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Product Management

Oracle Business Intelligence

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OracleBI Discoverer 10g R2 (10.1.2) Best Practices for Performance, Scalability, and Troubleshooting

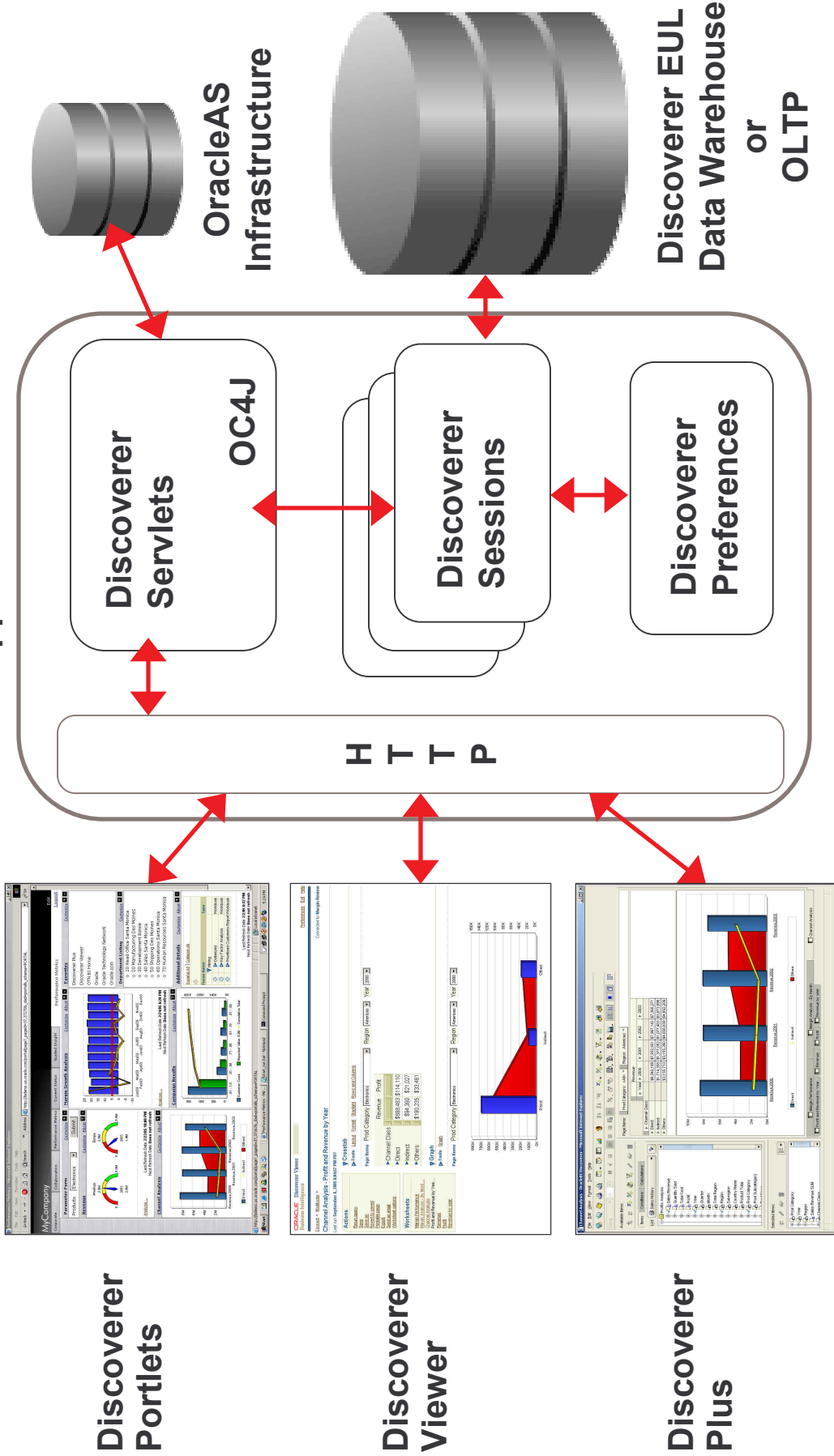
OracleBI Discoverer 10g (10.1.2) – Best Practices

- **Architecture**
- Performance
- Scalability
- Troubleshooting

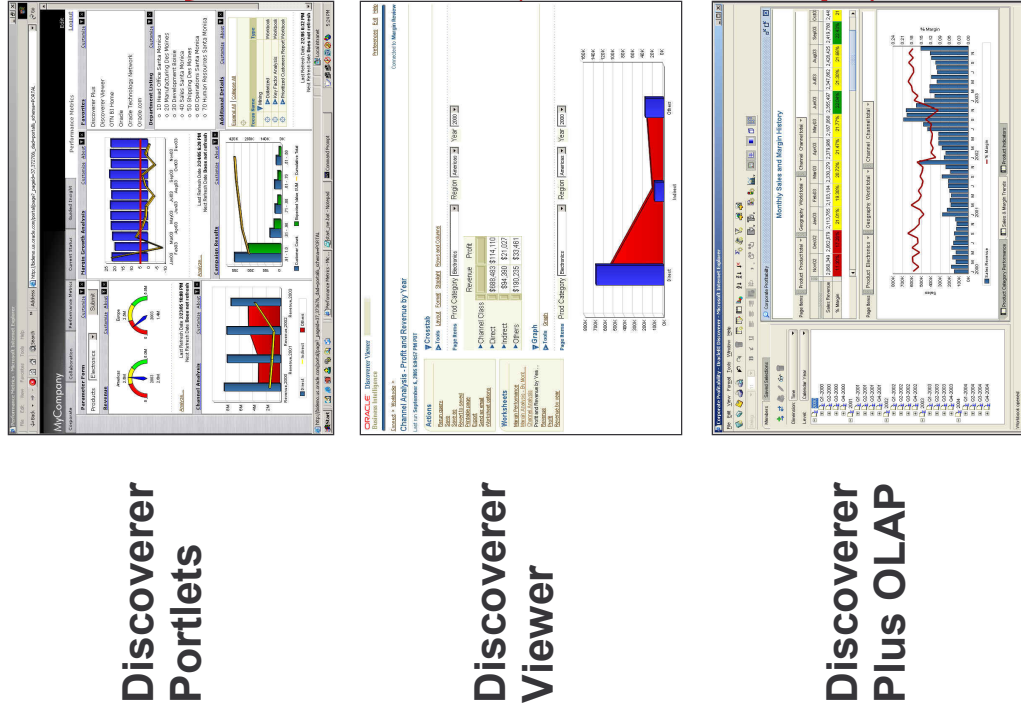
Architecture

- Architectural differences from 9.0.4
 - Supports OLAP data sources
 - Viewer uses UIX instead of XSL
 - Completely Removed Visibroker

Architecture - Discoverer (Relational)



Architecture - Discoverer (OLAP)



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OracleBI Discoverer 10g (10.1.2) – Best Practices

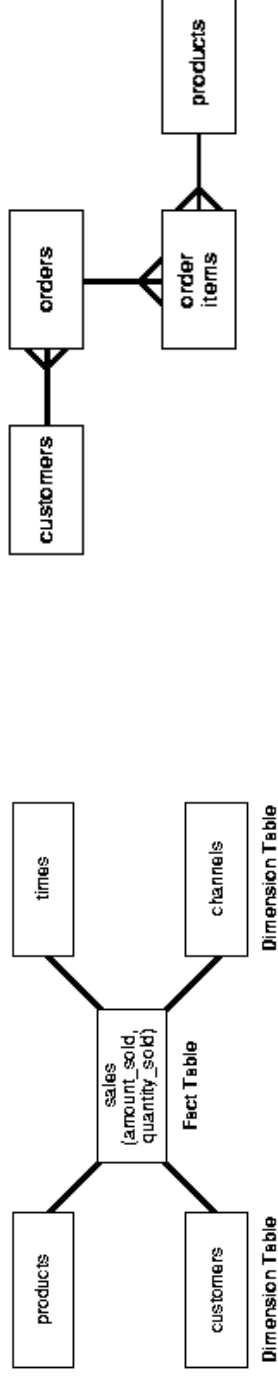
- Architecture
- **Performance**
- Scalability
- Troubleshooting

Performance

- **Database**
- Business Areas
- Worksheet design
- Scheduling
- Discoverer configuration
- Application Server configuration

Performance – Database

- Star Schema/DW or Analytic Workspace over OLTP/3NF



- Indices
- Materialized Views
 - Discoverer Automated Summary Management
 - Database Server Summary Advisor

Performance

- Database
- **Business Areas**
- Worksheet design
- Scheduling
- Discoverer configuration
- Application Server configuration

Performance - Business Areas

- Folders are SQL statements that generate result sets:
 - Simple, Complex, and Custom
- SQL Optimization in Discoverer 10g
 - Join and Item Trimming; SQL Flattening
- Custom Folders are useful for:
 - UNION, CONNECT BY, MINUS, INTERSECT
 - Optimizer Hints
- Recommend: Simple & Complex first, then Custom

Performance - Business Areas

- Avoid complex aggregation in folders -- try to defer to Worksheet if possible
- Use mandatory conditions in folders to enforce security and restrict result set sizes
- Create optional conditions in folders to encourage their use

Performance - Business Areas

- Tabular reports without page items execute faster than crosstab reports or tabular reports with page items
- Use “Default position” to encourage users to place items on top or side axis. Preferred order:
 - Top
 - Side or Top
 - Side
 - Page

Performance

- Database
- Business Areas
- **Worksheet design**
- Scheduling
- Discoverer configuration
- Application Server configuration

Performance – Worksheet Design

- Table over Crosstab (if appropriate)
- Smart use of parameters and page items
 - parameters reduce data fetched
- Create worksheets that are “human-sized”
 - avoid wide crosstabs
- Remove extraneous worksheets from workbooks
 - reduce time to open
 - reduce time to export
- Use Query Statistics Workbook to identify Worksheets that need tuning

Performance – Table over Crosstab

Sales Revenue		Region	Country Name	Sales Revenue
▶ Americas	▶ Argentina	Americas	Argentina	\$5,235
	▶ Brazil		Brazil	\$12,391
	▶ Canada		Canada	\$578,620
	▶ United States of America		United States of America	\$12,872,172
	Subtotal For Americas		<i>Subtotal For Americas:</i>	<i>\$13,468,419</i>
▶ Asia	▶ India	Asia	India	\$1,268
	▶ Japan		Japan	\$1,703,635
	▶ Singapore		Singapore	\$763,603
	Subtotal For Asia		<i>Subtotal For Asia:</i>	<i>\$2,468,507</i>
▶ Europe	▶ Denmark	Europe	Denmark	\$497,040
	▶ France		France	\$1,005,834
	▶ Germany		Germany	\$2,204,699
	▶ Poland		Poland	\$81
	▶ Spain		Spain	\$488,179
	▶ The Netherlands		The Netherlands	\$1,241,484
	▶ Turkey		Turkey	\$6,522
	▶ United Kingdom		United Kingdom	\$1,658,678
	Subtotal For Europe		<i>Subtotal For Europe:</i>	<i>\$7,102,517</i>
▶ Oceania	▶ Australia	Oceania	Australia	\$1,044,202
	▶ New Zealand		New Zealand	\$271
	Subtotal For Oceania		<i>Subtotal For Oceania:</i>	<i>\$1,044,472</i>
Grand Total for the Year				\$24,083,915

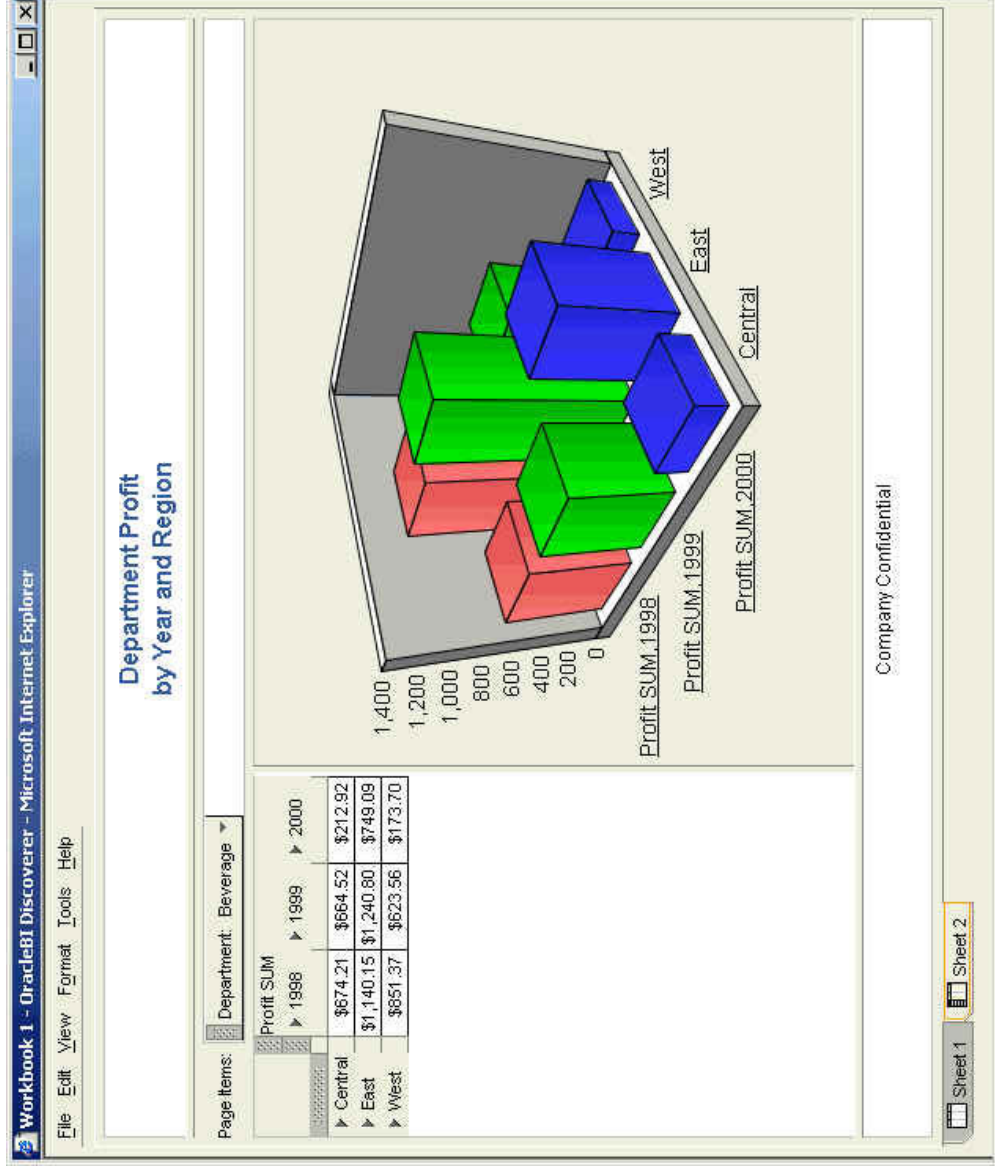
Performance – Parameters and Page Items

- Page Items provide very responsive, interactive manipulation of data
- At a cost:
 - Forces retrieval of all Detail values
 - Incremental increases of memory as indices are built
- Parameters reduce result set, improve performance
- Use Page Items only when needed – 2 to 3 with < 12 values each

Performance – Parameters and Page Items - example

- Loc(3), Dept(10), ProdType(50), Prod(1,000), Date(365)
- 547,500,000 potential rows/combinations
($3*10*50*1000*365$)
- Use parameters for Loc, Dept, ProdType, and 90 day date range
- 90,000 potential rows/combinations (1000*90)
- Reduce data retrieved by ~ 6000 X
- Improve performance by several orders of magnitude

Performance – Worksheet Design



Performance

- Database
- Business Areas
- Worksheet design
- **Scheduling**
- Discoverer configuration
- Application Server configuration

Performance - Scheduling

Schedule Wizard - Step 1 of 3: General

What do you want to name this scheduled workbook?
Channel Analysis

What description
Channel Analysis

Which works
 Margin
 Margin
 Channel
 Profit a
 Revenue
 Profit
 Revenue

Schedule Wizard - Step 3 of 3: Schedule

When do you want to schedule this workbook?
 Immediately
 Time: Tuesday, September 6, 2005 12:01 AM
Time zone: Pacific Daylight Time

How often do you want to repeat this schedule?
 Never
 Repeat every 1
Day(s)
Minute(s)
Hour(s)
Day(s)
Week(s)
Month(s)
Year(s)

Scheduled workbooks save r... versions of results?
 Yes, keep all results.
 No, just keep the latest se...

How long do you want to keep the results?
Delete results after 5 days.

Help < Back Next > Finish Cancel

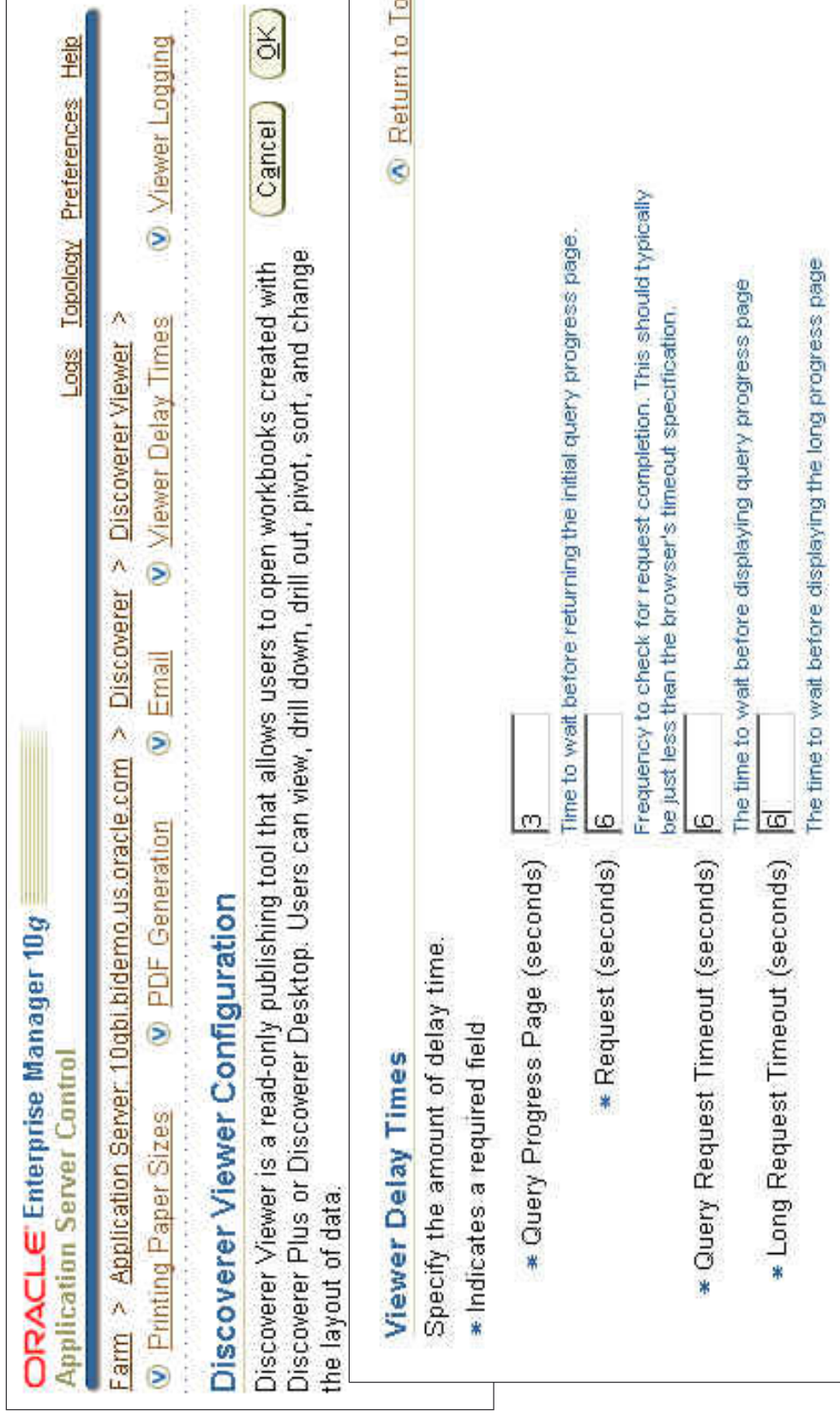
Performance

- Database
- Business Areas
- Worksheet design
- Scheduling
- **Discoverer configuration**
- Application Server configuration

Performance - Discoverer configuration

- Viewer
 - WebCache & Delay Times
- Portlet Provider
 - Session Pool
- Set RowsPerFetch appropriately
 - in prefs.txt overall
 - in Plus and Viewer Options per user

Performance – Viewer configuration



The screenshot shows the Oracle Enterprise Manager 10g Application Server Control interface. The breadcrumb trail is: Farm > Application Server: 10gbl.bidemo.us.oracle.com > Discoverer > Discoverer Viewer > Discoverer Viewer Configuration. The page title is "Discoverer Viewer Configuration". Below the title is a description: "Discoverer Viewer is a read-only publishing tool that allows users to open workbooks created with Discoverer Plus or Discoverer Desktop. Users can view, drill down, drill out, pivot, sort, and change the layout of data." At the bottom of the page are "Cancel" and "OK" buttons.

Discoverer Viewer Configuration

Discoverer Viewer is a read-only publishing tool that allows users to open workbooks created with Discoverer Plus or Discoverer Desktop. Users can view, drill down, drill out, pivot, sort, and change the layout of data.

Viewer Delay Times

Specify the amount of delay time.

- * Indicates a required field
- * Query Progress Page (seconds)
Time to wait before returning the initial query progress page.
- * Request (seconds)
Frequency to check for request completion. This should typically be just less than the browser's timeout specification.
- * Query Request Timeout (seconds)
The time to wait before displaying query progress page
- * Long Request Timeout (seconds)
The time to wait before displaying the long progress page

[Return to Top](#)

Performance – Portlet Provider configuration

Discoverer Session

The Discoverer Portlet Provider uses Discoverer sessions to update cached data for Discoverer Portlets. These Sessions can be pooled for reuse by different Discoverer Portlets, saving CPU and memory.

Specify the maximum number of Discoverer sessions to pool.

* Indicates a required field

* Maximum Sessions

✔ **TIP** A small number of maximum sessions in the pool saves memory but causes requests to be queued for a short time if all sessions are in use.

* Maximum Session Inactivity (minutes)

✔ **TIP** The maximum number of minutes a session is allowed to be inactive in the pool before being removed.

* Maximum Session Age (hours)

✔ **TIP** The maximum number of hours a session is allowed to be in the pool even if it is active.

* Maximum Wait Time (minutes)

✔ **TIP** The maximum number of minutes to wait for a session to become available before cancelling a portlet refresh

Performance – RowsPerFetch

- Default is 250. Set to 1000 if expecting to typically fetch thousands of rows
- Set for all users in prefs.txt – apply preferences
- Set for individual users with dis51pr command line or in “Retrieve data incrementally in groups of” in ...
 - Plus (Tools | Options | Query Governor)
 - Viewer (Preferences)

Performance

- Database
- Business Areas
- Worksheet design
- Scheduling
- Discoverer configuration
- **Application Server configuration**

Performance – Application Server configuration

- OC4J number of JVMs
 - machine resources permitting, 1 per 2 CPUs
- OC4J JVM memory settings

Performance – Application Server configuration

ORACLE Enterprise Manager 10g
Application Server Control

Farm > Application Server: 1012_BIAS_050808_1601_dssga15.us.oracle.com > OC4J_OC4J_BI_Forms >

Page Refreshed Sep 6, 2005 6:30:16 PM

Server Properties

Name: OC4J BI Forms
Server Root: C:\1012_BIAS_050808_1601\jee\OC4J_BI_Forms\config

Command Line Options

Java Executable:

OC4J Options:

Java Options:

Environment Variables

Select Name	Value	Append
<input checked="" type="radio"/> DISPLAY	localhost:0	<input type="checkbox"/>
<input type="radio"/> LD_LIBRARY_PATH	C:\1012_BIAS_050808_1601\lib32\C	<input type="checkbox"/>

Multiple VM Config

TIP if OC4J is running

Clusters(OC4J):

Cluster(OC4J) Name:

Related Links: [Tracing Properties](#)

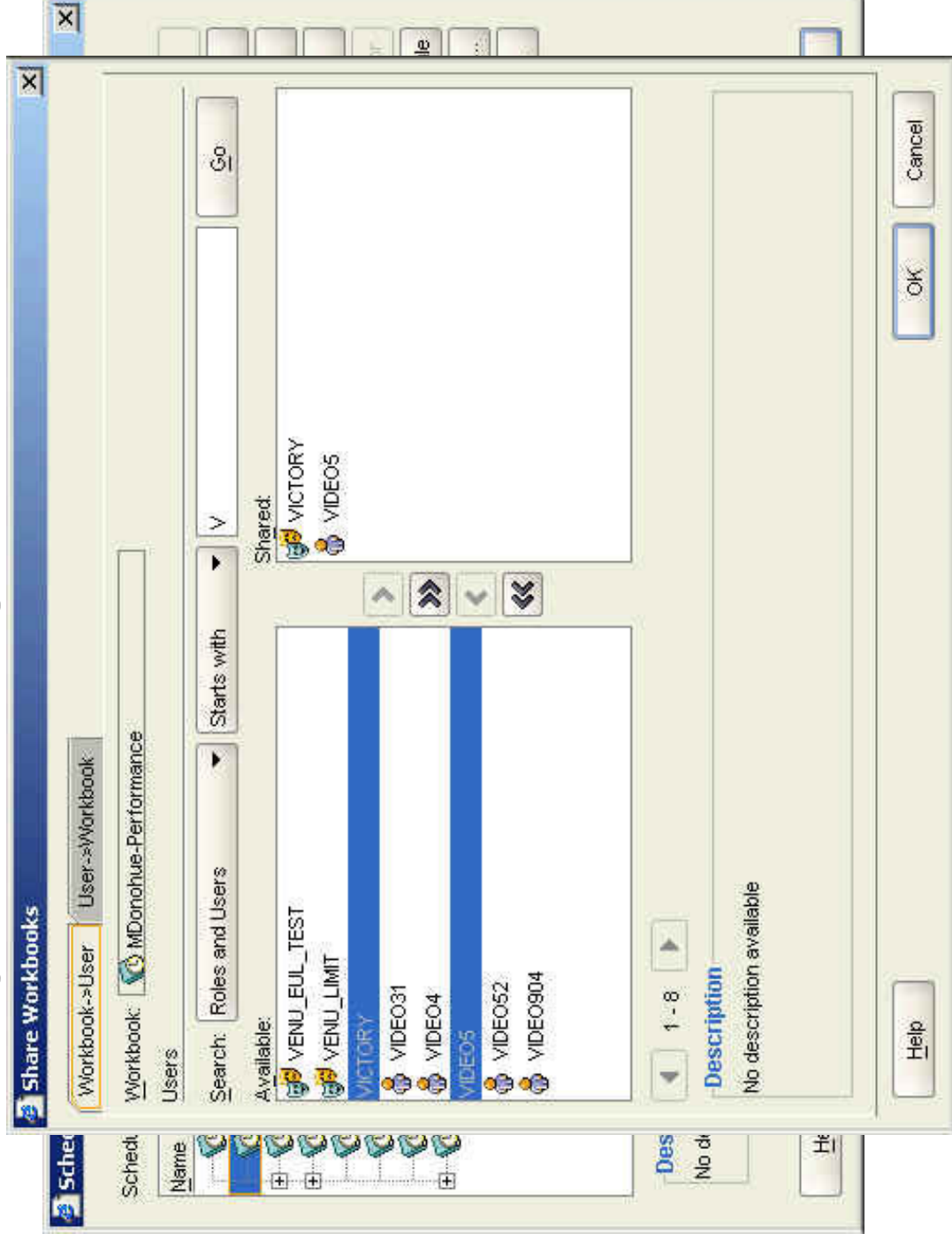
OracleBI Discoverer 10g (10.1.2) – Best Practices

- Architecture
- Performance
- **Scalability**
- Troubleshooting

Scalability

- Sharing Scheduled Results
- Session timeout
- Load Balancing
- Deployment Considerations
- Balancing Portlet Providers

Scalability – Sharing Scheduled Results



Scalability – Session Timeout

- To reduce memory consumption on mid-tier reduce session timeout values to clean up inactive sessions
 - Plus – timeout (default 1800 = 30 minutes) in pref.txt
 - Viewer -- session-timeout tag (default 10 minutes) in web.xml

Scalability – Load Balancing

- Install Oracle AS Discoverer on multiple machines
 - Oracle AS WebCache
 - Commercial HTTP/IP Router load balancers
- Try to distribute Portlet refreshes as evenly as possible

Scalability – Deployment Considerations

- Consider user population, uses and right mix
 - Portlet Provider
 - Viewer
 - Plus
- Typical mix is 70/30 report consumers to report authors
- Active users are typically 10% of total population
- Follow Capacity Planning Guidelines on OTN

Scalability – Balancing Portlet Providers

- Synchronize machine times
- Identical Portlet Provider Session Pool Settings
- Identical peekSleepIntervalSec in opmn.xml file
- If adjustments are needed
 - Maximum Sessions
 - peekSleepIntervalSec

OracleBI Discoverer 10g (10.1.2) – Best Practices

- Architecture
- Performance
- Scalability
- **Troubleshooting**

Troubleshooting

- checkdiscoverer script
- Plus OLAP Diagnose
- Monitor Performance
- Enable Logging
- Java Console
- SQL Trace
- EUL Status Workbooks

Troubleshooting - checkdiscoverer

- Use when nothing works
- Checks
 - Discoverer Activation processes
 - Discoverer Session
 - Discoverer Preferences
 - NICs
- collectlogs script

Troubleshooting – Plus OLAP Diagnose

Corporate Profitability - Oracle® Diagnose Connection

To analyze the connection error, run a Quick Diagnosis or Extensive Diagnosis to create a Diagnostic Report. Use the Save As button to save the report to a file which you can send to Oracle support.

Diagnostic Report:

26/37)	Measure Margin 12 Mo MV Avg = Successful
27/37)	Measure Margin 6 Mo MV Avg = Successful
28/37)	Measure Margin Fcst Best Fit = Successful
29/37)	Measure Margin % Growth Prior Period = Successful
30/37)	Measure Margin % Growth = Successful
31/37)	Measure Margin % = Successful
32/37)	Measure Quantity = Successful
33/37)	Dimension Time = Successful
34/37)	Dimension Promotion = Successful
35/37)	Dimension Product = Successful
36/37)	Dimension Geography = Successful
37/37)	Dimension Channel = Successful

Members: Saved Selections

Dimension: Time

Level: Calendar Year

- 2000
 - Q1-2000
 - Q2-2000
 - Q3-2000
 - Q4-2000
- 2001
 - Q1-2001
 - Q2-2001
 - Q3-2001
 - Q4-2001
- 2002
 - Q1-2002
 - Q2-2002
 - Q3-2002
 - Q4-2002
- 2003
 - Q1-2003
 - Q2-2003
 - Q3-2003
 - Q4-2003
- 2004
 - Q1-2004
 - Q2-2004
 - Q3-2004
 - Q4-2004


Workbook opened

Run Quick Diagnosis
Run Extensive Diagnosis
Stop Diagnostics
Save As...
Close

Troubleshooting – Monitor Performance

- Use Application Server Control
 - Discoverer Services
 - Discoverer Components
 - Plus
 - Viewer
 - Portlet Provider

Troubleshooting – Monitor Performance



Status: **UP**
Version: **10.1.2.48.18**
Start Time: **August 29, 2005 1:28:35 PM PDT**
Total Memory

[Stop](#) [Restart](#)

Page Refreshed **Sep 6, 2005 8:10:33 PM**

Discoverer Plus

[Home](#) [Performance](#)

Discoverer Plus Sessions

The session information is for Discoverer Plus only. Discoverer Plus OLAP connects directly to the database using JDBC and does not create sessions in the middle-tier.

Sessions **2**

Display Top 10 CPU Usage All Plus Sessions [Go](#)

Session ID	OS Process ID	Total CPU Usage (%)	Total Memory Usage (MB)	SSO User	View Log
200509061954452688	2688	0.0	2.05	VIDEO4@/(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP) (HOST=dssqa21.us.oracle.com)(PORT=1521)) (CONNECT_DATA=(SERVER=DEDICATED) (SERVICE_NAME=discoqa.us.oracle.com)))	ORCLADMIN
200509061917232680	2680	0.29	25.14	VIDEO1012@dssqa92	

Troubleshooting – Enable Logging

- Use Application Server Control
 - Discoverer Services
 - Discoverer Components
 - Plus
 - Viewer
 - Portlet Provider

Troubleshooting – Enable Logging

The screenshot displays the Oracle Enterprise Manager 10g Application Server Control interface. The breadcrumb navigation shows: Farm > Application Server: 10gbi.bidemo.us.oracle.com > View Logs > Log File: redirected output/errors. The page title is "Log File: redirected output/errors" and it indicates the page was refreshed on Sep 6, 2005 at 12:40:41 PM. A "Refresh" button with a "Manually" dropdown is present. The log file path is C:\oracle\ora10g\bin\logs\Discoverer~PreferenceServer~1. A table lists the log file details:

Component Name	Preference Server	Modified	Size (bytes)
Component Type	Discoverer	Sep 6, 2005 8:55:27 AM	84919

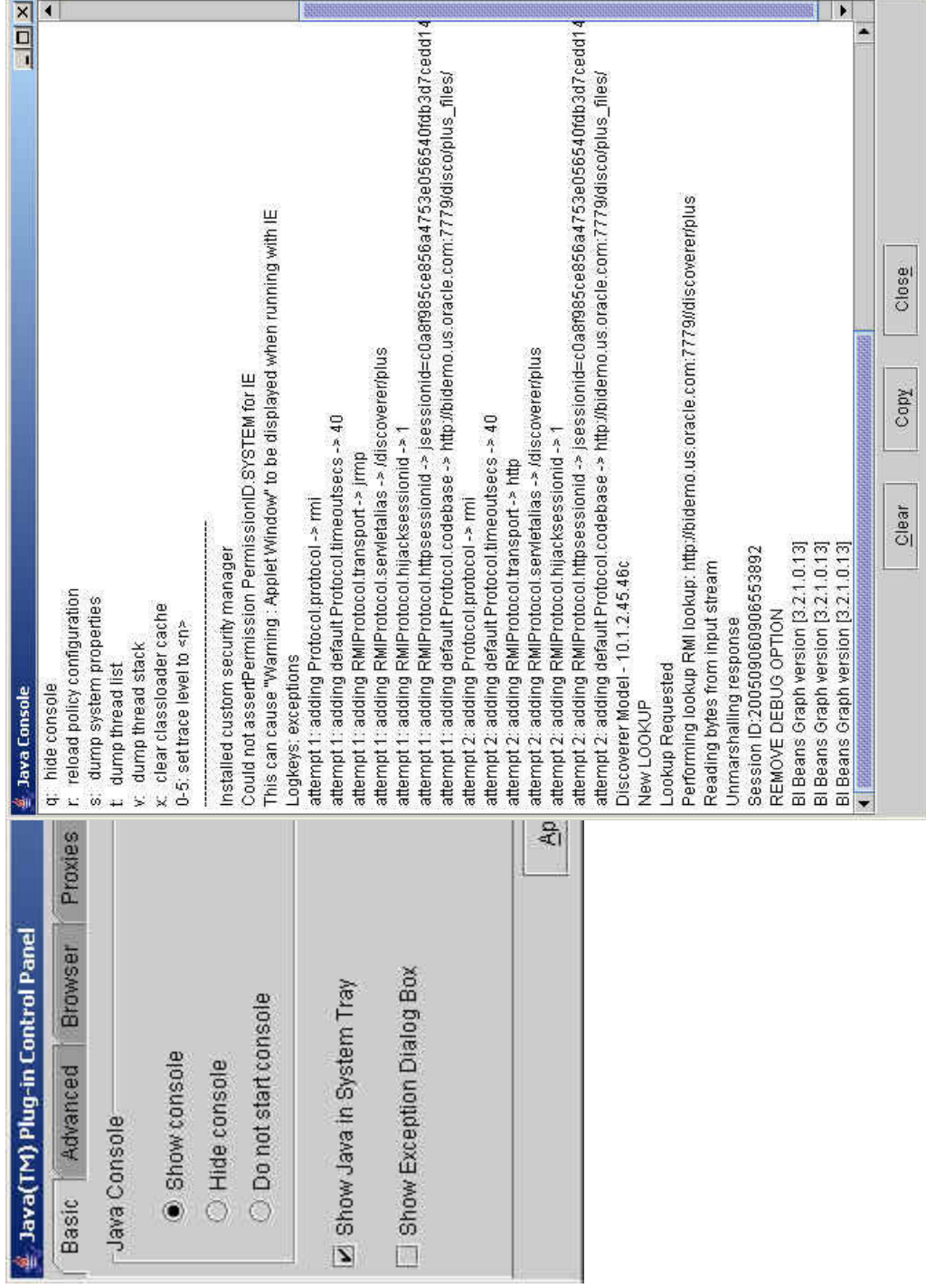
The "Log File Contents" section shows the following table:

Log Text
OR:010000001a000000049444c3a444349434f524241496e7465726661636553a312e30000000010006572656e63655000000200000000000000008000000010000000004f41540100000014000000010000

05/08/03 17:44:08 Start process

Creating Preference Repository.
Activating Preference Repository
Preference Repository is ready ...
OR:010000001a000000049444c3a444349434f524241496e7465726661636553a312e30000000010006572656e63655000000200000000000000008000000010000000004f41540100000014000000010000

Troubleshooting – Java Console



Troubleshooting – SQL Trace

- Set SQLTrace preference
 - Collect trace files from DB Server
- Manual
 - Extract the SQL
 - Plus – Show SQL
 - Plus – post_save_document EUL trigger
 - Start trace and run in SQL Plus

Troubleshooting – EUL Status Workbooks

- Reports on the EUL itself (joins, folders, conditions, hierarchies etc.)
- Report on Discoverer usage by users
 - Which worksheets run by which users and the frequency
 - Number of rows returned
 - Useful in diagnosing worksheets which can be improved with additional parameters
- Standard business area and workbook which ships with the product. Simply import and run.

Best Practices References

- Oracle Business Intelligence Discoverer 10g Release 2 (10.1.2.1) Documentation - <http://www.oracle.com/technology/documentation/discoverer.html>
 - Oracle Business Intelligence Discoverer Configuration Guide
 - Oracle Discoverer Administrator Administration Guide
- Oracle Application Server 10g Release 2 Documentation <http://www.oracle.com/technology/documentation/appserver1012.html>
 - Oracle Application Server Performance Guide
- Oracle Database 10g Release 2 Documentation <http://www.oracle.com/technology/documentation/database10gr2.html>
 - Data Warehousing Guide
 - Performance Tuning Guide
- To be released:
 - Diagnostics for Discoverer 10g (10.1.2)
 - Capacity Planning Guide for Discoverer 10g (10.1.2)

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