



This is Unit #3 of the BPEL Fundamentals I course. In this Unit we will look at ActiveBPEL Designer, the premier BPEL development tool.

Unit Objectives

- At the conclusion of this unit, you will be familiar with:
 - ActiveBPEL Designer Environment
 - Working with projects and resources
 - Web References


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This session we will cover the ActiveBPEL Designer working environment, the structure of projects and resources and the use of Web References.

ActiveBPEL Designer

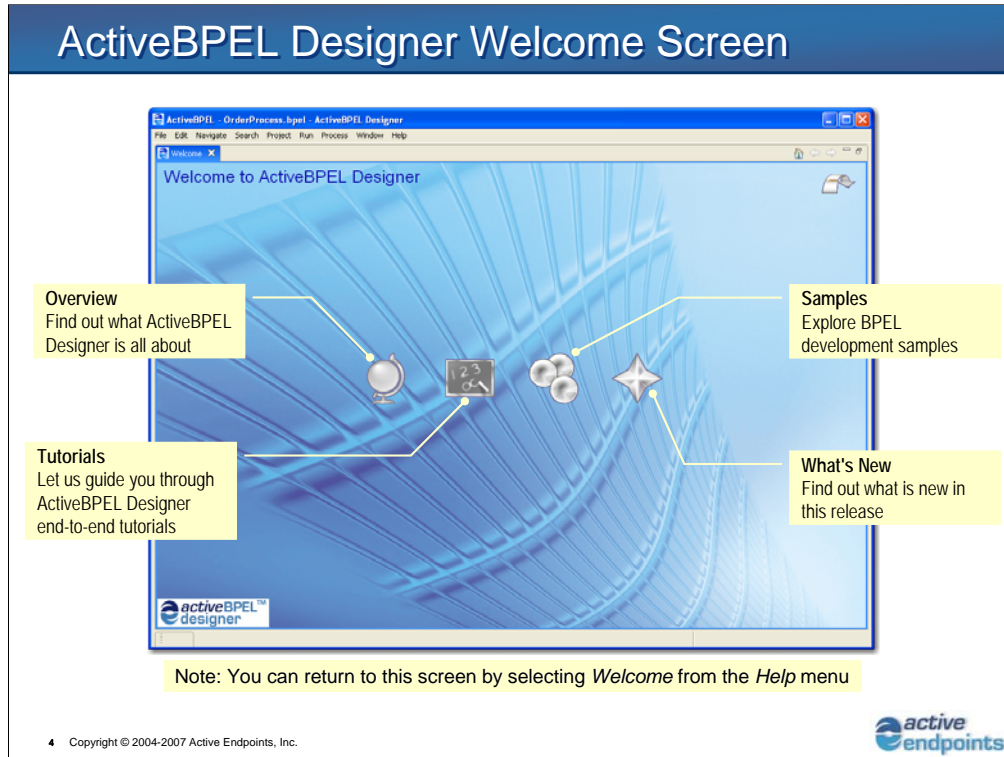
- Visual design environment for creating, testing, deploying and debugging BPEL processes
 - Designed around the BPEL specifications
 - Based on the open-source Eclipse platform
 - Takes full advantage of the Eclipse Workbench features to enable BPEL building capabilities



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ActiveBPEL Designer is a visual development environment that was designed to create BPEL processes. It is based on the Eclipse platform, designed to implement the BPEL specifications and makes use of Eclipse Workbench features. If you are an experienced Eclipse user, you may notice, however, that not all Eclipse functionality is implemented in ABD. And, while in the background it is implemented as a plug-in, it is not currently available to configure it as such, that is, as a group of Eclipse plug-ins. (This option may be available in future releases.) You should therefore use the installer to load the program onto your machine. ActiveBPEL Designer is free and functional, includes the ActiveBPEL Engine, which is open source, and it runs on a Tomcat server, which is provided. It is currently only available on the Windows platform...



This slide is self-explanatory. It shows the welcome screen with the buttons you use to find different kinds of information. They are:

The Overview, which describes the tool and how it is used in a development context.

A Tutorial (which we highly recommend you do before taking any of our classes) that will help you familiarize yourself with the Designer.

An extensive directory of Sample code, including both introductory and advanced topics.

A "what's new" in the tool for the most current release. We are currently on version 5.0, with a 5.x version due in the Summer of '08.

Close the Welcome screen to enter ABD, and you can return to the Welcome screen at any time by using the Help->Welcome menu.

ActiveBPEL Designer Features

- **Web References**
 - Global registry of SOA artifacts referenced by one or more processes
- **Process Editor**
 - Graphical layout of BPEL processes
- **Simulation**
 - Simulate process execution based on sample data prior to deployment
- **Process Deployment**
 - Wizard-based mechanism to deploy a process to an ActiveBPEL server
- **Debugging**
 - Remotely debug a process already deployed and running on an ActiveBPEL server
- **Help System**
 - HTML Based, searchable, context sensitive

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To give you an overview of the product, here are some helpful features that come with ActiveBPEL Designer:

Web References = a global registry of SOA artifacts - i.e., WSDLs and Schemas - which can be viewed through various filters that give insight into the contents of those file types.

Process Editor = A graphical layout of your BPEL processes with full simulation capabilities. This editor features drag & drop process construction and an extensive collection of wizards.

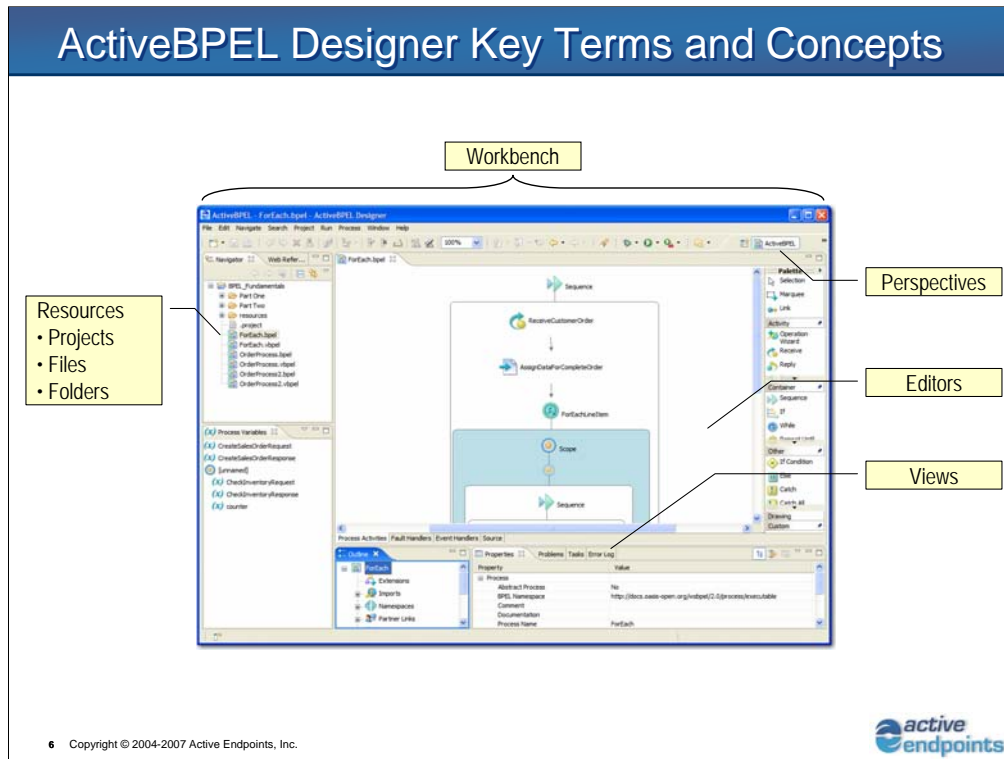
Simulation = Lets the User configure sample data to step through and verify all of the execution paths of your process in the Designer, prior to deployment.

Process Deployment = Uses a wizard to create a deployment package, greatly simplifying the procedure you go through to deploy your BPEL process onto an ActiveBPEL Server.

Debugging = Enables the User to perform remote debugging of a BPEL process that has already been deployed onto the server.

Help System = Provides Help in creating and deploying web services... and is a context-sensitive, searchable and html-based system.

We also have an ActiveBPEL Designer User Guide available that is installed with the product. Check for the install location and then look for the "docs" folder to find the Guide. Also, please note that deployment is vendor-specific, as far as the file types generated and the actual mechanics. Process deployment is not part of the BPEL 2.0 specification.



This is what you see after you close the application's Welcome screen.

The ActiveBPEL Designer *Workbench* is the whole thing, i.e., the entire working area of the application.

The Designer's *Perspectives* are an Eclipse term that defines a pre-configured layout used by the workbench in order to accomplish a specific task. There are several perspectives that come with the tool and you can also define your own.

The *Editors* include the Process Editor, where you lay out the process itself... and other Editors for specific functionality. These editors show as tabs across the bottom of the main canvas.

Designer's *Views* give deeper insight into certain types and arrangements of process data... such as Process Variables view and the Activity Properties view.

Finally, *Resources* are the projects, files, folders, etc... that are in the current workspace.

Workbench

- Refers to the desktop development environment
 - Where you create, edit, test, deploy, debug BPEL processes
- Each Workbench window contains one or more perspectives

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Workbench is the central and defining element of the UI. It is the main window of the application and all that it includes.

The Workbench is seen through a Perspective. There are an unlimited number of Perspectives, each one looking at the same process data, but in different ways and for different purposes.

An example of this would be looking at your Process from the ActiveBPEL Design perspective and then looking at the same process from the ActiveBPEL Debug perspective. You would see the same process, but with different layouts and with a different set of Views.

Perspectives

- Defines the initial set and layout of views in the Workbench window
 - In addition, usually defines an editor area
- Provides a set of functionality aimed at accomplishing
 - A specific type of task
 - Working with specific types of resources
 - Control over what appears in certain menus and toolbars
- Can be tailored to make your own custom perspective

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A Workbench window can have several separate Perspectives, only one of which is visible at any given moment. Each Perspective has its own Views and Editors that are arranged for presentation on the screen, and these Perspectives are completely user-definable and saveable.

They are usually created to:

accomplish a specific task...

work with specific resources...

define what appears in menus and toolbars

If you open up ActiveBPEL Designer and click on the icon next to the Perspectives you will see a lists of the available choices.

Editors

- Allow you to create and modify resources
 - Where you do most of your work
 - Any number of editors can be open at once, but only one can be active
- Depending on the file resource type, the associated editor is displayed in the editor area
- Editors are stacked in a tabbed notebook when several editors are open
 - Optionally, can choose to tile them for simultaneous viewing

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ActiveBPEL Designer's *Editors* are where most of your development work is done, and they allow the user to open, edit and save objects. You can have as many Editors open as you want, and as many types of Editors as you want open at once (e.g., WSDL and process editors), but only one Editor can have *focus* at any given time. Editors can be tiled inside the workbench, or they can be stacked on top of each other, using a tab-type of idiom. If you grab a view's Title bar and drag it, the mouse will change to an icon that will show you what happens when you drag it to certain areas, i.e., whether it will tile or stack on top of other Views when you drop it.

Views

- Play a supporting role to the editors
 - Provide alternative presentations of data
 - Ways to navigate through the information
- Can appear by themselves or stacked with other views in a tabbed notebook
 - Can also be resized, minimized, or maximized

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ActiveBPEL Designer's *Views* support the editors and provide a presentation of specific data for whatever it is you are working on in the process editor. For example, we can see it using an Outline view, which shows the process structure in a hierarchy...

Or, we can see a list of all of the Process Variables...

Or, we can see all the details on a specific activity, such as an Invoke or a While Loop.

Changes made in Views are generally saved immediately and will therefore be reflected immediately in other, related parts of the UI.

Views, like Editors, can be stacked in tabs or they can be displayed on their own.

Resources

- Collective term used to represent
 - Files
 - Map to files in a file system
 - Folders
 - Contain files and other folders
 - Map to directories in a file system
 - Projects
 - Special type of folder
 - Contain files and other folders

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ActiveBPEL Designer uses the term *Resources* for the files and folders available in the Workspace.

Files map one-to-one to files in the File system.

Folders map one-to-one to directories in the file system, and can contain other folders and files.

Projects are a special type of folder that contains other files and folders. We'll talk more about Designer Projects later in this Unit...

ActiveBPEL Perspective

- Default perspective to support the task of designing and implementing BPEL process definitions

Available Editors

- Process Editor

Available Views

- Navigator
- Web References
- Outline View
- Properties View

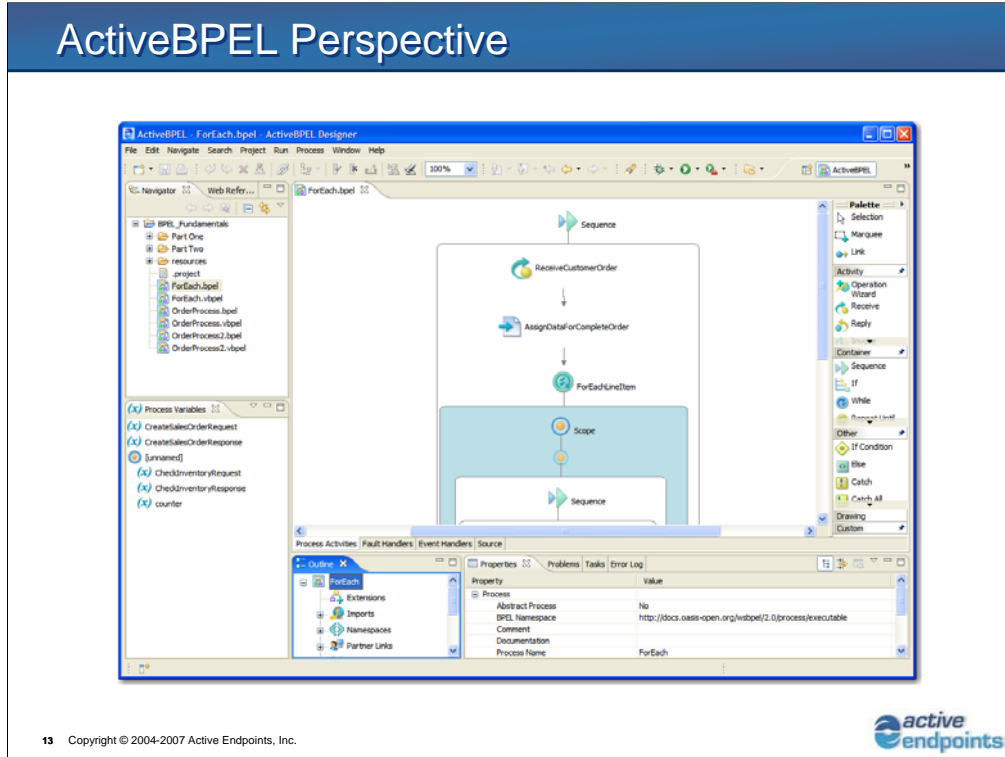
Available Views (cont.)

- Process Variables
- Error Log
- Problems View
- Tasks View
- Thumbnail View
- Bookmarks View

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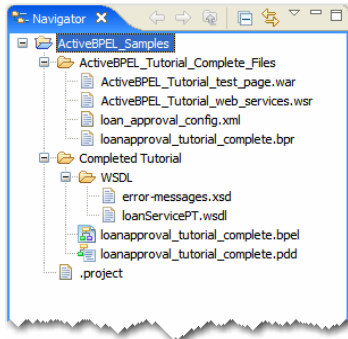
The ActiveBPEL Perspective is the default development environment for designing and implementing a process. Here are the available Views, but note that not all of the available views have to be displayed at any given time. You can open specific Views by using the “Window->Show View->View Name menu “ selection.



Here is the Default ActiveBPEL Perspective.

Navigator View

- Displays projects and their contents
 - Folders and files associated with the Workspace
- Navigator is a mirror image of the file system Workspace folder



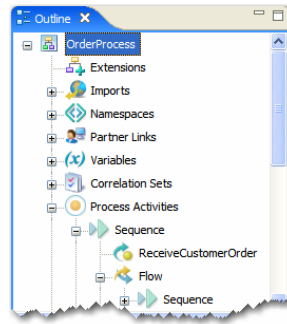
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The ActiveBPEL Designer's *Navigator* mirrors the file system's "Workspace" folder... A *Workspace* can contain **one or more** projects, and displays the folders and files that each of the projects contain. Navigator shows *all* of the files and folders used by *all* of the projects in the *current* Workspace.

Outline View

- Hierarchical representation of a BPEL process
- Supports full manipulation of the BPEL file
 - Add, Delete, Reorder, etc.
- Nodes in the outline synchronize with the Process Editor and the Properties view



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The Designer's *Outline* view is one of the most useful views in the tool. It shows the contents of the entire project in a graphical, hierarchical representation and is a quick way to see the overall process flow. The displayed resources are added to the Outline View in the same order in which they are created and items can be rearranged easily by dragging and moving them in the Outline View. Also, the nodes in the Outline view *synchronize* with the Process Editor and Properties View, so if you select an item in one, the same item is highlighted in the other two. What this means is that when you move something in the process editor, for example, the Outline View is updated and vice-versa. It also shows the internal operations of the various activities, such as the Copy operations inside each Assign activity, that can otherwise only be seen by drilling into the process diagram.

Properties View

- Displays attribute (property) names and values for a selected item
 - e.g., resource, process, or BPEL activity
- Changes are automatically applied once the field loses focus

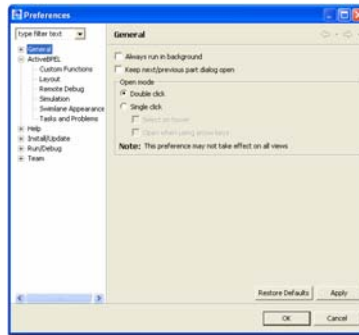
Property	Value
Process	
Abstract Process	No
Abstract Process Profile	(none)
BPEL Namespace	http://docs.oasis-open.org
Comment	
Create XPath	No
Disable Selection Failure	No
Documentation	
Exit On Standard Fault	No
Expression Language	
Extension Attributes	(none)
Extension Elements	(none)
Generate Prefixed Source	Yes
Message Exchanges	
Process Level Compensation	No

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The *Properties* View will display different information depending on what is selected. For example, selecting a file in Navigator and then selecting Properties View will display the file size, path, etc. Selecting an activity in the Process Editor will display relevant information about the activity under scrutiny, such as name, variables, etc. This supports the easy editing of activities, variables and other process data in one view. The Properties View has different levels of visibility depending on what you need to see... such as Advanced Properties, Show Categories, etc., and like all views, it can be minimized or maximized as needed. Just double-click on the tab or use the menu items.

Preferences

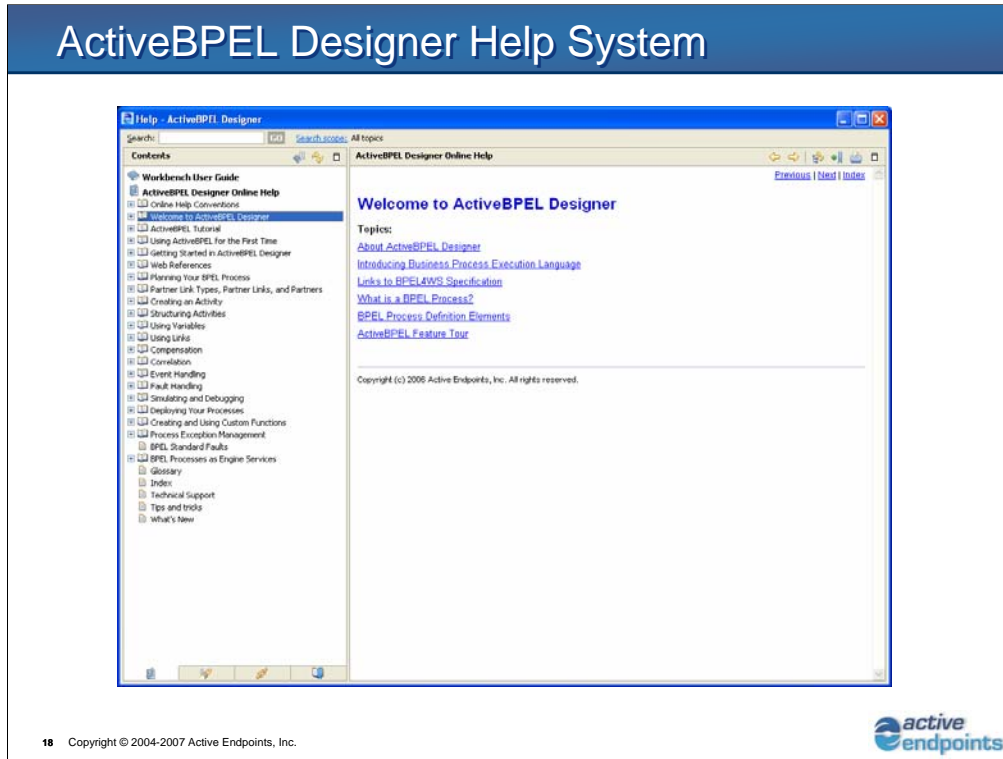
- Allows you to change the appearance and behavior of virtually everything in the ActiveBPEL Designer
- View or modify your preferences by selecting Window>Preferences from the menu



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You can find ActiveBPEL Designer's Preferences by going to the Windows->Preferences menu item. These Preferences give you access to the Global settings that control the appearance and behaviour of the Designer. For the most part, the Preference settings are *not* project-centric, but rather are associated with the *Workspace*, and therefore the settings here will apply to all projects in the workspace. For example, the Auto-save default setting is every 5 minutes. Preferences categories include General, ActiveBPEL, Help, etc.



The ActiveBPEL Designer *Help* system is integral to the tool, and is not accessed through a web connection. When you are new to the tool, a good place to get started is with the Tutorial. You can then follow up by taking this class, and exploring the rest of the Help. The Help system also has Tips and Tricks, a set of Cheat Sheets for common tasks, and “hover help” that displays tooltips on for the item under scrutiny. You can select any View or Editor and click F1 to open up context-sensitive Help for that item. Finally, you can refer to the actual BPEL 2.0 specification, as needed.

Unit Objectives

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 - ✓ ActiveBPEL Designer Environment
 - Working with projects and resources
 - Web References

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Now that we've looked at the Designer's working environment, let's go on to projects and resources...

Workspace

- A folder in your file system for storing your projects, their resources, and meta-data such as preferences
 - The root of a workspace is the file system folder where its `.metadata` folder is located
- All of the resources that you create with the Workbench are stored as normal folders and files
 - Allows for the use of other external tools

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It is an Eclipse requirement to designate a *Workspace*, inside which are your projects, resources and preferences. When inside the file system, we can identify a *Workspace* by looking for the `.metadata` folder, which is the workspace root. We can import a project and its preferences from our customers into a workspace, for example, so we can see it as they do. All files are stored as normal files and folder, which allows you to use other, external tools in concert with the Designer.

Note: Designer's Project files use the ".project" extension and the Preferences files use the ".epf" extension

ActiveBPEL Projects

- Contains all of the required resources for the application you are building
 - Includes BPEL, WSDL, XML Schema, and Sample Data resources

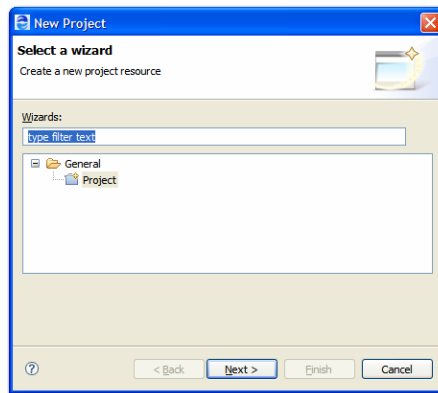
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Files commonly used by BPEL Projects are .bpel, .wsdl, .xsd, .xml and .txt files.

Creating Projects – Step 1

1. Select File>New>Project
 - New Project Wizard opens
2. Expand Simple and select Project, then select Next



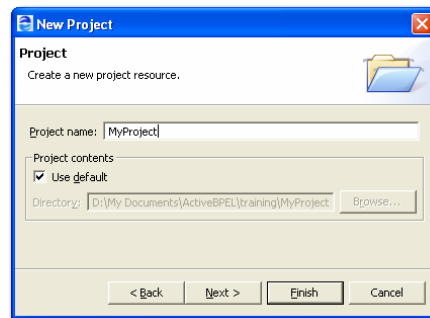
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To create a new project in ActiveBPEL Designer, go to the File menu and select New->Project to open the New Project wizard. Then, Expand the General folder and select the project icon and click Next.

Creating Projects – Step 2

- Specify a name for the new project
- By default, the project will be created in the Workspace folder
 - Uncheck **Use default** checkbox to specify a location other than the default workspace



Note: The root of a project is the file system folder where its .project file is located

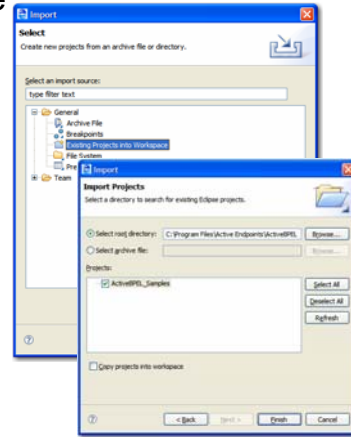
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Name the project and the Designer will store the new project in a “.project” file that is added to the current Workspace. The "Use Default" checkbox tells ActiveBPEL Designer to store the project in the default Designer folder, which was created at install time. Uncheck this box to specify a location other than the default.

Import Existing Project

- Use the Import Wizard to copy a project that either
 - Exists in a different workspace
 - Previously existed in a workspace
- Steps
 1. Select File>Import
 - Import Wizard opens
 2. Select **Existing Project into Workspace** and click **Next**
 3. Browse to the root directory or archive of project to import
 4. Select project or projects
 5. Select Finish to start the import



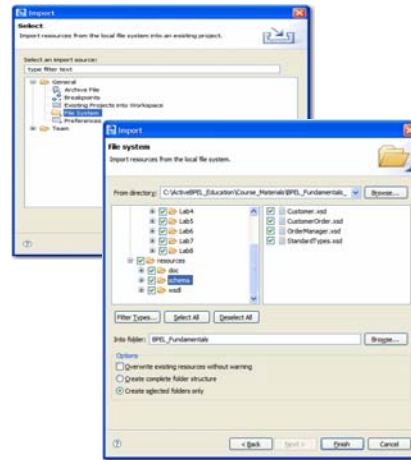
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You can also import an existing Designer project into a workspace. This will import the original file(s), not a copy. Browse to the project root and point to its root directory to import the project. Note that deleting a project from a workspace does not delete the underlying project from the file system. (And yes, it can be re-imported.)

Import Resources From File System

- Use the Import File system wizard to import resources from the local file system into an existing project
 - WSDL, Schema, Sample Data, etc.
- Steps
 1. Select File>Import
 - Import Wizard opens
 2. Select **File System** and click **Next**
 3. Browse to the root directory to import resources from
 4. Select the resources to import from and which project to import to
 5. Select **Finish** to start the import



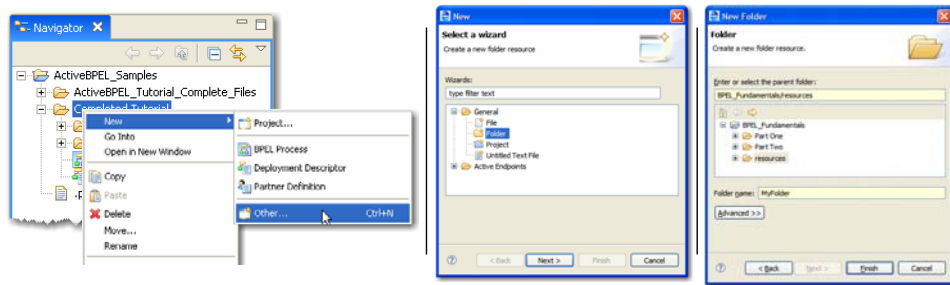
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You can also import “stand-alone” resources (.wsdl, .xsd, etc.) to add WSDL, Schema and other files into your project. Note that when you import a file it imports a copy of the file. The original file remains in the underlying file system.

Creating Folders

1. In the Navigator view, right-click the project or folder where you want to create the new folder
2. From the pop-up menu, select New>Other
 - New Resource Wizard opens
3. Expand General and select Folder, then select Next
4. Enter the name of the new folder and click Finish



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To create a folder, go to the Navigator and Right-Mouse on the project to use the Resource Wizard, which allows you to create a new folder. Note that the Right Mouse button is very powerful in ActiveBPEL Designer, and you should get in the habit of using it. You can create separate folders for WSDL, sample data or for schema. How you choose to arrange your files and data is your preference.

Unit Objectives

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 - ✓ ActiveBPEL Designer Environment
 - ✓ Working with projects and resources
 - Web References

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Now that we've looked at Designer itself and at ActiveBPEL Designer projects, let's take a look at using Web References.

Web References

- Provides the ability to catalog your SOA artifacts
 - Shared across all projects within the Workspace
 - SOA Registry associated with your Workspace
 - Currently WSDL and XML Schema files supported
- Allows for quick assembly of a BPEL orchestration
 - By either automatically creating or pre-filling the implementation details
 - Enable bottom-up design approach

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Web References is an SOA catalog of the artifacts that are in your .wsdl and .xsd files. Once they are added to Web References, the individual artifacts are associated with the current Workspace, and may or may not be used by the current process or project. This system allows for the quick creation of BPEL processes by importing pre-defined functionality from your WSDLs and XSDs and supports a bottom-up approach to Process design. So, if you have your PortTypes, Operations and Messages pre-defined, you just need to Drag & Drop them onto the canvas and then orchestrate them within the process.

Web References View

- Allows you to work with Web References associated with the current Workspace
 - Add, View, Delete, Search, Filter Web References

Refresh Web References

Remove Web References

Add Web References


View Web References

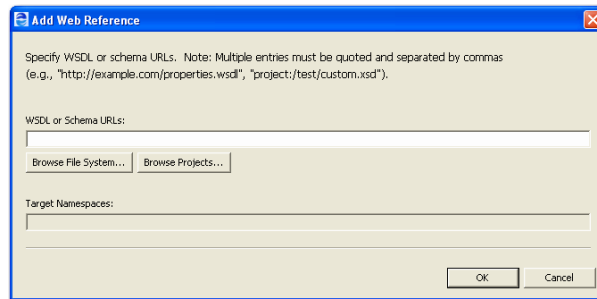
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Once files have been added to Web References, their artifacts are shared across all projects in the workspace. The icons on the Web Reference View toolbar are: Add Web Reference, Remove Web References and Refresh Web References. Refreshing Web References updates the display against any changes in the underlying file. The drop menu, that is located under the inverted triangle on the right, gives you multiple options to filter your views. When you “filter” you are simply reading these files and showing the definitions that they contain. So, when you filter for namespaces for example, you are seeing all the namespaces that are listed in all of the .wsdl files and .xsd files in the project, and underneath them you see the definitions they contain.

Adding Web References

- From the Web Reference View, Select Add Web Reference  from the toolbar or menu
- Can add Web References from various locations
- Can select multiple Web References from multiple locations at one time



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To add Web References to your Workspace, browse either the file system or your projects, and then navigate where you need to go. Currently, the Web References views support only .wsdl and .xsd files. Note that if you browse Projects and select a file, when it is imported you will get a project-relative file location and if you browse the File System and select a file, when it is imported you will get a hard-coded file location. Be careful when doing this! Files can have multiple versions located on your file system and network. Make sure you are pointing to the right one. It is usually the one that is in your project, so use the “Browse Projects” button and browse to your workspace and start looking from there.

Adding Web References - Locations

- Via Project Location
 - Resources located in a one of your projects
 - project:/MyProject/wsdl/loanapproval.wsdl
- Via URL Location
 - Resources located at a particular URL
 - http://hostname:port/wsdl/loanapproval.wsdl
- Via File System Location
 - Resources located on your local computer or network
 - file:///server/share/wsdl/loanapproval.wsdl
 - file:/C:/MyFolder/wsdl/loanapproval.wsdl

Note: Using Project or URL locations will make your projects more portable and easier to share

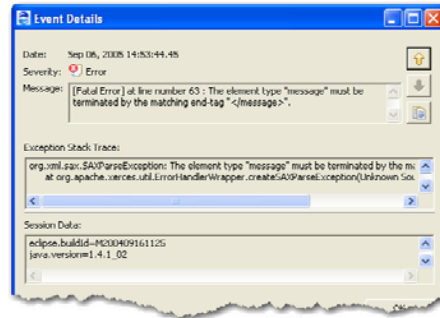
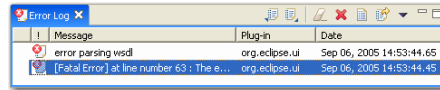
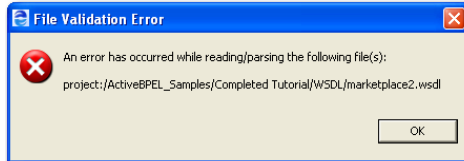
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When you are adding Web References to your Workspace, Project relative is the best choice, URL is next best choice and file-relative is dead last. Project relative, URL and File relative determine the **path** that is attached to the resource. If you make everything project relative you can export the project and make it portable. Note that if you have absolute (file path) references they will probably not be any good once you start moving projects around. These are normally only used for testing or teaching purposes.

Adding Web References – Errors

- When adding Web References errors might occur
 - Examine the Error Log view for the list of errors and their details



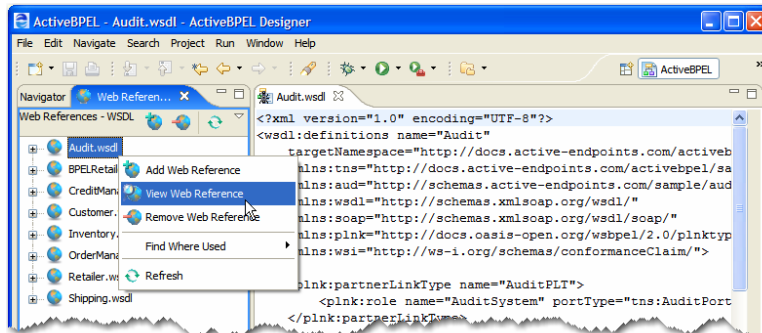
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When Web References are imported into your Workspace, the file is parsed to ensure that it is syntactically correct. If it finds an error it will show the error and, if you click the details button, additional information in Error Log view.

Viewing Web References

- To view the contents of a Web Reference
 - Right-click on a Web Reference and select View Web Reference
 - Alternatively, double-click on a Web Reference or the Web Reference Menu
 - Opens Web Reference in read-only mode



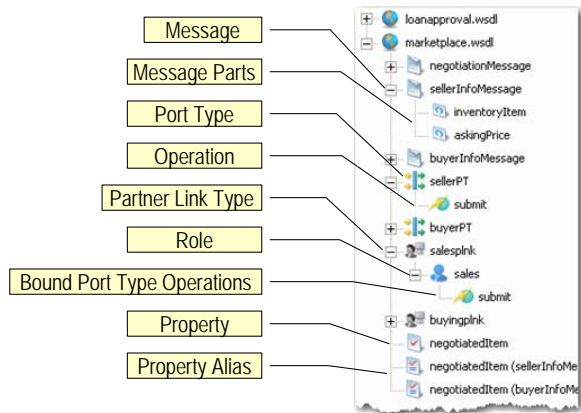
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To examine the contents of a WSDL file you can select it and then use the Right Mouse menu to open it, or just double-click it. When opened from Web References view the files are *read-only* because they are being used in the BPEL process. If you want to *edit* these files you have to go into Navigator, make your changes, and then refresh the project folder in Navigator (which also refreshes the file reference.) Since the underlying file has now been changed, you must then refresh your Web References so that they reflect the changes.

Viewing WSDL Web References


- Depicts a hierarchical outline of the complete WSDL structure
 - Includes all BPEL specific extensions if present

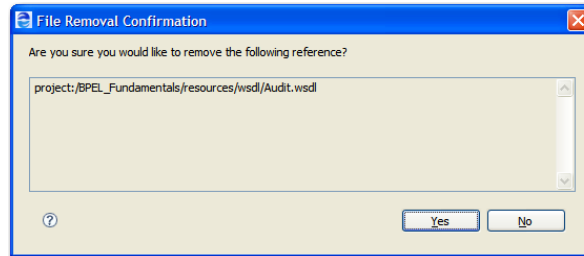


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As we know, a WSDL file has structure, and because of this it can be expanded out to see what is in there. Each type of artifact in the structure has its own unique icon, such as those for a PortType, a Role or an Operation. Note also that if you hover over these items, it will display relevant information for that kind of item. The difference between this View and the Outline View is that this shows the .wsdl file under scrutiny only, while the Outline View shows the entire process and all .wsdl file contents, right?

Removing Web References

- From the Web Reference View, Select Remove Web Reference  from the toolbar or menu -
- Only removes the entry from the registry
 - Does not delete the underlying file




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To remove Web References from the list simply select the file and use the Right Mouse menu to delete. Note that this only deletes the item from the Web References view itself, not from the Workspace or from the underlying file system.

Refreshing Web References

- From the Web Reference View, Select Refresh Web Reference  from the toolbar or menu -
- Use Refresh when you have modified the underlying Web Reference File
 - Causes the definition to be re-read from its location

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If you edit a .wsdl or .xsd file (and remember that editing is available in Navigator only, not from the Web References View) you have to then refresh the project or project folder...and then refresh the Web References View, because otherwise you will be looking at the previous version of the file.

File = Save saves current active Editor

File = Save As allows you to save the contents of the active Editor under another name or in another location

File = Save All saves the contents of all open editors

In Navigator = Select the top level folder, open the Right Mouse menu and select Refresh. This refreshes all files (synchs with file system)

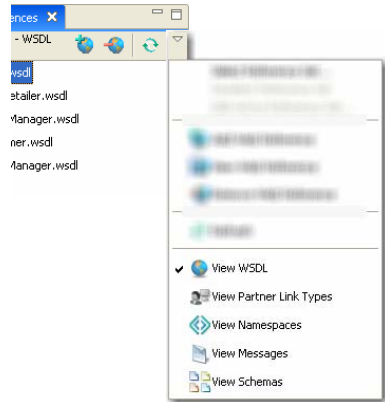
In Navigator = Select the .project file, open the Right Mouse menu and select Refresh. This refreshes all files referenced by the active project

Web References View = Selecting Refresh Web References refreshes the Web References tree, based on a read of the current files in the Navigator

Refresh Imports in the Outline View = Refreshes the imported files, based on the contents of the underlying files

Web Reference View Options

- Provides ability to view Web References using various categorization options



View WSDL	View all the WSDL Web References, expand to browse the complete WSDL structure
View Partner Link Types	Expand to view associated roles and operations
View Namespaces	Expand to view associated Web References
View Messages	Expand to view message parts
View Schemas	No further information is provided

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If you filter for .wsdl files you see everything that is inside the WSDLs, displayed in a hierarchical format.

If you filter for the partnerLinkTypes you see all of the Roles and Operations for each of the PartnerLinkTypes.

If you filter for the Namespaces, you can then drill into each namespace and see all of the resources defined within that namespace, such as its PLTs, Roles, Operations, Services, etc.

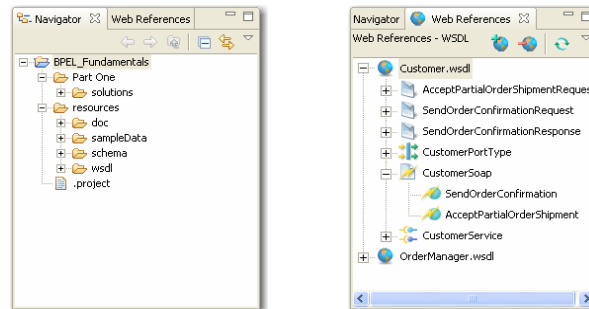
If you filter for Messages it lists all of the messages in all of the files, in alphabetical order, with no other references or connections.

If you filter for Schemas you see the schema file only. (Note that this filter does not show you a listing of the various types defined in the schema.)

Web Reference Sets allow you to only see the particular .wsdl and .xsd files you want to see, such as the ones you are currently working with. Web Reference Sets allow you to select what files/schemas are displayed. They are not removed from the project, just hidden from the current view. So, for example, if you have a project with 50 .wsdl files and you are only working on 2 or 3 of them, you can create a reference set to narrow the focus and reduce clutter.

Lab 2 – Project Setup

- Overview of Lab Exercises
 - Create new project
 - Import resources from file system
 - Add Web References
 - Modify Workspace preferences



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This is the second lab in the BPEL Fundamentals course. Its purpose is to continue with the set up we began in Lab #1 and to get ready for the other labs that follow. During the course of this lab you will create a new ActiveBPEL Designer Project, import the provided files into the project (i.e., .wsdl and .xsd files), then add them to the Web References View. When this is completed we'll modify some of the Designer's Workspace preferences.

Lab #2: has four tasks:

- 1.) Create a new Designer project
- 2.) Import the resource files provided for the course (WSDL and Schema)
- 3.) Add these files to the Web References View
- 4.) Modify some of ActiveBPEL Designer's preferences.

Unit Summary

- Now you are familiar with
 - ActiveBPEL Designer Environment
 - Working with projects and resources
 - Web References