Exadata Migration and Support for American Financial Research and Analysis Company

Client Business Requirement

- To migrate from Non-Exadata Sun E25K (Solaris) Server to Exadata (Oracle Linux).
- To replace Shareplex Replication with Oracle GG replication.
- Need to check performance of 11.2 RAC Exadata database with existing applications before migration to exadata.
- After migration, setup bi-directional, uni-directional replication between production databases with Conflict Resolution Handlers.
- After migration to 11g, replace streams CDC with GoldenGate auditing.
- Implement GoldenGate High Availability setup using Oracle Clusterware bundled agents for Oracle GoldenGate.
- Enable OS monitoring scripts for GoldenGate.
- DR set-up configuration for Exadata.
- Maintain and support Exadata machines and GoldenGate replication product.

Technology Platform

- Exadata: 5 Exadata X3-2 Full Rack and 1 Half Rack.
- 2 HP (High Performance) RAC and 1 HC (High Capacity) Rack in EWDC (East West Data Center).
- 1 HP and 2 HC in EQDC (Equinox Data Center).
- EQDC has DR (Disaster Recovery) setup.
- Oracle GoldenGate version 11.2.1.0.21.
- Oracle Database Version 11.2.0.3 BP21.
- Oracle Cloud Control 12C, 12.1.0.3.

Cognizant Solution

Setup Downstream Integrated Extract, Setup Cloud Control 12c, Setup Dataguard

- In-order to test real speed of Exadata machine we have suggested customer to mine logs on Exadata database.
- Instead of mining logs and running extract on source database 10g R2.
- Here we used Downstream Integrated Extract Replication Model to ship logs from 10g R2 to 11g R2 database and mine the logs on 11g R2 database.
- Created Downstream Integrated Extract on Downstream database 11g R2 database to mine shipped logs from old 10g R2 Database.
- Created GoldenGate replication downstream database to apply the changes to Target Tables.
- Tested and setup Cloud Control 12c for monitoring Exadata boxes and non-exadata databases.
- Setup Physical Standby Databases for all production databases and monitored all standby databases through Cloud Control.

Setup GoldenGate Replication

- Replaced Shareplex replications with Oracle GoldenGate replication.
- Setup bi-Directional replication between production databases with Conflict Resolution Handlers.
- Setup uni-directional replication between production databases. After migration to 11g, replaced streams CDC with GoldenGate auditing.

- Implemented GoldenGate High Availability Setup using Oracle Clusterware Bundled Agents for Oracle GoldenGate to ensure that Oracle GoldenGate can tolerate server failures by automatically moving processing to another available server in the cluster.


- Implemented GoldenGate replication on GoldenGate software 11.2.1.0.11 on test and production databases.

**Support and Maintenance on Exadata Machine**

- Handled all highly escalated Issues on Exadata machines.

- Database performance was slower on Exadata box.

- We analyzed AWR reports, OS statistics of Exadata DB nodes and cell nodes.

- We found that one of cell was consuming high CPU and slowing down database performance on whole rack.

- Then as an immediate solution we stopped cell service and database performance came to normal.

- Later we involved Oracle and Oracle found that a system disk has slow performance and it need to be replaced.

- We coordinated with Oracle Patching team during patching activity.

- We proactively found disk performance and failures before it affected cell or database performance.

- Frequently patched Oracle Cloud Control 12c that monitors Exadata machines and other non-exadata machines.

- Changed write-through cache to write-back cache on cells to improve Exadata database performance.

- Identified the reason for node reboots before involving Oracle support and also got help from Oracle support.

- For identifying tough issues that is causing node reboots.

- Identified the reason for slow performance of Database queries and involved application team to fix it.

- Frequently checked Load on Servers by sending Automatic Load Alert through emails and immediately analyzed the reason for high load and fixed the issue.

- Implemented Instance Caging and IORM (Exadata IO Resource Manager) to avoid Manage Resources on the server.

- Supported, maintained and resolved all Issues on Oracle Dataguard setups.

**Support and Maintenance on GoldenGate Replication**

- Upgraded GoldenGate Software from 11.2.1.0.11 to 11.2.1.0.21 on test, development and production database nodes.

- Setup uni-directional, bi-directional replications with conflict resolution, downstream integrated extract replication based on customer requirements.

- Resolved GoldenGate replication errors, GoldenGate replication slow performance whenever needed.

- Performed different load testing on classic extract integrated extract before deciding to use integrated extract on production replication.

- Involved Oracle support for fixing bug for slow performance issue on GoldenGate integrated extract.

**Support and Maintenance on Non-Exadata Databases**

- Monitored all Exadata and Non-Exadata databases using single Oracle Cloud Control 12c.

- Handled all critical and escalated issues on non-exadata databases.

- Applied latest patches on non-exadata databases on Solaris OS.

- Fine tuning Oracle Enterprise Manager Alerts to get meaning incident reported.

- 24x7 platform support.
Business Benefits

- Before migration to exadata, with replicated real-time data, customer tested behavior and performance of legacy applications on new Oracle database version 11.2.0.3 BP17 on exadata machine.
- Used all Oracle products for managing databases, replication to have benefit of full compatibility between the Products.
- Used latest technologies such as Integrated Extract and GoldenGate to engage Oracle support for all critical issues.
- Always used Oracle recommended settings and quickly worked on escalated issues and hence had zero downtime of business, databases and replication.
- Applying latest patches to Exadata Machines and GoldenGate to have fixes for all Known Oracle bugs which reduced frequent node reboots.
- And enhanced performance of Exadata Machines and GoldenGate replication.

Engagement Highlights

- Customer successfully tested real data on 11g R2 database on existing applications without affecting the performance of current production database that runs on 10g R2 database.
- This also acted as a test for GoldenGate product on customer data. That is we involved Oracle development to fix few bugs on GoldenGate product, before using Oracle GoldenGate version 11.2.1.0.11 on production replication.
- Later, after migration to Exadata, we implemented Downstream Integrated Extract Replication between 2 Exadata databases.
- Immediately involved all technical experts in Cognizant to parallelly work on highly problematic issues.
- Informed frequently to clients about the recent progress while analyzing the issue.
- In such a way we provided solutions to many Exadata and GoldenGate related issues.

For more information on Cognizant's Oracle solutions, contact us: OSP_Marketing@cognizant.com

About Cognizant

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting, and business process outsourcing services, dedicated to helping the world’s leading companies build stronger businesses. Headquartered in Teaneck, New Jersey (U.S.), Cognizant combines a passion for client satisfaction, technology innovation, deep industry and business process expertise, and a global, collaborative workforce that embodies the future of work. With over 75 development and delivery centers worldwide and approximately 217,700 employees as of March 31, 2015, Cognizant is a member of the NASDAQ-100, the S&P 500, the Forbes Global 2000, and the Fortune 500 and is ranked among the top performing and fastest growing companies in the world.

Visit us online at www.cognizant.com or follow us on Twitter: Cognizant