

Oracle Autonomous Data Management

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Safe harbor statement

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The development, release, timing, and pricing of any features or functionality described for Oracle's products may change and remains at the sole discretion of Oracle Corporation.

Database Complexity Has Steadily Increased

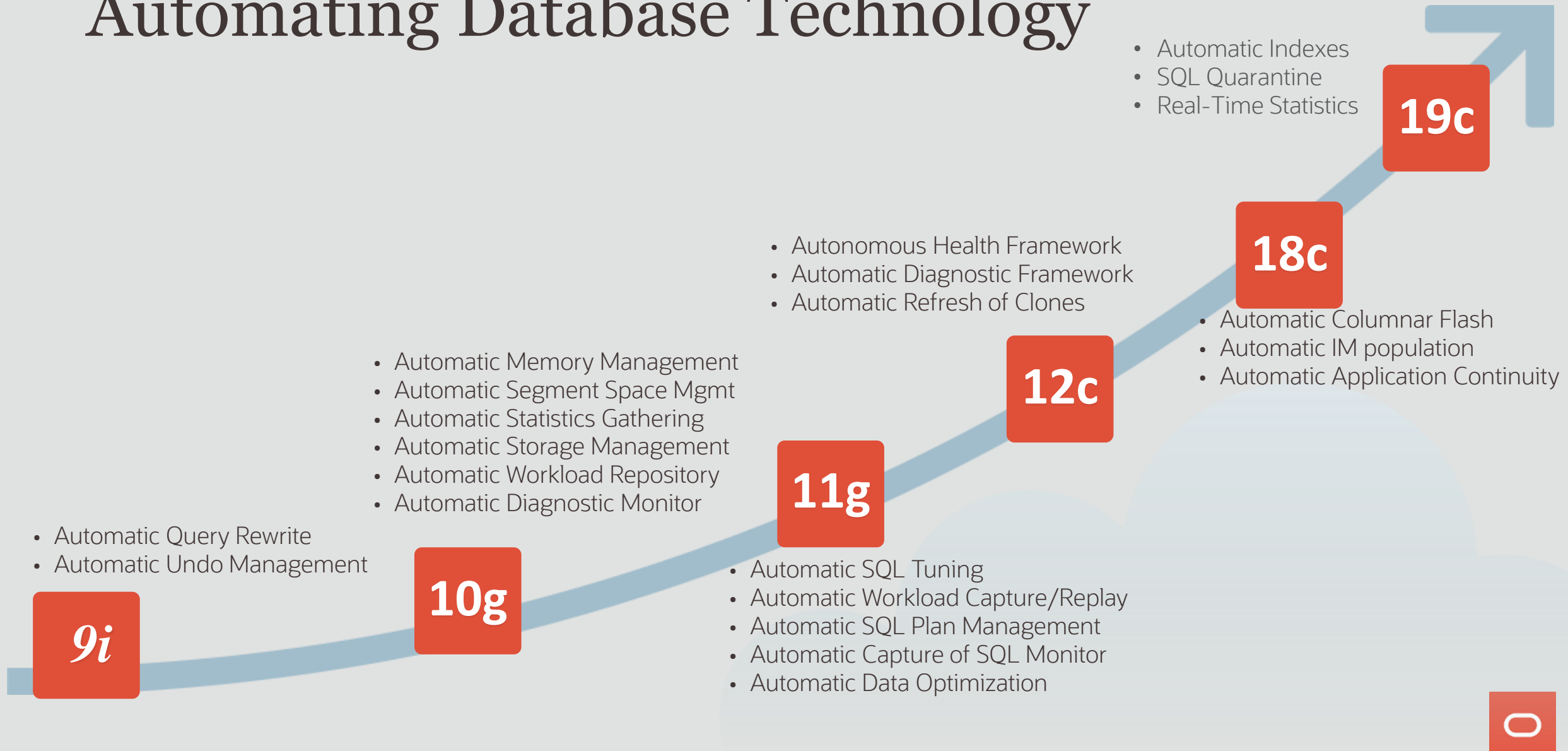
Adding new capabilities to meet the demands of a data-driven world has made databases more complex

Internet scale, real-time analytics, zero downtime

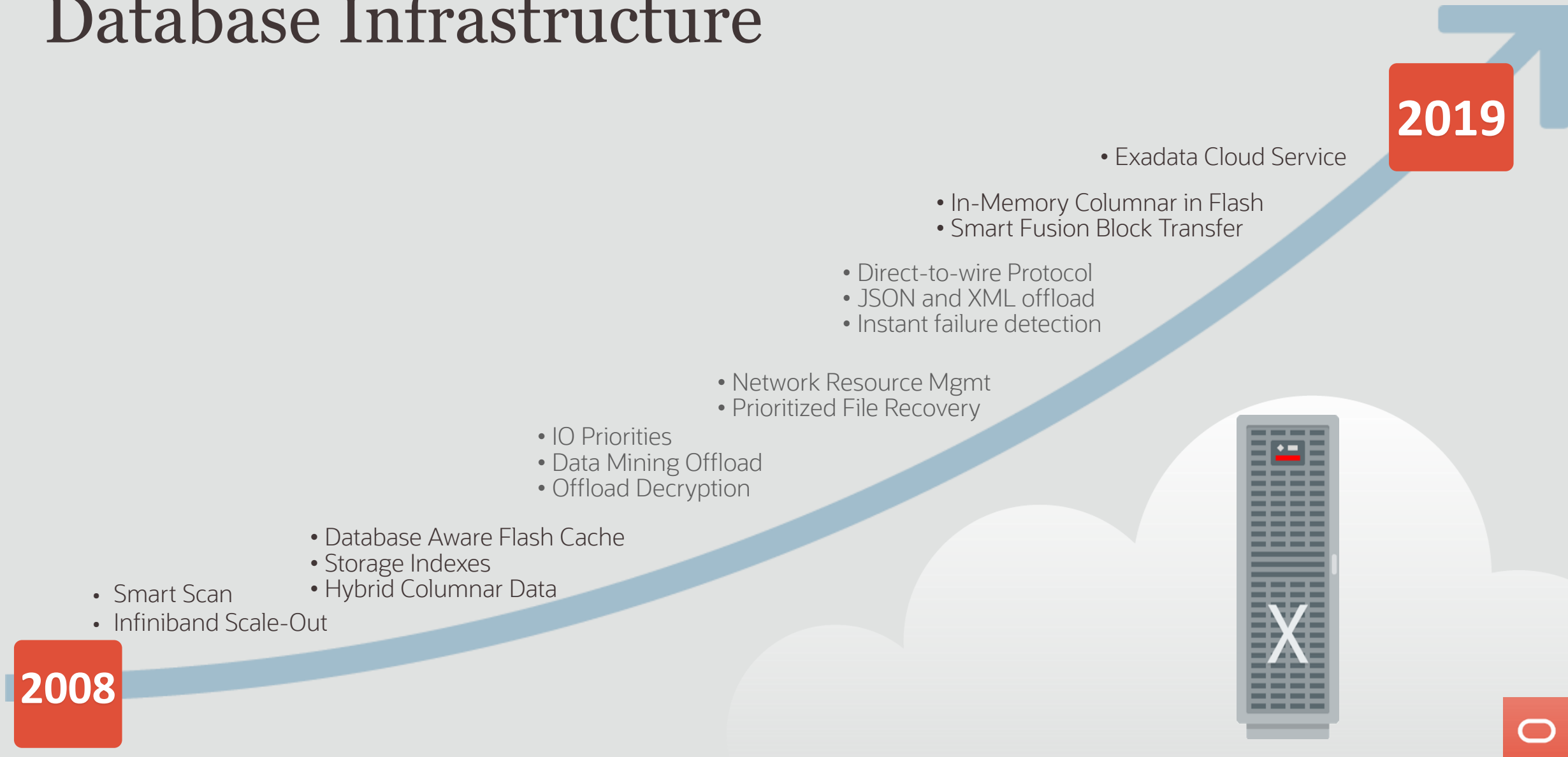
Oracle is now eliminating database management complexity

Decades of **automation** plus new **cloud** and **machine learning** technologies culminating in Oracle Autonomous Database

Oracle Spent Last 20 Years Automating Database Technology

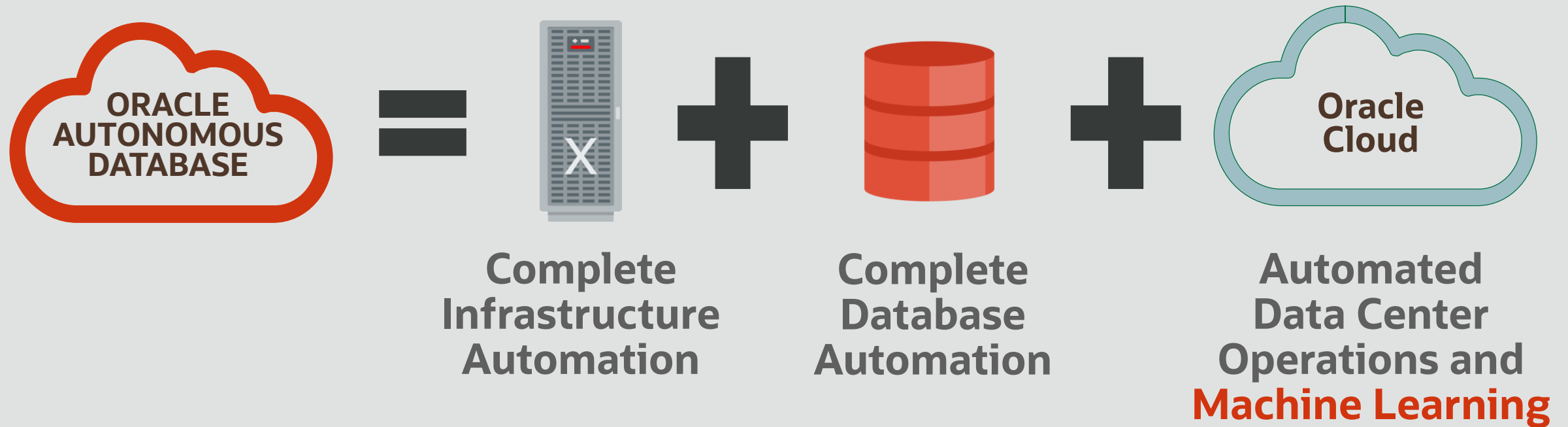


Oracle Spent Last 15 Years Automating Database Infrastructure



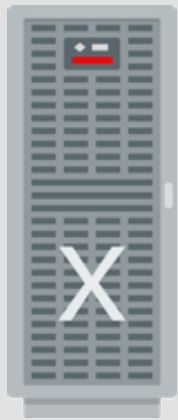
Oracle Autonomous Database Ingredients

Eliminates All the Complexity of Mission Critical Databases



Autonomous Database Machine Learning

Database Infrastructure



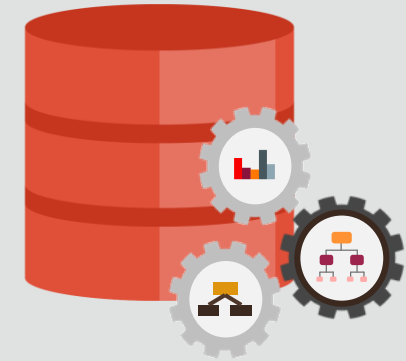
Detection and recovery of failed/sick server, storage or switch/link

Database Operations



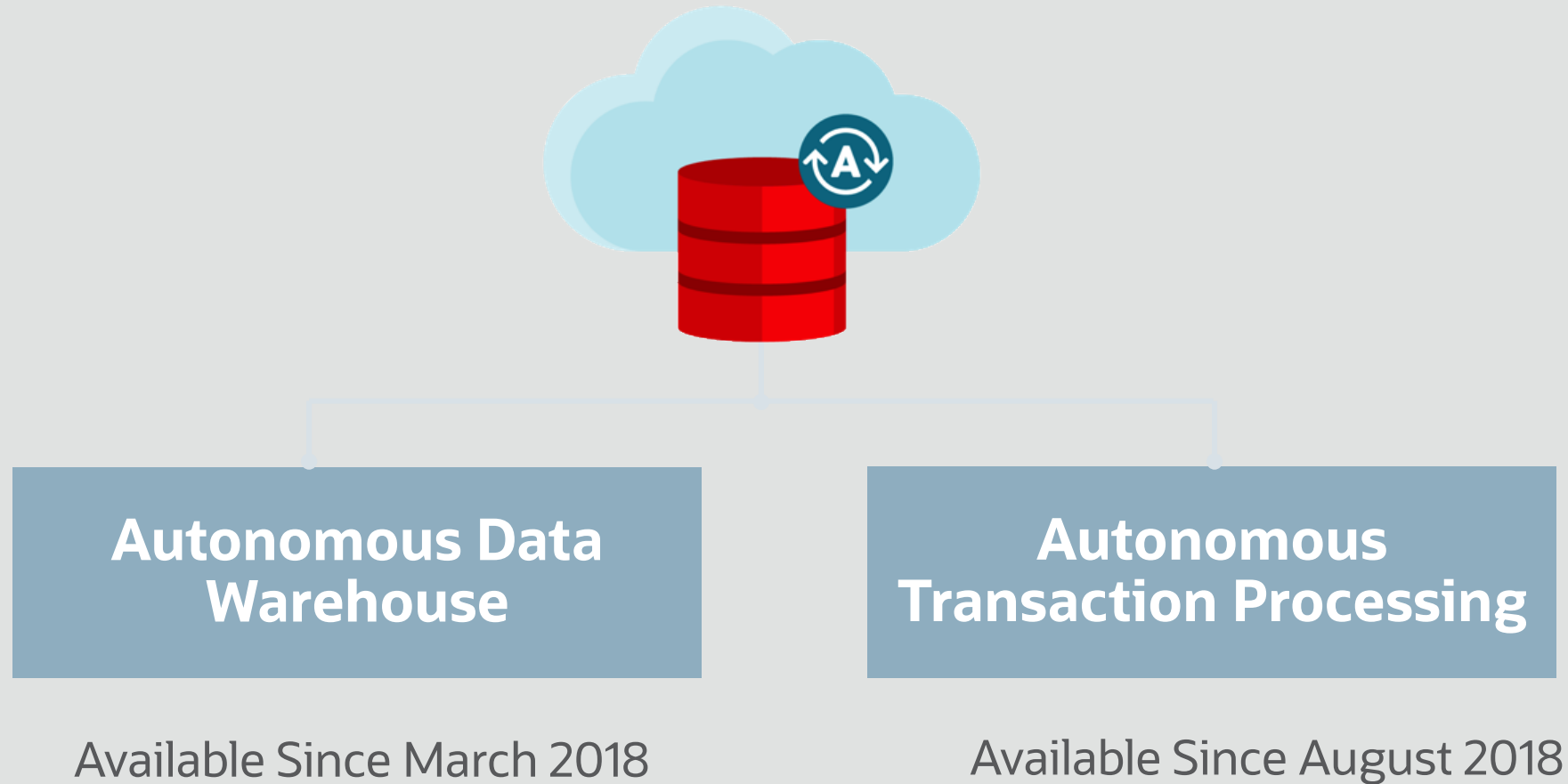
Hang Management
Anomaly Detection
Maintenance Slot Identification
Bug Identification and Prioritization

Workload Optimizations



Query Optimizer
Real-time statistics
Automatic Indexing

Autonomous Database | Optimized by Workload



Autonomous Optimizations | Specialized by Workload



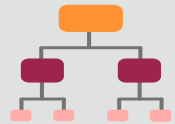
Optimizes Complex SQL

Optimizes Response Time



Autonomous Data Warehouse

Creates Data Summaries



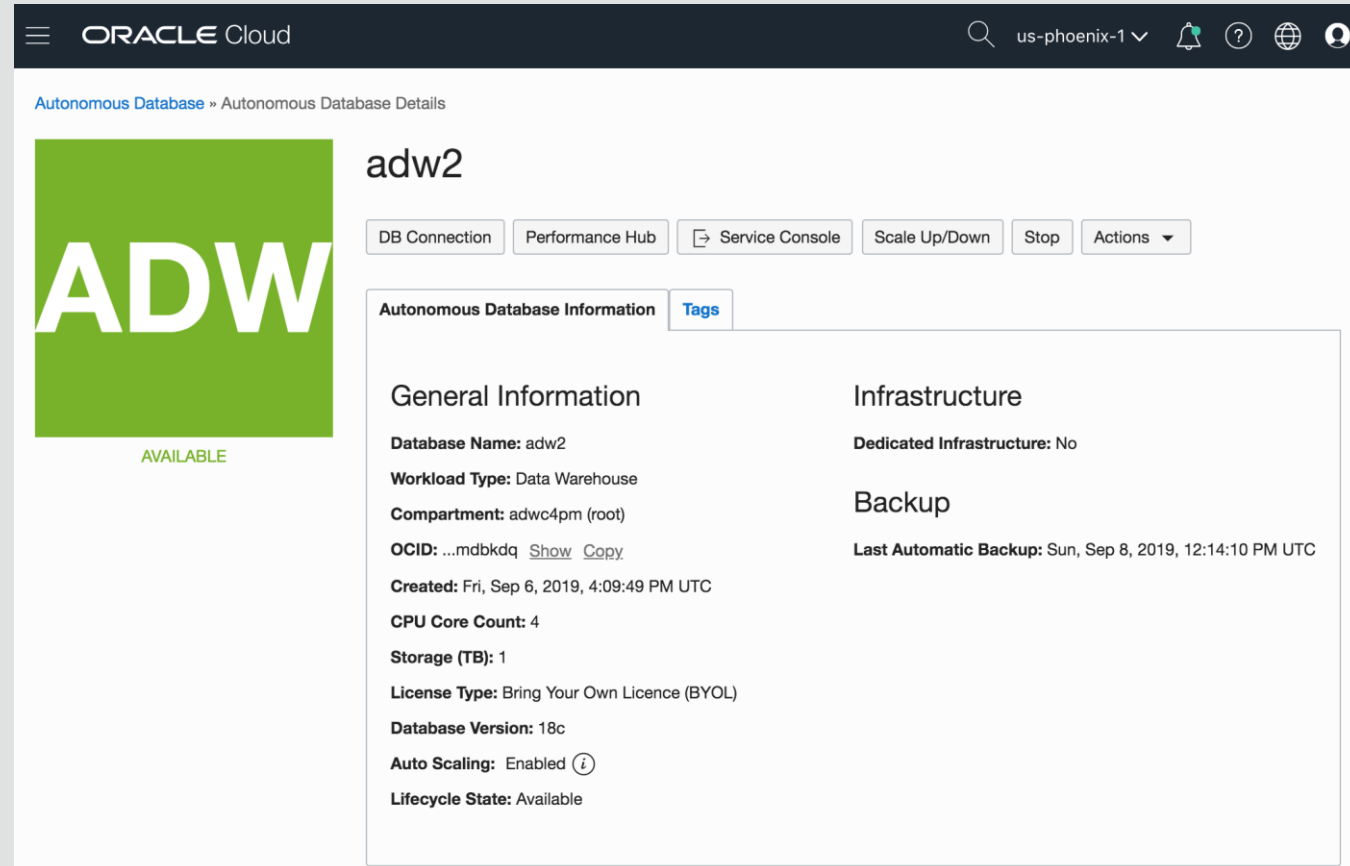
Autonomous Transaction Processing

Creates Indexes

Exadata + Real Application Clusters + Multitenant

Automated Management

- Oracle automates end-to-end management of data warehouse
 - Provisioning new instances
 - Backup and restore
 - Patching and upgrades
 - Database **Cloning** for easy dev/test
- Full lifecycle managed using Service Console or API's

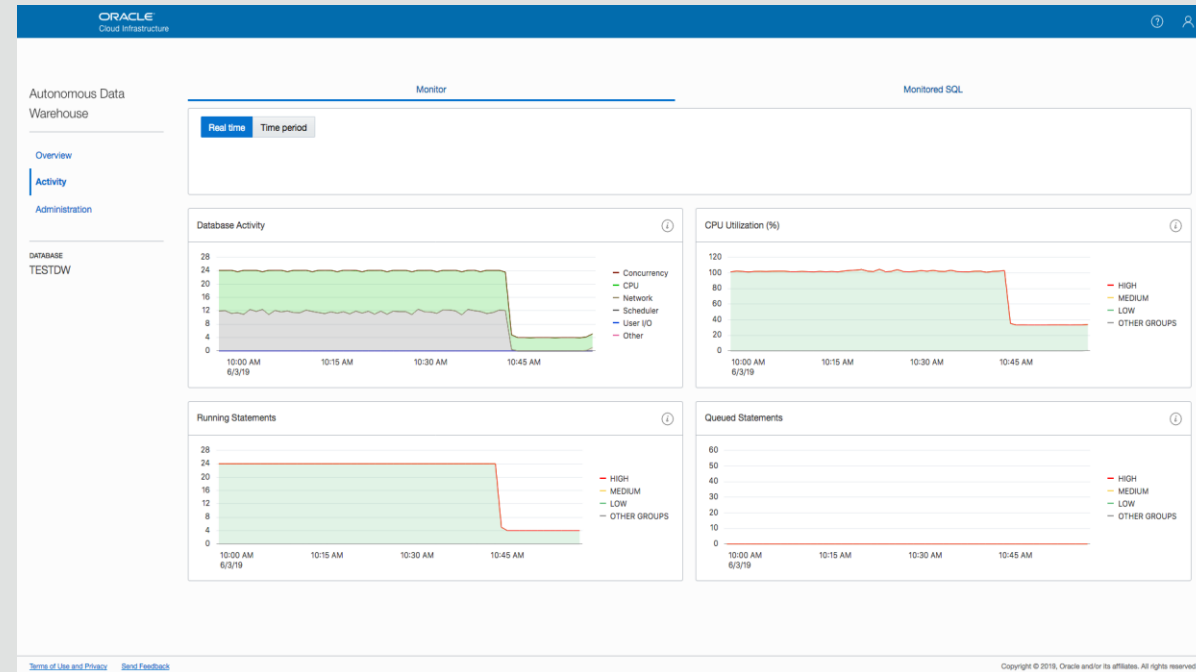


The screenshot displays the Oracle Cloud management interface for an Autonomous Database (ADW) instance named 'adw2'. The top navigation bar includes the Oracle Cloud logo, a search icon, and the region 'us-phoenix-1'. The breadcrumb trail indicates the path: 'Autonomous Database » Autonomous Database Details'. A large green square with the white text 'ADW' and the status 'AVAILABLE' is prominently displayed. To the right of the instance name, there are several action buttons: 'DB Connection', 'Performance Hub', 'Service Console' (with an external link icon), 'Scale Up/Down', 'Stop', and an 'Actions' dropdown menu. Below these buttons, the 'Autonomous Database Information' tab is selected, showing a table of details. The table is divided into two columns: 'General Information' and 'Infrastructure'. The 'General Information' column lists: Database Name (adw2), Workload Type (Data Warehouse), Compartment (adwc4pm (root)), OCID (with show and copy links), Created date (Fri, Sep 6, 2019, 4:09:49 PM UTC), CPU Core Count (4), Storage (1 TB), License Type (Bring Your Own Licence (BYOL)), Database Version (18c), Auto Scaling (Enabled with an info icon), and Lifecycle State (Available). The 'Infrastructure' column lists: Dedicated Infrastructure (No) and Backup information (Last Automatic Backup: Sun, Sep 8, 2019, 12:14:10 PM UTC).

Autonomous Database Information	
General Information	Infrastructure
Database Name: adw2	Dedicated Infrastructure: No
Workload Type: Data Warehouse	Backup
Compartment: adwc4pm (root)	Last Automatic Backup: Sun, Sep 8, 2019, 12:14:10 PM UTC
OCID: ...mdbkdq Show Copy	
Created: Fri, Sep 6, 2019, 4:09:49 PM UTC	
CPU Core Count: 4	
Storage (TB): 1	
License Type: Bring Your Own Licence (BYOL)	
Database Version: 18c	
Auto Scaling: Enabled ⓘ	
Lifecycle State: Available	

Automated Tuning

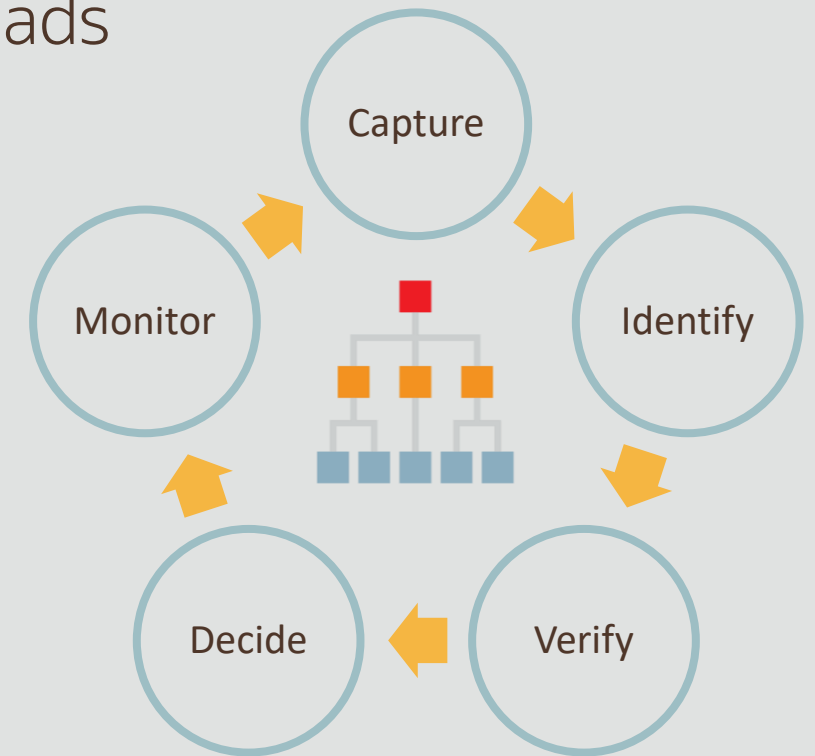
- “Load and go”
 - Define tables, load data, run queries
 - No tuning required
 - No special database expertise required
 - No need to worry about tablespaces, partitioning, compression, in-memory, indexes, parallel execution
 - Fast performance out of the box with zero tuning
 - Auto-scaling to adapt to changing workloads
 - Built-in resource-management plans



New | Automatic Indexing

NEW IN
19^C

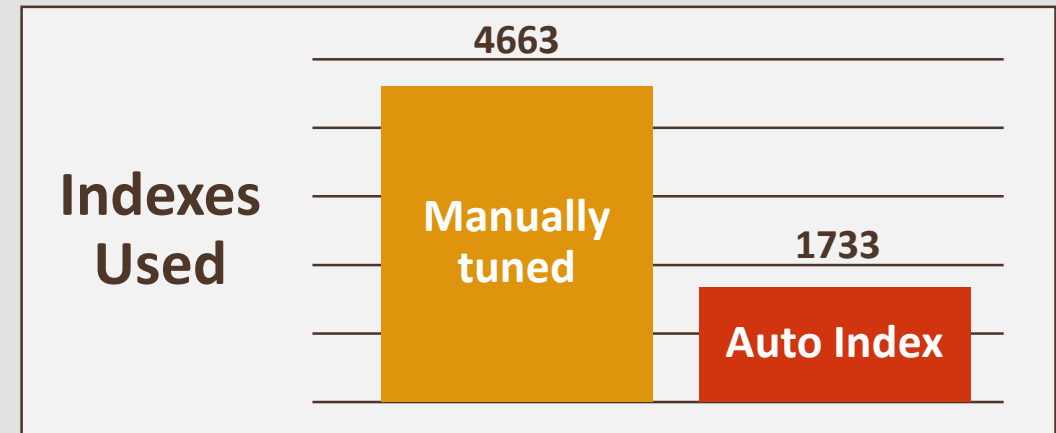
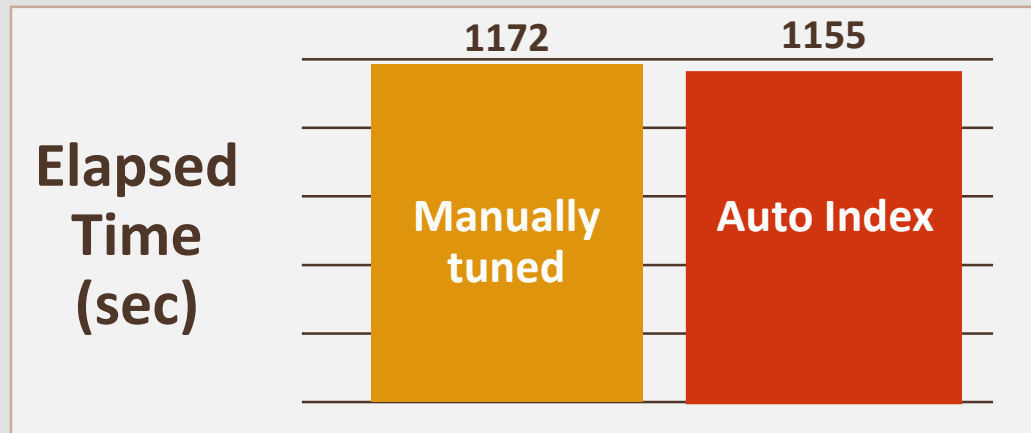
- Self-tuning for transactional and mixed workloads
 - Or use in advisory mode for existing workloads
- Fully automated index creation based on continuous analysis of the workload
- Expert system with reinforcement learning
 - Captures all SQL statements
 - Identifies **new** SQL plans and indexes
 - Changes **tested** outside of production
 - Then **validated** on first execution
- All auditable by customer



Auto Indexing On Netsuite

NEW IN
19^c

- Ran a complex Netsuite workload, and compared Auto Indexing to tuned system
- 17,542 SQL statements, 1,852 tables, 8,151 indexes - **years of tuning** to create these indexes
 - Before running on Auto Indexing, all indexes were dropped



Auto Indexing achieved near-identical performance to manual tuning
Auto Index DB stays tuned as workload changes

Automated Reliability

- Fault-tolerant, highly-available Exadata infrastructure
 - Triple-mirrored disks for disk failures
 - Real Application Clusters for compute node failures
 - Self-healing hardware
- Automatic backups
 - Point in time recovery to anytime in last 60 days
- Online patches
 - Regular patches applied with zero database downtime



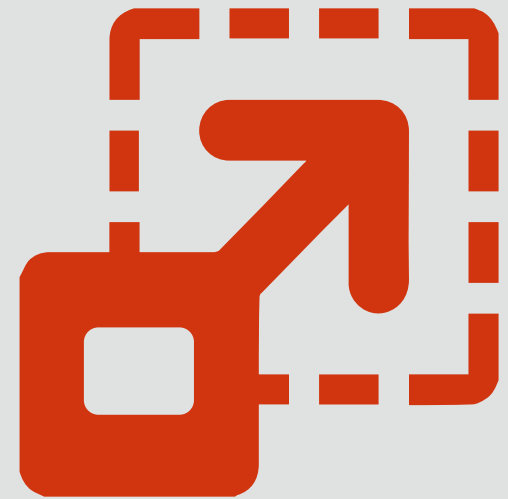
Automated Security

- Always up-to-date on **security patches**
 - Eliminates the largest security risk in current customer-managed systems
- **Full encryption** for entire database, backups and all network connections
- **Database auditing** always on
 - Login failures
 - Modifications to user accounts or database structures
- **Secure by default**
 - Customers are unable to disable security configurations



Fully Elastic: Pay for What you Use

- Size to the exact number of ODCU's and TB's required
 - Not constrained by fixed building blocks
- **Auto-scaling** instantaneously adjusts CPU and IO resources for current workload requirements
- Shut off idle compute save money
 - Restart instantly



Autonomous Database: Built-In Tools

APEX & ORDS

Rapid Database Application Development

SQL Developer Web

Data Modeling and SQL Development

Machine Learning Notebooks

Drag and Drop Analytic Dashboards

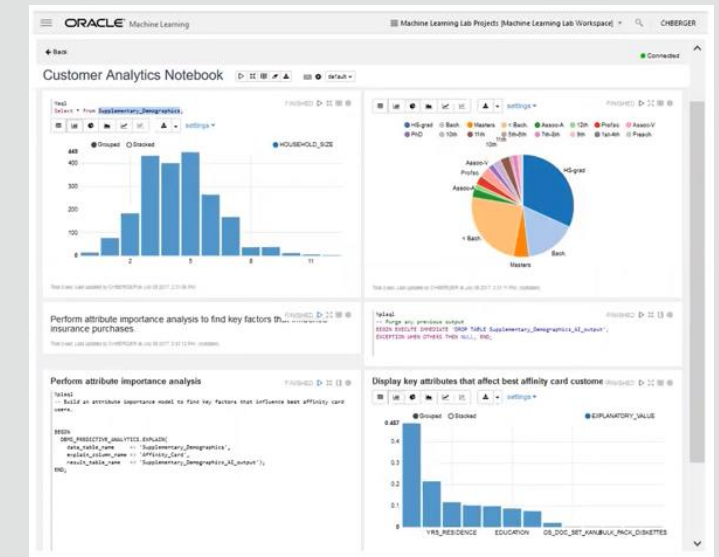
Performance Hub & Service Console

Real Time Database Monitoring

Oracle Data Visualization Desktop

Self-service data exploration for business users

Rich, interactive visualizations

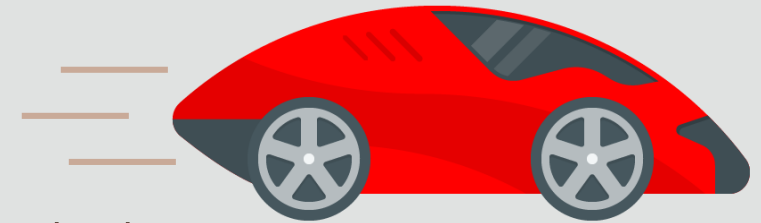


Ultimate in Productivity for Developers, Data Scientists, DBAs

Oracle Autonomous Database

Stop Administrating, Start Innovating

- Enables I.T. and **Database Administrators** to **innovate more**
 - Eliminates all system, storage, network management
 - Eliminates database operational drudgery
 - Use talent to implement more projects, get more value from data
- Empowers **Developers** to **innovate faster**
 - Create databases instantly with no manual tuning needed
 - Continuously adapts to changing workload
 - Advanced SQL accelerates developer productivity



Oracle Cloud Infrastructure

New Free Tier with Always Free Oracle Autonomous Database and Oracle APEX



oracle.com/cloud/free

Always Free

Services you can use for unlimited time



30-Day Free Trial

Get \$500 in free credits



Always Free - What's Included



Autonomous Database

*2 x Databases
20GB Storage Each*



Compute

*2 x VM
1GB Memory
Each*



Storage

*2 x 50GB Block
10GB Object
10GB Archive*



Load Balancing

*10 Mbps
Bandwidth
Shape*

Available to all new and existing cloud accounts

Thank you





ORACLE