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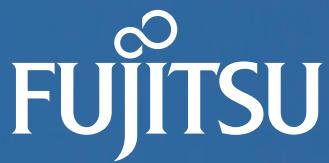
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Oracle customers and partners are technology pioneers, developing and implementing revolutionary new solutions with Oracle technology, and the Oracle Excellence Awards recognize these pioneers. In 2013, Oracle saluted outstanding achievement in nine Oracle Excellence Awards programs: CIO of the Year, Leadership, Database Administrator of the Year, Java Business Innovation, Oracle PartnerNetwork Specialized Partner of the Year, Data Warehouse Leader of the Year, Oracle Fusion Middleware Innovation, Eco-Enterprise Innovation, and Proactive Support: Champion. —*David A. Kelly, with additional reporting by Patty Waddington*

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# It's the Little Things

The Internet of Things puts the *big* in *big data*.

**T**he internet has always been about connecting things. Today more things—more internet-enabled devices—are connecting to the internet in more ways and for more reasons, and estimates for device growth are big—really big. And more internet-enabled devices means big data gets even bigger.

## BIG BILLIONS

In the early days of the internet, workstations and desktop PCs connected to servers via a wired internet. Later, internet connections were made from smaller and more-mobile devices, but regardless of the *thing* making a connection, internet-communicated information was for the *people* using those internet-enabled devices.

Enter the *Internet of Things* (IoT). The term is a new and evolving one, but at its core, IoT is about the variety, mobility, and ubiquity of internet-connected devices as well as an addition to who or what is communicating on the internet. *Machine-to-machine* (M2M) communication—where devices such as sensors and actuators communicate directly with other internet-enabled devices—is a big part of IoT.

Recent internet-enabled device growth has been driven by smartphone and tablet adoption. But as M2M devices for telematics, home automation (thermostat, lighting, security, appliances, and so on), health/fitness, and more get connected, these small devices will become the big driver in this area.

Estimates put the number of devices connected to the internet today at more than 9 billion. And as noted in this issue's "Navigating the Internet of Things" inter-

view with Peter Utzschneider, vice president of product management for Java at Oracle, analysts predict upwards of 50 billion devices connected to the internet by 2020, generating zettabytes of data each day.

Regardless of daily data volume and the size of each data point, business leaders will still need to see how their M2M communication is working, how it can provide better customer service, and how it can save more time and money, among other things. IT departments will then be called upon to provide business analytics on these massive data stores and generate results that lead to business benefits.

## BIG HELP

There's good news about what IT can do to help businesses manage—and take advantage of—the explosive growth in devices and data, however.

In his Oracle OpenWorld 2013 keynote address (available on demand at [bit.ly/1aCFRoM](http://bit.ly/1aCFRoM)), Oracle President Mark Hurd addressed this issue, and he interviewed Oracle customers who are dealing with big data challenges today and succeeding with Oracle solutions. In the same keynote, Oracle Executive Vice President Thomas Kurian talked about current and future Oracle big data and analytics solutions—including Oracle Database, Oracle NoSQL Database, Oracle Business Analytics, Oracle Big Data Appliance, and Oracle Exalytics—and about different ways to use those solutions to analyze and benefit from big data.

## NEXT STEPS

**WATCH** the Mark Hurd Big Data and Analytics keynote  
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**Tom Haunert, Editor in Chief**  
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# Get Started

Arup Nanda talks about his beginnings with Oracle technology and tells us all to write. Now.

**A**rup Nanda is an Oracle DBA, author, speaker, mentor, and frequent contributor to Oracle Magazine. Nanda recently sat down with Oracle Magazine Editor in Chief Tom Haunert to talk about how he got his start with Oracle technology, where Oracle technology has taken him, and what technology he plans to start on next. The following is an excerpt from that interview. Listen to the full podcast at oracle.com/magcasts.

**Oracle Magazine:** How did you get started with Oracle technology?

**Nanda:** It was an accident, actually. I have an undergraduate degree in engineering. After

that, I went to a business school to pursue my MBA, and after that, I joined a consultancy company, where we were developing software for a bank. And because I came from a business background, I was put in charge of design of the application for foreign exchange. I was the only one who understood credits and debits on the whole team of engineers. As we were developing and designing, I was a DBA, developer, designer, and client support person all rolled into one.

After about six months, I must have been doing something right there because people came to me for advice, and I got a reputation for knowing what I was doing. And after a year, I kind of fell in love with the product—Oracle Database—and I decided to stick with it. And 18 years later, I'm still working with it.

**Oracle Magazine:** You won your first Oracle Magazine award several years ago. Tell us about your Oracle career to that point, and tell us something about the specific task or



Oracle DBA, author, and speaker Arup Nanda in Bangalore, India, before going to Hyderabad to speak at an All India Oracle Users Group conference

project you were working on when you won that award.

**Nanda:** I got my first *Oracle Magazine* award in 2003. I was working on Oracle8i at that time, and that particular project was very interesting.

We were building a tool to identify mistakes or patterns of mistakes in a medical claims system. The database was the key component of the system, and I was designing the database component, along with a team of other engineers who were doing the front end.

The challenge was not the database size itself but the response time, which had to be less than one second to make everything possible. We had to use materialized views to make sure that people could access the system very quickly. We also had to add more and more providers and data as well. So I used Oracle Partitioning heavily to make sure that we continued to add providers, as well as time elements, and at the same time, not recompute the old data in

the materialized views.

In addition to that, we used Oracle Virtual Private Database. In fact, the very first article I wrote for *Oracle Magazine* was about Oracle Virtual Private Database—about what I used in that project. That project got the attention of *Oracle Magazine* editors at that time, and one thing led to another, and I was selected for the award.

**Oracle Magazine:** How did writing about Oracle technology start for you, and where has it taken you?

**Nanda:** Well, the first article I wrote for New York Oracle Users Group—that was my home

Oracle user group—was about 12 years ago. I was very hesitant and apprehensive about writing something in a public paper.

Remember, in those days there were no blogs. You had to send your article to somebody for review, approval, and so on, to be published. So I put an article together, and the response from readers was phenomenal, so I was very encouraged to write something else. About two years later, I wrote for *Oracle Magazine*, and I've been writing since then. So far, I have written about 500 published articles, not counting blogs and other content.

**Oracle Magazine:** Other than articles, what types of Oracle technology content have you written?

**Nanda:** I have coauthored five books on Oracle technology. Everything from Oracle Recovery Manager [Oracle RMAN] to security to PL/SQL and more.

In addition, I have presented about 300 sessions about Oracle technology in 22 countries. I also deliver something

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called the Oracle Celebrity Seminar Series, where I design my own two-day tutorials or courses, and I go and present them in different parts of the world.

I also speak and mentor a lot of DBAs and developers about Oracle technology, again for different user groups around the world.

**Oracle Magazine:** How do you keep up with the latest releases, identify the key features, and get to work writing and speaking about those features?

**Nanda:** Well, the first thing is that I have participated in all of the Oracle Database beta programs since Oracle9i Database. So that gives me early access to new features. Second, being a practicing DBA, and also being a mentor and a very deep participant in the Oracle user group community, I know what people are doing and thinking and what challenges they're facing. So that gives me an idea for what to look for in a new release.

In fact, in addition to participating in the beta program, I also generate a lot of requests for Oracle product managers to include new Oracle Database features. Being a practicing DBA, I face the same problems most users face, and I try to see how a new feature solves a problem or changes it.

**Oracle Magazine:** You wrote some of the earliest technical "how to" articles on Oracle Exadata, Oracle's first engineered system. What led you to do that?

**Nanda:** When Oracle Exadata was first introduced, there was a lot of criticism, such as, "Oh, this is a unicorn. This is one of a kind. Things will be very difficult if you don't go for training," and so on.

At that time, my company also acquired Oracle Exadata. And one of the reasons we got it was really simple: We wanted to continue our investment in Oracle technology, the knowledgebase, and the user community. We didn't want to retrain people, and at the same time, we wanted to make sure that we got the best performance possible. Oracle Exadata gives you much better performance, but without requiring that you change a single line of code.

So when my company got Oracle Exadata, I got the machine, and I got the manuals that came from Oracle. I wanted to prove the point to everybody that it doesn't take too much effort to become a master of

## Being a practicing DBA, I face the same problems most users face, and I try to see how a new feature solves a problem or changes it.

that technology. Because at the end of the day, it's specialized Oracle hardware and software that does certain things in a much better way, but that's it. There's nothing esoteric or challenging about it.

I wrote articles about Oracle Exadata for Oracle Technology Network ([oracle.com/technetwork](http://oracle.com/technetwork)) and *Oracle Magazine*. I wanted to show everybody that I don't work for Oracle; I'm a regular user, just like anybody else; and I don't have any special access to any Oracle executives or technology or code. So as a regular user, using the Oracle Exadata technology, I could write content that is useful to a lot of users.

That should speak volumes about how easy it is to use the Oracle Exadata product.

**Oracle Magazine:** Where can people see your presentations and follow you?

**Nanda:** One way is my blog, [arup.blogspot.com](http://arup.blogspot.com). I try to publish at least three or four blog posts in a month, and sometimes more. And whenever I present something, I also post the content—unless it is copyrighted—on the blog, so people can download it.

I also tweet (from @arupnanda) when I have something new. So those are the two ways to get information.

And my e-mail is pretty public—if you do a search, you'll find it. I try to respond to people, but at the end of the day, I also work for a living, so sometimes I don't get time to respond to everybody. But when I can, I certainly do.

**Oracle Magazine:** What kind of advice or suggestions do you have for budding, intermediate, or advanced Oracle technologists who have thought about writing, speaking, training, and so on, but haven't started on that journey yet?

**Nanda:** My first and last advice would be: start writing something—anything, anything at all—and don't wait for something to happen. We, as human beings, are programmed to disseminate our ideas, to collaborate with other humans. We collaborate, and that's how we have survived. So the art

of collaboration, the instinct to collaborate and spread ideas, is in our genes.

Don't suppress it. Just start acting and delivering on that, and you'll be surprised that there are a lot of people out there hungry for ideas. And if you think your story is not good enough or not important enough, you're wrong. Almost everything has an interesting element. There must be somebody out there who has faced the same problem, or is facing the problem right now. And your blog or your article or your presentation could be a boon to the person facing that problem.

When I first started, about 10 or 15 years ago, the blog concept wasn't there. The only way to collaborate was using a conference or an article or a magazine. Today, you have plenty of ways to do it. So I suggest start writing a blog. Blogs are free; you can write anything you want; you don't have to get approval. And if you feel that you don't have something interesting to talk about, again, you're wrong. Start something that you think is important. You will be surprised to find out that somebody will like it.

And that will encourage you to go further and further and further. Again, start something. Start today.

**Oracle Magazine:** Arup, what's your next technology?

**Nanda:** The thing I'm pretty excited about today is big data. Big data is becoming important because businesses now see the value of it. Value drives demand, and the affordability and value of big data are coming together. Big data is a new thing for me, and I'm training myself to be an expert in that area. ◀

## NEXT STEPS

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[oracle.com/magcasts](http://oracle.com/magcasts)

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### Privacy Filter

Prying eyes looking at your screen? Privacy Filter blocks side views—even on new larger screens—and can also darken the screen for discreet nighttime viewing. US\$1.99 (Android). [bit.ly/HbbxqL](http://bit.ly/HbbxqL)

### Private WiFi

This app gives your mobile device a personal VPN at any WiFi hotspot, even unsecured ones. Private WiFi also masks your IP address and location. Free with a three-day trial, then US\$10 per month or less (iPhone; Android under development). [privatewifi.com](http://privatewifi.com)

### Funbers

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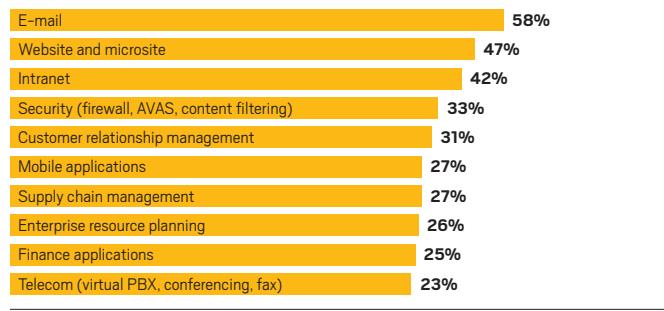
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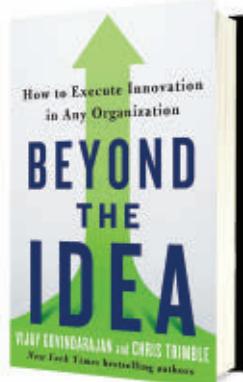
IT leaders are more than twice as willing to outsource e-mail as they are

to outsource mobile apps, supply chain management, enterprise resource planning, finance, or telecom. Nearly 450 CIOs, IT directors, VPs of IT, and senior IT managers in Canada, Germany, Hong Kong, Japan, Singapore, the United Kingdom, and the United States were surveyed.



Source: Savvis Global IT Leadership Report, [savvis.com](http://savvis.com)

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**"When companies launch innovation initiatives, they typically allot almost all of their time and energy to . . . the thrilling hunt for the breakthrough idea. The real innovation challenge . . . lies in a long, hard journey—from imagination to impact."**

—Vijay Govindarajan and Chris Trimble, authors of *Beyond the Idea* (St. Martin's Press, 2013)



### Execs Fear BYOD

71 percent of IT and security pros say their business leaders view employee use of personal mobile devices for work as potentially dangerous, costly, and not business critical. More than 1,600 people participated in the survey. Source: Dimension Data Secure Mobility Survey Report, [dimensiondata.com](http://dimensiondata.com)

## Mobile Sound



If you spend a lot of time in your mobile office (some call it a car), keep your phone calls and conference calls professional sounding with the speeCup. This Bluetooth wireless speaker fits in a cup holder and functions as a speakerphone, plays music, and is voice- and gesture-controlled. It features an integrated noise-canceling microphone and a rechargeable lithium-ion battery, and comes in black, white, or red. US\$129.95. [speecup.com](http://speecup.com)

and is voice- and gesture-controlled. It features an integrated noise-canceling microphone and a rechargeable lithium-ion battery, and comes in black, white, or red. US\$129.95. [speecup.com](http://speecup.com)

# Speeding Up Time to Value in Project Management

**S**tacey Witt, vice president of marketing at LoadSpring Solutions, discusses how LoadSpring's SpringBoard™ Cloud Portal solution can speed up "time to value" for Oracle's Primavera customers.

**Q: Why is time to value important for Oracle's Primavera enterprise project portfolio management customers?**

**A:** Time to value means the time from the initial software investment to successful goal achievement. The more we can speed up the time to value for Primavera customers, the faster they can start to achieve their goals.

**Q: How do cloud-based project management solutions quicken time to value?**

**A:** With on-premises solutions, you can spend a significant amount of time making the software accessible to all of your users around the globe. This process can also create a significant burden on the internal IT staff. With a cloud-based solution from a provider such as LoadSpring, we take the burden of the software deployment and long-term support off of the internal IT staff's shoulders and handle it ourselves, with speed and expertise. Deployment is only part of the time to value equation. Customers also want the software configured to meet their business and reporting needs. Once it is accessible and configured, then customers can start to get real success from their software investment. And a cloud-based system also helps customers avoid an initial capital expense, and is scalable as their business and project needs change.

**Q: Why do Primavera customers choose LoadSpring to deploy their solution?**

**A:** LoadSpring has been a project management cloud-based solution company since 2000, and a Primavera partner since the beginning. What's unique about LoadSpring is that we execute solutions quickly and easily because of our SpringBoard Portal technology. LoadSpring's SpringBoard Cloud Portal enables fast deployment as well as being an easy-to-use portal for local and global employees to have secure access to the software. This technology means deployment schedules can shrink from months to just a couple of weeks. We can also configure the software in the way that makes sense for your business and your industry. We know best practices



Stacey Witt, Vice President of Marketing, LoadSpring Solutions

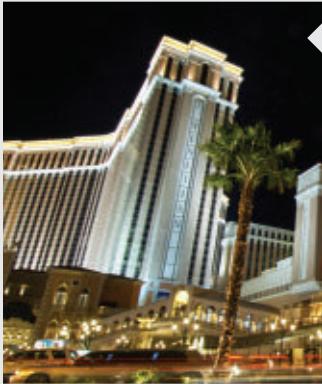
from a reporting and configuration standpoint, and we have a QuickStart and a QuickBuild program that can perform about 80 percent of the typical best-practices configurations in days. Finally, we can quickly and easily integrate the project management system with other existing systems within the enterprise, such as financials and other project management applications.

**Q: Once deployed, how is LoadSpring's solution unique from the competitors' solutions?**

**A:** You can have project management software that is accessible, but if nobody knows how to use it properly, you're not going to get the usage rates or accuracy that you're looking for. LoadSpring Academy, which is a module within SpringBoard, is an area users can go to for on-demand video training around the Primavera software. Also, the beauty of our SpringBoard Portal is it has a support module built right into it. Users can log cases from around the world, and we have 24/7 live support. So if something does happen, we're here for you.

# Technology Events

Conferences and sessions to help you stay on the cutting edge



## Oracle HCM World

**February 4–6, Las Vegas, Nevada**

This landmark event covers the intersection of human resources, talent management, and technology. Attendees will learn to increase employee productivity and engagement and will discover strategies to better attract, develop, and retain talent. Professionals in workforce planning, recruiting, onboarding, training, leadership development, compensation, benefits, and other human resources disciplines can choose from hands-on demos and more than 100 sessions across 9 tracks. Register at [oraclehcmworld.com](http://oraclehcmworld.com).

### Oracle Value Chain Summit

**February 3–5, San Jose, California**

► [bit.ly/GPBSva](http://bit.ly/GPBSva)

This event brings together thought leaders, practitioners, and technology experts for demos and sessions on product lifecycle management, manufacturing, enterprise asset management, logistics, planning, and procurement.

### Bancassurance Forum 2014

**February 11–12, Vienna, Austria**

► [bit.ly/15XnqMB](http://bit.ly/15XnqMB)

With streams for general insurance and life insurance, this forum focuses on customers and covers distribution networks, the digital present and future, and marketing and branding.

### HIMSS14 Annual Conference and Exhibition

**February 23–27, Orlando, Florida**

► [himssconference.org](http://himssconference.org)

This gathering of the Healthcare Information and Management Systems Society showcases the value of health IT with leading-edge education, networking, special events, and more.

### EVENTS LOCATOR

#### Oracle Events

[oracle.com/events](http://oracle.com/events)

#### Locate User Groups

[oracle.com/technetwork/community](http://oracle.com/technetwork/community)

### ORACLE USER GROUPS

#### Jfokus Developers Conference

February 3–5, Stockholm, Sweden

[jfokus.se](http://jfokus.se)

#### European Oracle WebCenter Sites User Group Meeting

February 5, Vienna, Austria

[bit.ly/SMyYZX](http://bit.ly/SMyYZX)

#### Rocky Mountain Oracle Users Group Training Days

February 5–7, Denver, Colorado

[rmoug.org](http://rmoug.org)

#### Melbourne Java and JVM Users Group Meetups

February 5 and March 5, Melbourne, Australia

[bit.ly/1817Xtk](http://bit.ly/1817Xtk)

#### Sacramento Java Users Group Meetings

February 11 and March 11,

Sacramento, California

[sacjug.org](http://sacjug.org)

#### Greater Cincinnati Oracle User Group Meeting

February 12, Cincinnati, Ohio

[gcoug.org](http://gcoug.org)

#### Western Washington Oracle Users Group Meetings

February 13 and March 13,

Seattle, Washington

[bit.ly/16THbp4](http://bit.ly/16THbp4)

#### Oracle Real World Performance Tour

February 19, Munich, Germany

[bit.ly/19qj5P7](http://bit.ly/19qj5P7)

March 28, Riga, Latvia

[bit.ly/1hlzGQU](http://bit.ly/1hlzGQU)

#### Northern California Oracle Users Group Winter Conference

February 20, Redwood Shores, California

[nocoug.org](http://nocoug.org)

#### Southwest Regional Oracle Applications User Group Meeting

February 21, Los Angeles, California

[sraug.com](http://sraug.com)

#### Esri Partner Conference

March 8–11, Palm Springs, California

[esri.com](http://esri.com)

#### OUG Ireland Meeting

March 11, Dublin, Ireland

[ukoug.org](http://ukoug.org)

#### Middle East Oracle User Group Meeting

March 25, Dubai, United Arab Emirates

[meoug.com](http://meoug.com)

#### Northeast Ohio Oracle Users Group Business Meeting

March 28, Independence, Ohio

[neouug.org](http://neouug.org)



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# What's New at Oracle

The latest videos, podcasts, blogs, and more

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► [bit.ly/1gqSXIO](http://bit.ly/1gqSXIO)

Hear from analysts and experts how companies are beginning to transform themselves with database as a service.

### "Switch from Red Hat to Oracle Linux in Minutes"

► [bit.ly/19kJvdf](http://bit.ly/19kJvdf)

Discover the why and how of switching to Oracle Linux and industry-leading Linux management and high-availability tools.

### "Introducing Oracle's Highest-Performing System: The M6 Big Memory Machine"

► [bit.ly/1cOC4IA](http://bit.ly/1cOC4IA)

Learn what game-changing benefits in-memory computing brings to business-critical databases and applications.

### "What's New: Features and Workflows in MySQL Enterprise Backup 3.9"

► [bit.ly/16xJ1cT](http://bit.ly/16xJ1cT)

Learn how to back up remotely, how to back up and restore to create replicas, and how to use backup for moving very large tables.

### "Developing JavaScript Applications for Node.js with MySQL and NoSQL"

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Get started building highly scalable, event-driven web, mobile, and social applications.

### "Tuning MySQL: The Fundamentals, Updated for MySQL 5.6"

► [bit.ly/GHOLbA](http://bit.ly/GHOLbA)

Walk through the basics of tuning your product's embedded or bundled MySQL database for higher performance.

### "Launch Webcast: Introducing Oracle Integration Products"

► [bit.ly/17Xikyg](http://bit.ly/17Xikyg)

Watch Oracle integration experts introduce Oracle Data Integrator 12c and Oracle GoldenGate 12c.

## VIDEOS

### Oracle OpenWorld Highlights

► [bit.ly/XpYdSI](http://bit.ly/XpYdSI)

Watch keynote and highlight videos plus general sessions and executive interviews from Oracle OpenWorld 2013, MySQL Connect, JavaOne, and executive and Oracle Partner conferences.

### *Oracle Platinum Services: Success with Engineered Systems*

► [bit.ly/1hCGfVk](http://bit.ly/1hCGfVk)

Accenture Global Head of Database Management Julian Dontcheff discusses Accenture's investment in and commitment to Oracle engineered systems and Oracle Platinum Services.

### *The Internet of Things: Managing the Complexity*

► [bit.ly/19ca3pR](http://bit.ly/19ca3pR)

Prepare to manage the complexity of the Internet of Things, from sensors and big data to gateways, security, the data center, and the cloud.

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► [bit.ly/GNDMMA](http://bit.ly/GNDMMA)

Learn how to manage the overall performance and health of your MySQL servers.

### Remotely Monitor MySQL in the Cloud

► [bit.ly/1c0FPaq](http://bit.ly/1c0FPaq)

Discover how to remotely monitor MySQL servers in the cloud without remote agents.

## E-BOOKS

### *Securing Oracle Database 12c*

► [bit.ly/15oimhC](http://bit.ly/15oimhC)

Register for a complimentary e-book and learn about Oracle Database security from the experts.

### *The Heroes Among Us*

► [bit.ly/1hCHG5W](http://bit.ly/1hCHG5W)

Read profiles of five real-world IT heroes who demonstrate their value to their organizations and the industry at large.

## *Engineered for Extreme Performance*

► [bit.ly/17gf5yC](http://bit.ly/17gf5yC)

Download a quick-reference guide to Oracle's engineered systems that includes customer videos and information on what each system does.

## *Oracle SPARC M6-32 Server: Highest Performance and Best Reliability, Availability, and Serviceability in a Single Server*

► [bit.ly/1ancmWa](http://bit.ly/1ancmWa)

Learn how to manage mission-critical enterprise applications with Oracle's SPARC M6-32 server.

## *Superior Performance for Better Business Results*

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Complex, aging, and poorly integrated IT infrastructures impede productivity. Learn how to get better business results. Discover the power of running Oracle applications on Oracle systems.

## WHITE PAPERS

### *"Optimizing Oracle Database Performance on Oracle Linux with Flash"*

► [bit.ly/1cvw6Y7](http://bit.ly/1cvw6Y7)

Discover how to deploy Oracle's Sun Flash Accelerator hardware on Oracle Linux with Oracle Database's Smart Flash Cache component.

### *"MySQL Workbench: Database Design. Development. Administration. Migration."*

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Find out why MySQL Workbench can be an indispensable aid to managing the complex data management infrastructure of a dynamic and growing business.

### *"The Advantages of Oracle Coherence on Oracle Exalogic"*

► [bit.ly/17XnXfY](http://bit.ly/17XnXfY)

Read an overview of Oracle Coherence and Oracle Exalogic Elastic Cloud and learn how to use them together.

**OVERHEARD**

**"The SPARC M6-32 server and Oracle SuperCluster M6-32 fundamentally change data center economics. With our big memory machines you can run huge databases and applications in memory to accelerate performance 10 or 20 times and experience mainframe-like reliability without paying the high premiums built into other vendors' high-end systems."**

—John Fowler, Executive Vice President of Systems at Oracle, in "Introducing Oracle's Highest-Performing System: The M6 Big Memory Machine" ([bit.ly/1cOC4IA](http://bit.ly/1cOC4IA))

#### **"Oracle's Internet of Things Platform for a Connected World"**

► [bit.ly/18v9Nb](http://bit.ly/18v9Nb)

With more than 50 billion connected, intelligent devices expected by 2025, businesses are seeking ways to manage the data they'll produce to unlock real business value.

#### **"Consolidation Using the High-End SPARC M6-32 Server"**

► [bit.ly/194UeBf](http://bit.ly/194UeBf)

Learn why Oracle's new SPARC M6-32 server is an ideal consolidation platform, combining the scalability, manageability, and high availability needed for deploying many mission-critical applications.

#### **"Mission-Critical C/C++/COBOL Applications with Oracle Exalogic and Oracle Tuxedo"**

► [bit.ly/17ggWn7](http://bit.ly/17ggWn7)

Discover native capabilities to maximize throughput, minimize latency, and drive higher availability through clustering.

#### **New Oracle WebLogic Server and Oracle Database Integration White Papers**

► [bit.ly/1bcuseL](http://bit.ly/1bcuseL)

Oracle WebLogic Server's Active GridLink for RAC feature provides intelligent integration between the server and Oracle Database. These white papers provide use cases, technical insights, and value propositions about this integration as well as detailed content on Oracle customer NEC.

#### **GAMES**

##### **Oracle's SPARC Runner Interactive Game**

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Help the SPARC Runner accelerate performance, increase speed, and consolidate multiple legacy

systems with the latest SPARC servers.

#### **RESOURCE CENTERS**

##### **Oracle's SPARC M6-32: The Next Generation of Oracle's SPARC Servers**

► [bit.ly/1hCKpwd](http://bit.ly/1hCKpwd)

Discover how Oracle's new SPARC M6-32 server can help you improve remote access service, accelerate business processing, and reduce cost.

##### **Oracle Systems: The Best Platform for Oracle Database 12c**

► [bit.ly/1grljjl](http://bit.ly/1grljjl)

Find out why Oracle Database 12c running on Oracle Solaris 11—and Oracle's SPARC servers—is faster, smarter, and more scalable than ever.

##### **Oracle Systems: The Best Platform for Oracle's PeopleSoft Human Capital Management**

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Learn how to increase productivity by running Oracle's PeopleSoft solutions on Oracle systems.

#### **PODCASTS**

##### **"Oracle's SPARC M6-32 Quick Overview"**

► [bit.ly/19Ajn9I](http://bit.ly/19Ajn9I)

Hear Oracle product management describe the key features and benefits of Oracle's SPARC M6-32 server.

##### **"Camping with Mobile Business Intelligence"**

► [bit.ly/GNIdXO](http://bit.ly/GNIdXO)

Learn how mobile business intelligence can go anywhere you go, even camping.

##### **"Nick Wagner and Robert Freeman on Oracle GoldenGate"**

► [bit.ly/1g0ohjO](http://bit.ly/1g0ohjO)

Oracle GoldenGate Director of Product Management Nick Wagner and Oracle Master Principal Database Expert Robert Freeman discuss Oracle GoldenGate.

#### **ORACLE UNIVERSITY**

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► [bit.ly/15VRxDX](http://bit.ly/15VRxDX)

Explore training and certification for Oracle Database 12c.

#### **Oracle Cloud Overview**

► [bit.ly/1cwzLJC](http://bit.ly/1cwzLJC)

Experts from Oracle present the essential concepts of cloud computing and introduce the key Oracle services for the cloud.

#### **Oracle Big Data Overview**

► [bit.ly/19kZh1b](http://bit.ly/19kZh1b)

Discover the key products in Oracle's big data platform and learn their business implications.

#### **Oracle WebLogic Server Training**

► [bit.ly/16eCm9b](http://bit.ly/16eCm9b)

Learn how to leverage the world's #1 application server.

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[myoraclesupport.com](http://myoraclesupport.com)

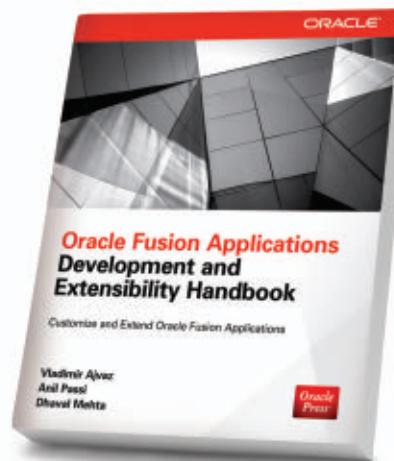
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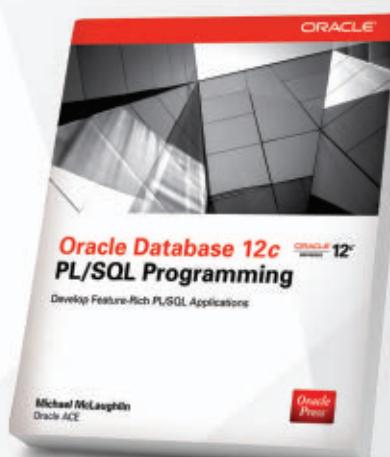
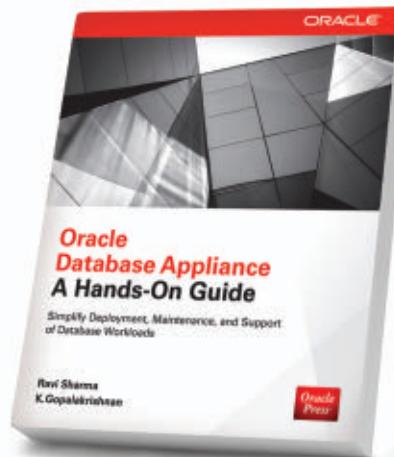
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This tutorial shows you how to use the Business Process Composer feature of Oracle Unified Business Process Management Suite to create a web form user interface for a human task and how to create two simple web form rules to make the form a dynamic user interface.

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## ARTICLES

### **"SOA and User Interfaces"**

In this article, which is part of the Industrial SOA article series, learn how to overcome the challenges to developing user interfaces in a service-oriented architecture.

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### **"Coherence\*Web: Sharing an httpSession Among Applications in Different Oracle WebLogic Clusters"**

Coherence\*Web permits a full session offload so Oracle WebLogic instances can be focused on processing Oracle WebLogic requests. This article introduces an easy approach to extend Coherence\*Web to enable session sharing.

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Get the latest Oracle Database release.

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This free IDE simplifies Oracle Database management and application development.

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### **Oracle Database 12c Multitenant Self-Service Provisioning Application (Beta)**

This beta application provides DBAs and developers with a way to get familiar with pluggable databases.

► [bit.ly/1a97kdP](http://bit.ly/1a97kdP)

### **Oracle Data Integration Portfolio**

Oracle GoldenGate 12c and Oracle Data Integrator 12c offer real-time data integration, transactional change data capture, high-performance batch loads, and more.

► [bit.ly/1clvmKm](http://bit.ly/1clvmKm)

► [bit.ly/16fmktF](http://bit.ly/16fmktF)

## Oracle Updates Its Data Integration Portfolio

Oracle has unveiled major updates to its data integration portfolio with the release of Oracle Data Integrator 12c and Oracle GoldenGate 12c. Oracle Data Integrator 12c delivers next-generation extract, transform, and load (ETL) technology that improves performance and reduces data integration costs—even across heterogeneous systems. Oracle GoldenGate 12c provides real-time data integration, transactional data replication, and data comparison across heterogeneous systems. These products help improve performance, increase productivity, and simplify deployment while providing organizations with solutions that can easily keep pace with new data-oriented technology trends such as cloud computing, big data analytics, real-time business intelligence, and continuous data availability.

Tight integration between Oracle Data Integrator 12c and Oracle GoldenGate 12c and other Oracle technologies, such as Oracle Database 12c and Oracle Applications,



provides a number of benefits for organizations. For example, the combination of Oracle Data Integrator 12c, Oracle GoldenGate 12c, and Oracle Database 12c provides a strong foundation for private cloud deployments. In addition, tight integration with Oracle Applications delivers real-time data for reporting, zero-downtime migration, and improved application performance and availability.

"The management and utilization of data is becoming increasingly complex, as the number and diversity of datasources organizations interact with continues to grow," says Brad Adelberg, vice president of development at Oracle. "With Oracle Data Integrator 12c and Oracle GoldenGate 12c, Oracle is in a unique position to help drive standardization across enterprises using our new products for not only traditional uses of ETL and business intelligence/data warehousing, but also for new and emerging styles of integration such as real-time replication, data services and federation, big data and business analytics, and cloud deployments."

► [bit.ly/1cawsEE](http://bit.ly/1cawsEE)

## Oracle Implements W3C's Standard for Data Provenance

To help organizations better assess whether data and sources can be trusted, Oracle has implemented the World Wide Web Consortium (W3C) Provenance standard (PROV) in the latest release of Oracle Advanced Controls. W3C is an international community that develops open standards to ensure the long-term growth of the web. The PROV family of documents (with W3C recommendations) defines a model to enable the interoperable interchange of provenance information in heterogeneous environments.

Oracle Advanced Controls enables organizations to improve their bottom lines and reduce operational risk without slowing down their businesses, helping to prevent financial leakage and strengthen control. By using a standardized approach to data provenance in Oracle Advanced Controls, Oracle is enabling customers and partners to quickly and easily create, integrate, and connect advanced control solutions with multiple heterogeneous on-premises and

cloud-based enterprise resource planning systems. Implementing the W3C PROV standard also allows Oracle to streamline implementations by allowing companies to reduce the need for customizations.

"To help organizations efficiently and effectively manage ever-increasing amounts of data, Oracle is committed to open standards that support both on-premises and cloud-based integrations," says Chris Leone, group vice president of applications development at Oracle. "The implementation of the W3C Provenance standard with Oracle Advanced Controls further demonstrates this commitment. By virtually eliminating time-consuming and costly customizations that are typically involved with the provenance of information, the implementation enables customers and partners to quickly and easily integrate and connect advanced control solutions with heterogeneous systems."

► [bit.ly/1hgWix2](http://bit.ly/1hgWix2)

## Oracle VM VirtualBox 4.3 Delivers Virtual Multitouch UI

Available now, Oracle VM VirtualBox 4.3 introduces a virtual multitouch user interface, supports additional devices and platforms, and provides enhanced networking capabilities, enabling developers to virtualize modern post-PC-era operating system features while maintaining compatibility with legacy operating systems.

This release builds on previous releases with support for the latest Microsoft, Apple, Linux, and Oracle Solaris oper-



ating systems, new virtual devices, and improved networking functionality.

"Building and testing modern applications requires developers to run everything from legacy environments to the latest Linux and Windows desktop and tablet operating systems with 3-D effects and multitouch interfaces," says Wim Coekaerts, senior vice president of Linux and virtualization at Oracle. "Oracle VM VirtualBox 4.3 adds an innovative way to operate multitouch interfaces on a desktop PC, making it easier for users to operate their virtual machines."

[bit.ly/1ayLTY9](http://bit.ly/1ayLTY9)

## Oracle Buys BigMachines

Oracle has entered into an agreement to acquire BigMachines, a cloud-based configure, price, and quote (CPQ) solution provider. BigMachines' CPQ Cloud accelerates the conversion of sales opportunities into revenue by automating the sales order process with guided selling, dynamic pricing, and an easy-to-use workflow approval process—accessible anywhere, on any device.

In combination with Oracle's enterprise-grade cloud solutions, including marketing, sales, social, commerce, and service clouds, Oracle and BigMachines will create an end-to-end "smarter selling" cloud solution with the goal of increasing sales

personnel productivity, customer satisfaction, and revenue.

"The fundamental goals of smarter selling are to provide sales teams with the information, access, and insights they need to maximize revenue opportunities and execute on all phases of the sales cycle," says Thomas Kurian, executive vice president of product development at Oracle. "By adding BigMachines' CPQ Cloud to the Oracle Cloud, companies will be able to drive more revenue and increase customer satisfaction with a seamlessly integrated process across marketing and sales, pricing and quoting, and fulfillment and service."

[bit.ly/19LrYUI](http://bit.ly/19LrYUI)

## Oracle Unveils New x86 Servers

Designed for high performance, reliability, and eco-responsibility, Oracle's Sun Server X4-2 and Sun Server X4-2L offer the versatility to address cluster computing and virtualization as well as the full spectrum of enterprise applications. These new x86 servers demonstrate Oracle's continued strategy of designing x86 offerings that are specifically engineered to serve as a foundation for Oracle software for standalone systems as well as within Oracle engineered systems.

"Oracle's x86 servers are designed and optimized at each level of hardware and firmware to be the most reliable, highest-performance systems for running Oracle software," says Ali Alasti, senior vice presi-



dent of hardware development at Oracle. "With comprehensive management and virtualization built in, Oracle's new x86 servers are ideal for a broad range of enterprise applications as standalone servers, while also providing building blocks for many Oracle engineered systems."

[bit.ly/1MOmSE](http://bit.ly/1MOmSE)

## Oracle Buys Compendium

Oracle has acquired Compendium, a cloud-based content marketing provider that helps companies plan, produce, and deliver content across multiple channels throughout their customers' lifecycle.

Compendium's content marketing solution complements Oracle Eloqua Marketing Cloud Service, which is a part of Oracle's customer experience solution.

"As customers increasingly access information through online and mobile channels, the buying process is shifting from sales-driven to marketing-driven. Now more than ever, marketers are challenged to deliver relevant and engaging content across multiple channels and throughout the customer lifecycle," says Thomas Kurian, executive vice president of product development at Oracle.

"By adding Compendium's content marketing platform to Oracle Eloqua Marketing Cloud



Service, customers will be able to capture more prospects, improve the customer experience, and drive top-line revenue."

[bit.ly/HnOsF](http://bit.ly/HnOsF)

## NetBeans IDE 7.4 Enhances Web and Mobile App Development

The latest release of NetBeans IDE, a free, open source integrated development environment (IDE), includes enhanced HTML5 and JavaScript development features and browser integration with existing and new Java Platform, Enterprise Edition (Java EE) and PHP applications.

NetBeans IDE enables developers to rapidly create web, enterprise, desktop, and mobile applications for PHP, C/C++, and the Java and HTML5 platforms. NetBeans IDE 7.4 also provides developer support for working with JDK 8 Developer Preview builds.

"The NetBeans team continues to bring advanced new user-interface capabilities to the Java community," says Chris Tonas, vice president of application development tools at Oracle. "NetBeans IDE 7.4 takes this further with innovative HTML5 capabilities, browser integration, and support for the JDK 8 Developer Preview builds."

[netbeans.org](http://netbeans.org)

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# Navigate the Internet of Things

Oracle's Peter Utzschneider discusses the challenges and opportunities from this new disruptive technology.

**A**nalysts predict upwards of 50 billion devices will be connected to the internet by 2020, generating zettabytes of data each day—a phenomenon called the Internet of Things (IoT). *Oracle Magazine's* Caroline Kvitka sat down with Peter Utzschneider, vice president of product management for Java at Oracle, to discuss IoT challenges, opportunities, and development. The following is an excerpt from that interview. Listen to the full interview at oracle.com/magcasts.

**Oracle Magazine:** What is IoT, and how does it relate to machine-to-machine, or M2M?

**Utzschneider:** The *Internet of Things* is a term used to describe the next wave of innovation that our industry is going through. Traditionally, we have thought primarily of humans connecting to the internet, but IoT is really the next step, where "things" are also connecting to the internet and to each other.

M2M describes part of IoT, which is machine-to-machine communication.

**Oracle Magazine:** What challenges do IoT and the massive amount of data being generated by these devices present?

**Utzschneider:** IoT brings a number of challenges. First, there are infrastructural challenges. All these devices will have to be connected, which means the networks to support them have to be able to support that new load. Each of these devices will be producing a lot of high-volume, low-value data.

Some of these devices will generate very small pieces of data, but there will be lots of pieces. The industry will have to cope with that new volume of big data and be able to manage it from the devices up through gateways all the way back to the enterprise.

Second, once we have that data, what are we going to do with it? This opens up a whole new opportunity for us to continue to drive



Peter Utzschneider, Vice President of Product Management for Java, Oracle

and to continue to innovate, providing new applications and services based on that data.

**Oracle Magazine:** What opportunities does IoT present for application developers, and what should they be thinking about when designing connected devices?

**Utzschneider:** The world is definitely going to change for application developers. We usually think of developing applications for humans and then having the interaction with those applications coming from their devices. Now, application developers are starting to develop code that will run on very small devices. Then they will extend their application development on the server side to be able to include those devices, which will add new richness and nearly endless new possibilities.

Developing on these devices is definitely a new and different domain for most application developers. We refer to these devices as being *resource constrained*. They

might have a smaller memory footprint, and they don't have a human on the other end that can click on an option or push a button to upgrade. A lot of these devices will be field-deployed in some cases for 10 or 15 years without anyone ever touching them. All this will push developers to shift and adapt to this new embedded development style.

On the server side, these are new device clients that will have to be integrated into existing infrastructure, while also integrated with data that we get from other "things" in order to create those new applications. Oracle is evolving and enhancing the Java platform, which has been used on a wide range of devices for quite some time, specifically for IoT. A Java developer will be able to write code, and it will run on a very small device all the way up to a very large device. We are working to make it as easy as possible for Java developers to reuse their Java skills for IoT development.

**Oracle Magazine:** Is Java becoming a standardized platform for IoT?

**Utzschneider:** We're seeing a number of different indicators that Java is being adopted as a basis for IoT. The challenge the industry has right now is that device-based development traditionally has been highly fragmented. Most of the time people would choose the components that go into a device and then write all the software in native code, so there weren't a lot of considerations about interoperability or reusability of the code for other similar applications. Java, with its "write once, run anywhere" history, allows developers to get started more quickly and to reuse code across devices. That's attractive for developers and also for the industry.

**Oracle Magazine:** How do you see IoT, big data, and cloud converging?

**Utzschneider:** We now have several major developments happening in our industry: cloud, big data, social, mobile, and IoT. It's going to take a tremendous amount of orchestration and coordination across the industry to make sure we're able to harness all those trends at the same time.

Take mobility. With innovation in smartphones and tablets, we can easily do e-commerce and connect to our social apps from these devices. With IoT, mobile device use is going to expand significantly. These same devices are becoming the ultimate remote controls for us to connect and control the physical environment around us. For example, with home automation, I can use my phone to turn the lights and the alarm system off and on, to look at energy consumption, and to manage home entertainment—whether I'm there or not.

As far as cloud, it becomes an enabling technology for IoT. For a lot of organizations, adding devices and the huge amount of data they generate to their existing infrastructures or their back-end systems simply won't scale, and they will need to rethink how those infrastructures are set up. They will look to cloud service providers to make that happen for them.

**Oracle Magazine:** Besides home automation, what are other emerging markets for IoT?

**Utzschneider:** IoT will affect every business. We're seeing early adoption in healthcare, including lifestyle health devices, patient monitoring, and home healthcare or tele-health. Another big area is telematics—the automotive industry is already connecting vehicles so that manufacturers can remotely monitor and support their vehicles. It is also a way for them to collect data on vehicles out there in the real world, which they then put into further design and innovation.

Telematics also applies to fleet management and logistics, managing things such as delivery vehicles to make sure they are running efficiently, and rental car companies, so they can push in-vehicle service offers or information to enable you to book a hotel or dinner reservations from the car.

Industrial automation is another category, especially in the area of manufacturing and process automation. All this technology will enable companies to pull more data off

## "We have thought primarily of humans connecting to the internet, but IoT is really the next step, where 'things' are also connecting."

—Peter Utzschneider, Vice President of Product Management for Java, Oracle

of machinery that's in factories in order to get a better idea of what's happening on the factory floor.

**Oracle Magazine:** What is Oracle doing in terms of IoT beyond Java?

**Utzschneider:** Oracle provides a complete data management and analysis solution across sensors, devices, data centers, and applications. Oracle's enterprise solutions provide a wide array of data management capabilities uniquely suited to IoT: with Oracle big data solutions, massive amounts of M2M data can be stored for the highest performance at the lowest cost with Oracle Exadata or Oracle Database Appliance. Enterprises can gain real-time visibility into this data with Oracle Business Intelligence, Oracle Exalytics, Oracle Event Processing, and Oracle business and industry applications. Not only do we have very rich back-end infrastructure to help the industry cope with a lot of those data volumes, but we also have a lot of technology that can push intelligence out to the new world of edge devices and enable customers to better filter, manage, and transform the data along the way before it reaches the back end. This data adds tremendous value to businesses.

Oracle is building an Internet of Things platform, which takes into consideration all the things on the device side around device lifecycle management with security of the applications on the devices—as well as tying them back to back-end infrastructure in order to better enable our customers to take their existing infrastructure investments and extend them. Oracle is in a great position to combine our history and technology on the back end with everything that we are now doing on the device side and then innovate on top of it specifically for the huge opportunity offered by IoT.

**Oracle Magazine:** What does Oracle's IoT strategy mean for customers and partners, including device makers and solution and service providers?

**Utzschneider:** Oracle is taking a holistic view of IoT. We work closely with many of the various players in the IoT value chain—from the silicon chip designer and the chip maker whose chip goes into an IoT module to the device manufacturer, the solution provider, the systems integrator, the service provider, and onto the enterprise customer. Oracle leadership is making sure that we are investing in all points of the value chain, such that when the smart devices come to market, we've taken care to ensure that they can easily be service-enabled. We believe the devices, in order to play in IoT, will have to be more service-oriented so that they can evolve over time and provide more value, more new services over time. We're working closely with all the partners in the ecosystem and the value chain to make sure the devices can do that—while at the same time working with our system integration partners and customers so they can prepare back-end systems to be able to support all these devices and build the advanced services and new applications that will become available with IoT.

This should provide everyone in the value chain with opportunity and a way to reduce costs. I think the combination is very powerful and a real game changer. ◀



**Caroline Kvitka** is a senior editor with *Oracle Magazine* and the editor in chief of *Java Magazine*.

### NEXT STEPS

**LEARN** more about the Internet of Things  
[oracle.com/iot](http://oracle.com/iot)

**LISTEN** to the podcast  
[oracle.com/magcasts](http://oracle.com/magcasts)

**WATCH** the video, *The Internet of Things: Managing the Complexity*  
[bit.ly/16j20ax](http://bit.ly/16j20ax)

# Enterprise Virtualization Evolution

Here's the state of virtualization, from applications to consolidation and engineered systems.

In August 2013, Oracle's virtualization solution portfolio expanded to include Oracle Virtual Compute Appliance, an engineered system for application virtualization. Wim Coekaerts, senior vice president of Linux and virtualization at Oracle, sat down with Tom Haunert, editor in chief of *Oracle Magazine*, to talk about the past, present, and future of enterprise virtualization and Oracle virtualization solutions. The following is an excerpt from that interview. Listen to the full interview at [oracle.com/magcasts](http://oracle.com/magcasts).

**Oracle Magazine:** Most *Oracle Magazine* readers are familiar with the term *virtual machine* [VM], but what is the origin of enterprise virtualization, and how is it defined today?

**Coekaerts:** When you look at enterprise virtualization, it started first on the mainframe, then on UNIX vendor systems, and then on x86 systems. Today many enterprise workloads are being virtualized to help with consolidation of applications and operating systems.

While many applications have been virtualized, in most cases it has been Windows applications (on x86 systems) in smaller environments. But there has been a trend in the last few years to start virtualizing enterprise applications such as Oracle Database and Oracle Fusion Middleware.

**Oracle Magazine:** What are the most significant Oracle enterprise virtualization products and solutions?

**Coekaerts:** We launched Oracle VM in 2007 on x86 to make sure that when customers virtualize Oracle products, we—Oracle—can say, "Look, this is completely certified. It's tested. You get everything from us, and you know that we can support this thing top to bottom."



Wim Coekaerts, Senior Vice President, Linux and Virtualization, Oracle

With the Sun acquisition, we got SPARC systems and the SPARC hypervisor [Logical Domains, or LDoms], which we renamed Oracle VM Server for SPARC. Oracle VM Server for SPARC is a very powerful hypervisor that has been used for many years on the SPARC T-Series systems. And now it also supports the SPARC M-Series.

We also have Oracle Solaris Zones, which is an isolation technology where you have one operating system running, but you can create zones within that operating system that make it look as if you are on a different hardware platform or virtualized hardware platform. The advantage of Oracle Solaris Zones is that there is no real virtualization overhead because there's nothing virtualized.

Most recently, we announced Oracle Virtual Compute Appliance, an x86-based appliance that uses Oracle VM.

**Oracle Magazine:** What are the key technologies in Oracle Virtual Compute Appliance?

**Coekaerts:** Oracle Virtual Compute Appliance integrates storage, servers, management nodes, compute nodes, built-in InfiniBand switches, and two Oracle fabric managers.

The base rack comes with two compute nodes, but you can go up to 25 compute nodes in a box. Everything in the rack is prewired for you. You plug in the power and network cables and power on one of the management nodes. The management node automatically powers on all the other nodes and provisions the entire system. After about 45 minutes, you can log in to the compute appliance and start creating virtual machines.

**Oracle Magazine:** What types of use cases do you see for Oracle Virtual Compute Appliance?

**Coekaerts:** One use case is that it is really easy for companies to ship a system to a remote location where you might not have people there to maintain it.

Another use case is consolidation. Suppose you have a whole bunch of database servers, some middle-tier servers, some third-party applications, and maybe even some Windows VMs, and the hardware is getting to end of life. Oracle Virtual Compute Appliance makes it very easy to take the applications on all of these machines and consolidate everything into one big rack where you have high availability automatically, right out of the box. ◀

## NEXT STEPS

**LEARN** more about Oracle virtualization solutions  
[oracle.com/virtualization](http://oracle.com/virtualization)

**LISTEN** to all *Oracle Magazine* Feature Casts  
[oracle.com/magcasts](http://oracle.com/magcasts)

### **Expert Consolidation in Oracle Database 12c**



By Martin Bach  
Apress  
[apress.com](http://apress.com)

Learn how to reduce data management costs and increase data center efficiency with *Expert Consolidation in Oracle Database 12c*.

The book guides you through planning and implementing a consolidated Oracle Database installation using many of the new features in Oracle Database 12c. You'll learn to identify candidates for consolidation and to recognize instances that are best left as standalone databases. Author Martin Bach, an Oracle Certified Master, also covers working with clustered systems and Oracle Automatic Storage Management in a consolidated environment. In addition, he discusses using the Oracle Enterprise Manager Cloud Control feature of Oracle Enterprise Manager 12c as a monitoring and management dashboard. Bach's focus is driving readers toward a cost-effective environment that is efficient in both technology and human resources.

### **Oracle Database 12c Performance Tuning Recipes**



By Sam Alapati, Darl Kuhn, and Bill Padfield  
Apress  
[apress.com](http://apress.com)

*Oracle Database 12c Performance Tuning Recipes* is a ready reference for database administrators in need of immediate help with performance issues relating to Oracle Database 12c. The book takes an example-based approach, wherein each chapter covers a specific problem domain. Each chapter includes recipes for how to perform common tasks in that chapter's domain. Solutions in the recipes are backed by clear explanations of background and theory. If you have a performance-related task, you're likely to find a recipe and a solution for it here.

### **Oracle Database 12c New Features**



By Robert Freeman  
Oracle Press  
[oraclepressbooks.com](http://oraclepressbooks.com)

Learn how to maximize the new capabilities of Oracle Database 12c. Author and Oracle ACE

Robert Freeman provides essential information to get you up and running quickly on Oracle Database 12c. The book offers commentary from Oracle Database expert

and *Oracle Magazine* columnist Tom Kyte, with additional contributions by Oracle Database experts Eric Yen and Scott Black. It features detailed coverage of upgrading to Oracle Database 12c; architectural changes; performance improvements; and new features for backup and recovery, administration, data warehousing, and information lifecycle management.

### **Oracle NoSQL Database**



By Maqsood Alam, Aalok Muley, Chaitanya Kadaru, and Ashok Joshi  
Oracle Press  
[oraclepressbooks.com](http://oraclepressbooks.com)

Written by members of the Oracle NoSQL

Database product development team, this book is an authoritative primer for Oracle's big data software stack. Learn how to use Oracle NoSQL Database to store big data in low-cost, low-impact, highly scalable and available data stores. Gain a real-world understanding of how Oracle NoSQL Database integrates with Oracle's other big data solutions, with coverage of Oracle NoSQL Database architecture, installation, configuration, application development, administration, security, and more. The book features actual use cases of Oracle NoSQL Database, emphasizing the success stories and the business problems solved.

### **Oracle Essentials, 5th Edition**



By Rick Greenwald, Robert Stackowiak, and Jonathan Stern  
O'Reilly Media  
[oreilly.com](http://oreilly.com)

This book distills an enormous amount of information about Oracle Database 12c into one volume. Ideal for novice and experienced DBAs, developers, managers, and users, *Oracle Essentials* walks you through technologies and features in Oracle Database 12c. Complete with illustrations and hints, this fifth edition provides a one-stop overview of Oracle Database 12c. The book begins with an introduction to Oracle Database and the evolution of the relational database, a summary of key features, and the role of Oracle Fusion Middleware. Other topics include core concepts in the architecture of Oracle Database, including pluggable databases, installation, data structures and datatypes, managing an Oracle database, security options, basic principles of multiuser concurrency, transaction processing, backup and recovery, cloud, and more.

Look for other Oracle books at [bit.ly/NjG3KM](http://bit.ly/NjG3KM).

## **Partners Earn Oracle Exadata Optimized and Oracle Exalogic Optimized Status**

Three Oracle partners have earned Oracle Exadata Optimized and Oracle Exalogic Optimized status for solutions that have been tested and tuned with Oracle Exadata Database Machine and Oracle Exalogic Elastic Cloud.

Atos Worldgrid, an international subsidiary of Atos and an Oracle Platinum Partner, earned Oracle Exadata Optimized and Oracle Exalogic Optimized status for Atos Smart Grid Suite (ASGS). ASGS enables energy and utilities companies to operate smarter energy grids. ASGS can process the daily collection of 60 million utility meters in hours.

Temenos, an Oracle Gold Partner providing solutions to the financial services industry, announced that Temenos T24 (Java) Release 13 achieved Oracle Exadata Optimized and Oracle Exalogic Optimized status. Temenos T24 helps customers achieve scalable, secure, high-performance banking capabilities.

Triple Point Technology, an Oracle Gold Partner, earned Oracle Exadata Optimized and Oracle Exalogic Optimized status for Commodity XL, its trading and risk management solution. Commodity XL analyzes data generated by daily commodities operations.

► [atos.net](http://atos.net)  
► [temenos.com](http://temenos.com)  
► [tpt.com](http://tpt.com)

## **Partners Earn Gold Membership**

Two Oracle partners have achieved Gold membership in Oracle PartnerNetwork.

Acuity Cloud Solutions, a cloud-based application support and services consultancy with a focus on talent management systems, reported that Oracle Gold Partner status will help it better serve its Oracle Taleo Enterprise Cloud Service client base.

BASH Technologies earned Oracle Gold Partner status for its commitment to design, deliver, and support smartphone- and tablet-based access to Oracle's PeopleSoft solutions.

► [acuitycloudsolutions.com](http://acuitycloudsolutions.com)  
► [bashconsulting.co](http://bashconsulting.co)

## Two Oracle Partners Earn Platinum Status

Two Oracle partners have earned Platinum membership in Oracle PartnerNetwork. Platinum status can be achieved by having any combination of five qualifying specializations, Oracle Exastack Ready applications, or Oracle Validated Integrations.

Cervello, a professional services and solutions provider, earned Oracle Platinum Partner status for its experience in consulting, implementation, and support services in enterprise performance management, data management, and business intelligence.

JMR Infotech, which provides end-to-end banking solutions and technology services, achieved Oracle Platinum Partner status as well as all available specializations for delivering Oracle Financial Services solutions, including the Oracle FLEXCUBE suite of products and Oracle Financial Services analytical applications.

 [mycervello.com](http://mycervello.com)

 [jmrinfotech.com](http://jmrinfotech.com)

## MphasiS Announces Application Upgrade Solution

MphasiS, an Oracle Gold Partner, announced MphasiS Upgrade and Transformation Services (MUSTS), a solution to help organizations upgrade to the latest versions of Oracle E-Business Suite and Oracle's PeopleSoft applications. MUSTS ensures compliance and minimal downtime during the migration through holistic assessment questionnaires, evaluation templates, testing, accelerators, and ongoing support.

 [mphasis.com](http://mphasis.com)

## ConSol\*CM Earns Oracle Exadata Ready, Oracle Exalogic Ready, and Oracle Linux Ready Status

ConSol\* Consulting & Solutions Software GmbH, an Oracle Gold Partner, reported that ConSol\*CM Version 6 has achieved Oracle Exadata Ready, Oracle Exalogic Ready, and Oracle Linux Ready status. ConSol\*CM is a workflow management system that maps, controls, and tracks tasks and processes in organizations of all sizes and industries.

 [consol.com](http://consol.com)

## Apex IT Earns Oracle PartnerNetwork Specialization for Oracle Fusion Customer Relationship Management

Apex IT, an Oracle Platinum Partner, has earned Oracle PartnerNetwork Specialized status for Oracle Fusion Customer Relationship Management. The company has completed more than 1,000 cus-



omer engagements worldwide and has worked with multiple companies on their Oracle Fusion implementations. To earn Specialized status, Apex IT passed tests on common customer relationship management configurations, lead and opportunity management, territory management, quota management, and forecasting.

 [apexit.com](http://apexit.com)

## 1Spatial Management Suite and Radius Studio Achieve Oracle Exadata Ready, Oracle Exalogic Ready Status

1Spatial Group, an Oracle Gold Partner, announced that 1Spatial Management Suite Version 1.0 and Radius Studio Version 2.3 have achieved Oracle Exadata Ready and Oracle Exalogic Ready status, demonstrating that the two products are

supported on Oracle Exadata Database Machine, Oracle Exalogic Elastic Cloud, and Oracle Linux. 1Spatial provides foundation technology for spatial data management and processing solutions.

 [1spatial.com](http://1spatial.com)

## Two Partners Earn Oracle Exadata Ready, Oracle Exalogic Ready, and Oracle SuperCluster Ready Status



The following two Oracle partners have earned Oracle Exadata Ready, Oracle Exalogic Ready, and Oracle SuperCluster Ready status for their solutions that have been tested and tuned with those engineered systems:

- Diasoft, for FLEXTERA Version 7.0, a product for financial businesses that covers back-office and core banking operations
- LABVANTAGE Solutions, for LABVANTAGE 6, a laboratory information management system of configurable, off-the-shelf solutions for laboratory research, development, and quality management

 [diasoft.com](http://diasoft.com)

 [labvantage.com](http://labvantage.com)

## CS Achieves Oracle Exadata Ready, Oracle SuperCluster Ready Status

CS, an Oracle Platinum Partner, said its Automated Banking System B2 3.22.0.0 has achieved Oracle Exadata Ready and Oracle SuperCluster Ready status, demonstrating that the system is supported on Oracle Exadata Database Machine, Oracle

SuperCluster, and Oracle Solaris 11. CS provides an integrated solution for banks and insurance companies that includes software, support, deployment, custom development, and training services.

 [csitd.com.ua](http://csitd.com.ua)

## Volante Suite Earns Oracle Exalogic Optimized, Oracle Exadata Ready, and Oracle SuperCluster Ready Status

Volante Technologies, an Oracle Gold Partner, has announced that Volante Suite 4.0 has been tested and tuned with Oracle Exalogic Elastic Cloud and is supported on Oracle Exadata Database Machine, Oracle SuperCluster, Oracle Solaris 11, Oracle

Linux, and Oracle VM 3. Volante Suite is a model-driven code generator that helps financial industry organizations manage the message formats, standards, and protocols of financial transactions.

 [volantetech.com](http://volantetech.com)

## CherryRoad Technologies Announces Public Sector Cloud Solution

CherryRoad Technologies, a public sector systems integrator and Oracle Platinum Partner, has developed a public sector cloud solution powered by Oracle Applications and Oracle's engineered systems. CherryRoad's subscription-based solution addresses infrastructure, methodologies, internal controls, and processes for K-12, higher education, and state and local governments.

 [cherryroad.com](http://cherryroad.com)



## Oracle Exadata Ready Program Attracts Oracle Partners

Five Oracle Gold Partners have earned Oracle Exadata Ready status for their solutions.

BPC Banking Technologies said that its SmartVista e-payment solution achieved the status after validation on an Exadata Database Machine X2-2 Quarter Rack and on Oracle's SPARC T4-1 server.

DATALAN, a.s. reported that DATALAN Digital City, its solution for operating municipalities, achieved Oracle Exadata Ready status.

Pattern Matched Technologies (PMT) said Amethyst (R2) and Emerald (R5) achieved Oracle Exadata Ready status. PMT provides solutions for transaction processing, financial switching, distribution, prepaid services, billing, and mobile banking.

Truven Health Analytics announced that the Truven Health Advantage Suite health-care data and analytics platform Version 5 achieved Oracle Exadata Ready status. The suite integrates and organizes information to support decision-making.

UNIT4 TETA announced that ERP TETA Constellation, a set of integrated IT systems for managing personnel, finance, logistics, manufacturing, customer relationships, and business intelligence, achieved Oracle Exadata Ready status.

 [bpctb.com](http://bpctb.com)  
 [datalan.sk](http://datalan.sk)  
 [patternmatched.com](http://patternmatched.com)  
 [truvenhealth.com](http://truvenhealth.com)  
 [unit4teta.pl](http://unit4teta.pl)

### ORACLE CLOUD MARKETPLACE

To meet the growing demand for business applications that leverage cloud, mobile, and social technologies, and to create new opportunities for its partners, Oracle has introduced the Oracle Cloud Marketplace. More than 100 applications developed by Oracle partners and leveraging Oracle Cloud platform services and Oracle software-as-a-service (SaaS) applications are available to browse, evaluate, and buy. They include

#### CallidusCloud Sales Performance

**Management solutions**, developed by Oracle Gold Partner Callidus Software and integrated with Oracle Sales Cloud. The integration gives sales representatives visibility into performance, revenue, and compensation metrics directly from within Oracle Sales Cloud, without the need to navigate to other systems.

**CardConnect Payment Gateway**, which enables PCI-compliant transactions from credit, debit, gift, and prepaid cards, created by Oracle Gold Partner CardConnect. It allows users of Oracle Cloud Marketplace to accept transactions from customers' credit, debit, gift, and prepaid cards, protect sensitive customer data, and reduce transaction costs through interchange optimization.

**DBSync**, a solution for cloud replication and integration for customer relationship management and enterprise resource planning data, made by Oracle Gold Partner DBSync. DBSync provides data replication and application integration for customer relationship management, accounting, and data integration activities.

**DocuSign**, a secure electronic signature solution created by Oracle Gold Partner DocuSign, which specializes in electronic signature transaction management. DocuSign helps customers close business anywhere, decrease costs, and enhance customer satisfaction.

**EASYProcess**, an enterprise development platform that enables Oracle Sales Cloud data to be brought into SharePoint, developed by Oracle Gold Partner K-Rise Systems. K-Rise Systems provides supply chain, human capital management, and e-commerce applications.

**Expensify**, an expense reporting solution that integrates with Oracle Sales Cloud, made by Oracle Gold Partner Expensify. Users of Expensify and Oracle Sales Cloud can automatically import company card transactions; capture mileage, time, and other reimbursable/billable expenses; code

expenses with Oracle tasks, sales accounts, and opportunities; centrally manage users; and create and submit expense reports from any smartphone or tablet directly to Oracle Sales Cloud.

**QAS for Oracle Sales Cloud**, an address verification solution created by Oracle Gold Partner Experian QAS. The interactive address verification solution connects at the point of capture to help standardize and verify US and Canadian addresses in real time, while the contact is still engaged, providing an opportunity to ensure that an accurate address is captured each time.

**ReadyTalk**, a solution for promoting, managing, and executing webinars in Oracle Marketing Cloud, developed by Oracle Gold Partner ReadyTalk. ReadyTalk's premeeting, in-meeting, and postmeeting tools help customers increase attendance and automatically capture behavioral data.

**TeamSupport**, a customer support suite for collaboration between support team members and others, developed by Oracle Silver Partner TeamSupport. TeamSupport solutions available in the Oracle Cloud Marketplace include channel management, lead generation, data quality, reporting and productivity tools, quoting, contract management, forecasting, sales incentives, and compensation management.

**ToutApp**, a real-time e-mail/presentation tracking and predictive analytics solution for sales teams, developed by Oracle Gold Partner ToutApp. ToutApp provides cloud-based sales communications software.

**Xactly Incent**, which integrates sales performance management and CRM solutions, made by Oracle Gold Partner Xactly Corporation. Xactly's cloud-based solutions enable the design, management, and optimization of incentive programs.

-  [cloud.oracle.com](http://cloud.oracle.com)
-  [calliduscloud.com](http://calliduscloud.com)
-  [cardconnect.com](http://cardconnect.com)
-  [mydbsync.com](http://mydbsync.com)
-  [docusign.com](http://docusign.com)
-  [kriesystems.com](http://kriesystems.com)
-  [expensify.com](http://expensify.com)
-  [qas.com](http://qas.com)
-  [readytalk.com](http://readytalk.com)
-  [teamsupport.com](http://teamsupport.com)
-  [toutapp.com](http://toutapp.com)
-  [xactlycorp.com](http://xactlycorp.com)



## POWERING THE INTERNET OF THINGS: DOWNLOAD JAVA ME TODAY

Billions of mobile devices, microcontrollers, sensors, and gateways make up the nervous system of modern enterprise communications. And billions of these embedded objects and their applications depend on the same foundation: Java.

Java Platform, Micro Edition (Java ME) provides a complete environment for applications running on mobile and embedded. Java ME includes robust security, built-in network protocols, and base configurations that support a wide range of devices and business use cases—everything from home automation systems and energy smart meters to industrial controllers and set-top boxes.

Download the most-recent Java ME binaries and software development kits at [bit.ly/DownloadJavaME](http://bit.ly/DownloadJavaME).

## Two Oracle Systems Experts Have a Friendly Debate



**Renato Ribeiro**, director of SPARC product management at Oracle, and **Michael Palmereter**, senior director of Oracle Solaris product management, enjoy a good duel. In a new video series, OTN Systems Community Manager Rick Ramsey poses two questions to them: Is the hardware

or software more important to system performance? And, Is horizontal or vertical scalability better?

As you might guess, there is no one right answer to these questions. If anything, Ribeiro and Palmereter's insights make it clear that integration and context are everything in IT:

software and hardware design must occur in concert, and designing for the highest levels of scalability is a matter of understanding your own organization's unique IT challenges.

Watch the interviews at [bitly/SystemsDebate1](http://bitly/SystemsDebate1) and [bitly/SystemsDebate2](http://bitly/SystemsDebate2).

**Roland Smart** is vice president of social and community marketing at Oracle.

## An Architectural Record: Subscribe to the New ArchBeat YouTube Channel



Solution architects are taking part in a new conversation platform: the ArchBeat YouTube channel, which features in-depth discussions with Oracle community leaders and subject matter experts focusing on middleware, business intelligence, enterprise management, and other topics of interest to architects and those who aspire to that role.

You'll find all of these video chats, hosted by Oracle Technology Network (OTN) Architect Community Manager Bob Rhubarb, at [bit.ly/ArchBeatVideos](http://bit.ly/ArchBeatVideos). If you're interested in doing an ArchBeat interview (virtually or in person), connect with Rhubarb via social: post a comment on the YouTube channel or tweet @OTNArchBeat.

## Oracle at SXSW Interactive



OTN will be giving a feature presentation at SXSW Interactive this March. The team is excited to be sharing the stage with a number of inspiring speakers, including leading technologists and engineers from NASA, the MIT Media Lab, and IDEO.

OTN's talk will explore how language design affects technology adoption and enterprise collaboration. If you're a software maker, chances are that you've thought about key behind-the-scenes factors such as resource management and structural partitioning. However, the actual customer experience is just as important: your front-end design and the language you choose to weave into your interfaces will make or break your products and technologies.

Get a sneak peek at the presentation slides, notes, and resources at [bit.ly/otnslides](http://bit.ly/otnslides).

# Get Ready for IoT

Challenges and opportunities in the Internet of Things

The term *Internet of Things* was coined in 1999 by Kevin Ashton, cofounder of the Auto-ID Center, an RFID research project at the Massachusetts Institute of Technology. Since then the Internet of Things concept—now often referred to as IoT—has evolved. In the twenty-first century, “IoT is really about intelligent devices talking to enterprise apps,” explains Harish Gaur, director of product management for Oracle Fusion Middleware. That communication between devices and the enterprise allows organizations to gather an astonishing volume and variety of data that can be of equally astonishing value in serving the needs of human beings in new and innovative ways.

But as with any innovative technological wrinkle, launching an IoT initiative involves more than flipping a switch, and there are important considerations. One such consideration is the lack of standard protocols for communication among all those devices. “Similar to earlier days on the internet, there are too many standards for device communication, messaging protocols, app development frameworks, and reference models,” says Gaur.

But just as in the wild early days of the internet, the necessary standards for device communication will very likely emerge from the IT industry. “Historically the industry has always come up with some new solution for addressing the lack of standards and protocols,” says Oracle ACE Director Basheer Khan, CTO at KNEX. Khan predicts that those same forces will muster to relegate to history any issues with IoT communication standards.

Solving communication protocol issues will certainly drive the evolution of IoT, and that’s an exciting prospect. But as that barrier drops away, the sheer volume of data that will be generated when your car, your toaster, and your necktie start transmitting information back to a data center will increase on a massive scale. The idea of

**“Mobile computing represents the tip of the iceberg in terms of the volume and velocity of data hitting enterprises.”**

—Harish Gaur, Director of Product Management, Oracle Fusion Middleware

*big data* grew out of the data stream from mobile devices such as cell phones and tablets. But the data stream from IoT will require a significant recalibration of our definition of *big*.

“Mobile computing represents the tip of the iceberg in terms of the volume and velocity of data hitting enterprises,” says Gaur. “The number of mobile devices is intrinsically tied to the population, but there could be 10 times or 100 times more IoT devices.” Your cell phone and tablet produce one sort of data stream. But what happens when every appliance in your kitchen also starts streaming data?

“How we capture, analyze, and process the data will play a big role in the evolution of IoT,” says enterprise architect Anbu Krishnaswamy, senior director for Oracle Technology Business Group. “Event-driven architecture and big data will become prominent technologies in solving these issues.”

Another issue is sorting through that massive IoT data stream to find the good stuff. “As IoT grows to billions of devices, it will become challenging to identify the data that is really useful,” says Krishnaswamy. Business analytics tools will become increasingly important in the age of IoT.

But these challenges aren’t deterring organizations from developing effective IoT solutions. At a roundtable of IT pros during

Oracle OpenWorld in September 2013, I spoke with the architects behind two such solutions. Mike Vadney, senior vice president and chief technical architect at Verizon Telematics, described that organization’s IoT initiative: a vehicle telematics system that tracks and transmits real-time vehicle and driver performance data for auto insurance companies. That system currently involves 100,000 devices generating more than 1.2 million messages each day. I also spoke with Cristian Simons, systems development and business solutions manager at Brazil-based Sascar. Among Sascar’s IoT solutions is one that helps its customers fight organized crime through a stolen-vehicle recovery system.

These companies have fully functioning and successful IoT solutions in place, and they’re not alone. The challenges of the Internet of Things are being met, and these early successes are proof that IoT represents exciting new opportunities for innovation. So what are you waiting for? ◀



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Oracle Technology Network ArchBeat podcast series, and the author of the ArchBeat blog ([blogs.oracle.com/archbeat](http://blogs.oracle.com/archbeat)).

## NEXT STEPS

### LISTEN TO

*IoT Challenges and Opportunities, Parts 1–3*  
[bit.ly/1a4WDyQ](http://bit.ly/1a4WDyQ)

### all ArchBeat podcasts

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### READ more about the Internet of Things

[oracle.com/iot](http://oracle.com/iot)

# Making a Change

Kellyn Pot'Vin embraces the evolution of Oracle technology and speaks up for women in technology.

**K**ellyn Pot'Vin is an expert in Oracle Exadata and Oracle Enterprise Manager 12c. She is also a DBA and senior technical consultant at Enkitec, an Oracle ACE Director, and a writer of a noted technical blog ([dbakevlar.com](http://dbakevlar.com)). Last June, I caught up with her at ODTUG Kscope13 in New Orleans, Louisiana, where she talked about changing technology and changing roles.

Pot'Vin has been involved in the change brought on by the introduction of Oracle Enterprise Manager 12c, database as a service, and Oracle Exadata into the data center. When we sat down between conference sessions, I asked her to talk about how that introduction has affected companies.

"Take Oracle Enterprise Manager 12c and database as a service," she said. "Instead of having to install a new Oracle VM, create a new database, and do all the things that can be time-consuming and tedious, those tasks can be automated."

Of course, administrators will have to adjust to the change. "DBAs want control," she said. "The idea that we are going to give up the control of creating databases and, with Oracle Enterprise Manager 12c, set up profiles and service templates and grant roles to our users and say, 'You are now going to request a database' could take many administrators out of their comfort zone. But I love it."

I asked Pot'Vin what changes Oracle Exadata has introduced. "It's an amazing engineered system," she said. "Oracle Exadata provides the most optimal performance for an Oracle environment. But it can also be initially overwhelming for companies that are not technically savvy." A knowledgeable DBA can help companies meet the challenge, she said.

## CHANGING ROLES

Pot'Vin was at Kscope13 to talk about technology but also about the need for change



Kellyn Pot'Vin, Oracle ACE Director

when it comes to women in technology. She participated in a symposium that explored the reasons why more women aren't attending technical conferences, pursuing high-tech careers, and succeeding beyond their job responsibilities.

"Only 7 percent or lower of the attendees at high-tech conferences such as Kscope, Hotsos, and Rocky Mountain Oracle Users Group Training Days are women," Pot'Vin noted. In comparison, roughly 30 percent of the staff members in IT departments are women,<sup>1</sup> she said.

Pot'Vin explained that women face a variety of challenges in the high technology industry that are affecting conference attendance and advancement at work. "Until their children are out on their own, women are so often still looked to by society as the primary caregiver.<sup>2</sup> So women have a tendency to get into their technical careers a little later in life, and because of that role of caregiver, they often don't become as involved in their careers as men do."

Not only are women turning down

speaking, writing, and management opportunities, but many are leaving high technology because of the challenges they face. "I started out in a DBA group of five women. I'm the only one who is still in the industry. All the others have left to work in either soft tech or nontechnical careers," she said.

So what's the answer? Pot'Vin stressed the importance of the Kscope13 symposium and similar events, where women leaders provided information, advice, and encouragement to help women "lean in," Pot'Vin said, referring to Sheryl Sandberg's book that focuses on ways women can become leaders in the workplace.

Attitudes in society and the workplace need to change regarding women's roles, and according to Pot'Vin, that includes women's attitudes regarding what they can accomplish. They don't need to necessarily work harder or longer. They need to focus on the career-building steps.

What about the glass ceiling in technology? "That ceiling can disappear when you're leaning in, taking on management responsibilities, writing books and blogs, and speaking on the technology conference circuit," she said. "People see your name. The ceiling is gone." ◀



**Jeff Erickson**

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

## NEXT STEPS

**LEARN** about ODTUG Kscope14  
[kscope14.com](http://kscope14.com)

**READ** Pot'Vin's blog  
[dbakevlar.com](http://dbakevlar.com)

# No Boundaries

Three peers transcend time zones, work weekends, and share knowledge across borders.



**MICHEL SCHILDEMEIJER**

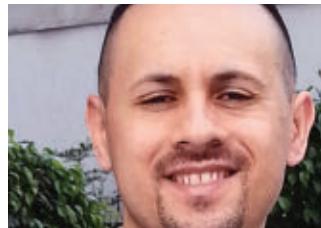


**Company:** Qualogy, an international firm specializing in Oracle and Java technologies

**Job title/description:** Oracle Fusion Middleware architect, responsible for advising potential Qualogy customers about Oracle Fusion Middleware solutions

**Location:** Rijswijk, the Netherlands

**Oracle credentials:** Oracle Certified Professional (Oracle Database 10g), with 15 years of experience using Oracle products



**ALEXANDRE BORGES**



**Company:** Various Oracle University partners, as well as Symantec and the International Council of Electronic Commerce Consultants (EC-Council)

**Job title/description:** Instructor, teaching multiple courses about Oracle solutions for Oracle University partners, in addition to teaching at Symantec and EC-Council

**Location:** São Paulo, Brazil

**Oracle credentials:** Nearly two dozen certifications including Oracle Certified Professional (MySQL 5.0 Developer, MySQL 5.0 Database Administrator) and Oracle Certified Expert (MySQL 5.1 Cluster Database Administrator), with 13 years of experience using Oracle products



**KOJI SHINKUBO**



**Company:** Insight Technology, a firm focused on database performance and security

**Job title/description:** Database evangelist, developing and doing research on Oracle Database-related management tools and high-performance hardware, while also providing professional database consulting services

**Location:** Tokyo, Japan

**Length of time using Oracle products:** More than 15 years

**How did you get started in IT?** I was working in a hospital pharmacy that had a poorly functioning medication system built on MUMPS, UNIX, and a SQL-like file database. I educated myself by reading the books that had been delivered with the system and learned to solve issues and errors, maintain the database, and enhance programming.

**What technologies have most changed your life?** Oracle Tuxedo and Oracle WebLogic Server. In 2000 I began working for a bank on the foreign exchange market that was involved in an international effort to build a time-zone-free settlement system called CLS. I helped build that system using BEA Tuxedo 6.5 [now Oracle Tuxedo] and BEA Jolt [now Oracle Tuxedo Jolt]. The system was running on Sun Java System Web Server [now Oracle iPlanet Web Server], but later we migrated to BEA WebLogic Server 6 [now Oracle WebLogic Server], which I worked with for many years.

**What's your go-to Oracle reference book?** *Oracle WebLogic Server 12c: Distinctive Recipes (Architecture, Development and Administration)*, by Frank Munz [munz & more, 2013].

**What's your favorite tool on the job?** Kali Linux, the penetration-testing framework formerly known as BackTrack. In my opinion, everyone working in IT should learn more about security.

**Which features and options in Oracle Database do you find most valuable?**

The best feature is Oracle RMAN [Oracle Recovery Manager], and the best options are Oracle Real Application Clusters and Oracle Active Data Guard. They bring me one very important thing: security. All my clients are looking for performance on their Oracle databases, but they always want to be certain that they won't lose their data.

**What advice do you have about how to get into web, database, or application development?** Study every single day. You should never give up your dreams. Buy an Oracle Press book, make your test environment, and start to study it. Someday the right people will appreciate your efforts.

**What's your favorite tool on the job?** I use only the open tools that come with Oracle's operating systems. I like using them to debug, write programs, and make presentations.

These tools make me platform- and hardware-independent—I don't have any trouble if the environment suddenly changes, and I don't have to worry about where to work.

**How are you using social media in your work?** To connect and communicate with people from around the world whom I've met at Independent Oracle Users Group [IOUG] and Japan Oracle User Group [JPOUG] events, as well as at Oracle OpenWorld. It's amazing how so many people are open with their thoughts and want to share their knowledge. I don't feel the borders between countries or languages anymore, thanks to social media.

**What's your favorite Oracle user group?** Actually, I have two: IOUG and JPOUG. IOUG sessions are so fascinating that I always forget about the time. And JPOUG is the only Japanese-language Oracle user group—and it's the only place where I can ask any work-related question that comes up. ◀

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# 2013 ORACLE EXCELLENCE AWARDS

Oracle recognizes technology leaders who engineer innovation.

Oracle customers and partners are technology pioneers, leading the way in developing and implementing revolutionary new solutions and establishing fresh standards and best practices using Oracle technology. The Oracle Excellence Awards recognize customers and partners that drive business value together with Oracle. This year, the Oracle Excellence Awards include nine award programs that celebrate leadership, technology, enterprise sustainability, database administration, and more.

Anchoring Oracle's annual awards is the CIO of the Year program, recognizing global leaders who demonstrate outstanding performance and vision in an enterprise that uses Oracle products and services. In addition, CIO of the Year winners have built a professional relationship with Oracle that fosters the two-way exchange of ideas between the winner's company and Oracle and produces insightful and honest feedback about Oracle technologies, services, and procedures.

## THE ORACLE EXCELLENCE AWARDS CATEGORIES

- CIO OF THE YEAR
- LEADERSHIP
- DBA OF THE YEAR
- JAVA BUSINESS INNOVATION
- ORACLE PARTNER NETWORK SPECIALIZED PARTNER OF THE YEAR
- DATA WAREHOUSE LEADER OF THE YEAR
- ORACLE FUSION MIDDLEWARE INNOVATION
- ECO-ENTERPRISE INNOVATION
- PROACTIVE SUPPORT: CHAMPION

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BY DAVID A. KELLY, WITH ADDITIONAL REPORTING BY PATTY WADDINGTON



**"WE EXPECT  
OUR ONGOING  
PARTNERSHIP  
WITH ORACLE  
WILL HELP US  
CONTINUE TO  
TRANSFORM  
OUR CUSTOMER  
EXPERIENCE  
CAPABILITIES."**

**A**ny successful business must ensure ongoing customer satisfaction, respond to increased competition, and minimize costs. Running a successful airline in today's economic climate requires all of those things, as well as the management of incredibly complex business operations and logistics. Yet, even with these challenges, All Nippon Airways (ANA) has steadily increased both its sales and profits, thanks in part to new IT systems based on Oracle technology.

"IT is essential for the success of our business. Operational control of aircraft and seat reservation systems are core parts of the airline infrastructure," says Takanori Yukishige, ANA senior vice president, Innovation and IT Strategy, and winner of the Oracle Excellence Award for CIO of the Year—Japan.

Over the past few years, ANA has migrated from traditional mainframe-based solutions to an open systems solution based on a set of Oracle technologies. For example, ANA moved its core ticketing system off of a mainframe system to an x86 environment using Oracle Database, Oracle WebLogic Server, Oracle SOA Suite, and Oracle Service Bus to make critical systems globally accessible while significantly lowering management costs. Its on-premises ticketing system for

### CIO OF THE YEAR | JAPAN

## TAKANORI YUKISHIGE

ALL NIPPON AIRWAYS | TOKYO, JAPAN

Customers fly and airline succeeds with an IT transformation.

domestic flights was deployed in February 2013, and the company is in the middle of development on a cloud-based system for international flights.

"Because ticketing is a core, mission-critical function, we always took a conservative approach, even if it took more time," says Yukishige. "I believe this was an important part of making a smooth transition to our new system."

Even after its successful initial rollout, ANA had some concerns about whether the new domestic ticketing system would be able to cope with holidays and other periods when demand peaks. "In the end, our worries were unnecessary," says Yukishige. "So far, the new system has performed flawlessly, even during the busy vacation periods."

The new Oracle-based solutions are delivering more than just top-notch performance. Compared to its old mainframe-based systems, the lead time for changes or new applications has been greatly reduced, enabling ANA to rapidly develop new services in response to changing market needs.

Yukishige and his team have also initiated a transformation of ANA's customer experience by deploying Oracle RightNow Cloud Service. "Today, changes in consumer expectations are causing big changes in the business world," says Yukishige. "We are carefully watching how customers use mobile and social media, and we expect our ongoing partnership with Oracle will help us continue to transform our customer experience capabilities and support ANA's future business challenges."

## CIO OF THE YEAR | NORTH AMERICA

**JUDITH A. LEMKE**

SCHNEIDER NATIONAL | GREEN BAY, WISCONSIN

IT transformation gives Schneider National a green light for growth.

**T**here's a saying that you can't drive down the road and change your tires at the same time. But transportation and logistics leader Schneider National's recent "on the road" business transformation provides evidence that you may be able to do just that—if you have the right business relationships.

"We literally replaced or re-platformed every piece of hardware and software we had within the company and in our trucks, because we had 20-plus-year-old technology driving our business," says Judy Lemke, executive vice president and CIO at Schneider National and winner of the Oracle Excellence Award for CIO of the Year—North America. "The heart of everything we have now is based on Oracle technologies. With Oracle's help we successfully went from 20-year-old technologies to cutting-edge solutions."

Schneider National is one of the largest transportation and logistics companies in America, with about US\$3.5 billion in annual revenues. The 78-year-old company was founded by one man with one truck; today it's a massive organization with close to 10,000 trucks and 44,000 trailers and containers providing transportation and logistics services to customers around the world.

Schneider recently completed a six-year transformation process that altered everything from what business the company engaged in to how it conducted that business. Schneider completely replaced its

aging and inflexible applications and IT systems with a new corporate and mobile infrastructure relying on Oracle solutions. At the same time, the company transformed its services to offer both regional and cross-country service, expanded the types of industries and customers it served, and realigned internally.

Schneider used Oracle's Siebel Customer Relationship Management and Oracle E-Business Suite applications, Oracle Fusion Middleware, and other technologies to redesign the fleet management systems at the heart of its business. While it took six years and US\$250 million to roll out the entire

program, ROI came much more quickly. "The program paid for itself in the first full year after implementation," says Lemke.

Not only is the new solution cost-effective, but it also gives Schneider a green light to grow. "Our new Oracle-based infrastructure sets us up to be able to grow and expand effectively," says Lemke.

"In the past, our growth had been partially constrained by our systems. Now we can grow and expand as we need to, and we have more flexibility than ever before."

A key to Schneider's success has been the company's deep relationship with Oracle. "We hit some problems when we finally went live with our new transportation management system, but Oracle was right there with us, and we turned it around quickly," concludes Lemke. "In the end, it really paid off."

**"OUR NEW  
ORACLE-BASED  
INFRASTRUCTURE  
SETS US UP TO BE  
ABLE TO GROW  
AND EXPAND  
EFFECTIVELY."**





## CIO OF THE YEAR | ASIA PACIFIC

## DR. JAI MENON

BHARTI ENTERPRISES | NEW DELHI, INDIA

Telecom calls on Oracle to support growth, customer focus, and expansion.

**W**hen Bharti Airtel (Airtel), one of the leading global telecommunications companies, rolls out new systems to support its 280 million subscribers and enterprise customers, it calls on technology partners.

With a broad portfolio of service offerings, Airtel needs an IT platform that is robust, scalable, and extremely flexible. To meet customer expectations and build a dynamic IT infrastructure, Airtel has invested heavily in technology and has deployed a 10-year roadmap with help from specialized IT partners. Oracle is one such partner, and Oracle has helped Airtel put together IT systems for customer relationship management (CRM), customer experience (CX), and enterprise resource planning (ERP). The solutions include Oracle Database, Oracle Fusion Middleware, and Oracle CX and Oracle ERP applications.

"Oracle continues to be the preferred technology partner for Airtel across three of our main facets of businesses, including customer, factory, and enterprise," says Dr. Jai Menon, winner of the Oracle Excellence Award for CIO of the Year—Asia Pacific and group CIO of Bharti Enterprises, a conglomerate based in New Delhi, India. While Bharti Enterprises runs companies that provide everything from insurance to neighborhood stores, one of its largest is Airtel, which boasts customers in 20 countries across Asia and Africa.

For a business as large and dynamic as Airtel, both agility and reliability are

critical. "While Oracle has always built rock-solid products, it is continuing to make them more and more flexible and configurable, which is very important for us," says Dr. Menon.

Airtel has three major business priorities: increasing its focus on customers to ensure that every customer gets exactly what he or she is looking for; continuing to grow its mobile business, especially mobile data; and expanding its geographical footprint and consolidating markets within countries to achieve market leadership.

"Oracle plays an important part across all our business initiatives," says Dr. Menon. "For example, Oracle CRM plays a crucial role in supporting our service initiatives and meeting our customer-facing initiatives."

For Menon, good partnerships are an important part of being a successful CIO. "I believe in long-term, strong, deep partnerships like the one we have with Oracle," says Dr. Menon.

And although it can be difficult to predict the future, especially when it comes to fast-moving markets such as telecommunications, Dr. Menon is confident that Airtel's decision to invest in a long-term IT partnership with Oracle is a good one that will give the company room for future growth.

"Given the investments that Oracle is making in the technologies we're using, we are very comfortable basing our future IT plans around the Oracle technology roadmap," says Dr. Menon. "All in all, our future is in safe hands with Oracle."

**"ORACLE PLAYS AN IMPORTANT PART ACROSS ALL OUR BUSINESS INITIATIVES."**

CIO OF THE YEAR | LATIN AMERICA

## AGENOR LEÃO

NATURA | CAJAMAR, BRAZIL

Technology enables growth in relationships and business for personal-care company.

**W**ith revenues of more than US\$3.2 billion, Brazil's Natura cosmetics and personal care company knows how to grow a business. But when it came time to create a more flexible IT infrastructure that could support future growth, Natura turned to Oracle.

"Oracle solutions provide us with greater agility as well as the scalability we need to accommodate our business growth," says Agenor Leão, Digital Technologies vice president at Natura and winner of the Oracle Excellence Award for CIO of the Year—Latin America.

Natura is the largest manufacturer of cosmetics, toiletries, and beauty products in Brazil and a leader in direct selling. The company has almost 7,000 employees, as well as more than 1.5 million consultants who sell the company's products to consumers.

As Natura grows, it needs to raise productivity, enable innovation, and continue to evolve its level of service. The company sees the intelligent use of technology as the way to achieve those business objectives.

"Our business is based on the relationships between our consultants and customers," says Leão. "That's why the evolution of our business is being driven by the use of technology to connect people, allowing us to understand the relationships of our consultants and customers and deliver innovative products and services."

To do that, Natura is using a wide

variety of Oracle hardware and software, including Oracle Exadata, Oracle Exalogic, Oracle SOA Suite, Oracle Unified Business Process Management Suite, Oracle Database, and Oracle WebCenter and Oracle ATG Web Commerce applications.

"Oracle technology plays an important role in our structural initiatives," says Leão. "Oracle products give us the speed we need to lead with solutions that increase business value."

For example, using Oracle technologies, Natura was able to roll out new

social and commerce solutions quickly.

"Oracle WebCenter Sites and Oracle ATG Web Commerce in the cloud made it possible for us to quickly launch new relationship and e-commerce portals," says Leão. "We know we can trust Oracle products to help power Natura's business

growth and transformation. Oracle products enable us to deliver agile, robust, reliable, and scalable IT solutions for the business."

For Natura, the right solutions are a blend of technology and service. "Oracle solutions are a good fit for our business not only because of their architecture, scalability, stability, and sturdiness, but also because they provide both on-premises and SaaS [software-as-a-service] options," says Leão.



**"THE EVOLUTION  
OF OUR BUSINESS  
IS BEING DRIVEN  
BY THE USE OF  
TECHNOLOGY TO  
CONNECT PEOPLE."**



CIO OF THE YEAR | EUROPE, MIDDLE EAST, AND AFRICA

## GIANLUIGI CASTELLI

ENI | MILAN, ITALY

Revolutionary IT changes are fuel for the future of giant energy company.

**S**ometimes incremental change is good. But not always.

Three years ago, Italian energy giant Eni determined that its business objectives required more-aggressive IT capabilities. With 7,000 physical servers, 54,000 CPUs, and hundreds of disparate applications, Eni needed a new IT hardware and software architecture that would be easier to manage and more efficient, resilient, and flexible. The company also needed something to enable future business growth across its many lines of business.

But instead of choosing incremental change, Eni's CIO went big. "We didn't need an evolution," says Gianluigi Castelli, executive vice president and CIO at Eni. "We needed an IT revolution."

As a result, Castelli, winner of the Oracle Excellence Award for CIO of the Year—Europe, Middle East, and Africa, and his team are driving a massive €160 million IT transformation program. Eni has totally re-engineered its IT infrastructure, from a new energy-efficient consolidated data center that uses 7,000 blades and a dynamic cloud-based infrastructure-as-a-service platform to a consolidated set of applications running on the same platform. And Eni is relying on a core set of Oracle solutions, including Oracle Database, Oracle Fusion Middleware, Oracle Enterprise Manager, and Oracle Customer Experience Cloud

and Oracle Human Capital Management Cloud applications.

A complete IT makeover is no small feat for any large company, and Eni is one of the largest integrated energy companies in the world, operating in 90 countries with 78,000 employees and annual revenues of more than €110 billion.

As Eni rolled out its new IT architecture and applications, it quickly started to realize significant savings. "We're saving a substantial amount of money," says Castelli, "roughly €30 million a year on application management, licensing costs, and operations."

Eni's IT transformation program is also much more than a technical project. In order to succeed, there's a complete cultural shift going on, not just within the IT organization but throughout the company. Castelli is

leading the charge of moving IT out of the traditional internal client/supplier model toward a business/IT relationship that's based on a full sharing of responsibility for achieving expected business results.

One of the keys to Eni's successful IT transformation has been its close partnership with Oracle. "Oracle has always been very willing to work with us at multiple levels to help us achieve the best results," says Castelli. "Oracle products are instrumental to achieving our goals. Oracle solutions are so pervasive in our company that they've become a true backbone of our operations."

**"ORACLE SOLUTIONS ARE SO PERVERSE IN OUR COMPANY THAT THEY'VE BECOME A TRUE BACKBONE OF OUR OPERATIONS."**

## LEADERSHIP

The leadership awards honor the achievements of chief financial officers, chief human resources officers, chief marketing officers, and chief operating officers in the categories of finance, human capital management, marketing, and value chain management.

### LEADERSHIP: FINANCE—ASIA PACIFIC

Gary Lennon, Executive General Manager, Finance, National Australia Bank

### LEADERSHIP: FINANCE—EUROPE,

### MIDDLE EAST, AND AFRICA

Ian Winham, Executive Vice President, Chief Financial Officer, and Chief Information Officer, Ricoh Europe

### LEADERSHIP: FINANCE—LATIN AMERICA

Otto Kroboth, Chief Financial Officer, Grupo Fármacos Especializados

### LEADERSHIP: FINANCE—NORTH AMERICA

John Stephens, Senior Executive Vice President and Chief Financial Officer, AT&T

### LEADERSHIP: HUMAN CAPITAL MANAGEMENT—ASIA PACIFIC

TAN Seng Chai, Group Chief Corporate Officer, CapitaLand Limited

### LEADERSHIP: HUMAN CAPITAL MANAGEMENT—EUROPE, MIDDLE EAST, AND AFRICA

Olivier Ruthardt, Group Vice President of Human Resources, MAIF

### LEADERSHIP: HUMAN CAPITAL MANAGEMENT—LATIN AMERICA

Jose Marcio, Vice President, Queiroz Galvão Oil and Gas

### LEADERSHIP: HUMAN CAPITAL MANAGEMENT—NORTH AMERICA

Frederick S. Koury, Senior Vice President, Pentair

### LEADERSHIP: VALUE CHAIN MANAGEMENT—ASIA PACIFIC

Edward Yu, Associate Vice President, ZyXEL

### LEADERSHIP: VALUE CHAIN MANAGEMENT—EUROPE, MIDDLE EAST, AND AFRICA

Mike A. Johnston, Global IT Program Manager, Supply Chain Management, Cummins Turbo Technologies

### LEADERSHIP: VALUE CHAIN MANAGEMENT—NORTH AMERICA

Thomas Crowe, Chief Supply Chain Officer, PL Developments



## LEADERSHIP

1. Finance winners from around the world with Oracle Chairman of the Board Jeff Henley (left to right): David Fodor, National Australia Bank (receiving the award for Gary Lennon); John Stephens, AT&T; Jeff Henley, Oracle; Ian Winham, Ricoh Europe; Otto Kroboth, Grupo Fármacos Especializados

2. Finance—North America winner John Stephens, AT&T

3. Finance—Latin America winners with Javier Cordero, president, Oracle Mexico (left to right): Agustín Lomelli, Grupo Fármacos Especializados; Otto Kroboth, Grupo Fármacos Especializados; Javier Cordero, Oracle; Ernesto Alcocer, Grupo Fármacos Especializados; Rubén Agüero, Grupo Fármacos Especializados

## 2013 ORACLE EXCELLENCE AWARDS



### DBA OF THE YEAR

1. DBA of the Year winner William S. Callahan, CCC Information Services 2. DBA of the Year winner Awad El-Sidiq, ADNOC Distribution



### JAVA BUSINESS INNOVATION

3. Java Business Innovation winner Guilherme Spina, V2COM (right), with Chris Baker, Oracle



### LEADERSHIP *continued*

#### LEADERSHIP: MARKETING—EUROPE, MIDDLE EAST, AND AFRICA

David Dorling, Head of Global Marketing, Swiss Post Solutions

#### LEADERSHIP: MARKETING—NORTH AMERICA

Michael Williams, Vice President Global Field Marketing, McAfee

### DBA OF THE YEAR

The DBA of the Year awards honor individuals who demonstrate technical ability with and superior knowledge of Oracle Database and Oracle's engineered systems within their organizations.

#### DBA OF THE YEAR—ASIA PACIFIC

Park Kweon, Senior Manager, Shinhan Card

#### DBA OF THE YEAR—EUROPE, MIDDLE EAST, AND AFRICA

Awad El-Sidiq, Senior Database Administrator, ADNOC Distribution

#### DBA OF THE YEAR—AMERICAS

William S. Callahan, Director, Products and Technology, CCC Information Services

### JAVA BUSINESS INNOVATION

The Java Business Innovation award recognizes achievement using the Oracle Java Embedded platform to drive innovation within business or product development.

Guilherme Spina, Chief Executive Officer, V2COM

### SPECIALIZED PARTNER OF THE YEAR

The Specialized Partner of the Year awards recognize Oracle PartnerNetwork partners for their commitment to delivering innovative, specialized solutions and services based on Oracle hardware and software.

#### SPECIALIZED PARTNER OF THE YEAR—ASIA PACIFIC

**APAC PARTNER OF THE YEAR:** Youngwoo Digital Co., Ltd.

**APPLICATIONS:** Accenture APAC

**DATABASE:** Youngwoo Digital Co., Ltd.

**ENGINEERED SYSTEMS:** Neusoft Corporation

**INDUSTRY:** Infosys Limited (Finacle)

**MIDDLEWARE:** TimeGate Co., Ltd.

**SERVER AND STORAGE SYSTEMS:** United Electronics Co., Ltd.

**VALUE ADDED DISTRIBUTOR:** ECS Holdings Limited

#### SPECIALIZED PARTNER OF THE YEAR—

#### EUROPE, MIDDLE EAST, AND AFRICA

**APPLICATIONS:** Capgemini

**DATABASE AND MIDDLEWARE:** Everis

**ENGINEERED SYSTEMS:** TAS SpA

**INDUSTRY:** Soft Alliances and Resources

**ORACLE CLOUD:** Accenture AG

**SERVER AND STORAGE SYSTEMS:** SCC Plc



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#### SPECIALIZED PARTNER OF THE YEAR—

#### GLOBAL

**APPLICATIONS:** Accenture

**DATABASE AND MIDDLEWARE:** NEC

Corporation

**ENGINEERED SYSTEMS:** Cloud Creek Systems, Inc.

**INDUSTRY:** Deloitte

**SERVER AND STORAGE SYSTEMS:** SCC Plc



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#### SPECIALIZED PARTNER OF THE YEAR—

#### JAPAN

**INDUSTRY:** NEC Corporation

**JAPAN PARTNER OF THE YEAR:** FUJITSU LIMITED

**ENGINEERED SYSTEMS:** FUJITSU LIMITED

**APPLICATIONS:** TIS Inc.

**DATABASE AND MIDDLEWARE:** NEC Corporation

**SERVER AND STORAGE SYSTEMS:** ITOCHU Techno-Solutions Corporation

**ENTERPRISE PERFORMANCE MANAGEMENT:** TIS Inc.

**ENTERPRISE MANAGER:** NS Solutions Corporation

**SECURITY AND DATA INTEGRATION:** ITOCHU Techno-Solutions Corporation

**ORACLE EXADATA:** ITOCHU Techno-Solutions Corporation

**ORACLE EXALOGIC:** NTT DATA INTELLILINK CORPORATION

**ORACLE EXALYTICS:** FUJITSU LIMITED

**ORACLE DATABASE APPLIANCE:** K.K. Ashisuto

**LINUX:** FUJITSU LIMITED

**APPLICATIONS INNOVATION:** IBM Japan, Ltd.

**SYSTEMS INNOVATION:** Hitachi, Ltd.

**SUPPORT QUALITY:** NEC Corporation

**VALUE ADDED DISTRIBUTOR:** SoftBank BB Corporation

**INDEPENDENT SOFTWARE VENDOR:** Toshiba Solutions Corporation



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#### SPECIALIZED PARTNER OF THE YEAR

1. Representatives of Specialized Partner of the Year Cloud Creek Systems, Inc., with Oracle executives (left to right): Matt Mills, Oracle; Bryan Colville, Cloud Creek Systems; Jeff Henley, Oracle; Rhos Dyke, Cloud Creek Systems; Thomas LaRocca, Oracle 2. Representatives of Specialized Partner of the Year KBACE Technologies, Inc., with Oracle executives (left to right): Terri Hall, Oracle; Bhaskar Reddy, John Faherty, and Nicole Mores, KBACE; Jeff Henley, Oracle; Ravi Mamgain, KBACE; Joanne Olsen, Oracle; Stephanie Edward-Scholes and Bill Keenan, KBACE; 3. Representatives of Specialized Partner of the Year Keste with Oracle executives (left to right): Matt Mills, Oracle; Srihari Nadathur and Vince Casarez, Keste; Jeff Henley, Oracle; Howard Moore, Keste; Thomas LaRocca, Oracle; Sri Ayyeppen and Ken Judd, Keste

### DATA WAREHOUSE LEADER OF THE YEAR

1. Data Warehouse Leader of the Year Dr. Marcus Prätzas (right), Deutsche Bank, with Cetin Özbütin, Oracle 2. Data Warehouse Leader of the Year Ross Bensen, Thomson Reuters



### SPECIALIZED PARTNER OF THE YEAR *continued*

**SPECIALIZATION:** ITOCHU Techno-Solutions Corporation

**SUPPORT:** K.K. Ashisuto

**ORACLE UNIVERSITY:** FUJITSU LEARNING MEDIA LIMITED

**CONSULTING:** N.S. COMPUTER SERVICE COMPANY, LTD.

#### SPECIALIZED PARTNER OF THE YEAR—LATIN AMERICA

**APPLICATIONS:** InMotion

**DATABASE AND MIDDLEWARE:** Discover

**INDUSTRY/APPLICATIONS:** Neticel

**ENGINEERED SYSTEMS:** Service Informática Ltda

**SERVER AND STORAGE SYSTEMS:** Grupo de Tecnología Cibernética

#### SPECIALIZED PARTNER OF THE YEAR—NORTH AMERICA

**BI/EPM:** Infosys Limited and KPI Partners

**BROAD MARKET SOFTWARE REVENUE:** Mythics, Inc.

**BROAD MARKET HARDWARE REVENUE:** Forsythe

**MIDDLEWARE:** Keste

**ORACLE ON ORACLE:** Cloud Creek Systems, Inc.

**SECURITY AND IDENTITY MANAGEMENT:** Deloitte and Simeio Solutions LLC

**SI APPLICATIONS:** IBM Global Business Services and KBACE Technologies, Inc.

**COMMUNICATIONS, MEDIA, AND**

**ENTERTAINMENT:** Fadel Partners, Inc.

**CONSUMER AND RETAIL:** Object Edge Inc.

**EDUCATION:** KPI Partners

**ENERGY AND UTILITIES:** Enkitec

**FINANCIAL SERVICES:** Enkitec

**HEALTH AND LIFE SCIENCES:** NTT Data

**MANUFACTURING AND DISTRIBUTION:**

Deloitte

**PUBLIC SECTOR:** 3Di

**SERVICES:** AST Corporation and Infosys Limited

### DATA WAREHOUSE LEADER OF THE YEAR

The Data Warehouse Leader of the Year awards recognize individuals who demonstrate excellent technical ability and superior knowledge of Oracle data warehouse technologies and consistently apply best practices while demonstrating leadership and sharing experience both inside and outside their businesses.

#### DATA WAREHOUSE LEADER OF THE YEAR—ASIA PACIFIC

Lao Zhiyong, Manager, Software Package and BI Platform Group, Platform Department, BP&IT, Huawei Technologies Co.

**DATA WAREHOUSE LEADER OF THE YEAR—****EUROPE, MIDDLE EAST, AND AFRICA**

Dr. Marcus Prätzas, Head of Technical Assurance for Global Technology Production, Deutsche Bank

**DATA WAREHOUSE LEADER OF THE YEAR—****NORTH AMERICA**

Ross Bensen, Head of Business Intelligence Architecture, Thomson Reuters

## **ORACLE FUSION MIDDLEWARE INNOVATION**

The Oracle Fusion Middleware Innovation awards honor Oracle customers for their cutting-edge solutions using Oracle Fusion Middleware. Winners are selected based on the uniqueness of their business case, business benefits, level of impact relative to the size of the organization, complexity and magnitude of implementation, and the originality of their architecture.

**BUSINESS ANALYTICS (ORACLE BI, ORACLE EPM, ORACLE EXALYTICS)**

SITA

WellPoint

**ORACLE APPLICATION DEVELOPMENT****FRAMEWORK AND ORACLE FUSION****DEVELOPMENT**

Infotech

Schneider National, Inc.

**ORACLE CLOUD APPLICATION FOUNDATION**

NTT DOCOMO

Pegasus

Telefónica

**ORACLE DATA INTEGRATION**

Royal Bank of Scotland

The Yalumba Wine Company

**ORACLE EXALOGIC ELASTIC CLOUD**

NTT Communications

University of Melbourne

**ORACLE IDENTITY MANAGEMENT**

ANZ Banking Group

Putnam Investments

**SERVICE-ORIENTED ARCHITECTURE AND BUSINESS PROCESS MANAGEMENT**

Sicredi

Telefónica Movistar Mexico

Wyndham Exchange & Rentals

**ORACLE WEBCENTER**

Choice Hotels

Statoil Fuel & Retail



## **ORACLE FUSION MIDDLEWARE INNOVATION**

1. Winners of the Oracle Fusion Middleware Innovation: Oracle Application Development Framework award
2. Winners of the Oracle Fusion Middleware Innovation: Oracle WebCenter award
3. Winners of the Oracle Fusion Middleware Innovation: Business Analytics (Oracle BI, Oracle EPM, Oracle Exalytics) award

## 2013 ORACLE EXCELLENCE AWARDS



### ECO-ENTERPRISE INNOVATION

1. Winners of the Eco-Enterprise Innovation Award and their partners with Oracle executives (left to right): Kirby Miner, Trex Company; Umang Nahata, Evolutionary System Arabia Fz LLC; Alamro, Mohammed Mansour; Al Buthi, Fahad Mohammed, National Guard Health Affairs; Henry Hon, Telstra International Group; Florin Guma, University of Salzburg; Jon Chorley, Oracle; Lance Fisher, SThree; Robert Kaplan, Walmart; Christopher Lofgren, Schneider National, Inc.; Jürgen Eriijgers, i4BI  
2. Chief Sustainability Officer winner Robert Kaplan, Walmart (left), with Jeff Henley, Chairman of the Board, Oracle



2



3

### PROACTIVE SUPPORT: CHAMPION

3. Proactive Support Champion winner Kashif Manzoor, Raqmiyat LLC

### ECO-ENTERPRISE INNOVATION

The Eco-Enterprise Innovation awards honor customers for their use of Oracle products to take an environmental lead, as well as to reduce costs and improve business efficiencies using green business practices. Partners that help winning customers with their sustainability initiatives are also honored.

#### CUSTOMERS AWARDED 2013 ECO-ENTERPRISE INNOVATION AWARDS:

Centennial Coal  
Indaver nv  
Korea Enterprise Data  
National Guard Health Affairs  
Schneider National, Inc.  
SThree  
Telstra International Group  
Trex Company  
University of Salzburg  
Walmart  
Yeoncheon County Office

#### PARTNERS AWARDED 2013 ECO-ENTERPRISE INNOVATION AWARDS:

CSS International, Inc.  
Daesang Information Technology  
Evolutionary System Arabia Fz LLC  
i4BI  
Infosys Limited  
Knowledge Global  
Solutions for Retail Brands Limited  
Sysgen

#### CHIEF SUSTAINABILITY OFFICER

Robert Kaplan, Director, Product Sustainability, Walmart

### PROACTIVE SUPPORT: CHAMPION

The Proactive Support Individual Champion awards honor Oracle customers or partners for driving the proactive adoption of tools and resources within their own or their customers' companies.

#### PROACTIVE SUPPORT: INDIVIDUAL CHAMPIONS

Kashif Manzoor, Project Manager, ERP, Raqmiyat LLC  
Mikko Pulli, Support Manager, BSC, Vaisala Oyi

### NEXT STEPS

#### MEET the winners

[oracle.com/us/corporate/awards](http://oracle.com/us/corporate/awards)

ORACLE BUSINESS INTELLIGENCE MOBILE APP DESIGNER

# Speed Mobile

Quickly deploy line-of-business mobile business intelligence apps with Oracle Business Intelligence Mobile App Designer.

**O**racle Business Intelligence Mobile App Designer enables organizations to quickly deploy HTML5-compliant mobile apps that work with most modern mobile devices, including Apple iOS, Android, and BlackBerry tablets and phones. Part of Oracle Business Intelligence Enterprise Edition 11g and enabled through the 11.1.1.7.1 patch set for Oracle Business Intelligence, Oracle Business Intelligence Mobile App Designer is particularly suited to creating line-of-business (LOB) applications because it offers complete control of the layout, navigation, and content of the app with a thin-client layout editor.

This article walks you through creating your first mobile business intelligence (BI) app with Oracle Business Intelligence Mobile App Designer and the Oracle Business Intelligence Enterprise Edition 11.1.1.7.1 Sample Application (V309 R2), which can be downloaded from Oracle Technology Network at [bit.ly/1feXOqb](http://bit.ly/1feXOqb). The designer and the sample app are delivered together as an Oracle VM VirtualBox image, and you'll use these tools to create an Oracle Business Intelligence Mobile LOB app for a fictitious product marketing manager who needs to quickly see sales and other activity for the brands and products he manages on his mobile device.

## CREATING AN INITIAL BUSINESS INTELLIGENCE MOBILE APP

To create your first Oracle Business Intelligence Mobile app, first download the Oracle Business Intelligence Enterprise Edition 11.1.1.7.1 sample application (V309 R2), unzip the files, and import them into your Oracle VM VirtualBox environment. Then follow these steps:

1. Ensure that the Oracle VM VirtualBox SampleApp V309 R2 virtual machine has

been started and that Oracle Database, Oracle WebLogic Server, and the services required to run Oracle Business Intelligence Enterprise Edition 11g are running. Navigate to the toolbar at the top of the desktop, and click the Firefox web browser icon to open a new browser window.

2. When the web browser opens, enter <http://localhost:9704/analytics> as the web address and click Enter to navigate to the local Oracle Business Intelligence website. On the login page, use the username and password Prodney/Admin123 and click Sign In to display the home page.
3. To start creating your mobile app, select New -> Mobile App from the application menu. A wizard appears that enables you to select the mobile device type your app will target and the datasource it will use. When prompted, select Tablet as the device type and BI Subject Area as the datasource type and ensure that A - Sample Sales is selected as the subject area for your datasource. Then click Save and, when prompted, navigate to the Shared Folders->Mobile App Designer

catalog folder, name your app Product Manager Brief, and click OK to save the initial app definition to the Presentation Services catalog.

4. The mobile app you'll now create will include a title page and a set of subsequent pages that contain charts, tables, and other visualization components. The app should now be open for editing, with the title page already created for you and a default cover image you can use or replace with one of your own. For this example, leave the default image in place but double-click the page name field and change the page name to Welcome!, as shown in Figure 1.
5. Then, on the same page, scroll down and locate the page title and subtitle text, double-click each in turn, and change them to Product Manager Brief and Powered by Oracle BI, respectively.
6. Now you'll start creating the pages to contain the app's content, with the first one enabling the user to navigate up and down within the product hierarchy, showing graphs and tables for products and product groupings the

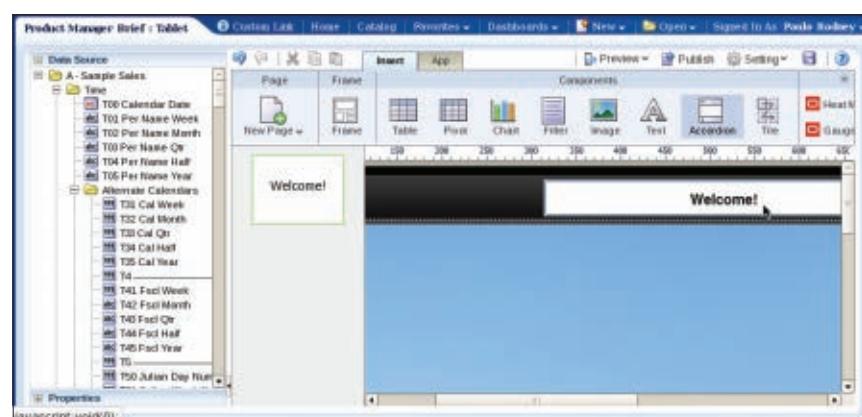


Figure 1: Editing the title page name

user selects. To create this page, ensure that the **Insert** tab is selected in the Oracle Business Intelligence Mobile App Designer ribbon toolbar and then select **Page** -> **Navigation Page**. When prompted, select **Products** -> **P3 LOB** as the column to group by and **Summation of Facts** -> **Base Facts** -> **1 – Revenue** as the measure to display alongside the product LOB names. When the selections are complete, click **OK** to close the dialog box and display the new page, ready for editing.

6. With the new page open for editing, in the same way you did with the title page, change the page name from **Page 2** to **Brands and Products**. Then navigate to the top left corner of the page editor, where you will see a navigation area with **P3 LOB** as the title and two tiles underneath it: **P3 LOB** on one side and **1 – Revenue** on the other. Using the **Data Source** panel on the far left of the page, drag and drop the **Products** -> **P2 Product Type** data item onto the **Drop Here** tile immediately below the **P3 LOB** tile in the page editor, as shown in Figure 2, to define the navigation path for that page.
7. Now that you have defined the navigation path, you can add app components to the right side of the page. When the user navigates through the product hierarchy on the left side of the page, the components on the right side will automatically filter the product group the user has selected.

With the **Insert** tab selected, start by dragging and dropping a **Chart** component into the top left cell in the layout grid, so that the default vertical bar chart is added to the layout grid, ready for you to configure. To create a bar chart that displays the total revenue for all production within the selection, use the following settings:

<b>Chart Type:</b>	<b>Bar -&gt; Vertical Bar (default)</b>
<b>Value:</b>	<b>Facts -&gt; Base Facts -&gt; 1 – Revenue</b>
<b>Label:</b>	<b>Products -&gt; P1 Product</b>

8. Now drag and drop another chart component into the top right cell in the layout grid, using the following settings:

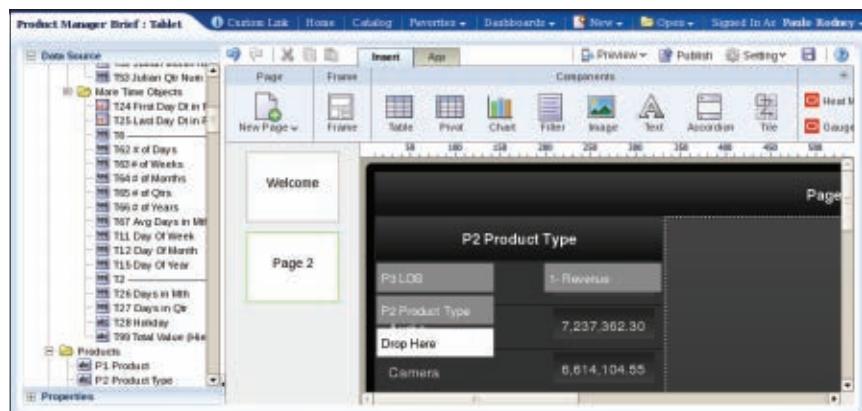


Figure 2: Defining the navigation path for the app page

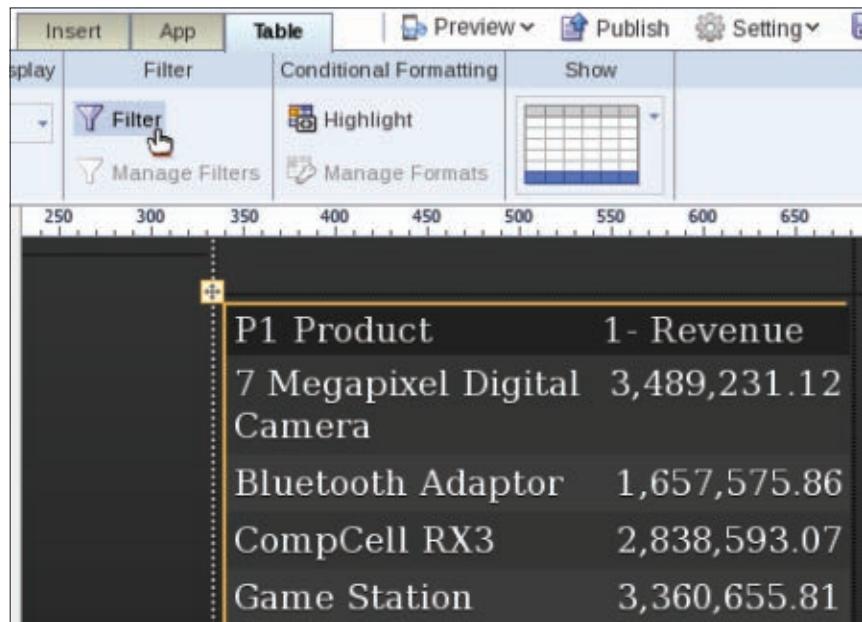


Figure 3: Filtering the rows displayed in the table

<b>Chart Type:</b>	<b>Line -&gt; Vertical Line</b>
<b>Value:</b>	<b>Facts -&gt; Base Facts -&gt; 1 – Revenue</b>
<b>Series:</b>	<b>Products -&gt; P2 Product Type</b>
<b>Label:</b>	<b>Time -&gt; T03 Per Name Qtr</b>

9. For the bottom left cell in the layout grid, add a table of the top five best-selling products within the selected product group. With the **Insert** tab selected, drag and drop a **Table** component into this cell and then drop the **Products** -> **P1 Product** data item onto the table so that it is left-aligned within the table. Then drag and drop the **Facts -> Base Facts -> 1 – Revenue** data item onto the table next to it on the right, so

that the revenue for each product is displayed.

Next, filter the list so that only the top five products by revenue are displayed. To do this, click the whole **Table** component so that it is selected and then click **Filter** on the ribbon menu, as shown in Figure 3.

In the **Filter** dialog box, which appears, select the following values to return just the top five products by revenue:

<b>Data Field:</b>	<b>1 – Revenue</b>
<b>Operator:</b>	<b>is in top</b>
<b>Value:</b>	<b>5</b>

Click OK to close the dialog box.

To ensure that the table's contents fit within the available space on the mobile app page, click each of the columns and column headers within the Table component to select them and then use the Font setting on the ribbon menu to change each element's font size to 10 points.

To clean up the column headings and set the column number format, click the two table column headers in turn and edit P1 Product to read Product and 1 - Revenue to read Revenue.

Finally, click the column containing the revenue measure, select Currency as the Data Formatting value, and repeat this for the total cell at the bottom of the column.

- Finally, put an image from the product catalog into the bottom right cell in the layout grid, to show how these mobile apps can display text, images, and other content relevant to the application. To add an image, ensure that the Insert tab is selected in the ribbon menu and click in the bottom right cell to select it. Then click Image in the menu and drag it into the empty cell. Enter the following URL at the Insert an Image prompt:

```
http://localhost:9704/analytics/
saw.dll?downloadfile&Path=
%2Fshared%2F3.%20Analysis
%20and%20Dashboards
%2FResources Uploaded in Webcat
%2FProducts_image.jpg
```

Note that this image URL refers to a JPG file contained in the SampleApp Presentation Services Catalog, used elsewhere in the demonstration dashboards. You can upload your own image if you prefer or reference an image file accessible to your Oracle Business Intelligence server.

When the selections and the edits are complete, click Save to save the app definition to the SampleApp Presentation Services Catalog. You're now at the point where you can preview your app before publishing it to the SampleApp Mobile Apps Store Apps Library, where your users can subscribe to it.

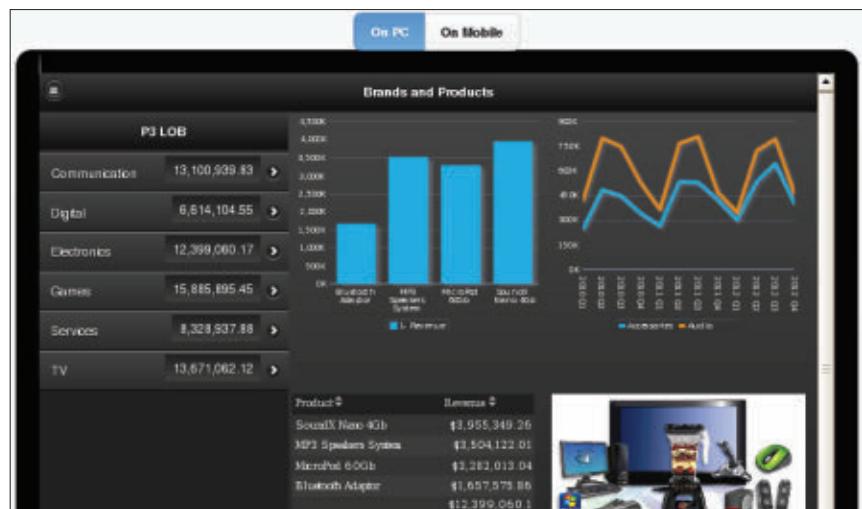


Figure 4: Previewing your mobile app

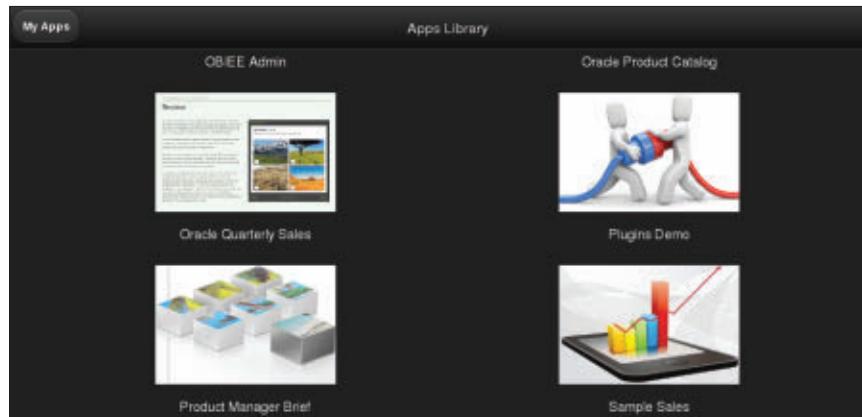


Figure 5: Viewing the app as listed in the Apps Library

- To preview the app, click Preview (above the ribbon menu). You can then work with a preview of the app in your web browser, using the menu button at the top left of the page to switch between the cover page and the page containing your BI components, and use the navigation elements on the second page to move up and down within the product hierarchy, as shown in Figure 4.

Now that you've created your mobile app, you can append additional pages with features such as tile and pivot table components and additional navigation components such as accordion menus and links to subpages. SampleApp V309 R2, which comes with several example mobile apps already installed and ready to be subscribed to, is accessible from your web browser at <http://localhost:9704/mobile/appstore>.

If you've already looked at the example apps on the SampleApp Mobile Apps Store Apps Library, you might be wondering how to get your new app listed alongside all the others in the Apps Library section, ready to be subscribed to and accessed by end users. To do this, you have to publish the app, and in this next set of steps, you'll do just that.

## PUBLISHING YOUR APP TO THE MOBILE APP STORE

When your app is ready to be made available for your end users to use, you can publish it to the app store by following these steps:

- Ensure that you are still logged in to the Oracle Business Intelligence website, open your app for editing again, and confirm that the Oracle Business Intelligence Mobile App Designer layout editor is displaying your app in edit mode.

2. Click the Publish button, at the top of the screen. The Publish App dialog box will then appear.
3. On the Sign-In page, leave Local as the default value and click Next. On the Enter Attributes page, click Browse to navigate to and select the following file—

`/home/oracle/obiee/user_projects/domains/bifoundation_domain/servers/bi_server1/tmp/_WL_user/analytics_11.1.1/7dezjl/war/res/sk_blafp/login/logoncubes.jpg`

- and click Next.
4. The dialog box should then display the message "Your app is valid. Click Publish to publish your app to the Apps Library." When the message appears, click Publish and then click View. You should see your new mobile app displayed in the Apps Library, as shown in Figure 5.

Congratulations! You have just created and published your first mobile BI app, using Oracle Business Intelligence Mobile App Designer.

#### CONCLUSION

Oracle Business Intelligence Mobile App Designer complements Oracle Business Intelligence's other mobile BI tools, providing a drag-and-drop environment for creating rich, interactive mobile apps that can be viewed by any HTML5-compliant mobile device.

To learn more about Oracle Business Intelligence Mobile App Designer, view documentation including *User's Guide for Oracle Business Intelligence Mobile App Designer 11g Release 1 (11.1.1)*, watch videos on how to create a mobile BI app and use key designer features, explore tutorials, review collateral, and interact with social media, go to [bit.ly/1cIORdI](http://bit.ly/1cIORdI). ◀



**Mark Rittman** is an Oracle ACE Director and cofounder of Rittman Mead, an Oracle Gold Partner based in the UK, with offices in the US, India, and Australia. Rittman has worked with Oracle's business intelligence, data integration, and data warehousing products for more than 15 years, and he writes for the Rittman Mead blog at [rittmanmead.com/blog](http://rittmanmead.com/blog).

#### NEXT STEPS

**READ** more about

Oracle Business Intelligence Mobile App Designer  
[bit.ly/1cIORdI](http://bit.ly/1cIORdI)

**DOWNLOAD**

Oracle Business Intelligence Enterprise Edition 11.1.7.1 Sample Application (V309 R2)  
[bit.ly/1feX0qb](http://bit.ly/1feX0qb)



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*Conservation through Research and Education*  
[www.polarbearsinternational.org](http://www.polarbearsinternational.org)



# Help Us Help the Polar Bear

PHOTO © R&C BUCHANAN

ORACLE DATABASE 12c

# Hide from Prying Eyes

Use Data Redaction in Oracle Database 12c to hide sensitive data automatically.



John, the lead DBA at Acme Bank, is listening patiently to the visitors in his office today. To comply with several mandates and regulations, the bank must make sure that some types of data—such as Social Security numbers and the date of the last withdrawal—in Acme's database tables are altered to hide their true values from all visitors. This masking must be done at the database level—not by the user interface tools that are pulling the data. (Masking data to protect it from prying eyes is called *redaction*.) Jill, the lead developer at Acme Bank, emphasizes an important requirement: the data must remain intact in the database tables; it is only the displayed information that must be redacted. Further, she adds, the application user accounts must show the real account information without redaction when account holders pull it.

Traditionally, meeting this redaction requirement has meant creating views on tables and assigning privileges to users on the views, not on the actual database tables. Although the view approach works for redaction, it is complex, error-prone, and subject to performance issues. Jill asks if there is a simple and fast mechanism for setting up redaction.

Yes, there is, John informs her, with Oracle Advanced Security's Data Redaction feature in Oracle Database 12c.

## THE REQUIREMENTS

Jill explains that all of the bank's data is stored in the TSBS schema, named after the application (Total Standard Banking System). A table named SAVINGS stores the details of the savings accounts. She shows everyone the structure of the SAVINGS table:

Name	Null?	Type
ACCNO		NUMBER
ACCNAME		VARCHAR2(20)
ID_NO		VARCHAR2(9)
LAST_DEP_DT		DATE
FOLIOID		NUMBER
EMAIL		VARCHAR2(200)

When the TSBS user selects data from the SAVINGS table, the results display with the values intact—but when any other user selects data from the table, Jill continues, the data must be masked, as shown in Table 1.

Jill explains that these redaction requirements have traditionally been met in two ways:

1. The developers put the data masking code in the application. This makes applications complex to develop and difficult to manage, and—even worse—the logic of redactions, being in the application code, may be inconsistent across different applications, making this approach highly undesirable to Jill.

2. The DBAs create a view—called VW\_SAVINGS, for example—on the SAVINGS table. Inside the view, the DBAs change the column values, grant necessary privileges to the appropriate users for this view, and create a public synonym called SAVINGS that points to the VW\_SAVINGS view instead of the SAVINGS table. This way, when users select from the SAVINGS object, they are actually selecting from the VW\_SAVINGS view instead of the SAVINGS table. Because the view performs the appropriate masking of the data, the users see the redacted values only, regardless of the application they connect from, solving the inconsistent-logic problem of the application coding redaction approach.

However, developers want to insert, update, and delete table data as well. A statement such as `INSERT INTO SAVINGS` actually references the VW\_SAVINGS view, so the statement fails, because data can't be inserted into the derived columns of the view. The only option for changing data while using the view is to use `INSTEAD OF` triggers, which actually update the table behind the scenes. This makes application development complex and prone to mistakes, and Jill does not want to use that technique either.

## REDACTION

Have no worries, John assures her. Acme can use Data Redaction in Oracle Database 12c to accomplish her objectives easily. The feature enables Acme to define a set of rules on what data can be redacted in a specific table, plus how and when. This set of rules is called a *redaction policy*, or just a *policy* for short. The supplied PL/SQL package, DBMS\_REDACT, includes all the

Column	Description and Redaction Requirement
ID_NO	National ID number, such as the Social Security number in the US. Replace each of the first five characters of the column with a * and show only the last four characters. (Example: for 123456789, show ****6789.)
LAST_DEP_DT	Date of last deposit. Show only day and month, and replace the year with 1900. (Example: for Jan 14, 2013, show Jan 14, 1900.)
FOLIOID	ID of the folio where the account is located. Replace the number with any random number.
EMAIL	E-mail address of the account holder. Replace the e-mail address before the @ sign with four x's, and keep the domain name. (Example: for john.smith@prolincence.com, show xxxx@prolincence.com.)

Table 1: Redaction requirements for Acme Bank's SAVINGS table

functionality for creating and maintaining policies on a table.

To set up a demonstration, John uses the setup.sql script, located in the Oracle-hosted online version of this article, at [bit.ly/1g5wgeA](http://bit.ly/1g5wgeA). John then uses the code shown in Listing 1 to set up a redaction policy on the SAVINGS table.

The DBMS\_REDACT.ADD\_POLICY procedure enables John to add the policy on a table with some basic parameters, including

- OBJECT\_SCHEMA: the owner of the table—TSBS in this case.
- OBJECT\_NAME: the table name—SAVINGS in this case—on which the policy is defined.
- POLICY\_NAME: the name of the policy—Savings\_Redaction in this case—used to refer to the policy later.
- COLUMN\_NAME: the name of the column—ID\_NO in this case—that is to be redacted.
- EXPRESSION: a parameter that enables John to specify a condition that returns either TRUE or FALSE. The redaction is performed only if the condition is TRUE. The expression SYS\_CONTEXT('USERENV', 'CURRENT\_USER')!= 'TSBS' will return TRUE for all users except TSBS, so the column will be redacted for all users except TSBS—exactly what Jill wants. John can place any expression here, as long as it returns TRUE or FALSE.

John explains the redaction mechanism, by referring to the line numbers in Listing 1. In line 8, he sets the extent of the redaction on the ID\_NO column, which is partial (DBMS\_REDACT.PARTIAL)—only a part of the value is to be redacted, not the entire value. (If he had wanted to redact the entire value, he would have used DBMS\_REDACT.FULL here.)

Line 9 shows the redaction formats. There are five masking parameters, separated by commas, John explains. The first—VVVVVVVVV—is the input value; it is the actual value stored in the ID\_NO column. In this case, each V represents a number. The second value—VVVVVVVVV—shows what to display. The third value, which in this case is \*, shows the value to use in place of the redacted value. Because Jill wants to show \* for the redacted values, John

#### Code Listing 1: Redaction setup

```

1 begin
2   dbms_redact.add_policy (
3     object_schema => 'TSBS',
4     object_name => 'SAVINGS',
5     policy_name => 'Savings_Redaction',
6     expression => 'USER!=''TSBS''',
7     column_name => 'ID_NO',
8     function_type => dbms_redact.partial,
9     function_parameters      => 'VVVVVVVVV,VVVVVVVVV,*,1,5'
10 );
11 -- subsequent columns will need to be added
12 dbms_redact.alter_policy (
13   object_schema => 'TSBS',
14   object_name => 'SAVINGS',
15   policy_name => 'Savings_Redaction',
16   action  => dbms_redact.add_COLUMN,
17   column_name => 'FOLIOID',
18   function_type => dbms_redact.random
19 );
20 dbms_redact.alter_policy (
21   object_schema => 'TSBS',
22   object_name => 'SAVINGS',
23   policy_name => 'Savings_Redaction',
24   action  => dbms_redact.add_COLUMN,
25   column_name => 'LAST_DEP_DT',
26   function_type => dbms_redact.partial,
27   function_parameters      => 'MDy1900'
28 );
29 dbms_redact.alter_policy (
30   object_schema => 'TSBS',
31   object_name => 'SAVINGS',
32   policy_name => 'Savings_Redaction',
33   action  => dbms_redact.add_COLUMN,
34   column_name => 'EMAIL',
35   function_type => dbms_redact.regexp,
36   regexp_pattern => dbms_redact.re_pattern_email_address,
37   regexp_replace_string => dbms_redact.re_redact_email_name,
38   regexp_position => dbms_redact.re_beginning,
39   regexp_occurrence => dbms_redact.re_all
40 );
41 end;

```

#### Code Listing 2: Selection by the APP user

```

SQL> conn app/app

SQL> select * from tsbs.savings;

ACCNO ACCNAME    ID_NO     LAST_DEP_DT FOLIOID EMAIL
-----  -----  -----  -----  -----  -----
101  John Smith  *****6789  21-SEP-00  3434562  xxxx@proligence.com
102  Jane Smith  *****7890  20-SEP-00  3452092  xxxx@proligence.com
103  Jane Doe    *****8901  19-SEP-00  4529012  xxxx@proligence.com

```

uses that character here. The fourth value indicates the position in the input value where the redaction should start, which, in this case is 1—meaning that the redaction should start in the first position. The fifth and final value shows the number of characters to be redacted from the starting

position. Because Jill wants to redact the first five numbers, John uses 5 here. With this setting, if the input value is 123456789, the redaction will be between the first and fifth positions, inclusive, and \* will be used to mask actual values, so the final redacted value will be \*\*\*\*\*6789.

But ID\_NO is not the only column Acme needs to redact. To add the other columns to the redaction policy, John alters the policy by executing another procedure in the DBMS\_REDACT package—ALTER\_POLICY—shown in line 12 of Listing 1. The ACTION parameter in line 16 specifies the type of alteration—ADD\_COLUMN—and line 17 specifies the column that needs to be added to the policy—FOLIOID. Because the FOLIOID column should be completely redacted with random values, the next parameter—FUNCTION\_TYPE—in line 18, specifies DBMS\_REDACT.RANDOM.

John adds the other columns to the policy in the same way. For the LAST\_DEP\_DT column, where only the year needs to be redacted, he sets the FUNCTION\_TYPE parameter to DBMS\_REDACT.PARTIAL in line 26 of Listing 1. In line 27, he sets the FUNCTION\_PARAMETERS value to MDy1900. The use of uppercase M and D means that the month/day component of the date value should remain unaltered during redaction. The use of the lowercase y means that the year should be redacted and that the number immediately following that y—1900—is the value substituted for the actual value. The net effect of the parameter is that the date and month in the LAST\_DEP\_DT column value remain the same and the year is replaced everywhere with 1900.

The redaction requirement for the EMAIL column is a bit more complex. The redaction policy must detect a pattern in the value and redact only part of it. In this case, the policy must redact only the portion before the @ sign and leave the rest intact. Jill worries that it might require complex coding. On the contrary, John explains, it is quite easy with the built-in functions for regular expressions, which are designed for partial matching. In Listing 1, line 35, he sets the FUNCTION\_TYPE parameter to a constant named DBMS\_REDACT.REGEXP, which instructs the redaction package to use regular expressions. The redaction package includes some predefined templates for different types of values, including e-mail addresses. In line 36, he specifies that EMAIL column values are in e-mail address format. In line

#### Code Listing 3: Selection by the TSBS user

```
SQL> conn tsbs/tsbs
SQL> select * from tsbs.savings;
ACCNO ACCNAME      ID_NO       LAST_DEP_DT  FOLIOID EMAIL
-----  -----
101  John Smith   123456789 21-SEP-13  1234567  john.smith@proligence.com
102  Jane Smith   234567890 20-SEP-13  2345678  jane.smith@proligence.com
103  Jane Doe     345678901 19-SEP-13  3456789  jane.doe@proligence.com
```

#### Code Listing 4: Effect of redaction on update

```
SQL> select id_no, FOLIOID from tsbs.savings where accno=101;
ID_NO      FOLIOID
-----  -----
*****6789    7420987

SQL> update tsbs.savings set FOLIOID = 500 where id_no='123456789';
1 row updated.

SQL> select id_no, FOLIOID from tsbs.savings where accno=101;
ID_NO      FOLIOID
-----  -----
*****6789    7590112
```

37, he specifies replacement of the name portion—the part before the @ sign. It's that simple to include the appropriate parameters, he explains, and the DBMS\_REDACT package does the rest.

#### TESTING

After John executes the code in Listing 1, the Savings\_Redaction redaction policy on the SAVINGS table is now active on the ID\_NO, LAST\_DEP\_DT, FOLIOID, and EMAIL columns. To test the redaction, Jill logs in to an application that connects as the APP user, and she selects from the SAVINGS table, as shown in Listing 2. Jill compares the results with her original requirements in Table 1 and pronounces them completely compliant. To complete the test, she logs in as the schema owner—TSBS—and selects from the SAVINGS table in the application. The results, shown in Listing 3, display the original values without redaction.

#### PROTECTION MECHANISMS

There is a small issue with this redaction policy, Jill opines. The application is using

the APP user to connect to the database. It needs to update, insert into, and delete from the table as well as select from it. If the data is masked, the APP user will not be able to match exact values. For example, she continues, after a folio shuffling, suppose the APP user wants to set the FOLIOID of the account of the customer with ID\_NO 123456789 to 9876 but, due to redaction, the APP user can't see the exact value of either the ID\_NO or FOLIOID columns. The applications would have to be modified to change the predicate or use different user IDs—neither of which is a palatable option for Jill, who wants a better, more workable solution from John.

That's simple, John answers. Redaction protects data from being visible for examination, but it does not prevent application logic. Data Redaction, he explains, does not change the underlying data in the database; it redacts the data only when it is displayed. To demonstrate, he performs a simple update as the APP user, as shown in Listing 4. He also selects the data before and after the update. The update works perfectly without any issues, but

the displayed data is redacted in all cases. What this means, John clarifies, is that the application needs no change whatsoever to enable redaction. Jill is greatly relieved to hear that.

Jack, another developer, is concerned that when a user creates another table by selecting data from the SAVINGS table, whose data is redacted—and, in some cases, replaced by completely random values—the new table may contain wrong data and create confusion among users, which is quite a serious issue. John assures him that that will not be the case and demonstrates:

```
SQL> create table my_savings as
select * from tsbs.savings;
create table my_savings as select *
from tsbs.savings
*
ERROR at line 1:
```

ORA-28081: Insufficient privileges - the command references a redacted object.

The realm of protection is not just for the table, John explains. If the APP user creates a view on the SAVINGS table, the view will also contain the redacted data.

### CONCLUSION

Using the Data Redaction feature in Oracle Database 12c, Acme can add policies to tables to mask data in any column to a desired format quickly and easily. Acme does not need to change any existing application code to enable the redaction, and UPDATE, INSERT, and DELETE operations continue to work as before for authorized users. And, most importantly, Acme does not need to create, use, and maintain views.

Everyone is satisfied with the solution, and the meeting is adjourned. ◀



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ORACLE DATABASE 12c

# Sophisticated Call Stack Analysis

UTL\_CALL\_STACK package in Oracle Database 12c gives developers better answers.

This third and last article on new PL/SQL features in Oracle Database 12c Release 1 focuses on the new UTL\_CALL\_STACK package.

## CALL STACKS, ERROR STACKS, AND ERROR BACKTRACES

Prior to Oracle Database 12c, Oracle Database offered several DBMS\_UTILITY functions to answer key questions programmers ask as they develop, debug, and maintain their code, and the functions have been extremely helpful. There is, however, always room for improvement, and that is why Oracle Database 12c added UTL\_CALL\_STACK.

Before I dive into UTL\_CALL\_STACK, here's a refresher on the three DBMS\_UTILITY functions that are reimaged by the new UTL\_CALL\_STACK package.

### DBMS\_UTILITY.FORMAT\_CALL\_STACK.

Introduced in Oracle7, the DBMS\_UTILITY.FORMAT\_CALL\_STACK built-in function returns a formatted string that shows the execution call stack: the sequence of invocations of procedures or functions that led to the point at which the function was called. In other words, this function answers the question, "How did I get here?"

Listing 1 demonstrates the DBMS\_UTILITY.FORMAT\_CALL\_STACK function and what the formatted string looks like.

This is very helpful information for tracing and error logging, but there are some drawbacks to using the DBMS\_UTILITY.FORMAT\_CALL\_STACK function and the string it returns:

- If you call a subprogram in a package, the formatted call stack will show only the package name, not the subprogram name and certainly not the names of nested subprograms defined within that packaged subprogram.

- If you simply want the name of the most recently executed subprogram, you will have to parse the string. This is not hard to do, but it's more code that you

have to write and maintain.

- The object handle value is, for all practical purposes, "noise." PL/SQL developers—outside of Oracle, at least—never use it.

**Listing 1:** Demonstration of the DBMS\_UTILITY.FORMAT\_CALL\_STACK function

```
SQL> CREATE OR REPLACE PROCEDURE proc1
  2  IS
  3  BEGIN
  4    DBMS_OUTPUT.put_line (DBMS_UTILITY.format_call_stack);
  5  END;
  6 /

SQL> CREATE OR REPLACE PACKAGE pkg1
  2  IS
  3    PROCEDURE proc2;
  4  END pkg1;
  5 /

SQL> CREATE OR REPLACE PACKAGE BODY pkg1
  2  IS
  3    PROCEDURE proc2
  4    IS
  5      BEGIN
  6        proc1;
  7      END;
  8  END pkg1;
  9 /

SQL> CREATE OR REPLACE PROCEDURE proc3
  2  IS
  3  BEGIN
  4    FOR indx IN 1 .. 1000
  5    LOOP
  6      NULL;
  7    END LOOP;
  8
  9    pkg1.proc2;
 10 END;
 11 /
```

```
SQL> BEGIN
  2  proc3;
  3  END;
  4 /
```

PL/SQL Call Stack		
object handle	line number	object name
000007FF7EA83240	4	procedure HR.PROC1
000007FF7E9CC3B0	6	package body HR.PKG1
000007FF7EA0A3B0	9	procedure HR.PROC3
000007FF7EA07C00	2	anonymous block

### DBMS\_UTILITY.FORMAT\_ERROR\_STACK.

Also introduced in Oracle7, the DBMS\_UTILITY.FORMAT\_ERROR\_STACK built-in function, like SQLERRM, returns the message associated with the current error (the value returned by SQLCODE).

The DBMS\_UTILITY.FORMAT\_ERROR\_STACK function differs from SQLERRM in two ways:

- It can return an error message as long as 1,899 characters, thereby avoiding (or at least making extremely unlikely) truncation issues when the error stack gets long. (SQLERRM truncates at only 510 characters.)
- You cannot pass an error code number to this function, and it cannot be used to return the message for an error code.

As a rule, you should call this function inside your exception handler and then store the error stack in your error log for later analysis.

### DBMS\_UTILITY.FORMAT\_ERROR\_BACKTRACE.

**Introduced in Oracle Database 10g,** the DBMS\_UTILITY.FORMAT\_ERROR\_BACKTRACE built-in function returns a formatted string that displays a stack of programs and line numbers *tracing back* to the line on which the error was originally raised.

This function closed a significant gap in PL/SQL functionality. In Oracle9i Database and earlier releases, once you handled an exception inside your PL/SQL block, you were unable to determine the line on which the error had occurred (perhaps the most important piece of information for developers).

If you did want to see this information, you had to allow the exception to go unhandled, at which point the full error backtrace was displayed on the screen or was otherwise presented to the user.

DBMS\_UTILITY.FORMAT\_ERROR\_BACKTRACE generates extremely useful information. I suggest that whenever you handle an error, you call the DBMS\_UTILITY.FORMAT\_ERROR\_BACKTRACE function and write the trace to your error log table. It will aid greatly in resolving the cause of the error.

Yet, as with the DBMS\_UTILITY.FORMAT\_CALL\_STACK function, the key

information (the name of the subprogram and the number of the line on which the error was raised) is buried in the formatted trace string. And, even worse, you do not see the name of the subprogram within the package in which the error occurred.

All of these drawbacks are addressed by the new-in-Oracle Database 12c UTL\_CALL\_STACK package.

### THE NEW UTL\_CALL\_STACK PACKAGE

The UTL\_CALL\_STACK package provides information about currently executing subprograms. Although the package name sounds as though it only provides information about the execution call stack, it also offers access to the error stack and error backtrace data.

Each stack contains *depths* (locations),

**Listing 2:** The format\_call\_stack\_12c procedure calls UTL\_CALL\_STACK subprograms

```
SQL> CREATE OR REPLACE PROCEDURE format_call_stack_12c
  2  IS
  3  BEGIN
  4    DBMS_OUTPUT.put_line (
  5      'LexDepth Depth LineNo Name');
  6    DBMS_OUTPUT.put_line (
  7      '----- ----- ----- -----');
  8
  9    FOR the_depth IN REVERSE 1 ..
 10      utl_call_stack.dynamic_depth ();
11    LOOP
12      DBMS_OUTPUT.put_line (
13        RPAD (
14          utl_call_stack.lexical_depth (
15            the_depth),
16            9)
17        || RPAD (the_depth, 5)
18        || RPAD (
19          TO_CHAR (
20            utl_call_stack.unit_line (
21              the_depth),
22            '99'),
23            8)
24        || utl_call_stack.concatenate_subprogram (
25          utl_call_stack.subprogram (
26            the_depth)));
27    END LOOP;
28 END;
29 /
```

Name	Description
BACKTRACE_DEPTH	Returns the number of backtrace items in the backtrace
BACKTRACE_LINE	Returns the line number of the unit at the specified backtrace depth
BACKTRACE_UNIT	Returns the name of the unit at the specified backtrace depth
CONCATENATE_SUBPROGRAM	Returns a concatenated form of a unit-qualified name
DYNAMIC_DEPTH	Returns the number of subprograms in the call stack, including SQL, Java, and other non-PL/SQL contexts invoked along the way—for example, if A calls B calls C calls B, this stack, written as a line with dynamic depths underneath it, will look like this: A B C B 4 3 2 1
ERROR_DEPTH	Returns the number of errors in the call stack
ERROR_MSG	Returns the error message of the error at the specified error depth
ERROR_NUMBER	Returns the error number of the error at the specified error depth
LEXICAL_DEPTH	Returns the lexical nesting level of the subprogram at the specified dynamic depth
OWNER	Returns the owner name of the unit of the subprogram at the specified dynamic depth
UNIT_LINE	Returns the line number of the unit of the subprogram at the specified dynamic depth
SUBPROGRAM	Returns the unit-qualified name of the subprogram at the specified dynamic depth

**Table 1:** The UTL\_CALL\_STACK package subprograms

and you can ask for the information at a certain depth in each of the three types of stacks made available through the package. This means that you no longer have to parse the formatted strings to find the specific information you need.

One of the greatest improvements of UTL\_CALL\_STACK over DBMS\_UTILITY.FORMAT\_CALL\_STACK is that you can obtain a *unit-qualified name*, which concatenates the unit name, all lexical parents of the subprogram, and the subprogram name. This additional information is not available, however, for the error backtrace. Table 1 includes a list and descriptions of the subprograms in the UTL\_CALL\_STACK package.

Let's look first at how you can use UTL\_CALL\_STACK to emulate the DBMS\_UTILITY.FORMAT\_CALL\_STACK function and display the complete call stack. To do this, you must iterate through the entries in the stack, identified by their depth. The format\_call\_stack\_12c procedure in Listing 2 does precisely this.

Here are the key UTL\_CALL\_STACK package subprogram calls in Listing 2:

- Lines 9 and 10 set up the numeric FOR loop and use the DYNAMIC\_DEPTH function to start from the last entry in the stack and go in reverse back to the first entry in the stack.
- Line 14 calls the LEXICAL\_DEPTH function to display the depth in the stack of each entry.

### **Listing 3:** The pkg.do\_stuff procedure calls the format\_call\_stack\_12c procedure

```
SQL> CREATE OR REPLACE PACKAGE pkg
  2  IS
  3      PROCEDURE do_stuff;
  4  END;
  5  /
SQL> CREATE OR REPLACE PACKAGE BODY pkg
  2  IS
  3      PROCEDURE do_stuff
  4      IS
  5          PROCEDURE np1
  6          IS
  7              PROCEDURE np2
  8              IS
  9                  PROCEDURE np3
 10                  IS
 11                      BEGIN
 12                          format_call_stack_12c;
 13                      END;
 14                      BEGIN
 15                          np3;
 16                      END;
 17                      BEGIN
 18                          np2;
 19                      END;
 20                      BEGIN
 21                          np1;
 22                      END;
 23  END;
 24  /
SQL> BEGIN
  2  pkg.do_stuff;
  3 END;
  4  /
```

LexDepth	Depth	LineNo	Name
0	6	2	__anonymous_block
1	5	21	PKG.DO_STUFF
2	4	18	PKG.DO_STUFF.NP1
3	3	15	PKG.DO_STUFF.NP1.NP2
4	2	12	PKG.DO_STUFF.NP1.NP2.NP3
0	1	12	FORMAT_CALL_STACK_12C

### **Answer to Last Issue's Challenge**

The PL/SQL Challenge question in last issue's "SQL in PL/SQL Enhancements" article focused on enhancements for executing SQL from PL/SQL in Oracle Database 12c. The quiz demonstrated the new DBMS\_SQL.RETURN\_RESULT procedure, and all three choices were correct!

- Lines 20 and 21 call UNIT\_LINE to get the line number of the program unit.
- Lines 24 and 25 first call SUBPROGRAM to get the entry in the stack at the current depth. CONCATENATE\_SUBPROGRAM then obtains the fully qualified name of that subprogram.

I then use the format\_call\_stack\_12c procedure (in Listing 2) in the pkg.do\_stuff procedure and execute that procedure, as shown in Listing 3.

Next I use the UTL\_CALL\_STACK package to show the name of the program unit and the line number in that unit where the current exception was raised. In Listing 4, I create and execute a function named BACKTRACE\_TO that "hides" the calls to the UTL\_CALL\_STACK subprograms. In each call to BACKTRACE\_UNIT and BACKTRACE\_LINE, I pass the value returned by the ERROR\_DEPTH function.

Note that the depth value for the error backtrace is different from the depth value for the call stack. With the call stack, 1 is the top of the stack (the currently executing subprogram). With the error backtrace, the location in my code where the error was raised is found at ERROR\_DEPTH, not 1.

With UTL\_CALL\_STACK there is no longer any need to parse the complete backtrace string, as would be necessary with DBMS\_UTILITY.FORMAT\_ERROR\_BACKTRACE. Instead, I can very surgically find, display, and/or log the key information I need.

Here are some things to keep in mind about UTL\_CALL\_STACK:

- Compiler optimizations can change lexical, dynamic, and backtrace depth, because the optimization process can mean that subprogram invocations are skipped.
- UTL\_CALL\_STACK is not supported past remote procedure call boundaries. For example, if proc1 calls remote procedure remoteproc2, remoteproc2 will not be able

to obtain information about proc1 by using UTL\_CALL\_STACK.

- Lexical unit information is not exposed through UTL\_CALL\_STACK. Instead, you

can use PL/SQL conditional compilation to obtain that information.

UTL\_CALL\_STACK is a very handy utility, but for real-world use, you will likely need

to build some utilities of your own around this package's subprograms. I have built a helper package with utilities I think you'll find helpful. You can find this code in the 12c\_utl\_call\_stack\_helper.sql and 12c\_utl\_call\_stack\_helper\_demo.sql files, available at [bit.ly/l1cuIyf](http://bit.ly/l1cuIyf).

The Oracle-hosted online version of this article at [bit.ly/1ayMI37](http://bit.ly/1ayMI37) includes this issue's PL/SQL Challenge question.

## BETTER DIAGNOSTICS, BETTER PROGRAMMING

The three DBMS.Utility functions (DBMS.Utility.Format\_Call\_Stack, DBMS.Utility.Format\_Error\_Stack, and DBMS.Utility.Format\_Error\_Backtrace) have been crucial aids in diagnosing and resolving problems in PL/SQL code. The UTL\_CALL\_STACK package recognizes the importance of this data and takes a big step forward in giving PL/SQL developers access to more in-depth and useful information. ◀

```
SQL> CREATE OR REPLACE FUNCTION backtrace_to
  2   RETURN VARCHAR2
  3   IS
  4   BEGIN
  5     RETURN
  6       utl_call_stack.backtrace_unit (
  7         utl_call_stack.error_depth)
  8       || ' line '
  9       ||
10       utl_call_stack.backtrace_line (
11         utl_call_stack.error_depth);
12 END;
13 /
SQL> CREATE OR REPLACE PACKAGE pkg1
  2 IS
  3   PROCEDURE proc1;
  4   PROCEDURE proc2;
  5 END;
 6 /
SQL> CREATE OR REPLACE PACKAGE BODY pkg1
  2 IS
  3   PROCEDURE proc1
  4   IS
  5     PROCEDURE nested_in_proc1
  6     IS
  7     BEGIN
  8       RAISE VALUE_ERROR;
  9     END;
10    BEGIN
11      nested_in_proc1;
12    END;
13
14   PROCEDURE proc2
15   IS
16   BEGIN
17     proc1;
18   EXCEPTION
19     WHEN OTHERS THEN RAISE NO_DATA_FOUND;
20   END;
21 END pkg1;
22 /
SQL> CREATE OR REPLACE PROCEDURE proc3
  2 IS
  3 BEGIN
  4   pkg1.proc2;
  5 END;
 6 /
SQL> BEGIN
  2   proc3;
  3 EXCEPTION
  4   WHEN OTHERS
  5   THEN
  6     DBMS_OUTPUT.put_line (backtrace_to);
  7 END;
 8 /
HR.PKG1 line 19
```



**Steven Feuerstein**

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ORACLE DATABASE 12c

# On Oracle Database 12c, Part 3

Our technologist improves partitions, adapts query plans, and optimizes statistics gathering.



Usually I take three or four user-submitted questions from the past two months and answer them here in each Ask Tom column. The last two and next two columns, however, take a look at some key Oracle Database 12c features. These features are all part of the "12 Things About Oracle Database 12c" presentation I gave at Oracle OpenWorld 2012 in San Francisco. (You can find the slides for that presentation on [asktom.oracle.com](http://asktom.oracle.com) on the Files tab). The first three Oracle Database 12c features I looked at in the initial article were improved defaults, bigger datatypes, and top-n queries. In the last issue, I discussed a new row-pattern-matching clause and how undo for temporary tables has changed in Oracle Database 12c. In this issue, I cover some partitioning improvements, adaptive execution plans, and enhanced statistics.

## PARTITIONING IMPROVEMENTS

Partitioning was first introduced in Oracle8 Database, back in 1997. In the last 16 years, many new partitioning capabilities have been added, and Oracle Database 12c adds quite a few more. I'll take a look at five new Oracle Database 12c partitioning capabilities here. If you are unfamiliar with partitioning and the terms associated with it, I suggest that you first read "Partition Decisions," by Arup Nanda, at [bit.ly/H9fhZL](http://bit.ly/H9fhZL). That article provides a great overview of partitioning for those who do not work with it day to day.

The first new Oracle Database 12c partitioning capability is asynchronous global index maintenance. A global index is an index on a partitioned table that is partitioned with different rules than the table it is defined on. For example, suppose you have an ORDERS table that is range-partitioned by a date column, ORDER\_DATE. You might want an index on a column in that ORDERS table, such

as CUSTOMER\_NAME, and the CUSTOMER\_NAME index would likely be a global index, either on a single partition or partitioned by range or hash on CUSTOMER\_NAME. If you dropped the oldest ORDERS table partition in Oracle Database 11g Release 2 and before, the global index either became immediately unusable (and required a rebuild before it could be used) or had to be maintained during execution of the DROP partition command. But if you maintained the index, execution of the DROP partition command could take hours instead of completing immediately.

In Oracle Database 12c, you get the best of both worlds: the DROP partition command executes immediately—the index will not be maintained during the DROP operation (the index entries pointing to the dropped partition will remain in the global index) but will remain usable. After the DROP partition command finishes executing, all scans of the global index will ignore the entries that point to the dropped (or truncated) partition. Later on, as a separate transaction, the index can be cleaned up, the deleted "orphaned" index entries can be removed, and the space can be reclaimed. This process can either be manually invoked by the DBA or can be automated to run as a job during a normal maintenance window. In any case, the dropping or truncation of a partition completes immediately, the index is always available for use, and the maintenance of the index is deferred.

Another new partitioning capability is the use of reference partitioning on tables that employ interval partitioning. Both reference and interval partitioning were introduced in Oracle Database 11g (see "More Partitioning Choices," by Arup Nanda, at [bit.ly/1d4YzZo](http://bit.ly/1d4YzZo), for a description of interval and reference partitioning), but you could not use

them simultaneously. Oracle Database 12c removes that restriction.

For example, let's say you have an ORDERS table such as

```
SQL> create table orders
  2  (
  3    order#      number primary key,
  4    order_date  date,
  5    data        varchar2(3)
  6  )
  7  enable row movement
  8  partition by range(order_date)
  9  interval (numtodsinterval(1,'day'))
 10 (partition p0 values less than
 11   (to_date('01-jan-2013',
 12     'dd-mon-yyyy'))
 13   )
Table created.
```

In Oracle Database 12c, you can now create a child table (LINE\_ITEMS) that references the partitioning scheme of the parent table (ORDERS) successfully:

```
SQL> create table line_items
  2  (
  3    order#      number not null,
  4    line#      number,
  5    data        varchar2(3),
  6    constraint c1_pk
  7      primary key(order#,line#),
  8    constraint c1_fk_p
  9      foreign key(order#)
 10     references orders
 11   on delete cascade
 12  )
 13  enable row movement
 14  partition by reference(c1_fk_p)
 15  /
Table created.
```

The parent/child connection leads me to another new partitioning capability: the ability to do CASCADE DROP and TRUNCATE operations on parent/child tables.

In the past, if you truncated a partition in (or dropped it from) the ORDERS table, you had to truncate the corresponding partition in (or drop it from) the child table first, meaning that you had to truncate/drop the table partitions of all child tables and work your way up the chain of referential integrity constraints, all the way up to the parent. This involved multiple independent SQL statements, and each statement committed itself. That made the truncation/dropping of partitions somewhat error-prone in a parent/child hierarchy—and unnecessarily hard. (It also introduced short periods of logical inconsistency.)

In Oracle Database 12c, you can accomplish a CASCADE DROP or TRUNCATE in a single command. For example, I add some data to the ORDERS and LINE\_ITEMS tables and look up the parent table's partition:

```
SQL> insert into
orders(order#,order_date,data)
2 values ( 1, to_date(
      '15-mar-2013' ), 'xxx' );
1 row created.
```

```
SQL> insert into
line_items(order#,line#,data)
2 values ( 1, 1, 'yyy' );
1 row created.
```

```
SQL> commit;
Commit complete.
```

```
SQL> select partition_name
2   from user_tab_partitions
3  where table_name = 'ORDERS'
4  and partition_name like 'S%';
```

PARTITION_NAME
SYS_P853

You can see that there is a link between the parent and child partitions when I attempt to truncate the parent table partition:

```
SQL> alter table orders truncate
partition SYS_P853;
```

```
alter table orders truncate partition
SYS_P853
*
ERROR at line 1:
```

ORA-02266: unique/primary keys in table referenced by enabled foreign keys

The truncation fails, because there is some child data referencing the data that is about to be truncated. If I apply the new CASCADE option—

```
SQL> alter table orders truncate
partition SYS_P853 cascade;
Table truncated.
```

—the truncate will succeed and, in fact, will truncate not only the parent but the child partition as well. (Note that to ensure that data is not removed unintentionally, the cascading functionality requires the foreign key constraint to be defined as ON DELETE CASCADE.) A similar option exists for exchanging partitions. You can now exchange partitions in a full parent/child hierarchy of table partitions in a single command. For example, I load some staging tables with data, as shown in Listing 1.

I can now swap the ORDERS and ORDERS\_TMP data and LINE\_ITEMS and LINE\_ITEMS\_TMP data in a single command, using the new CASCADE option:

```
SQL> alter table orders
2 exchange partition p0
3 with table orders_tmp
4 cascade;
Table altered.
```

```
SQL> select * from orders;
```

ORDER#	ORDER_DAT	DAT
100	31-DEC-12	abc

```
SQL> select * from line_items;
```

ORDER#	LINE#	DAT
100	1	def

So, instead of having to use multiple independent data definition language (DDL) statements, you can now exchange partitions in a single atomic DDL statement.

Next in the area of partitioning improve-

**Code Listing 1:** Loading staging tables in preparation for partition exchange

```
SQL> create table orders_tmp
2 (
3   order#      number primary key,
4   order_date  date,
5   data        varchar2(3)
6 );
Table created.
```

```
SQL> create table line_items_tmp
2 ( order#    number not null,
3   line#     number,
4   data      varchar2(3),
5   constraint c1_tmp_pk primary key(order#,line#),
6   constraint c1_tmp_fk_p foreign key(order#) references orders_tmp
7   on delete cascade
8 );
Table created.
```

```
SQL> insert into orders_tmp (order#,order_date,data)
2 values (100,to_date('31-dec-2012','dd-mon-yyyy'),'abc');
1 row created.
```

```
SQL> insert into line_items_tmp (order#,line#,data)
2 values (100,1,'def');
1 row created.
```

```
SQL> commit;
Commit complete.
```

ments in Oracle Database 12c is the ability to perform multiple partition operations in a single DDL statement. This enables you to split a partition into multiple partitions or merge many partitions into a single partition in a single DDL statement. Previously, if you wanted to split a single partition into four partitions, you had to execute three split statements. That involved a lot of reading and rereading, writing, and rewriting of data. Now those multiple partition operations can be achieved in a single atomic DDL statement.

Last in the area of partitioning improvements is the ability to move a partition

in an online fashion with the new ALTER TABLE MOVE PARTITION command. This command also transparently maintains global indexes, providing 100 percent data availability without any downtime.

For detailed information on these new capabilities, see *Oracle Database VLDB and Partitioning Guide 12c Release 1 (12.1)*, at [bit.ly/16hT8El](http://bit.ly/16hT8El).

### ADAPTIVE QUERY PLANS

Adaptive query plans in Oracle Database 12c are plans that can "change their mind" while they are executing. For example, the optimizer might believe that using a

nested loops join is the best way to join two tables, based on the number of rows it estimates the tables will produce. But runtime reveals that the driving table chosen by the optimizer returns many more rows than anticipated. In Oracle Database 12c, the query plan can now adapt, change, and switch from a nested loops join to a hash join.

Oracle's Maria Colgan, known to some as the "optimizer lady," wrote up a nice post on the Oracle Optimizer blog—"What's New in 12c: Adaptive Joins"—at [bit.ly/17OAWgO](http://bit.ly/17OAWgO). The "Adaptive Joins" sidebar presented here is an excerpt from that post.

### ADAPTIVE JOINS

### Excerpted from "What's New in 12c: Adaptive Joins," by Maria Colgan

The goal of adaptive plans is to avoid catastrophic behavior of bad plans on first execution. If we detect during execution that the optimizer's cardinality estimates were wrong, some plan choices can be changed on the fly to better options. Although we can't completely change a plan during execution, there are certain local decisions, such as the join method, that can be changed. In this post, I'll introduce the concepts and terminology related to adaptive plans and then go through an example in detail.

#### CONCEPTS AND TERMINOLOGY

An adaptive plan enables certain decisions in a plan to be postponed until runtime, in case runtime conditions are different from optimizer assumptions. For the purposes of explaining the concepts, I will consider a plan for a simple two-table join, where the join method is adapted. The diagram below shows the two options for this plan.



An adaptive plan consists of a *default plan*, which is the plan that the optimizer picks, based on the current statistics, as well as alternatives to various portions of the default plan. In my example join, let's assume that the nested loops plan is the default and that the alternative is the hash join. Each alternative portion of a plan is referred to as a *subplan*. A subplan is a set of related operations in a plan. In the diagram, the subplan on the left consists of the nested loops operation and the index scan; the alternative subplan on the right consists of the hash join and the table scan. For each decision that can be adapted, the plan contains two or more alternative subplans. During execution, one of those alternatives is chosen, in a process called *adaptive plan resolution*. Adaptive plan resolution occurs on the first execution of a plan; once the plan is resolved, future executions will use the same plan.

To resolve the plan, statistics are collected at various points during execution. The statistics collected during one part of execution are used to resolve parts of the plan that run later. For instance, statistics can be collected during the scan of table T1, and based on those statistics, we can choose the right join method for the join between T1 and T2. The statistics are collected with a "statistics collector." Because the join of T1 to T2 and the scan of T1 would typically be pipelined, buffering is required in order to collect the statistics, resolve the choice of join method, and then perform the join. Some plan decisions can be adapted without row buffering, but adaptive joins require a buffering statistics collector.

The optimizer determines what statistics are to be collected and how the plan should be resolved for different values of the statistics. The optimizer computes an *inflection point*, which is the value of the statistics where the two plan choices are equally good. For instance, if the nested loops join is optimal when the scan of T1 produces fewer than 10 rows and the hash join is optimal when the scan of T1 produces more than 10 rows, the inflection point for these two plans is 10. The optimizer computes this value and configures a buffering statistics collector to buffer and count as many as 10 rows. If at least 10 rows are produced by the scan, the join method is resolved to the hash join; otherwise, it is resolved to the nested loops join.

The plan that is chosen by resolution is referred to as the *final plan*. The plan the optimizer expects to be chosen (based on its estimates) is the default plan. The physical plan, which actually contains all the operations from all the subplan options, is referred to as the *full plan*. As the plan is resolved, the plan hash value changes to indicate the new choice of plan. The plan displayed by our plan display APIs (in DBMS\_XPLAN) changes as the plan is resolved. At any given point, some plan decisions may have been resolved whereas others have not. For the unresolved plan choices, the plan display APIs show the plan that is expected by the optimizer (based on its estimates).

When EXPLAIN PLAN generates a query plan, none of the adaptive sub-plans have been resolved, so we see the default plan when displaying the plan through DBMS\_XPLAN.DISPLAY. For example, if the optimizer thinks the nested loops join plan is best, EXPLAIN PLAN and DBMS\_XPLAN.DISPLAY will display the nested loops join plan as shown below.

Id   Operation	Name   Rows   Bytes	
0   SELECT STATEMENT		20   280
1   NESTED LOOPS		20   280
2   TABLE ACCESS FULL	T1   10000   107K	
*3   INDEX UNIQUE SCAN	T2_PK   1   3	

Suppose the plan resolves during execution to a hash join instead. Then the plan displayed by DBMS\_XPLAN.DISPLAY\_CURSOR will show the final plan, containing the hash join with a full table scan.

Id   Operation	Name   Rows   Bytes		
0   SELECT STATEMENT			
*1   HASH JOIN		20   280	
2   TABLE ACCESS FULL	T1   10000   107K		
3   TABLE ACCESS FULL	T2   20   60		

To see the complete post on the Oracle Optimizer blog, go to [bit.ly/17OAWgO](http://bit.ly/17OAWgO).

For more information on adaptive query plans, you can watch a video that describes and then demonstrates it at [bit.ly/19gtDS4](http://bit.ly/19gtDS4). You can also read about it in *Oracle Database SQL Tuning Guide 12c Release 1 (12.1)*, at [bit.ly/H9ijN2](http://bit.ly/H9ijN2).

### STATISTICS IMPROVEMENTS

There are many enhancements to statistics in Oracle Database 12c. Two I'll be talking about here are statistics generation during data loads (online statistics gathering) and session private statistics for global temporary tables.

**Online statistics gathering.** Since Oracle Database 10g, statistics have been automatically generated on indexes whenever you create or rebuild them. (There is no need to gather index statistics in your reporting/warehouse database if you rebuild or create indexes immediately after a data load!) You can easily observe this behavior in the following example (the STAGE table is just a copy of the ALL\_OBJECTS view):

```
SQL> create table t
  2  as
  3  select *
  4  from stage
  5  where 1=0;
Table created.

SQL> create index t_idx on t(object_id);
Index created.

SQL> alter index t_idx unusable;
Index altered.

SQL> insert /*+ append */ into t
  2  select *
  3  from stage;
87814 rows created.

SQL> alter index t_idx rebuild;
Index altered.

SQL> select num_rows, last_analyzed
  2  from user_indexes
  3  where index_name = 'T_IDX';
```

NUM_ROWS	LAST_ANALYZED
87814	26-SEP-13

So the query against USER\_INDEXES shows that the index has valid statistics. What is new in Oracle Database 12c is that statistics will be automatically gathered on the table as well, if the segment being loaded into is empty (just created or truncated) to begin with. In this example, my table was empty during my data load, so the table itself will now have basic statistics gathered:

```
SQL> select num_rows, last_analyzed
  2  from user_tables
  3  where table_name = 'T';
```

NUM_ROWS	LAST_ANALYZED
87814	26-SEP-13

Furthermore, if I look at the generated query plan for the load, I see a new step in Oracle Database 12c:

Row Source Operation
LOAD AS SELECT ...
OPTIMIZER STATISTICS GATHERING ...
TABLE ACCESS FULL STAGE ...

The new step—OPTIMIZER STATISTICS GATHERING—shows that statistics were generated during this load. I have all the basic statistics on this table, but I won't have nondefault statistics such as histograms. This is because the creation of a histogram requires additional scans of the data and online statistics gathering was implemented to have minimal impact, if any, on the data load. Fortunately, I can easily gather just the histograms without having to regenerate the basic statistics I've already generated. I'll start by priming the column usage information. (See the "Why Does My Plan Change?" section of "On Joins and Query Plans" at [bit.ly/PQnpPB](http://bit.ly/PQnpPB) for details on what column usage information is.) I can do this by running a few representative queries that reference columns in the predicate I anticipate using in my real queries. Here's one example:

```
SQL> select count(*)
  2  from t
  3  where owner = 'SCOTT';
```

COUNT(*)
11

Now the database knows that I use the OWNER column in WHERE clauses, so the next time it gathers statistics by using the default METHOD\_OPT setting, it will inspect the OWNER column to see if it is a candidate for new histogram generation. In this case, it will be, because the OWNER column contains skewed data values: the SYS user owns many objects, whereas SCOTT owns very few. I'll start the process of gathering statistics by verifying that there are just basic column statistics on the OWNER column:

```
SQL> select count(*)
  2  from user_tab_histograms
  3  where table_name = 'T'
  4  and column_name = 'OWNER';
```

COUNT(*)
2

And then I'll gather statistics by using the GATHER AUTO option. This will fill in only the missing bits of statistics and will not generate the statistics I already have:

```
SQL> begin
  2    dbms_stats.gather_table_stats
  3    ( user, 'T',
  4      OPTIONS => 'GATHER AUTO' );
  5  end;
  6  /
```

PL/SQL procedure successfully completed.

And I can now verify that histograms have been generated for the OWNER column:

```
SQL> select count(*)
  2  from user_tab_histograms
  3  where table_name = 'T'
  4  and column_name = 'OWNER';
```

COUNT(*)
22

Now that you know about online statistics gathering for tables as well as indexes in

Oracle Database 12c, you will want to review your statistics gathering methods as you upgrade. You might not have to gather statistics anymore on some tables!

For more details on online statistics gathering in Oracle Database 12c, you can watch the *Oracle Database 12c: Enhanced Optimizer Statistics with Tom Kyte* video at [youtu.be/AW6pT\\_RwGdc](http://youtu.be/AW6pT_RwGdc).

**Session private statistics for global temporary tables.** The last new capability I want to discuss in this issue's column is the ability to have statistics on global temporary tables that exist only for the session that generates them. Maintaining representative statistics on global temporary tables has been difficult, to say the least, because every session—even every transaction, in many cases—sees a completely different set of data from every other session or transaction, and getting statistics that convey to the optimizer what the data looks like is problematic. Every session and transaction is different.

Enter session private statistics for these temporary tables. By default, each session in Oracle Database 12c will have its own set of statistics on global temporary tables, enabling the optimizer to correctly estimate cardinalities and derive the correct plan.

To demonstrate this, I'll generate a global temporary table that will subsequently be used in an "in" clause in a query. In this example, the application running against the database will put some number of rows into the global temporary table and then use that data in a WHERE clause to retrieve data from some other table. The issue that commonly arises is that sometimes a session will put in a few rows and some other session will put a large number of rows into the same global temporary table. I would like to have two different plans for these different cases, but if the optimizer sees only one set of statistics—one that represents only one or the other case above—I'll get just one plan. This is the problem that session private statistics is trying to solve.

I start by creating a global temporary table and a table to query against:

```
SQL> create
  2  global temporary
```

```
3  table gtt
4  ( x int )
5  on commit delete rows
6  /
Table created.
```

```
SQL> create table t
2  as
3  select *
4  from stage;
Table created.
```

**Code Listing 2:** Using global temporary table and session private statistics

```
SQL> select *
  2  from t
  3  where object_id in
  4  (select x from gtt);
```

Id   Operation	Name   Rows   Bytes   Cost (%CPU)  Time
0   SELECT STATEMENT	5   550   5 (0)   00:00:01
1   NESTED LOOPS	
2   NESTED LOOPS	5   550   5 (0)   00:00:01
3   SORT UNIQUE	5   15   2 (0)   00:00:01
4   TABLE ACCESS FULL	GTT   5   15   2 (0)   00:00:01
* 5   INDEX UNIQUE SCAN	T_PK   1     0 (0)   00:00:01
6   TABLE ACCESS BY INDEX ROWID	T   1   107   1 (0)   00:00:01

Predicate Information (identified by operation id):

```
5 - access("OBJECT_ID"="X")
```

Note

- this is an adaptive plan
- Global temporary table session private statistics used

**Code Listing 3:** In another session, loading different data and using another plan

```
SQL> connect /
Connected.
```

```
SQL> insert into gtt
  2  select object_id
  3  from stage;
87813 rows created.
```

```
SQL> select *
  2  from t
  3  where object_id in
  4  (select x from gtt);
```

Id   Operation	Name   Rows   Bytes   Cost (%CPU)  Time
0   SELECT STATEMENT	87813   10M  924 (1)   00:00:01
* 1   HASH JOIN	87813   10M  924 (1)   00:00:01
2   SORT UNIQUE	104K   1331K  40 (3)   00:00:01
3   TABLE ACCESS FULL	GTT   104K   1331K  40 (3)   00:00:01
4   TABLE ACCESS FULL	T   87813   9175K  384 (1)   00:00:01

Predicate Information (identified by operation id):

```
1 - access("OBJECT_ID"="X")
```

Note

- dynamic statistics used: dynamic sampling (level=2)
- this is an adaptive plan

```
SQL> alter table t
  2 add constraint
  3 t_pk primary key
  4 (object_id);
Table altered.
```

Now I load some data into my global temporary table and see what statistics exist:

```
SQL> insert into gtt
  2 select object_id
  3   from t
  4 where rownum <= 5;
5 rows created.
```

```
SQL> select scope, num_rows
  2   from user_tab_statistics
  3  where table_name = 'GTT';
```

SCOPE	NUM_ROWS
SHARED	

There are no statistics yet, so I gather them:

```
SQL> begin
  2     dbms_stats.gather_table_stats
  3     ( user, 'GTT' );
  4 end;
  5 /
PL/SQL procedure successfully completed.
```

```
SQL> select scope, num_rows
  2   from user_tab_statistics
  3  where table_name = 'GTT';
```

SCOPE	NUM_ROWS
SHARED	
SESSION	5

Now I can see that there are session statistics for this global temporary table. They are not "shared"; they are private to this session, and I can see that they accurately represent the data I loaded into the table.

I use my global temporary table in a query as shown in Listing 2, and the optimizer comes up with the best plan, based on

valid, representative statistics.

I go into another session, load the global temporary table with entirely different data, run a query, and see the result in Listing 3.

In this new session, the optimizer found no statistics and hence used dynamic sampling to fill them in. Because there were many more than five rows in the temporary table this time, a different, better plan was chosen. This also demonstrated that the statistics from the first session "disappeared"—they were private to that session.

So, you've seen two methods—gathering statistics and dynamic sampling—that provide the optimizer with representative statistics. A third approach is to set the statistics directly. Suppose a developer just did an insert and knows how much data was loaded. That person could just give the optimizer this information. For example, I just loaded 300 rows into the global temporary table and set the statistics as shown in Listing 4. The optimizer uses the statistics I added to optimize the query, resulting in a different plan once again.

For more information on all the new optimizer features and more, see *Oracle Database New Features Guide 12c Release 1 (12.1)*, at [bit.ly/GUZUnQ](http://bit.ly/GUZUnQ).



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## NEXT STEPS

### ASK Tom

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

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**Code Listing 4:** Setting statistics directly and seeing session private statistics used

```
SQL> begin
  2     dbms_stats.set_table_stats
  3     ( user, 'GTT', numrows => 300 );
  4 end;
  5 /
PL/SQL procedure successfully completed.

SQL> set autotrace traceonly explain
SQL> select *
  2   from t
  3  where object_id in
  4  (select x from gtt);
```

Id	Operation	Name	Rows	Bytes	Cost (%CPU)	Time
0	SELECT STATEMENT		9	1080	38 (0)	00:00:01
1	NESTED LOOPS					
2	NESTED LOOPS		9	1080	38 (0)	00:00:01
3	SORT UNIQUE		300	3900	29 (0)	00:00:01
4	TABLE ACCESS FULL	GTT	300	3900	29 (0)	00:00:01
5	INDEX UNIQUE SCAN	T_PK	1		0 (0)	00:00:01
6	TABLE ACCESS BY INDEX ROWID	T	1	107	1 (0)	00:00:01

#### Predicate Information (identified by operation id):

5 - access("OBJECT\_ID"="X")

#### Note

- this is an adaptive plan
- Global temporary table session private statistics used

# Survival for the Database Technologist

Five steps to help you sort through the information about information management

The exciting part of being a database technologist is the data: the amount of new information being thrown your way and new ways to support and manage the data. The challenging part of that role is also the data: the amount of new information being thrown your way and new ways to support and manage the data. Just a few years ago, you were worried about storing terabytes of data; then it was petabytes; and now it's zettabytes! And it's not just the amount of data being stored in the databases that is growing but the amount of information you receive as managers of these environments that's worrisome. You are bombarded with so much information about best practices, faster hardware solutions, and high-availability options that it can seem as if the amount of information you have to sort through about how to work with your database environment is larger than the amount of information in your databases. How is anyone managing database architecture supposed to survive all of the new information about managing information?

Because information is coming with overwhelming velocity, here are five basic things to consider as part of your own information management process.

**1. Develop trusted sources.** Just as you do for a database upgrade, gather information from trusted sources as a first step. This gathering might even require a step back to develop some trusted sources. Sources can include people who have already been there and done that as well as experts on the subject. User groups, such as the Independent Oracle Users Group (IOUG), are an excellent source of information about managing information. There are experts on a variety of topics in the user group community, and networking within

## Even a busy database administrator needs to make time to develop new skills.

user groups offers the opportunity to discuss your issues with others who have implemented similar solutions or have looked at the same issues. Developing a few trusted sources allows you to get needed information without having to pull in a volume of information that you can't possibly sort through.

**2. Test before tackling.** Just as when you roll out something new in your database environment, testing is also a part of the managing-information-about-managing-information process. Pull in information from experts, test some of the suggested solutions, and verify that the results sync up with what is being said.

**3. Educate yourself.** As another part of the information-gathering process, make it a priority to read an article or attend a webinar once a week about a topic that is relevant for a current issue as well as something that is an up-and-coming topic. Even a busy database administrator needs to make time to develop new skills.

**4. Develop a checklist.** The next step in the information-gathering process is to develop a checklist. I have checklists for setting up a database environment, adding monitoring and maintenance jobs, setting up security, and applying patches and managing changes. In considering the process of gathering new information, your checklist should include business issues, hot topics, new things to learn, things to

ignore, and trusted sources of information. Each company has its own issues and focus areas, so you should also be prepared to anticipate additional needs and look for new information areas to develop.

**5. Expand your knowledgebase.** Information is out there about Oracle Database 12c's new features, storage, hardware, engineered systems, performance tuning, and high availability for the database environment. Add these topics to your information management checklist, review your current sources, and verify the solution information by testing it and comparing the results with those of other users or people in your network.

To survive as a database technologist, you need some filters on new information. So develop your trusted sources, but keep learning—it's important to stay current and to keep developing better ways to support your database environments. ◀



**Michelle Malcher**

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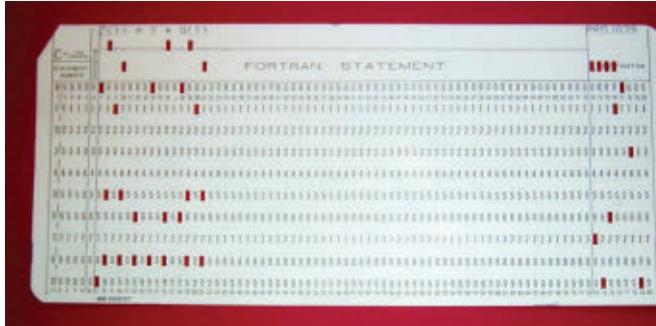
in database development, security, design, and administration. Malcher is a coauthor of *Oracle Database 12c: Install, Configure & Maintain Like a Professional* (Oracle Press, 2013) and *Securing Oracle Database 12c: A Technical Primer* (Oracle Press, 2013).

## NEXT STEPS

### JOIN IOUG

ioug.org

**LEARN** more about Oracle Database 12c  
oracle.com/database



1957

## Fortran on Punched Cards

To run scientific and engineering applications written in IBM's Fortran, programmers used punched cards to describe instructions in the program, represented by the presence or absence of holes in predefined positions. Do not fold, spindle, or mutilate—you'll crash your app.

1979

## VisiCalc

As a Harvard Business School student, Dan Bricklin codeveloped VisiCalc, the first electronic spreadsheet for home and office use. Wait, you mean my Apple II isn't just for playing Castle Wolfenstein and Lode Runner?

C11 <L> TOTAL				
A	ITEM	B NO.	C UNIT	D COST
1	SMUCK RAKE	43	12.95	556
2	BUZZ CUT	150	46.700	101
3	SUE TUNER	250	4.900	1248
4	EYE SHUFF	2	9.900	9
5			SUBTOTAL	13155.50
6			9.75% TAX	1282.66
7			TOTAL	14438.16
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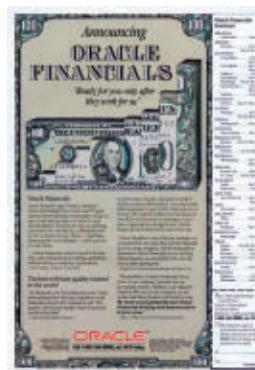
SHALL WE PLAY A GAME?

1983

## Cold War Killer App

"A strange game. The only winning move is not to play. How about a nice game of chess?"

—US military supercomputer WOPR (War Operation Plan Response) to young hacker David Lightman (Matthew Broderick), who unwittingly launched a nuclear war simulation application in *War Games* (MGM)



1987

## Oracle's Applications Division

Oracle creates the Oracle Applications division, initially with seven employees. The first two applications to roll out are Oracle General Ledger and Oracle Purchasing.

2013

## Cloud Apps

Announced during Oracle OpenWorld 2013, 10 new subscription-based, enterprise-grade application services further expand the Oracle Cloud.

1995

## The Internet Changes Everything

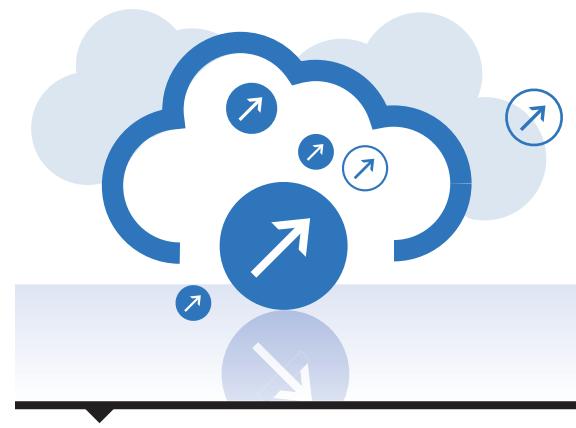
Oracle announces Oracle Internet Commerce Server and Oracle EDI Gateway, delivering integrated internet access as part of its applications suite. iApps, anyone?



2012

## Apps on Oracle Exadata

By consolidating business applications with Oracle Exadata, organizations are simplifying their information technology; lowering costs; and improving system performance, scalability, and reliability.



YOUR TURN

From spreadsheets and word processors to databases, analytics, and beyond, there's a galaxy of applications out there to choose from. What is your killer enterprise app? And why?

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# Oracle Cloud Applications



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