ptc

thingworx® analytics™

Windows Installation Guide

8.2

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Document Revision History

Revision Date	Description of Changes
February 2018	Initial document version.

Note

Between software releases, check the Reference Document page of the PTC Support Portal for updated versions of this document.

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Overview

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This guide provides the prerequisites and instructions for installing ThingWorx Analytics Server via a native Windows installation process. The guide also provides troubleshooting information about issues you might encounter during the installation.

Note

The Windows installation process supports these install modes:

- Graphical
- Silent

In most cases, this document describes the graphical process. For more information about the silent installation mode, see Silent Mode Installation.

ThingWorx Analytics Server is composed of a set of individual microservices that each focus on a specific area of functionality. Interaction with these microservices requires that ThingWorx Foundation is already installed and running.

Note

The microservice architecture and integration with ThingWorx Foundation were both new in the 8.1 release. For information about upgrading from a previous release of ThingWorx Analytics Server, see the *ThingWorx Analytics 8.1 Transition Guide* available in the Reference Documents section of the PTC eSupport portal.

The Windows installer tool packages all of the ThingWorx Analytics Server microservices, as well as other necessary libraries and settings into a set of individual JAR files. When you launch the installer file, everything is unpacked and installed for you. You will be asked to provide minimal input, such as a location to install the server and connection information to your installed ThingWorx Foundation server.

The installer includes the following components:

- NGINX (ThingWorx Analytics API Router)
- ThingWorx Analytics Clustering
- ThingWorx Analytics Data
- ThingWorx Analytics Edge Agent
- ThingWorx Analytics Prediction
- ThingWorx Analytics Prescriptive
- ThingWorx Analytics Profiling
- ThingWorx Analytics Results
- ThingWorx Analytics Signals
- ThingWorx Analytics Training
- ThingWorx Analytics Validation

Security Considerations

When deploying a ThingWorx Analytics Server, especially in a production environment, be sure to observe all best practice security measures. Before making the server or its components accessible to other users, consider the following security measures:

- Change default passwords
- Disable the administrative privileges for SSH access
- Install an IP address-filtering firewall

All datasets, services, and results are globally available within a specific ThingWorx Analytics Server deployment. Any user, with access to the Things that represent the server deployment, can access any dataset, service, job, or result. To restrict access to these objects, multiple Analytics Server deployments are necessary. There are two ways to set up multiple deployments:

- Multiple deployments that connect to a single ThingWorx Foundation server – In this scenario, use the ThingWorx Foundation permissions and visibility functionality to restrict access, to the Things associated with each deployment, to specific users, groups, and organizations.
- Multiple deployments that each connect to a different ThingWorx Foundation server – In this scenario, there should be a one-to-one correspondence between the Analytics server and the ThingWorx Foundation server. Users would only be able to access the Things associated with the deployment they are authenticated through.

Prerequisites – Windows Installation

The ThingWorx Analytics Server requires the hardware and software listed below. For the most current system requirements, refer to the *ThingWorx Foundation 8.2 System Requirements* on the PTC Reference Documents site.

Administrator Access

All installation and troubleshooting procedures must be run with Administrator permissions. To launch the installer file, or shortcut options from the Start menu, right click and select the **Run As Administrator** option. To execute procedures from a command line, launch the Command Prompt window in Administrator mode.

Operating System

The ThingWorx Analytics Server Native Windows installation is supported on the following operating systems:

- Windows Server 2008, R2 SP1
- Windows Server 2012
- Windows Server 2016

Web Browser

The ThingWorx Analytics Server is supported on the following browsers:

- Internet Explorer 11 and later
- Firefox 49 and later
- Chrome 53 and later
- Safari 10 and later

Software

- ThingWorx Foundation 8.2
    - Make sure that the ThingWorx Foundation server is installed and running, preferably on a separate computer, before installing the ThingWorx Analytics Server.
    - Before beginning installation of the ThingWorx Analytics Server, log into ThingWorx Composer (the front end user interface for ThingWorx Foundation) and create an Application Key. For information about this process, see Application Keys in the ThingWorx Foundation Help Center.
- Java 8.x JDK 64-bit (Java SE Development Kit) – necessary for all Native Windows installations
    - Open JDK and Oracle are both supported.
    - The installer must have administrative permissions (use the **Run as Administrator** option).

Hardware

The ThingWorx Analytics Server must meet the following minimum requirements:

- 3 GB of disk space
- 4 CPU cores
- 16 GB internal memory

Downloading the Installer Files

1. Log into the PTC ThingWorx & Axeda eSupport page.
2. On the **ThingWorx & Axeda** tab, find the **Software Downloads** section, and click **PTC Software Downloads**.

   The **Order or Download Software Updates** page opens.
3. Click the first subheading, **Order or Download Software Updates**. Enter your **Customer Name** and **Customer Number** and click **Next**.

   The **PTC Software Download** page opens.
4. Under **Step 1: Select the Product Family**, scroll to **ThingWorx Analytics** and select it.
5. Under **Step 2: Choose Release & Download**, navigate to the download links by expanding each of the following successive options:
   - **Release <n.n>**
   - **ThingWorx Analytics Server**
   - **Most Recent Datecode**
6. Next to **ThingWorx-Analytics-Server-Windows-<n-n>**, click **HTTPS** or **Download Manager** to download the zip file and extract its contents.

   The zip file includes the following installer files:

File/Folder Name	Description
ThingWorxAnalyticsServer-<n.n.n>-windows-installer.exe	Installer for Windows operating systems.
standalone_jars	A folder of JAR installer files for each component of the ThingWorx Analytics Server. These installers are launched automatically as part of the installation process.
sample-data	A folder for sample CSV data files and JSON metadata files.
eula.rtf	Contains the PTC End User License Agreement.
ThingWorx-Analytics-Server-Windows-Installation-Guide-<n-n>.pdf	This document describes the installation process.

File/Folder Name	Description
ThingWorx-Analytics-ReleaseNotes-<n-n>.pdf	This document describes new functionality, upgrades, and fixes in the release.
ThingWorx-Analytics-ReadMeFirst-<n-n>.pdf	This document describes what the software package includes.

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Installation Procedure

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To install the ThingWorx Analytics Server you must have administrative permissions on the system where you are installing.

Note

This procedure represents the graphical installation mode, typically used in a Windows environment. For launch information using the Silent installation mode, see Silent Mode Installation

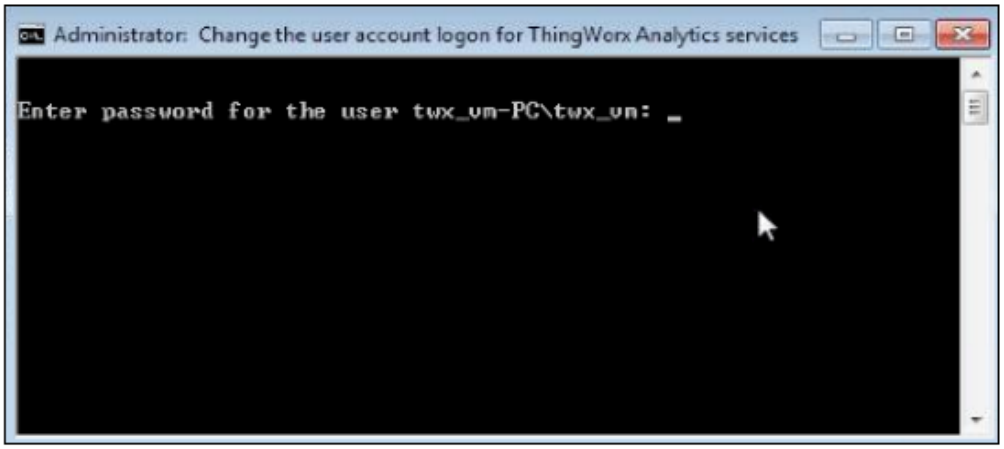
Installation requires the following steps:

1. Make sure all of the prerequisites have been met.
2. Download the appropriate installer files for your operating system.
3. Extract the downloaded files to a location on your host system.
4. Navigate to the extracted Windows installer file, ThingWorxAnalyticsServer-<n.n.n>-windows-installer.exe, right click the file, and select the **Run as Administrator** option.

5. Follow the on-screen installation instructions. After each step, click **Next** to advance to the next step. You'll be asked to:
   - Accept the license agreement.
   - Specify an installation directory. You can accept the default or provide a different location.
   - Enter connection information, including the following:
     - **ThingWorx Host** – Enter the IP address or host name of your ThingWorx Foundation server, which must already be installed and running.
     - **ThingWorx Port** – Enter the port for communicating with your ThingWorx Foundation server.
     - **Analytics Server AppKey** – Enter the value from the `keyID` field of the application key you created in ThingWorx Foundation.
     - **Analytics Server Thing Name** – Enter a name for the AnalyticsServer Thing that will be created in ThingWorx Foundation during the Analytics Server installation. This full name will be attached as a prefix to each microservice name. This Thing name must be unique within the server deployment.
     - **Use SSL?** – Set to `true` in order to require the use of SSL when connecting to ThingWorx Foundation. The default value is `false`.

   When you complete the last step, the installation begins. Depending on your operating system, several windows may open and then close while the process unpacks and installs the necessary libraries and settings.
6. When the installation process is complete, a final page is displayed. Click **Finish**. An Installation Summary page is displayed with a list of the components that were installed.
7. Review the Installation Summary page and then click **OK**. A dialog box opens with a prompt to change the user account logon for ThingWorx Analytics services (see image below). For security purposes, the logon account for each ThingWorx Analytics service must be updated from a local system account to

a specific user account. This prompt requests a password for your specific user account.



8. Enter a password for your user account and click the **Enter** key. The system updates the logon for each of the ThingWorx Analytics services that were installed.
9. To test the ThingWorx Analytics Server installation, see Verify the Installation.

Silent Mode Installation

To launch the silent installation in a Windows environment:

1. Make sure all of the prerequisites have been met.
2. Download the appropriate installer files for your operating system.
3. Extract the downloaded files to a location on your host system.
4. Open a Command Prompt window in Administrator mode and navigate to the directory where you saved the extracted launch files.
5. Run the following command, substituting specific information in the angled brackets:

   ```
   .\ThingWorxAnalyticsServer-<n.n.n>-windows-installer.exe --unattendedmodeui minimal --mode unattended --accept_eula YES --THINGWORX_FOUNDATION_IP_ADDR "<IP address or host name>" --THINGWORX_EXTERNAL_IP_ADDR_PORT "<Port where ThingWorx is running>" --ANALYTICS_SERVER_APPKEY "<valid ThingWorx App Key>" --ANALYTICS_SERVER_THINGNAME "<Analytics Server Thing Name>" --USE_SSL "<false/true>"
   ```

   When the installation is complete, the command line prompt will be returned.
6. A final manual step is required to complete the installation. A script must be run to change the user account logon for ThingWorx Analytics services. For security purposes, the logon account for each ThingWorx Analytics service must be updated from a local system account to a specific user account. To run this script:

   - Change directory (cd) to the bin folder in the installation directory, for example: `C:\Program Files (x86)\ThingWorxAnalyticsServer\bin`.
   - Execute the following command: `.\changeServiceUserAccount.bat <domain\username> <password>`

     The system updates the logon for each of the ThingWorx Analytics services that were installed.
7. To test the ThingWorx Analytics Server installation, see Verify the Installation.

Verifying the Installation

In ThingWorx Composer

To test the ThingWorx Analytics Server installation from ThingWorx Composer, follow the steps below to ensure that all of the connected microservice Things are running properly:

Note

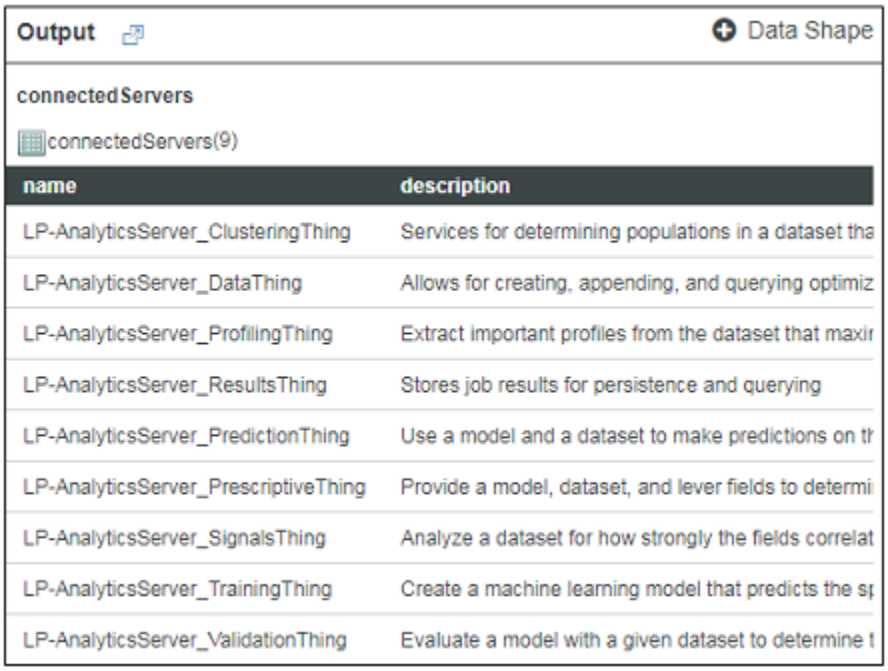
In order to interact with the installed AnalyticsServer Thing in ThingWorx Composer, both ThingWorx Foundation and ThingWorx Analytics Server must be running.

1. Enter ThingWorx Composer and navigate to the **Things** page.
2. Scroll through the list of Things to find the AnalyticsServer Thing that you assigned a name to during installation.

Note

In the list of Things, you will also see each microservice that was installed (each with the AnalyticsServer Thing name you assigned as a prefix). That's a good sign. But to ensure that they are each installed properly, continue with the next few steps.

3. Click to open the AnalyticsServer Thing and navigate to the **Services** page.
4. In the **Inherited Services** table, find the RetrieveAnalyticsServers service and click to open it.
5. In the **Inputs** panel, click the green **Execute** button. If all of the components installed properly, a list of the installed microservice Things will be returned in the **Output** panel.

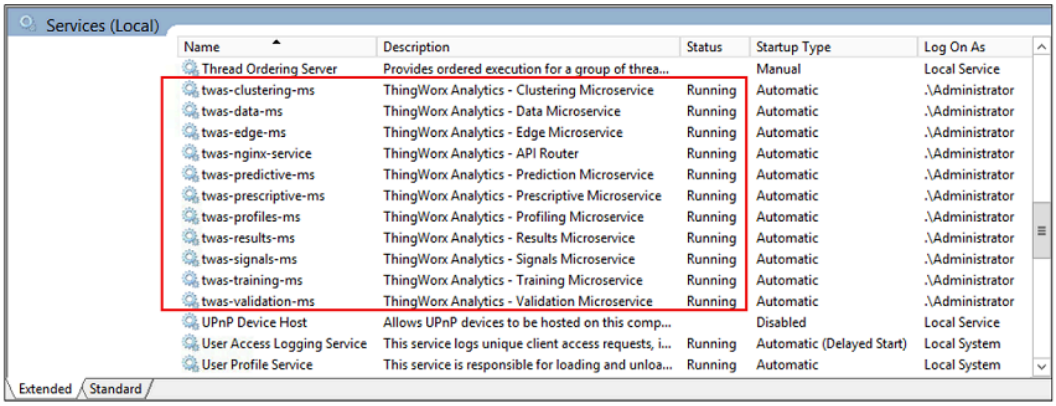


In a Windows Environment

When the installation is complete, you can also verify its success by checking for a new `ThingWorxAnalyticsServer` directory on your host computer.

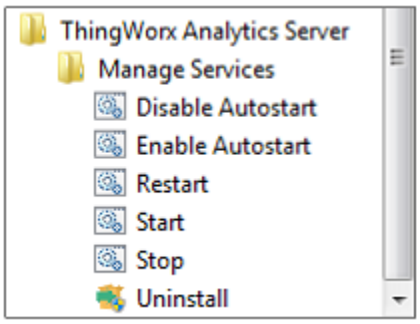
To verify that all of the necessary services are running properly, use the Administrative Tools that Windows provides to view services running locally on your computer. To access the services, navigate to **Control Panel ▸ System and Security ▸ Administrative Tools ▸ Services**. Depending on your version of Windows, you may or may not need to start from the Control Panel.

Ideally, each of the ThingWorx Analytics services should show a **Status** of Running (see the image below). If any of the services are Paused or show an empty status, see Troubleshooting.



You can also verify that the Start menu displays a new program entry for ThingWorx Analytics Server (see the image below). It includes links to launch the following actions:

- Disable Autostart of the server
- Enable Autostart of the server
- Restart the server
- Start the server
- Stop the server
- Uninstall the server



Disable/Enable Automatic Startup

By default, all of the ThingWorx Analytics services are started whenever the server is started or restarted. You can disable this automatic behavior by following the steps below.

1. From the Windows Start menu, click **All Programs**.
2. Navigate to **ThingWorx Analytics Server** and select it.
3. Navigate to **Manage Services ▸ Disable Autostart**.

   The system disables the autostart behavior of each service.
4. To verify the update for each service:
   - Navigate to **Control Panel ▸ System and Security ▸ Administrative Tools ▸ Services**. Depending on your version of Windows, you may or may not need to start from the Control Panel.
   - Check the value in the **Startup Type** column for each service. If the automatic startup has been disabled, the value will be `Manual`. If the automatic startup is still enabled, the value will be `Automatic`.
5. To re-enable the automatic startup behavior, repeat steps 1 – 3, but navigate to the following shortcut option: **Manage Services ▸ Enable Autostart**.

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Troubleshooting

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After the ThingWorx Analytics Server has been installed, several basic utility scripts and commands are available to troubleshoot the application, when necessary. In the troubleshooting commands described below, the default installation directory is assumed to be the following:

```
C:\Program Files (x86)\ThingWorxAnalyticsServer
```

If your installation directory is different, adjust the commands accordingly.

To Restart, Start, or Stop the Server

1. From the Windows Start menu, click **All Programs**.
2. Navigate to **ThingWorx Analytics Server** ▸ **Manage Services**. Several shortcuts are displayed, including the following:
   - **Restart** – stops a running server and restarts it
   - t**Start** – starts a server that is not running
   - **Stop** – stops a running server
3. Right click the desired shortcut option and select **Run As Administrator** to restart, start, or stop the entire server.

To Start or Restart a Single Service

1. Navigate to **Control Panel** ▸ **System and Security** ▸ **Administrative Tools** ▸ **Services**. Depending on your version of Windows, you may or may not need to start from the Control Panel.
2. In the list of services, locate the desired `twas` service and select it. Several options are displayed on the left, including the following:
   - **Start** – starts a service that is not running
   - **Restart** – stops a running service and restarts it
3. Click an option to start, pause, or restart the selected service.

To Check the Status of a Single Service

1. Navigate to **Control Panel** ▸ **System and Security** ▸ **Administrative Tools** ▸ **Services**. Depending on your version of Windows, you may or may not need to start from the Control Panel.
2. In the list of services, locate the desired `twas` service and check the value of the **Status** column.

To Update the ThingWorx AppKey

1. Log into ThingWorx Composer and create a new AppKey. For more information, see the Application Keys section of the ThingWorx Foundation Help Center.
2. In your Windows Explorer, navigate to the **config** folder of your installation directory.

   For example: `C:\Program Files (x86)\ThingWorxAnalyticsServer\config\`
3. Open each of the following properties files and update the **thingworx.application.key** property with the new AppKey. Then save each file.
   - `analytics-server.properties`
   - `system-environment-variables.properties`
4. On the Windows Start menu, navigate to **ThingWorx Analytics Server** and right click on the **Restart** shortcut option.
5. Select the **Run as Administrator** option to restart the server.

   It might take several seconds for the Things in ThingWorx Foundation to refresh and reconnect.

To Change the User Account

1. Open the Windows PowerShell (or the Command Prompt window) in Administrator mode.
2. Navigate to the **bin** folder of the installation directory.

   For example: `C:\Program Files (x86)\ThingWorxAnalyticsServer\bin`
3. Execute the following command: `.\changeServiceUserAccount.bat <domain\username> <password>`

   Where `domain\username` is a new user and `password` is a password for the new user.

   The system updates the username and password for the logon account of each service.
4. To check the updated user for each service:
   - Navigate to **Control Panel** ▸ **System and Security** ▸ **Administrative Tools** ▸ **Services**. Depending on your version of Windows, you may or may not need to start from the Control Panel.
   - Check the value in the **Log On As** column for each service.

To Check Component Logs

Individual component logs for each microservice are available at the following path:

`C:\Program Files (x86)\ThingWorxAnalyticsServer\data\logs`

Handling a Failed Installation

If an error occurs that prevents the ThingWorx Analytics Server installation from completing successfully, the software will roll back the failed installation. It will remove the various installed components and leave behind the installation directory containing the log files for further investigation. You can perform the manual steps below to ensure the product is completely removed before running a fresh installation.

Note

The procedures below assume that you have already consulted the `install.log` and fixed whatever problem caused the installation to end.

Follow these steps to remove components:

Note

Depending on where the installation failed, not all of the steps below will be available or applicable.

1. Open the Windows PowerShell (or the Command Prompt window) in Administrator mode.
2. Navigate to the **bin** folder of the installation directory.

   For example: `C:\Program Files (x86)\ThingWorxAnalyticsServer\bin`
3. Execute the following command: `.\twas.bat abort`.

   One of the following will happen:

   - If the install failed ***after*** the `twas.bat` file was created, each service that was installed will be stopped and deleted.
   - If the install failed ***before*** the `twas.bat` file (or even the **bin** folder) was created, nothing will happen and you will need to continue with Step 4 below.
4. If the install did not create the `twas.bat` file before failing, execute individual commands to remove each service that was installed. The table

below provides the stop and delete commands for each service. Execute both a stop and a delete command for any service that was installed.

Stop Commands	Delete Commands
`sc stop twas-clustering-ms`	`sc delete twas-clustering-ms`
`sc stop twas-data-ms`	`sc delete twas-data-ms`
`sc stop twas-edge-ms`	`sc delete twas-edge-ms`
`sc stop twas-nginx-ms`	`sc delete twas-nginx-ms`
`sc stop twas-predictive-ms`	`sc delete twas-predictive-ms`
`sc stop twas-prescriptive-ms`	`sc delete twas-prescriptive-ms`
`sc stop twas-profiles-ms`	`sc delete twas-profiles-ms`
`sc stop twas-results-ms`	`sc delete twas-results-ms`
`sc stop twas-signals-ms`	`sc delete twas-signals-ms`
`sc stop twas-training-ms`	`sc delete twas-training-ms`
`sc stop twas-validation-ms`	`sc delete twas-validation-ms`

5. Before attempting a new installation, check the memory and hard disk space on the host server. For more information, see the Hardware section of Prerequisites.

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The Installation Log

During the ThingWorx Analytics Server installation, the installer writes a log file called `install.log` to the `ThingWorxAnalyticsServer` directory on your host computer. The log file contains details about the installation process for each component. If you have issues during the installation, you can consult the log for any errors that might be recorded there.

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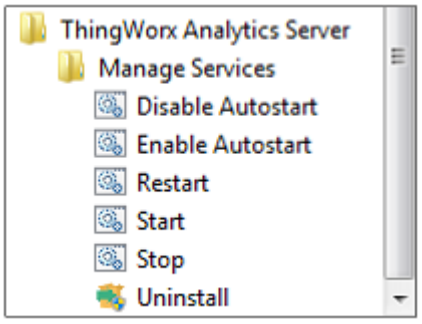
Uninstalling

Follow the steps below to uninstall the ThingWorx Analytics Server.

Note

These procedures uninstall the components of the ThingWorx Analytics Server installation. If you also want to remove the auto-generated Things created in the ThingWorx Foundation, open ThingWorx Composer, find your AnalyticsServer Thing, and use the RetrieveAnalyticsServers service to find and delete the connected Things.

1. In the operating system program list, find the **ThingWorx Analytics Server** folder and open it. Several options are displayed. (See the Windows 7 example in the image below.)



2. Right click the **Uninstall** option and select **Run As Administrator**.

   A **Question** window opens asking you to confirm that you want to uninstall the ThingWorx Analytics Server and all its modules.

3. Click **Yes**.

You might be asked to confirm a second time. Then the **Uninstalling ThingWorx Analytics Server** screen opens. When the process finishes, another window opens to let you know the uninstall is complete.

4. Click **OK** to close the window.

The ThingWorx Analytics Server is now uninstalled from your system.

Note

Alternately, you can open your Windows Explorer and navigate to the installed `ThingWorxAnalyticsServer` directory. Launch the `thingWorxAnalyticsServer_uninstall.exe` to uninstall the server.