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Introduction to Cisco Edge Intelligence

Cisco Edge Intelligence is an edge-to-multi-cloud data orchestration software that is designed to process data from connected edge assets. This software is deployed on Cisco industrial routers and compute gateways for simple out-of-the-box deployment.

Cisco Edge Intelligence is now available as an independent IOx application, without dependency on IoT Operations Dashboard cloud platform. This guide covers the standalone solution, while the documentation for Cisco Edge Intelligence deployed using cloud infrastructure (IoT Operations Dashboard) is available here.

Cisco Edge Intelligence gives organizations full control over data, including its extraction, transformation, governance, and delivery. At each stage of data collection, Cisco Edge Intelligence streamlines processes for easy scalability. For example, Cisco Edge Intelligence significantly reduces the time required for the labor-intensive process of developing and deploying applications that process data at the edge.

Cisco Edge Intelligence also provides the flexibility to integrate with multiple applications in multiple clouds. Cisco Edge Intelligence offers native integrations for Microsoft Azure IoT Hub and other MQTT applications.

Devices that support Cisco Edge Intelligence agent

The Cisco Edge Intelligence agent runs on Cisco network devices as a Cisco IOx app on the following devices:

- Cisco 829 Industrial Integrated Services Routers (Cisco IR829)
- Cisco Catalyst IR1101 Rugged Series Router
- Cisco Catalyst IR1800 Rugged Series Routers
- Cisco Catalyst IE3400 Rugged Series
- Cisco IC3000 Industrial Compute Gateway

Overview of edge to multi-cloud data flow

Cisco Edge Intelligence helps you take control of your data throughout key aspects of its lifecycle, helping you simplify processes from start to finish.

Figure 1: Data lifecycle

You configure the Cisco Edge Intelligence agent to address the following processes:

- **Extract**: You can automatically ingest data from any edge sensor using Cisco Edge Intelligence hosted on Cisco network equipment. Cisco Edge Intelligence has built-in industry-standard connectors such as OPC Unified Architecture (OPC-UA), Modbus (TCP/IP and Serial), and MQ Telemetry Transport (MQTT) that allow data to be extracted from various dissimilar sources. The data is then converted to industry-standard formats to enable its full use.
- **Transform**: Once the data is extracted, Cisco Edge Intelligence enables real-time processing to filter, compress, or analyze data in a uniquely simple way. You can then create code to define how the extracted data is processed. Using an in-app editor, developers can create, test, and deploy code without having to leave the Cisco Edge Intelligence portal.
- **Govern**: Cisco Edge Intelligence provides a central point for the creation and deployment of policies that govern how edge data is processed and delivered.
- **Deliver**: The extraction, transformation, and governance processes provide you with data from multiple aggregated sources to gain actionable insights for the best decision making. You can then choose what data is sent to which destination, and send the data to multiple destinations or applications.

Cisco Edge Intelligence pipelines

Creating an edge-to-multicloud data policy is a multistage process that can be completed in the Cisco Edge Intelligence local manager.

In the Cisco Edge Intelligence local manager, you create pipelines to define the progression of data. Data management begins with a extraction of the data from different sources. The gathered data is transformed using data policy configurations and the data policies are then deployed to a wide range of destinations.

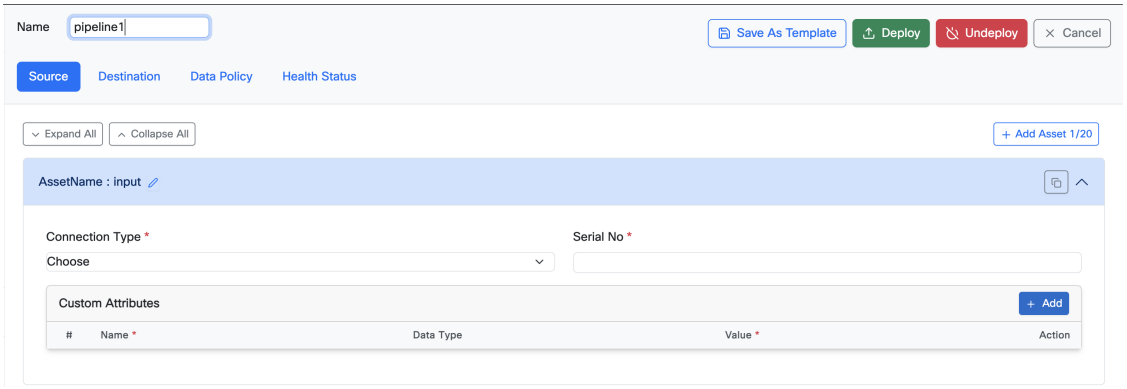
Creating a Cisco Edge Intelligence pipeline comprises the following steps:

- **Add data source**: Define assets or data sources types based on the communication protocols they use. Each protocol then allows further configurations to define the data sources.

  You can add up to 20 data sources in a pipeline.
- **Add data destinations**: Add data destinations such as MQTT servers, Microsoft Azure IoT Hub, or AWS IoT Core.

- **Create a data policy**: Define a data policy to define how data is sent from data sources to destinations. A data policy can comprise one of the following methods:
  - **Data rules**: Data rules allow data flow from defined sources to defined destinations, without any data transformation.
  - **Data logic**: Data logic involves using JavaScript, developed using an in-app code editor, to transform data before it is sent to a destination (if local processing of data is required).

Figure 2: Pipeline creation page in Cisco Edge Intelligence



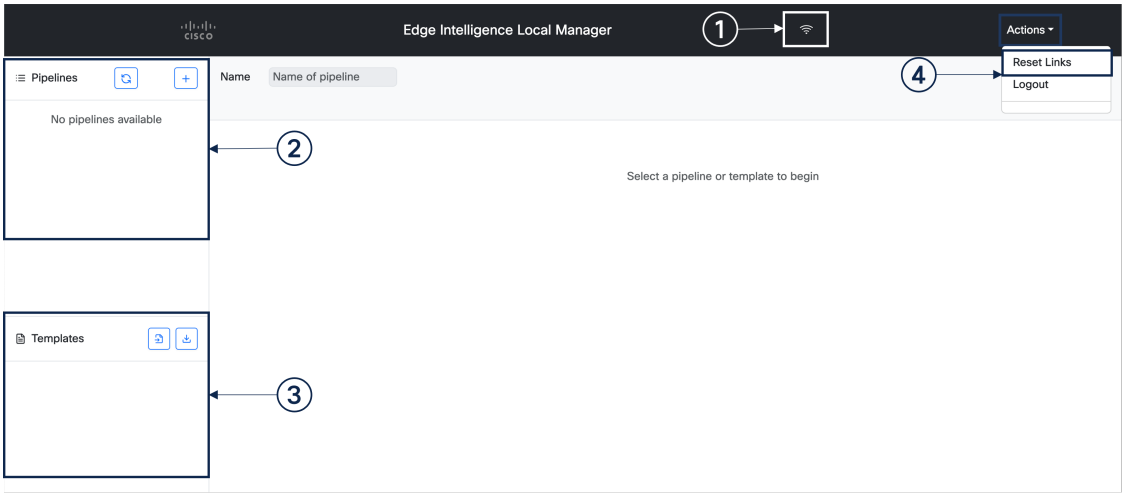
Manage pipelines at scale

To deploy Cisco Edge Intelligence pipelines at scale across devices and agents, you have these options:

- Use the Cisco Edge Intelligence Release 2.0 API.
- Using CLI: See Cisco Edge Intelligence CLI Utility Tool for an example of pipeline management using CLI.

Cisco Edge Intelligence local manager

Figure 3: Cisco Edge Intelligence local manager



The following features are available in the Cisco Edge Intelligence local manager.

1. **Check Cisco Edge Intelligence connection status**:

   Hover over the network connection icon (Wi-Fi icon) in the top banner to view whether Cisco Edge Intelligence is online or offline, and for agent details such as version and ID.

2. **Create and view deployed pipelines**:

   - The pipelines area provides a quick view of the deployed pipelines and their respective statuses.
   - Click an existing pipeline to view its health status details, or to edit the pipeline's configurations.
   - To create a new pipeline, click the plus (+) icon.

3. **View, import, or export templates**:

   The templates area displays all the templates that are available in the Cisco Edge Intelligence local manager.

   - Click the import icon to upload template files from your local system.
   - Click the download icon to download one or all the templates to your local system, in JSON format. You can then import the templates into other agents for deployment.

4. **Delete all pipelines**:

   To delete all the pipelines in your Cisco Edge Intelligence local manager, choose **Actions** > **Reset Links** from the top banner.

Caution Once deleted, a pipeline cannot be retrieved.

Templates are browser-specific and access is restricted to your user credentials. However, deployed pipelines do not have similar restrictions. Multiple users can check the health status of a pipeline and edit any existing pipeline configurations.