SyncStudio

MobileFast SyncStudio

A Complete Mobile Database Synchronization Solution

Quick-Start Manual

Release 1.61, May 2014

Edition Notes - Release May 2014

Document Printing For best results, print this document in color, on letter size paper (8.5 x 11 inches), double sided. If using A4 paper (210 x 297 mm), configure your printer to scale the content accordingly.

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Document Revision The SyncStudio Quick-Start Manual, Rev. 1.6, supersedes all previous versions of this manual. Discard any older versions and replace with this version.

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Installing and configuring SyncStudio

SyncStudio is built on top of MS SQL Server and the Microsoft Sync Framework. Both are required, and should be installed first. You should have MS SQL Server (or SQL Express) installed, either in your own development machine or in some other machine that you can access over your network. If you don't have MS SQL Server you can download a free copy of SQL Server Express here:

MS SQL Server 2012 Express Edition

You also need to have installed the Microsoft Sync Framework redistributables in your machine. The SynStudio installation program will automatically check if MS Sync Framework is already installed and if not it will install it for you.

Only download using this link if you want to manually install the MS Sync Framework.

MS Sync Framework

This download provides the Microsoft Sync Framework 2.1 redistributables that developers can include with applications that use synchronization. The Sync Framework components are provided in three separate redistributable packages so that installation can be tailored to application requirements. The three redistributables are:

1) **Synchronization.msi**
   Includes managed and native API for the synchronization runtime, core components, and Web synchronization components. This package is a pre-requisite for the other packages and must be installed first.

2) **ProviderServices.msi**
   Includes managed and native API for simple custom providers, the file synchronization provider, the metadata storage service, and also DLLs for the lightweight database that the storage service uses.

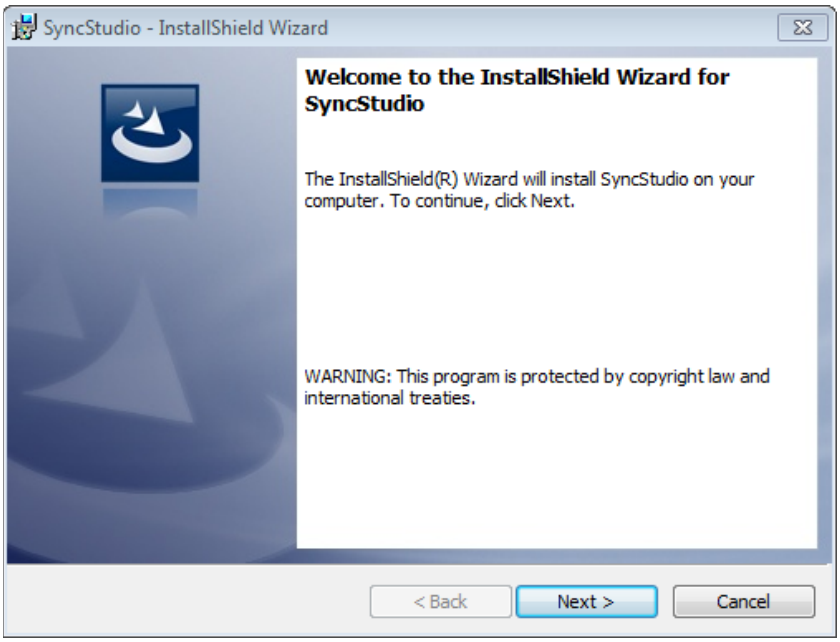
3) **DatabaseProviders.msi**
   Includes managed API for database synchronization providers.

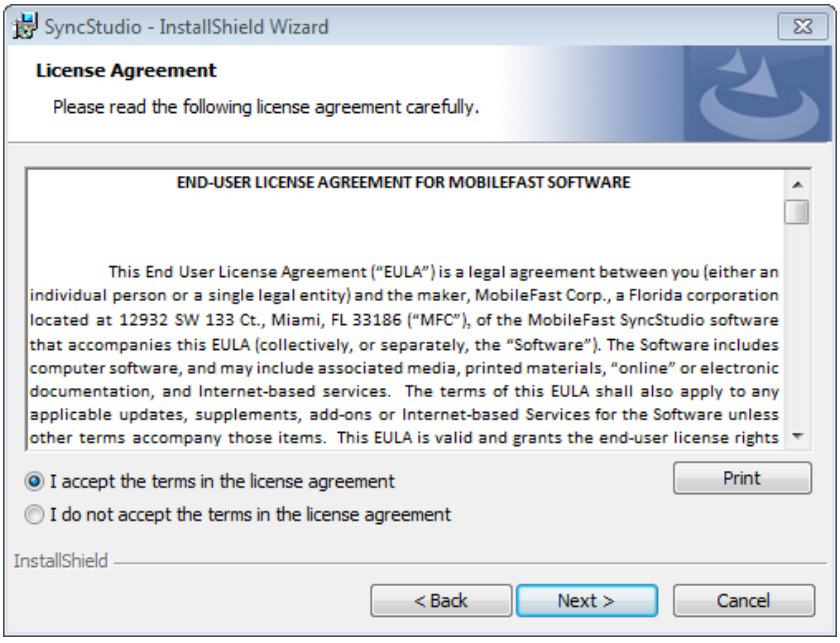
Please install all three in the order indicated above. Once that is done, to install and configure SyncStudio we will follow these steps:

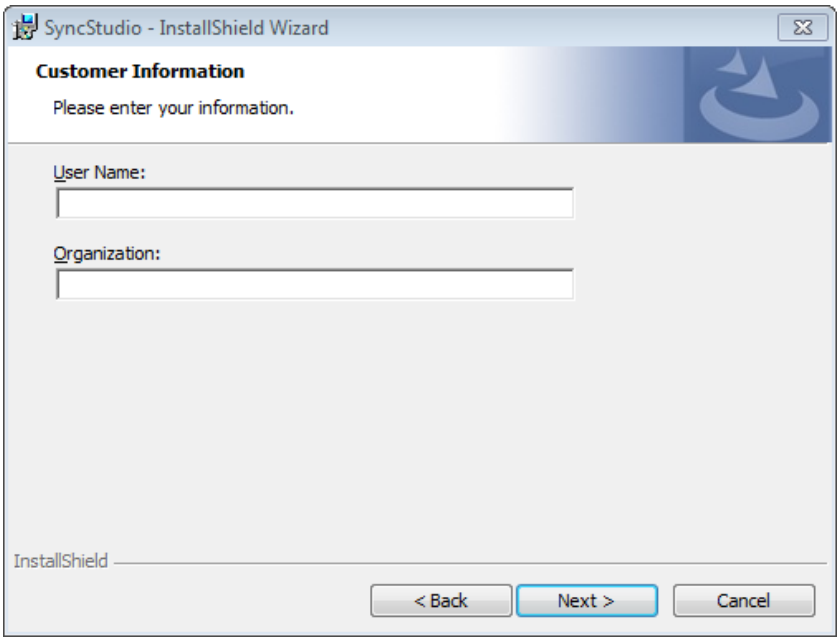
1) Install the SyncStudio in your development machine
2) Create a sample SQL Server database
3) Create a test SyncStudio Project and connect to the test database
4) Configure the project
5) Deploy the project to your IIS Server
6) Install the SyncStudio Client in your Android device
7) Test the synchronization

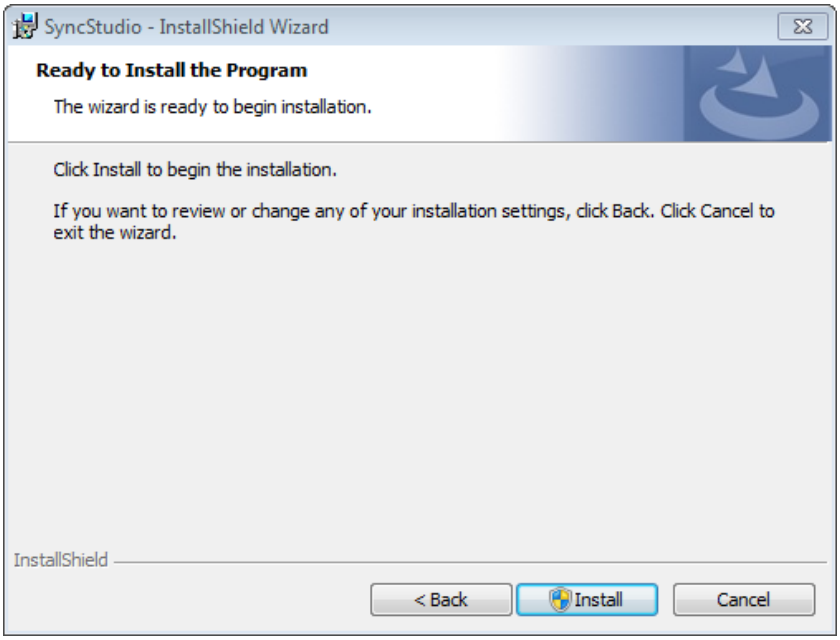
Installation

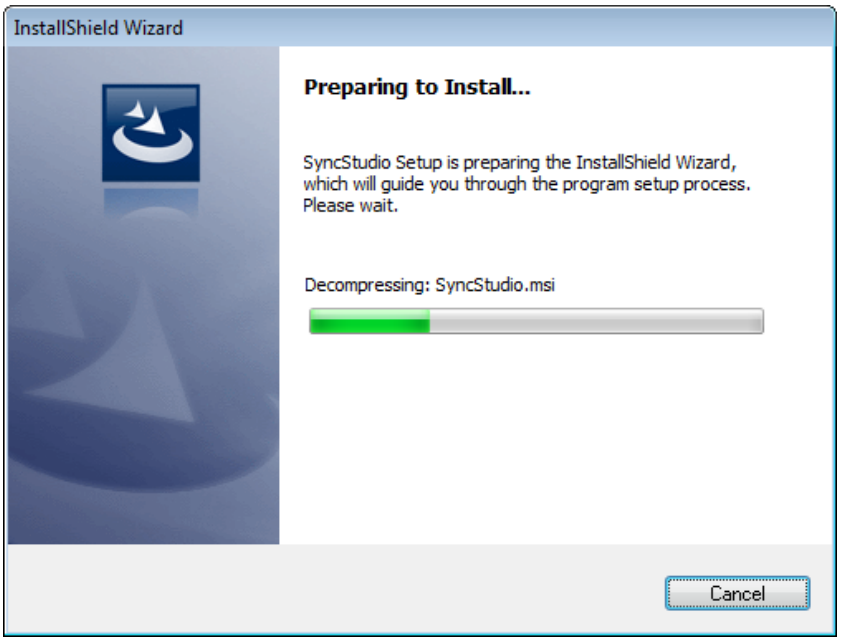
SyncStudio comes with a simple .msi installer. Just follow the steps below to install the SyncStudio to your development machine.

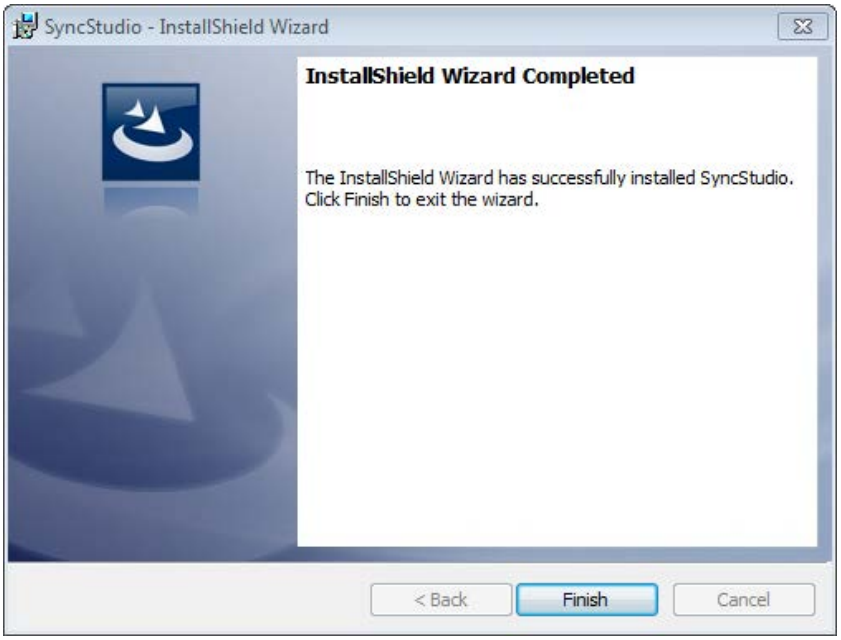





SyncStudio - InstallShield Wizard
Customer Information
Please enter your information.
User Name:
Organization:
InstallShield
< Back
Next >
Cancel


SyncStudio - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel


InstallShield Wizard
Preparing to Install...
SyncStudio Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.
Decompressing: SyncStudio.msi
Cancel


SyncStudio - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed SyncStudio. Click Finish to exit the wizard.
< Back
Finish
Cancel

The SyncStudio Sample Database

We strongly recommend that you first test SyncStudio using the sample database we provide. This will give you a good indication of what the product can do and how it works.

WARNING: PLEASE DO NOT ATTEMPT TO USE AN SQL DATABASE THAT HAS PREVIOUSLY BEEN PROVISIONED OR USED WITH STANDARD MICROSOFT SYNC FRAMEWORK. ONLY USE DATABASES WITH SYNCSTUDIO THAT ARE CLEAR OF THIRD PARTY SYNC RELATED OBJECTS OR ARE NEW AND HAVE NOT ALREADY BEEN ALTERED BY OTHER SYNCHRONIZATION TOOLS. IT IS LIKELY THAT SYNCSTUDIO PROVISIONING WILL FAIL IF ATTEMPTED WITH DB ALREADY PROVISIONED BY SOME OTHER TOOL.

For this guide we will be using a small SQL Server (or SQL Server Express) database with only three tables: CUSTOMERS, PRODUCTS and SALES. The database will be called SYNCSTUDIO_SAMPLE. To create the sample database:

1) Open the Microsoft SQL Server Management Studio and connect to the MS SQL server of your choice.

2) On the toolbar click on the “Open File” icon.

3) Browse to the folder “c:\program files (x86)\SyncStudio\Sample DB”. There you will find a file called “SYNCSTUDIO_SAMPLE.sql”. This is an SQL script file that has everything needed to create the sample database and also to populate the tables with thousands of records worth of sample data. Choose this file and click OPEN.

4) MAKE SURE that the selected database in the upper left corner of the toolbar is “Master”. Also MAKE SURE that you do not already have a database called “SYNCSTUDIO_SAMPLE”. If you do you must first drop or rename that database or running this script will result in an error.

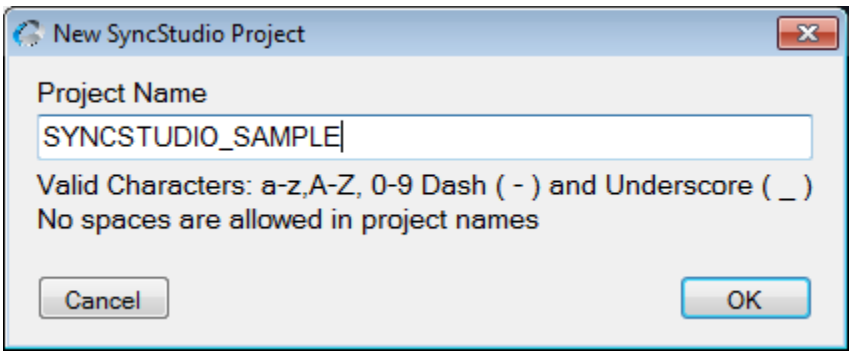
5) On the toolbar click on the “Execute” button. It may run for a while so please be patient.

6) When done you will have a new database ready to test with SyncStudio.

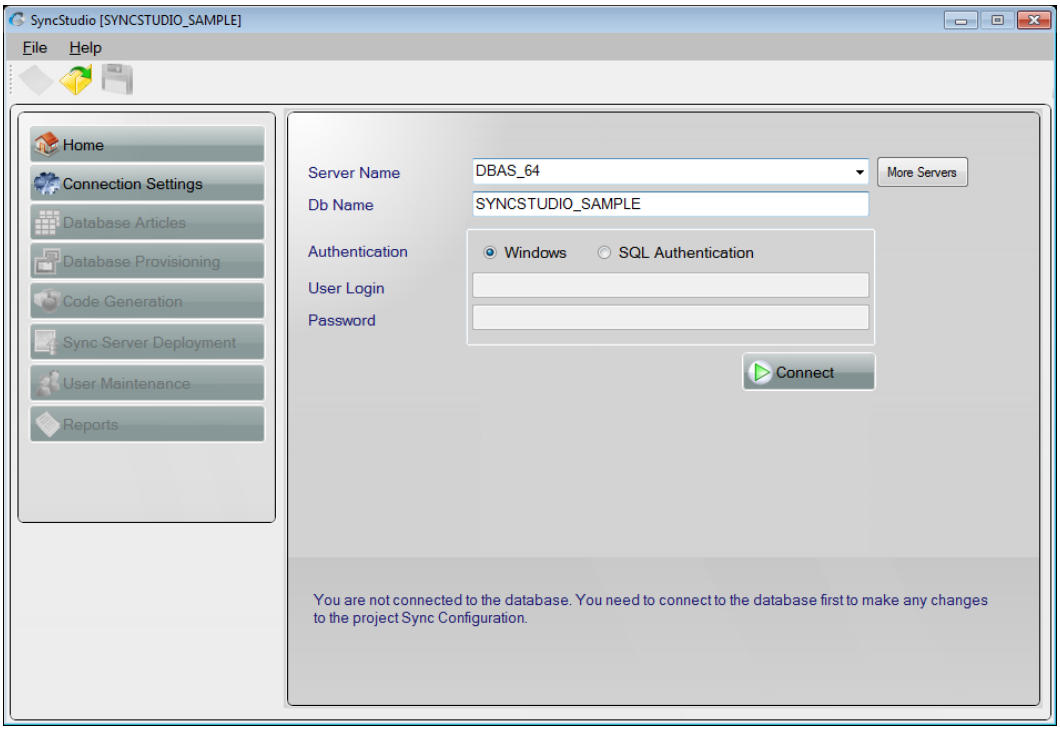
7) On the left in “Object Exporter” click on “Databases” and then hit F5 to refresh. You should now see a database called “SYNCSTUDIO_SAMPLE” appear.

Create and Configure your SyncStudio Project

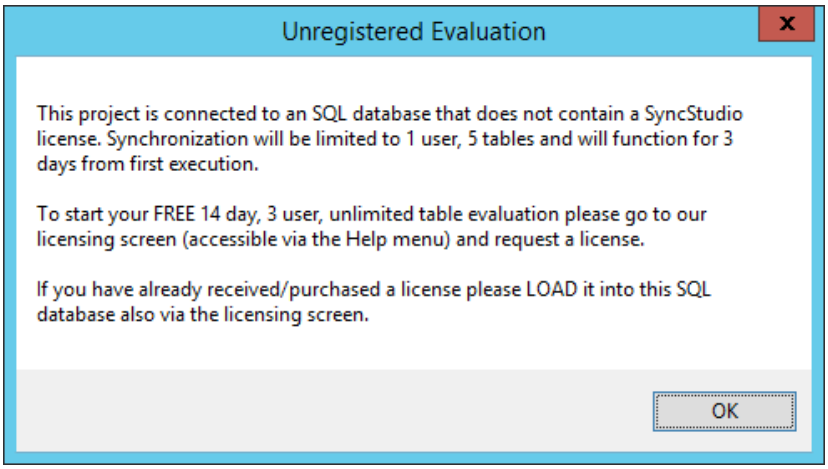
Now that you have all three tables created open the SyncStudio program and click on File → New Project and enter SYNCSTUDIO_SAMPLE for the project name, as shown in the following screenshots:



At this point you need to connect to the database so that SyncStudio can fetch the database schema. Please enter the Server Name (this is the same as the top node in the SQL Server Management Studio), enter SYNCSTUDIO_SAMPLE for the database name and click on the Connect button, as seen in the following screen. Here we assume that you are connecting to the database using Windows Authentication. If that is not the case then you can use the Authentication Pulldown to select SQL Authentication and then enter the SQL Server User Id and Password of an account that has access to the SYNCSTUDIO_SAMPLE database.

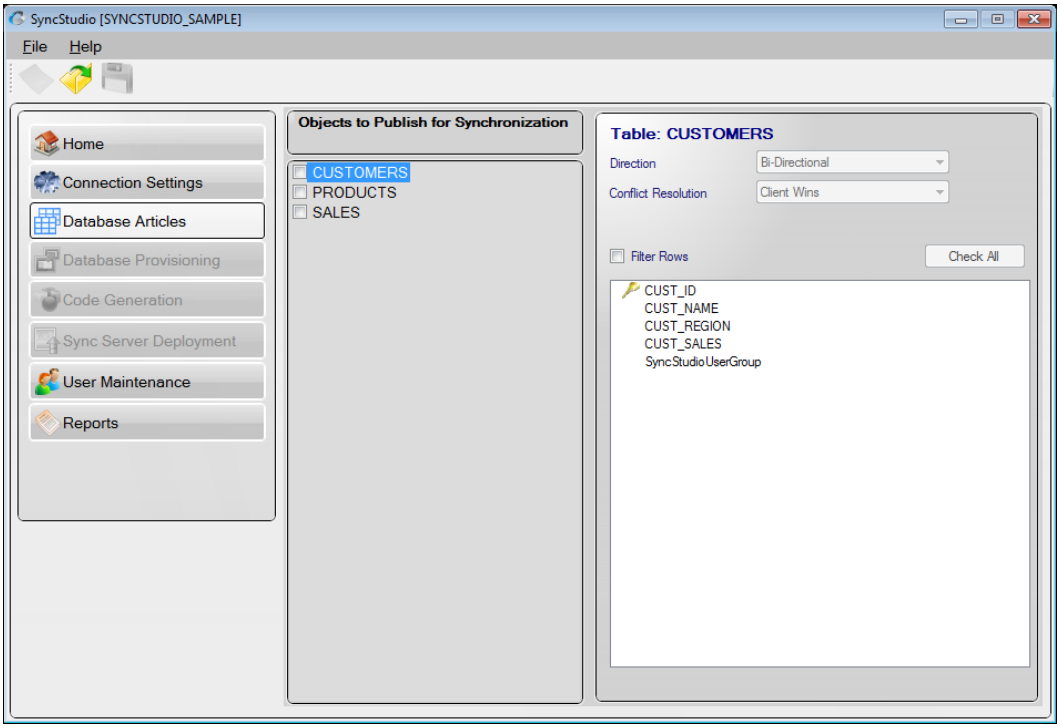


You should be connected to the database and SyncStudio will have retrieved the database schema from the SQL Server.



When SyncStudio connects to a database it checks to see if there is a license already installed. If not the you will receive a message. When first installed SyncStudio will run in a limited (unregistered) evaluation mode for 3 days. In this mode a license inside the database is not required but functionality will be limited. A 14 days evaluation license is available at no charge but it must be requested via our licensing screen. Please see the licensing section of the SyncStudio User Manual for details.

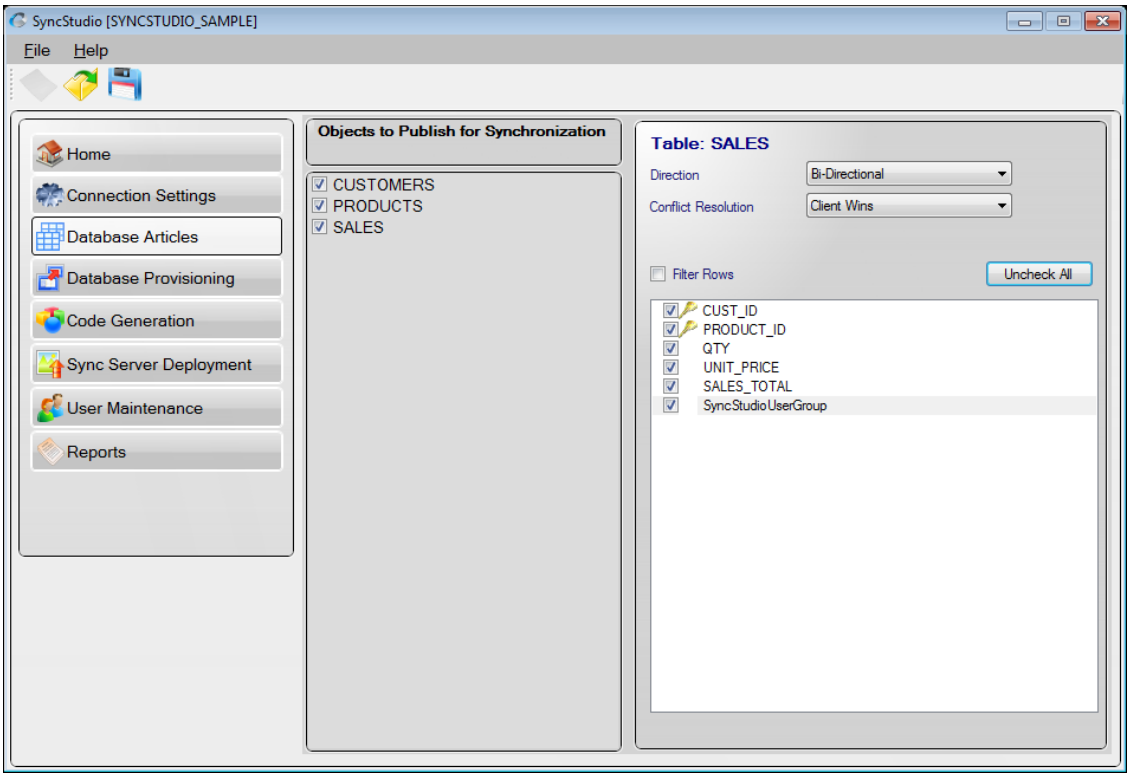
Now click on the “Database Articles” tab on the left side of the SyncStudio. You will get a screen like the one below. All three tables (CUSTOMERS, PRODUCTS and SALES) should be there. We will now use the SyncStudio to select these three tables for synchronization.



To select a table for synchronization first click on the table name; you will see that all the fields are shown, with a checkbox for each field (the default is that all primary key fields will be checked) and the fields that are part of the primary key indicated with a key icon. For this guide we will be synchronizing all the fields in all the tables. Click “Check All”

Also notice that there is a checkbox named “Filter Rows”. This checkbox indicates if the User Group field is to be used to filter the rows sent to the user based on a group id (of your choice). Note that every table in this example has a field called “SyncStudioUserGroup”. This is the field that is used for filtering, and you need to populate the values in this field yourself. The Filter Rows check box is only enabled if the table has a“SyncStudioUserGroup”.

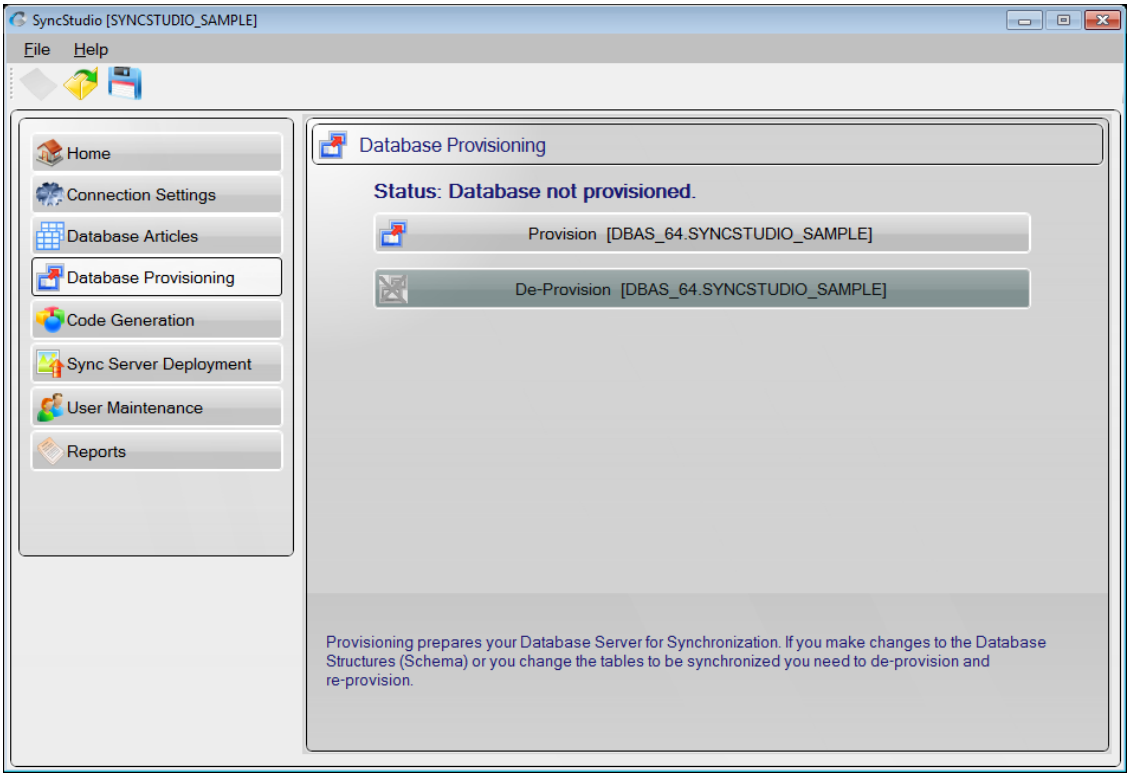
For this guide we want to select all three tables for synchronization, and all fields in all the tables as well. In your own projects you can select only some tables for synchronization, and you do not need to select all the fields (but all the fields that make up the primary key have to be selected).



At this point you will have selected all the tables for synchronization. Now we need to provision the database for synchronization.

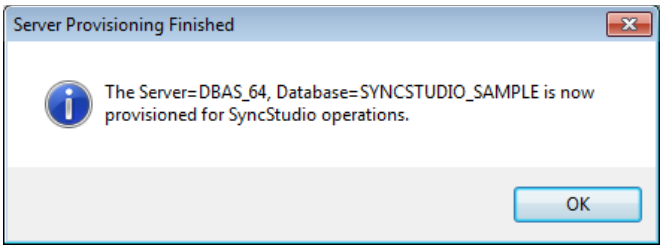
WARNING: PLEASE DO NOT ATTEMPT TO USE AN SQL DATABASE THAT HAS PREVIOUSLY BEEN PROVISIONED OR USED WITH STANDARD MICROSOFT SYNC FRAMEWORK. ONLY USE DATABASES WITH SYNCSTUDIO THAT ARE CLEAR OF THIRD PARTY SYNC RELATED OBJECTS OR ARE NEW AND HAVE NOT ALREADY BEEN ALTERED BY OTHER SYNCHRONIZATION TOOLS. IT IS LIKELY THAT SYNCSTUDIO PROVISIONING WILL FAIL IF ATTEMPTED WITH DB ALREADY PROVISIONED BY SOME OTHER TOOL.

Click on the "Database Provisioning" tab on the left side of the SyncStudio. You will see a screen like the following.

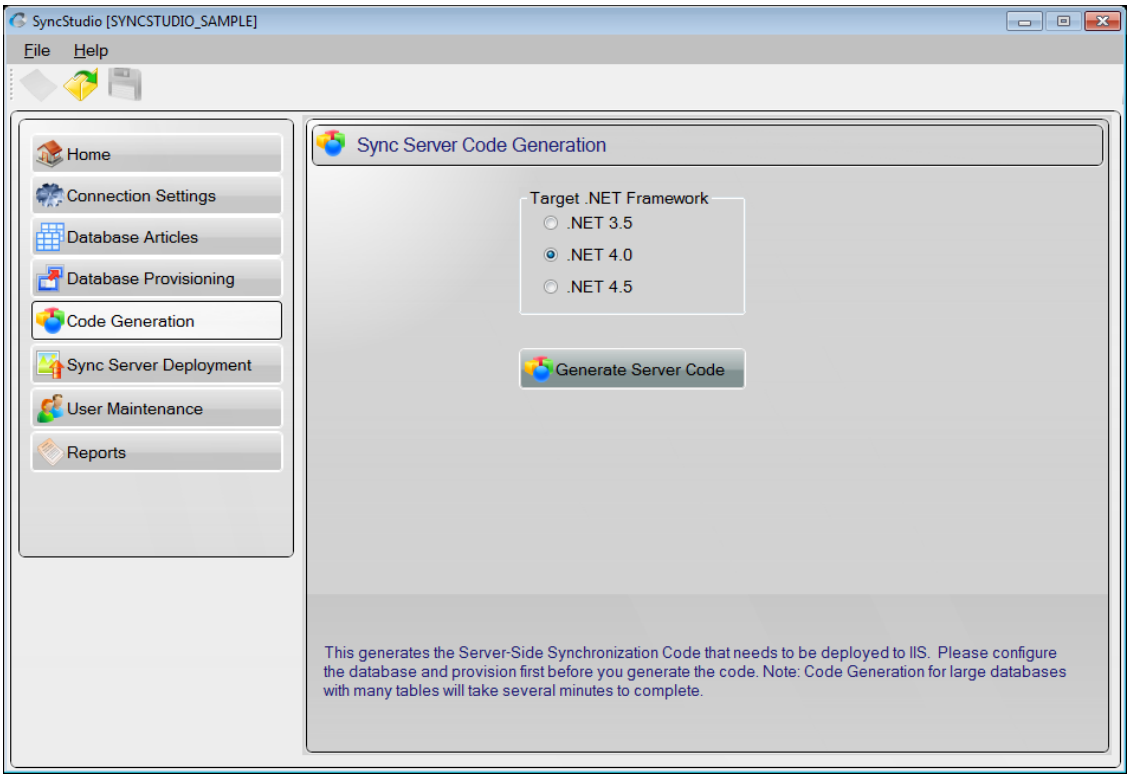


The Provisioning process creates a number of tables and stored procedures that are used by the Microsoft Sync Framework to keep track of which records have changed and when, so that the appropriate records can be sent to the clients. The screen has two options: "Provision Server" and "De-Provision Server". Click on the "Provision Server" button. You will see a progress bar appear during the provisioning process. Note: This database is very small, only three tables and a few fields in each table. For very large databases with many tables and fields the provisioning process may take some time. Please do not interrupt or stop the provisioning.

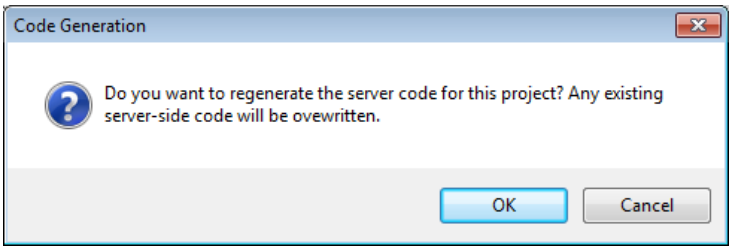
If everything goes well you will be given a message telling you that the database is now provisioned for synchronization. Otherwise, you will get an error message. In order to synchroniza a database you MUST first provision it.



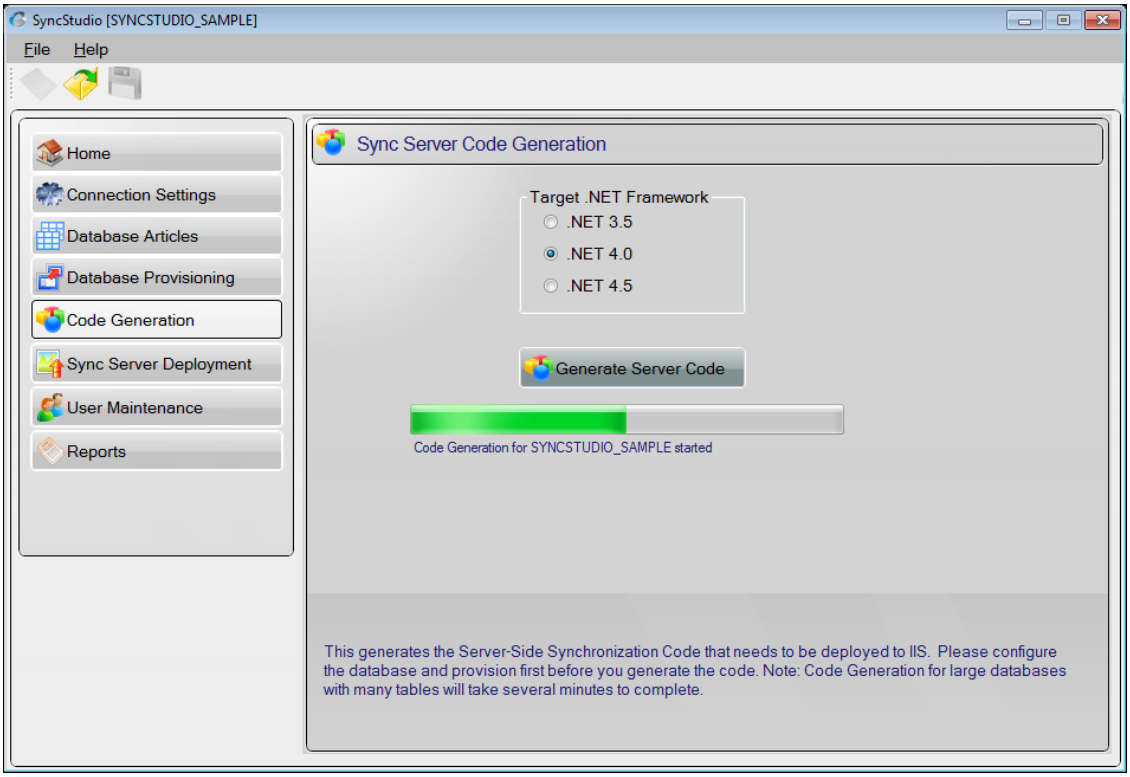
Now that the database has been provisioned we need to generate the synchronization code. To do this please click on the "Code Generation" tab on the left side of the SyncStudio. You will see a screen like the following:

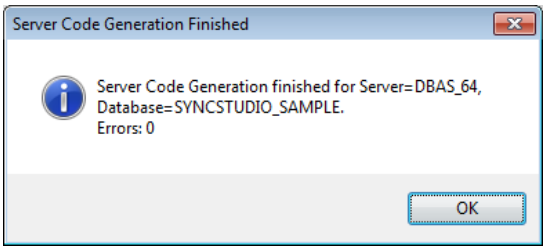


Select the version of the .NET Framework that matches the Web Server where the sync project will be running and then click on the "Generate Server Code" button. You will be given a message asking you if you want to re-generate the server code, and warning you that any existing code will be overwritten. In this case this is our first code generation; however, for your production systems you should probably keep a backup copy of the prior project code in case you need to restore the system.



Click OK and wait for the code generation to complete. Note: as with provisioning, this is a small project so that the code generation should be very fast. Large projects with many tables and fields will take longer. Please be patient. You will see a progress bar while the code generation is being done, and you will get a message box at the end.





At this point your database is provisioned and you have the synchronization code that you need for the server. Now we need to deploy your synchronization code to IIS. We are assuming that you are running this sample in a machine that has both SQL Server and IIS installed. In your production system the database can be hosted in a different machine from the Web Server.

Also, SyncStudio produces compiled code, not source. After you create the server-side code the build directory in your project will contain the following directories and files:

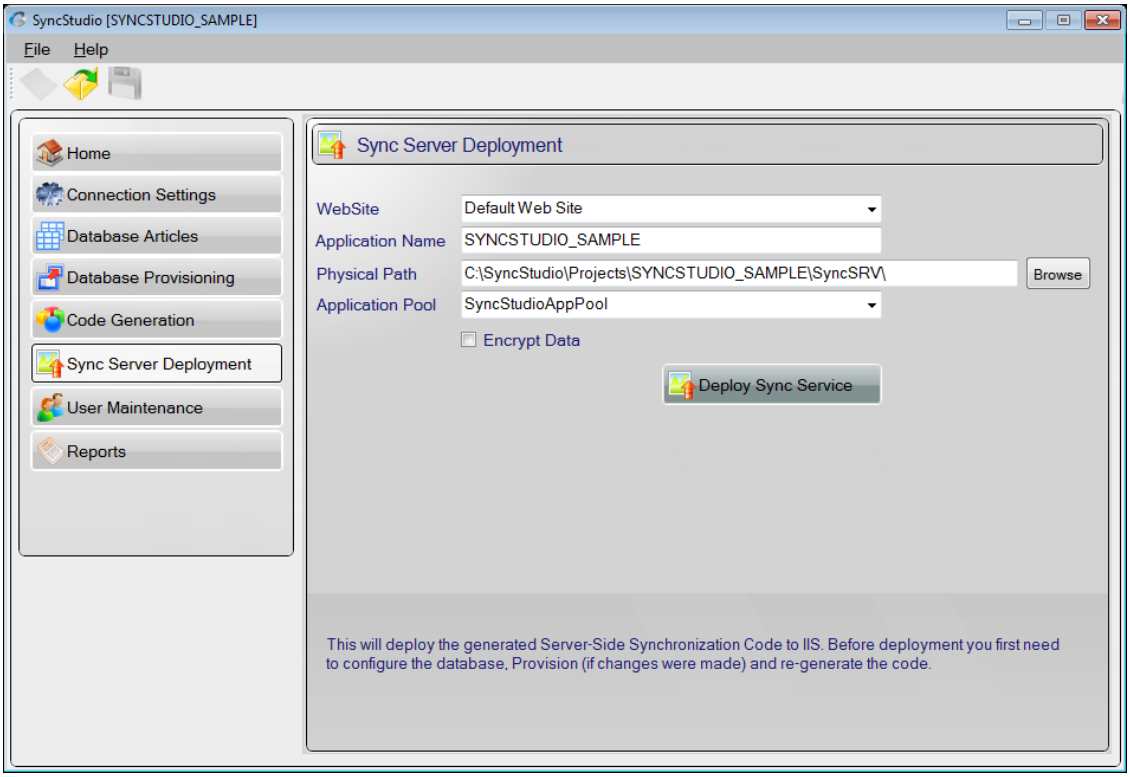
\bin
\bin\SyncStudioService.dll
\bin\Microsoft.Synchronization.Services.dll
DataScopeSyncService.svc
DefaultScopeSyncService.svc
Web.config

All the files above are required for deployment. Please do not make manual changes to any of these files (except for the Web.config database connection, as described below) or your synchronization project will not work correctly.

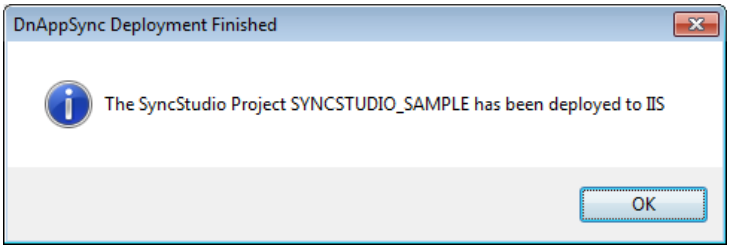
The project creates a default Web.config file. The connection string to the database is inside this Web.config under the tag “SyncStudioCn”.

```
<add name="SyncStudioCn" connectionString="Server=YOURSERVER\YOURDBNAME;
    Database=YOURDBNAME; Integrated Security=SSPI; Connection Timeout=30;"
    providerName="System.Data.SqlClient"/>
```

To deploy the new synchronization server code to IIS please click on the “Sync Server Deployment” tab on the left side of the SyncStudio.

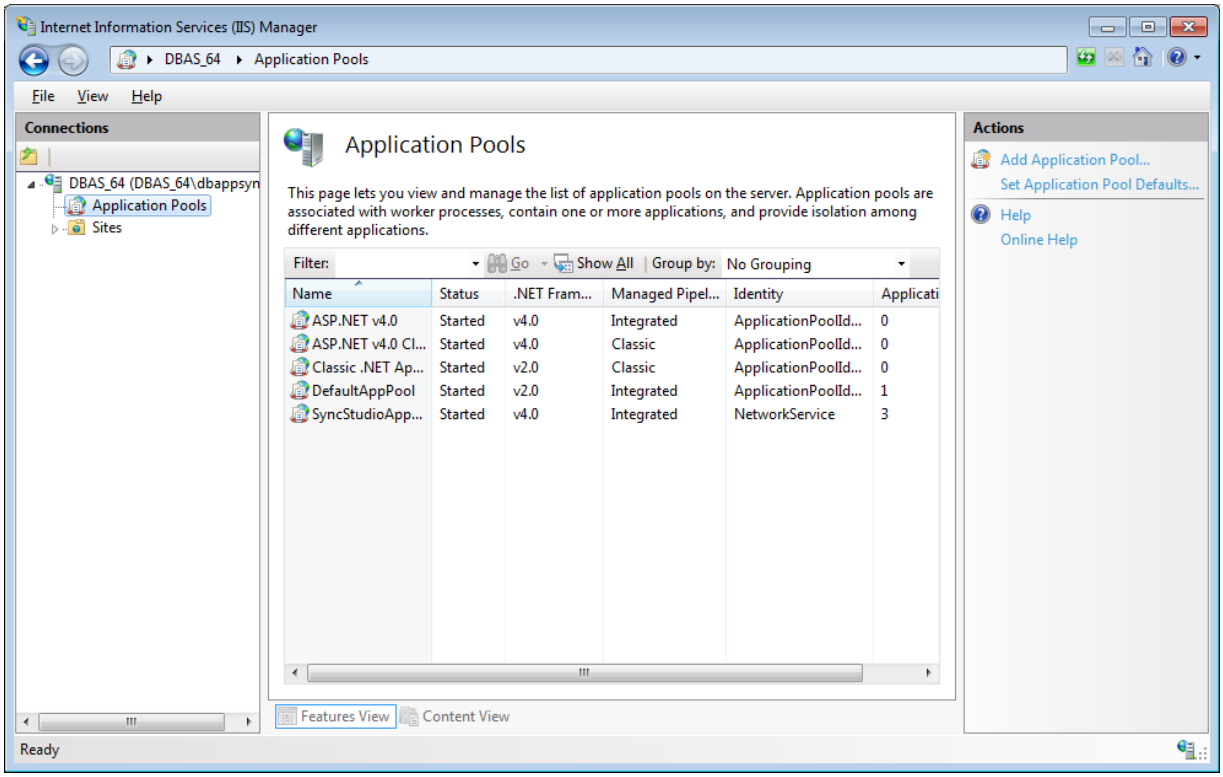


SyncStudio has an automated deployment feature to move the code and configure your Web Service code to run under IIS. This utility is there for your convenience—you could always copy the contents of the Build directory in your project to a virtual directory that you create in IIS yourself, and manually configure IIS.



Notes:

1) SyncStudio needs to run in an Application Pool that is configured to use the .NET Framework Version 4.x. We create on called “SyncStudioAppPool” and configure as needed.
2) SyncStudio requires IIS 7 and up to run.
3) The project will be deployed to the Default Web Site (unless you change it).
4) The project will be deployed to a directory in wwwroot.



Create at least one User.

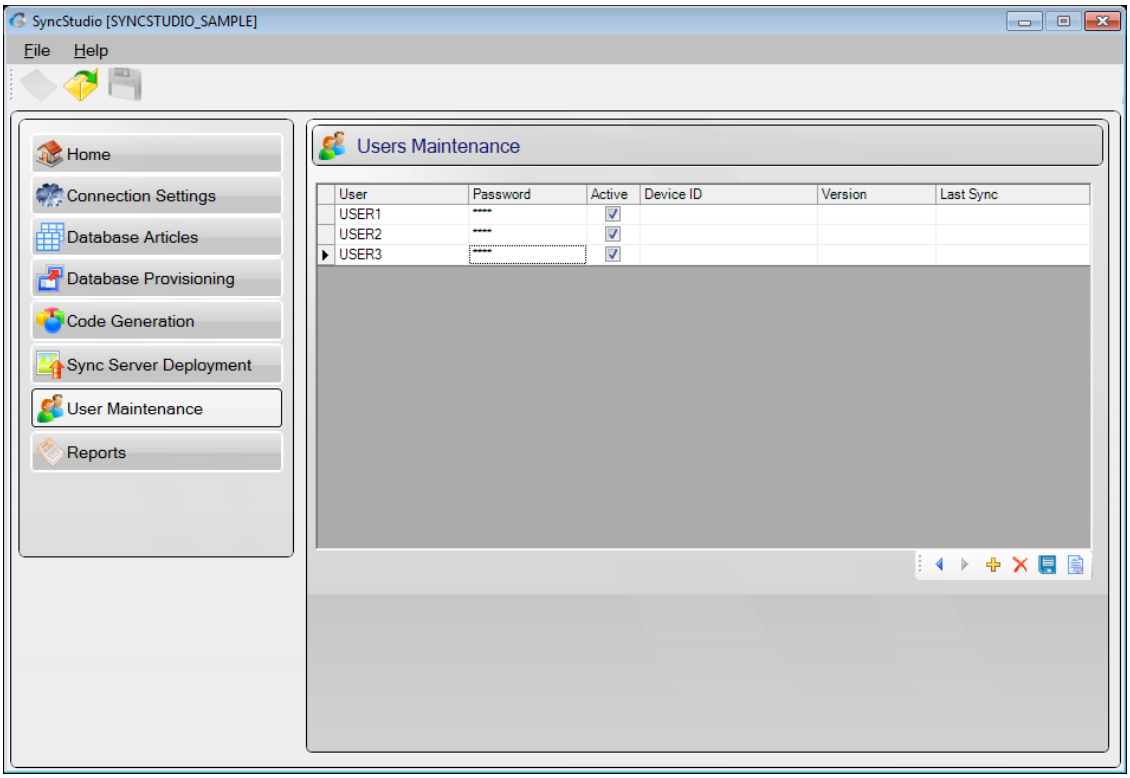
SyncStudio has a separate authentication mechanism; our users are not related to Windows users or to SQL Server users. Every user (i.e., client device) in your system ***must*** have an entry in the SyncStudio User Table with a unique User ID in order for it to be able to synchronize.

You can configure any number of users in your user table, but the system will not operate if there are more users than you are licensed for (***Important***: if your license allows you to have only 10 users and you configure 11 users the sync will stop working for ***all*** the users, not just the 11th one). Demo Licenses (what you get when you download the SyncStudio demo) allow only 3 users—please do not configure more than 3 users for a demo license or you will receive an error message during the synchronization test.
At a minimum, a user has to have a unique User ID and a non-empty password. Optionally, you can store a Device ID and a Client Version (this should be the version # of your own client-side application, not the SyncStudio Client), but these fields are there for your own information—we do not use them for either authentication or synchronization.

For this test we will be configuring three users, with User Id's USER1, USER2 and USER3.

First, click on the tab called "User Maintenance" on the left then click on the  button and fill in at least the User Id and Password fields, click  button. Repeat this for USER2 and USER3.

At the end your screen should look like this:



Your users cannot share User Ids. Every user in SyncStudio must have a different User Id, otherwise they will interfere with each other and they will not be able to synchronize.

If two of your users accidentally use the same User Id (and Password) they will interfere with each other and will not be able to synchronize. If this happens the only recourse is to have both of them delete the local database (you will lose any pending transactions), enter the appropriate User Id and Password for each one in their respective devices and re-synchronize, which will require a full download.

Please note that this should never happen during normal usage because every user should not only have a unique User Id, but also their secret password, which they should never give to anyone else.

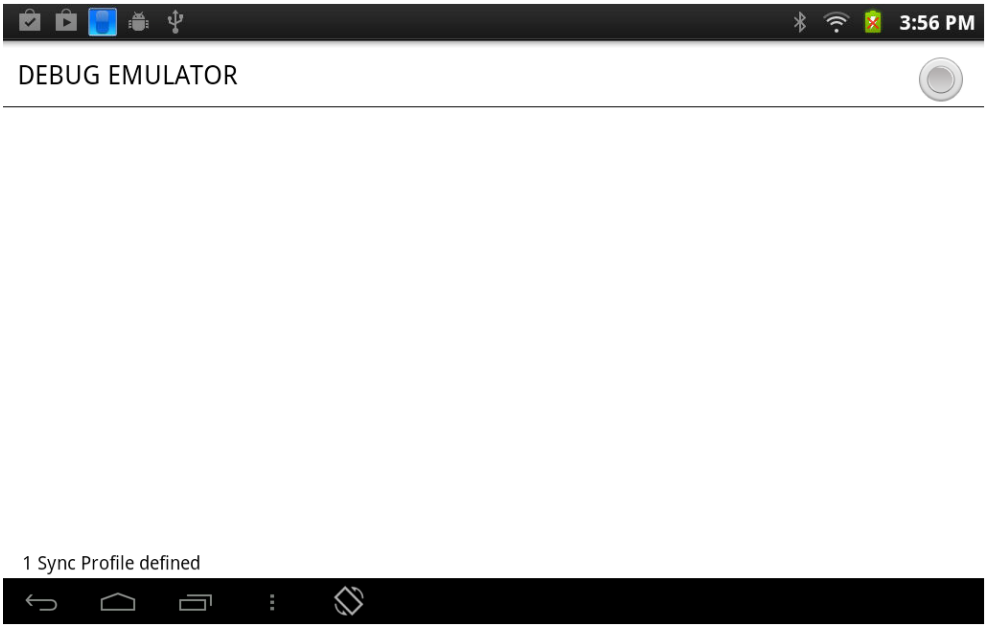
Additionally, sharing User Ids is a violation of the SyncStudio licensing terms, since we license this product on a per-user basis. In other words, it is not allowed (or possible) to buy a 5 user license and then have 100 users by giving everyone the same User Id and password—it will fail, your users will lose any transactions that have been entered but not uploaded to the server and will be forced to re-synchronize with a full download.

The SyncStudio Android Client

You can use Standard SyncStudio Android Client .apk that is delivered with your installation package, or load the client in the Basic4Android development environment and execute it.

When you open the SyncStudio Android Client for the first time there will see a screen similar to the following.

Tap the Android Menu button and select the “Profiles” menu option. This will show a list of the available sync server profiles.



Tap the Menu again and choose “New Profile” to create a new profile, which in this example we called “SALES”:

Our profile will be called SALES and we will assume that the server is located in a development machine in the local network. In this case the IP address of the development machine is 192.168.1.115 (you own IP will likely be different!).

The Server URL will be: http://192.168.1.115/SYNCSTUDIO_SAMPLE/

We will enter the following parameters:

USER ID = USER1

PASSWORD = test (or whatever you set it to when created)

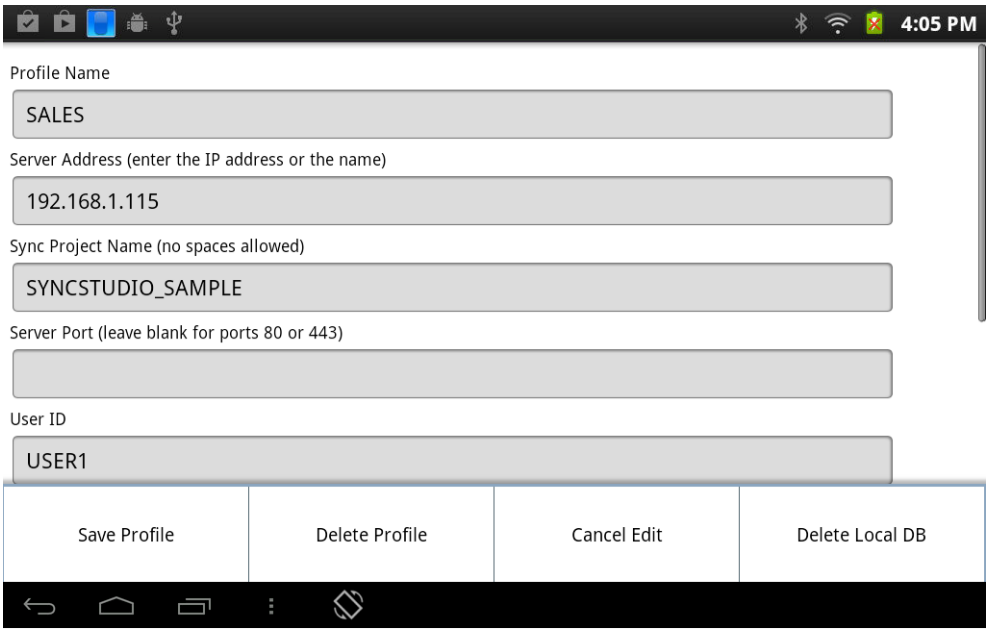
USER GROUP = (leave blank)

DB Folder = TEST (local folder on SD card)

DATABASE NAME = TESTDB

No SSL.

Once you have filled-in the profile information click the Menu key on your device and select the “Save Profile” option, as seen below:

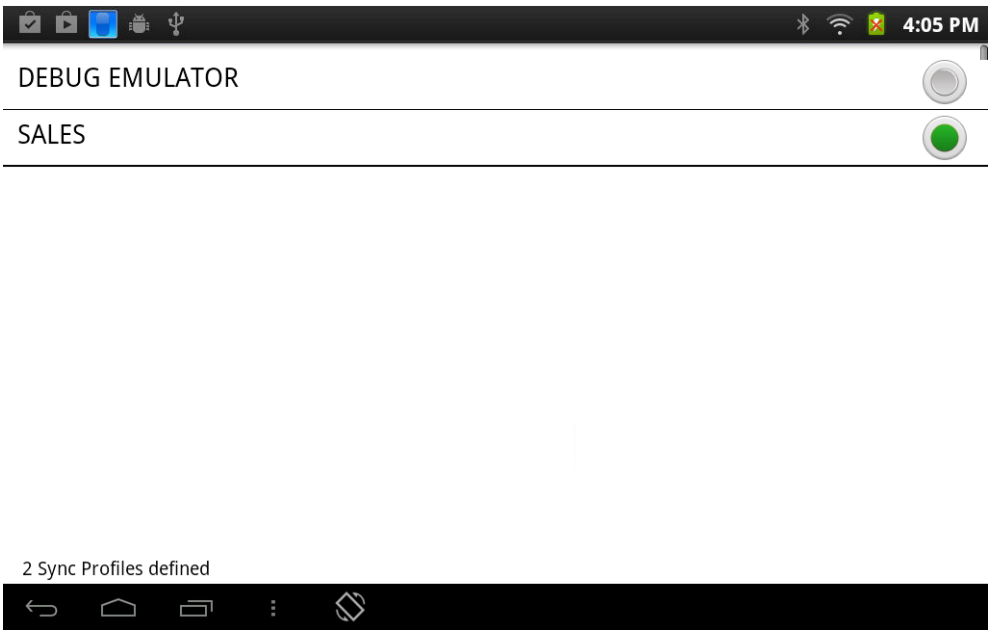

4:05 PM
Profile Name
SALES
Server Address (enter the IP address or the name)
192.168.1.115
Sync Project Name (no spaces allowed)
SYNCSTUDIO_SAMPLE
Server Port (leave blank for ports 80 or 443)
User ID
USER1
Save Profile
Delete Profile
Cancel Edit
Delete Local DB

Notes:

Blanks and/or special characters are not allowed in the Server Address, Project Name, User Id and User Group. Use a-z,A-Z,0-9 and the Underscore character (_) only.

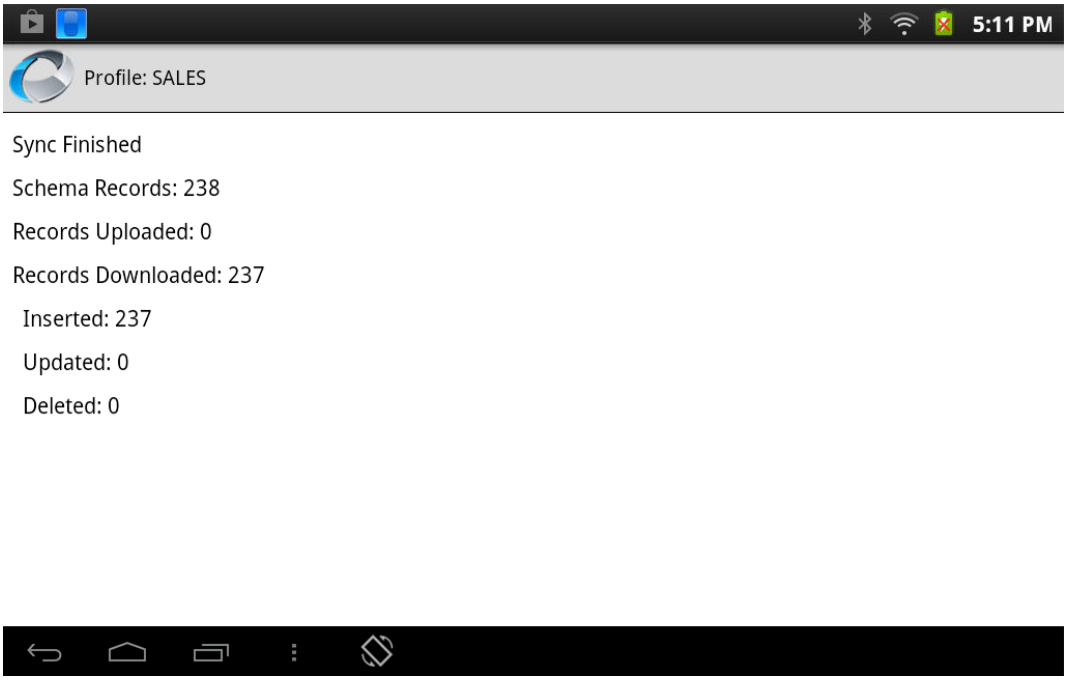
You can specify a port number in the Server Port field. Normally, this will be either port 80 (http) or Port 443 (https or SSL). For ports 80 and 443 you can leave this field blank and use the SSL checkbox in the profile, or else you can specify a custom port number.

After creating the new profile it will be selected as the one to use. To switch profiles tap on the radio-button to the right of the profile name to make it the active profile:

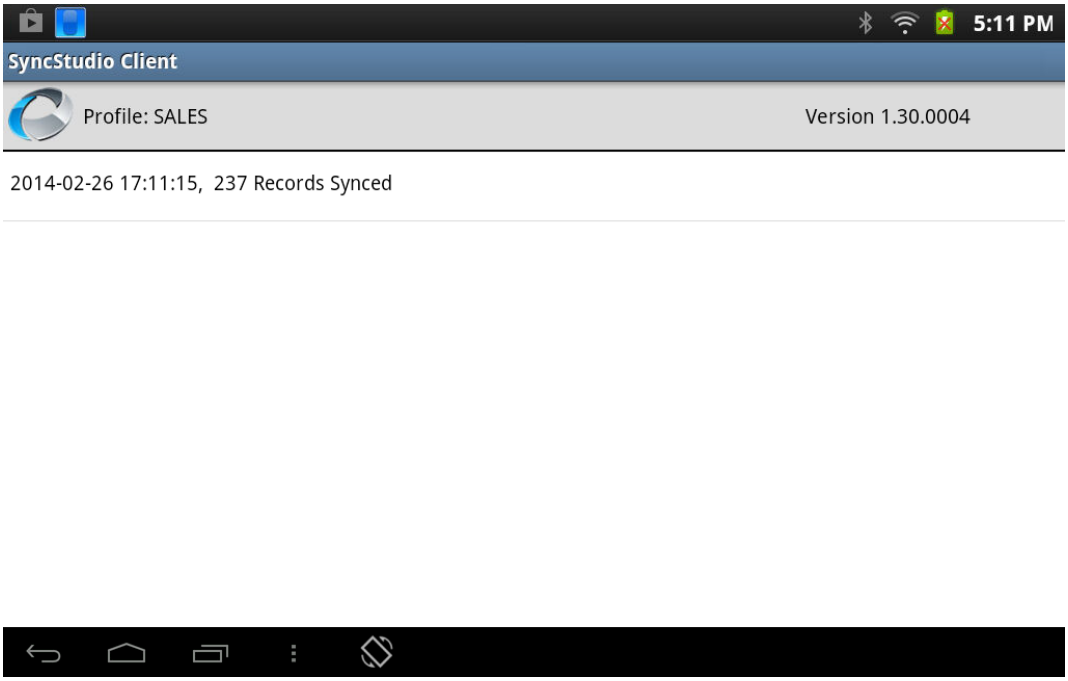


At this point we are ready to synchronize (we assume that you have followed all the prior steps so that your sync server has been deployed to a web server that is “visible” from the Android device. Tap the back key on your device to return to the home screen.

Tap on the "Sync Now" button and tap "Yes". The device will now attempt to synchronize with the server. If the database did not exist (as it would for a new profile) it will be created for you.



At the end of the process you will have a copy of the server database with all the records that were selected for synchronization. In this example 238 records downloaded. If you go back to the main screen (just press the "Back" button) and then tap the menu button and select "Logs" you will see the following screen:



Click the entry for the session to get the details: