Tips and Tricks on Successful Upgrade to 11gR2

Project Approval

- Get buy in from CIO and other groups
- Justify the need
  - End of premier support
  - Extended Support Cost
  - To be current
  - Benefits of new release

Build Standard Software Image

- 11.2.0.1 Linux Server RPM for standalone releases
- 11.2.0.1 Linux Client RPM
- 11.2..0.1 Windows Client RPM

Assumption: You have the same version of OS.

Dev/QA Functional Env

- Push software to Dev
- Install db in the Dev env
- Get feedback from Developer community

Planning Phase

- Hardware Refresh
- Lock down on a release i.e 11.2.0.1
- Parallel Env vs In place upgrade Strategy
- Upgrade Oracle server and Oracle client
- Guinea Pig
- Big Bang Approach vs Staggerred Rollout
- Storage Requirements

Lockdown Release

- Ignore latest vendor releases/patches.
- Don’t alter any project plans.
- Change release if you are encountering a business critical bug.

Parallel Env

- Pros
  - Db upgrade can be combined with Hardware and OS Upgrade.
  - Environment can be build and tested without impacting production
  - Less Risky as all critical components can be installed and made available earlier.

Parallel Env

- Pros
  - Production Infrastructure can be certified and tested for months before the actual rollout date
  - Production cutover is easy as number of tasks to be performed on cutover day are much less

Parallel Env

- Cons
  - May not be feasible in 24x7 envs
  - Data migration(export/import) from old env to new needs to be completed in the maintenance window.
  - Licenses for parallel env Build out

In place Upgrade

- Pros
  - Software and db can be upgraded on the same server
  - Faster approach if we don’t run into any install issues
  - Data doesn’t need to be migrated

In place Upgrade

- Cons
  - Hardware and OS remains the same.
  - Need to have good and tested RMAN/logical backups
  - Very risky as business may get affected if we run into issues during installation.

Environment Build Out/Testing Phase

- QA Staging
- Prod

Staging/Prod Environment

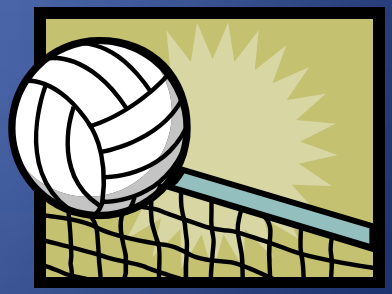
- Have a staging env exactly same as prod for proper testing
- Testing with Production Baseline data
- End-end testing including running jobs(Control M)

Prod rollout in Guinea Pig Env

- Get a taste of how new release is working in prod
- Evaluate how good Active Data Guard is working

Implementation/Rollout Phase

- Parallel Upgrade steps
  - Export/Import data from 10g/11g
  - Repoint tnsnames.ora to point to the new 11g server.



11gR2 Workarounds/Patches

Disable case sensitivity

- Disable the following parameter to prevent migration issues from 10gR2 to 11gR2
- SQL> show parameter case
- NAME TYPE VALUE
- ------------------------------------ ----------- ------------------------------
- sec_case_sensitive_logon boolean FALSE

Package/db Link Compile

- Apply patch or implement workaround for packages referencing db link.
- Workaround is to flush cache

11g Cardinality Feature

This can adversely affect the performance of some queries. Disable at session level if its not a system wide issue using a login trigger.

- set "_optimizer_use_feedback" = false

With clause

Queries using WITH clause and distinct will fail with ORA-3113 because of a bug.

Implement the below workaround to fix it or apply patch.

- *_optimizer_distinct_agg_transform*=false

Database Utilities-Exp/Imp

- Use DataPump export instead of original export (which is de-supported beginning with Oracle Database version 11g)
- Convert all your logical backup scripts to use expdp/impdp

SCAN/ACFS/ASM/RMAN

SCAN

- 10g client
  - Failover doesn’t work with Scan in tnsnames.ora for OCI apps
  - JDBC apps work fine as they don’t use tnsnames.ora
- 11g client
  - SCAN works fine for OCI apps.

SCAN Configs

- Make sure client app servers connecting to 11g Db can telnet to port 1521 over
  - 3 SCAN address
  - 2 VIP address for a 2 Node RAC Cluster
- Make sure DNS is resolving and you can ping the RAC virtual ips from the client servers
- DNS resolution for VIPS should resolve correctly for JDBC clients.

ASM

- External Redundancy-EMC Clarion
- RAID Groups
  - Use Correct RAID Group for DATA and FLASH
  - Cross Verify devices being added to DATA or FLASH Disk Group is the same as you had planned like RAID 10 or RAID 5.

ASM Advantages

- Disks can be added or removed from Disk Groups without bringing down anything.

ACFS

- Regular file system for doing logical backups
- integrates well with Commvault.

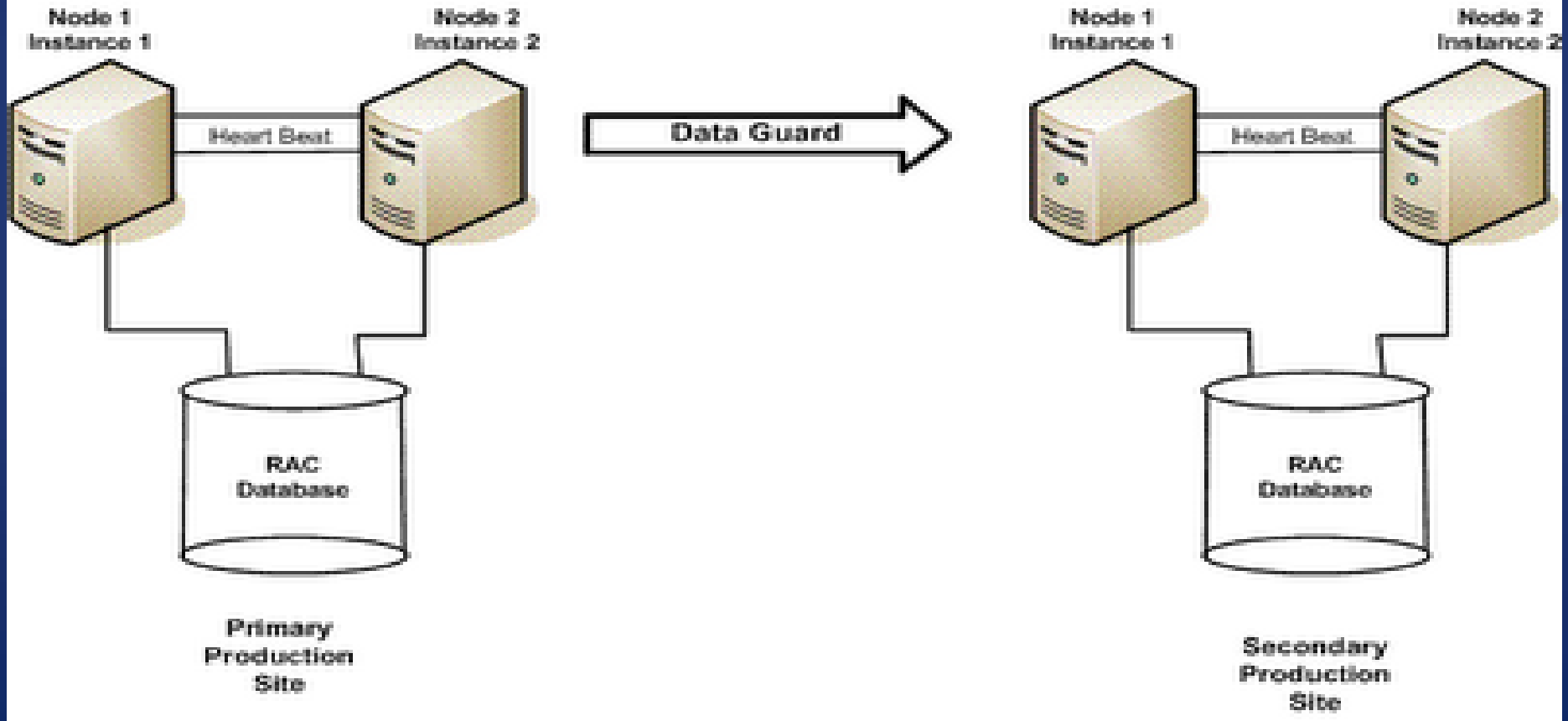
RMAN Architecture

- Merged Incremental Backups
- Use DR Site for backups
- Do only archive log backups in Primary.

RMAN Catalog

- Install Catalog db on a non production server
- We installed it on the Grid Control db

Maximum Availability Architecture



MAA Details

- Data Guard running in Maximum Performance Mode
- Fine tune your redo size as per recovery requirements and commit rates

Active Data Guard/Physical Standby Tips

Active Data Guard

- Offload real time reporting to DR Site
- Data Guard Management Interface
  - SQL Plus
  - Data Guard Broker
  - OEM Grid Control

Physical Standby and Duplicate

- Create Standby using one rman script using duplicate command.
- Script does everything behind the scenes
  - Copies datafiles
  - Configures Data Guard Standby
  - Fully functional standby using one script

Active Data Guard/RAC

- All Reporting works fine from Apply Node on Physical Standby
- Some issues on running queries from second node in 2 Node RAC Cluster Physical Standby
  - Ora 6553:Pls-801: internal error[pklsdlp: dependency verification]
  - Ora -1555 snapshot too old

RAC Service

- Use service in tnsnames.ora for applications to connect to the RAC
- You can hide db/instance information from applications

Switchover/Failover Tests

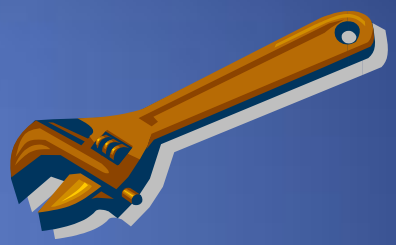
- Test out switchover and Failover
- create a run book of steps

Monitoring-Grid Control

- Install 11g Grid Control Server
- Install agents and use Grid Control to manage all your Db Servers.

Troubleshooting Tools

- ASH
- AWR
- Grid Control



Before/After

Before	After
• G1 HP Blade Server • Red Hat AS 5.3 • 2 Node 64 bit RAC Cluster running 10.2.0.4 • OCFS2 • NON-ASM • Data Guard • Service_name • DG Mgmt – SQL Plus	• G6 HP Blade Server • Red Hat AS 5.4 • 2 Node 64 bit RAC Cluster running 11.2.0.1 • ASM • ACFS • Active Data Guard • Service in RAC • DG Mgmt – DataGuard Broker

Timeline

Products	Timeline
LEAP Development	December 2009
LEAP Prod	April 2010
ATS Development	June 2010
ATS Functional QA	August 2010
ATS,CDB Staging	December 2010
ATS,CDB 11g Rollout	Feb 2011
CSA ,FSA 11g Rollout	July 2011
GRDB	October 2011

Celebrate

- Party after you have successfully completed your project

Reference

- http://www.oracle.com/technetwork/database/upgrade/index-088044.html
- http://www.oracle.com/technetwork/database/upgrade/best-practices-for-upgrading-11gr2-174946.pdf
- http://www.oracle.com/technetwork/database/upgrade/upgrade11gr2-2day-workshop-173044.pdf
- http://download.oracle.com/docs/cd/E11882_01/server.112/e17222/toc.htm

Appendix

issues.xlsx