BOE Pro Windows Deployment & Upgrade Guide

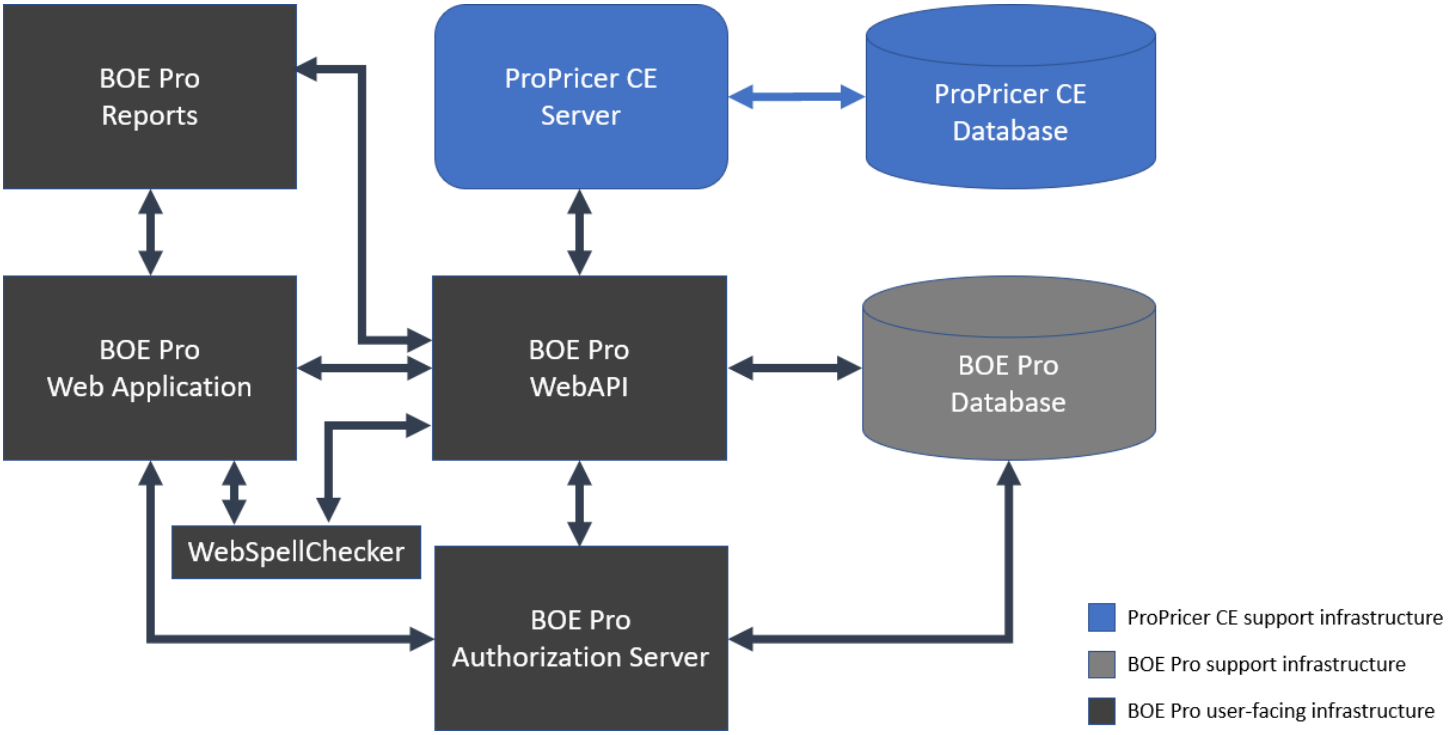
Revised July 27, 2023

Contents

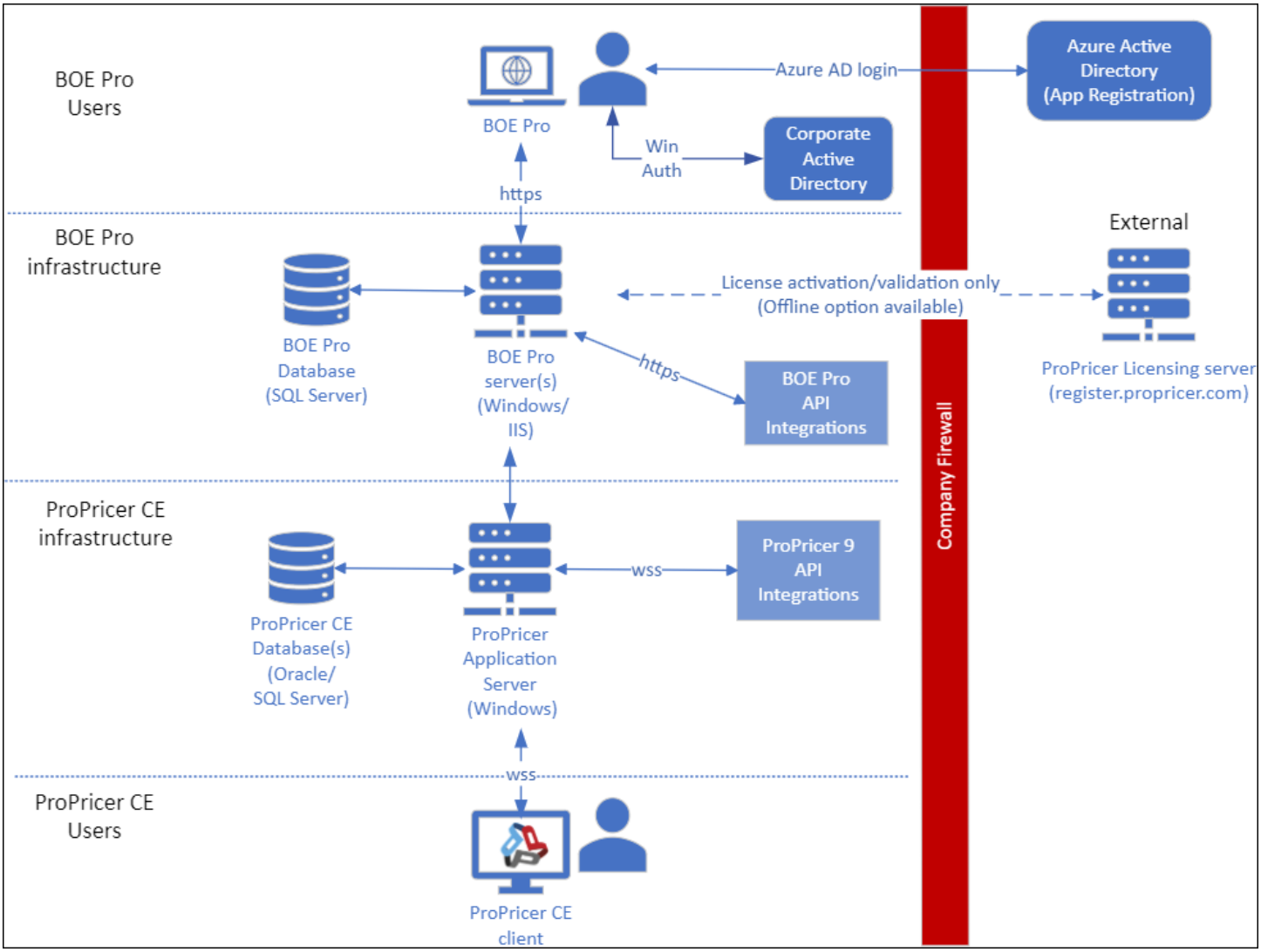
Introduction

BOE Pro, an n-tier web application developed with ASP.NET Core, supports various deployments options. The focus of this guide is deployment on Microsoft Windows servers using Internet Information Services (IIS). It explains in detail how to install BOE Pro on premises.

Architecture



Integration architecture



Requirements and recommendations

Minimum requirements

- Microsoft Windows Server 2016 (64 bits)
- Internet Information System 8.0
- Microsoft SQL Server 2016 (13.x) or later
- SSL certificate(s) for all user-facing websites

Upgrade recommendations

- Stop all BOE Pro sites and application pools before upgrading the following:
  - Authorization Server
  - Reports
  - WebAPI
  - Web Application
- Back up a copy of your sites before upgrading them.
- Back up your database before upgrading it.
- Go to the ProPricer Support Portal to download the zip packages for the new version you want to upgrade to.

Known limitations

- Bookmarking the URL of the Log In page can cause login issues for users. To quickly open BOE Pro in a browser, users should bookmark the web application start URL instead.

Self-contained deployment packages

All components, including the .NET 6 libraries and the .NET 6 runtime, come with the application, and are isolated from other .NET 6 applications. Self-contained deployment packages include an executable, such as EBS.ProPricer.BOEPro.WebAPI.exe.

Since the packages are separate self-contained deployments, you can deploy each one in a different server. You can even deploy them in different operating systems (for example, Authorization Server in Windows, and WebApp in Linux).

> The zip packages are available in the ProPricer Support Portal.

BOE Pro Authorization Server

BOEPro_Authorization_[version]_win-x64.zip

BOE Pro Authorization Server provides a centralized login logic. This component uses .NET 6 framework (contained in the zip package).

BOE Pro WebAPI

BOEPro_WebAPI_[version]_win-x64.zip

Back-end BOE Pro Web API that receives requests from the BOE Pro web application, provides the WebSockets implementation for live collaboration updates, communicates with the database to persist the information, and links BOE Pro with your installation of ProPricer 9. This component uses .NET 6 framework (contained in the zip package).

BOE Pro Reports

BOEPro_Reports_[version]_win-x64.zip

BOE Pro report engine. Processes reporting requests from the Web Application and communicates with the WebAPI to retrieve the information. This component uses .NET 6 framework (contained in the zip package).

BOE Pro Web Application

BOEPro_WebApp_[version]_win-x64.zip

Front-end BOE Pro Web Application. This component uses only static files (JS, HTML, CSS, etc.).

BOE Pro Database Setup

BOEPro_DatabaseSetup_[version]_win-x64.zip

Console application that creates and upgrades BOE Pro databases. This component uses .NET 6 single .exe deployment (.NET 6 contained in the .exe).

WebSpellChecker (Optional)

wsc_app_x64_[wsc_version].exe

WebSpellChecker installation package for a Windows-based server. This component provides Spell, Grammar, and Autocomplete in BOE Pro. It requires CPU with AVX2/AVX512* instructions support.

*AVX stands for Advanced Vector Extensions. Read more.

Create or upgrade a BOE Pro database

BOE Pro Database Setup is a command line tool that allows the database administrators to create and upgrade BOE Pro databases.

Usage

`BOEProDatabaseSetup [options] [command]`

Options

`-v|--version` Show version information.

`-?|-h|--help` Show help information.

Commands

`addsysadmin` Add a system administrator account to a BOE Pro database.

`create` Create a new BOE Pro database.

`upgrade` Upgrade a BOE Pro database to the current version.

create command

Create a BOE Pro database.

Usage

```
BOEProDatabaseSetup create [options]
```

Options

`-?|-h|--help` Show help information.

`-f|--scripttofile <fileName>` Output the script to a file.

`-s|--server <servername>` Name of the database server.

`-w|--windowsauth` Use Windows authentication.

`-d|--dbname <databasename>` Name of the database. Default value is `BOEPro`.

`-al|--adminlogin <login>` BOE Pro admin user email. Default value is `sysadmin@propricer.com`.

`-ap|--adminpass <password>` BOE Pro admin user password. Default value is `sysadmin`.

`-an|--adminname <name>` BOE Pro admin username. Default value is `System Administrator`.

`-u|--dbauser <dbalogin>` Database user login.

`-p|--dbapass <dbapassword>` Database user password.

`-e|--useexistingdb` Use an existing database (for example, when using Azure SQL Database).

Examples

Create a BOE Pro database on an SQL Server on premises using Windows Authentication:

```
BOEProDatabaseSetup create -s sqlserver.mycompany.com -d BOEPro -al
sysadmin@mycompany.com -ap SysAdmin@BOEPro -an "System Administrator" -w
```

Create a BOE Pro database on an Azure SQL Database using SQL Authentication:

```
BOEProDatabaseSetup create -s mycompany.database.windows.net -u myazureuser -p
MyAzurePassword -d BOEPro -al sysadmin@mycompany.com -ap MyStrongPassword4BOEPro
-an "System Administrator" -e
```

upgrade command

Upgrade an existing BOE Pro database.

Usage

```
BOEProDatabaseSetup upgrade [options]
```

Options

`-?|-h|--help` Show help information.

`-s|--server <servername>` Name of the database server.

`-w|--windowsauth` Use Windows authentication.

`-u|--dbauser <dbalogin>` Database user login.

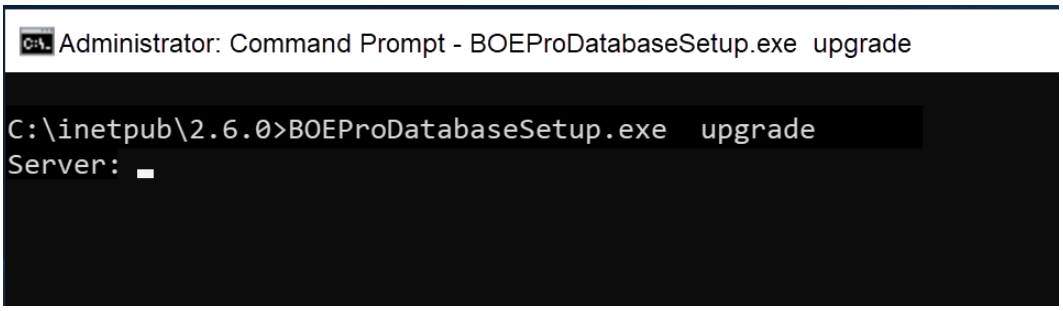
`-p|--dbapass <dbapassword>` Database user password.

`-d|--dbname <databasename>` Name of the database. Default value is `BOEPro`.

`-f|--scripttofile <fileName>` Output the script to a file.

Upgrade a BOE Pro database

1. Download the **BOEProDatabaseSetup** package.
2. Unzip **BOEProDatabaseSetup.exe**.
3. Open Command Prompt and navigate to the folder where **BOEProDatabaseSetup** is located.
4. Use the **`upgrade`** command to upgrade your database:
   `BOEProDatabaseSetup upgrade`



5. If you need to use Windows Authentication, add **`-w`**: **`BOEProDatabaseSetup upgrade -w`**
6. Enter the information requested by the tool.

Examples

Upgrade a database named BOEPro on an SQL Server on premises using Windows Authentication:

```
BOEProDatabaseSetup upgrade -s sqlserver.mycompany.com -d BOEPro -w
```

Upgrade a database named BOEPro on an Azure SQL Database using SQL Authentication:

```
BOEProDatabaseSetup upgrade -s mycompany.database.windows.net -u myazureuser -p
MyAzurePassword -d BOEPro
```

addsysadmin command

Create an administrator-type user in a previously created BOE Pro database. The user will have the Admin-only role. There can be only one user with the Admin-only role.

Usage

```
BOEProDatabaseSetup addsysadmin [options]
```

Options

`-?|-h|--help` Show help information.

`-s|--server <servername>` Name of the database server.

`-w|--windowsauth` Use Windows authentication.

`-d|--dbname <databasename>` Name of the database. Default value is `BOEPro.`

`-al|--adminlogin <login>` BOE Pro admin user email. Default value is `sysadmin@propricer.com`.

`-ap|--adminpass <password>` BOE Pro admin user password. Default value is `sysadmin`.

`-an|--adminname <name>` BOE Pro admin username. Default value is `System Administrator`.

`-u|--dbauser <dbalogin>` Database user login.

`-p|--dbapass <dbapassword>` Database user password.

Prerequisites

You can install all BOE Pro sites on a single Windows server, or on multiple servers. BOE Pro Authorization, BOE Pro Reports, BOE Pro WebAPI, and BOE Pro WebApp must comply with the following requirements.

> WebSpellChecker must comply with these and other specific requirements.

Enable Web Server (IIS)

1. Open **Add Roles and Features**.
2. Select **Web Server (IIS)**.
3. Select the following role services:
    a. Common HTTP Features
        i. **Default Document**
        ii. **Directory Browsing**
        iii. **HTTP Errors**
        iv. **Static Content**
    b. Health and Diagnostics
        i. **HTTP Logging**
    c. Performance
        i. **Static Content Compression**
    d. Security
        i. **Request Filtering**
        ii. **Windows Authentication (optional)**
    e. Management Tools
        i. **IIS Management Console**
    f. Application Development
        i. **WebSockets Protocol**

Configure and enable Windows authentication in BOE Pro (Optional)

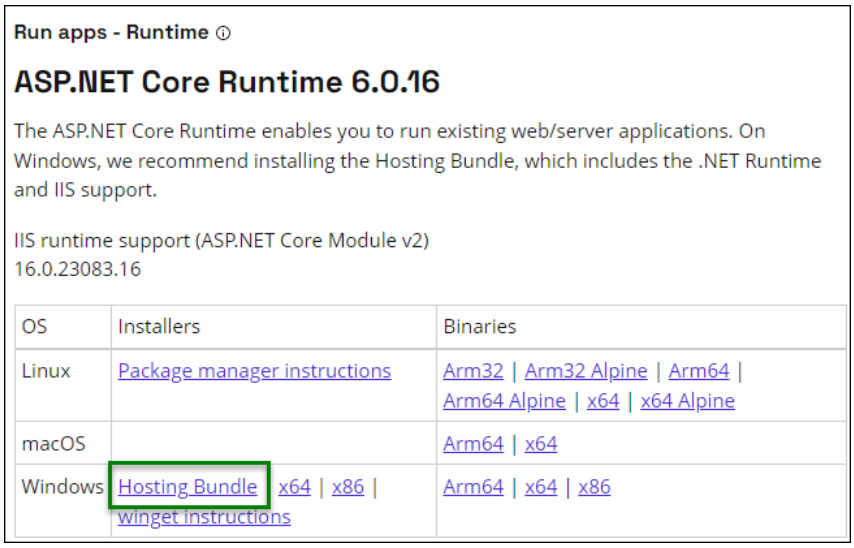
BOE Pro allows Windows authentication as a login option.

1. Ensure that all sites are hosted in a reverse proxy configuration with IIS on Windows Server 2016 or later, joined to your Active Directory.
2. Configure IIS.
    a. Enable the **Web Server (IIS)** server role.
    b. Enable the **Windows Authentication** role service for **Web Server (IIS)**.
    c. For more information, see the References at the end of this section of the guide.

Install the .NET 6 Windows Server Hosting Bundle

Install the .NET 6 Hosting Bundle on the hosting system. The bundle installs the .NET 6 Runtime, .NET 6 Library, and the ASP.NET Core Module. The module allows ASP.NET Core apps to run behind IIS.

1. Go to the Download .NET 6.0 page.
2. Under **Run apps - Runtime**, download the installer using the **Hosting Bundle** link.



3. Run the installer on the server.
4. Restart IIS or execute the following commands in a command shell:

```
net stop w3svc /y
net start w3svc
```

Install the URL rewrite 2.1 IIS extension

Download the extension at: https://www.iis.net/downloads/microsoft/url-rewrite

Install BOE Pro Authorization Server

Download and unzip the BOE Pro Authorization self-deployment package. Then move the **AuthorizationServer** folder to the desired site location (for example, **C:\inetpub\BOEPro\AuthorizationServer**).

> The zip packages are available in the ProPricer Support Portal.

Prerequisites

Make sure you followed all prerequisites before continuing.

Installation

1. Open Internet Information Service (IIS) Manager.
2. Create the BOE Pro Authorization application pool. To create a new pool:
    a. Right-click **Application Pools**, then select **Add Application Pool**.
    b. In the **Name** field, enter a valid name like **BOE Pro Auth App Pool**.
    c. In the **.NET CLR version** field, select **No Managed Code**.
    d. In the **Managed pipeline mode** field, select **Integrated**.
    e. Select **Start application pool immediately**.
    f. Click **OK** to create the application pool.
    g. Verify that the process model identity has the proper permissions. If the default identity of the application pool (**Process Model** > **Identity**) was changed from **ApplicationPoolIdentity** to something else, then the new identity needs permission to access the application's folder, database (when using Trusted Connection for the database connection string), and other required resources. For example, the pool needs Read and Write access to folders where the application reads and writes files.

3. Create the BOE Pro Authorization website.
    a. Right-click the **Sites** folder, then select **Add Website**.
    b. In the **Site name** field, enter **BOE Pro Authorization**.
    c. In the **Application Pool** field, select the application pool created in previous steps.
    d. In the **Physical path** field, select the path to the **AuthorizationServer** folder. For example, **C:\inetpub\BOEPro\AuthorizationServer**.
    e. In the **Type** field of the **Binding** section, select **https**.
    f. In the **IP address** field, select **All Unassigned**.
    g. In the **Port** field, enter a valid port number.

> Use different ports for each BOE Pro website when installing all BOE Pro websites on the same server and under the same domain. Ensure the port is accessible to the final users.

    h. In the **Host name** field, enter a domain.
    i. Select the box **Require Server Name Indication**.
    j. Select a valid SSL certificate for the domain.
    k. Click **OK** to create the website.
4. (Optional) Configure Windows authentication.
    a. Open the **Authentication** menu for the site.
    b. Enable **Anonymous Authentication**.
    c. If you also enable **Windows Authentication**, verify that the enabled providers work on your network. Right-click **Windows Authentication**, then click **Providers**. By default, they are **Negotiate** and **NTLM**.

Configuration

To configure BOE Pro Authorization Server, use the Manager tool, or edit **appsettings.json** in the **AuthorizationServer** folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window with Administrator permissions.
2. Go to the folder where BOE Pro Authorization Server is installed.
3. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config**
4. Enter the information requested.

> Optionally, launch the Manager tool by double-clicking the **config.bat** batch file located in the **AuthorizationServer** folder.

Example

Configuration of Authorization Server for all sites running on the same server boepro.mycompany.com under different ports and database connection using Windows Authentication. In this example Authorization Server is running in port 44350, and WebApp is running in https default port 443:

```
BOEProAuthorizationServerManager.exe config --appurl https://boepro.mycompany.com
--authurl https://boepro.mycompany.com:44350 --dbserver sqlserver.mycompany.com -
-dbname BOEPro --dbwinauth true --lifetime 720
```

Certificate for access tokens

BOE Pro Authorization Server uses a certificate file to encrypt the access tokens. If no certificate is provided, BOE Pro Authorization Server will generate the file tempkey.jwk in the same location as Authorization Server.

> Make sure the Application Pool Identity user has full permissions in this folder.

Your own certificate is recommended. You can specify the use of a certificate file (.pfx), or a certificate from a Windows certificate store.

Configure certificate from file

To configure a certificate from a file in BOE Pro Authorization Server, use the Manager tool, or edit **appsettings.json** in the **AuthorizationServer** folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window with Administrator permissions.
2. Go to the folder where BOE Pro Authorization Server is installed.
3. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config-token-cert-from-path**
4. Enter the information requested.

Example

Configuration of BOE Pro Authorization Server to use the certificate located in c:\inetpub\certs\mycert.pfx and the password MyCertPassword:

```
BOEProAuthorizationServerManager.exe config-token-cert-from-path --certfile
c:\inetpub\certs\mycert.pfx –cpassword MyCertPassword
```

> Make sure the Application Pool Identity user has read permissions to this path.

Configure certificate from store

To configure a certificate from a store in BOE Pro Authorization Server, use the Manager tool, or edit **appsettings.json** in the **AuthorizationServer** folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window with Administrator permissions.
2. Go to the folder where BOE Pro Authorization Server is installed.
3. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config-token-cert-from-store**
4. Enter the information requested. It is recommended that you use the **LocalMachine** location, and **My** as the store name.

Example

Configuration of BOE Pro Authorization Server to use the certificate located in the Personal store in the LocalMachine location, with thumbprint 5E6EA846843AFA78FF939BA0F4B29A9BF6A517AF.

```
BOEProAuthorizationServerManager.exe config-token-cert-from-store –
certstorelocation LocalMachine –cstorename My –cthumbprint
5E6EA846843AFA78FF939BA0F4B29A9BF6A517AF
```

> Make sure the Application Pool Identity user has access permissions to the certificate's private key.

Azure Active Directory (BOE Pro login support)

BOE Pro Authorization Server can allow the use of Azure Active Directory (AD) as a login option. Completing the steps to configure the app registration is required. If you also want to communicate with ProPricer 9 using Azure AD, follow the steps for configuring the client certificate as well.

Configure app registration

To configure the app registration to use in BOE Pro Authorization Server, use the Manager tool, or edit **appsettings.json** in the **AuthorizationServer** folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window with Administrator permissions.
2. Go to the folder where BOE Pro Authorization Server is installed.
3. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config-azuread**
4. Enter the information requested.

Example

Configure BOE Pro Authorization Server to use the app registration with tenant id 4763c4d4-f09b-4633-a8d1-989c8a3f859b and client id 150eea99-ab25-2c23-2f92-2dc80e2540e2 on Azure Government cloud:

```
BOEProAuthorizationServerManager.exe config-azuread --azureadinstance
https://login.microsoftonline.us/ --azureadtenantid 4763c4d4-f09b-4633-a8d1-
989c8a3f859b --azureadclientid 150eea99-ab25-2c23-2f92-2dc80e2540e2
```

Azure AD client credentials (ProPricer 9 Azure AD login support)

Client credentials are required to support ProPricer 9 Azure AD logins from BOE Pro. You can specify that client credentials use a certificate private key from Key Vault, a Windows certificate store, or a file (.pfx).

Configure client credentials certificate from Key Vault

To configure the client credentials to use a certificate from Key Vault in BOE Pro Authorization Server, use the Manager tool, or edit **appsettings.json** in the **AuthorizationServer** folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window with Administrator permissions.
2. Go to the folder where BOE Pro Authorization Server is installed.
3. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config-azuread-client-cert-from-keyvault**
4. Enter the information requested.

Example

Configure BOE Pro Authorization Server to use the certificate **MyBOEProCert** from Key Vault url https://mycompany.vault.azure.us:

```
BOEProAuthorizationServerManager.exe config-azuread-client-cert-from-keyvault --keyvaulturl https://mycompany.vault.azure.us --keyvaultcertname MyBOEProCert
```

Reference https://github.com/AzureAD/microsoft-identity-web/wiki/Certificates

Configure client credentials certificate from file (.pfx)

To configure the client credentials to use a certificate from a .pfx file in BOE Pro Authorization Server, use the Manager tool, or edit **appsettings.json** in the **AuthorizationServer** folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window with Administrator permissions.
2. Go to the folder where BOE Pro Authorization Server is installed.
3. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config-azuread-client-cert-from-path**
4. Enter the information requested.

Example

Configure BOE Pro Authorization Server to use the certificate file in **C:\inetpub\certs\myBOEProCert.pfx** with password MyCertPassword:

```
BOEProAuthorizationServerManager.exe config-azuread-client-cert-from-path --certfile C:\inetpub\certs\myBOEProCert.pfx --cpassword MyCertPassword
```

Reference https://github.com/AzureAD/microsoft-identity-web/wiki/Certificates

Configure client credentials certificate from windows store

To configure the client credentials to use a certificate from a Windows certificate store in **LocalMachine** in BOE Pro Authorization Server, use the Manager tool, or edit **appsettings.json** in the **AuthorizationServer** folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window with Administrator permissions.
2. Go to the folder where BOE Pro Authorization Server is installed.
3. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config-azuread-client-cert-from-store-with-thumbprint**
4. Enter the information requested.

Example

Configure BOE Pro Authorization Server to use the certificate with thumbprint 5A6AF846843AFA78FF939AE0F4B29A9BF6A517AF in **LocalMachine** location and the Personal (**My**) store name:

```
BOEProAuthorizationServerManager.exe config-azuread-client-cert-from-store-with-thumbprint --cstorename My --cthumbprint 5A6AF846843AFA78FF939AE0F4B29A9BF6A517AF
```

Reference https://github.com/AzureAD/microsoft-identity-web/wiki/Certificates

Enable logging

BOE Pro Authorization Server uses the Serilog library to provide diagnostic logging. Logging to file is optional but recommended.

1. In the **AuthorizationServer** folder, edit **appsettings.json**.
2. In the **`<Serilog>`** section, find the **`WriteTo`** array section, and add one entry for **`File`** above the **`Console`** entry.
3. Specify the path where you want the log file to be created.

   > Make sure the application pool's identity can write to this folder.

4. To apply your changes, restart the application pool and the website.

Example

The new **File** section is highlighted yellow.

```
"Serilog": {
    "Using": [ "Serilog.Sinks.Console" ],
    "MinimumLevel": {
      "Default": "Information",
      "Override": {
        "Microsoft": "Information",
        "IdentityServer4": "Information",
        "EBS.PROPRICER.AuthorizationServer": "Information"
      }
    },
    "WriteTo": [
      {
        "Name": "File",
        "Args": {
          "path": "\\inetpub\\logs\\logfiles\\boepro-auth.log",
          "rollOnFileSizeLimit": "true"
        }
      },
      {
        "Name": "Console",
        "Args": {
          "theme":
"Serilog.Sinks.SystemConsole.Themes.AnsiConsoleTheme::Literate,
Serilog.Sinks.Console"
        }
      }
    ]
```

References

- Learn more about Windows authentication and installing it for IIS. https://docs.microsoft.com/en-us/iis/configuration/system.webServer/security/authentication/windowsAuthentication/
- Configure Windows authentication in an ASP.NET Core app. https://learn.microsoft.com/en-us/aspnet/core/security/authentication/windowsauth?tabs=visual-studio&view=aspnetcore-6.0
- Host ASP.NET Core on Windows with IIS. https://learn.microsoft.com/en-us/aspnet/core/host-and-deploy/iis/?view=aspnetcore-6.0

Install BOE Pro Reports Server

Download and unzip the BOE Pro Reports Server self-deployment package. Then move the **Reports** folder to the desired site location (for example, **C:\inetpub\BOEPro\Reports**).

> The zip packages are available in the ProPricer Support Portal.

Prerequisites

Make sure you followed all prerequisites before continuing.

Installation

1. Open **Internet Information Service (IIS) Manager**.
2. Create a new application pool. To create a new pool:
    a. Right-click **Application Pools**, then select **Add Application Pool**.
    b. In the **Name** field, enter **BOE Pro Reports App Pool**.
    c. In the **.NET CLR version** field, select **No Managed Code**.
    d. In the **Managed pipeline mode** field, select **Integrated**.
    e. Select **Start application pool immediately**.
    f. Click **OK** to create the application pool.

3. Create the BOE Pro Reports website.
    a. Right-click the **Sites** folder, then select **Add Website**.
    b. In the **Site name** field, enter **BOE Pro Reports**.
    c. In the **Application pool** field, select the pool created in previous steps.
    d. In the **Physical path** field, enter or select the path where the files will be located. For example, **C:\inetpub\BOEPro\Reports**.
    e. In the **Type** field of the **Binding** section, select **https**.
    f. In the **IP address** field, select **All Unassigned**.
    g. In the **Port** field, enter a valid port number.

> Use different ports for each BOE Pro website when installing all BOE Pro websites on the same server and under the same domain. Ensure the port is accessible to the final users.

    h. In the **Host name** field, enter a domain.
    i. Select the box **Require Server Name Indication**.
    j. Select a valid SSL certificate for the domain.
    k. Click **OK** to create the website.

Configuration

To configure BOE Pro Reports, use the Manager tool, or edit **appsettings.json** in the **Reports** folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window.
2. Go to the folder where BOE Pro Reports is installed.
3. At the command prompt, enter: **BOEProReportsManager.exe config**

> Optionally, launch the Manager tool by double-clicking the **config.bat** batch file located in the **Reports** folder.

Example

Configuration of BOE Pro Reports Server for all sites running on the same server boepro.mycompany.com under different ports. In this example, WebAPI is running in port 44360, and WebApp is running in https default port 443:

```
BOEProReportsManager.exe config --apiurl https://boepro.mycompany.com:44360 --appurl https://boepro.mycompany.com
```

Enable logging

BOE Pro Authorization Server uses the Serilog library to provide diagnostic logging. Logging to file is optional but recommended.

1. In the **Reports** folder, edit **appsettings.json**.
2. In the **<Serilog>** section, find the **WriteTo** array section and add one entry add for **File** above the **Console** entry.
3. Specify the path where you want the log file to be created.

> Make sure the application pool's identity can write to this folder.

4. To apply your changes, restart the application pool and the website.

Example

The new **File** section is highlighted yellow.

```
"Serilog": {
    "Using": [ "Serilog.Sinks.Console" ],
    "MinimumLevel": {
      "Default": "Information",
      "Override": {
        "Microsoft": "Information",
        "IdentityServer4": "Information",
        "EBS.PROPRICER.AuthorizationServer": "Information"
      }
    },
    "WriteTo": [
      {
        "Name": "File",
        "Args": {
          "path": "\\inetpub\\logs\\logfiles\\boepro-reports.log",
          "rollOnFileSizeLimit": "true"
        }
      },
      {
        "Name": "Console",
        "Args": {
          "theme":
"Serilog.Sinks.SystemConsole.Themes.AnsiConsoleTheme::Literate,
Serilog.Sinks.Console"
        }
      }
    ]
```

Install BOE Pro WebAPI Server

Download and unzip the BOE Pro WebAPI self-deployment package. Then move the **WebAPI** folder to the desired site location (for example, **C:\inetpub\BOEPro\WebAPI**).

> The zip packages are available in the ProPricer Support Portal.

Prerequisites

Make sure you followed all prerequisites before continuing.

Installation

1. Open **Internet Information Service (IIS) Manager**.
2. Create a new application pool. To create a new pool:
    a. Right-click **Application Pools**, then select **Add Application Pool**.
    b. In the **Name** field, enter **BOE Pro WebAPI App Pool**.
    c. In the **.NET CLR version** field, select **No Managed Code**.
    d. In the **Managed pipeline mode** field, select **Integrated**.
    e. Select **Start application pool immediately**.
    f. Click **OK** to create the application pool.
    g. Right-click **BOE Pro WebAPI App Pool**, then select **Advanced Settings**.
    h. Set **Load User Profile** to **True**.
    i. Click **OK** to save the change.
    j. Right-click **BOE Pro WebAPI App Pool**, then select **Recycle**.
    k. Verify that the process model identity has the proper permissions. If the default identity of the application pool (**Process Model** > **Identity**) was changed from **ApplicationPoolIdentity** to something else, then the new identity needs permission to access the application's folder, database (when using Trusted Connection for the database connection string), and other required resources. For example, the pool needs Read and Write access to folders where the application reads and writes files.

3. Create the BOE Pro WebAPI website.
    a. Right-click the **Sites** folder, then select **Add Website**.
    b. In the **Site name** field, enter **BOE Pro WebAPI**.
    c. In the **Application pool** field, select the pool created in previous steps.
    d. In the **Physical path** field, enter or select the path where the files will be located. For example, **C:\inetpub\BOEPro\WebAPI**.
    e. In the **Type** field of the **Binding** section, select **https**.
    f. In the **IP address** field, select **All Unassigned**.
    g. In the **Port** field, enter a valid port number.

> Use different ports for each BOE Pro website when installing all BOE Pro websites on the same server and under the same domain. Make sure port is accessible by final users.

    h. In the **Host name** field, enter a domain.
    i. Select the box **Require Server Name Indication**.
    j. Select a valid SSL certificate for the domain.
    k. Click **OK** to create the website.
4. (Optional) Configure Windows authentication.
    a. Open the **Authentication** menu for the site.
    b. Enable **Anonymous Authentication**.
    c. To support ProPricer 9 logins, you need to enable **Windows Authentication.**

> If **Windows Authentication** is not in the Authentication dialog, enable the **Windows Authentication** feature in **Windows features**.

Configuration

To configure BOE Pro WebAPI, use the Manager tool, or edit **appsettings.json** in the target folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window.
2. Go to the folder where BOE Pro WebAPI is installed.
3. At the command prompt, enter: **BOEProWebAPIManager.exe config**

> Optionally, launch the Manager tool by double-clicking the **config.bat** batch file located in the **WebAPI** folder.

Example

Configuration of WebAPI when all sites are running on the same server boepro.mycompany.com under different ports and database connection using Windows Authentication. In this example, Authorization Server is running in port 44350, and WebApp is running in https default port 443:

```
BOEProWebAPIManager.exe config --auth https://boepro.mycompany.com:44350 --appurl
https://boepro.mycompany.com --dbserver sqlserver.mycompany.com --dbname BOEPro
--dbwinauth true --server propricer.mycompany.com --port 8092
```

Enable logging

BOE Pro Authorization Server uses the Serilog library to provide diagnostic logging. Logging to file is optional but recommended.

1. Edit **appsettings.json** in the **WebAPI** folder.
2. In the **`<Serilog>`** section, find the **`WriteTo`** array section and add one entry add for **`File`** above the **`Console`** entry.
3. Specify the path where you want the log file to be created.

> Make sure the application pool's identity can write to this folder.

4. To apply your changes, restart the application pool and the website.

Example

The new **File** section is highlighted yellow.

```
"Serilog": {
    "Using": [ "Serilog.Sinks.Console" ],
    "MinimumLevel": {
      "Default": "Information",
      "Override": {
        "Microsoft": "Information",
        "IdentityServer4": "Information",
        "EBS.PROPRICER.AuthorizationServer": "Information"
      }
    },
    "WriteTo": [
      {
        "Name": "File",
        "Args": {
          "path": "\\inetpub\\logs\\logfiles\\boepro-webapi.log",
          "rollOnFileSizeLimit": "true"
        }
      },
      {
        "Name": "Console",
        "Args": {
          "theme":
"Serilog.Sinks.SystemConsole.Themes.AnsiConsoleTheme::Literate,
Serilog.Sinks.Console"
        }
      }
    ]
```

Common errors

500.119

A user in the application pool cannot read **appsettings.json**. To fix this, assign permissions to the folder where the website files are located (for example, **C:\inetpub\BOEPro\WebAPI**).

HTTP Error 503 – The service is unavailable

The service is unavailable when the application pool of the corresponding web application is stopped, disabled, or paused. It may also be unavailable when the given user identity of the application pool is invalid due to an expired password or is locked.

https://blogs.msdn.microsoft.com/webtopics/2010/02/17/a-not-so-common-root-cause-for-503-service-unavailable/

https://stackoverflow.com/questions/13322937/http-error-503-the-service-is-unavailable

Bad Request – Request header too long

"HTTP Error 400. The size of the request header is too long."

While using Windows authentication, this error may appear instead of the BOE Pro application. It is the result of the user being a member of many Active Directory user groups.

To fix this:

1. Open **Windows Registry Editor** and go to:

   ```
   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HTTP\Parameters
   ```

2. Increase the settings for the `MaxFieldLength` and the `MaxRequestBytes` registry entries on the server so that the user's request headers do not exceed these values. For example:

   ```
   "MaxRequestBytes"=dword:01000000

   "MaxFieldLength"=dword:0000fffe
   ```

https://docs.microsoft.com/en-us/troubleshoot/iis/http-bad-request-response-kerberos

http://www.grouppolicy.biz/2013/06/how-to-configure-iis-to-support-large-ad-token-with-group-policy/

Cannot access path 'Executive Business Services, Inc\PROPRICER\9'

You will receive this error if the BOE Pro WebAPI Application Pool **Load User Profile** is set to **False**.

To fix this:

1. Right-click **BOE Pro WebAPI App Pool**, then select **Advanced Settings**.
2. Set **Load User Profile** to **True**.
3. Click **OK** to save the change.
4. Right-click **BOE Pro WebAPI App Pool**, then select **Recycle**.

Firewall

Your firewall must allow inbound connections to ProPricer 9 Server from the computer running BOE Pro WebAPI.

Install WebSpellChecker (Optional)

Download the WebSpellChecker windows installer.

> The installer is available in the ProPricer Support Portal.

Prerequisites

- WebSpellChecker license. Contact ProPricer Technical Support to obtain it.

Hardware requirements

You can install a self-hosted WebSpellChecker Server on a:

- Dedicated server.
- Virtual machine (you can enable VMWare virtualization when installing WebSpellChecker) *.
  - *AI-based engine is not supported under VM VirtualBox.
- Docker container.

Or you can install it using a cloud computing platform, such as Amazon Web Services, Google Cloud, and Microsoft Azure.

Following are the minimum hardware requirements for WebSpellChecker Server with an AI-based engine:

- HDD: 2 GB
- RAM: 4 GB
- CPU: 2 CPU cores with AVX2/AVX512* instructions support
  - *AVX stands for Advanced Vector Extensions. Read more.

The preceding minimum requirements vary depending on:

- Number of end users who will be proofreading with WebSpellChecker features.
- Amount of text to be proofread.
- Type and size of the language.
- Percentage of text errors.

Software requirements

- Operating system: Windows Server 2008 R2 or newer with a 64-bit architecture only.
- Internet Information Services (IIS) version 7.0 or newer.
- Java Runtime Environment (JRE) or Java Development Kit (JDK) with Java Virtual Machine (JVM) version1.8 or newer, 64-bit.

Install the Application Request Routing (ARR) 3.0IIS extension

Download the extension at:
https://www.microsoft.com/web/handlers/webpi.ashx?command=getinstallerredirect&appid=ARRv3_0

Installation

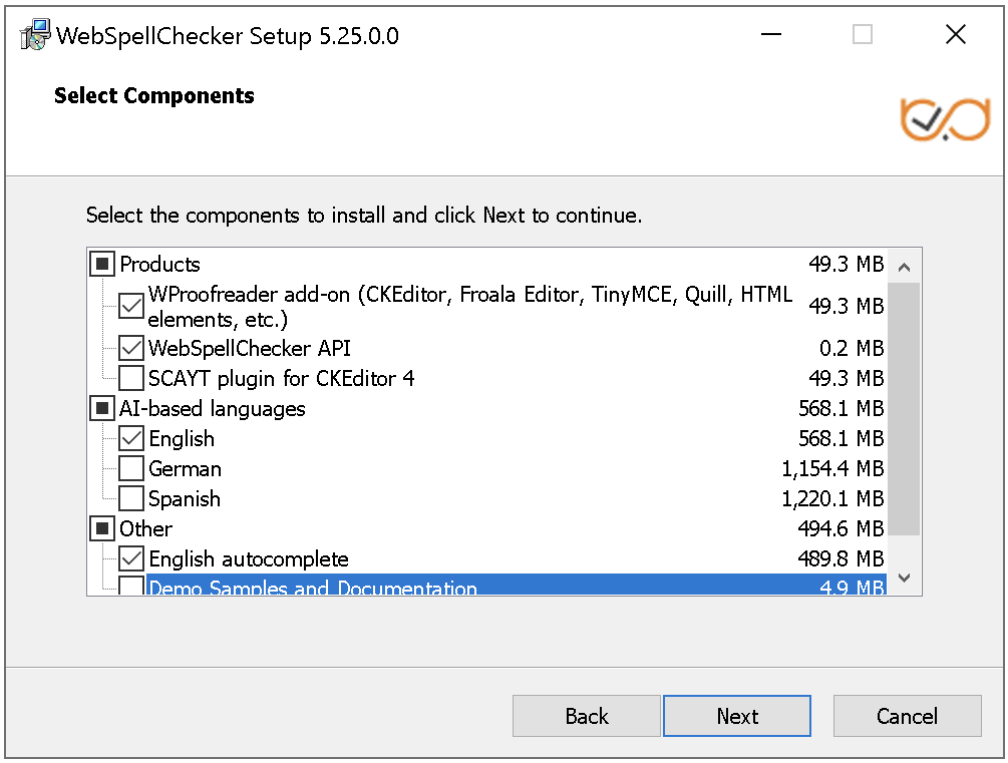
1. Open **Internet Information Service (IIS) Manager**.
2. Create a new application pool. To create a new pool:
    a. Right-click **Application Pools**, then select **Add Application Pool**.
    b. In the **Name** field, enter **BOE Pro Spell Pool**.
    c. In the **.NET CLR version** field, select **No Managed Code**.
    d. In the **Managed pipeline mode** field, select **Integrated**.
    e. Select **Start application pool immediately**.
    f. Click **OK** to create the application pool.
    g. Verify that the process model identity has the proper permissions. If the default identity of the application pool (**Process Model** > **Identity**) was changed from **ApplicationPoolIdentity** to something else, then the new identity needs permission to access the application's folder. For example, the pool needs Read and Write access to folders where the application reads and writes files.

3. Create the BOE Pro Spell website.
    a. Right-click the **Sites** folder, then select **Add Website**.
    b. In the **Site name** field, enter **BOE Pro Spell**.
    c. In the **Application pool** field, select the pool created in previous steps.
    d. In the **Physical path** field, enter or select the path where the files will be located. For example, **C:\inetpub\BOEPro\Spell**.
    e. In the **Type** field of the **Binding** section, select **https**.
    f. In the **IP address** field, select **All Unassigned**.
    g. In the **Port** field, enter a valid port number.

> Use different ports for each BOE Pro website when installing all BOE Pro websites on the same server and under the same domain. Make sure the port is accessible by final users.

    h. In the **Host name** field, enter a domain.
    i. Select the box **Require Server Name Indication**.
    j. Select a valid SSL certificate for the domain.
    k. Click **OK** to create the website.
4. Install the WebSpellChecker component.
    a. Run the installation package (e.g. wsc_app_win_x64_release_5.x.x.x_xx.exe).
    b. Before proceeding with the installation, read and confirm **WebSpellChecker Software License Agreement**.
5. Select WebSpellChecker installation location and click **Next** to proceed. The default WebSpellChecker installation folder is **C:\Program Files\WebSpellChecker**. Click **Browse** and specify a different installation location if needed.

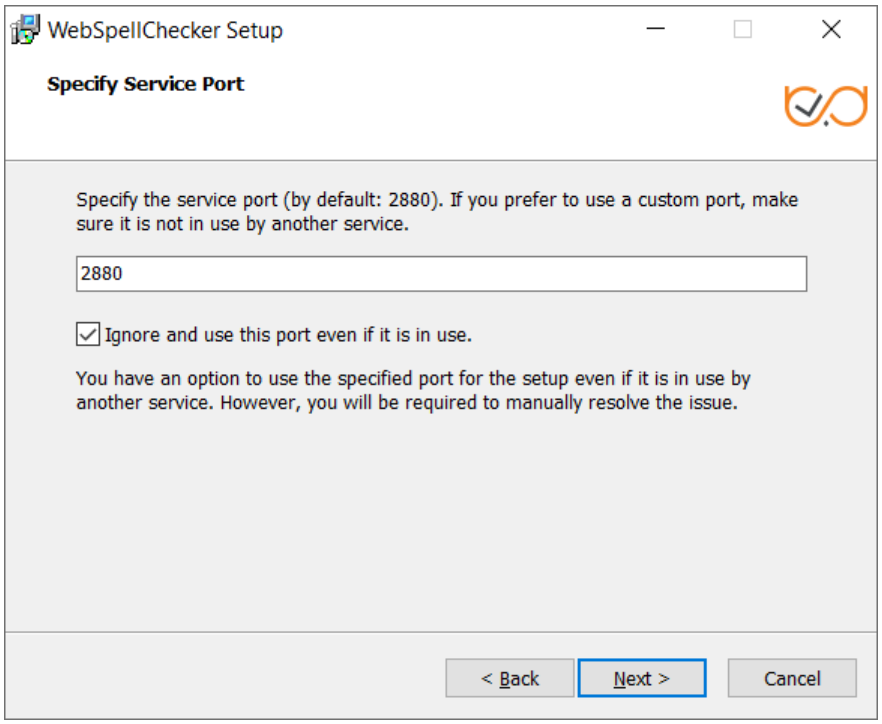
6. Select the following components to install:
    a. **WProofreader add-on**
    b. **WebSpellChecker API**
    c. **AI-based languages** > **English**
    d. **Other** > **English autocomplete**



Do not select the **SCAYT plugin for CKEditor 4** component for installation.

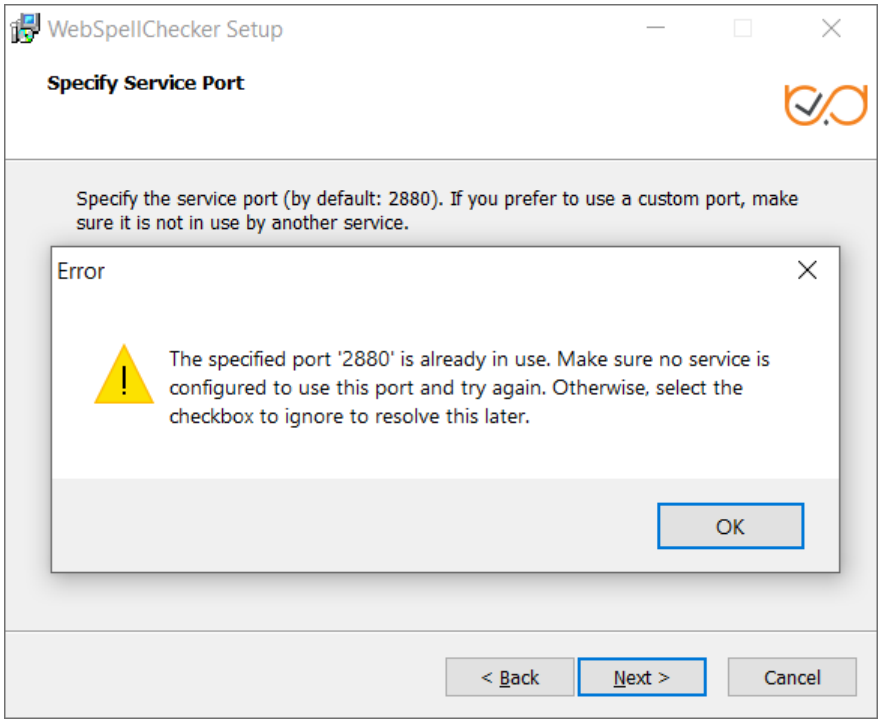
7. Click **Next**.
8. Select the type of protocol to use for communication with the WebSpellChecker service and a web server or Java application server, then click **Next**. The default protocol is **HTTPS**.

9. Specify the service port that AppServer will listen to, then click **Next**. AppServer processes only the service requests, such as spelling or grammar checking. The default port is **2880**.



This is not the port used by your web server or Java application server (80, 443, 8080, 8043, etc.). Configuration of this port will be explained next.

a. If the port is already in use, the following error message appears:

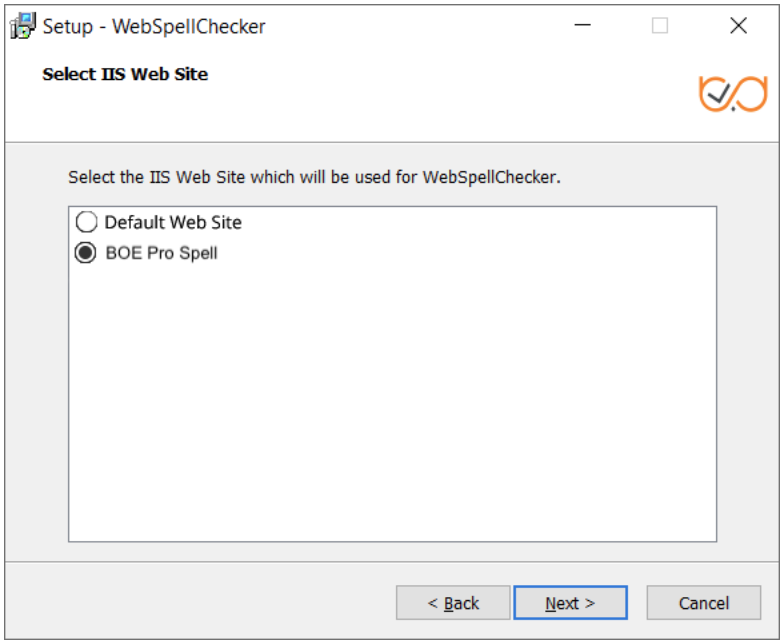


b. To continue the installation using port 2880, click **OK**, then select **Ignore and use this port even if it is in use**.

If WebSpellChecker Server is installed on the same server, and AppServer is running using port 2880, select a different unused port (for example, 2881) for this installation.

10. Select **Internet Information Services (IIS)** as a web server and configure its settings.

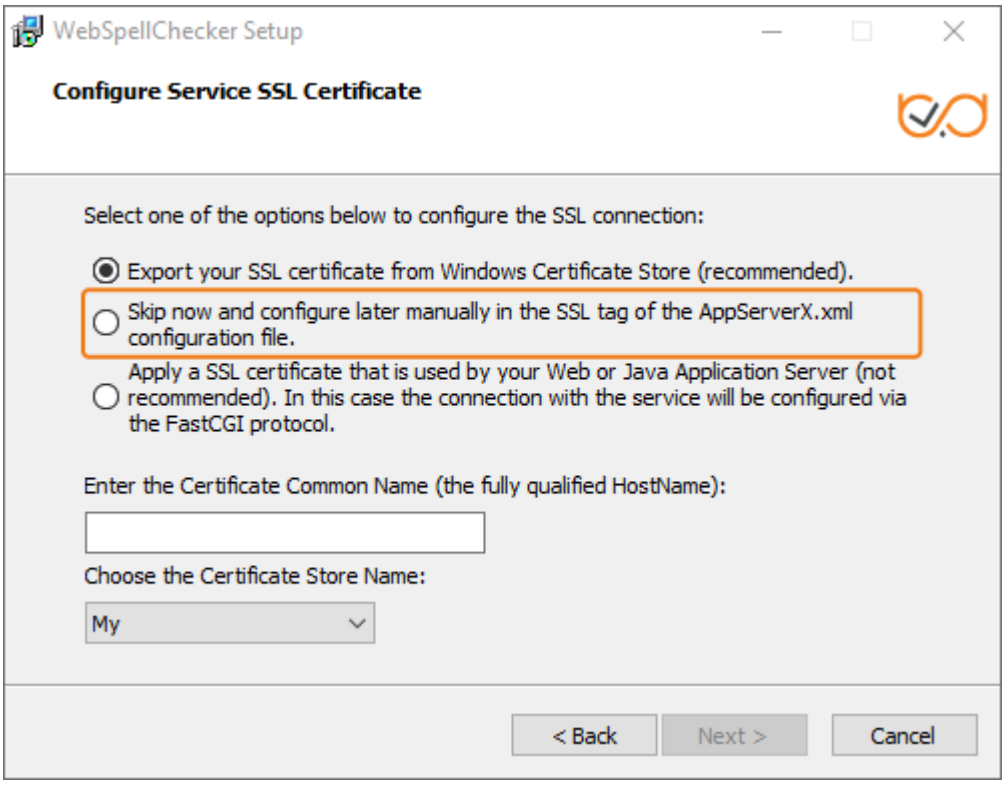
11. Select the website created previously (for example, **BOE Pro Spell**), then click **Next**.



12. Define the settings of the selected web server.
    a. Enter a domain name (for example, boepro-spell.mycompany.com).
    b. Enter a port number. The installer will suggest a port number based on the specified protocol and selected web server. The default port for web servers is **443** for HTTPS protocols.
    c. Enter the name of the virtual directory for the WebSpellChecker service. The default is **wscservice**.
13. Click **Next**.

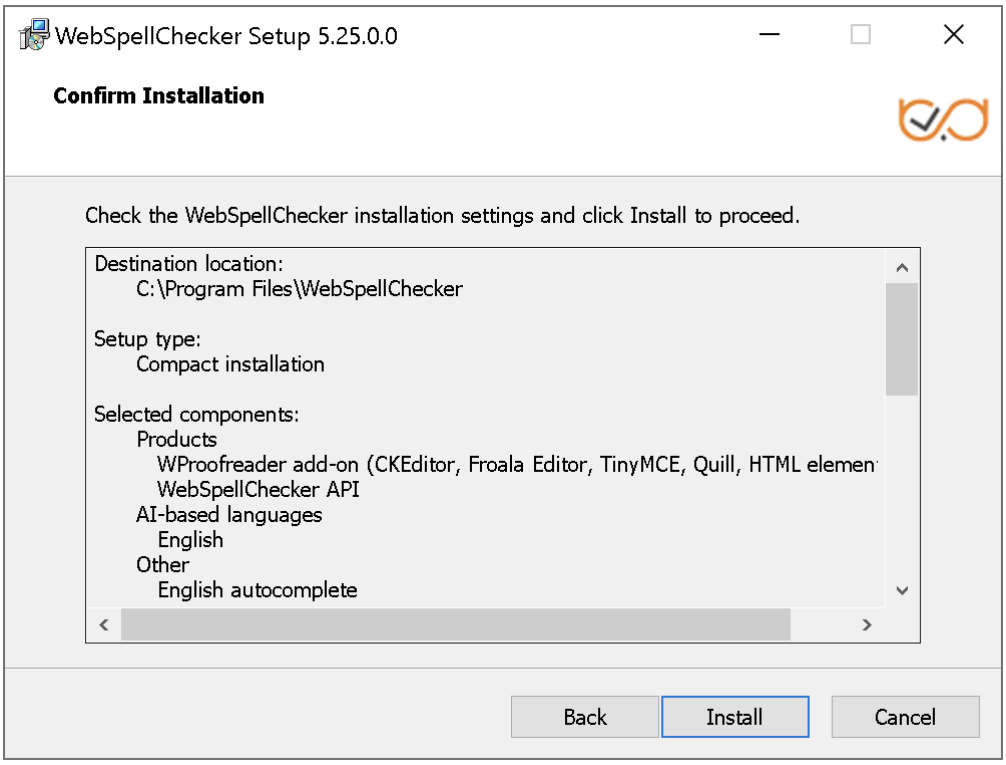
14. If you previously selected HTTPS as the protocol type, you will be asked to configure an SSL connection.

    a. Select the second option (**Skip now and configure later**...). Later, instead of configuring an SSL certificate for AppSever directly, set up a reverse proxy on Windows IIS, and use an SSL certificate configured for IIS.

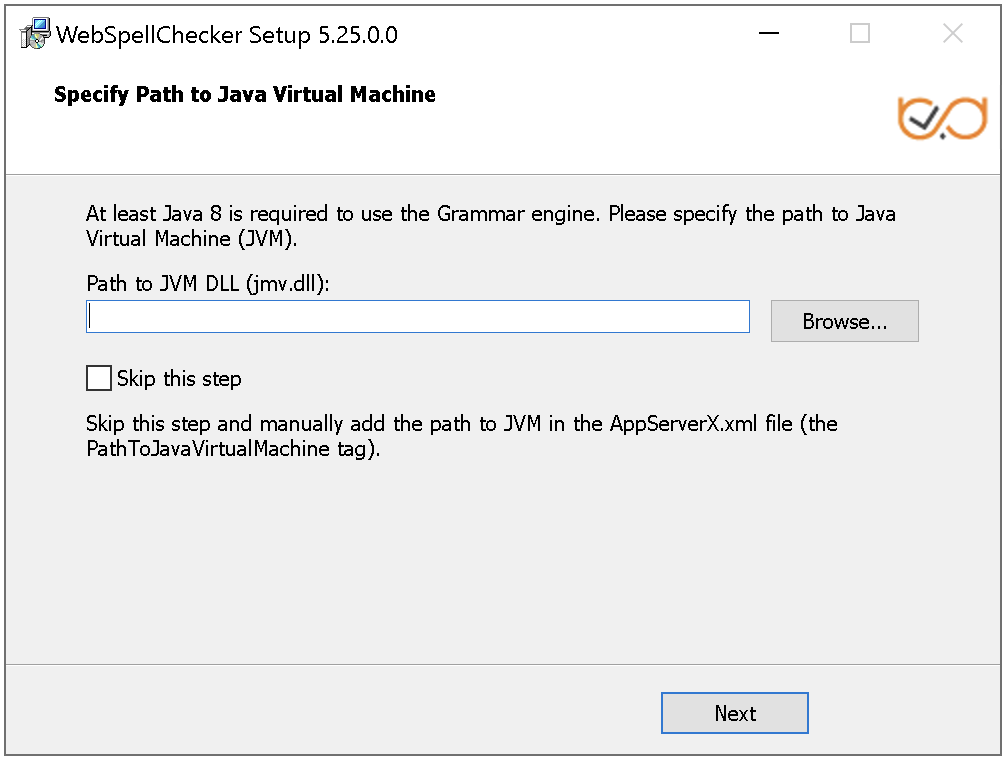


15. Select the WebSpellChecker **Start Menu folder**, and enter the program name that will appear as a Start Menu item. Then click **Next**.

16. The installer summarizes the information you entered previously. Click **Install** to proceed, or return to previous steps if you want to make changes. When the installation starts, libraries will be downloaded.

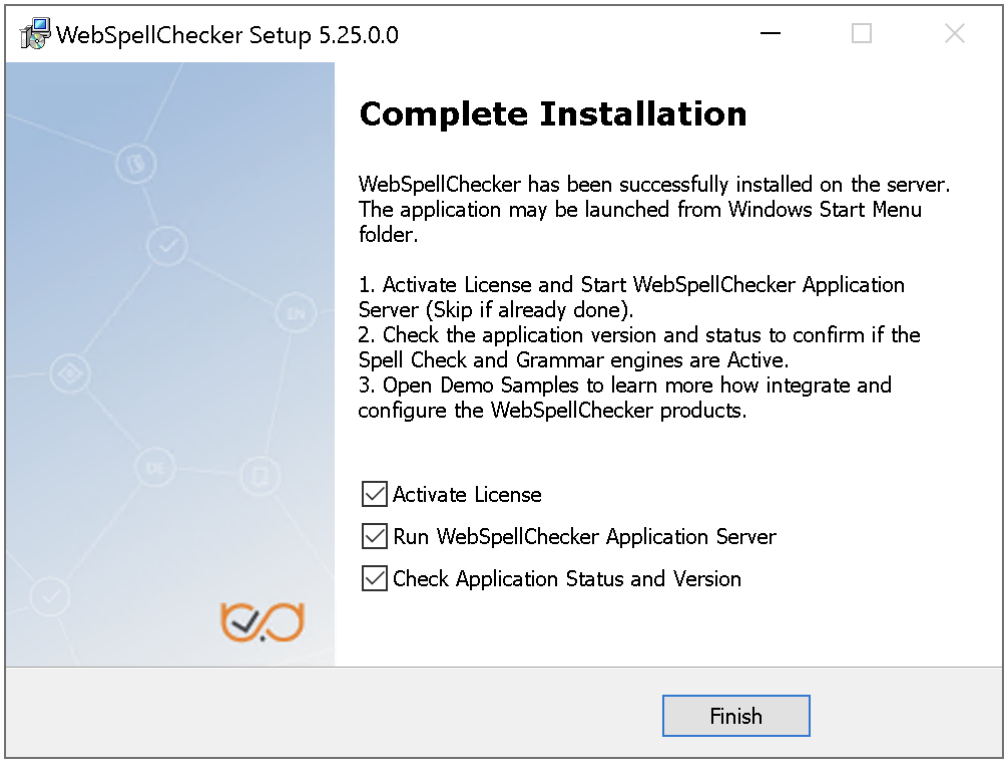


17. The Grammar engine requires the 64-bit version of Java 8 or newer. The installation wizard will try to auto-detect a path to an existing Java Virtual Machine (JVM). If no path is found, you will be asked to specify the JVM path:

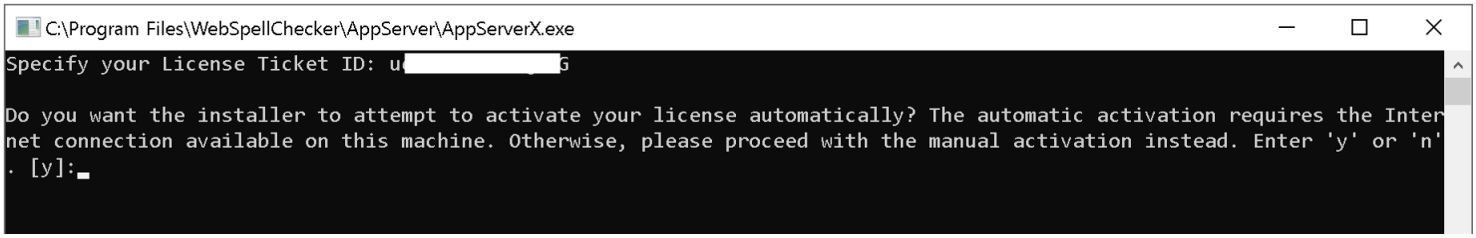


Make sure to select JVM 64-bit.
For example, **C:\Program Files\Java\jre1.8.0_351\bin\server**.

18. When the installation is complete, select **Activate License** if you are installing WebSpellChecker Server for the first time. Then click **Finish** to close the installation dialog. You can view the samples and verify application operability in newly opened web browser tabs, namely the samples page, a page with status check, and a page with version check.



19. When prompted, enter your WebSpellChecker license to activate it.



Contact ProPricer Technical Support for a WebSpellChecker license.

Verify operability

Check the status and version of AppServer to verify if WebSpellChecker Server works properly. To do so, use the following links to navigate to the detailed command and response descriptions:

Check AppServer version: https://localhost/wscservice/api/?cmd=ver or https://boepro-spell.mycompany.com/wscservice/api/?cmd=ver

Check AppServer status: https://localhost/wscservice/api/?cmd=status or https://boepro-spell.mycompany.com/wscservice/api/?cmd=status

Install BOE Pro Web Application

Download and unzip the BOE Pro Web Application package. Then move the **WebApp** folder to the desired site location (for example, **C:\inetpub\BOEPro\WebApp**).

> The zip packages are available in the ProPricer Support Portal.

Prerequisites

Make sure you followed all prerequisites before continuing.

Installation

1. Open **Internet Information Service (IIS) Manager**.
2. Create a new application pool. To create a new pool:
    a. Right-click **Application Pools**, then select **Add Application Pool**.
    b. In the **Name** field, enter **BOE Pro WebApp App Pool**.
    c. In the **.NET CLR version** field, select **No Managed Code**.
    d. In the **Managed pipeline mode** field, select **Integrated**.
    e. Select **Start application pool immediately**.
    f. Click **OK** to create the application pool.
    g. Verify that the process model identity has the proper permissions. If the default identity of the application pool (**Process Model** > **Identity**) was changed from **ApplicationPoolIdentity** to something else, then the new identity needs permission to access the application's folder. For example, the pool needs Read and Write access to folders where the application reads and writes files.

3. Create the BOE Pro WebApp website.
    a. Right-click the **Sites** folder, then select **Add Website**.
    b. In the **Site name** field, enter **BOE Pro WebApp**.
    c. In the **Application pool** field, select the pool created in previous steps.
    d. In the **Physical path** field, enter or select the path where the files will be located. For example, **C:\inetpub\BOEPro\WebApp**.
    e. In the **Type** field of the **Binding** section, select **https**.
    f. In the **IP address** field, select **All Unassigned**.
    g. In the **Port** field, enter a valid port number. 443 is recommended for WebApp.

Use different ports for each BOE Pro website when installing all BOE Pro websites on the same server and under the same domain. Make sure the port is accessible by final users.

    h. In the **Host** name field, enter a domain.
    i. Select the box **Require Server Name Indication**.
    j. Select a valid SSL certificate for the domain.
    k. Click **OK** to create the website.

Configuration

To configure BOE Pro Web Application, use the Manager tool, or edit **config.js** in the target folder.

The Manager tool is recommended.

1. Open the **Command Prompt** window.
2. Go to the folder where BOE Pro Web Application is installed.
3. At the command prompt, enter: **BOEProWebAppManager.exe config**

> Optionally, launch the config manager by double-clicking the **config.bat** batch file located in the **WebApp** folder.

4. (Optional) If you installed WebSpellChecker and need to enable it in BOE Pro, at the command prompt, enter: **BOEProWebAppManager.exe EnableWebSpellChecker**

Example

Configuration of WebApp when all sites are running on the same server boepro.mycompany.com under different ports and database connection using Windows Authentication. In this example, Authorization Server is running in port 44350, WebAPI is running in port 44360, and Reports is running in port 44370:

```
BOEProWebAppManager.exe config --auth https://boepro.mycompany.com:44350 --webapi
https://boepro.mycompany.com:44360 --reports https://boepro.mycompany.com:44370
```

Microsoft Clarity (Optional)

Microsoft Clarity is a user behavior analytics tool that helps you understand how users are interacting with your website through features such as session replays and heatmaps.

Enabling Microsoft Clarity is completely optional. Be aware that BOE Pro and Executive Business Services, Inc. receive no data from Clarity, and that Microsoft collects all Clarity data. Before enabling, ensure that this is not a security problem for your organization.

To enable Microsoft Clarity in BOE Pro:

1. Sign in to https://clarity.microsoft.com.
2. Create a new Clarity project for BOE Pro.
3. Go to **Settings** > **Overview** and copy the Project ID.
4. At the command prompt, enter: **BOEProWebAppManager.exe EnableClarity**
5. When prompted, enter the Project ID.

Remove ProPricer 9 WebAPI

BOE Pro v3.5.100.3 and later implements communication with ProPricer 9 Server in the BOE Pro WebAPI. This makes the ProPricer 9 WebAPI site no longer necessary. If you have BOE Pro v3.5.100.2 or earlier, delete the ProPricer 9 WebAPI website, application pool, and the website's folder in **C:\inetpub**. For example, **C:\inetpub\BOEPro\ProPricer9WebAPI**.

> ProPricer 9 Server Host Name and ProPricer 9 Server Port settings are now required on BOE Pro WebAPI configuration settings.

Upgrade BOE Pro Authorization Server

Before upgrading from EstimatorFLEX version 3.4.102.2 or earlier to BOE Pro version 3.5.100.0 or later, download and install the .NET 6 Hosting Bundle.

The zip packages are available in the ProPricer Support Portal.

1. Download and unzip the ProPricer Authorization Server package.
2. Using IIS Manager:
    a. Stop the Authorization Server website.
    b. Stop the Authorization Server application pool.
3. Using Windows Explorer, navigate to the folder for the Authorization Server website.
4. Back up the **appsettings.json** file.
5. Remove everything in the folder.
6. Copy all extracted files to the Authorization Server website's folder inside **C:\inetpub**. For example, **C:\inetpub\BOEPro\AuthorizationServer**.
7. Use the Manager tool to complete the configuration.
    a. Open the **Command Prompt** window.
    b. Go to the folder where ProPricer Authorization Server is installed.
    c. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config**
8. If you have Azure AD logins enabled for BOE Pro version 3.5.100.5 or earlier, starting in 3.5.101.0 you need to rename "AzureActiveDirectory" setting to "AzureAD" in appsettings.json file, or use the Manager:
    a. Open the **Command Prompt** window.
    b. Go to the folder where ProPricer Authorization Server is installed.
    c. At the command prompt, enter: **BOEProAuthorizationServerManager.exe config-azure-ad**
9. Using IIS Manager:
    a. Start the ProPricer Authorization Server application pool.
    b. Start the ProPricer Authorization Server website.

Example

Configuration of Authorization Server for all sites running on the same server boepro.mycompany.com under different ports, and a database connection using Windows Authentication (Application Pool Identity must have owner permissions to access the database). In this example, Authorization Server is running in port 44350, and WebApp is running in https default port 443:

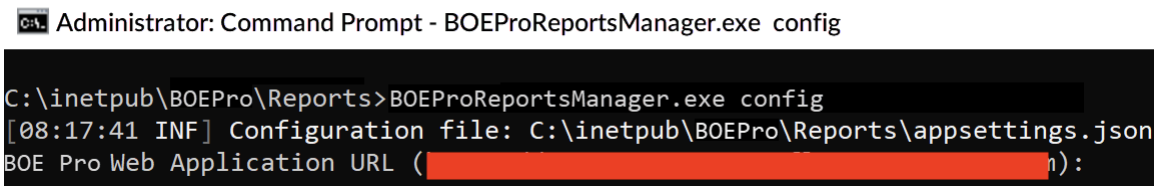
```
BOEProAuthorizationServerManager.exe config --appurl https://boepro.mycompany.com
--authurl https://boepro.mycompany.com:44350 --dbserver sqlserver.mycompany.com -
-dbname BOEPro --dbwinauth true --lifetime 720
```

Upgrade BOE Pro Reports

Before upgrading from EstimatorFLEX version 3.4.102.2 or earlier to BOE Pro version 3.5.100.0 or later, download and install the .NET 6 Hosting Bundle.

> The zip packages are available in the ProPricer Support Portal.

1. Download and unzip the BOE Pro Reports package.
2. Using IIS Manager:
    a. Stop the BOE Pro Reports website.
    b. Stop BOE Pro Reports' application pool.
3. Using Windows Explorer, navigate to the folder for the Reports site.
4. Back up the **appsettings.json** file.
5. Remove everything in the folder.
6. Copy all extracted files to the Reports site's folder inside **C:\inetpub**. For example, **C:\inetpub\Reports**.
7. Use the Manager tool to complete the configuration.
    a. Open the **Command Prompt** window.
    b. Go to the folder where BOE Pro Reports is installed.
    c. At the command prompt, enter: **BOEProReportsManager.exe config**



8. Using IIS Manager:
    a. Start the BOE Pro Reports application pool.
    b. Start the BOE Pro Reports website.

Example

Configuration of Reports Server for all sites running on the same server boepro.mycompany.com under different ports. In this example, WebAPI is running in port 44360, and WebApp is running in https default port 443:

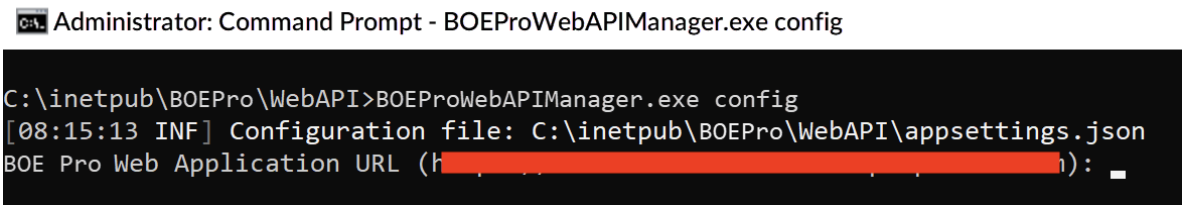
```
BOEProReportsManager.exe config --apiurl https://boepro.mycompany.com:44360 --appurl https://boepro.mycompany.com
```

Upgrade BOE Pro WebAPI

Before upgrading from EstimatorFLEX version 3.4.102.2 or earlier to BOE Pro version 3.5.100.0 or later, download and install the .NET 6 Hosting Bundle.

> The zip packages are available in the ProPricer Support Portal.

1. Download and unzip the BOE Pro WebAPI package.
2. Using IIS Manager:
    a. Stop the BOE Pro WebAPI website.
    b. Stop the BOE Pro WebAPI application pool.
3. Using Windows Explorer, navigate to the folder for the WebAPI site.
4. Back up the **appsettings.json** file.
5. Remove everything in the folder.
6. Copy all extracted files to the WebAPI site's folder inside **C:\inetpub**. For example, **C:\inetpub\BOEPro\WebAPI**.
7. Use the Manager tool to complete the configuration.
    a. Open the **Command Prompt** window.
    b. Go to the folder where BOE Pro Web API is installed.
    c. At the command prompt, enter: **BOEProWebAPIManager.exe config**



8. Using IIS Manager:
    a. Start the BOE Pro WebAPI application pool.
    b. Start the BOE Pro WebAPI website.

Example

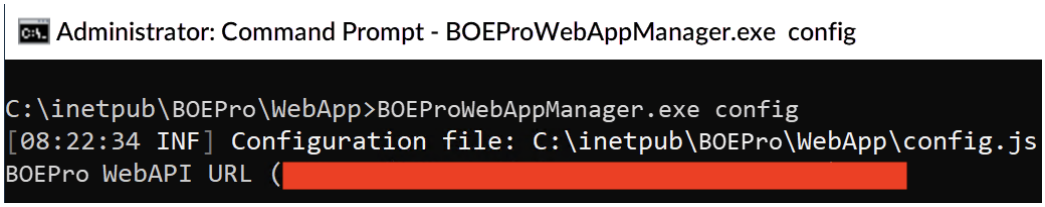
Configuration of WebAPI when all sites are running on the same server boepro.mycompany.com under different ports, and a database connection using Windows Authentication. In this example, Authorization Server is running in port 44350, and WebApp is running in https default port 443:

```
BOEProWebAPIManager.exe config --auth https://boepro.mycompany.com:44350 --appurl
https://boepro.mycompany.com --dbserver sqlserver.mycompany.com --dbname BOEPro
--dbwinauth true --server propricer.mycompany.com --port 8092
```

Upgrade BOE Pro Web Application

The zip packages are available in the ProPricer Support Portal.

1. Download and unzip the BOE Pro WebApp package.
2. Using IIS Manager:
    a. Stop the BOE Pro WebApp website.
    b. Stop BOE Pro WebApp's application pool.
3. Using Windows Explorer, navigate to the folder for the WebApp website.
4. Back up the **config.js** file.
5. Remove everything in the folder.
6. Copy all extracted files to the WebApp site's folder inside **C:\inetpub**. For example, **C:\inetpub\BOEPro\WebApp**.
7. Use the Manager tool to complete the configuration.
    a. Open the **Command Prompt** window.
    b. Go to the folder where BOE Pro Web Application is installed.
    c. At the command prompt, enter: **BOEProWebAppManager.exe config**



8. Using IIS Manager:
    a. Start the BOE Pro WebApp application pool.
    b. Start the BOE Pro WebApp website.

Example

Configuration of BOE Pro WebApp when all sites are running on the same server boepro.mycompany.com under different ports, and a database connection using Windows Authentication. In this example Authorization Server is running in port 44350, WebAPI is running in port 44360, and Reports is running in port 44370:

```
BOEProWebAppManager.exe config --auth https://boepro.mycompany.com:44350 --webapi
https://boepro.mycompany.com:44360 --reports https://boepro.mycompany.com:44370
```