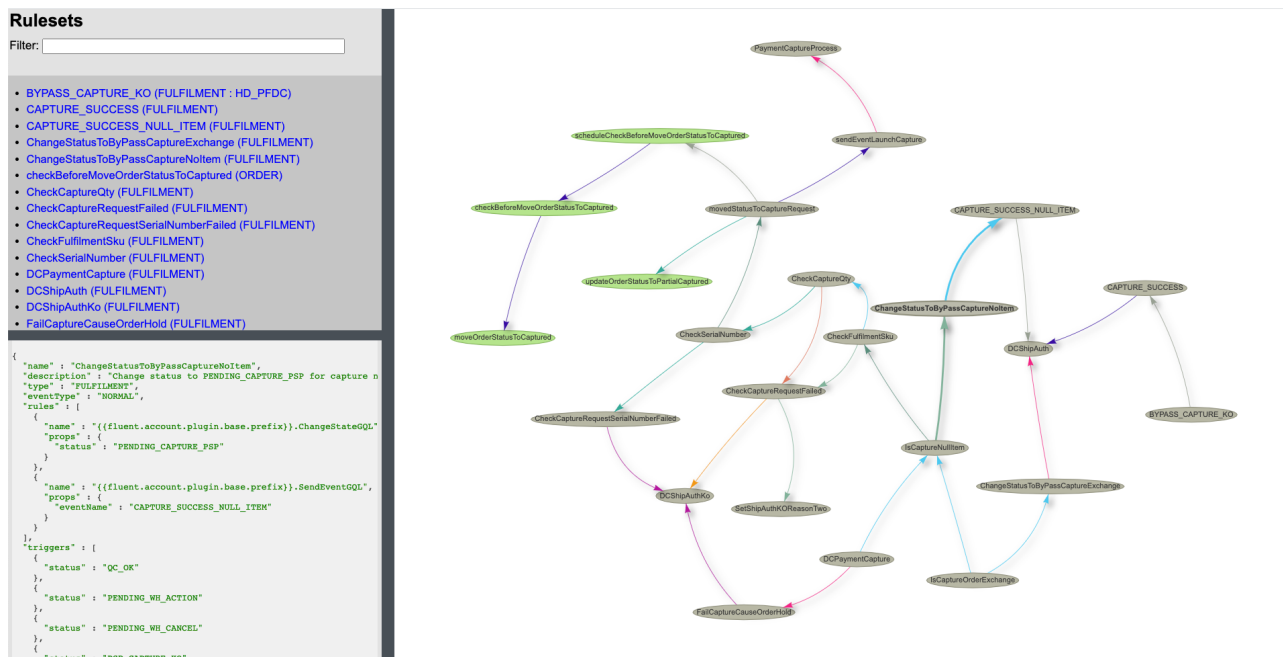


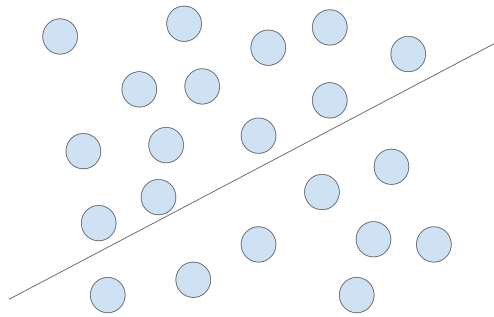
Fluent Workflows Graph Visualization Tool

The objective of this tool is to provide a visual representation of how the Fluent Workflow events relate to each other, to help Developers and BAs to debug and track the processes in the OMS.

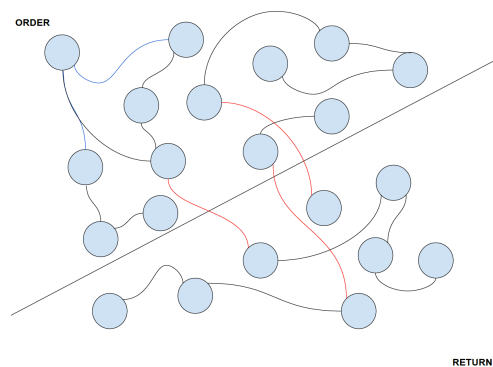


This tool works by creating a **Graph** in which the Nodes are the Workflow Rulesets and the **Edges** represent the interaction that exist between them. Then it performs a graph analysis looking for **“Clusters of Nodes”** to create a view like the one above in which we can visualize how all the related Rulesets interact with each other.

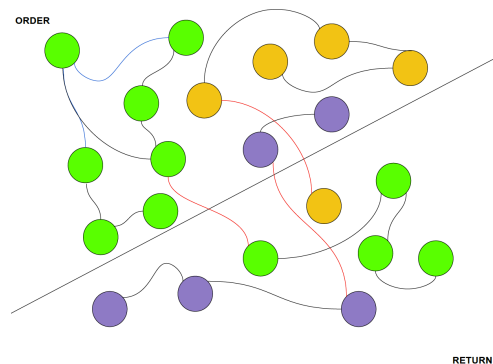
1) The tool creates one Node per each Ruleset in a set of Workflows.



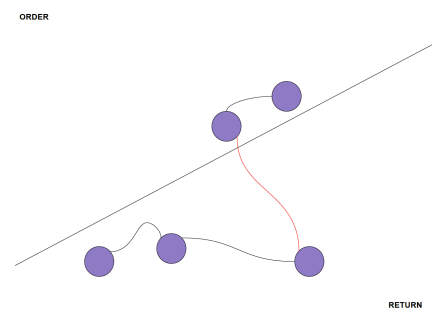
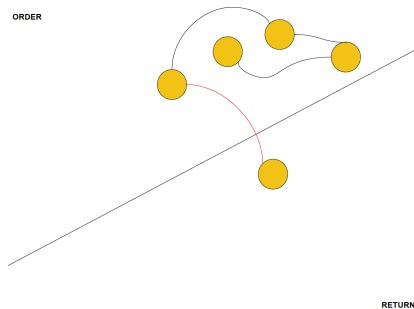
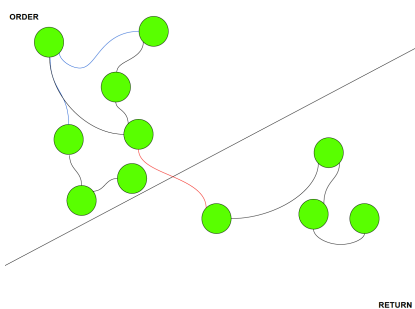
2) The tool analyses the workflow to determine the relations (Edges) that exists between the nodes. We end up with a graph that can be analyzed.



3) The tool identifies the different “Clusters of Nodes” or “Subgraphs” that are formed.



4) The tool separates this Clusters and saves them in a database.



5) We can visualize the generated clusters in the tools panel:

Workflows

☒ ORDER_ID

☐ RETURN_ORDER

☐ BILLING_ACCOUNT

Generate

Add Workflow

Name:

Path:

Enabled:

☐

Add

Workflows Paths Config

ORDER_ID:

/Users/dfores/dior_glt/glt/cdc-eco-oms/postman/workflows/order/ORDER_ID.json

Remove

RETURN_ORDER:

/Users/dfores/dior_glt/glt/cdc-eco-oms/postman/workflows/returnorder/RETURN_ORDER

Remove

BILLING_ACCOUNT:

/Users/dfores/dior_glt/glt/cdc-eco-oms/postman/workflows/billingAccount/BILLING_ACCOUNT

Remove

Update

Cluster 0

Rulesets (170)

Cluster 1

Rulesets (24)

Cluster 2

Rulesets (12)

Cluster 3

Rulesets (10)

Cluster 4

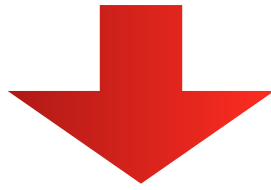
Rulesets (8)

Cluster 5

Rulesets (8)

Cluster 6

Rulesets (5)

[illegible]

Important Notes:

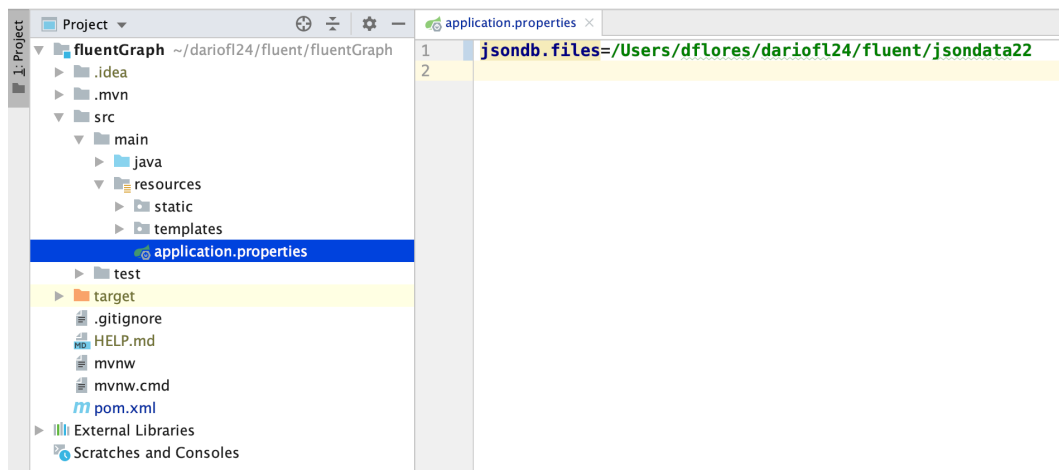
- The Tool works better when the names of the Rulesets are unique across the workflows, still there are some cases in which having repeated names does not affect it.

- The Tool has not been QAed properly. It's on an Experimental phase yet. Always double check the concussions you get out of the analysis you make of the Workflows with it.

How to Run the Workflows Graph Visualization Tool

This tool is a Spring Boot MVC project build with Maven, that makes use of a documents database called JSONBD (<http://jsondb.io/>) and in the frontend utilizes the Javascript framework VIS.JS for the visualization on the graphs (<https://visjs.org/>).

- 1) Once you get the project folder you will need to configure the directory where the JSONBD database is going to store its files. This is an embedded in memory database and this is the only configuration it needs (no need to install extra tools). To do this, create a new empty directory and then open the file "fluentGraph/src/main/resources/application.properties":



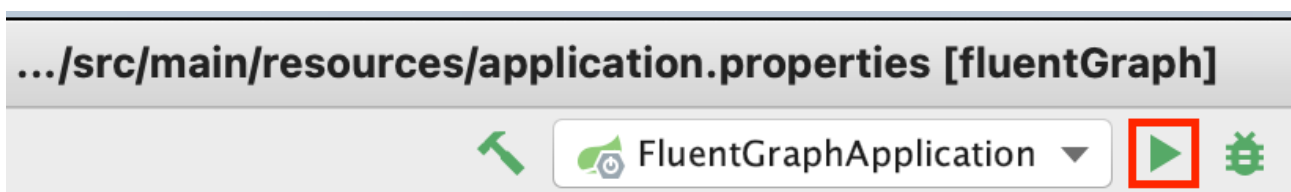
set the property "**jsondb.files**" with the path to the newly created directory.

Trouble Shooting Note:

Once you start using the tool and if you get some issues with it, one way to "Reset it" is to delete ALL the contents of this directory, or to point the configuration property to a new empty Directory.

- 2) To run the tool there are two options.

2.1) If you are using IntelliJ you can import the project and install the SpringBoot plugin (<https://www.jetbrains.com/help/idea/spring-boot.html>). Once this is done you can click the play button in the upper panel and the application will be launched:



- 2.2) You can run it with your local Maven or with the packaged Maven wrapper:

```
# using packaged Maven wrapper
dflores$ ./mvnw spring-boot:run

# OR local Maven
dflores$ mvn spring-boot:run
```

[illegible]

```

2021-03-08 16:03:41.969 WARN 99391 --- [ restartedMain] o.s.boot.StartupInfoLogger : InetAddress.getLocalHost().getHostName() took 5004 milliseconds to respond
* Please verify your network configuration ( macOS machines may need to add entries to /etc/hosts).
2021-03-08 16:03:46.977 INFO 99391 --- [ restartedMain] c.t.k.fluentGraph.FluentGraphApplication : Starting FluentGraphApplication using Java 1.8.0_151 on Darios-MacBook-Pro
in /Users/dflores/dariof124/fluent/fluentGraph/target/classes started by dflores
2021-03-08 16:03:46.978 INFO 99391 --- [ restartedMain] c.t.k.fluentGraph.FluentGraphApplication : No active profile set, falling back to default profiles: default
2021-03-08 16:03:47.021 INFO 99391 --- [ restartedMain] e.DevToolsPropertyDefaultsPostProcessor : Devtools property defaults active! Set 'spring.devtools.add-properties' to
'false' to disable
2021-03-08 16:03:47.021 INFO 99391 --- [ restartedMain] e.DevToolsPropertyDefaultsPostProcessor : For additional web related logging consider setting the 'logging.level.web
' property to 'DEBUG'
2021-03-08 16:03:47.759 INFO 99391 --- [ restartedMain] o.s.b.w.embedded.TomcatWebServer : Tomcat initialized with port(s): 8080 (http)
2021-03-08 16:03:47.769 INFO 99391 --- [ restartedMain] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2021-03-08 16:03:47.769 INFO 99391 --- [ restartedMain] org.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/9.0.43]
2021-03-08 16:03:47.818 INFO 99391 --- [ restartedMain] o.a.c.c.c.[Tomcat].[/localhost/] : Initializing Spring embedded WebApplicationContext
2021-03-08 16:03:47.819 INFO 99391 --- [ restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 797 ms
2021-03-08 16:03:47.869 INFO 99391 --- [ restartedMain] io.jsonb.JsonBTemplate : Encryptions is not enabled for JSON DB
2021-03-08 16:03:47.918 INFO 99391 --- [ restartedMain] org.reflections.Reflections : Reflections took 28 ms to scan 1 urls, producing 1 keys and 2 values
2021-03-08 16:03:48.209 INFO 99391 --- [ restartedMain] o.s.concurrent.ThreadPoolTaskExecutor : Initializing ExecutorService 'applicationTaskExecutor'
2021-03-08 16:03:48.368 INFO 99391 --- [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is running on port 35729
2021-03-08 16:03:48.387 INFO 99391 --- [ restartedMain] o.s.b.w.embedded.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ''
2021-03-08 16:03:48.396 INFO 99391 --- [ restartedMain] c.t.k.fluentGraph.FluentGraphApplication : Started FluentGraphApplication in 21.787 seconds (JVM running for 22.164)

```

Workflows

Generate

Add Workflow

Name:

Path:

Enabled:

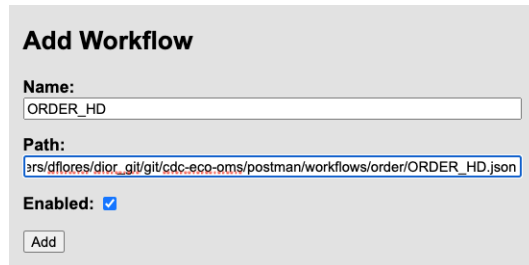
☐

Add

This is normal since there are no workflows configured yet.

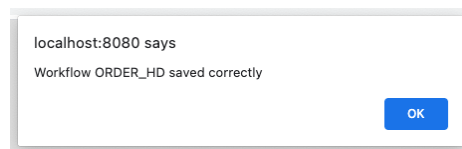
How to Add, Edit and Remove Workflows from the Tool

To add a workflow to the Tool, go to the tools **Home Panel** in “http://localhost:8080/home”. Then in the “Add Workflow” section, specify the Name of the Workflow, the absolute path to its JSON file location and optionally check the “Enabled” checkbox (more on this property in the next section):

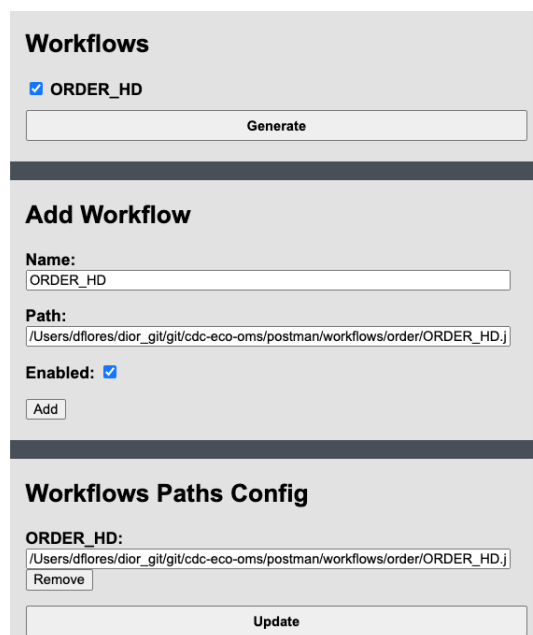


The screenshot shows a form titled "Add Workflow". It contains three fields: "Name:" with the value "ORDER_HD", "Path:" with the value "/Users/dflores/dior_git/git/cdc-eco-oms/postman/workflows/order/ORDER_HD.json", and "Enabled:" with a checked checkbox. There is an "Add" button at the bottom.

Click on add and you should see the confirmation popup:



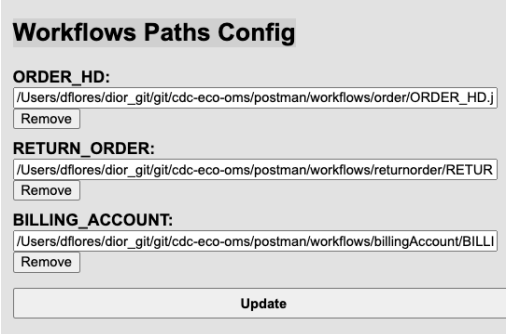
Now the workflow is configured in the tool:



The screenshot shows the "Workflows" section of the tool. It lists the workflow "ORDER_HD" with a checked checkbox. Below it is a "Generate" button. The "Add Workflow" section is also visible, showing the same fields as before. At the bottom, there is a "Workflows Paths Config" section with the same path and a "Remove" button, followed by an "Update" button.

You can add as many workflows as you need.

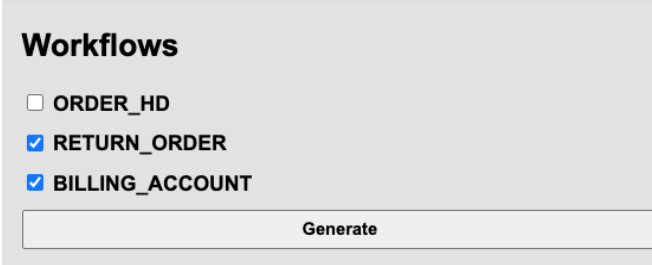
In the “**Workflows Paths Config**” section, you can update the Path of the Workflows or completely remove them:



The 'Workflows Paths Config' form contains three sections: 'ORDER_HD' with a text input field containing '/Users/dflores/dior_git/git/cdc-eco-oms/postman/workflows/order/ORDER_HD.j' and a 'Remove' button; 'RETURN_ORDER' with a text input field containing '/Users/dflores/dior_git/git/cdc-eco-oms/postman/workflows/returnorder/RETUR' and a 'Remove' button; and 'BILLING_ACCOUNT' with a text input field containing '/Users/dflores/dior_git/git/cdc-eco-oms/postman/workflows/billingAccount/BILLI' and a 'Remove' button. At the bottom is an 'Update' button.


How to generate clusters and visualize them

In the Workflows section of the **Home Panel** chose the Workflows for which you want to generate the clusters by clicking on the checkboxes:



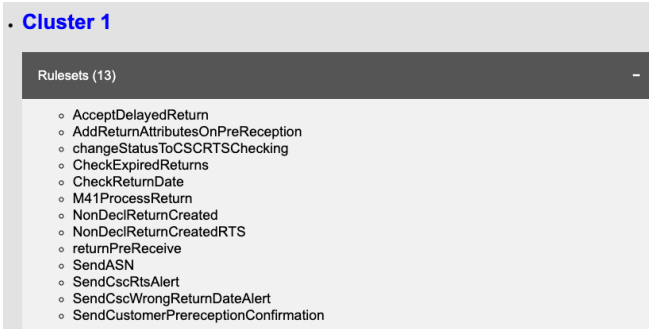
The 'Workflows' form has three checkboxes: 'ORDER_HD' (unchecked), 'RETURN_ORDER' (checked), and 'BILLING_ACCOUNT' (checked). Below the checkboxes is a 'Generate' button.

In above example we chose **RETURN_ORDER** and **BILLING_ACCOUNT**, so the generated clusters will show us how the Rulesets from this two workflows interact with each other. Then click on “**Generate**”. You should see the confirmation popup and the list of generated clusters:



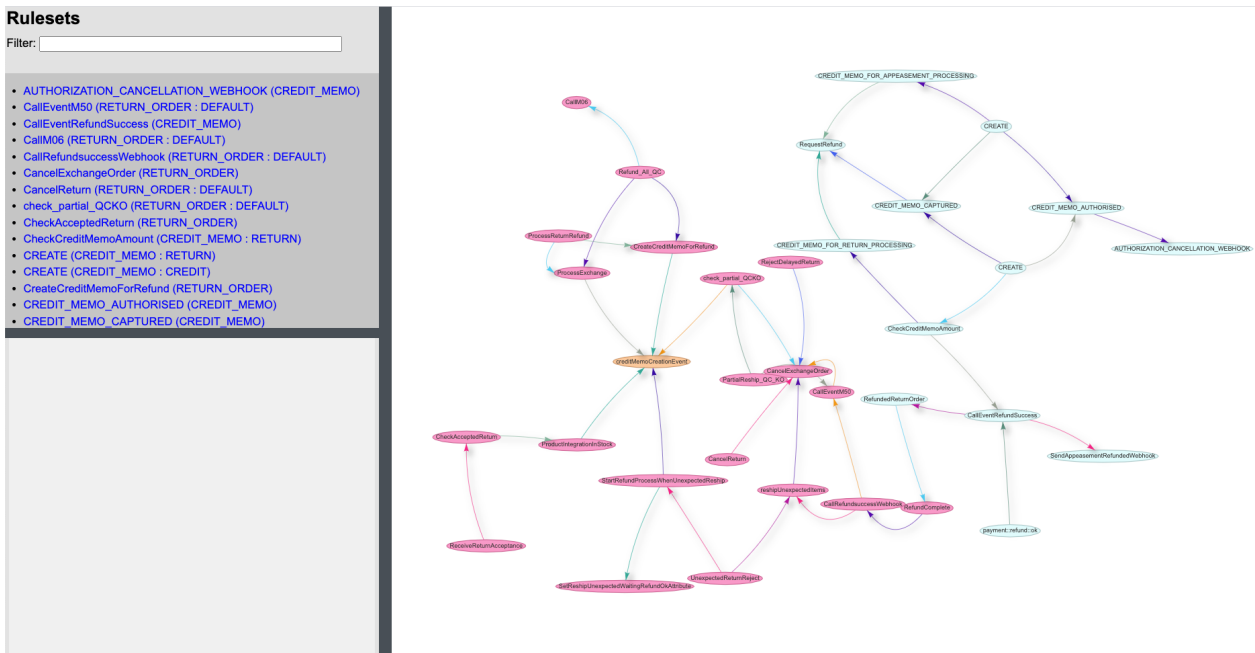
The 'Generated clusters' list shows three clusters: 'Cluster 0' with 34 Rulesets, 'Cluster 1' with 13 Rulesets, and 'Cluster 2' with 6 Rulesets. Each cluster has a '+' button to expand it.

You can click on the Rulesets section to see which are contained in each cluster:

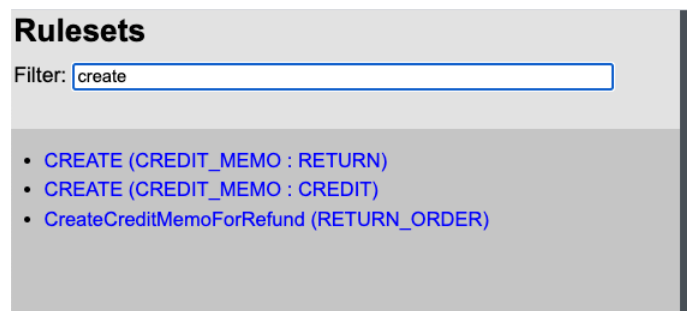


The 'Cluster 1' Rulesets list shows 13 Rulesets: 'AcceptDelayedReturn', 'AddReturnAttributesOnPreReception', 'changeStatusToCSCRTSChecking', 'CheckExpiredReturns', 'CheckReturnDate', 'M41ProcessReturn', 'NonDeclReturnCreated', 'NonDeclReturnCreatedRTS', 'returnPreReceive', 'SendASN', 'SendCscRtsAlert', 'SendCscWrongReturnDateAlert', and 'SendCustomerPrereceptionConfirmation'.

Click on the blue “**Cluster N**” label to visualize the cluster you want. A new window will open:



You can use the filter to look for a particular Ruleset:



By clicking on the Ruleset you need in the list, the view will focus on that particular Node and will display the Ruleset definition:

