Dell EMC VPLEX and Oracle Extended Real Application Cluster (RAC) provide true disaster avoidance solution

VPLEX enables Oracle Extended RAC over metro distance

ESSENTIALS

VPLEX solution:

- Enables customers to implement Oracle Extended RAC over distance
- Oracle certified and supported
- Reduces complexity and management
- Allows users to relocate, share and balance infrastructure resources between sites
- Provides deterministic I/O continuation on site partition events

VPLEX Provides:

- Active/active use of both data centers for continuous application availability
- High availability for applications
- Fully automatic failure handling
- Better resource utilization
- Lower capital and operational costs

The Challenge

Global enterprises demand always-on application and information availability to remain competitive. Dell EMC VPLEX™ and Oracle™ Extended RAC offers high availability and disaster avoidance for mission-critical applications, such as Oracle database and applications. Recovery Point Objectives (RPO) and recovery time objectives (RTO) are key metrics when planning a business continuity strategy.

For mission-critical Oracle applications, high availability is essential. This dictates aggressive RPOs and RTOs and demands solutions that minimize data loss and recovery times. The main challenges that businesses must consider when designing a high availability and disaster recovery (DR) solution include:

- Minimizing RPO and RTO
- Eliminating single points of failure (SPOF)—technology, people, processes
- Maximizing resource utilization
- Reducing infrastructure costs
- Managing the complexity of integrating, maintaining and testing multi-point solutions
- Gaining certainty about where applications and databases will continue running during WAN and site loss events.

This solution addresses these challenges for Oracle mission-critical applications.

VPLEX

The VPLEX family removes physical barriers within, across and between data centers. VPLEX Local provides simplified management and nondisruptive data mobility across heterogeneous arrays. VPLEX Metro provides data access and mobility between two VPLEX clusters within synchronous distances. VPLEX Metro is a SAN-based federation solution that delivers both local and distributed storage federation.

Oracle RAC

Oracle Extended RAC, with Oracle Database 11g/12c Enterprise Edition, enables a single database to run across a cluster of servers, providing unbeatable fault tolerance, performance and scalability with no application changes necessary. Benefits include: 24/7 availability, on-demand scalability, flexibility, lower costs, world-record performance and grid computing.

VPLEX Metro and Oracle Extended RAC Solution

VPLEX Metro is the enabling technology for this solution. VPLEX delivers a multi-site high-availability virtual storage layer while significantly simplifying the configuration and ongoing management of extended RAC deployments. Its breakthrough Active/Active technology, enables the same data to exist in two separate geographical locations, accessed and updated at both locations at the same time.

VPLEX Witness, architecturally designed for VPLEX Metro clusters, is a virtual machine that runs in an independent (third) fault domain. Witness provides certainty about where each application and database will continue to run should a WAN or site loss event occur. When using VPLEX Metro Active/Active replication technology in conjunction with VPLEX Witness, the lines between local high availability and synchronous distance disaster recovery are blurred because high availability is stretched beyond the data center walls.

VPLEX extends the high availability of Oracle Extended RAC greater distances, up to 5 ms RTT, by providing the shared distributed storage required by Extended RAC across those distances with local read access times. By mirroring between sites, VPLEX adds to the storage layer availability by allowing database instances to continue to operate in the event of an array failure or even a complete site failure.
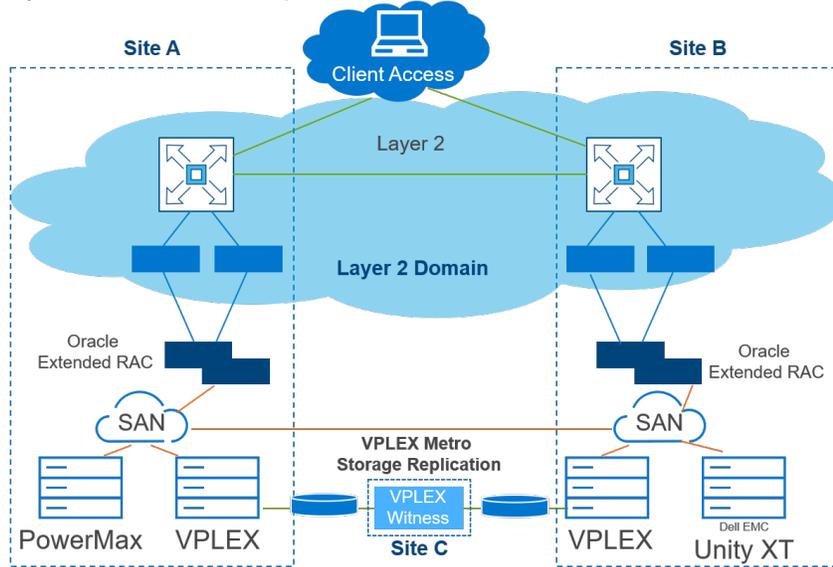
Figure 1.   Solution Architecture: FC=Orange, Ethernet=Blue and IP=Green

Testing: Validating VPLEX Metro with Oracle RAC

In order to validate the functionality of the Dell EMC VPLEX and Oracle Extended RAC solution, Dell EMC E-Lab™ created and deployed an Oracle Extended RAC configuration attached to VPLEX across multiple operating system platforms (UNIX, Linux, Windows). The configuration was comprised of:

- Oracle ASM
- Four RAC cluster nodes
- VPLEX Metro
- Oracle GRID Infrastructure with Oracle database
- VPLEX Witness (deployed on virtual machine)
- Dell EMC PowerPath® for multipathing
- Distance extension simulation equipment (5ms delay for network and FC traffic)

Qualifications consisted of integrating VPLEX hardware and software components with Oracle DB/RAC and ensuring data integrity and consistency in a cluster environment. Testing focused on interoperability of the whole solution and included hardware replacement (drives, directors, storage processors), test case scenarios, online configuration changes (including code upgrades), cluster behavior during I/O interruptions, I/O path distractions for SAN components and cluster nodes failover and heartbeat failure simulations.

Proven Results

Instead of the traditional DR deployment model of Active/Passive production and DR data centers, this solution demonstrates an innovative Active/Active deployment model for data centers up to 5 ms RTT latency apart. This model transforms the entire infrastructure from a disaster recovery solution to a true disaster avoidance solution, with 24/7 application availability, no single points of failure, and zero RTO and RPO. No other solution provides the level of continuous availability and local-like performance at both locations simultaneously.
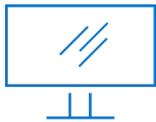
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