**INDEX**

**INDEXES** are used to improve the performance of SQL queries by providing a faster way to locate rows. Index are created in where clause column.

The **OPTIMIZER\_USE\_INVISIBLE\_INDEXES** parameter in Oracle Database determines whether invisible indexes are considered by the optimizer during query execution. Invisible indexes are maintained like regular indexes but are ignored by the optimizer unless this parameter is set to **TRUE**

* show parameter optimizer\_use\_invisible\_indexes
* alter system set optimizer\_use\_invisible\_indexes=true.

**Bitmap Index**:

* Used for columns with low cardinality.
* Bitmap index is created on more duplicate values column.

**B-Tree Index**:

* Used for columns with high cardinality.
* B-TREEE indexes created on columns where it contains UNIQUE values.
* By-default indexs are B-TREE indexes.

**STATISTICS**

**STATISTICS** refer to the metadata that provides information about the data within the database objects, such as tables, indexes, and partitions. These statistics are used by the Oracle optimizer to determine the most efficient execution plan for SQL queries.

* EXEC DBMS\_STATS.gather\_table\_stats('EISJMSPROD01','T\_FG\_APR\_SAL\_RET\_INV\_MAIN');
* EXEC DBMS\_STATS.gather\_schema\_stats('EISR1PROD02');

**EX:**

* A table contains 50,000 records if we execute query on this plan will generate for 50,000 records.
* If we delete 20,000 recorde and optimizer dosen’t awair of this deleted records, again it will generate plan for 50,000 records,
* To make optimizer awair of the deleted records STATISTICS should run on the table.
* So that optimizer will generate best execution plan.

**Performance Tuning**

* **Check the server level performance using TOP**
* **Check the services running on the server and consuming high resource**

1. **) Check the blocking session:**

* select blocking\_session,

sid,

wait\_class,

seconds\_in\_wait

from v$session where blocking\_session is not null order by blocking\_session;

2) **Check the queries which are running:**

* select sid,username,sql\_id from v$session where status='ACTIVE';

**3) Check active & inactive sessions:**

* select count(\*) from v$session where status='ACTIVE';
* select count(\*) from v$session where status='INACTIVE';

**4. Check Tablespace having enough space or not:**

* column "tablespace" format a30

column "used MB" format 99,999,999

column "free MB" format 99,999,999

column "total MB" format 99,999,999

select fs.tablespace\_name "tablespace",(df.totalspace - fs.freespace)

"used MB", fs.freespace "free MB",df.totalspace "total MB",

round(100\*(fs.freespace / df.totalspace)) "pct.free" from (select tablespace\_name,round(sum(bytes)/1048576)

totalspace from dba\_data\_files group by tablespace\_name) df,(select tablespace\_name,round(sum(bytes)/1048576)

FreeSpace from dba\_free\_space group by tablespace\_name) fs where df.tablespace\_name=fs.tablespace\_name;

* Generate **AWR** (**ACTIVE WORKLOAD REPORT**) If required.

**SQL Query Tuning**

1. **Check the query hitting table columns and where class columns.**
2. **Check the view is in valid state or not and dependencie tables of the view.**

* select owner,object\_name,STATUS,object\_type from ALL\_OBJECTS where object\_name ='V\_ANALYTICS\_SALES';
* select \* from all\_dependencies where type='VIEW' and name='V\_ALL\_INV\_MAIN';

1. **Check the table last analyzed date & if required run stats gather on table.**

* select table\_name,last\_analyzed from dba\_tables where table\_name='T\_CUSTOMER' and owner='EISR1PROD02';
* EXEC DBMS\_STATS.gather\_table\_stats('EISJMSPROD01','T\_FG\_APR\_SAL\_RET\_INV\_MAIN');

1. **To check indexed columns of the table.**

* select

a.index\_name, a.table\_name, a.column\_name

from all\_ind\_columns a, all\_indexes b

where a.index\_name=b.index\_name

and a.table\_name = upper('T\_FG\_APR\_SAL\_RET\_INV\_MAIN')

order by a.table\_name, a.index\_name, index\_type, a.column\_position;

1. **To Check indexes required REBUILD.**

* SELECT 'alter index ' ||OWNER||'.'||INDEX\_NAME||' rebuild online ;' FROM DBA\_INDEXES where owner='EIST1PROD02' and table\_name IN ('T\_RM\_LOT','T\_WIP\_ISSUE\_DET');

1. **If required create index on the table column.**

* create index ID\_X0DT on EIST1PROD02.T\_FG\_APR\_SAL\_RET\_INV\_MAIN(inv\_due\_dt) tablespace USERS;

1. **To run stats gather on schema.**

* EXEC DBMS\_STATS.gather\_schema\_stats('EISR1PROD02');

1. **Query to find the queries consuming more resource through PID value:**

* select b.spid,

a.sid,

a.serial#,

a.username,

a.osuser

FROM v$session a, v$process b

WHERE a.paddr = b.addr AND b.spid = '&sid'

ORDER BY b.spid;

1. **To generate executain plan of query:**

* set pages 200 lines 200

SELECT \* FROM table(DBMS\_XPLAN.DISPLAY\_CURSOR('&sql\_id'));