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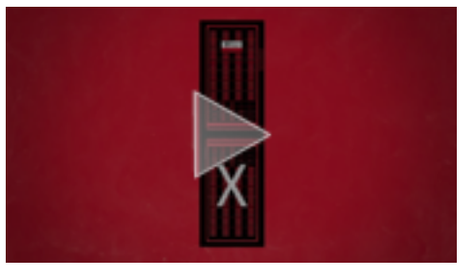
Oracle Exadata

Extreme performance.
Lowest cost.

What does extreme performance mean for your business?

Chapter 1

Qualitative Breakthrough



Take a look at Oracle Exadata and get ready to see what extreme performance can mean for your business.

[Watch video]

"Now we're able to put forward certain functionality that we weren't able to think about before."
—Jim Duffy, BNP Paribas

[Watch video]

Overview

As organizations contend with escalating demands for greater quantities of information, more sophisticated data analysis, and a burgeoning user population, Oracle Exadata makes database workloads faster, easier to manage, and less expensive. Oracle Exadata is the world's first database machine to provide extreme performance for both data warehousing and online transaction processing (OLTP) applications.

But it's not the quantitative gains that make the Oracle Exadata Database Machine so exciting. It's the qualitative ones. With Oracle Exadata, customers can reduce IT costs through consolidation, manage more data on multiple compression tiers, improve performance of all applications, and make better business decisions in real time. Oracle Exadata's extreme performance has opened the floodgates of imagination, powering new business processes and fostering a raft of innovation that can lead to competitive differentiation and greater revenue opportunities.

For example, LinkShare, an online marketing affiliate company, uses Oracle Exadata to enhance reporting and analysis services for hundreds of thousands of advertisers and publishers, cutting query response times and enabling its clients to analyze campaign performance on a near real-time basis. BNP Paribas, a global bank, was able to cut the size of its data warehouse in half with Oracle Exadata, resulting in better manageability and a 17-fold performance improvement. But even more significant was the ability to conduct advanced statistical analysis based on a more granular view of trading transactions.

"Exadata represents a real paradigm shift for us," says Jim Duffy, senior data warehouse architect at BNP Paribas. "We are now in a very rare position of having spare capacity, allowing us to put forward new ideas that had previously been shelved. Users can connect to the raw data, enabling richer analytics and multiple layers of fine-grained statistics. This gives them the freedom to go in multiple directions, to follow their train of thought when analyzing data. This wasn't possible before because of the sheer volume of data."

Chapter 1 (continued)

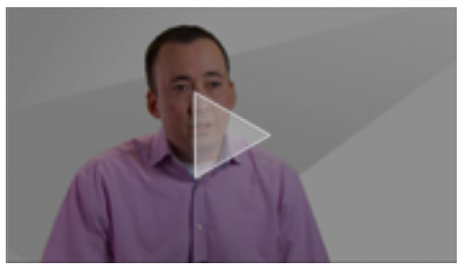
Qualitative Breakthrough

Oracle Exadata in action. See the 3-D demo.

[Watch video]

Unleashing a Giant

Oracle Exadata is a massively scalable, fully redundant, and highly secure package of servers, storage, networking gear, and software components that have been engineered together to deliver extreme performance for all database applications. This Oracle Database 11*g* relies on a massively parallel architecture to create a dynamic server and storage pool for Oracle Database 11*g* deployments and is the ideal private cloud consolidation platform.



"Oracle Exadata Database Machine provides a great platform for Hotwire's analysts to do innovative work with data."
—Kolin Ohi, Hotwire.com

[Watch video]

Chapter 2

Secret Sauce

Oracle Exadata Smart Scan: Are you a believer? You will be.

[Watch video]

Oracle Exadata Smart Flash Cache: Want to know what's so smart about Oracle Exadata Smart Flash Cache?

[Watch video]

Essential Ingredients for Extreme Performance

While the individual components of the Oracle Exadata Database Machine are industry-standard servers and networking components, analysts like Merv Adrian, research vice president at Gartner (formerly a principal at consulting firm IT Market Strategy), believe there is a "secret sauce" in the platform that makes it greater than the sum of its parts. With database innovations such as Oracle Exadata Smart Scan, Smart Flash Cache, and Hybrid Columnar Compression, he believes Oracle has "rewritten the rules of data movement and I/O within a large data environment." Each advancement adds unique capabilities to the Exadata platform, forming the essential ingredients of Oracle's secret formula for delivering extreme performance for both data warehouse and OLTP workloads.

The Oracle Exadata Smart Scan lets the storage system query subsets of the data directly, without an I/O operation. These "database-aware" storage services move processing directly to the hardware storage layer, eliminating 90 percent of the latency in most data storage and retrieval operations.

Oracle Exadata Smart Flash Cache intelligently caches data, replacing mechanical "spinning disk" operations with electronic flash memory operations. And with 5.3 TB of flash storage in a fully configured database machine, Exadata can perform up to 1.5 million I/O operations per second. In many cases the entire database can reside in the cache, enabling performance that far exceeds the mechanical limits of standard disk drive technology.

The Oracle Exadata Hybrid Columnar Compression reduces the cost of storing large amounts of data and increases the speed at which data can be scanned. Oracle's compression and flash technologies work hand in hand: by compressing data 10-fold or more, the server can load 10 times more data into memory.

At 40 Gb per second, the InfiniBand network linking Oracle Database servers to Oracle Exadata Storage Server Software is 10 times as fast as Fibre Channel, with lower latency.

Chapter 2 (continued)

Secret Sauce

Oracle Exadata Hybrid Columnar Compression: Reduce storage needs by 10x.

[Watch video]

Oracle Exadata is powered by powerful Intel Xeon processors, which offer up to eight cores and 16 processing threads in a single semiconductor die. The Oracle Exadata Database Machine X2-8 includes two database servers, each with eight Intel Xeon processors X7560. The Oracle Exadata Database Machine X2-2 includes either two, four, or eight database servers, each with two Intel Xeon processors X5670.

Oracle Exadata Database Machines feature Oracle Database 11*g*, which is renowned for its exceptionally robust availability, scalability, and security characteristics.

"We replaced 11 cabinets with only one Exadata cabinet and as an added benefit, I get 10x performance improvement."
—Metin Yilmaz, Turkcell

[Watch video]

Chapter 3

Extreme Performance

"We're performing on average eight times better and in some cases as much as 30 times better, yet using only 12 percent of the power."
—Jonathan Levine, LinkShare

[Watch video]

"We are able to bill our customers more quickly than before and we can obtain real-time insights that help us accurately measure the profitability."
—Manohar Reddy, Sogeti

[Watch video]

What Are the Implications of Extreme Performance?

More robust analytic capabilities. A huge surge in operational productivity. And greater efficiencies throughout the enterprise as market leaders leverage the raw power of Oracle Exadata to do things that haven't been done before.

Better Analytic Capabilities

Oracle Exadata enables superior business decision-making by allowing analysts to consider more possibilities and do deeper analysis more quickly. That's precisely what attracted LinkShare to the Exadata platform. Its advertisers want to be able to analyze three to five years of historical data to help them understand the effectiveness of various internet offers and the performance of particular ads on particular sites. Thanks to Oracle Exadata, LinkShare's clients can make better decisions faster.

Greater Efficiency

As organizations look to improve efficiencies by adopting a cloud-computing environment, many are turning to Oracle Exadata for their infrastructure platform. Because of its extremely fast processing capability, Oracle Exadata can handle multiple workloads, making it the ideal platform for consolidating onto a private cloud.

More Productive Operations

Normally data must be extracted from online transaction processing (OLTP) systems and loaded into a separate data warehouse for reporting and query processing, consuming valuable resources and requiring the IT staff to maintain two separate database systems. Oracle Exadata now enables customers to consolidate OLTP and business intelligence applications onto the same system, reducing both capital and operational overheads. Merv Adrian explains, "Combining OLTP and analytics on the same platform, with high-performance components and connections, enables profound changes. Hybrid applications, with some embedded analytics/intelligence inside OLTP, become possible; real-time data loading for up-to-the-minute decisions sweetens the customer's experience."

Chapter 4

Rapid ROI

"In its preintegrated form, Oracle Exadata allowed us to deliver it in a very, very short time to market."
—Nicholas Tan, Commonwealth Bank of Australia

[Watch video]

Rapid Return on IT Investments

Deeper levels of insight, advanced statistical analysis, greater productivity, fast data warehouses, datacenter consolidation...customers deploy Oracle Exadata for many reasons, yet they all realize a common benefit: a rapid return on their IT investments.

Quick Time to Market

Oracle Exadata is a complete system that has been preintegrated and performance-optimized from day one. The time, risk and expense involved with custom configurations are eliminated, so you can get up and running quickly. And because it is based on Oracle Database 11*g*, you can easily leverage your existing Oracle personnel and ecosystem.

Commonwealth Bank of Australia pioneered a new business model by using Oracle Exadata as a consolidation platform for its private cloud architecture. "Oracle Exadata allowed us to quickly provision an Oracle Database 11*g* environment, providing higher performance than we could have provided by building our own implementation," says Jason Reinhardt, an executive manager at the bank. "As our business seeks more and more services on demand, Exadata gives us a resilient consolidation platform that can meet all of those needs. Its preintegrated nature allowed us to deliver a complete solution to market very quickly."

Reduced IT Costs

Many customers turn to Oracle Exadata as they modernize their datacenters, consolidating equipment and reducing energy consumption. With Oracle Exadata as your data management solution, your data is stored so efficiently that you actually need less storage to store more data, leading to even more cost savings. When multiple racks are joined via the fast and wide InfiniBand networking fabric, hundreds of terabytes of data can be stored in a consolidated platform.

For example, SoftBank Mobile, a mobile communications company based in Japan, replaced 36 Teradata racks with just three Oracle Exadata racks. The new solution increases storage capacity 150 percent to 150 TB, improves database query performance 2 to 8x, and reduces operational costs by 50 percent. As a result, SoftBank can analyze call-detail records and customer logs more than three times as quickly as before, giving the company an edge in Japan's highly competitive mobile communications market. [Read the Softbank case study]

Chapter 5

Lower Risk

"Our acquisition of Oracle Exadata confirms the benefits to AFG of a single-model supply in reducing our total cost of ownership."
—Malcolm Watkins, AFG

[Watch video]

"At last you get to this one rack that has everything bundled together: the Oracle Exadata Database Machine. It's pretty amazing."
—Douglas Miller, Polk

[Watch video]

Mitigate Deployment Risks

In addition to the technical benefits, customers adopt Oracle Exadata to mitigate deployment risks. It offers a single support contact, easier system management, and fewer licensing issues. With prebundled hardware and software, there are no lengthy implementation, configuration, and tuning chores. The solution has been optimized for all types of database processing tasks, and one vendor is accountable for every aspect of the platform.

A Complete Solution from One Vendor

Oracle offers many other products to extend this rich database platform. In-database analytics include online analytical processing (OLAP) and data mining tools as well as data models that address industry-specific requirements, instantly transforming raw data into insightful, actionable information. Oracle's suite of business intelligence and data integration solutions completes the data warehouse stack. Oracle provides comprehensive services across the entire Oracle Exadata lifecycle.

Comprehensive Start-Up Services

The Oracle Exadata Start-Up Pack provides expertise to help you maximize the value of your Oracle Exadata technology investment. This suite of services includes planning, designing, installation, and technical reviews to help you deploy Exadata solutions quickly and effectively. Oracle also provides patch recommendations and deploys proactive unified patch bundles every quarter for one year.

Support for the Entire Stack

Oracle Premier Support Services for Oracle Exadata provides 24/7 support for software, server, and storage systems, including software updates, onsite hardware response within two hours, and automated service requests. With one vendor supporting the entire Oracle stack, you get faster problem resolution, more-effective proactive maintenance, and easier upgrades.

Outsourcing to Oracle

If your strategy is to outsource end-to-end IT services, Oracle will manage your system remotely at your datacenter or at Oracle's datacenter with stringent service levels, a dedicated security team, processes, and technologies.

Chapter 6

Superior Processors

"With Oracle Exadata, Intel processors and Oracle Database have been brought together to deliver extreme performance."
—Pauline Nist, General Manager, Intel

[Watch video]

Engineered for Extreme Database Processing

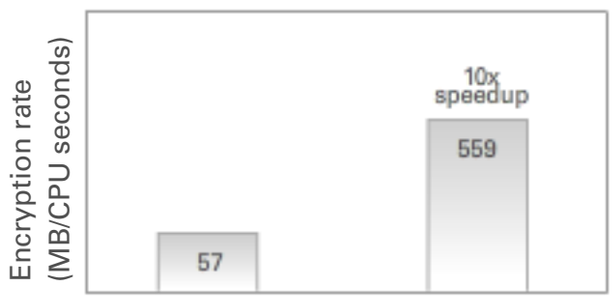
Two decades of engineering collaboration between Oracle and Intel has resulted in Intel Xeon processor-based solutions that deliver unprecedented performance, unparalleled reliability, and intelligent scalability for the most demanding enterprise environments. Oracle Exadata relies on powerful Intel microprocessors to move large volumes of data efficiently and handle millions of transactions per second. Advanced reliability features maintain data integrity, accelerate encrypted transactions, and maximize the availability of database services, with automatic management of hardware errors.

Extensive coengineering, testing, and validation by Oracle and Intel have yielded an optimal balance between processor, memory, and I/O resources to deliver extreme performance for demanding OLTP and data warehouse applications. With a roadmap that stretches years into the future, Oracle continues to work closely with Intel to architect complementary technologies.

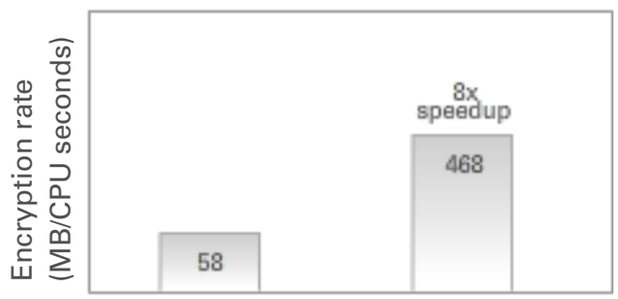
Chapter 6 (continued)

Superior Processors

Database Encryption
(Oracle Database Enterprise Edition 11.2.0.2 TDE 256 Bit)



Database Decryption
(Oracle Database Enterprise Edition 11.2.0.2 TDE 256 Bit)



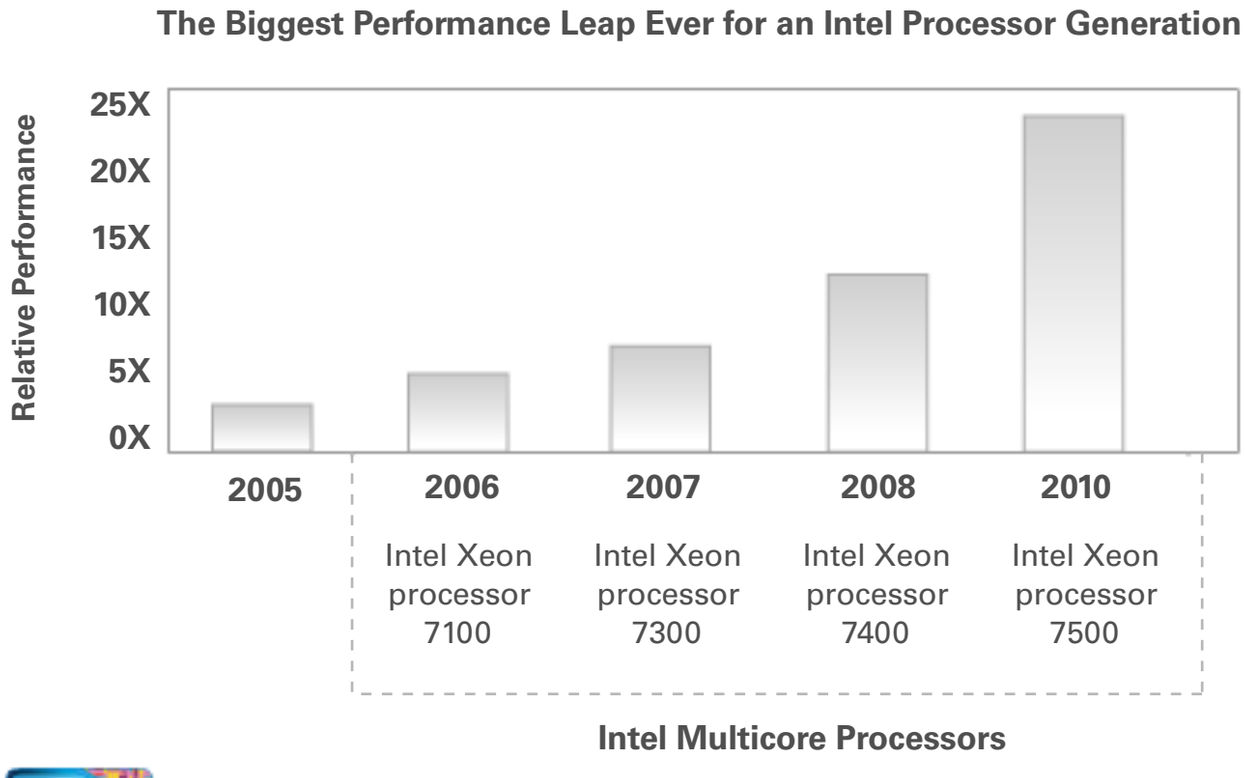
The Intel Xeon processor 5600 series allows businesses to meet their compliance needs with Oracle Advanced Security by dramatically lowering the processing cost of encryption.

Hardware-Level Encryption

This collaboration is evident in the unique security capabilities of the Intel Xeon processor 5600 series. Organizations that wish to deploy cryptographic encryption to protect sensitive data can use Oracle Advanced Security with Intel Advanced Encryption Standard New Instructions (AES-NI) to speed up Transparent Data Encryption (TDE) performance. Testing with Oracle Database 11*g* demonstrated a 10-fold performance improvement when inserting 1 million rows 30 times into an empty table on Intel Xeon processor X5680 when optimized with Intel Integrated Performance Primitives crypto library.

Chapter 6 (continued)

Superior Processors



As the workhorse of Oracle's flagship Exadata product line, the Intel Xeon 7500 processor series delivers steady improvements in performance.

The Intel Xeon Processor 5600 Series

Intelligent processors that automatically regulate power consumption, combining industry-leading energy efficiency with intelligent, adaptive performance. Compared to single-core processors, the Intel Xeon 5600 processor series delivers:

- Up to 15x greater performance
- Up to 95 percent lower operating costs
- Up to 40 percent better performance per watt

The Intel Xeon Processor 7500 Series

Scalable performance with advanced reliability features for data-demanding applications. These processors automatically adapt to the diverse needs of a virtualized environment. Compared to the previous generation, the Intel Xeon processor 7500 series delivers:

- Up to 3x the database performance
- Up to 3.7x better performance in a virtualized environment
- Up to 8x the memory bandwidth
- Up to 20:1 server consolidation ratio

Chapter 7

Resources

Videos

AFG Expands Cloud-Based CRM with Oracle Exadata

LinkShare Uses Oracle Exadata for Real-Time Data Analysis

Oracle Exadata Smart Scan

BNP Paribas Improves Performance by 17x with Oracle Exadata

R.L. Polk Discusses Storage Efficiency with Oracle Exadata

Oracle Exadata Smart Flash Cache

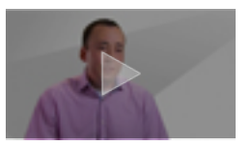
Commonwealth Bank of Australia Consolidates on Oracle Exadata

Sogeti Consolidates Oracle E-Business Suite on Oracle Exadata

Oracle Exadata Hybrid Columnar Compression

Oracle Exadata: Are You Ready?

Turkcell Reduces Database Size by 90 percent with Oracle Exadata



Hotwire Competes with Innovative Analysis Using Oracle Exadata

Oracle Exadata in action. See the 3-D demo.

Chapter 7 (continued)

Resources

Podcasts

- *Enkitec Improves Performance, Scalability, and Management of Hosted IT Services Environment with Oracle Exadata*
- *Hotwire Competes with Innovative Analysis Using Oracle Exadata*
- *Targetbase Enhances its Client Services with Oracle Exadata*
- *Turkcell Achieves Up to 400x Performance Improvement for its 100 TB Data Warehouse with Oracle Exadata*
- *BNP Paribas Cuts Data Warehouse Size and Improves Manageability, Performance with Oracle Exadata*
- *LinkShare Migrates to Oracle Exadata for Fast, Real-Time Data Analysis*

Case Studies

- Customers Discuss Oracle Exadata
- SoftBank Mobile Improves Database Query Performance By, Up to Eight Times
- Bayer HealthCare Integrates OLTP and DWH Through Oracle Exadata for More Efficient Drug Information Analysis
- BNP Paribas Deploys Oracle Exadata to Accelerate Information Processing: The Hardware Perspective
- Nagase & Co. Cuts Batch Processing Time by One-Third, Improves Regulatory Compliance

White Papers

- *Database Consolidation to Private Clouds*
- *Lowering Your IT Costs with Oracle Database 11g Release 2*
- *A Technical Overview of the Oracle Exadata Database Machine and Exadata Storage Server*
- *Oracle Exadata Smart Flash Cache and the Oracle Exadata Database Machine (PDF)*
- *Oracle Exadata Hybrid Columnar Compression (PDF)*
- *Oracle Database 11g Release 2 for Data Warehousing and Business Intelligence*

Data Sheets

- *Oracle Exadata Database Machine X2-8*
- *Oracle Exadata Database Machine X2-2*
- *Oracle Exadata Storage Server*
- *Oracle Exadata Start-Up Pack*
- *Intel Xeon 7500 series*
- *Intel Xeon 5600 series*