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# New Features in Database 11gR2

You will not hear about from Oracle Corp.



presentation for:  
NoCOUG Summer 2010

# Introduction

- Daniel Morgan – [damorgan11g@gmail.com](mailto:damorgan11g@gmail.com)
- Oracle Ace Director 🏆
- University of Washington, retired
- The Morgan of Morgan's Library on the web
  - [www.morganslibrary.org/library.html](http://www.morganslibrary.org/library.html)
- Member: Western Washington Oracle Users Group
- Member: UK Oracle Users Group
- Former Member: Oracle Applications Users Group
- Frequent speaker . . . . .
- Oracle since version 6
- 11g beta test site






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New Features in Database 11gR2 You Won't Hear About From Oracle

# Morgan's Library: www.morganslibrary.org



## Morgan's Library


www library

### Morgan's 2010 - 2011 Calendar






[Apr](#) [May](#) [Jun](#) [Jul](#) [Aug](#) [Sep](#) [Oct](#) [Nov](#) [Dec](#) [Jan](#) [Feb](#) [Mar](#)

#### EMEA Harmony Conference

Tallinn, Estonia  
May 20-21, 2010



The first joint conference of the Finnish, Estonian, Latvian and Russian user groups!  
EMEA Harmony will focus on Technology, Middleware and BI  
Featured speakers include Tom Kyte and ACE Director Dan Morgan



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#### Presentations Map




#### The Mad Dog ACE



#### Training Events


- OUGN - Apr 14 - 16, Oslo, Norway
- ORCAN - May 18 - 19, Stockholm, Sweden
- EMEA Harmony - May 20 - 21, Tallinn, Estonia
- NoCOUG - August 2010
- AI OUG - Sep 3 - 4, Hyderabad, India
- OOW - Sep 19 - 23, San Francisco CA
- DOAG - Nov 16 - 18, Nurnberg, Germany
- UKOUG - Nov 29 - Dec 1, Birmingham UK

#### Oracle Events



**Oracle Users Group Norway: April 14-16**

#### Morgan





aboard USA-71


#### Library News

- Morgan's Notepad vi (Blog)** UPDATED
- [Join the Western Washington OUG](#)
- [Morgan's Oracle Podcast](#)
- [DBA Best Practice Guidelines](#)
- [Bryn Llewellyn's PL/SQL White Paper](#)
- [Bryn Llewellyn's Editioning White Paper](#)
- [Troubleshooting Performance](#)

#### ACE News

 **Would you like to become an Oracle ACE?** 

Learn more about becoming an ACE

-  [ACE Directory](#)
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### A Guide To Meeting Challenges in Oracle Database 11g

Modified

1	Guarantee case insensitive uniqueness	<a href="#">Click Here</a>	28-Oct-2009
2	Read a list of operating system files into a PL/SQL array (without using C or Java)	<a href="#">Click Here</a>	28-Oct-2009
3	Identify the columns and data types in a weakly typed ref cursor	<a href="#">Click Here</a>	29-Oct-2009
4	Write a CLOB to a file	<a href="#">Click Here</a>	14-Nov-2009
5	Track the parts of my application that are in use	<a href="#">Click Here</a>	02-Nov-2009
6	Create a data type that will only hold the values 0 and 1	<a href="#">Click Here</a>	21-Nov-2009
7	Create a single check constraint across multiple columns guaranteeing only one is used	<a href="#">Click Here</a>	16-Nov-2009
8	Trap, in a table trigger, the name of the column being updated	<a href="#">Click Here</a>	19-Nov-2009
9	Only report the rows from a query if the number of rows exceeds a limiting value	<a href="#">Click Here</a>	20-Nov-2009
10	Work effectively with the deprecated LONG data type	<a href="#">Click Here</a>	11-Jan-2010
11	Write block corruption alerts to my alert log	<a href="#">Click Here</a>	02-Feb-2010
12	Verify that a string passed into a function or procedure does not contain malicious code (SQL Injection)	<a href="#">Click Here</a>	Soon



This is the start of a new Morgan's Library feature.  
For the next couple of years, while we learn more about 11gR2,  
we will be focusing our efforts here.  
Please join us while we grow this section  
and learn how to index it so you can find what you need.

Can we code it?

Yes we can!

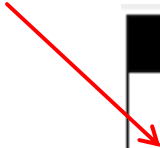
Daniel A. Morgan | [damorgan11g@gmail.com](mailto:damorgan11g@gmail.com) | [www.morganslibrary.org](http://www.morganslibrary.org)

New Features in Database 11gR2 You Won't Hear About From Oracle

# OpenWorld Unconference

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## Oracle OpenWorld *Unconference*



Session ID	Title & Description
Unconference 21-Sep-2010 09:00 - 10:00	Title: Developer Coding Strategies for Very Large Databases <b>Track:</b> <u>Unconference</u> <b>Location:</b> Hotel Parc 55: Mason Room
S313426 21-Sep-2010 11:00 - 12:00	<b>Title:</b> Edition-Based Redefinition: Live in SQL*Plus <b>Track:</b> Database <b>Location:</b> Moscone South #302

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# New in 11gR1

# New in 11gR1

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- Oracle Database introduced a large number of new features. Among the most notable:
  - ADR
  - Compound Triggers
  - Continue Statement
  - Flashback Archive
  - Follows Clause
  - Invisible Indexes
  - Native Compilation Improvements
  - Partitioning Options
    - Partition by Interval
    - Partition by Reference
    - Partition by System
    - Many new composite partitioning options
  - Pivot & Unpivot Operators



# New in 11gR1

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- PL/Scope
- Simple Integer Data Type
- SKIP LOCKED
- New XML Functions
- Pragma Inline
- Read Only Tables
- Virtual Columns

# New in 11gR1

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- Many new packages, objects, and parameters in

- CTX\_DDL
- DBMS\_ADVISOR
- DBMS\_AQ and DBMS\_AQELM
- DBMS\_AUTO\_TASK
- DBMS\_AW
- DBMS\_CAPTURE\_ADM
- DBMS\_CDC\_PUBLISH
- DBMS\_CONNECTION\_POOL
- DBMS\_DATAPUMP
- DBMS\_DRS
- DBMS\_EXTENDED\_TTS\_CHECKS
- DBMS\_FLASHBACK
- DBMS\_HM

Connection Pool Management

Transaction Backout

Health Management

# New in 11gR1

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- DBMS\_LOB
- DBMS\_METADATA
- DBMS\_MONITOR
- DBMS\_NETWORK\_ACL\_ADMIN
- DBMS\_ODCI
- DBMS\_PREDICTIVE\_ANALYTICS
- DBMS\_REGISTRY
- DBMS\_RESOURCE\_MANAGER
- DBMS\_RESULT\_CACHE
- DBMS\_SCHEDULER
- DBMS\_SERVICE
- DBMS\_SESSION
- DBMS\_SHARED\_POOL
- DBMS\_SQL
- DBMS\_SQLDIAG
- DBMS\_SQLPA
- DBMS\_SQLTUNE
- DBMS\_STATS

Access Control Lists

Result Cache

# New in 11gR1

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- DBMS\_STREAMS
- DBMS\_SYSTEM
- DBMS\_TTS
- DBMS\_WARNING
- DBMS\_WORKLOAD\_CAPTURE
- DBMS\_WORKLOAD\_REPLAY
- DBMS\_XA
- DBMS\_XPLAN
- UTL\_XML

Streams

PL/SQL Warnings

Real Application Testing

Distributed Transactions

Explain Plan

# New in 11gR1

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- And in 11.1.0.7
  - DBMS\_AUDIT\_MANAGEMENT
  - DBMS\_BACKUP\_RESTORE
  - DBMS\_IR
  - DBMS\_LOGSTDBY
  - DBMS\_METADATA
  - DBMS\_SCHEDULER
  - DBMS\_SQLPA
  - DBMS\_SQLTUNE
  - DBMS\_WORKLOAD\_CAPTURE
  - DBMS\_WORKLOAD\_REPLAY
  - DBMS\_XPLAN
  - UTL\_XML

Incident Reporting

What Oracle  
will talk about  
"here at OpenWorld"

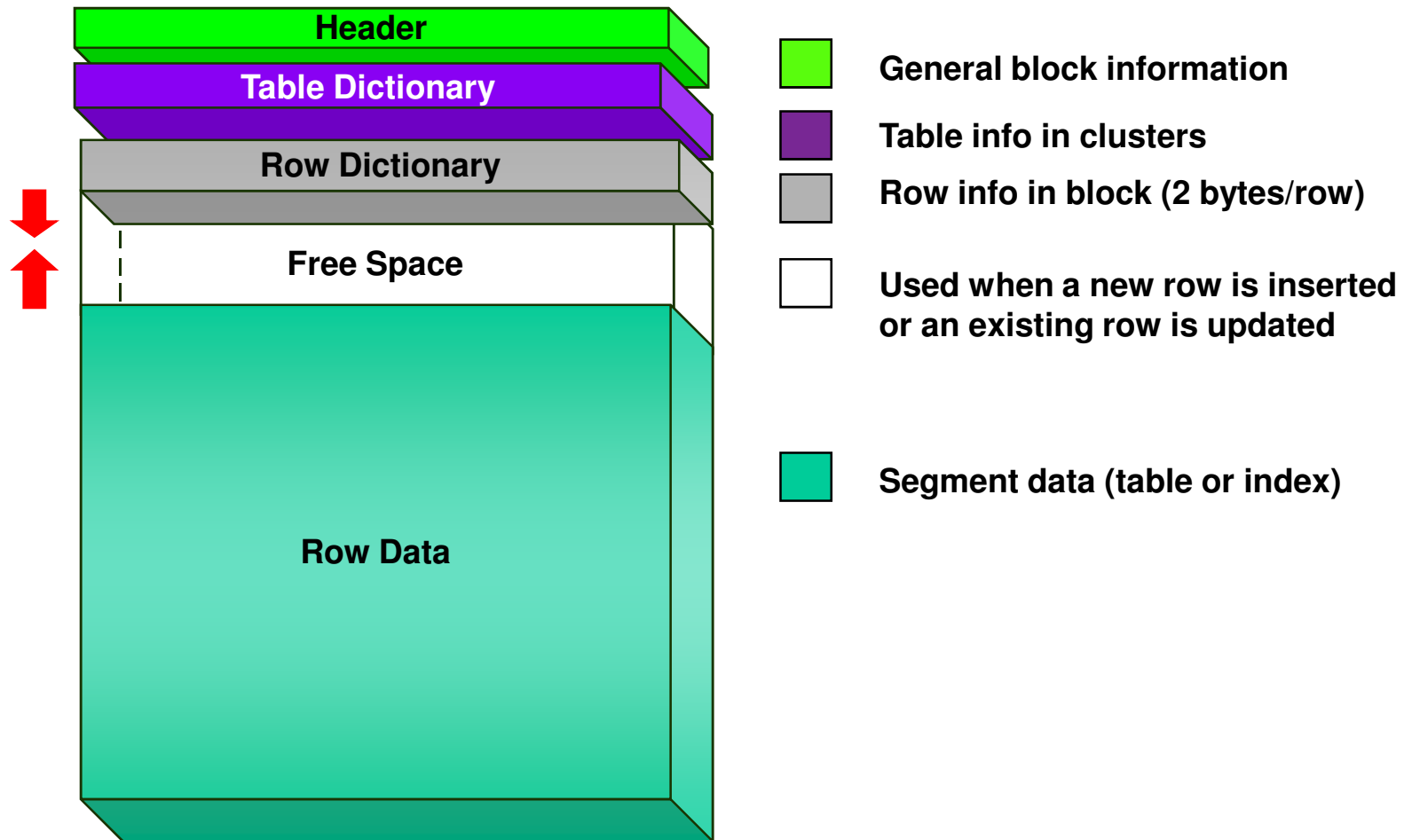


# What Oracle Will Talk About

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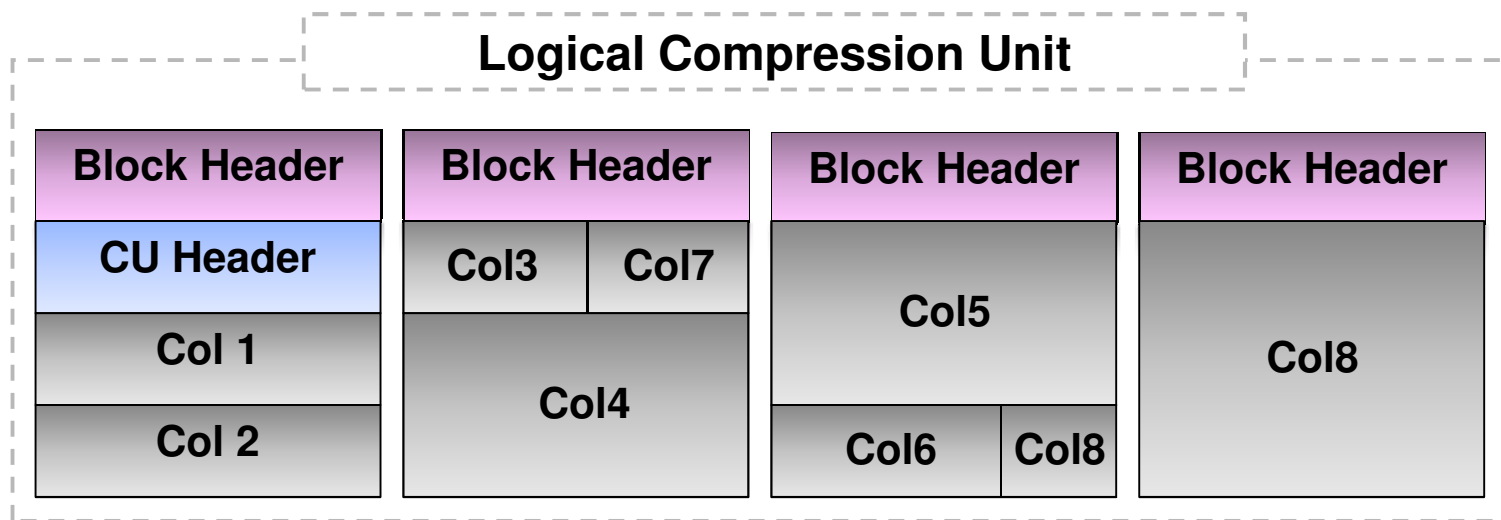
- Edition Based Redefinition - 11.2.0.1
  - Functions, Packages, Procedures, Synonyms, and Views
- New Grid Features
  - Single Node RAC
  - New ASM Capabilities
  - Omotion
  - DBFS
  - the Grid
- In Memory Parallel Query
- Advanced Compression
- Exadata V2 and Hybrid Columnar Compression

# Database Block Anatomy



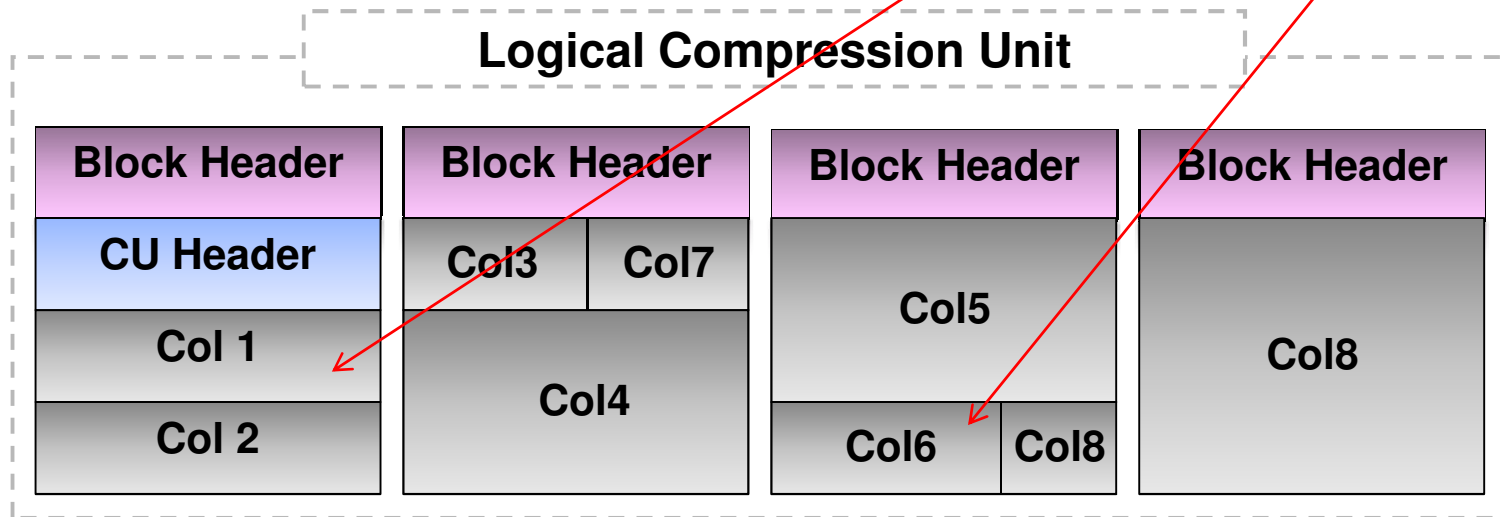
# Logical Compression Unit

- Tables are organized into Compression Units (CU)
  - CU's are logical structure spanning multiple database blocks
    - Typically 32K - (4 x 8K block size)
  - Data is organized by column during data load
  - Each column is compressed separately
  - Column organization brings similar values close together



# Logical Compression Unit

```
CREATE TABLE demo (  
  person_id      NUMBER(10),  
  first_name     VARCHAR2(20),  
  mid_initial    VARCHAR2(4),  
  last_name      VARCHAR2(35),  
  date_of_birth  DATE,  
  hire_date      DATE,  
  status         VARCHAR2(5),  
  comments       VARCHAR2(500));
```



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# New in 11gR2 and you won't hear about from your Oracle rep

# What's Deprecated

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- ALTER USER AUTHENTICATED USING PASSWORD
  - "has been deprecated for this release. If you use this clause, Oracle Database converts it to the AUTHENTICATION REQUIRED clause. If you do not specify the AUTHENTICATION REQUIRED clause, then Oracle Database uses either the AUTHENTICATED USING CERTIFICATE clause or the AUTHENTICATED USING DISTINGUISHED NAME clause."
- DB\_EXTENDED Audit Syntax
  - Instead, use the DB, EXTENDED
- Listener Passwords
  - "This does not cause a loss of security because authentication is enforced through local operating system authentication."
- WKUSER Role and Ultra Search Schemas Deprecated
- DBCA no longer provides default security settings



# Database Level Changes

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- Structure changes in the ADR
- DataGuard Compressed Table Support for Logical Standby and LogMiner
- DataPump Legacy Mode
- `ALTER SYSTEM SET cpu_count = 4;`

# Execute for Directory Objects

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- In 10g we granted READ and/or WRITE
- But this also allowed executing the ORACLE\_LOADER access driver
- Only a user that has been given EXECUTE access to the directory object is allowed to run programs in it

```
CREATE DIRECTORY stage on /home/oracle/stage
```

```
GRANT read ON stage;
```

```
GRANT write ON stage;
```

```
GRANT execute ON stage;
```

# RMAN

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- Automatic Block Repair

```
RMAN> BLOCKRECOVER DATAFILE 2 BLOCK 12,13 DATAFILE 3  
      BLOCK 5,98,99 DATAFILE 4 BLOCK 19;  
  
RMAN> BACKUP VALIDATE DATABASE;  
RMAN> BLOCKRECOVER CORRUPTION LIST;
```

- New options for DUPLICATE DATABASE
  - DUPLICATE can be performed without connecting to a target database: Requires connecting to a catalog and auxiliary database.
- Enhanced Tablespace **P**oint-**I**n-**T**ime-**R**ecovery
  - Recover a dropped tablespace.
  - Can be repeated multiple times for the same tablespace
  - DBMS\_TTS.TRANSPORT\_SET\_CHECK is run automatically

# Storage

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- Tablespaces
  - Enhancements to SecureFiles (learn about DBFS)
  - New Tablespace Master Rekey
- Indexes
  - Zero-size unusable indexes & index partitions
- Tables
  - Segment creation on demand (deferred segment creation)

Demo

# SQL

---

- New Analytic Functions
  - LISTAGG
  - NTH\_VALUE
  - RESPECT or IGNORE NULLS

```
SELECT department_id "Dept.",  
LISTAGG(last_name, ';' ) WITHIN GROUP (ORDER BY hire_date) "Employees"  
FROM employees  
GROUP BY department_id;
```

```
SELECT prod_id, channel_id, MIN(amount_sold),  
NTH_VALUE (MIN (amount_sold), 2)  
  OVER (PARTITION BY prod_id ORDER BY channel_id ROWS  
        BETWEEN UNBOUNDED PRECEDING AND UNBOUNDED FOLLOWING) NV  
FROM sales  
WHERE prod_id BETWEEN 13 AND 16  
GROUP BY prod_id, channel_id;
```

```
FIRST_VALUE (<expression> [RESPECT | IGNORE> NULLS]) OVER (<analytic clause>)
```

# SQL

---

- ALTER DATABASE LINK
- IGNORE\_ROW\_ON\_DUPKEY\_INDEX Hint
  - To ignore collisions and insert the rows that do not collide with existing rows, put the hint in the INSERT statement
- Improved Flashback Archive allows more DDL
- DATABASE\_ROLE constant for SYS\_CONTEXT
  - PRIMARY
  - PHYSICAL STANDBY
  - LOGICAL STANDBY
  - SNAPSHOT STANDBY

```
SELECT sys_context('USERENV', 'DATABASE_ROLE') FROM dual;
```



# SQL

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- Recursive Queries
  - CONNECT BY
- Recursive Common Table Expressions (WITH)

```
WITH <alias> AS
  (subquery_sql_statement)
  SEARCH <BREADTH | DEPTH>
  FIRST BY <column_name> [ASC | DESC] [NULLS FIRST | NULLS LAST]
  SET <ordering_column>
  CYCLE (alias) SET <cycle_mark_alias>
  TO <cycle_value> DEFAULT <no_cycle_value>
SELECT <column_name_list>
FROM <alias_one>, <alias_two>
WHERE <join_condition>;
```

# PL/SQL

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- New NO\_DATA\_NEEDED Predefined Exception
  - ORA-06548: For parallel access and pipelined table functions  
The caller of a pipelined function does not need more rows to be produced by the pipelined function.
- Improved fine grained dependency tracking
- Warnings
  - Severe
    - 5018 - omitted optional AUTHID clause
    - 5019 - deprecated language element
    - 5020 - parameter name must be identified
  - Informative
    - 6016 - native code generation turned off (size/time)
    - 6017 - operation will raise an exception
    - 6018 - an infinity or NaN value computed or used
  - Performance
    - None

# Built-in Packages

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- New Packages (26 in all)

- DBMS\_COMPRESSION
- DBMS\_CUBE\_LOG
- DBMS\_PARALLEL\_EXECUTE

HCC

Control logging of OLAP components

RAC

- Packages with new Functions and Procedures (108)

- DBMS\_BACKUP\_RESTORE
- DBMS\_CUBE
- DBMS\_LOB
- DBMS\_LOGSTDBY
- DBMS\_METADATA
- DBMS\_METADATA\_UTIL
- DBMS\_NETWORK\_ACL\_ADMIN
- DBMS\_RESULT\_CACHE
- DBMS\_SCHEDULER

Restore blocks from Standby

Create CUBE Materialized View

Set Content Type for BLOBS + DBFS

DB IS LOGSTDBY & IS APPLY SERVER

Assign ACL to a Wallet

Delete Dependency

File Watcher

# Built-in Packages

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- Packages with new Functions and Procedures

- DBMS\_SESSION [Get package memory utilization & EBR](#)
- DBMS\_SPACE\_ADMIN [Segment Repair \(NOT!\)](#)
- DBMS\_SPM [Migrate Stored Outlines](#)
- DBMS\_SQLDIAG [Dump Trace File](#)
- DBMS\_SQLPA [DBMS\\_SPA "Undocumented" <g>](#)
- DBMS\_SQLTUNE [REPORT\\_SQL\\_MONITOR enhanced](#)
- DBMS\_STATS
- DBMS\_STREAMS & STREAMS\_ADM
- DBMS\_UTILITY [WAIT\\_ON\\_PENDING\\_DML](#)
- DBMS\_WLM
- DBMS\_WORKLOAD\_CAPTURE & REPLAY
- DBMS\_WORKLOAD\_REPOSITORY [GLOBAL\\_DIFF\\_REPORT](#)
- DBMS\_XPLAN [DIFF\\_PLAN procs](#)

Demo

# Built-in Packages

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- Packages with new Functions and Procedures

- UTL\_HTTP
- UTL\_SMTP

SET\_AUTHENTICATION\_FROM\_WALLET

CLOSE\_CONNECTION

- And many have new overloads (39+)
- And new parameters (13+)
- And new types (1+)
- And new constants (4+)
- Adding new and enhanced functionality

# Questions

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**ERROR at line 1:**

**ORA-00028: your session has been killed**

**All demos at [morganslibrary.org](http://morganslibrary.org)**

- **Library**
- **How Can I?**

**[damorgan11g@gmail.com](mailto:damorgan11g@gmail.com)**

Thank you