DELLTechnologies

Oracle Deployments in the Digital Business

Setting a Modern IT Foundation for Oracle Environments

Abstract

This 15-minute guide looks at how Oracle has transformed its applications and database capabilities to help businesses deploy and run intelligent data-driven applications. We also explore how, as a result, IT management, project leads and architects are pausing to rethink paths forward for modernizing Oracle, IT deployment models, as well as the infrastructure and data services best suited for mission-critical systems within the digital business.

We will examine how Dell Technologies can partner with IT to unlock the value of Oracle with platforms and solutions that reduce TCO by simplifying Oracle landscapes and are ready to run emerging Oracle applications and converged databases in a cloud operating model.
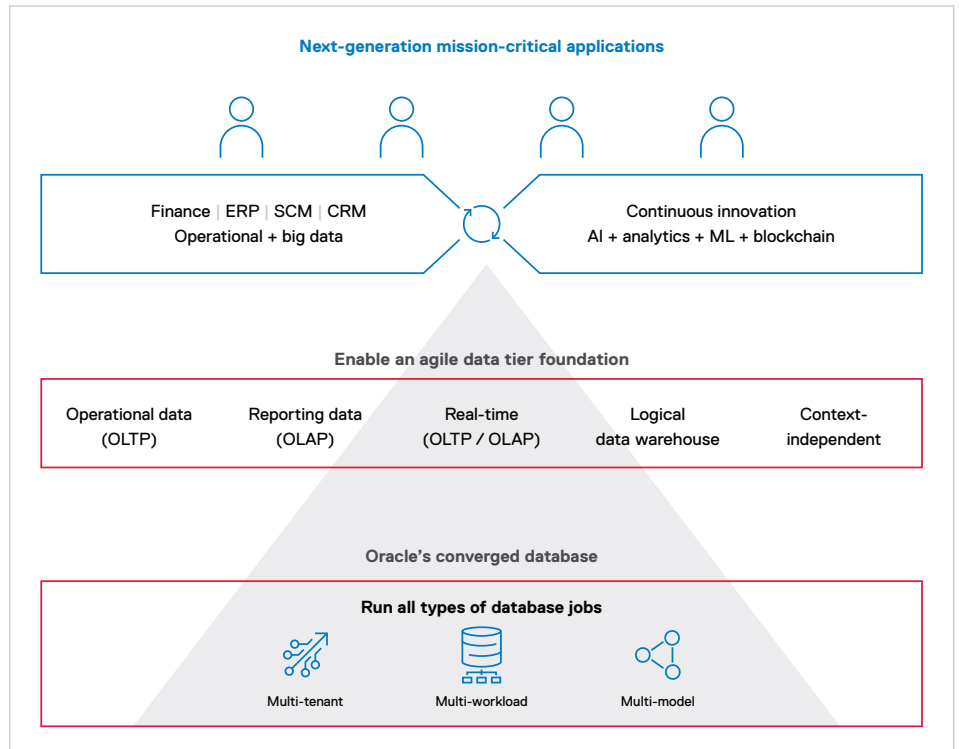
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Introduction

Oracle applications and databases are changing.

Increasingly, next-generation, data-driven applications are coming of age. They're maturing at an accelerated pace, both in the consumer space and the business realm. And, with the rise of emerging technologies like artificial intelligence (AI) and machine learning (ML), Internet of Things (IoT), digital assistants and blockchain, business applications, including finance, ERP, SCM and CRM, are rapidly becoming more intelligent. An ESG study commissioned by Oracle shows that 84% of organizations today are using at least one emerging technology in production to enhance finance and/or supply chain operations.[1]

84%

of organizations use at least one emerging technology — AI, IoT, digital assistants, blockchain — to enhance finance and supply chain operations.[1]

Next-generation mission-critical applications

Finance | ERP | SCM | CRM
Operational + big data

Continuous innovation
AI + analytics + ML + blockchain

Enable an agile data tier foundation

| Operational data (OLTP) | Reporting data (OLAP) | Real-time (OLTP / OLAP) | Logical data warehouse | Context-independent |

Oracle's converged database

Run all types of database jobs

Multi-tenant   Multi-workload   Multi-model

Database platforms are foundational to intelligent applications. For decades, the database has been the backbone for operational data (OLTP) and data warehousing for reporting and some analytics (OLAP). But today, as organizations look for ways to unlock insights hidden in their structured operational data together with unstructured big data across multiple platforms and environments, relational database management (RDBM) platforms have responded with new architectures and capabilities.
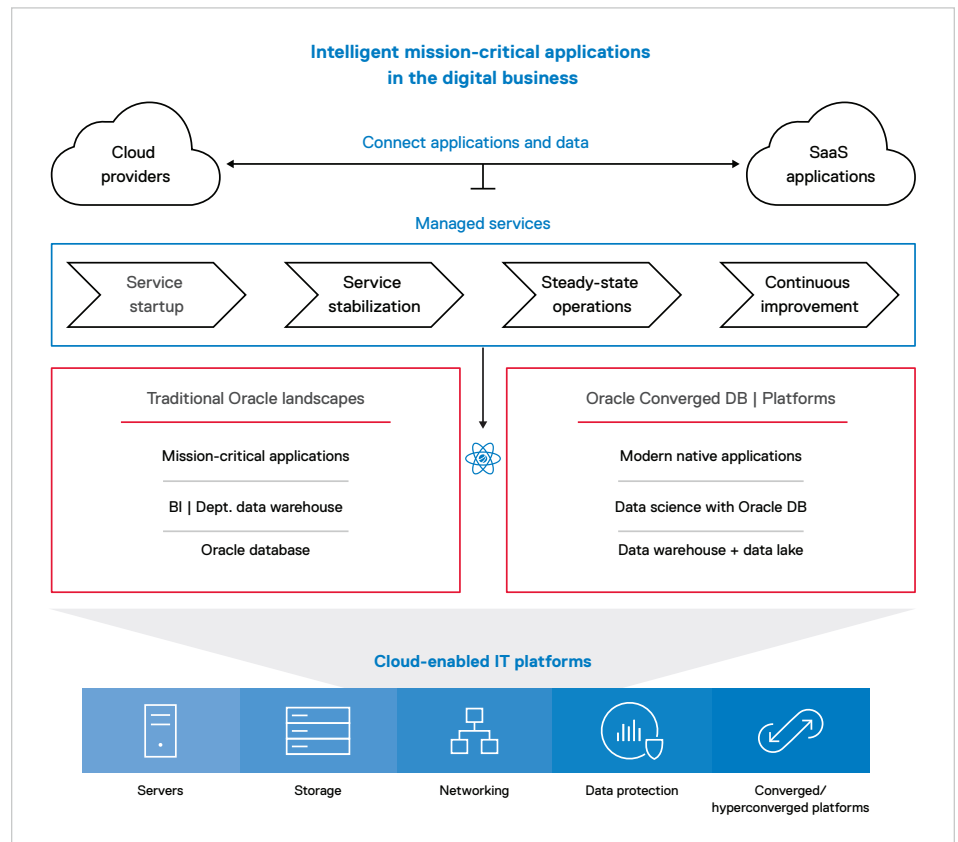
Rethinking IT for Oracle deployments

Traditional applications (systems of record) are critical components of most business transformation initiatives that work with AI, analytics, ML and blockchain.

For IT, this means disruption as business demands drive migrations, upgrades and new implementations for Oracle applications (Oracle E-Business Suite, PeopleSoft, JDE) and databases that the business requires to be agile and competitive.

Thus, it should be no surprise that IT management, project leads and architects are taking a moment to rethink modernizing applications; databases; and the deployment models, underlying data, and infrastructure services best suited for mission-critical systems in the digital business.

When you're designing an IT foundation to support your current state, make sure you do so with an eye to the future. Primary objectives should include:

- Eliminating siloed IT and operational complexity running traditional complex Oracle landscapes
- Supporting traditional and emerging operating profiles enabled with Oracle Converged Databases and applications working with AI, ML and IoT
- Supporting a mission-critical application and data environment on sovereign, dedicated IT that embraces a cloud operating model, optimally deployed to run in a multi-cloud landscape

Intelligent mission-critical applications in the digital business

Cloud providers — Connect applications and data — SaaS applications

Managed services

| Service startup | Service stabilization | Steady-state operations | Continuous improvement |

Traditional Oracle landscapes
- Mission-critical applications
- BI | Dept. data warehouse
- Oracle database

Oracle Converged DB | Platforms
- Modern native applications
- Data science with Oracle DB
- Data warehouse + data lake

Cloud-enabled IT platforms

Servers | Storage | Networking | Data protection | Converged/ hyperconverged platforms

Dell Technologies recognizes that every organization is unique when it comes to the Oracle (and non-Oracle) applications and databases it runs and the paths required for achieving modernization.

In this 15-minute guide, we explore how Dell Technologies partners with IT to unlock the value of Oracle with platforms, IT solutions and deployment models that reduce TCO by simplifying complex Oracle landscapes and running a new generation of Oracle applications and converged databases in a cloud operating model.

Setting the IT foundation with APEX

As IT plans a foundation for running Oracle, it is important to keep in mind application and business requirements for today and the near future. Our goal at Dell is to underpin your application and database transformation with Infrastructure-as-a-Service (IaaS) that enables business and IT outcomes now and to ensure you are ready to support emerging application scenarios as they arise.

Business digital core
It begins with considering the personality and SLA requirements for mission-critical Oracle environments (financials, ERP, supply chain management and manufacturing). These are the backbone of core business functions, applications, processes and business data. Simply stated, if core business applications and operations are disrupted, the surrounding connected ecosystem is impacted.
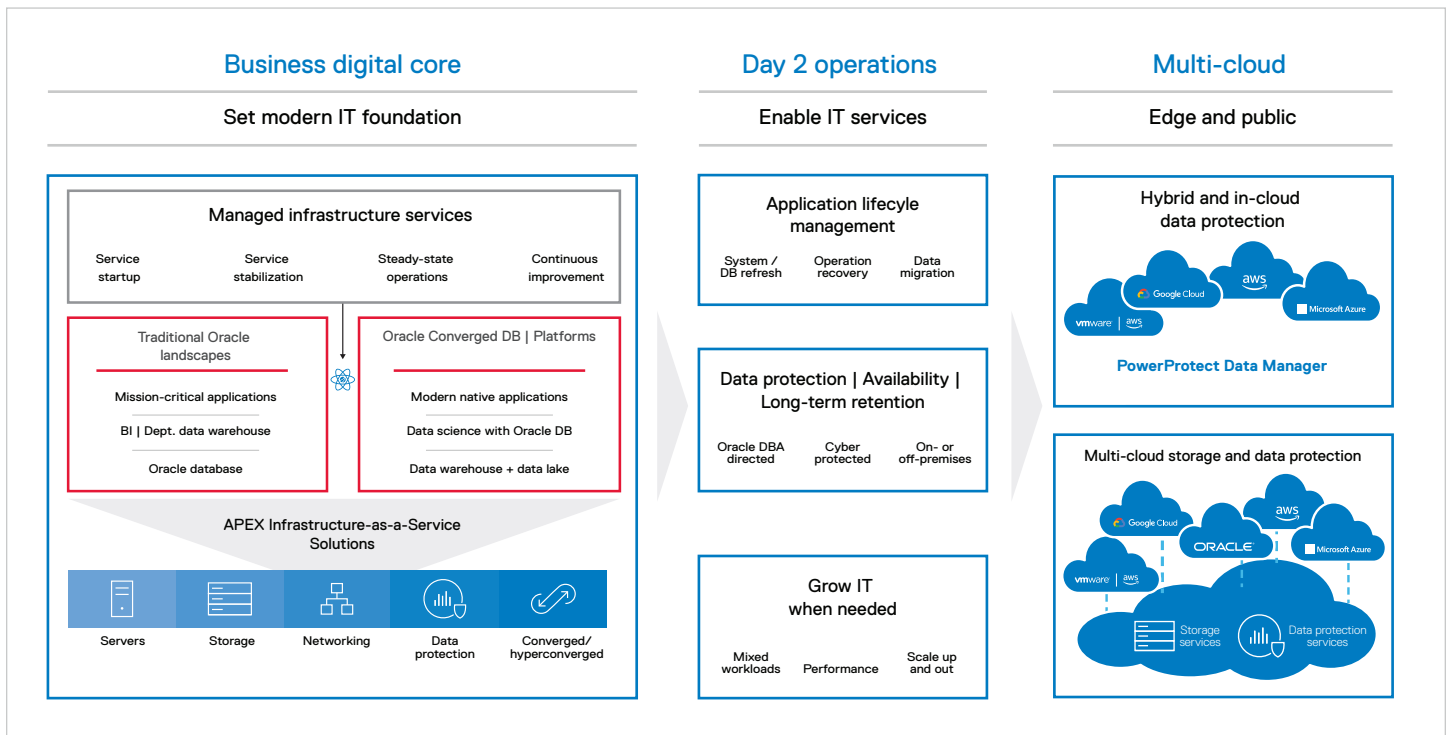
Dell Technologies has a distinguished trusted partner reputation for delivering best-in-class cloud-enabled infrastructure solutions and platforms for mission-critical environments like Oracle. Underpinning Dell IT solutions for Oracle is our broad portfolio of software and infrastructure, including:
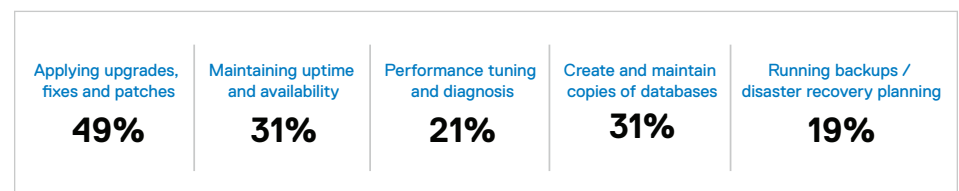
- **Servers:** Address evolving compute demands for traditional and emerging Oracle use cases, including analytics and data scientists working with large structured, unstructured and IoT data sets
- **Primary storage:** Provide the scalability, intelligence and cloud integration needed to unlock the value of Oracle data while decreasing application outages and reducing storage requirements with advanced deduplication
- **Unstructured data:** Enable Oracle data warehouse plus data lake, managing the rapid growth of unstructured batch and streaming data with file and object storage at any scale
- **Data protection:** Certified with Oracle RMAN, database administrators get direct control over backup and recovery, enabling self-service without any loss of visibility
- **Cyber-recovery:** Protect critical data from cyberattacks and ransomware, identify suspicious activity and perform data recovery with easy-to-deploy management and automation software
- **Hyperconverged infrastructure (HCI):** Transform operations with turnkey integrated systems that accelerate IT outcomes or continue to leverage existing operating models while gaining HCI benefits through flexible, pre-validated HCI building blocks
- **Converged infrastructure:** Simplify IT and transform operations by bringing together compute, storage, networking and data protection in fully engineered systems and validated designs from Dell Technologies.

Day 2 operations

Once you have the right IT foundation for Oracle, you want to make sure that that you're getting your Oracle database administrators (DBAs) and developers the right IT services. You especially want to support key objectives in maintaining, protecting and ensuring availability for mission-critical landscapes.

Database maintenance still consumes too much of a DBA's time, which can impact competitiveness. Even with database automation and cloud resources abundantly available on the market, many DBAs still spend substantial amounts of time on low-level tasks. This is holding back progress.

In a survey of Oracle DBAs and IT managers, the most costly database management activities from an operational standpoint include[2]:

Applying upgrades, fixes and patches	Maintaining uptime and availability	Performance tuning and diagnosis	Create and maintain copies of databases	Running backups / disaster recovery planning
49%	**31%**	**21%**	**31%**	**19%**

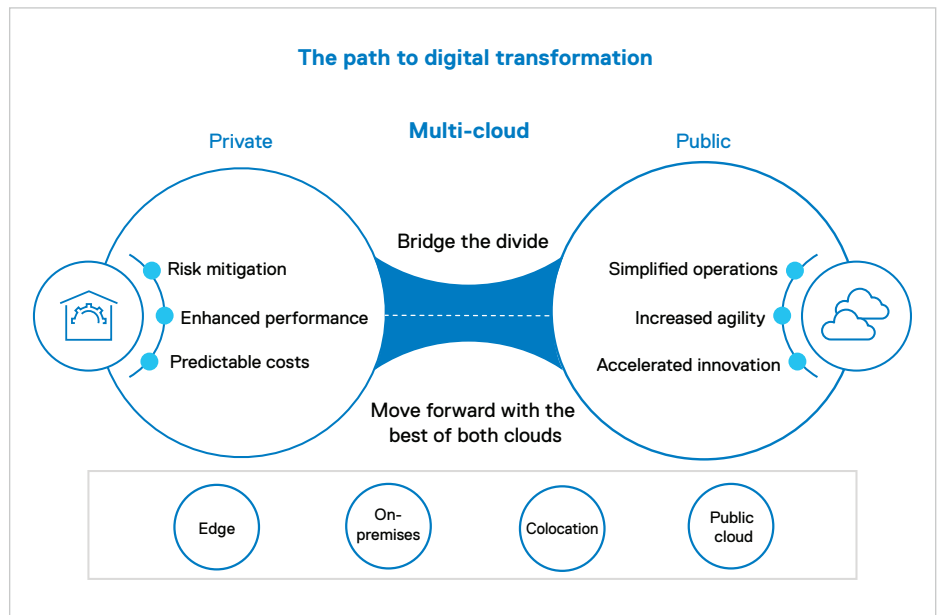### Enabling day-two services with Dell Technologies

As mentioned, Dell IT solutions, software and infrastructure portfolio establish the pillars for enabling IT operations running Oracle to address the challenges highlighted above. Working with Dell Oracle specialists, we explore how our best-in-class infrastructure solutions can enhance business and IT outcomes for Oracle environments.

Multi-cloud

Many organizations now adhere to a cloud-first policy, considering cloud-based technology solutions before all others. It's because they value the ease and agility of the cloud experience, particularly being able to provision services quickly, scale resources on demand and make payments over time.

According to an ESG study, while 78% of surveyed organizations who want to put services into production quickly — and, whenever possible, eliminate infrastructure management and maintenance — currently leverage public cloud infrastructure services, while at the same time 88% of cloud strategies include on-premises infrastructure.[1] Private cloud (sovereign IT deployed on-premises or hosted at co-location) is where businesses turn for increased control (especially as it relates to security incident response and compliance), enhanced performance, and predictable costs.

The path to digital transformation

Private   **Multi-cloud**   Public

Risk mitigation
Enhanced performance
Predictable costs

Bridge the divide

Simplified operations
Increased agility
Accelerated innovation

Move forward with the best of both clouds

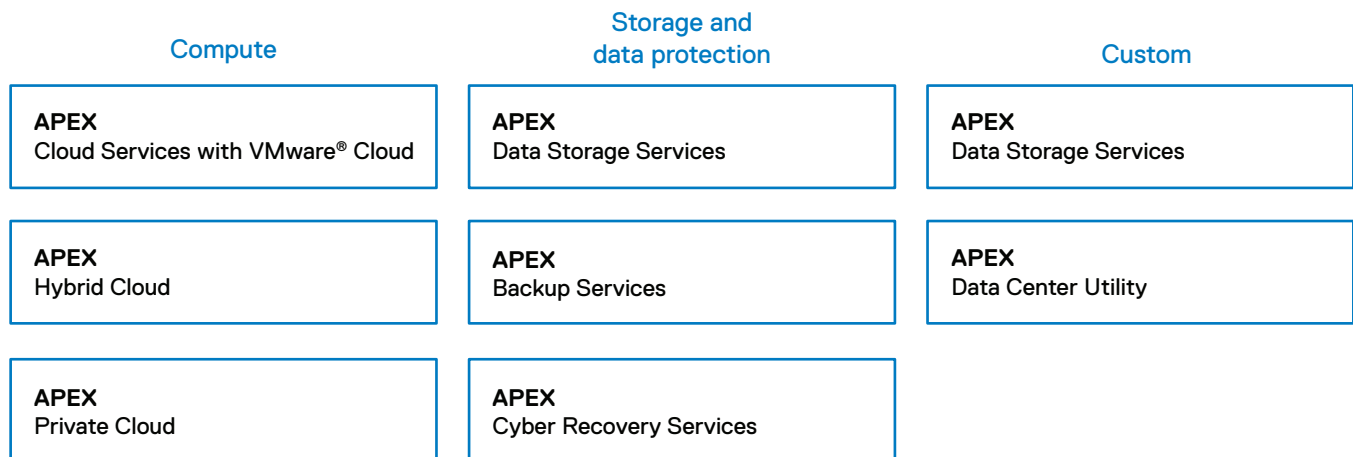Edge   On-premises   Colocation   Public cloud

Dell Technologies looks to provide IT the flexibility to scale and grow IT investments for Oracle with choice blending of CapEx and OpEx models, helping IT to achieve the right cost structure for running Oracle on best-in-class compute, storage, networking and data protection infrastructure.

With wide-ranging consumption models — pay for technology as you grow it, as you use it, and as a service — Dell Technologies offers flexibility and choice, supporting the various paths IT can employ for Oracle environments.

APEX-as-a-Service offers

APEX Cloud Services were built to meet the challenges of multi-cloud, giving you a more secure and consistent experience with the best-of-breed capabilities and performance that your Oracle applications and databases require.

Dell Technologies innovation delivered as a service

Compute	Storage and data protection	Custom
APEX Cloud Services with VMware® Cloud	**APEX** Data Storage Services	**APEX** Data Storage Services
APEX Hybrid Cloud	**APEX** Backup Services	**APEX** Data Center Utility
APEX Private Cloud	**APEX** Cyber Recovery Services	

Provision quickly, scale on demand and pay as you go across your entire multi-cloud environment.

APEX Custom Solutions

APEX Custom Solutions enable IT to create its own on-demand environment with preferred infrastructure and services customized to order for Oracle with pay-per-use consumption model or an enterprise-scale managed utility.

Create your own on-demand environment for Oracle with the following:

APEX Flex on Demand allows you to pay for technology as you use it, and it provides immediate access to buffer capacity. Flex on Demand is available with storage, server, converged and hyperconverged infrastructure, data protection and services.[2]

APEX Data Center Utility aligns costs directly to usage, allowing you to maximize your scaling flexibility while only paying for what you use.[3] It provides Dell's market-leading product portfolio built with Intel® flexibility and performance coupled with professional services and support to fully manage your data center and its operations in a simple, single-invoice monthly payment based on your actual usage.

Oracle in a multi-cloud operating model

Increasingly, the path to digital is through an as-a-service model. The preference is for a hybrid cloud approach, because business and IT leaders want the flexibility to choose the right path to best meet their objectives.

As mentioned before, an ESG survey revealed that while organizations want to put services into production quickly and, whenever possible, leverage public cloud infrastructure services, it is just as important that cloud strategies also include on-premises infrastructure.

Workload placement matters

It is beneficial to have a logical view to navigate deployment models strategy and planning discussions across applications and infrastructure teams.

The starting position is the business digital core. IT needs to consider the performance, availability, service levels, security and compliance requirements running heavy mission-critical Oracle environments. Simply stated, if core business applications and operations are disrupted, the surrounding connected ecosystem is impacted.

Run, connect and protect Oracle in the connected business
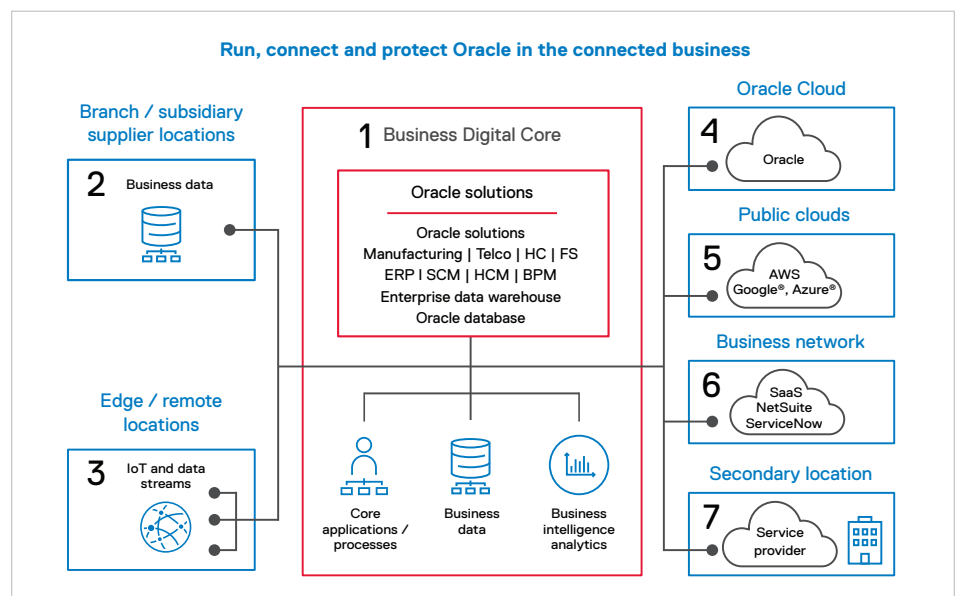
Building out from the business digital core, whether developing new applications, designing new experiences or inventing new business models, time to market depends on quickly connecting and integrating with new applications and innovations with the core applications, processes and business data. For example:

- With core business applications and processes becoming more intelligent at working business data and non-business data in various locations, IT and data services must support access to virtual and streaming data for DBAs, developers, application admins, business analysts and data scientists access.
- The proximity of the business digital core to Oracle Cloud and public clouds should also be considered. For many businesses, innovation with data — which, in many cases, results in new functional and vertical applications extensions — needs to connect with core applications and processes.
- In the digital business, it is becoming about the interconnected business ecosystem with business data, Oracle Cloud, and the business network. No organization is an island. To succeed, IT needs to create a fabric of connectivity that spans your company, your customers and your partners.

Classic and next-generation IT deployment models

To establish a competitive advantage, IT organizations must enable the business to further the digital transformation by embracing cloud capabilities and redesigning IT environments to meet diverse needs of Oracle (and non-Oracle) applications and database environments. The diagram below helps create a context for exploring classic and next-gen strategies for Oracle deployments.

Today's **classic and traditional models** encompass;

1. **Public (shared)** for innovation and analytics working with big data leveraging purpose-built databases and tools. This also includes early of adopters of cloud-first strategies who have moved some Oracle legacy applications such as PeopleSoft, JDE and E-Business Suite to public providers.
2. **Sovereign (dedicated) IT** is tailored to the businesses digital core running Oracle environments delivering performance, availability, service levels, security and compliance. It is worth noting that in some cases organizations are looking to repatriate mission-critical applications back to sovereign dedicated IT whether on-premises or hosted in a colocation.
3. **Distributed edge (aligned)** for branch offices, plants and remote locations working with Oracle and non-Oracle applications and databases.
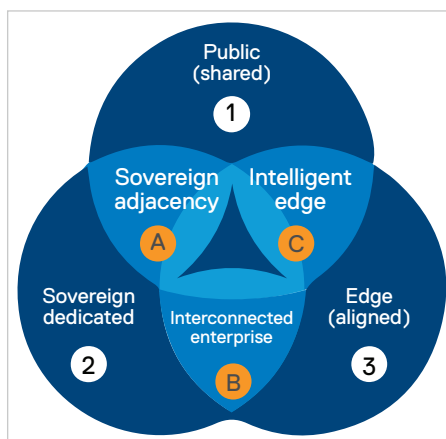
Next-generation combines and amplifies classic models, which is important to unlocking Oracle's value in the digital business.
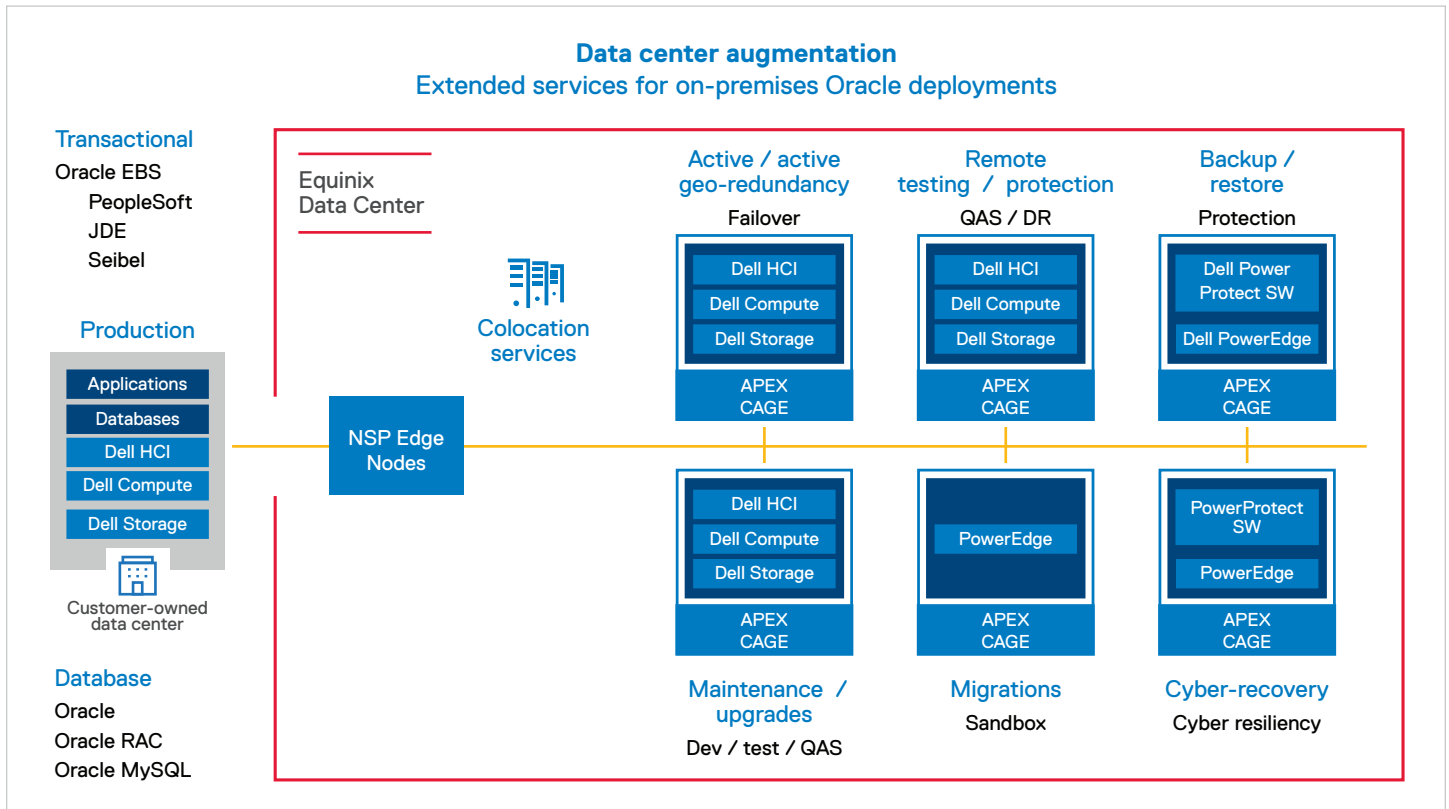
A. Sovereign adjacency extends sovereign dedicated IT to locate the digital core running Oracle to a facility, where network and cloud providers physically meet — e.g., Amazon® Web Services® (AWS), Azure, Google and Oracle Cloud.
B. Interconnected enterprise extends sovereign adjacency aligning IT resources where demand is greatest — across the global digital ecosystem connecting the core business with suppliers and partners integrating applications, processes and data.
C. Intelligent edge capitalizes on AI, IoT, edge processing and data streaming to deliver intelligent data for analytics and innovation including use by Oracle and non-Oracle applications, processes and database running in the business digital core.

Why colocation matters

Colocation facilities together with Dell IT solutions for Oracle provide IT and the business full control of Oracle applications and data without sacrificing cloud capabilities, convenience and value. Example deployment scenarios are illustrated below:

Data center augmentation: Oracle (non-Oracle) applications and Oracle databases in customer owned data center.

Scenario: For businesses preferring to maintain production Oracle environments in an on-premises private cloud, colocation provides a path to protecting Oracle applications and databases for high availability, disaster recovery, data protection and new projects for migrations, upgrades and maintenance.

Data center augmentation
Extended services for on-premises Oracle deployments

Transactional

Oracle EBS
PeopleSoft
JDE
Seibel

Production
- Applications
- Databases
- Dell HCI
- Dell Compute
- Dell Storage

Customer-owned data center

Database
Oracle
Oracle RAC
Oracle MySQL

Equinix Data Center

Colocation services

NSP Edge Nodes

Active / active geo-redundancy
Failover
- Dell HCI
- Dell Compute
- Dell Storage
- APEX CAGE

Remote testing / protection
QAS / DR
- Dell HCI
- Dell Compute
- Dell Storage
- APEX CAGE

Backup / restore
Protection
- Dell Power Protect SW
- Dell PowerEdge
- APEX CAGE

Maintenance / upgrades
Dev / test / QAS
- Dell HCI
- Dell Compute
- Dell Storage
- APEX CAGE

Migrations
Sandbox
- PowerEdge
- APEX CAGE

Cyber-recovery
Cyber resiliency
- PowerProtect SW
- PowerEdge
- APEX CAGE

Sovereign adjacency: Business digital core running Oracle aligned to hyperscalers

Scenario: Increasingly, with innovation, analytics and functional and industry application extensions happening on hyperscalers and public clouds (e.g., AWS, Azure, Google, Oracle Cloud), core business applications (ERP and financial, for example) will need closer physical proximity and network connectivity, providing significantly lower latency.

In this example, sovereign IT is extended for adjacency. Oracle production applications are deployed in a hosted Equinix colocation on sovereign IT infrastructure with Dell Technologies delivering the performance, availability, security and services levels required for mission-critical core. The physical proximity to hyperscalers and Equinix direct network connections provide low latency and security.
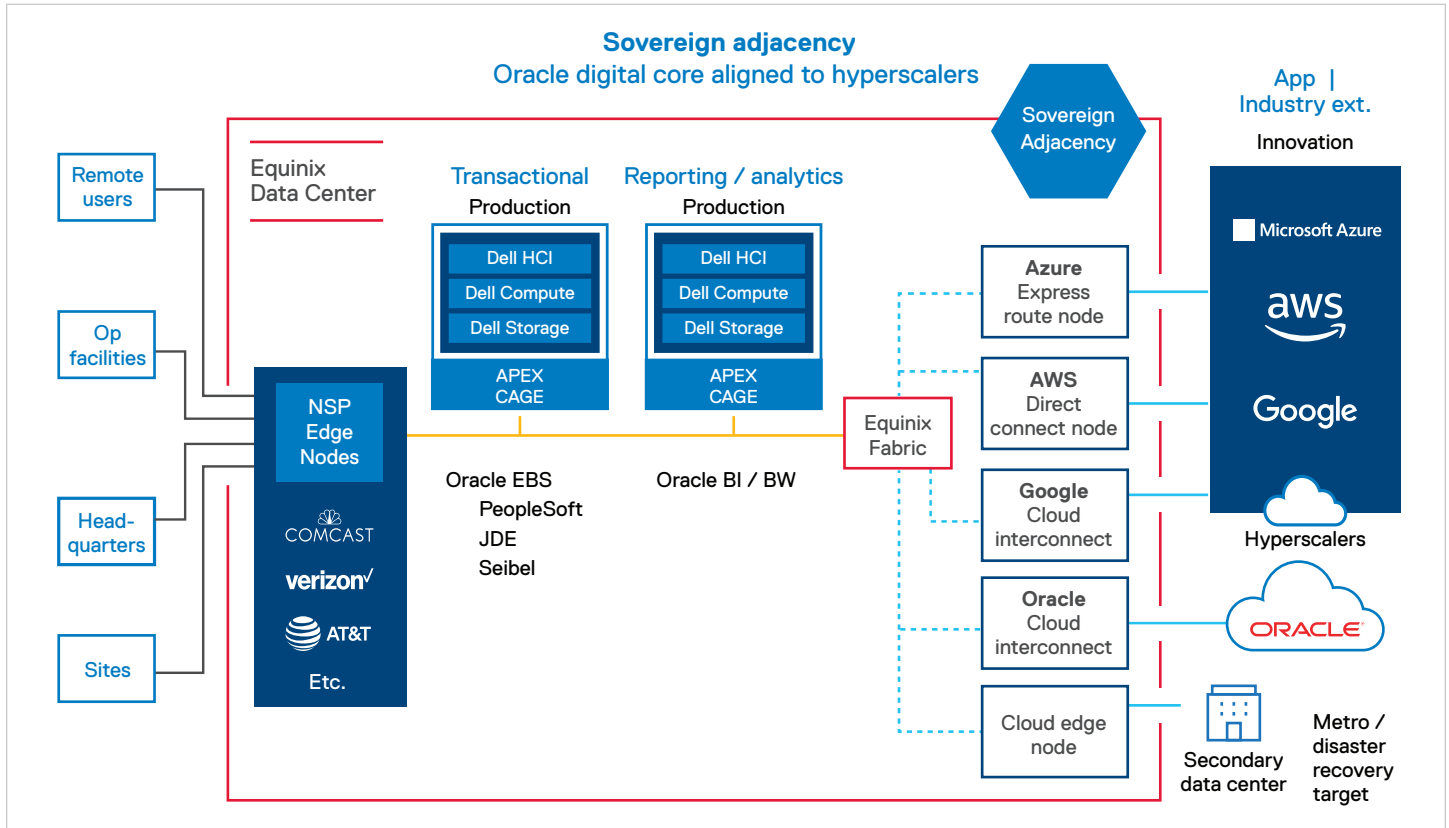
Interconnected enterprise: Oracle digital core running in the connected business
Scenario: A logical extension of sovereign adjacency is connecting the Oracle application core across the global ecosystem, connecting supplier, partners and SaaS providers with Equinix Cross Connects and Equinix International Business Exchange (IBX).
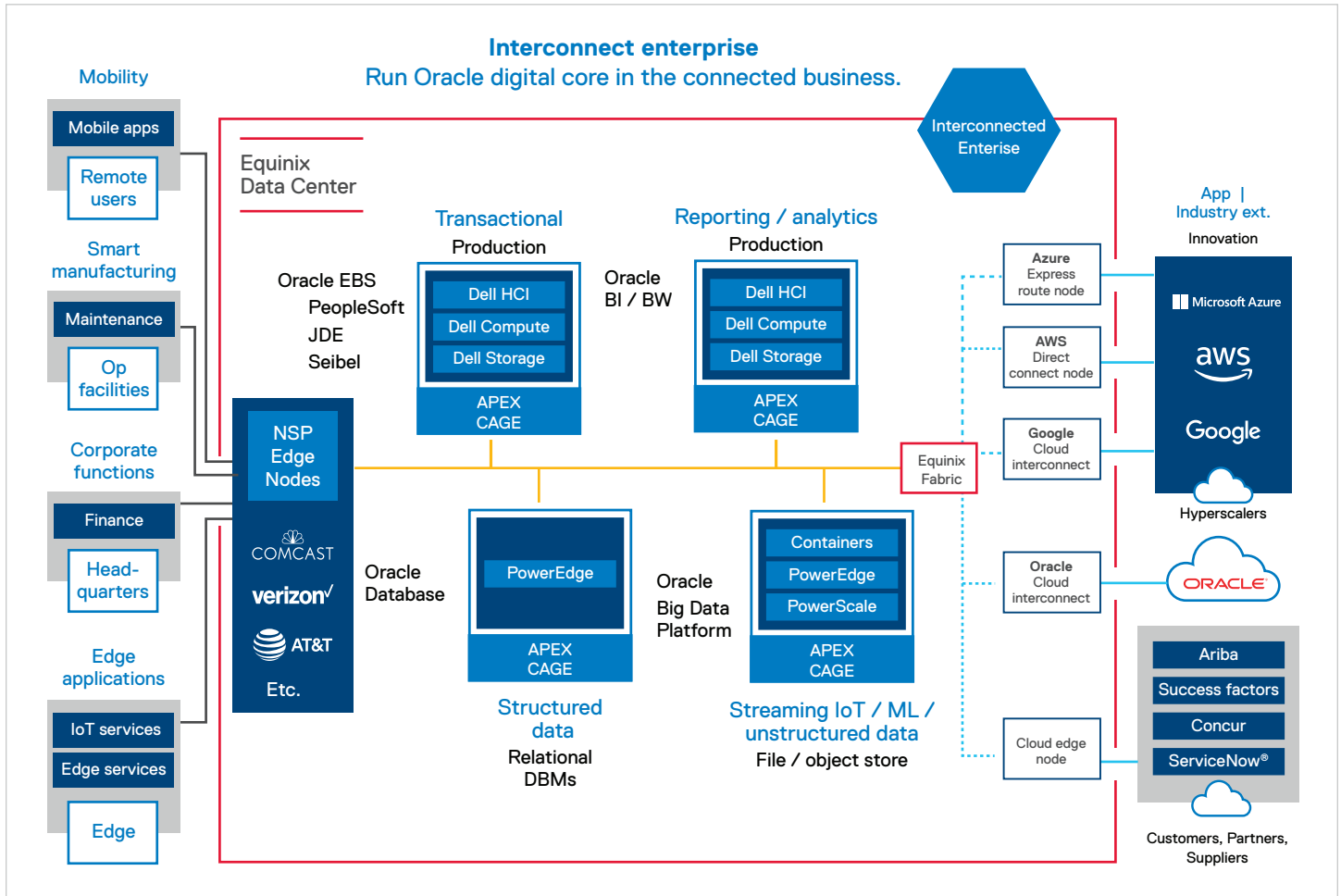
Multi-cloud: Oracle data protection and long-term retention

Data Protection with Dell Technologies APEX Multi-Cloud Data Services provides a single destination for protecting Oracle applications and data that originates with on-premises and public cloud providers. Data Protection with APEX Multi-Cloud Data Services is a managed service that provides a single target for backup and recovery for Oracle data that is on-premises and in AWS, Microsoft Azure and Google Cloud environments.
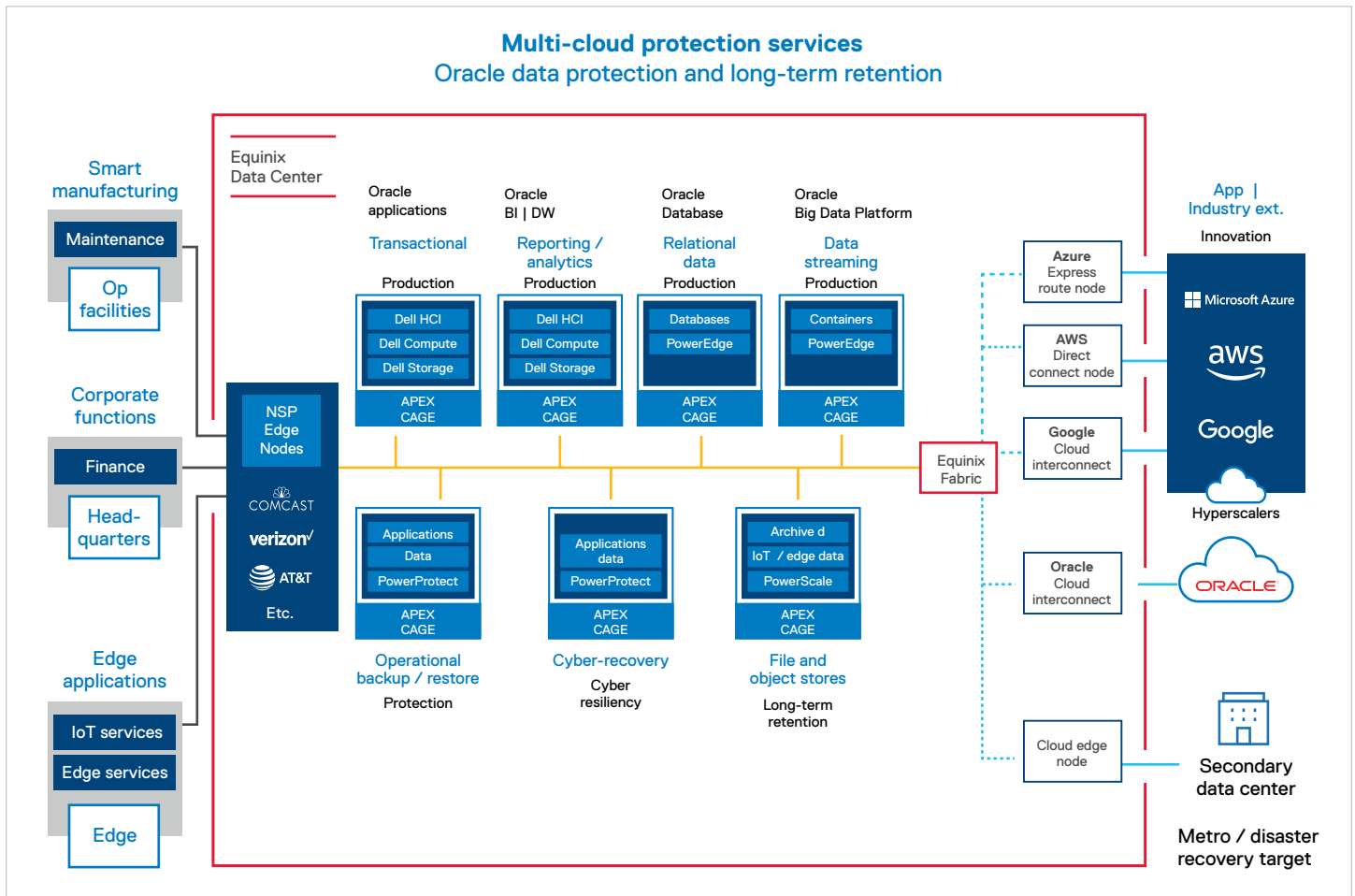
Dell Validated Designs for Oracle

Accelerating time to value for Oracle

Fundamental to our solution strategy for workloads like Oracle is designing offers with business and IT outcomes in mind. Key to this is our collaboration with leading software and technology partners to deliver compelling solutions for joint customers.

With our solutions investments, we look to enabling accelerated deployments with reduced risk and cost with partner certified Dell platforms and best-practice use cases.

Use Case	Description
Consolidate complex Oracle landscapes	Whether planned or unplanned, over time, sprawling Oracle application and database landscapes running core business functions have become complex to manage and maintain. Consolidate and reduce TCO for Oracle running on siloed IT with platforms ready to run mixed OLTP, OLAP and analytics workloads.
Oracle database containers	Container technology enables development teams to quickly provision isolated databases without the traditional complexities, but you need to maintain persisted data somewhere on the network, providing performance, scalability, resiliency and availability. Dell has you covered with storage platforms to dynamically provision persistent volumes and secure the cloud-native databases workloads.
Oracle Big Data SQL	Organizations are making significant investments to develop data management strategies using data warehouses, data marts, data lakes and so on to move from information to actionable insights. Dell has invested in validated designs to demonstrate how data virtualization can be an efficient and seamless experience with Oracle Big Data SQL with highly scalable storage services.
Oracle MySQL® Database	Supporting different storage engines for accelerating workloads, including OLTP, in-memory OLTP, data warehouses and very large databases (VLDB), the MySQL InnoDB a strong choice for web applications. Dell Technologies combines the value of MySQL with InnoDB clustering with the advanced storage capabilities for a high availability solution that transforms and mobilizes both traditional and modern workloads.

Table 1: Dell Validated Designs for Oracle

Taking the next steps

Regardless of whether you're just beginning your database transformation or well into that journey, operating on-premises or in the cloud, Dell Technologies is here to help you optimize your solution for today's needs and tomorrow's objectives.

We can ensure your organization gains control and reduces IT complexity by running Oracle on a modern, secure IT foundation that supports traditional and emerging Oracle applications and containerized databases working with AI, ML and IoT.

For more information about how Dell Technologies can support your Oracle environments, please visit: Dell.com/oracle.