Tutorial: Android Object API Application Development

SAP Mobile Platform 2.3

Contents

SAP Mobile Platform Tutorials

The SAP® tutorials demonstrate how to develop, deploy, and test mobile business objects, device applications, and Hybrid App packages. You can also use the tutorials to demonstrate system functionality and train users.

- Learn mobile business object (MBO) basics, and use this tutorial as a foundation for the Object API application development tutorials:
  - *Tutorial: Mobile Business Object Development*

  Note: For all Object API tutorials, if you opt to use the Mobile Business Object example project instead of performing the Mobile Business Object Tutorial, you must deploy the mobile application project to SAP Mobile Server as a prerequisite.
- Create native Object API mobile device applications:
  - *Tutorial: Android Object API Application Development*
  - *Tutorial: BlackBerry Object API Application Development*
  - *Tutorial: iOS Object API Application Development*
  - *Tutorial: Windows Object API Application Development*
  - *Tutorial: Windows Mobile Object API Application Development*
- Create a mobile business object, then develop a hybrid app package that uses it:
  - *Tutorial: Hybrid App Package Development*

Getting Started with SAP Mobile Platform

Install and learn about SAP Mobile Platform and its associated components.

Complete the following tasks for all tutorials, but you need to perform them only once.

Installing SAP Mobile Platform

Install SAP Mobile SDK and SAP Mobile Platform Runtime.

Before starting this tutorial, install all the requisite SAP Mobile Platform components. See the SAP Mobile Platform documentation at *http://sybooks.sybase.com/sybooks/sybooks.xhtml?id=1289&c=firsttab&a=0&p=categories*:

- *Release Bulletin*
- *Installation Guide for SAP Mobile SDK*
- *Installation Guide for Runtime*

1. Install these SAP Mobile Platform Runtime components:
   - Data Tier (included with single-server installation)
   - SAP Mobile Server
2. Install SAP Mobile SDK, which includes:
   - Development support for native Object API and OData SDK applications, as well as HTML5/JS Hybrid Apps.
   - SAP Mobile WorkSpace, the Eclipse-based development environment for MBOs and Hybrid Apps.

Starting SAP Mobile Platform Services

Start SAP Mobile Server, SAP Control Center, the sample database, the cache database (CDB), and other essential services.

The way in which you start SAP Mobile Platform Services depends on the options you selected during installation. You may need to manually start SAP Mobile Platform Services.
Select **Start > (All) Programs > SAP > Mobile Platform > Start SAP Mobile Platform Services**.
The SAP Mobile Platform Services enable you to access the SAP Mobile Platform runtime components and resources.

Starting SAP Mobile WorkSpace

Start the development environment, where you can create mobile business objects (MBOs), create connection profiles and manage SAP Mobile Server connections, develop Hybrid Apps, and generate Object API code.
Select **Start > (All) Programs > SAP > Mobile Platform > Mobile WorkSpace 2.3**.
The SAP Mobile WorkSpace opens in the Mobile Development perspective. The Welcome page displays links to the product and information.

Next

To read more about SAP Mobile WorkSpace concepts and tasks, select **Help > Help Contents**.

Connecting to SAP Control Center

Open SAP Control Center to manage SAP Mobile Server and its components.

From SAP Control Center, you can:

- View servers and their status
- Start and stop a server
- View server logs
- Deploy a mobile application package
- Register application connections
- Set role mappings
- Assign/Unassign a hybrid application to a device

For information on configuring, managing, and monitoring SAP Mobile Server, click **Help > Help Contents**.

1. Select **Start > (All) Programs > SAP > SAP Control Center**.

   Note: If SAP Control Center does not launch, make sure that the SAP Control Center service is started in the Windows Services dialog.
2. Log in by entering the credentials set during installation.

   SAP Control Center gives you access to the SAP Mobile Platform administration features that you are authorized to use.

Learning SAP Mobile WorkSpace Basics

SAP Mobile WorkSpace features are well integrated in the Eclipse IDE. If you are unfamiliar with Eclipse, you can quickly learn the basic layout of SAP Mobile WorkSpace and the location of online help.

- To access the online help, select **Help** > **Help Contents**. Some documents are for SAP Mobile WorkSpace, while others are for the Eclipse development environment.
- The Welcome page provides links to useful information to get you started.
  - To close the Welcome page, click **X** in the upper right corner of the page.
  - Reopen the Welcome page by selecting **Help** > **Welcome**.
  - To learn about tasks you must perform, select the **Development Process** icon.
- In SAP Mobile WorkSpace, look at the area (window or view) that you will use to access, create, define, and update mobile business objects (MBOs).

Window	Description
WorkSpace Navigator view	Use this view to create Mobile Application projects, and review and modify MBO-related properties. This view displays mobile application project folders, each of which contains all project-related resources in subfolders, including MBOs, datasource references to which the MBOs are bound, personalization keys, and so on.
Enterprise Explorer view	A view that provides functionality to connect to various enterprise information systems (EIS), such as database servers, SAP® back ends, and SAP Mobile Server.

Window	Description
Mobile Application Diagram	The Mobile Application Diagram is 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 datasource, when creating an MBO. For example, you may want to model your MBOs before creating the datasources to which they bind. This MBO development method is sometimes referred to as the top-down approach. • Drag and drop items from Enterprise Explorer to the Mobile Application Diagram to create the MBO – quickly creates the operations and attributes automatically based on the datasource artifact being dropped on the Mobile Application Diagram. Each new mobile application project generates an associated mobile application diagram.
Palette	The Palette is accessed from the Mobile Application Diagram and 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. While you cannot create an MBO from the Properties view, most development and configuration is performed here.
Outline view	Displays an outline of the active file and lists structural elements. The contents are editor-specific.

Window	Description
Problems view	Displays validation errors or warnings that you may encounter in addition to errors in the Diagram editor and Properties view. Follow warning and error messages to adjust MBO properties and configurations to avoid problems, and use as a valuable source for collecting troubleshooting information when reporting issues to Customer Service and Support.
Error Log view	Displays error log information. This is a valuable source for collecting troubleshooting information.

Developing an Android Application

Generate code for the Android platform, develop an Android device application using that code and sample files, and test the application's functionality on an emulator.

Prerequisites

Note: This tutorial was created using SAP Mobile Platform 2.3, Android SDK r21.0.1, ADT Plugin for Eclipse 21.0.0, and run on an Android 4.1.2 - API Level 16 target emulator. If you use a different version, some steps may vary.

1. Complete the tasks in *Getting Started with Mobile Platform*.
2. Either:
   - create the MBO project by completing *Tutorial: Mobile Business Object Development*, or
   - download and deploy the MBO SMP101 example project (complete project files) from the SAP® Community Network: *http://scn.sap.com/docs/DOC-8803*.

   Note: If you upgrade SAP Mobile SDK after completing the tutorial, you can convert the project to the current SDK by importing the earlier project into the SAP Mobile WorkSpace and then accepting the confirmation prompt.
3. (Optional) To use as a reference and copy source code when completing this tutorial, download the Android SMP 101 example project (source code only) from the SAP® Community Network: *http://scn.sap.com/docs/DOC-8803*.
4. Download the supported versions of the Android SDK and Android Development Tools (ADT).

   See the *Supported Hardware and Software* guide at *http://sybooks.sybase.com/sybooks/sybooks.xhtml*. Select the appropriate version of the SAP Mobile Platform document set.

Task

Create an Android native application that communicates with the mobile business objects that are deployed to SAP Mobile Server.

Installing the Android SDK

Install the Android SDK.

1. Confirm that your system meets the requirements at *http://developer.android.com/sdk/requirements.html*.
2. Download and install the supported version of the Android SDK starter package.

   See *Google Android Versions for Object API* in *Supported Hardware and Software* at *http://sybooks.sybase.com/sybooks/sybooks.xhtml?*

id=1289&c=firsttab&a=0&p=categories. Select the appropriate version of the SAP Mobile Platform document set.

3. Launch the Android SDK Manager and install the Android tools (SDK Tools and SDK Platform-tools) and the Android API.
4. Launch the **Android Virtual Device Manager**, and create an Android virtual device to use as your emulator.

Installing ADT in SAP Mobile WorkSpace

Install the supported version of Android Development Tools (ADT) in the SAP Mobile WorkSpace Eclipse environment.

See *Google Android Versions for Object API* in *Supported Hardware and Software* at *http://sybooks.sybase.com/sybooks/sybooks.xhtml?id=1289&c=firsttab&a=0&p=categories*. Select the appropriate version of the SAP Mobile Platform document set.

1. Start SAP Mobile WorkSpace, then select **Help** > **Install New Software**.
2. In the Available Software window, click **Add**.
3. In the Add Repository window, enter `ADT Plugin` for the name and `https://dl-ssl.google.com/android/eclipse/` for the location. Click **OK**.
4. In the Available Software window, select **Developer Tools**, then click **Next**.
5. In the Install Details window, you see a list of downloadable tools. Click **Next**.
6. Accept the license agreements, then click **Finish**.

   Note: If you see a security warning about the authenticity or validity of the software, click **OK**.

7. When the installation completes, restart SAP Mobile WorkSpace.
8. For first-time installations:
   a) In Welcome to Android Development, select **Use existing SDKs**, then browse to where the Android SDK is installed, by default, `C:\Program Files\Android\android-sdk`.
   b) Click **Next**.
9. Click **Finish**.

Generating Java Object API Code

Use the Generate Code wizard to generate object API code for the SMP101 mobile application project. Code generation creates the business logic, attributes, and operations for the mobile business objects (MBOs) in the project.

Prerequisites

- In Enterprise Explorer, you must be connected to both My Sample Database and My Mobile Server. Code generation fails if the server-side (runtime) enterprise information system (EIS) datasources referenced by the MBOs in the project are not running and available to connect to when you generate object API code.
- In WorkSpace Navigator, verify the Java Compiler level is set correctly:
  1. Select **Window** > **Preferences** > **Java** > **Compiler**.
  2. In the Compiler compliance level list, select **1.6** if it does not already appear.
  3. Click **Apply**, then **OK**.

Task

1. In SAP Mobile WorkSpace, open the **SMP101** mobile application project.

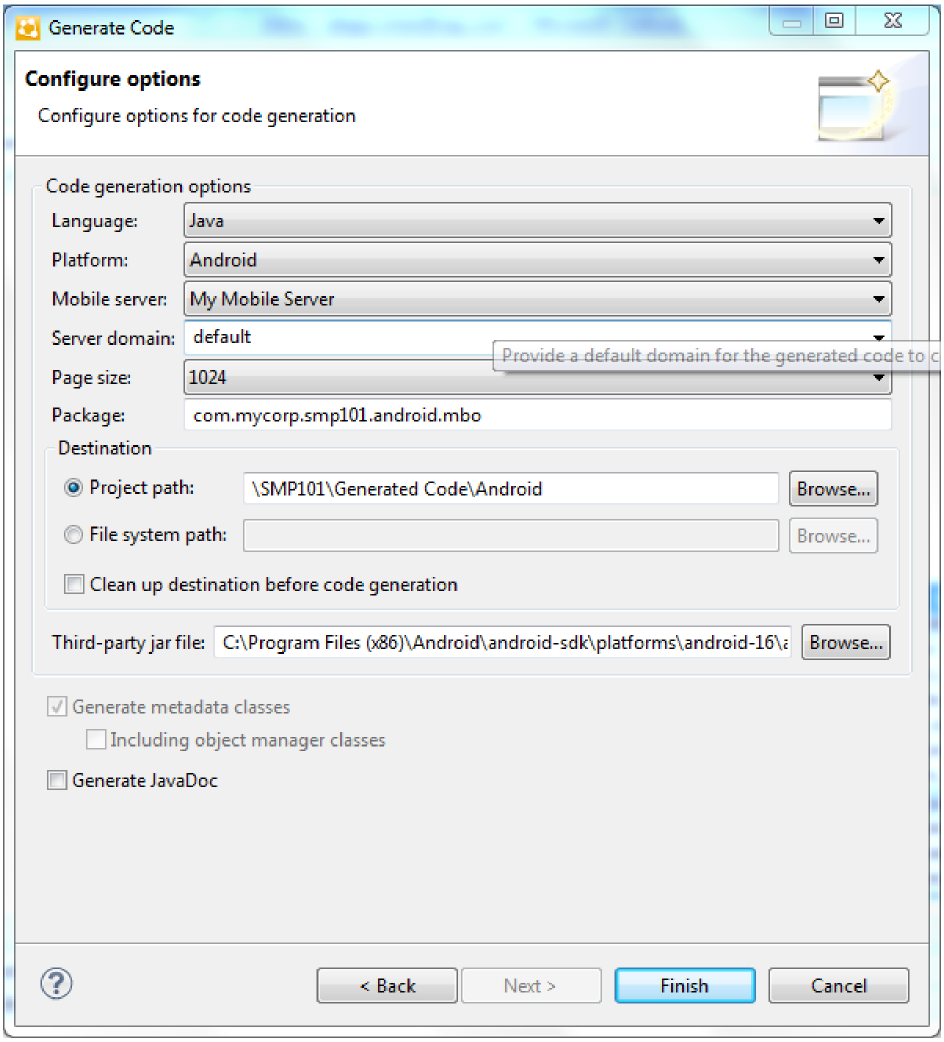
   In WorkSpace Navigator, right-click the **SMP101** folder and select **Open in Diagram Editor**.
2. In WorkSpace Navigator, expand **SMP101**. Under **Generated Code**, add a folder named `Android`.

   The `Generated Code` directory was created during the MBO tutorial.
3. Right-click anywhere in the SMP101 - Mobile Application Diagram and select **Generate Code**.
4. In the Generate Code wizard, click **Next** to continue without a configuration.
5. In the Select Mobile Business Objects window, select the **Customer** MBO, then click **Next**.

   Ignore any warning about unresolved mobile business object dependencies.
6. In the Configure options window, specify these values and click **Finish**.

Option	Description
Language	Select **Java**.
Platform	Select **Android**.
Mobile server	Select **My Mobile Server**.

Option	Description
Server domain	Select **default**.
Page size	Select **1024**.
Package	Enter `com.mycorp.smp101.android.mbo`.
Project path	Enter `\SMP101\Generated Code\Android`.
Third-party jar file	Click **Browse** to open an `android.jar`, by default located in `C:\Program Files (x86)\Android\android-sdk\platforms\android-`*`xx`*.
Generate JavaDoc	Unselect for this tutorial.



Generate Code

Configure options

Configure options for code generation

Code generation options

Language: Java

Platform: Android

Mobile server: My Mobile Server

Server domain: default

Provide a default domain for the generated code to c

Page size: 1024

Package: com.mycorp.smp101.android.mbo

Destination

(●) Project path: \SMP101\Generated Code\Android

( ) File system path:

[ ] Clean up destination before code generation

Third-party jar file: C:\Program Files (x86)\Android\android-sdk\platforms\android-16\a

[✓] Generate metadata classes

[ ] Including object manager classes

[ ] Generate JavaDoc

7. In the Success dialog, click **OK**.
   In the `Generated Code` directory, you see an `\Android\src\` folder.

Creating the Android Project

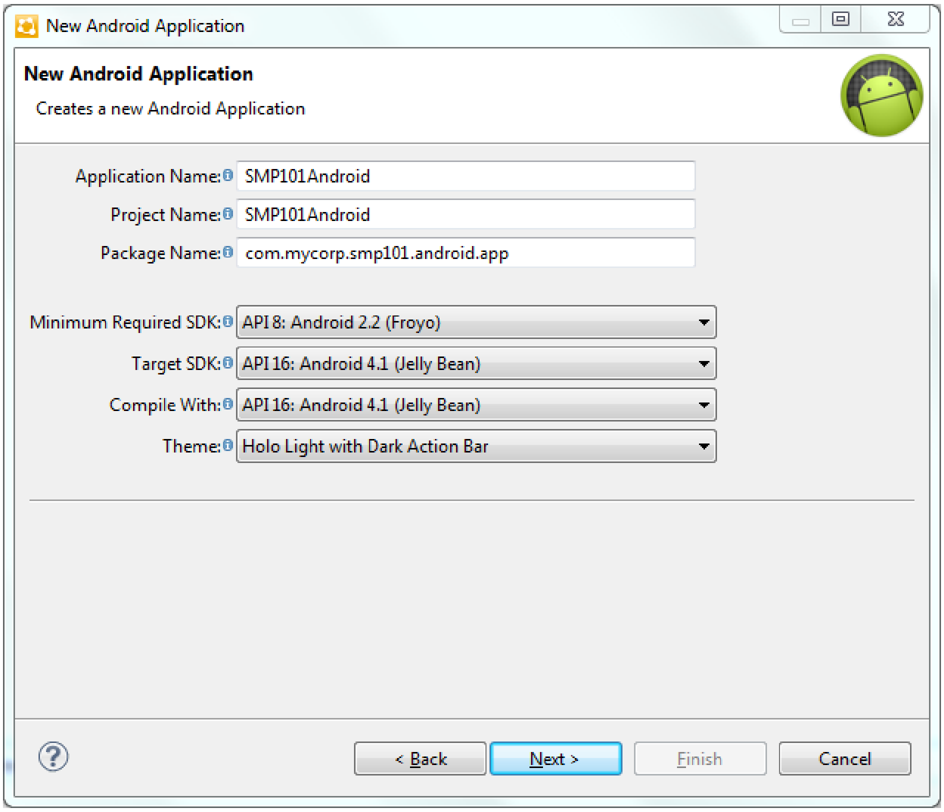
Create a new Android project in SAP Mobile WorkSpace. Add library resources to the project and set other application properties.

Prerequisites

To help create your project—and in a subsequent topic, build the user interface—download the SMP101 Android Object API (2.3) example project from the SAP Community Network (SCN) Web site at *http://scn.sap.com/docs/DOC-8803*.

Task

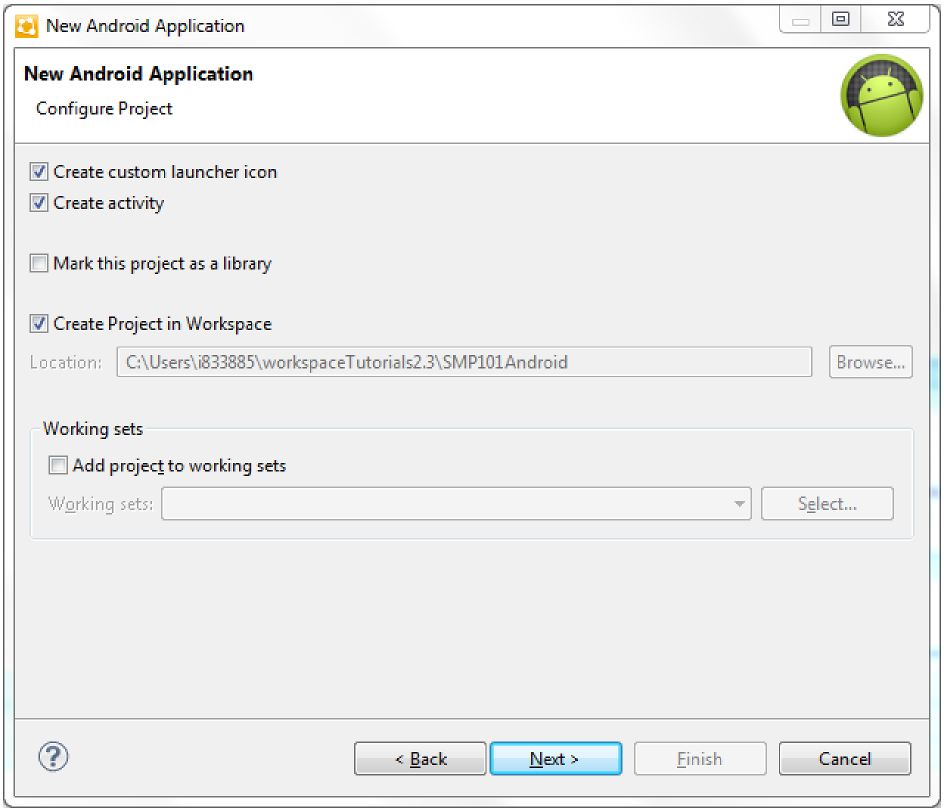
1. Start SAP Mobile WorkSpace.
2. In SAP Mobile WorkSpace Preferences, set the Android SDK location.
3. Select **File > New > Project**.
4. Select **Android** > **Android Application Project**, then **Next**.
   If you have a version of Android other than the one used to design this tutorial, the screens you use to enter the information in the next several steps may be in different screens.
5. In the Creates a new Android Application page of the New Android Application wizard, use these values and then click **Next**.
   - Application Name – enter `SMP101Android`.
   - Project Name – enter `SMP101Android`.
   - Package Name – enter `com.mycorp.smp101.android.app`.
   - Minimum Required SDK – accept the default.
   - Target SDK – select the Android SDK used for the tutorial.
   - Compile With – select the Android SDK used for the tutorial.
   - Theme – accept the default.



Application Name: SMP101Android
Project Name: SMP101Android
Package Name: com.mycorp.smp101.android.app
Minimum Required SDK: API 8: Android 2.2 (Froyo)
Target SDK: API 16: Android 4.1 (Jelly Bean)
Compile With: API 16: Android 4.1 (Jelly Bean)
Theme: Holo Light with Dark Action Bar

6. In the Configure Project page, use these values and click then **Next**.

- Select **Create custom launcher icon**, **Create activity**, and **Create Project in Workspace**.
- Unselect **Mark this project as a library** and **Add project to working sets**.


New Android Application

New Android Application

Configure Project

- [✓] Create custom launcher icon
- [✓] Create activity
- [ ] Mark this project as a library
- [✓] Create Project in Workspace

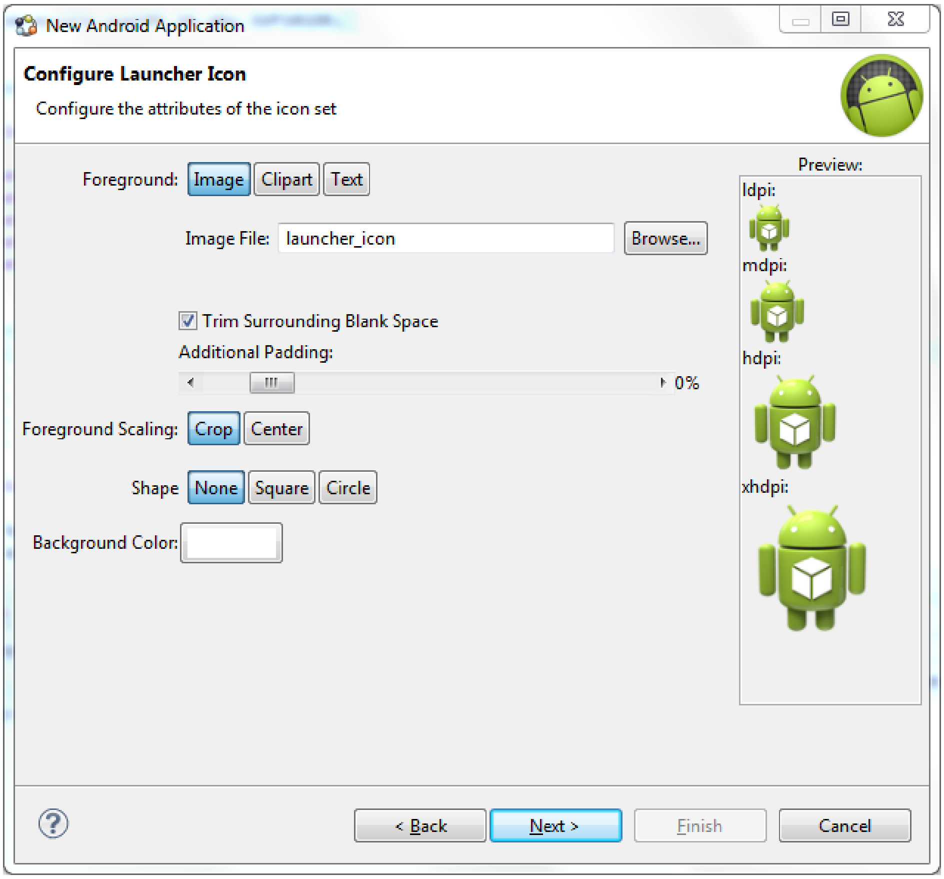
Location: C:\Users\i833885\workspaceTutorials2.3\SMP101Android

Working sets

- [ ] Add project to working sets

Working sets:

7. In the Configure Launcher Icon page, accept the default settings and click **Next**.


New Android Application

Configure Launcher Icon

Configure the attributes of the icon set

Foreground: [✓ Image] Clipart Text

Image File: launcher_icon

[✓] Trim Surrounding Blank Space

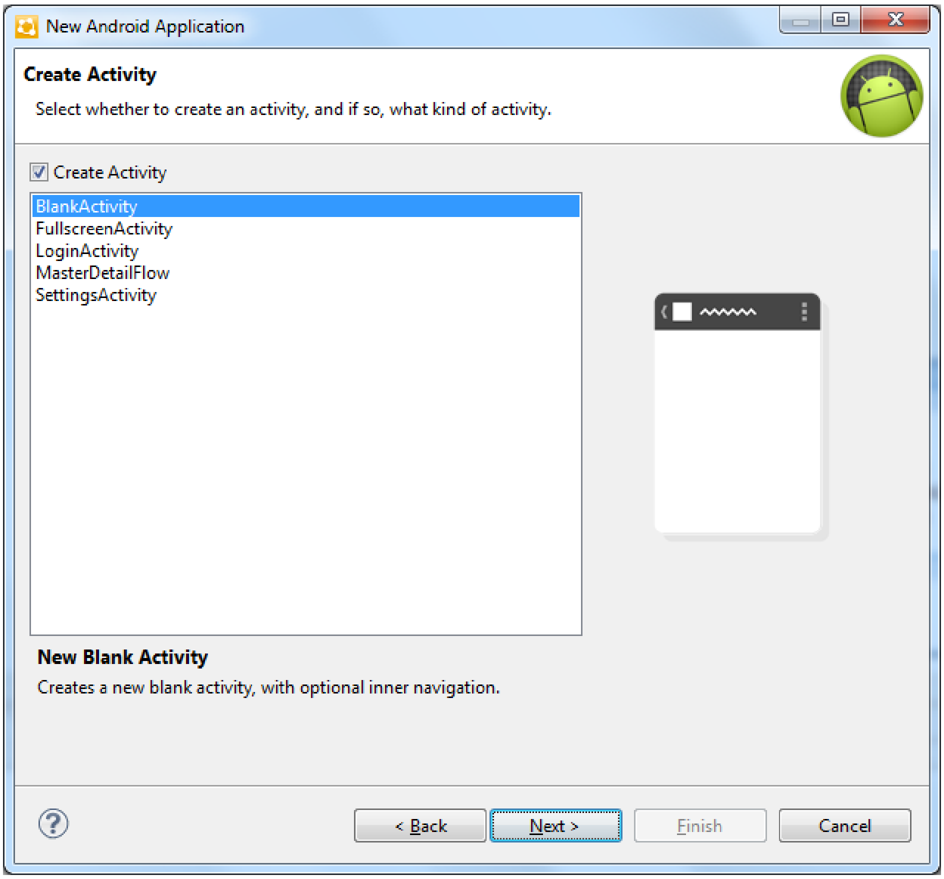
Additional Padding: 0%

Foreground Scaling: [✓ Crop] Center

Shape [✓ None] Square Circle

Background Color:

8. In the Create Activity window select **Create Activity**, then select **BlankActivity**, and click **Next**.


New Android Application

Create Activity

Select whether to create an activity, and if so, what kind of activity.

☑ Create Activity

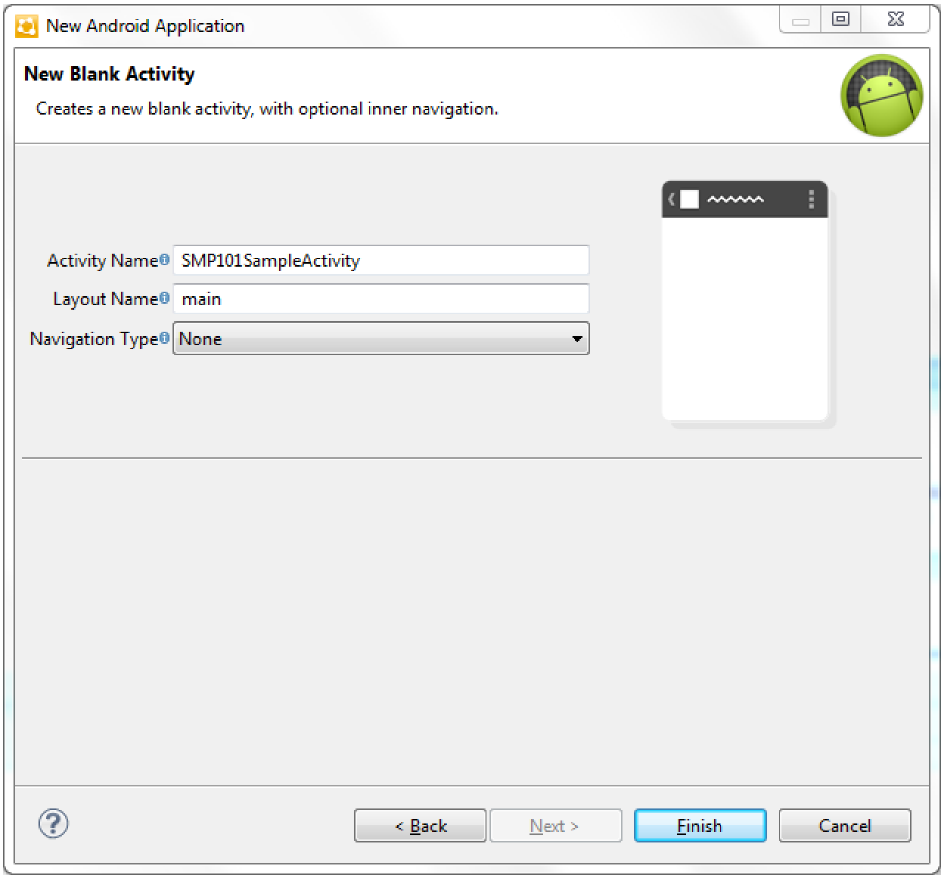
- BlankActivity
- FullscreenActivity
- LoginActivity
- MasterDetailFlow
- SettingsActivity

New Blank Activity

Creates a new blank activity, with optional inner navigation.

9. In the New Blank Activity window, use these values and click **Finish**.

- Activity Name – enter `SMP101SampleActivity`.
- Layout Name – enter `main`.
- Navigation Type – accept the default of `None`.


New Android Application

New Blank Activity

Creates a new blank activity, with optional inner navigation.

Activity Name: SMP101SampleActivity

Layout Name: main

Navigation Type: None

The left pane of the Workspace Navigator should list the SMP101Android project. In the `src` folder, a default Sample Activity class was automatically generated when you created the project.

Tip: To correct a misspelled package name, right-click the package and select **Refactor** > **Rename** to change the name and update all references.

Adding Compiler and Library Resources

Add compiler and library resources to the Android project.

1. Add a compiler resource to the root directory of the project:
   a) In Windows Explorer, browse to *`SMP_HOME`*`\MobileSDK23\ObjectAPI\Android` and copy the `armeabi` folder and these JAR files: `AfariaSLL.jar`, `ClientLib.jar`, `sup-client.jar`, and `UltraLiteJNI12.jar`.

   b) In Workspace Navigator, expand **SMP101Android**, select the `libs` folder, and paste the `armeabi` folder and JAR files into it.

2. Add library resources to the project:
   a) In Workspace Navigator, right-click the **SMP101Android** project, click **Properties**, and select **Java Build Path**.
   b) Click the **Libraries** tab and select **Add JARs**.
   c) In the JAR Selection window, expand the `SMP101Android\libs` folder and select **AfariaSSL.jar**, **ClientLib.jar**, **sup-client.jar**, and **UltraLiteJNI12.jar**.
   d) Click the **Order and Export** tab and select those four JARs.
   e) Click **OK**.

Copying SAP Mobile Platform Files to Sample Project

Copy the object API code you generated using the Generate Code wizard for Android.

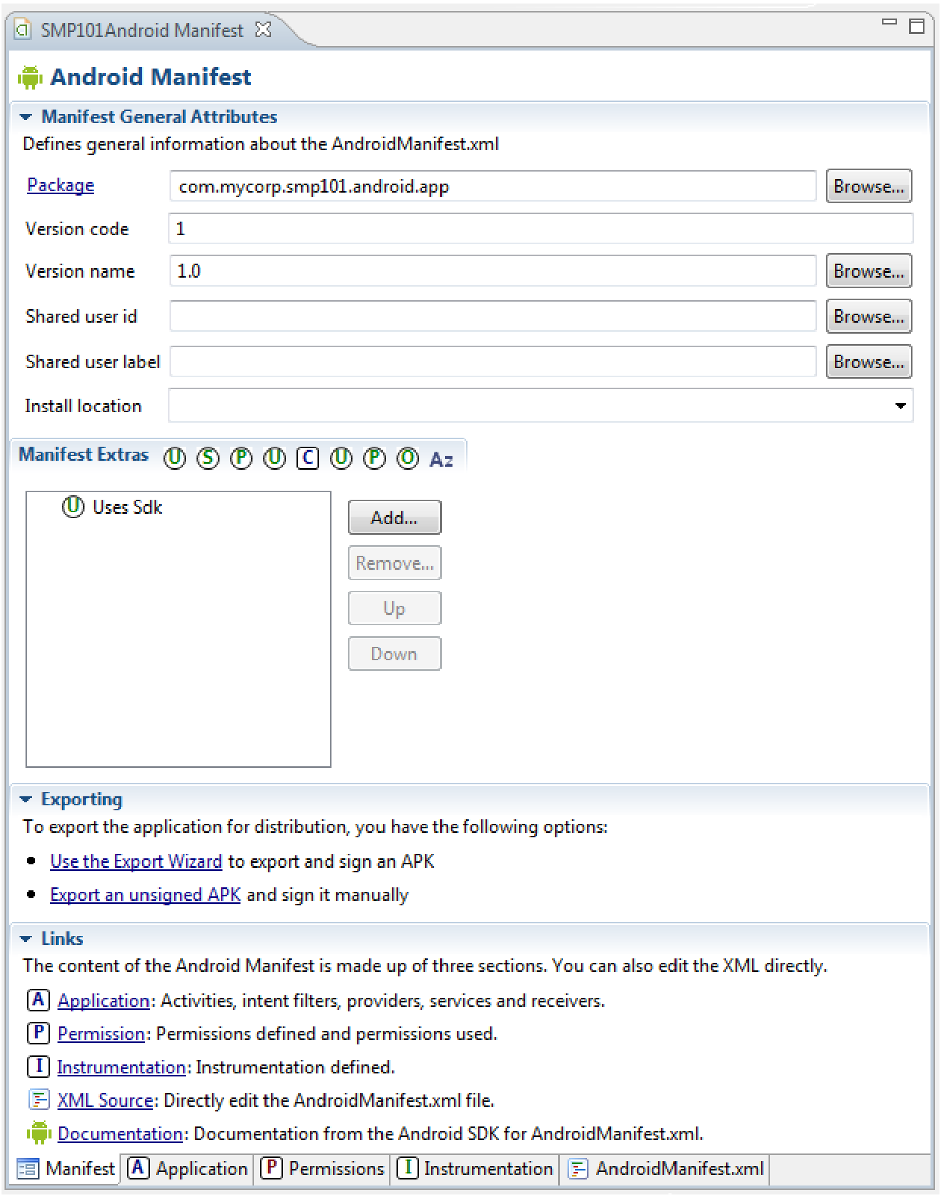
1. In Workspace Navigator, go to the **SMP101** project and copy the `com` folder in `\Generated Code\Android\src\`.
2. Go to the **SMP101Android** project and paste the `com` folder in to the `src` directory. Select **Yes to All** to copy over existing folders.

Configuring Android Application Properties

(Optional) Review the Android Manifest window, where you define the general Android properties used in an application.

1. In Workspace Navigator, expand the **SMP101Android** project.
2. Double-click the `AndroidManifest.xml` file.
3. Select the **Manifest** tab.
4. Review the options in the Android Manifest window, where you can change the general attributes, export options, and content of the `AndroidManifest.xml` file.

   Tip: In **Manifest Extras**, you can click **Uses Sdk** to indicate the API level for the minimum Android SDK version on which you want to run the application.



Defines general information about the AndroidManifest.xml

Package	com.mycorp.smp101.android.app
Version code	1
Version name	1.0
Shared user id	
Shared user label	
Install location	

To export the application for distribution, you have the following options:

- Use the Export Wizard to export and sign an APK
- Export an unsigned APK and sign it manually

The content of the Android Manifest is made up of three sections. You can also edit the XML directly.

- Application: Activities, intent filters, providers, services and receivers.
- Permission: Permissions defined and permissions used.
- Instrumentation: Instrumentation defined.
- XML Source: Directly edit the AndroidManifest.xml file.
- Documentation: Documentation from the Android SDK for AndroidManifest.xml.

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

Next

Modify the Android manifest file to add a Detail Activity class.

Adding User Permissions and a Class to the Android Manifest File

Add user permissions to the Android project. Also add a Detail Activity class to the `AndroidManifest.xml` file. This declaration launches a customer detail screen where you can make changes when you test the application.

1. If needed, open the Android manifest file.
2. Select the **AndroidManifest.xml** tab.
3. Replace the code with the source code from the AndroidManifest.xml file you downloaded from the SAP Community Network (SCN) Web site, also provided below:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/
android"
    package="com.mycorp.smp101.android.app"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="8"
        android:targetSdkVersion="16" />
   <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission
android:name="android.permission.READ_PHONE_STATE" />

    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name=".SMP101SampleActivity" >
            <intent-filter>
             <action android:name="android.intent.action.MAIN" />
                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <activity android:name=".DetailActivity"
            android:label="@string/app_name">
            <intent-filter>
             <action android:name="android.intent.action.MAIN" />
                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

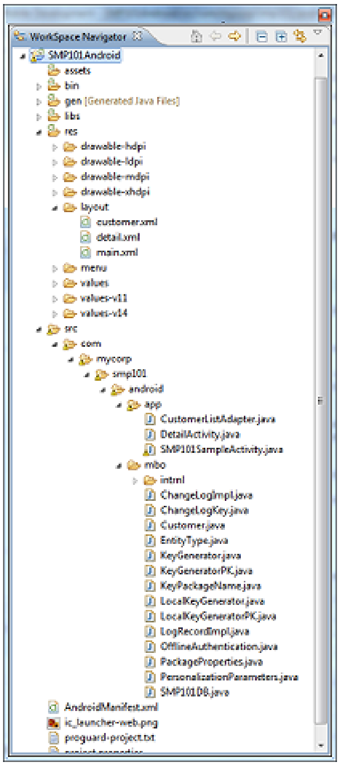
4. Select **File > Save**.

Creating the User Interface

Copy the Java code files, which provide the functionality and layout of the user interface, from the SMP101 Android Project example project archive to the SMP101Android project.

1. In Windows Explorer, browse to the directory where you saved the SMP101 Android Project example project.
2. Copy these Java files: `CustomerListAdapter.java`, `DetailActivity.java`, and `SMP101SampleActivity.java`.
3. In Workspace Navigator, go to **SMP101Android** and expand `\src\com\mycorp\smp101\android\app`, then paste the copied Java files, copying over any existing files.
4. Modify the host IP address in the `SMP101SampleActivity.java` file to point to the SAP Mobile Server.
   a) In Workspace Navigator, expand the **SMP101Android** project.
   b) Under the `\src\com\mycorp\smp101\android\app` folder, double-click the `SMP101SampleActivity.java` file.
   c) Modify the host IP address, and verify the username and password are valid.
5. Browse to the directory where you saved the SMP101 Android Project example project.
6. Copy the sample layout XML files: `customer.xml`, `detail.xml`, and `main.xml`.
7. In the `SMP101Android` project folder, go to the `res\layout` directory and paste the copied XML files, copying over any existing files.

   The SMP101Android project directory should look like this:



Creating a Launch Configuration for the Project

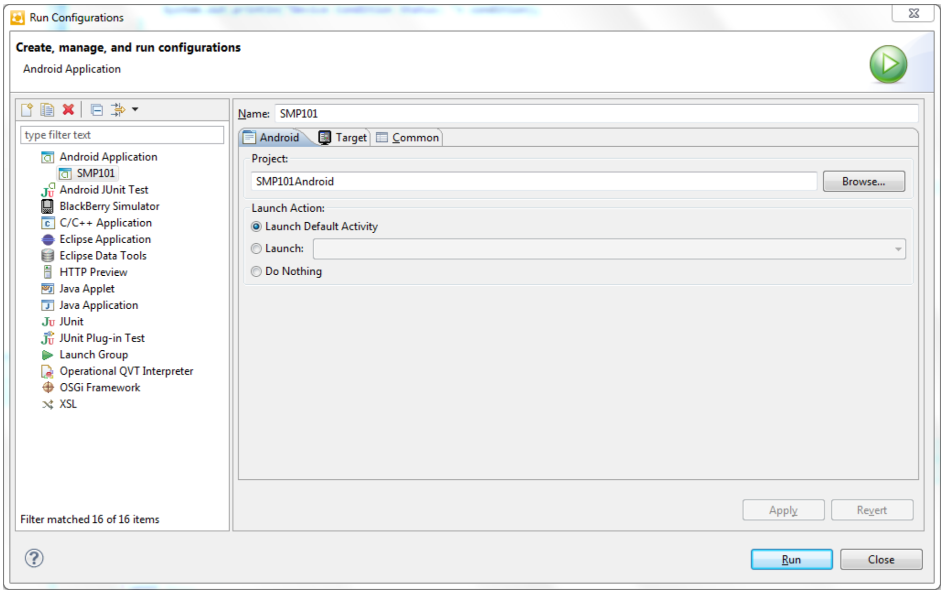
Create a new launch configuration for the SMP101Android project. The configuration specifies how the application launches, and defines the target Android platform.

Prerequisites

In the SAP Mobile WorkSpace, use the AVD Manager to add a new target Android Virtual Device (AVD).

Task

1. In Workspace Navigator, right-click the **SMP101Android** project, and select **Run As > Run Configurations**.
2. Right-click **Android Application** and select **New**.
3. In the Name field, enter `SMP101`.
4. In the Android tab, click **Browse** and select **SMP101Android**. Click **OK**.
5. In the Launch Action area, select **Launch Default Activity**.


Run Configurations

Create, manage, and run configurations

Android Application

type filter text

- Android Application
  - SMP101
- Android JUnit Test
- BlackBerry Simulator
- C/C++ Application
- Eclipse Application
- Eclipse Data Tools
- HTTP Preview
- Java Applet
- Java Application
- JUnit
- JUnit Plug-in Test
- Launch Group
- Operational QVT Interpreter
- OSGi Framework
- XSL

Filter matched 16 of 16 items

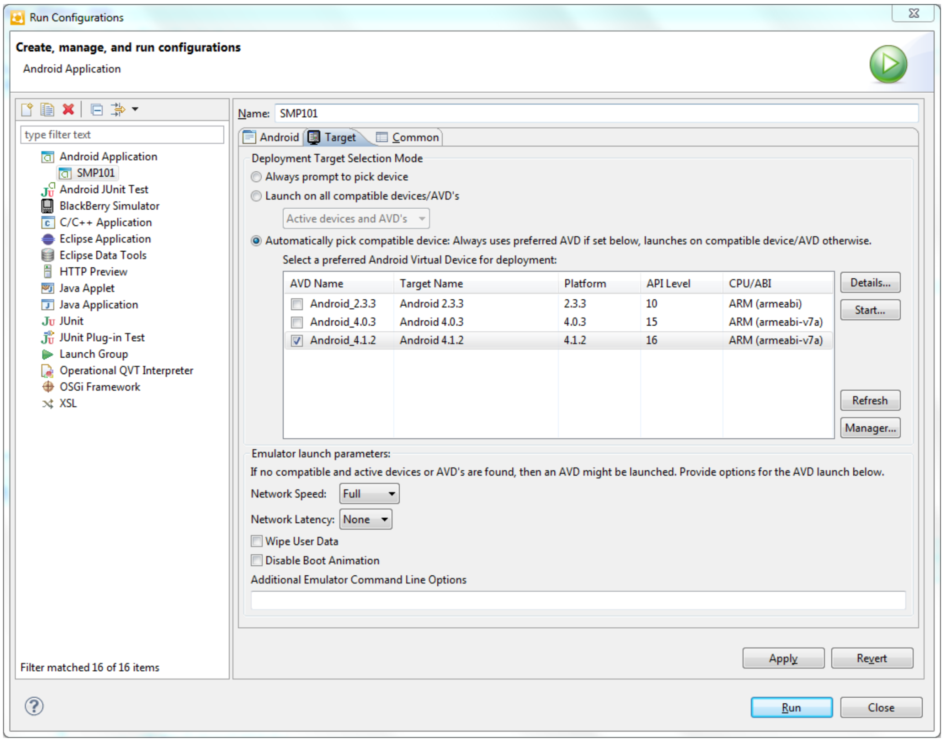
Name: SMP101

Android | Target | Common

Project: SMP101Android

Launch Action:
- (●) Launch Default Activity
- ( ) Launch:
- ( ) Do Nothing

6. In the Target tab, select a deployment target. For example, select Automatically pick compatible device, then specify an AVD for deployment. Accept all other default settings.


Run Configurations

Create, manage, and run configurations

Android Application

type filter text

- Android Application
  - SMP101
- Android JUnit Test
- BlackBerry Simulator
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- Java Applet
- Java Application
- JUnit
- JUnit Plug-in Test
- Launch Group
- Operational QVT Interpreter
- OSGi Framework
- XSL

Filter matched 16 of 16 items

Name: SMP101

Android | Target | Common

Deployment Target Selection Mode
- ( ) Always prompt to pick device
- ( ) Launch on all compatible devices/AVD's
  - Active devices and AVD's
- (●) Automatically pick compatible device: Always uses preferred AVD if set below, launches on compatible device/AVD otherwise.

Select a preferred Android Virtual Device for deployment:

AVD Name	Target Name	Platform	API Level	CPU/ABI
☐ Android_2.3.3	Android 2.3.3	2.3.3	10	ARM (armeabi)
☐ Android_4.0.3	Android 4.0.3	4.0.3	15	ARM (armeabi-v7a)
✓ Android_4.1.2	Android 4.1.2	4.1.2	16	ARM (armeabi-v7a)

Emulator launch parameters:

If no compatible and active devices or AVD's are found, then an AVD might be launched. Provide options for the AVD launch below.

Network Speed: Full

Network Latency: None

☐ Wipe User Data

☐ Disable Boot Animation

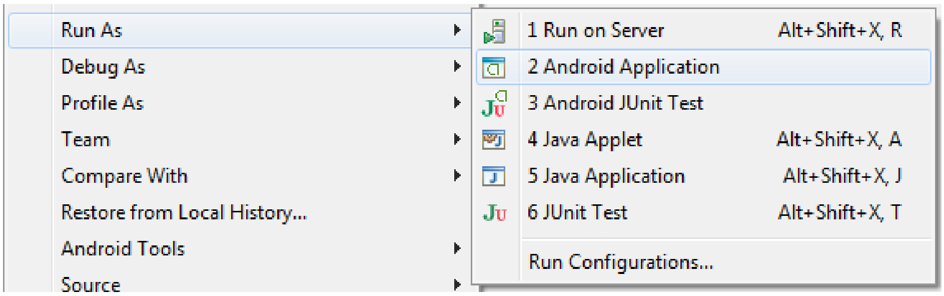
Additional Emulator Command Line Options

7. Click **Apply**, then **Close**.

Testing the Device Application on the Android Emulator

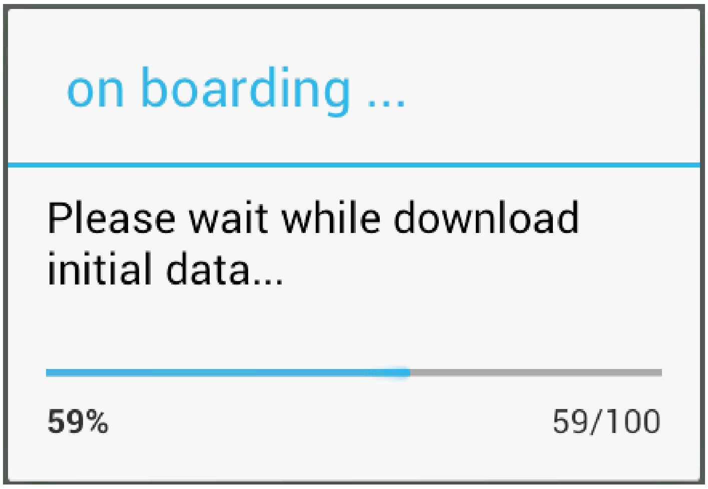
Run the SMP101Android application on the Android emulator, and change customer information to update the interface.

1. In WorkSpace Navigator, right-click **SMP101Android** and select **Run As > Android Application**.


Run As
Debug As
Profile As
Team
Compare With
Restore from Local History...
Android Tools
Source
1 Run on Server Alt+Shift+X, R
2 Android Application
3 Android JUnit Test
4 Java Applet Alt+Shift+X, A
5 Java Application Alt+Shift+X, J
6 JUnit Test Alt+Shift+X, T
Run Configurations...

Note: It may take several minutes for the Android emulator's home screen to appear.

The application activation (on boarding) image indicates that the application is registering data from SAP Mobile Server.


on boarding ...

Please wait while download initial data...

59% 59/100

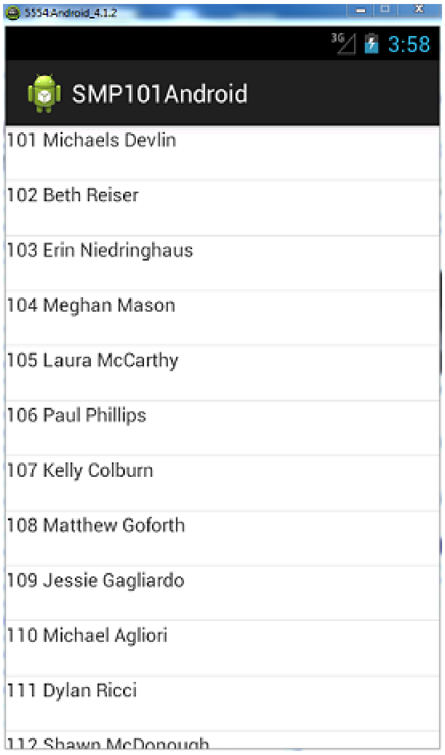
During initialization, the system enables the operation to target change notifications using:

```
SynchronizationGroup
sg=SMP101DB.getSynchronizationGroup("default");
sg.setEnableSIS(true);
sg.save();
```

When the data finishes synchronizing, the device application shows the SMP101Android application with a list of customer data in a ListView control. You can scroll through the customer list to see more data and to make changes. The data loads from the database on demand.

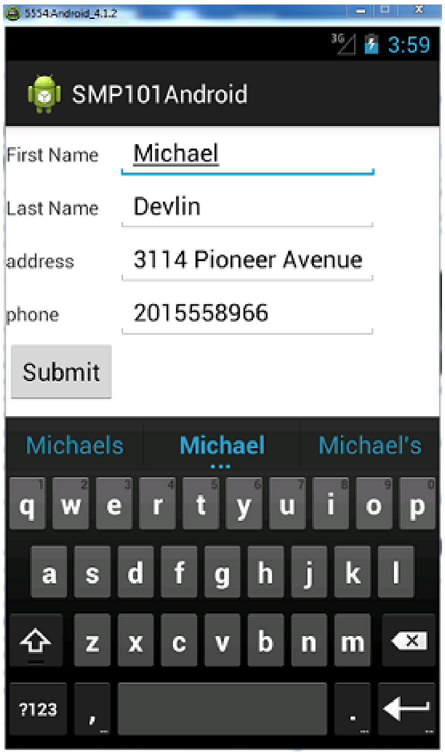
Note: The Android application illustrates a device application with a small buffer (30 customers). In commercial applications, based on the amount of user data, you can use a large buffer (1,000 customers).

When the application queries the customer list, it uses an `SMP101DB.executeQuery()` API to get only columns that are needed, such as (fname, lname...), instead of the entire customer object; this results in better performance.



101 Michaels Devlin
102 Beth Reiser
103 Erin Niedringhaus
104 Meghan Mason
105 Laura McCarthy
106 Paul Phillips
107 Kelly Colburn
108 Matthew Goforth
109 Jessie Gagliardo
110 Michael Agliori
111 Dylan Ricci
112 Shawn McDonough

2. Select the customer to update.
3. In the customer detail screen, change the first name of the customer and click **Submit**.



The Submit button is mapped to the synchronize operation using `SMP101DB.beginSynchronize`. The synchronization occurs in the background, so the user interface is unaffected.

Any back-end changes initiate notifications from the server. The device application uses a ChangeLog API to query those managed items and update the user interface if needed.

```
GenericList<ChangeLog> changeLogs=SMP101DB.getChangeLogs(query);
```

4. Close the emulator to stop the SMP101Android application.

Learn More About SAP Mobile Platform

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

Check the Product Documentation Web site regularly for updates: *http://sybooks.sybase.com/sybooks/sybooks.xhtml?id=1289&amp;c=firsttab&amp;a=0&amp;p=categories*, then navigate to the most current version.

Tutorials
Try out some of the other getting started tutorials available on the Product Documentation Web site to get a broad view of the development tools available to you.

Example Projects
An example project contains source code for its associated tutorial. It does not contain the completed tutorial project. Download example projects from the SAP® Community Network (SCN) at *http://scn.sap.com/docs/DOC-8803*.

Samples
Sample applications are fully developed, working applications that demonstrate the features and capabilities of SAP Mobile Platform.

Check the SAP® Development Network (SDN) Web site regularly for new and updated samples: *https://cw.sdn.sap.com/cw/groups/sup-apps*.

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

Developer Guides
Learn best practices for architecting and building device applications:

- *Mobile Data Models: Using Data Orchestration Engine* – provides information about using SAP Mobile Platform features to create DOE-based applications.
- *Mobile Data Models: Using Mobile Business Objects* – provides information about developing mobile business objects (MBOs) to fully maximize their potential.
- *SAP Mobile Workspace: Mobile Business Object Development* – provides information about using SAP Mobile Platform to develop MBOs and generate Object API code that can be used to create native device applications and Hybrid Apps.

Use the appropriate API to create device applications:

- *Developer Guide: Android Object API Applications*
- *Developer Guide: BlackBerry Object API Applications*

- *Developer Guide: iOS Object API Applications*
- *Developer Guide: Windows and Windows Mobile Object API Applications*
- *Developer Guide: Hybrid Apps*

Customize and automate:

- *Developer Guide: SAP Mobile Server Runtime > Management API* – customize and automate system administration features.

Javadoc and HeaderDoc are also available in the installation directory.

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