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# Oracle Advanced Compression

July, 2024, Version 23ai  
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## Oracle Advanced Compression

Oracle Advanced Compression provides a comprehensive set of compression capabilities to maximize storage utilization, reduce costs and improve query performance.

Although storage cost savings and optimization across servers is the most tangible benefit, all the features with Advanced Compression are designed to improve performance across components of your IT infrastructure, including memory, network bandwidth and storage

### Reduce Database Storage – Defer Future Storage Purchases

Advanced Row Compression and Advanced Index Compression are non-obtrusive compression solutions that typically results in a 50%, or more, reduction in overall storage requirement for database tables and indexes with little, or no, disruption for implementation.

This enables organizations to better utilize existing database storage, and possibly defer additional purchases of new storage, for growing applications. Because Advanced Compression substantially reduces the total data size in the application database, storage requirements grow much slower than non-compressed databases

### Improved Query Performance

Advanced Row Compression has no adverse impact on read operations. There is additional work performed while writing data, making it impossible to eliminate performance overhead for write operations. However, Oracle has put in a significant amount of work to minimize this overhead for Advanced Row Compression

### Data and Indexes Compressed in Memory

The benefits of compression go beyond just on-disk storage savings.

One significant advantage is Oracle's ability to read compressed blocks directly without uncompressing the blocks. This helps improve query performance due to the reduction in I/O, and the reduction in system calls related to the I/O operations. Further, the buffer cache becomes more efficient by storing more data without having to add memory

### Reduced RMAN Backup and Recovery Times

Due to RMAN's tight integration with Oracle Database, backup data that is already compressed remains compressed when it is written to disk or tape and doesn't need to be uncompressed before recovery – providing an enormous reduction in storage and a potentially large reduction in backup and restore times

### Application Transparency

No application changes are required to implement data and index compression with Advanced Compression

## Comprehensive Compression Features

- **Advanced Row Compression.** Enables table data to be compressed during all types of data manipulation operations, including DML INSERT and UPDATE operations -- intelligent algorithm minimizes compression overhead during write operations, thereby making compression viable for both data warehouse and OLTP workloads
- **Advanced Index Compression.** Reduces the size of all supported unique and non-unique indexes - automatically chooses the right compression per index block. Advanced Index Compression provides significant space savings while also improving performance for queries that are executed using indexes
- **Advanced LOB Compression and Deduplication.** Provides compression and deduplication for SecureFiles LOBS. SecureFiles is a high performance, and powerful, infrastructure for managing unstructured data such as images, documents, videos and more
  - Advanced LOB Compression. Compresses unstructured data
  - Advanced LOB Deduplication. Eliminates duplicate copies of unstructured data
- **Backup Data Compression.** The storage requirements for maintaining database backups and backup performance are directly impacted by database size. Advanced Compression includes compression for backup data when you employ Oracle Recovery Manager (RMAN) or Oracle Data Pump for database backups/exports
- **Data Guard Redo Transport Compression.** Enables the compression of Oracle Data Guard (primary to standby database) redo data as it is transmitted over the network
- **Automatic Data Optimization (ADO).** Enables organizations to create policies that implement compression tiering and storage tiering automatically. ADO policies define conditions and corresponding actions, applied to specific objects, to automate a Data Lifecycle Management solution
- **Advanced Network Compression.** Compresses network data to be transmitted at the sending side and then uncompressed at the receiver to reduce the network traffic
- **Storage Snapshot Optimization.** Using the RECOVER ... SNAPSHOT TIME capability storage snapshots taken without the database in backup mode can be recovered in one step, whether to the current time or a specific point-in-time after the snapshot was taken, without any additional procedures
- **Exadata Flash Cache Compression (Exadata only).** Dynamically increases the logical capacity of the flash cache by transparently compressing user data as it is loaded into the flash cache
- **Hybrid Columnar Compression Row Level Locking.** Hybrid Columnar Compression uses one lock per Compression Unit (CU) -- optionally, with Advanced Compression, users can choose to enable Row Level Locking
- **Online Move Table or Partition (to any compressed format).** ALTER TABLE ... MOVE ONLINE, with Advanced Compression, enables non-blocking online DDL where DML operations continue to run uninterrupted on the table, or partition, being moved to a compressed format (Basic, Advanced Row or Hybrid Columnar Compression)

- **Optimization for Flashback Time Travel History Table.** Enables Flashback Time Travel to utilize Advanced Row Compression, Advanced LOB Compression and/or Advanced LOB Deduplication -- which are not available by default for Flashback Time Travel history tables

## Conclusion

Oracle Advanced Compression provides a comprehensive set of compression capabilities to help you improve query performance while reducing storage costs. It allows IT administrators to significantly reduce their overall database storage footprint by enabling compression for all types of data –relational (table), unstructured (file), index, network, and backup data.

Although storage cost savings and optimization across servers (production, development, QA, test, backup etc...) are often seen as the most tangible benefits, all the features of Advanced Compression are designed to improve performance for all components of your IT infrastructure, including memory, network bandwidth and storage.

Whether it is a cloud or an on-premise Oracle database deployment, Oracle Advanced Compression can deliver robust compression across different environments with no changes in applications. Benefits from Oracle Advanced Compression include smaller database storage footprint, savings in backups and improved database query performance.

## Free Compression Advisor

An easy way to get started, with Advanced Compression, is by using compression advisor. The “DBMS\_COMPRESSION” PL/SQL package (commonly called compression advisor) gathers compression-related information within a database environment.

This includes estimating the compressibility of both uncompressed partitioned, and non-partitioned tables, and gathering row-level compression information on previously compressed tables/partitions. Compression advisor provides organizations with the storage reduction information needed to make compression-related usage decisions.

The output of running compression advisor is an estimation of the compression ratio for the specific table or partition that was the target of compression advisor. The output indicates the “COMPRESSION RATIO” presented as a number such as 2.1. This number indicates that, for this specific table or partition, the estimated compression ratio is 2.1x, which represents about a 50% reduction in the footprint of the table or partition should compression be enabled.

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