviation — a statistical method of calculating how much the latency of a set of received packets varies from the mean. Average latency and jitter in was tested for Ethernet frame sizes of 64, 128, 256, 512, 1,024, 1,280 and 1,518 bytes. Latency was measured using the "cut-through" method. The ERS 2500 switches in standalone mode demonstrated extremely low latency and standard deviation in microseconds.

Figure 3. Nortel Ethernet Routing Switch 2500 Series throughput (%) test results

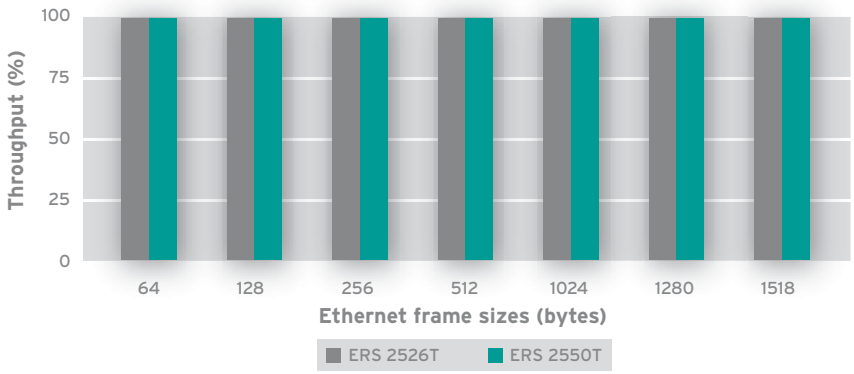
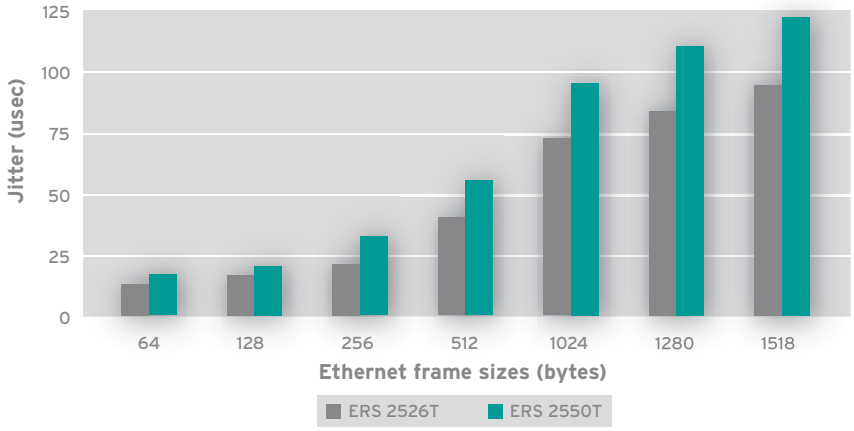


Figure 4. Nortel Ethernet Routing Switch 2500 Series jitter (usec) test results



In summary

When put to the test, the ERS 2526T/2526T-PWR and the ERS 2550T/2550T-PWR demonstrated superior forwarding capabilities of 9.523 Mpps and 11.606 Mpps, respectively. Switches achieved wire-speed performance across all 10/100BaseT ports and Gigabit Ethernet ports when handling Ethernet frame sizes of 64 bytes. Tests also showed that ERS 2500 Series switches deliver the low latency and jitter required for enterprises running VoIP and other converged applications across the network.

Product specifications

Height: 4.45 cm (1.75 in)
Width: 43.82 cm (17.25 in)

Depth

- 2526T/PWR: 30.7 cm (12.13 in)
- 2550T/PWR: 36.7 cm (14.56 in)

Performance specifications

- Switching capacity: 12.8 Gbps for 2526T and 15.6 Gbps for 2550T switches
- Frame forwarding rate max: 9.523 Mpps for ERS2526T models, and 11.606 Mpps for ERS 2550T models
- 1 RU high

Port forwarding performance

- For 10 Mbps: 14,880 pps maximum (64-byte packets)
- For 100 Mbps: 148,810 pps maximum
- For 1000 Mbps: 1,488,100 pps maximum

Forwarding database size

- 16,000 entries

Frame length

- 64 to 1,518 bytes (IEEE 802.1q Untagged)
- 64 to 1,522 bytes (IEEE 802.1q Tagged)

Multi-Link Trunks (and 802.3ad)

- Up to six trunks, four link members per trunk VLANs
- Up to 256 port-based; per VLAN Tagging option

Multiple Spanning Tree Groups

- Up to eight 8 (802.1w/s)

Interface options

- 10BASE-T/100BASE-TX/1000BASE-T RJ-45 (8-pin modular) connectors for Auto MDI/MDI-X interface

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