Integration Objects'

Seamless & Secure IT-OT-IoT Integration

Smart IoT Highway

Version 2.4.2

INSTALLATION GUIDE

Integration Objects' Smart IoT Highway Installation Guide 2.4.2 Revision 1
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PREFACE

About This Installation Guide

This document lists the pre-installation requirements and provides step-by-step instructions for installing Integration Objects' Smart IoT Highway (SIOTH) and all its modules: Data Flows, Data Model, Job Engine and Unified HMI (UHMI).

Target Audience

This document is intended for Integration Objects' Smart IoT Highway users responsible for installing SIOTH in the master node and remote nodes. It assumes knowledge about Windows operating system and its configuration.

Document Conventions

Convention	Description
Bold	Bolded text indicates user interface elements, such as buttons, menu items, and dialog names.
(!) Note	Information to be noted

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OVERVIEW

Smart IoT Highway (SIOTH®) is an advanced IT-OT-IoT integration platform designed to facilitate secure data exchange and transformation. It establishes secure end-to-end pipelines to collect and store data from edge IoT devices and various other sources. SIOTH enables organizations of all sizes to easily connect applications, systems, and services in a managed, scalable, and secure environment. This comprehensive integration solution allows for seamless connectivity between IT and OT, enabling the conversion of industrial data into actionable intelligence and valuable insights.

The SIOTH platform operates on robust functional architecture, as illustrated in Figure 1.

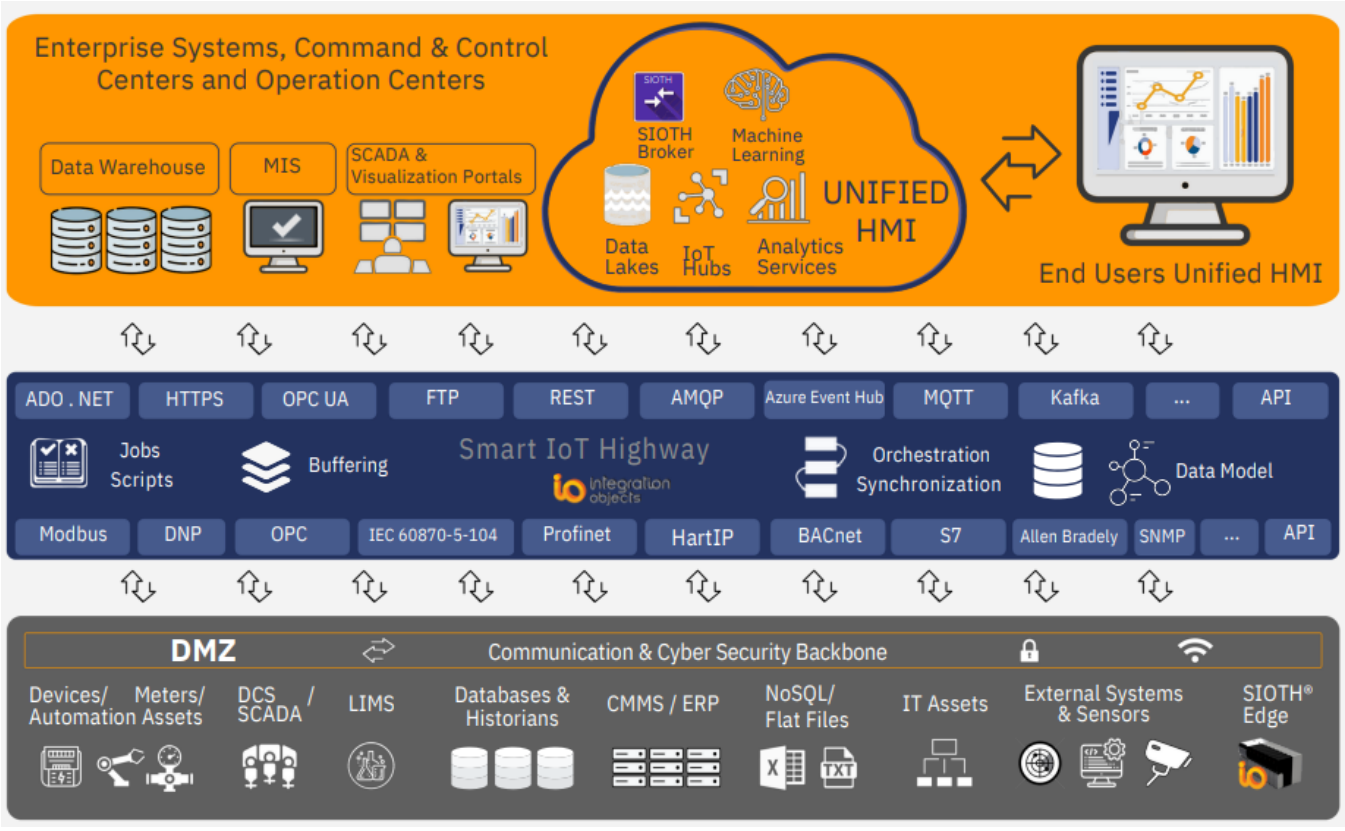

Figure 1. SIOTH Platform Overview

SIOTH® Platform could be installed on 2 different modes:

- Standalone Mode: All SIOTH components are installed in a single node called Master Node.
- Distributed Mode: A master node is installed to host the SIOTH core modules and remote nodes are installed to host remote connectors or UHMI modules.

GETTING STARTED

1. Compatibility

For Windows based systems, Integration Objects' Smart IoT Highway supports the following:

- **Operating Systems**
  - Windows 10 Enterprise
  - Windows 11
  - Windows 11 IoT
  - Windows Server 2022
  - Windows Server 2019
  - Windows Server 2016
  - Windows Server 2012 Standard
- **Web Browsers**
  - Chrome in its latest version
  - Firefox in its latest version
  - Edge in its latest version
- **Microsoft SQL Server (Express, Standard and Enterprise Editions)**
  - SQL Server 2022
  - SQL Server 2019
  - SQL Server 2017
  - SQL Server 2016
  - SQL Server 2014

2. Minimum Hardware Specifications

The table below outlines the minimum hardware specifications recommended for SIOTH master node:

Hardware Component	Minimum Specification
Processor	8 cores
RAM	16 GB
Disk Space	10 GB dedicated to SIOTH installation

Table 1. Minimum Specifications Recommended for SIOTH Master Node

3. Master Node Installation Prerequisites

The following minimum prerequisites need to be met before installing Integration Objects' Smart IoT Highway (SIOTH) on the master node:

3.1. Web Browser

Make sure that a web browser is installed on the master node. Refer to the compatibility section for the list of supported web browsers.

3.2. Windows Features Activation

3.2.1. Online Activation

Open the Control Panel and click on "**Turn windows features on or off**".

1. For Windows Server OS

Activate the following features as illustrated in the screens below:

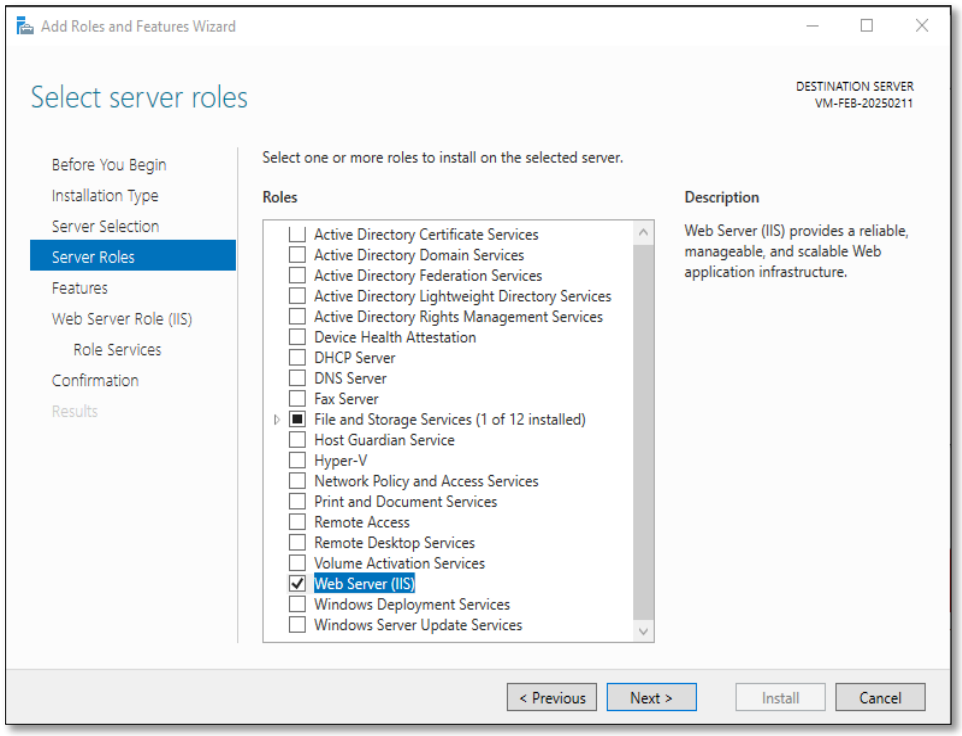

Figure 2. Server Roles Activation on Windows Server (1/3)

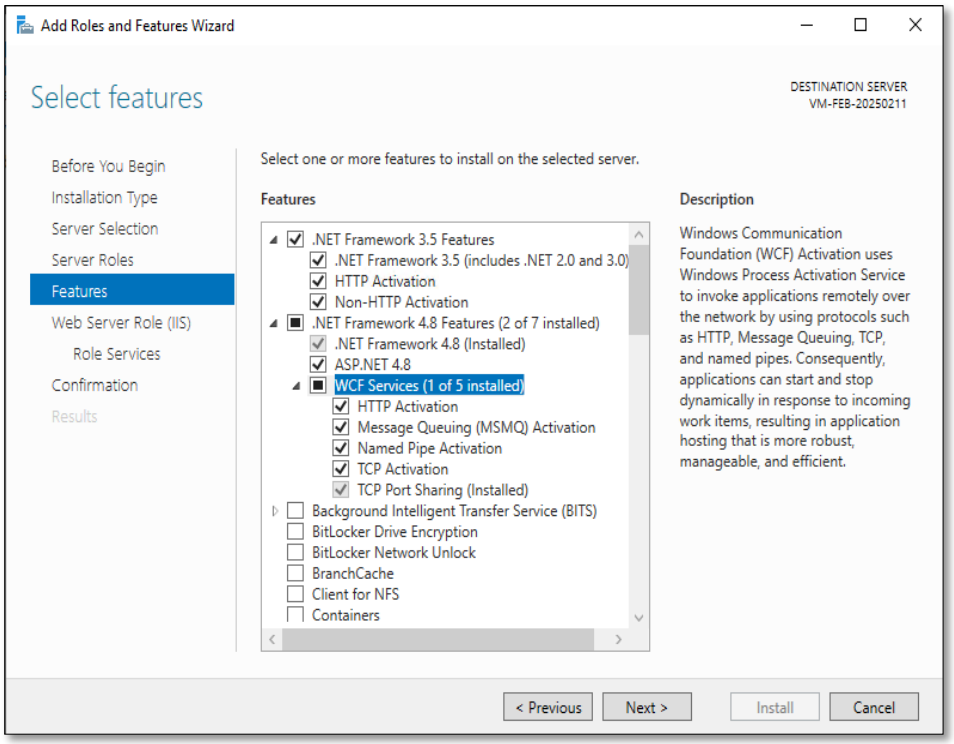

Figure 3. Server Roles Activation on Windows Server (2/3)

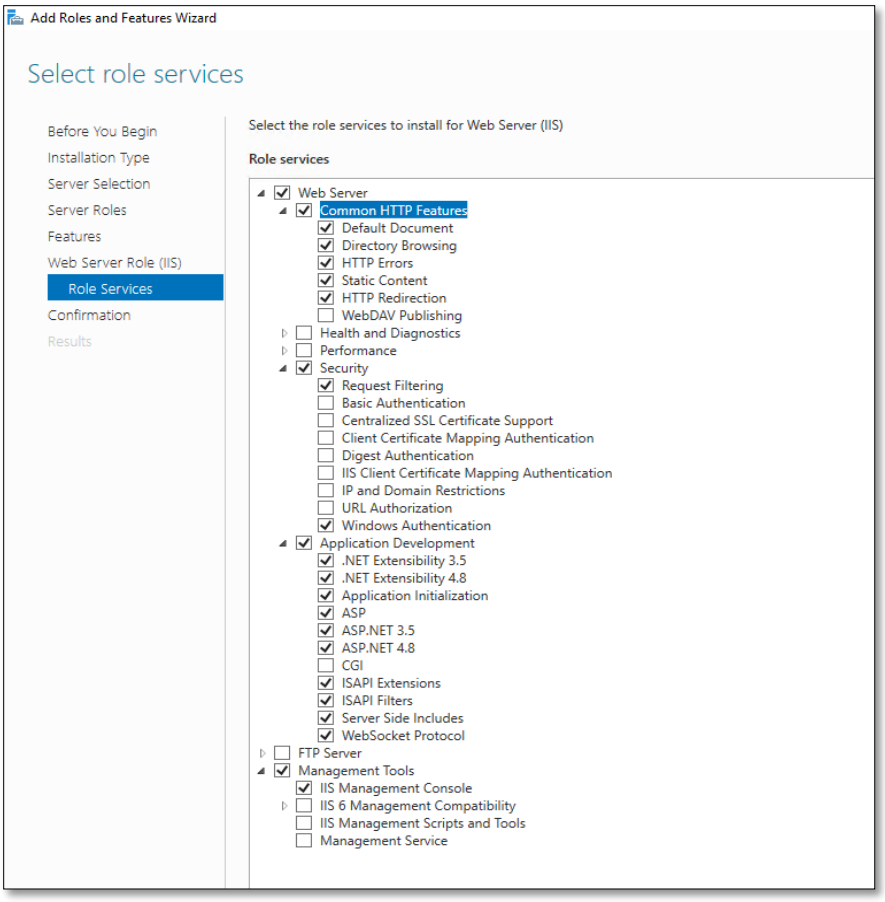

Figure 4. Role Services Activation on Windows Server (3/3)

(!) Note:

For Windows Server 2012 and Windows Server 2016 operating systems, it is necessary to download and install ".NET Framework 4.8" using a separate installer.

2. For Windows Client OS

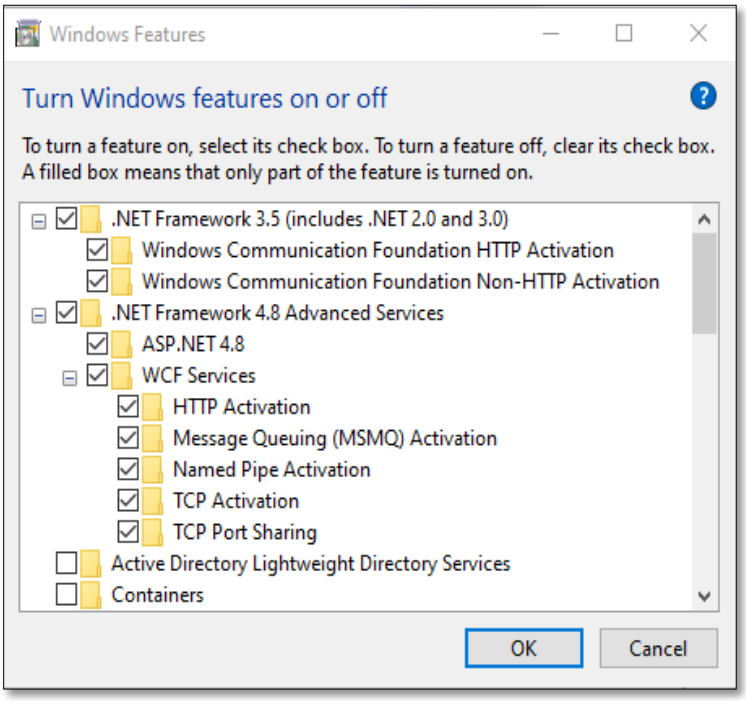

Figure 5. .NET Features Activation on Windows Client

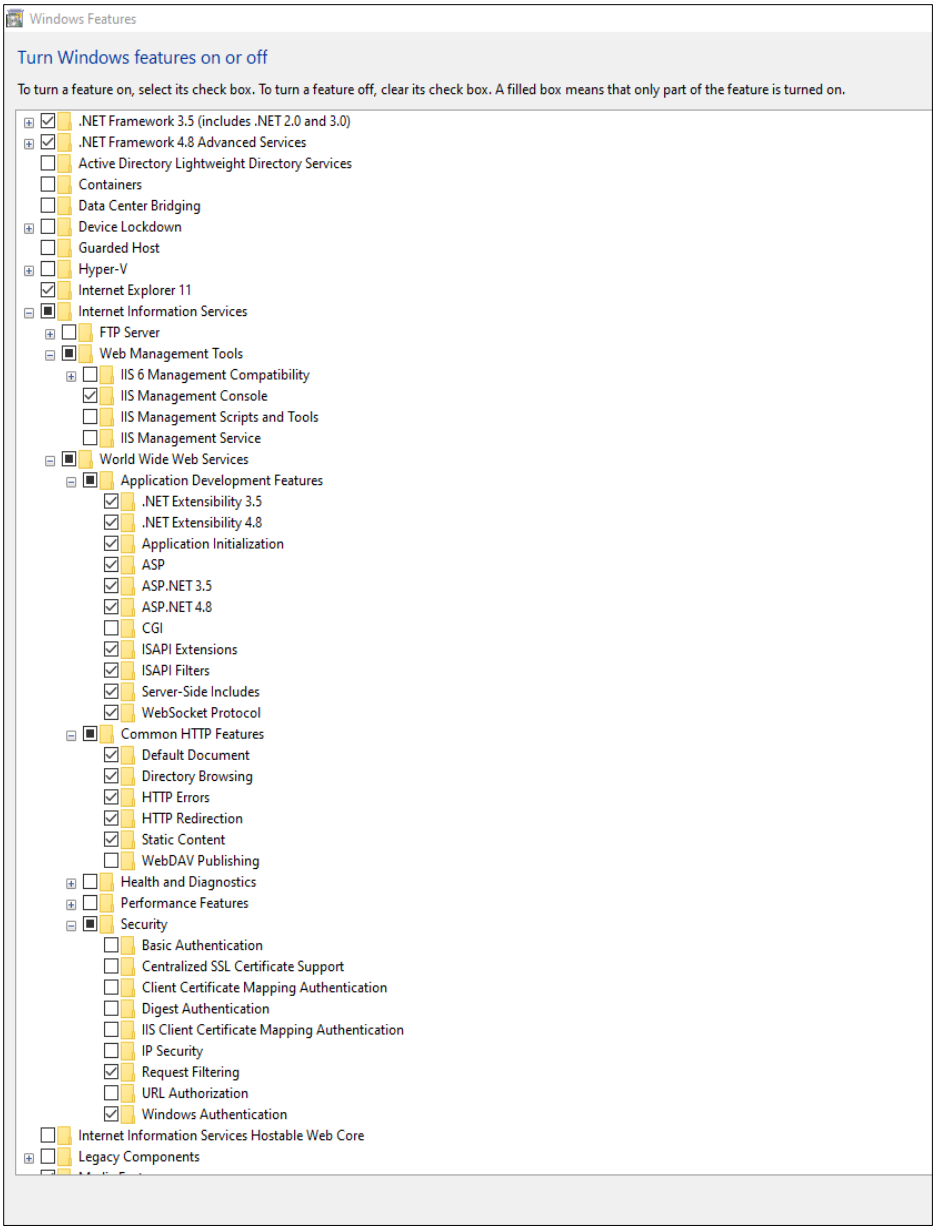

Figure 6. IIS Features Activation on Windows Client

3.2.2. Offline Activation

1. **Windows Server OS**

   Follow the steps indicated in this section **"For Windows Server OS".**

   In the Confirmation Installation section, choose the **'Specify an alternate source path'** option and set the path of the source files.

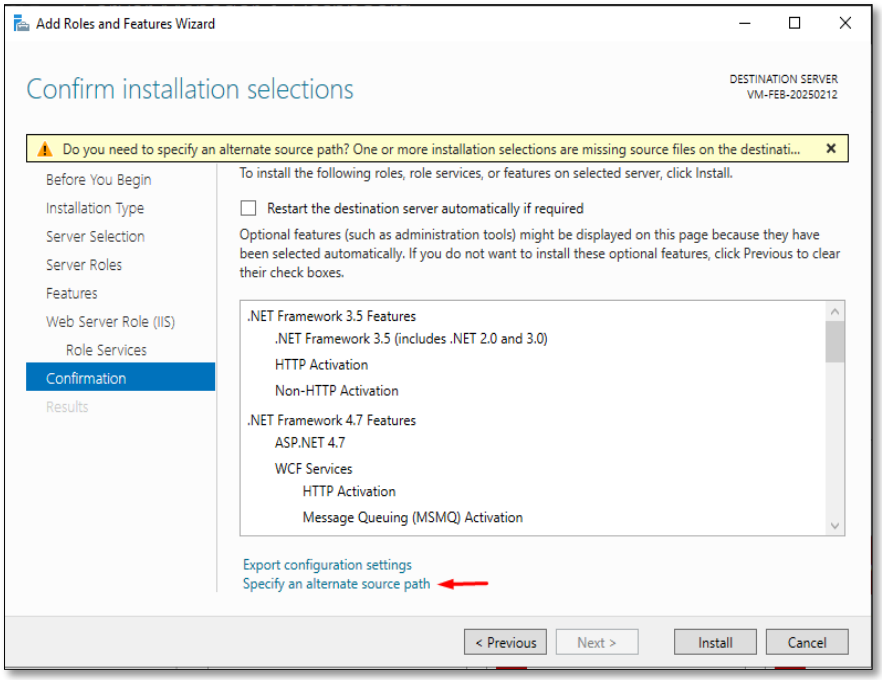

Figure 7. Confirmation Activation on Windows Server

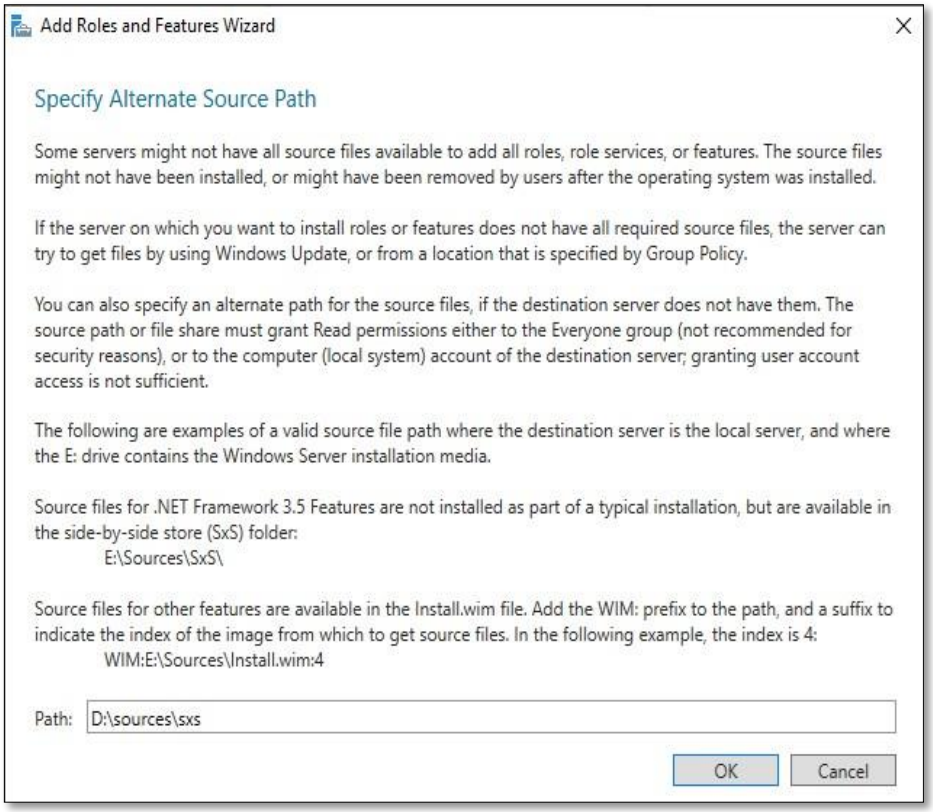

Figure 8. Alternate Source Path for Offline Installation

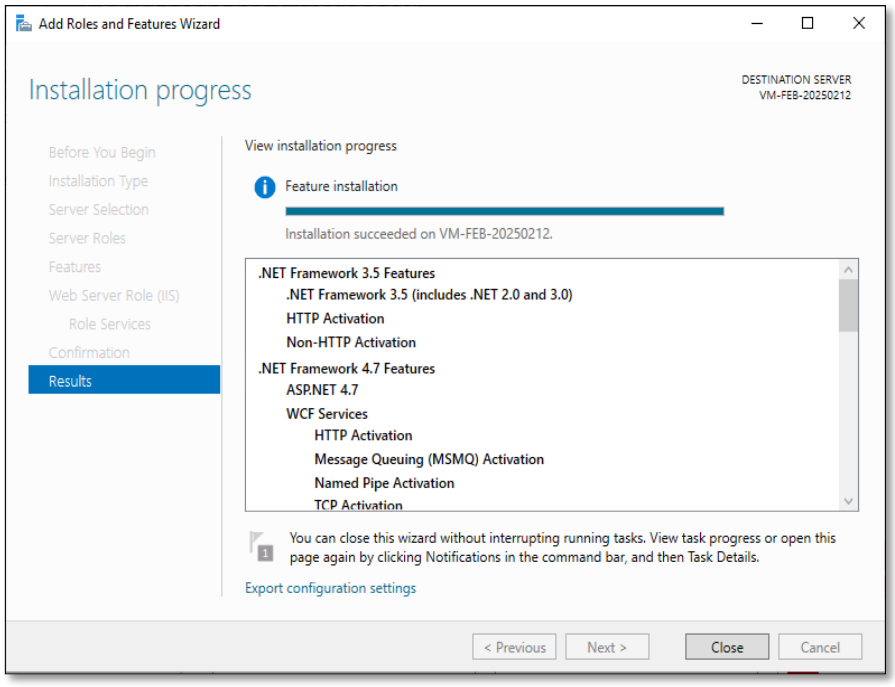

Figure 9.Offline Activation Succeeded

2. Windows Client OS

Mount the installation media to your computer and note down the associated drive letter.

Figure 10. Mount the Installation

Then, run the batch script 'WindowsFeatures_script.bat' with administrative privilege. You will find it located in the downloaded package under the following subfolder: "...\Integration Objects' Smart IoT Highway\Pre-Requisites\WindowsFeatures_script.bat".

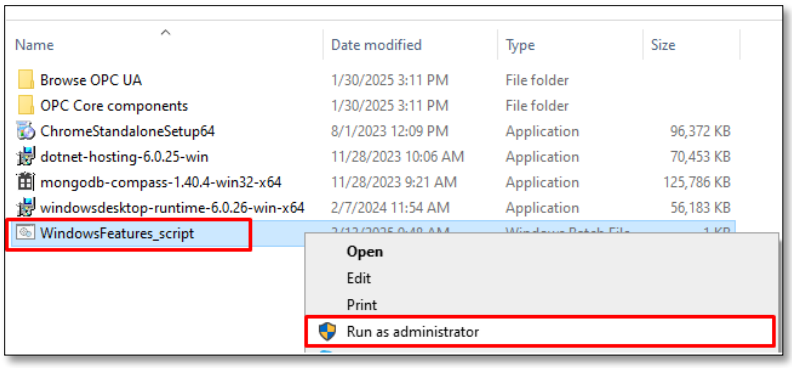

Figure 11. Windows Features Script

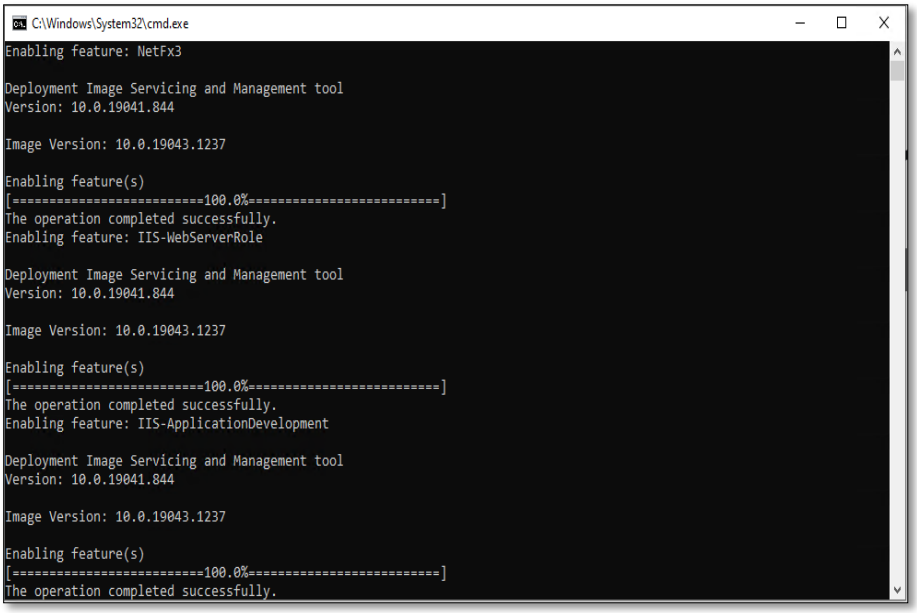

Figure 12. NET features Activation offline

3.3. .Net Hosting

Install the dotnet-hosting-6.0.25-win.

3.4. SQL Server – Optional

If SQL Server is intended to host SIOTH users management or UHMI databases, refer to the "**Appendix1**" section for the SQL Server configuration requirements.

4. Remote Node Installation Prerequisites

4.1. Data Source/Destination Server

The following minimum prerequisites need to be met on each server where a SIOTH connector will be deployed:

4.1.1. Windows Features Activation

Open the Control Panel and click on "**Turn windows features on or off**".

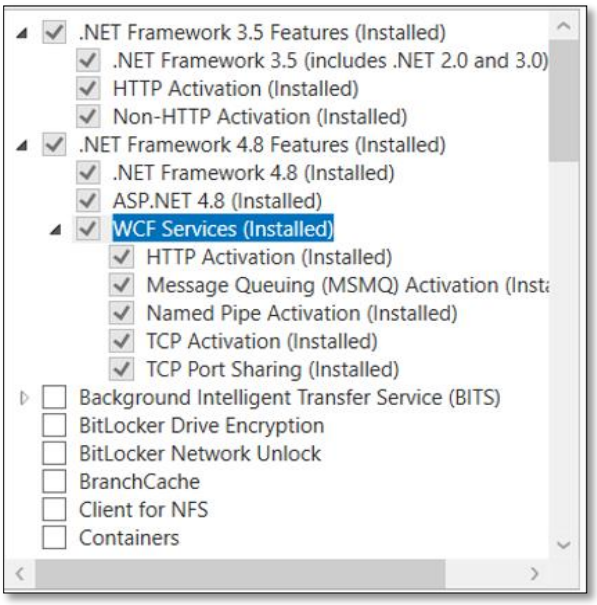

Figure 13. Data Source/Destination Server Features Activation

4.1.2. .Net Hosting

Refer to the section **".Net Hosting"**.

4.1.3. Windows Runtime Desktop

Install windowsdesktop-runtime-6.0.26-win-x64.

4.2. UHMI Server

The following prerequisites need to be met on the server hosting the UHMI Designer and UHMI Runtime environments:

4.2.1. Web Browser

For further details, refer to the section "**Web Browser**"

4.2.2. Windows Feature Activation

- For Windows Server operating system: Refer to the section "**Windows Server OS**".
- For Windows Client operating system: Refer to the section "**Windows Client OS**".

4.2.3. .Net Hosting

Refer to the section **".Net Hosting"**.

5. Specific Connectors Prerequisites

For specific SIOTH connectors, additional prerequisites may be required based on the supported communication protocol or data store:

5.1. OPC Classic Connector (DA, HDA, AE)

- OPC Core Components Redistributable (x64 or x86), SIOTH setup will handle the installation of this component.

5.2. OPC UA Connector

- OPC UA Local Discovery Server (Setup will be included under the prerequisites folder)
- Change the parameter **AllowLocalRegistration = yes** under the path

".:\ProgramData\OPC Foundation\UA\Discovery\ualds.ini"

- Restart the windows service "OPC UA Local Discovery Server"

5.3. DNP Connector

- dotnet-hosting-5.0.12-win
- Microsoft Visual C++ Redistributable 2015-2019 v 14.28.29913.0 (x64)
- OpenSSL for Windows 1.1.1L x64 (Win64OpenSSL_Light-1_1_1k)

5.4. PI/PI AF Connector

- PI SDK 2018 (PISDK_2018-SP1-Patch-3)

INSTALLING SIOTH

1. Installation Process

Right-click on the downloaded executable of the SIOTH installation program and select "**Run as administrator**". The installation will start automatically, and the setup wizard will take you through the following steps:

(!) Note: If SIOTH is already installed on your machine, the setup wizard will proceed to the uninstallation of the existing version as a first step. You will need remove the existing version before installing a new version.

1. Click the **Next** button on the prompt dialog to go to the next page.

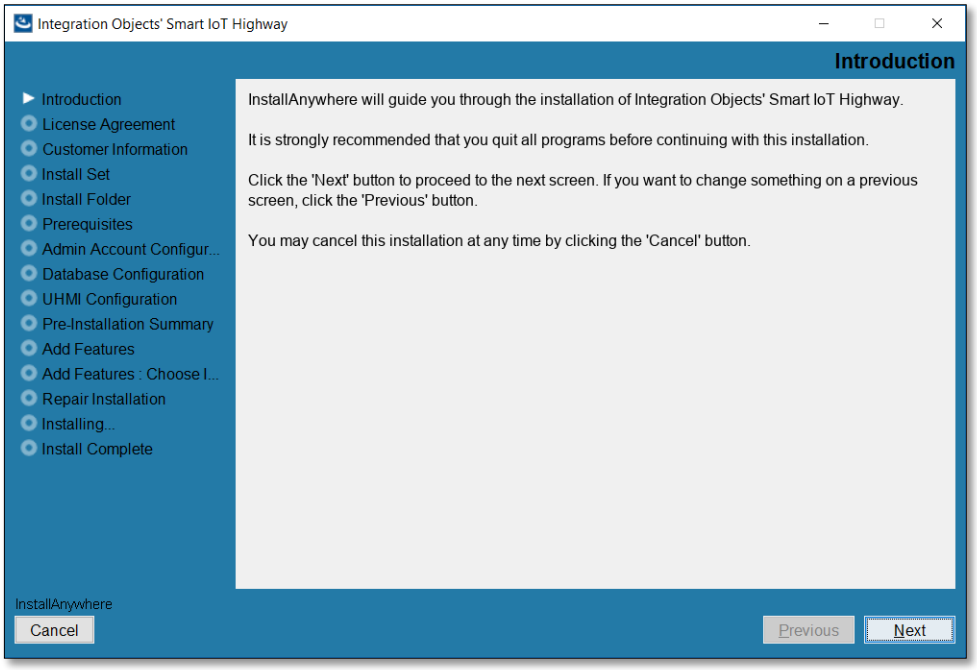

Figure 14. Welcome Dialog

2. Read and accept the license agreement by selecting "**I accept the terms of the license agreement**" and click **Next.**

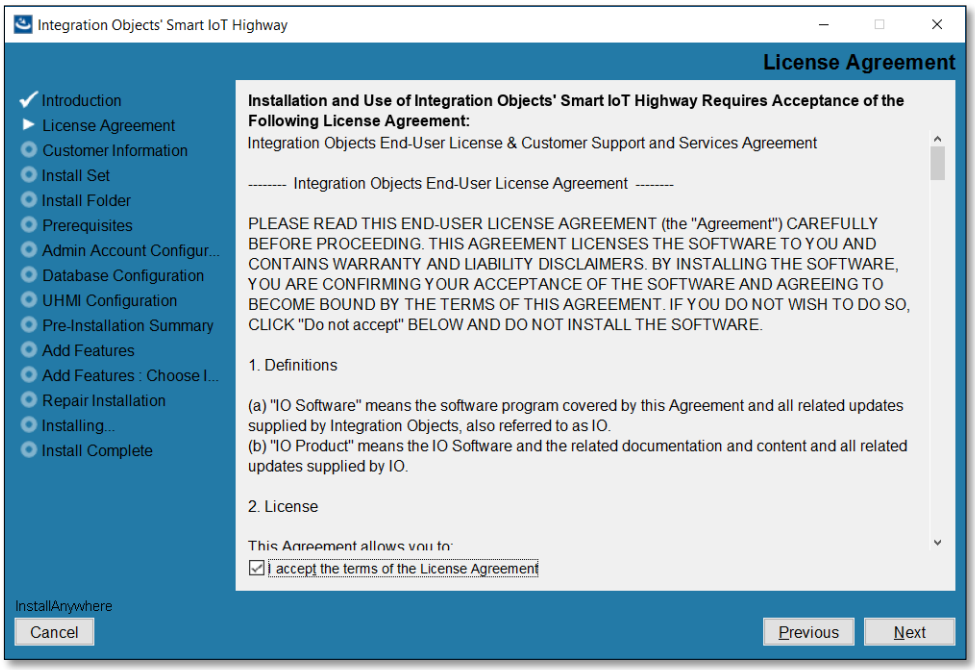

Figure 15. License Agreement Dialog

3. Provide your **Username** and **Company Name**, then click **Next**.

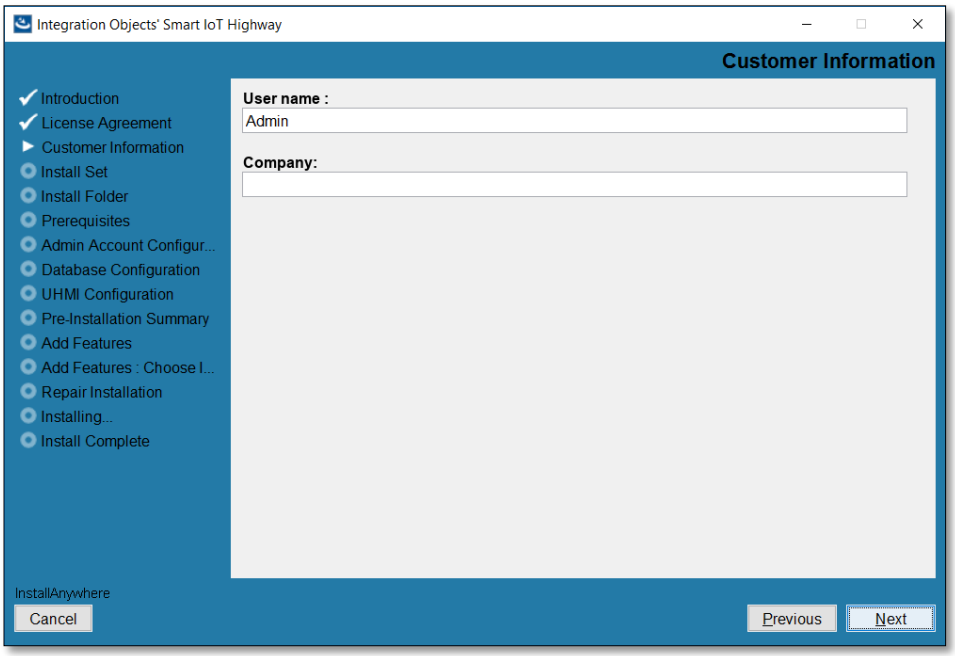

Figure 16.User and Company Information Dialog

4. Choose the type of installation you want to proceed with and click **"Next"**.

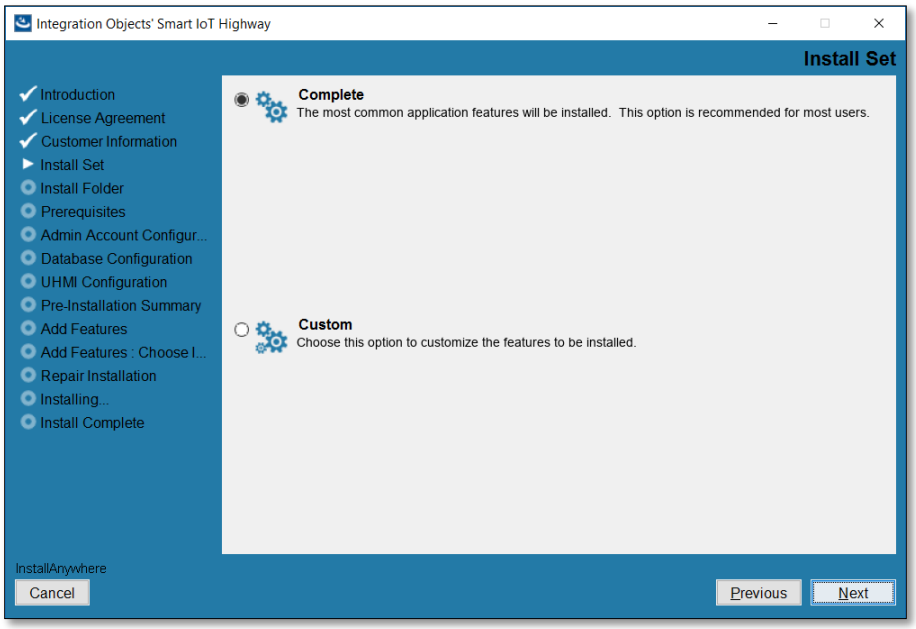

Figure 17. Installation Type Dialog

In case of **Custom** installation, you will be redirected to the list of SIOTH components. Select the components you want to install and unselect the ones you do not and click **"Next"**.

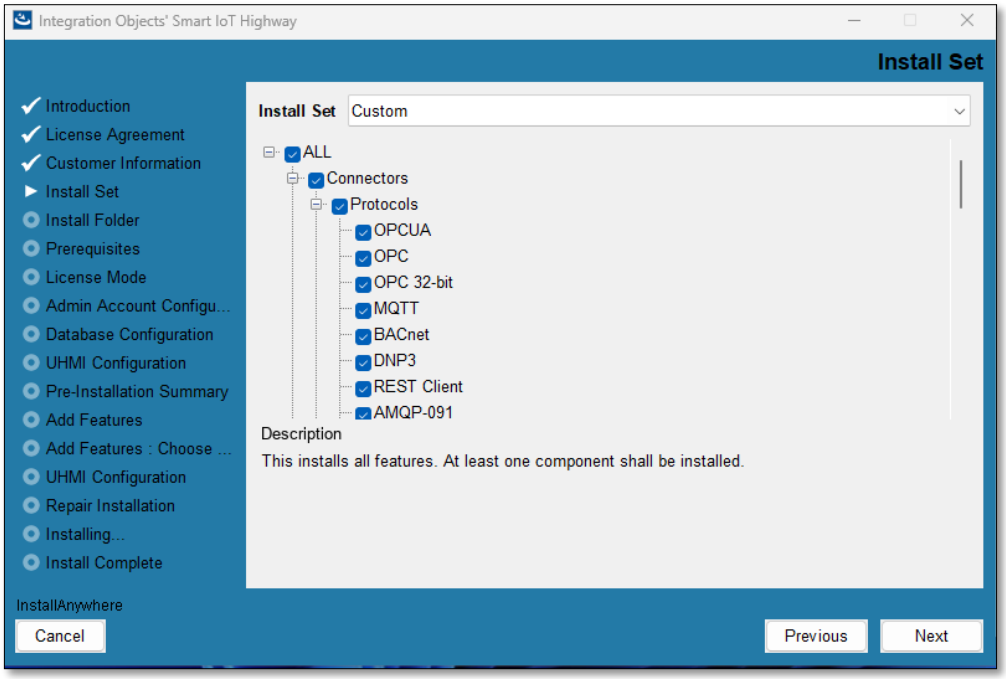

Figure 18.Custom Components Selection Dialog

5. Choose the installation folder path. Click **"Next"** for the default path or click **"Choose"** to select a different destination folder.

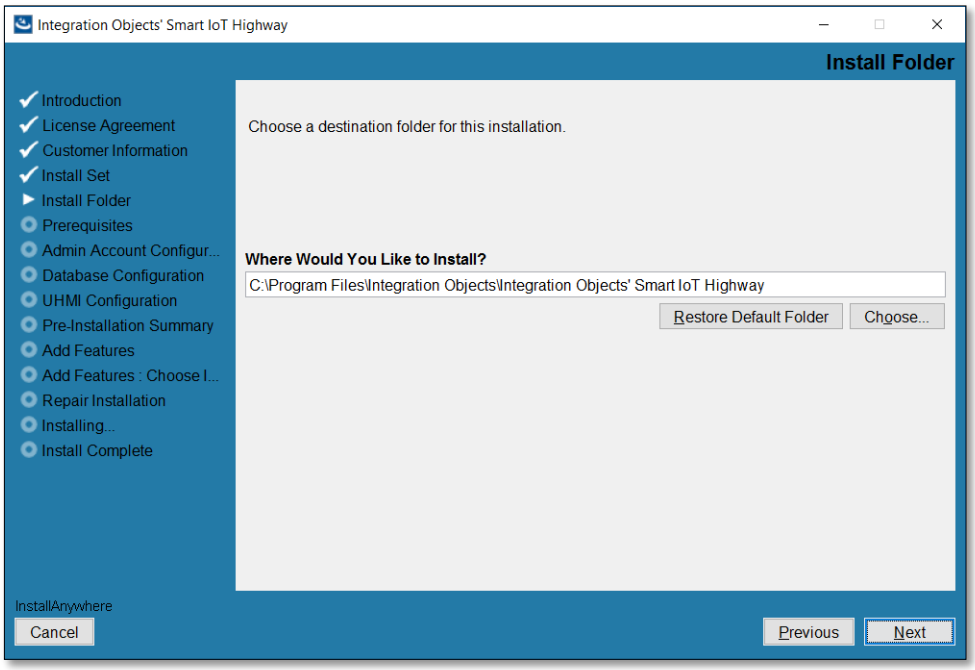

Figure 19. Selecting Install Destination Folder Dialog

6. Configure the local node settings:
    - Provide the IP address or Hostname of the target machine.
    - Select whether you are installing SIOTH on the Master Node or not. The **Master node** stands for the machine where the SIOTH Middleware will be installed along with the SIOTH configuration portal.
    - Select **MongoDB** to install it if it is not installed yet and in case of master node installation.
    - Select **InfluxDB** to install it if it is not installed yet and in case of master node installation.
    - Select **RedisDB** to install it if it is not installed yet and in case of master node installation.

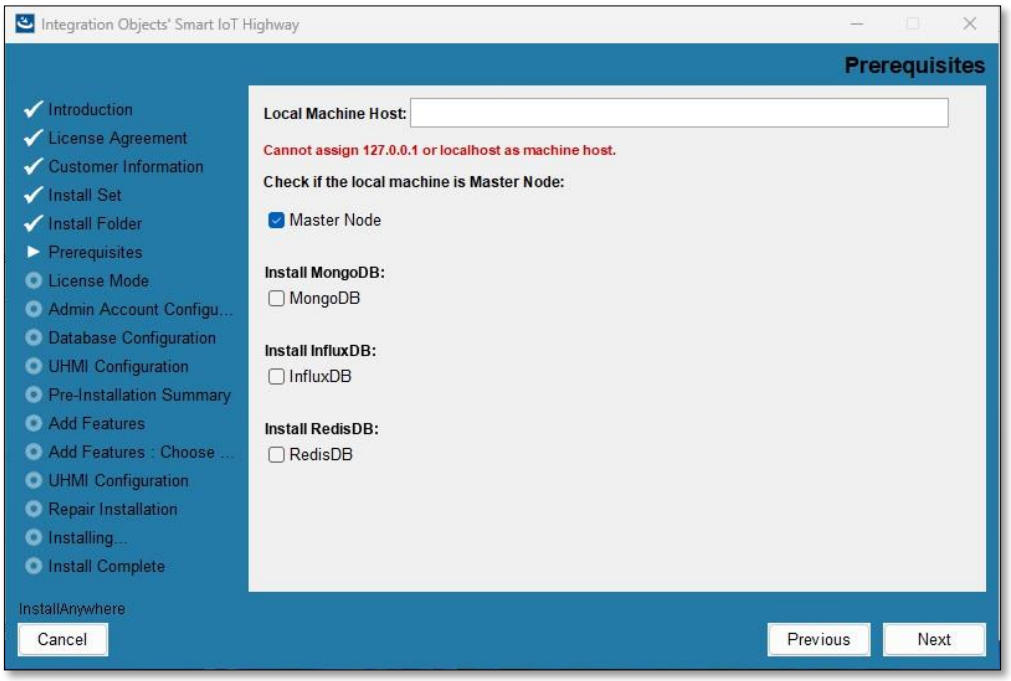

Figure 20. Prerequisites Configuration Dialog

7. Choose the license mode that SIOTH will be following:

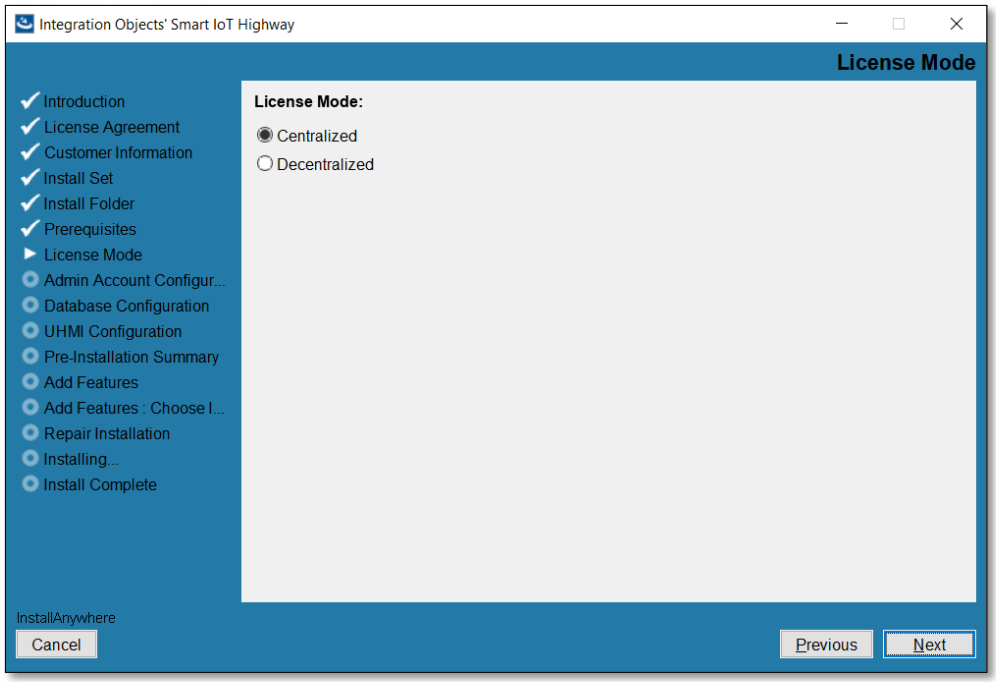

Figure 21. License Mode Selection Dialog

8. Choose a user account to run the SIOTH services or leave the fields empty to use the local system account. Click **Next** to continue. You can still configure the services logon from Windows Services after installation.

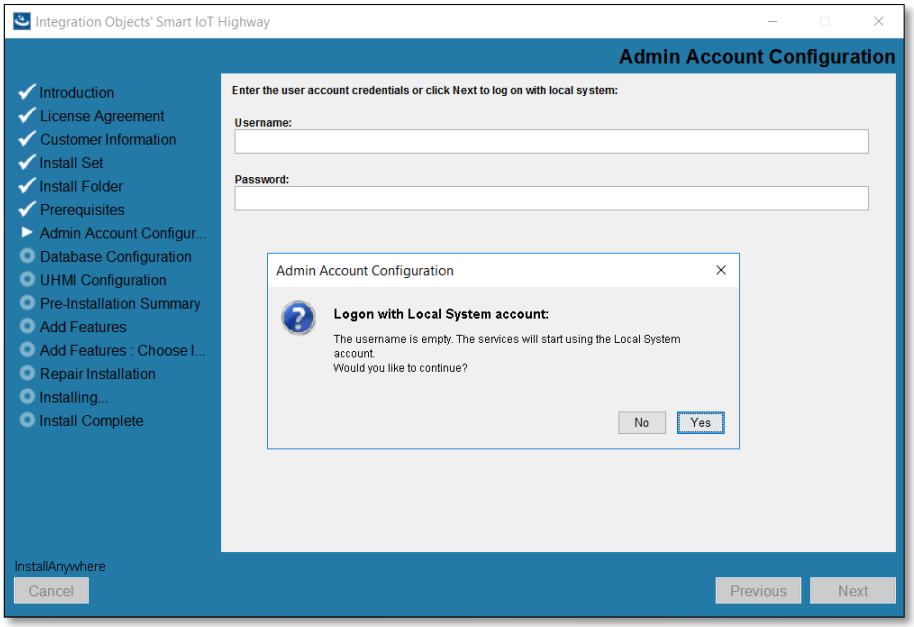

Figure 22. User Account Credentials

9. Choose the **Database Type** and the corresponding information, then click **Next**. SIOTH supports MS SQL, SQLite, MySQL, and PostgreSQL Servers.

    1. Proceed with the default database selected: **SQLite**

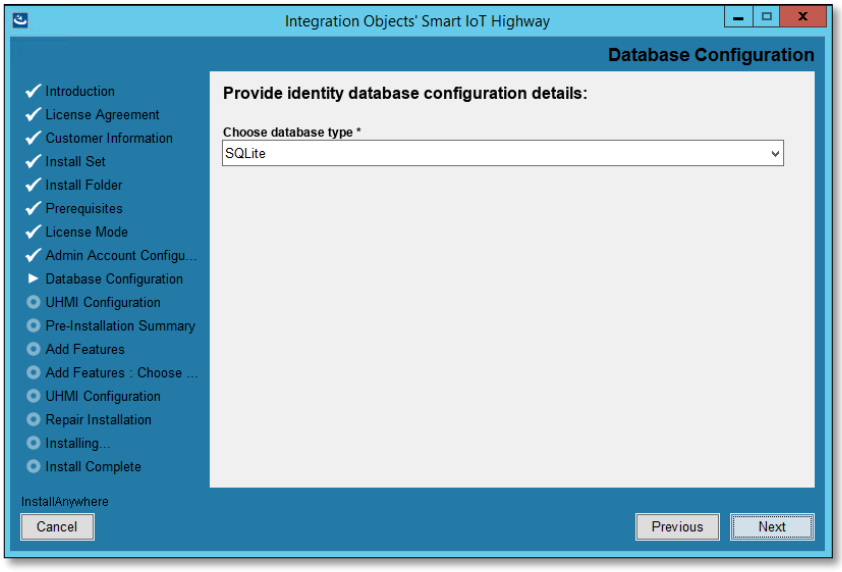

Figure 23. Default SQLite Database

10. Click "**Next**" then UHMI database configuration dialog will be prompted, choose the Database type: SQLite or SQL DB.

    - Proceed with the Default Database selected: **SQLite**

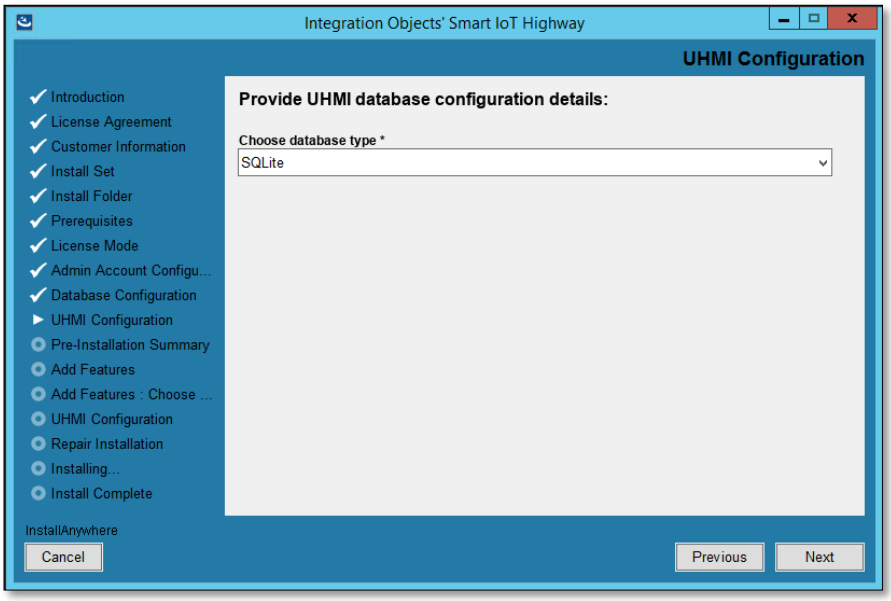

Figure 24. UHMI Default Database

Upon clicking "**Next**", review your pre-installation summary, then click the "**Install**" button to start the installation.

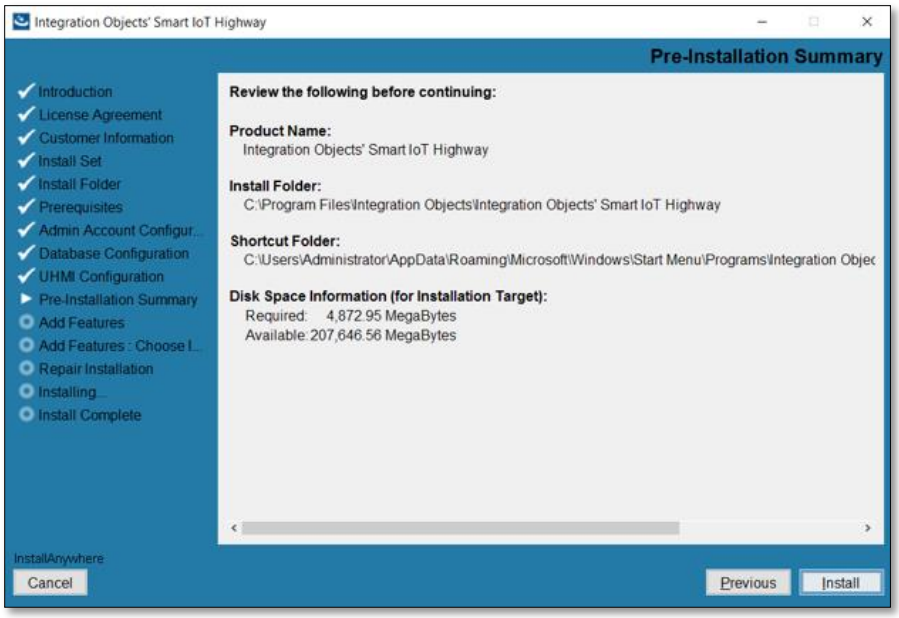

Figure 25. Pre-Installation Summary Dialog

The setup will copy the necessary files into the target folder, create the SIOTH application pools and websites in IIS, create a shortcut icon to access the SIOTH configuration portal, create the services for the installed features and make an uninstallation entry in the Add/Remove Programs in the Control Panel. This process may take a few minutes.

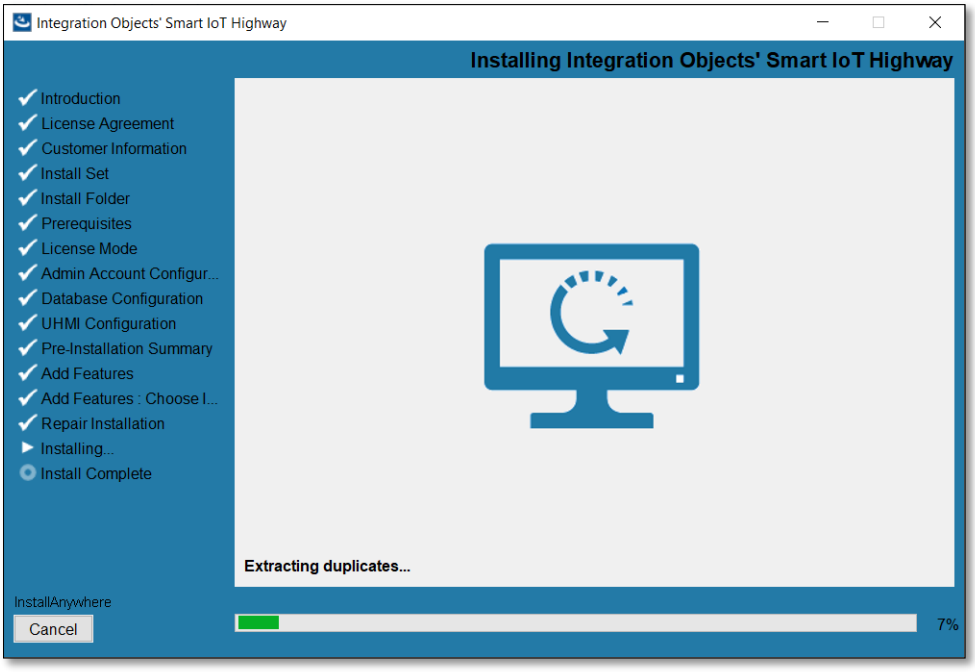

Figure 26. Installation Progress Dialog

During the installation process, MongoDB setup will be launched. Go through the setup wizard to install MongoDB.

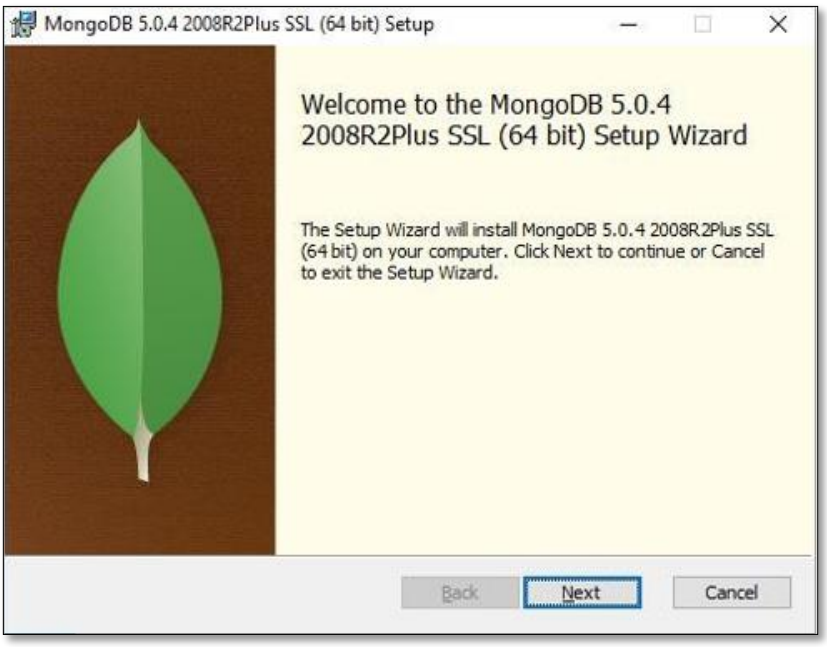

Figure 27. MongoDB Setup – Welcome Dialog

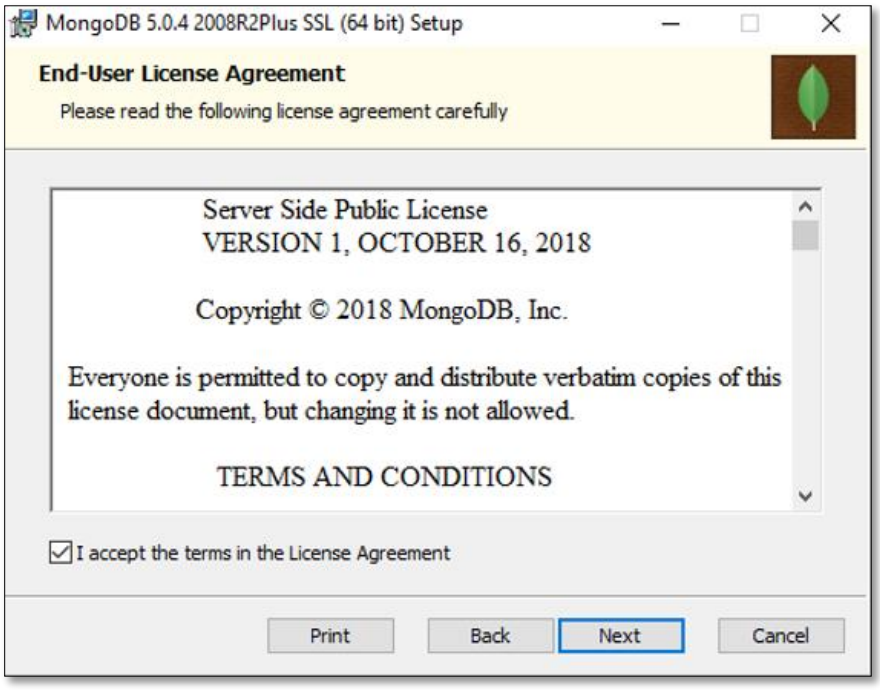

Figure 28. MongoDB Setup – License Agreement

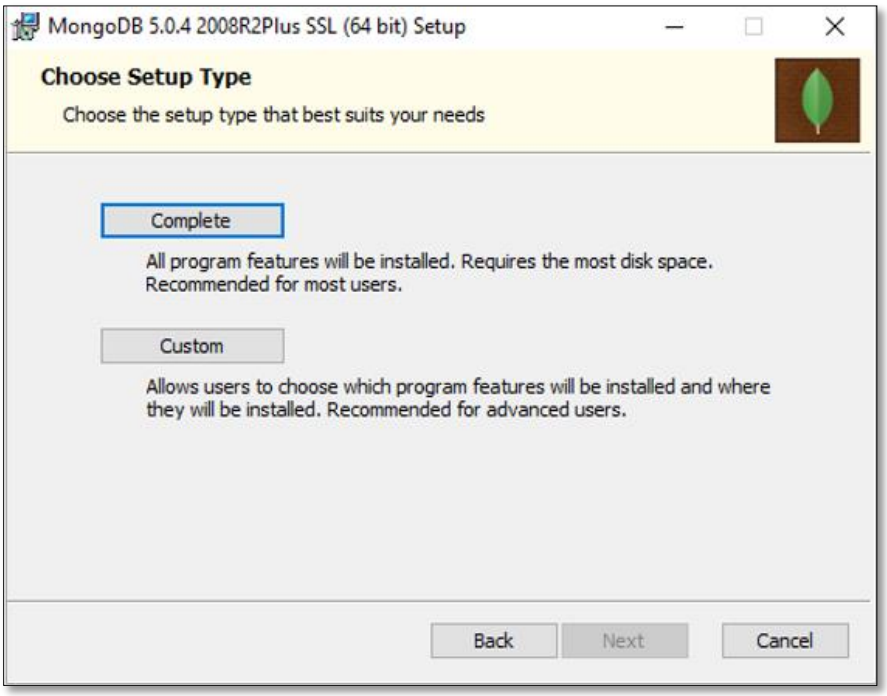

Figure 29. MongoDB Setup Type – Choose Complete

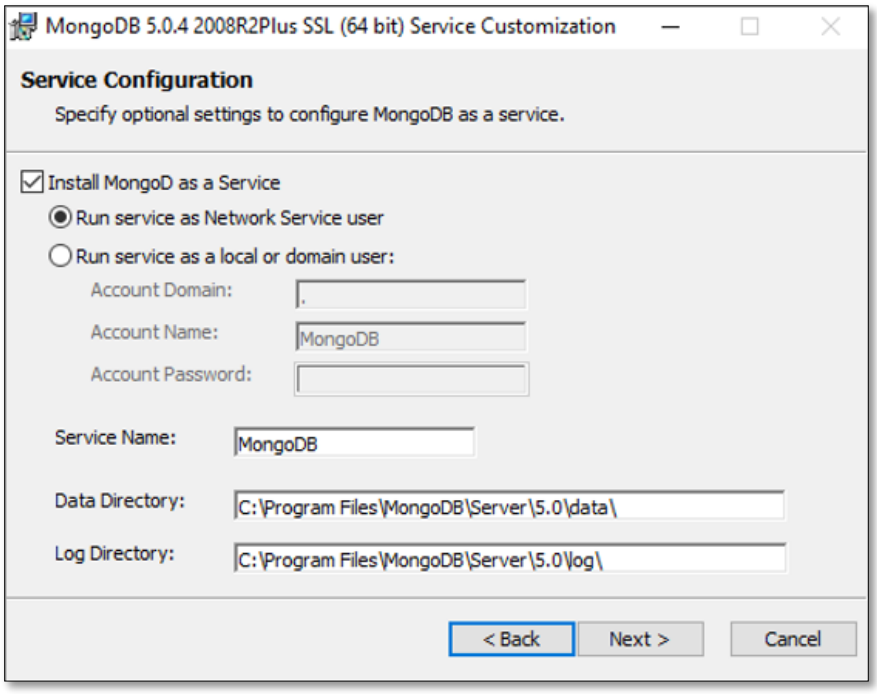

Figure 30. MongoDB Setup – Service Configuration

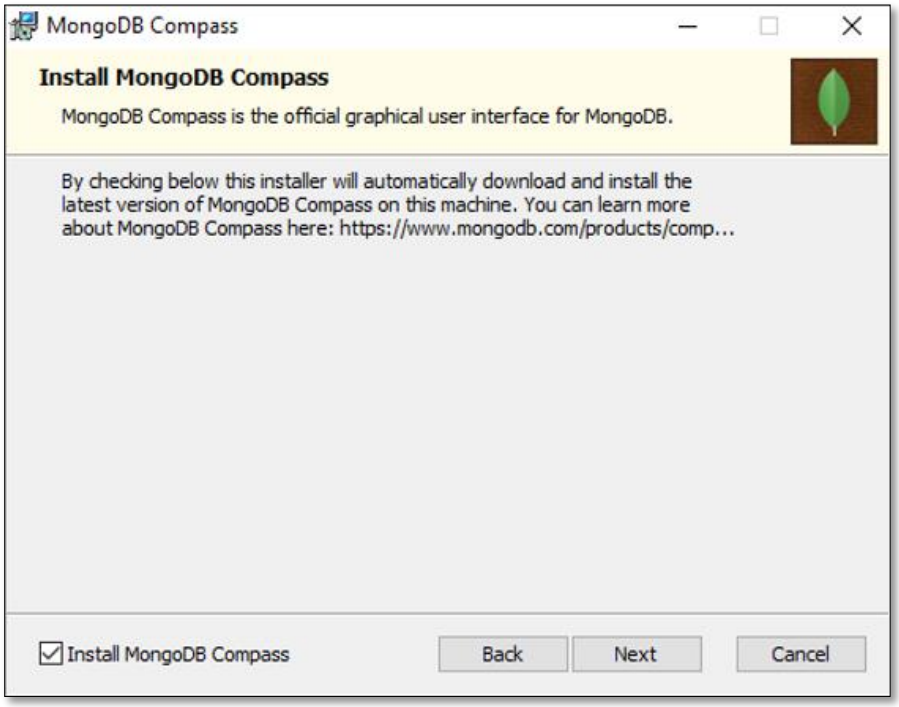

Figure 31. MongoDB Setup – Install MongoDB Compass

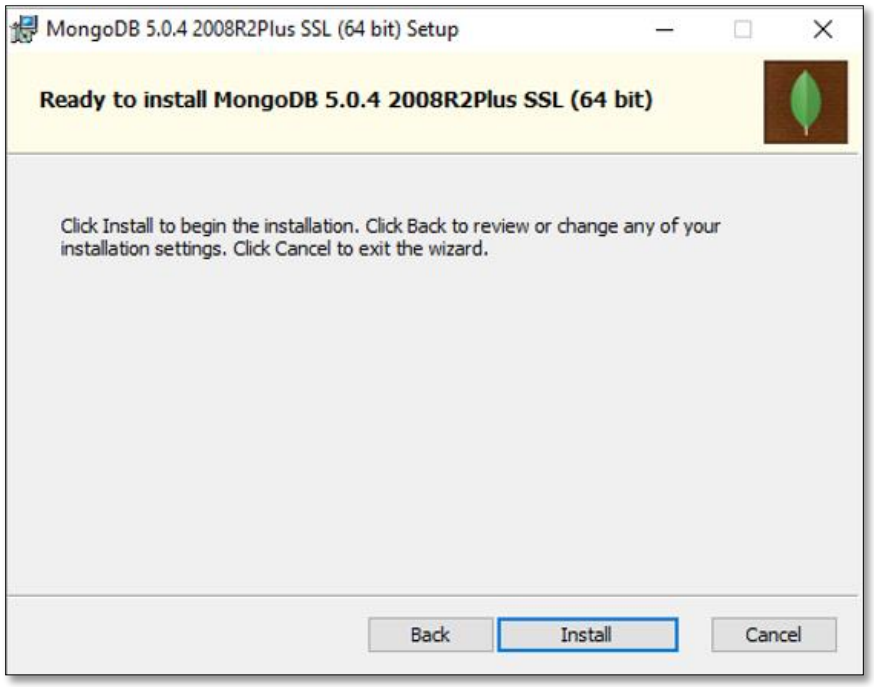

Figure 32. MongoDB Setup – Start Installation

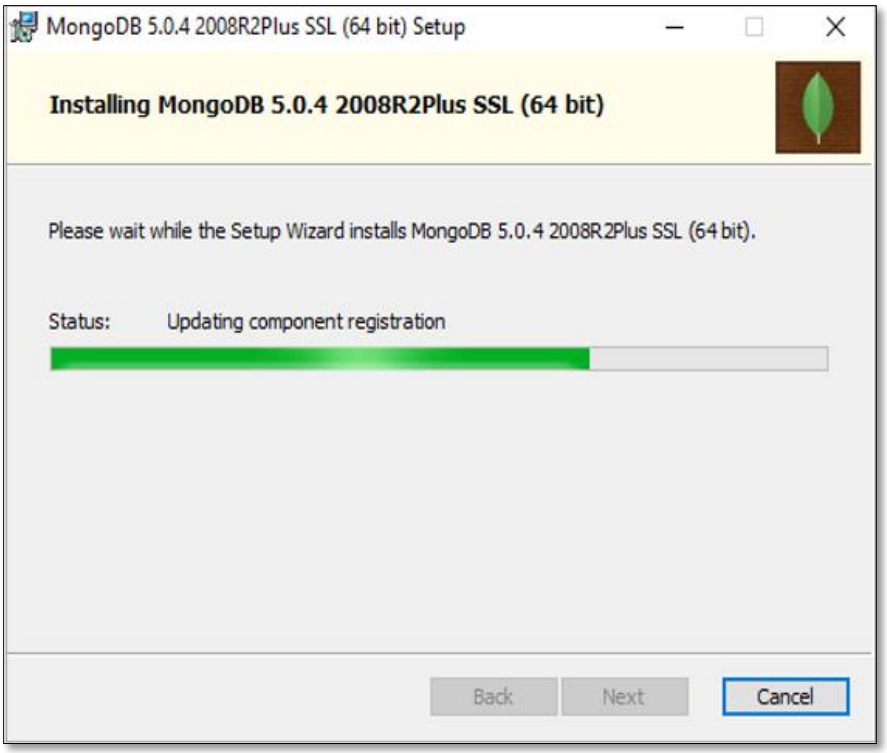

Figure 33. MongoDB Setup – Installation in Progress

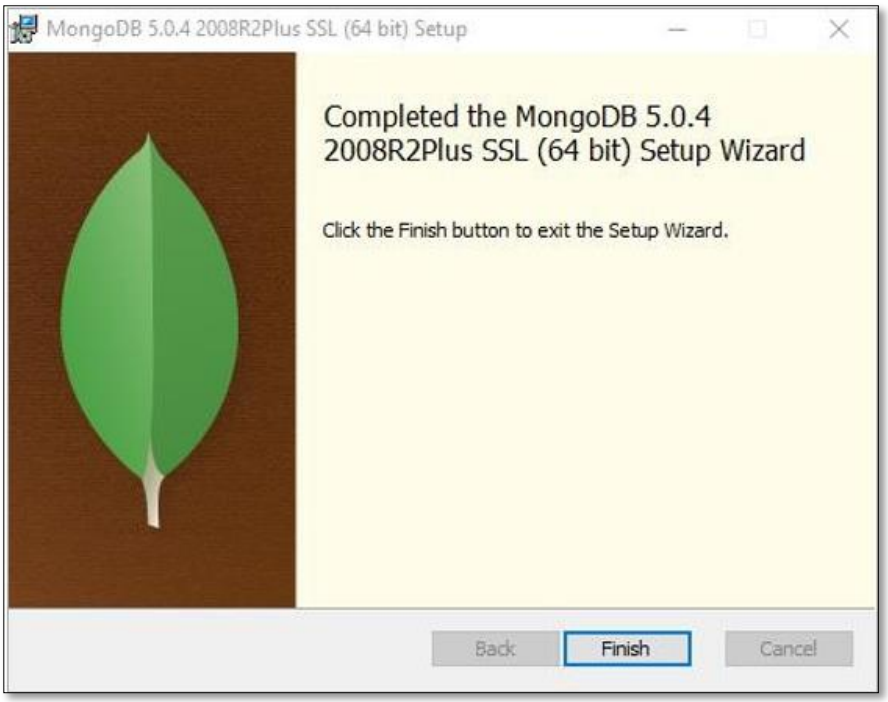

Figure 34. MongoDB Setup – Installation Complete

Once the MongoDB installation is completed, Redis setup will be launched. Go through the setup wizard to install Redis.

Figure 35. Redis Setup – Welcome Dialog

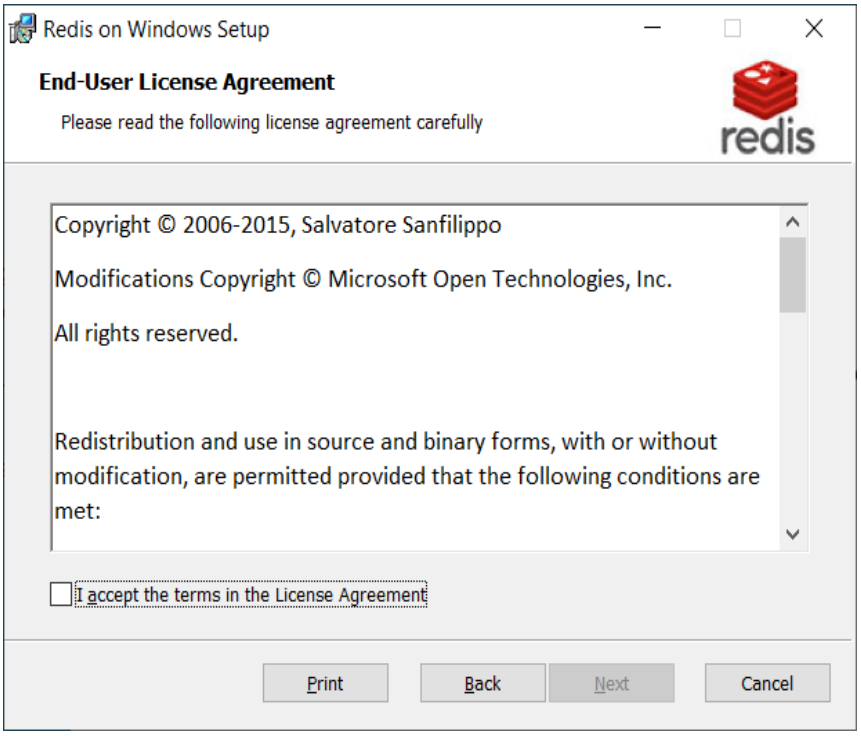

Figure 36. Redis Setup – License Agreement

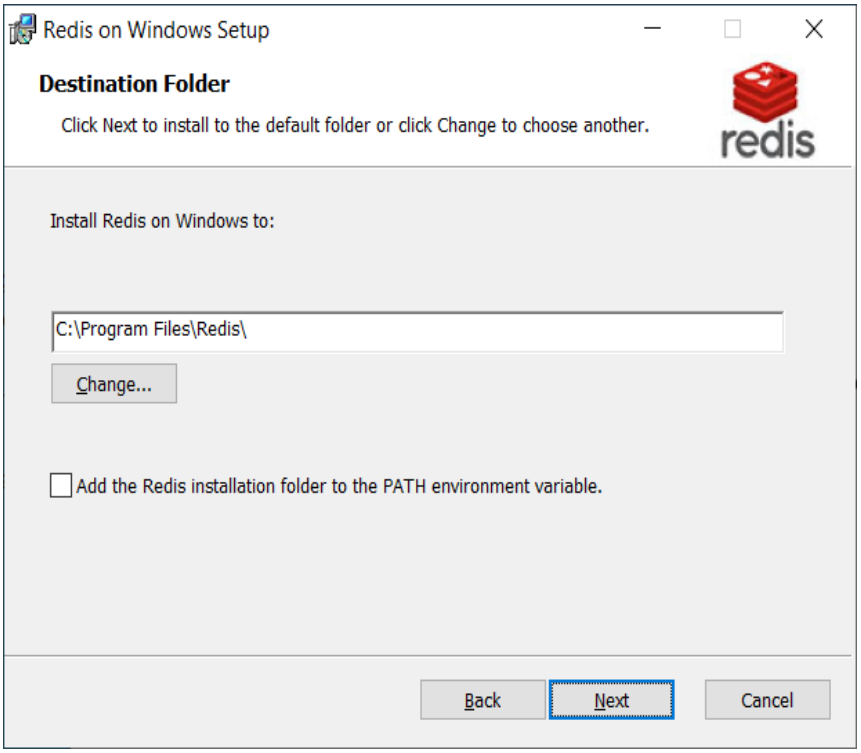

Figure 37. Redis Setup – Destination Folder Configuration

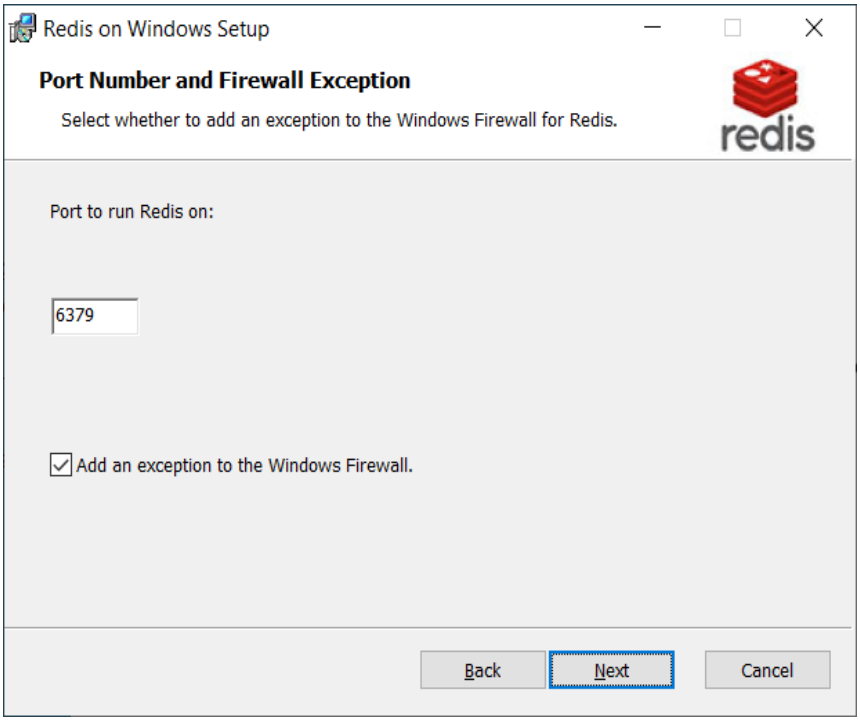

Figure 38. Redis Setup – Port Number and Firewall Exception Configuration

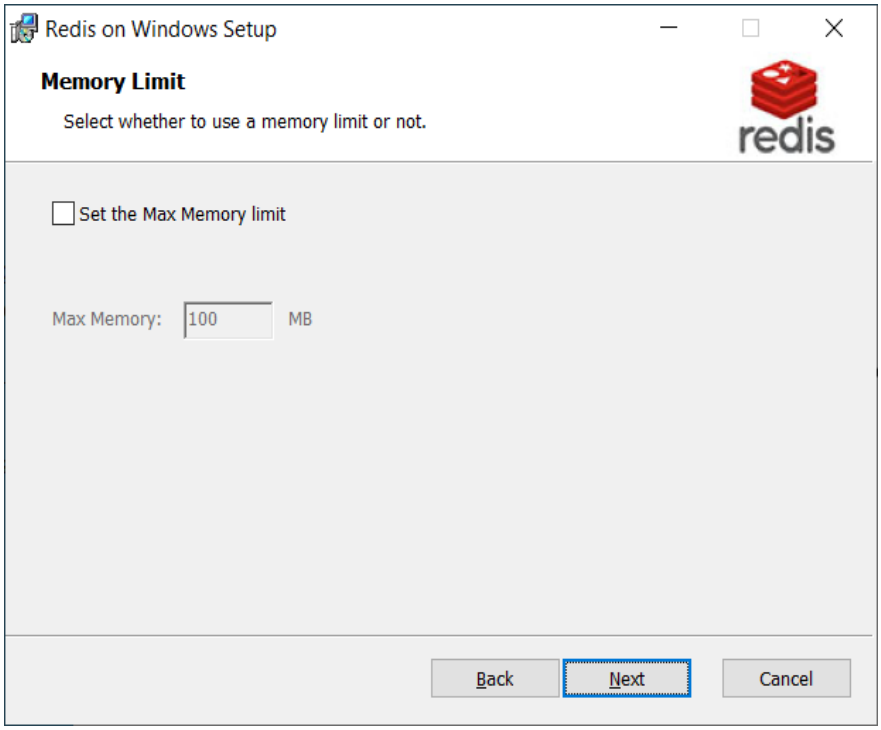

Figure 39. Redis Setup – Memory Limit Configuration

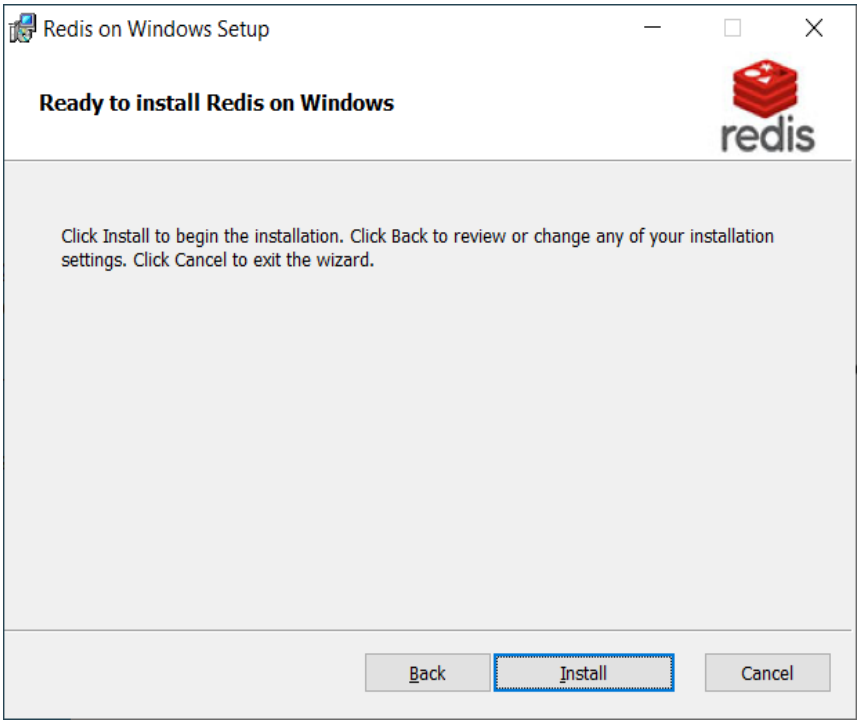

Figure 40. Redis Setup – Start Installation

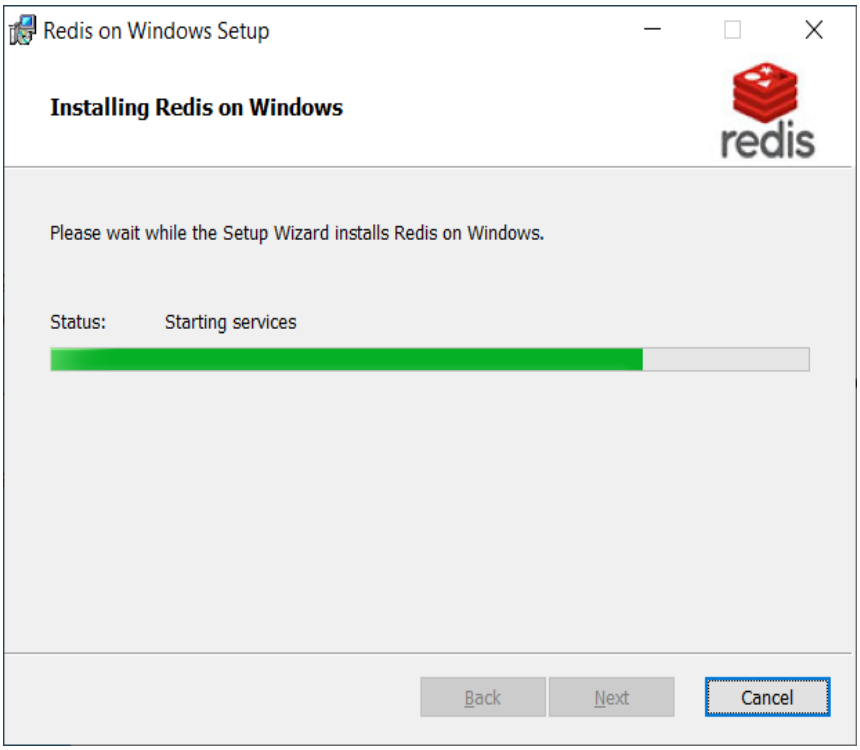

Figure 41. Redis Setup – Installation in Progress

Figure 42. Redis Setup – Installation Complete

Once the installation is complete, the following dialog will be displayed. Click "**Done**" to close the installer.

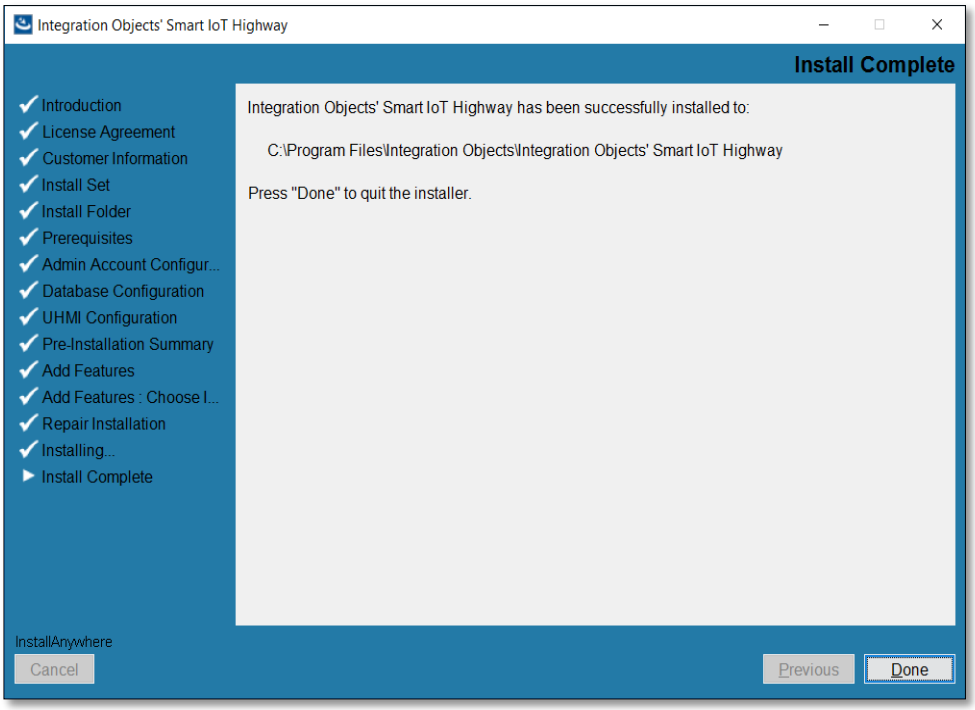

Figure 43. Installation Complete Dialog

(!) Note: In the event of an interruption during the installation phase, navigate to the following path: **"C:\Program Files\Zero G Registry"** and remove the **".com.zerog.registry"** file, as shown below. This interruption may happen if previous versions of SIOTH were installed on the same machine.

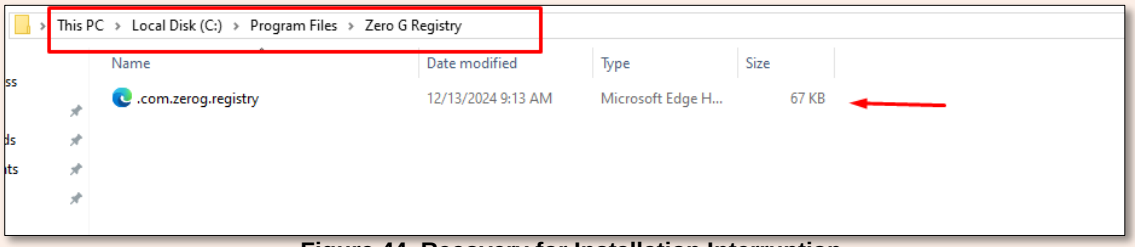

Figure 44. Recovery for Installation Interruption

After that, re-run the setup to proceed with the installation phase.

2. Post-Installation Verification

After installation, the SIOTH Windows services will start automatically. The installed services are described below:

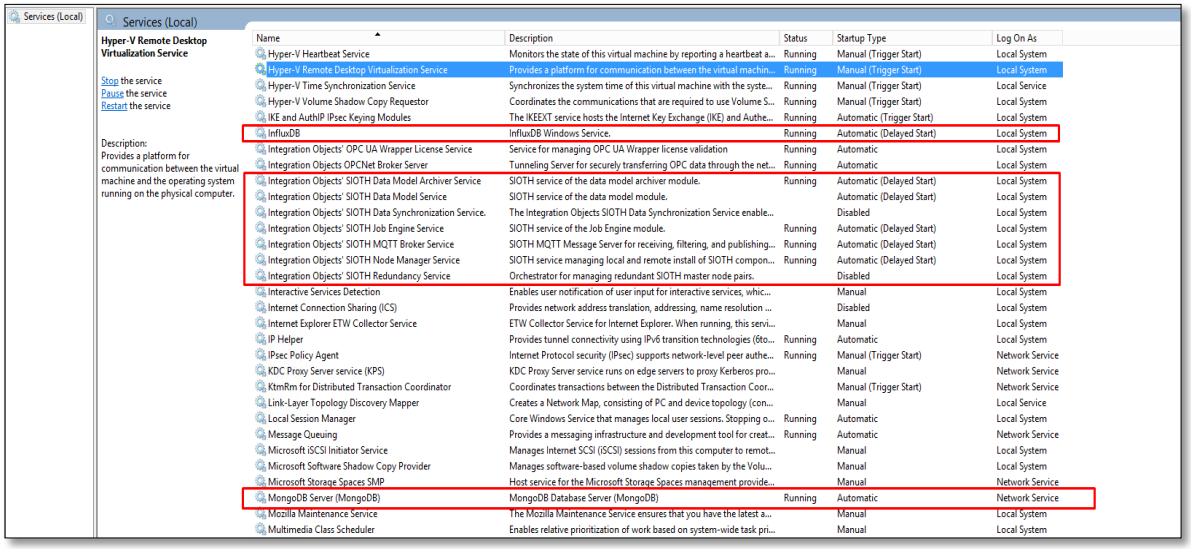

Figure 45. SIOTH Services

The installed services are configured to start up automatically and are running with the Local System account by default, except for the MongoDB service that runs with the Network Service account.

The table below outlines the installed services:

Name	Description
IO SIOTH Node Manager Service	SIOTH service managing local and remote installation of SIOTH components.
IO SIOTH Job Engine Service	SIOTH service of the Job Engine module.
IO SIOTH Data Model Service	SIOTH service of the Data Model module.
IO SIOTH Data Model Archiver	SIOTH service of the Data Model Archiver module.
IO SIOTH Redundancy Service	SIOTH service for managing redundant SIOTH master node pairs.
InfluxDB	InfluxDB service.
MongoDB	MongoDB database server service.

Table 2. Services Description

SIOTH websites and APIs will also be created in IIS and run automatically using the Local System account.

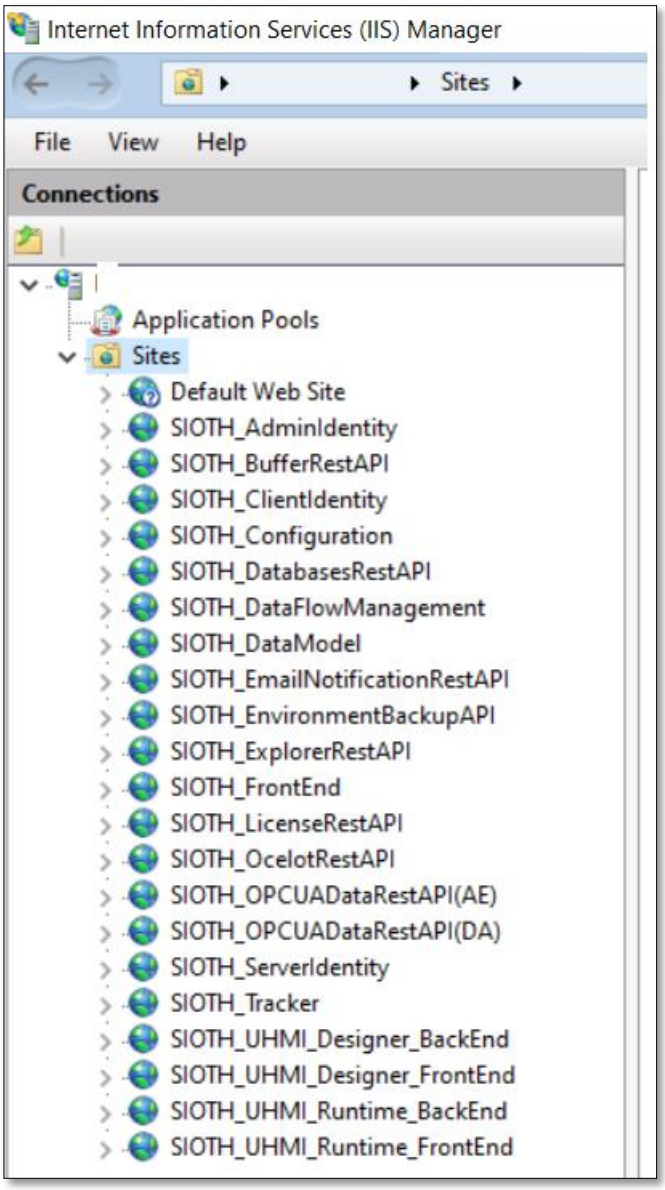

Figure 46. SIOTH Web APIs

(!) Note:

The list of the SIOTH Web APIs created in the IIS might vary according to the setup type and selected features.

3. Uninstallation Process

Proceed as follows to uninstall SIOTH from your machine:

1. Go to the **Control Panel** and select **Uninstall a Program**.under Programs.
2. Right-click on **Integration Objects' Smart IoT Highway** and choose **Uninstall**.

Figure 47. Uninstall SIOTH

3. Select the **Uninstall Product** Option, then click **Next**.

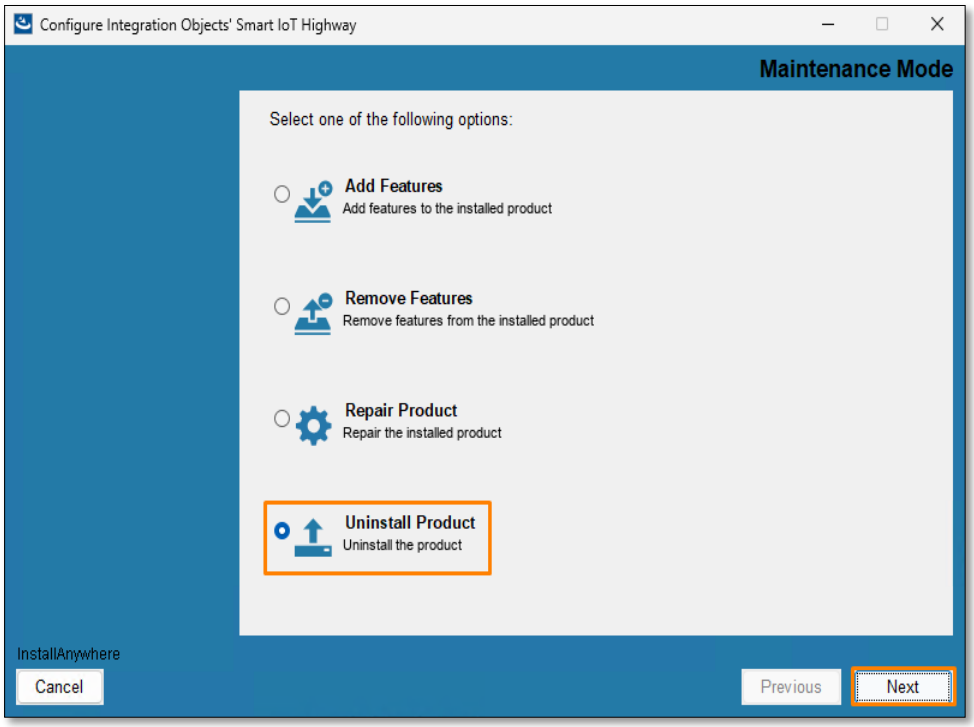

Figure 48. Uninstall Dialog

4. Confirm the uninstallation of all installed features by clicking **Next**.

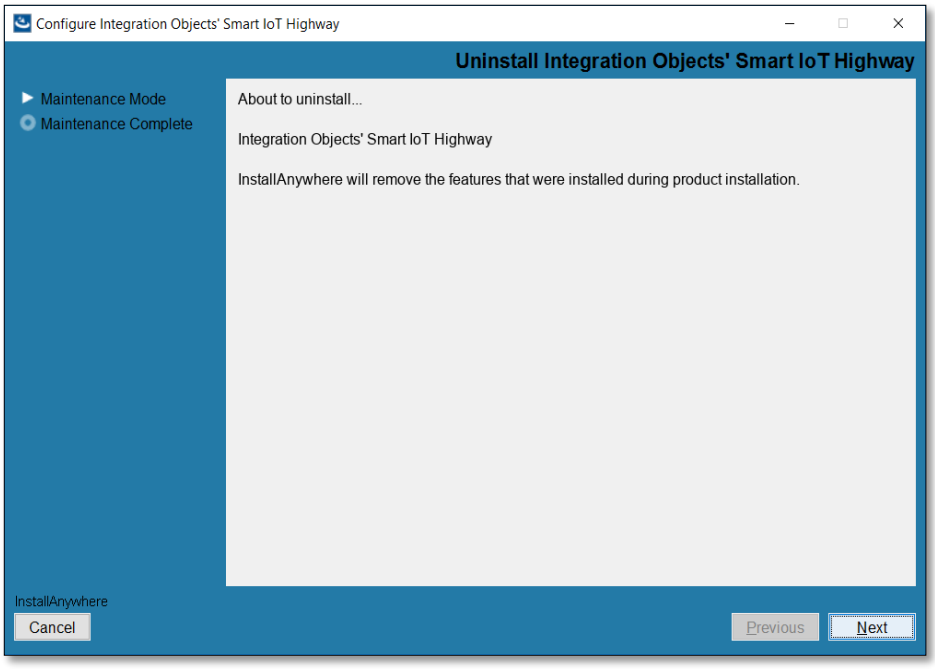

Figure 49. Uninstall Confirmation Message

5. Select whether to uninstall the MongoDB, InfluxDB and RedisDB or not, then click **Uninstall** to continue.

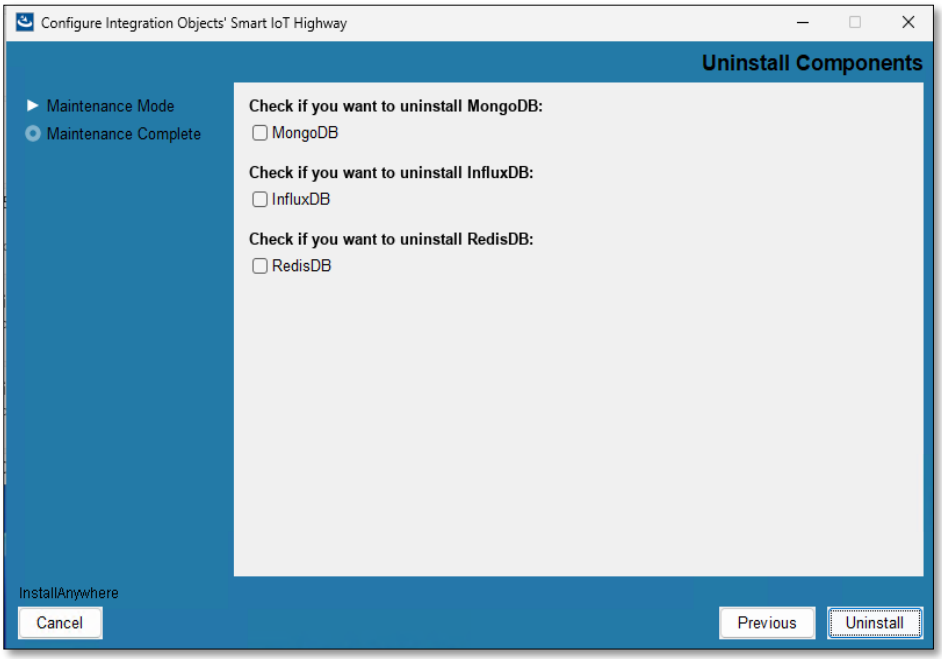

Figure 50. Uninstall Prerequisites Selection Dialog

6. Then, you will be prompted to confirm if the MongoDB and InfluxDB data should be deleted during the uninstallation. Click **Yes** to confirm the deletion of MongoDB and InfluxDB data or **No** to keep them.

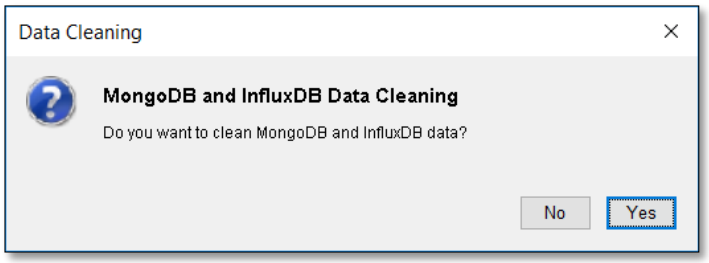

Figure 51. MongoDB and InfluxDB Data Cleaning

7. The uninstall process will then begin and progress will be displayed:

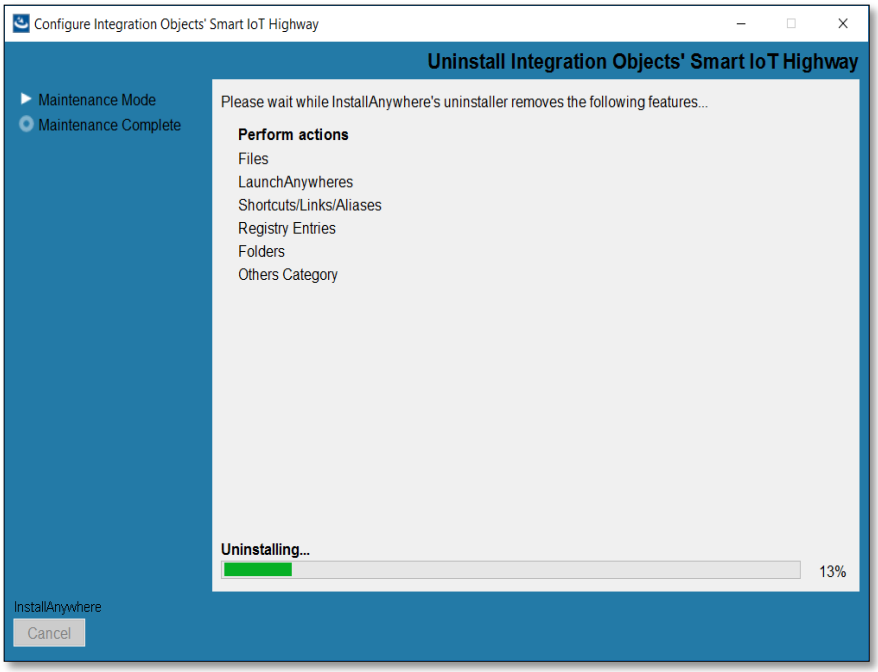

Figure 52. Uninstall Progress

8. Once the uninstallation is complete, a dialog will appear summarizing the uninstallation status. Choose **Yes, restart my system** and click **Done** to finish.

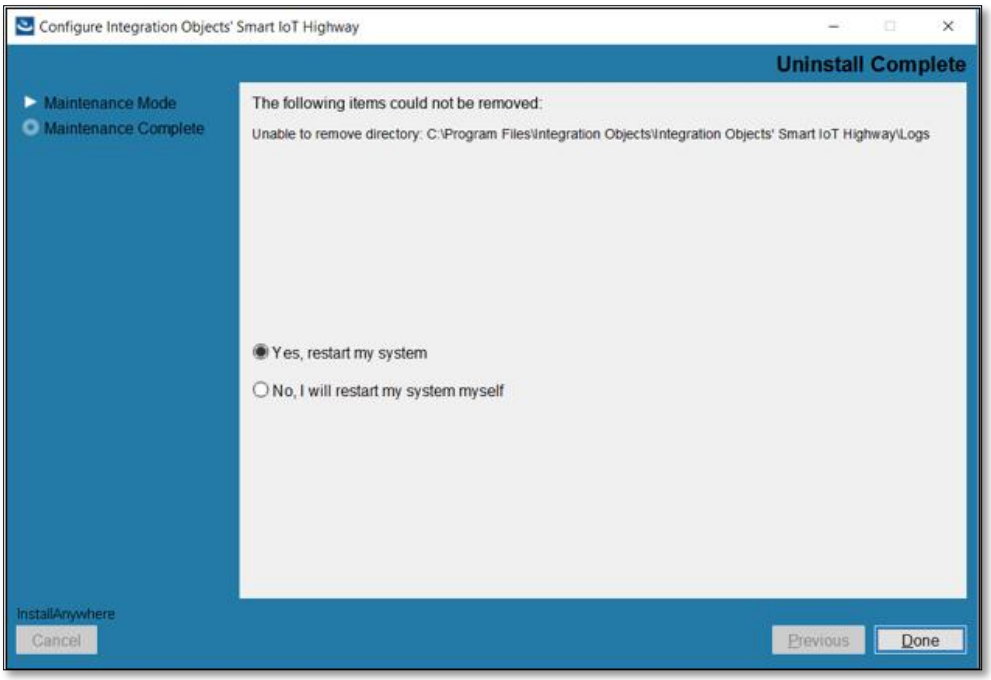

Figure 53. Completed Uninstallation

(!) Note:

It is recommended to restart the system after SIOTH uninstallation for all files clean-up and Windows services deletion.

4. Repair Process

Proceed as follows to repair the SIOTH installation on your machine:

1. Go to the folder where SIOTH is installed and run the program **"Change Integration Objects' Smart IoT Highway Installation"** as an administrator, as illustrated below:

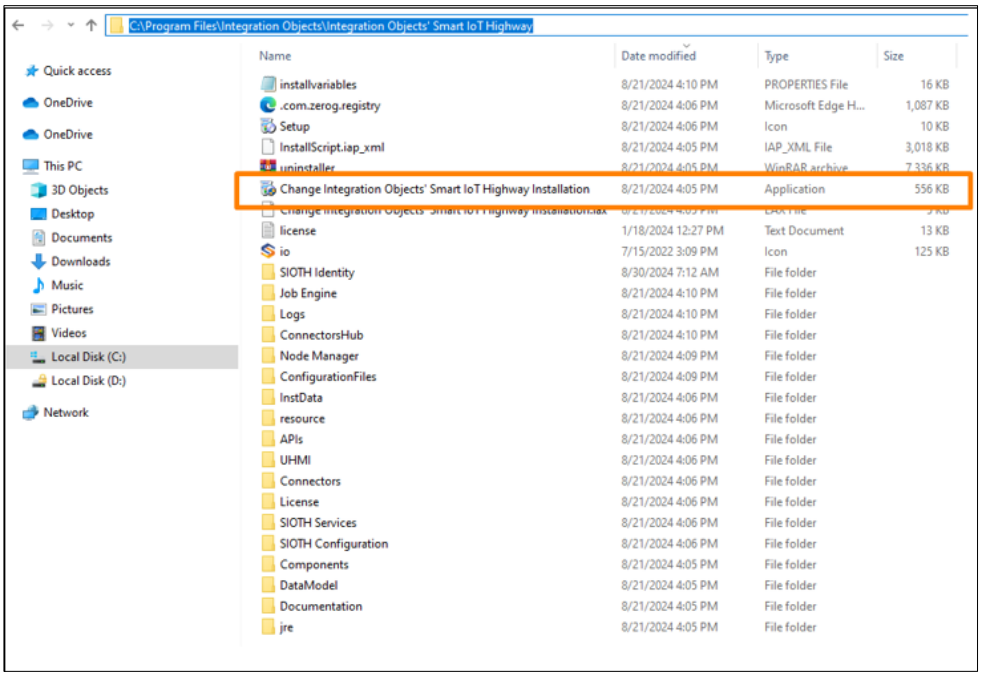

Figure 54. Installation Folder

2. A pop-up window will appear. Select "**Repair Product**" and click on the "**Next**" button.

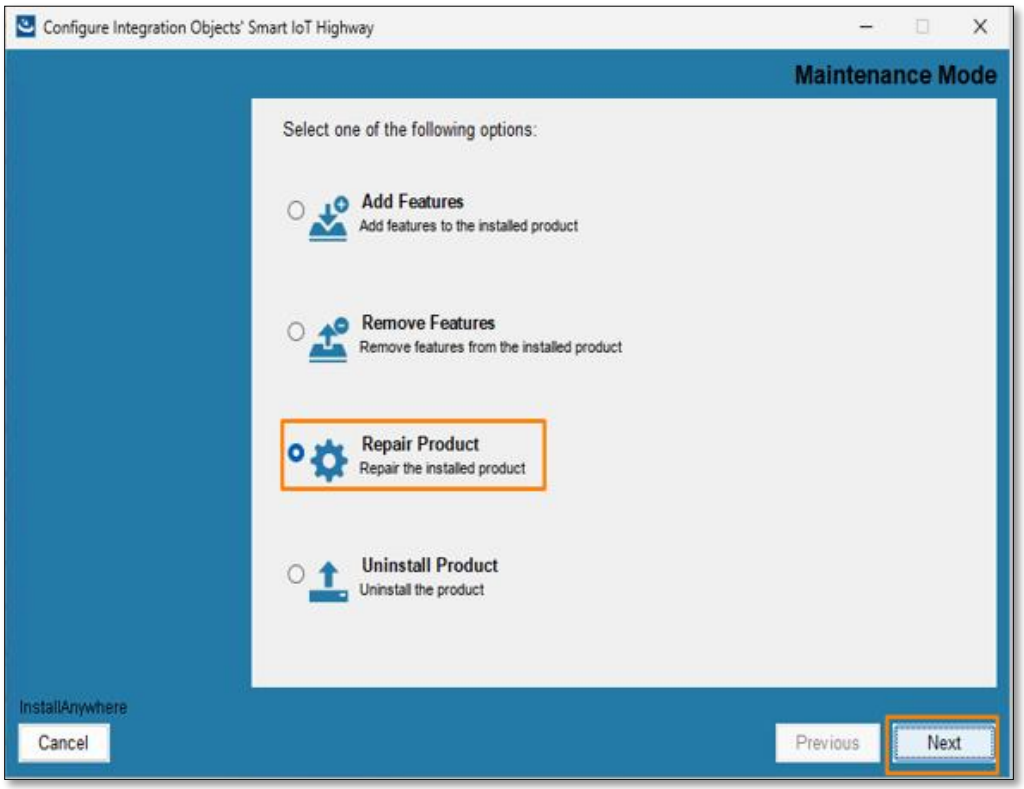

Figure 55. Repair Product

3. Click on the "**Install**" button

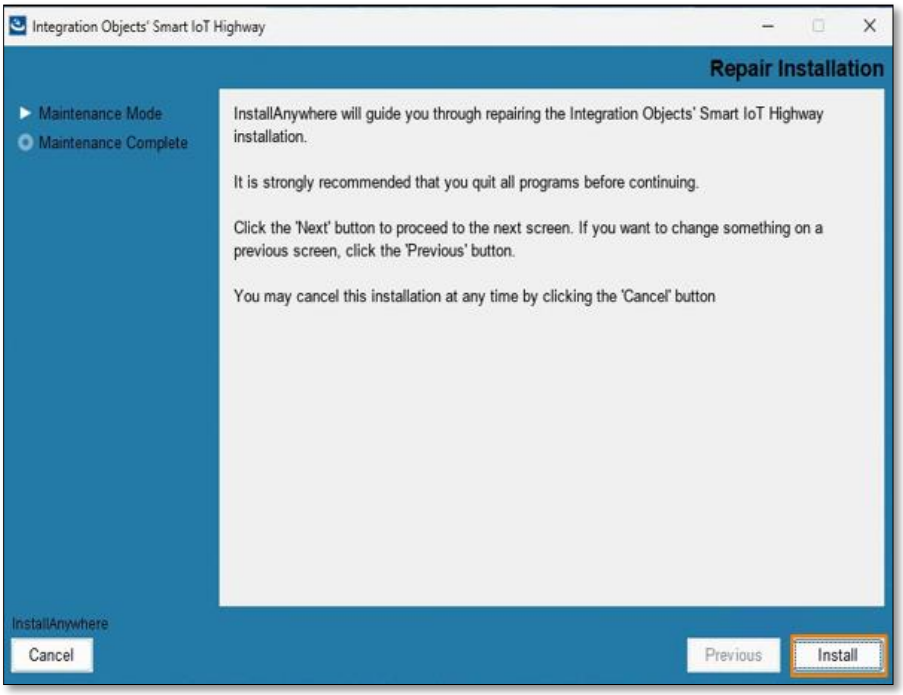

Figure 56. Repair Installation

This action may require the user to "repair", "change" or "remove" the setup for MongoDB, RedisDB, and InfluxDB.

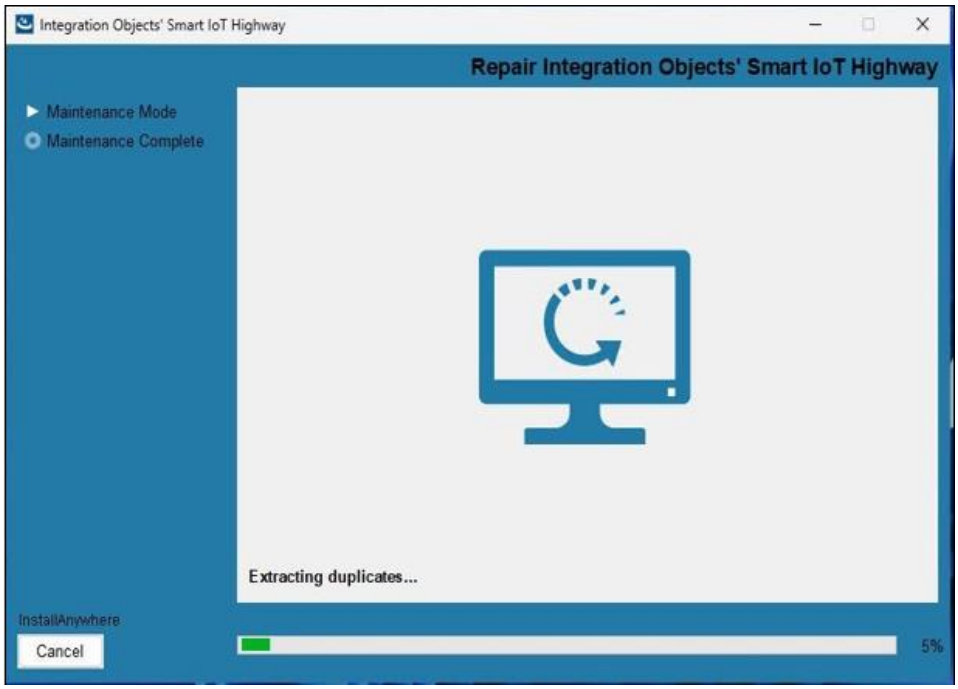

Figure 57. Repair In Progress

4. Once the repair process is complete, a confirmation dialog will appear. Click "**Done**" to close the installer.

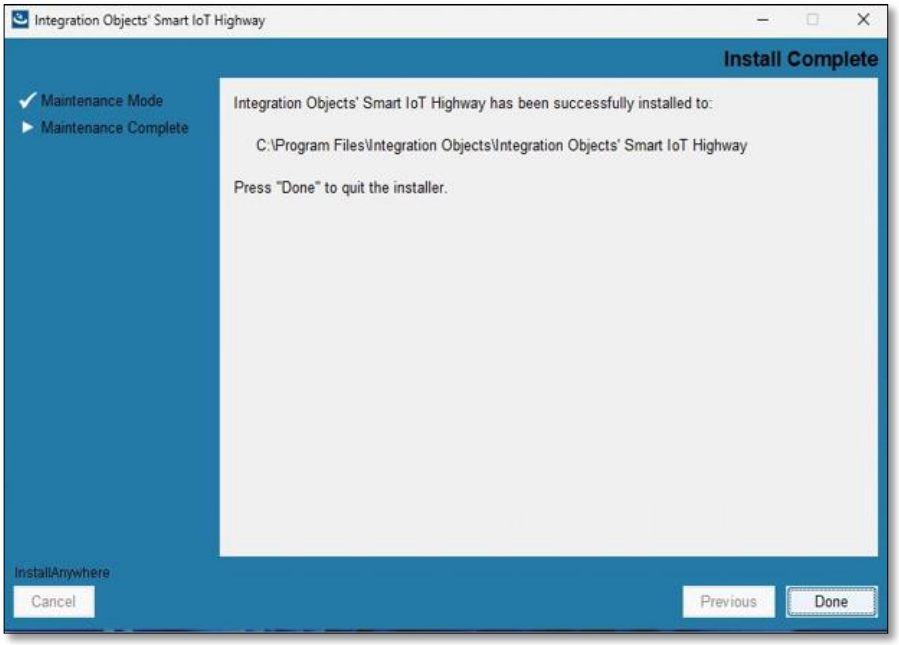

Figure 58. Repair Complete Dialog

5. Add Features Process

Proceed as follows to add a new feature into the SIOTH installation:

1. Go to the folder where SIOTH is installed and run the program **"Change Integration Objects' Smart IoT Highway Installation"** as an administrator, as illustrated below:

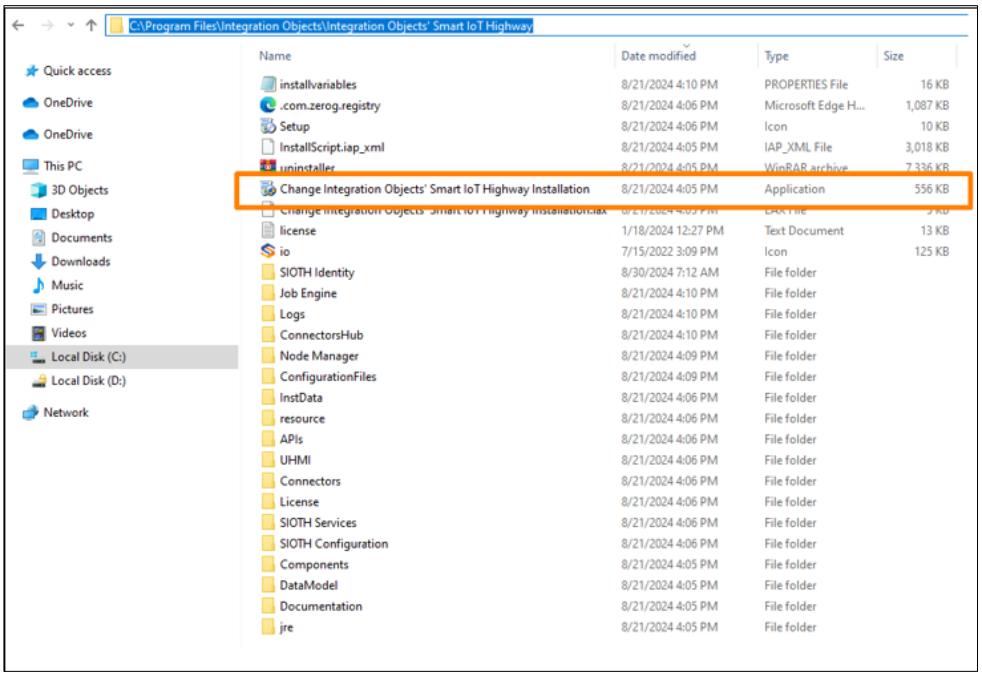

Figure 59. Installation Folder

2. To add a feature to the installed product, click "Add Features" as shown below:

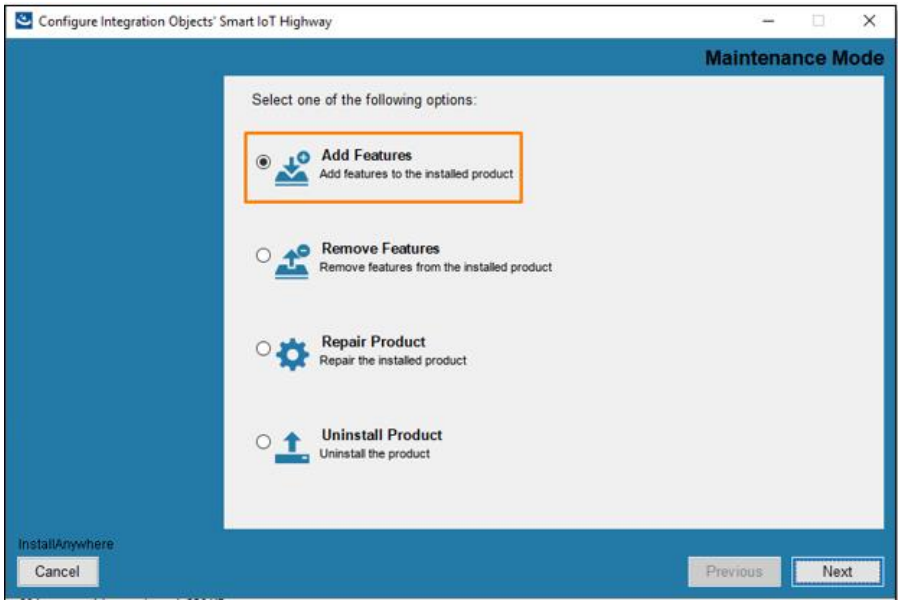

Figure 60. Add Feature 1

3. Then, click on the “Next” button.

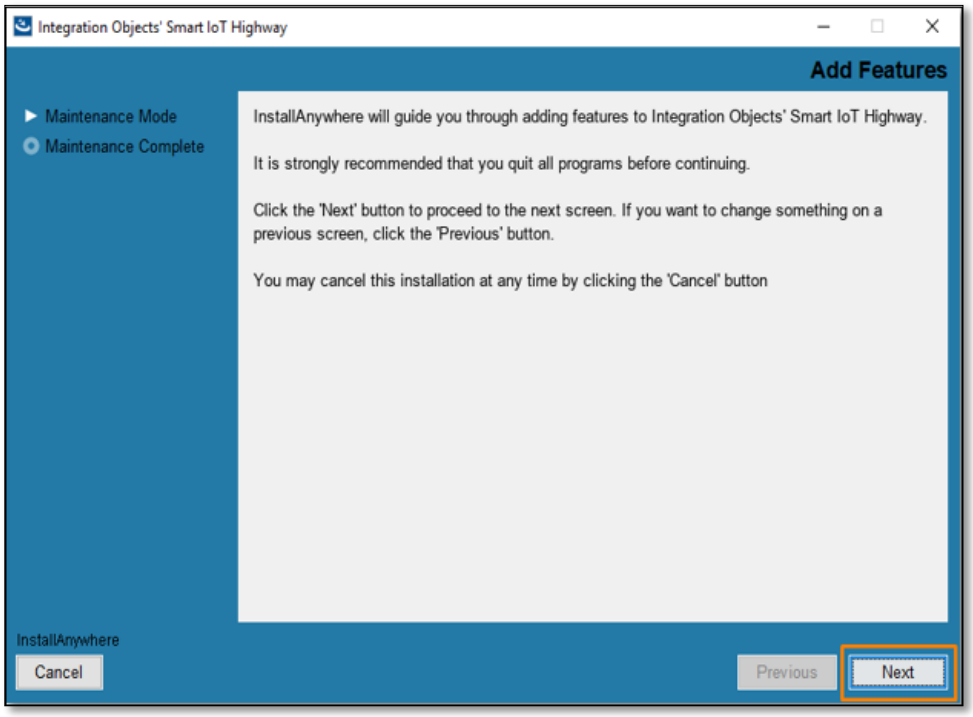

Figure 61. Add Feature 2

4. Select the desired features you want to instal, then click the “Install” button.

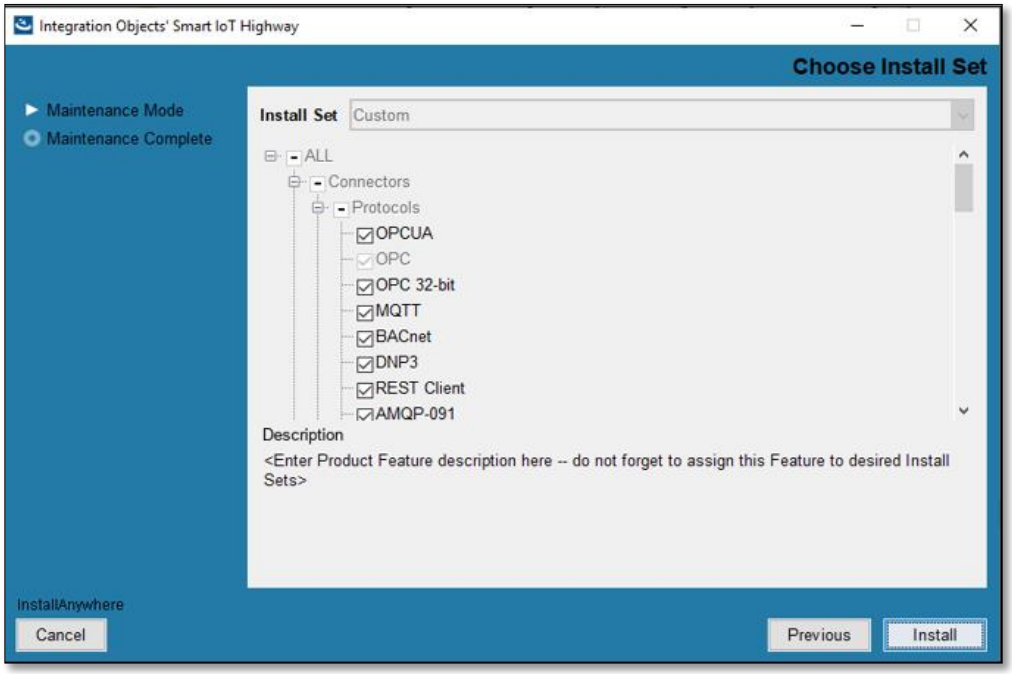

Figure 62. Features List

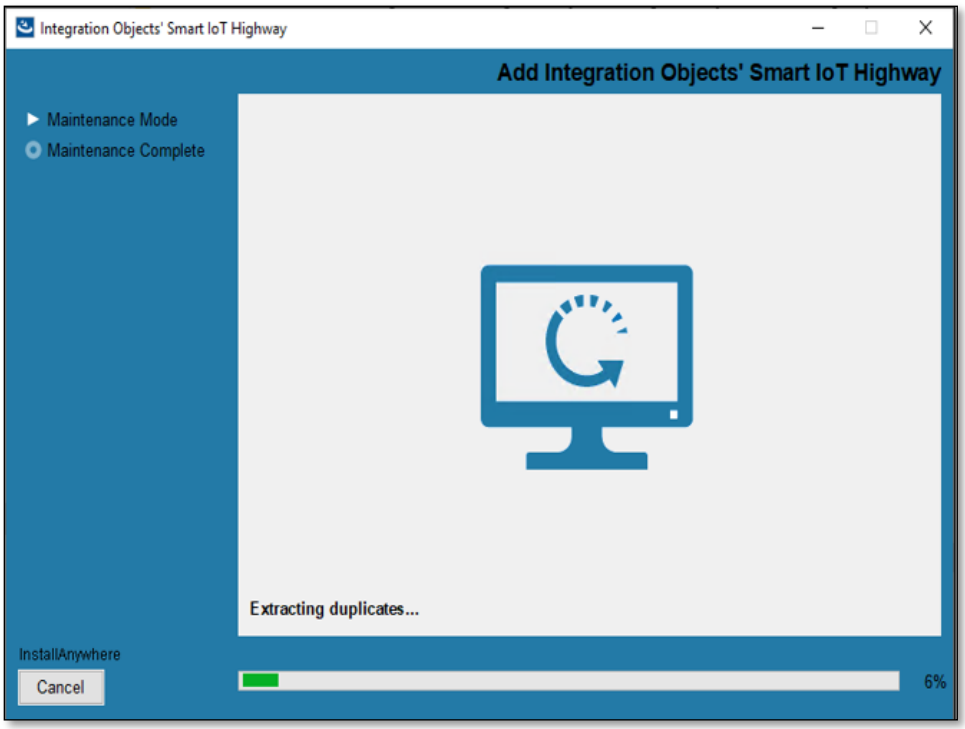

Figure 63. Features Installation in Progress

5. Once the installation is complete, the following dialog will be prompted to confirm that the add features process is done successfully.

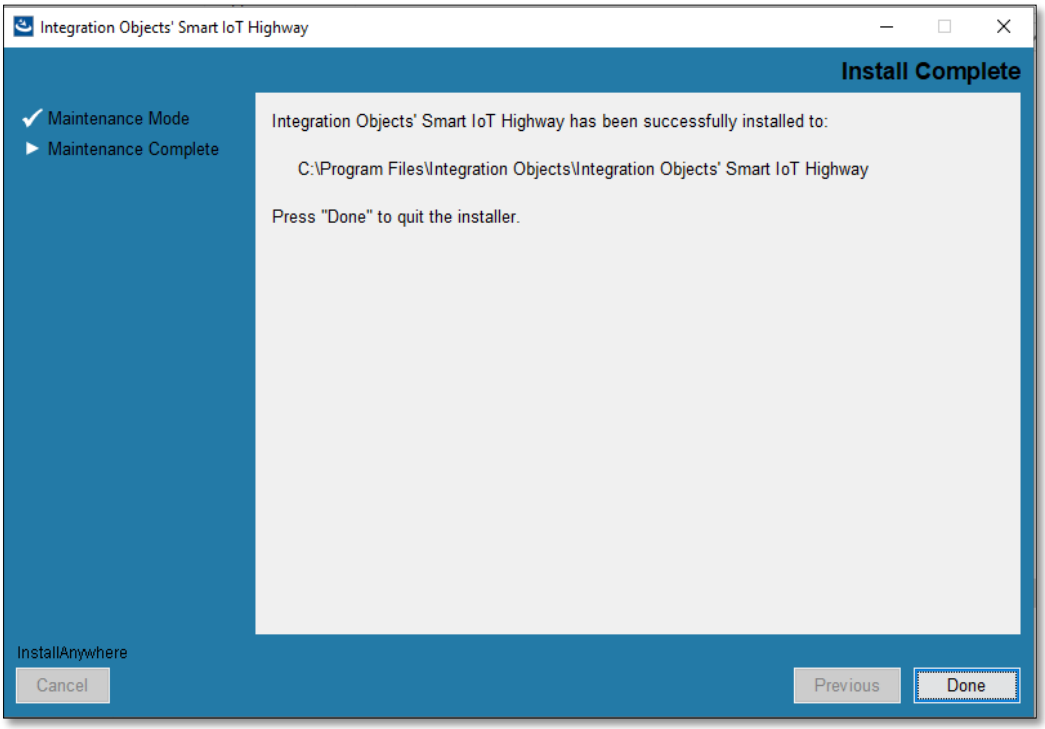

Figure 64. Features Installation Complete Dialog

6. Remove Features Process

Proceed as follows to remove an installed feature from the SIOTH installation:

1. Go to the folder where SIOTH is installed and run the program **"Change Integration Objects' Smart IoT Highway Installation"** as an administrator, as illustrated below:

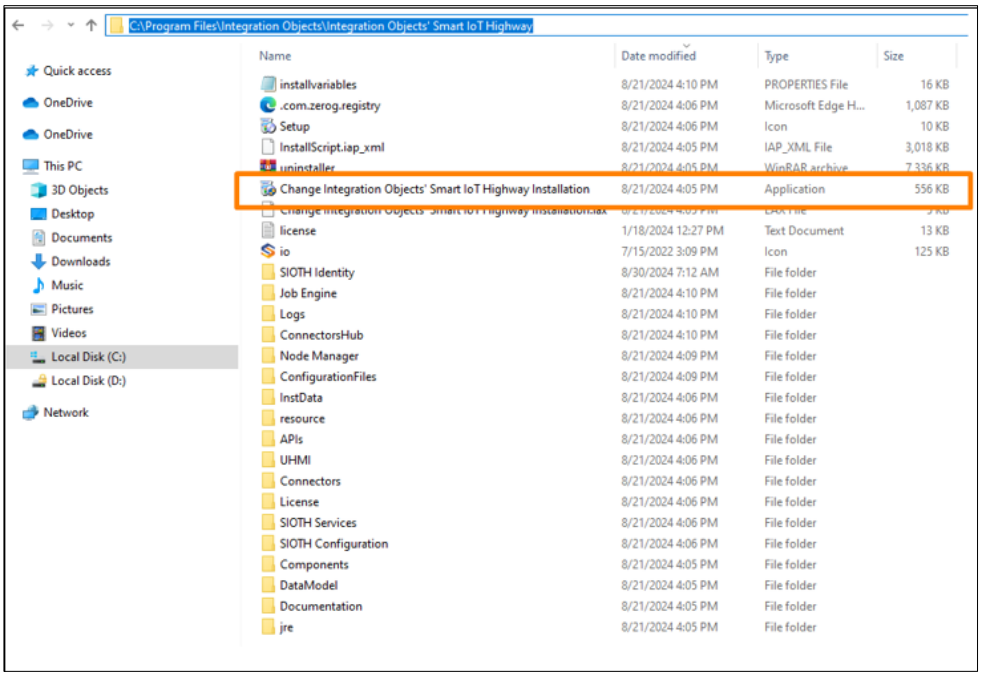

Figure 65. Installation Folder

2. To remove a feature from the installed product, click on "Remove Features" as illustrated below:

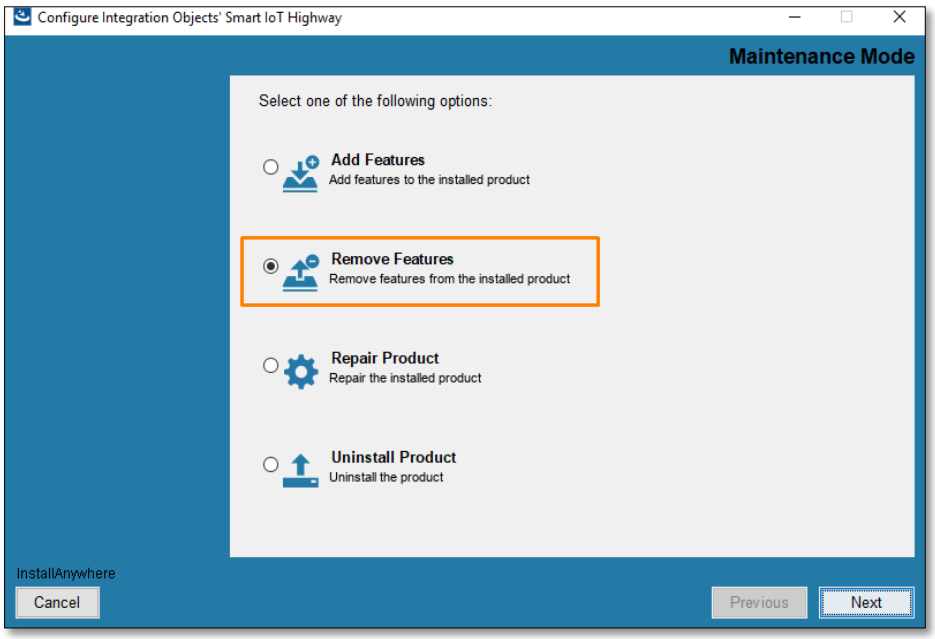

Figure 66. Remove Features 1

2. Then, click "Next".

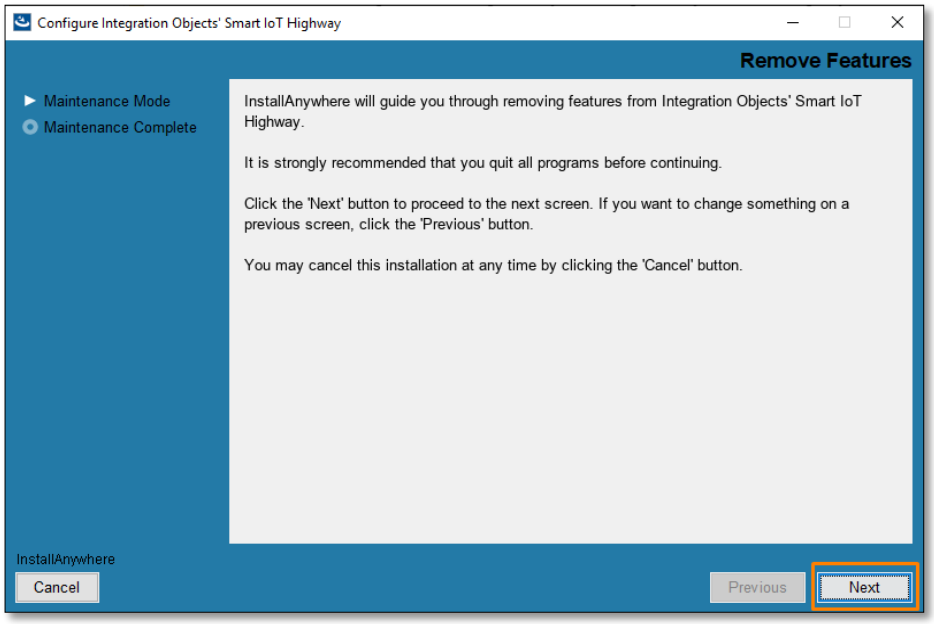

Figure 67. Remove Features 2

3. Select the features you want to remove from the installation.

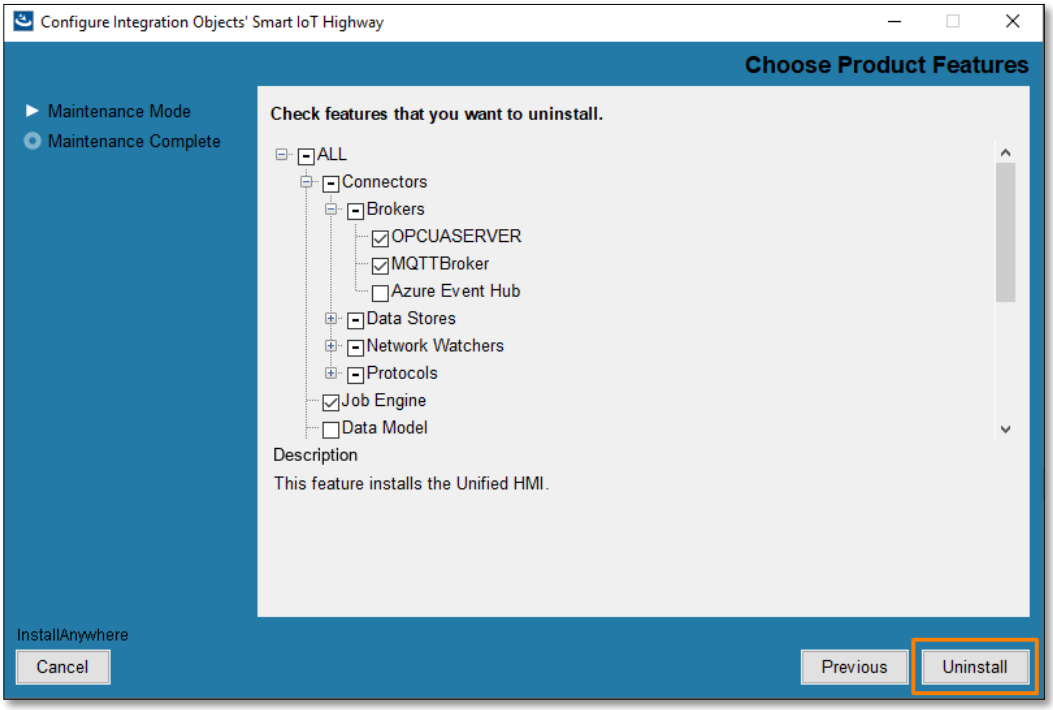

Figure 68. Features to be Removed

Then click on the "**Uninstall**" button to begin the uninstall process.

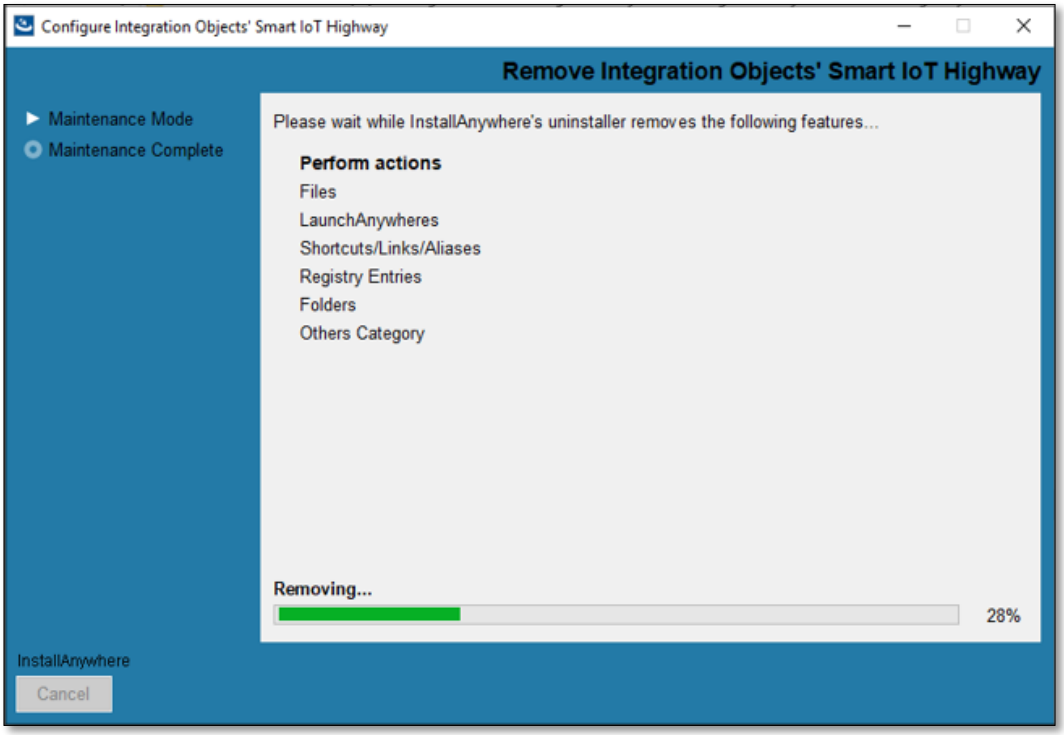

Figure 69. Uninstalling in Progress

4. The features uninstallation will be completed after restart of the system.

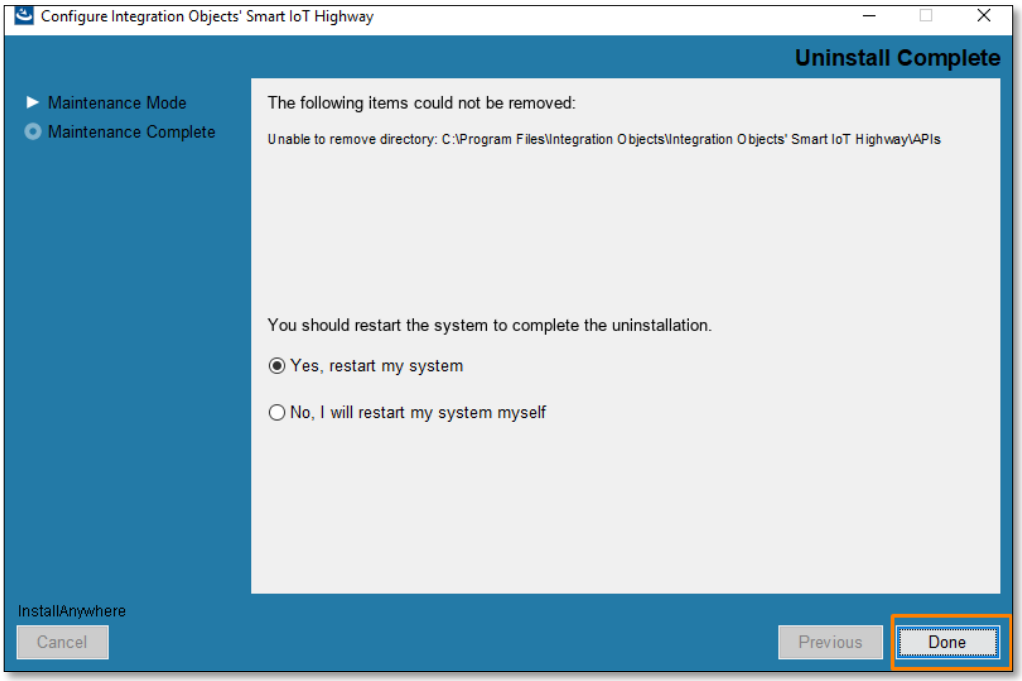

Figure 70. Restart System

(!) Note:

It is recommended to restart the system after removing features from SIOTH installer.

APPENDIX 1: SQL PREREQUISITES

1. SQL Server Configuration

Installation Microsoft SQL Server is required if it is selected as a database during installation. Refer to the compatibility section for a list of supported SQL Server versions.

Ensure that the SQL Server network options are properly configured, and the user account has adequate privileges to connect to the SQL Server. The next sections explain the required privileges for Windows Authentication and SQL Authentication.

2. SQL User Privileges for Windows Authentication

For installations using the **Windows Authentication** for SQL Server, the following privileges need to be added to the "**NT AUTHORITY\SYSTEM"** service account before running the SIOTH setup:

- dbcreator

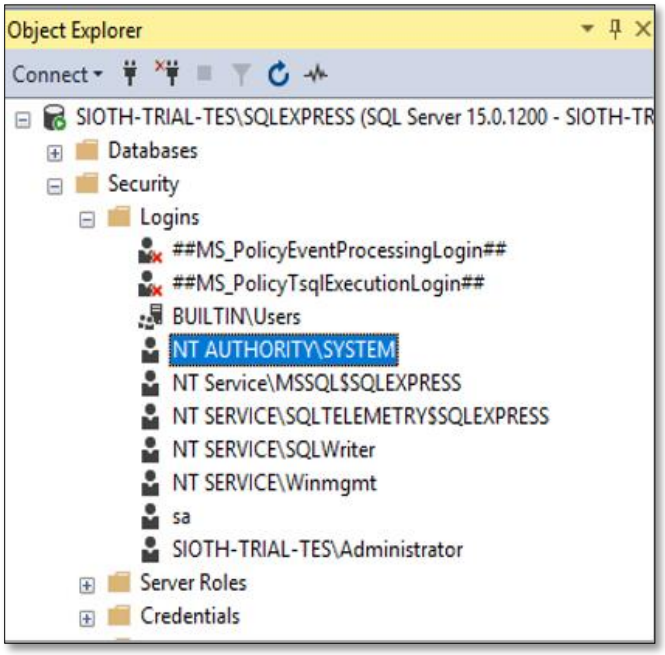

Figure 71. NT AUTHORITY\SYSTEM Account

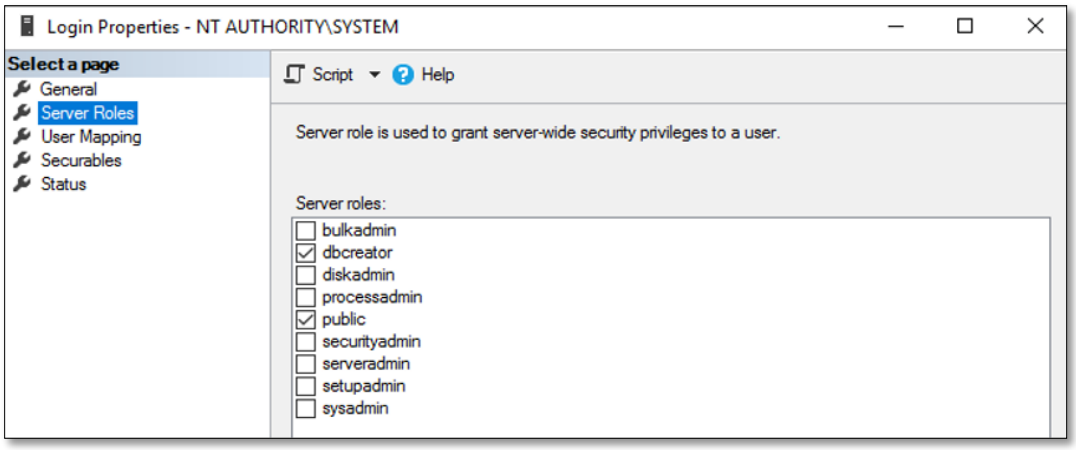

Figure 72. Server Roles Configuration for the NT AUTHORITY\SYSTEM Account

3. SQL User Privileges for Specific User Authentication

For SIOTH installations using authentication for a specific user in SQL Server, the following privileges need to be configured for the related SQL user account after its creation and before running the SIOTH setup:

- Dbcreator

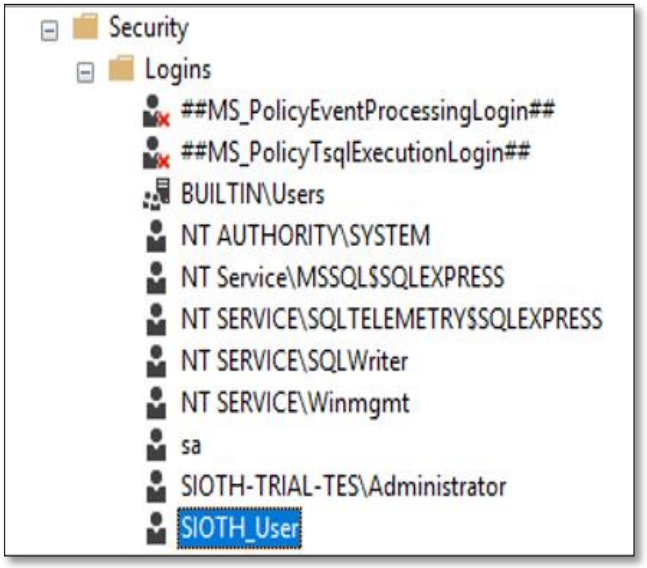

Figure 73. SQL Server Specific User

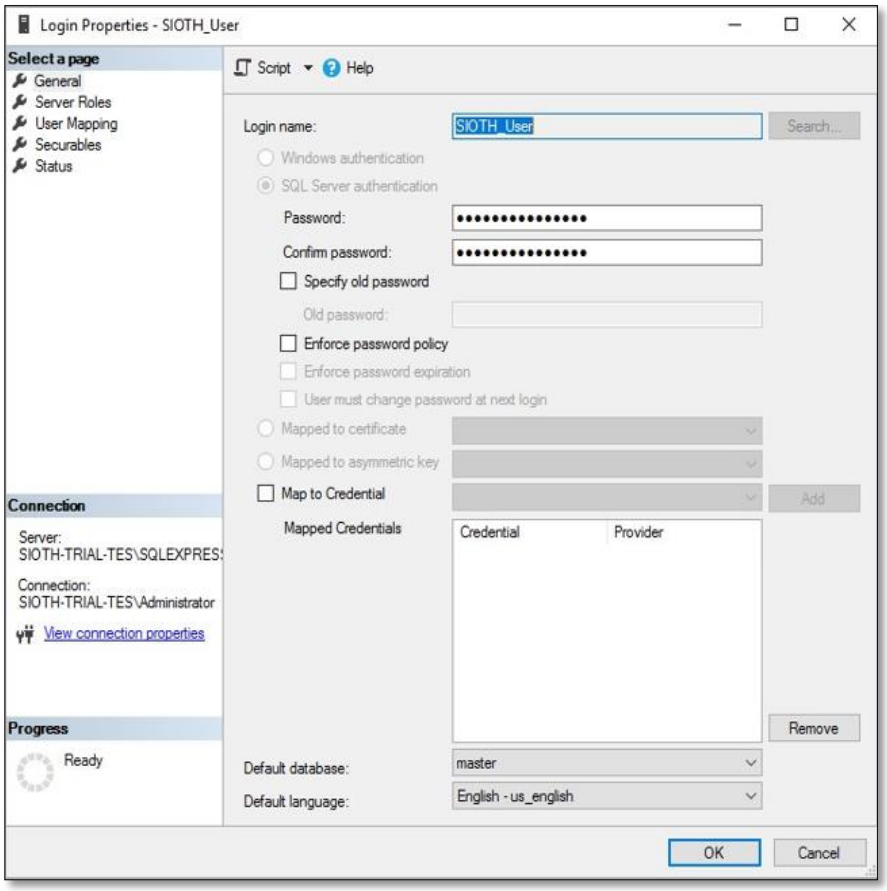

Figure 74. SQL Server Specific User Login Properties

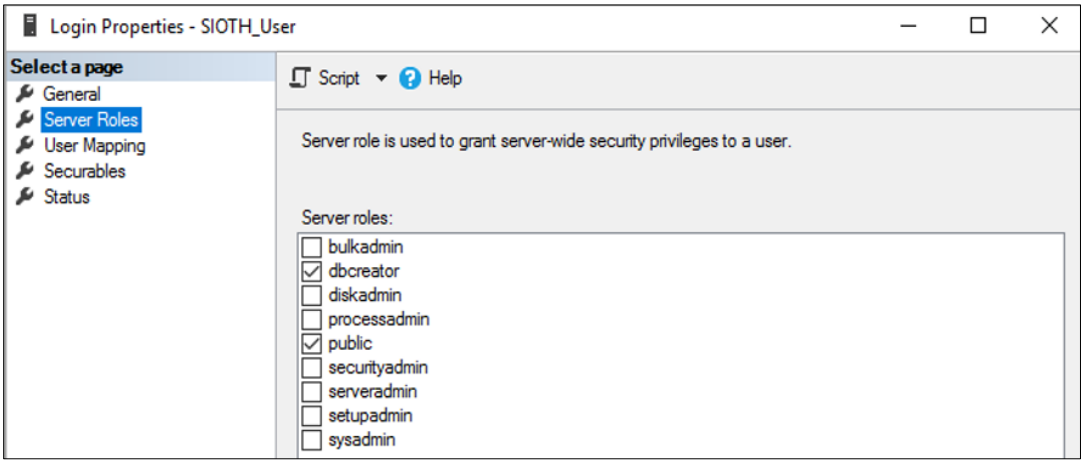

Figure 75. SQL Server Specific User Server Roles

4. SQL Server Network Configuration

To establish a connection between SIOTH and the SQL Server database, configure the following parameters in the SQL Server Configuration Manager:

1. **Enable all protocols** under the SQL Server Network Configuration.

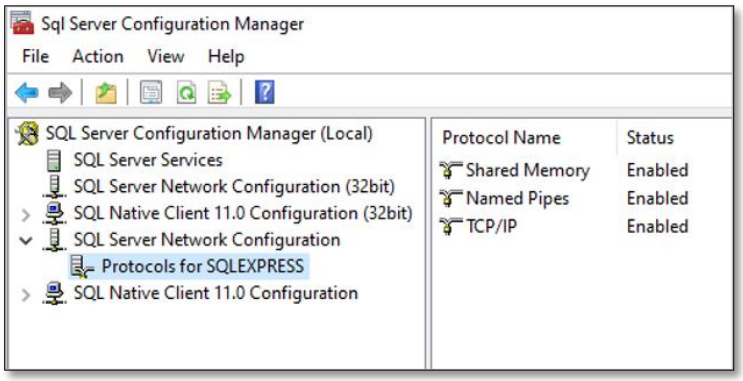

Figure 76.SQL Server Network Configuration

2. **Set the correct TCP/IP port** for connections. Open the TCP/IP protocol **properties**, navigate to **IPAll** under **IP Addresses** and set the **TCP Port** to **1433.**

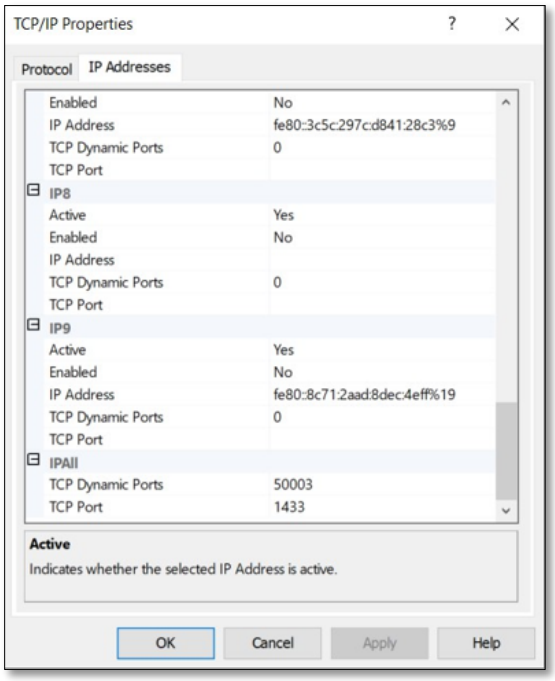

Figure 77. SQL Server TCP/IP Port Configuration

For additional information on this guide, questions, or problems to report, please contact:

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