

Restoring Your Data or Restoring Your Reputation

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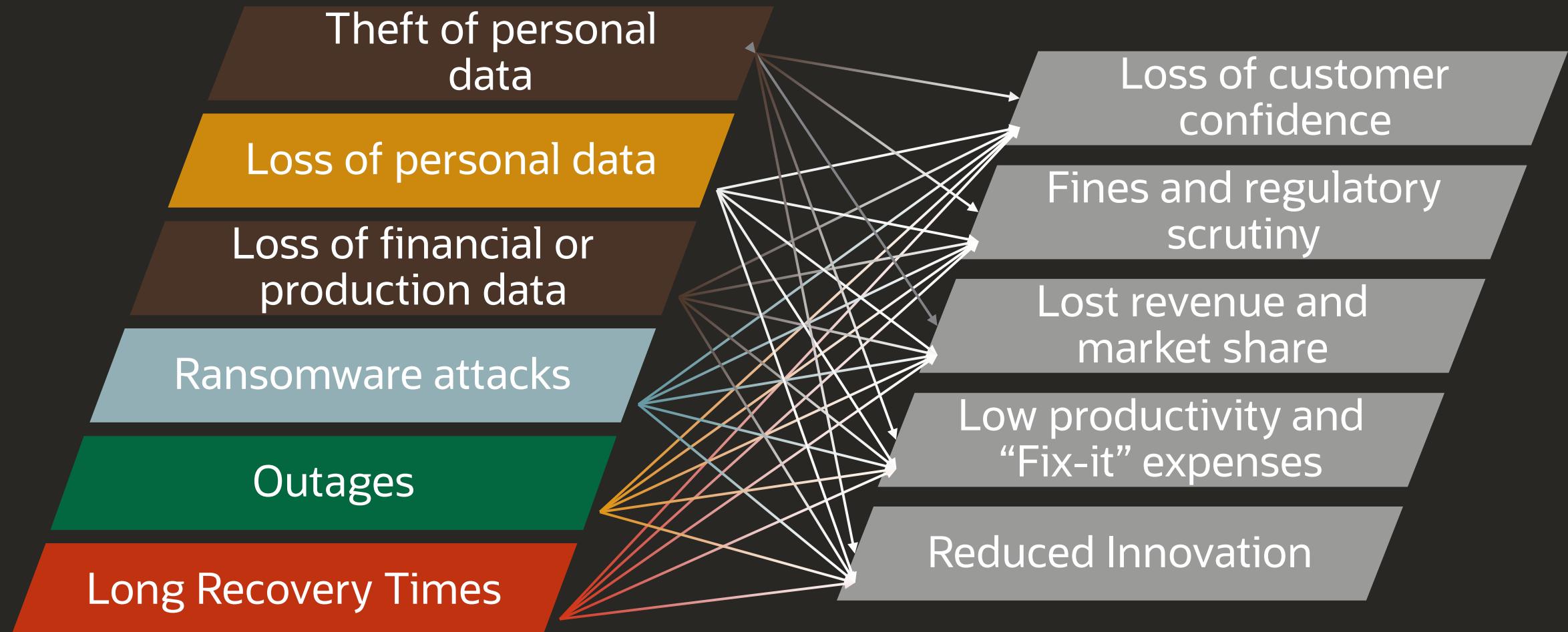


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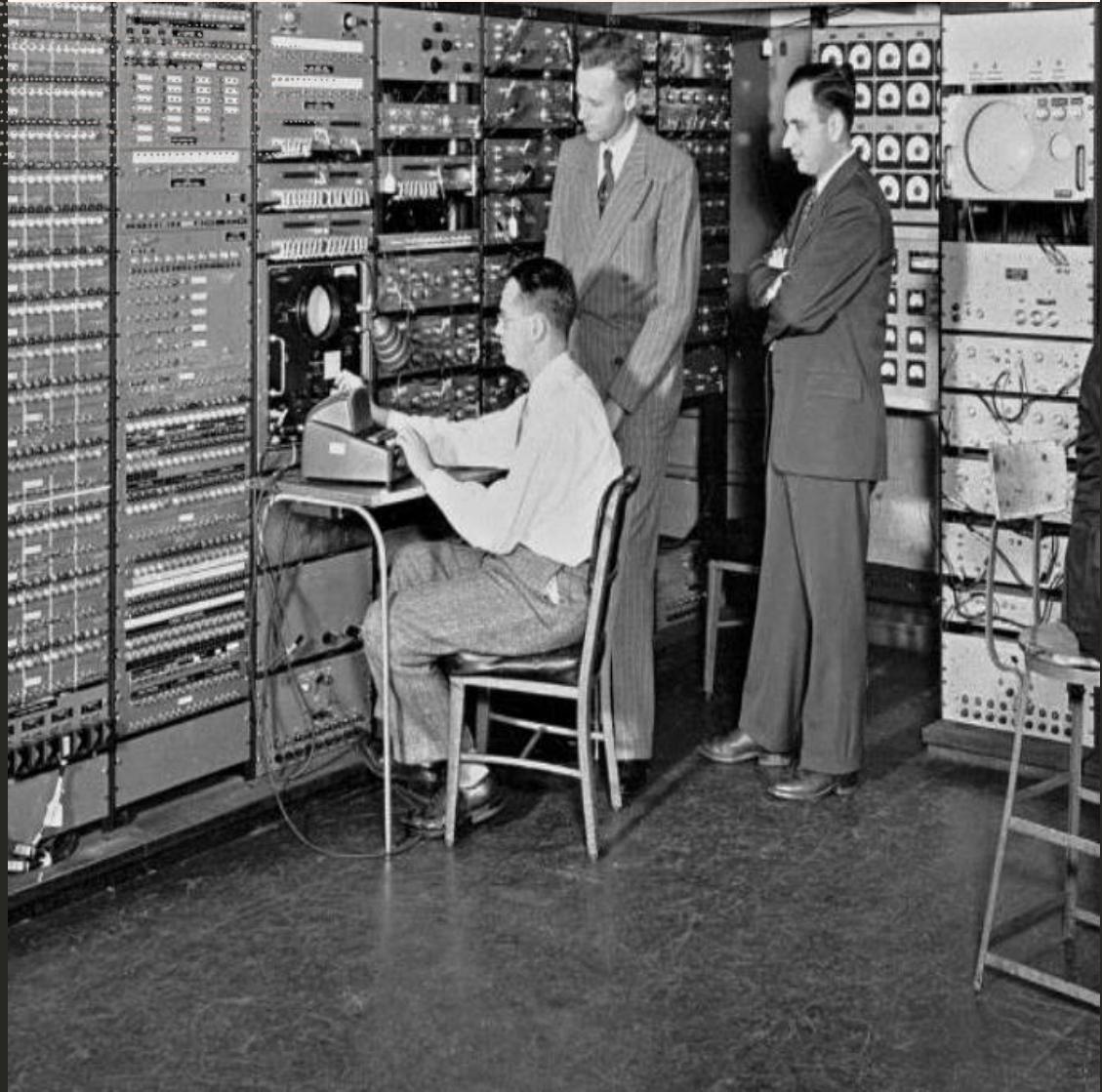
Your Business and Reputation Can be Damaged in Many Ways



IT Technology Has Progressed, But Storage and Data Protection Has Not

Current Industry Norms:

- “One-size-fits-all” backup approach independent of data type and usage
- Varying performance and capacity by using different media types and deduplication
- Long recovery times and data loss
- Backup and restore failure is common





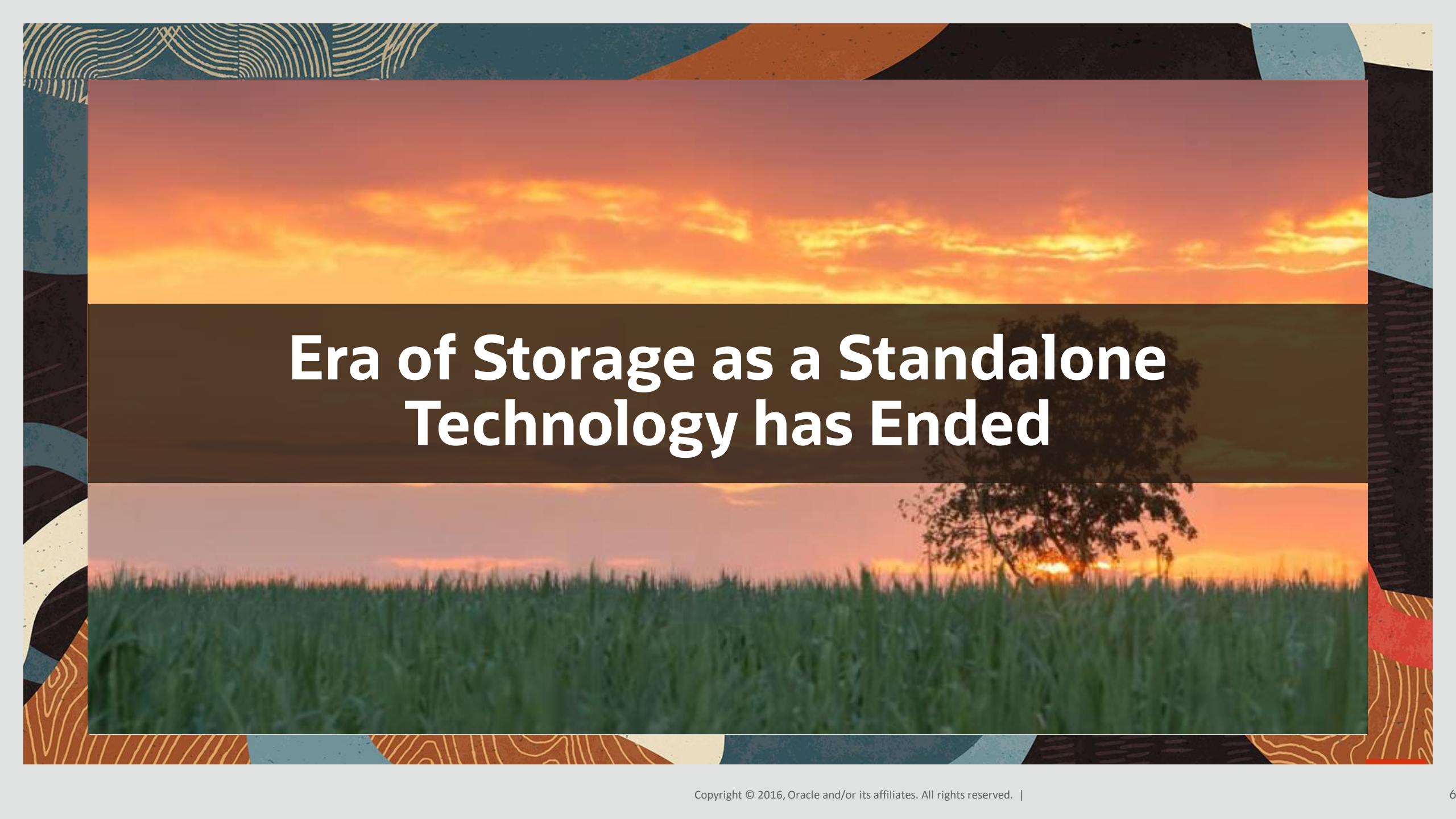
Enterprise
Databases &
Applications



Cloud
Storage
Extensions



New Data
Center
Architectures



Era of Storage as a Standalone Technology has Ended

Oracle's Unique Storage Integration Strategy

STORAGE AND DATA PROTECTION SOLUTIONS

Storage Engineered with Databases and Applications

- Increased efficiency
- Simplified management
- Reduced costs

Storage Engineered In New Data Center Architectures

- Higher performance
- Unsurpassed protection for Oracle Database
- Greater value

Storage Engineered with Public and Private Cloud Models

- Automated data placement
- Easier access
- Lower cost

The Zero Data Loss Recovery Appliance

The Focus on ZDLRA was to automate logging and recovery – take human error out of it... and never lose any of your data.”

Larry Ellison
Executive Chairman & CTO, Oracle



Recovery Appliance

Continuously protects
Oracle Databases

Minimizes
performance impact
on production servers

Reduces downtime
with rapid, automated
database recovery

Validates each backup

Reduces data loss
exposure

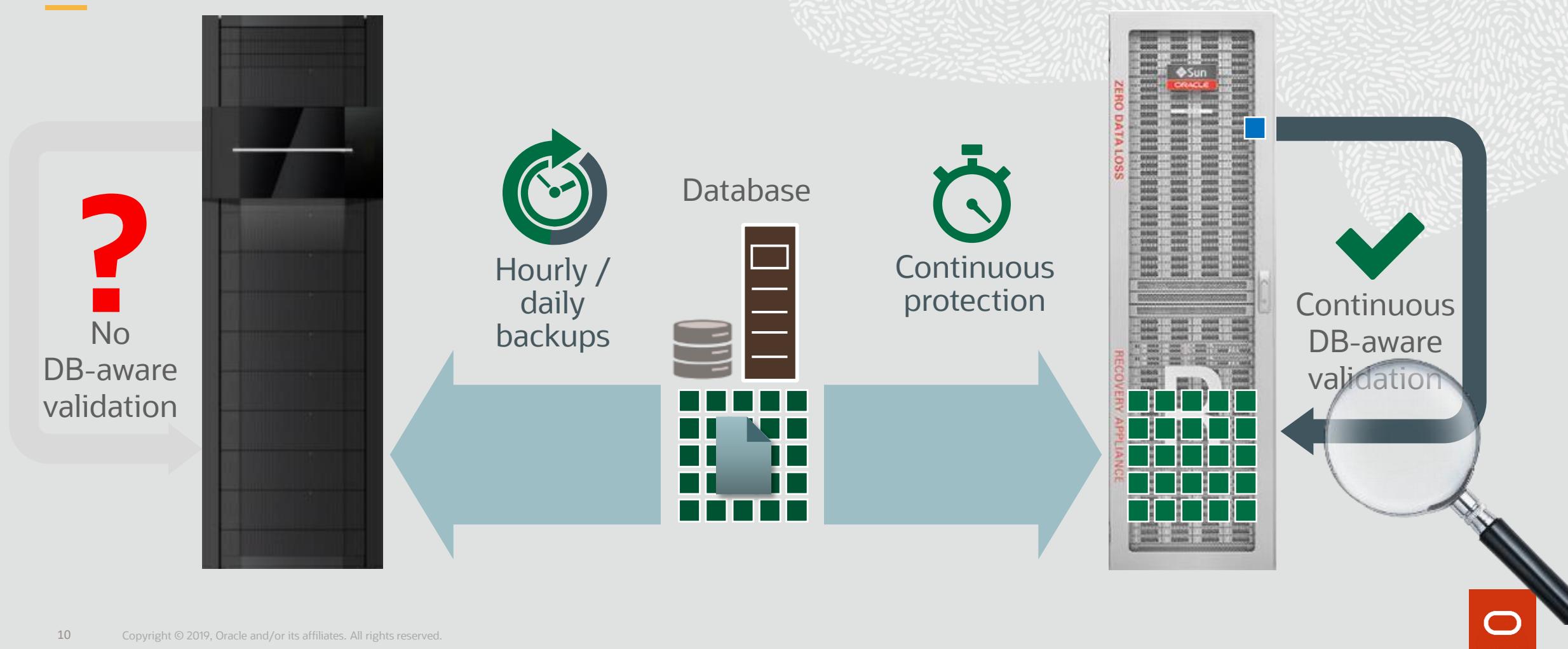
Provides clear
indication of
time to restore

Tight integration delivers better protection throughout the data life-cycle



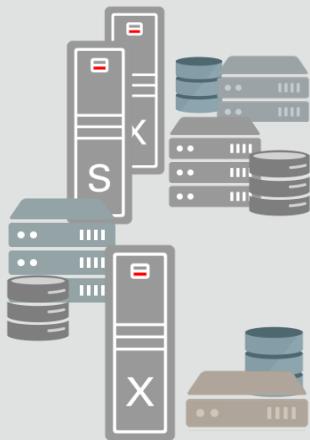
General Purpose Backup vs. Recovery Appliance

Continuous protection and built-in integrity checking



Centralized Data Protection for Oracle Databases

Protected Databases



Delta Push

- DBs access and send only changes
 - Minimal impact on production
- Real-time redo transport instantly protects ongoing transactions

Recovery Appliance



Protects all DBs in Data Center

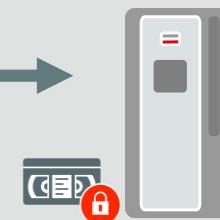
- Petabytes of data
- Oracle 11g-19c, any platform
- No expensive DB backup agents

Delta Store

- Stores validated, compressed DB changes on disk
- Fast restores to any point-in-time using deltas
- Built on Exadata scaling and resilience
- Enterprise Manager end-to-end control



Offloads to Oracle Cloud



Offloads Tape Backup



Replicates to Remote Recovery Appliance



Real-Time Database Recoverability Status

Enterprise Manager-Integrated Monitoring, Alerting, and Reporting

Real-time recoverability status for all databases at your finger tips:											
Target Name	Database Size (GB)	Goal (days)	Recovery Window Current (days)	Needed Space (GB)	Threshold	Unprotected Data Window Current	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		✓	✓	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 window Current amount of unprotected data



Alerts and warnings issued if a database is not meeting user-defined recovery goals or thresholds



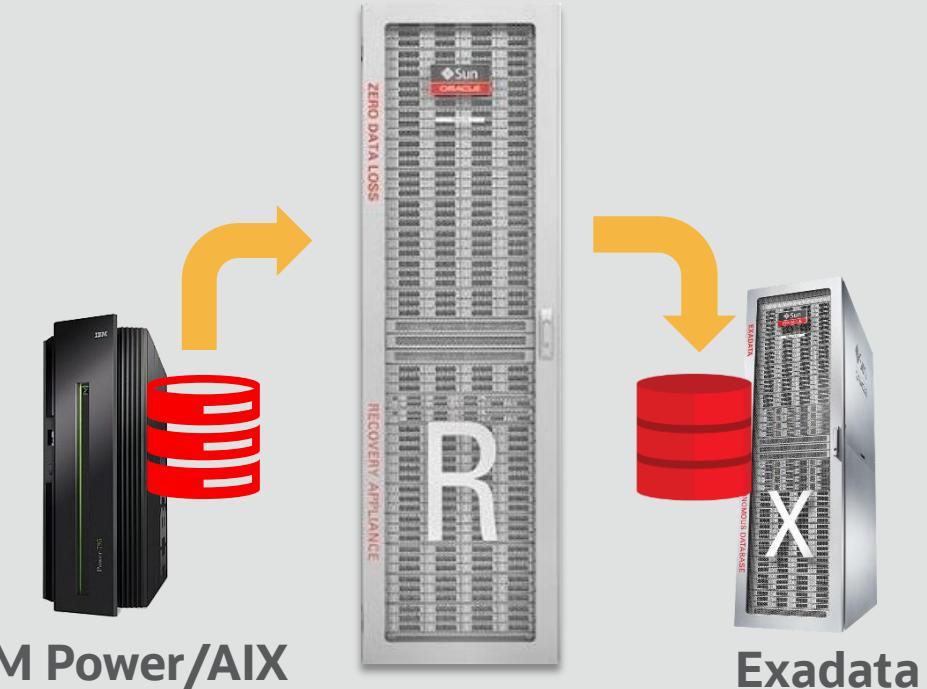
Data Protection-as-a-Service: Policy-based management to meet Recovery SLAs throughout the enterprise



Recoverability Status & System Utilization Reports

Simplify Database Migration with Recovery Appliance

- Recovery Appliance migration automation tool **simplifies** platform migration steps
 - Especially useful for large databases
- Significant **reduction in downtime** – less than 2 hour read-only downtime, regardless of DB size.
- Supports **same and cross-endian platform** migration activities



Global Chip Design Leader Improves Protection SLAs and Accelerates Move to Cloud

- **Up to 6X** faster backup and recovery
- **50TB** production DB with point-in-time recovery
- **Eliminated** speed and connectivity issues with 3rd party solution on NetApp NAS



Requirement to modernize backup/recovery solution for SLAs:

- Could no longer meet Recovery Time Objective (RTO) with existing solution
- Too much overhead on production servers due to backup operations
- Address current data growth challenges and longer-term expectations
- Product roadmap align with strategic direction of moving to Oracle Public Cloud

Recovery Appliance delivered key advantages:

- Incremental forever backup strategy –
 - Faster backups, less overhead on network and DB server
- Reduced RPOan important business objective
 - Very beneficial feature during decision phase
- Operational efficiencies managing Oracle Database backup/recovery
- Oracle wall-to-wall responsibility instead of multiple different vendors

[Watch the Video](#)

Global Food Distributor and Retailer Enables Rapid Recovery

- 30X faster backup
- 4PB of critical data rapidly protected
- Point-in-time recovery of business-critical data



CUSTOMER PERSPECTIVE

“ The Recovery Appliance helps us migrate databases, especially when you have to do cross-platform migrations. And what we want to do in the next couple of years is to migrate from IBM to Oracle Cloud at Customer. ”

Soner Toraman, Product Owner – Relational Databases

METRONOM

[Watch the Video](#)

Oracle Solution



RA X6 - 5 cells (180 TB)

Backup Rate – 11.84 Gbs

Backup Size – 8.5 TB

Backup Time – 67 Min

Restore Rate – 9.33 Gbs

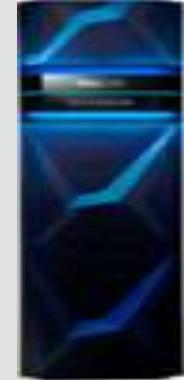
Virtual Restore Time – 124 Min

of channels: 16

+ Stores Real-Time Redo &
Eliminates Archived Log Backup Time



Storage Team Solution



Leading Deduplication Device

Backup Rate – 7.26 Gbs

Backup Size – 12.64 TB

Backup Time* – 237 Min

Restore Rate – 7.03 Gbs

Restore Time** – 245 Min

of channels: 48

Recovery Appliance
IS JUST FASTER

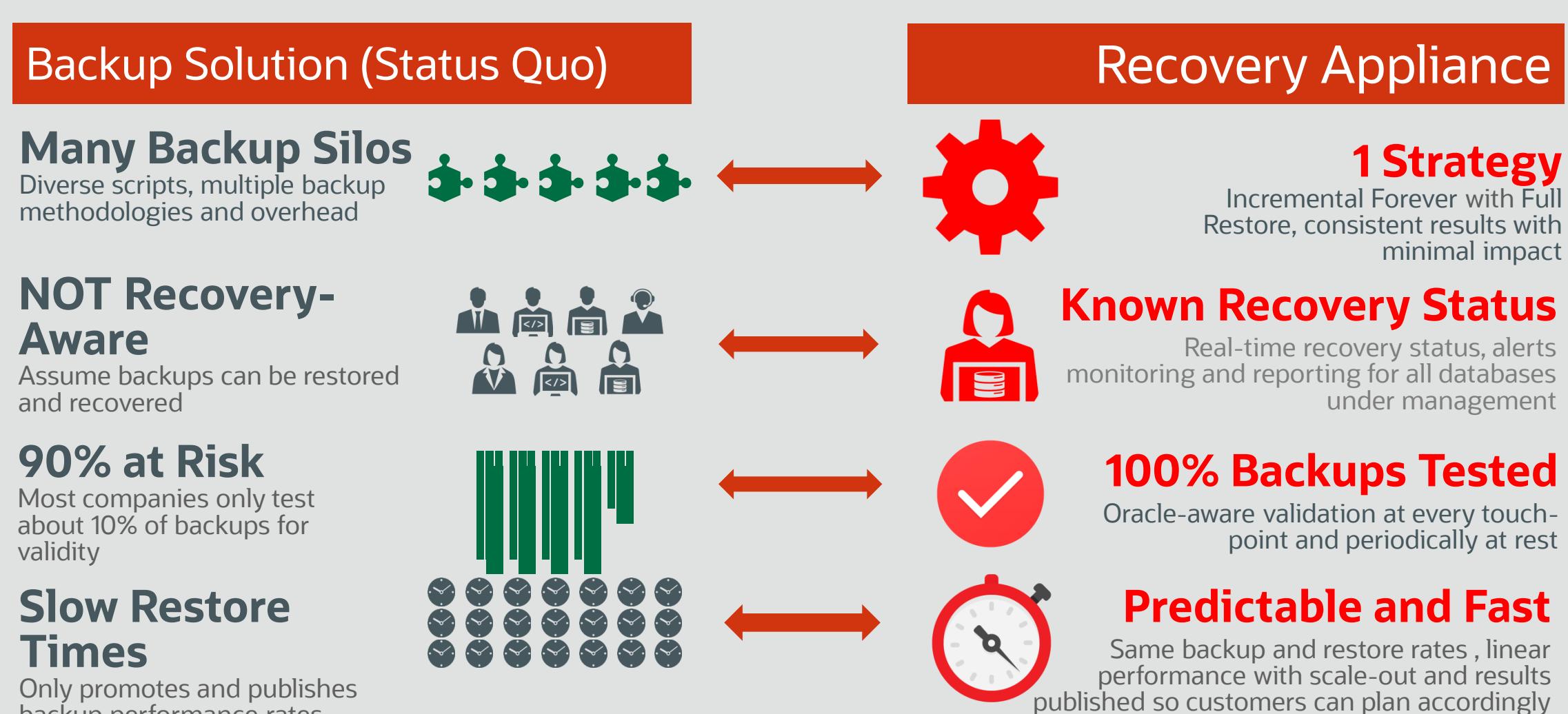


3X Faster Backup vs. Dedupe Device
2X Faster Restore vs. Dedupe Device
4X Faster Restore vs. Legacy Backup

* Dedupe Device requires additional archived log backup time

** Dedupe Device requires additional incremental restore + apply time

Backup vs Recovery Solution



Recovery Appliance Delivers IT Advantages

Demonstrated business value with “Database Protection-as-a-Service”

Status Quo: Managing Backup Tasks

- Backup management unrewarding (necessary) task
- NO ONE gets a “thank you” for performing backups
- Only feedback is generally complaints
- Periodically test/validation a sampling of backups

Recovery Appliance: Managing Recovery SLAs

- Provide regular recovery status reports to business owners / management
- Virtually eliminate data loss exposure for all databases
- Chargeback business owners using out-of-the-box reports
- 100% of backups validated with NO overhead of personnel or database servers

Oracle Helps Protect Your Entire Enterprise

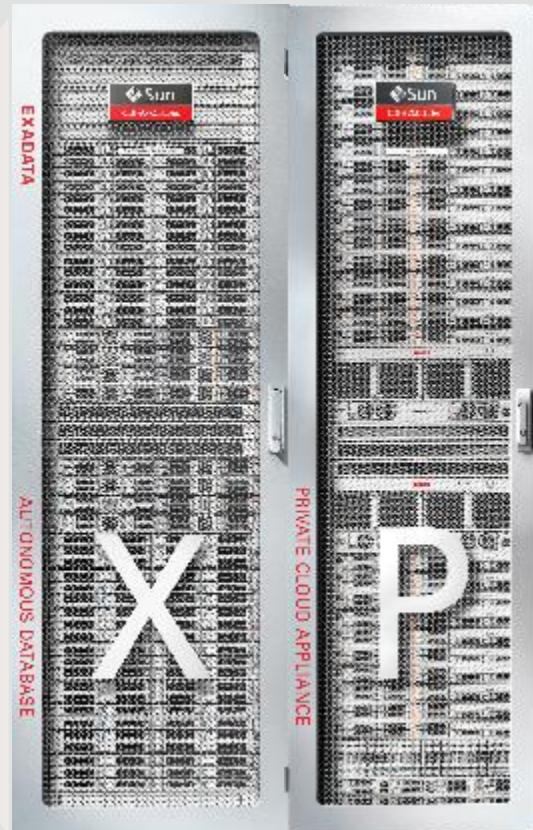
Oracle Database

20% of Data with
80% of Enterprise Value



Recovery Appliance

High-Performance
Oracle Database
Recovery



Unstructured Data

80% of Data with
20% of Enterprise Value

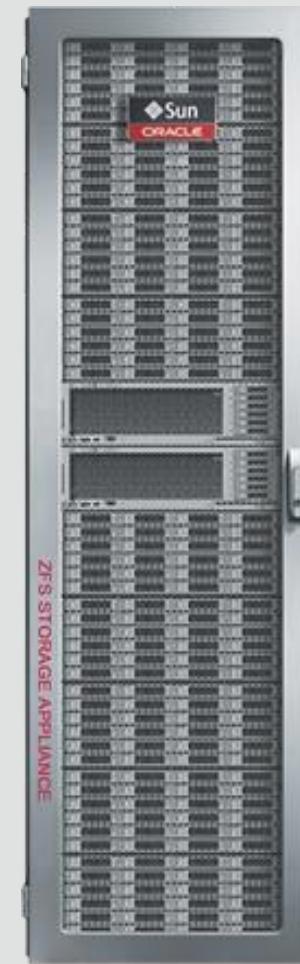


ZFS Storage Appliance

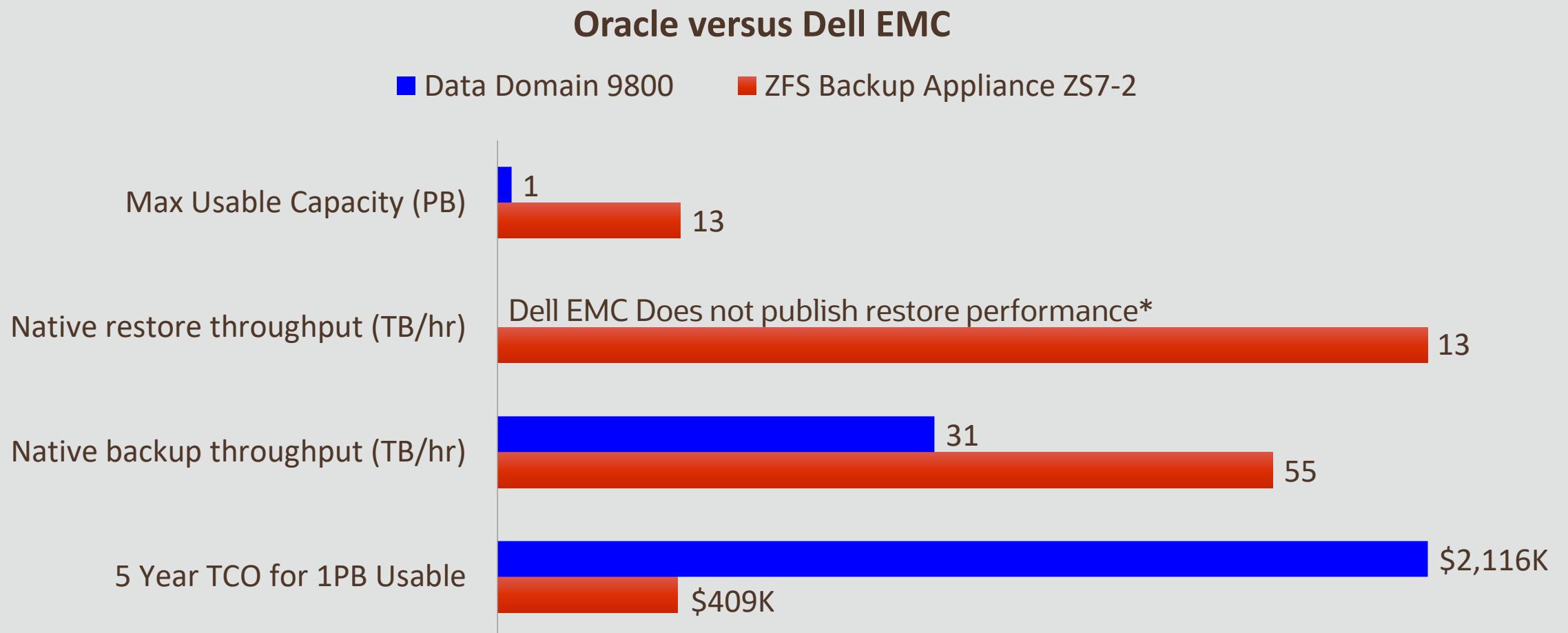
High-Performance
General-Purpose
Backup

Oracle ZFS Storage Appliance

- High performance for all data
 - 55+ Tbytes/Hour backup
 - 60+ Tbytes/Hour restore
- High capacity with 13+ PBytes usable
- Native compression and deduplication
- Unique Oracle Database integration
- Flexible usage models – not just backup
- Low-cost – up to 80% lower TCO than Dell EMC Data Domain at 1PB capacity



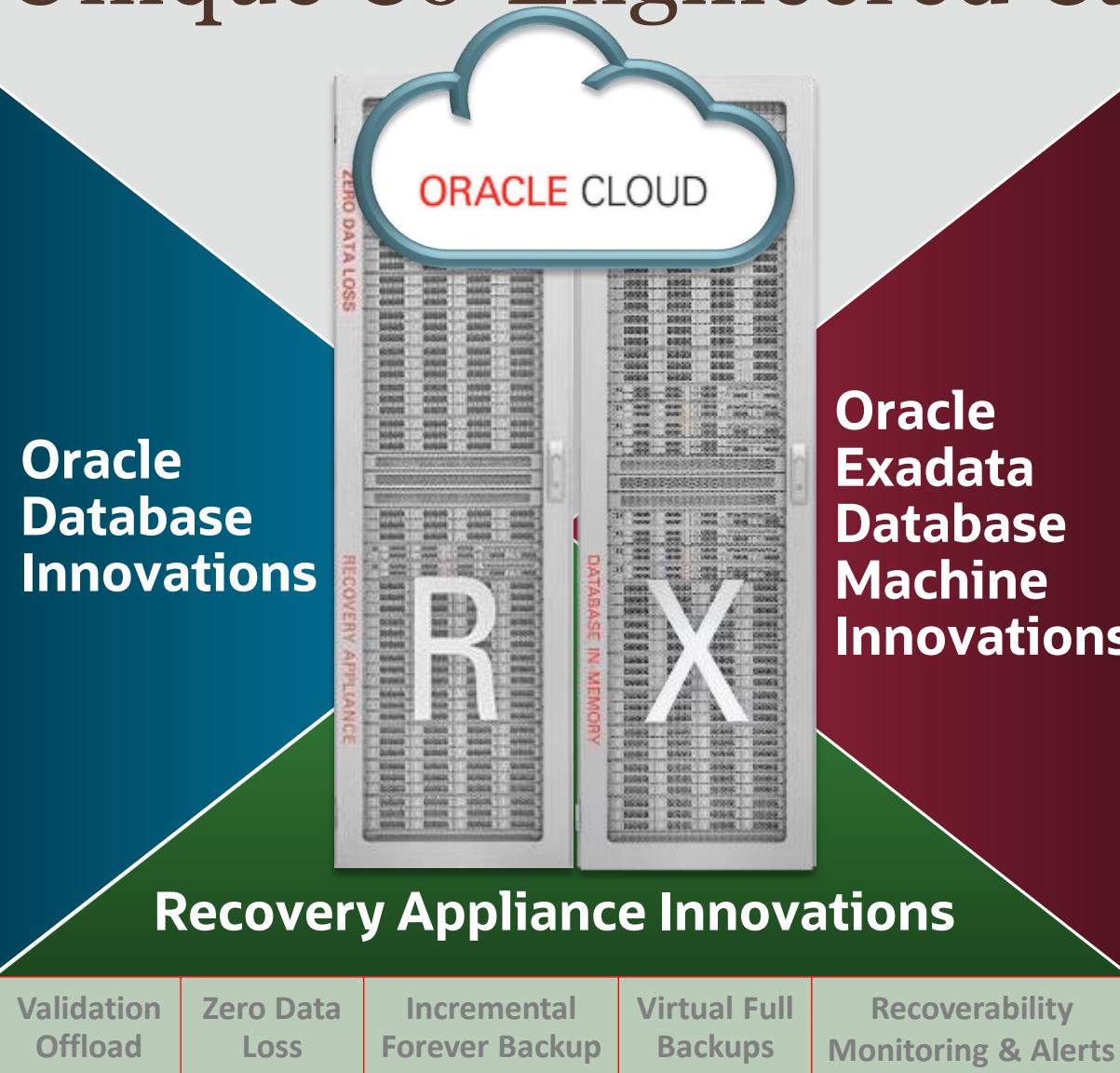
13X More Scalable, Significantly Faster, 80% Less Expensive

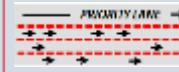
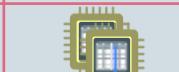


Native performance achieved without additional add-on license fees or agents, no deduplication or compression applied.
• Estimates of DD9800 restore performance based on POC data and other third party validation are between 5TB/hour and 10TB/hour
• 5 Year TCO based on Oracle Value Navigator tool, Jun 20, 2019

Full Suite of Unique Co-Engineered Capabilities

	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
	Automatic Storage Manager



	Offload SQL to Storage
	InfiniBand Fabric
	Smart Flash Cache, Log
	PCI Flash
	Storage Indexes
	Columnar Flash Cache
	Hybrid Columnar Compression
	I/O Resource Management
	Network Resource Management
	In-Memory Fault Tolerance
	Exafusion Direct-to-Wire Protocol

Thank You





ORACLE

Announcing: Recovery Appliance X8M



- RA X8M leverages new 100 Gb/s RDMA over Converged Ethernet (RoCE) for high throughput internal data transfers between compute and storage
 - Backup/restore network same as RA X8 (25 Gb/s): 24 TB/Hr
- Rack usable capacity configurations same as RA X8
 - Base rack: 155 TB, Full rack: 949 TB, Per storage server: 53 TB
- RA X8 (Infiniband) continues to ship for customers expanding existing Recovery Appliances

Backup/Recovery Benefits with Recovery Appliance

Reduce RTO and RPO

High Protection and Zero Data Loss

High Deduplication Factor

Incremental Forever

New level 0 (virtual full) after only 23 minutes incremental backup time

Nearly 200X improvement in backup performance

Fast 10 Gbps Network

Facilitated DB Migration from Exadata X4 to X5

2 Recovery Appliances less expensive than expanding Data Domain to support same backup requirements

*The major benefit for us was **Incremental Forever and Virtual Full***



Presentation on OTN:

<http://www.oracle.com/technetwork/database/availability/con8830-tjsc-2811110.pdf>

World Leader in Aircraft Engine Manufacturing Eliminates Data Loss Exposure

5X to 10X

faster restore time

Gained

validated backup
confidence

Up to the moment
recovery possible



<https://www.youtube.com/watch?v=Wq2H2un84EA>