Database Tables to Storage
Bits: Data Protection Best Practices for Oracle Database

Ashish Ray,
Senior Director, Product Management, Oracle

Gurmeet Goindi,
Principal Product Manager, Oracle

Gagan Singh,
Senior DBA, Intel
Data Protection and High Availability Practices at High Tech Manufacturing

Gagan Singh
Sr. Database Administrator
Technology and Manufacturing Group
Intel Corporation
Agenda

- Intel – Database Setup Overview
- Enterprise Backup & Recovery (eBaR) setup – Past
- Enterprise Backup & Recovery (eBaR) HA2.0 – Present Architecture
- Production Scenarios
- Key Takeaways
Database Setup Overview

• DSS and OLTP Setup
• Zero data loss and high availability is priority
• DB sizes range from few GB’s to ~ 50 TB
• Monitoring and auditing are key
• Robust Backup and Recovery procedures
• Application tier includes third party vendor products and in-house apps
• 24x7 uptime
eBaR setup - Past

- Perl wrappers (8.x-10.2.x)
- Manageability challenges with new OS/DB versions
- Decentralized Recovery Catalog (RCAT)
- Complex to add/modify RMAN parameters
- Troubleshooting challenges
- Operations Nightmare - Monitoring and Auditing.
eBaR setup – Present Architecture

Data Centre A

Grid Control Node

MSCS Failsafe Cluster

OMS+RCAT

Data Guard Redo Shipping

+DATA

+DATA

+DATA

Symantec 6.5

Backup Network

VTL Servers

Data Centre B

Grid Control Node

Observer

11.2.0.2-Grid/DB

Backup Network

Symantec 6.5

+DATA

VTL Servers

+DATA

+DATA

VTL Servers

FRA(Backup+Flashback+Archivelog)
The Setup

- Weekly Incremental → D2D → D2T
- Weekend L0 → D2D → D2T (Monthly Offsite)
- Global Scripts
- Block Change Tracking is Enabled
- Basic Compression
- Backup type “Backupset”
- Flash Back Enabled (24Hr retention)
Back up Flow

- EM Grid Control OMS initiates scheduled backup Job
- EM Grid Agent invokes RMAN on target DB
- RMAN Global Script is executed
- Disk To Disk (+FRA)
- Purge Archivelogs (follow retention of 7 days)
- D2T (FRA to VTL)
- EM Grid Control Sends Success/Failure Email
eBaR Eco-System and Highlights

- Online Data Duplication for STDBY creation
- Roll Forward STDBY with RMAN incremental
- RMAN Global Scripts
- Substitution Variables for TAGS
- Archive log deletion policies
- Block Change Tracking
- Multiple Channels (4)
- Queue Depth
- MAXPIECESIZE(32G)
- FILESPERSET (2 data files, 20 archivelogs)
- Centralized RCAT
- RCAT HA
- Centralized Monitoring
- Centralized Scheduling
- Log History
- Grid Control Integration
- Performance
- Manageability
- STANDBY Database Cloning
- Online Data Duplication for STDBY creation
- Roll Forward STDBY with RMAN incremental
- Centralized RCAT
- Centralized Monitoring
- Centralized Scheduling
- Log History
- Grid Control Integration
- Performance
- Manageability
- STANDBY Database Cloning
- Online Data Duplication for STDBY creation
- Roll Forward STDBY with RMAN incremental
Production Scenarios – Unplanned Outage

1. Failure Detected on Storage Layer
2. DB Outage detected by Data Guard FSFO Observer
3. Fast Start Fail Over (FSFO) initiated
4. Database Failover to STDBY < 60 seconds
5. No impact to App (Designed for retries)
6. STDBY reinstated automatically using Oracle Flashback Database & Observer
Planned Outage

1. Disabled FSFO
2. Patched the STDBY Stack
3. Switched roles using Data Guard Broker
4. No impact to App (Designed for retries)
5. Patch the new STDBY
6. Enabled FSFO
Key Takeaways

Summary:
• No downtime to factory operations during planned outage compared to ~40min in the past
• Zero Impact on Role Changes (Planned/Unplanned)
• Auto Reinstatement via Flashback Database saves hours of STDBY rebuild time

Learning’s
Intel created in-house scripts to
• Automate Backup job swaps in Grid Control upon role change
• Automatic relocation of Observer on role changes based on DG guidelines
• Force Level 0 backups on role change
• Pre-checks to identify issues that prevent switchover need to be integrated
Thanks to the Intel TMG(ATTD) Engineering Team

Contact Info:

gagan.singh@intel.com
Reference

My Oracle Support:

Master Note for Data Guard [ID 1101938.1]

RMAN Backup Performance [ID 360443.1]

RMAN Performance Troubleshooting [ID 1326686.1]

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