

ORACLE

# Oracle Systems Portfolio

Performance, availability and data governance with enterprise scale

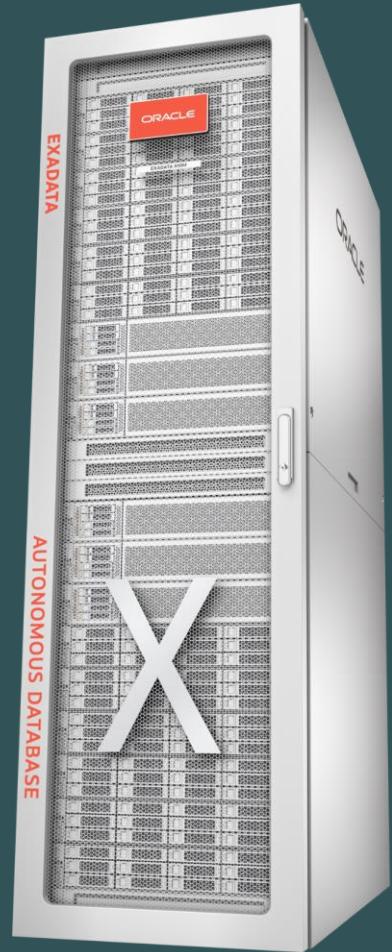
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**Marcel Lamarca**

Exadata Cloud Specialist

Oracle, Alliances and Channels LAD

October, 2023



O

**SQL> select \* from person where name = 'Marcel Lamarca'**



Father, husband, Cooker and son!

Graduated in Business Administration (FMU-SP)

### **Oracle DBA**

21 Years dedicated to study and support Oracle Databases.  
12 Years working with Exadata (On-prem, C@C and Cloud Services) .  
4 Year working for Oracle do Brasil  
1 Year on Alliances LAD knowledge Team

### **Oracle Cloud Specialist (OCS)**

Exadata Database Machine X9M Certified Specialist  
OCI Foundation 2020 / 2023  
Oracle Autonomous Database Administrator  
Oracle Cloud Database Migration and Integration  
OCI Cloud Certified Architect Associate 2022  
OCI Cloud Certified Architect Professional 2022  
OCI Multicloud Architect Professional

### **Oracle Certified Professional (OCP)**

10g, 11g and 12c.

### **Oracle Certified Specialist (OCE)**

Grid/RAC Database Administrator 11g



# Agenda

1 Oracle Database Appliance X10M (ODA)

2 Exadata Database Machine X10M

3 Zero Data Loss Recovery Appliance

4 Private Cloud Appliance (PCA)

5 ZFS Storage Appliance

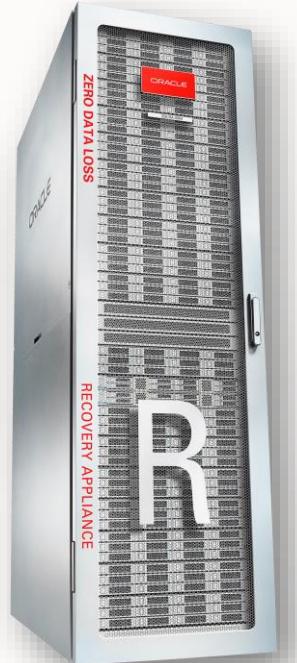


# Oracle Cloud Systems Portfolio

ZFS Storage Appliance



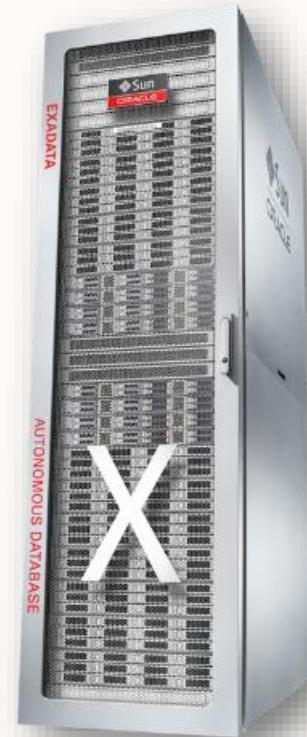
Zero Data Loss Recovery Appliance



Oracle Database Appliance



Exadata



Private Cloud Appliance



Data Protection

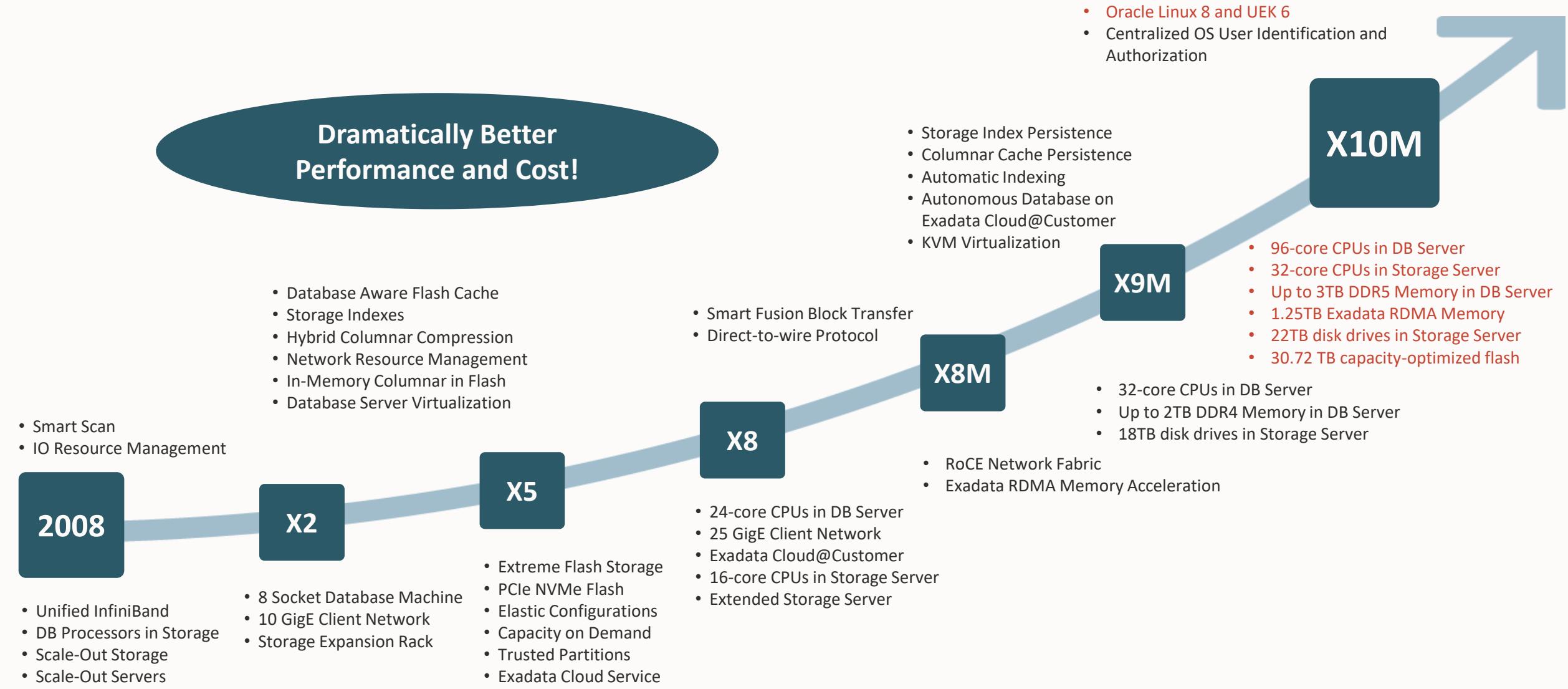
Databases

Middleware / Apps

# Exadata Database Machine X10M



# Exadata Advantages Increase Every Year



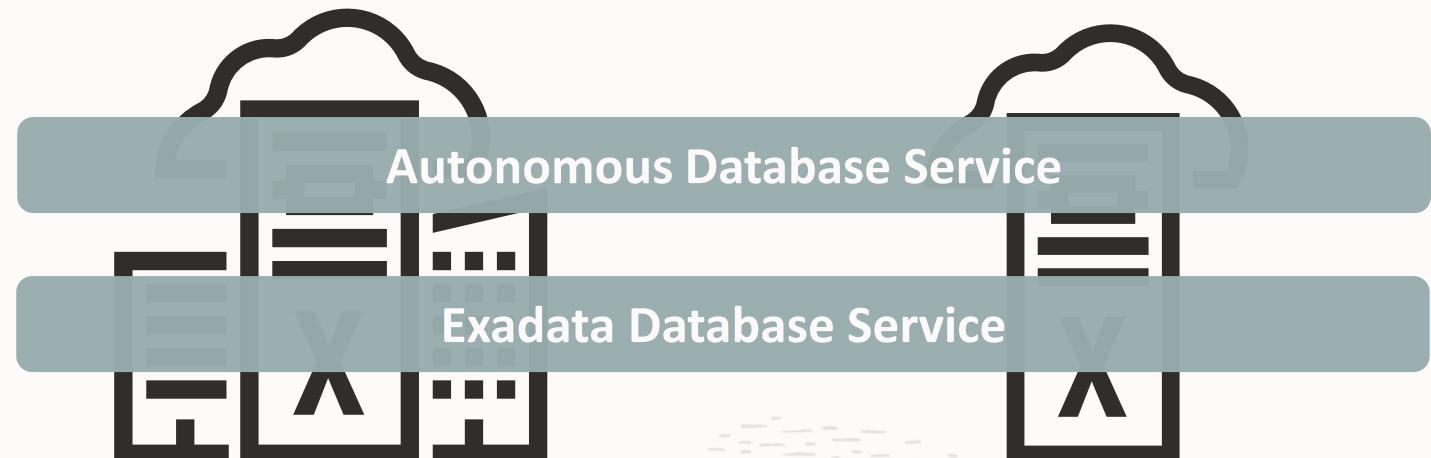
# We meet you where you are in your database consolidation journey

On-Premises Traditional  
Exadata Database Machine

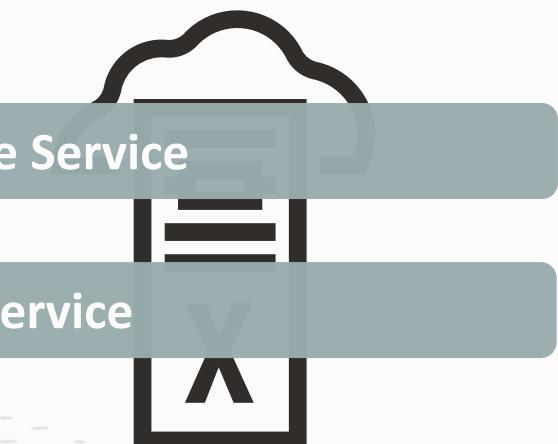


Customer Data Center  
Purchased  
Customer Managed

Cloud@Customer  
Exadata Cloud@Customer



Public Cloud, Dedicated Region, and  
Oracle Database@Azure  
Exadata Cloud Infrastructure



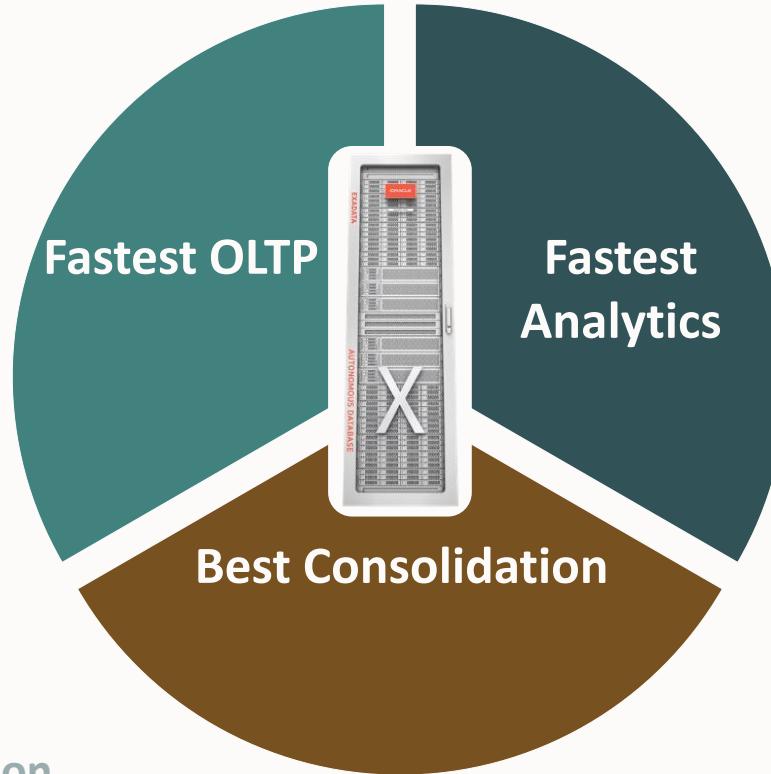
Oracle Cloud  
Subscription  
Oracle Managed



# Exadata's Superior Software Architecture Highlights

## Fastest OLTP

- **Fastest OLTP I/O** with scale-out storage, RDMA to storage, and NVMe flash
- **Fastest scale-out** with unique RDMA algorithms for inter-node cluster coordination
- **Fastest recovery** from unplanned downtime and component failure



## Fastest Analytics

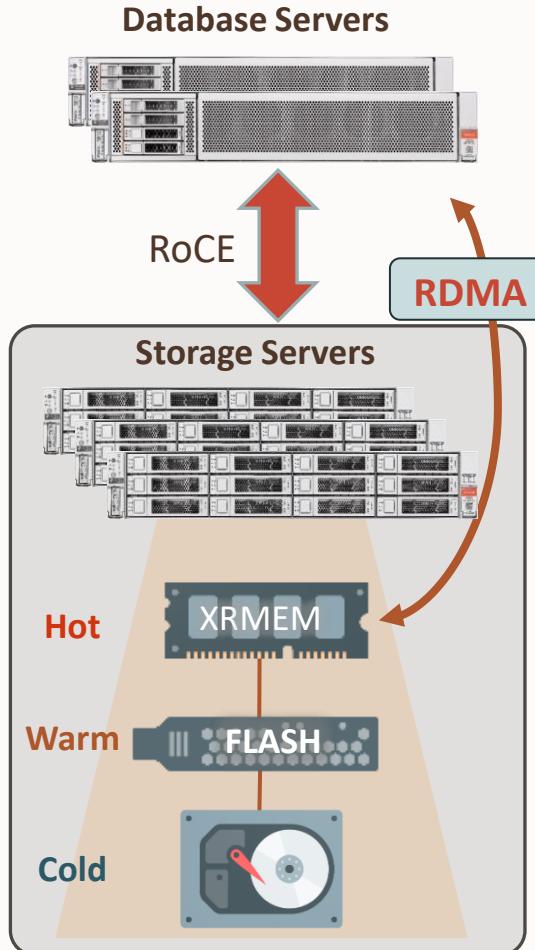
- **Unique Smart Scan** automatically offloads data intensive SQL operations to storage
- **Unique Smart Flash Cache and Storage Index** automatically accelerate database I/O
- **Unique Columnarization** automatically converts data to fast In-Memory Columnar format in flash

## Best Consolidation

- **Unique Prioritization** of latency sensitive or important workloads
- **Unique Workload Isolation** of multiple tenants or workloads



# Exadata architecture – scale out with intelligent storage



## Scale-out system architecture and software

- Independent, online scaling of database and storage servers
- Scales from 2 to 210 Exadata X10M database servers
- Scales from 3 to 264 Exadata X10M storage servers
- Redundancy with fast failover provides high availability

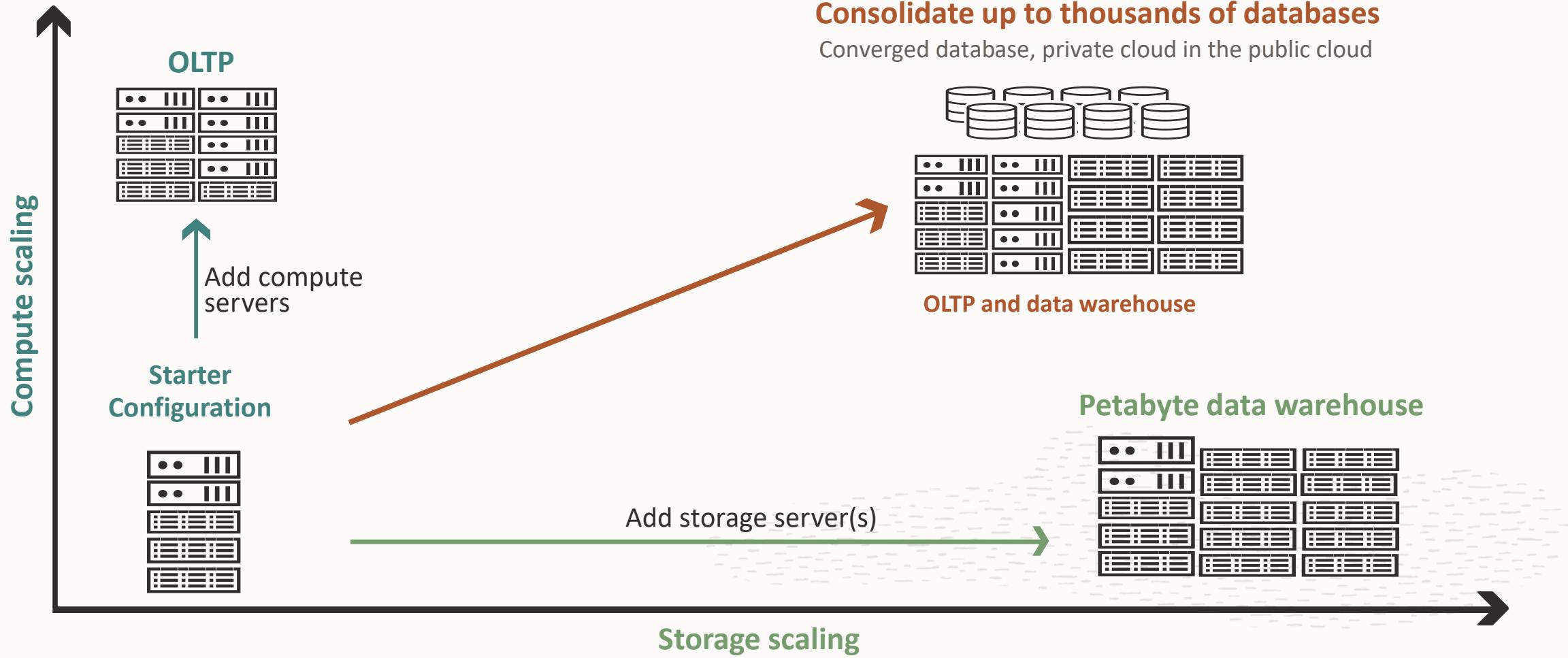
## Database uses RDMA instead of I/O to read XRMMEM in Smart Storage

- Bypasses network and I/O software, interrupts, context switches
- Data is transparently managed in multiple storage tiers to minimize latency
- High-performance active-active 100 Gbit/s internal network maximize throughput
- Speeds up both database reads and commits

## Database cluster virtualization

- Deploy environments with different needs on the same system
  - Dev-Test, Staging Production, DR
  - OLTP, Analytics, Mixed Workloads
- Share and manage pools of resources to increase efficiency and lower costs
- Isolate resources to meet differing security and predictability requirements

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



# Exadata X10M greatly improves OLTP performance

Performance improvements over Exadata X9M

Up to **3X**

## Higher Transaction Throughput

3X more cores per database server (192 cores)

Up to 9% faster per core performance

Up to **50%**

## Higher Flash Write IOPS in Storage Servers

2X more cores

916K IOPS per storage server

Up to **15%**

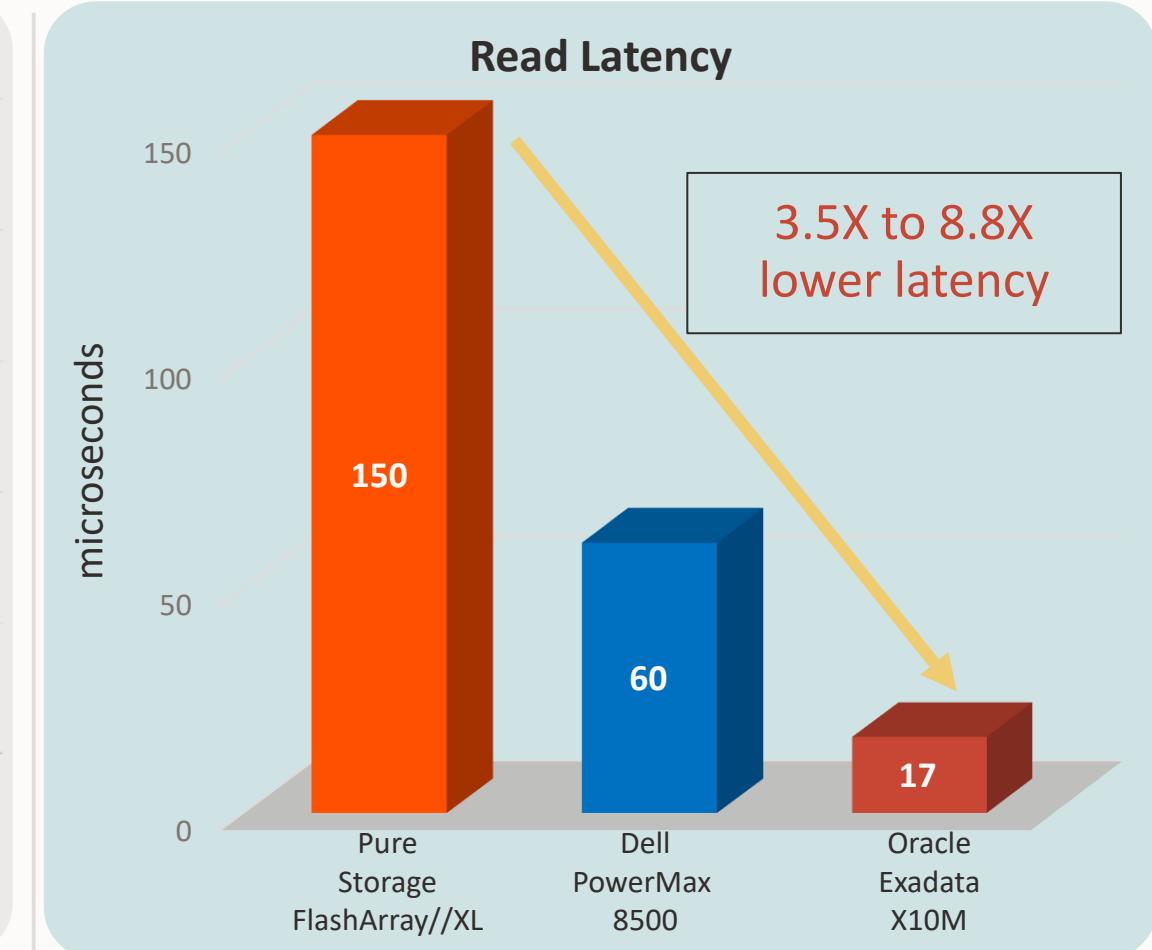
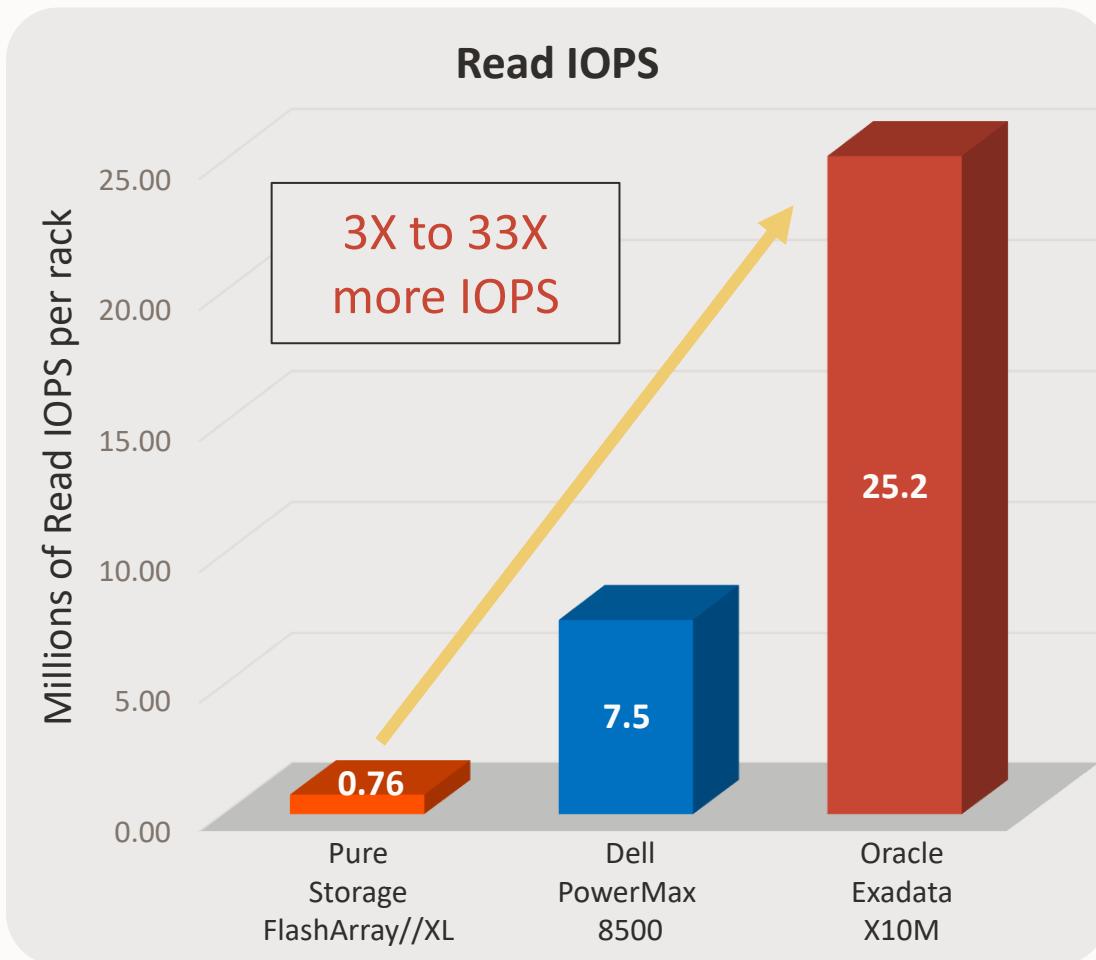
## Faster Read IOPS and Lower Latency

2.8 million 8K RDMA reads per storage server

< 17 microseconds latency



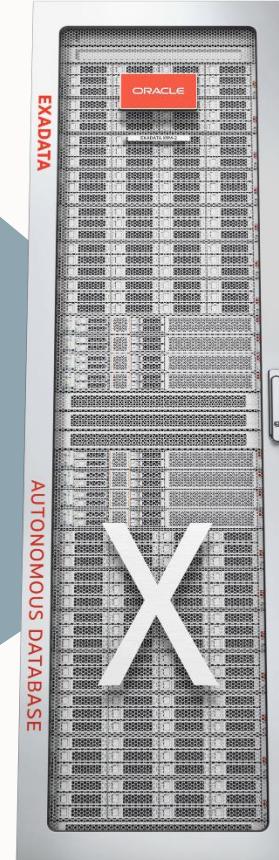
# Dramatically higher OLTP IOPS and lower latency than traditional on-premises platforms



# Oracle Exadata Database and Platform Innovations

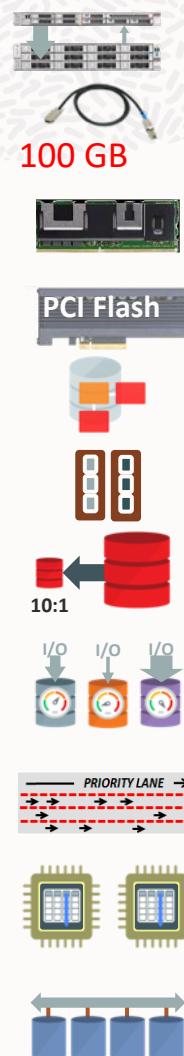
- Multitenant
- In-Memory DB
- Real Application Clusters
- Active Data Guard
- Partitioning
- Advanced Compression
- Advanced Security, Label Security, DB Vault
- Real Application Testing
- Advanced Analytics, Spatial and Graph
- Management Packs for Oracle Database

All Oracle Database Innovations



All Exadata Innovations

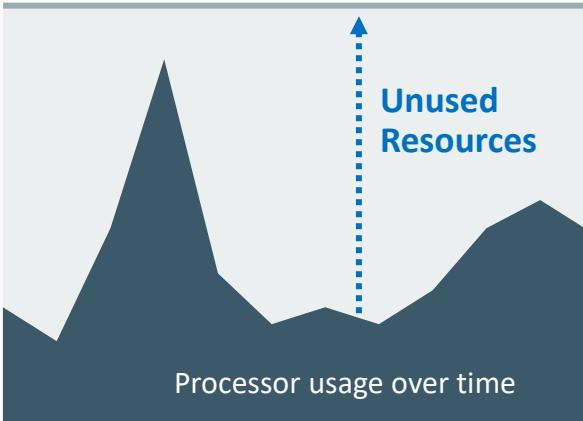
- Offload SQL to Storage
- RoCE Fabric
- PMEM Commit and Data Accelerators
- Smart Flash Cache
- Storage Indexes
- Columnar Flash Cache
- Hybrid Columnar Compression
- I/O Resource Management
- Network Resource Management
- In-Memory Fault Tolerance
- Exafusion Direct-to-Wire Protocol



# Online, Elastic Scaling with Exadata and Autonomous Database Services

Pay only for what you use, in OCI or your data center

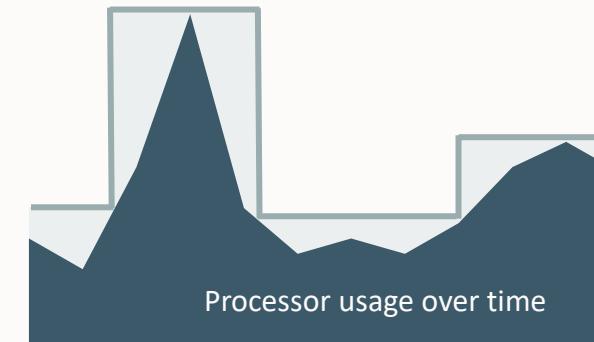
Total Processor Resources



## On-Premises & Other Clouds – Static

Purchase server processors and software licenses for **highest projected peak load**

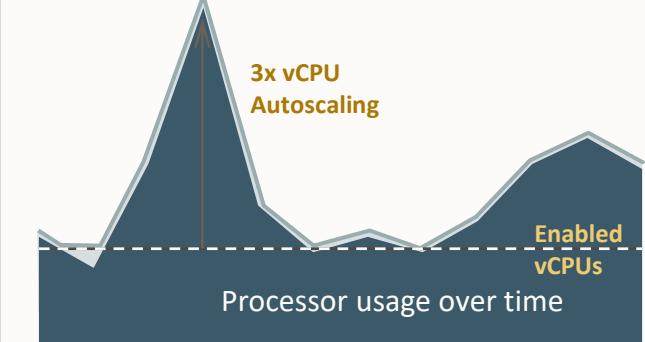
Manually Scaled CPU cores



## Exadata Database Service – Elastic

Adjust enabled CPUs to match **actual workload** via APIs and web UI - CPUs are charged per second

Autonomously Scaled CPU cores



## Autonomous Database – Self-scaling

Automatically scales CPU core consumption based on **dynamic workload demands**, in real-time





SCAN ME

# Exadata X10M Introduction on Learning Center

The screenshot shows the Oracle Exadata X10M Introduction course page. At the top, there's a navigation bar with 'Back', 'Courses' (selected), 'Live Sessions', 'Progress', 'Favorites', 'Sign In', and a dropdown menu. Below the title 'Oracle Exadata X10M Introduction' is a descriptive paragraph about the course's purpose and content. To the right, there's a summary box with 'Not Started' status, 'Your Goal: Pass Assessment', and '0 of 2 items completed'. Below the summary is an 'Enroll in this path' button. The main content area features a large yellow box labeled 'Course' with '30m' duration and a dark grey box labeled 'Assessment' for the 'Oracle Exadata X10M Introduction 2024 Sales Specialist Assessment'. The assessment box includes a note to score 80% or higher to pass.

Oracle Exadata X10M Introduction will provide you with Oracle's vision for Exadata and its unique position in the industry. This uniqueness comes from Exadata being the best platform for running mixed workloads or OLTP, analytics, and consolidation. Exadata offers multiple ways of deployment to meet customers needs and requirements. All the ways Exadata outperforms the competition, as well as previous Exadata generation, will also be covered. Throughout this course you will hear from Juan Loaiza, Executive Vice President of Mission Critical Database at Oracle key messages you can use with your customers.

Learning Path    30 Minutes   

Not Started

Your Goal:  
Pass Assessment

0 of 2 items completed.

Enroll in this path

Course

30m

Assessment

Course

0%

Oracle Exadata X10M Introduction

Oracle Exadata X10M Introduction 2024 Sales Specialist Assessment

Not Started

Score 80% or higher to pass.





SCAN ME

# Oracle Cloud@Customer 2024 Sales Specialist

Back

Courses

Live Sessions

Progress

Favorites

Marcel | :

## Oracle Compute Cloud@Customer 2024 Sales Specialist

Not Started

Your Goal:

Pass Assessment

0 of 2 items  
completed.

Oracle Compute Cloud@Customer, customers can cost-effectively run middleware and applications with high performance, availability, and cloud economics in their data center or distributed data centers; it helps customers meet data residency requirements and the need to allocate cloud resources close to end-users. For Oracle Database-intensive workloads, such as Oracle packaged applications like PeopleSoft or E-Business Suite, customers get an optimized full-stack distributed cloud environment by directly connecting Compute Cloud@Customer to Oracle Exadata Cloud@Customer by the lowest latency connection to the fastest and most versatile cloud database platform available.

Learning Path    30 Minutes   

[Enroll in this path](#)

### Oracle Compute Cloud@Customer Overview

Course

Course

0%

30m

Assessment

### Oracle Compute Cloud@Customer 2024 Sales Specialist Assessment

Score 80% or higher to pass.

Not Started





## 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  
Oracle Cloud VMware Solution



### 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](#)



# Private Cloud Appliance



# Oracle Private Cloud Appliance

The best platform for middleware and applications in customer data centers

## Manage diverse workloads

- Supports multiple operating systems (Oracle Linux, Oracle Solaris, and Windows)
- Runs enterprise workloads alongside cloud-native applications
- Proven consolidation platform

## Deploy mission critical Oracle applications and middleware

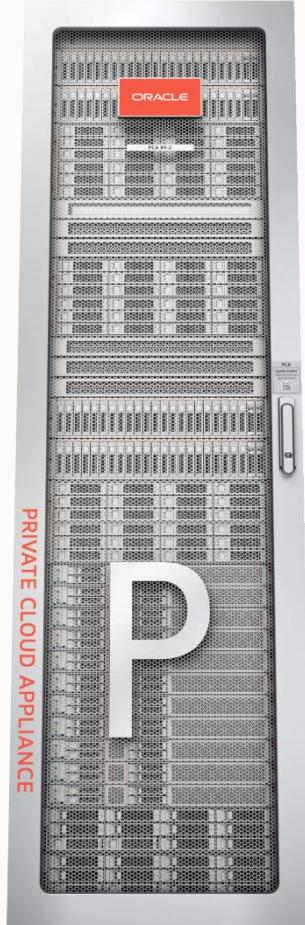
- Highly available: 3 isolated fault domains and no single point of failure
- Lowest latency Exadata direct connect
- Integrated disaster recovery

## Reduce TCO by over 40%

- Trusted Partitions optimize software license costs
- Eliminates infrastructure “tax” by including cloud administration and management, Oracle Linux, Oracle Solaris, Cloud Native Stack, etc.
- Up to 8 tenancies securely consolidate infrastructure for multiple organizations



# Private Cloud Appliance X9: Use Like Oracle Cloud Infrastructure



## Built like OCI

- Container-based platform software
- Secure separation of cloud administration from users

## Portable to OCI

- Architectural patterns and tools consistent with infrastructure as code environments
- Develop containerized, cloud-native applications
- Applications and data migrate with little or no modification

## User experience like OCI

- OCI compatible APIs, CLI, SDK
- OCI like console

## Managed like OCI

- Cloud native tooling:
  - Kubernetes
  - Prometheus and Grafana,
  - Terraform

## Upgraded like OCI

- CI/CD methodology - channel-based distribution of bug fixes, CVEs
- Zero-downtime upgrade for all components - container-based services provide continuous availability

## Private Cloud Appliance to Exadata Direct Connect

Lowest latency connection to Exadata improves response times and productivity



- Secure low latency application to database connectivity
- Designed-in optimizations for Oracle Database and multi-node scalability



**50 Gbps bandwidth to each database server**

# Oracle Cloud Compatible Infrastructure on Premises

Engineered for Mission Critical Private Cloud



Image portability to OCI  
OCI compatible APIs



Tools and Services

CI/CD  
SDK



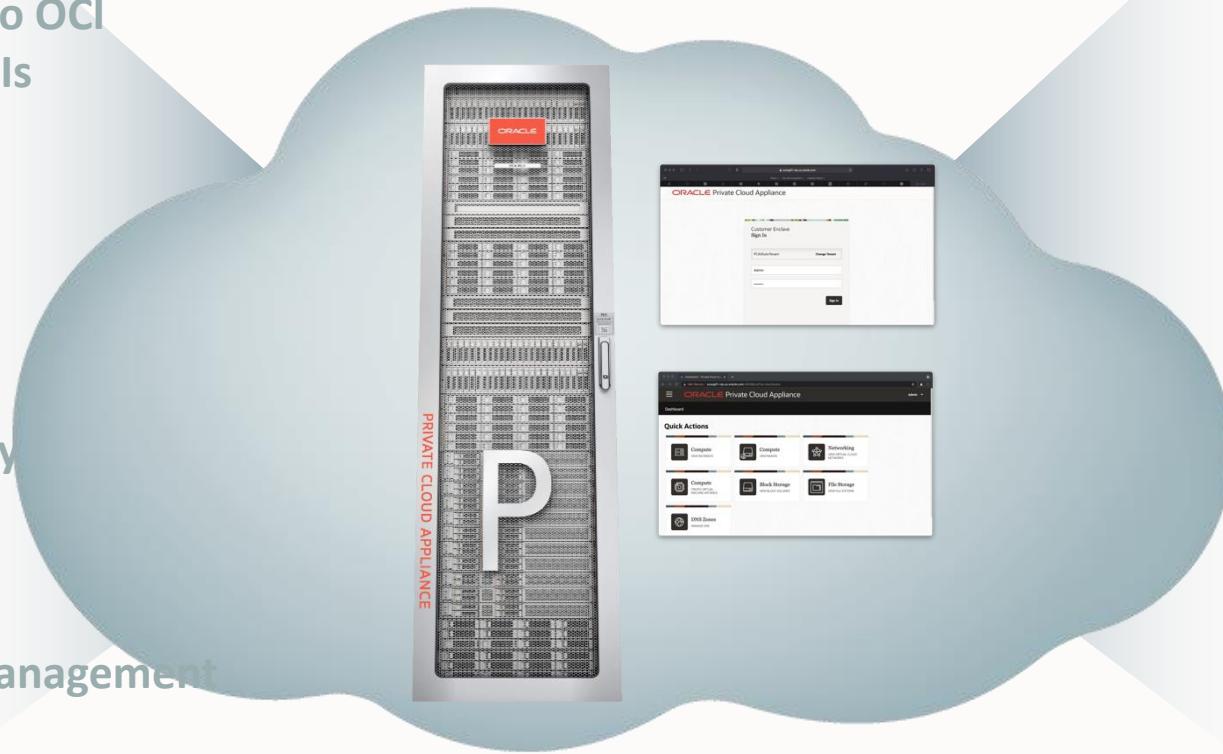
Business Continuity

Fault Domains  
Disaster Recovery



Monitoring and Management

Grafana, Prometheus



Security and Governance

Identity and Access  
Policy  
Tagging  
Encryption



Storage

Block  
File  
Object



Network

Virtual Cloud Network  
Network Services  
Security Lists  
Gateway Services  
Datacenter Connectivity



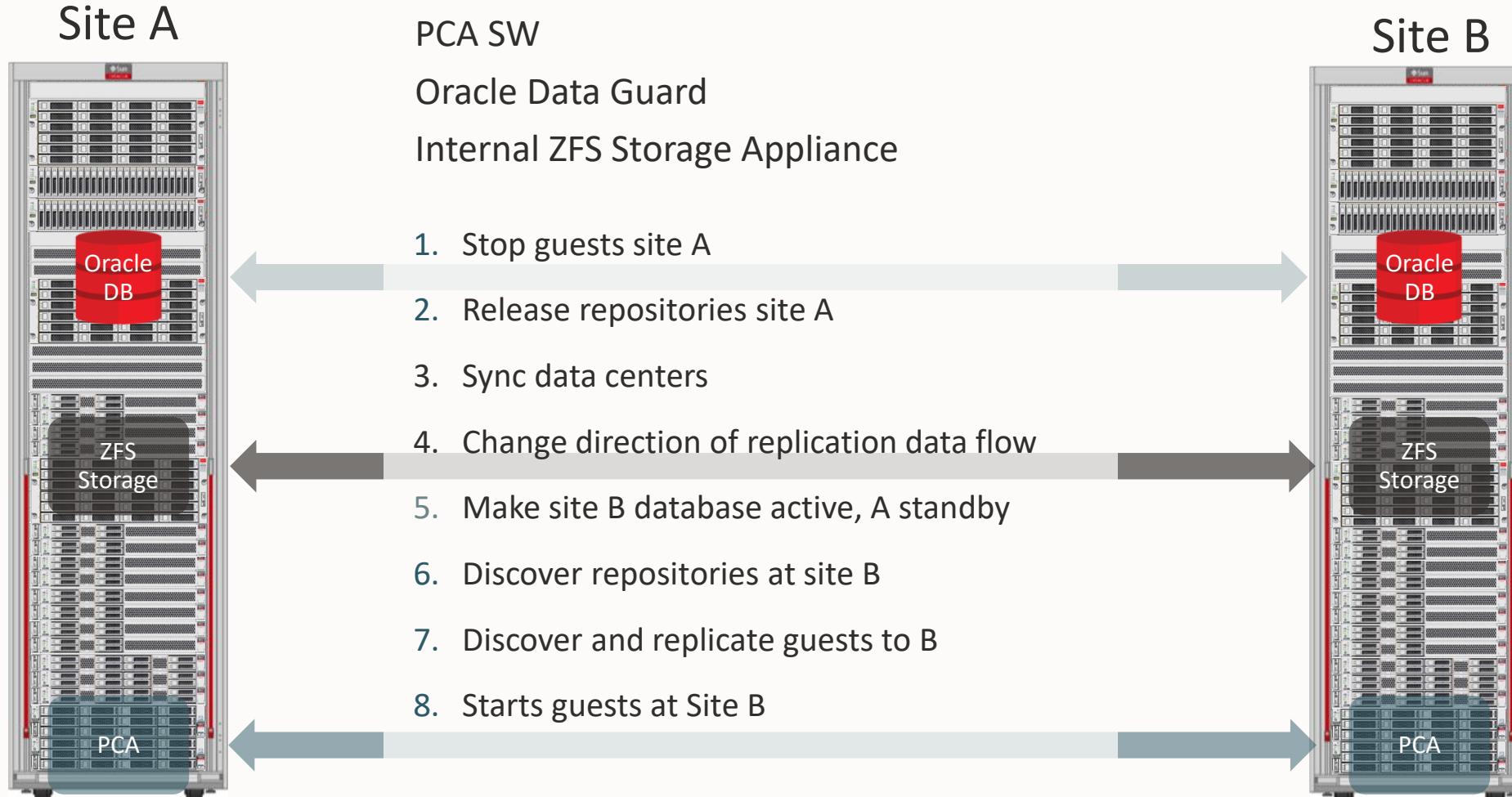
Compute

Virtual Machines



# Disaster Recovery with Site Guard

Site Guard orchestrates management of failover or switchover



# Private Cloud Appliance X9 Integration and Scalability

Tenancies	Up to 8
Services Compute shapes Storage Containers Network	Fixed VM Shapes Block, File, Object VCN, Gateways
Fault Domains	3
Usable CPU Cores	180 to 1080
Service Enclave - Servers	3
Customer Enclave - Servers	3 to 18
Storage Capacity	180 TB to 8.4 PB



## Private Cloud Appliance X9 – Guest OS Matrix

Guest Operating System	Platform Image	Custom Image
Oracle Linux Release 8.x	✓	✓
Oracle Linux Release 7.x	✓	✓
Red Hat Enterprise Linux 8.x		✓
Red Hat Enterprise Linux 7.x		✓
CentOS 8.x		✓
CentOS 7.x		✓
SUSE Linux Enterprise Server 12 SP5		✓
SUSE Linux Enterprise Server 15 SP1		✓
Ubuntu 20.04 and later		✓
Ubuntu 18.04 and later		✓
Oracle Solaris 11		✓
Microsoft Windows Server 2019		✓
Microsoft Windows Server 2016		✓
Microsoft Windows Server 2012 R2		✓
Microsoft Windows Server 2012		✓



# VM Shapes

## VM Shapes

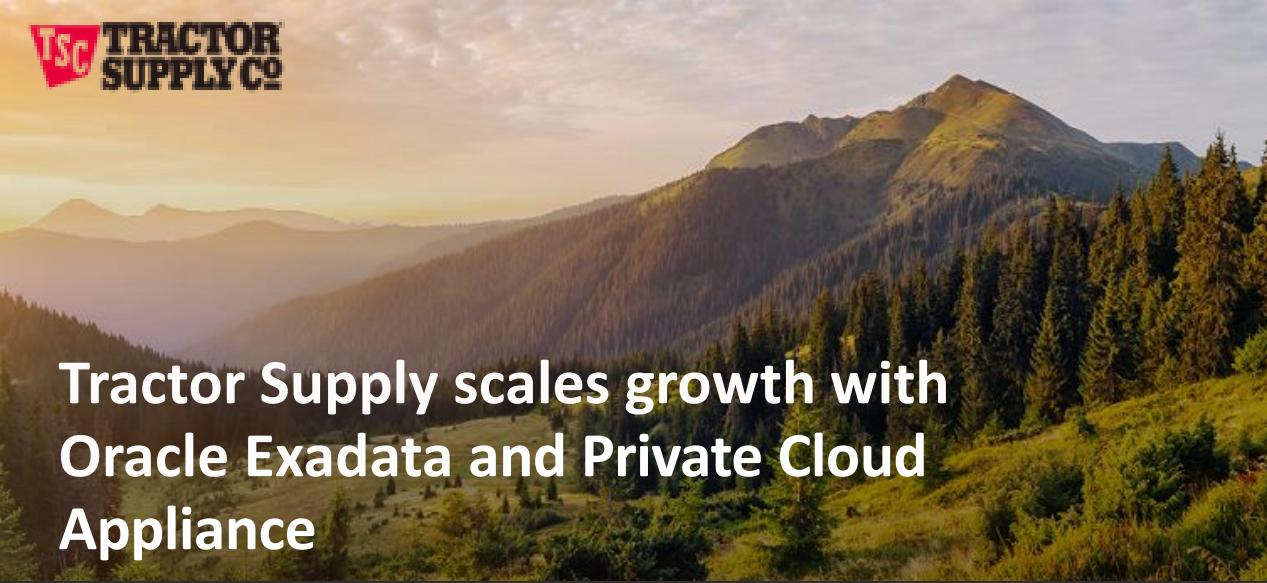
- Fixed 1:16 ratio (OCPU:GB Memory)

## Resources reserved for the hypervisor

- 4 cores
- 40 GB memory

Flexible shapes also available !

Shape	Cores	Memory (GB)
VM.PCAStandard1.1	1	16
VM.PCAStandard1.2	2	32
VM.PCAStandard1.4	4	64
VM.PCAStandard1.8	8	128
VM.PCAStandard1.16	16	256
VM.PCAStandard1.24	24	384
VM.PCAStandard1.32	32	512
VM.PCAStandard1.48	48	768
VM.PCAStandard1.Max	60	960



## Tractor Supply scales growth with Oracle Exadata and Private Cloud Appliance

“Oracle Exadata is a fantastic solution for us since it provides the high performance and availability that we need for critical applications and fast backup and recovery. By far, Oracle has the best database engine on the planet. With Exadata, I sleep better at night, and my team sleeps better at night.”

**Drew Diamond,**  
Technology Manager, Tractor Supply Co.

### Business Challenge:

Tractor Supply has been a leading retailer for rural farmers, ranchers, and outdoorsmen for more than 80 years. To continue providing legendary customer service Tractor Supply needed to refresh its aging environment that managed huge amounts of data for internal analysis and processed many mission-critical applications.

### Results:

- ✓ Using new Oracle Exadata systems, Tractor Supply experienced an average 3x performance improvement across its Oracle Database workloads.
- ✓ Tractor Supply deployed an Oracle Private Cloud Appliance to successfully support a mobile point-of-sale system for contactless curbside pick-up.
- ✓ Tractor Supply’s batch processing of its warehouse management system improved 7X to 8X, cutting their nightly analysis run from minutes to seconds.

### Products Used:

Oracle Exadata, Oracle Database, Oracle RAC

Oracle Private Cloud Appliance, ZFS Storage Appliance

# Oracle Database Appliance X10



# Five reasons why Oracle Database Appliance is a better choice

## Simple

Pre-configured engineered solutions offer time savings, simplicity, and oracle integrated support.

## Database optimized

Top-tier performance without extensive tuning, enhancing system efficiency.

## Affordable

Predictable costs, reduced ownership expenses, and resource allocation for core business initiatives.

## Secure

ODA prioritizes security through comprehensive appliance design, & end-to-end security enhancements.

## Reliable

Engineered for high availability and built-in redundancy, ensuring rock-solid reliability.



# Improved Oracle Database Appliance X10 capabilities

## New 4th-gen 32-core AMD EPYC™ processors

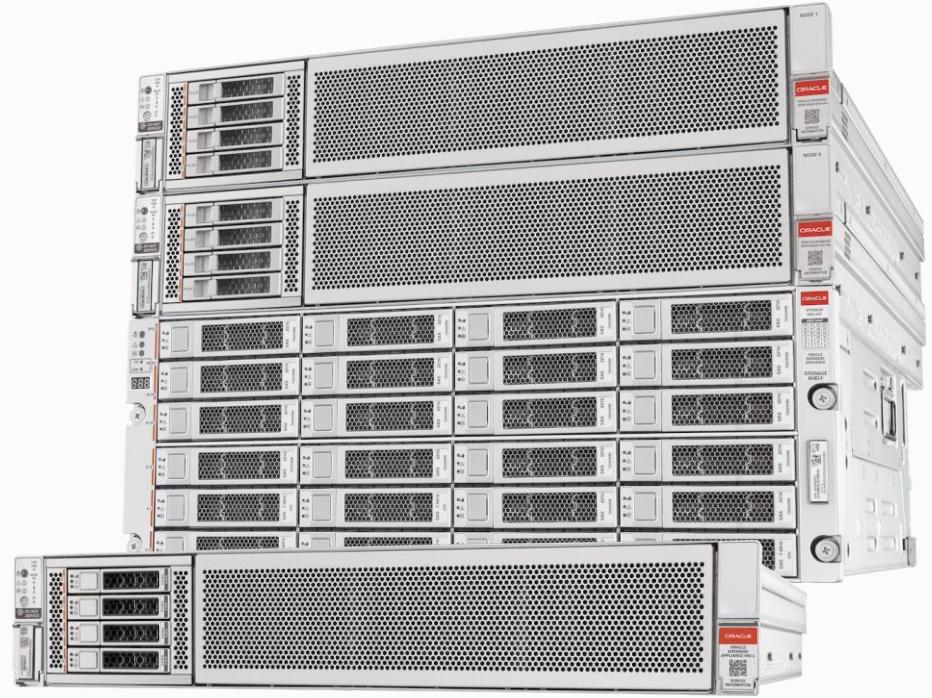
- Double the core count over X9
- Up to 50% more DDR5 memory
- 50% more memory channels

**Up to 150% improved OLTP performance over X9 at the same entry prices**

**High-capacity model offers:**

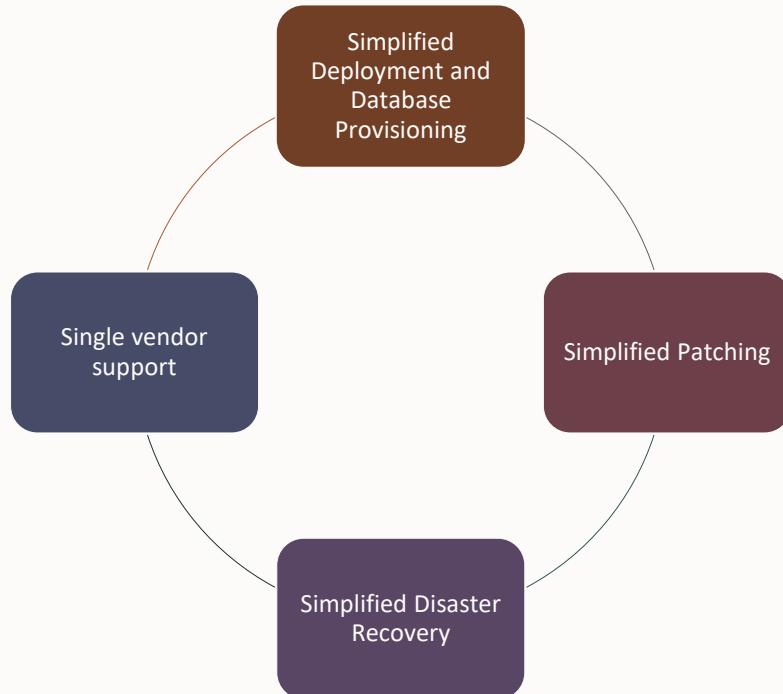
- 22% greater data capacity
- Larger database shapes
- Better database consolidation
- Enhanced solution-in-a-box capabilities for application and database VMs

**Significantly enhanced price-performance ratio**



# Simple

Oracle Database Appliance offers seamless integration and automation that simplifies the deployment, management, and utilization of databases and applications.

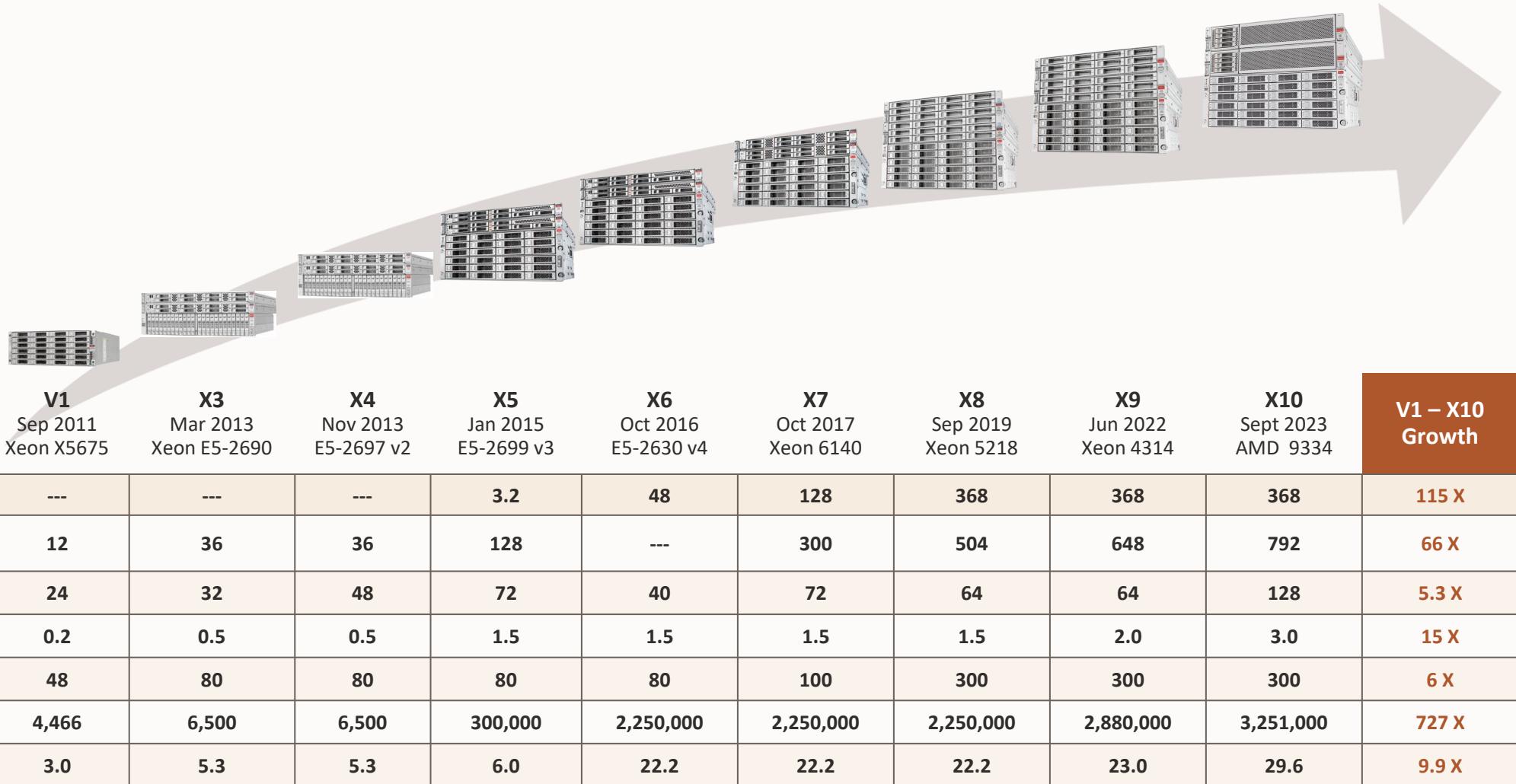


The screenshot shows the Oracle Database Appliance management interface. The left sidebar has tabs for Appliance, Network, Oracle ASR, and Patch Manager, with Appliance selected. The main content area has tabs for Basic Information and Advanced Information, with Basic Information selected. Under Basic Information, it shows Appliance Information with ID: 5c8e3f57-2fc6-4380-8085-482fc7ab72f4, Platform: X7-2M, Data Disk Count: 2, CPU Core Count: 36, and Created: Fri Apr 10 2020 3:49:32 PM. It also shows System Information with Host Name, Domain Name: us.oracle.com, Time Zone: GMT, DNS Servers, and NTP Servers. Under Disk Group Information, there are two entries: DATA (Redundancy: FLEX, Physical Total Space: 9.31 TB, Physical Free Space: 8.81 TB, Logical Free Space: 2.93 TB - 4.40 TB) and RECO (Redundancy: FLEX, Physical Total Space: 2.32 TB, Physical Free Space: 1.72 TB, Logical Free Space: 589.07 GB - 883.61 GB). A Refresh button is at the bottom right of the table.

Stand up system and begin loading data  
in 60 to 90 minutes



# Oracle Database Appliance | High-Availability Configuration



# Oracle Database Appliance X10 Model Family

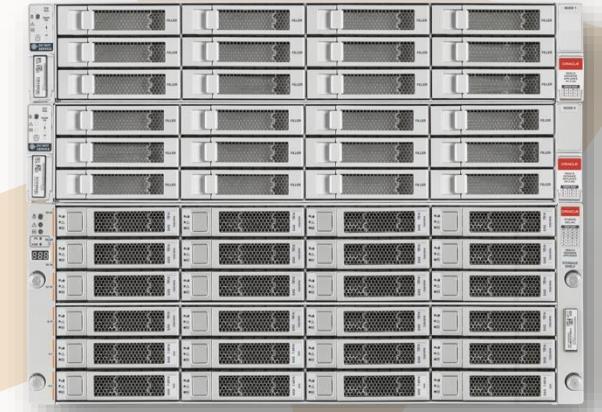
PERFORMANCE ↑ HIGHER



**Oracle Database Appliance X10-S**  
Single-instance  
32 Cores  
256 GB Memory, expandable to 768 GB  
Up to 3x Public Network Cards  
13.6 TB Data Storage (Raw)



**Oracle Database Appliance X10-L**  
Single-instance  
64 Cores  
512 GB Memory, expandable to 1.5 TB  
Optional: 2TB PMem  
Up to 3x Public Network Cards  
13.6 TB Data Storage,  
expandable up to 54.4 TB (Raw)



**Oracle Database Appliance X10-HA**  
Single-instance and RAC  
128 Cores  
1 TB GB Memory, expandable to 3 TB  
Up to 6 public network cards  
46 TB SSD Data Storage, expandable up to  
368 TB SSD or up to 92 TB SSD / 762 TB HDD (Raw)

CAPACITY → HIGHER



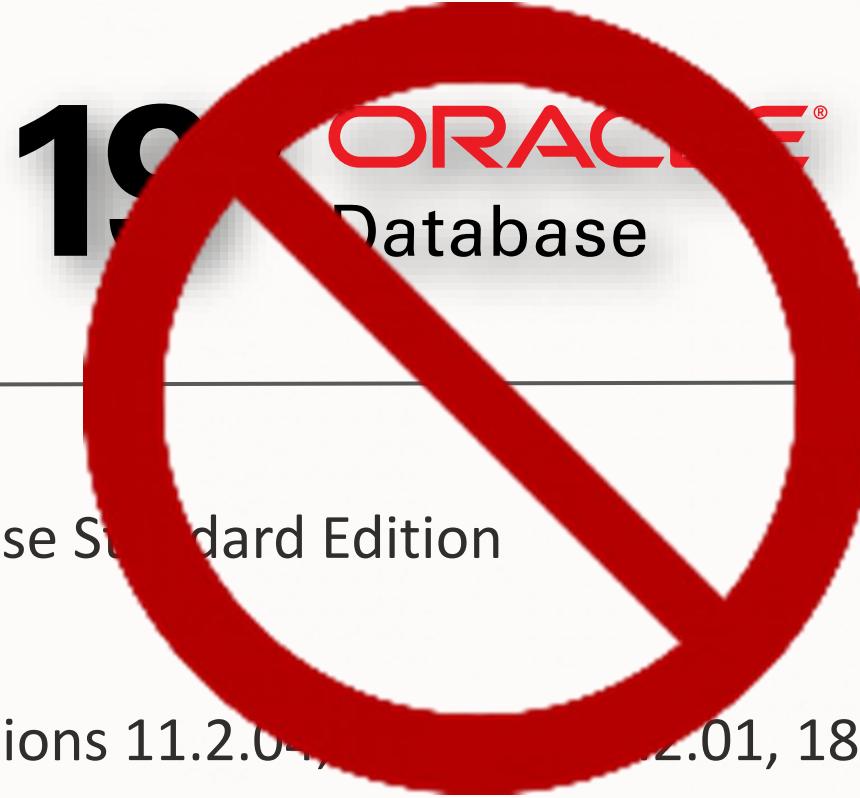
SCAN ME

# Oracle Database Appliance model family



- Choice of Oracle Database Software:
  - Oracle Database 19c Enterprise Edition
  - Oracle Database 21c Enterprise Edition (DB Systems only)
- Oracle Real Application Clusters (Supported on X10-HA)
- Oracle Real Application Clusters One Node (Supported on X10-HA)
- Oracle Automatic Storage Management (ASM)
- Oracle ASM Cluster File System (ACFS)

# Oracle Database Version and Edition **NOT** supported on ODA X10



- Oracle Database Standard Edition
- Database Versions 11.2.0, 12.1.0, 12.2.0, 12.2.0.1, 18c and below



## Rede Bistek gains productivity with Oracle Database Appliance

“We saw an immense productivity improvement. Some jobs and routines that used to take hours to run now take just minutes.”

**Tatiana Mendonça**

Technology Director, Rede Bistek



### Business Challenge:

Brazilian supermarket chain Rede Bistek needed a new data management solution to bolster its digital business efforts. In addition, the company sought to evolve its cybersecurity strategy, including meeting the requirements of new legislation such as the Brazilian General Data Protection Law (LGPD).

### Results:

- ✓ Increased its processing performance and storage capacity
- ✓ Routine tasks that used to take hours to execute are now done in a matter of minutes
- ✓ Database management has become much faster and more efficient
- ✓ Improved cybersecurity and reliability

### Products Used:

Oracle Database Appliance



# ZFS Storage Appliance



# Oracle ZFS Storage Appliance

Unified Storage for modern IT and easy operation

- Delivers higher performance and consolidation at a lower cost
- Optimizes Oracle Database storage with unique features and automation
- Tight Oracle Engineered Systems integration
- Extensive data integrity and security optimizations
- Accelerates backup and recovery for Oracle Database and all other sources
- Replicates backups to Oracle Cloud



# Intelligent caching optimizes performance, latency and cost

Automatically serves IO from the fastest available media

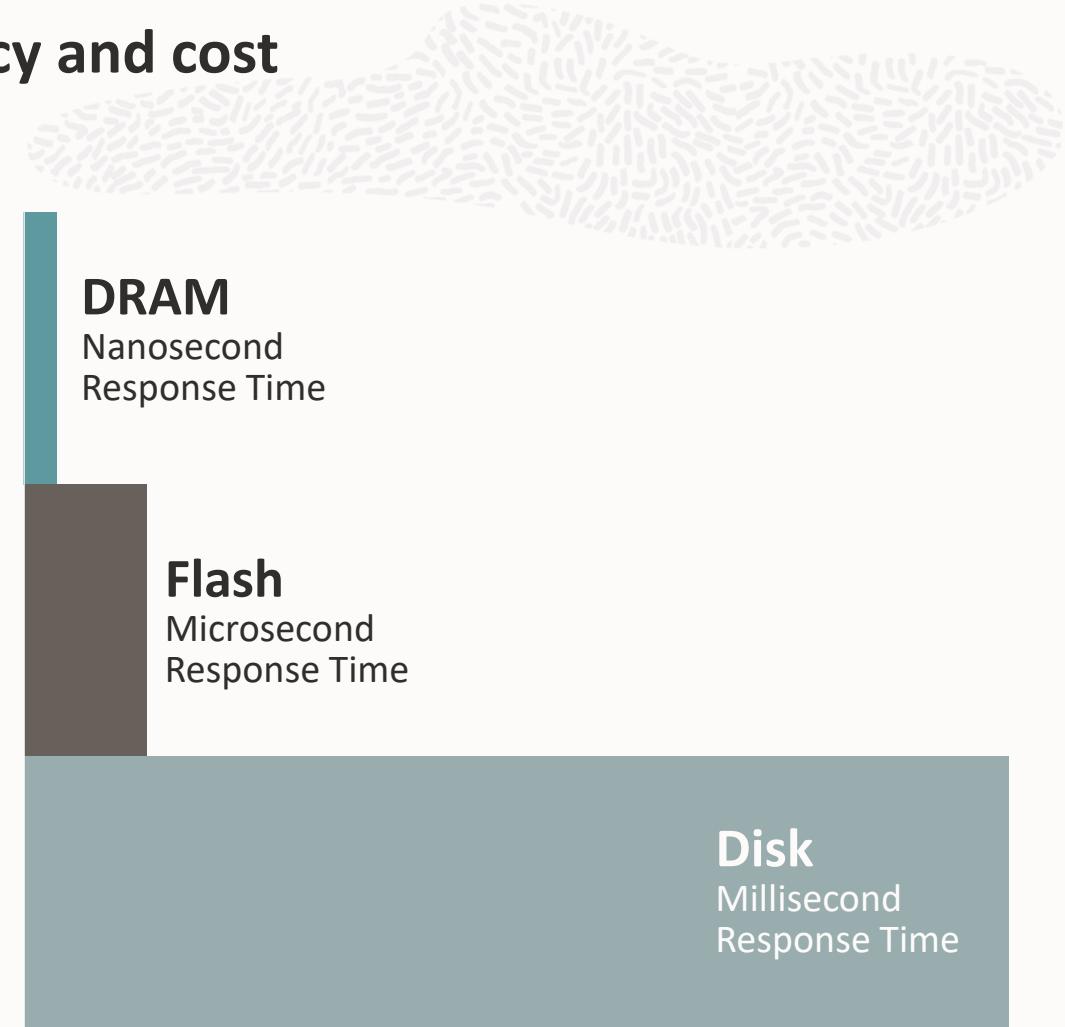
Minimizes latency for up to 90%  
of IOs with massive DRAM

- Up to 1000X faster than flash
- Up to 4TB of DRAM increases data reuse and improves VM scaling

Active-active design for maximum availability

Advanced analytics to minimize management

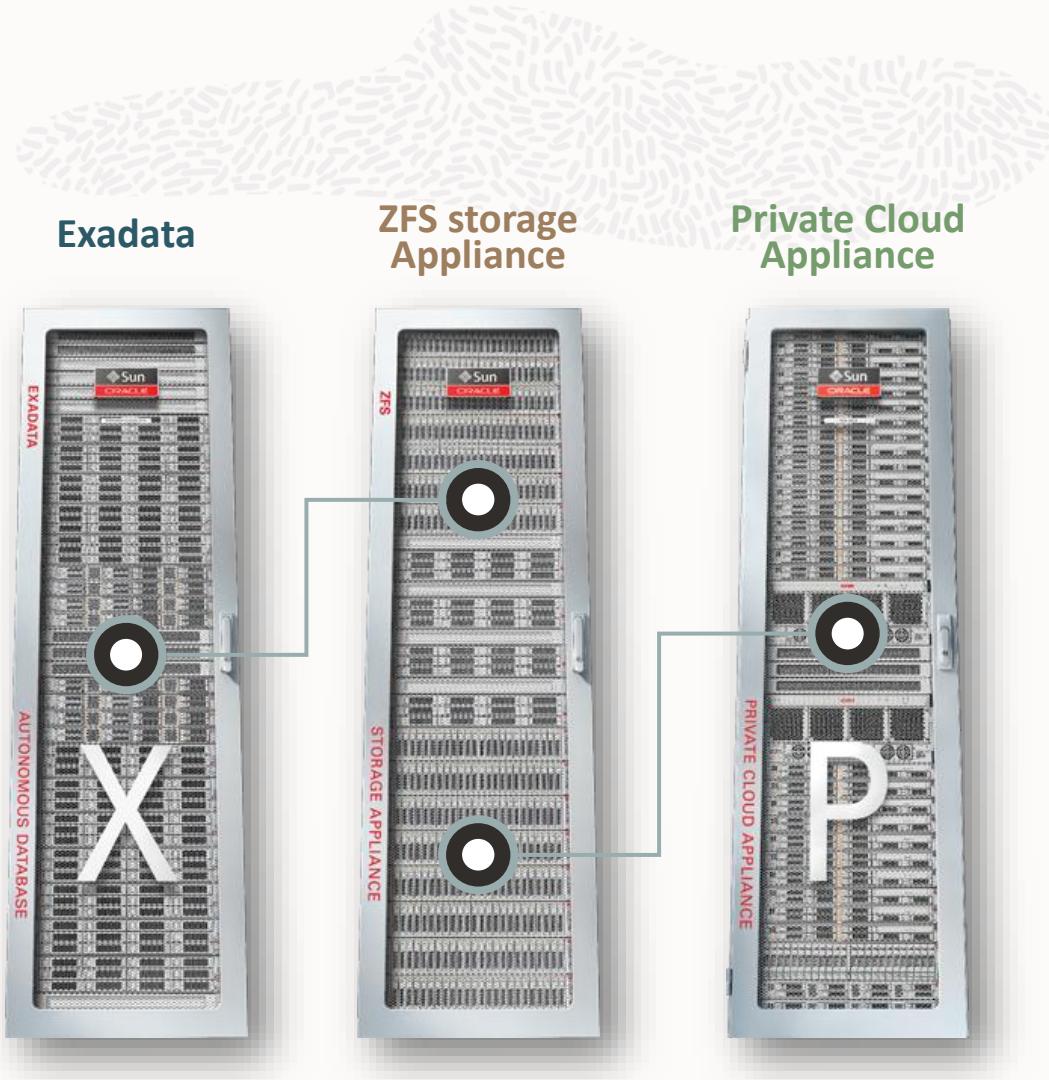
Intelligence bypasses the cache for IO intensive database backup & recovery, maximizing its impact for other apps



# Tight Integration with Oracle Cloud Systems

Oracle Exadata, ZFS Storage and PCA can work together!

- High-performance 100Gb/second Ethernet for data access and protection
- Database IO performance and efficiency optimizations
- End-to-end management with Oracle Enterprise Manager
- Production storage integrated with Oracle Private Cloud Appliance
- Shared storage expansion for Oracle Database Appliance





## IT Services provider optimizes client results with Oracle Exadata and PCA

“The Oracle Private Cloud Appliance combined with ZFS and Oracle Exadata have provided a solution which we have been able to get on the floor quickly, cheaply and which provides services to our customers which are not available anywhere else and in a way that gives them significant benefits.”

**Ryan Lea**

Solution Consultant, Revera

### Business Challenge:

Revera is a leading cloud services provider in New Zealand providing private and public services for commercial and government clients. They sought an infrastructure which could be deployed quickly to meet their clients pressing data processing requirements.

### Results:

- ✓ Revera reduced key processing times from 24 minutes to 15 seconds using the combined Oracle Private Cloud Appliance, Exadata, and ZFS infrastructure.
- ✓ The combined Oracle architecture enabled Revera to dramatically improve dev ops and code deployments.
- ✓ Using Oracle Private Cloud Appliance, Exadata, and ZFS together, Revera reduced deployment times from 240 to 20 minutes.

### Products Used:

Oracle Private Cloud Appliance

Oracle Exadata, Oracle Database

Oracle ZFS

# Zero Data Loss Recovery Appliance

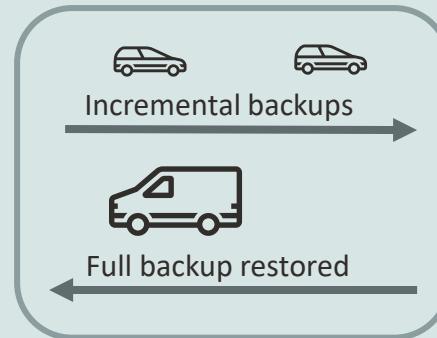


# Recovery Appliance uses less personnel and infrastructure resources



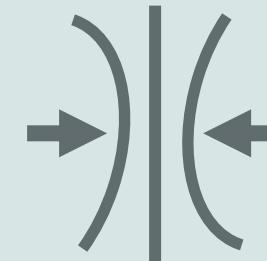
## Less overhead on DB servers

Most backup / recovery processing is offloaded from database servers thereby freeing up resources for other operations



## Less LAN/WAN traffic

Incremental forever backups and virtual full restore send less data over the network than periodic full backups and restore requiring a full backup *plus* incremental backups



## Less storage consumption

Blocks are only stored once (e.g. deduplicated) and backups are compressed on the Recovery Appliance to further reduce storage consumption



## Less personnel time needed

Simplifies backup management by standardizing backup processes along with automated operations

# Leadership in database recovery and backup management

## Oracle's Zero Data Loss Recovery Appliance

- Provides recovery assurance
- Reduces business risk
- Simplifies antiquated data protection complexities
- Saves personnel time
- Reduces infrastructure overhead freeing up resources

*Innovation moving beyond traditional backup appliances*

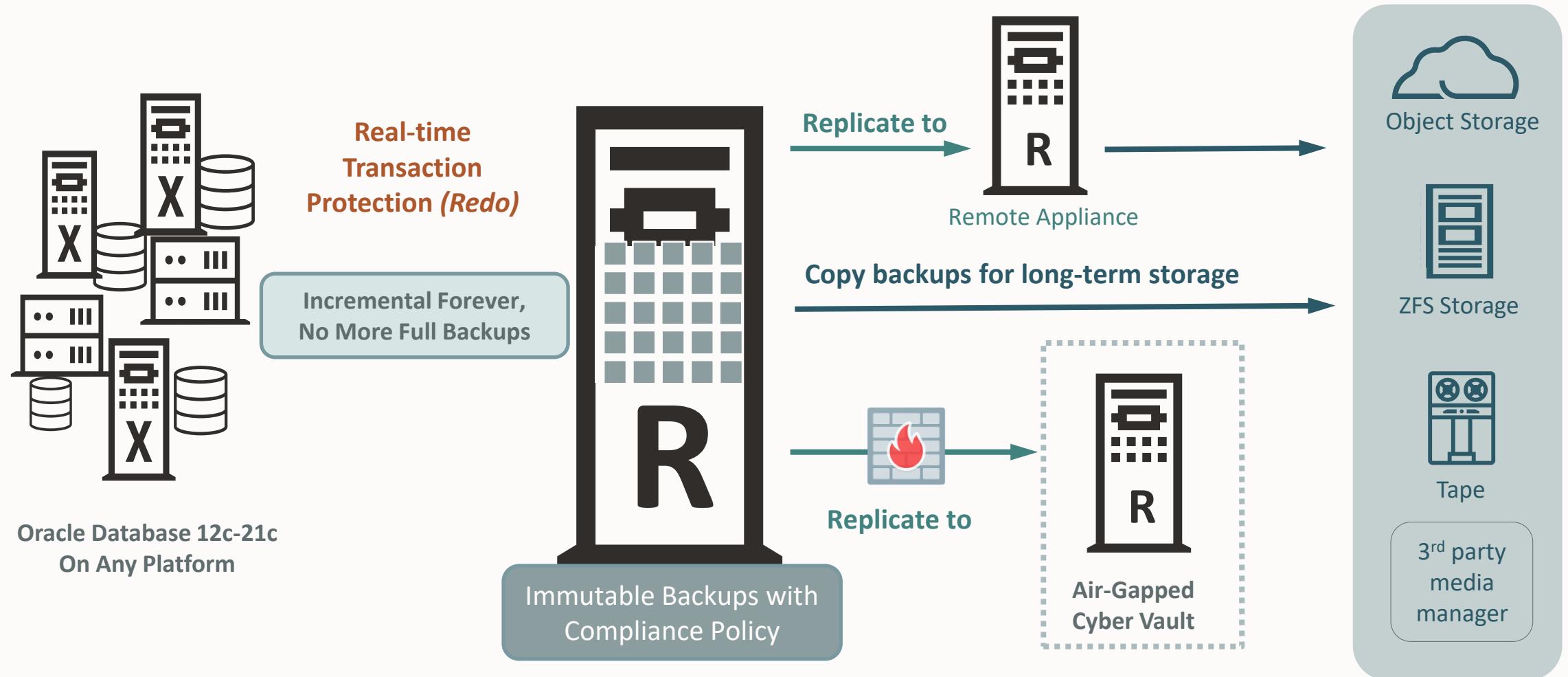


*for Oracle Database protection*



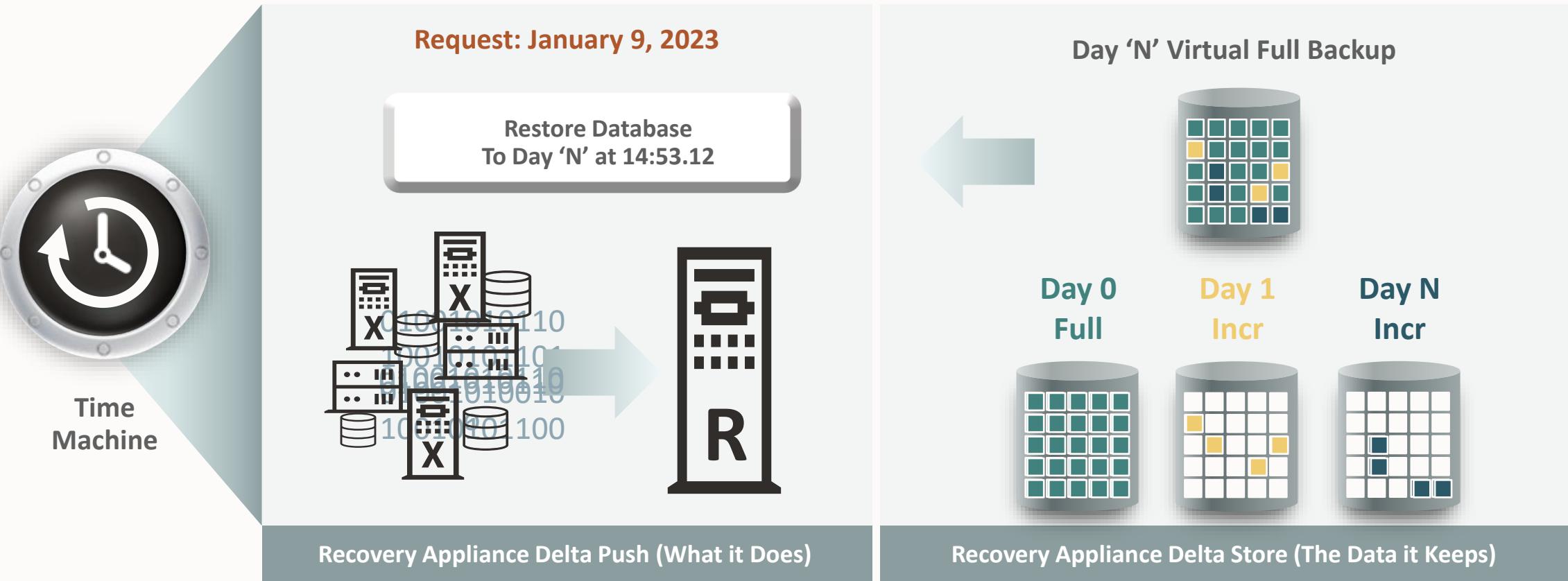
# Centralized, policy-based management across the backup lifecycle

Continuous data protection and multi-tiered backup addressing compliance requirements

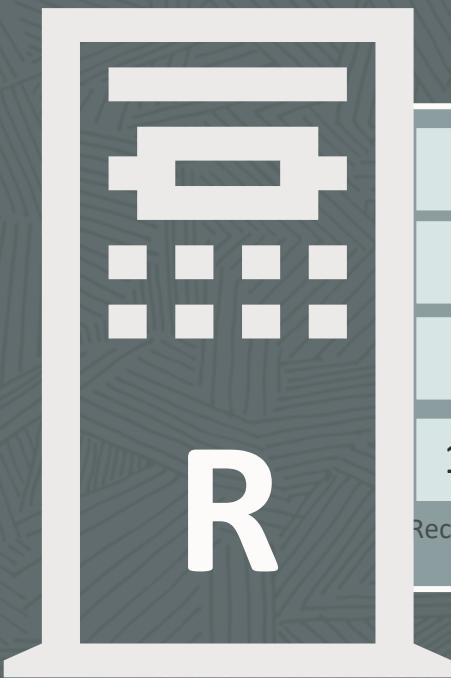


# Minimal impact incremental forever backup with virtual full restore

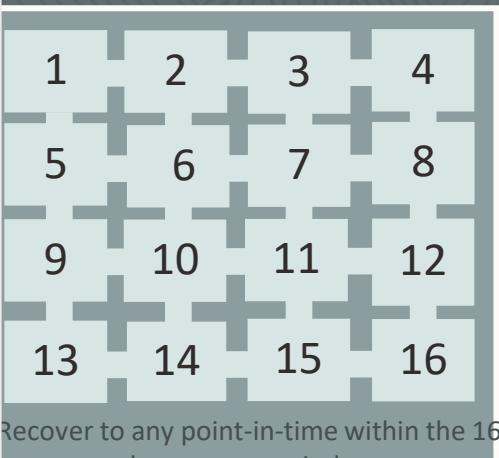
Pointer-based representation of physical full backup at incremental backup time



# Create adhoc or scheduled backup copies for long-term retention



Recovery Appliance



Recovery Window = 16 days  
(Example)

Copy specific backup (e.g.  
end of month/year)

Create full backup  
recoverable to 12:00pm on  
<date> (e.g. day 3)

Define retention period for  
backup (e.g. 7 years)

Schedule ongoing  
backup copies

- Weekly Full
- Daily Incrementals and Archived logs

*Retention defined within Protection Policy*

Choice of longer-term storage media:



Object Storage



ZFS Storage



Tape

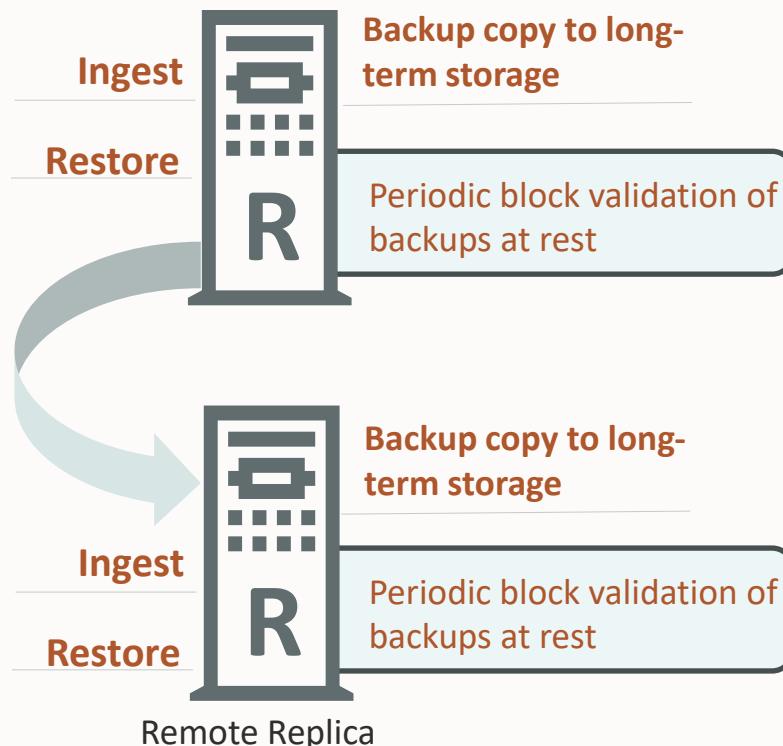
3<sup>rd</sup> party  
media  
manager

## End-to-end data-aware validation

Recovery Appliance is built on a maximum availability architecture (MAA)

### End-to-End Block Validation

Data **validated** at every touch point



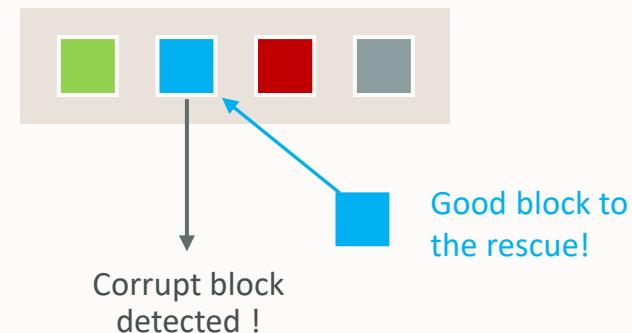
### Built-in Redundancy

No single point of failure architecture

- Data is striped and mirrored on Recovery Appliance disk
- Recovery Appliance servers are clustered providing automatic failover—eliminating a single point of failure

### Self-Healing Architecture

Automatic block repair from the mirrored copy



# Real-time database recoverability status

Recovery Appliance provides extensive recovery monitoring, alerting, and reporting

Real-time recoverability status for all databases at your finger tips:

Target Name	Database Size (GB)	Goal (days)	Recovery Window		Unprotected Data Window		Errors/Warnings	Redo Shipping	Copy-to-Tape	Replication	Last Complete Backup
store32	573.0	2.0	6.2	465.4	24.0 hrs	5.7 hrs	< 1 sec	✓	✓	✓	Sep 4, 11:12 PM PDT
store33	473.0	2.0	6.4	449.0	24.0 hrs	< 1 sec	✓	✓	✓	✓	Sep 4, 11:16 PM PDT
store34	463.0	2.0	6.4	444.5	24.0 hrs	< 1 sec	✓	✓	✓	✓	Sep 4, 11:19 PM PDT



Current point-in-time-recovery (PITR) window



Current data loss exposure

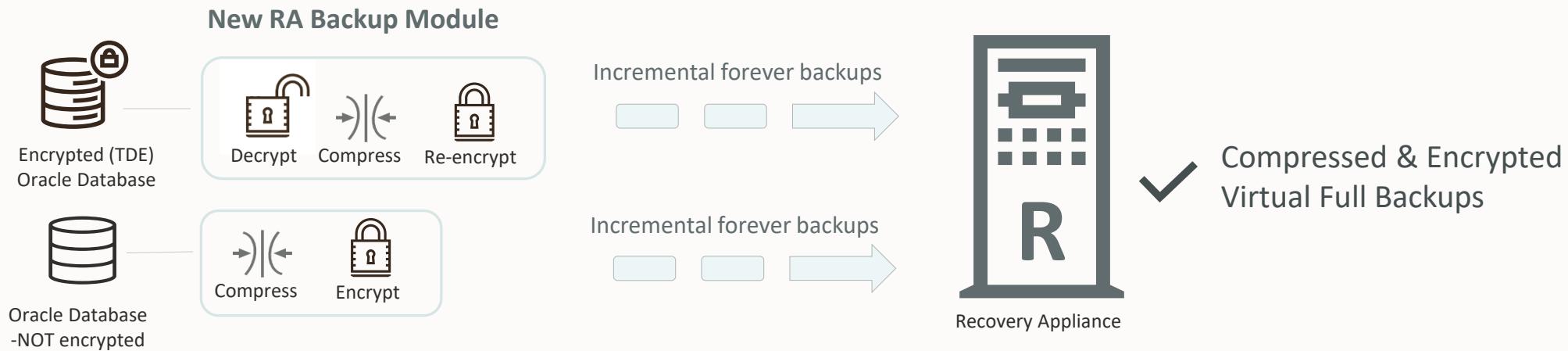


## Proactive monitoring and alerting of potential business risks

- Data loss exposure exceeds user-defined threshold
- Recovery Window out of goal
- Capacity usage reaching expected upper limit
- Validation of backups at rest outside of normal schedule

# Space-efficient backup encryption lowers TCO

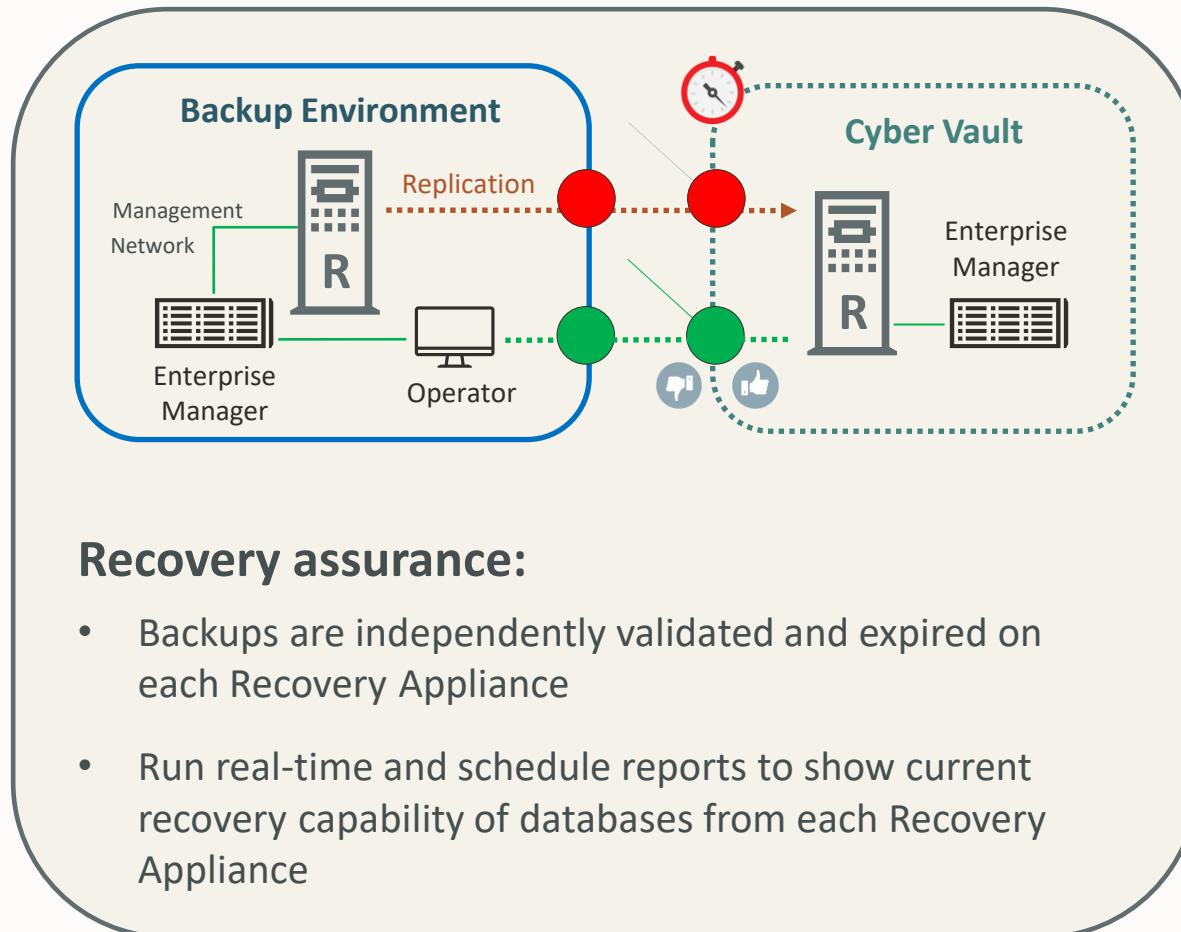
Data security and minimized backup storage consumption



- **End-to-End Backup Encryption for Security Compliance**
  - Encryption Keys are stored and managed only on the Protected Database
  - Encryption/decryption fully handled on database server – Data are never decrypted on ZDLRA
  - Data remain encrypted when copied to or restored from cloud
  - Supported for DB 19.16 and higher protected databases running on Linux platform
- **Uniquely enables backups to be compressed + TDE encrypted + Incremental forever backup strategy**

# Ransomware protection you can depend upon

## Recovery Appliance cyber vault architecture



- Cyber vault access is air-gapped
  - Network access control by operator
- No single user account has access across the architecture
  - Access control is siloed per zone
- Databases are protected in real-time in the backup environment
  - Upon cyber vault opening, the latest immutable backup is automatically replicated

**Note:** Encrypted databases using TDE have no impact on the backup validation process.





## Energy Transfer accelerates recovery by 5x and backups by 48x

“Once the RA showed up, it basically changed everything. Backups that we're taking up to 12 hours were completing in 15 minutes. Restores that were taking up to four hours we're completing in just about 30 minutes to 45 minutes. And we were able to actually extend the recovery window.”

George Mamvura and Javier Ruiz, Energy Transfer

### Business Challenge:

Energy Transfer needed more reliable backup and recovery for Oracle Database to meet service level agreement requirements and increase visibility of backups across disk and tape. Since their legacy DIY solution was cumbersome to manage requiring staff to come in at off-hours to resolve issues, simplifying backup and recovery processes was key to improving efficiency.

### Results:

Chose Recovery Appliance to increase efficiency and performance along with simplifying backup management across its lifecycle.

- ✓ Reduced data loss exposure from up to 23 hours down to <1 second
- ✓ Improved restore performance from 4 hours to 30-45 minutes
- ✓ Shortened backup window from 8-12 hours to 15 minutes
- ✓ 5x less backup storage consumption with incremental forever backups
- ✓ Minimized downtime to only 4 down from 32 hours using Recovery Appliance capabilities to migrate 120 databases from SPARC to Exadata Cloud@Customer

### Products Used:

Oracle's Zero Data Loss Recovery Appliance

Oracle Exadata Cloud@Customer

Oracle Database



# Use Cases





## Amaggi boosts uptime by migrating key workloads to Oracle Cloud Infrastructure

“Moving from our data center onto Oracle Cloud Infrastructure has reduced costs, eliminated hardware refresh bottlenecks, and has given our producer and logistics ecosystem a tremendous boost in availability.”

**Wagner Biasi,**  
CSC and IT Manager, Amaggi

Product used:  
Oracle Exadata Database Service  
Exadata Cloud@Customer  
Oracle Cloud Infrastructure  
OCI FastConnect



### Business challenge:

Amaggi is a Brazilian agribusiness company active in large-scale soybean, corn, and cotton production with emphasis on sustainable development. In 2022, with data center equipment and maintenance at end of life, the company decided to migrate to a more robust structure that would guarantee data security and high availability of its IT infrastructure.

### Results:

Migrated their entire production environment to OCI with Exadata Database Service and use Exadata Cloud@Customer for disaster recovery resulting in:

- 99.999% database uptime
- 20% overall cost saving by not refreshing their data center
- 8x faster monthly closes
- 3x faster database provisioning supports complex app demands
- Runs in-house applications as well as Amaggi’s SAP ERP system
- Helps comply with fiscal complexity and controls
- Implemented their migration in less than 6 months assisted by Oracle Consulting and Oracle partner, [Lanlink](#)

Read [Amaggi's story](#)



## MITEC accelerates growth with Oracle Database Appliance

“Oracle Database Appliance gives us peace of mind and confidence in our operation. The security, availability, and performance elements of the database are very important in our industry; we feel we chose the right ally.”

**Edgar de la Luz**

Director of Technology, MITEC



### **Business Challenge:**

Mercadotecnia Ideas y Tecnología, or MITEC, has a mission to ensure fast payments for the 20,000 small- and medium-size merchants it serves. MITEC began working with Oracle more than 17 years ago. Today the company stores all its information in Oracle databases, providing high performance and scalability.

### **Results:**

- ✓ Empowered MITEC to achieve 0.003-second transaction time
- ✓ Achieved 99.9% availability
- ✓ 6X faster replication speeds
- ✓ 90% approval rate
- ✓ That ratio of card vs. digital transactions reversed during the pandemic—60% of transactions became digital

### **Products:**

Oracle Database Appliance

OCI GoldenGate

Oracle Real Application Clusters (RAC)

**Implementation Partner:** Genap Tecnología

Read full story [here](#)



## Metro-NOM accelerates backup performance by up to 30x

“The Recovery Appliance was the best solution for us because we handle our backup volume of three to four petabytes in a short time.

Before we had Recovery Appliance, we had sleepless nights because we had to be on-call with team ready 24x7.”

**Soner Toraman**

**Product Owner, Relational Databases, METRONOM**



### Business Challenge:

As the IT division of Metro, a large wholesale and retail food specialist conglomerate, METRONOM needs data available when needed by the business. Their legacy Oracle Database backup solution was complex, expensive and challenging with long backup and recovery times. Metro-NOM needed simplify management and achieve better performance at scale to address data growth.

### Results:

Metro-NOM decided to migrate their legacy IBM and TSM solution to Recovery Appliance for Oracle Database data protection.

- ✓ 10x – 30x faster backups of about 4 PB of data
- ✓ Increased DBA productivity freeing them up for other projects
- ✓ Simplified multi-vendor backup and recovery deployment

### Products Used:

Oracle’s Zero Data Loss Recovery Appliance

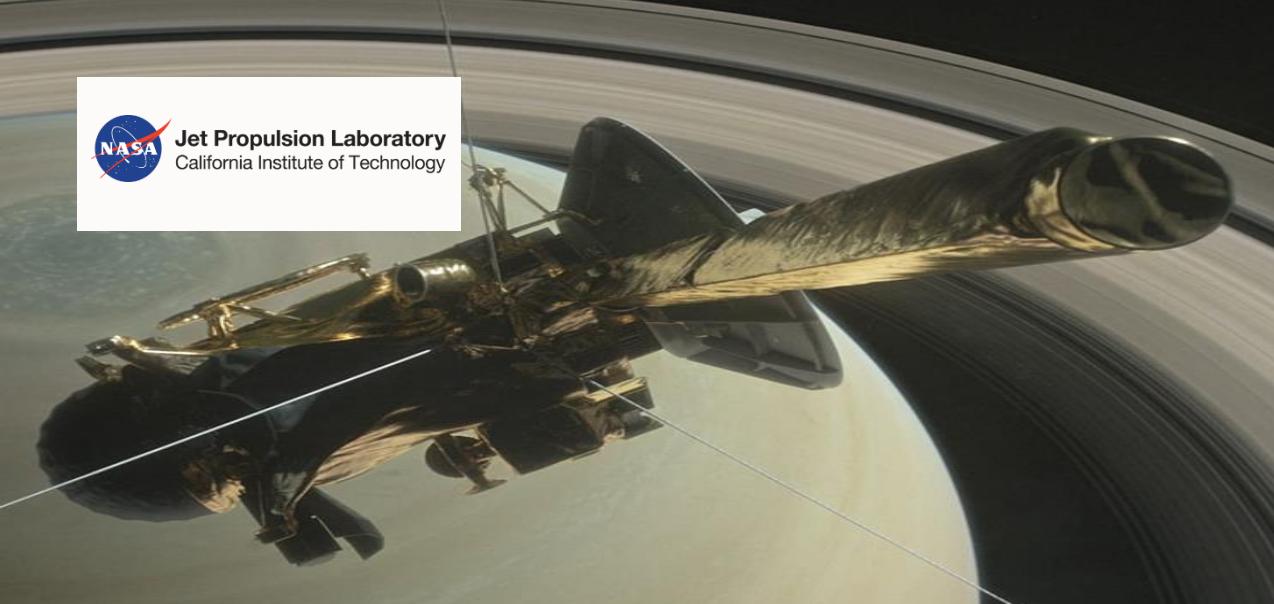
Oracle Exadata

Oracle Database





**Jet Propulsion Laboratory**  
California Institute of Technology



## NASA's Deep Space Network powered by Oracle Private Cloud Appliance

### Business Challenge:

NASA's Jet Propulsion Laboratory (JPL) relies on its Deep Space Network (DSN) to provide uninterrupted communications with spacecraft exploring beyond Earth's orbit. NASA needed to upgrade from a legacy environment to a modernized infrastructure to receive data from space, then process it quickly and efficiently running a number of homegrown applications.

### Results:

- ✓ Crucial for monitoring and managing satellite assets for NASA
- ✓ Consolidated over 300 legacy servers to six Oracle Private Cloud Appliances
- ✓ Achieved zero downtime for critical operations.

### Products Used:

Oracle Private Cloud Appliance

Link to Forbes article:

<https://www.forbes.com/sites/oracle/2017/09/27/how-nasa-captured-the-moment-of-cassinis-last-dive>



# Resources



- **Exadata Database Machine**

<https://docs.oracle.com/en/engineered-systems/exadata-database-machine>

- **Exadata Cloud Services**

<https://docs.oracle.com/en-us/iaas/exadatacloud/exacs/exadata-cloud-service-overview.html>

- **Exadata Cloud at Customer**

<https://docs.oracle.com/en/engineered-systems/exadata-cloud-at-customer>

- **Oracle Live Labs**

<https://apexapps.oracle.com/pls/apex/r/dbpm/livelabs/home>

- **Exadata Services on Azure**

<https://docs.oracle.com/en/solutions/deploy-exadata-on-oracle-db-azure/index.html>

- **Oracle free certification program**

<https://education.oracle.com/oracle-oci-certification>



- Oracle Partner Network Site

<https://www.oracle.com/partnernetwork/program>

- Introducing Exadata X10M

<https://learn.oracle.com/ols/learning-path/oracle-compute-cloudcustomer-2024-sales-specialist/89350/128629>

- Oracle Cloud at Customer sales Specialist 2023

<https://learn.oracle.com/ols/learning-path/oracle-exadata-x10m-introduction/89350/128363>

- Exadata Database Machine X10M Datasheet

<https://www.oracle.com/a/ocom/docs/engineered-systems/exadata/exadata-x10m-ds.pdf>

- Oracle Database Appliance Site

<https://www.oracle.com/br/engineered-systems/database-appliance/>

- Oracle Private Cloud Appliance Site

<https://www.oracle.com/br/engineered-systems/database-appliance/>

- **ZFS Storage Appliance Site**

<https://www.oracle.com/storage/nas>

- **Oracle Database Appliance (ODA) Simulator**

[https://cloudmarketplace.oracle.com/marketplace/en\\_US/listing/84422479](https://cloudmarketplace.oracle.com/marketplace/en_US/listing/84422479)

- **Oracle Database Appliance X10 Model Family**

<https://www.oracle.com/a/ocom/docs/oda-x10-model-family-tech-brief.pdf>

- **ZDL Syber Security architecture**

<https://www.oracle.com/technetwork/database/availability/recovery-appliance-cyber-twp-6729502.pdf>

# Thank you

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**Marcel Lamarca**

[marcel.lamarca@oracle.com](mailto:marcel.lamarca@oracle.com)



# ORACLE

