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Application Note 112

Oracle Real Applications Cluster (RAC)

INTRODUCTION

Oracle RAC software provides continued operation of Oracle applications and databases in the event of a server failure. This creates an extraordinarily high availability database environment, balances workloads across multiple servers and allows unprecedented levels of scalability.

The key to Oracle's clustering solution is their Cache Fusion - cache RAM shared by multiple Oracle instances. This enables many Oracle sessions to run on separate servers and coordinate cluster status information. If any server fails, Transparent Application Failover (TAF) enables each application to continue individually on designated backup servers to avoid overloading a single backup server. An article on Oracle's web site estimated that, "in a 12-computer configuration, an application running on Oracle9i RAC would not experience a catastrophic failure for well over 100,000 years."

Oracle RAC requires that all the servers in the cluster share data volumes. Normally a SAN is used to create an Oracle RAC. In fact, Oracle disclosed that they developed RAC after realizing that SANs could easily be used to create a database cluster environment. Building a SAN generally requires redundant Fibre Channel switches and an elaborate, expensive infrastructure.

However, there is another way. A disk array with direct connections for up to 8 servers *without a switch* provides a virtual "SAN-In-A-Box" that is a perfect way to implement an Oracle RAC without the cost and the complexity. This simple solution also means that there are far fewer components to fail and thus is inherently more reliable.

WHY ORACLE REAL APPLICATIONS CLUSTERS

- High availability Oracle environment
- Faster response time
- Faster reports, sorts and queries
- Workload balancing

REQUIREMENTS

- Disk array with multiple ports
- Oracle Real Applications Cluster Software

TYPICAL ENVIRONMENTS

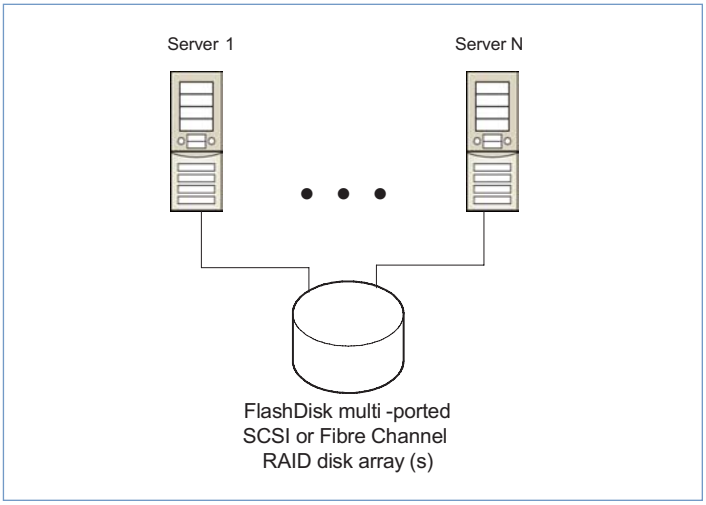
- 24x7 operations
- High transaction environments
- Large number of users

BENEFITS

- High availability database access
- High productivity
- Low cost

HOW IT WORKS

Up to 8 servers running Oracle RAC can be directly connected to a FlashDisk RAID array to create a simple, reliable and low cost cluster. Each server in the cluster sees the same storage. Oracle RAC coordinates access to the shared storage. The FlashDisk can be configured as a single logical unit or partitioned into several logical units. The Oracle database administrator determines storage assignments to various servers. FlashDisk supports all operating systems including UNIX, Linux and Windows. No software drivers are required on the servers. FlashDisk support RAID 1, 3, 5, 10, 15 and 50. FlashDisk also supports Oracle's "raw" partitions to avoid operating system overhead for efficiency as needed. The multiple ports on the FlashDisk RAID disk arrays provides a virtual "SAN-In-A-Box" and is a perfect storage device to use as the basis for an Oracle RAC. The solution easily scales in groups of eight servers. Clusters of over eight servers in a single cluster are easily created with switches. FlashDisk supports all versions of Oracle including versions 9i and 10g.



The diagram shows how Oracle Real Application Cluster software, multiple servers and a FlashDisk multi-hosted storage array can create a simple, high performance and yet exceptionally reliable Oracle Real Application Cluster at very low cost.

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