

Oracle Distributed Transactions

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Room

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Oracle Database Distributed Transactions

This presentation examines remote and distributed queries and transactions over database links. The problem of multiple transaction branches involving RAC database instances are discussed followed by Oracle Single Phase and Two Phase commit processing over DB Links including:

Prepare, Response to Prepare, Commit/Rollback and Forget phases. It is followed by a discussion of two phase commit in-doubt failures and resolution using the Recoverer Process (RECO) or DBA manual resolution. Finally, the implications of Point in Time Recovery on Distributed Databases is examined.

Remote and Distributed System Concepts

The Presentation begins by discussing the conceptual framework of Remote Queries, Distributed Queries, Remote Transactions and Distributed Transactions and how they are performed over Database Links. Knowledge of DB links is useful but will be described if required. A distinction is made between Single Instance Oracle databases and Multi-Instance RAC databases regarding transaction branches.

Commit Processing Concepts

Commit processing varies depending on the situation but the most complex case is two phase commit for distributed transactions. This section describes single phase commit, two phase commit, the commit point site, commit point local and global coordinators. It includes the prepare, commit and forget phases of the two phase commit processing, and the roles played by each database instance in this process. This includes The Global Coordinator, Local Coordinator(s) if any, and the Commit Point Site.

Resolving In-Doubt Transactions

Transaction failure during two phase commit is normally resolved automatically. If one or more of the sites involved in the transaction are not available, then the Recoverer Process (RECO) will do this when connectivity is re-established. But if a site is unavailable for more than a short while, then administrators may need to resolve this situation manually to release locked resources. This section will discuss, the RECO process, Manual In-doubt resolution, using the DBA_2PC_PENDING and DBA_2PC_NEIGHBORS views, and V\$GLOBAL_TRANSACTION view as well as the COMMIT FORCE or ROLLBACK FORCE statements are presented.

Using Crash Tests

Oracle provides a Crash Test simulation capability so that DBAs can practice resolution of failures during two phase commit. This section of the talk discusses this feature.

Recovery Summary for Distributed Databases

The talk ends with some guidelines on Distributed recovery. If any point in time recovery is done to a database that participates in distributed transactions, then the other databases in that distributed environment may require point in time recovery as well. This could require database, tablespace or table point in time recovery.

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