What's New ...
In Eleven Dot Two

And will, [likely], not be announced at OpenWorld

... or anywhere else

Victoria
Oracle Users Group

November, 19 2009

Copyright © Daniel A. Morgan all rights reserved

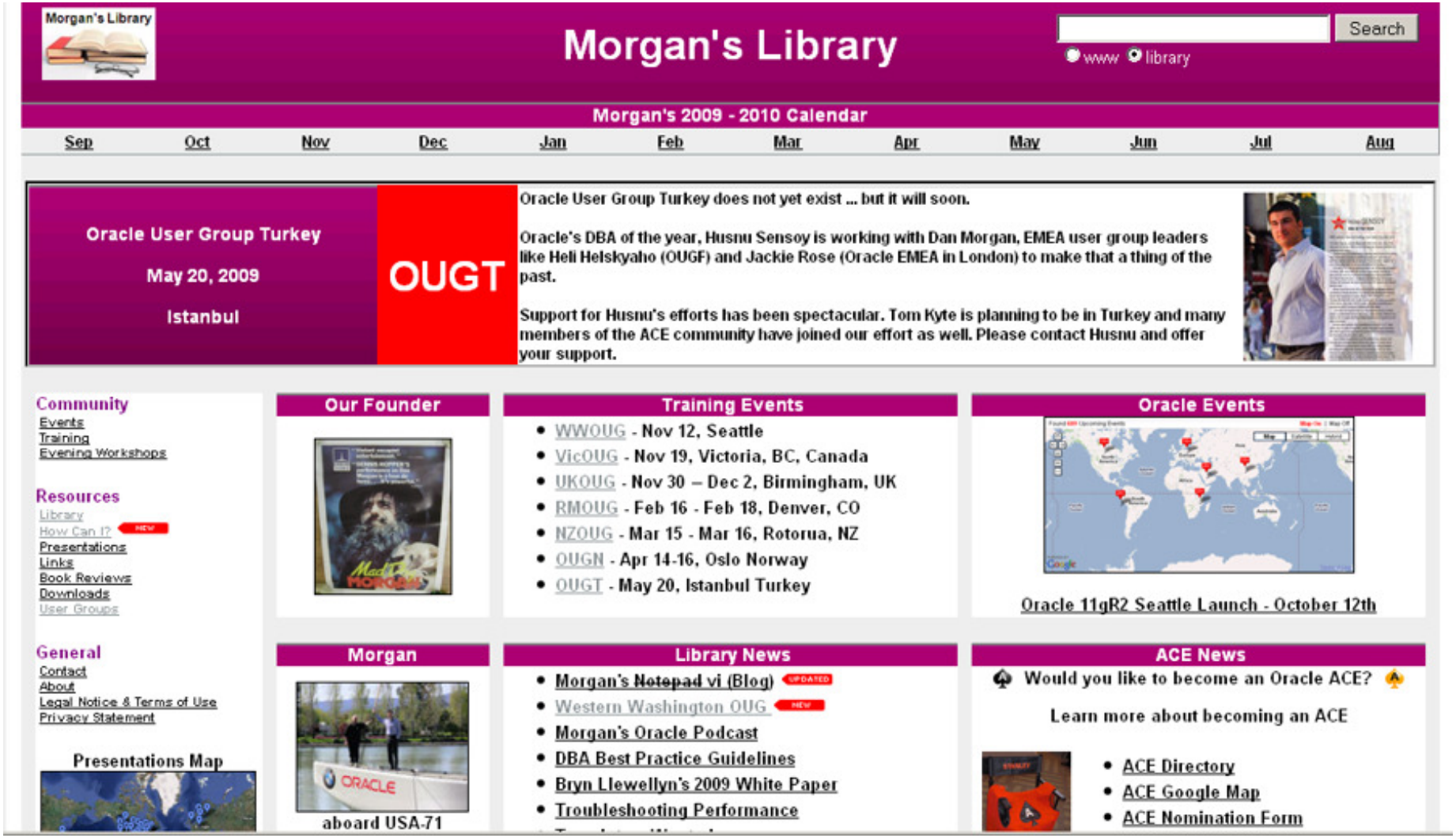
Dan Morgan

- damorgan11g@gmail.com
- Oracle Ace Director
- University of Washington, ret.
- The Morgan of Morgan's Library on the web
  - www.morganslibrary.org
- Frequent speaker

Official Beta Site
ORACLE 11g DATABASE

Copyright © Daniel A. Morgan all rights reserved

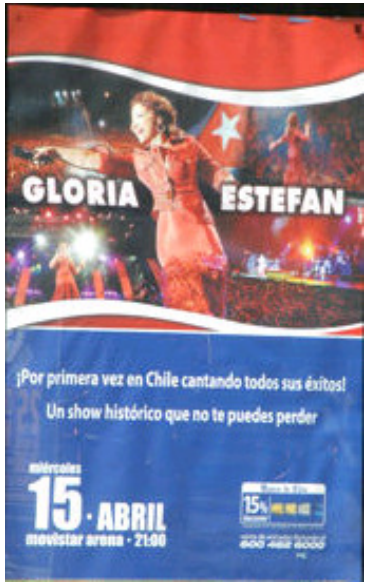
Morgan's Library



www.morganslibrary.org

Copyright © Daniel A. Morgan all rights reserved

Joining the ACEs with Gloria Estefan

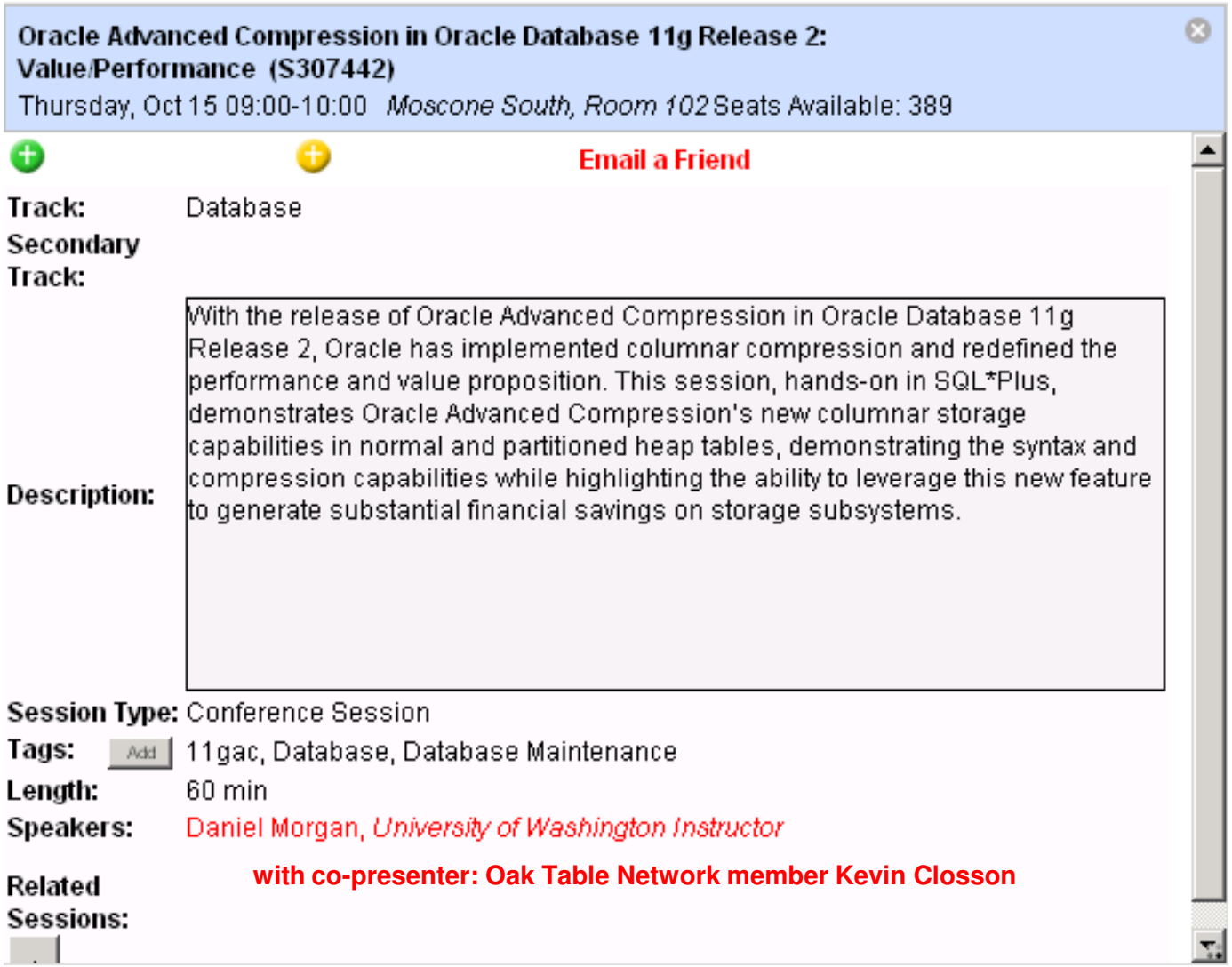


Copyright © Daniel A. Morgan all rights reserved

Visiting HQ

Copyright © Daniel A. Morgan all rights reserved

Oracle OpenWorld 2009



Oracle Advanced Compression in Oracle Database 11g Release 2: Value/Performance (S307442)

Thursday, Oct 15 09:00-10:00 *Moscone South, Room 102* Seats Available: 389

Email a Friend

Track: Database

Secondary Track:

Description: With the release of Oracle Advanced Compression in Oracle Database 11g Release 2, Oracle has implemented columnar compression and redefined the performance and value proposition. This session, hands-on in SQL*Plus, demonstrates Oracle Advanced Compression's new columnar storage capabilities in normal and partitioned heap tables, demonstrating the syntax and compression capabilities while highlighting the ability to leverage this new feature to generate substantial financial savings on storage subsystems.

Session Type: Conference Session

Tags: Add 11gac, Database, Database Maintenance

Length: 60 min

Speakers: Daniel Morgan, *University of Washington Instructor*

with co-presenter: Oak Table Network member Kevin Closson

Related Sessions:

Copyright © Daniel A. Morgan all rights reserved

And a few other places

Copyright © Daniel A. Morgan all rights reserved

Vancouver Oracle Users Group

Vancouver Oracle Users Group

First Meeting	Nov 19, 2009 Victoria, BC	At the conclusion of the VicOUG meeting we will be meeting to plan the formation of an active group across the straight in Vancouver. Please join us.
Second Meeting	Dec, 2009 Vancouver, BC	Oracle is planning a Christmas party for its customers in Vancouver and we hope to use it as an opportunity to meet the Vancouver Oracle community.
Links	Oracle Corporation Oracle Technology Network Oracle Technical Documentation Oracle Installation Documentation Tom Kyte's Website Morgan's Library	
Contact Us	Email Us	

Copyright © Daniel A. Morgan all rights reserved

Agenda

- Hour 1
  - What was new in 11gR1
  - What Oracle Will Talk About
  - What else is new in 11gR2
- Hour 2
  - How Can I [...] ?

Copyright © Daniel A. Morgan all rights reserved

Oracle OpenWorld Unconference

Monday - Oct 12

2pm

Overlook I: Fundamentals of Performance (Oracle ACE Director Cary Millsap)
Overlook II: Oracle Scheduler: what front end tools are available. bring your own tools and demonstrate ! (Ronald Rood, Ciber)
Overlook III: Hudson community meet up

Tuesday - Oct 13

9am

Overlook I: What's New in Eleven ... Dot Two (that Oracle won't be talking about) presented by Oracle ACE Director Daniel Morgan
Overlook II: Creating Platform as a Service (PaaS) environments with WebLogic Server: Best Practices and Stories from the Trenches. (Bill Dettelback)
Overlook III: Reserved for onsite signups

10am

Overlook I: Oracle Indexes: Q & A Discussion With Oracle ACE Director Richard Foote
Overlook II: Experiences on Java programming within the databases, tips & tricks, tools, open source libraries and more. (Oracle ACE Marcelo F. Ochoa)
Overlook III: Reserved for onsite signups

Copyright © Daniel A. Morgan all rights reserved

New in 11gR1

Copyright © Daniel A. Morgan all rights reserved

New in11gR1

- 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

Copyright © Daniel A. Morgan all rights reserved

New in11gR1

- Compound Triggers
- Follow Clause
- Continue Statement
- Improved Native Compilation
- Simple Integer Data Type
- New XML Functions
- Pragma Inline

Copyright © Daniel A. Morgan all rights reserved

New in11gR1

- 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
  - DBMS_FLASHBACK **Transaction Backout**
  - DBMS_HM **Health Management**

Copyright © Daniel A. Morgan all rights reserved

New in11gR1

- 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

Copyright © Daniel A. Morgan all rights reserved

New in11gR1

DBMS_STREAMS	**Streams**
DBMS_SYSTEM	
DBMS_TTS	
DBMS_WARNING	**PL/SQL Warnings**
DBMS_WORKLOAD_CAPTURE	**Real Application Testing**
DBMS_WORKLOAD_REPLAY	
DBMS_XA	**Distributed Transactions**
DBMS_XPLAN	**Explain Plan**
UTL_XML	

Copyright © Daniel A. Morgan all rights reserved

New in11gR1

- And in 11.1.0.7
  - DBMS_AUDIT_MANAGEMENT
  - DBMS_BACKUP_RESTORE
  - DBMS_IR **Incident Reporting**
  - DBMS_LOGSTDBY
  - DBMS_METADATA
  - DBMS_SCHEDULER
  - DBMS_SQLPA
  - DBMS_SQLTUNE
  - DBMS_WORKLOAD_CAPTURE
  - DBMS_WORKLOAD_REPLAY
  - DBMS_XPLAN
  - UTL_XML

Copyright © Daniel A. Morgan all rights reserved

What Oracle will talk about "here at OpenWorld"

Copyright © Daniel A. Morgan all rights reserved

What Oracle Will Talk About

- DBMS_REDEFINITION - 9.0.1
  - Tables, Constraints, Indexes, and Triggers
- Edition Based Redefinition - 11.2.0.1 **Bryn Llewellyn**
  - Functions, Operators, Packages, Procedures, Synonyms
- New Grid Features
  - Single Node RAC, New ASM Capabilities, DBFS, the Grid
- Advanced Compression
- Exadata V2 and Hybrid Columnar Compression

Copyright © Daniel A. Morgan all rights reserved

We all have our favorite customers: This is mine

Store More Data

Maintain Performance

Honor the same Service Level Agreement

GB, TB, EB What's the big deal?

Copyright © Daniel A. Morgan all rights reserved

How Traditional Compression Works

- A grossly oversimplified "how it works"
  1. Oracle examines full blocks for duplicates
  2. Creates a symbol that is stored in the block header
  3. Rewrites the block substituting the symbol for the values it represents
- Compression is performed at the block level
  not the table like DB2

City	State	Postal Code
Hot Springs National Park	AR	71901
Hot Springs National Park	AR	71902
Hot Springs National Park	AR	71903
Hot Springs National Park	AR	71913

128 btyes

City	State	Postal Code
Hot Springs National Park	AR	71901
"	"	"02
"	"	"03
"	"	"13

38 btyes

Copyright © Daniel A. Morgan all rights reserved

Two New Features in Exadata V2

Warehouse Compression

- 10x average storage savings
- 10x reduction in Scan IO

Optimized for Speed

Archive Compression

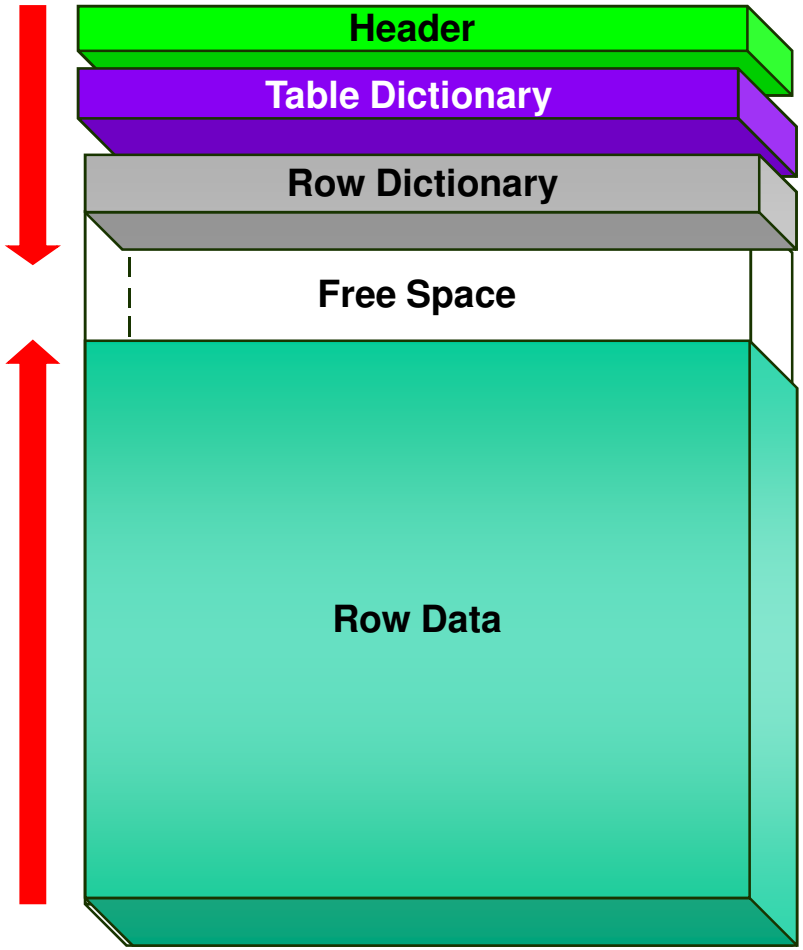
- 15x average storage savings
  - **Up to 70x on some data**
- Some access overhead
- For cold or historical data

Optimized for Space

Totally application transparent

Copyright © Daniel A. Morgan all rights reserved

Database Block Anatomy



General block information

Table info in clusters

Row info in block (2 bytes/row)

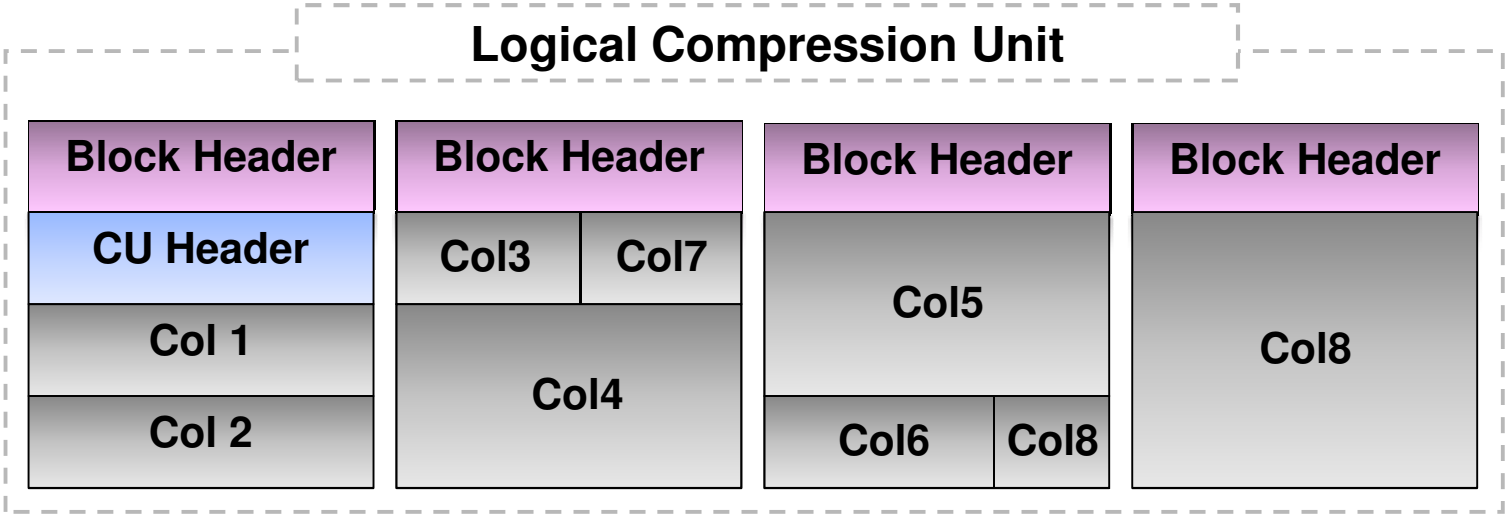
Used when a new row is inserted or an existing row is updated

Segment data (table or index)

Copyright © Daniel A. Morgan all rights reserved

Logical Compression Unit

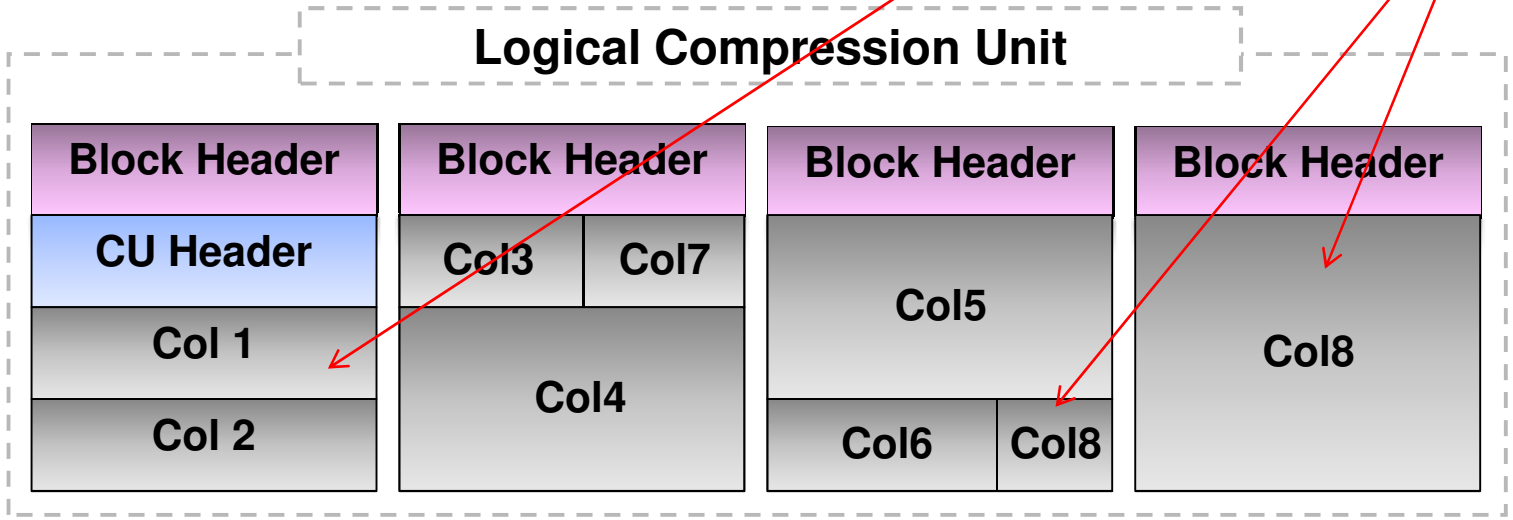
- Tables are organized into Compression Units (CU)
  - CU's are logical structure spanning multiple database blocks
    - Typically 32K - (4 x 8K block size)
  - Data is organized by column during data load
  - Each column is compressed separately
  - Column organization brings similar values close together



Copyright © Daniel A. Morgan all rights reserved

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));
```



Copyright © Daniel A. Morgan all rights reserved

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

Copyright © Daniel A. Morgan all rights reserved

Database Level Changes

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

Demo

Copyright © Daniel A. Morgan all rights reserved

Execute for Directory Objects

- 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;
```


Copyright © Daniel A. Morgan all rights reserved

- 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
```

Ok they did have one session on IMPQ

Copyright © Daniel A. Morgan all rights reserved

RMAN

- 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
- Enhanced Tablespace PITR

Copyright © Daniel A. Morgan all rights reserved

Storage

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

```
CREATE TABLE uwclass.later (
col1 NUMBER,
col2 VARCHAR2(20))
SEGMENT CREATION DEFERRED;
```

Demo

Copyright © Daniel A. Morgan all rights reserved

- 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>)
```


Copyright © Daniel A. Morgan all rights reserved

SQL

- ALTER DATABASE LINK
- IGNORE_ROW_ON_DUPKEY_INDEX Hint for INSERT Statements
- 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;
```

Demo

Copyright © Daniel A. Morgan all rights reserved

- 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>;
```


Copyright © Daniel A. Morgan all rights reserved

- New NO_DATA_NEEDED Predefined Exception
  - ORA-06528: For parallel access and pipelined table functions
- 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

Demo

Copyright © Daniel A. Morgan all rights reserved

Built-in Packages

- New Packages (26 in all)
  - DBMS_COMPRESSION
  - DBMS_CUBE_LOG
  - DBMS_PARALLEL_EXECUTE
- 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 **File Watcher**

Copyright © Daniel A. Morgan all rights reserved

DBMS_SCHEDULER

```
exec dbms_scheduler.create_credential(
 'uw_credential',
 'uwclass',
 'uwclass');

exec dbms_scheduler.create_program(
 'file_watcher',
 'stored_procedure',
 'load_file',
 1);

exec dbms_scheduler.create_file_watcher(
 'UW_FWatch',
 'STAGE',
 'democlob.txt',
 'uw_credential');

exec dbms_scheduler.create_job(
 'UW_File_Job',
 'file_watcher',
 event_condition => 'tab.user_data.file_size > 10',
 queue_spec => 'UW_FWatch',
 enabled => TRUE,
 auto_drop => FALSE);
```


Copyright © Daniel A. Morgan all rights reserved

Built-in Packages

- Packages with new Functions and Procedures
  - DBMS_SESSION
  - 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

Copyright © Daniel A. Morgan all rights reserved

Built-in Packages

- Packages with new Functions and Procedures
  - UTL_HTTP
  - UTL_SMTP
- And many have new overloads (39)
- Or new parameters (13)
- Or new types (1)
- Or new constants (3)
- Adding additional functional capabilities

Copyright © Daniel A. Morgan all rights reserved

New in Database 11.2 Summary

. . . . . We did not come here to fear the future

Copyright © Daniel A. Morgan all rights reserved

Agenda

- Survey
- Hour 2
  - How Can I guarantee case-insensitive uniqueness?
  - Read a list of operating system files into an array?
  - Identify weakly typed REF CURSOR columns?
  - Write a CLOB to a file?
  - Track the parts of my application that are in use?
  - Create a variable that acts like a check constraint?

Copyright © Daniel A. Morgan all rights reserved

How Can I?

How Can I (...) ?

Home

Community
Events
Evening Workshops
Training

Resources
Library
How Can I?
Presentations
Links
Book Reviews
Downloads
User Groups

General
Contact Us
About Us
Legal Notices & Terms of Use
Privacy Statement

A Guide To Meeting Challenges in Oracle Database 11g

1	Guarantee case insensitive uniqueness	Click Here	28-Oct-2009
2	Read a list of operating system files into a PL/SQL array (without using C or Java)	Click Here	28-Oct-2009
3	Identify the columns and data types in a weakly typed ref cursor	Click Here	29-Oct-2009
4	Write a CLOB to a file	Click Here	01-Nov-2009
5	Track the parts of my application that are in use	Click Here	02-Nov-2009
6	Create a data type that will only hold the values 0 and 1	Click Here	08-Nov-2009
7	Verify that a string passed into my function or procedure does not contain malicious code (SQL Injection)	Click Here	Soon
8	Create a single check constraint across multiple columns guaranteeing only one is used	Click Here	Soon
9	Work effectively with the deprecated LONG data type?	Click Here	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!

Copyright © Daniel A. Morgan all rights reserved

guarantee case-insensitive uniqueness

```
CREATE TABLE depts (
dept_id   VARCHAR2(2),
dept_name VARCHAR2(30));

ALTER TABLE depts
ADD CONSTRAINT pk_departments
PRIMARY KEY (dept_id);

ALTER TABLE depts
ADD CONSTRAINT uc_dept_name
UNIQUE (dept_name);

INSERT INTO depts (dept_id, dept_name) VALUES ('1', 'Accounting');
INSERT INTO depts (dept_id, dept_name) VALUES ('2', 'RESEARCH');
INSERT INTO depts (dept_id, dept_name) VALUES ('3', 'Sales');

INSERT INTO depts (dept_id, dept_name) VALUES ('4', 'Research');
INSERT INTO depts (dept_id, dept_name) VALUES ('5', 'research');
INSERT INTO depts (dept_id, dept_name) VALUES ('6', 'ResearcH');

CREATE UNIQUE INDEX fbi_depts_dept_name
ON depts(UPPER(dept_name));
```

Demo

Copyright © Daniel A. Morgan all rights reserved

read a list of operating system files using PL/SQL

```
DECLARE
 TYPE file_rec IS RECORD (FileName dbms_sql.varchar2_table);
 frec file_rec;

 CURSOR fcur IS
 SELECT fname_krbmsft AS FileName
 FROM x$krbmsft
 WHERE fname_krbmsft LIKE '%.%';

 dirname VARCHAR2(1024) := 'c:\tmp';
 ns      VARCHAR2(1024);
BEGIN
  dbms_backup_restore.searchfiles(dirname, ns);

  OPEN fcur;
  FETCH fcur BULK COLLECT INTO frec;
  CLOSE fcur;

  FOR i IN 1 .. frec.FileName.COUNT LOOP
    dbms_output.put_line(frec.FileName(i));
  END LOOP;
END;
/
```

Demo

Copyright © Daniel A. Morgan all rights reserved

identify weakly type ref cursor columns

```
DECLARE
 refcur SYS_REFCURSOR;
 h      NUMBER;
 cnt    NUMBER;
 ret    dbms_sql.desc_tab;
BEGIN
  OPEN refcur FOR
  SELECT * FROM airplanes;

  h := dbms_sql.to_cursor_number(refcur);

  dbms_sql.describe_columns(h, cnt, ret);
  print_desc_tab(ret);
  dbms_sql.close_cursor(h);
END demo;
/
```

Demo

Copyright © Daniel A. Morgan all rights reserved

write a CLOB to a file

```
fhandle := utl_file.fopen('CTEMP', 'testfile0.txt', 'W')
LOOP
    EXIT WHEN offset >= clobLen;
    clobPart := next_row(buf, offset);
    utl_file.put_line(fhandle, clobPart, FALSE);

  offset := offset + 1024;
END LOOP;
utl_file.fflush(fhandle);
utl_file.fclose(fhandle);



dbms_advisor.create_file(buf, 'CTEMP', 'testfile1.txt');



dbms_xslprocessor.clob2file(buf, 'CTEMP', 'testfile2.txt');
```

Demo

Copyright © Daniel A. Morgan all rights reserved

track the parts of my application that are in use

```
SELECT module, action, client_info
FROM gv$session;
```

```
exec dbms_application_info.set_client_info('AAA');
```

```
exec dbms_application_info.set_module('BBB','CCC');
```

```
exec dbms_session.set_identifier('DDD');
```

```
exec owa_util.who_called_me(oname, pname, lnumb, callr);
```

Demo

Copyright © Daniel A. Morgan all rights reserved

create a data type that will only hold 0s and 1s

```
DECLARE
 SUBTYPE flagtype IS PLS_INTEGER RANGE 0..1;
 x flagtype;
BEGIN
  BEGIN
    x := 0;
    dbms_output.put_line('Success: ' || TO_CHAR(x));
  EXCEPTION
    WHEN others THEN
      dbms_output.put_line('Can not assign 0 to flagtype');
  END;

  BEGIN
    x := 1;
    dbms_output.put_line('Success: ' || TO_CHAR(x));
  EXCEPTION
    WHEN others THEN
      dbms_output.put_line('Can not assign 1 to flagtype');
  END;

  ....
END;
/
```

Demo

Copyright © Daniel A. Morgan all rights reserved

Vancouver Oracle Users Group

Vancouver Oracle Users Group

First Meeting	Nov 19, 2009 Victoria, BC	At the conclusion of the VicOUG meeting we will be meeting to plan the formation of an active group across the straight in Vancouver. Please join us.
Second Meeting	Dec, 2009 Vancouver, BC	Oracle is planning a Christmas party for its customers in Vancouver and we hope to use it as an opportunity to meet the Vancouver Oracle community.
Links	Oracle Corporation Oracle Technology Network Oracle Technical Documentation Oracle Installation Documentation Tom Kyte's Website Morgan's Library	
Contact Us	Email Us	

Copyright © Daniel A. Morgan all rights reserved

ERROR at line 1:

ORA-00028: your session has been killed

All demos at morganslibrary.org

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

Thank you

Copyright © Daniel A. Morgan all rights reserved