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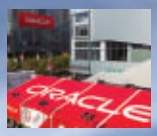
SECURITY ON THE MOVE

Organizations use Oracle Identity Management solutions to secure operations in the cloud and on the go



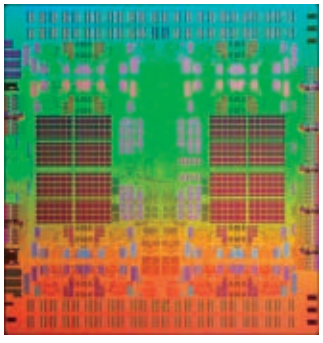
Engineered for Innovation

So many conferences, so much content: Oracle OpenWorld, JavaOne, and more
San Francisco
September 29–October 5

Complete Cloud

Oracle unveils broadest cloud strategy in the industry

The bright future of SPARC



Cool Technologies: Fujitsu provides a roadmap update for the collaboration between the two companies ensuring that SPARC systems interoperate well with next generations of Oracle Solaris, Oracle Database, and other Oracle software products.

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ORACLE MAGAZINE

Cover: Robert Garcia

SECURITY ON THE MOVE

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As corporate computing services become more diverse and the underlying IT infrastructure gets more complex, authorizing users for enterprise information systems becomes progressively more challenging. How do you handle identity administration, authentication, trust management, access control, directory services, and governance for a roving workforce that expects a consistent experience? Ideally, your information systems should support access, permissions, and password security across all devices and all locations. Find out how organizations are using Oracle Identity Management solutions to secure operations in the cloud and on the go. *—By David Baum*

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Oracle OpenWorld, JavaOne, MySQL Connect, and several other events are set for San Francisco, September 29–October 5. Don't miss the wealth of learning and networking opportunities during this content-focused week. No matter what your role in the Oracle ecosystem—from Oracle database developer or Java programmer to Oracle partner or Oracle Applications user—there is something just for you in this diverse mix of keynotes, sessions, educational opportunities, demos, and networking events. Get the details and start planning your trip to San Francisco in September. *—By Karen Shamban*

Complete Cloud /21

Oracle's cloud strategy is the broadest in the industry, and Oracle Cloud is the heart of that strategy. Learn how Oracle Cloud delivers a complete, modern, and flexible enterprise cloud that provides subscription-based access to best-of-breed, integrated, and standards-based application, platform, and social services—all completely hosted, managed, and supported by Oracle. *—By Chip Brookshaw*

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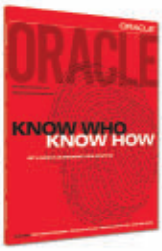

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Newsworthy

Get the news and be part of it.

Oracle Magazine publishes some small amount of Oracle news every 60 days, and that's not an apology or false modesty on behalf of the magazine. Oracle generates far more news about products, strategy, and technology in a two-month period than we could possibly fit in the pages of this publication. (Take a look at the Oracle press release feed at pressroom.oracle.com to see what I mean—and to search for the latest Oracle news.)

Information technology news is also the kind of news that benefits from several different approaches, formats, and presentations. *Oracle Magazine* strives to present Oracle news in news briefs and interviews, community briefs, customer reference stories, technology how-to content, and analysis. But even these variations are not enough to guarantee that organizations have the news they need to see the potential impact the latest Oracle products, strategy, and technology could have on their own operations.

OPEN UP

Fortunately, as the volume of news about Oracle and Oracle technology has continued to expand, it has gotten easier to separate into components and address with a tighter focus. The aforementioned Oracle press releases are now broken into bite-size bullets, suitable as launch points for social media conversations. Oracle Web pages, data sheets, white papers, customer case studies, and newer-media assets including podcasts, Webcasts, and videos present new information in all sizes, to fit the time you have and the approach you're looking for when exploring any area of Oracle technology.

Finding time—that's one challenge. Finding the right information with the right approach for your situation in the sea of information available to you—that's another. I'm not suggesting that anyone avoid looking to *Oracle Magazine*, oracle.com, Oracle newsletters, Oracle Media Network, Oracle Technology Network, or any of Oracle's social media sites for information whenever you need it. But in addition, Oracle will be providing the news about products, strategy, and technology live and in person the week of Oracle OpenWorld in San Francisco, California, September 29 through October 5.

In the same way Oracle news volume has increased, so have the activities the week of Oracle OpenWorld. Oracle OpenWorld and JavaOne continue as flagship conferences, joined this year by the new MySQL Connect. But Oracle OpenWorld and JavaOne now include a series of new opportunities to focus on the news and networking related to your role and interest. Check out "Next Steps" for links to these @ OpenWorld and @ JavaOne events, and check out "Engineered for Innovation" (page 36) for the full lineup of Oracle events the week of September 29 through October 5.

ANOTHER TIME

In the spirit of doing more and thinking small, this issue of *Oracle Magazine* brings the "small plates" approach of our award-winning MashUp to Community Bulletin and the new Time Capsule. Let us know what you think about these pages, and for Time Capsule, let us know what pop culture, industry, Oracle, and *Oracle Magazine* history content you'd like to see.

Tom Haunert, Editor in Chief
tom.haunert@oracle.com

NEXT STEPS

LEARN more about Oracle OpenWorld
oracle.com/openworld

Oracle Customer Experience Summit @ OpenWorld
oracle.com/cxsummit

The Executive Edge @ OpenWorld
oracle.com/events/us/en/executive-edge

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Closing date: October 31, 2012

LOST PHONE APPS

With smartphones holding both personal and enterprise data, losing one can spell disaster. These apps locate stray mobile devices and help secure them.

Find My iPhone

Locate your iPhone on a map, make it ring (even if the sound is off), display a text message, and remotely lock the device or wipe out its data, all from a Website. Free (iPhone). **apple.com**

Find My Phone (for Windows)

Ring, lock, or locate your phone on a map from a Website and erase the phone's data. The app is built into the Windows Phone platform. Free (Windows Phone). **windowsphone.com**

Plan B

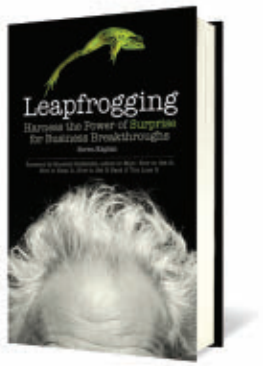
Download and install this app remotely on your phone *after* it's lost. PlanB sends you the phone's location and then lets you track the phone via SMS. Free (Android). **bit.ly/NItqeb**

Find My Phone (for Blackberry)

This GENOA net works app lets you get your phone's location via e-mail or SMS and make it ring and flash. US$2.99 or free with ads (BlackBerry). **bit.ly/O1wqAg**

OLD PHOTOS, NEW LIFE

Scanning your old photo prints and 35mm slides has been on your to-do list for years now. iPics 2 Go from ION Audio helps you tackle this time-consuming task and adds the convenience of instant sharing to Facebook. Just place your iPhone4/4S into a cradle on top of the iPics 2 Go box, slide a 3x5 or 4x6 print or 35mm slide into the appropriate tray, and take a photo of the print with the iPics 2 Go iPhone app. iPics 2 Go is not a scanner but a mini photo booth where the original is isolated from all outside lighting and interference and positioned perfectly for your iPhone 4 camera. Built-in lighting illuminates a photo without any glare or hotspots, resulting in the best possible photos that your iPhone can take. *US$49.99*. **bit.ly/MPo1jJ**



"The single most important factor in fostering true game changers isn't the classic lightbulb-above-the-head big idea. It's the way leaders and organizations handle the discomfort, the disorientation, and the thrill (and pain) of living with uncertainty, finding clarity . . . , and being surprised."

—Soren Kaplan, author of *Leapfrogging* (Berrett-Koehler Publishers, 2012)

NORTH AMERICA LEADS WORLD IN CPOS

23 percent of North American organizations have a chief privacy officer (CPO). Only 5 percent of organizations in Asia and 3 percent of European organizations have one.

Source: *Carnegie Mellon*, Enterprise Security: CyLab 2012 Report, *bit.ly/Pa84tl*

Big Data Overload

In an Oracle survey of 333 C-level executives from U.S. and Canadian enterprises spanning 11 industries, 94 percent said that their organization is collecting and managing more business information today than two years ago, by an average of 86 percent more. Other key findings:

97%
need to make changes to improve information optimization

93%
believe they are losing revenue at an average rate of 14% annually because they can't leverage the information they collect

67%
say the ability to draw intelligence from their data is a top priority

60%
say their companies are unprepared to leverage the data deluge

Source: *Oracle,* From Overload to Impact: An Industry Scorecard on Big Data Business Challenges, *bit.ly/ONfNcd*

Sleep Better, Work Better

You spend about a third of your life sleeping. To maximize the benefits of sleep, it's important to sleep a specific number of hours and also wake up during periods of light sleep. Renew SleepClock uses ultralow-power reflected radio frequency waves to monitor your movement during sleep and does not require you to wear a wristband. Measuring low amplitude waves for breathing and high amplitude waves for body movement, the SleepClock knows exactly when to wake you up so that you'll feel refreshed the rest of the day. Your sleep data is collected by an associated iOS application. With that data, you can compare your stats with an average for your gender and age to track your sleeping patterns. *US$199.99*. **renewsleepclock.com**

Data Quality Tools for Oracle

ORACLE Gold Partner

Now, Oracle-based data stewards and information workers can effectively verify, enrich and cleanse contact information assets – from around the country to around the world. Native data quality components make implementation easy and ensure you always have a perfect fit.

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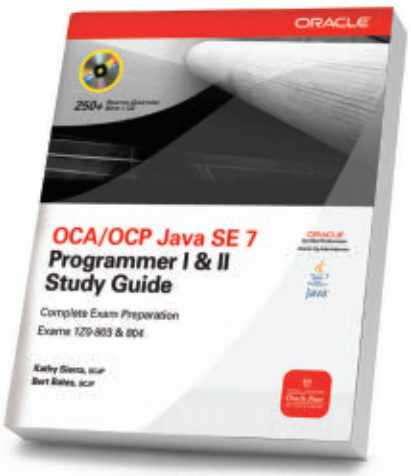
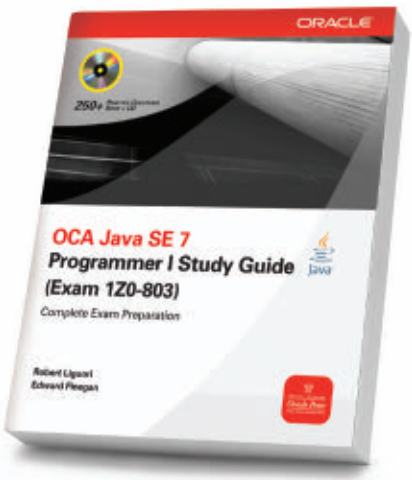


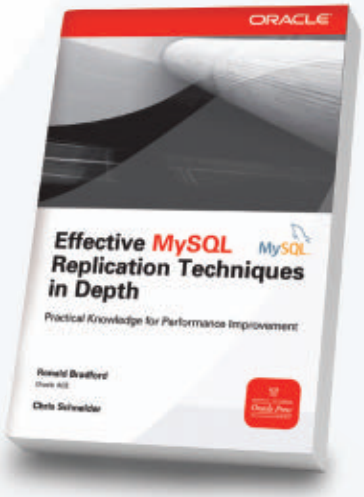


OCA/OCP Java SE 7 Programmer I & II Study Guide
Kathy Sierra, Bert Bates
Get complete coverage of all objectives for exams 1Z0-803 and 1Z0-804 plus challenging practice exam questions.

OCA Java SE 7 Programmer I Study Guide
Edward Finegan, Robert Liguori
Get complete coverage of all objectives for exam 1Z0-803 plus challenging practice exam questions.

Oracle Exalogic Elastic Cloud Handbook
Tom Plunkett, TJ Palazzolo, and Tejas Joshi
Plan and deploy a reliable, secure, highly available private cloud computing infrastructure.

Effective MySQL: Replication Techniques in Depth
Ronald Bradford, Chris Schneider
Implement MySQL replication to build scalable business solutions.



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Technology Events

Conferences and sessions to help you stay on the cutting edge

Oracle OpenWorld

September 30–October 5, San Francisco, California

Oracle OpenWorld is the most important educational and networking event of the year for Oracle technologists, customers, and partners. Thousands of sessions and hundreds of demos and labs empower attendees to get better results from their Oracle solutions today and to plan strategically for the future. New this year is the Oracle Music Festival, featuring five nights of rock, jazz, hip-hop, blues, and more.

oracle.com/openworld

Cloud Connect

September 10–13, Chicago, Illinois

▶ **cloudconnectevent.com/chicago**

More than 1,200 IT professionals, developers, and technology executives are expected at CloudConnect, where the tracks and workshops revolve around all things cloud.

Taleo World

September 11–14, Chicago, Illinois

▶ **taleoworld.com/2012**

At this event, human resources, recruiting, and staffing personnel discover how talent intelligence gives business managers the insights they need to drive higher business performance. Oracle President Mark Hurd is a keynote speaker.

HIMSS AsiaPac

September 17–19, Singapore

▶ **bit.ly/Mm6wso**

This event is four gatherings in one: HIT X.0, focusing on innovations in healthcare IT; mHIMSS, exploring the role of mobile technology in healthcare; Care in the Community, examining IT adoption in nursing homes and inpatient hospice; and Standards and Interoperability, exploring the way healthcare technologies interface and interact.

SNIA Storage Developer Conference

September 17–20, Santa Clara, California

▶ **bit.ly/L9c4L3**

At this event, presentation topics include the storage-related aspects of cloud computing, data management, and virtualization, as well as various storage technologies and protocols.

SIOUG 2012

September 23–26, Portorož, Slovenia

▶ **bit.ly/LgPu13**

The 17th annual Slovenian Oracle Users Group meeting consists of the SIOUG conference, covering business IT, business intelligence, application development, and IT administration; and the Java Developer and Architect Conference, covering all aspects of Java-based solutions.

SOA Cloud Service Technology Symposium

September 24–25, London, England

▶ **servicetechsymposium.com**

This event focuses on innovations and trends in SOA, cloud computing, and modern service technologies and features 80 speaker sessions.

MySQL Connect

September 29–30, San Francisco, California

▶ **oracle.com/mysqlconnect**

Learn, share, and network with the MySQL community over two days of technical sessions, labs, exhibits, demos, and networking events. Oracle engineers, MySQL community members, users, and customers share new MySQL features and discuss product roadmaps.

ORACLE USER GROUPS

UKOUG Development SIG Meeting
September 6, Reading, England
www.ukoug.org

Utah Oracle Users Group Fall Symposium
September 6, Salt Lake City, Utah
utoug.org

OUG Ireland BI and EPM and Technology Joint SIG Meeting
September 11, Dublin, Ireland
www.ukoug.org

New Zealand Oracle Users Group Committee Meetings
September 17 (online) and October 26 (Auckland)
nzoug.org/calendar

Ch'ti Java User Group Meeting
September 18, Lille, France
chtijug.org

Brussels Java User Group Meeting
September 19, Brussels, Belgium
brussels-jug.be

Southern California User Group Meeting
September 19, City of Industry, California
questdirect.org/events/2460990

"Ask Tom Live" Seminar Featuring Tom Kyte
September 20, Utrecht, the Netherlands
bit.ly/NMY1eZ

Upper Midwest Regional User Group Fall JD Edwards Breakout Meeting
September 20, Golden Valley, Minnesota
questdirect.org/events/2475076

Dallas Oracle Users Group Database Forums
September 27 and October 25, Dallas, Texas
doug.org

East Coast Oracle Users Conference
October 17–18, Raleigh-Durham, North Carolina
eastcoastoracle.org

UKOUG Partner of the Year Awards 2012
October 18, London, England
www.ukoug.org

Nordic User Group Tour
October 23, Denmark
doug.dk
October 24, Sweden
orcan.se
October 25, Norway
ougn.no
October 26, Finland
ougf.fi

JavaOne

September 30–October 5, San Francisco, California

JavaOne offers hundreds of technical sessions, hands-on labs, and small special interest gatherings. Keynotes, user group meetings, and Java University courses make for a full schedule. Conferencegoers learn and share practical tips and coding techniques usable today, and hear where Java technology is headed. Areas of focus include core Java platform, development tools and techniques, and much more. **oracle.com/javaone**.

CalConnect XXV

October 1–5, Zurich, Switzerland

▶ **calconnect.org**

The Calendaring and Scheduling Consortium gathers for its thrice-annual meeting, which consists of interoperability tests, a technical conference, roundtables, and workshops.

Apps World

October 2–3, London, England

▶ **apps-world.net**

More than 5,000 developers, mobile marketers, mobile operators, device manufacturers, platform owners, and industry professionals are expected at this global multiplatform event for the mobile industry. The agenda includes 10 workshop tracks, speed meetings, and awards.

Cerner Health Conference 2012

October 7–10, Kansas City, Missouri

▶ **bit.ly/Lsk4X4**

Healthcare professionals from around the world discuss current issues related to clinical, financial, administrative, and IT concerns.

GITEX Technology Week

October 14–18, Dubai, UAE

▶ **gitex.com**

More than 138,000 technology professionals from 144 countries discuss the consumerization of IT, cloud, and digital strategies at the largest event of its kind in the Middle East, Africa, and South Asia. Industry briefings for oil and gas, banking and finance, healthcare, education, and government sectors are on the agenda.

Higher Education User Group EMEA Conference

October 16–17, London, England

▶ **bit.ly/Pd2pRs**

Colleagues from educational institutions around Europe, the Middle East, and Africa discuss all aspects of Oracle and Oracle's PeopleSoft technologies used in higher education.

HrOUG (Croatian Oracle User Group) Conference

October 16–22, Rovinj, Croatia

▶ **hroug.hr**

The Croatian Oracle community gathers to present and analyze the past year's news and events related to Oracle and other information and communication technologies.

PMI Global Congress 2012—North America

October 20–23, Vancouver, British Columbia, Canada

▶ **bit.ly/LgWqLT**

More than 3,000 project management professionals converge to discuss project management topics, earn continuing education credits, network, and listen to keynote addresses.

South African Oracle User Group Conference

October 21–23, Sun City, South Africa

▶ **saoug.co.za/conference2012**

Under the banner "Connect, Communicate, and Collaborate," this event includes two days of keynotes, focused sessions, and networking.

Gartner Symposium/ITxpo 2012

October 21–25, Orlando, Florida

▶ **bit.ly/M5OSM1**

October 29–31, São Paulo, Brazil

▶ **gartner.com/technology/symposium/br**

This gathering of CIOs and senior IT executives offers hundreds of analyst sessions, workshops, roundtables, and keynotes over several days. Role-based and industry tracks focus on how IT will affect business today and in the future.

Zendcon PHP 2012

October 22–25, Santa Clara, California

▶ **zendcon.com**

The PHP community gathers for technical sessions and in-depth tutorials from international industry experts, thought leaders, and experienced PHP practitioners. Topics include PHP best practices and cloud-based technologies.

Parcel Forum 12

October 23–25, Chicago, Illinois

▶ **parcelforum.com**

At this parcel shipping industry conference, one day of tutorials will be followed by two days of workshops, case studies, panel discussions, and roundtables covering six tracks.

Oracle with 20:20 Foresight

October 29–30, Perth, Australia

▶ **ausoug.org.au/2020**

More than 300 end users, independent professionals, Oracle employees, Oracle partners, and Oracle service providers gather to discuss Oracle core technologies, Oracle middleware, Oracle business intelligence, Oracle Applications, and other Oracle products. A special one-day workshop on October 31 features Tom Kyte, Andrew Holdsworth, and Graham Wood.

DOCUMENT Strategy Forum

October 29–31, Greenwich, Connecticut

▶ **documentstrategyforum.com**

Customer communications professionals convene to learn about strategies for content management, imaging and archiving, business process management, IT integration, and more.

Avnet Guide to Oracle: Understanding Oracle Seminar

October 31, Reading, England

▶ **bit.ly/NOESAv**

This seminar for Oracle partners delivers a high-level overview of Oracle's three main business areas—applications, technology, and hardware—and describes each product area's pricing and licensing rules and processes.

EVENTS LOCATOR

Oracle Events
oracle.com/events

Locate User Groups
bit.ly/IjxKyd

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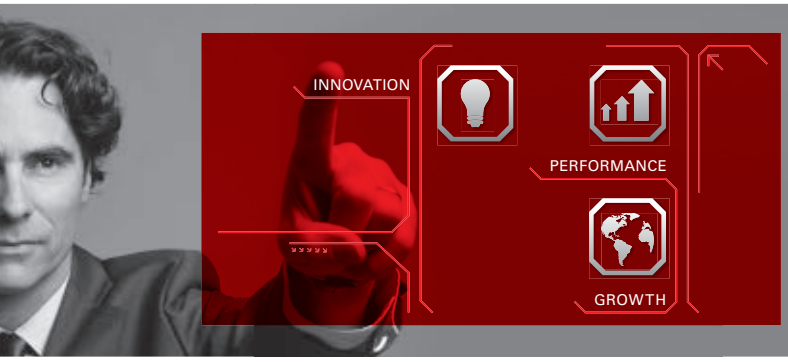

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What's New at Oracle

The latest videos, podcasts, blogs, and more

WEBCASTS

Webcast Series: *Oracle Customer Insights—SOA and BPM*

▶ **bit.ly/OoopLu**

Learn best practices directly from Oracle customers that have transformed their application infrastructure with Oracle SOA and business process management solutions.

"Boost Utilization and Cut Costs with SPARC Consolidation and Virtualization"

▶ **bit.ly/Lef7gw**

See how Oracle's integrated no-cost virtualization capabilities for SPARC servers enable consolidation of applications on fewer, more-powerful, and more-efficient servers.

Webcast Series: *Social Business Thought Leaders*

▶ **bit.ly/ym4JCb**

Industry experts discuss how social tools, 24/7 operations, and distributed teams are affecting businesses today.

"Real-Time Heterogeneous MySQL Replication using Oracle GoldenGate"

▶ **bit.ly/NJLUgM**

Find out how to capture and deliver real-time change data to big data platforms, data warehouses, operational data stores, and reporting systems with Oracle GoldenGate.

"Drive Online Engagement with Intuitive Portals and Websites"

▶ **bitly.com/Lizs5G**

Learn how to optimize your user experience and provide intuitive and secure access to back-office applications with Oracle WebCenter.

"Create a Cost-Effective, High-Performing Application Environment"

▶ **bit.ly/LNxfNH**

Find out how Oracle Optimized Solution for Oracle WebLogic Server helps you to cost-effectively and efficiently deliver Oracle, third-party, and customer applications to thousands of users.

Webcast Series: *Accelerate Business-Critical Database Deployments with Oracle Optimized Solutions*

▶ **bit.ly/QekVJK**

Learn how consolidating your database environment with Oracle Optimized Solution for Oracle Database can save your organization up to 75 percent in operational and acquisition costs.

VIDEOS

Oracle President Mark Hurd on the CX Revolution

▶ **bit.ly/OEE0YB**

Watch Oracle President Mark Hurd's keynote at Oracle's customer experience (CX) launch event in New York, New York, on June 25, 2012.

The Revolution in Data Processing

▶ **bit.ly/KGhV4H**

Doug Cutting, chief architect at Cloudera and creator of Apache Hadoop, talks about data processing, Oracle Big Data Appliance, and how Hadoop works with relational technologies.

Big Data Episode 1: Overview for the Boss

▶ **bit.ly/MoCRC8**

In the first of this big data video series, the boss needs to present a big data strategy to the CEO and needs to understand the business value.

Virtual Developer Day: Oracle Database

▶ **bit.ly/LRKvCF**

Watch this event replay to learn key tools, frameworks, techniques, and best practices for building .NET database-backed applications.

Putting Innovation Back in IT

▶ **bit.ly/KEjLDa**

See how Oracle's cloud services deliver value, choice, and confidence and allow your IT department to focus on strategic projects and innovation.

MySQL Innovation Day

▶ **bit.ly/LDuaoH**

Watch replays of MySQL Innovation Day keynotes and lightning talks to get the latest on MySQL.

Oracle WebCenter: The Center of Engagement

▶ **bit.ly/MDxbEy**

See how nontechnical users can easily create and manage social and interactive online experiences across channels using Oracle WebCenter Sites.

Oracle Database Appliance: Simple. Reliable. Affordable.

▶ **bit.ly/LC5zyK**

Learn how Oracle Database Appliance delivers an affordable high-availability database solution.

RESOURCE CENTERS/KITS

Oracle Data Integration: Moving Data to Transform Business

▶ **bit.ly/MWuVai**

Find information on data integration for big data, business analytics, cloud, and maximum availability solutions; details on zero downtime migrations to Oracle Exadata and Oracle Applications; and Oracle Data Integration success stories.

Oracle GoldenGate Resource Kit

▶ **bit.ly/LPoXop**

Learn about how Oracle GoldenGate delivers low-impact, high-performance data integration and transactional data replication.

Oracle Exadata—Optimized Communications Applications Platform

▶ **bit.ly/LRSyPV**

Discover Oracle Exadata intelligent warehouse solution for communications, a complete, integrated hardware and software solution designed for the communications industry.

WHITE PAPERS

"SPARC Servers: An Effective Choice for Efficiency in the Datacenter"

▶ **bit.ly/LDWfdD**

This International Data Corporation white paper discusses how a new generation of SPARC servers based on SPARC T-Series processors provide a high degree of controllability and granularity for IT flexibility and reduced operational costs.

OVERHEARD

"Today, having a good product isn't good enough. You have to have a great relationship and a great experience with customers to keep them. Customers who enjoy a great customer experience actually pay 30 percent more on average for that experience. It's not just a good idea; it's frankly great business."

—Mark Hurd, Oracle President, in *Oracle President Mark Hurd on the CX Revolution* (bit.ly/OEE0YB)

"Consolidating SAP Landscapes on SPARC SuperCluster"
▶ **bit.ly/MDfLY1**
Learn what makes the Oracle SPARC SuperCluster engineered system an ideal infrastructure for SAP deployments and read recommendations for improving SAP application consolidation, availability, and performance.

"Improving Data Center Infrastructure with Oracle's x86 Systems"
▶ **bit.ly/NS9LLk**
Read how Oracle's Sun x86 systems provide optimal performance for running enterprise applications and include everything needed for a complete cloud infrastructure.

BLOGS

Wim Coekaerts Blog
▶ **blogs.oracle.com/wim**
Hear about the latest Oracle Linux and Oracle VM updates from Wim Coekaerts, senior vice president of Linux and virtualization engineering at Oracle.

The Java Source
▶ **blogs.oracle.com/java**
Get insider news from the Java team at Oracle.

E-BOOKS

Simplify IT and Unleash Innovation
▶ **bit.ly/MW2Jny**
Is your IT organization focused on making your business more innovative, or is it caught up in maintaining the status quo? Find out how to make room for innovation by simplifying IT.

Enterprise Cloud Infrastructure for Dummies
▶ **oracle.com/goto/ecifordummies**
Read about Oracle Optimized Solution for Enterprise Cloud Infrastructure, which ensures that you have the right hardware and software stack and configuration for your cloud.

CALCULATOR

MySQL TCO Savings Calculator
▶ **mysql.com/tcosavings**
Customize this calculator with your configurations and see how much you can save using MySQL.

PODCASTS

"Transcendent Memory in Oracle VM and Oracle Linux"
▶ **bit.ly/LywB6Q**
Hear how the Transcendent Memory feature works on Oracle Linux and Oracle VM from Dan Magenheimer, consulting developer for Oracle VM engineering.

"MySQL Thread Pool"
▶ **bit.ly/MYu7xV**
Mikael Ronstrom, senior MySQL architect, explains how the Thread Pool feature of MySQL Enterprise Edition improves scalability.

"MySQL Replication Global Transaction Identifiers and HA Utilities"'
▶ **bit.ly/LTLEcQ**
Luis Soares, engineering manager of MySQL replication, discusses the new global transaction identifiers that are part of the MySQL 5.6 development release.

"Oracle Database 11*g* Performance Tuning Tips and Techniques"
▶ **bit.ly/Lx4eER**
Oracle expert and author Rich Niemiec discusses best practices for optimizing performance as described in his new book, *Oracle Database 11g Performance Tuning Tips and Techniques* (Oracle Press, 2012).

"Oracle Application Express: An Agile Perspective"
▶ **bit.ly/MZ7wDj**
The authors of *Agile Oracle Application Express* (Apress, 2012) show how Oracle Application Express and agile development principles work together to make Web-based application development more efficient.

ORACLE UNIVERSITY

Oracle Training on Demand
▶ **bit.ly/NH4kLG**
Get hands-on training in Oracle Database, Oracle Fusion Middleware, Oracle Applications, and Oracle systems delivered by Oracle's top instructors without the wait. Each course contains high-quality video of the complete classroom experience including lectures, white-boarding, and access to hands-on lab environments.

Certification Exam Prep
▶ **bit.ly/LjoRGu**
New Oracle University exam prep Certification Value Packages are available for Oracle Database Admin 1, Oracle Database SQL, and Java SE 6 Programmer exams. Save up to 20 percent with these packages, which include a seminar, a certification exam voucher, and a free retake.

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DEMO

Oracle Enterprise Manager 12*c*: Discover an Oracle Exadata Database Machine

This demo shows you how to add an Oracle Exadata Database Machine as a managed target.

▶ bit.ly/OritwF

TUTORIALS

Creating a Publish/Subscribe Model with Message-Driven Beans and GlassFish Server

In this tutorial, you'll implement a Java Message Service (JMS) Publish/Subscribe system. The user interface components, a JavaServer Faces page, and a managed bean have already been developed. Your task is to create a second managed bean to produce a message from the data in the form, and publish it to a JMS topic.

▶ bit.ly/OriS2g

Application Developer Days Workshop Series

This series contains four hours of content on Oracle SQL Developer Data Modeler, Oracle SQL Developer, and Oracle Application Express, demonstrating how these products can work together.

▶ bit.ly/NlcJXQ

Advanced ADF Series eCourse

This two-part series addresses Oracle Application Development Framework 11*g* (Oracle ADF) topics through video presentations, quizzes, and practices. Topics include Oracle ADF bindings, project considerations for team development, Oracle ADF region interaction, Oracle ADF Faces declarative components, and more.

▶ bit.ly/Me4REN

Oracle Social Network Video Series

This four-part video series on Oracle Social Network covers how to get started, chat basics, conversation basics, and notifications and preferences setup.

▶ bit.ly/LKg8NH

Developing an AJAX Client for RESTful Web Services in NetBeans 7: Part 3

This tutorial demonstrates how to use an Ajax-based HTML page as the client to consume a RESTful Web service in NetBeans 7. It provides an overview of two approaches to render Ajax response.

▶ bit.ly/OSueQD

Oracle Platinum Services Redefine IT Support

Available now for Oracle Exadata, Oracle Exalogic, Oracle SPARC SuperCluster, and Oracle Cloud, Oracle Platinum Services bridge the gap between traditional IT support and fully managed services by offering new services, including 5-minute issue response, 15-minute restoration or escalation to development, 30-minute joint debugging, 24/7 remote fault monitoring, and quarterly patching and system updates. Oracle Platinum Services are available at no additional cost to qualifying Oracle customers as part of their standard Oracle Premier Support contract.

"Oracle Platinum Services are a new paradigm in IT support that further reinforces the value proposition of systems engineered to work together," says Larry Abramson, senior vice president and general manager, Oracle Advanced Customer Support Services. "These platinum configurations are engineered together, tested together, and supported together. Oracle develops, engineers, and supports every component in the solution, and every component is best in class. Every platinum configuration is fault-tolerant."

bit.ly/LYTO5B

Oracle VM Server for x86 Release 3.1 Now Available

Oracle has introduced Oracle VM Server for x86 Release 3.1, a server virtualization solution that enhances ease of use and reduces deployment times. Oracle VM Server for x86 Release 3.1 features an intuitive user interface designed to simplify data center management from applications to disk and accelerate virtualization deployments. Three new prebuilt, preconfigured Oracle VM Templates for Oracle E-Business Suite 12.1.3, Oracle's PeopleSoft Financials and Release 9.1 of PeopleSoft supply chain management solutions, and Oracle Enterprise Manager 12*c* add to the more than 100 available templates that enable faster application deployment.

"Making it easier to deploy and manage enterprise applications in the data center and cloud is the driver behind Oracle's application-driven approach to virtualization," says Wim Coekaerts, senior vice president of Linux and virtualization engineering at Oracle. "Oracle VM 3.1 introduces a number of user interface enhancements designed to improve ease of use for administrators, and storage-related features that can increase flexibility when migrating virtual machine storage repositories. With this new release, customers should find it significantly easier to manage their applications and virtual environments."

bit.ly/LblaVv

Oracle Introduces Oracle Retail Customer Analytics

Oracle has unveiled Oracle Retail Customer Analytics, a business intelligence solution that helps retailers better understand their customers and what drives their buying decisions. Oracle Retail Customer Analytics takes advantage of existing data to deliver rapid time to value and enables retailers to adapt to customer preferences and market opportunities on the fly. Oracle Retail Customer Analytics is the latest solution in the Oracle Retail analytics family of applications, which provides visibility into item and store performance, inventory turn, and more.

"Oracle Retail Customer Analytics takes the custom-build programming off the retailer's plate and gives merchants, category managers, and pricing analysts the tools to analyze who's buying what and when," says Mike Webster, senior vice president and general manager, Oracle Retail. "This product demonstrates the advantages of leveraging Oracle's best-in-class business intelligence tools with retail-specific expertise."

bit.ly/MdtDtK

LINDY GROENING

Three Companies Win Oracle Communications Innovation Award

Hughes Telematics, Mobily, and Two Degrees Mobile Limited have received the 2012 Oracle Communications Innovation Award for leadership and innovation in machine-to-machine applications, social network–enabled customer experience, and real-time charging, respectively.

This new awards program recognizes organizations that use Oracle Communications products and solutions to address industry and business challenges.

"Our award winners have demonstrated extraordinary innovations and leadership in using Oracle Communications' solutions to develop integrated, flexible architectures to meet their customer needs and expand into new markets," says Bhaskar Gorti, senior vice president and general manager, Oracle Communications.

bit.ly/IKsAyQ

SAP Applications Certified for Oracle SPARC SuperCluster

SAP applications are now certified for use with Oracle's SPARC SuperCluster T4-4 (shown here), which enables organizations to consolidate on a single system, speed deployments, and improve performance. SAP infrastructure and applications based on the SAP NetWeaver technology platform 6.4 and above and certified with Oracle Database 11*g* Release 2, including SAP enterprise resource planning applications and SAP NetWeaver Business Warehouse, can now be deployed on SPARC SuperCluster T4-4.

"Oracle SPARC SuperCluster is an ideal platform for consolidating SAP applications and infrastructure," says Ganesh Ramamurthy, vice president of engineering at Oracle. "Because Oracle SPARC SuperCluster is a preintegrated engineered system, it enables data center managers to dramatically reduce their time to production for SAP applications to a fraction of what a build-it-yourself approach requires, and it radically cuts operating and maintenance costs."

bit.ly/Nfqlnv

Oracle Spatial Excellence Honored

The annual Oracle Excellence Awards for Oracle Spatial recognize organizations and individuals for solutions using the geospatial technologies of Oracle Database 11*g*. The winners of this eighth annual award include innovative industry leaders who have made great strides in the deployment of these technologies. Categories and winners are

Education and Research: Technical University of Berlin, Institute for Geodesy and Geoinformation Science

Innovator: Istanbul Metropolitan Municipality

Partnership: CSoft Group and OSCARS

Special Recognition: Olivier Dubois, General Manager, OSCARS, and Steve Pierce, CEO, ThinkHuddle

bit.ly/NMHwOD

Oracle Buys Assets of Skire

Oracle has entered into an agreement to acquire substantially all of the assets of Skire, a provider of capital program management and facilities management applications available both in the cloud and on premises.

Skire's software provides a complete set of management and governance tools across all project phases from planning and building to operations, enabling companies to efficiently manage their capital and construction programs.

"Adding Skire to the Oracle Primavera Suite will help our customers gain complete visibility, automation, and financial control across their entire project and program portfolio to help them manage for long-term growth," says Mike Sicilia, senior vice president and general manager, Oracle Primavera.

oracle.com/skire

LINDY GROENING

Oracle Health Sciences Accelerates Clinical R&D

Oracle has introduced Oracle Health Sciences Network and has released a new version of Oracle Health Sciences Translational Research Center. Oracle Health Sciences Network is a portfolio of integrated, cloud-based applications that enable healthcare providers and research institutions to collaborate more efficiently with life sciences organizations using de-identified healthcare information. In developing this solution, Oracle worked closely with leading healthcare providers and life sciences companies to create a network that furthers scientific inquiry while safeguarding patient privacy. The initial applications enable clinical investigators to determine protocol feasibility and recruit patients.

Oracle Health Sciences Translational Research Center is a platform that enables secondary use of electronic health records, administrative data, and omics (genomics, proteomics, or metabolomics) data to help accelerate biomarker identification for drug discovery, clinical development, and translational research. Oracle Health Sciences Translational Research Center is deployable on premises, in the HIPAA-certified Oracle Health Sciences Cloud, or in a hybrid model.

"To accelerate delivery of safer, more-effective, and personalized treatments, organizations across the healthcare value chain are increasingly seeking new ways to work together," says Neil de Crescenzo, senior vice president and general manager, Oracle Health Sciences. "Oracle Health Sciences Network creates a secure bridge that helps all stakeholders, including biopharma companies, health systems, and regulators, collaborate securely to raise the effectiveness and efficiency of our health system. With the latest version of Oracle Health Sciences Translational Research Center, organizations can effectively search across clinical, administrative, and molecular data in a single query, drilling down to individual patient–level details to ensure fast, accurate cohort identification."

bit.ly/OWZucW

Oracle Privileged Account Manager Secures Sensitive Data

Oracle has released Oracle Privileged Account Manager to assist organizations in complying with regulatory requirements, securing critical applications and sensitive data, and lowering operational costs. The latest addition to the Oracle Identity Management 11*g* Release 2 platform, Oracle Privileged Account Manager provides organizations with the ability to easily and safely manage passwords for shared or administrative accounts associated with business applications, databases, and operating systems. By combining advanced policy-based and automated password management capabilities with comprehensive auditing and reporting features, Oracle Privileged Account Manager delivers highly secure and simplified password administration, while streamlining identity compliance reporting. It also significantly reduces identity management costs, deployment times, and audit deficiencies.

"With increasing complexity and the need for tight policy controls, managing passwords for shared and administrative accounts can be a very time consuming and expensive process," says Amit Jasuja, group vice president, Oracle Identity Management. "Oracle Privileged Account Manager reduces the administrative burden while enabling customers to benefit from simplified, highly secure management of shared and administrative accounts. [This] combination significantly reduces identity costs and improves security by protecting sensitive data from unauthorized parties."

oracle.com/identity

Oracle Tuxedo 12*c* and Oracle Tuxedo Application Runtime Products Support Cloud and Data Center Deployments

To support development, rehosting, and deployment of C, C++, and COBOL applications in the data center and in the cloud, Oracle has released Oracle Tuxedo 12*c* and Oracle Tuxedo application runtime products.

Optimized to run on Oracle Exalogic Elastic Cloud (pictured below) and tightly integrated with Oracle Fusion Middleware, Oracle Database 11*g*, and Oracle Enterprise Manager 12*c*, Oracle Tuxedo 12*c* provides mainframe-grade quality of service for mission-critical and rehosted enterprise applications. It offers development, management, and operations tools and product enhancements to help lower the total cost of ownership for Tuxedo applications and reduce time to value for new application development. The Message Queue feature provides enhanced performance and availability of enterprise messaging applications.

The 12*c* releases of Oracle Tuxedo application runtime products for CICS, IMS, and batch provide performance improvements to run large-scale mainframe applications rehosted with Oracle Tuxedo Application Rehosting Workbench 12*c* in scalable cloud environments. Combined with new end-to-end lifecycle support in Oracle Tuxedo Application Rehosting Workbench 12*c*, the 12*c* release of Oracle Tuxedo application runtime products helps organizations reduce costs faster by rehosting large-scale mainframe applications to traditional Linux/UNIX servers, engineered systems, and Oracle Exalogic Elastic Cloud environments.

"To meet the increasing demands of conventional and cloud-based applications, organizations need a modern and open platform that can deliver mainframe-class scale and performance," says Frank Xiong, vice president of development at Oracle. "With Oracle Tuxedo 12*c* and the new and enhanced Oracle Tuxedo products, Oracle is able to deliver fast, scalable, and reliable application development and mainframe migration. This allows current and new customers to cost-effectively take advantage of high-performing business-critical applications to increase productivity and reduce costs."

bit.ly/MdT49o

Oracle Acquires Social Media Power

Oracle has entered into agreements to acquire three companies in the social media space: Collective Intellect, Involver, and Vitrue. Collective Intellect's cloud-based social intelligence solutions transform social conversations into actionable intelligence, creating better marketing campaigns, improving customer service, generating more-targeted leads and opportunities, and enhancing products and services with real-time customer feedback. Involver's social media development platform enables developers to create highly customized marketing applications for social media sites and Web campaigns. Vitrue's social media software-as-a-service marketing platform enables organizations to centrally create, publish, manage, and report on their social marketing campaigns on platforms such as Facebook, Twitter, and Google+.

These leading platforms and applications, combined with Oracle's leading sales, service, and commerce products, offer a complete social experience to Oracle customers, says Thomas Kurian, executive vice president of product development at Oracle.

oracle.com/collectiveintellect

oracle.com/involver

oracle.com/vitrue

New Oracle Commerce Solution

To help businesses deliver complete cross-channel customer experiences, Oracle has introduced Oracle Commerce Solution. This product unifies Oracle ATG Web Commerce and Oracle Endeca solutions into one complete commerce solution designed to help businesses deliver consistent, relevant, and personalized customer experiences.

Oracle Commerce Solution features prebuilt components that allow business teams to quickly and easily launch new brands and Websites and enter new markets.

"Oracle Commerce Solution combines the best Web commerce and customer experience solutions to enable businesses to optimize the cross-channel commerce experience," says Ken Volpe, senior vice president, product development, Oracle Commerce.

bit.ly/PNxRd9

LINDY GROENING

Complete Cloud

Oracle unveils broadest cloud strategy in the industry.

RON SELLERS

Oracle CEO Larry Ellison announced the industry's broadest and most advanced cloud strategy at an event in Redwood Shores, California, on June 6. At the heart of this strategy is Oracle Cloud, which delivers a complete, modern, and flexible enterprise cloud that provides subscription-based access to best-of-breed, integrated, and standards-based application, platform, and social services, all completely hosted, managed, and supported by Oracle.

The announcement was the culmination of a companywide initiative that involved thousands of employees and billions of dollars—and took nearly seven years to come to fruition. The project was so complex because Oracle chose to re-engineer its entire product line for the cloud, from applications to disk.

"We are not trying to be a niche provider [with] one, two, three applications in the cloud," Ellison said. "We are providing a complete suite of CRM applications, a complete suite for B2B and B2C including social relationship management, a complete suite for ERP [enterprise resource planning], a complete suite for human capital management and talent management. [It is] by far the most comprehensive set of applications in the cloud available from any vendor in the world."

PLATFORM SERVICES

Built on the same standards-based, enterprise-grade platform products as Oracle's on-premises software, Oracle Cloud's Platform Services enable organizations to speed time to market and lower costs by quickly building and deploying applications. Platform Services include Oracle Cloud Database Services, Oracle Cloud Java Services, Oracle Cloud Developer Services, Oracle Cloud Web Services, Oracle Cloud Mobile Services, Oracle Cloud Documents Services, Oracle Cloud Sites Services, and Oracle Cloud Analytics Services.

> **"We are providing a complete suite of CRM applications, a complete suite for B2B and B2C."**
>
> *—Larry Ellison, CEO, Oracle*

Oracle Cloud Database Services allow organizations to run Oracle Database in the cloud to manage data and rapidly build Web-based database applications using Oracle Application Express.

Oracle Cloud Java Services provide a way to develop, deploy, and manage Java applications in the cloud, with a choice of popular integrated development environments (IDEs) including Oracle JDeveloper, Eclipse, and NetBeans.

Oracle Cloud Developer Services provide instant access to tools that enable faster, smarter, and more-collaborative development in the cloud. With Developer Services, development teams can use their favorite developer tools (Hudson for continuous integration, Git and GitHub for source control, wiki and tasks for project management) in Oracle Cloud. These services also integrate with popular IDEs such as Oracle JDeveloper, Eclipse, and NetBeans.

Five additional services round out the Oracle Cloud Platform Services offering. The first two, Web Services and Mobile Services, complement the Developer Services component. Web Services support the rapid building of Web applications using PHP, Ruby on Rails, and Python. Mobile Services allow organizations to build cross-platform native and HTML5 applications for smartphones and tablets.

The other three components are services

that Oracle provides to end users: Documents Services, Sites Services, and Analytics Services. As Ellison put it, "We have a complete suite of tools for developers/programmers *and* a complete suite of tools for business users where they can develop and deploy applications in the cloud. You don't have to be a programmer."

The Documents Services component supports collaboration and sharing of documents via online workspaces and portals. "Collaborations are very important," Ellison said. "You have teams of people doing development. You have teams of people doing all sorts of things. We provide a variety of collaboration tools, of file-sharing [and] document-sharing tools."

Sites Services support the development and maintenance of visually engaging Websites. This component includes intuitive drag-and-drop design tools and self-service publishing capabilities.

Finally, Analytics Services allow organizations to quickly build and share analytic dashboards and reports. "Let's say you do deploy a store on Facebook, and you'd like to see what people are posting about the store and about the products you're selling in the store," Ellison said. "We provide you with tools where you can analyze those posts, analyze those tweets, and respond. An you don't have to be a programmer to set that up."

APPLICATION SERVICES

Oracle Cloud's Application Services give organizations access to a broad collection of cloud-based enterprise applications, Ellison said. Application Services are available across a wide spectrum of Oracle's enterprise applications, from enterprise resource planning and human capital management to talent management, sales and marketing, and customer experience.

These enterprise-class application services provide users with the same functionality they would get in an on-premises application. They are easy to set up, configure, and manage. And like Oracle Cloud's Platform Services, these application services are extremely secure, Ellison said. In addition, due to the flexible, standards-based nature of Oracle Cloud, applications deployed on the cloud can later be moved on premises.

> **"You don't forget everything you learned over the last 20 years about IT just because you're going to the cloud. Security is still important. . . . Scalability is still important."**
>
> *—Larry Ellison, CEO, Oracle*

Oracle also gives customers choice in terms of upgrading their application services. New versions aren't forced on customers just because they are available.

"We think a modern cloud lets you decide when you want to upgrade, not have the cloud vendor tell you when you upgrade. [When a new version becomes available] we're going to give you a window [to upgrade], and that window will be a year," Ellison said. "You decide when you want to move forward to the next version of the software. That's a huge difference between us and virtually every other SaaS [software as a service] vendor."

Oracle Cloud's Platform Services and Oracle Cloud's Application Services incorporate the principles of IT excellence that Oracle has developed and built into its products over decades.

"You don't forget everything you learned over the last 20 years about IT just because you're going to the cloud," Ellison said. "Security is still important. Industry standards are still important. Reliability is still important. Scalability is still important. I want all those things, now in the cloud."

SOCIAL SERVICES

Oracle Cloud's Social Services solutions, the newest set of services in Oracle Cloud, provide a complete enterprise social platform. Organizations can engage with their customers across social media properties through a variety of social relationship management tools. Social Services also provide a rich social networking platform for employees to collaborate within a company.

Oracle Cloud's Social Services solutions include Oracle Cloud Social Network Services, for secure enterprise collaboration and social networking for business; Oracle Cloud Social Data Services, to aggregate data from social networks and enterprise datasources to enrich business applications; Oracle Cloud Social Marketing and Engagement Services, to enable marketers to centrally create, publish, moderate, manage, measure, and report on their social marketing campaigns; and Oracle Cloud Social Intelligence Services, which allow these marketers to analyze social media interactions and to enable customer service and sales teams to engage with customers and prospects effectively.

ENTERPRISE-GRADE

As the engineered system foundation of Oracle Cloud, Oracle Exadata and Oracle Exalogic run all of Oracle Cloud's services across a range of global data centers, delivering extreme performance, massive scalability, and fault tolerance that has no single point of failure. Oracle Exadata and Oracle Exalogic provide the capacity on demand that is one of the biggest advantages of cloud computing. "As you need more capacity, we simply spool up another machine," Ellison said.

That flexibility and elasticity is the primary reason that the cloud truly represents a new era in computing, as important a transition as the move to a client/server model decades ago. Simply put, cloud computing is transforming the way businesses view technology, and Oracle is transforming the cloud. "Very few technology companies cross the chasm from one generation of technology to the next," said Ellison. Oracle has now bridged that gap to deliver "the most comprehensive cloud on the planet Earth." ◀

Chip Brookshaw has reported on IT and enterprise technology for more than 15 years.

NEXT STEPS

WATCH the Oracle Cloud Webcast
oracle.com/us/corporate/events/strategyupdate

LEARN more about Oracle Cloud
cloud.oracle.com

New Questions, Fast Answers

Oracle Endeca Information Discovery enables easy exploration of diverse and changing data.

As the volume and variety of data that organizations collect continues to grow, companies must be able to explore and understand the connections that crisscross that data if they want to stay competitive. Rich Schwerin, Oracle Magazine *contributing editor, sat down with Paul Sonderegger, senior director of analytics at Oracle, to talk about business analytics and data discovery. The following is an excerpt from that interview. Download the full podcast at oracle.com/magcasts.*

Oracle Magazine: How is business analytics defined today?

Sonderegger: Business analytics gives managers insight into the business so they can make choices that leave the firm better off. The thing that is changing now is the scale and scope of data available for an ever-increasing scale and scope of decisions. It's basically making more data available—not just more volume, but more variety—for ever-smaller daily decisions.

Oracle Magazine: What is *information discovery*?

Sonderegger: Analytics is evolving into not just reporting on metrics, which the company knows that it needs; it will continue to be important to get KPIs [key performance indicators] and proven answers to known questions. Information discovery moves beyond that to provide fast answers to new questions, especially for people who are not technical. They can't write SQL. They can't write the queries to express their questions. There has to be some easy way to explore, some way to search and navigate as easily as you do on an e-commerce site. These people are exploring data that comes from dozens, sometimes thousands, of different systems that were never designed to work together.

Oracle Magazine: Who is using information discovery, and how are they using it?

> **"Business professionals use information discovery to explore diverse data."**

Sonderegger: In a typical organization, the people using information discovery are actual business users: brand managers, commodity managers, procurement specialists, and warranty engineers at manufacturers. These are people who have expertise in the business, but not in writing queries. The reason that this matters is part of the idea behind information discovery—more and more jobs and more and more decisions in those jobs require fact-based decision-making. Business users need a way to ask the questions that only they can think of because they have expertise in the business.

DAVE BRADLEY

Paul Sonderegger, Senior Director of Analytics, Oracle

Oracle Magazine: How does information discovery relate to business intelligence [BI]?

Sonderegger: Information discovery is a complement to business intelligence. Information discovery is not a replacement for BI in any way. It's actually a new solution to a new problem. BI delivers proven answers to known questions, and that will continue to be important. Information discovery lives alongside BI and offers a way to get fast answers to new questions. For example, an appliance manufacturer still uses its analytics infrastructure to report on the price of copper. But when they see that the price of copper has jumped really high, they move to a discovery application to figure out the alternatives. Information discovery and BI complement one another in a virtuous circle.

Oracle Magazine: What is Oracle Endeca Information Discovery?

Sonderegger: Oracle Endeca Information Discovery is a platform for provisioning discovery applications as rapidly as a business requires. The product has three main pieces: Oracle Endeca Server; the Studio feature; and the Integration Suite feature. Oracle Endeca Server is the core search/analytical database that organizes complex and varied data from disparate source systems into a flexible, faceted data model. The Studio feature is a component-based environment for building enterprise-class discovery applications. The Integration Suite feature includes a content acquisition system for gathering content from file systems, content management systems, and Websites; an integrator that provides out-of-the-box ETL [extract, transform, and load] tooling for integrating and enriching enterprise data; and the open Web

Services API, which allows for direct data integration from other tools.

Oracle Magazine: How are business professionals and technologists using Oracle Endeca Information Discovery?

Sonderegger: Business professionals use information discovery to explore diverse data in order to get a better understanding of some new or unfamiliar situation. For example, a property and casualty insurer has very sophisticated reporting around claim codes used in processing various insurance claims, and it wants to better understand the information recorded in the adjuster's notes—long form, long text descriptions of what actually happened at the scene of the accident. These analysts are looking for emerging risks, like texting while driving. They're also looking for new kinds of fraud they didn't know existed; they need to discover it before they can modify an algorithm to detect it. On the IT side, technologists are using this technology to collaborate with the business better. BI professionals have all had the experience of saying to IT, "We need some new reports." IT says, "Great. Just tell me what should be in them." And the business says, "Well, we don't know yet because we're not exactly sure what we're looking for." And everybody throws up their hands and walks away.

With Oracle Endeca Information Discovery, organizations now can take a different approach where the IT folks can say to business users, "Give me just two or three datasources that you think might make a difference to answering your questions. We will pour them into Oracle Endeca Information Discovery, which you can access and start to explore and tell us what new questions that inspires." With Oracle Endeca Information Discovery, when the business discovers the need for new visualizations or additional datasources, IT can respond very quickly, modifying visualizations and adding new datasources. Oracle Endeca Server indexes those new sources, adds them into its index, changes its own model, and then shows those changes in Oracle Endeca Information Discovery. ◀

Rich Schwerin is a senior manager with Oracle Publishing who focuses on social media.

NEXT STEPS

LEARN more about Oracle Endeca Information Discovery
bit.ly/oeidmag

LISTEN to the podcast
oracle.com/magcasts

Oracle Storage Networking,
Powered by QLogic, Optimized with Oracle Linux

THE QLOGIC AND ORACLE alliance extends over 17 years of collaboration to deliver a stable, reliable, and highly responsive environment for your critical business needs. Oracle-branded storage networking products, powered by QLogic, offer the performance as well as the confidence that comes with knowing this platform has been fully tested and optimized for Oracle Linux including the latest version of Oracle Linux 6. As a component of Oracle's Validated Configurations, the StorageTek 8 Gb FC PCIe HBAs and Sun Storage 10 GbE FCoE CNAs are also integral to the Oracle Linux validated enterprise solutions. Together, Oracle Linux and QLogic enable organizations to confidently deploy these solutions knowing that they will achieve the high performance, scalability, and reliability they have been seeking.

Visit us at Oracle OpenWorld 2012, October 1st – 4th at the Moscone South! Find us at the QLogic Exhibitor's Booth (#1926) and at at the Oracle Linux Partner Pavilion (#1033). For more information on Oracle QLogic-branded HBAs, visit us at **www.qlogic.com/go/oracle**.

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Oracle Enterprise Manager Cloud Control 12c: Managing Data Center Chaos

By Porus Havewala

Packt
packtpub.com

Learn about Oracle Enterprise Manager 12c Cloud Control's capabilities from an Oracle Certified Master. Using enterprise examples and case studies, learn to install Oracle Enterprise Manager 12c or upgrade from earlier versions, discover components automatically, collect configuration information, compare configurations, and enforce security compliance. The book also provides techniques for automated provisioning and patching using the new Designer/Operator roles; covers database change management capabilities; and shows how to discover, monitor, and manage Oracle Exadata Database Machine. Management of Oracle E-Business Suite and Oracle's Siebel and PeopleSoft applications is covered, along with physical-to-virtual scenarios and infrastructure-as-a-service and database-as-a-service cloud setup and operation.

Oracle Exalogic Elastic Cloud Handbook

By Tom Plunkett, TJ Palazzolo, and Tejas Joshi

Oracle Press
oraclepressbooks.com

Written by members of the Oracle Exalogic X-Team—the elite group that supports strategic Oracle Exalogic customers—this guide was created for architects, administrators, and developers. It begins by describing the Oracle Exalogic Elastic Cloud hardware, software, and solution architecture, and then explores Oracle Exalogic administration and development. Topics include strategies and tips for deploying Oracle Exalogic successfully, advice and techniques for building private cloud applications, and points to consider when running packaged applications on Oracle Exalogic. System optimization, security, and migration of legacy applications from other platforms are also covered in detail.

Oracle Database 11g: Data Warehousing and Business Intelligence Solutions Cookbook

By John Heaton

Packt
packtpub.com

Master key techniques and components involved in effectively visualizing and analyzing information with this practical guide, packed with recipes for project management and project delivery. New and advanced techniques for extract, transform, and load (ETL) and extract, load, and transform (ELT) are covered, along with data modeling using Oracle SQL Developer Data Modeler. Readers will learn how to build logical and physical data models, how to build a presentation data model using Oracle Business Intelligence Enterprise Edition, how to create data discovery scripts that uncover data issues and gaps, and how to reverse-engineer source data models. Mapping information, semantic definitions, and security models are also covered.

Java Programming

By Poornachandra Sarang

Oracle Press
oraclepressbooks.com

Java Programming features hands-on programming exercises and examples based on the author's 10-plus years of teaching Java. The book covers all new Java features, including multilingual support, support for JavaScript and other scripting languages, JavaFX, and other modifications to the language. Other topics—including inheritance, exception handling, I/O, threads, network programming, events, GUI, applets, collections, strings, utility classes, and new features in JDK 7—are part of this comprehensive, expert-level guide to Java 7 programming.

Oracle WebLogic Server 12c: First Look

By Michel Schildmeijer

Packt
packtpub.com

Explore new Oracle WebLogic Server features using real-world examples. The book defines and explains all the concepts of Oracle WebLogic Server 12c, and then covers new features of Java Platform, Enterprise Edition (Java EE) and Java Platform, Standard Edition (Java SE) along with development of Java EE 6 applications. Readers will learn about integration and management of Oracle WebLogic Server 12c in Oracle Exalogic and cloud environments, including integration with Oracle Enterprise Manager Cloud Control 12c. Other topics include integrated services such as Oracle Coherence, JDBC, and Java Message Service, and components such as Oracle Virtual Assembly Builder, Oracle Traffic Director, and Exabus (the Oracle Exalogic I/O subsystem).

Look for other Oracle books at bit.ly/otnbookstore.

ADAX Supports Oracle's SPARC T4 Servers

Oracle Gold Partner ADAX has announced that its HDC3 I/O cards and drivers now support Oracle's SPARC T4 server line and Oracle's Sun Blade server modules. HDC3 cards are eight-trunk SS7 signaling and I-TDM controllers used in high-performance telecom environments.

ADAX's HDC3 cards are available for the full range of server I/O bus formats used in the telecom industry today: PCI, PCIe, PCIe Express Module, Low Profile PCI, PMC, and AMC. ADAX HDC3 cards have also been validated on Oracle x86 servers and Sun Blade 6000 modular systems. Support and drivers for Oracle Solaris 11, Oracle Solaris 10, and Oracle x86 servers are standard with ADAX HDC3 cards.

adax.com

Two Partners Earn Oracle Exadata Optimized Status

Oracle Gold Partner Kalido has achieved Oracle Exadata Optimized status for Kalido Information Engine 9.0, which allows organizations to develop and deploy a data analytics foundation in 90 days or less. Kalido combines business-driven automation capabilities with Oracle Exadata's data warehousing performance to enable rapid data warehouse implementations, migrations, and consolidation projects.

Oracle Gold Partner Neuralitic Systems, a provider of mobile data intelligence solutions, has earned Oracle Exadata Optimized status for its SevenFlow 3.2 data extraction and analysis tool. SevenFlow extracts and analyzes 100 percent of data usage from 100 percent of data subscribers on a wireless network, enabling mobile operators to develop strategies and tactics based on subscribers' and roamers' actual behavior. With Oracle Exadata Database Machine, SevenFlow customers can support tens of millions of subscribers for periods exceeding 12 months, while still providing end-user response time of less than two minutes.

kalido.com

neuralitic.com

Oracle PartnerNetwork Exchange @ OpenWorld

Oracle partners attending Oracle OpenWorld can look forward to enhanced opportunities for networking and learning through the new Oracle PartnerNetwork Exchange @ OpenWorld. Oracle PartnerNetwork Exchange @ OpenWorld will kick off on Sunday, September 30, with a partner-focused keynote session. Oracle executives, including Judson Althoff, senior vice president of Worldwide Alliances and Channels and embedded sales, will share insight into Oracle's strategic priorities and offer partners ways to further differentiate and expand their businesses with Oracle's applications-to-disk technology portfolio. Following the keynote, Oracle Alliances and Channels team members representing all global regions will meet with partners to discuss their unique regional opportunities and challenges.

Throughout Oracle OpenWorld, more than 30 partner-focused educational sessions will give partners exclusive access to Oracle's top experts as well as customers and fellow partners. Partners can take advantage of Oracle PartnerNetwork enablement resources, including onsite Specialized testing. The Oracle PartnerNetwork Lounge, available to partners throughout Oracle OpenWorld, will include meeting spaces, demo kiosks, Oracle PartnerNetwork information stations, and a special area for blogging and video blogging. The Oracle PartnerNetwork Lounge will also serve as a place to network with colleagues, customers, prospects, and other industry professionals. More than 450 Oracle partners will exhibit at Oracle OpenWorld in five Partner Pavilions: CRM Pavilion, Hyperion Pavilion, JD Edwards Pavilion, Oracle Linux Pavilion, Oracle Solaris Systems Pavilion, and Retail Row.

oracle.com/opnexchange

Intelenex Earns Oracle Accelerate for Midsize Companies Specialization

Intelenex, an Oracle Accelerate and Oracle Platinum Partner, has achieved Specialized status for Oracle Accelerate for Midsize Companies. The distinction recognizes Intelenex' expertise in delivering services to midsize companies specifically around Oracle CRM On Demand and Oracle Contact On Demand. Intelenex specializes in business process mapping.

intelenex.com

Partners Achieve Oracle Exadata and Oracle Exalogic Optimized Status

Oracle Gold Partner Adaptive TechSoft has achieved Oracle Exadata Optimized and Oracle Exalogic Optimized status for its e-Register 5.0 offering. This status demonstrates that e-Register has been tested and tuned on Oracle Exadata Database Machine and Oracle Exalogic Elastic Cloud to deliver speed, scalability, and reliability to customers. e-Register is a system for university communities—students, staff, and administration—that manages all student information. With e-Register, a student can perform registration activities and check academic information, grades, GPA, timetables, and academic calendars online. The system also enables students, faculty, staff, administration, and community members to interact.

Oracle Gold Partner ElectraCard Services (ECS) has earned Oracle Exadata Optimized and Oracle Exalogic Optimized status for its electraSWITCH iTx series. This series is part of ECS's electra EFT platform, which drives ATM, POS, and mobile payment networks worldwide. The series supports a variety of debit card standards and works with multiple institutions, currencies, time zones, and languages.

ats-ware.com

electracard.com

LINDY GROENING

Oracle PartnerNetwork Announces Specialization for Oracle Spatial

Oracle launched the Oracle PartnerNetwork specialization for Oracle Spatial at the 2012 Location Intelligence User Conference and Oracle Spatial User Conference, colocated in Washington DC in May. This specialization provides tools and resources to help partners with Oracle Spatial–related offerings gain visibility and become more competitive. It also provides an opportunity for partners not yet offering Oracle Spatial solutions to expand their reach into this growing market.

Specialization in Oracle Spatial demonstrates a partner's expertise in delivering value-added spatial and mapping solutions. Like other Oracle PartnerNetwork specializations, the specialization for Oracle Spatial combines business and competency criteria that measure a partner's skills in sales, presales, support, and implementation roles.

bit.ly/NhRCCU

KPIT Cummins Expands Oracle PartnerNetwork Specializations

Oracle Platinum Partner KPIT Cummins, an IT consulting and product engineering company serving global manufacturing, distribution, energy, and utilities corporations, has achieved 20 Oracle PartnerNetwork specializations and 5 advanced specializations. KPIT Cummins' advanced specializations include Oracle E-Business Suite Supply Chain Management, JD Edwards EnterpriseOne Financial Management, JD Edwards EnterpriseOne Distribution, JD Edwards EnterpriseOne Configurable Network Computing, and Oracle Database 11*g*. To earn each of the advanced specializations, the company met the Oracle PartnerNetwork Specialized business and competency criteria and had a minimum of 50 Oracle certified implementation specialists on staff. For each of the 20 specializations, KPIT Cummins' team of sales, presales, support, and implementation specialists passed rigorous certification testing.

kpitcummins.com

AdvancedEPM Consulting Gains High Technology Specialization

Oracle Platinum Partner AdvancedEPM Consulting has achieved a High Technology industry specialization. This specialization recognizes the company's proficiency in applying Oracle's hardware and software solutions for high-tech companies and underscores AdvancedEPM's knowledge of the industry.

AdvancedEPM's consulting business is exclusively focused on Oracle Hyperion enterprise performance management solutions. AdvancedEPM holds specializations in Oracle Hyperion Planning and Oracle Essbase, as well as industry specializations in Consumer Goods and Oil and Gas.

advancedepm.com

Foresight Achieves OPN Specialization for Oracle Argus Safety Suite

Oracle Gold Partner Foresight Group International, a provider of pharmacovigilance processes, regulations, systems, and tools, has achieved Specialized status for Oracle Argus Safety. The specialization recognizes Foresight's expertise in delivering and implementing solutions for Oracle Argus Safety and acknowledges Foresight's commitment to training its employees on critical skills required in those implementations.

The company's Oracle Argus Safety delivery model serves clients in the United States, Europe, and Asia, and its consultants combine hands-on experience implementing Oracle products with drug safety process skills. Foresight also provides clinical and postmarketing pharmacovigilance solutions, including process design and optimization; safety system implementation; compliance, performance monitoring, analysis, and corrective and preventive action; and industry survey and benchmarking.

foresightgroup.com

eVerge Group Earns Oracle Business Intelligence Specialization

Oracle Platinum Partner eVerge Group has achieved its ninth specialization—this one for Oracle Business Intelligence Applications. The company's previous specializations are in Siebel CRM, Oracle CRM On Demand, Oracle Business Intelligence Foundation, PeopleSoft Human Capital Management, PeopleSoft PeopleTools, Oil and Gas, Public Sector, and Education and Research.

eVerge Group has implemented Oracle Business Intelligence systems in commercial and public sector organizations since 2002. The company is an Oracle Business Intelligence Pillar Partner for public sector organizations and received an Oracle Titan Award in 2011 for Oracle Business Intelligence implementation excellence. Founded in 1993 and operating in the Americas, eVerge Group provides enterprise resource planning, customer relationship management, business intelligence, master data management, and enterprise performance management solutions.

evergegroup.com

FoxT ServerControl Achieves Oracle Validated Integration

Oracle Gold Partner Fox Technologies (FoxT) has achieved Oracle Validated Integration of FoxT ServerControl 6.5.4 with Oracle Identity Management 9.1. The integration, enabled by a Web services–based connector from FoxT, adds granular authentication and authorization policy enforcement to Oracle Identity Management processes and provides privileged-user access to systems and data.

Together, FoxT ServerControl and Oracle Identity Management allow organizations to provision user accounts across diverse servers and domains, manage authorization and authentication through assignment of roles to groups of users, and consolidate user access activity data (including keystroke logs) for automated audit and compliance reporting.

foxt.com

Performance Architects Earns Life Sciences Specialization

Oracle Platinum Partner Performance Architects has achieved Specialized status for life sciences, which includes pharmaceutical, biotech, and medical device companies. Performance Architects helps clients initiate and sustain improvements in enterprise performance through performance management–related business and technology consulting and industry expertise.

Performance Architects holds specializations in Oracle Hyperion Planning, Oracle Essbase 11, Oracle Accelerate for Midsize Companies, and Education and Research (Higher Education). The company has worked with Oracle Hyperion products since these products were launched, and has experience with the entire Oracle Business Intelligence Suite, Enterprise Edition.

performancearchitects.com

OutSystems Earns Oracle Database Ready Status

OutSystems' Agile Platform 6.0 has achieved Oracle Database Ready status. This status demonstrates that Oracle Gold Partner OutSystems has tested and supports Agile Platform 6.0 on Oracle Database 11*g* Release 2. Oracle Database Ready is part of the Oracle Exastack Ready program, in which partners develop, test, and tune their applications on Oracle Exadata Database Machine or Oracle Exalogic Elastic Cloud engineered systems.

Agile Platform is a development environment used to deliver custom enterprise Web applications and Websites and manage them through their entire lifecycle. Offered as a yearly subscription, it includes a Web-based management console, a desktop environment, an integration studio for linking to external applications and databases, and one-click deployment.

outsystems.com

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With support from Oracle, National Geographic Education is engaged in a major project to develop teacher leaders in marine ecology and create materials about ocean science and geography for students, families, the ocean recreation community, and the general public.

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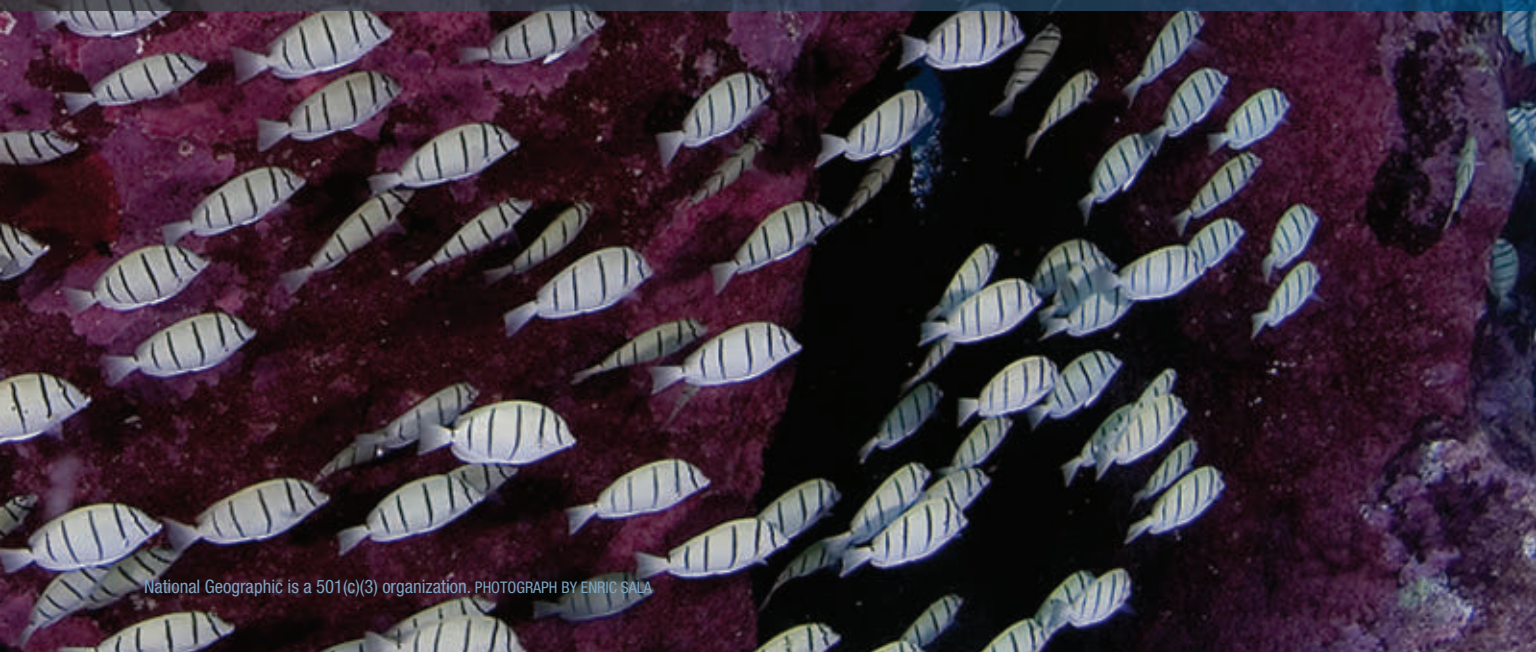


National Geographic is a 501(c)(3) organization. PHOTOGRAPH BY ENRIC SALA

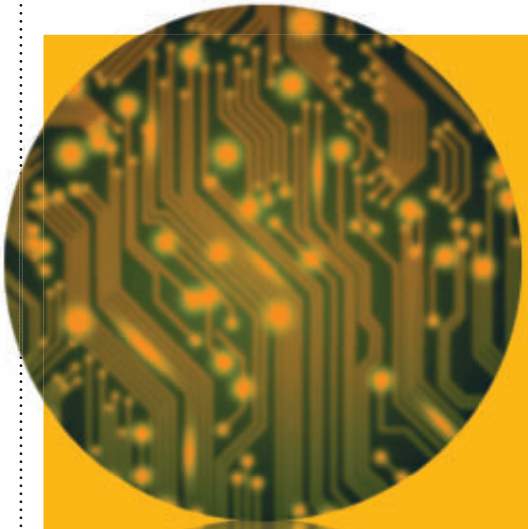
SKILLS STARTUP

It's never too late to acquire new skills or polish the ones you have. New self-paced tutorials on application development with Oracle SQL Developer, Oracle SQL Developer Data Modeler, and Oracle Application Express will meet either need, giving you detailed getting-started content for the latest generation of Oracle Database tooling.

bit.ly/MJlVS6

Virtualization Directions

If you're virtualizing at the server layer, you'll probably be facing a decision between using hard partitioning with the dynamic domains of Oracle's SPARC Enterprise M-Series servers, a hypervisor such as Oracle VM Server for SPARC or Oracle VM Server for x86, or something at the operating system layer, such as Oracle Solaris Zones or Oracle Linux containers. Perhaps you'll use a little of each—and, if you want to save yourself some work, Oracle VM Templates. **Ginny Henningsen** provides some guidance in the article "Which Tool Should I Use to Manage Which Virtualization Technology?" Henningsen explains the difference between dynamic domains and Oracle VM Servers and how those are different from the zones in Oracle Solaris 11 and containers in Oracle Linux. Then she shows you how to set up and manage those technologies with their different tools, including Oracle Enterprise Ops Center. If the virtualization picture looks a little blurry to you, let her clear things up. **bit.ly/NzKkiJ**



Based on the number of attendees—more than 1,700—logged in to the recently run Virtual Developer Day (in June, for American time zones) focusing on hands-on database application development, it appears that virtual hands-on workshops are hitting their stride. The biggest draw: the new Big Data track, including sessions on Oracle NoSQL Database, using Oracle Database with Hadoop, and scalable app design techniques. Seems that Oracle Database professionals have their eyes on the big data ball.

Look for new virtual workshops focusing on big data and cloud application development later this year.

bit.ly/Muzsj6

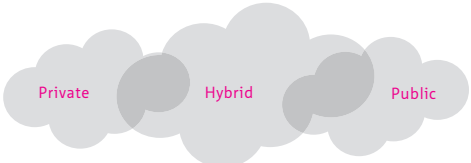
LINDY GROENING

NEW OTN TOUR
5 Countries in 11 Days

The third annual Latin America OTN Tour, organized by the Latin America Oracle Users Council (LAOUC) in cooperation with Oracle Technology Network and the Oracle ACE program, began on August 6 in Montevideo, Uruguay. The tour also stopped in Buenos Aires, Argentina (August 9); São Paulo, Brazil (August 11); Lima, Peru (August 14); and Santiago, Chile (August 16). Oracle luminaries and Oracle ACE Directors presented on topics such as database application development, SOA, and Java. **bit.ly/LjpzB3**

PODCAST

Understanding Public, Private, and Hybrid Clouds



In conversations about cloud computing, what do the terms *public*, *private*, and *hybrid* really mean? In this Oracle Technology Network ArchBeat podcast, cloud computing experts Dr. James Baty, Mark Nelson, Ajay Srivastava, and William Vambenepe compare and contrast the various flavors of cloud computing. **bit.ly/MmFgKp**

Decisions, Decisions

The art, science, and politics of technology selection

When the time comes for a solution architect to make the final decision about the technologies, standards, and other elements that are to be incorporated into a particular project, what factors weigh most heavily on that decision? It comes as no surprise that among the architects I contacted, business needs top the list.

Philip Wik, a senior consultant at MSS Technologies, stresses the importance of clearly stated and well-understood business goals when addressing technology considerations. "Don't put the technology cart before the business horse," he advises.

"It's cool to talk about Web services, REST, EDA [electronic design automation], clouds, and so on," says Wik. "But can I suggest a time-out? Let's table a discussion of implementation technologies until we clearly know what we're going to implement and why. We need to first know where our business is going and what it needs to meet the demands of the marketplace."

Oracle ACE Director Basheer Khan, an IT architect who is founder, president, and CEO at Innowave Technology, places a similar importance on meeting business needs. "No matter how great a specific technology is or how well defined a particular standard is, if it does not have the right price-performance ratio for the business, I reject it."

While price is an important consideration, making technology decisions based solely on price can have dire consequences. "We must weigh the cost in terms of value that can be delivered, rather than selecting a technology that is merely the least expensive," says Wik. "A less-expensive technology that can't support an organization's architectural principles is unlikely to meet its business goals.

Meeting those goals is key, but practical realities within the organization regarding budget and technical resources may pose challenges to meeting specific business requirements. Aki Iskhandar, system architect at Lambda Software, says solution architects must draw on their domain expertise and knowledge of those realities when making technology decisions.

> **"A solution architect's job typically involves blending art and science in connecting the dots."**
>
> *—Ron Batra, Director of Cloud Computing, AT&T*

"Solution architects must use their experience to balance resources and constraints in an effort to recommend an architecture that ensures a successful solution for the project at hand," says Iskhandar, "delivering on as many of the business requirements as possible, while pushing back on the ones that make no sense."

In some cases, however, technology options may be limited. In others, solution architects may have only limited input in any technology decisions.

"Larger organizations with fairly mature enterprise architecture programs may have rigid vendor lists, which impact the possible selection of tools and software packages," says Iskhandar. "The business should get what it wants, but it would be nice if they would run it past IT first. That almost never happens."

But keeping IT out of the technology selection loop may not be such a bad thing, at least according to Wik. "Those who should be making these decisions shouldn't be the implementers, but rather business and marketing managers who are most involved in profit and loss questions and business growth," says Wik. "The functional team rather than information technology should drive the technology selection process."

Welcome to the world of architectural politics.

"A solution architect's job typically involves blending art and science in connecting the dots across several broad landscapes," says Oracle ACE Director Ron Batra, director of cloud computing at AT&T. "Things often get fuzzy in trying to please multiple stakeholders."

Solution roadmaps can help to eliminate some of that fuzziness. "But more often than not, a business process or technology roadmap serves only as a guideline," Batra says. "Then it's the job of the solution architect to fill in the gaps within the guidelines."

Making those gap-filling decisions requires skills beyond the technical. "Solution architects have to sell the solution," says Batra, "and it is not always possible to keep everyone happy. This is where the soft skills—selling, persuasion, negotiation, communication—show their worth."

For solution architects, that's business as usual. ◀

Bob Rhubart (bob.rhubart@oracle.com) is manager of the architect community on Oracle Technology Network, the host of the Oracle Technology Network Arch2Arch podcast series, and the author of the ArchBeat blog (blogs.oracle.com/archbeat).

NEXT STEPS

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Deeper Developments

A database expert shares lessons from a life of coding and business.

Cary Millsap often speaks on technical subjects at user group events. But in late 2011, at the UK Oracle User Group (UKOUG) conference in Birmingham, England, he tried something new. He opened up to the assembled technologists about his struggles, his successes, and the wisdom that can be gained from a life in software development and business.

"I talked about how our work requires us to think clearly and explain our conclusions, and how that is applicable to other parts of life," says Millsap, an Oracle ACE Director with expertise in database management and performance. "I also talked about how running a business has made it imperative that I understand what I value most versus those things I can live without."

The presentation in Birmingham found a receptive audience, and Millsap was asked to reprise his talk in June 2012 at the Oracle Development Tools User Group (ODTUG) Kscope conference in San Antonio, Texas. I caught up with him at Kscope to explore the themes of his talk.

Oracle ACE Director Cary Millsap

PAUL S. HOWELL

THINK CLEARLY

Millsap, who is married with three children, spent his early career at Oracle and later founded two businesses. "People think that consultants get paid for having the right answers, but we don't," says Millsap. "We get paid for *convincing* people that we have the right answers." The way you do that, he says, is by showing them the exact process that led to your conclusion.

Millsap notes that this approach has had direct application when teaching math to his children. "When I work with my kids I want to see the same thing my clients want to see: how did they arrive at that answer?" he says. "That's when a real understanding happens."

But the steps to running a business, says Millsap, are far less straightforward than math equations. "A tragic event or a spectacularly good coincidence can happen to you at any time," Millsap says. "Even in a career that looks like a steady path upward, there are amazing turns of luck." Millsap designed compilers before coming to Oracle. The skill sat mostly dormant for years until it helped him cut a customer's project from six months to just two.

"That kind of good coincidence happens in business," says Millsap. "Sometimes you don't know exactly where the next job will come from, and you begin to wonder if your business will be there in a year or even in a few months. You have to have the stomach to withstand the doubt and trust that the work you've done and the relationships you've built will pay off."

OVERCOME FEAR

According to Millsap there is one obstacle that never goes away: fear. Unchecked, fear is man's most destructive emotion, he says, but it's also a magnificent teacher. "One of the consistent themes of my life is detecting a place where I have fear and finding a way to overcome it."

When he started a new business, Millsap feared all he would lose if it failed. So he prioritized the things he valued. "It's important to understand where things rank, because if you don't you might trade something dear for something shiny," he says.

Millsap thought the list of things he couldn't live without would be three to five items long. "It turned out to be one thing: my family," he says. When his wife assured him that she wasn't going anywhere if he failed, his confidence grew.

"I've learned that if I'm really afraid of something that I think can lead me to greener pastures, then it's something I must try," says Millsap. So while he feared speaking on personal themes that relate to his life as a developer and a businessman, when the opportunity came up, he didn't hesitate.

"Since then I have had incredible conversations with people who've heard my talks and want to share lessons from their work," says Millsap. "Others have disagreed with me on some points, and those too have been fruitful conversations." ◀

Jeff Erickson (jeffrey.x.erickson@oracle.com) is a senior editor with Oracle Publishing.

NEXT STEPS

READ Cary Millsap's blog
carymillsap.blogspot.com

FOLLOW Cary Millsap
twitter.com/CaryMillsap (@CaryMillsap)

WATCH the interview
oracle.com/oramag/upclose

Knowledge Bloggers

Peers use their blogs to communicate, educate, and rate past issues of *Oracle Magazine*.

DAVID RICARDO

ORACLE ACE

Company: Condominio de Soluções, an IT firm specializing in business intelligence tools

Job title/description: Senior database administrator and junior application administrator, working as part of a team focused on Oracle technologies

Location: São Bernardo do Campo, Brazil

Oracle credentials: Oracle Certified Associate (Oracle Database 10*g*), Oracle Certified Professional (Oracle Database 10*g*, Oracle Database 11*g*), Oracle Certified Expert (Oracle Database SQL, Oracle Real Application Clusters), with 10 years of experience using Oracle products

Which Oracle technologies are you currently finding most valuable? My team relies on the convenience of virtualized environments to ensure greater use of big hardware. Currently we're working hard in Oracle VM 3.0, developing architectures using Oracle JRockit Release 28, Oracle Real Application Clusters 10*g* and 11*g*, and Oracle Business Intelligence Enterprise Edition 11*g*. We always follow best practices, and we've seen excellent results.

What advice do you have about getting into database and application development? I'd encourage both businesses and professionals to explore applications oriented to the virtual world. Now is the time to invest in cloud computing, especially hybrid clouds and ways to promote quick end-user access to them.

How are you using social media in your work? I use my blog as a communications channel, maintain a group within Facebook for DBAs in São Paulo, and use Twitter to stay current on new trends among my fellow Oracle ACEs and within the Oracle community in general.

BRENDAN TIERNEY

ORACLE ACE

Company: Dublin Institute of Technology, a university in Ireland with one of Europe's largest schools of computing

Job title/description: Lecturer, DBA, and consultant, handling database administration and consulting work and giving postgraduate lectures on data mining and advanced databases

Location: Dublin, Ireland

Length of time using Oracle products: More than 20 years

What's your favorite tool on the job? Oracle SQL Developer is one of my favorite tools, and I'm pleased that it now comes with Oracle Data Miner. I use Oracle SQL Developer to explore data and gain a thorough understanding of it, and to perform all data manipulations. Now that the two tools have been integrated, my toolset is a lot simpler.

You've taken Oracle University (OU) classes in the past. What led you to do this? I've taken OU classes when I've been changing job roles or when there's been a major new release. More recently I've taught a few courses, including a new two-day Oracle Data Miner course—one of the first presentations of this class worldwide.

How are you using social media in your work? I blog and use Twitter, LinkedIn, and Facebook. At the moment, my blog has three main purposes: to share insights and how-tos about Oracle Data Miner and Oracle R Enterprise; to share my reviews of *Oracle Magazine*, which I've been collecting for more than 20 years; and to share ideas about data mining, data analytics, and predictive analytics.

ZEESHAN BAIG

ORACLE ACE

Company: Northwestern Memorial Hospital, an academic medical center

Job title/description: Senior software developer, responsible for in-house development in Oracle Application Development Framework and Oracle WebCenter

Location: Chicago, Illinois

Oracle credentials: Oracle Certified DBA (Oracle8, Oracle8*i*, Oracle Database 10*g*), with 12 years of experience using Oracle products

How did you get started in IT? Accidentally! During my college vacations in the late '90s I took some courses on computer basics, and I began to hear all about the Y2K hype. I learned that Oracle databases store date data with the complete year and time, which eliminates the Y2K issue. During a Microsoft Office course, my instructor—who also taught classes on FoxPro and Oracle technologies—suggested that I go with Oracle technology as a potential career. From that day on, I've never looked back.

What advice do you have about getting into application development? Oracle Technology Network is a great learning resource—just download software, read the documentation, and get your hands on it. I also advise starting a blog; it helps to spread knowledge and organize your own learning.

What's your go-to Oracle reference book these days? Oracle Fusion Middleware's documentation is my daily newspaper. I read it *that* often—always on my iPad.

How are you using social media in your work? I tweet, blog, and maintain a YouTube Oracle Fusion Middleware tutorial channel. ◀

Learn more about the Oracle ACE program at oracle.com/technetwork/community/oracle-ace.

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Visit the Golden Gate Bridge, which celebrated its 75th anniversary this year, and attend Oracle's week of conferences, September 29–October 5.

CONFERENCE WEEK PREVIEW

ENGINEERED FOR INNOVATION

So many conferences, so much content: San Francisco, September 29–October 5

BY KAREN SHAMBAN

As in years past, the Oracle OpenWorld and JavaOne conferences bring tens of thousands of Oracle and Java users, experts, developers, and influencers to San Francisco, California. In 2012 Oracle has added a number of smaller events to bring a depth of focus, learning, and networking to specific subjects (customer experience, Java embedded technology, and MySQL) and audiences (Oracle partners and executive-level Oracle customers).

With so many learning options which to choose from, attendees have the opportunity to tailor their days at the conferences to fit their needs. Some attendees might choose to dive deep into a particular technology or product set and strengthen their skills. Others from industries such as financial services or healthcare might opt to explore more broadly across technologies and trends to see what technology advantage they can gain to keep ahead of the competition.

GUILAIN GRENIER/ORACLE TEAM USA

2012 CONFERENCES IN BRIEF

The 2012 Oracle San Francisco lineup includes Oracle OpenWorld and its dedicated programs, Oracle Customer Experience Summit @ OpenWorld, the Executive Edge @ OpenWorld, and Oracle PartnerNetwork Exchange @ OpenWorld; JavaOne and its related dedicated program, Java Embedded @ JavaOne; and MySQL Connect. Here's a look at what each has to offer.

RON SELLERS/HARTMANN STUDIOS

ORACLE OPENWORLD

Oracle OpenWorld continues to be the world's largest, most important conference for Oracle users and technologists. As always, content is king at this event, with thousands of technical sessions, hands-on labs, Birds-of-a-Feather sessions (BOFs), and demos in which to participate and engage. All of these learning and networking opportunities are geared toward helping attendees get better results from the technology they have and a good idea of where they want to go in the future. Whether you are attending Oracle OpenWorld for the 1st time or the 10th, the sheer number of Oracle products, technology, and industry experts gathered in one place at one time is invaluable. At Oracle OpenWorld there are more educational and networking opportunities available than at any other Oracle event in the world. So if there's something you need to know about Oracle technologies, you'll find it here.

When: September 30–October 4

Content focus: Applications, Database, Industries, Middleware, Oracle Develop, Server and Storage Systems, Cross-Stream

oracle.com/openworld

ORACLE CUSTOMER EXPERIENCE SUMMIT @ OPENWORLD

New this year, the Oracle Customer Experience Summit @ OpenWorld challenges conventional thinking on how to achieve sustainable business growth and profit by focusing on the experience needs of customers. Attendees learn about the latest trends in customer behaviors and expectations that are having an impact on their industries, businesses, and roles, and gain a better understanding of how to leverage customers and prospects, processes, and technology to deliver on the promise of their brand. Participants learn best practices, strategy, and practical tips and tricks from expert speakers, including customer experience industry thought leaders and technology experts. If you want to help your organization succeed in delivering great customer experiences that create advantage and business value, plan to attend this event.

When: October 3–5

Content focus: Chief Experience Officer/Chief Customer Officer, Commerce and Loyalty, Marketing and Sales, Service and Support

oracle.com/cxsummit

THE EXECUTIVE EDGE @ OPENWORLD

The Executive Edge @ OpenWorld is a new, invitation-only conference that combines general-interest keynotes with targeted summits that attendees can choose based on their industry or job role. Attendees are invited to all keynotes, including those by partner sponsor Deloitte and other industry leaders. Industry summits focus on strategies and best practices for particular industries; audience summits focus on knowledge that will be invaluable to those executives in specific job roles (see content focus below for a list of summits). Regardless of which summit attendees choose, they experience four days of in-depth discussions, valuable networking opportunities, and immersion in business strategies that can help them lead their enterprise forward. Executives interested

SAUL LEWIS

in attending the Executive Edge @ OpenWorld should contact their Oracle sales representative.

When: September 30–October 3

Content focus: Industry Summits: Communications, Consumer Products, Energy and Resources, Financial Services, Healthcare, Life Sciences, Manufacturing, Public Sector, Retail, Utilities; Audience Summits: CFO, Chief Human Resources Officer, CIO, Chief Security Officer, Enterprise Architecture, Oracle Women's Leadership

oracle.com/events/us/en/executive-edge

ORACLE PARTNERNETWORK EXCHANGE @ OPENWORLD

Oracle PartnerNetwork Exchange @ OpenWorld premiers in 2012 with a dedicated program designed to enhance opportunities for partners to learn from and network with Oracle executives and experts as well as each other. The new program also provides more informal opportunities than ever throughout the week to meet up with the people who are most important to a partner's business: customers, prospects, and colleagues. In addition to sessions of general interest—such as keynotes from senior executives discussing Oracle partner vision, strategy, and resources—targeted sessions address challenges and opportunities for specific geographical regions, as well as for partner types such as independent software vendor, systems integrator, and channel.

When: September 30–October 4

Content focus: Applications, Cloud, Engineered Systems, Industry Solutions, Technology

oracle.com/opnexchange

JAVAONE

For the 17th year, JavaOne attracts experts and users from around the world to explore, expand, and expound on everything Java. As much a caffeine- and talk-fueled week of all-nighters as it is a traditional conference, JavaOne has always been and continues to be a community experience. Content runs the gamut from client-side and cloud-based applications to rich user experience and embedded devices. Nearly as important as time spent in the hundreds of sessions—including keynotes, technical sessions, BOFs, and hands-on labs—is time for networking. Conferencegoers learn and share practical tips and coding techniques usable today, and hear where Java technology is headed. At JavaOne, Java newcomers are just as welcome as the Java "rock stars" known worldwide for their expertise. Come for the content, stay for the contacts—it's all at JavaOne.

When: September 30–October 4

Content focus: Core Java Platform; Development Tools and Techniques; Emerging Languages on the Java Virtual Machine; Enterprise Service Architectures and the Cloud; Java EE Web Profile and Platform Technologies; Java ME, Java Card, Embedded, and Devices; JavaFX and Rich User Experiences

oracle.com/javaone

JAVA EMBEDDED @ JAVAONE

New this year is the Java Embedded @ JavaOne event. Java embedded technology can be found in many places, from business to consumer

arenas and smart meters to automated buildings, medical devices, and beyond—way beyond. Using Java embedded technologies, organizations can start realizing immediate value from a deeper, better understanding of how their products are built, shipped, deployed, and consumed. At this conference, C-level executives, architects, business leaders, and decision-makers from across the globe learn how Java embedded technologies and solutions offer compelling value and a clear path forward to business efficiency and agility. Dedicated business-focused content delves into how Java Embedded delivers a secure, optimized environment ideal for multiple network-based devices, while industry-focused sessions show how Java embedded technology is being successfully utilized.

When: October 3–4

Content focus: Consumer Products, Healthcare, Home Automation, Industry Controls and Factory Automation, Machine to Machine, Media and Television, Payment, Retail, Smart Energy, Utilities

oracle.com/javaembedded

MYSQL CONNECT

MySQL Connect debuts as a standalone conference with and for the MySQL community. MySQL—the open source database management system—is widely used as the database of choice in Web applications, and it powers some of the world's most frequently visited online sites. Learning, sharing, and networking are the sweet spots for the MySQL community attending this conference, which is packed with content delivered by Oracle engineers, community members, users, and customers. Attendees leave MySQL Connect with knowledge about new features and product roadmaps, and with their MySQL questions answered.

When: September 29–30

Content focus: Application Development, Architecture and Design, Cloud Computing, Database Administration, High Availability, Performance and Scalability

oracle.com/mysqlconnect

FOR ALL ATTENDEES

There are many experiences and activities that most full-conference attendees can take advantage of—regardless of the event they're "officially" attending. This flexibility allows attendees the broadest opportunity to meet experts and learn about a wide variety of technologies—all while focusing on the conference of their choice.

CONFERENCE KEYNOTES. Oracle OpenWorld and JavaOne keynotes take place throughout the week. In addition to hearing from top industry leaders—this year sponsor partners EMC, Fujitsu, Infosys, and Intel take the keynote stage—attendees hear strategy and the latest technology and product announcements from Oracle's top executives, including CEO Larry Ellison. When big things happen at Oracle conferences, they get their start in the keynote halls.

EXHIBITION HALLS AND DEMOGROUNDS. Discover all that the three main exhibition halls have to offer, including sponsor and exhibitor booths, theaters, product demos, and the usual fun and games. The Exhibition Hall at Moscone South features Oracle Database, Oracle Fusion Middleware, Oracle server and storage systems, and other key product technologies and services. Oracle Applications and Oracle Enterprise Manager for applications, along with select solutions for industries, are the focus at Moscone West. At the Hilton San Francisco Union Square, the Java Exhibition Hall brings innovation and practical learning about all things Java.

oracle.com/openworld/exhibition-halls

PAVILIONS. At the Oracle OpenWorld pavilions, explore your options for extending your Oracle implementations with cutting-edge partner solutions and services. The pavilions make it simple to find answers in key business and technology areas, with partner experts on hand to discuss specific challenges and their solutions. The Oracle OpenWorld pavilions are located in the Moscone South and West Exhibition Halls, in the upper lobby of Moscone North, and at the InterContinental San Francisco hotel. Each pavilion is dedicated to specific Oracle solutions, including cloud, customer relationship management, JD Edwards, Oracle Hyperion, Oracle Linux, and Oracle Solaris systems. oracle.com/openworld/pavilions

EDUCATION. Take advantage of two educational options on Sunday, September 30. Choose from expert-taught, in-depth training courses from Oracle University (oracle.com/openworld/oracle-university) and Java University (oracle.com/javaone/program/schedule/university) that cover the most-popular Oracle and Java technology topics. Or head to the Oracle Users Forum (oracle.com/openworld/user-groups), which provides a full-day program of user-driven content and technology interest group gatherings put on by the Oracle, Java, and MySQL user group communities.

NETWORKING. Conference veterans know that the time before and after sessions is invaluable for the networking opportunities it provides. Dedicated spaces throughout conference venues provide settings for informal and impromptu gatherings, including lounges sponsored by Fujitsu and Oracle Technology Network at the Howard Street Tent, and the Taylor Street Café and hang spaces at JavaOne. In addition to the wildly popular Oracle Appreciation Event that always features headline performers, the first-ever Oracle Music Festival debuts this year. For five nights, the streets of San Francisco vibrate with music by acts that range from reggae to rock, punk to ska, R&B to country, indie to honky-tonk. Finally, the It's a Wrap! experience winds it all down. Featuring stellar entertainment and a relaxed atmosphere, this event gives attendees the chance to unwind at the end of a valuable week. oracle.com/openworld/music-festival

Karen Shamban is a senior director of communications and editorial at Oracle and has run dozens of events during her corporate career.

HARTMANN STUDIOS

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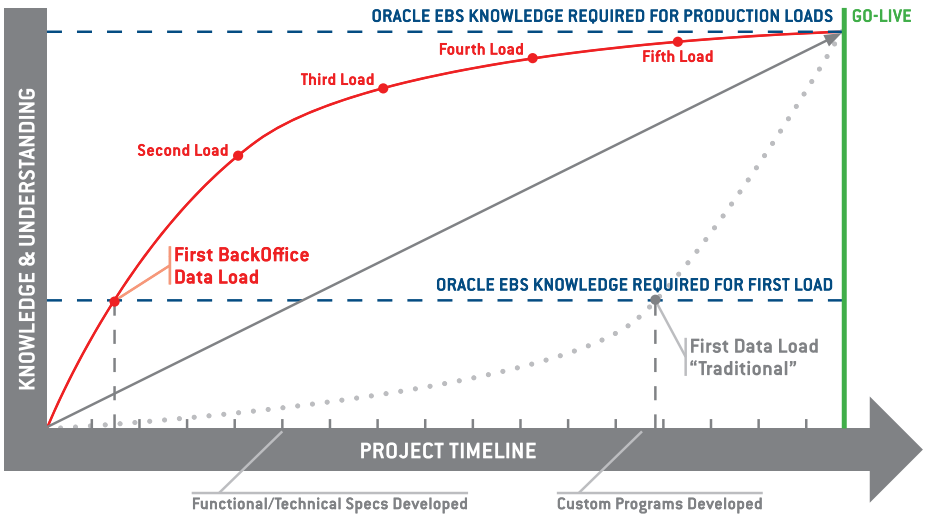

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BY DAVID BAUM

SECURITY ON THE MOVE

Organizations use Oracle Identity Management solutions to secure operations in the cloud and on the go.

ROBERT GARCIA

As corporate computing services become more diverse and the underlying IT infrastructure gets more complex, authorizing people to use enterprise information systems becomes progressively more challenging. How do you handle identity administration, authentication, trust management, access control, directory services, and governance for a roving workforce that expects a consistent experience, whether they use an iPad at a coffee shop or boot up a computer in the office?

Ideally, your information systems should recognize users in the same way and support access, permissions, and password security across all devices and all locations. Provisioning mobile, desktop, and every other type of system access must also be simple, cost-effective, and—of course—secure.

Organizations held to the highest security standards—including healthcare and telecom—are turning to Oracle Identity Management solutions for their ability to deliver comprehensive, business-focused provisioning solutions for any device accessing all enterprise resources—on premises or in the cloud.

When Kaiser Permanente (KP) decided to move to a centralized access provisioning model that would replace nine different systems, Oracle Identity Management was the solution, says Kurt Lieber, executive director of identity and access management and security compliance at KP.

PETER STEMBER

HEALTH ON THE GO

Founded in 1945, Kaiser Permanente (KP) is one of the nation's largest not-for-profit health plans, serving more than 9 million members. With 36 hospitals, 533 medical offices, 15,853 physicians, 172,997 employees, and thousands of visiting physicians, authenticating users and provisioning IT resources is an immense task.

Previously, access provisioning at KP varied from region to region and application to application. With nine different systems for provisioning users, KP had to gather nine sets of documentation to respond to auditors. KP decided to move to a centralized provisioning model in response to steady growth and tighter government regulations, which continue to get more stringent and require finer levels of control.

"We didn't have a consistent way to enable access to all of the applications that new hires needed to use," explains Kurt Lieber, executive director of identity and access management (IAM) and security compliance at KP. "We adopted Oracle Identity Management software to achieve faster Day One provisioning and also to meet the increasing expectations of regulators in a cost-efficient manner."

Lieber and 90 other IAM specialists support a workforce of about 260,000 people, including internal staff, visiting physicians, and other medical personnel. Several years ago, KP deployed Oracle Access Management Suite, a solution that now enables Web-based, secure single sign-on (SSO) for about 100 applications, simplifying computing tasks for the entire workforce. Over the last couple of years, KP added Oracle Adaptive Access Manager to add risk-control services to critical Web-based applications.

Today KP's IAM implementation supports major applications for finance, HR, and many clinical domains. IT pros have one interface to the directory groups that control access to various file systems and data sets, which dramatically simplifies resource provisioning chores. "Provisioning tasks that used to take days or weeks now take minutes or hours," says Lieber.

Keeping its information systems accessible, secure, and online has become even

SNAPSHOTS

Kaiser Permanente
kaiserpermanente.org
Industry: Healthcare
Employees: 172,997
Revenue: US$47.9 billion in 2011
Oracle products and services: Oracle Access Management Suite, Oracle Adaptive Access Manager, Oracle Identity Management 11*g*

BT
bt.com
Industry: Telecommunications
Employees: 89,000
Revenue: £19 billion in 2011
Oracle products and services: Oracle Financials, PeopleSoft applications, Oracle Identity Management 11*g*, Oracle Identity Analytics 11*g*

> **"We adopted Oracle Identity Management software to achieve faster Day One provisioning."**
>
> *—Kurt Lieber, Executive Director of Identity and Access Management and Security Compliance, Kaiser Permanente*

more important as KP makes headway with its electronic health record initiative. "All of our health records are entirely electronic, and they are stored in a single application called KP HealthConnect," explains Lieber. "Our care providers are dependent on our electronic health record system to enter and retrieve patient information. It's very critical to have 100 percent uptime to ensure that we can provide the appropriate care to our patients."

Access to 24/7 systems is complicated by the rise of mobile devices, which, in many cases, are replacing hospital PCs as the preferred mode of access. Many of KP's doctors want to access KP HealthConnect from their mobile devices.

"Multiapplication SSO is easy in a browser world; not so on a mobile client," says Amit Jasuja, vice president of development and security and identity management at Oracle. "Today's iPhone and iPad apps cache your password so you don't have to continually log in, which is very insecure. Another issue is where you are—the context is different if you are using public Wi-Fi or your company network. Organizations granting access to corporate applications need to figure this out before they serve up sensitive data."

When BT needed a robust identity management solution to deal with mounting compliance and audit issues, Oracle Identity Management was the logical choice, says Peter Boyle, head of identity services at BT.

Oracle is addressing mobile access challenges with Oracle Identity Management 11*g* Release 2, which includes features for mobile devices and support for the iOS operating system. The Oracle software incorporates standards such as OAuth and OpenID and RESTful interfaces to enable custom application development, device registration, context-sensitive authorization, and certificate and credential management, backed by device usage reports and analysis. IT professionals can administer the whole suite through the integrated management packs in Oracle Enterprise Manager.

Lieber and his colleagues have been testing Oracle Identity Management 11*g* Release 2, partly to evaluate its mobile application security capabilities. "We're looking at how to make these experiences as seamless as possible without introducing an additional level of risk," he says. "We like Oracle's comprehensive roadmap for where they are taking identity and access management, with respect to mobile computing and other emerging domains. Every dollar we can save on IT is a dollar more that we can put toward patient care."

JOHN BLYTHE

DIVERSIFIED COMMUNICATIONS

BT (formerly British Telecom) is a global provider of communications solutions and services that operates in 170 countries. Five years ago, the communications giant tracked user roles and privileges with a basic directory, but a mounting series of compliance and audit issues drove BT to deploy a more robust identity management solution. Successful deployments of Oracle Financials, Oracle's PeopleSoft

Announcing Oracle Identity Management 11*g* Release 2

Oracle Identity Management 11*g* Release 2 brings together Oracle's entire portfolio of identity management offerings, divided into three main categories designed to help customers reach a new equilibrium in performance and operational scale. The categories are

- Identity governance, which addresses access request, provisioning, and certification. New features include Oracle Privileged Account Manager, a business-friendly, self-service shopping-cart-style user interface that enables employees to request access to applications.
- Access management, which offers end-to-end user authentication and authorization protection across an organization's data, applications, and Web services.
- Directory services, which offer a comprehensive, proven directory service option. New features include proximity-based searching, Oracle Optimized Solution for Oracle Unified Directory, and all-in-one capabilities that unify storage, proxy, synchronization, and virtualization.

"We designed Oracle Identity Management 11*g* Release 2 to meet the new challenges our customers face from today's digital experience to help them better secure their existing infrastructure and continue to expand their reach," says Amit Jasuja, vice president of development and security and identity management at Oracle. "With Oracle Identity Management 11*g* Release 2, organizations can strengthen and simplify identity lifecycle management across the entire enterprise, while still meeting complex compliance and regulatory requirements."

applications, and Oracle Fusion Middleware components made Oracle Identity Management a logical choice.

"Our focus was on establishing a security layer above the directory infrastructure to provision and deprovision users and make sure that the data flows were good," explains Peter Boyle, head of identity services at BT. "Oracle supplies a common set of application services and a common application development framework that works across all of the middleware tiers. That makes things much simpler and much more standard for us. Previously we had several solutions for onboarding users, and now we have only one agreed-upon process, which has clarified things a lot. Consolidating multiple HR systems into one global instance has further simplified our infrastructure."

> **"Previously we had several solutions for onboarding users, and now we have only one agreed-upon process."**
>
> *—Peter Boyle, Head of Identity Services, BT*

Boyle's team is responsible for enabling around 89,000 employees and about 50,000 third parties to access BT's enterprise resources. In addition, many of BT's customers, from individual consumers to government departments to multinational corporations, access the company's information systems at some level.

BT's global deployment of Oracle Identity Management supports anyone who needs access to BT's internal systems for development or support of BT's products and services. Boyle foresees additional simplification as the company adopts Oracle Identity Management 11*g* Release 2. "The flexibility of the user interface in Oracle Identity Management 11*g* Release 2 is a major advantage," he notes, "especially being able to search for entitlements and rules and being able to put them in a shopping cart. It's a much easier experience that draws on people's comfort with popular e-commerce solutions such as eBay and Amazon."

Sally Hudson, research director of security products at International Data Corporation, believes that Oracle is ahead of the curve with the new entitlement capabilities in Oracle Identity Management 11*g* Release 2. "Using a catalog or shopping cart metaphor to associate entitlements with specific employee functions makes it easier to meet compliance requirements and ensure business integrity," she notes. "Managers are starting to work with IT in a partnership to better respond to these business requirements. Given these trends, this type of interface will be welcomed and embraced by the business community."

BT is also implementing Oracle Identity Analytics 11*g* to obtain identity intelligence, including analytics dashboards and advanced compliance features that monitor, analyze, review, and govern user access to mitigate risk, build transparency, and satisfy compliance mandates. According to Boyle, while the auditing process is mostly manual today, Oracle Identity Analytics will automate the process of reviewing and validating access permissions and entitlements.

"Previously we did this on an application-by-application basis, but with Oracle Identity Management 11*g* we will be able to do it centrally based on the Oracle toolset. That's a big move forward that will save a lot of resources," he says.

Like most companies, BT must accommodate a growing portfolio of services. In some cases those services are set up to support credentials from third-party social networks. Boyle advises IT managers to proceed with caution in these instances and to make sure that the type of authentication matches the level of trust. "A user's Facebook credentials may be appropriate for accessing an online game, but you wouldn't use those credentials to authorize a bank payment," he points out. "There are tiers of accreditation within the enterprise, and you must match the right level of authentication to each particular service." ◀

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NEXT STEPS

LEARN more about
Oracle Identity Management 11*g*
oracle.com/identity

WATCH the Oracle Identity Management 11*g* Release 2 Webcast
bit.ly/PeNfZa

READ more about identity management strategy
"Oracle's Strategy for Identity and Access Management"
bit.ly/Q1E4zt

SPECIAL PARTNER SECTION

Oracle Identity Management

Oracle Identity Management is a complete, integrated, next-generation identity management platform that provides breakthrough scalability, reduced operational costs, and best-in-class security and compliance capabilities—both on-premise and in the cloud. Oracle's Identity Management partners have deep expertise in identity and access management technology. They complement Oracle's existing solutions with valuable, industry-leading offerings that interoperate with Oracle Identity Management. Whether you're a small or midsize company looking for a hosted, managed solution, or a large enterprise looking for an extended capability, there is an Oracle PartnerNetwork member with the skills and expertise to help you.

The following section showcases Oracle Identity Management partners who are ready to provide solutions to your identity and access management challenges.

A Commitment to Technical Expertise

Hub City Media provides unique, value-driven solutions to Oracle Identity Management customers. Hub City Media is a software integration and development firm that specializes exclusively in identity management implementations using Oracle products. An Oracle Gold Partner with Specialized status in Identity Administration and Analytics, the Edison, New Jersey–based firm was founded in 1999 and serves clients nationwide, across all industries. Steve Giovannetti, founder and chief technical officer, discusses two unique products that were developed specifically to meet the needs of Oracle Identity Management customers.

WHAT IS IDENTITYBRIDGE?

IdentityBridge is our solution for migrating legacy Sun Identity Manager (SIM) customers to Oracle Identity Manager. It's a coexistence migration solution that allows customers to retain their investment in custom SIM workflow while migrating to the strategic platform. It works by keeping identities, attributes, and role information in sync between the two systems in near real time. IdentityBridge is the only solution that lets customers migrate at their own pace and allows them to decide which elements of the SIM implementation should be ported or discarded.

WHAT IS IDENTITYCERT?

IdentityCert is an iPad application for completing lengthy periodic access reviews, or certifications, on the go working with Oracle Identity Analytics. IdentityCert allows users to view and respond to user certification requests and policy violations. Users can securely download user certifications and violation remediation requests to the device and complete them from anywhere—even if they don't have a network connection. This work is synchronized back to the customer's Oracle Identity Analytics system. IdentityCert will be available soon in Apple's App Store, but we are demonstrating the product to interested customers today.

WHAT VALUE DOES HUB CITY MEDIA BRING TO ORACLE IDENTITY MANAGEMENT CUSTOMERS?

We deliver great results for our customers due to our technical excellence and our approach to building a technical team. Our teams are made up of individuals that we hire, train, and prepare to work specifically on identity management. All of our people have permanent positions with us—unlike other companies that use contractors, our staff members have experience working as a team. We feel this enables us to provide the highest quality of technical staff to work on our customers' projects.

HUB CITY MEDIA
software integration experts

Attend session CON5749 at Oracle OpenWorld on Thursday, October 4th at 11:15 a.m. to see these products in action!
For more information visit hubcitymedia.com.

Identity Management for Midsize Companies

aurionPro SENA delivers high security and low costs with managed support services for Oracle Identity Management.

aurionPro SENA is an expert-level consulting and software solutions firm and a Gold-level member in the Oracle PartnerNetwork. A long-term Oracle partner, aurionPro SENA has successfully driven hundreds of Oracle Identity Management projects over the past 13 years. Due to the firm's high level of identity management (IDM) expertise and success implementing the Oracle Identity Management product suite, aurionPro SENA became the first U.S.-based consulting firm to achieve Oracle PartnerNetwork Specialized status in Identity Administration and Analytics, and is honored to have been selected for Oracle North America Titan Awards two out of the last three years.

Now a division of aurionPro Solutions, aurionPro SENA has been able to extend its IDM offerings with the addition of hosted and managed Oracle Identity Management solutions, as well as to expand the breadth of its services, which now also include Oracle WebCenter and Oracle Applications consulting and solution offerings. Robert Levine, president and chief executive officer of aurionPro SENA, discusses the benefits of hosted identity management and managed services, and the convenience of mobile IDM.

WHAT ARE THE PAIN POINTS FOR MIDSIZE COMPANIES AROUND IDENTITY MANAGEMENT?

Midsize companies usually find that as they continue to scale their businesses, their initial set of IT solutions become less effective and increasingly difficult to manage. More-sophisticated enterprise systems that cover finance, human resources, and other critical functions are often implemented so that the business owners can gain operational efficiencies while obtaining strategic insights from their corporate data through business intelligence and analytics solutions. At the same time, these growing companies often have to consider implementing regulatory and compliance controls in a much more structured and comprehensive manner. This combination of increased IT system complexity and emerging regulatory and compliance challenges, all while the number of employees is growing rapidly, makes information security a critically important aspect of any midsize company's IT landscape.

HOW DOES AURIONPRO SENA DELIVER VALUE TO ORACLE IDENTITY MANAGEMENT CUSTOMERS WITH ITS MANAGED SERVICES OFFERING?

Since 2001, aurionPro SENA and Oracle have had a deep relationship at the sales, product management, and engineering levels around the Oracle Identity Management suite of products. It's a relationship that's built on delivering value to clients. aurionPro SENA's managed support services are offered to Oracle Identity Management customers who want to build their information security solution in-house, but who also desire to offload the costly and complex support and management of it to an expert-level organization. Our managed services offerings provide up to 24/7 system monitoring and a world-class service desk, which enable our customers to focus their resources on core efforts rather than on managing complicated infrastructure. Our managed support services include 24/7 system health and availability monitoring, sophisticated yet straightforward ticket-based support processes, and committed response times based on predefined service level agreements (SLAs), as well as comprehensive communication and performance review processes.

WHAT ARE THE BENEFITS OF A HOSTED IDENTITY MANAGEMENT SOLUTION?

aurionPro SENA's Hosted IDM Solution is a preconfigured identity management offering built on top of Oracle's enterprise-class IDM software suite, Oracle Identity Management 11*g*, and hosted in a secured and scalable cloud-based environment. The typical IDM use cases have all been developed and are ready to be implemented based on our clients' requirements, with a solution that can be implemented in a fraction of the time of a traditional IDM system. Along with improved time to market and an advantageous cost model in which our clients only pay for what they use, this solution drastically reduces the overall costs of development, support, and maintenance. Exclusive and fault-tolerant environments are monitored 24/7 with SLA-based guaranteed uptime for each customer, resulting in reduced operational overhead as well as ensured reliability and compliance through a secure, scalable, and auditable solution.

WHAT CAPABILITIES CAN COMPANIES GAIN WITH A MOBILE IDENTITY MANAGEMENT OFFERING?

aurionPro SENA's mobile IDM application, built on top of Oracle Identity Management, is targeted at information security professionals who manage individual users' system, application, and data-level security permissions. This innovative mobile app provides quick access to frequently used identity management services, including viewing an individual's access rights, basic workflow tasks such as creating requests for roles and entitlements, viewing request status, and approving requests.

aurionPro sena

For more information on aurionPro SENA's hosted identity management solutions, visit aurionprosena.com.

Simplifying Identity and Access Management

ICSynergy focuses on people, process, and technology as a trusted advisor to its customers.

Since 2000, ICSynergy International has delivered more than 130 successful Oracle Identity Management deployments throughout North America—many of these at key Fortune 500, public sector, and higher-education clients. ICSynergy's consulting and systems integration business with Oracle focuses exclusively in the identity and access management (IAM) and mail and calendar space. Mike Thompson, managing partner at ICSynergy, discusses how ICSynergy delivers value to Oracle Identity Management customers, and the capabilities of Oracle Identity Management 11*g* Release 2.

WHAT IS IC SYNERGY'S EXPERIENCE WITH ORACLE IDENTITY MANAGEMENT?

To our clients, IAM means identity governance, compliance, provisioning, access/federation, and directory. When it comes to our Oracle relationship, we differentiate ourselves by having a large contingent of senior architects, consultants, and analysts, who are equally versant in both the Oracle Identity Management products and the legacy Sun IAM products. We've found this to be a critical success factor when it comes to migrating customers from their legacy systems.

WHAT ARE THE PAIN POINTS FOR YOUR CUSTOMERS AROUND IDENTITY AND ACCESS MANAGEMENT?

Our customers' pain points are around security in the cloud and mobility/bring-your-own-device (BYOD). Our Fortune 500 clients are faced with deploying secure cloud solutions and providing secure access to software-as-a-service (SaaS) applications, from employee and contractor devices anywhere, at any time. This adds another layer of complexity and risk to their Oracle Identity Management deployments. It's very obvious that over the years, our clients have established a high degree of trust within the enterprise, but employees are demanding a BYOD culture. Many employees have multiple Apple and Android devices, each running multiple apps, and are asking IT to connect them to the corporate network. The critical part of this equation is to build the same level of trust with mobile devices and SaaS apps that exists inside the enterprise today. This immediately brings into play the ability to provide secure corporate single sign-on to these devices. Another key consideration for our clients is moving from their legacy and siloed platforms to a more strategic and unified platform approach. Our clients have built their business around their identity solutions, and many have elected to keep extending the functionality to meet changing business needs. We're well-positioned to ensure our Oracle Waveset and Oracle OpenSSO clients can keep their identity solutions in sync with their business demands. We are seeing some dramatic enhancements in Oracle Identity Management 11*g* Release 2 that will provide dramatic functional enhancements in governance and provisioning, as well as a strong solution set for mobility/BYOD and social networking.

HOW DOES ICSYNERGY DELIVER VALUE TO ORACLE IDENTITY MANAGEMENT CUSTOMERS WITH ITS OFFERINGS?

Our value proposition is pretty simple: We stick to what we know best, and that's identity and access management. In a lot of cases, we are truly the trusted advisor for our clients, and we don't take that lightly. It always comes back to the basics—people, process, and technology. By making sure not to lose sight of those three key ingredients, we get IAM right for the client. The first question we ask our new clients is, "Do you have an identity and access management strategy and roadmap?" It's certainly not a wise idea to jump into finding a solution for secure mobility and BYOD in isolation of where it fits in your IAM strategy. I'm not talking about the kind of plan that gets printed and stuck on a shelf someplace; IAM has to be a key, living ingredient in the ongoing security strategy of the enterprise. For a small company, we are very well-connected with our technology partners—from the guys who cut the code to the executive team that sets the course. Where it's required, we'll develop custom solutions that plug seamlessly into the Oracle Identity Management solution.

HOW ARE YOU HELPING CUSTOMERS BENEFIT FROM THE CAPABILITIES IN THE NEXT RELEASE OF ORACLE'S IDENTITY MANAGEMENT SOLUTION?

I can't tell you how pleased we are with Oracle Identity Management 11*g* Release 2. I distill the release down to a few things: dramatic increases in governance and provisioning functionality, a true focus on the cloud, mobility and social networking, and an integrated platform approach to IAM. From what we've seen, Oracle has delivered a lot of what was promised. We see both time and dollar savings with Release 2, and that's terrific news for our customers.

icSynergy™

For more information on how ICSynergy can help in your planning, please call Zan Moore at +1.972.608.4705.

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ORACLE APPLICATION DEVELOPMENT FRAMEWORK AND ORACLE JDEVELOPER

Consume Early, Consume Often

How to service-enable Oracle ADF Business Components application modules for consumption by SOA and Web services clients

Forward-looking enterprises build applications on a distributed architecture that transparently brings together Web, SOA, collaboration, content, and social networking services for user access from multiple device types (mobile, laptop, and so on).

The Oracle Application Development Framework Business Components (Oracle ADF Business Components) feature supports application development for distributed architectures, enabling developers to build business services with data persistence for Web applications and SOA by using a single development skill: the ability to develop with Oracle ADF.

In my last column ("Service, Please!," *Oracle Magazine*, July/August 2012), I showed you how to consume and integrate remote services in an Oracle ADF Business Components application. In this column, I will show you how to expose Oracle ADF Business Components application modules as services for remote use with the primary consumers of such services: Java EE service clients, SOA components, and remote and local Oracle ADF Business Components application modules.

SERVICE-ENABLED ORACLE ADF BUSINESS COMPONENTS MODULES

Creating service-enabled components with Oracle ADF Business Components requires little programming—it's mostly a matter of configuration: you configure view objects, view criteria, and public methods defined on the application module for access from SOA components, Java API for XML Web Services (JAX-WS) clients, and remote Oracle ADF Business Components modules.

Technically, as shown in Figure 1, Oracle ADF Business Components services are implemented as Enterprise JavaBeans (EJB) 3.0 session beans. When you expose an Oracle ADF Business Components application module as a service, Oracle JDeveloper generates all required Web service artifacts, including XML schema definitions (XSDs), Web Service Description Language (WSDL) files for service discovery, and Java classes for the application module and the exposed view objects.

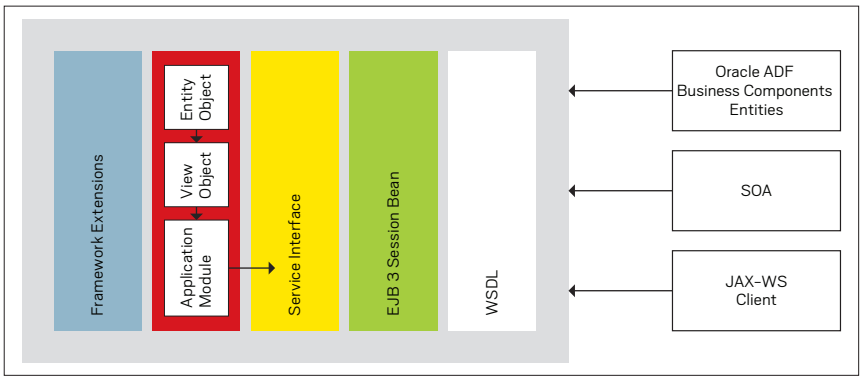

Figure 1: Oracle ADF Business Components service interface architecture

In this architecture, Oracle ADF Business Components view object rows are exposed as Service Data Objects (SDOs) on the service interface for create, read, update, and delete (CRUD) operations.

SDO is the linchpin of this architecture, providing an interface to data from the service to various back-end datasources. In such an architecture, the Oracle ADF Business Components application module acts as a data access service that queries data from and persists changes to the datasource.

The data bindings supported by SDO are EJB remote method invocation for service access from other Oracle ADF Business Components application modules, SOAP for JAX-WS service clients, and SOA bindings for component access in applications built based on the Service Component Architecture (SCA) standard.

As you work through the example for this column, you'll use Oracle JDeveloper 11*g* Release 1 to generate the necessary SDO artifacts and to configure the completed service to fully implement this architecture and then see it in action with the sample Web client.

GETTING STARTED

To follow the hands-on steps in this article, you'll need the Studio edition of Oracle JDeveloper 11*g* Release 1 (11.1.1.6), available as a free download on Oracle Technology Network. You'll also need an Oracle Database instance with an unlocked HR schema. Get started by downloading the sample application at bit.ly/OFwR4L and unzipping the file. The file contains two folders:

- **OraMagService** holds a starter workspace in which you can build, test, and deploy a service-enabled Oracle ADF Business Components application module.
- **OraMagServiceClients** is a test client appli-

cation that references the deployed Oracle ADF Business Components service from an Oracle ADF Business Components entity.

To prepare for the steps in this article, change the database connection in the Service Model to point to your HR database schema:

1. Launch Oracle JDeveloper 11*g* Release 1. From the menu, select **File -> Open**, and then navigate to the directory containing the unpacked sample application.
2. Open the **OraMagService** folder, select **OraMagService.jws**, and click **Open**. The workspace opens in Oracle JDeveloper.
3. From the menu, select **View -> Database -> Database Navigator**, and then expand the **OraMagService** node to display the **hrconn** node.
4. Right-click the **hrconn** node, and select **Properties** from the context menu. Edit the database connection information to work with your setup. Test the changes, and click **OK** to close the connection properties.

As another preliminary task, start the Oracle WebLogic Server instance integrated with Oracle JDeveloper. You'll use the integrated Oracle WebLogic Server for service deployment and testing and for running the client Web application.

To start Oracle WebLogic Server

1. From the Oracle JDeveloper menu, select **Run -> Start Server Instance (IntegratedWebLogicServer)**.
2. If a Create Default Domain dialog box appears, create a password for the default Oracle WebLogic Server domain and select an address from those listed for **Listen Address**, for best results. For example, choose **localhost** rather than leaving the address empty. Click **OK** to save the change, create the default domain, and configure it for Oracle ADF.

SAMPLE APPLICATION OVERVIEW

The OraMagService workspace contains an Oracle ADF Business Components application that consists of a single Oracle ADF Business Components application module, AppModule. As you follow the instructions in this article, you'll be exposing two view object instances on the Oracle ADF Business Components service interface:

- For the **hrAllDepartments** view object instance, you'll expose view rows together with methods for CRUD operations.
- For the **hrAllEmployees** view object instance, you'll expose (via a method on the service interface) a view criteria definition for querying employees by department ID.

View object instances exposed on the Oracle ADF Business Components application module service interface are automatically service-enabled.

In addition, the application module implementation class (**AppModuleImpl.java**) provided in the sample contains two public methods:

- **getAllSalaryForDepartment** provides the service method (operation) for computing total salaries for a specified department.
- **getEmployeesBySalaryRange** provides the service method for finding employees within a given salary range.

As you work through the sample, you'll create the actual datatypes (generate the view object row classes, for example) that will support these operations. (Be sure to use any names for items provided in the instructions, because many of the prebuilt sample components rely on those names.)

View objects that are exposed on the Oracle ADF Business Components service interface cannot have circular dependencies. The view objects in the sample workspace have been built with this requirement in mind. When creating your own view objects, be aware that the Create ADF Business Components from Tables wizard generates view links for every database constraint.

For example, generating Oracle ADF Business Components objects for the Departments and Employees tables in the Oracle HR schema creates view links for the department-to-employees, employees-to-manager, and departments-to-manager relations. Because the Oracle ADF Business Components SDO service is based on a stateless EJB session bean, the employees-to-manager and departments-to-manager links would cause a circular dependency that would lead to an array out-of-bounds exception at runtime, because of the infinitive loop they represent. To avoid such a problem, if you use the wizard in your own development projects, be sure to delete any generated view links that would result in circular queries. Or—better yet—create view objects and view links manually, as has been done for this sample.

BUILDING THE ORACLE ADF BUSINESS COMPONENTS SDO SERVICE

View object instances exposed on the Oracle ADF Business Components application module service interface are automatically service-enabled, which means that Oracle JDeveloper creates the SDO implementation classes and metadata files. For other view objects (such as the employees view row objects in this sample), you must explicitly service-enable the object, and you must do so before exposing any method that uses the object on the service interface.

For this sample, you are going to expose a public method that returns employee rows, so first you must ensure that a view object implementation class exists, as follows:

1. In the Application Navigator, expand the **ServiceModel** node and then the **Application Sources** node.
2. Expand the **oramag.sample.sepoct.model.views** package, and note the **EmployeesView** object. The **hrAllEmployees** view object instance (in the application module) is based on this view object definition.
3. Right-click the **EmployeesView** object, and choose **Open EmployeesView** from the menu to open the view object editor.
4. In the view object editor, select the **Java** option and then click the pencil icon next to the **Java Classes** header.
5. In the opened Select Java Options dialog box, check the **Generate View Row Class** and **Generate Service Data Object Class** checkboxes, leaving the other settings at their defaults. This creates the view row implementation class and an SDO object that wraps this class in the service.
6. Click **OK** to close the dialog box, which saves the settings and causes

Oracle JDeveloper to generate the necessary classes, including the view row implementation class (**EmployeesViewRowImpl**) and the SDO object that wraps the implementation in the service (**EmployeesViewSDO**).

Next you will configure the Oracle ADF Business Components service to filter the information of the Oracle ADF Business Components model that should be exposed on the service interface.

1. In the Application Navigator, expand the **oramag.sample.sepoct.model.am** package and then the **AppModule** node. Select the **AppModuleImpl.java** class, right-click, and select **Open** from the context menu to open the class in the Java code editor.
2. In the code editor, scroll down to **getEmployeesBySalaryRange** and **getAllSalaryForDepartment,** to study their implementation. As you can see, **getEmployeesBySalaryRange** returns a **java.util.List** of **EmployeesViewRowImpl**, the class you created earlier to hold the queried employee data objects.
3. Close the Java code editor.
4. Right-click the **AppModule** node, and select **Open AppModule** from the context menu to open the application module editor.
5. In the application module editor, select the **Service Interface** category and click the green plus (**+**) icon. The Create Service Interface wizard launches. On the Service Interface page (Create Service Interface—Step 1 of 4), enter `OraMagService` for **Web Service Name**; leave all other field values at the default settings.
6. Click **Next** to continue. On the Service Custom Methods page (Step 2 of 4), select the **getAllSalaryForDepartment** and **getEmployeesBySalaryRange** methods displayed in the Available list and click the add button (**>**) to move them to the **Selected** list. The **getEmployeesBySalaryRange** method returns a list of employee objects for which you'll next configure the service interface.
7. In the Selected list, click the **getEmployeesBySalaryRange** method node to expand it and then click the **Return** node.
8. Select the **java.util.List** item, and set the value of the **Element View Object** choice component to **hrAllEmployees**, the row type returned by the method.
9. Click **Next** to continue. On the Service View Instances page (step 3 of 4), select the **hrAllDepartments** and **hrAllEmployees** entries in the Available list and click the add button (**>**) to move these to the Selected list (for exposure on the service interface.)
10. Click **hrAllDepartments** on the Selected list. On the **Basic Operations** tab, enable the operations listed in Table 1 by checking the checkboxes in the **Enable** column (see Figure 2).

When you expose a view object on the service interface, its attributes become part of the rows returned by a query. You can exclude any attribute from being exposed on the service interface by deselecting its **SDO Property** option in the view object editor.

1. Select **hrAllEmployees** in the Selected list, and click the **View Criteria Find Operations** tab.
2. On the **View Criteria Find Operations** tab, click the green plus (**+**) icon to expose the view criteria defined on the **EmployeesView** object as a service method.
3. Click **Finish**. Oracle JDeveloper generates the service implementation classes, an XSD schema, and the WSDL reference in the service interface folder. In addition, Oracle JDeveloper creates the Java classes and an XSD schema for the view objects exposed on the service interface. The application module is updated with a new configuration, OraMagService.
4. In the application module editor, select the **Configurations** menu item and

Operation	Description	Service Interface Method
Create	Create new department	createhrAllDepartments
Update	Update department	updatehrAllDepartments
Delete	Delete department	deletehrAllDepartments
Find	Query all departments	findhrAllDepartments
GetByKey	Find single department by primary key	gethrAllDepartments

Table 1: Operations to be enabled on the service interface

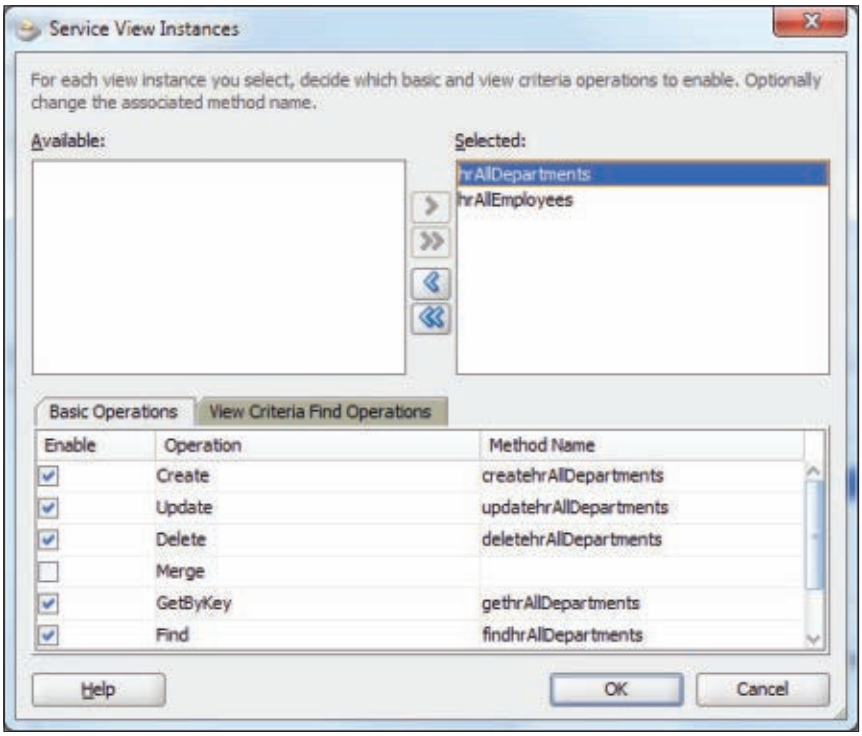

Figure 2: Oracle ADF Business Components service interface definition

enter `OraMagService` for **Default Configuration**.

DEPLOY THE SERVICE

The Oracle ADF Business Components service is deployed as an Enterprise Archive (EAR) file to the target deployment server. For the purposes of this example, we'll use the integrated Oracle WebLogic Server to simulate remote deployment.

1. In the Application Navigator, right-click the **ServiceModel** project and choose **Project Properties** from the context menu.
2. In the Project Properties dialog box, select the **Deployment** node and click the **New** button.
3. In the opened Create Deployment Profile dialog box, select **Business Components Service Interface** for **Archive Type** and enter `OraMagServiceArchive` in the **Name** field.
4. Click **OK**. Oracle JDeveloper creates a deployment profile consisting of two JAR descriptors: Middle tier JAR (which defines the service Oracle ADF Business Components and EJB sources for deployment to the target server) and Common JAR (which defines proxy classes that will be configured in a JAR library to enable service-oriented clients—Java SE, Servlets, and EJB programs—to access the Oracle ADF Business Components service).
5. Click **OK** to close the Project Properties dialog box.

Next create the EAR file required for remote deployment.

1. Select **Application -> Application Properties**.
2. Select the **Deployment** node.
3. Select **ServiceModel_OraMagServiceArchive** in the **Deployment Profiles** field, and click the **Edit** button to open the Edit EAR Deployment Profile Properties dialog box.
4. Expand the **Application Assembly** node to verify that the **Middle Tier** archive is selected for deployment. If not, select it.
5. Click **OK** to close the Edit EAR Deployment Profile Properties dialog box, and then click **OK** again to close the Application Properties dialog box.
6. To deploy the EAR file, select **Application -> Deploy** from the menu and click the **ServiceModel_OraMagServiceArchive** menu item to launch the deployment dialog box for the EAR file.
7. In the dialog box, select **Deploy to Application Server** and click **Next**.
8. Select **IntegratedWebLogicServer** in the Application Server list, and click **Next**. In the WebLogic Options dialog box, keep the default settings and click **Finish**.

After successful deployment, you can validate service access by opening a browser and entering the URL of the WSDL available on the Web server, as follows:

```
http://localhost:7101/oramag-sample/
OraMagService?wsdl
```

The WSDL URL is derived from the Java EE path defined in the ServiceModel project properties (oramag-sample) and the Oracle ADF Business Components service name (OraMagService) you specified for the service-enabled application module; 7101 is the default port number for the integrated Oracle WebLogic Server.

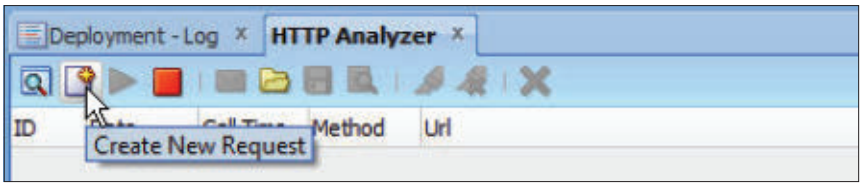

Figure 3: Creating a new HTTP Analyzer instance

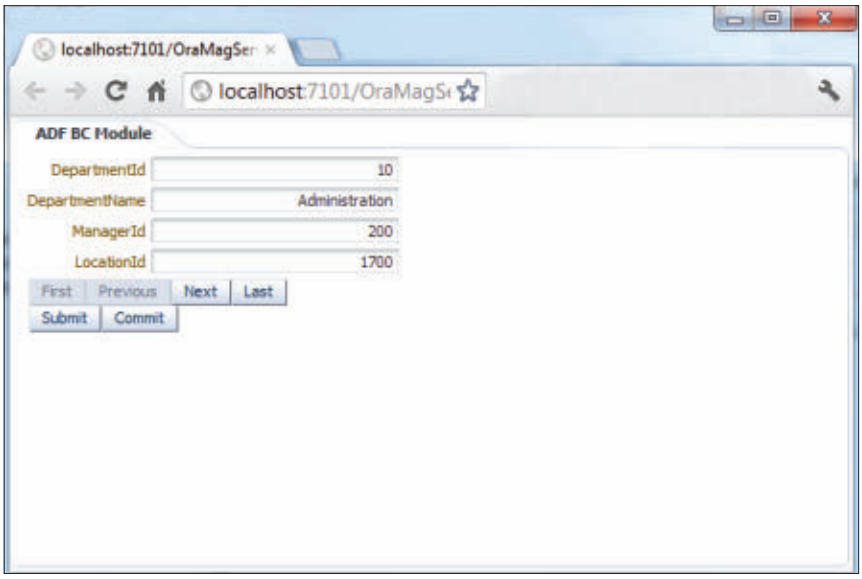

Figure 4. Running the sample application

TESTING THE DEPLOYED SERVICE

For testing Web service deployments on a remote Oracle WebLogic Server instance, I typically recommend using the Oracle Enterprise Manager Fusion Middleware Control feature (available through the Oracle Application Development Runtime Installer)—but for this sample application, you'll test the remote deployed Oracle ADF Business Components service with the Oracle JDeveloper HTTP Analyzer tool.

To launch the HTTP Analyzer tool,

1. Select **Tools -> HTTP Analyzer**.
2. In the HTTP Analyzer toolbar, click the **Create New Request** icon to create a new instance (see Figure 3).
3. Click the **Open WSDL** button. An HTTP Analyzer: Unsent Message page appears above the HTTP Analyzer tool (in the main window).
4. Enter `http://localhost:7101/oramag-sample/OraMagService?wsdl` as the value for the WSDL URL reference.
5. Select **OraMagServiceSoapHttpPort.getAllSalaryForDepartment** from the

Operations selector. In the parameters section of the page, enter 60 as the value of the **departmentIdVar** argument and click **SendRequest** to submit the message to the server. Assuming that you did not change the HR sample data, you should see 29000 as the result in the XML response in the analyzer.

RECOMMENDATIONS FOR SERVICE PROJECT LAYOUT

An Oracle ADF Business Components application module can be used as a model for Web applications and—if the application module is service-enabled—for service clients. So in theory, you could build a single Oracle ADF Business Components application module and configure it for use with Web and service clients. However, not everything that is possible makes sense in practice, because

- Deployments should be lean, containing only what a service actually needs.
- View objects used in a service model cannot have self-references or circular references defined as view links. Although this is not an issue for Web applications, it is for service models; keeping model projects of these two types separate from each other avoids conflict.
- Deployment profiles are easier to define and manage when each is specific to its service and the service model project to which it applies.
- Team development is easier to manage when Web projects and service model projects are separate from each other.

For these reasons, I recommend creating distinct Oracle ADF Business Components model projects for Web and service use. If you want to share view objects and entity objects among projects, create an appropriate Oracle ADF library and then reference the library from the Web or service project. (Note that you cannot create an Oracle ADF Business Components service module in a project that already contains a Java EE Web service.)

ORACLE ADF BUSINESS COMPONENTS SERVICE CLIENTS

With the configuration and deployment complete for the sample Oracle ADF Business Components service, you can now test the deployed service with an Oracle ADF Web application that uses an Oracle ADF Business Components business service for querying data from the deployed service.

The Web application assumes that the deployed Oracle ADF Business Components service is available at http://localhost:7101/oramag-sample/OraMagService?wsdl.

1. From the menu, select **File** -> **Open** and navigate to the directory containing the unpacked sample application.
2. Open the **OraMagServiceClients** folder.
3. Select the **OraMagServiceClients.jws** file, and click **Open**. The client application workspace opens in Oracle JDeveloper.

The WsSdoDepartmentsView (in the oramag.sample.sepoct.client.model package) is based on the WsSdoDepartments entity, which has been configured to access the deployed Oracle ADF Business Components service for CRUD operators.

Note that when you create a new entity object, you can specify that data should be obtained from a database schema object or from the service interface. To specify the service interface, you will need to provide the valid WSDL reference associated with a deployed Oracle ADF Business Components service, so that at runtime, the framework can create the entity object from an SDO object.

Also note that you should be aware of these two important configurations:

- The model project references the **OraMagServiceArchive_Common.jar** file in the **Libraries and Classpath** section of its properties page. Oracle ADF Business Components uses this JAR file reference to access the OraMagService proxy classes. (If the Oracle ADF Business Components client project that accesses the deployed service is exposed in an Oracle ADF library, you must also configure the **<service name>common.jar** file in the view layer project that consumes that library.)
- The **connections.xml** file (located in the **Application Resources** -> **Descriptors** -> **ADF META-INF** node) contains a local Java Naming and Directory Interface (JNDI) configuration for the deployed service. This configuration was copied from the **connections.xml** file of the OraMagService workspace.

When building your own Oracle ADF Business Components clients for a deployed Oracle ADF Business Components service interface, you'll configure these items yourself. See *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework* at bit.ly/LhB8Kk for details. For the sample service and application, you have nothing further to do but run the application.

To run the sample application

1. In the Application Navigator, expand the **ViewController** -> **Web Content** node so that the **ServiceSampleUI.jspx** file is visible, and click the file to select it.
2. Right-click the **ServiceSampleUI.jspx** file, and select **Run** from the context menu. The application opens in a browser window (see Figure 4).

Explore the application, navigating through the data returned from the service and updating data as you see fit.

CONCLUSION

This article showed you how to expose an Oracle ADF Business Components application module as a service for use with Web, service, and SOA clients. This approach demonstrates some of the chief benefits of using Oracle ADF Business Components, such as enabling developers to leverage a single development skill for SOA and Web development. ◀

Frank Nimphius is a senior principal product manager for Oracle JDeveloper and Oracle ADF. He is a coauthor of *Oracle Fusion Developer Guide: Building Rich Internet Applications with Oracle ADF Business Components and Oracle ADF Faces* (McGraw-Hill, 2010).

NEXT STEPS

READ more about exposing Oracle ADF Business Components as SDO services
Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework 11g Release 1 (11.1.1.6.0), "Integrating Service-Enabled Application Modules"
bit.ly/LhB8Kk

DOWNLOAD
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bit.ly/LRlg7k

the sample application for this article
bit.ly/OFwR4L

ORACLE DATA INTEGRATOR 11*g*

Lighten the Load

Oracle Data Integrator 11*g* makes data loading flexible, restartable, and routine.

Developers working on data integration projects are often required to load numerous database tables in a particular sequence, with parts of the load process carried out in parallel to reduce load times. Ideally such load routines should be configurable—so that, for example, a data warehouse can be reloaded or refreshed with new data—and it should be possible to restart a failed load routine once the reason for the failure has been addressed.

To handle these requirements, the 11.1.1.5 release of Oracle Data Integrator 11*g* introduces *load plans*. Load plans—building on the interfaces, packages, procedures, and scenarios already present in Oracle Data Integrator projects—provide the ability to create hierarchical data integration processes that enable conditional execution, parallel execution of integration tasks, and plan restartability after a failure.

CREATING YOUR FIRST LOAD PLAN

So how do load plans work, and how do they differ from packages, the traditional way to sequence integration steps in Oracle Data Integrator 11g? To find out, let's work through a scenario in which data is sourced from the OE (Order Entry) sample schema that comes with most Oracle Database releases and is loaded into product and customer dimension tables as well as an ORDERS fact table in another schema. If you want to try this new feature yourself, download and install Oracle Data Integrator 11.1.1.6, access a database with the OE sample schema installed, and download and install the load plan project files for this article from bit.ly/Mddj7I. Follow the instructions in the zip file for installing the load plan project files.

In the initial version of this article's Oracle Data Integrator project, a package loads each table in turn via a set of interfaces. Now let's enhance this load routine, so that (1) the two dimension tables are loaded in parallel before the fact table and (2) the user has the option to load just the fact table, skipping the dimension table load.

To do this, follow these steps:

1. With Oracle Data Integrator's Studio integrated development environment (IDE) open, click the **Designer** navigator tab and navigate to the Load Plans and Scenarios pane. At the right of the pane header, select **New Load Plan**.
2. The load plan editor opens on the right-hand side of the screen. Ensure that the **Definition** tab is selected, and then enter the following details:

   Name : `OELoadPlan`
   Description : `Load Plan to load customer, product, and order data`

   Click **Save** to save the load plan's initial definition.
3. To add a new first step to the plan that will run a procedure called Trunc Error Table to truncate the error table, first select the **Steps** tab in the left column. Then click the add step button (the green plus [+] sign), select **Serial Step** from the menu, and rename it `Initialize`.

   To add the Trunc Error Table procedure to the step, locate it on the Projects panel and drag and drop it on top of the new **Initialize** step. Load plans run only scenarios, the compiled form of procedures, and other Oracle Data Integrator integration objects, so when you drop the step, the load plan editor automatically creates the scenario and adds it to the load plan for you.
4. Now let's add the step that enables the plan to execute either the full load or just the fact table load, depending on the value of the LoadOrdersOnly variable defined elsewhere in the project. To do this, click **root_step** at the top of the load plan, click the add step (**+**) button, and this time select **Case Step** from the menu, as shown in Figure 1.

   The Case Step wizard launches. Click **Lookup Variable**, select the variable to use in the **Case** step—LoadOrdersOnly in this case—and then click **Finish**.
5. A **Case** step is accompanied by one or more **When** steps that test for individual values and an **Else** step that covers all other values. Here's how to add a **When** step that loads just the fact table when this variable value is set to 1: With **Case Step** selected, click the add step (**+**) button and select **When Step** from the menu. Then on the Step Properties panel, enter and select the following values:

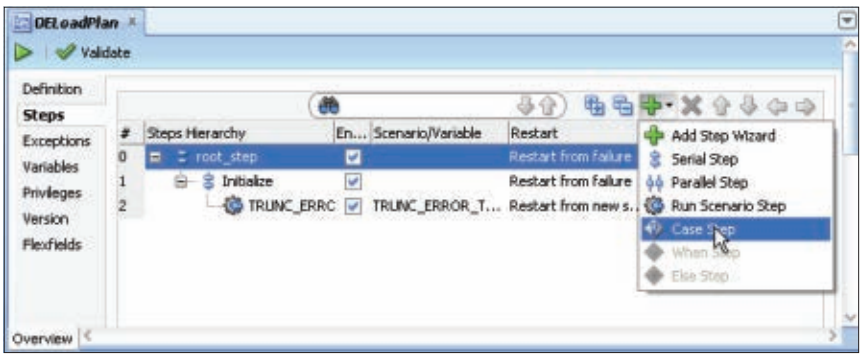

Figure 1: Adding a Case step to the load plan

GIL ADAMS

Name : When Value = 1
Operator : Equals (=)
Value : 1

Then go back to **Case Step** and click the add step button (+) to add an **Else** step to it. Finally, click **When Step**, **Else Step**, and the add step (+) button to add a new **Serial** step to each one—ready for you to start adding project interfaces to each of the new steps.

6. The first interface you'll add is for loading just the fact table. To do this, drag and drop the **Pop.Fact_Orders** interface onto the **Serial** step under the **When Value = 1** step.

For full loads handled by the **Else** step, you first want to load the two dimension tables in parallel and then load the fact table. To load the two dimensions in parallel, click the add step (+) button to add a new **Parallel** step under the **Serial** step under the **Else** step and then drag and drop the **Pop.Dim_Products** and **Pop.Dim_Customers** interfaces onto this new **Parallel** step.

Then click back on **Serial** step under the **Else** step, click the add step (+) button to add a new **Serial** step under it, and then drop the **Pop.Fact_Orders** interface onto it. Once complete, your load plan should look like the one in Figure 2.

Now that you've created the basic load plan, let's test it out. Click **Save** to save your load plan details, and ensure that you have a standalone agent running (because you cannot use the built-in agent that comes with Oracle Data Integrator's Studio to run load plans). Click the **Execute** button at the top of the load plan editor, enter `0` as the startup value of the LoadOrdersOnly variable to trigger a full load, and then switch to the Load Plan Executions pane within the **Operator** navigator to see the outcome of the load plan run.

Double-click the load plan run under the **Agent** folder on the Load Plan Executions pane. A window opens, showing the actual steps that were executed by this load plan run. In this case, because you passed 0 as the variable value when executing the load plan, the **Else** part of the plan executed and performed a full load. If you executed the load plan again but this time passed 1 as the LoadOrdersOnly variable value, you would see the **When** part executed instead.

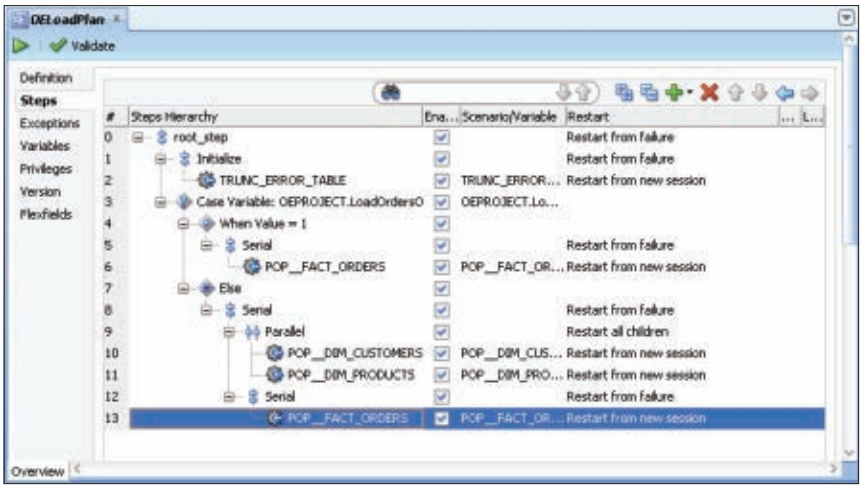

Figure 2: The initial load plan

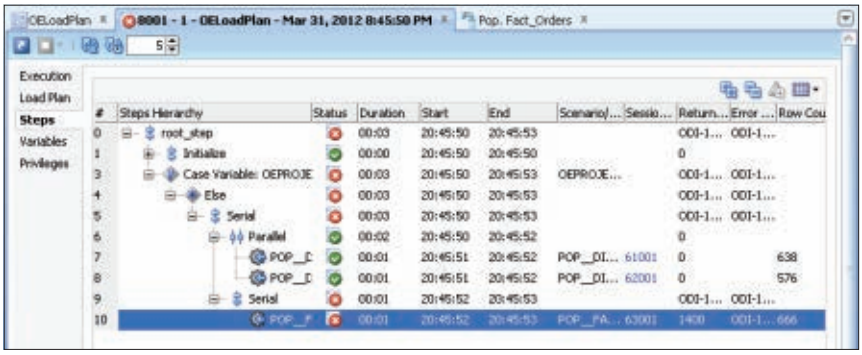

Figure 3: The load plan showing the error caused by an invalid product ID

EXCEPTIONS AND PLAN RESTARTABILITY

So far you've seen the conditional execution part of load plans in action, but what about exceptions and restartability?

Let's continue this scenario by considering how you might handle a situation in which the load plan tries to process rows for the ORDERS fact table but those orders reference product dimension IDs that don't exist, a common scenario for data warehouse developers.

To simulate this situation, let's first disable the constraint on the OE.ORDER_ITEMS table that stops you from entering invalid product ID values into the PROD_ID column. (You might want to back up your OE schema before doing this, so that you can restore it to its original values afterward.)

```
ALTER TABLE order_items
DISABLE CONSTRAINT order_items_
product_id_fk;
```

Now let's add new values into the ORDERS and ORDER_ITEMS tables that reference a PROD_ID that doesn't exist in the OE.PRODUCT_DESCRIPTIONS table:

```
INSERT INTO orders
VALUES (3000,TO_DATE('31-MAR-2012',
'DD-MON-YYYY'),'direct',118,5,4000,
163,null);

INSERT INTO order_items
VALUES (3000,1,9999,1,100);

INSERT INTO order_items
VALUES (3000,1,3134,2,50);

COMMIT;
```

Now execute the load plan again, passing 1 as the LoadOrdersOnly value to trigger

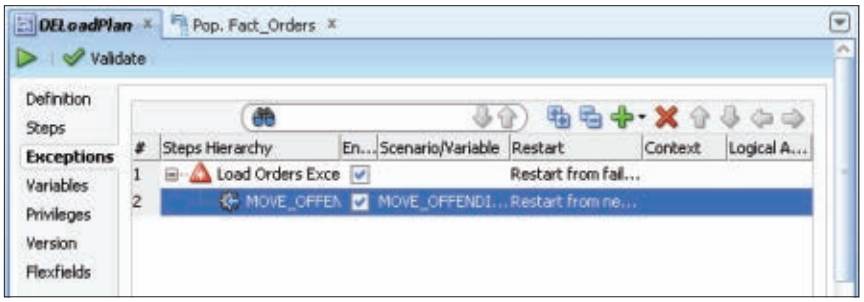

Figure 4: Defining the Exception step

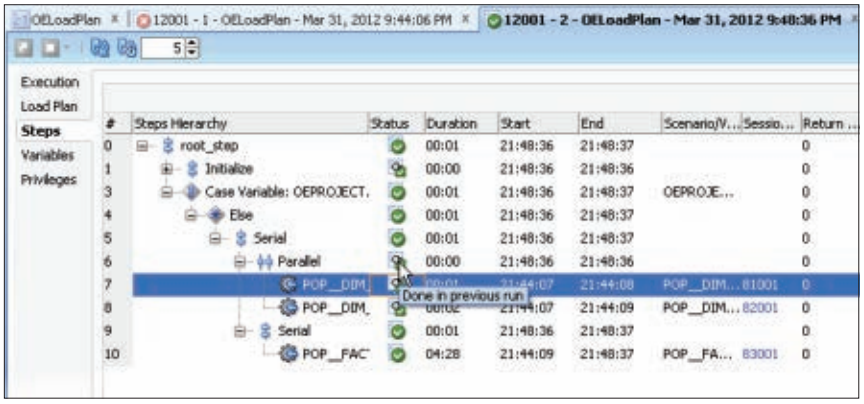

Figure 5: The restarted load plan, rerunning only the failed step

a full load. This time the load plan fails at the step where it tries to load the fact table, because the product key lookup fails and Oracle Database raises an error when the load plan subsequently tries to insert a NULL value into the OE_TARGET .FACT_ORDERS.PROD_ID column, which has a NOT NULL constraint on it, as shown in Figure 3.

To deal with this type of data issue, you need to do two things:

1. Create an exception with an Exception step that, in turn, runs an Oracle Data Integrator procedure that moves any such rows out of the OE.ORDER_ITEMS table into an error table in the OE_TARGET schema.
2. Associate this exception with the scenarios in the load plan that load the data warehouse fact table, so that when you try to restart the failed load plan, it will complete successfully.

To add this exception and configure the load plan for restartability, follow these steps:

1. With the load plan open in the **Designer** navigator, click the **Exceptions** tab, click the add step (**+**) button, and select **Exception Step** from the menu.
2. Double-click the new **Exception** step to rename it, and call it `Load Order Exception`. To add the Oracle Data Integrator procedure that moves the rows to the error table, drag and drop the **Move Offending Items** procedure from the Projects pane onto the new **Load Order Exception** step, so that it is added as a scenario to the load plan, as shown in Figure 4.
3. Now locate the steps in your load plan that run the scenarios that load the FACT_ORDERS table—in Figure 2, these are steps 6 and 13—and change their restart type in the Property Inspector from **Restart from New Session** to **Restart from Failed Step**.
4. Navigate in turn to each of these step's *parent* steps—in Figure 2, these are steps 5 and 12—and in the Property Inspector, change the **Exception** step value to `Load Order Exception`, the exception you defined in the previous step.

Choosing these settings ensures that in the event of an error, the **Move Offending Items** procedure will run to remove the erroneous rows and the load plan can be restarted at this point, skipping all the previous steps.

Now save the load plan and run it again. In the details of the load plan run in the **Operator** navigator, you will see that it has again failed. Run your new **Exception** step to clear out the erroneous rows, and click the **Restart** button at the top left corner of the load plan run. Your load plan will now restart and complete successfully, but more importantly, the plan will rerun only the step that failed (and subsequent steps, if there were any) rather than all the steps in the load plan, as shown in Figure 5.

Load plans in Oracle Data Integrator 11*g* give you the ability to define data warehouse and other data integration load routines that enable conditional execution and support exceptions and restartability. Available in the 11.1.1.5 release and with additional features in the 11.1.1.6 release, load plans build on the existing interface, procedure, and package features in Oracle Data Integrator and provide a new way to orchestrate and manage your data loading routines. ◀

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ORACLE DATABASE

Bulk Processing with BULK COLLECT and FORALL

Part 9 in a series of articles on understanding and using PL/SQL

In the previous article in this series, I introduced readers to PL/SQL collections. These data structures come in very handy when implementing algorithms that manipulate lists of program data, but they are also key elements in some of the powerful performance optimization features in PL/SQL.

In this article, I will cover the two most important of these features: BULK COLLECT and FORALL.

- BULK COLLECT: SELECT statements that retrieve multiple rows with a single fetch, improving the speed of data retrieval
- FORALL: INSERTs, UPDATEs, and DELETEs that use collections to change multiple rows of data very quickly

You may be wondering what *very quickly* might mean—how much impact do these features really have? Actual results will vary, depending on the version of Oracle Database you are running and the specifics of your application logic. You can download and run the script at bit.ly/Q6j9y8 to compare the performance of row-by-row inserting with FORALL inserting. On my laptop running Oracle Database 11*g* Release 2, it took 4.94 seconds to insert 100,000 rows, one at a time. With FORALL, those 100,000 were inserted in 0.12 seconds. Wow!

Given that PL/SQL is so tightly integrated with the SQL language, you might be wondering why special features would be needed to improve the performance of SQL statements inside PL/SQL. The explanation has everything to do with how the runtime engines for both PL/SQL and SQL communicate with each other—through a *context switch*.

CONTEXT SWITCHES AND PERFORMANCE

Almost every program PL/SQL developers write includes both PL/SQL and SQL statements. PL/SQL statements are run by the PL/SQL statement executor; SQL statements are run by the SQL statement executor. When the PL/SQL runtime engine encounters a SQL statement, it stops and passes the SQL statement over to the SQL engine. The SQL engine executes the SQL statement and returns information back to the PL/SQL engine (see Figure 1). This transfer of control is called a context switch, and each one of these switches incurs overhead that slows down the overall performance of your programs.

Let's look at a concrete example to explore context switches more thoroughly and identify the reason that FORALL and BULK COLLECT can have such a dramatic impact on performance.

Suppose my manager asked me to write a procedure that accepts a department ID and a salary percentage increase and gives everyone in that department a raise by the specified percentage. Taking advantage of PL/SQL's elegant cursor FOR loop and the ability to call SQL statements natively in PL/SQL, I come up with the code in Listing 1.

Suppose there are 100 employees in department 15. When I execute this block,

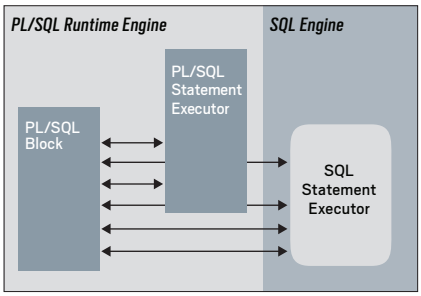

Figure 1: Switching between PL/SQL and SQL engines

```
BEGIN
   increase_salary (15, 10);
END;
```

the PL/SQL engine will "switch" over to the SQL engine 100 times, once for each row being updated. Tom Kyte, of AskTom (asktom.oracle.com), refers to row-by-row switching like this as "slow-by-slow processing," and it is definitely something to be avoided.

I will show you how you can use PL/SQL's bulk processing features to escape from "slow-by-slow processing." First, however, you should always check to see if it is possible to avoid the context switching between

Code Listing 1: increase_salary procedure with FOR loop

```
PROCEDURE increase_salary (
   department_id_in   IN employees.department_id%TYPE,
   increase_pct_in    IN NUMBER)
IS
BEGIN
   FOR employee_rec
      IN (SELECT employee_id
            FROM employees
           WHERE department_id =
                    increase_salary.department_id_in)
   LOOP
      UPDATE employees emp
         SET emp.salary = emp.salary +
             emp.salary * increase_salary.increase_pct_in
       WHERE emp.employee_id = employee_rec.employee_id;
   END LOOP;
END increase_salary;
```

PL/SQL and SQL by doing as much of the work as possible *within* SQL.

Take another look at the increase_salary procedure. The SELECT statement identifies all the employees in a department. The UPDATE statement executes for each of those employees, applying the same percentage increase to all. In such a simple scenario, a cursor FOR loop is not needed at all. I can simplify this procedure to nothing more than the code in Listing 2.

Now there is just a single context switch to execute one UPDATE statement. All the work is done in the SQL engine.

Of course, in most real-world scenarios, life—and code—is not so simple. We often need to perform other steps prior to execution of our data manipulation language (DML) statements. Suppose that, for example, in the case of the increase_salary procedure, I need to check employees for eligibility for the increase in salary and if they are ineligible, send an e-mail notification. My procedure might then look like the version in Listing 3.

I can no longer do everything in SQL, so am I then resigned to the fate of "slow-by-slow processing"? Not with BULK COLLECT and FORALL in PL/SQL.

Code Listing 2: Simplified increase_salary procedure without FOR loop

```
PROCEDURE increase_salary (
   department_id_in   IN employees.department_id%TYPE,
   increase_pct_in    IN NUMBER)
IS
BEGIN
   UPDATE employees emp
      SET emp.salary =
               emp.salary
             + emp.salary * increase_salary.increase_pct_in
    WHERE emp.department_id =
             increase_salary.department_id_in;
END increase_salary;
```

Code Listing 3: increase_salary procedure with eligibility checking added

```
PROCEDURE increase_salary (
   department_id_in   IN employees.department_id%TYPE,
   increase_pct_in    IN NUMBER)
IS
   l_eligible   BOOLEAN;
BEGIN
   FOR employee_rec
      IN (SELECT employee_id
            FROM employees
           WHERE department_id =
                    increase_salary.department_id_in)
   LOOP
      check_eligibility (employee_rec.employee_id,
                         increase_pct_in,
                         l_eligible);

      IF l_eligible
      THEN
         UPDATE employees emp
            SET emp.salary =
                     emp.salary
                   +   emp.salary
                     * increase_salary.increase_pct_in
          WHERE emp.employee_id = employee_rec.employee_id;
      END IF;
   END LOOP;
END increase_salary;
```

BULK PROCESSING IN PL/SQL

The bulk processing features of PL/SQL are designed specifically to reduce the number of context switches required to communicate from the PL/SQL engine to the SQL engine.

Use the BULK COLLECT clause to fetch multiple rows into one or more collections with a single context switch.

Use the FORALL statement when you need to execute the same DML statement repeatedly for different bind variable values. The UPDATE statement in the increase_salary procedure fits this scenario; the only thing that changes with each new execution of the statement is the employee ID.

I will use the code in Listing 4 to explain how these features affect context switches and how you will need to change your code to take advantage of them.

Listing 4 also contains an explanation of the code in this new-and-improved increase_salary procedure. There are three phases of execution:

1. Fetch rows with BULK COLLECT into one or more collections. A single context switch is needed for this step.
2. Modify the contents of collections as required (in this case, remove ineligible employees).
3. Change the table with FORALL using the modified collections.

Rather than move back and forth between the PL/SQL and SQL engines to update each row, FORALL "bundles up" all the updates and passes them to the SQL engine with a single context switch. The result is an extraordinary boost in performance.

I will first explore BULK COLLECT in more detail, and then cover FORALL.

ABOUT BULK COLLECT

To take advantage of bulk processing for queries, you simply put BULK COLLECT *before* the INTO keyword and then provide one or more collections *after* the INTO keyword. Here are some things to know about how BULK COLLECT works:

- It can be used with all three types of collections: associative arrays, nested tables, and VARRAYs.
- You can fetch into individual collections (one for each expression in the SELECT list) or a single collection of records.
- The collection is always populated densely, starting from index value 1.
- If no rows are fetched, then the collection is

emptied of all elements.

Listing 5 demonstrates an example of fetching values for two columns into a collection of records.

If you are fetching lots of rows, the collection that is being filled could consume too much session memory and raise an error. To help you avoid such errors, Oracle Database offers a LIMIT clause for BULK COLLECT. Suppose that, for example, there could be tens of thousands of employees in a single department and my session does not have enough memory available to store 20,000 employee IDs in a collection.

Instead I use the approach in Listing 6.

With this approach, I open the cursor that identifies a*ll* the rows I want to fetch. Then, inside a loop, I use FETCH-BULK COLLECT-INTO to fetch *up to* the number of rows specified by the c_limit constant (set to 100). Now, no matter how many rows I need to fetch, my session will never consume more memory than that required for those 100 rows, yet I will still benefit from the improvement in performance of bulk querying.

ABOUT FORALL

Whenever you execute a DML statement inside of a loop, you should convert that code

Answer to the Challenge

The PL/SQL Challenge question in last issue's "Working with Collections" article tested your knowledge of iterating through the contents of a sparsely populated collection. Choices (b) and (c) are both correct. Choice (c) offers the simplest algorithm for accomplishing this task:

```
DECLARE
  l_names  DBMS_UTILITY.maxname_array;
BEGIN
  l_names (1) := 'Strawberry';
  l_names (10) := 'Blackberry';
  l_names (2) := 'Raspberry';

  DECLARE
    indx  PLS_INTEGER := l_names.FIRST;
  BEGIN

    WHILE (indx IS NOT NULL)
    LOOP
      DBMS_OUTPUT.put_line (l_names
(indx));
      indx := l_names.NEXT (indx);
    END LOOP;
  END;
END;
/
```

Code Listing 4: Bulk processing for the increase_salary procedure

```
 1  CREATE OR REPLACE PROCEDURE increase_salary (
 2     department_id_in   IN employees.department_id%TYPE,
 3     increase_pct_in    IN NUMBER)
 4  IS
 5     TYPE employee_ids_t IS TABLE OF employees.employee_id%TYPE;
 6
 7     l_employee_ids   employee_ids_t;
 8     l_eligible_ids   employee_ids_t;
 9
10     l_eligible       BOOLEAN;
11  BEGIN
12     SELECT employee_id
13       BULK COLLECT INTO l_employee_ids
14       FROM employees
15      WHERE department_id = increase_salary.department_id_in;
16
17     FOR indx IN 1 .. l_employee_ids.COUNT
18     LOOP
19        check_eligibility (l_employee_ids (indx),
20                           increase_pct_in,
21                           l_eligible);
22
23        IF l_eligible
24        THEN
25           l_eligible_ids (l_eligible_ids.COUNT + 1) :=
26              l_employee_ids (indx);
27        END IF;
28     END LOOP;
29
30     FORALL indx IN 1 .. l_eligible_ids.COUNT
31        UPDATE employees emp
32           SET emp.salary =
33                    emp.salary
34                  + emp.salary * increase_salary.increase_pct_in
35         WHERE emp.employee_id = l_eligible_ids (indx);
36  END increase_salary;
```

Lines	Description
5–8	Declare a new nested table type and two collection variables based on this type. One variable, l_employee_ids, will hold the IDs of all employees in the department. The other, l_eligible_ids, will hold the IDs of all those employees who are eligible for the salary increase.
12–15	Use BULK COLLECT to fetch all the IDs of employees in the specified department into the l_employee_ids collection.
17–28	Check for salary increase eligibility: If ineligible, an e-mail is sent. (Note: Implementation of check_eligibility is not included in this article.) If eligible, add the ID to the l_eligible_ids collection.
30–35	Use a FORALL statement to update all the rows identified by employee IDs in the l_eligible_ids collection.

Code Listing 5: Fetching values for two columns into a collection

```
DECLARE
   TYPE two_cols_rt IS RECORD
   (
      employee_id   employees.employee_id%TYPE,
      salary        employees.salary%TYPE
   );

   TYPE employee_info_t IS TABLE OF two_cols_rt;

   l_employees   employee_info_t;
BEGIN
   SELECT employee_id, salary
     BULK COLLECT INTO l_employees
     FROM employees
    WHERE department_id = 10;
END;
```

Code Listing 6: Fetching *up to* the number of rows specified

```
DECLARE
   c_limit PLS_INTEGER := 100;

   CURSOR employees_cur
   IS
      SELECT employee_id
        FROM employees
       WHERE department_id = department_id_in;

   TYPE employee_ids_t IS TABLE OF
      employees.employee_id%TYPE;

   l_employee_ids   employee_ids_t;
BEGIN
   OPEN employees_cur;

   LOOP
      FETCH employees_cur
      BULK COLLECT INTO l_employee_ids
      LIMIT c_limit;

      EXIT WHEN l_employee_ids.COUNT = 0;
   END LOOP;
END;
```

to use FORALL. The performance improvement will amaze you and please your users.

The FORALL statement is *not* a loop; it is a declarative statement to the PL/SQL engine: "Generate all the DML statements that *would* have been executed one row at a time, and send them all across to the SQL engine with one context switch."

As you can see in Listing 4, lines 30 through 35, the "header" of the FORALL statement looks just like a numeric FOR loop, yet there are no LOOP or END LOOP keywords.

Here are some things to know about FORALL:

- Each FORALL statement may contain just a single DML statement. If your loop contains two updates and a delete, then you will need to write three FORALL statements.
- PL/SQL declares the FORALL iterator (indx on line 30 in Listing 4) as an integer, just as it does with a FOR loop. You do not need to—and you should not—declare a variable with this same name.
- In at least one place in the DML statement, you need to reference a collection and use the FORALL iterator as the index value in that collection (see line 35 in Listing 4).
- When using the IN low_value . . . high_value syntax in the FORALL header, the collections referenced inside the FORALL statement must be densely filled. That is, every index value between the low_value and high_value must be defined.
- If your collection is not densely filled, you should use the INDICES OF or VALUES OF syntax in your FORALL header.

FORALL AND DML ERRORS

Suppose that I've written a program that is supposed to insert 10,000 rows into a table. After inserting 9,000 of those rows, the 9,001st insert fails with a DUP_VAL_ON_INDEX error (a unique index violation). The SQL engine passes that error back to the PL/SQL engine, and if the FORALL statement is written like the one in Listing 4, PL/SQL will terminate the FORALL statement. The remaining 999 rows will not be inserted.

If you want the PL/SQL engine to execute as many of the DML statements as possible, even if errors are raised along the way, add the SAVE EXCEPTIONS clause to the FORALL header. Then, if the SQL engine raises an error, the PL/SQL engine will save that information in a pseudocollection named SQL%BULK_EXCEPTIONS, and continue executing statements. When all statements have been attempted, PL/SQL then raises the ORA-24381 error.

You can—and should—trap that error in the exception section and then iterate through the contents of SQL%BULK_EXCEPTIONS to find out which errors have occurred. You can then write error information to a log table and/or attempt recovery of the DML statement.

Listing 7, available in the online version of this article at bit.ly/OjTrko, contains an example of using SAVE EXCEPTIONS in a FORALL statement; in this case, I simply display on the screen the index in the l_eligible_ids collection on which the error occurred, and the error code that was raised by the SQL engine.

The online version of this article includes additional information on context switching from SQL to PL/SQL and using FORALL with sparse collections.

BULK UP YOUR CODE!

Optimizing the performance of your code can be a difficult and time-consuming task. It can also be a relatively easy and exhilarating experience—if your code has not yet been modified to take advantage of BULK COLLECT and FORALL. In that case, you have some low-hanging fruit to pick! ◀

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ORACLE SQL DEVELOPER

Make the Easy Move

Quickly copy, compare, and synchronize databases with Oracle SQL Developer.

Several methods are available for moving database objects and data from one location to another. DBAs and developers have had access to Oracle Database's SQL*Loader feature, IMP/EXP, Oracle Data Pump, and CREATE TABLE AS SELECT (CTAS) over DB_LINKs for many years. However, many of these technologies do not lend themselves easily to ad hoc tasks, and frequently database users lack the database privileges and resources to use them effectively.

With this in mind, Oracle SQL Developer 3.1 introduces new and improved wizards for copying database objects and their data, performing object definition comparisons, and generating scripts to synchronize environments. These features are supported across all releases of Oracle Database, with no additional license packs required. Oracle SQL Developer also supports Oracle Database, Express Edition, which is free to develop, deploy, and distribute.

This article will teach you how to copy selected objects and data from the HR schema to a new schema. After making a few changes to the new objects, you'll also see how to compare the original schema objects with the new ones. The article steps you through the process of running the Oracle SQL Developer Database Copy and Database Diff wizards to copy and compare database objects.

GETTING STARTED

To step through the example, you need to download and install Oracle SQL Developer 3.1, available as a free download from Oracle Technology Network. You also need access to an Oracle Database instance with the HR sample schema installed.

With Oracle SQL Developer 3.1 installed and launched and a connection to the HR sample schema created, create a new Oracle schema that will contain the copied database objects and data. Connect as SYSTEM or as another user with CREATE USER privileges to create a new schema; then run the following script in in the SQL Worksheet feature of Oracle SQL Developer (**Tools** -> **SQL Worksheet** and press F5 to execute the script) to create the new HR_COPY schema. Replace the password, USERS, and TEMP with the preferred password and tablespaces for objects and temporary space.

```
CREATE USER HR_COPY IDENTIFIED BY
password
DEFAULT TABLESPACE USERS TEMPORARY
TABLESPACE TEMP;
GRANT CONNECT, RESOURCE to HR_COPY;
```

The "user HR_COPY created" report on the **Script Output** tab indicates that the CREATE USER statement was successful.

Next, right-click **Connections** on the **Connections Navigator** tab, select **New Connection**, and enter information in the New/Select Database Connection dialog box to create a connection to the new HR_COPY schema. The HR_COPY connection will be used in the next step.

USING THE DATABASE COPY WIZARD

Select **Tools** -> **Database Copy** to launch the Database Copy wizard. In the Source/Destination wizard step, shown in Figure 1, choose a connection to the HR schema for **Source Connection** and the connection defined above—to HR_COPY—for **Destination Connection**. The rest of this article uses *Source* and *Destination* to reference the HR and HR_COPY schemas, respectively.

Leave the defaults under Copy Options to copy object structures and their data. Click **Next** to proceed to the next step.

In the Object Types wizard step, select the types of objects you want to copy. You will be copying the entire Source schema (HR), so leave all the Object Types options selected. Click **Next** to proceed to the next step.

In the Specify Objects wizard step, specify the database objects to be copied. Because you are logged in as a user other than HR (the source), you will need to use the object selector to specify the tables and views to be copied. Click **More**, choose **HR** from the Schema menu and **TABLE** from the Type menu, and click **Lookup**.

Click the blue double right arrow (>>) button to move all objects from the available-objects box to the selected-objects box.

Now choose **View** from the Type menu, click **Lookup**, and click the blue double right arrow (>>) button to move all objects from the

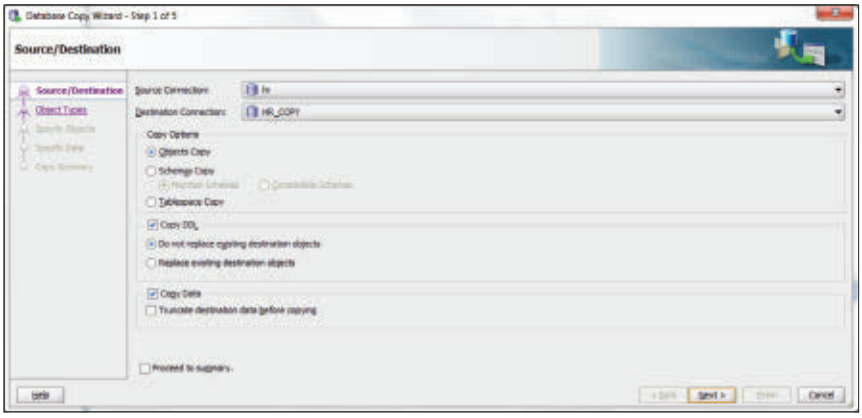

Figure 1: Database Copy wizard, Source/Destination wizard step

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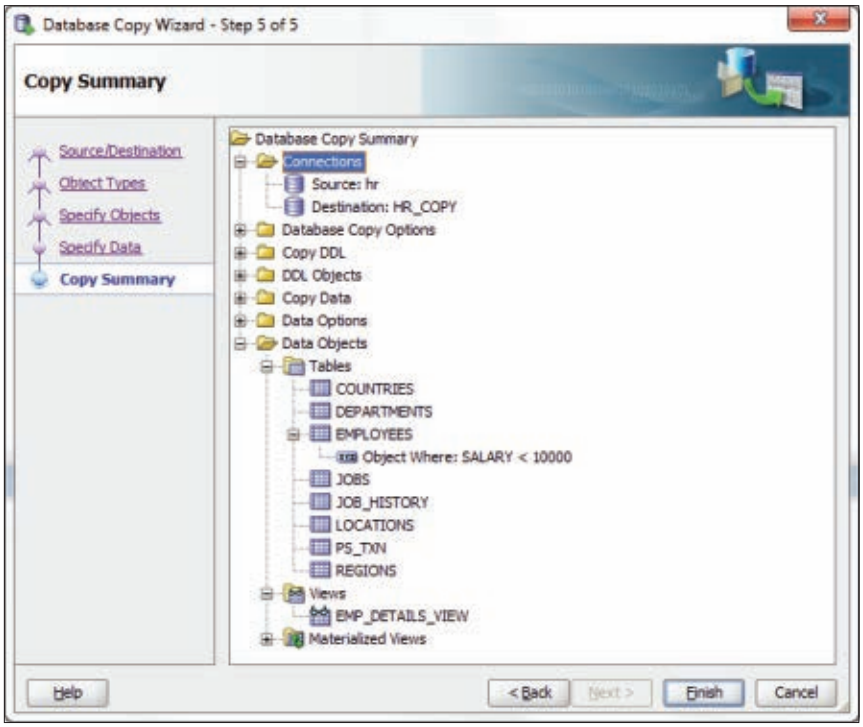

Figure 2: Database Copy wizard, Copy Summary wizard step

available-objects box to the selected-objects box. Click **Next** to proceed to the next step.

In the Specify Data wizard step, you now have the option to copy only a subset of the table data. For this exercise, you will copy only employees whose salary is less than 10,000.

In the bottom panel of the Specify Data wizard step, click in the **Object Where** cell for the HR.EMPLOYEES row and click the **Edit** button in the cell. Now supply the WHERE clause to limit the data being copied from the **Employees** table. Type the following into the **Object Where** input field:

```
SALARY < 10000
```

Click **Go** to preview the data to be copied, and then click **OK**. Click **Next** to proceed to the next step.

In the Copy Summary wizard step, before clicking **Finish**, first expand the tree items to confirm your selections, as shown in Figure 2. You should see the proper source and destination connections, the tables selected previously in the Specify Objects wizard step, and the salary filter applied for copying the **Employees** table data. After you have confirmed your selections, click **Finish**.

A Copying dialog box opens and stays open until the copy process is complete. Once the copy task has finished, a log of the operation will open in a new SQL Worksheet. Peruse the log and confirm that there are no critical error messages.

CONFIRM THE DATABASE COPY

Using the connection previously defined for the Destination schema, connect to HR_COPY in Oracle SQL Developer. Expand the tables list in the connection tree, and open the **Employees** table.

On the **Data** tab, you will notice that the table has been populated with the original table data from HR. To confirm that only the employees making less than 10,000 have been copied, type `salary > 10000` in the **Filter** field and press Enter. You should see that no rows are returned.

CREATING SOME DIFFERENCES

Before performing a Database Diff, create some differences between the Destination and Source schemas. Create two changes in the Destination (HR_COPY) schema:

1. Alter the EMPLOYEES SALARY column, datatype, and default value.
2. Modify the JOBS column comments for MIN_SALARY and MAX_SALARY.

Connected as HR_COPY, run the following script in the SQL Worksheet and press F5 to execute the script to create the changes in the HR_COPY schema:

```
alter table hr_copy.employees modify
(salary number(9,3) DEFAULT 1000);

Comment On Column hr_copy.jobs.min_
salary  is 'Minimum salary for a job
title is now 1000 or higher';

Comment On Column hr_copy.jobs.max_
salary is 'Maximum salary for a job
title is now 10000 or lower';
```

After executing the script, you should see the following on the **Script Output** tab:

```
table HR_COPY.EMPLOYEES altered.

Comment on column hr_copy.jobs.min_
salary 'MINIMUM SALARY FOR A JOB TITLE
IS NOW 1000 OR HIGHER' succeeded.

Comment on column hr_copy.jobs.max_
salary 'MAXIMUM SALARY FOR A JOB TITLE
IS NOW 10000 OR LOWER' succeeded.
```

You are now ready to compare the Source and Destination schemas.

USING THE DATABASE DIFF WIZARD

Select **Tools** -> **Database Diff** to launch the Database Diff wizard—it is very similar to the Database Copy wizard.

In the Source/Destination wizard step, start the database comparison by first selecting the Source and Destination schemas, as shown in Figure 3. Your connection to the HR sample schema is the **Source Connection**, and the HR_COPY connection is the **Destination Connection**.

Deselect everything but **Comments** in the DDL Generation Options section. In the DDL Comparison Options section, select the following options:

- **Ignore Schema**
- **Ignore Table Column Position**
- **Logical Compare**
- **Match Constraints by Definition**

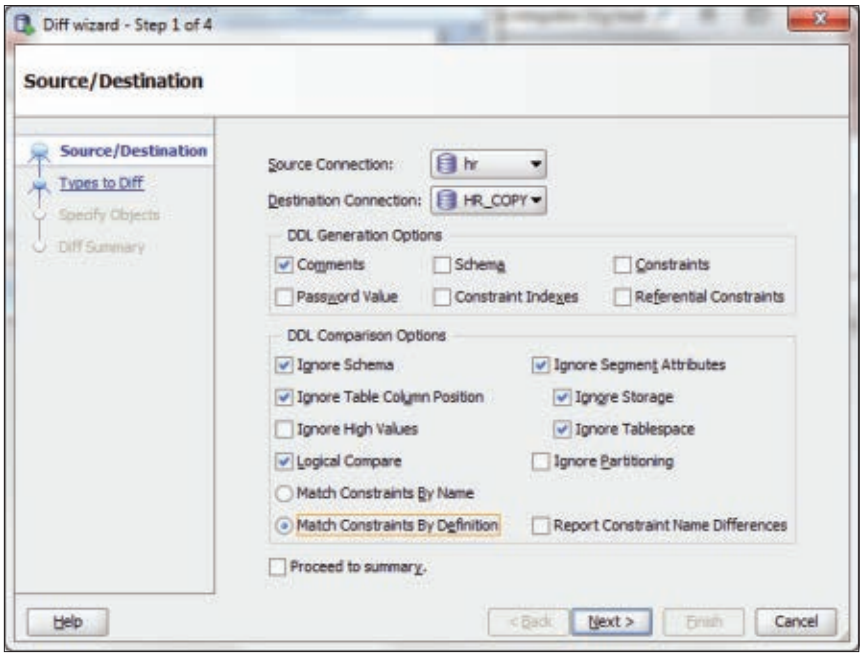

Figure 3: Database Diff wizard, Source/Destination wizard step

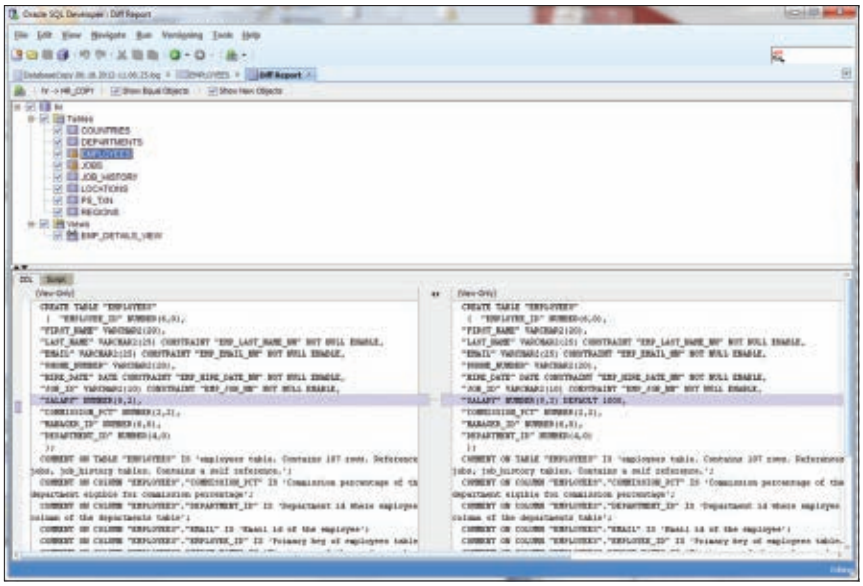

Figure 4: Oracle SQL Developer Database Diff report

- Ignore Segment Attributes
- Ignore Storage
- Ignore Tablespace

Click **Next** to proceed to the next step.

In the Types to Diff wizard step, select **Tables** and **Views** in the Object Types section. Click **Next** to proceed to the next step.

In the Specify Objects wizard step, click **More** to display the Schema and Type menus. Choose **HR** from the Schema menu and **TABLE** from the Type menu, click **Lookup**, and click the blue double right arrow (>>) button to move all objects from the available-objects box to the selected-objects box. Choose **View** from the Type menu, click **Lookup**, and click the blue double right arrow (>>) button to move all objects from the available-objects box to the selected-objects box. Click **Next** to proceed to the next step.

In the DIFF Summary wizard step, expand the tree items to confirm your selections and click **Finish**.

A Comparing dialog box opens and stays open until the comparison process is complete. Once the comparison task has finished, the **Diff Report** tab presents the results, as shown in Figure 4.

INTERPRETING THE DIFF REPORT

In the **Diff Report**, objects that exist in both the Source and Destination schemas and contain differences display a warning icon in the form of a yellow triangle with an exclamation mark. You can see this icon on the **Employees** and **Jobs** tables in Figure 4.

Click **Employees**. The **DDL** tab displays the DDL script for the different **Employees** tables side by side. Differences are highlighted for easy identification. Select the **Script** tab to see the ALTER, CREATE, and DROP statements.

CONCLUSION

This article has stepped you through the process of using Oracle SQL Developer's Database Copy and Database Diff features to copy and compare database objects. You've seen how the Database Copy and Database Diff wizards enable you to answer a few questions, have objects created and data copied, and then have one schema compared with another and detailed differences logged. You can see how Oracle SQL Developer makes ad hoc object management easily achievable in your development and testing environments without third-party tools or hard-to-obtain database privileges and options. ◀

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ORACLE DATABASE

From Floor to Ceiling and Other Functional Cases

Part 7 in a series on the basics of the relational database and SQL

Part 6 in this series, "A Function of Character" (*Oracle Magazine*, July/August 2012), introduced SQL character functions (also known as string functions or text functions) and showed how your queries can use them to modify the appearance of character result set data. Similarly, you can use SQL *number functions* to manipulate numerical data so that it displays differently from how it is stored in the database. This article introduces you to some of the more commonly used SQL number functions, along with some useful miscellaneous other functions.

To try out the examples in this and subsequent articles in the series, you need access to an Oracle Database instance. If necessary, download and install an Oracle Database edition for your operating system from bit.ly/fherki. I recommend installing Oracle Database, Express Edition 11*g* Release 2.

If you install the Oracle Database software, choose the installation option that enables you to create and configure a database. A new database, including sample user accounts and their associated schemas, will be created for you. (Note that SQL_101 is the user account you'll use for the examples in this series; it's also the schema in which you'll create database tables and other objects.) When the installation process prompts you to specify schema passwords, enter and confirm passwords for SYS and SYSTEM and make a note of them.

Finally—whether you installed the database software from scratch or have access to an existing Oracle Database instance—download, unzip, and execute the SQL script available at bit.ly/MEpcXX to create the tables for the SQL_101 schema that are required for this article's examples. (View the script in a text editor for execution instructions.) Some of the examples also use the DUAL table. Recall that DUAL is an Oracle system table owned by the SYS user, not the SQL_101 schema. DUAL contains no meaningful data itself, but it is useful to query it as a way to experiment with functions that work on literals.

A NICE ROUND NUMBER

One frequently used number function, ROUND, enables you to round a numeric value that is returned in a result set. For example, the simple query in Listing 1 uses this function to apply conventional rounding to two numbers. One number is rounded down, and the other is rounded up.

Number functions require input parameters that are numeric—either a column with a NUMBER datatype or a numeric literal. ROUND takes two parameters, one required and one optional. The required parameter is the numeric value to be rounded. The optional parameter is an integer that indicates the rounding *precision*—that is, how many places to the right (indicated by a positive integer) or left (indicated by a negative integer) of the decimal point the numeric value should be rounded to. The query in Listing 1 applies the ROUND number function to two numeric literal values. Both numbers are rounded to two digits to the right of the decimal point.

If you omit the second parameter, the ROUND function will round the numeric value to the nearest whole number, as shown in Listing 2. The query in Listing 3 demonstrates that if you pass the optional parameter a negative integer, the ROUND function will round the numeric value on the left side of the decimal point.

CUTTING YOUR DATA OFF

The TRUNC function returns a numeric value truncated to a certain number of

Code Listing 1: Using ROUND function to round one number up and another number down

```
SQL> set feedback on
SQL> select ROUND(7534.1238, 2), ROUND(99672.8591, 2)
  2    from dual;

ROUND(7534.1238,2)  ROUND(99672.8591,2)
------------------  ----------------------
           7534.12              99672.86

1 row selected.
```

Code Listing 2: Using ROUND function to round numeric values to whole numbers

```
SQL> select ROUND(7534.1238),  ROUND(99672.8591)
  2    from dual;

ROUND(7534.1238)  ROUND(99672.8591)
----------------  ------------------
            7534               99673

1 row selected.
```

decimal places. Like the ROUND function, it takes one required parameter and one optional parameter. The required parameter is the number to be truncated. The optional parameter is a positive or a negative integer. A positive integer specifies how many decimal places to truncate to. Listing 4 shows how the TRUNC function behaves when it is passed a positive value for the optional parameter. Note that the query simply truncates the returned values, leaving off any digits beyond two digits to the right of the decimal point.

If you omit the optional parameter, the returned value will be truncated to zero decimal places, as shown in Listing 5. When you use a negative integer for the optional parameter, as shown in Listing 6, you are specifying how many digits to the left of the decimal point should be changed to 0 in the displayed results.

TOP TO BOTTOM

Similar to ROUND and TRUNC are the FLOOR and CEIL number functions. The FLOOR function determines the largest integer less than (or equal to) a particular numeric value. Conversely, the CEIL function determines the smallest integer greater than (or equal to) a particular numeric value. FLOOR and CEIL (unlike ROUND and TRUNC) do not take an optional parameter for precision, because their output is always an integer. When all four of these functions are applied to a positive number, as illustrated in Listing 7, FLOOR behaves similarly to TRUNC with no optional parameter specified, and CEIL behaves similarly to ROUND with no optional parameter specified. Note, however, that FLOOR behaves like ROUND and CEIL behaves like TRUNC when these functions are applied to a negative number.

ARITHMETIC AND ITS REMAINS

The four arithmetic operators (+, –, *, and /—for addition, subtraction, multiplication, and division) can be used in SQL statements and combined with one another and any of the number functions. Listing 8 shows a query from the EMPLOYEE table that reports each employee's annual base salary, a calculated 3 percent bonus per salary value, and the weekly salary value (including bonus) for each employee.

Two number functions, MOD and REMAINDER, can both be used to calculate the remainder of a value divided by

Code Listing 3: Using ROUND function to round numeric values to the left of the decimal point

```
SQL> select ROUND(7534.1238, -1), ROUND(99672.8591, -3)
  2    from dual;

ROUND(7534.1238,-1)  ROUND(99672.8591,-3)
-------------------  ---------------------
               7530                 100000

1 row selected.
```

Code Listing 4: Using TRUNC function to cut off digits to the right of the decimal point

```
SQL> select TRUNC(7534.1238, 2), TRUNC(99672.8591, 2)
  2    from dual;

TRUNC(7534.1238,2)  TRUNC(99672.8591,2)
------------------  -------------------
           7534.12              99672.85

1 row selected.
```

Code Listing 5: Using TRUNC function to truncate numeric values to whole numbers

```
SQL>  select TRUNC(7534.1238),  TRUNC(99672.8591)
  2     from dual;

TRUNC(7534.1238)  TRUNC(99672.8591)
----------------  -----------------
            7534                99672

1 row selected.
```

Code Listing 6: Using TRUNC function to truncate numeric values to the left of the decimal point

```
SQL> select TRUNC(7534.1238, -1), TRUNC(99672.8591, -3)
  2    from dual;

TRUNC(7534.1238,-1)  TRUNC(99672.8591,-3)
-------------------  ---------------------
               7530                 99000

1 row selected.
```

Code Listing 7: Using and comparing ROUND, CEIL, TRUNC, and FLOOR functions

```
SQL> select ROUND(99672.8591), CEIL(99672.8591), TRUNC(99672.8591),
FLOOR(99672.8591)
  2    from dual;

ROUND(99672.8591)  CEIL(99672.8591)  TRUNC(99672.8591)  FLOOR(99672.8591)
-----------------  ----------------  -----------------  -----------------
            99673             99673              99672              99672

1 row selected.
```

another value. Both functions require two parameters: the value to be divided and the divisor. The MOD function uses the FLOOR function in its computation logic, and the REMAINDER function uses ROUND. For this reason, the values returned from the two functions can differ, as shown in Listing 9.

REPLACING THE UNKNOWN WITH THE KNOWN

Recall that a *null value* in a table is the absence of a value. Null values cannot be compared with, or computed with, one another. However, you can substitute a non-null value for a NULL value by applying the NVL miscellaneous function to the NULL. The NVL function requires two input parameters: the expression (a column value, literal value, or computed result) to be tested for nullity and the expression to substitute for any NULL expressions in the results.

For example, Listing 10 shows a query that lists each employee alongside the EMPLOYEE ID value of that person's manager. For the employees with no value for MANAGER—that is, those whose MANAGER values are NULL in the database—the results display 0 as the manager's EMPLOYEE ID. This occurs because the query applies the NVL function to each MANAGER value, substituting 0 for any NULL.

As you can also see in Listing 10, the original value of the tested expression is returned if it is not NULL.

In the Listing 10 example, a returned value of 0 might not tell you as clearly as you'd like that certain employee records have no assigned manager value. Instead, you might prefer to return text that states this fact explicitly.

Listing 11 shows a query that tries to replace each NULL value with a more descriptive text literal. The query returns an error, however, because the NVL function requires the substitution value to be convertible to the datatype of the comparison value. However, you can obtain the textual output in a few ways. Listing 12 demonstrates one of them: the inclusion of a *datatype conversion function*, TO_CHAR. Datatype conversion functions will be discussed in detail in subsequent articles in this series.

Code Listing 8: Arithmetic operators in combination with the ROUND number function

```
SQL> select first_name, last_name, salary, salary*.03 "BONUS",
ROUND((salary/52)+((salary*.03)/52)) "Weekly Sal w/Bonus"
  2    from employee
  3  order by salary desc, last_name;

FIRST_NAME      LAST_NAME          SALARY     BONUS     Weekly Sal w/Bonus
--------------- ------------------ ---------- --------- ------------------
Emily           Eckhardt           100000     3000                    1981
michael         peterson           90000      2700                    1783
Donald          Newton             80000      2400                    1585
Frances         Newton             75000      2250                    1486
Matthew         Michaels           70000      2100                    1387
mark            leblanc            65000      1950                    1288
Roger           Friedli            60000      1800                    1188
Betsy           James              60000      1800                    1188

8 rows selected.
```

Code Listing 9: Differences between the MOD and REMAINDER function results

```
SQL> select MOD(49, 18) modulus, REMAINDER(49, 18) remaining
  2    from dual;

   MODULUS   REMAINING
---------- ----------
        13          -5

1 row selected.
```

Code Listing 10: Substitute a NULL value for MANAGER with a value of 0

```
SQL> select employee_id, last_name, first_name, NVL(manager, 0) manager
  2    from employee
  3  order by manager, last_name, first_name;

EMPLOYEE_ID   LAST_NAME                 FIRST_NAME                      MANAGER
------------- ------------------------- ------------------------------ ---------
         28   Eckhardt                  Emily                               0
         37   Newton                    Frances                             0
       6569   peterson                  michael                             0
       6567   Friedli                   Roger                              28
       6568   James                     Betsy                              28
       7895   Michaels                  Matthew                            28
       1234   Newton                    Donald                             28
       6570   leblanc                   mark                             6569

8 rows selected.
```

Code Listing 11: Attempt to replace a returned NULL value with a text value

```
SQL>  select employee_id, last_name, first_name, NVL(manager,
'Has no manager') manager
  2    from employee
  3  order by manager, last_name, first_name;
select employee_id, last_name, first_name, NVL(manager, 'Has no manager')
manager
                                                        *

ERROR at line 1:
ORA-01722: invalid number
```

ADDING MORE DETAIL WITH DECODE

Sometimes a simple substitution function such as NVL doesn't provide all the choices you require. The DECODE function uses if-then-else logic to give you more than one possible substitution choice.

The syntax for the DECODE function starts with an input expression. It compares that expression with a comparison value. If the two values match (this is the "if-then" portion of the DECODE logic), the DECODE function returns the substitution value. If the two values do not match, the input expression will be compared with the next available comparison value. If another comparison value is not provided, the optional default substitution value (the "else" portion of the DECODE logic) will be returned. Listing 13 demonstrates the syntax for the DECODE function. It also demonstrates how DECODE functions can be nested inside one another.

The query in Listing 13, like the one in Listing 12, substitutes a textual value for the actual MANAGER value for each employee record. Note, though, that with DECODE, you can repeat the test and substitute values—that is, repeat the if-then logic—as much as you require. Another difference from NVL is that DECODE can test for conditions other than nullity; for example, the query in Listing 13 tests whether a particular value exists.

If you do want to test for nullity with DECODE, you can write a query such as

```
SELECT DECODE(manager, NULL, 'Has no
Manager', manager) FROM employee;
```

In this example, if the value obtained from the MANAGER column is NULL, the "Has no manager" string will be returned. Otherwise, the non-null manager value will be returned. You might be wondering why this statement does not return an error, given that the MANAGER value is of a different datatype than the string that would be returned if the MANAGER value were NULL. The reason is *implicit datatype conversion*. Oracle Database implicitly converts a number to a string in situations like this example. (It does not—and cannot—convert a string to a number.) However, it is not good practice to allow Oracle Database to perform implicit datatype

Code Listing 12: Replace a returned NULL value with a text value by using TO_CHAR

```
SQL> select employee_id, last_name, first_name, NVL(TO_CHAR(manager),
'Has no manager') manager
  2   from employee
  3  order by manager, last_name, first_name;

EMPLOYEE_ID  LAST_NAME             FIRST_NAME                MANAGER
-----------  ---------------------  ------------------------  ------------
       6567  Friedli                Roger                     28
       6568  James                  Betsy                     28
       7895  Michaels               Matthew                   28
       1234  Newton                 Donald                    28
       6570  leblanc                mark                      6569
         28  Eckhardt               Emily                     Has no manager
         37  Newton                 Frances                   Has no manager
       6569  peterson               michael                   Has no manager

8 rows selected.
```

Code Listing 13: DECODE substitution function

```
SQL> select employee_id, first_name, last_name, DECODE(manager, 28,
'Emily Eckhardt', 6569, 'Michael Peterson', DECODE(employee_id, 28,
'Is Emily', 6569, 'Is Michael', 'Neither Emily nor Michael')) manager
  2    from employee
  3  order by manager, last_name, first_name;

EMPLOYEE_ID  FIRST_NAME          LAST_NAME             MANAGER
-----------  --------------------  ---------------------  ------------------
       6567  Roger                 Friedli               Emily Eckhardt
       6568  Betsy                 James                 Emily Eckhardt
       7895  Matthew               Michaels              Emily Eckhardt
       1234  Donald                Newton                Emily Eckhardt
         28  Emily                 Eckhardt              Is Emily
       6569  michael               peterson              Is Michael
       6570  mark                  leblanc               Michael Peterson
         37  Frances               Newton                Neither Emily nor Michael

8 rows selected.
```

Code Listing 14: Searched CASE expression in a less-than comparison

```
SQL> select employee_id, first_name, last_name, salary,
  2     CASE WHEN manager = 28 THEN 'Emily is the manager. No bonus this year.'
  3          WHEN salary  < 80000 THEN 'Bonus this year.'
  4          ELSE 'No bonus this year.'
  5     END "Bonus?"
  6   from employee
  7   order by last_name, first_name;

EMPLOYEE_ID  FIRST_NAME LAST_NAME  SALARY Bonus?
-----------  ----------  ---------  ------  --------------------------------------------------
         28  Emily      Eckhardt   100000 No bonus this year.
       6567  Roger      Friedli     60000 Emily is the manager. No bonus this year.
       6568  Betsy      James       60000 Emily is the manager. No bonus this year.
       7895  Matthew    Michaels    70000 Emily is the manager. No bonus this year.
       1234  Donald     Newton      80000 Emily is the manager. No bonus this year.
         37  Frances    Newton      75000 Bonus this year.
       6570  mark       leblanc     65000 Bonus this year.
       6569  michael    peterson    90000 No bonus this year.

8 rows selected.
```

conversions. If you need a datatype conversion, you should always perform a call to a datatype conversion function explicitly.

A CASE FOR COMPARATIVE SEARCHES

Although the DECODE function is more powerful than the NVL function, it cannot be (easily) used for comparisons other than equality (and inequality.) A *searched CASE expression* can not only be used in place of the DECODE function but can also be used more easily for greater-than or less-than comparisons.

Listing 14 shows a query that uses a searched CASE expression. As you can see, the searched CASE expression starts with the CASE keyword and ends with the END keyword. Each WHEN clause tests a condition. If a condition is true, the CASE expression will return the value specified in the associated THEN clause. Like the DECODE function's ELSE condition, the default ELSE condition in the searched CASE expression is optional. CASE expressions can be used in WHERE clauses, as shown in Listing 15. They can even be nested, as shown in Listing 16.

Code Listing 15: Searched CASE expression in a WHERE clause

```
SQL> select employee_id, first_name, last_name, salary
  2    from employee
  3   where salary + CASE
  4            WHEN ROUND((salary/52)+((salary*.03)/52)) > 1500
  5            THEN 0
  6            WHEN ROUND((salary/52)+((salary*.03)/52)) < 1300
  7            THEN 500
  8         ELSE 200
  9         END > 75000
 10  order by last_name, first_name;

EMPLOYEE_ID   FIRST_NAME           LAST_NAME                      SALARY
-----------   --------------------  ------------------------------  ---------
         28   Emily                Eckhardt                       100000
       1234   Donald               Newton                          80000
         37   Frances              Newton                          75000
       6569   michael              peterson                        90000

4 rows selected.
```

Code Listing 16: Nested searched CASE expressions

```
SQL> select employee_id, first_name, last_name,
  2     CASE manager WHEN 28    THEN 'Emily Eckhardt'
  3                  WHEN 6569  THEN 'Michael Peterson'
  4     ELSE
  5        CASE employee_id WHEN 28    THEN 'Is Emily'
  6                         WHEN 6569  THEN 'Is Michael'
  7        ELSE 'Neither Emily nor Michael'
  8        END
  9     END manager
 10    from employee
 11  order by manager, last_name, first_name;

EMPLOYEE_ID  FIRST_NAME         LAST_NAME            MANAGER
-----------  --------------------  ------------------------  ------------------
       6567  Roger              Friedli              Emily Eckhardt
       6568  Betsy              James                Emily Eckhardt
       7895  Matthew            Michaels             Emily Eckhardt
       1234  Donald             Newton               Emily Eckhardt
         28  Emily              Eckhardt             Is Emily
       6569  michael            peterson             Is Michael
       6570  mark               leblanc              Michael Peterson
         37  Frances            Newton               Neither Emily nor Michael

8 rows selected.
```

CONCLUSION

This article has shown you a few of the more common number functions and how you can use them to manipulate the way your data displays. You've seen how to round numeric data values up and down and how to truncate them. You now know how the ROUND and TRUNC number functions behave, in comparison to FLOOR and CEIL. You've also seen that the MOD and REMAINDER number functions can return different values because of the type of computation each one uses. Last but not least, you understand the power and differences of substitution functions such as NVL, DECODE, and searched CASE expressions.

This article has by no means provided an exhaustive list of the Oracle number and miscellaneous substitution functions. Review the documentation at bit.ly/MgvEzi and bit.ly/LN8FOd for more information.

The next installment of SQL 101 will discuss date and datatype conversion functions. ◀

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NEXT STEPS

READ
SQL 101, Parts 1–6
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READ more about relational database design and concepts
Oracle Database Concepts 11g Release 2 (11.2)
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Oracle Database SQL Language Reference 11g Release 2 (11.2)
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Oracle SQL Developer User's Guide Release 3.1
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number and substitution functions
bit.ly/MgvEzi
bit.ly/LN8FOd

DOWNLOAD the sample script for this article
bit.ly/MEpcXX

ORACLE DATABASE

On Clustering Factor and Validating Keys

Our technologist explains different statistics and very foreign keys.

I created the following table and index to see the clustering factor, and I have a few questions.

```
create table t (a number);
insert into t (a)
with data (r)
as
(select 1 r from dual
 union all
 select r+1 from data where r+1 < = 10000000
)
select * from data
create index t_idx on t(a);
exec dbms_stats.gather_table_stats( user,
'T' );
```

When I query USER_INDEXES, I find that the number of LEAF_BLOCKS is 2,226 and the CLUSTERING_FACTOR is 1,516. If I drop that table, re-create it with a CHAR(8) datatype, and create the same index, I find that the number of LEAF_BLOCKS is 27,856 and the clustering factor has increased to 1,916,062.

Can you please tell me why CLUSTERING_FACTOR is so different between the two tables, given that they contain the same data—just in different datatypes?

Before I answer this, I'd like to explain the meaning and importance of the clustering factor statistic. This statistic is used by the optimizer during query optimization to determine the relative efficiency of an index. In short, the index clustering factor is *a measure of how many I/Os the database would perform if it were to read every row in that table via the index in index order*. If the rows of a table on disk are sorted in about the same order as the index keys, the database will perform a minimum number of I/Os on the table to read the entire table via the index. That is because the next row needed from an index key would likely be the next row in the table block as well. The query would not be skipping all over the table to find row after row—they are naturally next to each other on the block. Conversely, if the rows in the table are not in the same order on disk as the index keys—if the data is scattered—the query will tend to perform the maximum number of I/Os on the table, as many as one I/O for every row in the table. That is because as the database scans through the index, the next row needed will probably *not* be on the same block as the last row. The database will have to discard that block and get another block from the buffer cache. The query will end up reading every block from the buffer as many times as it has rows on it.

So if a table and an index key are in about the same order, the clustering factor will be near the number of *blocks* in the table and the index will be useful for very large index range scans and for retrieving numerous rows from the table. On the other hand, if the data is randomly scattered, the clustering factor will be near the number of *rows* in the table, and given that the number of rows in a table is usually at least an order of magnitude more than the number of blocks, the index will be less efficient for returning numerous rows. For example, if a table is 100 blocks in size and has 100 rows per block, an index with a clustering factor of 100 (near the number of blocks) will perform about 2 I/Os against the table to retrieve 200 rows. That is because when the database reads the first table block to get row #1, rows 2–100 are probably on that same block, so the query will be able to get the first 100 rows by reading the table block once. The process will be similar for rows 101–200. If the index has a clustering factor of 10,000—the number of rows in the table—the number of I/Os required against the table will be approximately 200, even though there are only 100 blocks! That is because the first row in the index will be on a different block than the second row, which, in turn, will be on a different block than the third row, and so on—the database will probably never be able to get more than one row from a table block at a time.

This is easy to observe. I'm going to take a copy of ALL_OBJECTS and put it into two tables. The STAGE table I am using is simply a copy of ALL_OBJECTS for starters:

```
SQL> create table organized
  2  as
  3  select x.*
  4    from (select * from stage
            order by object_name) x
  5  /
Table created.

SQL> create table disorganized
  2  as
  3  select x.*
  4    from (select * from stage
          order by dbms_random.random) x
  5  /
Table created.
```

Note that when I created these two tables, I used an ORDER BY statement. In the case of the first table, I sorted the data by OBJECT_NAME before loading it into the table. If I were to do a full table scan on the ORGANIZED table, the OBJECT_NAME column would be more or less sorted on the screen even without an ORDER BY (but you need the ORDER BY in the query if you want the data to be sorted). During the creation of the DISORGANIZED table, on the other hand, I sorted by a random value—I just scrambled the data. If I were to

do a full table scan on that table, the OBJECT_NAME values would come out in an arbitrary order—I might see an object starting with the letter N first, then Z, then A, then Q, then B, then Z again, and so on.

Now I'll index and gather statistics on these two tables and look at the statistics, as shown in Listing 1.

As you can see in Listing 1, both tables have the same number of rows and the same number of blocks. That is expected—they contain exactly the same rows, just in a different order. But when I look at the clustering factor, I see a large difference between the two. The ORGANIZED index has a clustering factor very near the number of blocks in the table, whereas the DISORGANIZED index has a clustering factor near the number of rows in the table. Again, this clustering factor metric is a measure of how many I/Os the database will perform against the table in order to read every row via the index. I can verify this fact by executing a query with tracing enabled that will, in fact, read every row of the table via the index. I'll do that by using an index hint to force the optimizer to use my index and count the non-null occurrences of a nullable column that is not in the index. That will force the database to go from index to table for every single row:

```
SQL> select /*+ index( organized
organized_idx) */
  2    count(subobject_name)
  3    from organized;

COUNT(SUBOBJECT_NAME)
---------------------
                  658

SQL> select /*+ index( disorganized
disorganized_idx) */
  2    count(subobject_name)
  3    from disorganized;

COUNT(SUBOBJECT_NAME)
---------------------
                  658
```

Reviewing the TKPROF report for reading every row via the index, I discover the results in Listing 2.

As you can see in Listing 2, I performed 363 I/Os for the ORGANIZED table against the index (cr=363 in the INDEX FULL SCAN ORGANIZED_IDX row source), and if I subtract 363 from the 1,401 total I/Os performed by the query, I'll get 1,038, which is exactly the clustering factor of this index.

Code Listing 1: Creating indexes, generating statistics, and viewing information

```
SQL> create index organized_idx on organized(object_name);
Index created.

SQL> create index disorganized_idx on disorganized(object_name);
Index created.

SQL> begin
  2  dbms_stats.gather_table_stats
  3  ( user, 'ORGANIZED',
  4    estimate_percent => 100,
  5    method_opt=>'for all indexed columns size 254'
  6  );
  7  dbms_stats.gather_table_stats
  8  ( user, 'DISORGANIZED',
  9    estimate_percent => 100,
 10    method_opt=>'for all indexed columns size 254'
 11  );
 12  end;
 13  /
PL/SQL procedure successfully completed.

SQL> select table_name, blocks, num_rows from user_tables
  2  where table_name like '%ORGANIZED' order by 1;

TABLE_NAME                          BLOCKS   NUM_ROWS
----------------------------------  ------- ----------
DISORGANIZED                          1064      72839
ORGANIZED                             1064      72839

SQL> select table_name, index_name, clustering_factor
  2  from user_indexes
  3  where table_name like '%ORGANIZED' order by 1;

TABLE_NAME                     INDEX_NAME                     CLUSTERING_FACTOR
-----------------------------  -----------------------------  -----------------
DISORGANIZED                   DISORGANIZED_IDX                           72760
ORGANIZED                      ORGANIZED_IDX                               1038
```

Code Listing 2: Information on index scans on both tables

```
select /*+ index( organized organized_idx) */
  count(subobject_name)
 from organized

Row Source Operation
---------------------------------------------------------------
SORT AGGREGATE (cr=1401 pr=1038 pw=0 time=307733 us)
 TABLE ACCESS BY INDEX ROWID ORGANIZED (cr=1401 pr=1038 pw=0 tim...
  INDEX FULL SCAN ORGANIZED_IDX (cr=363 pr=0 pw=0 time=53562 ...

select /*+ index( disorganized disorganized_idx) */
  count(subobject_name)
 from disorganized

Row Source Operation
---------------------------------------------------------------
SORT AGGREGATE (cr=73123 pr=1038 pw=0 time=535990 us)
 TABLE ACCESS BY INDEX ROWID DISORGANIZED (cr=73123 pr=1038 pw=0 t...
  INDEX FULL SCAN DISORGANIZED_IDX (cr=363 pr=0 pw=0 time=47207 us ...
```

Similarly, if I do the same analysis on the DISORGANIZED index, I'll see 73,123 – 363 = 72,760 I/Os against the table, again the clustering factor of that index.

So, for one table, the database performs 1,401 total I/Os to retrieve exactly the same data as for the other table—which needed 73,123 I/Os.

Obviously, one of these indexes is going to be more useful for retrieving a larger number of rows than the other. If I am going to read more than 1,038 blocks of the table via the index, I certainly should be doing a full table scan instead of using an index. I can observe this fact as well, by using autotrace on a few queries against both tables, as shown in Listing 3.

As you can see in Listing 3, both plans expect to return the same number of rows: 149. Both plans are using an index range scan. But the two plans have radically different costs: one has a low cost of 6 and the other a much higher cost of 152—even though both plans are going after exactly the same set of rows from two tables that contain the same data! The reason for the cost difference is easy to explain: the optimizer computes the cost column value as a function of the number of expected I/Os and the CPU cost. For this simple query, the CPU cost is negligible, so most of the cost is simply the number of I/Os. Walking through the first plan, I see there is a cost of 3 for using the index for the ORGANIZED table and index—about three I/Os against the index, which makes sense. The query will hit the root block, branch, and probably the leaf block. Then the query will be doing about three more I/Os against the table, because the rows needed are all next to each other on a few database blocks, for a total cost of 6. The DISORGANIZED index, on the other hand, does the math a little differently. The plan still has the same three I/Os against the index—that won't change—but because the rows needed from the table are not next to each other, the optimizer estimates that the query will have to perform an I/O against the table for every row it retrieves, and its estimated cost for 149 rows is 149 rows + 3 I/Os = 152.

If I change the query slightly, I can see what kind of effect this might have on the query plans shown in Listing 4.

As you can see in Listing 4, the estimated row count has jumped to 1,825 and the ORGANIZED table will still use the index. The cost of the query is 39 – 12 I/Os estimated against the index for the range scan and 27 more I/Os against the table. That makes sense, because the ALL_OBJECTS rows' size means that about 70 or so fit on a database block—it would take about 27 blocks to hold 1,825 rows. When I look at the DISORGANIZED table, I see that it gets the same estimated row counts but that the plan is totally different. The optimizer chose not to use an index but instead to do a full table scan. What would the cost of using the index have been? I know from the result in Listing 4 that the cost of the index step (INDEX RANGE SCAN) would be 12, and given that the clustering factor of the index is near the number of rows in the table, I can assume that every row I need to retrieve will require an I/O. So, the query would need to perform 1,825 I/Os against the table, for a total query cost of 1,837—it would be less expensive to do a full table scan.

In fact, I have enough information to figure out when the optimizer would stop using this index. I know that the cost of a full table scan is 291, and I know that the cost of a query plan that uses an index against this table would be at least equal to the number of estimated rows plus the cost of the query. So if the query is getting around 285 rows, the cost of using the index would probably be around 5 or 6, the cost of the table access would be about

Code Listing 3: Comparing costs of using an index on two tables

```
SQL> select * from organized where object_name like 'F%';

-----------------------------------------------------------------------------------------
| Id  | Operation                    | Name           | Rows | Bytes | Cost  |
-----------------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |                |  149 | 14602 |    6  |
|   1 |  TABLE ACCESS BY INDEX ROWID| ORGANIZED      |  149 | 14602 |    6  |
|*  2 |   INDEX RANGE SCAN           | ORGANIZED_IDX |  149 |       |    3  |
-----------------------------------------------------------------------------------------

SQL> select * from disorganized where object_name like 'F%';

-----------------------------------------------------------------------------------------
| Id  | Operation                    | Name              | Rows | Bytes | Cost |
-----------------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |                   |  149 | 14602 |  152 |
|   1 |  TABLE ACCESS BY INDEX ROWID| DISORGANIZED      |  149 | 14602 |  152 |
|*  2 |   INDEX RANGE SCAN           | DISORGANIZED_IDX |  149 |       |    3 |
-----------------------------------------------------------------------------------------
```

Code Listing 4: Changing queries, changing costs

```
SQL> select * from organized where object_name like 'A%';

-----------------------------------------------------------------------------------------
| Id  | Operation                    | Name           | Rows  | Bytes | Cost |
-----------------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |                |  1825 |  174K |   39 |
|   1 |  TABLE ACCESS BY INDEX ROWID| ORGANIZED      |  1825 |  174K |   39 |
|*  2 |   INDEX RANGE SCAN           | ORGANIZED_IDX |  1825 |       |   12 |
-----------------------------------------------------------------------------------------

SQL> select * from disorganized where object_name like 'A%';

-----------------------------------------------------------------------------
| Id  | Operation         | Name          | Rows  | Bytes | Cost |
-----------------------------------------------------------------------------
|   0 | SELECT STATEMENT  |               |  1825 |  174K |  291 |
|*  1 |  TABLE ACCESS FULL| DISORGANIZED |  1825 |  174K |  291 |
-----------------------------------------------------------------------------
```

291, and the full table and index scan costs would be tied. Any cost above an estimated row count of 285 would cause the optimizer to do a full table scan. The cost of getting thousands of rows from the organized table is less than the cost of getting a few hundred from the disorganized table. And the clustering factor is what reports that cost, in general, for the index range scan.

So, now that you know what a clustering factor is and why you might care about it, I can address the original question. Why did the two tables—one created with a NUMBER and the other a CHAR(8)—have such different clustering factors? The data in both tables is in exactly the same order on disk—so the tables should presumably have the same clustering factor, shouldn't they?

No, they won't—and they can't—for two reasons.

First, which table do you think is larger, the NUMBER implementation or the CHAR(8) implementation? I see that the number of index leaf blocks is more in the CHAR index than in the NUMBER index (storing a number in a CHAR or VARCHAR2 is *always* a bad idea, for many reasons—space being one of them).

The table with the CHAR(8) column is much larger than the table with the NUMBER column. And the clustering factor is, by definition, *the number of I/Os that would be performed in order to read the entire table via the index in a single range scan*, and the number of I/Os has to be at least the number of blocks in the table, reasonably assuming that more than one row exists per block.

So it would logically follow that if one table is much larger than another table, the clustering factor of the larger table has to be larger than the clustering factor of the smaller table.

That accounts for part of the issue here—the CHAR(8) table is obviously larger and hence would increase the clustering factor. But it doesn't account for all of it. To see the rest, you need to look at the data.

The person posting the question believes he loaded two tables with the same data—stored once (properly) as a NUMBER and stored again (totally wrong) as a string. But he didn't—he has two entirely different sets of data! Consider the following:

```
SQL> with data (r)
  2  as
  3  (select 1 r from dual union all
  4     select r+1 from data
  5       where r<= 1000 )
  6  select * from data
  7  order by to_char(r);

         R
----------
         1
        10
       100
      1000
      1001
       101
       102
       103
       104
       105
       106
       107
       108
       109
        11
       110
```

Look at that: 1, 10, 100, 1000 . . . are returned first. The data in the index would have 1, 10, 100, and 1000 *first*. Well, in order to process that first leaf block, how many I/Os against the table would the query have to perform? Remember, the data in the table is 1, 2, 3, 4, 5. . . . The table is ordered *numerically*, because the data was generated in numeric order, and the index is ordered with *character strings*. A number value in a character string sorts entirely differently than a number value *in a NUMBER* datatype.

So, this accounts for the *second* issue: The data in the table is not sorted in the same fashion as the data in the index! By definition, that will pretty much increase the clustering factor.

The clustering factor is higher in the CHAR(8) table because

- The table used a lot more space, making the lowest-possible clustering factor *much higher*
- The table was loaded in an unsorted fashion, so the database must do reads and rereads of blocks over and over and over. With the NUMBER datatype, the table data and the index data were *sorted* identically.

WHEN IS A FOREIGN KEY NOT A FOREIGN KEY?

I learn or relearn something new about Oracle Database every day. Really.

For example, a short while ago I was in Belgrade, Serbia, delivering a seminar, and an attendee reminded me of something I knew once but had totally forgotten about. It had to do with foreign keys and the dreaded NULL value.

Many of you might think the following demonstration is not possible, but it is. I'll start with the tables:

```
SQL> create table p
  2  ( x int,
  3    y int,
  4    z int,
  5    constraint p_pk primary key(x,y)
  6  )
  7  /
Table created.

SQL> create table c
  2  ( x int,
  3    y int,
  4    z int,
  5    constraint c_fk_p
  6    foreign key (x,y)
  7    references p(x,y)
  8  )
  9  /
Table created.
```

Looks like a normal parent-child relationship: a row may exist in C if and only if a parent row exists in P. But if that is true, how can this happen?

```
SQL> select count( x||y ) from p;

COUNT(X||Y)
-----------
          0

SQL> select count( x||y ) from c;

COUNT(X||Y)
-----------
          1
```

There are zero records in P—none. There is at least one record in C, and that record has a

non-null foreign key. What is happening?

It has to do with NULLs, foreign keys, and the default MATCH NONE rule for composite foreign keys. If your foreign key allows NULLs and your foreign key is a composite key, you must be careful of the condition in which only *some* of the foreign key attributes are not null. For example, to achieve the above magic, I inserted

```
SQL> insert into c values ( 1, null, 0 );
1 row created.
```

The database cannot validate a foreign key when it is partially null. In order to enforce the MATCH FULL rule for composite foreign keys, you would add a constraint to your table:

```
SQL> alter table c add constraint
check_nullness
  2  check ( ( x is not null
  3            and y is not null ) or
  4          ( x is null
  5            and y is null ) )
  6  /
Table altered.
```

The constraint will ensure that either

- All of the columns are NULL in the foreign key, or
- None of the columns are NULL in the foreign key

As long as that constraint is in place, your foreign key will work as you probably think it should. ◀

Tom Kyte is a database evangelist in Oracle's Server Technologies division and has worked for Oracle since 1993. He is the author of *Expert Oracle Database Architecture* (Apress, 2005, 2010).

NEXT STEPS

ASK Tom
Tom Kyte answers your most difficult technology questions. Highlights from that forum appear in this column.
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Success in the Clouds

Here are some cloud tips from experienced IT pilots.

Many organizations are already using or moving rapidly to the cloud to simplify and redefine the way they implement and maintain business systems.

In fact, a majority of respondents to a recent Oracle Applications Users Group (OAUG) member survey on cloud deployment strategies report that their organizations already have from one to five years of experience with cloud implementations.[1]

Given that so many additional respondents have upcoming cloud efforts on their radar, I reached out to several influential OAUG members to solicit advice and insight to share with those considering cloud deployments.

UNDERSTAND AND COMMUNICATE BUSINESS AND PERSONAL BENEFITS

To many of the OAUG members surveyed, strong and clear communication can make the difference between a successful deployment and an unsuccessful one. It's vital to prepare stakeholders to understand and embrace the organizations' long-term goals for cloud adoption as well as the personal payoffs. Based on OAUG member responses, here are some critical cloud goals and payoffs:

- Cloud-based deployments can free internal resources to focus on key competencies that support the business' strategic, high-value objectives.
- The organization and its employees have access to a wide range of services through the cloud that may not be available in traditional data center systems.
- The cloud may provide access to IT and business talent that is not available locally, allowing the business to leverage specialized expertise.
- The business gains the ability to stay current on applications, utilizing the newest features and functions that create additional efficiency, comply with new statutory requirements, and maintain the highest levels of support.

SELECT THE RIGHT CLOUD PARTNERS

For many OAUG members, choosing the right partner to support and manage your cloud systems is essential. The search for the proper partner should be treated with the same level of effort that would go into a key executive hire or even the due diligence of a merger or acquisition. While cost savings, speed, scalability, security, and certifications should be absolute minimums, other factors make some providers stand out as a better choice for your organization. OAUG members suggest that you consider how effectively the potential partner will provide

- Overall responsiveness and the ability to personalize key services
- A single point of contact to advocate on behalf of your organization, address issues, and provide ultimate accountability
- A stable, long-term staff, including a dedicated team that understands mission-critical processes and key time frames such as peak season and open enrollments, and that provides the same or better level of support than what was provided internally
- The willingness and ability to go beyond just keeping the system running, including speed in producing a clone, active involvement in upgrade efforts, the ability to handle change requests, and even crisis management
- Experience and competence in handling more-project-oriented work such as a merger, a new module implementation, or even upgrades to major releases
- Financial or other compensation for not meeting service-level agreements (SLAs)

FILE A PROPER FLIGHT PLAN

As we all know, going into a major project with a well-thought-out plan greatly improves the odds for successful implementation and adoption. As you map out your cloud project, I recommend adding these checklist items to your cloud implementation plan:

- Be transparent and make sure that stakeholders in your organization understand pricing models, SLAs, and what types of activities or situations may increase monthly or annual fees.
- Dedicate internal personnel as liaisons with your cloud provider. Even with the best partners, your organization can't abdicate responsibility for the systems and the processes they support.
- Establish conservative expectations and timelines with executives and other key personnel regarding the schedule of cost savings and whether additional expenditures may occur during the transition to the cloud.
- Understand the challenges of adding off-premises cloud solutions into an environment where all systems had been in your own on-premises data center. Determine the impact on policies, procedures, remote access, support for mobile devices, data integration, master data management, reporting, and analytics.

The availability of cloud-based systems presents IT and business leaders with options, alternatives, and opportunities that only recently came into being. Midsize companies now have access to services, architectures, and other technologies that were formerly reserved for large organizations or early adopters. Consider the advice shared by OAUG thought leaders as you embark on your own cloud journey. ◀

Mark C. Clark is president of OAUG and has been an active member since 1992. Clark is a senior partner at O2Works LLC.

NEXT STEPS

READ the survey or view the Webcast
bit.ly/N2S74Q

JOIN OAUG
oaug.org

1 *Cloud at the Crossroads, 2012 OAUG Survey on Application Delivery Strategies*, sponsored by Oracle and produced by Unisphere Research (March 2012), bit.ly/N2S74Q

Users Find Their Way

Whatever your interest, there's a user group out there for you.

As this is my last *Oracle Magazine* column as president of Oracle Development Tools User Group (ODTUG), I thought I'd look back at one pivotal moment from the past five years, what it has meant to the user group community, and what I learned from the experience.

April 2007: Oracle acquired Hyperion Solutions Corporation.

Oracle added Hyperion's industry-leading enterprise performance management solutions to its portfolio and Hyperion's customers to the Oracle customer community. The Oracle and Hyperion user group communities were also affected by the acquisition. Where would Hyperion users align themselves?

Many user group organizations reached out, in different ways, to the Hyperion user community. ODTUG, for example, reached out to influential independent leaders within the Hyperion community to help form an in-depth track at our annual ODTUG Kaleidoscope (now known as Kscope) conference. The track first surfaced at ODTUG Kaleidoscope 2008, held in New Orleans, Louisiana, that year, and was by all accounts a critical success. The Oracle Hyperion track attracted more than 170 attendees and was strictly focused on Oracle Essbase (formerly Hyperion Essbase).

ODTUG provided the infrastructure and logistics, and the Hyperion community leaders created the agenda, helped to market it, and spread the word. Out of that 2008 conference, Kscope has become known as the home for outstanding content related to Oracle Hyperion solutions. The conference has more Oracle Hyperion presentations than any other conference, includes the largest number of Oracle Hyperion–focused attendees, and attracts prominent vendors. Primarily—but not solely—as a result of this influx of content and attendees, Kscope has experienced significant growth each and every year, starting in 2008 and continuing through Kscope12 this year.

Many have chosen ODTUG as their home; many have chosen other user groups.

Other organizations also provide Oracle Hyperion content to the educational landscape, such as some of the recent Connection Point conferences, presented by the Oracle Applications Users Group (OAUG), and COLLABORATE, hosted by the Independent Oracle Users Group, OAUG, and Quest International Users Group. With these events and many others, Oracle Hyperion users have taken the time to investigate and determine their best fit within the Oracle user group community. Many have chosen ODTUG as their home; many have chosen other user groups.

What have I learned from the experience? Several things come to mind:

1. Don't listen to the hyperbole when user groups claim to have the monopoly on something. For example, despite the size of ODTUG's Oracle Hyperion content and attendance, it would be silly for me to claim that we are the only game in town.
2. Users will determine their best fit. Ask others within the community where they are getting their education. Investigate those user groups for yourself. As I said previously, each provides its own value proposition, so it's up to you to determine the best fit for yourself.
3. User groups change under at least three conditions: when users change, when users drive change, and when technology changes users. New users reinvigorate user groups; user group members reinvent user group programming with new ideas and technologies; new technologies entering the user ecosystem change what users want and need and lead to reinvigorated groups and reinvented programming.

ODTUG's conference content selection process has changed drastically as a result of the success of the Oracle Hyperion content at the conference in 2008. Instead of relying solely on an open call for papers and selection based on the highest scores, all of our content teams now select their content in a similar fashion to what was done in 2008: determine the best content, lay it out in a coherent fashion, and if necessary, recruit the speakers best able to deliver that content. In addition, our special interest group (SIG) program has been reinvigorated as a result of our Hyperion SIG, which meets at a minimum of once a month.

During my tenure as an ODTUG board member, as fast as technology has changed, the user group community has also changed. There is more interaction between the various user groups as we all realize that none of us alone can be a one-stop shop for the entire user community. These changes have been challenging and sometimes painful but ultimately worthwhile—because in the end, all of the user groups are interested in helping you, the user. Sometimes the only thing that seems constant in technology is change. ◀

Mike Riley (mriley@hortica-insurance.com) is the outgoing president of ODTUG and an Oracle ACE. Riley is a project manager/DBA for Hortica Insurance & Employee Benefits in Edwardsville, Illinois.

NEXT STEPS

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kscope12.com

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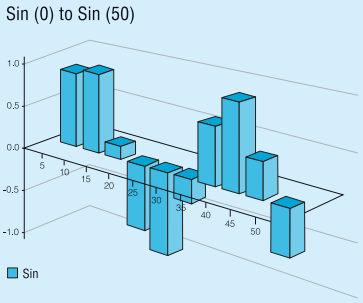

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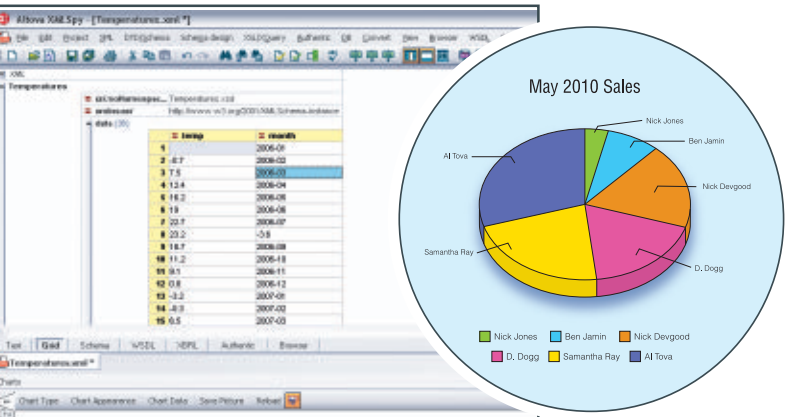

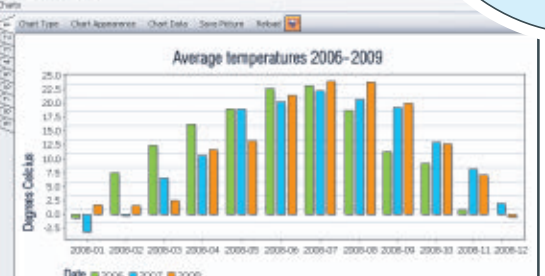

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Identity and Access

Centralized identity management platforms are evolving to accommodate new deployment methods and access requirements.

Oracle Magazine spoke with Sally Hudson, research director of security products at International Data Corporation (IDC), about securely authorizing users in an era of mobile devices, social networking, and cloud computing.

Oracle Magazine: What drives today's organizations to implement enterprise identity management systems?

Hudson: For Fortune 1000 companies, one of the major business drivers is the need to comply with regulations such as Sarbanes-Oxley for public entities, the FFIEC [Federal Financial Institutions Examination Council] for financial institutions, and HIPAA [Health Insurance Portability and Accountability Act] for healthcare firms. These regulations are furthering the move toward identity and access management because they make specific demands about accountability: who is accessing your IT resources, when, and for what reason.

Also, as companies extend their information systems to partners and customers, federated, secure single-sign-on and authentication technologies become progressively more important. On top of that, there is a steady convergence as different companies, different technologies, and different access methods come together to offer people more-holistic choices for accessing enterprise information systems.

Oracle Magazine: How do IT and line-of-business [LOB] managers participate in today's identity management [IDM] systems?

Hudson: While IT has traditionally been reluctant to hand over control to the business, they are now working in tandem with the business on granting entitlements, fine-grained attestation, and privileged user management. There are quantifiable business benefits associated with letting LOBs control who is accessing the system, who's on the list of provisioning, and who they can flag immediately to remove. It just makes it all much simpler and more secure. Business managers are not only more comfortable, but they're welcoming the interaction because they feel that they have more control over their environment and can better respond to audits.

> **Today's systems can provide temporary access and just as quickly take it away again.**

Oracle Magazine: How can businesses effectively control the privileges of the system administrators and DBAs that manage their information systems?

Hudson: "Privilege creep" is often unintentional. But as systems have become more open and distributed, and especially with so many mobile devices accessing the network, companies are looking for easier ways to identify where users are overprivileged and correct that immediately. Today's systems can provide temporary access and just as quickly take it away again. Having complete control over the provisioning/deprovisioning cycle of managing privileged identities is extremely important.

Oracle Magazine: How does the rise of smartphones and tablets complicate IDM deployments?

Hudson: We're seeing a much more diverse landscape of devices, computing habits, and access methods from outside of the corporate network. This trend necessitates a total security picture with different layers and end-point controls. It used to be just about keeping people out. Now, you have to let people in. Most organizations are looking toward multifaceted authentication—beyond the password—by using biometrics, soft tokens, and so forth to do this securely. Corporate IT strategies have evolved beyond just identity and access management to encompass a layered security approach that extends from the end point to the data center. It involves multiple technologies and touchpoints and coordination, with different layers of security from the internals of the database to the edge of the network.

Oracle Magazine: How do you create a consistent security architecture in public cloud deployments?

Hudson: Large companies see the cost benefits of moving certain aspects of their IT infrastructure into the cloud. However, they must do it in a secure fashion and not overlook their compliance regulations and their privacy regulations. It is important to work with a cloud vendor that is qualified and knowledgeable about your existing business and IT systems—ideally a vendor that understands the regulations within your industry and can demonstrate that it addresses multitenancy and privacy requirements accordingly. ◀

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IDC (idc.com) is a global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets.

NEXT STEPS

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Oracle Identity Management
oracle.com/identity

identity and access management strategy
bit.ly/PaMRMd

1974

HALT, WHO GOES THERE?

"Badges? We don't need no stinking badges!"

Quote from *Blazing Saddles* (Warner Bros. Pictures, 1974).

Identity management, anyone?

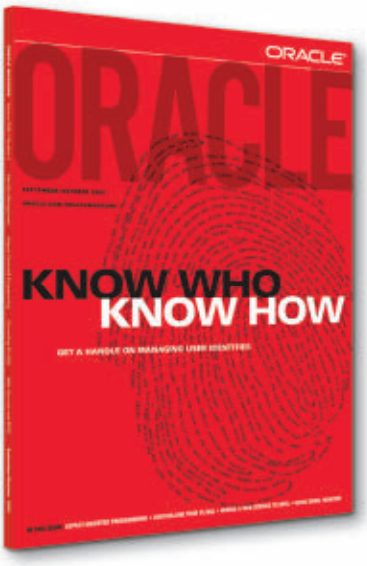
1992

DATABASE WITH FULL AUDITING

Oracle7 is the first database to include full auditing per the U.S. Trusted Computer System Evaluation Criteria (TCSEC) Orange Book C2 definition.

1977 Secure from the Start

"Security has been part of Oracle's corporate DNA since we've been a company," says Oracle Chief Security Officer Mary Ann Davidson. And with good reason: Oracle's first customer? The U.S. Central Intelligence Agency. Watch the video at **bit.ly/dnasecure**.



2004 Know Who, Know How

Identity management is typically seen through the eyes of the beholder. Some people think of smart cards or biometrics; others, single sign-on or a directory. But it's actually all the processes and technologies that manage the complete security and identity lifecycle for people and network entities in an organization. —*Oracle Magazine*, September/October 2004

2006 Security Inside

Oracle Database Vault addresses many of the key business concerns that organizations face today: regulatory compliance, separation of duty, strong internal controls, and concerns around database consolidation security as well as reporting. —*Oracle Magazine*, September/October 2006

2012 LOCKDOWN

File under Sleep, Losing: Two-thirds of sensitive and regulated data resides in databases, and unless the databases are protected using a multilayered security architecture, that data is at risk. File under Risk, Mitigating: Oracle Database Firewall, Oracle Advanced Security, and Oracle Database Vault. —*Oracle Magazine*, July/August 2012

DATA BREACH? *THAT'LL COST YOU*

Hackers and **spyware** and **spam**, **oh my!** According to a recent IDC survey, almost half of companies reported a **financial loss of more than US$100,000** per data breach event, while 8.5 percent of companies reported a **financial loss of more than US$1 million**.

Source: *"Effective Data Leak Prevention Programs: Start by Protecting Data at the Source: Your Database," International Data Corporation white paper, August 2011*

Feeling Insecure?

We asked our Facebook fans which of the following IT security threats they view as most significant:

Trojans, viruses, malware, spyware 56%

Employees exposing information 16%

Data stolen by trusted party 16%

Hackers/corporate espionage 12%

YOUR TURN

What historical factoids about technology, Oracle, and/or *Oracle Magazine* interest you most? Let us know at bit.ly/orclmagfb.

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