

Dell Computer Corp.

Dell PowerConnect 5212

Tolly Verified LAN Switch Evaluation

Test Summary

***Premise:** Network managers deploying hardware products in their networks need to be confident that the devices can perform as expected. When considering the purchase of such equipment, network architects and managers want verification of key features.*

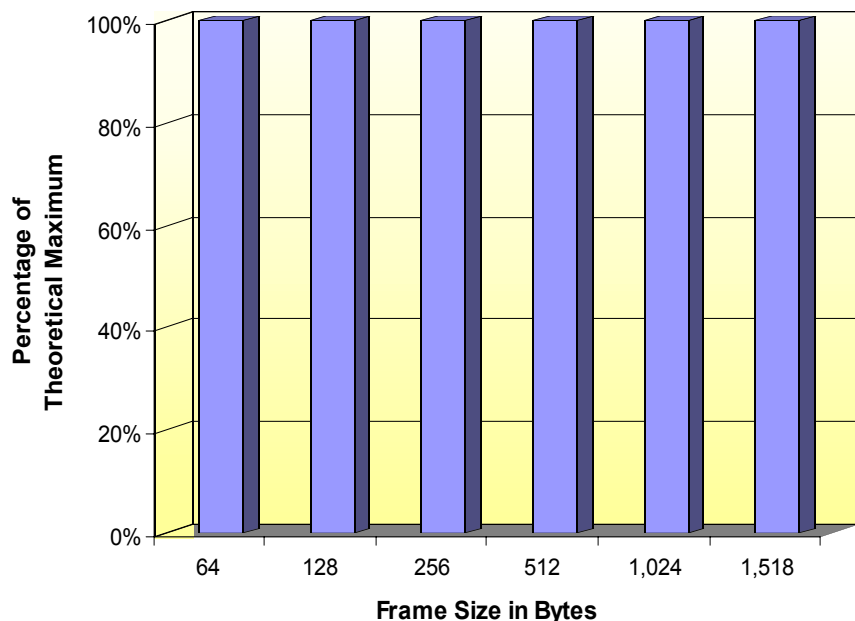
Dell Computer Corp. commissioned The Tolly Group to verify certain key attributes of its PowerConnect 5212, a 12-port, Layer 2 Gigabit Ethernet (GbE) switch. The Tolly Group engineers subjected the PowerConnect 5212 to a battery of tests designed to verify the PowerConnect 5212's key features. Testing was performed in May 2003.

Test results show that the Dell PowerConnect 5212 performs at GbE wire-speed at all frame sizes tested and exhibits a variety of key features essential to LAN switches including auto-negotiation, link aggregation (802.3ad), VLAN support (802.1Q), prioritization tagging (802.1p), rapid reconfiguration for Spanning Tree support (802.1w), and support for Jumbo (9,000-byte) Frames, plus support for RADIUS authentication. Further-more, system security and user management tests included management access authentication via RADIUS.

Test Highlights

- Achieves wire-speed throughput for all frame sizes tested
- Automatically sets link speed and duplex mode in conformance with partner port
- Supports IEEE 802.3ad to forward traffic across multiple aggregated links
- Appropriately tags and distinguishes traffic between multiple VLANs
- Correctly distinguishes and prioritizes traffic based on IEEE 802.1p
- Reconfigures Layer 2 Spanning Tree using "Rapid" Spanning Tree protocol
- Limits access to management functions via RADIUS

Layer 2 Gigabit Ethernet Throughput Dell PowerConnect 5212



Source: The Tolly Group, May 2003

Figure 1

Tolly Verified Certifications Earned

Certification ID	Certification	Category
10513	10/100/1000 Auto-Negotiation	LAN Connectivity
10554	Layer 2 Wire Speed 12-port Gigabit Ethernet	LAN Switch Core
10511	Link Aggregation (IEEE 802.3ad)	LAN Switch Core
10532	VLAN Support (IEEE 802.1Q)	LAN Switch Core
10533	QoS Recognition (IEEE 802.1p)	LAN Switch Core
10585	QoS- Four Traffic Queues	LAN Switch Core
10507	Rapid Reconfiguration Spanning Tree Support (802.1w)	LAN Switch Core
10503	Jumbo Frame Support - 9K	LAN Switch Core
10515	Port Mirroring	LAN Switch Core
10518	Dual Firmware Images	System Management
10519	Dual Configuration Images	System Management
10572	Embedded Web Management	System Management
10536	Management Access Authentication via RADIUS	System and Security User Management

For detailed descriptions of any of these certifications, visit <http://www.tolly.com>.

Source: The Tolly Group, May 2003

Figure 2

PERFORMANCE

Tests of Layer 2 wire-speed throughput utilizing 12 GbE ports verify that the PowerConnect performs at wire speed. Tests verify that the switch backplane is "non-blocking" and, thus, will not become a bandwidth bottleneck in the network. (See Figure 1.)

LAN CONNECTIVITY

Auto-negotiation tests verify that the PowerConnect 5212 interoperates with common 10/100/1000 networking components and automatically selects the optimum speed and duplex mode supported by the partner end of the connection, that is, it

correctly sets its link speed and duplex mode automatically in response to the speed and duplex settings of the partner port.

LAN SWITCH CORE TESTS

Link Aggregation tests certify that the PowerConnect 5212 has the capability to forward traffic across multiple aggregated links.

VLAN support tests demonstrate that the PowerConnect 5212 segments traffic appropriately according to the IEEE 802.1Q protocol.

QoS tests verify that the PowerConnect 5212 prioritizes traffic according to the 802.1p Quality of Service standard utilizing four traffic queues.

Rapid reconfiguration of Spanning Tree tests certify that the PowerConnect 5212 detects endpoints and forwards traffic utilizing the Rapid Spanning Tree protocol.

Jumbo Frame support tests demonstrate that the PowerConnect 5212 transports Ethernet Jumbo Frames, thus demonstrating that it can be used in high-performance data backup or storage networking applications in conjunction with Ethernet network interface cards that support Jumbo Frames.

Port Mirroring tests certify that the PowerConnect 5212 can be used in conjunction with network analyzers, intrusion detection/prevention systems, and other

devices that process a "mirrored" copy of the switch traffic.

SYSTEM MANAGEMENT

Dual firmware image tests certify that the PowerConnect 5212 can retain, and boot from, either a primary or a secondary image of the software. This capability provides a level of fault tolerance by allowing network managers to "fallback" to a previous version of software.

Dual configuration image tests certify that the PowerConnect 5212 can retain, and load from, either a primary or secondary image of the customer configuration file. This capability provides a level of fault tolerance by

allowing network managers to "fallback" to a previous version of user configuration.

Embedded Web Management tests verify that the PowerConnect 5212 demonstrates multiple configuration options via a standard Web browser interface.

SYSTEM SECURITY AND USER MANAGEMENT

Management access authentication tests demonstrate that the PowerConnect can accept and deny access to switch management functions via RADIUS.



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Key features*

Port attributes:

- 12 10/100/1000BASE-T auto-sensing Gigabit Ethernet switching ports
- Four SFP slots for fiber media support (Note: SFP slots are used instead of the built-in 10/100/1000BaseT ports)
- Auto-negotiation for speed, duplex mode and flow control
- Port mirroring
- Broadcast storm control

VLAN

- Up to 256 VLANs supported
- Dynamic VLAN with GVRP support

Availability

- Spanning Tree (IEEE 802.1D) and Rapid Spanning Tree (IEEE 802.1w) with Fast Link support

Multicast

- IGMP snooping for IP multicast support
- Static IP multicast

Quality of Service

- IEEE 802.1p tagging
- Port-based prioritization
- Layer 2/Layer 3-aware prioritization
- Four priority queues per port
- Adjustable Weighted-Round-Robin queue scheduling (WRR)

Security

- Switch access password protection
- Port-based MAC address alert and lock-down
- RADIUS and TACACS+ support for switch management access
- SSL/SSH encryption for switch management traffic
- SNMP access filtering

Other switching features

- Link aggregation with support for up to three aggregated links per switch and up to four ports per aggregated link (IEEE 802.3ad)
- LACP support
- Supports Jumbo Frames up to 9,000 bytes

Management

- Web-based management interface
- Industry-standard CLI accessible via Telnet or locally
- SNMPv1 and SNMP v2c supported
- Four RMON groups supported (history, statistics, alarms and events)
- TFTP transfers of firmware
- Dual firmware images supported
- Configuration file upload/download supported
- Statistics for error monitoring and performance optimization including port summary tables
- BootP/DHCP IP address management supported
- Syslog remote logging capabilities

**Vendor-supplied information not verified by The Tolly Group*

For more product information on the PowerConnect 5212 contact: Dell Computer Corp., One Dell Way, Round Rock, TX 78682 Phone: 1-800-BUY-DELL (1-800-289-3355) URL: <http://www.dell.com>

PROJECT PROFILE

Sponsor: Dell Computer Corp.

Document number: 203107

Product class: LAN switch




Products under test: Dell Computer Corp. PowerConnect 5212

Testing window: May 2003

For a full understanding of the certification tests passed by the PowerConnect 5212, on the Web go to:
<http://www.tolly.com/TVDetail.aspx?ProductID=73>

For more information on this document, or other services offered by The Tolly Group, visit our World Wide Web site at <http://www.tolly.com>, send E-mail to info@tolly.com, call (800) 933-1699 or (732) 528-3300.

The Tolly Group gratefully acknowledges the providers of test equipment used in this project.

Vendor	Product	Web address
	 SmartBits 6000B SmartFlow v2.00 SmartMetrics LAN3300A	http://www.spirentcom.com
	Domino DA-360	http://www.acterna.com

About Tolly Verified

The Tolly Group's Tolly Verified program certifies product features and functionality for various classes of strategic IT products - an apples-to-apples method to compare products in a category. Tolly Group engineers have classified the features, functions and performance characteristics of products and created test methodologies to compare product characteristics.

The Tolly Verified Online Catalog is a publicly accessible database designed for the user community that contains products that have successfully earned Tolly Verified certifications. The Tolly Verified products are listed by manufacturer name; products are listed initially for a one-year period, after which the vendor may have the product re-certified.

Tolly Verified is a certification service that enables vendors to validate product features at their most elemental level. The Tolly Verified Online Catalog provides an up-to-the minute centralized knowledge base that lists all products and features verified by The Tolly Group. This resource enables buyers to make quick, accurate product assessments and also helps vendors increase product awareness.

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