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Chapter 1: Engineered for You

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CHAPTER 1 Engineered for You



Is your information technology (IT) organization pressured to get more work done with fewer people or on a constricted budget? Do you need to make IT a competitive asset rather than a cost center? Does your business struggle with slow software applications or inconsistent business data? If you answered yes to any of these questions, it's time to take a close look at Oracle Exadata, the world's fastest database machine exclusively designed to run the Oracle database. It is the first database machine optimized for data warehousing, online transaction processing (OLTP) and consolidation workloads.

Oracle launched a revolution when it unveiled Oracle Exadata in 2008 as a complete and fully integrated database system—and it has steadily upgraded the platform ever since. As the industry leader in database technology, Oracle listened closely when customers talked about the challenges of getting consistent and timely results from their IT systems, while vast amounts of new data streams required much more capacity all with the constant pressure on budgets.

## **Oracle Exadata**

will transform the way you look at computing by providing:

Extreme performance and availability Flexibility, optimized for all database workloads Simpler and faster to deploy, manage and scale Oracle Exadata delivers a system that runs faster and more reliably than has ever been done before. Our differentiation is that we provide the best performance by combining leading-edge hardware with very sophisticated and special software technology—and that's really where the magic is.



Article: "Oracle's Secret Sauce: Why Exadata Is Rocking the Tech Industry."

Read the Forbes OracleVoice Article

#### Leave the Effort to Oracle

Deploying Oracle Exadata is faster than deploying a custom-assembled data management infrastructure because Oracle designs, integrates, tests, and upgrades the entire environment as a unified solution. Your database applications can run without any modification, and your database administrators can work with the same familiar Oracle Database and management tools—yet performance skyrockets 10-fold or more in some cases. Oracle Exadata boosts the productivity of IT staff and lowers operational costs. As this e-book shows, the implications are transformative.



Video: Oracle Exadata: World's Fastest Database Machine. Juan Loaiza, Senior Vice President, Systems Technology, Oracle Watch the Video (5:10)

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#### Chapter 1: Engineered for You



Video: Are You Ready? Take a look at Oracle Exadata Database Machine and the extreme performance it offers your enterprise. Watch the Video (3:00)

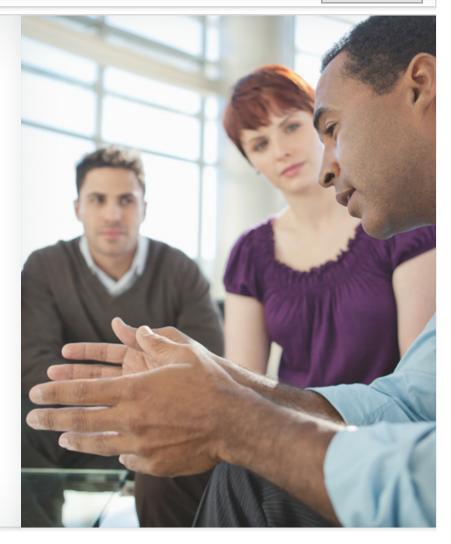
### "Exadata lets us consolidate multiple databases on to a single platform.... We've saved millions of dollars."

Alex Mann, Director of Infrastructure and Security, Garmin International



Video: Customers discuss how Exadata helped transform IT into a strategic part of the company, drive better real-time insights, enable cost savings of millions of dollars, accelerate performance, and improve uptime and scalability.

Alex Mann, Director of Infrastructure and Security, Garmin International Watch the Video (1:08)





#### Chapter 2: Engineered for Business

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CHAPTER 2 Engineered for Business



New types of data are pouring into the data center—not just traditional data from business applications, but also human-generated data from cell phones and social media, and machine-generated data from sensors and meters. Industry-leading companies are harnessing this data to obtain a competitive advantage through activities such as studying customer tendencies and predicting equipment failures.

More data of increasing variety necessitates better, faster, and more-predictable data warehouses, OLTP systems, and data management strategies. Unfortunately, many organizations are burdened with heterogeneous systems that are difficult to maintain and require support from multiple vendors. As data becomes more strategic to the business, can your information systems keep up?

Oracle Exadata simplifies data management. Instead of ordering, installing, and integrating servers, storage arrays, networking gear, peripherals, and management software, with Oracle Exadata you receive a fully optimized system. It comes preconfigured and preintegrated, eliminating the trial and error and bottlenecks of traditional systems. Everything is tuned for database performance and availability. Moreover, Oracle's unique software innovations can drive order-of-magnitude performance acceleration. Oracle Exadata is engineered for your business. "Oracle Exadata comes preconfigured, from the storage all the way up to the database. This is something we had to do before ourselves. Now it is done for us with the Exadata solution."

Jim Duffy, Senior Data Warehouse Architect, BNP Paribas



Video: BNP Paribas Improves Performance by 17x with Oracle Exadata.

Jim Duffy, Senior Data Warehouse Architect, BNP Paribas

Watch the Video (1:34)

#### **Built for an Information Revolution**



Once Oracle Exadata is online, you will marvel at its unique capabilities. In addition to being amazingly fast using industry standard Intel<sup>®</sup> Xeon<sup>®</sup> processors, Oracle Exadata's innovative compression technologies (such as Oracle Hybrid Columnar Compression) shrink the amount of space needed

to store very large volumes of data 10x to 15x—as much as 5x the industry average. This technology not only saves storage costs, it also speeds queries, multiplying the benefits. Reducing the storage footprint minimizes operational expenses, saves space in the data center, and helps you avoid expensive capital equipment upgrades, while improving performance at the same time.



#### Chapter 2: Engineered for Business

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Oracle Exadata uses special techniques to scan only the pertinent parts of the database at any given moment. As with any high-performance system, Oracle Exadata includes Flash memory to dramatically accelerate access to frequently used data, and Exadata Smart Flash Cache is Oracle's unique, application-aware Flash storage solution. And because Oracle Exadata is database-aware, the Exadata Smart Flash Cache feature loads only active data to Flash memory, making it even more efficient. Your business operations run more efficiently, which reduces costs and boosts productivity. And reporting and analytics are faster, which leads to better business decisions.

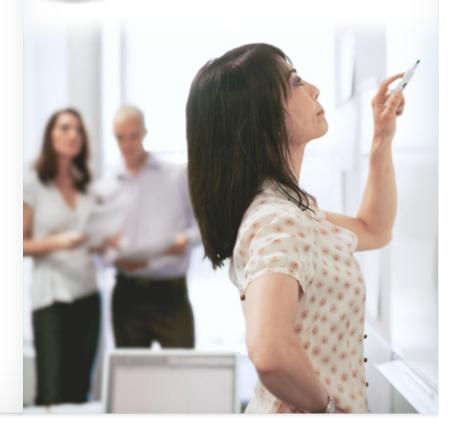
Technology from Oracle and Intel<sup>®</sup> bring extreme performance to every workload, from scan-intensive analytics applications to highly concurrent OLTP applications. And Exadata supports many types of consolidation scenarios, including running multiple schemas in a single database, hosting multiple databases on a single platform, and a hybrid of the two configurations.

"Oracle Exadata is an extremely fast, reliable, and secure data warehousing solution that can easily scale to meet the complex reporting and analytic needs of the most demanding organizations."

Philip Russom, Research Director, The Data Warehouse Institute



Report: "High-Performance Data Warehousing." Philip Russom, Research Director, The Data Warehouse Institute Read the Report



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#### Chapter 3: Engineered for Clouds

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CHAPTER 3 Engineered for Clouds



Organizations adopt cloud technologies in order to scale information systems quickly and enable on-demand, "pay-as-you-go" models for IT services. Deploying a database cloud increases flexibility and maximizes utilization by efficiently sharing the physical infrastructure. Because of its extremely fast processing abilities, near limitless capacity, and ability to handle multiple workloads, Oracle Exadata is the ideal platform for consolidating data onto a private, on-premise cloud, often called Databaseas-a-Service (DBaaS).

The DBaaS model empowers business users to speed the provisioning of databases without tying up IT and database administrator resources. As the State of Texas demonstrated, the DBaaS model combines the benefit of on-premise equipment with a charge-back model similar to a public cloud.

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White Paper: "Delivering Cloud Services to the State of Texas."

Read the White Paper



## Webcast: DBaaS Keynote Customer Panel.

Watch Oracle executive Juan Loaiza and IDC's Carl Olofson talk with customers using DBaaS. Learn why cutting edge customers are using DBaaS.

Watch the Webcast (1:00:22)

A DBaaS environment speeds deployments and enables dynamic resource utilization, allowing you to lower operating costs and increase the utilization of hardware and software by minimizing idle cycles. At the same time, users can provision and decommission a database themselves, speeding deployments. Whether you subscribe to a public cloud or create a private cloud with on-premise equipment, Oracle Exadata is an ideal platform to streamline the deployment and production of DBaaS environments.

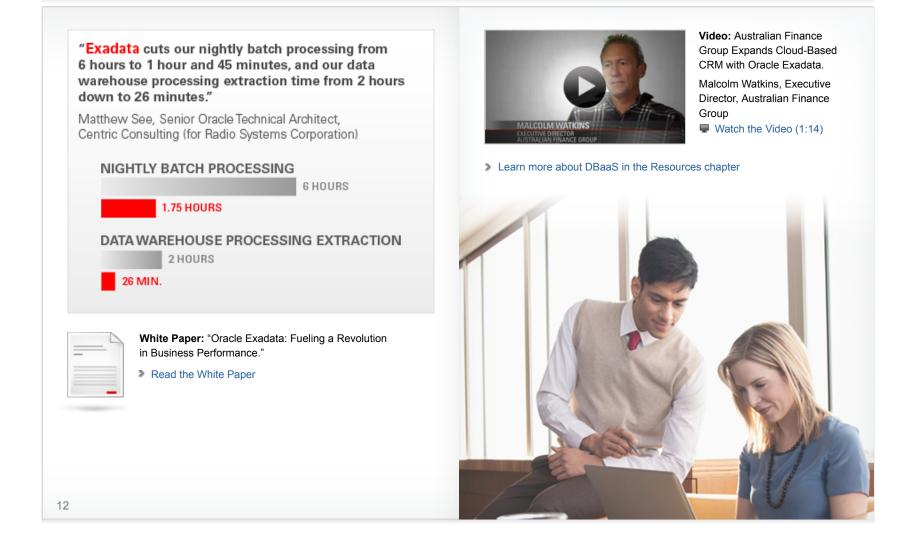
Keeping data secure is fundamental in DBaaS environments. Oracle Exadata is designed to deliver secure operations, including encryption from Intel Advanced Encryption Standards New Instructions (AES-NI). Intel AES-NI accelerates encryption and decryption in Intel Xeon processors, providing faster, more-affordable data protection and security that traditionally only occurred at the software layer with a significant performance degradation.

Some customers adopt a self-service model for provisioning new databases as part of a database cloud service. This approach speeds deployment and provides the elasticity to scale databases as necessary, as well as enabling chargeback based on actual usage.



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#### Chapter 4: Engineered for Performance

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CHAPTER 4 Engineered for Performance



With more than 30 years' experience in building the world's best database, Oracle understands what is required to deliver performance, from query and transaction speed to uptime. Oracle Exadata includes a number of technical advancements that dramatically improve performance for all types of database applications.

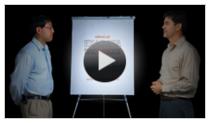
**Exadata Smart Scan** accelerates queries by looking for data only where it's most likely found. This makes nearly every query go faster by cutting out unnecessary work. Oracle's unique storage servers move processing directly to the hardware storage layer, eliminating 90 percent of the latency in most data storage and retrieval operations. Being able to execute queries faster and run reports more quickly accelerates business decisions, improves accuracy, and yields higher-quality results.



Video: Exadata Smart Scan. Learn how Exadata Smart Scan offloads query processing to the storage layer to deliver extreme performance.

Watch the Video (3:06)

**Exadata Smart Flash Cache** automatically moves frequently used data to faster Flash storage as needed without manual intervention. By intelligently caching data in Flash, it replaces magnetic disk operations with solid-state memory operations. In many cases the entire database can reside in the cache, enabling performance that far exceeds the mechanical limits of standard disk drive technology.



Video: Exadata Smart Flash Cache. Want to know what's so smart about Exadata Smart Flash Cache? This three minute video explains how Exadata Smart Flash Cache helps solve the random I/O bottleneck challenge and delivers extreme performance for consolidated database applications.

Watch the Video (3:02)

"We're performing on average 8 times better and in some cases as much as 30 times better, yet using only 12 percent of the power."

Jonathan Levine, CIO & Vice CTO of Rakuten Group



#### Chapter 4: Engineered for Performance

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**Oracle Hybrid Columnar Compression**, unique to Oracle Database, uses a combination of row and columnar storage methods to save space and improve performance. This reduces the cost of storing large amounts of data and increases the speed at which data can be scanned.



Video: Oracle Hybrid Columnar Compression. Watch a flipchart video explaining Oracle Hybrid Columnar Compression technology.

Watch the Video (3:22)

Why is this so important? Compression reduces the amount of storage required, which translates into millions of dollars in savings for large enterprises. Oracle Exadata is your ticket to the high-volume world of big data while lowering your costs.



Video: LinkShare Uses Oracle Exadata for Real-Time Data Analysis.

Jonathan Levine, CIO & Vice CTO of Rakuten Group Watch the Video (1:56)



Video: Oracle Exadata: Perfect Platform for Oracle Data Warehousing.

Corrado Azzarita, Associate Director, IT Development and Operations, Procter & Gamble Watch the Video (2:52)

"[Oracle] Hybrid Columnar Compression is giving us 10 to 15 times compression, and the performance improvement is astounding."

Douglas Miller, Director of Global Database Development and Operations, R.L. Polk



Video: R.L. Polk Discusses Storage Efficiency with Oracle Exadata.

Douglas Miller, Director of Global Database Development and Operations, R.L. Polk Watch the Video (1:42)

At 40 gigabits per second, the InfiniBand network linking Oracle Database servers to Oracle Exadata Storage Servers is many times faster than fiber channel, with lower latency.



#### Chapter 4: Engineered for Performance

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In addition, Oracle Exadata database servers are powered by top-of-the-line Intel Xeon processors, and Oracle Exadata Storage Servers are also powered by the versatile Intel Xeon processor, which offers multiple cores and multiple processing threads in a single semiconductor die.

Extensive co-engineering, testing, and validation by Oracle and Intel engineers have yielded an optimal balance between processor, memory, and I/O resources to deliver extreme performance for demanding OLTP and data warehouse applications. Oracle continues to work closely with Intel to architect complementary technologies.

"We're seeing 20 times compression, so we go from 20 TB to 1. Some queries used to take 10 minutes with the previous platform, and that's now down to a few seconds."

Jonathan Walsh, MIS Manager, Morrisons

Article: "Case Study: Morrisons' Data Warehouse."

Read the Article

#### **Maximum Service Levels**

Some companies count downtime in millions of dollars of lost revenue. Oracle Exadata is designed to provide a foundation for the highest level of availability, avoiding downtime from simple component failures and complex site or human failures. Combined with database options, customers can be confident that their applications and data will meet the highest levels of uptime.

For example, Using Oracle Active Data Guard or Oracle GoldenGate, a second Oracle Exadata Database Machine can be configured to transparently maintain a real-time copy of the database at a remote site to provide full protection against primary database failures and site disasters.

Additionally, Oracle Maximum Availability Architecture, a best-practices blueprint based on Oracle's high availability (HA) technologies and extensive validation from Oracle's development team and production experience of many customers, delivers a roadmap for uptime at the database level. Oracle Maximum Availability Architecture is designed to achieve an optimal HA architecture at the lowest cost and complexity.

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White Paper: VocaLink and Exadata Technical Case Study. VocaLink's switching platform connects more than 65,000 ATMs, and its payment platform processes more than 10 billion payment transactions with a value of £4.9 trillion. It uses Oracle Exadata and Oracle Maximum Availability Architecture to achieve the highest levels of availability and performance.

Read the White Paper





CHAPTER 5

Chapter 5: Engineered for All Workloads

**Engineered for All Workloads** 

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#### **Better Analytics Capabilities**

The datafication of the enterprise is driving a new era of analytics-based decision-making. Data warehouses are evolving as organizations discover how to acquire, organize, and analyze a tremendous influx of data. Whether they are scrutinizing past performance or projecting future trends, enterprises rely on the information in their databases to make sound business decisions.

Today's data warehousing applications are evolving to accommodate new types and quantities of data, even as these systems become more essential to the business. Growing data volumes require more-scalable warehouses. Increasing velocity calls for extreme performance. Incremental upgrades won't cut it. Astute companies are looking for qualitative breakthroughs.

Oracle Exadata delivers simple, cost-effective scalability with smart optimizations that improve performance by moving data processing closer to the data. These unique technical capabilities have opened the floodgates of imagination, and are powering new business processes and fostering innovative business tactics. Oracle Exadata enables superior decisionmaking by allowing analysts to consider more possibilities and do deeper analysis more quickly. Powered by the latest Intel Xeon processors, Oracle Exadata helps unlock the potential of your data.

#### **More-Responsive OLTP Operations**

For years customers have run their most important business databases on Oracle Database platforms. Critical business processes—from financial analysis to supply chain planning—are dependent on the performance of this leading database platform. With Oracle Exadata you can run these critical applications faster and more efficiently than ever before. The balanced Exadata configuration ensures continuous availability and exceptional performance for all types of data processing.



Video: Cox Communications Drive OLTP and Analytics with Exadata. "Exadata is our cornerstone strategy for supporting both analytics applications and OLTP applications."

John Landis, Senior Director, Cox Communications Watch the Video (1:07)

Video: Oracle Exadata Gives Salzburg University Performance Boost. Florin Guma, CIO, University of Salzburg

Watch the Video (2:29)

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#### Chapter 6: Engineered to Empower

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#### **Smarter Performance Eliminates Tuning**

Extensive automation in the Oracle Exadata platform makes it easier for IT pros to deliver high-performance applications with less manual effort and no wasted capacity. For example, because Oracle Exadata is database-aware, Exadata Smart Flash Cache automatically caches frequently accessed data in PCI Flash while keeping infrequent data on disk drives. This provides the performance of Flash and the economics of disk for more of the system's workloads.

Thanks to Exadata Smart Flash Cache memory technologies, DBAs do not need to concern themselves with manually moving data to faster storage tiers to improve performance, as Exadata is aware of the most frequently used data, and automatically prioritizes which data is stored on the fastest tier, whether it's RAM or Flash storage for example.

#### **Smarter Integration Simplifies Maintenance**

Oracle Exadata is the world's most advanced database environment, yet it runs the standard Oracle Database. Oracle Enterprise Manager Cloud Control supplies a comprehensive view of the database and all Oracle Exadata components in a consolidated snapshot. For DBAs already familiar with Enterprise Manager for managing the database, there is now an opportunity to be the primary administrator for the database software and the hardware platform. Administrators can oversee every aspect of the

system simultaneously, as well as monitor performance at the database level to make sure users receive adequate response time.

#### **Smarter Engineering Means Peace of Mind**

Oracle Exadata is backed by a single support contract for all hardware and software assets. A single vendor is accountable for every aspect of the platform. With Oracle Exadata, you can be sure that your business-critical systems are engineered for success and backed by comprehensive support.

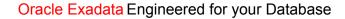


Video: Elavon Improves Query Performance 98% with Oracle Exadata. "We have a single version of the truth, with everything centralized on Exadata. We no longer have databases scattered all over the place."

Jefrino Afonso, Senior Vice President, Systems and Technology, Elavon Watch the Video (1:33)

Video: Oracle Exadata: A Month in the Life—Garmin Simplifies.

Alex Mann, Director of Infrastructure and Security, Garmin International Watch the Video (4:12)





#### Chapter 7: Engineered to Get Ahead and Stay Ahead

CHAPTER 7 Engineered to Get Ahead and Stay Ahead

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#### **Faster Time to Value**

Accelerate deployment, migration and adoption of Oracle Exadata with the help of Oracle Services experts who know Oracle technology inside and out. From strategy and architecture, to managing upgrades, migrations and implementations, to education and training, Oracle Services offer best practices, tools, and deep domain expertise to help you get up and running faster and with less risk.

- Migration Services: Accelerate adoption of Oracle Exadata with the unique tools and expertise of Oracle Migration Factory.
- Installation and Configuration Services: Learn best practices for deploying and configuring Oracle Exadata to achieve maximum availability.
- Oracle Exadata Start-Up Pack: Integrated service package and product expertise to ensure an optimized plan and deployment of Oracle Exadata.
- Training: Give your staff the essential skills and expertise they need to take full advantage of Oracle Exadata.

#### Integrated Support for Availability and Performance

- Complete Support Essentials: 24/7 coverage for hardware and software to keep your Oracle Exadata reliable, available and secure.
- Oracle Platinum Services: Remote patch installation and 24/7 fault monitoring with accelerated response times for certified Oracle Exadata Systems covered by Oracle Premier Support, at no extra cost.



Video: Hear Mark Hurd Announce Oracle Platinum Services.

Watch the Video (1:11)



Video: KPN Sees Great Benefits in Oracle Platinum Services.

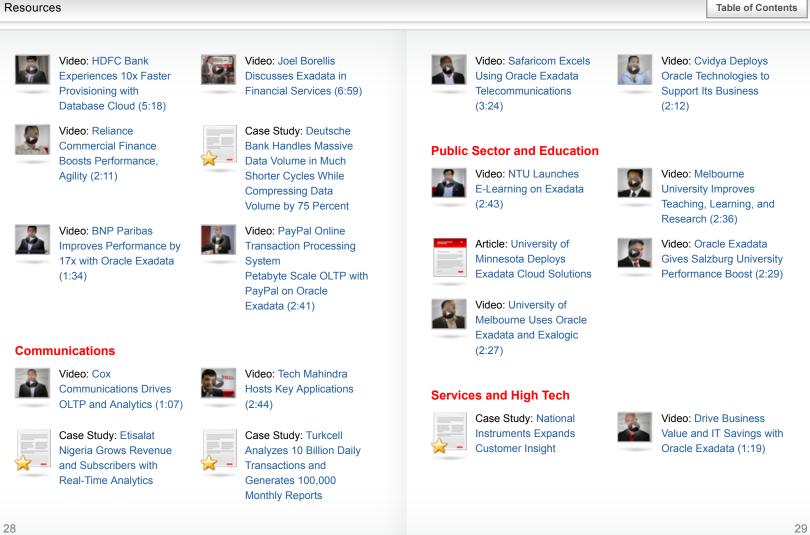
Michel Bosman, Lead Architect, Data Center Services, KPN Watch the Video (2:19)

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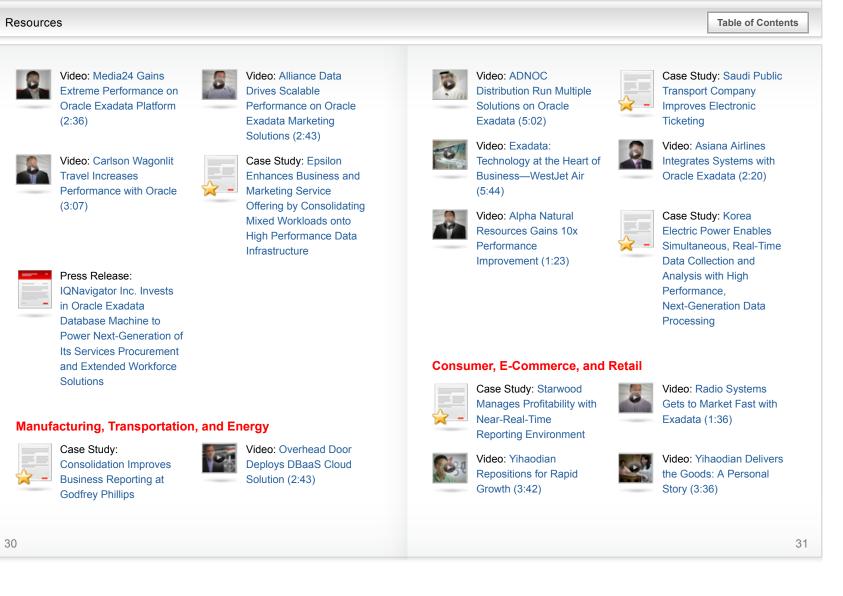


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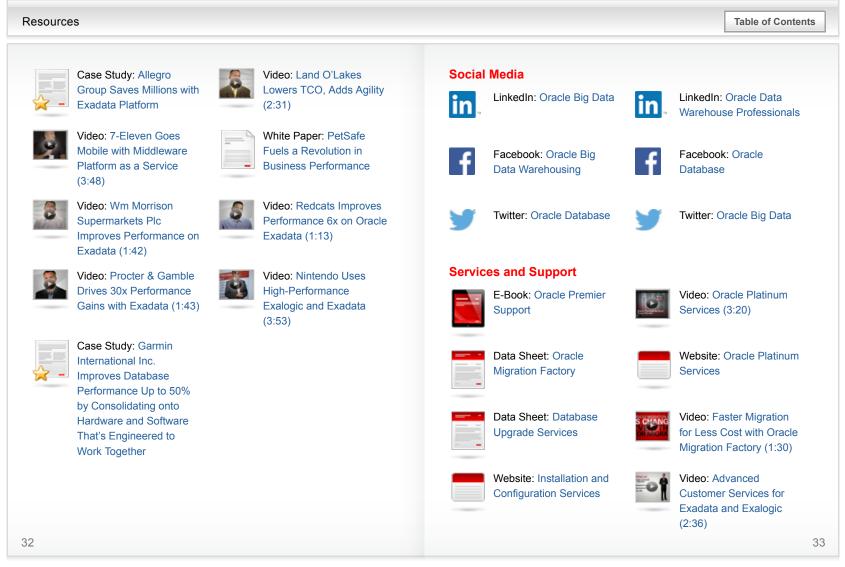














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