

ORACLE







Oracle Database Directions

Complete and Simple Data Management

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 [@FcoMunoz](https://twitter.com/FcoMunoz)



Oracle Data Management Vision

Make it simple to develop and run
modern operational and analytic apps
for all use cases
at any scale

Delivering the **Vision**

Complete and **Simple** data platform for developing and running modern apps and analytics



Converged Database Approach

Complete support for all modern data types, workloads, development styles

Completely consistent, scalable, available, and secure



Autonomous Database

Simplest cloud database for developers, DBAs, and data analysts

Simplest cloud database for running any app at any scale or criticality

Delivering the **Vision**

Complete and **Simple** data platform for developing and running modern apps and analytics



Converged Database Approach

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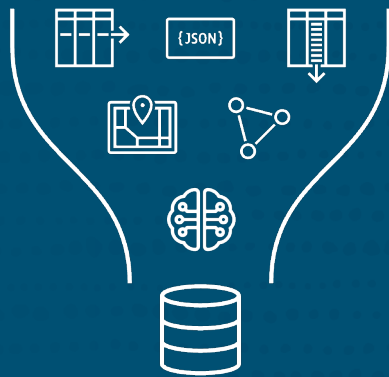
Autonomous Database

Simplest cloud database for developers, DBAs, and data analysts

Simplest cloud database for running any app at any scale or criticality

Oracle's Converged Database

A complete database that makes it dramatically easier to develop and run modern apps



**Converged
Database**

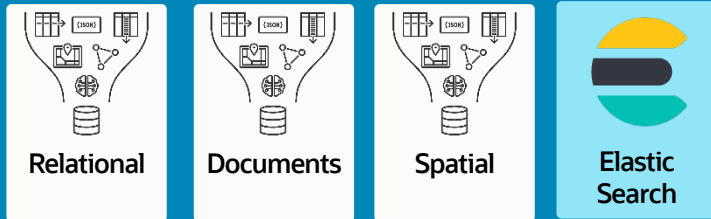
- Evolved to deliver **best-of-breed support** for all the data needs of modern apps
- Just call SQL for any data type, workload, or analytics
- **No need to fragment** data across databases to support new app requirements
- Scaling and availability are transparent, without sacrificing data consistency
- **No need to compromise** on functionality or performance
 - Oracle's data technologies are rated industry-leading in each area

Creating a Fully Complete Database has Taken Decades of Effort by Thousands of Engineers

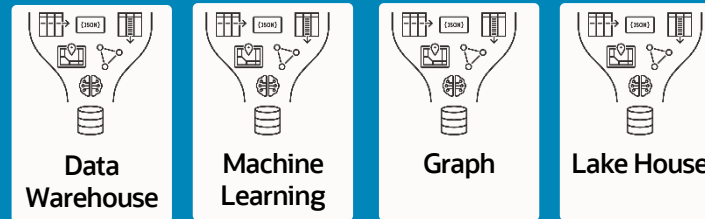
Oracle's Converged Database Enables Customer Choice

Converged does not mean data must be in one monolith database – **YOU choose:**

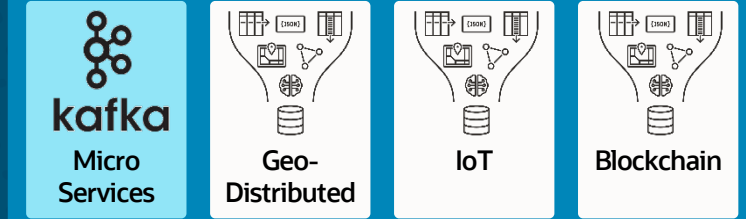
New Types of Data



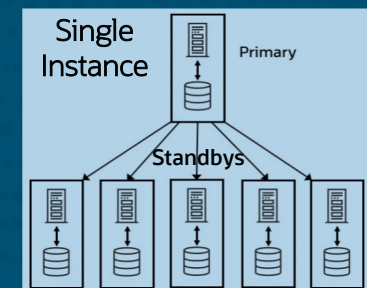
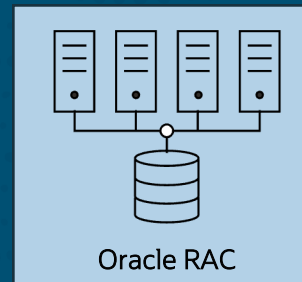
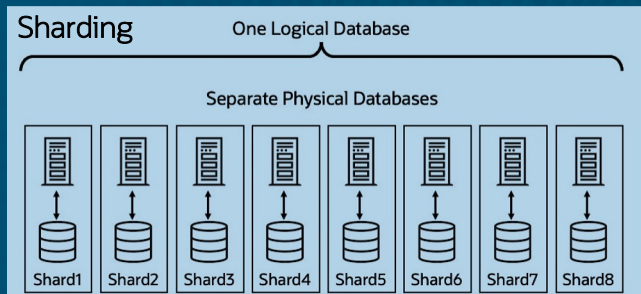
New Types of Analytics



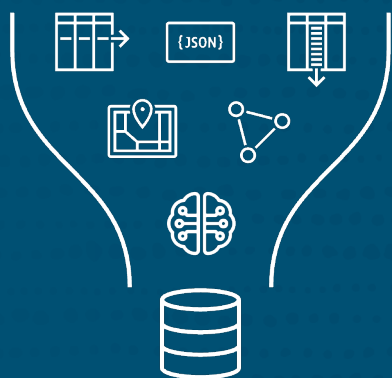
New Workload Types



(Support for all modern data types and analytics are included at no additional charge.)



Complete for Any Data

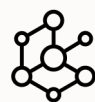


**Converged
Database**

Any Structured Data



Relational



Graph



Parquet



Blockchain

Any Semi-structured Data



Geospatial

{ JSON }

JSON

< / >

XML



Text

Converged support for all modern data simplifies app dev and eliminates data and app fragmentation

Best-of-breed for all – e.g.: better JSON than MongoDB, faster graph than Neo4j

bit.ly/OraclevsMongoDB
bit.ly/OraclevsNeo4j

Unique ability for transactions and queries to span ANY data, further simplifying development

Trivial to Create Data Rich Apps – Add a SQL Statement, Not a Database

For example, when implementing a Movie Streaming web site:

Store and Access movie details in JSON documents

```
CREATE TABLE movie_details(  
    title VARCHAR2(255),  
    movie JSON);  
  
SELECT m.title Title,  
       m.movie.director DIR,  
       m.movie.Star STAR  
FROM   movie_details m;
```

Find movies customers have in common
using Graph Analytics

```
SELECT c1, e, m, e1, c2  
FROM MATCH  
      (c1)-[e]->(m)<-[e1]-(c2)  
      on CUST_MOVIE  
WHERE  c1.cust_id= 1246813  
AND    C2.cust_id= 1002487  
LIMIT 100;
```

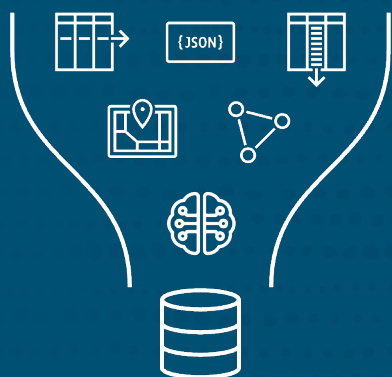
Use Fuzzy Text Search to find movie reviews containing
“disappointed” or variations of it

```
SELECT title, comments  
FROM   movie_reviews  
WHERE  CONTAINS(comment,  
                'fuzzy(disappointed,  
                70, 6, weight)', 1) > 0;
```

Store rental transactions in a Blockchain Table
to prevent fraud

```
CREATE BLOCKCHAIN TABLE rental(  
    u_id number,  
    user_name varchar2(100),  
    order_date date,.....);  
  
INSERT INTO rental VALUES (1,'John','08-Apr-22',..);
```

Complete for Any Workload



**Converged
Database**

Any Transactional Workloads



OLTP



IoT

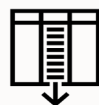


Temporal



Geo-Distributed

Any Analytical Workloads



Real-Time
Analytics



Data
Warehouse



Data
Lake



Machine
Learning



Multi-
Dimensional

Converged support for any modern transactional and analytical workloads simplifies app dev

Best-of-breed for all – e.g.: better analytics than pure data warehouses or Snowflake bit.ly/OraclevsSnowflake

Unique ability to run any combination of workloads on any combination of data

Trivial to Run Sophisticated Processing – Add a SQL Statement, Not a Database

For example, when implementing a Movie Streaming web site:

Use Machine Learning to predict which customers will rent Superhero Movies

```
-- Create the ML Model

DBMS_DATA_MINING.CREATE_MODEL2 (
  MODEL_NAME          => 'RENT_SH_MOVIES',
  MINING_FUNCTION     => 'CLASSIFICATION',
  DATA_QUERY        => 'SELECT * FROM cust',
  CASE_ID_COLUMN_NAME => 'CUST_ID',
  TARGET_COLUMN_NAME => 'SUPERHERO');

-- Use the ML Model

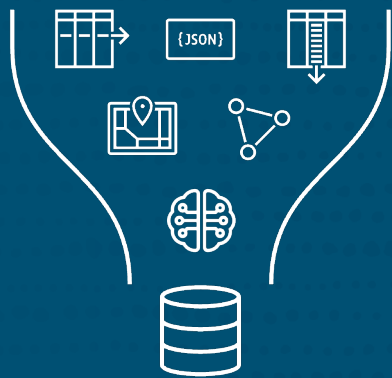
SELECT prediction_probability(
  RENT_SH_MOVIES,
  'Yes' USING 3500 as bank_funds,
  30 as age,
  2 as num_previous_rentals);
```

Easily get a Temporal view of company employees using Flashback Query

```
-- Query who was employed on 5th of April of 2022

SELECT * FROM employees
  AS OF TIMESTAMP
      TO_TIMESTAMP('2022-04-05',
                  'YYYY-MM-DD');
```

Complete for Any Development Style



**Converged
Database**

Unique Support for Microservice Centric App Dev

Native
DB Container



Microservices

Native
Event Queues



Events

Native
APIs

REST
Mongo
Graph

API Driven

Native
Operators



Kubernetes

Native Change
Capture



Data Mesh

Open Client-Tier App Dev



Any
Framework



Any
Language



Any
Tool

Most Open Data-Tier Development

SQL
PL/SQL

JavaScript

JS

R



Python



Java

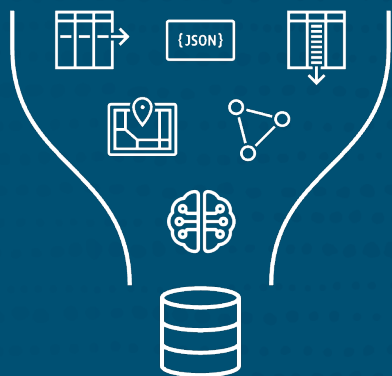


Converged support for all modern development styles simplifies app dev

Best-of-breed for all – for example, transactional event propagation and apply beats event platforms

Unique architectural support for containers, events, REST, low-code, SaaS, etc.

Complete Mission Critical Capabilities



**Converged
Database**

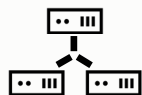
Complete Scaling in Every Dimension

Exadata



Performance

RAC



Scale-Out

Parallel SQL



Parallelism

In-Memory
Columnar



Analytics

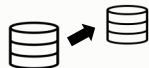
Sharding



Global-Scale

Complete Protection from All Types of Downtime and Risk

Max Availability
Architecture



Extreme
Availability

Editions



Online Data
Redefinition

ZDLRA



Cybersecure Zero
Loss Backup

Data
Safe



Data Security

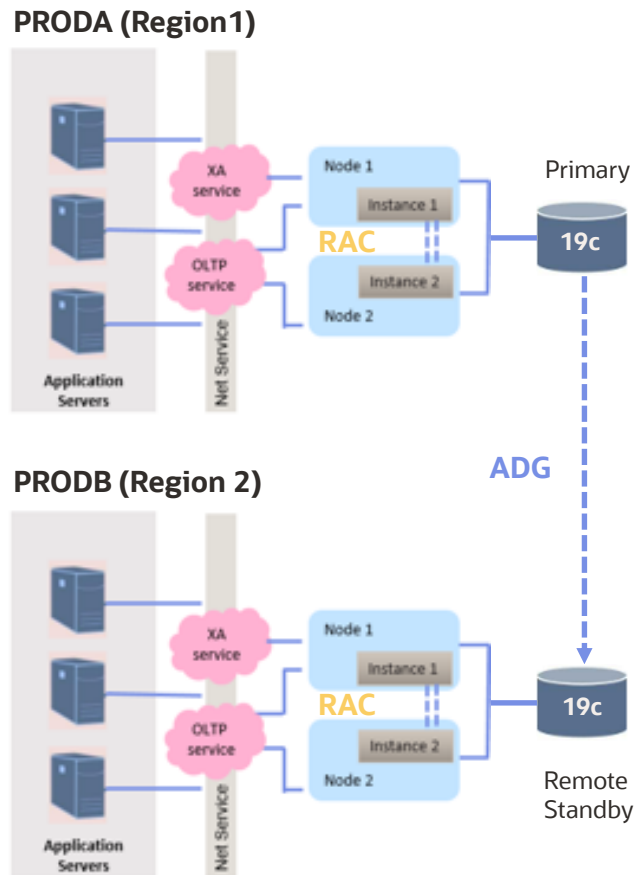
Converged support for the **complete** scaling and risk reduction needs of modern apps simplifies app dev

Best-of-breed for all – e.g.: better, availability, scalability, and sharding than Cassandra bit.ly/OraclevsCassandra

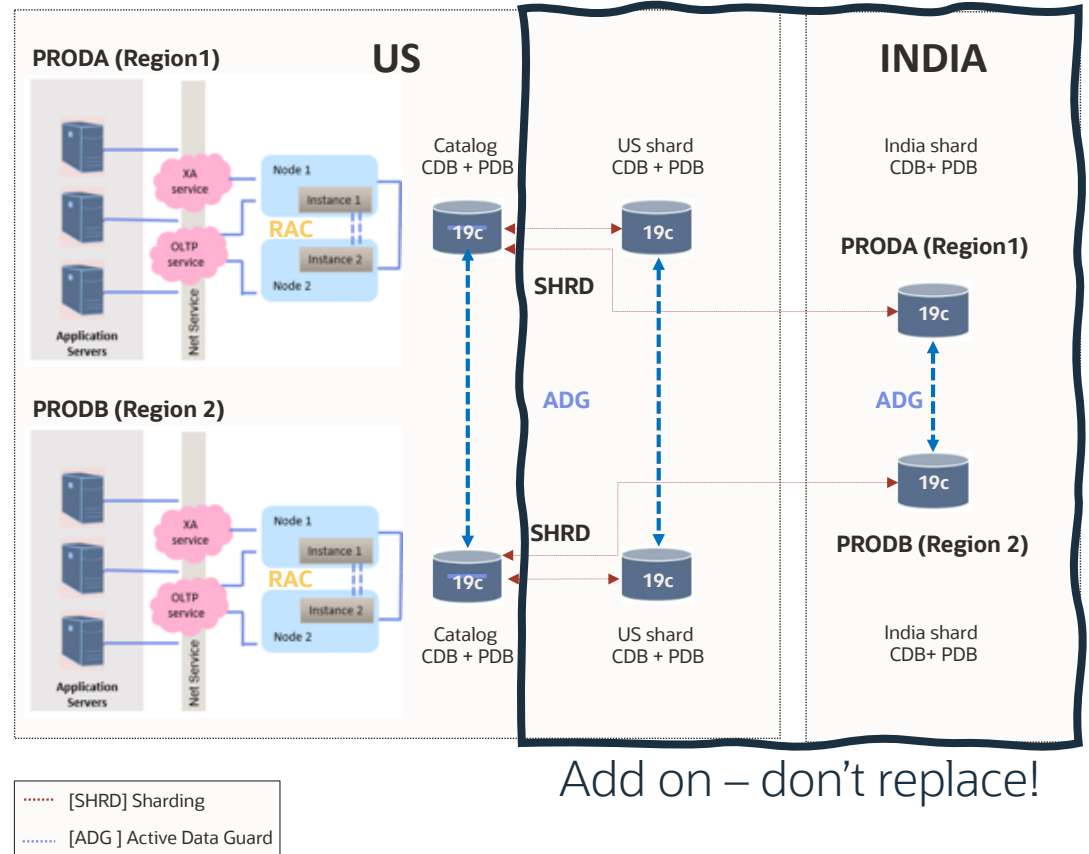
Unique transparent scalability, availability, and security without sacrificing functionality or consistency

Customer Example: Global Payment Processor

Architecture Before Sharding



The same architecture with Sharding



Add on – don't replace!

Oracle Converged Database is the Smartphone of Data



Previously, phones, maps, music, calendars, etc. were separate **products**

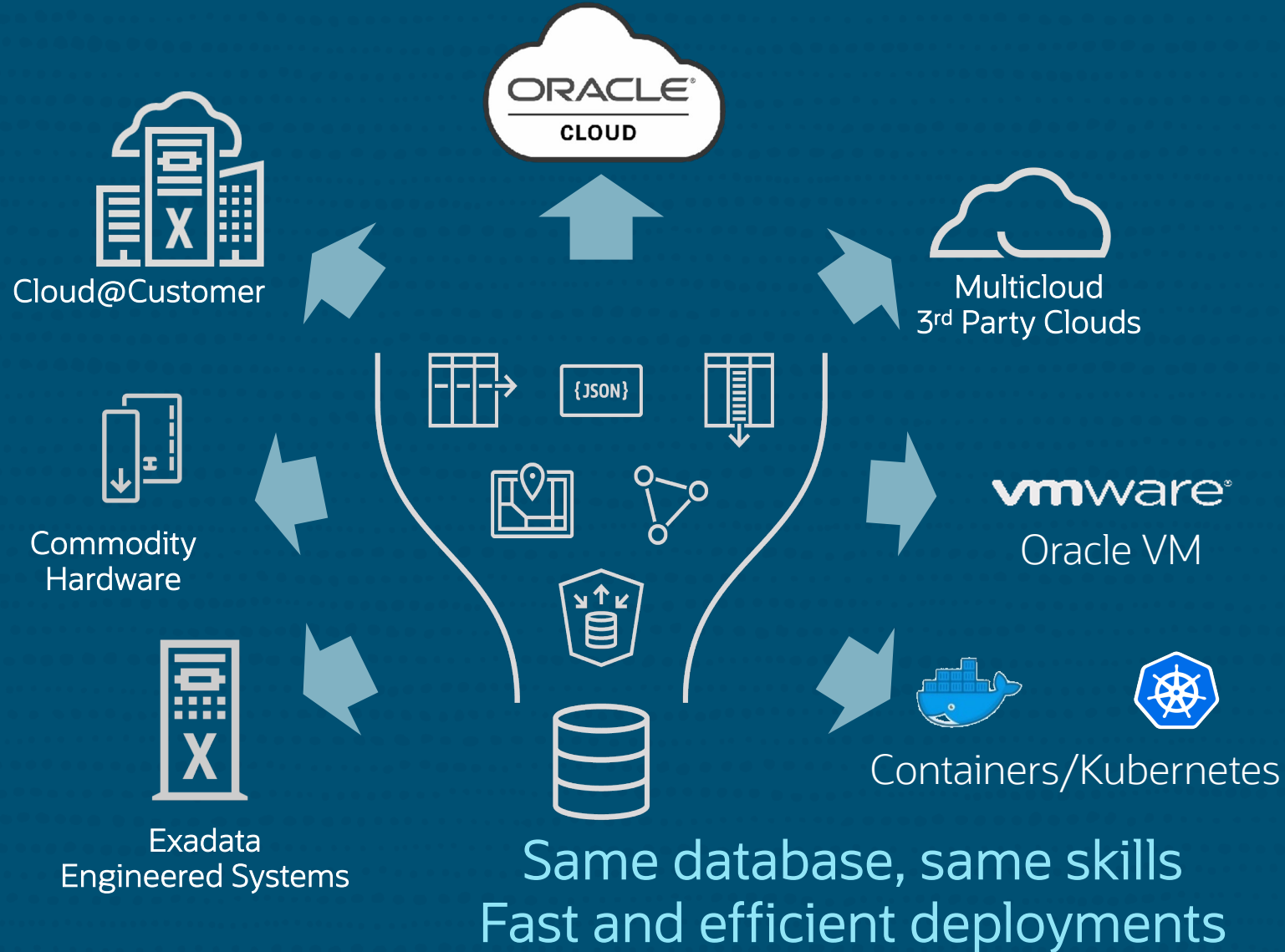
These products have now converged into **features** of smartphones

Similarly, new data technologies become features of the Oracle Converged database

- Converged features are simpler to run and develop with than separate products
- And convergence enables new **cross-feature innovations**

Oracle Database Deployment Choices

Develop and Deploy Oracle Anywhere – Extreme Portability



Delivering the Vision

Complete and **Simple** data platform for developing and running modern apps and analytics



Converged Database Approach

Complete support for all modern data types, workloads, development styles

Completely consistent, scalable, available, and secure

Simple



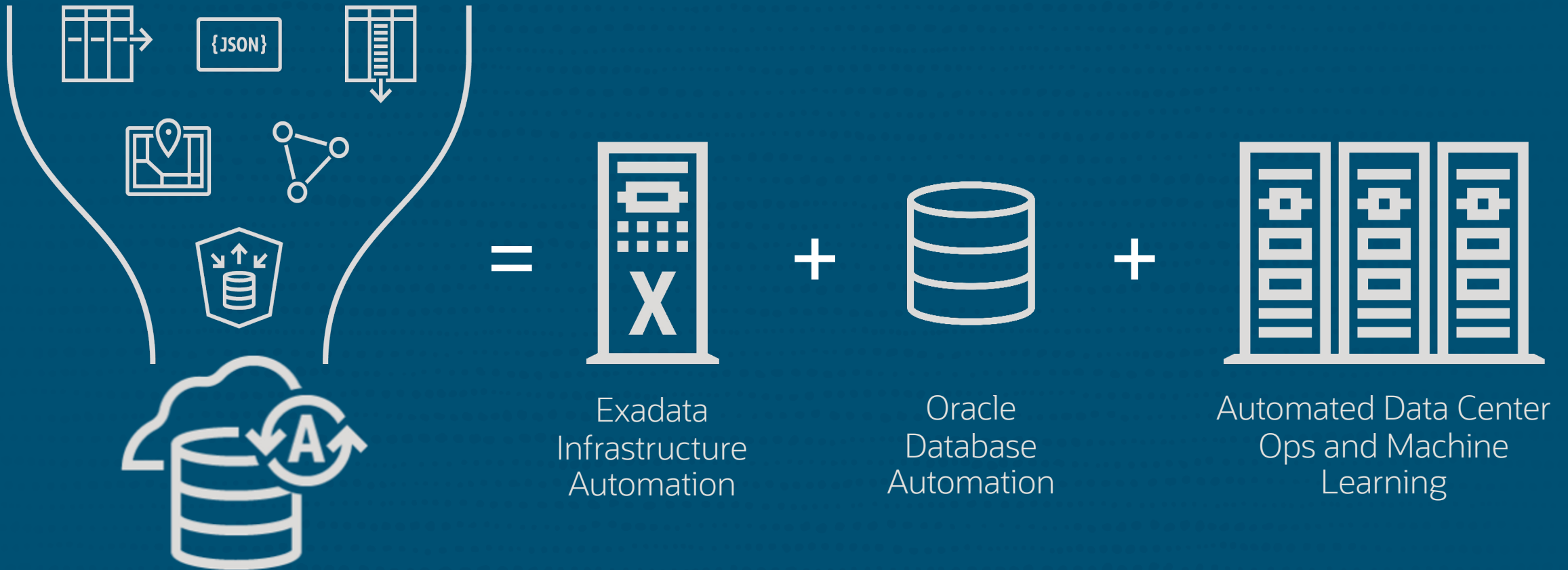
Autonomous Database

Simplest cloud database for developers, DBAs, and data analysts

Simplest cloud database for running any app at any scale or criticality

Oracle Autonomous Database is a Fully-Managed Cloud Service

With automation across all components driven by AI and predictive analytics



Autonomous Database – Runs Anywhere

Same autonomous database service available in the cloud and on-premises



Oracle
Public Cloud



Dedicated Region
Cloud@Customer



Exadata
Cloud@Customer



Hybrid and
Multicloud
Configurations



Oracle **Autonomous Transaction Processing** ranked **highest** out of 17 vendors in all **four use cases**

in the 2022 Gartner® Critical Capabilities for Cloud Database Management Systems for **Operational Use Cases.**

Source: [Gartner Critical Capabilities for Cloud DBMS for Operational Use Cases](#), Merv Adrian, Rick Greenwald, Henry Cook, Xingyu Gu, December 2022

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Oracle Database Service for Azure

Apps on Azure and databases on OCI

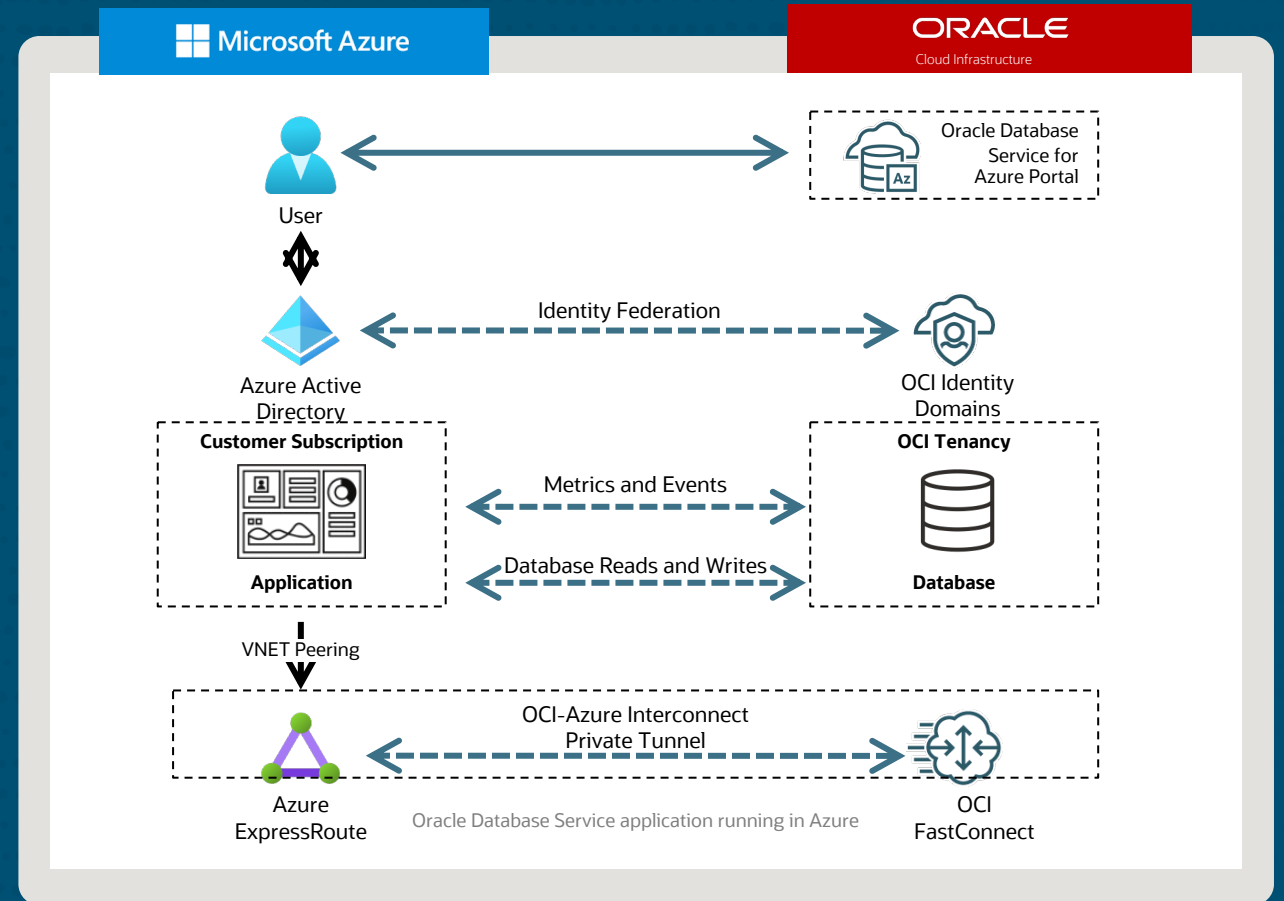
- Suitable for nearly any app
- < 2 ms latency private interconnect
- No egress or ingress fees for data

Runs Even the Most Mission Critical Apps

- Oracle Real Application Clusters
- Oracle Exadata

Familiar Azure-native user experience

- Integrated identity, networking, and monitoring



What do customers like about
Oracle Database?

What do customers like about
Oracle Database? – A Lot!

98%

of the FORTUNE 100 Run Oracle Database

[Share your story](#)[Leave a review](#)[Join our cloud community](#)[Explore customer awards](#)[View reference benefits](#)

Oracle Customer Successes <https://www.oracle.com/customers/>

Innovation, ease of use, better results—those are just some of the reasons organizations in all industries and of all sizes rely on Oracle to help them succeed. Hear from our customers to learn what makes Oracle the right choice for them, and why we're the right partner for your business.

430K+

customers

30K+

customer reviews

300K+

cloud community members

85K+

customer references

What about customer
pain points?

Top Customer Pain Points



Applying Patches &
Quarterly Updates



Database
Upgrades



Testing RUs
& Upgrades



Working with
Customer Support

Autonomous Database Addresses Customer Pain Points

Applies RUs, patches, and upgrades ... and does it online

- Detects and addresses some 88% of incidents
- Automatically collects diagnostics with no pinging of customers
- Automation of the testing process with Database Replay
- Only 39% of Sev1 SRs as compared to other OCI database services

Achieves 99.995% uptime

- With Autonomous Data Guard enabled

Coming soon

- Automatic prevention of SQL plan regressions with Real-time SQL Plan Management



Introducing Monthly Recommended Patches (MRPs)

For each new Release Update (RU)

- Each MRP contains the current set of recommended one-off patches for the RU plus the prior MRPs
- As documented in MOS note 555.1

Customers get access to recommended, one-off patches

- Without having to request a patch bundle after an RU release

Starting with 19.17 in October, Oracle will ship six MRPs for each RU

- Release Update Revisions (RURs) sunsetted after 19.16.2 (January 2023)
- MRPs are available on Linux only
- RUs continue to be available on all supported platforms



Automate On-Premises Upgrades with AutoUpgrade



Download AutoUpgrade from MOS Note [2485457.1](#)

Testing RUs and Upgrades with Real Application Testing

Database workload and performance testing with real production workloads

- Capture individual workloads
- Replay workloads individually or concurrently
- Remediate issues pre-production for risk-free upgrades

Replay production workloads against upgraded instance

- Test and measure transaction throughput against production
- Identify any application scalability and concurrency problems
- SPA Identifies and tunes any regressed SQL statements
- Leverage the cloud to automate the capture and testing process

Database Replay is available for Autonomous Database

- Use Oracle Real Application Testing Database Replay to capture workload from an on-premises or other cloud service database and replay it on an Autonomous Database instance.



Improving Customer Support Experience for SRs

Main Customer Pain points

- Time to resolve Service Requests (SRs)
- Too many “pings” between customer and support
- Too many unresolved SRs

Huge investment from Development to

- Simplify data collection using Trace File Analyzer (TFA)
- Improve diagnostics using TFA and Autonomous Health Framework
- Provide RU, plus, recommended patches to avoid known issues

Huge investment from Support to

- Assist development on product improvements to reduce “Non Bugged SRs”
- Utilize ML for sentiment analysis to reduce escalations and improve responsiveness
- Need more SRs with TFA Collections uploaded. Today only 25% of bugged SRs have TFA collections.



Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. 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.

BETA 2 AVAILABLE

Oracle Database 23c

Beta release available on-premises and
in the Cloud. Sign up now!



<https://tinyurl.com/OracleBeta>

23c

App Simple

Oracle Database 23c is the sum of...

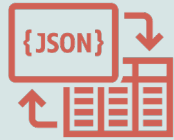
21^c + 23^c

All the features from the
Oracle Database 21c
Innovation Release

300+ New Features
and Enhancements

Oracle Database 23c Developer Focus

Accelerating our mission to simplify development of data-driven apps



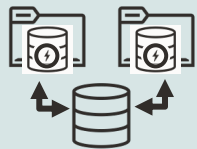
JSON Relational Duality



**Simple Access to
Data as Graphs**



**Simple Transactional
Microservices**



**App-Tier Caching
with True Cache**



**Simple JavaScript
Development**



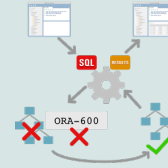
**Simple
SQL Syntax**

Oracle Database 23c Automation & Security

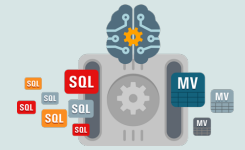
Continuing our mission to make securing Oracle Databases simpler



ML Augmented Real-time Statistics



Real-time SQL Plan Management



Automatic Materialized Views



SQL Firewall



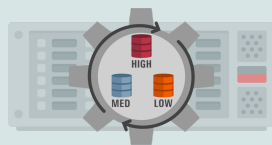
Support for TLS 1.3



Azure AD OAuth2 Integration

Oracle Database 23c Scalability & Availability

Continuing our mission to make operating and scaling Oracle Databases more reliable



Inter-Instance Resource Management



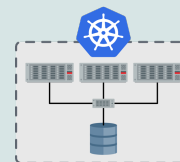
Transaction Priority Management



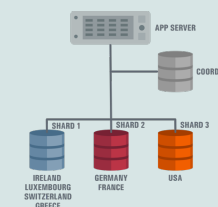
Lock-free Column Value Reservations



Data Guard per Pluggable Database Enhancements

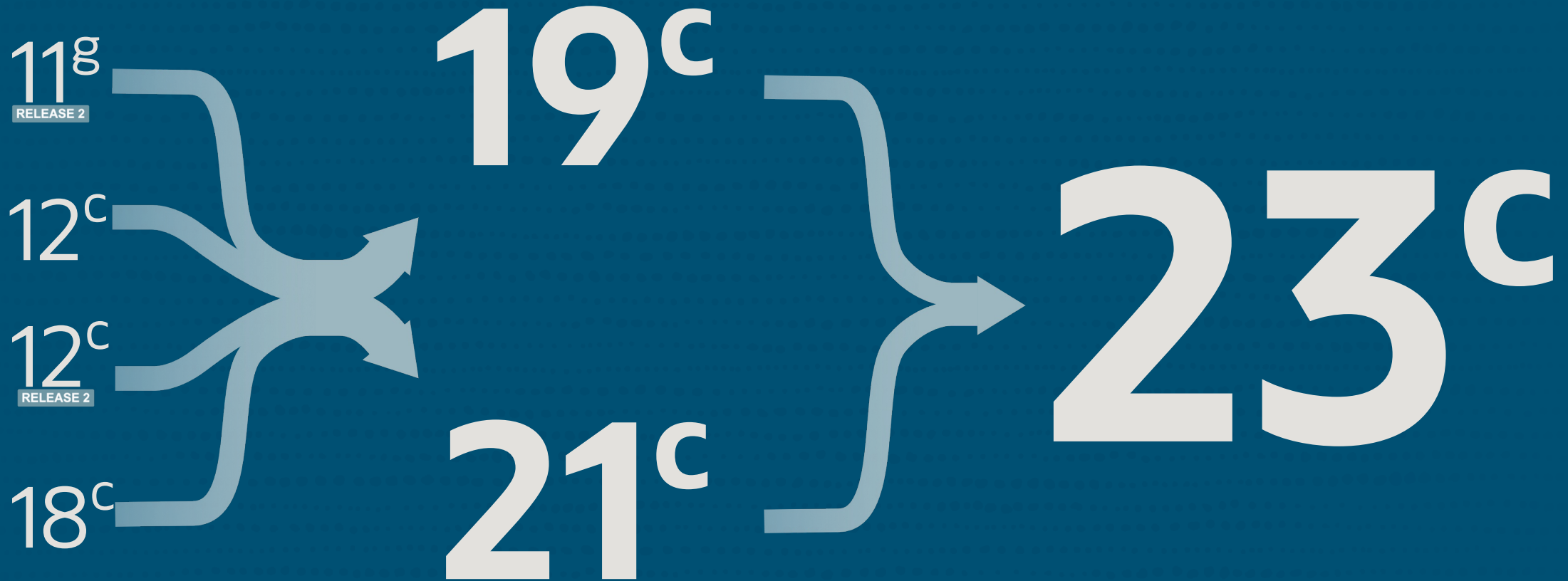


RAC in Docker/Podman and on Kubernetes



Raft-based Shard Replication

Upgrade Path to Oracle Database 23^c



Now Available

Oracle Database 23c FREE

Developer Release

Discover how Oracle Database 23c makes it dramatically simpler to develop and run data-driven apps

Download now



Oracle.com/23cFREE

FREE



Summary – Oracle Database Directions

Converged Oracle Database

- Supports all modern data types, workloads, and development styles
- Simplifies development of analytics and machine learning
- Completely consistent, scalable, available, and secure platform

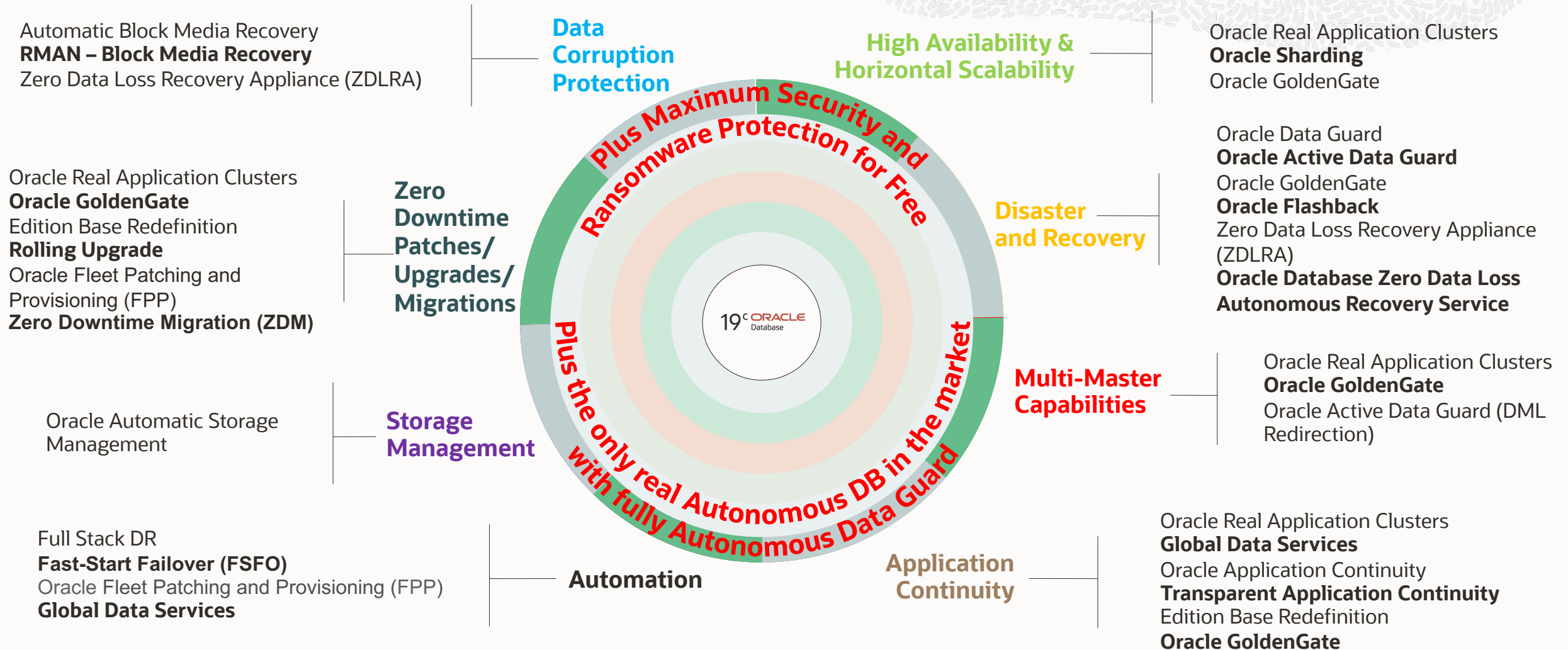
Oracle Autonomous Database

- All the benefits of converged Oracle Database, plus best customer experience
- Best cloud database for running any app at any scale or criticality
- Deploy in the cloud, on-premises and hybrid/multicloud configurations

Oracle Database 23c

- Next long-term release for on-premises and cloud deployments

Oracle Database – all-inclusive, converged by design and protected by MAA



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Showcasing how Oracle's solutions solve your business problems — available 24/7 for free!

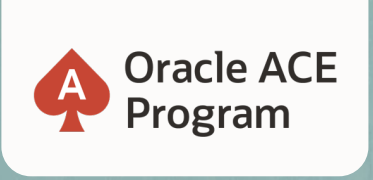


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1000+
events run
using LiveLabs
workshops

700+
free workshops,
available or in
development

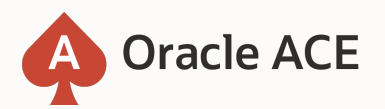
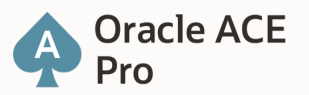
7 million
people have already
visited LiveLabs



500+ technical experts & community leaders helping peers globally

The **Oracle ACE Program** recognizes & rewards individuals for their technical & community contributions to the Oracle community

3 membership tiers



Nominate
yourself or a candidate:
ace.oracle.com/nominate

Learn more - ace.oracle.com



ORACLE

Thank you! Muchas Gracias! Muito Obrigado!

Francisco Munoz Alvarez

Distinguished Product Manager, Oracle Database High Availability (HA), Scalability and Maximum Availability Architecture (MAA) Team

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