

Oracle Application Express Workshop I

Student Guide - Volume II

D79653GC10

Edition 1.0

March 2013

D81479

ORACLE®

Authors

Anupama Mandya
Marcie Young

**Technical Contributors
and Reviewers**

Anthony Rayner
Bryan Roberts
Chaitanya Koratamaddi
David Peake
Hilary Farrell
Maarc Sewtz
Patrick Wolf
Sathish Kumar
Shakeeb Rahman
Wayne Abbott
Klaus Husermann
Salome Clement
Nancy Greenberg
Maria Billings
Diganta Choudhury
Joel Kallman
Yi Lu
Lakshmi Narapareddi
Swarnapriya Shridhar
Jason Straub

Editors

Aju Kumar
Malavika Jinka

Graphic Designer

Maheshwari Krishnamurthy

Publishers

Jayanthy Keshavamurthy
Veena Narasimhan

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Disclaimer

This document contains proprietary information and is protected by copyright and other intellectual property laws. You may copy and print this document solely for your own use in an Oracle training course. The document may not be modified or altered in any way. Except where your use constitutes "fair use" under copyright law, you may not use, share, download, upload, copy, print, display, perform, reproduce, publish, license, post, transmit, or distribute this document in whole or in part without the express authorization of Oracle.

The information contained in this document is subject to change without notice. If you find any problems in the document, please report them in writing to: Oracle University, 500 Oracle Parkway, Redwood Shores, California 94065 USA. This document is not warranted to be error-free.

Restricted Rights Notice

If this documentation is delivered to the United States Government or anyone using the documentation on behalf of the United States Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS

The U.S. Government's rights to use, modify, reproduce, release, perform, display, or disclose these training materials are restricted by the terms of the applicable Oracle license agreement and/or the applicable U.S. Government contract.

Trademark Notice

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Contents

1 Course Overview

- Course Objectives 1-2
- Agenda: Day 1 1-3
- Agenda: Day 2 1-4
- Agenda: Day 3 1-5
- Agenda: Day 4 1-6
- Agenda: Day 5 1-7
- Order Management Database Application 1-8
- Course Environment 1-9
- Workspace Details 1-10
- Accessing the labs Directory 1-11

2 Introducing Oracle Application Express

- Objectives 2-2
- Lesson Agenda 2-3
- What Is Oracle Application Express? 2-4
- Why Use Oracle Application Express? 2-5
- Types of Applications 2-6
- Applications Developed by Using Oracle Application Express 2-7
- High-Level Architecture 2-8
- Types of Installations 2-10
- Quiz 2-11
- Lesson Agenda 2-12
- What Is a Workspace? 2-13
- What Is an Internal Workspace? 2-14
- Defining Roles 2-15
- Quiz 2-17
- Lesson Agenda 2-18
- Logging In to a Workspace 2-19
- Creating a Developer User 2-20
- Workshop 2-1 Overview: Using Oracle Application Express as a Workspace
 - Administrator 2-21
 - Workspace Home Page 2-22
 - What Is SQL Workshop? 2-23
 - Accessing SQL Workshop 2-24

Running SQL Commands	2-25
Importing and Running a SQL Script	2-26
What Is Application Builder?	2-27
Types of Applications	2-28
Accessing a Packaged Application	2-29
Selecting a Packaged Application	2-30
Installing a Packaged Application	2-31
Running an Installed Packaged Application	2-32
Unlocking an Installed Productivity Application	2-33
Exporting an Application	2-34
Importing an Application	2-35
Workshop 2-2 Overview: Using Oracle Application Express as a Developer	2-36
Lesson Agenda	2-37
Oracle Database Cloud Service	2-38
Using Oracle Application Express in Oracle Database Cloud Service	2-40
Summary	2-41
3 Creating a Database Application	
Objectives	3-2
Lesson Agenda	3-3
Accessing Application Builder	3-4
Application Builder Home Page	3-5
Lesson Agenda	3-7
Database Application Home Page	3-8
Database Application User Interfaces	3-10
Themes	3-11
Components of a Database Application	3-12
Page Definition: Overview	3-13
Different Views of a Page	3-14
Switching Between Pages and View Types	3-16
Quiz	3-17
Lesson Agenda	3-19
Create Application Wizard	3-20
Accessing the Create Application Wizard	3-21
Different Ways of Creating a Database Application	3-22
Creating a Database Application Based on a Table, Query, or Drill-Down	
Query	3-23
Page Wizard for Desktop User Interface	3-24
Page Wizard for Mobile User Interface	3-25
Creating a Database Application from a Spreadsheet	3-26
Running an Application	3-27

Using the Developer Toolbar	3-28
Summary	3-30
Workshop 3 Overview: Creating Database Applications	3-31

4 Using and Creating Interactive Reports

Objectives	4-2
Lesson Agenda	4-3
Accessing the Create Report Wizard	4-4
Types of Reports	4-5
Selecting the Appropriate Report Type	4-6
Quiz	4-7
Lesson Agenda	4-8
Interactive Report Components	4-9
Searching for Information	4-10
Selecting Columns	4-11
Adding a Column Filter	4-12
Adding a Row Filter	4-13
Sorting Columns	4-14
Creating Control Breaks	4-15
Highlighting a Row or Cell	4-16
Adding Computed Columns	4-17
Aggregating Columns	4-18
Creating a Chart	4-19
Creating a Group By Report	4-20
Creating a Group By Sort Order	4-21
Quiz	4-22
Performing a Flashback Query	4-23
Saving a Report	4-24
Resetting Reports	4-25
Downloading Reports	4-26
Subscribing to a Report	4-27
Manipulating the Interactive Report by Using a Column Header	4-28
Quiz	4-29
Lesson Agenda	4-30
Creating an Interactive Report	4-31
Accessing the Report Attributes Page	4-32
Editing Report Attributes	4-33
Customizing the Search Bar	4-34
Specifying the Download Formats	4-35
Using the Link Column	4-36
Icon and Detail Views	4-37

Modifying the Interactive Report Query	4-38
Quiz	4-39
Summary	4-41
Workshop 4-1 Overview: Building and Manipulating an Interactive Report	4-42
Workshop 4-2 Overview: Customizing an Interactive Report	4-43

5 Creating Classic Reports, Wizard Reports, and Reports for Mobile Applications

Objectives	5-2
Lesson Agenda	5-3
Classic (SQL) Report	5-4
Creating a Classic (SQL) Report	5-5
Lesson Agenda	5-6
Wizard Reports	5-7
Creating a Wizard Report	5-8
Workshop 5-1 Overview: Creating Classic Reports	5-9
Lesson Agenda	5-10
Creating List View for Mobile Applications	5-11
Creating a List View	5-12
Modifying a List View	5-13
Workshop 5-2 Overview: Creating a List View	5-14
Summary	5-15

6 Creating Forms

Objectives	6-2
Lesson Agenda	6-3
Introducing Forms	6-4
Types of Forms	6-5
Accessing the Create Form Wizards	6-7
ROWID Versus Primary Key	6-8
Lesson Agenda	6-9
Example: Form on a Table	6-10
Creating a Form on a Table	6-11
Example: Form on a Table with Report	6-12
Creating a Form on a Table with a Report	6-13
Workshop 6-1 Overview: Creating a Form on a Table	6-14
Example: Master Detail Form	6-15
Creating a Master Detail Form	6-16
Workshop 6-2 Overview: Creating a Master Detail Form	6-17
Example: Tabular Form	6-18
Creating a Tabular Form	6-19
Workshop 6-3 Overview: Creating a Tabular Form	6-20

Quiz 6-21
Lesson Agenda 6-23
Using Show/Hide Edit Links 6-24
Linking a Report to a Form 6-25
Reordering Items 6-26
Editing Form Items by Using “Edit All” 6-27
Changing Item Display Type 6-28
Customizing Forms 6-29
Quiz 6-30
Lesson Agenda 6-31
Form on a Table with List View 6-32
Creating a Form on a Table with List View 6-33
Creating a Form on a Table 6-34
Linking to a Form on a Table from an Existing List View 6-35
Workshop 6-4 Overview: Create a Form on a Table for Mobile Applications 6-36
Summary 6-37

7 Working with Pages and Regions

Objectives 7-2
Lesson Agenda 7-3
What Is a Page? (Review) 7-4
Accessing a Page Definition 7-5
Page Definition Interface 7-6
Page Definition Interface: Component View 7-8
Editing Page Attributes 7-9
Lesson Agenda 7-11
Accessing the Create Region Wizard 7-12
About Region Types 7-13
Positioning the Region 7-15
Conditional Display of Regions 7-16
Viewing the Regions Page 7-17
Editing a Region 7-18
Specifying a Region Header and Footer 7-19
Enabling Region Display Selection 7-20
Creating a Region Display Selector 7-21
Copying Regions 7-22
Creating a Subregion 7-23
Workspace 7-1 Overview: Creating and Modifying Pages and Regions 7-24
Lesson Agenda 7-25
Global Page 7-26
Creating a Global Page 7-27

Workshop 7-2 Overview: Creating a Global Page and Adding a Region	7-28
Common Pages for Different User Interfaces	7-29
Auto-detection of Application Pages	7-30
Viewing jQuery Mobile Smartphone Pages	7-31
Workshop 7-3 Overview: Modify the Mobile Home page	7-32
Creating a Page Group	7-33
Copying a Page	7-34
Quiz	7-35
Summary	7-37

8 Adding Items and Buttons

Objectives	8-2
Lesson Agenda	8-3
Items	8-4
Page Items: Examples	8-5
What Are Application Items?	8-6
Accessing the Create Page Item Wizard	8-7
Types of Page Items	8-8
Lesson Agenda	8-10
Creating a Date Picker Item	8-11
Creating Multiple Items by Using the Tabular Form	8-12
Editing an Item	8-13
Creating Quick Picks	8-14
Finding Items by Using the Item Finder	8-15
Adding Subtypes on Mobile Item Types	8-17
Quiz	8-18
Workshop 8-1 Overview: Adding Items and Buttons	8-19
Lesson Agenda	8-20
What Is an LOV?	8-21
Accessing the “Lists of Values” Page	8-22
Creating a Static LOV	8-23
Creating a Dynamic LOV	8-24
Associating an LOV with an Item	8-25
Creating a Select List Item	8-26
Converting an LOV	8-27
Creating a Cascading LOV	8-28
Lesson Agenda	8-30
What Is a Button?	8-31
Creating an Item Button	8-32
Creating a Region Button	8-33
Accessing the Create Multiple Buttons Option	8-34

Creating Multiple Buttons	8-35
Editing Button Attributes	8-36
Modifying a Region Button to Redirect to a URL	8-37
Quiz	8-38
Workshop 8-2 Overview: Manipulating Items on Your Desktop Pages	8-39
Summary	8-40

9 Understanding Session State

Objectives	9-2
Lesson Agenda	9-3
What Is a Session State?	9-4
Session ID	9-5
Session Timeout	9-6
Setting Session Timeout	9-7
How Does Oracle Application Express Implement Session State?	9-8
Identifying the Parts of an Oracle Application Express URL	9-10
Quiz	9-12
Lesson Agenda	9-13
Viewing Session State	9-14
Referencing Session State	9-15
Referencing Session State by Using Bind Variables: Example	9-16
Referencing Session State in Static Text: Example	9-17
Clearing the Cache	9-18
Quiz	9-19
Summary	9-20
Workshop 9 Overview: Understanding Session State	9-21

10 Adding Page Processing

Objectives	10-2
Lesson Agenda	10-3
Page Rendering Versus Page Processing	10-4
Types of Logic	10-5
Scenario 1: Page Rendering	10-6
Scenario 2: Page Processes	10-7
Scenario 3: Page Processes	10-8
Scenario 4: Page Validation	10-9
Lesson Agenda	10-10
What Is a Computation?	10-11
Computation Examples	10-12
Creating Computations	10-13
Creating a Page-Rendering Computation	10-14

Creating a Page-Processing Computation 10-15
Quiz 10-16
Lesson Agenda 10-17
What Is a Page Process? 10-18
Automatic Processing Processes 10-19
Reviewing an Automated Row Fetch Process 10-20
Reviewing an Automatic Row (DML) Processing Process 10-21
Creating an On Submit Process 10-22
Creating an On Load Process 10-23
Options to Populate Items in a Form 10-24
Creating a Tabular Form Process 10-25
Lesson Agenda 10-26
What Are Validations? 10-27
Using the Create Validation Wizard 10-28
SQL Validation: Example 10-29
Creating a SQL Validation 10-30
PL/SQL Validation: Example 10-31
Creating a PL/SQL Validation 10-32
Item String Comparison Validation: Example 10-33
Creating an Item String Comparison Validation 10-34
Regular Expression Validation: Example 10-35
Creating a Regular Expression Validation 10-36
Tabular Form Validation: Example 10-37
Creating a Tabular Form Validation 10-38
Quiz 10-39
Lesson Agenda 10-40
What Is Branching? 10-41
Creating a Branch 10-42
Summary 10-44
Workshop 10 Overview: Creating and Manipulating Computations, Processes and Validations 10-45

11 Validating and Debugging Your Application

Objectives 11-2
Lesson Agenda 11-3
Using the Advisor 11-4
Resolving Advisor Errors/Warnings 11-6
Quiz 11-7
Workshop 11-1 Overview: Using the Advisor 11-8
Lesson Agenda 11-9
Managing Your Attribute Dictionary 11-10

Reviewing Items and Report Columns	11-11
Modifying Attributes in the Dictionary	11-12
Quiz	11-14
Workshop 11-2 Overview: Managing Your Attribute Dictionary	11-15
Lesson Agenda	11-16
What Is the Debug Option?	11-17
Enabling and Disabling Debug Mode	11-18
Debugging an Application	11-19
Viewing the Debug Messages: SHOW Application	11-20
Viewing the Debug Messages: ACCEPT Request	11-21
Troubleshooting Issues	11-22
Workshop 11-3 Overview: Debugging Your Application	11-23
Summary	11-24

12 Adding Shared Components That Aid Navigation

Objectives	12-2
Lesson Agenda	12-3
What Are Shared Components?	12-4
Navigational Shared Components	12-5
Lesson Agenda	12-6
Types of Tabs	12-7
Accessing the Tabs Page	12-8
Managing Tabs	12-9
Creating Parent Tabs	12-10
Creating Standard Tabs	12-11
Reassigning a Standard Tab	12-12
Lesson Agenda	12-13
Accessing the Lists Page	12-14
Creating a Static List	12-15
Creating List Entries	12-16
Creating a Dynamic List	12-17
Creating a List Region	12-18
Creating a List Region on the Global Page	12-19
Lesson Agenda	12-20
Viewing a Breadcrumb	12-21
Creating Breadcrumb Entries	12-22
Reparenting Breadcrumbs	12-23
Creating a Breadcrumb Region	12-24
Lesson Agenda	12-25
Accessing the Navigation Bar Entries Page	12-26
Creating a Help Page	12-27

Creating a Navigation Bar Entry	12-28
Quiz	12-29
Summary	12-30
Workshop 12 Overview: Adding Shared Components That Aid Navigation	12-31

13 Working with Themes, Templates, and Files

Objectives	13-2
Lesson Agenda	13-3
What Is a Theme?	13-4
Accessing the Themes Page	13-5
Creating a New Theme from the Repository	13-6
Switching Between Themes	13-7
Creating a Copy of an Existing Theme	13-8
Editing a Theme	13-9
Quiz	13-10
Lesson Agenda	13-11
What Are Templates?	13-12
Types of Templates	13-13
Accessing the Templates Page	13-14
Copying a Template	13-15
Editing a Template	13-16
Applying a Template	13-17
Applying a Template: Output	13-18
Using Substitution Strings in Templates	13-19
Changing Default Templates in a Theme	13-20
Overriding Application Defaults at the Page Level	13-21
Lesson Agenda	13-22
Uploading a Cascading Style Sheet	13-23
Referencing a Cascading Style Sheet	13-24
Uploading an Image	13-25
Using an Uploaded Image	13-26
Quiz	13-27
Summary	13-28
Workshop 13 Overview: Working with Themes, Templates, and Files	13-29

14 Implementing Security

Objectives	14-2
Lesson Agenda	14-3
Securing an Application: Overview	14-4
Accessing Security Tasks	14-5
Lesson Agenda	14-6

Authentication Schemes Page	14-7
Implementing Authentication	14-8
Preconfigured Authentication Schemes	14-9
Creating Authentication Based on Preconfigured Schemes	14-11
Copying an Authentication Scheme	14-12
Quiz	14-13
Workshop 14-1 Overview: Creating an Authentication Scheme	14-14
Lesson Agenda	14-15
Where Can You Implement Authorization?	14-16
Methods to Implement Authorization	14-17
Creating an Authorization Scheme from Scratch	14-18
Creating an Access Control Page	14-19
Configuring the Access Control Page	14-20
Applying an Authorization Scheme to an Application	14-21
Applying an Authorization Scheme to a Page	14-22
Applying an Authorization Scheme to a Column in a Report	14-23
Quiz	14-24
Workshop 14-2 Overview: Restricting Users By Using Access Control	14-25
Lesson Agenda	14-26
What Is Session State Protection?	14-27
Enabling Session State Protection from the Edit Application Page	14-28
Enabling Session State Protection from the Session State Protection Page	14-29
Configuring Session State Protection	14-30
Identifying Security Attributes	14-31
Configuring Session State Protection by Using a Wizard	14-33
Configuring Session State Protection for Pages and Items	14-34
Configuring Session State Protection for Application Items	14-35
Summary	14-36

15 Managing Application Navigation

Objectives	15-2
Lesson Agenda	15-3
Building a Hierarchical List with Images	15-4
Workshop 15-1 Overview: Building a Hierarchical List with Images	15-11
Lesson Agenda	15-12
Building a Database-Driven Navigation Report	15-13
Quiz	15-16
Workshop 15-2 Overview: Building a Database-Driven Report	15-17
Lesson Agenda	15-18
Building a Site Map	15-19
Adding a Navigation Bar Entry	15-24

Quiz 15-26

Workshop 15-3 Overview: Building a Site Map 15-27

Lesson Agenda 15-28

Enforcing Authorization on Your Site Map 15-29

Workshop 15-4 Overview: Enforcing Authorization on the Site Map 15-30

Summary 15-31

16 Extending Your Application

Objectives 16-2

Lesson Agenda 16-3

Data Load Wizard 16-4

Creating Data Load Wizard Pages 16-5

Data Load Wizard Pages 16-6

Workshop 16-1 Overview: Adding a Data Upload Wizard 16-7

Lesson Agenda 16-8

Creating an Upload and Download Page 16-9

Workshop 16-2 Overview: Creating an Upload and Download Page 16-10

Lesson Agenda 16-11

Adding BLOB Data to an Existing Application 16-12

Adding BLOB Data 16-13

Example: Creating a Form with a Report 16-14

Modifying the BLOB Format in the Report 16-15

SQL Query for BLOB Data in Report 16-16

Modifying the BLOB Format in the Form 16-17

Adding a Delete Image Region 16-18

Adding a Delete Image Region: Creating an Item 16-19

Adding a Delete Image Region: Creating a Process 16-20

Quiz 16-21

Workshop 16-3 Overview: Using BLOB Data in a Report and Form 16-22

Lesson Agenda 16-23

Contact Us Page 16-24

Creating a Send E-Mail Process 16-25

Summary 16-26

17 Creating and Editing Charts

Objectives 17-2

Lesson Agenda 17-3

Building Charts 17-4

Creating SQL Queries for Charts 17-5

Creating a Flash Chart 17-6

Viewing and Editing Chart Attributes 17-8

Workshop 17-1 Overview: Creating and Editing Charts	17-9
Creating an HTML5 Chart for Mobile Applications	17-10
Workshop 17-2 Overview: Creating an HTML5 Chart for Mobile Applications	17-11
Lesson Agenda	17-12
Creating a Combined Chart	17-13
Quiz	17-16
Creating a Project Gantt	17-17
Quiz	17-20
Creating a Circular Gauge Chart	17-21
Workshop 17-3 Overview: Enhanced Charting Examples	17-23
Summary	17-24

18 Adding Calendars and Trees

Objectives	18-2
Lesson Agenda	18-3
Creating a Calendar	18-4
Editing Calendar Attributes	18-7
Dragging and Dropping Calendar Entries	18-9
Linking to the Calendar from a Button	18-11
Calendars for Mobile Applications	18-13
Creating a Calendar for Mobile Applications	18-14
Workshop 18-1 Overview: Creating a Calendar	18-17
Lesson Agenda	18-18
What Is a Tree?	18-19
Creating a Tree	18-20
Manipulating a Tree	18-23
Workshop 18-2 Overview: Creating a Tree Whose Nodes Link to a Different Page	18-25
Summary	18-26

19 Using Dynamic Actions and Plug-Ins

Objectives	19-2
Lesson Agenda	19-3
What Is a Dynamic Action?	19-4
General Steps to Create a Dynamic Action	19-5
Enabling and Disabling an Item: Overview	19-6
Creating and Using Dynamic Actions: Examples	19-7
Changing the Class When an Item Is Null	19-8
Changing the Class When an Item Is Null: Overview	19-9
Setting the Value of an Item When Another Item Changes	19-10
Submitting the Page When Button Is Clicked	19-12

Disabling a Button When Clicked: Overview	19-13
Refreshing the Data in a Report Using Custom Filters	19-14
Refreshing the Data in a Report Using Custom Filters: Overview	19-15
Refreshing the Data in a Report Using Custom Filters	19-16
Refreshing the Data in a Report Using Custom Filters: Overview	19-17
Quiz	19-19
Workshop 19-1 Overview: Creating and Using Dynamic Actions	19-21
Lesson Agenda	19-22
What Is a Plug-In?	19-23
Steps to Use a Plug-in in Your Application	19-24
Accessing the Plug-in Repository	19-25
Importing a Plug-In	19-26
Installing a Plug-In	19-27
Reviewing a Plug-in Definition	19-28
Using an Item Plug-in on a Page	19-30
Quiz	19-31
Additional Plug-in Examples	19-32
Adding a Checkbox Item	19-33
Displaying a Notification Message When an Item is Clicked	19-34
Changing and Highlighting an Item When Another Item Changes	19-35
Changing and Highlighting an Item When Another Item Changes: Overview	19-36
Creating a Cascading LOV	19-37
Creating a Dynamic Action that Uses the Highlight Plug-In	19-38
Setting the Value of an Item When Other Item(s) Change	19-40
Setting the Value of an Item When Another Item Changes: Overview	19-41
Workshop 19-2 Overview: Importing and Using Plug-Ins	19-44
Summary	19-45

20 Using Application Express Printing

Objectives	20-2
Lesson Agenda	20-3
Report-Printing Configuration Options	20-4
Producing Reports in Oracle Application Express	20-5
Lesson Agenda	20-6
Standard Report, Print Enabled	20-7
Standard Report, with Derived Output	20-8
Quiz	20-9
Workshop 20-1 Overview: Printing a Standard Report with Derived Output	20-10
Lesson Agenda	20-11
Report Queries	20-12
Report Layouts	20-13

Creating a Report for Download	20-15
Creating a Report Query	20-16
Creating the Report Layout	20-17
Linking the Report to Your Application	20-18
Workshop 20-2 Overview: Creating a PDF Report with Multiple Queries	20-20
Summary	20-21

21 Managing Application Feedback

Objectives	21-2
Lesson Agenda	21-3
What Is Team Development?	21-4
Tracking the Progress of Your Application Development Project	21-5
Creating Features	21-6
Creating Milestones	21-7
Creating Bugs	21-8
Creating To Dos	21-9
Quiz	21-10
Lesson Agenda	21-13
Review the Progress of Your Milestones and Features	21-14
Enabling Feedback for an Application	21-15
Step 1: Enabling Feedback in Application Properties	21-16
Step 2: Creating a Feedback Page	21-17
Step 3: Submitting Feedback	21-18
Step 4: Accessing Submitted Feedback in Team Development	21-19
Quiz	21-20
Summary	21-21
Workshop 21 Overview: Adding and Monitoring Feedback in Your Application	21-22

Appendix A: Additional Resources

Additional Resources	A-2
Application Express Page on OTN	A-3
Documentation and Tutorials	A-5
Oracle Learning Library	A-6
Blogs	A-7
Forum: Application Express	A-8
Hosted Online Help	A-9
Learn More	A-10
Oracle Application Express Developer Certified Expert Examination	A-11

Appendix B: More Information About Application Development

Lessons	B-2
Objectives	B-4
Lesson Agenda Create a Websheet Application	B-5
What Is a Websheet?	B-6
Websheets Versus Database Applications	B-7
Default Websheet Interface	B-8
Creating and Running a Websheet	B-9
Lesson Agenda Create a Websheet Application	B-10
Types of Sections	B-11
Creating a Text Section	B-12
Adding Annotations to a Page	B-13
Copying a Page	B-14
Editing Page Sections	B-15
Viewing the Page Directory	B-16
Displaying an Image	B-17
Using Markup Syntax	B-18
Quiz	B-19
Lesson Agenda Create a Websheet Application	B-20
What Are Data Grids?	B-21
Creating a Data Grid from Scratch	B-22
Creating a Data Grid from a Spreadsheet	B-23
Creating a Data Section	B-24
Creating a Chart Section	B-26
Quiz	B-28
Lesson Agenda Create a Websheet Application	B-29
Overview	B-30
Adding a Column	B-31
Creating a List of Values	B-32
Editing Column Properties	B-33
Creating a Validation	B-34
Toggling Check Boxes	B-35
Setting Multiple Column Values	B-36
Replacing Values	B-37
Adding Annotations to a Data Grid	B-38
Summary	B-39
Manipulate and Administer a Websheet Application	B-40
Objectives	B-41
Lesson Agenda Manipulate and Administer a Websheet Application	B-42
Editing Websheet Properties	B-43
Reports	B-44

Creating a Report	B-45
Editing the Report Query	B-46
Using SQL Markup	B-47
Creating a PL/SQL Section	B-48
Quiz	B-49
Lesson Agenda Manipulate and Administer a Websheet Application	B-50
Creating Navigation Sections	B-51
Linking Pages	B-52
Moving a Section to a Different Page	B-53
Viewing Page History	B-54
Viewing a Page in Presentation Mode	B-55
Lesson Agenda Manipulate and Administer a Websheet Application	B-56
Viewing the Websheet Dashboard	B-57
Monitoring Activity in a Websheet	B-58
Sharing Websheets with Users	B-59
1. View the Current Websheet Authentication Method	B-60
2. Create Users in Application Express Administration	B-61
3. Create an ACL in Your Websheet	B-62
4. Change Websheet Authorization to Use a Custom ACL	B-63
5. Test User Access to the Websheet	B-64
Quiz	B-65
Summary	B-66

Appendix C: Developing Applications in Oracle Application Express for Oracle Database Cloud Service

Objectives	C-2
Lesson Agenda	C-3
What Is Oracle Cloud?	C-4
Oracle Database Cloud Service: Currently Available Features	C-5
Oracle Cloud Terminology	C-6
Oracle Cloud Roles	C-8
Lesson Agenda	C-9
Types of Services	C-10
Lesson Agenda	C-11
Creating a Database Cloud Trial Service	C-12
Lesson Agenda	C-14
About the My Services Page	C-15
Accessing the My Services Page	C-16
Launching a Database Cloud Service APEX Environment	C-17
Lesson Agenda	C-18
Creating a Database Application	C-19

Lesson Agenda C-20
Administering a Database Cloud Service C-21
Summary C-22

Appendix D: About Deploying an Application

Objectives D-2
Lesson Agenda Deploy an Application D-3
Steps to Deploy an Application D-4
What Is a Packaged Application? D-5
What Are Supporting Objects? D-6
Lesson Agenda Deploy an Application D-7
Identifying the Supporting Objects for an Application D-8
Creating Installation Scripts D-9
Specifying Prerequisites and Other Options D-10
Specifying Build Options D-11
Creating an Installation Script D-12
Creating Upgrade Scripts D-13
Creating Deinstallation Scripts D-14
Accessing the Export Page D-15
Exporting an Application D-16
Quiz D-17
Lesson Agenda Deploy an Application D-18
Importing an Application D-19
Installing the Application D-20
Publishing the Application URL D-21
Quiz D-22
Summary D-23

13

Working with Themes, Templates, and Files

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to do the following:

- Define themes and their uses
- Create a new theme from the repository
- Switch to a different theme
- Define templates and their uses
- View existing templates
- Create and edit a template
- Upload and use a cascading style sheet and an image



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This lesson provides an overview of the themes and templates provided by Oracle Application Express.

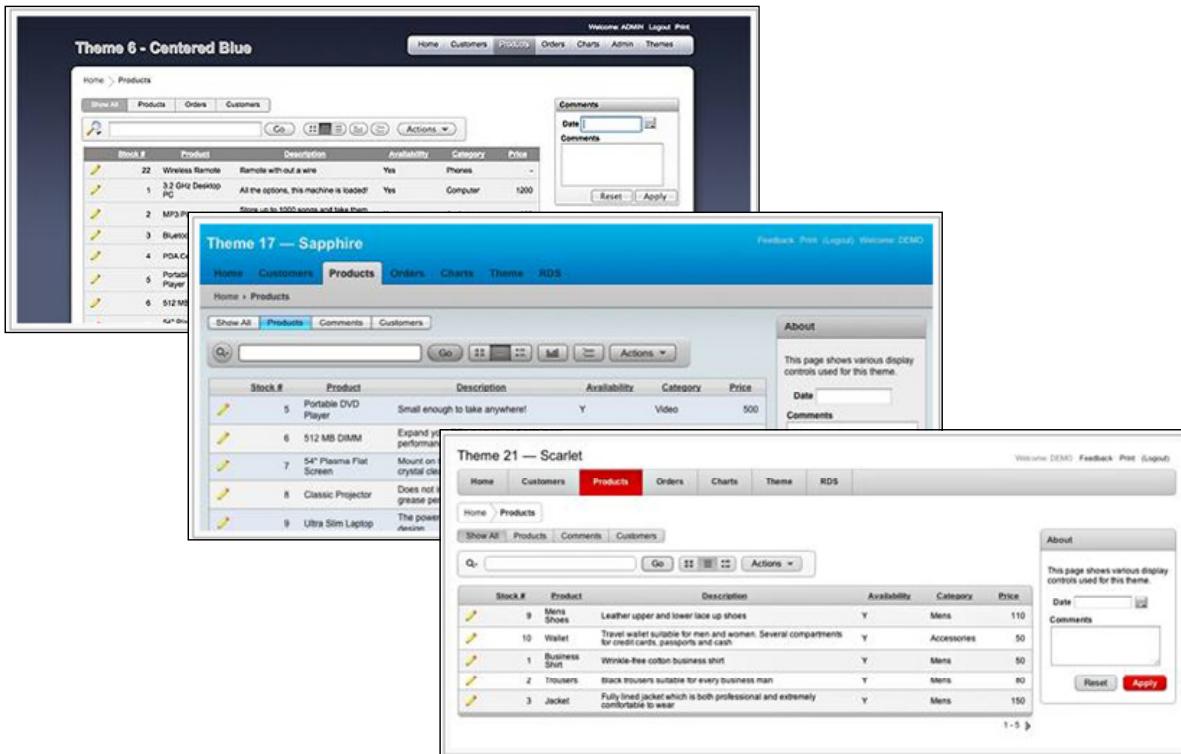
Lesson Agenda

- Using Themes
 - What Is a Theme?
 - Accessing the Themes Page
 - Creating a New Theme from the Repository
 - Switching Between Themes
 - Creating a Copy of an Existing Theme
 - Editing a Theme
- Using Templates
- Using Files

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Is a Theme?



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

A theme is a collection of templates that can be used to define the layout and style of an entire application. The purpose of a theme is to provide a complete set of templates that accommodate every user interface (UI) pattern that may be needed in an application. There are three types of themes available for desktop applications. They are standard themes, custom themes, and legacy themes. Mobile applications use the jQuery Mobile Smartphone theme.

Each theme comes with one or more templates for application components, such as reports, forms, charts, and so on. You can also create a new theme from scratch and define templates for an application. In this lesson, you learn how to use the themes and templates provided with Oracle Application Express.

The slide shows some themes provided by Oracle Application Express. Each theme defines an application's user interface, including the tabs, reports, buttons, and other controls.

Accessing the Themes Page

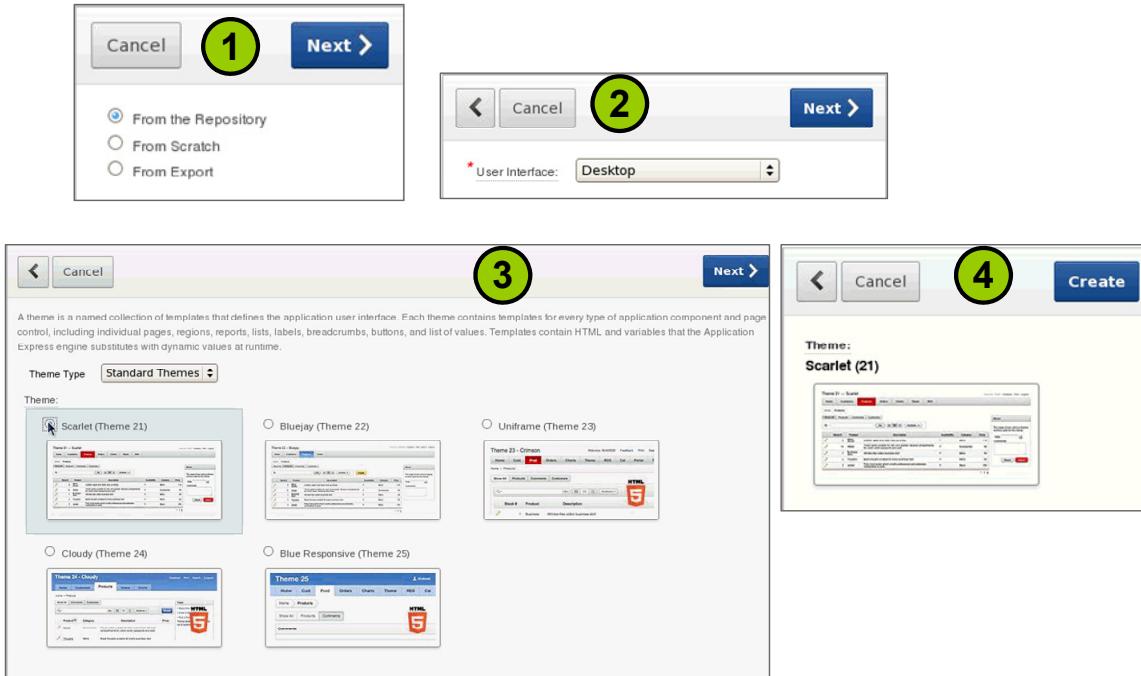
The screenshot shows the Oracle Application Express User Interface. In the top navigation bar, 'User Interface' is selected. Under 'Themes', there are several options: User Interface Attributes, Themes (which is selected and highlighted in blue), Templates, Lists of Values, Shortcuts, Plug-ins, and Component Settings. Below this is a toolbar with buttons for Search, Go, Actions, Reset, Switch Theme, and Create. The main content area displays two theme icons: 'Productivity Applications - 26' and 'jQuery Mobile Smartphone - 50'. To the right, a sidebar titled 'Themes' defines it as a named collection of templates for an application. A 'Tasks' section on the far right lists various actions: Copy Theme, Delete Theme, Edit Theme, Export Theme, Import Theme, Change Identification Number, and View Templates.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To access the Themes page for an application, click Shared Components on the application's home page. Under User Interface, click Themes. The Themes page displays the themes available for the application. From the Themes page, you can create a new theme for the application and switch between these themes. You can also edit a theme, copy a theme, import or export a theme, and so on by selecting the appropriate option from the Tasks section.

Creating a New Theme from the Repository



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a new theme for your application from the Oracle Application Express repository, click the Create button on the Themes page and perform the following steps:

1. Select “From the Repository” and click Next.
2. Select the User Interface and click Next.
3. Select a theme and click Next.
4. Click Create to create the selected theme for the application.

Switching Between Themes

1

A theme is a collection of templates. When you switch a theme, all templates assigned to components within one theme are assigned to templates in another theme. Application Express accomplishes template mapping through the assignment of template class identifiers.

Application: 108 - Order Management

Currently Active Theme: 26. Productivity Applications

Switch to Theme: 21. Scarlet

2

When you switch to a new theme, Application Builder maps all currently used templates to a template in the new theme using the template class. This report displays these template mappings.

Review the Status column to identify problematic mappings, if there is an error please ensure there is a template with the same class in both themes.

Application: 108 - Order Management

Currently Active Theme: 26. Productivity Applications

Switch to Theme: 21. Scarlet

Template Type A	From Template Class	To Template Class	Status
Breadcrumb	Breadcrumb Menu	Breadcrumb Menu	✓
Button	Button	Button	
Label	Optional	Optional	
	Optional with help	Optional with help	
	Required with help	Required with help	

3

Switching your theme may result in template issues if multiple templates are defined with the same template class identifier. Before switching a template, it is recommended you create a back up of your application before continuing.

Application: 108 - Order Management

Currently Active Theme: 26. Productivity Applications

Switch To Theme: 21. Scarlet

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

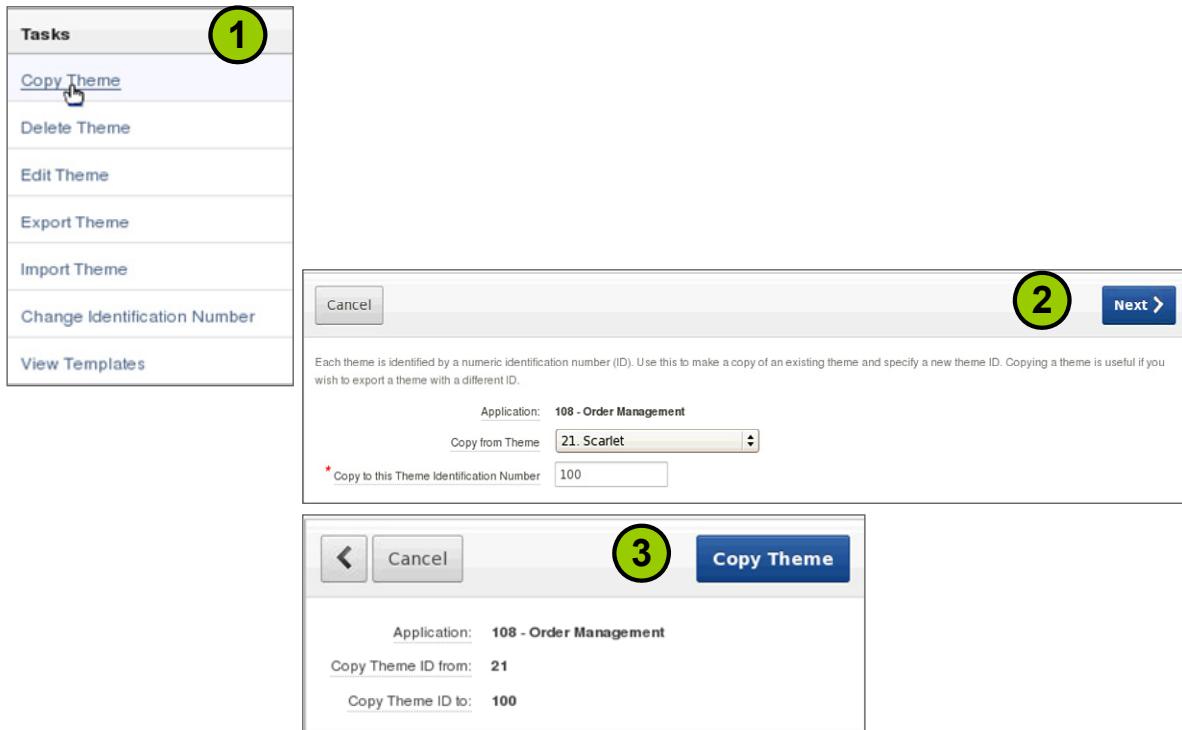
You can switch between the themes available for an application (that is, those displayed on the Themes page of an application). When you switch to a new theme, all the components that are assigned a template are assigned to a corresponding template in the new theme.

Click the Switch Theme button on the Themes page and perform the following steps:

1. Select the theme to switch to from the select list and click Next.
2. Review the compatibility status report and click Next.
 - A check mark indicates that the mapping was successful.
 - A warning indicates that there is more than one template in the theme you are switching to with the identified class. The warning provides a select list from which to choose the appropriate template.
 - An error indicates that Application Builder was unable to map the class between the themes. Ensure that a class is identified for the templates in both themes.
3. Click Switch Theme.

You can view the demonstration of creating a theme and switching between the themes by opening the `/home/oracle/labs/demos/les13_switching_themes.html` file.

Creating a Copy of an Existing Theme



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Instead of creating a theme from scratch, you can choose to copy an existing theme and make changes to it. Navigate to the Themes page and perform the following steps.

1. In the Tasks section, click Copy Theme.
2. Select the theme that you want to copy and enter an identification number for the theme. This number must be 100 or greater to indicate that it is a custom theme. Click Next.
3. Click Copy Theme.

The theme is copied successfully and you can make changes to it.

Editing a Theme

1

Number	Theme Name	Current	Default Page Template
21	Scarlet		One Level Tabs - Right Sidebar (optional / table-based)
26	Productivity Applications		One Level Tabs - No Sidebar
50	jQuery Mobile Smartphone		Page

2

3

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To edit a theme, perform the following steps:

1. In the Tasks section, click Edit Theme.
2. Select the theme that you want to edit.
3. You can change the theme name, component and region defaults, and so on. Click the appropriate tab and make changes. Click Apply Changes to save your modifications.

Quiz

Which of the following statements are true about themes?
(Choose all that apply.)

- a. Workspace themes are available to all developers in the workspace.
- b. You can add a custom theme to the theme repository only at the workspace level.
- c. When you switch to a new theme, all the components that are assigned a template are assigned to a corresponding template in the new theme.
- d. You can copy an existing theme and make changes to the copy.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a, c, d

Lesson Agenda

- Using Themes
- Using Templates
 - What Are Templates?
 - Types of Templates
 - Accessing the Templates Page
 - Creating a Copy of an Existing Template
 - Editing a Template
 - Applying a Template
 - Using Substitution Strings in Templates
 - Changing the Default Templates for a Theme
 - Overriding Application Defaults at the Page Level
- Working with Files

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Are Templates?

The screenshot illustrates a 'Sample Database Application' interface. At the top, there's a navigation bar with tabs: Home, Customers, Products, Orders, Reports, and a highlighted Orders tab. Below the navigation is a breadcrumb trail: Home > Orders > Enter New Order. The main content area is titled 'Create Order for:' and has a field labeled 'Customer' with a red asterisk, indicating it's a required field. There are two radio button options: 'Existing customer' (selected) and 'New customer'. To the right of the field is a small pop-up window labeled 'Pop-up LOV'. Above the content area, a progress bar indicates the user is at the 'Identify Customer' step of a wizard, with 'Select Items' and 'Order Summary' steps remaining. The bottom right corner of the slide features the Oracle logo.

One Level Tabs Page

Wizard Progress List

Optional with help and required with help labels

Pop-up LOV

Shared Components

- Page
 - One Level Tabs - Wizard Page
- Region
 - DIV Region with ID
 - Wizard Buttons
- Label
 - Optional (Horizontal - Left Aligned)
 - Required (Horizontal - Left Aligned)
- Button
 - Large Button
 - Large Button - Icon
- List
 - Horizontal Wizard Progress List
- Security

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

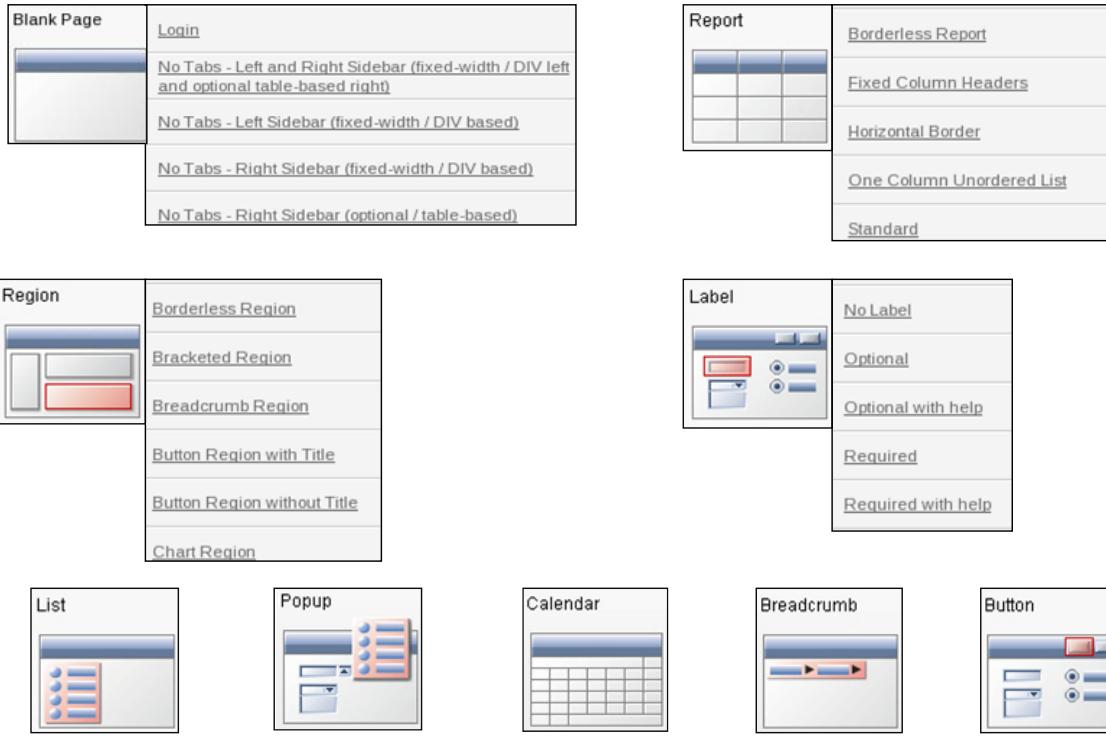
Templates define how the pages or the page components of an application are displayed. You can select templates for your page or page components from the templates available in the application's theme. Alternatively, you can customize the look and feel of the application by modifying the existing templates or creating new templates using HTML and cascading style sheets (CSS).

Templates facilitate the separation of business logic from user interface. The developers of your organization can focus on the code for the business logic, whereas the graphic artists can concentrate on the look and feel. The advantages of using templates are as follows:

- Multiple components of your application can use the templates.
- To incorporate any change in the component, a single change to the template is sufficient.

The slide shows an example of a page and the various templates associated with the page and its components. The templates used on a page can be accessed from the Shared Components region of the page definition.

Types of Templates



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Oracle Application Express offers nine types of templates. Each theme comes with one or more templates for each type. The slide shows some of the templates available for the Page, Report, Region, and Label types. Page templates control the appearance of the navigation bars, the parent tabs, and the standard tabs. Region templates control the display of region titles, buttons, and so on. Report templates control the format of the displayed report. The Label, List, Popup, Calendar, Breadcrumb, and Button templates specify how those respective components should be displayed.

Accessing the Templates Page

The screenshot shows the Oracle Application Express Shared Components page under the User Interface category. A green circle labeled '1' highlights the 'Templates' link in the sidebar. A green circle labeled '2' highlights the 'Templates' tab in the top navigation bar. The main content area displays a list of templates categorized by type (Breadcrumb, Button) and name (Breadcrumb, Breadcrumb Menu, 100% Button, 100% Button, Button, Button - Icon, Button - Icon Only). Each template entry includes columns for References, Updated, Updated By, Subscribed, Default, Theme, Preview, and Copy.

Type	Name	References	Updated	Updated By	Subscribed	Default	Theme	Preview	Copy
Breadcrumb	Breadcrumb	0	-	-	-	-	50	-	
	Breadcrumb Menu	2	-	-	-	✓	25	-	
Button	100% Button	0	-	-	-	-	150	-	
	100% Button	0	-	-	-	-	50	-	
	Button	4	-	-	-	✓	25	-	
	Button - Icon	4	-	-	-	-	25	-	
	Button - Icon Only	0	-	-	-	-	25	-	

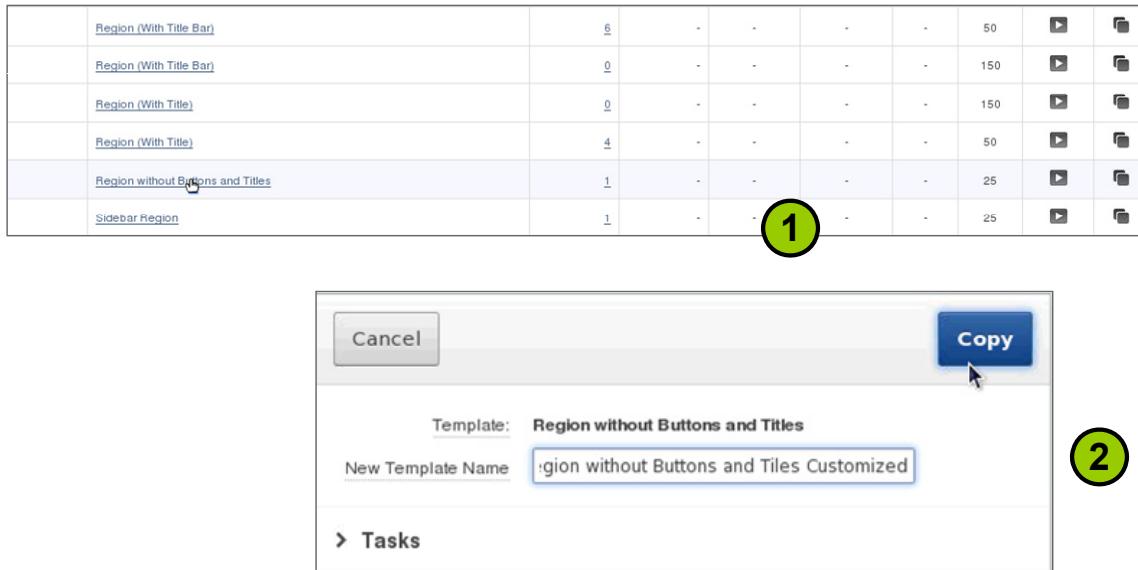
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To view the Templates page, navigate to the Shared Components page of the application. Under User Interface, select Templates. The Templates page appears. You can use the drop-down lists to display templates from a specific theme or type. You can view the default templates and the referenced templates.

Copying a Template

As a best practice, copy a template and edit it rather than modifying templates supplied by Oracle Application Express.



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

If you want to change one or a few of the templates supplied by Oracle Application Express, it is best to copy the template to another name, and then modify the copied template. Then associate the copied template with the desired page. You always copy a template so that you always have the original template to go back to or use in a different application.

To copy a template, perform the following steps:

1. On the Templates page, click the Copy icon for the template that you want to copy.
2. Enter a name for the template copy and click Copy. In the slide example, you create a copy of the “Region without Buttons and Tiles” template.

Editing a Template

The screenshot shows the Oracle Application Express Templates page. A green circle labeled '1' points to the row for 'Region without Buttons and Tiles Customized'. The table has columns for Name, ID, Description, Last Modified, Author, and various icons for actions like edit, delete, and preview. The 'Region without Buttons and Tiles Customized' row has an ID of 0, a description of 'Now', author 'user01', and a checked status icon.

The second part of the screenshot shows the 'Region without Buttons and Tiles Customized' template definition in a modal dialog. A green circle labeled '2' points to the 'Definition' tab. The 'Template' section contains the following code:

```

<section class="uRegion uNoHeading #REGION_CSS_CLASSES# clearfix"
id="#REGION_STATIC_ID#" #REGION_ATTRIBUTES#
><div class="uRegionContent clearfix">
#BODY#
#CLOSE##PREVIOUS##NEXT##DELETE##EDIT##CHANGE##CREATE##CREATE2##EXPAND##COPY##HELP#
</div>
<div>ORACLE CONFIDENTIAL - INTERNAL ONLY</div>
</section>

```

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

If you want to add some company-specific text or style, you can edit the template by performing the following steps:

1. On the Templates page, click the name of the template to modify.
2. Modify the definition of the template and click Apply Changes.

In this example, you add the text Oracle Confidential – Internal Only at the bottom of the page.

You can view the demonstration of changing a copying a template in an application by opening the `/home/oracle/labs/demos/les13_templates.html` file.

Applying a Template

The screenshot shows two interface panels. The top panel, titled 'Page Rendering', displays a hierarchical tree of page regions. The 'Regions' node is expanded, showing options like 'Create', 'Edit All', 'Expand All', and 'Collapse All'. A context menu is open over the 'Regions' node, with 'TA' and 'NEW' visible. The bottom panel, titled 'Regions', lists regions defined on the page. It includes columns for Sequence (10), Region Name (Customers), Template (25. Region without Buttons and Tiles Customized), Type (Interactive Report), and Items (0). The 'Regions' tab is selected at the top.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To associate a template with a region, navigate to the page definition and right-click the Regions node. Select Edit All. A list of all regions on the page appears. For the region to which you want to apply a new template, select the appropriate template from the drop-down list and click Apply Changes. Run the page to ensure that the template change takes effect.

Applying a Template: Output

The screenshot displays two versions of a customer list page side-by-side. The top part shows the 'Before' state, where the last column is labeled 'Tags'. The bottom part shows the 'After' state, where the last column has been modified to show the city name instead of 'Tags'. Handwritten annotations 'Before' and 'After' with arrows point to their respective sections.

Customer Name	Address	City	State	ZIP Code	Tags
Bradley, Eugene	Schoephoester Road	Windsor Locks	CT	06096	REPEAT CUSTOMER
Dulles, John	45020 Aviation Drive	Sterling	VA	20166	
Hartsfield, William	6000 North Terminal Parkway	Atlanta	GA	30320	REPEAT CUSTOMER
LaGuardia, Fiorello	Hangar Center, Third Floor	Flushing	NY	11371	
Lambert, Albert	10701 Lambert International Blvd.	St. Louis	MO	63145	
Logan, Edward	1 Harborside Drive	East Boston	MA	02128	REPEAT CUSTOMER
OHare, Frank	10000 West OHare				

Customer Name	Address	City	State	ZIP Code	Tags
Bradley, Eugene	Schoephoester Road	Windsor Locks	CT	06096	REPEAT CUSTOMER
Dulles, John	45020 Aviation Drive	Sterling	VA	20166	
Hartsfield, William	6000 North Terminal Parkway	Atlanta	GA	30320	REPEAT CUSTOMER
LaGuardia, Fiorello	Hangar Center, Third Floor	Flushing	NY	11371	
Lambert, Albert	10701 Lambert International Blvd.	St. Louis	MO	63145	
Logan, Edward	1 Harborside Drive	East Boston	MA	02128	REPEAT CUSTOMER
OHare, Frank	10000 West OHare	Chicago	IL	60666	

1 - 7

ORACLE CONFIDENTIAL - INTERNAL ONLY

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The screenshots in the slide show how a page looks before and after the modified template is applied.

Using Substitution Strings in Templates

A substitution string:

- Is a defined character string
- Is replaced by an object at run time
- Must be in uppercase
- Begins and ends with a pound (#) symbol

Example: #TITLE# is a substitution string that is replaced with the title text at run time.

```
<!DOCTYPE html>
<html lang="#&BROWSER_LANGUAGE." xmlns="http://www.w3.org/1999/xhtml"
      xmlns:htmldb="http://htmldb.oracle.com" xmlns:apex="http://apex.oracle.com">
<head>
  <title>#TITLE#</title>
  <link rel="icon" href="#IMAGE_PREFIX#favicon.ico" type="image/x-icon">
  <link rel="shortcut icon" href="#IMAGE_PREFIX#favicon.ico" type="image/x-icon">
  #HEAD#
  <link rel="stylesheet" href="#IMAGE_PREFIX#themes/theme_1/css/theme_4_0.css"
        type="text/css" />
  <!--[if IE]><link rel="stylesheet" href="#IMAGE_PREFIX#themes/theme_1
  /css/theme_4_0_ie.css" type="text/css" /><![endif]-->
  <!--[if IE 6]><link rel="stylesheet" href="#IMAGE_PREFIX#themes/theme_1
  /css/theme_4_0_ie6.css" type="text/css" /><![endif]-->
  <!--[if IE 7]><link rel="stylesheet" href="#IMAGE_PREFIX#themes/theme_1
```



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

A substitution string is a defined character string that is replaced by an object at run time. Substitution strings used within a template must be in uppercase and begin and end with a pound (#) symbol. For example, in a region template, the #TITLE# substitution string is replaced with the title of the region, and the #BODY# substitution string is replaced with the region source at run time. The region source can be static HTML, a report, or form fields. At run time, the Oracle Application Express engine replaces these strings with values, other objects, or null values.

If you are familiar with HTML, you can use HTML and, optionally, define some style definitions to customize your reports.

A basic page template must include the following four important substitution strings:

- #HEAD#
- #FORM_OPEN#
- #BOX_BODY#
- #FORM_CLOSE#

Changing Default Templates in a Theme

The figure consists of three screenshots illustrating the process of changing default templates in a theme:

- Screenshot 1:** Shows the "Tasks" section of the Themes page. The "EditTheme" link is highlighted with a green circle labeled "1".
- Screenshot 2:** Shows a list of themes. The "Blue Responsive" theme is selected and highlighted with a green circle labeled "2".
- Screenshot 3:** Shows the "Component Defaults" tab of the "Theme" edit dialog. A green circle labeled "3" highlights the "Apply Changes" button.

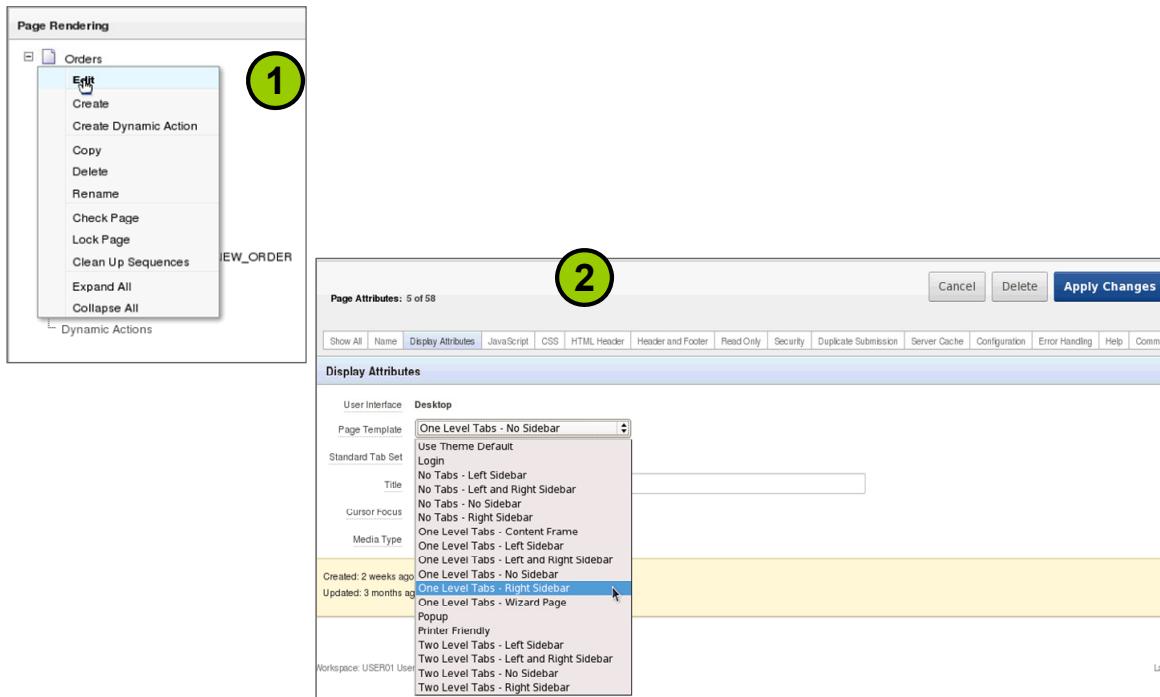


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can change the default templates for each type of template in a theme. Perform the following steps:

1. From the Tasks section on the Themes page, select Edit Theme.
2. Select the theme to edit.
3. Click the Component Defaults tab and change the template defaults as required. You can also change a region's defaults on the Region Defaults tab.

Overriding Application Defaults at the Page Level



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

There may be situations where you have defined an application-level default template; however, for a particular page, you want to use a different template. For example, you can specify a page template default to be “One Level Tabs – Right Sidebar.” But for a specific page, you want to use “One Level Tabs – Left and Right Sidebar.” To specify the page-level template, perform the following steps:

1. Navigate to the page definition and right-click the page node. Select Edit.
2. Click the Display Attributes tab and select the required template for the Page Template field.

Lesson Agenda

- Using Themes
- Using Templates
- Working with Files
 - Uploading a Cascading Style Sheet
 - Referencing Cascading Style Sheets
 - Uploading an Image
 - Using the Uploaded Image



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Uploading a Cascading Style Sheet



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To upload a CSS, navigate to the Shared Components page of the application and perform the following steps:

1. Under Files, click Cascading Style Sheets.
 2. The Cascading Style Sheets page appears. Click the Create button.
 3. Browse for the .css file and click Upload.
- The file is uploaded successfully.

Referencing a Cascading Style Sheet

The diagram illustrates the process of referencing a Cascading Style Sheet (CSS) in a page template. It consists of four main components:

- Cascading Style Sheet:** A screenshot of the Oracle Application Express 'Cascading Style Sheet' configuration screen. It shows a 'File URLs' section with the URL '#WORKSPACE_IMAGES#apexstyle.css'. A callout points to this URL with the text: "Enter Cascading Style Sheet File URL to be loaded."
- Display Attributes:** A screenshot of the 'Display Attributes' tab in the 'Page Template' configuration. It shows the 'Page Template' dropdown set to 'One Level Tabs - Right Sidebar (optional / table-based)' and the 'Standard Tab Set' dropdown set to 'TS1 (Home, Products, Customers...)'. A callout points to the 'Page Template' dropdown with the text: "Associate the template with the page."
- Page Definition:** A screenshot of the 'Template' section in the 'Page Definition' configuration. It shows the following HTML code:

```
<div class="#bigblue">-region #REGION_CSS_CLASSES# id="#REGION_STATIC_ID#" #REGION_ATTRIBUTES#</div>
<div class="bl"><body>#BODY#</body></div>
<div class = "bigblue">Oracle Confidential - Internal Only</div>
```

A callout points to the 'bigblue' class definition with the text: "Reference a style from style sheet."
- Resulting Page:** A screenshot of a sample page showing a table of data. The table has columns for Name, Stanton, Switzerland, Paradeplatz 4, Zuerich, and ZH. The 'bigblue' style is applied to some text in the table, such as 'Paradeplatz 4'. A callout points to the page content with the text: "The page looks like this now."

ORACLE

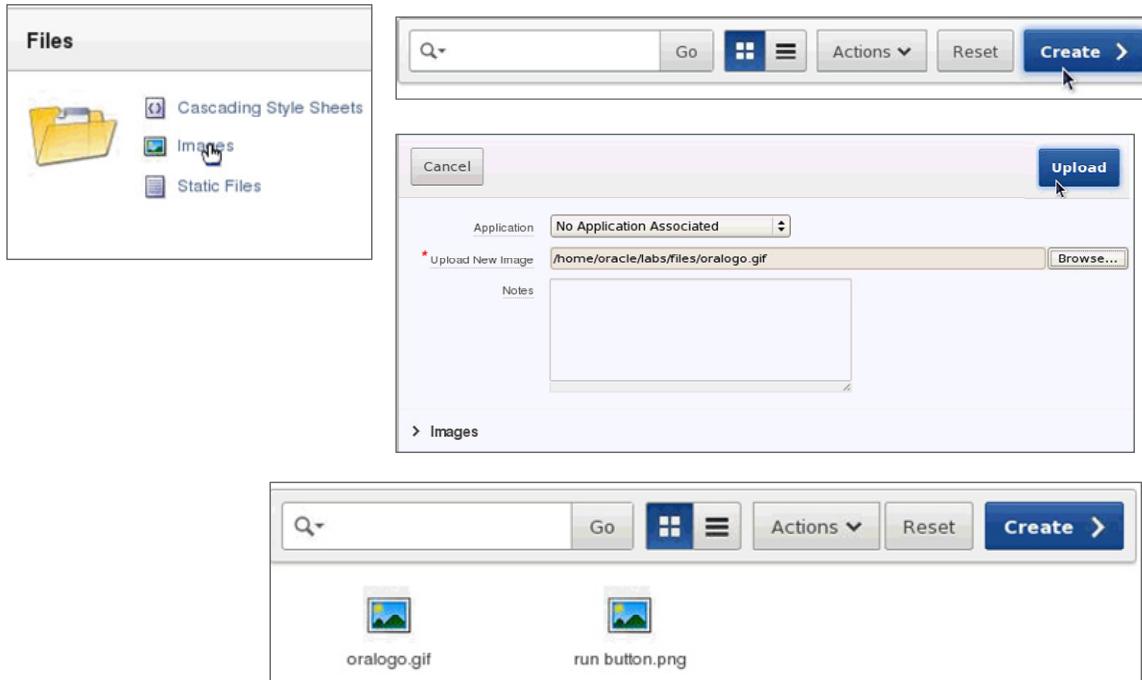
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can reference an uploaded CSS through the Header section of a page template. You use the Header section to enter the HTML that makes up the <HEAD> section of the HTML document. To reference a CSS, perform the following steps:

1. Navigate to the Shared Components page and from the User Interface region, click Templates.
2. Select the page template that you want to edit.
3. Click the Cascading Style Sheet tab. You need to use the #WORKSPACE_IMAGES# substitution string to reference files uploaded to the workspace. You refer to the File URL using the #WORKSPACE_IMAGES# substitution string.
4. Click Apply Changes to save the template.
5. Navigate to the page definition of the page where you want to use the style sheet and right-click the page name node. Select Edit and click the Display Attributes tab.
6. From the Page Template drop-down list, select the page template that you modified previously and click Apply Changes.
7. You can now reference the styles in the style sheet in regions in the page. In the slide example, a **bigblue** style is applied to some text and the outcome of the page is also shown.

You can view the demonstration of this task by opening the /home/oracle/labs/demos/les13_adding_css.html file.

Uploading an Image



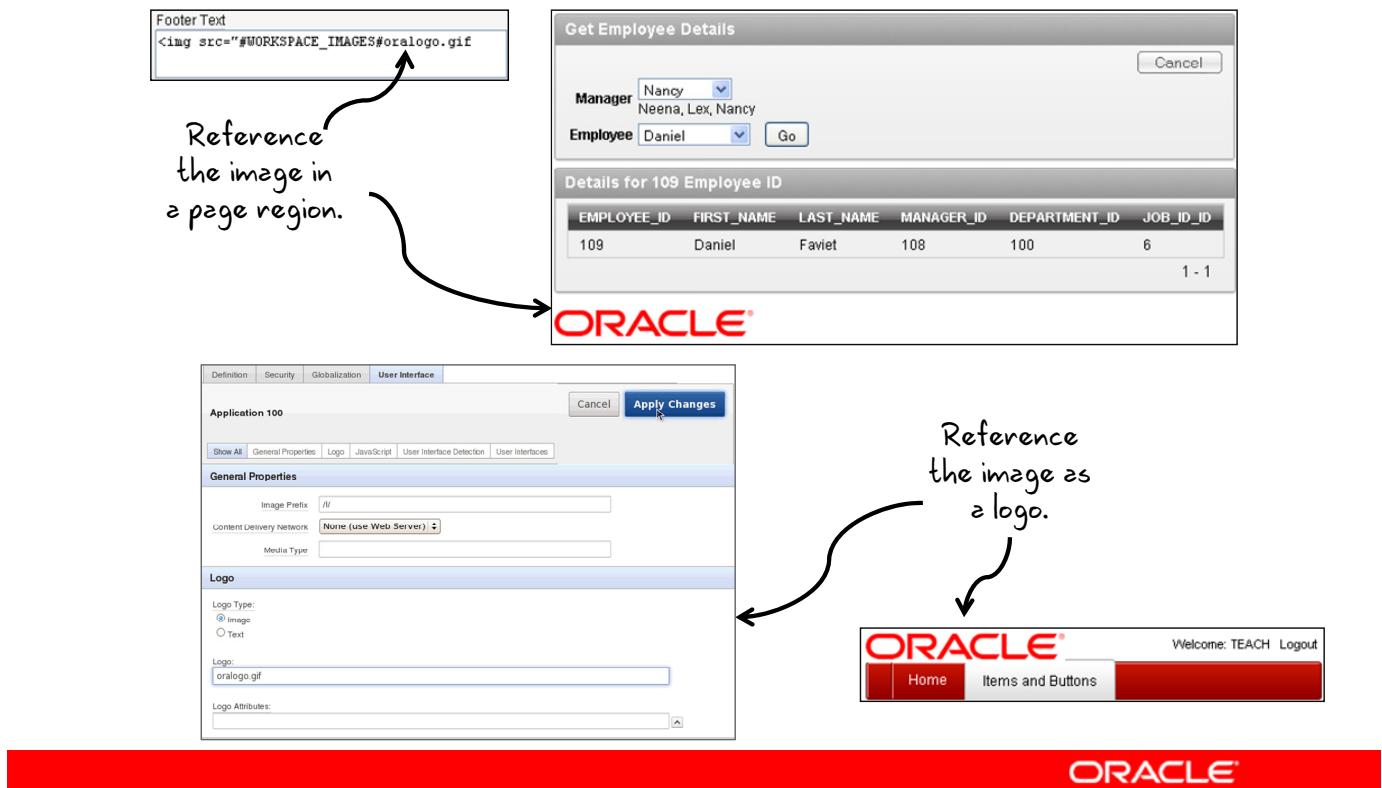
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can upload images that you want to reference in your application. To upload an image, navigate to the Shared Components page of the application and perform the following steps:

1. Under Files, click Images.
 2. The Images page appears. Click the Create button.
 3. Browse for the image file and click Upload.
- The file is uploaded successfully.

Using an Uploaded Image



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can reference the images uploaded to a workspace on application pages or as a logo for the application. To reference an image on application pages, you can use one of the following substitution strings:

- `#APP_IMAGES#` is used when the uploaded image is specific to the given application.
- `#WORKSPACE_IMAGES#` is used when the uploaded image is shared among various applications in the given workspace.
- `#IMAGE_PREFIX#` is used when you want to point to the images directory distributed with Oracle Application Express.

You can also specify the uploaded image as a logo for the application. Click the Edit Application Properties button on the application home page. Select User Interface and click the Logo tab and specify the image name in the Logo field.

Quiz

Which substitution string would you use to upload a CSS that is associated with a specific workspace?

- a. #IMAGE_PREFIX#
- b. #APP_IMAGES#
- c. #WORKSPACE_IMAGES#



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: c

Summary

In this lesson, you should have learned how to:

- Define themes and their uses
- Create a new theme from the repository
- Switch to a different theme
- Define templates and their uses
- View existing templates
- Create and edit a template
- Upload and use a cascading style sheet and an image



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This lesson provided an overview of the themes and the page, region, report, and other templates in Oracle Application Express.

Workshop 13 Overview: Working with Themes, Templates, and Files

This practice covers the following topics:

- Working with list templates
- Working with report templates
- Adding a logo to the pages
- Working with cascading style sheets



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

14

Implementing Security

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to do the following:

- List the different ways to secure your application
- Differentiate between authentication and authorization
- Create an authentication scheme for your application
- Create an authorization scheme by using Access Control
- Enable and configure Session State Protection



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This lesson shows you how to implement security for an application by using the security features of Oracle Application Express. You learn the difference between authentication and authorization. You also learn how to enable Session State Protection.

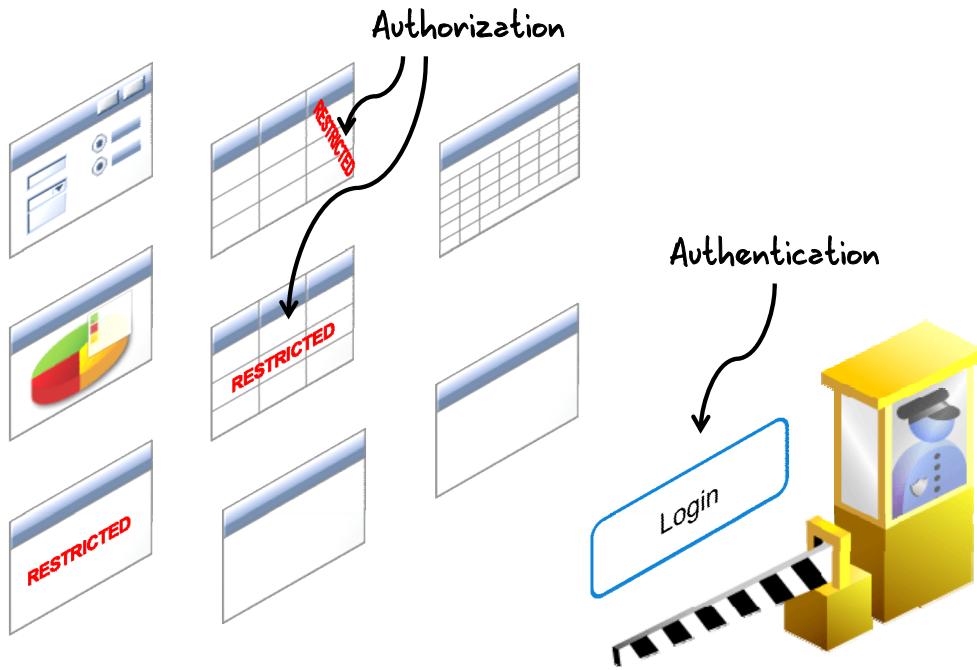
Lesson Agenda

- Securing an Application
 - Overview
 - Accessing the Security Tasks
- Using Authentication Schemes
- Using Authorization Schemes
- Using Session State Protection



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Securing an Application: Overview



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After creating an application, you want to ensure that only authorized users can access the application. You can provide security to your application through the following methods:

- **Authentication:** Confirming user credentials before allowing access to the application. This is done through a login page. The user can view any component of the application only if the login succeeds.
- **Authorization:** Restricting access to specific pages, components (for example, forms, reports, or items), or to a particular column in a report. Only privileged users can access these components.
- **Session State Protection:** Preventing users from tampering with the URLs

Accessing Security Tasks



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create security mechanisms for an application, navigate to the Shared Components page and click the appropriate link in the Security list.

Lesson Agenda

- Securing an Application
- Using Authentication Schemes
 - Authentication Schemes Page
 - Implementing Authentication
 - Preconfigured Schemes
 - Creating Authentication Based on Preconfigured Schemes
 - Copying an Authentication Scheme
- Using Authorization Schemes
- Using Session State Protection

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Authentication Schemes Page

Name	Scheme Type
Application Express Authentication - Current	Application Express Accounts

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

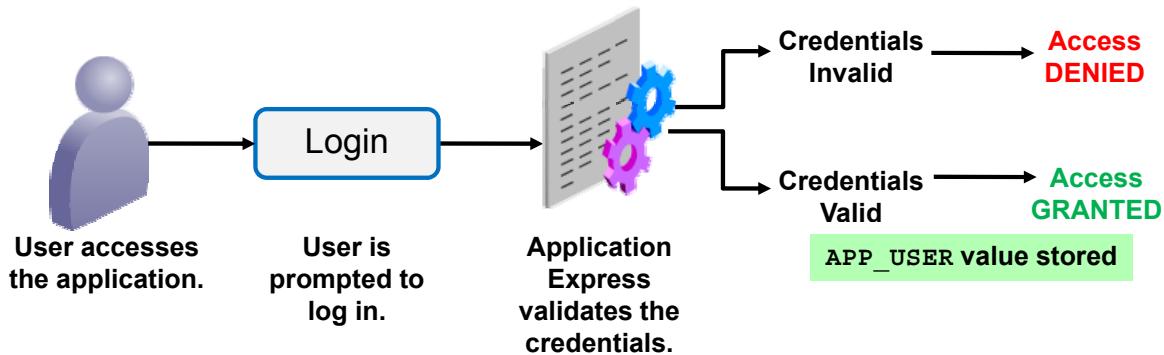
To access the Authentication Schemes page, click the Authentication Schemes link under Security on the Shared Components page of the application.

The Authentication Schemes page displays the authentication schemes available for an application.

The Application Express Authentication scheme enables access to users created in Application Express. When you run an application by using this scheme, a custom login page 101 is displayed, prompting you for a username and password. You must enter the user credentials created by using Oracle Application Express for this application.

The scheme that is current for the application is appended with the word “Current.” You can create more than one authentication scheme for an application, but only one scheme can be current. Click the pencil icon to view details about the current authentication scheme for an application.

Implementing Authentication



You can create authentication:

- Based on a preconfigured scheme from the gallery
- As a copy of an existing authentication scheme



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

When your application uses an authentication scheme, Oracle Application Express prompts each user for a username and password when the user tries to log in. The credentials are evaluated and accordingly the user is allowed or denied access to the application. After a user is identified, the Oracle Application Express engine keeps track of the user by setting the value of `APP_USER`. `APP_USER` is a built-in variable representing the current user running the application. The Oracle Application Express engine uses `APP_USER` to track each user's session state.

In Oracle Application Express, you can create authentication by:

- Using one of the preconfigured schemes
- Copying an authentication scheme from the same application or from a different application and then modifying the settings as needed

In this lesson, you learn to create authentication by using these two methods.

Note: If you choose not to authenticate your application, Oracle Application Express does not check user credentials. All the pages of your application are accessible to all users.

Preconfigured Authentication Schemes



Show Login Page

- Open Door Credentials
- Application Express Account Credentials
- Database Account Credentials
- LDAP Directory Credentials



No Authentication

- Using DAD



Oracle Application Server SSO

- Application Express Engine as Partner Application
- My Application as Partner Application

ORACLE®

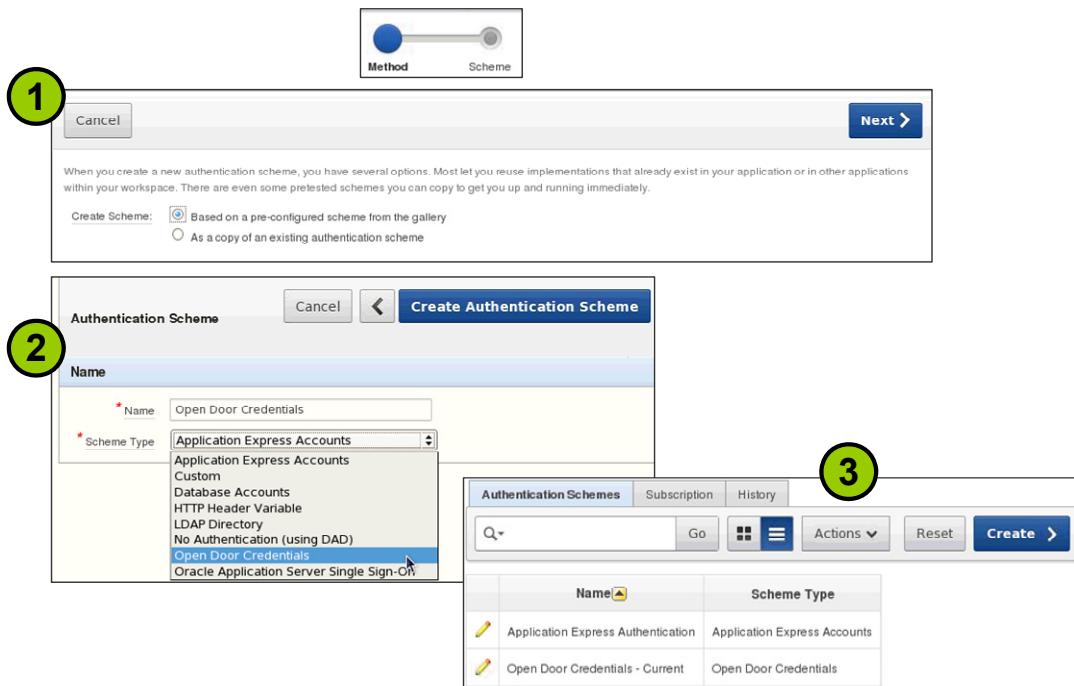
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Oracle Application Express provides some common, pretested authentication schemes that you can choose while creating an authentication scheme. For some of the schemes, you may also have to configure corresponding components:

- **Show Built-In Login Page and Use Open Door Credentials:** When you run an application with this scheme, a built-in login page is displayed and you are prompted for a username. You can enter any string, which then serves as the user identifier for the session. This scheme allows any user to access the application.
- **Show Login Page and Use Application Express Account Credentials:** To log in to an application by using this scheme, you must provide the user credentials created by using Oracle Application Express for this application. These user accounts are created and managed by an Oracle Application Express Workspace administrator. When you create this scheme, you have the option to specify whether to use a built-in login page or a custom login page.
- **Show Login Page and Use Database Account Credentials:** To log in to an application by using this scheme, you must provide database account credentials created for the local database. When you create this scheme, you have the option to specify whether to use a built-in login page or a custom login page.

- **Show Login Page and Use LDAP Directory Credentials:** This scheme validates the username and password entered on a login page by using a Lightweight Directory Access Protocol (LDAP). LDAP is an Internet protocol used to look up directory information. To use this scheme, you must have access to an LDAP directory. When creating the scheme, you must enter the LDAP host, port number, and the pattern used to construct the Domain Name Server (DNS) string.
- **No Authentication (using DAD):** This scheme provides no authentication for the application. No login page is shown, and all the pages of an application are accessible to all users. It uses Database Access Descriptor (DAD) configuration, which defines how Application Express will automatically log in to the database. This is why users will not be prompted to log in.
- **Oracle Application Server Single Sign-On (Application Express Engine as Partner App):** In this scheme, you must register the Oracle Application Express site as a partner application with the Oracle Application Server SSO server. You can then create this scheme for the application and the authentication responsibility is delegated to the SSO server.
- **Oracle Application Server Single Sign-On (My Application as Partner App):** In this scheme, you must register the Oracle Application Express application that you created with SSO as a partner application. The application authentication is delegated to the SSO server. In both these options, when a user accesses the application, the Oracle Application Express engine directs the page to the SSO login page. After the user is authenticated by SSO, the SSO components redirect your application, passing the user identity and other information to the APEX engine.

Creating Authentication Based on Preconfigured Schemes



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

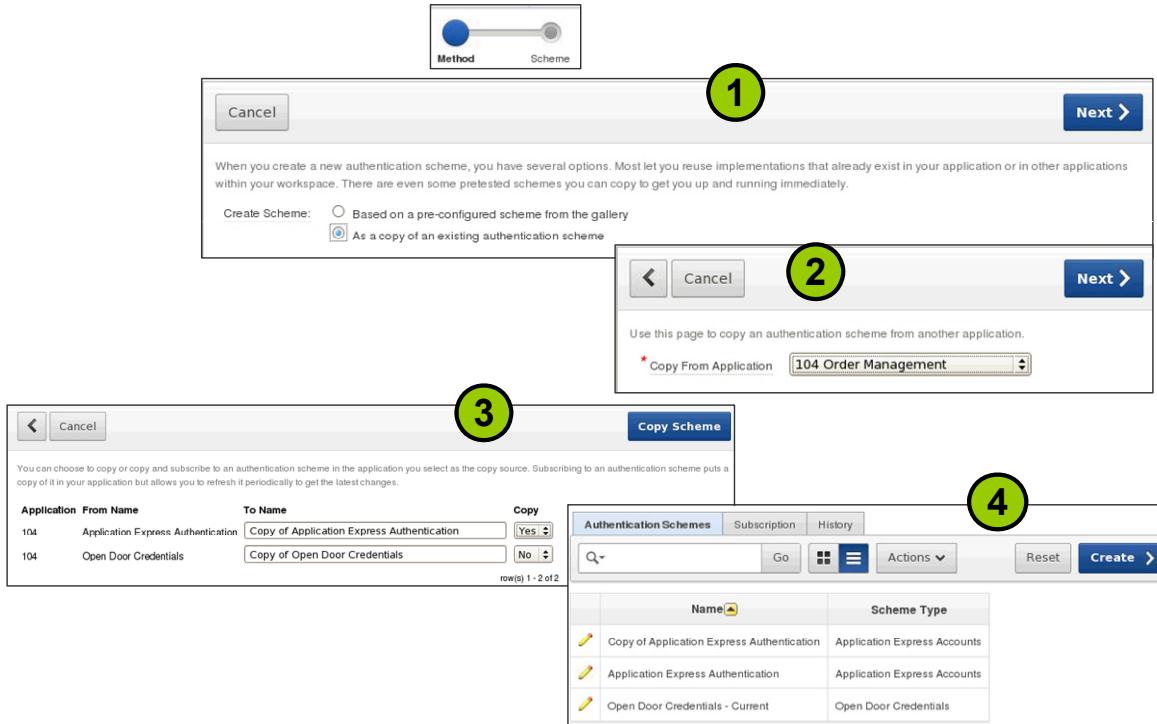
To create an authentication scheme, navigate to the Authentication Schemes page and click the Create button. The Create Authentication Scheme Wizard appears.

1. Select “Based on a pre-configured scheme from the gallery” and click Next.
2. Select a scheme depending on what user accounts you will use and enter a name for the new authentication scheme and click Create. In this example, Open Door Credentials are used.

The authentication scheme is created successfully.

You have successfully created a new authentication scheme. You can click the Change Current tab from the Authentication Schemes page and set the new scheme as the current scheme for an application.

Copying an Authentication Scheme



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can copy an authentication scheme from your application or any other application in your workspace and use it to authenticate your application. You can edit the copied scheme and change the name and other settings to meet your application requirements. To copy an authentication scheme, click the Create button on the Authentication Schemes page and perform the following steps:

1. Select “As a copy of an existing authentication scheme” and click Next.
2. Select the application from which you want to copy the scheme and click Next.
3. The schemes existing in the selected application are listed. Select Yes for the scheme that you want to copy. The Copy and Subscribe option copies the authentication scheme to your application, and you can refresh it periodically to retrieve the latest changes. Click Copy Scheme to copy the scheme.

You can watch the demonstration of creating an authentication scheme by opening the /home/oracle/labs/demos/les14_authentication_scheme.html file.

Quiz

Which authentication scheme uses the built-in users created by a workspace administrator within the workspace where the application is installed?

- a. Open Door Credentials
- b. Database Account Credentials
- c. Oracle Application Express Credentials
- d. LDAP Credentials



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: c

Workshop 14-1 Overview: Creating an Authentication Scheme

This workshop covers the following topics:

- Creating an authentication scheme
- Switching the current authentication scheme to Application Express



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

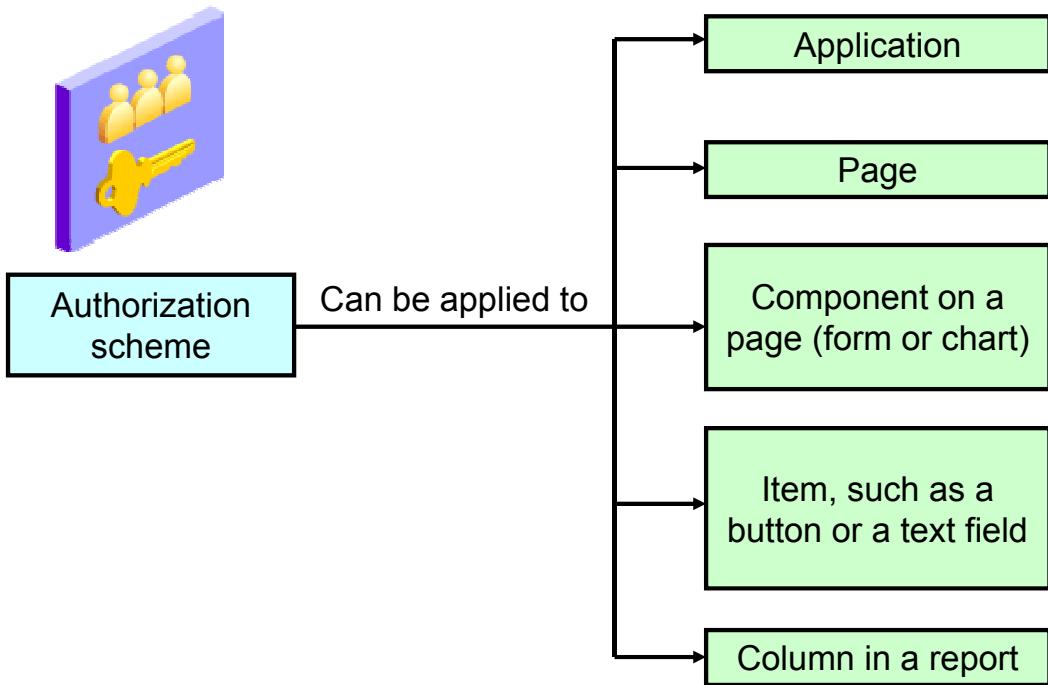
Lesson Agenda

- Securing an Application
- Using Authentication Schemes
- Using Authorization Schemes
 - Where Can You Implement Authorization?
 - Methods to Implement Authorization
 - Creating an Authorization Scheme from Scratch
 - Creating an Access Control Page
 - Configuring the Access Control Page
 - Applying an Authorization Scheme
- Using Session State Protection

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Where Can You Implement Authorization?



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Authorization controls access to resources within the application. Authorizations are implemented by using authorization schemes. You can specify an authorization scheme for an entire application, a page, or specific components such as a region, an item, a button, or a column of a report. If the component-level authorization succeeds, the user can view the component. If the application-level or page-level authorization fails, Oracle Application Express displays a predefined message. You first define the authorization scheme and then associate it with any component in your application. Two common types of authorization schemes include “exists” and “PL/SQL function returning a Boolean value.” The success or failure of authorization schemes can be cached on a per-session or per-page view to enhance performance.

You can view and modify the authorization schemes associated with a page from the Security node in the Shared Components column on the Page Definition page.

Methods to Implement Authorization

Two ways to create and implement an authorization scheme:

- Shared Components:
 - Create an authorization scheme from scratch.
 - Copy an authorization scheme from an existing scheme.
- Access Control Administration page:
 - Create an Access Control page.
 - Set the application mode.
 - Add users to the Access Control List.
 - Apply the authorization scheme to application components.

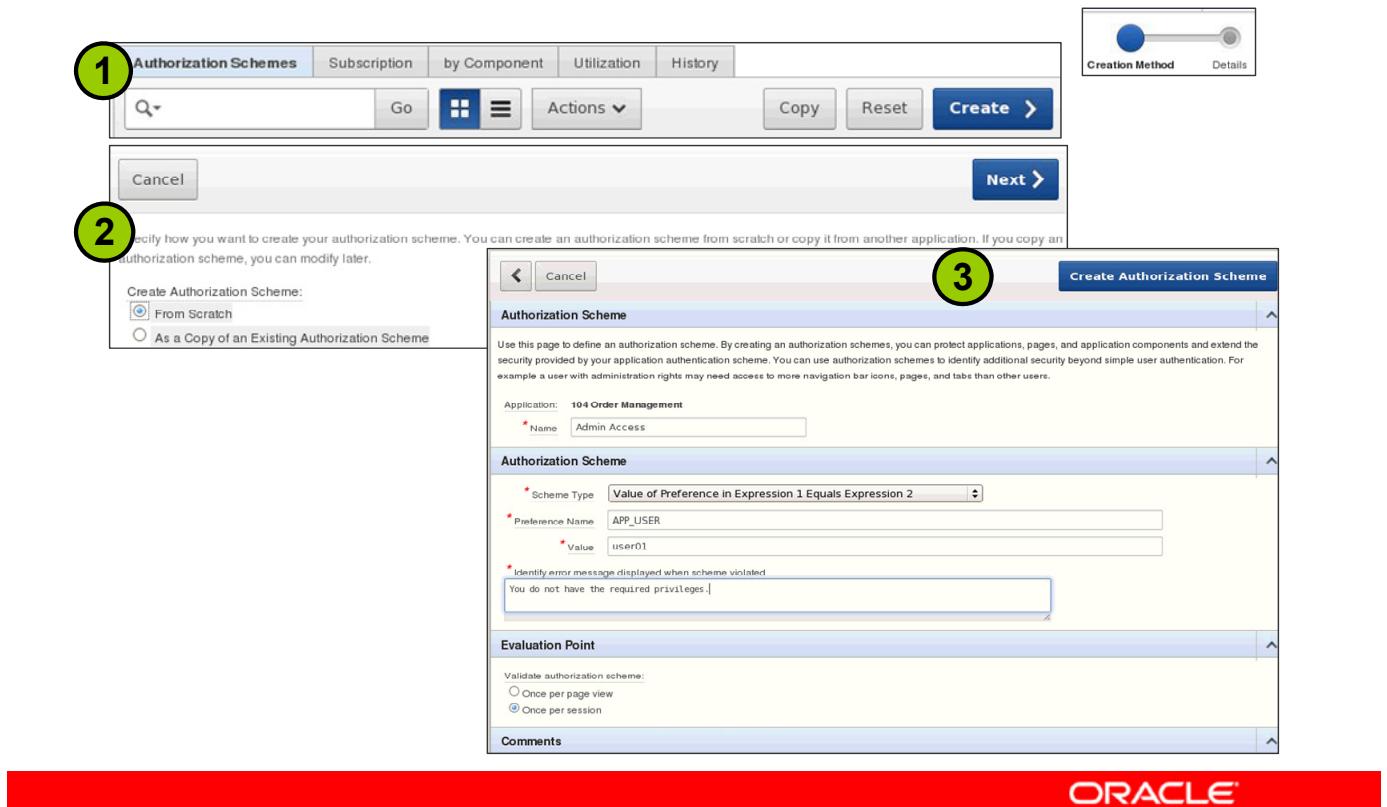


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

There are two ways to create and apply an authorization scheme to an application and its components:

- You can create an authorization scheme from scratch or from an existing scheme from the Shared Components page of an application.
- You can also create an authorization scheme through an Access Control page, which automates the step of creating the authorization schemes. The Access Control page enables you to set the mode of the application and the type of restricted access, if any, that the application should have. The page also enables you to define each user and the access that the user should have. You can also apply the authorization scheme to various application components.

Creating an Authorization Scheme from Scratch



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can create an authorization scheme from scratch or copy an existing authorization scheme, and then customize it. To create a new authorization scheme from scratch, navigate to the Shared Components page and in the Security section, click the Authorization Schemes link. From the Authorization Schemes page, perform the following steps:

1. Click the Create button.
2. Select From Scratch and click Next.
3. Specify the following details and click Create.
 - Enter a name for the scheme.
 - Select a scheme type that defines how the scheme will be applied. In this example, the value in Expression 1 (APP_USER) is compared to the value specified in Expression 2 (user01). If the comparison succeeds, the authorization scheme passes. If it fails, the authorization scheme fails.
 - Enter the error text to be displayed when the authorization scheme fails.
 - Specify whether the authorization scheme must be evaluated once per session or once per page view.

Creating an Access Control Page

1 Application Home Page

2 Create Page

3

This wizard creates a page to manage an access control list. Two tables will be created within this application's default parsing schema to manage the access control list. The access control list provides **view**, **edit** and **administration** privileges which can be associated with users. A corresponding authorization scheme will also be created for each privilege. These authorization schemes can be applied to pages and page components to manage access by user and privilege. All of these can be customized after they are created to meet the needs of your application.

* Administration Page Number 4

4

Administration Page: 4

Tab Options:

- Do not use tabs
- Use an existing tab set and create a new tab within the existing tab set.
- Use an existing tab set and reuse an existing tab within that tab set.

5

You have requested to create a page with the following attributes. Please confirm your selections.

Application	104
Page	4
Page Name	Access Control Administration Page
Page Title	Access Control Administration Page
Tab Set	TS1
Tab Label	
Create Table	APEX_ACCESS_SETUP
Create Table	APEX_ACCESS_CONTROL
Create Authorization Scheme	access control - administrator
Create Authorization Scheme	access control - edit
Create Authorization Scheme	access control - view

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Using an Access Control page, you can define the users who can access an application and specify privileges for each user.

To create an Access Control page for an application, perform the following steps:

1. Navigate to the application home page and click Create Page.
2. Select the Access Control page type and click Next.
3. Specify a page number or accept the given page number. Then click Next.
4. Choose whether you want a tab for the page.
5. Review the details and click Finish.

You have successfully created an Access Control page for an application.

Configuring the Access Control Page

The screenshot shows the 'Application Administration' interface with the 'Access Control List' tab selected. At the top, there is a section for 'Application Mode' with four radio button options: 'Full access to all, access control list not used.' (unselected), 'Restricted access. Only users defined in the access control list are allowed.' (selected), 'Public read only. Edit and administrative privileges controlled by access control list.' (unselected), and 'Administrative access only.' (unselected). Below this is a search bar with a 'Find' input field and a 'Go' button. A table titled 'Access Control List' displays a single row of data: a checkbox column (unchecked), 'Username' (john wreck), 'Privilege' (Administrator), 'Last Changed By' (null), and 'Date' (null). There are 'Delete' and 'Apply Changes' buttons at the top right of the table, and an 'Add User' button at the bottom right.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After the Access Control page has been created, you can run the page to set the application mode and add users to the Access Control List. Application mode defines what type of access you want the application to have. The options are:

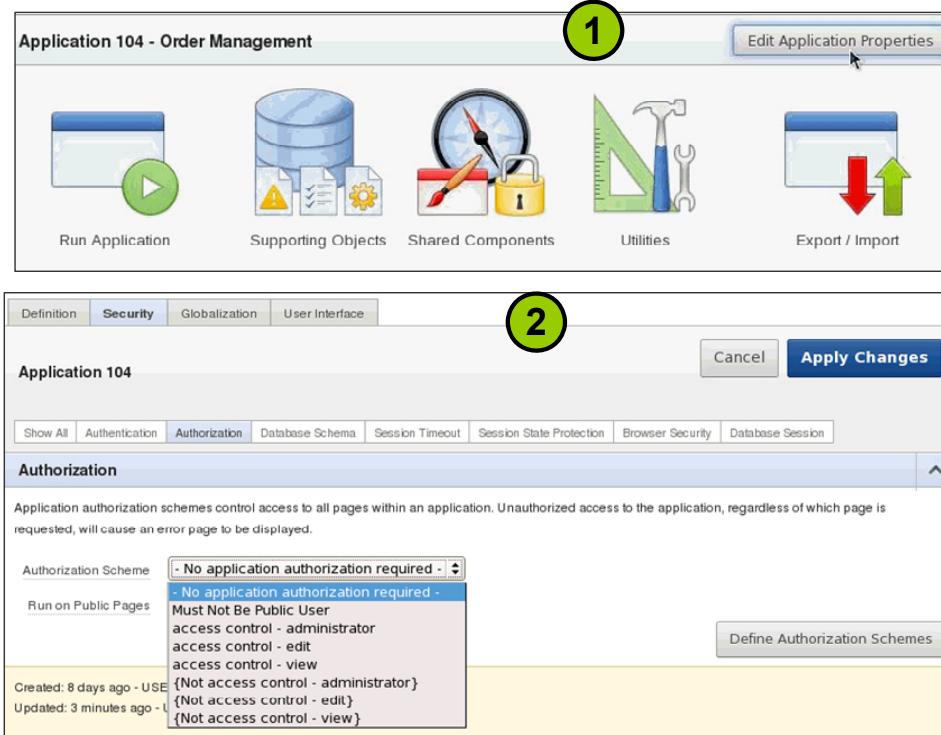
- **Full access:** All users are given access, and the Access Control List (ACL) is not used.
- **Restricted access:** Only the users specified in the ACL are given access according to the privilege given to them.
- **Public read only:** All users are given access to view the application or component. They cannot make any changes. Users defined in the ACL can view and modify the application or component.
- **Administrative access only:** Only users defined in the ACL with Administrative privileges are given access.

To add users and assign privileges to those users in Access Control List, perform these steps:

1. Click Add User.
2. Enter the username and select the privilege that you want to assign.
3. Click Apply Changes.

You can view the demonstration of creating an access control page by opening the /home/oracle/labs/demos/les14_access_control_page.html file.

Applying an Authorization Scheme to an Application



ORACLE®

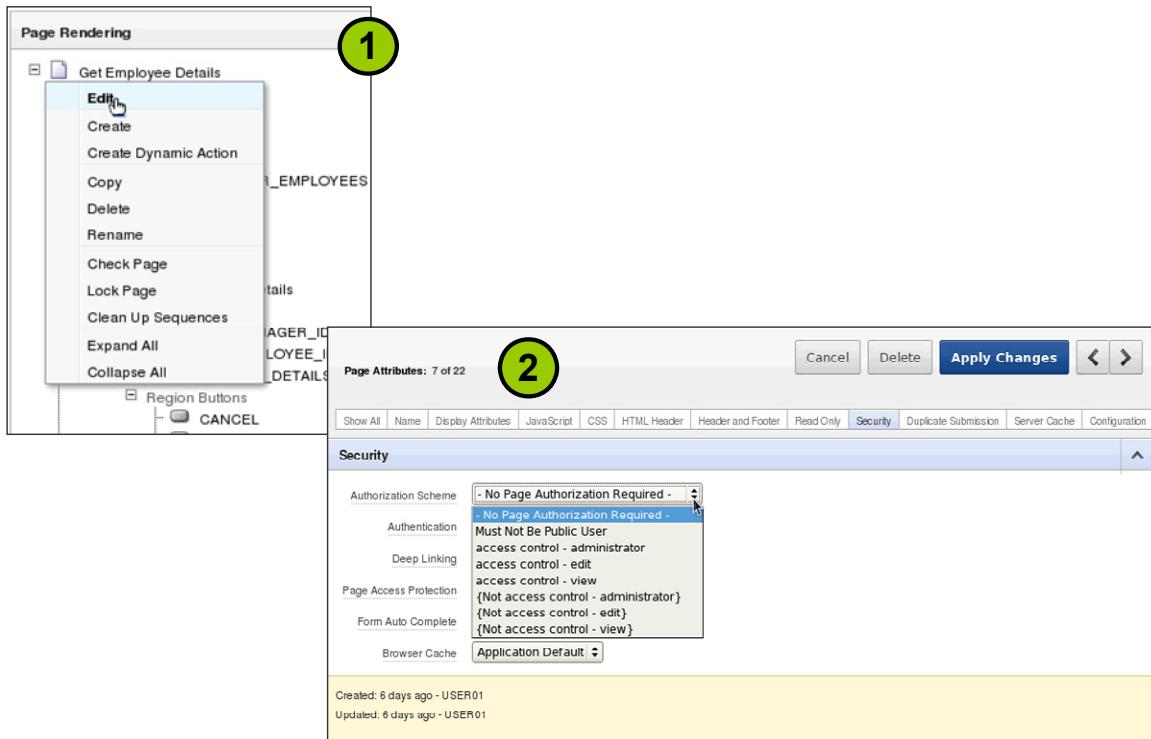
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To apply an authorization scheme to an entire application, navigate to the application home page and perform the following steps:

1. Click the Edit Application Properties button.
2. Click the Security tab, and then click the Authorization tab. Select an authorization scheme from the Authorization Scheme drop-down list, and click Apply Changes. The authorization scheme is applied to your application.

If you apply the “access control – administrator” scheme, all users in the ACL with administrator privileges have access to the application. Application Express also lists some schemes to reverse the condition created in your scheme. For example, if you apply the Not access control - administrator scheme, all users except the user01 user is given access to the application.

Applying an Authorization Scheme to a Page



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To apply an authorization scheme to a page, perform the following steps:

1. Navigate to the page definition of the page to which the authorization scheme must be attached. Right-click the page name node and select Edit.
2. Click the Security tab and select a scheme from the Authorization Scheme drop-down list. This authorization scheme must evaluate to TRUE for the page to be rendered.

Applying an Authorization Scheme to a Column in a Report

Screenshot 1: Page Rendering window showing the 'Employee Details' node selected. A green circle labeled '1' highlights the 'Edit Report Attributes' option in the context menu.

Screenshot 2: Column Attributes window for the 'Employee Details' column. A green circle labeled '2' highlights the 'Edit' icon next to the column header.

Screenshot 3: Column Attributes window showing the 'Authorization' tab selected. A green circle labeled '3' highlights the 'Authorization Scheme' dropdown menu, which is open to show options like '- No Authorization Required -', 'Must Not Be Public User', and 'access control - administrator'.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To apply an authorization scheme to a column in a report, perform the following steps:

1. Navigate to the page definition of the page that contains the report. Right-click the report name node and select Edit Report Attributes.
2. Click the Edit icon for the column where you want to apply the authorization scheme.
3. Click the Authorization tab and select a scheme from the Authorization Scheme drop-down list. Click Apply Changes.

Note that for each authorization scheme, you can set the authorization scheme to be valid when the user logging in is contained within the authorization scheme or when the user is not contained within it. This is very useful if you have a page with one region that should be displayed for users with authorization and another for users without authorization. You can conditionally display each without needing to manually code a second authorization scheme.

Quiz

Which of the following statements are true about an authorization scheme?

- a. You can attach an authorization scheme to any component or control in an application.
- b. After associating an authorization scheme with a page, you cannot modify it.
- c. You can create an authorization scheme through an Access Control page.
- d. If a page-level authorization scheme fails, Oracle Application Express displays a previously defined message.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a, c, d

Workshop 14-2 Overview: Restricting Users By Using Access Control

This workshop covers the following topics:

- Creating users to add to the access control list
- Creating an access control page
- Adding users to the Access Control List
- Defining and applying the authorization schemes to each application component



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Securing an Application
- Using Authentication Schemes
- Using Authorization Schemes
- Using Session State Protection
 - What Is Session State Protection?
 - Enabling Session State Protection
 - Configuring Session State Protection
 - Understanding Session Timeout



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Is Session State Protection?

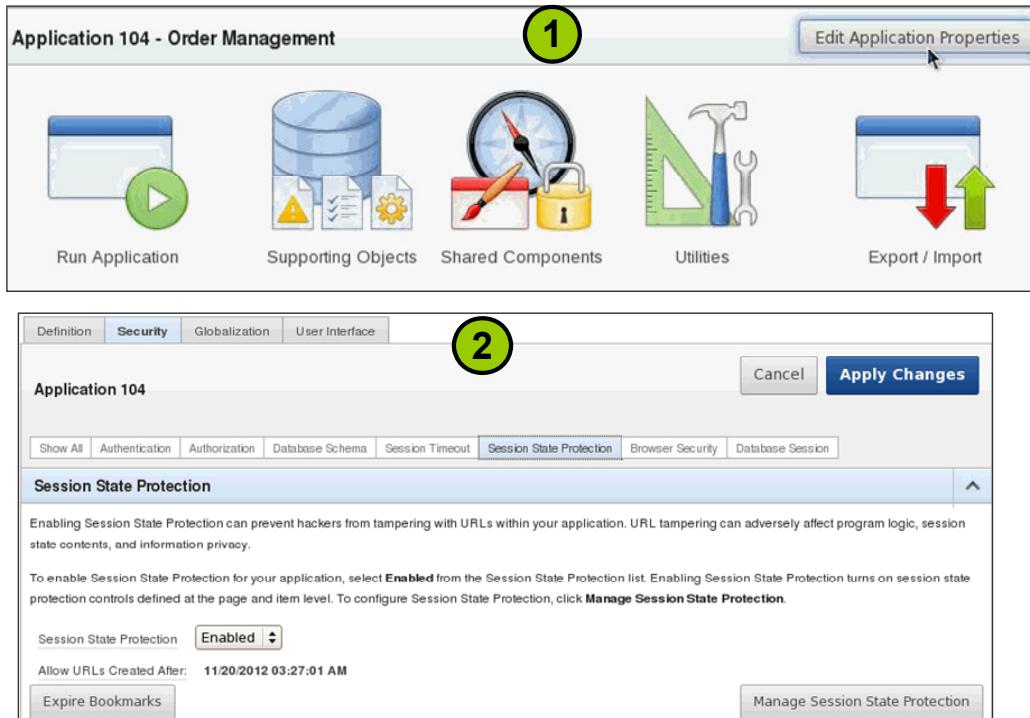
- Session State Protection is a built-in functionality that prevents hackers from tampering with the URLs within your application.
- Enabling Session State Protection is a two-step process:
 - Enable the feature.
 - Set the page and item security attributes.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

When enabled, Session State Protection uses the Page Access Protection attributes and the Session State Protection item attributes in conjunction with checksums positioned in f?p= URLs to prevent URL tampering and unauthorized access to and alteration of session state. When Session State Protection is disabled, the page and item attributes related to Session State Protection are ignored and checksums are not included in generated f?p= URLs.

Enabling Session State Protection from the Edit Application Page



ORACLE®

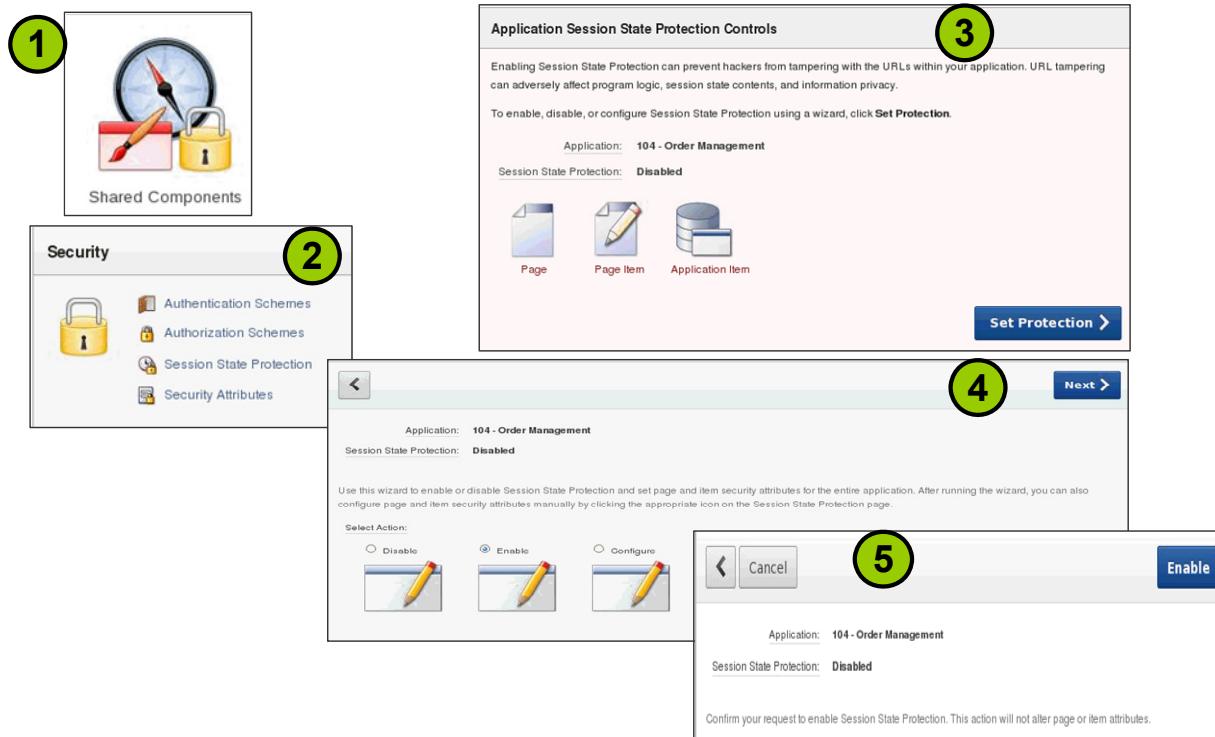
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To enable Session State Protection for an application, perform the following steps:

1. Navigate to the application home page and click the Edit Application Properties button.
2. Click the Security tab and then the Session State Protection tab. Select Enabled for Session State Protection and click Apply Changes.

Note: To disable Session State Protection, use the same procedure, but select Disabled instead of Enabled. Disabling Session State Protection will not change the existing security attribute settings, but those attributes will be ignored at run time.

Enabling Session State Protection from the Session State Protection Page



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

ORACLE

You can also access the Session State Protection page, and then enable Session State Protection for the application. Perform the following steps:

1. Click the Shared Components icon on the application home page.
2. Click the Session State Protection link in the Security list.
3. The Session State Protection page appears. Click the Set Protection button.
4. Select Enable and click Next.
5. Click the Enable button.

Configuring Session State Protection

You can configure security attributes in two ways:

- Use a wizard and select a value for specific attribute categories. Those selections are then applied to all pages and items within the application.
- Configure values for individual pages, items, or application items.

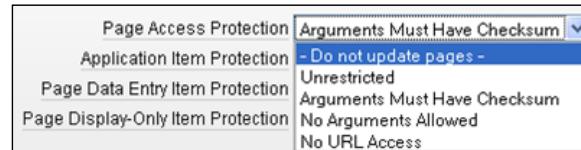


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

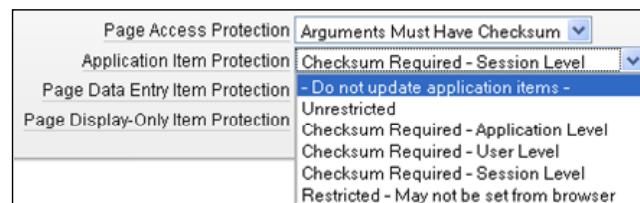
After enabling Session State Protection, the next step is to configure the security attributes. You can configure the security attributes in two ways as mentioned in the slide.

Identifying Security Attributes

Page Attributes



Item Attributes



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The following attributes are available for pages:

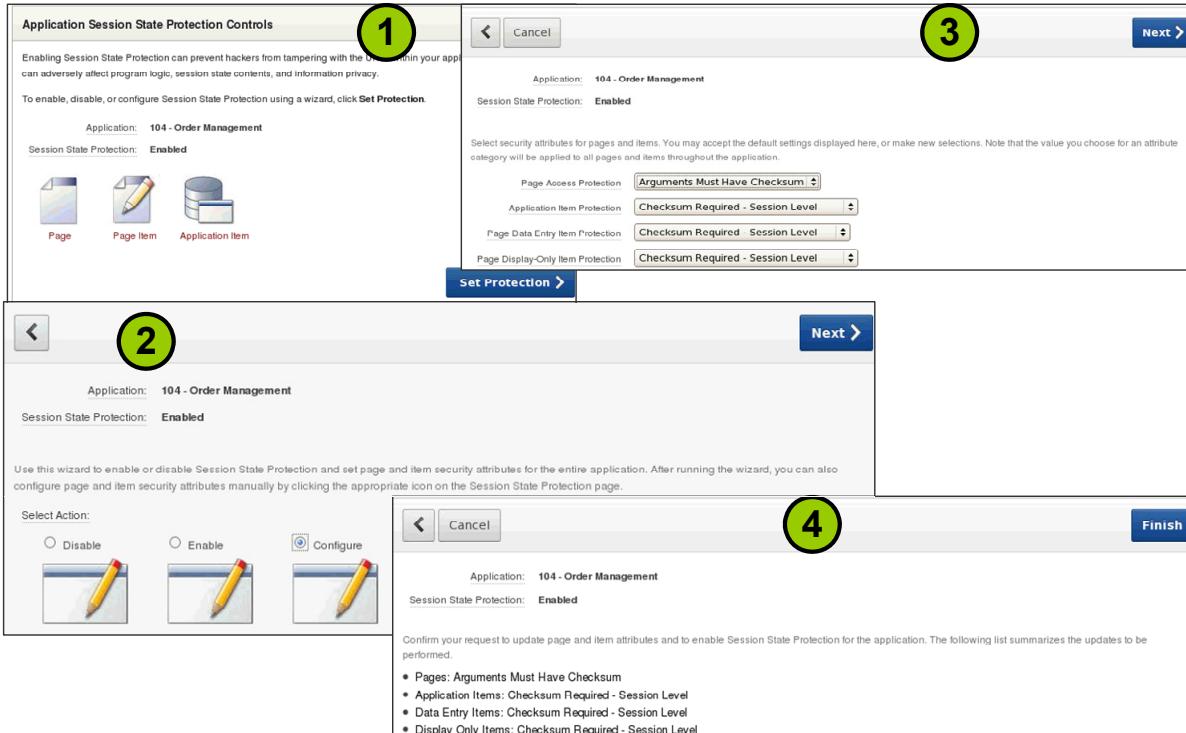
- **Unrestricted:** The URL to request the page may or may not have session state arguments.
- **Arguments Must Have Checksum:** If the session state arguments appear in the URL, a checksum must also be provided.
- **No Arguments Allowed:** The URL used to request the page must not contain session state arguments.
- **No URL Access:** The page may not be accessed by using a URL. However, the page may be the target of a Branch to Page branch type, which does not redirect the user to a URL.

The arguments specified on this page refer to the Request, Clear Cache, and Name/Value session state arguments.

To specify the way a page or an application item's session state value can be set, you have the following options:

- **Unrestricted:** May be set by passing the item name or value in a URL without any checksum
- **Checksum Required – Application Level:** May be set in a URL if a checksum is also provided, which is specific to the workspace and application. Use this option when you want to allow the item to be set only by URLs having checksums that were generated by any user running the same application in the current workspace but in a different session.
- **Checksum Required – User Level:** May be set in a URL if a checksum is also provided that is specific to the workspace, application, and user. Use this option when you want to allow the item to be set only by URLs having checksums that were generated by the same named user, running the same application in the current workspace, but in a different session.
- **Checksum Required – Session Level:** May be set in a URL if a checksum is also provided, which is specific to the current session. Use this option when you want to allow this item to be set only by URLs having checksums that were generated in the current session.
- **Restricted:** May not be set from a browser. Use this option when you want to restrict the way that the item value can be set to internal processes, computations, and so on. This attribute is always observed, even if Session State Protection is disabled.

Configuring Session State Protection by Using a Wizard



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To configure Session State Protection, perform the following steps:

1. Navigate to the Session State Protection page and click the Set Protection button.
2. The Session State Protection Wizard appears. Select Configure and click Next.
3. Select the security attributes for application pages, application items, and page items. Click Next.
4. Review the attributes and click Next.

The security attributes are applied to all pages and items within the application.

Configuring Session State Protection for Pages and Items

The screenshot shows the Oracle Application Session State Protection Controls page. At the top, there's a message about preventing URL tampering and a 'Set Protection' button. Below that, the application is identified as '104 - Order Management' and session state protection is shown as 'Enabled'. There are three icons: Page, Page Item, and Application Item. A table lists various pages with their names, access protection, items, and types. The 'EMPLOYEES INFO' page is selected. A modal dialog box titled 'Set Page and Item Protection' is open for this page, showing its current settings: application '104 - Order Management', session state protection 'Enabled', page '8', name 'EMPLOYEES INFO', and page access protection 'Unrestricted'. It also has options for display item type (radio buttons for Data Entry Items and Display-Only Items).

Page	Name	Page Access Protection	Page Items	Page Type
0	Global Page - jQuery Mobile Smartphone	No URL Access	0	Global Page
1	Home	Unrestricted	0	Home
2	Home	Unrestricted	0	Static HTML
4	Access Control Administration Page	Unrestricted	4	DML Form
8	EMPLOYEES INFO	Unrestricted	8	DML Form
15	Employee Details	Unrestricted		

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To configure Session State Protection for pages, perform the following steps:

1. Navigate to the Session State Protection page, and click the Page icon.
2. A report displays all the pages in the application and the security attribute set for the page. To set the security attribute for a page, click the page number link for the page.
3. You can now set the security attribute for the page. The page items for the page are also listed and you can set the attributes for each item. Click Apply Changes to save the settings.

If you click the Page Item icon on the Session State Protection page, a report displays all the page items in the application. You can click a particular item and set the attributes for that item.

You can view the demonstration of configuring Session State Protection for pages and items by opening the

`/home/oracle/labs/demos/les14_session_state_protection.html` file.

Configuring Session State Protection for Application Items

To configure Session State Protection for an application item:

1. Click the application item name link.
2. Specify the security attribute for the item and click Apply Changes.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Application items are named session state variables that are not specific to a particular page. From the Session State Protection page, click the Application Item icon. A report is displayed listing all the application items for the application. To configure Session State Protection for an application item, perform the steps provided in the slide.

Summary

In this lesson, you should have learned how to:

- List the different ways to secure your application
- Differentiate between authentication and authorization
- Create an authentication scheme for your application
- Create an authorization scheme by using Access Control
- Enable and configure Session State Protection



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learnt how to implement security for your application. You learnt how to associate an authentication scheme with your application and also how to create and attach an authorization scheme to your application. You also learnt how to enable Session State Protection and configure security attributes.

15

Managing Application Navigation

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to do the following:

- Build a hierarchical list with images
- Build a database-driven navigation report
- Build a site map
- Enforce authorization on the site map



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learn to build a hierarchical list with images on the home page. You also build a database-driven navigation report and a site map, and incorporate security into your site map.

Lesson Agenda

- Building a hierarchical list with images
- Building a database driven navigation report
- Building a site map
- Enforcing authorization on your site map

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Building a Hierarchical List with Images



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

One way to handle navigation is using a hierarchical list with images. The menu structure in Oracle Application Express uses hierarchical lists with images.

In the slide, you see the original navigation and also how the images can be used and the submenus are displayed. To accomplish the hierarchical list with images, several steps need to be performed.

Building a Hierarchical List with Images

1. Update the list with the desired sublist items.
2. Identify and upload the images to include in the list.
3. Change the template of the list region.
4. Change navigation region settings.
5. Associate an image with a list item.



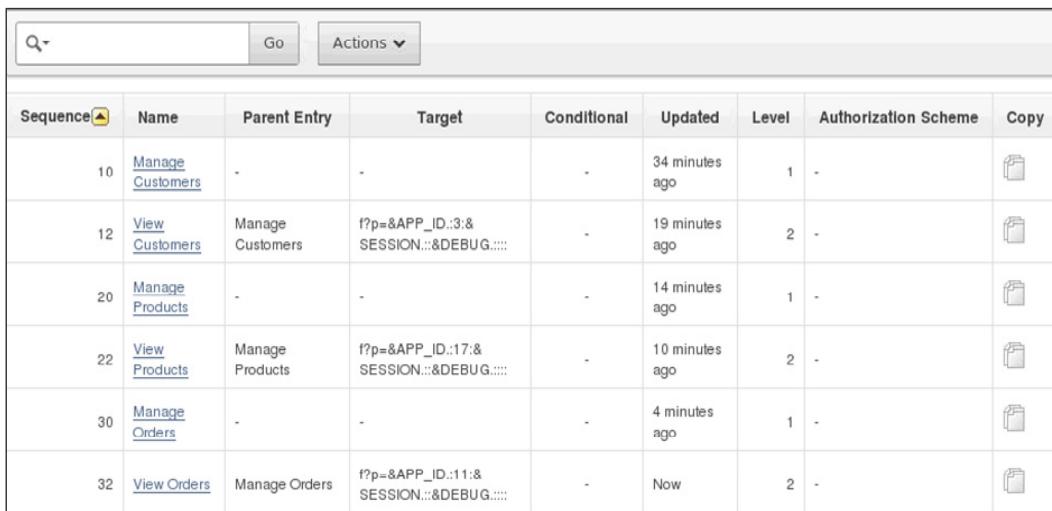
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To build a hierarchical list with images, you need to perform a series of steps:

1. Modify the list and add all the sublist items. In the example provided in the previous slide, there are three main list images and each image contains one or more sublist items.
2. Identify the images that you want to include in the list and upload them by using Shared Components.
3. Change the template of the list region to the “DHTML List (Image) with Sublist” template.
4. Change the navigation region on the page to use the list you created in the Type field, and change the template to No Template.
5. Associate the image for each parent list item. In the example provided in the previous slide, there are three images to associate: Manage Customers, Manage Products, and Manage Orders.

Building a Hierarchical List with Images

1. Update the list with the desired sublist items.



The screenshot shows a table with columns: Sequence, Name, Parent Entry, Target, Conditional, Updated, Level, Authorization Scheme, and Copy. The table contains six rows of data:

Sequence	Name	Parent Entry	Target	Conditional	Updated	Level	Authorization Scheme	Copy
10	Manage Customers	-	-	-	34 minutes ago	1	-	
12	View Customers	Manage Customers	f?p=&APP_ID.:3:&SESSION.::&DEBUG.::::	-	19 minutes ago	2	-	
20	Manage Products	-	-	-	14 minutes ago	1	-	
22	View Products	Manage Products	f?p=&APP_ID.:17:&SESSION.::&DEBUG.::::	-	10 minutes ago	2	-	
30	Manage Orders	-	-	-	4 minutes ago	1	-	
32	View Orders	Manage Orders	f?p=&APP_ID.:11:&SESSION.::&DEBUG.::::	-	Now	2	-	

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The first step is to update the list with the desired sublist items by performing the following steps:

1. On your application page, click Shared Components > Lists.
2. Select the list that exists or create one.
3. Click Create List Entry.
4. Create an entry for each item you want to include in the list. Specify a parent list entry (where appropriate) and a page to branch to when the entry is selected.

Note: The best practice is to sequence each entry by parent list entry and stagger the numbers in case a new list entry needs to be added at a later date.

Building a Hierarchical List with Images

2. Identify and upload the images to include.

The image consists of two side-by-side screenshots. The left screenshot shows a 'Files' interface with a folder icon, 'Cascading Style Sheets', 'Images' (which is highlighted with a red box and circled with a green number 1), and 'Static Files'. The right screenshot shows a table titled 'Image' with four rows. The columns are 'Name', 'Application', and 'Image'. The rows contain:

Name	Application	Image
customers.png	Workspace Image	
oralogo.gif	Workspace Image	
orders.png	Workspace Image	
products.png	Workspace Image	

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Identify the images that you want to incorporate and upload the images into Application Express.

1. On your Application page, click Shared Components.
 2. Under Files, select Images.
 3. For each image, click Create and select the file to upload. and then click Upload.
- The list of images uploaded is shown.

Note: To see the icon, change to the detail view.

Building a Hierarchical List with Images

3. Change the template of the list region.

The screenshot shows the Oracle Application Express interface for editing a list region. The top navigation bar has 'List' and 'Home Page List' selected. Below it is a search bar and an 'Actions' dropdown. The main area displays a table of list items with columns for Sequence, Name, Parent Entry, Target, and Condition. A red box labeled '1' highlights the 'Edit List' button in the top right corner of the table header. To the right of the table is a 'Region Definition' panel. The 'Source' tab is active, showing the list items. A green circle labeled '2' highlights the 'List Template' dropdown menu, which is currently set to 'Pull Down Menu with Image'. The 'Name' field in the panel is set to 'Home Page List'. The bottom of the panel shows a table of the list items with their corresponding Text and Target values.

Sequence	Name	Parent Entry	Target	Condition
10	Manage Customers	-	-	
12	View Customers	Manage Customers	f?p=&APP_ID.:3:&SESSION::&DEBUG::::	
20	Manage Products	-	-	
22	View Products	Manage Products	f?p=&APP_ID.:17:&SESSION::&DEBUG::::	
30	Manage Orders	-	-	

Sequence	Text	Target
10	Manage Customers	
12	View Customers	f?p=&APP_ID.:3:&SESSION::&DEBUG::::
20	Manage Products	
22	View Products	f?p=&APP_ID.:17:&SESSION::&DEBUG::::
30	Manage Orders	
32	View Orders	f?p=&APP_ID.:11:&SESSION::&DEBUG::::

ORACLE

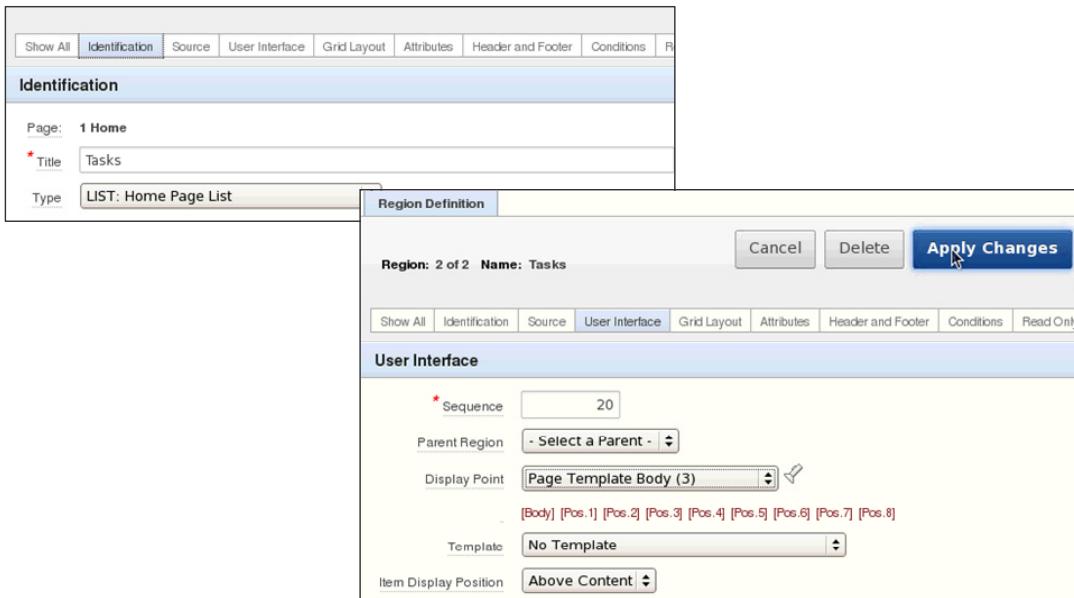
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Change the template of the list region.

- From Shared Components > List, with your list region selected, click Edit List.
- Select the “Pull Down Menu with Image” template from the List Template drop-down list and click Apply Changes.

Building a Hierarchical List with Images

4. Change the navigation region settings.



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Change the navigation region settings.

1. Under Page Rendering, from Regions, right-click the List node. Under Identification, select the list you created for Type.
2. Under User Interface, select No Template and click Apply Changes.

Building a Hierarchical List with Images

5. Associate an image with a list item.

The screenshot shows a table of list items and a detailed configuration dialog for one item.

Sequence	Name	Parent Entry	Target	Conditional	Updated
10	Manage Customers	-	-	-	12 hours ago
12	View Customers	Manage Customers	f?p=&APP_ID.:3:&SESSION.::&DEBUG.:::	-	18 hours ago
20	Manage Products	-	-	-	
22	View Products	Manage Products	f?p=&APP_ID.:4:&SESSION.::&DEBUG.:::	-	

Entry

List: Home Page List

Parent List Entry: - No Parent List Item -

Sequence: 10

Image: #WORKSPACE_IMAGES#customers.png

Attributes:

Alt Attribute: Manage Customers

List Entry Label: Manage Customers

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Associate your images with each parent list item.

1. Under Regions, select List.
2. Click Edit List.
3. Select one of the parent list items.
4. Under Entry, click the up arrow for Image to select the image that you want to associate with this list entry.
5. After you associate all the images, click Apply Changes.

You can watch the demonstration about building a hierarchical list of images by opening the `/home/oracle/labs/demos/les15_hierarchical_list1.html` file.

Workshop 15-1 Overview: Building a Hierarchical List with Images

This workshop covers the following topics:

- Updating the existing list
- Uploading images
- Changing the attributes of the navigation region
- Associating the images with each parent list entry



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Building a hierarchical list with images
- Building a database-driven navigation report
- Building a site map
- Enforcing authorization on your site map



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Building a Database-Driven Navigation Report

This report is used to navigate between pages by using links defined against values in the database.

1. Create a report based on a column.
2. Create a link to page and pass ID value.

The screenshot shows two pages from Oracle Application Express. The left page is titled 'List of Customers' and displays a list of customer names. The right page is titled 'Ajay Sen Customer Details' and shows a form with fields for Cust First Name (Ajay), Cust Last Name (Sen), Cust Email (AjaySen@TROGON.COM), Account Manager (Zlotkey, Eleni), Country (United States of America), City (Scranton), and Phone Number (+1 717 123 4741). A note at the bottom says 'The record created or modified in this form is reflected in the Customer Report.' A 'Hint' box at the bottom right says 'Use this page to enter and maintain customer information.'

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Often, you want to handle navigation through shortcuts. In this case, you want to show a list based on values in the database. In the example in this slide, a list of customers shortcuts is shown. The user selects a customer, which populates the customer detail page based on the customer.

This navigation between pages based on a value in the database is done using a report. The report also selects the ID column (in this case, CUSTOMER_ID), which is then passed to the linked page so that the page can be populated. In the example in this slide, the user selected the customer name, so the CUSTOMER_ID is passed to the Customer Detail page and the information for the customer is displayed.

Building a Database-Driven Navigation Report

1. Create a report based on a column.

The screenshot shows two overlapping windows. The top window is titled 'Report Definition' and contains fields for Application (109 - Order Management), Page Number (8), Page Name (List of Customers), Region Name (List of Customers), Region Template (Navigation Region, Alternative 1), and ReportTemplate (template: 1. Borderless Report). A note says 'do not use breadcrumbs on page'. The bottom window is titled 'Column Attributes' and shows a table with two columns: NAME and CUSTOMER_ID. The 'Heading' column has checkboxes for 'Show' and 'Sum'. The 'Custom' radio button is selected under 'Headings Type'. The SQL query in the report source is:

```
SELECT cust.first_name||' '||cust.last_name as Name, customer_id FROM oehr_customers
```

Region definition

Alias	Link	Edit	Heading	Column Width	Column Alignment	Heading Alignment	Show	Sum
NAME			Name		left	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CUSTOMER_ID			Customer Id		left	center	<input type="checkbox"/>	<input type="checkbox"/>

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In the example in this slide, a report was created and the NAME and CUSTOMER_ID columns were selected.

After the report is created, under Region Definition, change the template to Navigation Region.

Building a Database-Driven Navigation Report

2. Create a link to a page and pass an ID value.

The screenshot shows two stacked configuration panels for building a database-driven navigation report.

The top panel is titled "Column Attributes". It has a "Heads Type" section with radio buttons for "Column Names", "Column Names (InitCap)", "Custom" (which is selected), "PL/SQL", and "None". Below this is a table with columns for Alias, Link, Edit, Heading, Column Width, Alignment, Heading Alignment, Show, Sum, Sort, and Sequence. Two rows are present:

Alias	Link	Edit	Heading	Column Width	Alignment	Heading Alignment	Show	Sum	Sort	Sequence
NAME	[>CUSTOMERS]						<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CUSTOMER_ID	Customer Id						<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The bottom panel is titled "Column Link". It has sections for "Link Text" (#NAME#), "Link Attributes" (Target: Page in this Application, Page: 9), "Request" (empty), "Clear Cache" (button), and "Name/Value" pairs for Item 1 (P9_CUSTOMER_ID) and Item 2 (empty).

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The next step is to create a link from the NAME column to the Customer Detail page and pass the CUSTOMER_ID value.

Quiz

You can copy list entries from one list to another.

- a. True
- b. False



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a

Workshop 15-2 Overview: Building a Database-Driven Report

This workshop covers the following topics:

- Building a report based on the data in a table
- Navigating to the detail
- Changing the template to a navigation region template



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Building a hierarchical list with images
- Building a database driven navigation report
- **Building a site map**
- Enforcing authorization on your site map

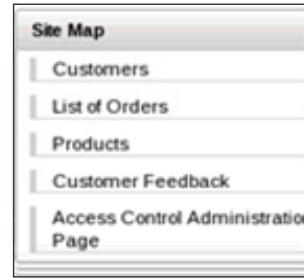


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Building a Site Map

A site map is used to navigate between pages by page title.

1. Create a page group with the pages that you want to appear in the site map.
2. From Utilities, create SQL from the APEX_APPLICATION_PAGES view.
3. Create a report that shows the page name.
4. Create a link from the item to #PAGE_ID#.
5. Modify the report to use the desired templates.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

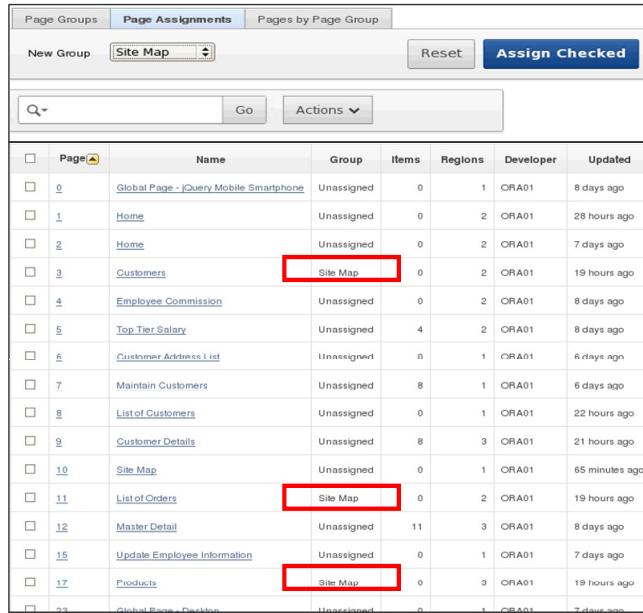
Site maps are typically useful for applications that are display- or query-only. For larger online transaction processing (OLTP) applications, site maps may not be as useful because there are many pages that perform similar functionality.

To create a site map, you must perform the following tasks:

1. Create a page group with the pages that you want to appear in the site map.
2. Under Utilities > Application Express Views, create the SQL to select the appropriate PAGE_NAME and PAGE_ID for your PAGE_GROUP and APPLICATION_ID.
3. Create a report that shows the page name.
4. Create a link from the page name to the page it corresponds to. Pass the item value #PAGE_ID# in the Page field.
5. Modify the report to use the desired templates. In the example in this slide, the Sidebar Region Template with the Borderless Report Template is used.

Building a Site Map

1. Create a page group with the pages that you want to appear in the site map.



Page	Name	Group	Items	Regions	Developer	Updated
0	Global Page - JQuery Mobile Smartphone	Unassigned	0	1	ORA01	8 days ago
1	Home	Unassigned	0	2	ORA01	28 hours ago
2	Home	Unassigned	0	2	ORA01	7 days ago
3	Customers	Site Map	0	2	ORA01	19 hours ago
4	Employee Commission	Unassigned	0	2	ORA01	8 days ago
5	Top Tier Salary	Unassigned	4	2	ORA01	8 days ago
6	Customer Address List	Unassigned	0	1	ORA01	8 days ago
7	Maintain Customers	Unassigned	8	1	ORA01	6 days ago
8	List of Customers	Unassigned	0	1	ORA01	22 hours ago
9	Customer Details	Unassigned	8	3	ORA01	21 hours ago
10	Site Map	Unassigned	0	1	ORA01	65 minutes ago
11	List of Orders	Site Map	0	2	ORA01	19 hours ago
12	Master Detail	Unassigned	11	3	ORA01	8 days ago
15	Update Employee Information	Unassigned	0	1	ORA01	7 days ago
17	Products	Site Map	0	3	ORA01	19 hours ago
93	Global Page - Dashboard	Unassigned	0	1	ORA01	7 days ago

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To show a list of desired pages in your site map, one technique is to use page groups. Create a page group and assign the pages that you want to appear in your site map to the page group you created.

To create a page group, perform the following steps:

1. On the application home page, click Utilities.
2. Under Page Specific Utilities, click Cross Page Utilities
3. Click Page Groups, and then click Create.
4. Enter Site Map for Name and click Create.
5. Click the Page Assignments tab.
6. Select Site Map for New Group and for all the appropriate pages, and click Assign Checked.

Building a Site Map

2. From Utilities > Application Express Views, create SQL from the APEX_APPLICATION_PAGES view.

The screenshot shows the Oracle Database SQL Developer interface. In the top-left corner, there is a 'Query' tab. Below it, the SQL code is displayed:

```
select WORKSPACE, APPLICATION_ID, APPLICATION_NAME, PAGE_ID, PAGE_NAME
from APEX_APPLICATION_PAGES
where PAGE_GROUP = 'Site Map'
and APPLICATION_ID = 109
```

A red arrow points downwards from the 'Query' tab towards the results table below. The results table has columns: WORKSPACE, APPLICATION_ID, APPLICATION_NAME, PAGE_ID, and PAGE_NAME. The data is as follows:

WORKSPACE ▼	APPLICATION_ID	APPLICATION_NAME	PAGE_ID	PAGE_NAME
ORA01	109	Order Management	3	Customers
ORA01	109	Order Management	11	List of Orders
ORA01	109	Order Management	26	Access Control Administration Page
ORA01	109	Order Management	25	Customer Feedback
ORA01	109	Order Management	17	Products

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The next step in building your site map is to generate the SQL statement that you want to run to produce the site map. To produce the SQL statement, perform the following steps:

1. Navigate to the Utilities > Application Express Views option.
2. Select the APEX_APPLICATION_PAGES view.
3. Click the Select Columns tab.
4. Deselect the default columns and select PAGE_ID and PAGE_NAME.
5. Click the Filter tab.
6. Select APPLICATION_ID from the list of columns and enter your application ID in the value field.
7. On the next line, select PAGE_GROUP from the list of columns and enter 'Site Map' in the value field.
8. Click Results to see the data result. This is the data you want to be included in your site map.
9. Click Query to review the query that was executed.

Building a Site Map

3. Create a report that lists just the page name.

The screenshot shows the Oracle Application Express interface. On the left, there is a 'Source' region containing a SQL query:

```
select PAGE_ID, PAGE_NAME
from APEX_APPLICATION_PAGES
where APPLICATION_ID = &APP_ID.
and PAGE_GROUP = 'Site Map'
```

On the right, under 'User Interface', there are several configuration fields:

- Sequence: 10
- Parent Region: - Select a Parent -
- Display Point: Page Template Body (3)
- Template: Navigation Region
- Item Display Position: Above Content

A handwritten note 'Region definition' is written next to the configuration area. Below it, another handwritten note 'Report attributes' is written over the column attributes section of the interface.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The next step is to create a report that invokes the query you just generated.

1. On the Application page, click Create Page.
2. Click Report > Classic Report.
3. Enter Site Map for the name and click Next.
4. Click Next to not include tabs because this page is going to be added to the navigation bar.
5. Enter the following SQL statement and click Next:

```
select PAGE_ID, PAGE_NAME
from APEX_APPLICATION_PAGES
where APPLICATION_ID = &APP_ID.
and PAGE_GROUP = 'Site Map'
```

6. Change the Region template to Navigation Region, enter Site Map for Region Name, change Column Heading Sorting to No, and click Next.
7. Click Finish.
8. Edit the page and, under Regions, right-click Site Map and select Edit Report Attributes.
9. Deselect the Show check box for PAGE_ID.

Building a Site Map

4. Create a link from the item to #PAGE_ID#.

Screenshot 1: Column Attributes

Alias	Link	Edit	Heading	Column Width	Column Alignment	Heading Alignment
PAGE_ID					left	
PAGE_NAME		Edit			left	left

Screenshot 2: Column Link

Link Text: #PAGE_NAME#

Link Attributes:

Target: Page in this Application

Page: #PAGE_ID#

Request:

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

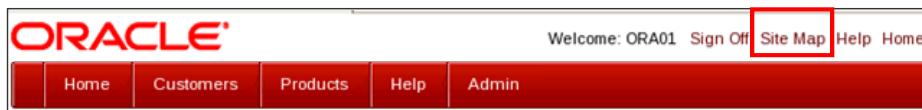
Now you need to add the link to view the page when selected.

- From the Column Attributes section in the Report definition, click the Edit icon next to PAGE_NAME.
- Click the Column Link tab.
- Select [PAGE_NAME] from the quick links.
- Select “Page in this Application” for Target.
- Enter #PAGE_ID# in the Page text box. This indicates that when the user clicks a particular page in the site map, the corresponding PAGE_ID will be resolved and that page will be opened.
- Click Apply Changes.

Adding a Navigation Bar Entry

To access the site map, create a navigation bar entry:

1. From Shared Components, select Navigation Bar Entry.
2. Click Create.
3. Select From Scratch and click Next.
4. Select “Navigation to URL” and click Next.
5. Enter Site Map for Entry Label and click Next.
6. Select the site map page from the Page drop-down list and click Next.
7. Click Create.



The steps in the slide indicate what is necessary to create a navigation bar entry with text.

If you prefer to associate an image with a navigation bar entry, you must perform the following steps:

1. Edit the page template.
2. In the “Sub template” region, edit the “Navigation Bar Entry” attribute. Add the #IMAGE# tag where you want your image source—for example, `
#TEXT#`.

3. To associate the Help text for the Navigation Bar Entry attribute, you must substitute the #BAR_BODY# navigation bar for each navigation bar entry. Use the following substitution strings to compose the navigation bar entry subtemplate.

- #LINK#: Entry link
- #TEXT#: Entry subtext
- #IMAGE#: Entry image (HTML image ALT, HEIGHT, and WIDTH arguments are included with the HTML IMG tag when supplied with the navigation bar entry.)
- #EDIT#: Inline edit link editing capability
- #WIDTH#: Image width
- #HEIGHT#: Image height
- #COLSPAN#: HTML COLSPAN value
- #ALT#: Image alternative text

You can watch the demonstration about creating a site map by opening the
`/home/oracle/labs/demos/les15_site_map.html` file.

Quiz

Navigation bars are different from other shared components in that you do not need to reference them on a page-by-page basis.

- a. True
- b. False



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a

Workshop 15-3 Overview: Building a Site Map

This workshop covers the following topics:

- Building a site map page
- Adding the page as a navigation bar entry



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Building a hierarchical list with images
- Building a database driven navigation report
- Building a site map
- Enforcing authorization on your site map



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Enforcing Authorization on Your Site Map

Showing an entry on the site map based on authorization requires the following:

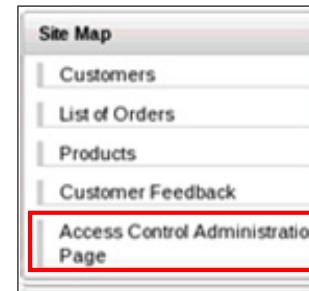
1. Create a function that checks for authorization.
2. Update the SQL query on the report to check whether the function is true.



Developer



Administrator



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To show only those pages that a particular user is authorized to use on the site map, you must create a function that checks the authorization scheme and then selects only those pages. The function should contain the following code:

```
create or replace function authorization_check(
    p_scheme in varchar2)
return varchar2
is
begin
    if apex_util.public_check_authorization(p_scheme) then
        return 'true';
    else
        return 'false';
    end if;
end;
```

Workshop 15-4 Overview: Enforcing Authorization on the Site Map

This workshop covers the following topics:

- Adding a function that determines authorization of a page in the site map
- Changing the SQL report query for the site map to make sure that the page is displayed only if authorized



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Summary

In this lesson, you should have learned how to:

- Build a hierarchical list with images
- Build a database-driven navigation report
- Build a site map
- Enforce authorization on your site map



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you have learned how to build a hierarchical list with images, a database-driven navigation report, a site map and authorize it.

16

Extending Your Application

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to do the following:

- Create Data Load Wizard pages
- Create an upload and download page
- Add BLOB data to an existing application
- Send email notification



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learn how to create Data Load Wizard pages and an upload and download page. You also learn how to add BLOB data in your application and how an email notification can be sent from your application.

Lesson Agenda

- Creating Data Load Wizard Pages
- Creating an Upload and Download Page
- Adding Binary Large Object (BLOB) Data to an Existing Application
- Sending Email from an Application



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Data Load Wizard

The screenshot shows the 'Data Load Source' page of the Data Load Wizard. The page has a red header bar with tabs: Home, Customers, Products, Help, Admin, Dashboard, and Data Load (which is selected). On the left, there's a sidebar with buttons for Data Load Source, Data / Table Mapping, Data Validation, and Data Load Results. The main content area is titled 'Data Load Source' and contains the following fields:

- Import From:** A radio button group with two options: 'Upload file, comma separated (*.csv) or tab delimited' (selected) and 'Copy and Paste'.
- *File Name:** An input field with a 'Browse...' button to its right.
- *Separator:** A dropdown menu currently set to 'lt'.
- Optionally Enclosed By:** A dropdown menu currently set to ''.
- First Row has Column Names:** A checked checkbox next to 'Yes'.
- File Character Set:** A dropdown menu currently set to 'UTF-8'.

Below this section is a 'Globalization' section with three input fields:

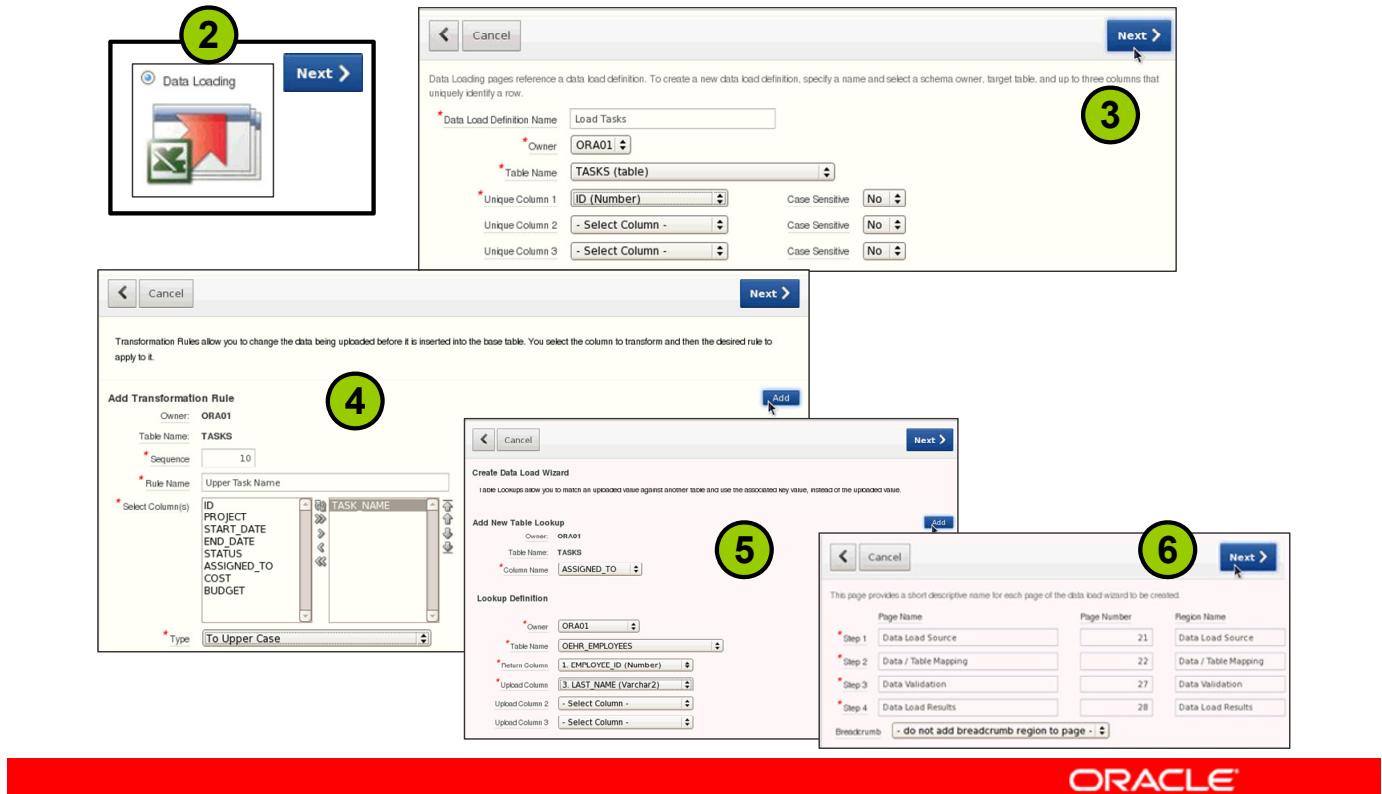
- Currency Symbol:** '\$'
- Group Separator:** ','
- Decimal Character:** ','

At the bottom of the page is a 'In the News' section containing a link to 'News and Events' and a note to 'Visit us at www.oracle.com'.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Applications with data loading capability enable end users to dynamically import data into a table within any schema to which the user has access. To do this, end users run a Data Load Wizard that uploads data from a file or copies and pastes data entered by the end user directly into the wizard. With Oracle Application Express 4.2, you can create a series of Data Load Wizard pages in your application by using the Data Load Wizard. You can use this wizard to add table lookups and transformation rules that are executed when the Data Load Wizard runs.

Creating Data Load Wizard Pages



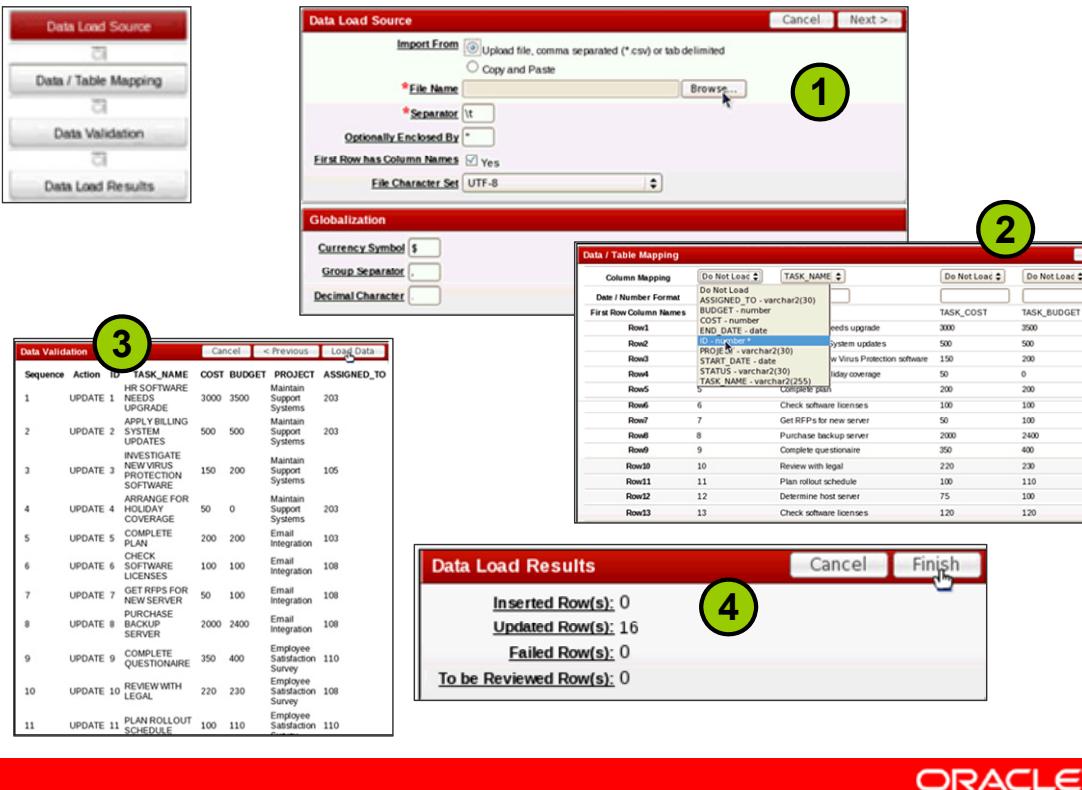
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create Data Load Wizard pages, perform the following steps:

1. Navigate to the application home page and click Create Page.
2. Select Data Loading.
3. To create a new data load definition, specify a name, and select a schema owner, target table, and up to three columns that uniquely identify a row.
4. Specify a transformation rule. Transformation rules allow you to change the data being uploaded before it is inserted into the base table. If required, you select the column to transform and then the desired rule to apply to it.
5. If required, you can add a new table lookup by specifying the column name and the lookup definition. Table lookups allow you to match an uploaded value against another table and use the associated key value instead of the uploaded value.
6. A short descriptive name for each page of the Data Load Wizard to be created is provided.
7. Select whether the page should have tabs.
8. Provide buttons and branching options.
9. Confirm your wizard attributes.

Data Load Wizard Pages



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After the Data Load Wizard pages are created, you notice the flow of the wizard. Four wizard pages are created:

1. The first wizard page is where you specify the data load source. You want to upload a file with task data. Select “Upload file...” for Import From and click Browse.
2. The Data/Table Mappings are displayed. Select the columns to match the columns in the database.
3. The Data Validation page displays the data that will be inserted into the database. Here the lookup is applied.
4. The Data Load Results page shows the rows that were inserted and updated, that failed, and that need to be reviewed.

You can watch the demonstration of creating the Data Load Wizard by opening the `/home/oracle/labs/demos/les16_data_load_wizard.html` file.

Workshop 16-1 Overview: Adding a Data Upload Wizard

This workshop covers creating a series of wizard pages to upload data into a table.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

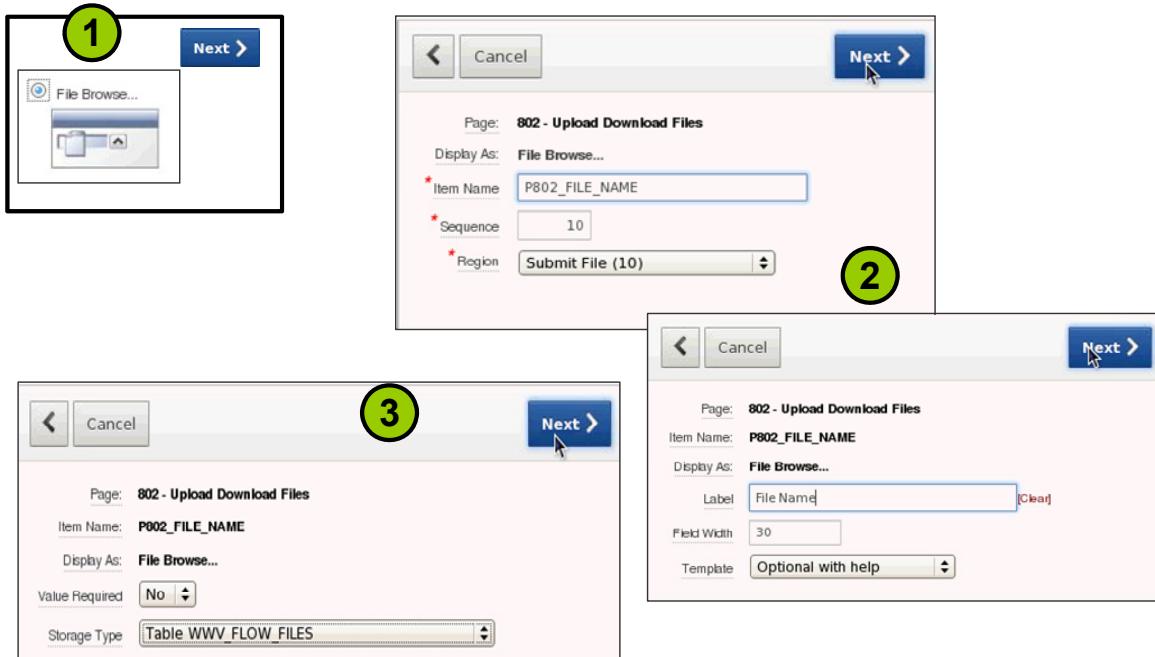
Lesson Agenda

- Creating Data Load Wizard Pages
- Creating an Upload and Download Page
- Adding BLOB Data to an Existing Application
- Sending Email from an Application



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Creating an Upload and Download Page



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can create an upload and download page by adding the file browse item type to your page. When you use the file browse item type, the files that you upload are stored in a table called `wwv_flow_file_objects$`. Every workspace has access to this table through a view called `APEX_APPLICATION_FILES`.

To create the file browse item type on a page, perform the following steps:

1. Select the file browse item type to be used on a page.
2. Enter the item name and label.
3. Select Table WWV_FLOW_FILES for Storage Type. Note that every time you upload a script in SQL Workshop or upload a file in Shared Components for an application, the reference to the file is placed in the `WWV_FLOW_FILES` table.
4. Create the item.

Workshop 16-2 Overview: Creating an Upload and Download Page

This workshop covers the following topics:

- Creating a form in an HTML region with a file upload item and a button
- Creating a report on the document table that has links to download documents
- Providing links to download the documents in the report



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Creating Data Load Wizard Pages
- Creating an Upload and Download Page
- Adding BLOB Data to an Existing Application
- Sending Email from an Application



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Adding BLOB Data to an Existing Application

The screenshot illustrates the integration of BLOB data handling into an existing application. On the left, a yellow box labeled "Report" contains a table of customer data. One row, for Sharmila Fonda, includes a "Photo" column with a link labeled "Download". On the right, a yellow box labeled "Form" shows a detailed view of the same customer record. A red box highlights the "Photo" section of the form, which includes a file browse button ("Browse...") and a download link ("Download"). The Oracle logo is visible at the bottom right.

Customer Id	Name	Cust Email	Photo
496	Scott Jordan	Scott.Jordan@WILLET.COM	-
605	Shammi Pacino	Shammi.Pacino@BITTERN.COM	-
606	Sharmila Kazan	Sharmila.Kazan@BRANT.COM	-
607	Sharmila Fonda	SHARMILA.FONDA@BUFFLEHEAD.COM	Download
609	Shelley Taylors	SHELLEY.TAYLOR@CURLEW.COM	-
615	Shyam Plummer	SHYAM.PLUMMER@VEERY.COM	-
621	Silk Kurosawa	Silk.Kurosawa@NUTHATCH.COM	-

Details

Name *: Sharmila
Name *: Fonda
Address: 1648 Anamika St
Postal Code: 361168
City: Cochin
State Province: Ker
Country Id: IN
Phone Number: +91 80 012 4891
Nls Language: hi
Nls Territory: INDIA
Credit Limit: 500
Cust Email: SHARMILA.FONDA@BUFFLEHEAD.COM
Account Mgr Id: 148

Photo: [Download](#)

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

If you have a column in a table of the binary large object (BLOB) type that you want your user to be able to populate, you need not write all the code to load the selected file. BLOB support in Application Express for Forms and Reports is built-in. If you create a form (via the Create Application Wizard, by creating a page of the Form or Report and Form type, or by creating a region of the Form type) or add an item to an existing form, any items whose source is a database column of the BLOB type will result in an item of the File Browse type. When the form is called for insert, the file selected by the user will be loaded into the BLOB. When the form is called for update, a download link will be displayed to the right of the Browse button. This allows the user to download the file.

Adding BLOB Data

Add a BLOB column and columns for BLOB attributes:

- File name
- Mimetype
- Last Column Updated

```
alter table "OEHR_CUSTOMERS" add
("PHOTO" BLOB NULL,
"FILENAME" VARCHAR2(255) NULL,
"MIMETYPE" VARCHAR2(255) NULL,
"LAST_UPDATE_DATE" DATE NULL)
/
```



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Before you create your form and report, you must add the BLOB column to the table. In this example, you add a Photo BLOB column to the OEHR_CUSTOMERS table. You can create three additional columns that store column attribute information about the BLOB data. In this example, you add MIMETYPE, FILENAME, and LAST_UPDATE_DATE that will store information about the BLOB so that you can efficiently retrieve and process BLOB data. MIMETYPE is important so that your browser knows how to display the BLOB, FILENAME allows the file to be saved using the original file name, and LAST_UPDATE_DATE (the date the BLOB column was last updated) facilitates browser-image caching.

Note: Character Set is another column that you can include in the BLOB definition.

Example: Creating a Form with a Report

To generate a form with a report that contains BLOB data, perform the following steps:

1. Create a form with a report.
2. Select the BLOB column. (Do not select the columns that contain the BLOB attributes.)
3. Change the BLOB format for both Form and Report.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To generate the appropriate code to store and display BLOB data declaratively, you create a form and/or form with a report by using wizards. In this example, you create a form with an interactive report. Select only the BLOB column when selecting the columns to include in the report and form. The columns that contain the metadata about the BLOB column (`MIMETYPE`, `FILENAME`, and `LAST_UPDATE_DATE`) are populated when the BLOB data is uploaded, and then used when the file is downloaded or displayed inline.

After the form and report are created, the BLOB format is changed to reflect what metadata columns to populate when a BLOB is added to the BLOB column, and then what attributes to use when the BLOB data is retrieved. For example, if you upload a `custpic.gif` file, the BLOB itself is uploaded to the BLOB column, `image/gif` is uploaded to the `MIMETYPE` column, and `custpic.gif` is uploaded to the `FILENAME` column. If you specify that you want the BLOB to be retrieved as an attachment when the download link is clicked, the download window appears with the name of the file. The appropriate software is represented based on `MIMETYPE`.

Modifying the BLOB Format in the Report

The screenshot illustrates the process of modifying BLOB format in Oracle Application Express. It consists of four main components:

- Column Definition:** A dialog box where the "Column Name" is set to "PHOTO" and "Column Type" is "NUMBER". The "Display Type" is "Standard Report Column". The "Single Row View Label" is "Photo". The "Number / Date Format" is "DOWNLOAD:OEHR_CUSTOMERS:PHOTO:CUSTOMER_ID::MIMETYPE:FILENAME:LAST_UPDATE_DATE::Attachment:D". A callout labeled **3** points to this field.
- Blob Column Attributes:** A dialog box containing fields for "Format Mask" (set to "DOWNLOAD"), "Table" ("OEHR_CUSTOMERS"), "Column" ("PHOTO"), "Primary Key Column 1" ("CUSTOMER_ID"), "Mimetype Column" ("MIMETYPE"), "Filename Column" ("FILENAME"), "Last Updated Column" ("LAST_UPDATE_DATE"), "Charset Column" (empty), "Content Disposition" ("Inline"), and "Download Text" ("Download"). A callout labeled **4** points to the "Format Mask" field.
- Search Dialog - Mozilla Firefox:** A browser window showing a search results page for "PHOTO". One result is highlighted with a red arrow pointing to the "BLOB Format" link at the bottom of the page.
- Report Preview:** A screenshot of a report page showing a list of dates and times, with a red arrow pointing to the "BLOB Format" link at the bottom right.

Specify the parameters for how you want the BLOB to be stored and retrieved.

Under Column Definition, click BLOB Format.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After the form and report are created using wizards, you can change the definition of the BLOB format mask for the column in your report. Perform the following steps:

1. On the Report Page, under Regions, expand the Report Columns node.
2. Right-click the BLOB column and select Edit.
3. Under Column Attributes, click BLOB Format.
4. In the BLOB Column Attributes section, you can specify the parameters for how you want the BLOB to be stored and retrieved. Format Mask indicates whether the file is available for download or the image itself will appear in the report. BLOB Table, Column, and Primary Key are specified to identify the BLOB data. If MIMETYPE, FILENAME, BLOB Last Updated Column, and Character Set Column are specified, the information is retrieved from the database when the link is clicked. In addition, the Content Disposition field indicates how the BLOB column is retrieved—inline in the browser or as an attachment allowing the user to download to another location to view. Download Text is the name that appears on the form indicating that a BLOB is contained in the column.

SQL Query for BLOB Data in Report

`dbms_lob.getlength(<column name>)` is generated to determine whether BLOB contains a value.

Already done for you

The screenshot shows the Oracle Application Express (APEX) report builder interface. At the top, there are tabs for 'Region Definition', 'Report Attributes', 'Saved Reports', and 'Print Attributes'. Below these, the 'Region' is set to '2 of 2' and the 'Name' is 'Customer Report'. Under the 'Identification' tab, the page is set to '2 Customers', the title is 'Customer Report', and the type is 'Interactive Report'. In the 'Source' tab, the SQL query is displayed:

```

select c.customer_id,
       c.cust_first_name||' '||c.cust_last_name name,
       c.city,
       c.cust_email,
       (select last_name from oe_hr_employees where employee_id= c.account_mgr_id) account_mgr,
       dbms_lob.getlength(c.photo) photo
  from oe_hr_customers c

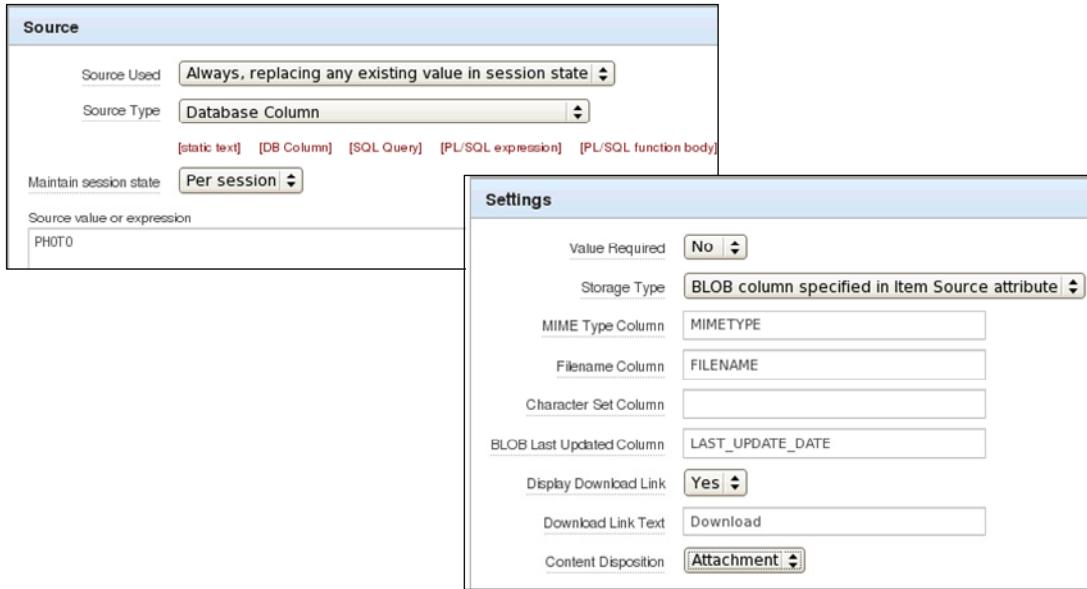
```

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

When using the wizards, the SQL to retrieve BLOB column data is generated automatically. The report includes selection of the length of the BLOB (for example, `dbms_lob.getlength(PHOTO)`). If the length is 0, the BLOB is null and no download link is displayed.

Modifying the BLOB Format in the Form



Specify the parameters for how you want the BLOB to be stored and retrieved.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can also change the definition of the BLOB format for the column in your form. Perform the following steps:

1. On the Form page, under Items, right-click the BLOB item link and select Edit.
2. Under Source, note that Source Type shows Database Column and Source value or expression field includes `<DB_COLUMN_NAME>`.
3. Click the Settings tab. For Storage Type, select “BLOB column specified in Item Source attribute.” You can specify the parameters for how you want the BLOB to be stored and retrieved. If MIMETYPE, FILENAME, BLOB Last Updated Column, and Character Set Column are specified, the information is stored in the database. When the download link is clicked, the information in these columns is retrieved from the database. In addition, the Content Disposition field indicates how the BLOB column is retrieved—inline in the browser or as an attachment allowing the user to download to another location to view. The Download Link Text is the name that appears on the form indicating that a BLOB is contained in the column.

Adding a Delete Image Region



The screenshot shows a composite interface. At the top is a modal window titled "Photo Image" containing a thumbnail of a woman's face. Below it is a standard form titled "Sharmila Fonda Details". The form includes fields for Cust First Name (Sharmila), Cust Last Name (Fonda), Street Address (1648 Anamika St), Postal Code (361168), City (Cochin), State Province (Ker), Country Id (IN), Phone Number (+91 80 012 4891), Nls Language (hi), Nls Territory (INDIA), Credit Limit (500), Cust Email (SHARMILA.FONDA@BUFFLEHEAD.COM), and Account Mgr Id (148). A "Photo" field contains the thumbnail from the modal. Below the photo field are "Browse..." and "Download" buttons. At the bottom right of the form are "Cancel", "Delete", and "Apply Changes" buttons.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The form created through the wizards does not allow you to update a row and set a BLOB column to null. You can add a delete image region. Perform the following steps:

1. Create an HTML region to store the image inline in column 2.
2. Create an item to show the image on the page.
3. Create a Delete button.
4. Create a Delete Image Column process to perform an update and set the BLOB, MIMETYPE, FILENAME, and LAST_UPDATE_DATE columns to null.

Adding a Delete Image Region: Creating an Item



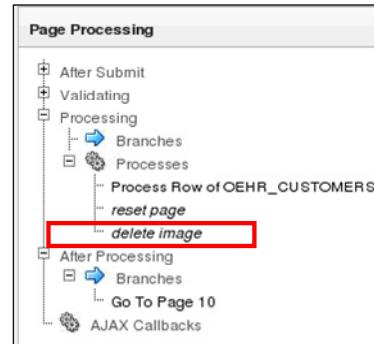
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create an item that will store the image on the page, perform the following steps:

1. Right-click the region that you just created and select Create Page Item.
2. Select Display Image and click Next.
3. Enter a name for the item and select the region you just created. Then click Next.
4. Click [clear] for the label and click Next.
5. Make sure that for Based On, “BLOB Column specified in Item Source” is selected. Enter **FILENAME** in Filename Column and **LAST_UPDATE_DATE** in BLOB Last Updated Column, and click Next.
6. Select Database Column for Source Type and change the Database Column Name to **PHOTO**. Click Create Item.

Adding a Delete Image Region: Creating a Process



PL/SQL page process code:

```
-- empty the image
update oehr_customers
set photo = null,
mimetype = null,
filename=null,
last_update_date=null
where customer_id = :P<n>_CUSTOMER_ID;
```



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The last step is to create a process that updates the table to set the BLOB column, as well as the MIMETYPE, FILENAME, and LAST_UPDATE_DATE columns, to null. Perform the following steps:

1. Under Page Processing, right-click Processes and select Create.
2. Select PL/SQL and click Next.
3. Enter a name and change the sequence number to 5 so that it will be executed first, and click Next.
4. Enter the code in the slide for PL/SQL Page Process and click Next.
5. Enter success and failure messages in the Success Message and Failure Message text boxes, respectively. Click Next.
6. Select the Delete button you just created, and click Create Process.

Quiz

If you create a form by using the Create Application Wizard, any item whose source is a database column of type BLOB will result in an item of type:

- a. Check Box
- b. Hidden
- c. File Browse
- d. Radio Group



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: c

Workshop 16-3 Overview: Using BLOB Data in a Report and Form

This workshop covers the following topics:

- Adding BLOB columns to a table
- Creating a form with a report
- Modifying the BLOB format in the form and the report
- Adding a delete item region to the form



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Creating Data Load Wizard Pages
- Creating an Upload and Download Page
- Adding BLOB Data to an Existing Application
- Sending Email from an Application



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Contact Us Page

Send email with values from a form:

The screenshot shows a 'Contact Us' page with a 'Submit' button being clicked. The 'Page Rendering' tree on the right details the components of the page.

Contact Us Page Components:

- From: marcie.young@oracle.com
- Subject: Form not working
- Message: Please review the form. It doesn't seem to be working correctly.
- Submit Button

Page Rendering Tree:

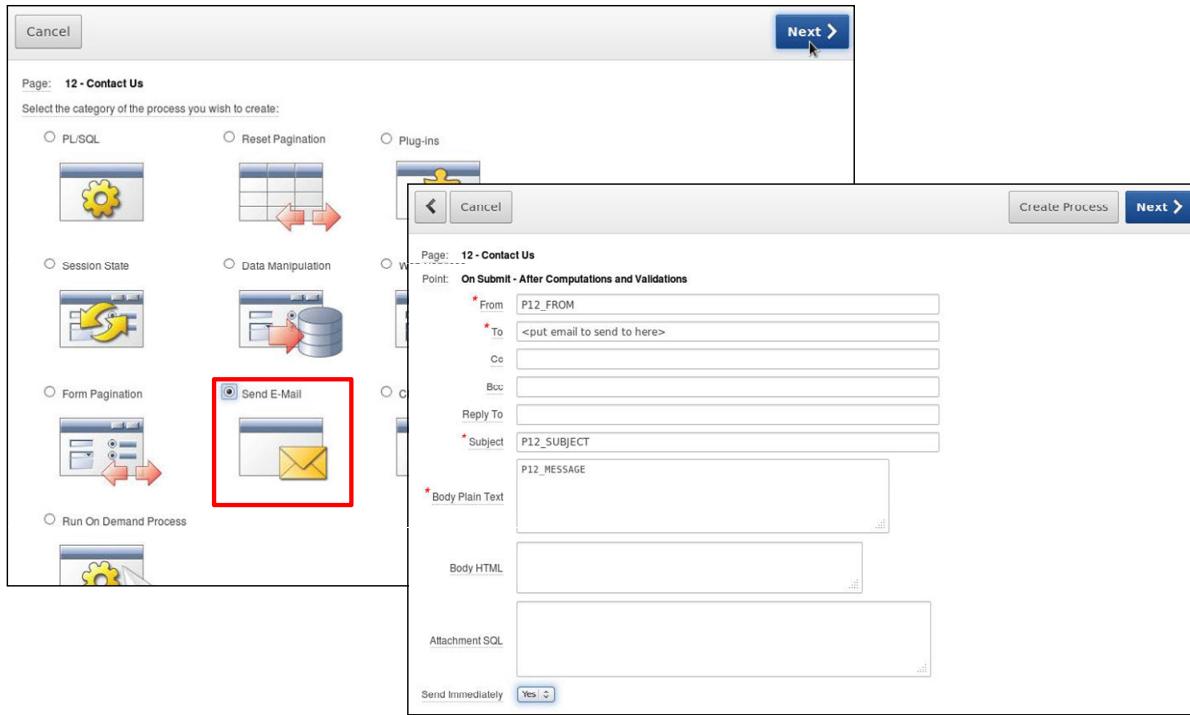
- Contact Us
 - Before Header
 - After Header
 - Before Regions
 - Regions
 - Body (3)
 - Contact Us
 - Items
 - P12_FROM
 - P12 SUBJECT
 - P12_MESSAGE
 - Region Buttons
 - SUBMIT
 - After Regions
 - Before Footer
 - After Footer



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To gather feedback, you can create a Contact Us page, which is a form where users enter their information and then submit the page. When the page is submitted, a process is fired that will send an email to the desired recipient. There are two methods to creating the send email process, declaratively or by using the APEX_MAIL package API. In the following slide, you examine the declarative approach.

Creating a Send E-Mail Process



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a Send E-Mail process, perform the following steps:

1. Under Page Processing, right-click Process and select Create.
2. Select Sent E-Mail for category and click Next.
3. Enter a name and click Next.
4. Enter a value or a page item name for, at a minimum, the mandatory fields and indicate whether you want the email to be sent immediately or not. Click Next.
5. Enter messages for Success and Error and click Next.
6. Select Submit for when button pressed and click Create Process.

You can watch the demonstration of creating a Send E-Mail process by opening the `/home/oracle/labs/demos/les16_Create_Email_Process.html` file.

Summary

In this lesson, you should have learned how to:

- Create Data Load Wizard pages
- Create an upload and download page
- Add BLOB data to an existing application
- Send email notification



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you should have learned how to extend your application to use advanced techniques such as creating Data Load Wizard pages, create an upload and download page, add BLOBs, and send email notifications.

17

Creating and Editing Charts

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to do the following:

- Create and use charts in desktop applications and mobile applications
- Explain some of the additional chart examples



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learn how to create and use charts in desktop and mobile applications. You also learn some of the additional charting examples that can be used in your application.

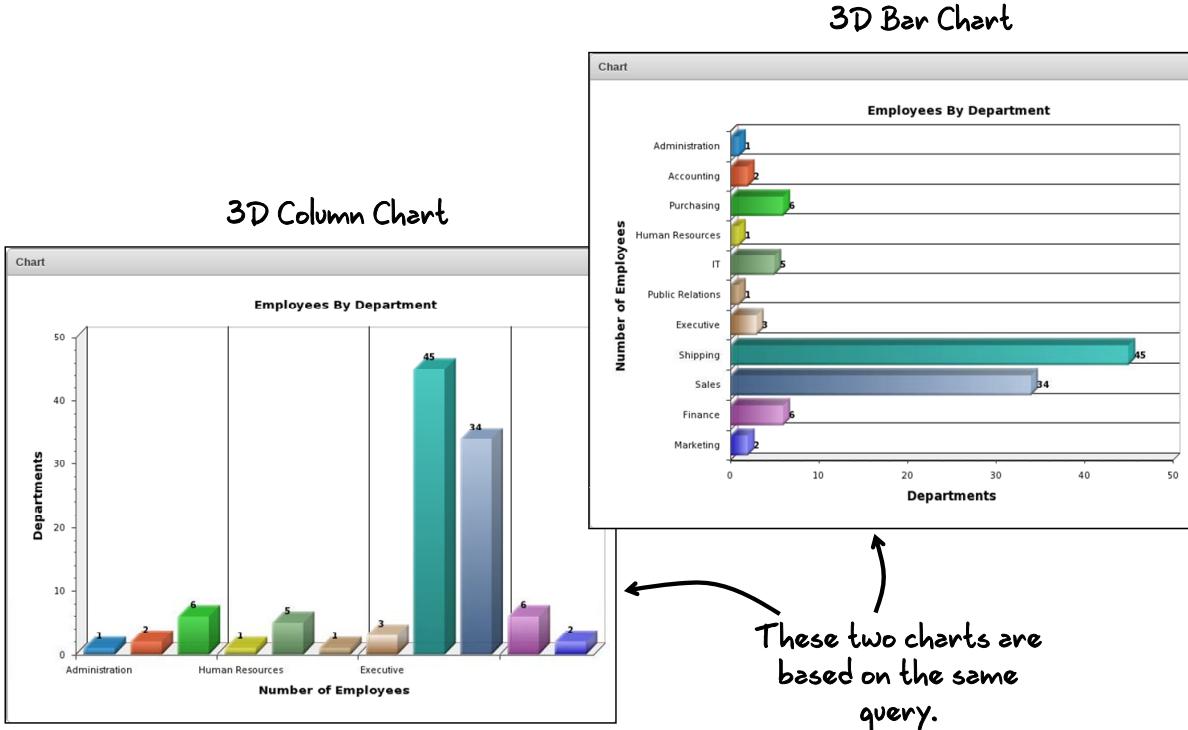
Lesson Agenda

- Creating and Using Charts
 - Creating a Flash Chart
 - Creating an HTML5 Chart for Mobile Applications
 - Viewing and Modifying Chart Attributes
- Reviewing Additional Charting Examples

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Building Charts



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Oracle Application Express includes built-in wizards for generating two types of charts: HTML5 and Flash charts.

Flash charts are based on the AnyChart Flash Chart component. AnyChart is a flexible Macromedia Flash-based solution that enables developers to create animated, compact, and interactive Flash charts. Flash charts are rendered by a browser and require Flash Player 9 or later. For more information about AnyChart, go to <http://www.anychart.com>.

HTML5 charts use a JavaScript chart engine, rendering the chart in SVG format. Flash cannot be rendered on most of the modern mobile devices. However, you can now take advantage of the new HTML5 charting solution to incorporate charts in your mobile applications. HTML5 charts are compatible with popular browsers. The example in the slide shows two Flash charts, 3D bar and 3D column, which are based on the same query and it shows the number of employees per department.

Creating SQL Queries for Charts

```
SELECT link, label, value  
FROM ...
```

Example:

```
SELECT null, last_name, salary  
FROM employees  
WHERE DEPARTMENT_ID = :P<n>_DEPARTMENT_ID;
```

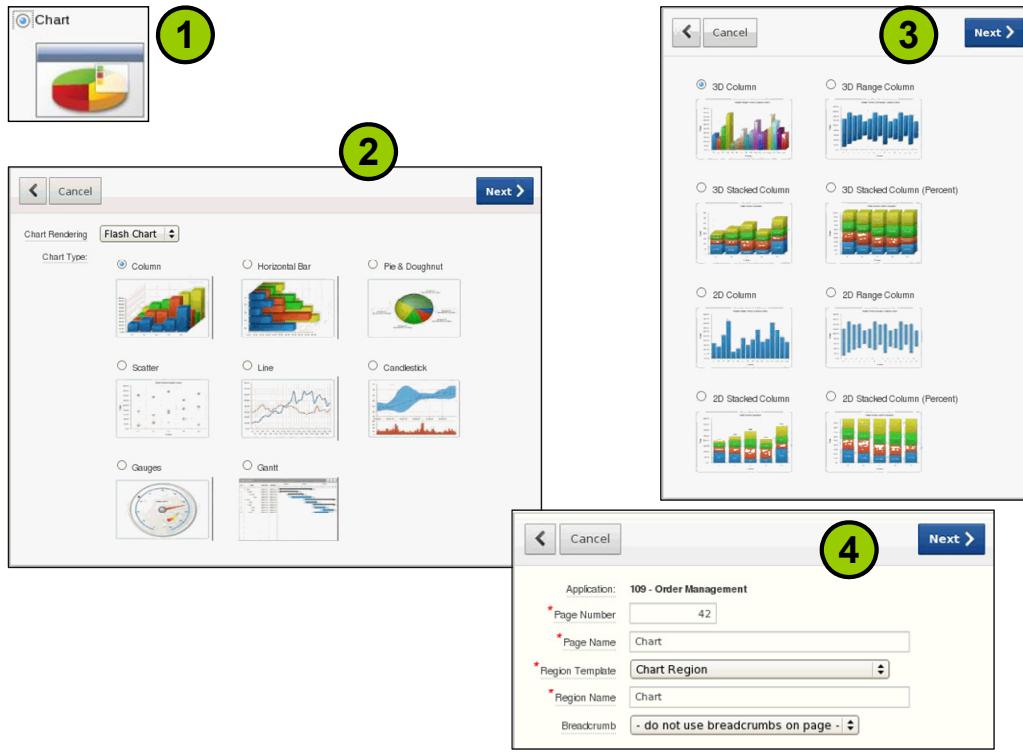


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You define a chart in Application Builder using a wizard. For most chart wizards, you select a chart type and provide a SQL query by using the syntax shown in the slide. Here `link` is a URL, `label` is the text that displays in the bar, and `value` is the numeric column that defines the bar size.

The example in the slide shows the SQL query using the syntax.

Creating a Flash Chart



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a Flash chart, navigate to your application home page and click Create Page. Perform the following steps:

1. Select Chart and click Next.
2. Select Flash Chart for Chart Rendering. Select the type of chart that you want to create. Click Next.
Note: Numerous Flash charts are available.
3. Depending on what you selected from the previous list, you may receive a set of more detailed charts to select from. Select the chart that you want and click Next.
5. Accept the defaults and click Next.

Creating a Flash Chart

The screenshot shows a sequence of five windows for creating a Flash chart:

- Window 6:** A configuration window for tabs. It shows "Page: 35" and three options for "Tab Options": "Do not use tabs" (selected), "Use an existing tab set and create a new tab within the existing tab set.", and "Use an existing tab set and reuse an existing tab within that tab set." A green circle with the number 6 is in the top right corner.
- Window 7:** A configuration window for the chart type. It shows "Chart Type: 3D Bar Chart", "Chart Title: Employees by Department", "Chart Animation: None", and various styling options like background type, colors, and grid settings. A green circle with the number 7 is in the top right corner.
- Window 8:** A configuration window for the SQL query. It shows a sample query: "select null t.rank, department_name chart_label, count(*) as value from oehr_employee e, oehr_departments d where e.department_id = d.department_id group by department_name". A green circle with the number 8 is in the top right corner.
- Window 9:** A confirmation window before creating the chart. It lists the selected attributes: Application (109), Page (35), Page Name (Employees by Department), Tab Set (TS1), Tab Label (Employees by Department), Region Title (Chart Region), Region Template (Chart Region), and Chart Type (Horizontal 3D Column). A green circle with the number 9 is in the top right corner.

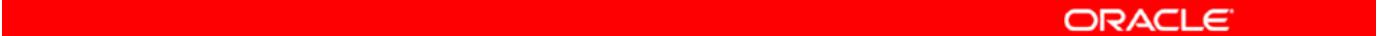
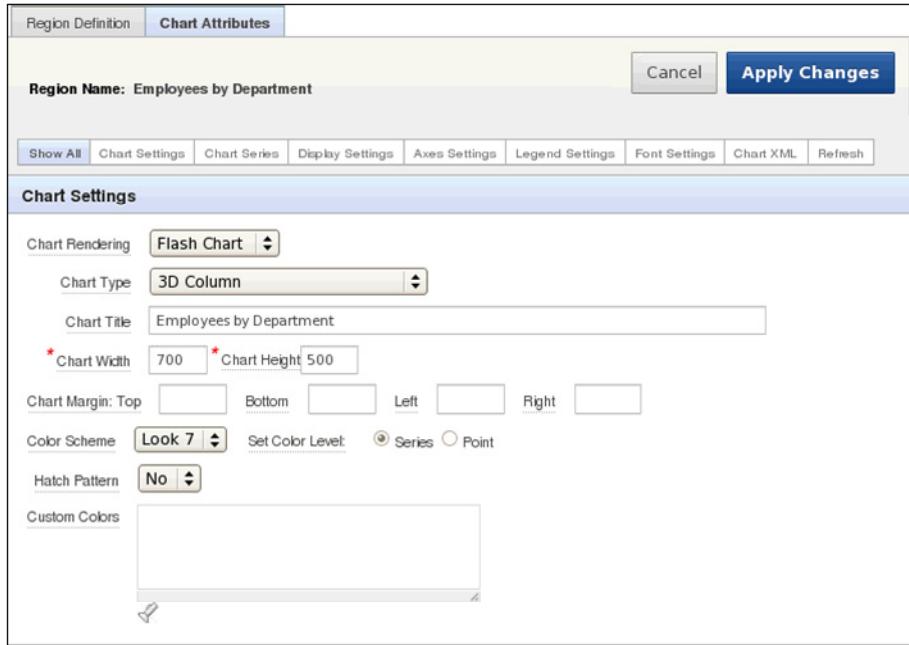
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

6. Accept the default tab options and click Next.
7. Enter a Chart Title and specify any of the parameters in this window. In the example in the slide, a different Color Scheme is selected and X-Axis and Y-Axis titles are specified. Click Next.
8. Enter a SQL query that this chart will be based on. If you want to see a sample of a SQL query, you can click the Chart Query Example link at the bottom of the window. The query can differ depending on the type of chart that you are creating. Click Next.
9. Click Create.

You can view the demonstration of creating a Flash chart by opening the `/home/oracle/labs/demos/les17_creating_flash_chart.html` file.

Viewing and Editing Chart Attributes

The Oracle logo is displayed on a red horizontal bar.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After you create a chart, you can edit the attributes of the chart region. To view and edit the attributes:

1. Click the Page icon on the application home page.
2. In Component View, click the chart region and click the Chart Attributes tab. In Tree View, right-click the chart region and select Edit Chart.

The attribute categories may be slightly different depending on the chart type.

Workshop 17-1 Overview: Creating and Editing Charts

This workshop covers the following topics:

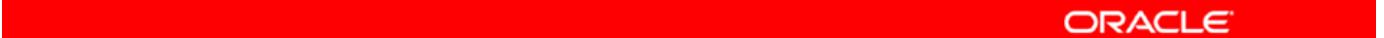
- Creating a Flash chart page that includes a Horizontal Bar – 3D Bar Chart
- Modifying the chart and changing it to a 3D Column Chart with look 7



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Creating an HTML5 Chart for Mobile Applications

1. Navigate to your application and create a new page.
2. Select **Chart**.
3. Select HTML5 Chart for chart rendering, and specify a chart type.
4. For page and region attributes, specify the page number, page name, region template, region name, and breadcrumb.
5. For Tab Options, specify whether to include tabs.
6. For Chart Attributes, specify the appropriate attributes.
7. For Query, specify a query by entering a SQL Query or by clicking the Build Query button.
8. Click Create.

**ORACLE**

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can create an HTML5 chart for both desktop and mobile applications by specifying the type of user interface. The steps to create an HTML5 chart for a mobile application is shown in the slide.

You can view the demonstration of creating an HTML5 chart for a mobile application by opening the `/home/oracle/labs/demos/les17_HTML5_mobile_chart.html` file.

Workshop 17-2 Overview: Creating an HTML5 Chart for Mobile Applications

This workshop covers creating HTML5 Pie and Doughnut charts for mobile applications.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Creating and Using Charts
- Reviewing Additional Charting Examples
 - Creating a Combined Chart
 - Creating a Project Gantt
 - Creating a Circular Gauge Chart

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Creating a Combined Chart

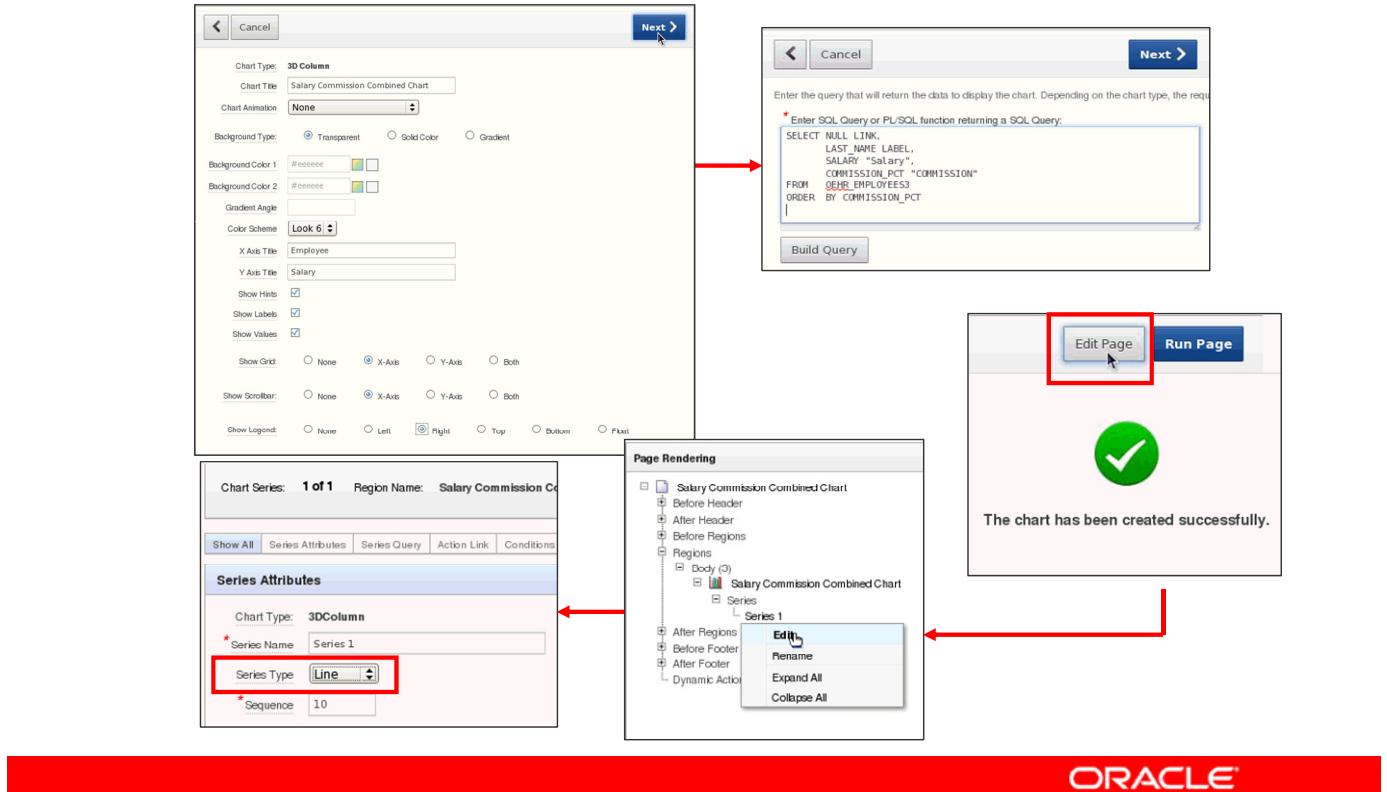


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can create a chart that is a combination of Line, Bar, and Marker chart types. If you want to show different chart types on the same chart, you simply create several data series of the different (but combinable) types. The example in the slide shows a combined chart. Salary series data is displayed as a Line chart and Commission data is displayed as a Bar chart.

In this example, you first create a chart page of 3D Column type. Then you edit the chart attributes and select Line for Series Type. The Salary series of the chart now appears as a Line, and the Commission series appears as a Bar.

Creating a Combined Chart



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a combined chart, perform the following steps:

1. Create a 3D Column chart. Specify Employee for X-Axis Title and Salary for Y-Axis Title. Select the X-Axis option for Show Scrollbar. For Show Legend, select the Right option. Use the following SQL query:

```
SELECT NULL LINK,
       LAST_NAME LABEL,
       SALARY "Salary",
       COMMISSION_PCT "COMMISSION"
  FROM OEHR_EMPLOYEES3
 ORDER BY COMMISSION_PCT
```

2. Edit the chart. Under Regions node, right-click Series 1 and select Edit.
3. Under Series Attributes, select Line for Series Type. Click Apply Changes.

When creating a combined chart, the Series Type selected is associated with a single series. If your query contains multiple series, the setting of "Line" Series Type is only applied to the first series of that multiseries query.

The Series Type of the second series will automatically pick up the default Series Type for the chart. In this example, the query contains multiple series. Therefore, the setting of “Line” Series Type is applied only to the first series of the query. The Series Type of the second series will automatically pick up “Bar” because the chart type is 3D Column Chart.

4. Run the page. You can now see a combination of salary as Line and commission as Bar charts.

Note: For a multiseries query, the setting of Series Type is applied *only* to the first series of your query. But, if you want to separate your multiseries into two separate queries and create two separate series on the chart, you can set a different series type on each.

You can view the demonstration of creating a combined chart by opening the /home/oracle/labs/demos/les17_combined_chart.html file.

Quiz

Your chart query syntax looks like the following:

```
SELECT link, label, value  
FROM ...
```

In the syntax, value refers to the:

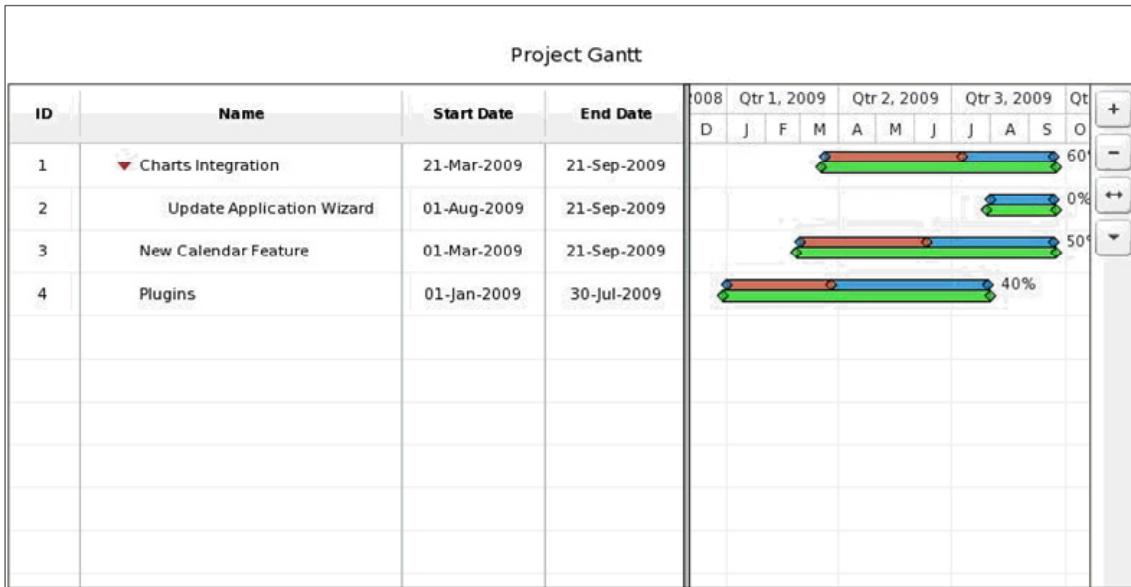
- a. Text that is displayed in the bar
- b. Column that defines the bar size
- c. Starting point
- d. URL



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: b

Creating a Project Gantt



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Application Builder includes built-in wizards for generating Project Gantt and Resource Gantt charts. How you create a Gantt chart depends on whether you are adding it to an existing page, or adding it on a new page. Gantt chart support in Oracle Application Express is based on the AnyChart-AnyGantt Component. AnyGantt is a flexible Macromedia Flash-based data-visualization solution that enables developers to create complex and informative Gantt charts.

You use a Project Gantt chart to show the progress of completion of a group of tasks. The chart considers planned time periods and actual time periods of the tasks. You can also use a Project Gantt chart for complex projects that involve hierarchies.

The slide example shows a parent/child hierarchy between Charts Integration and Update Application tasks. The Project Gantt chart in the slide consists of the following elements:

- A data grid that displays the task number, name, start time, and end time
- A timeline that displays the task progress bar in red, the actual progress bar in blue, and the planned timeline bar in green
- A navigation panel that enables you to modify your chart's visual appearance

The task tooltip uses the %dd.%MMM.%yyyydate format that you specify on the Gantt Settings tab.

Creating a Project Gantt

To create a Project Gantt chart, create a Flash chart and provide a SQL query by using one of the following syntaxes:

```
SELECT LINK,  
       TASK_NAME,  
       TASK_ID,  
       PARENT_ID,  
       ACTUAL_START_DATE,  
       ACTUAL_END_DATE,  
       PROGRESS  
  FROM TASKS1
```

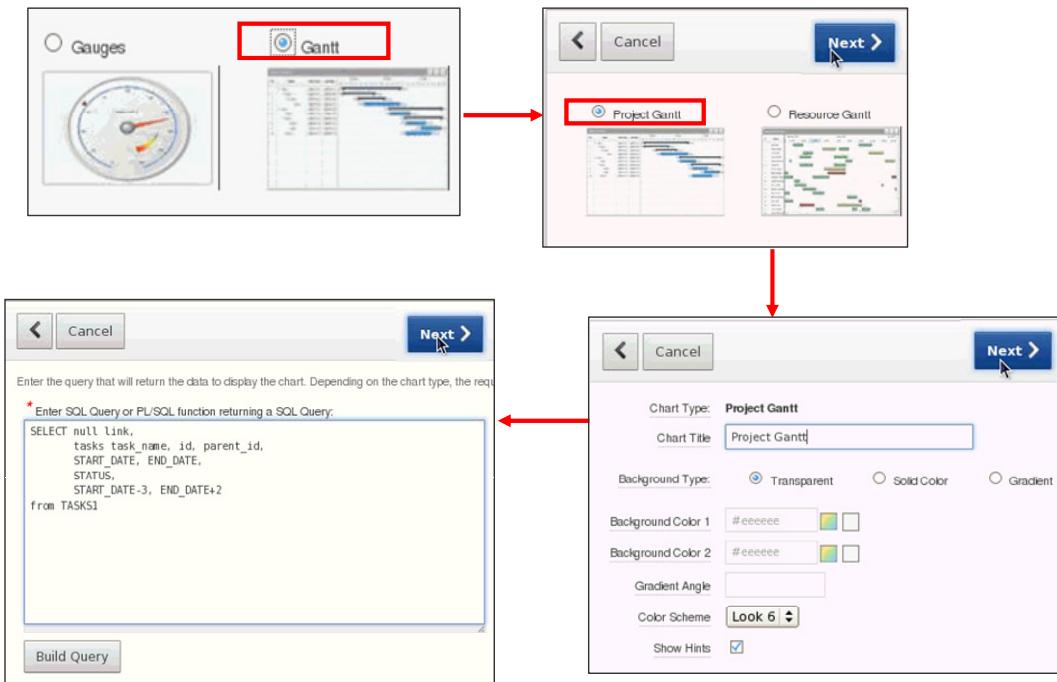
```
SELECT LINK,  
       TASK_NAME,  
       TASK_ID,  
       PARENT_ID,  
       ACTUAL_START_DATE,  
       ACTUAL_END_DATE,  
       PROGRESS,  
       PLANNED_START,  
       PLANNED_END  
  FROM TASKS1
```



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Project Gantt charts require a task name, task ID, parent task ID, actual start date, actual end date, and progress value for each task. Two optional values for planned start date and planned end date can also be used.

Creating a Project Gantt



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a Project Gantt chart, perform the following steps:

1. In your application, click Create Page. Select Chart page type and click Next.
2. Select Flash Chart and select Gantt and click Next. Then select Project Gantt and click Next.
3. Specify the page attributes and click Next. Accept the default tab option and click Next.
4. Specify the chart attributes. In the example in the slide, enter Project Gantt for Chart Title. Click Next.
5. Enter the following SQL and click Next:

```
SELECT null link,
       tasks task_name, id, parent_id,
       START_DATE, END_DATE,
       STATUS,
       START_DATE-3, END_DATE+2
  from TASKS1
```

6. On the Confirmation page, click Create.

You can view the demonstration of creating a Project Gantt chart by opening the /home/oracle/labs/demos/les17_Gantt_chart.html file.

Quiz

You can use a Project Gantt chart for complex projects that involve hierarchies.

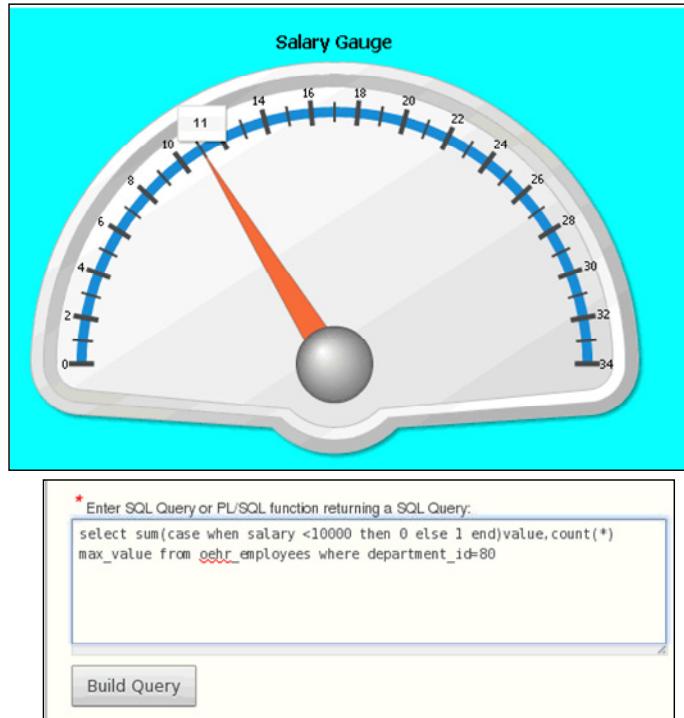
- a. True
- b. False



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a

Creating a Circular Gauge Chart



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

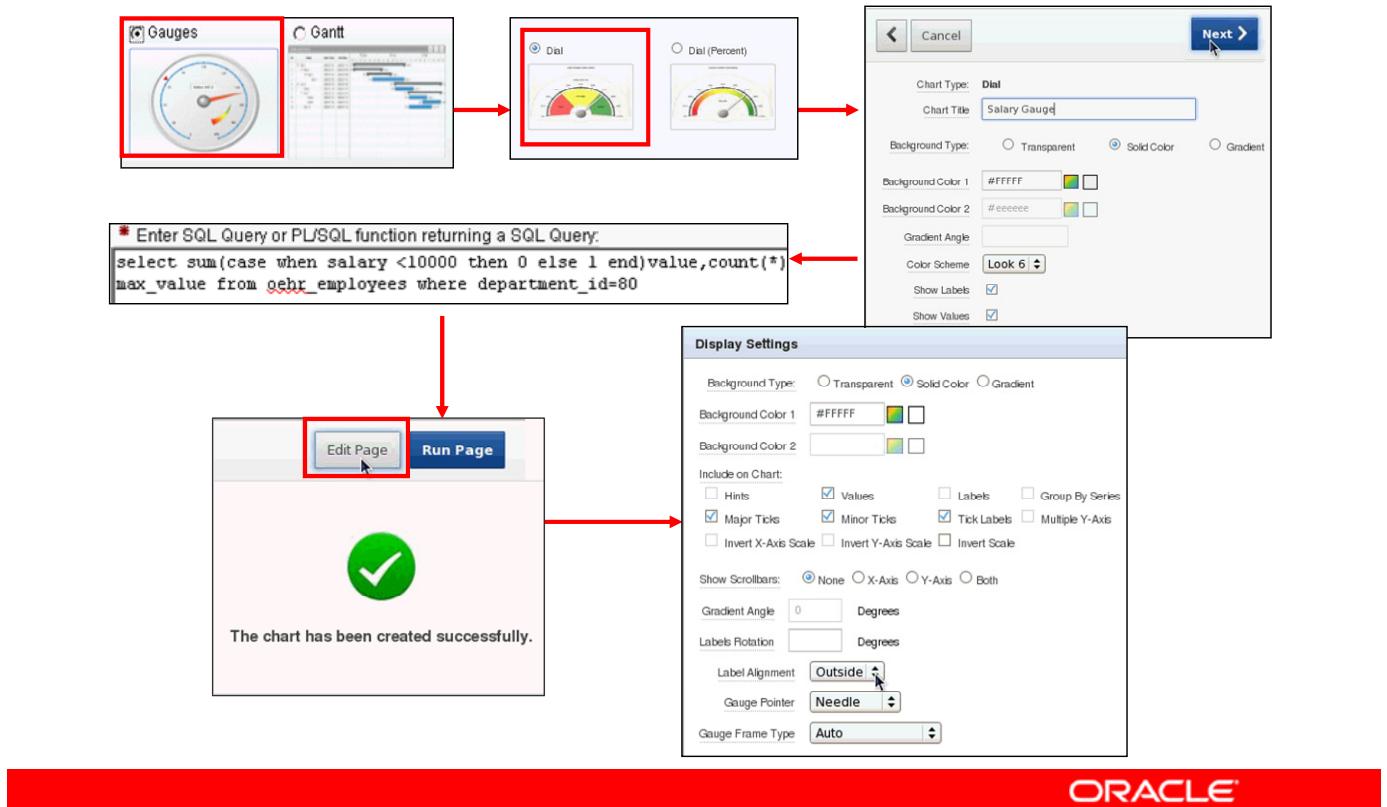
The example in the slide shows a Gauge chart with the label outside the gauge and a needle pointer.

To create a Gauge chart, you provide a SQL query by using the following syntax:

```
SELECT value , maximum_value [ ,low_value [ ,high_value] ]  
FROM ...
```

Total number of employees in department 80 is 34. The example in the slide shows that 11 employees' salary in department 80 is greater than or equal to 10000.

Creating a Circular Gauge Chart



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a Gauge chart, perform the following steps:

1. In your application, click Create Page. Select Chart page type and click Next.
2. Select Flash Chart and select Gauges. Click Next. Then select Dial and click Next.
3. Specify the page attributes and click Next. Accept the default tab option and click Next.
4. Specify the chart attributes. In the example in the slide, enter Salary Gauge for Chart Title, select Solid Color for Background Type, and enter #FFFFFF for Background Color. Click Next.
5. Enter the following SQL and click Next.

```
select sum(case when salary <10000 then 0 else 1
end) value, count(*) max_value from oechr_employees where
department_id=80
```

6. On the confirmation page, click Create.
7. By default, the label alignment is Inside. To display the label outside the Gauge, edit the page. Under Chart Attributes > Display Settings, select Outside for Label Alignment. Click Apply Changes. Now, run the page.

You can view the demonstration of creating a Gauge chart by opening the `/home/oracle/labs/demos/les17_gauge_chart.html` file.

Workshop 17-3 Overview: Enhanced Charting Examples

This workshop covers the following topics:

- Building a Combined chart
- Creating a Project Gantt chart
- Creating a Salary Gauge chart



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Summary

In this lesson, you should have learned how to:

- Create and use Flash charts
- Create an HTML5 chart for mobile applications
- Create a Project Gantt chart
- Create a Gauge chart



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you should have learnt about the various enhanced charting examples for both desktop and mobile applications.

18

Adding Calendars and Trees

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to create and manipulate:

- Calendars
- Trees



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learn how to create calendars and trees in your application.

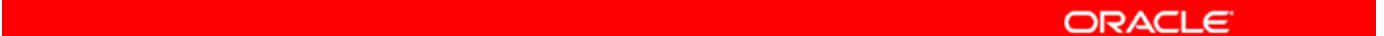
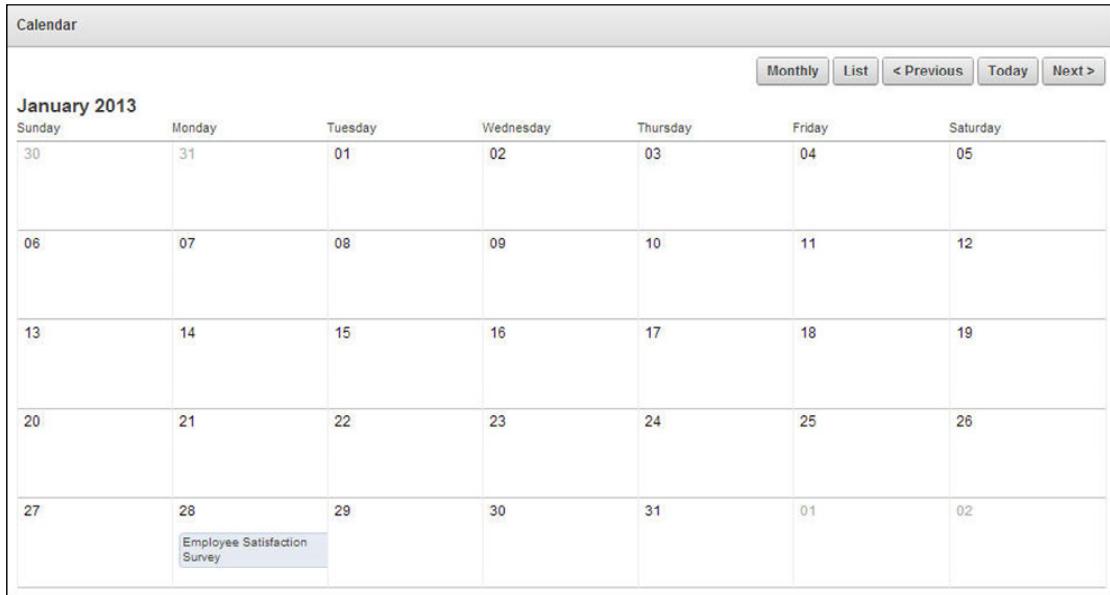
Lesson Agenda

- Using Calendars
 - Creating a Calendar
 - Editing Calendar Attributes
 - Dragging and Dropping Calendar Entries
 - Calendars for Mobile Applications
- Using Trees



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Creating a Calendar

The Oracle logo.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

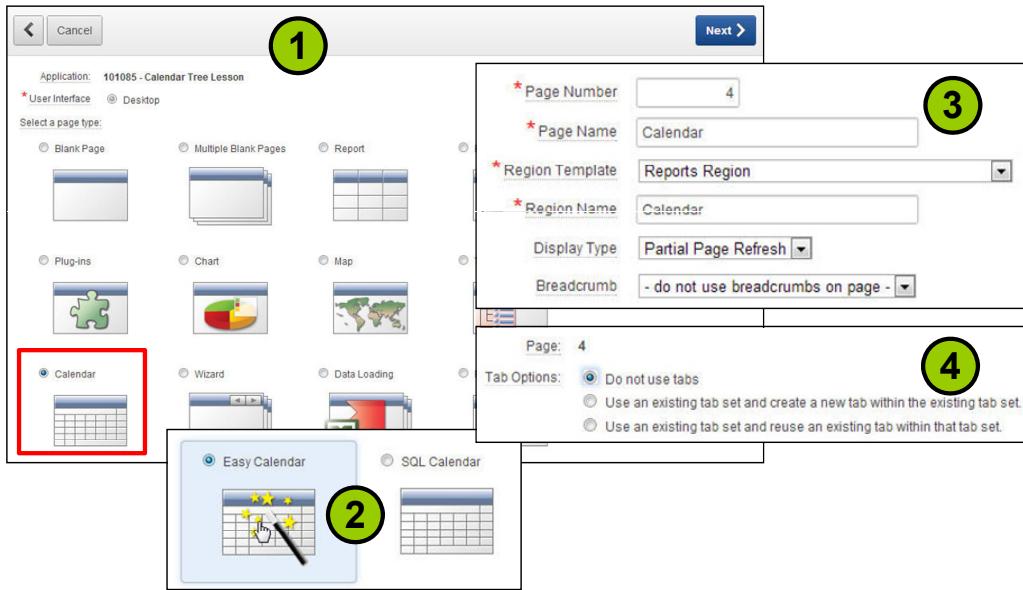
Oracle Application Express supports two types of calendars:

- **Easy Calendar:** Creates a calendar based on the schema, table, and columns that you specify. The wizard prompts you to select a date column and a display column.
- **SQL Calendar:** Creates a calendar based on a SQL query that you provide. The SELECT SQL statement that you provide must include at least two columns: a date column and a display column.

The date column determines which days on the calendar will contain entries. The display column defines a specific row that will display a calendar date.

The calendar can be viewed in three modes: monthly, weekly, and daily.

Creating a Calendar



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a calendar on a new page, navigate to your application home page and click Create Page. Perform the following steps:

1. Select Calendar and click Next.
2. Select the type of calendar required and click Next.
3. Specify a name and click Next.
4. Specify the tab option that you want and click Next.

Creating a Calendar

The screenshot shows four sequential steps in the Oracle Application Express interface:

- Step 5:** A dialog box titled "Specify the table or view details for the calendar entry." It shows the owner as "APEX_TRAIN" and the table/view name as "OEHR_PROJECTS(table)". A green circle with the number 5 is overlaid on the top right.
- Step 6:** A dialog box titled "Specify the data manipulation language (DML) operations and various display attributes to be used for the calendar entry." It lists the table name "OEHR_PROJECTS", date column "PROJECT_END_DATE", display column "PROJECT_NAME", date format as "Date Only", primary key column "PROJECT_ID", and enable drag and drop as "Yes". A green circle with the number 6 is overlaid on the bottom right.
- Step 7:** A dialog box titled "Specify the link details for the calendar entry." It shows the page number as 4, link target as "Page in this application", page item as 3, date item on target page as "P3_PROJECT_END_DATE", primary key item on target page as "P3_PROJECT_ID", and open link in as "Same Window". A green circle with the number 7 is overlaid on the top right.
- Step 8:** A confirmation dialog box titled "You have requested to create a calendar page with the following attributes. Please confirm your selections." It lists the attributes: Application 101085, Page 4, Page Name Calendar, Tab Set TS1, Tab Label, Region Title Calendar, Region Template Reports Region, Display Type Partial Page Refresh, Table / View Owner APEX_TRAIN, Table / View Name OEHR_PROJECTS, Date Column PROJECT_END_DATE, and Label Column PROJECT_NAME. A green circle with the number 8 is overlaid on the bottom right.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

5. Select the table, which has a date column, and click Next.
6. Specify the date column, the column to display, and the primary key column. Also, specify whether you want to show a custom date range and allow drag and drop in the calendar. Click Next.
7. Specify whether you want to link to another page, create a page, or exclude a link. In this case, you want to link to an existing page and specify the date item, the primary key item on that page, and whether you want to open the page in the same window or a new one. Click Next.
8. Click Finish.

You can watch the demonstration of creating a Calendar by opening the `/home/oracle/labs/demos/les18_Create_Calendar.html` file.

Editing Calendar Attributes

<p>Calendar Display</p> <p>Calendar Template <input type="button" value="Calendar"/></p> <p>Easy SQL Table Owner <input type="text" value="APEX_TRAIN"/></p> <p>Easy SQL Table <input type="text" value="OEHR_PROJECTS"/></p> <p>Date Column <input type="button" value="PROJECT_END_DATE"/></p> <p>Date Format <input checked="" type="radio"/> Date Only <input type="radio"/> Date and Time</p> <p>Date Item <input type="text" value="P4_CALENDAR_DATE"/></p> <p>End Date Item <input type="text" value="P4_CALENDAR_END_DATE"/></p> <p>Calendar Type Column <input type="text" value="P4_CALENDAR_TYPE"/></p> <p>Display Type <input type="button" value="Column"/></p> <p>Display Column <input type="text" value="PROJECT_NAME"/></p> <p>Primary Key Column <input type="text" value="PROJECT_ID"/></p> <p>Column Format [Insert column value]</p>	<p>Display Attributes</p> <p>Begin at Start of Interval <input checked="" type="checkbox"/></p> <p>Start of Week for Monthly Calendar <input type="button" value="Sunday"/></p> <p>Start Day for Weekly Calendar <input type="button" value="Sunday"/></p> <p>End Day for Weekly Calendar <input type="button" value="Saturday"/></p> <p>Time Format <input type="button" value="24 Hour"/></p> <p>Start Time <input type="text" value="0"/></p> <p>End Time <input type="text" value="23"/></p> <p>Data Background Color <input type="color"/></p> <p>Data Text Color <input type="color"/></p> <p>List View Days Display <input type="button" value="Current Month"/></p>
--	--

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

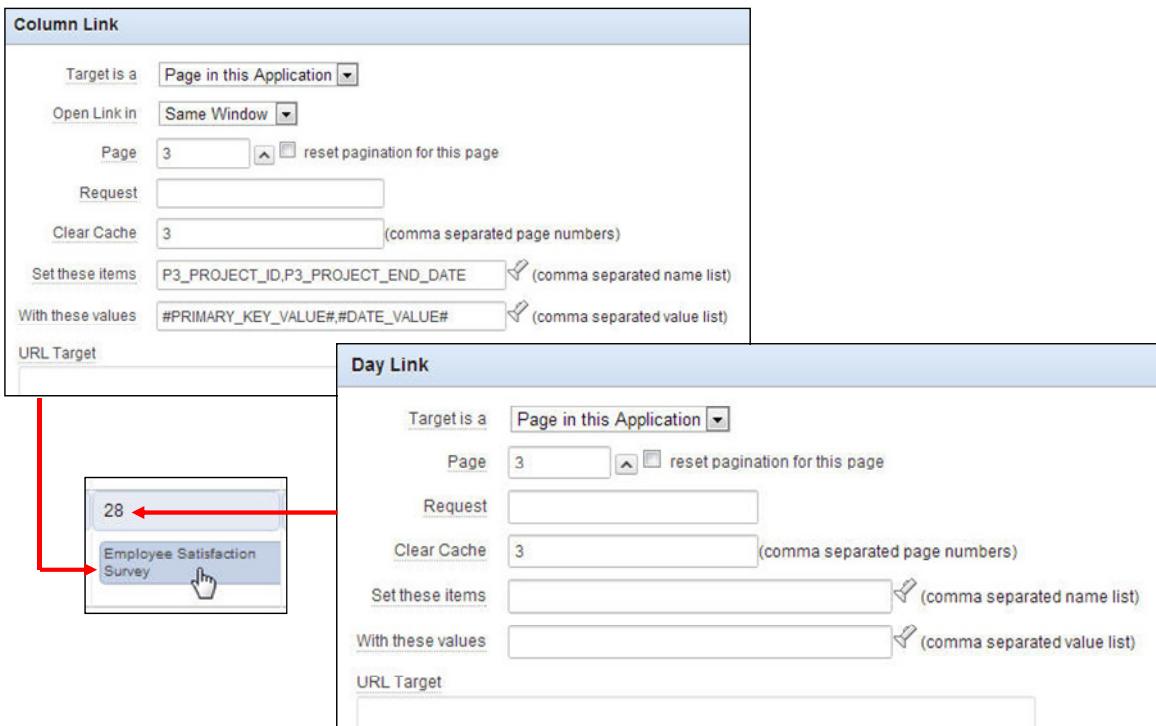
Use Calendar Display attributes to specify a template, date columns, and general calendar formatting. In addition, you can define the interval in which the calendar displays, as well as define the links to be placed on a day or a column in the calendar.

To modify calendar attributes, perform the following steps:

1. Navigate to the page definition where your calendar was created.
2. Under Regions, double-click the Calendar link, or right-click and select Edit Calendar.

Warning (on the use of Start Time/End Time): If the date column specified does not have a time component (or if individual records have no time), by default, the time is 0:00 hours and will not be displayed if the start time is set to a later time (for example, 8:00 AM).

Editing Calendar Attributes

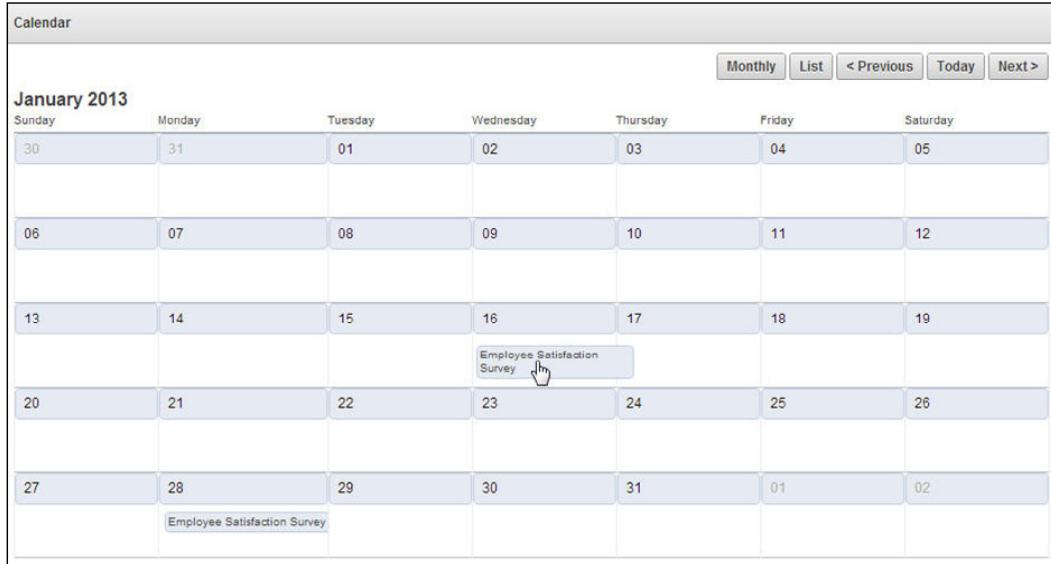


ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can also define the links to be placed on a day or a column in the calendar. In the example in the slide, you can modify an existing project by clicking it in the calendar. If you want to create a new project, click Day in the calendar. This navigates to the same page, but will clear the page so that you can create a new project.

Dragging and Dropping Calendar Entries



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

By enabling drag and drop of calendar entries, you can move a project from one day to another from the calendar itself.

Dragging and Dropping Calendar Entries

Page: 4 Calendar

* Name: Apex.Calendar.Drag_Drop.Process.f101085.p4

Type: PL/SQL anonymous block

Process Point

* Sequence: 10

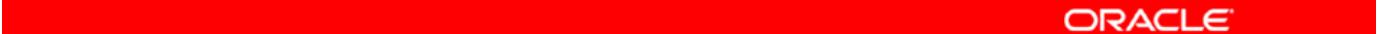
Process Point: On Demand - Run this process when requested by AJAX

Run Process: Once Per Page Visit (default)

Source

* Process [Download Source]

```
declare
    l_date_value      varchar2(32767) := apex_application.g_x01;
    l_primary_key_value  varchar2(32767) := apex_application.g_x02;
begin
    update "OEHR_PROJECTS" set "PROJECT_END_DATE" = to_date(l_date_value, 'RRRRMMDDHH24MISS') where
"PROJECT_ID"= l_primary_key_value;
end;
```

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

When you enable drag and drop in a calendar, an On Demand process is created that will update the date of the project in the database.

Linking to the Calendar from a Button

The figure consists of three vertically stacked screenshots of the Oracle Application Express configuration interface, each with a green circle containing a number indicating the step:

- Step 2:** Shows the 'Create Region Button' dialog. The 'Button Name' field is set to 'VIEW CALENDAR'. The 'Label' field contains 'View Calendar'. Other settings include 'Region: Project List', 'Button Style: Template Based Button', 'Button Template: Button', and 'Button Type: Normal'. A green circle with '2' is positioned above the 'Button Name' field.
- Step 3:** Shows the 'Configure Button' dialog. The 'Button Name' is now 'VIEW_CALENDAR'. The 'Sequence' is set to 30. The 'Position' is 'Right of Interactive Report Search Bar'. A green circle with '3' is positioned above the 'Sequence' field.
- Step 4:** Shows the 'Configure Action' dialog. The 'Action' is set to 'Redirect to Page in this Application'. The 'Page' dropdown shows '4'. Other fields include 'Request', 'Clear Cache', 'Set these items', and 'With these values'. A green circle with '4' is positioned above the 'Action' field.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You may want to link to a calendar from a button on another page. In the example in the slide, you create a button on the Project List report page that links to the calendar page. Perform the following steps:

1. Right-click the Interactive Reports region and select Create Region Button.
2. Enter a name and click Next.
3. Select the position where you want the button to be placed. In this case, you want the button at the "Right of Interactive Report Search Bar." Click Next.
4. Change Action to "Redirect to Page in this Application" and select the Calendar page and click Next.
5. Click Create Button.

Linking to the Calendar from a Button

The screenshot shows a report page for projects. At the top right, there is a 'View Calendar' button with a red box and arrow pointing to it. The main area displays a table with columns: Project Id, Project Name, Project Start Date, Project End Date, Project Dept, and Status. One row is visible: Project Id 1, Project Name 'Maintain Support Systems', Project Start Date '01-DEC-11', Project End Date '14-JAN-12', Project Dept 'Closed', and Status 'Closed'. Below the table, a calendar for January 2013 is overlaid. The calendar shows days from 30 to 02 of January. An event titled 'Employee Satisfaction Survey' is marked on January 16. Navigation buttons at the top of the calendar include 'Monthly', 'List', '< Previous', and 'Today'.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In the report, when you click View Calendar, the Calendar page is displayed.

You can watch the demonstration of linking to a Calendar from a button by opening the `/home/oracle/labs/demos/les18_ButtonLink_To_Calendar.html` file.

Calendars for Mobile Applications

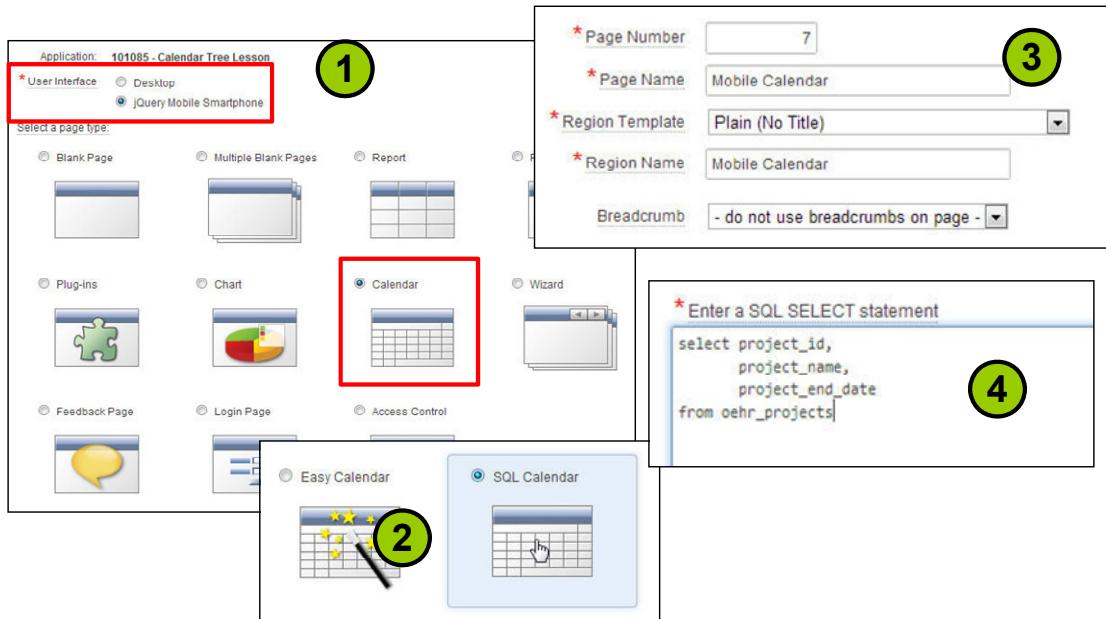
The screenshot illustrates a mobile application interface for managing calendar projects. At the top is a navigation bar with a logo, the title "Mobile Calendar", and a "Logout" button. Below is a monthly calendar grid for January 2013. A blue dot is placed on the 16th, indicating a project ends on that day. A red box highlights the list view for this date, showing a single entry: "Employee Satisfaction Survey". An arrow points from this list view to an "Edit Calendar Entry" dialog box. This dialog box contains fields for Project Name, Project Start Date, Project End Date, Project Dept, and Status, along with buttons for Cancel, Delete, and Apply Changes.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

When a calendar for mobile application is created, the calendar is displayed using the jQuery Mobile implementation. A dot on the calendar indicates that a project has an end date on that day. When the day is clicked, a List View is displayed below the calendar with a list of the entries on that day. When you click the project from the List View, the jQuery Mobile form page is displayed where you can modify the project.

Creating a Calendar for Mobile Applications



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a calendar on a new page, navigate to your application home page and click Create Page. Perform the following steps:

1. Select the jQuery Mobile Smartphone User Interface option. Select Calendar and click Next.
2. Select the type of calendar required and click Next. In this case, select SQL Calendar.
3. Specify a name and click Next.
4. Enter the SQL statement that you want to execute. Note that it must contain the `display_name` column and the date field to base the entry on, in this case, `project_end_date`. Then click Next.

Creating a Calendar for Mobile Applications

The screenshot shows two overlapping configuration windows:

- Left Window (Step 5):** "Specify the data manipulation language (DML) operations and various display attributes to be applied to the calendar." It includes fields for Date Column (PROJECT_END_DATE), Display Column (PROJECT_NAME), Date Format (Date Only selected), and Primary Key Column (PROJECT_ID).
- Right Window (Step 6):** "Specify the link details for the calendar entry." It includes fields for Page (7), Link Target (Create new edit page), Allowed Operations (Insert, Update, Delete checked), and a list of columns under Select Column(s). The columns listed are PROJECT_ID (Number), PROJECT_NAME (Varchar2), PROJECT_START_DATE (Date), PROJECT_END_DATE (Date), PROJECT_DEPT (Number), and PROJECT_STATUS (Varchar2).

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

5. Specify the date column, the column to display, and the primary key column. Click Next.
6. Specify whether you want to link to another page, create a page, or exclude a link. In this case, you want to create a new page and specify the Date column, Primary Key Column, and the columns you want to show on the new page. Then click Next.

Creating a Calendar for Mobile Applications

Page: 8

Table / View Name: OEHR_PROJECTS

Cancel Button Label	<input type="button" value="Cancel"/>		
Show Create Button	<input checked="" type="checkbox"/> Yes	Create Button Label	<input type="button" value="Create"/>
Show Save Button	<input checked="" type="checkbox"/> Yes	Save Button Label	<input type="button" value="Apply Changes"/>
Show Delete Button	<input checked="" type="checkbox"/> Yes	Delete Button Label	<input type="button" value="Delete"/>

7

You have requested to create a calendar page with the following attributes. Please confirm your selections.

Application	101085
Page	7
Page Name	Mobile Calendar
Region Title	Mobile Calendar
Region Template	Plain (No Title)
Display Type	Partial Page Refresh
Date Column	PROJECT_END_DATE
Label Column	PROJECT_NAME

8



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

7. Accept the default buttons and click Next.
8. Click Finish.

You can watch the demonstration of creating a Calendar for mobile applications by opening the `/home/oracle/labs/demos/les18_Calndar_mobile.html` file.

Workshop 18-1 Overview: Creating a Calendar

This practice covers creating a calendar for both desktop and mobile applications.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Using Calendars
- Using Trees
 - What Is a Tree?
 - Creating a Tree



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Is a Tree?

The screenshot shows a tree region in Oracle Application Express. The tree is populated with employee names from the OEHR_EMPLOYEES table, organized by manager. A tooltip for an employee node displays the following SQL query:

```

select case when connect_by_isleaf = 1 then 0
            when level = 1      then 1
            else                  -1
        end as status,
       level,
       "LAST_NAME" as title,
       null as icon,
       "EMPLOYEE_ID" as value,
       null as tooltip,
       'f?p&APP_ID.:10'||:APP_SESSION||'::::P10_EMPLOYEE_ID:'||"EMPLOYEE_ID" as link
  from "#OWNER#".OEHR_EMPLOYEES
 start with "MANAGER_ID" is null
connect by prior "EMPLOYEE_ID" = "MANAGER_ID"
order siblings by "LAST_NAME"

```

A tree is a type of region that is suited for representing hierarchical data, such as an organizational chart.

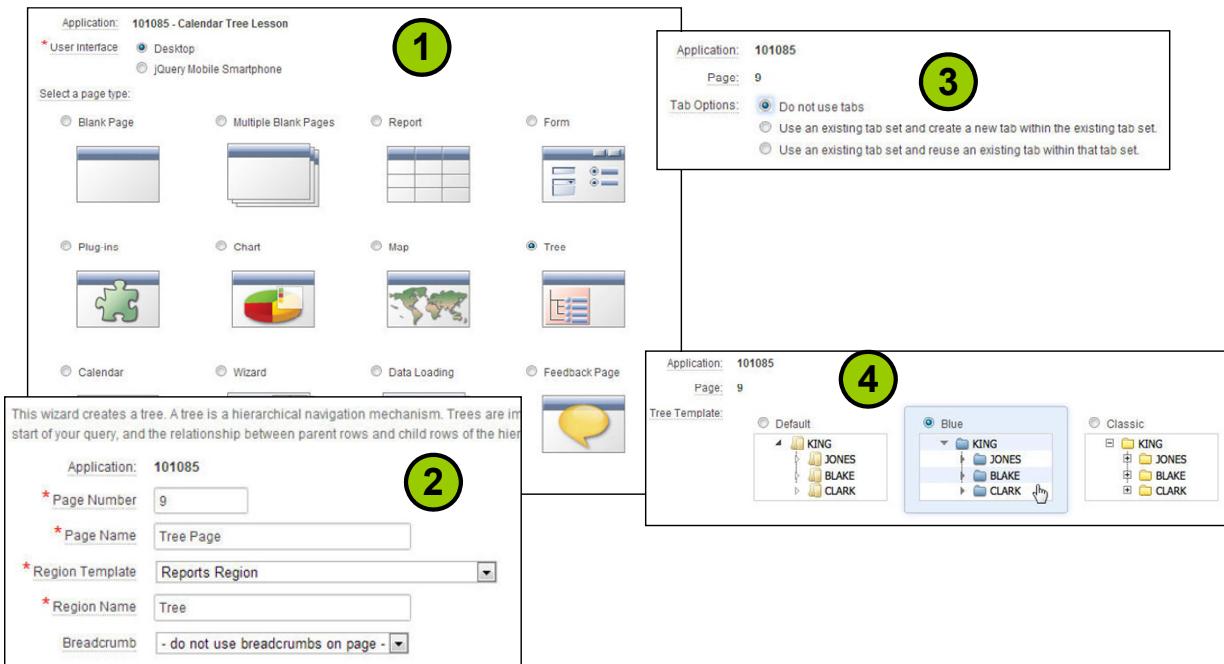
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

A tree is based on a table or view that contains a hierarchical relationship. You can create a tree in your application to communicate hierarchical or multiple-level data. You can create a tree from a query by identifying an ID and a parent ID in a table or a view. A tree definition contains a starting point and is displayed in a region on a page. The tree can also be referenced by multiple regions.

The example in the slide shows a tree created from the SQL specified on the right. The tree displays a list of managers and the employees who work for them.

Creating a Tree



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

When you create a tree, it can be included on a new page or added to an existing page. To create a tree on a new page, navigate to the application home page and select Create Page. Perform the following steps:

1. Select Tree and click Next.
2. Enter a Page Name and Region Name, and click Next.
3. Accept the default tab option, and click Next.
4. Select the tree template that you want and click Next.

Creating a Tree

Select the owner of the table or view from which you want to draw the tree query.

Application:	101085	5
Page:	9	
* Table / View Owner:	APEX_TRAIN	
* Table / View Name:	OEHR_EMPLOYEES (table)	

A tree is based on a query and returns data that can be re-used for other queries. A tree is a hierarchical structure where each node has zero or more children. Use this page to identify the column you want to use as the primary key for the tree. Identify the column you want to use as the parent key for the tree. Use this page to identify the column you want to use as the root of the hierarchical query, and its value can be based on a specific value or null.

Owner:	APEX_TRAIN	6
Table:	OEHR_EMPLOYEES	
* ID:	EMPLOYEE_ID	
* Parent ID:	MANAGER_ID	
* Node Text:	LAST_NAME	
* Start With:	MANAGER_ID	
* Start Tree:	Value is NULL	

Identify an optional where clause and order siblings by column for your query.

Where Clause (for example ename = 'JONES')	7
Order Siblings By (for example ENAME)	LAST_NAME

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

5. Accept the default schema owner and select the table or view. Click Next.
6. For Query, select the columns for the following to include in the tree and click Next:
 - ID:** Select the column to base the tree on; in this case, EMPLOYEE_ID.
 - Parent ID:** Select the column to use as the parent ID; in this case, MANAGER_ID.
 - Node Text:** Select the text to appear on the tree nodes.
 - Start With:** Select the column to be used to specify the root of the hierarchical tree query.
 - Start Tree:** Choose how to start your query; in this case, null.
7. You can specify a Where and an Order By clause and click Next. In addition, you can see the query that was generated by clicking the expand icon for Current Query.
 Note that connect_by_leaf is a pseudocolumn, and connect_by_prior specifies a condition that identifies the relationship between parent rows and child rows in the hierarchy. The START WITH clause identifies the row or rows to be considered for the starting point of the hierarchy.

Creating a Tree

Identify the button, tooltip and link attributes you want to define on your tree. To make leaf node text a link, click the 'Link Item' button.

Include Buttons:	<input checked="" type="checkbox"/> Collapse All <input checked="" type="checkbox"/> Expand All	8	
Selected Node Page Item:	<input type="text"/>		
Tooltip:	<input type="text" value="None"/>		
Link Option:	<input type="radio"/> Nothing <input checked="" type="radio"/> Existing Application Item		
* Link Page:	<input type="text" value="10 Edit Employee"/>		
* Link Item:	<input type="text" value="Page: 10: P10_EMPLOYEE_ID"/>		
		You have requested to create a tree page with the following parameters:	
		Application 101085 Page 9 Page Name Tree Page Tab Set TS1 Tab Label Region Title Tree Region Template Reports Region	9

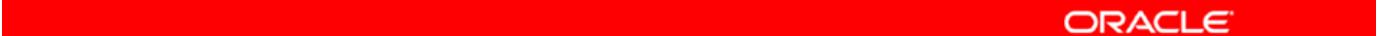
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

8. Specify whether you want to include buttons for Collapse All and Expand All, whether you want to link to an existing item or define a tool tip for the nodes of the tree, and whether the tree state should be saved via the Selected Page Node Item. Then click Next. In the example in the slide, you want to link to a previously created Edit Employee page (Page 10).
9. Click Finish.

You can watch the demonstration of creating a tree by opening the /home/oracle/labs/demos/les18_Trees.html file.

Manipulating a Tree

The screenshot shows a user interface for manipulating an employee hierarchy. On the left, there is a tree view of employees under a department named 'King'. The tree structure includes nodes for 'Cambrault', 'De Haan', 'Errazuriz', 'Fripp', 'Hartstein', 'Fay', 'Kaufling', 'Kochhar', 'Baer', and 'Greenberg'. The node 'Greenberg' is selected, indicated by a red arrow pointing from the text description below to the node in the tree view. To the right of the tree view is an 'Edit Employee' form. The form contains fields for First Name (Nancy), Last Name (Greenberg), Email (NGREENBE), Phone Number (515.124.4569), Hire Date (17-AUG-94), Job Id (FI_MGR), Salary (12500), Commission Pct (empty), Manager Id (Kochhar, with a red box around it), and Department Id (100). The 'Manager Id' field is populated with 'Kochhar'.

**ORACLE**

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The tree displays the employee hierarchy. In the example in the slide, you see that the manager for the employee Greenberg is Kochhar. When you click Greenberg, the Edit Employee form is displayed. Note that Manager is Kochhar.

Manipulating a Tree

The screenshot shows two panels. On the left is the 'Edit Employee' form for Nancy Greenberg. The 'Manager Id' field is highlighted with a red box and contains the value 'Hartstein'. A red arrow points from this field to the 'Tree' panel on the right. The 'Tree' panel displays a hierarchical list of employees under a 'King' node. The 'Hartstein' node is expanded, showing下属 employees: Fay, Greenberg (which contains Chen, Faviet, and Popp), Sciarra, Urman, and Young. The 'Greenberg' node is also highlighted with a red box.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Change the employee to another employee, in this case, Hartstein, and then click Apply Changes. Note that employee Greenberg now appears under the Hartstein node instead of Kochhar.

Workshop 18-2 Overview: Creating a Tree Whose Nodes Link to a Different Page

This practice covers the following topics:

- Creating a new page with a tree region and linking it to another page
- Adding a button on a page and navigating back to the tree page using the button



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Summary

In this lesson, you should have learned how to create and manipulate:

- A calendar
- A tree



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The lesson showed you how to use dynamic queries to display information in a calendar or tree.

19

Using Dynamic Actions and Plug-Ins

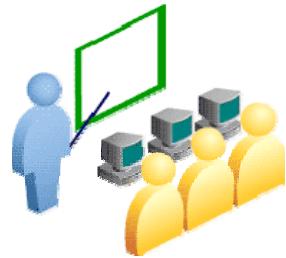
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to:

- Create and use dynamic actions
- Import and use plug-ins



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This lesson discusses dynamic actions and plug-ins. You learn what they are, how to create a dynamic action and use it in your application, and how to import a plug-in and use it in your application.

Lesson Agenda

- Using Dynamic Actions
 - What Are Dynamic Actions?
 - Creating a Dynamic Action
 - Dynamic Action Examples
- Using Plug-Ins



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Is a Dynamic Action?

Example of a dynamic action for enable and disable:

The figure consists of two side-by-side screenshots of an "Employee Details" form. Both screenshots show the same set of fields: First Name (Diana), Last Name (Lorentz), Email (DLORENTZ), Phone Number (590.423.5567), Hire Date (07-FEB-99), Job Id (IT_PROG), Salary (4200), Commission Pct (disabled, highlighted with a red box), Manager Id (10), and Department Id (60). In the left screenshot, the Job Id is IT_PROG, and the Commission Pct field is disabled. In the right screenshot, the Job Id is SA REP, and the Commission Pct field is enabled. Arrows point from the text labels below each screenshot to the Commission Pct field in its respective state.

Employee Details	
First Name	Diana
Last Name	Lorentz
Email	DLORENTZ
Phone Number	590.423.5567
Hire Date	07-FEB-99
Job Id	IT_PROG
Salary	4200
Commission Pct	(disabled)
Manager Id	10
Department Id	60

Commission Pct is disabled when Job is not Sales Representative.

Employee Details	
First Name	Diana
Last Name	Lorentz
Email	DLORENTZ
Phone Number	590.423.5567
Hire Date	07-FEB-99
Job Id	SA REP
Salary	4200
Commission Pct	(enabled)
Manager Id	103
Department Id	60

Commission Pct is enabled when Job is Sales Representative.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Dynamic actions provide developers a way to define client-side behavior declaratively without the need to know JavaScript. Using the Create Dynamic Action Wizard, you specify an action that is performed when a defined set of conditions occur. You can also specify which elements are affected by the action, and when and how they are affected.

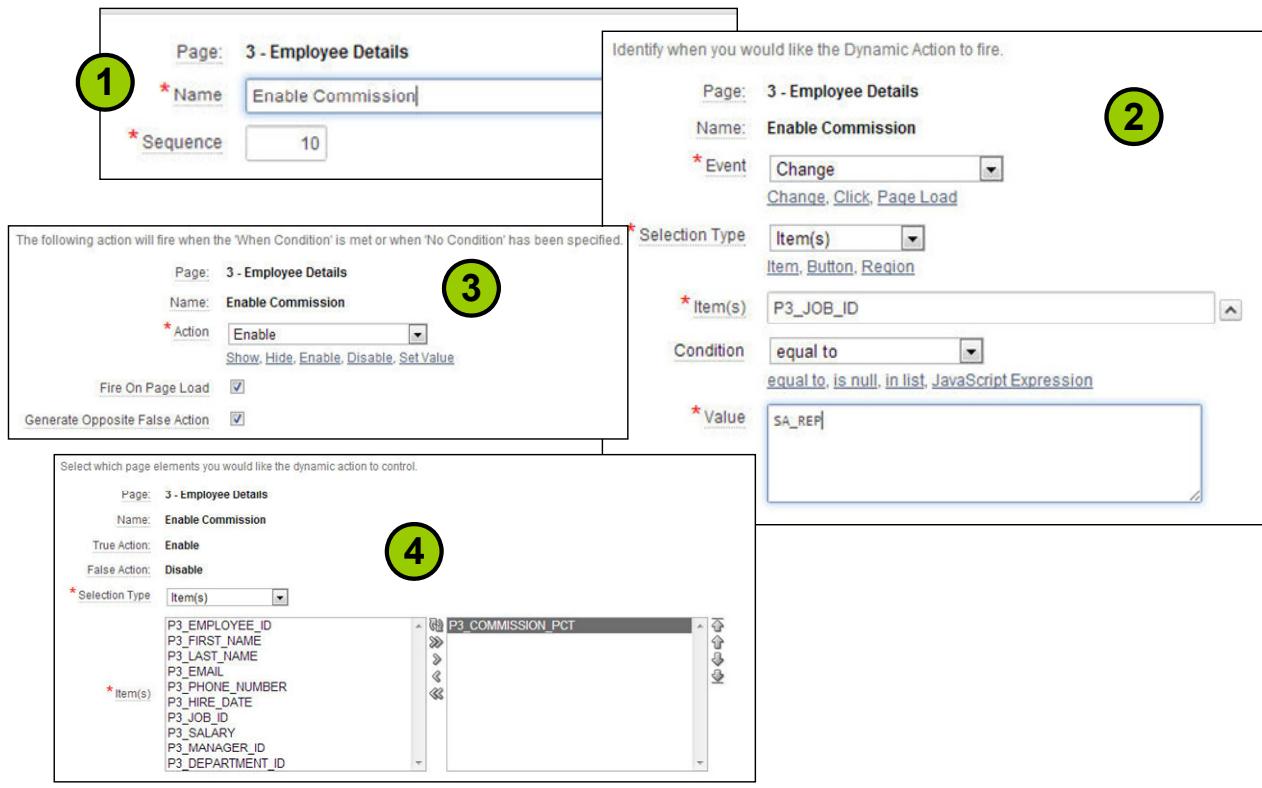
The process of implementing a dynamic action involves the following:

- Edit or create an item, button, region, DOM object, or jQuery selector on a page. This component is referenced within the dynamic action, which is defined when it fires.
- Create a dynamic action from the application page that invokes the action.
- Run your application to test the dynamic action.

In the example in the slide, in the screenshot on the left, the value for Job Id is IT_PROG and the Commission Pct item is disabled. In the screenshot on the right, the value for Job Id is SA REP and the Commission Pct item is enabled. The way in which the items work is controlled by the dynamic action created.

Many dynamic actions are available in Application Express. In this course, you examine a few of them. To learn more, review the Application Express User's Guide. In addition, an OBE tutorial is available in the Oracle Learning Library. This topic is also discussed in more detail in the *Advanced APEX Workshop* course.

General Steps to Create a Dynamic Action



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

There two ways to create a dynamic action:

- From a specific item
- From the Dynamic Actions node. If you create it from the Dynamic Actions node, you can identify multiple triggering items in the "When" steps.

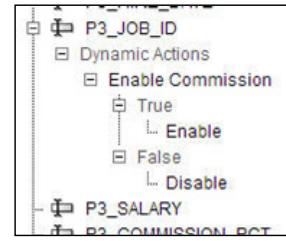
An example of a dynamic action is to enable and disable an item based on the value of the item. To create this type of dynamic action, navigate to the page that contains the item for which you want to create a dynamic action. In the tree view, right-click the page item and click Create Dynamic Action and perform the following steps:

- Enter a name for the dynamic action.
- Most of the fields on the next wizard page are prepopulated. In this case, enter a Value of SA_REP, which is the JOB_ID that you want when the dynamic action fires. Select the true action that should be performed when the When condition is met (for example, when P<n>_JOB_ID is equal to SA_REP), and click Next.
- In this case, Enable is selected. In addition, the false action of Disable will be created if the When condition is not met (for example, when P<n>_JOB_ID does not equal SA_REP).
- Select the item that you want the enable and disable actions to control, and click Next. In this case, the P<n>_COMMISSION_PCT item will be enabled or disabled depending on the value of the P3_JOB_ID item. Click Create Dynamic Action.

Enabling and Disabling an Item: Overview

In this example, you create a dynamic action called Enable Commission and specify the following in the wizard:

When	Event: Change Selection Type: Item(s) Item(s): <code>P<n>_JOB_ID</code> Condition: <code>equal</code> Value: <code>SA_REP</code>
Action(s)	True: Enable False: Disable
Affected Elements	Selection Type: Item(s) Item(s): <code>P<n>_COMMISSION_PCT</code>



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The table in the slide indicates what is entered to enable the commission when the value of `JOB_ID` is set to `SA_REP`. In addition, you see the dynamic action in the tree view after creation.

Creating and Using Dynamic Actions: Examples

This lesson covers the following examples of creating and using dynamic actions in Application Express.

- Changing the class when an item is null
- Setting the value of an item when another item changes
- Submitting the page when button is clicked
- Refreshing the data in a report using custom filters



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you examine the examples listed on the slide.

Changing the Class When an Item Is Null

Employee Details	
First Name	Diana
Last Name	Lorentz
Email	DLORENTZ
Phone Number	590.423.5567
Hire Date	07-FEB-99
Job Id	IT_PROG
Salary	4200
Commission Pct	
Manager Id	103
Department Id	60

A red border is applied when a user leaves the Last Name field empty.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

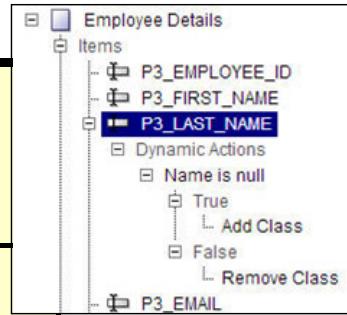
The example in the slide uses a dynamic action that fires whenever the user leaves the Last Name field and checks whether it is empty. If the Last Name field is empty, a red border is applied to indicate there is a problem. The border is subsequently removed if and when the user enters some text in the Last Name field.

The “Name is null” dynamic action includes the Add Class and Remove Class actions.

Changing the Class When an Item Is Null: Overview

To create this dynamic action, specify the following in the wizard:

When	Event: Lose Focus Selection Type: Item(s) Item(s): P<n>_LAST_NAME Condition: is null
Action(s)	True: Add Class False: Remove Class
Affected Elements	Selection Type: Item(s) Item(s): P<n>_LAST_NAME



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create this type of dynamic action, perform the following steps:

1. On the page that contains the item, in the tree view, right-click the item and select Create Dynamic Action.
2. Enter a name for the dynamic action.
3. Note that the Item name is prepopulated. Select Lose Focus for Event and “is null” for Condition. Click Next.
4. Dynamic actions can be defined to fire based on events that happen on the page. There are three different categories of events that can be used: browser, framework, and component. Lose Focus is a browser event. This fires when the triggering element loses focus either by the pointing device or by tabbing out of the element.
5. Select the action to be performed when the condition is met. In this case, you want to perform an Add Class. Make sure the Fire On Page Load check box is selected.
6. Under settings, enter error for Class. Select Remove Class from the False Action drop-down list. This condition will fire when the condition is not met. Make sure the Fire On Page Load check box is selected.
7. Select the page element you would like the dynamic action to control. In this example, select P<n>_LAST_NAME. Now, click Create.

Note: All event types show the Selection Type field except Page Load, Page Unload, Resize, and Before Submit.

Setting the Value of an Item When Another Item Changes

The location of a department is set when the department changes.

Employee Details	
First Name	Diana
Last Name	Lorentz
Email	DLORENTZ
Phone Number	590.423.5567
Hire Date	07-FEB-99
Job Id	IT_PROG
Salary	4200
Commission Pct	
Manager Id	103
Department	IT
Location	Southlake

Employee Details	
First Name	Diana
Last Name	Lorentz
Email	DLORENTZ
Phone Number	590.423.5567
Hire Date	07-FEB-99
Job Id	IT_PROG
Salary	4200
Commission Pct	
Manager Id	103
Department	Human Resources
Location	London

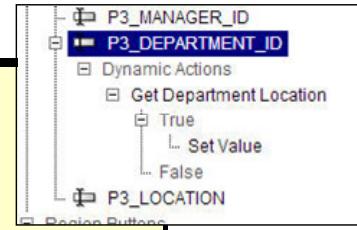
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The example in the slide has a dynamic action that fires when the value of page item P<n>_DEPARTMENT_ID changes. The dynamic action uses a SQL statement to select the City for the department and populates the Location page item.

Setting the Value of an Item When Another Item Changes

When	Event: Change Selection Type: Item(s) Item(s): P<n>_DEPARTMENT_ID Condition: none
Action(s)	True: Set Value
Settings	Set Type: SQL Statement SQL Statement: <select city for department_id> Page Items to Submit: P<n>_DEPARTMENT_ID
Affected Elements	Selection Type: Item(s) Item(s): P<n>_LOCATION



ORACLE

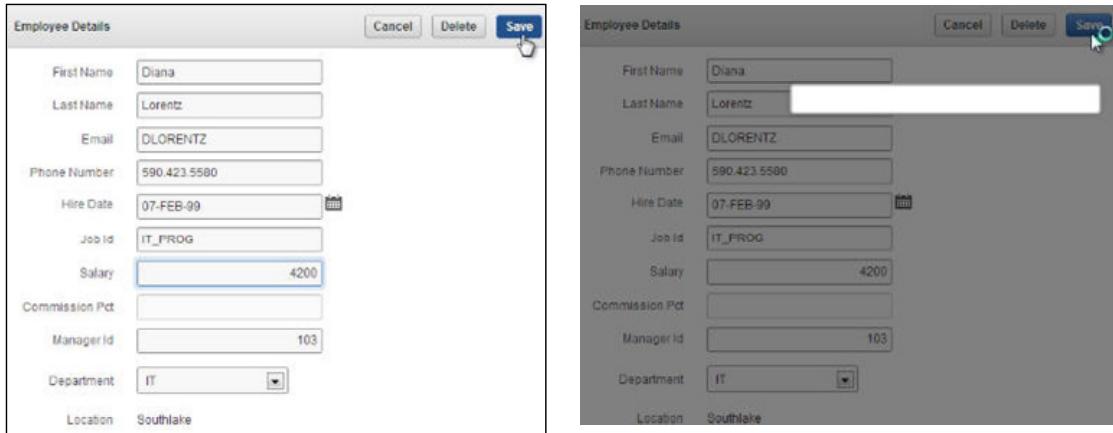
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create the dynamic action in the previous slide, perform the following steps:

1. Right-click the page item and select Create Dynamic Action.
2. Enter a name for the dynamic action. Most of the fields on the next wizard page are prepopulated. In this case, you do not want to base the dynamic action on a particular condition, so you can accept the defaults and click Next.
3. Select the action to be performed when the condition is met. In this case, you want to perform a Set Value.
4. For Settings, select the type of set value. In this case, you want to set the value by using a SQL statement.
5. Enter the SQL statement that you want to be submitted. Specify the “Page Items to Submit” and click Next. In this case, specify P<n>_DEPARTMENT_ID because its value has changed and needs to be set in session state in order for the SQL query to be able to bind in the new value and return the appropriate location.
6. Select the item that will be populated when the dynamic action is fired. In this case, P<n>_LOCATION_ID will be set. Click Create.

You can watch the demonstration of some Dynamic Action examples by opening the /home/oracle/labs/demos/les19_dynamicActions_Examples.html file.

Submitting the Page When Button Is Clicked



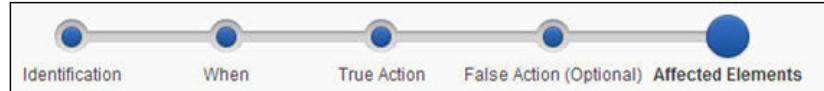
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can create a dynamic action to be fired when a button is clicked. Consider a situation when you are submitting a page by clicking a Save, Apply Changes, or Create button. It takes a few seconds for the page processing to complete and the resulted page to be displayed. Within these few seconds it is possible for the user to click the button again or make some other changes. This can lead to data integrity issues and also increase the response time if the button is clicked again and again. To avoid this situation, you can create a dynamic action to be fired when a button is clicked, which will disable the current page so that the user cannot make any changes. The example in the slide shows a form for Update. A dynamic action is defined to fire when the Save button is clicked. It displays a disabled page and also a progress bar. The progress bar appears when the submit page is executed. After the page processing is complete, the resulted page is displayed.

Disabling a Button When Clicked: Overview

When	Event: Click Selection Type: Button Button: SAVE
Actions(s)	Submit Page
Settings	Request/Button Name: SAVE



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a dynamic action on a button, perform the following steps:

1. Navigate to the page that contains the button for which you want to create a dynamic action. In the tree view, right-click the button and select Create Dynamic Action.
2. Enter a name for the dynamic action and click Next.
3. Most of the fields on the next wizard page are prepopulated. In this case, you do not want to base the dynamic action on a particular condition, so you can accept the defaults and click Next.
4. Select an action. In this case, Submit Page is selected. Enter the request that should be passed in the Request/Button Name field.
5. Click Create.

Refreshing the Data in a Report Using Custom Filters

The screenshot shows two views of an interactive report. On the left, a sidebar lists departments: Accounting, Administration, Benefits, Construction, Contracting, Control And Credit, Corporate Tax, Executive, Finance, Government Sales, Human Resources, IT, IT Helpdesk, IT Support, Manufacturing, and Ernst. The 'Executive' item is selected and highlighted with a blue border. On the right, the main report area displays employee data for the 'Executive' department. The columns are Employee Id, First Name, Last Name, Email, Phone Number, Hire Date, and Job Id. The data includes rows for Steven King, Neena Kochhar, and Lex De Haan.

Last Name	Email	Phone Number	Hire Date	Job Id
King	SKING	515.123.4567	17-JUN-87	AD_PRES
Kochhar	NKOCHHAR	515.123.4568	21-SEP-89	AD_VP
De Haan	LDEHAAN	515.123.4569	13-JAN-93	AD_VP
Hunold	AHUNOLD	590.423.4567	03-JAN-90	IT_PROG
Bernst	BERNST	500.423.4568	21-MAY-01	IT_PROG

Filtering the report based on department

This screenshot shows a more detailed view of the report. The sidebar now includes additional filters: AC_ACCOUNT, AC_MGR, AD_ASST, AD_PRES, FLACCOUNT, FL_MGR, HR REP, IT_PROG, MK_MAN. The 'AD_VP' item is selected. The main report area shows employees Steven King, Neena Kochhar, and Lex De Haan, each associated with their respective department and job roles.

Employee Id	First Name	Last Name	Phone Number	Hire Date	Job Id
100	Steven	King	515.123.4567	17-JUN-87	AD_PRES
101	Neena	Kochhar	515.123.4568	21-SEP-89	AD_VP
102	Lex	De Haan	515.123.4569	13-JAN-93	AD_VP

Filtering the report based on department and job



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Dynamic actions can handle AJAX-based filtering of report data. The approach is slightly different depending on whether your report is a classic or an interactive report.

The example in the slide demonstrates how custom filters can be added to reports, very easily with dynamic actions. When either a Department or Job is selected, the report is refreshed by AJAX to show the newly scoped employees. To achieve this, the report contains one dynamic action that refreshes the report after either a different Department or a Job has been selected. This makes use of the Refresh action.

The example in the slide uses an interactive report. For interactive reports, perform the following steps to create AJAX-based filtering:

1. Create a page with a report region, ensuring the page item filters are referenced in the SQL.
2. Create the page items for filtering.
3. Create the dynamic action so that it fires whenever any of the page item filters value changes in order to refresh the interactive report region.
4. Define the interactive report region to save these items' values in session state after the region is refreshed.
5. Make sure #REGION_STATIC_ID# is set in the Region Template.

Refreshing the Data in a Report Using Custom Filters: Overview

1. Create a page called Refresh Employee Report with an interactive report region.
2. Select Region without Buttons and Titles for region template and make sure the Region Template contains `id=#REGION_STATIC_ID#`.
3. Create another region with two page items called `P<n>_DEPARTMENT_ID` and `P<n>_JOB_ID`.
4. Create a dynamic action and specify the following in the wizard:

Event	Change
Selection type	Item(s)
True Action	Refresh

5. Update the interactive report region to save the items' values in session state after the region is refreshed.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The slide provides the steps necessary to produce a report that refreshes the data based on custom filters.

Refreshing the Data in a Report Using Custom Filters

The screenshot illustrates the configuration of a report region in APEX. On the left, the 'Regions' tree shows a 'Regions' node with a 'Body (3)' item. The third item is a 'Quick Filters' region. Inside this region, there are two filter items: 'P2_DEPARTMENT_ID' and 'P2_JOB_ID'. Each item has a 'Dynamic Actions' section containing a 'Quick filter refresh' item with a 'True' option and a 'Refresh' button. Below the filters is a 'Sub Regions' section with 'Employee' and 'Report Col' items.

On the right, the 'Region Template for Report' is displayed. It contains two SQL queries:

```

select department_name d, department_id r
from oe/hr_departments
order by 1

```

```

select distinct job_id d, job_id r
from oe/hr_employees
order by 1

```

Below the queries is a 'Template' code snippet:

```

<section class="uRegion uNoHeading #REGION_CSS_CLASSES# clearfix">
#REGION_STATIC_ID#
<div class="uRegionContent clearfix">
#BODY#
</div>
</section>

```

At the bottom, a preview of the report is shown. It features a 'Quick Filters' header with dropdowns for 'Department' and 'Job'. The main area displays a table of employee data:

	Employee Id	First Name	Last Name	Email	Phone Number	Hire Date
	100	Steven	King	SKING	515.123.4567	17-JUN-03
	101	Neena	Kochhar	NKOCHHAR	515.123.4568	21-SEP-03
	102	Lex	De Haan	LDEHAAN	515.123.4569	13-JAN-04

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

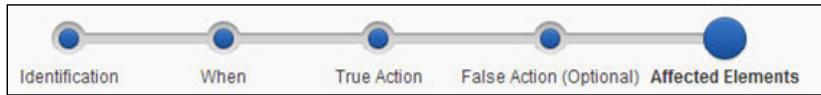
In this example, first create a page with an interactive report region. You must ensure that the Region Template is set to some template that contains the #REGION_STATIC_ID# substitution string. This is because, dynamic actions need this ID to be able to perform the refresh. Most of the new themes in Application Express default to an appropriate template when creating new interactive report regions. However, if you are using an old theme, then you may need to select an appropriate template. For example, you can use the Region without the Buttons and Titles templates.

The example in the slide shows the source SQL query of the interactive report.

In this example, you also create a Quick Filters region. In this region, you create two filter items P<n>_DEPARTMENT_ID and P<n>_JOB_ID to filter the employee report by department name and job ID. The slide shows the List of Values definition for the P<n>_DEPARTMENT_ID and P<n>_JOB_ID items.

Refreshing the Data in a Report Using Custom Filters: Overview

When	Event: Change Selection Type: Region Item(s): <code>P<n>_DEPARTMENT_ID, P<n>_JOB_ID</code> Condition: <code>none</code>
Action(s)	True: Refresh
Affected Elements	Selection Type: Item(s) Region: <code><report region name></code>



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create the dynamic action, perform the following steps:

1. Edit the page and right-click the Dynamic Actions node. Select Create.
2. Enter a name for the dynamic action, and click Next.
3. Select Change for Event and enter `P<n>_DEPARTMENT_ID, P<n>_JOB_ID` for Item(s). Accept the defaults and click Next. These selections define that the dynamic action will fire whenever the value in the department or job list changes.
4. Select Refresh for Action. The Refresh action currently supports interactive report regions, classic reports, and all item types with cascading LOV support. It also supports item or region plug-ins, depending on whether the plug-in author has coded the plug-in accordingly. Ensure that the Fire On Page Load check box is deselected. Click Next.
5. On the Affected Elements page, you define what will be refreshed. Select Region from the Selection Type drop-down list and the report region from the Region drop-down list. Click Create. If you run the page now, you notice that the filtering is not working as expected.

The dynamic action is firing and the report is being refreshed, but it is not being scoped by the filter selection. The problem is that the values for the filter page items are not being saved to session state and are, therefore, not set when the report's SQL is executed.

Perform the following steps to define the interactive report region to save these items' values in session state after the region is refreshed:

1. Right-click the Report Region and select Report Attributes.
2. Under Source, enter `P<n>_DEPARTMENT_ID`, `P<n>_JOB_ID` for Page Items to Submit. Click Apply Changes.

Now if you run the page, you see that the filters are fully functional. Select different job IDs and departments and see the refreshed report, which shows employees scoped by your selections.

You can watch the demonstration of refreshing the data using custom filters by opening the `/home/oracle/labs/demos/les19_dynamicactions_customfilters.html` file.

Quiz

Which of the following would be implemented as a dynamic action?

- a. Showing and hiding an item based on the changing of another item's value
- b. Setting an item's value when another element is clicked
- c. Refreshing a report based on the changing of an item's value
- d. Enabling an item based on the changing of another item's value
- e. All of the above



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: e

Quiz

In the Create Dynamic Action Wizard, if you select Change for event type, the dynamic action would fire when:

- a. The pointing device button is clicked over the triggering element
- b. The triggering element loses focus by tabbing out of the element
- c. The user selects some text in a text field
- d. A control loses the input focus and its value has been modified since gaining focus



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: d

Workshop 19-1 Overview: Creating and Using Dynamic Actions

This workshop covers creating and using the following dynamic actions:

- Hide and show an item based on the value of another item
- Changing the class when an item is null
- Setting the value of an item when another item changes
- Submitting the page when button is clicked
- Refreshing the data in a report using custom filters



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Using Dynamic Actions
- Using Plug-Ins
 - What Is a Plug-In?
 - Importing and Installing a Plug-In
 - Reviewing the Plug-in Definition
 - Using an Item Plug-in on Your Page
 - Plug-in Examples

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Is a Plug-In?

Item plug-in example

Employee Details

First Name	Diana
Last Name	Lorentz
Email	DLORENTZ
Phone Number	590.423.5580
Hire Date	07-FEB-99
Job Id	IT_PROG
Salary	4200
Commission Pct	
Manager Id	103
Department	IT
Location	Southlake
Rating	<input type="radio"/> <input checked="" type="radio"/>
	<input type="button" value="5"/>



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Plug-ins enable developers to declaratively extend the built-in types available with Application Express and share and reuse them.

Application Express supports a set group of item, region, dynamic action, and process types. Plug-ins offer a means of augmenting these built-in types by declaratively creating and using new types in your application. Because plug-ins are designed for reuse, developers can export them from and import them into other applications in the same or other workspaces and also share them with the Application Express Plug-in community by using the Plug-in Repository.

The process of implementing a plug-in involves the following:

- Create a plug-in in your application workspace or import a plug-in into it.
- Edit or create an item, region, process, or dynamic action type to use the plug-in.
- Run your application to test the plug-in.

The example in the slide shows a Rating plug-in item.

There are a number of plug-ins available in the plug-in repository (accessed from the Plug-in window). To find out more about plug-ins, see the *Application Express User's Guide*.

Steps to Use a Plug-in in Your Application

1. Create or import a plug-in for your application (under Shared Components).
2. Review and/or optimize the plug-in definition.
3. Edit or create an item, region, process. or dynamic action type to use the plug-in.
4. Run your application to test the plug-in functionality.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The slide shows the steps involved in using a plug-in in your application. In this lesson, you import two different plug-ins (Star Rating and Notification) provided in the Plug-in Repository, review the plug-in definition, and make some changes to optimize the use of the plug-ins. You will create appropriate objects on your page that will use the plug-ins and run the page to view their results.

Accessing the Plug-in Repository

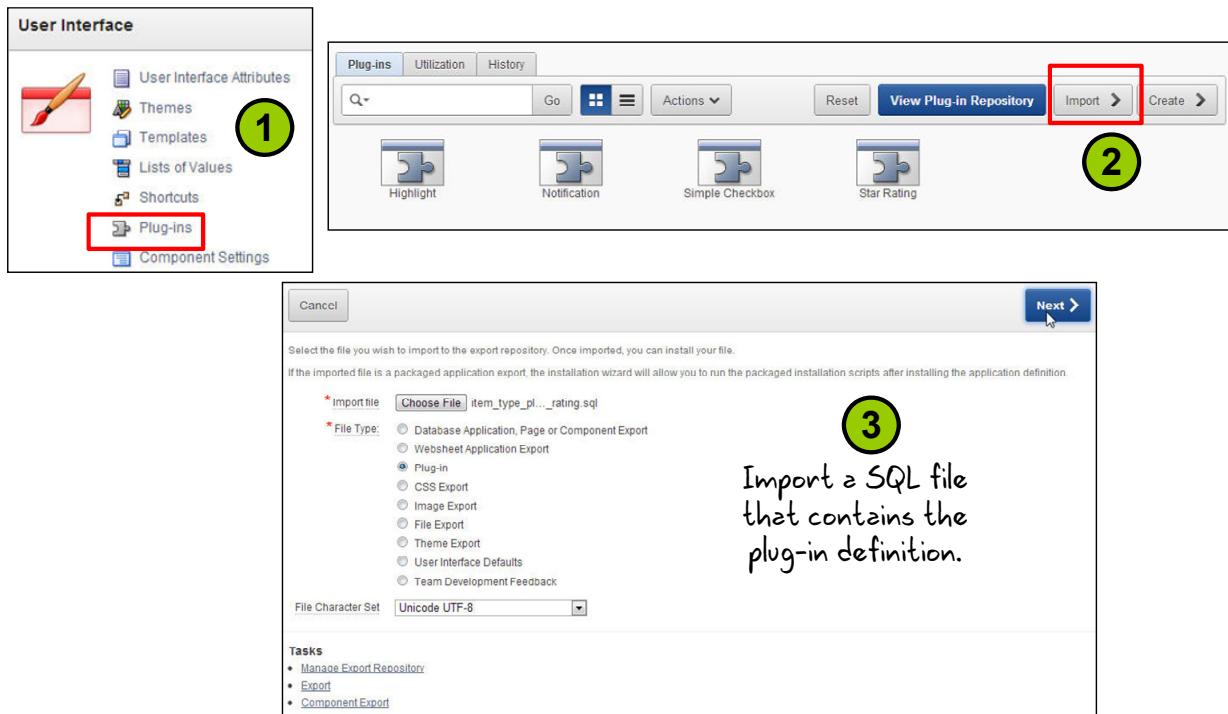
The screenshot shows the Oracle Application Express User Interface. On the left, there is a sidebar titled 'User Interface' with icons for User Interface Attributes, Themes, Templates, Lists of Values, Shortcuts, and Plug-ins (which is highlighted with a red box). The main area shows a 'Plug-ins' tab selected in a navigation bar. Below the navigation bar are four plug-in components: 'Highlight', 'Notification', 'Simple Checkbox', and 'Star Rating'. A red box highlights the 'View Plug-in Repository' button in the top right corner of the main area. The main content area is titled 'Oracle Application Express Plug-Ins' and contains a brief description of what plug-ins are, followed by a list of available items. One item, 'Star Rating', is expanded to show its details: Minimum Release: 4.0, Version: 1.0, Released on: 23-Jun-2010, Links: Demonstration, and Download: star_rating_v_1_0.zip.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The Plug-in Repository provides a series of available plug-ins developed by Oracle that can be used by customers to perform various tasks. This repository continues to be updated with additional plug-ins for use by the Oracle Application Express user community.

Importing a Plug-In



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To use a plug-in in your application, you import or create it under Shared Components. To import a plug-in, perform the following steps:

1. Navigate to your application's Shared Components page. Under User Interface, select Plug-ins.
2. Click Import.
3. Select your plug-in import file and click Next.

Installing a Plug-In

The export file has been imported successfully.
If you wish to Install now, click [Next >](#).
You can also install this file at a later time by navigating to the Export Repository.

Current Application
Application: 101012

Tasks

- [Manage Export Repository](#)
- [Preview File](#)

When you install a plug-in into the current application, the new plug-in will overwrite an existing installation of the plug-in becomes permanent. If any errors are encountered, the actions are:

Export File Version:	2010.05.13
Name:	Star Rating
Internal Name:	COM.ORACLE.APEX.STAR_RATING
Install Into Application:	101012 Dynamic Actions Lesson for Workshop I
Action:	Existing plug-in in application 101012 will be replaced.

4

After you import the file, you must install it.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

4. After the file is imported, click Next to install it.
5. Select the application that you want to install the plug-in into, and click Install Plug-in.

Reviewing a Plug-in Definition

The screenshot shows the Oracle Application Express interface for reviewing a plug-in definition. The main window is divided into several sections:

- Name:** Contains fields for Name (Star Rating), Internal Name (COM.ORACLE.APEX.STAR_RATING), and Type (Item).
- Subscription:** Shows a message indicating it is the "master" copy of the plug-in, with no other plug-ins subscribed.
- Source:** Displays PL/SQL code for rendering star ratings based on configuration parameters.
- Callbacks:** Lists Render Function Name (render_star_rating), AJAX Function Name, and Validation Function Name (validate_star_rating).
- User Interfaces:** Shows supported devices: Desktop and jQuery Mobile Smartphone.
- Standard Attributes:** A list of checkboxes for various widget attributes.
- Custom Attributes:** A table for defining custom attributes with columns for Scope, Attribute, Sequence, Label, Type, Required, and Depending on.
- Files:** A table listing files with their file names, mime types, file sizes, and download links.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To review the contents of a plug-in, from Shared Components > Plug-ins for your application, click the plug-in icon. Some of the sections that appear in the definition include:

- **Name:** Provides a name for the plug-in, an internal name, and type of plug-in it represents. In this case, the Star Rating plug-in is an Item type plug-in.
- **Callbacks:** Provides the name of the functions specified in the Source section that should be executed to render and validate the plug-in. In addition, you can call an AJAX function that behaves the same way as an on-demand process and can access the generic `apex_application.g_x01 - g_x10` global variables to transfer data from the browser to the back end. It can also read and set session state as an On-Demand process does.
- **Standard Attributes:** Contains a list of functions that are available for use with a plug-in. The items that are selected are needed for the Star Rating plug-in.

- **Custom Attributes:** Are used to prompt the developer for additional data in the Builder when the plug-in is used. In the Star Rating example, you want a wizard window to appear and prompt the user for the number of stars the user wants to appear when the page is displayed.
- **Files:** Displays the images, style sheet, and JavaScript files needed for this plug-in to run successfully.

Using an Item Plug-in on a Page

A component from your plug-in definition →

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After the plug-in is made available to the application, you can use it. Perform the following steps to create an item plug-in:

1. From your Page definition, right-click Items and select Create Page Item.
2. Select the item type of the plug-in and click Next. Note that this option appears because “Is Visible Widget” was selected in the Standard Attributes section of the plug-in definition.
3. Select the plug-in you want from the list and click Next. In this case, you select the Star Rating plug-in.
4. Enter an Item Name and click Next.
5. Accept the defaults and click Next.
6. Select whether the value for the item is required and the number of stars you want to show and click Next. Note that this wizard page was launched from the Custom Attributes section in the plug-in definition.
7. Select Database Column for Source Type and enter the column in the table you want the value to be stored in. Note you may need to create a new column with a data type of number(2) to store the value.

Quiz

Which of the following can be implemented by using a plug-in?

- a. Showing an item that has a particular format
- b. Changing the value of an item based on another item value
- c. Fading in and out an item
- d. Enabling or disabling an item



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a, c

b and d are dynamic actions.

Additional Plug-in Examples

- Adding a Checkbox Item
- Displaying Notification Message When Item Clicked
- Changing and Highlighting an Item When Another Item Changes
- Setting the Value of an Item When Other Item(s) Change



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

There are several plug-ins in the plug-in repository (accessed from the Plug-in window). You examine some additional examples provided in the slide.

To find out more about plug-ins, see the *Application Express User's Guide*.

Adding a Checkbox Item

Checkbox item plug-in

The screenshot shows two parts of the Oracle Application Express interface. On the left, a configuration dialog for a checkbox item is displayed:

- Page:** 3 - Employee Details
- Item Name:** P3_ACTIVE_YN
- Display As:** Simple Checkbox [Plug-in]
- Value Required:** No
- * Checked Value:** Y
- Unchecked Value:** (empty)
- Checkbox Label:** (empty)

On the right, the resulting page titled "Employee Details" is shown. It contains various employee details fields (First Name, Last Name, Email, Phone Number, Hire Date, Job Id, Salary, Commission Pct, Manager Id, Department, Location, Rating) and a checkbox labeled "Active?" which is checked.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

From the Plug-in Repository, you can download the Checkbox item plug-in and import it the same way that you imported the Star Rating plug-in earlier in this lesson. After the plug-in is imported, you can use it on your page.

When creating an item that uses the Checkbox item plug-in, you need to specify the settings that are specific to the plug-in, in this case, the checked and unchecked values and a check box label if so desired.

Displaying a Notification Message When an Item is Clicked

Notification Dynamic Action plug-in

The following action will fire when the 'When Condition' is met or when 'No Condition'

Page:	3 - Employee Details
Name:	Show email
Action:	Notification [Plug-in]
Show , Hide , Enable , Disable , Set Value	
Fire On Page Load	<input type="checkbox"/>
Settings	
* Title:	Email Notification
Your email is &P3_EMAIL.	
* Text:	<input type="text"/>
Image URL:	<input type="text"/>
Sticky:	No
Hide After x Seconds:	4

Employee Details

First Name:	Diana
Last Name:	Lorentz
Email:	DLORENTZ
Phone Number:	590-423-5580
Hire Date:	07-FEB-99
Job Id:	IT_PROG

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The Notification Dynamic Action plug-in is invoked when the dynamic action fires. In the example in the slide, you create a dynamic action that uses the notification plug-in. In this case, the user clicks the email field and a notification is displayed.

Perform the following steps:

1. Right-click the email item and select Create Dynamic Action.
2. Enter a name and click Next.
3. Select Click from the list of Events and click Next. Note that because you right-clicked the item to create the dynamic action, the Item(s) field is already populated. If you created a dynamic action in the dynamic action area, your item would not have been listed. Select Notification (Plug-in) from the list of Actions.
4. Notice that the Settings area is displayed, which contains the custom attributes defined for the Notification plug-in. Enter Email Notification for Title and Your email is &P<n>_EMAIL. for Text. You can control the fade in and fade out by specifying the number of seconds and whether to show a Sticky. Then click Next. Note that the plug-in supports the &P<n>_EMAIL. substitution syntax, which is substituted during page rendering and also the #P<n>_EMAIL# substitution syntax that reads the current value from the browser. If the value is changed, it would be better to use the #P<n>_EMAIL# syntax; otherwise, the notification will still show the old value.
5. Click Create.

Changing and Highlighting an Item When Another Item Changes

Highlight Dynamic Action plug-in

Employee Details	
First Name	Diana
Last Name	Lorentz
Email	DLORENTZ
Phone Number	590.423.5580
Hire Date	07-FEB-99
Job Id	IT_PROG
Salary	4200
Commission Pct	
Manager Id	Gietz
Department	Accounting
Location	Purchasing
Rating	4

Employee Details	
First Name	Diana
Last Name *	Lorentz
Email *	DLORENTZ
Phone Number	590.423.5567
Hire Date *	07-FEB-1999
Job Id *	IT_PROG
Salary	4200
Commission Pct	
Manager Id	Alexander
Department	Purchasing
Location	Seattle



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The Highlight Dynamic Action plug-in is invoked when the dynamic action fires. In the example in the slide, you create a dynamic action that highlights the Manager item when the value of Department changes.

Changing and Highlighting an Item When Another Item Changes: Overview

In this example, perform the following steps:

1. Create a cascading LOV to restrict the list of managers by the department selected.
2. Create a dynamic action and specify the following in the wizard:

When	Event: After Refresh Selection Type: Item(s) Item(s): P<n>_MANAGER_ID
Actions(s)	Action: Highlight [Plug-in]
Affected Elements	Selection Type: Triggering Element

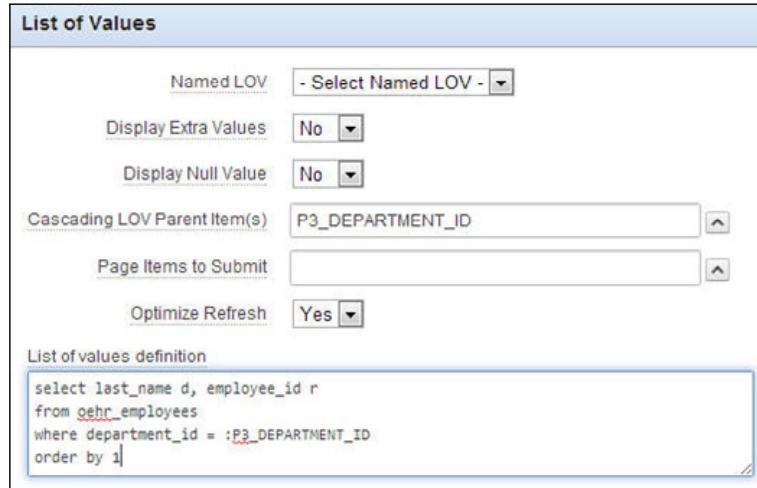


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In order to perform this type of example, you must first create a cascading LOV, which shows only the Managers for a particular Department. Then you create a dynamic action, which highlights Manager after the item is refreshed.

This example uses the Highlight plug-in action. The Highlight plug-in should already be imported into your application.

Creating a Cascading LOV



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

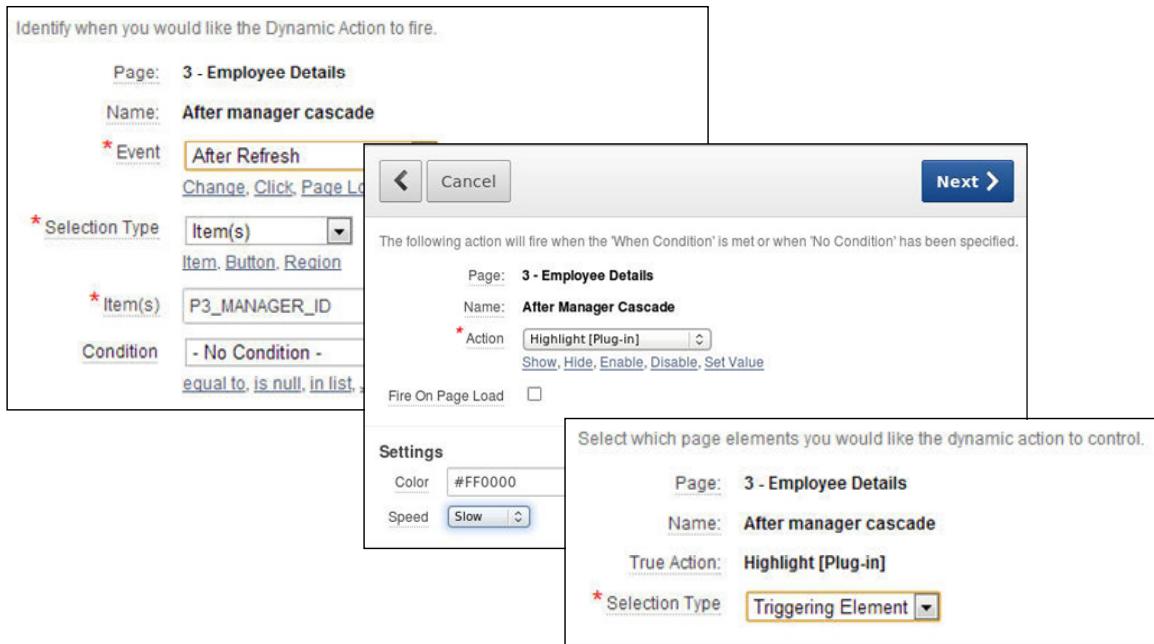
Perform the following steps:

1. Navigate to the page definition. Right-click the page item on which you want to create the cascading LOV. Select Edit. In this example, right-click P<n>_MANAGER_ID and select Edit.
2. Click the List of Values tab.
3. Select No for Display Extra Values and Display Null Value.
4. Cascading LOV Parent Item(s) should be prepopulated. For example, in this example, you can see P<n>_DEPARTMENT_ID.
5. Enter the "List of values definition." In the example in the slide, the code entered is:

```
select last_name d, employee_id r from oechr_employees
where department_id = :P<n>_DEPARTMENT_ID
order by 1
```

6. Click Apply Changes.

Creating a Dynamic Action that Uses the Highlight Plug-In



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create the dynamic action, perform the following steps:

1. In the example in the slide, because you want the dynamic action to be fired when the Manager field is refreshed, right-click `P<n>_MANAGER_ID` and select Create Dynamic Action.
2. Enter a name for the dynamic action.
3. Specify when you would like the dynamic action to fire. Select After Refresh for Event. Select Item(s) for Selection Type. Note that the Item(s) should be prepopulated with `P<n>_MANAGER_ID`. Accept the default and click Next.
4. Select the action that should fire when the condition is met. In this example, select Highlight [Plug-in] from the Action drop-down list. Depending on your application configuration, you may also have additional plug-in dynamic actions available here. Ensure that the Fire On Page Load check box is not selected.

5. Under Settings, enter the color code and select the Speed type. In this example, enter #FF0000 for Color and select Slow for Speed. When the MANAGER_ID field is refreshed, it is highlighted with this color to indicate that it has changed.
6. Select the page element type that triggers the dynamic action. In this example, select Triggering Element and click Create.

Setting the Value of an Item When Other Item(s) Change

Employee Details	
First Name	Diana
Last Name *	Lorentz
Email *	DLORENTZ
Phone Number	590.423.5567
Hire Date *	07-FEB-1999
Job Id *	SA_REP
Salary	4200
Commission	1050

When **Job Id** or **Salary** changes,
the commission percentage is
recalculated and highlighted



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The example in the slide demonstrates a similar example using a Set Value dynamic action with a PL/SQL Function Body Set Type. The CALC COMMISSION dynamic action fires when either the JOB_ID or the SALARY page items change. Upon change, the dynamic action does the following:

- First, an AJAX call is fired that retrieves the calculated commission (based on the current values for JOB_ID and SALARY) from calling a PL/SQL function. The COMMISSION page item is then set to the calculated commission.
- Next, the COMMISSION page item is highlighted to show that an update has occurred.

This example uses the Highlight plug-in action. The Highlight plug-in should already be imported into your application.

Setting the Value of an Item When Another Item Changes: Overview

1. Create the PL/SQL Function:

The screenshot shows the Oracle SQL Workshop interface. In the top navigation bar, 'SQL Workshop' and 'SQL Commands' are selected. Below the toolbar, there is a code editor window containing the following PL/SQL code:

```

create or replace function getCommission(pSalary number, pJob_id varchar2)
return number is
    l_multiplier number;
begin
    -- determine multiplier based on job
    case pJob_id
        when 'MK_MAN'      then l_multiplier := .2;
        when 'MK_REP'       then l_multiplier := .3;
        when 'AD_VP'        then l_multiplier := .4;
        when 'AD_PRES'     then l_multiplier := .5;
        when 'SA_MAN'       then l_multiplier := .3;
        when 'SA_REP'       then l_multiplier := .25;
        else                  l_multiplier := .1;
    end case;
    -- return getcommission, which is calculated by multiplying salary my multiplier
    return pSalary * l_multiplier;
end getCommission;

```

Below the code editor, the results pane displays the message "Function created." and "0.01 seconds".

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this example, you run the following PL/SQL function code from the Command window in SQL Workshop as shown in the screenshot in the slide.

```

create or replace function getCommission(pSalary number, pJob_id varchar2)
return number is
    l_multiplier number;
begin
    -- determine multiplier based on job
    case pJob_id
        when 'MK_MAN'      then l_multiplier := .2;
        when 'MK_REP'       then l_multiplier := .3;
        when 'AD_VP'        then l_multiplier := .4;
        when 'AD_PRES'     then l_multiplier := .5;
        when 'SA_MAN'       then l_multiplier := .3;
        when 'SA_REP'       then l_multiplier := .25;
        else                  l_multiplier := .1;
    end case;
    -- return getcommission, which is calculated by multiplying salary my
    -- multiplier
    return pSalary * l_multiplier;
end getCommission;

```

Setting the Value of an Item When Another Item Changes: Overview

2. Create a dynamic action and specify the following in the wizard:

When	Event: Change Selection Type: Item(s) Item(s): P<n>_JOB_ID, P<n>_SALARY
Action	Action: Set Value Set Type: PL/SQL Function Body PL/SQL Function Body: <pre>return getCommission (:P<n>_SALARY, :P<n>_JOB_ID);</pre> Page Items to Submit: P<n>_SALARY, P<n>_JOB_ID
Affected Elements	Selection Type: Item(s) Item(s): P<n>_COMMISSION



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create this type of dynamic action, perform the following steps:

1. In the tree view, right-click the item and select Create Dynamic Action.
2. Enter a name for the dynamic action..
3. Note that the P<n>_JOB_ID Item name is prepopulated. Enter P<n>_SALARY after P<n>_JOB_ID and click Next.
4. Select Set Value for Action.
5. Select PL/SQL Function Body for Set Type. In the PL/SQL Function Body text box, enter the following:


```
return getCommission (:P<n>_SALARY, :P<n>_JOB_ID);
```
6. Enter P<n>_SALARY, P<n>_JOB_ID in the “Page Items to Submit” text field.
7. Select the page element that you would like the dynamic action to control. In this example, you want the commission to change with the change in the job ID and salary values. Therefore, select P<n>_COMMISSION and click Create.

Setting the Value of an Item When Another Item Changes: Overview

3. Add another true action and specify the following in the wizard:

Action	Action: Highlight [Plug-in]
Settings	Color: #FF0000 Speed: Slow
Affected Elements	Selection Type: Item(s) Item(s): P<n>_COMMISSION



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

8. Now you want to add another true action. Under Dynamic Actions, right-click CALC COMMISSION and select Create TRUE Action.
9. Select Highlight [Plug-in] for Action. Ensure that the Fire On Page Load check box is not selected.
10. Under Settings, enter #FF0000 for Color and select Slow for Speed.
11. Under Affected Elements, enter P<n>_COMMISSION for Item(s). Click Apply Changes.

You can watch the demonstration of using plug-ins by opening the /home/oracle/labs/demos/les19_PlugIns.html file.

Workshop 19-2 Overview: Importing and Using Plug-Ins

This workshop covers creating and using a variety of plug-ins.

- Star Rating item plug-in
- Checkbox item plug-in
- Notification Dynamic Action plug-in
- Highlight Dynamic Action plug-in



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Summary

In this lesson, you should have learned how to:

- Create and use dynamic actions
- Import and use plug-ins



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you should have learnt how to create and use dynamic actions and plug-ins in your application.

Using Application Express Printing

20

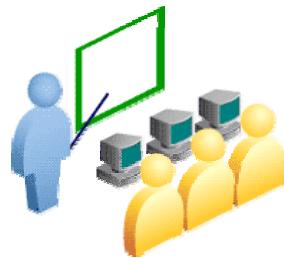
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to:

- Describe the Application Express printing architecture
- Customize and print a standard report
- Create a customized report



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you examine the various ways to create and print reports by using Oracle Application Express.

Lesson Agenda

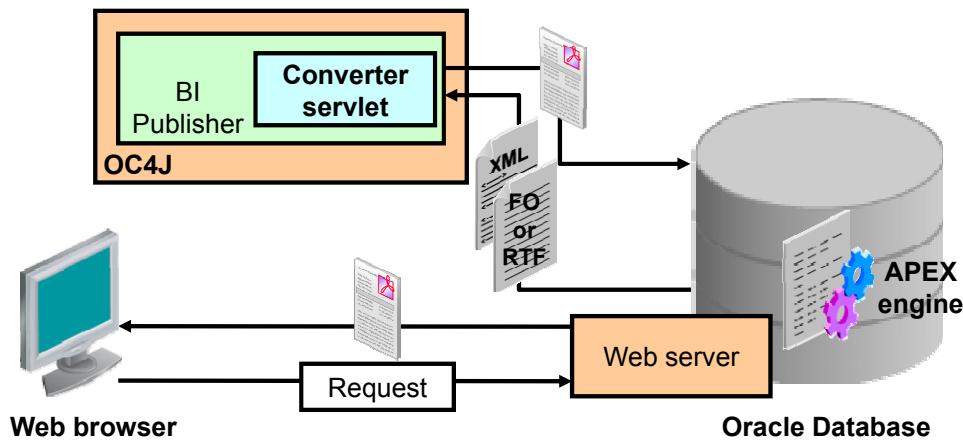
- Understanding Application Express printing architecture
- Customizing and Printing a Standard Report
- Creating a Customized Report

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Report-Printing Configuration Options

- Standard Support: Inherent reporting within Oracle APEX
- Advanced Support: RTF-based report layouts defined in BI Publisher



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Your report server can be Oracle BI Publisher, Oracle Application Server Containers for J2EE (OC4J) with Apache FOP, or another standard XSL-FO processing engine. Oracle BI Publisher provides a higher level of functionality and facilitates “high quality” output requirements including master-detail reports, charts, and multiple reports. To accommodate the difference in functionality, Oracle Application Express provides two report-printing configuration options:

- **Standard Support:** Enables you to print report regions and report queries by using either the built-in templates (provided with a standard XSL-FO processing engine) or other XSL-FO-compatible formats that you provide. The output formats include PDF and XML. This setting does not support rich text format (RTF). Standard Support provides declarative formatting of report regions and report queries with basic control over page attributes, including page orientation, page size, column heading formats, page header, and page footer.
- **Advanced Support:** Requires a valid license of Oracle BI Publisher (also known as Oracle XML Publisher). This setting provides you with all the capabilities of the standard configuration plus the ability to define RTF-based report layouts developed using the BI Publisher Word Template Builder. The output formats include Word, Excel, and HTML.

Producing Reports in Oracle Application Express

Oracle APEX enables you to:

- Export reports to PDF, RTF, XLS, and XML formats
- View and print reports that use a prepackaged query and layout
- Create and use customized report queries and layouts

Top Tier Salary

LAST_NAME	EMAIL	SALARY
Abel	EABEL	11000
Ande	SANDE	6400
Baer	HBAER	10000
Banda	ABANDA	6200
Bates	EBATES	7300
Bernstein	DBERNSTE	9500
Bloom	HBLOOM	10000
Cambrault	NCAMBRAU	7500
Chen	JCHEN	8200
Doran	LDORAN	7500
Ernst	BERNST	6000
Errazuriz	AERRAZUR	12000
Faviet	DFAVIET	9000
Fay	PFAY	6000
Fox	TEFOX	9600
Frapp	AFRAPP	8200
Gietz	WGIE TZ	8300
Grant	KGRANT	7000
Greenberg	NGREENBE	12000
Greenle	DGREENLE	9500
Hall	JPHALL	9000
Higgins	SHIGGINS	12000
Hunold	AHUNOLD	9000

row(s) 1 - 15 of 52 | Next



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can configure a classic report region to print by exporting it to an Adobe portable document format (PDF), a Microsoft Word rich text format (RTF), a Microsoft Excel (XLS) format, or an Extensible Markup Language (XML) format. By taking advantage of region report printing, your application users can view and print reports that have a predefined orientation, page size, column headings, and page header and footer. Interactive reports also have the ability to export to PDF, RTF, Microsoft Excel, and comma-separated values (CSV). Note that for interactive reports, it is not possible to define a custom report layout.

When printing to a PDF, the report data is transformed using an externally defined report server. When the application end user clicks a print link, a request is sent to the Application Express engine. The Application Express engine then generates the report data in XML format and the Report template in the XSL-FO or RTF format. The external reporting engine then transforms the data and the template into a PDF, which displays to the end user by using the conversion servlet that ships with BI Publisher 10.1.3.2 (formerly known as Oracle XML Publisher). Fortunately, this architectural complexity is transparent to both end users and developers. End users just click a print link, and developers declaratively set regions to support PDF printing. Output to other formats operates in the same manner using the necessary conversion servlet.

Note that you must have a valid BI Publisher license to produce your report in Word, Excel, or HTML output formats.

Lesson Agenda

- Understanding Application Express printing architecture
- Customizing and Printing a Standard Report
- Creating a Customized Report



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Standard Report, Print Enabled

- On the Print tab, in the Report region, select Yes for Print Enabled.
- Select the default print format (PDF, Word, Excel, HTML, XML).
- Create the report header and footer.
- Determine the columns to show and format.

```
--<DOCUMENT>
<DATE>17-DEC-12</DATE>
<USER_NAME>USER01</USER_NAME>
<APP_ID>108</APP_ID>
<APP_NAME>Order Management</APP_NAME>
<PAGE_ID>8</PAGE_ID>
<TITLE>Top Tier Salary</TITLE>
<P8_REPORT_SEARCH/>
<P8_ROWS/>
<P8_GO/>
<P8_RESET/>
--<REGION ID="5015528771597562">
--<ROWSET>
--<ROW>
  <LINK01/>
  <LAST_NAME>Abel</LAST_NAME>
  <EMAIL>ABEL</EMAIL>
  <SALARY>11000</SALARY>
</ROW>
--<ROW>
  <LINK01/>
  <LAST_NAME>Ande</LAST_NAME>
  <EMAIL>SANDE</EMAIL>
  <SALARY>6400</SALARY>
</ROW>
--<ROW>
  <LINK01/>
```



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This type of report is the most basic of all the types and very easy to produce. You can produce this report in different formats (PDF, Word, Excel, HTML, XML) and you can create a header and footer and determine which columns show and their format (color, spacing, and so on) on the report. When the Print Enabled option is set to Yes, a Print link appears at the bottom of your report. When selected, the report is produced in the default format selected.

Standard Report, with Derived Output

1. Create an item to produce a select list of formats.
2. Select Derived From Output for Output Format and specify the item.
3. Create a button and branch to print.

LAST_NAME	FIRST_NAME	SALARY
Hunold	KATHRINE	9000
Ernst	MATTHIAS	6000
Greenberg	NGREENBERG	12000
Faviet	DFAVIET	9000
Chen	JCHEN	8200
Sciarrra	ISCIARRA	7700
Urman	JMURMAN	7800
Popp	LPOPP	6900
Raphaely	DRAPHEAL	11000
Weiss	MWEISS	8000
Fripp	AFRIPP	8200
Kaufling	PKAUFLIN	7900
Vollman	SVOLLMAN	6500

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This type of report allows the output format to be changed at run time.

To produce this type of report, perform the following steps:

1. Create a select list item to store the valid formats the user can select from.
2. Click the Print Attributes tab for the report region. Select Derived From Output for Output Format and select the item you created for Item.

When the page is run, the user can select the desired format, and then click the Print link at the bottom of the report.

You can also create a button to produce the report based on the output format rather than clicking the Print link at the bottom of the report. When you create the button, select the Download Printable Report Query action so that it creates a branch. Then specify that the report query must execute from the branch when the button is clicked.

You can view the demonstration of printing a standard report with derived output by opening the `/home/oracle/labs/demos/les20_printing_std_report.html` file.

Quiz

With standard report, you can create a header and footer and determine which columns show and their format on the report.

- a. True
- b. False



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a

Workshop 20-1 Overview: Printing a Standard Report with Derived Output

This workshop covers the following topics:

- Enabling printing of a custom report
- Creating an output format item
- Deriving the printing of the report based on the item



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Understanding Application Express printing architecture
- Customizing and Printing a Standard Report
- Creating a Customized Report

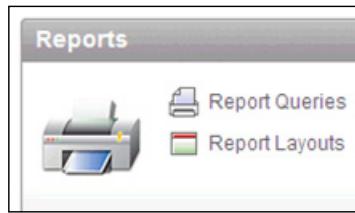
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Report Queries

Characteristics:

- SQL statements (one or more) are used to create a report.
- Report queries can be associated with report layouts. If no report layout is specified, a generic layout is used.
- Report queries can be integrated in different parts of your application (such as button, list item, branch, or other components that allow URLs as targets).



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can print a report region by defining a report query as a shared component. Unlike SQL statements contained in regions, report queries are not validated to ensure that they are formatted correctly and the objects they reference exist. With report queries, the query is used to generate the file that you create to build a template. Note that report queries must be SQL statements, not functions returning SQL statements.

You can associate a report query with a report layout and download it as a formatted document. If no report layout is selected, a generic layout is used. The generic layout is intended to be used to test and verify a report query. When using the generic layout option and multiple source queries are defined, only the first result set is included in the print document. The reports can include the session state of the current application.

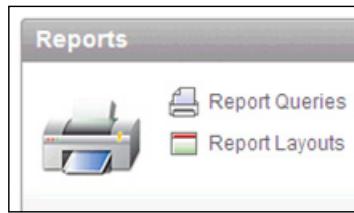
To make these reports available to end users, you integrate them with an application. For example, you can associate a report query with a button, list item, branch, or other navigational components that allow you to use URLs as targets. Selecting that item initiates the printing process.

Report Layouts

Using report layouts, you can customize the look of the report.

Options:

- Default XSL-FO layout
- Customize default XSL-FO layout
- RTF or XSL-FO report layouts (requires Oracle BI Publisher or OC4J with Apache FOP)



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To format a classic report region or report query, you associate it with a report layout. Using report layouts renders the data in a printer-friendly format. If you do not select a report layout, a default XSL-FO layout is used. The default XSL-FO layout is always used for the download function, which is a standard format for printing documents.

When creating and using report layouts, you can:

- Use a default layout for report regions and generic layouts for report queries
- Use the built-in XSL-FO-based layouts for report regions by copying and customizing the code. You can edit a number of attributes for report regions that control page size, fonts, colors, and so on.
- Create RTF or XSL-FO report layouts to customize the look and feel of the report. To use RTF report layouts, your Oracle Application Express service administrator must select the Advanced setting for your site.
- Create a new report layout based on one of these options:
 - **Generic columns:** A generic report layout works with most query result sets. With this layout, the number of columns is automatically adjusted when generating the printable document.

- A number of report layout attributes can be defined declaratively for report regions by using the built-in XSL-FO default layout. This step allows for creating customizable copies of the built-in default XSL-FO layout, if additional control over the report layout is needed.
- **Named columns:** A named column report layout is a query-specific report layout designed to work with a defined list of columns in the query result set. This type of layout is used for custom-designed layouts when precise control of the positioning of page items and query columns is required.

Note that the availability of the report layout options depends on how your site administrator configured the report printing settings at your site. All options described in these steps may not be available to you.

Creating a Report for Download

To create a report for download:

1. Create a report query.
2. Create an RTF template.
3. Create the report layout.
4. Link the report to your application.

Product Id	Product Name	Product Status	List Price
1772	HD 9.1GB @10000	orderable	456
2414	HD 9.1GB @10000 /I	orderable	454
2415	HD 9.1GB @7200	orderable	359
2395	32MB Cache /M	orderable	123
1755	32MB Cache /NM	orderable	121
2406	64MB Cache /M	orderable	223
2404	64MB Cache /NM	orderable	221



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The report query identifies the data to be extracted from the application. The report layout identifies where and how it should be displayed. To create a customized report, you can create both a report query and a report layout. The steps are as follows:

1. Create a report query.
2. Create an RTF template by using Oracle BI Publisher Desktop. Oracle BI Publisher Desktop is a tool that you use in Microsoft Word.
3. Create a report layout.
4. Link the report to your application page.

Creating a Report Query

Screenshot 2: Basic Report Configuration

Specify a name for your report query and select the output format. When using Oracle BI Publisher as the print server, you have a choice of exporting your report to PDF, Microsoft Word, Microsoft Excel and HTML. You can also allow the user to choose the output format at runtime using a page item to set the format. The name of the report query will be part of the request string in the URL used to download the report query. You can include session state of your current application in your report. Select this when you want to show additional data with your report. For example, you might want to include order header information along with order details in an order form.

* Report Query Name: multiquery
Output Format: PDF
Item:
View File As: Attachment
Session State: Include application and session information

Screenshot 4: Source Query Definition

Report queries can be formatted using RTF and XSL-FO based report layouts. From this page, download the report result set in XML format or download the XML Schema definition of your report query. If you use Oracle BI Publisher as your print server, you can then use its Microsoft Word plug-in to design your layout based the XML representation of your report or based on the XML Schema definition. The plug-in has a drag-and-drop interface that simplifies layout design. A report query can contain multiple source queries if you want to combine several different result sets in your report layout. Click the Add Query button to add additional source queries.

Report Query Name: multiquery
Data Source for Report Layout: XML Data XML Schema
Download
Source Query Definition

```
select product_id, product_name, product_status, list_price
from oepr_product_information
```

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a report query, perform the following steps:

1. From Shared Components for your application, under Reports, select Report Query. Click Create.
2. Enter a name for your report query and select:
 - The output format this report query requires
 - Whether you want the file to be viewed as an attachment or inline (in the browser)
 - Whether you want to include the session state information
Click Next.
3. Enter the SQL statement that will be executed when the report is run and click Next.
4. You can add multiple source query definitions. To add a query, click Add Query.
5. If you plan to create a customized report layout, you can download the data source by clicking Download and saving the file that is used to create the RTF template.
6. If you already have created the report layout, click Next. Select the existing report layout and click Next.
7. On the last page, you view the URL that is invoked to run the report. Click Test Report.
8. Click Finish.

Creating the Report Layout

After completing your report layout, you need to save it as an RTF or XSL-FO file. Then upload the file back into Application Express using the **Browse** button on this page. The file is stored as a report layout among the shared components of your application.

Report Layout Source: Create file based report layout

Layout Name: multiquery

Report Layout File: /home/oracle/labs/files/multiquery.rtf

A report query can be downloaded as a PDF document, a Word document (RTF based), an Excel Spreadsheet (HTML based) or as a HTML file. To integrate the document with your application, you can select the report query as the target for buttons or list items or integrate it in other places using the download URL as the target.

Query Name: multiquery

Report Layout: multiquery

Output Format: PDF

Derive from Item:

URL (To integrate this report, use the URL below as target for buttons, list items, etc):
?p=&APP_ID.:0.&SESSION.:PRINT_REPORT=multiquery

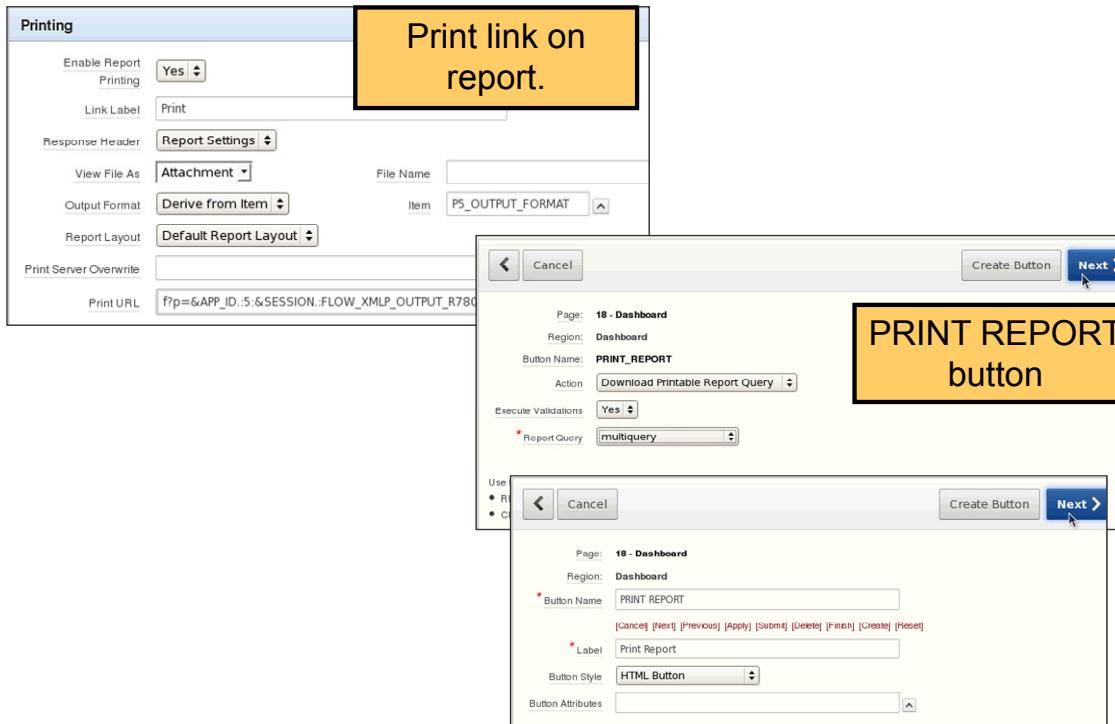
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can upload the RTF to create your report layout and change the report query to use this layout. Perform the following steps:

1. From Shared Components for your application, under Reports, select Report Layouts.
 2. Click Create.
 3. Select Named Columns (RTF) and click Next.
 4. Enter a name for the report layout, select the RTF file to upload, and click Create Layout.
 5. Select the Shared Components breadcrumb.
 6. Under Reports, select Report Query.
 7. Select the report query that you created in step 1.
 8. For Report Layout, select the report layout you just created and click Apply Changes.
- To test the report, perform the following steps:
1. Select the report query again.
 2. In the Attributes section, click Test Report.

Linking the Report to Your Application



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

One approach to printing a report region is to configure Print Attributes. After they are configured, these attributes apply only to the current region and cannot be used outside the context of the region. The other approach is to add another Page component, such as a button that executes the report query and layout.

To associate the report layout with the Print link on the report, perform the following steps:

1. Navigate to the page that contains the report you created previously.
2. Right-click the regions node and select Edit Print Attributes.
3. For Report Layout, select the report layout you just created and click Apply Changes.
Note: Because the query is defined for the report itself, the report query you created in Shared Components is not used in this case.

To create a button to invoke the report query and report layout, perform the following steps:

1. On the Page Definition page, select the region where you want the button and click Create Region Button. Click Next.
2. Enter a name for the button, accept the default button template, and click Next.
3. Accept the default display properties and click Next.

4. Select Download Printable Report Query for Action and the Report Query you created previously. Click Create Button.

Note: Because the report layout is assigned to the report query, Application Express knows what layout to use.

You can view the demonstration of printing a report with multiple queries by opening the `/home/oracle/labs/demos/les20_creating_pdfreport_multiqueries.html` file.

Workshop 20-2 Overview: Creating a PDF Report with Multiple Queries

This workshop covers the following topics:

- Creating a report query that contains two queries
- Creating a report that uses the report query you created
- Invoking the report from a button



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Summary

In this lesson, you should have learned how to:

- Describe the Application Express printing architecture
- Customize and print a standard report
- Create a customized report



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you should have learned how to print a standard report and a report derived from an item, create a report query and report layout, and use print APIs.

21

Managing Application Feedback

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to do the following:

- Describe what Team Development is
- Manage feedback



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This lesson explains how to use the Team Development component of Oracle Application Express. You learn to track features, milestones, bugs, and to dos. You also learn to manage the feedback received.

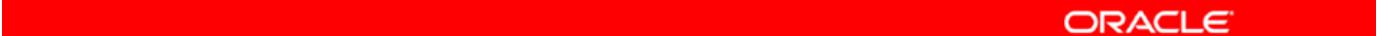
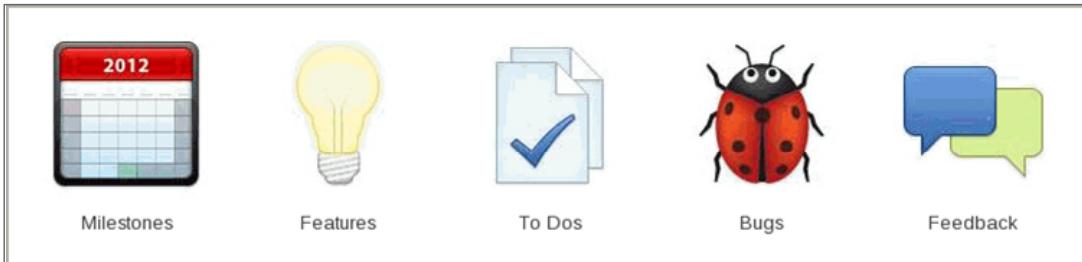
Lesson Agenda

- Understanding Team Development
 - Creating and updating Features
 - Creating and updating Milestones
 - Creating bugs
 - Creating and updating To Dos
- Reviewing the Progress of your Milestones and Features

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Is Team Development?

The Oracle logo, consisting of the word 'ORACLE' in white capital letters on a red horizontal bar.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Team Development is a built-in development management tool that enables you to manage the development process by tracking new features, non-feature-related tasks (or to dos), bugs, and milestones. Users can provide real-time feedback, which can then be categorized into to dos, bugs, or features.

The Workspace Administrator will have the privilege to access Team Development by default. When creating a developer or a user, you have an option to set the Team Development module access to Yes or No.

Tracking the Progress of Your Application Development Project

- Create and update features.
- Create and update milestones.
- Create bugs.
- Create and update to dos.
- Review the progress of your milestones and features (dashboards).

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The slide lists the tasks that you perform to track the progress of your application. The tasks need not be performed in the order in which they are listed in the slide. However, the order used in the slide is the logical flow of when to do the tasks.

Creating Features

The screenshot shows the Oracle Application Express Features page. At the top, there is a navigation bar with tabs: Dashboard, Features, Tree, Calendar, History, Progress Log, Focus Areas, Owners, and Utilities. Below the navigation bar, there are search filters for Assignee (All), Release (All), and Application (All). A 'Create Feature' button is prominently displayed. The main area is divided into two sections: 'Percent Complete' and 'Development Progress'. On the left, there is a sidebar titled 'Owners' with a 'New Feature' button. A modal window titled 'Feature' is open, showing fields for creating a new feature. The 'Feature' field is populated with 'Creating Reports'. Other fields include Tags (empty), Owner (Select Owner - dropdown), New Owner (Mark), Contributor (Select Contributor - dropdown), New Contributor (David), Focus Area (Select Focus Area - dropdown), New Focus Area (Interactive Reports), Release (Select Release - dropdown), New Release (1.0), Status (Select Status - dropdown), Desirability (3. Desirable), Priority (3. Normal priority), Milestone (Early Adopter 6.0 - 02/01/2013), and Parent Feature (empty). Below the 'Feature' section is another section titled 'Dates' with fields for Start Date (12/15/2012) and Due Date / Date Completed (01/15/2013).

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Use the Features page to track the features from initial concept through implementation. You can organize features by release, assignee, tags, or associated milestones. Click the Features tab to view the features created. To show details of the features, click the View Detail icon. In this view, you see additional information about each feature that you have created and its progress. There are several tabs that you can select for additional information, such as calendar, which will show you a calendar and the date on which the task is due.

To create a feature, click the Create Feature button and fill out the feature details. Then click Create Feature.

Creating Milestones

The screenshot shows the Oracle Application Express Milesstones page. At the top, there's a navigation bar with tabs: Dashboard, Milestones, Calendar, By Owner, and Features by Milestone. Below the navigation is a search bar with dropdowns for Show (Future Events), Release (All), and Set, along with a Reset button and a prominent blue 'Create Milestone >' button.

The main content area displays a grid of milestones:

Month	Date	Milestone Name	Description
January 2013	14	Beta 6.0	Due Date: 31 days from now Features: 1 Total: 0 Completed, 0 >= 80%
February 2013	01	Early Adopter 6.0	Due Date: 49 days from now Features: 1 Total: 0 Completed, 0 >= 80%
March 2013	15	Production 6.0	Due Date: 91 days from now

Below the grid, there's a section titled 'Milestone Owners' which lists 'harry' as the owner of one milestone.

A modal dialog box is open, titled 'Milestone', containing fields for creating a new milestone:

- Milestone: Release Early Adopter 1
- Date: 12/21/2012
- Type: - Select Type - (dropdown)
- Owner: - Select Owner - (dropdown)
- Release: - Select Release - (dropdown)
- Selectable for Features: Yes (dropdown)
- New Type: Release
- New Owner: Larry
- New Release: 1.0

To the right of the main content area, there's a sidebar titled 'Component Counts' with the following data:

Category	Count
Features with milestones	2
Features without milestones	2
To Do's with milestones	0
To Dos without milestones	1
Bugs with milestones	0
Bugs without milestones	1

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Use the Milestones page to manage important milestones. Milestones track events. You can associate milestones with features, bugs, and to dos. In the example in the slide, you see milestones for the phases of the development life cycle: Beta, Early Adopter, and Production. You can track how many features, to dos, and bugs are associated with each milestone. Other tabs provide additional information, such as features by milestone, which displays the features that have been assigned to a milestone. It is a good practice to organize milestones by release.

Creating Bugs

The screenshot shows the Oracle Application Express interface for creating a bug. At the top, there is a navigation bar with links for Dashboard, Bugs, Calendar, By Developer, and By Day. Below the navigation bar are search and filter controls, including dropdowns for Show (All), Release (- All -), Set, Reset, and a prominent blue 'Create Bug' button. The main content area displays a single bug entry with the ID '1'. The bug details include:

Bug	
Field	Value
Bug	Error when deleting a line item on an order
Status	80. Fixed in development
Severity	4. Moderate Impact
Priority	4. Not prioritized
Created By	USER01_ADMIN, 36 minutes ago

Below the bug details is a 'Resolution' section with the following fields:

Field	Value
Assigned To	tom
Fix By Release	6.0
Target Milestone	- Select Milestone -
Estimated Fix Date	(calendar icon)
Actual Fix Date	(calendar icon)
Duplicate of Bug	(dropdown menu)

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Bugs track software defects. Bugs can be assigned, associated with milestones, and tracked by due date, status, and other attributes. Tabs provide additional information, such as viewing all the bugs assigned to a particular developer or bugs opened and closed on a particular day.

Creating To Dos

The screenshot shows two pages of a web application interface for creating a To Do item.

Top Page: A navigation bar with tabs: Dashboard, To Dos, Calendar, Progress Log. Below the tabs are search and filter controls: Show (All To Do's), Release (- All -), Assignee (- All -), Application (- All -), Reset, and Create To Do button.

Bottom Page: A modal dialog titled "Create To Do". It has tabs: Show All, To Do, Dates, Details, Application Context, Tags, Additional Details. The "To Do" tab is active. It contains fields for: To Do Action (Verify Fixed Bugs), Assigned To (- Select Assignee -) with New Assignee (Linda), Contributor (- Select Contributor -) with New Contributor, Parent To Do (empty), and Status (Work Progressing - 20%). The "Dates" tab is also visible, showing Start Date (12/21/2012), Due Date (empty), and Date Completed (empty).

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To dos are action items that can be assigned, prioritized, tagged, and tracked. To dos can also have related parent tasks. To dos may or may not be associated with a feature or milestone. Tabs provide you additional information, such as a view of a to do progress log.

Quiz

Which Team Development component would you create to “Add Feedback to Application”?

- a. Feature
- b. To do
- c. Milestone
- d. Bug



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: b

Quiz

Which Team Development component would you create to “Allow employee to enter status report information”?

- a. Feature
- b. To do
- c. Milestone
- d. Bug



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a

Quiz

Which Team Development component would you create to “Correct packing list report error when using IE”?

- a. Feature
- b. To do
- c. Milestone
- d. Bug



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: d

Lesson Agenda

- Understanding Team Development
- Reviewing the Progress of your Milestones and Features



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Review the Progress of Your Milestones and Features

The screenshot shows a project management dashboard for milestones. At the top, there are navigation tabs: Dashboard, Milestones, Calendar, By Owner, and Features by Milestone. Below the tabs are search and filter controls: Show (All Events), Release (- All -), Set, Reset, and a prominent blue 'Create Milestone' button.

Milestones:

Date	Due Date	Description
January 2013	14	Beta 6.0 Due Date: 31 days from now Features: 1 Total: 0 Completed, 0 >= 80%
February 2013	01	Early Adopter 6.0 Due Date: 49 days from now Features: 1 Total: 0 Completed, 0 >= 80%
March 2013	15	Production 6.0 Due Date: 91 days from now

Milestones Summary: 91 days (Days before final milestone)

Component Counts:

Category	Count
Features with milestones	2
Features without milestones	2
To Do's with milestones	0
To Dos without milestones	1
Bugs with milestones	0
Bugs without milestones	1

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

There is a dashboard for every Team Development component. In the example in the slide, the milestone dashboard is displayed. It provides useful information, such as a summary of the upcoming milestones and the number of days that are left before the due date.

Enabling Feedback for an Application

1. Enable feedback in application properties.
2. Create a feedback page.
3. Submit feedback.
4. Access the submitted feedback in Team Development.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Feedback is the process of gathering real-time comments, enhancement requests, and bugs from your application users. To add a feedback page to an application, you perform the steps listed in the slide. Details about these steps are provided in the following slides.

Step 1: Enabling Feedback in Application Properties

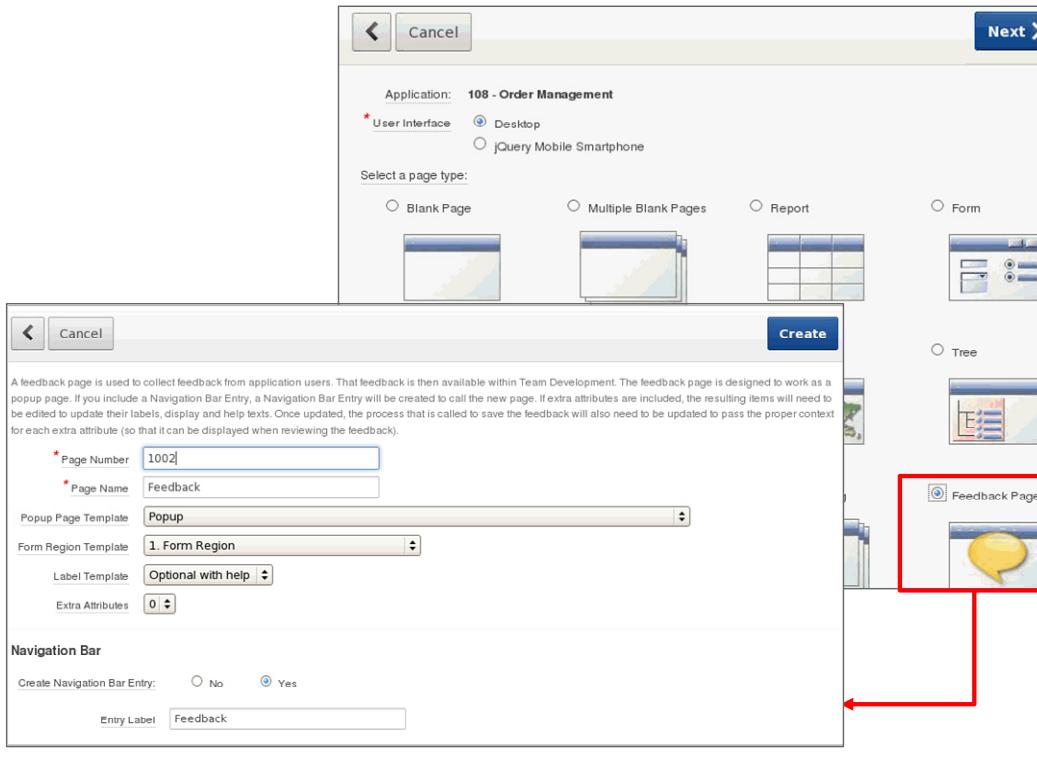
The screenshot shows the 'Edit Application Properties' screen for 'Application 108 - Order Management'. At the top, there are five icons: 'Run Application', 'Supporting Objects', 'Shared Components', 'Utilities', and 'Export / Import'. Below the icons, there are tabs for 'Definition', 'Security', 'Globalization', and 'User Interface'. The 'Properties' tab is selected. Under the 'Properties' tab, there are several configuration options: 'Logging' (Yes), 'Debugging' (Yes), 'Allow Feedback' (Yes, highlighted with a red box), 'Compatibility Mode' (4.2), 'Application Email From Address' (empty), and 'Proxy Server' (empty). At the bottom right of the properties section is a 'Cancel' button, a 'Delete' button, and a 'Apply Changes' button.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The first step to enable feedback in your application is to set the Allow Feedback option in Application Properties to Yes.

Step 2: Creating a Feedback Page



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The next step is to create a feedback page that will be displayed when the user clicks the Feedback link in your navigation bar. The Extra Attributes setting allows you to define additional items to be displayed and then captured, giving you the ability to ask the user other questions (such as category of feedback, severity of issue faced, and so on). Make sure that Create Navigation Bar Entry is set to Yes.

Step 3: Submitting Feedback

The screenshot shows a web browser window with the Oracle logo at the top. The navigation bar includes links for Home, Customers, Products, Help, Admin, and Data Load. The 'Feedback' link is highlighted with a red box. The main content area is titled 'Feedback' with 'Cancel' and 'Submit Feedback' buttons. It displays application and page details ('Application: 108. Order Management', 'Page: 1. Home') and a feedback text area containing 'Links not working on Home page.' Below this is a 'Feedback Type' dropdown set to 'General comment'. A sidebar on the right is titled 'In the News' with a 'News and Events' section and a link to 'www.oracle.com'.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Click the Feedback link in your navigation bar to view the feedback page. Enter your feedback in the feedback text area and click Submit Feedback.

Step 4: Accessing Submitted Feedback in Team Development

The screenshot shows the Oracle Team Development dashboard. At the top, there are five icons: Milestones (calendar), Features (lightbulb), To Dos (checkmark), Bugs (ladybug), and Feedback (two speech bubbles). Below the icons is a navigation bar with links: Dashboard, Feedback, Calendar, By Application, and By Filing User. A Refresh button is also present. The main area is divided into sections: 'Open Feedback' (showing 100% completion and 2 entries), 'Feedback Entries' (listing 1 user and 2 entries), and 'Feedback by Status' (showing status distribution: No status 100%, Acknowledged 0%, and Additional information requested 0%).

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

When your feedback has been submitted, you access it by using Team Development. Select Feedback and you see the feedback listed. You can edit the feedback and change the type to a bug, to do, or feature, and assign it to someone.

You can view the demonstration of managing feedback by opening the /home/oracle/labs/demos/les21_managing_feedback.html file.

Quiz

Feedback is enabled for an application automatically.

- a. True
- b. False



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: b

Summary

In this lesson, you should have learned how to:

- Track Team Development components
- Add feedback capabilities to your application



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learned how to track Team Development components.

Workshop 21 Overview: Adding and Monitoring Feedback in Your Application

This practice covers the following topics:

- Creating a Feedback form
- Reviewing and editing the feedback



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Additional Resources

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Additional Resources

- APEX home page on OTN
- Documentation
- Oracle Learning Library
- Blogs
- Forum
- Hosted online Help
- Oracle University courses
- Oracle Application Express Developer Certified Expert examination



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Application Express Page on OTN

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The Oracle Application Express product page on OTN is a very useful place to gather information. It contains the following sections:

- **Overview:** Get an overview of APEX and links to news, events, presentations, and books. The overview page also includes the following:
 - **Getting Started:** For those just getting started with Oracle Application Express, provides useful information such as obtaining a workspace, learning about Application Express, watching videos, taking self-paced learning courses, reading books, viewing presentations, and so on
 - **Collateral:** Provides technical information, white papers, videos, presentations, tutorials, and support
 - **New Features:** Provides information about new features in Oracle Application Express 4.2

- **Downloads:** Enables you to download the latest software
- **Documentation:** Provides access to the documentation and a host of How-to tutorials
- **Community:** Provides access to APEX OTN forum, Community How-Tos, and a list of blogs. The Application Express OTN forum is one of the most popular forums on OTN. The forum has a knowledge base of hints and tips, and issues that users have encountered and their resolutions.
- **Learn More:** Provides access to education and how-tos, technical information, and white papers

Documentation and Tutorials

The screenshot shows a navigation bar with tabs: Overview, Downloads, Documentation (which is selected), Community, and Learn More. Below the navigation bar, the title "Oracle Application Express 4.2 Documentation" is displayed in red. A horizontal line follows, followed by a list of documentation items with their corresponding file formats:

Full Library	HTML ZIP
Release Notes	HTML PDF
Installation Guide	HTML PDF
Application Builder User's Guide	HTML PDF
Migration Guide	HTML PDF
SQL Workshop Guide	HTML PDF
API Reference	HTML PDF
2 Day + Developer's Guide	HTML PDF
Administration Guide	HTML PDF
End User's Guide	HTML PDF

Below this list is a link: [Documentation Archives](#). Another horizontal line follows, followed by the heading "Other Oracle Reference Documentation". A final horizontal line follows, followed by a list of links:

- [Oracle Database Concepts](#)
- [Oracle Database SQL Language Reference](#)
- [Oracle Database PL/SQL Language Reference](#)
- [Oracle Database PL/SQL Packages and Types Reference](#)
- [Oracle Database Advanced Application Developer's Guide](#)
- [SQL*Plus User's Guide and Reference](#)
- [Oracle Database Administrator's Guide](#)

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

OTN has documentation to help answer your questions. You can access the documentation page from OTN at the following URL:

<http://www.oracle.com/technetwork/developer-tools/apex/documentation/index.html>

Oracle Learning Library

Title	Type	Release Date	Duration	Rating	Tags
Creating and Using a Manual SOAP Web Service in Your Application	Demo	21-Oct-11	3 mins	★★★★★	APEX, Application Development, OracleLearning, SOAP, Web Service, YouTube
Creating and Using a RESTful Web Service with an XML Response	Demo	21-Oct-11	3 mins	★★★★★	APEX, Application Development, OracleLearning, REST, RESTful, Web Service, YouTube
Creating and Using a RESTful Web Service with an XML Response and a Bind Variable	Demo	21-Oct-11	4 mins	★★★★★	APEX, Application Development, OracleLearning, REST, RESTful, Web Service, YouTube
Creating and Using Web Services In Your APEX Application	Demo	21-Oct-11		★★★★★	APEX, Application Development, REST, RESTful, SOAP, Web Services Manager
Utilizing Advanced Interactive Report Region Techniques in Oracle Application Express 4.1	OBE	29-Aug-11	50 mins	★★★★★	APEX, Application Development, IRR
Using Interactive Report Regions in Application Express 4.1	OBE	26-Aug-11	50 mins	★★★★★	APEX, Application Development, IRR
Building and Customizing an Interactive Report in Application Express 4.1	OBE	26-Aug-11	60 mins	★★★★★	APEX, Application Development, IRR
Building a Worksheet Application in Application Express 4.1	OBE	25-Aug-11	60 mins	★★★★★	APEX, Application Development, Worksheet

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The Oracle Learning Library (Learning Library) is an application built by using Oracle Application Express. The Learning Library enables you to search for free online training content (OBEs, demos, and tutorials) on OTN.

There are a few ways to search content in the Learning Library:

- Click the All Content tab and search by a specific set of desired search criteria.
- Click the tab for the product area that you are interested in. You will see a default view of the content for that product area. Then you can further narrow your search by using the criteria. When you have found the content that you are looking for, click the title to view the content.

Use the following URL to search for Oracle Application Express OBEs:

<http://apex.oracle.com/pls/apex/f?p=44785:2:0::NO:RIR::>

Blogs

APEX Community & Partners

Want to keep up to date with all the Oracle APEX Blogs then download this [OPML file](#) and import into your favorite feed reader, such as [Google Reader](#). Alternatively you can simply bookmark the [APEX BLOG Aggregator](#) from APEX Evangelists which also includes some very useful search capabilities, etc.

Consulting Companies | Hosting Companies

Blogger	URL	Blog Name
APEX.dbe.pl	http://apex.dbe.pl	APEX.dbe.pl - Blog o Oracle Application Express
APEXtras	http://blog.apextras.com/	APEXtras
Absodia.com	http://www.absodia.com/	Absodia.com
Andy Tulley	http://andrew.tulley.co.uk/	andrew.tulley.co.uk - SELECT * FROM RANDOM.stuff WHERE subject IN ('Application Express','Oracle',PL/SQL,'SQL','Javascript')
Anthony Rayner	http://anthonyrayner.blogspot.com/	Let's talk about APEX, with Anthony Rayner
Anton Nielsen	http://c2anton.blogspot.com/	Anton Nielsen - Mostly Random experience with Oracle technologies. It is mostly specific solutions to isolated problems.
Austrian Competence Center for Oracle APEX	http://blog.oracleapex.at/	Der Oracle Experten Blog
Ben Burrell	http://munkybenn.wordpress.com/	Munk's Blog - Yet more APEX musings
Bernard Fischer-Wasels	http://htmidb-de.blogspot.com/	Rund um Oracle APEX - erstes BLOG in DEUTSCH mit Hauptfokus Oracle Application Express (vormals HTML DB) Entwicklung von Bernhard Fischer-Wasels
BlueTIC	http://www.oracleapex.es/	El blog de Oracle Apex
Bradley Brown	http://www.buscsoftware.com/brown	Bradley D. Brown - CTO co-founder of TUSC, a provider of Oracle management and technical consulting. Best-selling author of multiple web-development books. Recently accepted as 1 of 9 U.S. Elite Oracle Fusion Middleware Regional Directors, Oracle ACE
Carl Backstrom	http://carlback.blogspot.com/	Carl Backstrom's Blog - Where spellcheck is just another word.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Oracle Application Express Blog is a website where users can communicate and interact on various topics. Users can post questions, images, events, and so on. The slide above contains a list of APEX blogs. You can access the Blogs page at the following URL:

<http://apex.oracle.com/pls/otn/f?p=24793:12:0>

Forum: Application Express

Forum Home [Database](#) [Application Express](#)

Forum: Application Express

[Post New Thread](#) [Back to Category](#)

Messages: 343,741 - Threads: 70,838 - Filter: [All Threads](#) Pages: 4,723 [[1](#) [2](#) [3](#) [4](#) [5](#) | [Next](#)]

Thread	Author	Replies	Last Post
Oracle Application Express 4.1 is now Production Posted By: dpeake -- Aug 24, 2011 12:12 PM	Min1	18	Nov 4, 2011 1:16 AM Last Post By: Min1 »
Welcome to the Oracle Application Express Discussion Forum! Posted By: sbkenned -- Sep 9, 2010 9:09 AM	iritschel	2	Nov 4, 2011 1:14 AM Last Post By: MBK »
Oracle Application Express Listener now Production --> New APEX Listener Forum now available Posted By: sbkenned -- Jul 6, 2010 11:33 AM	siegwin.port	6	Nov 4, 2011 1:04 AM Last Post By: siegwin.port »
Edit link is not available under the page in application Pages: [1 2]	Tammy.Osborn	1	Nov 4, 2011 12:57 AM Last Post By: Aries_21 »
Line Break in Select List Label	erics44	1	Nov 4, 2011 12:54 AM Last Post By: jarola »
show 2 report regions (subregions) side by side	882468	0	Nov 3, 2011 11:51 PM Last Post By: 882468 »
Substitution var in javascript:html Popup used for a region button			
Build Target URL			
Need to have Multiple Y axis chart in Apex 3.2			

Welcome, Guest

- [Sign In / Register](#)
- [Guest Settings](#)
- [Search](#)
- [FAQ](#)

Search Forum

Top Users in Forum

-  [ATD](#) (13015)
-  [jarola](#) (12720)
-  [varad.adharya](#) (6060)
-  [fac596](#) (6350)
-  [TexasApexDevelo...](#) (5020)
-  [sspadafro](#) (4830)
-  [Roel](#) (4665)
-  [Denes Kubicek](#) (4325)
-  [vee](#) (3955)
-  [Munku](#) (3570)



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The Application Express OTN forum is one of the most popular forums on OTN. In this forum, users can have conversations through posted messages. The forum has a knowledge base of hints and tips, and issues that users have encountered and their resolutions.

You can access the APEX Forum page at the following URL:

<https://forums.oracle.com/forums/forum.jspa?forumID=137>

Hosted Online Help

Hide Navigation

Oracle® Application Express Application Builder User's Guide Release 4.2
Part Number E35125-02

[Home](#) [Book List](#) [Contents](#) [Index](#) [Contact Us](#)

[PDF](#) • [Mobi](#) • [ePub](#)

This Page

- [About the Workspace Home Page](#)

About the Workspace Home Page

When you log in to Oracle Application Express, the Workspace home page appears. A **workspace** is a virtual private database allowing multiple users to work within the same Oracle Application Express installation while keeping their objects, data and applications private.



Description of the illustration wrkspc_home.gif

The following large icons display in the center of the page:

- **Application Builder**. Use Application Builder to create an application, composed of a set of HTML pages, based on database objects. See "Application Builder Concepts" and "Using Application Builder".
- **SQL Workshop**. Use the SQL Workshop to access tools for viewing and managing database objects. See [Oracle Application Express SQL Workshop Guide](#).
- **Team Development**. Use Team Development to track new features, non-feature related tasks (or To Do tasks), bugs, and milestones. Users can also provide real-time feedback which then can be categorized into features, general tasks, or bugs. See "Managing the Development Process".
- **Administration** links to the Workspace Administration page. See "Workspace and Application Administration" in [Oracle Application Express Administration Guide](#).

Click the [Learn more](#) link in the About box to view an informative introduction to Oracle Application Express. Topics covered include architecture, self service, security, Worksheets, application development, SQL Workshop, Team Development, administration, and managing development.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In Oracle Application Express, you can get help on any topic, such as get context-sensitive help for the page or field where you are at any given point and search for a particular topic.

Learn More



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

On the workspace home page, click the Learn More tab. A Learn More page appears that provides an overview of Oracle Application Express as shown in the slide.

Oracle Application Express Developer Certified Expert Examination

Oracle Certification Program

Home | Certification Paths | Exams | Preparation | Support | Benefits | News and Community

Oracle Application Express Developer Certified Expert

As an Oracle Application Express Developer Certified Expert, you should have the skills necessary to develop and deploy your application from beginning to end. The skills that you will gain through your experience and preparing for the exam will also allow you to manage database objects using SQL Workshop, utilize and manage shared components, manage authentication, authorization, and session state within your application, as well as administer Application Express Workspaces.

 A diagram showing a grey box labeled "EXAM 1Z0-450 Oracle Application Express 4: Developing Web Applications" connected by an arrow to a red box labeled "ORACLE® Oracle Application Express Developer Certified Expert".

Additional Path Information

- To view requirements in detail, click the links in the diagrams
- You should receive your success kit within 6-8 weeks of meeting all certification requirements
- [View an explanation of certification titles.](#)

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can access information about the *Oracle Application Express Developer Certified Expert* credential from the Certification Path > Application Development section at the following URL:

<http://education.oracle.com>

On the Oracle Application Express Developer Certified Expert page, click the links in the diagrams to view the *Oracle Application Express 4: Developing Web Applications* exam requirements in detail.

- Exam number:** 1Z0-450
- Associated certifications:** *Oracle Application Express Developer Certified Expert*

The recommended training and preparation for the Oracle Application Express Developer Certified Expert examination is the *Oracle Application Express: Workshop I* course.

More Information About Application Development

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lessons

The lessons covered in this appendix are:

- Create a Websheet Application
- Manipulate and Administer a Websheet Application



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This appendix explains how to use create, manipulate and administer websheet applications.

Objectives

After completing this lesson, you should be able to:

- Identify the different components of a websheet application
- Create a websheet application
- Create sections on a websheet page
- Annotate pages with files, notes, and tags
- Create and manipulate a data grid



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learn how to create a websheet application, create sections on a websheet page, annotate pages with files, notes and tags and also learn how to create and manipulate a data grid.

Lesson Agenda

Create a Websheet Application

- Overview
- Working with Pages and Sections
 - Types of Sections
 - Creating a Text Section
 - Adding Annotations to a Page
 - Copying a Page
 - Editing Page Sections
 - Viewing the Page Directory
 - Displaying an Image
 - Using Markup Syntax
- Creating Data Grids
- Manipulating Data Grids

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Is a Websheet?

The screenshot displays two pages from the Oracle Websheets application:

- Home Page:** Shows a navigation tree with Home, Departments, Employees, and Reports. The Reports node is highlighted with a red box and has a red arrow pointing to the Reports page.
- Reports Page:** Shows an overview section with the text "This page contains some useful reports." and a tasks section. Below these are search and search results sections. The search results table lists various projects and tasks:

PROJECT	TASK_NAME	START_DATE	END_DATE	STATUS	ASSIGNED_TO	COST	BUDGET
Maintain Support Systems	HR software upgrades	01-JAN-10	27-FEB-10	Closed	Pam King	8000	7000
Maintain Support Systems	Apply Billing System updates	01-JAN-10	28-FEB-10	closed	Russ Sanders	5000	7000
Maintain Support Systems	Investigate new Virus Protection software	15-FEB-10	23-MAR-10	Open	Pam King	1700	1500
Maintain Support Systems	Arrange for holiday coverage	10-JAN-10	12-JAN-10	Closed	Al Bines	300	500
Email Integration	Complete plan	08-FEB-10	14-FEB-10	Closed	Mark Nile	500	750
Email Integration	Check software licenses	12-FEB-10	13-FEB-10	Closed	Mark Nile	200	200
Email Integration	Get RFPs for new server	19-FEB-10	03-MAY-10	Open	Mark Nile	4000	1000
Email Integration	Purchase backup server	12-MAY-10	07-JUL-10	Pending	Al Bines	3200	3000

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Websheets provide a quick and easy way to post content on the web. Whether that content is text, images, reports, or charts, it can all be integrated into a websheet application. Most importantly, both the content and the structure are controlled by its users. If you have the data that you need in your database, expose it in a report or include that data on a page. If you need to manage your own data, use a data grid (which can then be referenced on a page).

Websheets provide the following functionality:

- Create and share content over the web.
- Organize webpages in a hierarchy and on cross-link pages.
- Create and manage tabular data by using an embedded feature called “data grids.”
- Create interactive reports by using SQL on existing data structures in your database.
- Expose data grid and report data within pages as a chart or a report.
- Annotate pages with files, tags, and notes. Associated images can be shown inline within page content.
- Search page content (using a search box in the upper-right corner of a page).
- Manage who can log in and, once logged in, who can read, write, and administer the application (authentication and authorization).

Websheets Versus Database Applications

	Websheet Applications	Database Applications
Database Objects	Automatically managed (APEX\$ tables)	Created by using SQL Workshop
Primary Key Management	Automatically managed	Triggers and sequences
Validations	Defined by using runtime UI	Created by using wizards
Report Layout	Defined by using runtime UI	Created by using SQL
List of Values	Defined by using runtime UI	SQL or static
Page Flow	Limited	Controlled by branches
Form Layout	Column groups	Items and regions
Look and Feel	Basic control	Themes and templates



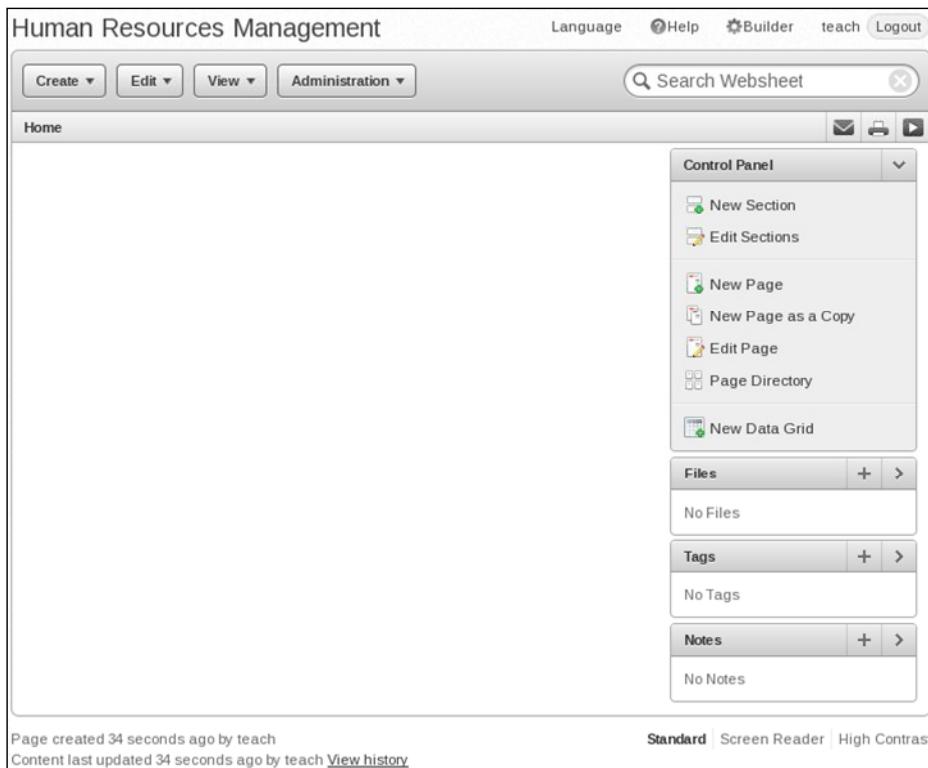
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Building an APEX database application is very easy for an IT professional and for many “power users.” They typically understand database concepts. They are comfortable using wizards to create an application and then working within the declarative framework to maintain and enhance the application.

Websheet applications simplify the process of creating database objects and providing runtime UI capabilities to define features such as validations and LOVs.

However, websheet applications have limited capabilities (compared to database applications) for UI customization and page control. It is important to understand the differences between websheet applications and database applications, which are outlined in the slide.

Default Websheet Interface

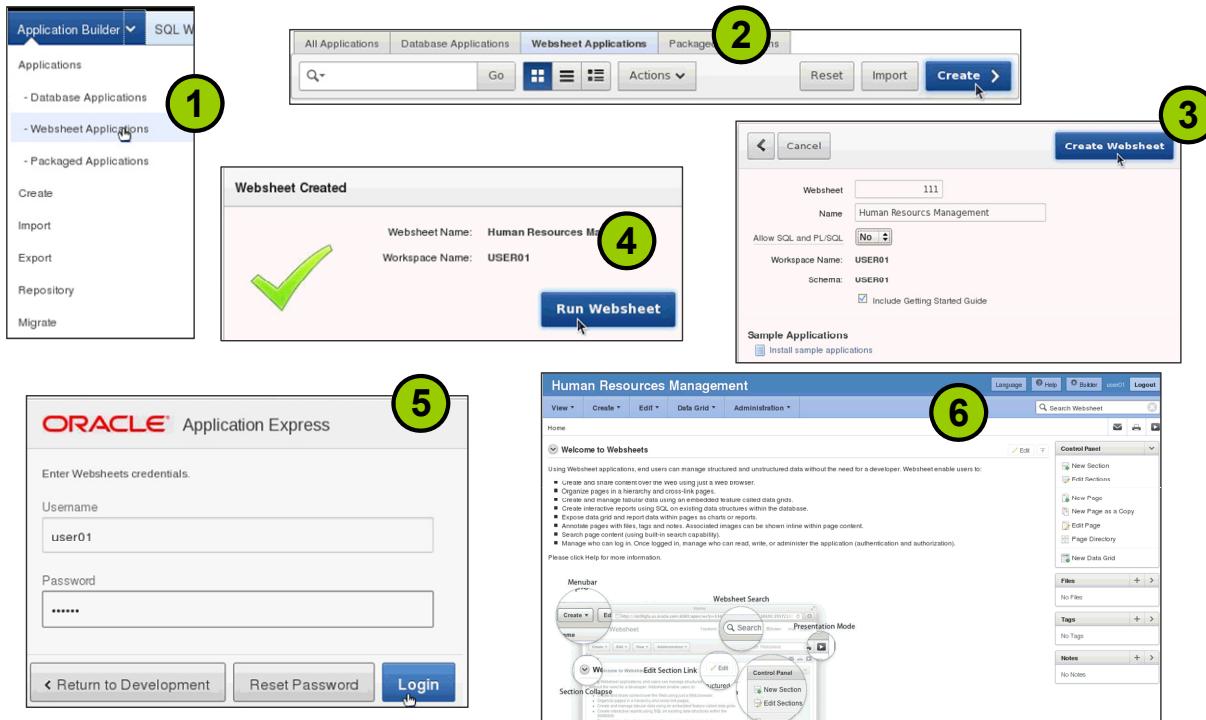


The slide shows the interface that gets created when you use the Create Application Wizard to create a websheet application. An empty home page is created by default. The look and feel of all websheet application will be the same. After you have created a websheet application, you can add content to your application by defining pages, sections, images, data from the database, and so on.

After a websheet application is created, the users of the application can perform the following actions:

- Create pages.
- Create different types of sections.
- Create links between pages.
- Annotate pages with notes, tags, and files.
- Create data grids.
- Create reports.

Creating and Running a Websheet



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a websheet, perform the following steps:

1. Click the down arrow next to the Application Builder tab and select Websheet Applications. (Alternatively, select Application Builder and click the Websheet Applications tab.)
2. Click Create.
3. Enter a name for the websheet and click Create Websheet.
4. Click Run Websheet to view the application.
5. Enter your websheet login credentials and click Login.
6. The websheet application is displayed.

Lesson Agenda

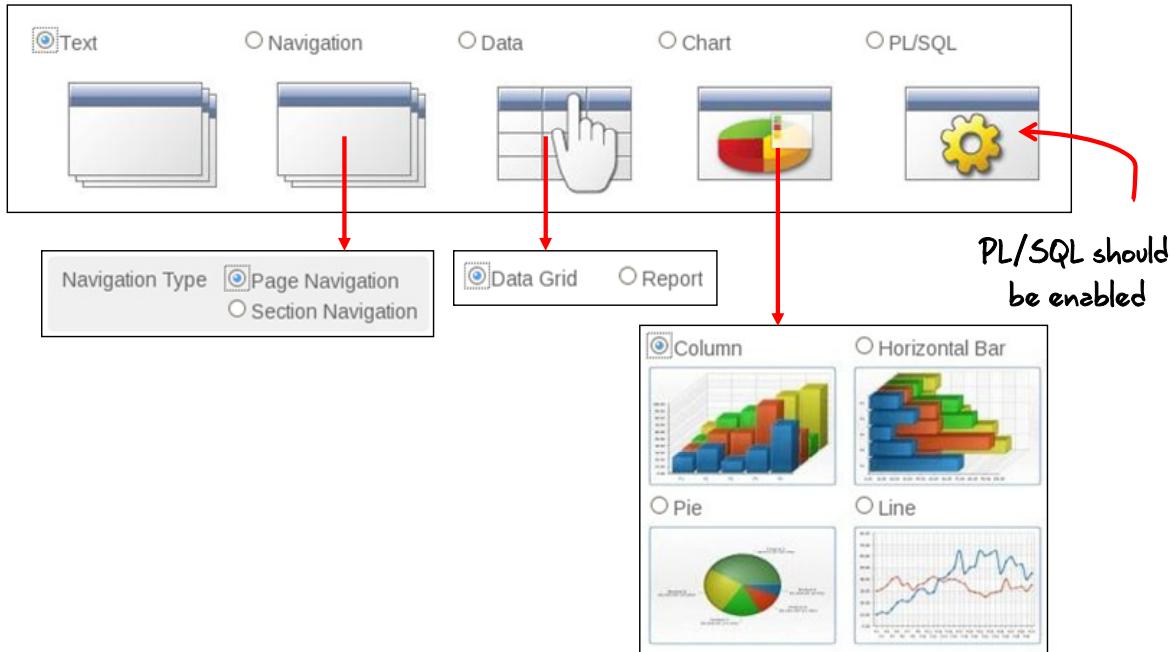
Create a Websheet Application

- Overview
- Working with Pages and Sections
 - Types of Sections
 - Creating a Text Section
 - Adding Annotations to a Page
 - Copying a Page
 - Editing Page Sections
 - Viewing the Page Directory
 - Displaying an Image
 - Using Markup Syntax
- Creating Data Grids
- Manipulating Data Grids

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Types of Sections

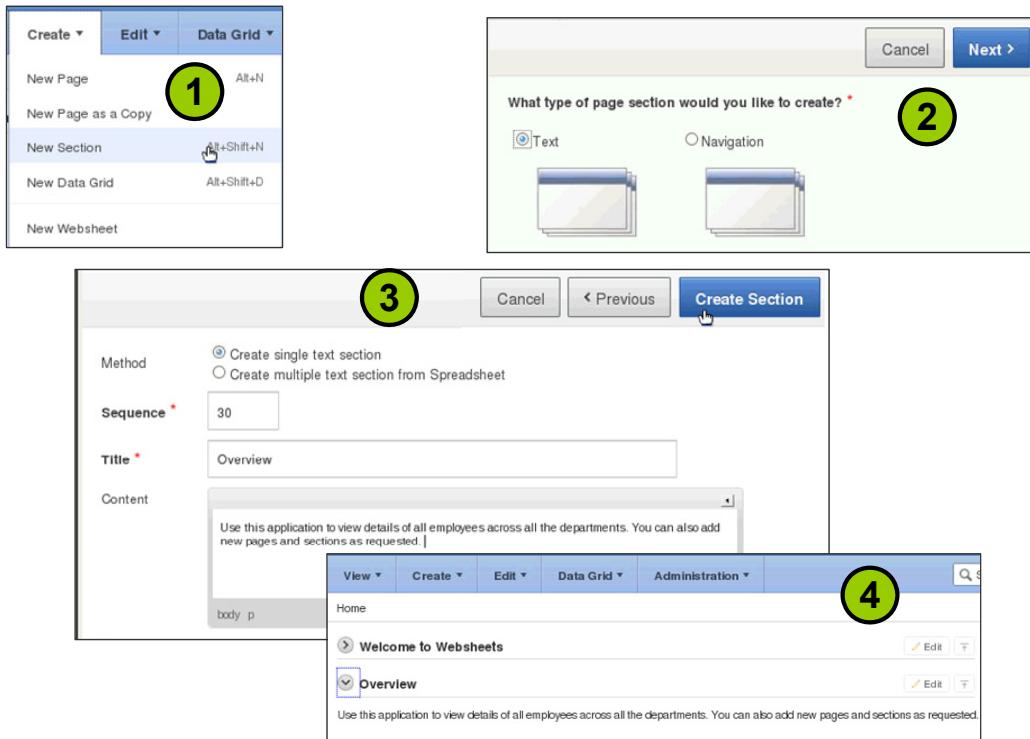


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The different types of sections that you can create are shown in the slide. The Text and Navigation options are available when the websheet is created. The Data and Chart options are available only when either a data grid or a report exists in the websheet. The PL/SQL option is available only when the ability to interact with the database is enabled for the websheet.

These options are discussed in detail later in this appendix.

Creating a Text Section



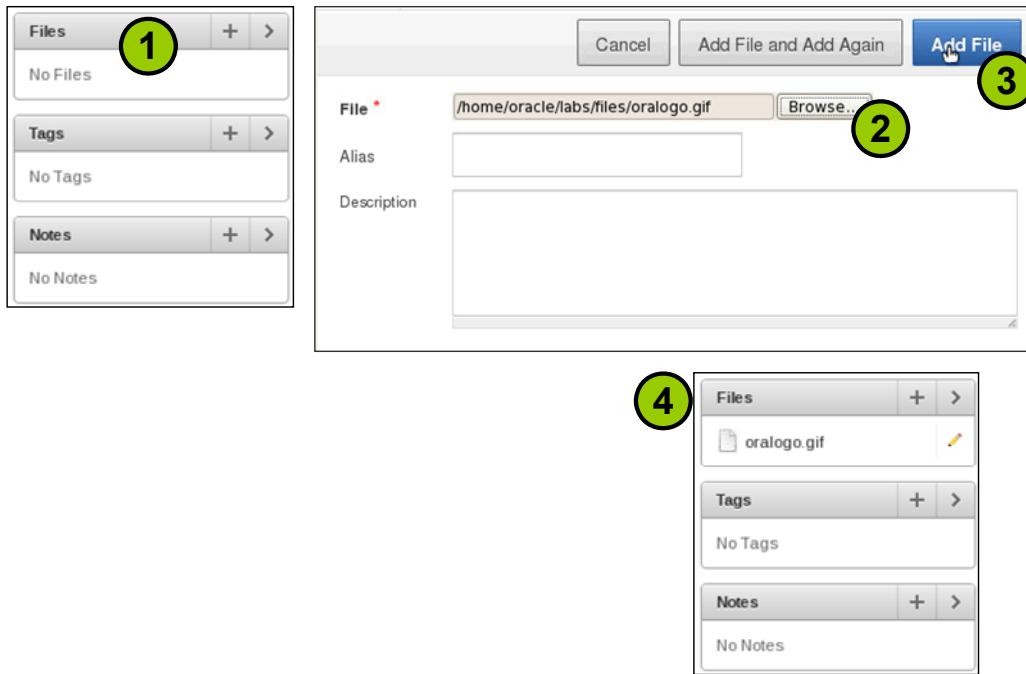
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can add textual content to your pages by creating a Text section. To create a Text section, perform the following steps:

1. Click Create and select New Section.
2. Ensure that Text is selected and click Next.
3. Enter a title for the section and enter the content for the section in the Content field. Click Create Section.
4. The Text section is created.

Adding Annotations to a Page



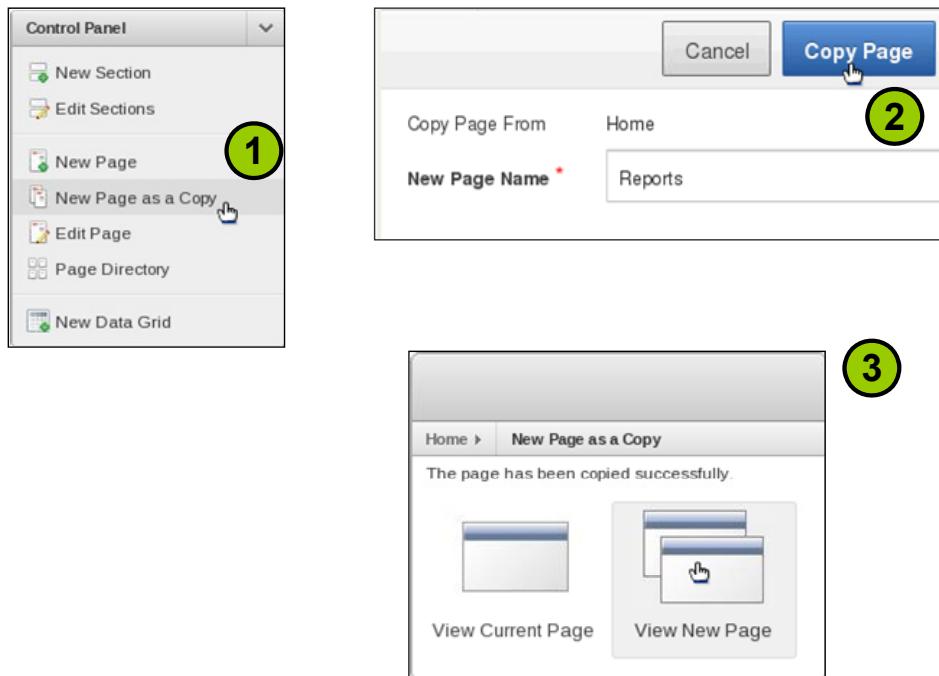
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can add files, tags, and notes to the websheet pages. These are displayed on the bottom-right side of a page. You can click the plus icon (+) depending on what you want to add to the page. The slide shows an example of annotating a page with an image file. Perform the following steps:

1. Click the plus icon (+) in the Files section.
2. Click the Browse button and locate the file you want to add.
3. Click Add File.
4. The file that is added to the page is listed in the Files section.

Copying a Page



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can quickly copy a page to a new page as follows:

1. Ensure that you are viewing the page you want to copy. Then select “New Page as a Copy” in the Control Panel.
2. Enter a name for the new page and click Copy Page.
3. The page is copied. Now you can choose to view either the current page or the new copied page.

Editing Page Sections

The first screenshot shows the 'Overview' section of a page in the Oracle Application Express interface. A green circle labeled '1' highlights the 'Edit' button, which is also highlighted with a red box. The second screenshot shows the 'Edit Section' dialog for the 'Overview' section. It includes fields for 'Sequence' (set to 10) and 'Title' (set to 'Overview'). The 'Content' area contains the text 'This page contains some useful reports.' A green circle labeled '2' highlights the 'Apply Changes' button.

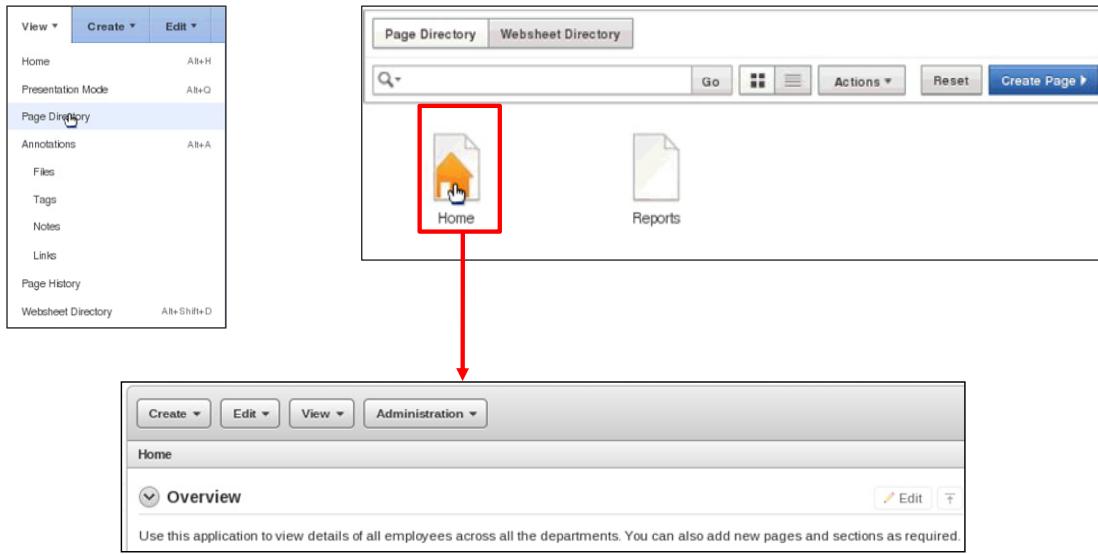
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

At any point, you can edit the sections on a page to change its title or contents. To edit a page section, perform the following steps:

1. Click the Edit button for that section.
2. Make your changes and click the Apply Changes button.

Viewing the Page Directory



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can view all the pages in a websheet by using the Page Directory. To access the Page Directory, click View and select Page Directory. All the pages in the websheet are displayed. You can view a particular page by clicking the page icon.

Displaying an Image

The composite screenshot illustrates the steps to add an image to a page:

- Files Sidebar:** Shows a file named "orologo.gif" uploaded to the "Files" region.
- Home Page Overview:** Displays the page title "Overview" and a brief description: "Use this application to view details of all employees across all the departments. You can also add new pages and sections as required."
- Edit Section Dialog:** Shows the "Edit Section" dialog for the "Overview" section. It includes fields for "Page" (set to "Home"), "Sequence" (set to 10), and "Title" (set to "Overview"). The "Content" area contains the page's HTML code, with the line "[[IMAGE: orologo.gif]]" highlighted and enclosed in a red box.
- Final Preview:** Shows the updated page with the Oracle logo displayed in the "Overview" section.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.



You can display images on a page by using markup syntax. First, you need to annotate the page with the image. You can do this by clicking the plus icon for the Files region and uploading the image. After the image is added to the page, you can edit the section where you want to display the image. In the example in the slide, an Oracle logo is added to the page and displayed in the Overview section.

Note the markup syntax that is used to display the image:

```
[ [ IMAGE: <file name> ] ]
```

After entering the markup text, click the Apply Changes button. The image is displayed in the Overview section.

Using Markup Syntax

The screenshot shows a help page for 'Page Linking'. At the top, there's a navigation bar with links for 'About', 'Overview', 'Access Control', 'Markup Syntax' (which is highlighted in red), 'SQL Generator for Data Grids', 'Application Content', 'FAQ', 'Language', 'Help' (highlighted with a red box), 'Builder', 'teach', and 'Logout'. The main content area has a sidebar on the left with links for 'Show All', 'Page Linking' (selected), 'Section Linking', 'External URLs', 'Files', 'Images', 'Data Grid Linking', 'SQL', and 'Advanced Data Grid Queries'. The main content area for 'Page Linking' includes sections for 'Syntax' (with code examples like `[[page: <page alias> | <link name>]]` and `[[<page alias> | <link name>]]`), 'Syntax Examples' (with examples like `[[page: home]]` and `[[mypage | My Page]]`), and 'In Context Example' (with the text 'One of the most colorful fish is the [[clownfish | Clown fish]].').

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Similar to the markup syntax you saw in the previous slide, you can use other markup syntaxes. The online Help provides useful hints on how to use markup syntax to reference objects in your websheet. Click the Help link to see what markup syntaxes are available.

Quiz

You can use markup text to reference a file or URL.

- a. True
- b. False



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: b

Lesson Agenda

Create a Websheet Application

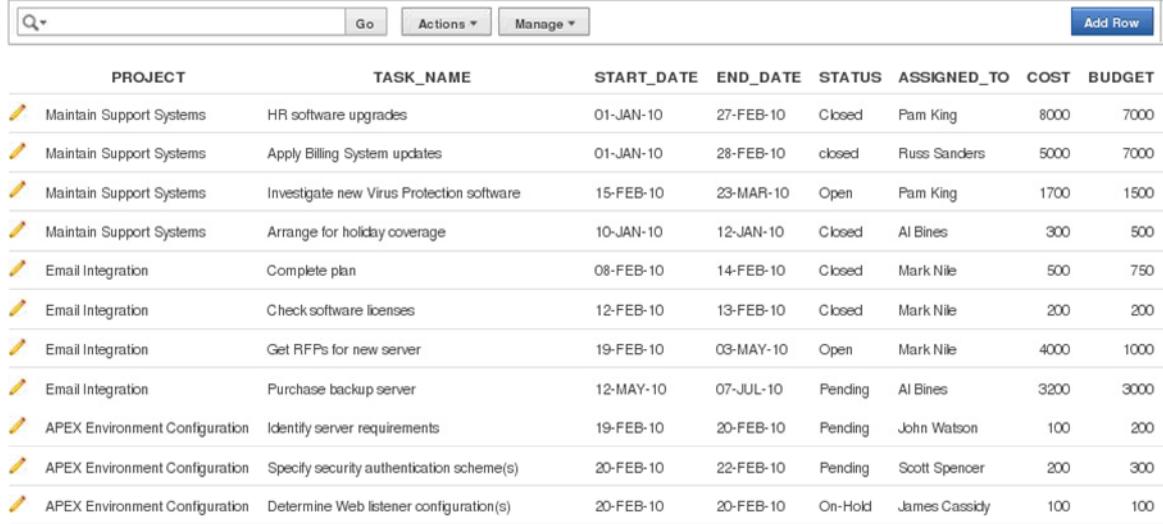
- Overview
- Working with Pages and Sections
- Creating Data Grids
 - What are Data Grids?
 - Creating a Data Grid From Scratch
 - Creating a Data Grid From a Spreadsheet
 - Creating a Data Section
 - Creating a Chart Section
- Manipulating Data Grids

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Are Data Grids?

Data grids are sets of tabular data displayed as an editable report and managed through APEX\$ tables.



The screenshot shows a data grid with the following columns: PROJECT, TASK_NAME, START_DATE, END_DATE, STATUS, ASSIGNED_TO, COST, and BUDGET. The data includes tasks for 'Maintain Support Systems' like 'HR software upgrades' and 'Apply Billing System updates', as well as tasks for 'Email Integration' and 'APEX Environment Configuration'. Each row has a small edit icon in the first column.

PROJECT	TASK_NAME	START_DATE	END_DATE	STATUS	ASSIGNED_TO	COST	BUDGET
Maintain Support Systems	HR software upgrades	01-JAN-10	27-FEB-10	Closed	Pam King	8000	7000
Maintain Support Systems	Apply Billing System updates	01-JAN-10	28-FEB-10	closed	Russ Sanders	5000	7000
Maintain Support Systems	Investigate new Virus Protection software	15-FEB-10	23-MAR-10	Open	Pam King	1700	1500
Maintain Support Systems	Arrange for holiday coverage	10-JAN-10	12-JAN-10	Closed	Al Bines	300	500
Email Integration	Complete plan	08-FEB-10	14-FEB-10	Closed	Mark Nile	500	750
Email Integration	Check software licenses	12-FEB-10	13-FEB-10	Closed	Mark Nile	200	200
Email Integration	Get RFPs for new server	19-FEB-10	03-MAY-10	Open	Mark Nile	4000	1000
Email Integration	Purchase backup server	12-MAY-10	07-JUL-10	Pending	Al Bines	3200	3000
APEX Environment Configuration	Identify server requirements	19-FEB-10	20-FEB-10	Pending	John Watson	100	200
APEX Environment Configuration	Specify security authentication scheme(s)	20-FEB-10	22-FEB-10	Pending	Scott Spencer	200	300
APEX Environment Configuration	Determine Web listener configuration(s)	20-FEB-10	20-FEB-10	On-Hold	James Cassidy	100	100



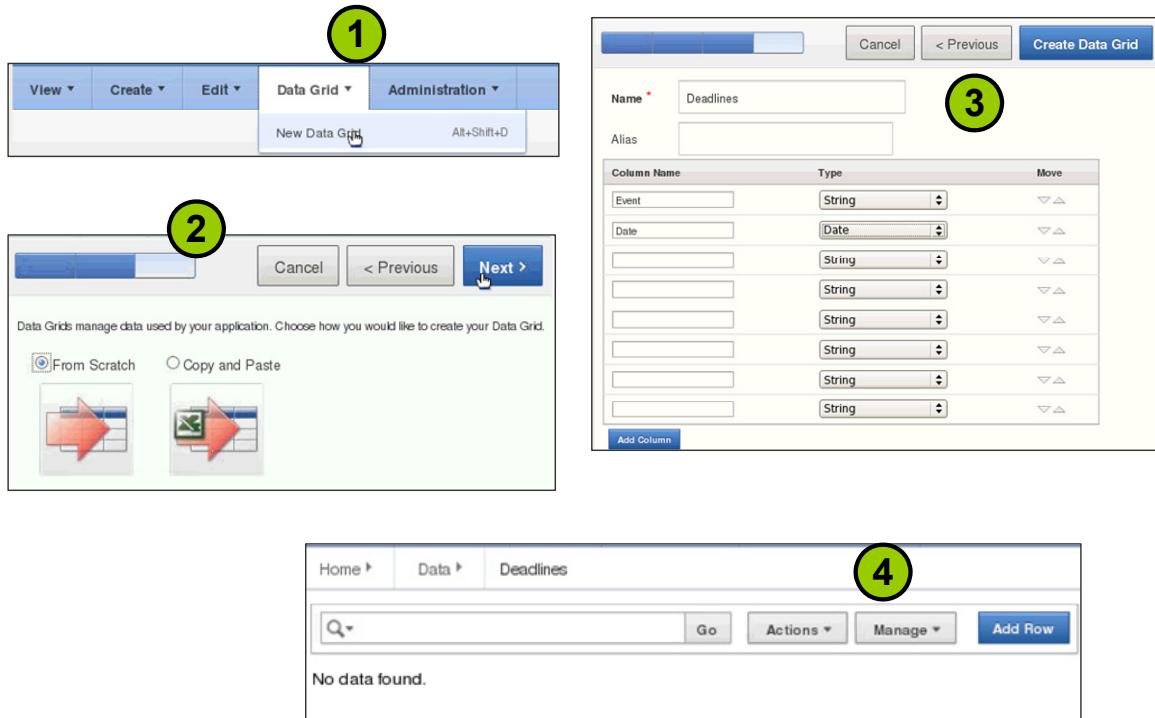
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Data grids are contributor-defined sets of tabular data—a web-based spreadsheet. You can define the structure of a data grid (column names, data types, and basic validations), or you can create a data grid by pasting in spreadsheet data. After it is created, the structure can be modified as needed over time. The data itself is managed by APEX\$ tables.

In addition to the defined columns, a set of standard columns is always included within each data grid. These include owner, created by, created on, updated by, updated on, row order, and annotation (files, notes, links, and tags).

Data grids are highly customizable. Users can alter the layout of report data by choosing the columns that they are interested in and applying filters, highlighting, and sorting. They can also define breaks, aggregations, group by, computations, and different charts. A subscription can also be set to email the data at a designated interval. Users can create multiple variations of a data grid and save them as named reports, for either public or private viewing. Apart from being available on the Data tab, data within a data grid can be included as a chart or report on any page.

Creating a Data Grid from Scratch



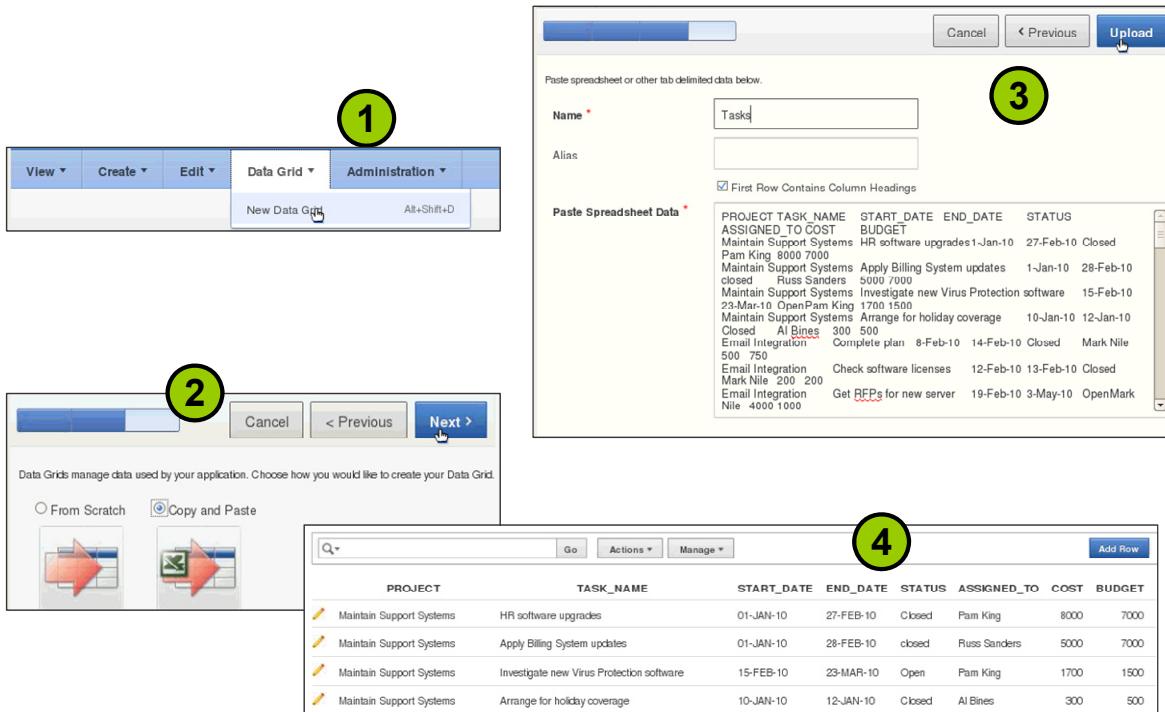
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a data grid from scratch, perform the following steps:

1. Click Data Grid and select New Data Grid.
2. Ensure that From Scratch is selected and click Next.
3. Enter a name for the data grid and specify the column names and types. Use the Add Column button to add more columns to the data grid. After defining the data grid columns, click Create Data Grid.
4. The data grid is created. The data grid contains no data. You can add rows to the data grid by clicking the Add Row button.

Creating a Data Grid from a Spreadsheet



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can also create a data grid from a spreadsheet. Access the Data page and perform the following steps:

1. Click Data Grid and select New Data Grid.
2. Select Copy and Paste and click Next.
3. Enter a name for the data grid and, in the text area, copy and paste the data grid content from the spreadsheet. If the pasted content contains column names as the first row, select the First Row Contains Column Headings check box. Click Next.
4. The data grid is created.

Creating a Data Section

The figure consists of four numbered screenshots:

- Screenshot 1:** A screenshot of the Oracle Application Express navigation bar. The "Create" dropdown is open, showing options like "New Page", "New Data Grid", and "New Section". The "New Section" option is highlighted.
- Screenshot 2:** A confirmation dialog box asking "What type of page section would you like to create?". It has four radio button options: "Text", "Navigation", "Data" (which is selected), and "Chart". There are also four corresponding icons below the radio buttons.
- Screenshot 3:** A configuration dialog for a "Data Section Source". It shows the "Display Sequence" set to 20, "Data Grid" set to "Tasks", "Report Settings to Use" set to "Primary Report (Primary Default)", and "Title" set to "Tasks". Under "Style", there are three preview boxes showing different table designs. The "Data Grid" radio button is selected.
- Screenshot 4:** A confirmation dialog box titled "Create Section". It lists the selected attributes: Display Sequence (20), Section Title (Tasks), Data Source (Tasks (Data Grid)), Report Settings to Use (Primary Report (Primary Default)), Maximum Row Count (Search Field), and Style (Style 1). At the bottom right is a "Create Section" button.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The data grids that you created in the preceding slides are located as data components in the Data section of your websheet. To display data from these data grids on your websheet pages, you now need to create data sections.

To create a data section, perform the following steps:

1. Click Create and select New Section.
2. Select the Data option and click Next.
3. For Data Grid, select a data grid. Select a report setting and style. Also, specify the section title. Click Next.
4. Review the details and click Create Section.

Creating a Data Section

This page contains some useful reports.

Search Report

PROJECT	TASK_NAME	START_DATE	ASSIGNED_TO	COST	BUDGET
Maintain Support Systems	HR software upgrades	01-JAN-10	Pam King	8000	7000
Maintain Support Systems	Apply Billing System updates	01-JAN-10	Russ Sanders	5000	7000
Maintain Support Systems	Investigate new Virus Protection software	15-FEB-10	Pam King	1700	1500
Maintain Support Systems	Arrange for holiday coverage	10-JAN-10	Al Bines	300	500
Email Integration	Complete plan	08-FEB-10	Mark Nile	500	750
Email Integration	Check software licenses	12-FEB-10	Mark Nile	200	200
Email Integration	Get RFPs for new server	19-FEB-10	Mark Nile	4000	1000
Email Integration	Purchase backup server	12-MAY-10	Al Bines	3200	3000
APEX Environment Configuration	Identify server requirements	19-FEB-10	John Watson	100	200

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This slide shows the data section that is created by performing the steps listed in the preceding slide. A search bar to enable you to search the entire report or specific columns is also created by default.

Creating a Chart Section

1

Select Chart Type *
 Column
 Horizontal
 Pie
 Line

2

Chart Type Pie
Chart Source Data Grid
Display Sequence * 30
Data Grid * Tasks
Report Settings to Use Primary Report (Primary Default)
Section Title Tasks Status

3

Chart Label * STATUS Axis Title for Label Project Status
Chart Value COST Axis Title for Value Project Cost
Function - Select Function -
Sort Default Enable 3D

4

You have requested to create a chart section with the following attributes. Please confirm your selections.

Display Sequence	30
Section Title	Tasks Status
Chart Type	Pie
Enable 3D	Enable 3D
Chart Source	Tasks (Data Grid)
Report Settings to Use	Primary Report (Primary Default)
Chart Label	STATUS
Axis Title for Label	Project Status
Chart Value	COST
Axis Title for Value	Project Cost
Function	- Select Function -
Sort	Default

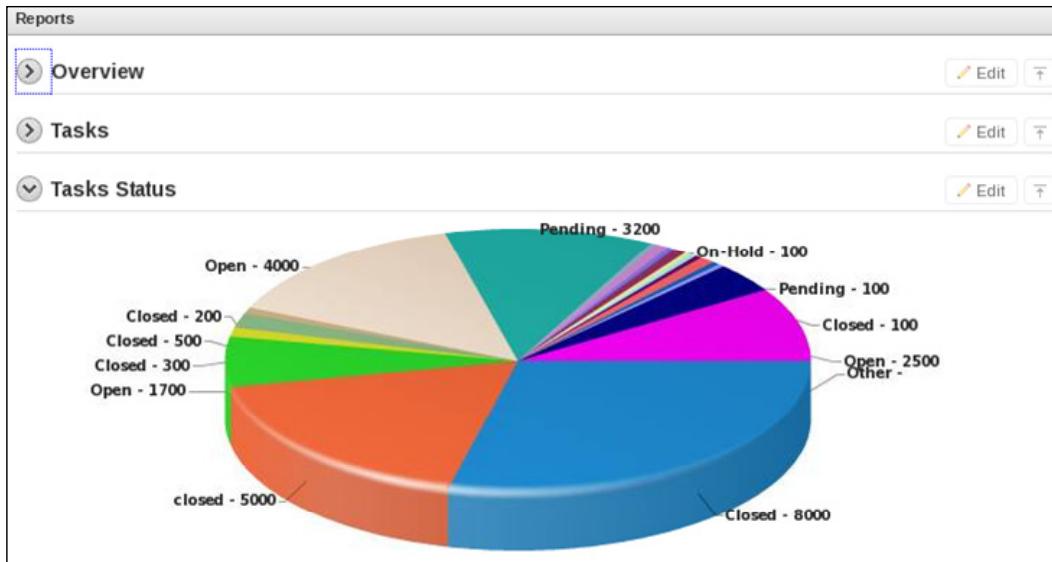
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In the preceding slide, you learned how you can display data from data grids as reports. You can also display the data in the data grids as charts. For this, you need to create a chart section. Create a new section on a page and select the Chart option. Then perform the following steps:

1. Select the type of chart you want to create and click Next. In the example in the slide, the Pie option is selected.
2. Select the data grid you want to use and the report settings. Also specify a title for the chart section. Click Next.
3. Select the Chart Label and Chart Value columns and specify the axis values. Click Next.
4. Review the details you entered and click the Create Section button.

Creating a Chart Section



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The slide shows the chart section that is created by performing the steps listed in the preceding slide.

Quiz

Which section types enable you to reference a data grid or report? (Choose all that apply.)

- a. Text
- b. Navigation
- c. Data
- d. Chart



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a, c, d

Lesson Agenda

Create a Websheet Application

- Overview
- Working with Pages and Sections
- Creating Data Grids
- Manipulating Data Grids
 - Overview
 - Adding a Column
 - Creating List of Values
 - Editing Column Properties
 - Toggling Check Boxes
 - Setting Multiple Columns Values
 - Replacing Values
 - Creating a Validation
 - Adding Annotations

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Overview

Click a text field to change the text.

PROJECT	TASK_NAME	START_DATE	END_DATE	STATUS	ASSIGNED_TO	COST	BUDGET
Maintain Support Systems	HR software upgrades	01-JAN-10	27-FEB-10	Closed	Pam King	8000	7000
Maintain Support Systems	Apply Billing System updates	01-JAN-10	28-FEB-10	closed	Russ Sanders	5000	7000
Maintain Support Systems	Investigate new Virus Protection software	15-FEB-10	23-MAR-10	Open	Pam King	1700	1500
Maintain Support Systems	Arrange for holiday coverage	10-JAN-10	12-JAN-10	Closed	Al Bines	300	500
Email Integration	Complete plan	08-FEB-10	14-FEB-10	Closed	Mark Nile	500	750
Email Integration	Check software licenses	12-FEB-10	13-FEB-10	Closed	Mark Nile	200	200
Email Integration	Get RFPs for new server	19-FEB-10	03-MAY-10	Open	Mark Nile	4000	1000
Email Integration	Purchase backup server	12-MAY-10	07-JUL-10	Pending	Al Bines	3200	3000

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

A data grid can be manipulated in many ways. There are two menus for data grids: Actions and Manage.

The Actions menu provides a way to change the way that the data grid is displayed. This menu is the same as the menu available for a basic interactive report in a database application. These options are discussed in detail in the lesson titled “Creating Reports.”

The Manage menu is specific to a data grid. You can manipulate the data in the data grid by using the options in this menu. Many of the tasks are covered in the next few slides.

You can click the pencil icon next to a row to edit that row. You can click the Add Row button to add a row to the data grid. You can also edit the text data in a data grid by clicking a cell (which changes the data into edit mode), making the change, and then changing focus to another field. This is the inline edit feature of a data grid.

Adding a Column

1

2

3

4

PROJECT	TASK_NAME	START_DATE	END_DATE	STATUS	ASSIGNED_TO	COST	BUDGET	Priority
Maintain Support Systems	HR software upgrades	01-JAN-10	27-FEB-10	Closed	Pam King	8000	7000	3
Maintain Support Systems	Apply Billing System updates	01-JAN-10	28-FEB-10	closed	Russ Sanders	5000	7000	3
Maintain Support Systems	Investigate new Virus Protection software	15-FEB-10	23-MAR-10	Open	Pam King	1700	1500	3
Maintain Support Systems	Arrange for holiday coverage	10-JAN-10	12-JAN-10	Closed	Al Bines	300	500	3
Email Integration	Complete plan	08-FEB-10	14-FEB-10	Closed	Mark Nile	500	750	3

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To add a column to a data grid, perform the following steps:

1. Select Manage > Columns > Add.
2. Enter the specifications for the new column. In the slide example, a new column for Priority is added. This column will be represented as a select list with the values 1 to 5, and the default value is 3.
3. Click Apply.
4. The new column is displayed in the data grid. The new column is also added to the Edit Row page when the user clicks the Edit icon for the row.

Creating a List of Values

The screenshot shows two windows related to creating a List of Values.

Left Window (Manage > Column):

- Properties
- Toggle Checkboxes
- Columns (highlighted with a green circle labeled '1')
- Rows
- Delete Data Grid
- Copy
- History

Right Window (List of Values):

List of Values are used to restrict the column values a user can enter. You can associate the defined List of Values to a column at edit Column Properties.

Form Fields:

- List of Values Name: Status (highlighted with a green circle labeled '2')
- List of Values Definition (Enter comma separated list.): Closed, On Hold, Pending
- Buttons: Cancel, Apply

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can create a list of values (LOV) to display column data in a data grid. To create an LOV, perform the following steps:

1. Select Manage > Column > List of Values.
2. Enter a name for the LOV and also enter the LOV values. Click Apply.

Editing Column Properties

The screenshot illustrates the steps to edit column properties in Oracle Application Express:

- Manage > Columns > Column Properties** (Step 1)
- Column Name: STATUS** (Step 2)
- Display As: Select List** (Step 3)
- List of Values: Status** (Step 4)
- Help Text** (Step 5)
- Cell in the STATUS column of the data grid, showing a dropdown menu with options: Closed, On-Hold, Pending, Open.** (Step 6)

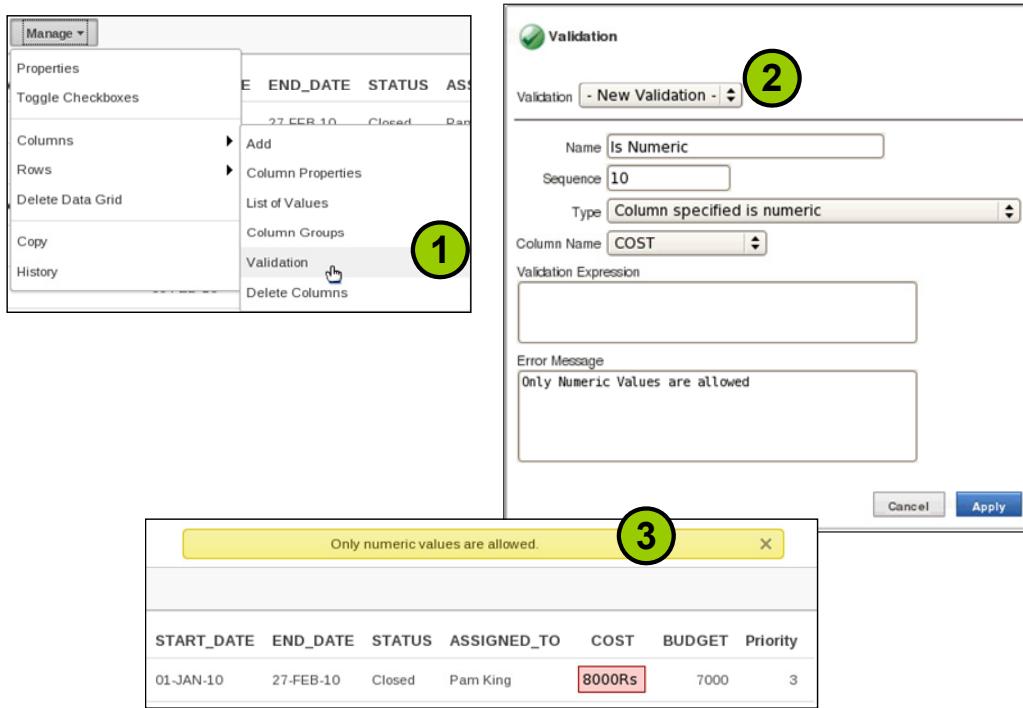
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You may want to control the values that your users enter. In this example, you change the text field to a drop-down list so that users can select only an existing value. Perform the following steps:

1. Select Manage > Columns > Column Properties.
2. In the Column Name drop-down list, select the name of the column that you want to change.
3. Specify the changes that you want to make. In the example in the slide, the Display As field is changed to Select List.
4. Select a list of values.
5. Click Apply.
6. Click one of the cells for the column that you changed. In the example in the slide, clicking a cell in the STATUS column opens a drop-down list (rather than a text field) with all the current values.

Creating a Validation



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can create validations for columns in a data grid. Perform the following steps:

1. Select Manage > Columns > Validation.
2. Specify the validation and click Apply. In this example, a validation is created to ensure that only numeric values are entered in the Cost column.
3. Test the validation by entering a character in the Cost field.

Toggling Check Boxes

The screenshot shows the 'Manage' menu on the left with the 'Toggle Checkboxes' option highlighted. A callout bubble points to the data grid below, containing four rows of project tasks. An arrow points from the 'Toggle Checkboxes' menu item to the first checkbox in the data grid header row. The data grid has columns: PROJECT, TASK_NAME, and START_DATE. The tasks listed are:

PROJECT	TASK_NAME	START_DATE
Maintain Support Systems	HR software upgrades	01-JAN-10
Maintain Support Systems	Apply Billing System updates	01-JAN-10
Maintain Support Systems	Investigate new Virus Protection software	15-FEB-10
Maintain Support Systems	Arrange for holiday coverage	10-JAN-10

Adding check boxes enables you to perform multirow or multicolumn tasks.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Certain tasks require that you select rows to which to apply the task. In such a case, you must toggle check boxes to turn them on to select the rows.

To toggle check boxes, select Manage > Toggle Checkboxes. Notice that there is a check box for each row. To turn the check boxes off, perform the action to toggle check boxes again. To select all rows, select the check box in the header area.

Setting Multiple Column Values

1

2

3

Only the rows that are checked are changed.

ID	Description	Start Date	End Date	Status	Assigned To	Cost	Hours	Priority	
1	Maintain Support Systems	Arrange for holiday coverage	10-JAN-10	12-JAN-10	Closed	AI Bines	300	500	3
2	Email Integration	Complete plan	08-FEB-10	14-FEB-10	Closed	Mark Nile	450	750	3
3	Email Integration	Check software licenses	12-FEB-10	13-FEB-10	Closed	Mark Nile	450	200	3
4	Email Integration	Get RFPs for new server	19-FEB-10	03-MAY-10	Open	Mark Nile	4000	1000	3

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can change the values for a particular set of rows. Turn toggle check boxes on and select the columns for which you want to change values. Then perform the following steps:

1. Select Manage > Rows > Set Column Values.
2. Select the column that you want to change, enter the new value, and select the Selected Rows option. Then click Apply.
3. Only the rows that you selected are changed. Alternatively, you can select the value to be applied to all rows or just the rows that are null.

Replacing Values

The screenshot illustrates the process of replacing values in a data grid. Step 1 shows the context menu with 'Replace' highlighted. Step 2 shows the 'Replace' dialog box for the 'Tasks' data grid. Step 3 shows the 'Find What' field set to 'On Hold' and the 'Replace With' field set to 'Pending'. Step 4 shows the 'Apply' button. Below the dialog, a screenshot of the data grid shows the replacement results.

Project	Task Name	Status	Assigned To	Start Date	End Date	Duration	Owner	Priority	Due Date	
Maintain Support Systems	Arrange for holiday coverage	Closed	Al Bines	10-JAN-10	12-JAN-10	2 days	Al Bines	300	500	3
Email Integration	Complete plan	Closed	Mark Nile	08-FEB-10	14-FEB-10	6 days	Mark Nile	450	750	3
Email Integration	Check software licenses	Closed	Mark Nile	12-FEB-10	13-FEB-10	1 day	Mark Nile	450	200	3
Email Integration	Get RFPs for new server	Open	Mark Nile	19-FEB-10	03-MAY-10	8 weeks	Mark Nile	4000	1000	3
Email Integration	Purchase backup server	Pending	Al Bines	12-MAY-10	07-JUL-10	8 weeks	Al Bines	3200	3000	3
APEX Environment Configuration	Identify server requirements	Pending	John Watson	19-FEB-10	20-FEB-10	1 day	John Watson	100	200	3
APEX Environment Configuration	Specify security authentication scheme(s)	Pending	Scott Spencer	20-FEB-10	22-FEB-10	2 days	Scott Spencer	200	300	3

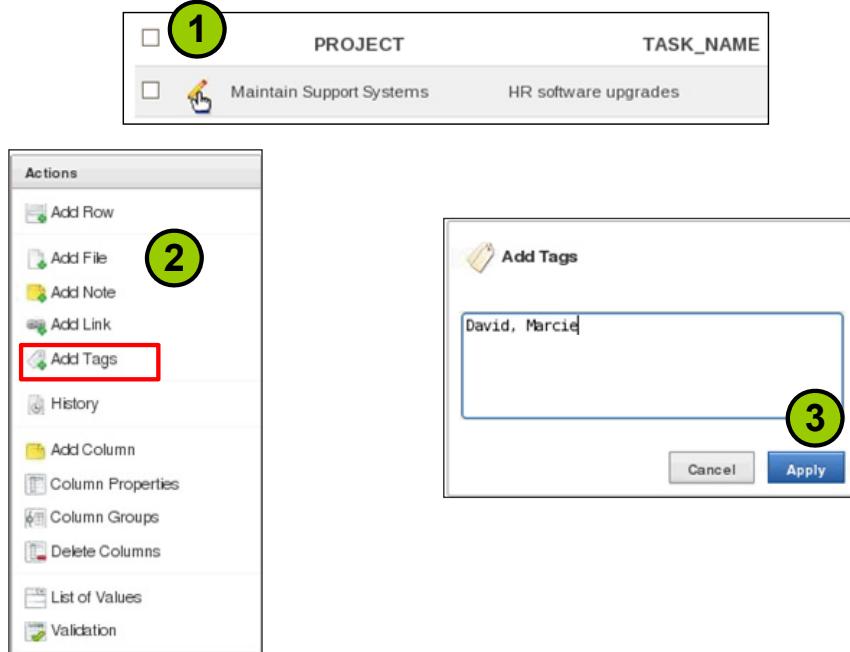
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

There may be situations where you want to change a set of values. In the example in the slide, the On-Hold STATUS value is changed to Pending. Perform the following steps:

1. Select Manage > Rows > Replace.
2. Select the column that you want. In this case, it is the STATUS column.
3. Enter the original value in the Find What area and the new value in the Replace With area. Then click Apply.
4. Note that all On-Hold values are replaced with Pending.

Adding Annotations to a Data Grid



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

On pages or in rows of a data grid, you can include the following annotations:

- **Files:** Upload files for download or to display as an inline image within section text.
- **Notes:** Obvious and usually temporary notes that are specific to the content
- **Tags:** Tags to aid in searching
- **Links:** URLs to specific websites or files on the Internet or intranet

To add an annotation, perform the following steps:

1. Click the Edit icon for a row.
2. In the Actions area of the Add/Edit Row page, select the annotation type.
3. Complete the specific fields (they vary depending on the annotation type), and click Apply.

The annotation is displayed.

To add the annotation to the data grid display, you must add the column to the display by using Actions > Select Columns.

Summary

In this lesson, you should have learned how to:

- Identify the different components of a websheet application
- Create a websheet application
- Create sections on a websheet page
- Annotate pages with files, notes, and tags
- Create and manipulate a data grid



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you should have learned about the various components of a websheet application. You should have learned how to create a websheet application, create sections on a websheet page, annotate pages with files, notes and tags and also create and manipulate a data grid.

Manipulate and Administer a Websheet Application

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to:

- Enable a websheet to interact with a database
- Create SQL, PL/SQL, and report sections
- Create navigation sections
- Administer a websheet



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learn how to edit a websheet application's properties and manipulate a websheet. You also learn how to share a websheet across different users.

Lesson Agenda

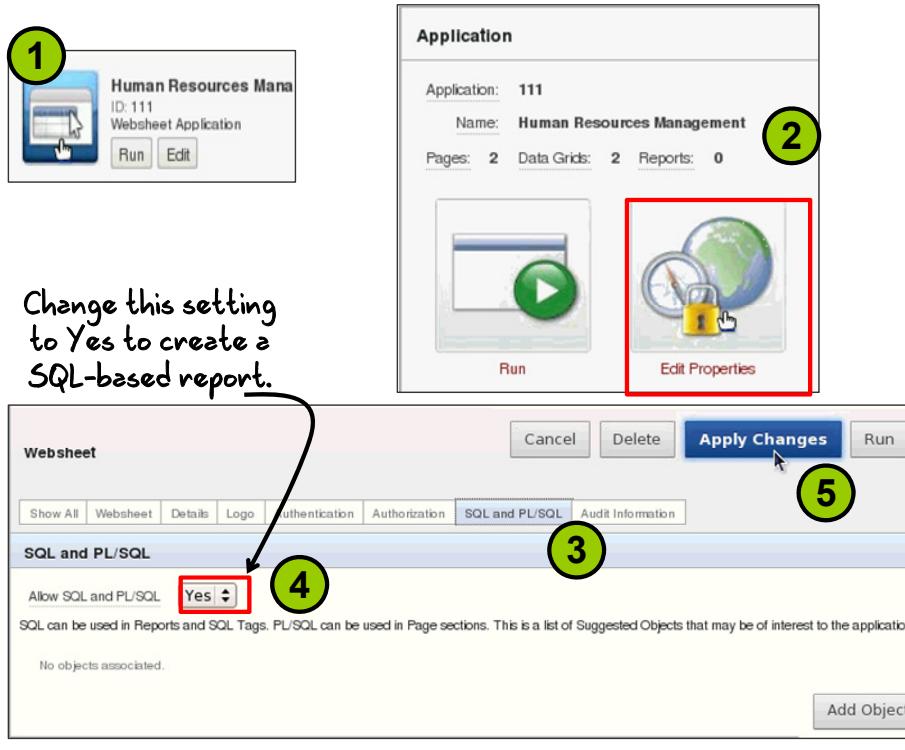
Manipulate and Administer a Websheet Application

- Interacting with the Database
 - Editing Websheet Properties
 - Creating a Report
 - Using SQL Markup
 - Creating a PL/SQL Section
- Enhancing Websheet Applications
- Administering Websheet Applications



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Editing Websheet Properties



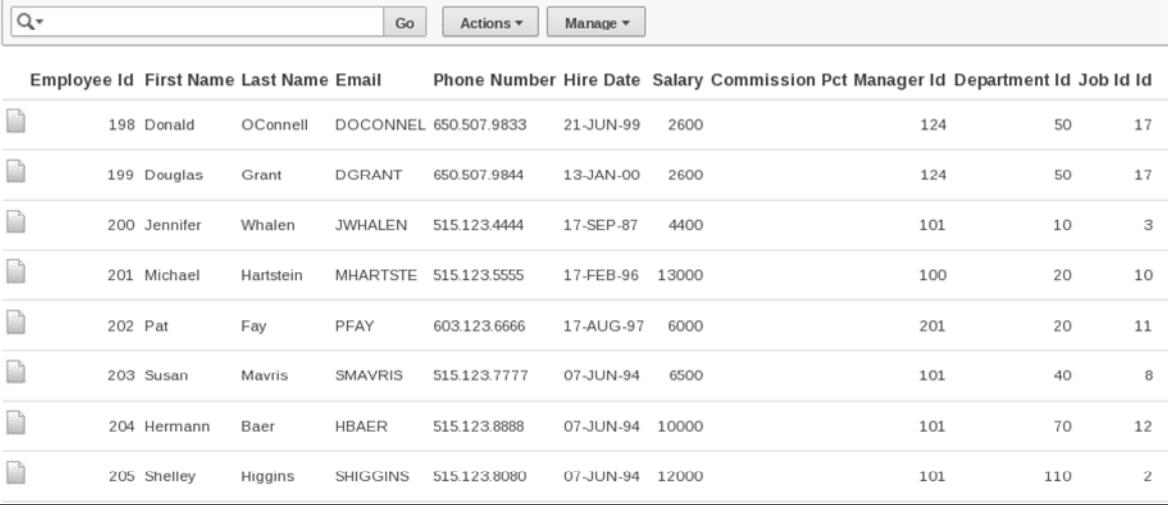
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

ORACLE

If you want to interact with database objects from a websheet, you must enable SQL and PL/SQL for the websheet. Perform the following steps:

1. On the Websheet applications home page, click the websheet icon.
2. Click Edit Properties.
3. Click the “SQL and PL/SQL” subtab.
4. Select Yes for “Allow SQL and PL/SQL.”
5. Click Apply Changes.

Reports



The screenshot shows a report grid with the following columns: Employee Id, First Name, Last Name, Email, Phone Number, Hire Date, Salary, Commission Pct, Manager Id, Department Id, Job Id, and Id. The data is as follows:

	Employee Id	First Name	Last Name	Email	Phone Number	Hire Date	Salary	Commission Pct	Manager Id	Department Id	Job Id	Id
	198	Donald	OConnell	DOCONNEL	650.507.9833	21-JUN-99	2600		124	50	17	
	199	Douglas	Grant	DGRANT	650.507.9844	13-JAN-00	2600		124	50	17	
	200	Jennifer	Whalen	JWHALEN	515.123.4444	17-SEP-87	4400		101	10	3	
	201	Michael	Hartstein	MHARTSTE	515.123.5555	17-FEB-96	13000		100	20	10	
	202	Pat	Fay	PFAY	603.123.6666	17-AUG-97	6000		201	20	11	
	203	Susan	Mavris	SMAVRIS	515.123.7777	07-JUN-94	6500		101	40	8	
	204	Hermann	Baer	HBAER	515.123.8888	07-JUN-94	10000		101	70	12	
	205	Shelley	Higgins	SHIGGINS	515.123.8080	07-JUN-94	12000		101	110	2	



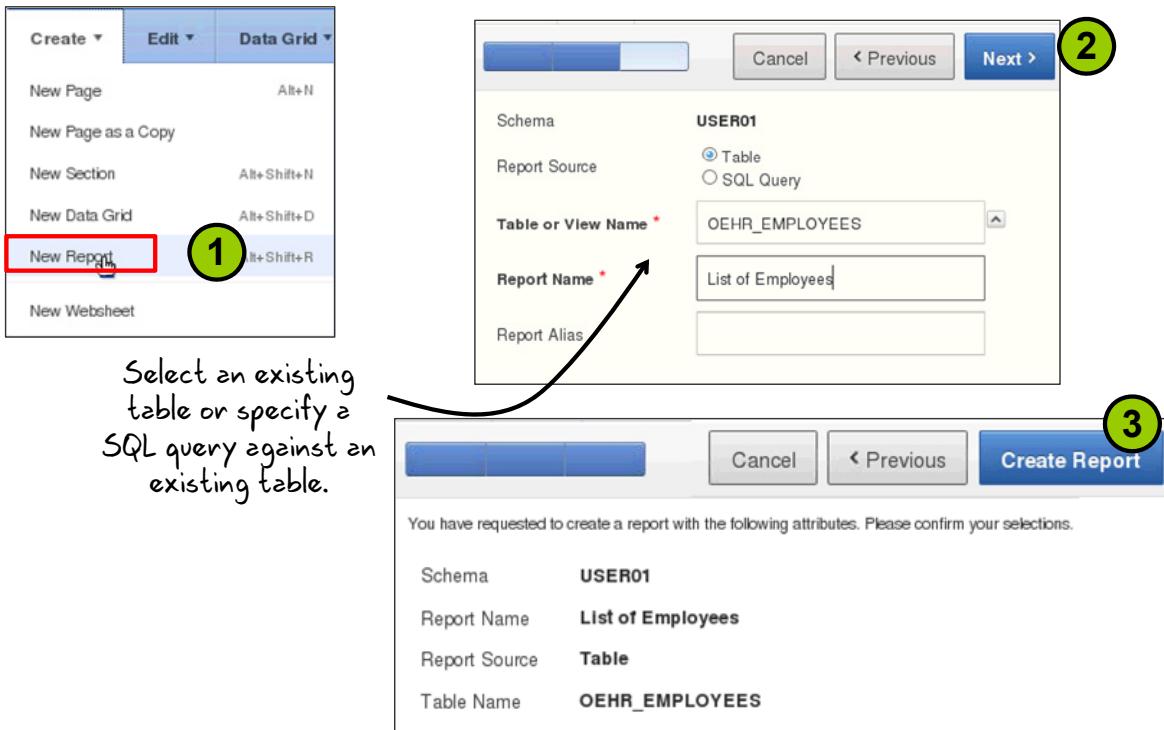
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Reports are queries against the database objects that you have access to. To define a report, you can either simply select a table or view within an available schema, or you can create something more complex by using industry-standard SQL.

Just as with data grids, reports are highly customizable. Users can alter the layout of report data by choosing the columns that they are interested in and applying filters, highlighting, and sorting. They can also define breaks, aggregations, group by, computations, and different charts. A subscription can also be set to email the report at a designated interval. Users can create multiple variations of a report and save them as named reports, for either public or private viewing.

In addition to being available on the Data tab, data within a report can be included as a chart or report on any page.

Creating a Report



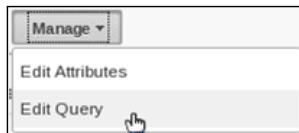
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a report, perform the following steps:

1. Click Create and select New Report.
2. Select Table or SQL Query for the report source, specify the rest of the fields depending on your report source, and click Next. In the example in the slide, Table is selected for the report source; so you select a table, specify a report name, and click Next.
3. Review the details and click Create Report.

Editing the Report Query

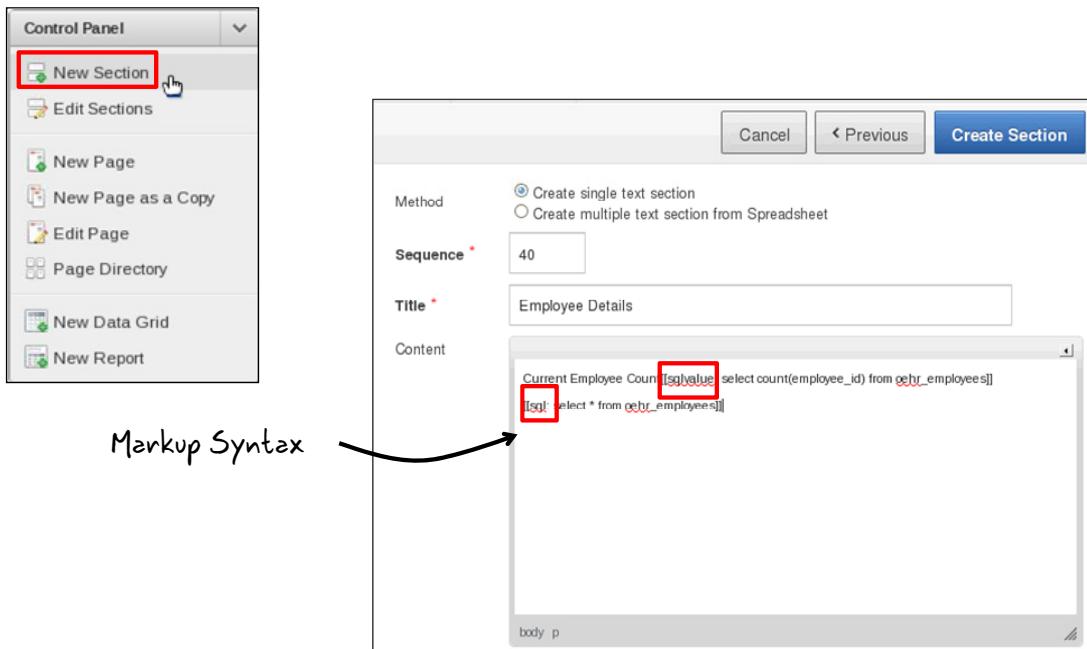
A screenshot of a report configuration screen. At the top, there are tabs for 'Report Attributes' and 'Report Query', with 'Report Query' being the active tab. Below the tabs are buttons for 'Cancel' and 'Apply Changes'. The main area shows a report name 'List of Employees' and a 'Report Query' section. The query text is: 'select EMPLOYEE_ID, FIRST_NAME, SALARY from "DEMR_EMPLOYEES"'.

A red horizontal bar containing the 'ORACLE' logo.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can change the query that the report is based on. Select Manage > Edit Query. Alternatively, if you are viewing report attributes, click the Report Query tab. After you change the query, click Apply Changes. If columns were added or removed, a window is displayed confirming the changes. Click Apply changes again to confirm the changes.

Using SQL Markup



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can write SQL queries within your text sections. This is done by using the SQL markup syntax. In the slide example, note the use of the SQL and SQLVALUE markup syntax.

```
[[ sqlvalue: <SQL query returning single value> ]]  
[[ sql: <SQL query> ]]
```

Creating a PL/SQL Section

The screenshot shows two windows side-by-side. On the left is the 'Create PL/SQL Section' dialog. It has fields for 'Sequence' (set to 50), 'Title' ('Emp Bar Chart'), and a large text area for 'Enter PL/SQL'. The PL/SQL code entered is:

```

declare
    l_total_cnt number := 0;
    l_percent   number := 0;
begin
    sys.hpt.p('');
    <style>
    table.cbc {
        width: 100%;
    }
    table.cbc th {
        text-align: left;
        font-weight: normal;
        font-size: 12px;
    }

```

Below the code is a checkbox: 'Do not validate PL/SQL code (parse PL/SQL code at runtime only)'. At the bottom is a 'PL/SQL Example' link. On the right is the generated report titled 'Emp Bar Chart'. It displays the following data in a bar chart format:

Department	Number of Employees
ACCOUNTING	3
RESEARCH	5
SALES	6
OPERATIONS	0

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After PL/SQL is enabled for a websheet, you can create PL/SQL sections on a page. Perform the following steps:

1. Click Create and select New Section.
2. Select the PL/SQL option and click Next.
3. Enter a title for the section and enter the PL/SQL code in the text area.
4. Click Create Section.

The example in the slide uses PL/SQL code to generate an Employee Bar Chart report.

Quiz

You can use markup text to reference a file or URL.

- a. True
- b. False



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: b

Lesson Agenda

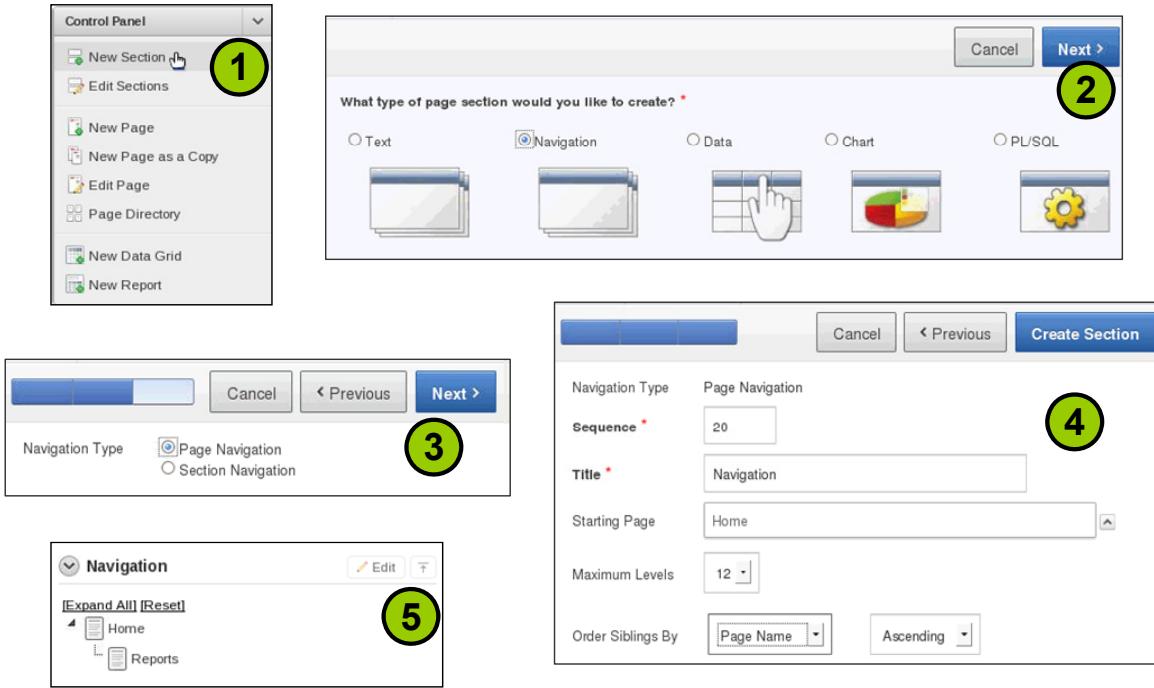
Manipulate and Administer a Websheet Application

- Interacting with the Database
- Enhancing Websheet Applications
 - Creating Navigational Sections
 - Linking Pages
 - Moving a Section to a Different Page
 - Viewing Page History
 - Viewing a Page in Presentation Mode
- Administering Websheet Applications

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Creating Navigation Sections



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Two types of navigation sections are available: Page and Section. The Page Navigation section is displayed as a tree showing the hierarchy of pages with links to each page. The Section Navigation section displays a list of sections on a particular page. To create a navigation section, perform the following steps:

1. Click New Section in the Control Panel.
2. Select Navigation and click Next.
3. Select the navigation type and click Next.
4. Enter a name for the section, and specify the appropriate fields depending on the navigation type. Click Create Section.
5. The navigation section is created.

Notice that if you add a section to a page or add another page to the websheet after you create the navigation section, it is automatically added to the navigation section.

Linking Pages

Edit Section

Page **Home**

Sequence * 10

Title * Overview

Content

Use this application to view details of all **[[Employees | employees]]** across all **[[Departments | departments]]**. You can also add new pages and sections as required.

[[IMAGE:oralogo.gif]]

body p

Overview

Use this application to view details of all **employees** across all **departments**. You can also add new pages and sections as required.

ORACLE

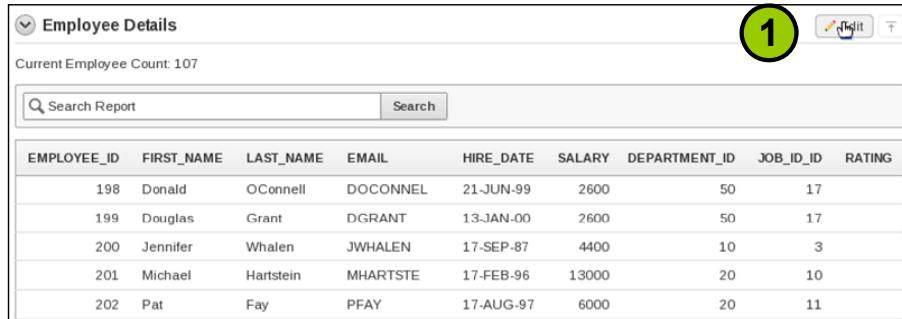
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

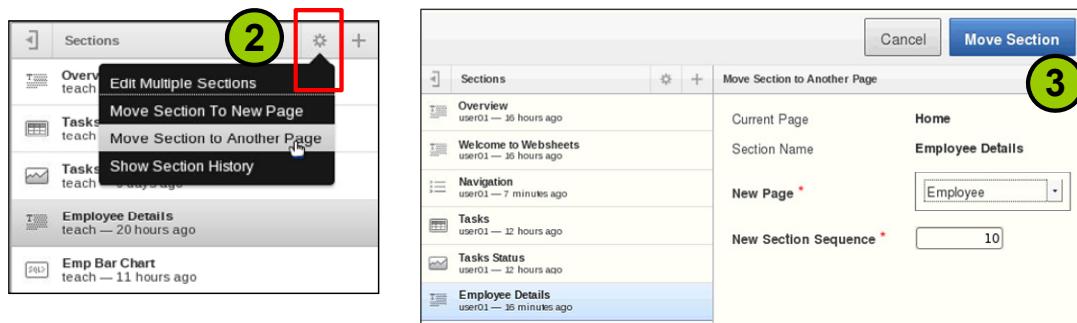
You can create links in the text section to reference another page in the application. Note the use of the markup syntax in the example in the slide:

`[[page name | link name]]`

Moving a Section to a Different Page



The screenshot shows the 'Employee Details' page with a table of employee information. The table has columns: EMPLOYEE_ID, FIRST_NAME, LAST_NAME, EMAIL, HIRE_DATE, SALARY, DEPARTMENT_ID, JOB_ID_ID, and RATING. The data includes rows for employees 198 through 202.



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can move an existing section to another page or create a new page with the section. To move a section, perform the following steps:

1. Click the Edit link for the section.
2. Click the settings icon and select “Move Section to Another Page.”
3. Select the page to move to and click Move Section.

The section will appear on the new page.

Viewing Page History



The screenshot shows the Oracle Application Express navigation bar with 'Create' selected. Below it is a list of items: Home, Page Directory, Annotations, Files, Tags, Notes, Links, and Page History. 'Page History' is highlighted with a blue background and a cursor icon.

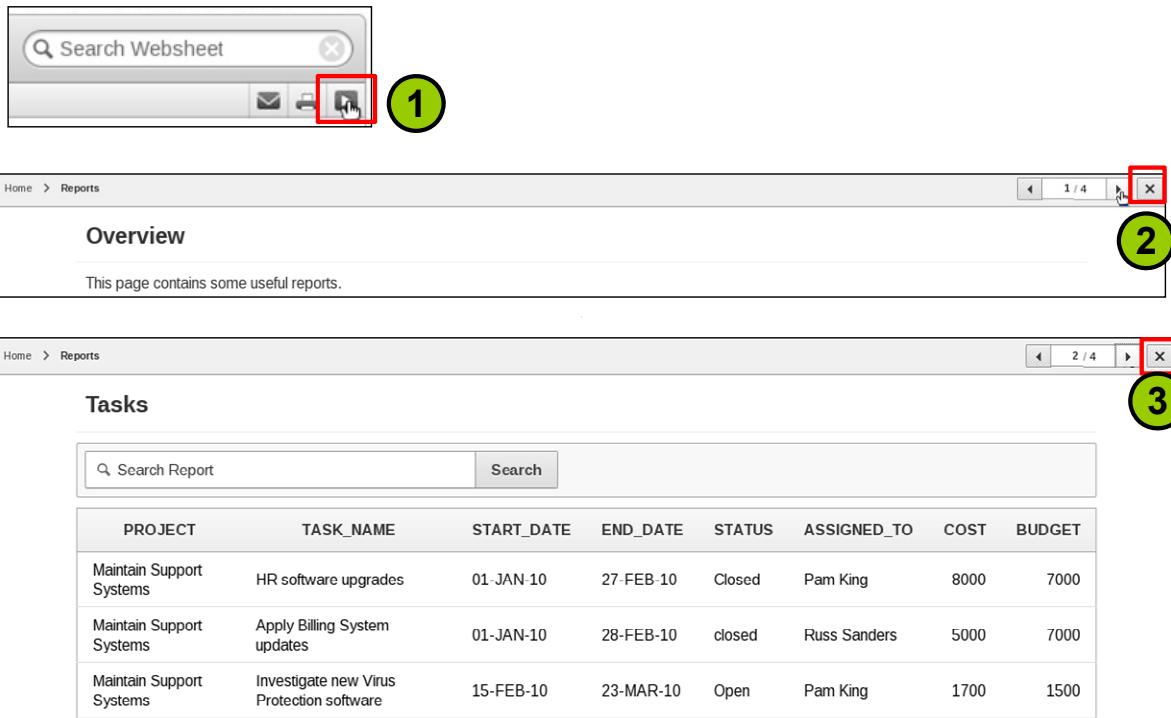
Report	Calendar	Page	Home	Set
<input type="text"/>	<input type="button" value="Go"/>	<input type="button" value="Actions"/>	<input type="button" value="Reset"/>	
Page	Section	Old Content	New Content	Changed <input checked="" type="checkbox"/> User
Home	Navigation	-	Section created	11 minutes ago user01
Home	Employee Details	-	Section created	20 minutes ago user01
Home	Tasks Status	-	Section created	12 hours ago user01
Home	Tasks	-	Section created	13 hours ago user01



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To view changes made to any pages or sections, select View > Page History.

Viewing a Page in Presentation Mode



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can view a page in presentation mode. This will display one section at a time and also provide controls to move to the next section. To view a page in presentation mode, perform the following steps:

1. Click the presentation icon at the top-right corner of the page.
2. The first section of the page is displayed. Click the next icon to move to the next section.
3. The next section on the page is displayed. Click the close icon to exit presentation mode.

Lesson Agenda

Manipulate and Administer a Websheet Application

- Interacting with the Database
- Enhancing Websheet Applications
- Administering Websheet Applications
 - Viewing the Websheet Dashboard
 - Monitoring Activity in a Websheet
 - Sharing Websheet with Users



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Viewing the Websheet Dashboard

The screenshot shows two panels. The left panel is a navigation menu under 'Administration' with 'Dashboard' selected. The right panel displays dashboard statistics: Timeframe (set to '1 week'), Application Details, Recent Changes, Top Users (highlighted with a blue dashed box), and Top Pages (listing Home, Reports, and Employee).

Page	Count
Home	57
Reports	6
Employee	1

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To see a summary of a websheet application, you can view the Dashboard by selecting Administration > Dashboard. Set the time frame to the number of days that you want, and then click Reset. Various information—such as the number of pages, data grids, reports, and when changes were last made—is displayed.

Monitoring Activity in a Websheet

The screenshot shows the Oracle Application Express Administration interface. In the left sidebar, under 'Administration', the 'Monitor Activity' link is selected (indicated by a mouse cursor icon). The main content area is titled 'Activity' and contains a list of monitoring categories. The 'Top Pages' category is highlighted with a red box. Below the list are sections for 'Annotations' (Top Files, Top Notes, Top Tags) and a search/filter bar. The bottom part of the screenshot displays a detailed report table for 'Top Pages' over the last day.

Page Name	Distinct Users	Page Views	Average Text Content	Content Served	Last View
Home	2	46	283.5	13KB	7 minutes ago
Reports	1	26	0	0	8 minutes ago
Employees	1	2	0	0	80 minutes ago
Departments	1	1	0	0	94 minutes ago

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To monitor activity for a websheet, select Administration > Monitor Activity. Click the link for the activity or annotations that you are interested in. A report is displayed with the corresponding activity information. In the example in the slide, Top Pages is selected to display a list of the top page views made over the last day.

Sharing Websheets with Users

1. View the current websheet authentication method.
2. Create users in Application Express Administration.
3. Define an Access Control List (ACL) in the websheet.
4. Change websheet authorization to use a custom ACL.
5. Test user access to the websheet.

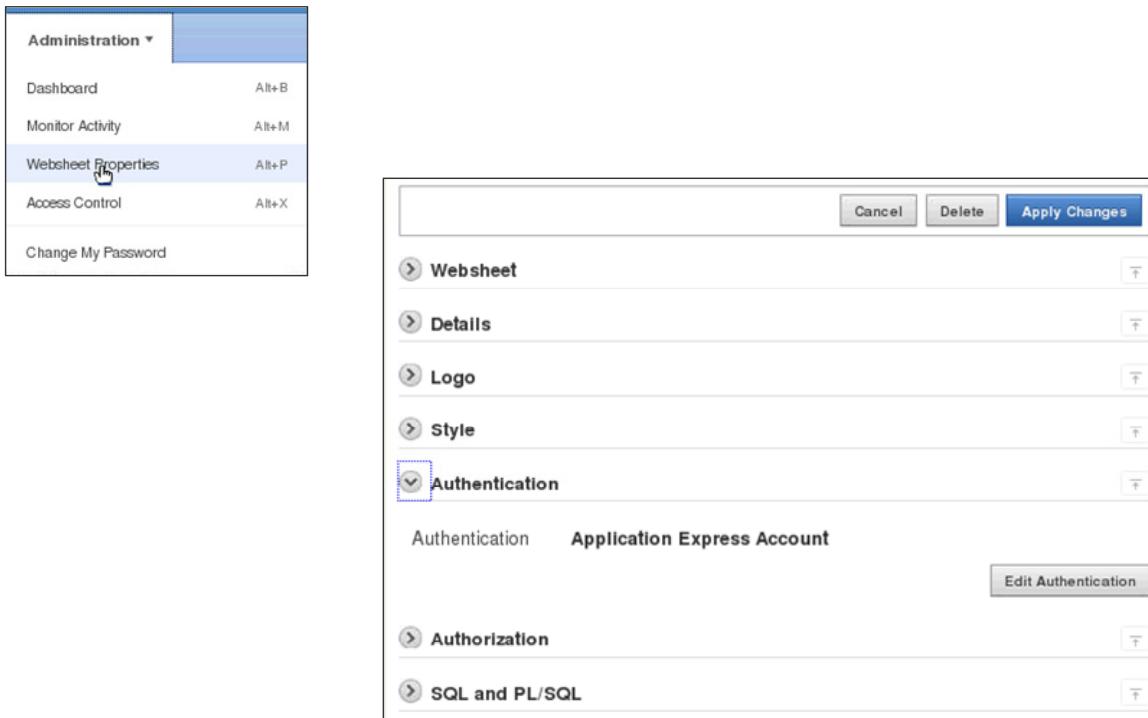


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To share the pages in your websheet with the user community, you must provide them with a username and password to log in. Depending on the username, you can authorize each user to have a particular level of access. The slide provides an overview of the steps required to set up an ACL, which determines who has access to your websheet and what privileges (if any) they have.

These steps are discussed in detail in the following slides.

1. View the Current Websheet Authentication Method

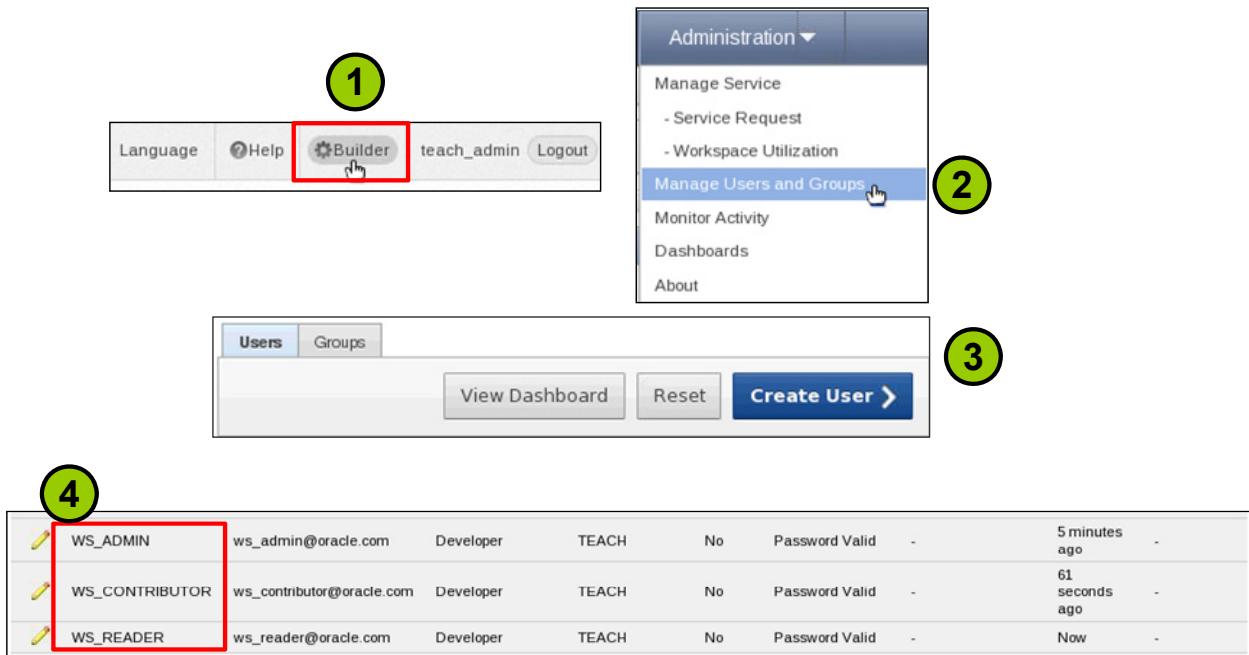


ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Before you set up an ACL, you should review the current authentication method that you are using. Select Administration > Websheet Properties and expand the Authentication region. In the example in the slide, the current authentication method is Application Express Account. This means that you must create all the users that you want to have access to this websheet in Application Express, and then you can assign them a particular privilege in the websheet when you create the ACL.

2. Create Users in Application Express Administration



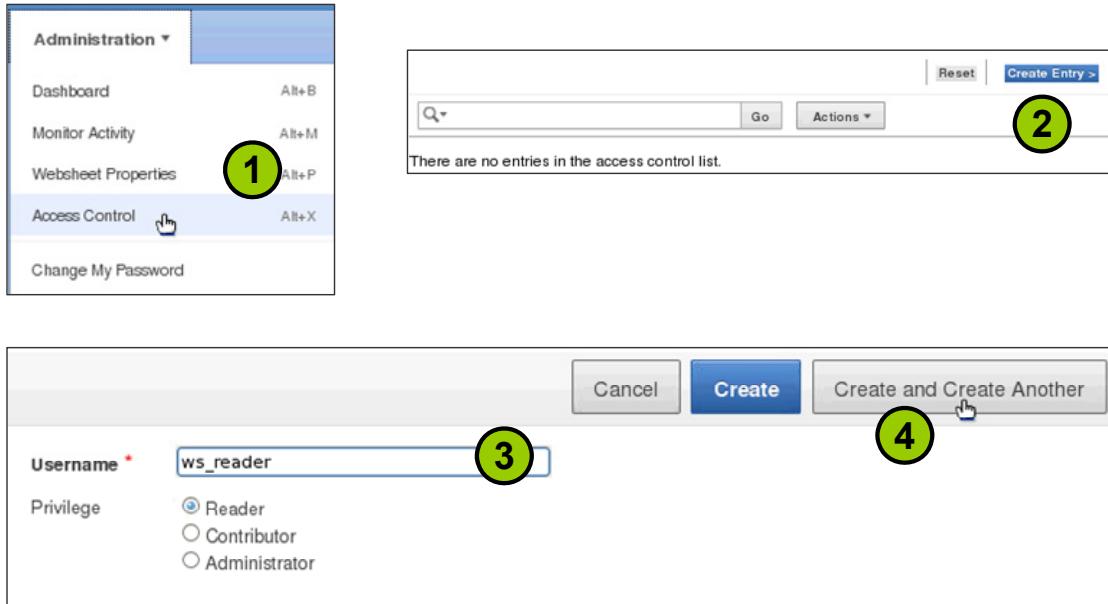
ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To create a user in Application Express Administration, perform the following steps:

1. In your websheet, click the Builder icon.
2. Select Administration > Manage Users and Groups.
3. Click Create Users and create the required users.
4. The users for this example are listed.

3. Create an ACL in Your Websheet



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After your APEX users are created, you can define an ACL in the websheet to allow the user to be authorized to access the websheet. You can assign the following three privileges to provide different levels of authorization for your websheet:

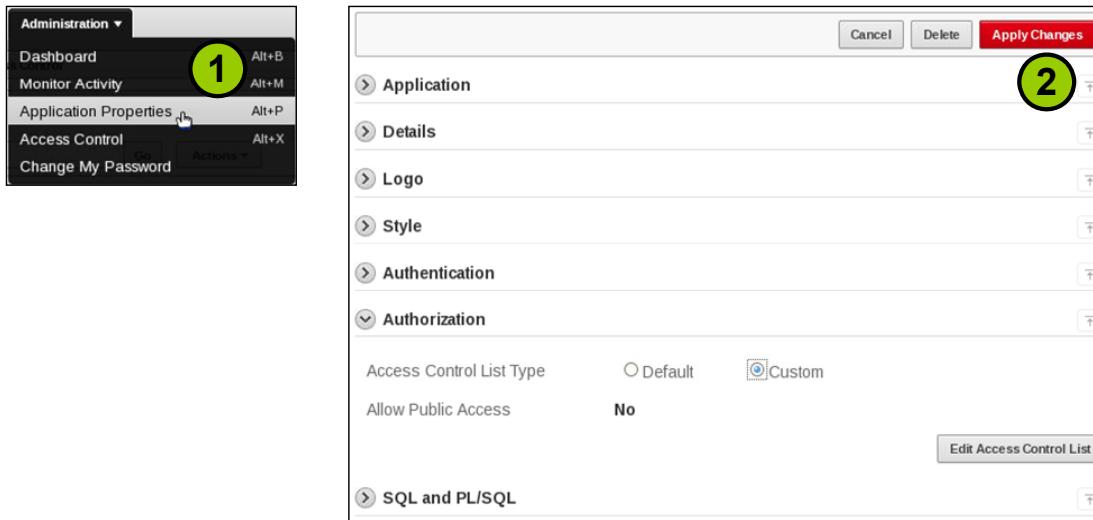
- **Reader:** Read access only; cannot make any changes
- **Contributor:** Can make changes to pages, sections, data grids, and reports, but cannot perform any administration tasks, such as define an ACL or change the authentication of the websheet
- **Administrator:** Can perform all functions allowed within a websheet

To create an ACL, log in to the websheet as the user who created it (who is the administrator) and perform the following steps:

1. Select Administration > Access Control.
2. Click Create Entry.
3. Enter the APEX username and select the privilege.
4. Click Create. Alternatively, click "Create and Create Another" to create another user.

Note: You must also add the creator of the websheet as an administrator so that the user can change the ACL type. If that user is not in the ACL, that person will not be able to enable the list (in the step in the next slide).

4. Change Websheet Authorization to Use a Custom ACL

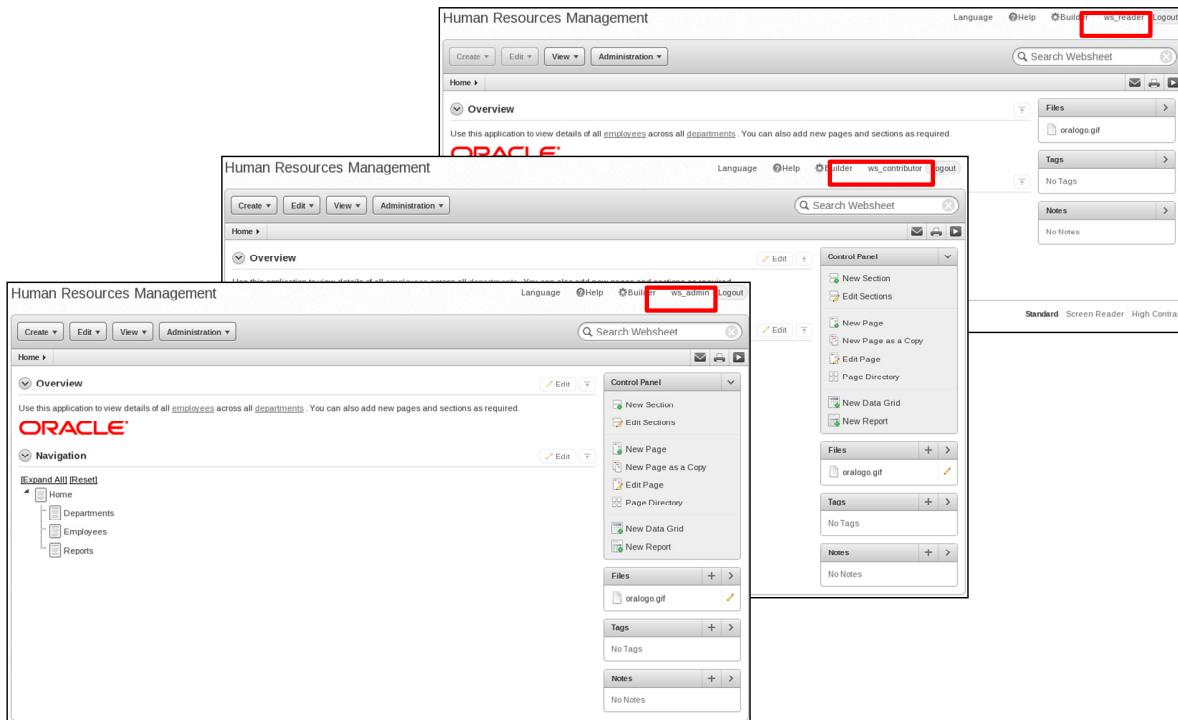


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To enable the ACL that you created in the previous step:

1. Select Administration > Application Properties.
2. Select Custom for the ACL type and click Apply Changes.

5. Test User Access to the Websheet



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

ORACLE

Depending on the privilege, the user is given different access to the websheet. In the example in the slide, note the following:

- The WS_READER user cannot create any new objects or edit any existing ones. This user can only view the websheet objects.
- The WS_CONTRIBUTOR user can create new websheet objects, but cannot administer the websheet.
- The WS_ADMIN user has all privileges—the same privileges that the user who created the websheet has.

Quiz

A user needs the ability to modify a section on a page but not change the properties of the websheet. Which websheet user privilege is needed?

- a. Administrator
- b. Reader
- c. Contributor
- d. Developer



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: c

Summary

In this lesson, you should have learned how to:

- Enable a websheet to interact with a database
- Create SQL, PL/SQL, and report sections
- Create navigation sections
- Administer a websheet



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you should have learned how to enable a websheet to interact with the database. You should have learned how to create SQL, PL/SQL, report sections, navigation sections, and administer a websheet application.

Developing Applications in Oracle Application Express for Oracle Database Cloud Service

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to:

- Explain Oracle Cloud
- Identify the types of services offered by Oracle Cloud
- Create a Database Cloud Service
- Access the Database Cloud Service Oracle Application Express Environment
- Add applications to a Database Cloud Service
- Administer a Database Cloud Service



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Oracle Cloud Overview
 - What Is It?
 - Currently available features
 - Oracle Cloud terminology
 - Oracle Cloud roles
- Types of Services offered by Oracle Cloud
- Creating a Database Cloud Service
- Accessing the Database Cloud Service Oracle Application Express environment
- Adding Applications to a Database Cloud Service
- Administering a Database Cloud Service



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

What Is Oracle Cloud?

Oracle Cloud is an enterprise cloud for business.

The screenshot shows the Oracle Cloud homepage. At the top, there's a banner with the text "Oracle Cloud Social. Mobile. Complete." and a "Learn More" button. To the right is a video player showing a man speaking. The main content area has three main sections: "Plan Effectively" (with icons for a folder and calendar), "Empower People" (with icons for a group of people), and "Boost Sales" (with an upward arrow icon). Each section has a brief description and links to "Enterprise Resource Planning", "Human Capital Management", and "Sales and Marketing". At the bottom is a red footer bar with the Oracle logo and the text "Copyright © 2013, Oracle and/or its affiliates. All rights reserved."

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Oracle Cloud offers self-service business applications delivered on an integrated development and deployment platform with tools to rapidly extend and create new services. With predictable subscription pricing, cloud delivers instant value and productivity for end users, administrators and developers. Its fully managed environment is built using the award-winning Oracle Exadata, Oracle Exalogic, Oracle Database, and Oracle WebLogic products while adding built-in identity management, high availability, elasticity, backup, and monitoring to enable secure and scalable applications. With open Java and SQL standards at the core, enterprises can finally leverage existing IT skill sets and avoid lock-in of their business applications in the cloud.

Oracle Database Cloud Service: Currently Available Features

- Oracle Application Express
- RESTful Web Service
- Some productivity applications to use with Database Cloud Service
- Instant deployment for applications created with Oracle Application Express
- Tools to create and manage data and data structures



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Oracle Database Cloud Service currently provides the following key features:

- A rapid application development tool, Oracle Application Express, that makes creating your cloud-based applications fast and easy
- RESTful Web Service access to your Database Cloud Service
- A set of business productivity applications, which you can install with just a few clicks and immediately start using with your Database Cloud Service
- Instant deployment for applications you create and modify with Oracle Application Express
- Tools to create, manage, and modify your data and data structures

Oracle Cloud Terminology

- **Account:** Corresponds to an individual, an organization, or a company that is an Oracle customer
- **Data center:** An identity domain and the services associated with it belong to a specific data center.
- **Identity domain:** Controls authentication and authorization about who can log in and what they can access
- **Oracle Identity Console:** Is a self-service administrative tool of the shared identity management system



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The following terminology is used when describing the Oracle Cloud features and functionality:

- **Account:** An account corresponds to an individual, organization, or company that is an Oracle customer. An account has one or more Account Administrators who are responsible for creating and nominating the other administrator types, creating identity domains, and managing the customer account information. If you sign up for trial or paid services, you will do so using an Oracle.com account; if you do not already have one, you will be prompted to create an account the first time you sign up.
- **Data Center:** Oracle provides data centers in various geographical regions. An identity domain and the services associated with it must belong to a specific data center. For optimal performance when purchasing a service subscription, select a data center closest to the majority of your user population.
- **Identity domain:** Identity domains control authentication and authorization about who can log in and what they can access once they log in. Multiple services can be associated with a single identity domain to share user definitions and authentication. Users in an identity domain can be granted different levels of access to each service associated with the domain. An Oracle Cloud Service has to belong to an identity domain. Identity domains control service user authentication and authorization. Service users in an identity domain can have different levels of access.

Oracle Cloud Terminology

- **Service:** A software offering in the Oracle Cloud
- **Service name:** A name assigned to your service
- **Service notifications:** Events reported on the notifications tab
- **Trial services:** Services available for free for a 30-day period
- **Utilization:** Metrics that show how much system resources are being consumed by a service

**ORACLE**

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

- **Oracle Identity Console:** It is a self-service administration tool of the shared identity management system that is used in the provisioning and management of service users and administrator accounts for all Oracle Cloud services
- **Service:** A service is a software offering in the Oracle Cloud. Oracle offers social, application, and platform services.
- **Service name:** It is a name assigned to your service, which must be unique within the identity domain. You can add a longer description to a service to help you identify it, after it is activated.
- **Service notifications:** Service notifications are events reported on the Notifications tab, which do not require administrative action. They provide information about upcoming systemwide and service-specific events, such as outages and blackouts.
- **Trial services:** These are services that are available for free for a 30-day period; for trial and evaluation purposes only.
- **Utilization:** It provides metrics that show how much system resources are being consumed by a service. You can find utilization metrics on the My Services pages, including the Services Overview tab (last usage for all metrics tracked) and Utilization tab (history and latest usage).

Oracle Cloud Roles

- **Account administrator:** Can view the status of existing services
- **Service administrator:** Is responsible for managing one or more service instances in an identity domain
- **Identity domain administrator:** Can create user accounts and roles within a given identity domain
- **Buyers:** Are people who make purchases in the Oracle Store on behalf of their organization or company
- **Service users:** Are end users with service and application roles assigned to them



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

- **Account administrator:** An account administrator can view the status of existing services monitor utilization, view and activate pending trial service requests, purchase and upgrade services, and add and remove account administrators. An account administrator can also be a service administrator.
- **Service administrator:** A service administrator is responsible for managing one or more service instances in an identity domain. Service administrators can monitor services, lock and unlock services, and perform service-specific operations such as data loading for a Database Cloud Service. A service administrator can be granted access to multiple identity domains, but must access and manage each one separately.
- **Identity domain administrator:** Identity domain administrators can create user accounts and roles within a given identity domain, independent of any service. They can also reset user passwords, assign and revoke roles, and grant identity domain administration privileges to other users. They cannot create or destroy identity domains. An identity domain administrator can also be a service administrator.
- **Buyer:** Buyers are people who make purchases in the Oracle Store on behalf of their company or organization. During the process of purchasing Oracle Cloud services, a buyer must designate himself or herself or another person as the account administrator. Buyers can upsize existing paid services and terminate paid services.
- **Service user:** Service users are end users with service and application roles assigned to them, which allows access to service instances within an identity domain.

Lesson Agenda

- Oracle Cloud Overview
- Types of Services offered by Oracle Cloud
 - Trial Services
 - Paid Services
- Creating a Database Cloud Service
- Accessing the Database Cloud Service Oracle Application Express environment
- Adding Applications to a Database Cloud Service
- Administering a Database Cloud Service

 ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Types of Services

- **Trial Services:** Subscriptions to try out and evaluate Oracle Cloud services for your enterprise needs that last for 30 days
- **Paid Services:** Subscriptions to buy a paid service at several pricing points and service levels to suit your organization's needs and budget



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Trial and paid service subscriptions are easy to request and activate in Oracle Cloud. All you need is an Oracle.com account.

The person who signs up for a trial service is, by default, the account administrator for the service. During signup, you can nominate others to act as service and identity domain administrators. Optionally, the service administrator and identity domain administrator can be the same person. Trial subscriptions are provided so that you can try out and evaluate Oracle Cloud services for your enterprise needs. After a trial service request has been submitted, you use My Services and My Account, available from the Oracle Cloud home page, to manage your trial requests and trial services. This guide describes how to subscribe to and manage Oracle Database Cloud Service trials. Trials last for 30 days.

The person who purchases a paid service can be the account administrator, or can designate another person to be an account administrator for his or her account. The account administrator creates service administrators, identity domains, and identity domain administrators for all services purchased for this account. Oracle offers Oracle Cloud services at several pricing points and service levels to suit your organization's needs and budget. You can purchase Oracle Database Cloud Service instance at any time. You can also upsize an existing paid service to a higher level. You can review pricing for services from the Oracle Cloud home page, by clicking a service, and then clicking the Pricing tab.

Lesson Agenda

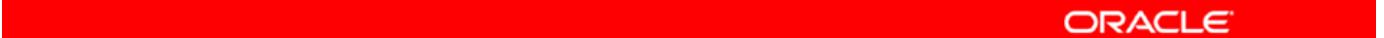
- Oracle Cloud Overview
- Types of Services offered by Oracle Cloud
- **Creating a Database Cloud Service**
- Accessing the Database Cloud Service Oracle Application Express environment
- Adding Applications to a Database Cloud Service
- Administering a Database Cloud Service

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Creating a Database Cloud Trial Service

1. In your web browser, go to Oracle Cloud by using the URL:
<http://cloud.oracle.com>
2. On the home page in Oracle Cloud, click **Try it**.
3. Select **Try it** for the desired service.
4. Click **Sign In** to sign in to your Oracle.com account.
5. On the Account Information page of the trial service request form, enter your details such as your first and last name, your company or organization's name, and your full address, which are required fields marked by asterisks.
6. Click **Next**.
7. On the Credit Card Validation page, enter the details for a valid credit card. When you are done, click **Next**.



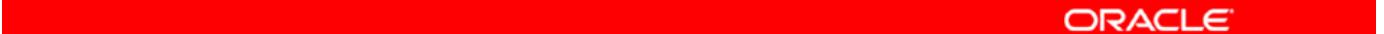
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The steps to create a Database Cloud trial service are provided in the slide.

Creating a Database Cloud Trial Service

8. On the Service Details page, fill out the **Service Information**, **Service Administrator** information, and **Identity Domain Administrator** information.
9. Click **Next**.
10. On the **Accept User Agreement** page, read the user agreement and select the check box at the bottom to accept the terms and conditions of the agreement. Then click **Submit Request**.
11. On the thank you page, you can click **My Account > Trial Requests** at the top of the page to see the status of your pending service request.

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Lesson Agenda

- Oracle Cloud Overview
- Types of Services offered by Oracle Cloud
- Creating a Database Cloud Service
- Accessing the Database Cloud Service APEX environment
 - About the My Services Page
 - Accessing the My Services Page
 - Launching a Database Cloud Service Oracle Application Express environment
- Adding Applications to a Database Cloud Service
- Administering a Database Cloud Service



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

About the My Services Page

The screenshot shows the Oracle Cloud My Services page. On the left, there's a sidebar with 'My Services' at the top, followed by 'Services' (with 1 notification), 'Notifications' (with 0 notifications), and 'Status History'. The main area has a search bar, a 'Filter' button, a 'Chat' button, and a 'Contact Us' button. Below that, a section titled 'Services within july06trial' shows a table with one row. The table has columns for Type (Database Trial), Service Name (database), Utilization (No Utilization Yet.), and Actions (with three icons). A 'Identity Console' button is also present in this section.

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Use the information on the Oracle Cloud My Services page to manage and monitor your Database Cloud Service. The My Services page consists of three major categories: Services, Notifications, and Status History.

Accessing the My Services Page

To access the My Services page:

1. On the Oracle Cloud home page, click **Sign In**.
2. For Data Center, select the data center.
3. Click **Sign In to My Services**.
4. Enter the Database Cloud Service credentials and click **Sign In**.

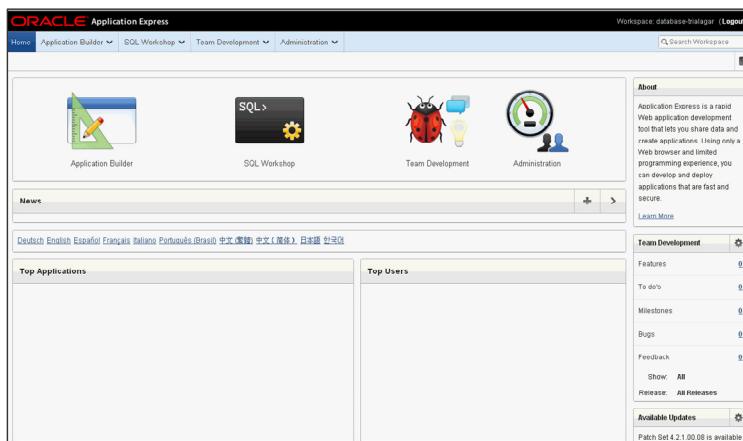


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The steps to access the My Services page are explained in the slide.

Launching a Database Cloud Service APEX Environment

1. From the Oracle Cloud home page, go to the My Services page.
2. Next to Database Cloud Service, click the **Launch Service** icon. The Oracle Application Express home page appears.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The steps to launch a database Cloud Service APEX environment are explained in the slide.

Lesson Agenda

- Oracle Cloud Overview
- Types of Services offered by Oracle Cloud
- Creating a Database Cloud Service
- Accessing the Database Cloud Service APEX environment
- Adding Applications to a Database Cloud Service
- Administering a Database Cloud Service



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Creating a Database Application

1. Launch the Database Cloud Service.
2. Click **Application Builder**.
3. Click **Create**.
4. Select **Database** and click **Next**.
5. Follow on-screen instructions.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Database applications are managed with Oracle Application Express Application Builder. Using Oracle Application Express Application Builder, you can create, edit, and remove applications. The Create Application Wizard enables you to create a complete application containing multiple pages including reports, interactive reports, forms, tabular forms, and master detail forms. The Create Application Wizard is designed to easily and quickly create Oracle Application Express Database applications. You can also create Websheet Applications and install Packaged Applications. Follow the steps given in the slide to create an Oracle Application Express database application.

After an application has been created or installed to an Oracle Database Cloud Service instance, end users with the appropriate authorization and authentication credentials can access it using a web browser. The application administrator simply provides the end users with the application's URL.

Lesson Agenda

- Oracle Cloud Overview
- Types of Services offered by Oracle Cloud
- Creating a Database Cloud Service
- Accessing the Database Cloud Service APEX environment
- Adding Applications to a Database Cloud Service
- Administering a Database Cloud Service



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Administering a Database Cloud Service

- A database administrator role is automatically granted to the service administrator when the Database Cloud Service is first set up in an identity domain.
- Only identity domain administrators can add users, and they are allowed to add, modify, and delete users only in the identity domains that they have been designated to administer.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After services have been activated and verified to be ready for use, users must be added to the Oracle Cloud identity management system before they can begin using cloud services. Service users may include developers, end users, and additional service administrators. Administrative individuals are automatically granted the preseeded roles that correspond to their administrator role and the type of service they are targeted to manage. In addition, all identity domain administrators are granted the **Identity Domain Administrator** preseeded role when any service is first set up. So if an individual is both the identity domain administrator and the service administrator for a service, such as a Database Cloud Service, then the individual is automatically granted the **Identity Domain Administrator** and **Database**.

Administrator preseeded roles. Identity domain administrators use Oracle Identity Console to add and manage users and roles for all Oracle Cloud services. A database administrator can access all Oracle Application Express application components, and manage application user accounts using Oracle Application Express authorization. A database administrator can perform workspace administrator tasks specific to a workspace, such as monitoring workspace activity and viewing log files. A database administrator can monitor and manage service usage in Oracle Cloud. Only identity domain administrators can add users, and they are allowed to add, modify, and delete users only in the identity domains that they have been designated to administer.

Summary

In this lesson, you should have learned about:

- Oracle Cloud and its concepts
- Types of services offered by Oracle Cloud
- Creating a Database Cloud Service
- Accessing the Database Cloud Service APEX environment
- Adding Applications to a Database Cloud Service
- Administering a Database Cloud Service



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Here, you learned about Oracle Cloud and its concepts and the various services offered by Oracle Cloud. You learned how to create a database cloud service and access the database cloud service APEX environment. You also learned about adding applications and administering a Database Cloud Service.

You can also view some of the tutorials about Oracle Database Cloud Service in the Oracle Learning Library at:

http://apex.oracle.com/pls/apex/f?p=44785:2:444793766274::FORCE_QUERY::2,CIR,RIR:P2_TAGS:Database%20Cloud%20Service

About Deploying an Application

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Objectives

After completing this lesson, you should be able to:

- Identify the supporting objects for your application
- Export an application and its supporting objects
- Import an application
- Install the supporting objects



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This lesson shows you how to manage supporting objects for your application by defining prerequisites and uploading scripts. You then export the application and import it into and install it in another Oracle Application Express instance.

Lesson Agenda

Deploy an Application

- Overview
 - Steps to Deploy an Application
 - What Is a Packaged Application?
 - What Are Supporting Objects?
- Creating a Packaged Application
- Installing a Packaged Application



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Steps to Deploy an Application

1. Create a packaged application.
 - Identify the application's supporting objects.
 - Manage the supporting objects definition.
 - Export the application.
2. Import the packaged application.
3. Install the packaged application.
4. Publish the URL.

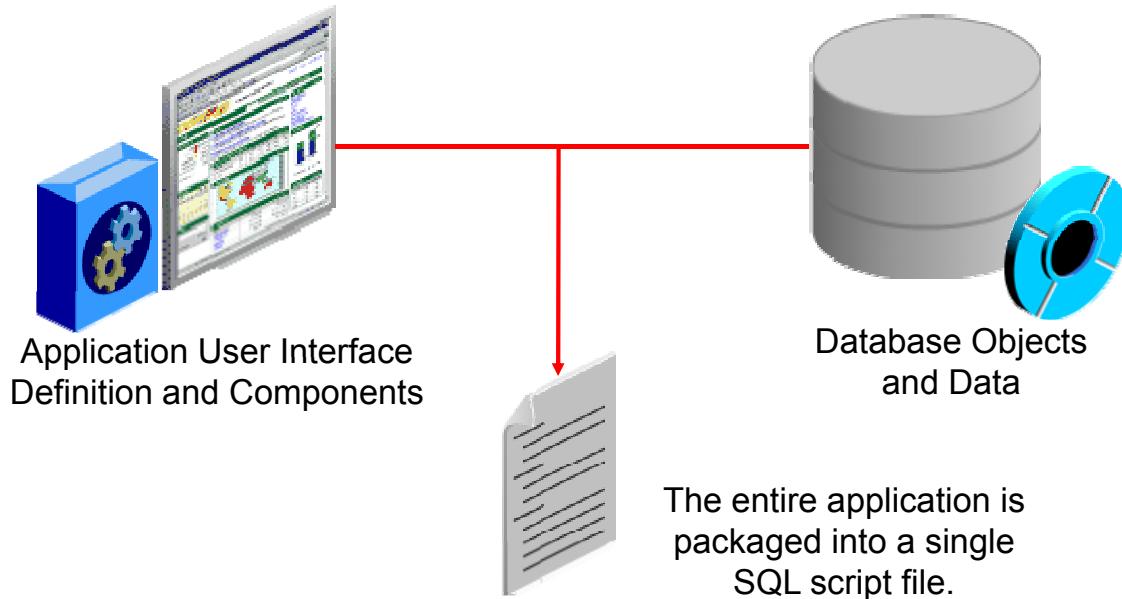


Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The steps to deploy an application are listed in the slide.

What Is a Packaged Application?

A packaged application simplifies the process of deploying an application.



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

A packaged application is a single SQL file that contains information about an application and its components, as well as information about the database objects and the data in them. This single SQL file can then be imported and installed into another Oracle Application Express instance.

What Are Supporting Objects?

Supporting objects are the database objects and data needed to run an application successfully.

The screenshot shows the 'Supporting Objects' page for the application '108: Order Management'. The 'Application' section displays statistics: Check for Objects: No, Substitutions: 0, Installation Scripts: 0; Verify System Privileges: No, Build Options: 0, Upgrade Scripts: 0; Required Free KB: 0, Validations: 0, Deinstallation Script: No; and Prompt for License: No, Include in Export: Yes. Below this are three main sections: 'Installation' (Prerequisites, Application Substitution Strings, Build Options, Pre-installation Validations, Installation Scripts, Messages), 'Upgrade' (Upgrade Scripts, Upgrade Message), and 'Deinstallation' (Deinstallation Script, Deinstallation Message).

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Supporting objects are the database objects needed by an application to run successfully. These include database object definitions, images, and sample data. The instance to which you want to deploy your application may already have all the supporting objects. In this case, you do not have to export and install them.

To manage supporting objects for an application, navigate to the application's home page and click the Supporting Objects icon. On the Supporting Objects page, you can create and manage the scripts required to install, upgrade, and deinstall an application.

Lesson Agenda

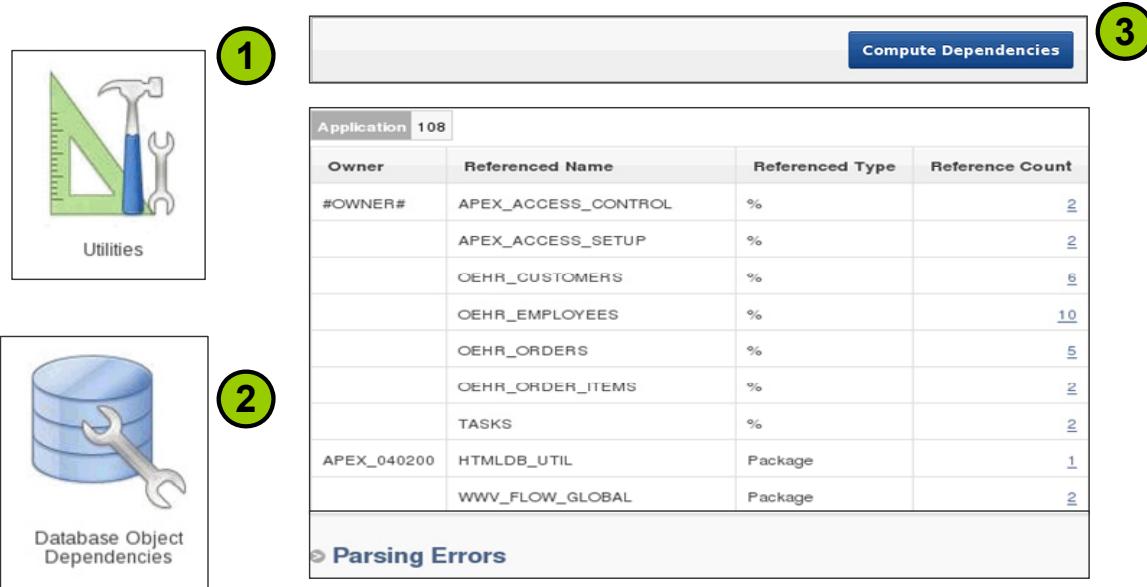
Deploy an Application

- Overview
- Creating a Packaged Application
 - Identifying the Supporting Objects for an Application
 - Creating Installation Scripts
 - Specifying Prerequisites and Other Options
 - Creating an Installation Script
 - Creating Upgrade Scripts
 - Creating Deinstallation Scripts
 - Accessing the Export Page
 - Exporting the Application
- Installing a Packaged Application

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Identifying the Supporting Objects for an Application



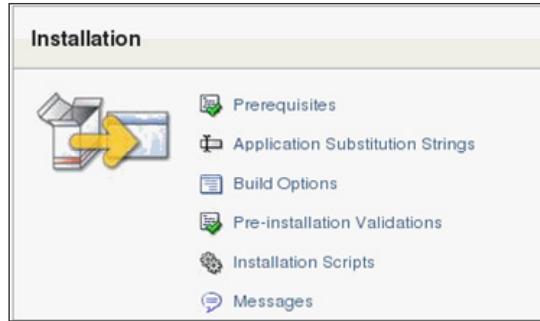
Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To identify which database objects an application uses, you can run the Data Object Dependencies report. Perform the following steps:

1. Navigate to the application's home page and click the Utilities icon.
2. Click the Database Object Dependencies icon.
3. Click the Compute Dependencies button.

A report is displayed listing the database objects used by the application. These are the application's supporting objects.

Creating Installation Scripts



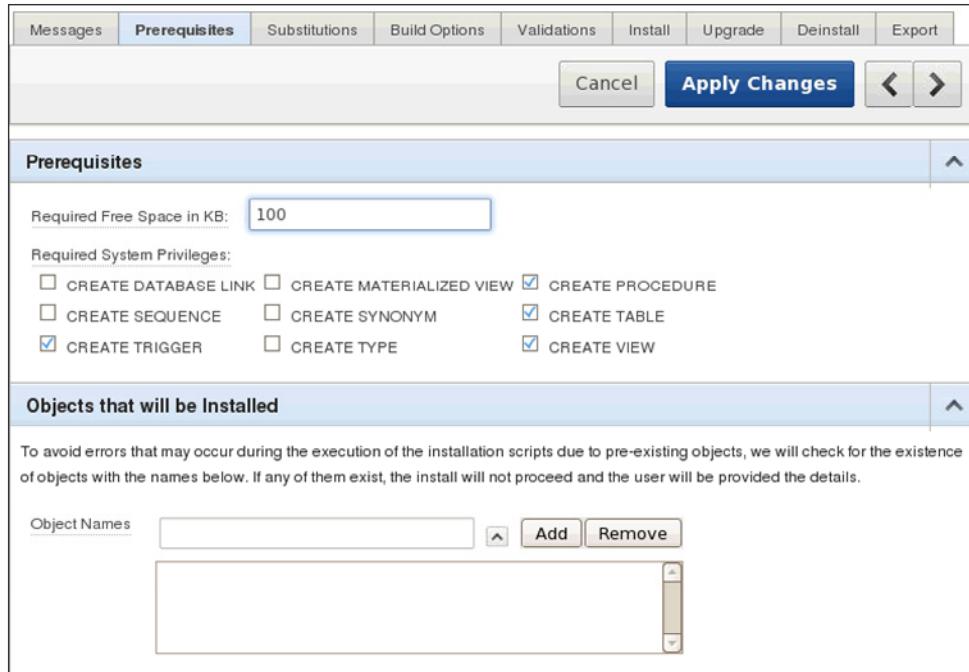
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

From the Installation pane on the Supporting Objects page, you can:

- Specify any prerequisites for the installation
- Specify the substitution strings used in the application
- Specify the build option for the application pages
- Verify the validations to be performed before installing the application
- Create the installation scripts
- Enter the messages to be displayed during installation. The supported HTML tags include ``, `<i>`, `<u>`, `<p>`, `
`, `<hr>`, ``, ``, ``, and `<pre>`.

Specifying Prerequisites and Other Options



ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

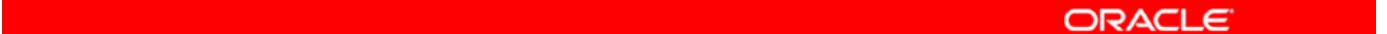
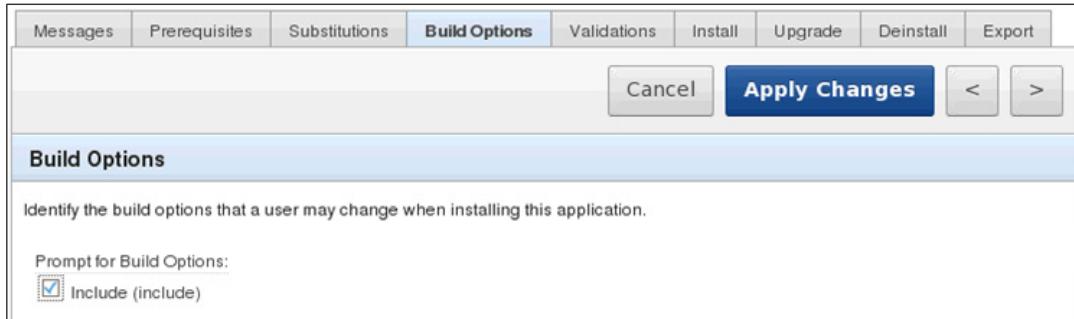
You can check for disk space, sufficient privileges, or existing table names before running the installation scripts. On the Supporting Objects page, click the Prerequisites link. On the **Prerequisites** tab, you can define built-in checks that are performed before installation. If prerequisites are defined, before installation, the installer checks whether there is enough space to create all the objects that are needed. It checks whether the system privileges are set accordingly and whether the list of objects exists.

You can use the **Messages** tab to enter the messages that you want to display during installation and deinstallation.

The **Substitutions** tab lists the static substitution strings defined for the application. You can specify the substitution strings that a user can define while installing.

The **Validations** tab lists the validations defined for the packaged application. These validations prevent a user from installing database objects if the defined conditions are not satisfied. On the **Export** tab, you can specify whether the deployment attributes should be exported with your application by default.

Specifying Build Options

The ORACLE logo.

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

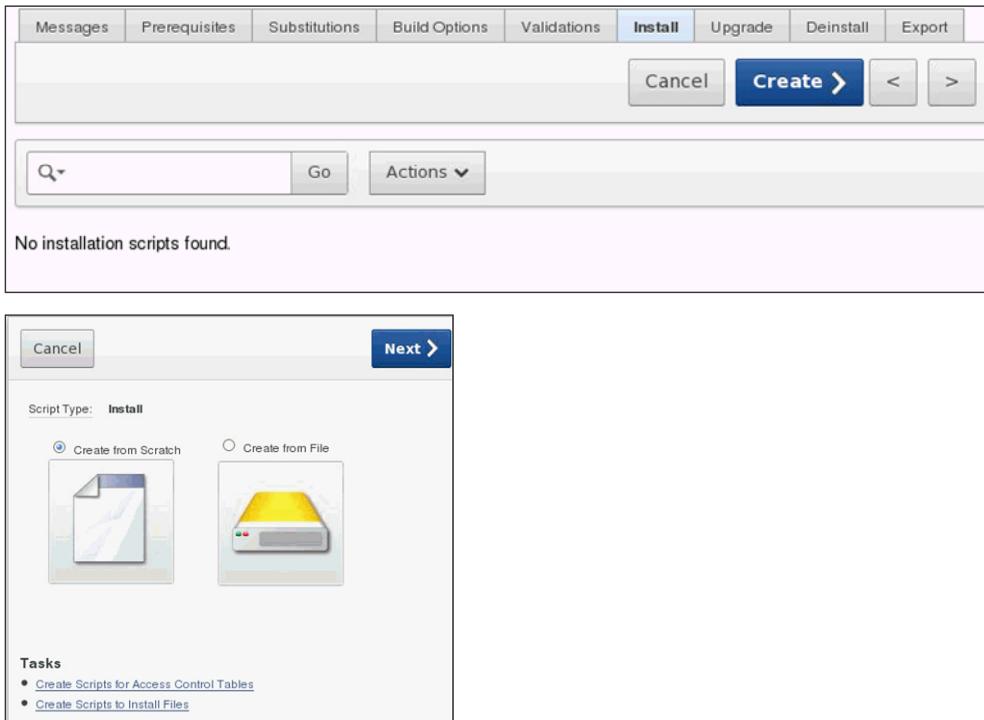
The **Build Options** tab lists the build options defined for this application. Build options enable you to hide or show specific functionality within an application. You can apply build options to an entire page or to specific components of the page.

To create a build option, navigate to the Shared Components page and click the Build Options link under Logic. Click the Create button. Specify a name and select a status for the build option. The available build options are `INCLUDE` and `EXCLUDE`. As the name specifies, you can select an option depending on whether you want to include or exclude a functionality.

After creating the build option, you can apply it to a page or component. Edit the page or component and specify the build option (located on the Configuration tab).

On the Build Options tab under supporting objects, you can specify the build options that should be included in the export file. These options can be changed by the user while installing the application.

Creating an Installation Script



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

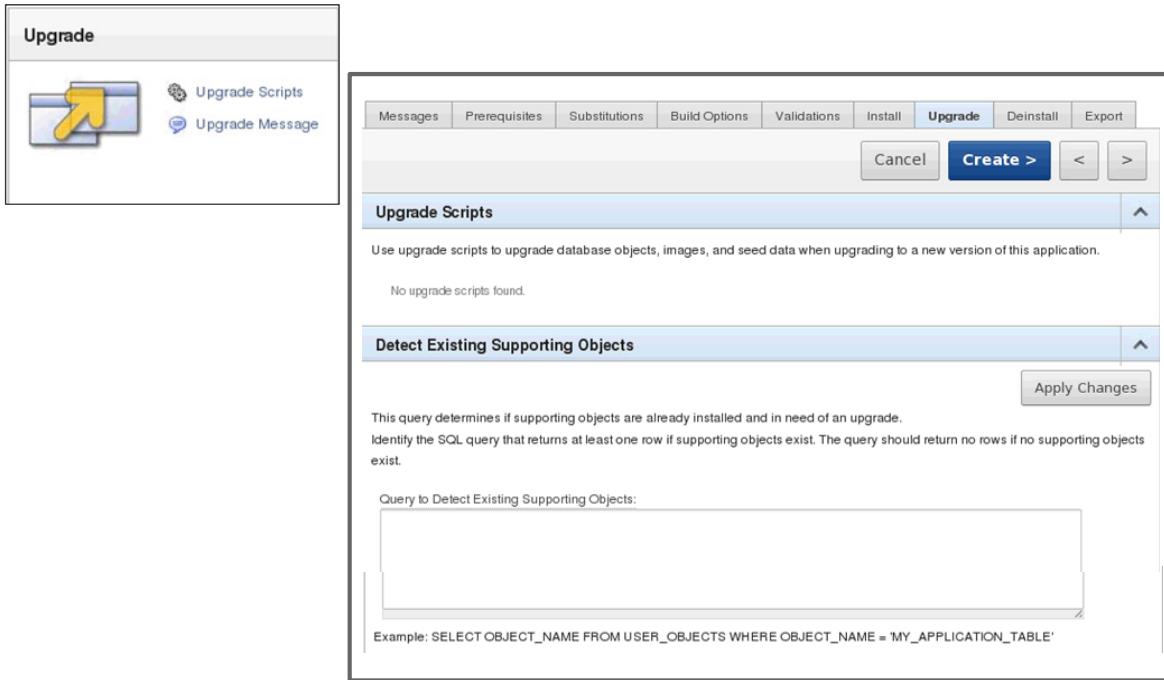
The Install tab enables a developer to define multiple installation scripts that install the supporting application objects. The DDL for these scripts can be created by using the DDL Generator under Utilities. To create the DML script, you can use Oracle SQL Developer (a free downloadable tool from <http://otn.oracle.com>) or you can create it from scratch. To add a script to the list, click the Create button.

- If you select the “Create from Scratch” option, you must enter the SQL code that you want to use for installation. You have an option to use the Script Editor.
- If you select the “Create from File” option, you can browse and select a script file that you want to use for installation.

You also have links to create installation scripts for Access Control tables and other files your application uses.

- If you click the “Create Scripts for Access Control Tables” link, the scripts to install the tables, populate the tables with data, and deinstall the tables can be automatically created. You can review the tables that will be created and click the Create Script button.
- If you click the “Create Scripts to Install Files” link, the files that exist in the workspace repository are listed. You can select the files that you want to create the script for and click the Create Script button.

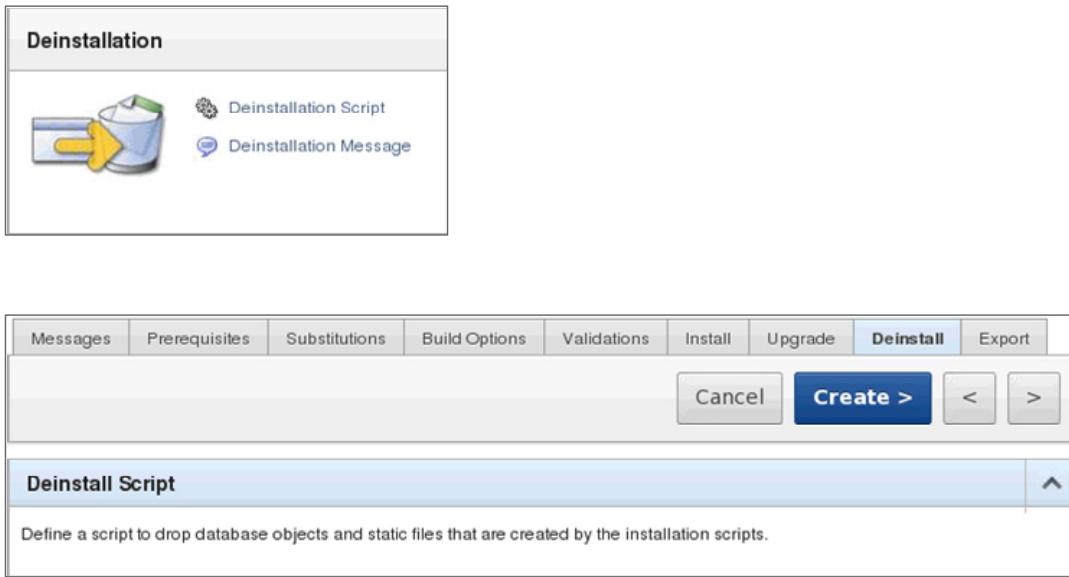
Creating Upgrade Scripts

**ORACLE®**

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

You can use the Upgrade page to define scripts to upgrade database objects, images, and seed data when upgrading an existing application. You specify a query to run to detect whether a supporting object exists. If a row is returned, the script is executed. To create the upgrade scripts, click the Create button on the Upgrade tab.

Creating Deinstallation Scripts



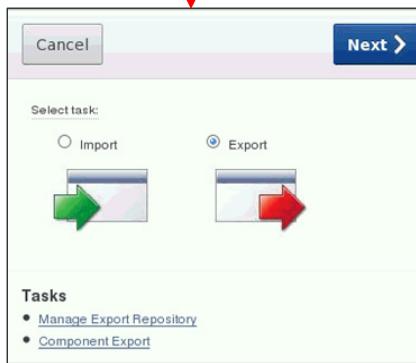
ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

The Deinstall tab enables you to define a deinstallation script that runs when a user clicks the Deinstall option. In this script, you specify the DROP commands to drop objects and operations performed in the installation scripts. To create a deinstallation script, click the Create button on the Deinstall tab.

Accessing the Export Page

- a** From the Application home page



- b** From the Supporting Object page



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

To move your application from a development instance to a production instance of Oracle Application Express, you can export the application definition and all the supporting objects to a file. You can export your application by performing either of the following actions:

- On the Application home page, click the Export/Import icon. Select Export and click Next.
- On the Manage Supporting Object Definitions page, select Export Application from the Tasks section.

Exporting an Application

ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

When you export your application, all the application attributes, templates, pages, regions, items, buttons, and supporting objects are exported to a single file.

On the Export Application page, perform the following steps and then click Export Application:

- Make sure that your application is selected in the Application list.
- For File Format, select how the rows in the export file will be formatted. Choose UNIX for a file containing rows delimited by line feeds. Choose DOS for a file containing rows delimited by carriage returns and line feeds. Choose Database to save the file as a normal SQL script with the `.sql` extension.
- For Owner Override, select an optional overriding owner for this application.
- For Build Status Override, select Run Application Only if you want to run the application in the target instance but want to make it inaccessible to developers. Selecting “Run and Build Application” makes it available to developers.
- For Debugging, select Yes to enable debugging.
- Use “As of” to export your application as it was previously defined.
- Set the export preferences.

In addition to exporting the actual application file, you can also use Export to export other related files, such as cascading style sheets, images, plug-ins, and script files.

Quiz

Before the application installation can proceed, the installer should check whether there is enough disk space to create all the objects that are needed. Where would you specify the required free space?

- a. Supporting Objects > Build Options
- b. Supporting Objects > Validations
- c. Supporting Objects > Install
- d. Supporting Objects > Prerequisites



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: d

Lesson Agenda

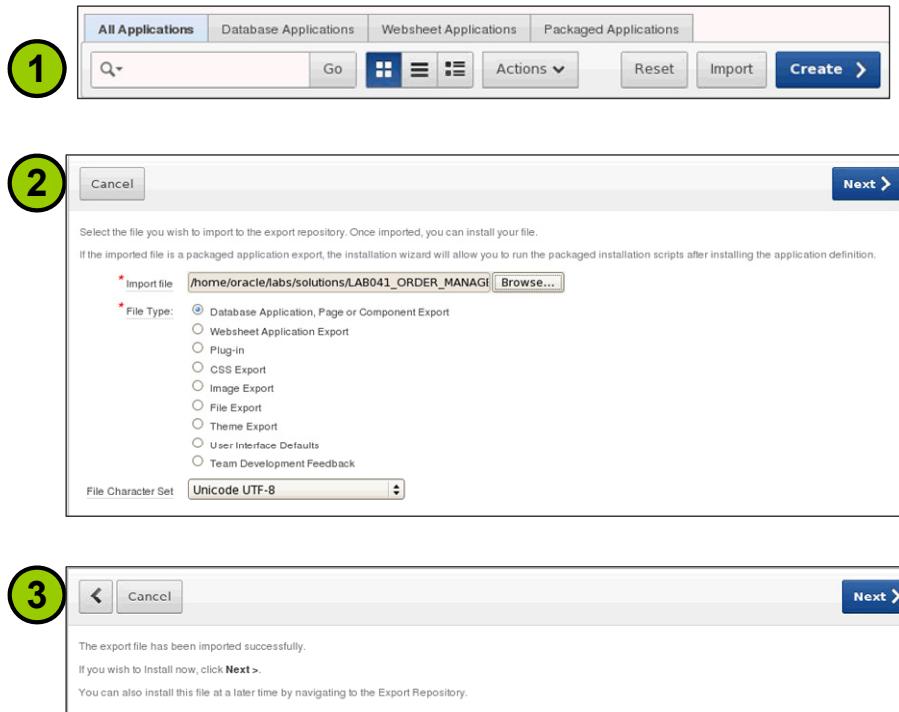
Deploy an Application

- Overview
- Creating a Packaged Application
- Installing a Packaged Application
 - Importing the Application
 - Installing the Application
 - Publishing the Application URL



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Importing an Application



ORACLE

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After you export your application and supporting files from the development environment, you can import the application file into the target Oracle Application Express workspace, and then install the application in the new environment. To import the application file, perform the following steps:

1. Navigate to the Application Builder page and click the Import button.
2. Browse and locate the file that you have previously exported from Application Express.
3. You get a confirmation message that the file was imported successfully. Click Next to install the file. You may also choose to install the application at a later time by accessing the Export Repository.

Installing the Application

Screenshot 1: Install Application Wizard

The wizard displays the following information:

- Current Workspace: USER01
- Export File Workspace ID: 1504810666884247
- Export File Application ID: 128
- Export File Version: 2011.02.12
- Export File Parsing Schema: ORA02
- Application Origin: This application was exported from another workspace.
- Parsing Schema: USER01
- Build Status: Run and Build Application
- Install As Application:
 - Auto Assign New Application ID
 - Reuse Application ID 128 From Export File
 - Change Application ID

Screenshot 2: Application Installation Confirmation

The screen shows a green checkmark icon and the message "Application 117 installed."

ORACLE®

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After you import the packaged application file into the target Oracle Application Express instance, you can install it. To install the imported file, perform the following tasks:

1. Select the Schema where you want to install the application and its supporting objects. Then click Install.
2. The application is installed successfully.

These steps continue from the wizard steps discussed in the previous slide. You can also install an imported file by navigating to the Export Repository and clicking the Install link next to the file.

Publishing the Application URL

`http://app.oracle.com:8080/apex/f?p=137`

Provide this URL
to end users of the application
if your setup uses the
embedded PL/SQL gateway or
the APEX Listener.

`http://app.oracle.com/pls/apex/f?p=137`

Provide this URL
to end users of the application
if your setup uses Oracle
HTTP Server with `mod_plsql`.



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

After you have deployed your Application Express application, you can provide its URL to the end users.

A typical Application Express URL looks like the following:

`http://app.oracle.com/pls/apex/f?p=137`

- `http://app.oracle.com` is the URL of the server.
- `pls` is the indicator to use `mod_plsql`.
- `apex` is the DAD name.
- `f?p=` is the prefix used by Application Express.
- `137` is the application number of the application being called.

The application will automatically redirect the user to the appropriate home page (as defined in the application attributes). Also, if the application requires authentication, the user will be redirected to the Login page.

If you want to protect against changing an application ID in the future, you can define an alias for your application and use that in the published URL (for example, `f?p=SALES`). The alias is set on the Application Definition page.

Quiz

Which of the following can you export by using the Export/Import utility? (Choose all that apply.)

- a. Application
- b. Uploaded cascading style sheets
- c. Uploaded images



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Answer: a, b, c

Summary

In this lesson, you should have learned how to:

- Identify the supporting objects for your application
- Export your application
- Import your application
- Install the supporting objects



Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

In this lesson, you learned how to manage supporting objects for your application by defining prerequisites and uploading scripts. You also learned how to export the application and import it into and install in another Oracle Application Express instance.

