Novell exteNd Composer™

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TUTORIAL

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Novell, Inc.
1800 South Novell Place
Provo, UT 85606

www.novell.com

Novell exteNd 5 Composer Tutorial
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Online Documentation: To access the online documentation for this and other Novell products, and to get updates, see **http://www.novell.com/documentation**.

Contents

About This Guide

Purpose

This tutorial introduces you to the environment and features of Novell exteNd Composer. You will learn about:

- The exteNd Composer design-time environment
- XML Templates
- Composer Actions and the Action Model
- Composer Connection Resources
- Deploying Web Services with Composer

Audience

This tutorial is intended for application developers who will be using exteNd Composer to develop J2EE applications, especially XML integration applications and Web Services.

Prerequisites

Experience: No prior Java programming experience is required to complete the tutorial. It is helpful to have some knowledge of the following:

- J2EE file packaging concepts (EAR, WAR, JAR)
- XML and its related standards (XSL, XPath, Schema)

Software: This tutorial is designed to use the following software. (All of these are included in the Novell exteNd 5 Enterprise Edition Suite.)

- Novell exteNd Composer (Enterprise Edition)
- Novell exteNd Composer Enterprise Server
- Novell exteNd Application Server
- MySQL
- Novell exteNd LDAP Utility

- A web browser that supports HTML 4.0 and (optionally) XML+XSL, to see the final output of the service you deploy

NOTE: You can use the Novell exteNd 5 Professional Edition Suite for all lessons except those involving deployment. The deployment techniques shown in this tutorial use the Enterprise Edition features, but you can still deploy your project(s) with the Professional Edition tools. See the Novell exteNd Director and App Server documentation for information on how to deploy Composer projects using Director's Utility Tools.

If you don't have the required software, you can download a trial version of the Novell exteNd 5 Enterprise Edition Suite (which includes MySQL as well as the Novell exteNd LDAP Utility) from the Novell download site.

Organization

A summary of the lessons you'll find in this tutorial:

Lesson		Description
1	Lesson 1, "Introduction to the Composer Environment"	Introduces the Composer Environment
2	Lesson 2, "Components and XML Mapping"	Teaches the design and structure of Composer Components
3	Lesson 3, "XML Templates"	Presents XML Templates and the files that XML templates may incorporate
4	Lesson 4, "Web Services"	Provides an overview of Web Services and how to create one in Composer
5	Lesson 5, "Deployment"	Discusses deployment considerations and shows you how to deploy a simple web service
6	Lesson 6, "JDBC and LDAP"	Introduces Composer Connection Resources and how to create JDBC and LDAP connections
7	Lesson 7, "Basic Composer Actions"	Teaches Basic Composer Actions used to operate on data elements in the Action Model

Lesson		Description
8	LESSON 8, “Publishing and Consuming Web Services”	Discusses methods of publishing and consuming web services, including JSP, XFORMS, XML Interchange and Web Service Interchange

Additional documentation

For the complete set of Novell exteNd Composer documentation, see the Novell Documentation Web Site (http://www.novell.com/documentation-index/index.jsp).

1 Introduction to the Composer Environment

What you will learn

This lesson describes the Novell exteNd Composer environment, and shows you how to use Composer's basic UI features. You will be introduced to some of the nomenclature associated with the creation of web services, and learn about Composer's *project* architecture.

You will learn about Composer Basics:

- Composer Building Blocks
- Launching Composer
- Navigating in the Composer Environment
- Composer Project Structure

What you will do

You will perform the following tasks using exteNd Composer:

1. Launch Composer
2. Explore the Composer Environment
3. Create a Composer Project

How long will it take? About 10 minutes

Composer Basics

Novell exteNd Composer (hereafter just “Composer”) provides rich-UI design environment in which to design, create, test, debug, package, and deploy web services.

Composer Building Blocks

Composer wrappers almost all of the objects you create in a special kind of object known as an xObject. An xObject is in most cases little more than an XML metadata description of a deployable artifact.

There are four main categories of xObject:

- Services – A service is a high level object that performs a unit of work or business transaction. Services are deployed on the application server and take XML documents as their input. Services utilize components to operate on the XML data and produce output XML documents.
- Components – A component in exteNd Composer performs a unit of work or business logic, and is invoked by a service or another Composer component. Components XML enable applications, i.e. a relational database, via the JDBC component.
- Resources – Components and Services utilize resource objects to perform tasks. Resources are specialized objects that perform such functions as establishing connections. map code tables, and define schemas for XML documents.
- XML Templates – XML Templates provide a way of categorizing and aggregating the sample XML documents your services operate on at design time.

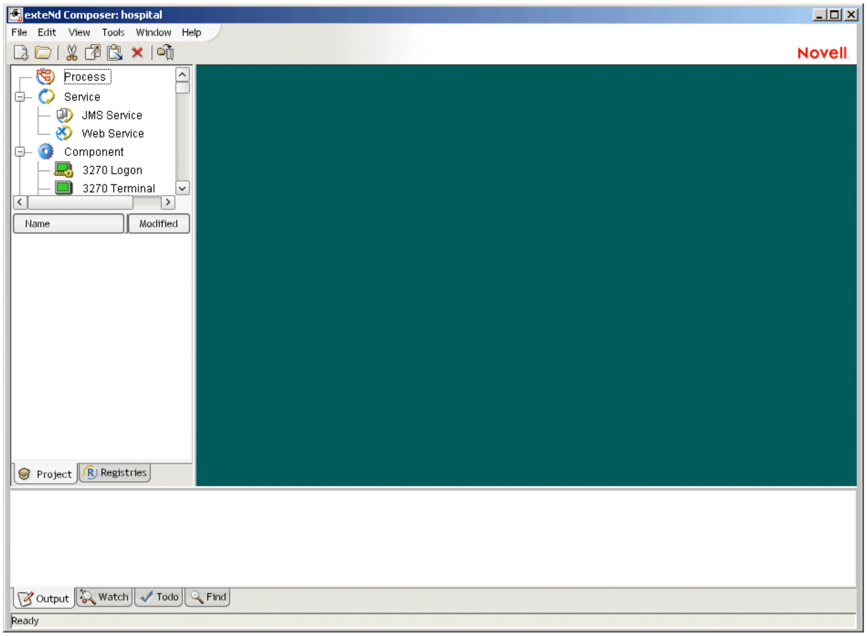
Launching Composer

When Composer launches, it opens the last project that the user opened or modified. The *first* time you launch Composer after installation, it will start with the tutorial project (“hospital”) as the current project. You can tell which project is the currently open project by looking at the title bar on the main Composer window.

EXERCISE 1-1: Launch Composer

1 You may launch Composer in any of the following ways

- From the Windows **Start** Menu, click **Programs**>**Novell exteNd 5.0>Composer>Composer Designer**
- Open Windows Explorer, navigate to the **exteNd5\Composer\Designer\bin** directory under the location where you installed Composer and double-click on the **XC.exe** file.
- Upon successful launch you will see a screen similar to the one depicted here.



Navigating in the Composer Environment

Composer contains several editors and wizards to aid in the design, building, testing, and debugging of Composer applications. When Composer is first launched it displays the navigation, editor and message frames.

EXERCISE 1-2: Explore the Composer Environment

1 Examine the Composer Frames and become familiar with the function of the different panes.

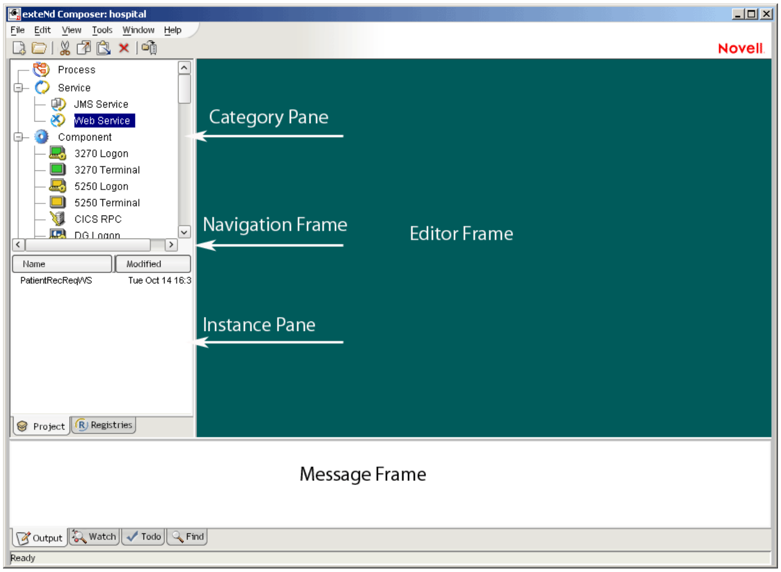
- **Navigation Frame** – The Navigation frame provides the user with a visual interface for creating and editing Composer objects.

  The upper, category pane, displays icons of the services, components and resources available to the user to build Composer projects.

  The lower, instance pane, displays project defined objects for the selected xObject in the category pane.

- **Editor Frame** – Component editor content such as DOM and action models are displayed in the editor frame.

- **Message Frame** – The message frame is composed of four tabs: the find tab displays the result of system searches. The log tab displays error and log messages. The watch tab displays system watch variables. The Todo tab allows you to track project related tasks.



Name	Modified
PatientRecReqWS	Tue Oct 14 16:3

In the example shown above, a project named “hospital” is the current Composer project. The Web Services Component has been selected in the category pane. The instance pane shows all the web services defined in the project “hospital.”

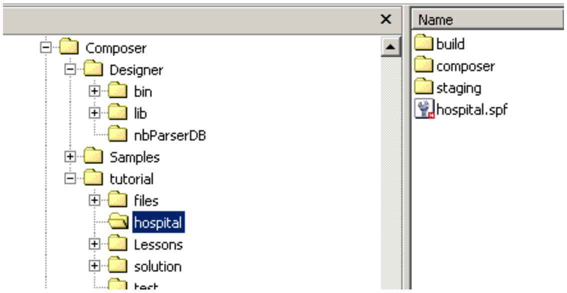
Use the mouse or keyboard and investigate the menus and options in the Composer environment.

Composer Project Structure

Services in Composer are organized into projects. A project contains one or more deployable services and all of the code, metadata, and other resources needed by those services at runtime. Composer uses projects as the unit of deployment to the application server.

When you create a project in Composer a hierarchy of folders is created to organize the xObjects and aid in deployment.

The project file extension utilized by Composer is **.spf**. When creating a project the **.spf** file is created in the folder you select for the project. Composer creates three subdirectories under the project folder: **\Composer**, **\staging**, and **\build**. As you create your application all of the xObjects you create are stored as XML files within subdirectories named after the category of the object, i.e. xmlcategories under the Composer subdirectory in the project folder.



About the Tutorial Project

In the tutorial project you will be acting as both the publisher and consumer of the web service you build. The exercises in each lesson are designed to build on the previous lesson and will instruct you on how to use Composer to create, deploy, and trigger the service.

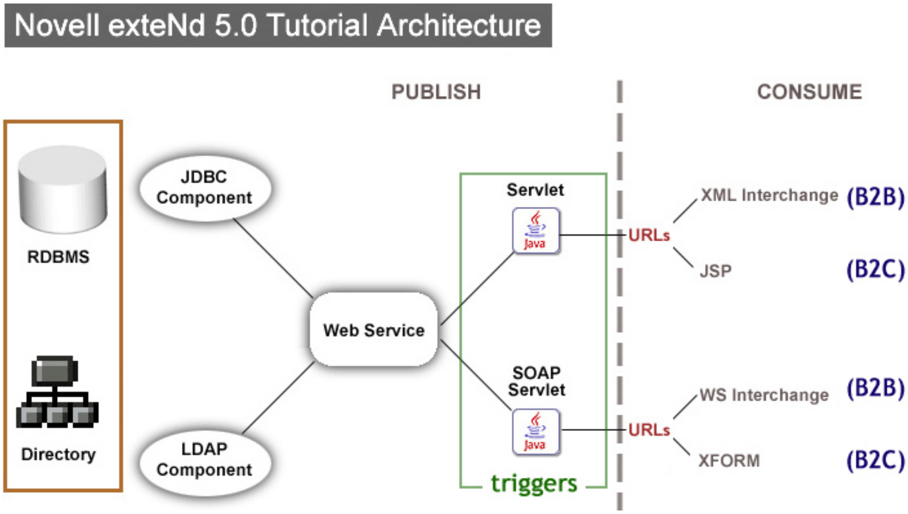
Tutorial Scenario

Pantagruelico Hospital maintains an e-directory of all its staff. The hospital also maintains a database of patient records. Insurance companies, medical offices and other hospital departments have a need to retrieve information from both data sources for their daily operations.

You will be creating a Composer web service that will provide the client information about physicians and their patients, when supplied with a physician’s name. The service will be deployed to the application server, where the client may invoke it.

The solution to the tutorial may be found under the exteNd Suite install directory in the location **\Composer\tutorial\solution\hospital**.

The diagram below gives a very-high-level architectural overview of the major pieces of this tutorial. At the far left are the major data sources (a database and a directory). The Web Service wrappers a JDBC Component and an LDAP Component, which together serve as the "data access" layer of the deployed application. The service (in this tutorial, at least) is triggered by servlets, which are exposed on URLs. The triggers may (optionally) be front-ended by JSPs, XForms, or ordinary HTML (or no presentation objects at all: an RPC type of scenario, common in B2B interactions).



The workings of these various pieces will become clearer as you go through the lessons of the tutorial.

Project Requirements

The requirements for the service are listed below:

1 The service may be invoked by any of the following service triggers:

- Servlet of the type Params(URL/Form) that outputs a raw XML document
- Servlet of the type Params(URL/Form) that uses an XForm
- Servlet that utilizes a JSP to format the output
- Servlet of the type XML (HTTP/Post) that outputs an XML document
- SOAP Servlet using WSDL
- Servlet of the type XML(HTTP/Post) which outputs XHTML that is formatted with a stylesheet

2 The input will be either parameters on a URL, a submission via an XForm, or an XML document containing the physician's name.

3 Retrieve the patient data from the hospital database for the given physician.

4 Retrieve the physician’s title, phone number, e-mail address, and the number of directory inquiries from the hospital e-directory.

5 Combine the retrieved data into an XML document and return it to the client as output.

EXERCISE 1-3: Create a Composer Project

1 Select **File** > **New** >**Project** from the menu bar. The new project dialog will appear.

2 In the project name field, type: **hospital**.

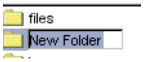
3 Click the **Browse** button to select a Project Location.

4 Navigate to the **tutorial** directory located in the exteNd5\Composer directory where you installed the Novell software. For example D:\Program Files\Novell\exteNd5\Composer\tutorial.

NOTE: The location of your files is dependent on where you installed Composer.

5 Click the **Create New Folder** button.

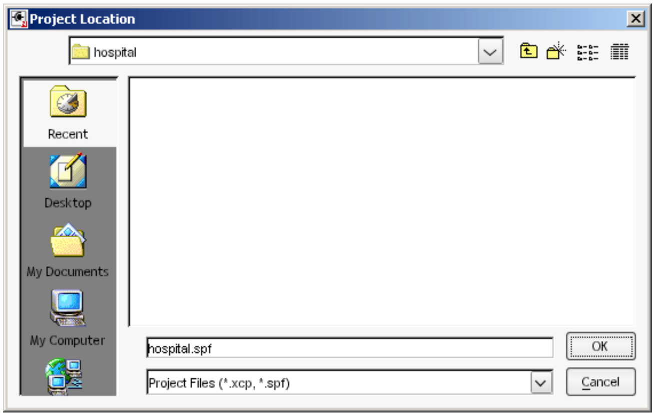
A folder named **New Folder** is added to the browser window. Note that the folder name is recessed and highlighted in the window.



6 Change the name of the folder to **hospital**

7 Click **Open.**

The Project Location dialog should look like the one below.



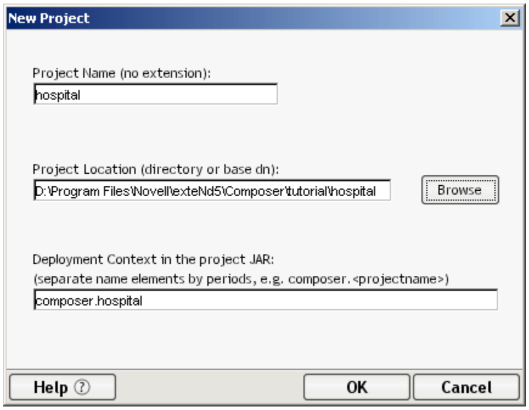
hospital.spf

Project Files (*.xcp, *.spf)

8 Click **OK** to close the project location dialog.

Accept the default deployment context, **composer.hospital** entered for you by Composer in the Deployment Context textfield.

Your New Project dialog should look similar to the one below.



New Project

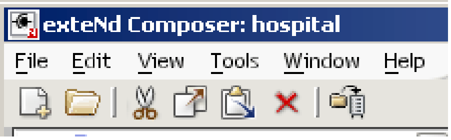
Project Name (no extension):
hospital

Project Location (directory or base dn):
D:\Program Files\Novell\exteNd5\Composer\tutorial\hospital

Deployment Context in the project JAR:
(separate name elements by periods, e.g. composer.<projectname>)
composer.hospital

9 Click **OK** to close the dialog and create the project.

10 Notice that the title bar on the Composer UI contains hospital as the open project.



exteNd Composer: hospital

Summary of what you’ve done

You have accomplished the following tasks:

- Learned about the basic Composer Building Blocks.
- Launched the Composer application
- Explored the Composer environment
- Created a Composer Project folder
- Investigated the Composer project folder structure
- Created a Composer Project

Next lesson

In the next lesson you will learn about DOM, Components and the XML Map Action.

2 Components and XML Mapping

What you will learn

In lesson 2 you will learn more about the design and construction of components within the Composer environment. The “hospital” Service that you will create in the tutorial will execute an XML Map Component. The map component will use a Mapping Action to take input you provide and transform it to output. Within this lesson, you will create a map component that the service will utilize. This map component will take a physician’s name as input. You will use it to model the data that will be passed to your web service. Once you have your component constructed, Composer’s features for animation and debugging will be introduced.

You will learn about Design and Structure of Composer Components:

- Composer Component Architecture
- Document Object Model (DOM)
- XML Map Action
- Component Animation

What you will do

You will perform the following exercise using exteNd Composer:

1. Create an XML Map Component.
2. Add a Map Action to the Component
3. Modify the Input DOM and Save as an XML Template
4. Animate the Map Component

How long will it take? About 15 minutes

Design and Structure of Composer Components

Composer applications are much like any other design project. First, the service to be provided must be understood and agreed upon between the client and the service provider. Composer applications are often utilized to provide services between business partners; for example, information exchange between a catalog and inventory supplier. Once the application is defined, Composer components are designed, created, and packaged to implement the service.

Composer Component Architecture

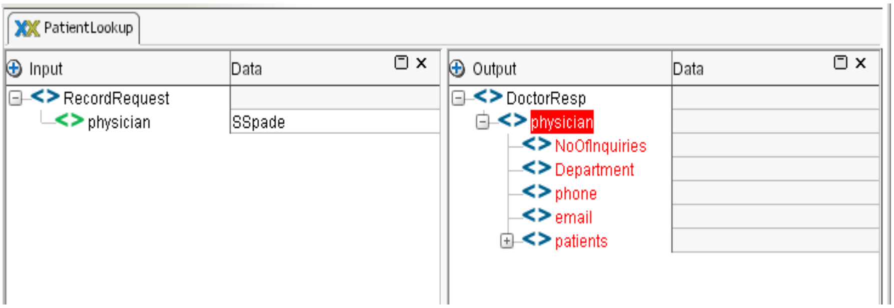
Components are the cornerstone of the Composer Architecture. They use resources, connections, and actions to accomplish the requirements of a service. Since components are capable of utilizing other components, they are readily compartmentalized into units of functionality. This makes them ideal for reuse by other services and components in your design.

Components are xObjects that take XML documents as their input, operate on these documents, and produce an XML document as output.

Document Object Model (DOM)

Composer represents XML documents in system memory as a DOM. The DOM represents the XML as a tree structure. The tree has a single root node, and a hierarchy of child nodes and elements that contain the data on which the component operates. The DOM provides standard methods of dealing with the XML document. A DOM is the structure that is created and manipulated at runtime.

When you create a component, Composer represents the input and output XML documents as a DOM in the Composer environment. The screen shot below shows a sample of a Composer XML Map Component with two input XML documents and one output XML document, represented as DOMs.



Input	Data
RecordRequest	
physician	SSpade

Output	Data
DoctorResp	
physician	
NoOfInquiries	
Department	
phone	
email	
patients	

XML Map Action

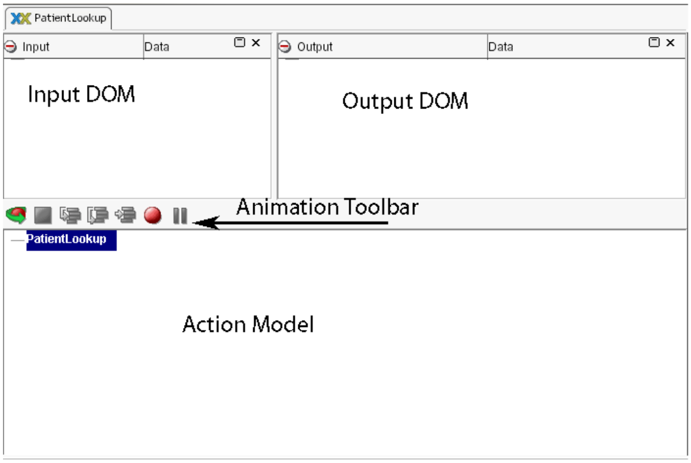
An Action in Composer is similar to a programming statement. As the verb implies, something takes place when an action executes. Components utilize actions to operate on the elements and data in the XML input document to produce the required output. These actions provide a wide variety of operations, that may include transformation and re-ordering of the elements and data.

The XML Map Action is one of the most important of all the actions available within Composer. A Map action can be as simple as passing the data from the input to the output with no intermediate steps, or a complex action with data transformations.

Composer has two methods of creating map actions, Drag and Drop, which allows nodes from the Input DOM to be dragged and dropped in the Output DOM. The second method is via the Map Action Dialog, which provides means for more complex mappings and transformations. The Map Action Dialog also allows you to use XPath or ECMAScript expressions to address locations in the DOM. You will be using some basic XPath in the exercises within the lessons. XPath will be covered more completely later in the tutorial.

Component Animation

Composer allows you to animate your components for testing and debugging. Animation provides you the ability to step into, or over, component actions as they execute. You may also set break points and watch variables to aid in the debug process. Use the animation tool bar at the top of the action model or the animate menu to access these features.

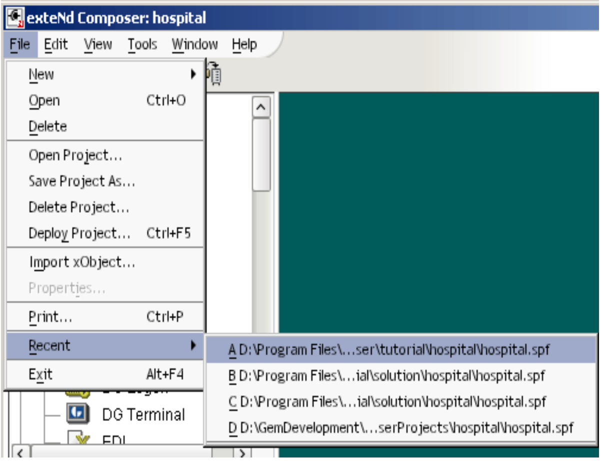


EXERCISE 2-1: Create an XML Map Component

1 If Composer is not running on your system, launch Composer as described in Exercise 1-1.

When Composer launches, it will open the last project you worked with in the application.

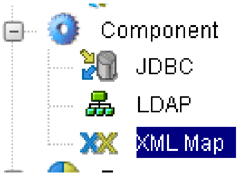
2 Check the title bar to insure you that the project listed is “hospital”. If not, open the “hospital” project by selecting **File>Recent** from the menu. You will see a list of the most recently accessed projects. Select “**hospital**” from the list.


exteNd Composer: hospital
File
Edit
View
Tools
Window
Help
New
Open Ctrl+O
Delete
Open Project...
Save Project As...
Delete Project...
Deploy Project... Ctrl+F5
Import xObject...
Properties...
Print... Ctrl+P
Recent
Exit Alt+F4
DG Terminal
EDI
A D:\Program Files\...ser\tutorial\hospital\hospital.spf
B D:\Program Files\...ial\solution\hospital\hospital.spf
C D:\Program Files\...ial\solution\hospital\hospital.spf
D D:\GemDevelopment\...serProjects\hospital\hospital.spf

3 Select the **Project Tab** in the Navigation Frame.

In this portion of the exercise you will create the map component that will be accessing the patient database. The input to this component will be the physician’s name. In the course of the exercise you will modify the Input DOM, and create the XML templates that model this input.

4 In the category pane highlight **XML Map** Component.



5 **RMB** (Right Mouse Button).

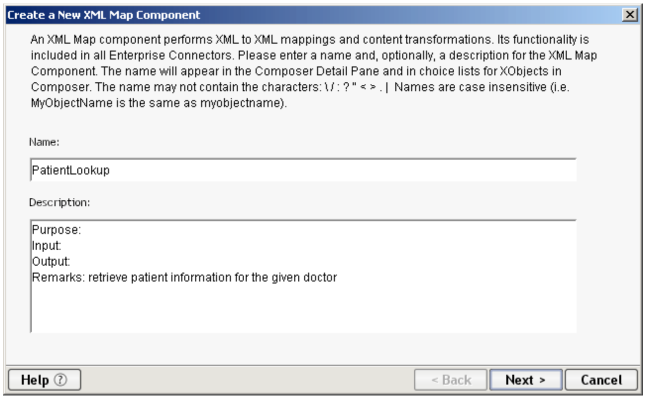
6 Select **New**.

The XML Map Component Wizard will appear.

7 Type **PatientLookup** in the Name text field.

8 Optionally, you may enter text in the Description fields, or leave them blank. The example below shows an entry in the remarks field.

Your wizard should look similar to the one depicted below.



Create a New XML Map Component

An XML Map component performs XML to XML mappings and content transformations. Its functionality is included in all Enterprise Connectors. Please enter a name and, optionally, a description for the XML Map Component. The name will appear in the Composer Detail Pane and in choice lists for XObjects in Composer. The name may not contain the characters: \ / : ? " < > . | Names are case insensitive (i.e. MyObjectName is the same as myobjectname).

Name:

PatientLookup

Description:

Purpose:
Input:
Output:
Remarks: retrieve patient information for the given doctor

9 Click **Next**.

The Select XML Template dialog appears. You will be creating and saving an XML Template for the component later in the exercise. For this step, accept the default input and output templates provided by Composer.

10 Click **Next**.

The Temp and Fault document dialog appears. You can think of Temp documents as a scratch pad area to use when manipulating data. Fault documents are used in fault handling. You will be using temp documents in a later lesson. The fault documents are beyond the scope of this introductory tutorial. For more information on them, please consult the *Novell exteNd Composer User Guide*. For the purpose of this exercise, you will accept the default values provided by Composer for these documents.

11 Click **Finish.**

The component editor window for the XML component will open.

Note that in the component editor you have an Input DOM and an Output DOM. The component name has been added to the Instance pane in the project tab, and the Action Model contains the XML Component Named “PatientLookup”.

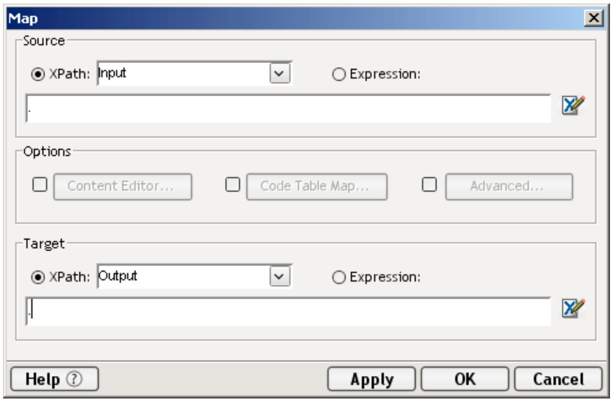
EXERCISE 2-2: Add a Map Action to the Component

1 Click to highlight “**PatientLookup**” in the action model.

2 **RMB** select **New Action>Map**, the map dialog appears.

Note that the XPath radio button is selected for both the Source and the Target.

3 Type a,“**.**”,without the quotes in both the source and target text fields. The period is XPath notation indicating that the current node is to be copied.



Source: ● XPath: Input ○ Expression:

.

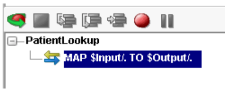
Options: □ Content Editor... □ Code Table Map... □ Advanced...

Target: ● XPath: Output ○ Expression:

.

4 Click **OK.**

A Map Action appears in the action model.



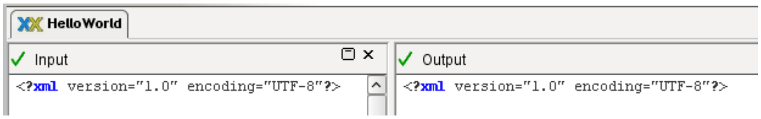
```
PatientLookup
  MAP $Input/. TO $Output/.
```

EXERCISE 2-3: Modify the Input DOM and Save as an XML Template

Composer lets you view XML documents in three ways, tree, stylized, and text. The default view is tree. The easiest way to edit the XML document is to use the text view.

1 Select **View>XML Documents>As Text** from the menu.

Note that the Input and Output DOM change to text view, which allows you to edit the structure of the XML document.



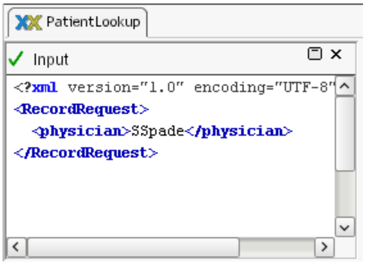
```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<?xml version="1.0" encoding="UTF-8"?>
```

2 Click within the Input pane below the text “<?xml version="1.0" encoding="UTF-8"?>.”

3 Enter the following XML elements in the order they appear below, include the brackets and slashes. Composer will generate an error if your XML document is not well-formed.

```
<RecordRequest>
   <physician>SSpade</physician>
</RecordRequest>
```

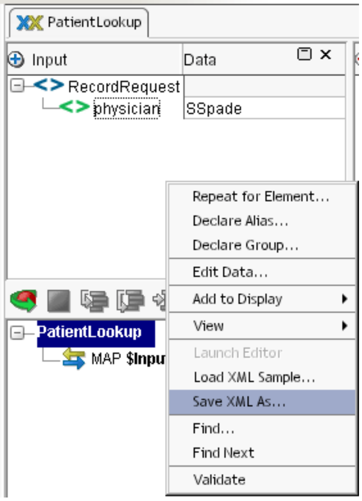


```
<?xml version="1.0" encoding="UTF-8"
<RecordRequest>
  <physician>SSpade</physician>
</RecordRequest>
```

4 Select **View>XML Documents>As Tree,** the Input DOM displays physician as a child element of the root node RecordRequest.

Next you will save the XML document you just created as a template to be used in later lessons. Any DOM that is visible in the component editor may be saved as an XML Template. A full discussion of XML templates is covered in Lesson 3

5 Click anywhere in the Input DOM, **RMB>Save XML As**.



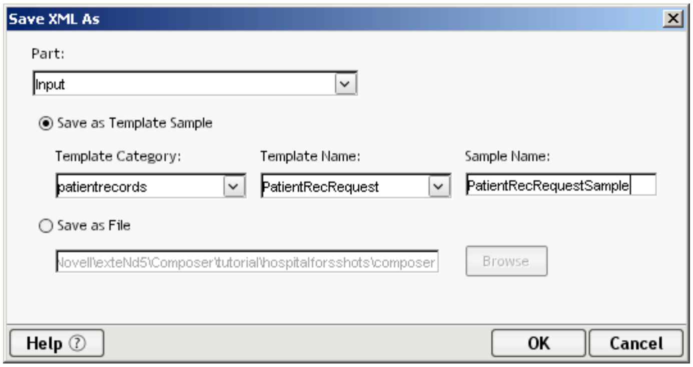
The Save XML As dialog appears. Note that input appears in the dropdown list for the part. You will be saving your template as a template sample.

6 Select the **Save as Template Sample** radio button.

7 Type **patientrecords** in the Template Category dropdown box.

8 Type **PatientRecRequest** in the Template Name dropdown box.

9 Type **PatientRecRequestSample** in the Sample Name dropdown box.



Part: Input

● Save as Template Sample

Template Category: patientrecords

Template Name: PatientRecRequest

Sample Name: PatientRecRequestSample

○ Save as File

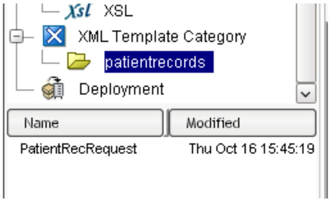
Novell\exteNd5\Composer\tutorial\hospitalforsshots\composer

10 Click **OK**

Composer creates a new folder under the XML Template Category named patientrecords.

11 Double click on the **patientrecords** folder in the Category pane.

Note that the XML template named PatientRecRequest is listed in the Instance pane. You will be using this template throughout the remainder of the tutorial.

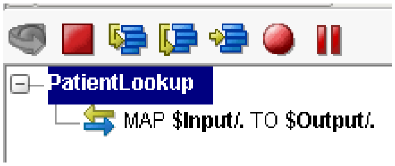


Name	Modified
PatientRecRequest	Thu Oct 16 15:45:19

EXERCISE 2-4: Animate the Map Component

1 Animate the map action by selecting **Animate>Start Animation** from the Composer menu.

Note that the animation tool bar buttons become active above the action model.



```
PatientLookup
  MAP $Input/. TO $Output/.
```

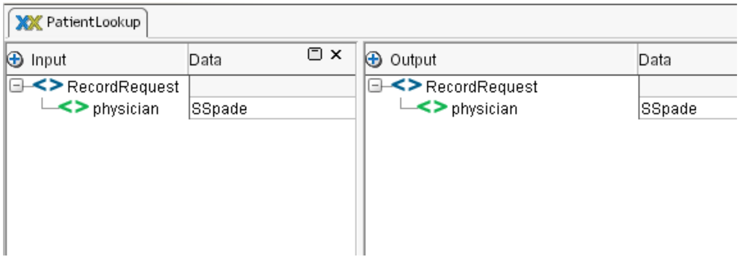
2 Hover the mouse over the buttons to determine their function.

3 Click the **Step Into** button twice to step through the component.

4 Click **OK** on the Animation dialog when you see the *Animation Completed* message.

5 Note that the physician element with the data “SSpade” has been mapped to the output DOM.

6 Select **File>Save** from the menu to save your work.



PatientLookup

Input	Data
RecordRequest	
physician	SSpade

Output	Data
RecordRequest	
physician	SSpade

Summary of what you’ve done

You have accomplished the following tasks:

- Learned about Composer Component Architecture
- Gained understanding about the Document Object Model (DOM)
- Created a XML Map Component.
- Added a XML Map Action to the component
- Created and saved an XML template
- Animated a Composer component

Next lesson

In the next lesson you will learn about Schemas, XML Templates and XML Template Categories.

3 XML Templates

What you will learn

Lesson 3 introduces you to XML Templates and the XML files that comprise them. Templates provide frameworks on which to build components. You create XML templates that provide the input and output structure for the design, and test of components you build with Composer.

You will learn about Composer XML Templates:

- XML Template Categories
- XML Sample Documents
- XML Schema
- XSL Style Sheets
- XML Templates

What you will do

You will perform the following tasks using exteNd Composer:

1. Work with XML Templates
2. Create an XML Template using the template wizard
3. Import an XML template from another Composer project
4. Edit the PatientLookup XML Map Component to use the XML Templates

How long will it take? About 20 minutes

Composer XML Templates

Composer XML Templates are an organization of XML files in a functional group. They are used by the components and services you build. XML Templates model the elements and data a service or component will encounter. The type of documents that can be included in an XML template are XML Sample Documents, XML Schemas, and XSL Style Sheets

XML Template Categories

XML Categories provide a convenient mechanism for grouping like instances of templates.When you create a template category, it appears as a folder in the Category pane of the Composer Navigation frame. When you create the XML template, you assign it to a category. The instances of the templates you have created appear in the Instance pane of the Navigation frame, when you select the appropriate XML Category.

XML Sample Documents

XML sample documents provide a representation of the runtime XML documents that a component or service will process. The elements and data in the sample document are the same as those encountered in practice. In B2B applications the sample documents are often supplied by your business partners. They may be used as inputs or outputs to a component or service.

XML Schema

XML Schema Definition (XSD) files are used to validate XML documents. They can be thought of as the contract that the XML document must fulfill to be interpreted properly by a service or component. Schemas are developed at design time between business partners. They act as an interface or description of the XML documents involved in the service. While XML documents are strictly concerned with data, schemas define the data’s valid format and may also define data types. A schema can also declare namespaces to uniquely identify elements as belonging to a particular document vocabulary. Schemas allow extensibility, in that new custom data types may be defined within them.

The scope of schemas reach far beyond this tutorial. Entire books have been devoted to them. A good starting point to investigate them further is the W3 Schools website.

XSL Style Sheets

XSL Style Sheets may be included as part of the XML Template. While XML documents are strictly concerned with elements and data, XSL Style Sheets define how the data within the XML document is displayed. If your application is to be implemented as a page within a web browser, you may want to include a style sheet as part of your XML template.

XML Templates

XML Templates are a collected grouping of related documents that represent the information a component or service would receive at runtime. The primary use of XML Templates in Composer is as a design and debugging aid. Components often have to handle a multitude of documents at runtime. These documents may have different optional elements that the components must handle gracefully. Templates allow you to test your component with the different document types your component may process at runtime.

EXERCISE 3-1: Work with XML Templates

1 If Composer is not running on your system, launch Composer as described in Exercise 1-1.

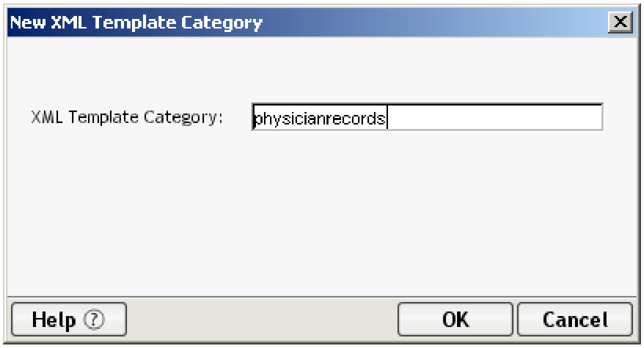
2 If you are not already in the “hospital” project, open it by either selecting it from the recent project list **File>Recent** on the menu. Alternatively, you may browse to the project location by selecting **File>Open Project**.

3 Select **XML Template Category** in the Navigation Frame.

4 **RMB>New.**

The New XML Category dialog appears.

5 Type **physicianrecords** in the dialog text field.

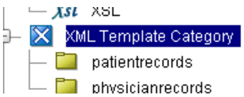


New XML Template Category

XML Template Category: physicianrecords

6 Click **OK**.

A new folder, “physicianrecords” appears in the Category pane of the Navigation frame.



7 Save your work by selecting **File>Save** from the menu.

EXERCISE 3-2: Create an XML Template using the template wizard

In this exercise you will create the XML templates that model the input and outputs of your service. The first template you create will model the final output of your service. It will combine the patient information retrieved from the database with the physician information extracted from the directory. In practice, a sample XML file might be supplied by the consumer of your service, you would then build your template using that sample file.

1 Click on the **patientrecords** folder.

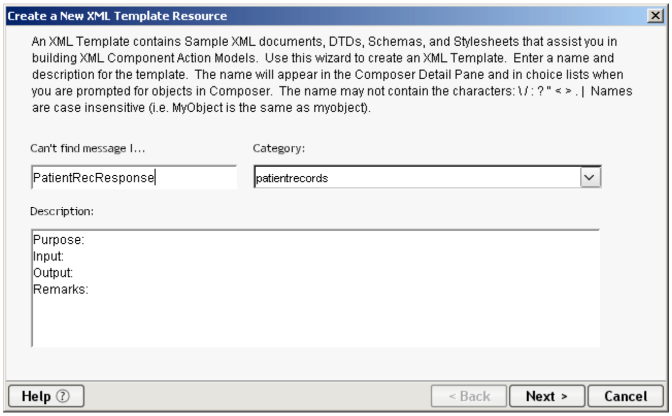
2 **RMB>New** to launch the Create a New XML Template Resource Wizard.

3 Enter **PatientRecResponse** in the Name text field.

Notice that Composer has entered the template category “patientrecords” in the category drop-down list.

4 (Optional) Enter text in the Description fields.

Your wizard should look similar to the one depicted below.


Create a New XML Template Resource

An XML Template contains Sample XML documents, DTDs, Schemas, and Stylesheets that assist you in building XML Component Action Models. Use this wizard to create an XML Template. Enter a name and description for the template. The name will appear in the Composer Detail Pane and in choice lists when you are prompted for objects in Composer. The name may not contain the characters: \ / : ? " < > . | Names are case insensitive (i.e. MyObject is the same as myobject).

Can't find message I...: PatientRecResponse

Category: patientrecords

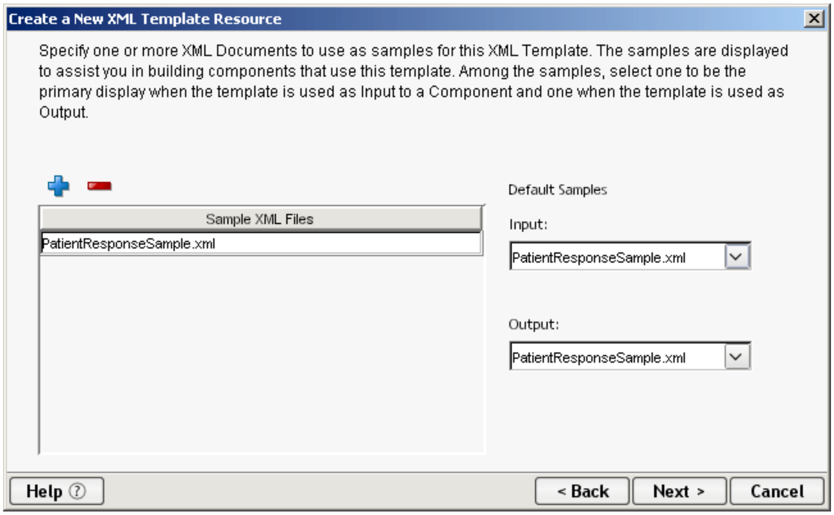
Description:

Purpose:
Input:
Output:
Remarks:

5 Click **Next.**

6 Add the XML Sample document to be used with the XML template.

- Click the **Add** button on the dialog.
- Navigate to the directory: **\tutorial\files**. This directory is located under the directory where Composer was installed. Double click on the file: **PatientResponseSample.xml.**
- The wizard adds the file to the list and to the Default Samples drop-down lists for Input and Output.
- The panel should look like the one below.



Create a New XML Template Resource

Specify one or more XML Documents to use as samples for this XML Template. The samples are displayed to assist you in building components that use this template. Among the samples, select one to be the primary display when the template is used as Input to a Component and one when the template is used as Output.

Sample XML Files
PatientResponseSample.xml

Default Samples

Input: PatientResponseSample.xml

Output: PatientResponseSample.xml

- Click **Next**.

The sample document specified in the previous panel doesn’t have an associated validation document. The wizard has selected the **None** radio button on this panel. Accept this default.

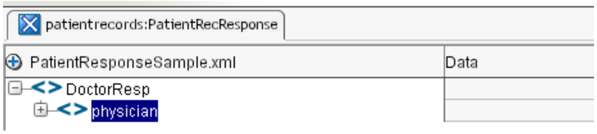
7 Click **Next.**

The Namespace and Prefix panel appears. Namespaces are used by Composer Map Actions to resolve prefix usage between documents that belong to the same Namespace. For this exercise, you will leave this panel blank.

8 Click **Next**.

9 No stylesheet definition is associated with this template, click **Finish**.

The new template appears in the Navigation frame’s Instance Pane and the XML Template Component Editor opens with the PatientRecRequest Template displayed. Note that the sample document’s name appears in the title of the Part pane for the template.



Next you will create templates for the input and output of the physician directory.

1 Click on the “**physicianrecords**” folder.

2 **RMB>New** to launch the Import dialog.

3 Enter **PhysDirInq** in the name text field.

4 Click **Next.**

5 Add the XML Sample document to be used with the XML template.

   - Click the **Add** button on the dialog.
   - Navigate to the directory: **\tutorial\files**. This directory is located under the directory where Composer was installed. Double click on the file: **PhysDirInqSpl.xml.**
   - The wizard adds the file to the list and to the Default Samples drop-down lists for Input and Output.

6 Click **Next**.

The sample document specified in the previous panel doesn’t have an associated validation document. The wizard has selected the **None** radio button on this panel. Accept this default.

7 Click **Next.**

The Namespace and Prefix panel appears. Namespaces are used by Composer Map Actions to resolve prefix usage between documents that belong to the same Namespace. For this exercise you may leave this panel blank.

8 Click **Next**.

No stylesheet definition is associated with this template.

9 Click **Finish**.

10 Open the template. Double click on the template name in the Instance pane. The XML Template Component Editor opens with the “PhysDirInq” template displayed.

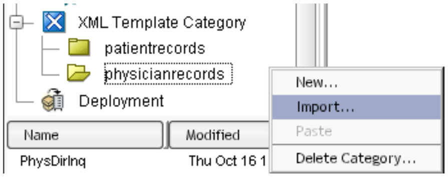
11 Save the XML Templates by selecting **File>Save All** from the menu.

EXERCISE 3-3: Import an XML template from another Composer project

In this exercise you will learn how to import an XML template from another project. You will be importing the output template that will be used by the physician directory search component.

1 Click on the **physiciansrecords** folder under XML Template Category in the Category pane.

2 **RMB>Import**

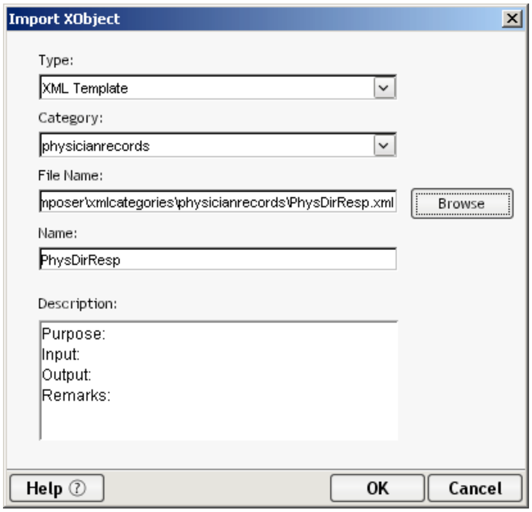


The Import XObject dialog appears.

3 Using the **Browse** button on the dialog navigate to the directory \Composer\tutorial\solution\hospital\composer\xmlcategories\physicianrecords under the location where you installed the exteNd Suite.

4 Double click on the file **PhysDirResp.xml.**

Your dialog should look similar to the one pictured here.


Import XObject

Type: XML Template

Category: physicianrecords

File Name: mposer\xmlcategories\physicianrecords\PhysDirResp.xml

Name: PhysDirResp

Description:
Purpose:
Input:
Output:
Remarks:

5 Click **OK**.

The template is added to the Instance pane.

6 Double click on the **PhysDirResp** template in the instance pane to open it.

7 Expand the root node in the template by clicking on the **plus sign** next to the root node.

8 Select **File>Save** from the menu, or use the **Save** button on the Composer toolbar to save your work.

EXERCISE 3-4: Edit the PatientLookup XML Map Component to use the XML Templates

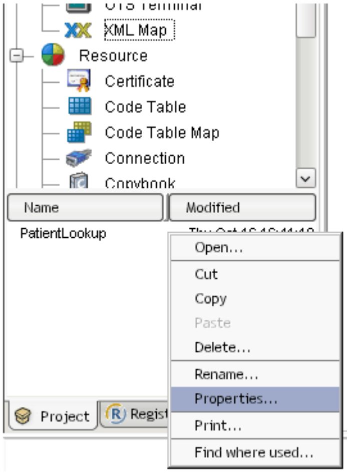
In this part of the exercise you will modify the PatientLookup map component to use the templates you have added to the project

1 Click on the **XML Map** component in the Category pane.

The PatientLookup map component appears in the instance pane.

2 **RMB** on the PatientLookup component in the instance pane.

3 Select **Properties** on the pop-up menu.



The properties dialog for the PatientLookup component appears.

4 Select the **Messages** tab on the Properties dialog.

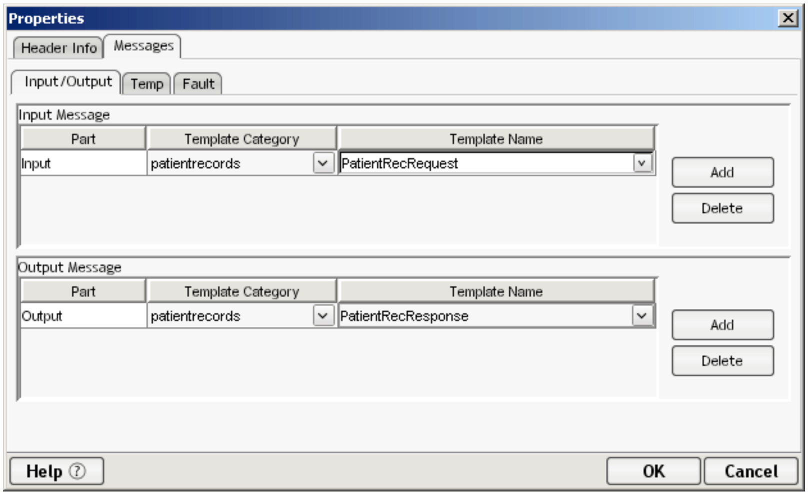
The template category for the component is currently set to System and the template name to ANY.

5 Select the Template Category **patientrecords** from the dropdown list under the Input Message.

6 Select **PatientRecRequest** from the Template Name dropdown list for the Input.

7 Select the Template Category **patientrecords** from the dropdown list under the Output Message.

8 Select **PatientRecResponse** from the Template Name dropdown list for the Output.



Input Message

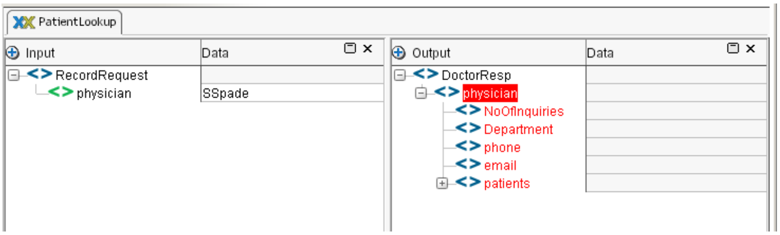
Part	Template Category	Template Name
Input	patientrecords	PatientRecRequest

Output Message

Part	Template Category	Template Name
Output	patientrecords	PatientRecResponse

9 Click **OK**.

10 Double click on the **PatientLookup** component in the Instance pane to open it. Note that input and output DOM reflect the templates you just added.



11 Save your work, select **File>Save All** from the menu.

12 Animate and step through the component using the animation tool bar.

Summary of what you’ve done

You have accomplished the following tasks:

- Learned about XML Templates and the documents that comprise them
- Created an XML Template Category
- Created an XML Template
- Imported an existing XML Template into a Composer project
- Modified an XML Map Component that uses your templates

Next lesson

In the next lesson you will learn how to create a Composer Service.

4 Web Services

What you will learn

This lesson will show you how to create a *web service* in the Composer environment.

You will learn about:

- Composer Service Basics
- Services vs. Components

NOTE: This lesson is just a very quick introduction to the basics of creating a new service in Composer. It does not discuss WSDL or SOAP. For a detailed example of how to create and deploy a web service that uses WSDL and SOAP, see LESSON 8, “Publishing and Consuming Web Services”.

What you will do

You will perform the following tasks using exteNd Composer:

1. Create a Web Service

How long will it take? About 5 minutes

Composer Web Services

Web Service Definition

Web Services are applications that reside on a server, and execute when triggered by a client request. The request that initiates the service provides any input parameters the service needs to carry out its function. The service's response may be returned within the same transaction as the request, or it may occur as a separate operation.

Transactions in a web service often occur between business partners. One partner provides the service that the other consumes. For example; a catalog website may interact with an inventory supplier via a web service that, in turn, invokes the service of a third party shipping company.

Composer web services accept XML documents as their input, use components and resources to act upon the data in the document, and return an XML document as their output.

Services vs. Components

Services in Composer are very similar to Composer Components, they each have an Action Model, and can execute the same tasks. The wizard to create services is similar to the Component Wizard. Like components, services take XML documents as their input, and produce XML documents as their output.

The major difference between a service and a component is that the service is the unit of deployment. The service is the actual application that is invoked when the server receives a client request. Services are registered with the server, and may be published via a UDDI registry. Components reside within services, and perform units of work for the service. Services may also invoke other services to accomplish their tasks. When designing your application, keep in mind that the service is the highest level of your application. It presents the public interface to your application. The primary objective of the service is to coordinate the activities of the other services and components needed to fulfill the requirements of the service, and deliver the appropriate response to the client.

EXERCISE 4-1: Create a Web Service

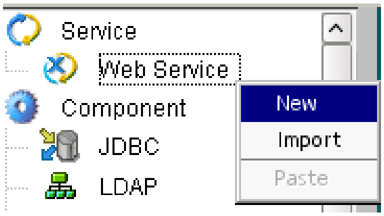
The web service you will create in this exercise will be deployed in the next lesson. The service you will implement is intentionally very simple, your goal is to understand how to create the service. In later lessons, you will add more complex tasks to components and service.

1 If Composer is not running on your system, launch Composer as described in Exercise 1-1.

2 If you are not already in the “hospital” project, open it by either selecting it from the recent project list **File>Recent** on the menu, or browse to the project location by selecting **File>Open Project**.

3 Select the Web Service Category in the Navigation Frame.

4 **RMB>New**.

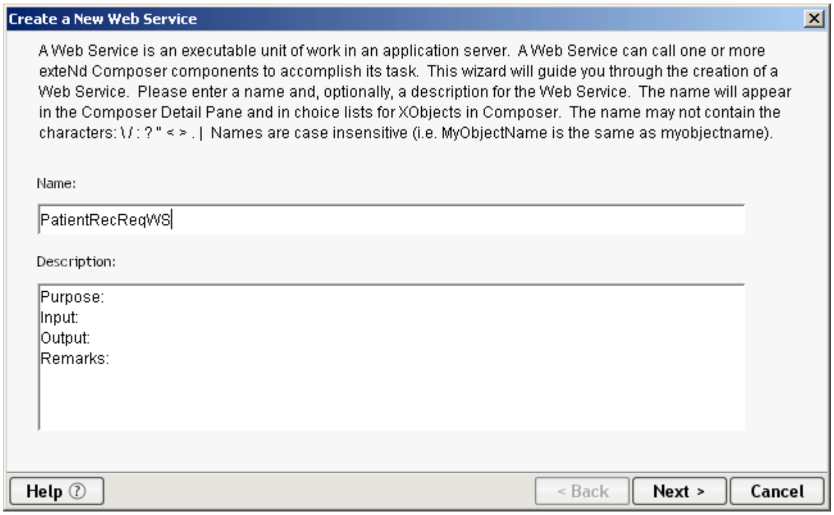


5 The Create a New Web Service Wizard appears.

6 Type **PatientRecReqWS** in the Name text field.

7 (Optional) Enter text in the Description fields.

Your wizard should look similar to the one depicted below.


Create a New Web Service

A Web Service is an executable unit of work in an application server. A Web Service can call one or more exteNd Composer components to accomplish its task. This wizard will guide you through the creation of a Web Service. Please enter a name and, optionally, a description for the Web Service. The name will appear in the Composer Detail Pane and in choice lists for XObjects in Composer. The name may not contain the characters: \ / : ? " < > . | Names are case insensitive (i.e. MyObjectName is the same as myobjectname).

Name:

PatientRecReqWS

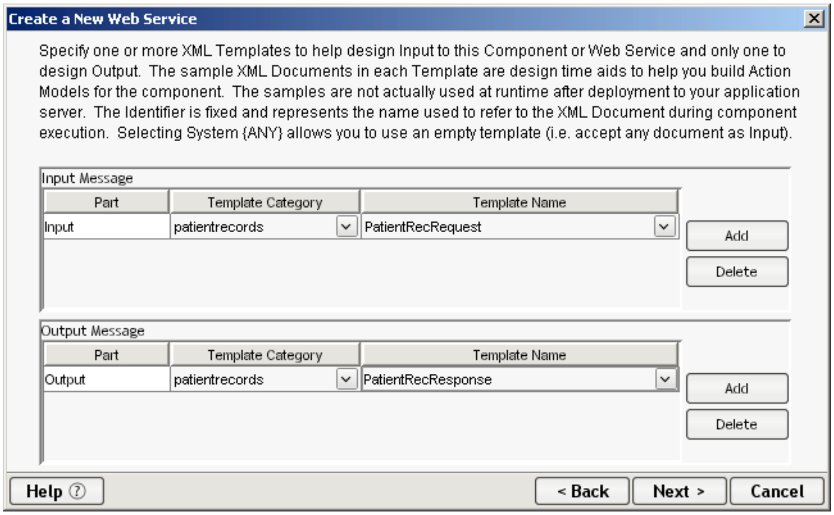
Description:

Purpose:
Input:
Output:
Remarks:

8 Click **Next.**

9 Specify the XML Templates.

- For the Input Message, select **patientrecords** from the Template Category dropdown list. Select **PatientRecRequest** as the Template Name.
- For the Output Message, select **patientrecords** from the Template Category drop-down list. Select **PatientRecResponse** as the Template Name.



Create a New Web Service

Specify one or more XML Templates to help design Input to this Component or Web Service and only one to design Output. The sample XML Documents in each Template are design time aids to help you build Action Models for the component. The samples are not actually used at runtime after deployment to your application server. The Identifier is fixed and represents the name used to refer to the XML Document during component execution. Selecting System {ANY} allows you to use an empty template (i.e. accept any document as Input).

Input Message

Part	Template Category	Template Name
Input	patientrecords	PatientRecRequest

Output Message

Part	Template Category	Template Name
Output	patientrecords	PatientRecResponse

- Click **Next.**

10 You won’t be using Temp or Fault documents in this section of the tutorial, so click **Next** to bypass this panel.

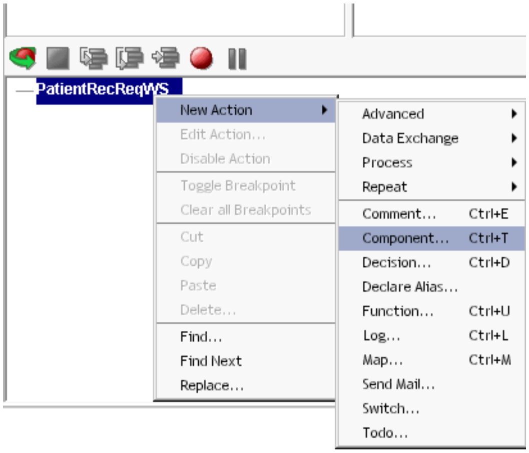
You will be deploying your service using SOAP as the service trigger in a later lesson. For this exercise, leave this panel blank.

11 Click **Finish**.

The component editor opens with the web service in the Native Environment pane. Next you will add an action to your web service to execute the PatientLookup XML component you created in Lesson 2.

12 Highlight **PatientRecReqWS** in the action model.

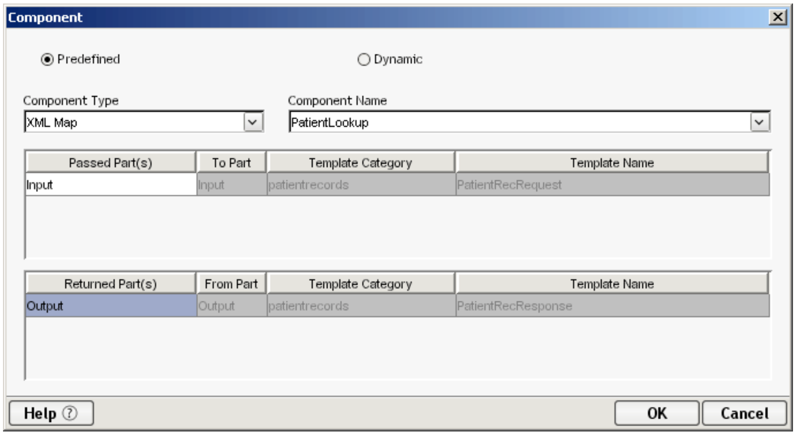
13 **RMB>New Action>Component.**



The Component dialog appears, with the Predefined radio button selected. At this point in the project, the PatientLookup component is the only component defined. The dialog defaults to this component. You will be passing the Input Part from the Web Service to the component and placing the output from the component into the Output Part of the service.

14 Select **Input** as the Passed Part, **patientrecords** as the Template Category, and **PatientRecRequest** as the Template Name.

15 Select **Output** as the Returned Part, **patientrecords** as the Template Category, and **PatientRecResponse** as the Template Name



Component

● Predefined ○ Dynamic

Component Type: XML Map

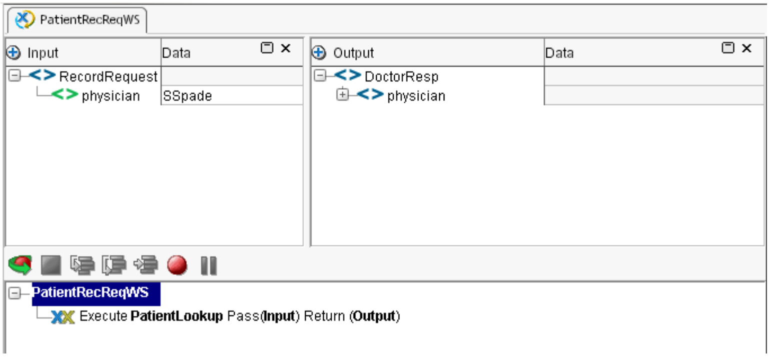
Component Name: PatientLookup

Passed Part(s)	To Part	Template Category	Template Name
Input	Input	patientrecords	PatientRecRequest

Returned Part(s)	From Part	Template Category	Template Name
Output	Output	patientrecords	PatientRecResponse

16 Click **OK**.

The execute component statement is added to the action model. Your component should be similar to the one below.



PatientRecReqWS

Input	Data
RecordRequest	
physician	SSpade

Output	Data
DoctorResp	
physician	

```
PatientRecReqWS
  Execute PatientLookup Pass(Input) Return (Output)
```

17 Save your work, select **File>Save All** from the menu.

18 Animate and step through the service using the animation tool bar.

Summary of what you’ve done

You have accomplished the following tasks:

- Studied Web Services
- Discovered the difference between a service and a component
- Created a Web Service in Composer

Next lesson

In the next lesson you will deploy your web service.

5 Deployment

What you will learn

Lesson 5 shows you how to deploy your Web Service.

You will learn about:

- Deployment Considerations
- Composer Deployment Profiles
  - Server Profiles
  - Deployment Components
- Creating a Server Profile
- Service Triggers

What you will do

You will perform the following tasks using exteNd Composer:

1. Create a Server Profile
2. Create a Deployment Object
3. Set up a Service Trigger for your Web Service.
4. Deploy your service

How long will it take? About 40 minutes

Composer Web Service Deployment

When you have completed the design, building, testing, and debugging of your service on your local system, it's time to deploy the service to your application server.

Each application server supports its own method(s) of deployment. The following discussions pertain to the Novell exteNd Application Server. If you are using another type of server, consult the documentation for your application server to learn how to deploy to your server.

Deployment Considerations

Prior to deploying your service, you need to take into account a number of factors ,as shown in the following table.

Factor	Details
Deployment Package	How will your service be packaged? Depending on your project requirements, you can choose to deploy your project from within the Composer product or you can choose to create your own **WAR** or **EAR** file and deploy the archive manually, using Novell exteNd Director's Utility Tools.
Triggering	How will your service be instantiated? There are several options for triggering a service, including servlets, JSP, EJB, custom Java objects, scheduled tasks, e-mail, and (on Enterprise Edition only) SAP RFCs and/or JMS listeners
Input Parameters	How will your service receive incoming data, and what will be the format and content of that data?
Resources	Will your service share resources with other services? How and where will you publish these resources?
Security	Will your service have restricted access? What about resource security?

In the tutorial you will package and deploy your web service using the Deployment xObject user interface of Composer Enterprise Edition. You will first create a Server Profile (which is a prerequisite for deploying *any* kind of J2EE artifacts, using any edition of Composer *or* Director), then you will create a Deployment xObject; and finally, you will deploy your project to the app server.

Server Profile

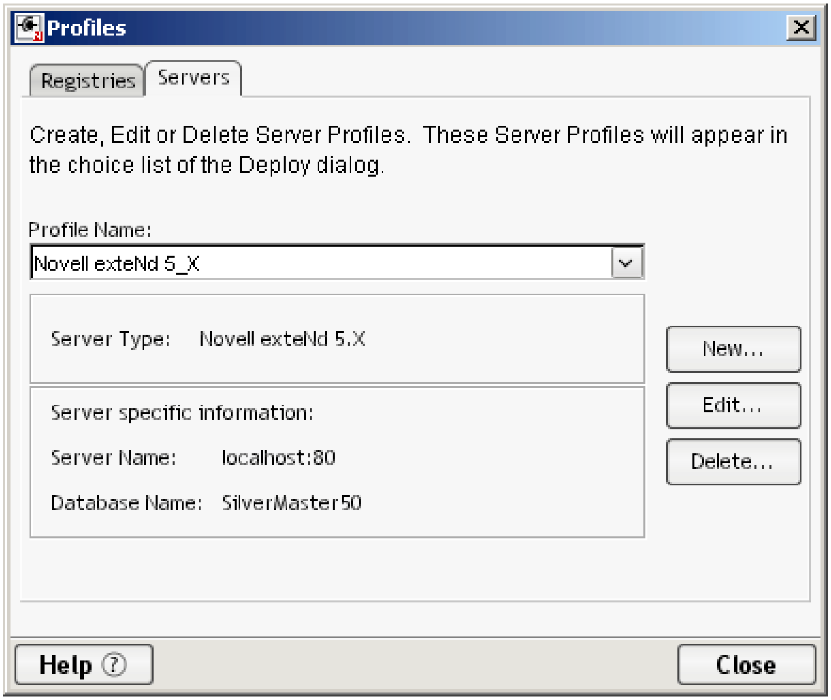
A Server Profile contains information characteristic to a given server, such as name (or IP address) and port number. Once a Server Profile is defined within Composer, any project can be deployed to that server. If you've defined more than one Server Profile (for example, a local "development server" versus a QA or production server, etc.), you can choose the desired profile at deployment time, and deploy directly to the server of your choice without having to reenter or re-specify host and port parameters.

NOTE: Once you've created profiles for the server(s) you need to deploy to, there is no need to revisit the following procedure (unless you've upgraded servers or need to add an entirely new profile for some reason). This can be thought of as a onetime task.

EXERCISE 5-1: Creating a Server Profile

The first time you deploy using Composer you need to define a server profile, as follows.

1. If Composer is not running on your system, launch Composer as described in Exercise 1-1.
2. If you are not already in the "hospital" project, open it either by selecting it from the recent project list **File>Recent** on the menu, or browse to the project location by selecting **File>Open Project**.
3. Select **Tools>Profiles** from the Composer menubar. The Profiles dialog appears.



Profiles

Create, Edit or Delete Server Profiles. These Server Profiles will appear in the choice list of the Deploy dialog.

Profile Name: Novell exteNd 5_X

Server Type: Novell exteNd 5.X

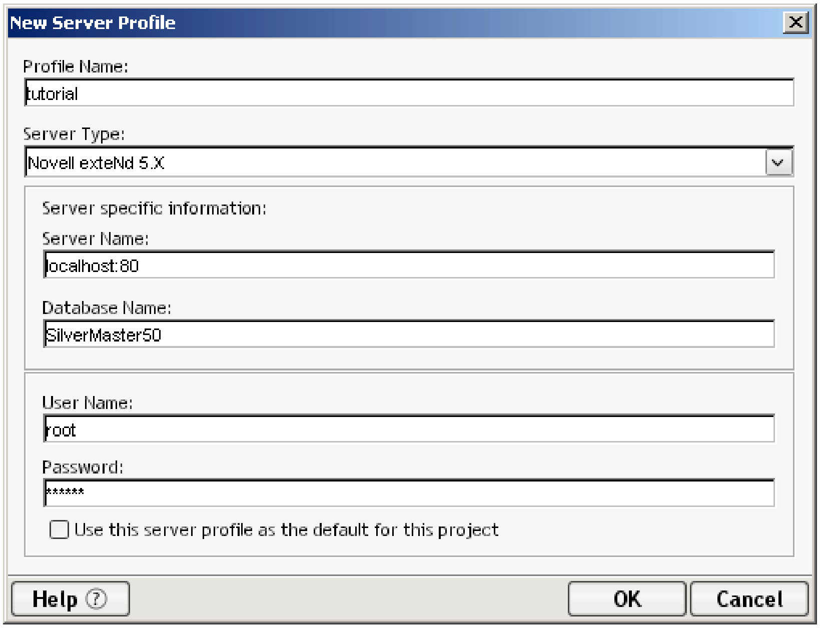
Server specific information:

Server Name: localhost:80

Database Name: SilverMaster50

4 Select the **Servers** tab if it is not already in front.

5 Click the **New...** button next to the Profile Name dropdown list. The New Server Profile dialog appears.


New Server Profile

Profile Name: tutorial

Server Type: Novell exteNd 5.X

Server specific information:

Server Name: localhost:80

Database Name: SilverMaster50

User Name: root

Password: ******

□ Use this server profile as the default for this project

6 Type “tutorial” in the **Profile Name** text field.

7 Select your **Server Type** from the dropdown list.

8 Type the name and port number (separated by a colon) of your server in the **Server Name** text field. For example: `localhost:80`

9 Enter **“SilverMaster50”** for the Database Name.

10 Enter *your* **User Name** and **Password** for accessing the server in question, in the indicated text fields.

11 (Optional) You may elect to use this server profile as a default for all your Composer Projects. To do so, select the checkbox at the bottom of the dialog.

12 Click **OK** to save the Server Profile.

13 Click **Close** on the Profiles dialog.

The server profile you just created will be available from *any* Composer project. It persists across

Deployment xObject

NOTE: The Deployment xObject is supported only in Novell exteNd 5 Enterprise Edition (or Composer Enterprise Edition standalone). If you are using Professional Edition, you will not be able to create Deployment xObjects in Composer and should skip this section. (You can, however, deploy your project manually, using exteNd Director. Consult the Director documentation and/or the Deployment chapter of the *Composer User’s Guide* for more information.)

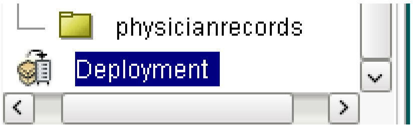
The Deployment xObject is a special type of resource that wrappers deployment-configuration info specific to a particular collection of Composer resources. The Deployment object specifies:

- The particular services to be deployed
- The types of *service triggers* that should be associated with the various services, along with parameters (URLs, Role names, etc.) specific to those triggers
- Any "publishable resources" that should be packaged into the deployment archive (such as WSDL, XSL, Image Resources, and other static resource types that should have archive-wide visibility)
- Any JARs that should be packaged into the deployment archive

It is possible to create more than one Deployment xObject within a given project. But for purposes of this tutorial, we will create just one Deployment xObject.

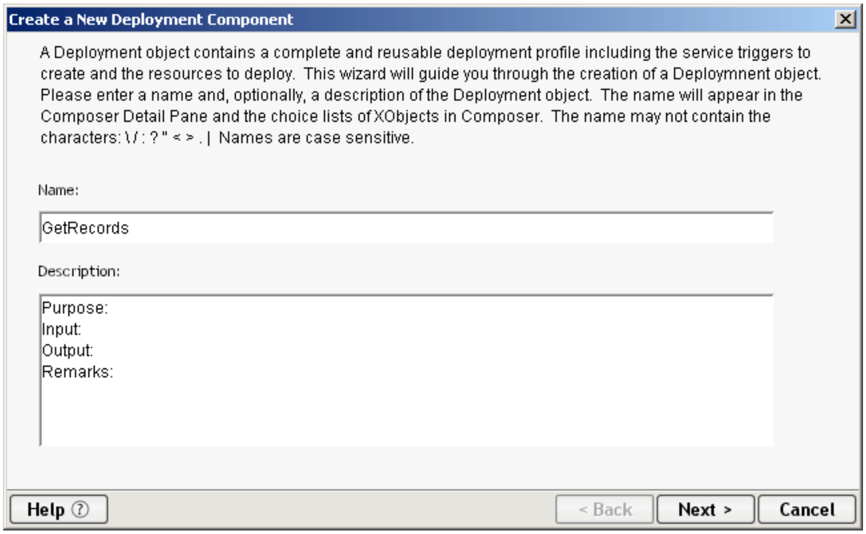
EXERCISE 5-2: Create a Deployment xObject.

1 Select the **Deployment** Category in the Navigation Frame.



2 **RMB>New**.

The Create a new Deployment xObject wizard launches.



A Deployment object contains a complete and reusable deployment profile including the service triggers to create and the resources to deploy. This wizard will guide you through the creation of a Deploymnent object. Please enter a name and, optionally, a description of the Deployment object. The name will appear in the Composer Detail Pane and the choice lists of XObjects in Composer. The name may not contain the characters: \ / : ? " < > . | Names are case sensitive.

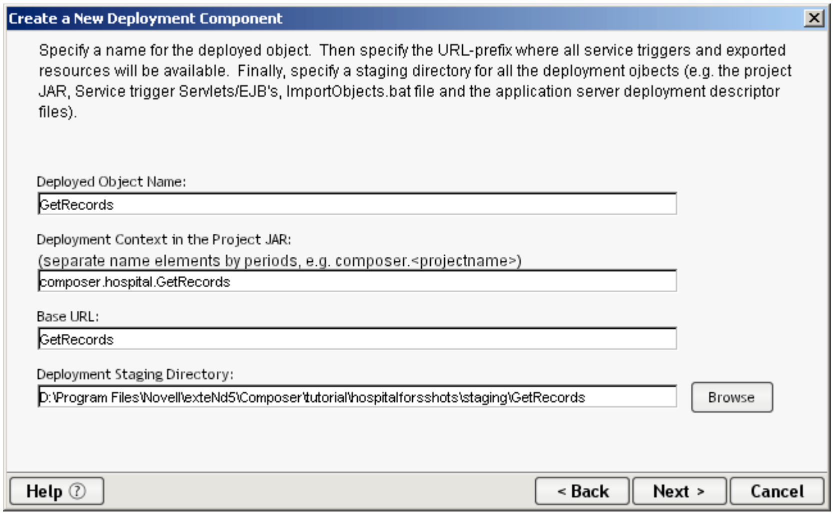
Name: GetRecords

Description:
Purpose:
Input:
Output:
Remarks:

3 Type **GetRecords** in the **Name** text field.

4 (Optional) Enter a description of the object.

5 Click **Next**. A new wizard panel appears.



Create a New Deployment Component

Specify a name for the deployed object. Then specify the URL-prefix where all service triggers and exported resources will be available. Finally, specify a staging directory for all the deployment ojbects (e.g. the project JAR, Service trigger Servlets/EJB's, ImportObjects.bat file and the application server deployment descriptor files).

Deployed Object Name: GetRecords

Deployment Context in the Project JAR:
(separate name elements by periods, e.g. composer.<projectname>)
composer.hospital.GetRecords

Base URL: GetRecords

Deployment Staging Directory: D:\Program Files\Novell\exteNd5\Composer\tutorial\hospitalforsshots\staging\GetRecords

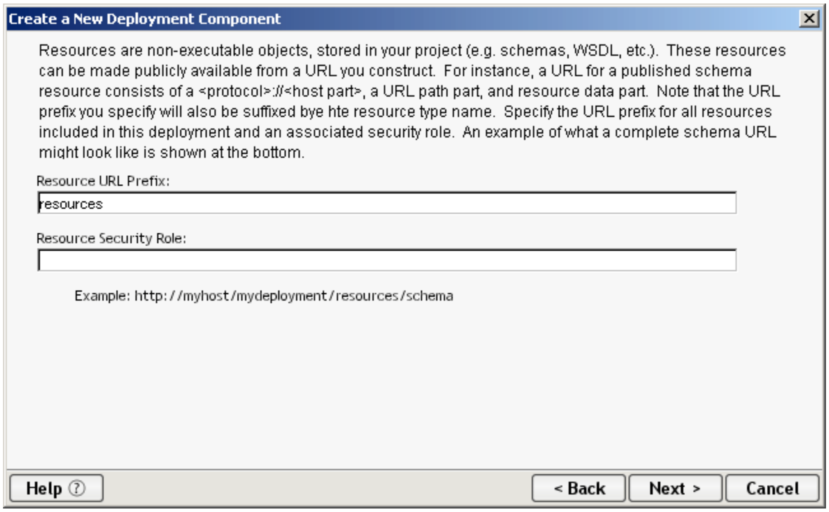
6 You can accept the default values for Deployment Object Name, Deployment Context, Base URL, and Deployment Staging Directory.

- The Deployment Object Name defaults to the project name you specified when you created your project.
- The Context in the JAR is any arbitrary string of names separated by periods, such as, for example,`com.composer.tutorial`.

  NOTE: As a best-practice, Novell recommends that you include the word “composer” in the deployment context of any applications built with Composer, to distinguish them from apps built in Director or other environments.

- The Base URL text field defaults to the Deployment xObject name.
- The staging directory defaults to the one that was specified when your project was originally created.

7 Click **Next**. A new wizard panel appears.



Create a New Deployment Component

Resources are non-executable objects, stored in your project (e.g. schemas, WSDL, etc.). These resources can be made publicly available from a URL you construct. For instance, a URL for a published schema resource consists of a <protocol>://<host part>, a URL path part, and resource data part. Note that the URL prefix you specify will also be suffixed bye hte resource type name. Specify the URL prefix for all resources included in this deployment and an associated security role. An example of what a complete schema URL might look like is shown at the bottom.

Resource URL Prefix: resources

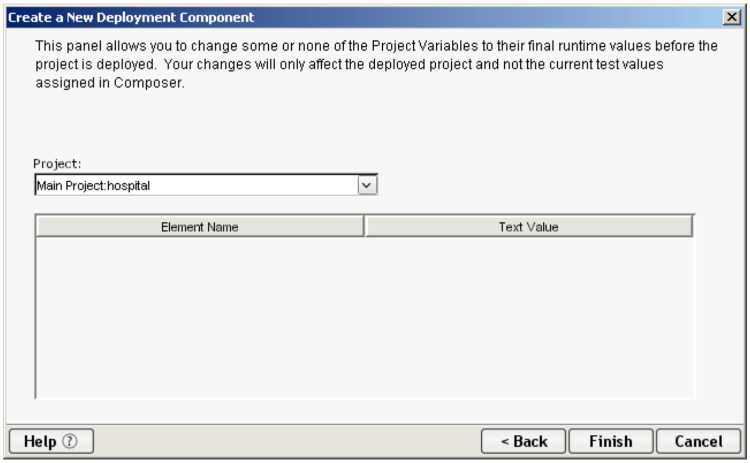
Resource Security Role:

Example: http://myhost/mydeployment/resources/schema

Accept the default URL Prefix for the resources and leave the security role blank.

- The Resource URL Prefix defines where project resource files will be stored within the **EAR** file.
- The Security Role defines the access privileges for the project resources. For the purpose of the tutorial, you will leave the resource files fully accessible.

8 Click **Next**. A new panel appears.



Create a New Deployment Component

This panel allows you to change some or none of the Project Variables to their final runtime values before the project is deployed. Your changes will only affect the deployed project and not the current test values assigned in Composer.

Project: Main Project:hospital

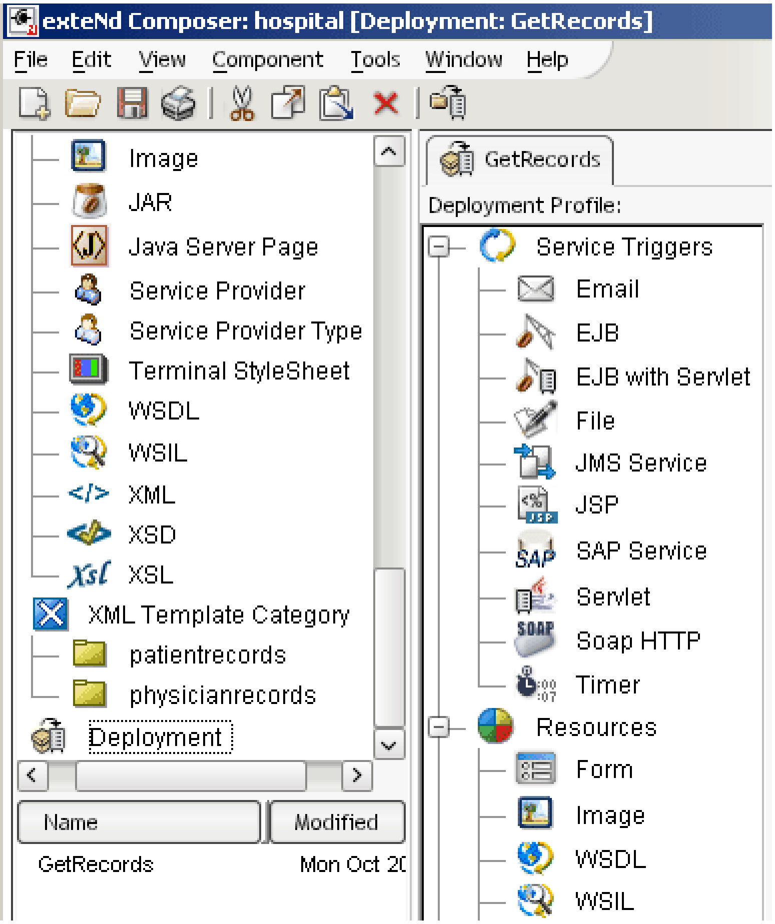
Element Name	Text Value

Your project’s name appears in the Project dropdown list.

The purpose of this panel is to allow you to change the names or values of any Project Variables that you might want to change before deployment. (Project Variables might contain values that are relevant to a test environment but not to a production environment, or vice versa.) The tutorial project doesn’t use any Project Variables, at this point, so it’s safe to just ignore this panel for now.

9 Click **Finish** to complete creation of the Deployment xObject. You should see a new Deployment Object name show up in the instance pane of the explorer frame.

The Deployment xObject should appear in its own tree-view (to the right of Composer's regular explorer frame) as shown in the screenshot below. If it does not, find the Deployment category in the regular explorer frame, and in the instance area, double-click the name of your deployment object.



Name	Modified
GetRecords	Mon Oct 2(

10 To save your work, select **File>Save** from the menubar, or click the diskette icon in the main toolbar.

Service Triggers

When planning the design of a web service, you should have a clear idea of the method by which the service will be triggered, and the parameters (or messages) that will need to be passed to the service. Composer can create many types of service triggers for you (and associate them with URLs that you specify). You can also create your own custom service trigger classes, if you wish. An in-depth discussion of service triggers is outside the scope of this tutorial, but if you want to learn more, please refer to the *Novell exteNd Composer User's Guide* in the chapter on deployment; and also see the separate *Composer Enterprise Server User's Guide* for code-level discussions of trigger objects.

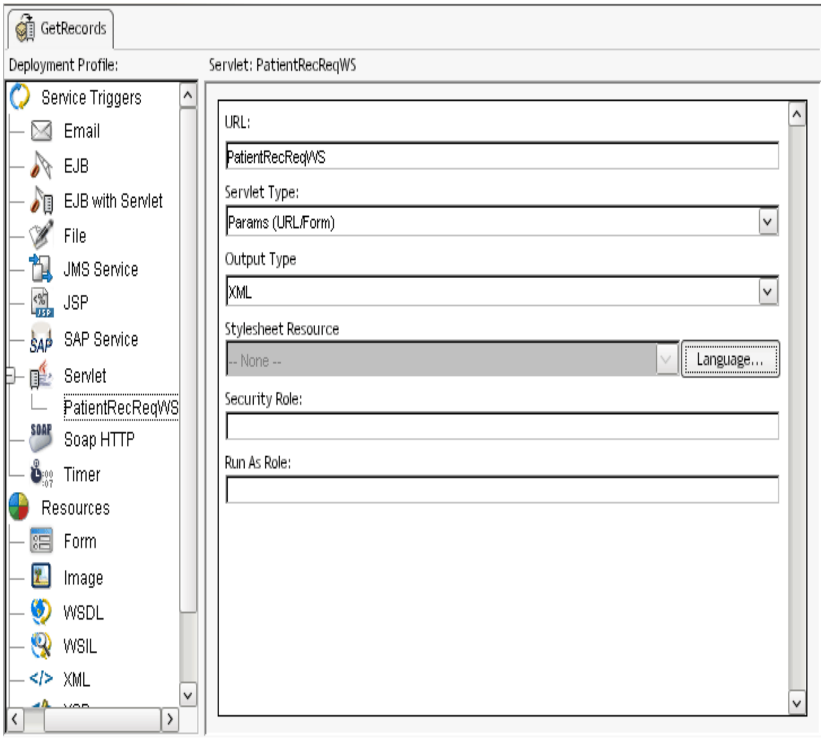
The following procedure leads you through the creation of JSP and servlet trigger types for the services contained in the tutorial project.

EXERCISE 5-3: Set up the Service Trigger(s) for your Web Service

The first method you will use to trigger your service is a servlet of the type Params(URL/Forms).

1. Expand the **Service Triggers** node in the **Deployment Profile** tree, if it is not already expanded.
2. Select **Web Service** at the top of Composer's main explorer tree.
3. Select "**PatientRecReqWS"** from the instance pane.
4. Drag **PatientRecReqWS** to the Deployment Profile pane and drop it on the Servlet icon under Service Triggers.

   "**PatientRecReqWS**" appears as a node under the Servlet branch, and the Servlet Properties sheet is displayed in the editor pane (what would normally be the Native Environment Pane). See below.



Servlet: PatientRecReqWS

URL: PatientRecReqWS

Servlet Type: Params (URL/Form)

Output Type: XML

Stylesheet Resource: -- None --

Security Role:

Run As Role:

5 In the property-sheet pane, enter a **URL** string representing the final piece of the URL (after the final forward slash) that will trigger this servlet.

6 Select **Params (URL/Form)** for the Servlet Type in the dropdown list.

7 Select **XML** as the **Output Type** from the dropdown list.

8 There is no **Stylesheet Resource** associated with this web service, so skip this control.

9 Likewise, for purposes of the tutorial, you will leave the **Security Role** and **Run As Role** fields blank. These fields have the following effect:

- The Security Role defines the access privileges for the service. (Roles are a J2EE 1.3 security construct and are implemented by the server; not by Composer.)
- The Run As Role defines the access privileges that PatientRecReqWS has to invoke other services.

10 Select **File>Save** from the menu.

EXERCISE 5-4: Import the MySQL JAR resource file.

IMPORTANT: Skip this procedure if you are deploying to the Novell exteNd App Server. This task is required only if you are deploying to another vendor's server. If you are deploying to the Novell exteNd Application Server, skip to exercise 5-5 and continue.

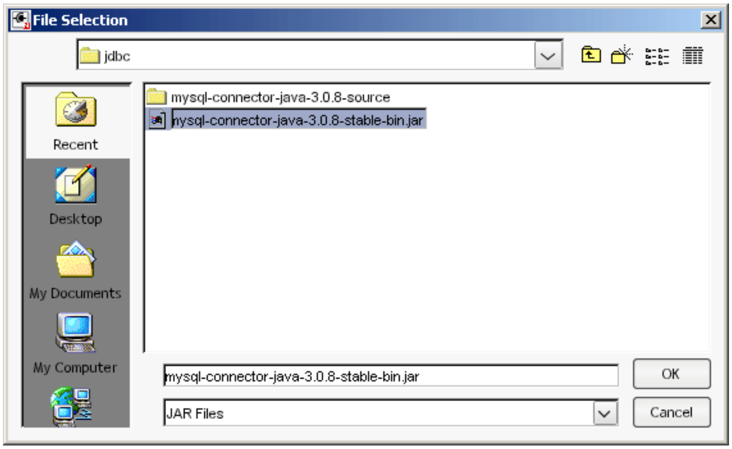
1 Select the **JAR** in the Resource section of the Category Pane.

2 **RMB>NEW.**

3 Click the **Browse** button on the Create a New Jar Resource wizard panel.

4 Navigate to the **..\MySQL\jdbc** directory under the location where you installed the exteNd Suite.

5 Double click on the file **mysql-connector-java-3.0.8-stable-bin.jar** to select it.



File Selection

jdbc

mysql-connector-java-3.0.8-source

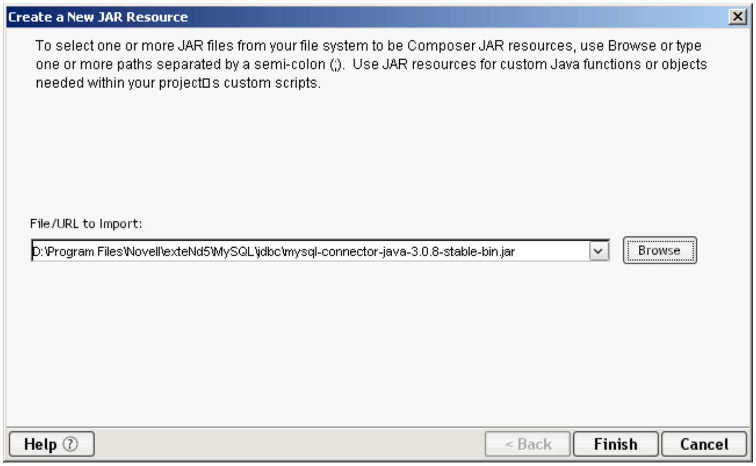
mysql-connector-java-3.0.8-stable-bin.jar

mysql-connector-java-3.0.8-stable-bin.jar

JAR Files

6 Click **OK.**

The file name is added to the file/URL to import text window of the wizard panel.



Create a New JAR Resource

To select one or more JAR files from your file system to be Composer JAR resources, use Browse or type one or more paths separated by a semi-colon (;). Use JAR resources for custom Java functions or objects needed within your project□s custom scripts.

File/URL to Import:

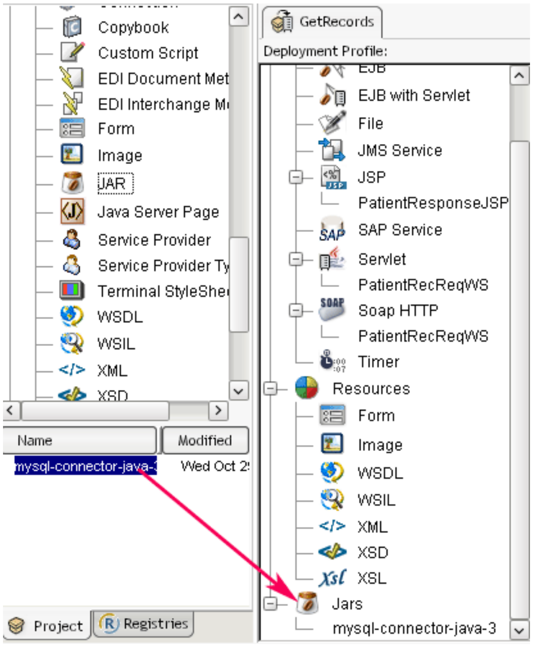
D:\Program Files\Novell\exteNd5\MySQL\jdbc\mysql-connector-java-3.0.8-stable-bin.jar

7 Click **Finish**.

The MySQL jar file is added to the Instance pane and opens in the component editor.

8 Double click the **GetRecords** tab in the component editor.

9 Drag the **mysql-connector-java-3** JAR resource from the Instance pane and drop it on the Jars element of the Resources tree in the Deployment Profile.



10 Select **File>Save** from the menu.

NOTE: The tutorial was written for deployment on the Novell exteNd Application Server via Composer Enterprise Edition. If you wish to deploy to a different application server, please refer to the deployment specific documentation for that server type.

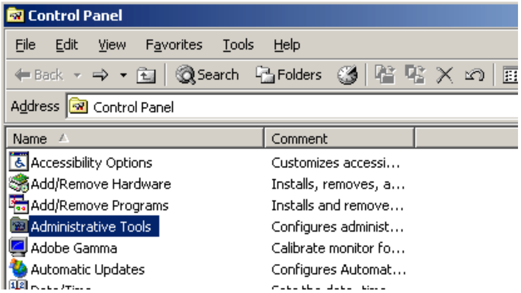
EXERCISE 5-5: Deploying to the Novell exteNd Application Server

Before proceeding, be sure the exteNd Application Server is installed and running, with Composer Enterprise Server also installed and running. (Composer Enterprise Server is the runtime engine that executes and manages Composer-built services in the app-server environment. If you installed the full exteNd 5 Professional or Enterprise Edition Suite, you already have Composer Enterprise Server.) The server must also have access to the MySQL database. These instructions assume the database and app server are installed on your local machine.

Start the MySQL service.

1 The exteNd Suite installs MySQL as a service on your local machine. Check to be sure that the service has started on your system. From the Windows Start menu, select **Start>Settings>Control Panel** to open the Control Panel Window.

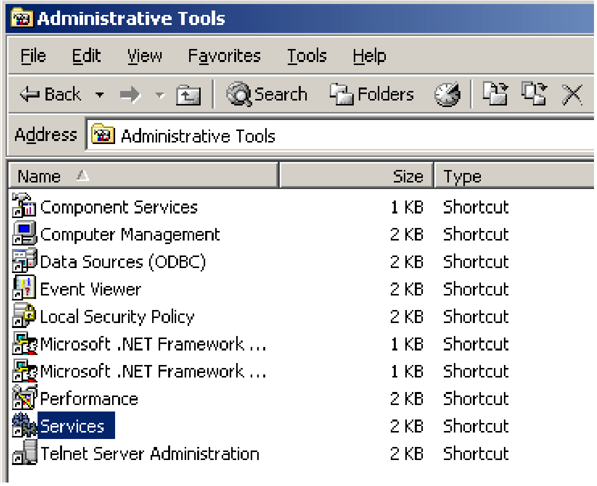
NOTE: The tutorial is based on a Windows 2000 OS. Access to your services window may be different, dependent on your operating system.



Address: Control Panel

Name	Comment
Accessibility Options	Customizes accessi...
Add/Remove Hardware	Installs, removes, a...
Add/Remove Programs	Installs and remove...
Administrative Tools	Configures administ...
Adobe Gamma	Calibrate monitor fo...
Automatic Updates	Configures Automat...

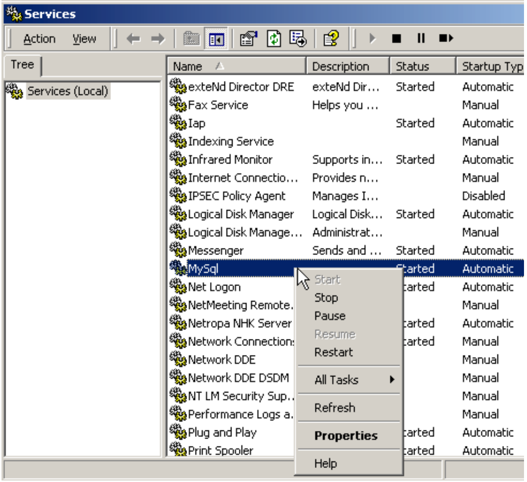
2 Select **Administrative Tools** in the window and double click it to open the Administrative Tools Window.



Name	Size	Type
Component Services	1 KB	Shortcut
Computer Management	2 KB	Shortcut
Data Sources (ODBC)	2 KB	Shortcut
Event Viewer	2 KB	Shortcut
Local Security Policy	2 KB	Shortcut
Microsoft .NET Framework ...	1 KB	Shortcut
Microsoft .NET Framework ...	1 KB	Shortcut
Performance	2 KB	Shortcut
Services	2 KB	Shortcut
Telnet Server Administration	2 KB	Shortcut

3 Select **Services** in the window and double click to open the Services Window.

4 In the Services window locate the **MySQL** service, and note the **status** of the service. It should read **Started**.



Name	Description	Status	Startup Typ
exteNd Director DRE	exteNd Dir...	Started	Automatic
Fax Service	Helps you ...		Manual
Iap		Started	Automatic
Indexing Service			Manual
Infrared Monitor	Supports in...	Started	Automatic
Internet Connectio...	Provides n...		Manual
IPSEC Policy Agent	Manages I...		Disabled
Logical Disk Manager	Logical Disk...	Started	Automatic
Logical Disk Manage...	Administrat...		Manual
Messenger	Sends and ...	Started	Automatic
MySql		tarted	Automatic
Net Logon		tarted	Automatic
NetMeeting Remote.			Manual
Netropa NHK Server		tarted	Automatic
Network Connection:		tarted	Manual
Network DDE			Manual
Network DDE DSDM			Manual
NT LM Security Sup..			Manual
Performance Logs a.			Manual
Plug and Play		tarted	Automatic
Print Spooler		tarted	Automatic

5 If the MySQL service is stopped, start it by **RMB** on the MySQL service and selecting **Start** from the pop-up menu.

Start the Novell ExteNd Application Server

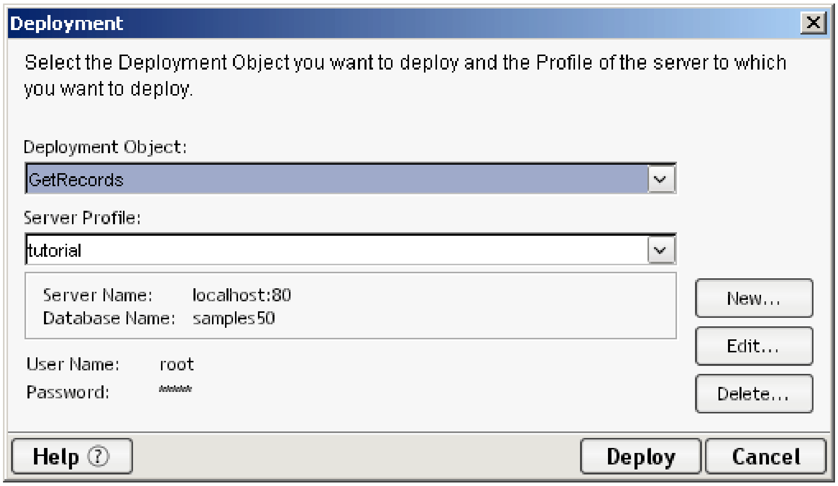
1 If the application server is not running on your system, start the server by selecting **Start>Programs>Novell exteNd 5.0>AppServer >Application Server** from the Windows Start Menu.

Deploy to the Novell exteNd Application Server

1 Select **Deployment** in the Category Pane.

2 Select the **GetRecords** deployment component in the Instance pane.

3 From the exteNd Composer menu, Select **File>Deploy**. The Deployment dialog appears.



Select the Deployment Object you want to deploy and the Profile of the server to which you want to deploy.

Deployment Object: GetRecords

Server Profile: tutorial

Server Name: localhost:80
Database Name: samples50

User Name: root
Password: *****

The “GetRecords” deployment object is listed in the **Deployment Object** dropdown list.

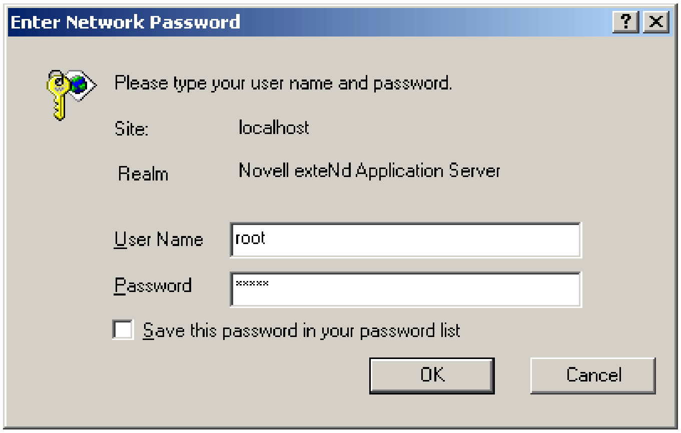
4 Select your server profile from the **Profile Name** dropdown list.

5 Click **Deploy**.

Composer will do a deployment validation to ensure that all required entries have been filled out in the properties sheet. If anything is missing, an entry will be made in the Todo list tab of the Message frame.

If your deployment is valid, your browser will launch. When the browser launches it will prompt you for the user name and password.

6 Enter the **user name** and **password** that you selected when you installed the Novell exteNd Suite application server. The password will appear as asterisks.



Please type your user name and password.

Site: localhost

Realm Novell exteNd Application Server

User Name root

Password *****

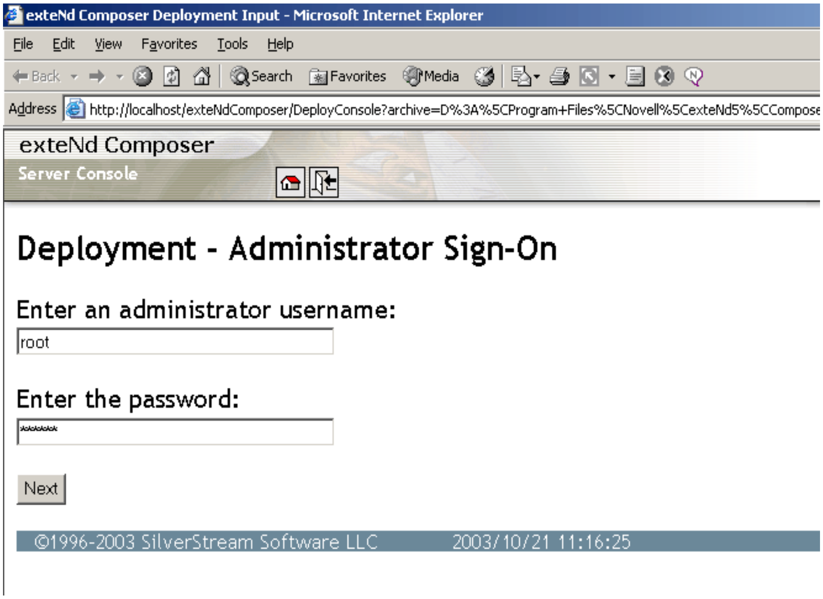
□ Save this password in your password list

7 Click **OK.**

The browser opens and the administration sign-on page appears.

8 Enter your **user name** and **password** if the fields are not already populated for you.

9 Click the **Next** button.


exteNd Composer Deployment Input - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address
exteNd Composer
Server Console
Next

http://localhost/exteNdComposer/DeployConsole?archive=D%3A%5CProgram+Files%5CNovell%5CexteNd5%5CCompose

Deployment - Administrator Sign-On

Enter an administrator username:

root

Enter the password:

******

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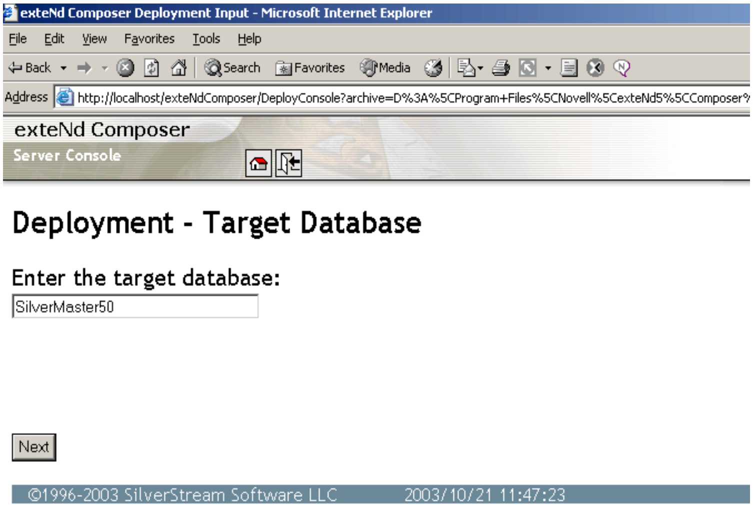
10 Enter **SilverMaster50** as the target database.



exteNd Composer Deployment Input - Microsoft Internet Explorer

http://localhost/exteNdComposer/DeployConsole?archive=D%3A%5CProgram+Files%5CNovell%5CexteNd5%5CComposer%

exteNd Composer

Server Console

Deployment - Target Database

Enter the target database:

SilverMaster50

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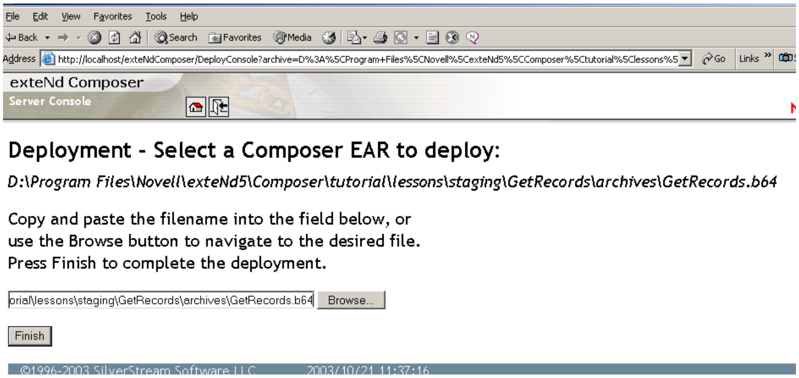
11 Click **Next**.

12 Follow the directions on the browser page. Namely: Cut and paste the fully qualified jar-file pathname into the text field. (In Windows, *triple-click* the pathname to select all of it at once.)



http://localhost/exteNdComposer/DeployConsole?archive=D%3A%5CProgram+Files%5CNovell%5CexteNd5%5CComposer%5Ctutorial%5Clessons%5

exteNd Composer

Server Console

Deployment - Select a Composer EAR to deploy:

D:\Program Files\Novell\exteNd5\Composer\tutorial\lessons\staging\GetRecords\archives\GetRecords.b64

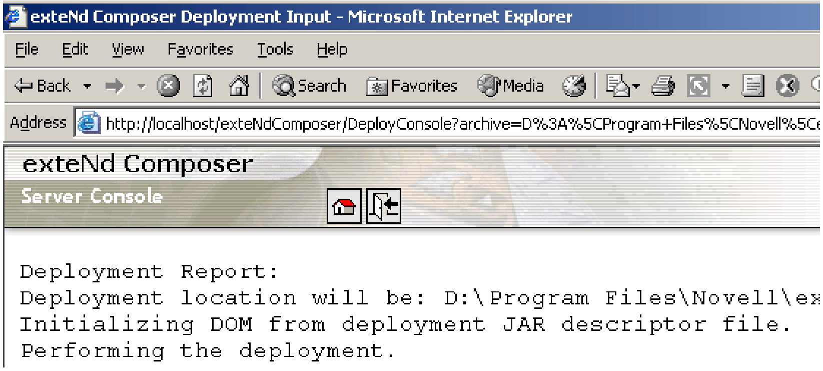
Copy and paste the filename into the field below, or
use the Browse button to navigate to the desired file.
Press Finish to complete the deployment.

orial\lessons\staging\GetRecords\archives\GetRecords.b64

©1996-2003 SilverStream Software LLC 2003/10/21 11:37:16

13 Click **Finish**.

14 When the deployment is complete the server will issue a deployment report.



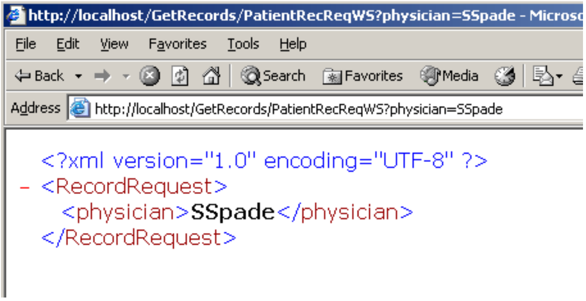
exteNd Composer Deployment Input - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
exteNd Composer
Server Console

Address http://localhost/exteNdComposer/DeployConsole?archive=D%3A%5CProgram+Files%5CNovell%5Ce

```
Deployment Report:
Deployment location will be: D:\Program Files\Novell\ex
Initializing DOM from deployment JAR descriptor file.
Performing the deployment.
```

15 Enter **http://localhost/GetRecords/PatientRecReqWS?physician=SSpade** in your browser address.

The service will run and display the XML file with SSpade in the physician element.



http://localhost/GetRecords/PatientRecReqWS?physician=SSpade - Microsc
File Edit View Favorites Tools Help
Back Search Favorites Media

Address http://localhost/GetRecords/PatientRecReqWS?physician=SSpade

```
  <?xml version="1.0" encoding="UTF-8" ?>
- <RecordRequest>
    <physician>SSpade</physician>
  </RecordRequest>
```

.Summary of what you’ve done

You have accomplished the following tasks:

- Learned about deployment of Web Services in Composer
- Created a Server Profile
- Created a Deployment xObject
- Set up a Service Trigger for your Web Service
- Deployed your Web Service

Next lesson

In the next lesson you will learn about Connections.

6 JDBC and LDAP

What you will learn

Lesson 6 introduces you to the JDBC and LDAP Connections, and their corresponding components.

You will learn how to create connection resources, and components that use those connections:

- Composer Connection Resources and Connection Components
- JDBC Connection
- JDBC Component
- LDAP Connection
- LDAP Component

What you will do

You will perform the following exercises:

- Create a JDBC Connection
- Create a JDBC Component
- Access a Database using the JDBC Component
- Check for an active LDAP directory connection.
- Start the Novell exteNd LDAP Utility
- Create an LDAP Connection
- Create an LDAP Component
- Access a directory using the LDAP component

How long will it take? About 30 minutes

Composer Connection Resources and Connection Components

Composer uses connections to interface with databases, directories, and legacy data systems. The Connection Component contains information about drivers, time-outs, transport protocols, and any necessary parameters, specific to the establishment of a connection with the data source. Since Connections are specific to their data source, they are created for each data source that a Composer project accesses.

Connection Components in Composer allow legacy systems to become “XML aware.” That is, they provide a mechanism for the data in the system to be brought into a Composer application as XML. This allows the Composer application to operate on the data, and in turn, output it to another system. The reverse is also true. Composer can take an XML input from a source, and update the legacy system via the Connection Component.

The tutorial will be using the JDBC and LDAP Connectors. You may have other, connectors in your Composer installation, i.e. 3270. Each connector has its own user guide to help you understand its function.

JDBC Connection

JDBC is the JAVA-API for database connectivity. JDBC contains the classes and interfaces needed to establish database connections, execute SQL statements within a database, and process the result sets returned by the database.

The Composer JDBC Connection provides connectivity to JDBC-accessible data stores. This connectivity is established utilizing a JDBC driver. A wide variety of database vendors supply JDBC drivers for their databases, enabling you to create connections to those databases within a Composer application.

EXERCISE 6-1: Create a JDBC Connection

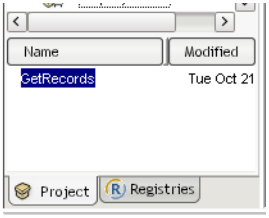
The tutorial uses the MySQL database that is packaged with Composer, however Composer supports any database that provides a JDBC driver.

1. If Composer is not running on your system, launch Composer as described in Exercise 1-1.

   When Composer launches, it will open the last project you worked with in the application.

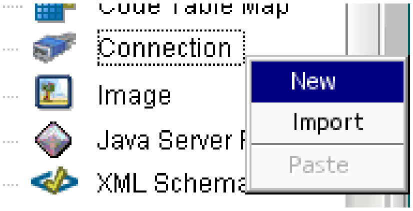
2 Check the title bar to ensure you that the project listed is “hospital”. If not, open the “hospital” project by selecting **File>Recent** from the menu. You will see a list of the most recently accessed projects. Select “hospital” from the list.

3 Select the Project Tab in the Navigation Frame.



4 In the Category pane, under Resource highlight **Connection**.

5 **RMB** (Right Mouse Button).



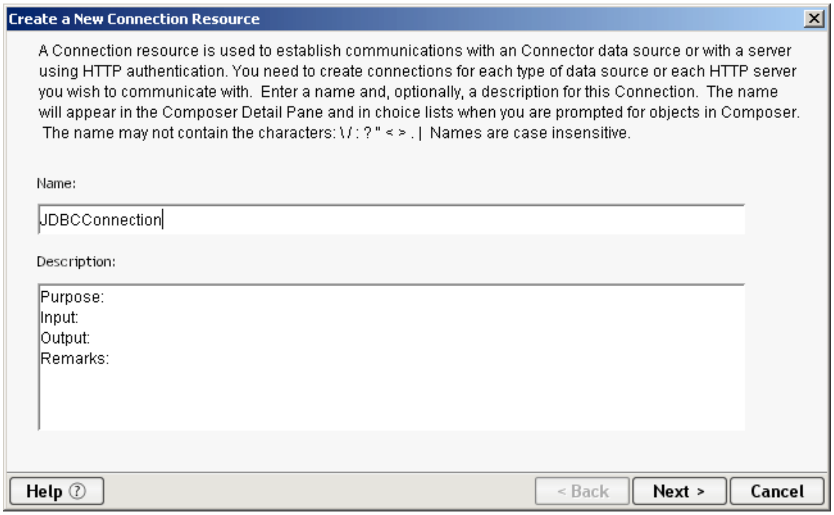
6 Select **New**.

7 The Create a New Connection Resource Wizard will appear.

8 Type **JDBCConnection** in the Name text field.

9 (Optional) Enter text in the Description fields.

Your wizard should look similar to the one depicted below.



Create a New Connection Resource

A Connection resource is used to establish communications with an Connector data source or with a server using HTTP authentication. You need to create connections for each type of data source or each HTTP server you wish to communicate with. Enter a name and, optionally, a description for this Connection. The name will appear in the Composer Detail Pane and in choice lists when you are prompted for objects in Composer. The name may not contain the characters: \ / : ? " < > . | Names are case insensitive.

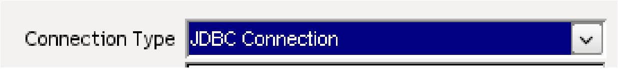
Name: JDBCConnection

Description:
Purpose:
Input:
Output:
Remarks:

10 Click **Next**.

11 The Select Connection panel appears.

- Select **JDBC Connection** from the Connection Type dropdown list.



Connection Type: JDBC Connection

- Type **com.mysql.jdbc.Driver** into the JDBC Driver text field. This is the driver for the MySQL database that ships with Composer.
- Type **jdbc:mysql://localhost:63306/samples50** into the JDBC URL field.

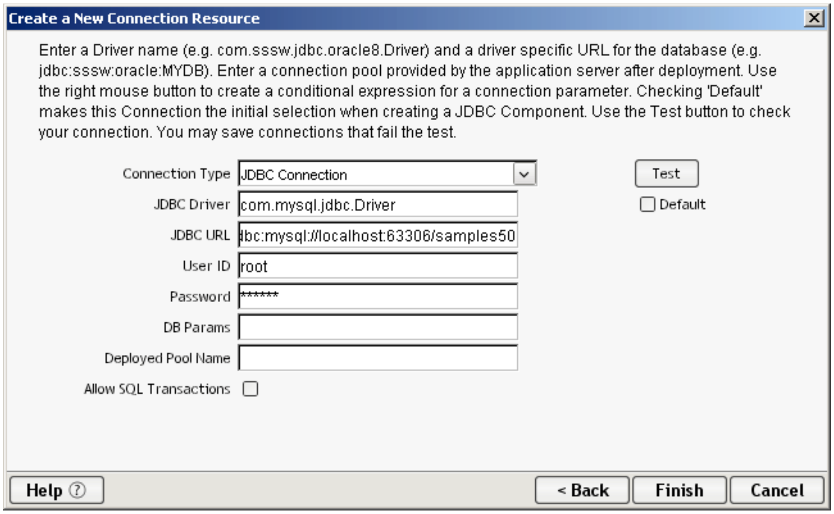
The JDBC Driver text field contains the context where the database driver is packaged in your Composer project.

The JDBC URL is the location on your Novell exteNd Application Server where the MySQL samples50 database can be found.

- Type **your user name** into the User ID field.
- Type **your password** into the Password field, note the password will appear as asterisks.

NOTE: These are the user name and password you entered for the database, when you installed the exteNd Suite.

- Leave the remaining fields blank and the “Allow SQL Transactions” checkbox un-checked.



Create a New Connection Resource

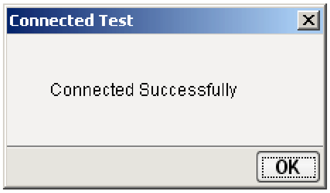
Enter a Driver name (e.g. com.sssw.jdbc.oracle8.Driver) and a driver specific URL for the database (e.g. jdbc:sssw:oracle:MYDB). Enter a connection pool provided by the application server after deployment. Use the right mouse button to create a conditional expression for a connection parameter. Checking 'Default' makes this Connection the initial selection when creating a JDBC Component. Use the Test button to check your connection. You may save connections that fail the test.

Connection Type	JDBC Connection
JDBC Driver	com.mysql.jdbc.Driver
JDBC URL	dbc:mysql://localhost:63306/samples50
User ID	root
Password	******
DB Params	
Deployed Pool Name	
Allow SQL Transactions	□

12 Click **Test**.

You should see a "**Connected Successfully**" dialog.

13 Click **OK**.



Connected Test

Connected Successfully

14 Click **Finish**, your connection is added to the Instance pane.

JDBC Component

A JDBC Component in Composer uses a JDBC connection component to interact with a database. The component is similar to the XML Map Component, and can map, transform, and transfer data between XML Parts. The JDBC Component, can also create and execute SQL statements. The component interprets database result sets, converting them to XML. In addition, the component can make use of all available Composer actions to operate on the data it receives.

EXERCISE 6-2: Create a JDBC Component

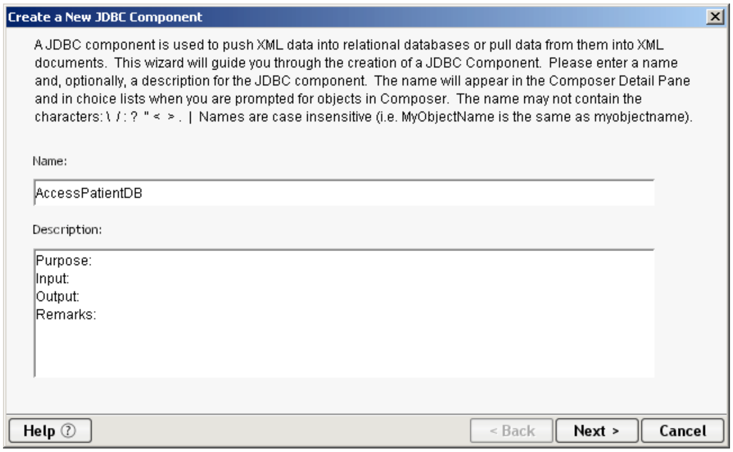
The JDBC Component you create will utilize the PatientRecReq XML template. The template contains the name of the physician, whose patients you want to retrieve from the database. Creating this component will fulfill the third requirement of your service; retrieve the patient data for the given physician.

1 In the Category pane under Components highlight **JDBC**.

2 **RMB**>**New**.

3 The Create a New JDBC Component Wizard appears.

4 Type **AccessPatientDB** in the Name text field.



Create a New JDBC Component

A JDBC component is used to push XML data into relational databases or pull data from them into XML documents. This wizard will guide you through the creation of a JDBC Component. Please enter a name and, optionally, a description for the JDBC component. The name will appear in the Composer Detail Pane and in choice lists when you are prompted for objects in Composer. The name may not contain the characters: \ / : ? " < > . | Names are case insensitive (i.e. MyObjectName is the same as myobjectname).

Name:

AccessPatientDB

Description:

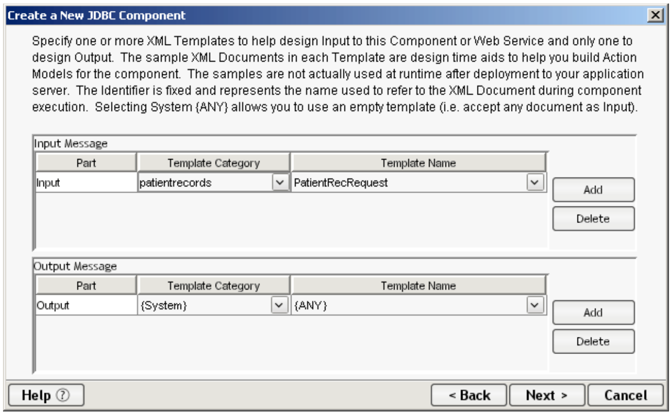
Purpose:
Input:
Output:
Remarks:

5 Click **Next**.

6 Select **patientrecords** from the dropdown menu for the Input Template Category.

7 Select **PatientRecRequest** as the Template Name for the Input Part.

Accept the defaults, System, for the Template Category, and Any, for the Template Name, for the Output Part.



Create a New JDBC Component

Specify one or more XML Templates to help design Input to this Component or Web Service and only one to design Output. The sample XML Documents in each Template are design time aids to help you build Action Models for the component. The samples are not actually used at runtime after deployment to your application server. The Identifier is fixed and represents the name used to refer to the XML Document during component execution. Selecting System {ANY} allows you to use an empty template (i.e. accept any document as Input).

Input Message

Part	Template Category	Template Name
Input	patientrecords	PatientRecRequest

Output Message

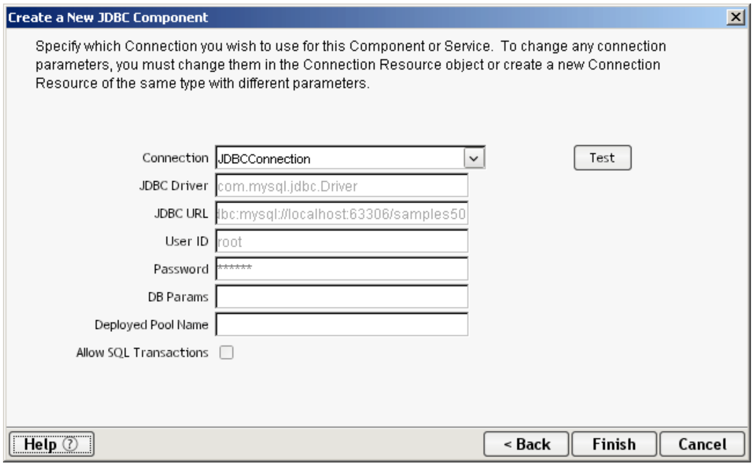
Part	Template Category	Template Name
Output	{System}	{ANY}

8 Click **Next**.

This section of the tutorial does not use Temp or Fault Messages.

9 Click **Next** to bypass this screen.

The wizard defaults to the JDBC Connection you created in the previous exercise.



Create a New JDBC Component

Specify which Connection you wish to use for this Component or Service. To change any connection parameters, you must change them in the Connection Resource object or create a new Connection Resource of the same type with different parameters.

Connection: JDBCConnection

JDBC Driver: com.mysql.jdbc.Driver

JDBC URL: dbc:mysql://localhost:63306/samples50

User ID: root

Password: ******

DB Params:

Deployed Pool Name:

Allow SQL Transactions ☐

10 Click **Finish**.

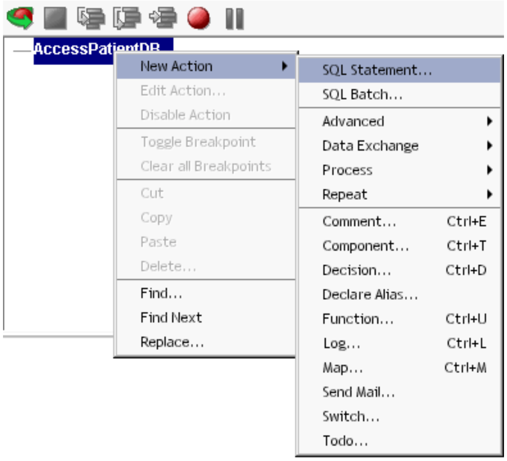
The “AccessPatientDB” component is added to the Instance pane and the JDBC Component Editor opens.

11 Select **File>Save**.

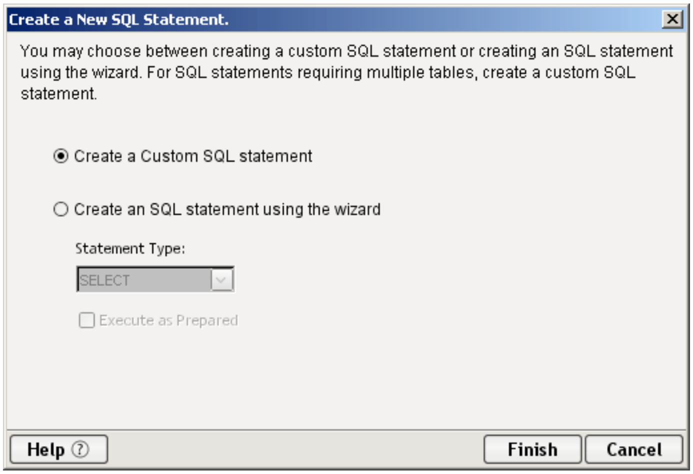
EXERCISE 6-3: Access a Database using the JDBC Component

1 Highlight the **AccessPatientDB** in the Action model.

2 Add a SQL Statement action to the component, **RMB>New Action>SQL Statement**.



3 The Create a New SQL Statement Wizard appears.The SQL Statement wizard aids you in building SQL expressions.



Create a New SQL Statement.

You may choose between creating a custom SQL statement or creating an SQL statement using the wizard. For SQL statements requiring multiple tables, create a custom SQL statement.

● Create a Custom SQL statement

○ Create an SQL statement using the wizard

Statement Type: SELECT

□ Execute as Prepared

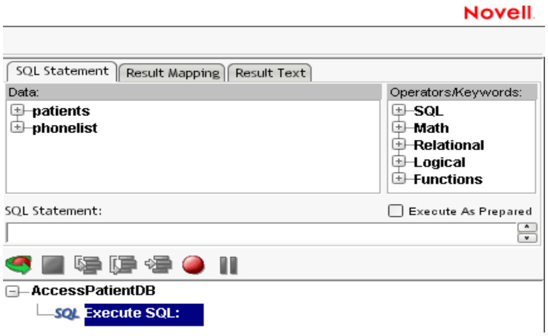
4 Select the **Create a Custom SQL** radio button.

5 Click **Finish**.

The JDBC Native Environment pane opens. Note the three tabs, SQL Statement, Result Mapping and Result Text. The SQL Statement editor is where you will build your SQL statement to query the database.

NOTE: If the editor is not visible hover the cursor over the border between the Native Environment pane and the Action Model. Use the double arrow to pull the editor window into view.

You will be adding a SQL Select statement that will search the database for patients whose physician is listed in the input document.



6 Click the **plus** sign before the **SQL** node in the SQL Operators and Keyword tree to expand the node.

7 Click the **plus** sign before the **Select** node in the SQL Operators and Keyword tree to expand the node.

8 Double-click **SELECT** then *****, then **FROM,** in the Operators and Keywords list tree. Note the phrase “**SELECT * FROM**” is added to the SQL Statement editor.

NOTE: You may have to use the scroll bar on the right side of the list to see all of the operators and keywords available.

9 Double-click the **patients** table in the Data tree, patients is added to the SQL statement.

10 Scroll down in the Operators and Keywords list and double-click on the **WHERE** operator to add it to the statement.

11 Expand the **patients** node in the Data list and double-click on the **physician** element.

12 Scroll down in the Operators and Keywords list to the **Relational** node.

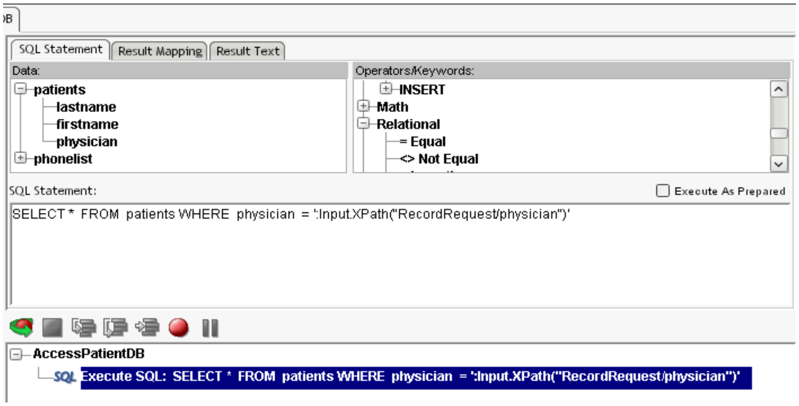
13 Expand the node and double-click on the **= Equal** element.

Your statement should now read “**SELECT * FROM patients WHERE physician** = ”.

14 Click in the **SQL Statement window** at the end of the statement to ensure the cursor is placed ***after*** the equal sign.

15 Highlight the **physician** element in the Input Part.

16 **Drag** the element from the Input physician node, and **Drop** it in the SQL Statement editor.



SELECT * FROM patients WHERE physician = ':Input.XPath("RecordRequest/physician")'

Execute SQL: SELECT * FROM patients WHERE physician = ':Input.XPath("RecordRequest/physician")'

17 Your statement should now read: “**SELECT * FROM patients WHERE physician = ':Input.XPath("RecordRequest/physician")'** “.

NOTE: Composer has created the XPath expression that accesses the data in the Input. When executed, this SQL statement will retrieve all the entries in the patients table whose physician element is equal to the data value in the physician element of the Input document.

You can uses the Result Mapping tab in the Native Environment pane to map the components output.

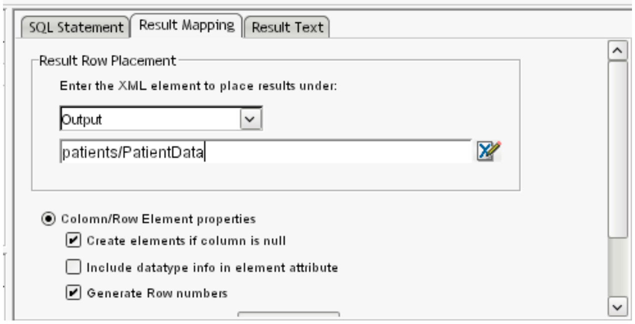
18 Select the **Result Mapping** tab in the Native Environment pane.

19 Delete the text **RESULTINFO/ROW** in the Result Row Placement textbox.

20 Enter **patients/PatientData** in the Result Row Placement textbox.

21 Using the scrollbar, scroll down in the pane to locate the **Generate Row numbers** checkbox.

22 Click the **Generate Row numbers** checkbox.



Result Row Placement

Enter the XML element to place results under:

Output

patients/PatientData

● Colomn/Row Element properties

☑ Create elements if column is null

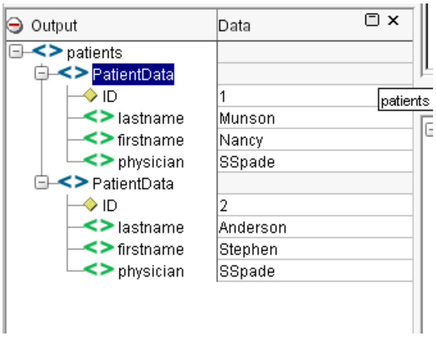
□ Include datatype info in element attribute

☑ Generate Row numbers

23 Select **File>Save** from the menu.

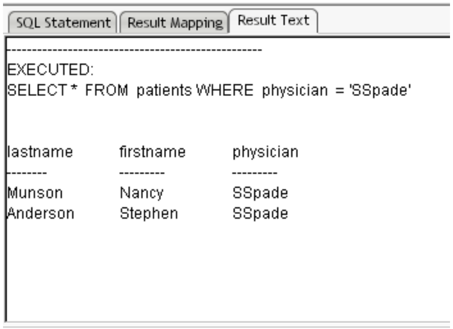
24 Execute the component, select **Component>Execute** from the menu.

25 Expand the **nodes** in the Output Part to examine the data.



Output	Data
patients	
PatientData	
ID	1
lastname	Munson
firstname	Nancy
physician	SSpade
PatientData	
ID	2
lastname	Anderson
firstname	Stephen
physician	SSpade

The Result Text tab shows the exact text that was sent to the database, and the result set prior to being parsed into the Output Part.



```
------------------------------------------------
EXECUTED:
SELECT * FROM patients WHERE physician = 'SSpade'


lastname     firstname     physician
--------     ---------     ---------
Munson       Nancy         SSpade
Anderson     Stephen       SSpade
```

Note that Composer has placed the result set in the component Output part.

LDAP Connection

LDAP (Lightweight Directory Access Protocol) is a specification for accessing information within directories. It defines a standard protocol (much like HTTP) for communicating with *directory servers*.

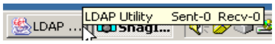
The Composer LDAP Connector allows you to access any directory that supports the LDAP protocol, and query the director using DSML (Directory Services Markup Language), which is a dialect of XML specific to directories. Composer creates and manages DSML documents as it does any other type of XML document. You do not have to write DSML yourself: the LDAP Connector creates DSML-formatted queries for you, based on parameters you set using a point-and-click/drag-and-drop GUI.

📖 For more information on LDAP, please refer to the *Novell exteNd Composer LDAP Connect User's Guide*.

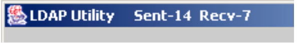
EXERCISE 6-4: Check for an active LDAP directory connection.

A small LDAP directory tree and lightweight directory server (the Novell exteNd LDAP Utility) are included with exteNd Composer. You will be using the test directory in the tutorial. The LDAP Utility must be running on your workstation in order to complete the remaining tutorial lessons.

If the LDAP Utility is running, the Windows OS tray will contain the JAVA icon as pictured below. (The Sent and Recv numbers will vary with your accesses to the directory.)



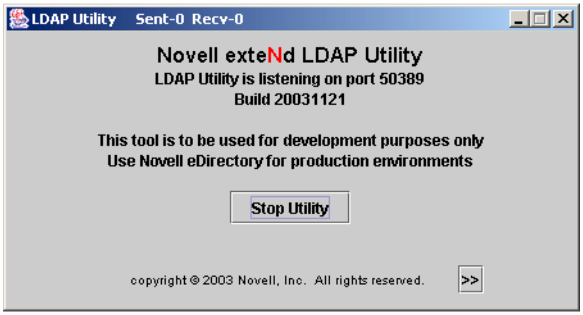
1 Double-click on the icon in the tray. Adialog with the title pictured below appears.



2 If the tool is **not running** on your work station, complete Exercise 6-5. *Otherwise, skip to Exercise 6-6.*

EXERCISE 6-5: Start the Novell exteNd LDAP Utility

1 From the Windows start menu select **Programs>Novell exteNd 5.0>Tools>LDAP Utility** to launch the Evaluation tool. A window appears, as shown below.



LDAP Utility Sent-0 Recv-0

Novell exteNd LDAP Utility

LDAP Utility is listening on port 50389

Build 20031121

This tool is to be used for development purposes only

Use Novell eDirectory for production environments

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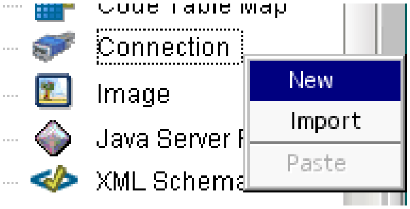
(If need be, you can locate the LDAP Utility in the **\tools** folder under your main exteNd installation directory, and start it from there using the batch file provided.)

IMPORTANT: Be sure the LDAP Utility is listening on port 50389. You can see the current port number in the main window, above the Build Number. (If the port is not 50389, either modify the LDAP Utility's startup batch file and restart the server on that port, or modify your Connection Resource, below, as necessary to utilize the port that you want to use.)

EXERCISE 6-6: Create an LDAP Connection

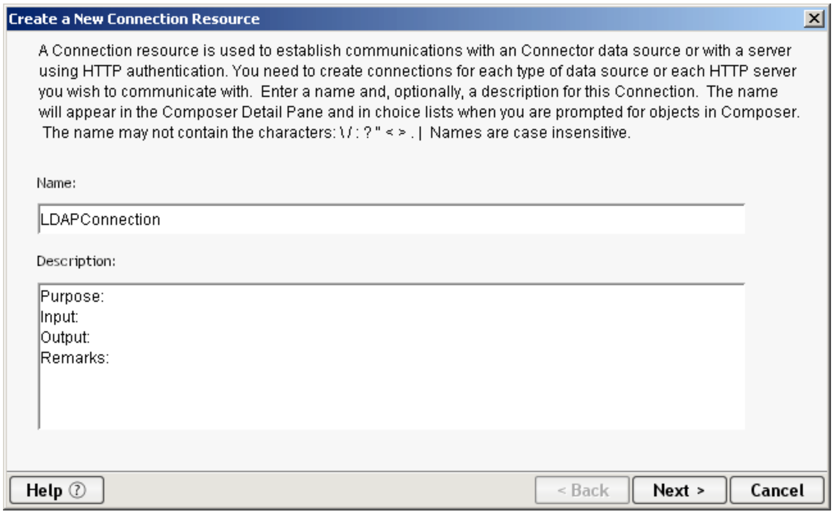
1 In the Category Pane of the Navigation Frame select **Connection**.

2 **RMB>New**.



3 The Create a New Connection Resource Wizard appears.

4 Type **LDAPConnection** in the Name text field.


Create a New Connection Resource

A Connection resource is used to establish communications with an Connector data source or with a server using HTTP authentication. You need to create connections for each type of data source or each HTTP server you wish to communicate with. Enter a name and, optionally, a description for this Connection. The name will appear in the Composer Detail Pane and in choice lists when you are prompted for objects in Composer. The name may not contain the characters: \ / : ? " < > . | Names are case insensitive.

Name: LDAPConnection

Description:
Purpose:
Input:
Output:
Remarks:

5 Click **Next**.

6 Select **LDAP Connection** from the Connection Type dropdown list.

Composer populates the dialog for you, setting the Host or IP Address to localhost, and 389 as the default Port Number.

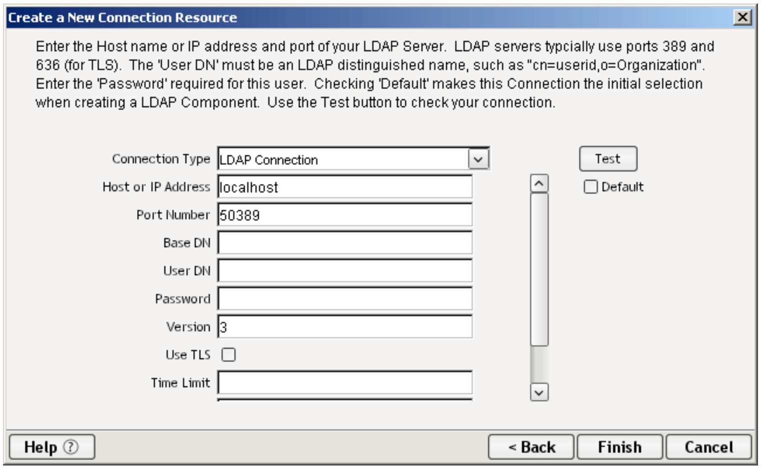
7 Change the **Port Number** to **50389.**

8 You may leave the Base DN, User DN and Password fields blank. Leaving the Base DN blank will enable you to see the entire LDAP directory tree, from the root node within Composer.

A blank UserDN and Password creates an anonymous bind when you connect to the directory.

9 Use the scroll bar to access the Time Limit field, enter **10000** in this field. (This is a millisecond value. It means that if no connection has been established after ten seconds, Composer will stop trying to establish a connection.)

10 Leave the **Size Limit** value at its default of 1000. (This is strictly a design-time value that has to do with limiting the number of tree nodes Composer will try to import for GUI/display purposes.)



Create a New Connection Resource

Enter the Host name or IP address and port of your LDAP Server. LDAP servers typcially use ports 389 and 636 (for TLS). The 'User DN' must be an LDAP distinguished name, such as "cn=userid,o=Organization". Enter the 'Password' required for this user. Checking 'Default' makes this Connection the initial selection when creating a LDAP Component. Use the Test button to check your connection.

Connection Type: LDAP Connection
Host or IP Address: localhost
Port Number: 50389
Base DN:
User DN:
Password:
Version: 3
Use TLS: □
Time Limit:

□ Default

11 Click the **Test** button to check the connection.

You should receive a "**Connected Successfully**"dialog. If not, check to be sure the port number matches that used by the LDAP Utility (see note further above, under Step 1); and be sure the utility is actually running.

12 Click **OK**.

13 Click **Finish**.

The LDAP Connection Resource will appear in the Instance pane in the Navigation Frame.

LDAP Component

The LDAP Component provides communication, via the LDAP Connection Resource, with an LDAP directory server. It supports the full set of Composer actions, allowing you to transform, map and manipulate directory data. In addition, the LDAP Component can create and execute DSML statements. You will typically use Temp documents to store transient DSML query and response info.

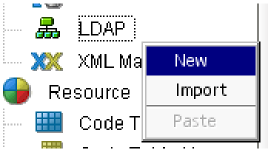
As with XML Map Components, you can use XML Templates to define the structure and mapping of the LDAP Component's Input and Output message parts.

The LDAP Component you create in this exercise will query a directory in order to obtain a given physician's *title*, *e-mail address*, *phone number*, and *hit count*. The hit count indicates the number of directory inquiries that have been made for that particular physician.

EXERCISE 6-7: Create an LDAP Component

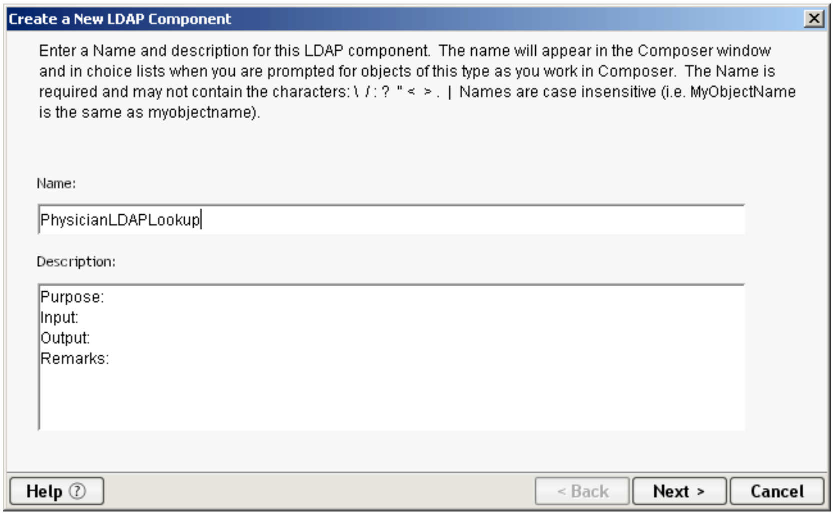
1 In the Category pane under Components, highlight **LDAP**.

2 **RMB**>**New**.



The Create a New LDAP Component Wizard appears.

3 Type **PhysicianLDAPLookup** in the Name text field.



Enter a Name and description for this LDAP component. The name will appear in the Composer window and in choice lists when you are prompted for objects of this type as you work in Composer. The Name is required and may not contain the characters: \ / : ? " < > . | Names are case insensitive (i.e. MyObjectName is the same as myobjectname).

Name:

PhysicianLDAPLookup

Description:

Purpose:
Input:
Output:
Remarks:

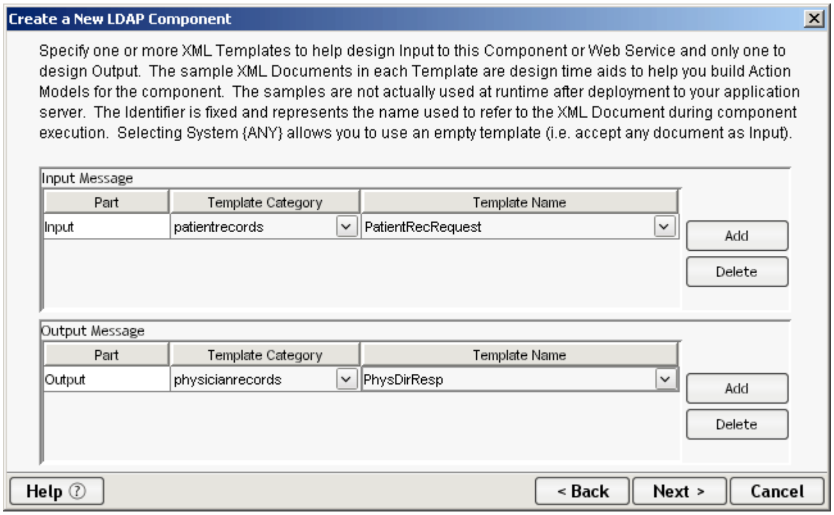
4 Click **Next**.

5 Select **patientrecords** as the Template Category for the Input part from the dropdown list.

6 Select **PatientRecRequest** as the Template Name for the Input part from the dropdown list.

7 Select **physicianrecords** as the Template Category for the Output part from the dropdown list.

8 Select **PhysDirResp** as the Template Name for the Output part from the dropdown list.



Specify one or more XML Templates to help design Input to this Component or Web Service and only one to design Output. The sample XML Documents in each Template are design time aids to help you build Action Models for the component. The samples are not actually used at runtime after deployment to your application server. The Identifier is fixed and represents the name used to refer to the XML Document during component execution. Selecting System {ANY} allows you to use an empty template (i.e. accept any document as Input).

Input Message

Part	Template Category	Template Name
Input	patientrecords	PatientRecRequest

Output Message

Part	Template Category	Template Name
Output	physicianrecords	PhysDirResp

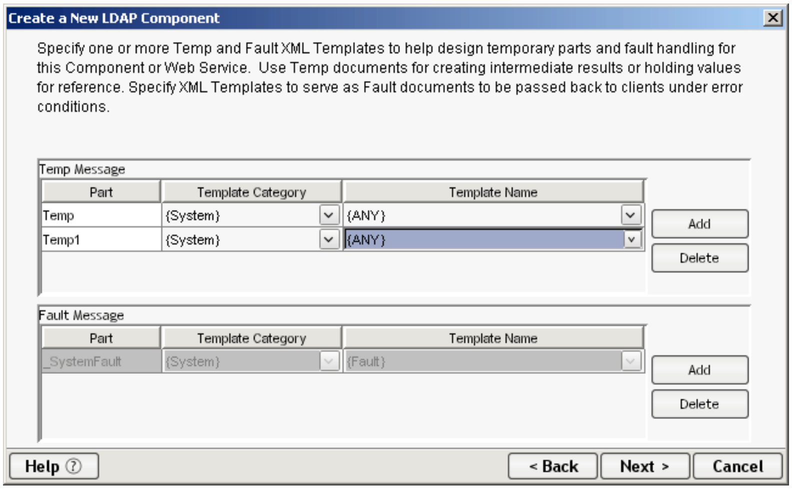
9 Click **Next**.

10 Your LDAP component will be using temp docs for creating DSML requests and responses.

Click the **Add** button twice in the Temp Message portion of the panel.

Two Temp parts are added to the panel, *Temp* and *Temp1*. You may leave the Template Category and Template Name fields at their default values.

You won’t be using Fault docs in this section of the tutorial.



Specify one or more Temp and Fault XML Templates to help design temporary parts and fault handling for this Component or Web Service. Use Temp documents for creating intermediate results or holding values for reference. Specify XML Templates to serve as Fault documents to be passed back to clients under error conditions.

Temp Message

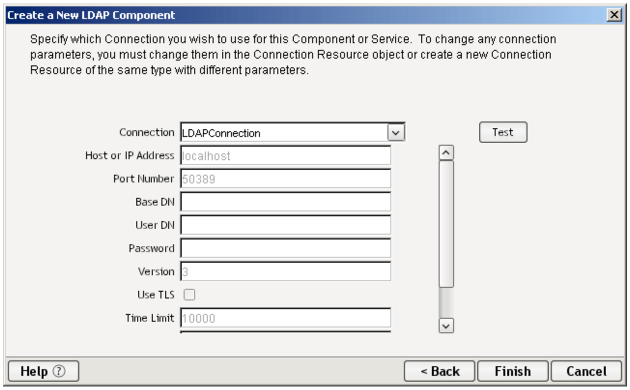
Part	Template Category	Template Name
Temp	{System}	{ANY}
Temp1	{System}	{ANY}

Fault Message

Part	Template Category	Template Name
_SystemFault	{System}	{Fault}

11 Click **Next**.

The wizard defaults to the LDAP Connection you created in the previous exercise.

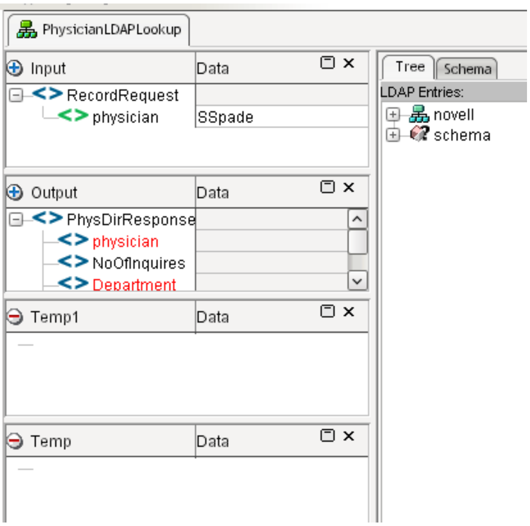

Create a New LDAP Component

Specify which Connection you wish to use for this Component or Service. To change any connection parameters, you must change them in the Connection Resource object or create a new Connection Resource of the same type with different parameters.

Connection: LDAPConnection
Host or IP Address: localhost
Port Number: 50389
Base DN:
User DN:
Password:
Version: 3
Use TLS: □
Time Limit: 10000

12 Click **Finish**.

The LDAP Component is added to the Instance pane of the Navigation Frame, and Composer launches the LDAP Component Editor. Note that there are 4 DOM in the Component, Input, Output, Temp and Temp1.


PhysicianLDAPLookup

Input | Data
RecordRequest |
physician | SSpade

Output | Data
PhysDirResponse
physician
NoOfInquires
Department

Temp1 | Data

Temp | Data

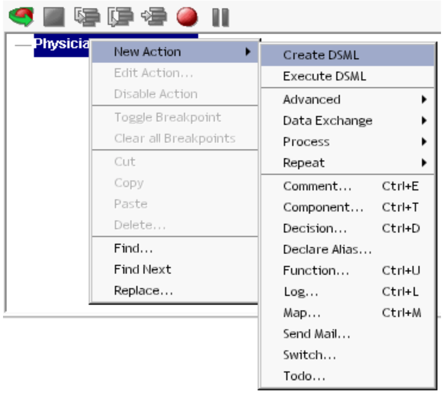
Access a directory using the LDAP component

In this exercise, you will query the LDAP directory. The search will return information from the directory for the physician in the Input DOM. After completing the search, you will either create an initial hit count for this physician, or increment the existing hit count.

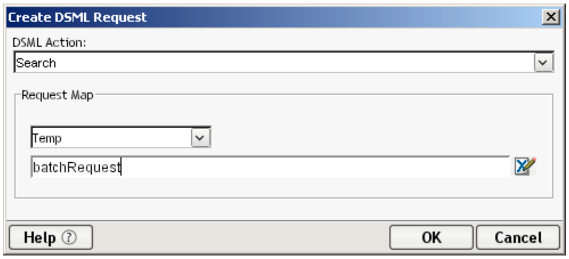
EXERCISE 6-8: Add a Create DSML action to the Action Model

1 Highlight the “**PhysicianLDAPLookup**” component in the Action Model.

2 **RMB>New Action> Create DSML**.



The Create DSML Request dialog appears. The dialog defaults to the Search action.


Create DSML Request

DSML Action: Search

Request Map

Temp

batchRequest

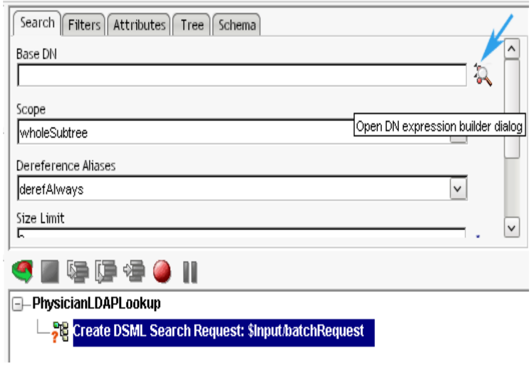
3 Select **Temp** for the Request Map.

4 Click **OK**.

A Create DSML Search Request action is added to the Action Model.

EXERCISE 6-9: Set the Depth of the Directory Search

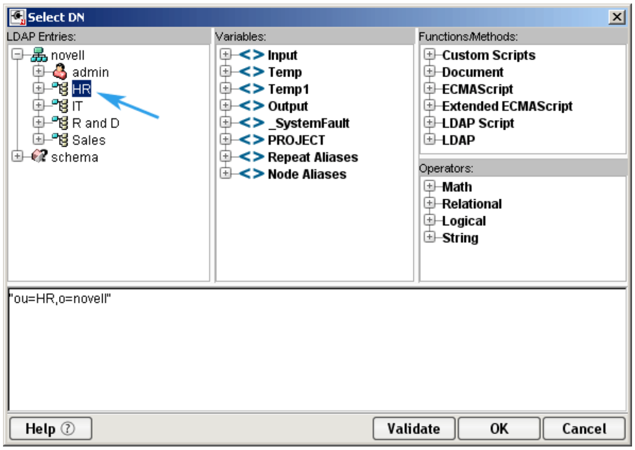
1 In the Native Environment Pane, with the Search Tab forward, click the **DN** button next to the Base DN text field.



The Select DN expression builder opens.

2 Expand the **Novell** node in the LDAP Entries Pane, click on the **plus** sign next to the node to expand it.

3 Double-click on the **HR** node, the expression "ou=HR,o=novell" is added to the dialog’s expression window.



```
"ou=HR,o=novell"
```

4 Click **OK**.

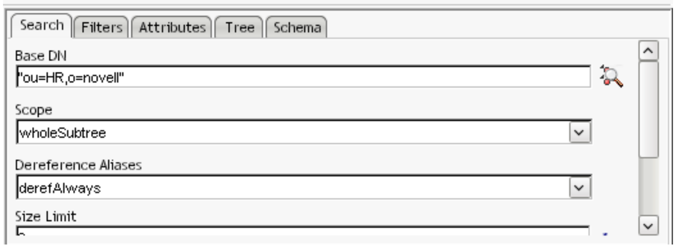
The Base DN field of the Search Tab in the Native Environment pane should now contain the expression you just built surrounded by quotes. This expression indicates that the search of the directory should begin at the “HR” organization unit, under the organization “novell”.

5 Select **wholeSubTree** from the dropdown list for Scope on the Search Tab.

The scope of the search will be the base node, and entire subtree under the Base DN, the HR node and all the nodes under it.

6 Select **derefAlways** from the dropdown list for the Dereference Aliases field. The search will dereference aliases (directory entries that contain a pointer to another entry in the directory) and search both.

Leave the remaining settings at the default values.



Base DN
"ou=HR,o=novell"

Scope
wholeSubtree

Dereference Aliases
derefAlways

Size Limit

EXERCISE 6-10: Create the Filter for the Search

The filters tab helps you build expressions that determine what data is returned by the search. Only the data from directory entries matching the filter specification will be returned.

1 Select the **Filters** tab in the LDAP Native Environment pane.

Accept the default of objectClass in the first dropdown list on the tab.

2 Select “**inetOrgPerson**” from the second dropdown list positioned after the equal sign on the tab.

3 Click the left most **Plus** button on the dialog to add an additional row to the filter.

Note that the relational operator at the end of the first expression changes from End to And.

4 Select “**cn**” from the first dropdown list of the new row.

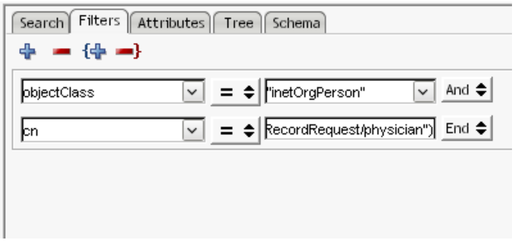
Next you will use drag and drop to create the XPath expression representing the data within the input DOM physician element.

5 Highlight the **physician** node in the Input DOM.

6 Using the mouse drag the **physician** element from the Input DOM and drop it on the second dropdown list of the row you added in the filter tab.

The expression **Input.XPath("RecordRequest/physician")** is added to the dropdown.

The filter you created will return directory items where the objectClass is equal to “inetOrgPerson” and whose “cn” (common name) is equal to the physician element of the input document.



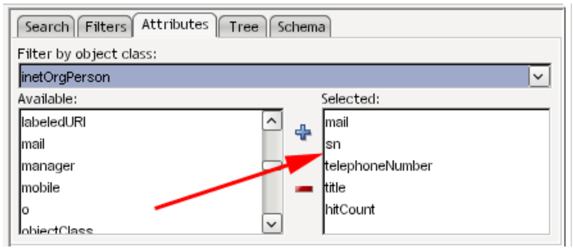
objectClass = "inetOrgPerson" And

cn = RecordRequest/physician") End

EXERCISE 6-11: Select the attributes to be returned by the search

The attributes tab lets you select what fields you would like returned from the directory for the searched object. You will be retrieving the physician's *surname, e-mail address, hitCount, telephone number* and *title* from the directory.

1. Select the **Attributes** tab in the Native Environment Pane
2. Select **inetOrgPerson** from the Filter by object class dropdown list.
3. While holding the control key (Ctrl) down, highlight the following items from the Available scroll list on the tab: **mail, hitCount, sn, telephoneNumber**, and **title**.
4. Click the **Plus** sign between the two windows to copy the objects to the Selected window.



Filter by object class: inetOrgPerson

Available:
labeledURI
mail
manager
mobile
o
objectClass

Selected:
mail
sn
telephoneNumber
title
hitCount

5. Select **File>Save** from the menu to save your work.

   DSML expressions must be created and executed in two steps, next you will add an execute DSML action to the Action Model

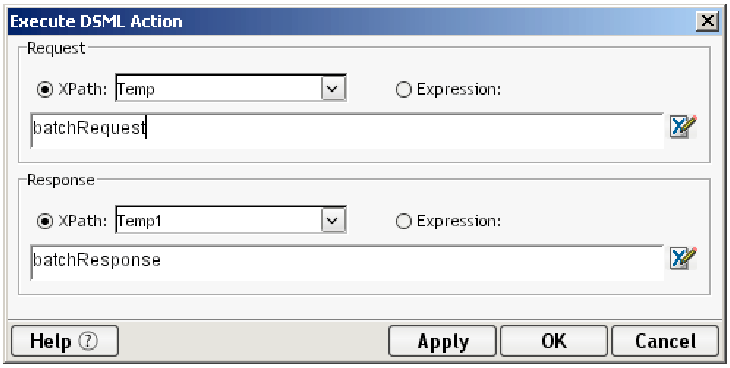
EXERCISE 6-12: Add the Execute DSML action to the Action Model

1. Highlight the "**Create DSML action**".
2. **RMB>New Action>Execute DSML**.

   The Execute DSML Action Dialog appears.
3. Select **Temp** as the Request part.
4. Select **Temp1** as the Response part.

5 Click **OK**.

Leave the remaining values at the default settings supplied by Composer.



Execute DSML Action

Request

● XPath: Temp ○ Expression:

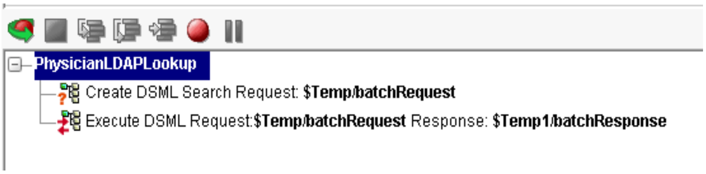
batchRequest

Response

● XPath: Temp1 ○ Expression:

batchResponse

Your action model should look similar to the one portrayed:



PhysicianLDAPLookup

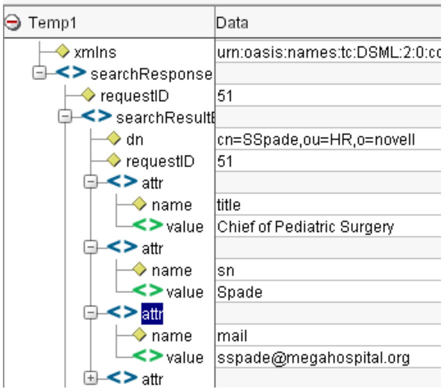
Create DSML Search Request: **$Temp/batchRequest**

Execute DSML Request:**$Temp/batchRequest** Response: **$Temp1/batchResponse**

6 Select **Component>Execute** from the menu to test your LDAP Component.

7 Expand the **searchResponse** node in the Temp1 DOM and explore the information.

You should see data similar to the following screenshot in your Temp1 Part.



Temp1	Data
xmlns	urn:oasis:names:tc:DSML:2:0:c
searchResponse	
requestID	51
searchResult	
dn	cn=SSpade,ou=HR,o=novell
requestID	51
attr	
name	title
value	Chief of Pediatric Surgery
attr	
name	sn
value	Spade
attr	
name	mail
value	sspade@megahospital.org
attr	

8 Select **File>Save** from the menu to save your work.

Summary of what you've done

You have accomplished the following tasks:

- Learned about Composer Connections and Components
- Become familiar with the JDBC Connect and the JDBC Component
- Learned about the LDAP Connect and LDAP Component
- Created a JDBC Connection
- Created a JDBC Component
- Accessed a database using the JDBC Component
- Created an LDAP Connection
- Created an LDAP Component
- Accessed a directory using the LDAP Component

Next lesson

In the next lesson you will add new functionality to the LDAP Component you just built, including a *modify* operation that actually writes to the directory. You'll also see how to map data into and out of DSML queries, check for error conditions, and perform conditional branching.

7 Basic Composer Actions

What you will learn

In Lesson 7 you will become familiar with some of the basic actions available in Composer that will help you accomplish the requirements of your projects. You add the actions to your components and web services that act on the data and elements passed to it in the Input Part, transforming them to the desired Output Part. If you are familiar with programming languages, you will find Actions analogous to the programming constructs found in any modern computer programming language. However, you don't need to be a programmer to use Composer. The most important items to understand when adding actions to your Composer components are the requirements of the component. The tutorial instructs you in some of the most common actions used when creating Composer projects. For information on the remaining actions supported by Composer, please refer to the *Novell exteNd Composer User Guide* and system help.

You will learn about the Composer Action Model and Actions:

- Comment Action
- Function
- XPath and ECMAScript (The Composer Expression Builder)

What you will do

You will perform the following tasks using exteNd Composer:

1. Edit the PhysicianLDAPLookup Component
   - Add a comment to the Action Model.
   - Add a Decision Actions
   - Add Map Actions

- Add Function Actions
- Add a Log Action

2 Edit the PatientLookup XML Map Component

- Add Component Actions
- Add Map Actions

How long will it take? About 30 minutes

Composer Action Model and Actions

Components and Web Services in Composer both use action models to achieve their goals.

In Composer, an Action Model is the set of instructions that a component implements to complete a task. The inputs to the action model are one or more XML Input Parts. The Input Parts may be data from XML documents, or from non-XML sources via Composer Connections, or both. The Component operates on the Input Parts by applying the actions in its Action Model to the data and elements of the Input Parts. The result of the Action Model is the Output Part of the component.

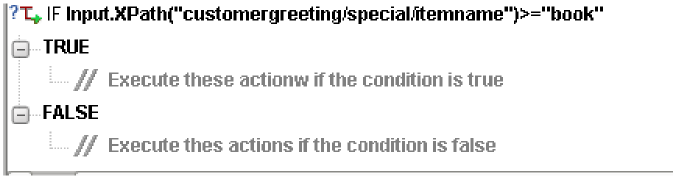
The architecture of Composer allows you to create components that break your project into logical units of work. Each Component performs a specific task needed by your web service or another component. You might have a LDAP Component that reads in data from a directory, another JDBC component that accesses a database, and a third Map Component that combines the output of those components into an XML Output Part, based on a common element in each.

Comment Action

Comment Actions are used to document your Action Models. Comments aid you in remembering what your action model does and are a valuable resource in the maintenance of your projects. Since comments are not executed, they do not add to run-time overhead. You may add comment actions anywhere in the Action Model.

Decision

The Decision statement is one of the conditional actions supported by Composer. It provides you with the ability to choose a course of action based on a provisional statement. When you add a Decision Action to Composer, you specify a condition on which to base the branch in the Action Model. One branch of actions is executed if the condition evaluates to “True”, the other if the evaluation is “False”. Decision actions allow your components to be flexible, and react to different run-time conditions in an appropriate manner.



```
IF Input.XPath("customergreeting/special/itemname")>="book"
TRUE
    // Execute these actionw if the condition is true
FALSE
    // Execute thes actions if the condition is false
```

Log Action

Log actions are designed to provide customized reporting capabilities (design-time as well as runtime) for Composer applications. You can exercise fine control over the degree of reporting desired, by the use of Log Level settings.

Examples of places where Log actions are useful include, writing error information to a file or console, debugging web services and components, capturing cycle specific information in looping constructs, and to track actions, i.e. hits on a URL.

Component

The Component action calls and executes another component or web service in your Composer project. You use Component Actions to process a unit of work in your project. When you call a component, you pass in four parameters, the Component Type, the Component Name, the Input Parts you want the component to process, and the name of the Output Part where you want the component’s output placed when it returns to the calling component. You can use Pre-defined or Dynamic parameters to call the component.

Pre-defined parameters are defined at design time, when you build the Action Model for the calling component.They are static and remain the same each time the component executes.

Dynamic parameters are generated at run-time while the calling component is executing. They vary dependent on the circumstances at the time of the call.

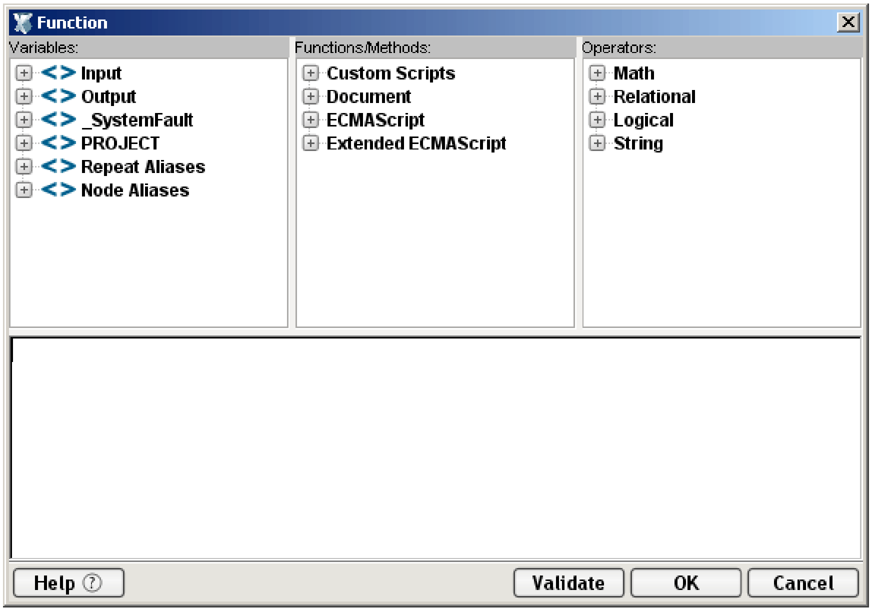
Function

A function action in Composer executes a task for a component, within the frame of the component or service. They differ from Component actions, in that a function is not an entity in your project, although it may make use of parameters and produce an output. You can use a functions to operate on individual or multiple Part Elements, perform a complex operations i.e. a mathematical operation, or access a file system or URL.

Function actions make "function calls", that is, they call either ECMAScript or previously created Custom Script functions that will execute the desired operation. In addition, you may register Java methods in the Custom Script Resources that you can invoke with a function action. Custom Scripts are outside the scope of a beginning tutorial, refer to the *Novel exteNd Composer Users Guide* for more information on this topic.

XPath and ECMAScript (The Composer Expression Builder)

The Expression Builder allows you to use either XPath or ECMAScript expressions to access and operate on XML document elements.



XPath is the primary means of addressing elements in an XML document. XPath uses pattern matching to locate a specific element or node in a document. XPath also provides simple expression statements that allow you to manipulate element data. Composer provides pick lists in the Expression Builder to generate XPath expressions. You select the elements from the pick list, and the expression is built for you by the editor. You will find the complete XPath Specification at **http://www.w3.org/TR/xpath**.

The second method of addressing Part elements in Composer is via ECMAScript. ECMAScript (ECMA-262and ISO/IED16262) is a scripting language that you can use to do more complex manipulation of objects within Composer. ECMAScript allows you to extend the operations you can perform in the Composer environment. ECMAScript is a powerful tool, to find out more about it, consult the *Novell exteNd Composer User Guide.*

Edit the PhysicianLDAPLookup Component

In exercises 7-1 to 7-5 you will modify the **PhysicianLDAPLookup** component you created in lesson 6. You will use a decision action, to determine if your directory search was successful Upon a successful search, you will return the physician attributes retrieved from the directory via the Output part. If the directory search fails, you will log the failure to System Out.

You will also be incrementing the *hitCount* for the physician that is the object of your directory search. If the *hitCount* element does not exist, you will create the element by modifying the directory.

Make sure the app server, the Novell exteNd LDAP Utility and the MySQL service are all running on your system before continuing. (See Lesson 6 for detailed instructions.)

EXERCISE 7-1: Set up the component for edits

1 If Composer is not running on your system, launch Composer as described in Exercise 1-1.

2 If you are not already in the “**hospital**” project, open it by either selecting it from the recent project list **File>Recent** on the menu, or browse to the project location by selecting **File>Open Project**

3 Select the **LDAP** Component in the Category pane.

4 Double-click on the **PhysicianLDAPLookup** component in the Instance pane.

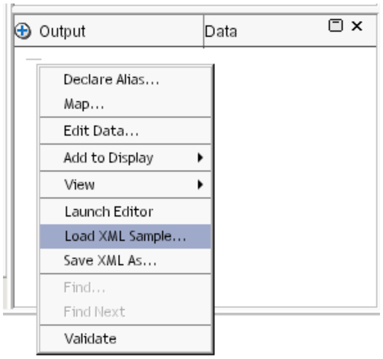
You will first need to execute the existing component to obtain data from the directory to use in when adding actions to the component.

5 Execute the component by selecting **Component>Execute** from the menu.

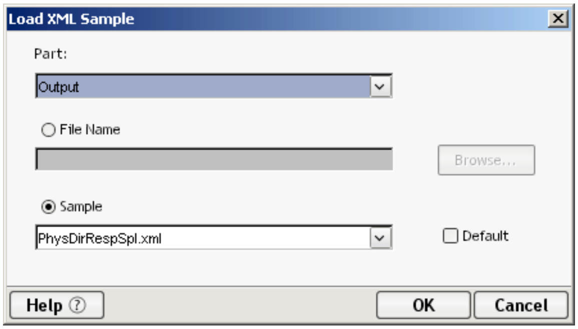
You will need to reload the output XML template to complete the map actions

6 Click in the **Output** Part window.

7 **RMB>Load XML Sample**.



8 Click **OK** on the Load XML Sample dialog.


Load XML Sample

Part: Output

○ File Name

● Sample

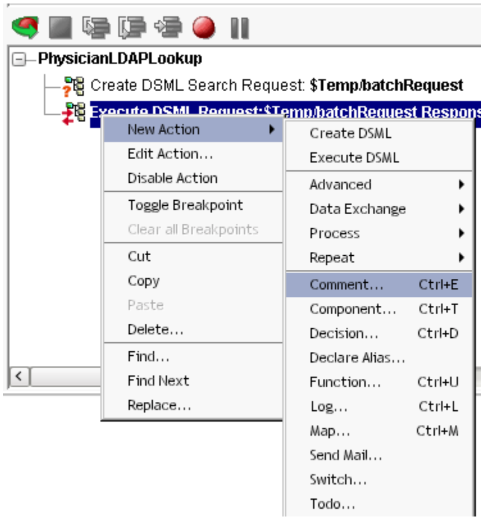
PhysDirRespSpl.xml

□ Default

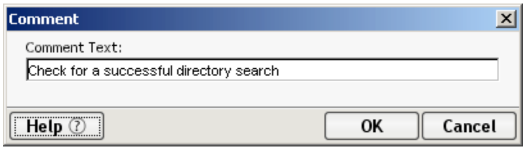
9 Highlight the **Execute DSML Request** statement in the Action Model.

EXERCISE 7-2: Add a comment to the Action Model.

1 **RMB>New Action>Comment**.



2 Enter **Check for a successful directory search** in the Comment Text field.



Comment Text: Check for a successful directory search

3 Click **OK.**

EXERCISE 7-3: Add a Decision Action

The Decision Action you add will check for a successful directory search and branch on that result. If true, the component will execute map actions that will map data to the Output Part. If false, the component will log a message to System Out.

1 Highlight the comment "**Check for a successful directory search**" in the Action Model.

2 **RMB>New Action >Decision**.

The Decision Dialog appears.

3 Click the **Editor Expression** Button on the Dialog.

The Enter Decision Expression Dialog appears.

4 In the Variables pane of the dialog drill down the tree to the following node: **Temp1/batchResponse/searchResponse/searchResultDone/resultCode**. Click on the **plus** symbol next to each of the respective nodes to expand them.

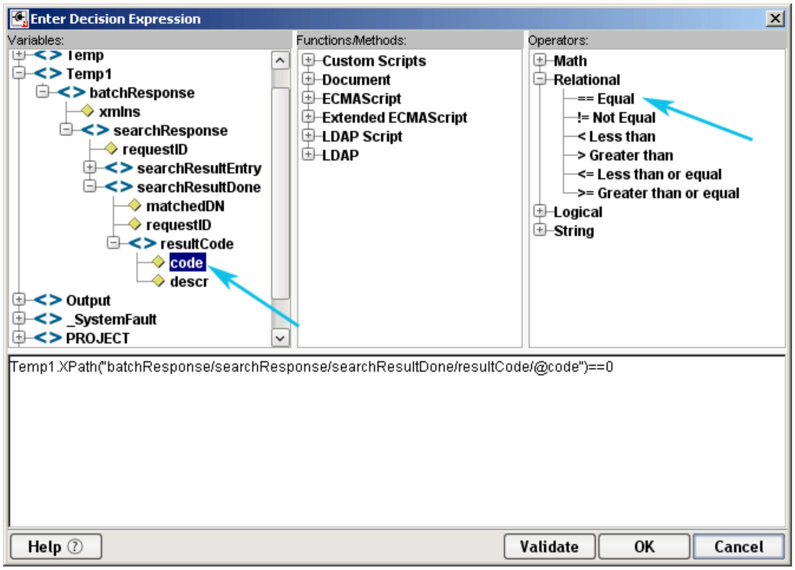
5 Double-click on the **code** element under the **resultCode** node.

The XPath expression is added to the editor pane.

6 Expand the **Relational** node in the Operators pane.

7 Double-click on the **= = Equal** element.

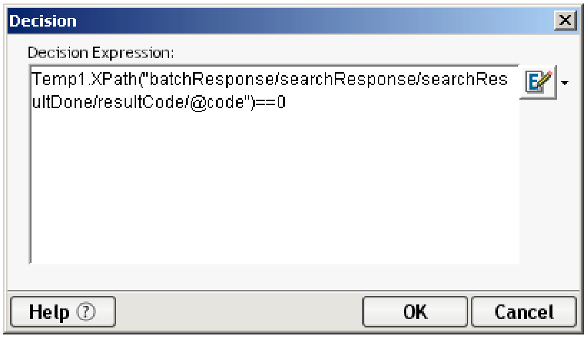
8 Click in the lower pane of the dialog just after the equal signs, type **0**.



```
Temp1.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@code")==0
```

The expression, **"Temp1.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@code")==0** appears in the lower window of the dialog.

9 Click **OK** to close the expression builder.



Decision Expression:

```
Temp1.XPath("batchResponse/searchResponse/searchRes
ultDone/resultCode/@code")==0
```

10 Click **OK** to close the Decision Dialog.

Note the Decision Action is added to the Action Model.

If you examine the syntax, you will see the path through the tree structure to the code element.

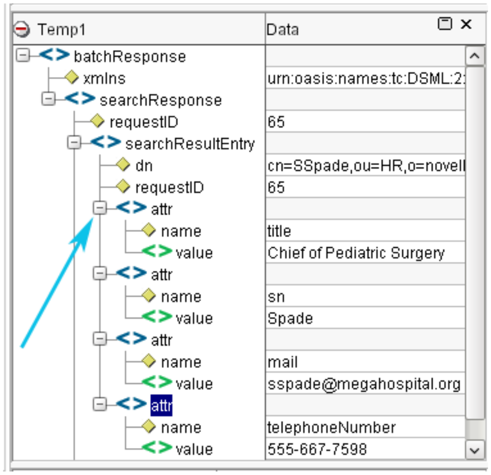
- Temp.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@code”)
- Temp is the Part
- batchREsponse is the root node
- searchResponse is a child node of the root
- searchResult Done is a child node of searchResponse
- resultCode is a child node of searchResultDone
- @code indicates retrieve the data from the element code

EXERCISE 7-4: Add Map Actions

1 Highlight the **TRUE** branch of the Decision Action.

2 Expand the **nodes** in the Temp1 part under searchResponse to expose the attributes retrieved by the search.

The attribute nodes are abbreviated **attr.** You may have to use the scroll bar on the side of the dialog to access all of the nodes.



Temp1	Data
batchResponse	
xmlns	urn:oasis:names:tc:DSML:2:
searchResponse	
requestID	65
searchResultEntry	
dn	cn=SSpade,ou=HR,o=novell
requestID	65
attr	
name	title
value	Chief of Pediatric Surgery
attr	
name	sn
value	Spade
attr	
name	mail
value	sspade@megahospital.org
attr	
name	telephoneNumber
value	555-667-7598

3 Use drag and drop to map the Temp1 Part **attr/value** elements **sn**, **title**, **mail** and **telephoneNumber** to **physician**, **Department**, **email,** and **phone**, respectively in the Output Part. Be careful to drag the **value element** under attr, in order to properly retrieve the data.

Note the map actions have been added to the “**TRUE**” branch of the Decision Action in the Action Model.

EXERCISE 7-5: Add a Log Action

You will be adding two log actions that will output messages to System Out. The log actions will output the result code and description from the directory search, if the search was not successful.

1 Highlight the **FALSE** branch of the Decision Action.

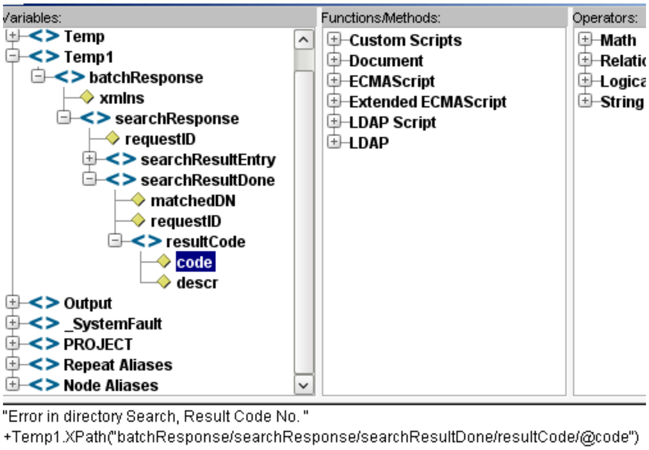
2 **RMB>New Action>Log**.

3 Enter (**"Error in directory Search, Result Code No. " +)** in the Log Expression text window, include the quotes, the space after No., and the plus sign.

4 Click on the **Expression Editor** button next to the text window.

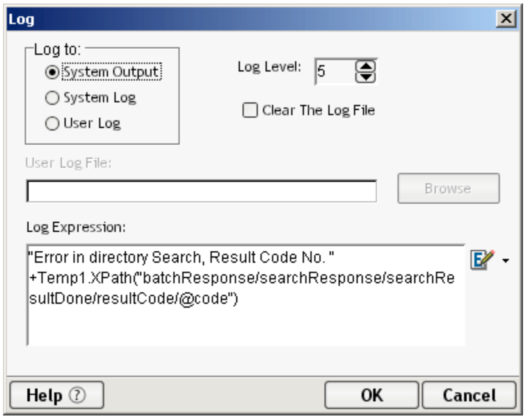
5 Expand the **Temp1** node in the Variables pane to access the **code** attribute under the resultCode element.

6 Double-click on the **code** attribute to place the expression in the editor text pane.



```
"Error in directory Search, Result Code No. "
+Temp1.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@code")
```

7 Click **OK**.



Log to:
● System Output
○ System Log
○ User Log

Log Level: 5

□ Clear The Log File

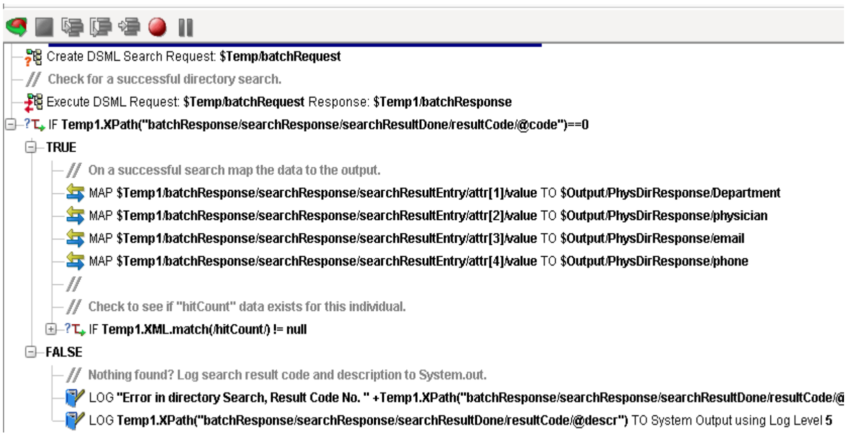
User Log File:

Log Expression:

```
"Error in directory Search, Result Code No. "
+Temp1.XPath("batchResponse/searchResponse/searchRe
sultDone/resultCode/@code")
```

8. Click **OK** to add the log expression to the Action Model.
9. Highlight the **Log** action you just added in the Action Model.
10. **RMB>New Action>Log**.
11. Click on the **Expression Editor** button next to the text window.
12. Expand the **Temp1**and it child nodes in the Variables pane to drill down to the **descr** attribute under the **resultCode** node.
13. Double-click on the **descr** attribute to place the expression in the editor text pane.
14. Click **OK**.
15. Click **OK** to add the log expression to the Action Model.

    Your Action Model should look similar to the one pictured.



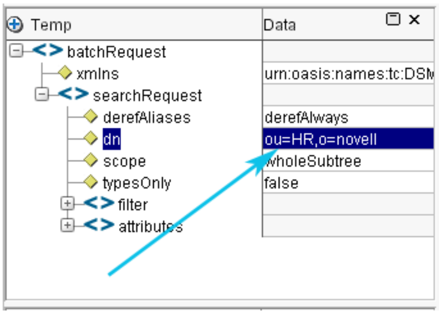
```
Create DSML Search Request: $Temp/batchRequest
// Check for a successful directory search.
Execute DSML Request: $Temp/batchRequest Response: $Temp1/batchResponse
IF Temp1.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@code")==0
  TRUE
    // On a successful search map the data to the output.
    MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[1]/value TO $Output/PhysDirResponse/Department
    MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[2]/value TO $Output/PhysDirResponse/physician
    MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[3]/value TO $Output/PhysDirResponse/email
    MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[4]/value TO $Output/PhysDirResponse/phone
    //
    // Check to see if "hitCount" data exists for this individual.
    IF Temp1.XML.match(/hitCount/) != null
  FALSE
    // Nothing found? Log search result code and description to System.out.
    LOG "Error in directory Search, Result Code No. " +Temp1.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@
    LOG Temp1.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@descr") TO System Output using Log Level 5
```

    Execute your component. You will see data mapped to the Output part.

16. To execute the False path of the Decision Action, select **Animate>Start Animation** from the Composer toolbar.
17. Using the **Step Over** button on the animation toolbar, click **twice** to animate to the **Execute DSML** statement in the Action Model.

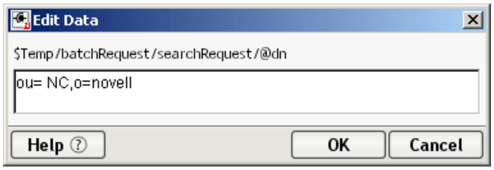
    The Temp Part is now populated with the search request data.

18. In the **Temp Part** expand the **searchRequest** node, and double-click on the **Data** in the **dn** element.



```
batchRequest
  xmlns            urn:oasis:names:tc:DSM
  searchRequest
    derefAliases   derefAlways
    dn             ou=HR,o=novell
    scope          wholeSubtree
    typesOnly      false
    filter
    attributes
```

19 In the Edit Data dialog, modify the expression ou=HR to **ou=NC.**



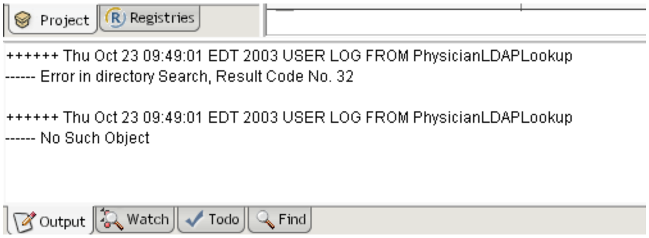
$Temp/batchRequest/searchRequest/@dn

ou= NC,o=novell

20 Click **OK**. The data in the Temp Part is changed. (This will cause the LDAP search to fail since NC is not in the directory.)

21 Click the **Run to Breakpoint End** button on the Animation Toolbar.

The Log messages will appear in the Message Pane Output tab.



```
++++++ Thu Oct 23 09:49:01 EDT 2003 USER LOG FROM PhysicianLDAPLookup
------ Error in directory Search, Result Code No. 32

++++++ Thu Oct 23 09:49:01 EDT 2003 USER LOG FROM PhysicianLDAPLookup
------ No Such Object
```

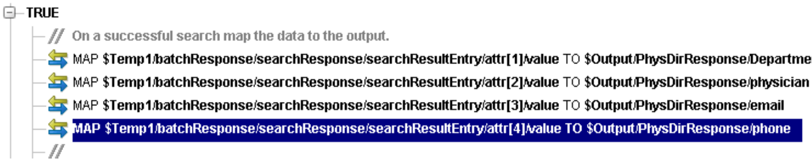
22 **File>Save** to save your work.

EXERCISE 7-6: Create or increment the hit count for the physician

The *hitCount* element has a value of null when the directory is first created. In the next set of exercises you will use a decision statement to determine if the hitCount element has a value in the directory. If the hitCount element exists, you will return the current hit count in the output, increment the count, and update the directory. If the element does not exist you will modify the directory to include the element, giving it an initial value of one.

The decision statement will utilize an exteNd Composer extension method “XML”. The XML method returns a string representation of the DOM it receives as input, in this example Temp1. You will then use the ECMAScript string match method to search for the string “hitCount”, within the string returned from the XML method. If a match is found, the True branch of the decision statement will be executed. If no match is found, the False branch will be executed.

1 Highlight the last **Map** action in the True branch in the action model.



```
TRUE
  // On a successful search map the data to the output.
  MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[1]/value TO $Output/PhysDirResponse/Department
  MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[2]/value TO $Output/PhysDirResponse/physician
  MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[3]/value TO $Output/PhysDirResponse/email
  MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[4]/value TO $Output/PhysDirResponse/phone
  //
```

2 **RMB>New Action>Decision**.

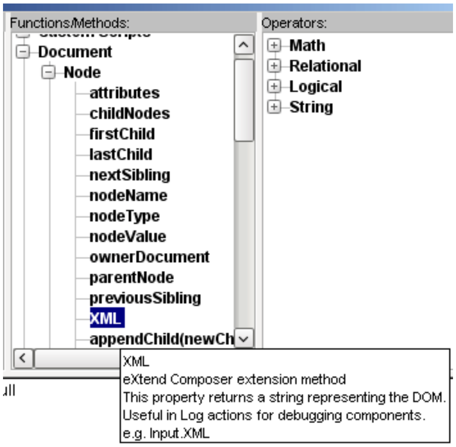
3 Click on the **Expression Editor** button next to the text window.

4 Double-click on **Temp1** in the Variables pane in the editor.

5 Expand the **Document** element in the Functions/Methods pane in the editor.

6 Expand the **Node** element under the Document element.

7 Double-click on **XML** under the Node element.



XML
eXtend Composer extension method
This property returns a string representing the DOM.
Useful in Log actions for debugging components.
e.g. Input.XML

8 Scroll down in the Functions/Methods window and expand the **ECMAScript** element.

9 Locate and expand the **String** element under the ECMAScript element.

10 Double-click on the **match** method under the String element.

The lower pane of the editor should now contain the text: “Temp1.XML.match()”.

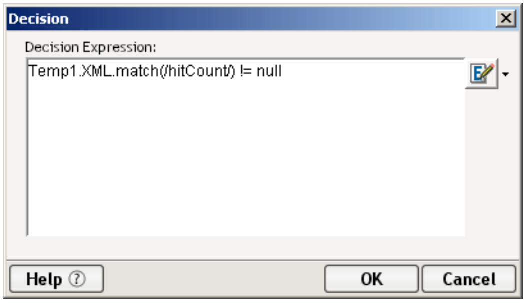
11 Click between the parenthesis following the word match, and enter "**/hitCount/**", do not include the quotes.

12 Click after the ending parenthesis and enter "**!=null**".

The lower pane of the editor should now contain the text: "Temp1.XML.match(/hitCount/) != null".

13 Click **OK**.

Your decision dialog should look similar to the one depicted below.



```
Temp1.XML.match(/hitCount/) != null
```

14 Click **OK**.

15 Save your work, select **File>Save** from the menu.

EXERCISE 7-7: Add Actions to the False Branch of the Decision action.

In this exercise you will add the actions to create the hit count, if it is not currently part of the physician directory entry. First you need to add actions that will clear the temp documents, to create a clean scratch pad area.

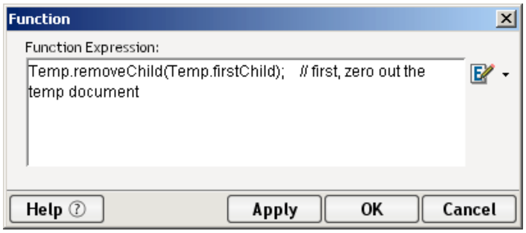
1 Highlight the **False** branch of the decision statement you just added.

2 **RMB>New Action>Function**.

3 Enter the text (without quotes) "**Temp.removeChild(Temp.firstChild);   // first, zero out the temp document**" in the Function Expression text window.

4 Click **OK**.

You could, alternatively, use the expression editor to create the statement. Make sure you include the semi-colon after the last parenthesis.



```
Temp.removeChild(Temp.firstChild);    // first, zero out the temp document
```

You will use the removeChild function a second time to clear the Temp1 document.

5 Highlight the **Temp.removeChild** function action you just added.

6 **RMB>New Action>Function**.

7 Enter the text “**Temp1.removeChild(Temp1.firstChild);”** in the Function Expression text window.

8 Click **OK**.

Next you will create the DSML statements to add the hitCount element to the physician, whose cn (common name) element in the directory matches that of the one passed into the Input part of the LDAP component.

9 Highlight the **Temp1.removeChild** function call in the action model.

10 **RMB>New Action>Create DSML**.

11 Select **Modify** from the DSML Action dropdown list.

12 Select **Temp** from the Request Map dropdown list.

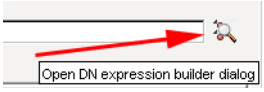
Accept the default batchRequest in the Request Map text field.

13 Click **OK**.

The modify action will add the hitCount element to the directory entry for the physician. Steps 14 through 21 set up the XPath expression that maps the proper physician element in the directory.

14 In the native environment pane, enter **“cn=” +** (include the quotes and the plus sign) in the Entry DN text field of the Modify tab.

15 Click the **DN expression builder** button.



16 In the Variables pane of the expression builder, expand the **Input** node.

17 Expand the **RecordRequest** node in the Input tree.

18 Double-click on the **physician** element.

The text “Input.XPath("RecordRequest/physician")” is added to the expression in the lower pane of the expression builder.

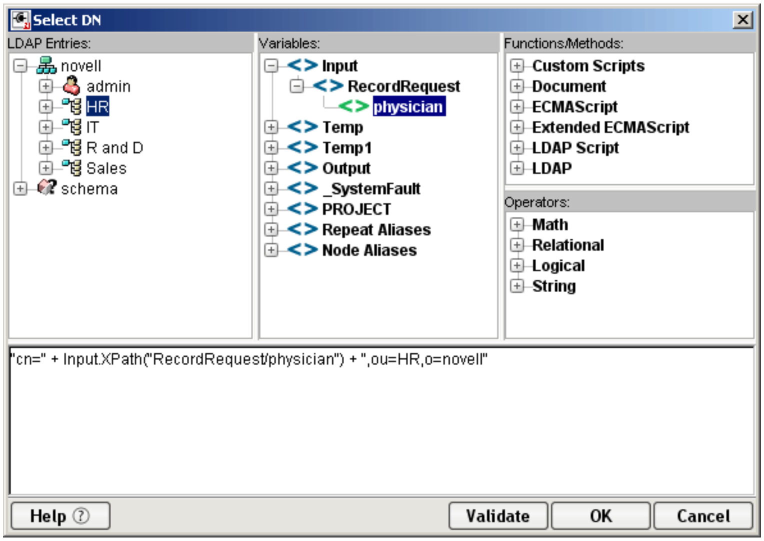
19 Enter a **plus sign “ + “** after the second parenthesis in physician.

The expression should read: "cn=" + Input.XPath("RecordRequest/physician") +

20 Expand the **novell** node in the LDAP entries window.

21 Double-click on the **HR** node in the novell tree.

The expression should read: "cn=" + Input.XPath("RecordRequest/physician") + ",ou=HR,o=novell".



```
"cn=" + Input.XPath("RecordRequest/physician") + ",ou=HR,o=novell"
```

22 Click **OK**.

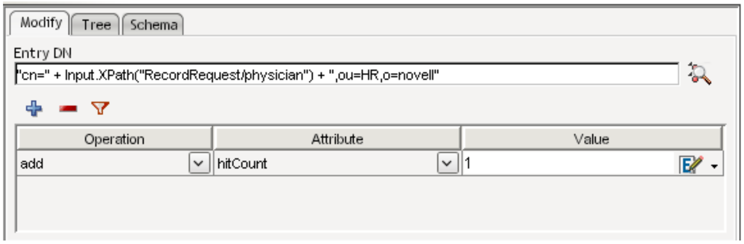
Use the add operation to add the hitCount element with an initial value of 1.

23 In the native environment Modify tab, click the **plus** button to add a new row to the attribute modification mappings.

24 Select **add** from the Operation dropdown list.

25 Select **hitCount** from the Attribute dropdown list.

26 Enter the number **1** in the Value field.



Entry DN: "cn=" + Input.XPath("RecordRequest/physician") + ",ou=HR,o=novell"

Operation	Attribute	Value
add	hitCount	1

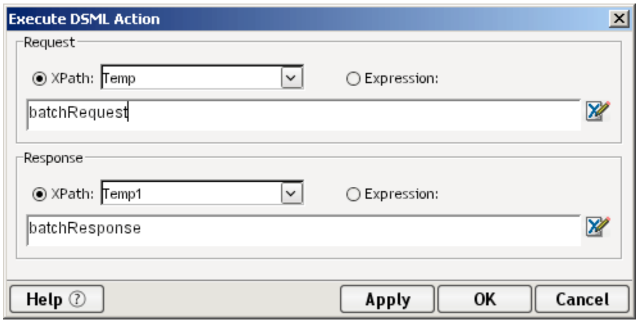
27 Highlight the **Create DSML Modify Request** in the LDAP component action model.

28 **RMB>New Action>Execute DSML**.

29 Select **Temp** from the Request part dropdown list.

30 Select **Temp1** from the Response part dropdown list.

Accept the default values for the remaining dialog fields.


Execute DSML Action

Request

● XPath: Temp ○ Expression:

batchRequest

Response

● XPath: Temp1 ○ Expression:

batchResponse

31 Click **OK**.

The Execute DSML Request is added to the action model. Map the newly created data value for hitCount to the NoOfInquiries attribute in the Output part.

32 In the action model, highlight the **Execute DSML Request** that you added in the preceding steps.

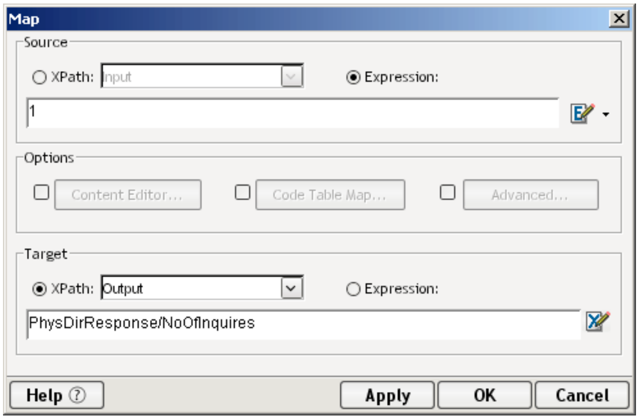
33 **RMB>New Action>Map**.

34 Select the **Expression** radio button in the Source section of the dialog.

35 Enter the number **1** in the Source section text field.

36 Select the **XPath** radio button in the Target section of the dialog.

37 Enter **PhysDirResponse/NoOfInquires** in the Target text field.


Map

Source

○ XPath: Input ● Expression:

1

Options

□ Content Editor... □ Code Table Map... □ Advanced...

Target

● XPath: Output ○ Expression:

PhysDirResponse/NoOfInquires

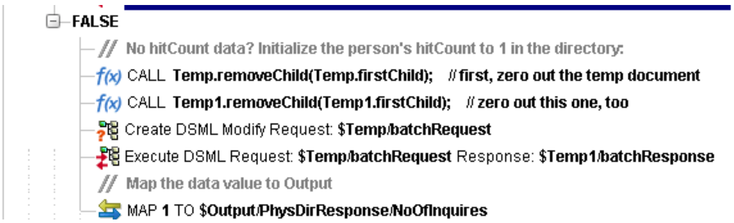
38 Click **OK**.

39 Select **File>Save** from the menu to save your work.

40 Select **Component>Execute** from the menu.

Your False block for the if hitCount decision action should look similar to the one below.

NOTE: Comments have been added to the tutorial action model to clarify the model.



FALSE
// No hitCount data? Initialize the person's hitCount to 1 in the directory:
f(x) CALL Temp.removeChild(Temp.firstChild); //first, zero out the temp document
f(x) CALL Temp1.removeChild(Temp1.firstChild); // zero out this one, too
Create DSML Modify Request: $Temp/batchRequest
Execute DSML Request: $Temp/batchRequest Response: $Temp1/batchResponse
// Map the data value to Output
MAP 1 TO $Output/PhysDirResponse/NoOfInquires

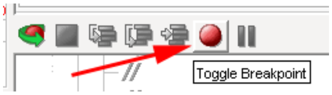
EXERCISE 7-8: Add Actions to the True Branch of the Decision action.

In this exercise you will add the actions to increment the hit count, if it is currently part of the physician directory entry.

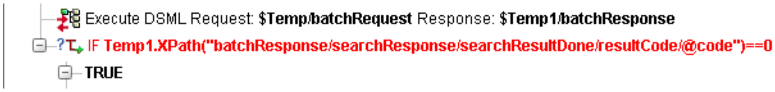
Before incrementing the count, map the current value of the count to the output. To accomplish this you need to add a breakpoint to the action model. Breakpoints are handy for debugging and modifying components during development. In this case, you will use the breakpoint to assist with mapping the hitCount to the Output part.

1 Highlight the first **Decision** action in the model. The one that checks for a successful search.

2 Click the **Toggle Breakpoint** button on the animation toolbar.



The Decision action will become red indicating that there is a breakpoint set on that action.



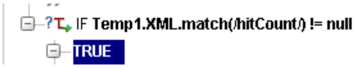
Execute DSML Request: $Temp/batchRequest Response: $Temp1/batchResponse
IF Temp1.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@code")==0
TRUE

3 Click the **Start Animation** button on the animation toolbar.

4 Click the **Run to Breakpoint/End** button on the animation toolbar.

The results from the physician search are now in the Temp1 part. To facilitate the mapping of the hitCount, reload the XML document for the Output part. If you have forgotten how to do this, refer back to EXERCISE 7-1: “Set up the component for edits”.

5 Highlight the True branch within the check for match decision action.



IF Temp1.XML.match(/hitCount/) != null
TRUE

6 Expand the nodes in the Temp1 part under **searchResponse** to expose the attributes retrieved by the search.

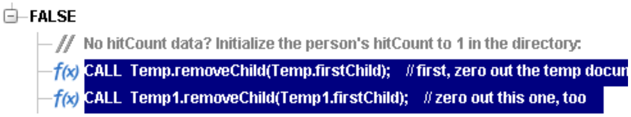
7 Drag the **value** element of the **hitCount** attribute and drop it on the **NoOfInquiries** element in the Output part.

Once the hitCount has been mapped, the component must increment and update the value in the directory. The component will use function calls to clear the Temp parts, to create a clean scratch pad area that will hold the modify request and response documents. You can do this by using cut and paste from the False block you created in the previous exercise.

8 Highlight the **Temp.removeChild(Temp.firstChild)** function call in the False block created in the previous exercise.

9 Holding down the shift key, click on the second function call in the block, **Temp1.removeChild(Temp1.firstChild).**

Both function calls should now be highlighted.



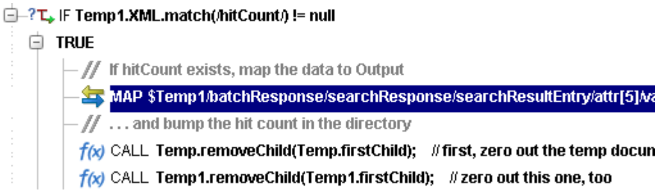
```
FALSE
  // No hitCount data? Initialize the person's hitCount to 1 in the directory:
  f(x) CALL Temp.removeChild(Temp.firstChild);   //first, zero out the temp docun
  f(x) CALL Temp1.removeChild(Temp1.firstChild);   //zero out this one, too
```

10 **RMB>Copy.**

11 Highlight the **Map hitCount** action in the True block under the Temp1.XML.match decision action.

12 **RMB>Paste**.

The function calls are added to the action model.



```
?T IF Temp1.XML.match(/hitCount/) != null
  TRUE
    // If hitCount exists, map the data to Output
    MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[5]/va
    // . . . and bump the hit count in the directory
    f(x) CALL Temp.removeChild(Temp.firstChild);   //first, zero out the temp docun
    f(x) CALL Temp1.removeChild(Temp1.firstChild);   //zero out this one, too
```

Add the DSML Create and Execute statements to the True block.

13 Highlight the **Temp1.removeChild** function call in the True block.

14 **RMB>New Action>Create DSML**.

15 Select **Modify** from the DSML Action dropdown list.

16 Select **Temp** from the Request Map dropdown list.

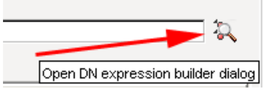
Accept the default batchRequest in the Request Map text field.

17 Click **OK**.

Set up the XPath expression that maps to the proper physician element in the directory.

18 In the native environment pane, enter **“cn=”** + (include the quotes and the plus sign) in the Entry DN text field of the Modify tab.

19 Click the **DN expression builder** button.



20 In the Variables pane of the expression builder, expand the **Input** node.

21 Expand the **RecordRequest** node in the Input tree.

22 Double-click on the **physician** element.

The text “Input.XPath("RecordRequest/physician")” is added to the expression in the lower pane of the expression builder.

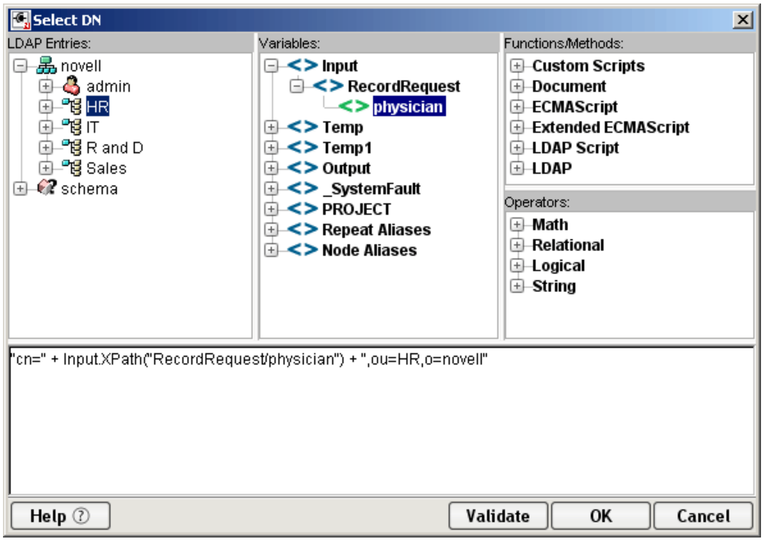
23 Enter a **plus sign “ + “** after the second parenthesis in physician.

The expression should read: "cn=" + Input.XPath("RecordRequest/physician") +

24 Expand the **novell** node in the LDAP entries window.

25 Double-click on the **HR** node in the novell tree.

The expression should read: "cn=" + Input.XPath("RecordRequest/physician") + ",ou=HR,o=novell".



"cn=" + Input.XPath("RecordRequest/physician") + ",ou=HR,o=novell"

26 Click **OK**.

Use the replace operation to increment the hitCount element.

27 In the native environment Modify tab, click the **plus** button to add a new row to the attribute modification mappings.

28 Select **replace** from the Operation dropdown list.

29 Select **hitCount** from the Attribute dropdown list.

30 Click the **Expression builder** button next to the Value field.

The current hitCount is available in the Output part as NumberOfInquiries. You can use this value to modify the directory entry. XML documents are represented as strings. In order to increment the hitCount, you must cast the value to a Number. You will be using an ECMAScript function to perform the cast.

31 Enter **Number( )** in the lower pane of the Expression builder.

32 Click between the parenthesis following the word **Number**.

Use the pick list in the variables window to select the NumberOfInquiries element from the Output.

33 In the Variables pane expand the **Output** node.

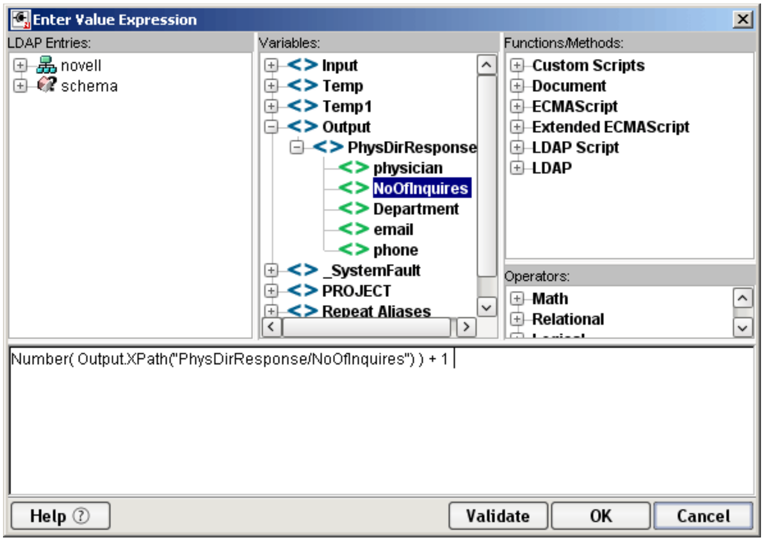
34 Expand the **PhysDirResponse** node under Output.

35 Double-click on the **NumberOfInquiries** element under PhysDirResponse.

The XPath expression Output.XPath("PhysDirResponse/NoOfInquires") is placed between the parenthesis.

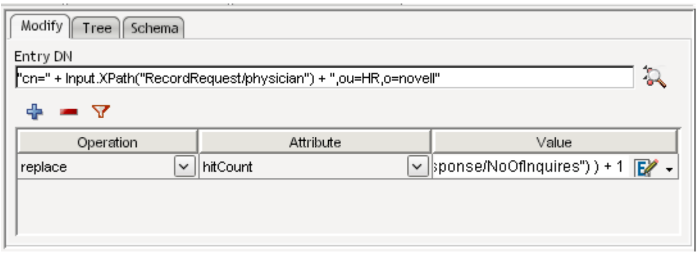
36 Enter "**+ 1**" (no quotes) after the last parenthesis in the editor pane.

The expression **Number(Output.XPath("PhysDirResponse/hitCount")) + 1** should now appear in the lower window of the editor. The expression editor should look similar to the one pictured.



```
Number( Output.XPath("PhysDirResponse/NoOfInquires") ) + 1
```

37 Click **OK**.



Entry DN

"cn=" + Input.XPath("RecordRequest/physician") + ",ou=HR,o=novell"

Operation	Attribute	Value
replace	hitCount	sponse/NoOfInquires")) + 1

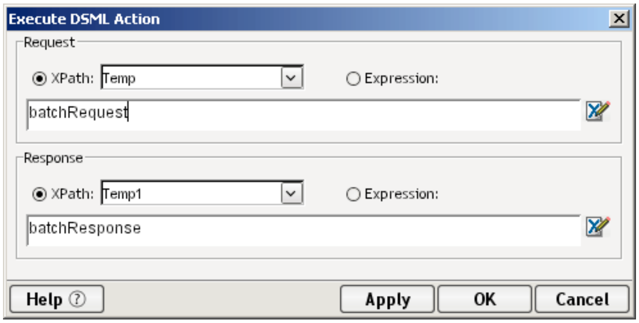
38 Highlight the **Create DSML Modify Request** that you added in the action model.

39 **RMB>New Action>Execute DSML**.

40 Select **Temp** from the Request part dropdown list.

41 Select **Temp1** from the Response part dropdown list.

Accept the default values for the remaining dialog fields.



Request

● XPath: Temp ○ Expression:

batchRequest

Response

● XPath: Temp1 ○ Expression:

batchResponse

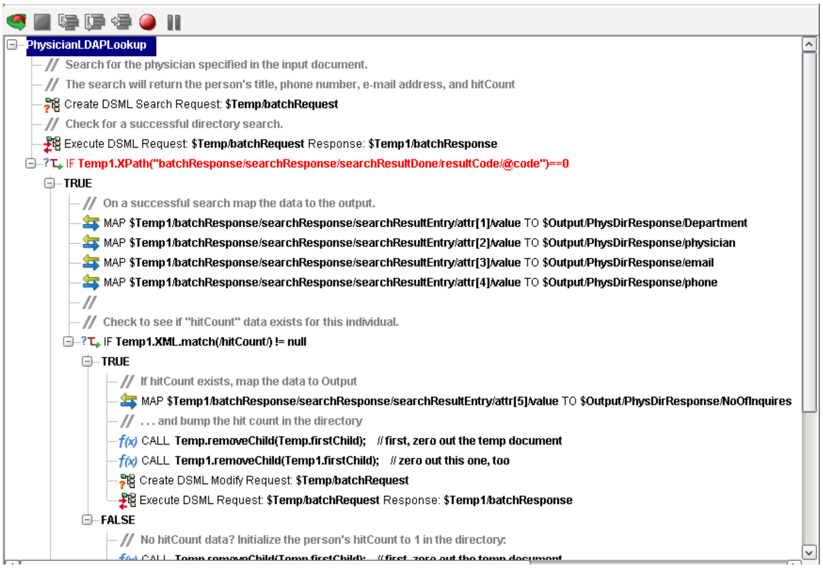
42 Click **OK**.

The Execute DSML Request is added to the action model.

43 Select **File>Save** from the menu.

44 Select **Component>Execute** from the menu.

By executing the component several times you can observe the NumberOfInquires increment in the Output part. Your component action model should be similar to the one pictured.



```
PhysicianLDAPLookup
  // Search for the physician specified in the input document.
  // The search will return the person's title, phone number, e-mail address, and hitCount
  Create DSML Search Request: $Temp/batchRequest
  // Check for a successful directory search.
  Execute DSML Request: $Temp/batchRequest Response: $Temp1/batchResponse
  IF Temp1.XPath("batchResponse/searchResponse/searchResultDone/resultCode/@code")==0
    TRUE
      // On a successful search map the data to the output.
      MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[1]/value TO $Output/PhysDirResponse/Department
      MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[2]/value TO $Output/PhysDirResponse/physician
      MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[3]/value TO $Output/PhysDirResponse/email
      MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[4]/value TO $Output/PhysDirResponse/phone
      //
      // Check to see if "hitCount" data exists for this individual.
      IF Temp1.XML.match(/hitCount/) != null
        TRUE
          // If hitCount exists, map the data to Output
          MAP $Temp1/batchResponse/searchResponse/searchResultEntry/attr[5]/value TO $Output/PhysDirResponse/NoOfInquires
          // . . . and bump the hit count in the directory
          CALL  Temp.removeChild(Temp.firstChild);   // first, zero out the temp document
          CALL  Temp1.removeChild(Temp1.firstChild);   // zero out this one, too
          Create DSML Modify Request: $Temp/batchRequest
          Execute DSML Request: $Temp/batchRequest Response: $Temp1/batchResponse
        FALSE
          // No hitCount data? Initialize the person's hitCount to 1 in the directory:
          CALL  Temp.removeChild(Temp.firstChild);   // first, zero out the temp document
```

Edit the PatientLookup XML Map Component

The web service described in Lesson 1 required that the output from the patient database and physician directory, be combined prior to returning the data to the consumer. (Requirement number 5)

In this series of exercises, you will edit the PatientLookup component. The component will call both the JDBC and LDAP components you have created, and combine their output. The final output of the PatientLookup component will be passed to the web service

EXERCISE 7-9: Edit the XML map component properties

In this exercise you will modify the properties of the component adding two temp parts to use as scratch pads, while combining the data for output. In the Category pane under Components, highlight **XML Map**.

1 Highlight **PatientLookup** in the Instance pane.

2 **RMB>Properties**

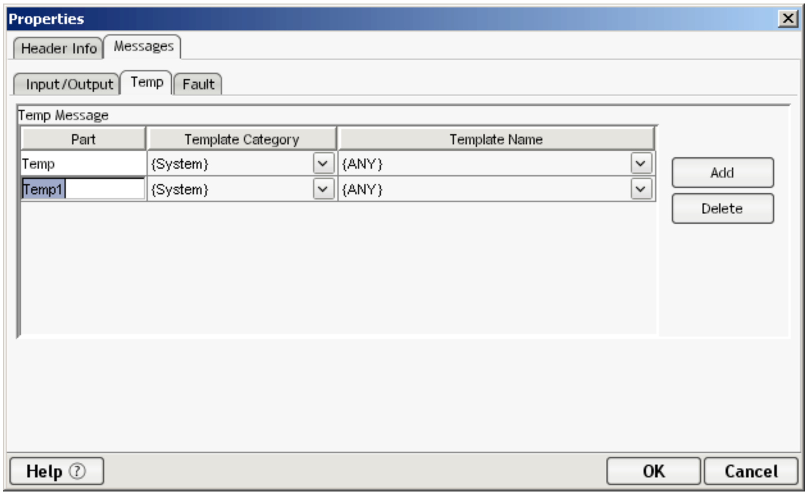
3 Click on the **Messages** tab in the Properties dialog.

4 Select the **Temp** tab.

5 Press the **Add** button **twice**.

Two parts, Temp and Temp1, are added to the dialog.

Leave the Template Category and Template Name at the default values.



Part	Template Category	Template Name
Temp	{System}	{ANY}
Temp1	{System}	{ANY}

6 Click **OK**.

EXERCISE 7-10: Add Component Actions

Currently the PatientLookup component maps the name of the physician from the input to the output. You will first need to delete this map action. You will then add other actions to the model.

1 Select **XML Map** in the Category pane.

2 Double-click on **PatientLookup** in the Instance pane to open the component.

3 Click on the **Map** action in the Action Model.

4 **RMB>Delete.**

A confirmation dialog will appear, with the text “Are you sure you want to delete this action?”

5 Click the **Yes** button on the Confirm Delete dialog.

Add the actions that will call the JDBC and LDAP components.

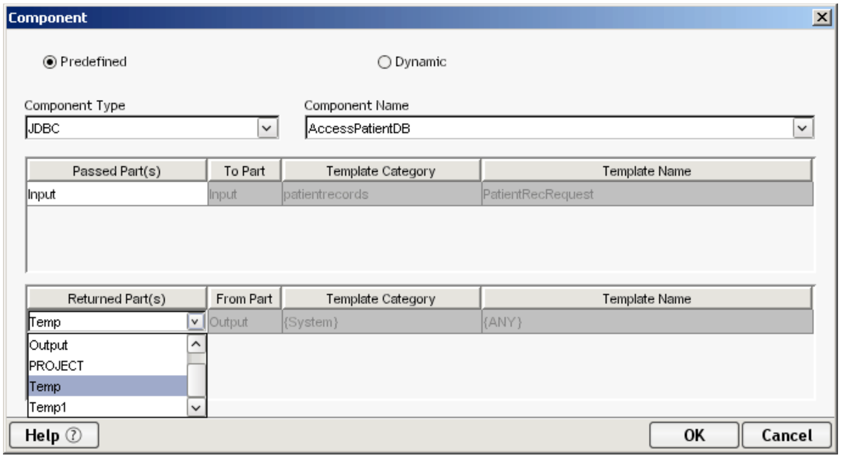
6 Highlight **PatientLookup** in the Action Model.

7 **RMB>New Action>Component.**

8 Select **JDBC** from the Component Type dropdown list.

9 Select **AccessPatientDB** from the Component Name dropdown list.

10 Select **Temp** from the dropdown list under Returned Part(s).



Component

● Predefined ○ Dynamic

Component Type: JDBC

Component Name: AccessPatientDB

Passed Part(s)	To Part	Template Category	Template Name
Input	Input	patientrecords	PatientRecRequest

Returned Part(s)	From Part	Template Category	Template Name
Temp	Output	{System}	{ANY}

11 Click **OK**.

12 Highlight the **Execute AccessPatientDB** action in the Action Model.

13 **RMB>New Action>Component.**

14 Select **LDAP** from the Component Type dropdown list.

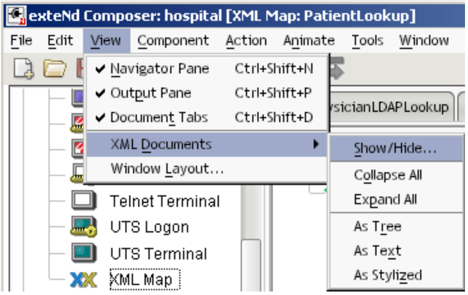
15 Select **PhysicianLDAPLookup** from the Component Name dropdown list.

16 Select **Temp1** from the dropdown list under Returned Part(s).

17 Click **OK**.

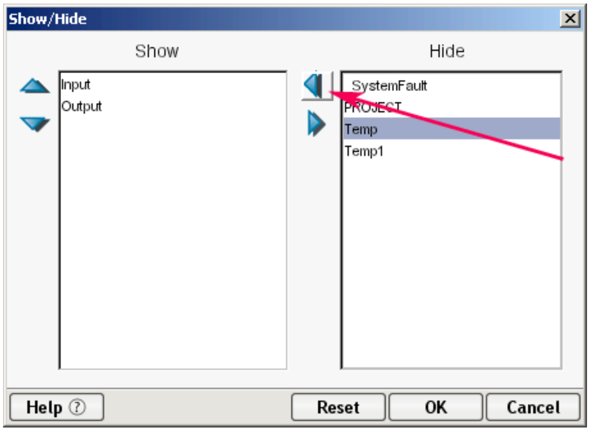
Two temp parts should now appear in the Native Environment pane with the Input and Output parts. If they do not appear, use the Show/Hide dialog from the menu to display them.

18 Select **View>XML Documents>Show/Hide** from the menu.



19 Highlight the **Temp** part in the Hide window.

20 Click the **left pointing arrow** button between the Show and Hide windows to move the document to the show list.



21 Repeat steps 18 and 19 for the **Temp1** part.

EXERCISE 7-11: Add Map Actions

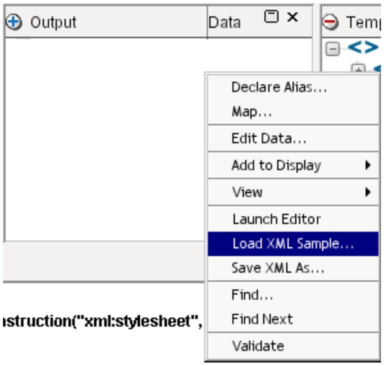
To complete the mapping, you will first have to execute the component. This will provide you with data, from the directory and the database to use in mapping. After executing the component, you will need to reload the sample document in the Output part.

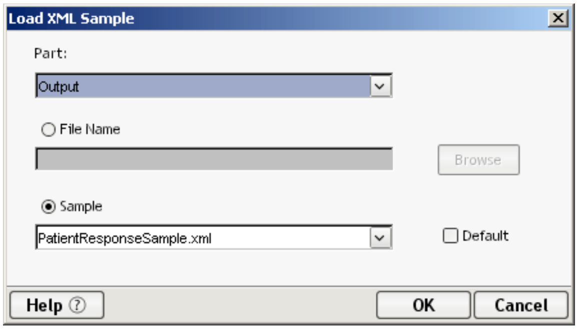
1 Select **Component>Execute** from the menu.

2 Click **OK** on the Component Executed message dialog.

3 Click in the **Output Part**.

4 **RMB>Load XML Sample.**





Load XML Sample

Part: Output

○ File Name

● Sample

PatientResponseSample.xml

□ Default

5 Click **OK** on the Load XML Sample dialog.

6 Expand the **physician** node in the Output part.

Using drag and drop, you will map the results from the two component actions to the output. Note that each drag and drop creates a new map action in the Action Model.

7 Highlight the **Execute PhysicianLDAPLookup** action.

8 Drag the **NoOfInquiries** element from the Temp1 part to the **NoOfInquiries** element in the Output.

9 Drag the **Department** element from the Temp1 part to the **Department** element in the Output.

10 Drag the **email** element from the Temp1 part to the **email** element in the Output.

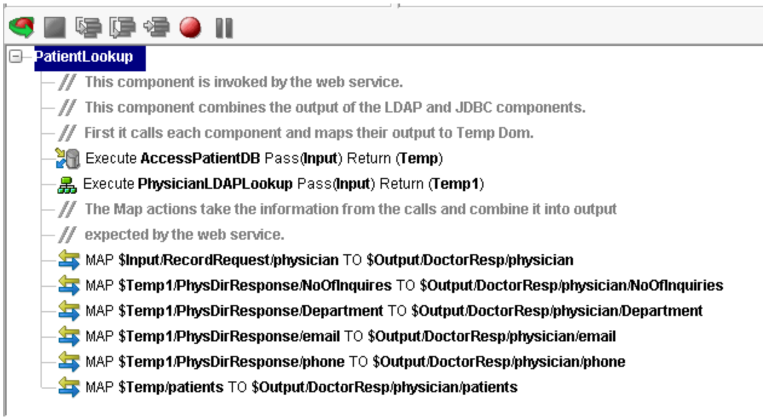
11 Drag the **phone** element from the Temp1 part to the **phone** element in the Output.

12 Drag the **patients** node (this will map all the child nodes of this node) from the Temp part to the **patients** node in the Output part.

13 Highlight the **Execute PhysicianLDAPLookup** action.

14 Drag the **physician** element from the Input part to the **physician** element of the Output part.

Your action model should be similar to the one pictured here.



```
PatientLookup
  // This component is invoked by the web service.
  // This component combines the output of the LDAP and JDBC components.
  // First it calls each component and maps their output to Temp Dom.
  Execute AccessPatientDB Pass(Input) Return (Temp)
  Execute PhysicianLDAPLookup Pass(Input) Return (Temp1)
  // The Map actions take the information from the calls and combine it into output
  // expected by the web service.
  MAP $Input/RecordRequest/physician TO $Output/DoctorResp/physician
  MAP $Temp1/PhysDirResponse/NoOfInquires TO $Output/DoctorResp/physician/NoOfInquiries
  MAP $Temp1/PhysDirResponse/Department TO $Output/DoctorResp/physician/Department
  MAP $Temp1/PhysDirResponse/email TO $Output/DoctorResp/physician/email
  MAP $Temp1/PhysDirResponse/phone TO $Output/DoctorResp/physician/phone
  MAP $Temp/patients TO $Output/DoctorResp/physician/patients
```

15 Select **File>Save** from the menu.

16 Select **Component>Execute** from the menu.

Summary of what you've done

You have accomplished the following tasks:

- Learned about the Composer Action Model and Actions:
- Have been briefly introduced to XPath, ECMAScript and the Composer Expression Builder
- Worked with Actions
  - Created a Comment Action
  - Created a Decision Action
  - Created a Log Action
  - Created a Function Action
  - Created a Component Action

Next lesson

In the next lesson you will learn about publishing and consuming web services.

8 Publishing and Consuming Web Services

What you will learn

In this lesson you will complete the last outstanding requirement outlined for your Composer project in the first lesson. You will learn how to trigger your service in a number of ways. You will also act as a consumer of your service via XML and Web Services Interchange. First review the requirement.

The service may be invoked by any of the following service triggers:

- Servlet of the type Params(URL/Form) that outputs a raw XML document
- Servlet of the type Params(URL/Form) that uses an XForm
- Servlet that utilizes a JSP to format the output
- Servlet of the type XML (HTTP/Post)
- SOAP Servlet using WSDL

After creating and deploying the service with the service triggers, you will act as a consumer of the service via both XML Interchange, and Web Service Interchange.

What you will do

You will perform the following exercises

- Create a JSP resource file
- Add the JSP to the Deployment Component
- Deploy the Web Service with the JSP
- Create an XML Map Component that uses XML interchange
- Modify the Deployment Component for the XML Interchange.

- Deploy the Web Service with Servlet Type XML(HTTP/Post)
- Create a WSDL for the PatientRecResponse Web Service
- Create XML Templates for the WSDL
- Add a Soap Trigger to the Deployment Component
- Deploy the Web Service with SOAP
- Create an XML Map component that executes a WSInterchange action
- Create an XForm for Physician Input.
- Deploy the XForm as a web service

How long will it take? About 40 minutes

Publishing Web Services

Servlets

The most common analogy regarding servlets is that they are to servers, what applets are to browsers. Servlets model a request/response architecture. A client makes a request of the server and the server provides a response. The servlet acts a middle-tier between the client and the server, containing the information necessary to invoke the service. A servlet resides on the server where the web service is deployed. When a hit on the web services URL reaches the server, the servlet triggers the service. In lesson 5 you deployed the service using a servlet of type Params(URL/Form). The servlet type is based on the method by which it receives parameters. In this lesson you will be creating a JSP resource to use with the Params(URL/Form) servlet. You will also create additional servlets of type SOAP and XML (HTTP/Post).

Web Service Description Language (WSDL)

After designing, developing, and testing a web service, the next step is to publish it via the UDDI (Universal Description, Discovery and Integration) registry. Publishing the service allows potential business partners to discover and utilize the service. A WSDL file is an XML file that contains all the necessary information to invoke your service. There are many sources of information on WSDL, including the SUN website. http://java.sun.com/

Composer generates the WSDL files for your service. In this lesson you will generate a WSDL file for the PatientReqRequest web service. The SOAP servlet you create will be based on this file.

Consuming Web Services

Java Server Pages (JSP)

A complete explanation of JSP is outside the scope of this tutorial. The Sun website offers a vast amount of information, and a tutorial on JSP.
http://developer.java.sun.com/developer/onlineTraining/JSPIntro/

JSP provide a means of separating the business logic of a service, from the presentation logic of the browser. By separating display issues from business logic, JSP provide platform independence for web services. Several different web pages or browsers, can invoke a service via a JSP. The web page can then format the data returned by the service in a manner suitable for their audience.

For the purpose of the tutorial, you will be creating a JSP resource within Composer. The page will invoke your web service and publish the output to the browser. The tutorial's JSP scenario represents a business to client exchange between the JSP and the web service.

XForms

Forms are the most common way of retrieving data from a web browser. An example of a form might be the order page for a book store site. XForms separate form data from the presentation logic of the device on which the "form" is displayed. They differ from JSP in that XForms are not limited to use by a server.

XForms provide device independence, the same form might collect data from a hand held device, a phone, or a browser window. For example, a dropdown list in a browser window might appear as a selection on a menu in a handheld device. The XForm would process the data from either into the same XML document and pass the data on to the web service. This separates the need for the service to have knowledge of the input device.

XForms process the "instance data" into an XML document. The data is then passed on to the server. The XForm maps the data to and from the form controls of the display device. The instance data is defined using an XPath tree representation. This method of structuring the data "binds" the date to the form control. The XForm standard defines the form controls For more information on XForms refer to the W3C's website.
http://www.w3.org/MarkUp/Forms.

In the tutorial you will create an XForm that will utilize a textfield for entry. You will create a web service that will invoke the XForm processor and display the form in the browser. When the user clicks the submit box on the form, the data in the form will be retrieved and the PatientRecReq web service will be invoked.

XML Interchange

The XML Interchange action in Composer reads external XML documents into a component and writes the data out as XML files. There are four types of XML Interchange actions: get, put, post and post with response.

You will be using the post with response action in the tutorial. The XML Interchange you create represents a business to business exchange. A business that utilized your web service might “post” its input to the web service as an XML document, via the interchange. The web service would then process the document and return a response.

WS Interchange

The WS Interchange is another example of a business to business exchange. As discussed in the above WSDL section, the web service would publish a WSDL describing the service. A business searching for services via the UDDI registry, would obtain a copy of the WSDL, and generate the appropriate SOAP trigger for the service. The business would then utilize the WSInterchange action to invoke the service with the SOAP servlet.

NOTE: The LDAP directory evaluation tool, the MySQL service and the exteNd Application server must all be running on your system to successfully complete the lab exercises for this unit.

EXERCISE 8-1: Create a JSP resource file

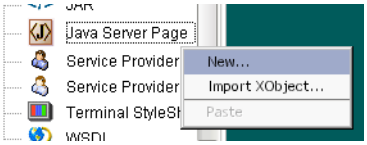
1 If Composer is not running on your system, launch Composer as described in Exercise 1-1.

2 If you are not already in the “**hospital**” project, open it by either selecting it from the recent project list **File>Recent** on the menu, or browse to the project location by selecting **File>Open Project**

3 Select **Java Server Page** under Resources in the Category Pane.

4 Select **JSP** from the Resource section of the Navigation frame.

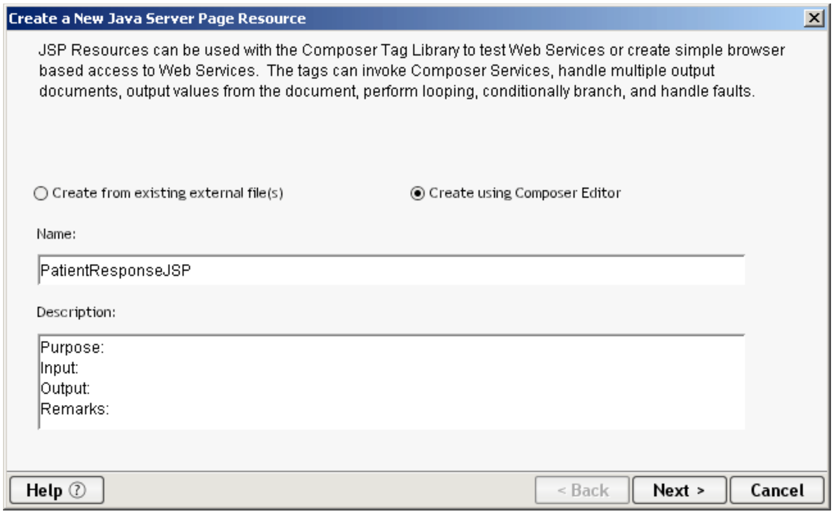
5 **RMB>New.**



The Create a New Java Server Page Resource wizard appears.

6 Select the **Create using Composer editor** radio button.

7 Enter **PatientResponseJSP** in the name text field.



Create a New Java Server Page Resource

JSP Resources can be used with the Composer Tag Library to test Web Services or create simple browser based access to Web Services. The tags can invoke Composer Services, handle multiple output documents, output values from the document, perform looping, conditionally branch, and handle faults.

○ Create from existing external file(s) ● Create using Composer Editor

Name: PatientResponseJSP

Description:

Purpose:
Input:
Output:
Remarks:

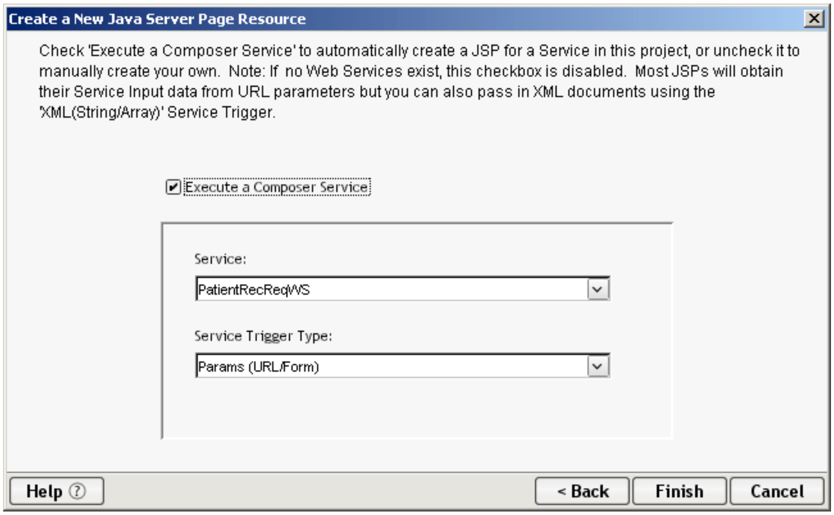
8 Click **Next**.

9 Select the **Execute a Composer Service** checkbox.

This will cause Composer wizard to generate a JSP file with the proper tags to invoke your service.

10 Select **PatientRecReqWS** from the Service drop down list.

11 Select **Params/URL** as the Service Trigger Type.



Create a New Java Server Page Resource

Check 'Execute a Composer Service' to automatically create a JSP for a Service in this project, or uncheck it to manually create your own. Note: If no Web Services exist, this checkbox is disabled. Most JSPs will obtain their Service Input data from URL parameters but you can also pass in XML documents using the 'XML(String/Array)' Service Trigger.

☑ Execute a Composer Service

Service: PatientRecReqWS

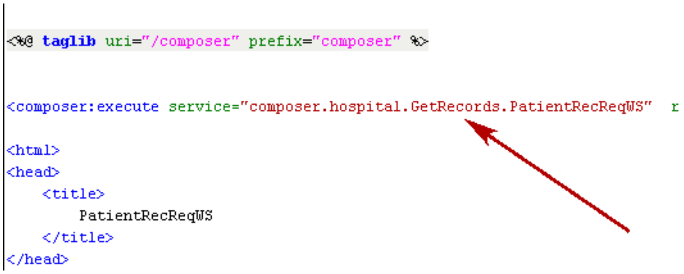
Service Trigger Type: Params (URL/Form)

12 Click **Finish**.

A **PatientResponseJSP** is created and opened in the Composer Native Environment window. The **PatientResponseJSP** is added to the Instance pane.

You will have to edit the JSP to tell it the deployment object of your service.

13. Find the **<composer:execute service=** tag in the file.
14. Enter **GetRecords.** after the . following the word hospital and preceding PatientRecReqWS.



```
<%@ taglib uri="/composer" prefix="composer" %>


<composer:execute service="composer.hospital.GetRecords.PatientRecReqWS"  r

<html>
<head>
    <title>
        PatientRecReqWS
    </title>
</head>
```

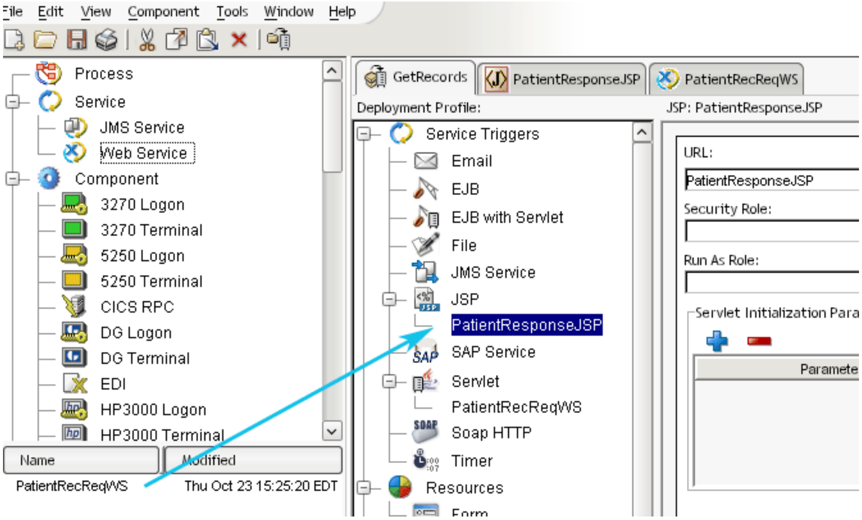
The line should now look like this one indicated by the arrow in the image above.

15. Select **File>Save** from the menu to save your work.

EXERCISE 8-2: Add the JSP to the Deployment Component

NOTE: The Deployment xObject is supported only in Novell exteNd 5 Enterprise Edition (or Composer Enterprise Edition standalone). If you are using Professional Edition, you will not be able to create Deployment xObjects in Composer and should skip this section. (You can, however, deploy your project manually, using exteNd Director. Consult the Director documentation and/or the Deployment chapter of the *Composer User's Guide* for more information.)

1. Select **Deployment** in the Category pane.
2. Double click on **GetRecords** in the Instance pane.
3. Click **JSP** under Resources in the Category pane.
4. Click **PatientResponseJSP** in the Instance pane.
5. Drag the **PatientResponseJSP** from the Instance pane and drop it on JSP under Service Trigger in the Deployment component



URL: PatientResponseJSP

Security Role:

Run As Role:

6 Select **File>Save** from the menu.

The PatientResponseJSP Properties sheet is displayed. The URL for the JSP is PatientResponseJSP. Leave the remaining fields blank for this exercise.

EXERCISE 8-3: Deploy the Web Service with the JSP

The steps to deploy your service pertain to the Novell exteNd Application Server, and are identical to those in Lesson 4. If you have difficulty following these instructions, you may want to page back to Lesson 4 for more detailed steps with pictures.

If you are deploying to a server other than the Novell exteNd Application Server refer to the documentation for your server for deployment instructions.

1 Select **File>Deploy** from the menu.

2 Click **Deploy** on the deployment dialog.

Your browser will launch. The following instructions refer to the pages displayed by the browser during deployment.

3 Enter your app server **user name** and **password**, when prompted by the browser.

4 Click **Next**, when the browser displays the Deployment - Administrator Sign-On Page.

NOTE: If the user name and password are not filled in by the browser, manually enter your App Server user name and password.

The Deployment-Target database page is displayed.

5 Enter **SilverMaster50** in the database field.

6 Click **Next**.

7 Cut and paste the **displayed file name** into the browser text window, as directed by the browser page.

8 Click **Finish**.

When the deployment is complete the browser will display a deployment completed message. After receiving this message proceed to the next step.

9 Enter

http://localhost/GetRecords/PatientResponseJSP?physician=SSpade in the text window of your browser.

You will see the output from the service displayed by the JSP.

EXERCISE 8-4: Create an XML Map Component that uses XML interchange

1 Select **XML Map** in the Category Pane.

2 **RMB>New.**

The Create a New XML Map Component dialog appears.

3 Enter **PatientInfoB2bXMLI** in the Name textfield.

4 Click **Next**.

5 Select **patientrecords** from the Template Category dropdown list for the Input.

6 Select **PatientRecRequest** from the Template Name dropdown list for the Input

7 Select **patientrecords** from the Template Category dropdown list for the Output.

8 Select **PatientRecResponse** from the Template Name dropdown list for the Output.

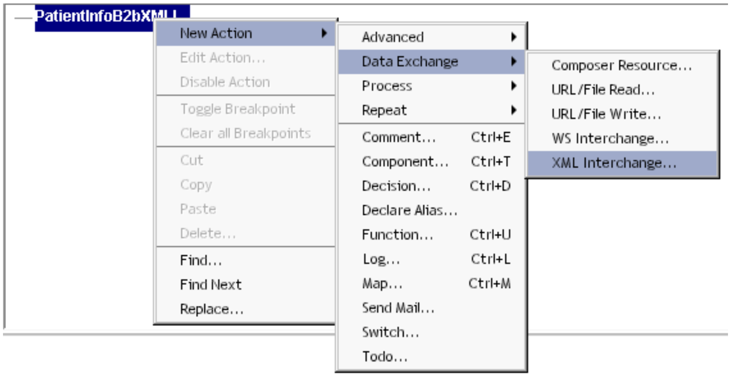
9 Click **Next**.

You won’t be using temp or fault documents in this component.

10 Click **Finish.**

11 Highlight the **PatientInfoB2bXMLI** component in the Action Model.

12 **RMB>New Action>Data Exchange>XML Interchange**



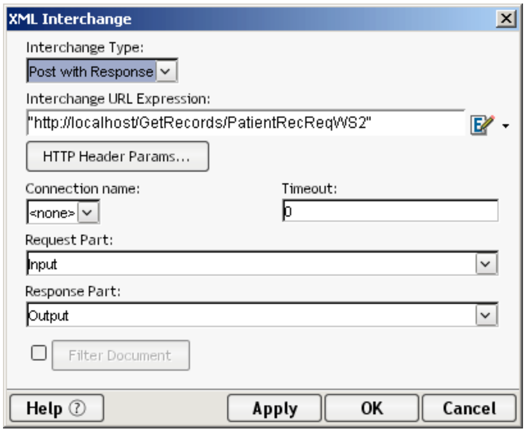
The XML Interchange Dialog appears.

13 Select **Post with Response** from the Interchange Type dropdown list.

14 Select **Input** from the Request Part dropdown list.

15 Select **Output** from the Response Part dropdown list.

16 Enter **"http://localhost/GetRecords/PatientRecReqWS2",** including quotes in the Interchange URL Expression textfield.



XML Interchange

Interchange Type: Post with Response

Interchange URL Expression: "http://localhost/GetRecords/PatientRecReqWS2"

Connection name: <none>

Timeout: 0

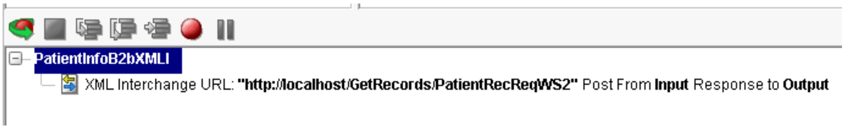
Request Part: Input

Response Part: Output

□ Filter Document

17 Click **OK**.

The interchange action is added to the component action model.



PatientInfoB2bXMLI

XML Interchange URL: **"http://localhost/GetRecords/PatientRecReqWS2"** Post From **Input** Response to **Output**

18 Select **File**>**Save** from the menu.

EXERCISE 8-5: Modify the Deployment Component for the XML Interchange.

NOTE: The Deployment xObject is supported only in Novell exteNd 5 Enterprise Edition (or Composer Enterprise Edition standalone). If you are using Professional Edition, you will not be able to create Deployment xObjects in Composer and should skip this section. (You can, however, deploy your project manually, using exteNd Director. Consult the Director documentation and/or the Deployment chapter of the *Composer User’s Guide* for more information.)

The current deployment of the patient record request web service expects parameters of the type Params(URL/Form). The XML Interchange uses XML documents as it method of passing parameters. You will need to modify the deployment component. You will also create a servlet of type XML(HTTP/Post), which expects input as an XML document.

1 Select **Deployment** in the Category Pane.

2 Select **GetRecords** in the Instance Pane.

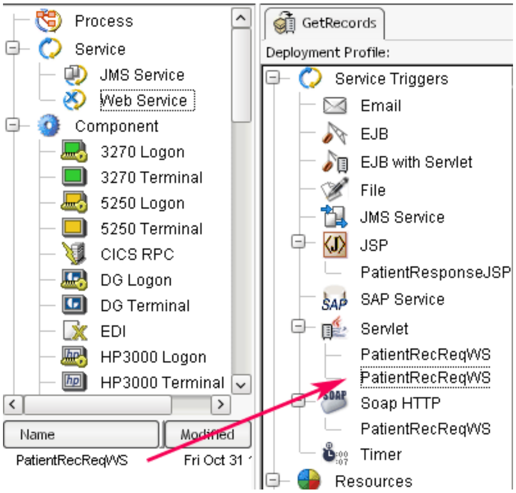
You will need to add an additional URL for the service prior to deployment. This will avoid a name collision with your previously deployed version of web service.

3 Double click on **GetRecords** in the Instance Pane, to open the component.

4 Select **Web Service** in the Category Pane.

5 Highlight **PatientRecReqWS** in the Instance Pane.

6 Drag and Drop a second copy of **PatientRecReqWS** onto the servlet icon under Service Triggers in the Deployment Profile.

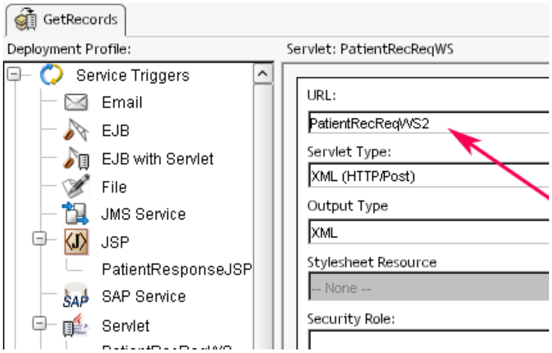


7 Enter **PatientRecReqWS2** in the URL field.

The URL must be a unique name for each servlet. The XML Servlet expects an XML document as its parameters.

8 Select **XML(HTTP/Post)** from the Servlet Type dropdown list in the servlet properties sheet.

9 Select **File>Save** from the menu.



Deployment Profile:

Servlet: PatientRecReqWS

URL: PatientRecReqWS2

Servlet Type: XML (HTTP/Post)

Output Type XML

Stylesheet Resource -- None --

Security Role:

EXERCISE 8-6: Deploy the Web Service with Servlet Type XML(HTTP/Post)

If you are deploying to a server other than the Novell exteNd Application Server refer to the documentation for your server for deployment instructions.

1 Select **File>Deploy** from the menu.

2 Click **Deploy** on the deployment dialog.

Your browser will launch. The following instructions refer to the pages displayed by the browser during deployment.

3 Enter your app server **user name** and **password**, when prompted by the browser.

4 Click **Next**, when the browser displays the Deployment - Administrator Sign-On Page.

The Deployment-Target database page is displayed.

5 Enter **SilverMaster50** in the database field.

6 Click **Next**.

7 Cut and paste the **displayed file name** into the browser text window, as directed by the browser page.

8 Click **Finish**.

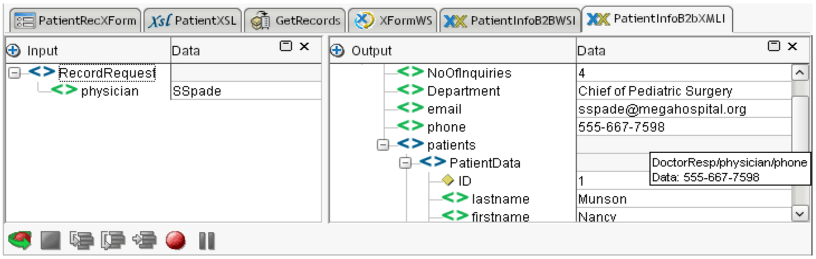
When the deployment is complete the browser will display a deployment completed message. After receiving this message proceed to the next step.

9 Return to **Composer**.

10 Select the **PatientInfoB2bXMLI** tab.

11 Select **Component>Execute** from the menu.

The service runs and returns data to the XML Map Components Output Part.



RecordRequest
physician SSpade

NoOfInquiries 4
Department Chief of Pediatric Surgery
email sspade@megahospital.org
phone 555-667-7598
patients
PatientData
ID 1
lastname Munson
firstname Nancy

DoctorResp/physician/phone
Data: 555-667-7598

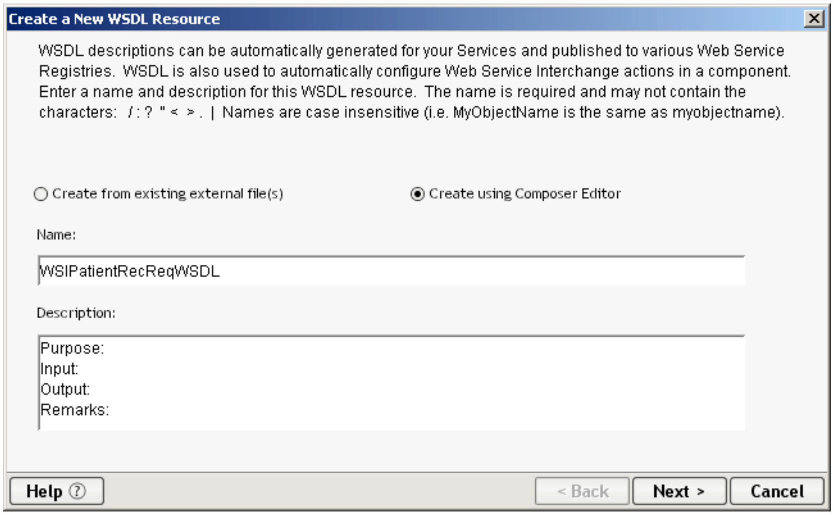
EXERCISE 8-7: Create a WSDL for the PatientRecResponse Web Service

1 Select **WSDL** from the Resource section of the Category Pane.

2 **RMB>New**.

3 Select the **Create using Composer Editor** radio button.

4 Enter **WSIPatientRecReqWSDL** in the Name textfield.



Create a New WSDL Resource

WSDL descriptions can be automatically generated for your Services and published to various Web Service Registries. WSDL is also used to automatically configure Web Service Interchange actions in a component. Enter a name and description for this WSDL resource. The name is required and may not contain the characters: / : ? " < > . | Names are case insensitive (i.e. MyObjectName is the same as myobjectname).

○ Create from existing external file(s) ● Create using Composer Editor

Name: WSIPatientRecReqWSDL

Description:

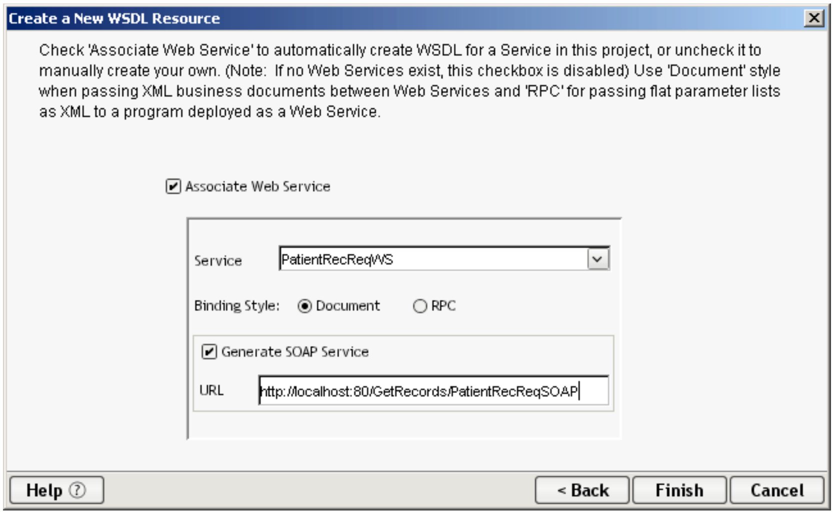
Purpose:
Input:
Output:
Remarks:

5 Click **Next**.

6 Select **PatientRecReqWS** from the Service dropdown list.

7 Select the **Generate SOAP Service** checkbox.

8 Enter **http://localhost:80/GetRecords/PatientRecReqSOAP** in the URL field.



Create a New WSDL Resource

Check 'Associate Web Service' to automatically create WSDL for a Service in this project, or uncheck it to manually create your own. (Note: If no Web Services exist, this checkbox is disabled) Use 'Document' style when passing XML business documents between Web Services and 'RPC' for passing flat parameter lists as XML to a program deployed as a Web Service.

☑ Associate Web Service

Service: PatientRecReqWS

Binding Style: ● Document ○ RPC

☑ Generate SOAP Service

URL: http://localhost:80/GetRecords/PatientRecReqSOAP

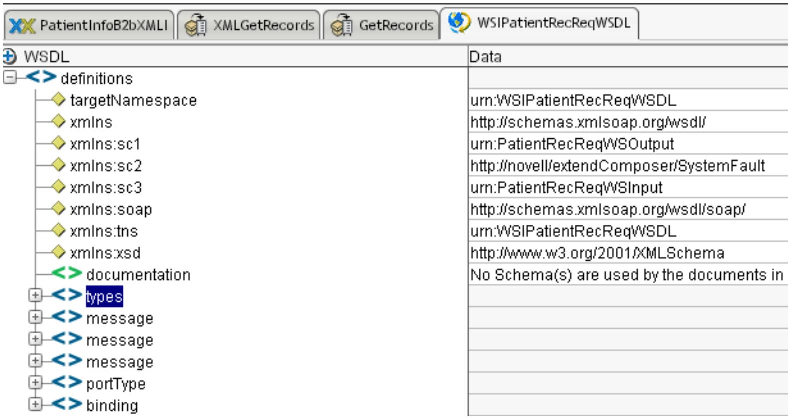
9 Click **Finish**.

A message dialog appears informing you that Composer has created element types of xsd:string in the WSDL.

10 Click **OK**.

The WSDL is created and opened in the component editor.

11 Select **File>Save** from the menu.

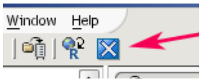


WSDL	Data
definitions	
targetNamespace	urn:WSIPatientRecReqWSDL
xmlns	http://schemas.xmlsoap.org/wsdl/
xmlns:sc1	urn:PatientRecReqWSOutput
xmlns:sc2	http://novell/extendComposer/SystemFault
xmlns:sc3	urn:PatientRecReqWSInput
xmlns:soap	http://schemas.xmlsoap.org/wsdl/soap/
xmlns:tns	urn:WSIPatientRecReqWSDL
xmlns:xsd	http://www.w3.org/2001/XMLSchema
documentation	No Schema(s) are used by the documents in
types	
message	
message	
message	
portType	
binding	

EXERCISE 8-8: Create XML Templates for the WSDL

You will need to have XML templates corresponding to message parts in the WSDL, in order to create working components. The templates will act as sample document that can be validated against the WSDL.

1 Click the **Create XML Templates** button on the Composer toolbar.

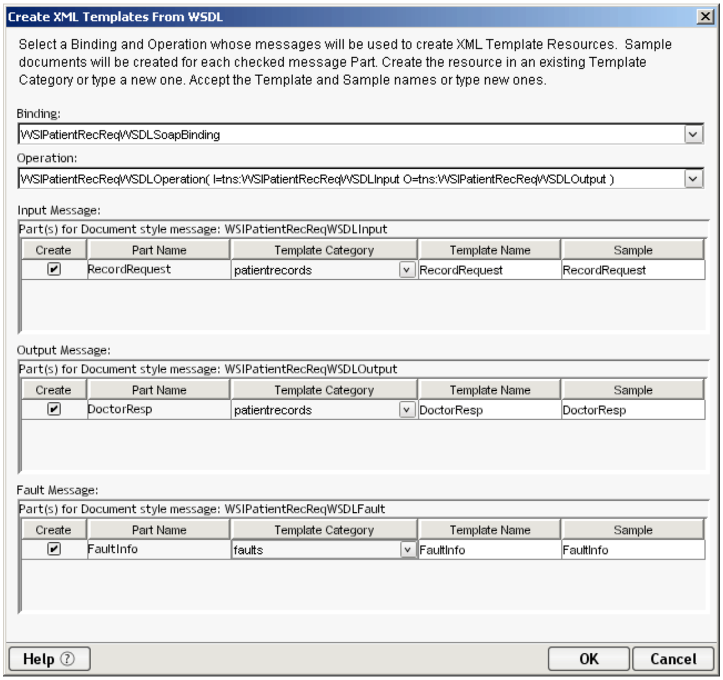


2 Select **patientrecords** as the Template Category from the dropdown list for the Input Message.

3 Select **patientrecords** as the Template Category from the dropdownl list for the Output Message.

4 Manually type **faults** in the Template Category for the Fault Message if it is not already populated by Composer.

Accept the defaults, Composer has created for the other fields.



Create XML Templates From WSDL

Select a Binding and Operation whose messages will be used to create XML Template Resources. Sample documents will be created for each checked message Part. Create the resource in an existing Template Category or type a new one. Accept the Template and Sample names or type new ones.

Binding: WSIPatientRecReqWSDLSoapBinding

Operation: WSIPatientRecReqWSDLOperation(I=tns:WSIPatientRecReqWSDLInput O=tns:WSIPatientRecReqWSDLOutput)

Input Message:

Part(s) for Document style message: WSIPatientRecReqWSDLInput

Create	Part Name	Template Category	Template Name	Sample
☑	RecordRequest	patientrecords	RecordRequest	RecordRequest

Output Message:

Part(s) for Document style message: WSIPatientRecReqWSDLOutput

Create	Part Name	Template Category	Template Name	Sample
☑	DoctorResp	patientrecords	DoctorResp	DoctorResp

Fault Message:

Part(s) for Document style message: WSIPatientRecReqWSDLFault

Create	Part Name	Template Category	Template Name	Sample
☑	FaultInfo	faults	FaultInfo	FaultInfo

5 Click **OK**.

Composer will return a message dialog “XML templates created.”

6 Click **OK**.

7 Select **File>Save ALL** from the menu.

If you look in the patientrecords folder under XML Template Categories you will see the newly created WSDL templates.

A new category “faults” has also been created, which contains the fault template.

EXERCISE 8-9: Add a Soap Trigger to the Deployment Component

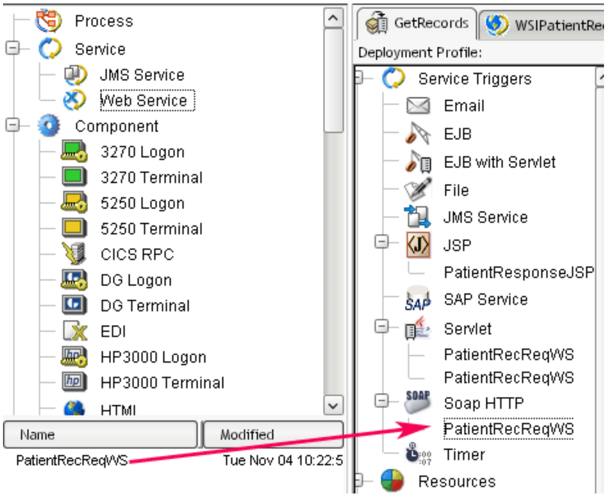
NOTE: The Deployment xObject is supported only in Novell exteNd 5 Enterprise Edition (or Composer Enterprise Edition standalone). If you are using Professional Edition, you will not be able to create Deployment xObjects in Composer and should skip this section. (You can, however, deploy your project manually, using exteNd Director. Consult the Director documentation and/or the Deployment chapter of the *Composer User's Guide* for more information.)

1 Select **Deployment** in the Category Pane.

2 Double click on **GetRecords** in the Instance Pane.

3 Select **Web Service** in the Category Pane.

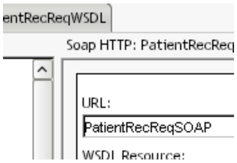
4 Drag the **PatientRecReqWS** from the Instance Pane and drop it on the SOAP HTTP trigger in the Deployment Profile pane.



The properties sheet for the SOAP HTTP:PatientRecReqWS appears.

You need to modify the URL so that you won't create a name collision with the servlet triggered version of the web service.

5 Enter **PatientRecReqSOAP** in the URL field in the properties sheet.



URL: PatientRecReqSOAP

6 Select **File>Save** from the menu to save your work.

EXERCISE 8-10: Deploy the Web Service with SOAP

If you are deploying to a server other than the Novell exteNd Application Server refer to the documentation for your server for deployment instructions.

1. Select **File>Deploy** from the menu.
2. Click **Deploy** on the deployment dialog.

   Your browser will launch. The following instructions refer to the pages displayed by the browser during deployment.
3. Enter your app server **user name** and **password**, when prompted by the browser.
4. Click **Next**, when the browser displays the Deployment - Administrator Sign-On Page.

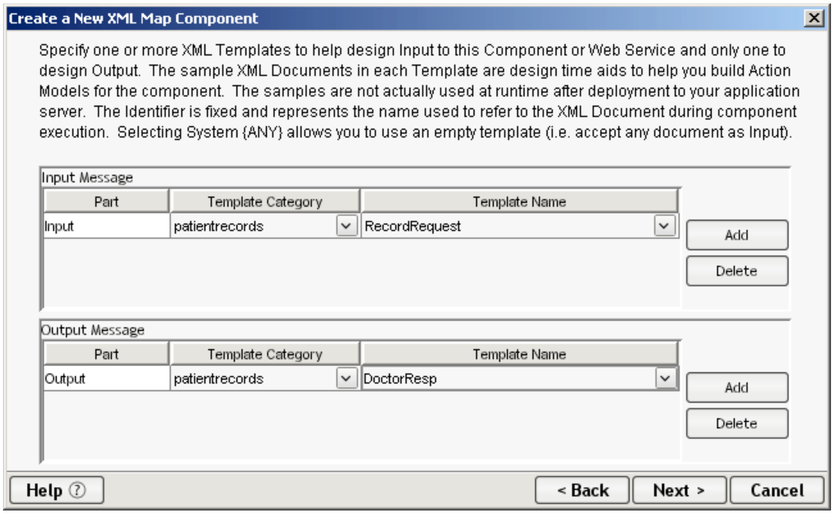
   The Deployment-Target database page is displayed.
5. Enter **SilverMaster50** in the database field.
6. Click **Next**.
7. Cut and paste the **displayed file name** into the browser text window, as directed by the browser page.
8. Click **Finish**.

   When the deployment is complete the browser will display a deployment completed message. After receiving this message proceed to the next step.
9. Return to **Composer**.

EXERCISE 8-11: Create an XML Map component that executes a WSInterchange action

You will create an XML Map component that uses the templates that you created from the WSDL in exercise 8-8.

1. Select the **XML Map Component** in the Category Pane.
2. **RMB>New**
3. Enter **PatientInfoB2BWSI** in the Name field
4. Click **Next**.
5. Select **patientrecords** as the Template Category for ***both*** the Input and Output parts.
6. Select **RecordRequest** as the Input Template Name.
7. Select **DoctorResp** as the Output Template Name.



Specify one or more XML Templates to help design Input to this Component or Web Service and only one to design Output. The sample XML Documents in each Template are design time aids to help you build Action Models for the component. The samples are not actually used at runtime after deployment to your application server. The Identifier is fixed and represents the name used to refer to the XML Document during component execution. Selecting System {ANY} allows you to use an empty template (i.e. accept any document as Input).

Input Message

Part	Template Category	Template Name
Input	patientrecords	RecordRequest

Output Message

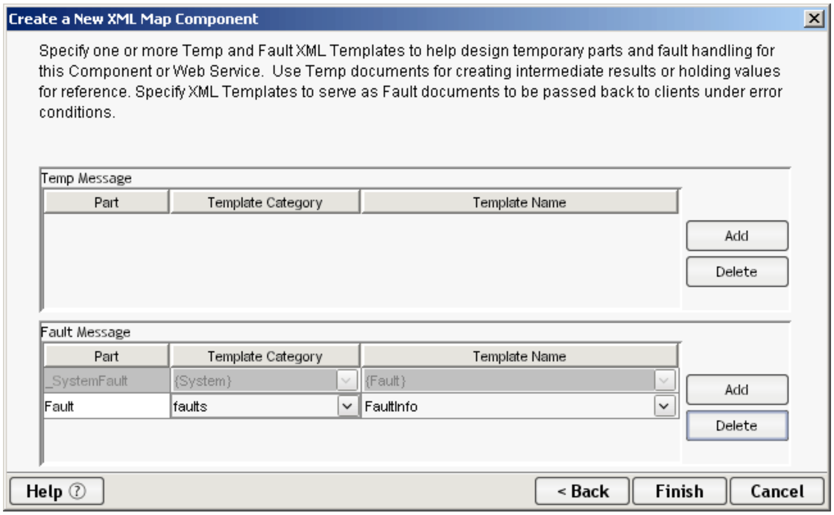
Part	Template Category	Template Name
Output	patientrecords	DoctorResp

8 Click **Next**.

9 Click the **Add** button in the Fault Message section of the dialog.

10 Select **faults** as the Template Category for the Fault Message.

11 Select **FaultInfo** as the Fault Template Name.



Specify one or more Temp and Fault XML Templates to help design temporary parts and fault handling for this Component or Web Service. Use Temp documents for creating intermediate results or holding values for reference. Specify XML Templates to serve as Fault documents to be passed back to clients under error conditions.

Temp Message

Part	Template Category	Template Name

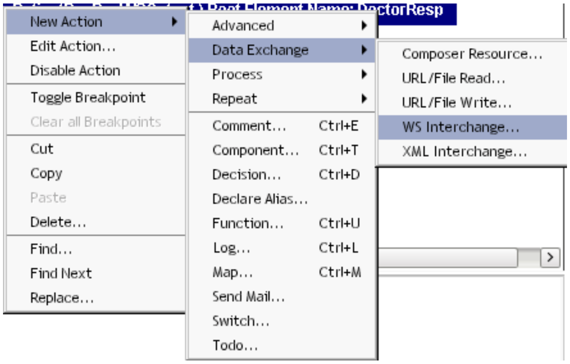
Fault Message

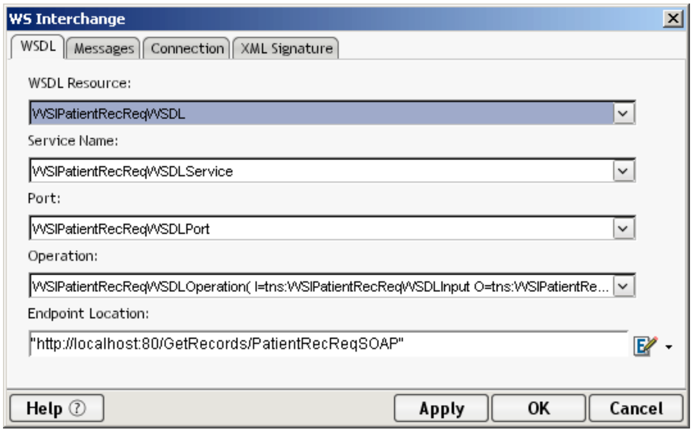
Part	Template Category	Template Name
_SystemFault	{System}	{Fault}
Fault	faults	FaultInfo

12 Click **Finish**.

13 Click on the **Apply NameSpaces** statement in the Action Model.

14 **RMB>New Action>Data Exchange>WS Interchange**.





WSDL Resource: WSIPatientRecReqWSDL

Service Name: WSIPatientRecReqWSDLService

Port: WSIPatientRecReqWSDLPort

Operation: WSIPatientRecReqWSDLOperation(I=tns:WSIPatientRecReqWSDLInput O=tns:WSIPatientRe...

Endpoint Location: "http://localhost:80/GetRecords/PatientRecReqSOAP"

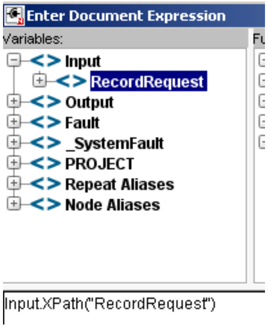
The WS Interchange dialog is populated by Composer, accept these value.

15 Click the **Messages** tab.

16 Click the **Expression Editor** button in the Expression list textfield for the input.

17 Expand the input node in the Variables pane and double click on the **RecordRequest** element.

The XPath expression appears in the editor pane.

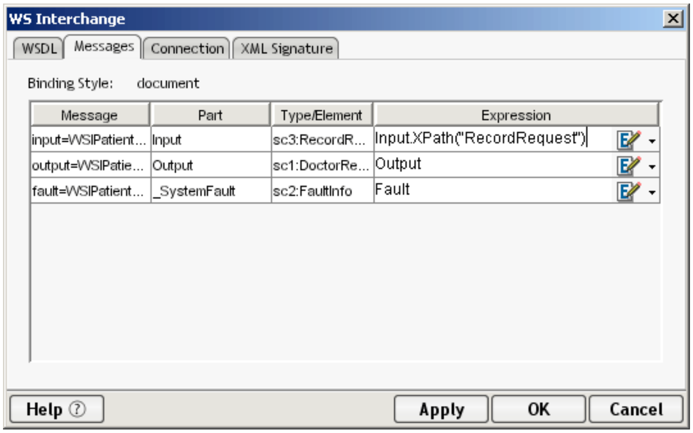


Input.XPath("RecordRequest")

18 Click **OK**.

19 Enter **Output** in the Expression list textfield for output.

20 Enter **Fault** in the Expression list textfield for fault.



Binding Style: document

Message	Part	Type/Element	Expression
input=WSIPatient...	Input	sc3:RecordR...	Input.XPath("RecordRequest")
output=WSIPatie...	Output	sc1:DoctorRe...	Output
fault=WSIPatient...	_SystemFault	sc2:FaultInfo	Fault

21 Click **OK**.

22 Select **File>Save** from the menu.

23 Double click on the **data** field of the **physician** element in the input.

24 Enter **SSpade** in the textfield of the Edit Data dialog.

25 Click **OK**.

26 Select **Component>Execute** from the menu.

The component executes invoking the web service via the WSInterchange action. You should see data in your Output part.

NOTE: You must have the Enterprise edition of exteNd Composer in order to complete the remaining exercises of the tutorial. If your installation of Composer is not an Enterprise edition skip to the summary section at the end of the lesson.

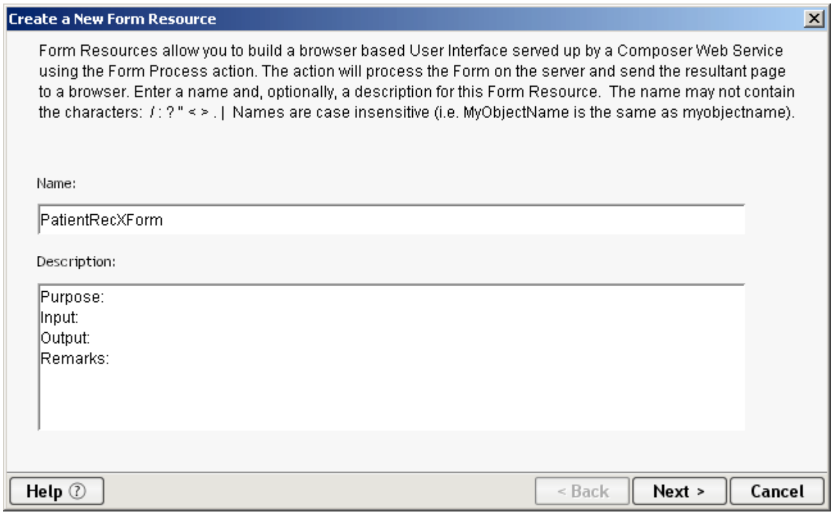
EXERCISE 8-12: Create an XForm for Physician Input

Composer will build an XML Form for you based on the instance data in the templates you specify.

1 Select the **Form** in the Category Pane.

2 **RMB>New**

3 Enter **PatientRecXForm** in the Name field.



Create a New Form Resource

Form Resources allow you to build a browser based User Interface served up by a Composer Web Service using the Form Process action. The action will process the Form on the server and send the resultant page to a browser. Enter a name and, optionally, a description for this Form Resource. The name may not contain the characters: / : ? " < > . | Names are case insensitive (i.e. MyObjectName is the same as myobjectname).

Name: PatientRecXForm

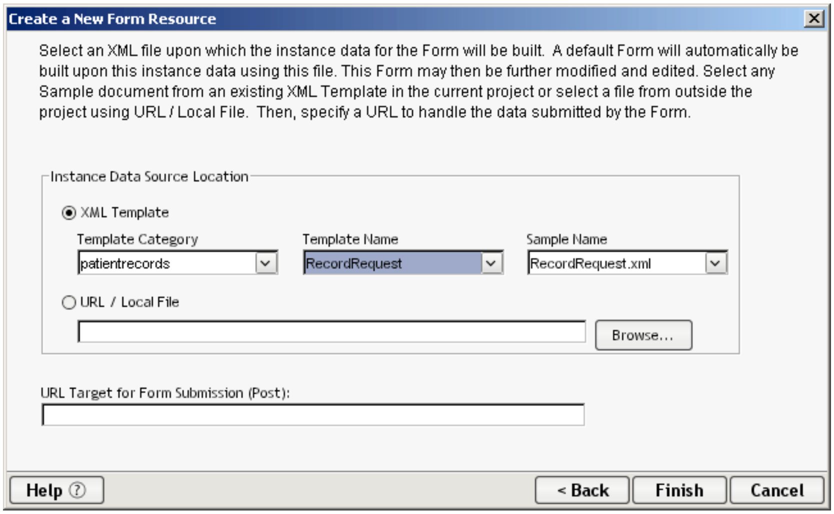
Description:
Purpose:
Input:
Output:
Remarks:

4 Click **Next**.

5 Select **patientrecords** as the XML Template Category from the dropdown list.

6 Select **RecordRequest** as the XML Template Name.

7 Select **RecordRequest.xml** as the Sample Name.



Create a New Form Resource

Select an XML file upon which the instance data for the Form will be built. A default Form will automatically be built upon this instance data using this file. This Form may then be further modified and edited. Select any Sample document from an existing XML Template in the current project or select a file from outside the project using URL / Local File. Then, specify a URL to handle the data submitted by the Form.

Instance Data Source Location

● XML Template

Template Category: patientrecords

Template Name: RecordRequest

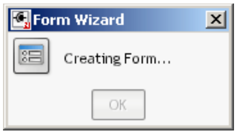
Sample Name: RecordRequest.xml

○ URL / Local File

URL Target for Form Submission (Post):

8 Click **Finish**.

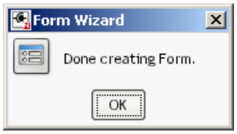
A “Creating Form” message dialog appears.



Form Wizard

Creating Form...

When Composer has completed creating the form, the message “Done creating Form” is displayed.

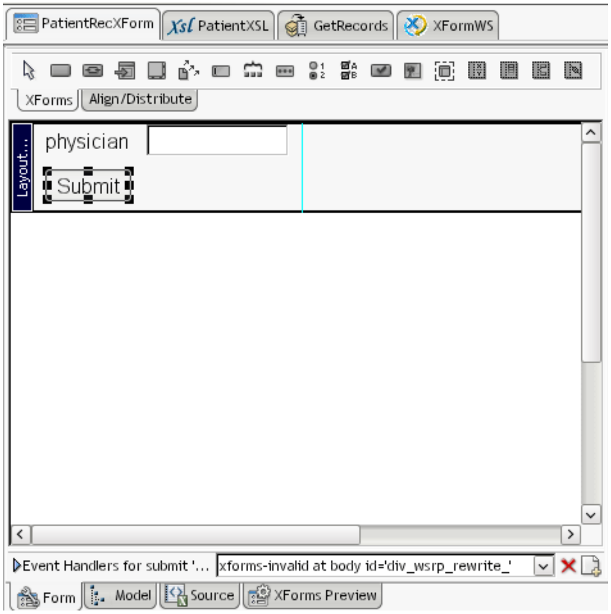


Form Wizard

Done creating Form.

9 Click **OK**.

The XForm Component editor opens with the Form layout editor displayed. Note the four tabs at the bottom of the editor window.

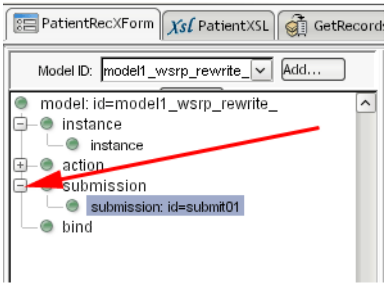


Event Handlers for submit '... xforms-invalid at body id='div_wsrp_rewrite_'

Next you will set the URL of the service that will be invoked when the submit button is clicked.

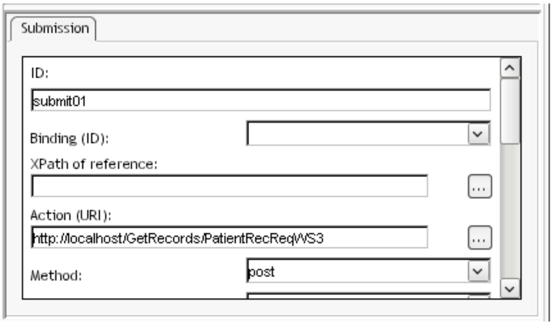
10 Select the **Model** tab in the component editor.

11 Expand the **submission** node in the editor.



12 Click on **submission id=submit01**.

The Submission property tab appears in the lower right corner of the editor. You will set the URL of the web service, and the method of passing parameters to the service in this tab.


Submission

ID: submit01

Binding (ID):

XPath of reference:

Action (URI): http://localhost/GetRecords/PatientRecReqWS3

Method: post

13 Enter **http://localhost/GetRecords/PatientRecReqWS3** in the Action URI field.

14 Select **post** from the Method dropdown list.

15 Select **File>Save** from the menu.

EXERCISE 8-13: Create a Web Service that uses the XForm

In this exercise you create a web service that will process the XForm.

1 Select **Web Service** in the Category Pane.

2 **RMB>New**.

3 Enter **XFormWS** in the Name field.

4 Click **Next**.

You can accept the default templates for the templates, the XForm contains the information about the templates. You will not be using the fault or temp parts for this web service or headers. Accept the defaults for these panels.

5 Click **Next**.

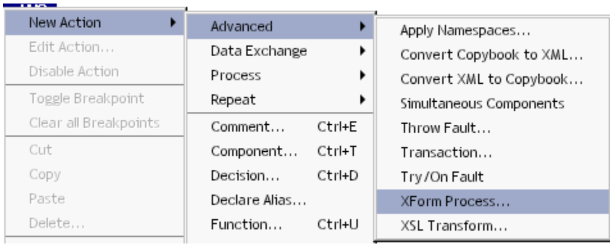
6 Click **Next**.

7 Click **Finish**.

The web service component editor appears. You will add an XForm Process action, that will use the form you created to process the input and output the result as html.

8 Highlight **XFormWS** in the component editor.

9 **RMB>New Action>Advanced>XFormProcess**.



The Form Process dialog appears.

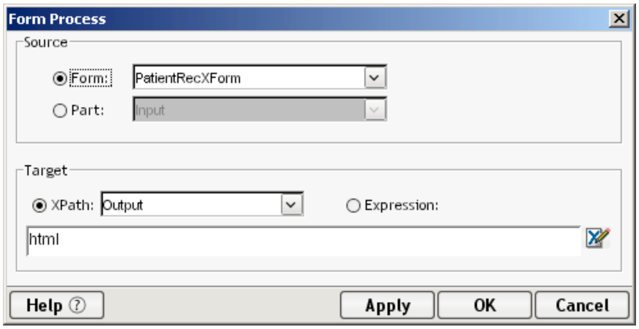
10 Select the **Form** radio button for the source.

11 Select **PatienRecXForm** from the source dropdown list.

12 Select the **XPath** radio button for the target.

13 Enter **html** in the target text box.

14 Click **OK**.



Form Process

Source

● Form: PatientRecXForm

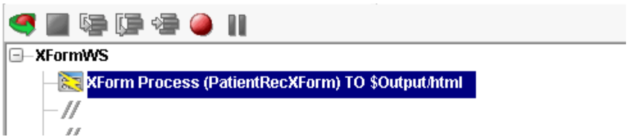
○ Part: Input

Target

● XPath: Output ○ Expression:

html

The XForm process action is added to the model.



XFormWS

XForm Process (PatientRecXForm) TO $Output/html

//

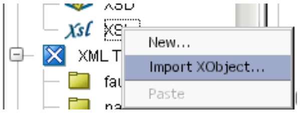
15 Select **File>Save** from the menu.

EXERCISE 8-14: Create the deployment profile for the XFormWS

In this exercise you will deploy both the XFormWS you just created, and the PatientRecReqWS. The PatientRecReqWS will be deployed as a servlet, which expects XHTML output by the XForm. You will also import a XSL style sheet that will format the output from the PatientRecReqWS in the browser.

1 Select **XSL** in the Category Pane.

2 **RMB>Import XObject**.

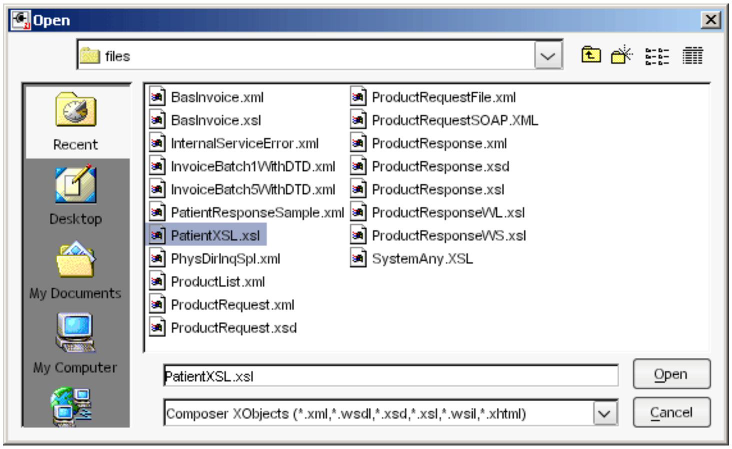


The Import XObject dialog appears.

3 Click the **Browse** button on the dialog.

4 Navigate to the ..**tutorial\files** directory.

This directory is located under where you installed Composer.



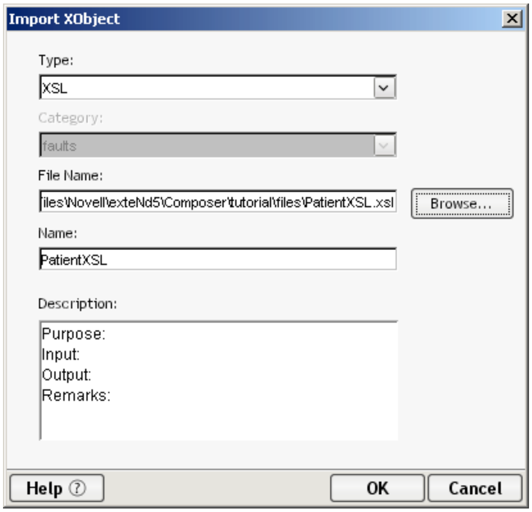
files

BasInvoice.xml
BasInvoice.xsl
InternalServiceError.xml
InvoiceBatch1WithDTD.xml
InvoiceBatch5WithDTD.xml
PatientResponseSample.xml
PatientXSL.xsl
PhysDirInqSpl.xml
ProductList.xml
ProductRequest.xml
ProductRequest.xsd
ProductRequestFile.xml
ProductRequestSOAP.XML
ProductResponse.xml
ProductResponse.xsd
ProductResponse.xsl
ProductResponseWL.xsl
ProductResponseWS.xsl
SystemAny.XSL

PatientXSL.xsl

Composer XObjects (*.xml,*.wsdl,*.xsd,*.xsl,*.wsil,*.xhtml)

5 Double click the file **PatientXSL.xsl** to select it.



Import XObject

Type: XSL

Category: faults

File Name: iles\Novell\exteNd5\Composer\tutorial\files\PatientXSL.xsl

Name: PatientXSL

Description:

Purpose:
Input:
Output:
Remarks:

6 Click **OK**.

PatientXSL is added to the Instance Pane.

7 Click on **Deployment** in the Category Pane.

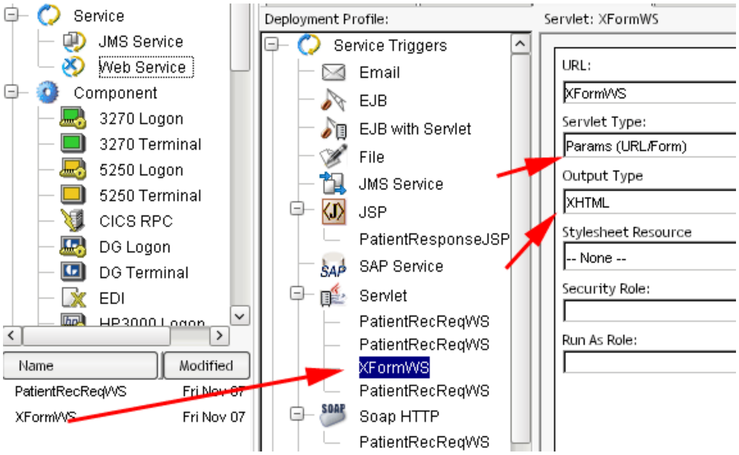
8 Double click on the **GetRecords** deployment object in the Instance Pane to open it.

9 Select **Web Service** in the Category Pane.

10 Drag the **XFormWS** from the Instance Pane and drop it on the **Servlet** section of the Service Triggers in the Deployment Profile pane.

11 Select **Params(URL/Form)** as the Servlet Type from the dropdown.

12 Select **XHTML** as the Output Type.



Name	Modified
PatientRecReqWS	Fri Nov 07
XFormWS	Fri Nov 07

Servlet: XFormWS

URL: XFormWS

Servlet Type: Params (URL/Form)

Output Type: XHTML

Stylesheet Resource: -- None --

Security Role:

Run As Role:

13 Drag **PatientRecReqWS** from the Instance Pane and drop it onto the **Servlet** section of the Service Triggers in the Deployment Profile pane.

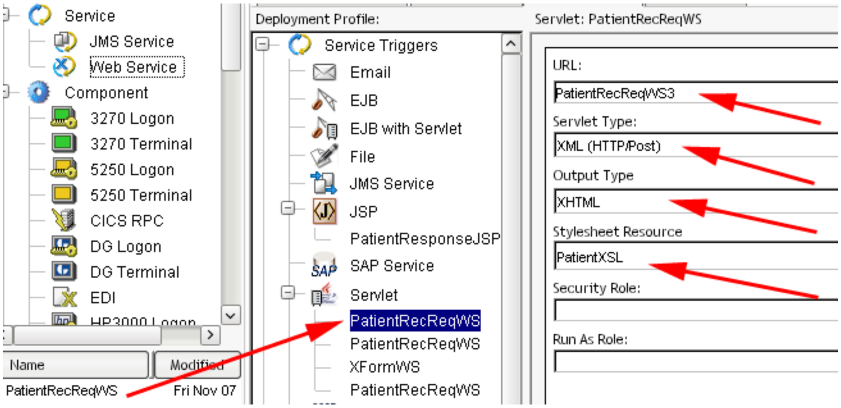
14 Enter **PatientRecReqWS3** in the URL field.

15 Select **XML (HTTP/Post)** as the Servlet Type from the dropdown list.

16 Select **XHTML** as the Output Type from the dropdown list.

17 Select **PatientXSL** from the dropdown list as the Stylesheet Resource.

18 Select **File>Save** from the menu.



URL: PatientRecReqWS3

Servlet Type: XML (HTTP/Post)

Output Type: XHTML

Stylesheet Resource: PatientXSL

Security Role:

Run As Role:

EXERCISE 8-15: Deploy the XForm Web Service

1 Select **File>Deploy** from the menu.

2 Click **Deploy** on the deployment dialog.

Your browser will launch. The following instructions refer to the pages displayed by the browser during deployment.

3 Enter your app server **user name** and **password**, when prompted by the browser.

4 Click **Next**, when the browser displays the Deployment - Administrator Sign-On Page.

The Deployment-Target database page is displayed.

5 Enter **SilverMaster50** in the database field.

6 Click **Next**.

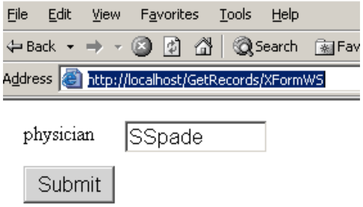
7 Cut and paste the **displayed file name** into the browser text window, as directed by the browser page.

8 Click **Finish**.

When the deployment is complete the browser will display a deployment completed message. After receiving this message proceed to the next step.

9 Enter **http://localhost/GetRecords/XFormWS** in your browser URL.

The XForm displays with physician field populated.


File Edit View Favorites Tools Help
Back Search Fav
Address http://localhost/GetRecords/XFormWS
physician
SSpade
Submit

10 Click the **Submit** button in the browser window.

11 The data is displayed in the browser window.

Summary of what you've done

- Created a JSP resource
- Deployed the PatientRecReqWS with a servlet trigger using a JSP
- Utilized XML Interchange as a consumer of the web service
- Created a WSDL for the PatientRecReqWS
- Deployed the PatientRecReqWS with a SOAP HTTP service trigger
- Utilized WSInterchange to consume the web service.
- Created an XForm.
- Deployed the XForm in a web service that processes the input and invokes the PatientRecReq web service.

What's next

Congratulations. You've completed the Novell exteNd Composer Tutorial. To learn more about Composer, consult your *Novell exteNd Composer User Guide* and the system help files. In addition, Novell offers classroom training on Composer, refer to the Novell website for more information. http://www.novell.com/training/train_product/extend.html

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Index