8 High Availability

This section describes the new high availability features.

Data Guard

Oracle Data Guard Redo Decryption for Hybrid Disaster Recovery Configurations

Oracle Data Guard now provides the capability to decrypt redo operations in hybrid cloud disaster recovery configurations where the cloud database is encrypted with Transparent Data Encryption (TDE) and the on-premises database is not.

Hybrid disaster recovery (DR) with Data Guard is now more flexible and easy to configure. Hybrid disaster recovery for the Oracle Database allows you to expand outage and data protection to take advantage of the automation and resources of Oracle Cloud Infrastructure (OCI). By enabling the ability to quickly configure disaster recovery in OCI, even in cases where on-premises databases might not already be encrypted with Transparent Data Encryption (TDE), the steps required to configure hybrid disaster recovery environments and prepare on-premises databases for a DR configuration with cloud databases in OCI have been greatly reduced.

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Per-PDB Data Guard Integration Enhancements

The new Oracle Data Guard per Pluggable Database architecture provides more granular control over pluggable databases, which can now switch and fail over independently. The enhancements to the Oracle Data Guard per Pluggable Database include simplified setup and validation, automatic addition of temporary files, improved management and housekeeping, and target pluggable databases open for query off-loading (Real-Time Query feature at the pluggable database level).

You can rely on Data Guard protection while keeping the flexibility and high consolidation rates that the multitenant architecture offers, reducing operational costs.

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General

Application Continuity Support for DBMS_ROLLING

Application Continuity and the draining of database sessions are now supported when performing a rolling upgrade or applying non-rolling patches using `DBMS_ROLLING`.

Using Application Continuity with `DBMS_ROLLING`, applications are continuously available during the database upgrade process.

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Database Native Transaction Guard

Transaction Guard is an application-independent infrastructure that enables recovery of work from an application perspective. With Transaction Guard, each logical transaction may map to single or multiple server-side transactions. Persisting each logical transactions, as part of a commit, introduces overheads in normal transaction operation. Database Native Transaction Guard enhances existing Transaction Guard and does not require persistence in a separate table.

Database Native Transaction Guard does not incur extra redo generation or performance overhead (extra writes are eliminated) and no client-side changes are required.

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Flashback Time Travel Enhancements

Flashback Time Travel can automatically track and archive transactional changes to tables. Flashback Time Travel creates archives of the changes made to the rows of a table and stores the changes in history tables. It also maintains a history of the evolution of the table's schema. By maintaining the history of the transactional changes to a table and its schema, Flashback Time Travel enables you to perform operations, such as Flashback Query (`AS OF` and `VERSIONS`), on the table to view the history of the changes made during transaction time.

Flashback Time Travel helps to meet compliance requirements based on record-stage policies and audit reports by tracking and storing transactional changes to a table, which has also been made more efficient and performant in this release.

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Optimized Fast-Start Failover Delay Detection in Maximum Performance Mode

Oracle Data Guard Fast-Start Failover has two additional properties for improved lag detection and status changes. `FastStartFailoverLagType` sets the lag type that Fast-Start Failover must consider when in Maximum Performance mode (`APPLY` or `TRANSPORT`). `FastStartFailoverLagGraceTime` lets the configuration transition to a pre-emptive `LAGGING` state that the observer can acknowledge before reaching the actual lag limit, so the status can transition immediately to `TARGET OVER LAG LIMIT` without waiting for the observer quorum.

The new properties for the Maximum Performance protection mode further enhance Fast-Start Failover capabilities and reduce the impact on application transactions for status changes requiring the observer quorum.

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Oracle RAC Two-Stage Rolling Updates

Oracle Real Application Clusters (Oracle RAC) rolling patches framework enables you to apply certain non-rolling fixes in a rolling fashion. Fixes that you implement using this framework are disabled by default. You can choose to enable these fixes after all the nodes are patched successfully.

Oracle RAC rolling patches framework reduces the need for costly downtimes to apply non-rolling patches. All non-rolling fixes can be applied as rolling patches.

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Transaction Guard Support during DBMS_ROLLING

Transaction Guard support for `DBMS_ROLLING` ensures continuous application operation during the switchover issued by `DBMS_ROLLING` to Transient Logical Standby. The procedure uses the last commit outcome of transactions part of in-flight sessions during a switchover-related outage (or caused by an error/timeout) to protect the applications from duplicate submissions of the transactions on replay.

Application Continuity supported by Transaction Guard during database upgrades using `DBMS_ROLLING` ensures that commit outcomes are guaranteed across the entire upgrade process.

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Real Application Clusters

Local Rolling Database Maintenance

Local Rolling Database Maintenance creates a new local database home and starts a second instance of the same database from the new home on the same server, allowing you to perform rolling patching and maintenance operations locally on one node of a multi-node Oracle Real Application Clusters (Oracle RAC) or Oracle RAC One Node cluster.

Local Rolling Database Maintenance provides uninterrupted database availability during maintenance activities (such as patching) for Oracle RAC and Oracle RAC One Node databases. This feature significantly improves the availability of your databases while limiting the impact on other nodes in the cluster.

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