

# Stonehenge .NET StockTrader Installation Guide

## Overview

Apache Stonehenge .NET StockTrader is a fork of Microsoft's .NET StockTrader Sample Application available [on MSDN](#). It is one of many implementations of the [Stonehenge StockTrader Sample Application](#). This document is designed to serve as a guide for installing the Apache Stonehenge .NET StockTrader sample application. It assumes an audience of experienced developers with at least limited conceptual knowledge of SOA, WCF, and the C# language.

### Warning

 This document applies to the upcoming [M2 Release](#) of Apache Stonehenge that supports claims-based security and federated identity. If you would like to experience and demonstrate interoperability with the [M1 Release](#) of the same, please access the [M1 version of this installation guide](#).

## Minimum System Requirements

| Item                  | Minimum   |
|-----------------------|---|
| Operating System      | Microsoft Windows Vista with Service Pack 2, or Microsoft Windows Server 2008 with Service Pack 2 |
| RAM Size              | 1 GB  |
| CPU Speed             | 1.2 GHz   |
| Free Hard Drive Space | 3 GB  |

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## Prerequisites

The following components are required for the Apache Stonehenge .NET StockTrader Sample Application to properly function.

- Microsoft SQL Server 2008 with mixed mode authentication enabled
- Microsoft .NET Framework 3.5 with Service Pack 1
- Microsoft Visual Web Developer Express 2008 or higher
- Windows HTTP Services Certificate Configuration Tool
- Windows Identity Foundation
- MySQL Connector/Net

### Note

 Even if you are not planning on using MySQL to store data for the StockTrader sample application, MySQL Connector/Net is still required for the source code to compile properly.

# Installing the Microsoft Web Platform

The Microsoft Web Platform Installer is a tool created to install software and components necessary to develop and host web applications in a Microsoft Windows environment. It will be used in this guide to install most of the prerequisite requirements for the [Stonehenge StockTrader Sample Application](#).

This process will install the following prerequisite components:

- Internet Information Services (IIS)
- Microsoft .NET Framework 3.5 with Service Pack 1
- Microsoft SQL Server 2008 Express Edition
- Visual Web Developer Express 2010

## Note

If you already have these components installed and configured on your system, you may proceed to the next section of this document. If you only have some of these components installed on your system, you should continue working through this section. If at any time a component is not available for selection in the Microsoft Web Platform Installer, your system may not meet the system requirements.

## To install the Microsoft Web Platform:

1. Download the latest version of the [Microsoft Web Platform Installer](#).
2. Run the **Web Platform Installer**. This will open a wizard that allows you to select the products that you would like to install on your machine.
3. In the **Web Platform Installer**, select the **Web Platform** tab.
4. In the **Web Server** section, click the **Customize** link.
5. In the **Application Development** group, check the boxes next to the following items:
  - **ASP.NET**
  - **.NET Extensibility**
6. In the **Common HTTP Features** group, check all available boxes.
7. In the **Health and Diagnostics** group, check the boxes next to the following items:
  - **HTTP Logging**
  - **Logging Tools**
  - **Request Monitor**
  - **Tracing**

## Note

These are not required, but may prove useful for troubleshooting purposes.

8. In the **Management** group, check the boxes next to the following items:
  - **IIS Management Console**
  - **IIS Management Scripts and Tools**
9. In the **Security** group, check all available boxes.
10. Click the **Back to Web Platform** link.
11. In the **Frameworks and Runtimes** section, click the **Customize** link.
12. In the **.NET Framework** group, check the boxes next to the following items:
  - **ASP.NET**
  - **.NET Framework 3.5 SP1**
13. Click the **Back to Web Platform** link.
14. In the **Database** section, click the **Customize** link.
15. In the **SQL** group, check the boxes next to the following items:
  - **SQL Server Express 2008 with Service Pack 1**
  - **SQL Server 2008 Management Studio Express**
  - **SQL Server 2008 Management Objects**

## Note

If these options are not available for selection, make sure that your system meets the [minimum requirements for SQL Server Express 2008](#).

16. Click the **Back to Web Platform** link.
17. In the **Tools** section, click the **Customize** link.
18. In the **Developer Tools** group, check the box next to **Visual Web Developer 2010 Express**.
19. Click the **Back to Web Platform** link.
20. Click the **Install** button.

## Note

You will be presented with a license agreement for all of the products that you are installing.

21. Click **I Accept** to continue installation.

## Warning

If you do not agree with the license terms, click **I Decline**. You will not be able to continue with installation if you do not agree to the license terms.

22. On the following page, configure the installation of **SQL Server Express** using the values shown in the table below:

| Setting             | Value   |
|---------------------|---|
| Authentication Mode | Mixed Mode Authentication (recommended for application development) |
| Password            | A strong memorable password   |

23. Click the **Continue** button.

Note



The Microsoft Web Platform Installer will begin to download and install the items that you have selected. You may be required to restart your computer for the installation to complete.

24. Once the installation completes, click the **Finish** button.
25. Click **Exit** to close the **Microsoft Web Platform Installer**.

## Configuring Microsoft SQL Server Installation

To configure the Microsoft SQL Server installation, follow the instructions in the [Configuring Microsoft SQL Server 2008 Express](#) document in the [Installing Common Prerequisites](#) section of this wiki.

## Installing Windows Identity Foundation

Starting with the upcoming [M2 Release](#), the [Stonehenge StockTrader Sample Application](#) includes support for claims-based security, and federated identity. [Windows Identity Foundation](#) includes a framework for dealing with claims, and creating custom Secure Token Services. This framework is used heavily within the .NET implementation of the [Stonehenge StockTrader Sample Application](#) to provide the enhanced identity management capabilities that will be found in the M2 release.

### To install Windows Identity Foundation

1. In a web browser, navigate to <http://www.microsoft.com/downloads/details.aspx?FamilyID=eb9c345f-e830-40b8-a5fe-ae7a864c4d76>.
2. At the bottom of the page, click the **Download** button next to the file you desire. Use the table below to determine the appropriate download:

| File                        | Description   |
|-----------------------------|---|
| Windows6.1-KB974405-x64.msu | Choose this if you have a machine with a 64-bit processor, and are running a 64-bit version of Windows 7, or Windows Server 2008 R2.  |
| Windows6.1-KB974405-x86.msu | Choose this if you have a machine with a 32-bit processor, or are running a 32-bit version of Windows 7.                              |
| Windows6.0-KB974405-x64.msu | Choose this if you have a machine with a 64-bit processor, and are running a 64-bit version of Windows Vista, or Windows Server 2008. |
| Windows6.0-KB974405-x86.msu | Choose this if you have a machine with a 32-bit processor, or are running a 32-bit version of Windows Vista, or Windows Server 2008.  |

Warning



If these update packages report that they do not apply to your system, verify that your operating system meets the minimum requirements stated at the beginning of this page. If you are using Windows Vista, or Windows Server 2008, ensure that you have already applied [Service Pack 2](#).

3. **Execute** the file downloaded, and then step through the installation wizard.

## Installing the Windows HTTP Services Certificate Configuration Tool

Note



If you have already previously downloaded and installed the **Windows Server 2003 Resource Kit Tools**, you may proceed to the next section of this document.

In order to configure permissions for the X.509 certificates used by the services that are components of the [Stonehenge StockTrader Sample Application](#), the **Windows HTTP Services Certificate Configuration Tool** will need to be installed.

### To install the Windows HTTP Services Certificate Configuration Tool

1. **Download** the Installer.
2. **Execute** the installation package downloaded.
3. Step through the installation wizard.

## Installing MySQL Connector/Net

Note



Even if you are not planning on using MySQL to store data for the StockTrader sample application, MySQL Connector/Net is still required for the source code to compile properly.

### To install MySQL Connector/Net:

1. In a web browser, navigate to <http://dev.mysql.com/get/Downloads/Connector-Net/mysql-connector-net-6.1.2.zip/from/pick#mirrors>.
2. Select a mirror from which to download the required files.
3. Extract, and run the **.msi** file inside the **.zip** file downloaded.
4. Step through the installation wizard.

## Installing a Subversion Client

To install a Subversion client, follow the instructions in the [Installing a Subversion Client](#) document in the [Installing Common Prerequisites](#) section of this wiki.

## Installing Apache Stonehenge StockTrader

This section of the document covers the actual installation of the [Stonehenge StockTrader Sample Application](#). It requires that all of the prerequisite components already discussed have been installed and configured properly. If this is not the case, please first go through the previous sections of this document.

### Preparing for Installation

#### To configure your firewall:

1. On the Windows **Start** menu, click **Control Panel**.
2. In **Control Panel**, in the **Security** section, click the **Allow a program through Windows Firewall** link.

Note



In Windows 7, port exceptions are added through [Windows Firewall with Advanced Security](#)

3. On the **Exceptions** tab, click the **Add port...** button.
4. Configure an exception using the values shown in the table below:

| Name                  | Port | Protocol |
|-----------------------|------|----------|
| Configuration Service | 7000 | TCP      |

1. Using the same process, create exceptions using the values shown in the table below:

| Name                     | Port | Protocol |
|--------------------------|------|----------|
| Order Processing Service | 8000 | TCP      |
| Business Service         | 9000 | TCP      |
| Active STS               | 9001 | TCP      |

### Installing the Trader Client Application

#### To download the latest source code:

1. Create a folder with a path similar to \*C:\StockTraderDemo\*
2. In **Windows Explorer**, Navigate to the folder that you created.
3. Right-click the background of that folder, and then click **SVN Checkout...**

Note



This assumes that you have installed TortoiseSVN client as described in one of the preceding sections. If you are using a different SVN client, observe the steps given, and replicate them as appropriate using your preferred client software.

4. In the **Checkout** dialog, configure the checkout using the values shown in the table below, and then click the **OK** button:

| Setting            | Value   |
|--------------------|---|
| URL of repository  | <a href="https://svn.apache.org/repos/asf/incubator/stonehenge/trunk/stocktrader/dotnet/">https://svn.apache.org/repos/asf/incubator/stonehenge/trunk/stocktrader/dotnet/</a> |
| Checkout directory | C:\StockTraderDemo (or whichever path you used in the previous steps)   |
| Checkout Depth     | Fully recursive   |
| Omit externals     | Unchecked   |
| Revision           | HEAD Revision   |

5. Once the checkout has completed, click the **OK** button.

#### To initialize the database and create accounts:

1. Follow the instructions in the [Preparing the StockTrader Database](#) document in the [Installing Common Prerequisites](#) section of this wiki.

#### To configure database access for the configuration service:

1. Open the XML-based configuration file located at C:\StockTraderDemo\config\_service\ConfigServiceConsoleHost\App.config
2. Update the **value** for the **DBServer** key to point to your SQL Server instance:

```
<add key="DBServer" value="INSTANCE HERE" />
```

#### Note



If you are using SQL Server 2008 Standard Edition (as opposed to express) you can likely leave this setting as it is. If you are using SQL Server 2008 Express, you will likely need to update this path to **COMPUTER\_NAME\SQLExpress** or simply **.\SQLExpress** if SQL Server Express is running locally.

3. **Save**, and then **close** the configuration file.

#### To configure database access for the Passive STS:

1. Open the XML-based configuration file located at **C:\StockTraderDemo\identity\_provider\PassiveSts\web.config**
2. In the **appSettings** section under the **configuration** node, update the **value** for the **SqlConnection** key to point to your SQL Server instance:

```
<add
  key="SqlConnection"
  value="server=INSTANCE HERE;initial catalog=StockTraderDB;User=trade;Password=yyy"
/>
```

#### Note



If you are using SQL Server 2008 Standard Edition (as opposed to express) you can likely leave this setting as it is. If you are using SQL Server 2008 Express, you will likely need to update this path to **COMPUTER\_NAME\SQLExpress** or simply **.\SQLExpress** if SQL Server Express is running locally.

3. **Save**, and then **close** the configuration file.

#### To setup the StockTrader web sites in Internet Information Services (IIS):

#### Note



If you are using Windows 7, you must first set the application pool identity for the DefaultAppPool to Network Service. See [this document](#) for more information.

1. On the Windows **Start** menu, click **Control Panel**.
2. Click the **Classic View** link, and then double click **Administrative Tools**.
3. Double-click **Internet Information Services (IIS) Manager**.
4. In the left pane, expand the **COMPUTER\_NAME > Sites** node.
5. Right-click **Default Web Site**, and then click **Add Application...**
6. Configure the application using the values shown in the table below, and then click **OK**:

| Setting       | Value                                  |
|---------------|--|
| Alias         | trade                                  |
| Physical path | C:\StockTraderDemo\trader_client\Trade |

7. Right-click **Default Web Site**, and then click **Add Application...**
8. Configure the application using the values shown in the table below, and then click **OK**:

| Setting       | Value   |
|---------------|---|
| Alias         | trade_identity                                  |
| Physical path | C:\StockTraderDemo\identity_provider\PassiveSts |

#### To install the test certificates:

1. Click the **Start** menu, and then type **mmc**.
2. Press the **Enter** key to launch **Microsoft Management Console**.
3. On the **File** menu, click **Add/Remove Snap-in...**
4. In the **Available snap-ins** list, click **Certificates**, and then click the **Add >** button.
5. In the **Certificates snap-in** dialog, click **Computer account**, and then click the **Next >** button.
6. In the **Select Computer** dialog, click the **Finish** button.
7. In the **Add or Remove Snap-ins** dialog, click the **OK** button to close the dialog.
8. In the **Console Root**, expand the **Certificates (Local Computer)** node.
9. Right-click the **Personal** node, and then click **All Tasks > Import...**
10. On the **Welcome** page of the **Certificate Import Wizard**, click the **Next >** button.
11. On the **File to Import** page, click the **Browse...** button.
12. Browse to and select **C:\StockTraderDemo\setup\_utilities\Util\stocktraderpfxfile.pfx**.

Note



In the file filter list, you will have to select **Personal Information Exchange (\*.pfx;\*.p12)**

13. On the **File to Import** page, click the **Next >** button.
14. In the **Password** box, type **yyy**, and then check the box next to **Mark this key as exportable [...]**.
15. On the **Password** page, click the **Next >** button.
16. Click **Next >** on any remaining pages, and then click the **Finish** button on the final page.
17. Click the **OK** button in the success message that appears.
18. In the left pane of **Microsoft Management Console**, expand the **Personal** node and click on **Certificates**.
19. In the center pane, right-click **Trade.com** and click **All Tasks > Manage Private Keys...**
20. In the **Permissions for Trade.com private keys** dialog, click the **Add...** button.
21. In the **Enter object names to select** box, type the name of the account that is the application pool identity for the StockTrader site that you set up in IIS, and then click the **OK** button.

Note



If nothing has been modified from defaults, you should type **Network Service**.

22. In the **Group or user names** list, click the account you added, and then in the **Permissions for ACCOUNT NAME HERE** list, check the **Allow** box next to **Full control**.
23. In the **Permissions for Trade.com private keys** dialog, click the **OK** button.
24. Leave **Microsoft Management Console** open, and then repeat the same import process for the following certificates:

| Certificate Name | Certificate Path                                      |
|------------------|---|
| OPS.Com          | C:\StockTraderDemo\setup_utilities\Util\OPSHost.pfx   |
| BSL.Com          | C:\StockTraderDemo\setup_utilities\Util\BSLClient.pfx |

25. In the center pane of **Microsoft Management Console**, select the three certificates imported.

Note



If there are any certificates in between them, you will have to click each one individually, while holding down the **Ctrl** key to select all of them at once.

26. On the **Action** menu, click **Copy**.
27. In the left pane, right-click on the **Trusted People** node, and then click **Paste**.
28. At a command prompt, type and execute the following command to associate the OPShost.pfx certificate in the personal store with the port 8005 to enable https for the Order Processor:

```
netsh http add sslcert ipport=0.0.0.0:8005 certhash=fa0f58bb605fa43369e279e8f9088872fde09943appid={C0C21DB2-6E94-4538-8A5E-C5AEBE6E3F8B}
```

#### To allow WCF services access to required resources:

1. In **Windows Explorer** open the folder **C:\StockTraderDemo\setup\_utilities\Util**
2. Right-click **AuthorizeWcfServices.bat**, and then click **Run as administrator**.
3. At the command prompt, type 1.
4. Press **Enter** at the command prompt when execution is complete.

#### To compile the StockTrader application:

1. Execute the script **C:\StockTraderDemo\BuildDotNet.cmd**.

## Running the StockTrader sample application

#### To run the sample application:

1. Execute the script **C:\StockTraderDemo\RunServices.bat**.
2. At the command prompt, type 1.
3. In a web browser, access <http://localhost/trade>

## Configuring Apache Stonehenge StockTrader

#### To configure the StockTrader application:

1. In a web browser, access <http://localhost/trade>.
2. In the toolbar, click the **Config** button.
3. On the **Configuration** page, in the **Business Service** list, select the Business Service endpoint that you wish to use.

Note



If you do not see the endpoint that you wish to use already included in these lists, use the **Advanced Configuration** option to create endpoint configurations of your choosing.

4. In the **Order Processing Service** list, select the Order Processing Service endpoint that you wish to use.
5. Click the **Set** button to save the configuration.

## Examining Available Utilities

Inside the **setup\_utilities/Util** folder, you will find a number of different scripts. For more information about these scripts see the [.NET Utilities List](#).