SYBASE®
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Tutorial: Mobile Business Object Development

Sybase Unwired Platform 1.5.2

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Contents

Introduction to Getting Started Tutorials

Getting started tutorials enable users of all levels to try Sybase® Unwired Platform with minimal setup. You can also use the tutorials to demonstrate system functionality and train users.

Overview of Getting Started Tutorials

The getting started tutorials demonstrate how to develop, deploy, and test mobile business objects, device applications, and message-based mobile workflow packages.

- Learn mobile business object (MBO) basics, and create a mobile device application:
  - *Tutorial: Mobile Business Object Development*
  - *Tutorial: BlackBerry Application Development using Device Application Designer*
  - *Tutorial: Windows Mobile Device Application Development using Device Application Designer*
- Create native mobile device applications:
  - *Tutorial: BlackBerry Application Development using Custom Development*
  - *Tutorial: iPhone Application Development using Custom Development*
  - *Tutorial: Windows Mobile Application Development using Custom Development*
- Create a mobile workflow package:
  - *Tutorial: Mobile Workflow Package Development*

The getting started tutorials demonstrate a cross section of basic functionality, which includes creating MBOs that can be used in replication-based or message-based synchronization; and using various Sybase Unwired WorkSpace development tools, independent development environments, and device types.

Table 1. Tutorial summary

Tutorials	Mobile business objects (MBOs)	Synchronization types	Development tools	Device types
Tutorial: Mobile Business Object Development	Create new MBOs	Replication-based	Sybase Unwired WorkSpace	N/A
Tutorial: BlackBerry Application Development using Device Application Designer	Reuse MBOs	Replication-based	Device Application Designer	BlackBerry

Tutorials	Mobile business objects (MBOs)	Synchronization types	Development tools	Device types
Tutorial: BlackBerry Application Development using Custom Development	Create new MBOs	Replication-based	Sybase Unwired WorkSpace	BlackBerry
Tutorial: iPhone Application Development using Custom Development	Create new MBOs	Message-based	Sybase Unwired WorkSpace	iPhone
Tutorial: Windows Mobile Application Development using Device Application Designer	Reuse MBOs	Replication-based	Device Application Designer	Windows Mobile
Tutorial: Windows Mobile Device Application Development using Custom Development	Create new MBOs	Message-based	Sybase Unwired WorkSpace	Windows Mobile
Tutorial: Mobile Workflow Package Development	Create new MBOs	Message-based	Mobile Workflow Forms Editor	Windows Mobile

Understanding the Unwired Platform Development Environment

Learn more from the getting started tutorials by understanding basic development environment concepts. Sybase Unwired Platform provides an Eclipse development environment.

Development in Eclipse

Sybase Unwired WorkSpace is a plug-in to your Eclipse development environment that provides tools for creating mobile applications.

Unwired WorkSpace includes back-end integration tools that connect Unwired Server to enterprise data sources, allowing you to create mobile business objects (MBOs) from the back-end business data model.

Developers can perform MBO code generation at any time and use this MBO model code along with the user interface code that users write in a native integrated development environment (IDE). This makes the code available to transition from the Unwired WorkSpace MBO development tool to the fully extensible and open development environment provided for device platforms from third-party vendors. Optionally, use the Device Application

Designer to create prototype device applications for BlackBerry and Windows Mobile devices.

Developers can use the Mobile Workflow Forms Editor to develop message-based mobile workflow packages for Windows Mobile and iOS devices.

Understanding Fundamental Mobile Development Concepts

Learn more from the getting started tutorials by understanding basic mobile development concepts.

Learn more about these concepts:

- *Fundamentals*
- *Sybase Unwired WorkSpace – Mobile Business Object Development*

Mobile Business Objects

Mobile business objects help form the business logic for mobile applications.

A mobile business object (MBO) is derived from a data source (such as a database server, Web service, or SAP® server). MBOs are deployed to Unwired Server, and accessed from mobile device application clients. MBOs include:

- Implementation-level details – metadata columns that include information about the data from a data source.
- Abstract-level details – attributes that correspond to instance-level properties of a programmable object in the mobile client, and map to data source output columns. Parameters correspond to synchronization parameters on the mobile client, and map to data source arguments. For example, output of a SQL SELECT query are mapped as attributes, and the arguments in the WHERE clause are mapped as synchronization parameters, so that the client can pass input to the query.

  MBO operations include parameters that map to data source input arguments. Operation parameters determine information a client passes to the enterprise information system (EIS).
- Relationships – defined between MBOs by linking attributes and parameters in one MBO, to attributes and parameters in another MBO.

You can define MBOs using either a top-down approach—first designing attributes and parameters, then binding them to a data source; or a bottom-up approach—first specifying a data source, then automatically generating attributes and parameters from it.

A mobile application package includes MBOs, roles, and data source connection mappings, and other artifacts that are delivered to the Unwired Server during package deployment.

Synchronization Methods

Developers can use either replication-based or message-based synchronization to move data and transactions between device application clients and Unwired Server.

The choice depends on the target device platform, application requirements, target platform, and the nature of data changes and activity between Unwired Server and clients, for example, mobile workflow forms always use message-based synchronization.

Unwired Server manages and maintains data freshness between multiple data sources and device application clients through synchronization.

Application Types

Sybase Unwired Platform supports two choices for application type. First is the native application type, and the other is the container-based business workflow type.

The native application model enables the developer to write custom code (C#, Java, or Objective-C, depending on the platform) to create a device application. The native application model is supported on BlackBerry, iOS, Windows Mobile, and Windows platforms. The choice depends on the functionality desired in the application, and the need to access third-party and platform-provided APIs. Optionally, use the Device Application Designer to create prototype device applications for BlackBerry and Windows Mobile devices.

The business workflow model offers a fast and simple way to build applications that support simple business workflows, such as approvals and requests. The workflow model is supported on iOS, Windows Mobile, and Windows platforms.

Data Sources

A data source is the enterprise information system where data is retrieved from and transactions are executed. A connection profile is a design-time connection to a data source. Connection profiles are created to specific data source by providing connection information such as host, port, login, and password among others. The connection profiles are used to define MBOs and operations, and mapped to existing, or used to create new, server connections when the package is deployed to Unwired Server..

Unwired Platform hides the interaction complexity with datasource-specific protocols, such as JDBC™ for database and SOAP for Web services.

Unwired Platform currently supports multiple EIS connection types. See *Supported Third-Party Software and Hardware* for information.

Switching Between Developer Profiles

Switch between basic and advanced developer profiles in the Mobile Application Diagram.

If you do not see an Unwired WorkSpace feature (wizard, property, or WorkSpace Navigator item) that you expect or need, switch to the advanced developer profile, or modify developer

profile settings. To use backend data sources other than those supplied by Sybase Unwired Platform, you must switch to the advanced developer profile to see the Server Connection Mapping page when deploying the Mobile Business Object package.

1. Right-click in the Mobile Application Diagram and select **Switch Developer Profile > Basic/Advanced**.
2. You can also select **Window > Preferences > Sybase, Inc. > Mobile Development > Developer Profile** to directly view or modify the developer profile preference settings. Basic is the default developer profile.

Task Flow

Sybase Unwired WorkSpace Eclipse tutorials explain how to develop, deploy, and run a mobile application.

Table 2. Eclipse tutorials

Task	Goals	Steps required to complete the task
Getting Started	• Install all required WorkSpace components and external resources. • Start Unwired Server. • Open the Mobile Development perspective, and become familiar with the views of the perspective, the Mobile Application Diagram, and the Device Application Designer.	• *Installing Sybase Unwired Platform* on page 9 • *Starting Unwired Server* on page 9 • *Starting Sybase Unwired WorkSpace* on page 10 • *Learning the Basics* on page 10 **Note:** These tasks are prerequisites for all the other tutorials. You need to perform them only once.
Developing Database Mobile Business Objects	• Create a mobile application project and a connection to the database. • Create two mobile business objects, and create a relationship between them. • Deploy the mobile business objects to Unwired Server.	• *Creating the SUP101 Mobile Application Project* on page 13 • *Creating the sampledb Connection Profile* on page 15 • *Creating Database Mobile Business Objects* on page 17 • *Creating a Relationship Between Mobile Business Objects* on page 20 • *Deploying the Database Mobile Business Objects* on page 23

Getting Started

Goal: Install and learn about Sybase Unwired Platform and its associated components.

The following tasks are required, unless otherwise noted, for all tutorials, but you need to perform them only once.

1. *Installing Sybase Unwired Platform* on page 9
2. *Starting Unwired Platform Services* on page 9
3. *Starting Sybase Unwired WorkSpace* on page 10
4. (optional) *Learning the Basics* on page 10

Installing Sybase Unwired Platform

Goal: Install Sybase Unwired Platform.

Install these Sybase Unwired Platform components:

- Data Tier
- Unwired Server
- Unwired WorkSpace
- Device Application Designer
- Windows Mobile .NET components (for developing device applications in Visual Studio)

If Unwired Platform is already installed and any of these components are missing:

1. Start the Sybase Unwired Platform installer.
2. Follow the instructions in the installation wizard.
3. Select the required components, and complete the installation.

For complete installation instructions, see the *Sybase Unwired Platform Installation Guide* and *Release Bulletin*.

Starting Unwired Platform Services

Goal: Start Unwired Server and the sample database.

In Windows, select **Start > Programs > Sybase > Unwired Platform<version> > Start Unwired Platform Services** .

Starting Sybase Unwired WorkSpace

Goal: Start Unwired WorkSpace.

1. In Windows, select **Start** > **Programs** > **Sybase** > **Unwired Platform<version>** > **Unwired WorkSpace**.

   Sybase Unwired WorkSpace opens, and displays the Welcome page with links to product information, and to the product.
2. To read more about Sybase Unwired WorkSpace concepts and tasks, select **Help** > **Help Contents** from the main menu.

Learning the Basics

Goal: Learn about Sybase Unwired WorkSpace and how to access help.

Prerequisites

Start Unwired WorkSpace.

Task

1. From the Welcome page, select any of the links to familiarize yourself with the Unwired WorkSpace environment.

   To close this page, click the **X**. You can reopen this page by selecting **Help** > **Welcome**.
2. Select **Start Development** to access the Sybase Unwired WorkSpace development environment. Look at the area (window or view) that you will be working in to access, create, define, and update mobile business objects (MBOs).

View	Description
WorkSpace Navigator	This view displays mobile application project folders, each of which contains all project-related resources in subfolders, including MBOs, data source references to which the MBOs are bound, personalization keys, and so on. Use this view to review and modify MBO-related properties.

View	Description
Enterprise Explorer	A window that provides functionality to connect to various enterprise back-end systems; for example, database servers, SAP servers, and Sybase Unwired Server.
Mobile Application Diagram	A graphical editor where you create and define mobile business objects. Use the Mobile Application Diagram to create MBOs (including attributes and operations), then define relationships with other MBOs. You can: • Create MBOs in the Mobile Application Diagram using Palette icons and menu selections – either bind or defer binding to a data source, when creating an MBO. For example, you may want to model your MBOs before creating the data sources to which they bind. This is sometimes called the top-down approach. • Drag items from Enterprise Explorer and drop them onto the Mobile Application Diagram to create the MBO – quickly creates the operations and attributes automatically based on the data source being dropped on the Mobile Application Diagram. This is sometimes called the bottom-up approach. Each new mobile application project generates an associated Mobile Application Diagram.
Palette	Access the Palette from the Mobile Application Diagram. It provides controls, such as the ability to create MBOs, add attributes and operations, and define relationships, by dragging and dropping the corresponding icon onto the Mobile Application Diagram or existing MBO.
Properties view	Select an object in the Mobile Application Diagram to display and edit its properties in the Properties view. You cannot create an MBO from the Properties view, but generally, most development and configuration is performed here.

View	Description
Outline view	Displays an outline of the file that is currently open in the editor area, and lists structural elements. The contents are editor-specific.
Problem view	Displays problems, errors, or warnings that you may encounter.

3. To access the online help, select **Help > Help Contents** from the main menu bar.
4. Expand any of the documents that appear in the left pane. Some documents are for Sybase Unwired Platform, while others are for the Eclipse development environment.

Developing Database Mobile Business Objects

Goal: Create two mobile business objects, each using a database as its data source; create a relationship between the two, and deploy them to Unwired Server.

Prerequisites

Complete *Getting Started* on page 9.

Task

Develop the database mobile business objects by completing the following tutorials, in order.

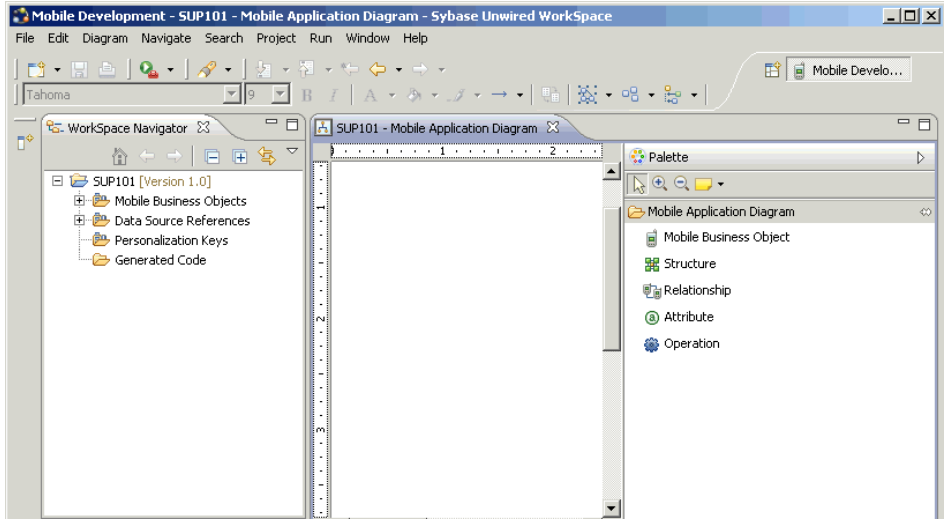
1. *Creating the SUP101 Mobile Application Project* on page 13
2. *Creating the sampledb Connection Profile* on page 15
3. *Creating Database Mobile Business Objects* on page 17
4. *Creating a Relationship Between Mobile Business Objects* on page 20
5. *Deploying the Database Mobile Business Objects* on page 23

Creating the SUP101 Mobile Application Project

Goal: Create a Mobile Application project to store the mobile business objects and resources you are developing.

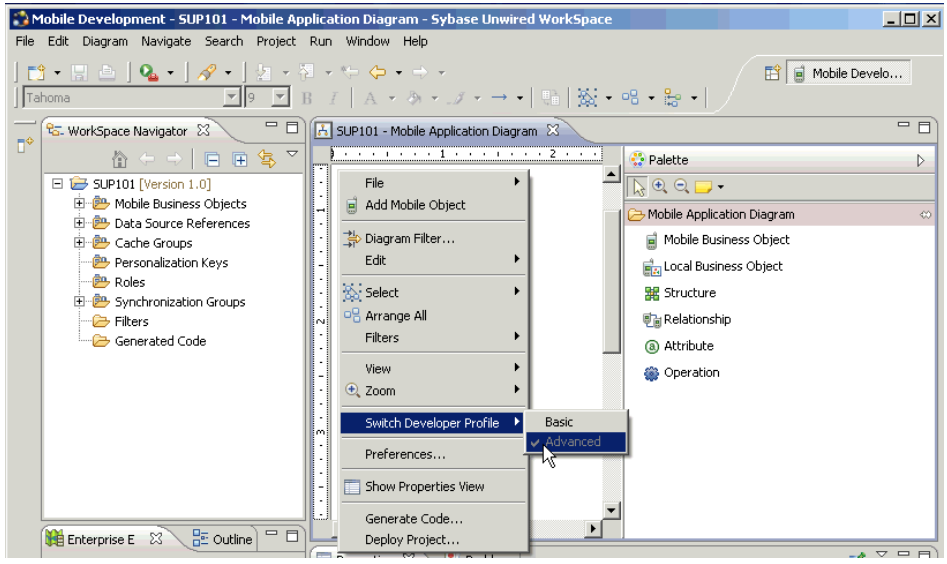
Several tutorials use the SUP101 Mobile Application project to store mobile business objects.

1. Select **File > New > Mobile Application Project** to create the project. If you do not find the Mobile Application Project, then select: **File >New >Other >Sybase >Mobile Development >Mobile Application Project**.
2. The New Mobile Application Project wizard appears. For Project Name, enter `SUP101` and click **Finish**.
   The project appears in the WorkSpace Navigator and the Mobile Application Diagram opens.



3. Right-click in the Mobile Application Diagram Panel and select **Switch developer profile > Advanced**.

   Unwired WorkSpace provides two developer profiles (basic and advanced). You should be able to complete the tutorial using the basic profile. However, as you explore Unwired WorkSpace features you may want to work in the Advanced profile.



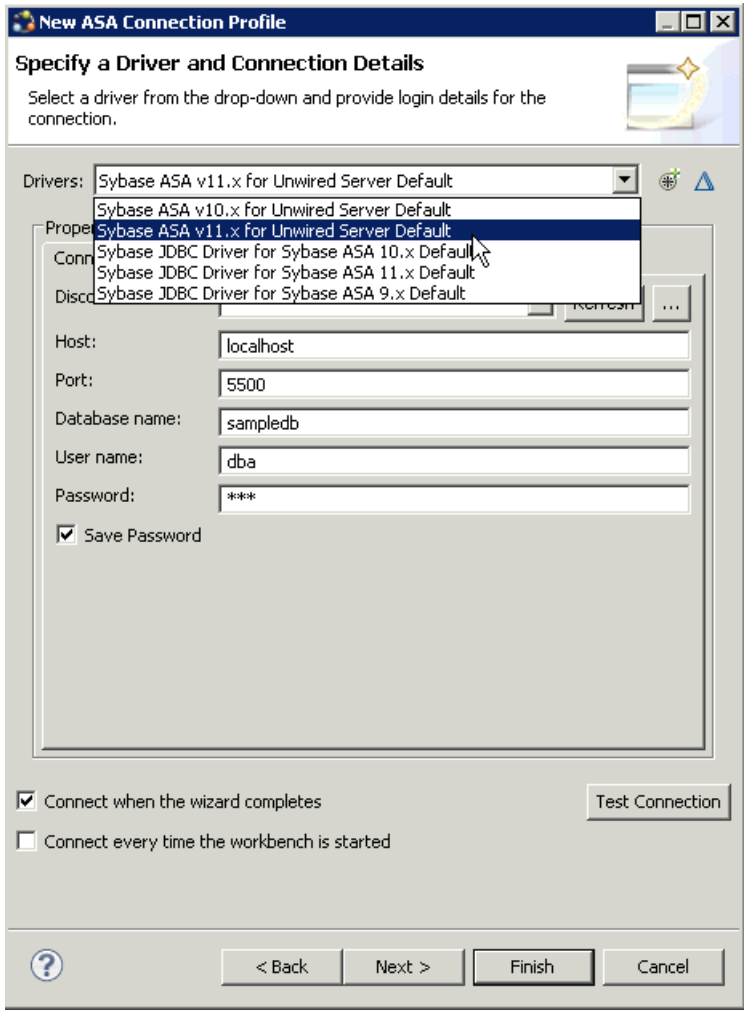
Creating the sampledb Connection Profile

Goal: Create a database connection profile and test the sample database connection.

Installing Sybase Unwired Platform also installs a sample database `sampledb`, which you can use to create and test mobile business objects (MBOs). Starting Sybase Unwired Platform Services automatically starts the database, depending on your license type. A default connection profile (My Sample Database) is included with the installation, and provides access to the `sampledb` database. This tutorial shows you how to create and use a new connection profile named `sampledb`.

This task is required for all tutorials, but you need to perform it only once. If the sampledb connection profile already exists, you do need not perform this task.

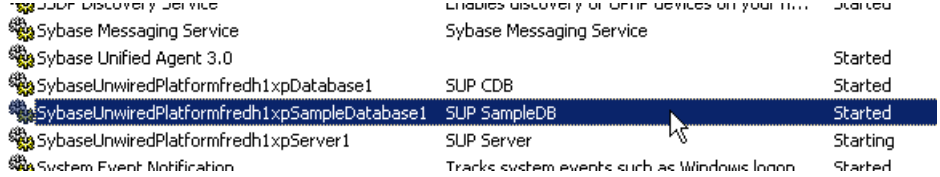
1. From the Enterprise Explorer, right-click the **Database Connections** folder and select **New** to open the Wizard Selection Page.
2. Select **Sybase ASA**, enter `sampledb` as the name, and click **Next**.
3. Select **Sybase ASA v11.x for Unwired Server Default** as the driver and keep the default settings, including `dba` as the **User name** and `SQL` as the **Password**. Select **Save Password**.



4. Click **Test Connection**.

   If Test Connection fails, verify Unwired Platform Services, including the sampledb database, are running.

   a) Select the Windows **Start > Settings > Control Panel** menu.
   b) Select **Administrative Tools**, then select **Services**.
   c) Depending on your installation options (for example, license type, whether or not you installed a cluster, and so on) determines which Sybase services are running.



Note: If the sampledb database is not running, you can install and start it from the command line. To install it, use the command **sampledb install auto/manual**. For example:

```
C:\Sybase\UnwiredPlatform\Servers\UnwiredServer\bin> sampledb
install auto
```

To start it from the command line, run the command **sampledb start**. For example:

```
C:\Sybase\UnwiredPlatform\Servers\UnwiredServer\bin> sampledb
start
```

5. In the Ping Succeeded message, click **OK**.
6. Click **Finish**.

View the sampledb connection profile from Enterprise Explorer by expanding the **Database Connections** folder.

Creating Database Mobile Business Objects

Goal: Create two mobile business objects, each from a database object.

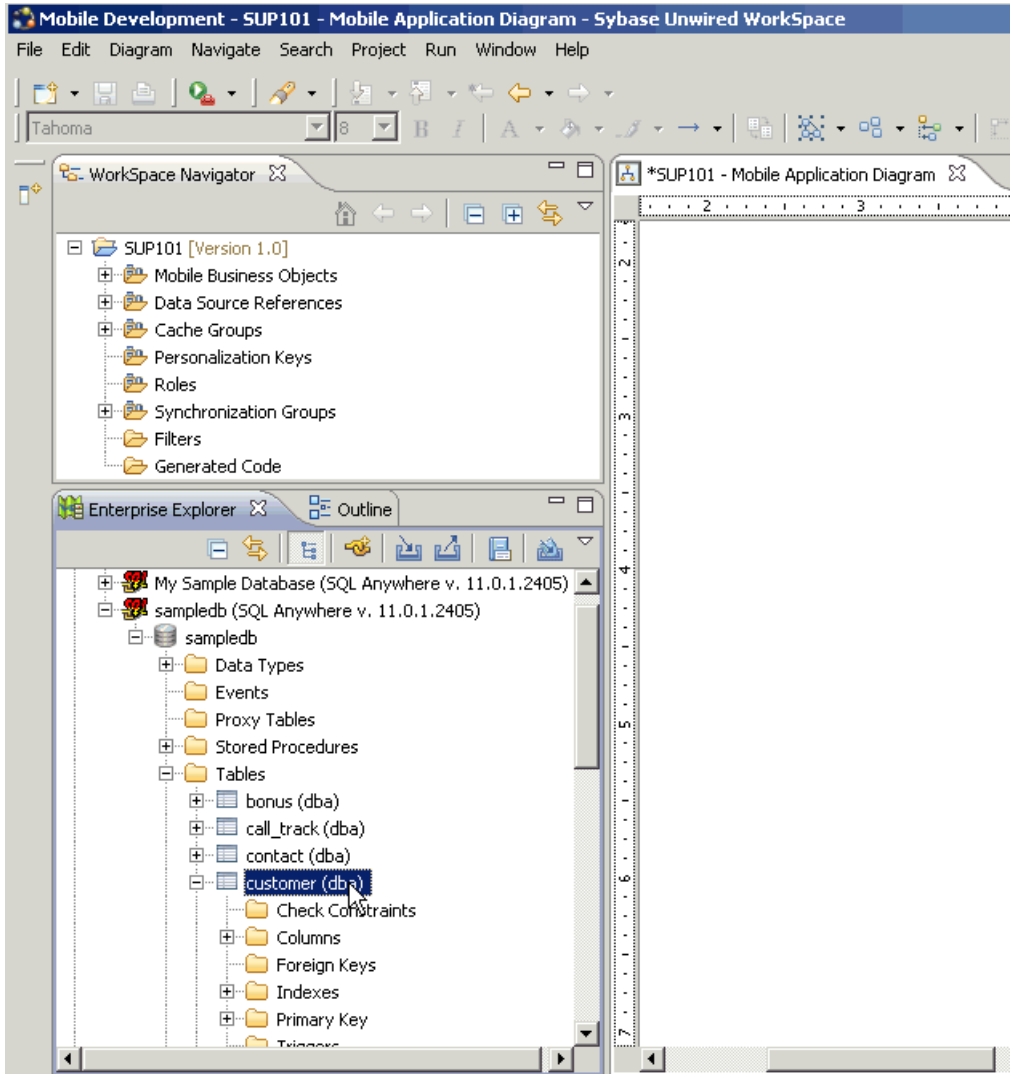
Prerequisites

Complete *Creating the sampledb Connection Profile* on page 15and *Creating the SUP101 Mobile Application Project* on page 13.

Task

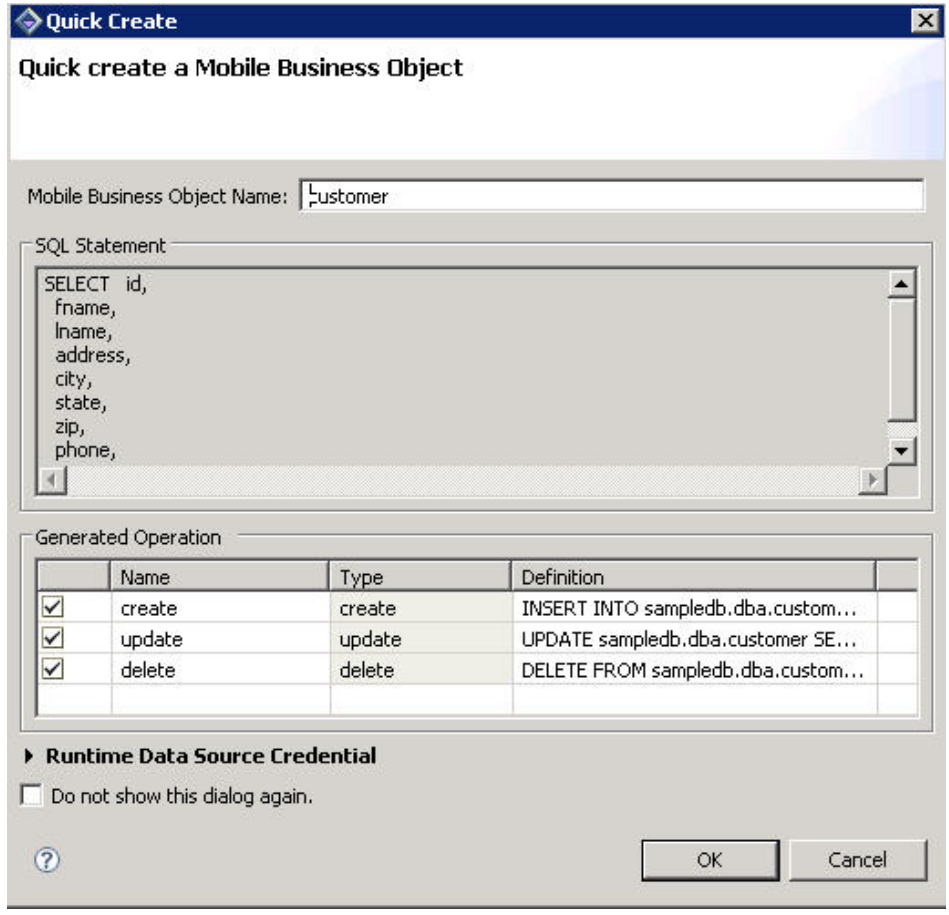
1. Open the SUP101 mobile application project if it is not already open:

   In WorkSpace Navigator, right-click on the SUP101 folder and select **Open in Diagram Editor**.
2. In the Enterprise Explorer, expand the Database folder, right-click **sampledb**, and select **Connect**, if not already connected. Enter SQL as the password if prompted.
3. Expand the sampledb database, then expand the **Tables** folder.
4. Select the customer table, while holding the mouse button drag the customer table onto the Mobile Application Diagram.



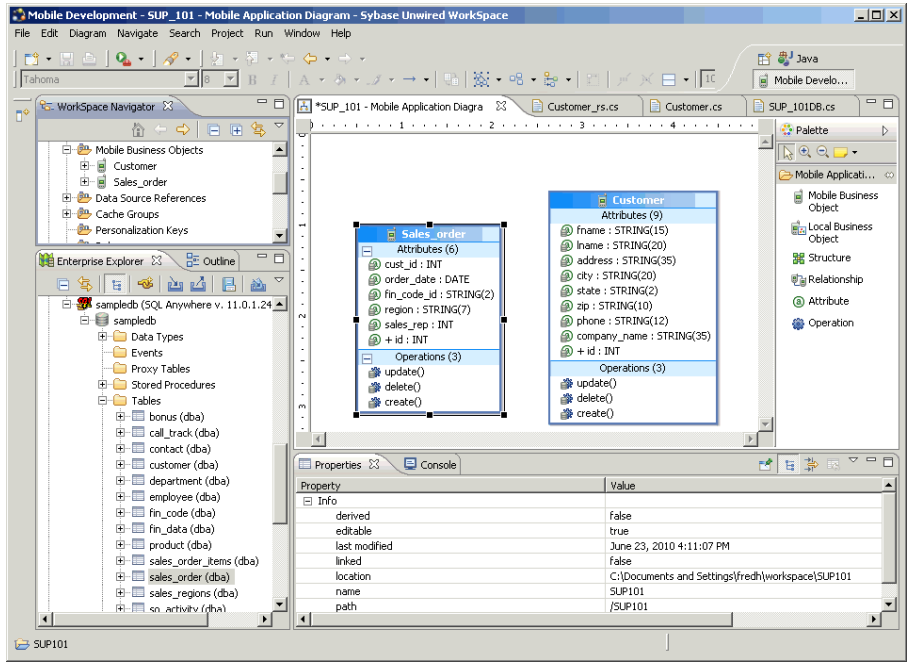
The Quick Create wizard launches.

5. In the Quick Create wizard, accept the defaults and click **OK**.



6. Create another MBO from the sales_order table:
   a) Drag the sales_order table from Enterprise Explorer, and drop it onto the Mobile Application Diagram.
   b) In the Quick Create wizard, accept the defaults and click **OK**.

      The customer and sales_order MBOs display on the Mobile Application Diagram.



7. Select **File** > **Save**.

Creating a Relationship Between Mobile Business Objects

Goal: Create a relationship between mobile business objects to associate related data and maintain data synchronization on the device.

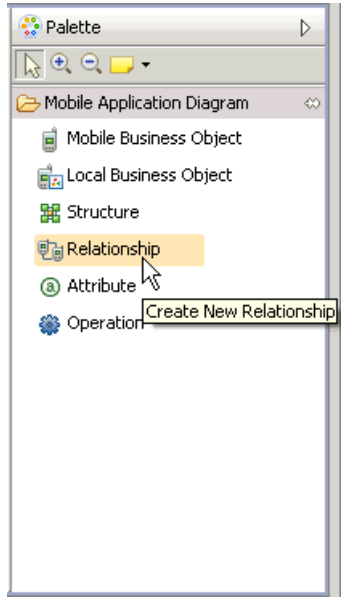
Prerequisites

Complete *Creating Database Mobile Business Objects* on page 17.

Task

In this tutorial, you create a relationship between the *customer* and *sales_order* mobile business objects (MBO).

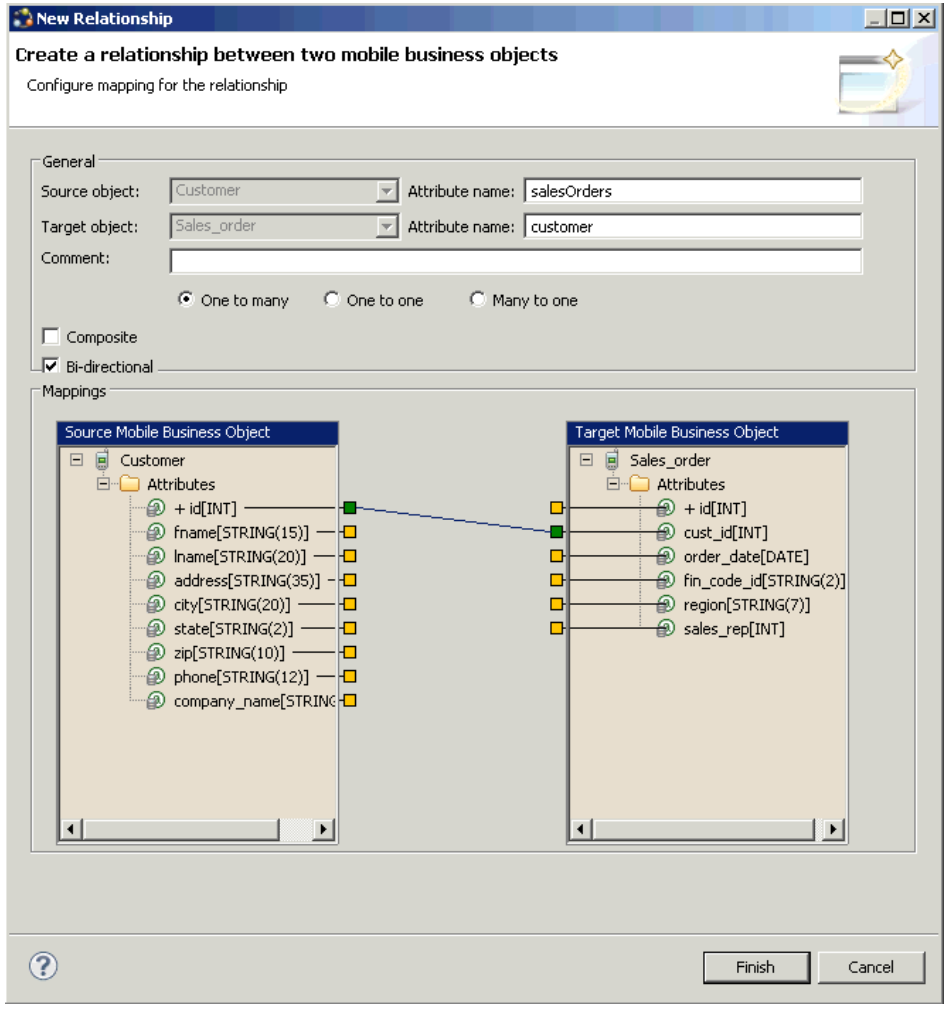
1. In the Palette, click **Relationship**.



2. Select the *customer* MBO and, keeping the mouse button pressed, drag the Relationship link to the *sales_order* MBO to establish the relationship link.

   The Relationship Creation wizard opens.

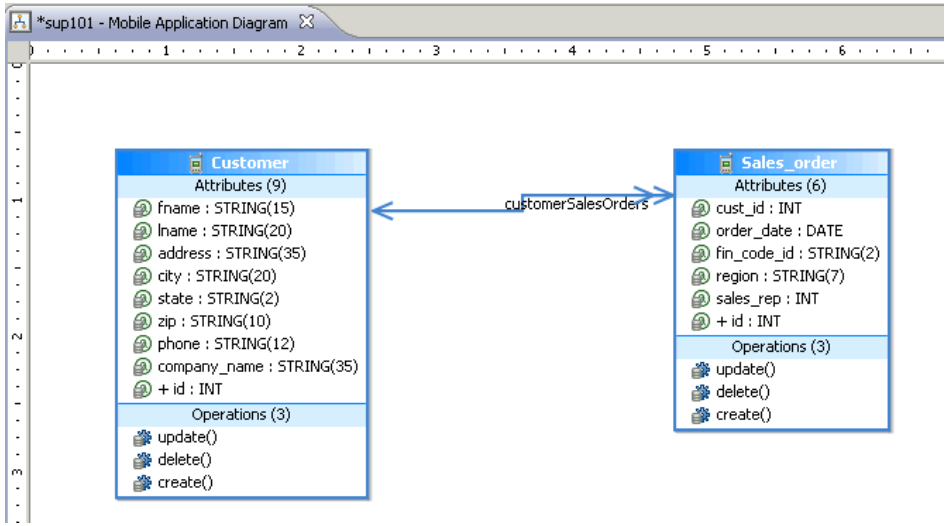
3. Accept the General default settings. In the Mappings section, select the **id** attribute in the **Source object** pane and **cust_id** in the **Target object** pane, or drag **id** from the Source Object to **cust_id** in the Target Object.



A line connects the two attributes.

4. Click **Finish**.

   The mobile application diagram now shows the link from the customer MBO to the sales_order MBO.



5. Select **File** > **Save**.

Deploying the Database Mobile Business Objects

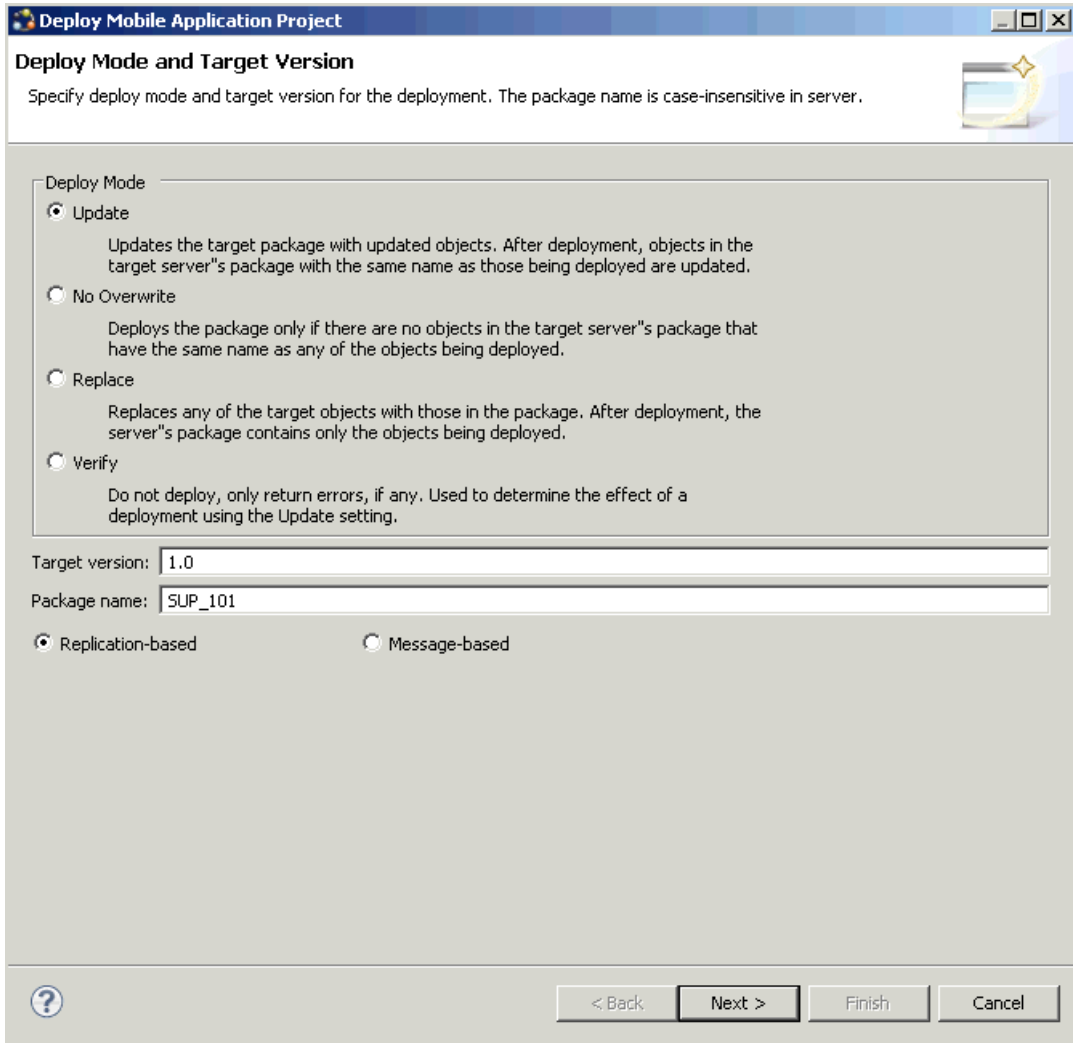
Goal: Deploy the project that contains the database mobile business objects to the server.

Prerequisites

- *Getting Started* on page 9
- *Creating Database Mobile Business Objects* on page 17

Task

1. Right-click in the SUP101 Mobile Application Diagram , and select **Deploy Project**. The Deploy Mobile Application Project wizard appears.

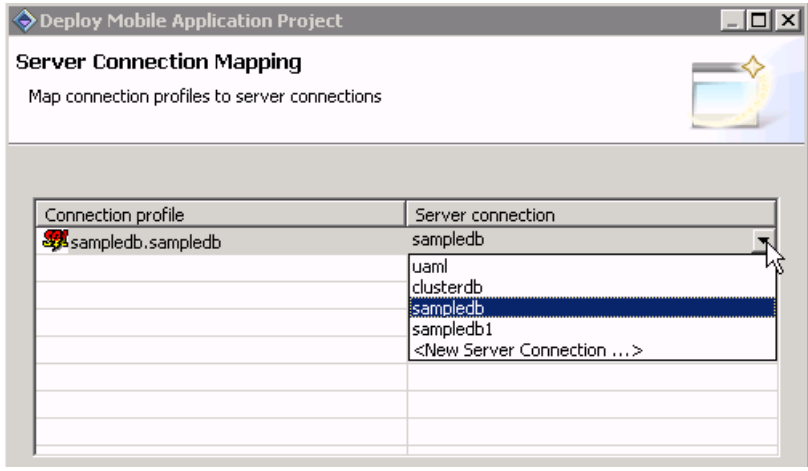


2. Accept the defaults (including **Replication-based**), and click **Next**.
   The Contents page appears.
3. Select the **customer** and **sales_order** MBOs and click **Next**.
   The Package Jars page appears.
4. Click **Next**.
   The Target Server page appears.
5. Select My Unwired Server from the list of available servers, then select **Refresh**or **Connect**.

   Accept the default Domain and Security configuration settings, and click **Next**.

6. If you have multiple server connections, the Server Connection Mapping page appears. Select the sampledb server connection from the drop-down list and click **Finish**.

   If the runtime database connection were on a remote machine, you would select **New Server Connection**, which allows you to create a connection from an existing template.

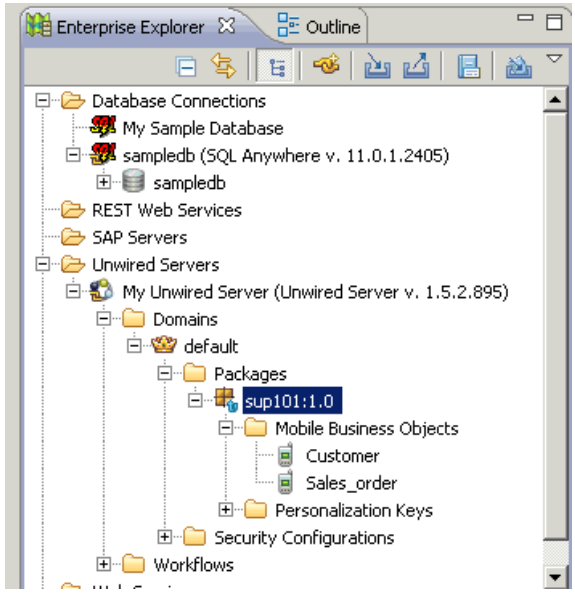


   The deployment progress window appears.

7. Click **OK** when the deployment status window appears.

   A status window indicates progress and a successful deployment.

8. Connect to Unwired Server and view the deployed project, by expanding **Domains > default > Packages**. The server package *SUP101:1.0* into which you deployed the MBOs appears in the Packages folder. The two MBOs, appear in the Mobile Business Objects folder.



The MBOs are now available for access by device applications or for deploying in a production environment. You will use this project in other getting started tutorials.

Learn More about Sybase Unwired Platform

Once you have finished, try some of the other samples or tutorials, or refer to other development documents in the Sybase Unwired Platform documentation set.

Getting Started Tutorials

Try out some of the other getting started tutorials to get a broad view of the development tools available to you.

Advanced Tutorials

Tutorials are available that demonstrate how to use some of Sybase Unwired Platform advanced features.

Check the Sybase Web site regularly for updates. Navigate to *Support > Product Documentation > Sybase Unwired Platform*, then select the most current version of the document.

Samples

Sample applications are fully developed, working applications that demonstrate the features and capabilities of Sybase Unwired Platform.

Check the Sybase Web site regularly for updates. Navigate to the Sybase Web site, then select *Products > Sybase Unwired Platform > Use tab*: *http://www.sybase.com/products/mobileenterprise/sybaseunwiredplatform?htab=USE*.

Online Help

See the online help that is installed with the product, or the Product Documentation Web site.

Check the Sybase Web site regularly for updates. Navigate to *Support > Product Documentation > Sybase Unwired Platform*, then select the most current version of the document.

Developer References

See the Developer References to learn about using the API to custom code device applications using the API.

- *Developer Reference for BlackBerry*
- *Developer Reference for iOS*
- *Developer Reference for Mobile Workflow Packages*
- *Developer Reference for Windows and Windows Mobile*

Check the Sybase Web site regularly for updates. Navigate to *Support > Product Documentation > Sybase Unwired Platform*, then select the most current version of the document.

Javadocs are also available in the installation directory.

Programmer References

See the Programmer References to learn how to use the Administration API and Server API to extend functionality.

- *Reference: Administration APIs* – integrate your own administrative tools with Unwired Platform to monitor and manage Unwired Platform.
- *Reference: Custom Development for Unwired Server* – customize some Unwired Server features.

Check the Sybase Web site regularly for updates. Navigate to *Support > Product Documentation > Sybase Unwired Platform*, then select the most current version of the document.

Javadocs are also available in the installation directory.

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