Cloudera Edge Management 1.4.0

# Cloudera Edge Management Overview

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## CLOUDƎRA

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# Cloudera Edge Management overview

Cloudera Edge Management (CEM) enables edge device managers, data engineers, and IoT administrators to gain control of the data from edge devices with realtime edge data collection and management. Get familiar with CEM, its components, key features, and use cases.

CEM is an edge management solution made up of edge agents and a management hub for the agents. The edge management hub manages, controls, and monitors agents to collect data from the edge devices and push intelligence back to those devices. CEM offers out-of-the-box data lineage tracking and provenance of data-in-motion.

For additional information about the main functionalities of CEM (like flow creation, authentication, authorization, monitoring, agent management and much more), check out the videos on the Cloudera Edge Management YouTube playlist:

## Components

CEM consists of two components:

- Edge Flow Manager (EFM) is an agent management hub that supports a graphical flow-based programming model to develop, deploy, and monitor edge flows on thousands of MiNiFi agents.
- Apache MiNiFi is a light-weight edge agent that implements the core features of Apache NiFi, focusing on data collection, processing, and distribution at the edge. It can be embedded inside any small edge device like a sensor or Raspberry Pi. It is available in two flavors: Java and C++.

## Capabilities

CEM provides three main capabilities to the edge flow lifecycle:

**Flow creation**

> EFM addresses the challenge of developing IoT applications by offering a code-free drag and drop development environment. This development environment offers a NiFi-like experience for capturing, filtering, transforming, and transferring data from edge agents to upstream enterprise systems like CDP Private Cloud Base or CDP Public Cloud.

**Flow deployment**

> Managing the deployment of IoT applications has been an industry challenge. EFM alleviates this challenge by offering a simple, yet powerful model for deploying flows to agents. Agents registered with EFM are notified when a new or modified flow is available. The agents access the flow and apply it locally.

**Flow monitoring**

> Agents in CEM send periodic heartbeats to their EFM instance. The heartbeat contains information about the deployment and runtime metrics. EFM stores, analyzes, and renders these heartbeats to end users. The heartbeats enable operators to visualize details such as flow throughput, connection depths, processors running, and overall agent health.

## Key features

- No-code drag-and-drop UI

  Hundreds of pre-built processors are available to connect with a range of data sources, devices, and protocols to build sophisticated data flow pipelines.
- Edge management hub

  You can ingest, capture, and deliver data in real-time from any streaming source, including clickstreams, social media, mobile, or IoT devices.

- Flow designer for edge flows

  You can build edge dataflows visually through a NiFi-like user interface for edge data collection and processing.
- MiNiFi edge agents

  Lightweight and portable C++ and Java agents with fine-grained data-lineage information generated constantly.
- Enterprise-grade security and data provenance

  Robust options for authentication and authorization and out-of-the-box data lineage tracking and provenance on data-in-motion.
- Edge management and data collection

  A custom-built dashboard enables edge management at scale with command, control, and monitoring of hundreds of thousands of agents with minimal footprint to collect, filter, and process data. You can deploy updates to thousands of edge agents at the same time.

## Use cases

**Predictive maintenance**

A data-driven approach to analyze IoT and sensor data from connected equipment to effectively predict when and how an asset might fail, detect variances, understand warning signals, and quickly identify patterns that might indicate a potential breakdown in, for example, manufacturing or fleet management. CEM offers a simple and small footprint solution for data ingestion from connected assets to enhance predictive maintenance.

**Patient monitoring**

Biometric and telemetric devices are used in healthcare organizations to monitor post-surgery or high-risk patients. Ingesting sensor data from these devices about various patient vitals helps to detect abnormalities or concerning patterns. CEM helps to capture patient-monitoring data and deliver them to stream-processing engines for insights.

**Data movement**

Traditional ETL processes are for use cases where data must move from one database to another. Modern enterprises transfer data from on-premises to cloud or cloud-to-cloud, moving petabytes of information in a matter of just hours.

**Log and metric collection**

The agents can be used to collect any type of logs or metrics from the hosts where the agents are installed. They can also be used as log aggregators. This data can be filtered, enriched, processed locally before being sent to any destination. This type of deployment is very common for cybersecurity use cases.

**Cloud native applications**

The MiNiFi C++ agent is commonly used as a side-car container or as a DaemonSet to collect data, logs, metrics, and so on, from cloud native applications running on Kubernetes. It can also be used as a way to get data to the running applications. Besides, with EFM, it is possible to update the processing on the agents without redeploying the application.