Introduction to AWR and Tuning
Some New Things in 11g

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OMC - Who are we?

- Oracle DBA on-site and remote services

- Systems DBA work – install, upgrade, patch

- Tuning – DB, IO, server, etc.

- Experience from 5.1, 6, 7, 8i, 9i,10g,11gR2

- Custom 'moving to 11gR2' projects

The Bad Old Days

- In 1988, V5.1 was out and 6.0 was coming

- Oracle v6 through v8.0 had BSTAT/ESTAT reports (but the tables were in SYSTEM)

- We tuned using "cache hit ratios"

- Wait info was captured, but hard to get to

- Before 8i, tuning was "an art" because it was subjective, and hard to repeat

Working hard to get any real Improvement

- No one wants to get the "DB is slow" call

- Management usually does not want to buy more RAM or a new, faster server

- In most cases, you have to make what you have run faster with no additional resources

- Performance Tuning = Magic Trick?

- HINT – make a list of things that work, where they work, and use it again next time

Work Smarter Not Harder

- Cache hit ratios are deceptive

- You really want to know: 'what is going on'

- Need info on all resources inside the DB

- Need stats on all the SQL recently run

- Need a way to compare 1pm to 9am

- Would be nice if the DB did this for us

AWR to the Rescue

- Automatic Workload Repository
- Auto gather of internal DB statistics
- Key – stats stored in DB managed tables
- Easy-to-use views help the DBA use the info
- Feeds into ADDM and the advisory suite
- Frequency of stats gather can be changed
- Statistics retention time can be changed

What about STATSPACK?

- Why not just use our friend STATSPACK?
- Was better than BSTAT/ESTAT
- Requires an external job to get a snapshot
- Physical tables need manual management
- Report is good, but limited
- Cannot easily compare REP4 to REP5

The Basics

- Each stat gather is called a SNAPSHOT
- A SNAPSHOT is specific to a point in time
- DBA_HIST_SNAPSHOT joins to the views
- Each DBA_HIST view has different kinds of stats, from different areas of the DB, but all are specific to a SNAPSHOT
- There are 40+ DBA_HIST views

Examples of the DBA_HIST Views

- DBA_HIST_SNAPSHOT - Displays snapshot information.

- DBA_HIST_SYSSTAT - Displays detailed system statistics

- DBA_HIST_FILESTATXS – Displays detailed datafile statistics

- DBA_HIST_SQL_SUMMARY – Displays summary and higher level SQL statistics

- DBA_HIST_SQLSTAT – Displays detailed SQL statistics

- DBA_HIST_WAITSTAT – Displays detailed wait statistics

AWR Reports

- AWR outputs reports like STATSPACK

- Based on the events between 2 snapshots

- Can be called from $ORACLE_HOME/rdbms/admin

  - awrrpt.sql statistics for a range of snapshot Ids.

  - awrsqrpt.sql statistics of a particular SQL statement for a range of snapshot IDs, to inspect the performance of a SQL statement.

  - awrddrpt.sql compares detailed performance attributes and configuration settings between two selected time periods.

AWR Reports (2)

- AWR reports can be run as PL/SQL call

Call: dbms_workload_repository.awr_sql_report_text

- Lets look at "runawrreport1.sql"

- Take report file and email it, or compress it and move it to a filesystem for later review

Another example: www.dba-oracle.com/art_orafaq_awr_sql_tuning.htm

AWR Reports (3)

- AWR reports can be run via VARIABLES
- Define the variables, then call the report:

```
define begin_snap = &1
define end_snap = &2
define report_name = &3
define  report_type = 'text';
define  db_name = 'SALES3';
define  dbid  = 994285834;
@/ora/product/11106/rdbms/admin/awrrpti
```

Too Much Info?

- With all the DBA_HIST views there, it can get confusing as to which to use, and when

- Look at these general categories:

File statistics

General system statistics

Concurrency statistics

Instance tuning statistics

SQL statistics

Segment Statistics

Undo Statistics

Time-model statistics

Recovery Statistics

Some Real Query Examples

- HISTBUFPOOLSTAT.SQL
- GETSQLFROM2SNAPS.SQL
- HISTBUFPOOLSTAT.SQL
- LOGONHIST.SQL

Learn, Learn and Learn More

- Oracle Doc – CD, online

- Books by well-regarded authors

- On-line websites and Blogs

- National conferences and training classes

- Local Oracle User Groups

- Email with other local DBAs

What Never Changes

- End users cannot explain what 'seems slow' really means

- You wont get more money for RAM

- More work, fewer people, multiple projects

- Fixing AA can break BB

- Everything affects everything else – other DBs, other applications, other programs/systems, SAN use, etc.

Using these new Powers

- Looking for SQL which consumes the most resources in your environment

- See which areas use the same SQL

- See IO Problems 'over time'

- See the 'hottest' datafile this week

- Explore the 'system metrics'

- Use Enterprise Manager to 'dig in'

Everyone Needs to Have this Data

- That includes the SAs, DBAs, and Developers

- SAs can see IO and OS statistics

- Developers can see SQL and PL/SQL plans

- Data modelers can see Table/View use

- Others DBAs can see the statistics and compare them to issues they have seen elsewhere, learn, and share their 'fixes'

Things To Watch Out For

- Watch the size of SYSAUX
- Don't test fixes in PROD, 'test in test'
- Don't change the snapshot interval, it is a good balance between too often/too few
- Unless you run reports and save the output, you cant diagnose a 'down DB'

Final Tips

- Use AWR in 10g and 11g, and remove STATSPACK from the DB entirely

- Set the retention to 60 or 90 days

- Develop your own set of scripts that you can run regularly, OEM 'steps' are often forgotten/lost

- Review the reports at least once a week

- Look into ASH also for more information