

# Motivation for a Mulesoft Plugin

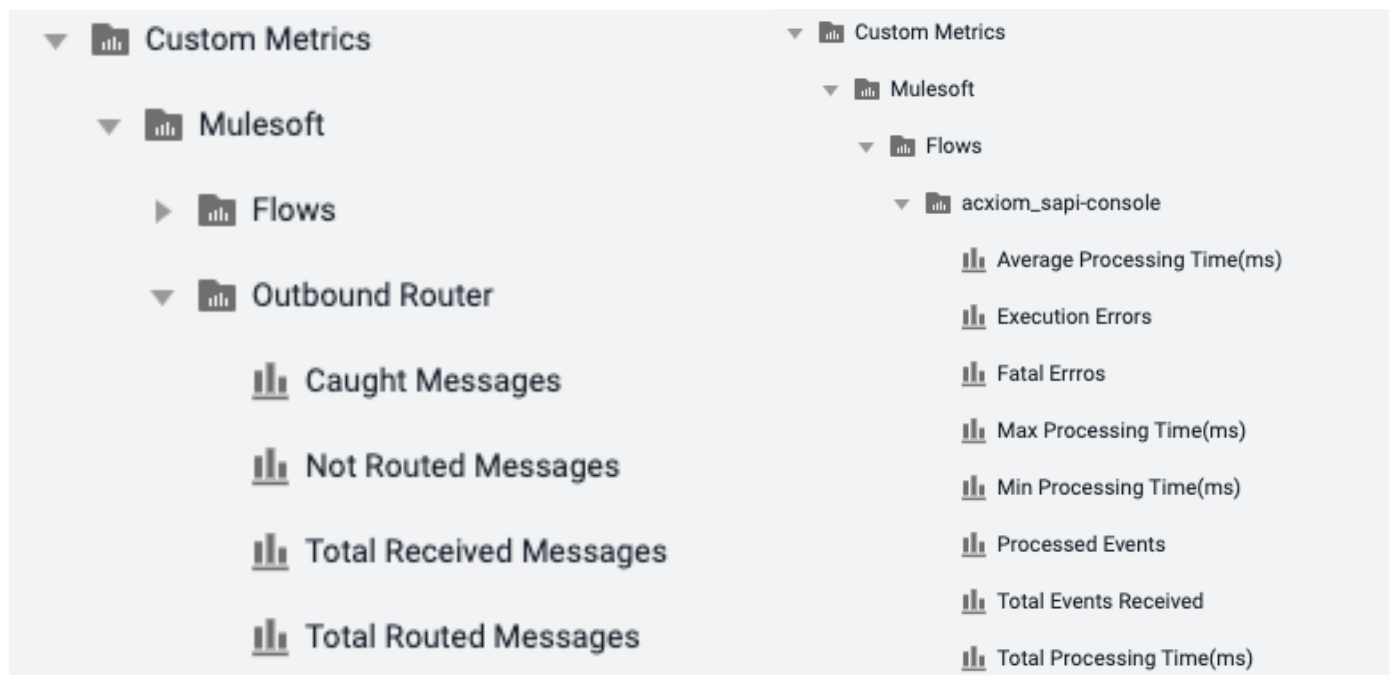
Though Mule is supported by appdynamics, the display of BTs and backends does not often display the design of Mulesoft flows and steps in the way administrators and developers work within mulesoft. This plugin takes advantage of the mulesoft notification framework to add decorations to transactions within mulesoft in order to help a user troubleshooting issues map what they know of the transactions to information made available within appdynamics.

The following capabilities are added with the mulesoft agent plugin:

- Custom Metrics of Mulesoft Analytics for Flows and Routers
- Custom Data within Snapshots to show flow and step execution
- Custom Data within Analytics to allow for queries on Mule Flow statistics
- Custom Events within the application to show Mulesoft Application install/start/stop/failure events
- An entry point is available for future extension in case a mule connector does not correlate OOTB in appdynamics





















## Custom Metrics

Custom Metrics are published from Mulesoft's internal analytics collection mechanism, directly into the controller as node level custom metrics



## Custom Data

An example of the Custom Data collected in Snapshots

Overview	Slow Calls and Errors	Waterfall View	Segment List	Data Collectors
 Drill Down	 Filters	 Find Snapshots	 Actions	
Name ↑		Value		
 ...	Flow credit-applications-sapi-v1 0	[credit-applications-sapi-main]		
 ...	Flow credit-applications-sapi-v1 0 StartTime...	[2021-06-16 09:45:50.382 CT]		
 ...	Flow credit-applications-sapi-v1 0 credit-app...	[Log end-log-end]		
 ...	Flow credit-applications-sapi-v1 0 credit-app...	[Log start-log-start, ...-router]		
 ...	Flow credit-applications-sapi-v1 1	[get:\credit-applications:credit-applications-sapi-config]		
 ...	Flow credit-applications-sapi-v1 1 StartTime...	[2021-06-16 09:45:50.402 CT]		
 ...	Flow credit-applications-sapi-v1 2 get-pendi...	[Log payload-log-payload, SP results are valid-is-true, httpStatus-set-variable, Map message-transform]		
 ...	Flow credit-applications-sapi-v1 2 get-pendi...	[Transform json-transform]		
 ...	Flow credit-applications-sapi-v1 2 get-pendi...	[Log intermediate-log-intermediate, Get pending applications-stored-procedure]		
 ...	Flow credit-applications-xapi-v1 0 credit-app...	[Log end-log-end]		
 ...	Flow credit-applications-xapi-v1 0 credit-app...	[Log start-log-start, ...-router]		
 ...	Flow credit-applications-xapi-v1 1	[get:\credit-applications:credit-applications-xapi-config]		
 ...	Flow credit-applications-xapi-v1 1 StartTime...	[2021-06-16 09:45:50.357 CT]		
 ...	Flow credit-applications-xapi-v1 2 get-pendi...	[httpStatus-set-variable]		
 ...	Flow credit-applications-xapi-v1 2 get-pendi...	[Log intermediate-log-intermediate, Request to credit application sapi-request]		
HTTP ...	Header-User-Agent	AHC/1.0		
HTTP ...	Header-User-Agent	rest-client/2.0.2 (linux-gnu x86_64) ruby/2.6.2p47		
HTTP ...	Header-client_id	47d8c268a47c490d8327b41f76c6531b		
HTTP ...	Header-client_id	336690a9a74847f98568ede6afe9cabe		
 ...	Mule-transactionId	[8b1c19e0-ceb1-11eb-97b9-0050569a36f6]		

An example of Custom Data collected in Analytics

Fields	Relevant Fields	Timestamp	User Experience	Application
<input type="text" value="Mule"/>		06/25/21 8:31:36 AM	✓ NORMAL	mulesoft
<input type="checkbox"/> T Mule-account_number		06/25/21 8:31:35 AM	✓ NORMAL	mulesoft
<input type="checkbox"/> T Mule-APIFlow		06/25/21 8:31:35 AM	✓ NORMAL	mulesoft
<input type="checkbox"/> T Mule-application_name				
<input type="checkbox"/> T Mule-application_number				
<input type="checkbox"/> T Mule-application_reference_num				
<input type="checkbox"/> T Mule-assignment_id				
<input type="checkbox"/> T Mule-attorney_code				
<input type="checkbox"/> T Mule-book_pk				
<input type="checkbox"/> T Mule-businessLoggerMessage				
<input type="checkbox"/> T Mule-customer_id				
<input type="checkbox"/> T Mule-enagement_id				
<input type="checkbox"/> ⌚ Mule-enddate				
<input type="checkbox"/> T Mule-error_message				
<input type="checkbox"/> T Mule-invoice_code				
<input type="checkbox"/> T Mule-login_id				
<input type="checkbox"/> T Mule-page_number				

Mule-APIFlow - Top Values


Value	Count	%
credit-applications-xapi-v1 credit-applications-xapi-main	49312	5.3
credit-applications-sapi-v1 credit-applications-sapi-main	47335	5.09
credit-applications-xapi-v1 get:\credit-applications:credit-applications-x...	44936	4.83
credit-applications-xapi-v1 get-pending-applications.Main	44765	4.81
credit-applications-sapi-v1 get:\credit-applications:credit-applications-s...	43147	4.64
credit-applications-sapi-v1 get-pending-applications.Main	42991	4.62
cust-service-papi-v1 Cust-Service-Papi-main	14613	1.57
instant-prequal-sapi-v1 instant-prequal-sapi-main	14216	1.53
instant-prequal-xapi-v1 instant-prequal-xapi-main	13079	1.41

Custom Events


An Example of Custom Events reported to the Application

Mulesoft


Dashboard   Network Dashboard   **Events**   Top Business Transactions   Transaction Snapshots   Transaction Score



Details



Filters























Actions

+ Add Criteria

Event Types: Application Deployment, App Server Re...

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	Type	Summary	Time ↓	Business Transacti
	Application Deployment	A mule API started: score-account-sapi-v1	06/15/21 11:32:49 PM	-
	Application Deployment	A mule API is installed: score-account-sapi-v1	06/15/21 11:32:40 PM	-
	Application Deployment	A mule API started: portal-cust-account-xapi-v1	06/15/21 11:32:39 PM	-
	Application Deployment	A mule API is installed: portal-cust-account-xapi-v1	06/15/21 11:32:31 PM	-
	Application Deployment	A mule API started: irepo-sapi-v1	06/15/21 11:32:27 PM	-
	Application Deployment	A mule API started: class-payoff-options-sapi-v1	06/15/21 11:32:24 PM	-
	Application Deployment	A mule API started: webhook-events-sapi-v1	06/15/21 11:32:21 PM	-
	Application Deployment	A mule API is installed: webhook-events-sapi-v1	06/15/21 11:32:12 PM	-
	Application Deployment	A mule API started: referrals-mgmt-papi-v1	06/15/21 11:32:12 PM	-
	Application Deployment	A mule API started: twn-verification-sapi-v1	06/15/21 11:32:11 PM	-
	Application Deployment	A mule API is installed: class-payoff-options-sapi-v1	06/15/21 11:32:06 PM	-
	Application Deployment	A mule API started: test-message-publish-sapi-v1	06/15/21 11:32:02 PM	-
	Application Deployment	A mule API is installed: twn-verification-sapi-v1	06/15/21 11:31:59 PM	-
	Application Deployment	A mule API started: poc-appd-agent-sapi-v1	06/15/21 11:31:58 PM	-
	Application Deployment	A mule API started: class-payment-sapi-v1	06/15/21 11:31:51 PM	-
	Application Deployment	A mule API is installed: referrals-mgmt-papi-v1	06/15/21 11:31:48 PM	-
	Application Deployment	A mule API is installed: irepo-sapi-v1	06/15/21 11:31:46 PM	-
	Application Deployment	A mule API started: unified-customer-papi-v1	06/15/21 11:31:46 PM	-
	Application Deployment	A mule API is installed: test-message-publish-sapi-v1	06/15/21 11:31:45 PM	-
	Application Deployment	A mule API started: gp-accounts-sapi-v2	06/15/21 11:31:43 PM	-

Details of a Custom Event

Application Deployment	
Summary	Details
Actions Executed (0)	
Comments (0)	
applicationStatus	CREATED
artifactDescriptorName	irepo-sapi-v1
artifactId	domain/default/app/irepo-sapi-v1
artifactName	irepo-sapi-v1
minMuleVersion	4.2.1

## Install Instructions

### Required

- Agent version 21.2+
- Mulesoft version 4.3+
- Java 8

### ## Deployment steps

- Copy AppD-MuleAgentTracer-2.x.jar file under <agent-install-dir>/ver.x.x.x.x/sdk-plugins

- OPTIONALLY: add the following config options as well to the wrapper.conf

```
wrapper.java.additional.92=-DAppDynamicsForceMulesoftStatisticsCollection=false
```

```
wrapper.java.additional.93=-DAppDynamicsFlattenNameMulesoftStatisticsCollection=false
```

- Copy AppD-MuleAgentTracer-2.x.jar file under <mule-install-dir>/lib/user
- Restart the mule JVM
- Edit MuleMetricCollection.properties file in <agent-install-dir>/ver.x.x.x.x/sdk-plugins  
to use the flow statistics white list and black list properties. Some organizations have thousands of flows and will not want to monitor all of them, this feature may or may not be needed for your deployment  
com.appdynamics.mulesoft.agent.metric.blackListRegex=regex test to skip collection on match  
com.appdynamics.mulesoft.agent.metric.whiteListRegex=regex test to collect on match else skip (applied after blacklist)

Flow data may come back in ways that are not intuitive to the developers creating flows and subflows. A review of this reference may help before considering something a "bug" <https://docs.mulesoft.com/mule-runtime/4.3/about-flows>

If errors in the agent log file resembling these lines:

```
[appdynamics-analytics-autodata-writer1] 11 May 2021 13:20:34,039  WARN
AnalyticsAutoDataTransform - Enqueuing transformed CollectionData failed since publish
queue is full. This operation has failed [18000] time(s).
[appdynamics-analytics-autodata-writer1] 11 May 2021 13:20:34,040  WARN
AnalyticsAutoDataTransform - Enqueuing transformed CollectionData failed since publish
queue is full. This operation has failed [18100] time(s).
[appdynamics-analytics-autodata-writer1] 11 May 2021 13:20:54,198  WARN
AnalyticsAutoDataTransform - Enqueuing transformed CollectionData failed since publish
queue is full. This operation has failed [18200] time(s).
[appdynamics-analytics-autodata-writer1] 11 May 2021 13:25:15,542  WARN
AnalyticsAutoDataTransform - Enqueuing transformed CollectionData failed since publish
queue is full. This operation has failed [18300] time(s).
[appdynamics-analytics-autodata-writer1] 11 May 2021 13:26:54,198  WARN
AnalyticsAutoDataTransform - Enqueuing transformed CollectionData failed since publish
queue is full. This operation has failed [18400] time(s).
add this node property to mulesoft nodes: max-analytics-collectors-allowed=5000 (2000 is
default, but that isn't enough in large environments)
```