

# CLOUDERA EDGE MANAGEMENT

Manage, Control and Monitor the Edge

## Why Cloudera Edge Management?

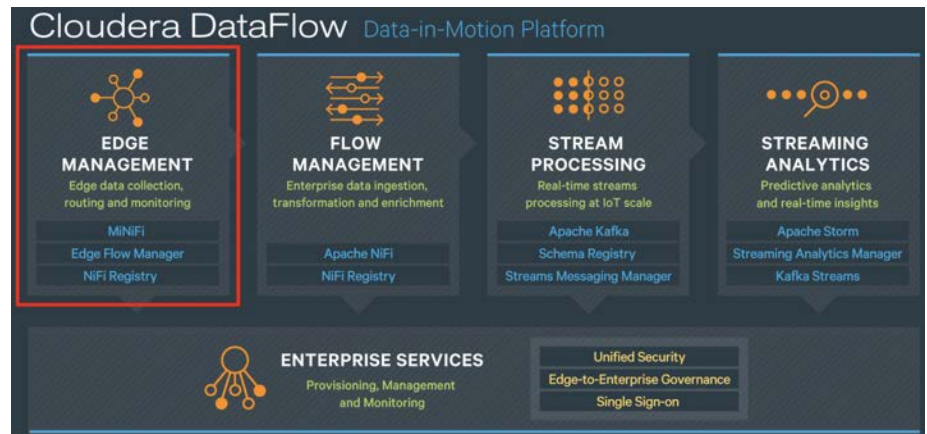
- **100% open source technology** – Only vendor with this strategy; prevents vendor lock-in and encourages continuous innovation
- **Agility of building edge apps** - Build edge data flows visually and with no code for edge data collection and processing. This also reduces the cost of developing IoT applications
- **Operational ease of edge management** - Deploy updates OTA to thousands of edge agents at the same time
- **Key enabler for IoT initiatives** - Build successful IoT initiatives by collecting, curating and analyzing data from thousands of edge devices.
- **Enable edge intelligence** - Process and react to data quickly at the edge
- **Operational confidence** - Gain complete operational confidence with your edge implementation by gaining visibility into all of your deployed agents.
- **Built-in data provenance** – Only product in the market to offer out-of-the-box data lineage tracking and provenance on data-in-motion

Cloudera DataFlow (CDF) is a comprehensive edge-to-enterprise streaming data platform. It addresses the key data management challenges with streaming and IoT data for all types of enterprises. Cloudera Edge Management (CEM) is a key part of the CDF platform and it addresses IoT and edge data management challenges around data collection and processing edge data from a wide range of edge devices and streaming sources.

## Cloudera Edge Management

Cloudera Edge Management (CEM) is an edge management solution made up of edge agents and an edge management hub. It manages, controls and monitors edge agents to collect data from edge devices and push intelligence back to the edge. CEM allows you to develop, deploy, run and monitor edge flow apps on thousands of edge devices.

Apache MiNiFi is a light-weight edge agent that implements the core features of Apache NiFi, focusing on data collection & processing at the edge. Edge Flow Manager (EFM) is an agent management hub that supports a graphical flow-based programming model to develop, deploy & monitor edge flows on thousands of MiNiFi agents.



## Edge Data Collection and Management Challenges

The key challenges that enterprises are facing today in IoT are about edge data collection and edge management. These can be addressed easily with Cloudera Edge Management. Some of these challenges are -

- Lack of tooling to collect and process data at the edge
- Expensive to move data from edge to cloud
- Building edge data collection / IoT apps require lots of coding and can be time consuming
- Managing apps on thousands of edge points is a complex problem
- No tooling to monitor thousands of applications running on the edge.
- Difficulty in developing secure data pipelines in environments with no user control

## MiNiFi

MiNiFi is a sub-project of Apache NiFi and was started almost a couple of years ago. Originally built out of a strong need to have the same kind of capabilities and strengths that NiFi has but at the edge, MiNiFi was created directly from NiFi by stripping out some core enterprise features like the user interface. The intent was to keep the edge agent as light-weight as possible. Today, with MiNiFi being available in two flavors - Java and C++, it can be embedded inside any small edge device like a sensor or Raspberry Pi.

### Key Features of MiNiFi

Some of the key capabilities and features of MiNiFi are:

- \_ Light-weight and portable - C++ and Java agents
- \_ Guaranteed delivery
- \_ Data buffering
- \_ Prioritized queuing
- \_ Flow Specific QoS (latency v throughput, loss tolerance, etc.)
- \_ Data Provenance
- \_ Extensible architecture
- \_ Site-to-site communication protocol
- \_ Tensorflow support

### Edge Flow Manager (EFM)

EFM is an agent management hub that provides a graphical user interface for designing, deploying and monitoring edge flow applications on thousands of MiNiFi agents. It also acts as the single management and monitoring layer for all the MiNiFi agents deployed in the field. EFM provides three key capabilities to the edge flow lifecycle -

- \_ **Flow Authorship:** Edge Flow Manager 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 CDH. It also comes with hundreds of pre-built processors to make the development much easier.
- \_ **Flow Deployment:** Managing the deployment of IoT applications has been an industry challenge. Edge Flow Manager alleviates this challenge by offering a simple, yet powerful, model for deploying applications to agents. Agents registered with EFM are notified when a new or modified application is available. The agents themselves acquire the updated application from EFM to avoid networking complications. The agents will update their local runtime with the application and send verification checks back to EFM once the operation has been verified to have completed successfully.
- \_ **Flow Monitoring:** Agents in CEM send regularly scheduled heartbeats to their Edge Flow Manager instance. The heartbeat represents the most recent snapshot of the agents' runtime. EFM stores, analyzes, and renders these heartbeats to end users. The heartbeats allows operators to visualize details such as flow throughput, connection depths, processors running, and overall agent health. Visualizing this information allows the operations administrator to take appropriate actions where needed.

Learn more at: [cloudera.com/cem](https://cloudera.com/cem)