

RELEASE NOTES FOR THE Kinetic - Edge & Fog Processing Module (EFM)

RELEASE 1.2.1

Revised: March 3, 2018

These release notes provide a high-level product overview for the Cisco Kinetic - Edge & Fog Fabric Module (EFM).

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Introduction

The Cisco Edge & Fog Processing Module (EFM) creates a reliable data communications messaging system on top of your data networking infrastructure. Use this data delivery system to rapidly deploy applications where needed, including at the edge, in the fog, or in the datacenter.

The Cisco Edge and Fog Processing Module is an open platform that allows micro services or applications to be added by anyone. This provides unlimited capability and growth by adding software components that optimize the results of the application, system, or outcome.

Cisco EFM addresses the complexity of building an enterprise ready scalable data messaging system for one or many applications to reside upon. The EFM includes tools to manage the system, the EFM system administrator, and the EFM system monitor.

Features and Functions

The system's key capabilities include:

- A high performance framework for edge and fog processing.
- Reusable micro services for collecting data from, and providing control over, devices and machines. Data is also processed before delivery to the destination.
- Options for reliable data transport through the system, including batch and real-time streaming options.
- Flexible mechanisms for integration with IT systems, reporting, and analytics.
- An architectural framework to extend fog processing to multiple tiers: east—west (fog to fog) and north—south (hierarchical processing leveraging network topology).
- Easy-to-use GUI tools to simplify development, deployment, and operation for all aspects of the system.
- A pervasive control paradigm and flow of information back to micro services, devices, and machines for management, control, optimization, and specific actions.
- A completely open and polyglot system, where third parties can provide devices, processing storage, software modules, analytics, applications, or any combination thereof.

This technology makes IoT approachable, and leads to much faster industry IoT adoption.

The Cisco Edge and Fog Processing Module Components

Component	Description
EFM Message Broker	<p>A small footprint component working with other brokers to form a message bus.</p> <p>The EFM Message Broker provides reliable and flexible data delivery between devices and micro services. The sources can be devices such as sensors or other micro services. Consumers can be micro services or user applications.</p>
EFM Data Flow Editor	Defines message paths between devices and micro services.
EFM Data Flow Engine	<p>Executes message paths between devices and micro services.</p> <p>We recommend installing this adjacent to the EFM Message Broker to perform data transformation and input sources that are not in the canonical data format of the system.</p>
EFM System Administrator	Configures and manages the message broker and micro services.
EFM System Monitor	A standalone tool for operators to obtain real-time functional status of a deployed solution.
Cisco ParStream (Historian database)	Purpose-built database to handle the massive volumes and high velocity of IoT data, as well as analytics at the Edge.
EFM Tools Runtime Engine	A standalone runtime tool for visualizing dashboards and driving EFM System Administrator, EFM Data Flow Engine, and EFM System Monitor.
Links	<ul style="list-style-type: none"> • DQL • System • Dataflow • ParStream
Smart License Agent Tool for Nodes	A client that allows system users to manage license registration for Node Product IDs.
Smart License Agent Tool for Devices	The Smart License Agent client that allows system users to manage license registration for Device Product IDs.

Hardware Requirements

Component	Requirement
EFM Message Broker EFM Data Flow Engine DQL Link System Link ParStream Link	<ul style="list-style-type: none"> RedHat Linux 7.2, CentOS 7 or Ubuntu 16.04, Windows 2016 server 1GB RAM, 10 GB HD* (recommended on the same system or VM)
EFM Data Flow Editor	Automatically installs with EFM Message Broker and EFM Tools Runtime Engine. Access via a web browser.
EFM System Administrator	Installs on the same system as the EFM Message Broker and EFM Tools Runtime Engine. Accessed via a web browser.
EFM System Monitor	Installs on the same system as the EFM Message Broker and EFM Tools Runtime Engine. Accessed via a web browser
Cisco ParStream (Historian database)	<ul style="list-style-type: none"> RedHat Linux 7.2, CentOS 7 or Ubuntu 16.04 6 cores with 2GB RAM per core 500 GB HD
EFM Tools Runtime Engine	Installs with EFM Message Broker
Smart License Agent Tool for Nodes and Smart License Agent Tool for Devices	<ul style="list-style-type: none"> RedHat Linux 7.2, CentOS 7 or Ubuntu 16.04 1GB RAM 10 GB HD

Supported Browsers for use with the EFM Data Flow Editor, EFM System Administrator and EFM System Monitor

Currently the supported browser is Chrome.

Cisco IOx supported versions

The current support version supported for the IR809/IR829 is IOx version 1.4. For the IE4000 is IOx version 1.3.

Open Caveats

Caveat	Workarounds
EFM C Broker and LifeCycle Management (on IOx) for IOx does not support updates from GitHub.	Downloading the component from the Internet repository and uploading from local directory
System Administrator shows the default value for ParStream Link action to "set default partitioning" – the currently active value is not visible	To ensure the value is set as expected have a look at the table definition
If the ParStream DSA Link is configured without credentials (also in case ParStream Authentication is disabled), queries fail.	Configure the link with dummy credentials for user and password.
With EFM 1.2.1 the message broker does not support reverse-proxy IWA setups.	Do not apply EFM 1.2.1 message broker upgrade on corresponding setups.

Best Practices

- When using Java DSLinks one should tune the Java Virtual Machine (JVM) to correspond to the memory and performance needs of the respective application. This includes (among others) tuning of “Garbage Collection”. An in-depth description about tuning the JVM can be found here:
<http://docs.oracle.com/javase/8/docs/technotes/guides/vm/gctuning/index.html>
- If upgrading a system of more than one EFM node, it is highly recommended that all the components be upgraded on all the platforms for consistent functionality. See the installation guide for installing or upgrading on each platform.

Changes since Release 1.0

- EFF System Administrator, for the Broker/Life Cycle Management “Update Server” has been fixed
- EFF System Administrator, System Administrator buttons “update all components” result in unsupported dart broker version update. The following actions have been removed:
 - Tab “Life Cycle”, Button “Update All Components” – removed
 - Tab “Job”, Action “Update All Components” – removed
 - Tab “Job”, Action “Update Server”, Dropdown List Entry “from Repository” – removed
- EFF ParStream Link 2.4 now uses an adapted ETL statement to decrease the amount of partitions, the corresponding modulo value can be configured in the System Administrator
- EFF Dataflow Editor - Fixes autosave feature.
- EFF Dataflow Editor - Fixes changing a block name when double-clicking in Chrome
- EFF C Message Broker (on IOx), Fixed memory leaks and memory access errors at startup
- EFF C Message Broker (on IOx), Fixed broker crashing when connecting with a link
- EFF C Message Broker (on IOx), installing an invalid Link no longer blocks installing or removing links
- EFF C Message Broker (on IOx), Fixed that C-Broker did not handle errno and return codes in the right fashion for upstream connections
- EFF C Message Broker (on IOx), Fixed that C-Broker tried to send message to closed link stream
- EFF C Message Broker (on IOx), removed IOx eff package for IR809/829 without Java
- EFF C Message Broker (on IOx), updated IOx eff package now properly supports serial port resources

Open Source Links:

- EFF C Message Broker (on IOx), Java Links did not start due to shell incompatibility. Update to a newer gradle version fixed this.

Changes since Release 1.0.1

New Features

- EFF DART Message Broker, DSLink support for IPV6
- EFF C Message Broker (on IOx), C-broker & Life cycle management support for IPV6
- EFF ParStream, ParStream support for IPv4 or IPv6 and IPv6 environments
- EFF ParStream, added new functionality for partition deletion
- EFF ParStream Link, added deletion mechanisms for historian tables

Incompatible Changes

- QoS levels changes to the following new definitions:

QoS Level	Definition
0	Default. Broker only sends the last value available from the publisher, no messages are stored except that one.
1	Non-durable queue. Broker maintains a queue with messages and sends as many as possible when there is enough bandwidth and processing power. Will drop messages when there is not or when client is disconnected.
2	Durable queue. Broker maintains a queue and stores messages even when client is disconnected. There should be no message loss when queue size is large enough.
3	Durable, Persistent queue. Broker queues and persists message on behalf of slow or disconnected requester.

When upgrading an existing EFF (1.0 .0, 1.0.1, 1.1.0) installation to EFF 1.2.0, please make sure that you compile your existing links with the latest version of the respective SDK. This assures, that Brokers and Links use the same QoS semantics due to changes.

Bug Fixes and Improvements

- EFF DART Message Broker, DsLink support for IPV6 is enabled via server.json configuration option enableIPv6 set to true. When enabled, the server is listening on IPv6 interface only. To support a mixed IPv4 and IPv6 environment, two copies of a message broker need to be installed and configured.
- EFF System Administrator, fixed to “add new group” under Permissions tab. The new group currently requires a broker restart for use.
- EFF System Administrator, fixed browser issue on "add new group" action if language is not EN-US
- EFF System Administrator, partially fixed update link from zip. Pending fix to link version update without broker restart
- EFF System Administrator, fixed authorizing quarantined connections in the Permissions tab
- EFF System Administrator, all lifecycle management actions for IOx C Brokers appear in the Management tab
- EFF System Administrator, fixed parsing of IPv6 addressing connection URL that caused a crash when restarting broker
- EFF System Monitor, fixed improper graphing of Broker Details/Live Trend initial graph state
- EFF Dataflow Editor, fixed recreating Dataflow Folder with identical name that was deleted
- EFF C Message Broker (on IOx), Links are now installed in the data partition instead of the root partition of the container

- EFF C Message Broker (on IOx), IOx default filesystem sizes have been expanded to the following values: 256 MB data partition size and 64 MB extra space in rootfs size (required for tmp files system operations including link upload)
- EFF C Message Broker (on IOx), Lifecycle management no longer functions as a separate dslink and the functionality placed inside the message broker is placed under the /sys node, providing consistency with DART message broker. Actions will require a new reference to the node location. Quarantine functionality is non-functional in C-broker.
- EFF C Message Broker (on IOx), Update from DART VM version 1.17.1 to 1.21.1 to increase stability of dslinks
- EFF C Message Broker (on IOx), fixed QoS level 2 to adhere to new definition
- EFF C Message Broker (on IOx), fixed C-Broker to catch up with messages
- EFF C Message Broker (on IOx), Logging level expanded from a single level to support the configurable values none, fatal, error, warn, info, debug (available only in debug builds)
- EFF C Message Broker (on IOx), Logging level is configurable at runtime
- EFF C Message Broker (on IOx), fixed error that C-Broker sometimes did not reconnect to upstream connection
- EFF C Message Broker (on IOx), all Java links properly start
- EFF ParStream Link, ParStream password no longer visible in metrics pane
- EFF Installer, fixed installer failure if installation path contains spaces

Changes since Release 1.1.0

Name changed from Edge and Fog Fabric to Kinetic Edge and Fog Processing Module.

New Features

- DGLux5 development tool is now available using the EFM core broker on Windows and Linux (installer option “dglux”). The user can request a 6 month 1500 topics trial license.
- EFM C Message Broker with Lifecycle Management is now available on Linux (installer option “cbroker”).

Bug Fixes and Improvements

- EFM Dataflow Editor actions for sys node, for the Broker/Life Cycle Management “Update All Components” has been removed
- EFM Dataflow Editor actions for sys node, for the Broker/Life Cycle Management “Update Server” has been removed
- EFM Linux installation now properly detects and installs on RedHat 7
- EFM System Administrator, for Management/Links fixed export action to allow for zip file download

- EFF C Message Broker, fixed QoS level 2 for message delivery

Changes since Release 1.2.0

Configuration Change

- Starting with EFM 1.2.1 permission management is enabled per default for new EFM and DGLux Server installations.

Note: On an upgrade the existing configuration is not changed. To enable permission management the corresponding server.json file needs to be adapted entering non-null value for “defaultPermission”.

The recommend defaultPermission setting is:

```
"defaultPermission": [  
    [":config", "config"],  
    [":write", "write"],  
    [":read", "read"],  
    [":user", "read"],  
    [":trustedLink", "config"],  
    ["default", "none"]  
]
```

When activating permission management and setting [":default", "none"] you should ensure the following additional adaptations have taken place in your setup:

- Upstream connections now must be configured with a permission group. For this you can add one of the defaultPermission groups “:config”, “:write” or “:read” to your upstream configuration.
 - The default group “:user” defines the permission level for all EFM UI users which are not configured as superuser. The EFM GUI Admin User defined on installation (default: efmAdmin) is a superuser and therefore has “config” permissions.
 - The default group “:trustedLink” defines the permission level for all DSLinks installed with your EFM server. You might reduce this to a lower permission level depending on your usage scenario.
 - External DSLinks connecting to the broker must provide a token defining the permission level.
- For improved memory handling Cisco ParStream 5.2.0 now uses tcmalloc. If not already installed in your environment, you can install the depended library with the following commands.

On Ubuntu16.04 and Debian8:

```
apt-get install libtcmalloc-minimal4
```

On CentOS7:

```
yum install gperftools-libs
```

New Features

- Smart License Agent, added support for new PIDs
- Smart License Agent, improved entitlement handling for better usability (see User Guide)
- ParStream Link, added support for null values on importCSV action

Bug Fixes and Improvements

- Smart License Agent, security fixes: upgraded jackson databind dependency due to vulnerability (CVE-2017-15095), solved command injection vulnerability (CSCvh70005)
- ParStream Link, security fix: upgraded jackson databind dependency due to vulnerability (CVE-2017-15095)
- Alarms Link, security fix: upgraded jackson databind dependency due to vulnerability (CVE-2017-15095)
- H2_DB Link, security fix: upgraded jackson databind dependency due to vulnerability (CVE-2017-15095)
- Cisco ParStream, fixed bug that could result in partial deletion in multiple node clusters
- DGLux, fixed offline license to request correct amount of topics
- System Administrator, fixed broken update of metrics after link update from zip
- Dataflow Editor, fixed broken update of metrics after link update from zip
- System Administrator, fixed bug that dropped password when user was renamed
- System Administrator, automatically rescan after installing a new link
- System Administrator, logout button now redirects to login page
- System Monitor, logout button now redirects to login page
- Dataflow Editor, logout button now redirects to login page
- Dataflow Editor, fixed export action for links
- EFM Installer, fixed bug that not preserve disabled secureMode on upgrade
- EFM Installer, fixed misconfigured .well-known-path in default configuration

Related Documentation

Use this document in conjunction with the following.

- Kinetic - Edge and Fog Processing Module 1.2.0 System Administrator User Guide
- Kinetic - Edge and Fog Processing Module 1.2.0 System Monitor User Guide
- Kinetic - Edge and Fog Processing Module 1.2.0 Dataflow Editor User Guide
- Kinetic - Edge and Fog Processing Module 1.2.1 Smart License Agent User Guide
- Kinetic - Edge and Fog Processing Module 1.2.0 Linux Installation Guide
- Kinetic - Edge and Fog Processing Module 1.2.0 Windows Installation Guide
- Kinetic - Edge and Fog Processing Module 1.2.0 IOx Components Installation Guide
- Cisco ParStream Release Notes 5.2.0
- Cisco ParStream DSA Link Manual 4.0.1

Obtaining documentation and submitting a service request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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