

Apppeon Mobile Tutorials

Apppeon® for PowerBuilder® 2013 R2
FOR WINDOWS & UNIX & LINUX

DOCUMENT ID: ADC50001-01-0680-01

LAST REVISED: February 11, 2014

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1 About This Book

1.1 Audience

This book is intended for PowerBuilder developers who want to install Appeon Mobile, deploy and run the mobile application, package and distribute the application, or configure the Appeon Server cluster.

1.2 How to use this book

There are six chapters in this book.

Chapter 1: About This Book

A general description of this book

Chapter 2: Tutorial 1: Set up the Environment

Detailed instructions for setting up the Appeon Mobile 1.0 environment.

Chapter 3: Tutorial 2: Config, Deploy & Run the Application

Detailed instructions for configuring and deploying an existing PowerBuilder application, and then running the application on mobile device.

Chapter 4: Tutorial 3: Develop & Debug with Appeon Mobile

High-level guidelines for developing and debugging the application with Appeon Mobile.

Chapter 5: Tutorial 4: Package & Distribute Native Mobile Apps

Detailed instructions for packaging and distributing the app as a native iOS or Android app.

Chapter 6: Tutorial 5: Configure Appeon Server Cluster

Detailed instructions for configuring an Appeon Server cluster.

1.3 Related documents

Appeon provides the following user documents to assist you in understanding Appeon for PowerBuilder and its capabilities:

- **Introduction to Appeon:**
Gives general introduction to Appeon for PowerBuilder and its editions.
- **Getting Started (for Appeon Mobile):**
Guides you through installing PowerBuilder and Appeon for PowerBuilder, and developing and deploying a mobile application.
- **New Features Guide:**
Introduces new features and changes in Appeon for PowerBuilder.
- **Appeon Mobile Tutorials:**
Gives instructions on deploying, running, and debugging the mobile application, distributing native mobile apps, and configuring the Appeon Server cluster.

- **Appeon Mobile (Offline) Tutorials:**
Gives instructions on setting up the Appeon Mobile (Offline) environment, and configuring, deploying, running, updating, and debugging the offline application.
- **Appeon Installation Guide:**
Provides instructions on how to install Appeon for PowerBuilder successfully.
- **Installation Guide on Cloud Platform:**
Provides instructions on how to install Appeon for PowerBuilder on the cloud-based platform such as Windows Azure and AWS EC2 and S3.
- **Mobile UI Design & Development Guide:**
Introduces general guidelines on designing and developing the mobile app and UI.
- **Migration Guidelines for Appeon Web:**
A process-oriented guide that illustrates the complete diagram of the Appeon Web migration procedure and various topics related to steps in the procedure, and includes a tutorial that walks you through the entire process of deploying a small PowerBuilder application to the Web.
- **Supported PB Features:**
Provides a detailed list of supported PowerBuilder features which can be converted to the Web/Mobile with Appeon as well as which features are unsupported.
- **Appeon Developer User Guide:**
Provides instructions on how to use the Appeon Developer toolbar in Appeon for PowerBuilder.
- **Workarounds & API Guide:**
Provides resolutions for unsupported features and various APIs to facilitate you to implement the features (including Web and mobile) that are not easy or impossible to implement in the PowerBuilder IDE.
- **Appeon Workspace User Guide:**
Gives a general introduction on Appeon Workspace and provides detailed instructions on how to use it.
- **Appeon Server Configuration Guide:**
Provides instructions on how to configure Appeon Server Monitor, establish connections between Appeon Servers and database servers, and configure AEM for maintaining Appeon Server and the deployed applications.
- **Web Server Configuration Guide:**
Describes configuration instructions for different types of Web servers to work with the Appeon Server.

- **Troubleshooting Guide:**
Provides information on troubleshooting issues; covering topics, such as product installation, application deployment, AEM, and Appeon application runtime issues.
- **Appeon Performance Tuning Guide:**
Provides instructions on how to modify a PowerBuilder application to achieve better performance from its corresponding Web/mobile application.
- **Testing Appeon Web Applications with QTP:**
Provides instructions on how to test Appeon Web applications with QTP.

1.4 If you need help

If you have any questions about this product or need assistance during the installation process, access the Technical Support Web site at <http://www.appeon.com/support>.

2 Tutorial 1: Set up the Environment

You will need to go through the following tasks to set up the Appeon Mobile 2013 R2 environment for deploying and running the mobile application:

2.1 Task 1: Prepare the machine

The simplest scenario will be used in this guide, which requires 1 Windows PC and 1 Android or iOS device.

- **1 Windows PC:** used as the development machine and the Appeon Server
- **1 Android or iOS device:** used as the mobile client

The 32-bit version of **Appeon Mobile for .NET** edition will be used to walk you through this guide, so please prepare the environment according to the following requirements.

Software requirements for **Windows PC**:

- Windows 7 or 8.1 (32-bit or 64-bit)
Appeon Mobile 32-bit version can be installed to the 64-bit OS without any special considerations. But if you have installed **Appeon for PowerBuilder 64-bit** version before please uninstall it first. See [Task 1.2: Uninstall previous version of 64-bit Appeon](#).
- Internet Explorer 8, 9, 10, or 11
- PowerBuilder 9.x, 10.x, 11.x, 12.x, or 15
- (Optional) Sybase ASA/SQL Anywhere (32-bit engine) 8.0.2, 9.0, 10.0.1, 11.0, 12.0, or 16.0 (for running the demos included with the Appeon installation)
- .NET Framework 4.x
For Windows 7, you will need to first download the .NET Framework 4.0 setup program from <http://www.microsoft.com/en-us/download/details.aspx?id=17718>.
- IIS 7.x or 8.x
See [Task 1.3: Install IIS](#) and [Task 1.4: Configure IIS](#).
- Appeon Mobile 2013 R2
Install Appeon Server and Appeon Developer. See [Task 2: Install Appeon Server & Appeon Developer](#).

Software requirements for the Android or iOS device:

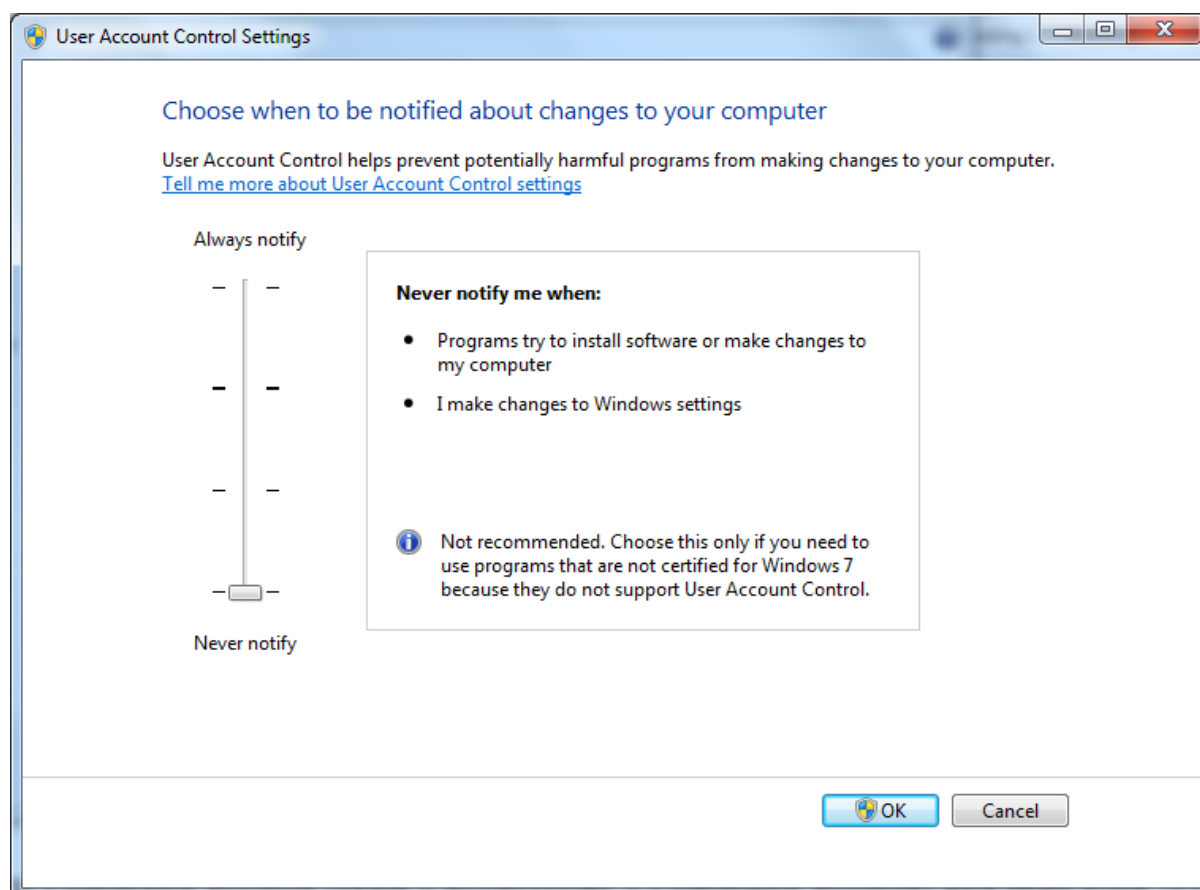
- Android OS: 4.1 or above
iOS: 5.1 or above
- Appeon Workspace

See [Task 4: Install Appeon Workspace \(on the Android or iOS device\)](#)

2.1.1 Task 1.1: Disable UAC (User Account Control)

On the Windows PC, go to the **Control Panel > User Accounts** and disable UAC by setting the slider to "**Never notify**" (see screenshot below). After you have disabled UAC you **MUST** restart the computer. If you do not restart the computer the change will NOT take effect.

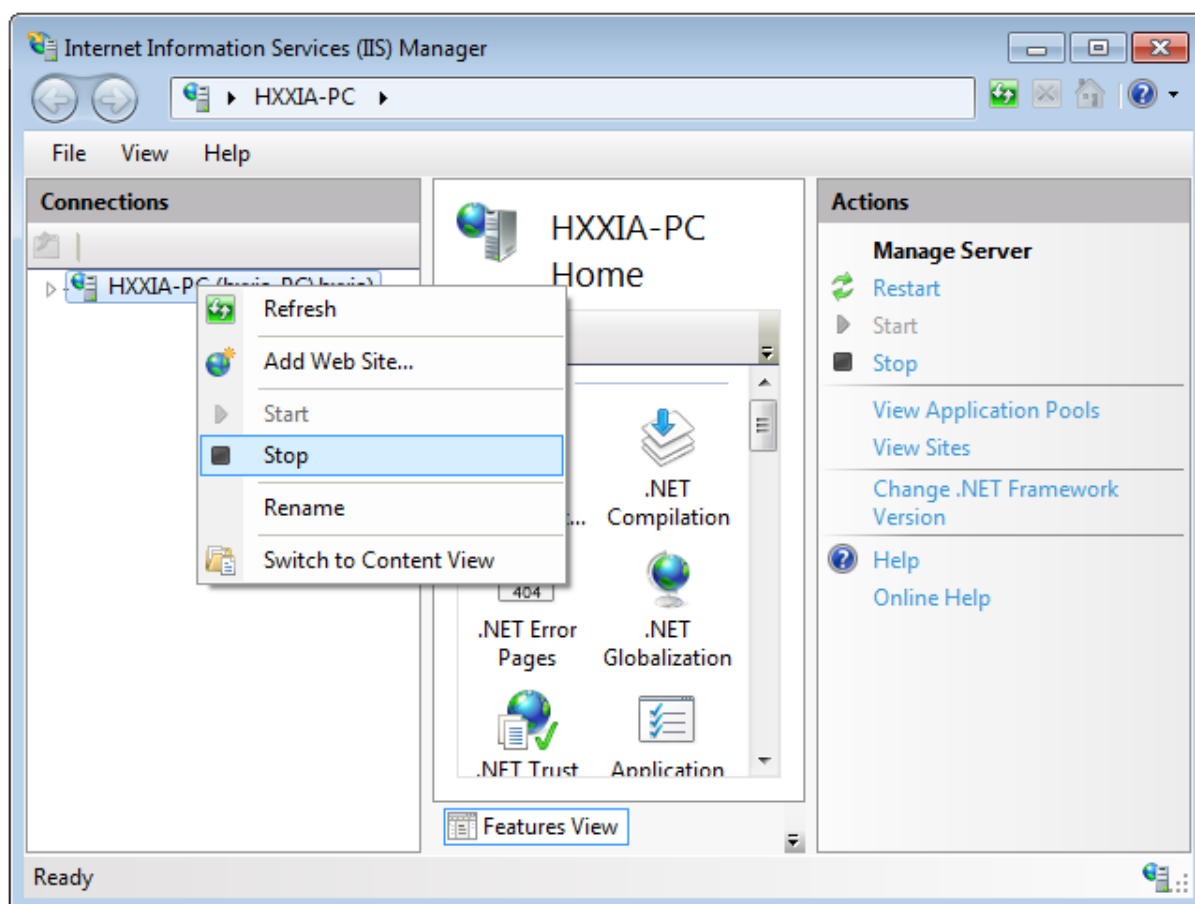
Figure 2.1: Disable UAC



2.1.2 Task 1.2: Uninstall previous version of 64-bit Appeon

If you are using a 64-bit machine you can install **Appeon Mobile (32-bit)** to the 64-bit OS without any special configurations. But if you have a previous version of **Appeon for PowerBuilder (64-bit)** already installed on this machine then you must uninstall it first.

Step 1: Open **IIS Manager**, right click the **top** node (not the website node) in the treeview and select **Stop** from the popup menu. This will stop the entire IIS.

Figure 2.2: Stop the entire IIS Manager

Step 2: Close any opened window, especially **Sybase PowerBuilder** and **IIS Manager**.

Step 3: Uninstall all of the Apeon components including **Apeon Server**, **Apeon Developer**, and **Apeon Help**. You will need to uninstall these components one by one.

Step 4: Verify Apeon is cleanly uninstalled by the following two steps:

- Double check the **Control Panel\Programs\Programs and Features** and make sure no Apeon component is listed.
- Open a command prompt window and then type **regedit<Enter>**. Double check that no **ADT** or **ASN** keys are listed under **HKEY_LOCAL_MACHINE\SOFTWARE\Apeon\<version_number>**.

Step 5: Clear the Internet Explorer cache and temporary files.

Step 6: Delete the entire Apeon folder from **C:\Users\User_Name\AppData\Roaming**.

Step 7: Delete all the Apeon application folders from the IIS Web root. For example, under **C:\inetpub\wwwroot** at minimum you should delete the following folders: **apeon**, **apeon_acf_demo**, **apeon_code_examples**, **pet_world**, **sales_application_demo**.

Step 8: Restart the machine.

Step 9: Start IIS by right-clicking the **top** node in the treeview in the IIS Manager and selecting **Start** from the popup menu.

After that, you can proceed to install **Appeon Mobile** by following steps in [Task 2: Install Appeon Server & Appeon Developer](#).

2.1.3 Task 1.3: Install IIS

IIS is not installed on Windows 7 or 8.1 by default. You need to manually install it.

Before you install IIS, make sure you have installed .NET Framework 4.x. To install .NET Framework 4.x for Windows 8.1, please go to the **Turn Windows features on or off** and check the box for .NET 4.5; for Windows 7, please download the setup program from <http://www.microsoft.com/en-us/download/details.aspx?id=17718> and install .NET Framework 4.0.

Below are steps for installing IIS. If you already have IIS installed, please carefully verify the correct IIS options are checked (see screenshots below). By default, not all the required components will be installed.

Step 1: Click **Start** and then click **Control Panel**. In Control Panel, click **Programs** and then click **Turn on or off Windows features**.

Step 2: Select the check box of **Internet Information Services**, then expand the list and select the items under **Web Management Tools, Application Development Features** and **Common HTTP Features** according to the figure below. Click **OK** to let Windows finish the install.

Figure 2.3: Select the Web Management Tools

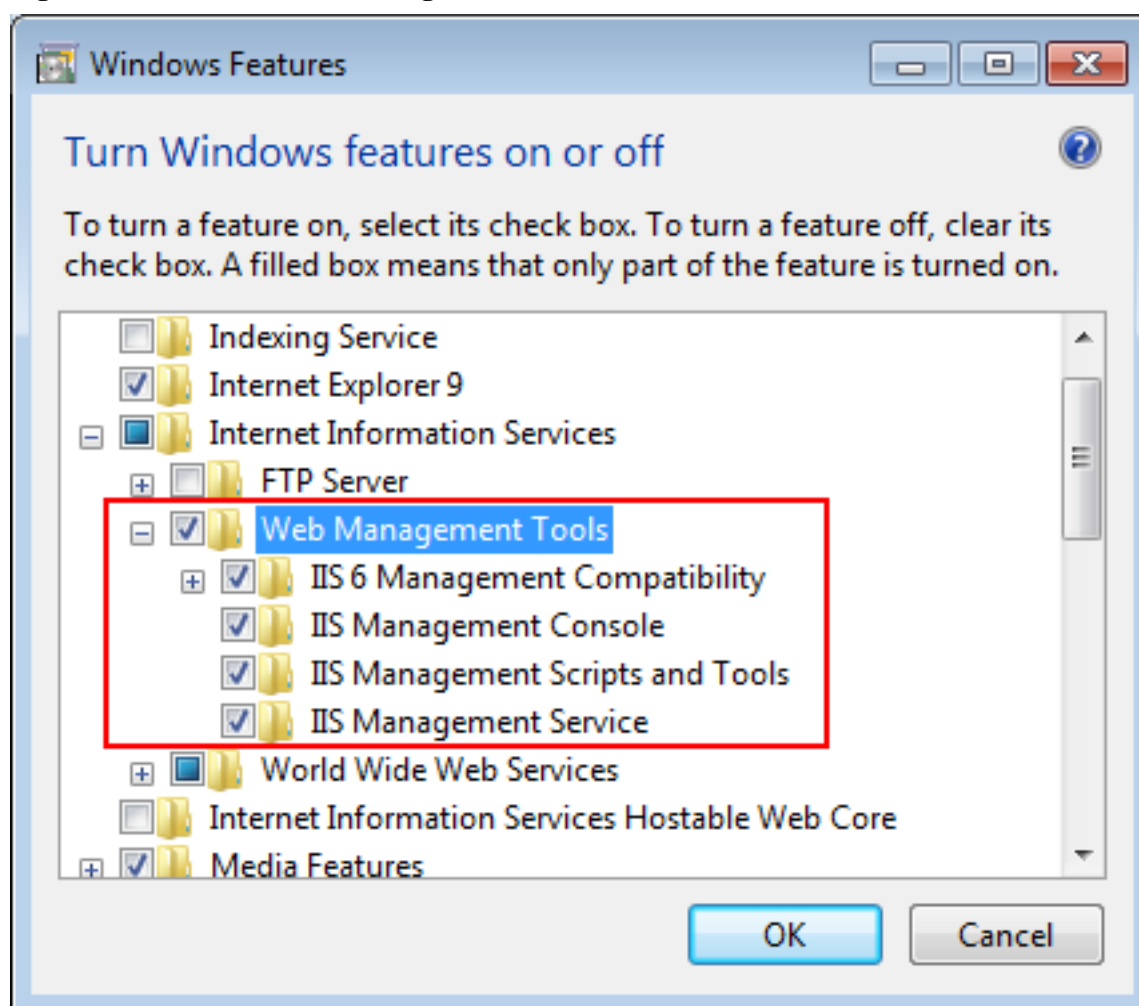


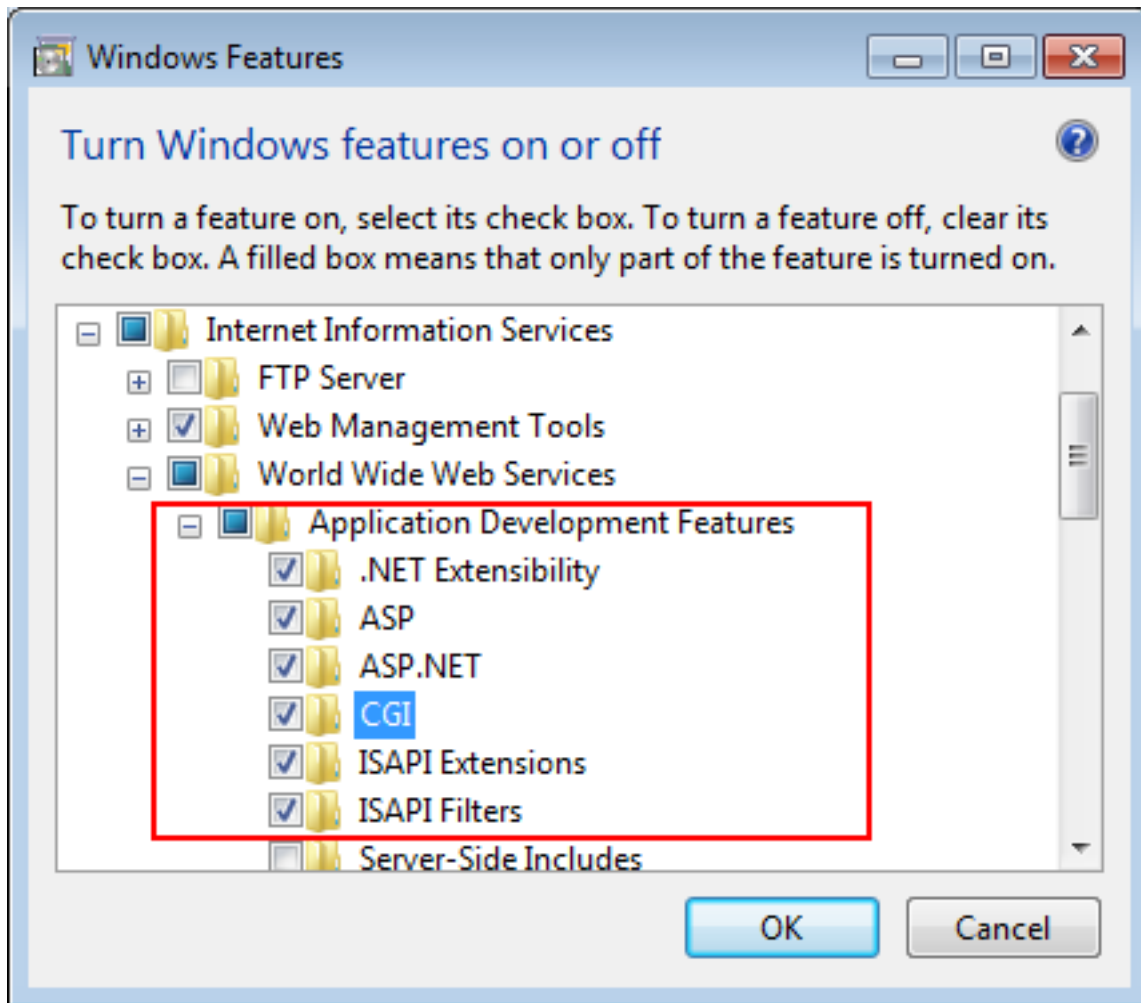
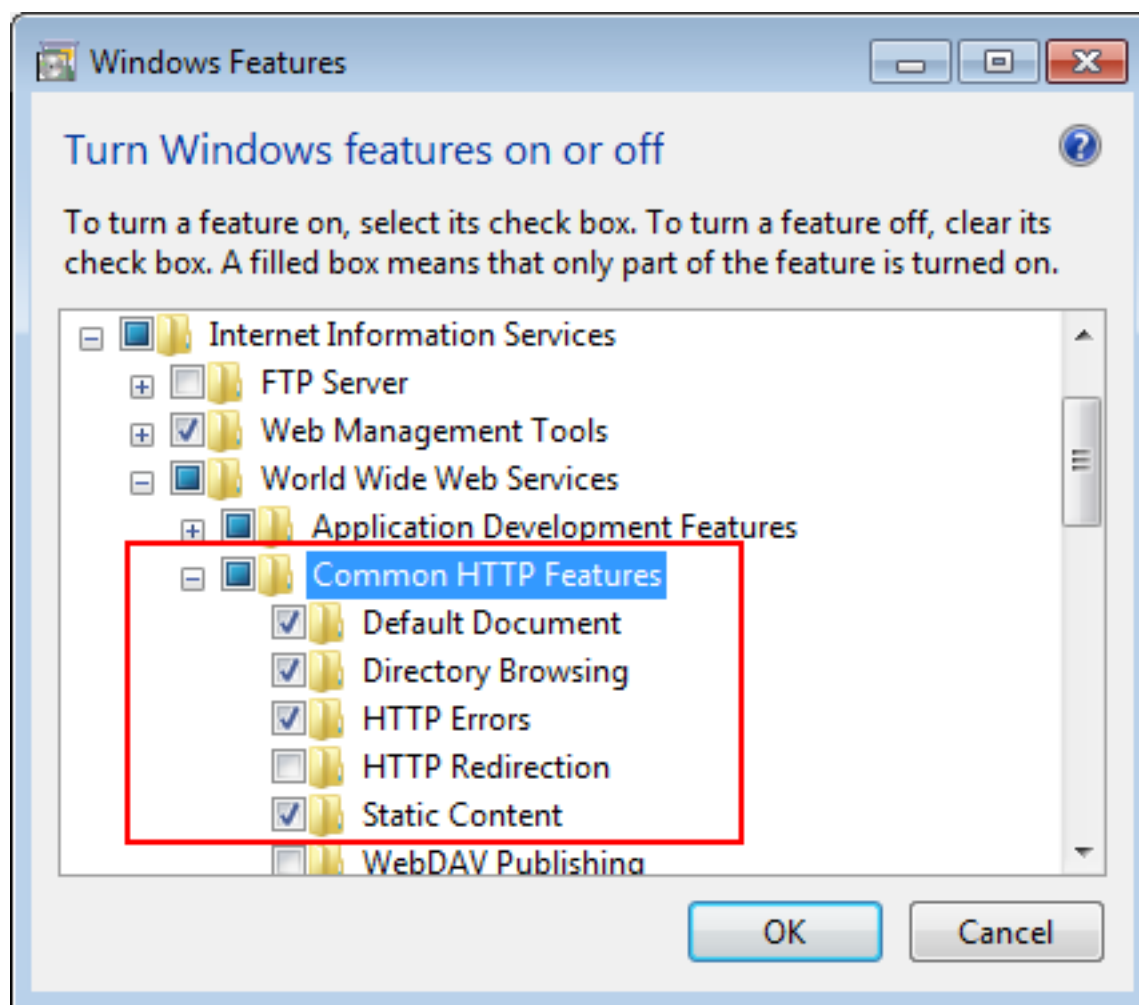
Figure 2.4: Select the Application Development Features

Figure 2.5: Select the Common HTTP Features

Step 3: After IIS is installed, go to **IIS Manager**, right click the **Default Web Site**, select **Binding**, and make sure **IP Address** is indicated with an asterisk "*". If not, please click **Edit** and select **All Unassigned** for the IP address, this will display **IP Address** as an asterisk "*".

Step 4: Run `http://IP_Address:80/` in Internet Explorer. If the IIS welcome screen displays, then IIS is working properly.

Tip: to obtain the IP address of the server, open a command prompt window and then type `ipconfig`<Enter>. Remember this IP address as it is also needed when you configure the mobile app in Apeon Workspace.

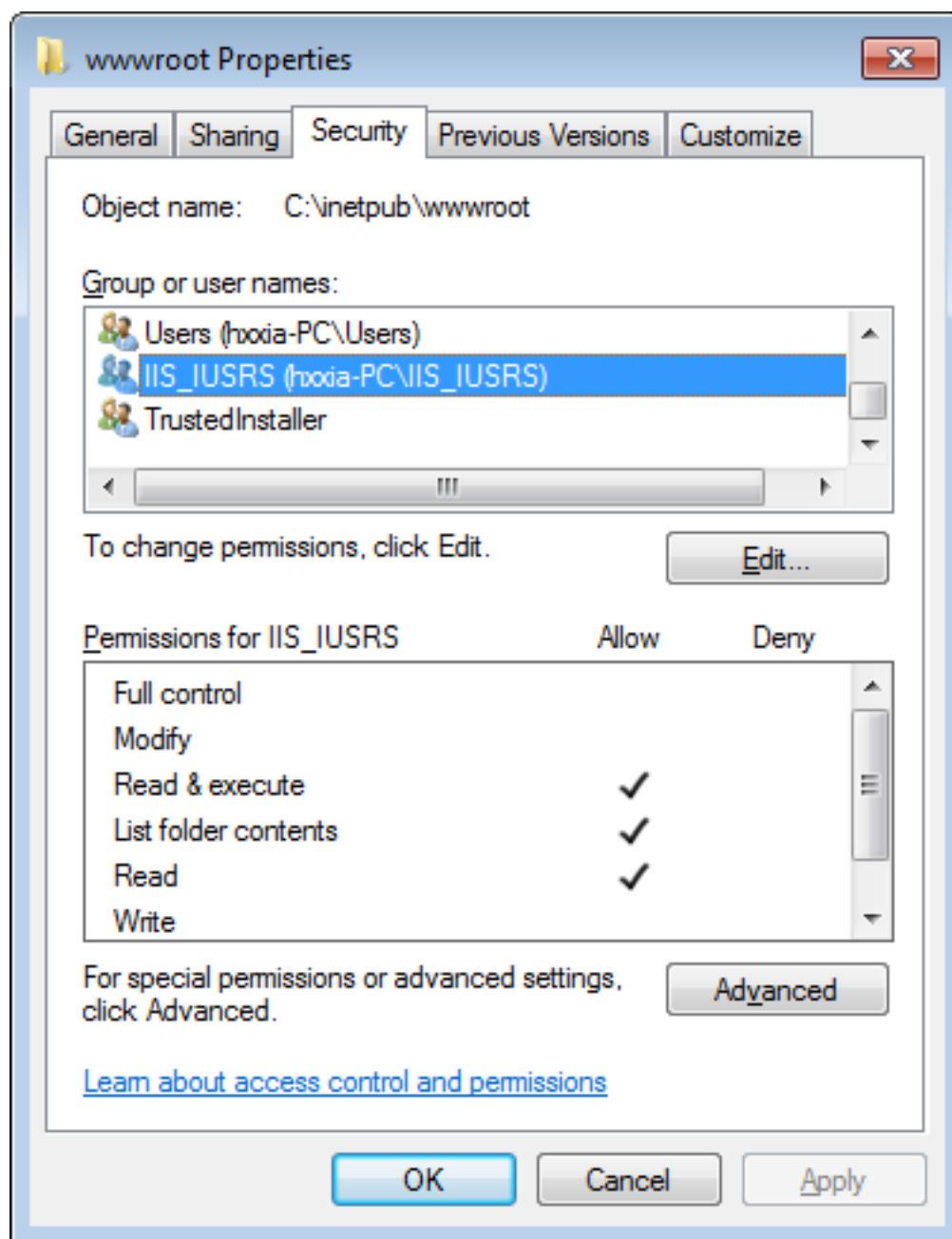
If IIS is not working, please re-install IIS or fix the IIS configuration by following the IIS help.

2.1.4 Task 1.4: Configure IIS

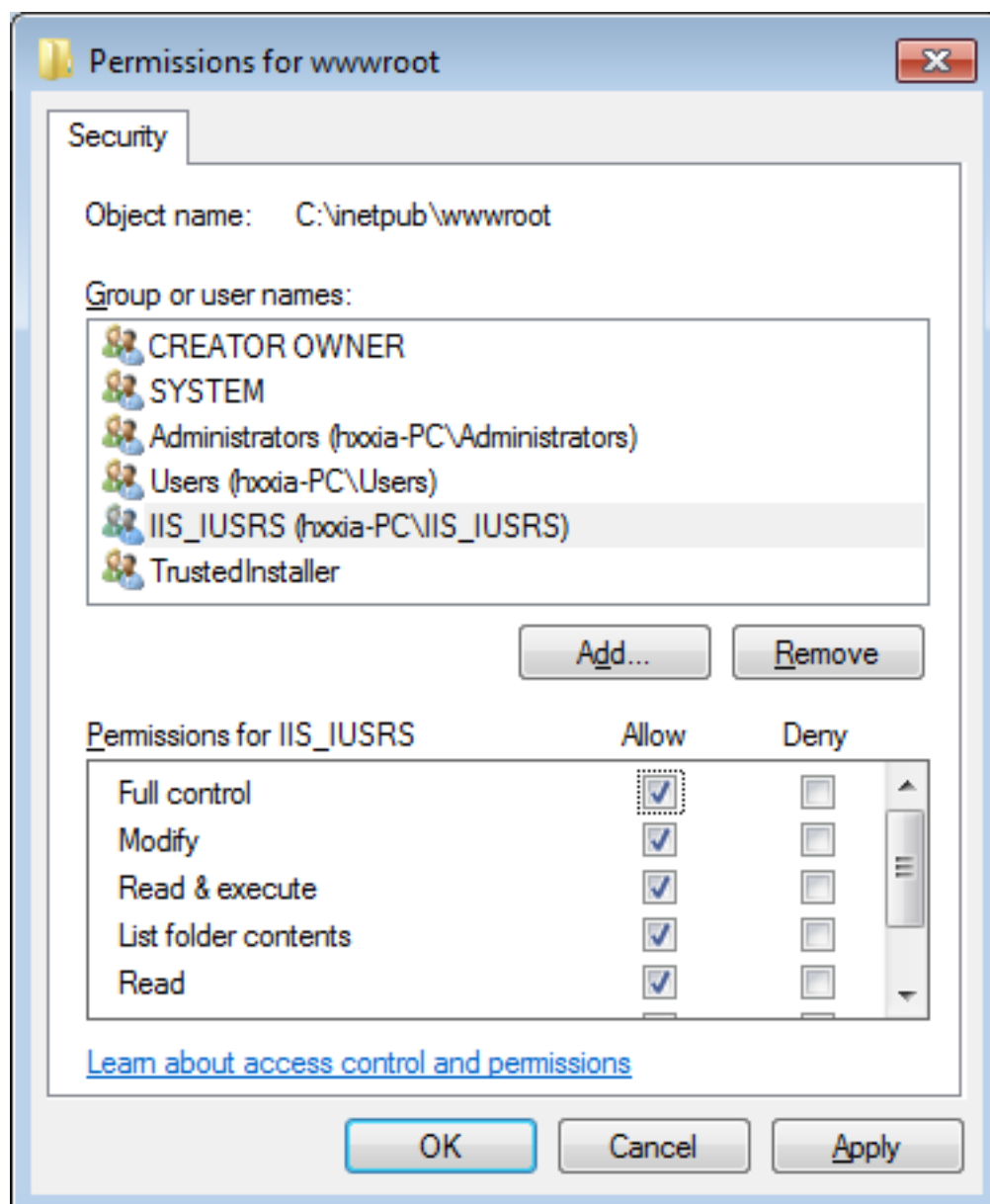
Follow steps below to grant **IIS_IUSRS** account with full controls to the IIS Web root folder:

Step 1: Right click the `C:\inetpub\wwwroot` folder and select **Properties** from the popup menu.

Step 2: On the **Security** tab, select **IIS_IUSRS** in the **Group or user names** list box, and then click the **Edit** button.

Figure 2.6: Select IIS_IUSRS

Step 3: Select **IIS_IUSRS** in the **Group or user names** list box, and then select the **Allow** check box for the **Full control**.

Figure 2.7: Select Full control for IIS_IUSRS

Step 4: Click **OK** to save the settings.

2.2 Task 2: Install Apeon Server and Apeon Developer

2.2.1 Task 2.1: Install Apeon Server and Apeon Developer

On the Windows PC, install Apeon Server and Apeon Developer by the following steps.

Step 1: Start IIS server: open IIS Manager, right click the **top** node (not the website node) in the treeview and select **Start** from the popup menu.

Step 2: Launch the Apeon product setup program by double-clicking **setup.exe**. Click **Next** until you reach the screen for selecting the product components. Make sure the checkboxes for **Apeon Server for .NET** and **Apeon Developer** are selected.

Step 3: Click **Next** until you reach the screen for specifying the IIS Web site where Appeon Server will be installed. Make sure **Select an existing Web Site** and **Default Web Site** are selected.

Step 4: Click **Next**. Choose whether to install the **Demo Applications**. If you have ASA/SQL Anywhere database server installed, select to install the demo; otherwise, do not install the demo since the demo requires ASA/SQL Anywhere database server to be previously installed.

Step 5: If you selected to install the **Demo Applications**, specify the path for the ASA/SQL Anywhere database server engine.

Step 6: Click **Next** until Setup begins copying files for the Appeon Server installation.

When Appeon Server installation is completed, Appeon Developer installation automatically starts.

Step 7: Click **Next** until Setup begins copying files for the Appeon Developer installation.

Step 8: When the installation is completed, select the checkbox for **Restart IIS Server** and **Register .NET Framework 4.0** and then click **Finish**.

You can also restart IIS by typing `iisreset` in the command prompt window.

2.2.2 Task 2.2: Verify the installation

On the Windows PC, run `http://IP_Address:80/AEM/`. If AEM is launched successfully, then Appeon Server is installed successfully.

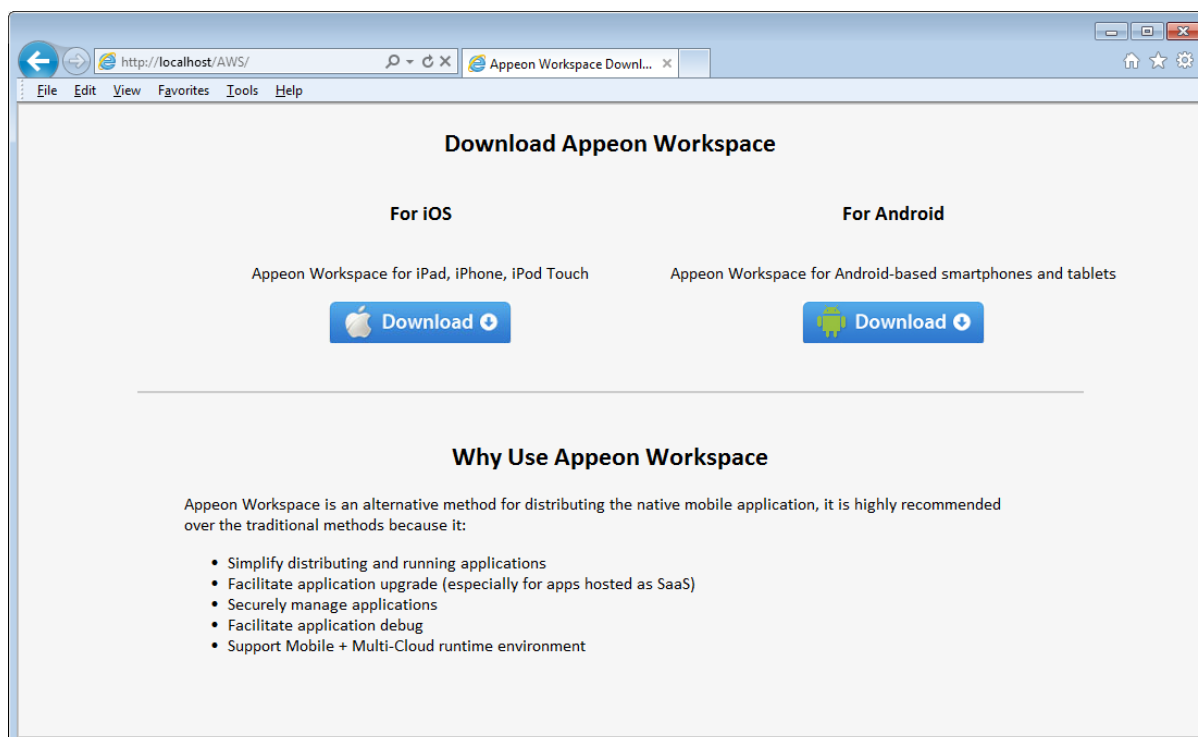
2.3 Task 3: Configure the network connection

Check and make sure the Windows PC and the mobile device connected to the same Wi-Fi router. To verify this, on the mobile device, open the Web browser and type `http://Server_IP:80/AEM/`. If AEM is launched successfully, it means that the Appeon Server is properly installed and that the mobile device is able to connect to the Windows PC.

NOTE: Mobile Internet is supported by Appeon Mobile. However, in order for the Appeon Workspace to connect to your Appeon Server you will need an external IP address. You can verify that your external IP address is properly working by typing `http://External_IP_Address:80` into a Web browser of any device connected to the Internet. If you get a page not found error or other HTTP error then your network is not configured properly for external access.

2.4 Task 4: Install Appeon Workspace (on the Android or iOS device)

On the Android or iOS device, visit the Appeon Workspace download center (`http://Server_IP:80/AWS`), and then click the download button to download and install Appeon Workspace.

Figure 2.8: Appeon Workspace download center**Notes:**

- For the iOS 7.1 device, you will have to download the .ipa file to the PC through IE browser, and then synchronize it from the PC to the iOS device using iTunes. Reason is since iOS 7.1, Apple requires the enterprise apps manifest file to be served over HTTPS, which means, you will have to configure the SSL certificate on your Web server. If you have no SSL certificate configured, then install from the download center will fail.
- For the Android device, you must enable the **Unknown resources** option (in **Settings > Security**) on the device before you can install apps that are not downloaded from Google Play.

3 Tutorial 2: Config, Deploy & Run the Application

This tutorial will use the Apeon Mobile for .NET edition to walk you through configuring, deploying and running the mobile application.

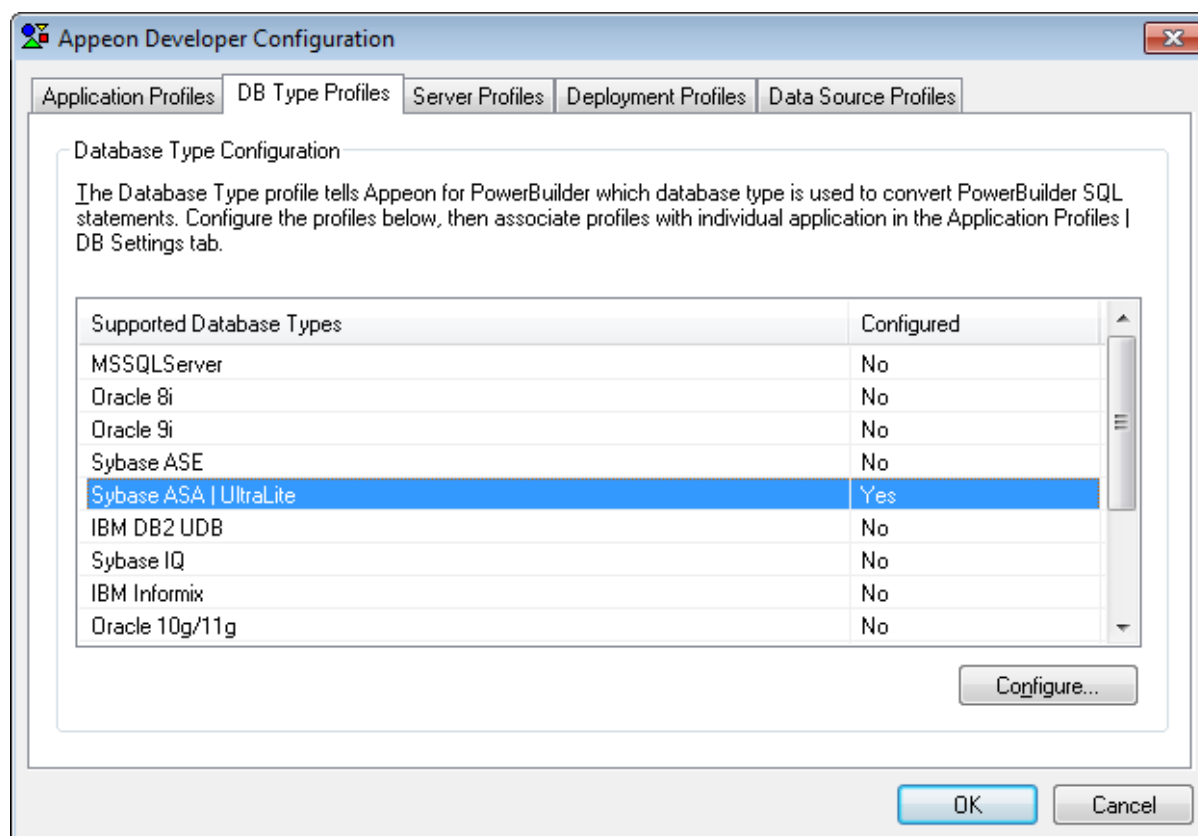
3.1 Task 1: Configure the database type

Step 1: On the Apeon Developer toolbar, click the **Configure** icon ().

Step 2: On the **Apeon Developer Configuration** window, click the **DB Type Profile** tab.

Step 3: View the **Configured** column of the database type used by your application, if it displays **Yes**, you can skip the remaining steps in this task. Otherwise, select the database type used by your application, and then click **Configure**.

Figure 3.1: DB Type Profile in ADT

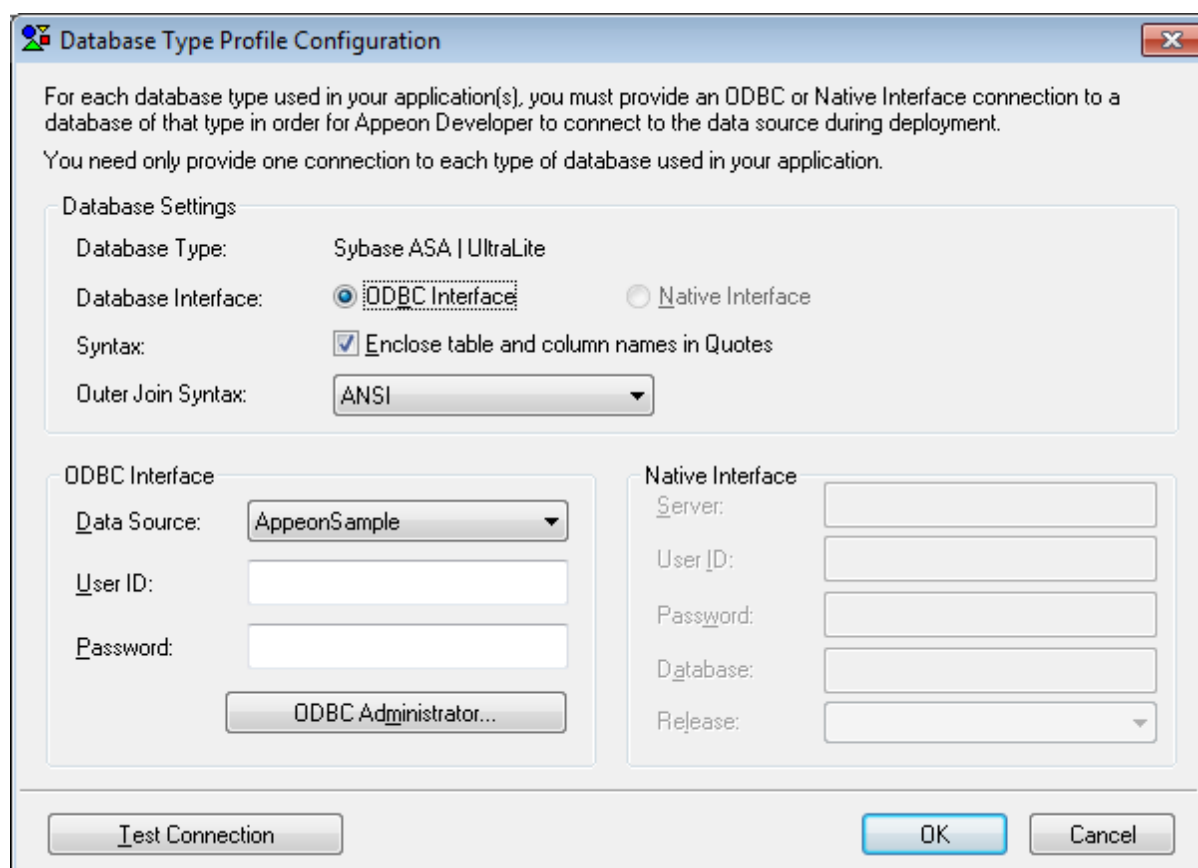


Step 4: On the **Database Type Profile Configuration** window, do the following (take **Sybase ASA | UltraLite** as an example):

1. Select the **ODBC Interface** radio button from the **Database Interface** option.
2. Select a data source from the **Data Source** dropdown list box. It can be any data source (ODBC DSN) provided it is the same type as used by your application. It does NOT have to be the actual ODBC DSN used by your particular application. The database type is what is important and that a connection can be established to the specified ODBC DSN.

3. Keep the rest as default, and then click **Test Connection**.
4. Make sure that the database connection is successful.
5. Click **OK**.

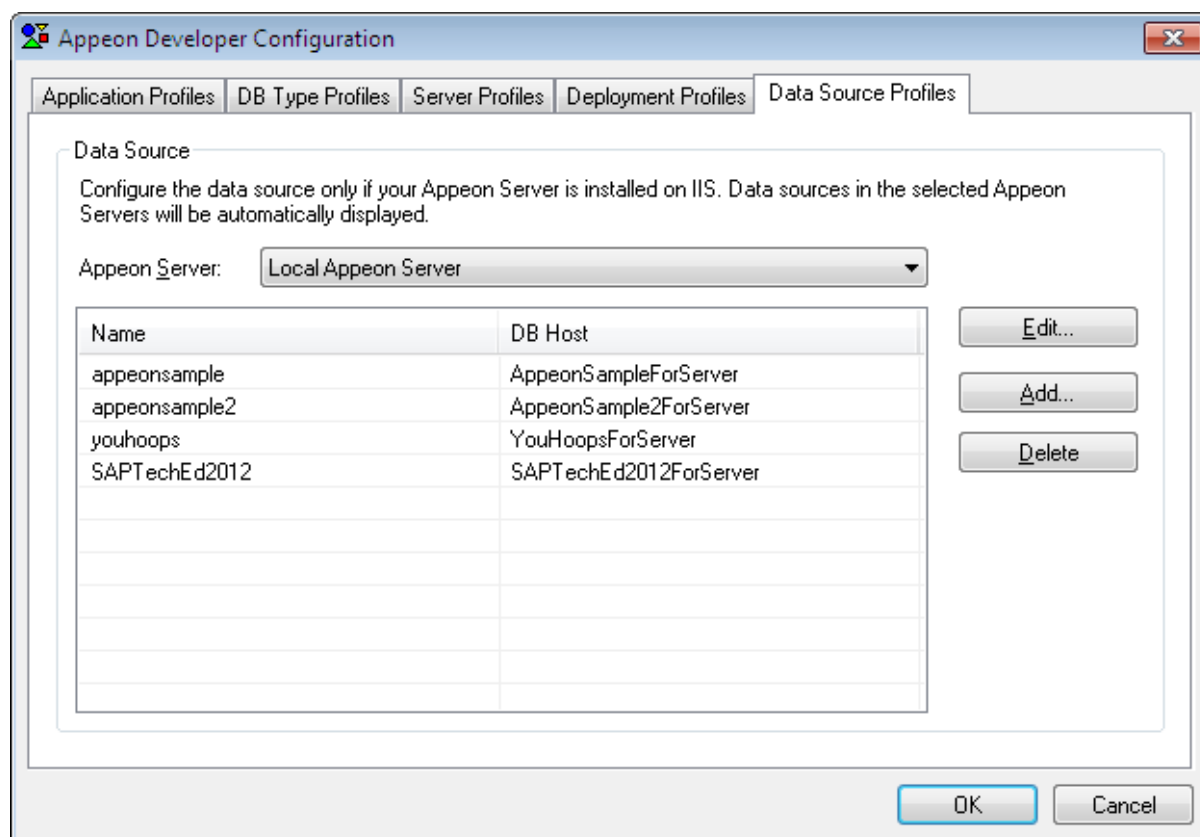
Figure 3.2: Database Type Profile Configuration



Now the **Configured** column of your database type will be indicated by **Yes**. You can select the database type when you create the application profile for your application in [Task 3: Configure and deploy the application](#).

3.2 Task 2: Configure the database connection

- Step 1: In the **Appeon Developer Configuration** window, click the **Data Source Profile** tab.
- Step 2: Select **Local Appeon Server** from the **Appeon Server** dropdown list box.
- Step 3: Click the **Add** button to create a data source in the selected Appeon Server.

Figure 3.3: Connection Cache Profiles

Step 4: On the **Add Data Source** window, specify the data source settings. Below we take **Sybase ASA/SQL Anywhere** and **Microsoft SQL Server** database as examples.

Steps for configuring a data source for **Sybase ASA/SQL Anywhere** database:

1. In the **Name** text box, input any text you like as the name of the data source.
2. Select **ODBC Driver** from the **Driver** dropdown listbox.
3. Select the data source from the **ODBC Data Source** dropdown listbox.
4. Input the database login user name and password respectively in the **User Name** text box and the **Password** text box.
5. Keep the rest as default, and then click **Test**. Make sure the test is successful.
6. Click **OK**.

Figure 3.4: Add Data Source

Add Data Source

Name: Unnamed1

Database

Driver: ODBC Driver

Host:

Port: 1433

ODBC Data Source: ApeonSample

User Name: dba

Password: ●●●

Character Set: ASCII

Session Mode: DEFAULT

Maximum Connection Pool Size: 100

Minimum Connection Pool Size: 10

Connection Timeout (seconds): 0

Command Timeout (seconds): 30

Connection Lifetime (seconds): 0

Other Options:

Dynamic Database Connection Pooling

Test OK Cancel

Steps for configuring a data source for **Microsoft SQL Server** database:

1. In the **Name** text box, input any text you like as the name of the data source.
2. Select **MS SQL Server Native Driver** from the **Driver** dropdown listbox.
3. Input the IP address or machine name of the database server in the **Host** field.
4. Input the port number of the database server in the **Port** field.
5. Input the database name, database login user name and password respectively in the **Database Name**, the **User Name** and the **Password** text boxes.
6. Keep the rest as default, and then click **Test**. Make sure the test is successful.
7. Click **OK**.

Tip: you should check with your SQL Server administrator to verify the port number, the user name, and the password are correct.


Figure 3.5: MS SQL Server Native Driver

The screenshot shows the 'Add Data Source' dialog box with the following configuration:

- Name: northwind
- Driver: MS SQL Server Native Driver
- Host: 192.0.0.205
- Port: 1433
- Database Name: northwind
- User Name: sa
- Password: (empty)
- Character Set: ASCII
- Session Mode: DEFAULT
- Maximum Connection Pool Size: 100
- Minimum Connection Pool Size: 10
- Connection Timeout (seconds): 0
- Command Timeout (seconds): 30
- Connection Lifetime (seconds): 0
- Other Options: (empty text box)
- Dynamic Database Connection:
- Pooling:

Now the data source you added will be listed in the **Data Source Profiles** tab. You can select it when you create the application profile for your application in [Task 3: Configure and deploy the application](#).

3.3 Task 3: Configure and deploy the application

Step 1: On the Apeon Developer toolbar click the first icon **Config Wizard** ()

Step 2: In the welcome screen click **Next**.

Step 3: Specify following settings and then click **Next**.

1. Specify the application profile name in the **Application Profile Name** text box. The same text will be displayed in the **Web Folder** text box and the **Mobile App Name** text box. You can modify these fields to use different text.

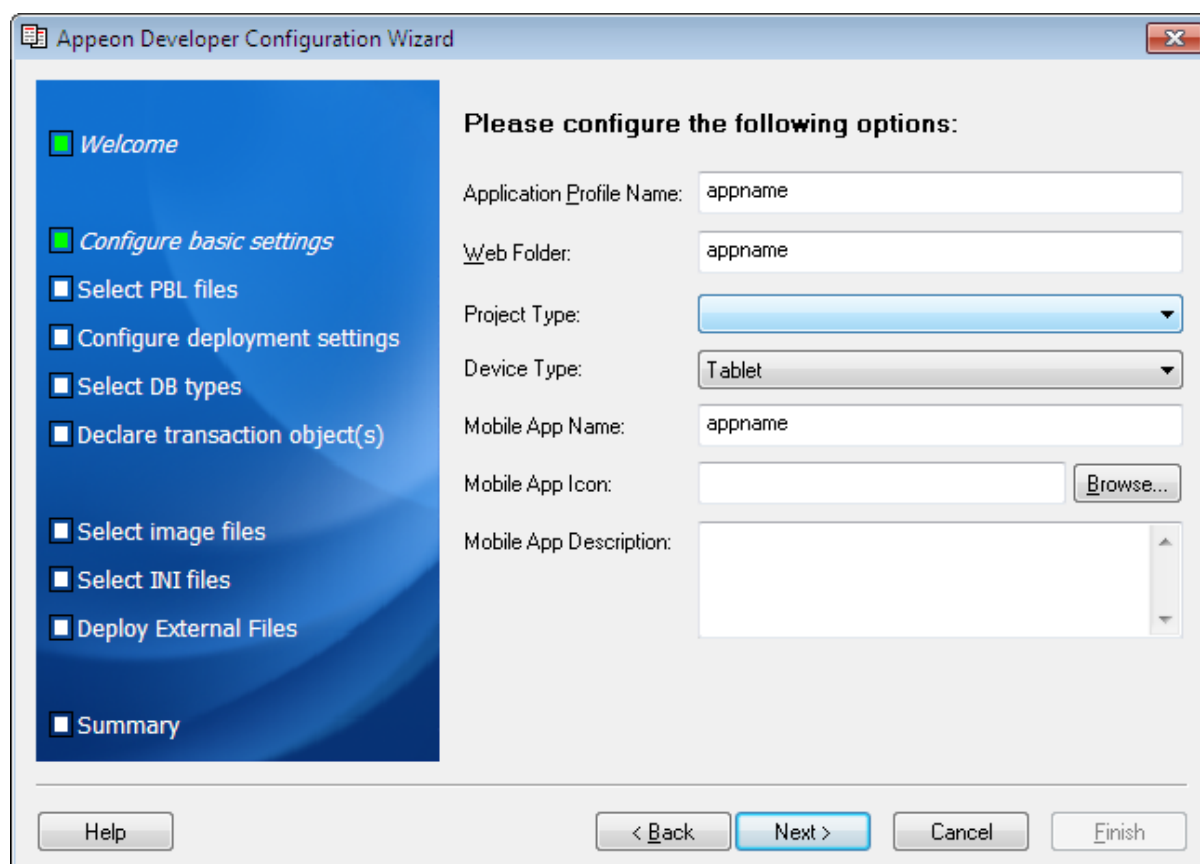
2. Select **Mobile** from the **Project Type** dropdown list box.
3. Select a device type from the **Device Type** dropdown list box.

For applications that are designed for tablets, select **Tablet**; for applications that are designed for smartphones, select **Smartphone**; for applications that are designed for both devices, select **Both**.

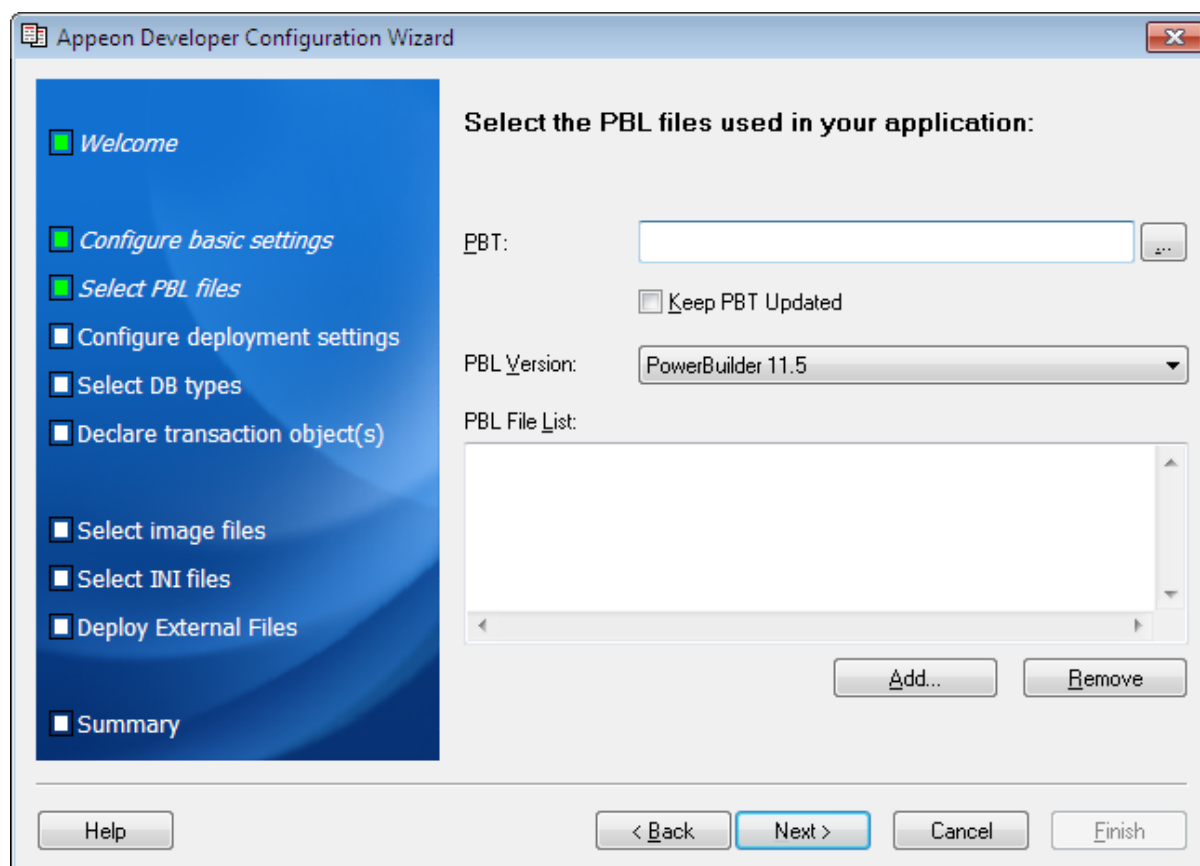
4. In the **Mobile App Icon** text box, specify an icon for your application by clicking **Browse** to select the image file of the PNG or JPG format. The image that you choose will be displayed as the application icon in the Apeon Workspace. Recommended size is 86 x 86 pixels (or above) for low-resolution display and 172 x 172 pixels (or above) for high-resolution display (such as retina display). To ensure the best display quality in both high-resolution and low-resolution screens, you must supply an image of 172 x 172 or above. The image will be automatically shrunk to fit properly. If you leave this field empty, the default icon will be displayed in Apeon Workspace.

5. Enter a brief description in the **Mobile App Description** text box. This description will be displayed in the Apeon Workspace next to the application icon. If you leave this field empty, no app description will be displayed in the Apeon Workspace.

Figure 3.6: Apeon Developer Configuration Wizard



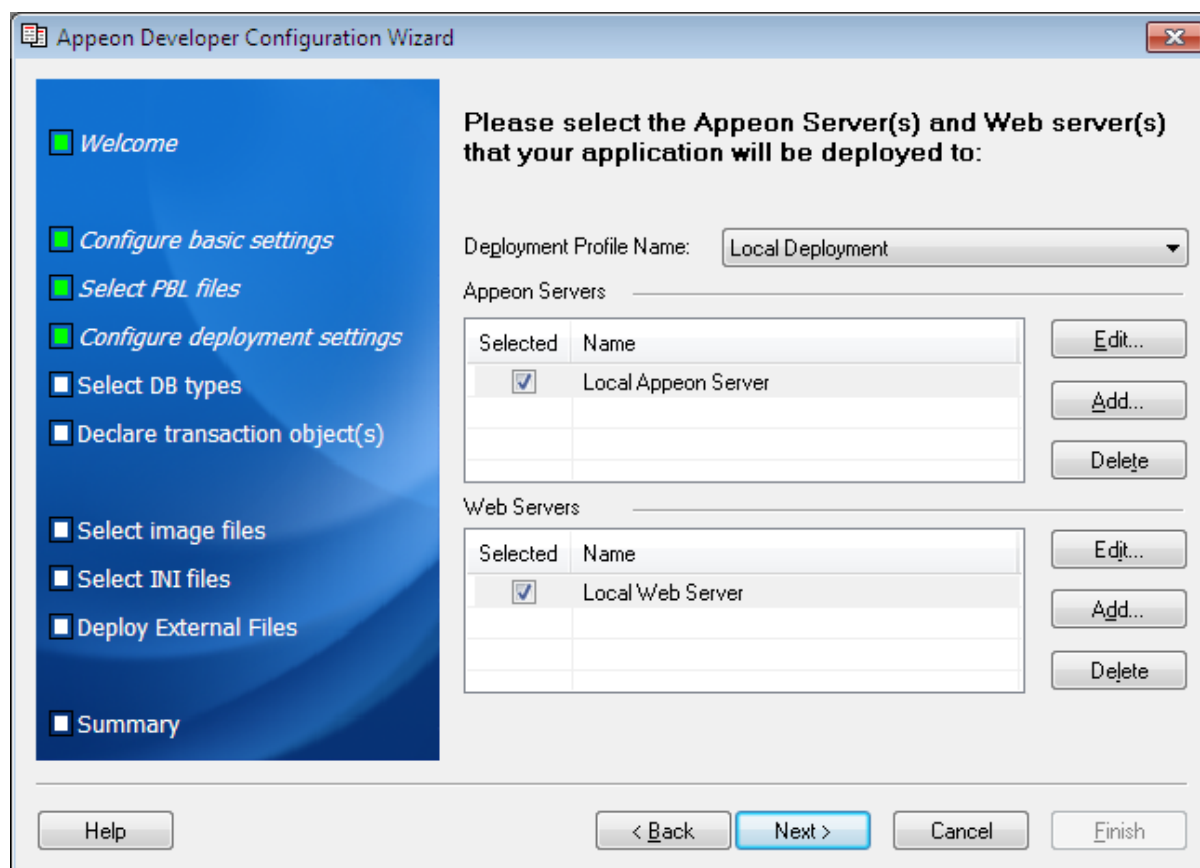
Step 4: Add the PBT from the **PBT** dropdown list box (and all related PBLs will be automatically added for you) or add the PBL files individually that are used in your application by clicking the **Add File** button in the **PBL File List** group box, and then select a PBL version from the **PBL Version** dropdown list box. Click **Next**.

Figure 3.7: Add the PBT in ADT Wizard

Step 5: Keep the default settings and click **Next**.

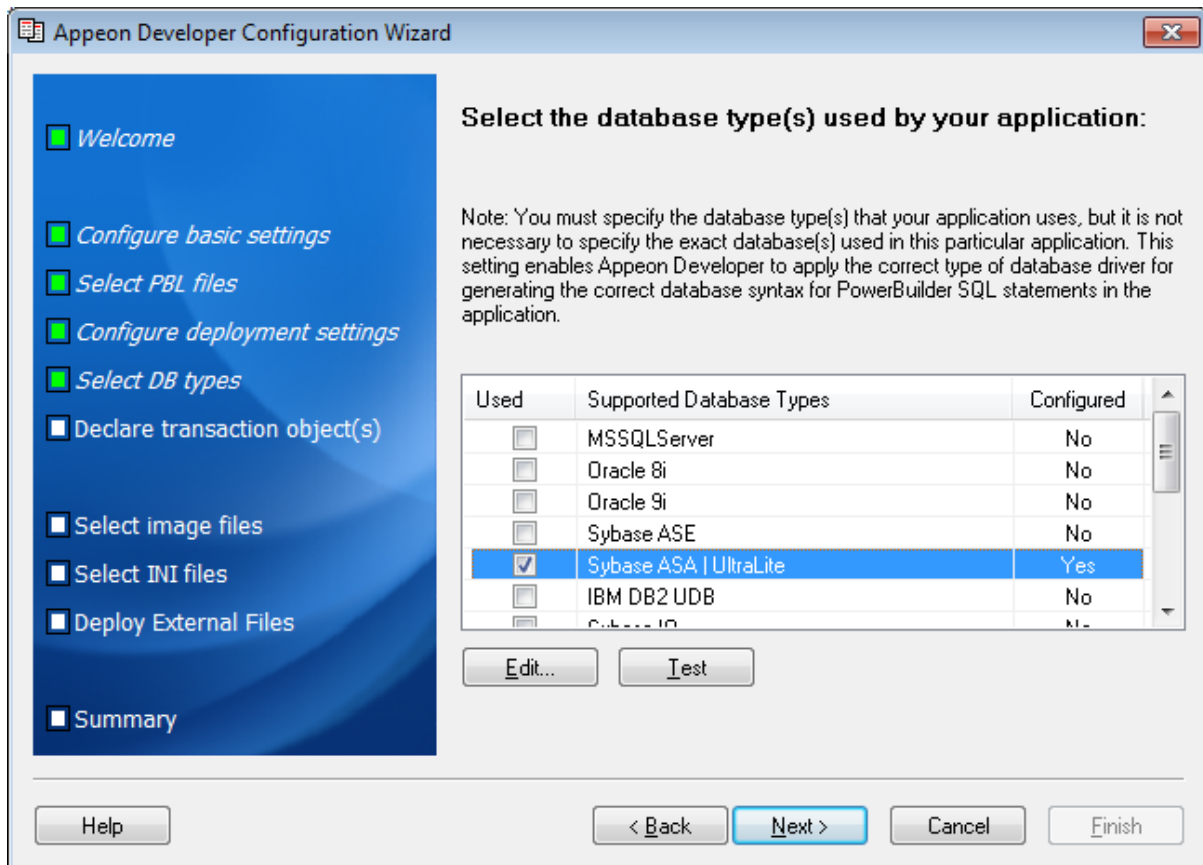
Since you have installed Appeon Developer and Appeon Server on the same machine, you can directly use the **Local Appeon Server** profile, the **Local Web Server** profile, and the **Local Deployment** profile, all of which are configured automatically by the product setup program.

When you click **Next** the config wizard will automatically test the connection to the server. You will not be able to proceed if the connection test failed.

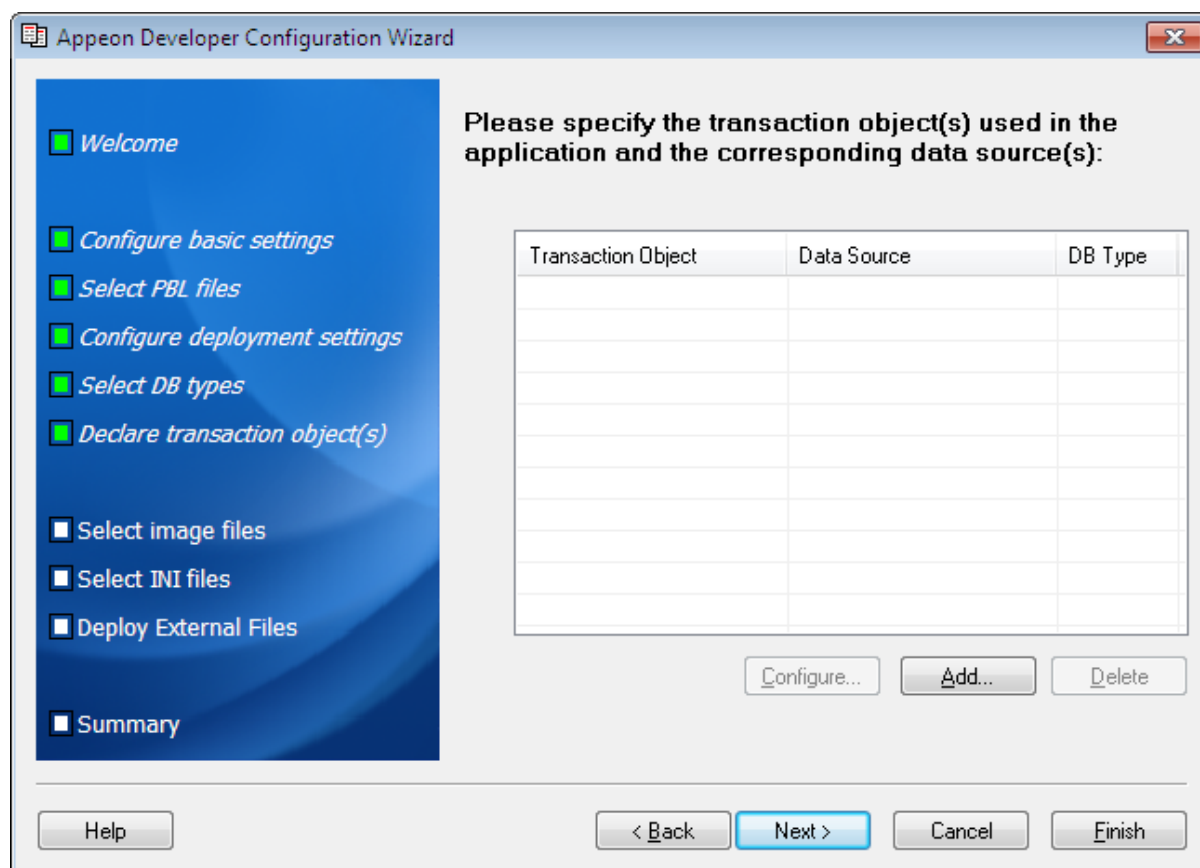
Figure 3.8: Select the Apeon Server(s) and Web Server(s)

Step 6: Select the database type used by your application and click **Next**.

If the required database type has not been configured in [Task 1: Configure the database type](#), you should highlight the database type, then click **Edit**, and then follow Step 4 in [Task 1: Configure the database type](#) to configure it.

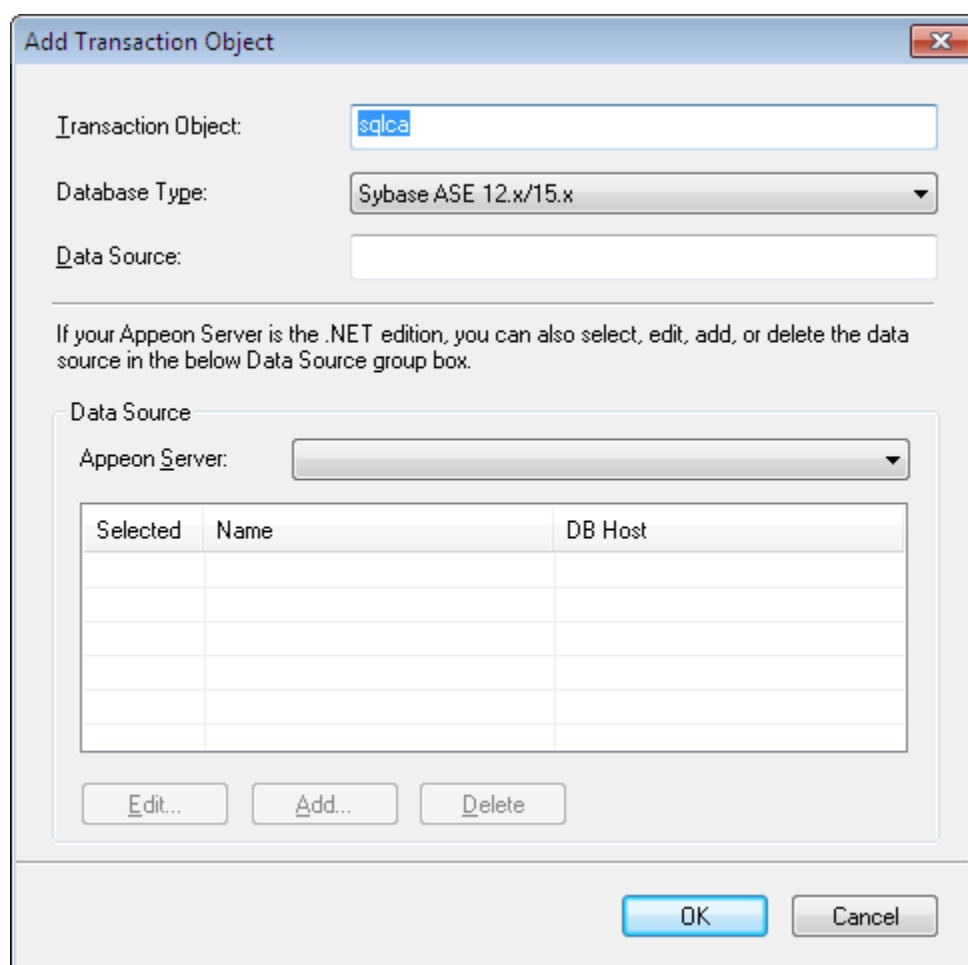
Figure 3.9: Select the database type(s)

Step 7: Click **Add** to specify the transaction object(s) used in your application.

Figure 3.10: Specify the transaction object

In the **Add Transaction Object** window, specify the following settings:

- Input the transaction object name used by the application to the **Transaction Object** text box. Default transaction object for most PB applications is **SQLCA**.
- Select the database type from the **Database Type** list box.
- Select **Local Appeon Server** from the **Appeon Server** dropdown list box.
- Select the data source from the table. The data source should connect to the same database that the PowerBuilder application connects to. If the required data source has not been configured in [Task 2: Configure the database connection](#), you should click **Add**, and then follow Step 4 in [Task 2: Configure the database connection](#) to create it.

Figure 3.11: Select the connection cache

Tip: If you have more than one transaction object you can add additional transaction objects by repeating the above steps.

Step 8: Click **Browse** to select the image file or the folder that contains the image files, if any. Click **Next**.

Step 9: Click **Add File** or **Add Directory** to select the INI file, if any. Click **Next**.

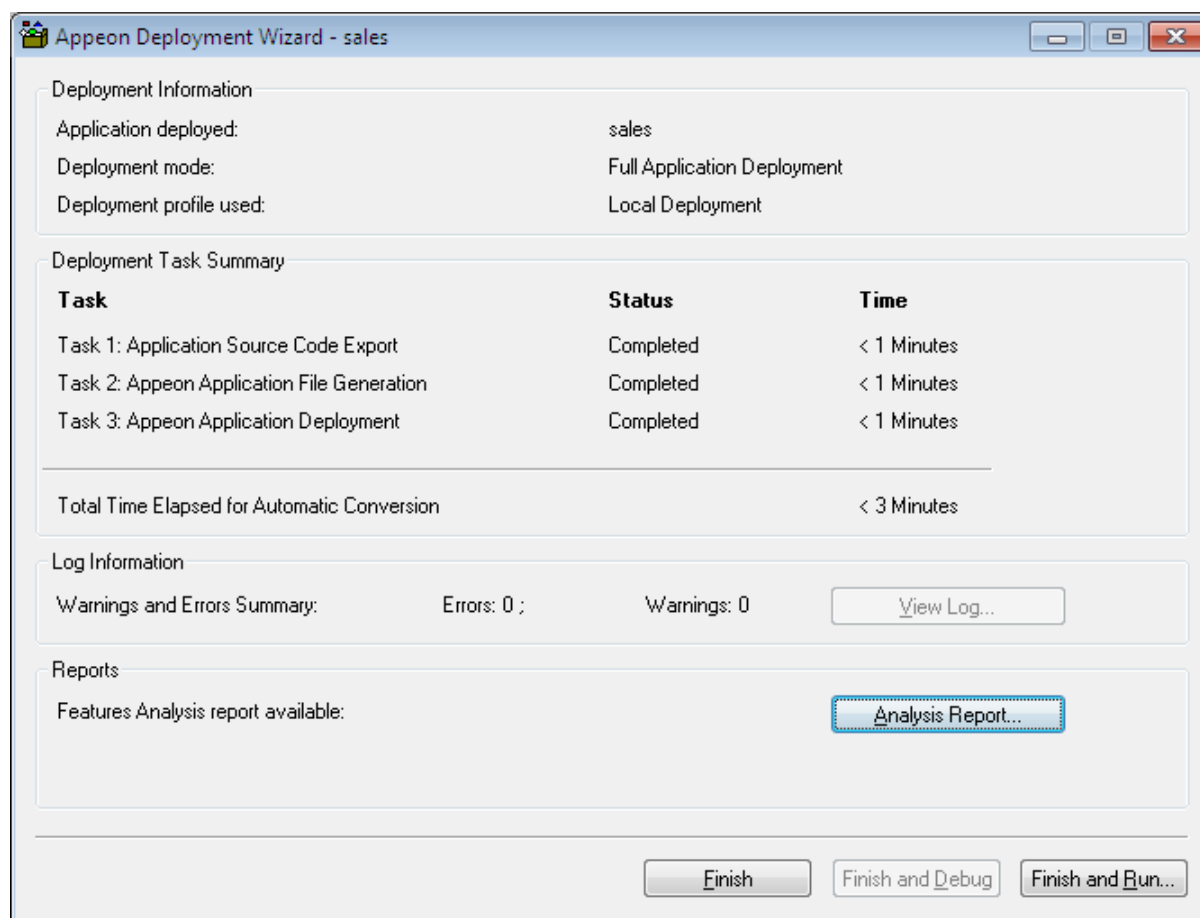
Step 10: Click **Add File** or **Add Directory** to select any other external files such as TXT file etc., if any. Click **Next**.

Step 11: In the configuration summary screen, keep the **Deploy the application now** option as selected. Click **Finish**.

Once you click **Finish**, the **Appeon Deployment Wizard** automatically starts deploying the application. To manually start **Appeon Deployment Wizard**, you can click the **Deploy** icon

() on the Appeon Developer toolbar.

Step 12: Click **Finish** when the deployment process is complete.

Figure 3.12: Appeon Deployment Wizard_sales

3.4 Task 4: Run the Web version of the application (in IE)

Before you run the application on the Android or iOS device, make sure your application can run successfully in the Internet Explorer Web browser (to aid debugging your application is automatically deployed as both a Web application using Appeon Web and a mobile application using Appeon Mobile):

Step 1: Open Internet Explorer and navigate to the trusted sites list (**Internet Option > Security > Trusted Sites > Sites**). Uncheck the **HTTPS** checkbox and add the IP address of your IIS as well as the localhost. For example, if your IP address is 192.168.1.117 then it should look as follows:

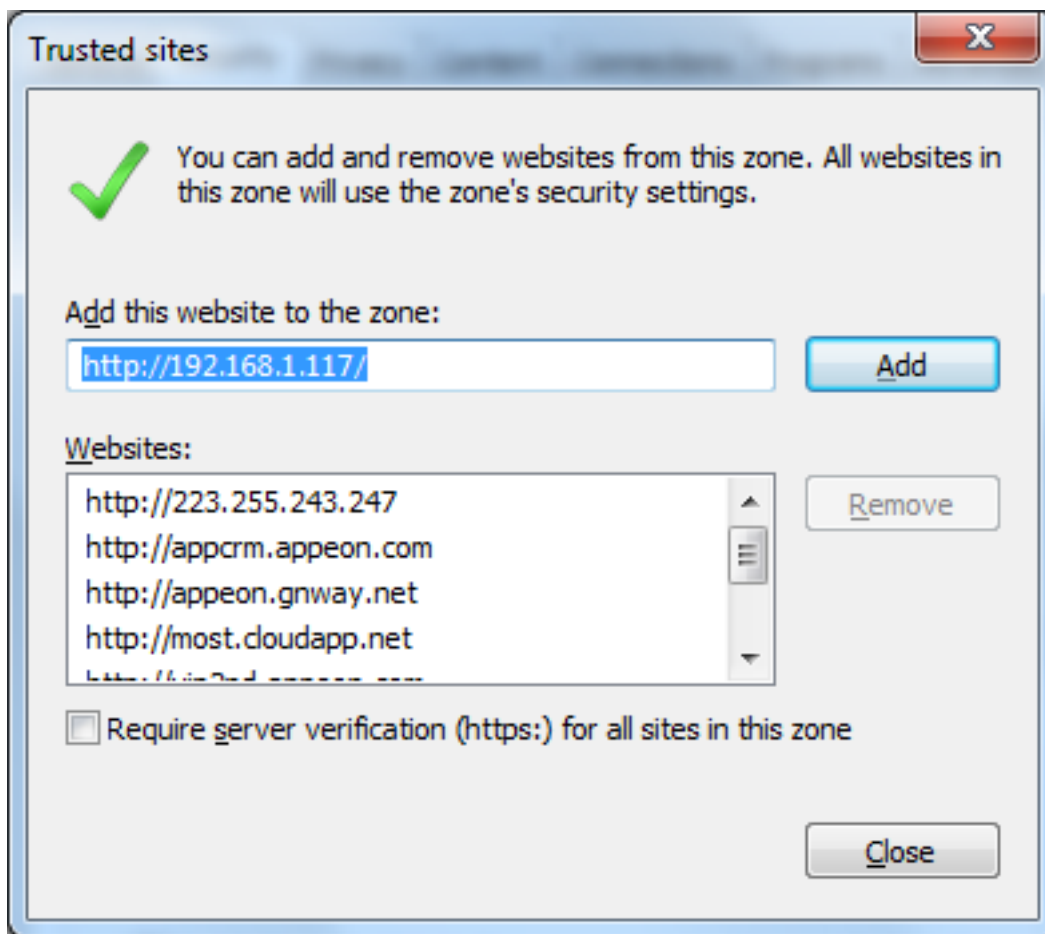
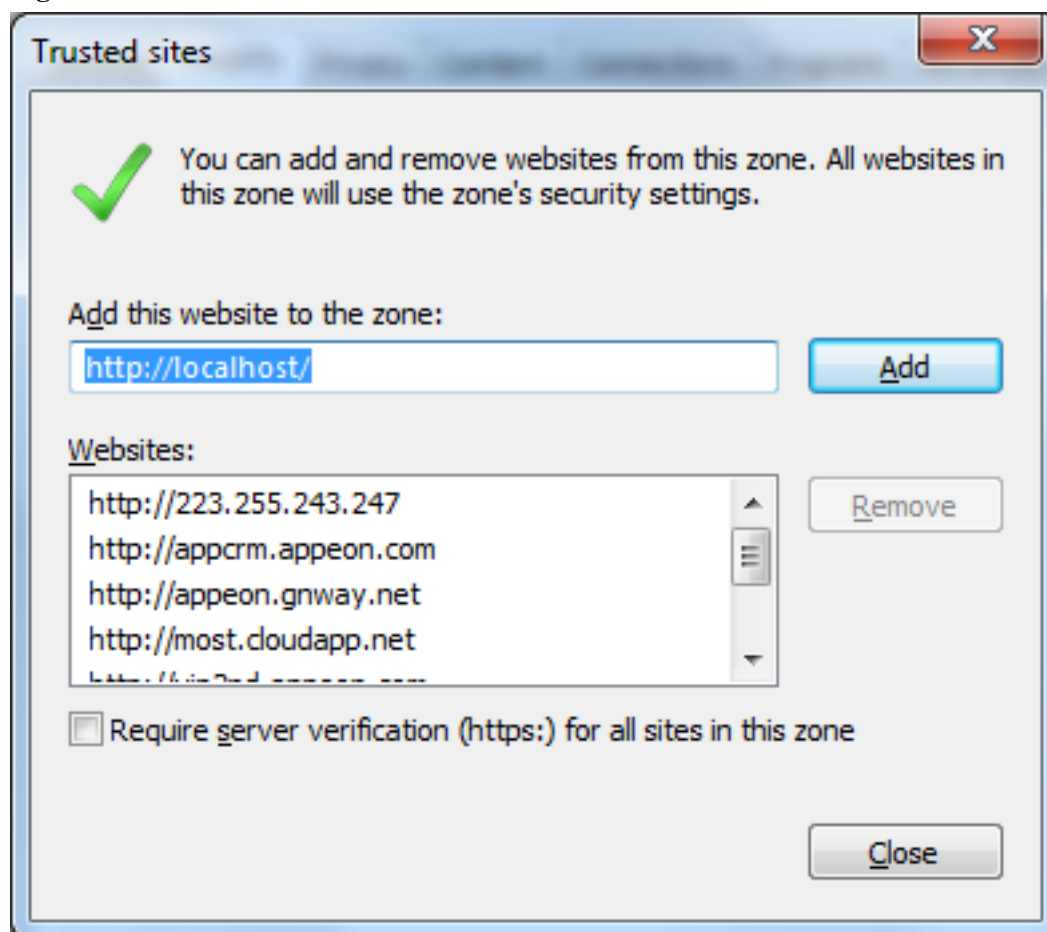
Figure 3.13: Add the IP address of IIS

Figure 3.14: Add the IP address of localhost

Step 2: Input the application URL in the Internet Explorer address bar and start the application. The application URL must contain index.htm, for example <http://192.168.1.117/myApplication/index.htm>.

Note: The application URL is specified in the **Web Folder** field in Step 1 of [Task 3: Configure and deploy the application](#).

Step 3: Install the Web browser plug-in, when you are prompted. You will be prompted twice, please accept both times.

Step 4: When the application is loaded successfully in Internet Explorer, test it carefully.

If you notice any issues, please debug the application according to the [Tutorial 3: Develop & Debug with Appeon Mobile](#).

3.5 Task 5: Run the mobile version of the application (on the Android or iOS device)

Now that you have run the application successfully in IE, you are ready to run your application on the Android or iOS device.

Step 1: Configure the network connection. See Task 3 in [Tutorial 1: Set up the Environment](#).


Step 2: Install Appeon Workspace. See Task 4 in [Tutorial 1: Set up the Environment](#).

Step 3: Tap the **AppeonMobile** icon on your Android or iOS device to launch Appeon Workspace.

Step 4: Tap the **New** icon () to the left of the title bar.

Step 5: In the **App URL** text box, enter the application URL in this format: *http://server_ip:port/app_name*. For example, if your IIS IP address is 192.168.1.117 on port 80 and you specified myApplication in the Appeon Developer configuration as the Web folder name then the URL would be *http://192.168.1.117:80/myApplication/*.

Step 6: Tap the **Test Connection** button to test the server connections. If successful please proceed to Step 7, otherwise please enter the correct URL.

Step 7: Tap the **Back** icon () on the title bar to save the information and return to the main screen of the Appeon Workspace.

Once you return to the main screen of the Appeon Workspace, the downloading and installation process of the application occurs automatically.

Step 8: After the installation process has completed, tap the application icon on the main screen to run the mobile app that is installed.


4 Tutorial 3: Develop & Debug with Appeon Mobile

Please keep in mind the following points when developing and debugging Appeon Mobile applications for the Android or iOS device. For detailed instructions on how to use the Appeon Developer toolset you may refer to Appeon Developer User Guide.

4.1 Point 1: Mobile UI Considerations

Many aspects of the UI for mobile applications differ significantly from traditional PowerBuilder best practices. How you layout controls on the window, the size of the window, controls, and other visual objects, and how the user expects to interact with your application are fundamentally different for mobile devices.



Please carefully read Chapter 2, *Best Practices in Mobile UI Design & Development Guide*, including the **Window** subsection. We have compiled valuable tips and suggestions that will help you develop user-friendly mobile applications.

Once you have a good understanding of Chapter 2, *Best Practices in Mobile UI Design & Development Guide*, we strongly recommend using the **Size Calculator** tool () in the Appeon Developer toolbar to properly size the application windows and controls to display appropriate on the Android or iOS device.

4.2 Point 2: Unsupported Features

Appeon Mobile supports nearly all the same features as Appeon Web. Those experienced with Appeon Web know that it supports many powerful PB features. So you should be able to build equally robust applications with Appeon Mobile also.

When developing applications for Appeon Mobile, it is critical to ensure that your application does not contain unsupported features. Appeon provides several tools to assist you with this:


- Tool 1: The **UFA** tool () in the Appeon Developer toolbar will automatically scan your application and list major unsupported features found based on a keyword scan.
- Tool 2: The **Code Insight** tool () in the Appeon Developer toolbar will pop-up a window, when you are writing dot notation in the PB script editor, that prevents you from writing PowerScript that is unsupported.
- Tool 3: The Supported PB Features for Appeon Mobile is a searchable online help that lists all unsupported features.


These tools have some limitations. Please keep in mind the following limitations when using these tools:

- The **UFA** tool uses a keyword scan. As such, not all unsupported features can be found, especially those that are dynamically occurring in runtime.

- The **Code Insight** tool is limited to unsupported PowerScript and essentially based on keywords (like the **UFA** tool). As such, it will not prevent all unsupported features from being added to the application, such as unsupported objects, unsupported expressions, etc.

We recommend you develop your mobile applications with Appeon Developer as follows:

Step 1: Use the **Code Insight** tool () from the Appeon Developer toolbar to code PowerScript that is compatible with Appeon Mobile. For details about how to configure and use the **Code Insight** tool, see Chapter 13, *Developing with Code Insight* in *Appeon Developer User Guide*.

Step 2: Run the **UFA** tool () from the Appeon Developer toolbar to generate the unsupported features report. For details about how to run the UFA report, see Chapter 5, *Using UFA Tool* in *Appeon Developer User Guide*.


Step 3: Remove or rewrite any unsupported features found by the **UFA** tool. Please make note of the unsupported features found such that in the future you do not reintroduce these same unsupported features.

Step 4: After you have deployed the application, attempt to run the Web version in the Internet Explorer Web browser. The Web version is based on Appeon Web 2013 R2 that has been on the market for over 10 years. As such, if you find something in your application is not working in the Web version chances are it is an unsupported feature rather than a product bug.

Step 5: Since the **UFA** tool and **Code Insight** cannot prevent 100% unsupported features, should you find something that does not work in the Web version please go back to the object or area of PowerScript in question and cross-reference that with the Supported PB Features for Appeon Mobile to see if your application contains any unsupported features.

Step 6: If after cross-referencing the Supported PB Features for Appeon Mobile you believe your application is free of unsupported features but it fails to run or operate properly please contact <support@appeon.com> for help.

4.3 Point 3: Previewing & Debugging

To preview the application UI and layout, use the **Appeon Workspace Emulator** () from the Appeon Developer toolbar.

To debug the application business logic, first ensure that the UFA report does not contain any unsupported features, or at least no unsupported features in the area of the application you are trying to debug. Then, launch the **Appeon Debugger** tool from the Appeon Developer installation directory, which will load the Web version of your application in the IE Web browser.

The **Appeon Debugger** requires the Microsoft Script debugger to be installed on your system and that your Internet Explorer is version 8 or earlier. There are also special configurations you need to perform in the Appeon Developer and Internet Explorer. Please see Chapter 7, *Debugging Appeon Web Applications* in *Appeon Developer User Guide* for more information about how to properly configure your environment for the Appeon Debugger.

Please note that Appeon Mobile does not contain a mobile-specific debugger, so we have included the Web debugger in lieu. While not exactly the same, it can still help to identify problems in the application business logic or areas that Appeon is having trouble converting.

5 Tutorial 4: Package & Distribute Native Mobile Apps

5.1 Overview

After you successfully deploy a PowerBuilder application to be a native mobile application using the Appeon Developer Toolbar, you can choose to run the mobile app immediately in Appeon Workspace (see Appeon Workspace User Guide for detailed instructions), or package the app and publish it to the online application store (such as Apple App Store, Google Play etc.) or distribute it over-the-air (such as by email, Web site etc.). In this section, you will go through all the required steps for packaging and distributing an Appeon Mobile app as a standalone native app.

5.2 Package & Distribute iOS Apps

You will need to go through the following tasks to package and distribute the Appeon Mobile app as a standalone native iOS app.

1. Task 1: Prepare the Xcode environment.
2. Task 2: Generate the Xcode project.
3. Task 3: Create the app archive.
4. Task 4: Distribute the app archive.

5.2.1 Task 1: Prepare the Xcode environment

5.2.1.1 Task 1.1: Prepare the Mac machine

Buy a Mac machine and install Xcode 4 or 5 on the Mac machine. Only Xcode 4.3 and later versions have been certified by Appeon. And applications compiled by Xcode 5.x can run on iOS 7; and applications compiled by Xcode 4.x can run on iOS 6.x only.

You will need to have a Mac machine with the Xcode tool installed already to

1. create and install the distribution certificate and the provisioning profile;
2. run the Xcode project (generated by the Appeon Application Package Wizard) and create the app archive;
3. distribute the app archive.

5.2.1.1.1 Install Xcode

Click <https://developer.apple.com/xcode/> to download and install Xcode 4 or 5.

You will need an Apple ID registered as an Apple Developer to access the Xcode tool. See [Task 1.2: Create an Apple ID](#) to create an Apple ID, and then sign in with your Apple

ID, follow the onscreen instructions to register your Apple ID as an Apple developer, and download and install the Xcode tool at the above mentioned website.

For more information on Xcode, see [Xcode User Guide](#).

5.2.1.2 Task 1.2: Create an Apple ID

Follow the onscreen instructions on [My Apple ID](#) to create an Apple ID if you do not have one.

5.2.1.3 Task 1.3: Enroll in an Apple Developer Program

Enroll in an Apple Developer program at <https://developer.apple.com/programs/start/ios/>.

Carefully compare the programs and choose one that suits you best, because different distribution types (App Store, Ad Hoc, In-House, etc.) will be available in different programs, for example, **App Store Distribution** is available in **iOS Developer** program only, while **In-House Distribution** is available in **iOS Developer Enterprise** program only.

Below is a brief introduction to the three distribution types that are commonly used (detailed instructions for these distribution types are provided with in [Section 5.2.4, “Task 4: Distribute the app archive”](#)):

- **App Store Distribution:** allows you to submit the app for publication to the Apple App Store.

You would need to enroll in the **iOS Developer** program.

- **In-House Distribution:** allows you to install the app to an unlimited number of devices inside your company.

You would need to enroll in the **iOS Developer Enterprise** program.

- **Ad Hoc Distribution:** allows you to install the app on a limited number (up to 100) of registered devices.

You would need to enroll either in the **iOS Developer** program or the **iOS Developer Enterprise** program. And you would need to register the devices by their unique device ID (UDID) and add them to the provisioning profile. For details, refer to [Registering Devices Using Member Center](#) in the Apple document *App Distribution Guide*.

Figure 5.1: Compare programs

Compare Programs

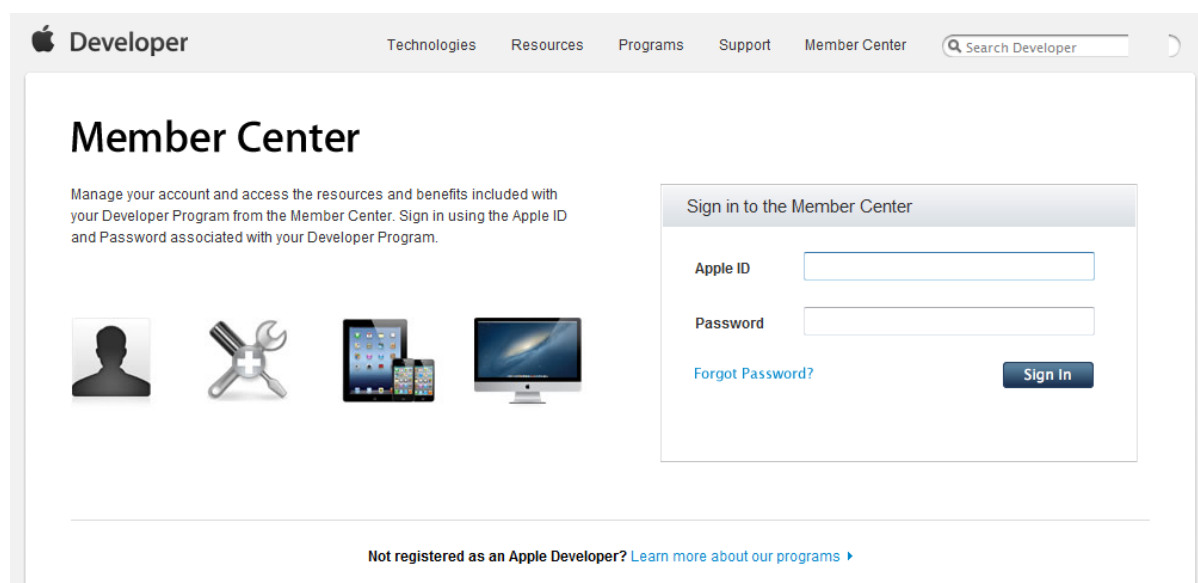
	iOS Developer For individuals and organizations creating apps for distribution on the App Store. Learn more ▶	iOS Developer Enterprise For companies and organizations distributing proprietary apps for internal use. Learn more ▶	iOS Developer University For higher education institutions introducing iOS app development into their curriculum. Learn more ▶
iOS SDK	✓	✓	✓
iOS SDK (Pre-release)	✓	✓	N/A
Test apps on iOS devices	✓	✓	✓
Code-level Technical Support	✓	✓	N/A
Ad Hoc Distribution	✓	✓	N/A
App Store Distribution	✓	N/A	N/A
Custom B2B App Distribution	✓	N/A	N/A
iAd Network	✓	N/A	N/A
In-house Distribution	N/A	✓	N/A
Cost	\$99 year	\$299 year	Free
Requirements	If you're enrolling as an organization, a D-U-N-S Number registered to your legal entity is required.	A D-U-N-S Number registered to your legal entity is required.	The University Program is only available to qualified, degree granting, higher education institutions.

5.2.1.4 Task 1.4: Create & install distribution certificates

Before you can create and install the provisioning profile, you need to create and install the distribution certificates. You only need to install the distribution certificates for the very first time. Follow steps below to create and install them.

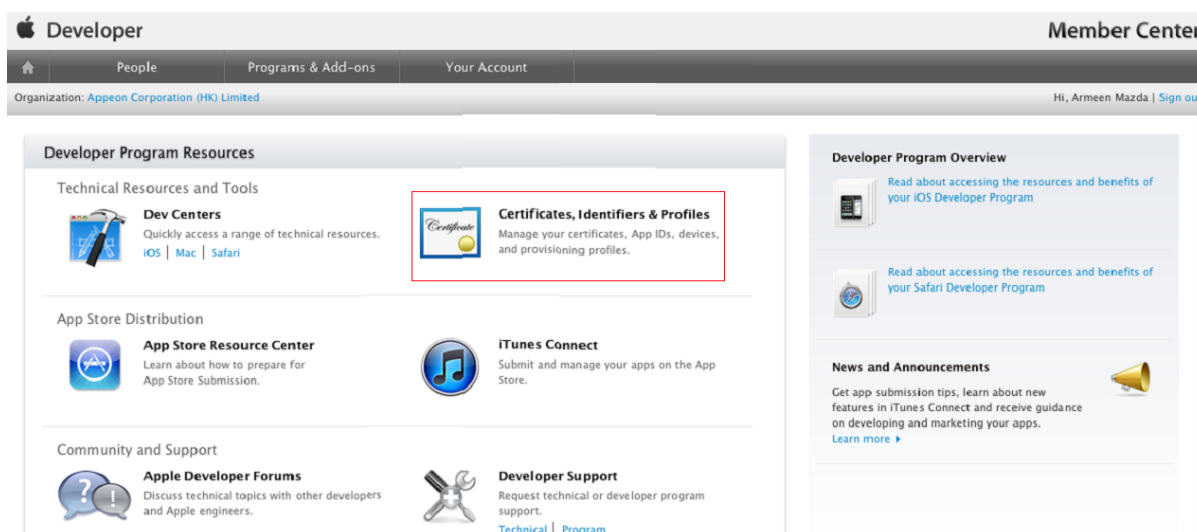
Step 1: On your Mac machine, log in to the [Member Center](#) with your Apple ID and Password.

Figure 5.2: Member Center



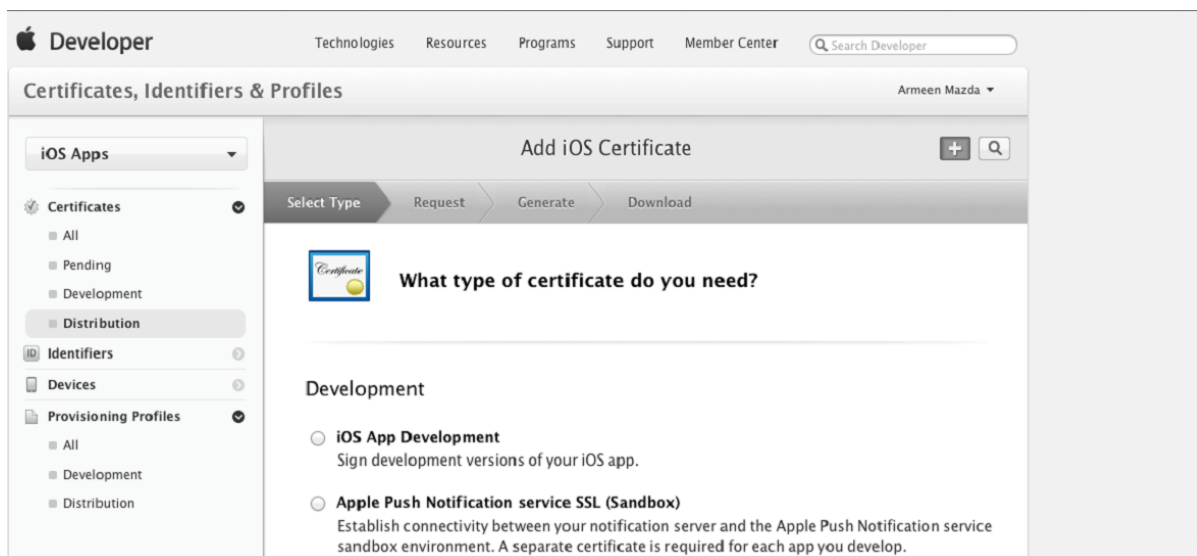
Step 2: Click the icon or text for **Certificates, Identifiers & Profiles** under **Developer Program Resources**.

Figure 5.3: Certificates, Identifiers & Profiles



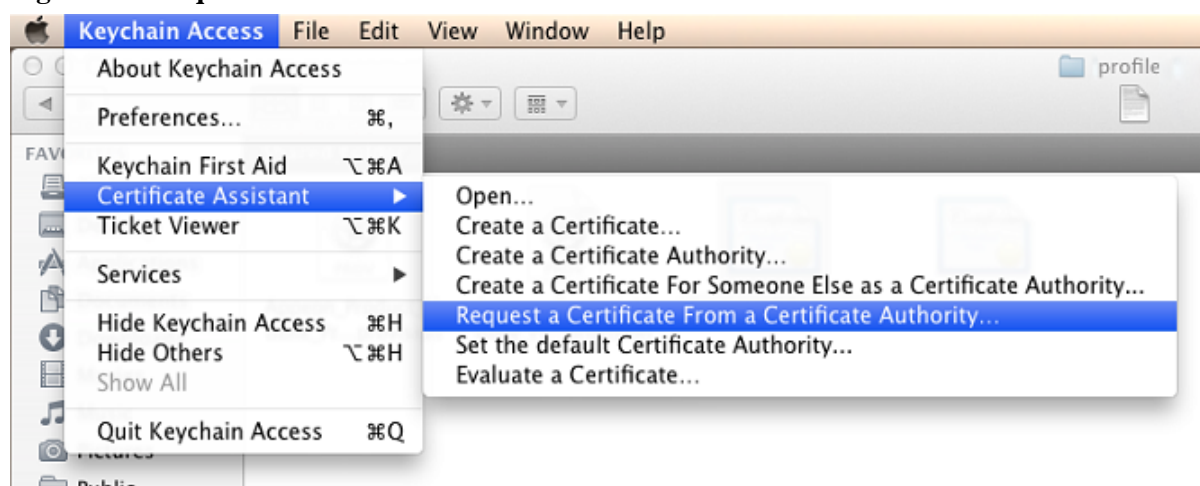
Step 3: Choose **Certificates > Distribution**, click the add certificate icon (), and then drag down the page and click **Worldwide Developer Relations Certificate Authority** to download the AppleWWDRCA.cer.

Figure 5.4: Download the AppleWWDRCA.cer



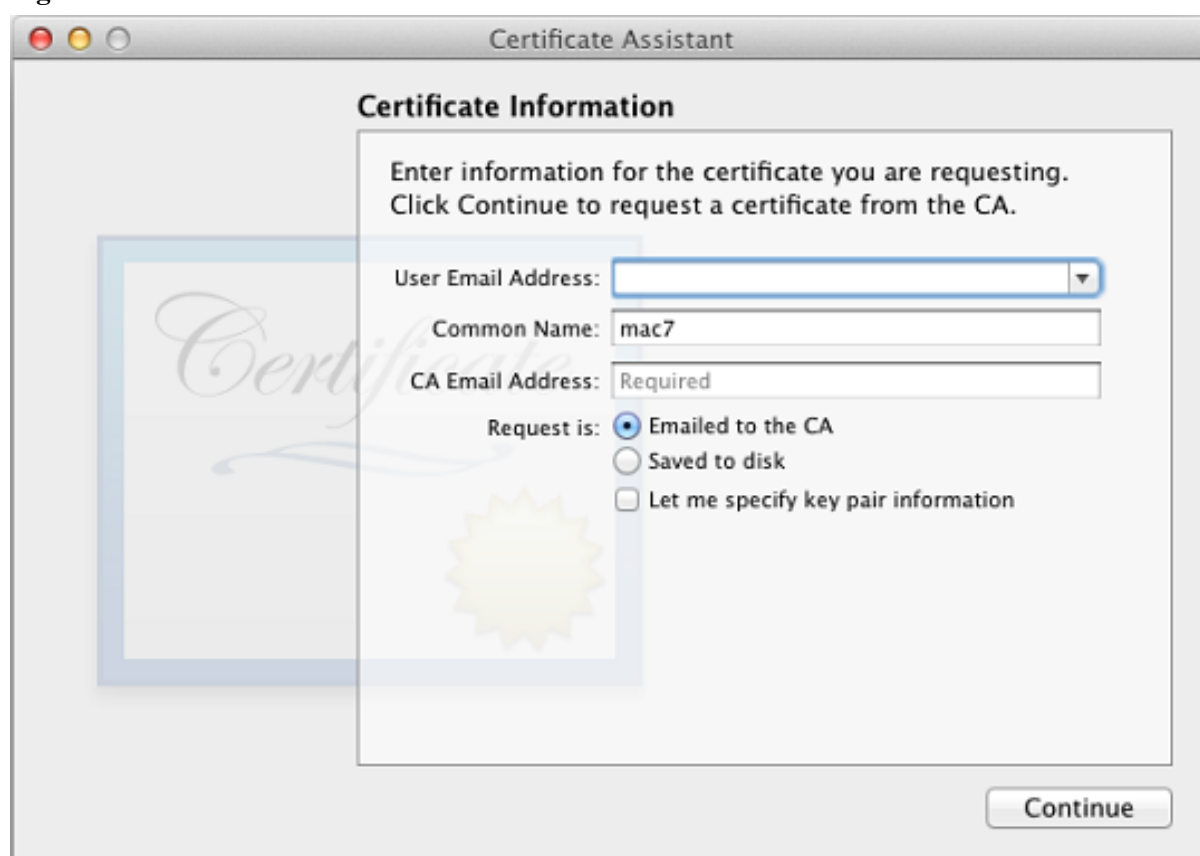
Step 4: Double-click the downloaded AppleWWDRCA.cer to open the Keychain Access and install it.

Step 5: Choose **Keychain Access > Certificate Assistant > Request a Certificate From a Certificate Authority...**

Figure 5.5: Request a Certificate

Step 6: In the **Certificate Assistant** dialog box, do the following:

1. In the **User Email Address** text box, enter your email address (use the same address as you used to register in the iOS Developer Program);
2. In the **Common Name** text box, enter a name (use the same name as you used to register in the iOS Developer Program);
3. In the **CA Email Address** text box, enter your CA email address;
4. Select the **Save to disk** radio button and click **Continue**.

Figure 5.6: Certificate Assistant

Step 7: Specify a filename (usually *CertifocateSigningRequest.certSigningRequest* by default) and click **Save**.

The *CertifocateSigningRequest.certSigningRequest* file is then saved, and you are ready to submit the generated CSR file.

Step 8: Go back to **Certificates, Identifiers & Profiles**, select a certificate type and then click **Continue**. On the page that appears, read the information and click **Continue** again.

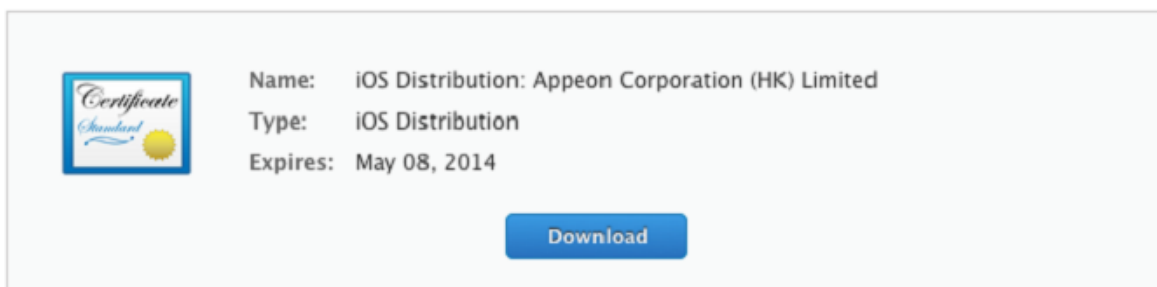
Step 9: Click **Choose File** to select the saved CSR (*CertifocateSigningRequest.certSigningRequest*) file, and then click **Generate**.

Step 10: Click **Download**.

Figure 5.7: Download Distribution Certificate

Download, Install and Backup

Download your certificate to your Mac, then double click the .cer file to install in Keychain Access. Make sure to save a backup copy of your private and public keys somewhere secure.

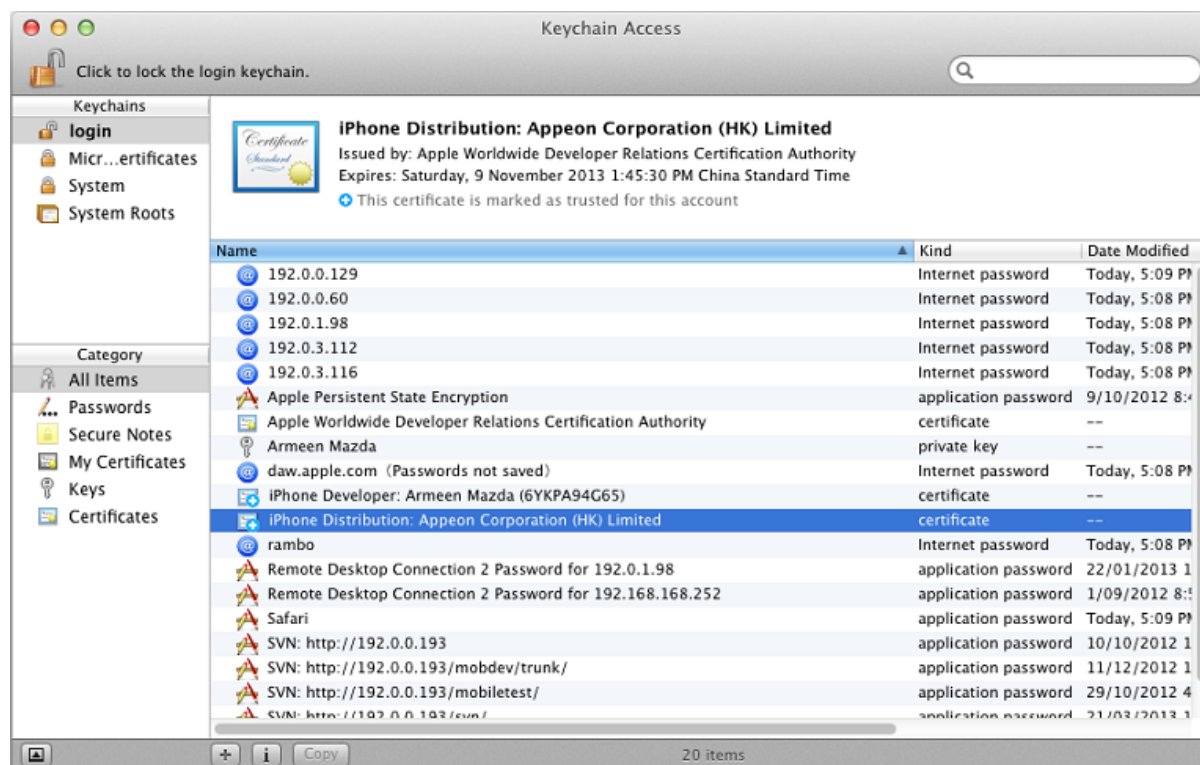


Documentation

For more information on using and managing your certificates read:

[App Distribution Guide](#)

Step 11: Double-click the downloaded distribution certificate (*ios_distribution.cer*) file to open the **Keychain Access** and install your certificate in your default keychain (usually the login keychain). The certificate is then listed in the Keychain, as shown in the following figure.

Figure 5.8: Installed Certificate

5.2.1.5 Task 1.5: Create & install distribution provisioning profiles

Depending on how you will distribute the app (App Store, In-House, or Ad Hoc), you need to create different distribution provisioning profiles.

The steps for creating the different distribution provisioning profiles are similar. To create a **Store** provisioning profile or an **In-House** provisioning profile, you select 1) an App ID and 2) a single distribution certificate. To create an **Ad Hoc** provisioning profile, you select 1) an App ID, 2) a single distribution certificate, and 3) multiple test devices. For details, refer to the below steps, or refer to [Creating Store Provisioning Profiles](#), and [Creating Ad Hoc Provisioning Profiles](#) in the Apple document *App Distribution Guide*.

Step 1: Go back to **Certificates, Identifiers & Profiles**, then choose **Provisioning Profiles** >

Distribution, and then click the add icon ().

Step 2: Select a distribution type and click **Continue** in the **Select Type** tag.

You will be provided with different distribution types according to the programs you enrolled in. If you enrolled in the **Apple Developer** program, you would choose between **App Store** and **Ad Hoc**; if you enrolled in the **Apple Developer Enterprise** program, you would choose between **Ad Hoc** and **In-House**.

Step 3: Select your App ID and click **Continue**.

Step 4: Select the distribution certificate you have created in [Task 1.4: Create & install distribution certificates](#) and click **Continue**.

Step 5: Select the devices you want to use for testing, and click **Continue**.

Note: This step is only required for creating the **Ad Hoc** provisioning profile.

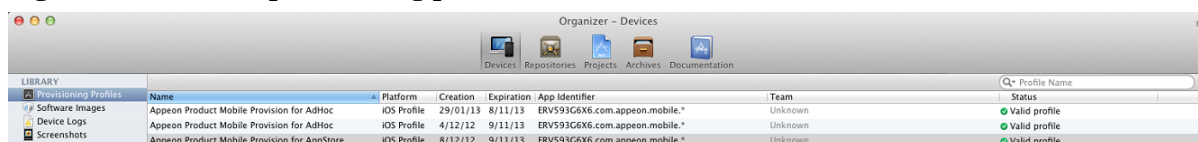
Step 6: Enter a profile name and click **Generate**.

Step 7: After the profile is generated, click **Download** to download and use it.

Step 8: Double-click the downloaded file to install the provisioning profile in Xcode.

Step 9: In **Xcode**, choose **Window > Organizer**, and then click **Device**. The installed provisioning file is listed.

Figure 5.9: Installed provisioning profile



Now that you have finished creating and installing the distribution certificate and the provisioning profile containing code signing, you are ready to create the app archive.

5.2.2 Task 2: Generate the Xcode project

Step 1: On the Apppeon Developer machine, use the **Package** tool in the Apppeon Developer toolbar to package the app files into an Xcode project.

You can select **Package a Native Mobile Project** or **Customize and Package Apppeon Workspace** to package the app files into an Xcode project, and the steps (in this task as well as the subsequent tasks) are the same for both projects.

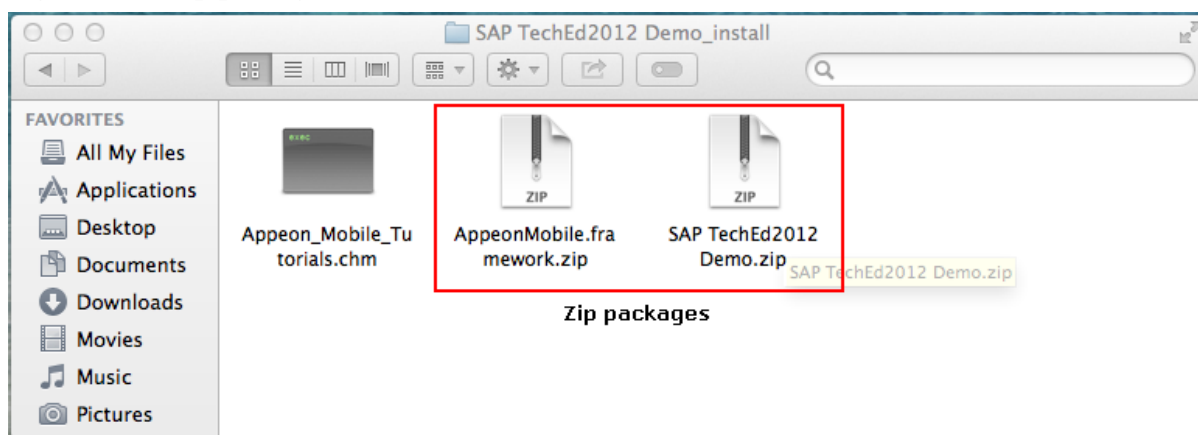
During the package process, you will be able to specify the settings, such as the app name, icons, etc., that are required by the Xcode project. See Section 11.3, “Packaging a stand-alone mobile project” in *Apppeon Developer User Guide* or Section 11.4, “Customizing and packaging Apppeon Workspace” in *Apppeon Developer User Guide* for detailed instructions.

After the package process is complete, you will find the following two zip packages generated under the specified destination folder.

- The zip package of the application.
- ApppeonMobile.framework.zip: this zip package is necessary for all apps (including the customized Apppeon Workspace) to be distributed on iOS.

Step 2: Copy the above two zip packages to the Mac machine.

Figure 5.10: Zip packages on the Mac machine



Step 3: On the Mac machine, extract the above two zip packages respectively.

Figure 5.11: Extracting the packages on the Mac machine

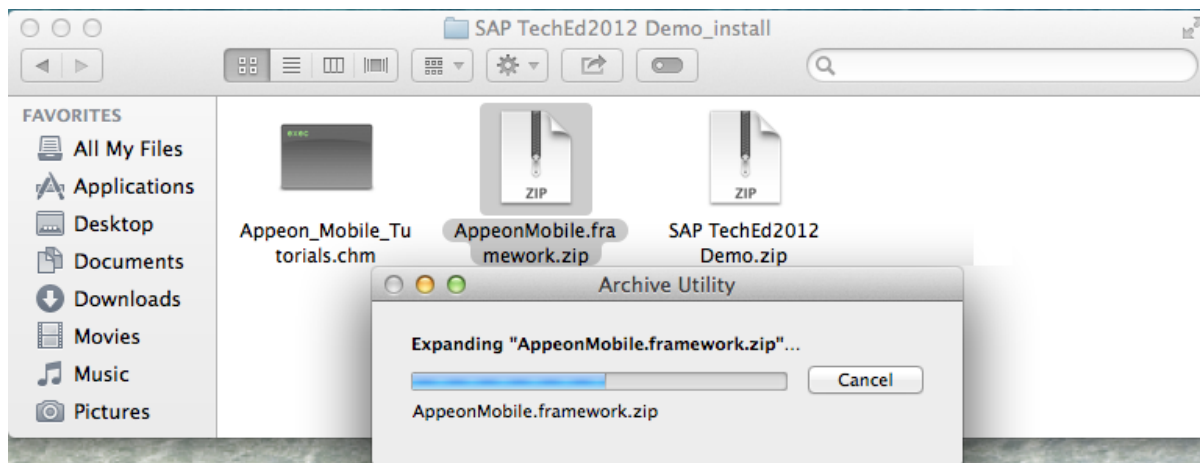
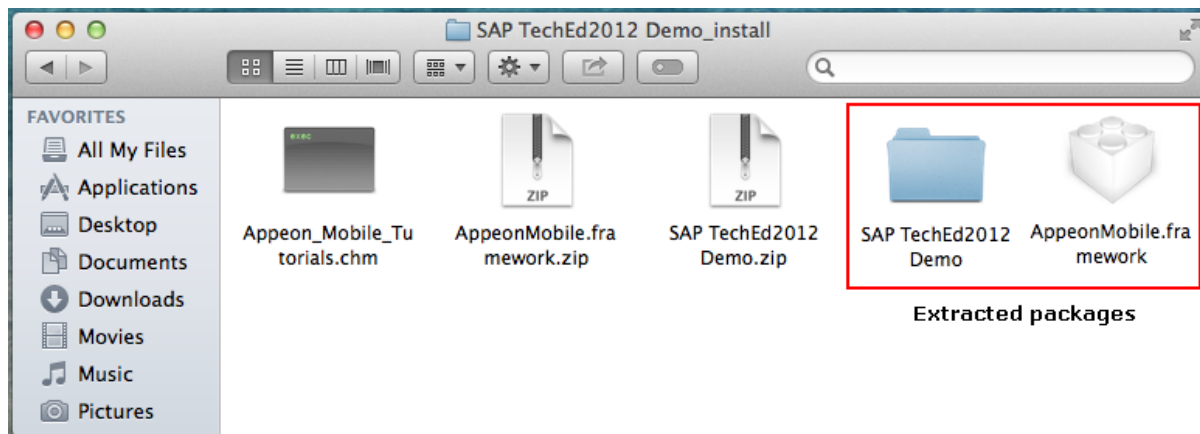


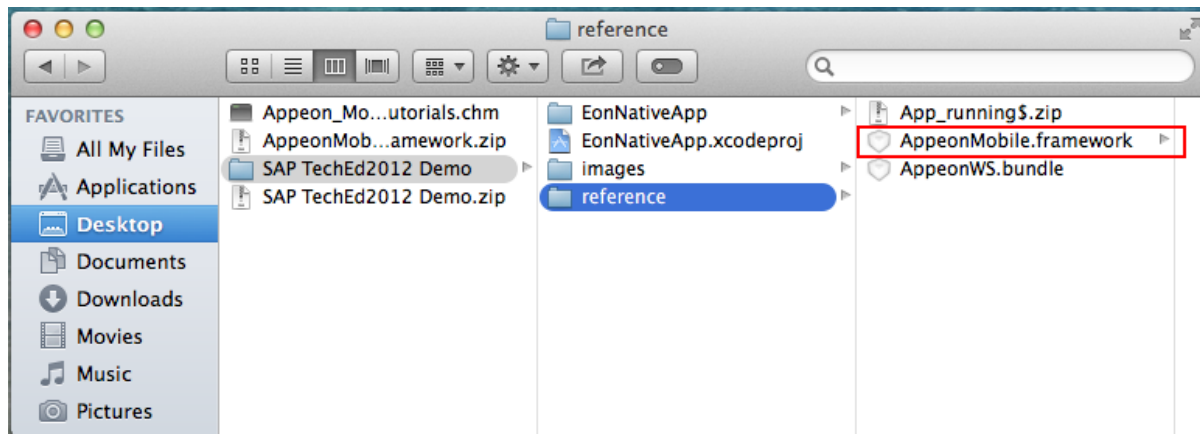
Figure 5.12: Extracted packages on the Mac machine



Step 4: Copy the extracted **AppeonMobile.framework** folder into the **reference** folder under the extracted app package.

The following screenshot shows the **reference** folder that contains the **AppeonMobile.framework** folder that was copied.

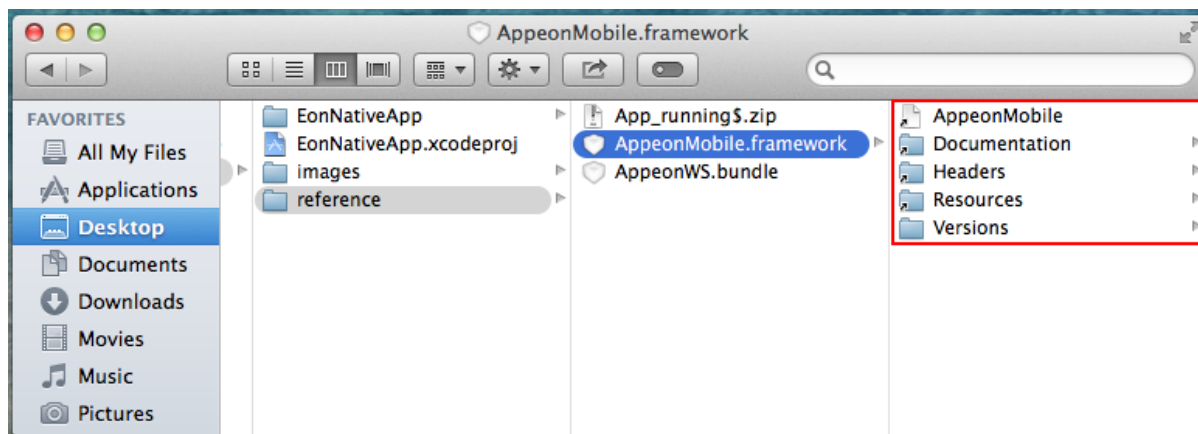
Figure 5.13: reference folder



Make sure you do Step 3 & 4 on the Mac machine, not on the Windows machine.

The following screenshot shows the **AppeonMobile.framework** folder and the subfolders and files it contains.

Figure 5.14: AppeonMobile.framework folder



5.2.3 Task 3: Create the app archive

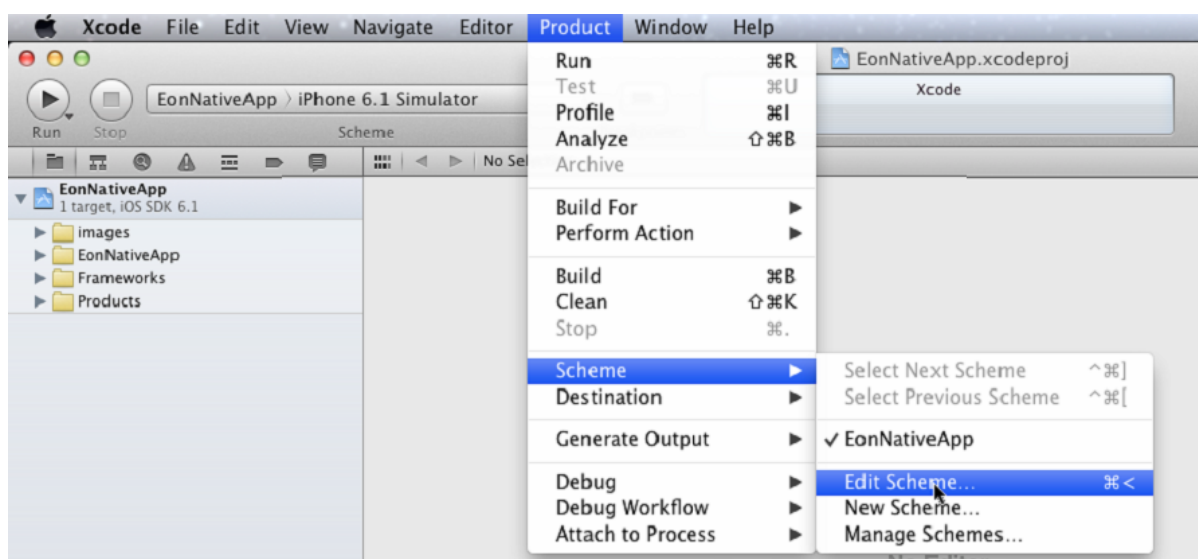
Since you have configured all the required information for the Xcode project, such as, the app icons, URL, etc., by using the **Package** tool in the Appeon Developer Toolbar, you are ready to create an app archive right away.

Step 1: In the extracted app package folder, double-click the **EonNativeApp.xcodeproj** project to open the Xcode.

Make sure you have extracted the zip packages and copied the extracted **AppeonMobile.framework** folder to the **reference** folder according to [Task 2: Generate the Xcode project](#).

Step 2: Choose **Product > Scheme > Edit Scheme** to open the scheme editor, as shown in the following figure.

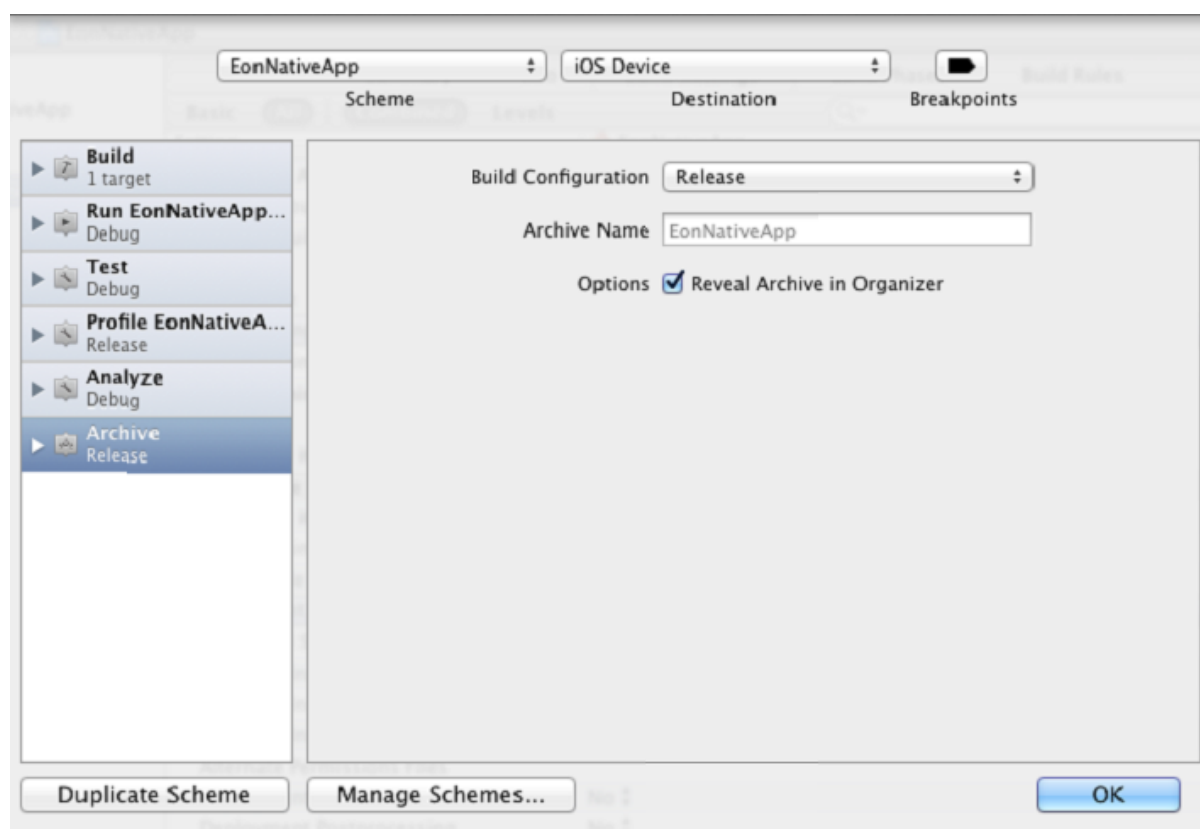
Figure 5.15: Edit Scheme



Step 3: In the scheme editor, do the following:

1. In the left column, select **Archive**;
2. Select the project from **Scheme**;
3. Select **iOS Device** from **Destination**;
4. Select **Release** from **Build Configuration**;
5. Modify the archive name or use the default name in the **Archive Name** field.
6. Click **OK** to save the settings.

Figure 5.16: Archive Release

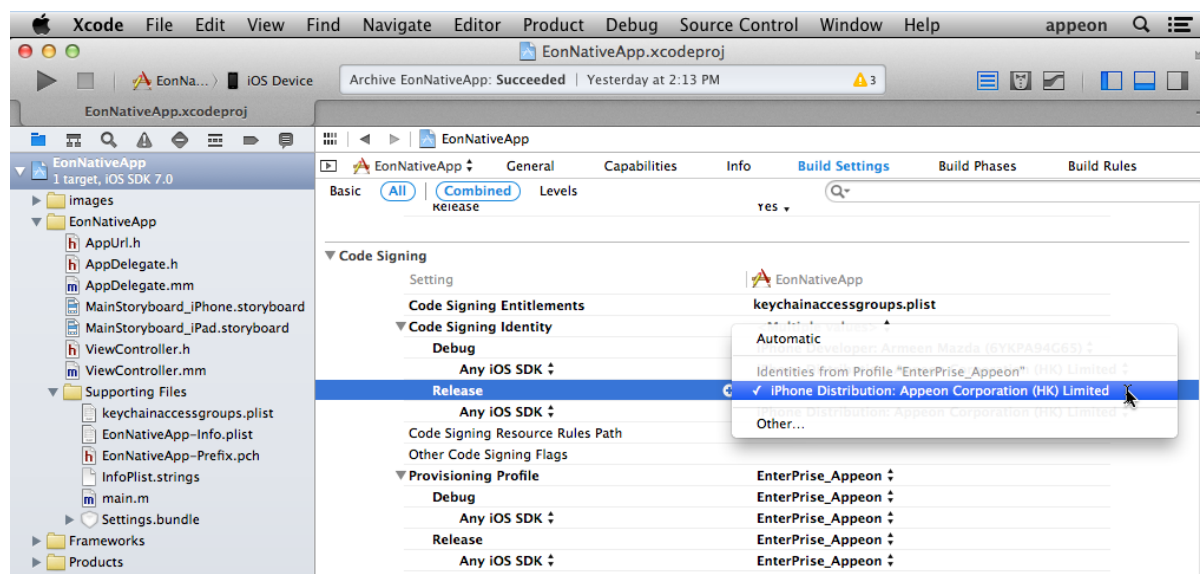


Step 4: (Optional) Click the target project for the app, select **Summary** (in Xcode 4.x) or **General** (in Xcode 5.x), and then configure the Xcode project for distribution. All the information specified in the **Appoon Developer Package** tool can be reconfigured here and you can also configure those that are not listed in the **Appoon Developer Package** tool (only the required information are listed for configuration in the **Appoon Developer Package** tool).

For details about how to configure the settings in Xcode, read [Configuring Your Xcode Project for Distribution](#) in the Apple document *App Distribution Guide*.

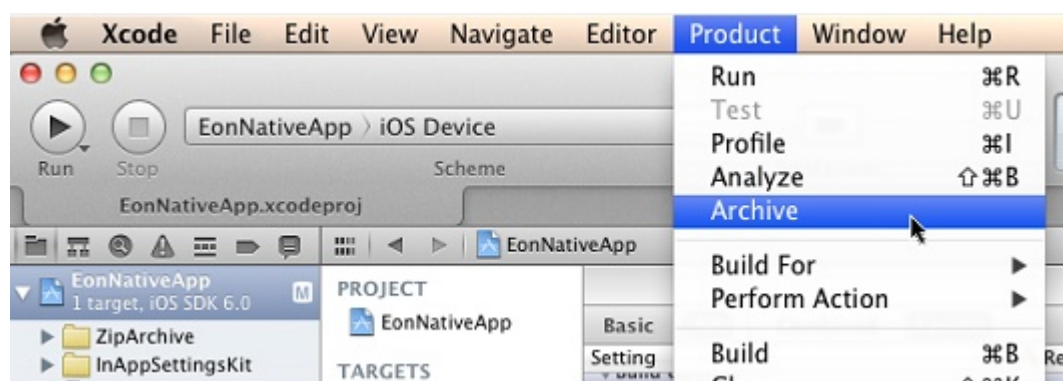
Step 5: Select **Building Settings**, drag down the screen to find the **Code Signing** group, then click **Release**, and then select the corresponding code signing profile.

Figure 5.17: Code signing



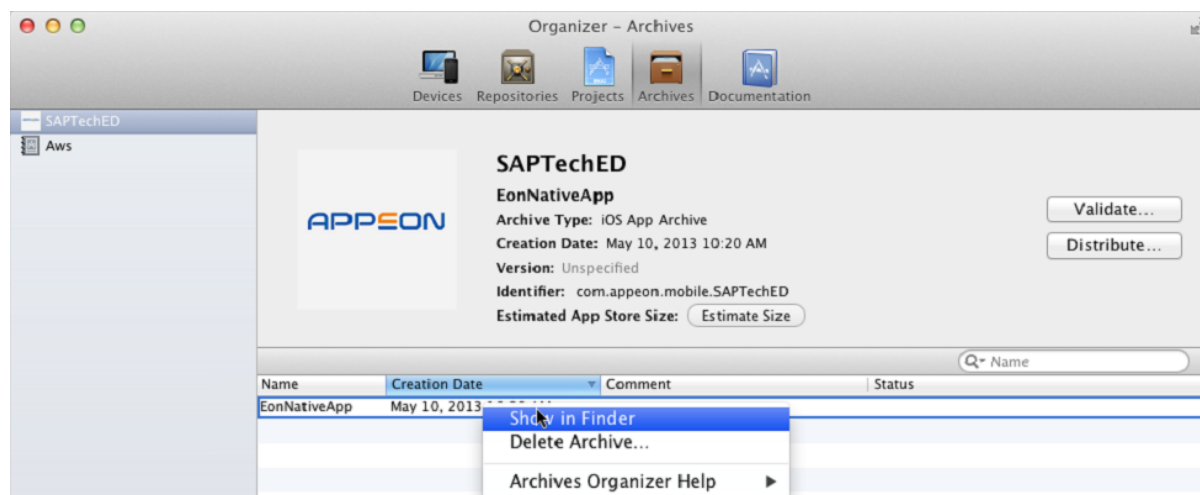
Step 6: In Xcode, choose **Product > Archive**.

Figure 5.18: Archive



After the project is built successfully, it will appear in the **Archives Organizer**, as shown below.

Figure 5.19: Archive list



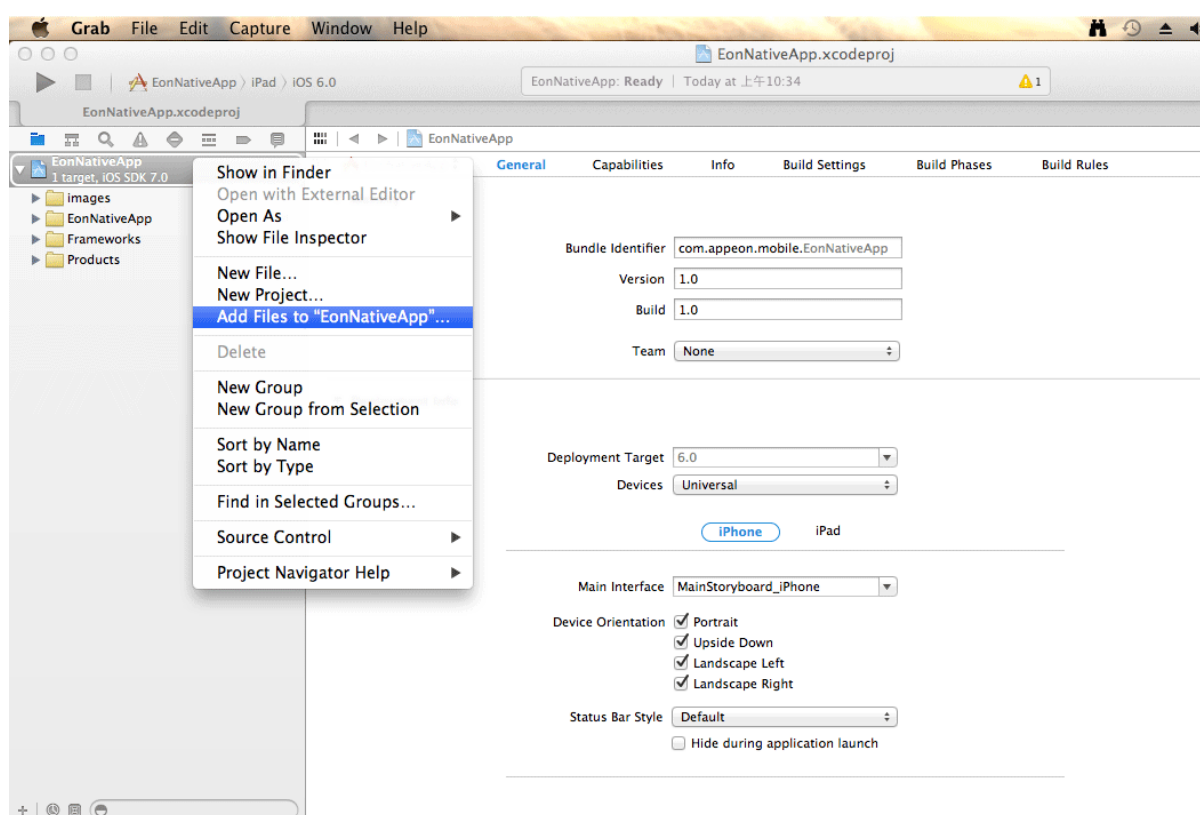
Now the app archive is ready. You can submit the archive to the Apple App Store or save the file for enterprise or Ad-Hoc distribution.

5.2.3.1 Task 3.1 (Optional): Import the certificate

MobiLink supports the encrypted transmission of the synchronous data stream by using HTTPS. If you want to use HTTPS for the encrypted transmission of the synchronous data stream, you should add the certificate file into the project. The following steps take **EonNativeApp** as an example.

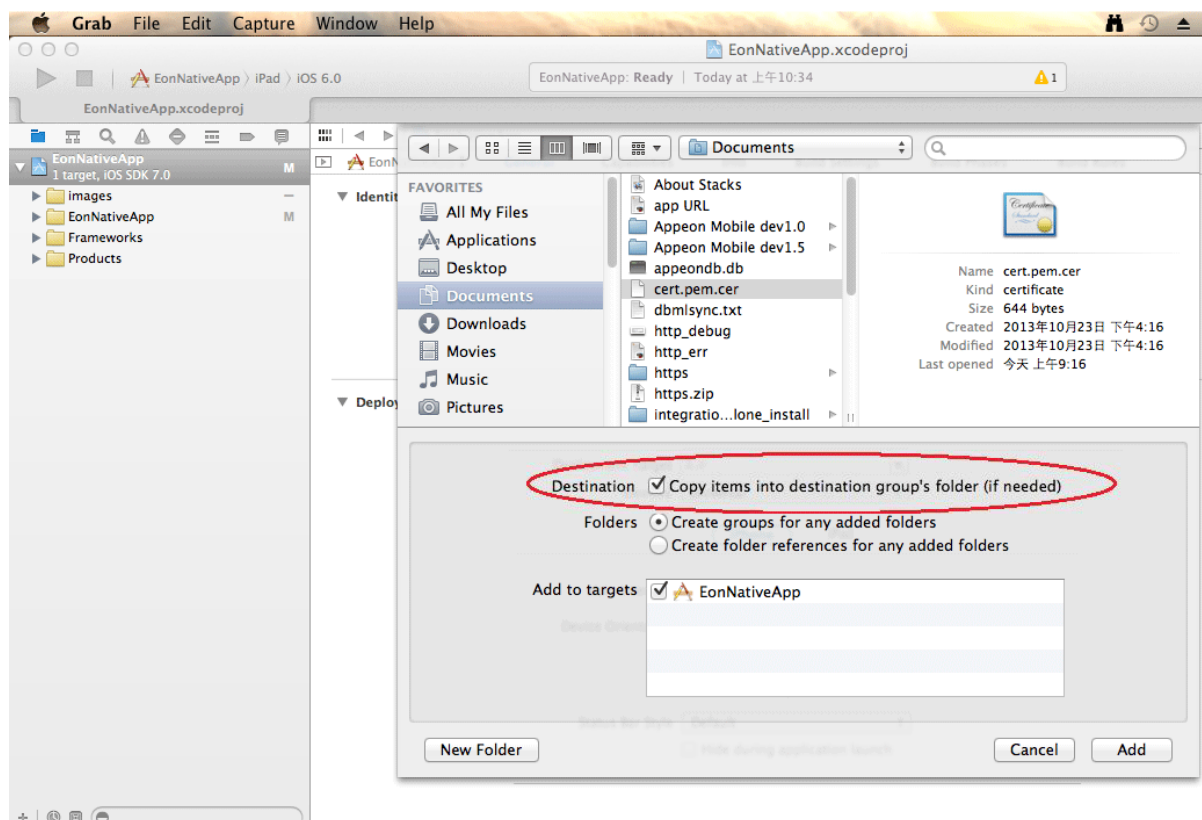
1. Right click **EonNativeApp** and select **Add Files to "EonNativeApp..."** to choose the certificate file, as shown in the following figure.

Figure 5.20: Add files to "EonNativeApp"



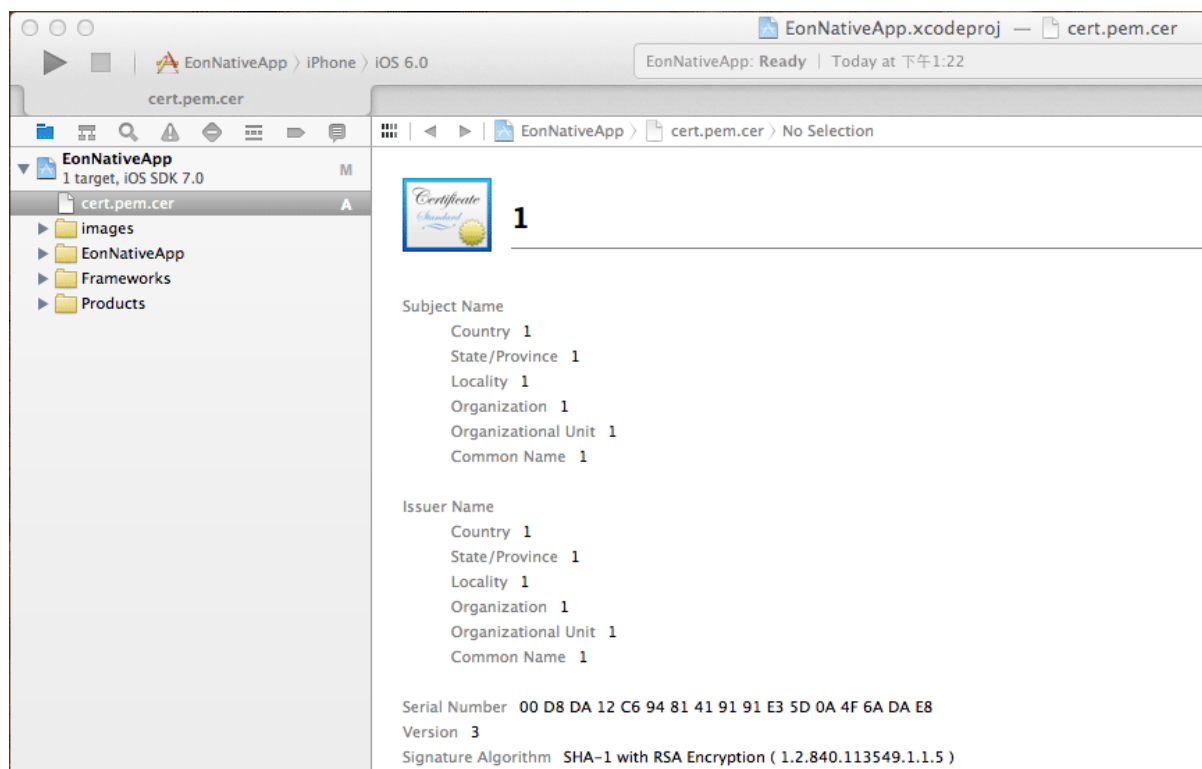
2. In this example, choose the cer.pem.cer file. Make sure to select the **Copy items into destination group's folder (if needed)** checkbox, as shown in the following figure. Click **Add**.

Figure 5.21: Select the destination checkbox



3. The certificate file is added successfully and is placed in the position parallel to other folders under the **EonNativeApp** directory, as shown in the following figure.

Figure 5.22: The certificate file is added successfully.



5.2.3.2 Task 3.2 (Optional): Configure the bundle identifier

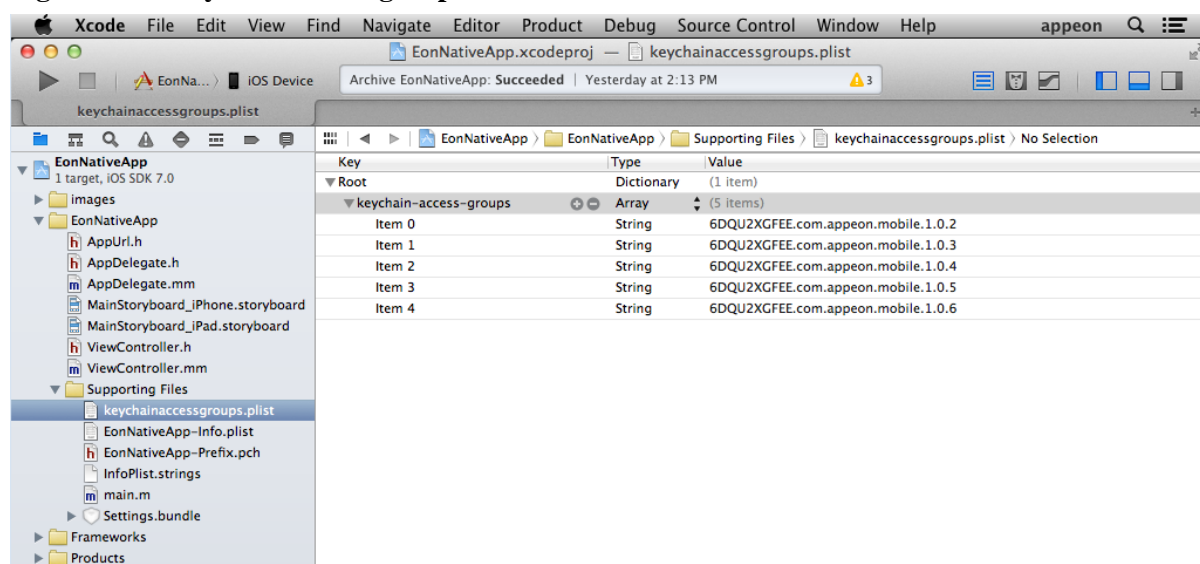
In order for the apps running on the same mobile device to be recognized as running on one device not on multiple devices by the Appeon License file, you will need to always input the same Apple ID for all apps and specify the same bundle identifier for the same app. For details, refer to Section 5.3.4.1.1, “Product Activation” in *Appeon Server Configuration Guide for .NET* or in *Appeon Server Configuration Guide for J2EE*.

Follow steps below to specify the consistent **Bundle Identifier** in the Xcode project:

Step 1: Find the **keychainaccessgroups.plist** file by expanding **EonNativeApp** > **Supporting Fills**, as shown in the following figure. The **keychainaccessgroups.plist** file is in the same directory as the **EonNativeApp.xcodeproj** file.

The key for the app in the **keychainaccessgroups.plist** file is made up of two parts: Apple ID + Bundle Identifier, in this format "AppleID.BundleIdentifier", take 6DQU2XGFEE.com.appeon.mobile.1.0.2 for example, 6DQU2XGFEE is the Apple ID, com.appeon.mobile.1.0.2 is the Bundle Identifier.

Figure 5.23: Keychain access group



Step 2: Check that the Apple ID in the **keychainaccessgroups.plist** file is correct and is the same as the Apple ID in the provisioning profile.

If the Apple ID in the **keychainaccessgroups.plist** file is incorrect, you can input the correct Apple ID, then click the menu **Product** -> **Clean**, and then click **Product** -> **Archive** to create the IPA file again.

Step 3: Copy the Bundle Identifier from the **keychainaccessgroups.plist** file.

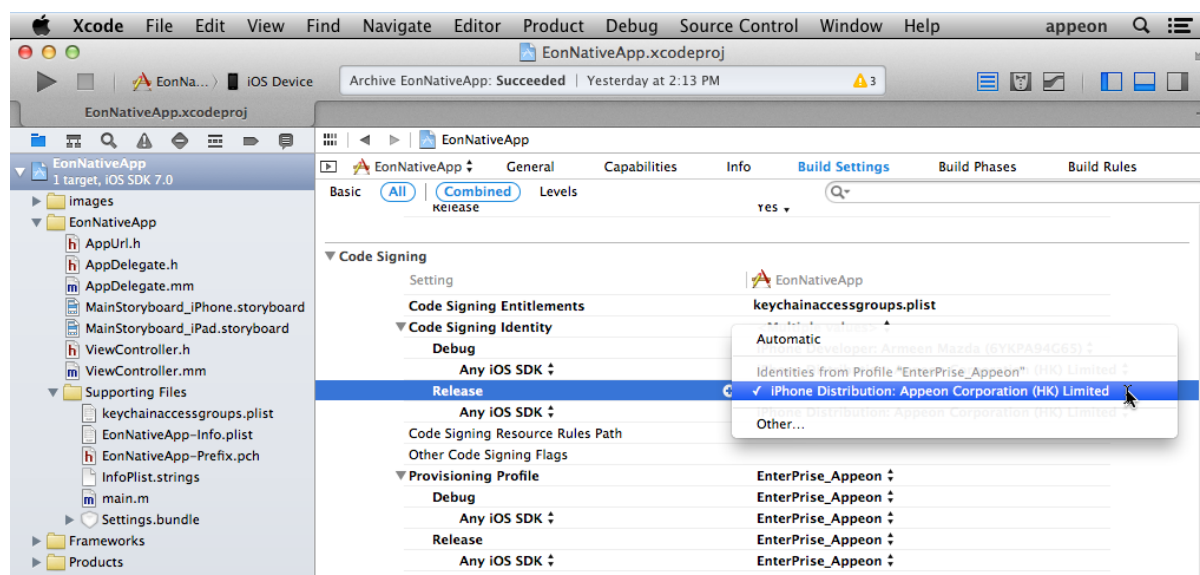
Step 4: Click the target project for the app, select the **Summary** (in Xcode 4.x) or **General** (in Xcode 5.x) tab, and then paste to the **Bundle Identifier** field. By default, the **Bundle Identifier** on this tab is different from the one in the **keychainaccessgroups.plist** file.

Also make sure the same **Bundle Identifier** is input when uploading the app to the App Store.

If you want to make change to the **Bundle Identifier**, please make sure the same **Bundle Identifier** is used consistently in all three areas: the **keychainaccessgroups.plist** file, the **Summary** (in Xcode 4.x) or **General** (in Xcode 5.x) tab, and the App Store upload process.

Step 5: Select **Building Settings**, drag down the screen to find the **Code Signing** group, modify the **Code Signing Entitlements** to "keychainaccessgroups.plist" if it is not displayed, then click **Release**, and then select the corresponding code signing profile. Make sure that the code signing profile matches the value specified in the keychain-access-groups in the keychainaccessgroups.plist, or there may be errors.

Figure 5.24: Code signing



5.2.4 Task 4: Distribute the app archive

Xcode allows you to distribute the app archive in the following methods:

- App Store distribution: submits the app for publication to the Apple App Store. Refer to [Section 5.2.4.1, “Method 1: App Store distribution”](#) for detailed instructions.
- In-House distribution: installs the app to an unlimited number of devices inside your company. Refer to [Section 5.2.4.2, “Method 2: In-house or Ad-Hoc distribution”](#) for detailed instructions.
- Ad Hoc distribution: installs the app on a limited number (up to 100) of registered devices. Refer to [Section 5.2.4.2, “Method 2: In-house or Ad-Hoc distribution”](#) for detailed instructions.

The detailed instructions for Ad Hoc distribution and In-House distribution are the same, though their provisioning profiles are different.

- Export as Xcode Archive: this method is not relevant to our distribution strategy, hence it is left out of this tutorial.

5.2.4.1 Method 1: App Store distribution

Step 1: In the Archives organizer, select the application archive you want to distribute, and click **Distribute**.

Step 2: Select **Submit to the iOS App Store** and click **Next**. Then follow instructions in [App Store Submission Tutorials](#) to submit your app to the iOS App Store.

5.2.4.2 Method 2: In-house or Ad-Hoc distribution

Step 1: In the Archives organizer, select the application archive you want to distribute.

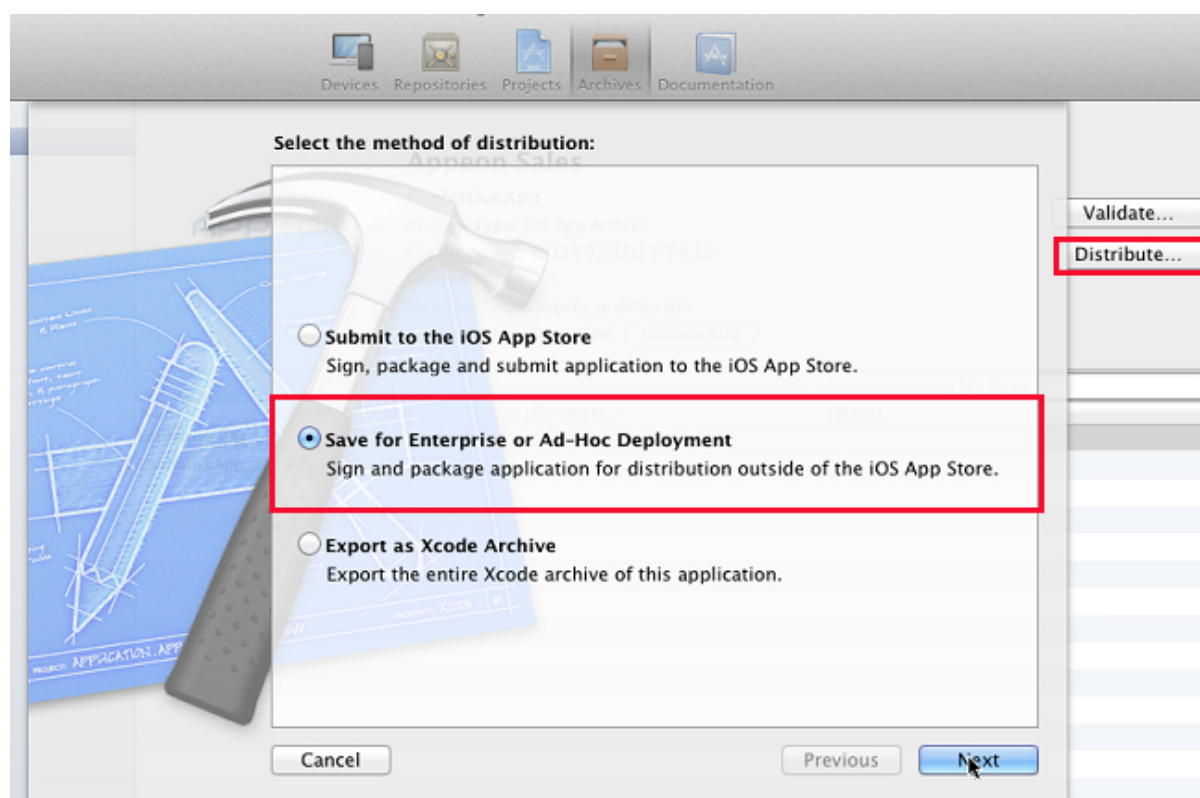
Step 2: Optionally, click the **Validate** button.

You can validate the archive and fix any problems before distributing it.

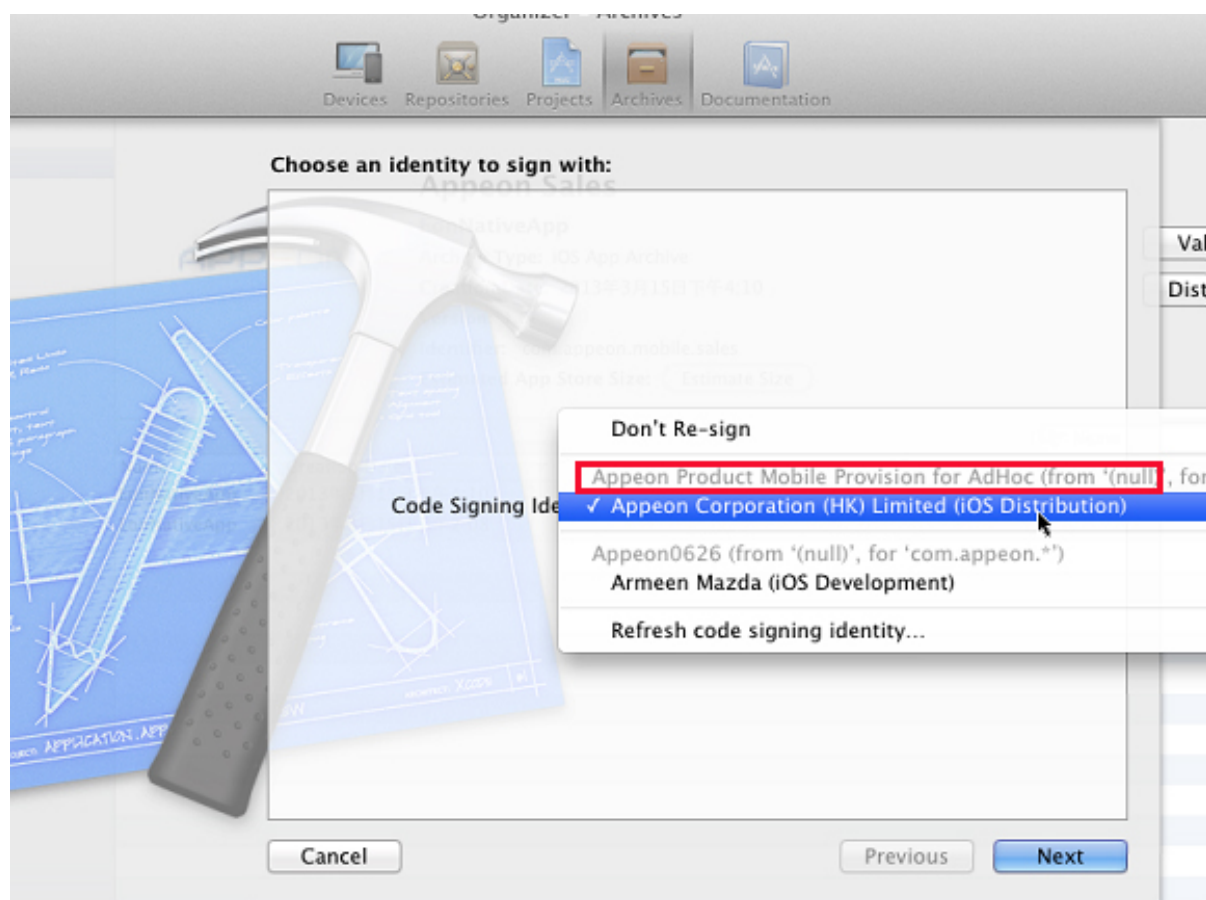
Step 3: Click the **Distribute** button.

Step 4: Select **Save for Enterprise or Ad-Hoc Deployment** and click **Next**.

Figure 5.25: Select distribution method



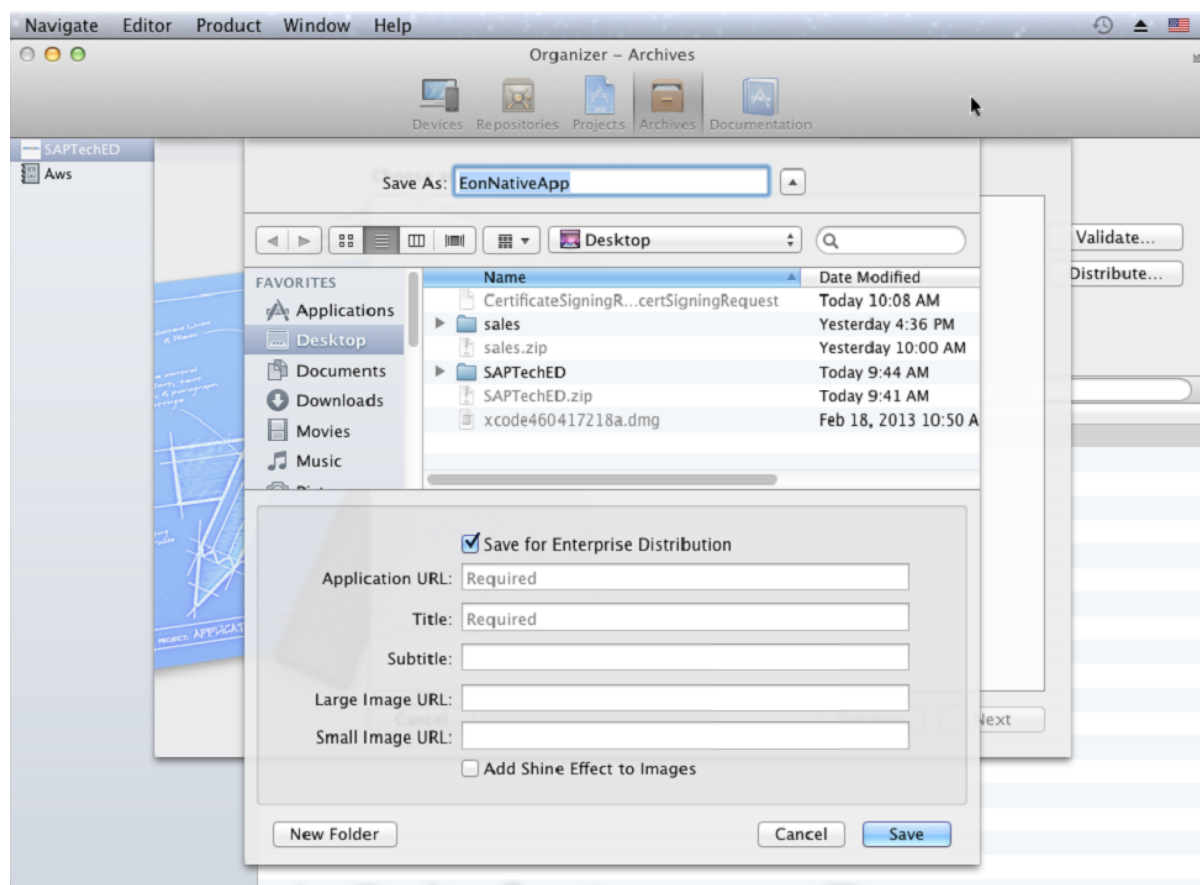
Step 5: Choose your distribution certificate (the one contained in your distribution provisioning profile) from the **Code Signing Identity** pop-up menu and then click **Next**, as shown in the following figure.

Figure 5.26: Choose an identity

Step 6: Specify the file name and the location of the IPA file and the relevant settings.

- Select the **Save for Enterprise Distribution** check box.
- In the **Application URL** field, specify the URL to the IPA file on a server.
- In the **Title** field, specify the app name that will be displayed during installation.
- In the **Large Image URL** and the **Small Image URL** fields, specify the app icon that will be displayed during installation.
- Click **Save**.

A .ipa file and a .plist file will be generated. The above settings will be saved in an XML manifest (.plist) file.

Figure 5.27: Save for Enterprise Distribution

Now you can distribute the app to your users in the following four ways:

- Distribute the .ipa file and .plist file to your users, and users perform the installation using **iTunes**. See [the section called “Install apps using iTunes”](#) for detailed instructions.
- Distribute the .ipa file and .plist file to your users, and users perform the installation using **iPhone Configuration Utility** or **Apple Configurator** (Using **Apple Configurator** is left out in this tutorial). See [the section called “Install apps using iPhone Configuration Utility”](#) for detailed instructions.
- Post the .ipa file and .plist file on a secure Web server, and users perform the installation wirelessly. See [the section called “Install apps wirelessly”](#) for detailed instructions.
- Use your MDM server to instruct managed devices to install the app, if your MDM server supports it. This is left out in this tutorial.

For more information on deploying apps, refer to [Distributing Enterprise Apps for iOS Devices](#).

5.2.4.2.1 Install apps using iTunes

Step 1: Copy the .ipa file for the app to a machine (either Windows or Mac) with iTunes already installed.

Step 2: In **iTunes**, choose **File > Add to Library**, and then select the .ipa file.

Step 3: Connect a device to the computer, and then select it in the **Device** list in **iTunes**.

Step 4: Click the **Apps** tab, and then select the **Sync Apps** checkbox and the app in the list.

Step 5: Click **Apply** (or **Sync**).

If your user's computers are managed, you can deploy the files to their computers and ask them to sync their device. iTunes automatically installs the files found in iTunes Mobile Application and Provisioning Profiles folders.

5.2.4.2.2 Install apps using iPhone Configuration Utility

Step 1: Copy the .ipa file for the app to a machine (either Windows or Mac) with **iPhone Configuration Utility** already installed.

Step 2: In **iPhone Configuration Utility**, choose **File > Add to Library**, and then select the .ipa file.

Step 3: Connect a device to the computer, and then select it in the **Device** list.

Step 4: Click the **Applications** tab, and then select the .ipa file.

Step 5: Click **Install**.

5.2.4.2.3 Install apps wirelessly

Before installing the app, you will need to first post the app to a Web server.

Step 1: Construct and configure the server.

1. Install IIS on the server.
2. Copy the app (.ipa) file, the manifest (.plist) file, and the icons to a location on the IIS website that is accessible to the users.
3. Create a page that links to the manifest file.

Here is a sample link:

```
<a href="itms-services:///?action=download-manifest&url=http://example.com/?manifest.plist">Install App</a>
```

Step 2: Set the MIME type of the server, so the server can correctly transfer the manifest file and the application.

- For Mac OS X Server, use the Server Admin to add the following MIME types to the Web service's **MIME Types** settings:

application/octet-stream ipa

text/xml plist

- For IIS, use the IIS Manager to add the following MIME types on the server's **Properties** page:

.ipa application/octet-stream

.plist text/xml

Now your app is ready for installation.

Step 3: Distribute the URL for downloading the manifest file by SMS or email to the users.

Step 4: The user clicks the URL to download the manifest file from the website to the iOS device, and the manifest file instructs the device to download and install the apps referenced in the manifest file.

5.3 Package & Distribute Android Apps

Compared to iOS apps, the steps for packaging and distributing the Android apps are a lot simpler. Once you package the app files using the Appeon Developer toolbar, you will get an Android application package (APK) that can readily be distributed using any approach, including publishing in the Android app marketplace such as Google Play, or serving the app from a Web site or emailing the app directly to users.

Therefore, you need to go through the following two tasks mainly.

1. Task 1: Generate the Android application package (APK).
2. Task 2: Distribute the Android APK.

5.3.1 Task 1: Generate the Android application package (APK)

On the Appeon Developer machine, use the **Package** tool in the Appeon Developer toolbar to package the app files into an Android APK file.

You can select **Package a Native Mobile Project** or **Customize and Package Appeon Workspace** to package the app files into an Android APK file. During the package process, you can press F1 to get help on the fields. See Section 11.3, “Packaging a stand-alone mobile project” in *Appeon Developer User Guide* or Section 11.4, “Customizing and packaging Appeon Workspace” in *Appeon Developer User Guide* for detailed instructions.

After the package process is complete, you will find an APK file generated under the specified destination folder. Get the APK file and distribute the app using any approach that meets your needs.

5.3.2 Task 2: Distribute the Android APK

This section only highlights three distribution approaches. For more details about these three approaches, refer to <http://developer.android.com/distribute/open.html>.

- Distributing through an App Marketplace.

For detailed instructions on how to publish on Google Play -- the premier marketplace for Android apps, refer to <http://developer.android.com/distribute/googleplay/publish/index.html>.

- Distributing your application through email
- Distributing through a web site

6 Tutorial 5: Configure Appeon Server Cluster

Appeon provides its own tools and plug-ins to configure an Appeon Server cluster and implement the load balancing and failover functionalities. An Appeon Server cluster is essentially a group of application servers, each with Appeon Server and Appeon plug-in installed.

Following are high level steps for configuring an Appeon Server cluster. For detailed instructions, you may need to go through the documents and sections as specified below.

1. Task 1: Install Appeon Server to multiple application servers.
2. Task 2: Create Appeon Server cluster in AEM.
3. Task 3: Configure the Web server for the Appeon Server cluster.
4. Task 4: Install an Appeon application to the Appeon Server cluster and Web server(s).

6.1 Task 1: Install Appeon Server to multiple application servers

Step 1: Set up a group of application servers.

The application server must be of the same type and of the same version. Appeon supports the following application server types: .NET IIS, JBoss, WebLogic, WebSphere, JEUS, EAServer, and NetWeaver. For more details, refer to the **Appeon Server requirements** section in Installation Guide for .NET.

Step 2: Install Appeon Server to each application server by following the installation instructions in the **Appeon Server installation** section in Installation Guide for .NET. In the **Select Components** page, make sure you select to install the appropriate edition of Appeon Server, for example, select **Appeon Server for .NET** if the application server is .NET/IIS.

6.2 Task 2: Create Appeon Server cluster in AEM

Once you have installed Appeon Server to several application servers, you can use the AEM **Cluster** tool to create an Appeon Server cluster and configure the load balancing and failover settings of the cluster. The following are the detailed instructions.

Step 1: Log into AEM. Each Appeon Server has an AEM. You only need to log in to one of them for the cluster, make configurations there, and then synchronize the settings to the other AEMs in the cluster.

Step 2: In the **Server | Resource | Cluster** tool, add the Appeon Servers one by one. It is **important** that the first Appeon Server you add is the one hosting the AEM you are currently logged into.

1. Click the **Add Appeon Server** button under the **Cluster Server List** table. The **Add New Appeon Server** page opens.
2. Verify that the Appeon Server to be configured is running and provide the required information (IP address, port, AEM user name, and password). For example:

- IP address: 161.0.0.1

Use the IP address or machine name of the Appeon Server when adding an Appeon Server. Do not use "localhost" or "127.0.0.1". The IP address or machine name and port number must match the settings of HTTP listeners in the application server.

- Port: 80
- AEM User Name: admin
- AEM Password: admin

3. Click the **Save and Add** button to add the other Appeon Servers. The program will automatically test the connection and add the Appeon Server if the test is successful.

Adding an Appeon Server will succeed only if:

- The Appeon Server is new to AEM.
- The information provided is correct.
- The Appeon Server is running.
- The first Appeon Server that you add is the one hosting AEM you are currently logged into.

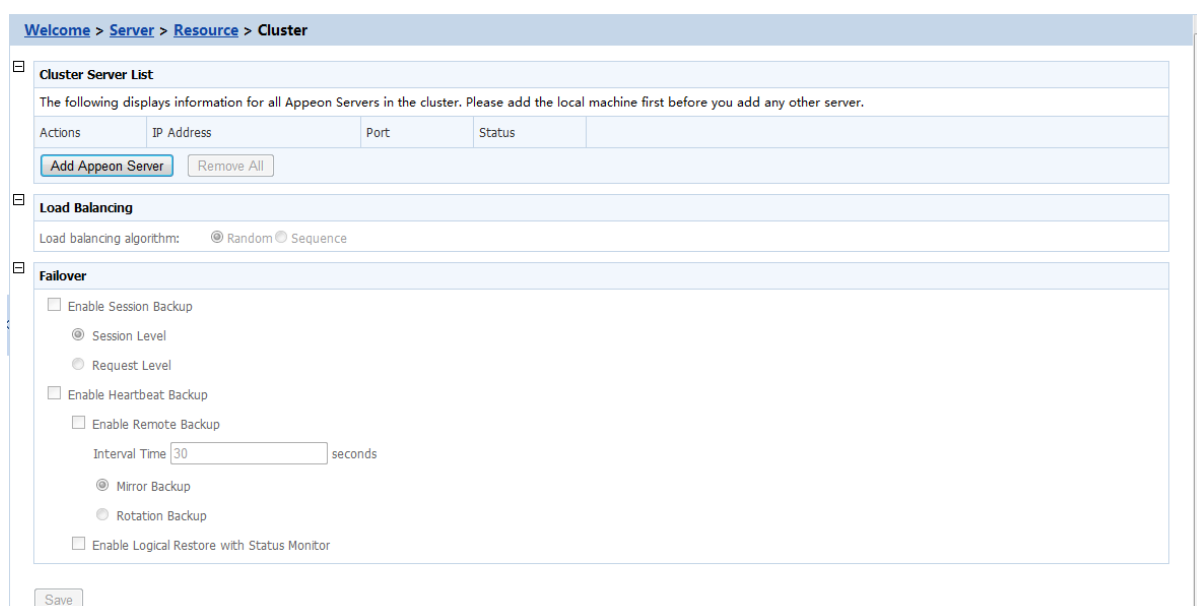
The Appeon Servers listed in the **Cluster Server List** group will work as a cluster in supporting the requests from their associated Web server.

Step 3: Configure the load balancing and the fail-over settings by following instructions in Section 5.3.3.1, "Cluster" in *Appeon Server Configuration Guide for .NET* or *Appeon Server Configuration Guide for J2EE*.

Step 4: Check status of Appeon Servers and verify that all servers are running.

Step 5: Click **Save** to synchronize AEM settings to the other servers in a cluster.

Once an Appeon Server is added to the cluster server list, you can use the AEM which maintains the list to manage all servers in the cluster. Whenever you change the settings of this AEM and click **Save**, the settings will be saved to the other servers in the cluster. Therefore, you do not need to repeat the configuration in each AEM. However, not all of the AEM settings will be synchronized, because some settings are not necessary to be the same for all servers.

Figure 6.1: Cluster

6.3 Task 3: Configure the Web server for the Appeon Server cluster

6.3.1 Task 3.1: Install the Appeon Server Web Component on Web server

Step 1: Set up one or more separate Web server(s).

For detailed system requirements, refer to the **(Optional) Web server requirements** section in Installation Guide for .NET.

Step 2: Install the **Appeon Server Web Component** on each Web server.

For detailed instructions, please follow the installation instructions in **Appeon Server Web Component installation** section in Installation Guide for .NET.

6.3.2 Task 3.2: Configure the Web server with the Appeon plug-in

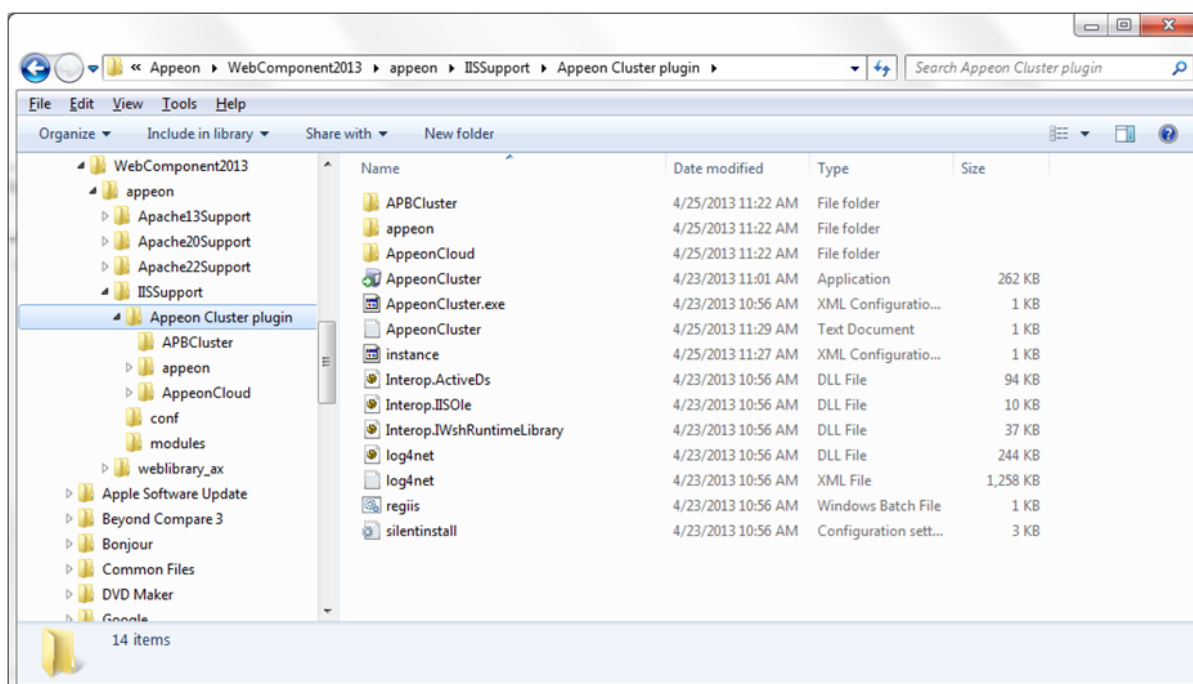
6.3.2.1 Type 1: IIS Web server

6.3.2.1.1 Method 1: Automatic configuration

Installing Appeon Cluster Plug-in

Step 1: Get the Appeon cluster plug-in installation package.

After you install **Appeon Server Web Component**, you can find the **Appeon Cluster plugin** folder under the **WebComponent2013\appeon\IISSupport** directory, and this folder is the Appeon cluster plug-in installation package, as shown in the following figure.

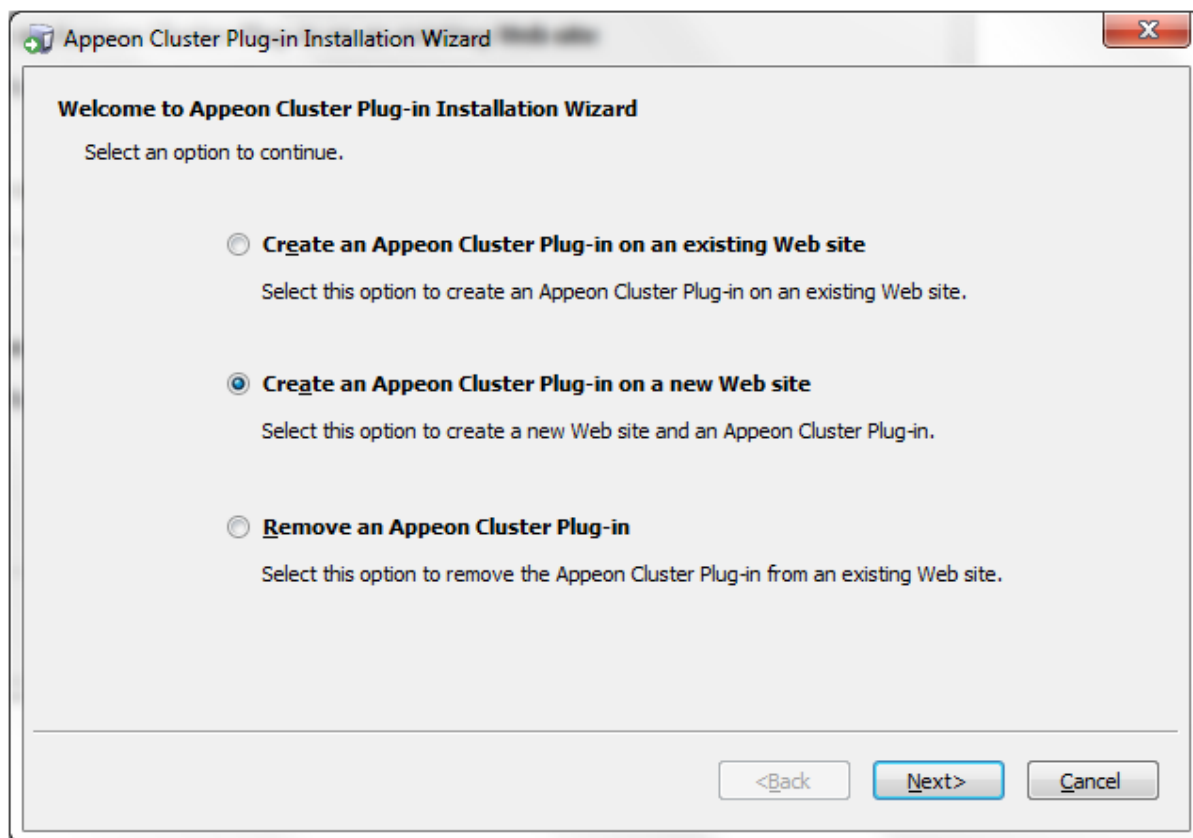
Figure 6.2: Appeon Cluster plugin

Step 2: Copy the **Appeon Cluster plugin** folder to the Web server in the cluster, and then double-click **AppeonCluster.exe** under this folder.

The **Appeon Cluster Plug-in Installation Wizard** is displayed.

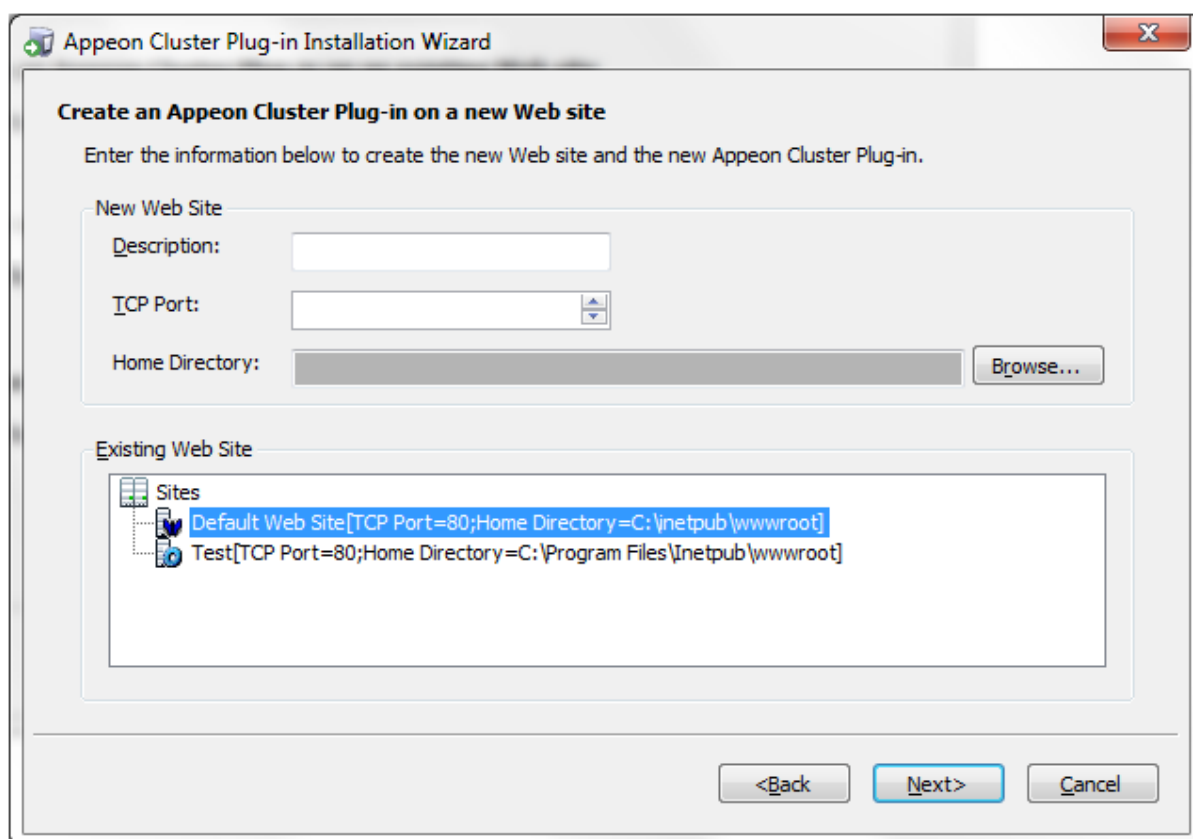
Step 3: Select **Create an Appeon Cluster Plug-in on a new Web site**, and click **Next**.

If you want to install to an existing Web site, select **Create an Appeon Cluster Plug-in on an existing Web site**, and click **Next**.

Figure 6.3: Create plugin on a Web site

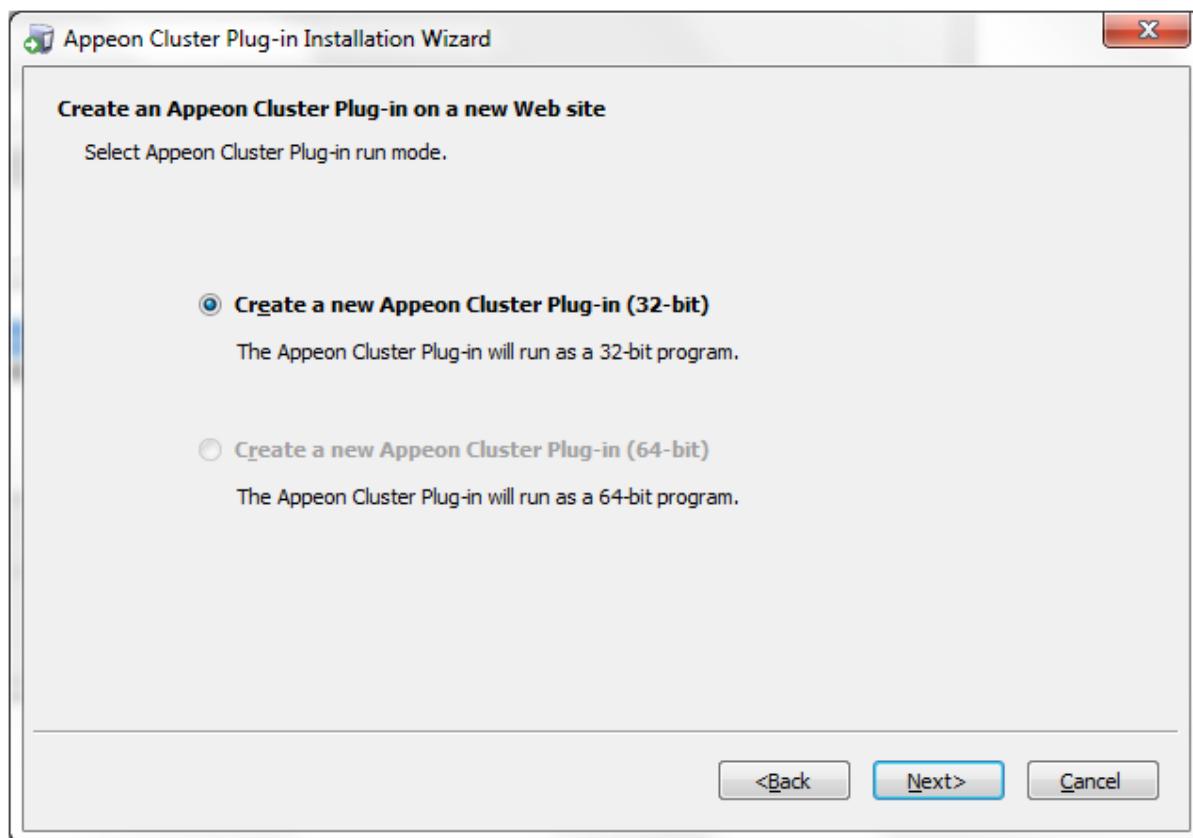
Step 4: To create the Appeon cluster plug-in on a new Web site, configure **Description**, **Port** and **Home Directory**, then click **Next**.

The new Web site will be created.

Figure 6.4: Configure the Web site

Step 5: Select to install a 32-bit or 64-bit Appeon cluster plug-in, and click **Next**. The program will detect if the server is on 32-bit OS or 64-bit OS and disable the inappropriate option.

32-bit plug-in works with 32-bit server and 64-bit server, and 64-bit plug-in works with 64-bit server only.

Figure 6.5: Select run mode

Step 6: Specify the Windows administrator user name and password, and click **Next**. Make sure to input the correct user name and password, otherwise you may not be able to access the **Appeon Cluster Manager** in the Web browser.

Figure 6.6: Windows administrator username and password

Specify the Windows administrator user name and password

Enter the username and password of an administrator group member for the IIS application pool.

The user name and password is required by Appeon Cluster Plug-in to support the cluster environment. It must be an administrator user name and password of the Windows operating system login account.

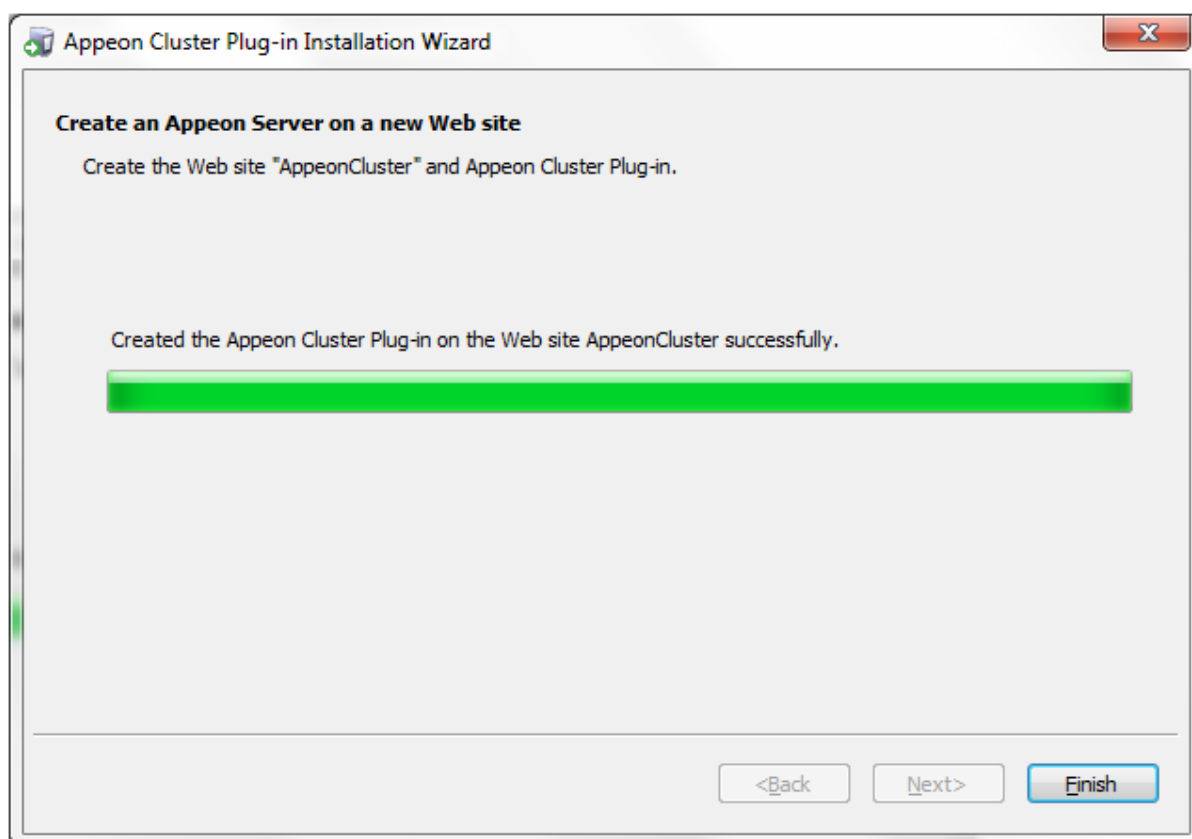
Username:

Password:

Confirm Password:

<Back Next> Cancel

Step 7: When the plug-in is created successfully, click **Finish** to exit the **Appeon Cluster Plug-in Installation Wizard**.

Figure 6.7: Create the plug-in

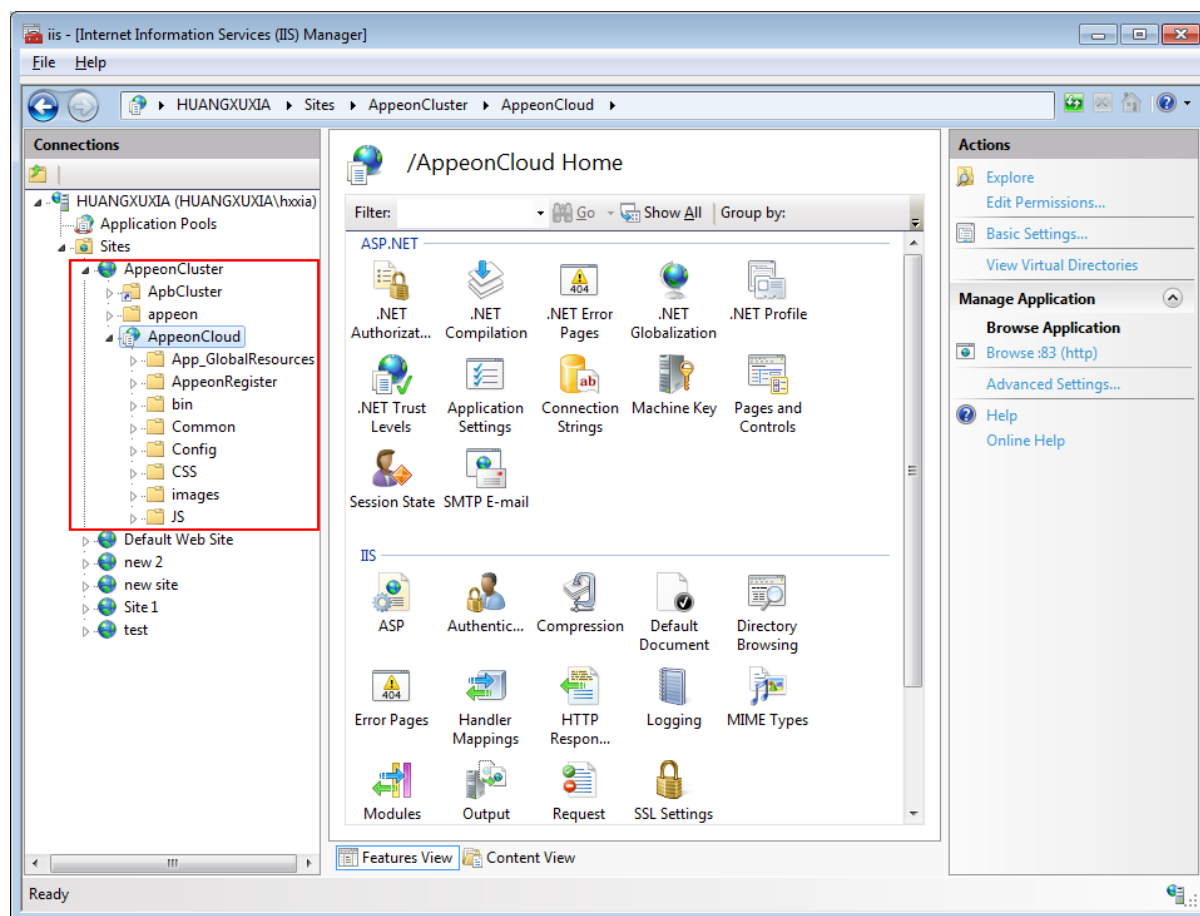
Configuring Load Balancing

After successfully installing the Appeon cluster plug-in, you can find **AppeonCloud** Web application (The application whose name contains "Cloud" also applies to non-cloud platform) under the specified IIS Web site, as shown in the figure below. You can add Appeon Servers to the cluster and configure the **load balancing** functionality via this Web application. Detailed instructions are provided below.

Another important functionality of an Appeon cluster is **failover**. To enable the **failover** functionality, you will need to go to Appeon Server AEM, add Appeon Servers to the cluster and configure the failover settings there. For details, refer to Section 5.3.3.1, "Cluster" in *Appeon Server Configuration Guide for .NET* or *Appeon Server Configuration Guide for J2EE*.

The Appeon cluster currently supports three kinds of platforms including **Local** (non-cloud platform), **Amazon Web Services** and **Windows Azure**. The **AppeonCloud** application will display different settings according to the specific platform.

Figure 6.8: IIS Manager



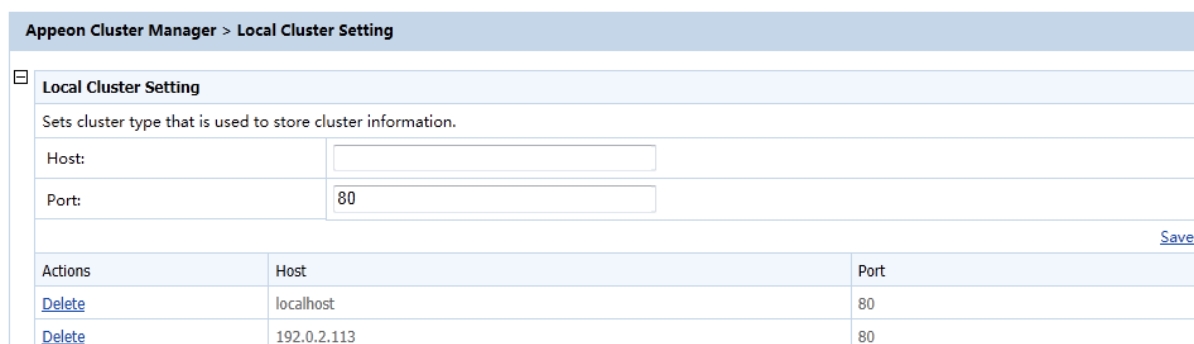
Step 1: Run the **AppeonCloud** application (browse the application in the right **Actions** pane in the IIS manager). The **Appeon Cluster Manager** displays.

Step 2: Input the username and password (both "admin") to log into the **Appeon Cluster Manager**.

Step 3: Click **Cluster Settings**. The following configuration settings will be displayed for the non-cloud platform.

- Specify the host name (or IP address) and port number of Appeon Server.
- Click **Save**. Appeon Server will be added to the cluster.

Figure 6.9: Local cluster settings



Step 4: Configure the other settings of the cluster if necessary, such as load balancing algorithm, timeout, and interval.

Figure 6.10: Cluster settings

Cluster Information Setting	
Configures information (such as load balance, timeout, etc.) that is used for Appeon Cluster.	
Load Balancing Setting:	<input type="radio"/> Random <input checked="" type="radio"/> Sequence
Timeout Setting:	<input type="text" value="120"/>
Interval Setting:	<input type="text" value="5"/>
Save	

Table 6.1: More cluster settings

Settings	Description
Load Balancing	Specify the load balancing algorithm which determined how requests will be distributed among the servers in the cluster. Random indicates that the plug-in distributes requests across Appeon Servers in random order, regardless of the status of Appeon Server; Sequence indicates that the plug-in distributes requests to Appeon Server in an allocated order.
Timeout	Specify the timeout for distributing a request, and the default value is 30 seconds.
Interval	Specify the interval (in seconds) for the plug-in to refresh the Appeon Server list.

6.3.2.1.2 Method 2: Manual configuration

Configuring Windows IIS 7.x with .NET server

Choose an existing Web site, or create a new site. The Default Web Site will be used as examples in the following guide.

1. Copying the Appeon Server Web component to the Web root of the IIS server.

During the installation of Appeon Server Web Component, an **IISSupport** folder will be created under the directory which (if you did not specify) is C:\Program Files\Appeon\WebComponent2013\appeon by default. **IISSupport** contains files and components that help IIS 7.x run with the Appeon Server cluster. Check if the **appeon\IISSupport** folder exists under the Web root of the IIS server, if not, perform the following steps to copy it from an existing Appeon Server Web Component installation directory:

Step 1: Create an **appeon** folder under the Web root of IIS server (**for example, C:\inetpub\wwwroot**).

Step 2: Copy the **IISSupport** folder from the installation path to the created **appeon** folder (for example, C:\inetpub\wwwroot\appeon).

2. Creating a virtual directory.

Step 1: Open **Control Panel | Administrative Tools | Internet Information Service (IIS) Manager**.

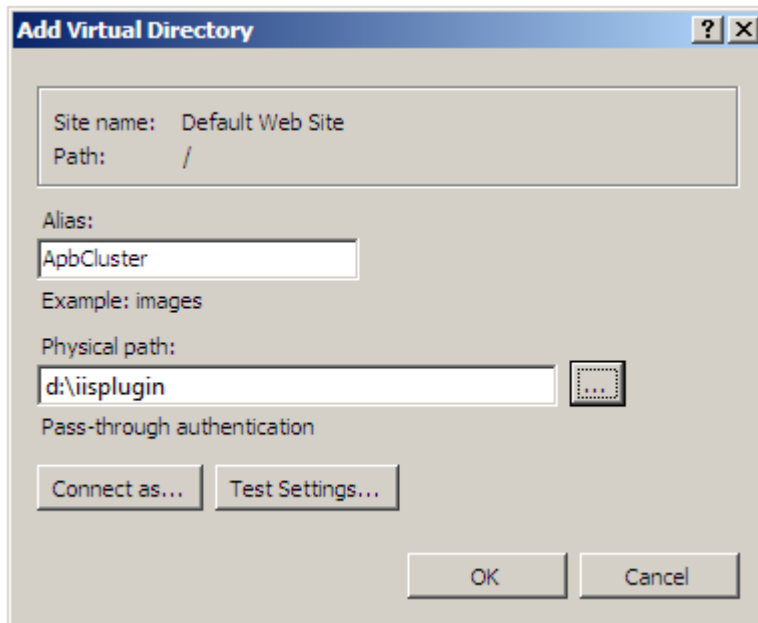
Step 2: Right click the **Default Web Site** and select **Add Virtual Directory**.

Step 3: Input the alias name, for example, "**ApbCluster**".

Step 4: Choose a local path in the **Physical** path box; for example, "d:\iisplugin".

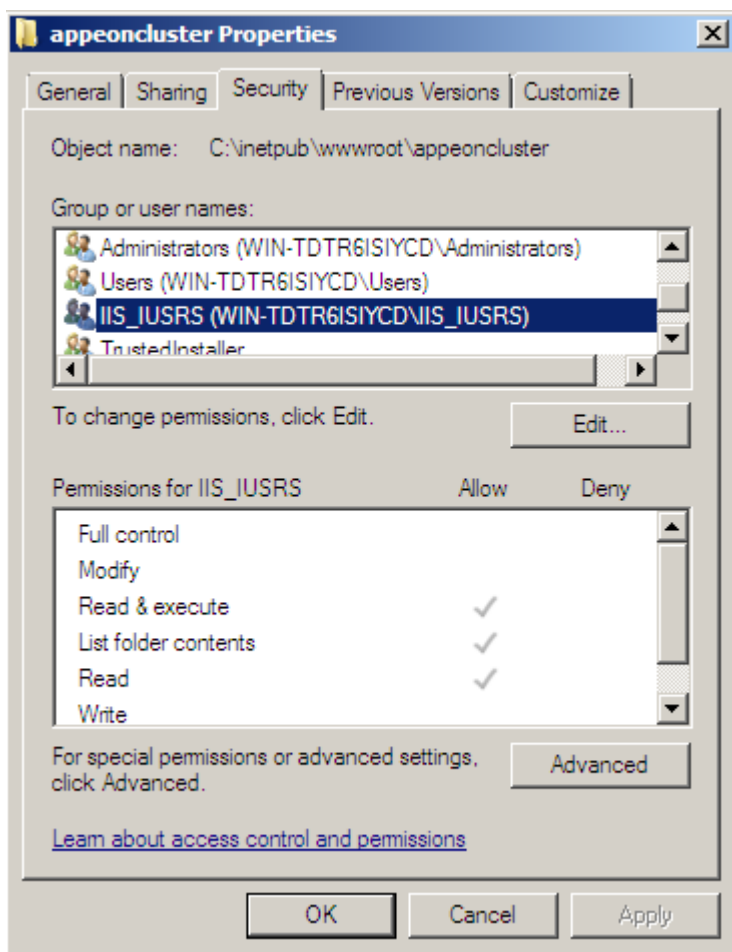
Step 5: Click **OK**.

Figure 6.11: Add virtual directory

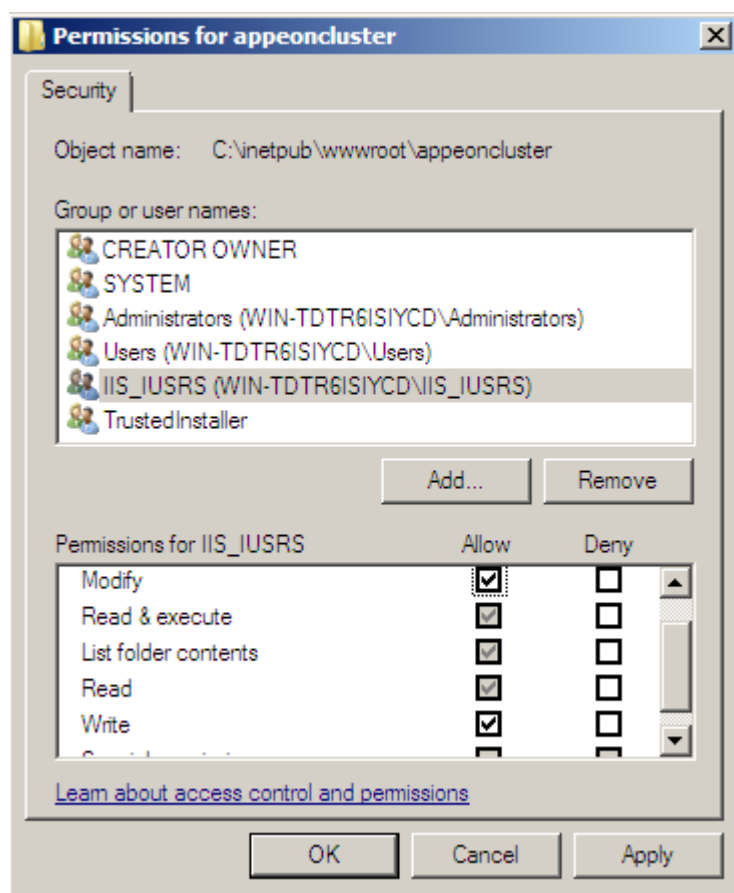


Step 6: Right click the **ApbCluster** Virtual Directory and select **Edit Permissions**.

Step 7: Choose the **Security** tab page, select **IIS_IUSRS (WIN-TDTR6ISYCD \IIS_IUSRS)** in the **Group or user names** list box, and then click the **Edit** button.

Figure 6.12: appeoncluster properties

Step 8: Select **IIS_IUSRS (WIN-TDTR6ISYCD\IIS_IUSRS)** in the **Group or user names** list box, and then select **Modify** and **Write** in the **Allow** column of the **Permissions for IIS_IUSRS** list box.

Figure 6.13: appeoncluster permissions

Step 9: Click **OK** to go back to the IIS window.

3. Copying Appeon plug-in (ApbCluster.dll or ApbCluster64.dll).

Copy the **ApbCluster.dll** (for 32-bit OS) or **ApbCluster64.dll** (for 64-bit OS) plug-in from `appeon\IISsupport\modules` to the newly created virtual directory (`d:\iisplugin` in this guide) .

In the 64-bit OS, you can either use **ApbCluster.dll** or **ApbCluster64.dll**. If you use **ApbCluster.dll**, you will need to set the **Enable 32-Bit Applications** to **True** for the **AppeonAppPool** application pool, as shown in figure below. If you use **ApbCluster64.dll**, then set this option to **False**.

4. Editing Appeon Cluster configuration file (cluster-config.xml).

Step 1: Copy the **cluster-config.xml** configuration file to the newly created virtual directory ("`d:\iisplugin`" in this guide).

`cluster-config.xml` resides in the `%appeon%\plugin\IIS` directory under the Appeon Server installation directory. You can get it from any machine with Appeon Server .NET installed.

Step 2: Modify the following information in the `cluster-config.xml` file: Appeon Server IP address, Appeon Server port number, and load balancing algorithm.

```
<?xml version="1.0" encoding="UTF-8" ?>
<cluster-config local="true" log="debug" timeout="30" polling="5"
arithmetic="sequence">
  <extention>/ApbCluster/ApbCluster.dll</extention>
  <filters>
    <filter>/AEM</filter>
    <filter>/servlet</filter>
    <filter>/reportfile</filter>
    <filter>/imagefile</filter>
    <filter>/dwfile</filter>
    <filter>/ajsdown</filter>
  </filters>
  <servers>
    <server host="192.0.0.168" port="88" />
    <server host="192.0.3.131" port="80" />
    <server host="192.0.3.145" port="80" />
  </servers>
</cluster-config>
```

Notes:

- **Local** specifies whether to read the configurations on the local server or the cloud server. For the cloud server, set **Local** to **False**.
- **log** specifies the level of information to be recorded in the log file. It can be set to the following level: **debug**, **info**, **warning**, **error**, or **off**.
- **timeout** specifies the number of seconds the Web server waits between sending an HTTP request to Appeon Server and receiving information from it. The HTTP connection timeout value is 2 times of this value.
- **polling** indicates the number of seconds when the configurations will be read again.
- **arithmetic**="random" indicates that the random algorithm is used to pick an Appeon Server; **arithmetic**="sequence" indicates that the round-robin algorithm is used.
- **extention** specifies the location of the virtual directory which contains ApbCluster.dll (or ApbCluster64.dll), that is /virtual-directory-alias-name/ApbCluster.dll (/ApbCluster/ApbCluster.dll in this guide).
- **filter** specifies the type of pages to redirect.
- **host** indicates the IP address (recommended) or machine name of the Appeon Server.
- **port** indicates the port number of the Appeon Server.

5. Installing Appeon plug-in as ISAPI Filters.

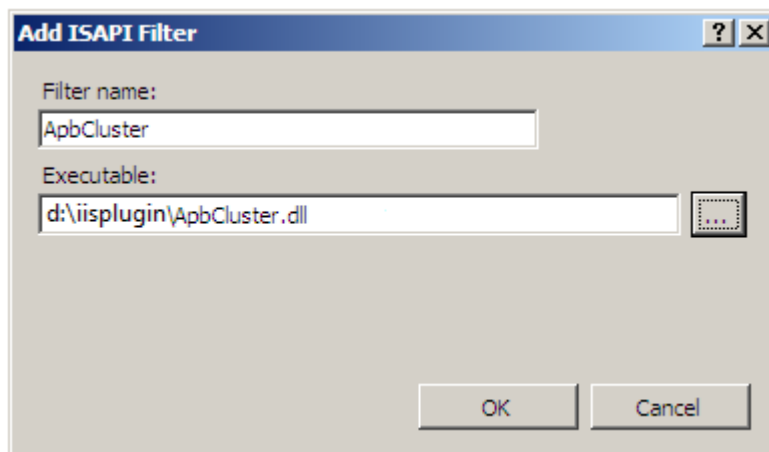
Step 1: Open **Control Panel | Administrative Tools | Internet Information Services (IIS) Manager**.

Step 2: Click the **Default Web Site** and then double-click **ISAPI Filters** on the right side.

Step 3: Right-click the blank area on the **ISAPI Filters** page, and click **Add**.

Step 4: Input **ApbCluster** in the **Filter name** box and specify **ApbCluster.dll** (or **ApbCluster64.dll**) as the ISAPI filter in the **Executable** box (d:\iisplugin\ApbCluster.dll in this guide). Click **OK**.

Figure 6.14: Add ISAPI filter



6. Creating the redirector configuration file.

Step 1: Create the redirector configuration file as the name **ApbCluster.cfg** under the virtual directory (d:\iisplugin in this guide).

Step 2: Copy and paste the following to the file:

```
Extension_URI=/ApbCluster/ApbCluster.dll
MatchExpression=/AEM
MatchExpression=/servlet
MatchExpression=/reportfile
MatchExpression=/imagefile
MatchExpression=/dwfile
MatchExpression=/ajsdwn
Log=On
```

Notes:

- The **Extension_URI** command points to the virtual directory where ApbCluster.dll resides, that is /virtual-directory-alias-name/ApbCluster.dll (/ApbCluster/ApbCluster.dll in this guide).
- The **MatchExpression** command specifies the pages to be redirected.
- The **Log** command specifies whether logging is enabled. On indicates logging is enabled; Off indicates logging is disabled.
- The **TimeOut** command specifies the number of seconds the Web server waits between sending an HTTP request to Apeon Server and receiving information from it. The HTTP connection timeout value is 2 times of this value.
- The commands and parameters are case insensitive.

7. Setting ISAPI and CGI Restrictions.

Step 1: Open **Control Panel | Administrative Tools | Internet Information Services (IIS) Manager**.

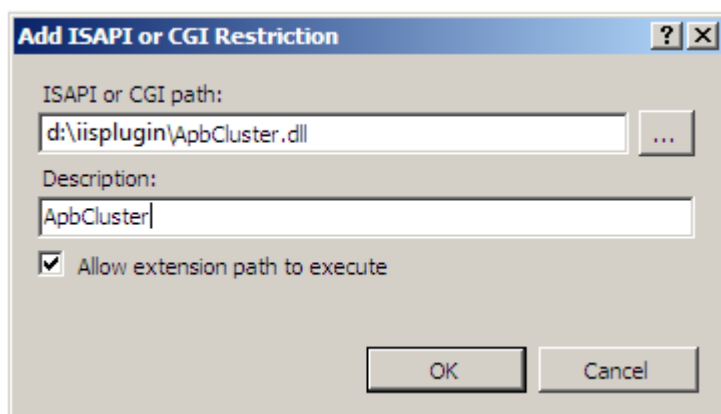
Step 2: Right-click the local machine, and then double-click **ISAPI and CGI Restrictions** on the right side.

Step 3: Right-click the blank area of the **ISAPI and CGI Restrictions** page and click **Add**.

Step 4: Specify the local path of **ApbCluster.dll** (or **ApbCluster64.dll**) in the **ISAPI or CGI path** box and input **ApbCluster** in the **Description** box, and then select **Allow extension path to execute**.

Step 5: Click **OK**.

Figure 6.15: Add ISAPI or CGI



8. Enabling ISAPI-dll.

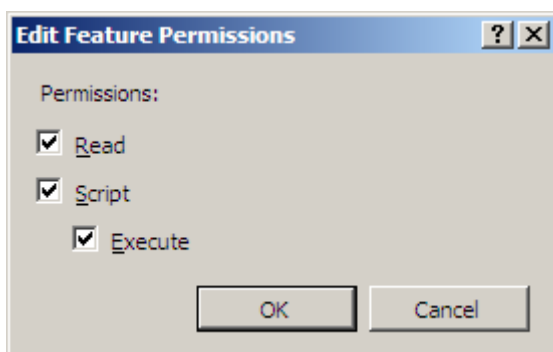
Step 1: Open **Control Panel | Administrative Tools | Internet Information Services (IIS) Manager**.

Step 2: Expand the **Default Web Site**, click **ApbCluster**, and then double-click **Handler Mappings** on the right side.

Step 3: Right-click **ISAPI-dll**, and select **Edit Feature Permissions**.

Step 4: Select **Read**, **Script**, **Execute**, and click **OK**.

Figure 6.16: Edit feature permissions



9. Adding MIME type.

Add a MIME type for loading the files with no extensions or MIME type definition.

Step 1: Click the **Default Web Site** and then double-click **MIME Types** on the right of the page.

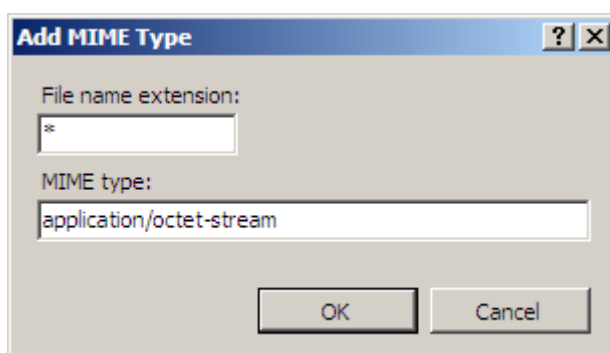
Step 2: Right-click the blank area of the **MIME Types** page, and click **Add**.

Step 3: Specify the following settings:

- Extension: *
- MIME Type: application/octet-stream

Step 4: Click **OK**.

Figure 6.17: Add MIME type



10. Restarting IIS.

Restart IIS to make the new settings effective.

Configuring Windows IIS 6.0 with .NET server

Choose an existing Web site, or create a new site. The following takes the existing Default Web Site as an example.

1. Copying the Appeon Server Web component to the Web root of the IIS server.

During the installation of Appeon Server Web Component, an **IISSupport** folder will be created under the directory which (if you did not specify) is C:\Program Files\Appeon\WebComponent2013\appeon by default. **IISSupport** contains files and components that help IIS 6.0 run with the Appeon Server cluster. Check if the **appeon\IISSupport** folder exists under the Web root of the IIS server, if not, perform the following steps to copy it from an existing Appeon Server Web Component installation directory:

Step 1: Create an **appeon** folder under the Web root of IIS server (**for example, C:\inetpub\wwwroot**).

Step 2: Copy the **IISSupport** folder from the installation path to the created **appeon** folder (**for example, C:\inetpub\wwwroot\appeon**).

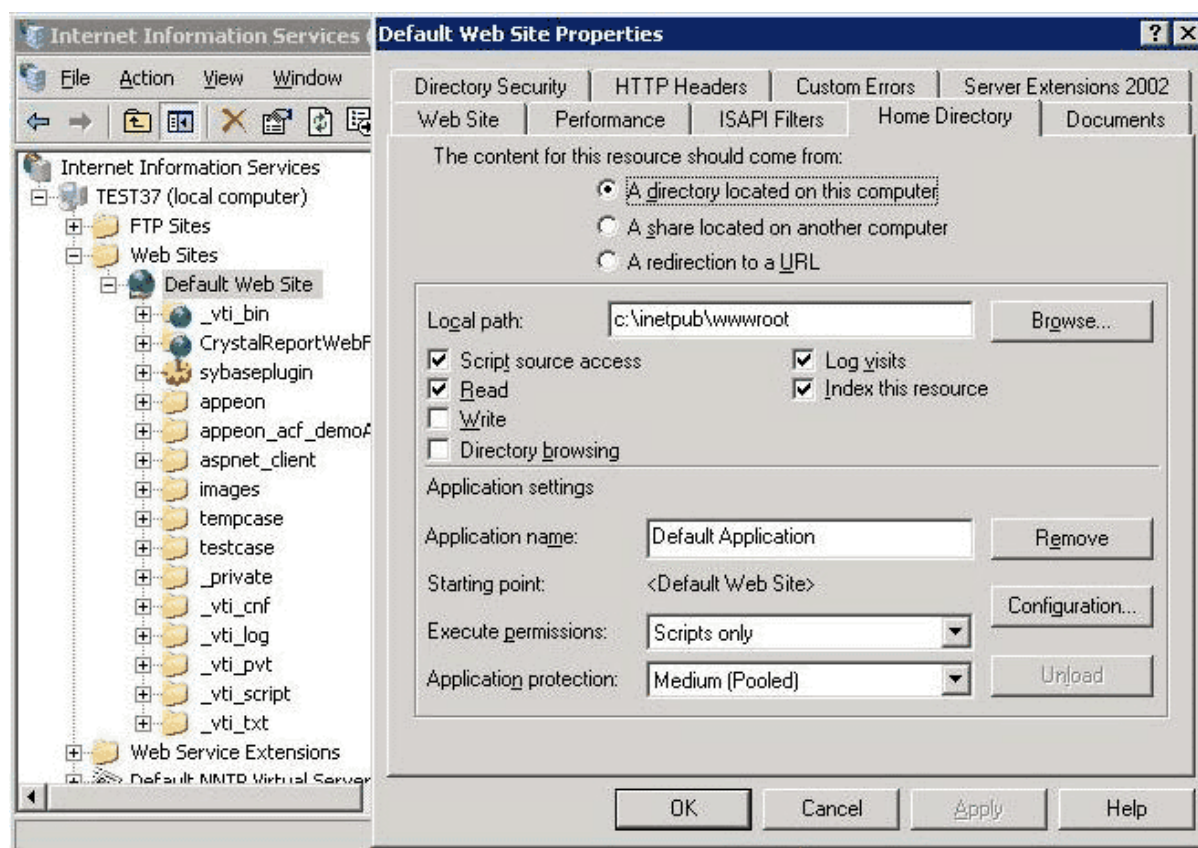
2. Specifying properties of IIS Web site.

Step 1: Open **Control Panel | Administrative Tools | Internet Service Manager**.

Step 2: Right click **Web Sites | Default Web Site** and select **Properties**.

Step 3: In the **Default Web Site Properties** window, select the **Home Directory** tab and set the **Execute permissions** to **Scripts only**.

Figure 6.18: Web site properties

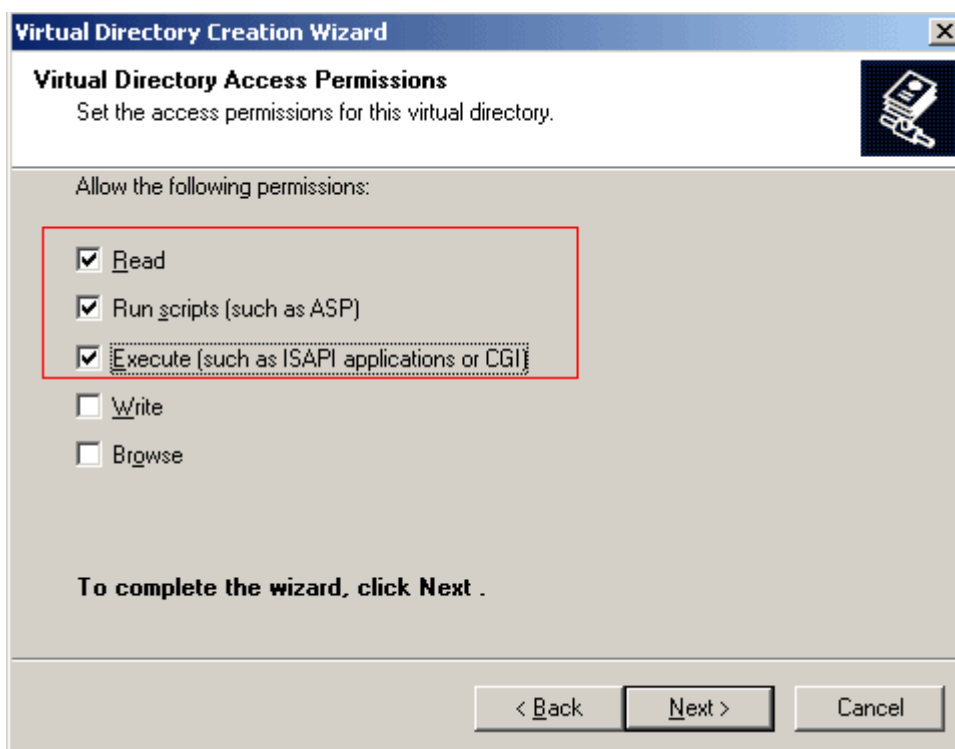


3. Creating virtual directory.

Step 1: Right click the **Default Web Site** and select **New | Virtual Directory**.

Step 2: Input the alias name (for example, "ApbCluster"), and select a mapping directory (for example, "d:\iisplugin").

Step 3: Allow the following permissions to the mapping directory: **Read**, **Run scripts (such as ASP)**, and **Execute (such as ISAPI application or CGI)**

Figure 6.19: Virtual directory

4. Copying Appeon plug-in.

Copy the **ApbCluster.dll** (for 32-bit OS) or **ApbCluster64.dll** (for 64-bit OS) plug-in from **appeon\IISSupport\modules** to the newly created virtual directory (d:\iisplugin in this guide) .

In the 64-bit OS, you can either use **ApbCluster.dll** or **ApbCluster64.dll**. If you use **ApbCluster.dll**, you will need to set the **Enable 32-Bit Applications** to **True** for the **AppeonAppPool** application pool, as shown in figure below. If you use **ApbCluster64.dll**, then set this option to **False**.

5. Editing Appeon Cluster configuration file.

Step 1: Copy the configuration file **Cluster-config.xml** to the newly created virtual directory ("d:\iisplugin" in this guide).

cluster-config.xml resides in the %appeon%\plugin\IIS directory under the Appeon Server installation directory. You can get it from any machine with Appeon Server .NET installed.

Step 2: Modify the following information in the cluster-config.xml file: Appeon Server IP address, Appeon Server port number, and load balancing algorithm, etc.

```
<?xml version="1.0" encoding="UTF-8" ?>
<cluster-config local="true" log="debug" timeout="30" polling="5"
arithmetic="sequence">
  <extention>/ApbCluster/ApbCluster.dll</extention>
  <filters>
    <filter>/AEM</filter>
    <filter>/servlet</filter>
    <filter>/reportfile</filter>
    <filter>/imagefile</filter>
    <filter>/dwfile</filter>
    <filter>/ajsdown</filter>
  </filters>
  <servers>
    <server host="192.0.0.168" port="88" />
    <server host="192.0.3.131" port="80" />
    <server host="192.0.3.145" port="80" />
  </servers>
</cluster-config>
```

Notes:

- **Local** specifies whether to read the configurations on the local server or the cloud server. For the cloud server, set **Local** to **False**.
- **log** specifies the level of information to be recorded in the log file. It can be set to the following level: **debug**, **info**, **warning**, **error**, or **off**.
- **timeout** specifies the number of seconds the Web server waits between sending an HTTP request to Appeon Server and receiving information from it. The HTTP connection timeout value is 2 times of this value.
- **polling** indicates the number of seconds when the configurations will be read again.
- **arithmetic**="random" indicates that the random algorithm is used to pick an Appeon Server; **arithmetic**="sequence" indicates that the round-robin algorithm is used.
- **extention** specifies the location of the virtual directory which contains ApbCluster.dll (or ApbCluster64.dll), that is /virtual-directory-alias-name/ApbCluster.dll (/ApbCluster/ApbCluster.dll in this guide).
- **filter** specifies the type of pages to redirect.
- **host** indicates the IP address (recommended) or machine name of the Appeon Server.
- **port** indicates the port number of the Appeon Server.

6. Installing IIS filter.

Step 1: Right click the **Default Web Site** and select **Properties**.

Step 2: In the **Default Web Site Properties** window, select the **ISAPI Filters** tab. Click **Add** to add **ApbCluster.dll** (or **ApbCluster64.dll**) as the ISAPI filter. Click **OK**.

7. Creating redirector configuration file.

Create the redirector configuration file as the name **ApbCluster.cfg** under the virtual directory d:\iisplugin and copy the following commands to the file:

```
Extension_URI=/ApbCluster/ApbCluster.dll
MatchExpression=/AEM
MatchExpression=/servlet
MatchExpression=/reportfile
MatchExpression=/imagefile
MatchExpression=/dwfile
MatchExpression=/ajsdwn
Log=On
```

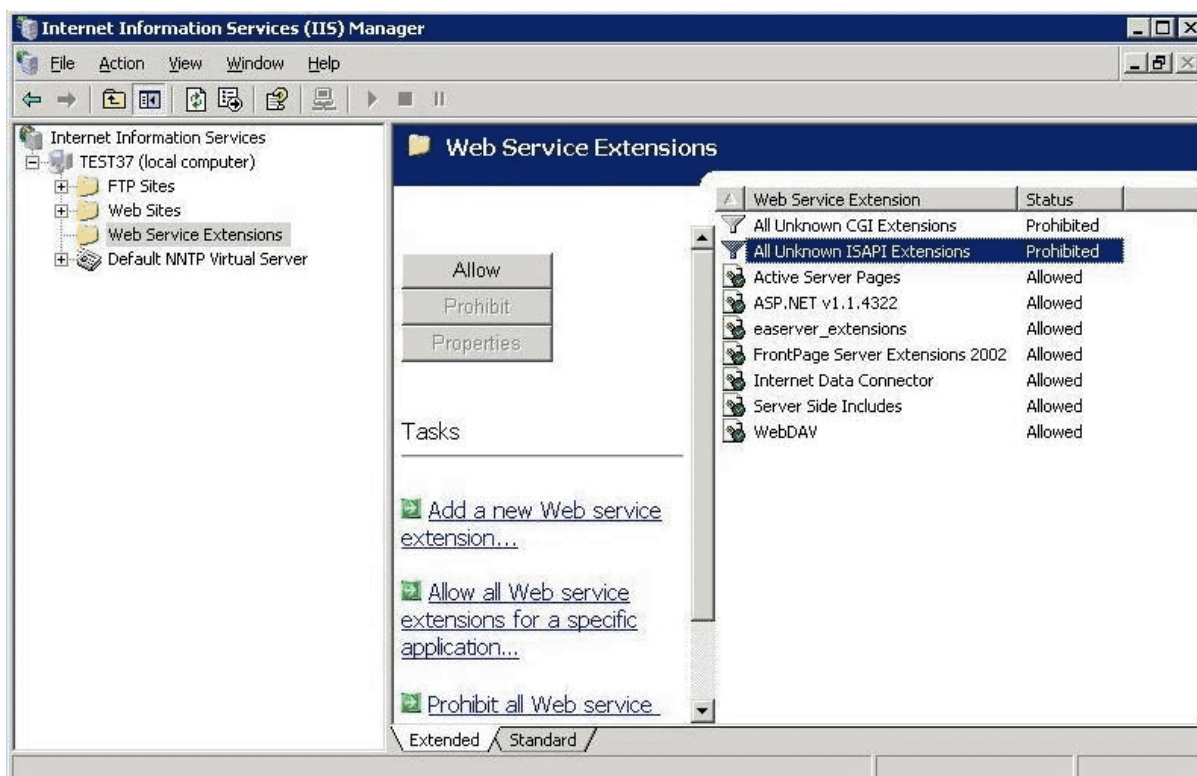
Notes:

- The **Extension_URI** command points to the virtual directory where ApbCluster.dll resides (/ApbCluster/ApbCluster.dll in this example).
- The **MatchExpression** command specifies the pages to be redirected.
- The **Log** command specifies whether logging is enabled. On indicates logging is enabled; Off indicates logging is disabled.
- The **TimeOut** command specifies the number of seconds the Web server waits between sending an HTTP request to Appeon Server and receiving information from it. The HTTP connection timeout value is 2 times of this value.
- The commands and parameters are case insensitive.

8. Activating ISAPI.

Step 1: Select the **Web Services Extension**. The ISAPI status will be displayed on the right.

Step 2: Select **All Unknown ISAPI Extensions** and click the **Allow** button.

Figure 6.20: Allow ISAPI

9. Adding new MIME type.

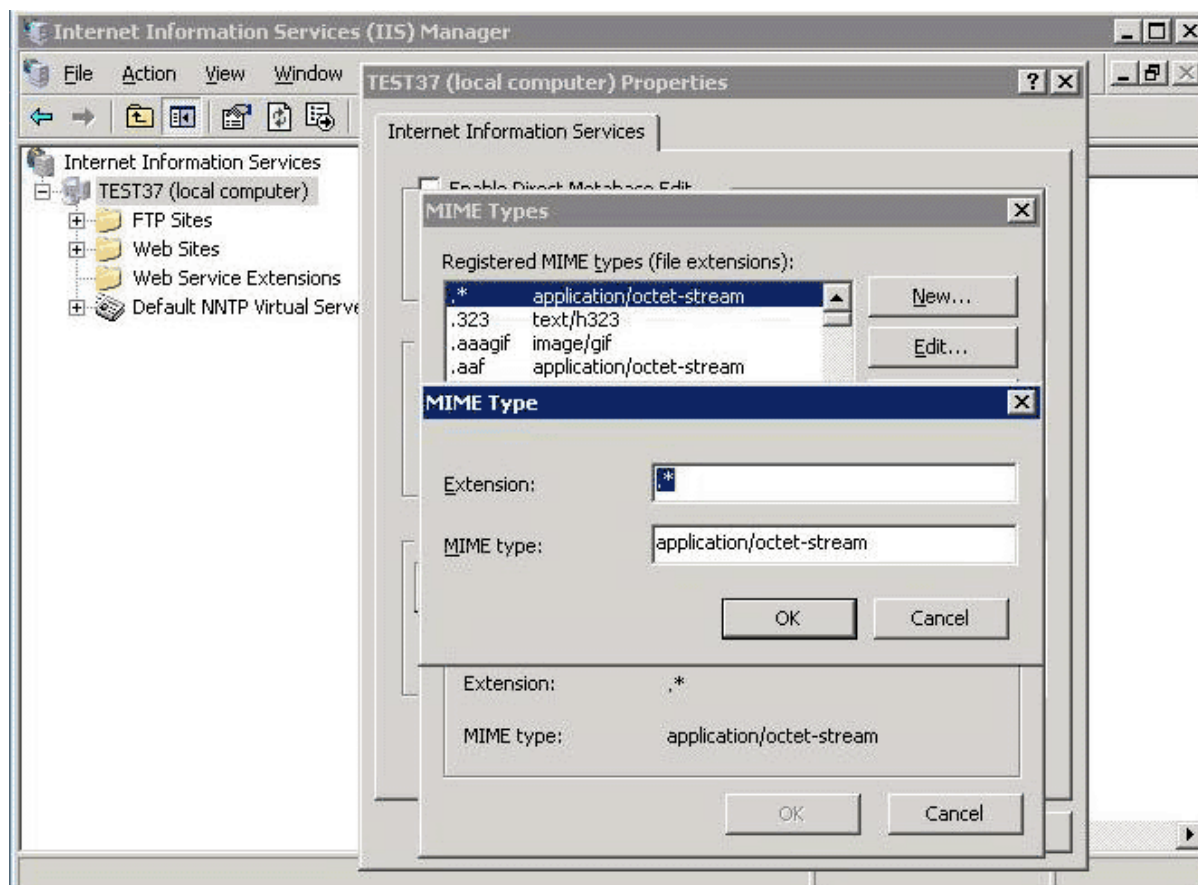
Step 1: Right click the Local computer and select **Properties**.

Step 2: In the properties window, click the **MIME Types** button. In the **MIME Types** window, click **New**.

Input the following information:

- Extension: *
- MIME type: application/octet-stream

This is to ensure that pages without extension names or pages without MIME types defined can be accessed.

Figure 6.21: MIME Types

10. Restarting IIS.

Restart IIS to make the new settings effective.

Configuring IIS 7.x with J2EE server

J2EE servers refer to Java servers, such as EAServer, WebLogic, WebSphere, JBoss, JEUS etc. The configuration is the same for the J2EE application servers than Apeon supports.

Choose an existing Web site, or create a new site. The Default Web Site will be used as examples in the following guide.

1. Copying the Apeon Server Web component to the Web root of the IIS server.

During the installation of Apeon Server Web Component, an **IISSupport** folder will be created under the directory which (if you did not specify) is C:\Program Files\Apeon\WebComponent2013\apeon by default. **IISSupport** contains files and components that help IIS 7.x run with the Apeon Server cluster. Check if the **apeon\IISSupport** folder exists under the Web root of the IIS server, if not, perform the following steps to copy it from an existing Apeon Server Web Component installation directory:

Step 1: Create an **apeon** folder under the Web root of IIS server (for example, C:\inetpub\wwwroot).

Step 2: Copy the **IISSupport** folder from the installation path to the created **apeon** folder (for example, C:\inetpub\wwwroot\apeon).

2. Creating a virtual directory.

Step 1: Open **Control Panel | Administrative Tools | Internet Information Service (IIS) Manager**.

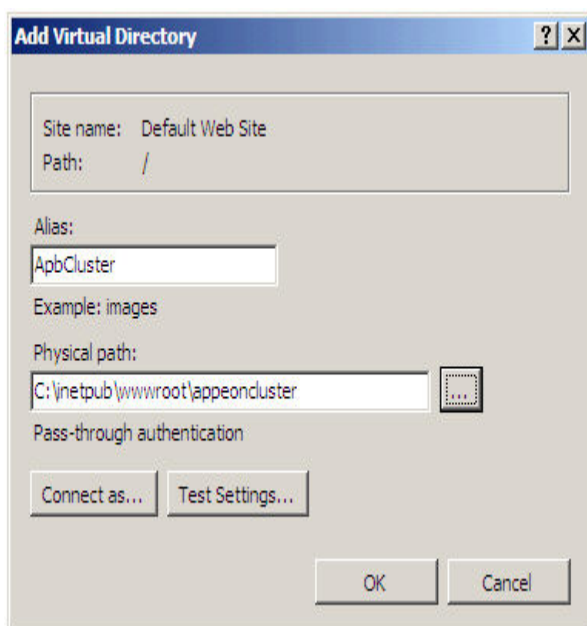
Step 2: Right click the **Default Web Site** and select **Add Virtual Directory**.

Step 3: Input the alias name, for example, "**ApbCluster**".

Step 4: Choose a local path in the **Physical** path box; for example, "d:\iisplugin".

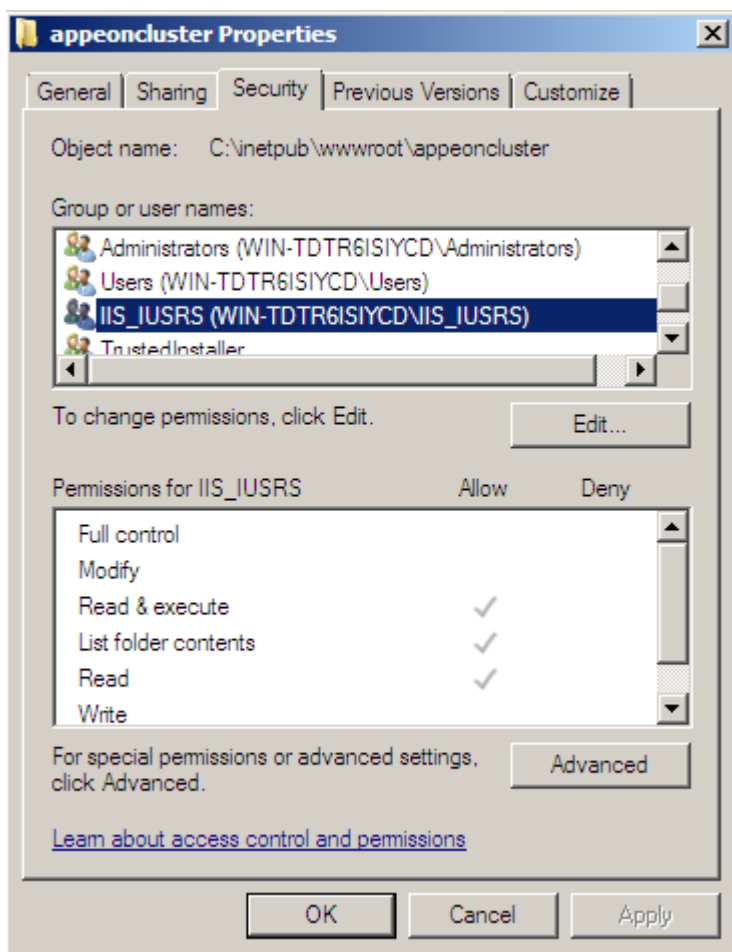
Step 5: Click **OK**.

Figure 6.22: Add virtual directory

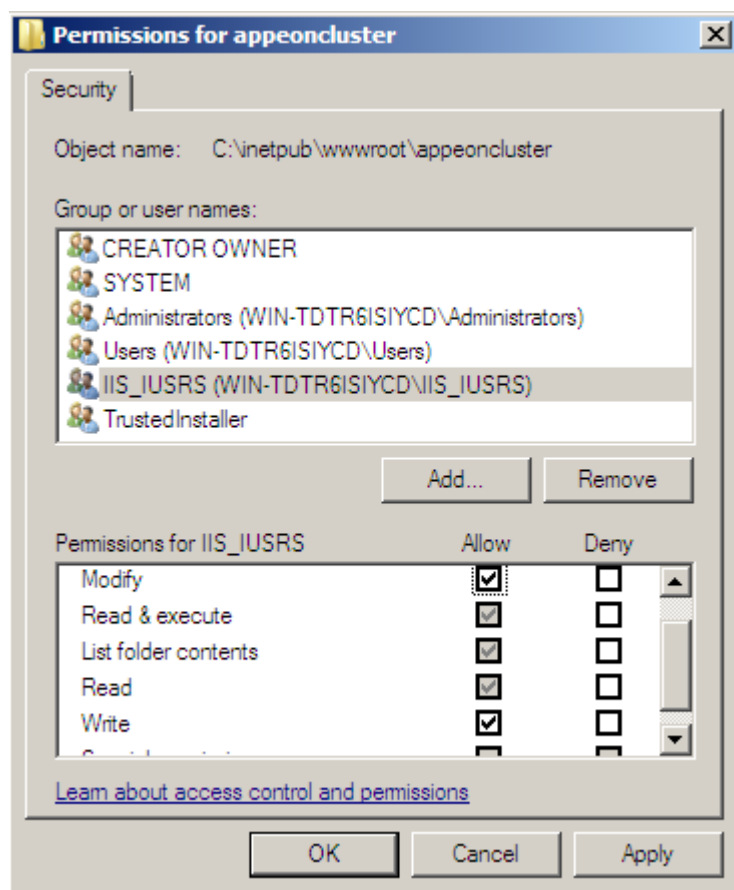


Step 6: Right click the **ApbCluster** Virtual Directory and select **Edit Permissions**.

Step 7: Choose the **Security** tab page, select **IIS_IUSRS (WIN-TDTR6ISYCD \IIS_IUSRS)** in the **Group or user names** list box, and then click the **Edit** button.

Figure 6.23: appeoncluster properties

Step 8: Select **IIS_IUSRS (WIN-TDTR6ISYCD\IIS_IUSRS)** in the **Group or user names** list box, and then select **Modify** and **Write** in the **Allow** column of the **Permissions for IIS_IUSRS** list box.

Figure 6.24: appeoncluster properties

Step 9: Click **OK** to go back to the IIS window.

3. Copying Appeon plug-in (ApbCluster.dll or ApbCluster64.dll).

Step 1: Copy the **ApbCluster.dll** (for 32-bit OS) or **ApbCluster64.dll** (for 64-bit OS) plug-in from `appeon\IISsupport\modules`.

Step 2: Paste it to the newly created virtual directory: `C:\inetpub\wwwroot\appeoncluster` in this guide.

In the 64-bit OS, you can either use **ApbCluster.dll** or **ApbCluster64.dll**. If you use **ApbCluster.dll**, you will need to set the **Enable 32-Bit Applications** to **True** for the **AppeonAppPool** application pool, as shown in figure below. If you use **ApbCluster64.dll**, then set this option to **False**.

4. Copying Appeon Cluster configuration file (cluster-config.xml).

Step 1: Copy the **cluster-config.xml** file from `%appeon%\repository\<instancename>\config`. `%appeon%` is the installation directory of Appeon Server, and `<instancename>` refers to the name of a server instance.

Step 2: Paste it into the newly created virtual directory: `C:\inetpub\wwwroot\appeoncluster` in this guide.

Note: The **cluster-config.xml** file acts as the redirector configuration file as it helps Web server redirect requests to Appeon Servers according to the IP addresses of Appeon

Servers, the ports and load balancing algorithm that it stores. This file cannot be modified manually and is automatically updated when you change the settings in the Cluster tool of AEM. Each time after you change the settings, be sure to copy this file and replace the old file in the virtual directory and restart IIS.

5. Installing Appeon plug-in as ISAPI Filters.

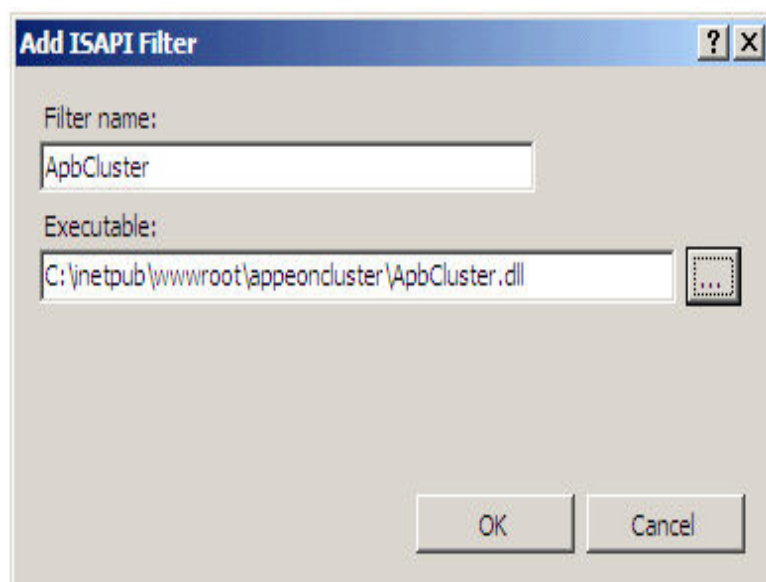
Step 1: Open **Control Panel | Administrative Tools | Internet Information Service (IIS) Manager**.

Step 2: Click the **Default Web Site** and then double-click **ISAPI Filters** on the right side.

Step 3: Right-click the blank area on the **ISAPI Filters** page, and click **Add**.

Step 4: Input **ApbCluster** in the Filter name box and specify **ApbCluster.dll** (or **ApbCluster64.dll**) as the ISAPI filter in the **Executable** box (*C:\inetpub\wwwroot\appeoncluster\ApbCluster.dll* in this guide). Click **OK**.

Figure 6.25: Add ISAPI filter



6. Creating the redirector configuration file.

Step 1: Create the redirector configuration file as the name **ApbCluster.cfg** under the virtual directory (*C:\inetpub\wwwroot\appeoncluster*) in this guide.

Step 2: Copy and paste the following to the file:

```
Extension_URI=/ApbCluster/ApbCluster.dll
MatchExpression=/AEM
MatchExpression=/servlet
MatchExpression=/reportfile
MatchExpression=/imagefile
MatchExpression=/dwfile
MatchExpression=/ajsdown
Log=On
```

Notes:

- The **Extension_URI** command specifies the location of the virtual directory which contains ApbCluster.dll (or ApbCluster64.dll), that is /virtual-directory-alias-name/ApbCluster.dll (/ApbCluster/ApbCluster.dll in this guide).
- The **MatchExpression** commands specify the type of pages to redirect.
- The **Log** command specifies whether to enable logging.
- The **TimeOut** command specifies the number of seconds the Web server waits between sending an HTTP request to Appeon Server and receiving information from it. The HTTP connection timeout value is 2 times of this value.
- **The commands and parameters are case insensitive.**

7. Setting ISAPI and CGI Restrictions.

Step 1: Open **Control Panel | Administrative Tools | Internet Information Services (IIS) Manager**.

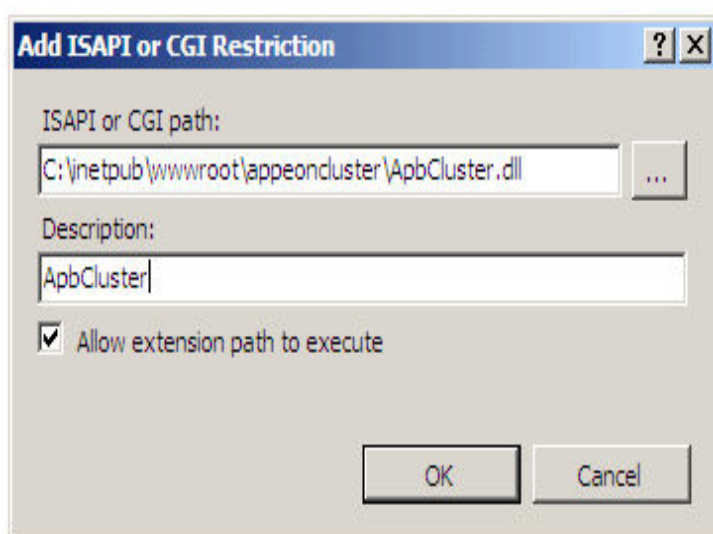
Step 2: Right-click the local machine, and then double-click **ISAPI and CGI Restrictions** on the right side.

Step 3: Right-click the blank area of the **ISAPI and CGI Restrictions** page and click **Add**.

Step 4: Specify the local path of **ApbCluster.dll** (or **ApbCluster64.dll**) in the **ISAPI or CGI path** box and input **ApbCluster** in the **Description** box, and then select **Allow extension path to execute**.

Step 5: Click **OK**.

Figure 6.26: Add ISAPI or CGI



8. Enabling ISAPI-dll.

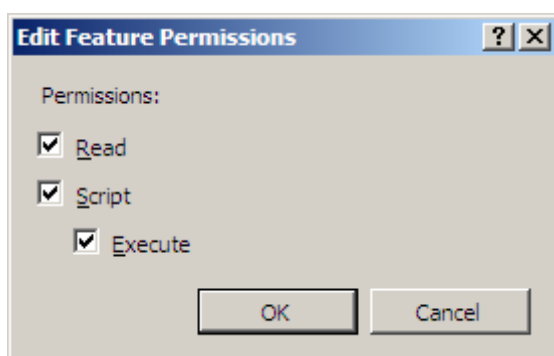
Step 1: Open **Control Panel | Administrative Tools | Internet Information Services (IIS) Manager**.

Step 2: Expand the **Default Web Site**, click **ApbCluster**, and then double-click **Handler Mappings** on the right side.

Step 3: Right-click **ISAPI-dll**, and select **Edit Feature Permissions**.

Step 4: Select **Read**, **Script**, **Execute**, and click **OK**.

Figure 6.27: Edit feature permissions



9. Adding MIME type.

Add a MIME type for loading the files with no extensions or MIME type definition.

Step 1: Click the **Default Web Site** and then double-click **MIME Types** on the right of the page.

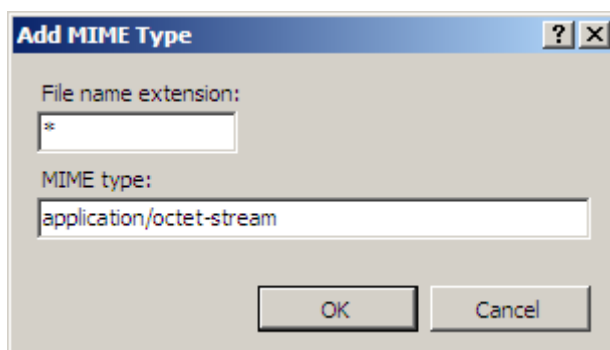
Step 2: Right-click the blank area of the **MIME Types** page, and click **Add**.

Step 3: Specify the following settings:

- Extension: *
- MIME Type: application/octet-stream

Step 4: Click **OK**.

Figure 6.28: Add MIME type



10. Restarting IIS.

Restart IIS to make the new settings effective.

Configuring IIS 6.0 with J2EE server

J2EE servers refer to Java servers, such as EAServer, WebLogic, WebSphere, JBoss, JEUS etc. The configuration is the same for the J2EE application servers that Appeon supports.

Choose an existing Web site, or create a new site. The following takes the existing Default Web Site as an example.

1. Copying the Appeon Server Web component to the Web root of the IIS server.

During the installation of Appeon Server Web Component, an **IISSupport** folder will be created under the directory which (if you did not specify) is *C:\Program Files\Appeon\WebComponent2013\appeon* by default. **IISSupport** contains files and components that help IIS 7.x run with the Appeon Server cluster. Check if the **appeon\IISSupport** folder exists under the Web root of the IIS server, if not, perform the following steps to copy it from an existing Appeon Server Web Component installation directory:

Step 1: Create an **appeon** folder under the Web root of IIS server (for example, **C:\inetpub\wwwroot**).

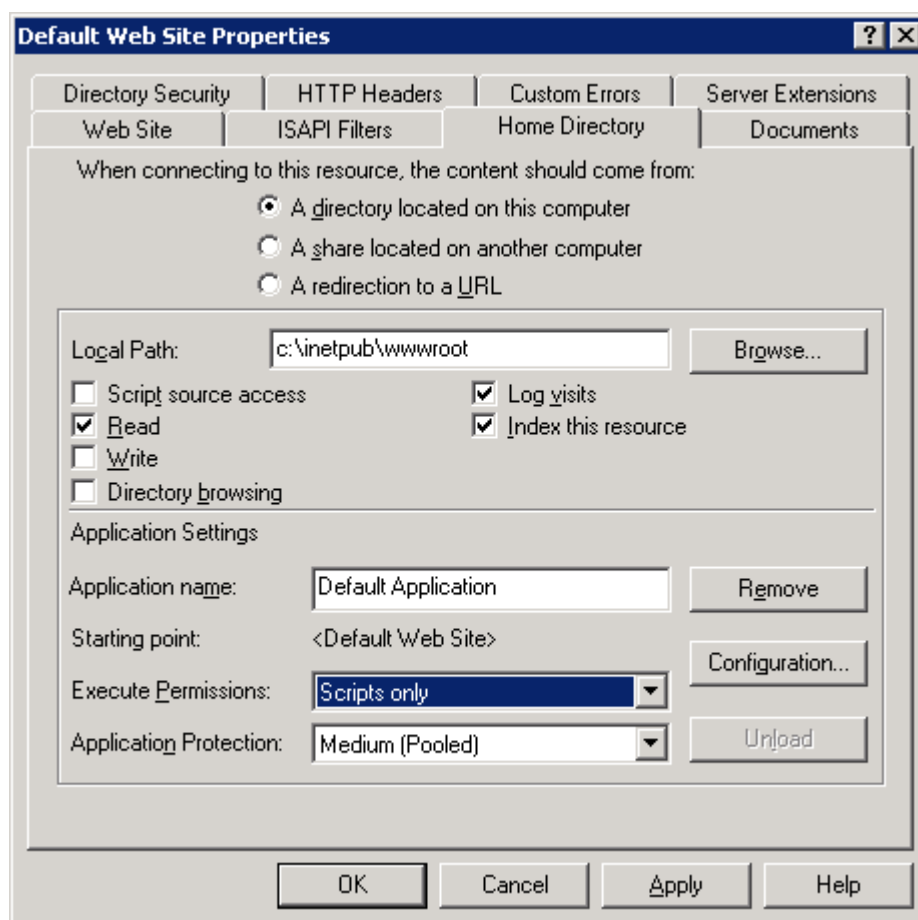
Step 2: Copy the **IISSupport** folder from the installation path to the created **appeon** folder (for example, **C:\inetpub\wwwroot\appeon**).

2. Specifying properties of IIS Web site.

Step 1: Open **Control Panel | Administrative Tools | Internet Information Service (IIS) Manager**.

Step 2: Right click the **Default Web Site** and select **Add Virtual Directory**.

Step 3: Click the **Home Directory** tab and select **Scripts only** in the **Execute Permissions** dropdown list.

Figure 6.29: Default Web site properties

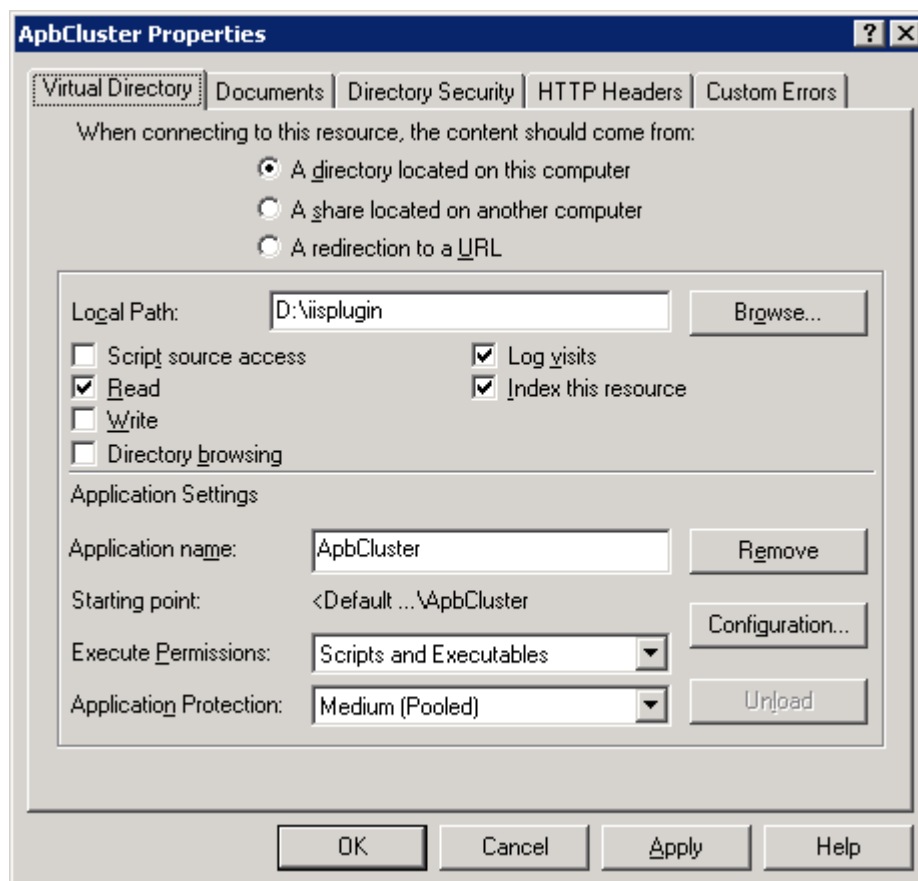
3. Creating a virtual directory.

Step 1: Right click the **Default Web Site** and select **New**.

Step 2: Click the **Virtual Directory** tab and input **ApbCluster** in the **Application name** box.

Step 3: Choose a local path; for example, *d:\iisplugin*.

Step 4: Enable read, run script, and execute on the virtual directory. Or select **Read** and selecting **Scripts and Executables** from the **Execute Permissions** dropdown list.

Figure 6.30: Apbcluster properties

4. Copying Apeon plug-in.

Step 1: Copy the **ApbCluster.dll** (for 32-bit OS) or **ApbCluster64.dll** (for 64-bit OS) plug-in from **apeon\IISSupport\modules**.

Step 2: Paste it to the virtual directory: *d:\iisplugin*.

In the 64-bit OS, you can either use **ApbCluster.dll** or **ApbCluster64.dll**. If you use **ApbCluster.dll**, you will need to set the **Enable 32-Bit Applications** to **True** for the **ApeonAppPool** application pool, as shown in figure below. If you use **ApbCluster64.dll**, then set this option to **False**.

5. Copying Apeon Cluster configuration file (cluster-config.xml).

Step 1: Copy the **cluster-config.xml** file from *%apeon%\repository\<instancename>\config*. *%apeon%* is the installation directory of Apeon Server, and *<instancename>* refers to the name of a server instance.

Step 2: Paste it to the virtual directory: *d:\iisplugin*.

Note: The **cluster-config.xml** file acts as the redirector configuration file as it helps Web server redirect requests to Apeon Servers according to the IP addresses of Apeon Servers, the ports and load balancing algorithm that it stores. This file cannot be modified manually and is automatically updated when you change the settings in the Cluster tool of AEM. Each time after you change the settings, be sure to copy this file and replace the old file in the virtual directory and restart IIS.

6. Installing Appeon plug-in as ISAPI Filters.

Step 1: Open **Control Panel | Administrative Tools | Internet Information Service (IIS) Manager**.

Step 2: Right click the **Default Web Site** and choose **Properties**.

Step 3: Click the **ISAPI Filters** tab page. Click **Add** to add **ApbCluster.dll** (or **ApbCluster64.dll**). Click **OK**.

7. Creating the ApbCluster.cfg file.

Step 1: Create the **ApbCluster.cfg** file in the virtual directory `d:\iispulgin`.

Step 2: Copy and paste the following:

```
Extension_URI=/ApbCluster/ApbCluster.dll
MatchExpression=/AEM
MatchExpression=/servlet
MatchExpression=/reportfile
MatchExpression=/imagefile
MatchExpression=/dwfile
MatchExpression=/ajsdwn
Log=On
```

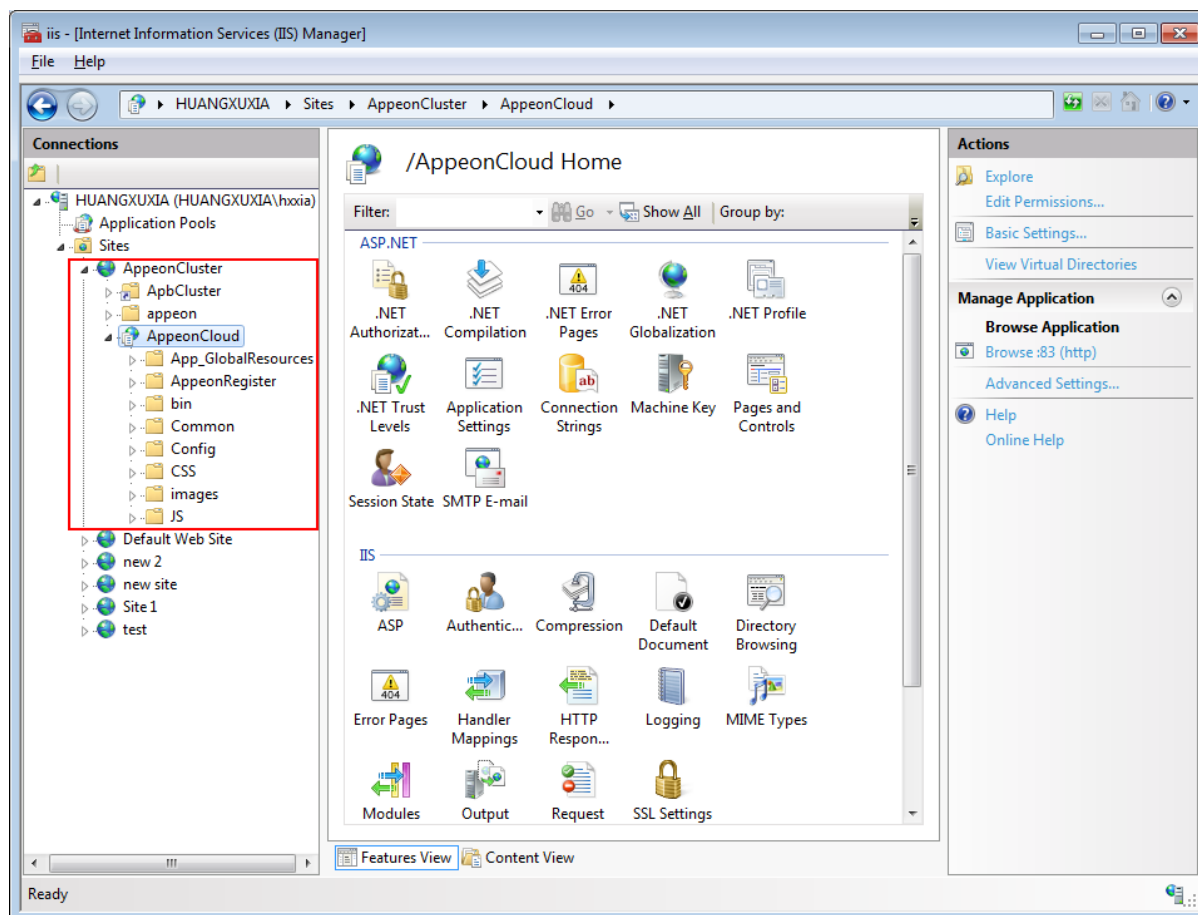
Notes:

- The **Extension_URI** command specifies the location of the virtual directory which contains `ApbCluster.dll` (or `ApbCluster64.dll`), that is `/virtual-directory-alias-name/ApbCluster.dll` (`/ApbCluster/ApbCluster.dll` in this guide).
- The **MatchExpression** commands specify the type of pages to redirect.
- The **Log** command specifies whether to enable logging.
- The **TimeOut** command specifies the number of seconds the Web server waits between sending an HTTP request to Appeon Server and receiving information from it. The HTTP connection timeout value is 2 times of this value.
- **The commands and parameters are case insensitive.**

8. Enabling Web Services Extension.

Step 1: Click **Web Services Extension** in the IIS Manager.

Step 2: **Select All Unknown ISAPI Extensions** and click the **Allow** button.

Figure 6.31: IIS Manager

9. Adding MIME type.

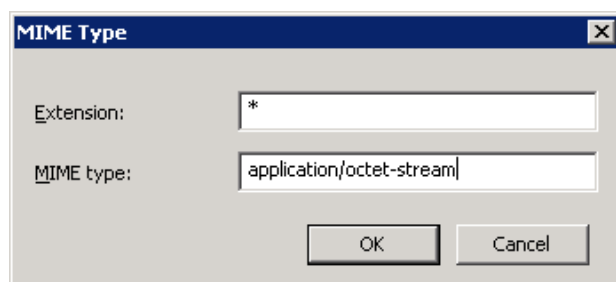
Add a MIME type for loading the files with no extensions or MIME type definition.

Step 1: Right click the Local computer and select **Properties**.

Step 2: Click the **MIME Types** button.

Step 3: Click the **New** button and specify the following settings:

- Extension: *
- MIME type: application/octet-stream

Figure 6.32: MIME Type

10. Restarting IIS.

Restart IIS to make the new settings effective.

6.3.2.2 Type 2: Apache Web server

6.3.2.2.1 Manual configuration

Configuring Apache 2.0/22 with J2EE servers

J2EE servers refer to Java servers, such as EAServer, WebLogic, WebSphere, JBoss, JEUS etc. The configuration is the same for the J2EE application servers than Apeon supports.

1. Copying the Apeon Server Web component to the Web root of the Apache server.

Before configuration, make sure that you have copied Apeon Server Web Component from the installation path to %APACHE%\htdocs, where %APACHE% refers to the home directory of Apache.

- a. Create an **apeon** folder under the Web root of Apache server (%Apache%\htdocs).
- b. Copy the **Apache20Support** or **Apache22Support** folder from the installation path to the created **apeon** folder (%Apache%\htdocs\apeon).

2. Copying Apeon plug-in.

Copy the **mod_apeon2.so** or **mod_apeon22.so** plug-in file from %APACHE%\htdocs\apeon\Apache2xSupport\modules to the %APACHE%\modules folder.

3. Copying Apeon Cluster configuration file.

Copy the **cluster-config.xml** file from the %apeon%\repository\\config folder to the %APACHE%\conf folder, where %apeon% is the installation directory of Apeon Server, and <instancename> refers to the name of a server instance.

Note: The **cluster-config.xml** file acts as the redirector configuration file as it helps Web server redirect requests to Apeon Servers according to the IP addresses of Apeon Servers, the ports and load balancing algorithm that it stores. This file cannot be modified manually and is automatically updated when you change the settings in the Cluster tool of AEM. Each time after you change the settings, be sure to copy this file and replace the old file in the %APACHE%\conf folder and restart Apache.

4. Modifying httpd.conf.

If the application server (such as EAServer, WebLogic, WebSphere, JBoss, or JEUS) is running on Windows, add the following statements into the httpd.conf file under the %APACHE%\conf folder (take mod_apeon2.so as an example):

```
LoadModule apeon_module modules\mod_apeon2.so
<IfModule mod_apeon.c>
MatchExpression /AEM
MatchExpression /servlet
MatchExpression /reportfile
MatchExpression /imagefile
MatchExpression /dwfile
MatchExpression /ajsdown
</IfModule>
```

If the application server is running on UNIX/LINUX, add the following statements into the httpd.conf file under the %APACHE%\conf folder (take mod_appeon2.so as an example):

```
LoadModule appeon_module modules/mod_appeon2.so
<IfModule mod_appeon.c>
MatchExpression /AEM
MatchExpression /servlet
MatchExpression /reportfile
MatchExpression /imagefile
MatchExpression /dwfile
MatchExpression /ajsdown
</IfModule>
```

5. Restarting Apache.

Restart Apache for the new settings to take effect.

Configuring Apache 1.3 with J2EE servers

J2EE servers refer to Java servers, such as EAServer, WebLogic, WebSphere, JBoss, JEUS etc. The configuration is the same for the J2EE application servers than Appeon supports.

1. Copying the Appeon Server Web component to the Web root of the Apache server.

Before configuration, make sure that you have copied Appeon Server Web Component from the installation path to %APACHE%\htdocs, where %APACHE% refers to the home directory of Apache.

- a. Create an **appeon** folder under the Web root of Apache server (%Apache%\htdocs\).
- b. Copy the **Apache20Support** or **Apache22Support** folder from the installation path to the created **appeon** folder (%Apache%\htdocs\appeon).

2. Copying Appeon plug-in.

Copy the **mod_appeon.so** plug-in file from %APACHE%\htdocs\appeon\Apache13Support\modules to the %APACHE%\modules folder.

3. Copying Appeon Cluster configuration file.

Copy the **cluster-config.xml** file from the %appeon%\repository\<instancename>\config folder to the %APACHE%\conf folder, where %appeon% is the installation directory of Appeon Server, and <instancename> refers to the name of a server instance.

Note: The **cluster-config.xml** file acts as the redirector configuration file as it helps Web server redirect requests to Appeon Servers according to the IP addresses of Appeon Servers, the ports and load balancing algorithm that it stores. This file cannot be modified manually and is automatically updated when you change the settings in the Cluster tool of AEM. Each time after you change the settings, be sure to copy this file and replace the old file in the %APACHE%\conf folder and restart Apache.

4. Modifying httpd.conf.

Add the following statements into the httpd.conf file under the %APACHE%\conf folder:

```
LoadModule appeon_module modules/mod_appeon.so
<IfModule mod_appeon.c>
MatchExpression /AEM
MatchExpression /servlet
MatchExpression /reportfile
MatchExpression /imagefile
MatchExpression /dwfile
MatchExpression /ajsdwn
</IfModule>
```

5. Restarting Apache.

Restart Apache for the new settings to take effect.

6.4 Task 4: Deploy or Install the application to the Appeon Server cluster and Web server(s)

To install an Appeon application to the Appeon Server cluster and Web server(s), you can either deploy the application via the **Appeon Deployment Wizard** (see Chapter 6, *Deploying PowerBuilder Applications in Appeon Developer User Guide*, or run the deployment project generated by using the **Appeon Application Package Wizard** (see Section 11.3, “Packaging a stand-alone mobile project” in *Appeon Developer User Guide*. This section will talk about how to install an application by running the deployment project generated via the **Appeon Application Package Wizard**.

6.4.1 Points to note before installation

Be aware of the following points before installing an Appeon application:

- The Setup program of the Web application or the mobile application runs on the Windows platform only. To install applications to servers running on Unix/Linux, you must run the Setup program on the Windows platform and then install the application to remote servers running on Unix/Linux.
- The target Web servers must have the Appeon Server Web Component correctly installed.
- The packaged EAServer components, if any, can only be installed to EAServer application server.

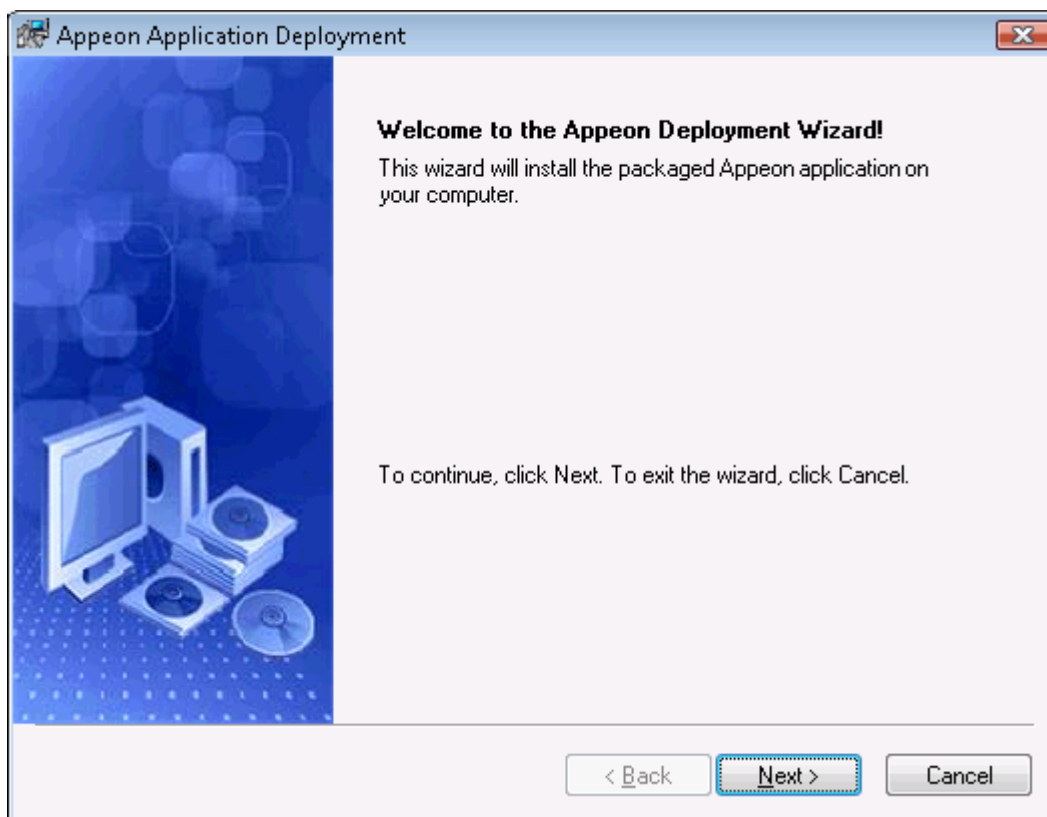
6.4.2 Installing an application

You can copy the generated package to any computer running Windows and install the application to any number of Appeon Servers and Web servers. Installing an application using the generated package is the same as deploying an application using the **Appeon Deployment Wizard**.

Step 1: Start the target Appeon Server(s) and Web server(s) where you want to install the application.

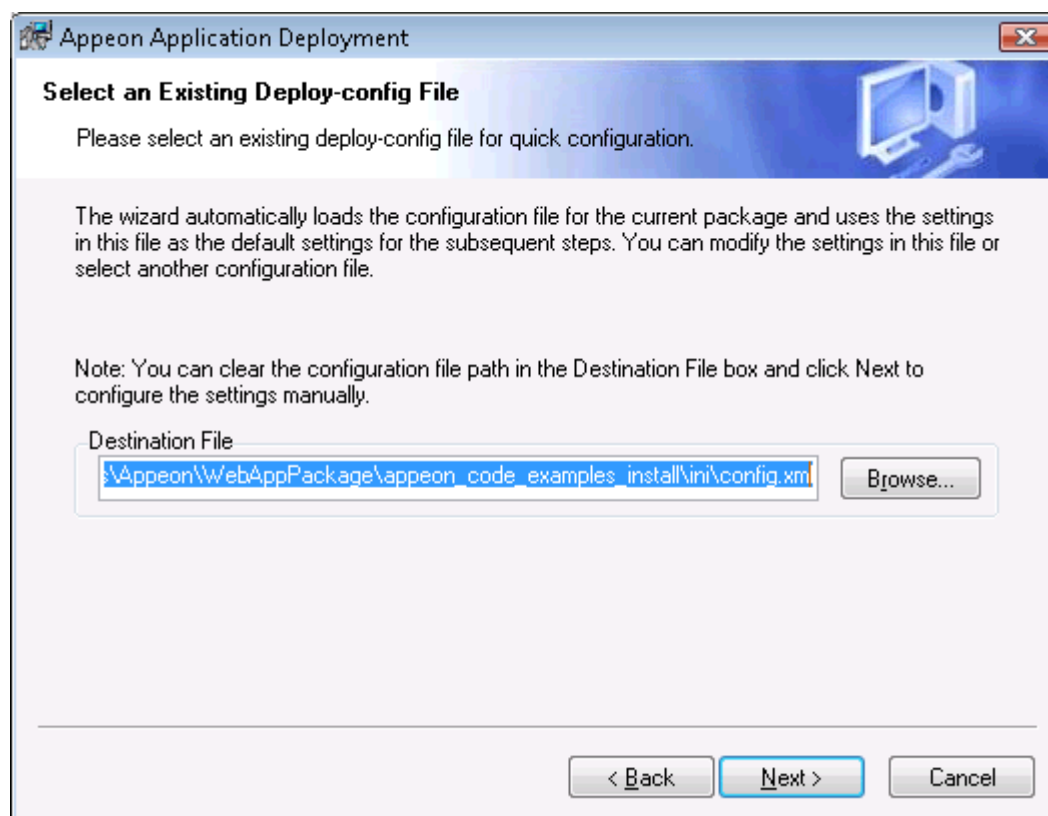
Step 2: Run the Setup.exe file in the generated package.

The Appeon Application Deployment wizard is displayed. Click **Next** to proceed.

Figure 6.33: Welcome page

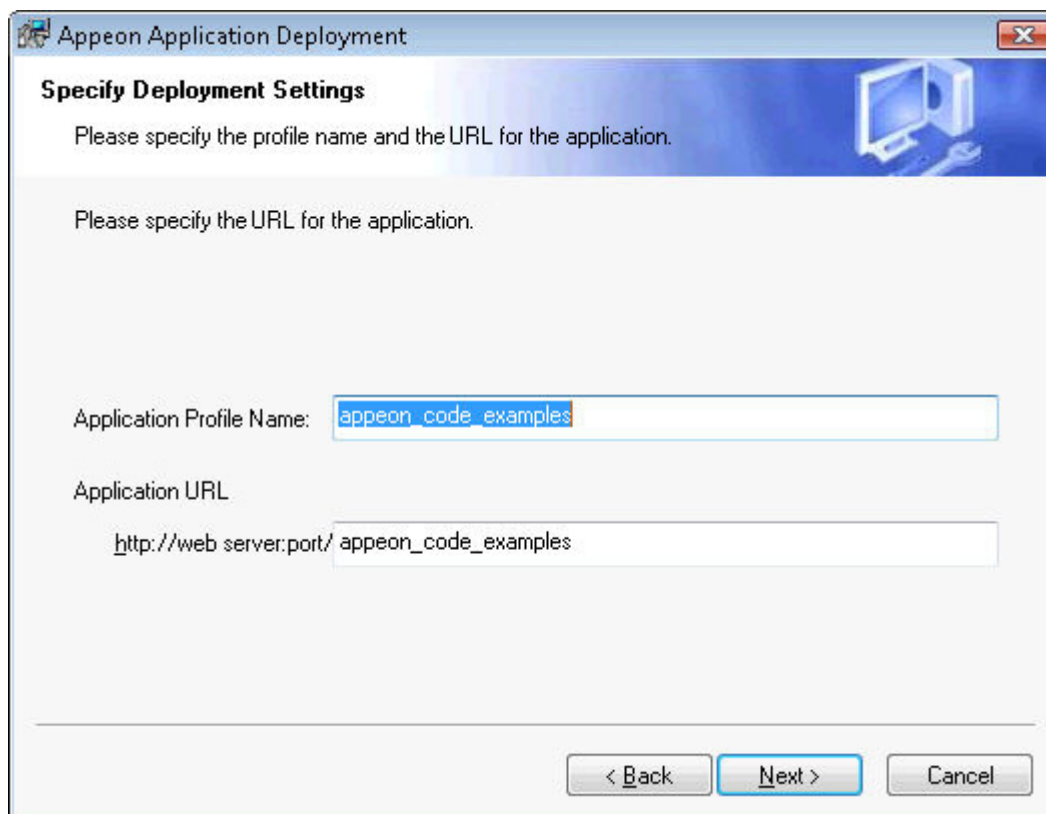
Step 3: Select the deploy-config file (config.xml) to ease your configuration of the installation wizard. The installation wizard will use the settings in the config.xml file.

If you do not want to use the deploy-config file, simply skip this option and click **Next** to configure the settings step by step.

Figure 6.34: Select the configuration file

Step 4: Input the Application Profile Name and the Application URL for the application and click **Next**.

The Application Profile Name is used as the application name to identify an application. If you want to install multiple instances of the same application on the same server, you can run the setup package repeatedly and specify different Application Profile Name here. For example, input `apeon_code_examples_test` as the Application Profile Name in the first installation, and input `apeon_code_examples_production` as the Application Profile Name in the second installation. The Application Profile Name will be used as the application name to distinguish the multiple application instances on the same server, so they can be run independently from each other.

Figure 6.35: Specify Application Profile Name and Application URL

Appeon Application Deployment

Specify Deployment Settings

Please specify the profile name and the URL for the application.

Please specify the URL for the application.

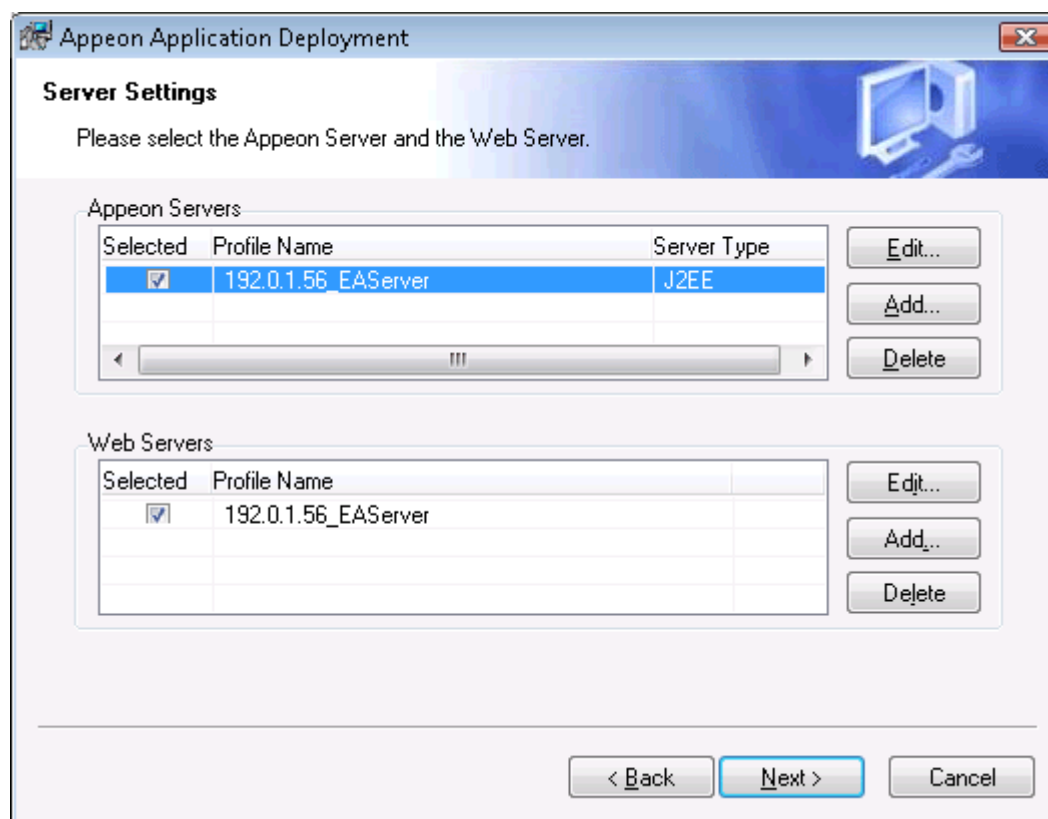
Application Profile Name:

Application URL

< Back Next > Cancel

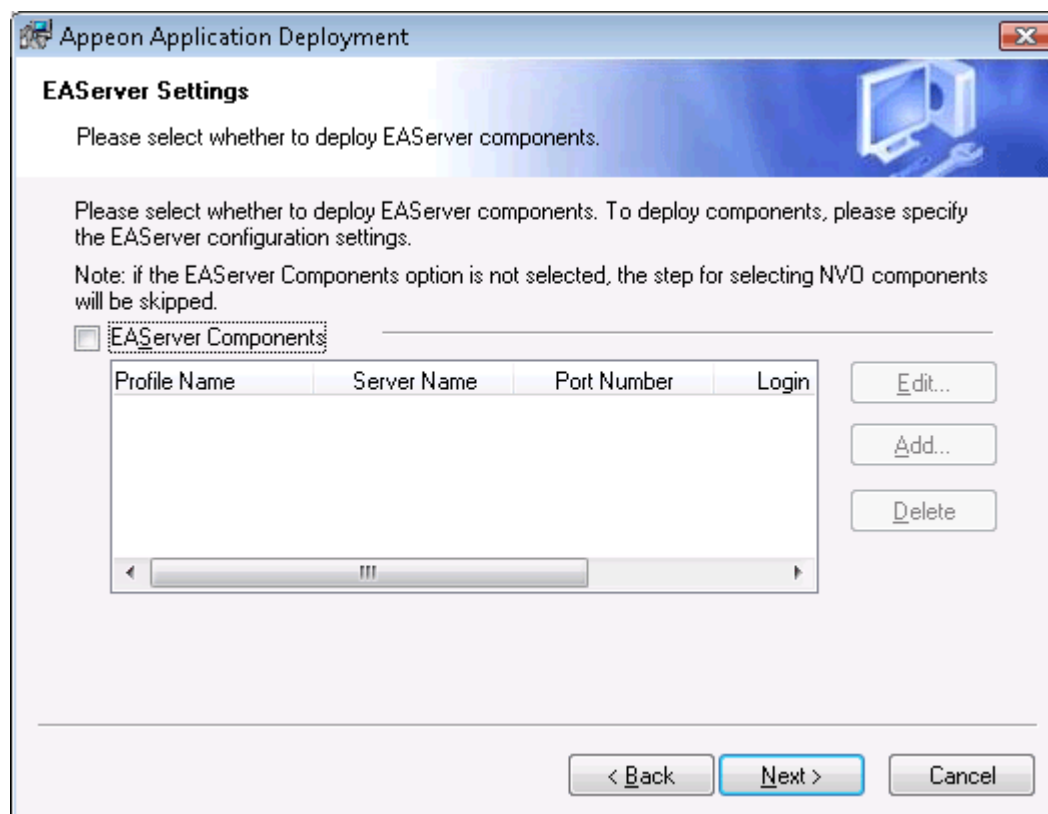
Step 5: Configure and select profiles for the Appeon Server(s) and the Web server(s) where the application will be installed.

To install the application to an Appeon Server cluster, please create an Appeon Server profile for each Appeon Server in the cluster. For detailed instructions on how to create the Appeon Server profile and Web server profile, refer to Section 4.2.3, “Managing server profiles” in *Appeon Developer User Guide*.

Figure 6.36: Specify server settings

Step 6: Select whether to deploy EAServer components.

After NVO components are deployed, you must generate stub/skeleton in EAServer. Detailed instructions are provided in Section 5.2.1, “Generating Stub/Skeleton in EAServer” in *Migration Guidelines for Appeon Web*.

Figure 6.37: Specify EAServer settings

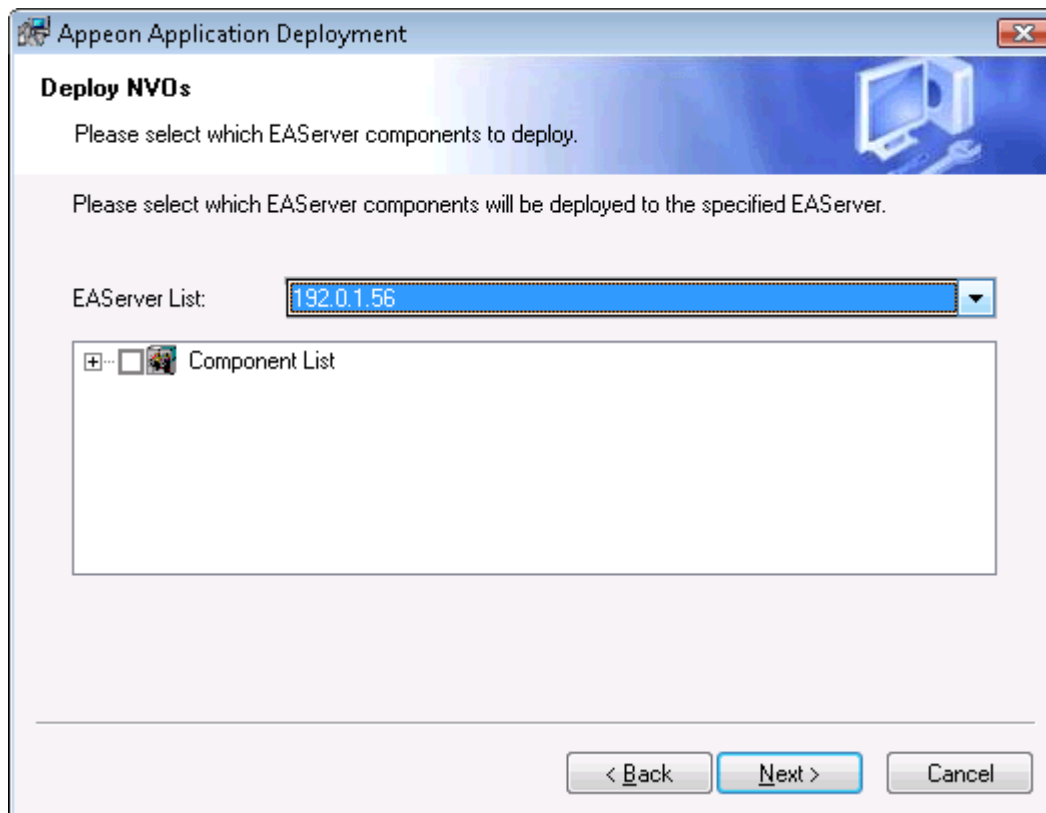
If EAServer components are used in the application, select the *EAServer Components* option and then create connection profiles for EAServers where you want to deploy the components. Follow instructions below to create EAServer profiles:

- Click **Add** to open the Edit EAServer Profile dialog box.
- Input the connection parameters: profile name, host name or IP address, port number, user name and password.
- Click **Test** to verify the connection and the click **OK** to finish the creation.

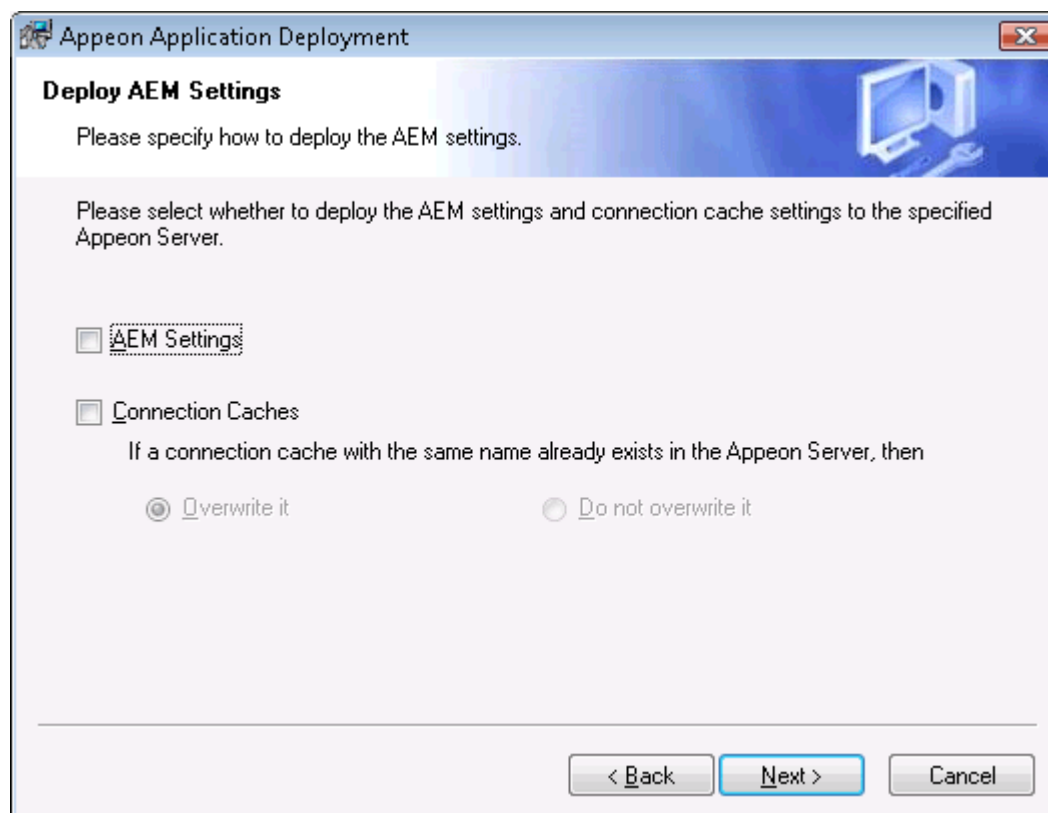
Figure 6.38: Edit EAServer Profile

Step 7: If the **EAServer Components** option is selected in the previous step, select the EAServer profile from the list and the components to deploy. Click **Next** to proceed.

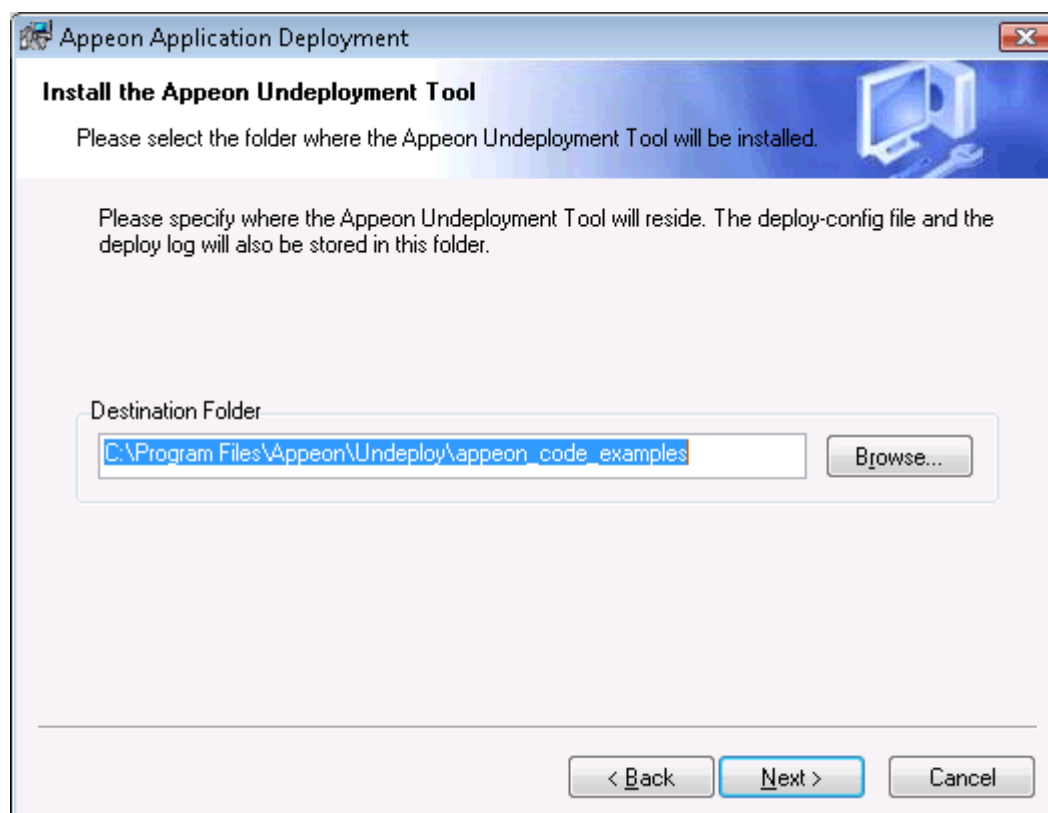
Figure 6.39: Deploy NVOs



Step 8: Select whether to install AEM settings and data sources for the current application and click **Next**.

Figure 6.40: Deploy AEM settings

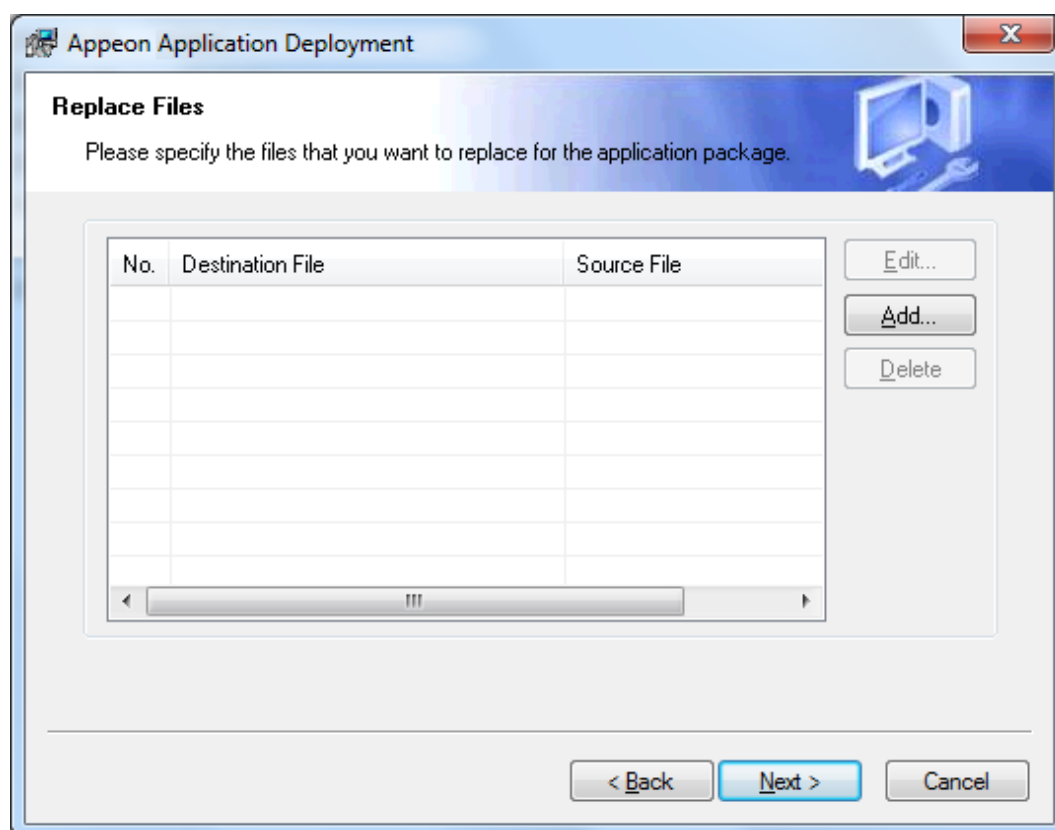
Step 9: Specify the destination folder for the undeployment tool and the log file and click **Next**.

Figure 6.41: Specify location for the Appeon Undeployment Tool

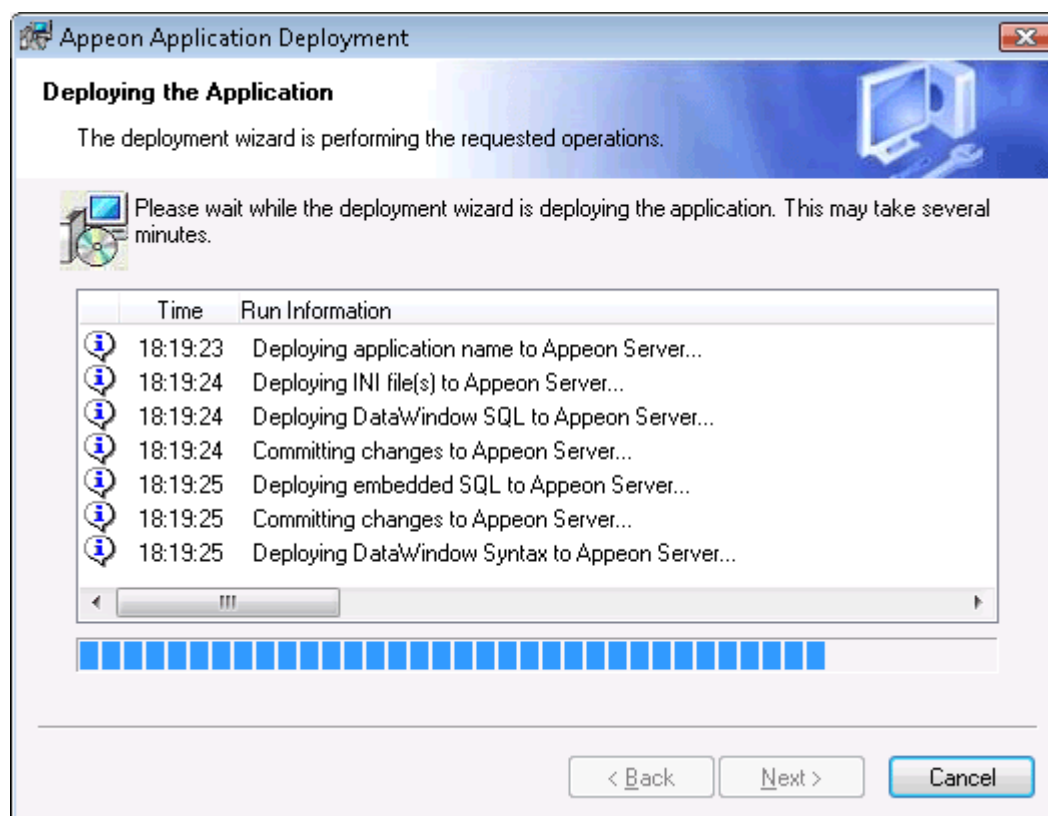
Step 10: Specify the destination file and source file that you want to replace for the Appeon application package, and click **Next**.

Files (also called "destination file") under the "wcode" folder of Appeon application package can be replaced by files of the same type (also called "source file"), so that the source file will be installed instead of the destination file. When you click the **Add** button, the **File Replacement** dialog box is opened. To select the destination file, click **Browse** to display the Open file dialog which will automatically open the "wcode" folder of Appeon application package, so you can conveniently select a file from the "wcode" folder or from its subfolder. To select the source file, click **Browse** to navigate to the folder where the source file is stored.

Figure 6.42: Specify files to replace for the application package



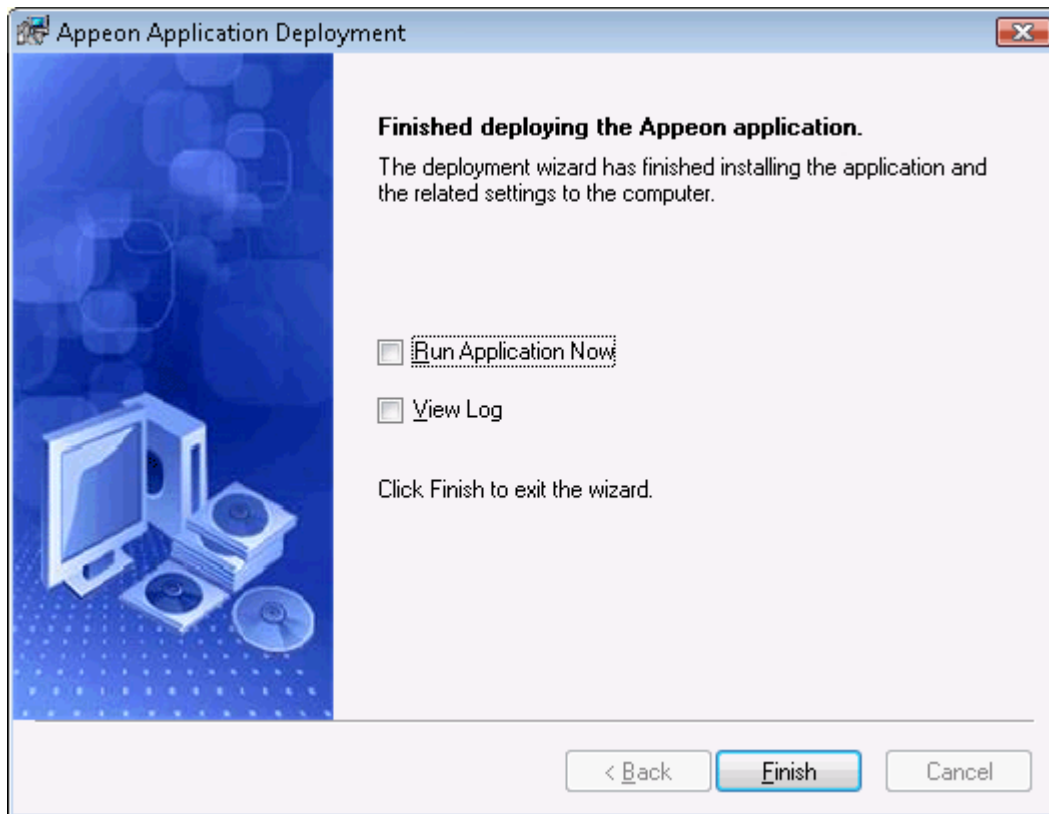
Step 11: Wait while the wizard is installing files and settings.

Figure 6.43: Deploying the application

Step 12: Once the operation is complete, click **Finish** to exit the installation wizard.

To run the application immediately, select the **Run Application Now** option and click **Finish**. Or you can run the application later from the Windows **Start | Programs | Appeon Web Application | ApplicationName**.

To view the log information generated during the installation process, select the **View Log** box and then click **Finish**. The log file will be displayed.

Figure 6.44: Deployment complete

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