



# Plant Applications Getting Started Guide

Version 8.1.



# Copyright GE Digital

© 2020 General Electric Company.

GE, the GE Monogram, and Predix are either registered trademarks or trademarks of General Electric Company. All other trademarks are the property of their respective owners.

This document may contain Confidential/Proprietary information of General Electric Company and/or its suppliers or vendors. Distribution or reproduction is prohibited without permission.

THIS DOCUMENT AND ITS CONTENTS ARE PROVIDED "AS IS," WITH NO REPRESENTATION OR WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF DESIGN, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. ALL OTHER LIABILITY ARISING FROM RELIANCE UPON ANY INFORMATION CONTAINED HEREIN IS EXPRESSLY DISCLAIMED.

Access to and use of the software described in this document is conditioned on acceptance of the End User License Agreement and compliance with its terms.

<b>Chapter 1. Plant Applications Installation Overview.....</b>	<b>7</b>
Introduction.....	7
United Manufacturing Database Support.....	7
Licensing.....	7
<b>Chapter 2. Preparing to Install Plant Applications.....</b>	<b>9</b>
System Requirements.....	9
Server Hardware Requirements.....	10
Silent Installers.....	11
SQL Server Configuration.....	11
SQL Server Requirements.....	12
Client Hardware Requirements.....	14
Client Software requirements.....	15
Supported Portals.....	15
Anti-Virus Scanning.....	15
VMware Support and Configuration.....	16
Installing the .NET Framework.....	18
Setting up IIS Web Services.....	19
Removing WebDAV Publishing from IIS.....	20
Editing the ISAPI File Path.....	21
Workflow Requirements.....	24
SSL Security Certificates.....	24
Port Requirements.....	25
Before You Begin.....	26
SQL Server Requirements.....	29
Setting up the Remote Data Service.....	29
Upgrade Strategies.....	30
Database Setup Strategies.....	30
About TLS Support.....	32
About FIPS Support.....	32
About the SQL Server AlwaysOn Requirements.....	32
<b>Chapter 3. Installing Plant Applications.....</b>	<b>34</b>
About Installing Plant Applications.....	34

Installation Overview.....	34
Installing the Proficy Application Server.....	35
Binding HTTPS.....	40
Installing the Plant Applications Server.....	42
Installing the Plant Applications Client and Administrator.....	45
Data Authorization for Events Configured for Each Event Type.....	46
Installing the Plant Applications SDK.....	47
Installing the Plant Applications Message Bridge.....	47
Configuring a User in RabbitMQ.....	56
Installing the Plant Applications Web Client.....	58
Unicode Utility.....	58
Task Lists for ActiveX and SOA Web Client.....	61
Preparing a SOA Database for UMDB Integration.....	61
Plant Applications REST APIs.....	62
Access the Plant Applications REST APIs.....	63
<b>Chapter 4. Installing the Report (Web) Server.....</b>	<b>64</b>
Report Server Installation Overview.....	64
Windows Installation Limitations.....	64
IIS Metabase Configuration Backup.....	64
Setting Up Internet Explorer Security for Web Reports.....	65
Installing the Plant Applications Report Server.....	65
Setting Up the Plant Applications Report Server.....	69
Secure Socket Layer and Certificate Requirements.....	70
Setting Up IIS for Remote Use.....	71
Setting Up the Plant Applications Excel Add-In.....	71
Local Client Application Support.....	73
<b>Chapter 5. Post-installation Tasks.....</b>	<b>74</b>
UTC Support.....	74
Upgrading Plant Applications to Use UTC.....	75
Setting Up Languages for Plant Applications Displays.....	75
Managing Port 12280 Conflicts.....	76
Security Modification for Proficy Plant Server.....	76

Database Purges.....	76
Customizing Your Application.....	77
<b>Chapter 6. Plant Applications Client Interfaces.....</b>	<b>79</b>
Plant Applications Administrator.....	79
Plant Applications Client.....	80
Workflow Client.....	81
Plant Applications Report Server Administrator.....	82
Plant Applications Web Server Client.....	83
Web Part Administrator.....	84
<b>Chapter 7. Maintenance and Troubleshooting.....</b>	<b>85</b>
Verifying Plant Applications Service Startup.....	85
Verifying the Server Connection.....	85
Changing the SharePoint Port Number.....	85
Changing the Zookeeper Port Number.....	86
Backing Up and Restoring an SQL Database.....	87
Moving Database and Log Files.....	88
Proficy Router Conflicts.....	89
SQL Login Conflicts.....	90
Runtime Error.....	90
SQL Server Blockage.....	91
License Server Startup Failure.....	92
Web Content Issues.....	92
Web Reports Issues.....	93
Proficy Server Shutdown Error.....	94
Proficy Server Installation Script Failure.....	94
Database Connection Failure.....	94
License Manager Connection Failure.....	95
Proficy Workflow Client Startup Failure.....	96
Plant Applications Client or Administrator Failure.....	96
<b>Chapter 8. Test and Production Environments.....</b>	<b>97</b>
Environment Overview.....	97
Test Environment.....	97

Standard Production Environment.....	98
High-Volume Production Environment.....	101
<b>Chapter 9. Upgrading from Version 7.0 SP5 or 8.0.....</b>	<b>102</b>
Upgrading from Plant Applications Version 7.0 SP5 or 8.0 to 8.1.....	102
<b>Chapter 10. Appendix B: Cluster Installation and Configuration.....</b>	<b>104</b>
Cluster Overview.....	104
System Requirements.....	104
Configure iSCSI Initiator.....	104
Create a New Storage Under Cluster.....	105
Create a Plant Applications Role.....	106
Configure Workflow Cluster.....	106
Configure Plant Applications Server Cluster.....	107
Change Registry to Reference Cluster Name.....	110
Change the Plant Applications Server Name to Cluster Name.....	111
Change the Path of the Log Files and Buffer Files.....	111
Change the CXS Services Records.....	112
Change All the .INI Files on All Nodes.....	112
Set the ClusteredSystem Parameter to True.....	112
Verification.....	112

# Chapter 1. Plant Applications Installation Overview

## *Introduction*

Plant Applications is a unique software solution that digitizes the collective information being generated throughout your production facilities into a “virtual plant” for access where, when, and how you need it. Plant Applications provides clear insight into your production to greatly improve operational effectiveness.

Plant Applications continues to offer an SDK to customize and implement platform (MESCore) features.

## *United Manufacturing Database Support*

Plant Applications continues support for the Unified Manufacturing Database (UMDB) that combines a Plant Applications data model with the S95 data model employed by the SOA platform.

The model offers a single platform to implement holistic, operational performance-management solutions for batch, discrete, and mixed environments using equipment, product, and people centric models. It provides the following benefits:

- Extension by the new MESCore Service provider of the SOA data model to enable creation of a Unified Manufacturing Database.
- Data entry through the convenient Workflow Client interface. A separate license for Workflow is required to use workflows.
- Data methods to design custom displays and forms to gather, monitor, and analyze plant operations data. Using methods with Workflow requires a license.

## *Licensing*

Plant Applications licensing has been simplified to help manage concurrent users. The Plant Applications Server is licensed based on the number of concurrent users that connect to the server.

A concurrent user has access to all modules and functions in Plant Applications. You can license individual modules, supporting module-level licensing for customers having previous licensing for the Efficiency, Quality, and Production modules.

A Workflow license is not required for Plant Applications. A separate Workflow license is required to create workflows or to use methods.

After installing Plant Applications, you can use the License Viewer to help determine what licenses exist on a machine. From the Windows **Start** menu, select **Programs > Proficy Common > License Viewer**.

For more information about the latest GE Digital product offerings, see <https://www.ge.com/digital/products>. For general information about the new GE Digital licensing model, search for Licensing information on <https://digitalsupport.ge.com/>. A help system is installed with licensing and is available from the Proficy Common directory.




# Chapter 2. Preparing to Install Plant Applications

## *System Requirements*


Before you install Plant Applications, verify that all required software versions have been installed on the target machine.

Workflow and Predix components are required for Plant Applications and installed from the **Installation Menu**.


See [Test and Production Environments \(page 97\)](#) to compare machine requirements in a test, standard production, and high-transaction environment.

 **Note:** Plant Applications 8.1 does not support Web Client Displays for Vision, which were delivered in previous versions.


- Windows Server 2019, 2016 or 2012 R2 for server installations (64-bit)
- Windows 10 for client installations (64-bit)
- SQL Server 2019 (with mandate Cumulative Update 4 installed), 2017, and 2016 (64-bit)

 **Note:** You must have SQL Server 2016 (64-bit) or later for the Plant Applications Server and Web Client installation. If you are running a previous version of SQL Server, a message stating that the prerequisite criteria not met appears. You must upgrade to SQL Server 2016 (64-bit) or later to continue with the installation.


- Microsoft System CLR Types SQL Server 2016 (32-bit only)

 **Note:** Do not install if you already have the Microsoft System CLR Types SQL Server 2016 (32-bit only) installed.

- Microsoft .NET Framework 4.7 for Plant Applications 8.1
- Microsoft .NET Framework 3.5 for Workflow 2.6 SP1


 **Note:** You can download the Microsoft .NET Framework 4.7 from the following URL: <https://go.microsoft.com/fwlink/?LinkId=825299>

- Internet Protocol Version 4 (IPv4)
- Web Server IIS 8.0 or later based on the operating system
- SQL Server 2012 Native Client version 11.4.7001.0 or later


 **Note:** The SQL Server 2012 Native Client is required for Plant Applications Server and Plant Applications Client machines. If the version of the SQL Server 2012 Native Client you installed is not 11.4.7001.0 or later, you must upgrade it. You can download the SQL

Server 2012 Native Client version 11.4.7001.0 or later from the following URL: <https://www.microsoft.com/en-us/download/details.aspx?id=50402>

- Microsoft Excel 2019, 2016, or 2013 (required for SQL Server and Web Engines)

 **Note:** If you import data using a Microsoft Excel file that was created in an older version, it will not contain the columns necessary to support the new Event Progress feature. Refer to topics in Plant Applications Help for steps describing how to use the Excel add-in.


- Workflow 2.6 SP1

 **Note:** You must install Workflow 2.6 SP1 if you are installing a clean environment of Plant Applications

- Browsers
  - Microsoft Internet Explorer 11 (Web Reports)

 **Note:** Currently, Plant Applications Web Client components do not support Internet Explorer.

- Chrome v80.0+ (Plant Applications Web Client components)
- Safari v13.1+ (Plant Applications Web Client components)

 **Note:** Process Analyzer only supports Chrome.

- PDF reader (required to view some Web Server reports)


## *Server Hardware Requirements*

The minimum server requirements when running a Plant Applications environment without SOA entities and not using the Client or Workflow:

- 4 CPUs with 3.0 GHz processor each
- 16 GB RAM (Optimization of memory allocation needs to be to SQL Server)
- 1 TB hard drive (minimum 7.2KRPM)

For a standard implementation, GE recommends the following:

- 10 Cores with 2.6GHz processor each
- 32 GB RAM (Optimization of memory allocation needs to be to SQL Server)
- 4 TB hard drive (minimum 7.2KRPM)

 **Note:** Hard drive size is dependent upon anticipated database growth, backups, and practices employed to purge data.


## *Silent Installers*

The Silent Installers are available in the Silent folder and the SQL Server 2012 Native Client prerequisites are available in the Tools folder on SP5 iso. For more information on executing the silent installers, refer to the [How to Silently Install the Plant Applications Client and SIM](#) KBA article.

## *SQL Server Configuration*

Databases, transaction logs, tempdb, non-clustered indexes, and back-ups should be installed on separate hard drives. The following RAID specifications are recommended when running in a Plant Applications environment without SOA entities and not using the Client or Workflow. Additional requirements may be necessary for a Unified Manufacturing Database.

- SQL database: RAID 0+1, RAID 1, or RAID 5 or higher
- SQL transaction logs: RAID 0+1 or RAID 1 and should be a separate physical device
- SQL tempdb: RAID 0+1 or RAID 1
- SQL indexes: RAID 0+1 or RAID 1
- Back-ups: RAID 0 (no fault tolerance, but faster writes), or RAID 5 or higher

 **Important:** For a current listing of the supported service packs and hot fixes released by Microsoft, refer to the article KB9920 in the GE support site (<https://ge-ip.force.com/communities/CC Home>).

For up-to-date instructions and the latest information on installing SQL Server, visit the MSDN web site: <https://msdn.microsoft.com/en-us/library/bb545450.aspx>

Additionally, the following configuration is recommended:

- Use Mixed Mode security.
- Exclude the database files from anti-virus scanning.
- Use multiple processors for every installation.
- Enable the default backup job, which is disabled during the Plant Applications Server installation, or create a maintenance plan.


## **Multiple Databases on a Single SQL Server**

Multiple Plant Applications databases cannot be installed in the same instance of SQL Server because the 'proficydbo' account uses a default database and there can only be one default database. To use multiple Plant Applications databases on a single SQL Server, you must install multiple instances of SQL Server.

## Table Statistics

When an individual table query experiences significantly reduced performance or selects the wrong index, the first thing that can be done is to update the table statistics. The query optimizer in SQL Server bases its choice of indexes and execution plans on the current table statistics. If the table statistics are not representative of the actual data in the table, the query optimizer may make bad decisions.

By default, SQL Server automatically updates table statistics periodically, but the automatic update is not always accurate. Furthermore, the default statistics are calculated based on a small subset of the rows in a table, which may not always give the best results. SQL Server chooses a small subset for performance reasons because calculating statistics can be a time-consuming and resource-intensive task, depending on the size of the table. Manually updating the statistics based on the full set of rows in the table or even based on a larger percentage of rows (for example, 50%) may improve query performance.

 **Note:** Care should be taken to ensure that the statistics update is done during low server utilization periods.

For Plant Applications, the `User_Defined_Events` table should have the statistics regularly updated, which can be accomplished using the `UPDATE STATISTICS` command. For example: `UPDATE STATISTICS User_Defined_Events WITH FULLSCAN`.

## Database Sizing


The database should be initialized to the full database size. This will reduce fragmentation within the database caused by incremental database growth. It will also prevent the periodic performance slowdowns that occur when the database size is incrementally increased by SQL Server. SQL Express is not supported because it limits database size to 2 GB, which is below the minimum required for Plant Applications.

### Setting Nested Triggers

In SQL Server nested triggers must be allowed. For more information on nested triggers, search for “nested triggers” in the SQL Server Books Online.

1. In the **SQL Server Management Studio**, right-click the server and click **Properties**. The **Server Properties** dialog box appears.
2. Under **Select a page**, click **Advanced**. The **Advanced** page appears.
3. Under **Miscellaneous**, ensure **Allow Triggers to Fire Others** is set to `True`.

## *SQL Server Requirements*

 **Note:** Passwords for recent versions of SQL Server are case sensitive. Ensure passwords are updated if upgrading from a version older than 2008.

## SQL Server Installed Components

The following components must be installed:

- Database Engine Services
- Reporting Services
- Client Tools Connectivity
- Client Tools Backwards Connectivity
- SQL Server Books Online (recommended)
- Management Tools - Basic

## SQL Server Naming Conventions

Do not use special characters for server names.

## Supported Network Protocols

Before installing SQL Server, the stand-alone named and default instances must support the following network protocols:

- Shared memory (Shared memory is not supported on failover clusters)
- Named pipes
- TCP/IP
- VIA

The same network protocol must be set up on the server and client computers to be able to communicate with each other.

## SQL Server Browser Service and Plant Applications Server


If you are installing Plant Applications Server on a server with Microsoft SQL Server, the SQL Server Browser service (sqlbrowser) must be running before installing Plant Applications Server.

For information on SQL Server Browser service, go to the MSDN web site: <http://msdn2.microsoft.com/en-us/library/ms165724.aspx>

## Enabling TCP/IP and XP\_cmdshell


The xp\_cmdshell option and the TCP/IP protocol, which are disabled by default, must be enabled. The installation process will verify whether the TCP/IP protocol is enabled and if it is not enabled, a message box appears asking permission to enable the TCP/IP protocol. If permission is denied, the

installation process will quit. The `xp_cmdshell` option is automatically enabled during the installation process.

 **Note:** If you are installing Plant Applications Server on a computer and SQL Server on a different computer, you must manually enable the TCP/IP protocol. It cannot be enabled remotely.

## Conflict with ReportServer Virtual Directory

SQL Server installs a virtual directory called ReportServer when the SQL Server Reporting Services (SSRS) component is installed. This virtual directory conflicts with the Plant Applications ReportServer virtual directory. If you are planning to run SQL reports, you need SSRS. But if you are planning to use Plant Applications reports delivered through the Plant Applications Report Server (web reports), do not install the SSRS component.

 **Note:** The virtual directory conflict affects only 2008 server that has been installed to the default instance. A named instance (not the default name) will not conflict with Plant Applications.

To Rename, Move, or Create the Reporting Services Virtual Directory:

1. Click **Start > Programs > Microsoft SQL Server 2008 > Configuration Tools**.
2. Click **Report Services Configuration**. The **Report Server Installation Instance Selection** dialog box appears so that you can select the report server instance.
3. For **Machine Name**, enter the name of the computer on which the report server instance is installed.
4. For **Instance Name**, select the **SQL Server Report Services** instance. Only SQL Server report server instances appear in the list.
5. Click **Connect**. The **Reporting Services Configuration Manager** screen appears.
6. Click **Report Server Virtual Directory**. The **Report Server Virtual Directory Settings** page appears.
7. Click **New**. The **Create a New Virtual Directory** dialog box appears.
8. In **Virtual Directory**, type in a new virtual directory name and click **OK**.

## *Client Hardware Requirements*

Client hardware requirements may vary depending upon the installed base of computers at your facility. However, based on GE's experience with multiple customer sites, we recommend the following configuration:

- Pentium 4-based computer with 2 GB of RAM (minimum)
- 20-GB hard drive space (minimum)
- DVD drive
- Network interface software for network communications supporting TCP/IP
- Monitor for the lab and floor operations, 100 percent IBM compatible, supporting a 24-bit graphics card for 1024 x 768 or higher resolution and at least 65535 colors

- Two-button mouse with scroll wheel or compatible pointing device such as a touch screen

## *Client Software requirements*


The requirements for the Plant Applications Client software are:

- Supported operating systems: Windows 10
- Microsoft Office 2013 and 2016 with Plant Applications Add-in for Excel
- Web browser

With Plant Applications 8.1, Microsoft Internet Explorer 11 is required for Plant Applications Reports. These reports are no longer supported for earlier versions of Internet Explorer. For Plant Applications Web Client Displays, Internet Explorer 11 is the preferred browser platform.

If you are using Google Chrome as the browser for Plant Applications Web Client Displays, content should continue to work providing you have version 80.0 or later.


- MAPI-compliant Mail client software

 **Note:** For a current listing of the supported service packs and hot fixes, refer to the article KB9920 in the GE support site ([https://ge-ip.force.com/communities/CC\\_Home](https://ge-ip.force.com/communities/CC_Home)).

## *Supported Portals*

The Plant Applications 7.0 continues support for Web Parts and Microsoft SharePoint Portal Services. The release does not support Proficy Real-time Information Portal or Link Manager.

Web Parts is validated for Windows SharePoint Services 3.0. To use Web Parts with a later version of SharePoint, contact GE Support on .

 **Note:** SharePoint Portal Services 3.0 installs on port 80, which conflicts with the Plant Applications Web Server that also uses port 80. You must change SharePoint to use a different port, such as port 81 or another port that is not used.

## *Anti-Virus Scanning*

To prevent performance issues, the following directories and files should be excluded from being scanned by your anti-virus software:

- MSScript.ocx
- Historian program files
- Historian archive data files
- SQL Server database files
- SQL Server transaction logs

- SQL Server backups
- Plant Applications program files
- Plant Applications log files
- Plant Applications buffer files

## *VMware Support and Configuration*

VMware is an officially supported and tested environment for running the Plant Applications Server and Clients. Support for VMware ESXi Server version 5.0 and above is provided. Advanced features of VMware (such as VMotion, VMware VMFS, clustering support, high availability, and so on) are not supported.

Validated configurations:

- A maximum of five VMware images running on sufficient hardware is supported
- One computer running Proficy Historian
- One or more computers running the Plant Applications clients (these may be the same computers as the Proficy Historian computers or a single computer)

## **General VMware Information**

For information regarding VMware specifications and requirements, see [http://www.vmware.com/pdf/vi3\\_30\\_20\\_installation\\_guide.pdf](http://www.vmware.com/pdf/vi3_30_20_installation_guide.pdf).

Due to the wide range of parameters associated with the hardware, configuration, memory settings, third-party software installations, and the number of virtual machines running, GE recommends that you visit the VMware web site to help you determine the hardware requirements for configuring your virtual environment. Start by looking at the VMware Compatibility Guide, provided by this link on the VMware web site: <http://www.vmware.com/resources/compatibility/search.php>

## **Time Zone Support**

The following table represents Plant Applications constraints and indicates whether other applications must be running in the same time zone as the Plant Applications server.

<b>Application</b>	<b>UTC Mode</b>	<b>Non-UTC Mode</b>
Plant Applications Web Server	Not supported – must use Proficy DataMart	Same time zone
Proficy DataMart	Same time zone	
SQL Server	Same time zone	Same time zone
Plant Applications Clients (including Web Clients)	Any time zone	Same time zone
Proficy Historian	Any time zone	Any time zone



<b>Application</b>	<b>UTC Mode</b>	<b>Non-UTC Mode</b>
Other Historians	Any time zone	Same time zone

## **VMware Licensing**

When installed on a VMware image, you must use a keyless license (not a HASP key) for Plant Applications.

## **Local Language Support for VMware**

All the computers interacting with a Plant Applications server must be set to the same code page (also known as the “Language for Non-Unicode Programs”) as the Plant Applications Server.

## **Performance for VMware**

It is critical that sufficient hardware is allocated to support multiple Plant Applications installations on a computer.

## **WAN Performance for VMware**

Plant Applications is designed to run on-node or in a high-speed, low latency LAN environment. Performance issues can be expected when running it across a low-speed or high latency WAN. If Plant Applications is being used for production control, then network downtime will cause production downtime. Therefore, it is critical that reliability, throughput, and latency of the network connections are carefully managed.

## **Computer**

- Model: Dell PowerEdge 2950
- System type: ACPI Multiprocessor PC
- Operating System: Microsoft Windows Server 2003, Enterprise Edition, Service Pack 2
- Internet Explorer 6.0.3790.3959
- VMware Workstation 6
- Allocated Memory per Virtual Machine: 4 GB

## **Mother board**

- CPU Type: 4x DualCore Intel® Xeon 5050, 3000 MHz
- Mother Board Name: Dell PowerEdge 1950
- Chipset: Intel Greencreek 5000X
- Memory: 8192 MB (DDR2-533 Fully Buffered ECC DDR2 SDRAM)
- BIOS Type: Phoenix (05/17/06)
- Communication Port: Communications Port (COM1)

- Communication Port: Communications Port (COM2)

## Data Stocking

- IDE Controller: Intel 631xESB/6321ESB Ultra ATA Storage Controller - 269E
- Storage Controller: Dell SAS 5/i Integrated Controller
- Hard Disk Drive: 2X MAXTOR ATLAS10K5\_300SAS SCSI Disk Device (300 GB, 10000 RPM, Serial Attached SCSI)
- Hard Disk Drive: 2X MAXTOR ATLAS10K5\_300SAS SCSI Disk Device (300 GB, 10000 RPM, Serial Attached SCSI)
- CD-ROM: HL-DT-ST CDRW/DVD GCC4244 (DVD:8x, CD:24x/24x/24x DVD-ROM/CD-RW)

## Additional VMware Notes


GE cannot guarantee the performance of the Plant Applications software in a virtualized environment due to the wide range of parameters associated with the hardware, configuration, memory settings, third-party software installations, and the number of virtual machines running - all of which can affect performance. Therefore, GE cannot provide support related to the performance of the Proficy software running on a virtual machine if it's determined that the issue is related to the virtual environment. Also, GE does NOT provide support or troubleshoot a customer's virtual machine infrastructure. It is the responsibility of you, the customer, to ensure that the performance of the Plant Applications software and any third-party applications (especially those not recommended by GE) are adequate to meet the needs of your run mode environment. GE does not support issues related to functionality that is not available as a result of running in a virtual machine infrastructure. Examples include the functionality of card level drivers such as those for the Genius® family of drivers, the Allen-Bradley® DH/DH+ drivers, the Cyberlogic's MBX® Driver for the SA85 card, as well as functions requiring direct video access. Check with the vendor of your third-party application for support statements regarding that third-party product's ability to run in a virtualized environment.

## *Installing the .NET Framework*

You should install or upgrade to .NET Framework 4.7.

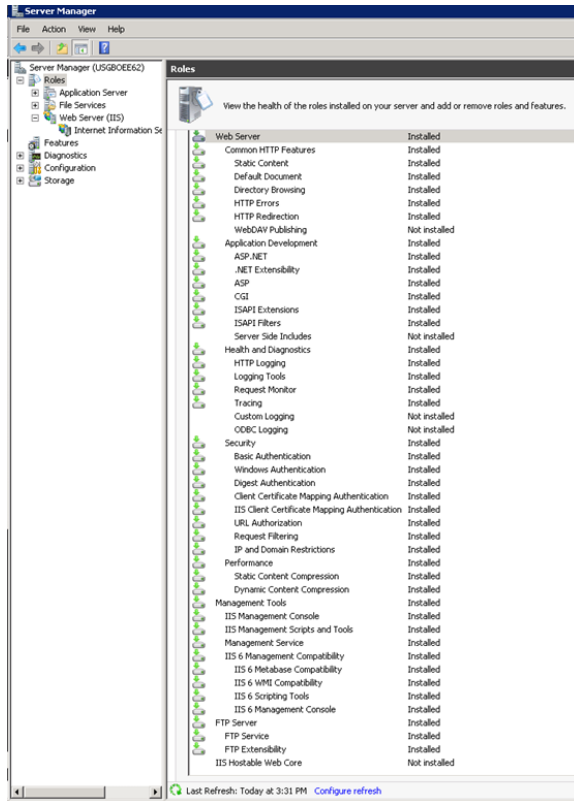
1. Stop all SOA services, Plant Applications services, and SQL server services to prevent the .NET Framework 4.7 installation from rolling back.
2. Download and install the .NET Framework 4.7 from the Microsoft product website.
3. Use the **Control Panel** to verify *Microsoft .NET Framework 4.7* is listed as an installed program.
4. Restart the services.

## *Setting up IIS Web Services*

 **Note:** Before you make any changes to Internet Information Services (IIS), you may want to export your existing configuration to review it. For more information on an existing Microsoft utility, refer to <https://www.iis.net/learn/get-started/getting-started-with-iis/getting-started-with-appcmdexe>

Verify that all role services for Web Server and IIS have been installed.

1. Open **Server Manager**.
2. Expand **Roles**, then select **Web Server (IIS)**.
3. Scroll down in the information listed for the Web Server (IIS) to view installed Role Services, and verify that the correct services have been installed.
4. If needed, click **Add Roles** in the Roles Services section to start the **Add Role Services** wizard to add a role.
5. Click the **Web Server (Installed)** box to enable service selection. Restart the machine if role services have been added.
6. Expand **Features**, and run the **Add Features** wizard.

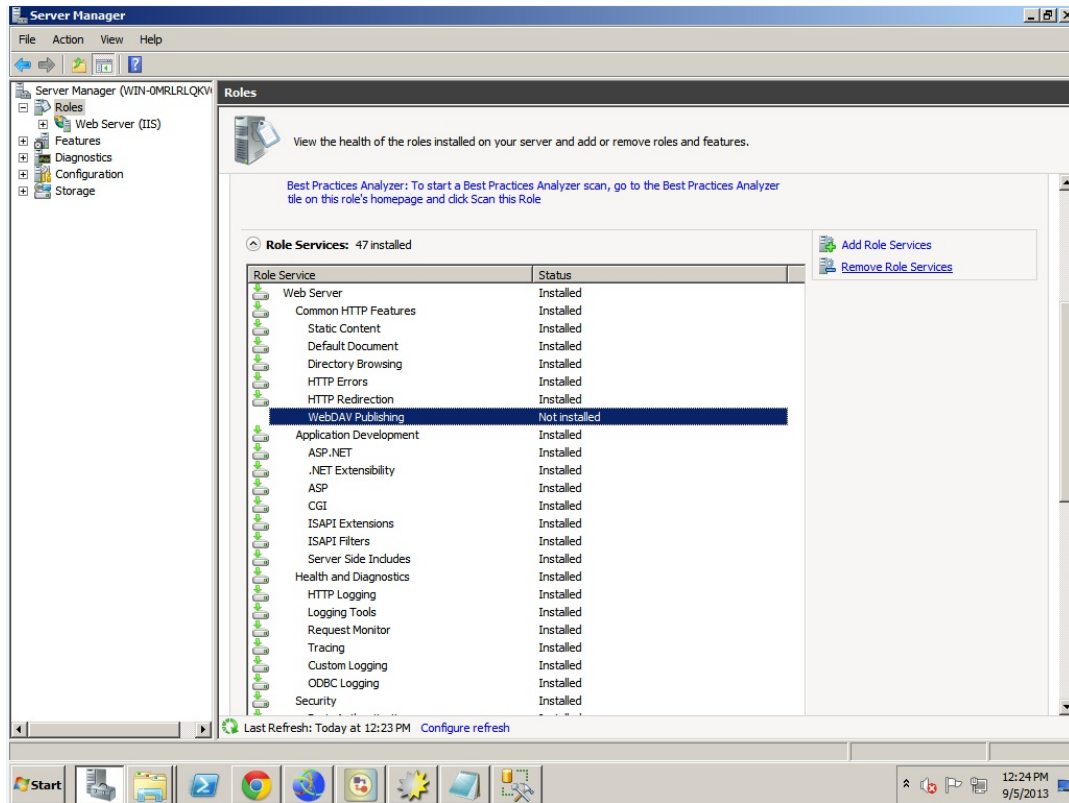


7. Select **HTTP Activation** under .NET Framework 3.5.1 Features, then run the wizard to install the feature.

## *Removing WebDAV Publishing from IIS*

WebDAV Publishing causes an error when deleting or updating comments or events. When installing IIS, do not include WebDAV.

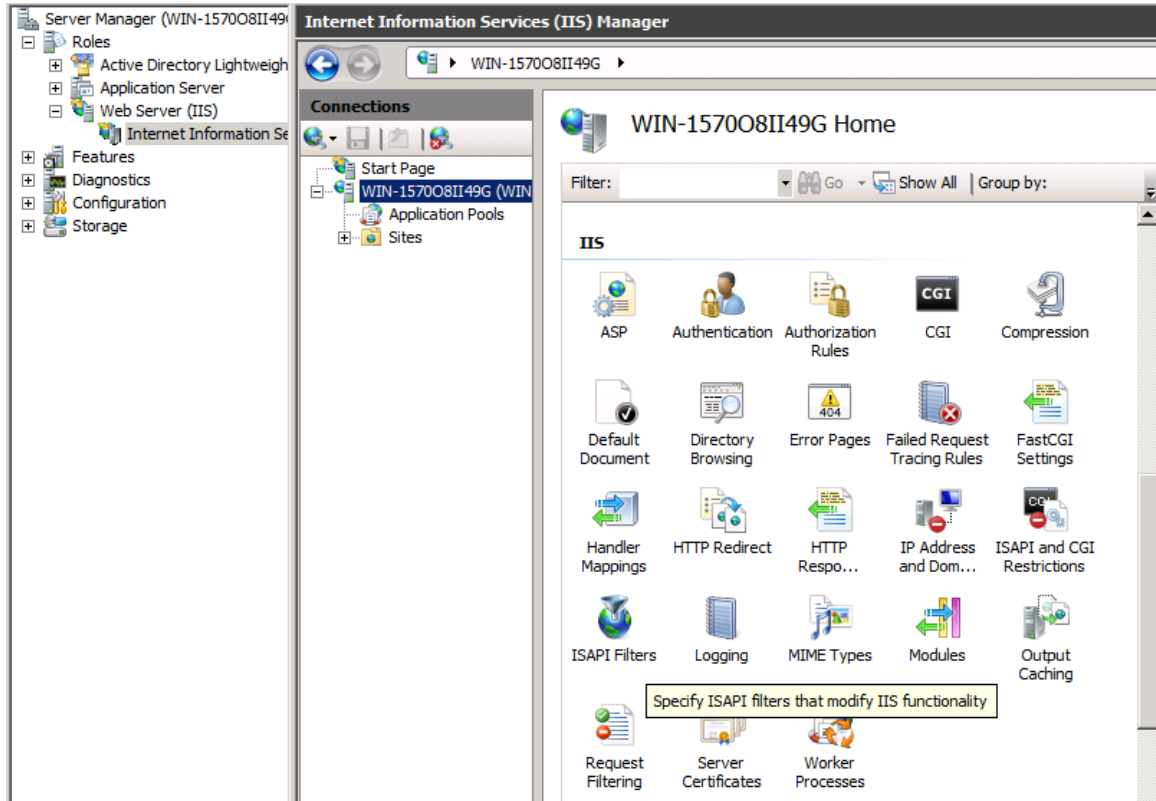
If IIS is already installed with WebDAV, uninstall it from the **Role Services** screen of the **Server Manager**.



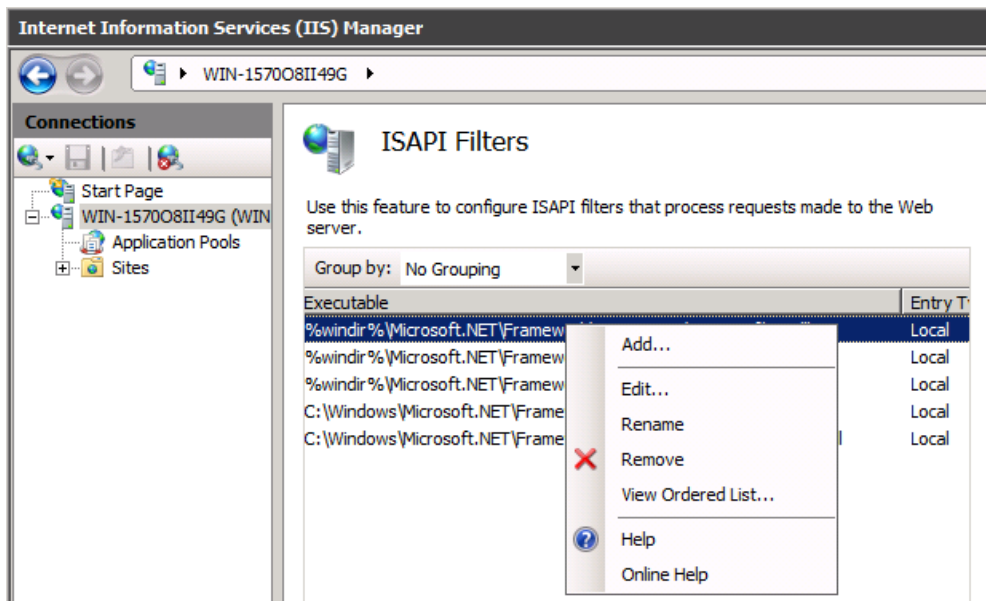
## *Editing the ISAPI File Path*

An error can occur when loading ISAPI filters.

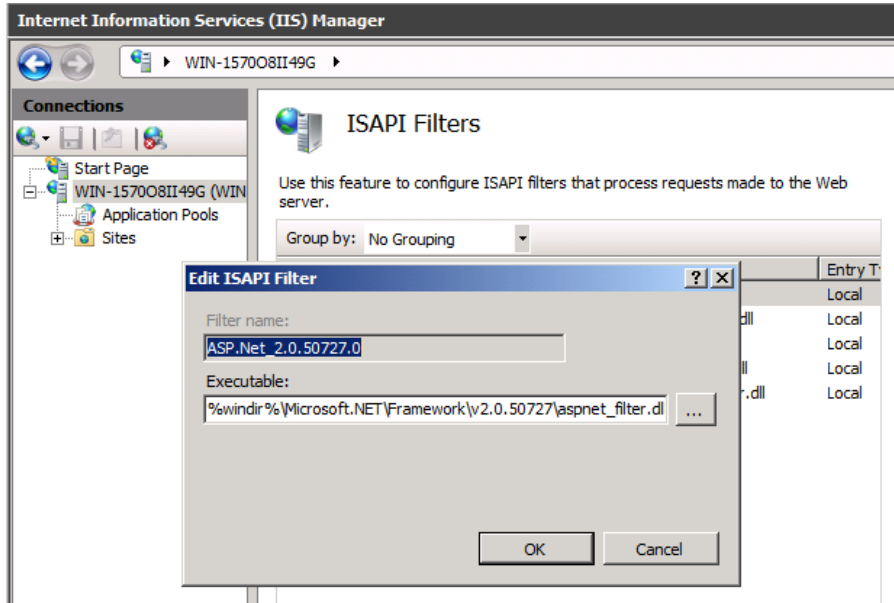
1. Open **Internet Information Services (IIS) Manager** from the **Server Manager**, then right-click the icon to open the **ISAPI Filters** pane from the ISS section of the ISS Manager.



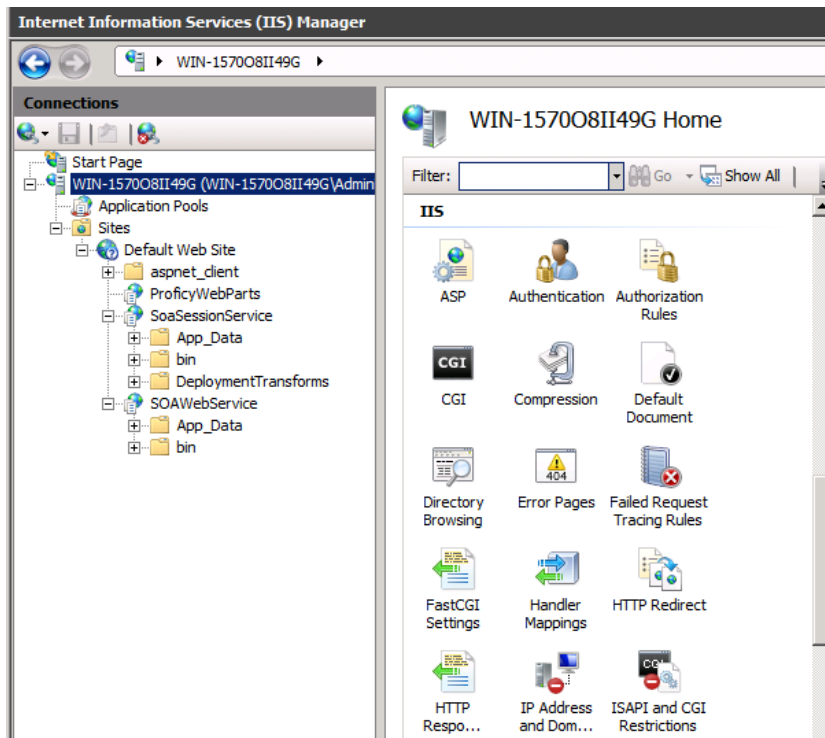
2. Expand the Executable column and look for any executable path containing two backslashes instead of one. Right-click the executable and select **Edit**.



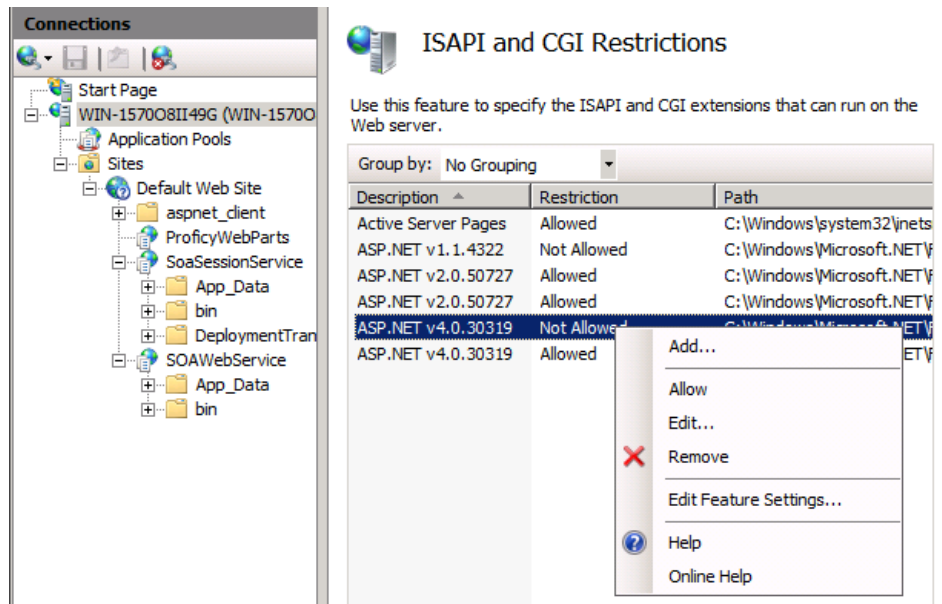
3. Change the ISAPI Filter path to use a single slash, such as `\aspnet_filter.dll` as shown in the following example.



4. Navigate to **ISAPI and CGI Restrictions** under IIS for the Report Server, then right-click to open the pane.



5. Verify that the *Framework* and *Framework64* extensions for ASP.NET, version 4.0.30919, are set to **Allowed**. Right-click an entry to make a change if necessary.



## Workflow Requirements

The **Proficy Application Server** selection under **Prerequisites** in the Plant Applications Installation Menu installs Workflow 2.6 SP1 components. When upgrading, refer to [Upgrading from Plant Applications Version 7.0 SP5 or 8.0 to 8.1 \(page 102\)](#).

## SOA Platform

The SOA platform is installed along with Workflow and is required by Plant Applications to install the UMDB. A Workflow license is not required to use Plant Applications with the UMDB, but a Workflow license is required to build workflows. Plant Applications supports the 32-bit version of Workflow.

**Note:** Install or upgrade Workflow components before Plant Applications components. When upgrading, follow the steps in [Upgrading from Plant Applications Version 7.0 SP5 or 8.0 to 8.1 \(page 102\)](#) to remove components before starting the installation.

## SSL Security Certificates


The Proficy Application Server requires SSL security certificates.

You can use self-signed certificates in intranet environments only. The certificates need to be trusted on each client machine that accesses the websites. Self-signed certificates are best used in



demonstration environments, but not in enterprise or Internet deployments. You can use existing certificates deployed by your existing security policy or purchase new certificates.

When installing the Proficy Application Server, you are prompted to generate new certificates, import certificates, or use legacy certificates. If you do not have a certificate, you will typically generate a new one. You can follow the instructions at [technet.microsoft.com](http://technet.microsoft.com) to create a self-signed certificate for testing in an intranet environment.

 **Note:** You need the fully-qualified domain or machine names when registering SSL security certificates.. They should be the same names that you provide when you define IIS and the HTTPS binding, and must match the name on the certificates (for example: `MyComputer.MyDomain.com`).

## Port Requirements

Use internal interfaces to open the ports required for Plant Applications operations.

Port	Description
80	Used by Web server for serving traditional, web reports.
1433	Used by SQL Server for communication to SQL.

Use the `CXS_Service` table in the Plant Applications database to modify the following ports.

Port	Description
12293	Used by Proficy Server Manager for the Service Control feature of the Administrator.
12294	Used by Proficy Server Gateway for clients (including SDK) to send/receive Plant Application messages.
12295	Used by Proficy Server Gateway for clients (including SDK) to send/receive Plant Application messages.
12295	Used by older (4.0 and older) versions of Client Manager.
12299	Used by Proficy Server Remote Data Service, allowing Proficy services perform remote read and write operations to a historian.
12401	Used by Proficy License Manager for licensing requests from Proficy services to clients.

Use INI files such as `cmRTR.ini`, `cmConfigMgr.ini`, `PlantAppsMessging.ini`, or `Message.ini`(found in the Plant Applications program installation directories), to modify the following ports.

Port	Description
10000	Used by the Proficy message router to process Plant Applications messages between services clients communicating with the router.

Port	Description
12280	Used by the Proficy message router to process Plant Applications messages between services clients communicating with the router.

Following ports are required for the Plant Applications Web Client.

Port	Description
15672	Used by the Rabbit MQ Message bridge to communicate with the Plant Applications server to retrieve data updates.
8443	Used to provide the required redirect to allow the UAA to load the Web Client.
8444	Tomcat port used by the Web Client.
5433	Default port for PostgreSQL installation.
9095	The default port for Kafka.
2185	The default port for ZooKeeper.

## *Before You Begin*

Before you install Plant Applications, complete the tasks described in this section.

### **Review Time Zone Settings**

Ensure that the system time and time zone of the server and client that you want to use for Plant Applications are correct and in sync.

 **Note:** Ensure that you must set the Plant Applications Server and the Database Server to the same time zone as that of the Default time zone site parameter.

### **Review Architecture Requirements**

You must install a historian such as GE Digital Historian as well as prerequisite software such as SQL Server. Plant Applications supports Historian (standard or enterprise) 8.1.

Due to the competition for ports, “all-in-one” deployments are no longer supported. We recommend that Historian and Web Client be installed on separate server nodes.

Refer to (page ) to learn about architecture strategies to meet the needs of particular environments.

## Review Upgrade References

If you are upgrading from version 7.0 SP5 or 8.0 to 8.1 of Plant Applications, refer to [Upgrading from Plant Applications Version 7.0 SP5 or 8.0 to 8.1 \(page 102\)](#) for additional steps. Contact GE Support at [General Contact Information \(page 114\)](#) for assistance with upgrading from earlier versions.

If you are installing the Plant Applications Server, Clients or Web Server report components in a clustered environment, review the information in *Appendix B* at [Cluster Overview \(page 104\)](#).

If upgrading the Unified Manufacturing Database (UMDB), refer to these sections:

- [Upgrade Strategies \(page 30\)](#) gives strategies to upgrade the UMDB from previous versions.
- [Database Setup Strategies \(page 30\)](#) describes how to upgrade a SOA or Plant Applications database to a UMDB.
- [Setting Up Languages for Plant Applications Displays \(page 75\)](#) explains how to implement additional languages after installing Plant Applications. Plant Applications displays use English as the default language.

## System Requirements Location

[System Requirements \(page 9\)](#) outlines system requirements.

## Preparing for a UMDB Implementation

The UMDB essentially combines the SOADB' database (S95 data model) and GBDB database (Plant Applications data model). You can choose to use only the Plant Applications data model by disabling UseProficiencyClient configuration parameter (ID 87). The following items are important to consider as a part of installation planning:

- Strategy
  - Using the new, combined data model offered by the UMDB enables you to define a plant environment in an S95 structure while providing a strict and formal definition that was not possible with Plant Applications. Thus, it is advantageous to define all configuration information through the Client interface and to use Plant Applications for features that are unique to Plant Applications such as specifications, alarms, and downtime.
  - Although it may be helpful to configure some units in an S95 model, it may be practical to maintain the configuration of some units in Plant Applications. In this situation, it is important to carefully manage the configurations. Once data is extracted from Plant Applications to the S95 model, it retains characteristics of the S95 model. If units are defined in both models, problems with orphans can arise.
  - See Working with a Merged System and UMDB in Plant Applications Help for a description of the new Client interfaces and changes to the Plant Applications Administrator.

- Database purges: Plant Applications supports a Unified Manufacturing Database (UMDB) to combine a SOA database employing an S95 data model with a Plant Applications database. Purging data from the UMDB is a two-step process involving both the Plant Applications and SOA purge utilities. The following notes apply to a purge of the Plant Applications database:
  - Perform online purges to Plant Applications databases before upgrading to the latest version.
  - For sites using only the Plant Applications data model, there are cursor purges that can be executed to trim the database as an interim solution.
  - For sites incorporating both the Plant Applications and S95 data models, do not purge the PA database as this will orphan data on the WF side and could introduce issues.
- Conversion of custom containers and displays remains a GE IP Services function.
- Moving or renaming a server after migrating to a UMDB.
  - Standard Plant Applications 5.0 scripts work with Plant Applications 8.1 to move or rename the server.
  - Refer to Workflow documentation for information about scripts and related procedures.
- Recommended installation paths
- New naming convention for specific Plant Applications tables starting in version 6.1.
  - UMDB tables have a \_Base naming convention and are associated with SQL Views for improved performance and to enable modifications without impacting existing structures. Data is linked in a view to maintain compatibility between the S95 and Plant Applications models.

Table	SQL View
Product_Base	dbo.Products
Prod_Lines_Base	dbo.Prod_Lines
Prod_Units_Base	dbo.Prod_Units
Departments_Base	dbo.Departments
Users_Base	dbo.Users
Variables_Base	dbo.Variables

- Modification of existing spLocals when upgrading to Plant Applications is not needed.
- Table limitations on the Plant Applications side are not enforced in for the S95 structures to SOA to enable incorporation of proactive error checking for conditions inside workflows. It is recommended to incorporate field size limitations in documents where appropriate. For example, limit event\_num.Events to 25 characters.
- Reporting
  - Plant Applications has two reporting structures.
  - Plant Applications continues to have Web Reports for information that is specific to Plant Applications.
  - The SOA database (S95 data structure) has its own reporting.

## *SQL Server Requirements*

To install Plant Applications, the SQL Server Browser service for SQL Server must be running, and the TCP/IP protocol must be enabled.

The SQL User account used for the database when installing Plant Applications requires, at minimum, system administrator privileges.

If you are installing Plant Applications Server and SQL Server on different computers, you must manually enable the TCP/IP protocol. It cannot be enabled remotely.

## *Setting up the Remote Data Service*

The Remote Data Service (RDS) allows Plant Applications Client components, including the Administrator, to access historians without installing the API components on the local server.

By consolidating the historian connections, the RDS provides a single point of configuration and software installation, making it easier to deploy the Plant Applications software. If you do not use the RDS, you must install the Historian API Client Tools on the Plant Applications Server and the individual Client workstations.

1. Use the Plant Applications client installation to install the RDS service on the remote historian server.
2. Edit the historian in the Plant Applications Administrator, then select the Remote Data Source option to facilitate communications.
3. Install Historian Client API tools.
  - a. Install the Historian on the computer where you will install the Plant Applications server.
  - b. Select the following components on the **Select Components** page:
    - Historian Excel Add-in
    - Historian Administrator
    - Historian Client Tools
    - Historian Documentation & Help
    - OLE DB
  - c. Click **Next**, then click **Finish** to restart the computer with your changes.

## *Upgrade Strategies*

When upgrading Plant Applications 7.0 SP5 or 8.0 to 8.1, you must take UMDB management into account.

For more information, on handling your UMDB, see [Database Setup Strategies \(page 30\)](#). You should always back up an existing database. See [Upgrading from Plant Applications Version 7.0 SP5 or 8.0 to 8.1 \(page 102\)](#) if you are upgrading from Plant Applications 7.0 SP5 or 8.0 to 8.1, or contact Support at [Support \(page 114\)](#) if you are running a version of Plant Applications that does not support the UMDB or for any other upgrade paths.

## *Database Setup Strategies*

The SOA platform and Plant Applications employ SQL databases running on SQL Server software to store information.

Merging an existing SOA database with an existing Plant Applications database to form a Unified Manufacturing Database (UMDB) requires detailed planning. The strategy you employ to set up database depends on your existing situation and your goals. For example, you can opt for a new installation with a new database, or you can upgrade an existing database to install a UMDB. It is probably a rare case that you would need to install a UMDB that combines existing SOA and Plant Applications databases. The UMDB can reside on the same machine as the Plant Applications server or on a separate server with SQL Server installed.

You can use one of the following basic strategies for establishing a database:

### **Create a New Database for New Data**

Enter a new database name during the Workflow installation with the intention of starting fresh with new data for a new UMDB to hold and Plant Applications data. The necessary SQL database tables, compatible with the software versions, are set up.

When using Workflow Client to create equipment, material, and personnel, the entities are aspected to the Plant Applications data model for access in Plant Applications. In the same way, entities created in Plant Applications are aspected for use in the Workflow Client. To create a new database, enter a new database name. Refer to *Plant Applications Client Help* for information about Fully Qualified Domain Names.

You should back up an existing database before installing a new release of Workflow or Plant Applications. SQL Server changes to the SOA database, such as the addition of data models and tables included with software, cannot be reversed.

## Point to an Existing Database

If you have an existing SOA or Plant Applications database, you can point to the database during the Workflow installation and a subsequent Plant Applications installation. To point to an existing database, enter its name when prompted for a database name. During the Workflow installation, SOA data tables are updated for compatibility with new software.

When Plant Applications is installed, the MESCore Service Provider adds the necessary Plant Applications tables and aspects to the SOA database to install a UMDB. If you are using only an existing Plant Applications database, it will not have any SOA data structures.

If upgrading an existing SOA database to a UMDB, refer to [Preparing a SOA Database for UMDB Integration \(page 61\)](#). After Plant Applications is installed, you must run the CreateAspect command from the command line with options to prepare the database for migration.

## Create a New Database as a Placeholder

Enter a new database name as a placeholder during the Workflow installation with the intention of later pointing to an existing database. Database upgrade can be a slow process or you may want to follow a more complex strategy to merge data. Creating a new database during installation helps to not interrupt the installation process while providing options for handling database setup.

- Use the utilities available with SQL Server to move a database from one server to another.
- Historian data is stored in separate tables and may be in a separate database. It is useful for reporting to have the Historian database point to a Plant Applications database, because alarms are then kept in a common “alarms” table. When generating a custom report, you can report on alarms from both Historian and Plant Applications.

## Aspecting

Aspecting cross-references objects residing in the Plant Applications database with objects that follow the S95 data structures used by Workflow.

Set the **UseProficiencyClient** site parameter to `True`, to enable aspecting. You cannot rename aspected items. Aspecting of user names uses the fully-qualified domain name (FQDN) specified for a Windows account. For more information, see the *Plant Applications Help*.

- When using the Workflow client to create equipment, material, and personnel, the entities are aspected to the Plant Applications data model for access in Plant Applications. In a similar fashion, entities created in Plant Applications are aspected for use in the client.
- Set the `UseProficiencyClient` site parameter to `True` to merge the Plant Applications and the SOA equipment models using the Workflow client. For more information, see *Enabling the Proficiency Client UI and Aspecting* in the *Plant Applications Help*.


## *About TLS Support*

You must install the following software packages to support transport layer security (TLS) 1.2:

- Microsoft .NET Framework 4.7
- Microsoft SQL Server Native Client for the SQL Server (the minimum required version is 11.4.7001.0)

Consider the following points to enable TLS 1.2 in operating systems:

- TLS 1.2 is already enabled in Windows 8 (and later versions) and Windows Server 2012 (and later versions) operating systems. To use TLS 1.2 in these operating systems, you must add registry keys to disable TLS 1.0 and 1.1.
- To enable TLS 1.2 in operating systems prior to Windows 8 or Windows Server 2012, you must add keys, and modify existing keys to disable TLS 1.0 and 1.1.

 **Note:** Use the following URL to access the keys: [https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-server-2012-R2-and-2012/dn786418\(v=ws.11\)#BKMK\\_SchannelTR\\_TLS10](https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-server-2012-R2-and-2012/dn786418(v=ws.11)#BKMK_SchannelTR_TLS10).

## *About FIPS Support*

Plant Applications supports Federal Information Process Standards (FIPS). If you want to use FIPS-compliant algorithms for encryption, hashing, and signing, you must enable FIPS on the machine on which you want to install Plant Applications.

## *About the SQL Server AlwaysOn Requirements*

The Plant Applications modules support the Microsoft SQL Server AlwaysOn feature that provides a high-availability and disaster-recovery solution for SQL servers. The feature acts as an enterprise-level alternative to database mirroring and maximizes the availability of a set of user databases for an enterprise. For more information, refer to the URL [https://docs.microsoft.com/en-us/previous-versions/sql/sql-server-2012/ms190202\(v%3dsql.110\)](https://docs.microsoft.com/en-us/previous-versions/sql/sql-server-2012/ms190202(v%3dsql.110)).

## **About Replicating Logins and Jobs for the SQL Server Nodes**

For the high-availability solutions to work, you must replicate all the user logins (including the default logins ComXClient, ProficyConnect, and ProficyDBO) and all SQL Server Agent Jobs of the primary replica of the Plant Applications database (SOADB) to all the secondary replicas of the SQL Server instance (nodes used in a cluster environment). In addition, you must create replicated user




logins with security identifiers (SID) that match those of the primary replica of the Plant Applications database. For more information, refer to the URL <https://docs.microsoft.com/en-us/sql/database-engine/availability-groups/windows/logins-and-jobs-for-availability-group-databases?view=sql-server-2017>.

## About the Tested High-Availability Solutions

The following table describes the high-availability solutions tested for Plant Applications modules.

High-Availability Solution	Cluster Type	SQL Server Node 1	SQL Server Node 2	SQL Server Node 3
Failover Cluster Instances	Single Subnet	Network A	Network A	Not applicable
Failover Cluster Instances	Multi-Subnet	Network A	Network B	Not applicable
Availability Groups	Single Subnet	Network A	Network A	Not applicable
Failover Cluster Instances + Availability Groups	Single Subnet	Network A	Network A	Network A
Failover Cluster Instances + Availability Groups	Multi-Subnet	Network A	Network B	Network B
Failover Cluster Instances + Availability Groups	Multi-Subnet	Network A	Network B	Network A

 **Note:** The performance of a high-availability solution in a multi-subnet cluster environment depends on the complexity of the network.

# Chapter 3. Installing Plant Applications

## *About Installing Plant Applications*


This section of the document describes how to get started with the installation of Plant Applications in the non-Docker environment. Ensure that you perform the following tasks for installing Plant Applications:

- [Installation Overview \(page 34\)](#)
- [Installing the Proficy Application Server \(page 35\)](#)
- [Binding HTTPS \(page 40\)](#)
- [Installing the Plant Applications Server \(page 42\)](#)
- [Installing the Plant Applications Client and Administrator \(page 45\)](#)
- [Data Authorization for Events Configured for Each Event Type \(page 46\)](#)
- [Installing the Plant Applications SDK \(page 47\)](#)
- [Installing the Plant Applications Message Bridge \(page 47\)](#)
- [Configuring a User in RabbitMQ \(page 56\)](#)
- [Installing the Plant Applications Web Client \(page 58\)](#)
- [Unicode Utility \(page 58\)](#)
- [Task Lists for ActiveX and SOA Web Client \(page 61\)](#)
- [Preparing a SOA Database for UMDB Integration \(page 61\)](#)
- [Plant Applications REST APIs \(page 62\)](#)

## *Installation Overview*

Plant Applications software includes components for Plant Applications and Workflow.

The Unified Manufacturing Database (UMDB) requires Workflow, but you only need licensing if you are using workflows. The Proficy Application Server installs Workflow 2.6. If you are upgrading from a previous version of Plant Applications, see [Upgrading from Plant Applications Version 7.0 SP5 or 8.0 to 8.1 \(page 102\)](#).


 **Note:** By default, all non GE functionality is installed on the C: drive. If you do not want to use the default location, you can manually install the non GE functionality to the required location.

Run the `installfrontend.exe` program as an administrator to display the **Installation** menu, which includes the following options:

Menu Selection	Description
View Documentation	Accesses documentation.

Menu Selection	Description
Browse the DVD	Displays a dialog for browsing files and folders.
Exit	Closes the menu.
Proficy Application Server	Installs the Proficy Application Server, which includes Workflow. Workflow includes SOA components (without a Workflow license), which are necessary to support UMDB data structures.
Plant Applications Server	Installs Proficy Plant Applications and the MESCore Service Provider with Proficy Server (Plant Applications) services.
Plant Applications Report Server	Installs the server used to view Plant Applications Web Server reports with a browser.
Plant Applications Client	Installs the Plant Applications Administrator option for administration and the Plant Applications Client option to access Client displays. Also installs Plant Applications help and other documentation.
Plant Applications .NET SDK	Installs the .NET SDK for use with VB.NET applications. It uses a COM wrapper with C# or VB.NET applications. Access additional Utilities for Plant Applications
Plant Applications Message Bridge	Enables real time updates on the Web Client displays.
Plant Applications Web Client	Installs the Plant Applications Web Client .
SQL Native Client download	Installs the Microsoft SQL Server Native Client.

By default, Proficy Server services are automatically installed on the computer where the Plant Applications Server installation runs. To install Proficy Server services on one computer and install the UMDB on another, run the Plant Applications Server installation on the computer where you want the Proficy Server services installed. During the installation, you can identify the SQL Server where you want to install the UMDB.

 **Note:** The *Preparing to Install Plant Applications* chapter includes steps for setting up the SQL Server.

## *Installing the Proficy Application Server*

The Proficy Application Server installs Workflow components as prerequisites for Plant Applications.

Verify that licensing has been installed before installing the Plant Applications Server.

Workflow is required even if you are planning to use legacy Plant Applications features and Plant Applications data models without any merged SOA data models. You need a Workflow license to use workflows.

During the Proficy Application Server installation, you must specify the location for the SQL Server that hosts the database, as well as the the name of the database. Stored in an XML file the Plant Applications installation uses this information in one of these scenarios:

- When Workflow adds Plant Applications tables to the SOA database to install a UMDB. After installing Plant Applications, you must run scripts to prepare data when a UMDB is installed with existing SOA data.
- When Workflow adds SOA tables and keys to a Plant Applications database (if specified as the database during installation) to install a UMDB. Before installing Workflow, you must run a script to prepare the Plant Applications database for the UMDB installation.

Refer to the following log files when troubleshooting service provider installation failures: `configuresite.log` and `configureproficymocule.log`. You can find the log files in the Documents and Settings\users\application data proficy\logdirectory, or at `\programdata\proficy\logs`.

1. Copy software and extract files to the machine where you want to install the Proficy Application Server components, then run `InstallFrontEnd.exe` as an administrator.
2. From the **Installation Menu**, select **Proficy Application Server** from the **Prerequisites** group.
3. Select the **Proficy Application Server** from the options in the **Application Server Setup Wizard** screen.
4. Select **Core** as the type of **Proficy Application Server**, then click **Next**.
5. Accept the End User License Agreement (EULA) for Proficy Workflow by clicking **I Agree**.
6. From the **Installation Folders and Architecture** screen, select the destination folders for the installation location, then select **32-bit architecture**. Click **Next** to continue.

## Installation Folders and Architecture



Proficy application server 32- and 64-bit components will be installed to the appropriate folders indicated below. To change the default locations, click **Browse**, and then select a new location.

Destination Folder (32-bit) \_\_\_\_\_

C:\Program Files (x86)\Proficy\Proficy Workflow

Destination Folder (64-bit) \_\_\_\_\_

C:\Program Files\Proficy\Proficy Workflow


Architecture \_\_\_\_\_

32-bit  64-bit




 **Note:** Plant Applications does not support 64-bit architecture.

- Specify **Active Directory Lightweight Directory Services (AD LDS)** settings if using AD LDS, or use a standalone local directory. Click **Next** to continue.

 **Note:** If AD LDS is not installed, the wizard defines a standalone local directory.

- Verify that the SQL Server Browser service is running. At the **Database Configuration** screen, specify SQL Server settings for the installation. The example screen specifies a database named SOADB, which is typical when installing a UMDB from a SOA database. If upgrading from an existing Plant Applications database, specify its name. Or enter a new name for the UMDB. Click **Next** to continue.

## Database Configuration

Specify the SQL Server database settings for this application.

Back up your existing database

Use a local database with Windows Authentication

SQL Server

Server

Database

Authentication

User Name

Password

Please ensure your service account is configured with the appropriate SQL server permissions. See documentation for details.

The SQL User account used for the database when installing Plant Applications requires, at minimum, system administrator privileges. To review login permissions and connection properties set up in SQL Server:

- a. Select **Properties** by right-clicking with a server name in **Object Explorer** in **SQL Server Management Studio**.
  - b. Review the **Security and Permissions** pages in the Server Properties window.
  - c. Click **View connection properties** in the **Connections** pane.
9. If needed, start the **SQL Server Agent (MSSQLSERVER)** service.
10. At the **Security** screen, enter administrator credentials for Workflow.

**Security**

Specify the administrator credentials for this application.

Name

Password

Confirm Password

This section is optional. Select one of the following options in order to allow users to change their authentication settings when they log on.

Advanced user authentication settings:

Use SSO (Single Sign On)


Change user password

Lock user account

Enforce user password complexity rules


<Back    Next>    Cancel

11. From the **Service Certificates** screen, generate new certificates or import existing certificates. For more information, see, [SSL Security Certificates \(page 24\)](#). Click **Next** to continue. The installation program places a certificate into the trusted root store on the server where the Application Server is installed.
12. If the installation wizard displays a `Firewall Detected` message, disable your firewalls or configure your computer to communicate with the server. Click **Next** to continue.
13. From the **Installation Confirmation** screen, click **Install** to install Proficy components. Follow any additional screen prompts.

 **Note:** The installation program times out after 10 minutes if the Proficy Server service does not start, and a message prompts you to manually start the service. Once the service starts, the installation automatically continues.

The installation script performs the following actions:

- Installs MS Visual C++ redistributables.

 **Note:** In order to install Workflow 2.6, you may be required to uninstall version VC++ 2017 and then reinstall it.

- Installs Proficy Application Server.
- Sets up the SOA database.
- Sets up security.
- Sets up IIS.

- Sets up SQL.

14. Upon successful installation, the wizard displays a confirmation message. Click **Exit** to close the installation wizard.

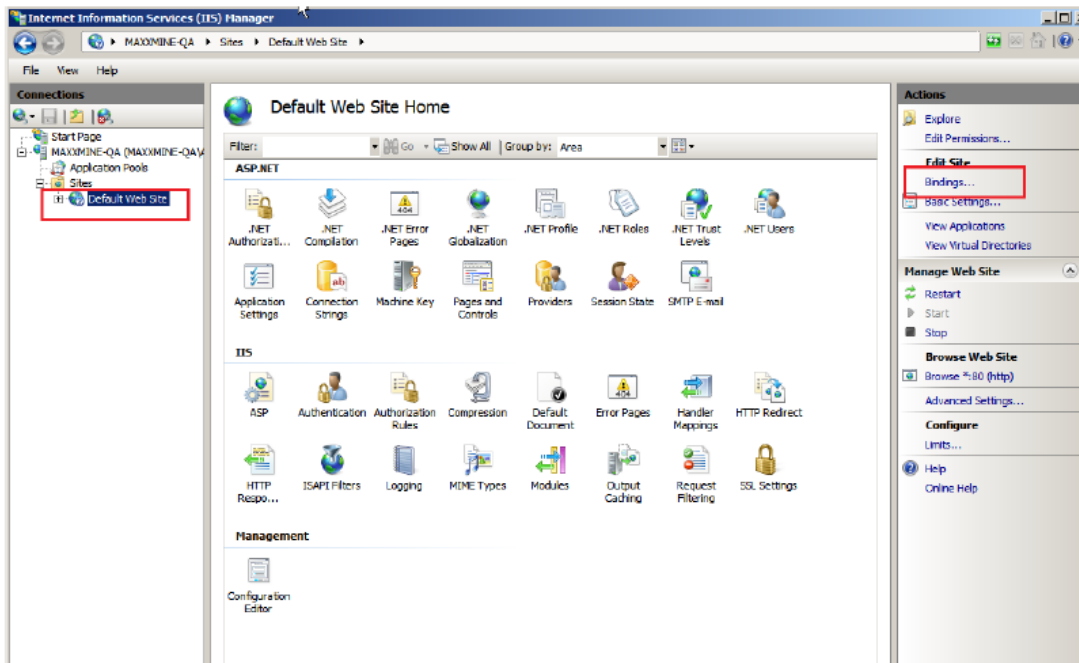
15. You can verify that the SQL Server installed successfully by checking the `SQL server setup failed` status in the `SetupDataPlantAppsTemplateFile.xml` file under `Program Data/Proficy`.

## Binding HTTPS

After IIS is installed and basic setup completed, you may need to bind an SSL certificate to HTTPS on the machine where the web server is installed.

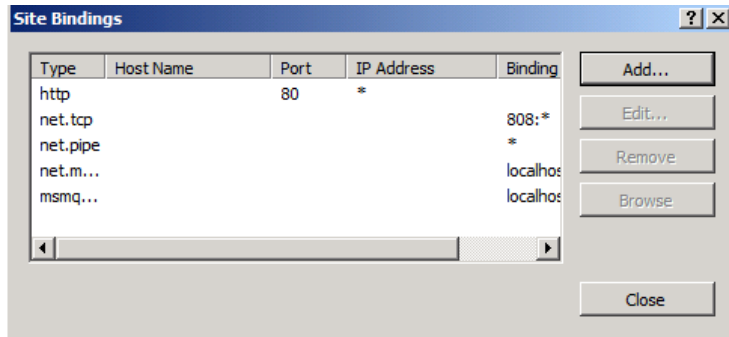
A certificate was installed when the Proficy Application Server was installed and downloaded to the machine where the web server resides as part of its installation. For more information, see the *Proficy Workflow Getting Started Guide*.

1. Start the Internet Information Services (IIS) Manager.
2. Navigate to and select **Default Web Site**. Select **Bindings**.



The Site Bindings dialog box is displayed.



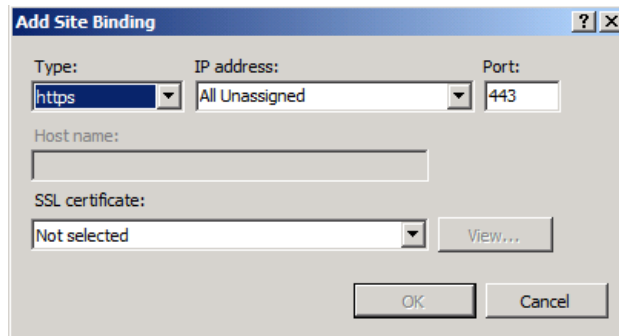


### 3. Bind the certificate to HTTPS.

- a. Click **Add** to display the **Add Site Binding** dialog box.

If you are re-binding the HTTPS certificate, select `https` from the **Site Bindings** dialog box, then click **Edit**.

- b. Select `https` in the **Type** field.



- c. In the **SSL certificate** field, enter the fully-qualified domain name of the server that received the certificate.

For the Proficy Application Server, the server is typically the host that the Web Server uses to connect to the server.

If you are re-binding the HTTPS certificate, the port remains 443. Select your SSL certificate from the drop-down menu. Click **View** to verify that you have a private key that corresponds to the certificate.

- d. Click **OK** to add HTTPS binding to the list of bindings in the Site Bindings dialog box.

### 4. Close the Site Bindings dialog box.

### 5. Close the Internet Information Services (IIS) Manager.

After installing Plant Applications Administrator, change the `Global Configuration/Plant Applications Site Parameters/Client/UseHttps` value to `True`.

## *Installing the Plant Applications Server*

- Install Proficy Application Server.
- Bind HTTPS or select a new port.
- If upgrading from an earlier version of Plant Applications, verify that the MESCore Service Provider is uninstalled.
- Install a hardware key.

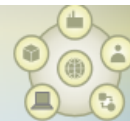
The SOA platform installed with the Workflow installation is a prerequisite for Plant Applications 6.1 or later even if you are planning to use legacy Plant Applications features and Plant Applications data models without any merged SOA data models. You do not require a Workflow license to use Plant Applications 6.1 or later with the UMDB unless you plan to use workflows.

The `configuresite.log` and `configureproficymocule.log` files can be useful for troubleshooting if a service provider is not correctly installed. These logs are stored under `users\application data proficy\log` in the Documents and Settings folder or at `\programdata\proficy\logs`.

1. Select **Plant Applications Server** from the Installation menu to start the **Setup Wizard**. If the installation does not automatically start, locate and double-click the `ProficyServer.exe` file.
2. Accept the End User License Agreement (EULA), then click **I Agree** to continue.
3. Enter the administrator credentials for the Proficy (Workflow) SOA Server or Proficy (Workflow) Client at the **Configure Security** screen, then click **Next** to continue.

In the following example, `Admin` is the Administrator Name that was entered when installing Workflow.

## Configure Security



Please specify the administrator credentials for this installation.

Administrator Credentials

Administrator Name	<input type="text" value="Admin"/>
Administrator Password	<input type="password"/>

<Back

Next>

Exit

- If needed, select Install Plant Applications Service Provider (PASP) at the **Install PASP** screen, and click **Next**.

**Note:** The PASP supports Plant Applications versions 4.4.1 and 5.0 for customers using interface methods published with the old version of the service provider. A standalone installation program is available if you install the PASP at a later time. The new MESCore Service Provider, which supports the UMDB, is installed with Plant Applications 6.0 or higher. Methods for the PASP remain documented in the Proficy Workflow help. You must install the PASP to run any workflow applications developed to run against Plant Applications 6.0 and earlier, as they will not run with the new MESCore SP.

- From the **Ready to Install** screen, click **Install** to start the installation.

The installation script times out after 10 minutes if the Proficy Server service does not start, and prompts you to manually start the service. Once the service is started, the installation automatically continues.

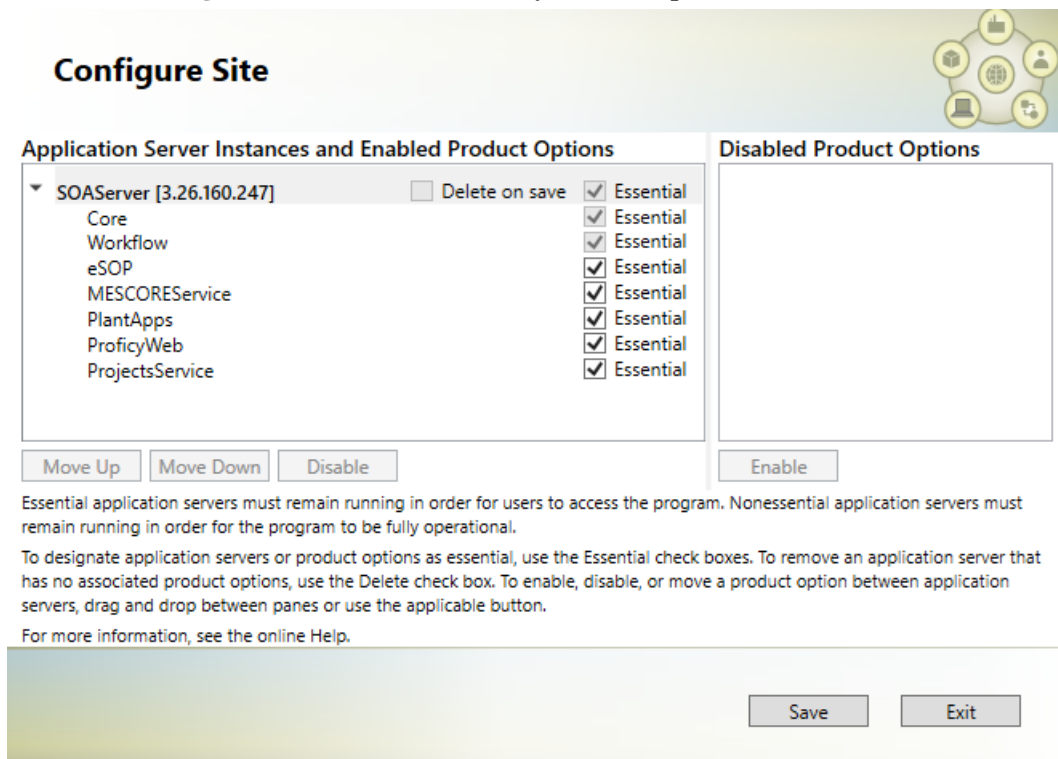
The installation script performs the following actions:

- Maps user accounts to the installed database.
- Installs Plant Applications Server.
- Sets COM DLLs and ActiveX controls by registering the following files:
  - C:\Program Files\Common Files\Proficy\Plant Applications\PRMmsg.dll

- C:\Program Files\Common Files\Proficy\Plant Applications\ProfSVR.dll

- Creates the Plant Applications database and tables, and populates the database (database size affects length of time).
- Installs the MESCore Service Provider module.
- Stops the Proficy Server, Proficy Publisher, and Proficy STS services.
- Installs product options, including displays, and sets up the Proficy site, Plant Applications services, and MESCore service views and triggers.
- Creates a BAT file with uninstall settings.
- Calls a data model loader to create aspect tables for the database.
- Starts the PRLicenseMgr, PRProficyMgr, and Plant Applications services, and restarts Proficy services.

6. From the **Configure Site** screen, enable any essential product items.



Click **Save** to save your changes, then click **Exit** to complete the wizard.

7. Click **Exit** to close the wizard.

8. Confirm that the Proficy Server and Proficy Server Manager services are started. If services fail to start, check the applicable log files.

9. Verify your installation by checking the installation log files.

Directory	Action
<Drive>:\<Program Files>\Proficy\Proficy Database\SetupLogs	Verify that Verifies.log and StoredProcedures.log files for the UMDB contain no errors.
<Drive>:\<Program Files>\Proficy\Proficy Server\SetupLogs	Verify that its StoredProcedures.log file contains no errors.
<Drive>:\<Program Files>\Proficy\Proficy Server\LogFiles	Verify that the Plant Applications Service log files, CalculationMgr-xx.log files, and Gateway-xx.log files contain a Connected to Router notification. This notification indicates that the TCP/IP communications are functioning successfully on the Plant Applications Server.
<Drive>:\<Program Files>\Proficy\Proficy Server\LogFiles	Verify that the Router-xx.log file initialized successfully and does not contain any errors.

## *Installing the Plant Applications Client and Administrator*

If you are using Web Server reports, install the Plant Applications Report (Web) Server after installing the Plant Applications Server, but before installing a Plant Applications Client.

The Report (Web) Server is required for Web Server reports. Before installing, verify that the required IIS roles are installed. When installing IIS, make sure that WebDAV is not installed.

If an error occurs when loading the ISAPI filters, check the ISAPI file path.

The client installation installs the Plant Applications Client and Administrator, Plant Applications Excel Add-in, Downtime Supervisor Screens, and Help files. It also installs Development tools and remote services, including the Plant Applications OPC Server and Remote Data Services. Plant Applications Administrator is the primary means of maintaining and managing the Plant Applications software. You can control system security by limiting the number of computers with the Administrator program installed.

To make it easier for technical support to quickly correct any potential problems, install the Plant Applications Administrator and Client software on the same computer as the Plant Applications Server. Also, install the Administrator and Client software on workstations that maintain the Plant Applications configuration.

1. Select **Plant Applications Client** from the Installation Menu, then click **Next** at the **Welcome** screen.
2. When prompted, click **OK** to review the **Important Product Information** page.
3. From the **Custom Setup** screen, select **Plant Applications Client** and **Plant Applications Excel Add-in** from the list of options.

You can also select **Plant Applications Administrator, OPC Server, and Remote Data Services** to install.

No prerequisite software is required to install the Proficy OPC Server. However, you can use an OPC test client such as Matrikon OPC Explorer to test connections to the OPC Server. See *Plant Applications Help* to set up a user account.

Click **Space** to display the available and required space for features.

4. Click **Next** to continue.  
You are prompted to install desktop shortcuts and, if needed, Microsoft Excel.
5. Enter the name of the SQL database server, or click **Browse** button to select one. Click **Next** to continue.
6. On the next screen, accept or change the destination folder.
7. Click **Yes** to allow Plant Applications to bypass firewall and port settings, or to make appropriate setup changes.
8. From the **Ready to Install** screen, click **Install**.  
The **Installing Plant Applications Client** screen is displayed as the wizard installs the software and completes post-installation tasks.
9. When the wizard displays the **InstallShield Wizard Completed** screen, click **Finish**. Ignore an error message related to a file unzip action not responding.

Start the Plant Applications Administrator and Client. See [Maintenance and Troubleshooting \(page 85\)](#) topics in the event of any server connection failures.

## *Data Authorization for Events Configured for Each Event Type*

Follow these rules to set up authorization access for event properties:

- If the time stamp of the event for which you want to edit property data is before the **MaxEdit** window and the user does not have Read/Write access to the Administrator group, lock the cell for editing.
- A security group can be assigned directly to a variable, sheet or sheet group. If there is no security group assigned to the sheet, it inherits the security group assigned to the sheet group. When determining the access level, use the lowest access level between the variable and sheet.
- Determine the **AccessLevel** for a specific Property. If the **PropertyAccessLevel** is less than the **SheetAccessLevel** and a security group is assigned to the variable, use the

**PropertyAccessLevel.** Otherwise, use the **SheetAccessLevel.** If the **PropertyAccessLevel** is greater than the **SheetAccessLevel** and a security group is assigned to the sheet or sheet group, use the **SheetAccessLevel.** Otherwise, use the **PropertyAccessLevel.**

- Determine the write access. If the **AccessLevel** is the same as the level for the Administrator of the security group or the user has Read/Write access to the Administrator group, set the **WriteAccess** as `True` regardless of data source. If the **AccessLevel** is less than the level for the Administrator and the DataSource is 2 (Autolog), set the **WriteAccess** to `True`, but only if the **AccessLevel** is greater than or equal to the Read/Write level.

## *Installing the Plant Applications SDK*

The Plant Applications SDK is a DLL that exposes methods to read and write Plant Applications data to use with VB.NET applications, Excel reports, and so forth.

A functional change has been introduced for Plant Applications SDK to address the incorrect message issue. In the event a message is sent to the database manager with Write Direct = False and Pending = False, a “pre” message was issued. Now, with the introduction of the messaging bridge a “post” message is issued, which is the proper implementation.

Existing functionality where Write Direct = True is unchanged.

Plant Applications 6.1 added a COM wrapper to the .NET SDK to use with C# or VB.NET applications. Refer to the *Plant Applications Help* for coding examples. When upgrading from the .COM SDK, SDK applications must be completely rewritten to use the .NET SDK. For more information, see the knowledgebase at the Support site.

 **Note:** The COM wrapper does not support `BigInt` (long integers) in the Tests table because Visual Basic and COM do not support 64 bits.

1. Select **Plant Applications .NET SDK** from the Installation Menu.
2. Click **Next** at the **Welcome** screen.
3. From the **Setup Type** screen, select **Typical** to install DLLs or **Custom** to provide options to install help or the SDK test application.
4. Click **Next**. If you selected the Custom installation options, make the applicable selections.
5. Click **Finish**.

## *Installing the Plant Applications Message Bridge*

You must install the Plant Applications Message Bridge on the Plant Applications server node to access the real-time updates on the applications in the Plant Applications Web Client.

We recommend that the Plant Applications Message Bridge be installed before installing the Plant Applications Web Client. In addition, the Message Bridge configuration file will not be replaced with the new one during the installation. Therefore, we recommend

that you delete the existing configuration file located at <Plant Applications installation folder>\Proficy Server\RabbitMQMessageBridgeService\Proficy.PlantApps.MessageBridge.Service.exe.

- Ensure that you complete the following procedure specific to the Plant Applications Message Bridge:

1. Uninstall the earlier version of the Plant Applications Message Bridge, RabbitMQ, and Erlang.

The Proficy Server Message Bridge service is disabled.

2. Delete following directories:

- C:\Program Files (x86)\Proficy\Proficy Server\RabbitMQMessageBridgeService
- C:\Users\{users who installed MessageBridge}\AppData\Roaming\RabbitMQ

3. Restart your computer.

4. Delete (if any) the RabbitMQ key from the registry:

- HKEY\_LOCAL\_MACHINE\SOFTWARE\Ericsson\Erlang\ErlSrv\1.1\RabbitMQ

5. Install the version of the Plant Applications Message Bridge included in the Plant Applications installer.

6. Restart the Proficy Server Manager service.

The Proficy Server Message Bridge service is automatically restarted.


- Ensure that you create a backup copy of the text file that includes the user-specific settings. The file is created in the directory <tomcat\_home>/Apache Software Foundation/Tomcat 9.0/users/<user>, where:

- <tomcat\_home> is the directory where you installed Apache Tomcat. For example, C:/Program Files.
- <user> is the name of a logged-in user.

After you upgrade, you can copy-paste the file to the same location to replicate the user-specific settings. For more information, refer to the Plant Applications Web Client Help.

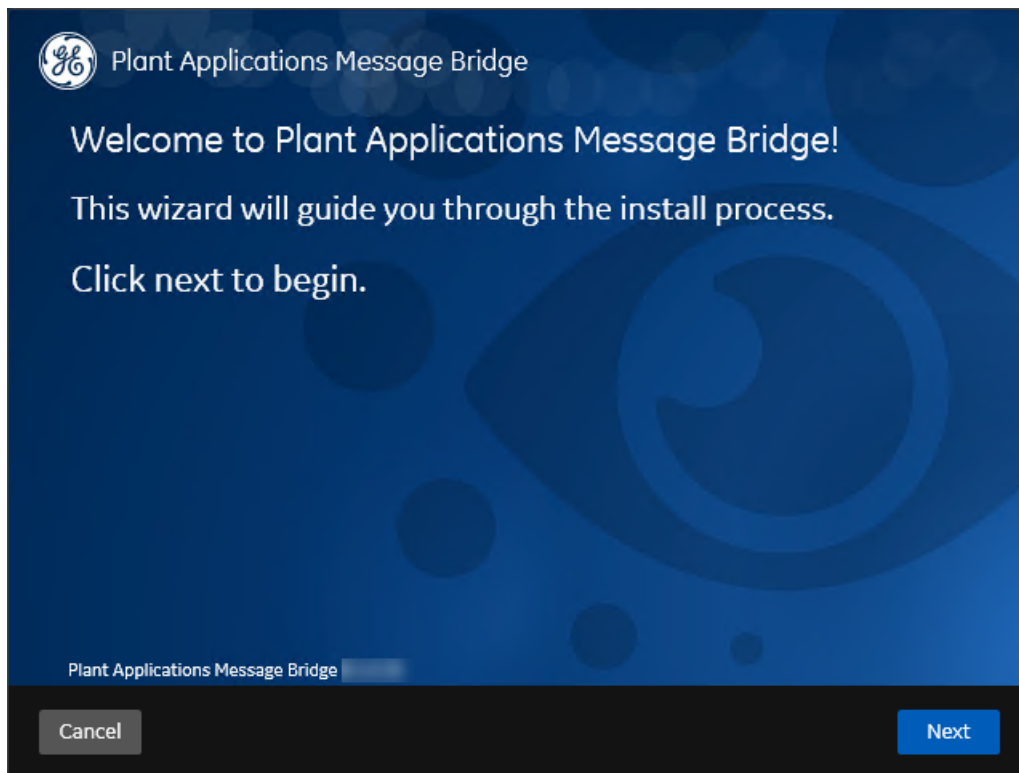
The Plant Applications Message Bridge installer installs the following prerequisites:

- Erlang OTP
- RabbitMQ Server
- Kafka
- Zookeeper

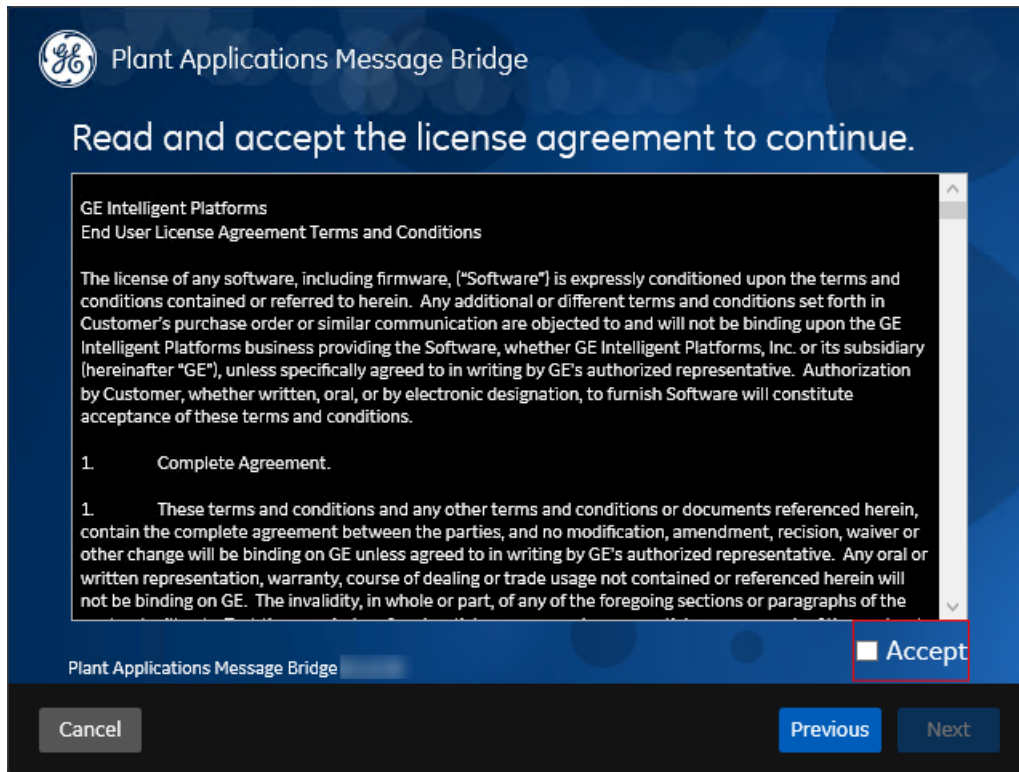
 **Note:** If the Plant Applications Message Bridge is currently installed, do not reinstall the Message Bridge. You can verify whether the Message Bridge is installed in the **Programs and Features** list on your computer as shown in the following image.



1. Select the **Plant Applications Message Bridge** wizard, and, on the welcome screen, select **Next** to install the Message Bridge.



2. Select **Next**.  
The **Read and accept the license agreement to continue** screen appears.



3. Read the license agreement, select **Accept**, and then select **Next** to continue the installation. The **RabbitMQ Administrator Account Credentials** screen appears.

Plant Applications Message Bridge

## RabbitMQ Administrator Account Credentials

Servername:

Username:

Password:

Confirm Password:

Notes:

- Your System Administrator will need to create the RabbitMQ account as entered above after this install has completed.
- RabbitMQ is required to run web applications like Activities used in both Process and Discrete applications.

Plant Applications Message Bridge

Cancel Previous Next

4. In the **RabbitMQ Administrator Account Credentials** screen, enter the following credentials:



Credential	Description
<b>Server name</b>	Enter the computer name or IP address that hosts your Plant Applications Message Bridge.
<b>Username</b>	Enter the user name you intend to use as an administrator.
<b>Password</b>	Enter the password for the administrator's user name you entered in the <b>Username</b> box.
<b>Confirm Password</b>	Re-enter the password that you entered in the <b>Password</b> box for confirmation.

5. Select **Next**.  
The **Kafka TCP port assignments** screen appears.

 **Note:** Kafka is installed in a different directory than the default directory to ensure that the kafka service is up and running.

- By default, Zookeeper is installed in <Plant Applications installation \_directory>\Proficy\Proficy Server\zookeeper-3.5.5.
- Kafka is installed in C:\Kafka.

6. In the **Kafka TCP port assignments** screen, enter the credentials to access the Kafka server as described in the following table.

Credential	Description
<b>Use external Kafka</b>	Select this check box if you want to configure an external Kafka instance.
<b>Server Name</b>	Enter the host name of the Kafka server.  <b>Note:</b> Instead of IP address, it is recommended to use the Kafka host name (computer name).
<b>Zookeeper Client Port</b>	Enter the Zookeeper Client port number.  <b>Note:</b> Ensure that you have entered a valid Zookeeper port number. If you have entered an invalid port number, refer to <a href="#">Changing the Zookeeper Port Number (page 86)</a> .
<b>Zookeeper Admin Port</b>	Enter the Zookeeper Admin port number.


Credential	Description
<b>Kafka Port</b>	Enter the Kafka port number.

If all the options are entered correctly, the **Next** button is enabled.

7. Select **Next**.

The **Plant Applications Database Credentials** screen appears.

8. In the **Plant Applications Database Credentials** screen, enter the Plant Applications database credentials as described in the following table.

Credential	Description
Server name	Enter the server name where the Plant Applications database is installed in the format <code>HOST_NAME \INSTANCE</code> . Where <code>HOST_NAME</code> is the host name (either a fully qualified domain name or IP address, of the server) and <code>INSTANCE</code> is the instance of the server used by the database.   <b>Note:</b> If there is no instance for the server, you can enter <code>HOSTNAME</code> as the server name. <code>localhost</code> is not an acceptable value for <code>HOSTNAME</code> .
Database	Enter the name of the Plant Applications database that you want to connect with the Plant Applications Web Client.
User	Enter the user name that has permissions to access the database you entered in the <b>Database</b> box. By default, the user name appears as <code>sa</code> .
Password	Enter the password for the user name you entered in the <b>User</b> box.
Instance	Enter the name of the instance of the SQL server. Entering an instance is optional.

Credential	Description
Port	Optional: Enter the number of the port that the instance uses to listen for client connections.

9. Select **Validate Connection** to validate the database connection.  
If the database connection is successfully validated, the **Next** button is enabled.
10. Select **Next**.  
The **Plant Applications Administrator Account Credentials** screen appears.

Plant Applications Message Bridge

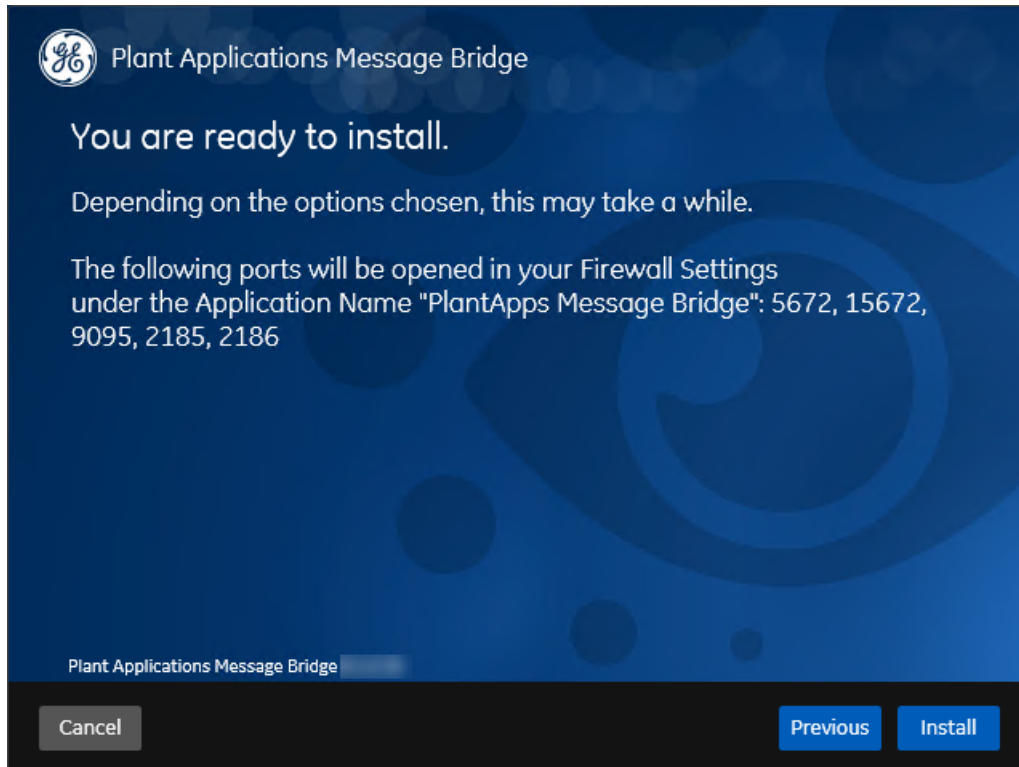
## Plant Applications Administrator Account Credentials

Username:

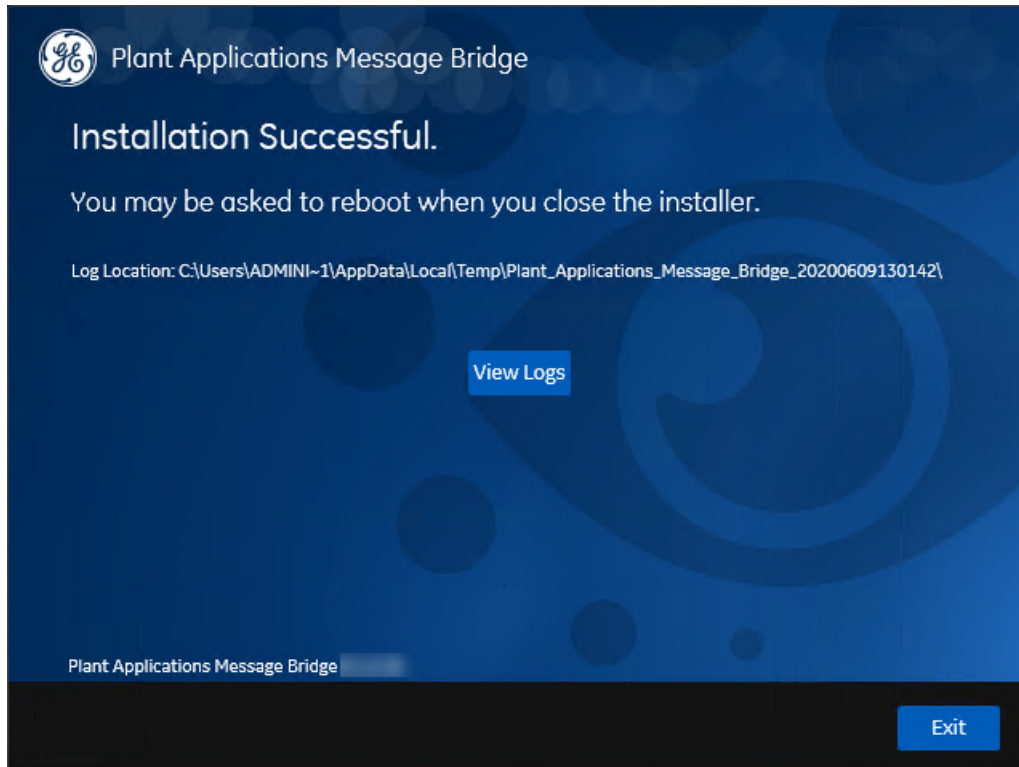
Password:

Plant Applications Message Bridge

11. In the **Plant Applications Administrator Account Credentials** screen, enter the user name and password for an administrator account in Plant Applications, and then select **Validate Connection** to validate the credentials.  
If the credentials are successfully validated, the **Next** button is enabled.
12. Select **Next**.  
The **You are ready to install** screen appears.



13. Select **Install** to install all the prerequisites and the Message Bridge. Depending on the options selected, the installation process may take some time. The installer displays the status updates.  
On successful installation, the **Installation Successful** screen appears.



14. **Optional:** Select **View Logs** to see the installation details.
15. In the **Installation Successful** screen, select **Exit** to close the wizard.

The Message Bridge is successfully installed on your computer.

After you install the Message Bridge, complete the following procedure to enable the Proficy Server Manager service to pass messages between the Plant Applications:

1. Configure your Administrator user in RabbitMQ. For more information, refer to the [Configuring a User in RabbitMQ \(page 56\)](#) topic.
2. Restart the Proficy Server Manager service to automatically start the Proficy Server Message Bridge service.

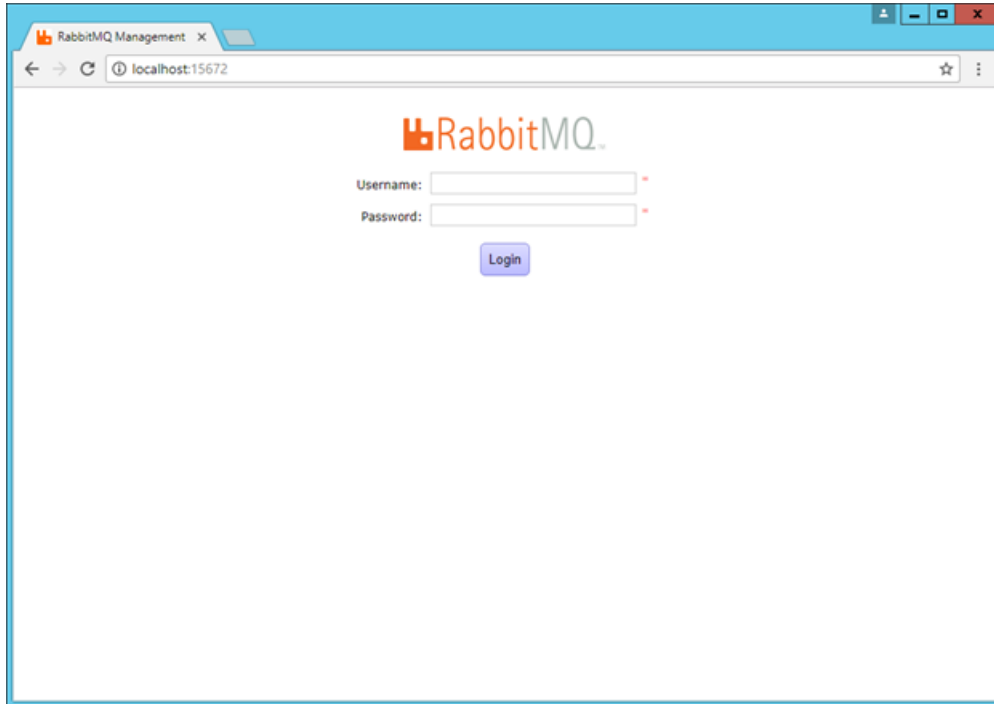
The Proficy Server Message Bridge service allows messages to pass between the Plant Applications clients.

## *Configuring a User in RabbitMQ*

1. Open the RabbitMQ management console, *http://localhost:15672*.
2. Login as a guest. Enter `guest` as the **Username** and **Password**.

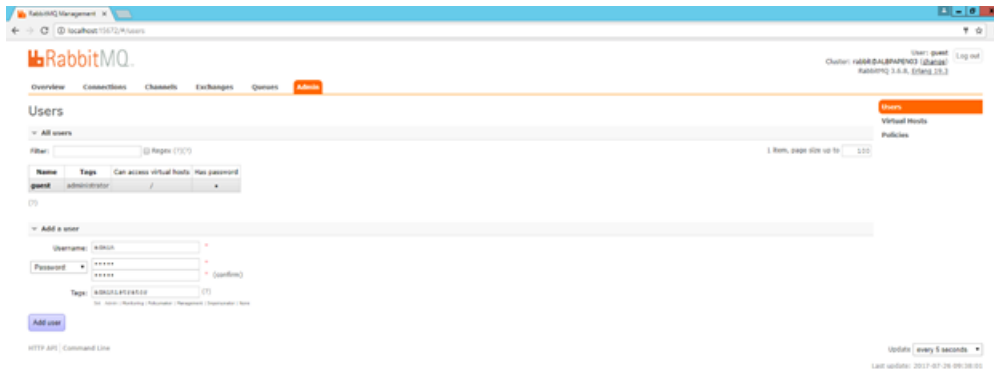


**Note:** The default user “guest” is an administrative user and its login credentials are published on the official RabbitMQ web site. It is recommended that you update this user or delete it as per your local security policies.

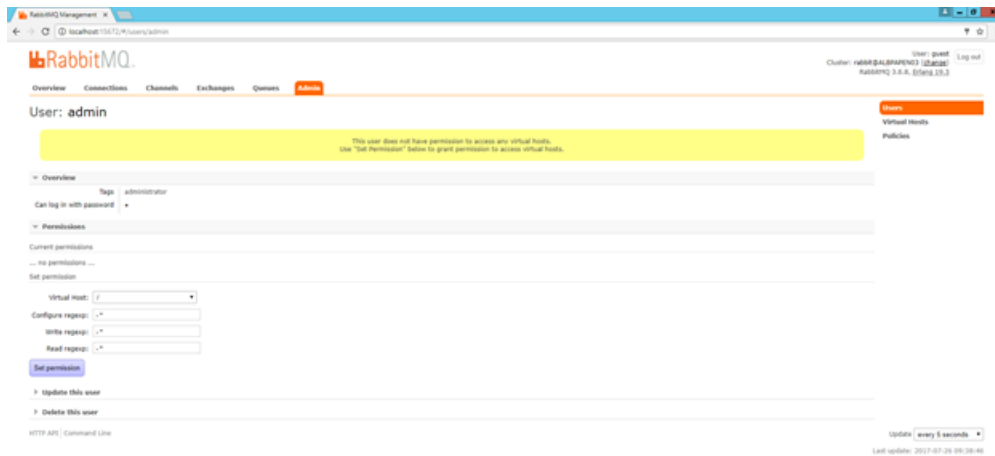


3. On the **Admin** tab, select **Add a User**. Enter the username and password provided for the RabbitMQ account during the setup and for **Tags**, select **Set > Admin**.

4. Click **Add user**.



5. In the **All users** list, click on the user you just added under the **Name** column.
6. Set the required permissions for the user and click **Set permission**.



7. The page refreshes and the user is added with the selected permissions.

## *Installing the Plant Applications Web Client*

You must install the Plant Applications Web Client to access the applications within the Plant Applications Web Client. For more information about installing Plant Applications Web Client, refer to the *Web Client Installation Guide*.

## *Unicode Utility*

Unicode Utility can be used to apply schema changes in the Plant Applications database to accept the Unicode characters.

### **Note:**

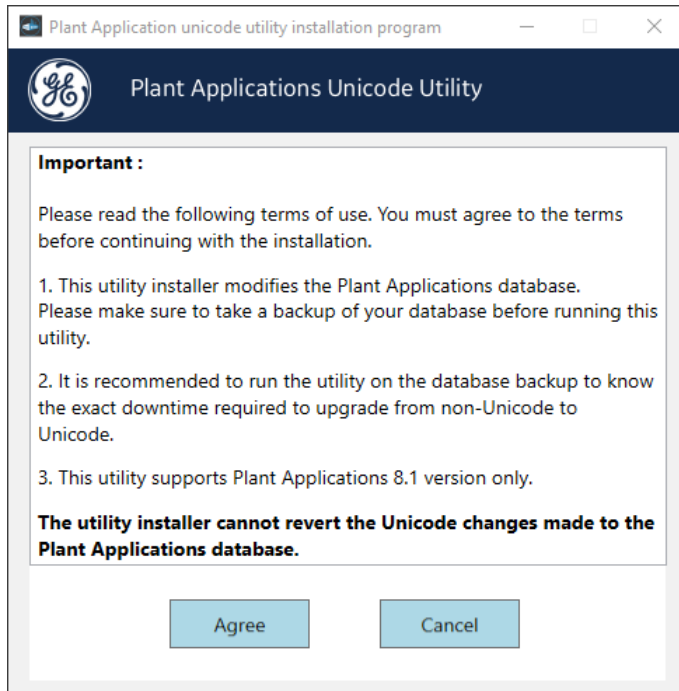
- You must run this utility only after **completing** installation of all the Plant Applications components.
- This utility supports the Plant Applications 8.1 version only.
- You must run the Unicode utility where Plant Applications Server is installed.
- This utility installer modifies the Plant Applications database. The schema changes made to the Plant Applications database cannot be reverted. Please make sure to take a backup of your database before running this utility.

- It is recommended to run the utility on the database backup to know the exact downtime required to upgrade from non-Unicode to Unicode.

## *Install Unicode Utility*



Perform the following steps where you have installed Plant Applications Server.

1. Select **Plant Applications Unicode Utility** from the Installation Menu.  
The **Important Information** screen appears.



2. Read the important information and then select **Agree**.  
The **Plant Applications Database Credentials** screen appears.

3. In the **Plant Applications Database Credentials** screen, enter the Plant Applications database credentials as described in the following table.

Credential	Description
Server name	<p>Enter the server name where the Plant Applications database is installed in the format <code>HOST_NAME \INSTANCE</code>. Where <code>HOST_NAME</code> is the host name (either a fully qualified domain name or IP address, of the server) and <code>INSTANCE</code> is the instance of the server used by the database.</p> <p> <b>Note:</b> If there is no instance for the server, you can enter <code>HOSTNAME</code> as the server name. <code>localhost</code> is not an acceptable value for <code>HOSTNAME</code>.</p>
Database	Enter the name of the Plant Applications database for which you want to apply the schema changes to accept the Unicode characters.
User name	Enter the user name that has permissions to access the database you entered in the <b>Database</b> box. By default, the user name appears as <code>sa</code> .
Password	Enter the password for the user name you entered in the <b>User name</b> box.
Port	<p><b>Optional:</b> Enter the number of the port that the instance uses to listen for client connections.</p> <p> <b>Note:</b> The default port is 1433.</p>

4. Select **Deploy** to apply the schema changes.  
Based in the database size, the time to complete the deployment varies. Once the deployment is completed, you can see the status being updated as **Unicode: Successfully Deployed** at the

bottom of the screen. On successful deployment, the Plant Applications database will accept the Unicode characters.

## *Task Lists for ActiveX and SOA Web Client*

ActiveX Task List installation is available as a separate option in a Workflow installation.


The Web Task List associated with the SOA Web Client is installed as part of the Workflow. After Workflow installation, refer to the *Workflow Help* for the link to connect to the Web Task List.

## *Preparing a SOA Database for UMDB Integration*

If you are upgrading an existing SOA database to a UMDB, prepare the database for migration by running the CreateAspect command from the command line with any required aspect options.

Ensure that Plant Applications is installed.

The script prepares the SOA data structures to work in the unified data model of the UMDB. For more information, see [Database Setup Strategies \(page 30\)](#).

 **Note:** Setting the **UseProficiencyClient** site parameter to **True** enables aspecting and disables the renaming of aspected items. Aspected user names require a fully-qualified domain name (FQDN) as specified for a Windows account. See the *Plant Applications help* for more information.

1. From a command prompt, enter the Plant Applications installation path. For example: .  
C:\<Program Files location>\Proficy\Proficy Workflow\Program
2. Run the Proficy.MESCore.Utils.CreateAspect.exe program to create Equipment and Material aspects, or add the following options to create aspects:

Option	Description
/addEquipProp	Creates the Equipment Property aspect.
/addEquipProp /addMatProp	Creates Equipment and Material aspects as well as the Equipment Property and Material Property aspects.
/addEquipProp /addMatProp	Creates Equipment and Material aspects as well as the Equipment Property and Material Property aspects.

For example: Proficy.MESCore.Utils.CreateAspect.exe /addEquipProp /addMatProp

## *Plant Applications REST APIs*

The Plant Applications UCC provides a Swagger-based UI to view and run the Representational State Transfer (REST) APIs.

You can access the UI from the list of supported Web browsers by entering a URL in the following format: `https://<server_name>:<port_number>/<micro_service_name>/swagger-ui.html`.

Where:

- `<server_name>`: Represents the name of the server on which the Plant Applications Web Client is installed.
- `<port_number>`: Represents the network port used by the Plant Applications Web Client.
- `<micro_service_name>`: Represents the name of the microservice for which you want to run the REST APIs. The microservice and the corresponding applications where you can run the microservice are listed in the following table.

Microservice	Applications
<code>productionmetrics-service</code>	<ul style="list-style-type: none"> <li>◦ Equipment</li> <li>◦ Reports</li> </ul>
<code>productionmetrics-app-service</code>	<ul style="list-style-type: none"> <li>◦ Equipment</li> <li>◦ Reports</li> </ul>
<code>processanalyzer-service-impl-0.6.1</code>	Analysis
<code>mes-dataservice-impl-0.6.1</code>	Analysis
<code>activities-service-0.5.1</code>	Activities
<code>activities-app-service-impl-0.1.0</code>	Activities

### **Important:**

The following REST API microservices are deprecated from Plant Applications 8.1. These REST API microservices will be permanently removed in the future release.

- In `activities-service`:
  - GET `/userDefined/v1/events/{eventId}/status`
  - GET `/production/v1/events/{eventId}/status`
- In `comment-service`:
  - GET `/comment/v1/commentThreads/permissions`

## *Access the Plant Applications REST APIs*

1. Open a web browser.
2. Enter the URL for a Swagger-based UI in the following format: `https://<server_name>:<port_number>/<micro_service_name>/swagger-ui.html`.  
For example, `https://www.ge.com:443/activities-app-service-impl-0.1.0/swagger-ui.html`  
The UI for the specified microservice appears.
3. Select **Authorize**.  
The **Available authorizations** window appears.
4. In the **client\_id** box, enter the `clientId` for the Plant Applications universal client server.
5. In the **client\_secret** box, enter the client secret for the Plant Applications universal client server to authorize requests to expose the REST API endpoints.

You can now view and run the REST APIs for the selected microservice.

# Chapter 4. Installing the Report (Web) Server

## *Report Server Installation Overview*


Plant Applications offers Web Reports for access through a browser and specialized Web Parts for access through a portal using the Report (Web) Server.

The Plant Applications Report Server must be installed after the Plant Applications Server, but before installing a Plant Applications Client. For information about setting up and using Web Reports and Web Parts, see the *Plant Applications help*.

Web Client Reports offer another means to access similar data. See *Plant Applications Client Interfaces* for information about accessing the Plant Applications Web Server Administrator and the Web Server.

You must also determine the account that the Plant Applications services uses to start. The account must have `Log on as a service` rights.

For information about installing and using SSRS, see the *Proficy Plant Applications SSRS Report Configuration and Report Creation Guide*, which is posted with KB16011.

 **Note:** The Plant Applications services do not start when using the Local System account.

## *Windows Installation Limitations*

By default, Windows Server OS versions do not install the Web Server (IIS), FTP, and ASP components required for Web Reports. Before you install the Proficy Application Server, you must install the necessary components by following the steps in [Setting up IIS Web Services \(page 19\)](#).

## *IIS Metabase Configuration Backup*

Metabase backup files contain copies of the metabase configuration file. You can create a portable backup if needed.

You can locate the appropriate information at the corresponding Microsoft websites:

- IIS 6.0: <http://www.microsoft.com/technet/prodtechnol/WindowsServer2003/Library/IIS/131b609d-ff3a-488f-a8dd-13044fa623a1.mspx?mfr=true>
- IIS 7.0 and 7.5: <http://support.microsoft.com/kb/954872>



## *Setting Up Internet Explorer Security for Web Reports*

Install web reports.


1. From Internet Explorer, select **Tools > Internet Options**.
2. Select **Local Intranet** on the **Security** tab, then click **Custom Level** to display the **Security Settings** dialog.
3. Scroll down to **User Authentication**, then select **Automatic logon with current username and password**. Click **OK**.
4. Select **Trusted sites on the Security** tab, then click **Custom Level** to display the **Security Settings** dialog.
5. Scroll down to **User Authentication**, then select **Automatic logon with current username and password**. Click **OK**.
6. Select **Trusted sites on the Security** tab, then click **Sites** to modify the **Trusted sites** dialog.
  - a. Verify that the web server name and localhost are included in the list of trusted sites in the format `http://servername`.
  - b. To add the web server or local host to the list of trusted sites, enter the server in the **Add this website to the zone** field in the format `http://servername`, then click **Add**.
  - c. Click **Close**.
7. On the **Privacy** tab, click **Advanced** to display the **Advanced Privacy Settings** dialog.
8. Select **Override automatic cookie handling**, then click **OK**.
9. Scroll down to **Security** on the **Advanced** tab, and verify that **Enable Integrated Windows Authentication (requires restart)** is selected. Click **OK**.


## *Installing the Plant Applications Report Server*

After installing IIS roles, you can install the Plant Applications Report Server.

Determine which components to install and complete the required prerequisites.

- Verify that role services have been installed as described in the *Setting up IIS Web Services* section in the *Plant Applications Getting Started Guide* in [Setting up IIS Web Services \(page 19\)](#).
- If planning to use a web portal (for example, Proficy Portal or SharePoint Services), verify the portal has been installed before installing the Web Server.
- A PDF distiller is installed to generate reports in PDF format. A default printer must be installed on the computer, and the PDF service must start with its own Windows user account (Login As Service policy required) for the report engines to print or produce reports in PDF format. For more information, see *Adding a Printer* in the *Web Server and Web Client* section of the *Plant Applications Help*.
- Microsoft Excel is required to install Plant Applications Web engines.

 **Note:** After installing the Plant Applications Web Server, you must start Excel under the same login account used by the Plant Applications Report engine services.

 **Note:** By default, SharePoint Portal Services 3.0 uses port 80, also used by Plant Applications Web Server. You must change SharePoint to use an open port, such as port 81.

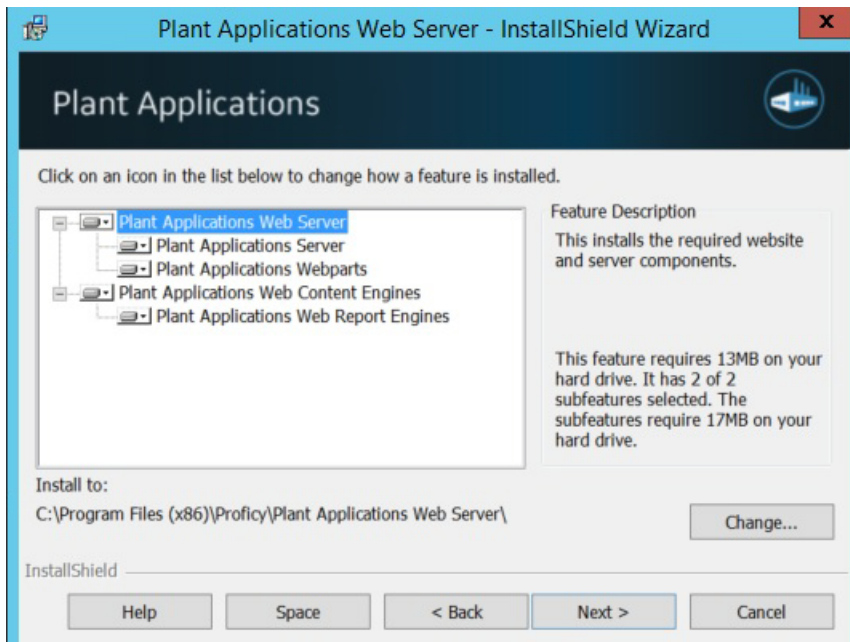
Web Reports can use the following components:

- Plant Applications Server – Interacts with the Web Server and maintains a profile of Web Client users.
- Plant Applications Web Server – Framework to schedule and distribute standard and ad-hoc web reports by means of the Plant Applications Web Client.
- Plant Applications Web Parts – Customizable web components for use in a portal to view relevant plant information in real time.
- Plant Applications Web Content and Web Report Engines – Generate content data for Web Parts and reports. When report generation time increases or CPU usage is high, you should place another engine into service.

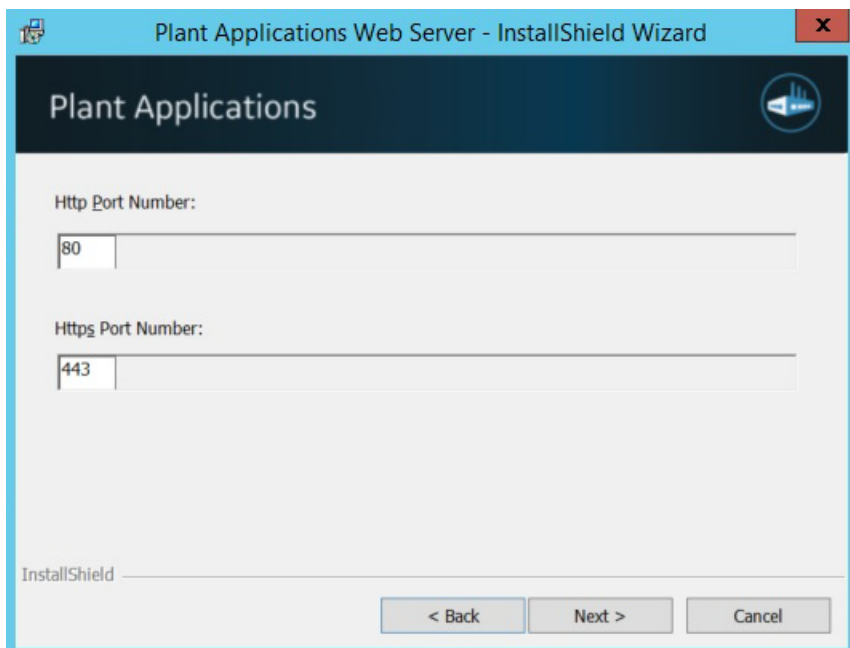
 **Note:**

- If you are installing Plant Applications in a production environment, you must install the Plant Applications Web Server, engines, and Plant Applications Server on different computers. You can install all components on a single computer for testing.
- Engine services do not start unless assigned their own Windows user account. **Login As Service** policy required.

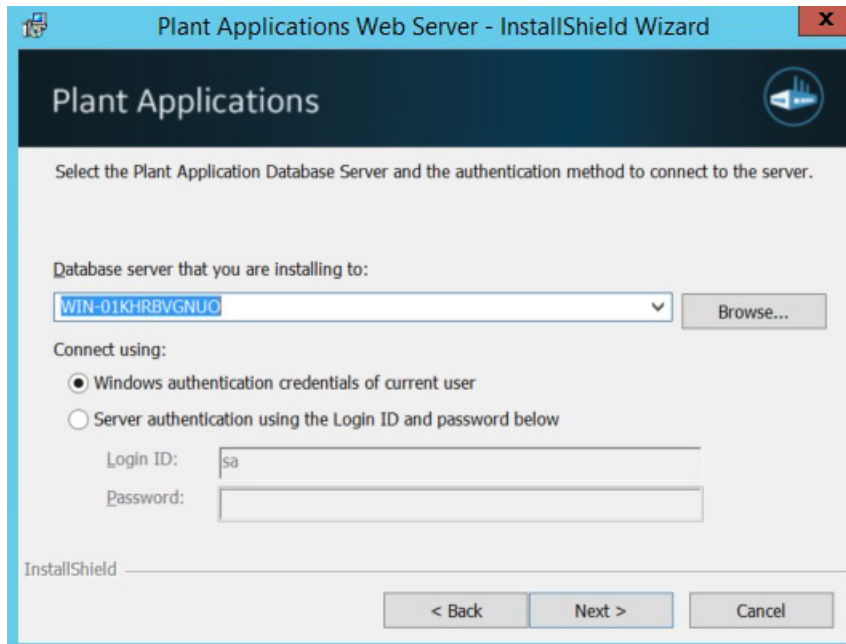
1. Run `InstallFrontEnd.exe` to display the Plant Applications **Installation Menu**.
2. Select **Plant Applications Report Server** to start the installation program. If the installation does not start, run the `PlantApplicationsWebServer.exe` file.
3. Click **Next** at the **Welcome** screen, click **OK** at the next screen to proceed, and then click **Yes** to override firewall settings.
4. At the **Custom Setup** screen, select the components to install on this server. Click **Next** to continue.



5. If a dialog opens to to acknowledge installation of a distiller to produce PDF documents, click **OK**
6. Accept default port numbers for the HTTPS port, or enter different ports as needed. Click **Next**.




7. Enter the name of the SQL Database server if prompted, and select the authentication method. If using Server authentication, enter the server credentials, then click **Next**.



The Web Server installation program checks a specific registry key for an existing SQL Server name.

8. Click **Next** to continue. Record any listed tasks that you may need to complete.
9. Click **Next** to continue, and complete the dialog when prompted:
  - a. Confirm whether you want to install the Plant Applications Web Reporting engines on the same computer as the Plant Applications Server.
  - b. If the Plant Applications Web Server already exists, confirm that you want to overwrite its configuration.
  - c. Click **Next**.
10. Enter the Windows Account (username) and Password of the local Windows user account for the machine where the Plant Applications Report engines and Plant Applications services will be running. Click **Next**.

 **Note:** Although the Plant Applications services run under the Local System account, you should use a local Windows user account.

11. At the **Destination Folder** screen, accept the default location for the web server destination folder, or click **Browse** to select another location. Click **Next**.
12. Click **OK** to acknowledge that SharePoint Portal Services are required to access Sharepoint dashboards.

 **Note:** See [Changing the SharePoint Port Number \(page 85\)](#) for steps to use a port other than port 80.

13. Click **Install** at the **Ready to Install the Program** screen to begin copying files.  
The installation program sets up the web server. The program installs the Microsoft SOAP if needed, imports the Web Part templates, and populates the database.

 **Note:** If a portal is not found, a prompt notifies you that Web parts will be available only through the Plant Applications Web Server or Proficy Real-time Information Portal (RTIP).

14. Click **Finish**.

Report Server instances are displayed under the `Sites` folder in the **IIS Manager**.

15. Restart your computer to complete the installation.

1. Log into the computer with the newly installed Report Server using the Windows User Account that was selected during the installation.
2. Verify that the `DashboardImport.log` and `ExecuteScripts` installation log files contain no errors. By default, the log files are located in `C:\Program Files (x86)\Proficy\Plant Applications Web Server\SetupLogs`.
3. Access the **Site Parameters** sheet by selecting **Administer Site Parameters** under **Global Settings** in the Plant Applications Administrator, and set `UseHttps` in the **Client** section to `True`.

These additional steps may be required to complete installing the Report Server:

- Follow the steps in *Configuring the Plant Applications Report (Web) Server* to set up a different user only if the Report Server is installed on a non-local machine.
- Follow the steps in [Secure Socket Layer and Certificate Requirements \(page 70\)](#) *Secure Socket Layer and Certificate Requirements* available in *Plant Applications Getting Started Guide* to support the functionality of secure (HTTPS) URLs.
- Configure Excel as described in [Setting Up the Plant Applications Excel Add-In \(page 71\)](#) *Setting Up the Plant Applications Excel Add-In* available in *Plant Applications Getting Started Guide*.
- Perform the steps for Setting Up for Using and SSO Login, if required.

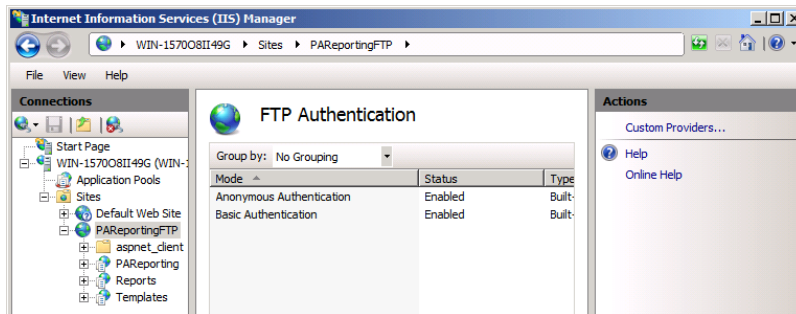
After installing the Plant Applications Report (Web) Server, return to [Installing the Plant Applications Client and Administrator \(page 45\)](#).

## *Setting Up the Plant Applications Report Server*

- Install the Plant Applications Report (Web) Server.
- In the **Services** screen, verify that the Plant Applications Report Engine services are logging in under the domain user you specified when installing the Report Server. Check the **Log On As** column for each service.

- If the Proficiency Server Remote Data Service resides on the Plant Applications server, verify that the service logs in under the domain user. If the Proficiency Server Remote Data Service resides on another server, such as the Plant Applications Web server, use a Windows user account or a local administrator account with Log on as a Service rights instead of Local System.
- Verify that the domain user has Log on as a Service rights.

1. Start Excel under the same login account used by the Plant Applications Report Engine services.
2. Under the **Internet Information Services (IIS) Manager**, verify that **Anonymous access** has been enabled for the three virtual FTP directories (*Templates*, *Reports*, and *PAReporting*) by enabling **Anonymous Authentication** for the *PAReportingFTP* site.



**Note:** By default, this action occurs when installing the Web Server for Plant Applications.

3. Verify that the anonymous users (*IUSR\_\**) have full control.
4. Verify that you can use FTP, and log in as *anonymous*.
5. Right-click the `.. \inetpub\wwwroot` folder in Windows Explorer, select **Properties**, and then open the **Security** tab. Grant full control under Permissions to all users including *Users <computer name>*, *IIS\_IUSR\_<computer name>* (Internet Guest Account) and *IIS\_WPG* (Launch IIS Process Account).
6. In **Local Users and Groups** (access from Computer Management, or search for “Local Users” from the Windows **Start** menu), add the following users to the **Administrators group**:
  - *IUSR\_<computer name>* (Internet Guest Account)
  - *IWAM\_<computer name>* (Launch IIS Process Account)

## *Secure Socket Layer and Certificate Requirements*

The Plant Applications Report Server requires a valid IIS server certificate to work in SSL mode.

When you install and access the Report Server across different machines, the certificate should be validated across machines and preferably signed by a Certificate Authority (CA) known to these machines.

## Setting Up IIS for Remote Use

When the Plant Applications Report Server has been installed on a different machine from the Plant Applications Web Client, you must configure Plant Applications Report Server applications (PAReporting, Apps, and ProficyDashBoard) to use different X-Frame-Options.

1. Start the **Internet Information Services (IIS) Manager**.
2. In the **IIS Manger**, drill down in the Connections tree to **Sites > Default Web Site > Apps**, and then select **HTTP Response Headers**.



## Setting Up the Plant Applications Excel Add-In

1. Start Excel from the command line.
  - a. Click **Start > Run**.
  - b. Type `excel.exe` in the **Open** field, then click **OK**.
2. Click **Microsoft Office**, then click **Excel Options**.

3. Click the **Add-Ins** category
4. In the Manage box, click **Excel Add-ins**, then click **Go** to display the **Add-Ins** dialog box.
5. Select the **Plant Applications Excel Add-In** check box, then click **OK**.  
A message verifies the Plant Applications Add-in has been installed.
6. Click **Plant Applications** on the **Add-ins** ribbon, then click **Options** to display the Plant Applications **Add In Options** dialog box.
7. Under **Server Access**, verify the following three items in the display
  - Correct default server.
  - Correct user.
  - Connected status.

If not:

- a. Click **Edit** to display the **Connect Server** dialog to edit the user details. If necessary, log in with Plant Applications Administrator credentials.
  - b. Right-click the server, then click **Edit** to update the Add-in connection details.
  - c. In the **Server** dialog, click **Advanced**, and verify that the Default Server is selected. Click **OK**.
  - d. If the Add-In is not connected to the server, right-click the server. Select **Connect**, then click **Close**.
  - e. Click **Save** to update the registry settings.
8. Click the **Microsoft Office** button, then select **Excel Options** to display the **Excel Options** screen.
  9. Click **Trust Center**, then click **Trust Center Settings** to display the **Trust Center** screen.
  10. Click **Add-ins**, and verify that all options are not selected.
  11. Click **Macro Settings**, then select **Enable all macros**.
  12. Click **OK**, then click **Save**.
  13. Clear the **Save AutoRecover information every** option, then select the **Disable AutoRecover for this workbook only** option.
  14. Click **OK** and close Excel.

Verify the virtual directories have been created:

1. Open **Administrative Tools** from the **Control Panel**, then select **Internet Services Manager** or **Internet Information Services (IIS) Manager**.
2. Expand the IIS tree, then open the **Web Sites** folder.



3. Expand **Default Web Site** to display the virtual directories. Verify that the following three virtual directories have been created in IIS:

- Apps
- Reports
- PAReporting

For information about installing and using SSRS, refer to the *Proficy Plant Applications SSRS Report Configuration and Report Creation Guide*, which is posted with KB16011.

If you installed the Plant Applications Web Parts, also verify that the virtual directories `ProficyWebParts` and `ProficyDashboard` have been created.

## *Local Client Application Support*

You can install local copies of the Plant Applications Administrator, Plant Applications Client, and Workflow Client and directed them to an installed server to access the Unified Manufacturing Database (UMDB), a historian, and Web Server reports.

Use the **Proficy Applications Client** selection from the Plant Applications **Installation** Menu.

# Chapter 5. Post-installation Tasks

## *UTC Support*

Plant Applications supports Coordinated Universal Time (UTC) as an option on a fresh installation of the Proficy Server..


When you install a new Proficy Server, you can use the time zone of the server to store your data or you can use the UTC option. The UTC option is required to support a Regional Server where plants span time zones. It is also required to support storage of time across the Daylight Saving Time (DST) boundary. UTC is similar to using GMT +0:00 as your time zone, with the exception that UTC does not acknowledge Daylight Saving Time. For example, GMT -6:00 is minus five hours from UTC, when adjusting for Daylight Saving Time. When you choose the UTC option, all the data is stored on your server in UTC time regardless of the time zone of the server.

Visit this Knowledge Base article to understand how to implement Coordinated Universal Time.  
[https://digitalsupport.ge.com/communities/en\\_US/Article/To-Leverage-The-UTC-Functions-in-The-Latest-50-Release](https://digitalsupport.ge.com/communities/en_US/Article/To-Leverage-The-UTC-Functions-in-The-Latest-50-Release).

## **Reporting and UTC**

Plant Applications displays support UTC including displaying data across the DST boundary. When data comes into a display, the timestamp is converted to the time zone of the client. For example, a test value with a UTC timestamp of 07:00:00 would be displayed with a timestamp of 02:00:00 on a client with a time zone of GMT -6:00 (assuming Daylight Saving Time). For data that crosses the Fall DST boundary, you see multiple rows and columns arranged in UTC order, depending on the display, in the same time range. For example, you can set up a time-based Autolog display which includes columns of 30-minute samples. Assuming your DST boundary is at 2:00 AM, the first 1:30 AM column in Autolog precedes 2:00 AM, while the second 1:30 AM column presents its sample after the DST boundary.

Plant Applications 6.1 or higher supports UTC-enabled standard reports and a UTC-enabled Excel Add-in.

 **Note:** To use custom reports with UTC, you must rewrite the reports.


## **Default Time Zone Site Parameter**

Use the Default Time Zone site parameter to specify UTC or the time zone of the server. You cannot edit this option after entering data in the Plant Applications database. This option is not available when upgrading directly from an earlier version of Plant Applications.

## Upgrading Plant Applications to Use UTC

You must manually upgrade your system to use UTC on an existing Plant Applications installation.

Make a copy of your production database. You can use the production database copy as a backup or for reporting.

 **Note:** These options require advanced knowledge of both SQL Server and Plant Applications. You should test the results of either action before implementing them in a production environment.

- Create a gap in your data, based on your server time.

### 1. Change the UTC.

Server time	Do this	Example
GMT	Switch to UTC. The gap is created automatically when you switch to UTC time.	If you are at GMT -5:00 and your last data was recorded at 14:22, when you switch to UTC (GMT) the data is stored at 19:22, creating a gap in your data of five hours.
+GMT	Wait until the UTC time is newer than the last time stamp in the database. This prevents data from being overwritten.	If you are at GMT +3:00 and your last data was recorded at 11:00:00, you can shut down the server, wait for four hours and switch to UTC. The system stores your data at 12:00:00, providing a one-hour gap.

### 2. Move the server as described in the Knowledgebase article KB5427 at the Support web site: <https://digitalsupport.ge.com>.


- To eliminate the runtime data from the copy of your database, move the server as specified in KB5427 and truncate your runtime data. See the the support web site <https://digitalsupport.ge.com> for the additional truncation procedure.

## Setting Up Languages for Plant Applications Displays

After installing Plant Applications, you can implement support for additional languages using its Native Language Support (NLS) features.

1. Select **All Programs** from the Windows **Start** menu.
2. In the Proficy folder, open the Proficy Plant Applications folder.

3. In the Configuration folder, select **Configure Plant Applications Language Support**. You can also run `ConfigurePALanguages.exe` to set up language support.
4. At the **Configure Plant Applications Database** screen, modify any server settings as needed.
5. Select one or more languages to include, then click **Save**.

 **Tip:** Use these options to set up language support after any subsequent Service pack or SIM upgrade.

## *Managing Port 12280 Conflicts*

Communication conflicts can arise when some third-party applications use port 12280, also used by Plant Applications, which can cause the application to disconnect from the router.

If necessary, update the default communications port inside Plant Applications INI files. See [Proficiency Router Conflicts \(page 89\)](#) to modify the default port values.

## *Security Modification for Proficiency Plant Server*

See *Security Management* in the *Plant Applications Help* for additional details on setting up your security.

## *Database Purges*

Plant Applications provides a Unified Manufacturing Database (UMDB) that combines a Workflow (SOA) database with a Plant Applications database.

Purging data reduces the amount of used space in the database. It does not reduce the size of the database. For instructions to reduce the size of the database, consult SQL Server documentation.

Purging the database is a two-step process involving the Plant Applications and SOA purge utilities. Contact Support at <https://digitalsupport.ge.com/> for more information.

The following notes apply to a purge of the Plant Applications database:

- Perform online purges to Plant Applications databases before upgrading.
- For sites using only the Plant Applications data model, you can perform cursor purges to trim the database as an interim solution.

- For sites incorporating both the Plant Applications and S95 data models, do not purge the Plant Applications database. Doing so orphans data in the SOA environment, and can introduce other issues.

You can use the Plant Applications Purge Utilities to conduct database purges online or offline. When creating an online purge plan, you should perform an initial database purge based on your site's desired retention limit. For more information, see KB14802 on <https://digitalsupport.ge.com/>.

## Customizing Your Application

You can edit the values in the Plant Applications configuration file to customize your installation.

Change any of the following parameters in the configuration file as needed.

**Table 1. <filename> Parameters**

Parameter	Description
<b>EventNumIsNumber</b>	For the Excel Add-in to translate numeric values, set this value to <i>True</i> . The default value is <i>False</i> . See the <b>EventNumIsNumber</b> site parameter in the <i>Plant Applications Help</i> .
<b>ProdCodelsNumber</b>	For the Excel Add-in to translate numeric values, change this value to <i>True</i> . (The default value is <i>False</i> .) See the <b>ProdCodelsNumber</b> site parameter in <i>Plant Applications Help</i> .
<b>AllowPasswordSave</b>	To prevent users from saving their client passwords to local workstations, change this value to <i>False</i> . The default value is <i>True</i> . See <b>AllowPasswordSave</b> in the <i>Plant Applications Help</i> .
<b>LanguageNumber</b>	By default, the site language is set to U.S. English. To change the default language, edit this value. See the <b>LanguageNumber</b> parameter in the <i>Plant Applications Help</i> .
<b>StartupSetBack</b>	By default, the Event Manager service looks back three days (4320 minutes) to look for events at startup. To change this interval, edit the <b>EventMgr</b> system value. The suggested configuration is 6 to 12 hours. Services must be restarted for changes to take effect. See the <i>System Users</i> in <i>Plant Applications Help</i> .
<b>SpecificationSetting</b>	The Autolog display uses this parameter to color-code test values by comparing them to the specification limits defined for each variables. When the value is 1 (the default) and the Test Values limit is greater than the Triggering Specification Limit, it triggers a specification flag updating the Test Values Color. When the value is 0 and the Test Values limit is greater than or equal to the Triggering Specification Limit, it triggers a specification flag updating the Test Values Color.

<b>Parameter</b>	<b>Description</b>
<b>UseProficiencyClient</b>	Set this site parameter to <code>true</code> to merge the Plant Applications and SOA equipment models using the Workflow) Client. Refer to <i>Enabling the Proficiency Client UI and Aspecting</i> in the <i>Plant Applications Help</i> .
<b>MinEventTimeSpan</b>	To reduce the frequency of event generation, set this value to 0. The default value of this parameter is four minutes. For more information, see the <b>MinEventTimeSpan</b> site parameter in the <i>Plant Applications Help</i> .

# Chapter 6. Plant Applications Client Interfaces

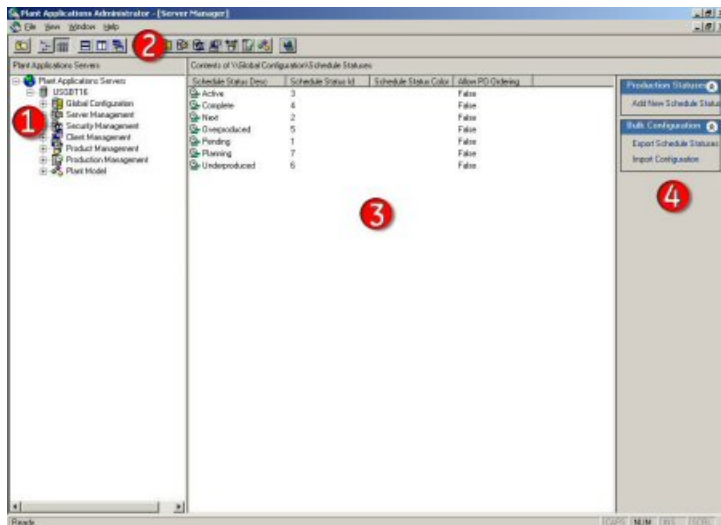
## *Plant Applications Administrator*

The Plant Applications Administrator is the main client application for administrators configuring the system.

Use the Plant Applications Administrator to perform the following tasks:

- Configure data captured from the plant floor and other sources.
- Create security rights for data input, changes, verification, and viewing.
- Process collected information using calculations and many other data functions.
- Provide the link and the structure to the SQL database where the data is stored.
- Design displays viewed through the Plant Applications Client application.
- Provide a method for importing and exporting Plant Applications data.

The Plant Applications Administrator environment is similar to Windows Explorer. On the left side of the main screen is the Plant Applications Administrator tree. From this hierarchical tree all tasks can be performed. For the most part, every object in the Administrator tree can be right-clicked to view a menu of the available commands. The center pane displays additional details about objects directly below the currently selected level. The right pane displays the hyperlink menu, if you have that option enabled.



Legend:

1. Right-click objects in the Plant Applications Administrator tree to view a menu of available commands.

2. The Plant Applications toolbar provides a shortcut to the various levels in the Administrator tree.
3. The **Detail** pane displays the contents of the object selected in the Administrator tree.
4. If the **Hyperlink** button is active, all tasks that can be performed on the object selected in the Administrator tree are presented as hyperlinks.

## Plant Applications Client

The Plant Applications Client provides a customizable environment for using Plant Applications Views and Displays to access your plant data. For more information about using the Plant Applications Client, refer to *Plant Applications Help*.

The screenshot shows the Plant Applications Client interface. The window title is "Plant Applications - Coater - [CT1 Logsheet]". The interface is divided into several sections:

- Toolbar (2):** Located at the top, it contains various icons for navigation and actions.
- Detail Pane (1):** On the left, it displays a table with columns for "Reel", "Date", "Time", "Description", and "Product". The table is currently empty.
- Main Display Area:**
  - Process Diagram:** A central diagram showing the production process with components like "P15U2810", "P15U2811", "P1 Coater #1", "Unwind", and "P15U2812".
  - Genealogy:** A section below the diagram showing the lineage of the data.
  - Charts (3, 4):** Six line charts displaying various process parameters over time, including "P1 RS Basis Weight Avg (Lab)", "P1 1st Dryer Draw", "P1 Headbox pH", "P1 Pickup Vacuum", "P1 Reel Speed", and "P1 Stuff Box Freeness".
- Comments Pane (5):** At the bottom left, it contains a text area for entering comments, with a "Font" button and a "Comments For Test Results: 'P1 C1 Crew' Results At: [03-Aug-05 13:02]" label.

The status bar at the bottom indicates "Ready", "comxclient", "CAPS", "NUM", "INS", "SCRL", "8/3/2005", and "1:08 PM".

Legend:

1. A View is a group of displays that can be opened at the same time. Views are created in the Plant Applications Client.
2. The toolbar provides a quick way to perform tasks specific to the active display. The toolbar automatically changes depending on which display is active.
3. The box indicates the status of the connection to the Plant Applications Server. Green indicates the connection is active.



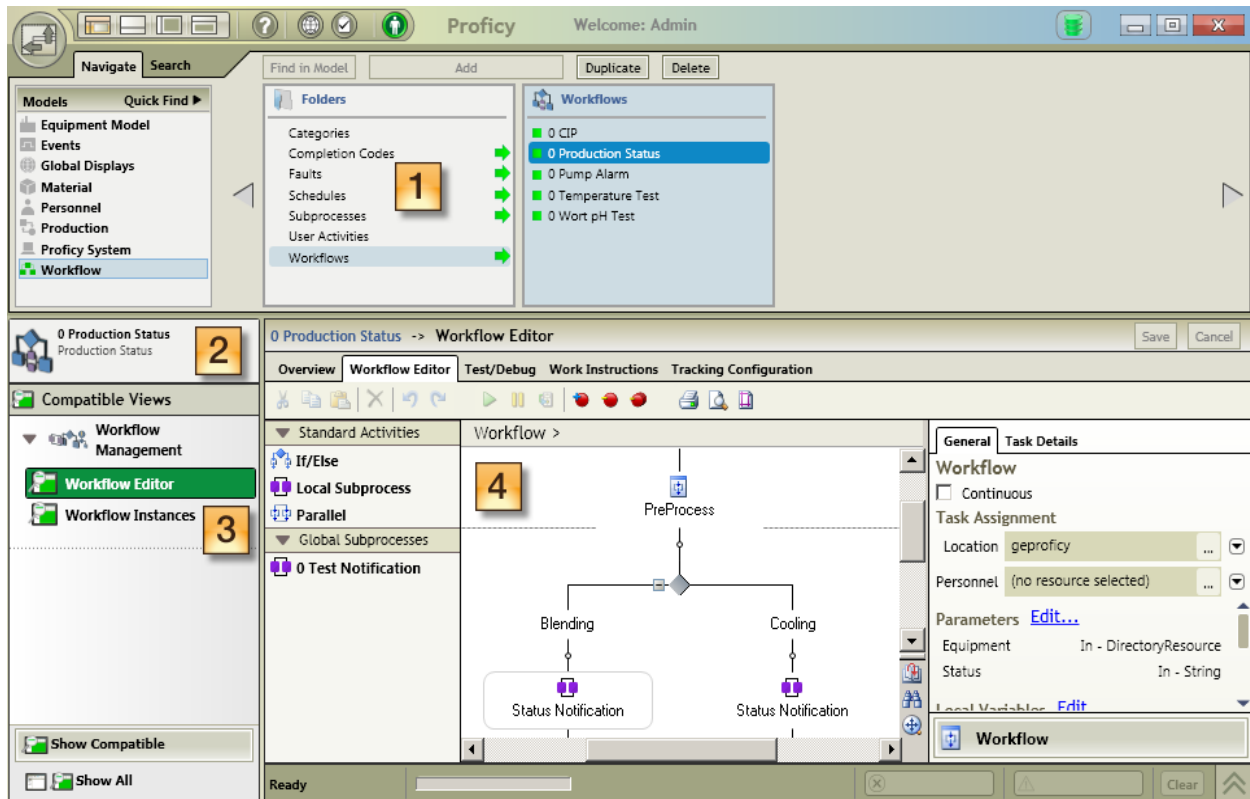
4. This area displays the name of the person who is currently logged in to the Plant Applications Client.
5. Click the tabs to switch between displays.

## Workflow Client

Use the Proficy (Workflow) Client interface to define resources and execute workflows when working with a UMDB.

For more information about using the Proficy (Workflow) Client, see the *Workflow Help*. For more information about new Plant Applications features accessed through the Proficy (Workflow) Client refer to the *Plant Applications Help*.

**Note:** Set the **UseProficyClient Site Parameter** to **True** to merge the Plant Applications model with the SOA Equipment Model when preparing to use the Workflow Client.



Legend:

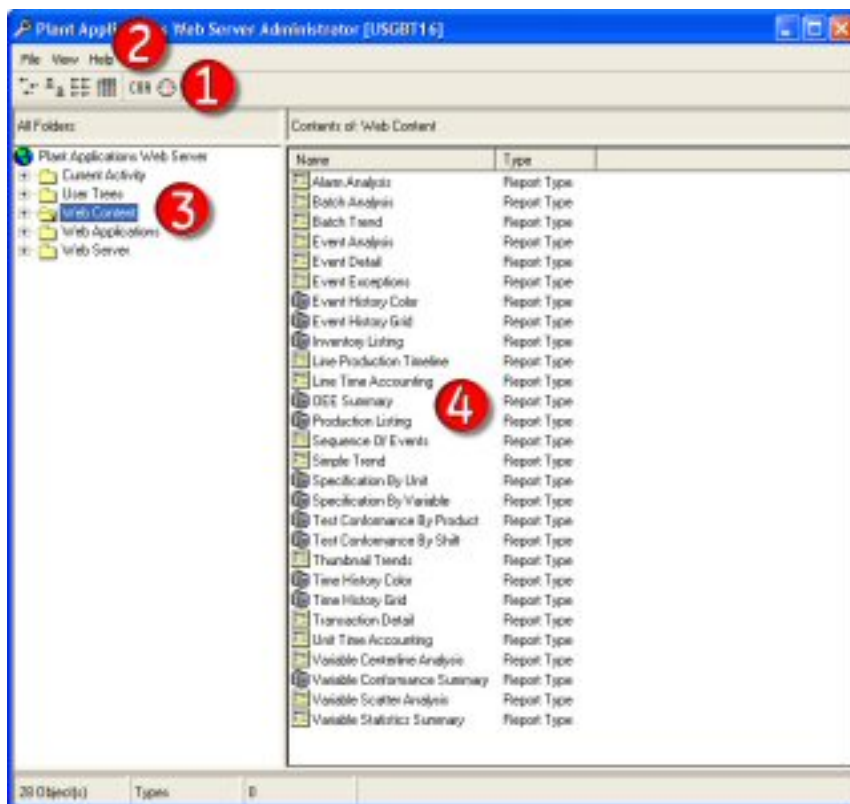
1. Use the Navigator to change the focus between objects in a model.
2. Use solution panels to view collections of editors, views, and reports specific to each model resource.
3. Use displays (Views) to show options after a resource object is selected.

4. Use the Workspace to view details of a selected object, and to present editors used to configure and modify model resources.

## *Plant Applications Report Server Administrator*

Use the Web Server Administrator, accessed through the Plant Applications Administrator, to set up the Plant Applications Report (Web) Server. The Web Administrator can be started from any computer with Plant Applications Administrator installed.

To start the Web Server Administrator, expand Server Management in the Plant Applications Administrator tree and double-click **Administrator Web Server**.



Legend:

1. Use the toolbar to change the view of the contents in the right pane, start the Automated Certificate of Analysis (COA) applications, and schedule a report.
2. From the **File** menu, you can import Web report packages and exit the application. From the **View** menu, you can refresh the view. From the **Help** menu, you can access the online help file and view information about your version of the Web Administrator.
3. The left pane displays the Web Administrator tree for you to add users, schedule reports, manage the Web Server, and manage Web reports.

4. The right pane displays the contents of the node that you have selected in the left pane.

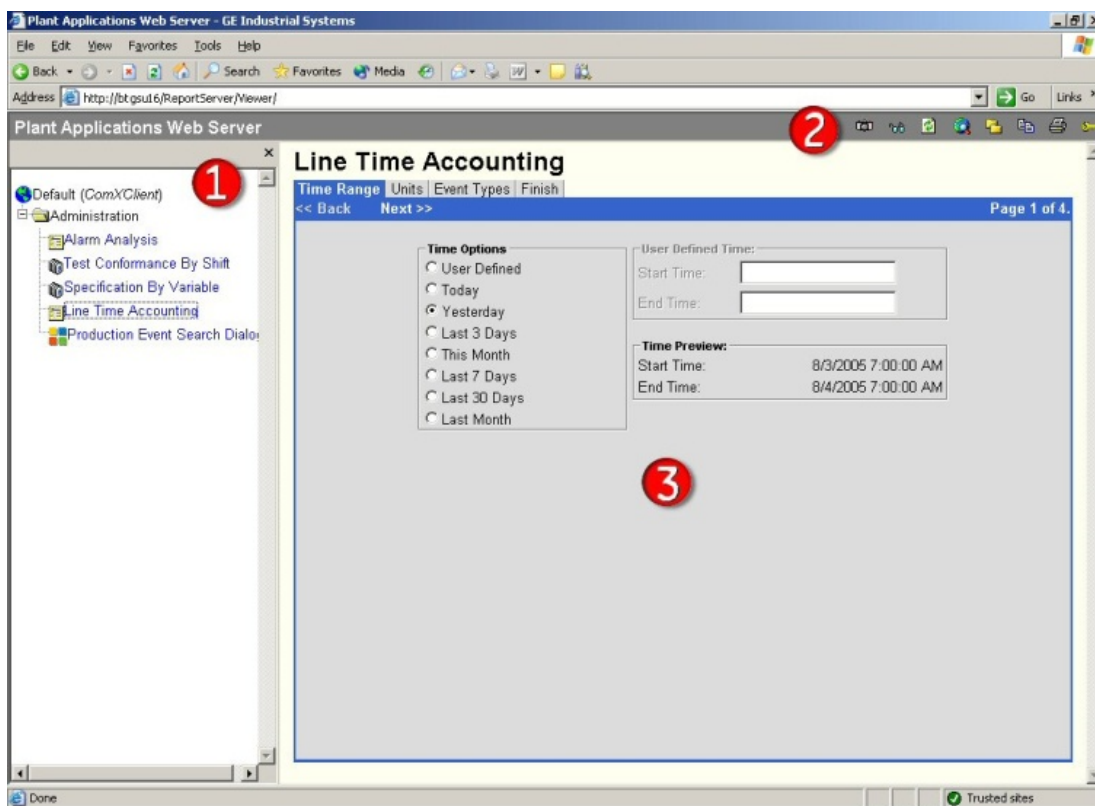
## *Plant Applications Web Server Client*

The left pane of the two-pane display shows the reports and web content available to the current user.

Select a report definition or web content to display the information in the right pane. Select a report type to display the report dialog boxes in the right pane.

Use a browser to access the Plant Applications Web Server client from a URL:

```
https://<server>/PAReporting
```



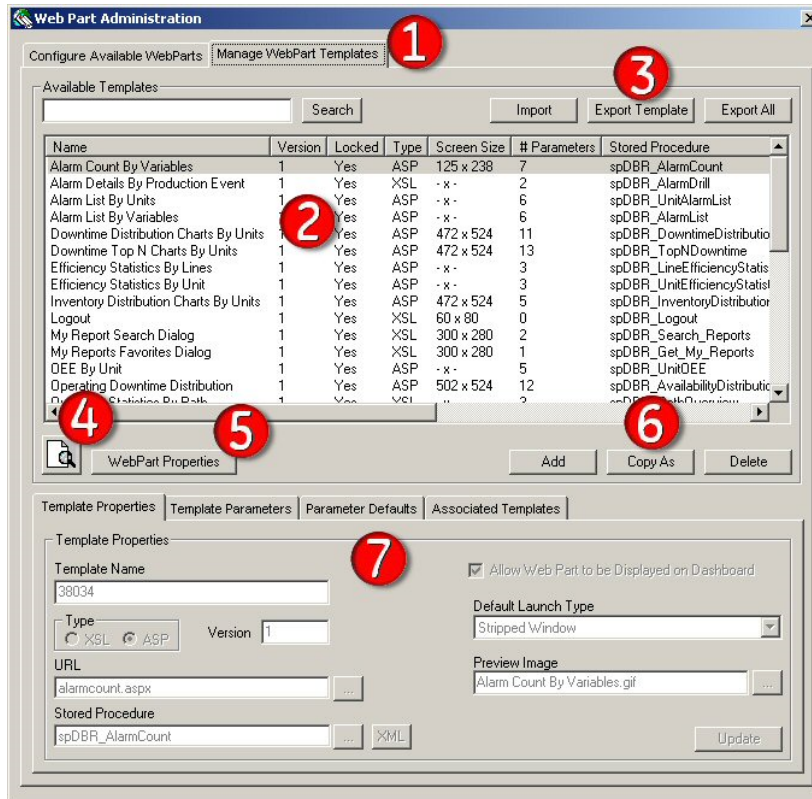
Legend:

1. Lists the Web Reports and Web Parts available to the user.
2. Web Server toolbar.
3. Web Report or dialog boxes for creating the selected Web Report.

## Web Part Administrator

Use the Web Part Administrator to configure and manage Web Parts, create new Web Parts, change default parameters, and access a variety of statistical reports.

Expand Server Management in the Plant Applications Administrator tree, then double-click Administrator Web Parts to open the Web Administrator.



Legend:

1. The **Manage** tab lists the templates used to create user-defined Web Parts. Use the **Configure** tab to set up Web Parts.
2. Lists of Web Parts or Web Part templates and information about each Web Part or template.
3. Click to import or export Web Parts and Web Part templates.
4. Click to preview the selected Web Part or Web Part template.
5. Click to specify parameters that control properties such as the placement of your Web Part or Web Part template in your portal.
6. Click to create new Web Part templates, and to copy or delete existing templates.
7. Provides information about the selected Web Part or Web Part template. You can also use the tabs to edit the default parameters for the associated Web Part or template.

# Chapter 7. Maintenance and Troubleshooting

## *Verifying Plant Applications Service Startup*

After installing the Plant Applications Server, the Plant Applications Server services should start automatically.

Verify that the Plant Applications Server services have started.

1. Open the Windows **Control Panel**, and double-click **Administrative Tools**.
2. Double-click **Services**.
3. Scroll through the list of services and verify that the Plant Applications Server services have all started. If they have not started, start them manually.  
Another method for verifying that the Plant Applications Server services have started is to view the server log files. These text files are created during the Plant Applications Server installation. Each service has its own log file. By default, the log files are located on the Plant Applications Server in the following directory:

```
C:\<Program Files>\Proficy\Proficy Server\LogFiles
```

## *Verifying the Server Connection*

When using Plant Applications, the connection to the server can be lost for a number of reasons.


1. Start Plant Applications **Administrator** and log in with username `comxclient` and password `comx`.
2. Start Plant Applications client and log in with username `comxclient` and password `comx`.
3. Start Microsoft Excel.
4. Load the Plant Applications Add-in for Excel, click **Tools > Add-ins > Plant Applications Excel Add-in**.
5. Connect to the Plant Applications Server. For more information, see *Connecting to a Server* topic in the online help for the Add-in.

## *Changing the SharePoint Port Number*

SharePoint Services 3.0 uses port 80 by default, which is the port used by the Plant Applications Web server.

You must change the port used by SharePoint:

1. On the Plant Applications Web server, select **Start > Administrative Tools > Internet Information Services (IIS) Manager** to open Internet Information Services (IIS) Manager.
2. Expand the server and expand Web Sites.
3. Right-click **SharePoint - 80**, then select **Properties**.  
The SharePoint – 80 Properties dialog box appears.
4. Under web site identification on the Web Site tab, enter an unused port number in the **TCP Port** field. Click **OK**.
5. Right-click **SharePoint Central Administration v3**, then select **Browse** to display the **SharePoint Central Administration** page.
6. Select the **Operations** tab and select **Alternate access** mappings under Global Configurations.
7. Under Internal URL, select the URL for the server (for example: `http://<myservername>/`).
8. In the URL protocol, host and port field, append the port number used in step 5 to the end of the computer name. For example: `http://<myservername>:85/`.
9. Click **OK** and, if necessary, start the Default Web Site.

 **Note:** Add the port number to the SharePoint URL. For example, if you used port 81, the URL would be: `http://<myservername>:81`.

## *Changing the Zookeeper Port Number*

You must perform below changes only if have entered an invalid Zookeeper port number in the **Kafka TCP port assignments** screen when installing the Plant Applications Message Bridge.

1. Stop the CDC service.
2. Navigate to `<installation_directory>\Service-EventuateCDC`.
3. Open the `nssm-create-cdc-service.bat` file using a text editor.
4. Modify the Zookeeper port number in **CDCArguments** with a valid port number.
5. Save your changes to the `nssm-create-cdc-service.bat` file.  
The `nssm-create-cdc-service.bat` file is modified with the valid Zookeeper port number.

6. Restart the CDC service.
7. In the directory `<tomcat_home>/Apache Software Foundation/Tomcat 9.0/webapps/<service_name><version>/WEB-INF/classes`, access the `application.properties` file by using a text editor. Where:
  - `<tomcat_home>`: Is the directory where you installed Apache Tomcat. For example, `C:/Program Files`.
  - `<service_name>`: Is the service for which you must modify the zookeeper port number. Below are the list of services for which you need to modify the Zookeeper port number.
    - Labour App service
    - Route service App
    - Operator App service
    - Plant Execution App Service
    - Work Order History Service
    - Approval cockpit App Service
    - Comment service
    - Comment App service
    - Product app service
    - ERP export App service
  - `<version>`: Is the version of the microservice created during the installation of the Plant Applications Web Client.
8. For the each service listed above, enter the valid Zookeeper port number in the respective `application.properties` files.
9. Save changes to the `application.properties` file for all the service listed above.
10. Restart Tomcat to apply the changes.

## *Backing Up and Restoring an SQL Database*

You can use an SQL Server database as the Plant Applications database or Unified Manufacturing Database (UMDB).

You must back up and restore an SQL Server database.

1. Back up the database on the SQL Server instance.  
See *How to create a database backup (Enterprise Manager)* in the SQL Server Books Online.
2. Make a copy of the backup file.  
Because SQL Server Management Studio does not allow restoration from a network location, the backup file must be copied to the local disk of the SQL Server instance.
3. Restore the database to the SQL Server instance.

See *How to: Create a New Database from an Existing Database Backup (SQL Server Management Studio)* in the SQL Server Books Online.

4. After the database has been restored, ensure that permissions are set up correctly in the Plant Applications database. From SQL Server Management Studio, run the following script to rebuild the SQL permissions

```
exec sp_Revokedbaccess 'ProficyDBO'
go
exec sp_Revokedbaccess 'ComXClient'
go
exec sp_Revokedbaccess 'ProficyConnect'
go
exec SpSupport_ChangeDBOAccount 'Proficydbo','ProficyDBO'
```

## Moving Database and Log Files

After installing the Plant Applications Server, you can move the Plant Applications or Unified Manufacturing Database (UMDB) database file and log file to a separate physical disk to optimize performance.

The physical disk should be part of the disk subsystem,

### Note:

- For more information on optimizing SQL Server performance, contact Support at [Support \(page 114\)](#).
- If upgrading SQL Server to a newer version, run `sp_revokeDBAccess` for ProficyDBO, ComxClient, and ProficyConnect. Next, run `spSupport_ChangeDBOAccount` to reconfigure the SQL User Accounts.

An SQL Server database consists of MDF (database file) and LDF (log file) files. By default, these two files are located in the following directory:

```
C:\Program Files\Microsoft SQL Server\MSSQL\Data
```

1. Locate the MDF and LDF files.
  - a. Start SQL Server Management Studio from the Windows **Start** menu.
  - b. Navigate to the database, right-click it, then select **Properties** to display the **Database Properties** dialog box.
  - c. Under **Select a page**, right-click **Files** to view the location of the MDF and LDF files.
2. Stop the following Plant Applications Server services:
  - Proficy Server Manager
  - Proficy Server Router



- Proficy Server License Manager
3. Stop the Proficy Server, Proficy Publisher, and Proficy STS Services used for SOA.
  4. In **SQL Server Management Studio**, take the database offline.
    - a. Select **Plant Applications SQL Server**, then select **Databases**.
    - b. Right-click the Plant Applications database, select **Tasks**, and then select **Take Offline**.
  5. Detach the database (refer to SQL Server documentation).
  6. Copy the MDF and LDF files to the SQL Server instance.
  7. Attach the database to the SQL Server instance.
  8. Bring the database online, then verify the location of the MDF and LDF files.
  9. Restart the Plant Applications Server and SOA services.
  10. After the database has been restored, verify that permissions are set up correctly in the Plant Applications database. From **SQL Server Management Studio**, run the following script to rebuild the SQL permissions:

```
exec sp_Revokedbaccess 'ProficyDBO'Plant Applications
go
exec sp_Revokedbaccess 'ComXClient '
go
exec sp_Revokedbaccess 'ProficyConnect '
go
exec SpSupport_ChangeDBOAccount 'Proficydbo','ProficyDBO'
```

## *Proficy Router Conflicts*

By default, Plant Applications uses port 12280, which is occasionally used by other software. This can cause communication conflicts causing the Plant Applications Server to disconnect from the Proficy Router.

The following four files must be edited on the Plant Applications Server:

- cmConfigMgr.ini
- cmRtr.ini
- Message.ini
- PlantAppsMessaging.ini

You must change the port used by Plant Applications.

1. On the Plant Applications Server, navigate to <drive>:\Program Files\Proficy\Proficy Server\Messaging. By default, this directory is on the C: drive.
2. Using a text editor, open each of the INI files.
3. Locate the following line: `Protocol0_Item0 = 12280`.
4. Change 12280 to an unused port number. You must use the same port number in each of the four files.
5. Save the file.
6. After you update all the files, restart the Plant Applications Server.

## *SQL Login Conflicts*

When installing the Plant Applications Server, if the SQL user information cannot be validated, the installation program generates an error message.

Upon failing to validate the SQL user account, the installation program displays the following message before returning to the login validation screen:

```
Database Install Fatal Error encountered: Invalid SQL Username and Password
Install aborted.
```

The error indicates a configuration conflict in the registry with the ADO Connection string used to instantiate a connection to the SQL Server. If the Plant Applications Server had been previously installed with a different server name, the **DatabaseNodeName** registry key may be pointing to an invalid SQL Server.

To resolve the error, open **REGEDIT** and validate that the String Value <*datasenodename*> exists in the following locations:

- HKey\_LocalMachine\Software\Proficy\Plant Applications\Proficy Server
- HKey\_LocalMachine\Software\MountainSystems\Proficy\Proficy Server\DataBaseNodeName

## *Runtime Error*

Plant Applications Server or Common Licensing installation fails upon encountering a pre-existing installation.

This error typically occurs on machines that have Terminal Services enabled and where you are running a compressed setup that is not named `setup.exe`. The error occurs because the operating system fails to return the correct Fonts system folder, which causes a `setup.exe` exception during initialization.

In most cases, the operating system uses `C:\Documents and Settings\Windows`, instead of a real `Windows` folder, and does not include a `Fonts` subfolder. The operating system fails when attempting to locate the `Fonts` subfolder. Refer to MSDN for additional information.

- Rename the single executable file to `setup.exe`, and run the installation again.
- Disable Terminal Services on the machine, and re-run the installation.
- Replace the compressed, single executable with a full DVD release.
- Run the installation from **Add/Remove Programs** rather than launching the installation directly. Create the `Fonts` folder in the location where the setup is checking under the current user at `Documents and Settings\Windows\Fonts`.

## SQL Server Blockage

The Plant Applications SQL Server can fail when running at the same time as an Online-Transaction Processing (OLTP) application and a reporting database.

Because SQL transactions are typically small for OLTP applications, a common practice is to disable parallelism to minimize conflicts between different processes. To improve the response of large complex reporting queries however, it is generally recommended to maximize parallelism. If the Plant Applications SQL Server starts to experience a significant amount of blocking that affects the timely interaction of Plant Applications with operators and control systems, reducing or disabling the parallelism option may alleviate the issue.

You should initially restrict the SQL Server parallelism option to use half the number of processors available. If not adequate, try disabling parallelism altogether by setting the option to 1 so that one processor is used for a given query. For more about max degree of parallelism option, see the *SQL Server documentation*.

1. In SQL Server Management Studio, right-click the server, then click **Properties** to display the **Server Properties** dialog box.
2. Under **Select a page**, click **Advanced** to display the **Advanced** page.
3. Under **Parallelism**, edit the **Max Degree of Parallelism** value. The default is 0 (zero), which uses the actual number of available processors.

---

Option	Description
<b>Edit</b>	Recommended value: half the number of processors on the server.
<b>1</b>	Disables the option.

---

4. Click **OK**.

## *License Server Startup Failure*


The Plant Applications Server License Manager service may not start due an incorrect database password stored in the registry.

As the Proficy Server License Manager service is used to change the password, you must reset the database passwords to correct this issue.

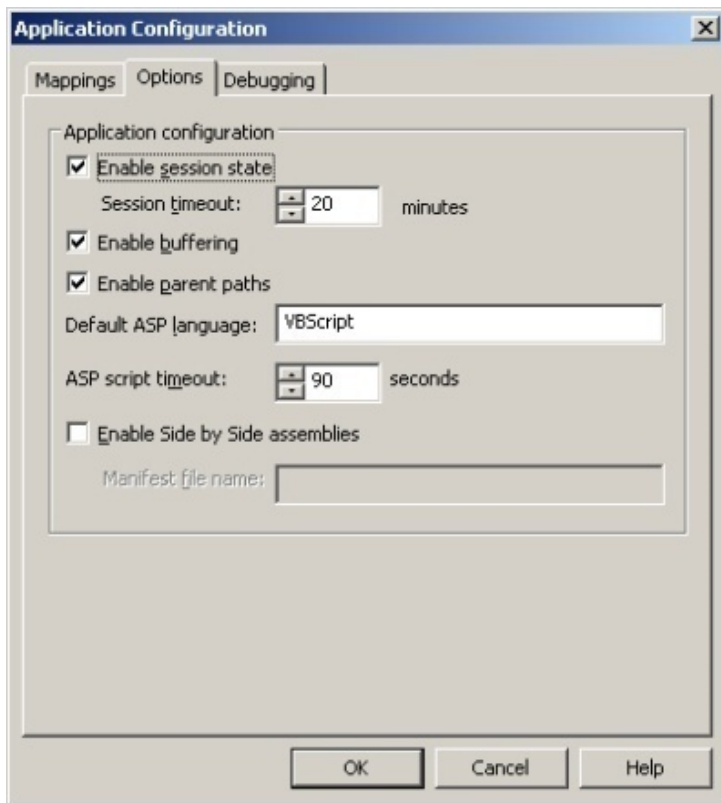
1. Set the `proficydbo` password to the default password, `proficydbo`, in SQL Server.
2. Set the `comxclient` password to the default password, `comxclient`, in SQL Server.
3. Delete the encrypted passwords from the registry:
  - HKEY\_LOCAL\_MACHINE\SOFTWARE\Proficy\Plant Applications\Proficy Server\DBParam1
  - HKEY\_LOCAL\_MACHINE\SOFTWARE\Proficy\Plant Applications\Proficy Server\DBParam2
4. Start Proficy Server License Manager to initialize the registry to the default.
5. Reset the password using the Administrator.

## *Web Content Issues*

If you are having difficulty viewing the web content tree or you are receiving errors when you try to view the tree in a web client, you may need to enable parent paths for the **PAReporting** virtual directory.

 **Note:** ASP.NET is required to log into the Web Report server.

1. Open **Internet Information Services (IIS) Manager** and expand the server.
2. Right-click the **PAReportingvirtual** directory, then click **Properties**.  
The PAReporting dialog box appears.
3. On the **Virtual Directory** tab, click **Configuration**.  
The Application Configuration dialog box appears.
4. On the **Options** tab, select **Enable parent paths**.



5. Click **OK** twice to return to the **Internet Information Services** window.
6. Close the **Internet Information Services** window.

## Web Reports Issues

If the Plant Applications Web Reports are not working correctly, you may need to enable HTTP Keep-Alives.

For information about installing and using SSRS, refer to the *Proficy Plant Applications SSRS Report Configuration and Report Creation Guide*, which is posted in KB16011.

1. In the Internet Information Services (IIS) Manager, locate the local computer.
2. Expand Web Sites, right-click the website, and then select **Properties**. The Properties dialog box for the web site is displayed.
3. On the **Web Site** tab, click **Connections** and ensure **Enable HTTP Keep-Alives** is selected.
4. Click **OK**.

## Proficy Server Shutdown Error

When stopping the Proficy Server, the system can generate a 1067 error message indicating that the process terminated unexpectedly. This error can be ignored.

Click **OK**, then confirm that the status of the service is no longer started.

## Proficy Server Installation Script Failure

Proficy Server installation can fail when the scripts utility cannot log in with authentication for the previously installed version.

When the SQL script cannot run, the installation script generates the following message:

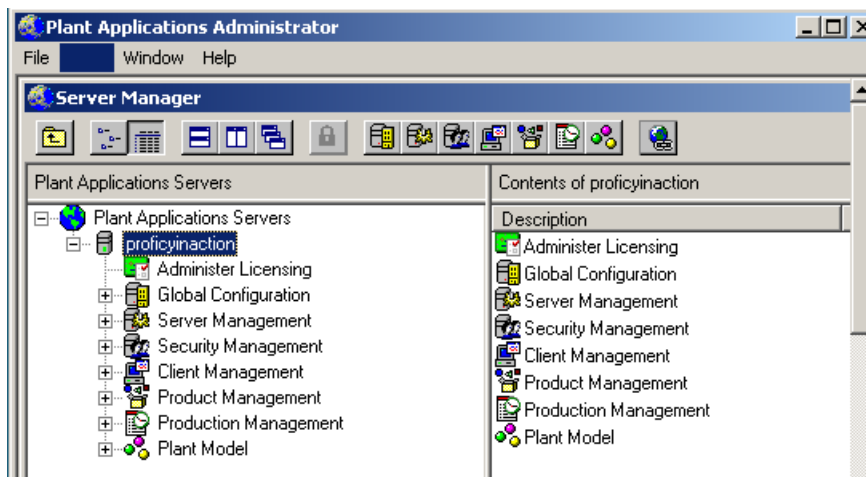
```
Script Execution- Login Failed
```

As a workaround, set the `sa` user login to a blank password in SQL Server Management Studio.


## Database Connection Failure

After installation, the system displays a `failed to connect to database server` message when starting the Plant Applications Administrator or client.

**Note:** If the server appears in the list of Plant Applications Servers in the Plant Applications Administrator, double-click the server name to display the list of nodes.



1. Verify that the Proficy Licensing and Proficy Server License Manager services are running. If not, start the services. Restart the Plant Applications Administrator or Client to see if it connects to the database.
2. If you are still unable to connect to the database, register the following controls using the command line:
  - Regsvr32 "C:\<Program Files location>\Common Files\Proficy\Plant Applications\PRMsgs.dll"
  - Regsvr32 "C:\<Program Files location>\Common Files\Proficy\Plant Applications\ProfCDG.ocx"
  - Regsvr32 "C:\<Program Files location>\Common Files\Proficy\Plant Applications\ProfSVR.dll"
  - Regsvr32 "C:\<Program Files location>\Common Files\Proficy\Plant Applications\PRUtils.dll"

 **Note:** The Program Files location varies depending on whether the operating system is 32- or 64-bit. For a 64-bit operating system, the path is Program Files (x86). For a 32-bit operating system, the path is Program Files.

## *License Manager Connection Failure*

The License Manager depends on the ProficyConnect database user.

If the Proficy Server Router log file indicates that it is waiting for the license manager connection and the license is installed correctly as confirmed through the License Viewer, the database users are likely not synchronized.

To check whether database users are synchronized, connect to the database (for example, SOADB) using SQL Server authentication with ProficyConnect as the user and proficy as the password. If the connection attempt fails, you must fix the database users.

1. Stop the following services:
  - Proficy Server Manager
  - Proficy Server Router
  - Proficy License Manager
2. Connect to the SQL server as sa, under the main Security\Logins branch, then delete the ComXClient, ProficyConnect, and Proficydbo users.
3. Run the following command as a database query:
 

```
exec spSupport_ChangeDBOAccount
```
4. Restart the Proficy License Manager and Proficy Server Manager services.

All the services controlled by Proficy Server Manager should start up.

## *Proficy Workflow Client Startup Failure*

If the Workflow client does not start:

- Verify that all related services, including the licensing and Proficy Server services, are running.
- Stop and restart the services if necessary.

## *Plant Applications Client or Administrator Failure*

This procedure is applicable if you installed GE Proficy Historian Server 8.1 on the same node as Plant Applications.

1. Verify whether the Historian is uninstalled.
2. Reinstall the Historian on the same node as Plant Applications.



# Chapter 8. Test and Production Environments

## *Environment Overview*

Installing Plant Applications involves installing several different servers that communicate with each other.

The servers can be installed on one computer for testing, or they can be distributed in a network to create production environments. Before installing the software for a new installation, decide what your environment will be and what its architecture will look like.

A list of prerequisite software for Plant Applications 8.1 is included in the [Preparing to Install Plant Applications \(page 26\)](#) section. For information about using Plant Applications in a clustered environment with Microsoft server failover technology for highest availability of the Plant Applications Server, see [Appendix B: Cluster Installation and Configuration \(page 104\)](#).

## *Test Environment*

A simple Plant Applications installation employs a single computer for testing. In most cases, this environment is not suitable for production, because the architecture does not scale well. However, it may be satisfactory for very low-frequency and low-transaction environments.

Proficy Application Server  
Proficy Plant Applications Server (Proficy Server)  
Plant Applications Report (Web) Server  
Proficy Vision Web Server with Web Client Displays  
Unified Manufacturing Database (UMDB)  
Plant Applications Administrator and Client



Windows Server  
Microsoft IIS  
SQL Server

## **Test Environment Checklist**

Your environment should include the following installed or upgraded software:

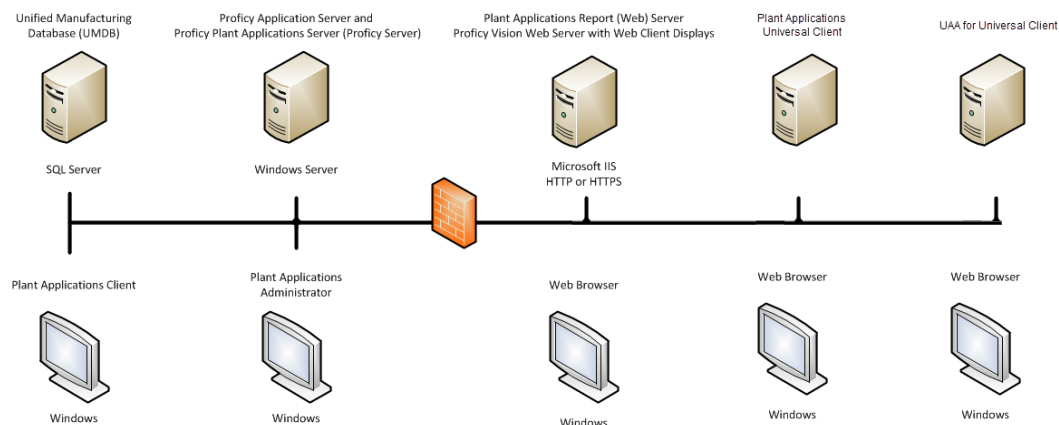
- Supported version of Microsoft Windows Server.
- Latest service pack update (Windows update).
- Microsoft .NET Framework 4.7 for Plant Applications 8.1.
- Microsoft .NET Framework 3.5 for Workflow 2.6 SP1.
- SQL Server 2012 Native Client 11.4.7001.0.
- IIS 8.0 or higher with ASP.NET and FTP for Plant Applications Web Reports. Configure the HTTPS binding if required. If necessary, uninstall WebDAV Publishing.
- Supported browser. Plant Applications legacy reports and web parts are not supported in Chrome.
- Microsoft Office with Excel for SQL Server and Web Engines.
- SQL Server and latest service pack.
- Hardware key and software licenses.
- Proficy Application Server and Web Server, which installs Workflow.
- Plant Applications Server software.
- Plant Applications Report (Web) Server software for Web Server reports.
- SSL Security Certificates.
- Plant Applications client applications.
- Historian or another historian, and all service packs.

 **Note:** Plant Applications can use the Remote Data Service (RDS) SQL instance hosted in AWS.

## *Standard Production Environment*

A standard production environment representing the most common architecture for production sites to deliver performance is shown in the image below.

Install the following servers and components on separate computers: Plant Applications Server, Plant Applications Report Server (Web Server) reports, historian, and clients. Although the Plant Applications Server and a Web Server can be installed on the same machine, performance may be affected.



## Unified Manufacturing Database (UMDB)

- Supported version of Microsoft Windows Server.
- SQL Server.
- Microsoft .NET Framework 3.5.

## Proficy Plant Applications Server Computer

Your environment should include the following installed or upgraded software.

- Supported version of Microsoft Windows Server.
- Latest service pack update (Windows update).
- Microsoft .NET Framework 4.7 for Plant Applications 8.1.
- Microsoft .NET Framework 3.5 for Workflow 2.6 SP1.
- SQL Server 2012 Native Client 11.4.7001.0.
- IIS 8.0 or higher with ASP.NET and FTP for Plant Applications Web Reports. Configure the HTTPS binding if required. Ensure WebDAV Publishing is uninstalled.
- Microsoft Office with Excel for SQL Server and Web Engines.
- Hardware key and software licenses.
- Proficy Application Server which installs Workflow components.
- Plant Applications Server software.

## Plant Applications Report (Web) Server

- Supported version of Microsoft Windows Server.
- Latest service pack update (Windows update).
- Microsoft Office with Excel for Web Engines.
- Microsoft .NET Framework 4.7 for Plant Applications 8.1.
- Microsoft .NET Framework 3.5 for Workflow 2.6 SP1.
- SQL Server 2012 Native Client 11.4.7001.0.
- IIS 8.0 or higher with ASP.NET and FTP for Plant Applications Web Reports. Configure the HTTPS binding if required. Ensure WebDAV Publishing is uninstalled.
- Plant Applications Report (Web) Server software for Web Server reports.
- SSL Security Certificates.
- Supported browser. Plant Applications legacy reports and web parts are not supported in Chrome.
- Install additional components:

Once software is installed, you need to create Services user accounts to start with their own Windows user account and apply the Login As Service policy.

## Historian Server

- Windows Server (refer to Historian documentation for version requirements).

- Refer to Historian documentation for system requirements and software configuration.
- Historian or another historian, and all service packs.

## **Plant Applications Administrator Computer**

These requirements typically apply to the client computer as well.

- Supported version of Microsoft Windows Server.
- Latest service pack update (Windows update).
- Microsoft Office with Excel.
- SQL Server and latest service pack.
- Plant Applications Administrator.
- Supported browser. Plant Applications legacy reports and web parts are not supported in Chrome.
- Plant Applications UI support in Workflow Client:
  - Microsoft .NET Framework 4.7 for Plant Applications 8.1.
  - Microsoft .NET Framework 3.5 for Workflow 2.6 SP1.
  - SQL Server 2012 Native Client 11.4.7001.0.
  - IIS 8.0 or higher with ASP.NET and FTP for Plant Applications Web Reports. Configure the HTTPS binding if required. Ensure WebDAV Publishing is uninstalled.
  - Proficy Application Server which installs Workflow.

## **Plant Applications Client Computers**

- Supported version of Microsoft Windows Server.
- Latest service pack update (Windows update).
- Plant Applications Client.

## **OperationsHub UAA**

- Supported version of Microsoft Windows Server or Client.
- Latest service pack update (Windows update).
- Microsoft .NET Framework 4.7 for Plant Applications 8.1.

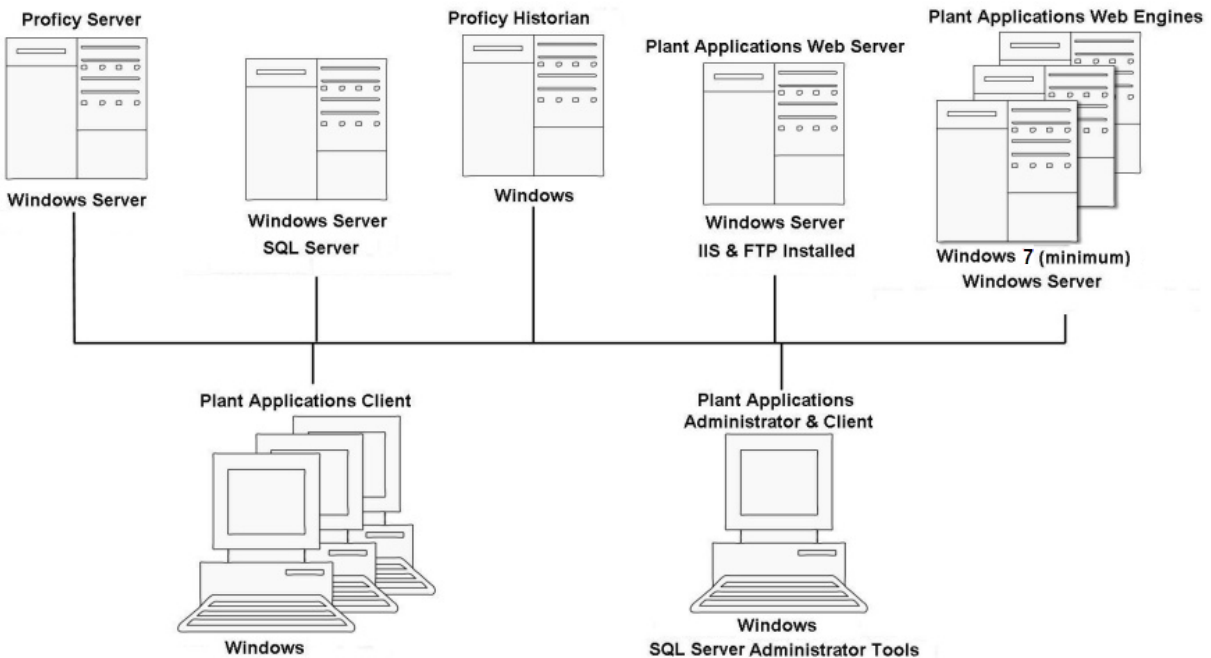
## **Plant Applications Web Client Computer**

- Supported version of Microsoft Windows Server or Client.
- Microsoft .NET Framework 4.7 for Plant Applications Web Client 8.1.

## *High-Volume Production Environment*

In a high-volume production environment with a high number of transactions or a high reporting volume, Plant Applications web engines can be installed on separate machines to increase performance throughput.

High-production environments can also employ Plant Applications installations on multiple machines. The following image shows an example of a high-volume production environment for Plant Applications.



SOA services reside on the Proficy Server, which is also called the Plant Applications Server.

# Chapter 9. Upgrading from Version 7.0 SP5 or 8.0

## *Upgrading from Plant Applications Version 7.0 SP5 or 8.0 to 8.1*


- You must have SQL Server 2016 (64-bit) or later for upgrading Plant Applications Server from earlier Plant Applications versions and existing PlantApplications Database compatibility must be greater than or equal to 130.
- Delete the existing Message Bridge configuration file located at <Plant Applications installation folder>\Proficy Server\RabbitMQMessageBridgeService\Proficy.PlantApps.MessageBridge.Service.exe. This is because installing Plant Applications does not replace the old configuration file with the new one.
- Run the `PREPDBUpdImpliedSequence.sql` SQL script.
  - Mount the ISO file for the Plant Applications or load the DVD if you created one from the ISO file on the application server for Plant Applications.
  - Execute the `PREPDBUpdImpliedSequence.sql` file on the Plant Applications database where the Plant Applications is installed.

This will populate implied sequence as epoch date(with respect to the forecast start date) instead of integer number (starting from 1).

 **Note:** If upgrading from a version of Plant Applications earlier than 7.0 SP5, contact Support to uninstall Plant Applications components.

1. Go to **Server Manager > Local Server > Tasks > Add Roles and Features** .
2. Add the following roles:
  - a. Go to **Web Server (IIS) > Web Server > Common HTTP Features** and select the **HTTP Redirection** check box.
  - b. Go to **Web Server (IIS) > Web Server > Security** and select the **Basic Authentication, URL Authorization** and **Windows Authentication** check boxes.
3. Add the following feature:
  - a. Go to **.NET Framework 4.7 Features > WCF Services** and select the **HTTP Activation** feature.
4. From the Windows **Start** menu, select **Control Panel > Programs > Programs and Features**.
5. **Optional:** If you have installed Service Packs or SIMs from Plant Applications, from **REGISTRY** (regedit.exe), you must manually remove SIM entries from the registry key:

```
HKEY_LOCAL_MACHINE\Software\Wow6432Node\Microsoft\Windows  
\CurrentVersion\Uninstall.
```

6. Upgrade the Proficy license keys to include:
  - Plant Applications 8.1
  - Historian 8.1
  - SOA/Workflow 2.6 SP1
7. Stop **Proficy License Manager** and **Proficy Server Manager** to upgrade.
8. In the **Install Proficy Plant Applications 8.1** window, select **Proficy Application Server**. The **Proficy Application Server** (Workflow 2.6 SP1) page appears. Follow the on-screen instructions to upgrade the client and the application server.
9. In the **Install Proficy Plant Applications 8.1** window, select **Plant Application Server**, and then follow the on-screen instructions to upgrade the Plant Applications server. For instructions, refer to [Installing the Plant Applications Server \(page 42\)](#).
10. In the **Install Proficy Plant Applications 8.1** window, select **Plant Applications Report Server**, and then follow the on-screen instructions to upgrade the report server. For instructions, refer to [Installing the Plant Applications Report Server \(page 65\)](#).  
  
 **Note:** For binding HTTPS with the fully-qualified domain name to a certificate, refer to [Binding HTTPS \(page 40\)](#).
11. In the **Install Proficy Plant Applications 8.1** window, select **Plant Applications Client**. For instructions, refer to [Installing the Plant Applications Web Client \(page 58\)](#).
12. Start the **SQL Server Agent** service manually.

# Chapter 10. Appendix B: Cluster Installation and Configuration

## *Cluster Overview*

Deploying Plant Applications in a clustered environment with Microsoft server failover cluster technology ensures the highest availability of the Plant Applications Server. For example, if the primary Plant Applications node in the cluster experiences difficulties, Plant Applications automatically starts on another node to take over. SQL Server, a historian, and the Plant Applications Web (Report) Server can also run as part of a cluster. Refer to Microsoft documentation for information to implement clustering for your particular environment.

## *System Requirements*

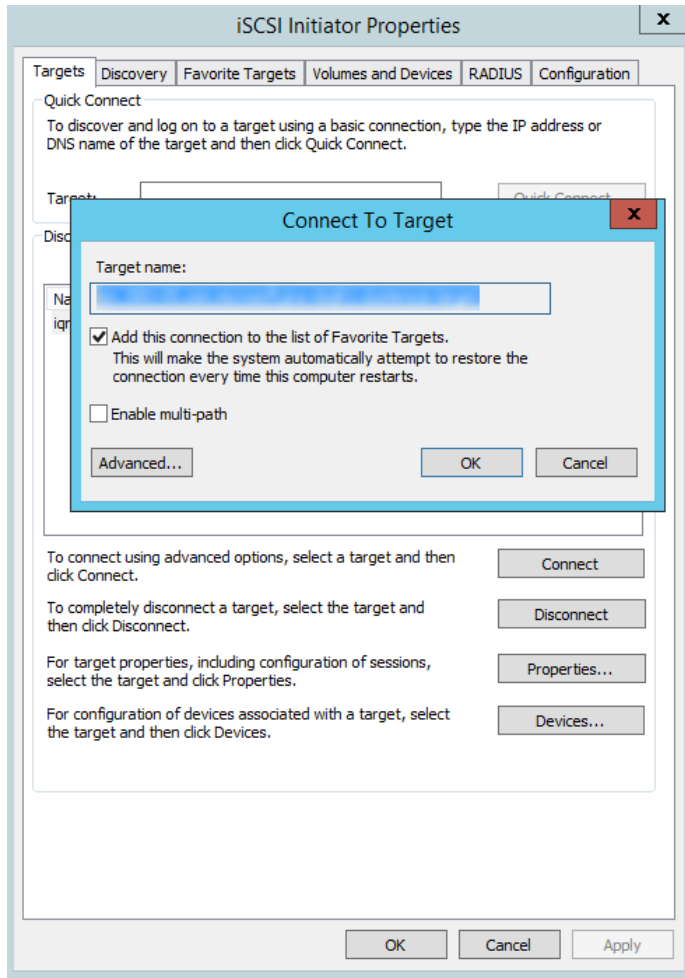
To deploy Plant Applications in a clustered environment, you will need at least two cluster nodes. All the cluster nodes must be assigned to the same domain name, and must contain the following components:

- Windows 2016 server with the same service pack versions installed on them.
- SQL Server 2016 on a different Server
- Feature Failover Clustering
- All cluster nodes must be assigned to a domain
- An active Proficy license
- Proficy Workflow
- Plant Applications
- iSCSI Target Server, serving as a remote drive for Plant Applications Buffer Files and Log Files
- Configured Workflow Cluster

## *Configure iSCSI Initiator*

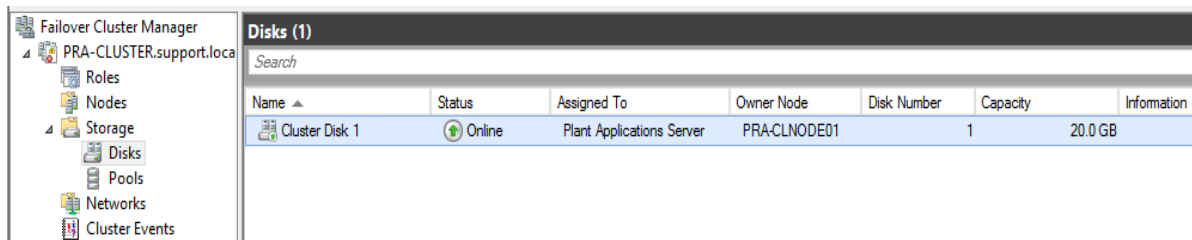
On each cluster node, run iSCSI Initiator, and provide the address of an existing iSCSI target.





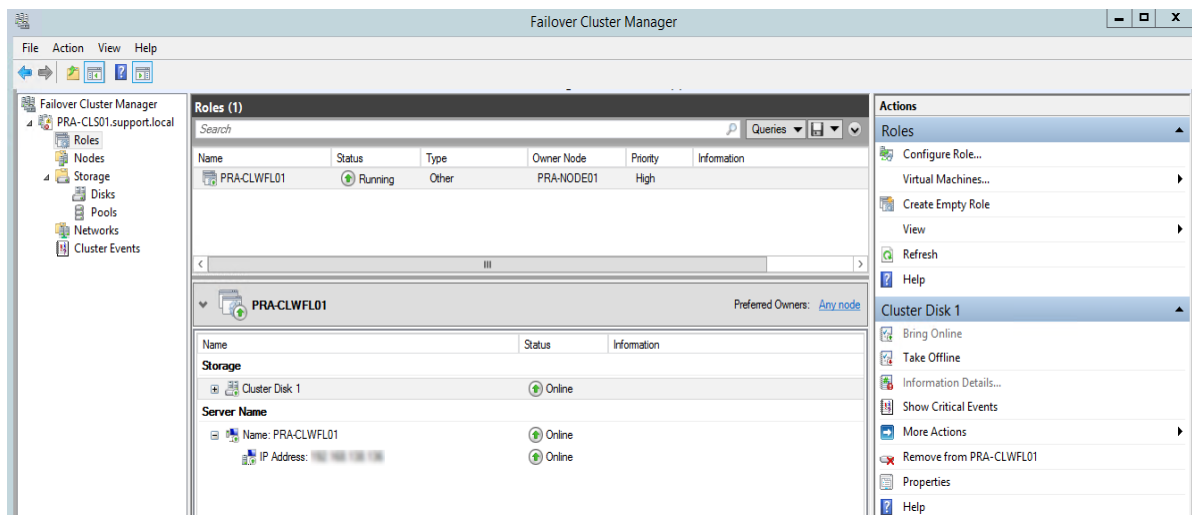
## Create a New Storage Under Cluster

1. Under **Cluster > Storage Disks > Add Disk**
2. Select **iSCSI**.  
This will add the disk to the cluster configuration.



## Create a Plant Applications Role

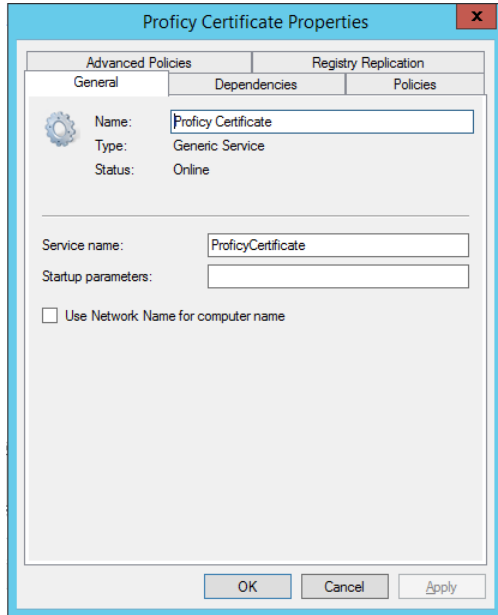
1. Select **Roles node > Create Role > Other Server**.
2. Set the NetBios name of the Plant Applications server.
3. Right-click the shared drive, select **Assign to Role**, and then pick the Plant Applications Cluster role.



## Configure Workflow Cluster

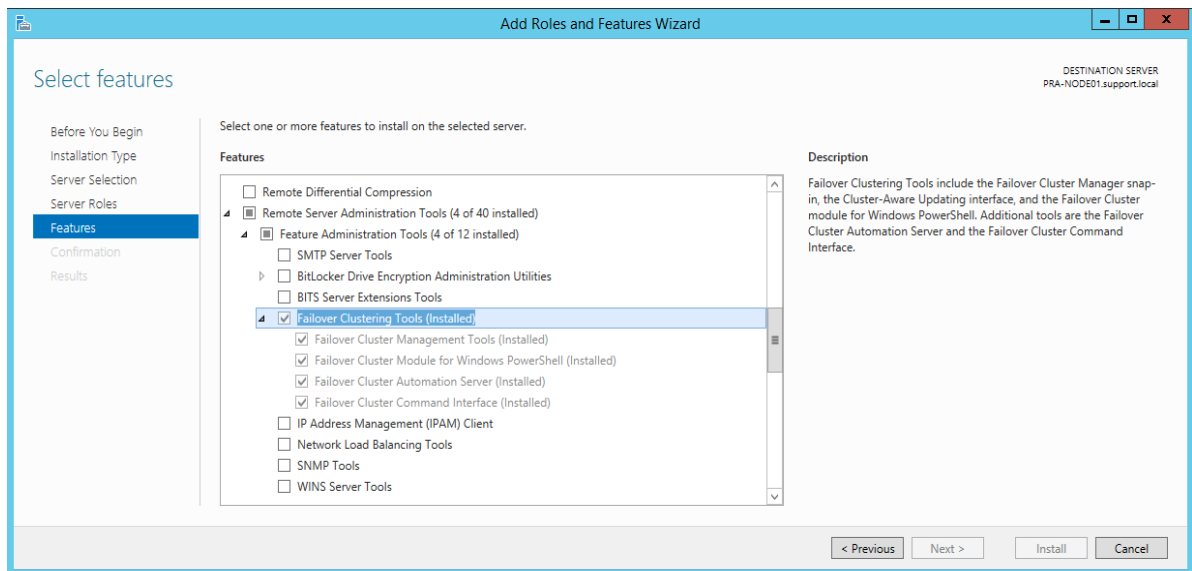
Perform the steps in the following KB article: [KB15908](#)

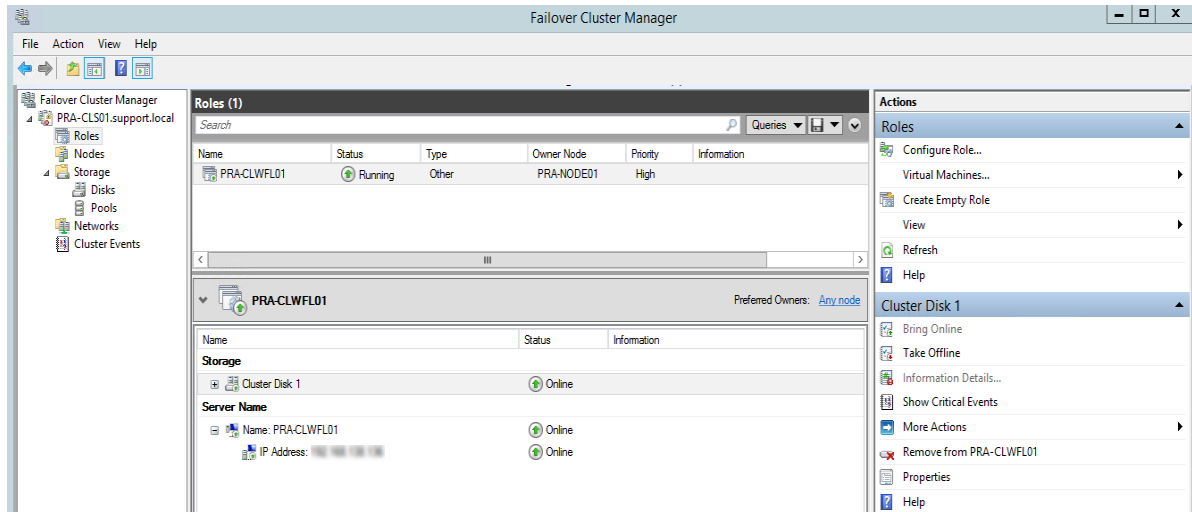
**Note:** Add the Workflow 2.5 or later Added Proficiency Certificate service to the configuration: Add Generic Service > Pick Proficiency Certificate from Existing List of Services.



## Configure Plant Applications Server Cluster

1. If you are using Windows Server 2012 R2 or later, install the Failover Cluster Automation Server and Failover Cluster Command Interface as features for the Local Server in the Server Manager.





2. **Optional:** Add PlantAppsRes type on all Plnnt Applications nodes using Command Prompt.

You can perform this step using PowerShell as well.

- a. Register the PlantAppsResEx.dll file: `Regsvr32 "C:\Program Files (x86)\Proficy\Proficy Server\Server\PlantAppsResEx.dll" /s`
- b. Create the PlantAppsRes Resource Type: `Cluster restype PlantAppsRes /create /dll:"C:\Program Files (x86)\Proficy\Proficy Server\Server\PlantAppsResEx.dll" /type:PlantAppsRes /LooksAlive:5000 /IsAlive:30000`

3. **Optional:** Remove PlantAppsResType. This step is not required when installing only for clean up of the server. You can perform this step using PowerShell as well.

- a. Delete the PlantAppsRes Resource type: `Cluster restype PlantAppsRes /delete /type`
- b. Unregister PlantAppsRes type: `Regsvr32 "C:\Program Files (x86)\Proficy\Proficy Server\Server\PlantAppsResEx.dll" /u /s`

```
# Unregister Extension Dll
#Regsvr32 "C:\Program Files (x86)\Proficy\Proficy Server\Server
\PlantAppsResEx.dll" /u /s

# Delete Cluster Resource Type
# remove-clusterresourcetype `
# -cluster PRA-CLS01 `
# -name PlantAppsRes

# Register Extension Dll
Regsvr32 "C:\Program Files (x86)\Proficy\Proficy Server\Server
\PlantAppsResEx.dll" /s

# Configure Resource Type
add-clusterresourcetype `
-cluster PRA-CLS01 `
```

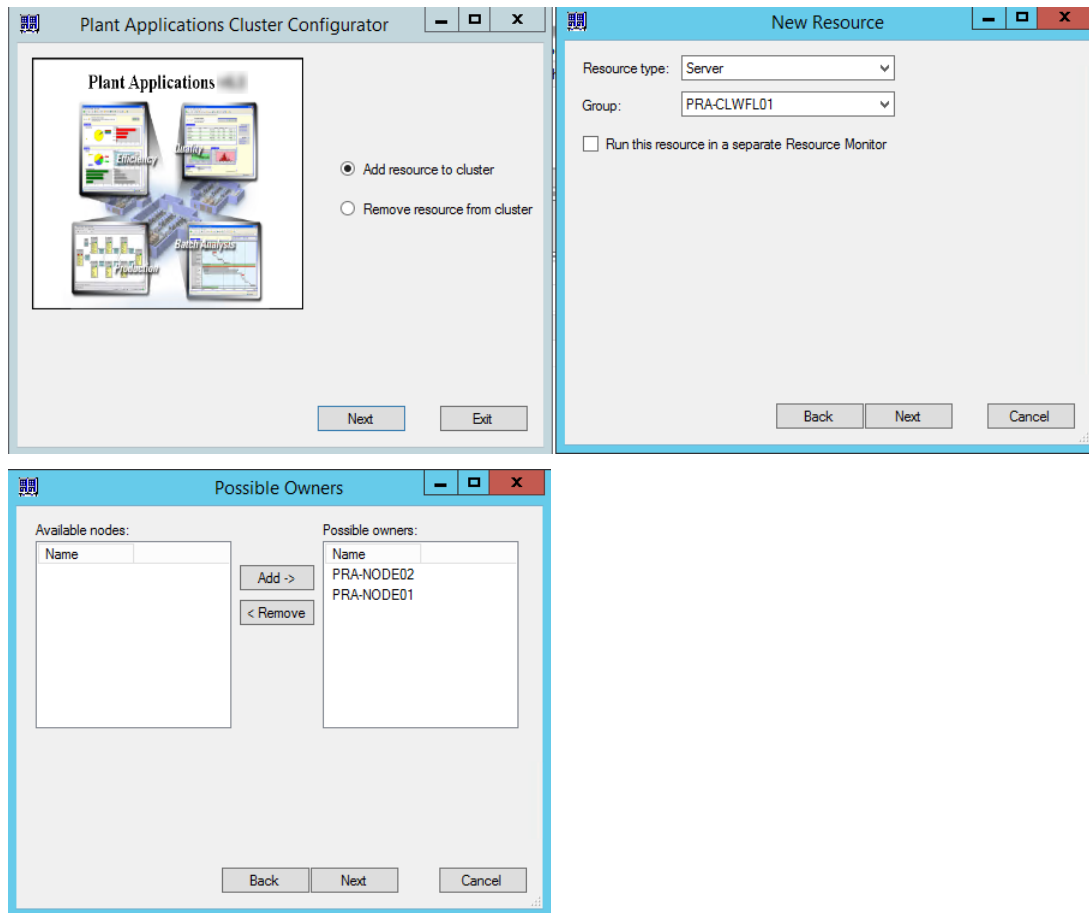
```

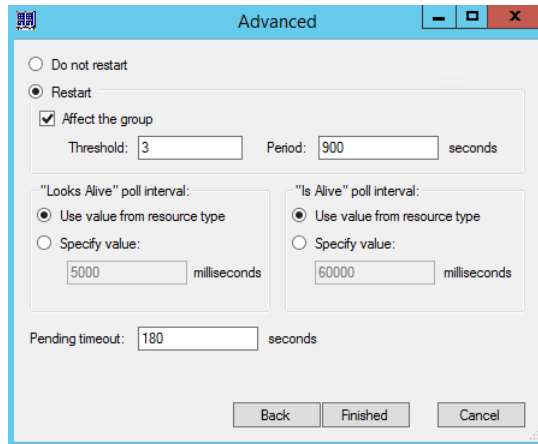
-name PlantAppsRes `
-Dll "C:\Program Files (x86)\Proficy\Proficy Server\Server
\PlantAppsRes.dll"

# Confirm that PlantAppsRes type exists
get-clusterresourcetype

```

c. Run the Plant Applications Cluster Configurator (C:\ProgramFiles (x86)\Proficy\Proficy Server\Server\ClusterConfigurator.exe)

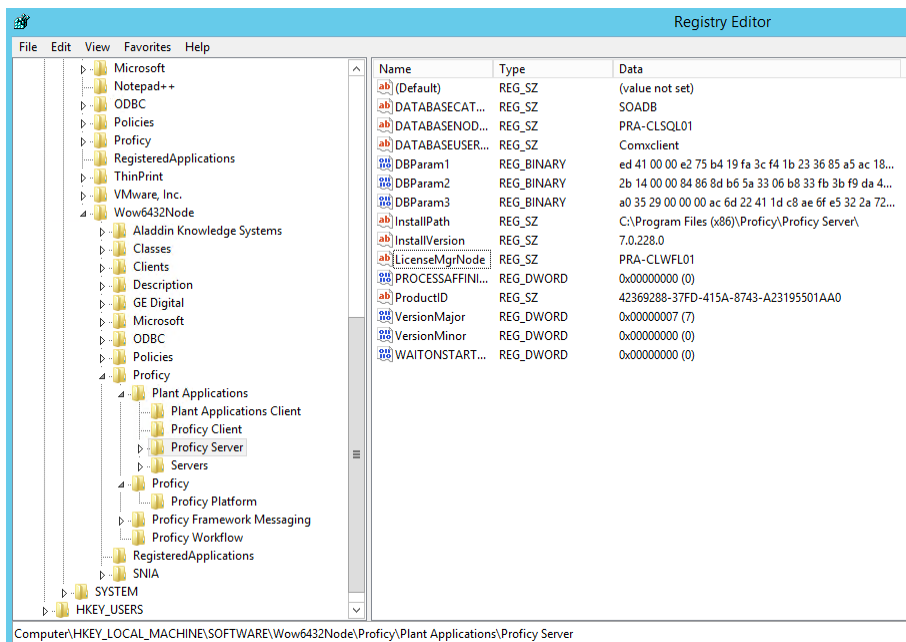




## Change Registry to Reference Cluster Name

Registry changes required to reference cluster name when connecting to Plant Applications License Manager. This topic describes how to verify that the registry settings are correct. This procedure is optional.

On each Plant Applications node, the following registry key must be set to Plant Applications cluster name: `Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Proficy\Plant Applications\Proficy Server\LicenseMgrNode` must contain PA Cluster NetBios Name.



## *Change the Plant Applications Server Name to Cluster Name*

Change the Plant Applications Server Name to Cluster Name. Perform this step on both node names and old Plant Applications server name (in case the database was moved). Use an existing spSupport store procedure to set Plant Applications Cluster name:

```
spSupport_UpdatePAserverReferences_Split '<old server name>', '<Cluster
NetBios Name>'
```

## *Change the Path of the Log Files and Buffer Files*


This topic describes how to change the path of the log files and buffer files to the cluster shared drive. This procedure is optional.

1. Check the current path value for site parameters and user parameters.

```
Select * from dbo.Site_Parameters where parm_id in (101, 102)
Select * from dbo.User_Parameters where parm_id in (101, 102)
```

2. Change the path to an existing folder on a shared Cluster drive:

```
Select * from dbo.Site_Parameters where parm_id in (101, 102)
Select * from dbo.User_Parameters where parm_id in (101, 102)
```

 **Note:** The value must be set to an existing path.

```
UPDATE Site_Parameters
SET Value = '<Cluster Shared Drive Path to Log files>'
WHERE parm_id = 101

UPDATE Site_Parameters
SET Value = '<Cluster Shared Drive Path to Buffer files>'
WHERE parm_id = 102

UPDATE User_Parameters
SET Value = '<Cluster Shared Drive Path to Log files>'
WHERE parm_id = 101

UPDATE User_Parameters
SET Value = '<Cluster Shared Drive Path to Buffer files>'
```

```
WHERE parm_id = 102
```

## *Change the CXS Services Records*

This topic describes how to change the CXS services records for all Plant Applications services. This procedure is optional.

Change the CXS services records. Plant Applications Manager must not start or stop Plant Applications services. To do so, run the following command:

```
Update dbo.CXS_Service
Set Auto_Start = 0, Auto_Stop = 0, Restart_Non_Responding = 0
where Service_Id between 2 and 25
```

## *Change All the .INI Files on All Nodes*

1. Adjust router group and domain name to cluster name.
2. adjust LogFiles and BufferFiles path to shared drive.
  - cmRtr.ini
  - PlantAppsMessaging.ini
  - cmConfigMgr.ini
  - Message.ini

## *Set the ClusteredSystem Parameter to True*

Run the following command to set the ClusteredSystem site parameter to true:

```
Select * from dbo.Parameters where Parm_Name like '%Cluster%'
Select * from Site_Parameters where Parm_Id = 131

Update Site_Parameters
Set Value = 1
Where Parm_Id = 131
```


## *Verification*

Verify the following things to confirm that Plant Applications has been set up on a clustered environment:



- Log files and buffer files are stored on a shared drive.
- All services are creating log files with the cluster node as follows: <CLUSTER NODE NAME>\_EventMgr-XX.log
- Plant Application Manager must not control Plant Applications Services. In Plant Applications log (high debug), the following records must exist:

```
Adding Service to monitor. [Name=PREventMgr] [ServiceId=4]
[AllowRestarting=0] [AutoStart=0] [AutoStop=0] [StartCheck=15]
[StopCheck=15] [RestartWaitTime=5] [ServiceName=EventMgr]
[RestartNonResponding=0] [IsClustered=-1]
```

 **Note:** AllowRestarting and IsClustered is automatically set when services run as PlantAppsRes type.

- 
- The defined failover rules work.