

# Oracle 11g Advanced Compression for E-Business Suite R12 RAC Database : A Comparative Analysis

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Presented by:

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# Agenda

- **What's in ACO?**
- **ACO Benefits**
- **Comparative Analysis for ACO before and after compression**
- **ACO restrictions**
- **ACO and Partitioning**
- **Demo**
- **Decompression Techniques**
- **Questions and Answers**

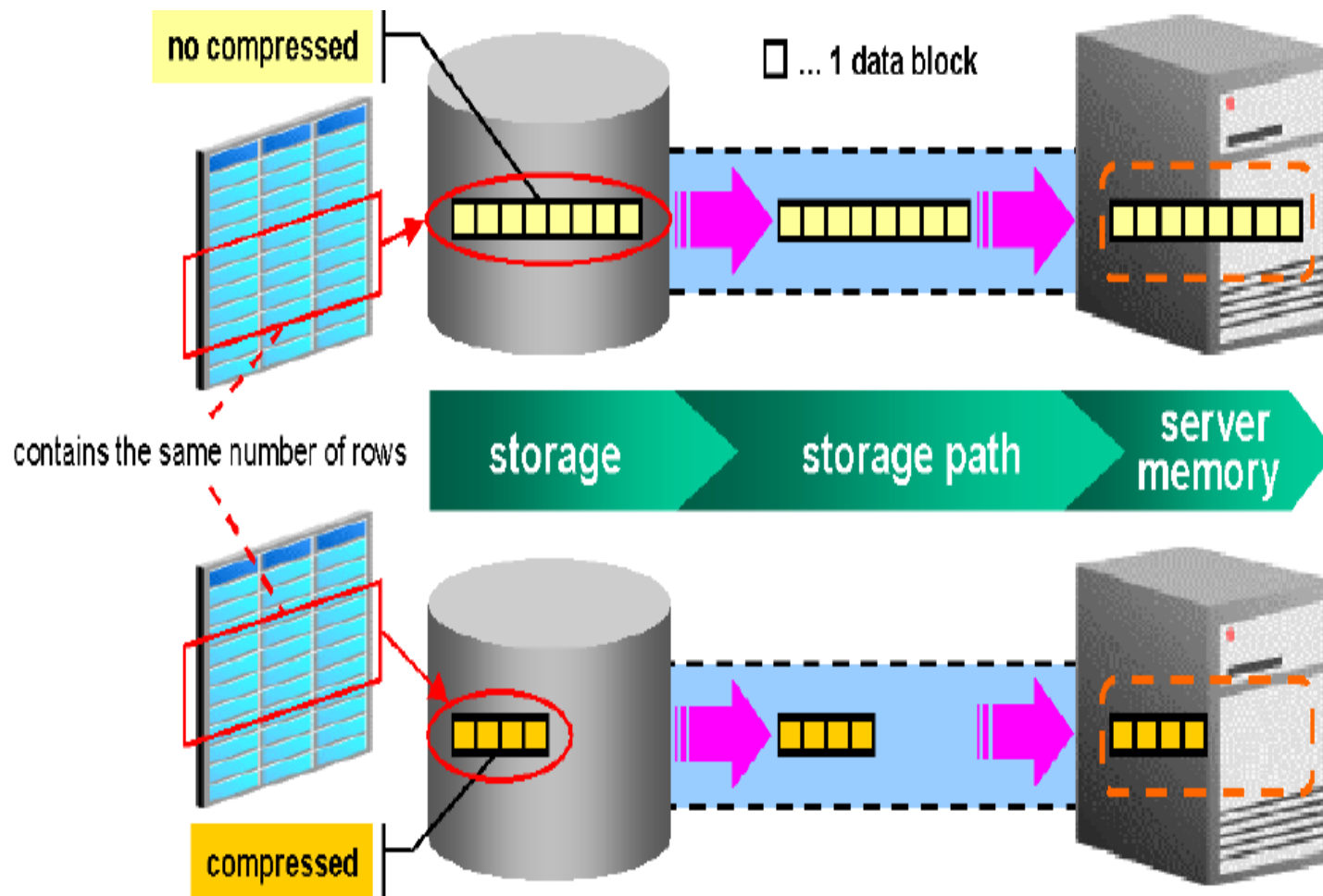
# What's in ACO?

- Compresses Data in Table, Indexes
- Compresses Oracle Secure Files LOBs
- RMAN Backups compression
- Data Pump Compression
- Data Guard Redo Compression

# ACO Benefits

- Save on Disk Storage Costs
- This radically improves query performance
- Misconception that ACO decompress data while reading and holds it in uncompressed format in cache
- Data stays in the cache in compressed form, thereby increasing cache efficiency
- Improved cache hit ratio and reduced I/O physical disk reads

# Data Segment Compression



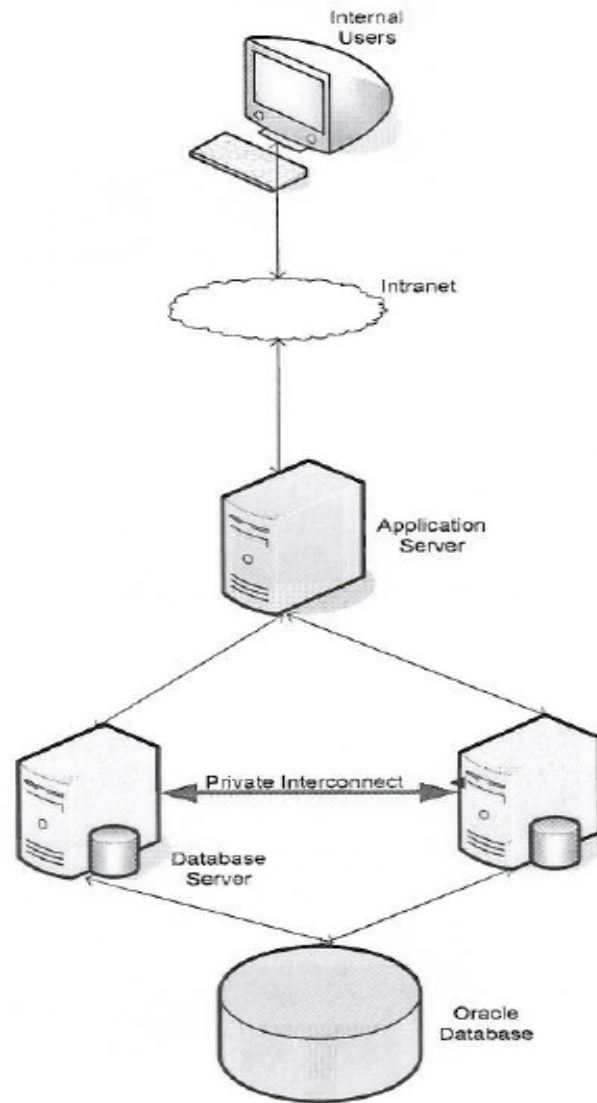
# Data Compression Technology

- Extends Industry standard algorithms to compress data at a block level
- Repeating Data Patterns are stored in block header as symbols
- Occurrences of such data in the block are replaced with pointers to symbols

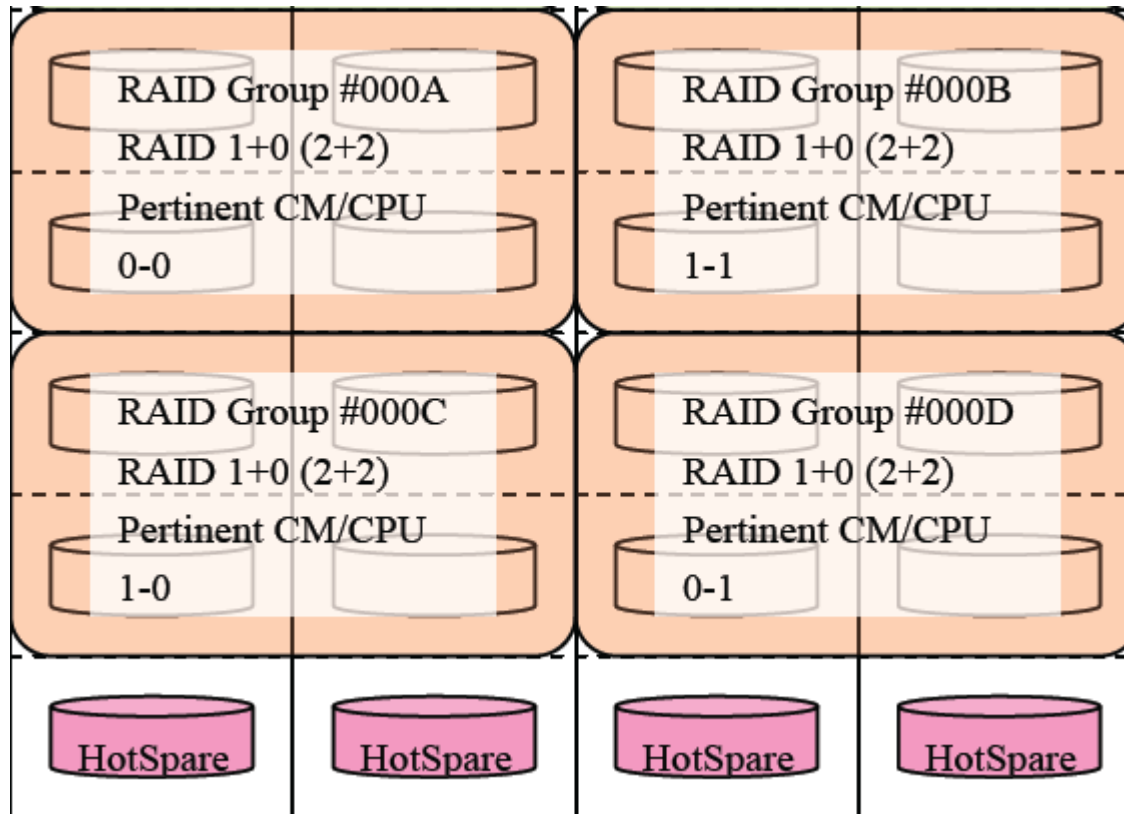
# Environment

- Oracle Database 11g - 2 Node RAC
- Oracle E-business Suite R12
- Oracle Database sized at 700GB
- Growing about 150GB per Quarter
- Major Application Modules used  
AP,AR,GL,INV,OM
- Oracle Retail Point of Sale is used and orders imported into E-Business Suite

# Setup Architecture



# Storage System – ASM Disks setup



# Compression Approach

- An 80/20 rule is followed for Oracle Advanced Compression Technique as 80% of space is consumed by 20% of tables and Indexes of database
- For this client, 3 schema objects (XLA, INV, AR) consuming most space in the database are taking into consideration and compressed

# Major Data Segments

- Current Major Data Segments occupied in Size
- XLA\_DISTRIBUTION\_LINKS ( 60 GB)
- XLA\_DISTRIBUTION\_LINKS\_N1 ( 14 GB)
- XLA\_DISTRIBUTION\_LINKS\_U1 ( 10 GB)
- XLA\_DISTRIBUTION\_LINKS\_N3 ( 6.1 GB)
- AR\_DISTRIBUTIONS\_ALL ( 13 GB )
- MTL\_UNIT\_TRANSACTIONS ( 23 GB)
- MTL\_SERIAL\_NUMBERS ( 8 GB )

# Compression Sizes

- Compression ratios are dependent on the nature of data compressed
- Can vary from dataset to another
- A 2 – 4 times reduction can be expected

# Sizes of Data Segments

- **Size before compression**
- **Total Size of the 35 segments selected for compression amounts to 150 GB before compression**
- **Size after compression**
- **After Compression, Total size of the objects is reduced to 32 GB.**
- **An impressive gain of about 80% of space savings.**

# Compression Options

- Compression clause can be specified at tablespace, table, partition level.
- Compression comes with 2 options
- Compress for Direct Load operations – suitable for Data warehouse systems
- Compress for all Operations – Suitable for OLTP, including regular DML

# DEMO

```
SQL*Plus: Release 11.1.0.7.0 - Production on Sun Oct 23 20:25:03 2011
```

```
Copyright (c) 1982, 2008, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 11g Enterprise Edition Release 11.1.0.7.0 - 64bit Production  
With the Partitioning, Real Application Clusters, Oracle Label Security, OLAP,  
Data Mining and Real Application Testing options
```

```
SQL> set time on
```

```
20:25:06 SQL> alter table ar.ra_customer_trx_lines_all compress for all operations parallel 20;
```

```
Table altered.
```

```
20:26:36 SQL> █
```

# DEMO Contd.,

```
1* select owner,table_name,compression,compress_for from dba_tables where table_name='RA_CUSTOMER_TRX_LINES_ALL'  
20:32:01 SQL> /
```

OWNER	TABLE_NAME	COMPRESS	COMPRESS_FOR
AR	RA_CUSTOMER_TRX_LINES_ALL	ENABLED	FOR ALL OPERATIONS

```
20:32:01 SQL>
```

# Index Compression

- If Needed compress Indexes on tables that are compressed to gain maximum space savings and get better query performance

# Demo

```
20:35:09 SQL> alter index ar.RA_CUSTOMER_TRX_LINES_N12 rebuild online compress parallel 20;
```

Index altered.

```
20:43:06 SQL> select owner,index_name,status,compression from dba_indexes where table_name='RA_CUSTOMER_TRX_LINES_ALL';
```

OWNER	INDEX_NAME	STATUS	COMPRESS
AR	RA_CUSTOMER_TRX_LINES_N12	VALID	ENABLED

# Partitioned Table Compression

- In 11g, we can compress on partition level.

# DEMO

```
SQL>
```

```
SQL>
```

```
SQL>
```

```
SQL> alter table xla.xla_distribution_links move partition dpp compress for all operations parallel 20;
```

```
Table altered.
```

```
SQL> █
```

# DEMO

```
1* select table_name,partition_name,compression from dba_tab_partitions where table_name like 'XLA_DISTRIBUTION_LINKS' and  
compression='ENABLED'  
SQL> /
```

TABLE_NAME	PARTITION_NAME	COMPRESS
XLA_DISTRIBUTION_LINKS	DPP	ENABLED

-

# Index Rebuild

- Best Practice is to rebuild indexes with or without compression on the tables that are being compressed.
- Alter index xla.xla\_distribution\_links\_n1 rebuild online parallel 16;

# Comparative Analysis

- Comparing Major E-Business Tables/Indexes.

Object Name	Object Type	Size before Compress	Size after Compress
XLA_DISTRIBUTION_LINKS	Table	60 GB	8 GB
XLA_DISTRIBUTION_LINKS_N1	Index	14 GB	7 GB
XLA_DISTRIBUTION_LINKS_N3	Index	6.1 GB	3 GB
XLA_DISTRIBUTION_LINKS_U1	Index	10 GB	4.5 GB
INV.MTL_UNIT_TRANSACTIONS	Table	23 GB	2.5 GB
INV.MTL_SERIAL_NUMBERS	Table	7 GB	975 MB
INV. MTL_UNIT_TRANSACTIONS_N1	Index	5.8 GB	3 GB
AR.AR_DISTRIBUTIONS_ALL	Table	13 GB	3 GB
RA_CUST_TRX_LINE_GL_DIST_ALL	Table	4.8 GB	855 MB
RA_CUSTOMER_TRX_LINES_ALL	Table	3.4 GB	562 MB
AR_DISTRIBUTIONS_N1	Index	3.9 GB	1.2 GB

# Decompress

- If due to performance issues in query execution after compression, we have option to decompress the objects
- Decompression option gives DBA ability to turn off the compression at will

# DEMO

```
SQL> alter table xla.xla_distribution_links move partition dpp nocompress parallel 20;
```

```
Table altered.
```

```
SQL>
```

```
21:22:56 SQL> alter table ar.ra_customer_trx_lines_all nocompress parallel 20;
```

```
Table altered.
```

```
21:23:22 SQL> █
```

```
21:23:22 SQL> alter index ar.RA_CUSTOMER_TRX_LINES_N12 rebuild online nocompress parallel 20;
```

```
Index altered.
```

```
21:28:43 SQL>
```

# Compression Restrictions

- The restrictions associated with table compression include:  
Compressed tables can only have columns added or dropped if the COMPRESS FOR ALL OPERATIONS option was used.
- Compressed tables must not have more than 255 columns.
- Table compression is only valid for heap organized tables, not index organized tables.
- The compression clause cannot be applied to hash or hash-list partitions. Instead, they must inherit their compression settings from the tablespace, table or partition settings.
- Table compression cannot be specified for external or clustered tables

# Questions

## Questions And Open Discussion



### Contact Information

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