Understanding Oracle Database 10g Editions, Features and Costs

Presenter: Dave Anderson
About Your Presenter

- Dave Anderson
  - Oracle DBA, Consultant, Instructor
  - Started working with Oracle in 1995
  - Founded SkillBuilders

- In I.T. since 1980
  - Started with IBM Mainframe, MVS
  - DB2 Developer and DBA for 10 years
  - Banking, Insurance, Energy, ISV
SkillBuilders

- I.T. Training
  - Instructor-led training
  - Customer-site and off-site
- Consulting
  - DBA services, onsite or remote
  - Application Development
- Oracle Partner
  - Sales
  - Consulting
  - Oracle Health Checks

- Focus Technologies
  - Oracle
  - Java, J2EE and XML
  - Web Design
    - Application Express
    - Ajax
    - Dreamweaver
    - JSTL - JSP
  - SOA
  - Web Services
  - OOAD / UML
  - Linux / Unix
Today’s Agenda…

- AM Session – *Understanding Oracle Editions, Features and Costs*
  - Is Oracle Database 10g easier to install and use?
  - Good for SMB’s?
  - A good alternative to SQL Server?
  - What are the differences between the various Editions?
  - What are the advanced options and features?
…Today’s Agenda

- PM Session – Oracle Database 10g New Features for Administrators
  - Technical session, with demos
  - Automatic Management
  - Self-Service Error Correction
Introduction to Oracle 10g

- 10g R2 released late 2005
  - R1 released 2004
  - 10.2.0.3 current release

- “g” is for Grid Computing
  - Next generation of computing
    - After client-server and multi-tier
  - Grid pools low-cost computing resources for enterprise needs

- RAC is foundation for Oracle Database Grid support
  - Clustered database servers
Oracle 10g – Major Directions…

- Grid support
  - Pool low-cost computing resources for enterprise needs
- Scalability
  - Scale to exabyte-sized databases with no application changes
- High Availability
  - Protection against hardware and human error
  - Availability during maintenance operations
- Ease of installation and management
  - Simple step-by-step GUI
...Oracle 10g – Major Directions

- Automatic management, tuning
  - Automatic collection of performance data (baselines!)
  - Advisors to analyze data
  - Metrics and Thresholds for pro-active management
- Lower cost for SMB’s
- Zero cost for developers and ISV’s
Oracle and SMB’s

- Oracle already a recognized leader in large and VLDB environments
  - Oracle used in all of the largest 10 Linux DB’s
  - Why?
    - VLDB Features
    - Great High Availability Features
    - Performance

- Will 10g provide solutions needed by SMB’s?
  - Yes!
Spotlight on SMB’s
Solutions for SMB’s…

- Low cost
  - Start at $0 - $149 per user
- Easy “DBA-less” installation
  - GUI, step-by-step
- Easy to use, even by non-tech personnel
  - Application Express!
- Auto-tuning
  - Automatic Memory Management
  - Automatic statistics collection job
...Solutions for SMB’s

- Scalability
  - Applications 100% upgradeable to Enterprise Edition
- Easy backup and recovery
  - Auto backup job created with database
Oracle Database 10g Editions

- Express Edition
  - “XE”
- Standard Edition One
  - “SE1”
- Standard Edition
  - “SE”
- Enterprise Edition
  - “EE”
10g Express Edition...

- Free to develop, deploy and distribute
- Fast, easy installation
  - Developers can easily install
- Available for 32-bit Linux and Windows
- Includes Oracle Application Express
  - Fast, free and easy web apps
…10g Express Edition…

- Great for all developers and ISV’s
  - SQL, PL/SQL, PHP, Java, C, C++, .NET, XML
  - Ruby on Rails, NetBeans, more…
- LinuxWorld Product Excellence Award for
  - *Best Database Solution*
- Easy upgrade to SE1, SE, or EE
  - 100% upward compatible
  - No application changes
…10g Express Edition

- Includes
  - Backup, recovery, including incrementals
  - Encryption toolkit
  - Flashback Query
  - Auto-Memory Management
  - Auto-UNDO management
  - Auto-Statistics Management
  - Browser-based management tool
  - Oracle Text

- Limitations
  - 1 CPU, 4GB max user data, 1GB max memory, online support forum only

See handout for complete list of features
Oracle 10g XE
vs.
Microsoft and MySQL

- Ease of Installation – Advantage: None
  - Installation in less than 20 minutes
- Cost
  - Vs. Access – Advantage Oracle
- Scalability – Advantage Oracle
  - Apps 100% upgradeable to SE1, SE, EE
- Platform Support and Portability – Advantage Oracle
  - Support for Windows, Linux, 32 bit platforms
10g Standard Edition One…

- **Typical use** (not limits)
  - 1 – 400 users
  - 500 Gb user data

- **Includes**:
  - Enterprise Manager Database Control
    - Web-based management tool
  - RMAN, plus RMAN auto-backup
    - Server-based backup and recovery utility, including true incrementals
    - OEM provides GUI
  - Automatic Storage Management
    - Built-in file and volume manager, Provides S.A.M.E.

See handout for complete list of features
...10g Standard Edition One

- Apps 100% upgradeable to SE or EE
  - No code changes
- Limitations
  - Max 2 CPUs
  - No RAC or other options
- Low-cost
  - $745 for 5 user license
  - $4995 for 1 CPU license
Oracle 10g SE1
vs.
SQL Server 2005

- Platform Support and Portability – Advantage Oracle
  - Support for all Oracle-certified platforms
    - Windows, Linux, Unix, more

- Linux
  - Low-cost, reliable, Oracle-certified platform
  - “Oracle Unbreakable Linux” support program
Oracle 10g SE1 vs. SQL Server 2005

- Ease of Installation – Advantage: None
  - Installation less than 20 minutes
- Cost – Advantage Oracle
# Cost: Advantage Oracle

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<th>No of Users</th>
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Oracle 10g SE1 vs. SQL Server 2005

- Concurrency – Advantage Oracle
  - Oracle multi-version read control (MVRC)
    - Available for 20 years
    - Default in Oracle
    - Leveraged by Flashback technology
  - MS Snapshot Isolation
    - SQL Server 2005 New feature
    - Requires code changes
    - Performance hit
Why Oracle is Different:
Row-Level Locking with Multi-Version Read Consistency

**Non-Oracle Databases**
- Table Data
- Lock List (in memory)
  - Row
  - Row
  - Table

**Oracle Databases**
- Table Data
- Undo Segment
  - Locked
  - UNDO

Transaction Logs

ORACLE PARTNER
Readers don’t block writers
Writers don’t block readers

1. Query begins
2. Query continues
3. Query continues
4. Query reads snapshot
5. Query continues
6. Query finishes

Oracle (user A)

User B
Update row
Update row
Commit

Others
Read Consistency

“When using Uncommitted Read, you give up the assurance of strongly consistent data in favor of high concurrency in the system without users locking each other out.

Clearly, you don’t want to use it for financial transactions in which every number must balance.”

Source: Inside Microsoft SQL Server 2000, Microsoft Press
10g Standard Edition

- **Typical use** (not limits)
  - 1 – 1000 users
  - 500 Gb data

- **Includes**
  - All SE1 features
  - *RAC and Clusterware*

- **Platform support**
  - All Oracle-certified platforms
  - Windows, Linux, Unix, AIX, more

- **Limits**
  - Up to 4 CPUs (or 8 cores)
RAC…

- Real Application Clusters = clustered database
  - Many instances, one database
    - ASM recommended for datafile storage
    - Cache fusion – no pinging to disk
- Scalability and Availability technology
  - Availability
    - Cluster survives node failure
  - Linear scalability
    - Just add server
- Transparent to applications
  - Custom apps and 3rd party, e.g. SAP
- 10g bundles clusterware
...RAC

Real Application Clusters

- Centralized Management Console
- High Speed Switch or Interconnect
- Clustered Database Servers
- Hub or Switch Fabric
- Mirrored Disk Subsystem

Interconnect

Network

Users

No Single Point Of Failure

Shared Cache

Cluster-aware Storage

Drive and Exploit Industry Advances in Clustering

Oracle Partner
Oracle 10g SE vs. SQL Server 2005 SE / EE

- Concurrency – Advantage Oracle
- Ease of Installation – Advantage: None
- Platform Support and Portability – Advantage Oracle
- Scalability and Availability – Advantage Oracle
  - RAC technology superior to MS Clustering
- Cost – Advantage Oracle
Microsoft No Longer Costs Less Than Oracle

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<th>No of Users</th>
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<th>SQL Server 2005 Enterprise Edition</th>
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10g Enterprise Edition

- Full-featured edition
- All Oracle-certified platforms supported
  - Windows, Linux, Unix, AIX, more…
- Up to 8 Exabytes user data
- Cost
  - $800 per named user (min 25 users)
  - $40,000 per CPU
10g EE Features...

- Data Guard
  - Physical and logical standby database
- All Flashback Features
  - Query, Table, Drop Table, Database, Trans Query
- Parallel Backup and Recovery
  - Decrease backup / recovery time
- Duplexed Backups
  - Redundancy
- Virtual Private Database
  - Dynamic row-level security
- Fine Grained Auditing
  - Built-in selective query and DML auditing
…10g EE Features…

- **Database Resource Manager**
  - Manage CPU resources by group
  - Prioritize users, sessions, groups

- **Data Compression**
  - Compress table and index data

- **Bitmap Indexes**
  - Data Warehouse table indexing

- **Parallel Query, DML and index scans**
  - Read and write in parallel
  - Create indexes in parallel
  - Collect statistics in parallel
…10g EE Features

- Parallel Data Pump Export / Import
  - Move data into / out of the database in parallel
- Transportable Tablespaces
  - Plug underlying datafiles into different DB
  - 10g cross platform support
- Advanced Replication
  - Maintain multiple copies of database
- Connection Manager
  - Connection multiplexing, access control, source routing, multi-protocol Support, Firewall Proxy Support
High Availability Features

Unplanned Downtime
- System Failures
- Data Failures

Planned Downtime
- System Changes
- Data Changes

Real Application Clusters
- ASM
- Flashback
- RMAN & Oracle Secure Backup
- H.A.R.D
- Data Guard
- Streams

Online Reconfiguration
- Rolling Upgrades

Online Redefinition
Spotlight on VLDB

- Parallel Query, DML, Backup / Recovery
- Partitioning
- Compression
- Bitmap Indexes
- OLAP
- Data Mining
- Materialized Views
- Many more Warehouse features
High Performance Oracle

- **Data Warehouse**
  - 68,100 QphH@1000GB (1)
  - Holds 6 of the Top 10 positions
    - Including #1

- **OLTP**
  - 1,601,784 tpmC (2)
  - Holds 4 of the Top 10 positions
EE Options...

- **RAC**
  - Clustered servers
  - Scalability and High Availability with no application changes
  - $20k / processor

- **Partitioning**
  - Divide and conquer
  - Very large tables and indexes are manageable and performant
  - $10 / processor

- **Advanced Security**
  - Transparent Data Encryption (TDE)
  - Encrypted Backups
  - $10 / processor
...EE Options...

- **Management Packs**
  - Web-based tools management tools
  - PL/SQL API available

- **Diagnostic**
  - Auto performance diagnostic and monitoring

- **Tuning**
  - Tuning advisors for SQL, indexes, mviews, etc.

- **Change**
  - Capture, compare schema changes, update, copy

- **Configuration**
  - Automation of installation, patching and cloning

- **$3k / processor**
...EE Options

- **OLAP**
  - Business Intelligence features
  - Advanced analytic features
  - $20k / processor

- **Data Mining**
  - Model building and scoring functions
  - Convenient GUI
  - $20k / processor

- Visit oracle.com for complete list of EE options
Oracle 10g EE
vs.
SQL Server 2005 EE

- **Scalability – Advantage Oracle**
  - RAC currently supports 100 nodes
  - Database supports 8 Exabytes of data

- **High Availability – Advantage Oracle**
  - Physical and Logical Standby Database with Data Guard
  - Clustering with RAC
  - Mirroring with ASM
  - Flashback technology
  - Online redefinition
  - RMAN online backup
  - Block level recovery
  - Streams
Oracle EE vs SQL Server 2005 EE

- Platform Support and Portability – Advantage Oracle
- Concurrency – Advantage Oracle
- Performance – Advantage Oracle
- Security – Advantage Oracle
- TDE!
## Security Evaluations

<table>
<thead>
<tr>
<th>Security Evaluations</th>
<th>Oracle</th>
<th>DB2</th>
<th>SQL Server</th>
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<tbody>
<tr>
<td>US TCSEC, Level B1</td>
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<tr>
<td>US TCSEC, Level C2</td>
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<tr>
<td>UK ITSEC, Levels E3/F-C2</td>
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<tr>
<td>UK ITSEC, Levels E3/F-B1</td>
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<tr>
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<td><strong>1</strong></td>
<td><strong>1</strong></td>
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</table>
Oracle EE vs SQL Server 2005 EE

- In summary, Oracle Database 10g
  - Better value
  - Less risk
Related Products, Support…

- Enterprise Manager Grid Control
  - Manage all software in grid
  - Also Web applications, hosts, and the network
  - Extensible
- Application Express (HTML DB)
  - Rapid web app development tool
  - Free with all editions
Related Products, Support

- Secure Backup
  - Tape backup management
  - Free Express Edition
  - $3000 / device
- Support / Updates
  - 22% of product cost
Learning Oracle Database

- Developers, 5 – 10 days
  - SQL
  - PL/SQL
  - Application Express

- DBA’s
  - Architecture and Basic Administration, 5-10 days
  - Options, e.g. Data Guard extra

- Business Analysts and Auditors
  - Introduction to Oracle (~3 days)
How SkillBuilders and Oracle Can Help You

- Your local, Rhode Island-based Oracle VAR
  - Oracle product sales
  - Demonstrate Oracle capabilities
  - Oracle needs analysis
    - What edition is right for you?
  - Oracle Health Checks
- Installations, Upgrades, Migrations
- Training
  - Oracle, Web Development, Java, SOA, more
- DBA Services, Application Development
Q&A

- Questions?
Thank You!

- Thanks for attending
- See you this afternoon…