iBed® Server v3.0

Installation/Configuration Manual

REF 5212

Connected Hospital®

EN

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Symbols

	Manufacturer

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Warning/Caution/Note Definition

The words **WARNING**, **CAUTION**, and **NOTE** carry special meanings and should be carefully reviewed.

WARNING

Alerts the reader about a situation which, if not avoided, could result in death or serious injury. It may also describe potential serious adverse reactions and safety hazards.

CAUTION

Alerts the reader of a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or damage to the product or other property. This includes special care necessary for the safe and effective use of the device and the care necessary to avoid damage to a device that may occur as a result of use or misuse.

Note - Provides special information to make maintenance easier or important instructions clearer.

Introduction

This manual assists you with the operation or maintenance of your Stryker product. Read this manual before operating or maintaining this product. Set methods and procedures to educate and train your staff on the safe operation or maintenance of this product.

Note - Stryker continually seeks advancements in product design and quality. This manual contains the most current product information available at the time of printing. There may be minor discrepancies between your product and this manual. If you have any questions, contact Stryker Customer Service or Technical Support at 1-800-327-0770.

Indications for use

The intended use for the ***i*Bed**® Wireless (with ***i*Bed** Awareness) is to assist clinical staff to monitor bed parameters on specific Stryker beds. The desired bed parameters are set by operators at the bedside. The ***i*Bed** Wireless software is only intended for use with specifically enabled Stryker beds that have been verified and validated with the ***i*Bed** Wireless software, and is not intended to provide bed status information for non-Stryker beds. The ***i*Bed** Wireless software is not intended to communicate any patient status information, nor to permanently store any type of data. The ***i*Bed** Wireless with ***i*Bed** Awareness System is not intended to provide automated treatment decisions or as a substitute for professional healthcare judgment. The ***i*Bed** Wireless with ***i*Bed** Awareness System is not a replacement or substitute for vital signs monitoring or alert equipment. All patient medical diagnosis and treatment are to be performed under direct supervision and oversight of an appropriate healthcare professional.

*i*Bed Server software

Note - Before uninstalling the application, copy the following files to the **Public Documents** folder. The files will import to the new application. Using the ***i*Bed** Server Tool, configure the Master Device List and the Locator Associations.

Install directory\Stryker\iBedServerApplication\Data

BBIDList.xml	DeviceURLs.xml
DeviceBBIDLocationAssociation.xml	HospitalLocationList.xml

Stryker disclaims all responsibility for information transmitted off of its devices.

System requirements and recommendations

Note

- If minimum system requirements are not met, system performance will be impacted.
- Apply relevant software updates and patches.

Hardware:

Minimum requirements for the ***i*Bed** Server hardware is dependent on the number of beds connected to the system.

1 - 300 connected beds:

- 2.x GHz processor or higher with a total of 4 cores
- Memory: 8 GB RAM
- Hard Drive: 150 GB

301 - 600 connected beds:

- 2.x GHz processor or higher with a total of 8 cores
- Memory: 16 GB RAM
- Hard Drive: 150 GB

601 - 800 connected beds:

- 2.x GHz processor or higher with a total of 16 cores
- Memory: 32 GB RAM
- Hard Drive: 150 GB

801 - 1,000 connected beds:

- 2.x GHz processor or higher with a total of 24 cores
- Memory: 32 GB RAM
- Hard Drive: 150 GB

1,001 - 1,300 connected beds:

- 2.x GHz processor or higher with a total of 32 cores
- Memory: 64 GB RAM
- Hard Drive: 150 GB

Note

- For systems that have over 1,300 connected beds, add a core for every 50 additional beds.
- Two server environments are recommended for the ***i*Bed** Wireless System: TEST and PROD
- The ***i*Bed** Wireless System is supported in either physical or virtual environments.

Software:

Windows Server 2016 / 2019

- Add Roles
  - Web Server (IIS) (Installed)
  - Roles Services
    - Application development
      - ASP.NET 3.5 (Installed)
      - ASP.NET 4.5 (or higher) (Installed)
      - ASP (Installed)
    - Management tools
      - IIS Management Console (Installed)
- Features
  - .NET Framework 3.5 features (Installed)
  - .NET Framework 4.5 (or higher) features (Installed)
  - Telnet Client
    - WCF Services
      - HTTP Activation
- All current Microsoft High Priority Updates (Installed) and optional update for .NET Framework 4.5 (or higher)

To make sure your network is secure, Stryker recommends the following:

- Anti-virus/malware protection
- Close unused network ports
- Disable unused services

- Manage access to system/network infrastructure (Firewall, white listing, etc.)
- Monitor network activity for irregularities

Additional configuration or setup may be required depending on equipment and other variables. If you have difficulties during installation, setup, configuration, or while attempting to establish a connection between the ***i*Bed** Server and Stryker wireless clients, contact Stryker Technical Support at 1-800-327-0770.

Device connection requirements

Note - You are required to use the DNS naming convention for each Stryker device if the devices can travel to multiple sub-nets.

- DHCP connections using a reserved IP address for each device via its MAC address
- Static connections using static IP address for each device via its MAC address
- DNS naming convention using each device host name that is hard-coded to the device (Host name example = SYK-82453f21f0c2 [SYK device MAC address])

Contact information

Contact Stryker Customer Service or Technical Support at: 1-800-327-0770.

Stryker Medical
3800 E. Centre Avenue
Portage, MI 49002
USA

E-mail: medicaliBedWirelessSupport@stryker.com

Installation

Server configuration

Windows Server 2016

1. In the **Server Manager** navigate to the Dashboard.
2. Click on the **Add roles and features** link (Figure 1).

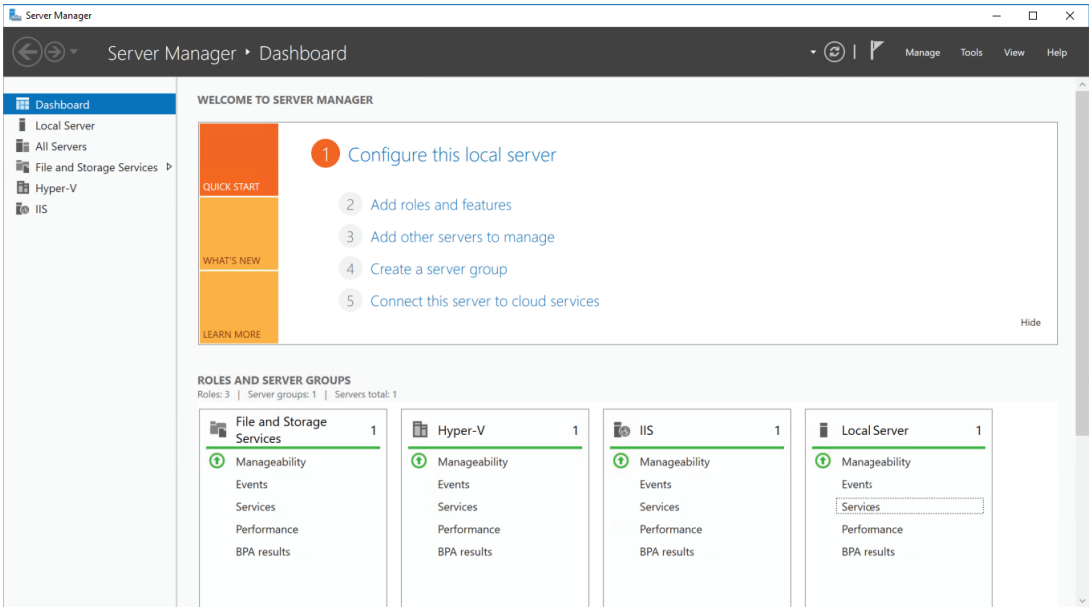

Figure 1 – Add roles and features

3. Click the **Next** button in the **Add Roles and Features Wizard** (Figure 2).

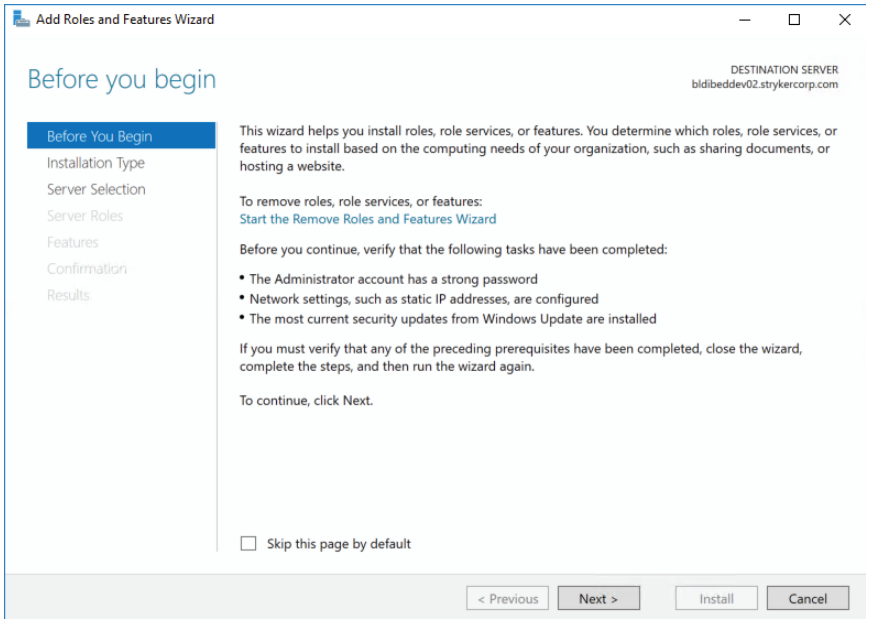

Figure 2 – Add Roles and Features Wizard

4. In the **Installation Type** step, select the **Role-based or feature-based installation** if not already selected and click **Next** (Figure 3).

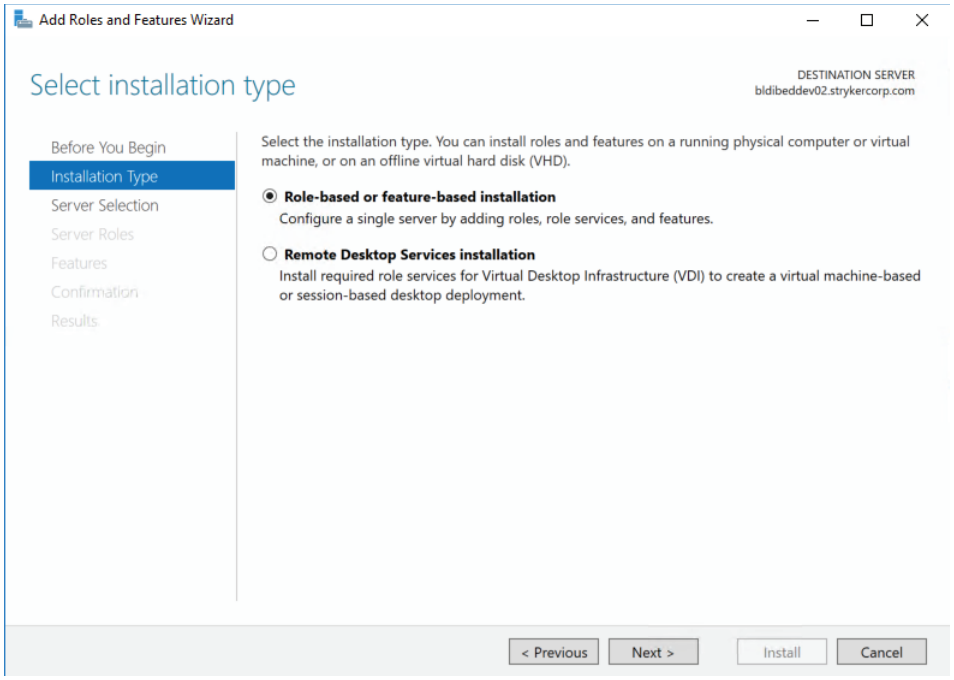

Figure 3 – Installation Type

5. In the **Server Selection** step, click **Select a server from the server pool** and make sure that the server is correct in the **Server Pool** box and click **Next** (Figure 4).

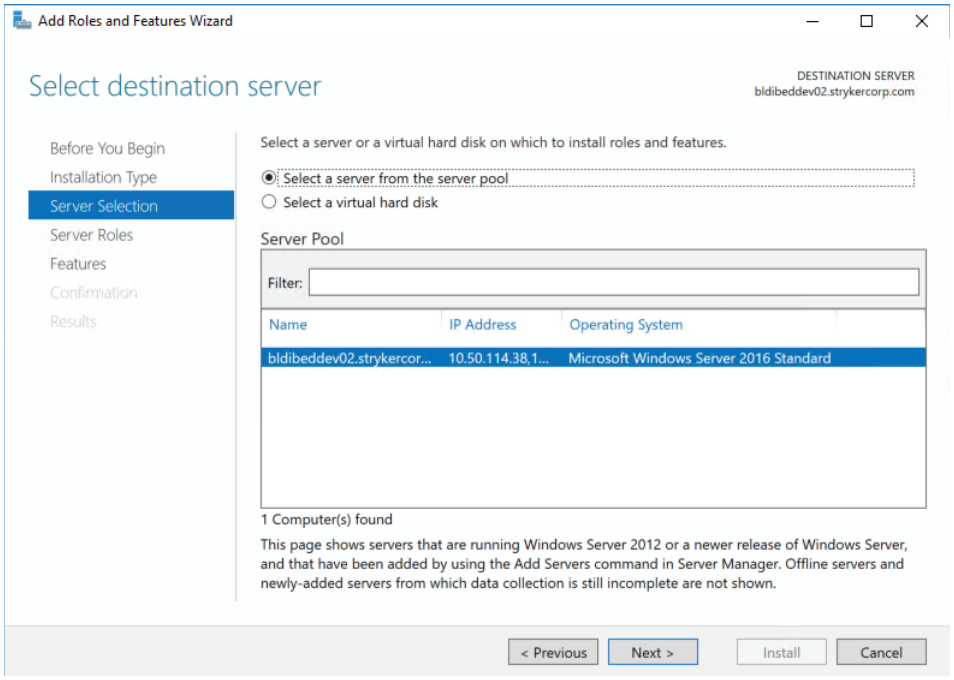

Figure 4 – Server Selection

6. In the **Server Roles** step, scroll through the options in the **Roles** box and select **Web Server (IIS)** (Figure 5).

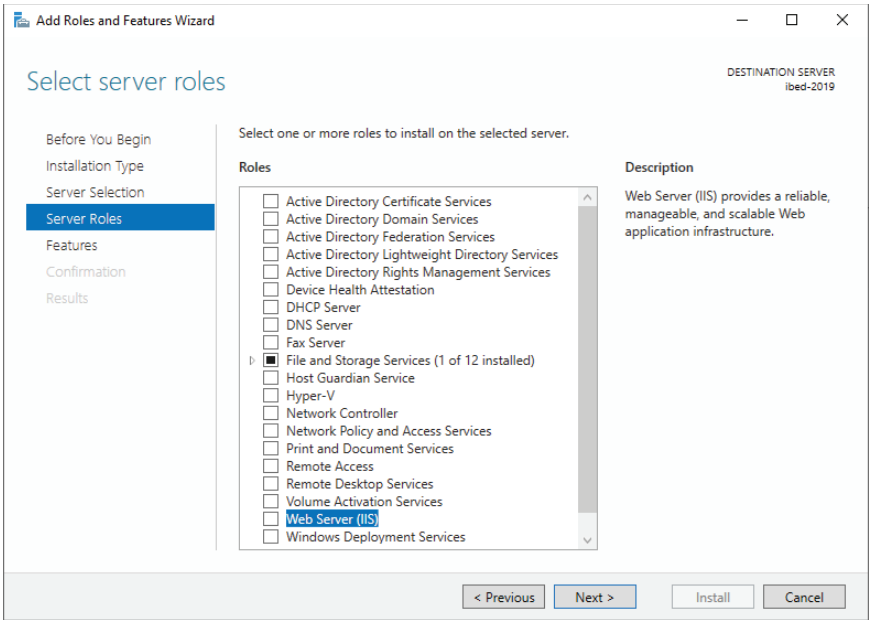

Figure 5 – Web Server (IIS)

7. In the pop-up, **Add features that are required for Web Server (IIS)**, click the **Add Features** button (Figure 6).

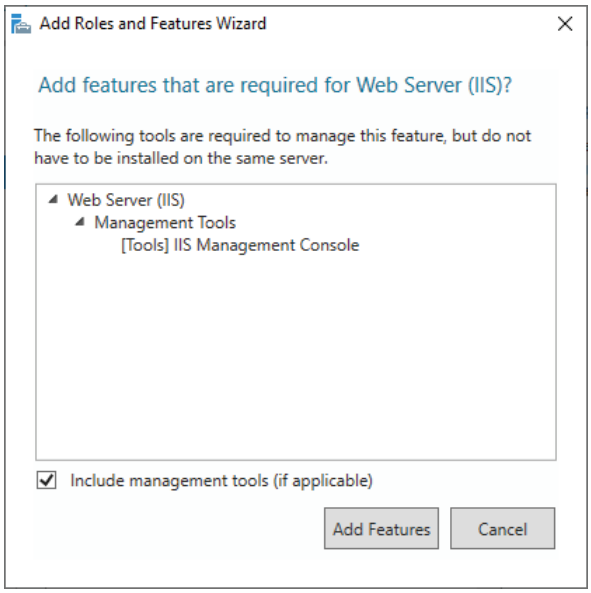

Figure 6 – Add Features

8. In the **Server Roles** step, click the **Next** button (Figure 7).

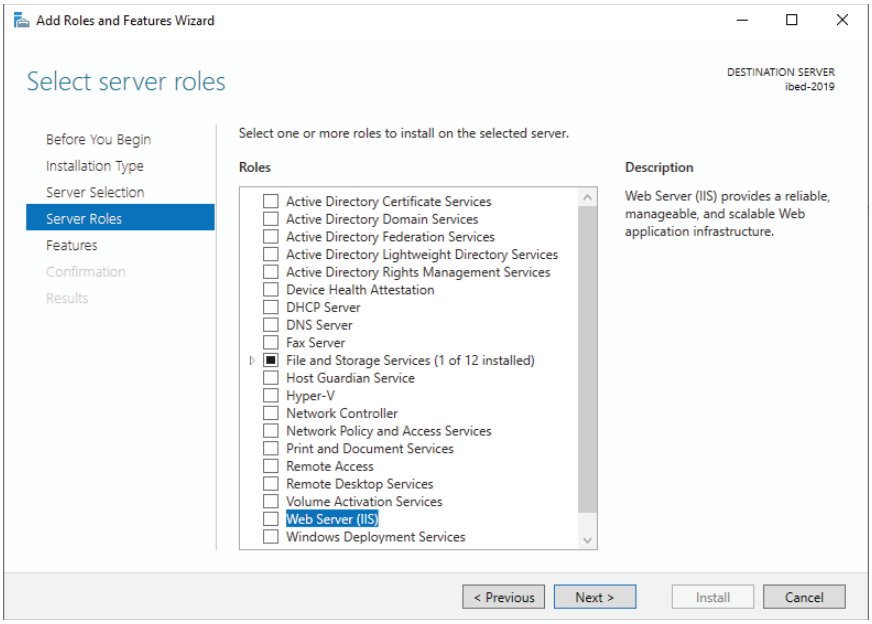

Figure 7 – Server confirmation

9. In the **Features** step, select **.NET Framework 3.5 Features**, **.NET Framework 4.5 Features**, and **Telnet Client** in the **Features** box (Figure 8).

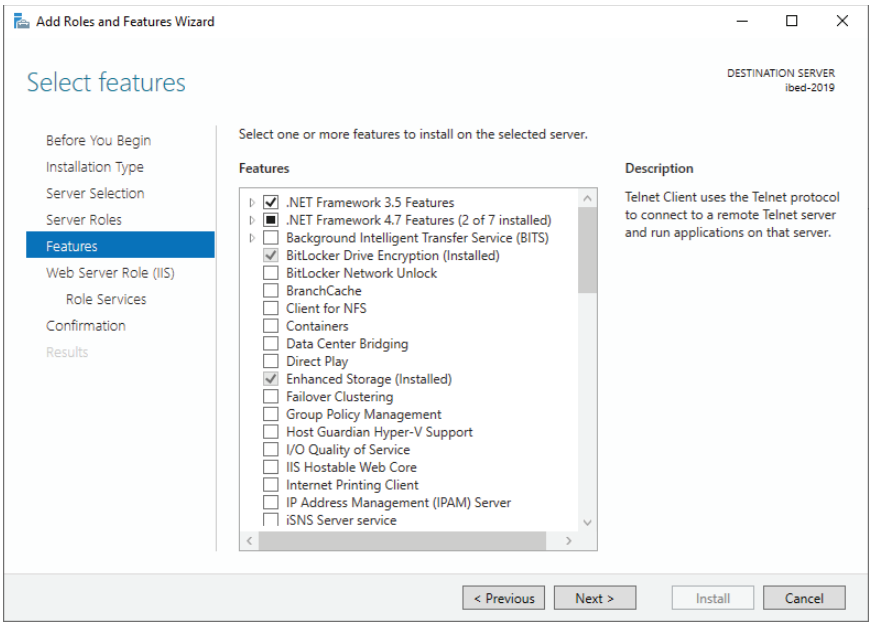

Figure 8 – Features selection

10. In the **Web Server Role (IIS)** step, click the **Next** button (Figure 9).

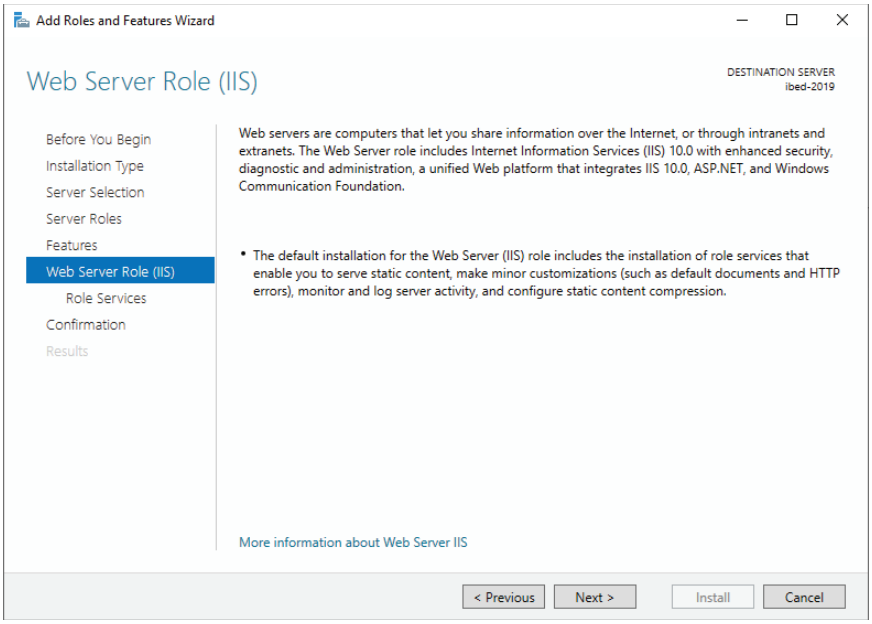

Figure 9 – Web Server Role (IIS)

11. In the **Role Services** step, click the **Next** button (Figure 10).

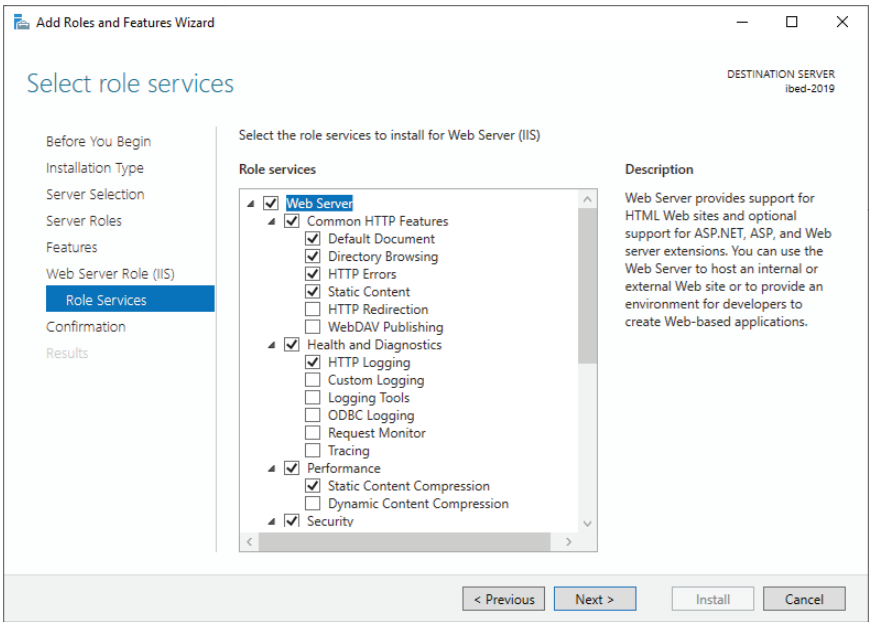

Figure 10 – Role Services

12. In the **Confirmation** step, click the **Install** button to start the installation of the role and features (Figure 11).

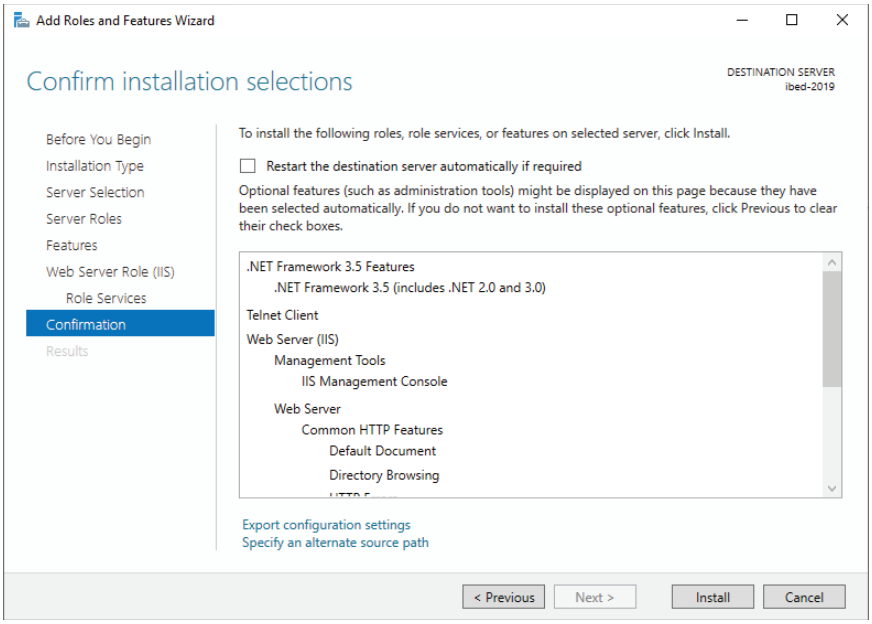

Figure 11 – Install confirmation

13. When the installation is finished, click the **Close** button (Figure 12).

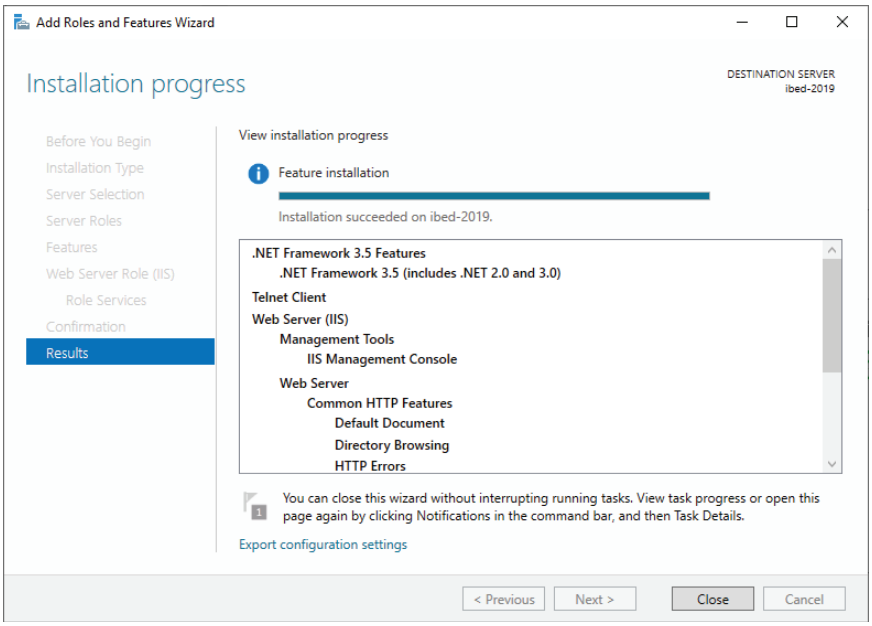

Figure 12 – Completed installation

14. Click on the **Add roles and features** link (Figure 13).

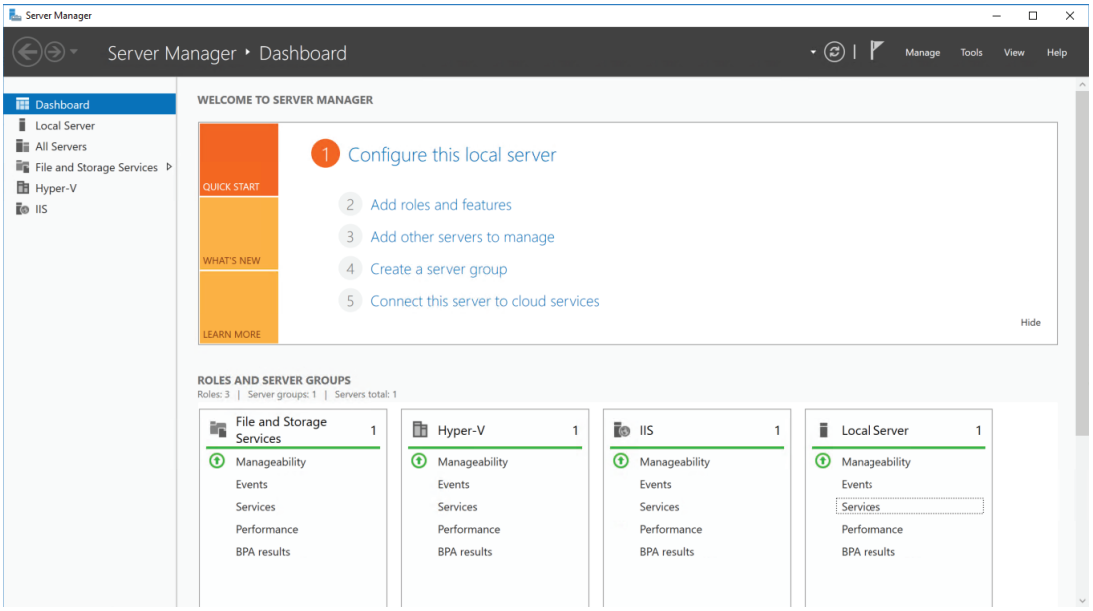

Figure 13 – Add roles and features

15. Click the **Next** button in the **Add Roles and Features Wizard** (Figure 14).

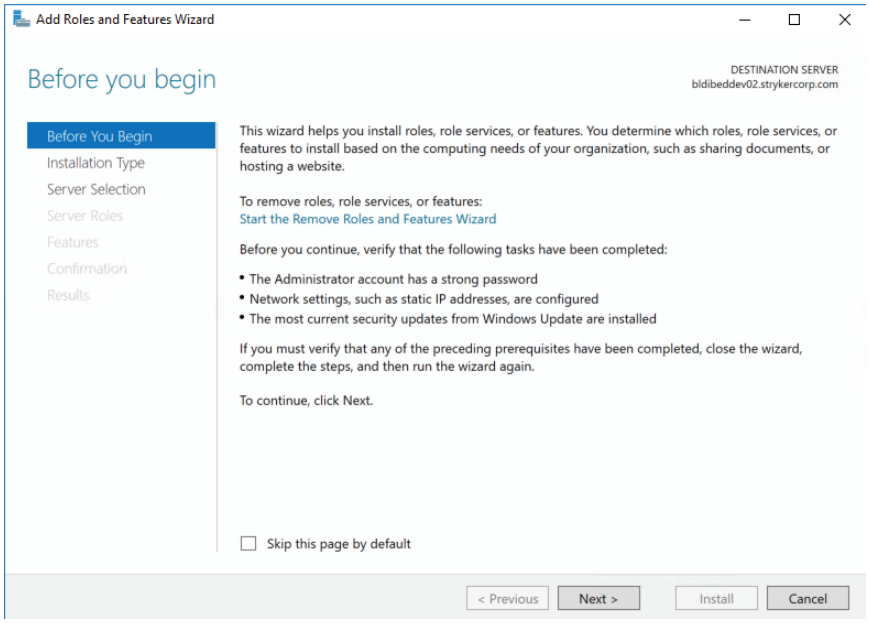

Figure 14 – Add Roles and Features Wizard

16. In the **Installation Type** step, select the **Role-based or feature-based installation** and click **Next** (Figure 15).

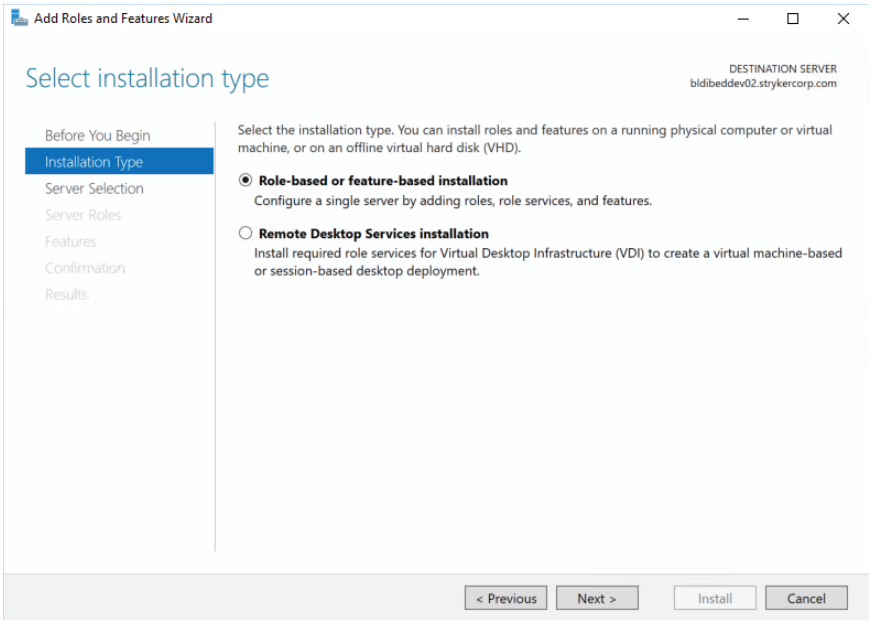

Figure 15 – Installation Type

17. In the **Server Selection** step, click **Select a server from the server pool** and verify that the server is correct in the **Server Pool** box and click **Next** (Figure 16).

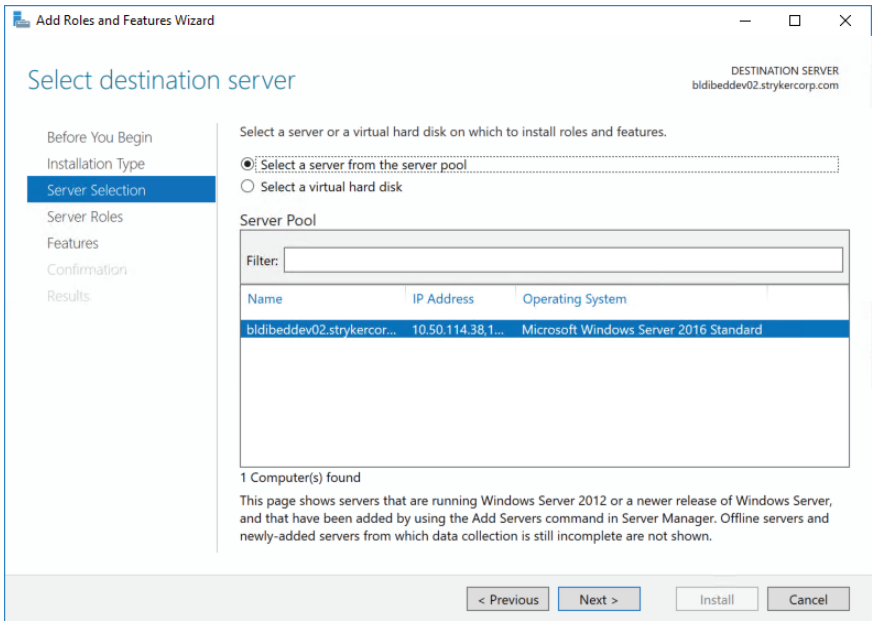

Figure 16 – Server Selection

18. In the **Server Roles** step in the **Roles** box, expand the **Web Server (IIS)** heading, **Web Server** heading, and then **Application Development**. Select **ASP.NET 3.5** and **ASP.NET 4.5** and click **Next** (Figure 17).

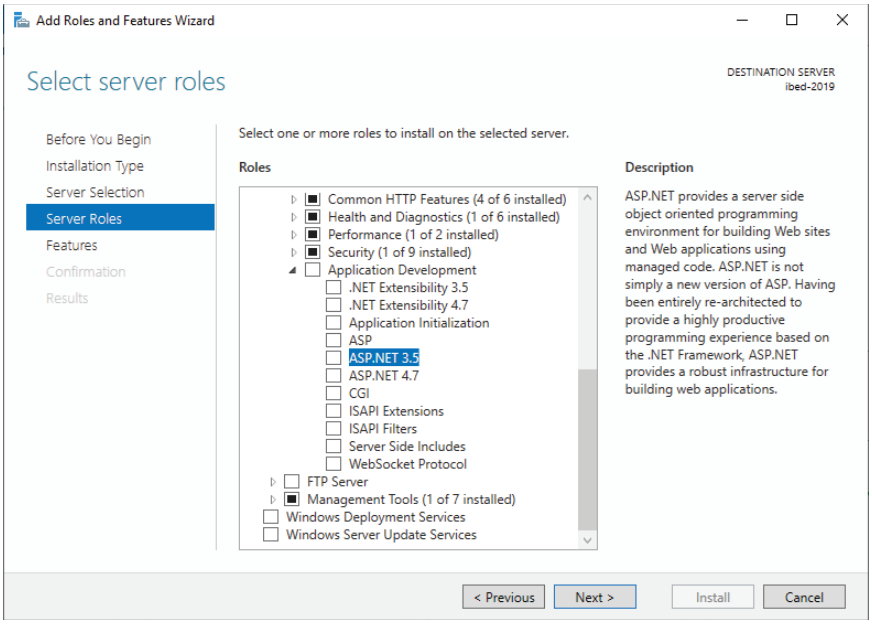

Figure 17 – Server Roles

19. In the pop-up window, click **Add Features** (Figure 18).

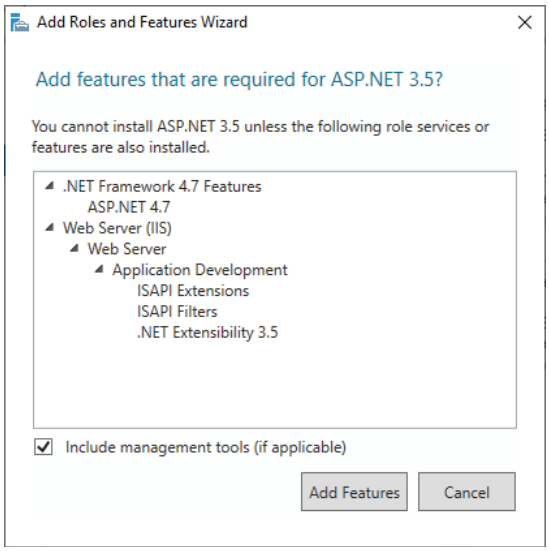

Figure 18 – Add Features

20. In the **Server Roles** step, select **ASP** and click **Next** (Figure 19).

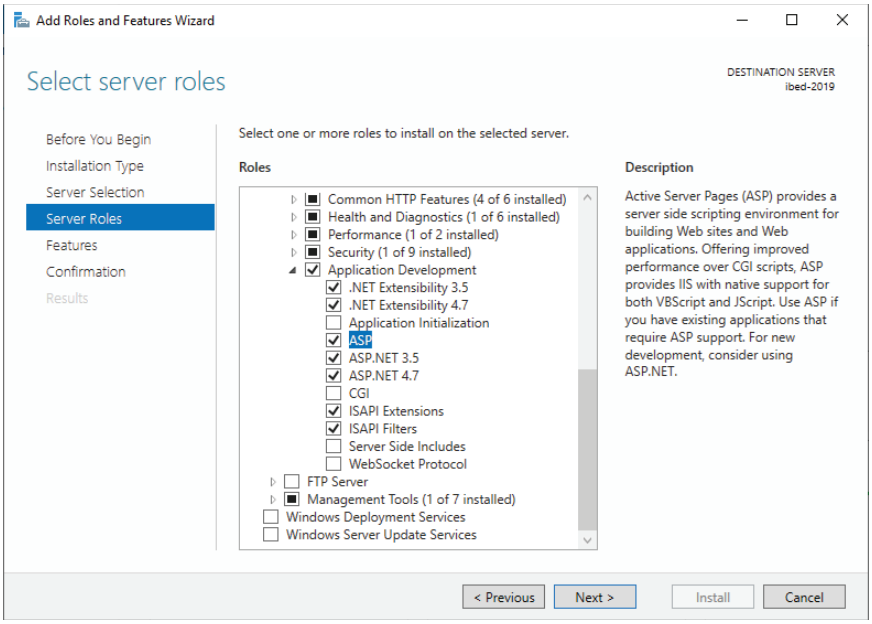

Figure 19 – ASP

21. In the **Features** step, click **Next** (Figure 20).

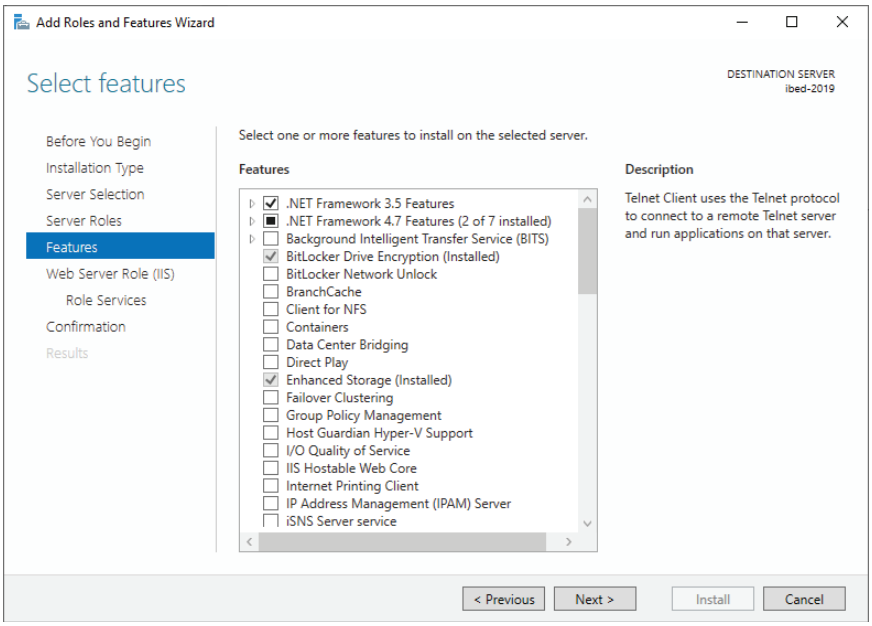

Figure 20 – Features selection

22. In the **Confirm installation selections** step, click **Install** (Figure 21).

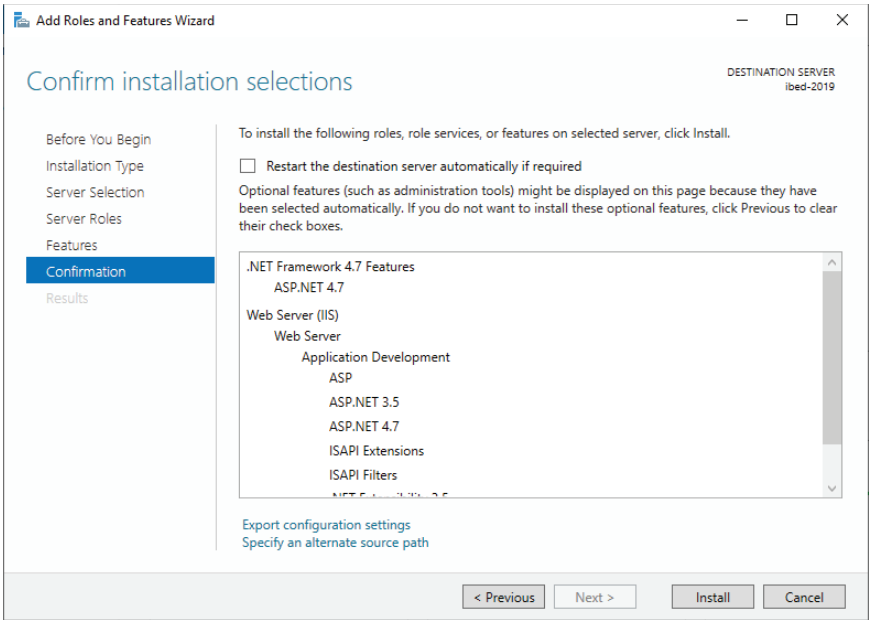

Figure 21 – Confirm installation

23. When installation is complete, click the **Close** button (Figure 22).

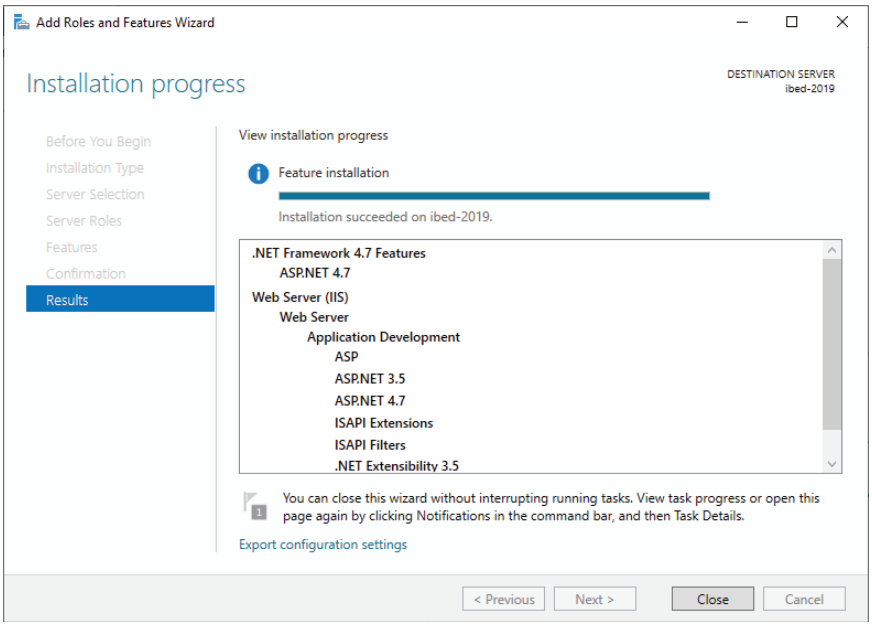

Figure 22 – Installation complete

24. Restart the server.
25. Run **Windows Update** to look for any important and optional updates and install them. Restart the server if required.

Windows Server 2019

1. In the **Server Manager** navigate to the Dashboard.
2. Click on the **Add roles and features** link (Figure 23).

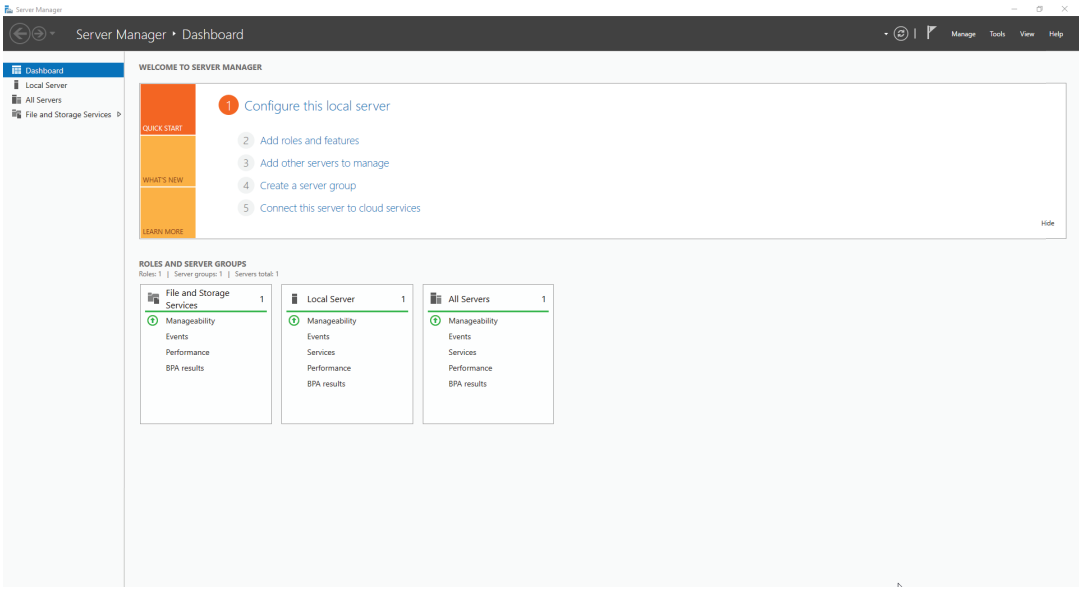

Figure 23 – Add roles and features

3. Click the **Next** button in the **Add Roles and Features Wizard** (Figure 24).

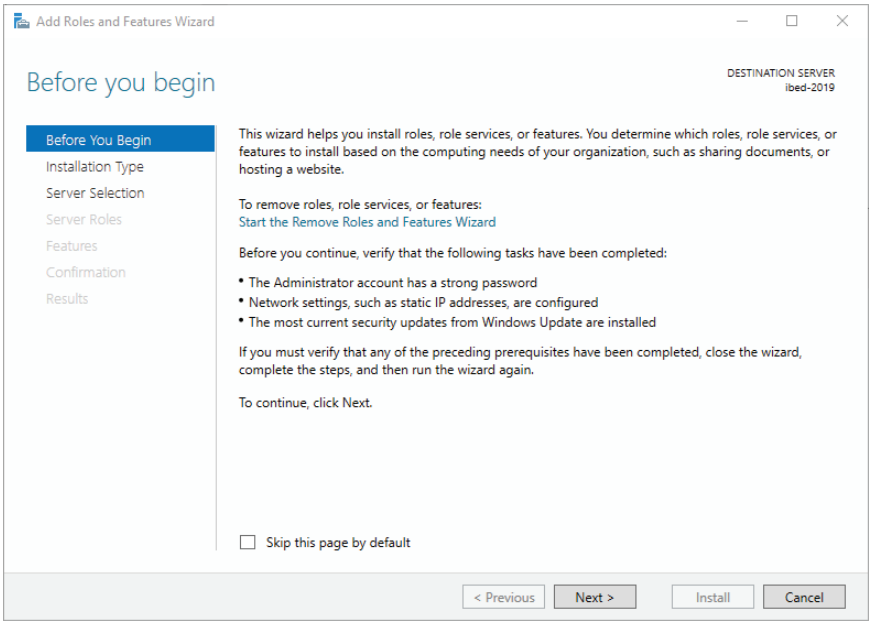

Figure 24 – Add Roles and Features Wizard

4. In the **Installation Type** step, select the **Role-based or feature-based installation** if not already selected and click **Next** (Figure 25).

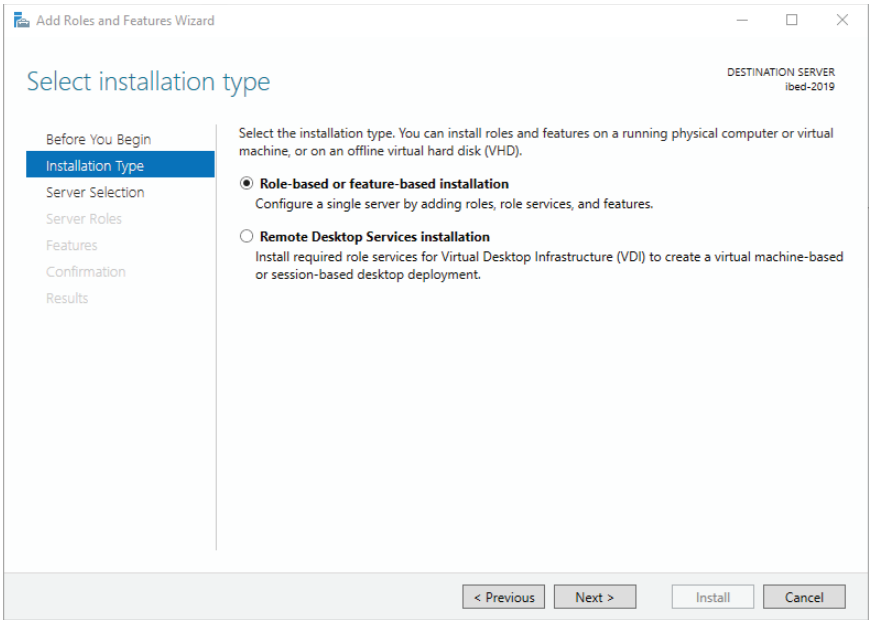

Figure 25 – Installation Type

5. In the **Server Selection** step, click **Select a server from the server pool** and make sure that the server is correct in the **Server Pool** box and click **Next** (Figure 26).

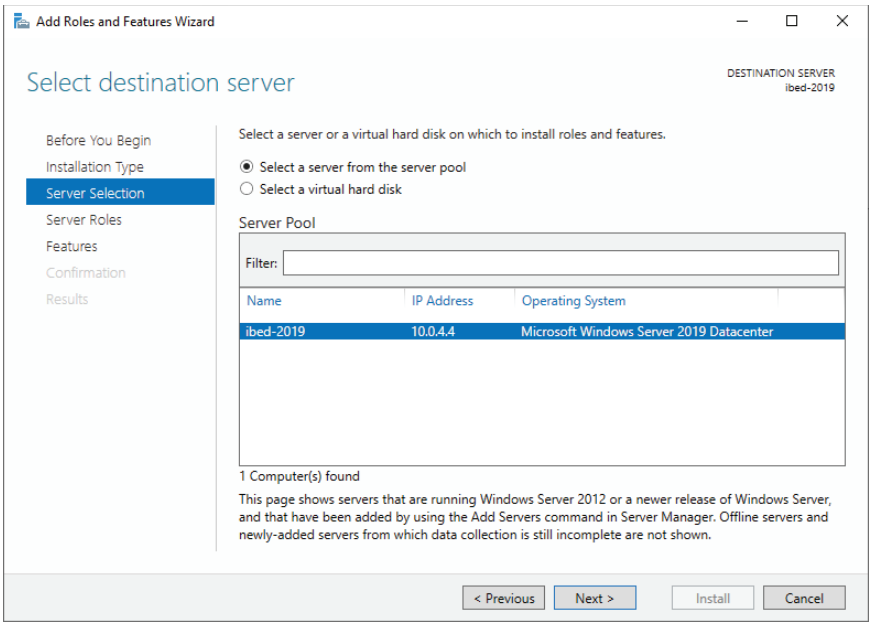

Figure 26 – Server Selection

6. In the **Server Roles** step, scroll through the options in the **Roles** box and select **Web Server (IIS)** (Figure 27).

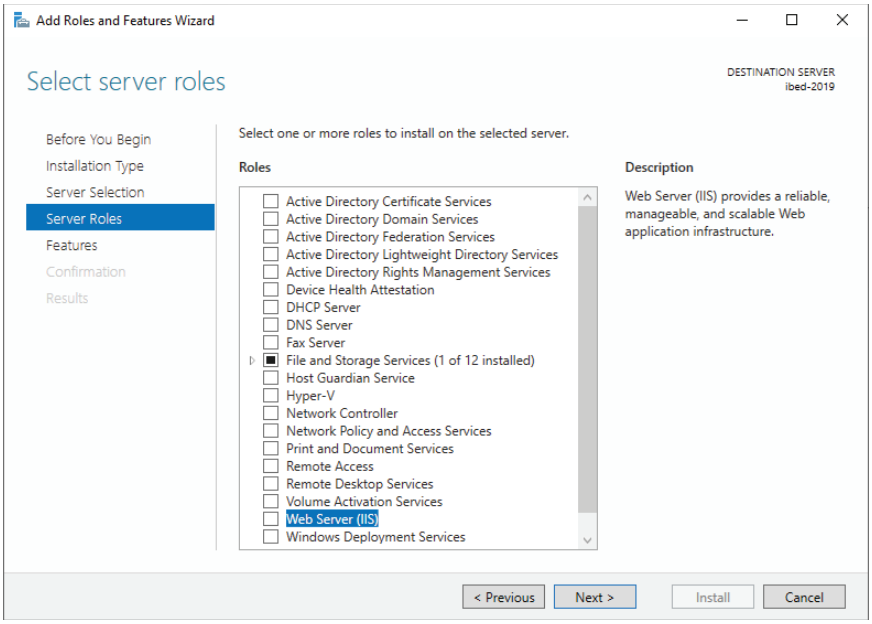

Figure 27 – Web Server (IIS)

7. In the pop-up, **Add features that are required for Web Server (IIS)**, click the **Add Features** button (Figure 28).

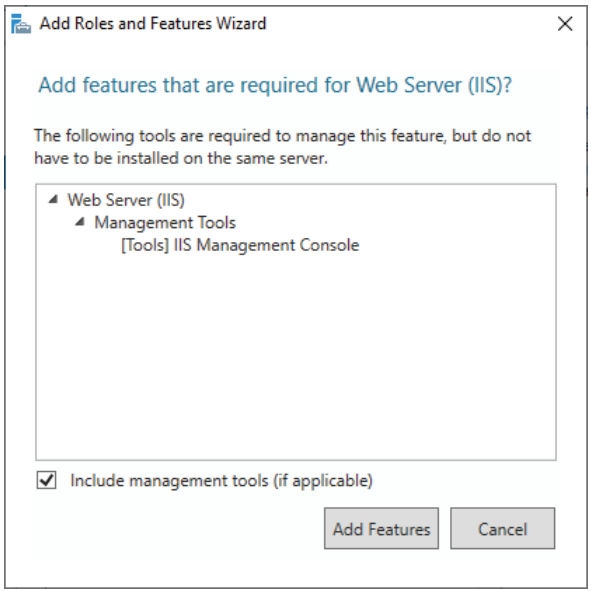

Figure 28 – Add Features

8. In the **Server Roles** step, click the **Next** button (Figure 29).

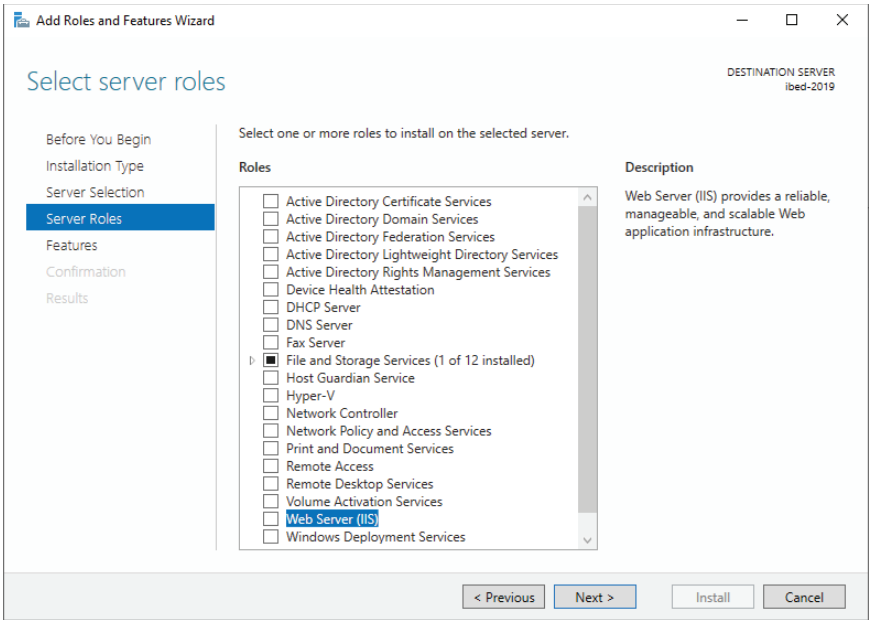

Figure 29 – Server confirmation

9. In the **Features** step, select **.NET Framework 3.5 Features**, **.NET Framework 4.7 Features**, and **Telnet Client** in the **Features** box (Figure 30).

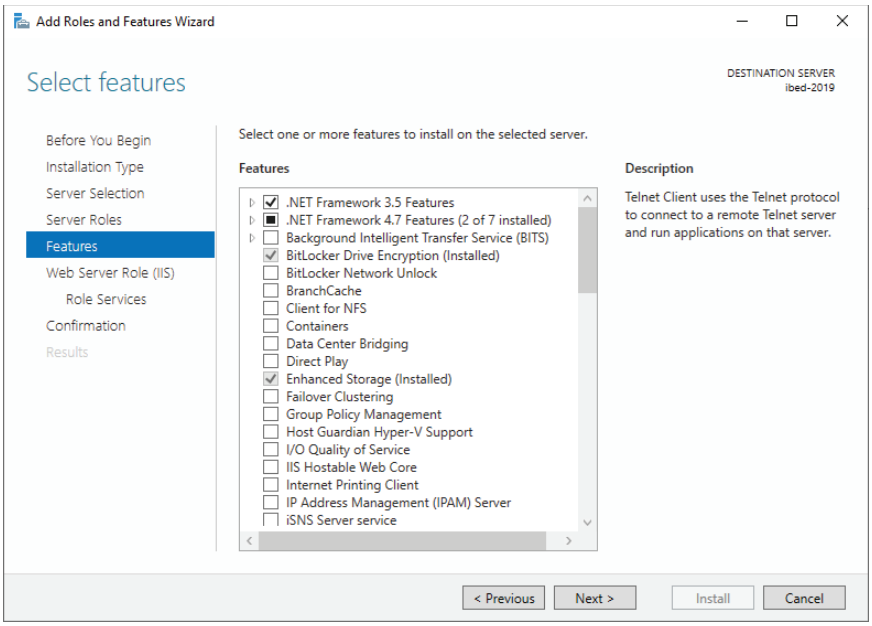

Figure 30 – Features selection

10. In the **Web Server Role (IIS)** step, click the **Next** button (Figure 31).

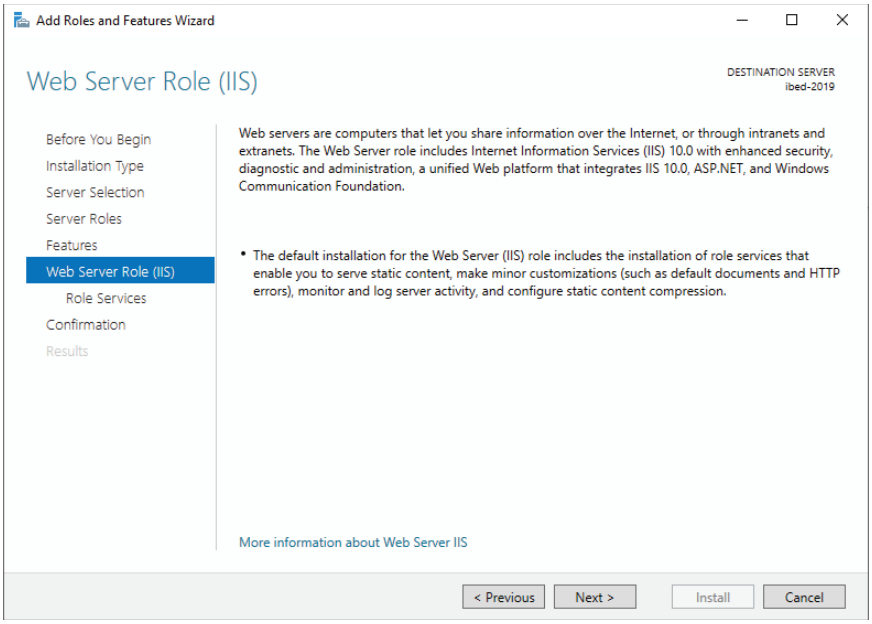

Figure 31 – Web Server Role (IIS)

11. In the **Role Services** step, click the **Next** button (Figure 32).

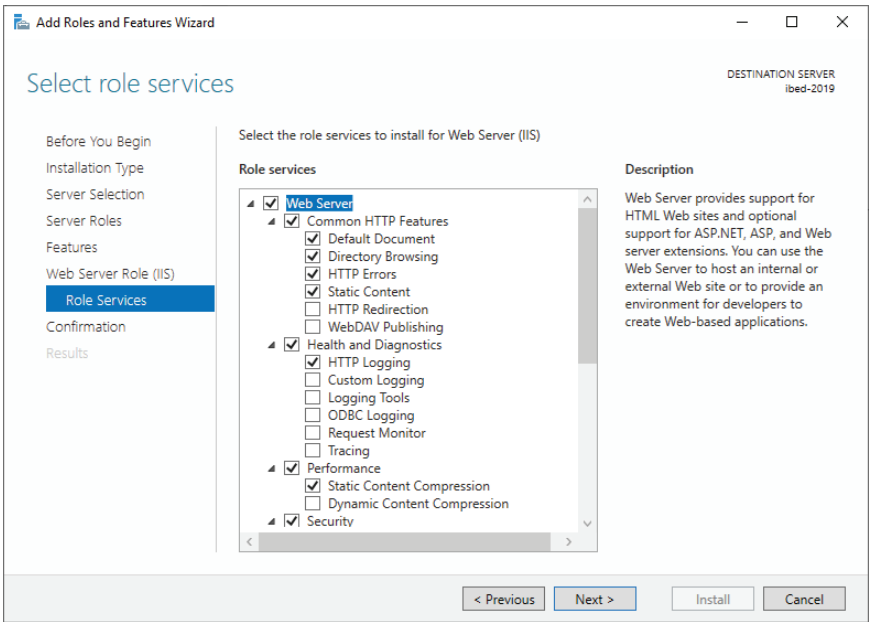

Figure 32 – Role Services

12. In the **Confirmation** step, click the **Install** button to start the installation of the role and features (Figure 33).

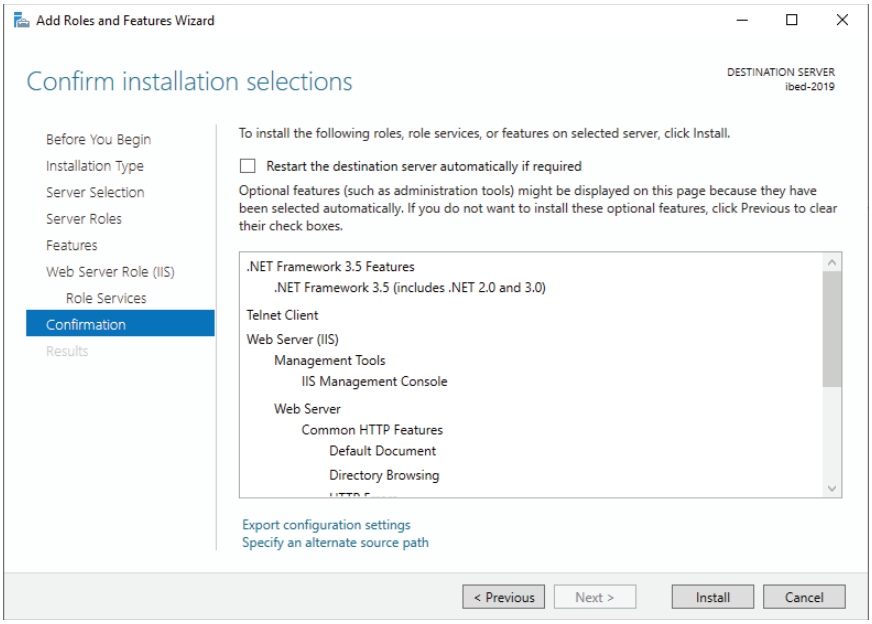

Figure 33 – Install confirmation

13. When the installation is finished, click the **Close** button (Figure 34).

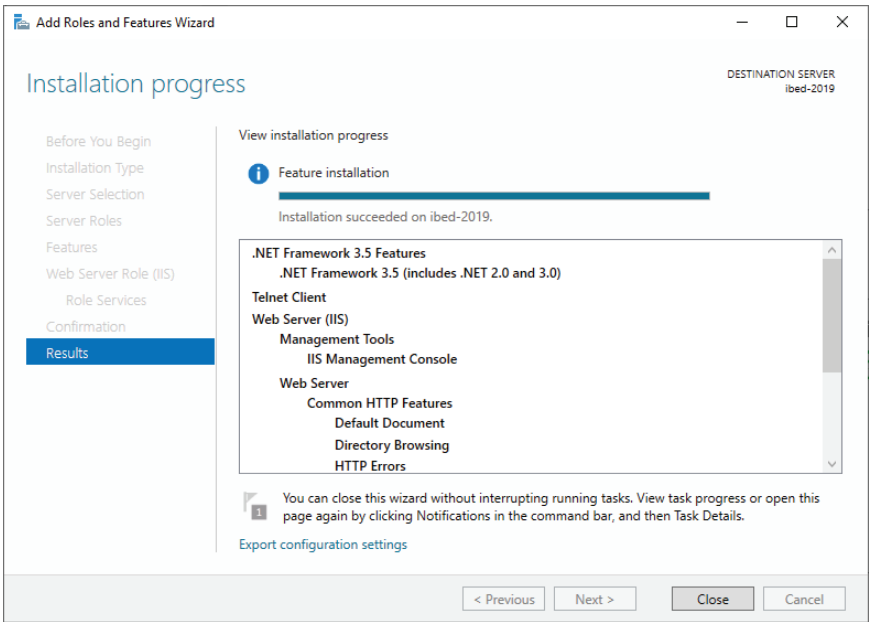

Figure 34 – Completed installation

14. Click on the **Add roles and features** link (Figure 35).

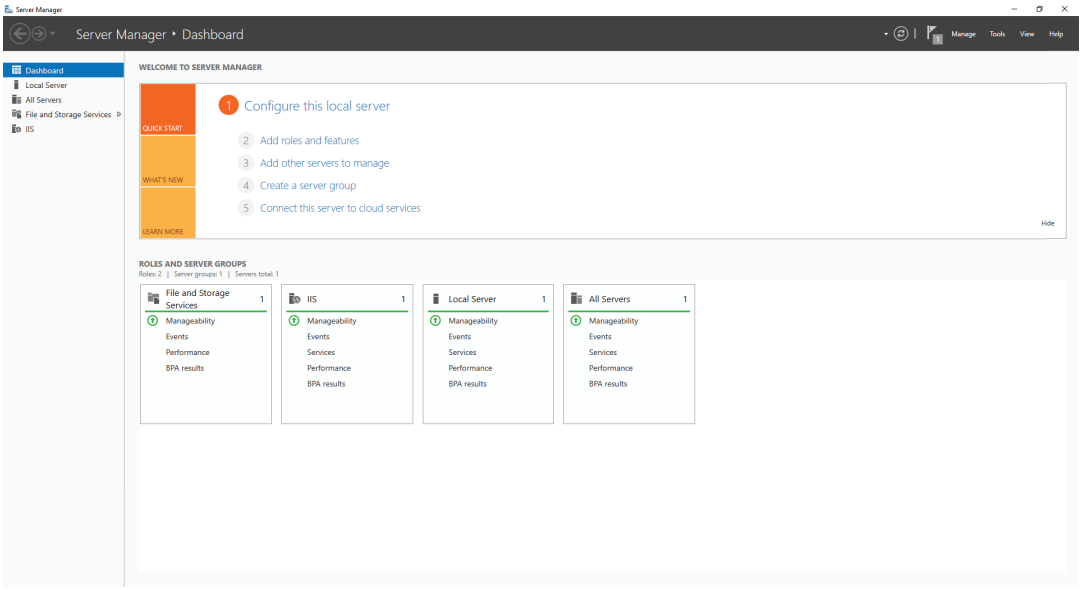

Figure 35 – Add roles and features

15. Click the **Next** button in the **Add Roles and Features Wizard** (Figure 36).

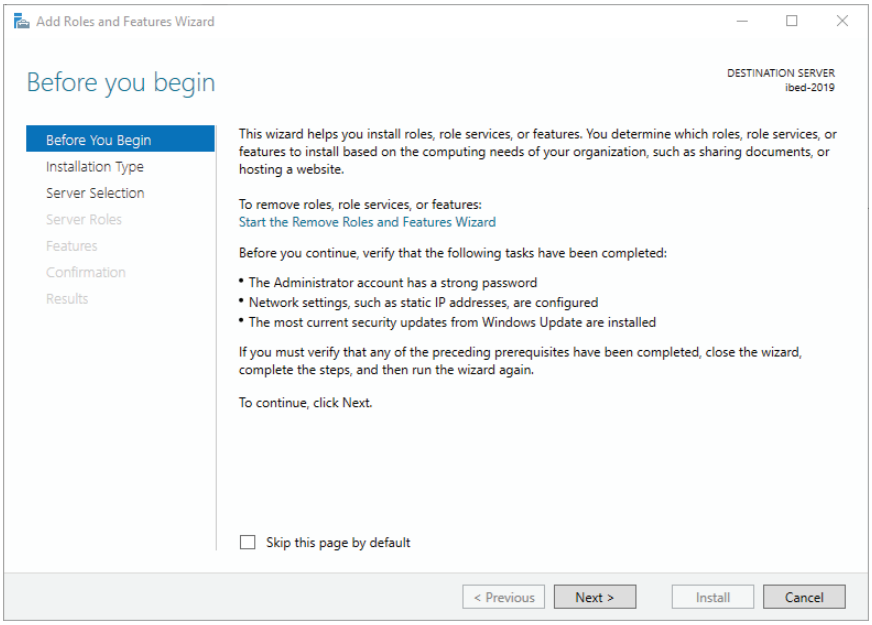

Figure 36 – Add Roles and Features Wizard

16. In the **Installation Type** step, select the **Role-based or feature-based installation** and click **Next** (Figure 37).

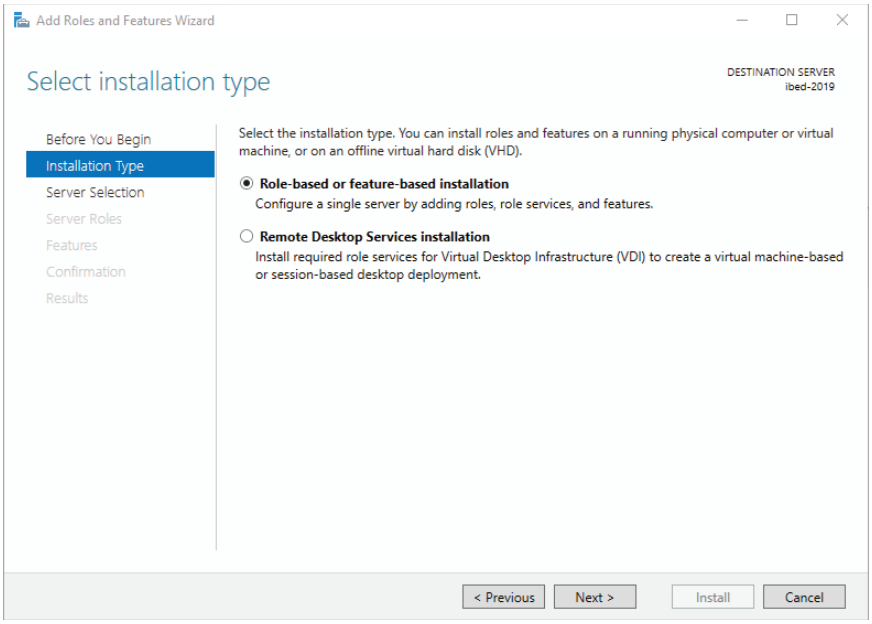

Figure 37 – Installation Type

17. In the **Server Selection** step, click **Select a server from the server pool** and verify that the server is correct in the **Server Pool** box and click **Next** (Figure 38).

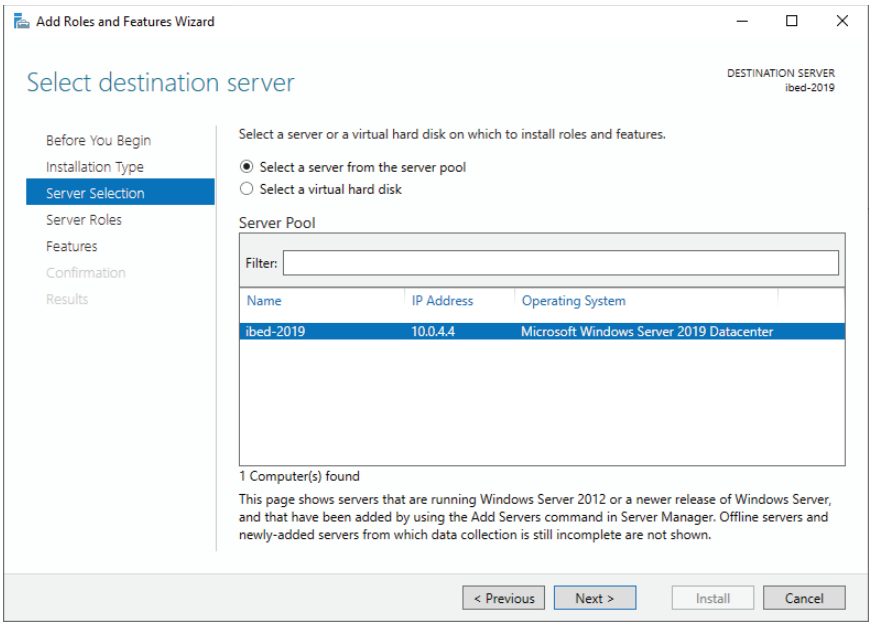

Figure 38 – Server Selection

18. In the **Server Roles** step in the **Roles** box, expand the **Web Server (IIS)** heading, **Web Server** heading, and then **Application Development**. Select **ASP.NET 3.5** and **ASP.NET 4.7** and click **Next** (Figure 39).

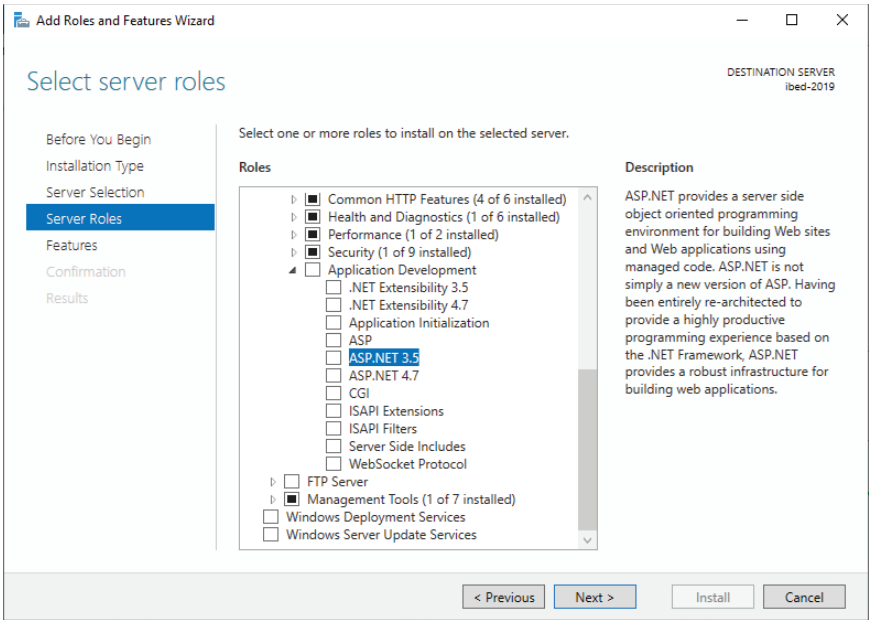

Figure 39 – Server Roles

19. In the pop-up window, click **Add Features** (Figure 40).

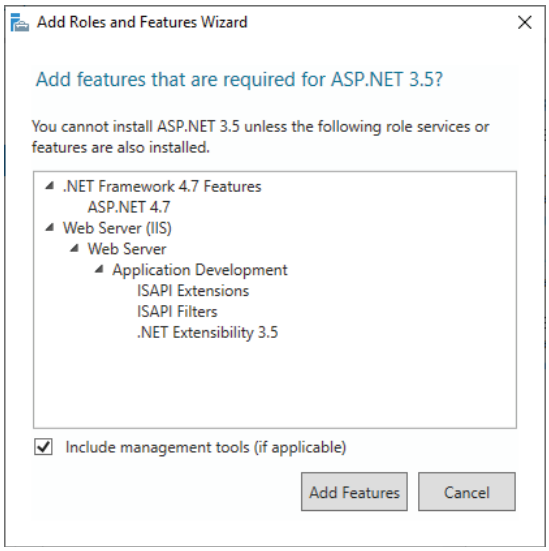

Figure 40 – Add Features

20. In the **Server Roles** step, select **ASP** and click **Next** (Figure 41).

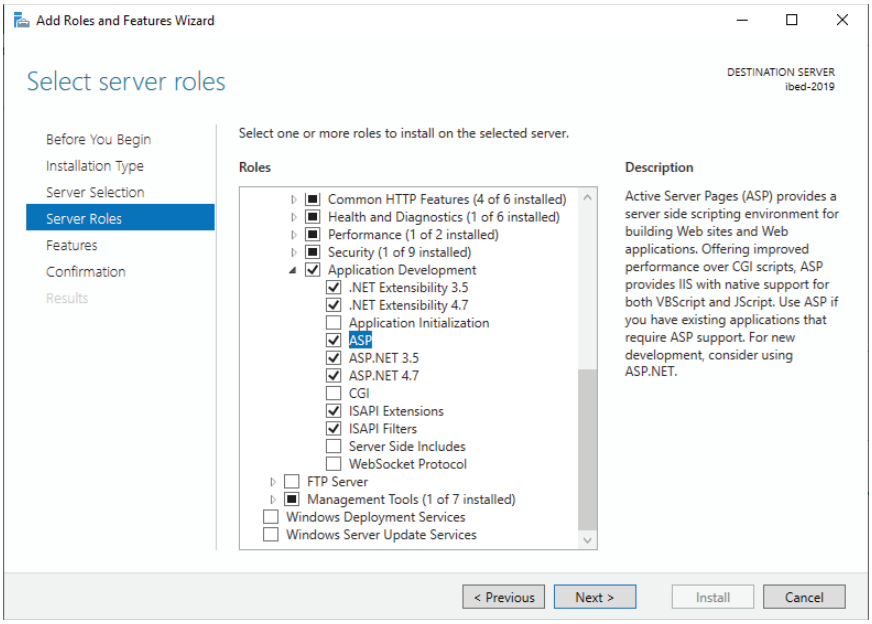

Figure 41 – ASP

21. In the **Features** step, click **Next** (Figure 42).

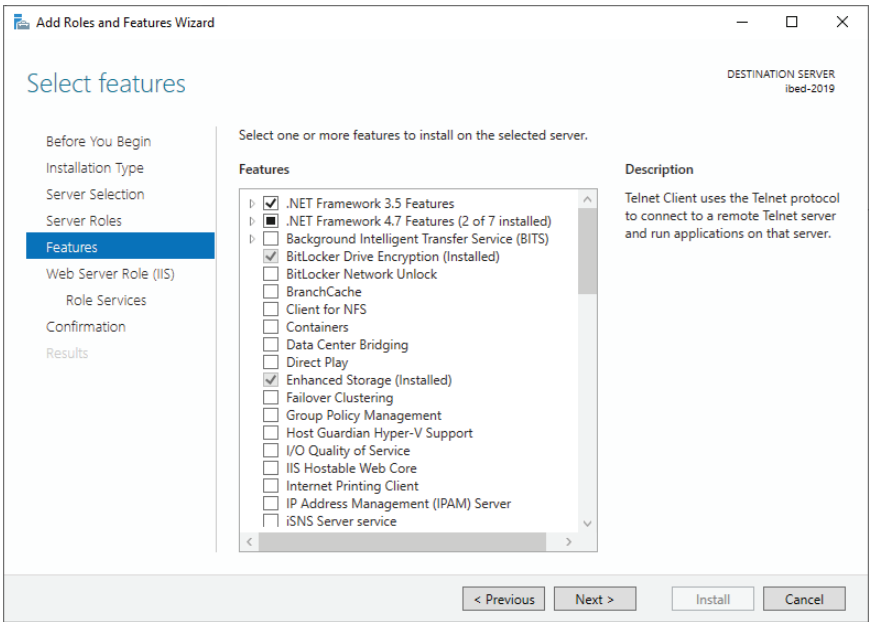

Figure 42 – Features selection

22. In the **Confirm installation selections** step, click **Install** (Figure 43).

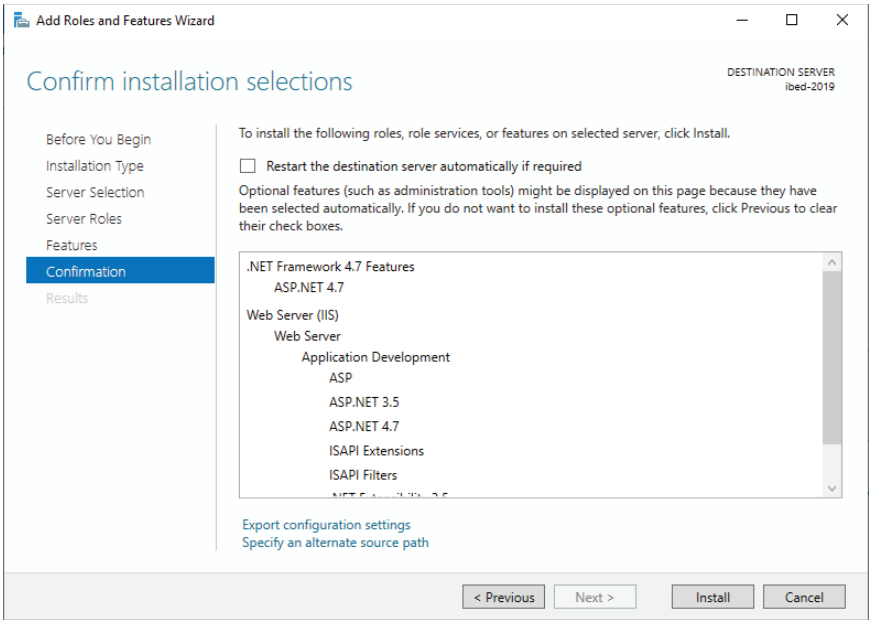

Figure 43 – Confirm installation

23. When installation is complete, click the **Close** button (Figure 44).

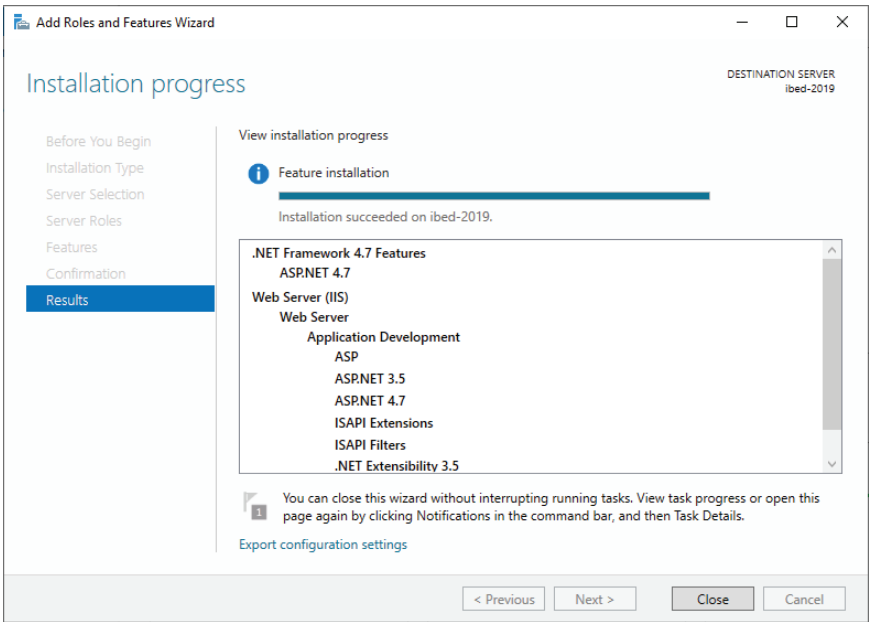

Figure 44 – Installation complete

24. Restart the server.
25. Run **Windows Update** to look for any important and optional updates and install them. Restart the server if required.

*i*Bed Server application

1. Begin the ***i*Bed** Server Application installation by right clicking the **5212-502-001 Server Application Setup.exe** file and select **Run as Administrator**.
2. If Microsoft SQL Server 2019 Express is not already installed, the **InstallShield Wizard requirements** window will open. Click the **Install** button (Figure 45).

Note - If Microsoft SQL Server 2019 Express is already installed, go to step 15.

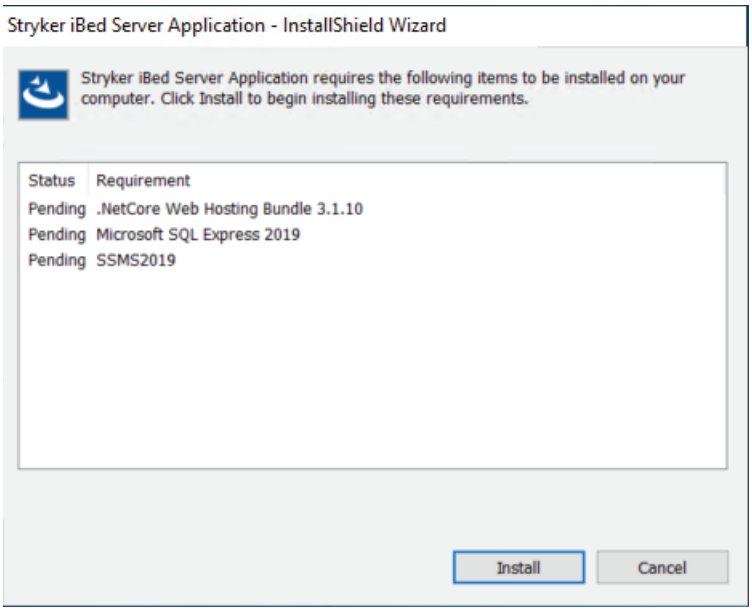

Figure 45 – Microsoft SQL service

3. Click the **Yes** button in the confirmation pop-up to start the .NetCore Web Hosting Bundle installation (Figure 46).

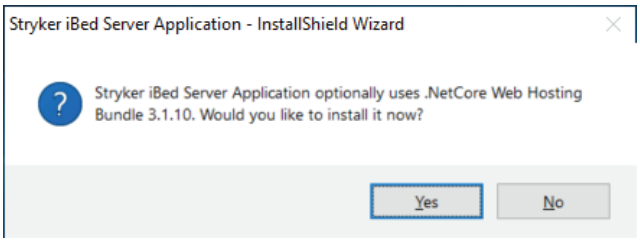

Figure 46 – .NetCore confirmation

4. Click the **Yes** button in the confirmation pop-up to start the SQL Server installation (Figure 47).

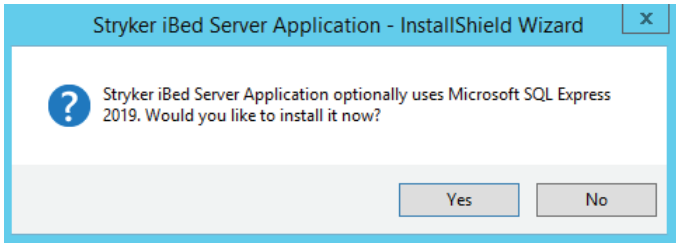

Figure 47 – SQL confirmation

5. The **Choose Directory For Extracted Files** screen will appear (Figure 48).
   a. If using the recommended location, input **C:\temp\sqlserver**.
   b. If using a different location, click **Browse…**

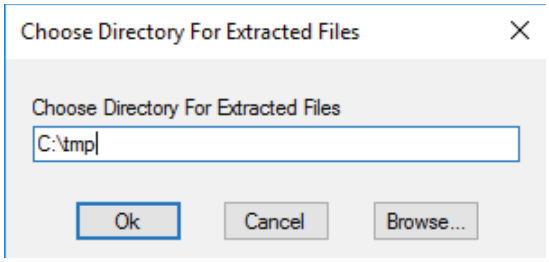

Figure 48 – Choose Directory for Extracted Files

6. Select **I accept the license terms** box and then click the **Next** button (Figure 49).

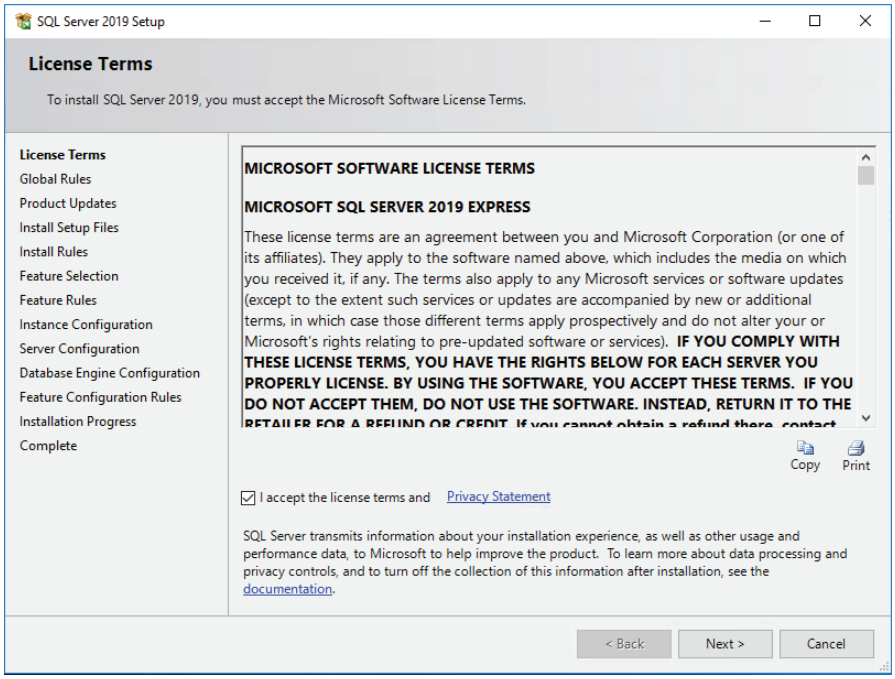

Figure 49 – SQL license

7. In the **Feature Selection** step, leave the **Features** selection at the defaults. If the **Shared feature directory** does not default to **C:\Program Files**, browse or create the new destination location for the installation and then click **Next** (Figure 50).

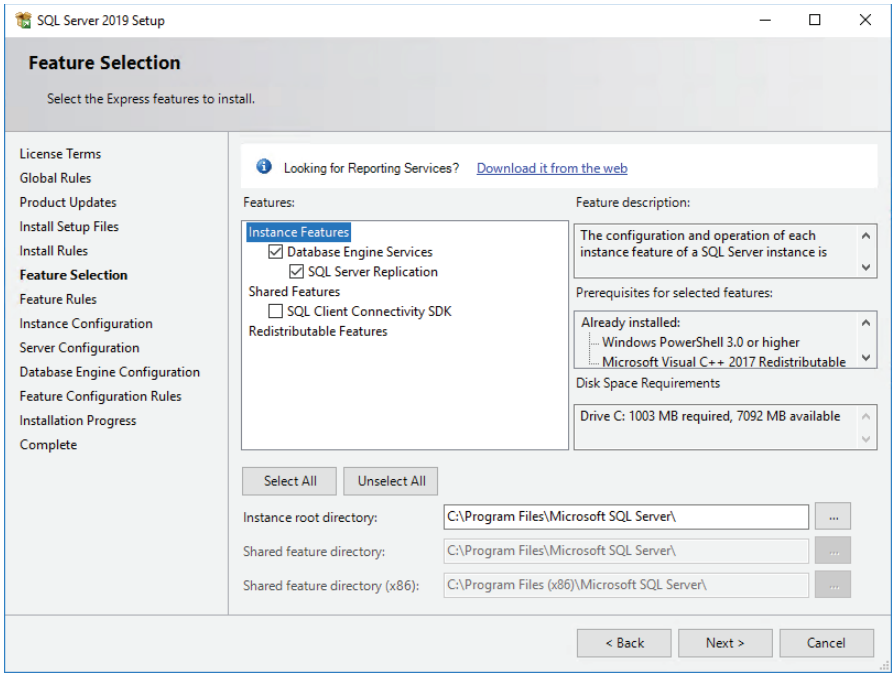

Figure 50 – SQL features

8. In the **Instance Configuration** step, click **Next** (Figure 51).

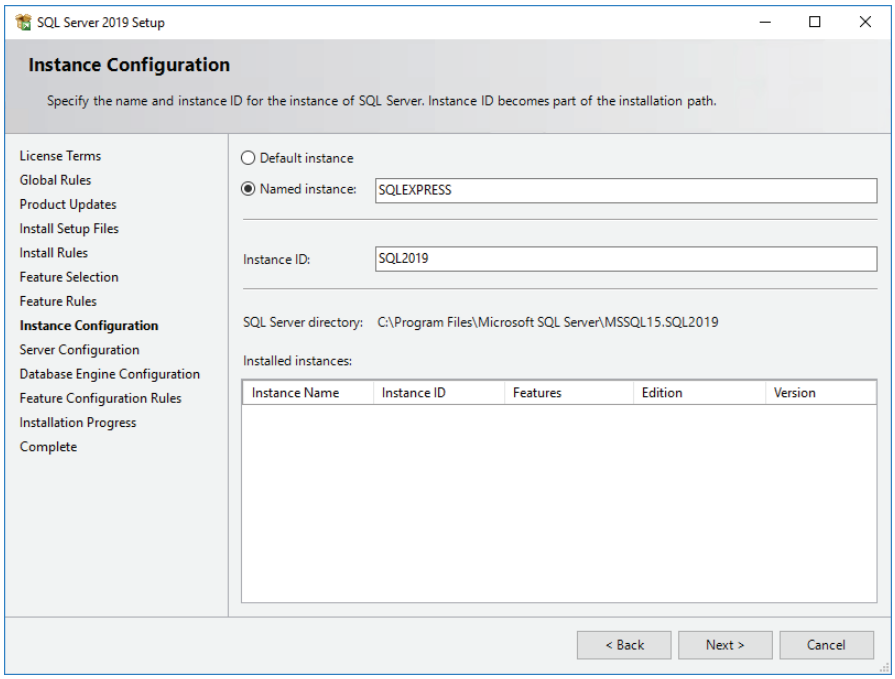

Figure 51 – Instance Configuration

9. In the **Server Configuration** step, click **Next** (Figure 52).

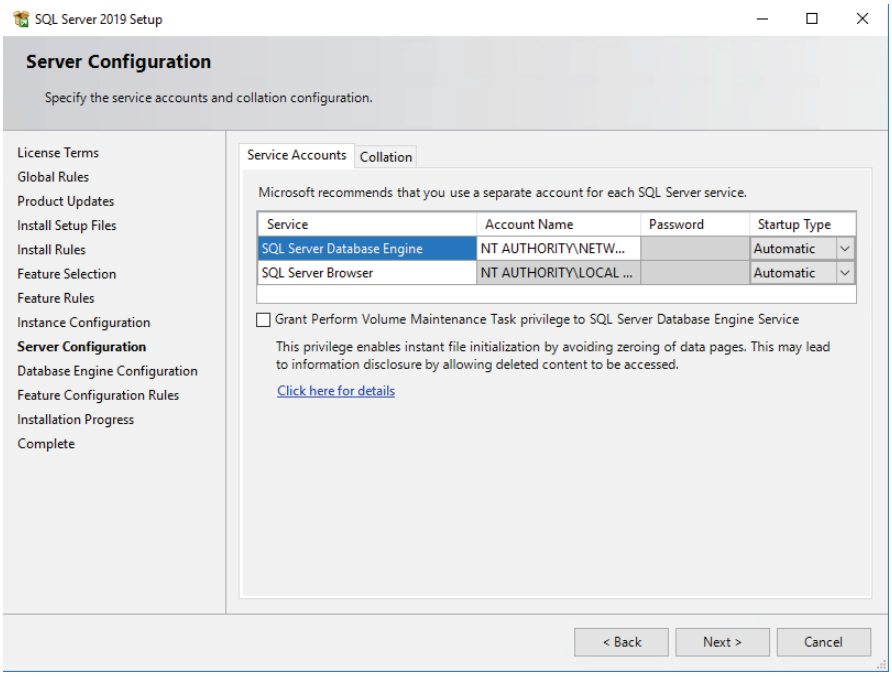

Figure 52 – Server Configuration

10. In the **Database Engine Configuration** step, click **Next** (Figure 53).

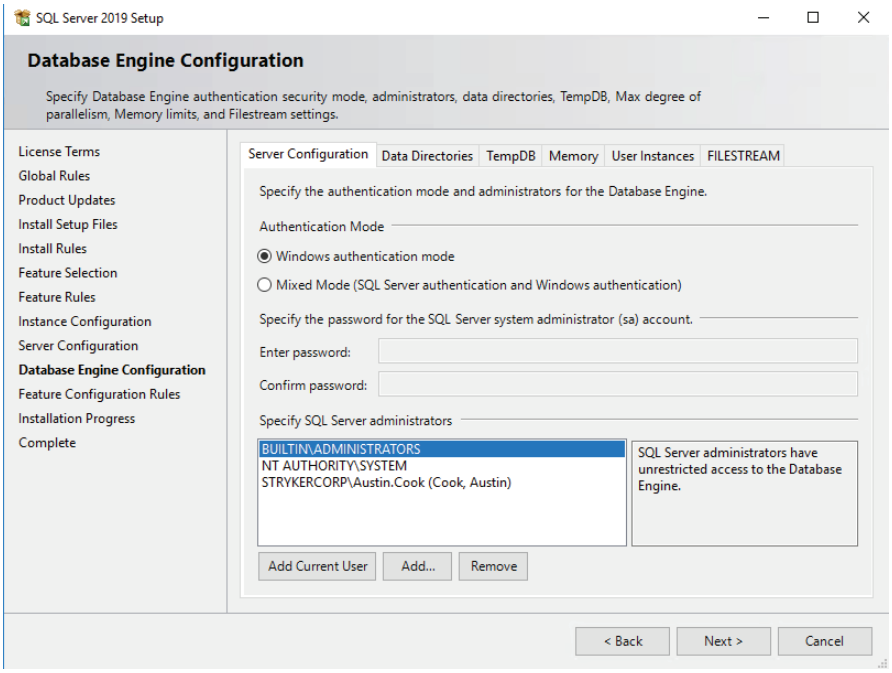

Figure 53 – Database Engine Configuration

11. When installation is complete, click **Close** in the **Complete** window which will start the **SQL Server Management Studio** installation (Figure 54).

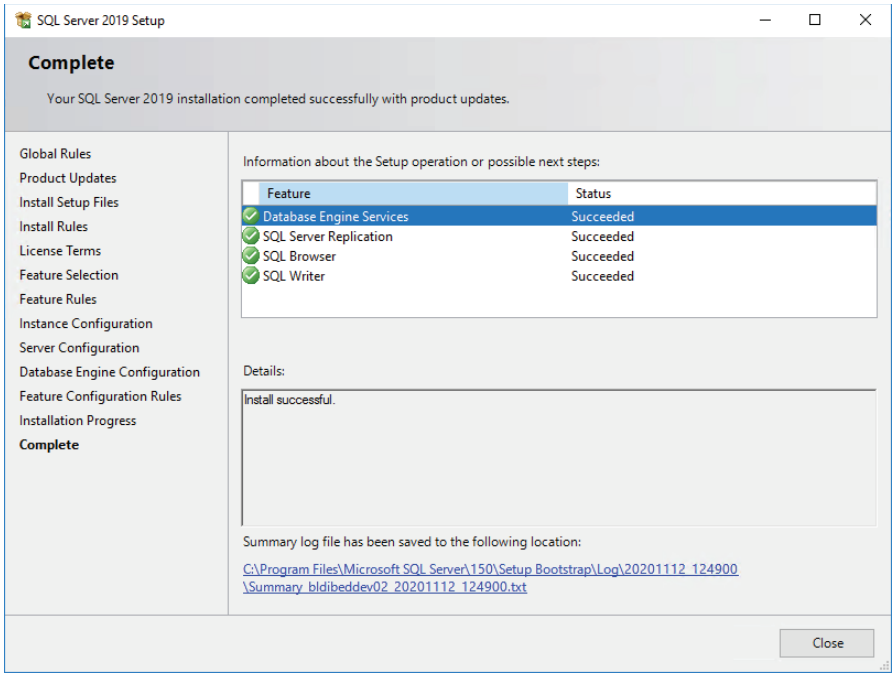

Figure 54 – SQL server install complete

12. Click the **Yes** button in the confirmation pop-up to start the **SQL Server Management Studio** installation (Figure 55).

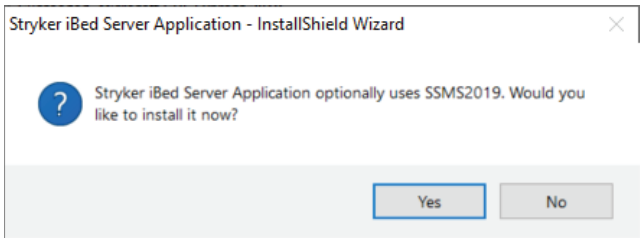

Figure 55 – SQL Server Management Studio confirmation

13. The **SQL Server Management Studio** installation screen will appear (Figure 56).
    a. If using the default location, click **Install**.
    b. If using a different location, click **Change** and then **Install** to confirm.

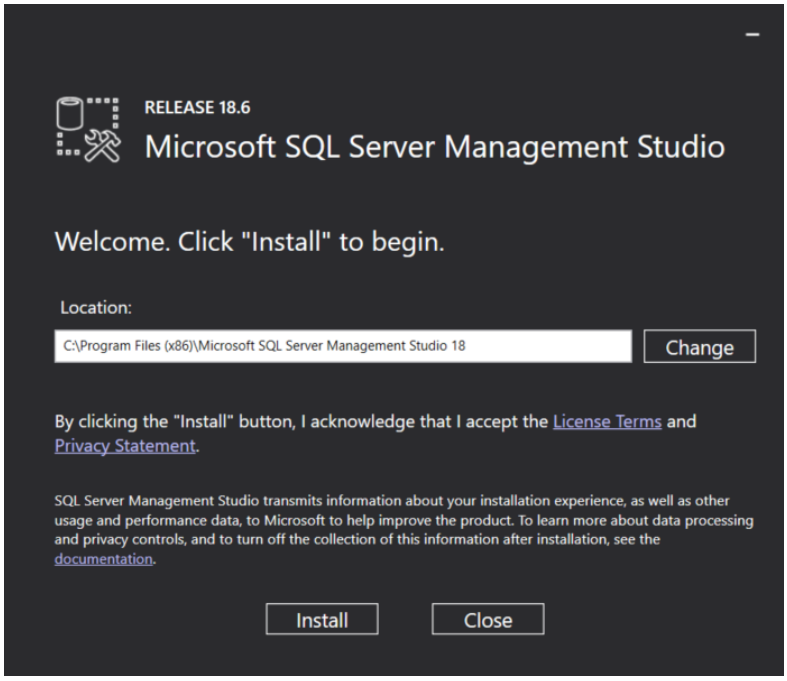

Figure 56 – SQL Server Management Studio installation

14. When installation is complete, **SQL Server Management Studio** will require a restart. Click **Restart** to continue (Figure 57).

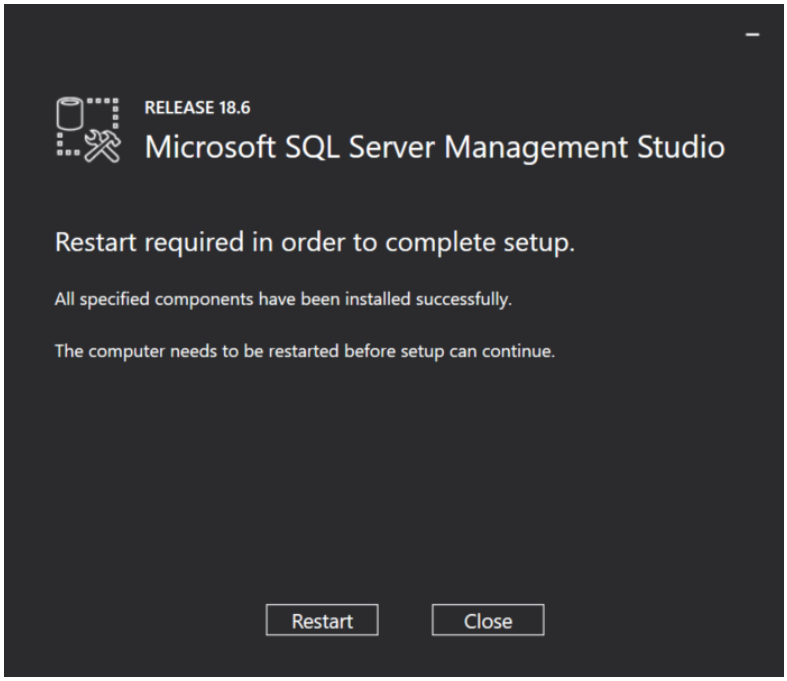

Figure 57 – SQL Server Management Studio restart

15. When the restart is complete, the **InstallShield Wizard** window will appear. Click **Next** (Figure 58).

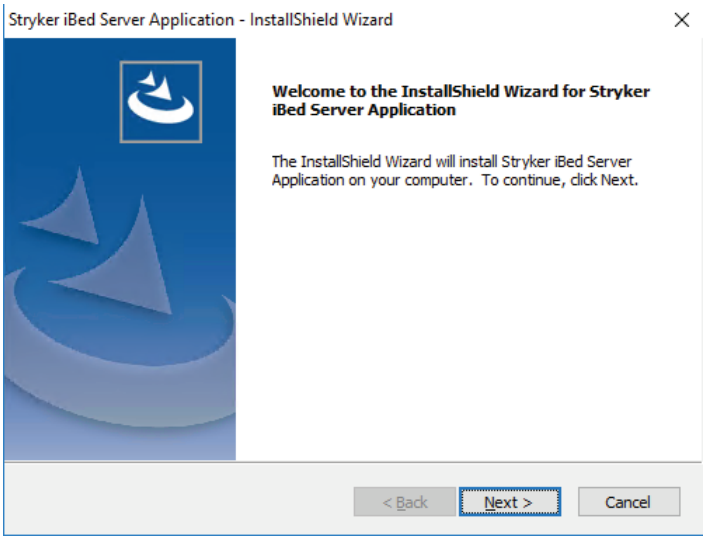

Figure 58 – InstallShield Wizard

16. In the ***i*Bed Server Application** system configuration window, enter the sites information and click **Next** (Figure 59).

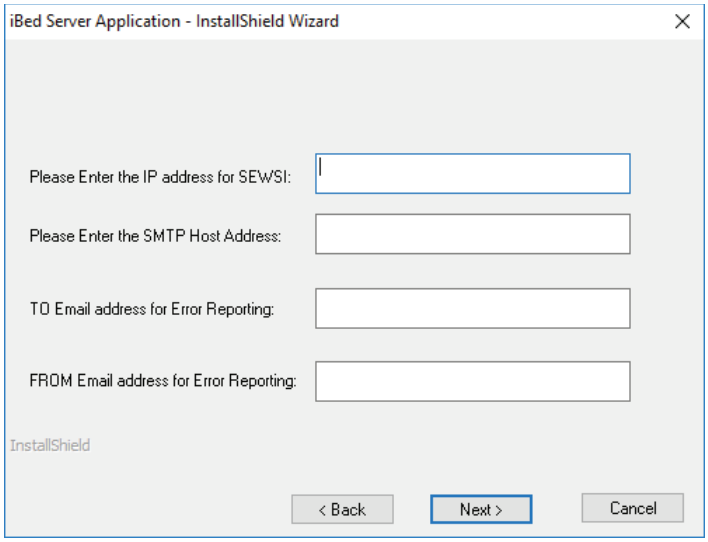

Figure 59 – Application configuration

17. The **Choose Destination Location** screen will appear (Figure 60).
    a. If using the default location, click **Next**.
    b. If using a different location, click **Change** and then **Next** to confirm.

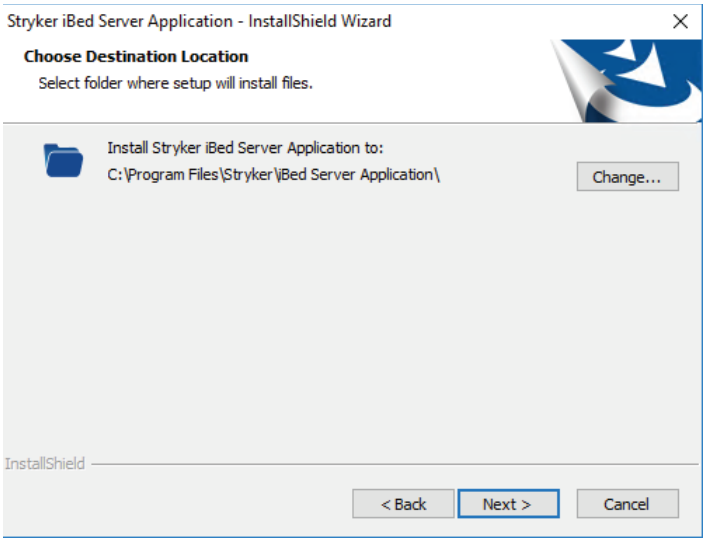

Figure 60 – Choose Destination Location

18. The **Select Program Folder** screen will appear (Figure 61).
    a. If using the default folder, click **Next**.
    b. If using a different folder, create a different folder name and click **Next**.

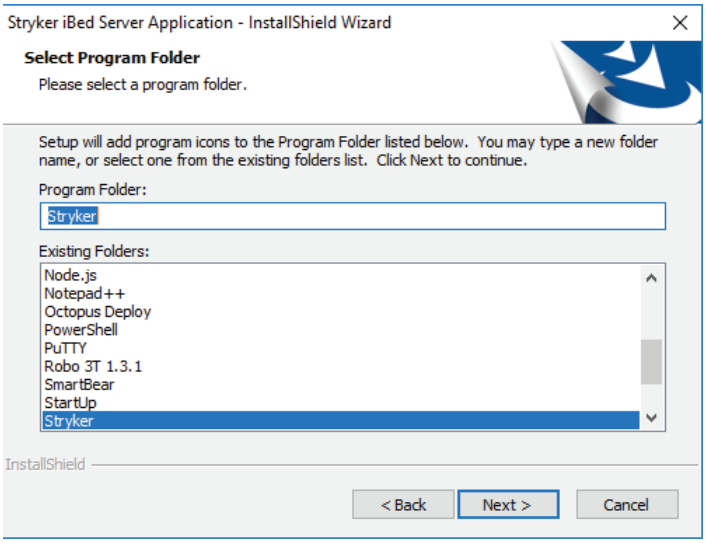

Figure 61 – Select Program Folder

19. Click **Install** to begin the installation (Figure 62).

    Note - To return to the **Select Program Folder**, click **Back**.

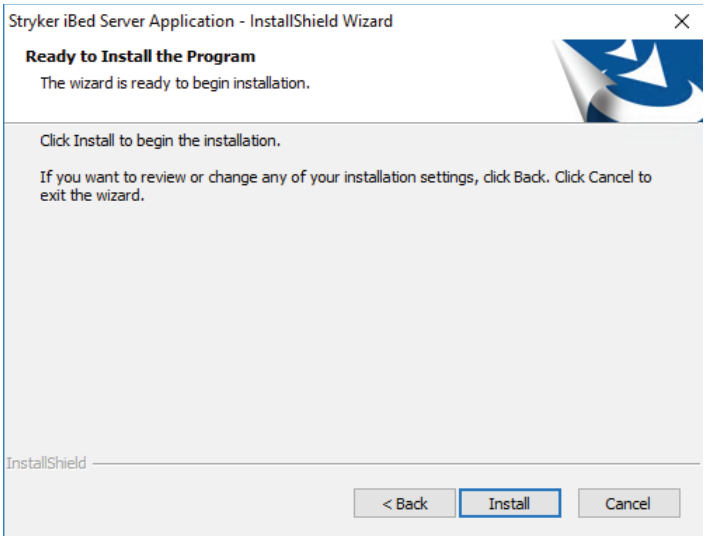

Figure 62 – Install *i*Bed Server

20. Click **Finish** to exit the **InstallShield Wizard** (Figure 63).

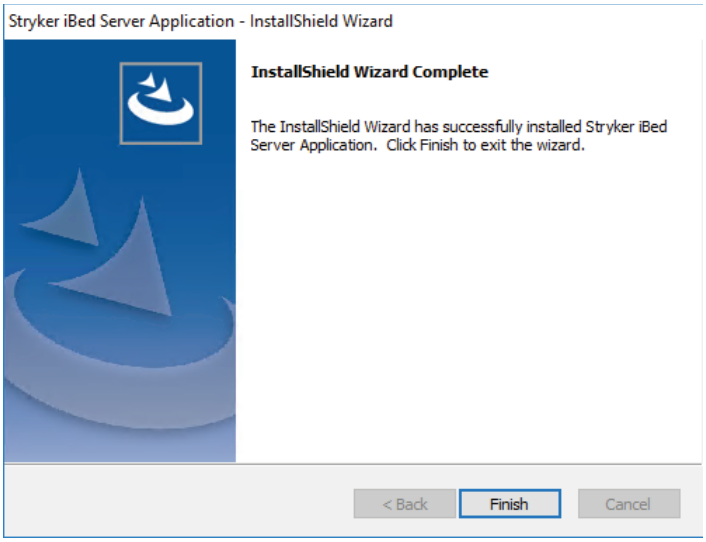

Figure 63 – Finish

*i*Bed Server Tools

1. Begin the ***i*Bed** Server Tools installation by right clicking the **5212-502-001 Server Tools Setup.exe** file and select **Run as Administrator**.
2. In the **InstallShield Wizard** window, click **Next** (Figure 64).

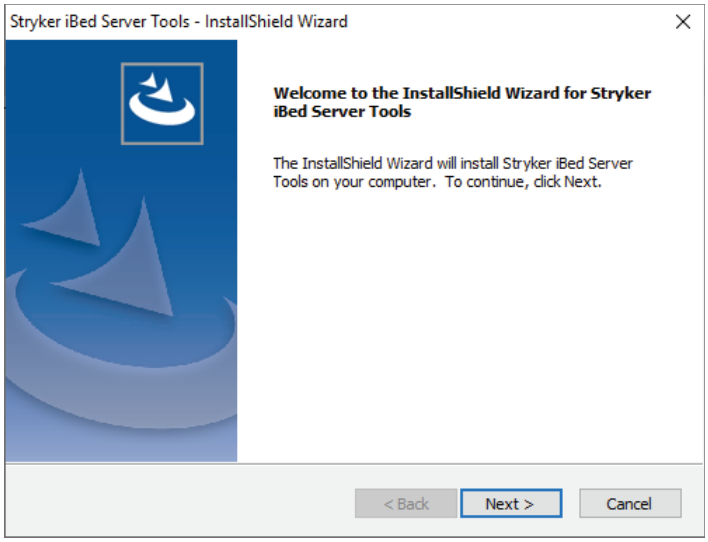

Figure 64 – InstallShield Wizard

3. The **Choose Destination Location** screen will appear (Figure 65).
   a. If using the default location, click **Next**.
   b. If using a different location, click **Change** and then **Next** to confirm.

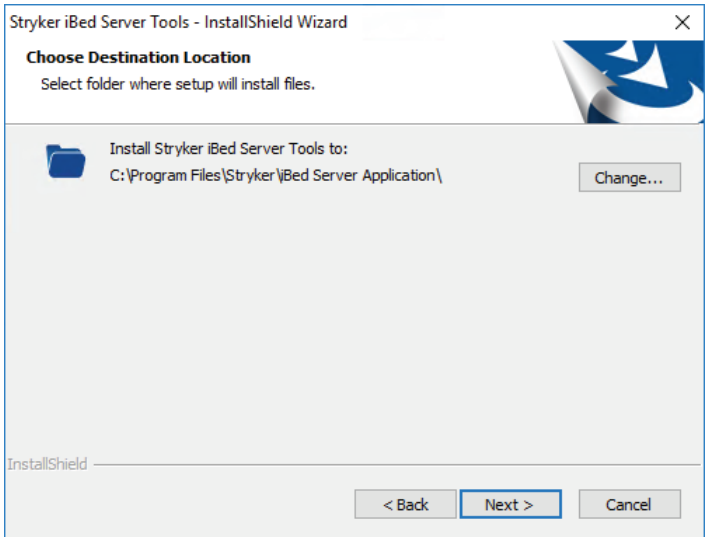

Figure 65 – Choose Destination Location

4. Click **Finish** to exit the **InstallShield Wizard** (Figure 66).

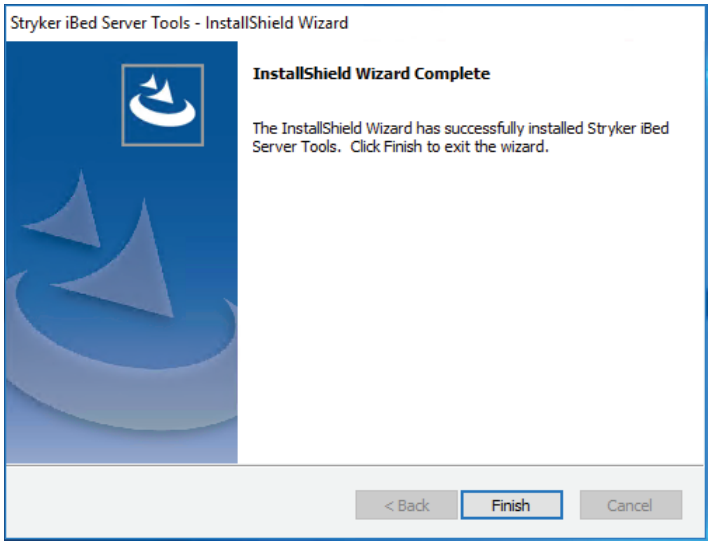

Figure 66 – Finish

*i*Bed Wireless Configuration Tool

1. Run the ***i*Bed** Wireless Configuration Tool by double-clicking the **5212-503-001 *i*Bed Wireless configuration tool Setup.exe** file on the source location.
2. In the **InstallShield Wizard** screen, click **Next** (Figure 67).

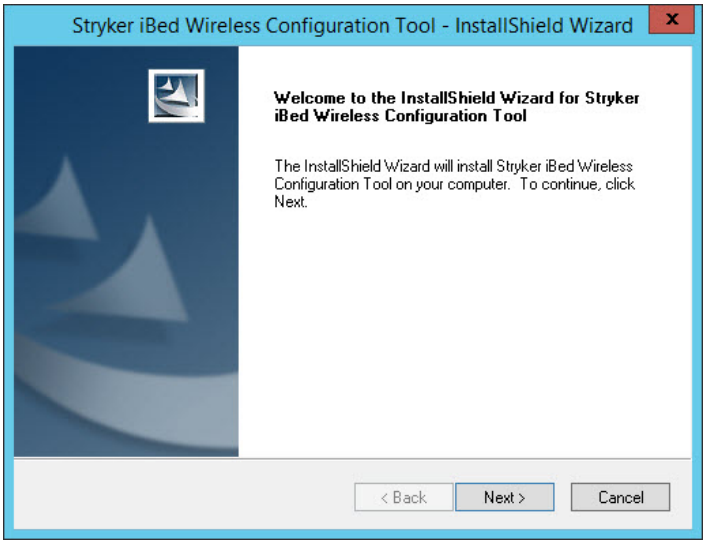

Figure 67 – InstallShield Wizard

3. The **Choose Destination Location** screen will appear (Figure 68).
   a. If using the default location, click **Next**.
   b. If using a different location, click **Change** and then **Next** to confirm.

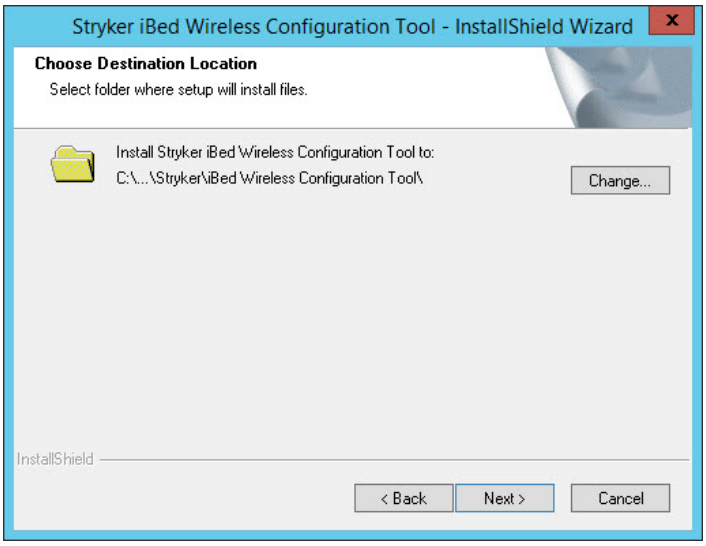

Figure 68 – Choose Destination Location

4. Click **Finish** to exit the **InstallShield Wizard** (Figure 69).

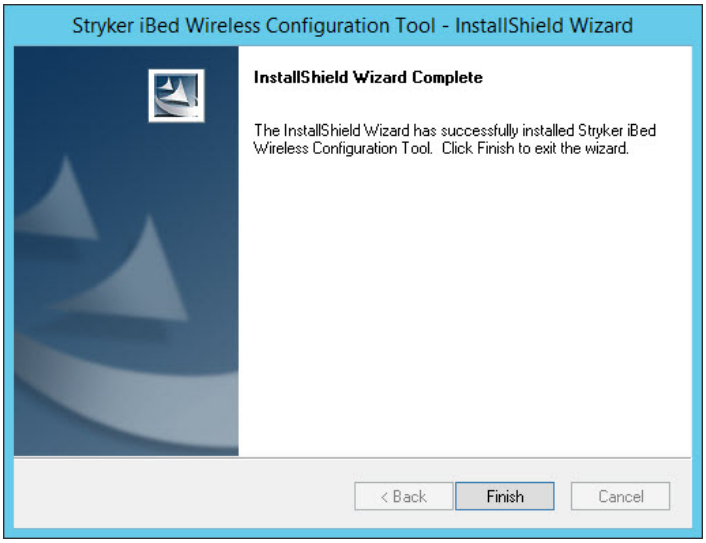

Figure 69 – Finish

Verify *i*Bed Server

To verify ***i*Bed** Server:

1. Open the **Stryker *i*Bed Server Tool** by either double-clicking the ***i*Bed** Server Tools Suite shortcut located on your desktop, or by clicking **Start > All Programs > Stryker >*i*Bed Server Tools** (Figure 70).

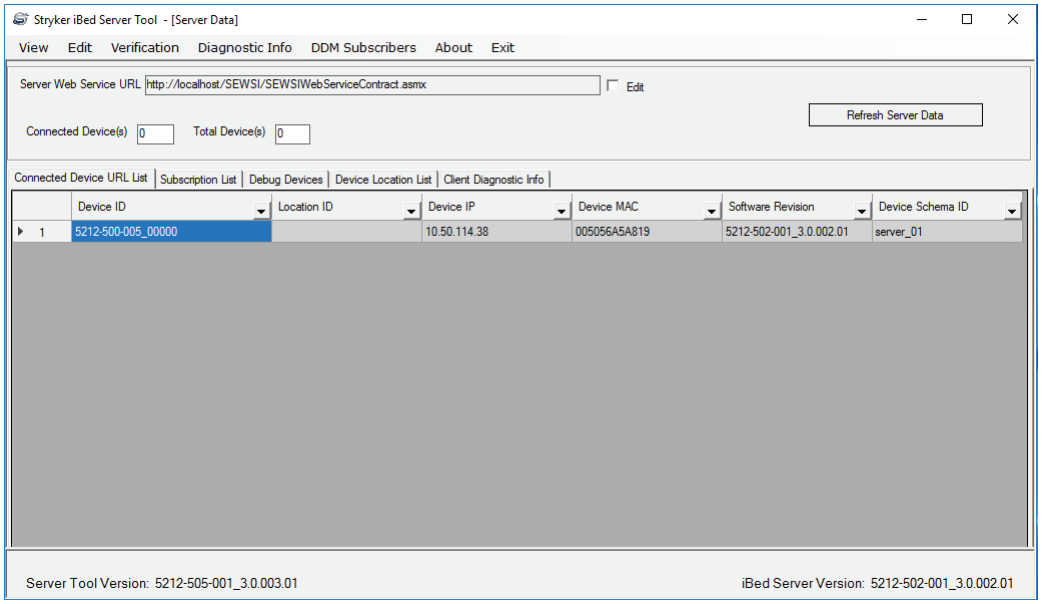

Figure 70 – Stryker *i*Bed Server Tool

2. Click **Verification>Server** in the task bar.
3. In the ***i*Bed Server Verification** window, click **Verify Server** (Figure 71).

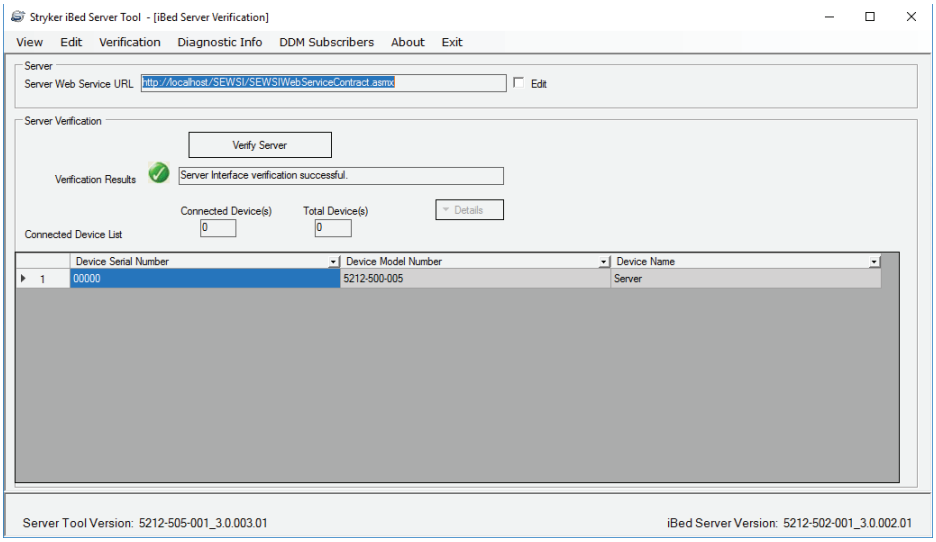

Figure 71 – Verify *i*Bed Server

a. If the server interface verification is successful, the system returns a green check (Figure 71).

b. If the server interface verification is unsuccessful, the system returns a red X.

   Note - Before you continue installing ***i*Bed** Server, you must resolve this error. To resolve the error, return to the beginning of the installation process and make sure that all steps were executed properly. For further troubleshooting details, see *Troubleshooting* (page 51).

4. Proceed to *Adding devices (clients) to the Master Device List* (page 41).

Setup

Adding devices (clients) to the Master Device List

1. Open the ***i*Bed** Server Tool by either double-clicking the ***i*Bed** Server Tools Suite shortcut located on your desktop, or by clicking **Start > All Programs > Stryker > iBed Server Tools > *i*Bed Server Tools**.
2. In the ***i*Bed Server Tool** window, click **Edit>Master Device List** (Figure 72).

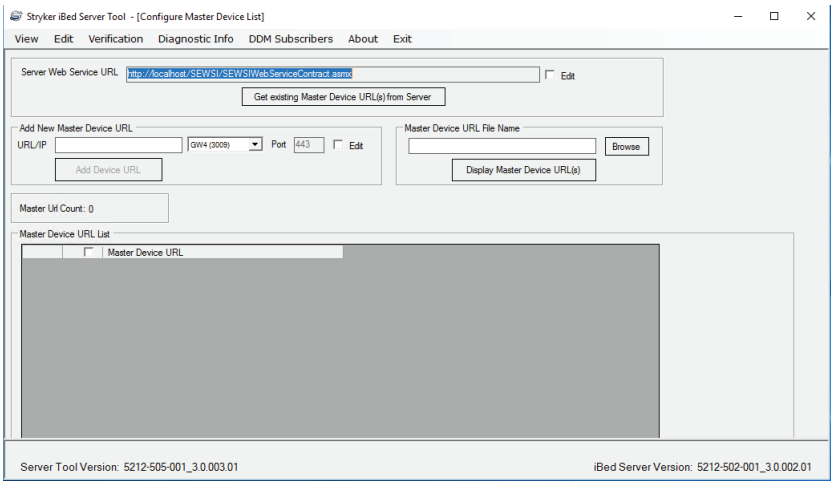

Figure 72 – Edit Master Device List

3. In the **Add New Device URL** box, type in the URL of the device and then click **Add Device URL** (example: http// 10.32.56.101:1639 or http://syk-84253f2356a.stryker.com:1639) (Figure 73).

   Note - Make sure to enter the web extension http:// and the Stryker communication port :1639 to the IP or DNS name for each device (client).

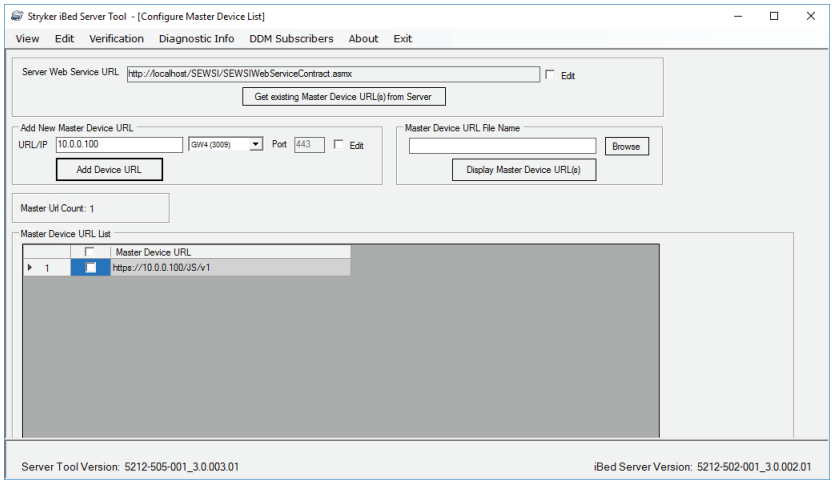

Figure 73 – Add Device URL

4. Repeat step 3 until all new devices have been added.
5. Once all new devices are in the list, click the **Select All** box of the **Master Device URL List** and then click the **Upload Master Device URL List to the Server** button (Figure 74).

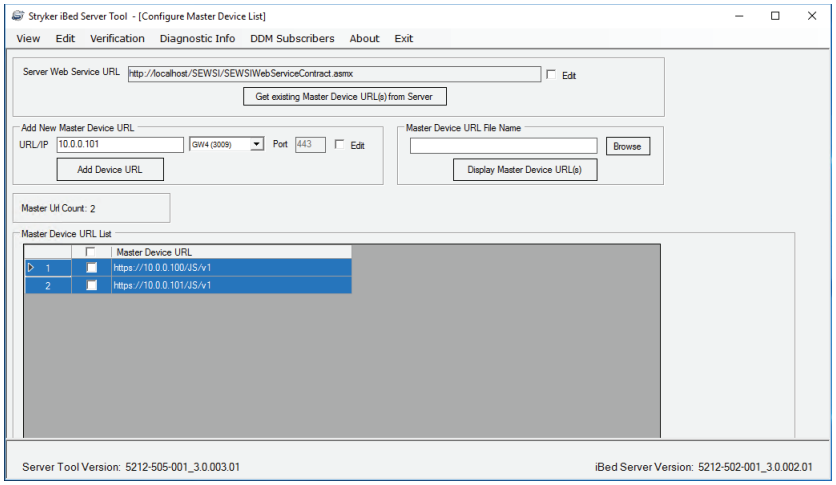

Figure 74 – Master Device URL List

6. Click the **OK** button in the **Alert** window confirming that the **Master Device URL List** was uploaded to the server.
7. To make sure that the **Master Device URL List** uploaded, go to the ***i*Bed Server Tool** window and click **View>*i*Bed Server**.

   Note - Allow time for synchronization before you make sure that the **Master Device URL List** was uploaded.

Adding locator IDs and hospital locations

1. Open the ***i*Bed** Server Tool by either double-clicking the ***i*Bed** Server Tools Suite shortcut located on your desktop, or by clicking **Start > All Programs > Stryker > iBed Server Tools > *i*Bed Server Tools**.
2. In the ***i*Bed Server Tool** window, click **Edit>Location Association** (Figure 75).

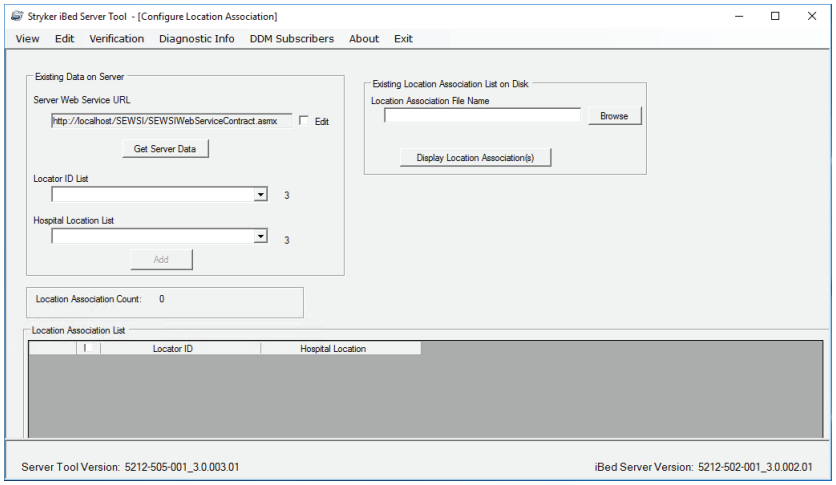

Figure 75 – Location Association

3. In the **Location Association List** box, click in the **Locator ID** box and type the ID from the locator (Figure 76).

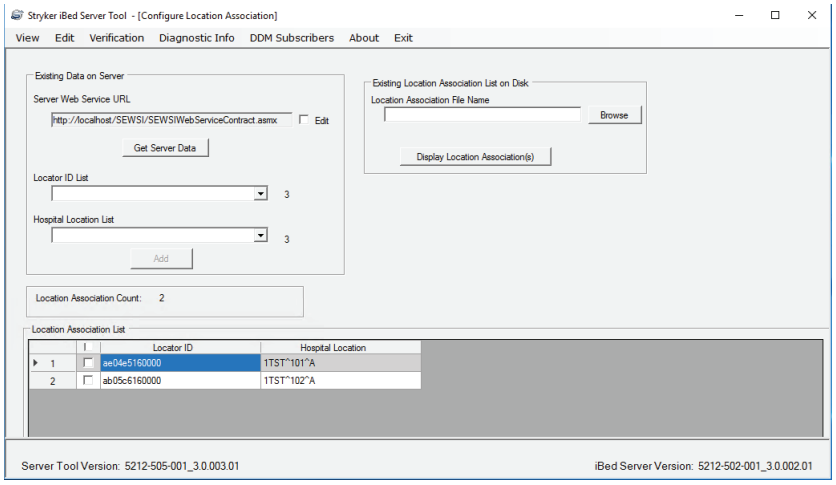

Figure 76 – Add Location Association

4. In the **Location Association List** box, click in the **Hospital Location** box and type the Hospital Location (Figure 76).

   Note - The Hospital Location is normally formatted using the location HL7 alias name.

5. To add another association, click the **Add Row** button (Figure 76).
6. Repeat steps 3 and 4 until all new Locator IDs and Hospital Locations have been entered.
7. Once all new location associations have been made, click the upper left **Select All** box of the Location Association List, and then click **Upload Location Association(s) to Server** (Figure 77).

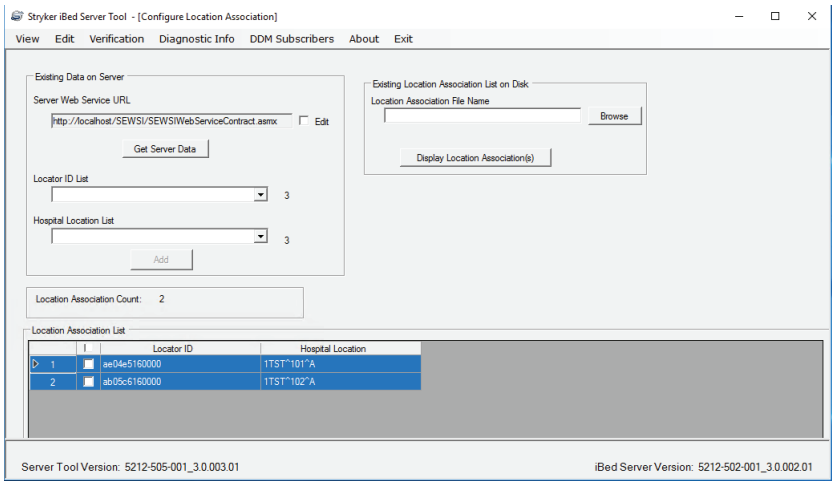

Figure 77 – Upload Location Association

8. Click the **OK** button in the **Alert** window to confirm that the Locator ID List, Hospital Location List, and Location Association List have been successfully uploaded to the server.
9. To verify in the ***i*Bed Server Tool** window, click **View>*i*Bed Server**.

   Note - Allow time for synchronization before you make sure that the Master Device URL List was uploaded.

Adding an additional Stryker interface

Integrating Smart Equipment Management (SEM)

Note - This installation to be performed by Stryker personnel only.

To integrate SEM, follow the installation steps found in SD-227 available from the Stryker quality system.

Integrating *i*Bed Platform

Note - This installation to be performed by Stryker personnel only.

To integrate ***i*Bed** Platform, follow the installation steps found in SD-228 available from the Stryker quality system.

Adding a third-party interface

Integrating Rauland Responder® 5

Note - This installation to be performed by Stryker personnel only.

To integrate **Rauland Responder** 5, follow the installation steps found in SD-180 available from the Stryker quality system.

Configuring the wireless router (Stryker device configuration)

Note - ***i*Bed** Server 2.0 and higher wireless clients only authenticate with AES encryption. Below is an example of configuring a LINKSYS EA6350 router.

To configure the wireless router for Stryker devices:

1. Enter the router's admin menu to configure the router for use.
2. In the **Basic** tab, edit the 2.4 GHz and 5 GHz Wireless Settings so they match (Figure 78).

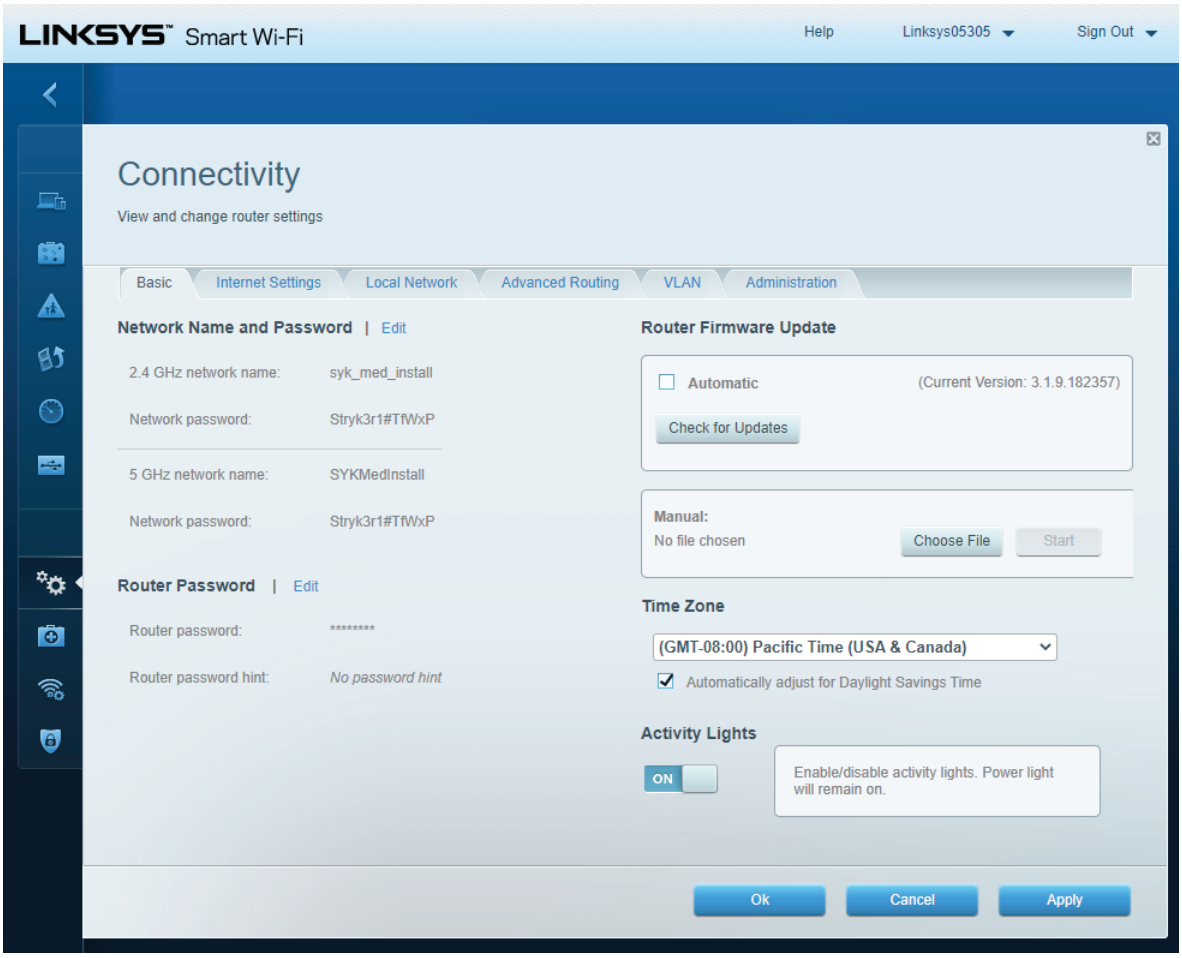

Figure 78 – Basic tab

3. In the **Local Network** tab, verify the router is set for DHCP (Figure 79).

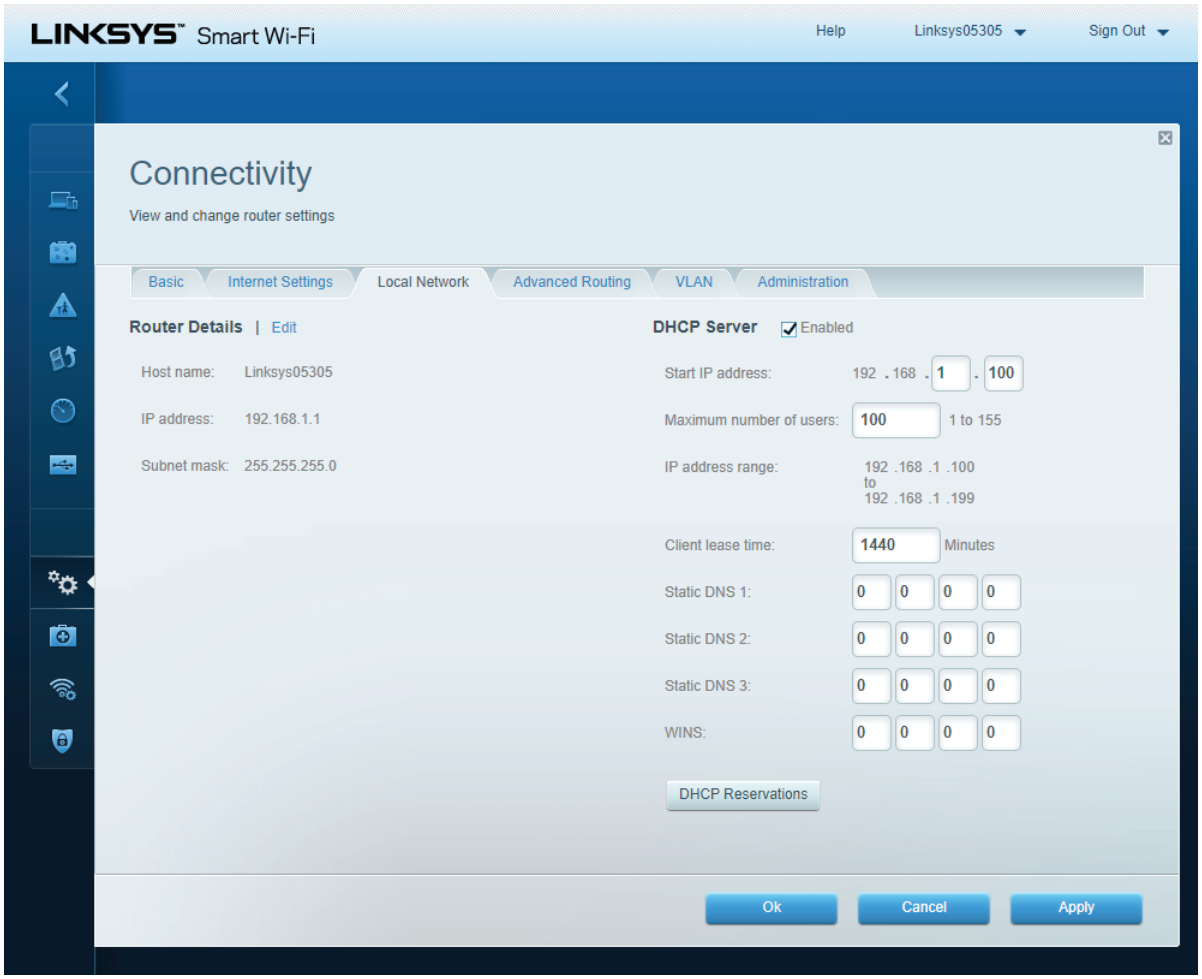

Figure 79 – Local Network tab

4. Click the **Apply** button.

Configuring wireless network connection settings

Applies to Gateway 1 (3002 **Secure**® II, 3002 / 3005 **S3**®), Gateway 2 (3002 / 3005 **S3**), Gateway 3 (2131 / 2141 **InTouch**®), and Gateway 4 (3009 **ProCuity**™).

Note - You must have a laptop and a router configured for Stryker defaults.

1. Plug in the router configured for Stryker defaults (*Configuring the wireless router (Stryker device configuration)* (page 45)).
2. Plug the power cord of the bed into the wall outlet and make sure that the wireless option is turned on.
3. Connect the laptop to the syk_med_install SSID which the configured router is broadcasting.
4. Open the ***i*Bed** Wireless Configuration Tool.
5. On the bed, enter the **Connectivity Info** menu by accessing the service menu on the footboard (see the appropriate product maintenance manual).
6. Scroll down to the IP address which the router provided for the bed.
7. Enter the bed IP address in the **Wireless Device URL/IP** box (Figure 80).

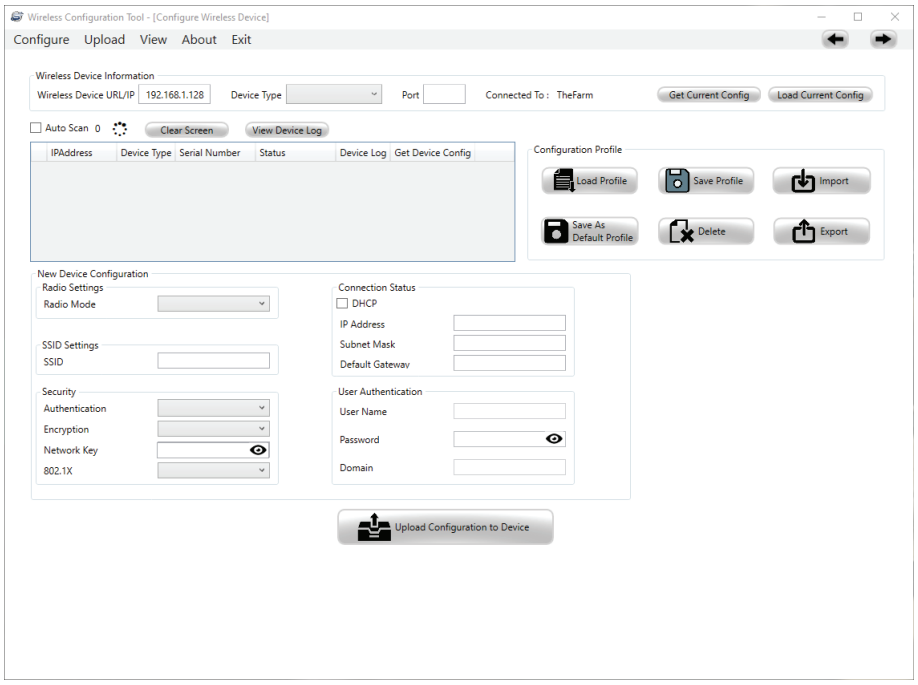

Figure 80 – Wireless Device URL

8. Click the **Get Current Config** button. This will retrieve the bed wireless default settings and connect to the bed, which is shown in the left column of the tool.
9. Click the **OK** button of the retrieval confirmation.
10. Enter the facility network information and make sure that you fill in all of the appropriate blanks in the right column of the tool.
11. Select the **Radio Mode** for the facility requirements.
12. Click the **Upload Configuration to Device** button.

    Note - If the radio does not connect, make sure that you check the settings entered into the column on the right. If they are incorrect, the radio will need to be reset to defaults and then repeat the configuration process.

Resetting the wireless module to factory default settings (Med-Surg bed)

Tools required:

- Large paper clip

Procedure:

1. Raise the product to its highest position.
2. Using a large paper clip, insert it into the reset hole (A) on the bottom side of the wireless module (B) (Figure 81).
3. Hold the large paper clip inside the reset hole for five seconds.

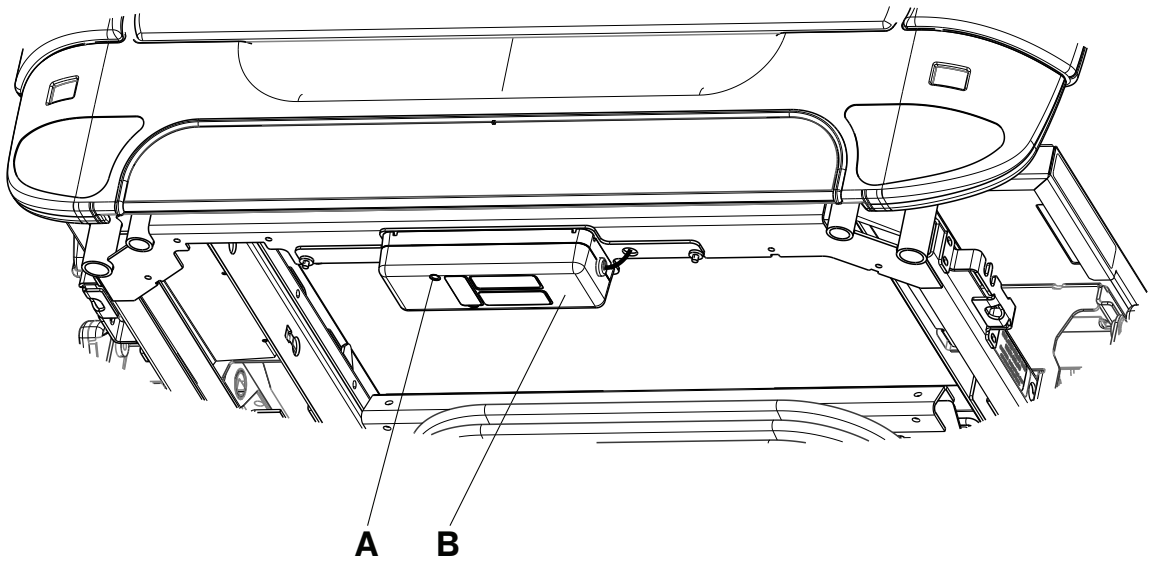

Figure 81 – Wireless module

Resetting the wireless module to factory default settings (Model FL27 InTouch)

Note - For **InTouch** 2.1-4.0, follow all of the steps below. For **InTouch** 5.0 or higher, see step 1 to reset Wi-Fi.

Tools required:

- Appropriate FL27 **InTouch** maintenance manual

Procedure:

1. Use the appropriate FL27 **InTouch** maintenance manual to access the **Configuration** menu (For **InTouch** 2.1-4.0 see Figure 82. For **InTouch** 5.0 or higher, see Figure 84).
2. Tap **Wi-Fi Configuration** (A) (Figure 82).
3. Tap the **Advanced** tab (B) (Figure 83).
4. Tap **Reset** (C) (Figure 83).
5. Tap **Save**.

InTouch 2.1 - 4.0

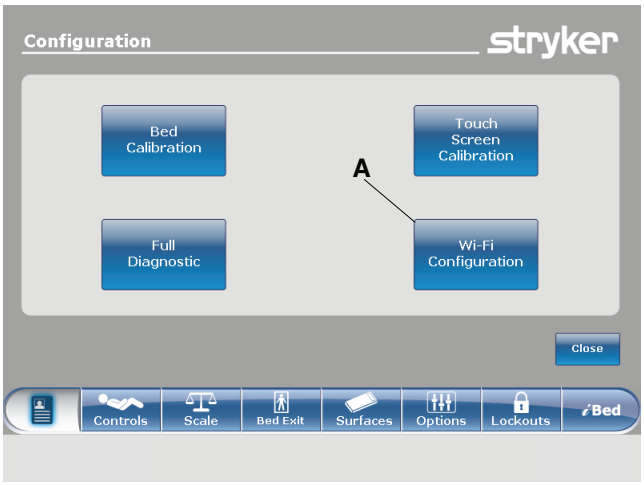

Figure 82 – InTouch Configuration Menu

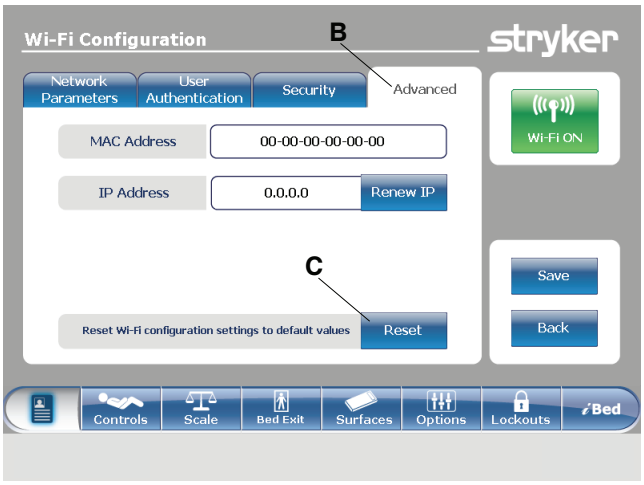

Figure 83 – InTouch Wi-Fi Configuration menu

InTouch 5.0 or higher

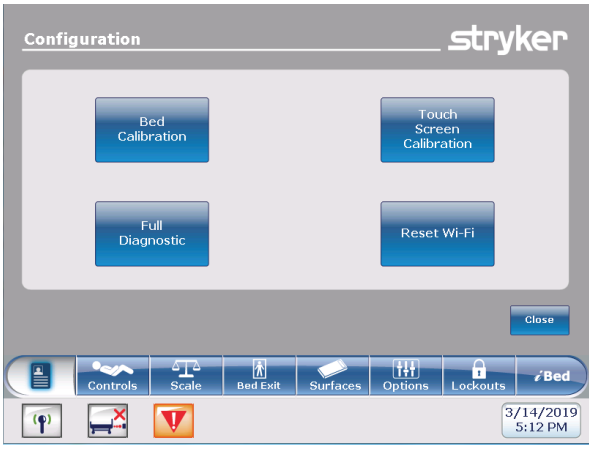

Figure 84 – InTouch Wi-Fi Reset

Resetting the wireless module to factory default settings (Model 3009 ProCuity)

Procedure:

1. Enter the service menu and select **Connectivity** (A).

   Note - See the Model 3009 **ProCuity** Maintenance Manual for steps to access the service menu.

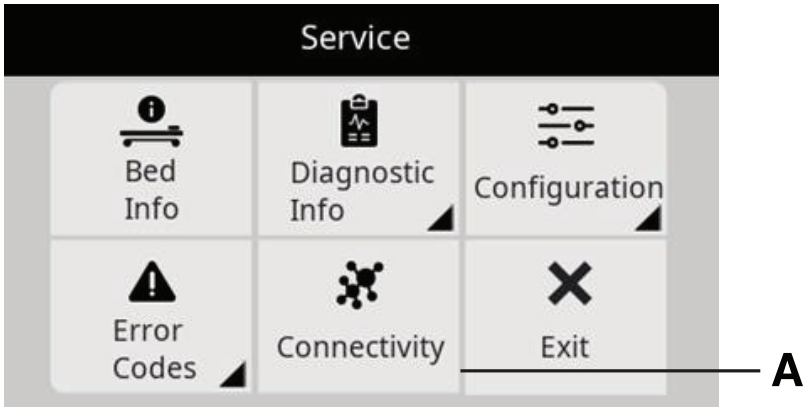

Figure 85 – ProCuity service menu

2. Select **Wi-Fi**.
3. Select **Reset Wi-Fi**.

Troubleshooting

Basic

Problem	Possible cause	Solution
Cannot verify the ***i*Bed** Server Tool	The Web Service URL is incorrect.	Make sure the URL in the Web Service URL box is correct. 1. If the URL is incorrect, enter the following URL into the Web Service URL box (*Verify iBed Server* (page 39)):**http://localhost/SEWSI/SEWSIWebServiceContract.asmx**. 2. Click **Verify Server**.
	The Heartbeat service is not active.	1. Make sure that the Heartbeat service is running. 1.1. If the Heartbeat service has not started, start the service, restart the server, and then reverify the *i*Bed Server application.
	The IIS Manager does not have all of the required Default Web Sites.	1. Make sure that the IIS Manager has all of the required Default Web Sites. 1.1. Go to **Internet Information Services (IIS) Manager**. 1.2. Navigate to **Web Sites > Default Web Site** to verify that the three web sites are listed: CHAP / SERVERSCHEMA / SEWSI. 1.3. If the Default Web Site is not listed, reinstall the ***i*Bed** Server application.

Problem	Possible cause	Solution
Cannot see the device in the ***i*Bed** Server application	The MAC address does not have the bed's IP address or DNS name.	1. If the troubleshooting steps in the appropriate bed maintenance manual were followed: 1.1. Use the MAC address from the bed and verify with IT what wireless module's IP address or DNS name is. 1.2. Ping the wireless module from the server machine using the Command Prompt (ping **IP address or DNS name**). 1.3. Press **Enter**. 1.3.1. If you receive four (4) responses, then the bed is on the wireless network. 1.3.2. If you receive no response, check the wireless module on the bed.
Problem	**Possible cause**	**Solution**
Cannot see a device in the Server Tools under the Device Location List, but the device shows under the connected device URL List	The device was not added to the device list.	1. Using the server tool, select **Verify Device Directly**. 2. Click **Get Existing Device(s)**, and then select the device in question. 3. Add it to the **Device List**. 4. In the **Device List**, select the device, and then click **Verify Device(s)**. 5. Check the **Connection Status** once it responds. 5.1. If there is a response, the device is communicating properly on the wireless network.

Problem	Possible cause	Solution
	The serial number in the CPU and the serial number on the bed specification label do not match.	• Identify the bed serial number that is stored in the CPU. It should match the serial number on the serial label on the bed. **Note** - If there are two matching serial numbers in the device list, the server will only recognize the first device that logs on to the server. • To find the bed's serial number, put the bed into the Bed Configuration mode and navigate to **Serial Number > Current SN** to verify the serial number. • If the serial number does not match, go to the **Edit SN** menu to edit the serial number, and then save.
Problem	**Possible cause**	**Solution**
Cannot see a location	The Locator ID was entered incorrectly.	1. Using the ***i*Bed** Locator Association Tool, select **View Current Location Associations**. 2. Click **Get Location Associations** from server. 3. Look through the **Hospital Location** and verify the Locator ID. **Note** - The Locator ID is alphanumeric and case sensitive. You must use lower case to enter the Locator ID letters, or the server will not recognize the locator. 3.1. If the Locator ID is incorrect, use the **Update** function to update the error. 3.2. If the Locator ID is missing, see *Adding locator IDs and hospital locations* (page 42).

Problem	Possible cause	Solution
Third party does not receive bed status information		1. Make sure the SEWSI **web.config** file has the correct Web URL.. 1.1. Navigate to the directory where the ***i*Bed** Server Tool is installed. 1.1.1. Navigate to the SEWSI folder and open the **web.config** file. 1.1.2. Find the line which contains **ServerURL=** 1) Make sure the local host was replaced with the IP of the server **Note** - This cannot be a DNS name. 2. Make sure **Port 80** is not blocked. 2.1. **Port 80** needs to be open between the Stryker server and products (bi-directional), and the Stryker server and any third-party servers (bi-directional) **(LINK HERE)**. 2.2. If **Port 80** is blocked, work with IT to open the port. 3. Search SEWSI logs to make sure there are no communication failures. Find messages generated for the third-party **(LINK HERE)**

Advanced

Connectivity issues (total device counts)

View total device counts to identify drops.

- Navigate to the directory where iBed Server Tools is installed and open the LOGS folder.

1. Find **StrykerMainenanceService_logfile.txt**.
2. Highlight several of the **StrykerMainenanceService_logfile.txt** files during the time when there may have been an outage.
   a. Right click and select **Edit with Notepad++.**
3. In **Notepad++** press **Ctrl+F** to open a find window.
   a. Search for the below string and select **Find in All Opened Documents**.

      Note - [Total Connected Devices Count excluding server =

b. The **Find Result** pane in **Notepad++** will populate with the lines of the selected log files (Figure 86).

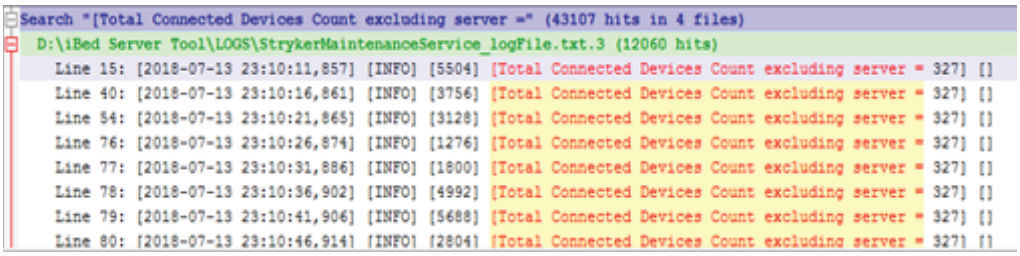

Figure 86 – Total device counts

c. Review the list until you locate the drop in the number of connected devices and the duration of time the devices were offline.

Work with the local IT department to investigate.

Third party communication issues

Search SEWSI log files for third party messages.

1. Open the ***i*Bed** Server Tool.
2. Navigate to the subscription list tab.

   Note - When you search for messages from a product, make sure that you use the correct Device ID.
3. Copy the subscription ID for a device which is going to the correct third party.

   a. Verify subscriber URL to find messages to a specific third party.
4. Navigate to the directory where ***i*Bed** Server Tool is installed.

   a. Open the **LOGS** folder.

   b. Find **SEWSI_logfile.txt**.
5. To search for messages in a specific timeframe, highlight multiple **SEWSI_logfile.txt** in that range based on the date modified in Windows Explorer.

   a. Right click the highlighted files and select **Edit with Notepad++**.
6. Press **Ctrl+F** to open a find window.

   a. Paste the **Subscription ID** copied in step 3.

   b. Select **Find in all opened documents**.

   c. The Find result pane will open with all messages containing the **Subscriber ID**.
7. Click the XML message from the Find pane to open the file to that line.

   a. XML messages will start in format **<?xml version=”1.0” encoding=utf-8”?>**.

   Note - Example message with the payload XML data highlighted: <?xml version="1.0" encoding="utf-8"?><soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"><soap:Body><ReceiveSubscriptionRequest xmlns="http://SEWSI.ServiceContracts/2008/09"><SubscriberID>C3000-000-000_180415201155204742</SubscriberID>**<PayloadXML><device id="3000-000-000_180415201"><BedHeightIn>27</BedHeightIn><LastLoggedWeightLb>102.900009</LastLoggedWeightLb><BedExitAlarming>false</BedExitAlarming></device></PayloadXML><TimeStamp>2018-07-16T11:59:14.3410647-04:00</TimeStamp>**</ReceiveSubscriptionRequest></soap:Body></soap:Envelope>] []

Device not connecting to server

Search for duplicate serial numbers (devices newer than GW1).

1. Open the ***i*Bed** Server Tool.
2. Navigate to the **Client Diagnostic Info** tab.
3. Click the far left blank cell of the header to highlight the entire table.
   a. Copy and paste the data in **Microsoft Excel**.
4. Highlight the **Client ID** column.
5. In the **Home** tab of the ribbon, click **Conditional Formatting**.
   a. Highlight **Cells Rules - Duplicate Values**.
   b. Click **OK** to highlight duplicates in red.
   c. Highlight the row above where the data was pasted, click the **Data** tab, and select **Filter**.

Any cells highlighted (except **Network Exception / Timeouts**) are duplicate serial numbers which need to be resolved.

Connectivity issues to one / multiple devices

Not receiving specific bed status over port 80.

- Verify communication from devices to the server with SOAP UI.

  Note - Requires Stryker supplied project file.

1. Open **SOAP UI**.
2. In the **Projects** pane, expand the **SEWSI** folder.
3. Click **Connectivity Mock** to open **Connectivity Mock** window (Figure 87).

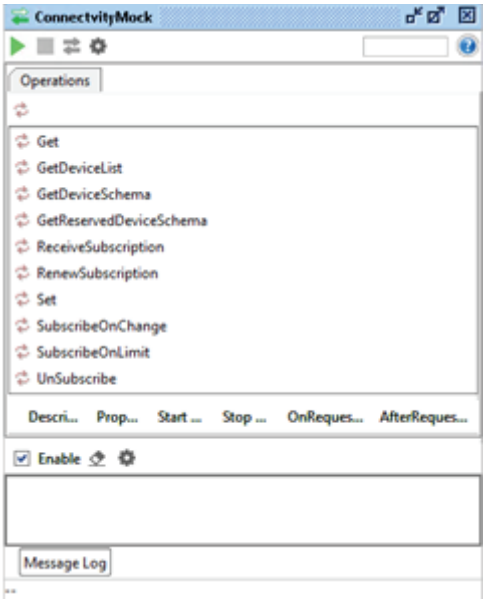

Figure 87 – Connectivity Mock

4. Click the gear icon to edit settings for Mock Third Party.
    a. Modify host URL to the IP address of the server where SOAP UI is running (Figure 88).

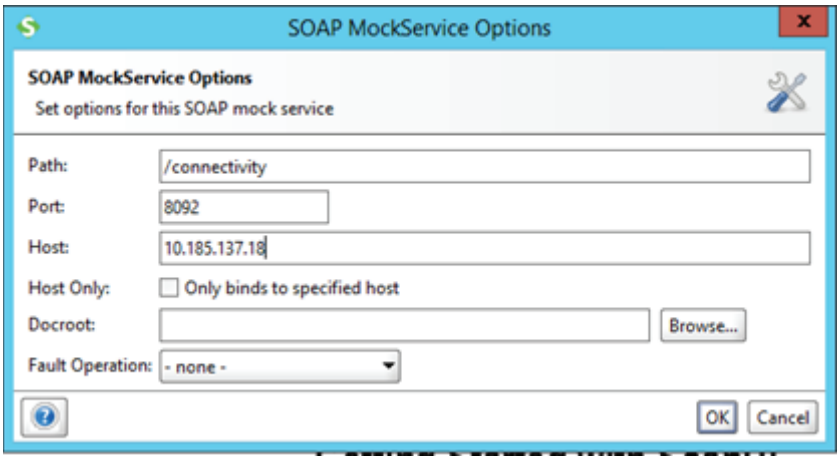

Figure 88 – SOAP UI

    b. Click **OK** to save.
5. Click the green **Play** icon to start the Mock Third Party Service.
6. Click the green arrows to open the service webpage to verify.
    a. Copy the URL of the webpage to the clipboard
7. In the Projects Pane, expand **SEWSIWebServiceContract**.
    a. Expand **SubscribeOnChange**.
    b. Double click **VTF - Sub 3 (72 hour)**.
    c. Modify the Subscriber URL with the URL from step 3.3.1 (Figure 89).

Figure 89 – VTF - Sub 3 (72 hour)

    d. Change the Device ID to the Device ID being searched for (Figure 89).
    e. Click the Play icon in **VTF - Sub 3 (72 hour)** window.

8. In the **ConnectivityMock** window, you will begin to see messages appear in the message log if the ports are open and the server is able to communicate with the device (Figure 90).

   Note - If messages do not populate, port 80 may be closed or the **WebServiceURL** in the **SEWSI web.config** file may be incorrect.

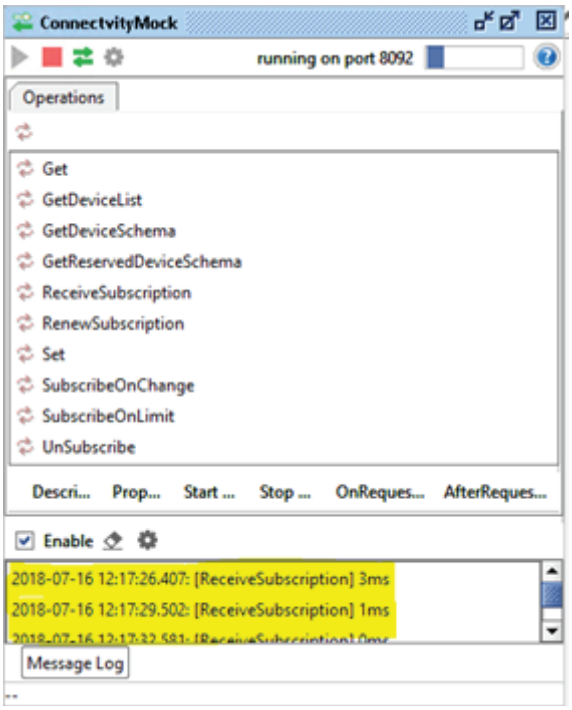

Figure 90 – Message Log

9. Double click a message to view the XML generated (Figure 91).

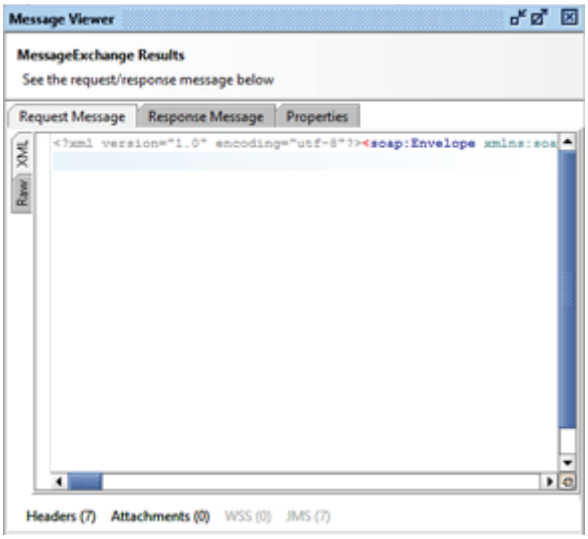

Figure 91 – Message Viewer

Cannot communicate with device (verify ports are open)

Verify communication with device over port using **TELNET**.

1. Open a **command** prompt.

2. Enter the command **telnet <IPAddress> <Port>**, where **IP Address** is the address of the device and **Port** is the port number for verification (Figure 92).

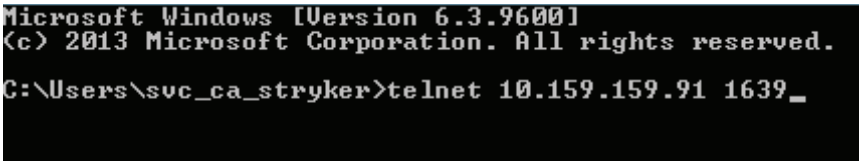

Figure 92 – Command prompt

- A blank box with a blinking cursor indicates that the port is open.
- **Connecting to** indicates that the port is closed or the device is offline (Figure 93).

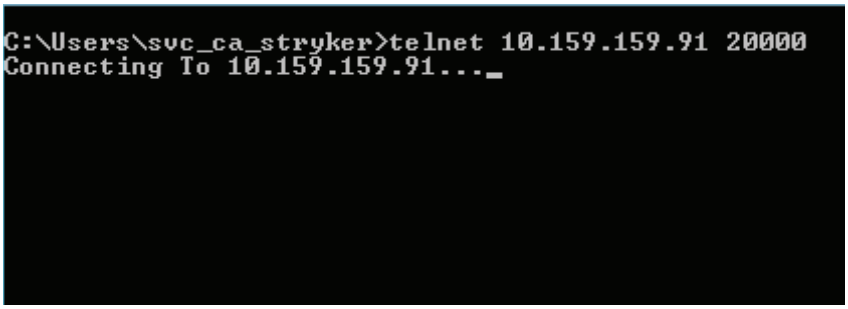

Figure 93 – Connecting

Note - Only use **TELNET** for a device that is online and pingable.

Cannot communicate with device (DNS only)

Verify Hostname with **NSLOOKUP**

1. Open a **command** prompt.
2. Enter the command **nslookup <IPAddress>** where **IP Address** is the address of the device for **DNS entry** verification.
   - A reply with the **hostname** and **IP address** indicates success (Figure 94).

   Note - The first line is the **DNS** server name and IP address. The second line is the device hostname/IP.

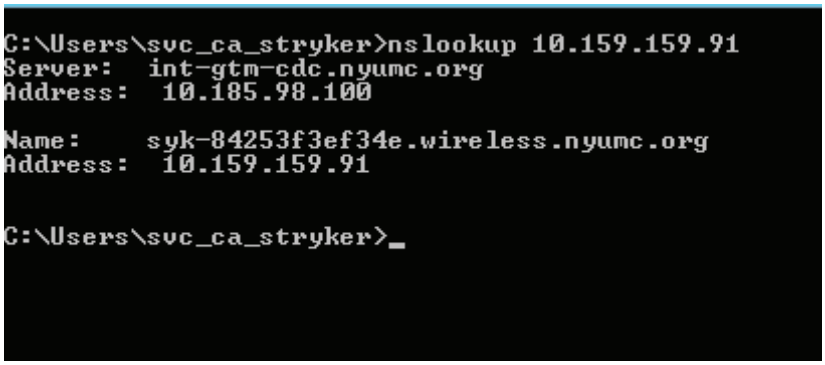

Figure 94 – DNS success

- A reply that states **<DNSServerName> can't find <IPAddress>** indicates failure (Figure 95).

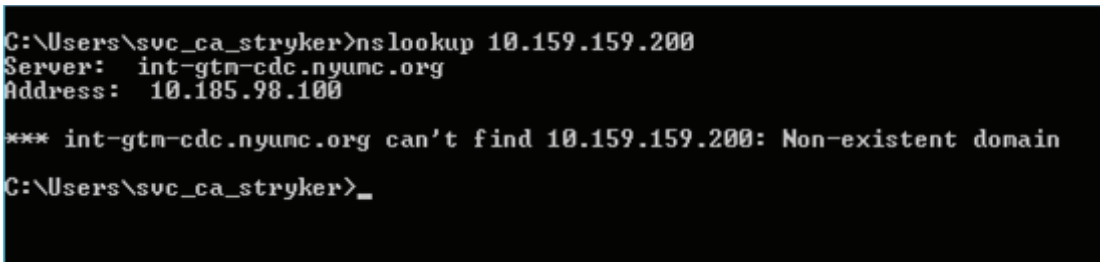

Figure 95 – DNS failure

3. To verify a reverse lookup, enter the command **nslookup <hostname>** where the **hostname** is the device you are verifying DNS entry for.

   Note - The server reply should be the same as seen in step 2.

Smart Equipment Management (option) troubleshooting

1. To verify **Device Data Manager Utility**:
   - In Windows, click **Start**.
   - Enter **StrykerDeviceDataManagerRegistration** in the search box.
   - Make sure that the **StrykerDeviceDataManagerRegistration** utility is displayed in the search results.
2. To verify in ***i*Bed Server Tool**:
   - Locate the machine where the Stryker ***i*Bed** Server application is installed and open the ***i*Bed Server Tool**.
   - Click the **Subscription List** tab and make sure that the **Device ID** and **Subscription ID** columns are populated.
   - Make sure that the server has a general subscription and each device has both a general and alarm subscription (Figure 96).

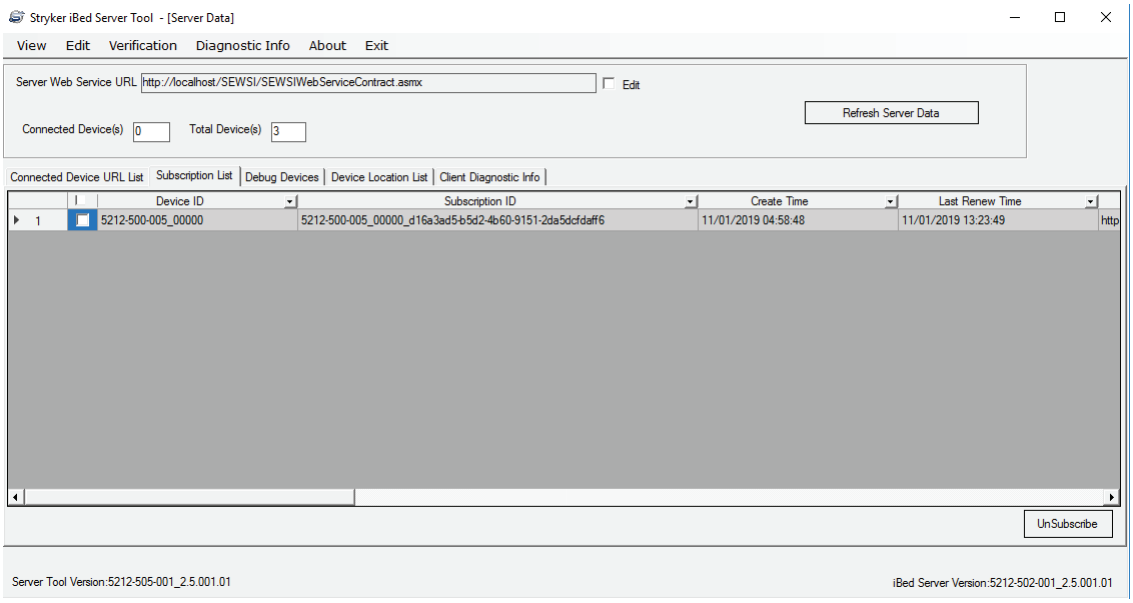

Figure 96 – General subscription

- Make sure that the **Subscriber URL** column displays the same URL shown in the **Web.config** file of the Device Data Manager (Figure 97 and Figure 98).

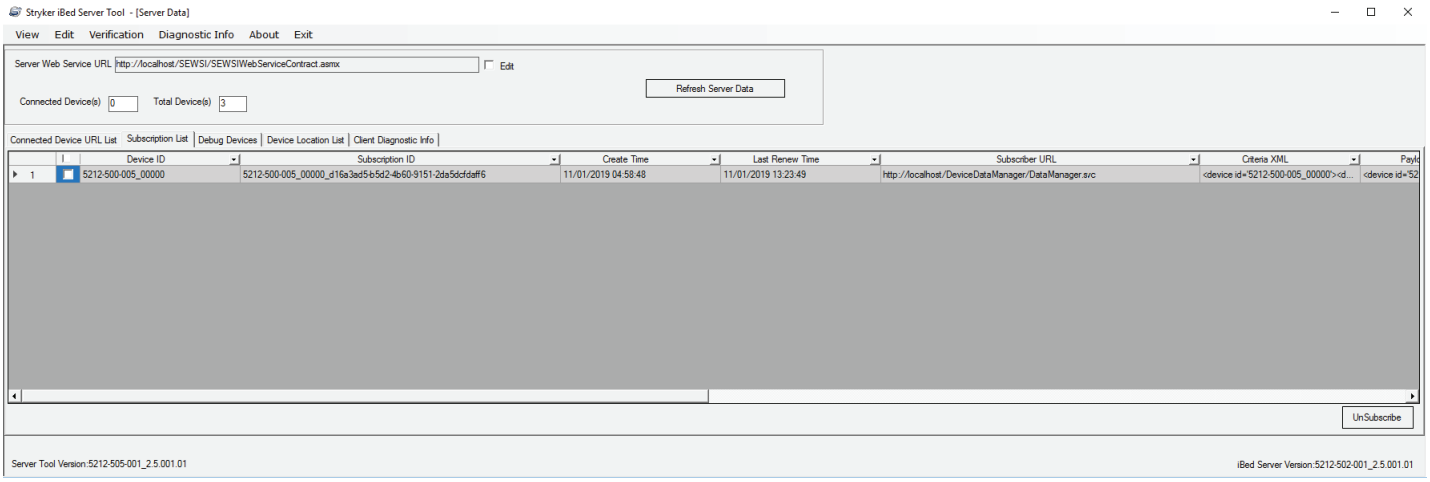

Figure 97 – Subscription List

```
appSettings>
   <add key="SEWSI_URL" value="http://10.117.40.238/SEWSI/SEWSIWebServiceContract.asmx"></add>
   <add key="CHAP_URL" value="http://10.117.40.238/CHAP/CHAPWebServiceContract.asmx"></add>
   <add key="SUBSCRIBERURL" value="http://10.117.40.238/DeviceDataManager/DataManager.svc"></add>
   <add key="IserverIP" value="10.117.40.238"></add>
   <add key="IsLifenet" value="true"></add>
   <add key="LifenetRegistrationUrl" value="https://api-ng-dev.physio-labs.com/bedagents/?api-version=1.0"></add>
   <add key="LifenetAgentUrl" value="/bedagents/{0}?api-version=1.0"></add>
   <add key="LifenetBedUrl" value="/beds/{0}?api-version=1.0"></add>
   <add key="LifeNetUserName" value="Test"></add>
```

Figure 98 – Web.config file

3. To verify server data in the Device Data Manager log file:

   - Search for string **"DeviceID=<SerialNumber> JsonContent="** in the log file (Figure 99)

     Note - Replace **<SerialNumber>** with serial number in the **Web.config** file.

```
[2017-11-23 11:51:07,355] [DEBUG] [19364] [Entering function LifenetDataManager::UploadDataToCloud] []
[2017-11-23 11:51:07,394] [INFO] [19364] [In LifenetDataManager DeviceID = 1234567890 JsonContent=
{"GatewaySerial":"1234567890","GatewayModel":"5212-500-005_00000","IPAddress":"10.50.113.78","SoftwareVersion":"1.0.0.2","Description":"TestHospital","TotalDevices":6}]
[2017-11-23 11:51:07,470] [DEBUG] [19364] [Leaving function IServerManager::ParseSubscribedDataStream] []
```

Figure 99 – Example: DeviceID = 1234567890 JsonContent=

   - Search for string **"Data Uploaded for Server successfully!"** in the log file (Figure 100)

```
[2017-05-22 13:33:07,487] [INFO] [3624] [No change detected in server data returning] []
[2017-05-22 13:33:07,503] [INFO] [15340] [Data Upload Response for deviceID = :3000-000-000_DeviceS11Pal43 content = ] []
[2017-05-22 13:33:07,503] [INFO] [15340] [Data Uploaded successfully for DeviceID = 3000-000-000_DeviceS11Pal43] []
[2017-05-22 13:33:07,518] [INFO] [16072] [Data Upload Response for deviceID = :247703F4B422 content = ] []
[2017-05-22 13:33:07,518] [INFO] [16072] [Data Uploaded for Server successfully!] []
[2017-05-22 13:33:07,612] [INFO] [16072] [Starting request processing for SubscriptionID = C3000-000-000_DeviceS11Pal78_201705221317313380] []
[2017-05-22 13:33:07,737] [INFO] [15340] [Data Upload Response for deviceID = :3000-000-000_DeviceS11Pal138 content = ] []
[2017-05-22 13:33:07,737] [INFO] [15340] [Data Uploaded successfully for DeviceID = 3000-000-000_DeviceS11Pal138] []
[2017-05-22 13:33:07,737] [INFO] [16072] [Time taken for deserilization (ms) = 0] []
[2017-05-22 13:33:07,752] [INFO] [6156] [DeviceID = 3000-000-000_DeviceS11Pal78 JsonContent=
```

Figure 100 – Data uploaded in log file

4. To verify connected devices in the log file:

   - Search for string **"DeviceID = <deviceID> JsonContent="** in the log file (Figure 101)

     Note - Replace **<deviceID>** with device ID of the connected device.


```
[2017-12-05 14:13:26,222] [INFO] [10152] [In LifenetDataManager DeviceID = 3000-000-000_DeviceS1 JsonContent=  {"ActiveDeviceError":true,"ActiveDeviceErrorInformation":"load cell
error","DeviceErrorLog1":"FR LoadCell Error","DeviceErrorLog2":"FRSR Switch Error","DeviceErrorLog3":"HRSR Switch Error","DeviceErrorLog4":"FLSR Switch Error","DeviceErrorLog5":"FLSR
Switch Error","DeviceErrorLog6":"FLSR Switch Error","DeviceErrorLog7":"FRSR Switch Error","DeviceErrorLog8":"FRSR Switch Error","DeviceErrorLog9":"FR LoadCell Error","DeviceErrorLog10":"FR
LoadCell Error","IPAddress":"172.156.10.11","MACAddress":"pqrst","NetworkAddress":"http://localhost/device1/service.asmx/Interface
","SoftwareVersion":"1.0","PatientPresent":false,"RSSI":"20","LowBedHeight":false,"HRSiderailUp":true,"HLSiderailUp":true,"FRSiderailUp":true,"FLSiderailUp":true,"BrakeOn":true,"BedExitArmed
":false,"LBSArmed":false,"BedExitAlarming":false,"LBSAlarming":false,"BrakeAlarming":false,"Online":true,"ConnectionUptime":1564.4642602,"SerialNumber":"3000-000-000_DeviceS1","Model":"Med-S
urg"}] []
```


Figure 101 – Example: DeviceID = 3000-000-000_DeviceS1 JsonContent=

   - Search for string **"Data Uploaded successfully for DeviceID = <deviceID>"** in the log file (Figure 102)

     Note - Replace **<deviceID>** with device ID of the connected device.


```
[2017-12-05 13:47:56,425] [INFO] [12688] [Connection to Lifenet established successfully. Data uploaded successfully for d
[2017-12-05 13:47:56,425] [DEBUG] [12688] [Leaving function LifenetDataManager::UploadDataToCloud] []
[2017-12-05 13:47:56,425] [INFO] [12688] [Device data successfully uploaded for 3000-000-000_DeviceS1 in Lifenet] []
[2017-12-05 13:47:56,425] [DEBUG] [12688] [Leaving function LifenetDeviceStatusManager::UploadDeviceData] []
[2017-12-05 13:47:56,425] [DEBUG] [12688] [Leaving function LifenetDeviceStatusManager::ProcessData] []
```


Figure 102 – Example: Data Uploaded successfully for 3000-000-000_DeviceS1 in LIFENET

Email alerts

The following email alerts may be generated by the ***i*Bed** server application.

Email info	Scenario
Email Subject: Stryker iBed Server Alert **Email Body:** 2015-04-20 00:24:59,298 [2964] ERROR Stryker.IServer. BusinessLogic.SEWSI.RuleManager. EMailToAdminForLowBatteryStatus - SEND EMAIL: Stryker room locator f5d5b2130000 in room 205 has a low battery. Currently connected to device ID 3000-000-000_ 130316141.	Low Battery Status is true for the BBID mapped with a location
Email Subject: Stryker iBed Server Alert **Email Body:** 2015-04-20 00:35:51,784 [2328] ERROR Stryker.IServer. BusinessLogic.SEWSI.RuleManager. EMailToAdminForLowBatteryStatus - SEND EMAIL: Stryker room locator f5d5b2130000 is not in the location list and has a low battery, update the location and association lists as required. Currently connected to device ID 3000-000-000_130316141.	Low Battery Status is true for a BBID which is not mapped to any room or the BBID is missing

Email info	Scenario
Email Subject: Stryker iBed Server Alert **Email Body:** 2015-04-20 00:45:22,254 [2328] ERROR Stryker.IServer. BusinessLogic.SEWSI.RuleManager. EmailToAdminForMissingBBID - SEND EMAIL: Stryker room locator f5d5b2130000 is not in the location list and does not have an association to a room, update or create the location association as required. Currently connected to device ID 3000-000-000_130316141.	BBID is sent in the subscription payload but it is not present in the “BBIDList.xml” file
Email Subject: Stryker iBed Server Alert **Email Body:** 2015-04-20 00:48:02,395 [2328] ERROR Stryker.IServer. BusinessLogic.SEWSI.RuleManager. EmailToAdminForMissingBBID - SEND EMAIL: Stryker room locator f5d5b2130000 is in the location list but is not associated to a room, update the location association as required. Currently connected to device ID 3000-000-000_ 130316141.	BBID is sent in payload and it is present in “BBIDList.xml” file but not present in “DeviceBBIdLocationAssciation.xml” file
Email Subject: Stryker iBed Server Alert **Email Body:** 2015-04-20 00:50:52,536 [2328] ERROR Stryker.IServer. BusinessLogic.SEWSI.RuleManager. EmailToAdminForMissingBBID - SEND EMAIL: Stryker room locator f5d5b2130000 is in the location list but is associated to an undefined room, update the location association as required. Currently connected to device ID 3000-000-000_130316141.	BBID is sent in payload and it is present in “BBIDList.xml” file and in “DeviceBBIdLocationAssciation.xml” file but location for that BBID is missing in “DeviceBBIdLocationAssciation.xml” file
Email Subject : **Stryker iBed Server Urgent Alert** **Email Body:** **Application Health Check Failed at Step 1 -> iBedServer is unable to access the database. Please restart the MS-SQL database. After restart, if the message continues, please contact Stryker support.**	When DB is down
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **Application Health Check Failed at Step 2 -> The MS-SQL database is corrupt. Following Tables are missing in Database ->DeviceConnectionInfoList. Please contact Stryker support to rebuild.Application Health Check Failed at Step 3 -> iBedServer is unable to access SEWSI. Please restart the World Wide Web Publishing Service and StrykerSEWSIHeartbeatservice. After restart, if the message continues, please contact Stryker support.**	DeviceConnectionInfoList table doesn't exist

Email info	Scenario
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **Application Health Check Failed at Step 2 -> The MS-SQL database is corrupt.Following Tables are missing in Database ->MasterSubscriptionInfo. Please contact Stryker support to rebuild.**	MasterSubscriptionInfo table doesn't exist
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **Application Health Check Failed at Step 2 -> The MS-SQL database is corrupt.Following Logins are missing in Database ->NT AUTHORITY\LOCAL SERVICE. Please contact Stryker support to rebuild.**	LOCAL SERVICE doesn't exist
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **Application Health Check Failed at Step 2 -> The MS-SQL database is corrupt.Following Logins are missing in Database ->NT AUTHORITY\NETWORK SERVICE. Please contact Stryker support to rebuild.** **Application Health Check Failed at Step 3 -> iBedServer is unable to access SEWSI. Please restart the World Wide Web Publishing Service and StrykerSEWSIHeartbeatservice. After restart, if the message continues, please contact Stryker support.**	NETWORK SERVICE doesn't exist
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **Application Health Check Failed at Step 3 -> iBedServer is unable to access SEWSI. Please restart the World Wide Web Publishing Service and StrykerSEWSIHeartbeatservice. After restart, if the message continues, please contact Stryker support.** **Application Health Check Failed at Step 4 -> StrykerSEWSIHeartbeatservice is not running. Please restart StrykerSEWSIHeartbeatservice. After restart, if the message continues, please contact Stryker support.**	Both SEWSI and HB services are down

Email info	Scenario
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **Application Health Check Failed at Step 2 -> The MS-SQL database is corrupt.Following Tables are missing in Database ->MasterSubscriptionInfo . Please contact Stryker support to rebuild.** **Application Health Check Failed at Step 3 -> iBedServer is unable to access SEWSI. Please restart the World Wide Web Publishing Service and StrykerSEWSIHeartbeatservice. After restart, if the message continues, please contact Stryker support.** **Application Health Check Failed at Step 4 -> StrykerSEWSIHeartbeatservice is not running. Please restart StrykerSEWSIHeartbeatservice. After restart, if the message continues, please contact Stryker support.**	Both SEWSI and HB services are down and MasterSubscriptionInfo table doesn't exist
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **Application Health Check Failed at Step 3 -> iBedServer is unable to access SEWSI. Please restart the World Wide Web Publishing Service and StrykerSEWSIHeartbeatservice. After restart, if the message continues, please contact Stryker support.** **Application Health Check Failed at Step 4 -> StrykerSEWSIHeartbeatservice is not running. Please restart StrykerSEWSIHeartbeatservice. After restart, if the message continues, please contact Stryker support.**	HB is down
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **iBed Server is unable to communicate with Stryker clients. Please check the server/network configuration. If the message continues, please contact Stryker Technical Support.**	No devices are detected

Email info	Scenario
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **Total number of clients connected to iBed Server has gone below <configured threshold>. Please check the server/network configuration. If the message continues, please contact Stryker Technical Support.**	Number of connected devices drops below the configured threshold value
Email Subject: **Stryker iBed Server Urgent Alert** **Email Body:** **The following errors with Third Party Communication has been recorded in last 1 hour.** **<Error>**	Error with third party

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