

Software Service Level Agreement and Database HA solutions

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Michael Chapiro

- HA project typical Workload Breakdown Structure
- Database HA main terminology and concepts
- Oracle Database HA Solutions
- Solutions

Topics

- A **service level agreement (SLA)** is a **contract** between a **service** provider (either internal or external) and the end user that defines the **level** of **service** expected from the **service** provider.
- Service-level requirements are the levels of service provider is expected to support. They consist of the service-level expectations and operational requirements and provide guidelines for handling delays and failures.
- Service-level requirements can be broken up into two categories of requirements: service-level requirements and operational requirements.
- Service-level requirements assist in aligning the HA technology implementation with the project's scope—the project's business goals. It starts with identifying customer service-level requirements by first analyzing requirements of existing systems. This analysis includes reviewing existing system operational, technical, and support procedures and documentation.

SLA and SLR definitions

Tier	Severity-Level Description	Performance	Availability	Resolution Requirement
5	Normal operation	System is responding at normal operating baseline.	System is 100% available. All outages are properly scheduled.	None
4	Severity level 4: Trivial problem with little or no impact	Performance is 10% to 30% below the required baseline.	90% to 95% of the applications or application functionality is available.	Must be resolved within five days
3	Severity level 3: Minor problem with minimal impact	Performance is 30% to 50% below the required baseline.	85% to 90% of the applications or application functionality is available.	Must be resolved within three days
2	Severity level 2: Noticeable problem with measurable impact	Performance is 50% to 70% below the required baseline.	80% to 85% of the applications or application functionality is available.	Must be resolved within one day
1	Severity level 1: Severe problem with high business impact	Performance is 70% or more below the required baseline.	75% or less of the applications or application functionality is available.	Must be resolved within three hours

Example of Service Level Requirements

Scheduled Maintenance Outages	The last weekend of every month will be reserved for Oracle RAC system maintenance operations. The outage will not last more than 56 hours, starting Friday evening. These outages will be reserved for maintenance operations that cannot be performed "online."
System Backups	Full backups will be run online on the weekends, with incremental backups performed in the evenings during the week. Four weeks' worth of backups will be maintained on tape, with one day's worth of backups maintained on disk.
Failover Procedures	All application sessions should fail over to available Oracle RAC nodes in the event of a single-node failure. In the event of a localized disaster in which all Oracle RAC nodes are unavailable, the local standby environment should come online within three hours.
Disaster Recovery Procedures	In the event of a sitewide disaster, the off-site standby environment will be brought online within three hours.
System Capacity	The system should support our current user load, with a projected two-year user increase, and support the current set of applications. In the event that the system is not keeping up with the user load, additional Oracle RAC nodes will be added. Processor, memory, and storage requirements will be based on data gathered on current application performance on the existing hardware.

A sample of operational requirements list

- Full Tolerance Systems
- Resilient Highly Available
- Share Nothing Systems
- Share Everything Systems
- Single Instances vs Cluster Systems
- Storage & Interconnect

Database HA main terminology and concepts

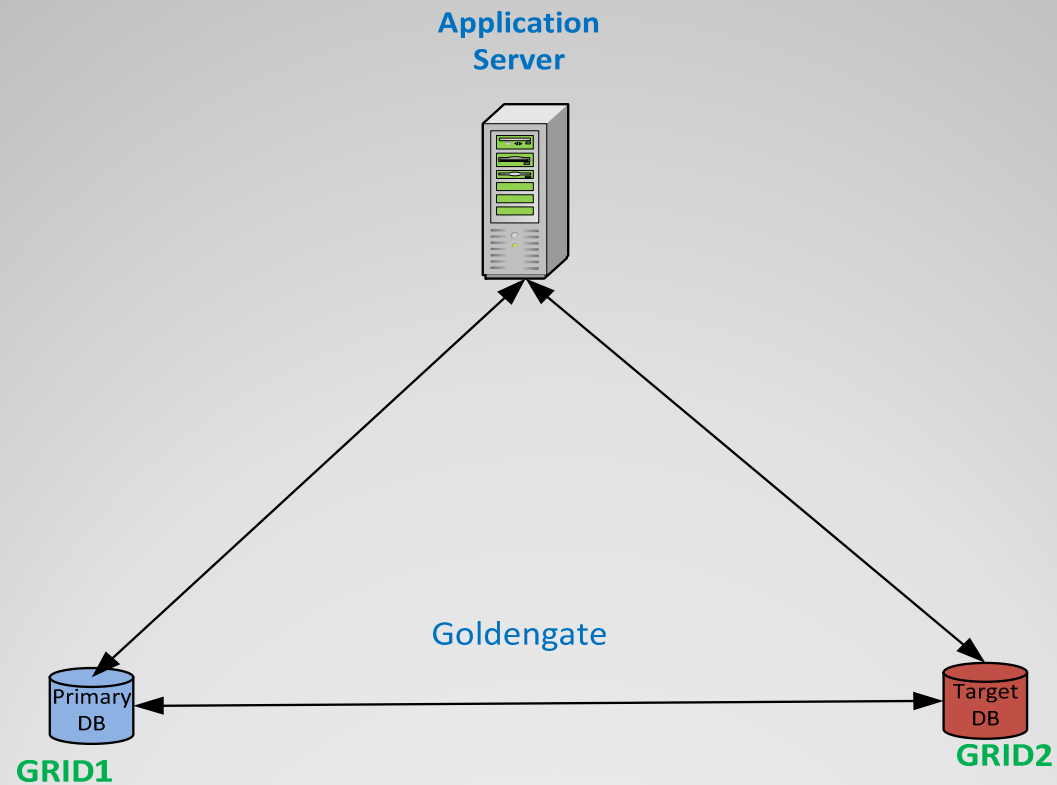
- Oracle Advanced Replication
- Oracle Standby/Active Data Guard
- Oracle RAC One Node to Multiple Nodes
- Oracle Database with Oracle Clusterware and Data Guard
- Oracle RAC and cold failover with Data Guard
- Oracle Database with Oracle RAC on Extended Clusters

Oracle Database HA Solutions

- Oracle HA using Oracle Advanced replication:
 - Using Oracle Streams
 - Using Golden Gates
 - Oracle GoldenGate is deployed from the ground up, the applications become replication-aware (transparent replication) which promote Oracle GoldenGate for a high availability platform.

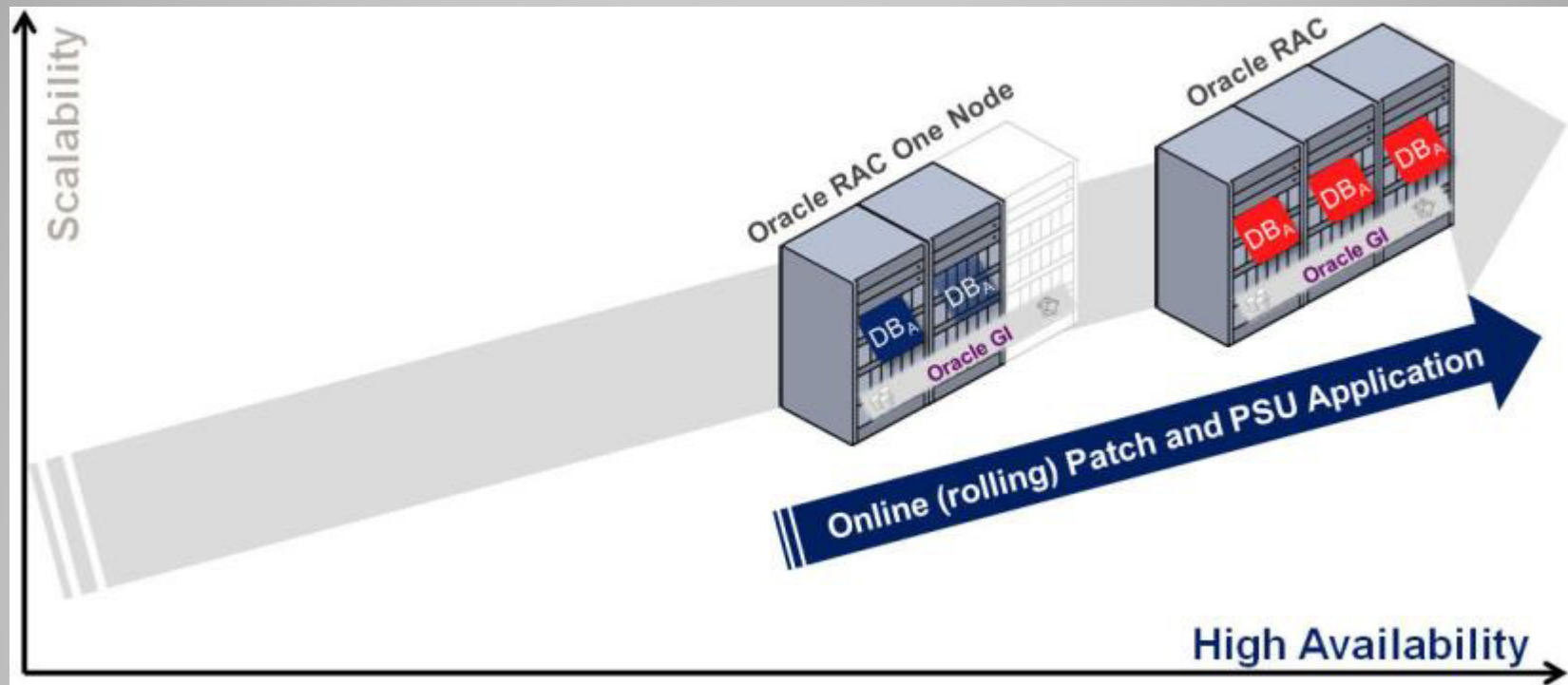
Oracle Database HA Solutions

Oracle HA using Oracle Advanced replication

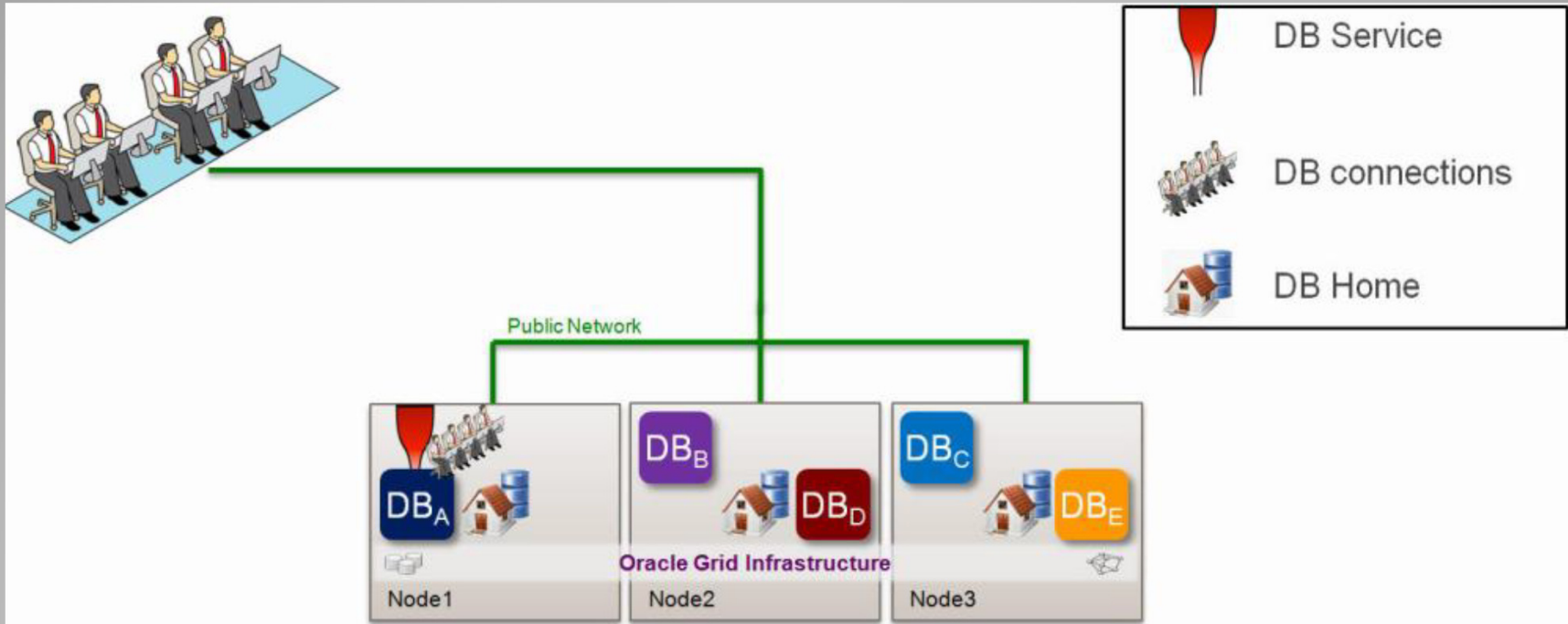


Oracle Database HA Solutions

- Oracle RAC One Node 12c

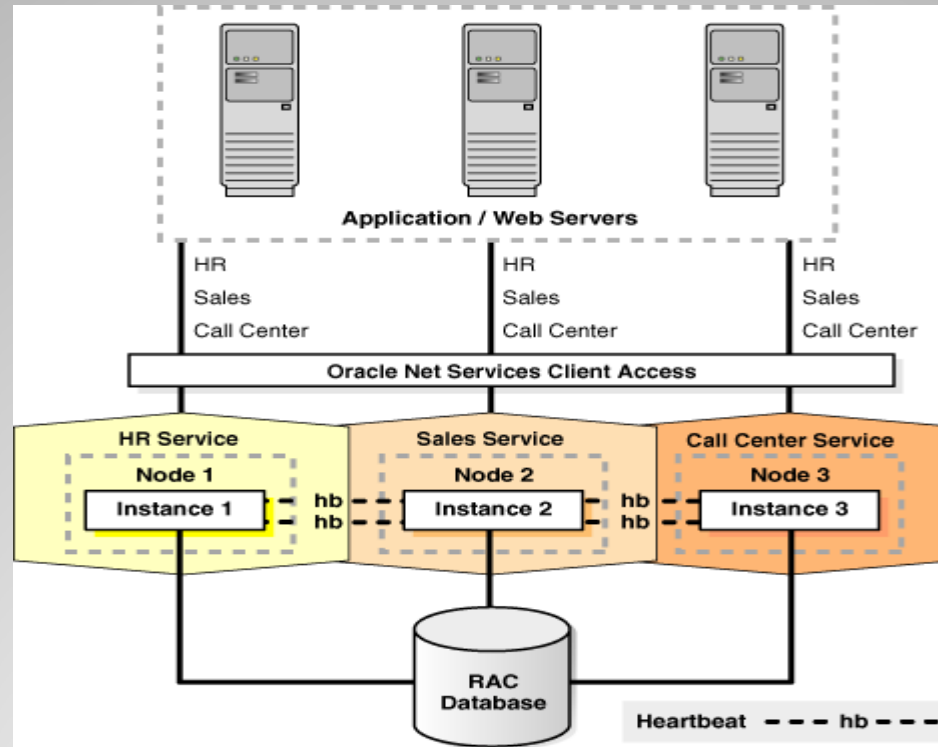


Oracle Database HA Solutions



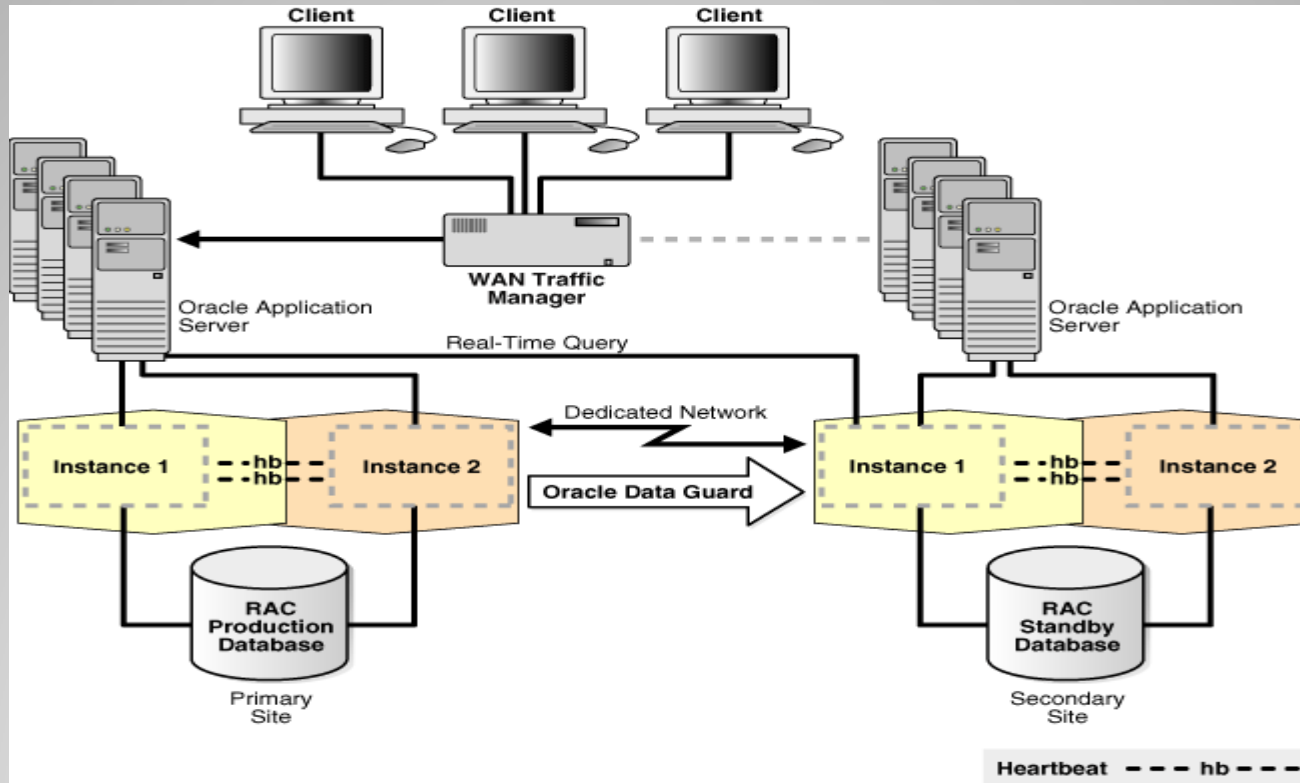
Oracle Database HA Solutions

- Oracle RAC Database



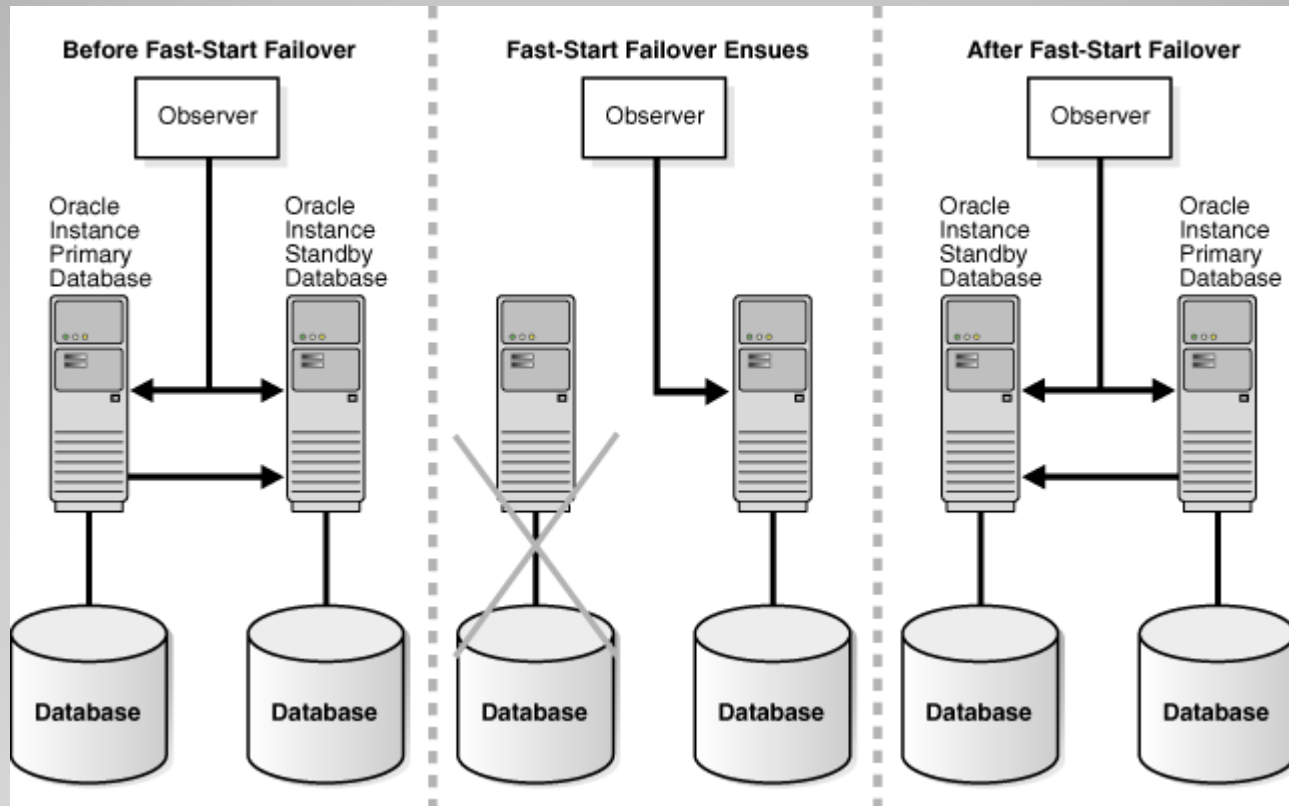
Oracle Database HA Solutions

- Oracle Database with Oracle RAC and Data Guard



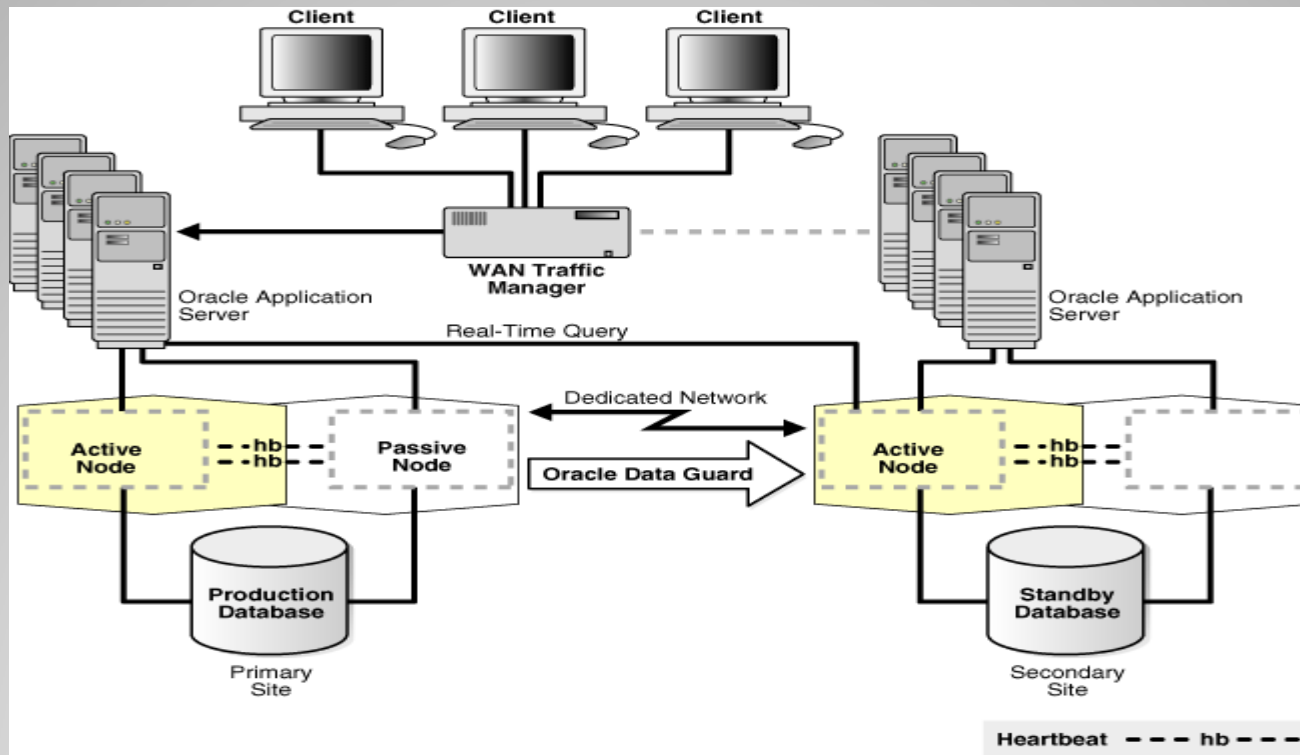
Oracle Database HA Solutions

- Data Guard configurations using single standby database.



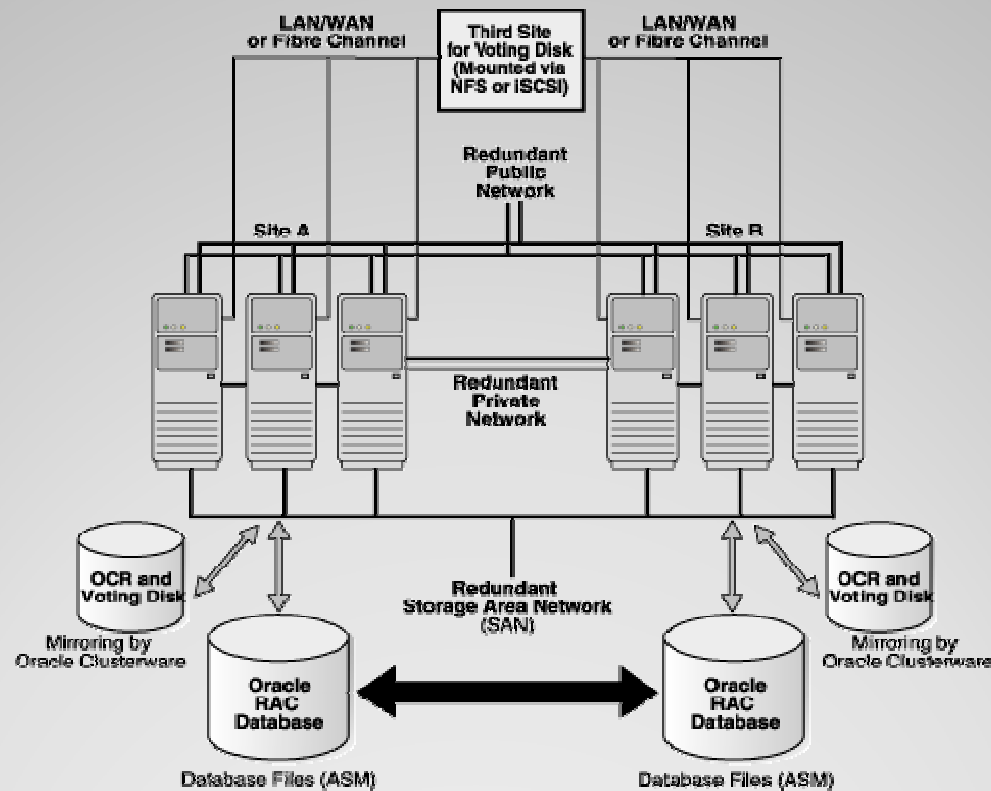
Oracle Database HA Solutions

- Oracle Database with Oracle Clusterware and Data Guard



Oracle Database HA Solutions

- Oracle Database with Oracle RAC on Extended Clusters



Oracle Database HA Solutions

Oracle Database with Oracle RAC on Extended Clusters

- Testing has shown the distance (greatest cable stretch) between Oracle RAC cluster nodes generally affects the configuration, as follows:
 - Distances less than 10 km can be deployed using normal network cables.
 - Distances equal to or more than 10 km require DWDM links.
 - Distances from 10 to 50 km require storage area network (SAN) buffer credits to minimize the performance impact due to the distance. Otherwise, the performance degradation due to the distance can be significant.
 - For distances greater than 50 km, there are not yet enough proof points to indicate the effect of deployments.

Oracle Database HA Solutions

- Oracle Standby/Passive Data Guard
- Oracle cold failover using VCS on sun Solaris

Obsolete Solutions

- **Solutions**

- Oracle cold failover using VCS on Linux
- Oracle ASM cold failover using VCS on Linux
- Oracle RAC (TBD)

Oracle Database HA Solutions