

Autonomous Data Management

Priyanka Sancheti
Oracle Cloud Strategy & Business Development

September 2019

**The
Economist**

MAY 6TH-12TH 2017

Theresa May v Brussels

Ten years on: banking after the crisis

South Korea's unfinished revolution

Biology, but without the cells

The world's most valuable resource



**Data and the new rules
of competition**

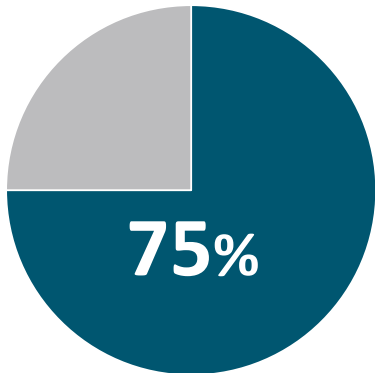
Data Is the Key Asset in Innovation



Managing Data Is Tough

In Pursuit of Optimal Data Management

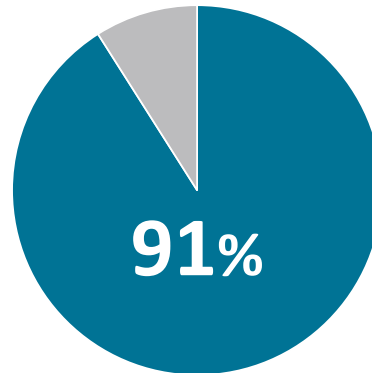
Cost & Complexity



3/4 Cost of Database Management spent on labor

– [IDC](#)

Reliability



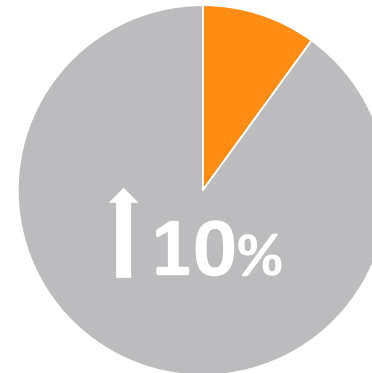
91% experience unplanned data center outages

– [Healthcare IT News](#)

Database downtime costs **\$7,900 / minute**

– [DB Maestro](#)

Speed of Innovation



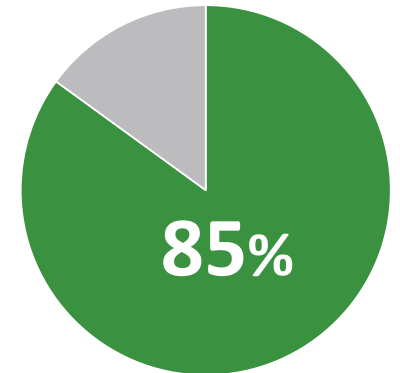
10% increase in data accessibility translates into

\$65.7 million

in net income

– [Baseline Magazine](#)

Security



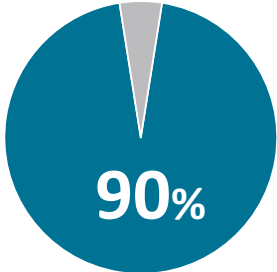
85% of security breaches occurred after the CVE was published

– [DB Maestro](#)

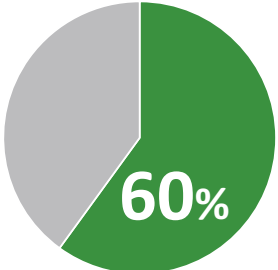
Lack of Data Automation Prevents Business and IT Transformation

- Manual provisioning and maintenance increases time to market
- Patching, scaling requires downtime impacts business momentum
- Data security, privacy and integrity affects brand reputation
- Limited data, different data sources causes lost revenue opportunities

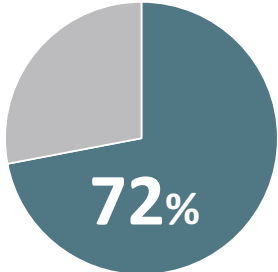
Don't remain stuck with a rigid architecture unable to cope with rapid change



AppDev: updating databases delay application releases



All*: Database release delays application release



CIO: struggle to balance business innovation and operational excellence

Source: [CIO Magazine](#) * All = CIOs, DBAs and AppDev



More data

More mobile and web apps

More algorithms and analytics

More regulations and laws

More is different

Smart Cities



Higher Education



Precision Agriculture



Customer Experience





DIY Data Management



Tune by hand

**Achieve enterprise-class
by hand**

**Specialized engine for
every job**

DIY Data Management

Oracle Autonomous Database

Built to overcome these challenges

Oracle Data Management Objectives

- Lead database software innovation - **Oracle Database**
 - Best database for all workloads and platforms
- Lead **database infrastructure innovation - Engineered Systems**
 - Best database platform - on-premises and in Cloud
- Lead **database cloud innovation - Autonomous Database**
 - Best database cloud - public Cloud and Cloud at Customer



Autonomous Data Management

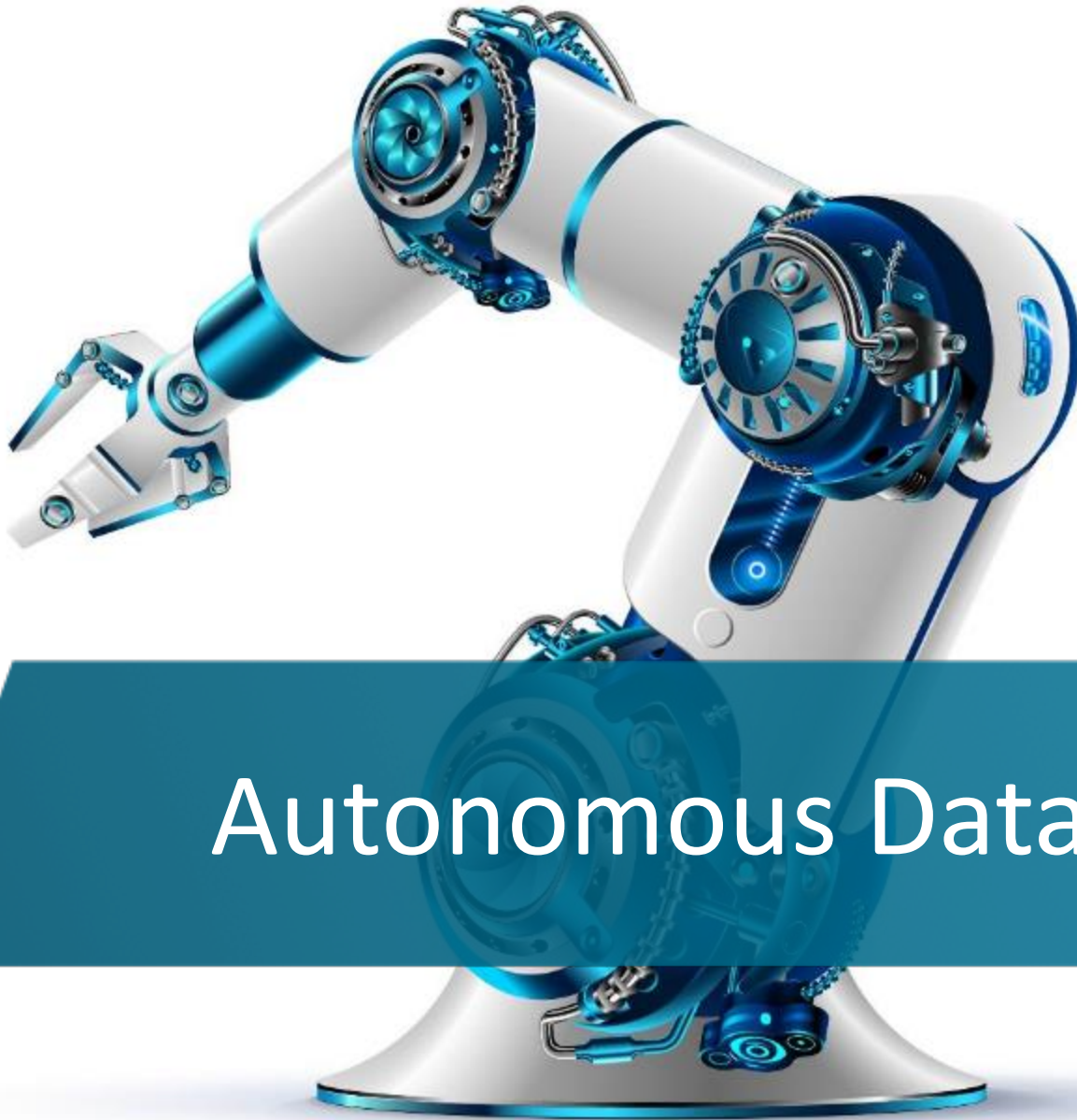
Self-driving

Enterprise-class built-in

Adaptive engine for any job



Autonomous Data Management



Increase return on data capital

Faster time to new products

Create more data assets, faster

Autonomous Data Management

Autonomous Completes the Journey

Start new app dev project in minutes



Oracle
Autonomous
Database



Complete
Infrastructure
Automation



Complete
Database
Automation



Automated Data
Center Operations

World's First Fully Autonomous Database: [Load Data and Run queries](#)

Biggest Trend in Data Management Is Machine Learning

Gartner

“The big ticket item for 2018 & 2019 is the use of ML & AI in the DBMS allowing the DBMS to maintain itself — **the DBMS becomes Self-Driving**. The job of the DBA evolves to use their skills for tasks with greater business value.”

Donald Feinberg, Distinguished Analyst

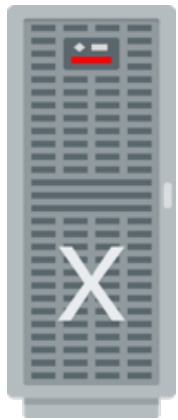

accenture

“We are at the dawn of the intelligent enterprise era, and having an automated database is a natural progression.”

Paul Daugherty, Chief Technology and Innovation Officer

Autonomous Database Machine Learning

Database Infrastructure



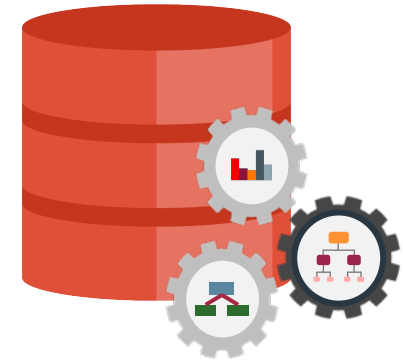
Detection and recovery of failed/sick server, storage or switch/link

Database Operations



Hang Management
Anomaly Detection
Maintenance Slot Identification
Bug Identification and Prioritization

Workload Optimizations



Query Optimizer
Real-time statistics
Automatic Indexing

One Autonomous Family Optimized for Varied Workloads



Oracle Autonomous Database

Autonomous Data Warehouse

All Analytic Workloads

- Data Warehouse, Data Mart
- Data Lake, Machine Learning

Autonomous Transaction Processing

Online TP and Mixed Workloads

- Transactions, Batch, Reporting, IoT
- Application Dev, Machine Learning

Select an Autonomous Database cloud solution that best meets your workload needs

Autonomous Database Optimizations

Autonomous Data Warehouse

Autonomous Transaction Processing



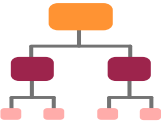
Optimizes Complex SQL

Optimizes Response Time



Columnar Format

Row Format



Creates Data Summaries

Creates Indexes

Exadata + Real Application Clusters + Multitenant

Autonomous Transaction Processing Database

Autonomous Transaction Processing Key Features

Towards complete transaction processing autonomy



True Pay per Use

Scales up/down online and uses clustering to grow beyond the size of physical server



100% On-Premises Compatibility

Oracle Database software, Options, Tools



Autonomous Operations

Maximum Availability Architecture: Online Patching, Scaling, 99.995% Availability, Disaster Recovery, ZDLRA – Backup



Highest Performance IOPS

Exadata database infrastructure's tiered storage – Flash over disk

Enterprise Grade Security

Software based patching, Machine learning for external attack detection and prevention



Continuous Workload Optimization

Real-time monitoring, analysis and validation of performance optimizations (auto-indexing)



Protection from Human Error and Hardware Failure

Flashback technology and built-in redundancy

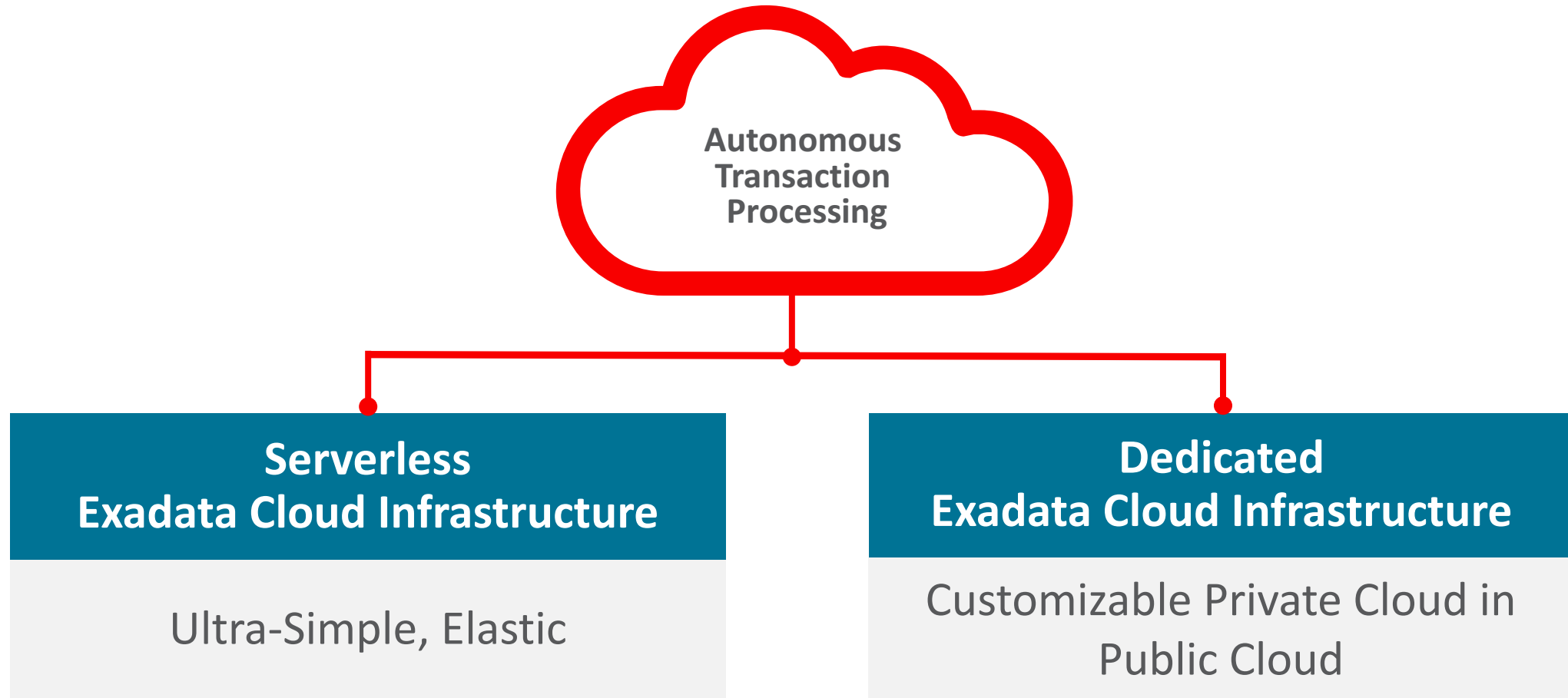


Active Standby to Reduce Costs

Active data guard allows read operations from standby database



Autonomous Transaction Processing in Two Deployment Options



New | Autonomous Database Dedicated

- Deploy on **dedicated** Exadata Cloud infrastructure
 - With **guaranteed** 99.995% SLA (< 2.5 minutes downtime per month)
- Complete stack is fully **isolated** from other tenants:
 - Virtual Cloud Network is hardware enforced
- Unique **fully isolated private cloud** in Public Cloud
 - Enables more customer control over updates
 - Ideal for customers consolidating databases on-prem



New | APEX on Autonomous Database

APEX on Autonomous

- Declarative
- Few lines of code
- Robust
- Secure by default

vs.

JavaScript on AWS

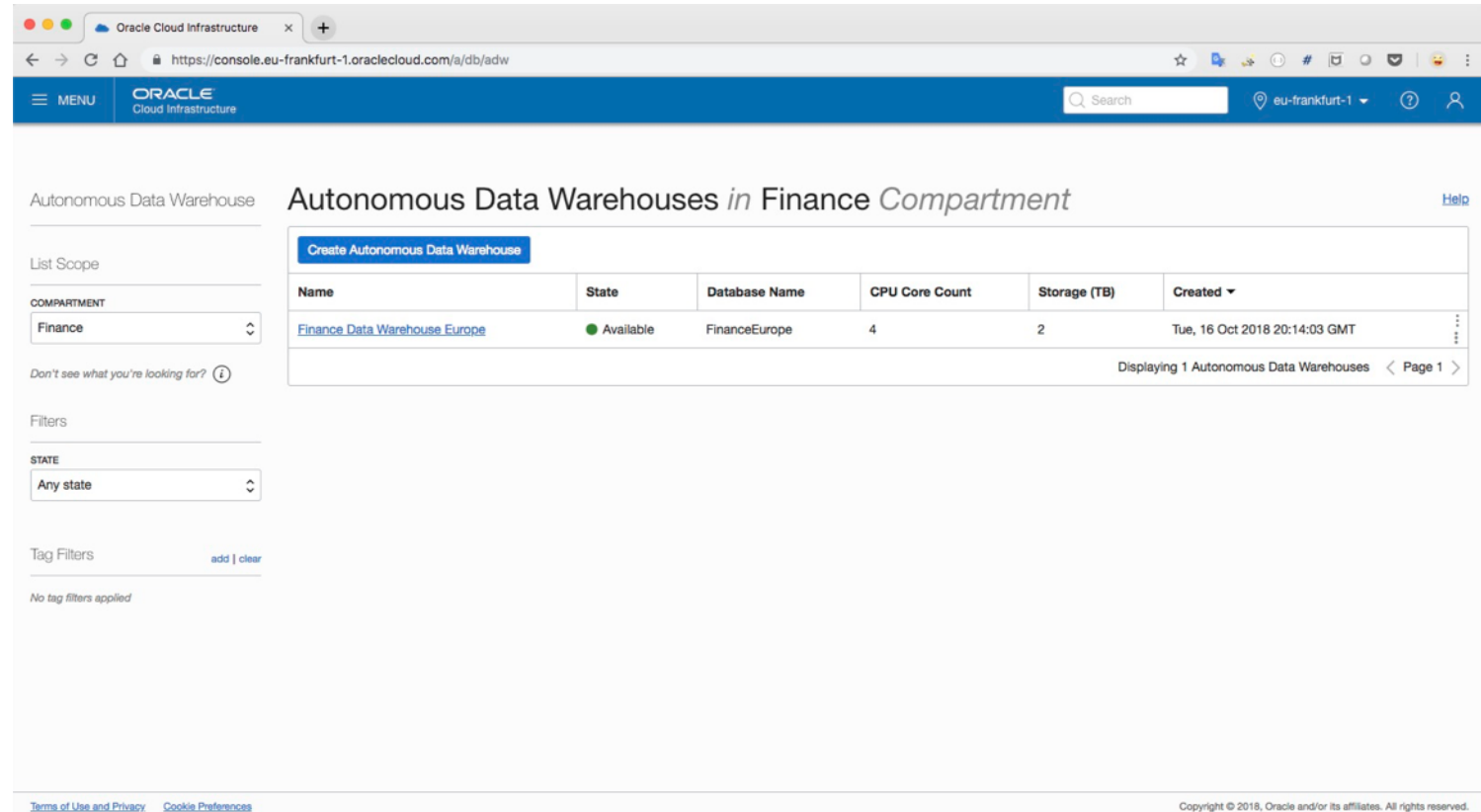
- Hand coding
- Lots and lots of code
- Complex to maintain and diagnose
- Security coded by each developer

20X faster to develop
100X fewer lines of code

Autonomous Data Warehouse Database

Fully-managed

- Oracle automates end-to-end management of the data warehouse
 - Provisioning new databases
 - Growing/shrinking storage and/or compute
 - Patching and upgrades
 - Backup and recovery
- Full lifecycle managed using the service console
 - Alternatively, can be managed via command-line interface or REST API



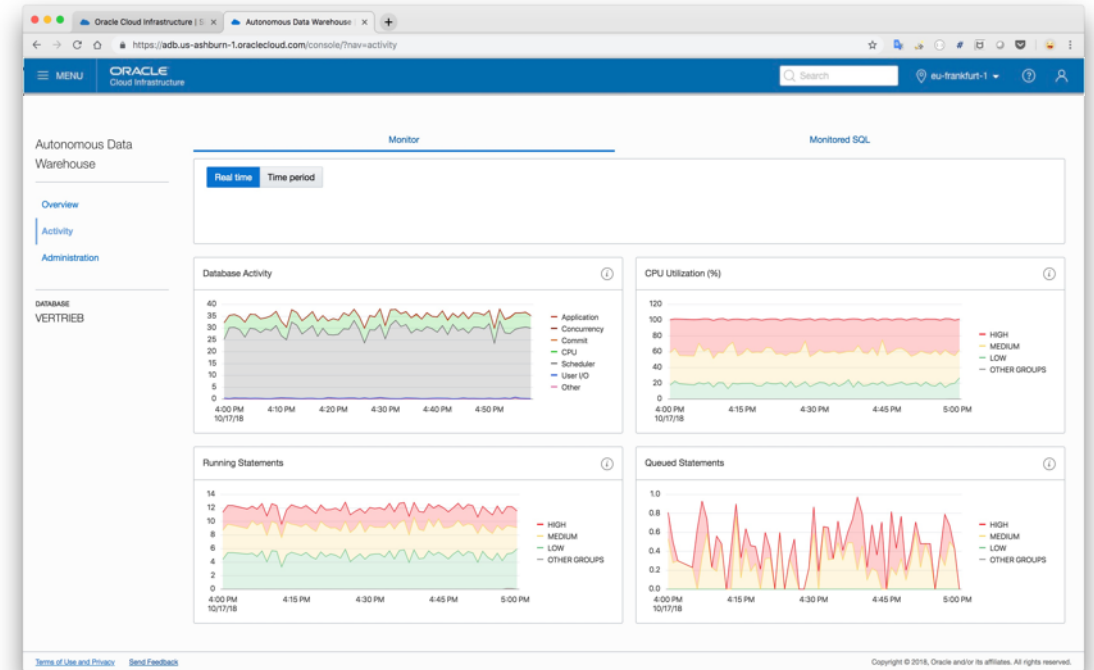
The screenshot displays the Oracle Cloud Infrastructure console interface. The main heading is "Autonomous Data Warehouses in Finance Compartment". A "Create Autonomous Data Warehouse" button is visible. Below it is a table with the following data:

| Name | State | Database Name | CPU Core Count | Storage (TB) | Created |
|---|-----------|---------------|----------------|--------------|-------------------------------|
| Finance Data Warehouse Europe | Available | FinanceEurope | 4 | 2 | Tue, 16 Oct 2018 20:14:03 GMT |

The interface also includes a left-hand navigation menu with options like "List Scope" (set to "Finance"), "Filters" (set to "Any state"), and "Tag Filters". The footer contains "Terms of Use and Privacy" and "Cookie Preferences" links, along with a copyright notice: "Copyright © 2018, Oracle and/or its affiliates. All rights reserved."

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
 - Simple web-based monitoring console
 - Built-in resource-management plans



Fully-elastic

- Size the DW to the exact compute and storage required
 - Not constrained by fixed building blocks, no predefined shapes
- Scale the DW on demand
 - Independently scale compute or storage
 - Resizing occurs instantly, fully online
- Shut off idle compute to save money
 - Restart instantly

Full Support of DW Ecosystem

- Autonomous Data Warehouse Cloud supports :
 - Existing tools, running on-premises or in the cloud
 - Third-party BI tools
 - Third-party data-integration tools
 - Oracle BI and data-integration tools: BIEE, ODI, etc
 - Oracle cloud services: Analytics Cloud Service, Golden Gate Cloud Service, Integration Cloud Service, and others
 - Connectivity via SQL*Net, JDBC, ODBC

Autonomous Database Customers

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  | |

Autonomous Database Experiences

A
T
P



Order processing runs 100x faster via ATP and eliminated human error



600% performance improvement on 1/2 CPUs with Azure Interconnect



Provisioning time reduced from 2 days to 3 minutes



Guaranteed performance, availability, and security of PoS system for 1,000 clients

A
D
W



40X report performance improvement and 40% less cost versus on-premises



50% cost reduction versus Teradata on-prem, eliminated maintenance



Able to analyze medical lab results in hours vs weeks for faster treatment



Reduced complex pricing query from 6 minutes to 2 seconds

Oracle Cloud Infrastructure

New Free Tier



oracle.com/oow19freetier

Always Free

Services you can use for unlimited time

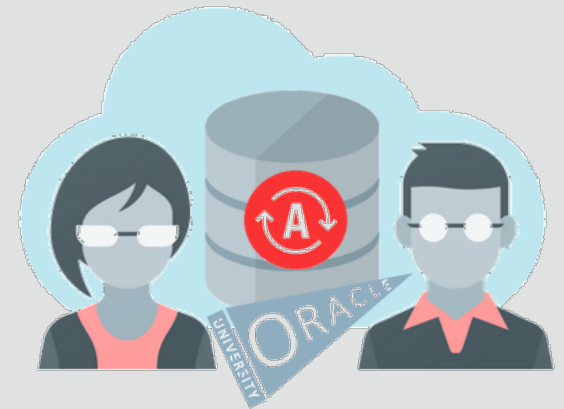
+

30-Day Free Trial

Get \$500 in free credits

Announcing | Free Autonomous Database

- Always-free “micro” instances with up to
 - 2 always free ADB instances per OCI tenancy
 - 20 GB database storage per instance
 - 1 OCPU per instance
- Runs on same infrastructure as ADW/ATP
- Full functionality, full experience, including
 - APEX
 - REST Interface (ORDS)
 - SQL Developer Web
 - Machine Learning Notebooks
- Ideally suited to requirements of developers and students



Integrated Cloud

Applications & Platform Services

ORACLE®