

Auto Index Creation

Oracle 19c

```
dbms_auto_index.configure ('AUTO_INDEX_MODE', 'IMPLEMENT');
```

Turn on auto index

```
dbms_auto_index.configure ('AUTO_INDEX_MODE', 'REPORT ONLY');
```

Report only mode. Identify possible indexes

SYS_AI Prefix added to index to differentiate them from normal indices

Invisible Index concept:

Automatic Indexing autocreates indexes as invisible first and then tests the index impact against SQL statements. If the impact is positive—if the SQL statements perform better with an index—the index is made visible

some SQL statements will show improvements and some will show degradation due to this autocreated index. What will the fate of the index be then?

In this case, the index will be made visible, but Automatic Indexing will create a SQL plan baseline to prevent a SQL statement that regressed in performance from using the index. The other SQL statements—statements that did not regress in performance—will continue to use the index.

autocreated indexes may overwhelm the tablespace

To prevent that, ensure that only 50% of the tablespace is used

The system ignores autocreated indexes for any SQL statements run for the first time. This prevents evaluation of one-off SQL statements that are never issued again and wouldn't have been able to benefit from the indexes anyway.

DBAs can disable the autoindex job for specific periods of time, so as not to affect normal processing.

By using the Resource Manager feature of Oracle Database, DBAs can limit the job to a limited number of CPUs, to reduce any negative effect of autoindex jobs.

If an autoindex job is not completed by a certain time, the next run will be skipped. This prevents proliferation of runaway jobs.

the indexes created automatically are deleted after a specific number of days, which defaults to 373.

The automatic indexing feature does the following.

Identify potential automatic indexes based on the table column usage. The documentation calls these "candidate indexes".

Create automatic indexes as invisible indexes, so they are not used in execution plans. Index names include the "SYS_AI" prefix.

Test the invisible automatic indexes against SQL statements to make sure they give improved performance. If they result in improved performance they are made visible. If performance is not improved, the relevant automatic index is marked as unusable and later removed. The SQL statements tested against failed automatic indexes are blocklisted, so they will not be considered for automatic indexing in future. Automatic indexes are not considered by the optimizer for first time SQL run against the database.

Delete unused indexes.

Phases:

1. Candidate Indexes
2. Created Indexes
3. Indexes under testing(subset of 2)
4. Blacklisted Indexes
5. Blacklisted query plans

Considerations for Tables, Views