



**SyncStudio**  
by HandApps

**SyncStudio by HandApps Software**

A Complete Mobile Database Synchronization Solution

Quick-Start Manual

December 2024

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## **Edition Notes** - Release December 2024

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**Document Revision** This SyncStudio Quick-Start Manual 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 was created to make database synchronization between SQLite, SQL LocalDB/Express and Microsoft SQL Server fast, easy and affordable. To get started with SyncStudio please read this entire document FIRST. You should also already 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 from the Microsoft website.

To install and configure SyncStudio please 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

## Critical Installation Notes and Pre-requirements

### PLEASE NOTE:

**UNINSTALL ANY/ALL VERSIONS OF THE MICROSOFT SYNC FRAMEWORK ON THE TARGET MACHINE. IF YOU DO NOT UNINSTALL SYNCFRAMEWORK SYNCSTUDIO WILL NOT FUNCTION AND YOU WILL NOT BE ABLE TO SYNC YOUR DEVICES/OFF-LINE DATABASE.**

For SyncStudio to function certain Windows Features/Roles need to be installed and configured properly. Below are screenshots showing the required settings for Windows Server 2012 or Windows 10/11.

You must be logged in with an account that has Administrator privileges.

### Windows Server 2012+ – Features and Roles

Before running the SyncStudio installation program please review the following and ensure that your system has been properly configured. Failure to do so will likely result in errors during the installation or during program execution. It is especially critical to confirm that your system has the needed .NET components/features installed.

## Install Win Roles – IIS

The following screenshots show the specific IIS and .NET features/roles that SyncStudio needs setup in order to work. These screens are from Win Srv 2012. If you are using a different version of Windows or Windows Server please extrapolate from this example.

### Roles

- ▲  Web Server (IIS) (16 of 43 installed)
  - ▲  Web Server (14 of 34 installed)
    - ▲  Common HTTP Features (4 of 6 installed)
      - Default Document (Installed)
      - Directory Browsing (Installed)
      - HTTP Errors (Installed)
      - Static Content (Installed)
      - HTTP Redirection
      - WebDAV Publishing
    - ▲  Health and Diagnostics (1 of 6 installed)
      - HTTP Logging (Installed)
      - Custom Logging
      - Logging Tools
      - ODBC Logging
      - Request Monitor
      - Tracing
    - ▲  Performance (Installed)
      - Static Content Compression (Installed)
      - Dynamic Content Compression (Installed)
    - ▲  Security (1 of 9 installed)
      - Request Filtering (Installed)
      - Basic Authentication
      - Centralized SSL Certificate Support
      - Client Certificate Mapping Authentication
      - Digest Authentication
      - IIS Client Certificate Mapping Authentication
      - IP and Domain Restrictions
      - URL Authorization
      - Windows Authentication

- Application Development (6 of 11 installed)**
  - .NET Extensibility 3.5 (Installed)
  - .NET Extensibility 4.5 (Installed)
  - Application Initialization
  - ASP
  - ASP.NET 3.5 (Installed)
  - ASP.NET 4.5 (Installed)
  - CGI
  - ISAPI Extensions (Installed)
  - ISAPI Filters (Installed)
  - Server Side Includes
  - WebSocket Protocol
- ▶  FTP Server
- Management Tools (2 of 7 installed)**
  - IIS Management Console (Installed)
  - ▶  IIS 6 Management Compatibility
  - IIS Management Scripts and Tools (Installed)
  - Management Service

Install these Windows Features -

**Features**

- .NET Framework 3.5 Features (2 of 3 installed)**
  - .NET Framework 3.5 (includes .NET 2.0 and 3.0) (Installed)
  - HTTP Activation (Installed)
  - Non-HTTP Activation
- .NET Framework 4.5 Features (4 of 7 installed)**
  - .NET Framework 4.5 (Installed)
  - ASP.NET 4.5 (Installed)
  - WCF Services (2 of 5 installed)**
    - HTTP Activation (Installed)
    - Message Queuing (MSMQ) Activation
    - Named Pipe Activation
    - TCP Activation
    - TCP Port Sharing (Installed)

## Windows 10 – Features and Roles

### Turn Windows features on or off

To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.

- .NET Framework 3.5 (includes .NET 2.0 and 3.0)
  - Windows Communication Foundation HTTP Activation
  - Windows Communication Foundation Non-HTTP Activation
- .NET Framework 4.6 Advanced Services
  - ASP.NET 4.6
  - WCF Services
    - HTTP Activation
    - Message Queuing (MSMQ) Activation
    - Named Pipe Activation
    - TCP Activation
    - TCP Port Sharing
- Active Directory Lightweight Directory Services
- Containers
- Data Center Bridging
- Device Lockdown
- Hyper-V
- Internet Explorer 11
- Internet Information Services
  - FTP Server
  - Web Management Tools
    - IIS 6 Management Compatibility
      - IIS 6 Management Console
      - IIS 6 Scripting Tools
      - IIS 6 WMI Compatibility
      - IIS Metabase and IIS 6 configuration compatibility
    - IIS Management Console
    - IIS Management Scripts and Tools
    - IIS Management Service



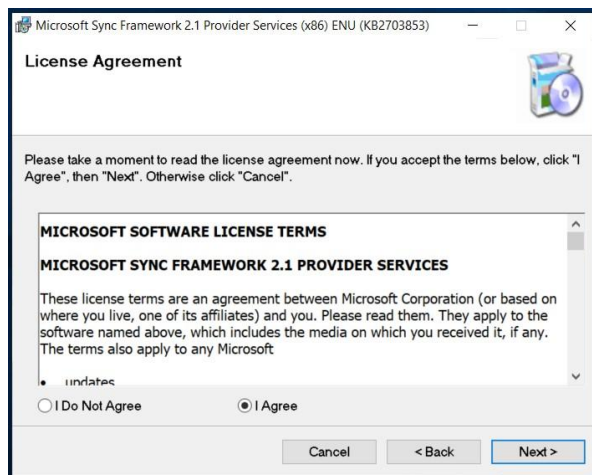
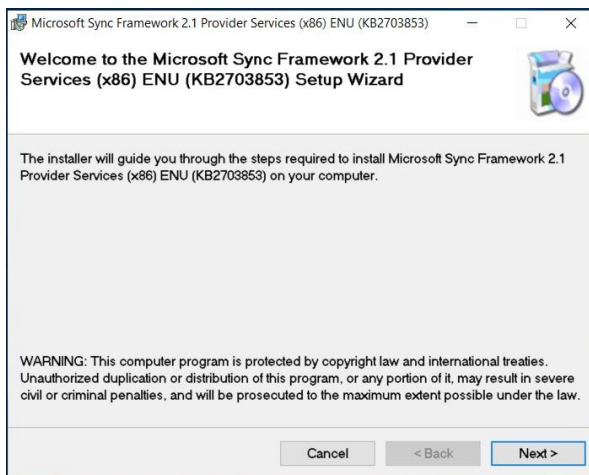
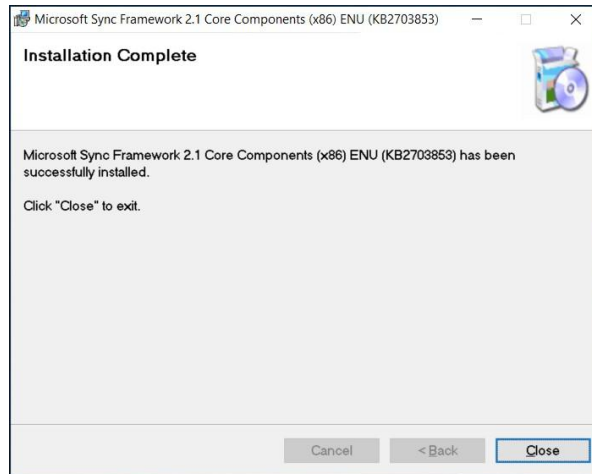
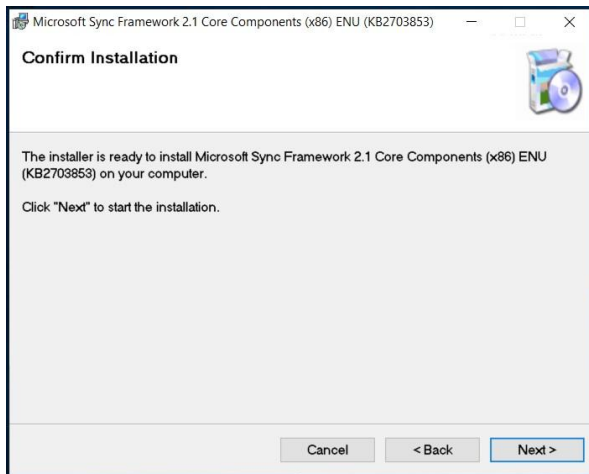
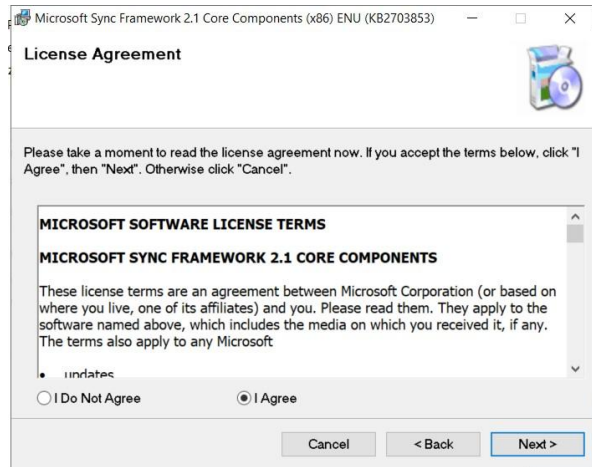
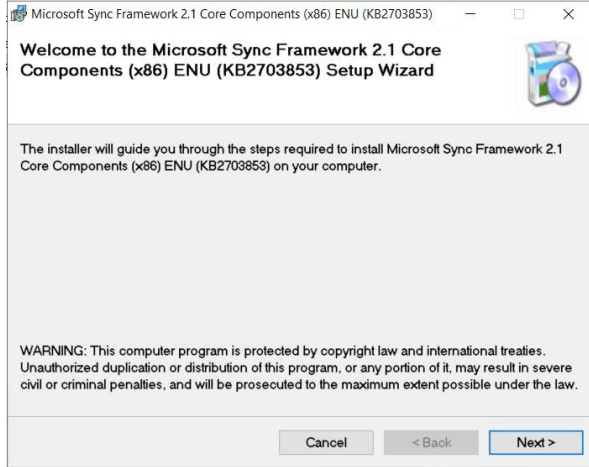
## Turn Windows features on or off

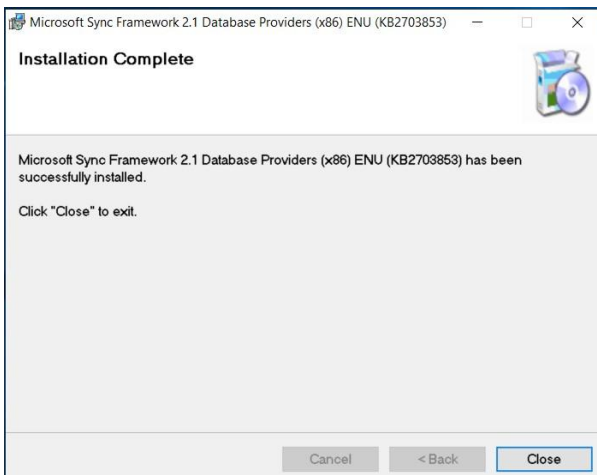
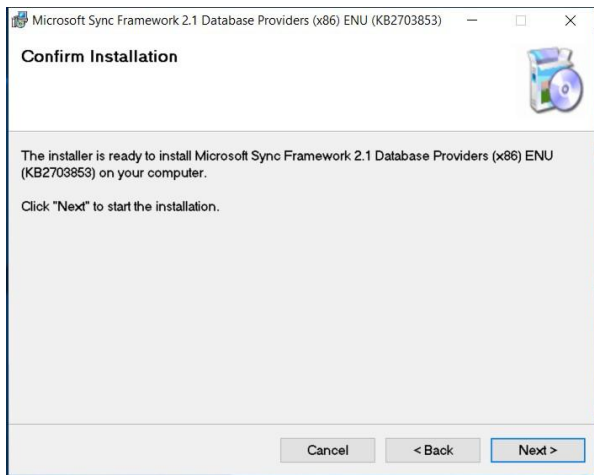
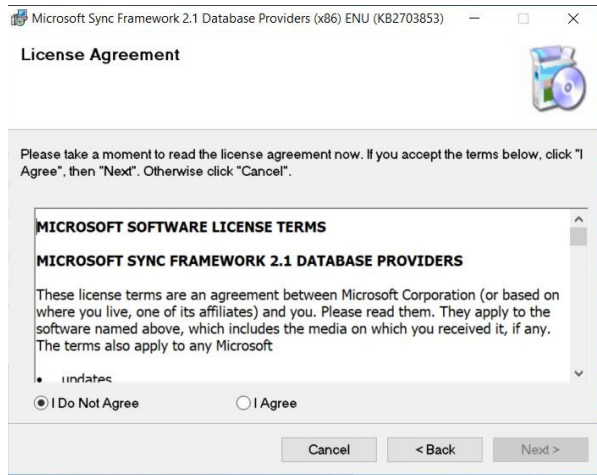
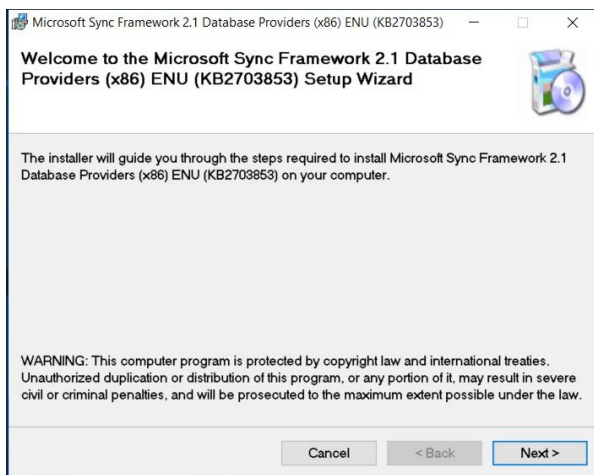
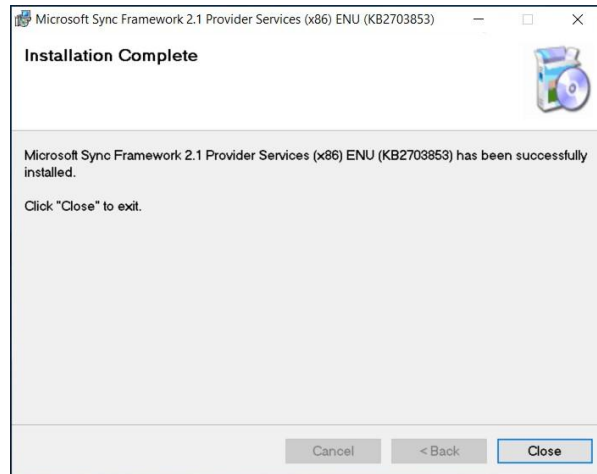
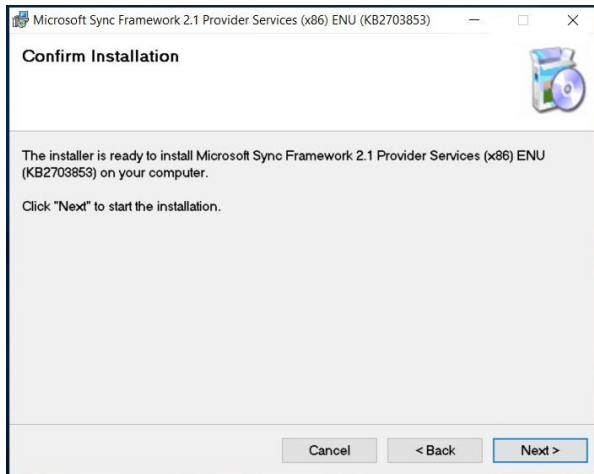
To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.

- World Wide Web Services
  - Application Development Features
    - .NET Extensibility 3.5
    - .NET Extensibility 4.6
    - Application Initialization
    - ASP
    - ASP.NET 3.5
    - ASP.NET 4.6
    - CGI
    - ISAPI Extensions
    - ISAPI Filters
    - Server-Side Includes
    - WebSocket Protocol
  - Common HTTP Features
    - Default Document
    - Directory Browsing
    - HTTP Errors
    - HTTP Redirection
    - Static Content
    - WebDAV Publishing
  - Health and Diagnostics
  - Performance Features
  - Security
    - Basic Authentication
    - Centralized SSL Certificate Support
    - Client Certificate Mapping Authentication
    - Digest Authentication
    - IIS Client Certificate Mapping Authentication
    - IP Security
    - Request Filtering
    - URL Authorization

Install MS Sync framework 2.1 Redist HOTFIX KB2703853 – Install the x86 version. Even on a 64 bit machine you must install x86 version.

You must install 3 files. Install the Synchronization first then Providerservices and finally DBProviWin





## Visual Studio

One of the most unique and valuable features of SyncStudio is that it can automatically generate and compile your unique sync web services DLL. But, to do this the computer running SyncStudio needs to also have a supported version of Visual Studio. This is because the SyncStudio Code Generator needs MSBuild to function. If you have installed MS Visual Studio 2010 or above on your machine you have what you need for SyncStudio to be able to generate code. If you do not have Visual Studio installed or do not own a license of Visual Studio that is OK.

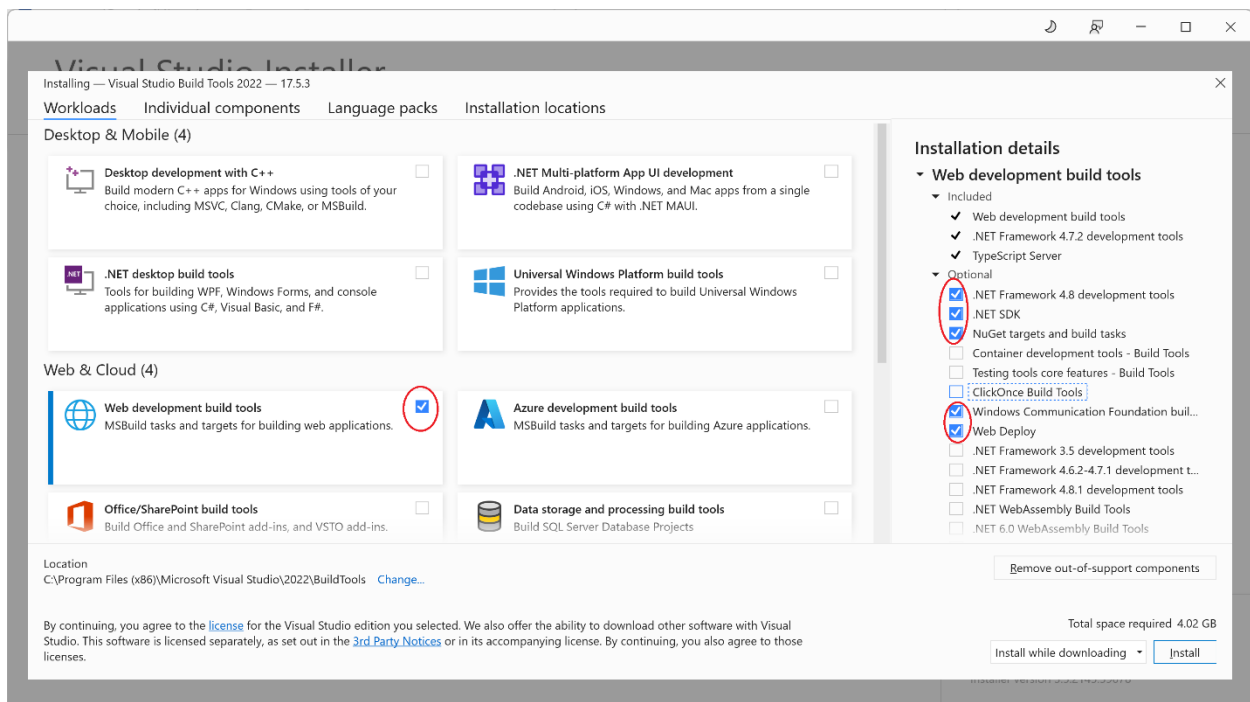
On the machine where you will be generating code with SyncStudio please follow the screenshots below to install the Visual Studio Build Tools 2022. This is available free of charge.

### Visual Studio Build Tools 2022

Use the link below to download the Build Tools.

[vs\\_BuildTools\\_2022.exe](#)

Run the installation and follow the prompts to get to the screen below. Note that for SyncStudio to be able to perform code generation the only features we need are circled in RED. For any other development you are doing or for any other use of the Build Tools then you may need other features. It's up to you to determine what you do or do not need.



Other install information, recommendations and troubleshooting

## PERMISSIONS

- SQL – Add login NT AUTHORITY\NETWORK SERVICE and make it a db owner of the SQL database you intend to Sync using SyncStudio.
- Turn off firewall or configure pass thru as needed.

## MSBUILD

[If you have an issue with MSBuild when generating the code in SyncStudio](#) look in the SyncStudio project folder for a file called dbSyncStudioSvcBuildErrorLog.txt

if error = “The specified solution configuration "Debug|MCD" is invalid”

Please try the following...

Using regedit.exe, navigate to the registry path

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Environment

and selected the key “Platform” if it’s there. If you don’t have the reg key please let us know. This is not a key we add. It may be there from some other MS project or app.

Does it have the value “MCD”?

Then delete only the value MCD. After this the key Platform was still there but empty, close Regedit, and try again to generate the code.

## COMPRESSION

<https://stackoverflow.com/questions/17321131/compression-filter-for-web-api/17331627#17331627>

turn logging off

Turn off ASP.NET debug

Set compression for JSON in Static and Dynamic

Pre-load application pool.

<https://www.wiliam.com.au/wiliam-blog/sydney-web-design-preloading-your-application-pools>

<https://docs.microsoft.com/en-us/biztalk/technical-guides/optimizing-iis-performance>

## Change/Limit SQL Server Memory usage

By default, SQL Server will continue to consume memory until there is none left for anything else. This is usually a bad idea but it’s up to you or your DB Adnin to decide what to do and how.

To set a memory limit for SQL Server you can follow the steps below. But be very careful and don't do this unless you know what you are doing.

In SQL Management Studio open a new QUERY Window....

-- SET SQL MEM LIMIT

--To prevent Microsoft SQL Server from consuming too much memory, you can use the following formula to determine the recommended maximum server memory:

--●Reserve 4GB from the first 16GB of RAM and then 1GB from each additional 8GB of RAM for the operating system and other applications.

--●Configure the remaining memory as the maximum server memory allocated for the Microsoft SQL Server buffer pool.

--For example, if the computer hosting the Microsoft SQL Server instance has 32GB of total physical memory, you would reserve 4GB (from first 16 GB) + 1GB (from next 8 GB) + 1 GB (from next 8 GB) for the operating system, then set the Maximum server memory for Microsoft SQL Server to 26GB (32GB – 4GB – 1GB – 1GB = 26).

--Reference:

--[https://msdn.microsoft.com/en-us/library/ms178067\(v=sql.105\).aspx](https://msdn.microsoft.com/en-us/library/ms178067(v=sql.105).aspx)

USE master

GO

EXEC sp\_configure 'show advanced options', 1;

GO

RECONFIGURE WITH OVERRIDE

GO

-- enable lookup of set memory usage

USE master

GO

EXEC sp\_configure 'max server memory (MB)', 32768;

GO

-- here the max memory used by the sql instance is set to 32GB

-- To calculate take the number 1024 and multiple times the number of GB you want to allocate. 1024 x 32 = 32768

RECONFIGURE WITH OVERRIDE

GO

USE master

GO

EXEC sp\_configure 'show advanced options', 0;

RECONFIGURE WITH OVERRIDE

GO

## Crystal Reports

The SyncStudio Sync Management Console requires Crystal Reports Runtime and installs it automatically.

## Microsoft SQL

SyncStudio supports all versions of Microsoft SQL Server from 2010 through to 2022 and from Express to Enterprise.

### SQL Server Security

Add login NT AUTHORITY\NETWORK SERVICE in SQL security and make it a db owner of the SQL database you will be synchronizing via SyncStudio.

## Windows Firewall

In order for SyncStudio to work it needs to be able to connect from the device or computer running the client application to the computer running SQL Server. The communication is via HTTP and TCP/IP and therefore proper connectivity and routing must exist.

For testing purposes, you should either turn off your Windows or computer firewall OR configure the appropriate pass thru settings as needed.

The default HTTP ports for a Windows machine is port 80 and for HTTPS it's port 441. You can use whatever port you wish, and you can have the connecting device connect to a specific external port and then setup port forwarding to connect to your SyncStudio machine.

The setup of your ports, port forwarding, routing and firewall need to be done properly or sync will not succeed.



## Support Sync Client Platforms

SyncStudio enables data synchronization between Microsoft SQL Server and applications using the platform appropriate SyncStudio Universal Sync Client class library. Currently available class libraries are as follow.

JAVA Android Apps (Android Studio)

Basic4Android Apps

Windows Apps (Forms or WPF) using SQLite

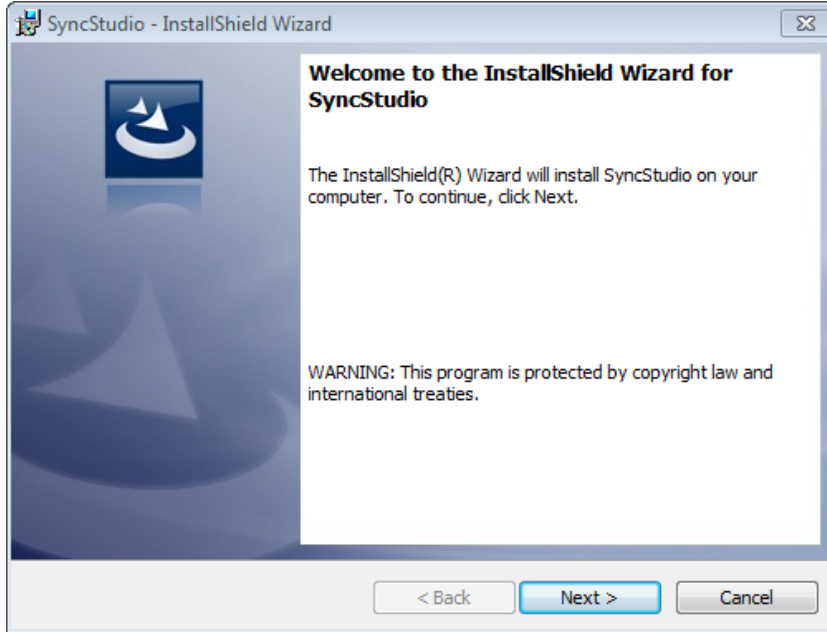
Windows Apps (Forms or WPF) Microsoft LocalDB, SQLEXPRESS, SQL Standard+

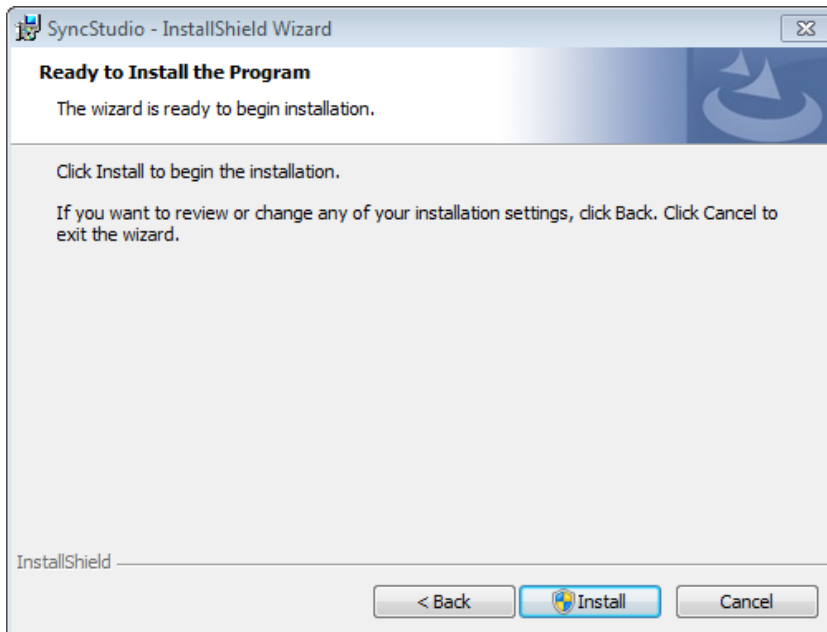
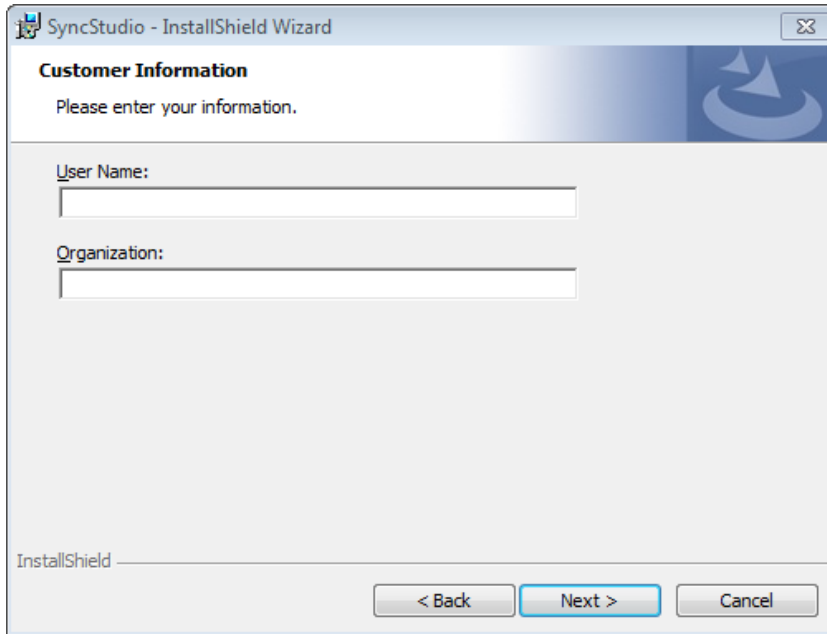
Xamarin for Android

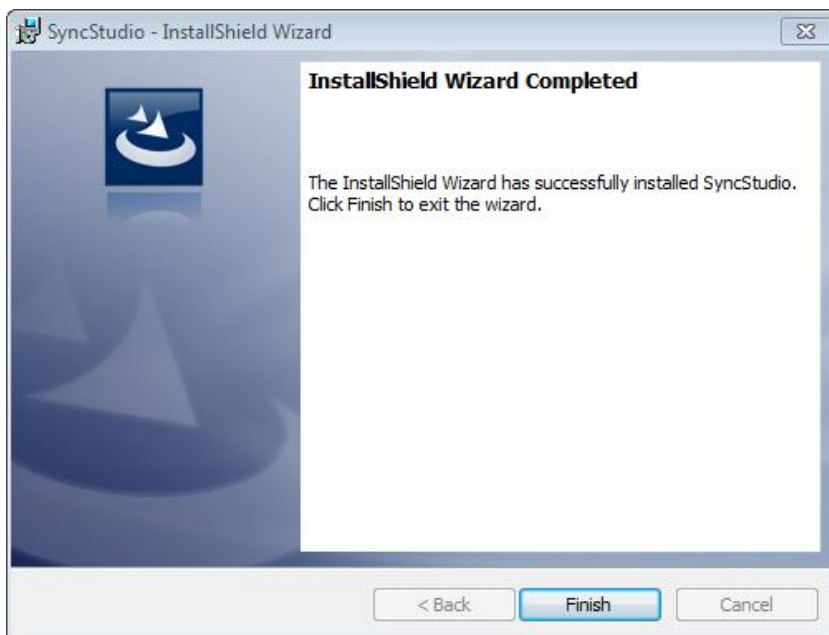
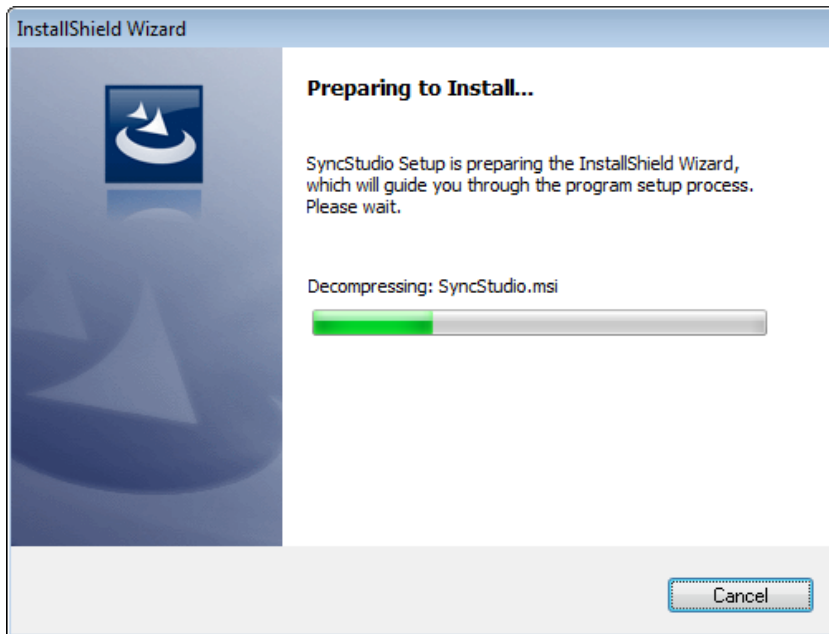
Xamarin for iOS

## Installation

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







## 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.

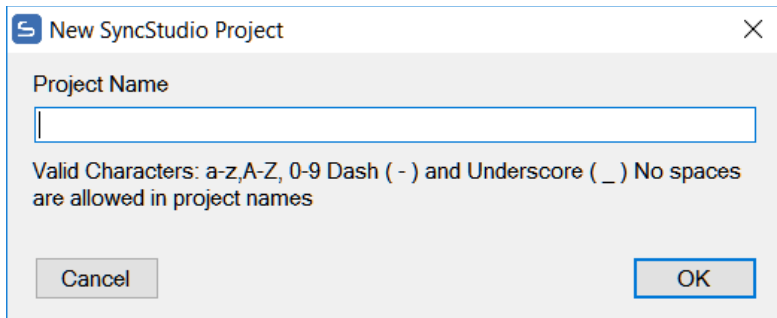
**WARNING: PLEASE DO NOT ATTEMPT TO USE AN SQL DATABASE THAT HAS PREVIOUSLY BEEN PROVISIONED OR USED WITH STANDARD MICROSOFT SYNC FRAMEWORK. ONLY USE DATABASES WITH SYNCSTUDIO THAT ARE CLEAR OF THIRD PARTY SYNC RELATED OBJECTS OR ARE NEW AND HAVE NOT ALREADY BEEN ALTERED BY OTHER SYNCHRONIZATION TOOLS. 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:

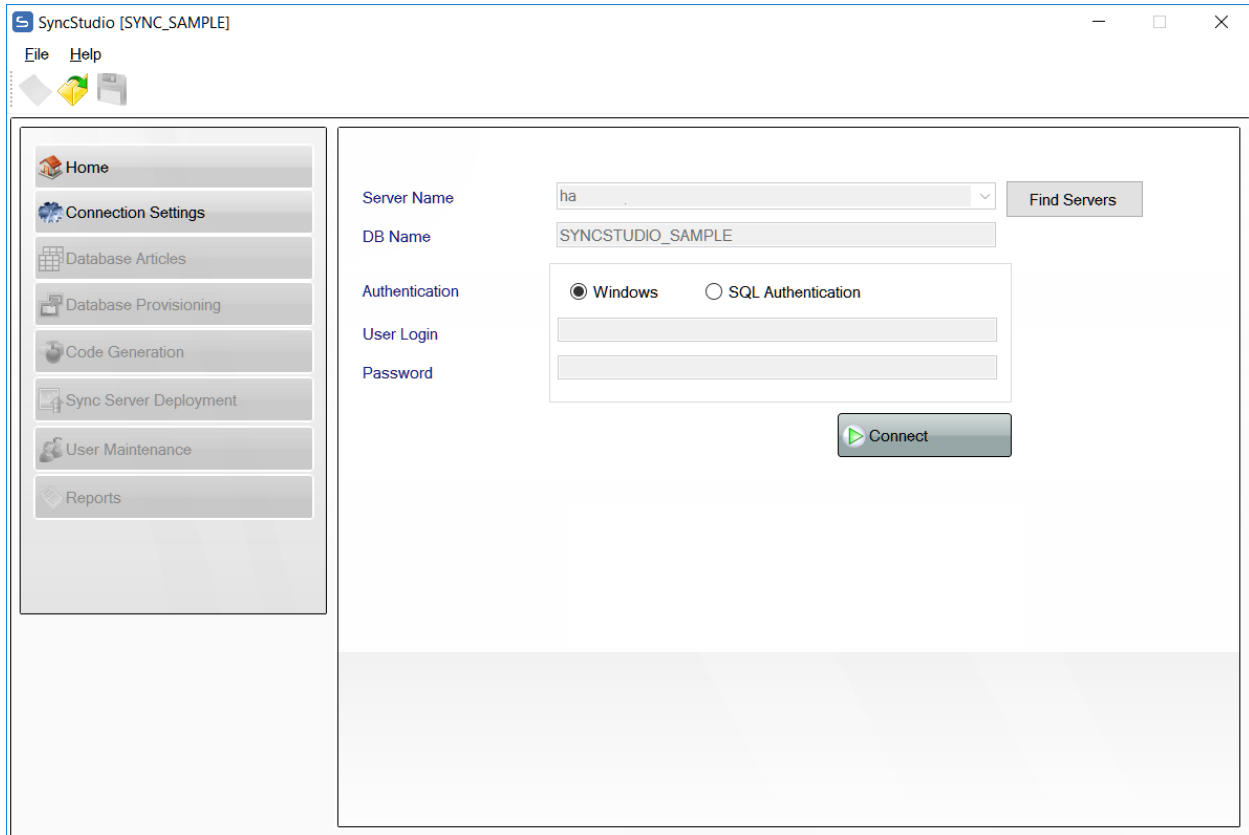
- 1) Open the Microsoft SQL Server Management Studio and connect to the MS SQL server of your choice.
- 2) On the toolbar click on the “Open File” icon.
- 3) Browse to the folder “c:\program files (x86)\SyncStudio\Sample DB”. There you will find a file called “SYNCSTUDIO\_SAMPLE.sql”. This is an SQL 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 Explorer” 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

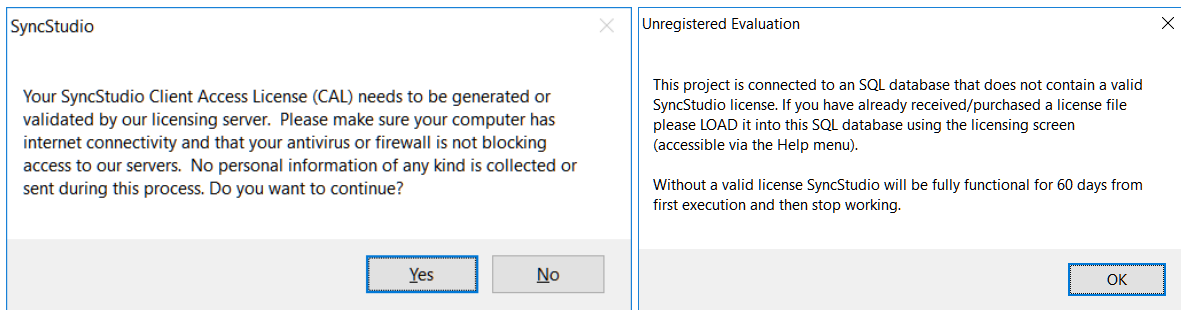
Now that you have all three tables created open the SyncStudio program and click on File → New Project and enter SYNCSTUDIO\_SAMPLE for the project name, as shown in the following screenshots:



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.



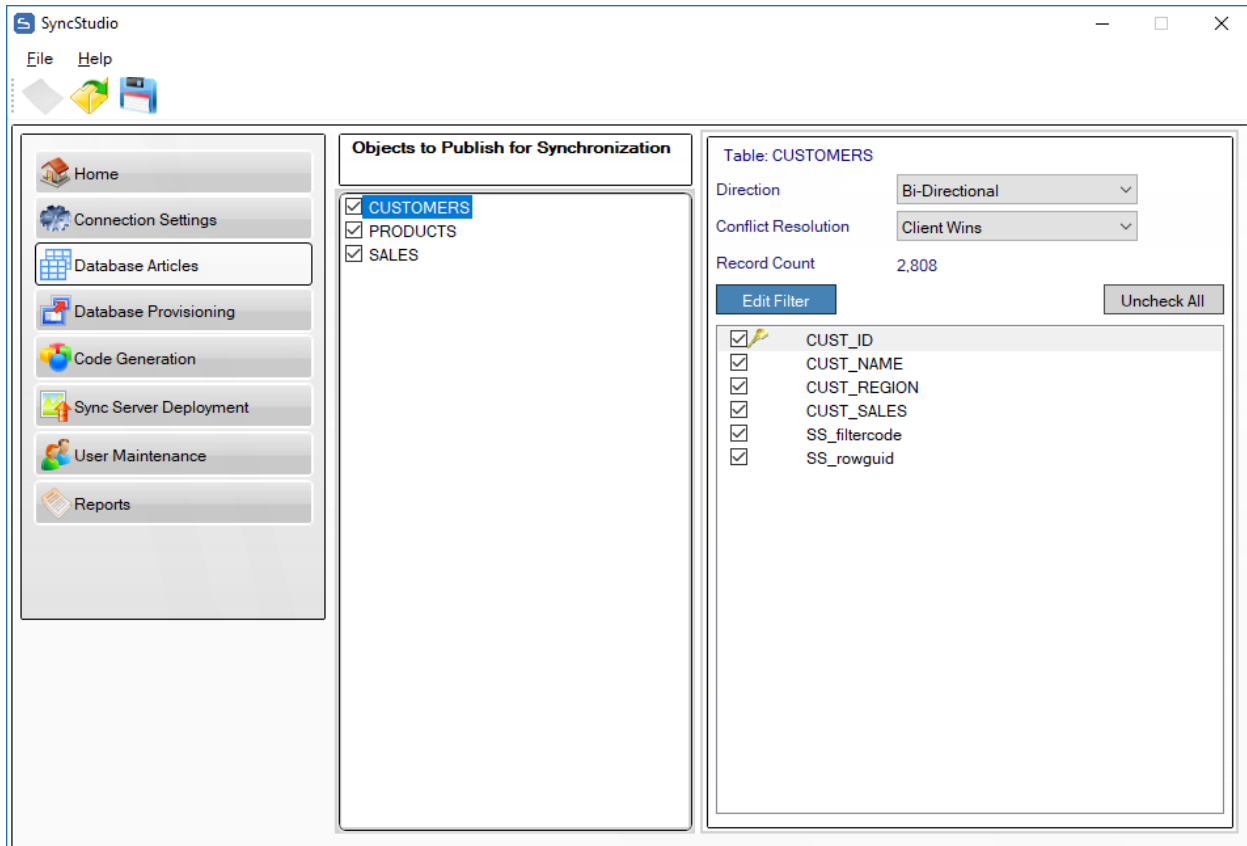
You should be connected to the database and SyncStudio will have retrieved the database schema from the SQL Server.



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.

## Database Articles

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”

### PLEASE NOTE

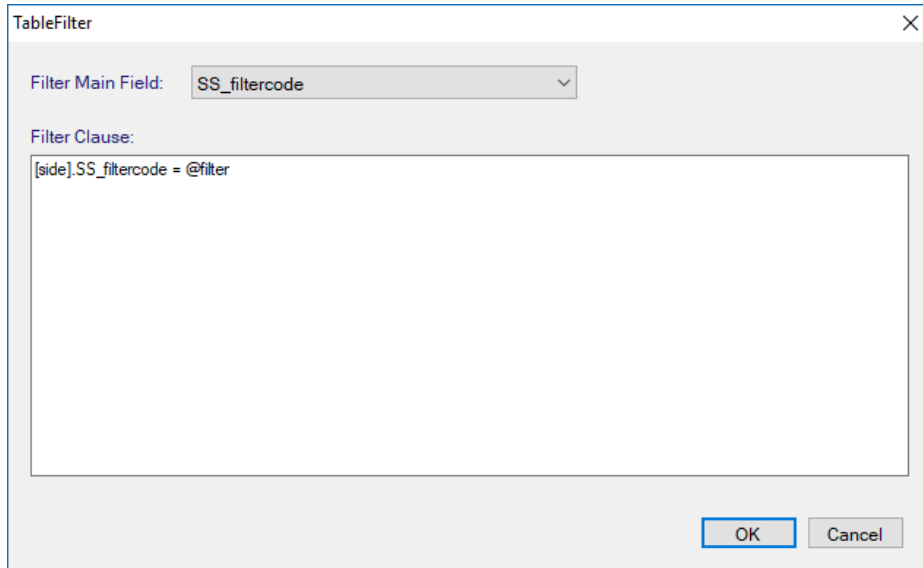
SyncStudio requires you add the field SS\_rowguid to any table that you intend to sync with the client application. The following SQL script can be used to automatically create the ALTER command for each table in your DB.

```
SELECT 'ALTER TABLE ' + T.name + ' ADD SS_rowguid UNIQUEIDENTIFIER DEFAULT newid() NOT null' FROM sys.tables AS T where t.name not like 'SyncStudio%' and t.name not like '%_Tracking' and t.name not like 'scope%' and t.name not like 'schema_info'
```

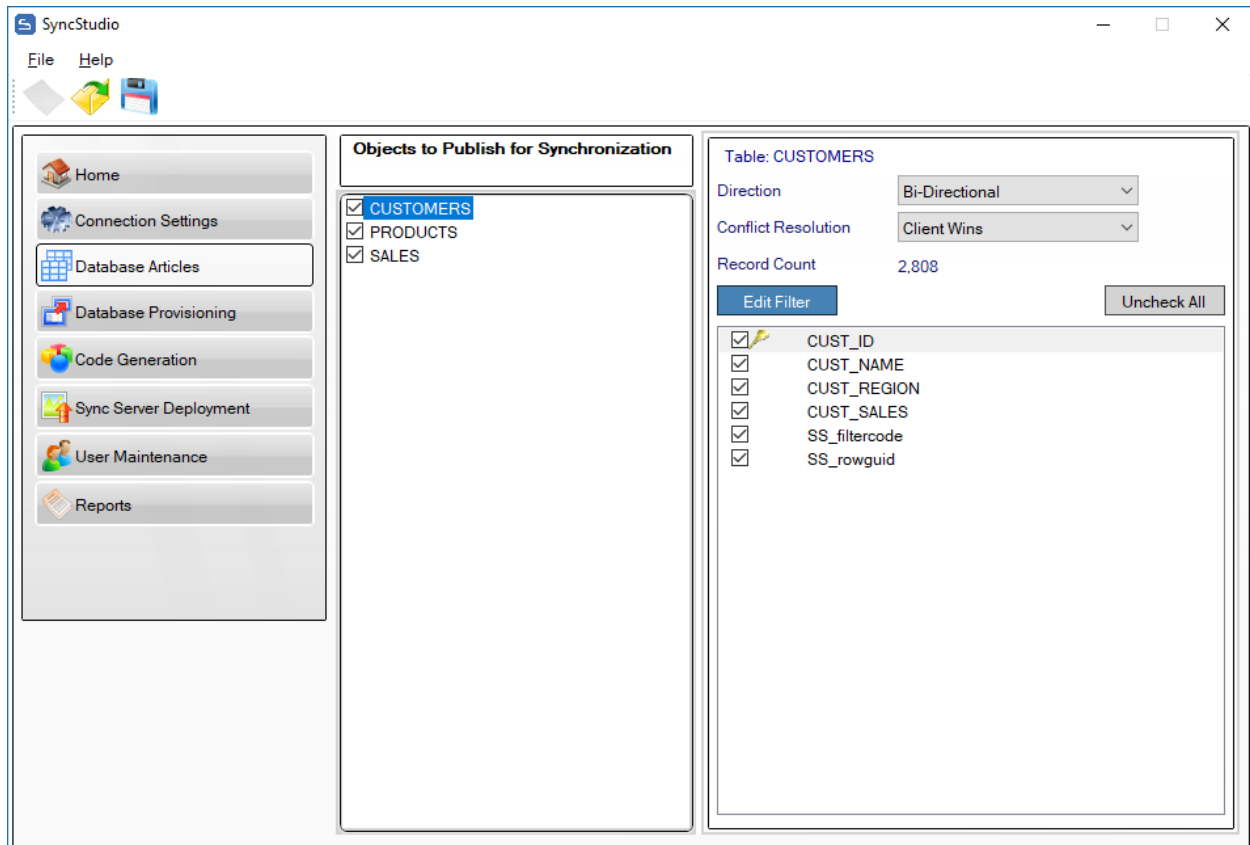
For this guide we want to select all three tables for synchronization, and all fields in all the tables as well. In your own projects you can select only some tables for synchronization, and you do not need to select all the fields (but all the fields that make up the primary key have to be selected).



Also notice that there is a Add/Edit Filter button. Click the button and form will display with a pulldown control and an edit box. Open the pulldown and select any field from the table that you want to use to filter against. Automatically upon selection a default WHERE clause will appear in the text box area. If you are ok with this standard filter condition just click "OK".



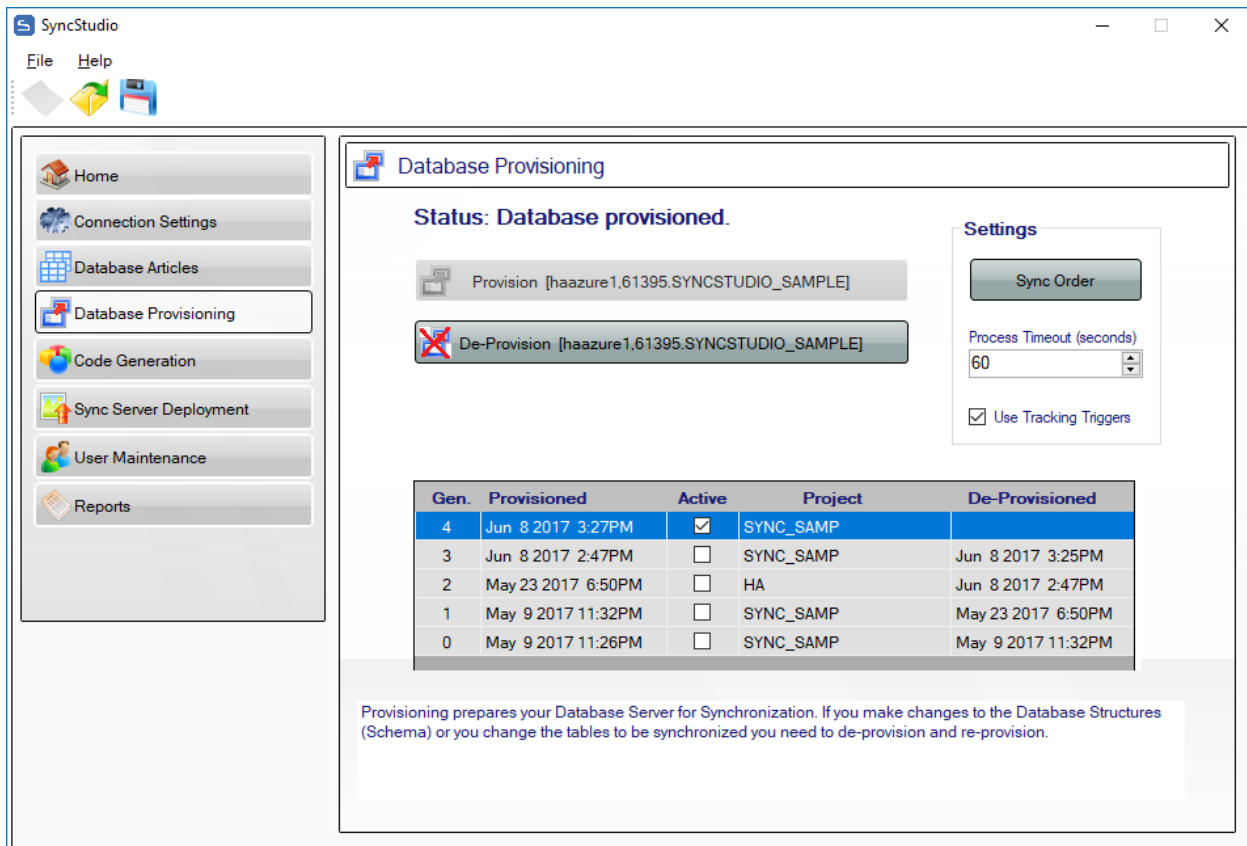
At this point you will have selected all the tables for synchronization. Now we need to provision the database for synchronization.



## Database Provisioning

**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.



Gen.	Provisioned	Active	Project	De-Provisioned
4	Jun 8 2017 3:27PM	<input checked="" type="checkbox"/>	SYNC_SAMP	
3	Jun 8 2017 2:47PM	<input type="checkbox"/>	SYNC_SAMP	Jun 8 2017 3:25PM
2	May 23 2017 6:50PM	<input type="checkbox"/>	HA	Jun 8 2017 2:47PM
1	May 9 2017 11:32PM	<input type="checkbox"/>	SYNC_SAMP	May 23 2017 6:50PM
0	May 9 2017 11:26PM	<input type="checkbox"/>	SYNC_SAMP	May 9 2017 11:32PM

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.

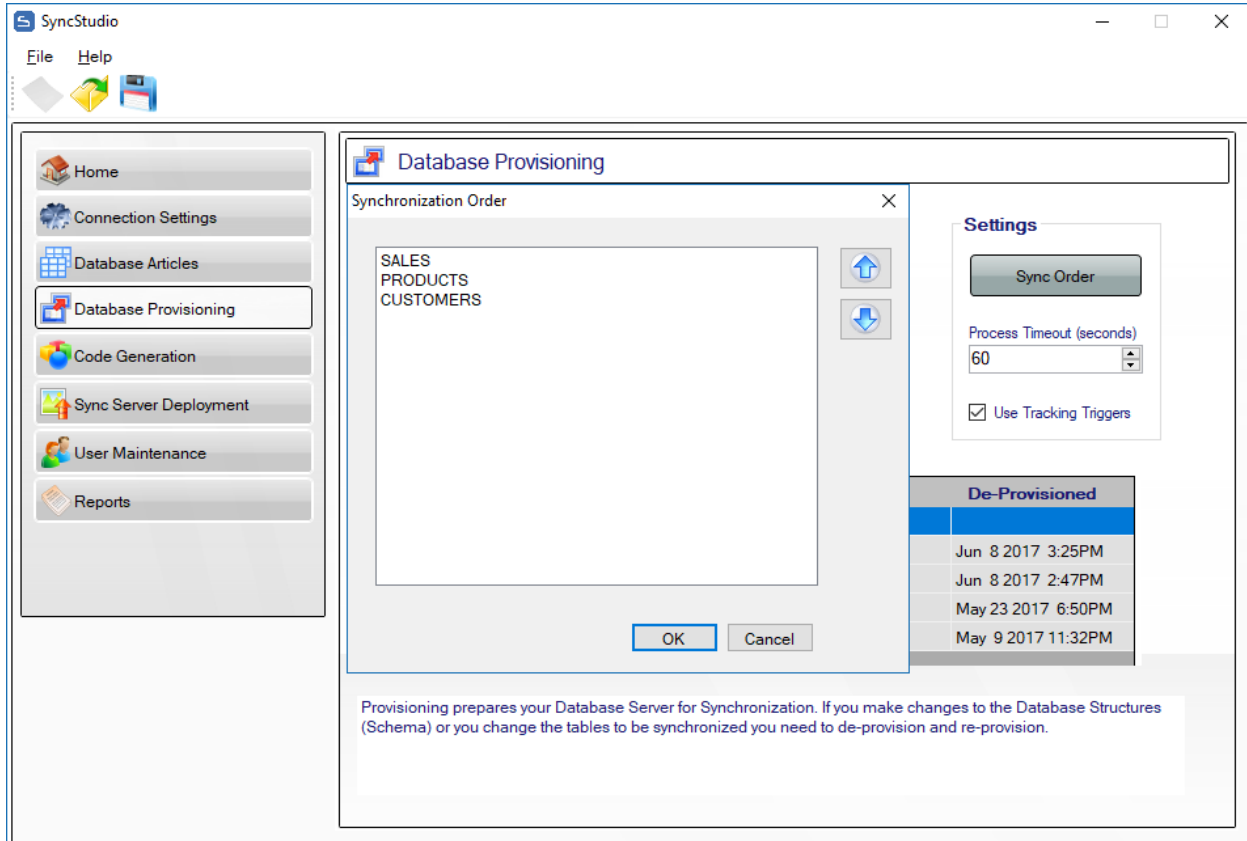
### PLEASE NOTE

SyncStudio requires you add the field `SS_rowguid` to any table that you intend to sync with the client application. The following SQL script can be used to automatically create the ALTER command for each table in your DB. If you don't add this field you will not be able to provision the database.

```
SELECT 'ALTER TABLE ' + T.name + ' ADD SS_rowguid UNIQUEIDENTIFIER DEFAULT newid() NOT null' FROM sys.tables AS T where t.name not like 'SyncStudio%' and t.name not like '%_Tracking' and t.name not like 'scope%' and t.name not like 'schema_info'
```

## Foreign Keys

If you selected any Database Articles that have Foreign Key's, then before Provisioning the database you MUST review and confirm the Sync Order of the tables. Click the "Sync Order" button to open the control.



You must carefully arrange the tables in the correct sync order so as to not cause a foreign key violation during the sync process. If none of your tables have foreign keys then the sync order does not matter. However, if you have foreign keys then, for example, a new child record cannot be inserted before the corresponding parent record is inserted first. Be sure you understand the foreign key relationships between selected tables so you can properly set the sync order. Click on a table then use the arrow keys to move it up or down into the order you want.

When done click OK.

### Use Tracking Triggers (We strongly urge you to enable this option)

In SyncStudio version 3 we introduced the option to automatically create change tracking triggers on the client side database. In order to maintain backward compatibility, we do not enable this feature by default. For new SyncStudio projects we strongly recommend enabling this feature. With this feature on the client database will be fully capable of detecting inserts, edits and deletes without the developer needing to make any codes changes.

### Process Timeout (seconds)

The provisioning of a database with lots of tables or where tables contain considerable amounts of data will naturally take longer than when the database is small with little data. In order to avoid the possibility of an SQL time due to inactivity you have the option of increasing the time out interval. Sixty seconds is usually good for most cases but if more is needed you can increase it here before trying to provision the database.

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.

The screenshot shows the SyncStudio application window. The main area is titled "Database Provisioning" and displays the status "Status: Database provisioned." Below this, there are two buttons: "Provision [haazure1.61395.SYNCSTUDIO\_SAMPLE]" and "De-Provision [haazure1.61395.SYNCSTUDIO\_SAMPLE]". To the right, a "Settings" panel includes a "Sync Order" button, a "Process Timeout (seconds)" dropdown set to 60, and a checked "Use Tracking Triggers" option. A table below shows the provisioning history:

Gen.	Provisioned	Active	Project	De-Provisioned
4	Jun 8 2017 3:27PM	<input checked="" type="checkbox"/>	SYNC_SAMP	
3	Jun 8 2017 2:47PM	<input type="checkbox"/>	SYNC_SAMP	Jun 8 2017 3:25PM
2	May 23 2017 6:50PM	<input type="checkbox"/>	HA	Jun 8 2017 2:47PM
1	May 9 2017 11:32PM	<input type="checkbox"/>	SYNC_SAMP	May 23 2017 6:50PM
0	May 9 2017 11:26PM	<input type="checkbox"/>	SYNC_SAMP	May 9 2017 11:32PM

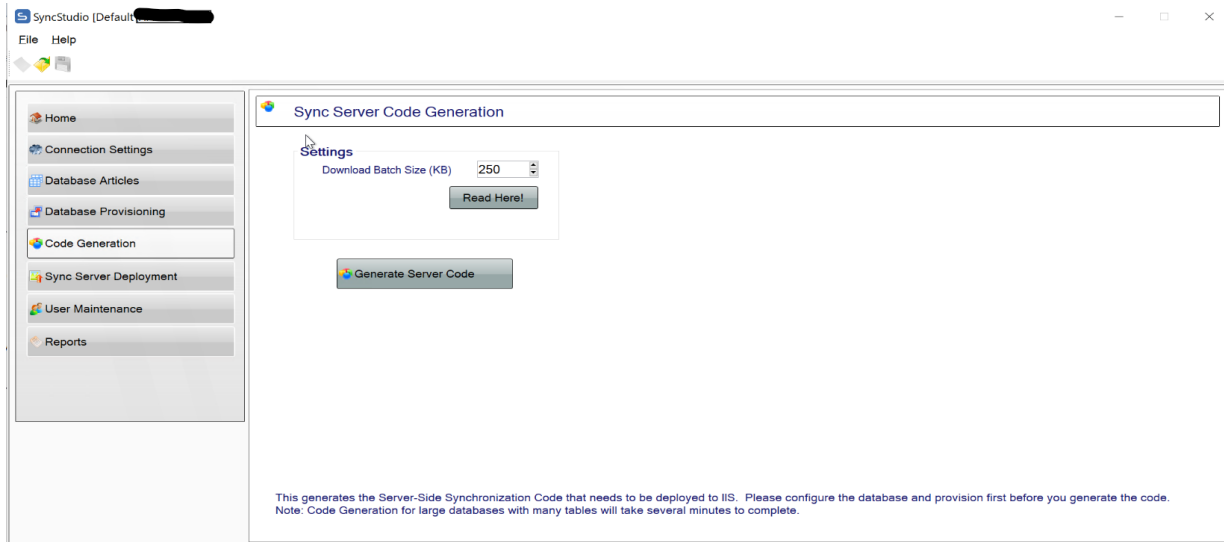
Below the table, a note states: "Provisioning prepares your Database Server for Synchronization. If you make changes to the Database Structures (Schema) or you change the tables to be synchronized you need to de-provision and re-provision."

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.

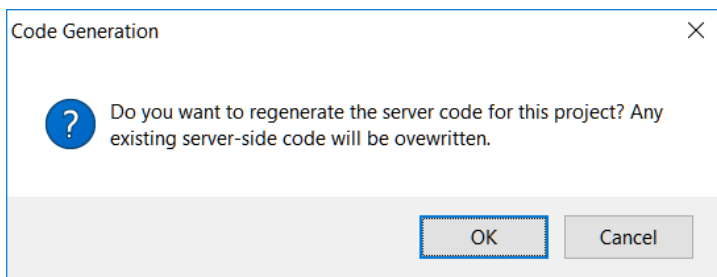
The screenshot shows a dialog box titled "Server Provisioning Finished" with a close button (X) in the top right corner. It contains an information icon (i) and the text: "The Server=ha, Database=SYNCSTUDIO\_SAMPLE is now provisioned for SyncStudio operations." At the bottom, there is an "OK" button.

## Code Generation

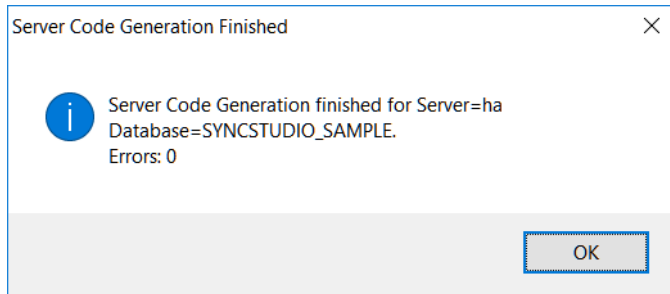
Now that the database has been provisioned we need to generate the synchronization code. To do this please click on the “Code Generation” tab on the left side of the SyncStudio. You will see a screen like the following:



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"/>
```

#### **NOTE: ERRORS DURING CODE GENERATION**

If there is an error during code generate please look for a log file in your SyncStudio project folder called dbSyncStudioSrvcBuildErrorLog.txt.

Open the file and if the error encountered contains something like the following...

Message The specified solution configuration "Debug|MCD" is invalid. Please specify a valid solution configuration using the Configuration and Platform properties (e.g. MSBuild.exe Solution.sln /p:Configuration=Debug /p:Platform="Any CPU") or leave those properties blank to use the default solution configuration. :

Then do this...

Using regedit.exe, navigate to the registry path HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Environment and selected the key "Platform" if it's there. If you don't have the reg key please let us know. This is not a key we add. It may be there from some other MS project or app.

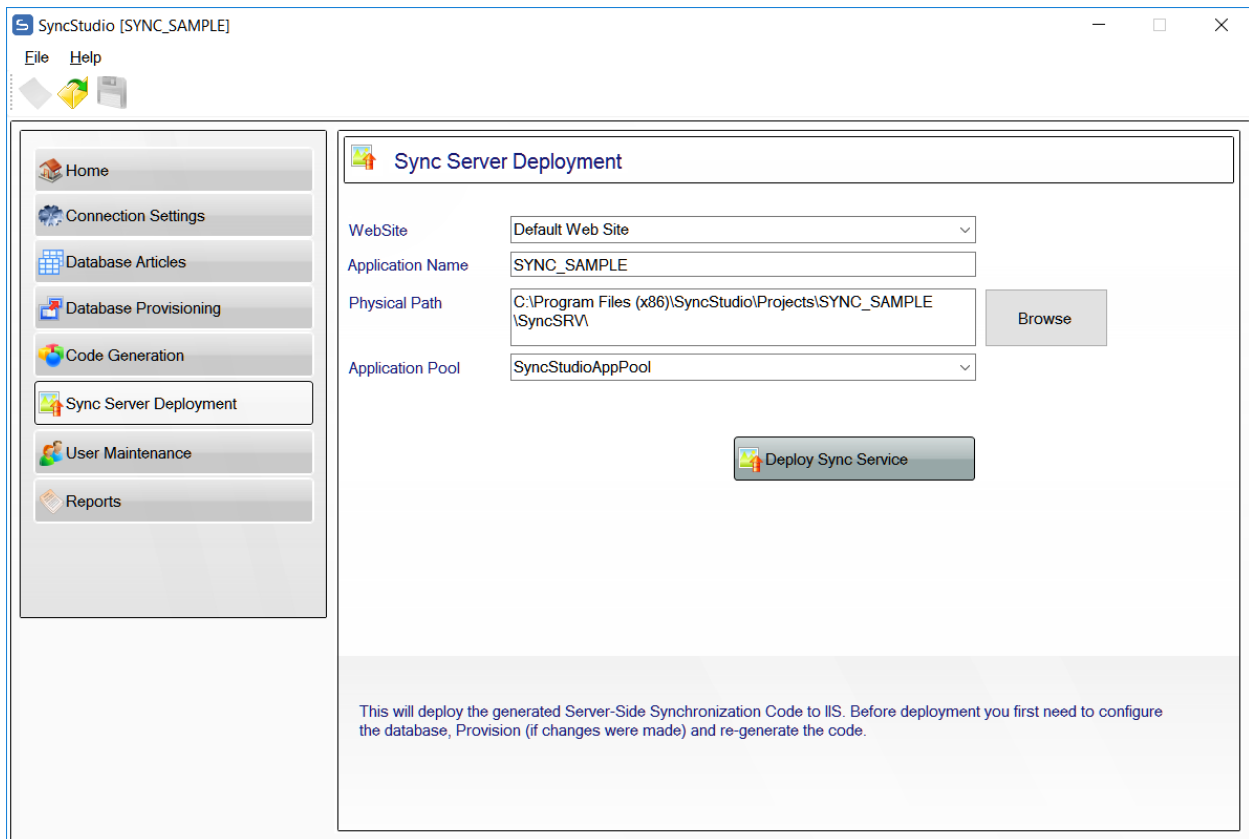
Does it have the value “MCD”?

Then delete only the value MCD. After this the key Platform was still there but empty, close Regedit, make sure you exit and restart the SyncStudio Sync Management Console. The re-open SyncStudio, re-open your project and try again to generate the code.

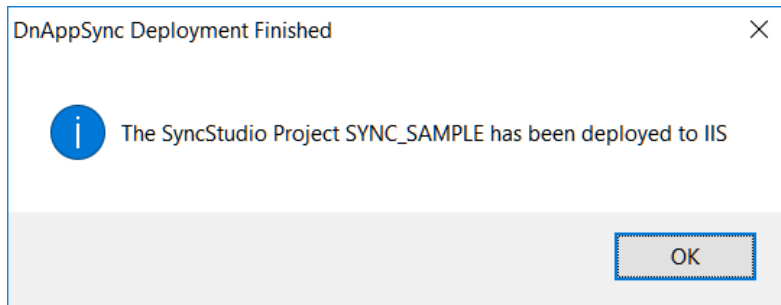
If the content of the dbSyncStudioSvcBuildErrorLog.txt is different than above please email a copy of it to [support@handapps.com](mailto:support@handapps.com)

## Sync Server Deployment

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

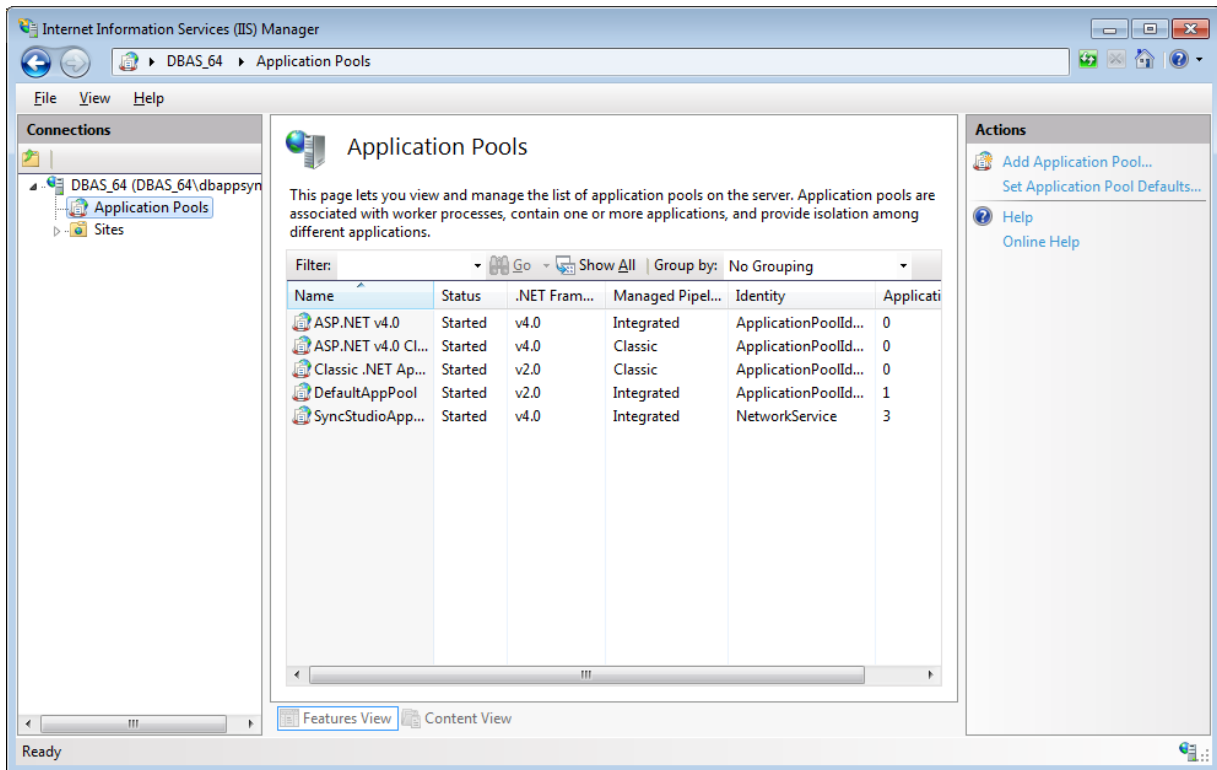


SyncStudio has an automated deployment feature to move the code and configure your Web Service code to run under IIS. This utility is there for your convenience—you could always copy the contents of the Build directory in your project to a virtual directory that you create in IIS yourself, and manually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



**Notes:**

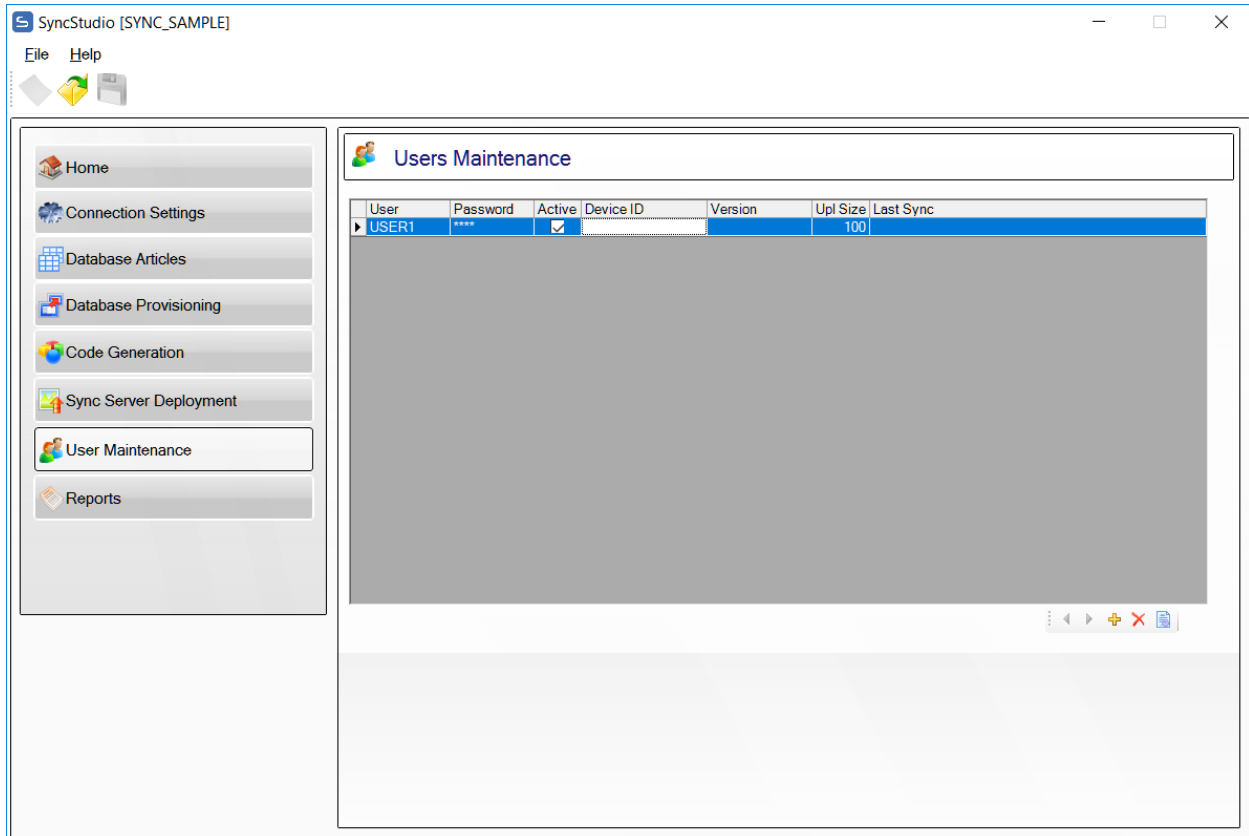
- 1) SyncStudio needs to run in an Application Pool that is configured to use the .NET Framework Version 4.x. We create one called "SyncStudioAppPool" and configure as needed.
- 2) SyncStudio requires IIS 7 and up to run.
- 3) The project will be deployed to the Default Web Site (unless you change it).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






## Create at least one User

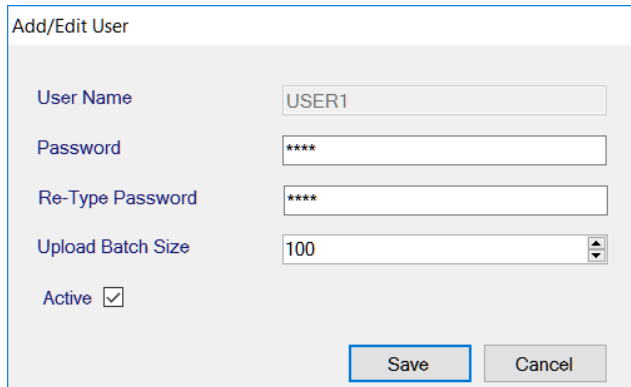
SyncStudio uses the SQL Server authentication mechanism; our users need to also be SQL Server users. You can use our User Maintenance form to create and manage these SQL user id's. Every user (i.e., client device) in your system **must** have a unique SQL user id in order for it to be able to synchronize.



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 11<sup>th</sup> 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.

For this test we will be configuring one users, with User Id USER1 .

First, click on the tab called “User Maintenance” on the left then click on the  button and fill in the form.



Add/Edit User	
User Name	USER1
Password	****
Re-Type Password	****
Upload Batch Size	100
Active	<input checked="" type="checkbox"/>
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

The Upload Batch Size determines how many records the remote client will send (new, modified) in a single batch. 100 is the default but the value can be higher or lower depending on your application and what device you are using. 10 is the minimum.

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.

**Note: When Device has no Menu button**

On some Android devices the “Menu” button/icon has been eliminated. However, most of these devices have the option of turning on the assistant menu. The following video shows how to do it on a Samsung device.

<https://www.youtube.com/watch?v=fH5C2EgcrhQ>

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:

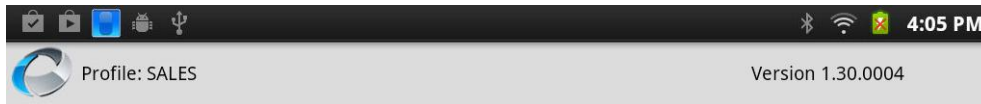
Blanks and/or special characters are not allowed in the Server Address, Project Name, User Id and User Group. Use a-z,A-Z,0-9 and the Underscore character (\_) only.

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.



## SyncStudio

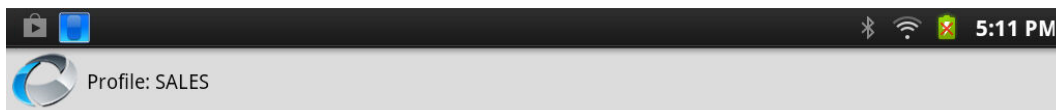
Copyright (c) 2014 MobileFast Corporation  
[www.dbsyncstudio.com](http://www.dbsyncstudio.com)



DB Folder: TEST DB Name:TESTDB



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.



Sync Finished

Schema Records: 238

Records Uploaded: 0

Records Downloaded: 237

Inserted: 237

Updated: 0

Deleted: 0



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:

SyncStudio Client  
Profile: SALES Version 1.30.0004

2014-02-26 17:11:15, 237 Records Synced



Click the entry for the session to get the details:

Profile: SALES  
Date: 2014-02-26 17:11:15  
Session: 3ee0d133fcd1d039509dcb4b4f2327454a5596e0  
Total Records: 237  
Total Records Received: 237  
Total Records Sent: 0  
Table=COMMENTS, RECV Ins=5 Edits=0 Del=0  
Table=CUSTLIST, RECV Ins=68 Edits=0 Del=0  
Table=ITEMLIST, RECV Ins=155 Edits=0 Del=0  
Table=SLSCOMM, RECV Ins=9 Edits=0 Del=0

