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LGR Telecommunications handles massive data loads with Oracle Exadata

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Grant Salmon, CEO of LGR Telecommunications

A portrait of Grant Salmon, CEO of LGR Telecommunications, against a dark blue background. He is wearing a dark suit jacket over a blue shirt. The image is overlaid with numerous glowing, golden-yellow light trails that form a complex, swirling pattern across the lower half of the frame. The light trails consist of many overlapping, curved lines that create a sense of motion and energy.

Grant Salmon, CEO,
LGR Telecommunications

LIGHT-SPEED PERFORMANCE

LGR Telecommunications handles massive data loads with Oracle Exadata.

LGR Telecommunications is a company that knows something about the performance of large data warehouses. Its solutions help telephone companies digest and analyze billions—yes, billions—of call records each day. But even they were a bit surprised when they benchmarked the new Oracle Exadata storage system.

“When it comes to speed, Oracle Exadata technology has changed the game completely,” says Grant Salmon, CEO of Atlanta, Georgia–based LGR Telecommunications, who appeared in a taped segment during Oracle CEO Larry Ellison’s announcement at Oracle OpenWorld. “And it’s not like we had an old, cluttered-up system before. We build some of the world’s largest data warehouses on leading

PHOTOGRAPHY BY BOB ADLER, STYLING BY FAWN OREGA FOR MACZENOBIA

hardware and storage facilities, yet queries that used to take half an hour are now taking less than a minute with this new Oracle Exadata technology.”

LGR chief architect Hannes van Rooyen can attest to Oracle Exadata’s speed as well. “From an architecture perspective, Oracle Exadata provides us with major performance improvements. And that’s impressive, considering that we were already building some of the world’s largest and fastest data warehouses on the world’s leading hardware and storage products such as those from HP, Sun, IBM, and EMC.”

LGR has been involved in the Oracle Exadata beta program for more than a year and has had a system actively working since April 2008, doing all types of testing and measurements.

“Some of the performance metrics that we’ve observed are just incredible. We had a system that was loading three billion records per day, and building indexes on the Oracle Exadata system took less than 30 seconds compared to 30 minutes in our traditional high-performance environment,” says van Rooyen. “It’s almost unbelievable. Oracle is selling [Oracle Exadata] as extreme performance, and it truly is.”

Although not every company needs this type of true extreme performance from its database system, almost all companies are facing the need to process, analyze, and understand rapidly increasing volumes of data in more and more detailed ways. It’s more important than ever for organizations to understand the behavior of customers and effectively process all the data they already have, especially at the individual customer level. Most companies still tend to look at summarized information or store-level data because they just don’t have the ability to analyze data down to discrete customer records.

“Oracle Exadata technology is going to open up whole new business opportunities for companies in industries like retail and telecommunications,” says Andrew Mendelsohn, senior vice president for Oracle Server Technologies. “It’s going to enable them to understand the behaviors of individual customers down to the transaction level and create more-effective direct marketing for them.”

Created in conjunction with HP, the HP Oracle Exadata Storage Server is a combination of storage devices, database-tuned intelligent processing, and an internal high-performance network for enormous data throughput. Its massively parallel architecture allows it to dramatically speed up Oracle data warehouses by using internal intelligence to do query processing



Andy Mendelsohn, senior vice president for Oracle’s Server Technologies group, notes that Oracle’s Exadata technology will open up new opportunities for telecom and retail companies.

closer to the data.

“You can put together your own hardware, but it’s difficult to approach the type of tuning that Oracle and HP have done and achieve the capabilities that they’ve built in,” says Paul Hartley, general manager for LGR. “We think there’s a massive difference between purchasing an off-the-shelf solution like Oracle Exadata and building it yourself. You can easily remove six months of the implementation cycle simply by taking that architecture decision off the table. And with that, you can probably eliminate 10 people’s salaries for six months—that’s a lot of cash right there. In addition, we estimate there’s up to a 70 percent reduction in terms of cost of ownership compared to custom solutions, just in terms of the personnel savings.”

BUILDING BLOCK FOR UNLIMITED PERFORMANCE

“I think what’s exciting about the Oracle Exadata solution is not just what it is but also the incentive it creates in the industry to innovate and respond,” says Carl Olofson, research vice president of information management and data integration software at IDC, in Framingham, Massachusetts.

The innovative Oracle Exadata solution is designed as a building-block component that includes both storage and intelligent processing power—a unique combination that dramatically affects performance.

“The Oracle Exadata Storage Server is significant because it’s a storage server put together specifically as a vehicle for optimizing storage access for Oracle databases,” says Olofson. The unique thing about this solution is that Oracle software actually manages the query processing.

In addition, the Oracle Exadata Storage Servers can be combined into a grid to serve one application or many. “Each one of these servers can deliver a gigabit per second of data bandwidth,” says Oracle’s Mendelsohn. “So when you create a grid of 10 servers, you can achieve 10 gigabytes per second of data bandwidth to the database servers, or 100 if you have a hundred servers. It’s a completely scalable architecture that can keep pace with data growth. As customers create bigger and bigger data warehouses, they can be assured of bigger and bigger data bandwidth.”

They can also be assured that time to query isn’t going to be cumbersome. With large data warehouses, time to query can become longer and longer as tables become bigger and bigger. Not so with Oracle Exadata. “We can scale out so that as a data

“In our empirical test, the little Oracle Exadata box with less than 100 spindles dramatically beat our production system with more than 1,000 spindles.”

—Hannes van Rooyen, Chief Architect, LGR Telecommunications

warehouse doubles in size, we double the number of storage servers, and that doubles the amount of data bandwidth and keeps the query time constant,” Mendelsohn says. “Because we have Oracle’s software running on the storage servers, we can do something you can’t do today with conventional storage.”

For example, when a customer sends a SQL query to the database server requesting rows for a specific customer, the Oracle Exadata Storage Server will send back only the rows that meet that request and thereby greatly reduce the network traffic. “It’s a pretty radical shift from conventional storage servers,” says Mendelsohn. “Oracle Exadata Storage Servers can form massively parallel grids to do massively parallel query processing. It’s really a revolutionary change.”

It may also be a big change for organizations used to spending time and energy to build out their own database and storage solutions. “If you buy storage and install your software on it, even if it’s a configuration that’s supported by Oracle and the storage vendor, there are always situations where it’s a little ambiguous as to whether the problem you’re having is due to software or storage,” says IDC’s Olofson. “With the Oracle Exadata storage system, you obviously won’t have that kind of issue.”

DATA WAREHOUSE IN A BOX

Oracle’s hardware vision doesn’t stop at the Oracle Exadata Storage Server. Working with HP, Oracle has also developed the HP Oracle Database Machine, a complete package of software, servers, and storage designed for large, multiterabyte data warehouses. The HP Oracle Database Machine uses Oracle Exadata Storage Servers as one of its key components.

“The primary benefit of the HP Oracle Database Machine is that it’s got the Oracle Exadata Storage Server built into it, so it’s a database server and storage server all in one cabinet,” says Olofson. The HP Oracle Database Machine is also a hardware building-block component—it contains 14 of the Oracle Exadata Storage Servers, 8 database servers, and an InfiniBand switch for connecting the database servers to the storage servers. The result is an out-of-the box data warehouse experience that can scale as business needs require.

“If someone wants to build a new data warehouse, they can just order the HP Oracle Database Machine and it’ll come pre-set-up and installed and configured to run a data warehouse really efficiently right out of the box,” says Mendelsohn. “You don’t have to figure out how to design it, what types of storage and servers to select, how to configure it, or anything else.

Instead, you get a really nice, simple, out-of-the-box experience.”

“Like any appliance offering, it simplifies the configuration and setup as well as the support relationship,” adds Olofson.

“The result is that a system administrator won’t have to research the best way to configure the combination of server and storage for an Oracle data warehouse. It’s already done, and it’s fully supported, so you don’t have to worry about the finger-pointing between vendors that might occur if you build your own solution.”

OPTIMIZED DATA ANALYSIS

Really testing out the Oracle Exadata solution requires a data warehouse environment with millions or billions of records—a data warehouse that’s really large and requires a lot of analysis. That’s why LGR Telecommunications was invited to beta-test Oracle Exadata.

Using Oracle databases and data warehousing technologies, LGR has developed a powerful call detail record (CDR) solution used by companies such as AT&T, Telstra, Vodafone, and MTN for extraction, transformation, loading, analysis, and reporting of all the data coming from telecommunications networks. The mountains of telephone and networking equipment owned by a phone company can typically generate billions of records a day. Mining that amount of data for valuable business insights is no small matter. “Given the highly competitive business environment, every subscriber is gold. The best way to determine how the subscribers are using the network is from the information in the CDR,” notes Salmon.

“Until recently, though, the primary challenge that prevented most telecommunications companies and network operators from unlocking the intelligence within their CDRs was the sheer volume of data—billions of records and hundreds of terabytes of storage—and the costs associated with managing that data,” says LGR’s Hartley.

At one of LGR’s largest customer sites, maintaining data on more than 75 million subscribers requires two 310-terabyte solutions loading an average of 3 billion new records a day (about 35,000 per second) and about 1.2 petabytes of raw storage. This places it among the world’s foremost data warehouse installations, and one that the customer reports has delivered more than 500 percent return on investment (ROI) to date. “We see Oracle Exadata as a perfect platform to scale and absorb this growth,” says Salmon. “It’s a plug-and-play system: plug in more discs, and the system just uses those discs. You don’t have to reconfigure anything.” That functionality is important. “This tremendous speed and capacity translates into money in the bank for our

>> SNAPSHOT

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www.lgrtelecoms.com
Locations: Atlanta, Georgia;
Centurian, South Africa;
Melbourne, Australia
Employees: More than 100
Oracle products: Oracle
Database, Oracle Real
Application Clusters, Oracle
Exadata Storage Server,
HP Oracle Database Machine

customers,” Salmon says, “since it enables them to establish one source of CDR data to feed multiple business units.”

“In the past, our customers were already able to get business intelligence with our solution that they weren’t able to get anywhere else,” says LGR’s van Rooyen. “Now we’re able to offer our customers two options for their data warehouse architecture—a custom-built data warehouse platform or the Oracle Exadata solution. With Oracle Exadata, we can provide everything in one easy box.”

As part of its beta testing, LGR used the same terabyte database to run an apples-to-apples comparison between Oracle Exadata and one of its production systems running HP Superdomes. “In our empirical test, the little Oracle Exadata box with less than 100 spindles dramatically beat out our production system with more than 1,000 spindles, which was a real David and Goliath event,” says van Rooyen. “So far we’ve observed up to an 89 percent increase in performance in certain areas. While that kind of improvement won’t happen across the board, Oracle Exadata provides a quantum leap in terms of a different approach to database design. For example, there’s such a high increase in performance on certain types of queries that it becomes possible to do away with index maintenance. In data warehouse environments, that impact can be massive.”

From LGR’s perspective, that type of performance means only one thing: There’s no limit on Oracle’s (and LGR’s) ability to scale solutions for future needs. “You can now get Oracle for very, very large production systems with guaranteed performance,” says van Rooyen. “It’s a powerful message. It’s future-proof Oracle.”

PUTTING THE FOCUS ON BUSINESS BENEFITS

Extreme performance isn’t the only benefit of Oracle Exadata. From LGR’s perspective, Oracle Exadata has the potential to eliminate architectural discussions, encouraging organizations to focus on addressing business needs rather than IT infrastructure. In the past, Hartley has seen customers spend 6, 12, or even 18 months defining and redefining their data warehouse architecture to build it for scalability and redundancy. “Now they don’t have to do that,” he says. “Oracle Exadata changes the discussion from, ‘How am I going to configure this technology stack?’ to the more-strategic discussion of, ‘How can I use this solution to immediately drive benefits across my business?’ Once we eliminate that technological/IT debate, we’re able to get to the business benefits much faster.”

The major impact of Oracle Exadata for LGR, Hartley believes, is going to be the ways in which LGR packages and sells its product. Being able to bundle hardware and software together as a single, commercial, off-the-shelf solution transforms LGR from a software provider to an end-to-end solutions provider, making it an even more valuable partner to its customers. “We haven’t had to change our code at all to offer these new [Oracle] Exadata systems to our customers,” says Salmon. “We literally hand the technology straight on to the customer, and the customer gets the advantage. They are lining up for this product, and we are already working on a number of high-profile installations around the globe.”

“We now have a solution neatly packaged inside a box with guaranteed performance at levels far exceeding anything anybody else can provide—and far exceeding what our customers require, both now and even in five years’ time” says Hartley. “With Oracle Exadata’s prepackaged combination, we can configure and drop a solution into a customer’s data center with minimal disruption and have it up and running in a matter of weeks. In the past, we’ve delivered 300 percent ROI to Telstra and 550 percent ROI to AT&T inside of the first year. With Oracle Exadata, we think we can double that speed.”

In addition to performance and rapid gains in ROI, LGR’s experience with Oracle Exadata highlights how effective the solution is for Oracle-oriented enterprises, especially when compared with other high-end proprietary data warehousing platforms. It already benefits LGR, which can capitalize on its Oracle knowledge and leverage existing skill sets.

“There’s a learning curve associated with supporting customized customer solutions. But with Oracle Exadata, we can easily leverage our Oracle knowledge in a consistent way across customer deployments,” says Hartley. “One of the key messages our customers are sending back to us is that they love Oracle because everyone knows Oracle. When we do a search for qualified Oracle professionals, we can find 300 people that are right for the job compared to about 3 for Teradata platforms. It’s literally a ratio of 100 to 1 in terms of finding the right support staff. Oracle Exadata is a win-win-win for everyone—Oracle, us, and our customers.”

POINTING THE WAY TO THE FUTURE

Oracle’s primary focus for now is applying Oracle Exadata solutions to the data warehousing market, but its potential doesn’t stop there. “The HP Oracle Database Machine and the Oracle Exadata Storage Server can be used to run any Oracle database application with any type of workload,” says Mendelsohn. “You can run SAP, Oracle E-Business Suite, or whatever you want. It will all run on the HP Oracle Database Machine.”

For now, Oracle Exadata provides immediate, huge performance benefits for any organization that wants to expand, upgrade, or implement a data warehouse.

“We now have the most scalable solution in the industry. Customers can feel confident that as they go from today’s data warehouses to the multipetabyte data warehouses of the future, we have a technology that’s going to scale with them as their data needs grow,” says Mendelsohn. “Oracle Exadata users can feel confident that they have the right technology to move them into the future.” <>

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