How to Deploy AWS IoT SiteWise on the EC942 Edge Computer

Part 1: Creating SiteWise Edge Gateway

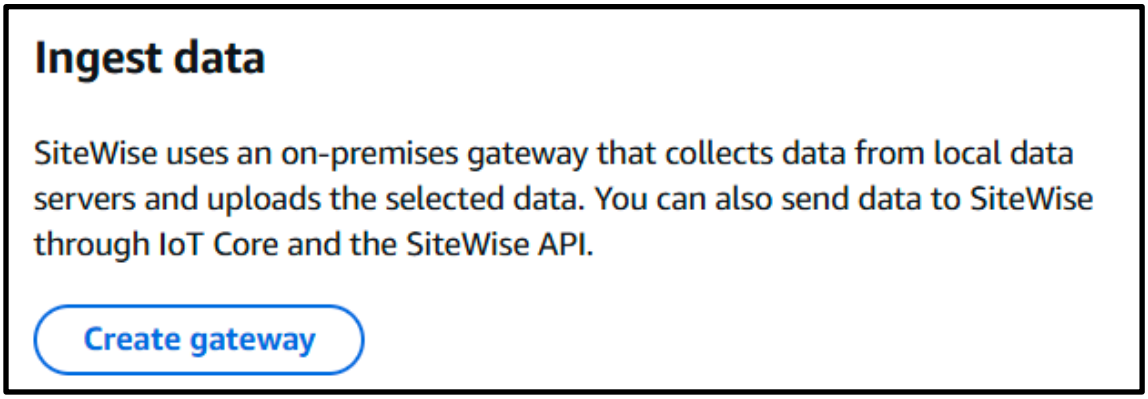
Setting up an AWS IoT SiteWise Edge gateway involves creating the gateway in the AWS Management Console, installing the necessary software on your local device, and configuring the publisher component to manage data flow to the AWS Cloud. Below are detailed step-by-step instructions to guide you through this process.

Prerequisites:

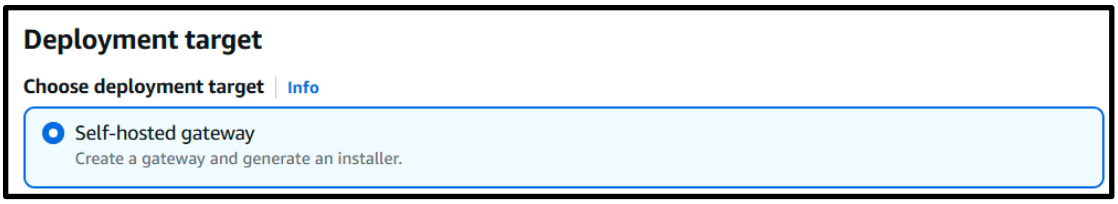
- **AWS Account:** Ensure you have an active AWS account with the necessary permissions to create and manage AWS IoT SiteWise resources.
- **Installed IoT Greengrass:** Greengrass provides the runtime for deploying and managing local IoT workloads, including the SiteWise Edge components necessary for data collection, processing, and sending data to the AWS IoT SiteWise cloud service.
- **Inhand EC942 Device:** A physical or virtual device that will serve as the SiteWise Edge gateway.

Step 1: Create a SiteWise Edge Gateway

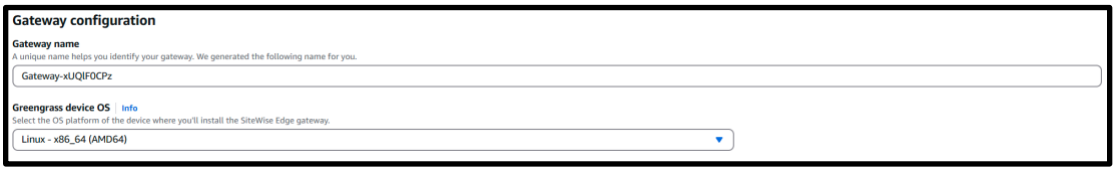
1. **Access the AWS IoT SiteWise Console:**
    - Sign in to the AWS Management Console.
    - Navigate to the AWS IoT SiteWise console.
2. **Initiate Gateway Creation:**
    - In the navigation pane, select **Edge gateways**.
    - Click on **Create gateway**.



3. **Configure Gateway Details:**
    - **Deployment type:** Choose **Self-hosted gateway**.



- **Gateway name:** Enter a unique name for your gateway or use the default name provided.
- **Greengrass device OS:** Select the operating system of your local device (e.g., Linux).



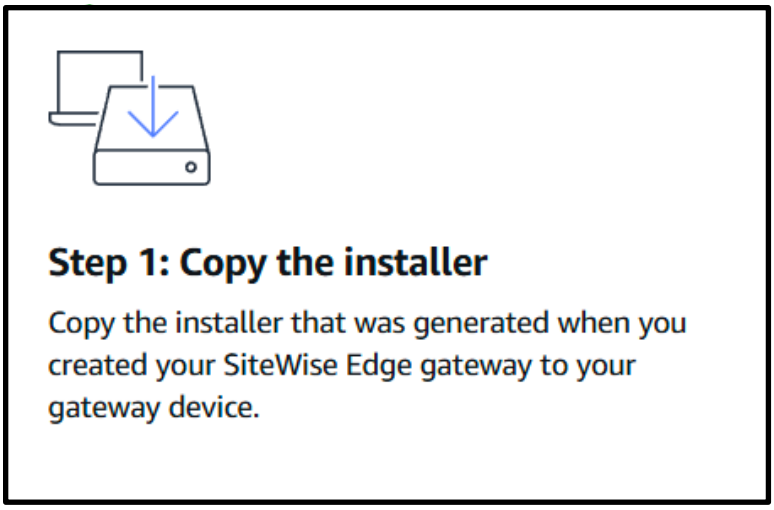
- **Click Create gateway button to finish:**

- **Click Generate and download:**

4. **Set Up Greengrass Core Device:**
   - **Automatic setup:**
     - Enter a name for the Greengrass core device or use the default.
   - **Advanced setup:**
     - Choose an existing Greengrass core device or create a new one in the AWS IoT Greengrass V2 console.
     - For detailed instructions, refer to the AWS IoT Greengrass V2 Developer Guide.
5. **Finalize and Create:**
   - Review all configurations.
   - Click **Create gateway** to complete the setup.

Step 2: Install Gateway Software on Your Local Device

After creating the gateway, you'll need to take the xxx-deploy.sh file that was downloaded and install the SiteWise Edge gateway software on your local device.



For EC942:

1. **Transfer the Installer:**
    - Use SSH or another method to copy the installer file from your computer to the local device.

Example using `scp`:
bash
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```
scp path-to-installer.sh username@device-ip:/desired-directory/
```

2. **Install the Software:**

Connect to your device via SSH:
bash
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```
ssh username@device-ip
```

Navigate to the directory containing the installer:
bash
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```
cd /desired-directory/
```

Make the installer executable:
bash

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```
chmod +x path-to-installer.sh
```

Run the installer with elevated privileges:
bash
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```
sudo ./path-to-installer.sh
```

For detailed installation instructions, refer to the AWS IoT SiteWise User Guide.

If you see this error stating the minimum OS version is Debian 11:

```
Error: Please make sure 'docker' group is succesfully created with the docker installation, and run the installation script again.
```

Execute

```
sudo groupadd docker
```

```
sudo usermod -aG docker <your_username>
```

Re-run the script again

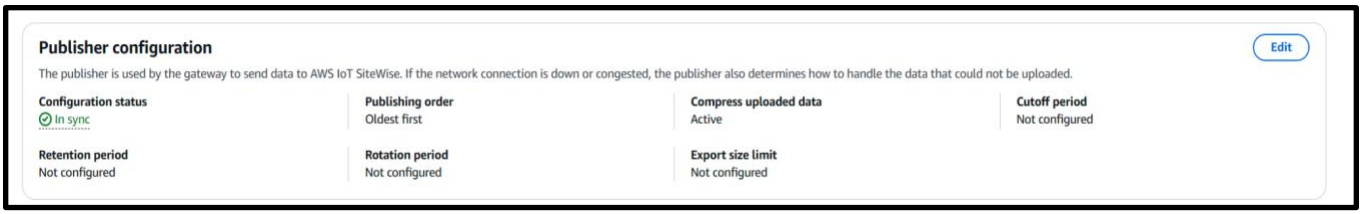
```
sudo ./path-to-installer.sh
```

You should now see your SiteWise Edge Gateway device online

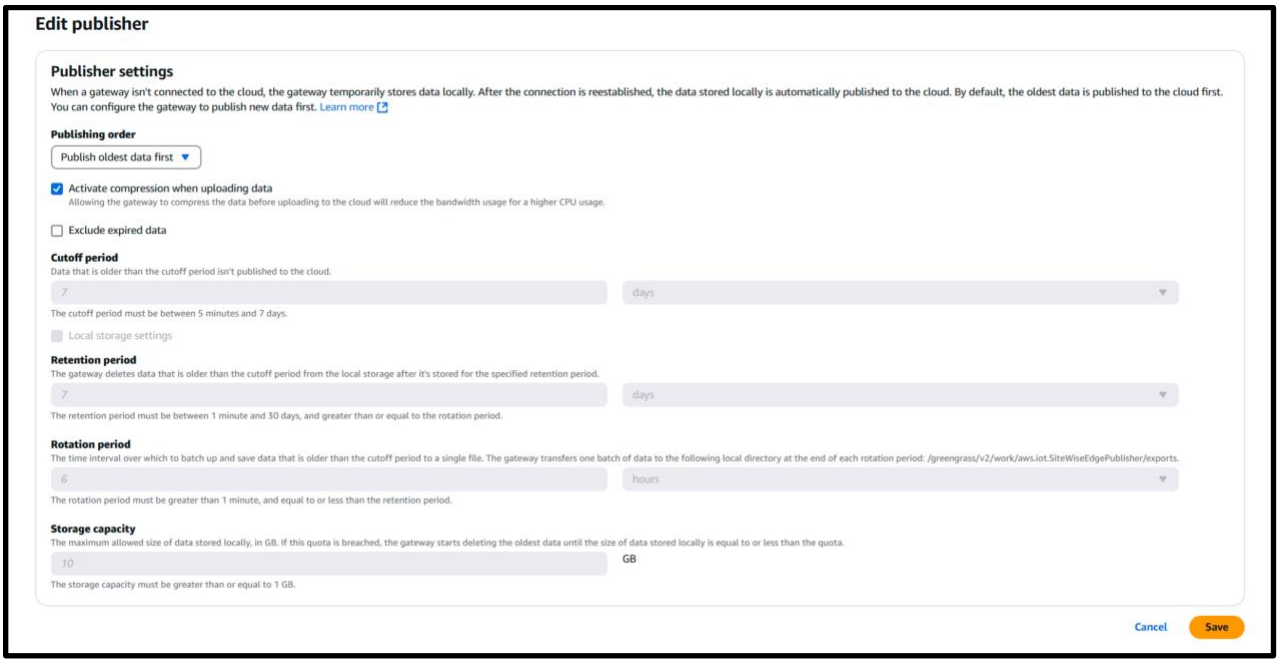
Step 3: Configure the SiteWise Publisher Component

The SiteWise Publisher component manages the data flow from your local device to the AWS Cloud.

1. **Access Edge Gateway Settings:**
    - In the AWS IoT SiteWise console, navigate to **Edge gateways**.
    - Select your newly created gateway.
2. **Edit Publisher Configuration:**
    - In the **Publisher configuration** section, click **Edit**.



3. **Set Publishing Preferences:**
    - **Publishing order:** Choose between:
        - **Publish oldest data first** (default)
        - **Publish newest data first**
    - **Data compression:** Enable or disable compression during data upload.
    - **Data expiry:** Set a cutoff period to exclude data older than a specified duration from being published.
4. **Configure Local Storage Settings (Optional):**
    - **Retention period:** Define how long data should be stored locally.
    - **Storage capacity:** Set the maximum storage capacity for local data.
5. **Save Configuration:**
    - After configuring the settings, click **Save** to apply the changes.



For more information on configuring the publisher component, see the AWS IoT SiteWise User Guide.

Additional Resources:

- **Video Tutorial:** For a visual walkthrough of the setup process, watch the Using the Streamlined SiteWise Edge Gateway Setup Process video.

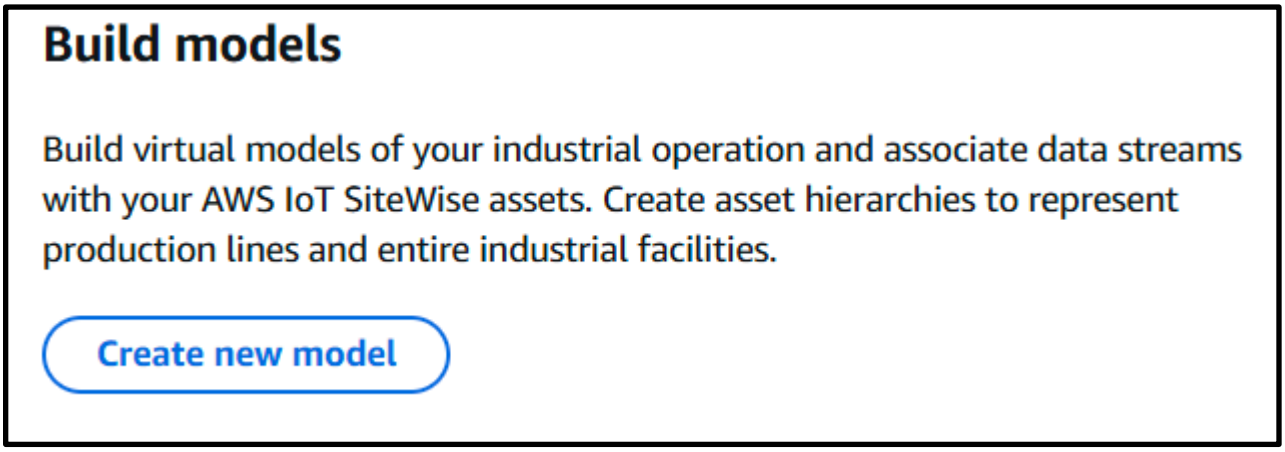
Part 2: Creating Data Model

Step 1: Access the AWS IoT SiteWise Console

1. Sign in to the AWS Management Console.
2. Navigate to the AWS IoT SiteWise console.

Step 2: Create an Asset Model

1. In the navigation pane on the left, select **Models**.
2. Click on **Create model**.



3. On the **Create model** page, provide the following details:
    - **Name**: Enter a unique name for your asset model (e.g., "Wind Turbine Model").
    - **Description**: (Optional) Provide a brief description of the model.
    - **External ID**: (Optional) Add a user-defined ID for external reference.
4. Define the properties of the asset model:
    - **Measurements**: Represent real-time data streams from equipment.
        - Click **Add measurement**.
        - Enter a **Name** (e.g., "Temperature").
        - Choose a **Data type** (e.g., "Double").
        - Specify the **Unit** (e.g., "°C").
    - **Transforms**: Define formulas to process incoming data.
        - Click **Add transform**.
        - Enter a **Name** (e.g., "Temperature in Fahrenheit").
        - Define the **Formula** (e.g., `input_property * 9/5 + 32`).
        - Select the **Input property** (e.g., "Temperature").
    - **Metrics**: Aggregate data over specified time intervals.
        - Click **Add metric**.
        - Enter a **Name** (e.g., "Average Temperature").
        - Define the **Expression** (e.g., `avg(input_property)`).

        - Select the **Input property** (e.g., "Temperature").
        - Choose a **Window type** (e.g., "Tumbling") and specify the **Interval** (e.g., "1h").
    - **Attributes**: Static information about the asset.
        - Click **Add attribute**.
        - Enter a **Name** (e.g., "Manufacturer").
        - Choose a **Data type** (e.g., "String").
        - Enter a **Default value** (e.g., "ABC Corp").
5. Define hierarchies if your asset model includes components:
    - Click **Add hierarchy**.
    - Enter a **Name** (e.g., "Blades").
    - Select a **Child asset model** that represents the component.
6. (Optional) Add tags to organize and manage your asset model.
7. Review all configurations and click **Create model**.

After creation, the asset model's status will be **CREATING**. This process may take a few minutes. Once the status changes to **ACTIVE**, you can proceed to create assets based on this model.

Step 3: Create an Asset from the Asset Model

1. In the navigation pane, select **Assets**.
2. Click on **Create asset**.
3. On the **Create asset** page:
    - **Model**: Choose the asset model you created (e.g., "Wind Turbine Model").
    - **Name**: Enter a unique name for the asset (e.g., "Turbine A").
    - (Optional) Add tags for the asset.
4. Click **Create asset**.

The asset's status will initially be **CREATING**. Once it changes to **ACTIVE**, the asset is ready for use.

Additional Resources:

For a visual walkthrough, you can watch the following video:

Part 3: Monitor Asset Information

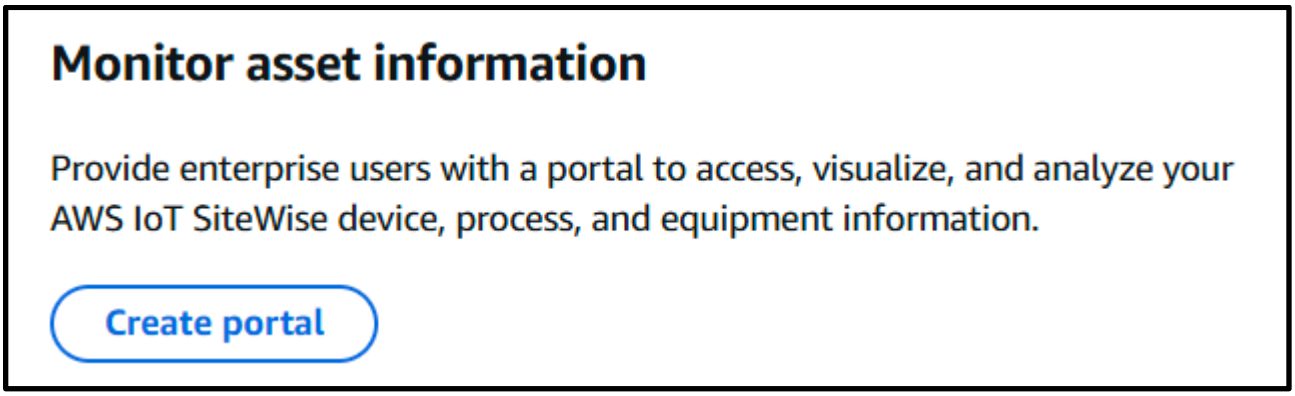
To monitor asset information in AWS IoT SiteWise, you can create a SiteWise Monitor portal. This portal allows you to visualize and interact with your asset data through customizable dashboards. Follow these steps to set up your portal:

Step 1: Sign in to the AWS IoT SiteWise Console

1. Open the AWS Management Console.
2. Navigate to the AWS IoT SiteWise console.

Step 2: Create a New Portal

1. In the navigation pane, select **Monitor**, then choose **Getting started**.
2. Click on **Create portal**.



Step 3: Configure Portal Details

1. **Portal name**: Enter a unique name for your portal.
2. **Description**: (Optional) Provide a brief description to help identify the portal's purpose.
3. **Logo**: (Optional) Upload a square PNG image for branding. Non-square images will be scaled to fit.
4. **User authentication**: Choose one of the following:
    - **IAM Identity Center**: Allows users to sign in with corporate credentials. If not enabled, you'll be prompted to set up IAM Identity Center.
    - **IAM**: Users sign in with AWS Identity and Access Management credentials.
5. **Support contact email**: Enter an email address for user support inquiries.
6. **Permissions**:
    - Choose **Create and use a new service role** to allow portal users to access your AWS IoT SiteWise resources.
7. Click **Next** to proceed.

Step 4: Enable Alarms (Optional)

1. To monitor asset properties and receive notifications for specific conditions, enable alarms:
    - Select **Enable alarms**.
    - Configure the necessary alarm settings as prompted.
2. Click **Next** to continue.

Step 5: Review and Create the Portal

1. Review all the configurations you've made.
2. Click **Create portal** to finalize the setup.

Step 6: Add Administrators and Users

1. After the portal is created, you'll need to add administrators:
    - In the portal details page, select **Administrators**.
    - Click **Add administrator** and provide the required information.
2. To add users:
    - In the portal details page, select **Users**.
    - Click **Add user** and enter the necessary details.

Step 7: Create Projects and Dashboards

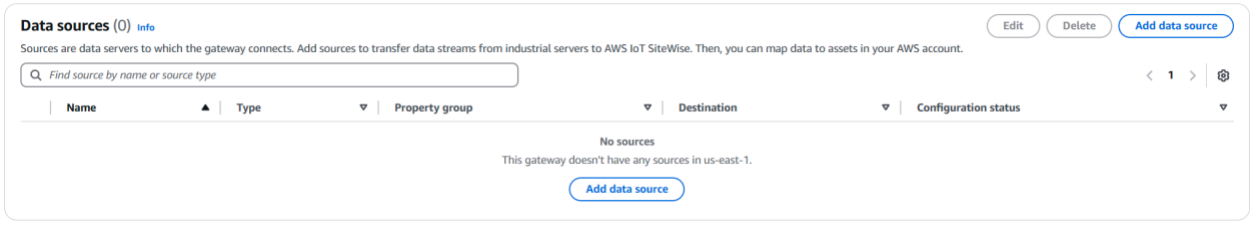
1. Within your portal, create projects to organize your assets and dashboards:
    - Navigate to the **Projects** section.
    - Click **Create project** and provide a name and description.
2. Inside each project, create dashboards to visualize asset data:
    - Open the desired project.
    - Click **Create dashboard**.
    - Use the available widgets to display asset properties, charts, and other relevant information.

By following these steps, you can effectively monitor your asset information through a customized SiteWise Monitor portal. For more detailed guidance, refer to the AWS IoT SiteWise User Guide.

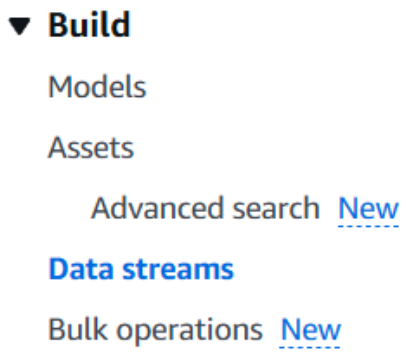
Part 4: Data Source (optional)

For testing purposes, I used Node-Red deployed on my InHand device to simulate an OPC-UA server that based on a 1 second timer, sends temperature values to the server.

Under Edge gateways -> Add data source, an OPC-UA server can be configured.



After letting Node-Red simulate data, you can view the data under Data Streams:



Click the Up arrow in the bottom right of the screen to view the graph: