



# TIBCO Flogo<sup>®</sup> Enterprise

## Release Notes

*Version 2.14.1*

*November 2021*



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## New Features

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The following features have been added since the last major release of TIBCO Flogo® Enterprise.

### Release 2.14.1

#### TIBCO Flogo® Enterprise Core

No new features have been introduced in this release of TIBCO Flogo® Enterprise.

### Release 2.14.0

#### TIBCO Flogo® Enterprise Core

##### **New activities**

The following activities are introduced in this release:

- **ReplyToTrigger activity:** Use this activity to map output values and send a response back to the trigger without ending the execution of the flow. See [ReplytoTrigger](#).
- **ProtobufToJSON activity:** Use this activity to convert protocol buffer messages to JSON format. See [ProtobufToJSON](#).
- **NoOp activity:** Use this activity to create branches in a flow without performing any other operation. See [No-Op](#).

##### **New triggers**

The following triggers are introduced in this release:

- **App Startup trigger:** Use this trigger to execute flows before starting the app engine. See [App Startup Trigger](#).

- **App Shutdown trigger:** Use this trigger to execute flows before the app engine is gracefully shut down. See [App Shutdown Trigger](#).

## New Functions

The following functions are introduced in this release:

- New category, URL:
  - `url.encode`
  - `url.escapedPath`
  - `url.hostname`
  - `url.path`
  - `url.pathEscape`
  - `url.port`
  - `url.query`
  - `url.queryEscape`
  - `url.scheme`
- JSON ()
  - `json.get`
  - `json.length`
  - `json.encodeNumbersToString`
  - `json.objKeys`
  - `json.objValues`
  - `json.set`

## Support for Mutual TLS

The `InvokeRESTService` activity now supports mutual TLS (client certificate and client key). You can either select a certificate or configure an app property for these fields. See [InvokeRESTService](#).

## Overriding an app property value in the Flow Tester

You can now override app property values in the launch configuration of the Flow Tester. To override properties defined in the app and those defined in a connection, go to **Mapping settings > properties**. See [Configuring a Launch Configuration](#) and [Overriding an App Property Value While Testing a Flow](#).

### **Mapper Support on the “Retry on Error” tab**

On the **Retry on Error** tab of an activity, you can now map elements in the schema by using the mapper or enter values for the element in the mapper directly. See [Using the Retry on Error Feature in an Activity](#).

### **Deploying a Flogo App to Microsoft Azure Functions**

After you have designed a Flogo app or imported an existing app, you can now deploy it to Microsoft Azure Functions. See [Deploying a Flogo App to Microsoft Azure Functions](#).

### **Support for `$loop.index` in foreach array mapping**

Starting from this release, you can include `$loop.index` in the array mapping of the `foreach()` method to get the current index.

## TIBCO Flogo® Connector for Microsoft SQL Server

The following features have been added in this release of TIBCO Flogo® Connector for Microsoft SQL Server.

- TIBCO Flogo® Connector for Microsoft SQL Server now supports Connection TCP Timeout.
- TIBCO Flogo® Connector for Microsoft SQL Server now supports app property override for certificates.

## TIBCO Flogo® Connector for Oracle MySQL

In this release of TIBCO Flogo® Connector for Oracle MySQL, the support for Connection TCP Timeout has been added.

## TIBCO Flogo® Connector for PostgreSQL

The following features have been added in this release of TIBCO Flogo® Connector for PostgreSQL.

- TIBCO Flogo® Connector for PostgreSQL now supports Connection TCP Timeout.
- TIBCO Flogo® Connector for PostgreSQL now supports app property override for certificates.

## TIBCO Flogo® Connector for WebSockets

### **Auto reconnect**

The WebSocket Subscriber trigger reconnects automatically to the WebSocket server in an event of a connection failure. You can specify auto reconnect attempts and auto reconnect maximum interval by using the following fields:

- AutoReconnectAttempts
- AutoReconnectMaxDelay

For more information, see the "WebSocket" section in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

## Release 2.13.0

## TIBCO Flogo® Enterprise Core

### **File support**

ReceiveHTTPMessage REST trigger and InvokeRESTService activity now support multipart/form-data and form-urlencoded request types to handle file support.

For more information, see "REST Trigger - ReceiveHTTPMessage" and "InvokeRESTService" in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

### **Move branches within a flow**

You can now move branches and their respective activities from an activity to another within a flow by selecting and dragging the branch across the flow designer.

For more information, see "Moving Branches" in *TIBCO Flogo® Enterprise User's Guide*.

### **Execute Javascript activity**

This release introduces a new activity, Execute JavaScript, to execute Javascript code.

For more information, see "Execute JavaScript" in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

### **Application tags**

You can now define custom tags for your Flogo apps. These tags are preserved even when an app is imported or exported.

For more information, see "Using App Tags" in *TIBCO Flogo® Enterprise User's Guide*.

### **Automatic generation of manifest.json file**

When an app is created, the `manifest.json` file is now automatically generated in the `<FLOGO_HOME>/apps/<app>/` directory.

For more information, see "Creating an App" and "Editing an App" in *TIBCO Flogo® Enterprise User's Guide*.

## **TIBCO Flogo® Connector for WebSockets**

TIBCO Flogo® Connector for WebSockets is added to send and receive messages over a Websocket connection. This connector provides the following out-of-the-box activities and triggers:

- Websocket Server trigger
- Websocket Subscriber trigger
- Websocket Client activity
- Websocket Write Data activity

For more information, see the "Websocket" section in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

## **TIBCO Flogo® Connector for Oracle MySQL**

### **Support for Overriding a Certificate Using an Environment Variable**

You can override Certificate Authority (CA) Certificate, Client certificate, and Client Key by using an app property. For more information, see 'Overriding a Certificate Using an Environment Variable' section in *TIBCO Flogo Connector for Oracle MySQL User's Guide*.

## TIBCO Flogo® Connector for Apache Kafka

### **Support for Connectivity to TIBCO Cloud Messaging Service**

TIBCO Flogo® Connector for Apache Kafka now supports connectivity to TIBCO Cloud Messaging service. For more information, see 'Connecting to TIBCO Cloud Messaging - Kafka' section in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections* guide.

## TIBCO Flogo® Connector for TIBCO Cloud™ Messaging eFTL

### **Identifying message redelivery**

The MessageSubscriber trigger output provides **messageId** and **deliveryAttempt** to identify message redelivery.

## TIBCO Flogo® Connector for Apache Pulsar

### **Support for Connectivity to TIBCO Cloud™ Messaging Service**

TIBCO Flogo® Connector for Apache Pulsar now supports connectivity to TIBCO Cloud Messaging service. For more information, see the "Connecting to TIBCO Cloud Messaging – Apache Pulsar" section in the *TIBCO Flogo® Enterprise Activities, Triggers, and Connections Guide*.

## Release 2.12.0

## TIBCO Flogo® Enterprise

### **Distributed tracing by using AWS X-Ray**

You can use AWS X-Ray for tracing a Flogo Enterprise app running in the cloud or in your local environment. You can track how the app is performing or troubleshoot performance issues and errors.

For more information, see the "Tracing Apps Using AWS X-Ray" section in the *TIBCO Flogo® Enterprise User's Guide*.

### Share data within a flow or across flows in an app

A new activity, SharedData, is now available under the General category. This activity enables you to share runtime data within a flow or across flows in an app.

For more information, see the "SharedData" section in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

### Response headers in InvokeRESTService activity

In the InvokeRESTService activity, if the output has multiple response codes, you can now add response headers corresponding to each response code on the **Output Settings** tab.

For more information, see the "InvokeRestService" section in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

### Basic Auth and OAuth 2.0 support for InvokeRESTService activity

- The InvokeRESTService activity now supports Basic Auth and OAuth 2.0. The following fields have been added to the InvokeRESTService activity:
  - **Enable Authentication**
  - **Authentication Connection**

For more information, see the "InvokeRESTService" section in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

- A new connection called **HTTP Client Authorization Configuration** has been added to the **General** category, to enable authentication and authorization in InvokeRESTService activity. For more information about the connection, see the "HTTP Client Authorization Configuration" section in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

### XML response handling in InvokeRESTService activity

The InvokeRESTService activity now supports application/xml as the response type.

For more information, see the "InvokeRESTService" section in *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

### **Adding a function in an argument to the array.forEach() function**

You can now add a function in the first argument of the array.forEach() function. For example:

```
array.forEach(array.slice($activity[Mapper], 1, 4), "data")
```

For more information, see the "Mapping Complex Arrays - Using the array.forEach() Function" in the *TIBCO Flogo® Enterprise User's Guide*.

## TIBCO Flogo® Connector for Oracle MySQL, TIBCO Flogo® Connector for Microsoft SQL Server, and TIBCO Flogo® Connector for PostgreSQL

Added support for Connection Retry mechanism in case of a connection failure (while creating a connection or executing an activity).

## TIBCO Flogo® Connector for Apache Pulsar

- The Apache Pulsar Message Ack activity acknowledges the Pulsar messages received by the Apache Pulsar Consumer trigger.
- The Apache Pulsar Consumer trigger is configured to process messages in a synchronous manner by using the Sync mode and multiple messages concurrently by using the Async mode.
- You can use the Apache Pulsar connection to set the connection and operation timeouts.

For more information, see the *TIBCO Flogo® Connector for Apache Pulsar User's Guide*.

## TIBCO Flogo® Connector for TIBCO Cloud™ Messaging eFTL

The Message Subscriber trigger is configured to process multiple messages concurrently.

For more information, see the *TIBCO Flogo® Connector for TIBCO Cloud™ Messaging eFTL User's Guide*.

## Release 2.11.0

### TIBCO Flogo® Enterprise

#### **SendEmail activity**

The SendEmail activity now supports:

- Sending file attachments
- Setting Reply-To configuration

For more information, see the "SendMail" section in the *TIBCO Flogo® Enterprise Activities and Triggers Guide*.

#### **Step-back flow testing**

Using the enhanced Flow Tester, you can:

- See the flow execution and the progress made in the execution of the flow. In the new Flow Tester interface, when an activity is being executed, a blue animation is displayed around it.
- See errors displayed at the activity-level.
- Select an activity after its execution to see the inputs and outputs.
- Change the inputs to other valid values and start the execution of the flow from that point onwards.

For more information, see the "Flow Tester" section in the *TIBCO Flogo® Enterprise User's Guide*.

#### **Support for OpenAPI Specification**

Support for OpenAPI Specification is added as follows:

- The ReceiveHTTPMessage trigger supports Open API Specification 3.0.
- The InvokeRESTService activity supports both Open API Specification 3.0 and Swagger 2.0.

For more information, see the "REST Trigger - ReceiveHTTPMessage" and "InvokeRESTService" sections in the *TIBCO Flogo® Enterprise Activities and Triggers Guide*.

## App file persistence

Flogo app (JSON) files are now persisted to the directory that you specify on your local machine. This allows you to easily use an external source control system such as Git or SVN. This makes it easier for you to set up the version control for Flogo apps for automated delivery using Continuous Integration/Continuous Deployment (CI/CD).

For more information, see the "App File Persistence" section in the *TIBCO Flogo® Enterprise User's Guide*.

## Missing extensions

When you import an app that contains one or more activities or triggers that are not installed in your environment, a warning is displayed in the Import App dialog but you can still import those activities and triggers. Activities and triggers with a missing extension display an error until you upload the extension.

For more information, see the "Resolving Missing Activities and Triggers" section in the *TIBCO Flogo® Enterprise User's Guide*.

## Apache Pulsar connectivity

TIBCO Flogo® Connector for Apache Pulsar is added to send and receive messages using publish-subscribe pattern and includes:

- Apache Pulsar Consumer Trigger
- Apache Pulsar Producer Activity

For more information, see the TIBCO Flogo® Connector for Apache Pulsar documentation.

## Database connectivity

- For all complex queries which needed manual mode, metadata generation is significantly enhanced to use standard query parsing leading to better user experience.
- Secure connection support for TIBCO Flogo® Connector for Microsoft SQL Server, TIBCO Flogo® Connector for PostgreSQL, and TIBCO Flogo® Connector for Oracle MySQL is now provided.

# Release 2.10.0

## TIBCO Flogo® Enterprise

### Enhanced monitoring

- **Hybrid monitoring:** Unified monitoring experience in TIBCO Cloud Integration is now available for monitoring Flogo applications deployed in private cloud environments outside of TIBCO Cloud. You can see and monitor your Flogo apps the same way as apps deployed on TIBCO Cloud using the TIBCO Cloud Integration - Hybrid Agent.
- **Kubernetes native monitoring:** Flogo Enterprise Monitoring can be run as a standalone app or in a container on Kubernetes. Once it starts on Kubernetes, it monitors Flogo apps added to the Kubernetes cluster.

### App version support

The UI displays app versions that can be modified anytime. At the creation of a new app, the default version displayed is 1.0.0.

### Automatically generated HTTP response, Return activities and mapping configuration

When creating triggers and flows from an API (Swagger) specification, the app's Configure HTTP Response, Return activities, and mappings are now automatically configured.

### Additional configuration for "Send email" activity

Input fields are added to the "Send email" activity to support HTML body and CC/BCC configuration.

### Ability to run updated application without binary rebuild

In the CLI builder, an option is available to exclude the JSON file of the app when building the binary of an updated app to avoid creating a new app binary if you only want to make minor configuration or mapping changes in the app.

### Improved Prometheus metrics

New improved Prometheus metrics related to count and execution interval for activity and flow are now available.

### Mapping enhancement for loop

The output of an activity is accessible for mapping in its input for each iteration while using repeat while true loop.

That is, when using the Mapper you can use the output of an activity generated by the last iteration as an input for the next iteration. You can see this output as part of “Upstream Output”. For example, assume you have a loop with three iterations. In iteration zero, there is no value from that output because the activity has not run yet, but on the next iteration you can access the output of the activity from the previous run.

## TIBCO Flogo® Connector for TIBCO Cloud™ Messaging eFTL

- TCMMessageAck has been added to the connector with the following modes:
  - **Auto:** messages are auto acknowledged as soon as they are received from the TIBCO Cloud Messaging service.
  - **Explicit:** messages can be acknowledged by using new activity TCMMessageAck within the flow.
- The MessageSubscriber trigger now supports standard durables.

## TIBCO Flogo® Connector for MQTT

Auto reconnect: The MQTT Publisher activity and MQTT Subscriber trigger reconnect automatically to the MQTTbroker in the event of a connection failure.

## TIBCO Flogo® Connector for Oracle MySQL, TIBCO Flogo® Connector for Microsoft SQL Server, and TIBCO Flogo® Connector for PostgreSQL

There have been significant enhancements to the connection configuration for configuring maximum open connections, maximum idle connections, and maximum connection lifetime. For more details, see *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*.

# Release 2.9.0

## Application monitoring

TIBCO Flogo® Enterprise now provides a component, TIBCO Flogo® Enterprise Monitoring , to monitor running Flogo Enterprise apps. The Flogo® Enterprise Monitoring application collects metrics of flows and triggers from all running apps that are registered with it. In the app's UI, you can visualize the metrics.

For details, see the "TIBCO Flogo® Enterprise Monitoring Application" section in the *TIBCO Flogo® Enterprise User's Guide*.

## App-level schemas

In a flow input or output, you can now define a schema and share it across the app. An app-level schema can be used in any flow, activity, or trigger configuration where a schema editor is provided. Types of schemas supported are JSON and Avro.

For details, see the "Application Schemas" section in the *TIBCO Flogo® Enterprise User's Guide*.

## Coercing of fields

In the input, output or trigger reply configuration of an OSS activity, you can now coerce a parameter to take the value from a schema that you dynamically defined during design time.

Flogo Enterprise supports coercing for parameters of the following data types: array, object, param, and any.

Currently, coercion is supported only for top-level parameters.

## Validation of flows

You can now validate an app before you deploy it. To validate your app, click the **Validate** button on the App details page. This validates each flow and activity. If a flow or activity has an error, it displays an error or warning icon on the flow or activity.

Validation of flow is done only when you click the **Validate** button.

## Data mapping functions

This release now includes the `Date` and `Array.flatten` Open Source functions.

**Iteration index available for "Repeat While True" loops**

If you select **Repeat while true** as the type of a loop in an activity, iteration index is now available for mapping.

**Support for PATCH method in InvokeRESTService activity**

You can now use the PATCH method in the InvokeRESTService activity.

**Configure app properties from the Flow View**

You can now configure app properties from the Flow View directly, instead of navigating back to the Flow list page to edit the app properties.

**Flexibility to start with a trigger or a flow**

With the enhancements in this release, you can create and configure a new trigger without binding it to a flow. This gives you flexibility to start with either a trigger or a flow.

## Release 2.8.1

**Streaming App Metrics to logs**

You can now emit flow and activity metrics of a Flogo Enterprise app to logs by using two new environment variables: FLOGO\_APP\_METRICS\_LOG\_EMITTER\_ENABLE and FLOGO\_APP\_METRICS\_LOG\_EMITTER\_CONFIG.

**Merging changes to an API specification**

While creating a REST trigger, you can configure it by uploading the API specification file.

If the API specification is changed after the trigger is created, you can now merge the changes into an existing app by uploading the specification file again.

**Propagating error data from subflow to main flow**

You can now propagate error data from a subflow to the main flow using the Throw Error activity.

**Overriding host and port in the URL for Invoke REST Service activity**

You can now override the host name and port in the URL when calling a REST service using InvokeRESTService activity.

### **Defining common schema for a response code category in REST Invoke activity**

In the InvokeRESTService activity, you can now define a single schema for a category of response codes. For example, if you are calling a REST service which uses same schema for all response codes in the range 500-599 (such as 501, 502, 503, and so on), you can define a single schema (as 5xx) for them.

### **Improved TCM connection management**

The TIBCO Cloud Messaging Connector now uses an upgraded client library for improved handling of reconnect and connection timeouts.

Two new fields have been added to TIBCO Cloud Messaging Connector - AutoReconnectAttempts and AutoReconnectMaxDelay (in seconds). These fields allow the client to re-establish a connection with TIBCO Cloud Messaging Server if the connection is lost.

## **Release 2.8.0**

### **gRPC Support**

This release of Flogo Enterprise:

- Includes a gRPC Client activity for calling gRPC services from the Flogo Enterprise flows
- Simplifies implementing the gRPC services in Flogo Enterprise by adding the ability to import gRPC Protocol Buffers (.proto) file for generating the trigger and flows automatically.
- Supports header input field for GRPCActivity

### **Avro Schema Registry for Kafka**

Flogo Enterprise now supports built-in connectivity to Avro Schema Registry for Kafka Client Configuration for Serialization and Deserialization of messages published on or subscribed from Kafka topic in Avro format. Basic authentication is used to connect to the registry if the username and password are provided.

### **OpenTracing**

In the area of Microservices Observability, Flogo Enterprise now adds native support for OpenTracing, a Cloud Native Computing Foundation (CNCF) project, that provides vendor-neutral API specification and instrumentation libraries for distributed tracing.

This release also provides built-in integration with the open source Jaeger tracing library for collecting the traces from Flogo Enterprise apps. With this new feature, you can set an environment variable `FLOGO_APP_MONITORING_OT_JAEGER` to `true` for enabling generation of OpenTracing compliant traces and spans and collection of those traces and spans using Jaeger.

## Flow Design

This release of Flogo Enterprise adds the following functionality to improve the Developer Experience (DX) for designing Flogo apps using the UI:

- **Selective Import:** To improve the reusability of Flogo Enterprise apps a new 'Selective Import' feature has been added to the Import functionality of the UI. This allows you to import a Flogo Enterprise app into a new app or an existing app with the flexibility to select specific triggers, flows and connections while importing the app.
- **Loop:** This release of Flogo Enterprise adds significant improvements to the ability to iterate execution of an activity. A new Loop tab has been added on activity configuration with support for two types of loops - Iterate and Repeat while true. Iterate type allows you to specify a number of iterations and Repeat while true type allows you to specify condition to repeat the execution of activity when the condition is true. In addition, this release includes a new Accumulate option for accumulating output of the activity from each iteration into in array.
- **Retry on Error:** There is a new 'Retry on Error' tab added in the activity configuration of InvokeRESTService and TCMMMessagePublisher activities to retry the execution of these activities if it encounters a retrievable error. This new tab allows you to specify the retry count and retry interval.
- **Success with no matching condition:** This new type of branch added in this Flogo Enterprise release can be used when you want to execute one or more specific activities when none of the 'Success with condition' branches meet the condition and execute.
- **List view:** A new list view is added for Flow Input & Output parameters in addition to existing JSON schema view. This view allows users to define the Flow parameters and their types in the UI.
- **Copy activity:** Flogo Enterprise now provides an option to create a copy of an existing activity within the same flow.
- **Branch Labels:** A label is now added to a branch by default and displayed when

hovered on the branch. You can also update the branch labels.

### **Support for Red Hat® OpenShift®**

This release of Flogo Enterprise adds certification for Red Hat OpenShift Container Platform version 4.x.

### **Building a Docker image from CLI**

In the area of DevOps Flogo Enterprise CLI now provides an option to build a Flogo application docker image. This is useful for automating the docker image build process.

## Release 2.7.0

### **gRPC Support**

gRPC is a modern, open source RPC framework commonly used in Microservices architecture. This release adds a new trigger for implementing gRPC services in Flogo applications.

### **Certification for Serverless container deployments**

This release adds certification for the following managed Cloud services for Serverless container deployments:

- Google Cloud Run
- Azure Container Instances

### **TIBCO Cloud Deployment**

The UI now provides an option to export Flogo app deployment artifacts for deployment to TIBCO Cloud Integration (TCI).

### **REST API Development**

This release of Flogo Enterprise adds the following advanced capabilities for simplifying development of REST APIs using Flogo applications:

- A new **Configure Response Codes** option has been added to the ReceiveHTTPMessage trigger and InvokeRESTService activity that allows you to add multiple HTTP response codes and define response content-type and schema for each code.
- A new ConfigureHTTPResponse activity has been added in this release of Flogo

Enterprise. You can add this activity before a Return activity if **Configure Response Codes** option is enabled on the ReceiveHTTPMessage trigger and use the activity to select a response code and define the response to be returned for that specific code.

- You can also define custom HTTP response header on the ReceiveHTTPMessage trigger.
- InvokeRESTService activity adds ability to configure a connection timeout and proxy URL while invoking external REST APIs from the Flogo flows.

### Kafka Consumer

KafkaConsumer trigger now supports the Whitelist feature to consume messages from multiple topics. You can whitelist a group of Kafka topics for consuming messages by specifying them as a comma-separated list of topics (**Topic** field) or a regex pattern (**Topic Whitelist** field).

### UI Improvements

- The UI now provides an ability to add multiple handlers for a trigger giving you the ability to bind multiple flows to a single trigger. It also adds a new Trigger View and the ability to switch between the Flow view and the Trigger view so that you can add more than one flow for a single trigger.
- Errors and warnings:
  - The UI now provides a better and consolidated view of validation errors and warnings.
  - For error branches, details of the error (such as activity and type of error message) are now captured and returned in the \$error variable. These details can be used by subsequent activities and the logic of the flow can be based on the type of error.

### New Activities

This release adds the following two new out-of-the-box activities in Flogo Enterprise:

- Sleep: This activity is used to pause execution of the Flow for a specified time period.
- ParseJSON: This activity is used to parse JSON data in String format into a JSON Object.

## Mapper Functions

- This release of Flogo Enterprise adds support for mapper function contributions giving you flexibility to create custom mapper functions, install them as extensions and use within the mapping expressions.
- This release of Flogo Enterprise also includes a set of mapper functions from the open source Project Flogo out-of-the-box.
- The `array.foreach()` function now supports passing of an argument for filtering array elements to return only the matching elements.

## Extensibility

- The UI now allows users to install extensions from GitHub repositories, thus eliminating the need to zip and upload the extension.
- Flogo Enterprise now provides ability to plug-in custom Golang code into the application binary enabling developers to write custom code for integrating with third-party tools like monitoring agents, configuration management.

## Support for AssumeRole

This release of Flogo Enterprise adds support for AssumeRole in AWS Connection configuration.

## Exporting an Application's .json File

You can now export an application's `.json` file (embedded within the binary file), by using the `./<app-binary-name> --export app` command. The `.json` is exported as `<app-binary-name>.json`.

# Release 2.6.1

Starting with this release Flogo Enterprise supports Spring Cloud Services. The Spring Cloud Config Server is supported for application configuration management for Flogo apps deployed on Pivotal Application Service (PAS).

This release also adds support for Kubernetes Secrets. Kubernetes Secrets object lets you manage and store sensitive information such as passwords, keys, and so on. This new feature in Flogo Enterprise allows you to resolve the values of application properties in a Flogo application deployed on Kubernetes using Kubernetes Secrets.

# Release 2.6.0

## GraphQL

This release of Flogo Enterprise adds an out-of-the-box trigger for GraphQL that provides an efficient and flexible API design paradigm with a powerful query language allowing frontend clients to query exact data. You can import a GraphQL schema in a Flogo application and choose to auto-generate the GraphQL trigger and flows for implementing resolver functions or add a GraphQL trigger to existing flows allowing you to rapidly implement GraphQL server for your API.

## Support for OpenAPI Specification 2.0 (formerly Swagger Specification)

Using Flogo Enterprise, you can now develop REST APIs from OpenAPI Specification version 2.0 (formerly Swagger Specification). You can import the OpenAPI Specification in a Flogo application and auto-generate the REST trigger and flows for implementing the API, which in turn enables rapid development.

## Improved error handling capabilities

The new Error branch type extends the flow execution control and error handling capabilities of Flogo. An Error branch allows you to catch activity level exceptions and execute a different path in the flow if activity execution throws an error. Flogo Enterprise now supports three types of branches - Success, Success with Condition, and Error.

## Mapper activity

The new Mapper activity enables you to define data mappings for any data type and construct data in the required structure for mapping to subsequent activities in the flow.

## New schema synchronization option

A new Sync flow input/output configuration option is added on the Trigger configuration tabs. If you make any changes in the trigger input/output schema, this option allows you to propagate the changes to the flow input and output parameters by copying the Trigger Output schema to Flow Inputs and Trigger Reply schema to Flow outputs without having to manually update flow input/output schema.

## Additional platforms supported for containerized deployment

The PaaS or containerized deployment options have been extended to support Pivotal Application Service (PAS) of the Pivotal Cloud Foundry (PCF) platform, Amazon ECS,

and AWS Fargate.

### **Support for securing APIs using TLS**

Using Flogo Enterprise, you can now secure APIs built using Swagger and GraphQL through X509 certificates.

### **Mapper improvement**

With this release, you can clear child mappings configured for objects and arrays in the mapper using a single click "Clear Mapping" option.

## **Release 2.5.0**

### **AWS Lambda Triggers**

This release of Flogo Enterprise takes integration with AWS Lambda to the next level by adding triggers for Amazon API Gateway and Amazon Simple Storage Service (S3). This gives you ability to develop functions in Flogo, deploy them on AWS Lambda, and invoke them from Amazon API Gateway and S3.

### **Prometheus Support**

In the area of Application Monitoring Flogo Enterprise now provides support for Prometheus, an open source project under Cloud Native Computing Foundation (CNCF). If the environment variable FLOGO\_APP\_METRICS\_PROMETHEUS is set to true, Flogo application starts exposing flow and activity metrics via the HTTP endpoint as Prometheus-compliant time series data. This gives you the ability to configure Prometheus for pulling and storing Flogo application metrics, use features of Prometheus for monitoring as well as alerting, and also use tools like Grafana for visualization.

### **Out-of-the-box support for Kafka, MQTT, TCM and Avro connectors**

Starting with this release, Flogo Enterprise includes a range of activities and triggers for Apache Kafka, MQTT, Apache Avro, and TIBCO Cloud Messaging out of the box removing the need to install them as separate connectors.

### **Duplicating Flows**

You can now make a copy of an existing flow within a Flogo app.

### **Ability to build engine from CLI**

To simplify CI/CD for Flogo applications, this release adds the ability to build a single Flogo runtime engine binary with a set of required connectors. You can execute this binary to run any compatible Flogo application by passing '--app' argument to provide the application's JSON file. This removes the need to install Flogo Enterprise on build machines and build the binary for individual applications. For example, If you develop ten applications that use TIBCO Flogo Connector for Kafka and TIBCO Flogo Connector for Avro connectors, you can build a single Flogo runtime engine binary with TIBCO Flogo Connector for Kafka and TIBCO Flogo Connector for Avro connectors included in it and use the same binary to run all ten applications instead of building ten different binaries.

### **Support for Docker Toolbox**

For developers who are using Docker Toolbox on Windows, this release allows you to use Docker Toolbox for running the UI.

## **Release 2.4.0**

### **Configuration Management**

This release adds a set of new features to help you isolate the configuration from your application and manage it using external stores, so that you can deploy the same application in multiple environments without making any changes to the application. Flogo Enterprise extends the Application Properties feature and allows you to provide the values for application properties at runtime using environment variables or fetching them by connecting to external configuration stores such as Consul. This release certifies use of Consul, AWS Param Store, and Kubernetes ConfigMaps for storing your application configuration. This release also adds the ability to export application properties from the application binary in a JSON file, or as environment variables. If you use application properties for configuring secrets in your application, such as database passwords, you can now generate obfuscated values for the secrets.

### **Application Logging**

This release adds support for the Zap library for application logging. Zap aims to provide fast, structured, and leveled logging. You can switch to the Zap logger for your application by setting the environment variable, `FLOGO_LOGGER_IMPL`, to `zap`. This release also gives you ability to log in JSON format by setting the environment variable, `FLOGO_LOGGER_FORMAT`, to `JSON`.

## Kubernetes

Flogo Enterprise now certifies deployment and management of apps using Kubernetes. This allows you to run Flogo apps in Docker containers and use Kubernetes to manage the containers leveraging the benefits of Kubernetes including self healing, load balancing, health check, configuration management, rollouts, and rollbacks

## Application Metrics API

This release provides the ability to collect flow and activity metrics for monitoring your application using a REST API. You can now enable collection of application metrics by setting the environment variable, `FLOGO_APP_METRICS`, to `true` and collecting instrumentation as well as execution statistics for the flows and activities in your application using the REST API.

## Subflows

This release adds support for creating a subflow and calling the subflow from other flows in your application. This gives you the ability to define the common logic in a subflow and reuse it in multiple flows.

## Mapper Improvements

Flogo Enterprise now adds a set of new array functions to support `count`, `get`, `delete`, and `append` operations in the mapper. The use of nested ternary operators in the mapper expressions for conditions is now supported. This release also improves validation of mandatory fields and expressions in the mapper.



**Note:** Application binaries created prior to 2.4 must be recreated to use above features.

# Release 2.3.0

## Application Properties

This release introduces the concept of application properties and the ability to define, configure (inside an application) and manage application properties. Apart from properties provided during application design, developers can also override the value for such properties at the time of deployment.

## Runtime Statistics

In the area of monitoring and tracking your application runtime, new features have been introduced across two areas:

- Memory and CPU profiling data can be collected and reviewed for a given application in a test environment
- TIBCO Flogo® Enterprise includes the ability to gather Go runtime statistics such as memory usage, number of Go routines, logical CPUs used, version and more

## Healthcheck

This release introduces the ability to enable healthcheck for a Flogo application that is running.

## DB Service

TIBCO Flogo Enterprise 2.3 supports a common DB Service component that facilitates database operations for database connectors.

# Release 2.2.0

## Flow Testing

This release introduces the ability for testing the flows created using TIBCO Flogo® Enterprise from the design-time including creating and managing launch configurations for running these tests.

## Command-Line Interface

This release provides a command-line utility capable of building a Flogo application binary.

# Release 2.1.0

## Improved support for building and deploying AWS Lambda functions

This release allows developers to build Flogo flows as functions in AWS Lambda and deploy them directly from the design-time environment in to their AWS accounts.

## **Support for Connectors**

This release introduces an installation manager and the ability to install and manage connectors for Flogo® Enterprise.

# Release 2.0.0

## **Improved experience across installation, design, and runtime**

A completely revamped user experience across installation, design-time, and runtime components has been introduced in v2.0.0 of TIBCO Flogo® Enterprise. This makes the experience better aligned for enterprise developers and consistent with the concepts available in TIBCO Flogo® apps.

## **Cross-compatibility for Flogo Applications**

Starting with this release, Flogo apps/flows created in the open-source Project Flogo™ can be imported into TIBCO Flogo® Enterprise (or TIBCO Cloud™ Integration - Flogo®). Starting from this release, Flogo® Enterprise picks the most current stable release of the open-source Project Flogo™ and is compatible with capabilities provided in such a release.

## **Support for AWS Lambda Trigger**

This release introduces the support for triggers for server-less frameworks and environments such as AWS Lambda. Developers can now build Flogo flows that can be run in AWS Lambda as functions.

## Changes in Functionality

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The following functionality and features have been changed in this release of Flogo Enterprise.

### Release 2.14.1

#### TIBCO Flogo® Enterprise Core

There are no changes in functionality in this release.

### Release 2.14.0

#### TIBCO Flogo® Enterprise Core

##### NULL Value in Flow Input or Output

When designing a flow, if the flow input or output has a NULL value in the JSON data at the parent level, an error message is now displayed and the **Save** button is disabled.

##### Mapper Support on the Retry on Error tab

On the **Retry on Error** tab of an activity, you can now set values using the mapper.

##### Confirmation prompt when deleting an activity

When you click the **Delete Activity** icon , a confirmation prompt is now displayed.

## Support for form-url-encoded ReceiveHTTPMessage trigger

With the newly added support for `form-url-encoded` for REST trigger, if the trigger is configured with `application/json` request body type but the client sends `Content-Type` as `application/x-www-form-urlencoded`, Flogo Enterprise converts all body to a key-value pair body (with `body` as key and an empty string as value).

## Change in Log Level

The handler and activity execution time logs have now been moved from an INFO level to a DEBUG Level.

## Release 2.13.0

### TIBCO Flogo® Enterprise Core

There are no changes in functionality in this release.

## Release 2.12.0

The following functionality-related changes have been made in this release.

### TIBCO Flogo® Enterprise

#### **Flow Tester**

The Flow Tester engine is now built from scratch every time you start the Flow Tester. As a result, the Flow Tester takes some time to start. The time taken to start the Flow Tester depends upon the number of contributions used in the app and the resources assigned to the Docker daemon.

For more information, see the *Flow Tester* section in the *TIBCO Flogo® Enterprise User's Guide*.

## Order in which branches are executed

When an activity has multiple branches, the order in which the branches are executed is changed to:

1. Success branch
2. Success with condition branch
3. Success with no matching condition branch
4. The Error branch gets executed as soon as the flow execution encounters an error.
5. The Main flow is run last.

The order is random if there are more than two branches which belong to same type.

For more information, refer to the *Order in which branches are executed* section in the *TIBCO Flogo® Enterprise User's Guide*.

## Docker image generation using the -n flag

The syntax of the `-n` flag of the Builder command to generate a Docker image has changed:

```
-n <name>:<tag>
```

(or)

```
-name <name>:<tag>
```

Where `<name>` is the name of the binary file to be generated and `<tag>` is the tag to be used if a Docker image is to be created.

**i Note:** Standalone use of `-t` or `-tag` is no longer supported.

For more information, refer to the *Builder Command* section in the *TIBCO Flogo® Enterprise User's Guide*.

## Metadata for Oracle MySQL

When Oracle MySQL activities contain SQL statements with prepared parameters, the datatype of the prepared parameter shows up as `varchar` in the fields table. This change does not have a runtime impact.

## Mapper validation errors

When you click on the **Validate** button, mapper validation errors are now displayed at the activity level as well as flow level.

## Release 2.11.0

The following functionality-related changes have been made in this release.

## TIBCO Flogo® Enterprise

### Metadata in database connectors

For database connectors, metadata populated in the table now displays generic datatypes.

### Aggregate function in TIBCO Flogo® Connector for Microsoft SQL Server

When using the Aggregate function (SUM, AVG, COUNT, and so on) in a query, use an alias with the Aggregate function as follows:

- Replace:
  - `SELECT COUNT(*) FROM BookStore;`
  - `SELECT AVG(BookNumber) FROM BookStore;`
- With:
  - `SELECT COUNT(*) AS alias_name <name of alias> FROM BookStore;`
  - `SELECT AVG(BookNumber) AS alias_name <name of alias> FROM BookStore;`

### Table names with spaces

If a table name contains space, change the query as follows:

- From: `select * from "Order Details"`
- To: `select * from [Order Details]`

## **Authentication key type in TIBCO Flogo® Connector for TIBCO Cloud™ Messaging eFTL**

In TIBCO Flogo® Connector for TIBCO Cloud™ Messaging eFTL, the type of the Authentication Key field has been changed from PASSWORD to STRING.

## **Release 2.10.0**

The following functionality-related changes have been made in this release.

### **Automatic generation of mappings, Configure HTTP Response, and Return activities**

When a Flogo app is created from a Swagger API specification, Flogo REST triggers and flows are now automatically configured with:

- trigger and flow input/output mappings
- Return and Configure HTTP Response activities, wherever applicable

### **Flogo Studio now called Flogo Web UI**

Flogo Studio is now called Flogo Web UI. For example, this is reflected in the following areas of the product:

- The commands `run-studio.sh` and `run-studio.bat` are renamed to `start-webui.sh` and `start-webui.bat` respectively.
- Console output of the startup scripts
- Docker image is renamed to `flogo-webui`
- Title of the tab in the web browser

## **Release 2.9.0**

The following functionality-related changes have been made in this release.

## Connector installation

Starting with this release, you need not install the following connectors separately:

- TIBCO Flogo® Connector for PostgreSQL
- TIBCO Flogo® Connector for Oracle MySQL
- TIBCO Flogo® Connector for Microsoft SQL Server

## Database service installation

Starting with this release, the database service is available out-of-the-box and need not be installed separately.

## Revalidating an app after navigating into a flow

After validating an app, if you navigate into a flow, you must validate the app again irrespective of whether you made changes to the flow or not. Flogo Enterprise does not retain the results of any previous validation.

## Validation improvements

- In prior releases, flows on the flow list page were validated automatically. Now, you need to manually validate the flows.
- In prior releases, on editing an activity, the entire flow was validated automatically. Now, only that particular activity is validated automatically.

## Timeout field of InvokeRESTService activity

The unit of measurement for the **Timeout** field in the InvokeRESTService activity has been changed to milliseconds. You might want to reconfigure this field using milliseconds and deploy the app again.

## Changes in user interface

The following changes have been made to the user interface:

- Flows list page
  - The **App Properties** Button has been renamed to **Properties**.

- The **Revert to last build**, **Import**, and **Export** buttons have been moved into a list menu.
- Flow Canvas/Details page
  - The **Start testing** button is renamed to **Test**.
  - The **Revert to last build** button is removed.
  - The **Properties** button has been added for specifying app properties.
- Buttons have been rearranged to group primary actions together and secondary actions together.

## Release 2.8.1

The following functionality-related changes have been made in this release.

### Explicit save for activity and trigger configuration

If you make any changes to the schema that you entered when creating a trigger, you must save the changes explicitly by clicking Save and then propagate the changes to the flow input and flow output.

If you have make changes to the schema but do not save the changes explicitly by clicking **Save**, a warning message is displayed asking you to first save the changes before the schema can be synchronized.

## Release 2.8.0

### Lambda triggers

For apps with Lambda triggers (namely ReceiveLambdaInvocation trigger, S3BucketEventLambda trigger, and AWSAPIGatewayLambda trigger):

- An app can have multiple flows or handlers.
- When a trigger is added to other flows, a validation error indicating that other triggers are not allowed in the app is displayed.

## Resource name for InvokeLambdaFunction

For InvokeLambdaFunction, you can now specify the Amazon Resource Name (ARN) from the Input tab in addition to the Settings tab. This can be used to take the ARN from a previous activity or trigger.

## Return activity

A Return activity is not added by default. Depending on your requirements, you must add the Return activity manually. The Return activity is not added by default in the following cases:

- Creating a flow
- Adding a branch
- Creating error handler
- Importing an app

## Mandatory sign

In the input mapper window, for mandatory fields, the mandatory sign (\*) is now displayed before the field name instead of after the field name.

## Updating GraphQL schema

You can now update the GraphQL schema without generating a new Flogo flow.

## Restarting Studio after installing connectors

After installing any connector, Studio must be re-started.

# Release 2.7.0

## JSON string in quotes

If an input string value contains a JSON string and it is not included in quotes, a validation error is returned.

## Response Type in InvokeRestService

In the InvokeRestService activity, **Response type** has been moved from **Settings** to **Output Settings**. The default value of **Response type** is `application/json`.

**i** **Note:** If you set **Response type** to `plain/text` and export the application from 2.6.1, after upgrading to 2.7.0, you must manually change the **Response type** to `application/json`.

## Consistent structure across functions

The structure of Flogo Enterprise and open source Project Flogo functions is now consistent so that the open source Project Flogo functions can be used in Flogo Enterprise and vice versa.

## Redesigned error panels

The error panel is no longer displayed. Errors and warnings are now displayed on the trigger, activity, and flow UI.

## DEBUG logs

The default log level of the Flogo Tester is now INFO and not DEBUG.

## Release 2.6.0

The following functionality-related changes have been made in this release.

### Iterator Mappings

Apps created in earlier versions of Flogo Enterprise have iterator mappings using the `$current` tag. Such apps return validation errors in version 2.6. You must manually update the iterator mappings for such apps.

Also, the datatype for key attribute under `$current` is changed from number to string. So, any mappings that involve the key attribute must also be manually updated.

## **Imported Applications**

It is mandatory to provide a condition on branches. If the condition is not provided, the application fails at runtime.

## **Application Property**

This release of Flogo Enterprise provides additional validations for application properties. If you delete an application property or the property is not configured properly, the application fails to start.

## **Application Property Override Using Environment Variables**

The environment variable used to enable application property override using environment variables has changed from `FLOGO_APP_PROPS_RESOLVERS=env` to `FLOGO_APP_PROPS_ENV="{ }"`.

## Deprecated and Removed Features

---

The following features have been deprecated or removed as of this release of TIBCO Flogo® Enterprise.

When relevant, useful alternatives to the deprecated features are listed. As a deprecated feature can be removed in a future release, you must plan for discontinuing the use of the feature and avoid creating new dependencies that use the deprecated feature.

### Flogo Enterprise Core

#### Deprecated Features

##### *Deprecated Features*

<b>Affected Component</b>	<b>Deprecated Feature</b>	<b>Alternative Feature</b>	<b>Deprecated in Release</b>
Project Flogo contributions	Deprecated contributions: <ul style="list-style-type: none"> <li>• Receive HTTP Message</li> <li>• REST Invoke</li> <li>• Log activity</li> </ul>	Alternative activities and triggers: <ul style="list-style-type: none"> <li>• Receive HTTP Message</li> <li>• Invoke REST Service</li> <li>• Log Message</li> </ul>	2.11.0
Prometheus Metrics	<ul style="list-style-type: none"> <li>• flogo_activity_metrics</li> <li>• flogo_flow_metrics</li> </ul>	<ul style="list-style-type: none"> <li>• flogo_activity_execution_count</li> <li>• flogo_activity_execution_duration_msec</li> <li>• flogo_flow_execution_count</li> </ul>	2.10.0

Affected Component	Deprecated Feature	Alternative Feature	Deprecated in Release
		<ul style="list-style-type: none"> <li>flogo_flow_execution_duration_msec</li> </ul>	
Functions	boolean.true()	true	2.7.0
	boolean.false()	false	
	float.float64()	string.float()	
	number.int64()	coerce.toInt64()	
	number.len()	string.len()	
	string.base64ToString()	utils.decodeBase64()	
	string.stringToBase64()	utils.encodeBase64()	
	string.dateFormat()	YYYY-MM-DD	
	string.datetimeFormat()	YYYY-MM-DDTHH:mm:ss	
	string.timeFormat()	HH-mm-ss	
	string.lowerCase()	string.toLowerCase()	
	string.upperCase()	string.toUpperCase()	
	string.regex()	string.matchRegEx()	
	string.length	string.len()	
	string.toString()	coerce.toString()	
	utility.renderJSON	coerce.toString()	

Affected Component	Deprecated Feature	Alternative Feature	Deprecated in Release
Triggered flows	Use of triggered flows is deprecated.		2.4.0
Flogo OSS Reply(Legacy) activity		Use the Return activity in serverless flows.	2.2.0

## Removed Features

### Removed Features

Affected Component	Description	Deprecated in Release	Removed in Release
TIBCO Flogo® Enterprise Web UI	To remove the effort of installing and updating TIBCO Flogo® Enterprise, the functionality of TIBCO Flogo® Enterprise web UI is delivered as a part of the hosted TIBCO Cloud Integration environment. The option to set up TIBCO Flogo® Enterprise web UI locally is removed. This does not affect app deployment options supported with TIBCO Flogo® Enterprise. Also, as the TIBCO Flogo® Enterprise web UI is removed, the latest Flogo features are accessible from TIBCO Cloud™ Integration.	2.14	2.14.1
<b>Start with Trigger</b> option	The <b>Start with Trigger</b> option on the UI (when creating flows), has been removed.	-	2.5.0

## Migration and Compatibility

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The following information provides migration procedures and a compatibility matrix for this release of TIBCO Flogo® Enterprise.

### Release 2.14.1

#### TIBCO Flogo® Enterprise Core

To migrate an existing app (created using release 2.14.0 or a prior release) from Flogo Enterprise to TIBCO Cloud™ Integration, you must:

1. Export your app from Flogo Enterprise (using release 2.14.0 or a prior release)
2. Import the (exported) app in TIBCO Cloud™ Integration

For more information, see *TIBCO Flogo® Enterprise Transition Guide*.

### Release 2.14.0

#### TIBCO Flogo® Enterprise Core

There are no migration procedures or compatibility issues in this release.

### Release 2.13.0

#### TIBCO Flogo® Enterprise Core

There are no migration procedures or compatibility issues in this release.

## Release 2.12.0

There are no migration procedures or compatibility issues in this release.

## Release 2.11.0

There are no migration procedures or compatibility issues in this release.

## Release 2.10.0

### **HTTP Rest Trigger Mappings**

Importing an app created in a prior version of Flogo Enterprise that uses a REST Trigger and is configured with an HTTP response code breaks trigger reply mappings. To fix this issue, export the app from the latest version and import it again.

### **Mappings after import**

For older apps, in some cases, mappings done at parent level are displayed at the element level after import. Note that it does not have any impact at runtime.

## Release 2.9.0

### **Zuora App**

If a Zuora app is created in a prior version of Flogo Enterprise and is then imported to the current version, mapping issues are observed on the **Input** tab of the Zuora Subscription Activity for the Create Subscription operation.

Export the app without making any changes and then import it again.

## Release 2.8.1

There are no migration or compatibility related changes in this release.

## Release 2.8.0

There are no migration or compatibility related changes in this release.

## Release 2.7.0

### **InvokeRESTService Backward Compatibility**

After an old application JSON file is imported, if it uses the open source Project Flogo REST Invoke activity, an error is encountered.

As a workaround, import the application and delete the existing open source Project Flogo REST Invoke activity. Then, add a new REST Invoke activity from the Default category.

### **Array Mapper Filter**

When you upgrade to 2.7.0, if you use an array mapper filter for an application created in a release prior to 2.7.0, an error is displayed during design time. To fix this, delete the old mapping and remap it from the Upstream Output section. A scoping variable is now included in the mapping.

For example, if the old mapping is:

```
array.forEach($flow.body.Book)
```

After the remap, the mapping becomes:

```
array.forEach($flow.body.Book, "Book")
```

## Release 2.6.0

The following migration and compatibility related changes have been made in this release.

### **Flogo Enterprise Importing Old Apps Due to a Model Change**

In version 2.6, due to an application model change, it is recommended that you import old apps JSON in version 2.6 and export them.

## **CLI Tool**

When the CLI tool is used to build an application created in an earlier version of Flogo Enterprise, the application binary created might not work properly in version 2.6 due to an application model change.

To avoid errors, import and export old apps in version 2.6 before using the CLI tool.

## Closed Issues

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The following issues have been fixed since the last major release of Flogo Enterprise.

### Release 2.14.1

#### TIBCO Flogo® Enterprise Core

No issues have been fixed in this release of TIBCO Flogo® Enterprise.

### Release 2.14.0

#### TIBCO Flogo® Enterprise Core

The following issues have been fixed in this release of TIBCO Flogo® Enterprise.

Key	Summary
FLOGO-7666	The value of data type BIGINT is converted to an incorrect value.
FLOGO-7544	The <b>Discard</b> button is activated in the OSS Invoke REST Service activity even when no changes are made. The UI is disoriented after clicking on the <b>Discard</b> button and requires a browser refresh.
FLOGO-7541	If the trigger with coercion has individual mapping for elements, the mapping of the Return activity changes after export and import.
FLOGO-7531	When you access a property of type array using a square bracket notation, a false mapper validation error is thrown. For example, an error is thrown for the following property:

Key	Summary
	<pre>coerce.toBool((\$flow.body["Customer"] [0+1])</pre>
FLOGO-7528	If you import an app that contains double quotes (""), the value within the double quotes is not preserved in the activity and the expression becomes empty. A design-time validation error is thrown.
FLOGO-7510	In the Invoke REST Service activity, when <b>Configure Response Codes</b> is set to <b>True</b> and it is provided in the JSON Schema format, <b>Response Headers</b> are not populated in <b>Output</b> .
FLOGO-7474	The <code>array.foreach()</code> function cannot be used as a function argument or in conditional expressions.
FLOGO-7407	When a dynamic name is used in the property value lookup, the mapper reports validation error. For example, an error is thrown for the following property:
	<pre>\$property[\$activity[foo].output.name],</pre>
FLOGO-6936	In the InvokeRESTService activity, when <b>Configure Response Codes</b> is set to <b>true</b> and <b>Response Body</b> or <b>Response Headers</b> is configured with JSON schema, response headers do not show up correctly in the output.
FLOGO-6720	If an extension is deleted before an app and uploaded again, the deleted app name or flow name is shown in the extension.
FLOGO-5827	Flow input or output with JSON data of NULL value is not supported.

## TIBCO Flogo® Connector for PostgreSQL

The following issues have been fixed in this release of TIBCO Flogo® Connector for PostgreSQL.

*Closed Issues*

<b>Key</b>	<b>Summary</b>
WIPGRS-462	When you use ENUM functions on table creates with an enum as datatype for one of its columns, then error "query parsing failed: no prefix parse function found for ILLEGAL" occurs.
WIPGRS-461	Datatype JSON is not supported. At run time output of JSON datatype shows as base64 encoded value.
WIPGRS-428	At runtime output of XML type is showing base64-encoded value.
WIPGRS-257	Postgres values of enum type are base-64 encoded instead of the actual value being displayed.

## TIBCO Flogo® Connector for Oracle MySQL

The following issues have been fixed in this release of TIBCO Flogo® Connector for Oracle MySQL.

<b>Key</b>	<b>Summary</b>
WIMYSQ-546	Inserting a record with null values does not work.

## Release 2.13.0

### TIBCO Flogo® Enterprise Core

The following issues have been fixed in this release of TIBCO Flogo® Enterprise.

Key	Summary
FLOGO-7294	Launch configurations in the Flow tester of the source app are not seen in the target app after the app is replaced from the App Details page.
FLOGO-7060	In the InvokeRESTService activity, for existing activities, you cannot see the <b>Output Format</b> field if you select <b>Response Type</b> as <b>application/xml</b> in the <b>Output Settings</b> tab. The activity fails at runtime.
FLOGO-7022	When a new element is added to the JSON (such as a new array element in the existing schema), all mappings are cleared and the mapping must be done again. The old mapping is not retained.
FLOGO-7045	After selecting an app-level schema for an OSS trigger or activity, the schema does not appear in the dialog box until you click inside the dialog box.
FLOGO-6815	If an arithmetic operator is used inside a function argument, validation errors are returned in the mapper.
FLOGO-5869	App-level schema is not available for the request or response of Plain/text and Other types because they have a non-editable schema by default.
FLOGO-5200	If you add wrong data in the input mapper, an error symbol is not displayed for the activity. The error symbol is, however, correctly displayed in the input mapper section.
FLOGO-4263	Adding a new element to an existing mapper schema, removes any existing mapped elements.
FLOGO-4104	When Project Flogo apps are imported into Flogo, the Input/Output mappings are lost after the Sync Schema option is used.
FLOGO-3624	If a field in the mapper of an activity is mandatory and you have not provided a value, an error is not displayed on the activity or flow canvas.
FLOGO-2536	Importing a Flogo app using Salesforce activities with no connection set in connections page takes longer than expected time to import.
FLOGO-2223	When there is a conflict in the path parameters wildcards, even though you see an error in the logs, the app proceeds to run.

## TIBCO Flogo® Connector for TIBCO Cloud™ Messaging eFTL

Key	Summary
FGTCM-88	MessageSubscriber trigger output provides the metadata on the <b>Map to flow Inputs</b> tab. The <b>metadata</b> field includes the <b>messageId</b> and <b>deliveryAttempt</b> properties.

## TIBCO Flogo® Connector for PostgreSQL

### *Closed Issues*

Key	Summary
WIPGRS-282	Returns {"records":null} at run time for parameter queries where parameter name is same as data in the query.

## TIBCO Flogo® Connector for Microsoft SQL Server

### *Closed Issues*

Key	Summary
WIMSSS-268	At run time, XML type is not supported.

## TIBCO Flogo® Connector for Oracle MySQL

### *Closed Issues*

Key	Summary
WIMYSQ-62	Mapper fails to resolve function name on the output for the activity.

## Release 2.12.0

The following issues have been fixed in this release of Flogo Enterprise.

Key	Description
FLOGO-6661	<p>After installing or uploading a connector or extension with a dependency (such as a third-party library), a flow using such a connector or extension cannot be tested in the Flow Tester. The following error is displayed:</p> <pre>Failed to create engine instance</pre>
FLOGO-2224	<p>In a REST trigger, when the endpoints have the same base path but different wildcard in path parameters, the app fails to run and results in a path conflict error.</p>
WIPGRS-285	<p>(TIBCO Flogo® Connector for PostgreSQL) The PostgreSQL Update activity does not work when the returning clause is used.</p>
WIMSSS-284	<p>(TIBCO Flogo® Connector for Microsoft SQL Server) When creating a connection with incorrect SSL details, a meaningful error message is not displayed.</p>
WIPGRS-166	<p>(TIBCO Flogo® Connector for PostgreSQL) Using multiple user-defined prepared parameter as a sub-string of another does not work. The following query does not work as dep is a substring of dep1:</p> <pre>select name, dept_name from student where student.dept_name=?dep OR student.dept_name=?dep1;</pre>

## Release 2.11.0

The following issues have been fixed in this release of Flogo Enterprise.

Key	Description
FLOGO-6269	After renaming a Flogo app, the app name field was not editable.
FLOGO-6234	(Only for database connectors) In the Manual mode, after you click <b>Clear Table</b> , the subsequent fetch query failed.
FLOGO-6233	(Only for database connectors) In the manual mode, when you entered a query and clicked <b>Fetch</b> , the table was populated with metadata. However, when you clicked <b>Add row</b> , all previous metadata disappeared.
FLOGO-6216	You could not multiply <code>float64</code> with a JSON number. When using the multiply operation in the mapper of a number field, an error occurred at run time.
FLOGO-6175	(Windows OS only) If you clicked the <b>Create/Import</b> button multiple times, the UI became unresponsive for a certain period. When the UI finally became responsive, multiple unwanted app instances were created. This happened because one new app was created for each click.
FLOGO-5998	The <code>datetime.currentDate()</code> function could not be formatted or parsed by the <code>datetime.parse()</code> or <code>datetime.formatDate()</code> function.
FLOGO-5876	For any old REST triggers where the API Specification upload feature was not enabled, adding a new handler failed.
FLOGO-5867	App level schema was not available for the <code>application/xxx-urlformEncoded</code> request type and it had a non-editable schema by default.
FLOGO-5647	When creating a new trigger, you could not use the <b>Bind an application property</b> button to bind a property to the port.
FLOGO-5344	While adding elements in the <code>array.flatten()</code> function, the mapper became slow and the page became unresponsive after some time.
FLOGO-4954	When multiple flows used the same TIBCO Cloud Messaging subscriber trigger, only some of the flows worked as expected.
FLOGO-1488	Mandatory fields in all the AWS Kinesis activities were not displayed as

Key	Description
	mandatory on the UI.
WIMYSQ-441	The output schema is not generated and the following error is displayed: <div style="background-color: #e6f2ff; padding: 5px; margin-top: 5px;"> <pre>evaluation failed: unknown operator: DATETIME_OBJ * INTEGER</pre> </div>

## Release 2.10.0

The following issues have been fixed in this release of Flogo Enterprise.

Key	Description
FLOGO-6255	When an existing Flogo Enterprise setup was upgraded to 2.10, the version of the existing apps was set to 4.0.0 by default.
FLOGO-5895	You could not map empty arrays in activity mappings.
FLOGO-5893	At runtime, the Flogo engine threw an error when the application property was configured to the <b>Delay</b> field in a <b>Repeat Until True</b> loop.
FLOGO-5846	The <b>Add row</b> option was present for path parameters. It could not be added from <b>Input Settings</b> .
FLOGO-5755	The Send Email activity did not work with Office365 mail server.
FLOGO-5730	Subflow flow mappings got moved to the top level node after export/import app.
FLOGO-5714	If an existing trigger in a flow was deleted from the flow list page and you added a new trigger from the same page, you could not build the binary app and export the app.  As a workaround, you could duplicate the existing flow and delete the original one. You can perform all actions on the newly created flow.

Key	Description
FLOGO-5655	<p>You could not import tester launch configuration. The following error was displayed:</p> <pre>Configuration already exists.</pre>
FLOGO-5654	For the InvokeRESTService activity, the Accept request header was set to Response Type when using Configure Response Codes.
FLOGO-5650	<b>Summary:</b> If an app-level schema was attached in the request or response schema of the AWSAPIGatewayLambda trigger, the API gateway was not created.
FLOGO-5634	In the input and output of a flow, if you changed the parameter type and then selected another type as <b>Required</b> , the parameter type changed to the previous type again.
FLOGO-5616	If you did not click the <b>Save</b> button while configuring an activity and then moved to the <b>Flow Inputs &amp; Outputs</b> tab, the flow was unavailable and appeared grayed out.
FLOGO-4855	<p>If you upgraded from Flogo Enterprise 2.8.0 to 2.8.1, the following error message was displayed:</p> <pre>'o' is not recognized as an internal command or 'things' is not recognized as an internal command"</pre> <p>You can ignore the error. The upgrade happens correctly despite the error.</p>
FLOGO-4420	<b>Summary:</b> While mapping arrays, validation errors were displayed on the UI when the source array came from a fixed array child such as: <code>\$flow.input[0].test.arraysource</code> .
WIMSSS-188	The SQLServer output schema was not available immediately for mapping in the downstream activities.
WIMSSS-207 / WIMSSS-215	Input schema was blank and did not populate immediately.

## Release 2.9.0

The following issues have been fixed in this release of Flogo Enterprise.

Key	Description
FLOGO-5570	If an input string contained the equals sign (=) in the app property and the app property was updated at run time, the <code>string.replaceAll</code> function generated an incorrect result.
FLOGO-5267	When the reply settings of a <code>ReceiveHTTPMessage</code> trigger were modified, the corresponding <code>ConfigureHTTPResponse</code> activities within the flow were not modified appropriately.
FLOGO-5068	Loading an app and validating flows took a long time. In addition, if you tried to access mappings in a flow, the mapper UI did not load.
FLOGO-4969	Moving activities around in large flows was slow.
FLOGO-4968	Mapper was slow for large flows.
FLOGO-4953	When the <code>InvokeRestService</code> activity was used in an app with output settings configured for a <code>String</code> type response code, the output for the response code was generated as type <code>JSON</code> .
FLOGO-4946	If a <code>TIBCO Cloud Messaging</code> trigger had multiple flows, only one flow was triggered and the rest of the flows were not triggered.
FLOGO-4945	For the <code>MongoDBInsertDocument</code> activity, when an app was imported, input parameters were not displayed on the <b>Input</b> tab.  If the imported flow contained any object or param fields that did not have a fixed schema definition in the <code>activity.json</code> or <code>trigger.json</code> , it resulted in loss of data and a blank screen was displayed.
FLOGO-4935	After upgrading to the current release, all codes were displayed as 200 in the manifest.
FLOGO-4924	For REST triggers created in prior releases (which did not have the <b>Configure Response Codes</b> field in <b>Reply Settings</b> of the REST trigger),

Key	Description
	the Swagger spec was generated with response code as undefined.
FLOGO-4903	When a Flogo app was scaled down to 0, the app did not shut down gracefully. Thus, in Flogo apps with Salesforce activities, the push topics were not deleted.
FLOGO-4902, FLOGO-4872	The <b>Extensions</b> tab took a long time to load and, in some cases, was unresponsive. If the number of large apps was high, the <b>Extensions</b> tab did not load.
FLOGO-4860	For large apps, there was a lag in design-time performance. For example, tasks such as viewing logs in a browser or downloading a large log file took a long time.
FLOGO-4845	If an app was updated and the app already existed in another environment, when the app was imported into the other environment, changes made to the app did not reflect in the other environment.
FLOGO-4570	If an array name contained a dollar sign (\$) or a dash (-) character and the flow output was mapped to the Return activity, the character (\$ or -) was removed from the array name in the <b>Input</b> field.
FLOGO-4492	When an app property was bound to a trigger handler configuration and the same trigger was used in another flow, the same app property was used in the new trigger handler. You had to manually unbind the app property in the new trigger handler.

## Release 2.8.1

The following issues have been fixed in this release of Flogo Enterprise.

Key	Description
FLOGO-4582	A TIBCO Cloud Messaging Subscriber Content Matcher was not saved after importing the app.

Key	Description
FLOGO-4573	Flogo Enterprise did not handle special variables containing bracket notation, such as 'address[Line1]'.
FLOGO-4489	When an app property was bound to a trigger handler configuration and the app was exported, the name of the property was lost and was not displayed in the design-time model after the app was imported using the UI. The app failed at runtime.
FLOGO-4456	The Flogo AWS Connection failed at runtime if <b>Use Assume Role</b> was set to <b>True</b> .
FLOGO-4448	When the output was configured for a flow, a warning message regarding the Error Handler was reported.
FLOGO-4427	At design time, when a filter expression in a mapper had multiple arguments from \$loop, a wrong validation marker was displayed.
FLOGO-4407	The Flogo AWS Connection failed at runtime if <b>Use Assume Role</b> was set to <b>True</b> and <b>External ID</b> was not configured.
FLOGO-4388	The data set in the Throw Error activity in a sub flow was not accessible to the parent flow.
FLOGO-4315	You could import apps with AWS API Gateway Lambda Trigger, Receive Lambda Invocation Trigger, or S3 Bucket Event Lambda Trigger along with other triggers in the same app. A validation error was not returned at design time and the app failed at runtime.
FLOGO-4250	If you changed or switched a Loop type, the configuration settings of the previous Loop type were not stored or preserved.
FLOGO-3910	For an app, when a child element was added as a filter to the parent array mapping, an index was not added.
FLOGO-3908	While mapping arrays, an extra element was added as a null value for missing elements in the array. For example, if the first element in an array had 3 fields and the second element had only 1 field, 2 fields were

Key	Description
	added as null for the second element.
FLOGO-389	<p>Anonymous arrays are not supported.</p> <p>You can add a root element to the array.</p>
FLOGO-3741	If you upgraded to Flogo Enterprise 2.7.0 and then tried to build a binary for an app with a Lambda trigger, building the binary failed with an error.
FLOGO-3650	<p>Building an app using the builder CLI resulted in an issue for an app exported before 2.6.0.</p> <p>You can import the app into the latest version of Flogo Enterprise and export it again.</p>
FLOGO-3561	<p>Logs were not visible in Flow Tester and the following error was displayed:</p> <pre data-bbox="488 989 1414 1146">Debugger failed to start as the test engine is currently being built. Please try again after sometime. For more information check builder.log.</pre>
FLOGO-3520	For the InvokeRestService activity, if you selected <b>Response type</b> as text/plain or Other in the <b>Output settings</b> tab, the <b>Response schema</b> was not refreshed.
FLOGO-3375	On re-importing an app, single quotes were replaced by double quotes in a JSON string field.
FLOGO-2676	<p>On Linux platforms, the UI was not launched after connecting to a VPN.</p> <p>You can disconnect the VPN and re-launch or refresh the UI.</p>
FLOGO-2451	After importing a Flogo app, an extra return activity was added if the flow had no return activity.

## Release 2.8.0

Key	Description
FLOGO-4322, FLOGO-4298	You could not filter an array based on a condition on the child element of the object in that array.
FLOGO-4262	When ternary operators were used with the <code>array.count()</code> function an error was displayed at design time.
FLOGO-4161	False validation errors were reported in case of nested array fields mapping from different sources.
FLOGO-4129	You could not throw the error caught in a subflow to the main flow and stop the execution of main flow when an error occurs.
FLOGO-4056	When the URL of a big-sized Github repo (which did not have the expected structure of extensions) was provided to extensions downloaded from Github, a new app could not be created.
FLOGO-3912	For a child array filter mapping, when only a parent element was used in the filter expression, activities and flow showed a false validation error. Even if the activities show a red mark on the UI, the required results were shown at runtime. You can ignore the red marks.
FLOGO-3878	If a Flogo app had a RESTInvoke activity which called a REST service created in Flogo and which used <code>ConfigureHTTPResponse</code> , the RESTInvoke flow failed if it used <code>ConfigureHTTPResponse</code> whose input was mapped from RESTInvoke output.
FLOGO-3858	If an array inside an array was mapped to root, the child elements were not upgraded to <code>\$loop</code> . Instead, they were mapped using <code>\$</code> only for hybrid mappings.
FLOGO-3561	Logs could not be seen in the Flow Tester.
FLOGO-3856	If you mapped an array to an array and its child elements, an error was displayed at the trigger and activity level even though mappings were correct.

Key	Description
FLOGO-3754	When importing an app, if the app used an extension that was not present in the environment, the import process hanged.
FLOGO-3742	After upgrading to version 2.7.0, if you uninstalled the dbservice and then installed it again, the following error was displayed: <div style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> <pre>Failed to install service</pre> </div>
FLOGO-3595	When a Flogo application was created by importing a Swagger specification with multiple response codes, the <b>Message</b> field was displayed in <b>Map from Flow Outputs</b> even after adding a <b>Response body</b> in <b>Reply Settings</b> .

## Release 2.7.0

Key	Description
FLOGO-3304	An application that used an open source Project Flogo REST trigger or REST Invoke activity did not work in the Flow tester or with the binary.
FLOGO-3235	An error in a condition was not shown anywhere in the flow except on the condition definition page.
FLOGO-3209	When you import an application created in open source Project Flogo into Flogo Enterprise, the data type of the code field in the REST trigger was not displayed.
FLOGO-3162	In Lambda applications, if you used an application property when configuring the <b>Execution Role Name</b> field, you could not push the application. The following error was displayed: <div style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> <pre>Execution role name [= \$property ["execRoleName"] ]Execution role name [= \$property ["execRoleName"] ]ValidationError: The specified value for roleName is invalid.</pre> </div>

Key	Description
FLOGO-3136	On importing a Lambda Trigger application, Reply Data schema (in the Reply Settings tab in Receive Lambda Invocation Trigger) was lost.
FLOGO-3131	In a condition, you could not check whether an object was empty or null.
FLOGO-3121	Creating a Flogo application from an API specification resulted in a validation error during application creation.
FLOGO-3117	In branch condition, if you compared a string type variable with a number, a validation error was not displayed at design time and the flow did not get executed at runtime.
FLOGO-3102	An error was not displayed for an empty condition on the UI.
FLOGO-3099	If a string in a mapper started with =, the flow failed at runtime.
FLOGO-2863	You could not create a Flogo application from an API specification that had a 400 response code with a schema response.
FLOGO-2855	A flow was unable to capture the body of the response when Invoke API returned a 400 error.
FLOGO-2466	Use of any "trigger output" was not supported in "trigger output" to "flow input" array mappings. Also, use of "flow output" was not supported in "flow output" to trigger reply array mappings.
FLOGO-2432	After upgrading a connector, if you tried to uninstall the connector, the following error was displayed: <div data-bbox="451 1423 1414 1514" data-label="Code-Block"> <pre>bash: ./installmgr.sh: No such file or directory.</pre> </div>
FLOGO-2187	When the Iterator key was used as an array index, the following error was displayed and the flow execution failed: <div data-bbox="451 1650 1414 1740" data-label="Code-Block"> <pre>index based access expected for an array</pre> </div>

Key	Description
FLOGO-2171	Application properties updated in the AWS Parameter Store were not propagated to Lambda functions when self deploy (./App --deploy) mode was used. The flow continued to use the default value for such properties.
FLOGO-646	Formatting and parsing of date and time to a MM-DD-YYYY format was not supported.

## Release 2.6.1

Key	Description
FLOGO-3204	Flogo applications exported from Project Flogo™ version 0.9.0 could not be imported into Flogo® Enterprise 2.6.0.
FLOGO-3186	You were not able to import a Swagger specification which did not have any unsupported methods or paths while creating flows. This has been fixed.
FLOGO-3160	A validation error was not returned for invalid credentials in Connections.
FLOGO-3154	Failed to get data from Marketo Upsert or Delete activity's output errors field.
FLOGO-3152	On Windows platforms, you could not uninstall Flogo Enterprise using the installmgr script.
FLOGO-3141	When an app was imported, input data (string) in a subflow activity was lost.
FLOGO-3133	After upgrading Flogo Enterprise from 2.x to 2.6.0, if the application had an OSS activity, the Flogo tester failed to run and displayed the following error message: <div data-bbox="479 1717 1299 1789" style="background-color: #e6f2ff; padding: 10px; margin-top: 10px;"> <pre>Failed to create engine: %!s(MISSING) error unmarshalling flow: activity '#error' not imported.</pre> </div>

## Release 2.6.0

Key	Description
FLOGO-2923	For an empty condition, an error was not returned and the condition was evaluated as true at runtime.
FLOGO-2695	Building a Flogo application binary through UI and testing the Flogo application through Flogo tester did not work.
FLOGO-2512	If you created a Flogo application from an API specification, the flows for the REST methods that had query or path parameters of type integer or long were not created even though the application was created successfully.
FLOGO-2403	To run Flogo Enterprise on the Docker toolbox, you had to do the following: <ul style="list-style-type: none"><li>• provide the virtualbox read/write access if it was installed in any directory other than the home directory hierarchy.</li><li>• make the following changes in the bash script file:<pre>SET DATA_DIR="/c/Users/&lt;username&gt;/customer_docker_18.09.01_toolbox/flogo/data" SET FLOGO_HOME="/c/Users/&lt;username&gt;/customer_docker_18.09.01_toolbox/flogo/2.3" SET TOOLS_DIR="/c/Users/&lt;username&gt;/customer_docker_18.09.01_toolbox/flogo/tools" SET SERVICES_DIR_ LOCAL="/c/Users/&lt;username&gt;/customer_docker_18.09.01_toolbox/flogo/services" ECHO %DATA_DIR% ECHO %FLOGO_HOME% ECHO %TOOLS_DIR% ECHO %SERVICES_DIR_LOCAL%</pre></li></ul>

## Release 2.5.0

Key	Description
FLOGO-2404	If you imported an application that contained a connection extension, the application got imported without errors, but you had to recreate the connection after importing the application. The connection detail are now preserved except for the password which must be reset in the imported app.
FLOGO-2396	When invoking a Flogo service from LiveApps, LiveApps did not get a response from the Flogo service.

## Release 2.4.0

Key	Description
FLOGO-2103	If the InvokeRESTAPI activity URL contained "--", it gave an error at design time for Flogo applications.
FLOGO-2022	Flogo Enterprise now supports nested ternary operators.
FLOGO-2021	If you removed the <code>array.forEach()</code> from the root element, all the mappings underneath would get deleted.
FLOGO-1999	On certain Windows machines, the uninstall service would fail.
FLOGO-1925	When overriding a property from the CLI using the <code>FLOGO_APP_PROPS_OVERRIDE</code> environment variable, if your value was a query that used the comma delimiter, you encountered an error.
FLOGO-1833	The XPATH expression <code>count()</code> which is used to get the number of array items is now available for Flogo apps.
FLOGO-1723	Fixed an issue when running <code>run-studio.sh</code> as a regular user, you received a "permission denied" error.

Key	Description
FLOGO-578	When using branch conditions in Flogo applications, you received error messages when the conditions contained special characters (Expected "(", ",", ".", "/", "*", "//", ";", "[", comment, end of line, or whitespace but "<" found.) but the condition would work and the flow executed as per the condition provided.
FLOGO-368	If the schema entered in the <b>Input</b> and/or <b>Output</b> tab of a REST activity or trigger contains reserved names in the schema attributes, after the application is imported into Flogo Enterprise, such attributes get treated as special characters which results in runtime errors. The reserved names to avoid in schemas are now documented in the product documentation under the "Mapper" section.
FLOGO-324	When uploading an application that contained a subflow, the subflow-related configurations did not get imported.

## Release 2.3.0

Key	Description
FLOGO-1443	Fixed an issue where if your Flogo application used any Flogo connector using OAUTH for authentication, the application binary built using the Flogo CLI tool did not work at runtime.
FLOGO-1405	Flogo applications exported from prior versions such as 2.0.0 or 2.1.0 were not compatible with the Flogo CLI tool.
FLOGO-325	When uploading an application that contains an iterator, the iterator-related configurations did not get imported.
FLOGO-313	When uploading an application that contained application properties, the application properties related configurations did not get imported.

## Known Issues

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The following issues exist in this release of TIBCO Flogo® Enterprise.

### Flogo Enterprise Core

The following issues exist in this release of Flogo Enterprise.

Key	Description
FLOGO-7968	<p><b>Summary:</b> If you have defined the multipart form data field as filecontent but provide string in the input, multipart form data is returned as a string instead of a file.</p> <p><b>Workaround:</b> Use <code>array.create("string")</code> while passing multipart content.</p>
FLOGO-7967	<p><b>Summary:</b> If you have defined a filecontent type multipart form data field, you cannot provide a filename as input.</p> <p><b>Workaround:</b> None</p>
FLOGO-7868	<p><b>Summary:</b> [Microsoft Azure] When building an app binary, messages of the build process are not shown on the UI immediately. They are shown only after the build process is completed.</p> <p><b>Workaround:</b> None</p>
FLOGO-7810	<p><b>Summary:</b> When the ReplyToTrigger activity is used in a flow, the following warning related to the Return activity is incorrectly displayed:</p> <pre>Flow output is defined but not configured. To set flow output, add Return activity from Default category.</pre> <p><b>Workaround:</b> Ignore the warning. It does not impact run time.</p>
FLOGO-7665	<p><b>Summary:</b> Instrumentation metrics data is not available for an app and tibagent deployed on AWS Fargate.</p>

Key	Description
	<b>Workaround:</b> None
FLOGO-7657	<p><b>Summary:</b> When adding a description for an app, the "This field is required" message is displayed and the cursor moves in front of the message when you start typing the description. The message does not go away until you go inside the flow. The Back button is also disabled.</p> <p><b>Workaround:</b> None</p>
FLOGO-7600	<p><b>Summary:</b> For Project Flogo extensions, configuration UI is disoriented after clicking on the <b>Discard</b> button and requires a browser refresh. If you click the <b>Discard</b> button, the UI for FIELDS is transformed to basic type inputs (input=text).</p> <p><b>Workaround:</b> None</p>
FLOGO-7572	<p><b>Summary:</b> When you upload a contribution with a Default category (display.category set to Default), an error message is not displayed.</p> <p><b>Workaround:</b> None</p>
FLOGO-7491	<p><b>Summary:</b> REST trigger settings UI hangs when an app is created from Open API spec 3.0 with Object type in multipart/form-data request.</p> <p><b>Workaround:</b> Change the Object type multipart data to string in the API spec and then create the Flogo app from the API spec.</p>
FLOGO-7464	<p><b>Summary:</b> The Multipart/form-data table does not sync properly when API spec is uploaded in the InvokeRestService activity.</p> <p><b>Workaround:</b> Refresh the page after uploading the API spec and saving the settings in the InvokeRestService activity. Then, the table or schema is populated.</p>
FLOGO-7436	<p><b>Summary:</b> Runtime validation is not enabled for <b>Required Form Params</b>.</p> <p><b>Workaround:</b> None</p>
FLOGO-7421	<p><b>Summary:</b> Runtime validation error is observed for filecontent type data</p>

Key	Description
	when <b>Output Validation</b> is set to true in the REST trigger. <b>Workaround:</b> Do not enable <b>Output Validation</b> when the <b>Request type</b> is multipart/form-data in the REST trigger.
FLOGO-7411	<b>Summary:</b> Overriding app property names with (secs) for the deployed Lambda functions from the command line is not supported. <b>Workaround:</b> Remove the app property name with (secs) from the property file.
FLOGO-7405	<b>Summary:</b> If you use a function as a source array for <code>array.foreach()</code> , Studio cannot determine the array element schema and throws a design-time validation error. <b>Workaround:</b> Use the mapper to define the function output schema and then use it in the <code>array.foreach()</code> source array.
FLOGO-7269	<b>Summary:</b> On the flow list page, a "missing extension" validation error is shown for each flow even after installing the missing extension. <b>Workaround:</b> Validate each flow to remove the validation error for that flow.
FLOGO-7031	<b>Summary:</b> When building an app binary from builder CLI with Golang version 1.15.x, the gRPC activity fails to send a request and displays the following error: <pre data-bbox="399 1249 1377 1396">authentication handshake failed: x509: certificate relies on legacy Common Name field, use SANs or temporarily enable Common Name matching</pre> <b>Workaround:</b> <ol style="list-style-type: none"><li data-bbox="435 1501 987 1528">1. Downgrade the Golang version to 1.14.x.</li><li data-bbox="435 1560 1360 1627">2. Run the binary with the option <code>GODEBUG=x509ignoreCN=0</code> as follows: <code>GODEBUG=x509ignoreCN=0 ./binary</code></li></ol>
FLOGO-6951	<b>Summary:</b> Password type app properties do not support encrypted values during design time.

Key	Description
	<b>Workaround:</b> None
FLOGO-6950	<p><b>Summary:</b> If an app is created with app property type as password and double quotes are used in the value of the password, the app fails.</p> <p><b>Workaround:</b> Avoid using double quotes in the password.</p>
FLOGO-6904	<p><b>Summary:</b> When the InvokeRESTService activity is used with the <b>HTTP Client Authorization Configuration</b> connection and <b>OAuth2 Authorization type</b>, it fails to auto-refresh the token if the expired or invalid token response does not have the status code as 401.</p> <p><b>Workaround:</b> Use another InvokeRESTService activity to get the new token and use the new token in InvokeRESTService activity.</p>
FLOGO-6847	<p><b>Summary:</b> If a database connector activity has a design time error, the message incorrectly disappears after clicking the <b>Clear Table</b> link.</p> <p><b>Workaround:</b> None</p>
FLOGO-6586	<p><b>Summary:</b> The value of BIGINT data type is converted to an incorrect value.</p> <p><b>Workaround:</b> If possible, use a STRING data type instead.</p>
FLOGO-6552	<p><b>Summary:</b> The resource path of a previous specification is shown in the <b>Resource path</b> list even after deleting the specification file and uploading a new specification file.</p> <p><b>Workaround:</b> Select the resource path from the <b>Resource path</b> list even if it shows paths of previous specifications. Even though the specification displayed is incorrect, the new path is loaded.</p>
FLOGO-6542	<p><b>Summary:</b> If you upload an OpenAPI Specification (OAS) file in the InvokeREST activity and later upload an updated version of the same OAS, the changes to the schema are not reflected in the associated parameters and request/response schemas.</p> <p><b>Workaround:</b> Delete the original specification and upload the new OAS again.</p>

Key	Description
FLOGO-6458	<p><b>Summary:</b> If you use the Cisco AnyConnect VPN client and then use the <code>InvokeRESTService</code> in the debugger to call a service, it fails.</p> <p><b>Workaround:</b> Use any VPN client other than Cisco AnyConnect. Alternatively, restart the UI after disconnecting the VPN.</p>
FLOGO-6383	<p><b>Summary:</b> When the REST trigger (<code>ReceiveHTTPMessage</code>) or <code>InvokeRESTService</code> activity is configured with Swagger/Open API Specification, any manual changes to the configuration are reset when the specifications are uploaded again.</p> <p><b>Workaround:</b> None</p>
FLOGO-6237	<p><b>Summary:</b> Using literal values in the <code>string.join</code> function in a Flogo app fails both at design and run time.</p> <p><b>Workaround:</b> None</p>
FLOGO-6031	<p><b>Summary:</b> In the <b>InvokeRestService</b> activity, the application level schema toggle is displayed for <code>plain/text</code> and other type request and response.</p> <p><b>Workaround:</b> None</p>
FLOGO-5400	<p><b>Summary:</b> While running an app in flow tester, if you provide a JSON schema with a nested array, it returns an error at design time.</p> <p><b>Workaround:</b> None</p>
FLOGO-5267	<p><b>Summary:</b> The <b>ConfigureHTTPResponse</b> activity is not updated correctly when reply settings are changed.</p> <p><b>Workaround:</b> Trigger a save operation by re-doing or undoing some of the mapper mappings on the <b>ConfigureHTTPResponse</b> activity.</p>
FLOGO-5133	<p><b>Summary:</b> In the <b>ReceiveHTTPMessage</b> trigger and <code>InvokeRestService</code> service, you cannot select an app-level schema if the trigger or activity has multiple responses.</p> <p><b>Workaround:</b> None</p>

Key	Description
FLOGO-4936	<p><b>Summary:</b> Boolean data type and null data type are not supported in TIBCO Cloud Messaging.</p> <p><b>Workaround:</b> None</p>
FLOGO-4842	<p><b>Summary:</b> If you upgrade from Flogo Enterprise 2.x.x to 2.8.1, binaries of an app cannot be generated.</p> <p><b>Workaround:</b> Before upgrading from 2.x.x to 2.8.1, manually delete the &lt;FLOGO_HOME&gt;/2.8/lib/core directory.</p>
FLOGO-4840	<p><b>Summary:</b> If you upgrade from Flogo Enterprise 2.x.x to 2.8.1, the Flow Tester does not work.</p> <p><b>Workaround:</b> Before upgrading from 2.x.x to 2.8.1, manually delete the &lt;FLOGO_HOME&gt;/2.8/lib/core directory.</p>
FLOGO-4717	<p><b>Summary:</b> When a Swagger specification file of size 2.5 MB or more is used for creating an app or uploaded using the REST trigger configuration, the app is not deployed to TIBCO Cloud.</p> <p><b>Workaround:</b> Use a Swagger specification file of a smaller size.</p>
FLOGO-4716	<p><b>Summary:</b> If required elements of a request schema are not provided, the runtime provides a response but the tester returns a validation error.</p> <p><b>Workaround:</b> None</p>
FLOGO-4661	<p><b>Summary:</b> Single quotes are not supported in mapper variables.</p> <p><b>Workaround:</b> None</p>
FLOGO-4659	<p><b>Summary:</b> If you use a field name that contains special characters, the <code>array.foreach</code> mapping fails with the following error:</p> <pre>eval expression failed to resolve Loop: 'field name', ensure that Loop is configured in the application</pre> <p><b>Workaround:</b> Add a scope name before the field name. For example, manually</p>

Key	Description
	change <code>\$loop["fieldName"]</code> to <code>\$loop["ScopeName"]["fieldName"]</code> .
FLOGO-4653	<p><b>Summary:</b> An unsupported data type in the request or response schema is not converted to a supported one.</p> <p><b>Workaround:</b> In the API Spec, change the type to the supported data type. For example, change <code>Float</code> and <code>long</code> data type to <code>Integer</code>.</p>
FLOGO-4628	<p><b>Summary:</b> If a Swagger specification file is modified and the file is saved with a different name, the changes are not reflected in the app even if you click the <b>Sync Schema</b> button.</p> <p><b>Workaround:</b> None</p>
FLOGO-4625	<p><b>Summary:</b> If there are changes in an uploaded Swagger file, a warning message is not displayed requesting the user to update the activity mappings. As a result, you need to navigate to each downstream activity to check for changes in the schema.</p> <p><b>Workaround:</b> None</p>
FLOGO-4583	<p><b>Summary:</b> A TIBCO Cloud™ Messaging Subscriber app of type <b>Durable</b> with <b>Content Matcher</b> fails to start, if an app with the same <b>Durable</b> name and <b>Content Matcher</b> was pushed before.</p> <p><b>Workaround:</b> None</p>
FLOGO-4387	<p><b>Summary:</b> An activity throws a mapper error if the mapped object does not exist, as the <code>FLOGO_MAPPING_SKIP_MISSING</code> environment variable cannot be set in the flow tester.</p> <p><b>Workaround:</b> None</p>
FLOGO-4375	<p><b>Summary:</b> When a Kafka app created in a previous release is imported in the current release, and you click <b>Edit</b> in the <b>Connections</b> tab, the <b>Use Schema Registry</b> option is not available in the <b>Apache Kafka Client Configuration</b> dialog box.</p> <p><b>Workaround:</b> Create a new connection and use the connection in the app.</p>

Key	Description
FLOGO-4363	<p><b>Summary:</b> When an app with different trigger and handler settings is imported, trigger and handler settings are not replaced after selective import.</p> <p><b>Workaround:</b> None</p>
FLOGO-4255	<p><b>Summary:</b> While starting a gRPC app binary which has a gRPC trigger and gRPC activity using the same proto file, duplicate proto type registered message was returned.</p> <p><b>Workaround:</b> Change the package name to a different one to make sure gRPC trigger and gRPC activity use the different package name in proto file.</p>
FLOGO-4188	<p><b>Summary:</b> For OpenTracing, even after terminating an app, recurring warnings are displayed in JaegerUI.</p> <p><b>Workaround:</b> None</p>
FLOGO-4164	<p><b>Summary:</b> While starting a gRPC app binary that has a gRPC trigger and gRPC activity using the same proto file, the following error message is displayed:</p> <pre>Duplicate enum registered</pre> <p><b>Workaround:</b> Change the package name to a different one to make sure gRPC trigger and gRPC activity use the different package name in proto file.</p>
FLOGO-3906	<p><b>Summary:</b> After mapping array root nodes, when a child node mapping is updated, only a mapped child node is returned at run time.</p> <p><b>Workaround:</b> None</p>
FLOGO-3821	<p><b>Summary:</b> When configuring a response code in a REST trigger, the response body and response header must follow the same input schema type.</p> <p><b>Workaround:</b> Ensure that the response body and response header is of the same type, either JSON data or JSON schema.</p> <p>Do not use ConfigureHTTPResponse in the RESTInvoke flow.</p>

Key	Description
FLOGO-3393	<p><b>Summary:</b> If a Kafka producer produces a JSON string, the Kafka consumer does not receive any data.</p> <p><b>Workaround:</b> None</p>
FLOGO-3155	<p><b>Summary:</b> If there is no activity on the UI for some time, the UI is redirected to <code>http://localhost:&lt;port&gt;/undefined/idm/logout-request</code>.</p> <p><b>Workaround:</b> Change the URL and access it again: <code>http://localhost:&lt;port&gt;/</code></p>
FLOGO-2888	<p><b>Summary:</b> You cannot upload Swagger specification definitions which have a cyclic dependency.</p> <p><b>Workaround:</b> None</p>
FLOGO-2886	<p><b>Summary:</b> Depending on your machine configuration and browser configuration, you might not be able to upload a large Swagger API definition JSON file or the browser might become unresponsive. The following error message is displayed on the <b>Network</b> tab and the file is not uploaded:</p> <pre>Request entity too large</pre> <p><b>Workaround:</b> None</p>
FLOGO-2861	<p><b>Summary:</b> When uploading custom schema for GraphQL, if the custom schema has a cyclic dependency, the following error is returned and the upload fails:</p> <pre>Maximum call stack size exceeded for circular reference</pre> <p><b>Workaround:</b> None</p>
FLOGO-2844	<p><b>Summary:</b> If you change the input or output schema in a subflow, it does not give any warning or error in mapping in the call flow activity.</p> <p><b>Workaround:</b> None</p>

Key	Description
FLOGO-2720	<p><b>Summary:</b> You cannot export app properties from a binary that has an API Gateway or S3 trigger.</p> <p><b>Workaround:</b> None</p>
FLOGO-2594	<p><b>Summary:</b> Deploying Lambda apps on AWS using the Flogo engine binary is not supported.</p> <p><b>Workaround:</b> None</p>
FLOGO-1757	<p><b>Summary:</b> JSON schema with cyclic references is not supported.</p> <p><b>Workaround:</b> Remove the cyclic references from the schema.</p>
FLOGO-1727	<p><b>Summary:</b> When a value which starts with 0 is assigned to a field of integer type, the mapper throws a validation error.</p> <p><b>Workaround:</b> Define such values as a string and then use <code>coerce.toInt()</code> for integer values.</p>
FLOGO-1684	<p><b>Summary:</b> When accessing the UI, a "502 Bad Gateway" error is returned if the machine is configured with a static IP address.</p> <p><b>Workaround:</b> Configure the machine IP address as dynamic.</p>
FLOGO-992	<p><b>Summary:</b> If you enter an invalid API Key when creating a Chargify connection, you are prompted to enter username and password for your Chargify account instead of an error being displayed.</p> <p><b>Workaround:</b> Cancel out of the username/password dialog box and reenter the valid API Key. This is a third-party issue.</p>
FLOGO-814	<p><b>Summary:</b> In the flow error handler, <code>\$error.data</code> and <code>\$error.code</code> are not supported in the mapper.</p> <p><b>Workaround:</b> If you import an open source Project Flogo app, manually delete <code>\$error.data</code> and <code>\$error.code</code> from the mappings.</p>
FLOGO-358	<p><b>Summary:</b> On macOS, if you run the <code>run-studio.sh</code> installer from a directory</p>

Key	Description
	<p>that is not shared with the Docker container, the installation fails and the following error is displayed:</p> <pre>Mounts denied</pre> <p><b>Workaround:</b> Configure the path to the <code>run-studio.sh</code> file in <b>Docker &gt; Preferences &gt; File Sharing</b> before running the <code>run-studio.sh</code> command.</p>

## Database Services

Key	Description
WIDBSV-451	<p><b>Summary:</b> In a <code>select</code> query with a <code>where</code> clause, if the parameter name is the same as the column name, the return type is incorrect.</p> <p><b>Workaround:</b> None</p>

## TIBCO Flogo® Connector for Oracle Database

Key	Description
WIORA-153	<p><b>Summary:</b> If the password contains a colon (:), an error occurs while connecting to the database.</p> <p><b>Workaround:</b> None</p>

## TIBCO Flogo® Connector for Salesforce.com Einstein Analytics

Key	Description
WISFEI-62	<p><b>Summary:</b> If Flogo apps using Salesforce Wave activities are run for longer durations, a token refresh error is displayed.</p> <p><b>Workaround:</b> Reconfigure the Salesforce connection used in the activities and build the app again.</p>

## TIBCO Flogo® Connector for Apache Avro

Key	Summary
WIAVRO-65	<p><b>Summary:</b> For Avro activities, when app-level schemas are used, Avro schemas are not displayed in the list for selecting the schema. Instead, JSON schemas are displayed.</p> <p><b>Workaround:</b> None</p>

## TIBCO Flogo® Connector for Microsoft SQL Server

Key	Description
WIMSSS-355	<p><b>Summary:</b> In case of queries combining results from multiple tables, if the tables have identical column names, then the repeated column names are renamed as columnName_&lt;number&gt;.</p> <p><b>Workaround:</b> For duplicate column name use alias.</p>
WIMSSS-	<p><b>Summary:</b> When passing list of values in prepared parameter, then query does not</p>

Key	Description
327	<p>return any values.</p> <p><b>Workaround:</b> Pass multiple prepared parameters like ?a1,?a2</p>
WIMSSS-213	<p><b>Summary:</b> If you export or import from 2.8.1 to the current version, an error is shown on the activities even after establishing a connection.</p> <p><b>Workaround:</b> Refresh the page or click on the respective activity again.</p>
WIMSSS-310	<p><b>Summary:</b> For incorrect query, an error message is not showing up in the Insert, Delete, and Update activities at design time.</p> <p><b>Workaround:</b> None</p>
WIMSSS-92	<p><b>Summary:</b> OUTPUT clause in INSERT INTO is not supported. For example, the following INSERT INTO statement does not return the expected value for promotion id:</p> <pre>INSERT INTO promotions (     promotion_name,     discount,     start_date,     expired_date ) OUTPUT inserted.promotion_id VALUES     (         '2018 Fall Promotion',         0.15,         '20181001',         '20181101'     );</pre> <p><b>Workaround:</b> None</p>

## TIBCO Flogo® Connector for Oracle MySQL

Key	Description
WIMYSQ-524	<p><b>Summary:</b> In case of queries combining results from multiple tables, if the tables have identical column names, then the repeated column names are renamed as <code>columnName_&lt;number&gt;</code>.</p> <p><b>Workaround:</b> For Duplicate column name use alias.</p>
WIMYSQ-488	<p><b>Summary:</b> When importing an app's JSON with a MySQL, SQL Server, or Postgres activity, an error marker is shown on the activity even after updating the credentials.</p> <p><b>Workaround:</b> Refresh the page.</p>
WIMYSQ-464	<p><b>Summary:</b> For incorrect query, an error message is not showing up in the Insert, Delete, and Update activities.</p> <p><b>Workaround:</b> None.</p>
WIMYSQ-440	<p><b>Summary:</b> If there is no SSL server and you configure the connection as an SSL Connection with the <b>TLS Required</b> option selected, no error is generated at design time. An error is generated only at run time.</p> <p><b>Workaround:</b> None</p>

## TIBCO Flogo® Connector for PostgreSQL

Key	Description
WIPGRS-460	<p><b>Summary:</b> In case of queries combining results from multiple tables, if the tables have identical column names, then the repeated column names are renamed as <code>columnName_&lt;number&gt;</code>.</p> <p><b>Workaround:</b> For duplicate column name use alias.</p>

Key	Description
WIPGRS-429	<p><b>Summary:</b> In PostgreSQL "rowsAffected" is not showing in the output schema of the INSERT and UPDATE activity.</p> <p><b>Workaround:</b> None</p>
WIPGRS-387	<p><b>Summary:</b> When running the connector with an SSL configuration with incorrect client key and client certificate issues, it results in errors at run time. These issues are not validated at design time.</p> <p><b>Workaround:</b> None</p>
WIPGRS-327	<p><b>Summary:</b> If you export or import from 2.8.1 to the current version, an error is shown on the activities even after establishing a connection.</p> <p><b>Workaround:</b> Refresh the page or click on the respective activity again.</p>
WIPGRS-88	<p><b>Summary:</b> When using time datatype, "time without timezone" is not supported.</p> <p><b>Workaround:</b> None</p>

## TIBCO Flogo® Connector for TIBCO Cloud™ Messaging eFTL

Key	Description
FGTCM-53	<p><b>Summary:</b> The subscriber stops receiving the message from the server after the reconnect attempts are exceeded.</p> <p><b>Workaround:</b> Make sure that the TIBCO Cloud™ Messaging server is running normally and try the following:</p>

Key	Description
	<ul style="list-style-type: none"><li>• Restart the app.</li><li>• Configure a larger number of <code>AutoReconnectAttempts</code> under the connection to make sure it can try to reconnect more times until the server is up.</li></ul>
FGTCM-18	<p><b>Summary:</b> Content matcher does not work with INTEGER type for TIBCO Cloud™ Messaging Subscriber.</p> <p><b>Workaround:</b> None</p>

# TIBCO Documentation and Support Services

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For information about this product, you can read the documentation, contact TIBCO Support, and join TIBCO Community.

## How to Access TIBCO Documentation

Documentation for TIBCO products is available on the [TIBCO Product Documentation](#) website, mainly in HTML and PDF formats.

The [TIBCO Product Documentation](#) website is updated frequently and is more current than any other documentation included with the product.

## Product-Specific Documentation

Documentation for TIBCO Flogo® Enterprise is available on the [TIBCO Flogo® Enterprise Product Documentation](#) page.

The following documents for this product can be found in the TIBCO Documentation site:

- *TIBCO Flogo® Enterprise Release Notes*
- *TIBCO Flogo® Enterprise Installation*
- *TIBCO Flogo® Enterprise User's Guide*
- *TIBCO Flogo® Enterprise Activities, Triggers, and Connections*
- *TIBCO Flogo® Enterprise Security Guide*
- *TIBCO Flogo® Enterprise Transition Guide*

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