Run Critical Databases in the Cloud

Oracle Cloud is ideal for any size database workloads,
including your enterprise workloads.

Cloud **Essentials**

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Cloud computing is transforming business practices and simplifying data-center operations. However, when it comes to moving critical database assets to the cloud, many IT leaders are leery—and rightly so. They have seen the limitations of popular commodity cloud solutions, which mostly consist of fragmented hardware and software offerings that must be manually configured. IT pros must build their own platforms on top of the service provider's commodity infrastructure, migrate their data, and then figure out how to keep everything in sync with the apps and data still maintained on premises.

Can a public cloud offer turnkey database functionality along with the high levels of security, availability, scalability, and performance that you are accustomed to in your own data center? Can it ensure consistency with your on-premises applications and databases, and give you the tools to easily move workloads between the two? Can it automate mundane administrative tasks, helping you eliminate manual, error-prone management processes?

With Oracle Cloud, the answer is yes. Oracle's proven cloud database services guarantee enterprise-caliber scalability, security, performance, and automation—often beyond what you can achieve in your own data center. You can subscribe to complete database platforms with a few clicks, eliminating the need to provision, build, and manage in-house databases and storage systems. With pay-as-you-grow configurations—all managed by Oracle experts—your organization will obtain operational flexibility with zero up-front capital expenses. It's a great way to lower operational costs because you pay only for what you use.

Read on to discover what Oracle Database Cloud can do for your business.

Does your business need the cloud?

Modern businesses depend on their data more than ever before—and it's coming at an alarming rate, placing crushing demands on data marts, enterprise data warehouses, and analytic systems. Some businesses look to the cloud to help solve these scalability issues. However, most cloud providers simply shift your old problems to a new infrastructure—and it's up to you to keep the entire platform running efficiently. Industry research firm IDC found that as much as 75 percent of the total cost of database management can be attributed to labor.[1]

Migrating to a cloud-computing model.

Developing new applications using a cloud model is one thing, but how do you achieve results that completely transform your business—like significant cost savings, easier IT management, and faster developments?

The key is to move both existing and new applications to the cloud—ensuring you deliver wide-scale transformational results. With Oracle's unified cloud platform, you get a complete data ecosystem in which a broad set of related cloud services work together automatically—and in many cases, autonomously.

Did you know?

By 2020, cloud-adoption strategies will influence more than 50 percent of IT outsourcing deals.[2]

[1] Carl W. Olofson and David Schubmehl, "Oracle's Autonomous Database: AI-Based Automation for Database Management and Operations," IDC report, February 18, 2018, oracledwh.de/downloads/07_ADWC/Bericht_von_IDC.pdf.

[2] "Gartner Forecasts Worldwide Public Cloud Revenue to Grow 21.4 Percent in 2018," April 12, 2018, gartner.com/newsroom/id/3871416.

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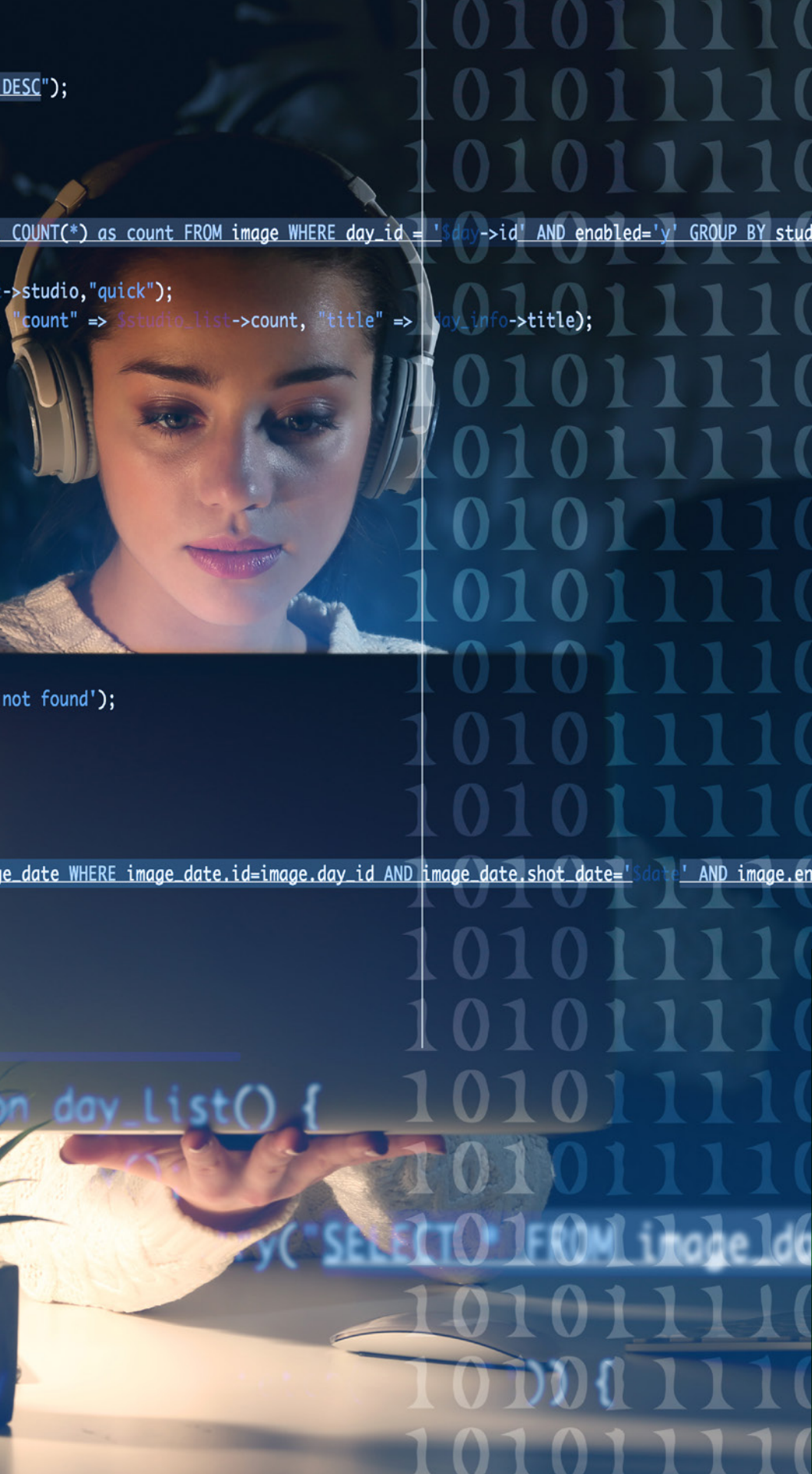
Shielding sensitive data from external and internal threats.

Cyberattacks have evolved to become increasingly more sophisticated. Individual hackers are the least of your worries. Your cybersecurity team is tasked with fighting off highly skilled and ultrasophisticated nation states and large online criminal communities.

To survive, you need to join forces with an experienced technology partner; a partner that leverage the latest technologies to deliver the highest possible level of security. Oracle automatically applies patches across the entire stack of software that supports your applications—even while those apps are running.

Delivering guaranteed uptime.

Your business's success and reputation depend on your ability to maintain system uptime. That's why it's essential your chosen cloud architecture is able to handle every threat it faces—from software and hardware failures to maintenance repairs and natural disasters.

[3] Statista, "Average Organizational Cost to a Business in the United States after a Data Breach from 2016 to 2017 (in Million US Dollars)", statista.com/statistics/273575/average-organizational-cost-incurred-by-a-data-breach/.

[4] Statista, "Average Cost per Hour of Enterprise Server Downtime Worldwide in 2017 and 2018", statista.com/statistics/753938/worldwide-enterprise-server-hourly-downtime-cost/.

Did you know?

Last year, the average cost to businesses affected by a data breach amounted to around US$7.4 million.[3]

Did you know?

24 percent of businesses worldwide reported average hourly downtime costs of their services as between US$301,000 and US$400,000.[4]

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Intelligent business analytics requires automation.

Relying on a cloud provider accelerates the process of provisioning data warehouses and business intelligence applications, but in most cases database administrators still have to install and manage the database platform, then work with the business community to create a correct data model. Once the warehouse is deployed—either on premises or in the cloud—they face an endless cycle of tuning, securing, scaling, and maintaining these analytic assets.

Oracle Autonomous Data Warehouse gives you an easier way to store, access, and manage your analytic data. This unique data-warehouse service is self-tuning and preconfigured for automated patches and upgrades, helping you eliminate manual, error-prone management processes. The database detects available patches and automatically applies them, without human intervention.

This easy-to-use analytic database scales elastically and delivers incredible query performance—without requiring IT pros to perform routine database administration. You can deploy a data warehouse in the cloud in 15 minutes, and then expand or shrink computing and storage resources independently, with no downtime. Because it is built on Oracle Database, all business intelligence tools and services and all data integration tools and services that support Oracle Database also support this service. Once in production, all provisioning, patching, updating, backing up, tuning, and security updates take place automatically.
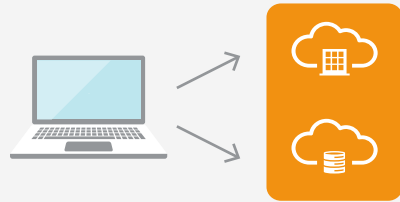
Oracle Hybrid Cloud Management

Simple
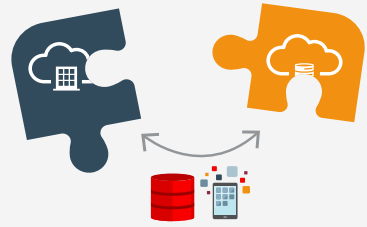
Move to Oracle Cloud

Migrate workloads to Oracle Cloud and back with one click

Reliable

Monitor Oracle Cloud

Ensure quality of service for Oracle Cloud Services

Comprehensive

Control Hybrid Cloud

Enjoy single-pane-of-glass management for private and public clouds

The world's most complete DBaaS offering.
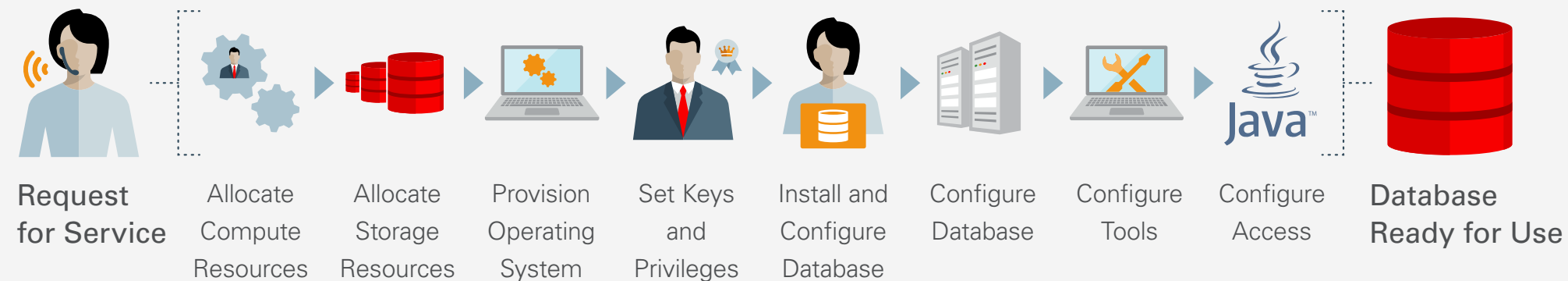
Oracle's mature (DBaaS) offerings satisfy various levels of availability, scalability, and performance. You can set up and tear down databases on an as-needed basis, and let Oracle handle all the details of configuring and managing servers and storage resources.

All Oracle Cloud database offerings are 100 percent compatible with the Oracle Database instances that you have deployed on premises, ensuring a smooth transition to the cloud and a flexible hybrid management strategy. You can migrate your databases to Oracle Cloud with a single click, and then monitor the DBaaS environment in the

same way that you monitor your on-premises databases—all from a single console. You can do it yourself or you can let Oracle handle everything for you, including backups, software patches, and upgrades.

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Automated Database Provisioning

Request for Service → Allocate Compute Resources → Allocate Storage Resources → Provision Operating System → Set Keys and Privileges → Install and Configure Database → Configure Database → Configure Tools → Configure Access → Database Ready for Use

Rapid provisioning processes.

Provisioning an on-premises database is often a lengthy process, including finding space in the data center, procuring hardware resources, setting up storage volumes, allocating memory, configuring database instances, and much more. Oracle simplifies the provisioning process via a cloud portal interface and APIs that integrate with any management or orchestration tool. You can have a fully configured Oracle Database instance up and running in an hour or less. After that, new database instances can be provisioned in minutes. This highly efficient model avoids the burden of having to maintain extra capacity.

Intelligent business analytics require automation.

Oracle Database Cloud Service is preconfigured for automated backup and recovery. No setup is required, and you can restore the database to any point in time. Built-in integration with Oracle's Recovery Manager (RMAN) utility, Oracle Data Guard, Oracle Active Data Guard, and other maximum availability architecture (MAA) capabilities ensure top-notch reliability and performance.

- **Comprehensive data management** with support for both structured and unstructured data with mixed workloads such as online transaction processing (OLTP) and analytics; Oracle Exadata options for high-end demands such as big data and Internet of Things applications

- **Unmatched performance** for database workloads that can be deployed on elastic cloud in a virtualized environment, on bare metal for predictable performance, or on Oracle Database Exadata Cloud Service for extreme performance

- **Easy migrations** with no code change to your applications when you move them to the cloud, which preserves investments and eliminates costly recoding efforts

- **Familiar management tools** that deliver comprehensive visibility for software, databases, and applications

- **Industry-leading innovations** such as pluggable databases for portability, in-memory technology for performance, and engineered systems optimized for mission-critical workloads

- **Deployment choice** as you migrate workloads among private clouds, Oracle Public Clouds, and Oracle Cloud at Customer hybrid environments—with the same products, architecture, and skills across all environments, giving you flexibility for the future

- **Exceptional protection** with Oracle defense-in-depth security, including encryption of at-rest and in-transit data to keep your information safe

- **Autonomous operation** that automates patching, upgrades, and tuning—including performing all routine database maintenance tasks while the database management system is running—without human intervention

A cloud for all uses.

You can migrate any OLTP or data-warehouse workload to Oracle Database Cloud and scale it as needed. Some of the more popular DBaaS use cases include the following.

Application development and testing.

DevTest is one of the leading use cases for the public cloud. Many companies form DevOps teams for developers to collaborate with operations personnel in creating, testing, troubleshooting, and improving applications as part of a continuous flow. These nimble teams rely on elastic cloud services such as Oracle Application Express and Oracle Database to gain database and compute services that can be rapidly provisioned and easily scaled, and run in a cost-effective Oracle Database Exadata Express Cloud Service environment.

Sandbox environment.

Some Oracle Database customers use Oracle Database Cloud as a staging ground to practice upgrade procedures or try out new database features, such as transportable table spaces and pluggable databases. If you make a mistake, you can easily delete the database instance and start over.

Data warehouses.

Oracle Cloud is ideal for data-warehouse workloads, especially when a diverse or geographically dispersed workgroup needs to access analytic services. Oracle Cloud reduces the cost and complexity of managing the infrastructure, allowing analysts to focus on extracting value from their data. Once your data warehouse is in the cloud, people can access it from anywhere, allowing your entire team to utilize data-warehouse assets. Having your data warehouse in the cloud enables data to flow easily to key destination points—including to Oracle's cloud-based business intelligence engine.

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High performance data management.

For high-performance data warehouses and OLTP applications, consider Oracle Database Exadata Cloud Service. It includes preconfigured hardware and software to eliminate costly data-warehouse builds, and delivers extreme performance for instant analytics.

Backup and disaster recovery services.

Oracle Database Backup Cloud Service gives you enterprise-grade data encryption, compression, and protection for backing up your on-premises data to a secure cloud database. You can also use Oracle Cloud to establish an offsite disaster-recovery service, complete with Oracle Data Guard and Oracle Active Data Guard. Many customers use their backups as standby databases for reporting and analytics.
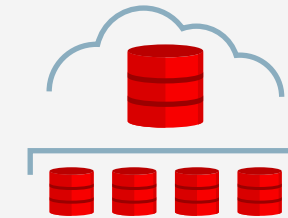
Migrating existing workloads to the cloud
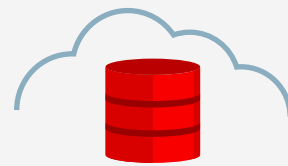
Enterprise Data Warehousing

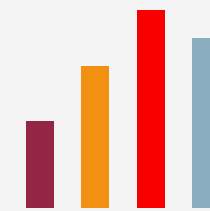Sandbox Environment

Line-of-Business Data Marts

Backup and Disaster Recovery to the Cloud

Discovering new monetization opportunities

Data Warehousing and Cloud Compute Analytics

High-Performance Data Management

Expansion of Data Warehouse to Big Data Cloud Service

Introducing Oracle Autonomous Database.

Oracle has introduced the world's first autonomous database. It consists of a single set of technologies, available in multiple products, each tailored to a different workload.

- Oracle Autonomous Database for Data Warehousing is the simplest and most efficient database for data marts, reporting databases

- Oracle Autonomous Database for OLTP, coming soon, is designed to run mission-critical enterprise applications, including mixed workloads and real-time analytics, with exceptional application performance

For both of these, Oracle automates patching, upgrades, and tuning—including performing all routine database maintenance tasks while the database management system is running, without human intervention. This unique database offering provides the unrivaled performance, scalability, and reliability you would expect from the world's number one business database.

Manually managed databases simply can't compete. Oracle Autonomous Database outperforms any other offering on the market on price, performance, availability, and risk.

Self-driving.

Oracle Autonomous Database eliminates human error when provisioning, securing, monitoring, backing up, recovering, troubleshooting, and tuning your database. In addition to reducing the need for manual input, it cuts costs and allows your IT staff to concentrate on higher-value tasks. Thanks to adaptive machine-learning (ML) algorithms, the database can automatically tune itself—allowing you to submit queries, visualize data, and share results without getting bogged down with mundane data management tasks.

Self-securing.

Devastating security lapses can occur if patches are not applied in a timely manner. Oracle Autonomous Database patches itself to avoid human errors or omissions. It automatically applies the latest security patches, reducing the risk of vulnerability

and minimizing application downtime. Always-on encryption lets you control your own keys to further enhance security. In the future, Oracle Autonomous Database will leverage Oracle's data masking and redaction technologies to conceal sensitive data.

Self-repairing.

Oracle Autonomous Database automatically recovers from any physical failures—at both the server and data-center levels. In addition, by applying software updates in a rolling fashion across multiple nodes within a cluster, it ensures your applications remain online. Thanks to AI diagnostics, Oracle Autonomous Database detects errors by continually gathering statistics, analyzing the root cause of problems, and resolving them quickly. It uses artificial intelligence to deliver unprecedented reliability, performance, and elasticity to data-warehouse deployments.

A Complete Cloud Platform for Big Data Analytics
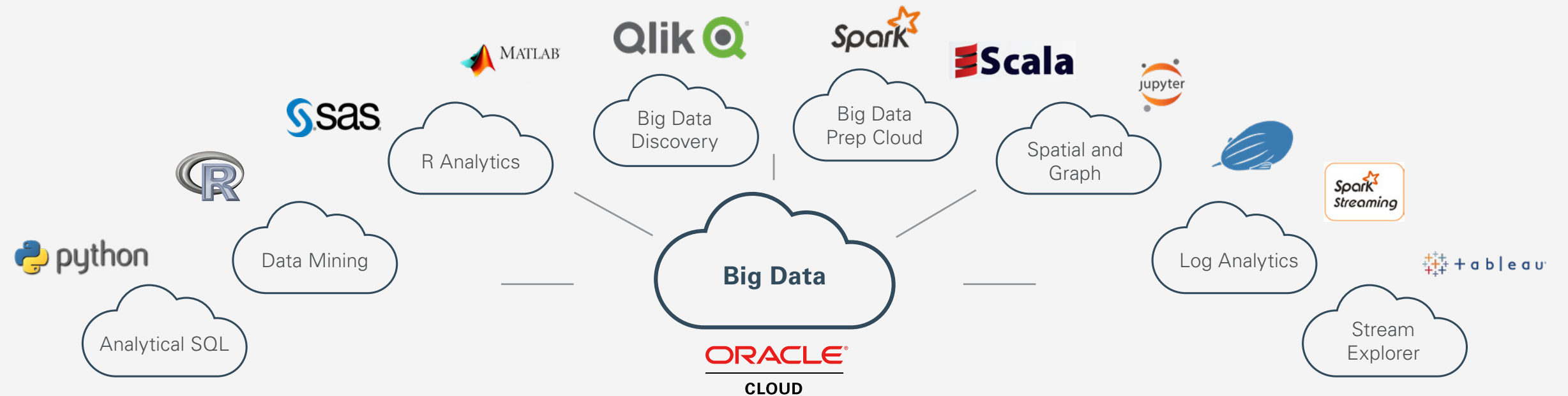
Big data analytics in Oracle Cloud.

Today's analytics implementations often include Hadoop and NoSQL databases that exist side by side with relational databases. Oracle Big Data Cloud Service can help you capture the value of Hadoop as you integrate new data streams with traditional data-consumption models.

All Oracle Cloud customers can take advantage of Oracle's versatile data-management and analytics solutions, including Oracle Database Exadata Cloud Service, Oracle Big Data Cloud Service, and Oracle Big Data SQL Cloud Service. You can also use Oracle's cloud-based tools for data discovery, data preparation, and data integration.

Once your data is stored in Oracle Cloud, you will find it is especially efficient to use these unique cloud services, anchored by Oracle Database 12c,

Oracle Exadata, and Oracle Big Data Appliance. For example, you can use Oracle Big Data SQL Cloud Service to simultaneously query Oracle Database, Hadoop, and NoSQL databases.

Of course, Oracle Cloud supports much more than just Oracle applications and data. You can run many popular third-party platforms for big data analytics, along with Oracle Big Data SQL technology, to extend SQL tools to your entire data-management environment.

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Big capabilities for big data.

Oracle Cloud has what you need for
all types of big data projects.

Dedicated: You can enjoy autonomous database
instances, networks, and direct-attached disks
for consistent performance.

Optimized: Your configuration is optimized based
on your specific compute and storage needs,
ensuring fast time to value.

Secure: Your big data workload resides on a
secure and encrypted Hadoop cluster, with
optional Oracle Database security.

Comprehensive: Oracle Big Data Cloud Service
includes CDH in conjunction with key Oracle
software including Oracle Data Integration, Oracle
R Advanced Analytics for Hadoop, and Oracle
Spatial and Graph.

Oracle's complete spectrum of DBaaS offerings.

- **Oracle Database Cloud Service:** A dedicated single-node or clustered database designed for development, testing, and deployment of existing applications.

- **Oracle Bare Metal Cloud Database Service:** On-demand, pay-per-use database services with the performance and reliability of dedicated hardware, non-volatile memory express (NVMe) storage, and Oracle Real Application Clusters (RAC), all on a low-latency, highly configurable, secure virtual cloud network.

- **Oracle Database Exadata Cloud Service:** A high-performance, high-availability database designed for mission-critical applications and high-density database consolidation.

- **Oracle Database Exadata Cloud Machine:** The world's most advanced database cloud, ideal for customers who require their databases to be on premises. This cloud offering uniquely combines the world's #1 database technology with Oracle Exadata, the most powerful database platform, giving you the simplicity, agility, and elasticity of a cloud-based deployment in your own data center.

- **Oracle Database Express Cloud Service:** A fully managed Oracle Database, Enterprise Edition running the latest database release on an Oracle Exadata platform, packed with features for modern application development and suitable for small- to medium-sized data management.

- **Oracle Database Backup Cloud Service:** Redundant, unlimited capacity for data storage and backup, with transparent management, data security, and privacy protection.

The organization.

DoDream System, an IT service developer in Korea, provides cloud applications to customers in the public sector. These applications include an electronic library system and an asset management system.

"By migrating to Oracle Cloud Platform rather than Microsoft Azure, we have increased elibrary system capacity by four times and improved the reliability and efficiency of our service delivery. It also helped us to reduce maintenance costs for 100 customer sites and support global expansion."

—Tae-Seok Lee,
CEO, DoDream System

The challenge.

DoDream needed a new database platform to streamline the delivery of its electronic library system to overseas customers. IT leaders knew that an effective cloud database would simplify IT maintenance, reduce costs, and make it easier to manage the rollout of new services.

The strategy.

DoDream decided to standardize on Oracle Database Cloud not only because it is the most commonly used database among the company's customer base, but also because its evaluation revealed Oracle Database Cloud to be the most reliable, most secure, and highest-performing cloud database available. According to Tae-Seok Lee, CEO at DoDream System, the company selected the Oracle Cloud platform over Microsoft Azure because Oracle provides a more cost-effective and optimized platform for existing Oracle Database users.

Oracle Database Cloud Service has allowed DoDream's in-house IT personnel to focus on improving their core information systems, while Oracle handles routine database chores—with the corollary benefits of improved reliability for critical applications, lower deployment costs, and a four-fold decrease in onsite computing resources.

The success.

DoDream not only increased the memory and storage capacity of its electronic library system, but also lowered operating costs for 100 customer sites. The company now has the resources to manage up to 400 customer sites with Oracle Public Cloud Services, and can scale up as needed.

Automating database-administration tasks, such as patching and upgrades, has cut labor and maintenance costs significantly—with only seven system administrators doing the work that previously took 50 people. Oracle Cloud has improved service quality, accelerated application development projects, and maximized the performance and availability of business-critical applications.

Using the same Oracle Database on premises as DoDream does in the cloud has made it easier for the company to migrate customers to Oracle Public Cloud services. It has also reduced risk by minimizing database failures. Oracle's instantaneous technical support ensures reliable, round-the-clock cloud services to customers—making it easier to successfully reach an expanding global market.

Solid security for your data.

Oracle's multilevel security strategy protects your data throughout its lifecycle, and all database access is monitored, recorded, and can be audited at any time. As part of Oracle Database Cloud Service, all data is encrypted both in transit and while at rest, along with redaction of sensitive application-layer data, restriction of privileged-user capabilities, subsetting and masking of data in nonproduction environments, and monitoring of user activities.

Administrative access to your Oracle Database environment includes multiple security zones to restrict access on a need-to-know basis for all IT staff. Logical access controls encrypt data on staff computers, along with personal firewalls, two-factor authentication, and role-based accounts.

Cloud security for the entire lifecycle of data …

- Data encrypted by default in the cloud

- Data encryption in transit and at rest

- Data masking for DevTest activities

… with controlled access for authorized users.

- Access keys using Oracle Key Vault

- Audit trails using Oracle Audit Vault and Database Firewall

- Collection of audit records stored on premises

Oracle brings the cloud to you.

Sometimes you can't move your data to the public cloud due to sovereignty laws, industry regulations, or corporate security policies. Fortunately, you can still take advantage of the scalability, affordability, and ease of Oracle Database Cloud by utilizing Oracle Cloud at Customer, a unique service that brings Oracle Cloud technology to your data center.

You get all the benefits of DBaaS with complete control over your data—the same robust cloud platform services, the same automatic software updates, and the same subscription-based pricing model.

Rather than purchasing hardware and database software, you can simply subscribe to a cloud service and let Oracle handle every aspect of installation, configuration, patching, lifecycle management, upgrading, and monitoring.

Extreme performance from a cloud machine in your data center.

If you need extreme availability and performance, you can utilize Oracle Database Exadata Cloud Machine, a cloud-on-premises version of Oracle Exadata that brings you the most powerful database platform available in the cloud—all controlled by Oracle Cloud software and managed by Oracle Cloud experts.

Oracle's top of the line database-management system platform consists of hardware and software that have been engineered together to deliver maximum performance. It includes essential tools for development and deployment, such as Oracle Application Express, Oracle SQL Developer, Oracle Java Cloud, and RESTful web services.

With Oracle Exadata at the foundation of your cloud, it's easy to consolidate OLTP, data warehousing, in-memory analytics, and mixed or hybrid workloads into a single cohesive system. You can use Oracle's proven migration tools to perform a logical migration via Oracle Data Pump and Oracle GoldenGate, or make a physical byte-by-byte copy of your data via Oracle's RMAN utility, transportable technologies, and Oracle Data Guard. Simply add your data with Oracle's automated migration tools and get ready for a new era of affordable, high-performance cloud simplicity.

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Oracle Cloud Platform.

✔ **Complete:** Best-of-breed and integrated solutions in every cloud category—data, software, platform, and infrastructure

✔ **Open:** Standards-based platform that supports all workloads, apps, languages, open source, and data types

✔ **Secure:** Automated, always-on protection that extends throughout the entire cloud stack, all the way down to the silicon layer

✔ **Choice:** Flexible deployment options—public, private, Oracle Cloud at Customer, and hybrid cloud

✔ **Intelligent:** Artificial intelligence and machine learning in every cloud category—data, software, platform, and infrastructure

Cloud **Essentials**

Discover the many advantages of moving your data-management activities to the cloud while learning what sets Oracle apart from other DBaaS providers.

Learn more about **Oracle Database Cloud Service**, or check out our blog to see what your peers have to say about Oracle DBaaS.

Try Oracle Cloud today. Go to **cloud.oracle.com/tryit**.

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