

Dell Computer Corp. PowerConnect 3348

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 3348, a 48-port, Layer 2 10/100BASE-T Fast Ethernet switch with Gigabit Ethernet uplinks. The Tolly Group engineers subjected the PowerConnect 3348 to a battery of tests designed to verify the PowerConnect 3348's key features. Testing was performed in July 2003.

Test results show that the Dell PowerConnect 3348 performs at wire speed at all frame sizes tested and achieves wire-speed Layer 3 ACL performance for 64-byte frames. The PowerConnect 3348 also exhibits a variety of key features essential to LAN switches including link aggregation (802.3ad), VLAN support (802.1Q), correctly prioritizes traffic based on IEEE 802.1p and rapid reconfiguration for Spanning Tree support (802.1w). Furthermore, system security and user management tests included management access authentication via RADIUS and IP ACLs.

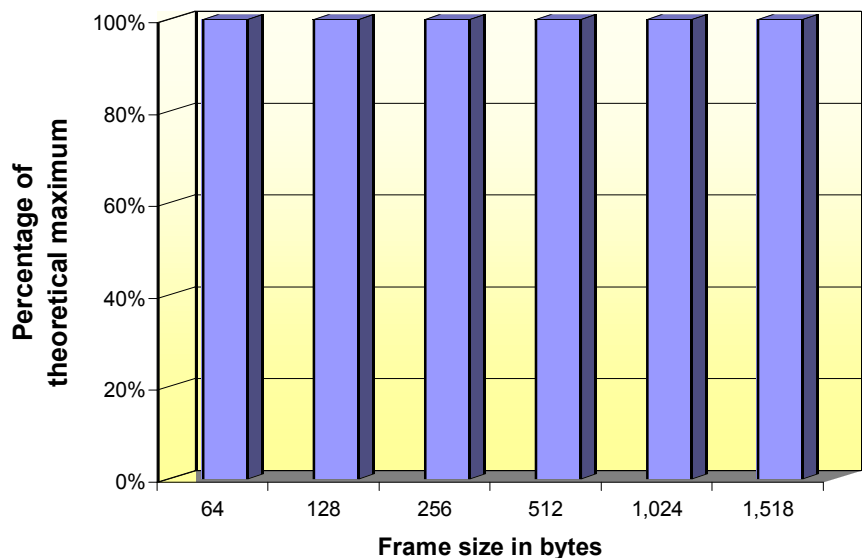
PERFORMANCE

Tests of Layer 2 wire-speed throughput utilizing 48 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.)

Test Highlights

- Achieves wire-speed throughput for all frame sizes tested
- Achieves wire-speed Layer 3 ACL performance for 64-byte frames
- 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
- Allows managers to limit access via RADIUS and IP ACLs

**Layer 2 Fast Ethernet Throughput
 Dell PowerConnect 3348**



Source: The Tolly Group, July 2003

Figure 1

Tolly Verified Certifications Earned

Certification ID	Certification	Category
10513	10/100/1000 Auto-Negotiation	LAN Connectivity
10528	Layer 2 Wire-Speed 48-port Fast Ethernet, All Ports (Fixed Configuration Switch)	LAN Switch Core
10552	Layer 2 Wire-Speed 48-port Fast Ethernet w/ Layer 3 ACLs	LAN Switch Core
10501	VoIP Capable Infrastructure	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
10515	Port Mirroring	LAN Switch Core
10518	Dual Firmware Images	System Management
10519	Dual Configuration Images	System Management
10572	Embedded Web Management	System Management
10535	Management Access Authentication via IP Access Control Lists	System Security and User Management
10536	Management Access Authentication via RADIUS	System and Security User Management

For detailed descriptions of any of these certifications, visit www.tolly.com.

Source: The Tolly Group, July 2003

Figure 2

LAN CONNECTIVITY

Auto-negotiation tests verify that the PowerConnect 3348 interoperates with common 10/100 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

The test for Layer 2 wire-speed Fast Ethernet with Layer 3 ACLs verified

that the switch could forward traffic at wire speed while applying Layer 3 IPv4-based ACLs on all ports. Devices earning this certification have demonstrated wire-speed throughput with a total of 15 ACLs specifically where the first 14 are set to deny traffic and the final ACL to permit.

In the VoIP Capable Infrastructure test for Quality of Service, engineers verified that the PowerConnect 3348's QoS mechanisms can adequately support latency-sensitive applications such as voice in a congested environment by providing sufficiently low latency as well as voice quality scores

that are coincident with those deemed toll quality.

Link Aggregation tests certify that the PowerConnect 3348 has the capability to forward traffic across multiple aggregated links.

VLAN support tests demonstrate that the PowerConnect 3348 segments traffic appropriately according to the IEEE 802.1Q protocol.

QoS tests verify that the PowerConnect 3348 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 3348 detects endpoints and forwards traffic utilizing Rapid Spanning Tree protocol.

Port Mirroring tests certify that the PowerConnect 3348 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 3348 can retain, and boot from, either a primary or 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 verified that the PowerConnect 3348 could store two images from which to load the customer configuration (as distinct from the system software) for the device.

Embedded Web Management tests verify that the PowerConnect 3348 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 and ACL management controls.



DELL COMPUTER CORP.
POWERCONNECT 3348
WWW.TOLLY.COM

Dell Computer Corp.

PowerConnect 3348

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Dell Computer Corp. PowerConnect 3348



Port attributes:

- 48 10/100BASE-T auto-sensing Fast Ethernet switching ports
- Four SFP slots for fiber media support (Note: SFP slots are used instead of the built-in 10/100BaseT 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

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)

Multicast

- IGMP snooping for IP Multicast Support
- Static IP multicast

Security

- IP Address filtering for management access via Telnet, HTTP, HTTPS/SSL, SSH and SNMP
- User-definable settings for enabling or disabling Web, SSH, Telnet, SSL management access
- Port-based MAC Address alert and lock-down
- RADIUS support for switch management access
- SSL/SSH encryption for switch management traffic
- Access Control Lists (ACLs) supported; up to 248 Access Control Entries (ACEs) per Fast Ethernet ACL and up to 120 ACEs per Gigabit Ethernet ACL; up to 2,000 total ACEs per switch
- ACLs can identify flows based upon protocol (TCP/UDP port), source/destination IP address, source/destination port, DSCP values, IP precedence values, source/destination MAC address, and VLAN ID
- ACLs can be bound to ports, link aggregation groups and VLANs

Other Switching

- Link Aggregation with support for up to six aggregated links per switch and up to eight ports per aggregated link (IEEE 802.3ad)
- LACP support

Management

- Web-based management interface
- Industry-standard CLI accessible via Telnet or console
- 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

Chassis

- 1U, rack-mounting kit included

For more product information on the PowerConnect 3348 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: 203115

Product class: LAN switch

Products under test: Dell Computer Corp. PowerConnect 3348, SW Ver. 1.0.0.52 (29Jun2003); Boot Ver. 1.0.0.13

Testing window: July 2003

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 or call (732) 528-3300.

For a full understanding of the certification tests passed by the PowerConnect 3348, on the Web go to:

<http://www.tolly.com/TVDetail.aspx?ProductID=87>

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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