

# ClockWork 5 Install Guide

## with SQL Server Setup

*INSTRUCTION MANUAL AND REFERENCE  
FOR IT DEPARTMENTS*



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# INSTALLATION OVERVIEW

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ClockWork consists of four main software components:

- The ClockWork server application is built on Microsoft WCF technology and provides a central point that all clients connect to;
- The ClockWork client application is a .NET based application installed on the client computers that provides the front-line interface for staff and administrative users. Updates are handled automatically through a web-based update system;
- The ClockWork web application is an ASP.NET based application that provides a front-line interface for some functionality to students and instructors. Functionality is provided through various modules built for different purposes.
- The ClockWork Appointment Sync supports either Microsoft Exchange or Google and optionally syncs all appointments to/from ClockWork (2-way mirror sync).

## ClockWork Web

The online web modules offer complementary services to students and are available on and off campus. They provide a pluggable authentication system for students to use; stand-alone and LDAP / Active Directory modules are built in and a custom plug-in system is available if required.

## Database

ClockWork uses a Microsoft Sql Server database as the back-end. Sql Server 2008/2012 Express may be used at no cost if a Sql Server database server is not currently available. The Express version of Sql Server has some limitations when compared with the full version, including a maximum usage of one CPU, a maximum memory usage of 1GB, and a maximum database size of 10 GB. These limitations are not normally a hindrance for an average ClockWork implementation.

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# SYSTEM REQUIREMENTS

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## Application Server

ClockWork Server uses Microsoft Windows Communication Foundation (WCF) as the back-end for the application server software. WCF is a free Microsoft component on the server, similar to IIS, and runs in conjunction with IIS.

Application Server Requirements	
Processor	2GHz dual core or higher
Framework	<ul style="list-style-type: none"> <li>• .NET Framework 3.5 Service Pack 1 (SP1)</li> <li>• Windows Communication Foundation (WCF) (this is located in the Windows "Add/remove features" area in Windows)</li> <li>• IIS 7 or higher</li> </ul>
SSL Certificate	<ul style="list-style-type: none"> <li>• Can be the same SSL certificate used for the web modules (below) if the Application Server is on the same machine as the Web Server (this is the recommended setup)</li> </ul>
Memory	4GB or more recommended
Hard Disk	recommended 4GB of free space or more for installation
Ports	<ul style="list-style-type: none"> <li>• 808 (TCP) and 80 (HTTP) (open to client)</li> <li>• 26 (SFTP) (server must download updates from a TechnoPro server – this feature is recommended but can be disabled if updates are to be downloaded manually)</li> </ul>

## Database Server

ClockWork uses Microsoft Sql Server as the back-end database, and is compatible with any of the 2005 or higher versions. The ClockWork database is intended to run from a server that hosts other databases for other applications; an automated backup schedule should be in place. A virtual machine may be used.

Database Server Requirements	
Software	Microsoft SQL Server 2008 or higher, any edition, is recommended.
Hard Disk	25 GB minimum recommended for data. Actual data space requirements depend on usage. Backups will require additional space. It is recommended to store a copy of backups externally.
Sql Server user	<ul style="list-style-type: none"> <li>• One Sql Server user account with dbread and dbwrite permissions on the ClockWork database</li> <li>• One Sql Server user account with truncate, create, and alter permissions on the ClockWork database (for installation and upgrading purposes)</li> </ul>

## Web Server

The ClockWork web modules can be installed on an existing web server along-side other applications. A virtual machine may be used.

Web Server Requirements	
Processor	2GHz dual core or higher recommended
Server-side language	<ul style="list-style-type: none"> <li>• ASP.NET 3.5 Service Pack 1 (SP1)</li> <li>• IIS 7 or higher</li> </ul>
Operating System	Any operating system that supports the http server and the Server-Side language specified above
Memory	4 GB or higher recommended
Hard Disk	2GB of free space for installation, plus sufficient free hard drive space to allow Windows/IIS to run smoothly.
SSL certificate	A signed SSL certificate is required for secure transmission of data over the Internet.

## Client (Staff computer)

The client software is installed on each staff computer. The Microsoft .NET Framework 3.5 is a free Microsoft download. ClockWork software updates are provided through a built-in ClockWork-Server-based updating system and can be controlled/restricted at an administrative level.

Client (Staff) Requirements	
Processor	2GHz or faster recommended
Framework	.NET Framework 3.5 Service Pack 1 (SP1)
Operating System	Windows XP SP3 or later, Windows Vista, Windows 7, or Windows 8
Memory	4 GB or more is recommended
Hard Disk	2GB of free space or more for installation and updates
Display	SVGA (1024x768) or higher recommended
Other	Microsoft Word 2003 or higher

## ClockWork Appointment Syncs (Server)

Outlook (Exchange) and Google Appointment Syncs are available. The sync will run as a Windows Service and perform full 2-way mirror syncs between ClockWork and Google or Exchange. Sync frequency is controlled by a setting.

ClockWork Appointment Sync Requirements	
Processor	2GHz dual core or higher recommended
Framework	.NET Framework 3.5 Service Pack 1 (SP1)
Operating System	<ul style="list-style-type: none"> <li>• Windows 7 or higher</li> <li>• Windows Server 2008 or higher</li> </ul>
Memory	4 GB or more is recommended
Hard Disk	1GB of free space or more for installation and updates

## Combination: Application Server and Web Server (Server)

These requirements are recommended if the ClockWork Application and Web Servers will be running on the same machine.

ClockWork Appointment Sync Requirements	
Processor	2GHz dual core or higher recommended
Framework	.NET Framework 3.5 Service Pack 1 (SP1)
Operating System	<ul style="list-style-type: none"> <li>• Windows 7 or higher</li> <li>• Windows Server 2008 or higher</li> </ul>
Memory	6GB minimum, 8GB or more is recommended
Hard Disk	6GB of free space or more for installation and updates

## Combination: Application Server and Appointment Sync (Server)

These requirements are recommended if the ClockWork Application server and ClockWork Appointment Sync will be running on the same machine.

ClockWork Appointment Sync Requirements	
Processor	2.4GHz dual core or higher recommended
Framework	.NET Framework 3.5 Service Pack 1 (SP1)
Operating System	<ul style="list-style-type: none"> <li>• Windows 7 or higher</li> <li>• Windows Server 2008 or higher</li> </ul>
Memory	6GB minimum, 8GB or more is recommended
Hard Disk	6GB of free space or more for installation and updates

## Combination: Application Server, Web Server and Appointment Sync (Server)

These requirements are recommended if the ClockWork Application Server, Web Server, and Appointment Sync will be running on the same machine.

ClockWork Appointment Sync Requirements	
Processor	2.4GHz dual core or higher recommended
Framework	.NET Framework 3.5 Service Pack 1 (SP1)
Operating System	<ul style="list-style-type: none"> <li>• Windows 7 or higher</li> <li>• Windows Server 2008 or higher</li> </ul>
Memory	8GB minimum, 12GB or more is recommended
Hard Disk	10GB of free space or more for installation and updates

\* Please contact us for specific requirements if multiple ClockWork systems will be running from the same machine.

## ClockWork Licensing Specifications for IT information

Each Department that purchases ClockWork will be allowed the following:

Install a Test and Production version of the "ClockWork Database", the "ClockWork Server Application", the "ClockWork Web Server".

Department may install the "Software Client" on as many computers as they wish. The number of "Concurrent Licenses" purchased will dictate how many users can connect to ClockWork at the same time.

## STEP ONE

# INSTALLING SQL

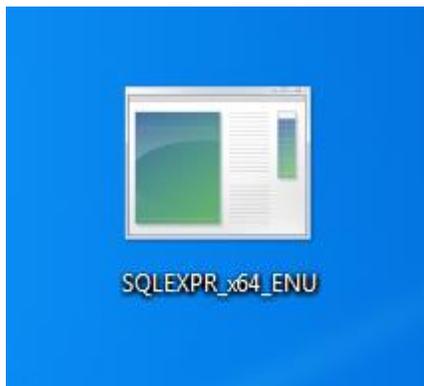
## DOWNLOAD SQL

A free version of MS SQL Server (2012 Express) can be downloaded from [www.microsoft.com/en-us/download/details.aspx?id=29062](http://www.microsoft.com/en-us/download/details.aspx?id=29062)

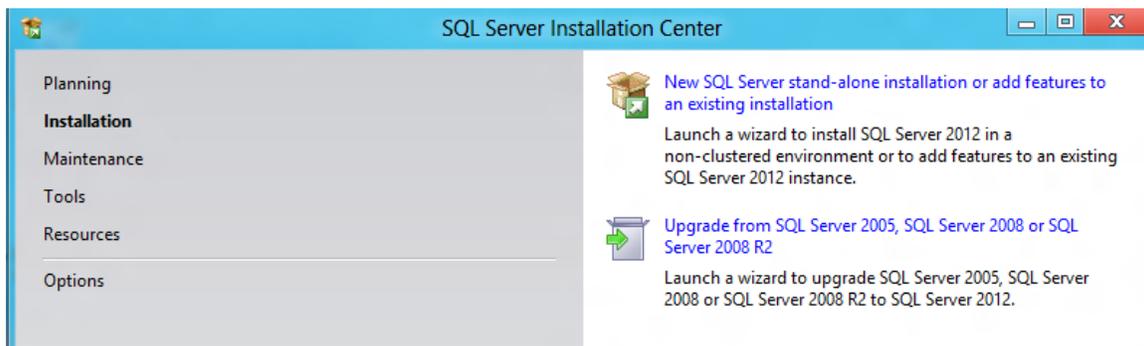
For most functionality, download SQLEXPADV\_x64\_ENU.exe for a 64 bit operating system and SQLEXP32\_x86\_ENU.exe for a 32 bit operating system.

## INSTALL SQL

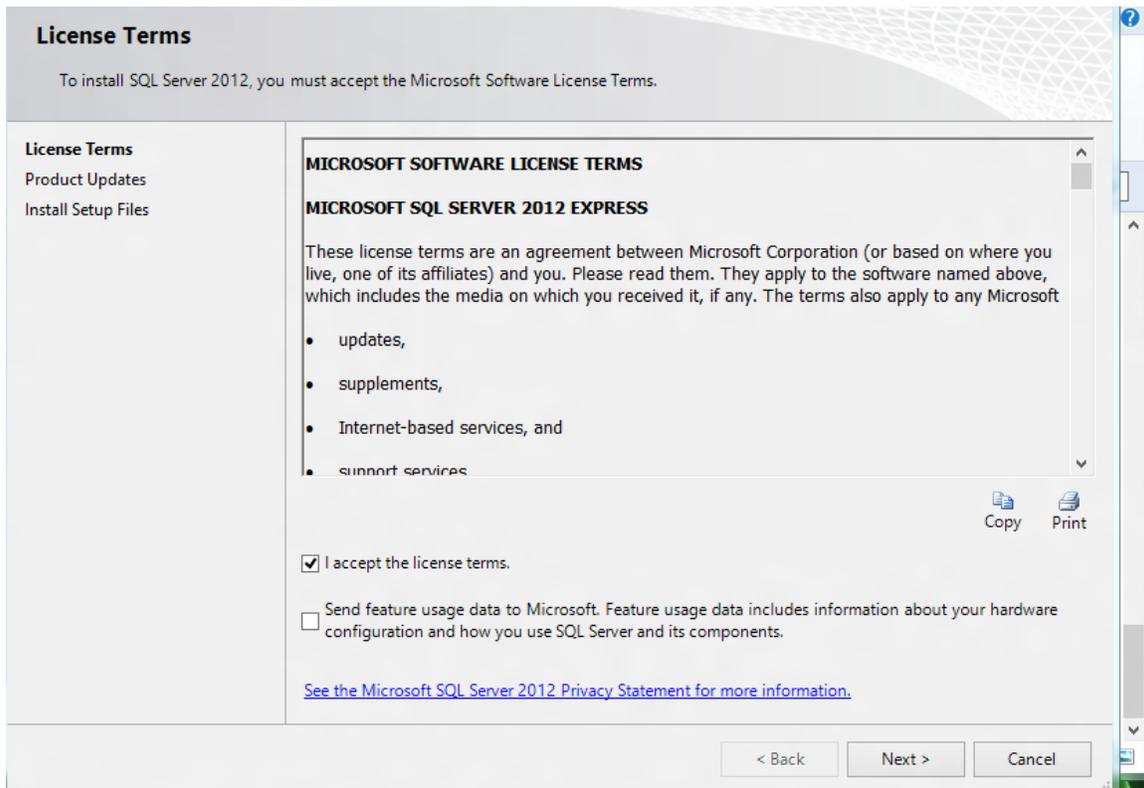
1. Run the SQL Installer



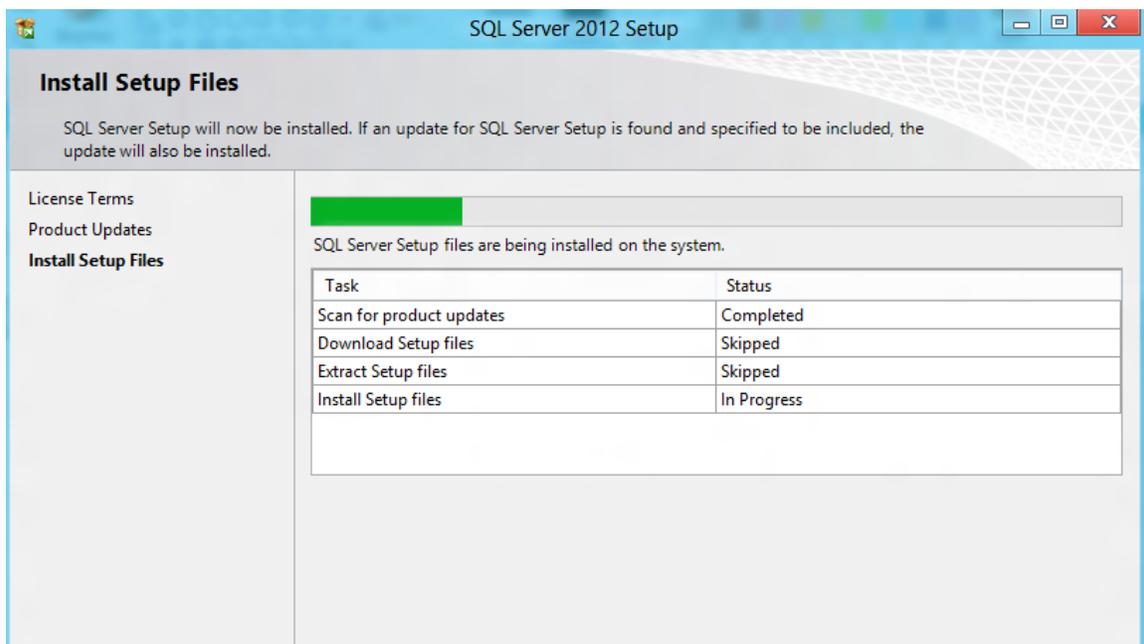
2. Select “New SQL Server stand-alone installation” option



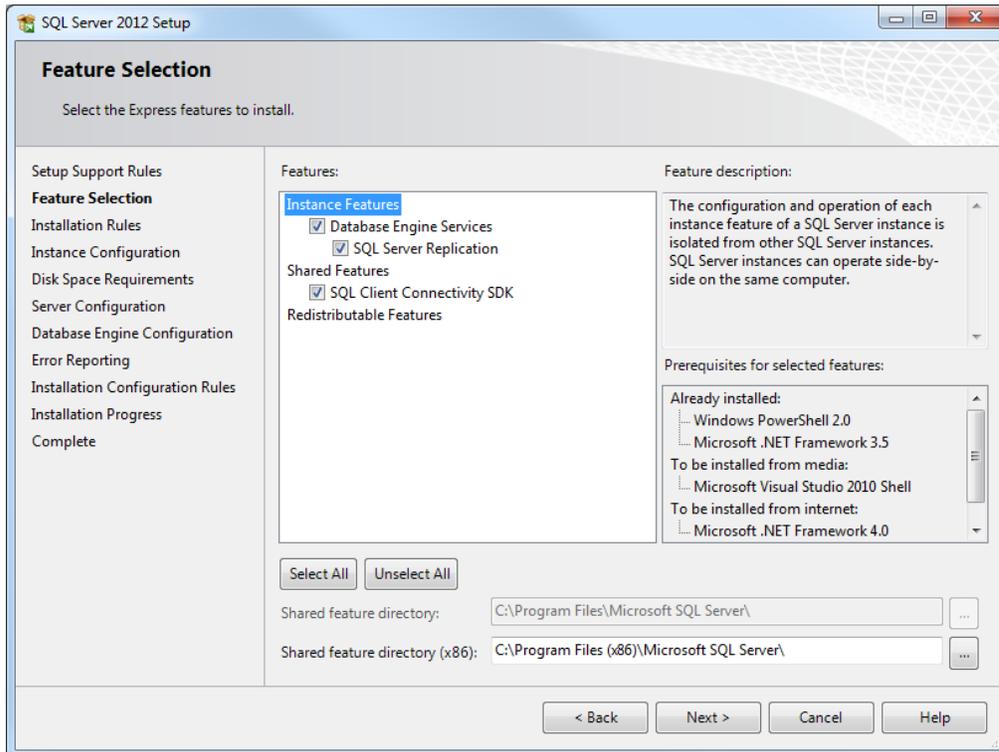
### 3. Accept the license conditions and click next



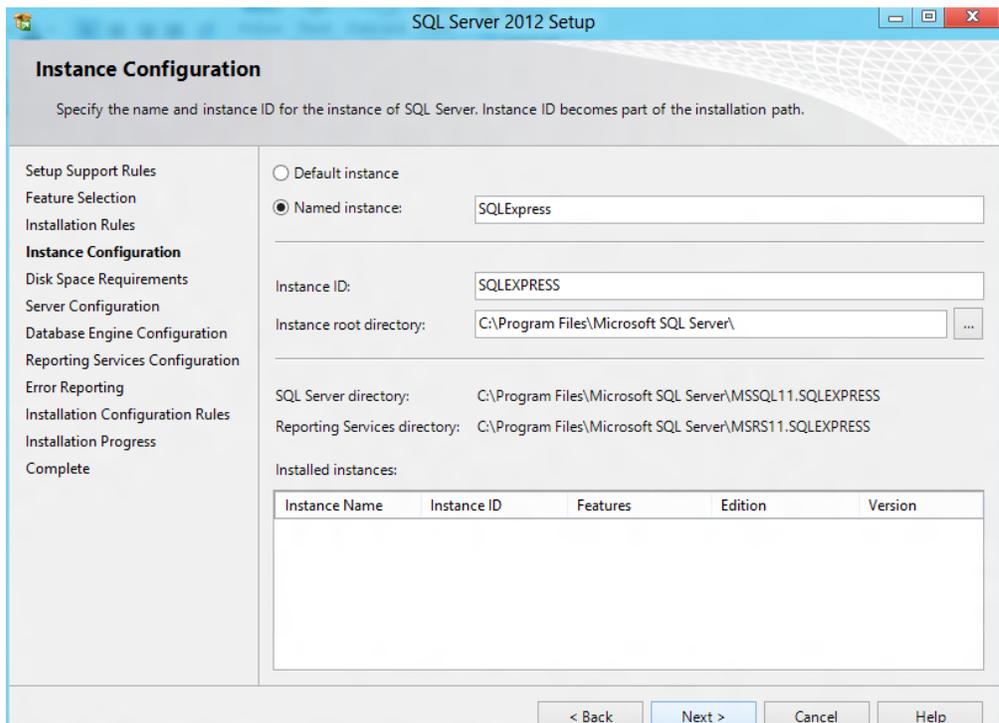
### 4. Installation will begin



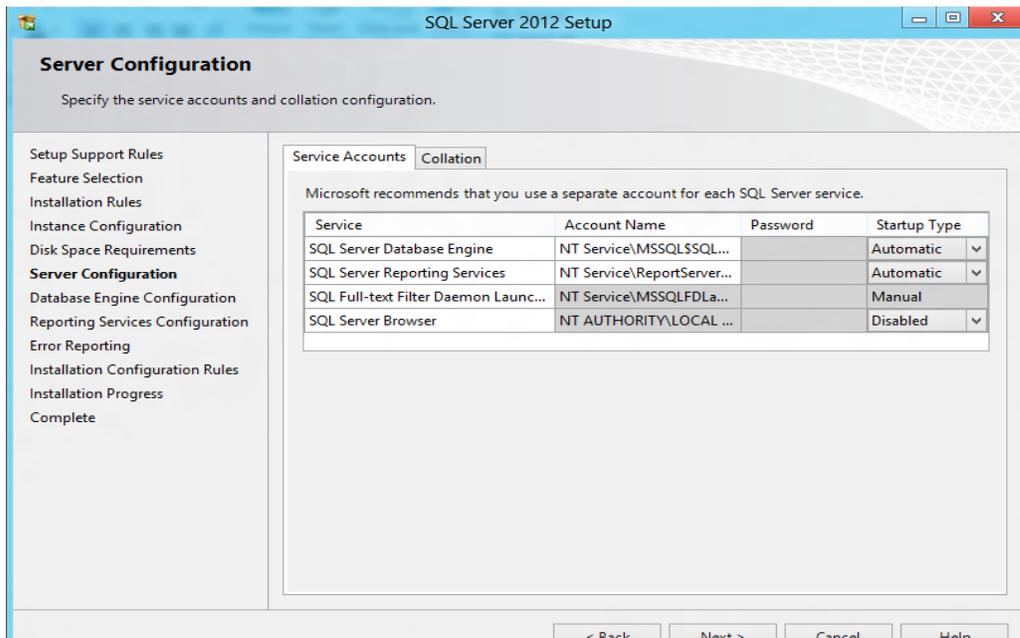
## 5. Select All features and click **Next**



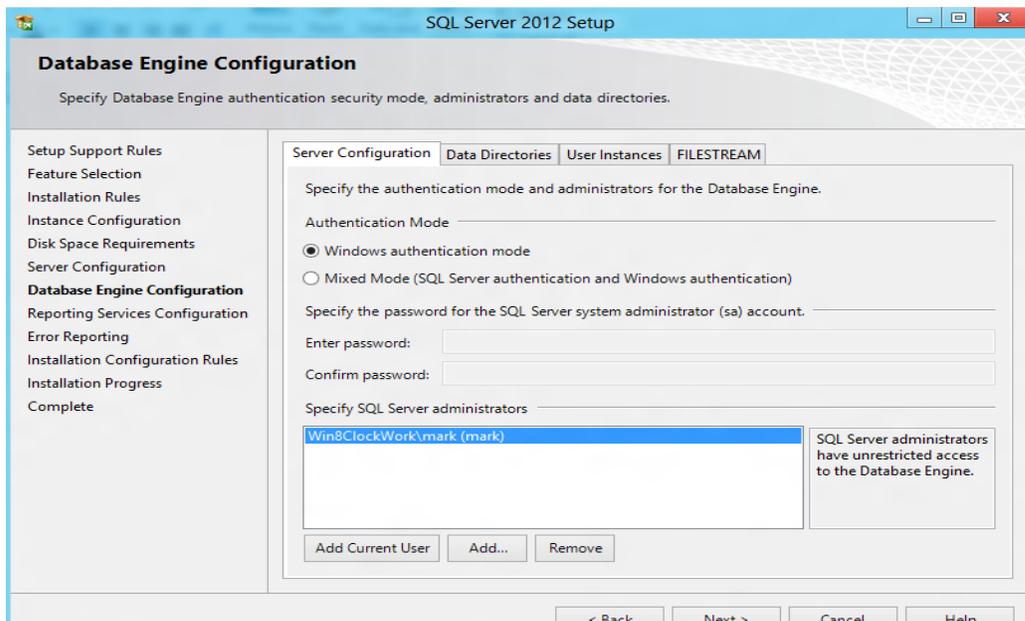
## 6. Leave default settings and click **Next**



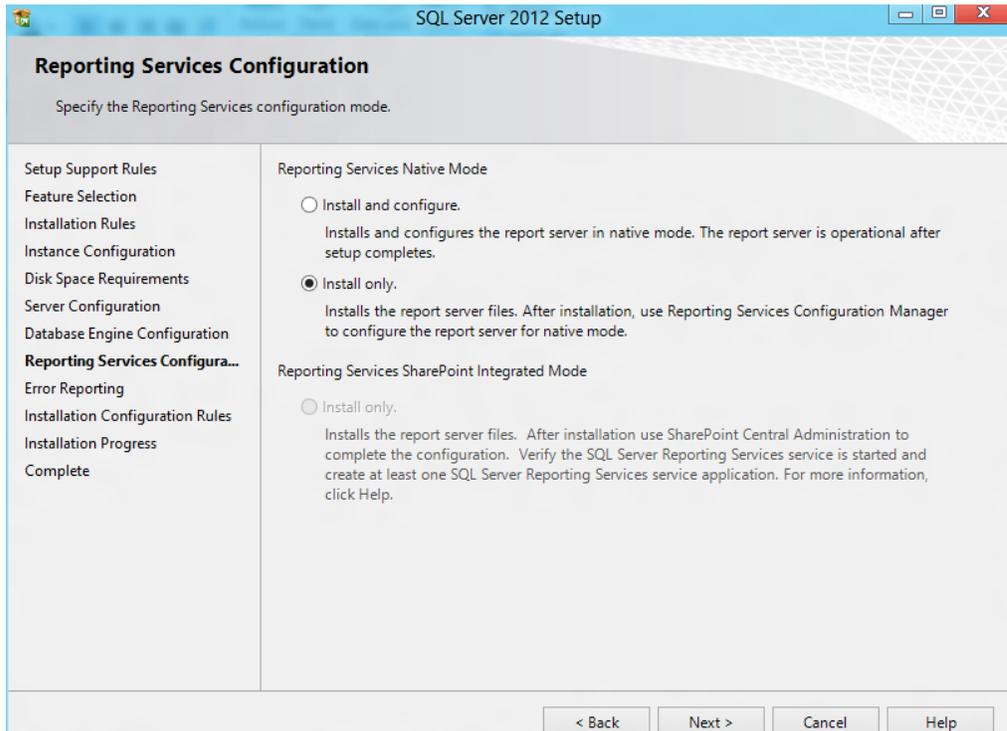
7. Leave default settings again and click **Next**. Configuration will be done later.



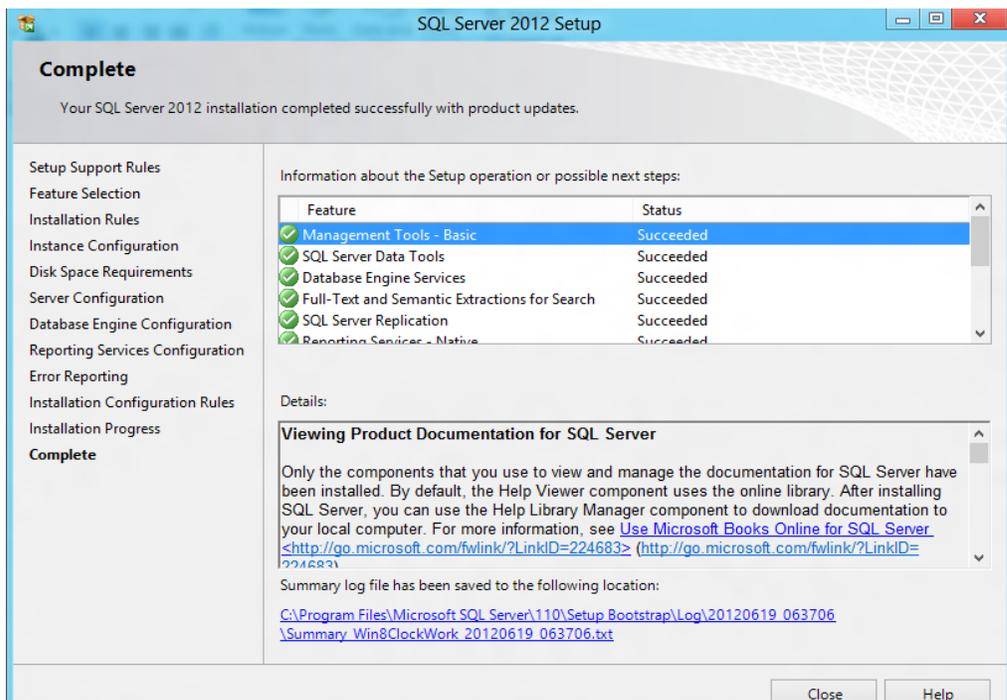
8. Authentication Mode: Select “**Mixed Mode**” and select an SQL admin. Then click **Next**



## 9. Select **Install Only** and click **Next**



## 10. Keep click **Next** until installation is complete then click **Close**



## STEP TWO

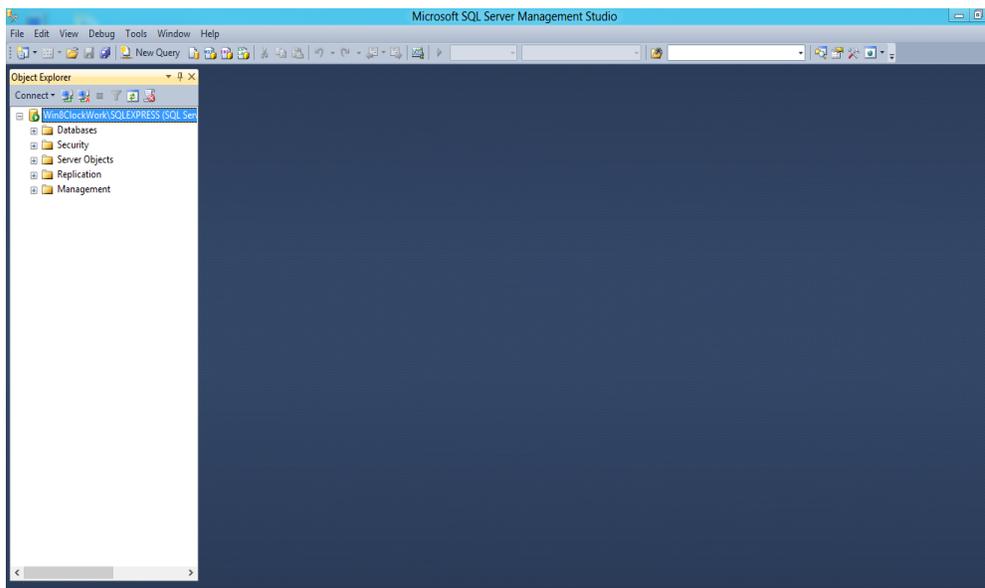
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# CREATING THE DATABASE

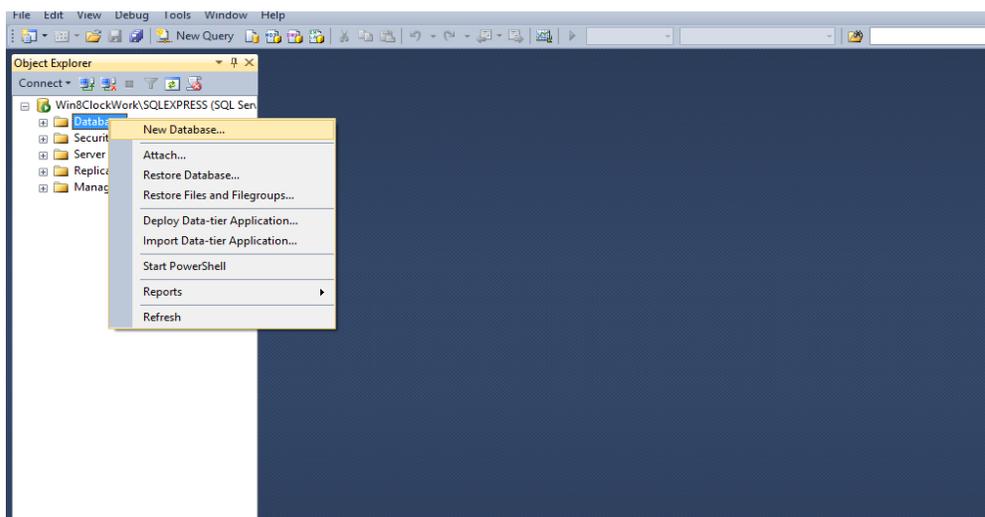
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## CREATE NEW DATABASE

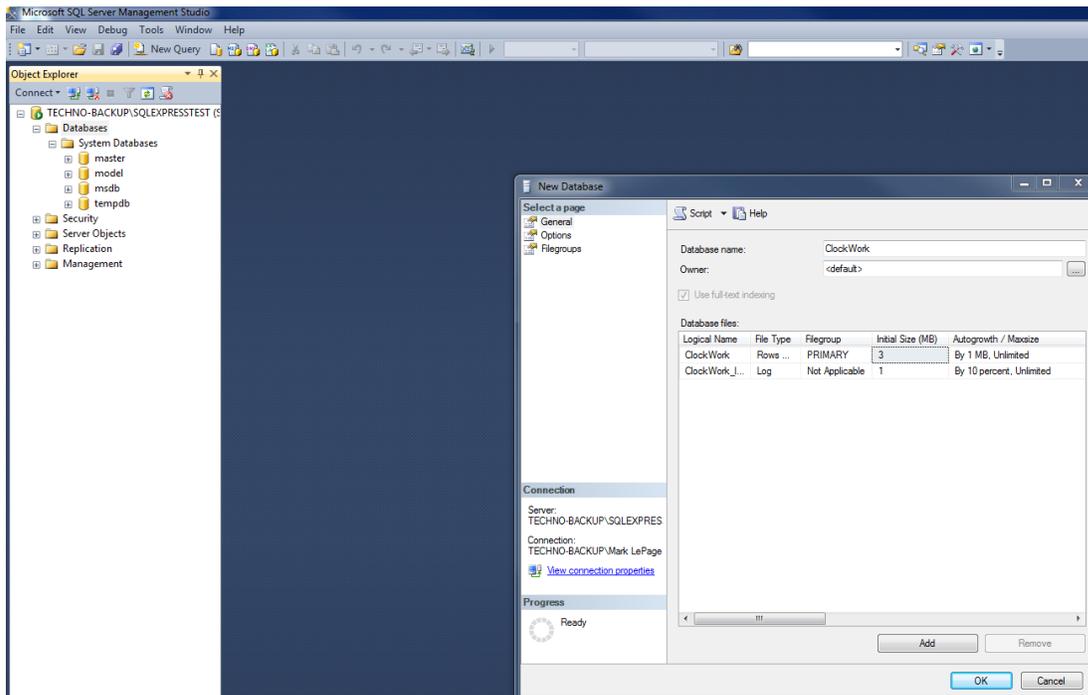
1. Open SQL Server Management Studio



2. Right click on **Databases** in the left pane and select **New Database**

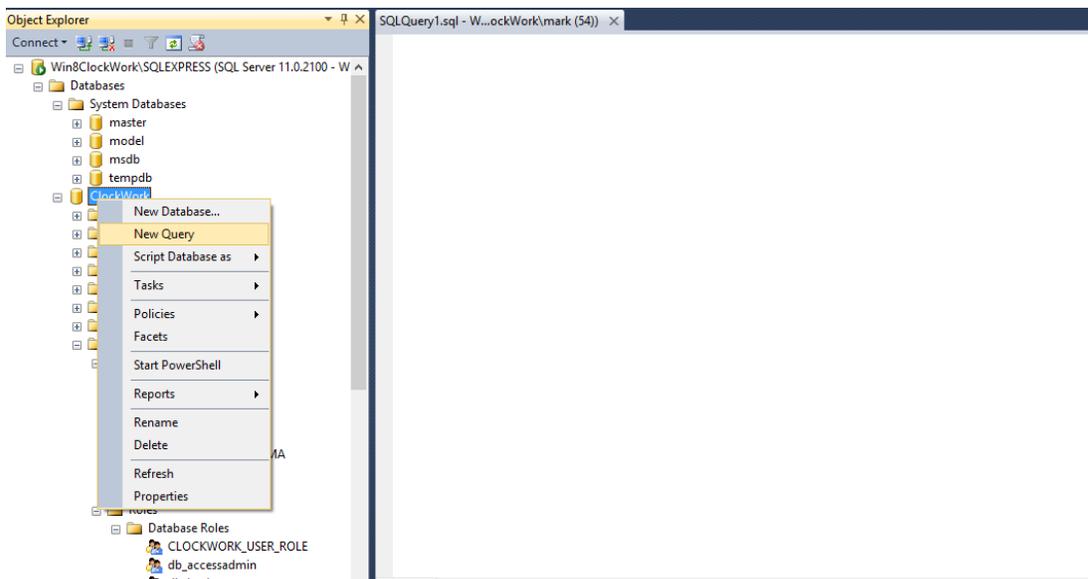


3. Name the Database “ClockWork” and click **Ok**



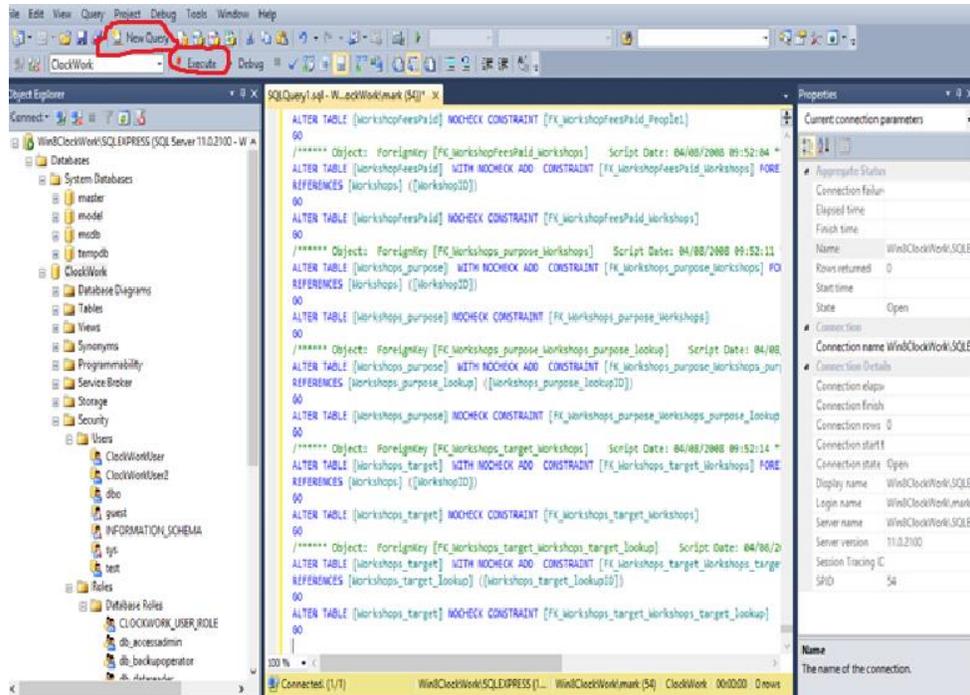
## PREPARE DATABASE

1. Right click on the newly created database and select **New Query**

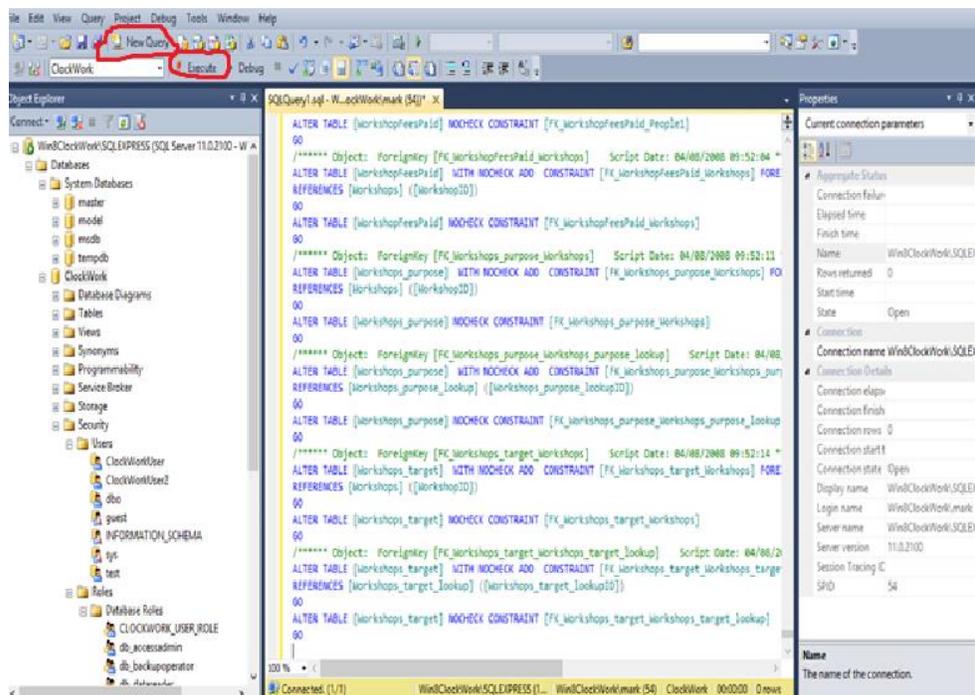


\*The following queries must be executed in this order

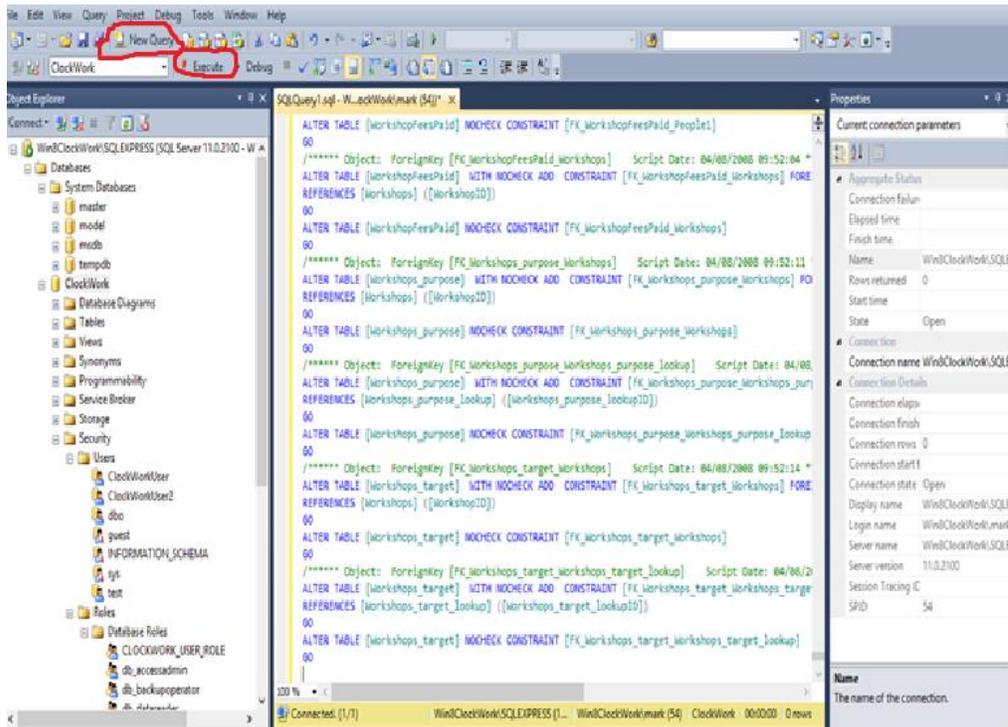
- Paste “ClockWorkTables” query into the white space then click **Execute**.



- Click **New Query**. Paste “ClockWorkData” query into the white space then click **Execute**.



4. Click **New Query**. Paste “DatabasePatch” query into the white space then click **Execute**.

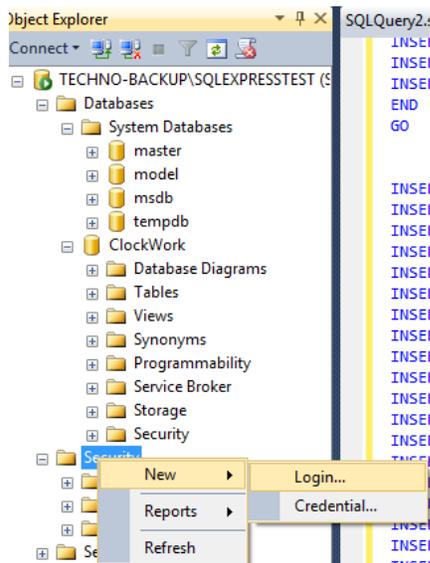


## STEP THREE

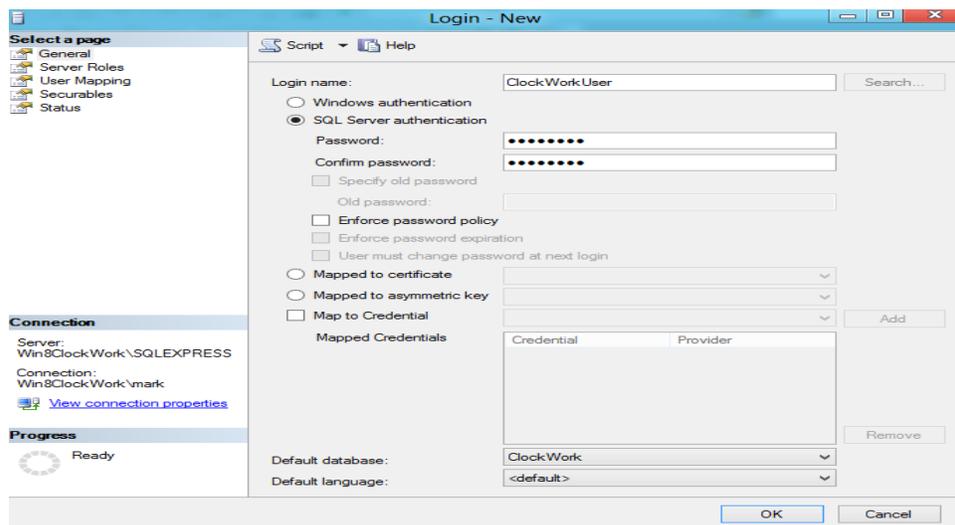
# CREATING SQL LOGINS

## CREATE CLOCKWORKUSER LOGIN

1. Right Click **Security** and select **New -> Login**

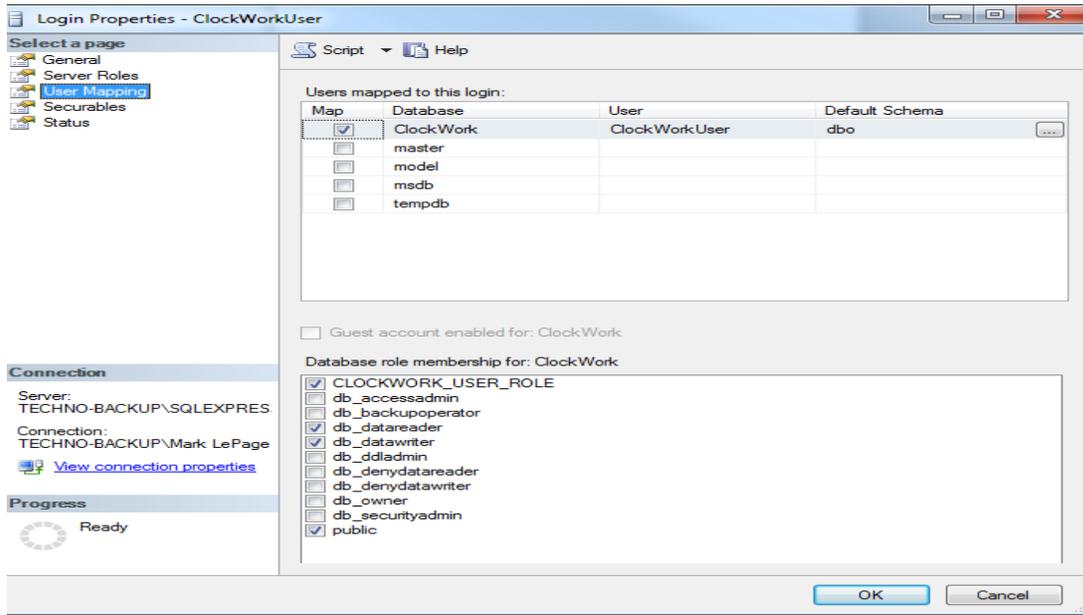


2. Enter the username "ClockWorkUser" and choose a password



## CONFIGURE CLOCKWORKUSER LOGIN

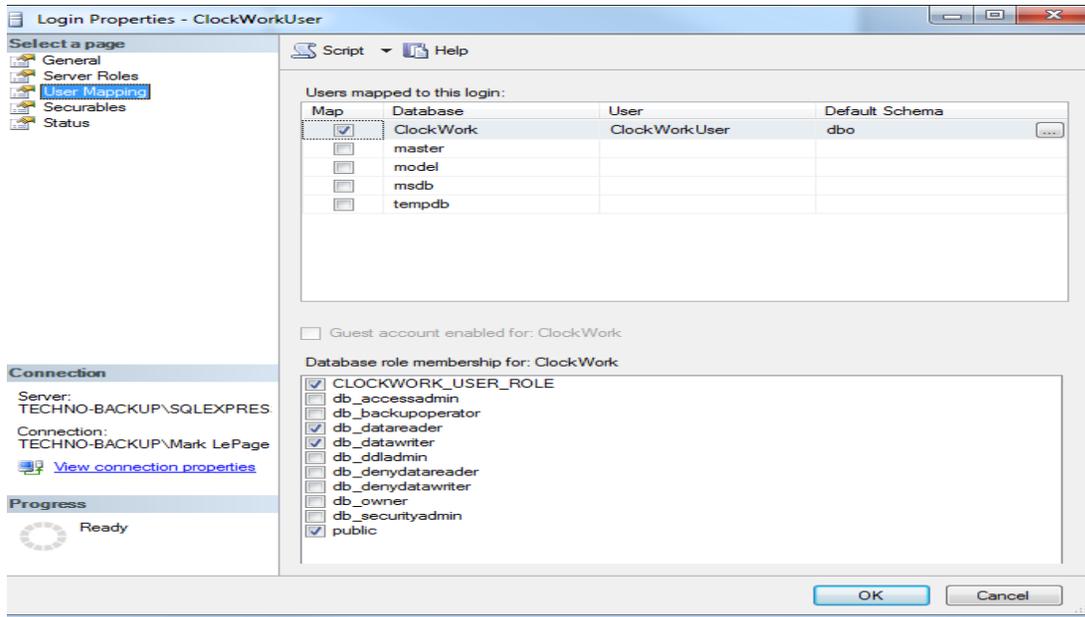
1. Click **User Mapping** in the left pane. Under Database role membership for: ClockWork, check off **db\_datareader** and **db\_datawriter** then click **OK**





## CONFIGURE CLOCKWORKUPDATEUSER LOGIN

1. Click **User Mapping** in the left pane. Under Database role membership for: ClockWork, check off **db\_datareader** , **db\_datawriter** , **db\_owner** , **db\_securityadmin** then click **OK**

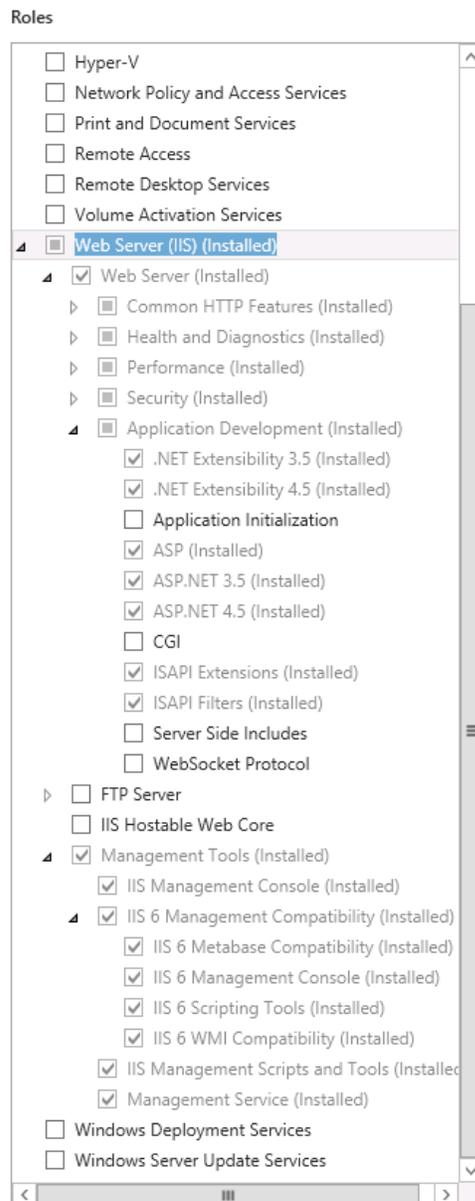


## STEP FOUR

# SERVER 2012 PREPERATION

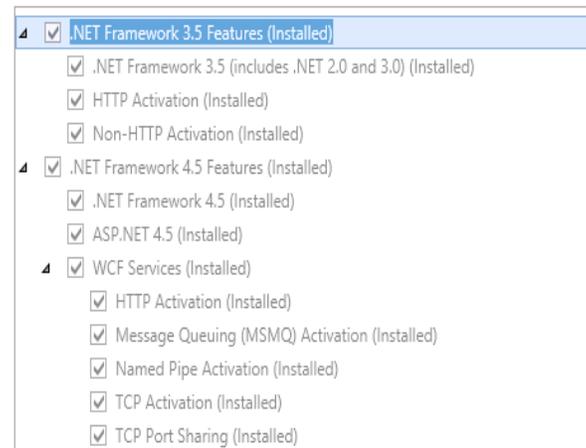
## 1. Install the following roles

Select one or more roles to install on the selected server.



## 2. Install the following features:

Features



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# WINDOWS SERVER 2012 FIX

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**THIS STEP IS ONLY FOR WINDOWS SERVER 2012. IF USING ANOTHER VERSION OF SERVER, PLEASE SKIP THIS STEP.**

1. Open the following file in a text editor, such as Notepad, as an administrator:  
%windir%\Microsoft.NET\Framework\v2.0.50727\CONFIG\web.config
2. Add the following configurations section before the “</configuration>” tag.

**Note:** the “</configuration>” tag is located at the bottom of the file.

```
<system.serviceModel>
<serviceHostingEnvironment>
<add name="net.tcp"
transportConfigurationType="System.ServiceModel.Activation.TcpHostedTransportConfigur
ation, System.ServiceModel, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089" />
<add name="net.pipe"
transportConfigurationType="System.ServiceModel.Activation.NamedPipeHostedTransportCo
nfiguration, System.ServiceModel, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089" />
<add name="net.msmq"
transportConfigurationType="System.ServiceModel.Activation.MsmqHostedTransportConfigu
ration, System.ServiceModel, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089" />
<add name="msmq.formatname"
transportConfigurationType="System.ServiceModel.Activation.MsmqIntegrationHostedTrans
portConfiguration, System.ServiceModel, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089" />
</serviceHostingEnvironment>
</system.serviceModel>
```

3. Add the following configuration sections to the file, if they do not already exist:

```
<protocols>
<add name="net.tcp"
processHandlerType="System.ServiceModel.WasHosting.TcpProcessProtocolHandler,
System.ServiceModel.WasHosting, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089"
appDomainHandlerType="System.ServiceModel.WasHosting.TcpAppDomainProtocolHandler,
System.ServiceModel.WasHosting, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089"
validate="false" />
<add name="net.pipe"
processHandlerType="System.ServiceModel.WasHosting.NamedPipeProcessProtocolHandler,
System.ServiceModel.WasHosting, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089"
appDomainHandlerType="System.ServiceModel.WasHosting.NamedPipeAppDomainProtocolHandle
r, System.ServiceModel.WasHosting, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089"
validate="false" />
<add name="net.msmq"
processHandlerType="System.ServiceModel.WasHosting.MsmqProcessProtocolHandler,
System.ServiceModel.WasHosting, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089"
appDomainHandlerType="System.ServiceModel.WasHosting.MsmqAppDomainProtocolHandler,
System.ServiceModel.WasHosting, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089"
validate="false" />
<add name="msmq.formatname"
processHandlerType="System.ServiceModel.WasHosting.MsmqIntegrationProcessProtocolHand
ler, System.ServiceModel.WasHosting, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089"
appDomainHandlerType="System.ServiceModel.WasHosting.MsmqIntegrationAppDomainProtocol
Handler, System.ServiceModel.WasHosting, Version=3.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089"
validate="false" />
</protocols>
```

4. Save the file.
5. After the file is saved, follow steps 4.2 – 4.4 again for the following file, and then restart the computer.

*%windir%\Microsoft.NET\Framework64\v2.0.50727\CONFIG\web.config*

---

# INSTALL CLOCKWORK CLIENT

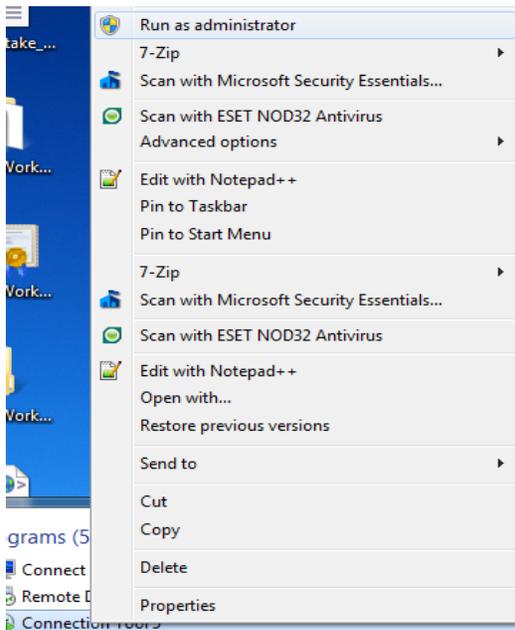
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## INSTALL CLOCKWORK CLIENT ON SERVER

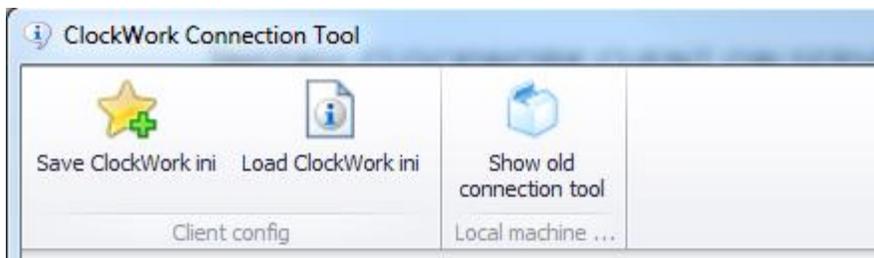
1. Run the client file and follow the on screen instructions



2. When complete, run the ClockWork Connection tool as an Administrator



3. Click **Show old connection tool**



4. Enter the database server name or IP and the database name

ClockWork Database Connection Setup

File Tools

This tool will allow you to set and check the connection settings for this computer to connect to the ClockWork Database for the currently logged in user. Please enter the appropriate settings and use the 'Test Connection' and 'Test Database Password' buttons to verify your settings.

TechnoPro  
Computer Solutions, Inc.

1. Select the type of database you are using:  
SQL Server

2. Select or enter a database server name or IP:  
ClockWorkDatabase Refresh List

3. Enter the database name (this will normally be 'ClockWork'):  
ClockWork

4. Enter information to logon to the database server:  
 Use Integrated Security  
Username:   
Password:

Test Connection ...

5. Enter the database encryption/decryption password for your department:

Test Connection And Password ...

lockWork2.ini exists in Program Fil

Add to favourites Favourites Save Close

5. Uncheck **Use Integrated Security** and enter the username and password of the server

ClockWork Database Connection Setup

File Tools

This tool will allow you to set and check the connection settings for this computer to connect to the ClockWork Database for the currently logged in user. Please enter the appropriate settings and use the 'Test Connection' and 'Test Database Password' buttons to verify your settings.

TechnoPro  
Computer Solutions, Inc.

1. Select the type of database you are using:  
SQL Server

2. Select or enter a database server name or IP:  
ClockWorkDatabase Refresh List

3. Enter the database name (this will normally be 'ClockWork'):  
ClockWork

4. Enter information to logon to the database server:  
 Use Integrated Security  
Username: ClockWorkUser  
Password: \*\*\*\*\*

Test Connection ...

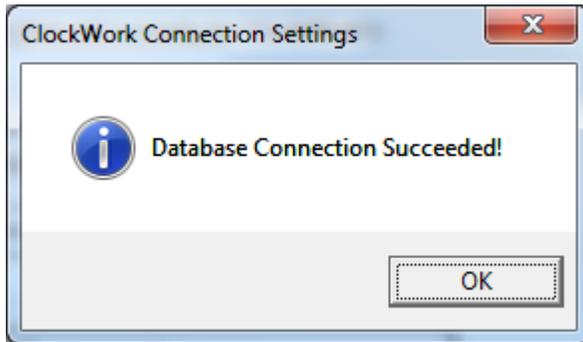
5. Enter the database encryption/decryption password for your department:

Test Connection And Password ...

lockWork2.ini exists in Program Fil

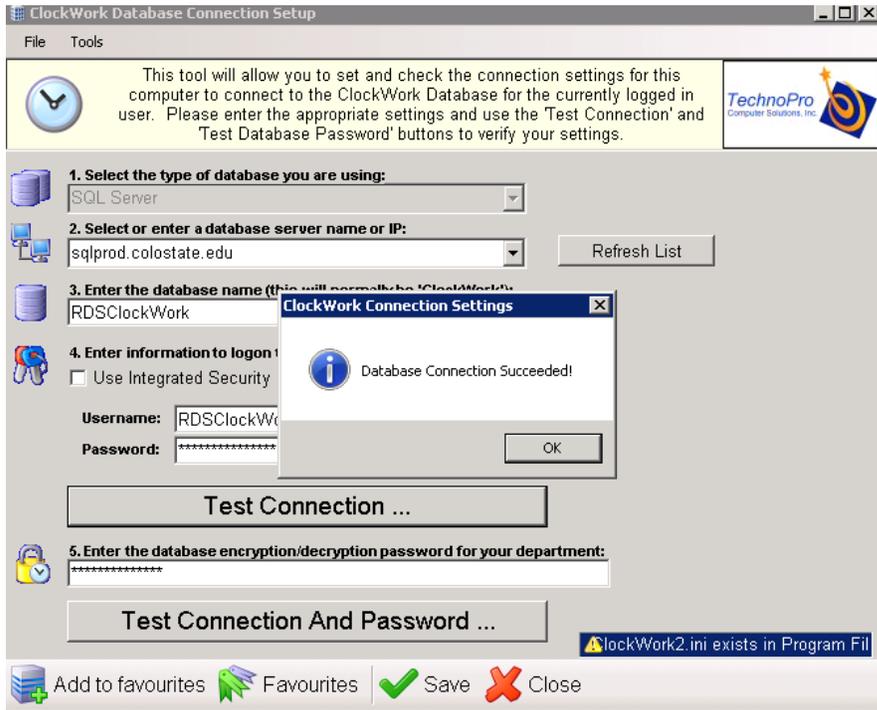
Add to favourites Favourites Save Close

6. Test the connection



7. Click on "Tools" then "Initialize ClockWork". Follow the on-screen instructions. When creating user, check off "Make admin user". Choose a strong encryption password.

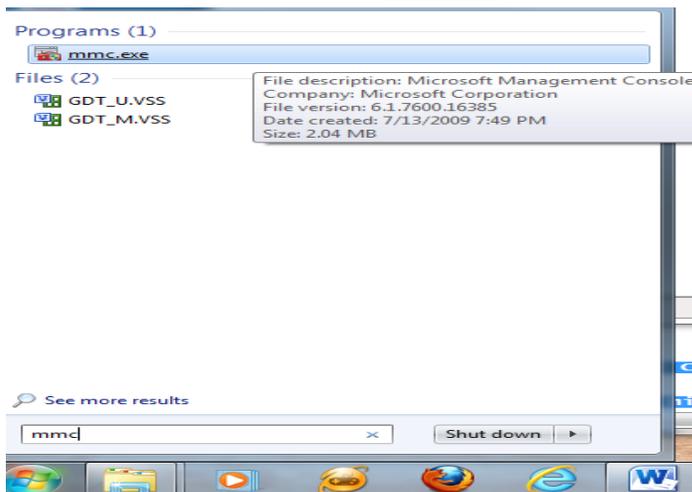
8. Enter the **encryption password** from the previous step and click “Test connection and password”



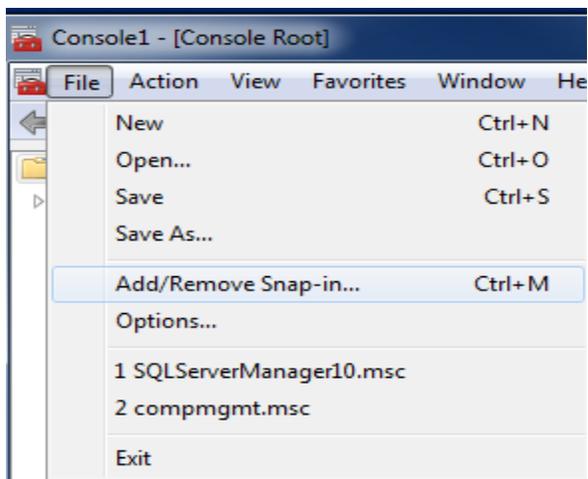
# SET UP SSL CERTIFICATE

## SET UP SSL CERTIFICATE

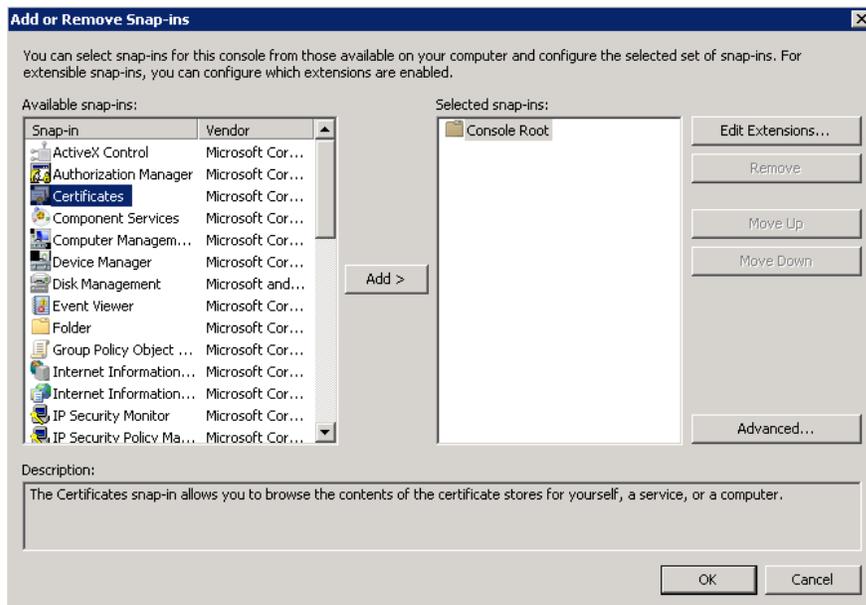
1. Run MMC as an administrator



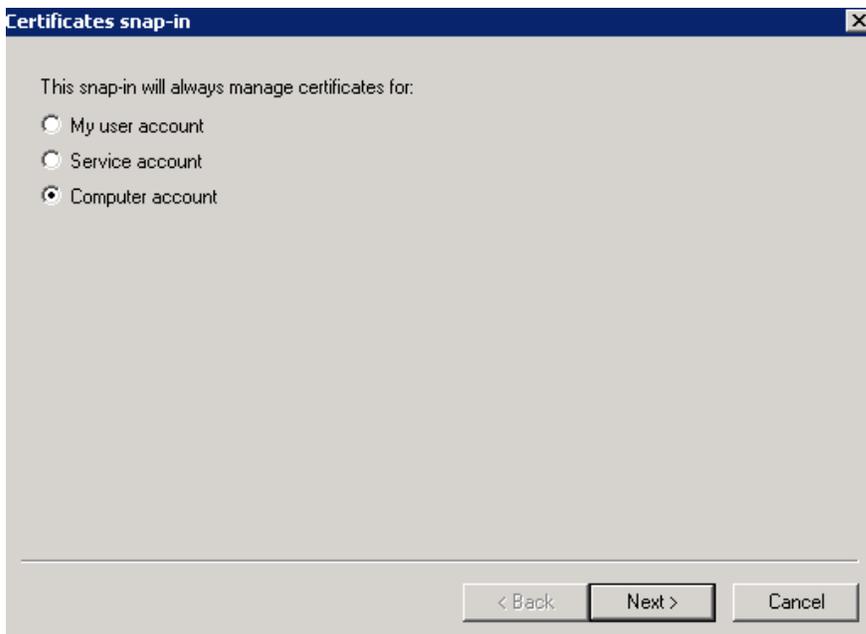
2. Go to 'File' and click 'Add/Remove Snap



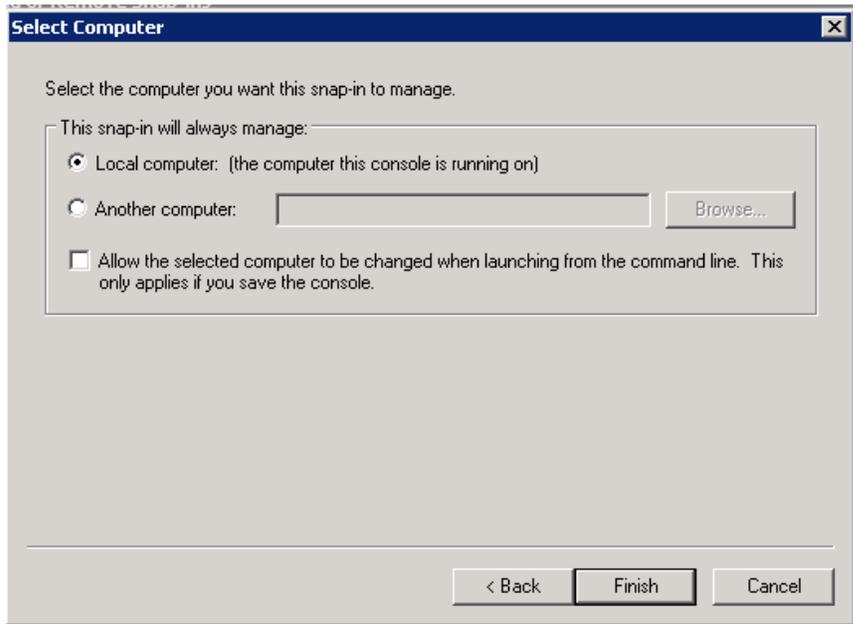
### 3. Double click on 'Certificates'



### 4. Select **Computer account** and click **Next**

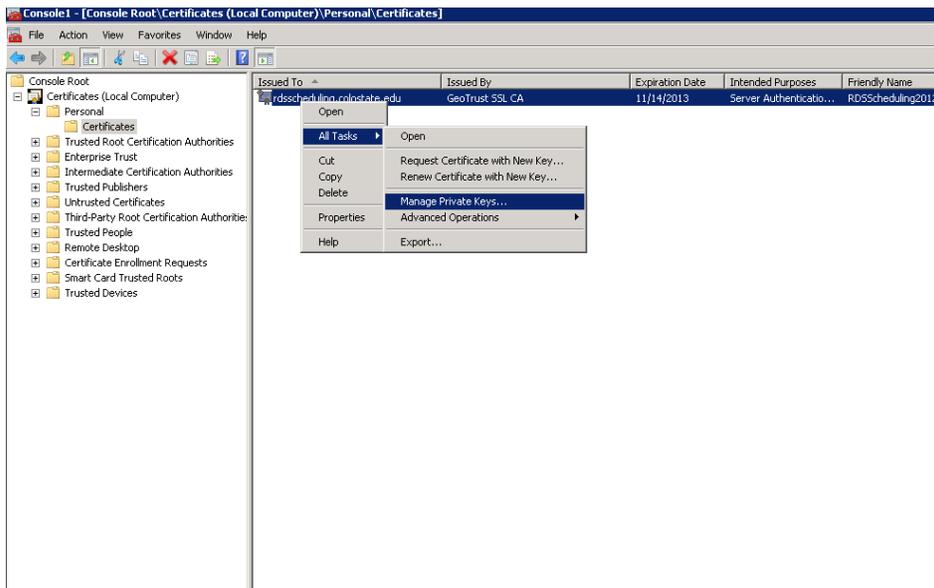


## 5. Choose **Local computer** and click **Finish**

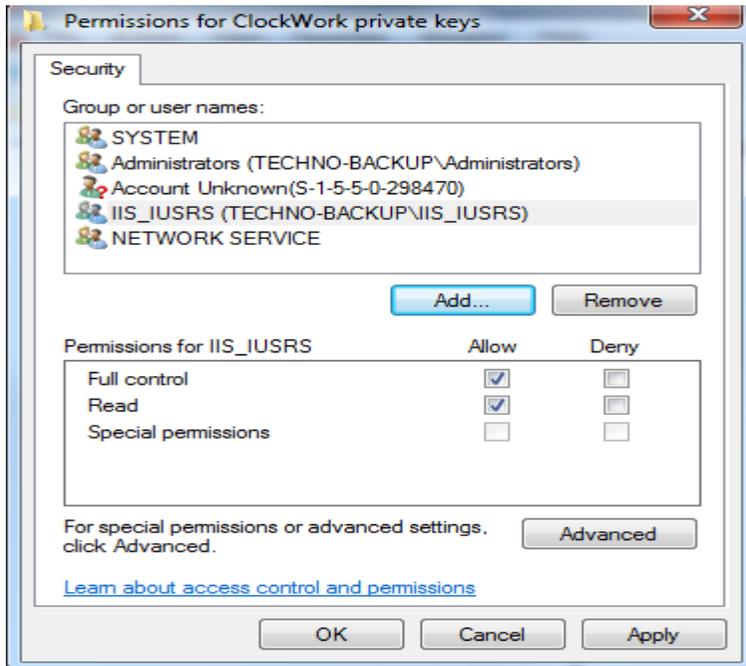


## SET CERTIFICATE PERMISSIONS

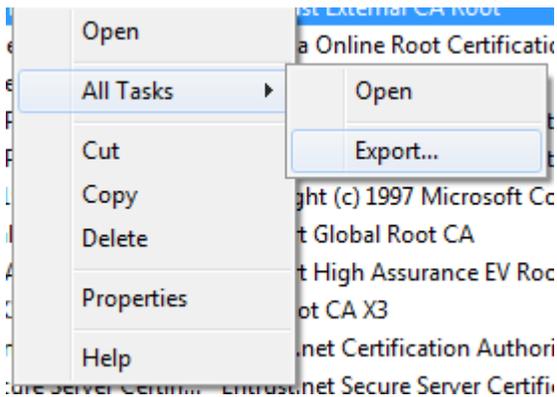
### 1. Right click on certificate and click on 'All Tasks' then 'Manage Private Keys'



- Click on 'Add' and add users "IIS\_IUSRS" and "NETWORK SERVICE". They must both have full control.



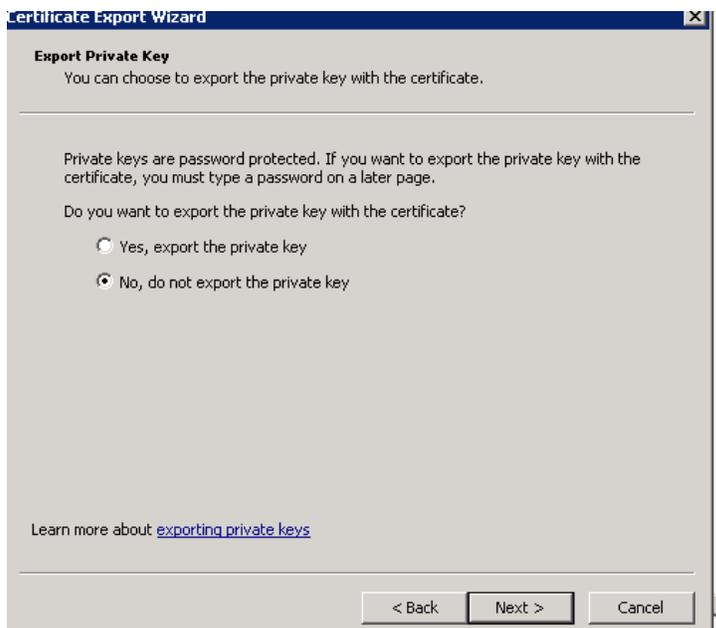
- Right click on Certificate and click 'All Tasks' then 'Export'



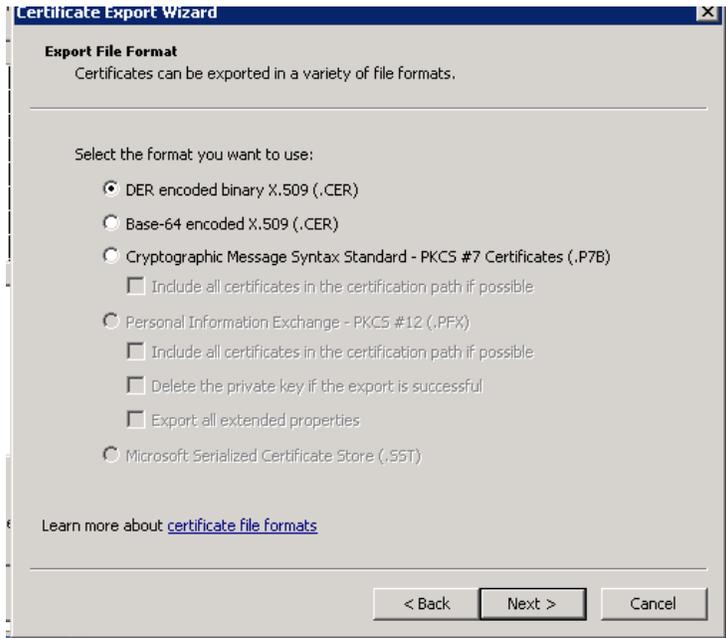
- The Certificate Export Wizard will open. Click Next.



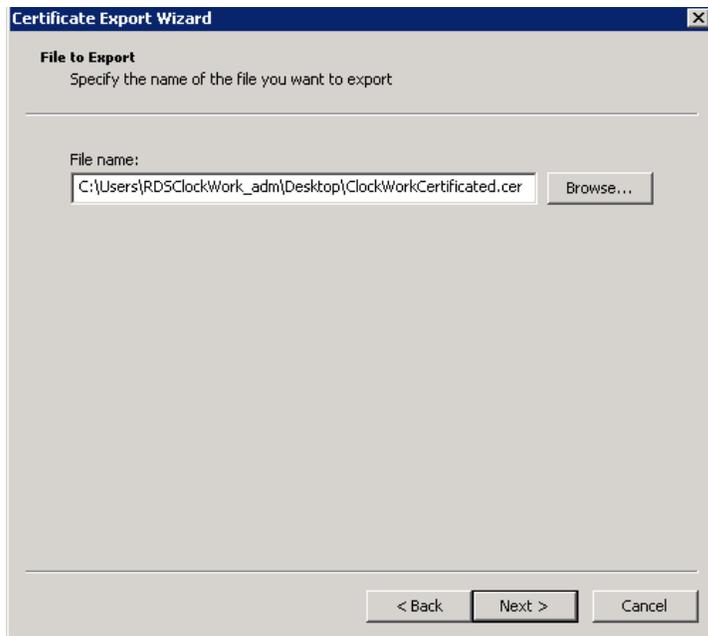
- Choose **No**, do not export the private key and click Next



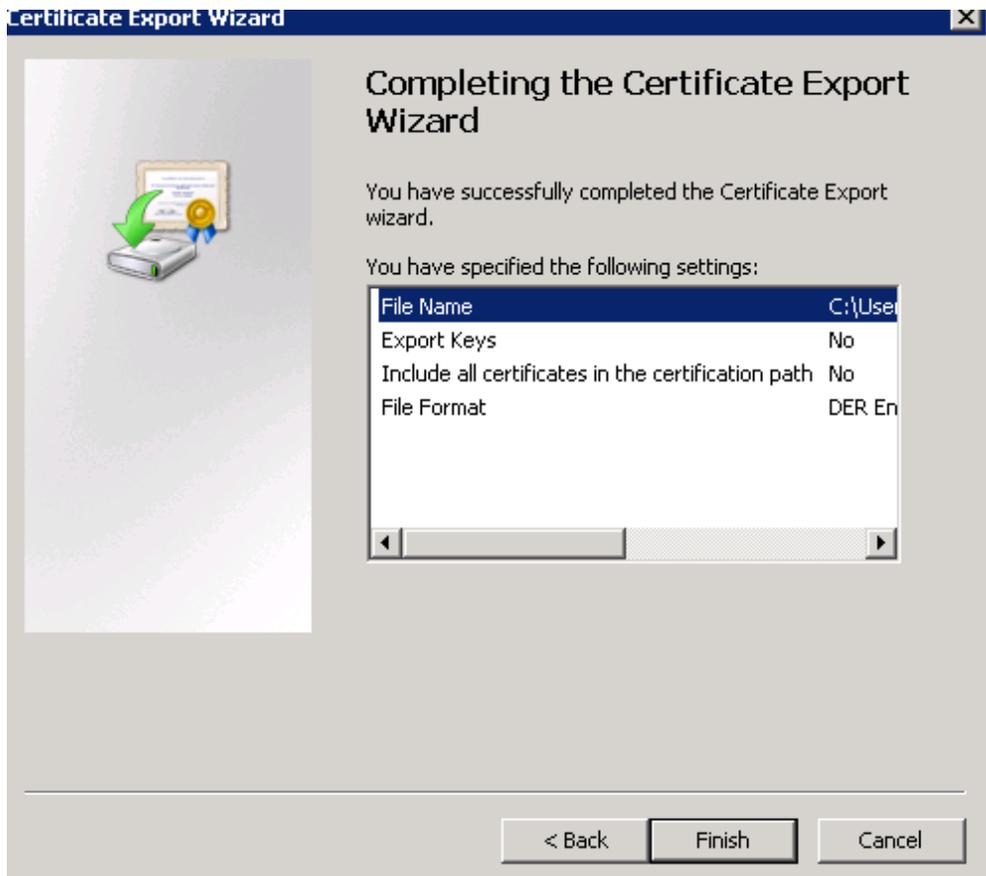
6. Choose **DER encoded binary X.509 (.CER)** and click Next.



7. Save this file on the desktop. Name is "ClockWorkCertificate"



8.

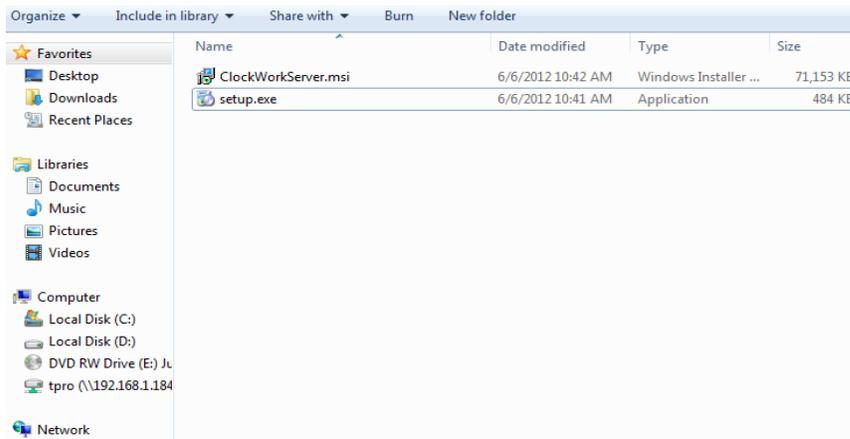


## STEP EIGHT

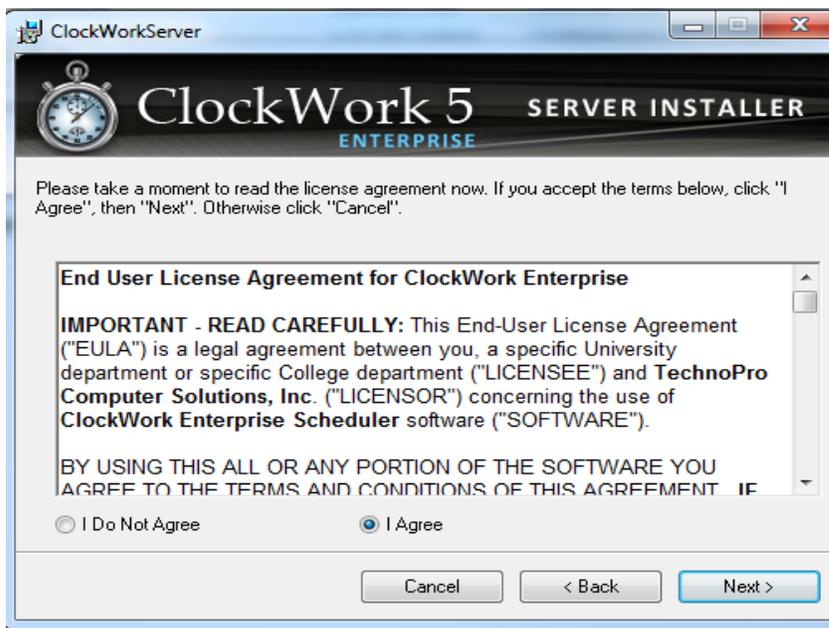
# INSTALL CLOCKWORK SERVER

## INSTALL CLOCKWORK SERVER

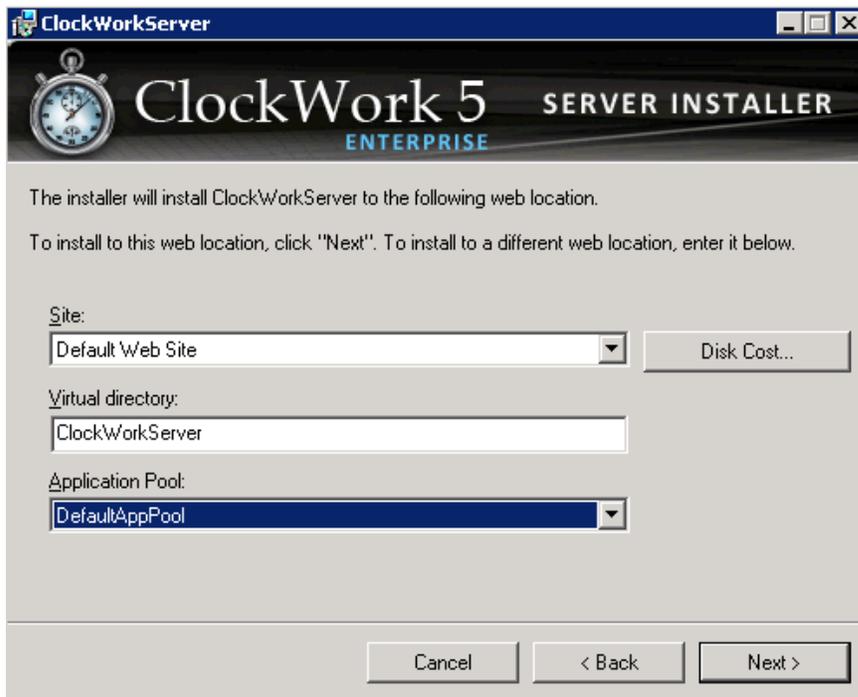
1. Run the server installation file



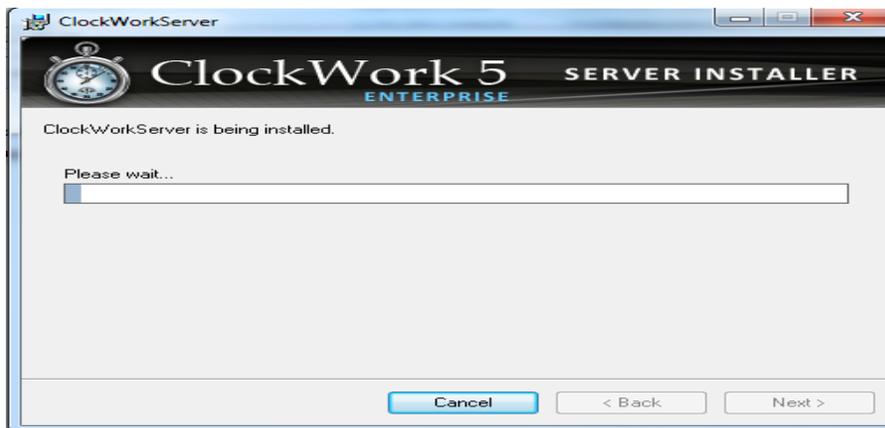
2. Follow the on screen instructions



3. Select DefaultAppPool and click next

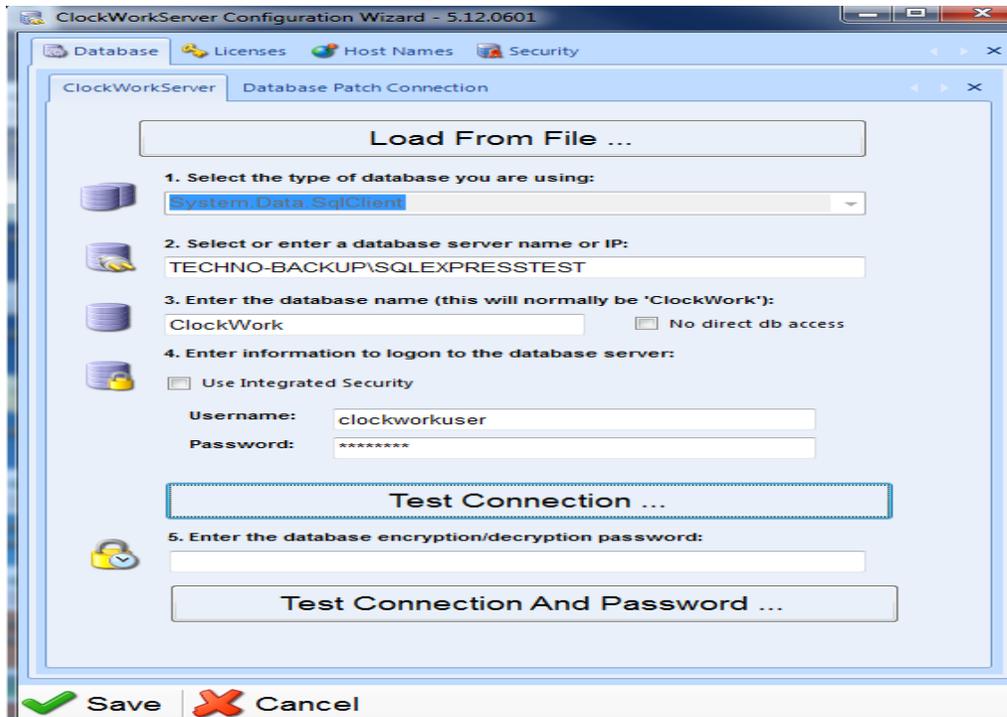


4. Finish the installation

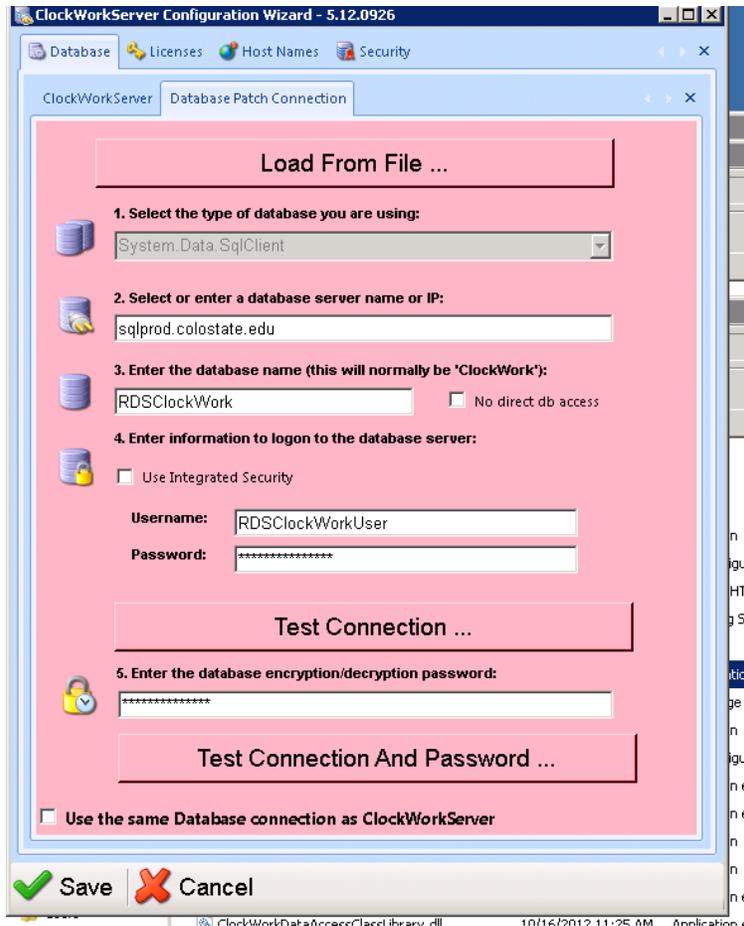


## CREATE .INI FILE

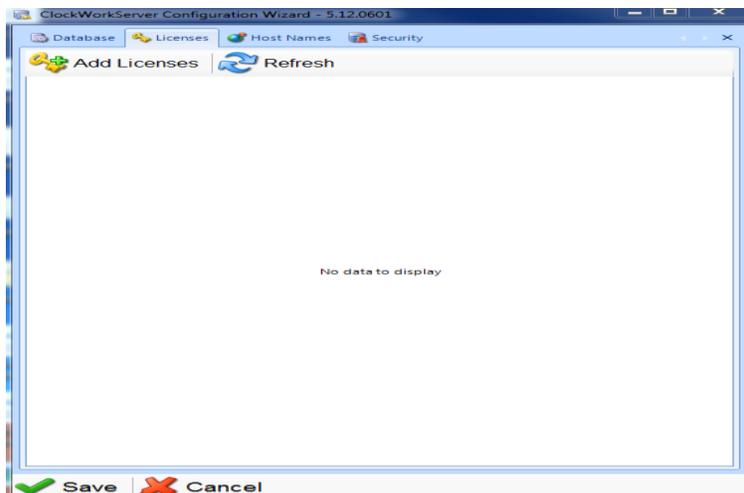
1. Run Configuration Wizard
2. Under ClockWorkServer tab, enter database server name or ip, database name, username and password of user 'ClockWorkUser' created in step 3.1, encryption password and click on **Test Connection and Password**.



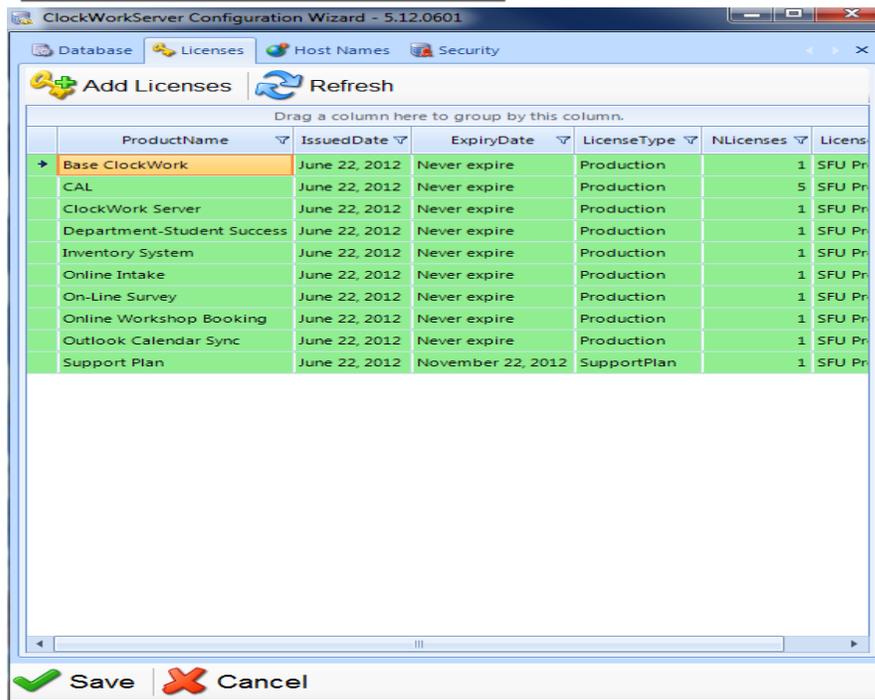
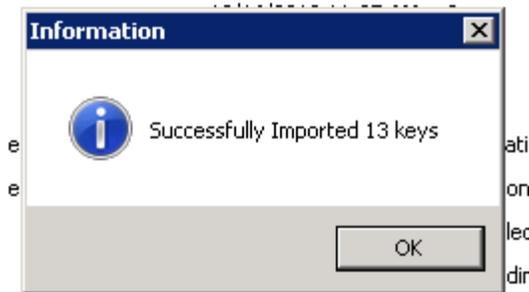
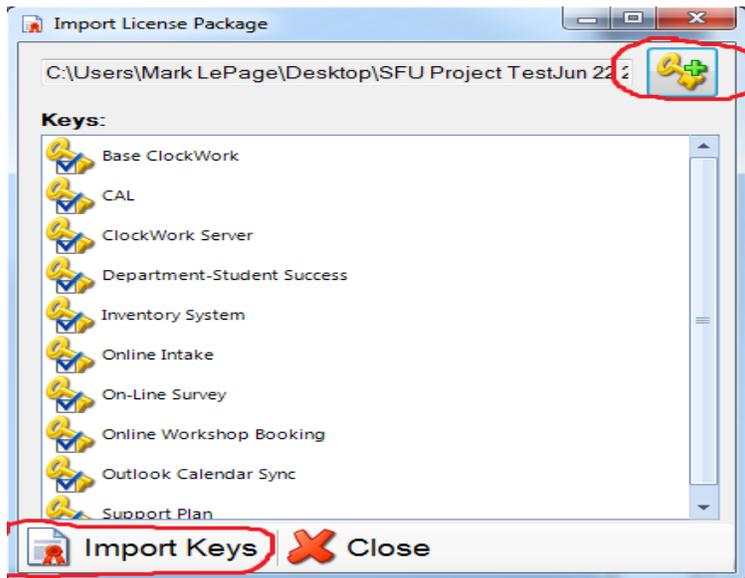
- Under **Database Patch Connection** tab, enter database server name or ip, database name, username and password of user 'ClockWorkUpdateUser' created in step 3, encryption password and click on **Test Connection and Password**.



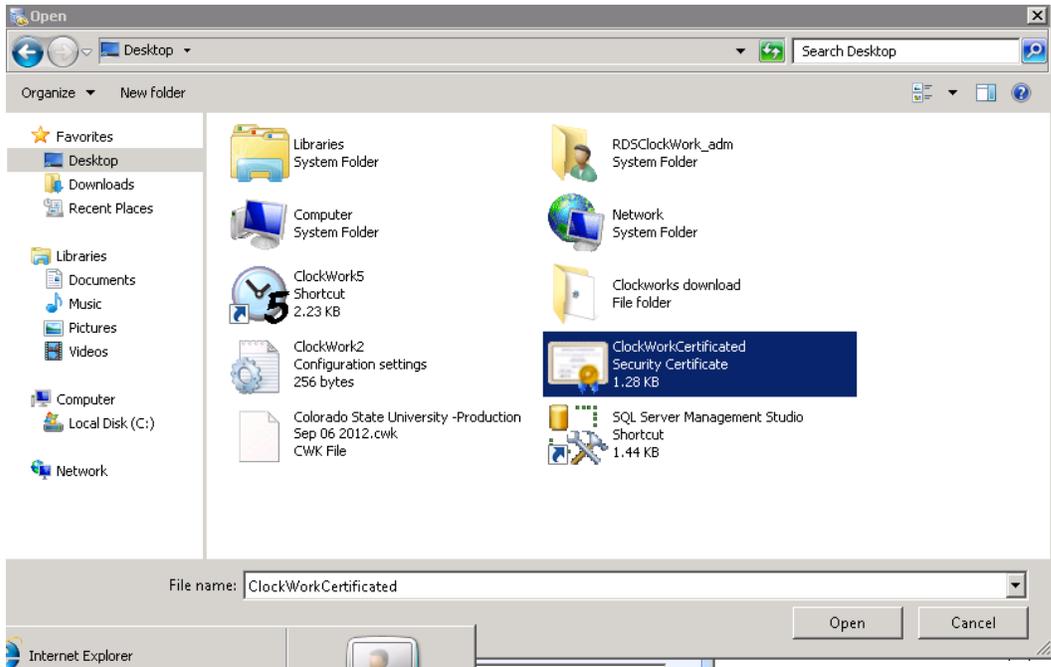
- Under **Licenses** tab, click on **Add Licenses**.



- Click on the key then browse to your .cwk key file then click Import Keys.



- Under the **Host Names** tab, enter the current server's ip address in **Intranet**
- Under the **Security** tab, click on **Load Certificate**. Open the Certificate created in Step 5.



- Click Save

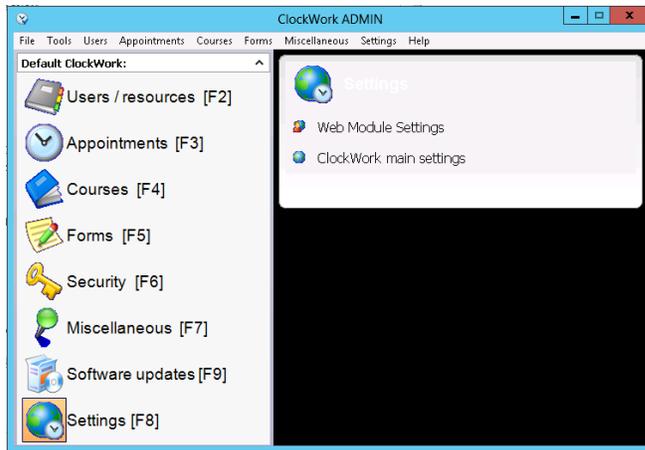


9. Save this .ini file into C:\inetpub\wwwroot\ClockWorkServer and C:\Program Files (x86)\TechnoPro Computer Solutions\ClockWork5.
10. Save this .ini file on all client machines in C:\Program Files (x86)\TechnoPro Computer Solutions\ClockWork5

## STEP NINE

# ACTIVATE SERVER

1. Open “ClockWork Admin”.



2. Click Settings -> ClockWork Main Settings -> System

Setting	Value
Disable software updates	No
Department name	Learning Assistance Center
Minimum ClockWork version	
Use the ClockWork server. The ClockWork server should be installed and configured before this is turned on.	Yes
The date format to use (ex. yyyy-MM-dd)	MM/dd/yy
The time format to use (ex. hh:mm tt, h:mm)	hh:mm tt
Language 1 description	English
Language 2 description	
Messaging system enabled	No
Updating Mode (how the updates will be performed - 0 means normal, 1 means close ClockWork and launch the updater as a process)	
Report number to run for importing students from external database	
Report number to run for previewing students from external database	
Data sync report to run to import student courses (0 to disable)	-1
Password for encrypted data (importing students from external database)	
Report number to run for getting group memberships for students from external database	
Report id for looking up student by first or last name using the 'Lookup student' button in the intake form.	
Data Sync report id for the report that moves the data into the ClockWork tables (custom_data and custom_courses)	-1
Data Sync report id for the batch sync report (updates all active ClockWork students once a day)	-1
What email method should be used for sending out emails? (examples: Outlook)	

3. Double click on “Use the ClockWork Server. The ClockWork server should be installed and configured before this is turned on.” And select “True” then save.

## STEP TEN

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# RUN CLOCKWORK

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1. Open “ClockWork Database Scheduler”
2. Enter your username and password from step 6.7
3. The bottom right hand corner of the window should say “Connected to Server”

