



Database Consolidation



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August 2022

Agenda

1

What do we hear from customers?

2

Three ways to consolidate Oracle Database

3

How Oracle can help you implement database consolidation

4

Wrap up and next steps



Our customers say they are modernizing to support new business models

80%

of businesses are planning strategic moves
that require IT modernization*

Top reasons for modernizing IT estates*

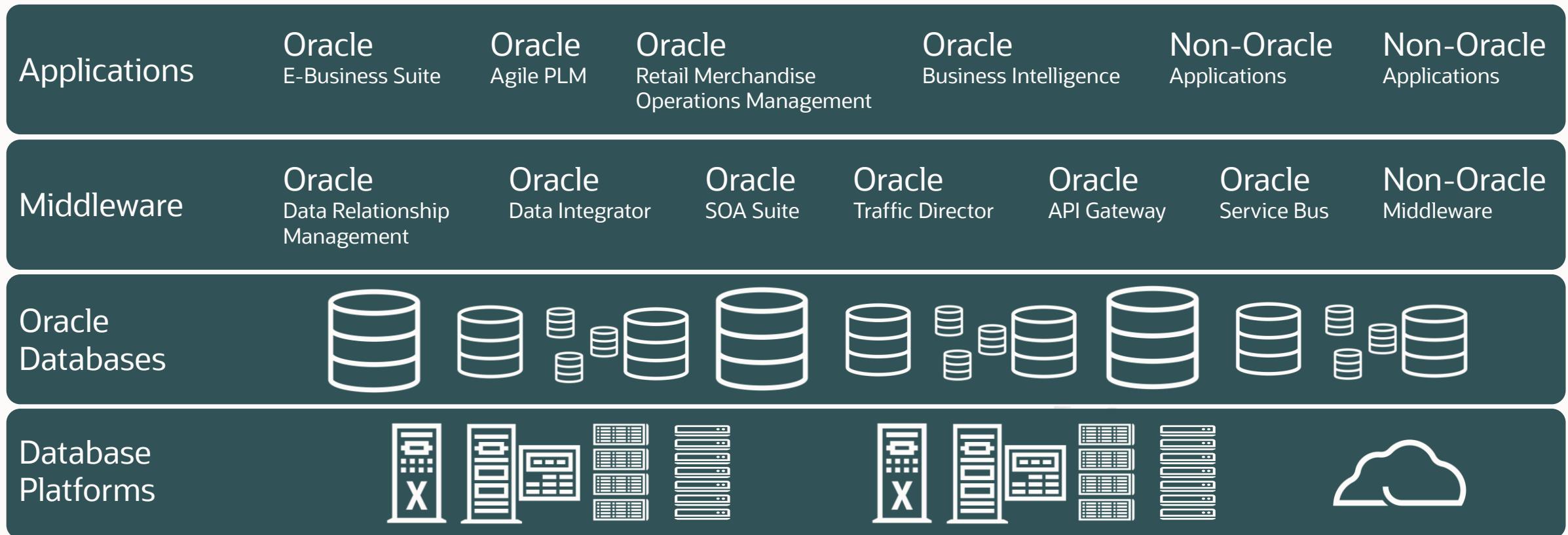
DRIVE COST-REDUCTION PROJECTS	53%
CHANGE HOW PRODUCTS/ SERVICES ARE SOLD	52%
PIVOT TO NEW MARKETS	50%
REALLOCATE RESOURCES	44%

Database consolidation is a core IT strategy used to achieve strategic goals

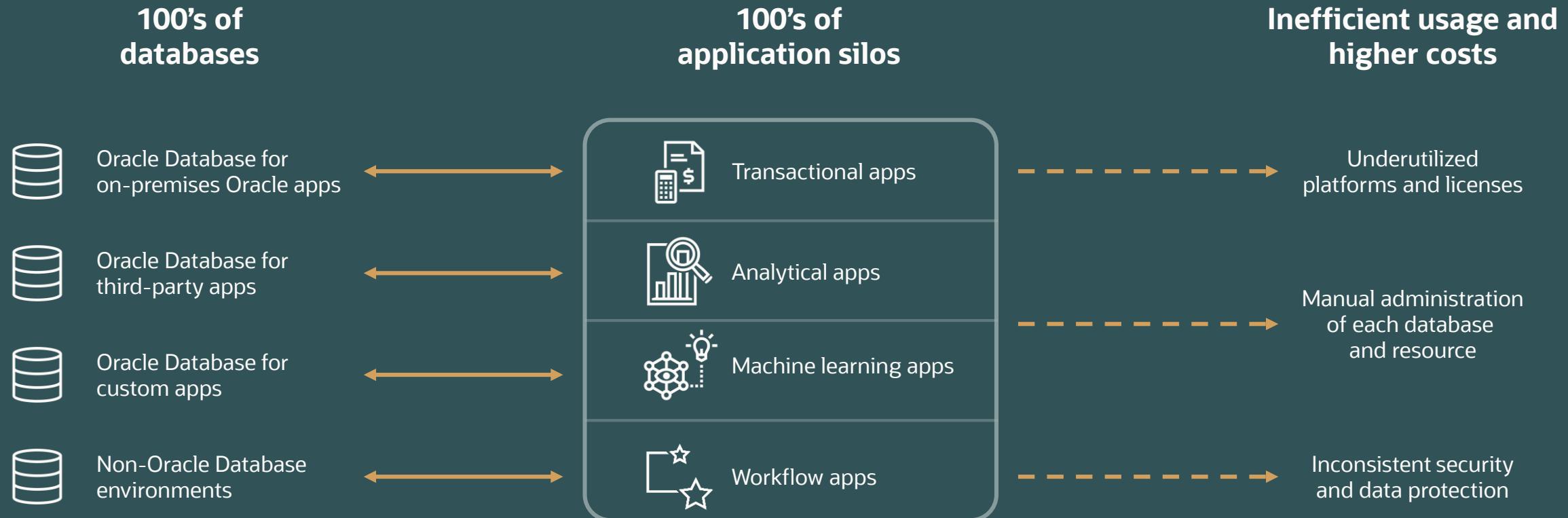
* MIT Technology Review Insights: New business models, big opportunity



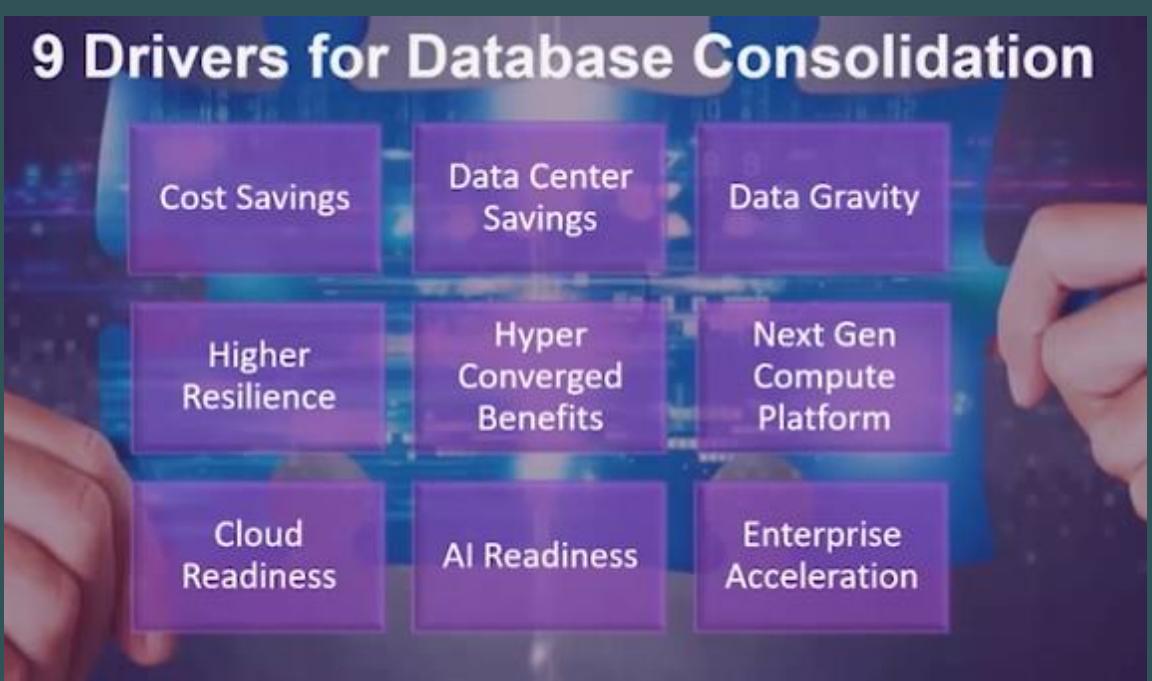
Many organizations have extensive Oracle Database estates



But stand-alone databases limit efficiency and increase costs



Database consolidation increases business value



“Database consolidation is one of the most basic steps to bring the data together, to have two plus two equals five benefits, to be on a modern platform and have the ability to move workloads back and forth between cloud and on-premises to get better and greater insights from a more universal database.“

“You must be moving faster than your markets. If you cannot do that, you’re at risk of being disrupted. “



Holger Mueller

Vice President and Principal Analyst
Constellation Research

[Watch the webcast](#)

Customers have achieved better results with database consolidation

90%

Less time patching

Equinix consolidated databases on
Exadata Database Machine

- 50% cost savings
- 40% faster, 70% less time tuning
- Higher availability
- 52% fewer databases¹



Saving

Triple-digit million €

Deutsche Bank moved to **Exadata Cloud@Customer**

- 10,000 databases, 40 PB of data
- Maintained data residency to meet government regulations
- Lower latency for core banking
- Reduce operational costs²



50%

Lower TCO

Eneco moved from on-premises systems to **Exadata Database Service**

- Moved more than 20 mission-critical workloads including SAP to OCI
- Higher availability
- Lower costs with online scale-up and scale-down of database resources³



Why hasn't everyone consolidated their databases?

Legacy apps are running fine

There are minimal or no issues, so why change?

Commodity hardware limits consolidation

Mandated use of generic x86 servers and storage doesn't enable high levels of consolidation

Data governance requirements

Databases are separated to meet performance, availability, risk management, or security SLAs

Cloud database services aren't designed for consolidation

Most services lack the functionality, performance, scale, or availability needed for consolidation

Different timing and decentralized IT budgets

Multiple LOBs must work together and agree to pool resources and budgets

Oracle reduces costs for legacy apps

Efficiently run mission-critical applications and analyze results faster

Oracle offers added value and low cost

High performance and efficient use of pooled resources eliminates the cost of over-consuming and over provisioning

Oracle provides consistent governance

Multiple levels of isolation and resource management help meet SLAs for all Oracle databases

Oracle is designed for the cloud

Run consolidated databases with the same or greater speed, scale, and availability in OCI than in on-premises data centers

Oracle solutions are scalable

Start small when projects permit and incrementally add resources as consolidation increases



We meet you where you are in your database consolidation journey

On-Premises Traditional
Exadata Database Machine



Customer Data Center
Purchased
Customer Managed

Cloud@Customer
Exadata Cloud@Customer



Public Cloud or Dedicated Region
Exadata Cloud Infrastructure





7-Eleven's 3-step journey to database consolidation on OCI

Consolidated databases on premises



Exadata
Database Machine

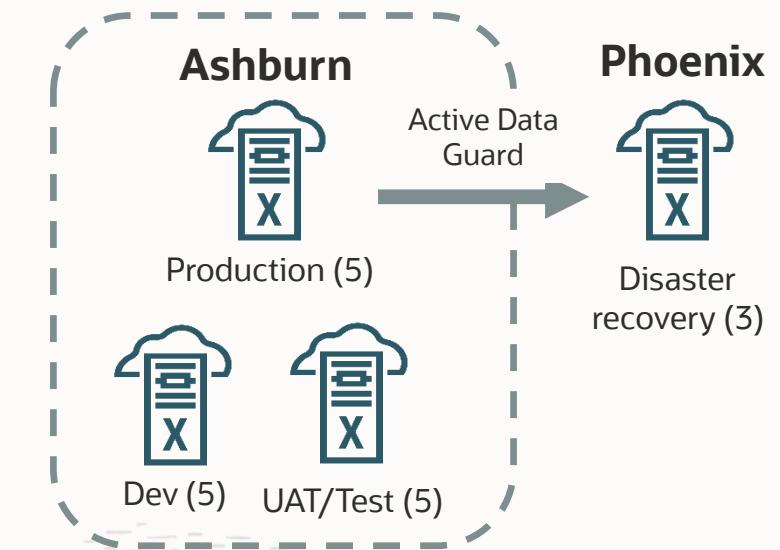


Added disaster recovery in OCI



Exadata
Database Service

Migrated production databases to OCI



- **Consolidated mission-critical E-Business Suite ecosystem** on Oracle Exadata Database Machine
- Maximum Availability Architecture (MAA) is critical to meeting their corporate SLAs

- **Set up cloud DR** to Exadata Database Service with Active Data Guard in 13 weeks
- Worked with Oracle Consulting to mirror MAA environment in the cloud
- Started to use DR platform for dev/test

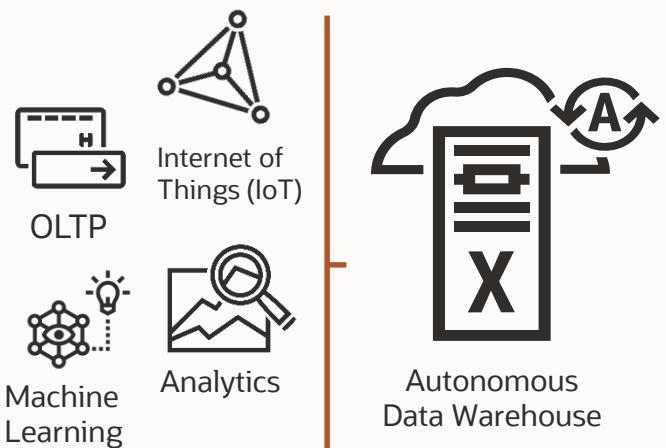
- Moved mission-critical, 2nd tier apps, development, and testing
- **Achieved up to 30x more performance**
- **Decommissioned 60 on-premises services and lowered costs**

Read [7-Eleven's story](#)



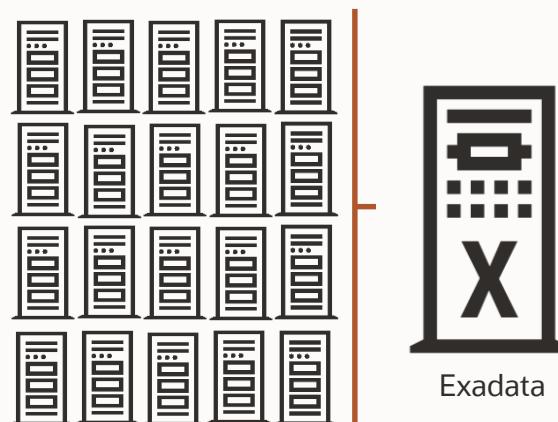
Three ways we've helped organizations with database consolidation

Use fewer databases
Digital payment gateway



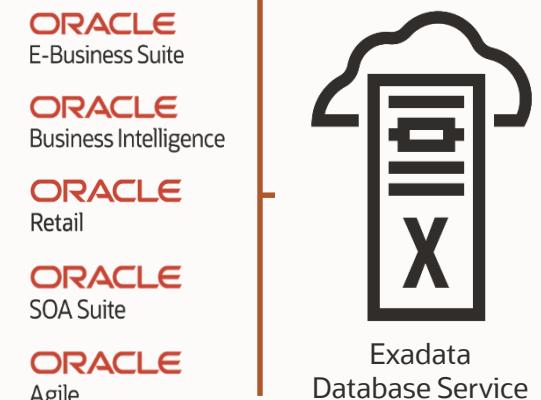
4:1 Consolidation of the type and number of databases

Use fewer platforms
Large US bank



40:1 Platform consolidation with multi-\$M savings

Consolidate in the Cloud
Large US Retailer

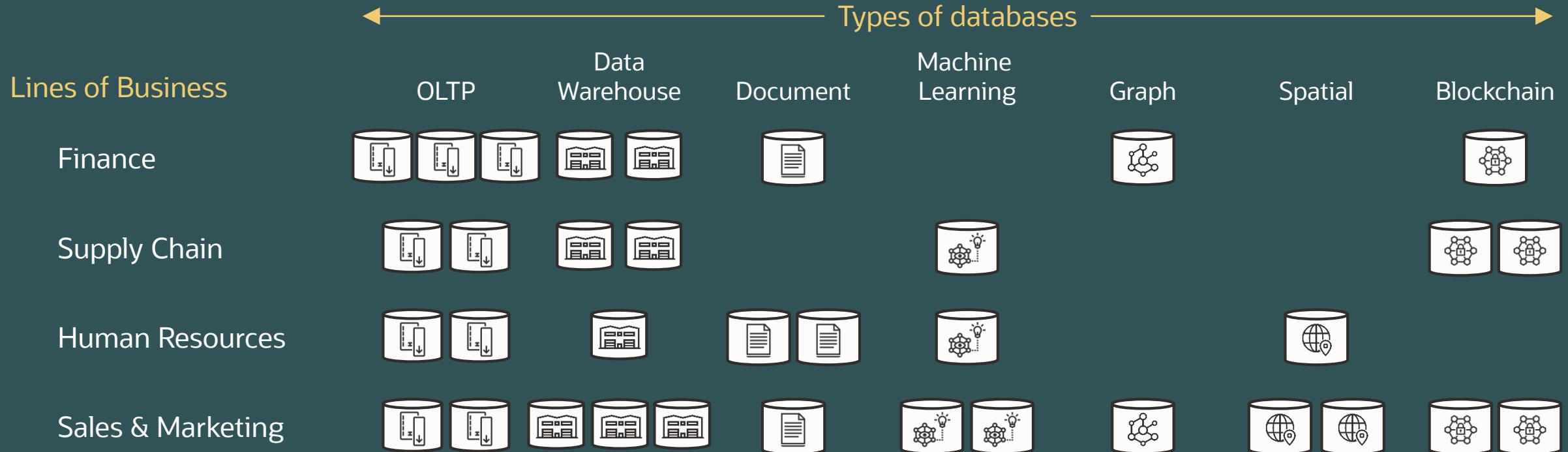


60 Data center services eliminated

Consolidate with fewer databases



Organizations typically use many database silos



Using multiple databases per application creates complexity and risk

Oracle Database's complete capabilities enable database convergence

Multiple data types

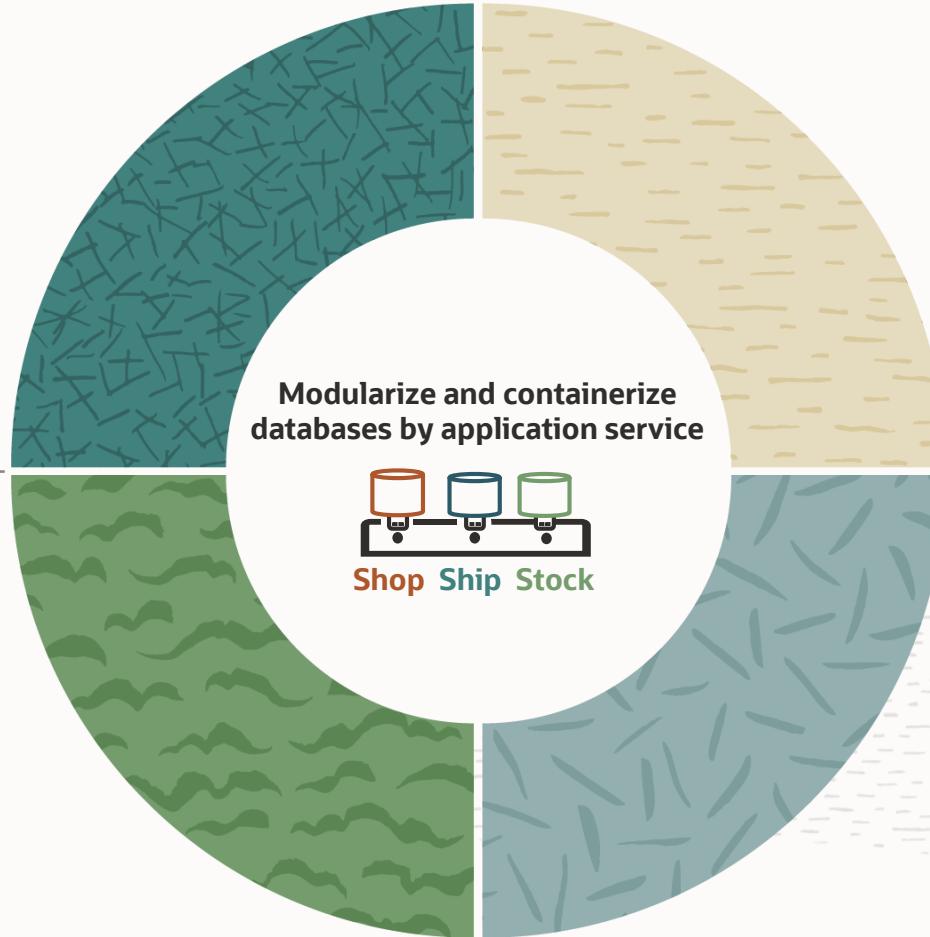
Structured: Relational, Graph, Avro, Parquet, Blockchain

Unstructured: Geospatial, XML, JSON, Text

Mission-critical capabilities

Scaling: Performance, capacity, query parallelism, analytics, multitenant

Risk reduction: Disaster protection, replication, security, zero data loss backup, crypto-security



Multiple workloads

Transactional: OLTP, IoT, distributed, key-value

Analytical: Data warehouse, data lake, operational intelligence, machine learning, multi-dimensional

Multiple development styles

Decentralized: Microservices, events, data mesh, APIs

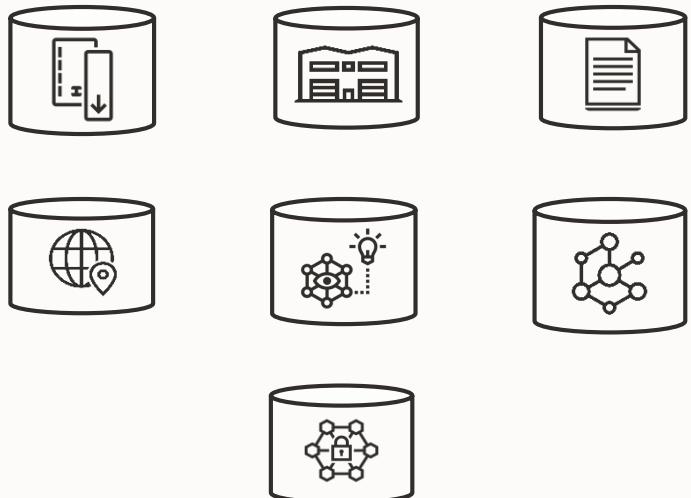
Accelerated: Low code, data engineering, schema-less, SaaS



Converged capabilities reduce the number of database types you need

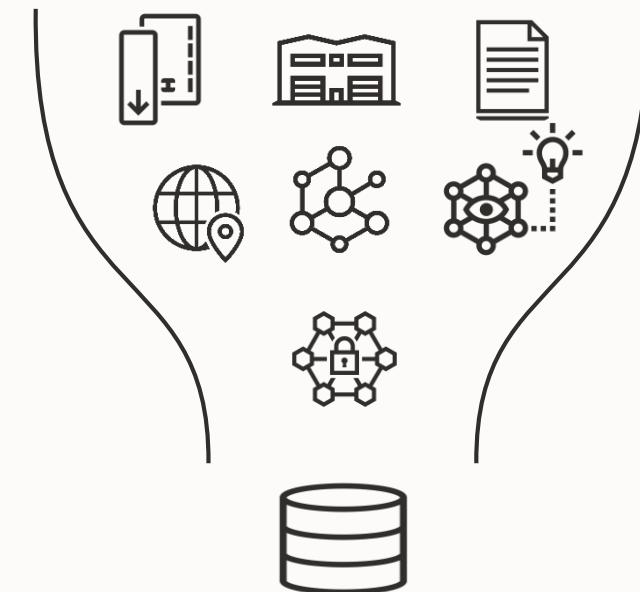
Non-converged databases

Apps integrate multiple database types,
one for each type of data



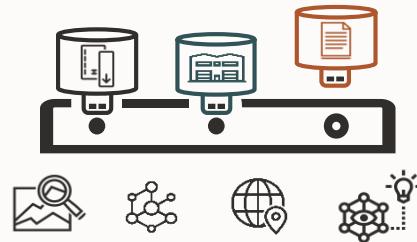
Converged Oracle Database

Apps use one database for all
data types and workloads



How Oracle improves converged database consolidation

Complete data type and workload support



- Developers use **one database** when working with multiple data types
- Multiple application **databases run and are managed together** using Oracle Multitenant
- Native JSON** with high performance and scale simplify modern apps
- Multiple types of analytics** and machine learning eliminate stand-alone services

Automation of the complete dev lifecycle



- Point-and-click **cloud native development** using native tools
- AutoML** helps automate machine learning model creation
- Autoscaling** eliminates the need for developers to implement scaling inside applications
- Autoindexing** eliminates the need for DBAs to tune database indexes for greater performance

Mission-critical apps are easy to run



- Automatic performance optimizations on **Exadata** reduce tuning requirements
- Transparent** query parallelism simplify performance tuning
- Consistent governance** of self-service databases with fleet management
- Databases run unchanged for **Oracle and 3rd-party apps**

Important data is easy to secure



- Transparent encryption** protects data at rest, in motion, and in backups
- Data masking and redaction** remove sensitive information
- Separation of duties** controls administrative access to data, software, and infrastructure
- Label security** and virtual private databases limit users access to data
- Blockchain tables** enable tamper-resistant ledgers for centralized apps

Business Value Highlights

256% return
on investment

Six months
to breakeven

47% reduced
total cost of operations

69% more
efficient IT infrastructure staff

73% reduction
in unplanned downtime

40% reduction
reduction in IT infrastructure costs

\$479,000
additional new revenue gained
per year

\$1.93 million
total average benefits per year

40% faster
time to market



IDC Customer Business Value Analysis of Oracle Exadata Cloud@Customer

“Exadata Cloud@Customer optimizes database performance, reduces operational costs, and contributes to better business results”

Customer Comments:

More business: “If we didn’t have Exadata Cloud@Customer, **we would’ve lost a business offer worth \$10,000 to \$200,000 per day.**

Faster performance: “We had a critical financial report that took 12 minutes to run...**It takes 41 seconds now.**”

[Read IDC's Business Value Analysis](#)

Consolidate in the Cloud



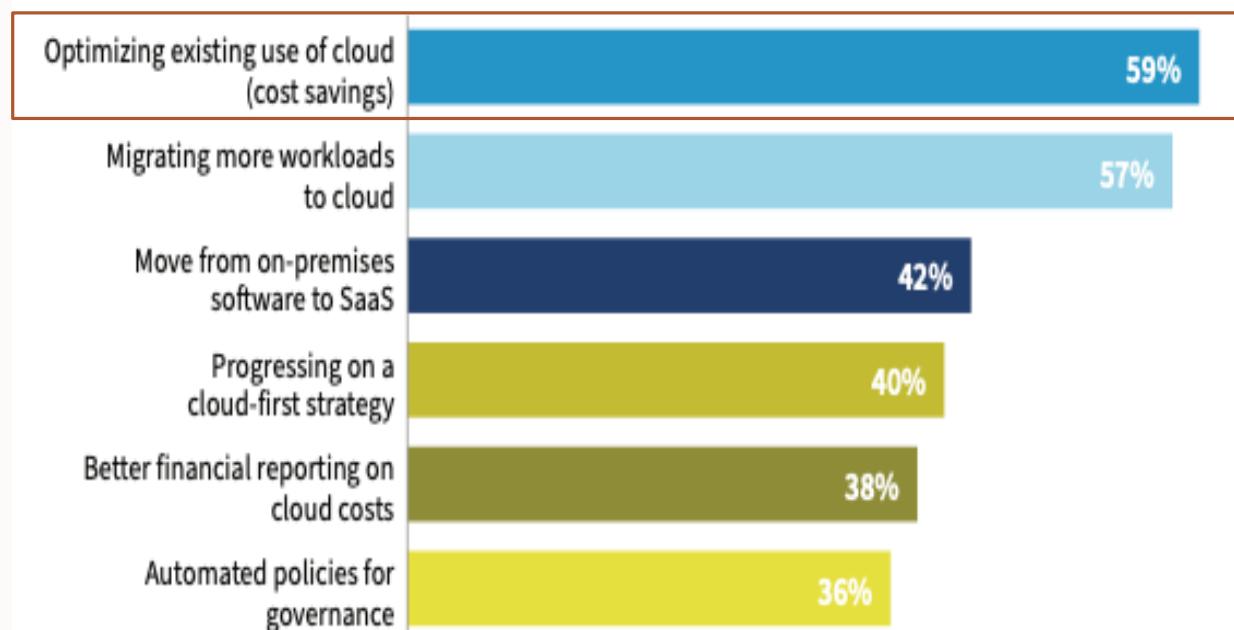
Controlling cloud cost is now a top enterprise initiative

Were on-premises inefficiencies simply moved to the cloud?

FIGURE 25

Cost-control measures and moving to SaaS solutions are top of mind.

Top cloud initiatives for 2022 across all organizations



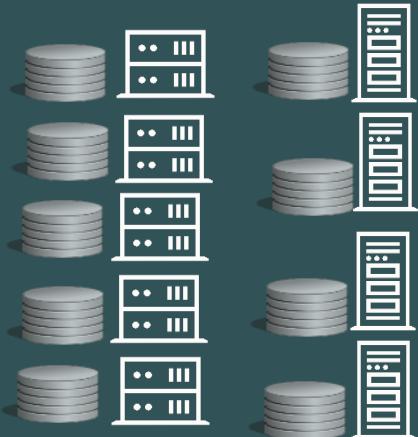
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Source: Flexera 2022 State of the Cloud Report

FLEXERA

Simply “moving” to the Cloud may not save you money

On-premises databases



Typical cloud deployment



Size-for-peak architectures
- License all server CPUs

Size-for-peak provisioning
- License all vCPUs per shape

Eliminates infrastructure management and **does little to reduce software licensing costs**

One database per cloud service

- Still managing and paying for lots of idle resources—just in case
- Still setting up and tuning the same or more database environments
- Still must move to a bigger environment when workload demands increase
- Still securing and managing each database
- May not provide the performance, availability, and scale of previous on-premises capabilities

Consolidating databases in OCI reduces complexity and costs

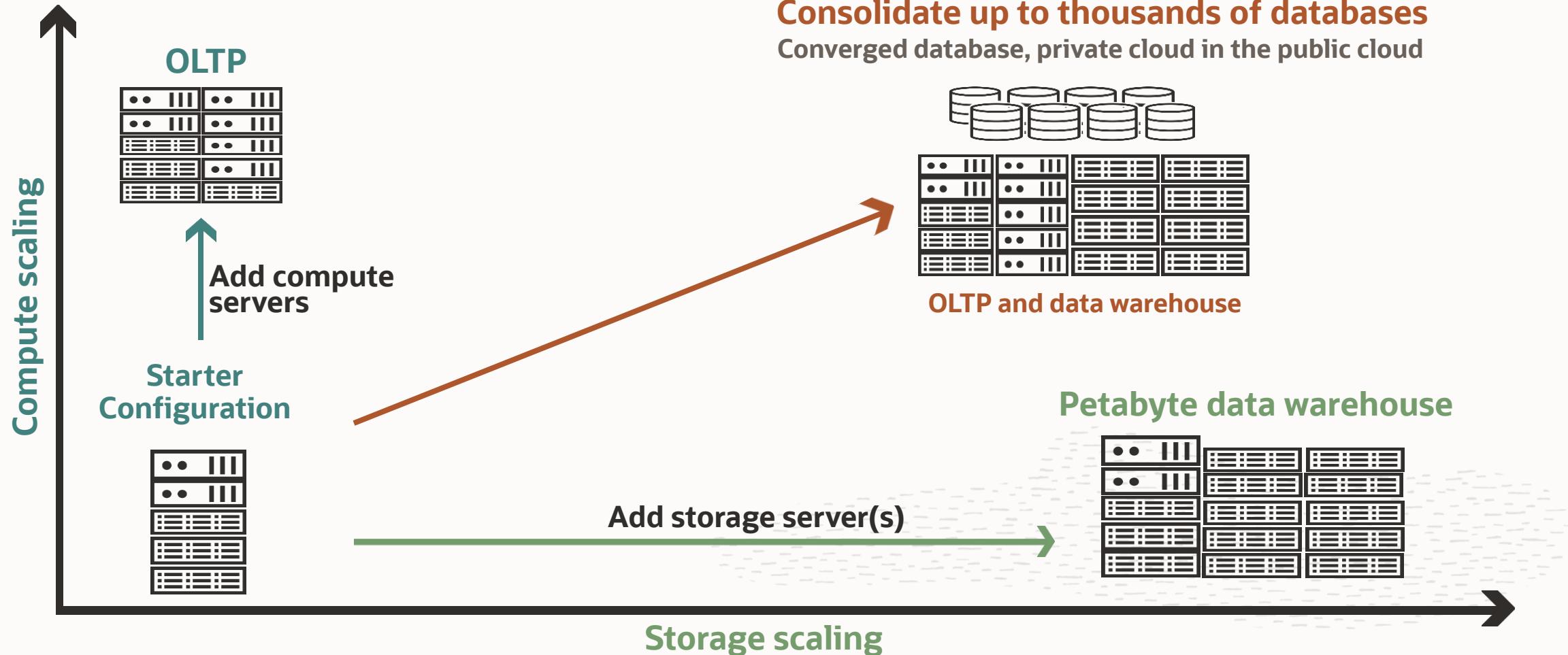


- Pooled resources increase utilization rates
- High scalability, performance, and agility
- Unified management and security

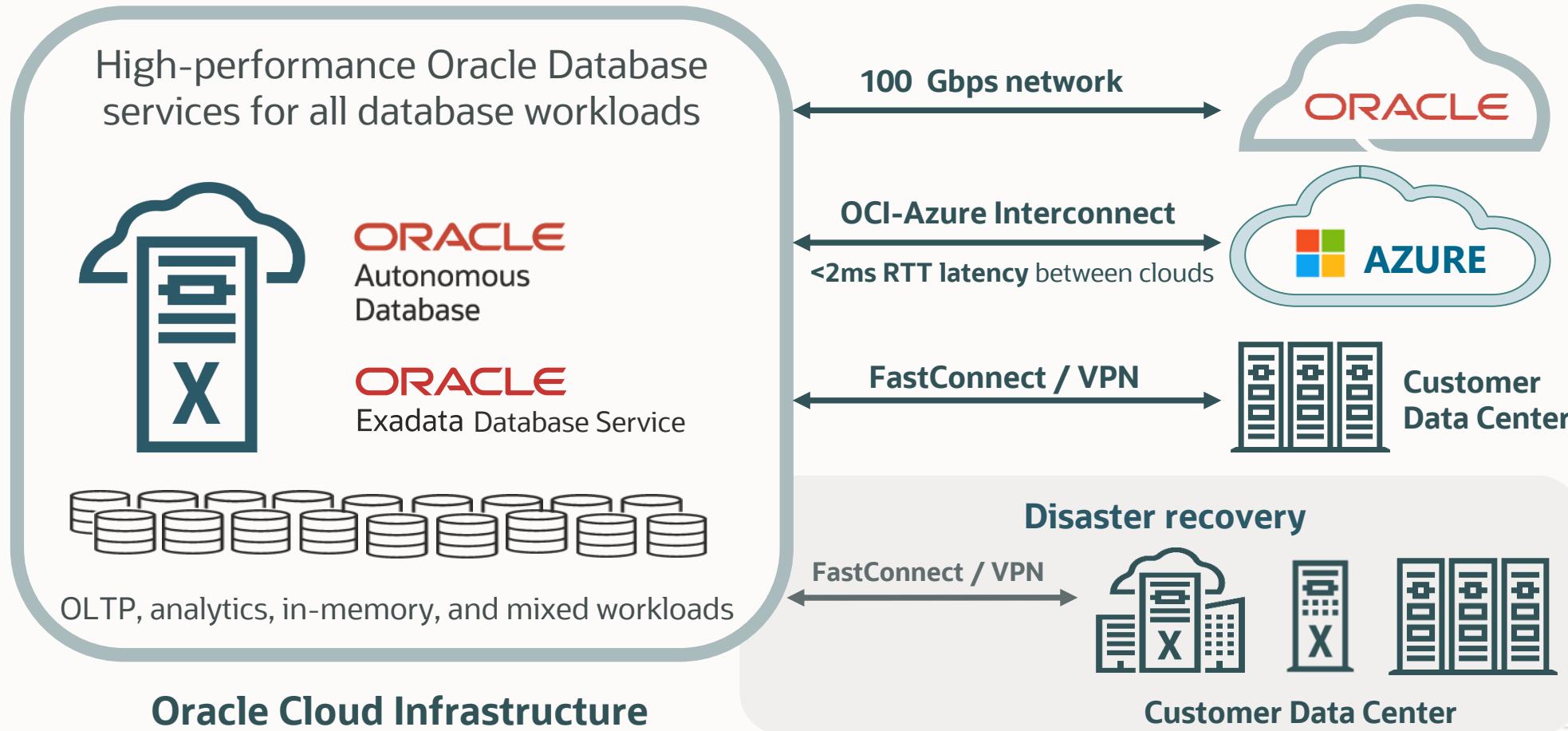
Consolidate databases in one cloud service

- Scale vCPU up / down to meet workload demands
 - Starter configuration allows scaling between 8 and 504 vCPUs
 - No fixed vCPU costs
 - Only pay for what you use
- Maintain continuous operations with online scaling

Easily right-size your service by adding compute and storage as needed



Unify Oracle Database management in multicloud environments





Consolidated Oracle Databases on OCI using a Multicloud Architecture

“Our proposal is to take the customer’s experience to a new level with more efficiency and agility, and always with the highest levels of security. We are the first carrier to promote a change with this dimension, also anticipating initiatives related to governance and sustainability, within a larger project related to an ESG agenda across all of TIM’s operation.”

Pietro Labriola
CEO, TIM Brasil

Products used:

Oracle Exadata Database Service
OCI Compute and Storage
OCI – Azure Interconnect

Oracle Database Service
VMware services



Business challenge:

TIM Brasil needed to modernize their infrastructure in order to improve customer experiences while taking efficiency, agility, and security to the next level. They wanted to simplify management, reduce energy use, and cut carbon emissions.

Results:

The Brazilian telecommunications provider is moving critical workloads to a multicloud environment with databases running on Oracle Exadata Database Service and Oracle Database service, VMware in OCI, and other workloads and VDI environments on Azure.

- Run customer billing, Siebel, and Oracle SaaS apps in Oracle Cloud
- Migrate 1,200 databases, 15 petabytes of storage, 7,000 servers
- Run up to 4,000 VMware servers on OCI
- Use a 40 Gbps link to Azure with < 2 mS latency for distributed apps
- Federated identity services with Azure to reduce management

Read [story](#)



Dialog's 3-step path to database consolidation on OCI



Exadata
Database Machine

Exadata
Cloud@Customer

Exadata
Database Service

- **Consolidated mission-critical databases** on Exadata Database Machine
- **Consolidated all Oracle databases** on Exadata Cloud@Customer in their data center
- Developed cloud-based operational procedures to simplify move to OCI
- First step in exiting data centers
- **Migrated databases and operations to OCI**
- Met requirements for performance, stability, security, and scalability.
- Enabled flexible access to data and applications from anywhere

Read the [Dialog story](#)



Oracle Database Consolidation with OCI's Global Footprint

August 2022: 39 Regions, 5 planned; 11 Azure Interconnect Regions





How Oracle can help you implement database consolidation



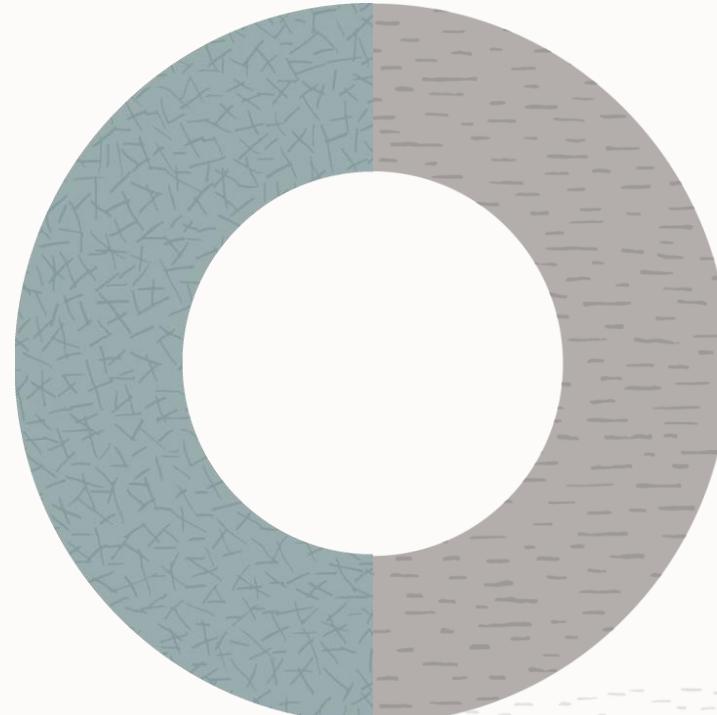
Move existing workloads to the cloud cost-effectively and with guidance

Oracle Cloud Lift Services

Free assistance when migrating to OCI.
Guidance from Oracle cloud engineers
on:

- Planning
- Architecting
- Prototyping
- Managing cloud migrations

<https://www.oracle.com/cloud/cloud-lift/>



Oracle Support Rewards

The more customers use Oracle
Cloud Infrastructure (OCI) the more
they save:

- Earn \$0.25 to \$0.33 in rewards for
every \$1 spent on OCI
- Use rewards to reduce tech
software license support costs –
even down to zero!

<https://www.oracle.com/cloud/rewards/>

Lots of resources to help along the way

Learn more



Oracle LiveLabs workshops

- On-premises [converged database](#) approach for developers
- [Simplify microservices](#) with converged Oracle Database
- Learn more about Oracle [Multitenant](#) pluggables, clones, and containers



Database consolidation guidance

- [Best practices white paper](#) on database consolidation concepts and strategies
- [TheCUBE Interview](#) on Database Consolidation
- Blog – [Database Consolidation – Why and How](#)
- Blog – [A Guide to Why and How to Consolidate Databases](#)



Converged database strategy

- [What is a converged database?](#)
- [Oracle Converged Database Virtual Event Series](#)
- [Converged Oracle Database MAA in the world of hybrid cloud and multicloud deployments](#)



Websites

- [Exadata family page](#)
- [Exadata Database Machine](#)
- [Exadata Cloud@Customer](#)
- [Exadata Database Service](#)
- [Autonomous Database on Exadata Cloud@Customer](#)
- [Autonomous Database on Dedicated Exadata Infrastructure in OCI](#)



Multicloud strategies

- [Oracle multicloud website](#)
- [Databases on OCI and apps on Azure](#)
- [Accelerate multicloud adoption with OCI and Azure Interconnect](#)
- [Explore multicloud webcast series](#)



Migrating to the cloud

- [What is a cloud database?](#)
- [How Oracle can help migrate to the cloud](#)
- [Oracle PaaS and IaaS Universal Credits Service Descriptions](#)

Wrap up and next steps



Each organization approaches database consolidation differently

Add or improve disaster recovery in the cloud

Consolidate disaster recovery targets in the cloud to improve resilience and economics

Consolidate a few apps on premises and grow

Increase efficiency and lower costs, become familiar with consolidation and grow as infrastructure ages out

Take a multistep path to consolidate in the Cloud

Maximize confidence by consolidating databases on premises, then using to Cloud@Customer, and finally on OCI

Lift and shift to directly in the Cloud

Move entire workloads to the cloud and consolidate databases from aging on-premises platforms

Consolidate shared applications first

Build LOB confidence by uncovering potential issues early in the process and showing success

Oracle can help you implement all of these



Key Benefits of Oracle Database Consolidation on Oracle

- 
- 1 Consolidate mission-critical databases without refactoring
 - 2 Automate database management
 - 3 Provide higher availability and scaling
 - 4 Zero downtime scaling and maintenance
 - 5 Pay only for vCPUs used instead of all available within the configuration
 - 6 Run databases faster in the Cloud with:
 - Latency as low as 19 microseconds
 - Up to 22.4M SQL read IOPS with 8 database servers
 - Up to 2,880 GB/s SQL throughput

Exadata has thousands of critical deployments since 2008

88% of the Fortune Global 100 run Exadata | 39% run Exadata Cloud

Virtually all Exadata are used for consolidation

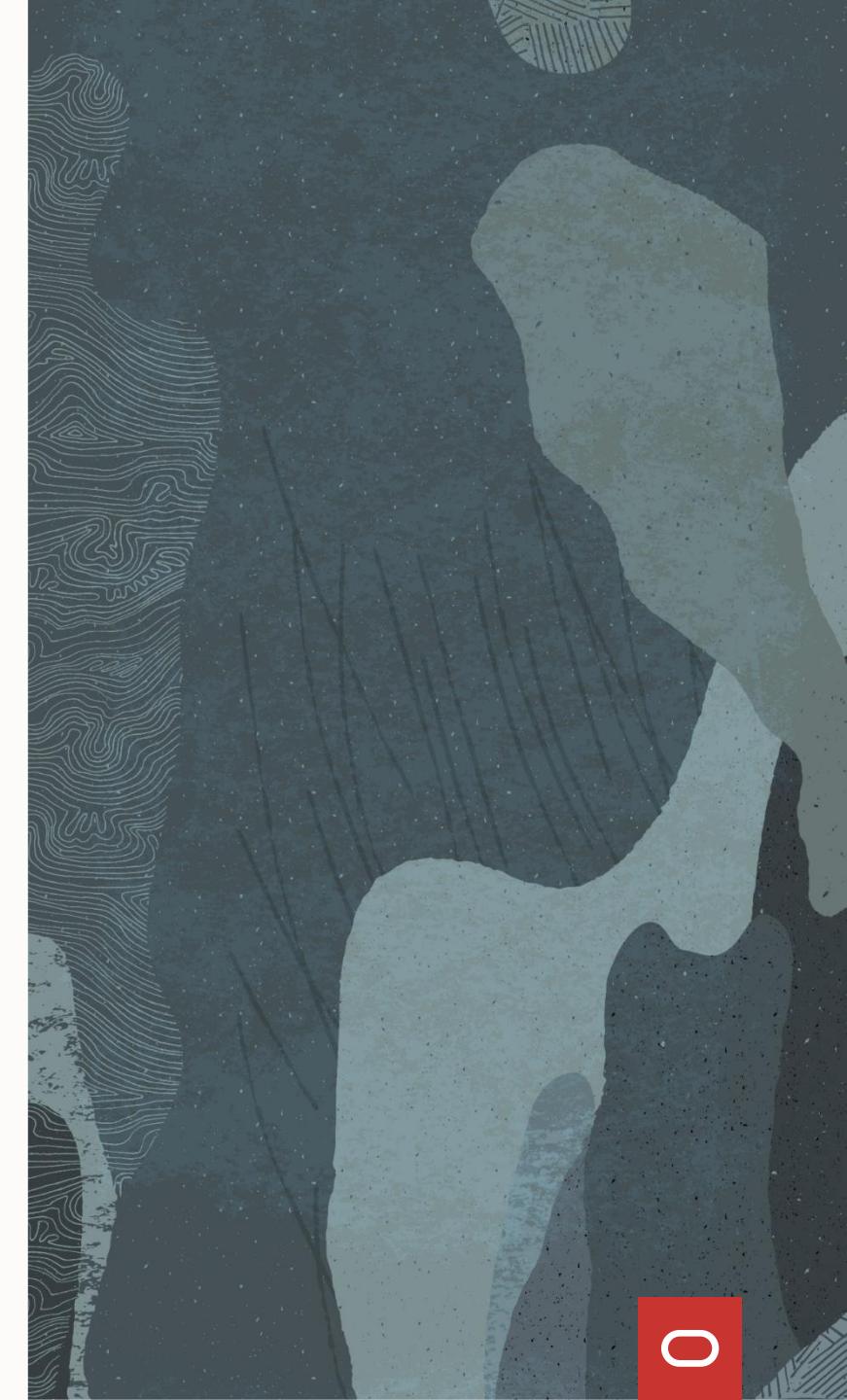
Superior architecture for All database workloads

- Petabyte warehouses
- Mission-critical Systems
 - Financial trading
 - Process manufacturing
 - E-commerce
- Diverse Applications
 - SAP, Oracle, Siebel, PSFT, ...
 - Custom applications



Next steps

- Go to Oracle Exadata [website](#)
- [Try Oracle Autonomous Database for free](#)
- Read the Oracle Autonomous Database [datasheet](#)
- Follow us on social media
 - <https://twitter.com/OracleDatabase>
 - <https://www.facebook.com/OracleDatabase/>
 - <https://www.linkedin.com/showcase/oracleautonomousdatabase/>



Thank you



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