

EDITOR'S COMMENTS

6 Engineered Here: The Scalable Enterprise

By Tom Kolnowski

EXECUTIVE INSIGHTS

8 Delivering Value to the Scalable Enterprise

An interview with Jeff Clarke, senior vice president and general manager of the Dell Product Group

PULL-OUT POSTER

64a Next-Generation Dell PowerEdge Servers

PowerEdge 1850, PowerEdge 2800, and PowerEdge 2850 servers offer screaming-fast performance, platform commonality, and plenty of room to grow. This special pull-out poster gives a glimpse into what makes these the most manageable PowerEdge servers ever. Visit <http://www.dell.com/powersolutions> to download additional copies.

SPECIAL SECTION: NEW-GENERATION SERVER TECHNOLOGY

18 Exploring the Next-Generation DRAC 4

Dell Remote Access Controller

By Jon McGary and Donnie Bell

21 Using Microsoft Active Directory Authentication with the DRAC 4

By Jon McGary and Bradley Bransom

26 Remote Management with the Baseboard Management Controller in Eighth-Generation Dell PowerEdge Servers

By Haihong Zhuo; Jianwen Yin, Ph.D.; and Anil V. Rao

30 Remote Management with Virtual Media in the DRAC 4

By Weimin Pan and Gang Liu

36 Introducing DDR2 Memory in Eighth-Generation Dell PowerEdge Servers for Improved Performance

By Ramesh Radhakrishnan, Ph.D., and Jim Pankratz

40 Evaluating the Performance of 64-bit Oracle9i Database Release 2 on the Intel EM64T-based Platform

By Ramesh Radhakrishnan, Ph.D.

HIGH-PERFORMANCE COMPUTING

46 Performance Characterization of BLAST on Intel EM64T Architecture

By Garima Kochhar, Kalyana Chadalavada, Amina Saify, and Rizwan Ali

53 Maximizing NFS Scalability on Dell Servers and Storage in High-Performance Computing Environments

By Andrew Bachler and Jenwei Hsieh, Ph.D.

58 Managing and Monitoring High-Performance Computing Clusters with IPMI

By Yung-Chin Fang, Garima Kochhar, and Randy DeRoek

64 Felix, Scali, and Rocks: An Introduction to Cluster Computing Solutions

By Rinku Gupta; Baris Guler; Saeed Iqbal, Ph.D.; and Monica Kashyap

69 Exploring InfiniBand as an HPC Cluster Interconnect

By Onur Celebioglu, Ramesh Rajagopalan, and Rizwan Ali

COVER STORY | PAGE 12

Dell Extends the Scalable Enterprise with Eighth-Generation PowerEdge Servers

By John Fruehe

Eighth-generation Dell PowerEdge servers are designed as the foundation for a cost-effective network infrastructure that can grow flexibly to meet business needs—delivering excellent manageability, performance, and scalability across the enterprise.



Dell PowerEdge 2850

EDITORIAL

EDITOR-IN-CHIEF | Tom Kolnowski
MANAGING EDITOR | Debra McDonald
SENIOR EDITORS | Liza Graffeo, Cathy Luo, Vicki Van Ausdall
ASSISTANT EDITOR | Keri Ehlinger
CONTRIBUTING AUTHORS | Kerstin Ackerman; Rizwan Ali; Andrew Bachler; Donna Bell; Lara Benson; Robert Bernstein; Bradley Bransom; Onur Celebioglu; Kalyana Chadalavada; Johnny Dahlberg; Alan Daughetee; Randy DeRoche; Tracy D. Edwards; Yung-Chi Fang; John Fruehe; Subbu Ganeshan; Michael Gierhart; Carol Gittinger; Manoj Gujarathi; Baris Guler; Rinku Gupta; Stephen M. Hahn; Richard Hou; Jenwei Hsieh, Ph.D.; Saeed Iqbal, Ph.D.; Dave Jaffe, Ph.D.; Carl Kay; Monica Kashyap; Zain Kazim; Garima Kochhar; Michael Kosack; Jay Kozak; Senthil Kumaran OR; Gang Liu; Morten Loderup; Jet Martin; Anirban Mehis; Belisic A. Meletis; Jon McGary; Tesfamariam Michael; Todd Muirhead; Tim T. Murphy; Farukh Noman; Mike Owens; Weimin Pan; Jim Pankratz; Trenton Potgieter; Pritesh Prabhu; Ranjith Purush; Paul Rad; Ramesh Radhakrishnan, Ph.D.; Ramesh Rajagopalan; Anil V. Rao; Gautham Ravi; Armina Saify; Brian Schwarz; Simone Shumate; Suman Kumar Singh; Scott Stanford; Jeff Woolsey; Edward Yardumian; Jianwen Yin, Ph.D.; and Haifeng Zhuo

ART

ART DIRECTOR | Mark Mastroianni
DESIGNER AND ILLUSTRATOR | Cynthia Webb
COVER DESIGN | Mark Mastroianni
CONTRIBUTING PHOTOGRAPHERS | Lee Kirgan, Robert McGee

ONLINE

WEB PRODUCTION | Brad Klenzendorf

SUBSCRIPTION SERVICES

CIRCULATION | Sheryl Williams

Subscriptions are free to qualified readers who complete the online subscription form or the subscription reply form on page 136 in this issue. To sign up as a new subscriber, renew an existing subscription, change your address, or cancel your subscription, submit the online subscription form at WWW.DELL.COM/POWERSOLUTIONS_SUBSCRIBE, return the subscription reply form by surface mail, or fax the subscription reply form to +1 512.283.0363. For subscription services, please e-mail US_POWER_SOLUTIONS@DELL.COM.

ABOUT DELL

Dell Inc., headquartered in Round Rock, Texas, near Austin, is the world's leading direct computer systems company. Dell is one of the fastest growing among all major computer systems companies worldwide, with approximately 47,800 employees around the globe. Dell uses the direct business model to sell its high-performance computer systems, workstations, and storage products to all types of enterprises. For more information, please visit our Web site at WWW.DELL.COM.

Dell, the Dell logo, Dell OpenManage, Dell Precision, ImageWatch, Latitude, OptiPlex, PowerConnect, PowerEdge, and PowerVault are trademarks of Dell Inc. in the United States, other countries, or both. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell disclaims proprietary interest in the marks and names of others.

Dell Power Solutions is published quarterly by the Dell Product Group, Dell Inc. *Dell Power Solutions*, Mailstop 8456, Dell Inc., One Dell Way, Round Rock, TX 78682, U.S.A. This publication is also available online at WWW.DELL.COM/POWERSOLUTIONS. No part of this publication may be reprinted or otherwise reproduced without permission from the Editor-in-Chief. Dell does not provide any warranty as to the accuracy of any information provided through *Dell Power Solutions*. Opinions expressed in this magazine may not be those of Dell. The information in this publication is subject to change without notice. Any reliance by the end user on the information contained herein is at the end user's risk. Dell will not be liable for information in any way, including but not limited to its accuracy or completeness. Dell does not accept responsibility for the advertising content of the magazine or for any claims, actions, or losses arising therefrom. Goods, services, and/or advertisements within this publication other than those of Dell are not endorsed by or in any way connected with Dell Inc.

ON THE FRONT COVER | Dell VIP engineers, front row: Haifeng Zhuo; second row: Weimin Pan, Andy Regimbal; third row: Marcelo Vinante, Shawn Dube, Earl Reeves, and Allen Wynn. Photography by Lee Kirgan.

Copyright © 2004 Dell Inc. All rights reserved. Printed in the U.S.A.
October 2004

**TALK BACK**

We welcome your questions, comments, and suggestions. Please send your feedback to the *Dell Power Solutions* editorial team at US_POWER_SOLUTIONS@DELL.COM.

73 Understanding the Behavior of Computational Fluid Dynamics Applications on Dell PowerEdge 3250 Servers

By Baris Guler and Rizwan Ali

SCALABLE ENTERPRISE**77 Introducing Microsoft Virtual Server 2005: Running Legacy Windows Environments on Dell PowerEdge Servers**

By Ranjith Purush, Jeff Woolsey, and Edward Yardumian

83 Migrating Databases from Sun Systems to Dell Servers Running Microsoft Windows Server 2003

By Todd Muirhead; Dave Jaffe, Ph.D.; and Kerstin Ackerman

87 Migrating Databases from Sun Systems to Dell Servers Running Red Hat Enterprise Linux AS 3

By Todd Muirhead and Dave Jaffe, Ph.D.

91 Best Practices for Oracle Database 10g Automatic Storage Management on Dell/EMC Storage

By Paul Rad, Ramesh Rajagopalan, Tesfamariam Michael, and Jay Kozak

97 Designing a Balanced Architecture with Oracle RAC and VERITAS Software for Linux

By Brian Schwarz and Gautham Ravi

SYSTEMS MANAGEMENT**99 Using the Dell 2161DS Remote Console Switch to Control Data Center Servers**

By Stephen M. Hahn and Robert Bernstein

102 Implications of Virtualization for Image Deployment

By Simone Shumate

105 Using Log Messages and Alert Actions in Dell OpenManage Server Administrator

By Senthil Kumaran OR

108 Simplifying System Deployment Using the Dell OpenManage Deployment Toolkit

By Alan Daughetee and Zain Kazim

TABLE OF CONTENTS

111 Scripting Dell Update Packages on Windows and Linux

By Manoj Gujarathi, Pritesh Prabhu, and Subbu Ganesan

115 Planning for the Retirement of Microsoft Windows 2000 Products

By Carol Gitterer and Mike Owens

STORAGE

118 Designing and Optimizing Dell/EMC SAN Configurations: Part 2

By Arrian Mehis and Scott Stanford

122 Dell/EMC MetaLUNs: A New Approach to Storage Design

By Richard Hou, Michael Kosacek, Michael Gierhart, and Trenton Potgieter

127 Virtual Disk Library Deployment with BakBone NetVault

By Jet Martin

130 Building High-Availability Clusters with the Dell PowerEdge Cluster FE550W and Dell/EMC AX100 Storage Array

By Suman Kumar Singh, Morten Loderup, and Farrukh Noman

NETWORK AND COMMUNICATIONS

133 Using Network Segmentation to Optimize Network Performance

By Tracy D. Edwards

137 Tightening Security in Wireless Networks

By Belsis A. Meletis and Johnny Dahlberg

ADVERTISER INDEX

Avocent Corporation	5
Dell Inc.	10-11, 31, 39, 43
Emulex Corporation	23
Intel Corporation	C2
McDATA Corporation	35
Microsoft Corporation	47
Novell, Inc.	C4
Oracle Corporation.....	C3
Quantum DLTape	3
VERITAS Software Corporation	7

WWW.DELL.COM/POWERSOLUTIONS



Remote Configuration of Serial and Telnet Interfaces to the DRAC 4

By Jon McGary and Carl Kagy

The Dell Remote Access Controller 4 (DRAC 4) provides a command-line interface designed to enable the configuration and systems management functions that an administrator would normally perform using the DRAC 4 Web-based graphical user interface. This article discusses the tools available to the DRAC 4 through serial and Telnet sessions, which help provide administrators with a quick, convenient way to manage remote systems.



Improving Server Security Through DRAC 4 User Role-based Permissions

By Jon McGary

The Dell Remote Access Controller 4 provides excellent remote access controller (RAC) security by giving administrators the capability to configure user permissions. This article focuses on the use of the RAC graphical user interface and Racadm command-line interface to add and configure RAC users.



Dell and VMware: Partnering to Deliver VMware Virtualization Software on Dell PowerEdge Servers

By Lara Benson and Simone Shumate

Dell and VMware partnered in Dell development labs to release the latest shipping version of VMware virtualization software on Dell PowerEdge servers—enabling enterprises to implement and manage simple, pretested virtual server configurations. This article highlights Dell and VMware co-development activities including certification, qualification, and beta testing that help support VMware products on Dell servers and Dell/EMC storage.



Managing Dell PowerEdge Servers Using IPMItool

By Tim T. Murphy

Dell promotes industry-standard server management capabilities through its support for Intelligent Platform Management Interface (IPMI) 1.5 technology in eighth-generation Dell PowerEdge servers. This article provides guidance on the preparation and use of an open source tool called IPMItool with IPMI 1.5-compliant Dell servers running a Linux operating system.