

Database 11gR2 New Features

**Oracle will not announce
this year at OpenWorld**

and you'll likely not read about in any book

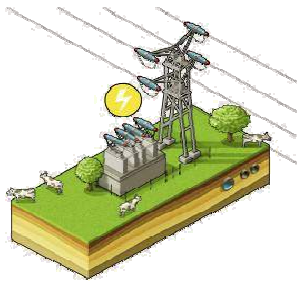


**presentation for:
Oracle OpenWorld 2009**

- damorgan@u.washington.edu
- Oracle Ace Director
- University of Washington, ret.
- The Morgan of Morgan's Library on the web
 - www.morganslibrary.org
- Frequent speaker



PRODUCTS



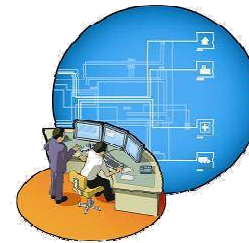
- HV Switchgear
- Power and Distribution Transformers
- Measurement Transformers
- MV Switchgear

SYSTEMS



- Turnkey Transmission Projects
- Turnkey Distribution Projects
- Power Electronics

AUTOMATION



- Substations Automation Solutions
- Network Management Solutions

SERVICE

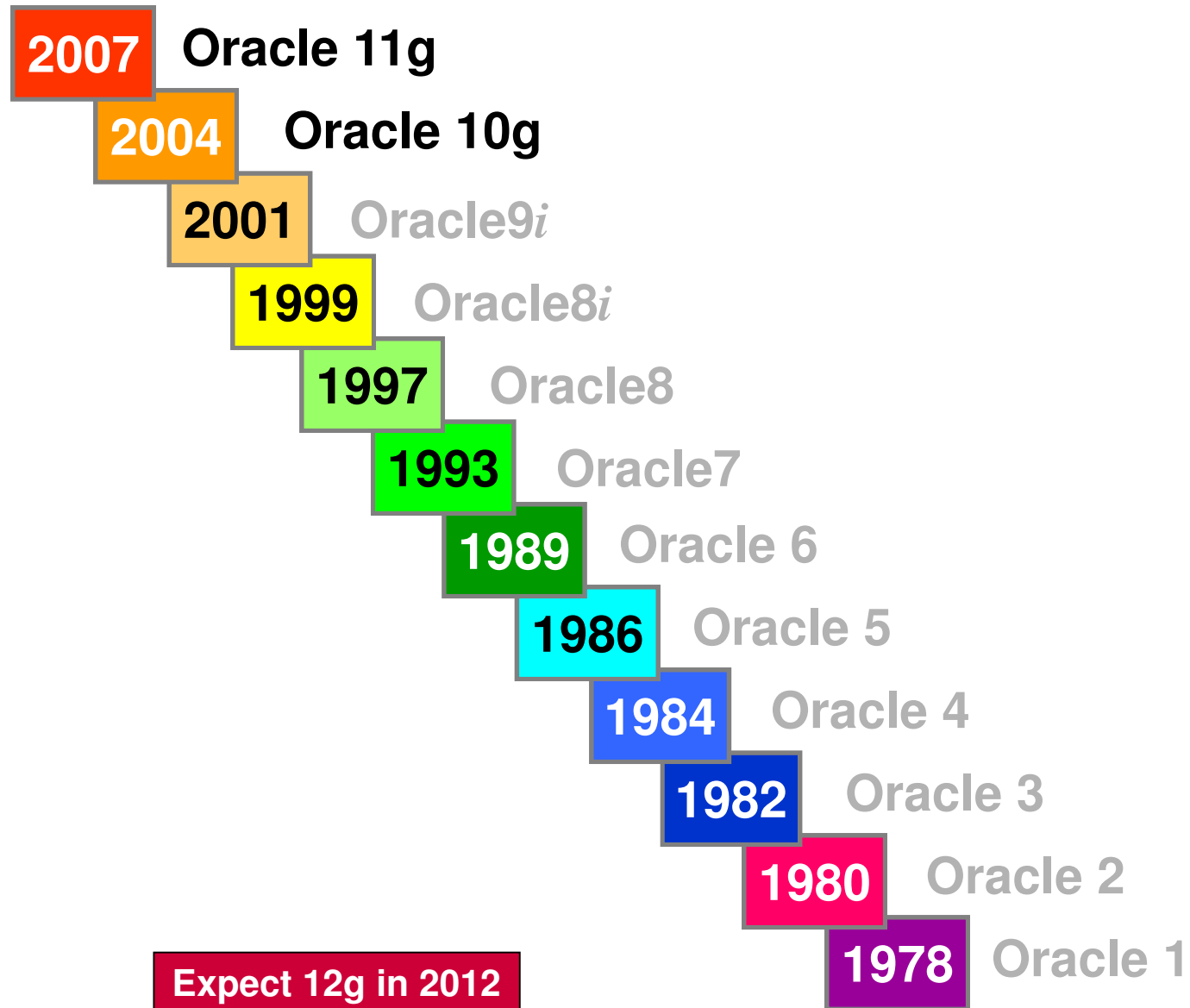


- Network Consulting
- Erection & Commissioning
- Maintenance & Repair & Retrofit
- Spare Parts
- Training and Expertise
- Customer Solutions
- Asset Care



- What was new in 11gR1
- What Oracle Will Talk About
- What is new in 11gR2

Oracle Server History



New in 11gR1

- Oracle Database introduced a large number of new features. Among the most notable
 - ADR
 - Flashback Archive
 - PL/Scope
 - Virtual Columns
 - Invisible Indexes
 - Read Only Tables
 - SKIP LOCKED
 - Interval Partitioning
 - System Partitioning
 - Reference Partitioning
 - New composite partition types
 - Pivot & Unpivot Operators
 - Compound Triggers
 - Follow Clause

- Continue Statement
- Improved Native Compilation
- Simple Integer Data Type
- New XML Functions
- Pragma Inline
- 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 **Connection Pool Management**
 - DBMS_DATAPUMP
 - DBMS_DRS
 - DBMS_EXTENDED_TTS_CHECKS **Transaction Backout**
 - DBMS_FLASHBACK **Health Management**
 - DBMS_HM

- DBMS_LOB
- DBMS_METADATA
- DBMS_MONITOR
- DBMS_NETWORK_ACL_ADMIN **Access Control Lists**
- DBMS_ODCI
- DBMS_PREDICTIVE_ANALYTICS
- DBMS_REGISTRY
- DBMS_RESOURCE_MANAGER
- DBMS_RESULT_CACHE **Result Cache**
- DBMS_SCHEDULER
- DBMS_SERVICE
- DBMS_SESSION
- DBMS_SHARED_POOL
- DBMS_SQL
- DBMS_SQLDIAG
- DBMS_SQLPA
- DBMS_SQLTUNE
- DBMS_STATS
- DBMS_STREAMS **Streams**
- DBMS_SYSTEM

- DBMS_TTS
- DBMS_WARNING
- DBMS_WORKLOAD_CAPTURE
- DBMS_WORKLOAD_REPLAY
- DBMS_XA
- DBMS_XPLAN
- UTL_XML

PL/SQL Warnings

Real Application Testing

Distributed Transactions

Explain Plan

■ 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

- DBMS_REDEFINITION - 9.0.1
 - Tables
 - Constraints
 - Indexes
 - Triggers
- Edition Based Redefinition - 11.2.0.1
 - Functions
 - Operators
 - Packages
 - Pipelined Table Functions
 - Procedures
 - Procedures
 - Synonyms
- Exadata

Hybrid Columnar Compression

- Co-presenters
 - Dan Morgan
 - Kevin Closson
- Thursday
- Moscone South
- Room 102
- 9:00am



**Sun Runs Oracle
Twice as Fast**
as IBM's Fastest Computer

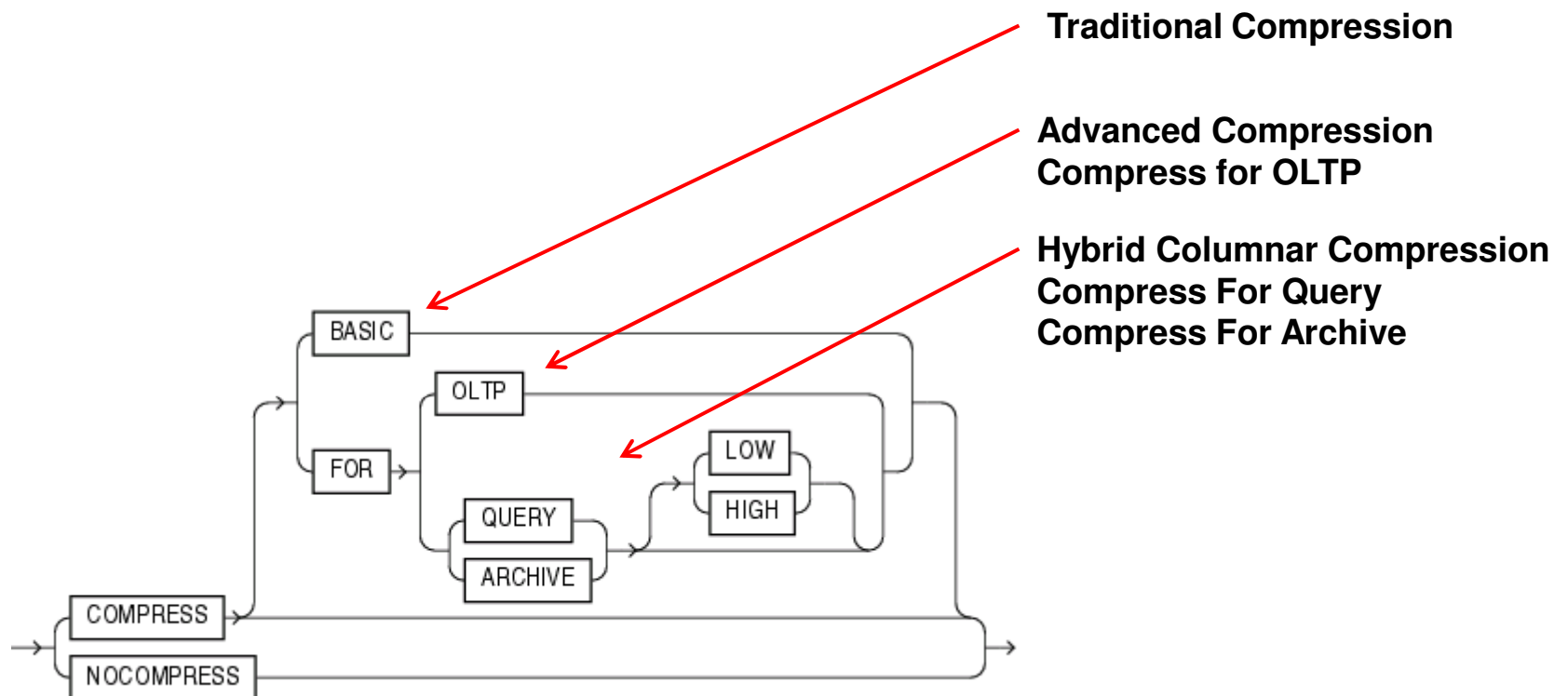


**Win
\$10 Million**

If your database application does not run twice as fast on SUN hardware, IBM, you're welcome to enter.

ORACLE

■ Compressed Tables



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

What Oracle Isn't Talking About

- Structure Changes in the ADR
- DataGuard Compressed Table Support for Logical Standbys and LogMiner
- DataPump Legacy Mode

- 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;
```

- In-Memory Parallel Query
 - Traditionally, parallel execution has access to large amounts of data by taking full advantage of the I/O capacity of the system
 - With, Oracle maps fragments of the object into the buffer caches of active instances so it knows which buffer cache to access
 - As clusters scale-out this new functionality optimizes large parallel operations by minimizing or eliminating physical I/O if parallel operation can be satisfied in memory

```
parallel_adaptive_multi_user=TRUE  
parallel_automatic_tuning=FALSE  
parallel_degree_limit=CPU  
parallel_force_local=FALSE
```

```
PARALLEL_DEGREE_POLICY = {MANUAL | LIMITED | AUTO}  
parallel_degree_limit=AUTO
```

- Automatic Block Repair
- New options for DUPLICATE DATABASE
- Enhanced Tablespace PITR

- Tablespaces
 - Enhancements to SecureFiles
 - New Tablespace Master Rekey
- Indexes
 - Zero-size unusable indexes & index partitions
- Tables
 - Segment creation on demand

- 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>)
```

- ALTER DATABASE LINK
- IGNORE_ROW_ON_DUPKEY_INDEX Hint for INSERT Statement
- DATABASE_ROLE parameter FOR SYS_CONTEXT function
 - PRIMARY
 - PHYSICAL STANDBY
 - LOGICAL STANDBY
 - SNAPSHOT STANDBY

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

- 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>;

```

- 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

- New Packages
 - DBMS_CUBE_LOG
 - DBMS_PARALLEL_EXECUTE *
 - DBMS_POSIX *
- Packages with new Functions and Procedures
 - DBMS_BACKUP_RESTORE
 - DBMS_CUBE
 - DBMS_LOB
 - DBMS_LOGSTDBY
 - DBMS_METADATA
 - DBMS_METADATA_UTIL
 - DBMS_NETWORK_ACL_ADMIN
 - DBMS_RESULT_CACHE
 - DBMS_SCHEDULER
 - DBMS_SESSION

- Packages with new Functions and Procedures
 - DBMS_SPACE_ADMIN
 - DBMS_SPM
 - DBMS_SQLDIAG
 - DBMS_SQLPA
 - DBMS_SQLTUNE
 - DBMS_STATS
 - DBMS_STREAMS & STREAMS_ADM
 - DBMS_UTILITY
 - DBMS_WLM
 - DBMS_WORKLOAD_CAPTURE & REPLAY
 - DBMS_WORKLOAD_REPOSITORY
 - DBMS_XPLAN
 - UTL_HTTP
 - UTL_SMTP

- And many have new overloads
- Or new parameters
- Or new types
- Or new constants
- Adding additional functional capabilities



We did not come here to fear the future



All demos at www.morganslibrary.org

Thank you.

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