This Is What Opportunity Looks Like

When it comes to your Oracle environment, data growth can look like opportunity or risk. Data is fast becoming the enterprise’s most valuable asset; however, explosive data growth creates challenges around databases and systems that are already large and complex.

How can mission-critical Oracle applications become more resilient so that the enterprise can extract value from ever-growing data? Data center directors wonder how to protect a complex and growing Oracle infrastructure, while the database administrator (DBA) worries about service-level agreements (SLAs) and recovery objectives across many Oracle database instances.

The EMC Protection Portfolio for Oracle can help. It comprises a range of backup and protection solutions that are optimized for Oracle environments, and it addresses the CIO’s strategic challenges while assisting the DBA’s daily operations. The portfolio delivers faster backups and improved recovery capabilities while helping to reduce costs through dramatic reductions in disk storage space. Learn how EMC solutions provide:

- Next-generation backup and recovery
- Local and remote replication
- Disaster avoidance and storage federation

Next-Generation Backup and Recovery for Oracle Environments

Oracle backups and recovery can be challenging in today’s enterprise. Large databases are growing and application environments are increasingly complex. Backup windows in some organizations can stretch as long as 24 hours and can require significant oversight. These challenges mean that DBAs often struggle to meet backup and recovery SLAs—putting valuable data at risk.

Data growth and complexity also require additional disk and tape capacity to store full backup copies. To free up disk space, IT organizations often move data to tape before short-term retention policies expire. But this dependence on tape for backup storage raises costs while lowering service levels.
Real-World Deployments

EMC’s IT organization:

• Runs more than 670 Oracle databases
• Generates more than 30 TB of Oracle Redo logs per day
• Backs up its mission-critical environments daily

EMC IT migrated their production mission-critical Oracle Global Data Warehouse and Oracle customer relationship management (CRM) environments to a new backup infrastructure based on EMC® Data Domain® and realized dramatic improvements. The new system is:

• Four times less costly: Data Domain appliances are one quarter the cost of legacy EMC disk libraries and virtual tape libraries.
• Eight times faster: Data Domain achieves transfer speeds of up to 4 TB/hour compared to 500 MB/hour on the legacy system.

The Data Domain system delivered greater reliability, greater backup density by storing more backups, and improved protection by easily replicating backups to an offsite location. READ ABOUT THE JOURNEY.

Simplify and Enhance Oracle Backup and Recovery

You can address these challenges and simplify Oracle backup and recovery with EMC® Data Domain® deduplication storage systems. These systems are optimized for backup and archive data, making them a cost-effective alternative to tape. Because they store data on disk, recovery from backup becomes fast and reliable while their deduplication technology enables you to keep more copies of data for longer periods. In addition, Data Domain integrates with Oracle Recovery Manager (RMAN), which lets you back up Oracle environments directly to disk using RMAN and a network-attached storage Data Domain as a target. READ THE WHITE PAPER.

Figure 1: EMC® Data Domain® integrates with Oracle RMAN, which lets you back up directly to disk.

Data Domain systems can reduce the amount of storage required by as much as 30 times through inline deduplication, which lets you store weeks or months of full backups.¹

Enhance Backup through Oracle RMAN Integration

You can further enhance backup efficiency with the Data Domain Boost plug-in for RMAN, which improves backup performance by distributing parts of the deduplication processing from the Data Domain system to the Oracle server. This integration can decrease CPU utilization on the Oracle server and reduce LAN bandwidth required by 80 to 99 percent because only unique data is sent to the Data Domain system.¹

Integration of Oracle RMAN and Data Domain Boost gives DBAs needed visibility into and control over backup and disaster recovery processes without involving the backup administrator. Additionally, integration of Oracle RMAN and Data Domain Boost gives DBAs the following:

• Faster, more efficient Oracle backups, reducing backup window time
• Catalog aware, centralized disaster recovery
• Simplified administration
• Support for Oracle Database 10g, Oracle Database 11g, and Oracle Real Application Clusters (RAC)

EMC Data Domain deduplication storage systems can simplify complex Oracle backup processes while also controlling costs and meeting retention requirements.
Flexible Replication: Local, Remote, and Continuous Protection

Oracle environments are among many enterprises’ most critical IT assets. To support crucial Oracle application development efforts, administrators and development teams need to deploy new test and development environments without impacting the production environment. However, that process is time consuming and costly. Organizations that want to derive the most value from their Oracle investments and their enterprise data must reduce the time and costs associated with provisioning multiple test and development environments.

To do so, organizations need a solution that provides seamless and continuous access to their databases and the applications those databases support while making efficient use of infrastructure resources. This availability becomes possible with EMC technologies, including EMC® Symmetrix® VMAX® arrays, EMC® VNX® unified storage systems, and EMC replication software.

Local and Remote Replication with EMC VNX

The VNX series is designed to deliver maximum performance and scalability for enterprises, enabling them to dramatically grow, share, and cost-effectively manage multi-protocol file and block systems.

The VNX Operating Environment (VNX OE) allows Microsoft Windows and Linux/UNIX clients to share files in multi-protocol NFS and Common Internet File System (CIFS) environments. At the same time, VNX OE supports Internet SCSI (iSCSI), Fibre Channel (FC), and Fibre Channel over Ethernet (FCoE) access for high-bandwidth and latency-sensitive block applications.

EMC VNX protects against hardware or software failure by providing one or more standby Data Movers.

Storage tiering on VNX systems can be managed automatically by EMC® Fully Automated Storage Tiering (FAST) Suite. The FAST Suite contains the necessary software, specifically FAST Cache and FAST VP, to improve performance and maximize storage efficiency.

VNX offers several solutions for local and remote replication of Oracle databases and applications data.

Local Protection Suite for safe data protection and repurposing that uses block storage snaps and clones, file system snaps and DVR-like recovery for local storage.

Remote Protection suite enables data protection against localized failures, outages and disasters that give granular file system level replication and recovery. It gives integrated WAN deduplication and bandwidth reduction and enables unified storage replication with a DVR-like recovery.

VNX systems also support the Application Protection Suite, which automates application copies to help ensure that users can recover the data they need. The software also generates alerts automatically to help identify recovery gaps, and it includes integrated reporting functionality that helps prove compliance with data protection policies.
Symmetrix VMAX systems are built on the highly scalable EMC Virtual Matrix Architecture, which enables you to scale the systems seamlessly and cost-effectively.

Storage tiering on VMAX systems can be managed automatically by EMC® Fully Automated Storage Tiering for Virtual Pools (FAST VP™), and VMAX supports flash, Fibre Channel (FC), and Serial ATA (SATA) drives, in addition to RAID 1, 5, and 6.

Symmetrix VMAX offers several solutions for local and remote replication of Oracle databases and applications data, including Symmetrix Remote Data Facility (SRDF) software and EMC® TimeFinder® software.

Remote Replication with VMAX and Symmetrix Remote Data Facility
SRDF is a configuration of multiple Symmetrix units that work together to maintain real-time (with SRDF/S) or near real-time (with SRDF/A) copies of host devices in more than one location. The Symmetrix units can be in the same room or hundreds of miles apart. SRDF provides data mobility and disaster restart spanning multiple host platforms (including the boot volume/LUN), operating systems, and applications.

Built for VMAX architecture, the SRDF family delivers a wide range of distance replication capabilities. With SRDF software, single or multiple database mirrors can be created, together with their external data, application tiles, and/or message queues all sharing a consistency group. Replicating data this way creates a point of consistency across business units and applications before any disaster takes place.

Local Replication with VMAX and TimeFinder
The TimeFinder family of software provides reliable local storage replication for VMAX for use in disaster recovery testing, backups, point-in-time recovery, and test and development environments. TimeFinder lets you create or restore multiple local copies of databases in seconds (either full volume clones or virtual snapshots), regardless of the database size. Such operations are incremental and only changes are copied over.

As soon as TimeFinder creates (or restores) a replica, the target devices (or source) shows the final image as if the copy has already finished, even if data copy operations continue incrementally in the background. This functionality shortens business operation times and simplifies Oracle backups and provisioning. For example, rather than performing backup directly on production servers, backup processing can be offloaded in seconds to a standalone replica. Database recovery can start as soon as a TimeFinder restore operation starts. This ability, also referred to as parallel restore, dramatically reduces recovery time objective (RTO) and increases business availability.
Real-World Deployment

GENEX Services is a large managed care provider in North America, with more than 2,700 employees across 60 service locations. In 10 years, the company’s storage quadrupled from 15 TB to 60 TB, pushing its storage solution beyond its limits. Performance problems affected productivity, prevented full implementation of a disaster recovery plan, and stalled the company’s virtualization strategy.

GENEX replaced the system with EMC® VNX® and EMC RecoverPoint™ while strengthening its disaster recovery capability. While the legacy storage buckled under the added workload of replicating data, VNX and EMC RecoverPoint handle it with ease.

"Even though we had the equipment to do replication, we didn’t have the horsepower," says Dennis Robinson, director of technical infrastructure at GENEX Services. "We have apps that our customers expect to be recovered within four hours, and that was a real challenge before. Now, with the VNX and RecoverPoint, we’re quite confident in meeting our recovery time objectives."

Safeguard Your Data Integrity

A new standards-based, end-to-end data integrity solution—the result of a joint effort by EMC, Emulex, and Oracle—mitigates episodes of silent data corruption so that you can have confidence in the data you copy and restore through real-time data corruption checks. Silent data corruption occurs when invalid data is read or written rather than causing a failed input/output (I/O) operation. It is called silent because it does not generate I/O errors that would allow applications and data center staff to detect it. To help protect against silent data corruption, the joint EMC, Oracle, and Emulex solution implements the protection information (PI) additions to the T10 SCSI Block Commands (SBC) standard, which enable the validation of data as it moves through the data path.

EMC Symmetrix VMAX is the first enterprise storage array to implement end-to-end T10 PI. The joint solution ensures data integrity throughout the I/O stack using the following components:

- Unbreakable Enterprise Kernel for Oracle Linux
- Emulex LightPulse 8 Gb Fibre Channel host Bus Adapter (HBA)
- EMC Symmetrix VMAX family array

Metadata generated by Oracle Automatic Storage Management (ASM) is validated first by the host operating system, then by the Emulex LightPulse 8 Gb Fibre Channel HBA (model number LPe12000-E), and finally by the EMC Symmetrix VMAX 40k storage array with EMC® Enginuity™ version 5876.82.57 or later, ensuring protection through the I/O stack.

Full Application Replication with EMC RecoverPoint™

When you need to protect your entire Oracle application infrastructure rather than just the databases, EMC VNX or EMC VMAX with EMC RecoverPoint let you replicate all application components, not just the database files, overcoming limitations of Oracle Data Guard.

The EMC VNX Series are unified storage devices that support file and block level storage on a single platform. They integrate with Oracle Direct NFS (dNFS) to provide flexible backup options for physical and virtual Oracle environments. EMC RecoverPoint is replication technology that uses sophisticated journaling techniques and write splitting to provide local and remote replication. VNX or VMAX systems, together with EMC RecoverPoint, provide fast and easy recovery to any point in time—a granularity not possible with other replication technologies. EMC RecoverPoint enables:

- Continuous Data Protection (CDP): CDP continuously captures and stores data modifications locally, enabling local recovery from any point in time, with no data loss. Both synchronous and asynchronous replication are supported.
- Continuous Remote Replication (CRR): CRR supports synchronous and asynchronous replication between remote sites over FC and a WAN. Synchronous replication is supported when the remote sites are connected through FC and provides a zero recovery point objective (RPO). Asynchronous replication provides crash-consistent protection and recovery to specific points in time, with a small RPO.
Real-World Deployment

Sanofi, a global and diversified healthcare leader wanted to utilize a cohesive end-to-end architecture to facilitate optimal information mobility and access.

Challenges

- Need to share profession data between all group sites globally
- Consolidate 26 IT sites into three major data centers in the U.S., France and Singapore

Results

- Simple Data Migration
- Three identical data center providing high-availability services
- High-performance, secure and scalable data sharing

"On Reflection, we chose to create a private cloud through a partnership using a single ecosystem, so we went with EMC." says Sebastien Roque.

Disaster Avoidance with EMC® VPLEX® and Active-Active Data Center Innovation

Global enterprises demand always-on application and information availability to remain competitive. They have aggressive RTOs and RPOs for mission-critical systems. To meet these objectives, businesses must eliminate single points of failure and maximize the number of available points-in-time for disaster recovery—all while reducing infrastructure costs and increasing resource utilization.

One way that organizations manage these challenges is with Oracle RAC. Oracle RAC enables a single database to run across a cluster of servers with access to shared storage, providing fault tolerance and 24/7 availability. RAC can span between data centers, but geographic distance is limited. EMC VPLEX helps you overcome the distance limitation. VPLEX lets you extend Oracle RAC across remote sites for a true active-active solution that helps you avoid disasters—not merely recover from them. READ THE WHITE PAPER.

EMC VPLEX is an enterprise-class storage federation technology that aggregates and manages pools of FC-attached storage within and across data centers. VPLEX Metro provides data access and mobility between two VPLEX clusters within synchronous distances.

Figure 2. Combine EMC® VPLEX® Metro storage virtualization technology with Oracle RAC on extended distance clusters to remove the data center as a single point of failure.

The VPLEX solution simplifies the deployment of Oracle RAC and increases availability by enabling:

- Active-active data centers that support RPO and RTO of zero, in addition to mission-critical business continuity
- Third-site replication and recovery to specific points in time in the event of data corruption, viruses, or human error
- Quick recovery and restart of your Oracle databases and applications
- Virtual machine migration across distance

READ THE CASE STUDY.
Comprehensive Protection for Oracle Environments

If you look at data growth and see risk rather than opportunity, it might be time to re-envision your Oracle protection strategy. Don't let backup and recovery complexity dilute the value of your growing volumes of data. Organizations that deploy EMC Protection Portfolio for Oracle solutions enjoy comprehensive protection for their Oracle databases and application infrastructure, enhance efficiency, and reduce costs. Contact your EMC representative today to learn how the EMC Protection Portfolio for Oracle can help transform your backup, recovery, replication, and disaster preparedness processes.

CONTACT US

To learn more about how EMC products, services, and solutions can help solve your business and IT challenges, contact your local representative or authorized reseller—or visit us at www.EMC.com.

1 EMC. “EMC Data Domain Boost for Oracle Recovery Manager.”

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