

NEOAUG



Top 10 Performance Tips for OBI-EE

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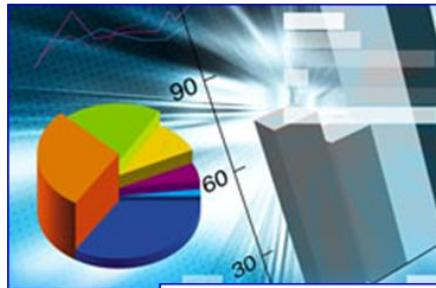


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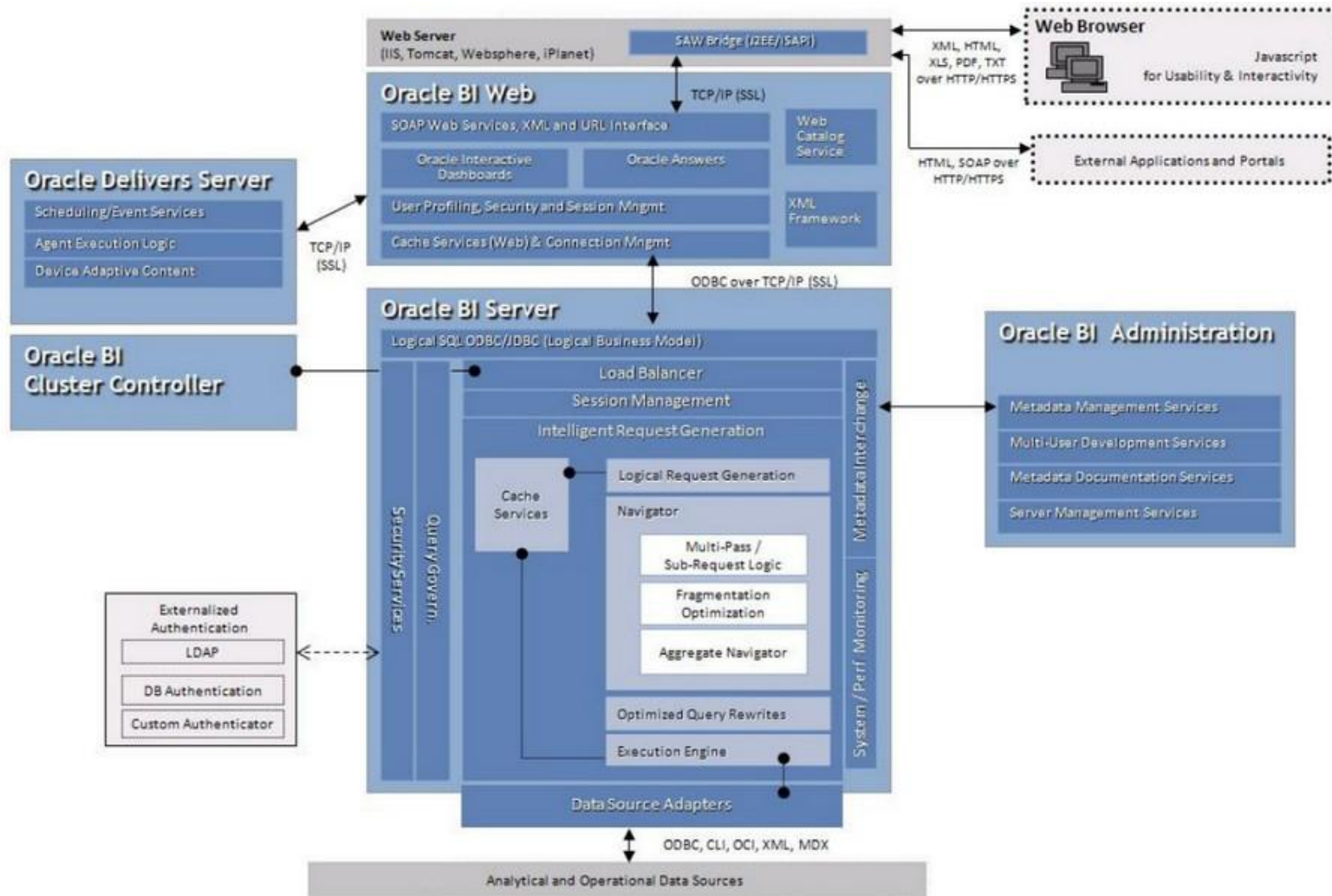
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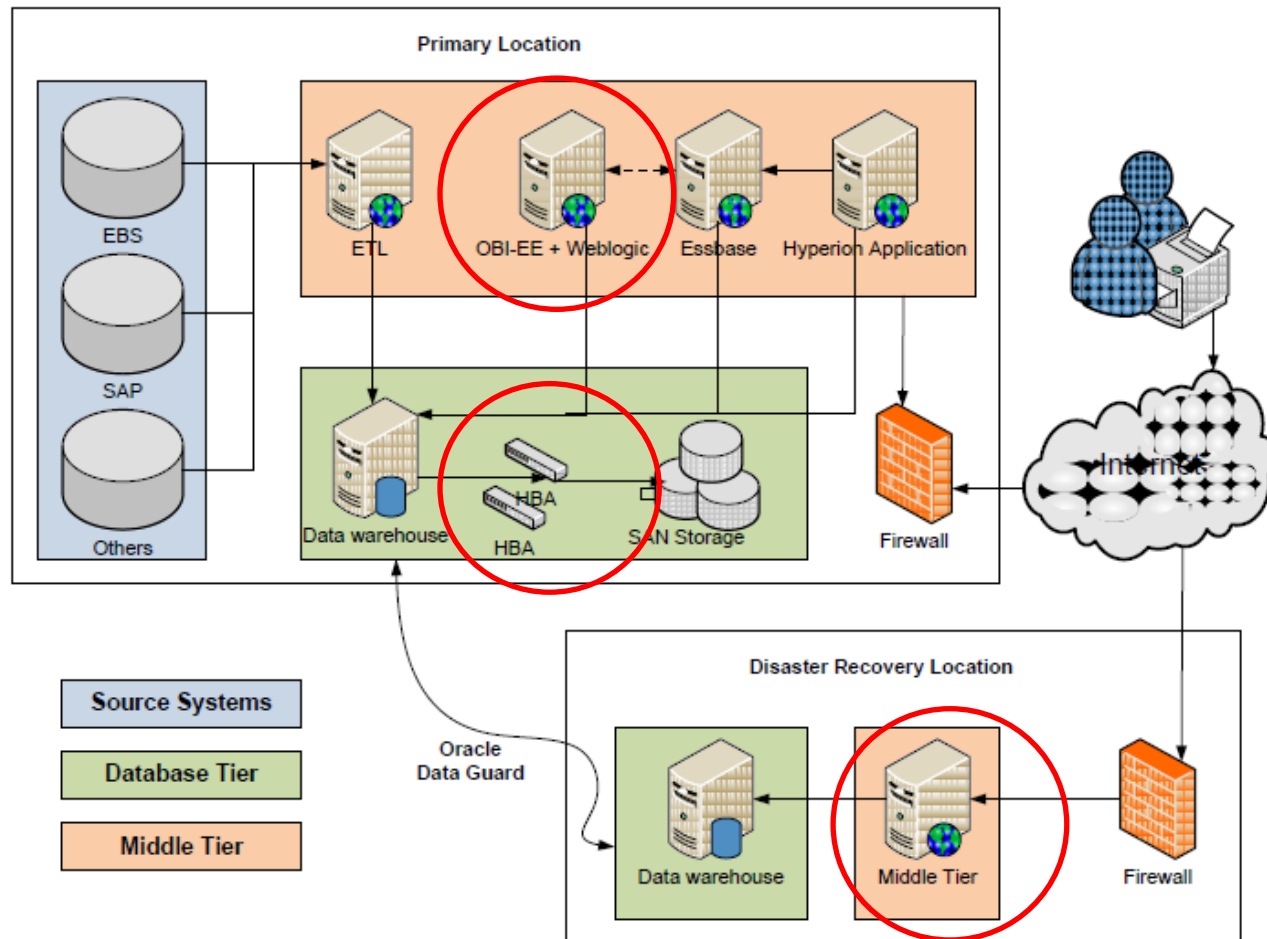
Agenda

- OBIEE System Architecture Overview
- Performance Expectations
- Approach to Performance Issues
- Tuning Tips
- Question and Answers

OBIEE Architecture



Typical BI Farm



Agenda

- OBIEE System Architecture Overview
- Performance Expectations
- Approach to Performance Issues
- Tuning Tips
- Question and Answers

Performance Expectations

- Response Time
- Optimized Design
- BI Server Performance
- Database Performance
- Iterative Approach

Common Issues

- Report Running for Long time
- OBIEE Not Responding
- Logging in...
- BI Publisher bursting delayed
- Specific iBot failed

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Sources for Debugging

- Logs
 - NQServer.log
 - NQQuery.log
 - Saw0.log
 - Java Host Log
 - Application Server Log
 - Scheduler log
 - Trace Files
- Usage Tracking
- Performance Counters
- Network trace
- Resource Utilization in EM

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Variable Management

- Scope of the Variable
- Consolidate Initialization Blocks where possible
- Disable unused Initialization Blocks

Report Modeling

- Column Filters
- Union Reports
- Non Cacheable SQL Element
- Large Result Sets
- Prompts on Fact Tables

Data Modeling

- Snowflake to Star
- Detail vs. Aggregate tables
- Opaque Views and Materialized Views
- Managing Joins
 - Driving Table
 - Outer Joins
 - Foreign Key vs. Complex Join in Logical Layer

Infrastructure

- CPU
 - Chips, Cores, Cores/Chip, Multithreading, Clock Speed
- Memory
 - Emulation, Size VM
- Disk
 - RAID, I/O Controller
- Network
 - Latency, Compression

Operating System Tuning

- Release TCP/IP closed connections faster
- Tune TCP Wait times
- Increase File descriptors
- Increase Backlog connections queue
- Adjust the MaxUserPort
- Power Options to High Performance
- Enable /3 GB Switch for 32-BIT Operating systems

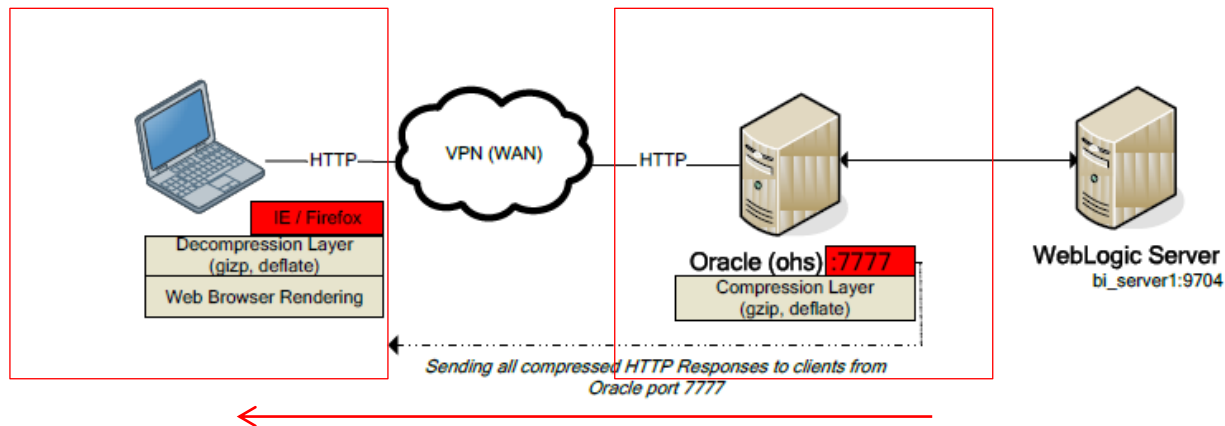
J2EE Server Tuning

- Configure each application on separate OC4J container.
- Configure Multiple JVMs
- Tune Heap Memory Size

Compression/Caching

- **Tune HTTP Server Compression / Caching**
 - Why use Web Server Compression / Caching for Oracle Business Intelligence?
 - Bandwidth Savings
 - Improves request/response latency

Compression enabled on Oracle® HTTP server (ohs) level:



Benchmarks with Compression

	11g		
Pages	HTTP Response Size (Kbytes)	HTTP Response Size with Compression (KB)	Compression ratio (%)
Dashboard with 3 Tables and 3 Charts (each table has 5~10rows, 3~5 cols)	297.5	39	86
Dashboard with 1 Table (25rows , 10 columns)	210	28.5	86
Dashboard with 1 Large Table (300rows , 10 columns)	938	79	91

Database Tuning

- Initialization Parameters
- Index Strategy
- Optimal Redo log sizing
- Statistics
- Layout

Database Tuning

- Initialization Parameters
 - PARALLEL_DEGREE_POLICY
 - OPTIMIZER_MODE
 - OPTIMIZER_INDEX_COST_ADJ
 - OPEN_CURSORS
 - MEMORY_TARGET

Memory_Target

```
SQL> select * from v$memory_target_advice order by  
memory_size;
```

<u>MEMORY SIZE</u>	<u>MEMORY SIZE FACTOR</u>	<u>ESTD DB TIME</u>	<u>ESTD DB TIME FACTOR</u>	<u>VERSION</u>
180	0.5	458	1.344	0
270	0.75	367	1.0761	0
360	1	341	1	0
450	1.25	335	0.9817	0
540	1.5	335	0.9817	0
630	1.75	335	0.9817	0
720	2	335	0.9817	0

Database Tuning

- Initialization Parameters
 - PARALLEL_DEGREE_POLICY
 - OPTIMIZER_MODE
 - OPTIMIZER_INDEX_COST_ADJ
 - OPEN_CURSORS
 - MEMORY_TARGET
 - Processes
 - USE_LARGE_PAGES

Huge Pages in Linux

	Snap Id	Snap Time	Sessions	Cursors/Session
Begin Snap:	18289	02-Mar-11 00:00:42	45	3.0
End Snap:	18303	02-Mar-11 14:00:49	62	1.5
Elapsed:		840.13 (mins)		
DB Time:		2,186.33 (mins)		

Post

Pre

	Snap Id	Snap Time	Sessions	Cursors/Session
Begin Snap:	18337	04-Mar-11 00:00:02	46	10.7
End Snap:	18351	04-Mar-11 14:00:26	58	10.4
Elapsed:		840.40 (mins)		
DB Time:		171.35 (mins)		

SQL ordered by Elapsed Time

- Resources reported for PL/SQL code includes the resources used by all SQL statements called by the code.
- % Total DB Time is the Elapsed Time of the SQL statement divided into the Total Database Time multiplied by 100

Elapsed Time (s)	CPU Time (s)	Executions	Elap per Exec (s)	% Total DB Time	SQL Id	SQL Module	SQL Text
49,398	550	20	2469.90	37.66	333u6g56f3tn6	NQSServer.exe	Select Max(INVOICE_DATE) from...

SQL ordered by Elapsed Time

- Resources reported for PL/SQL code includes the resources used by all SQL statements called by the code.
- % Total DB Time is the Elapsed Time of the SQL statement divided into the Total Database Time multiplied by 100

Elapsed Time (s)	CPU Time (s)	Executions	Elap per Exec (s)	% Total DB Time	SQL Id	SQL Module	SQL Text
1,104	146	12	91.98	10.74	333u6g56f3tn6	NQSServer.exe	Select Max(INVOICE_DATE) from...

Database Tuning

- Index Strategy
 - Goal to Optimize Query performance
 - Understand Star Schema Queries
 - So how do we go about optimizing these queries?
 - Tuning a star query has two important criteria, they are:
 - Create a bitmap index on each of the foreign key columns in the fact table or tables
 - Set the initialization parameter `STAR_TRANSFORMATION_ENABLED` to `TRUE`.

Database Tuning

- Optimal Redo log sizing
 - The size of the redo log files can influence performance.
 - Larger redo log files provide better performance.
 - Rule of thumb increase Redo log size so that not more than 3 log switches per hour.

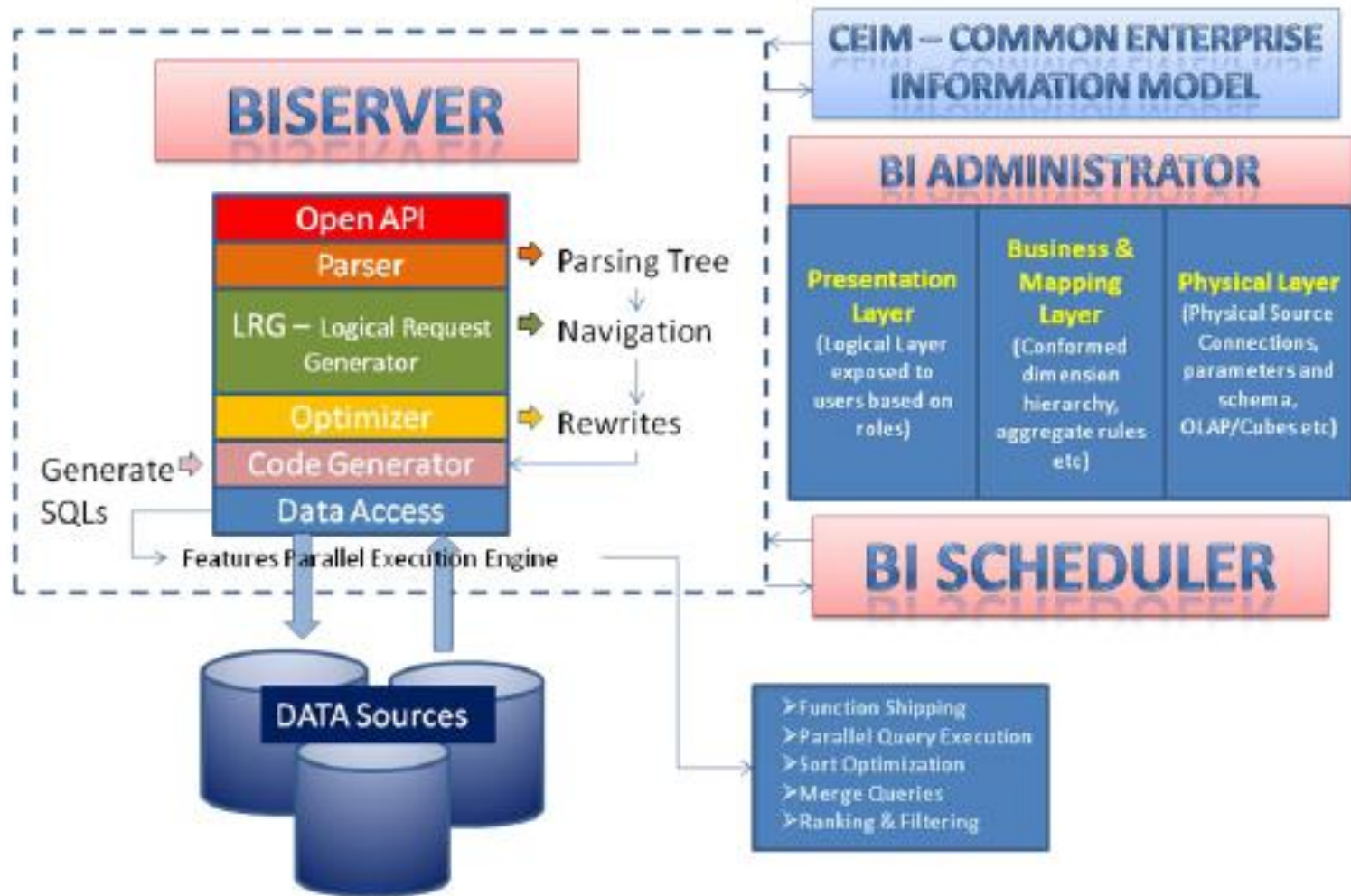
Database Tuning

- Statistics
 - Gathering Table and Index statistics is key for optimizer to build optimal execution plan.
 - Gather Workload statistics on Source and Target databases.
 - Desired system statistics are computed when database is under significant workload.
 - BIAPPS Customers can automate gathering index statistics during ETL
 - Edit the customsql.xml under DAC_HOME
 - D:\app\oracle\product\10.1.3.4PRODDAC\bifoundation\dac\CustomSQLs\customsql.xml
 - Set cascade=>True

Database Tuning

- Tablespace Layout
 - Isolate tablespace for FACT and DIMENSION tables
 - Isolate Index tablespace for FACT and Dimension tables
 - TEMP and UNDO data files should be on RAID 1 for faster I/O

BI Server



BI Server Tuning..

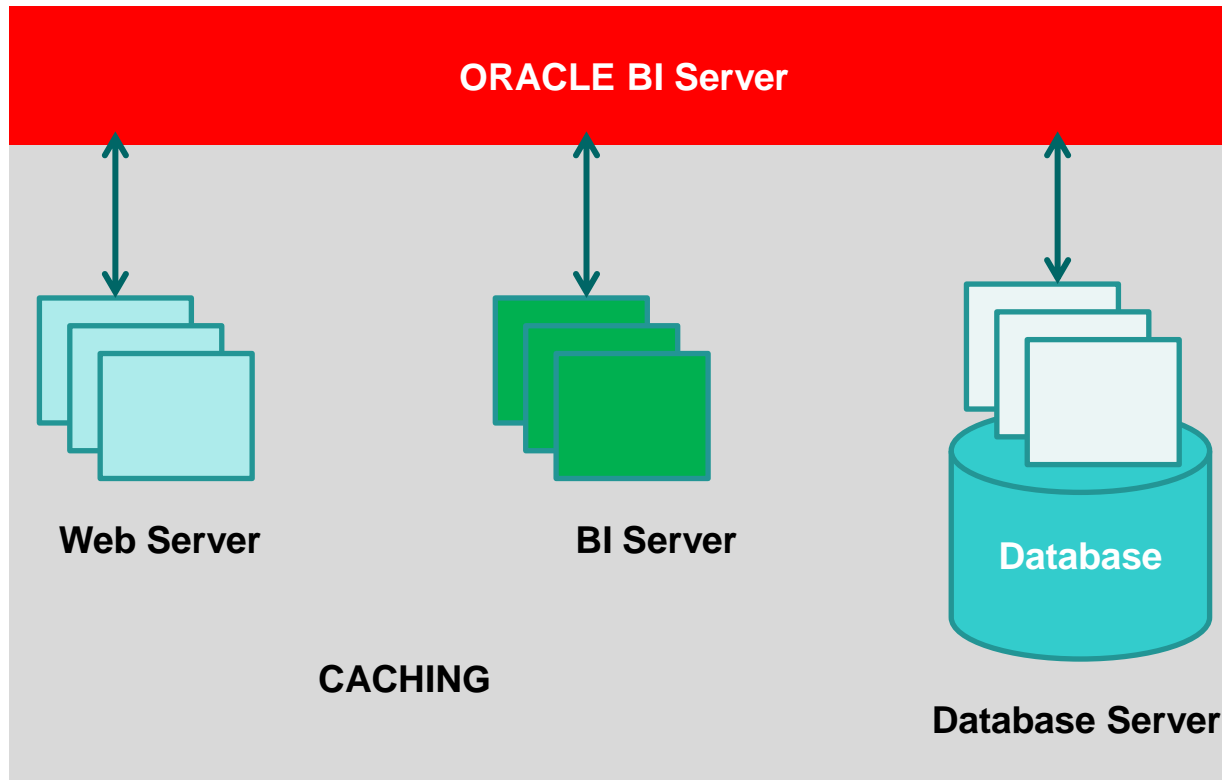
- The most important performance and scalability features are:
 - CONNECTION POOLING
 - QUERY REUSE AND CACHING
 - Configuration Parameters
 - Statement Cache

BI Server Tuning..

- Connection Pooling
 - BI Server can be configured with one or more connection pools for each database.
 - Specific users or groups can be assigned to specific connection pools.
 - An administrator can give certain groups higher priority.
 - Limit maximum number of connections to keep open.
 - This setting will prevent database servers from being overloaded.

BI Server Tuning..

- Query / Cache Tuning
 - Oracle BI Server to intelligently re-use previous query results, a capability called "query caching".



BI Server Tuning...

- BI Server Configurations
 - Increase session limit based on Client connections.
 - Define proper limits for server and database threads.
 - Use faster disks to data cache storage
 - Cache aggregate rollup hits
 - Define proper cache entry size
 - Define Temporary path to faster disk
 - Ex. /dev/shm on Linux

BI Server Tuning...

- Statement Cache
 - TUNE THE STATEMENT CACHE SIZE
 - If Oracle database is used set Statement Cache Size to 0 or a lower value.
 - Oracle JDBC Driver consumes lot of memory when calling statements from the Weblogic Server Cache.
 - Setting the statement cache size to 0 will disable Weblogic Server Cache.
 - For all other databases ex. Sql server maintain the default value for Statement Cache.

Partitioning and MVs


- Partition Advantages
 - Partition Pruning
 - Partition - Wise Joins
 - Reduce Maintenance times for Indexes
 - Improve Web query performance
- Materialized views speed up query performance
 - Build Summary views for expensive joins and aggregation operations
- Partition materialized views to take advantage as partition tables

Partitioning and MVs..

- Compression for MVs
 - Compression can be employed
 - Reduces the storage space
 - Faster access of data

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Thank you

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