

**Oracle® Communications
Performance Intelligence
Center**

Observability Application Guide

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Chapter 1: Overview

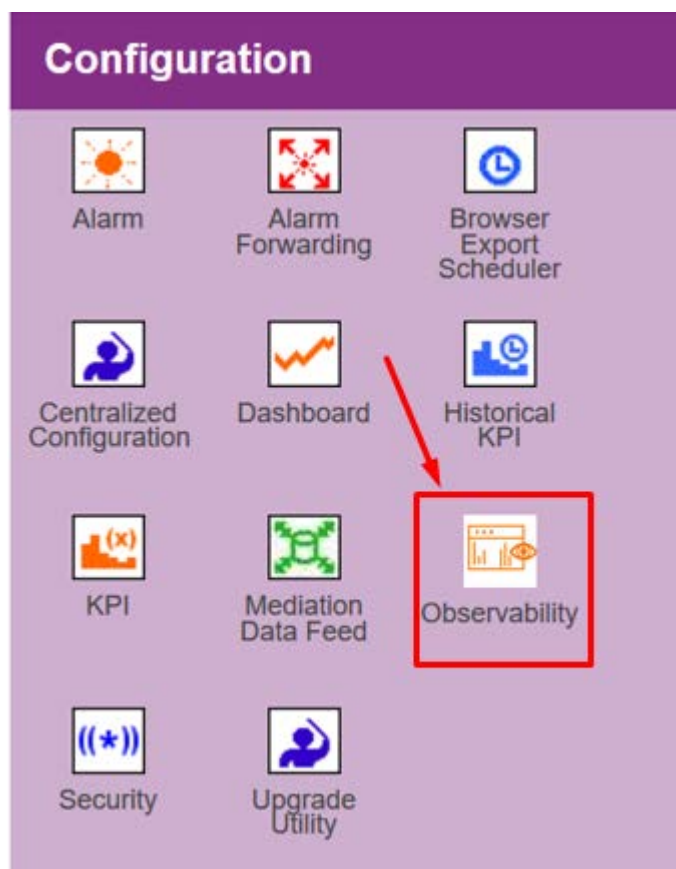
This section gives an overview of the new Observability Application in OCPIC. The new Observability application shall be responsible for creating configuration so that the KPIs generated by OCPIC mediation system is also stored on the server hosting InfluxDB and can be visualized using Grafana.

Introduction

The new observability feature in OCPIC will provide rich visualization by leveraging Grafana's dashboard capabilities. OCPIC will provide the integration with the Grafana Server, it will provide an option to the user to configure the data source for the Grafana server. The Grafana server will have the InfluxDB installed on it. The InfluxDB will store the KPIs exported from the OCPIC system and dashboards will be created using the Grafana. The mediation server will be enhanced to support writing into InfluxDB along with the Oracle database. The IxpStore process in the mediation server will use an HTTP interface to write into InfluxDB.

The configuration for the Grafana and InfluxDB data source shall be provided by a new Observability Application available on the OCPIC portal. The application additionally shall support the export of the custom KPIs and pre-packaged KPIs towards Grafana Server. The new Observability application shall be developed in OJET and Spring boot. The observability Application shall be available inside the Configuration perspective on the Management application portal.

Note: Only Management Admin user will be able to access the Observability Configuration Application

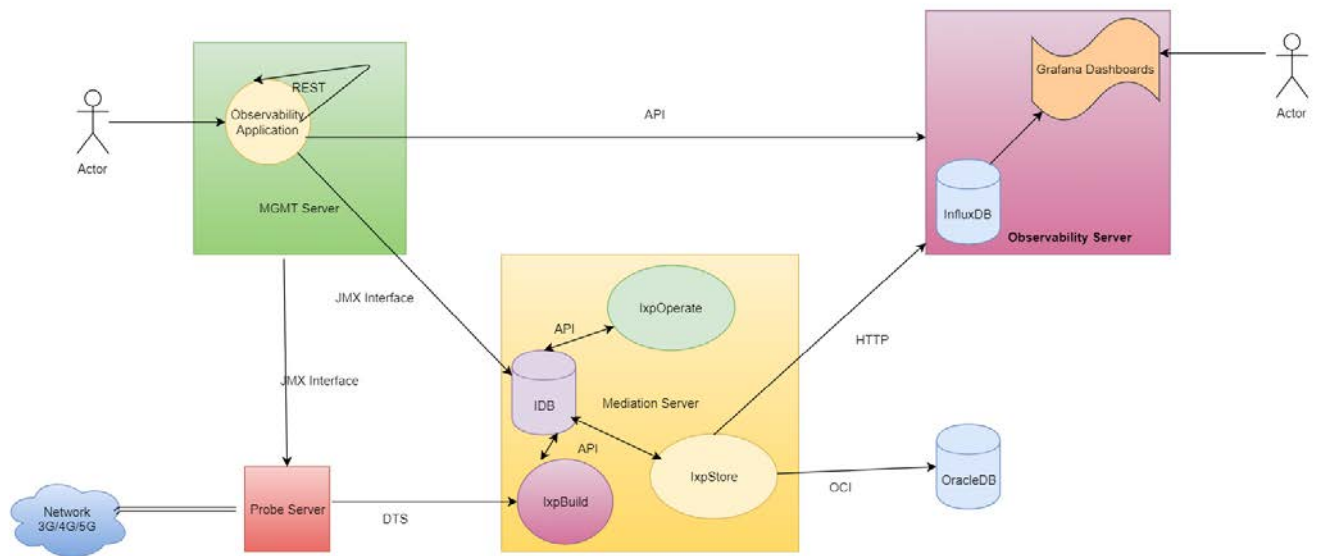


Functional Overview

The observability feature shall provide the following functionalities:

- **Grafana Server API key configuration:** The user will be required to configure the Grafana server API key for its Organization. The API key will be used by OCPIC Observability application to create the exports of the custom and pre-packaged KPIs on the Grafana server. The API key can be modified for the organization but once added can't be deleted. Currently, only one organization can be added to the observability application. The API key shall also be used for creating the pre-packaged dashboards on the Grafana Server. The OCPIC system shall store the API key into its database.
- **InfluxDB Data source configuration:** The user will be required to configure the InfluxDB data source. The InfluxDB credentials and data source URL will be required. The retention policy on the InfluxDB for the particular data source shall also be required during the configuration. More than one InfluxDB data sources are supported. Currently, the deletion of the data source on InfluxDB is not supported, however, the addition and modification of the data source on InfluxDB are supported. The InfluxDB parameters will be stored in OCPIC Management database and will be made available to the mediation server during the creation of the custom and pre-packaged KPIs export.
- **Custom KPIs Configuration:** The user will be required to export the KPIs into the InfluxDB in case it wants to create the visualization using the Grafana Dashboard capabilities. The user will select the input statistics sessions (output session of the KPIs already running on OCPIC system) and associate it with the InfluxDB data source created earlier. It will select the output session that shall be created on the InfluxDB, an option to select the Tag keys will be provided. The Tag keys are helpful in a group by queries on the Grafana Dashboard. After the custom KPI export is configured the user will be notified to sync the changes to the mediation server. On the completion of the sync action, an IxpStore process on the mediation server shall be created that shall be responsible for writing the KPIs generated by OCPIC system into the output session on InfluxDB. The custom KPIs can be viewed and deleted from the observability application.
- **Pre-packaged KPI Configuration:** The pre-packaged KPIs are the useful generic KPIs bundled with dashboard configurations. These are defined for the ease of OCPIC system users so that they don't have to configure the KPIs and dashboard separately. The pre-requisite for the pre-packaged KPIs is that the input reconstitution session should already be created on the OCPIC system. The user can select the various 3G/4G/5G/VOIP and Usage statistics KPIs from the pre-packaged configuration screen available under the new Observability application. The dashboard configuration is also bundled along with the KPI definition. The KPIs selected for the pre-packaged dashboards are generic in nature and any customer-specific adaptations should be done using the custom KPI flow. The pre-packaged KPIs can be configured and deleted from the Observability application.
- **Launching Grafana Dashboard from Observability application:** The link to the Grafana dashboard will be available from the Observability application. On clicking this link the user shall be taken to the Grafana login page.

High-level Architecture



Chapter 2: Hardware Requirements

The Observability Application will be deployed on the OCPIC Management Server, so there are no additional hardware requirements for the new Observability Application.

The server hosting Grafana and InfluxDB can either be a virtual machine or bare-metal server. The hardware recommendations for the server hosting Grafana and InfluxDB are mentioned below:

- CPU: 4 vCPUs
- RAM: 4GB
- Disk Space: 200 GB or a separate partition of having 200GB of space.

Chapter 3: Software Requirements

The new Observability application shall be deployed along with the other Management server applications and there are no specific software requirements for it.

Grafana Software

- Grafana 6.5.x
- Download Link: <https://grafana.com/grafana/download>
 - v6.5.x
 - OS: RedHat & CentOS

InfluxDB Software

- InfluxDB version 1.7
- Download Link: <https://portal.influxdata.com/downloads/>
 - v1.7.x
 - OS: RedHat & CentOS

Chapter 4: Installation

The installation chapter shall provide the installation steps for the Grafana and InfluxDB open source applications.

Observability Application

The Observability Application shall be deployed along with other applications, there is no separate installation required for the new application.

Grafana Server

Pre-requisite:

- A virtual machine or server with hardware configure identified in section [Chapter 2: Hardware Requirements](#) should already be installed with Oracle Linux 7.4 or any other compatible LINUX distribution like RedHat or CentOS.
- NTP rpm should be installed and NTP should be synced with NTP server used by PIC system.

Grafana Application

1. Login to the Grafana server using root
2. Copy the downloaded Grafana rpm on the server
3. Execute rpm -Uvh <rpm file path for Grafana rpm>
4. Allow port 3000 for Grafana GUI access
 - a. `firewall-cmd --permanent --add-port=3000/tcp`

Refer URL <https://grafana.com/docs/grafana/latest/installation/configuration/> , in case of other detailed configuration for Grafana application is needed. The integration with OCPIC will work with the default configuration.

Grafana Plugins:

1. Install the Pie chart plugin
 - a. Use <https://grafana.com/grafana/plugins/grafana-piechart-panel/installation>

InfluxDB Application

1. Login to the Grafana server using root
2. Copy the downloaded InfluxDB rpm on the server
3. Execute rpm -Uvh <rpm file path for InfluxDB rpm>
4. Allow port 8086 and 8088 for InfluxDB
 - a. `firewall-cmd --permanent --add-port=8086/tcp`
 - b. `firewall-cmd --permanent --add-port=8088/tcp`

Refer <https://docs.influxdata.com/influxdb/v1.7/introduction/installation/#configuring-influxdb-oss>

5. Customize the “/etc/influxdb/influxdb.conf” file
 - a. Update [Meta] section, for the value of “dir” with the path where InfluxDB should be created
 - b. Update [Data] section, for the value of “dir” with the path where InfluxDB should be created
 - c. Update [Data] section, for the value of “wal-dir” with the path where InfluxDB should be created

```

###
### [meta]
###
### Controls the parameters for the Raft consensus group that stores metadata
### about the InfluxDB cluster.
###

[meta]
# Where the metadata/raft database is stored
dir = "/opt/data/influxdb/meta"

# Automatically create a default retention policy when creating a database.
# retention-autocreate = true

# If log messages are printed for the meta service
# logging-enabled = true

###
### [data]
###
### Controls where the actual shard data for InfluxDB lives and how it is
### flushed from the WAL. "dir" may need to be changed to a suitable place
### for your system, but the WAL settings are an advanced configuration. The
### defaults should work for most systems.
###

[data]
# The directory where the TSM storage engine stores TSM files.
dir = "/opt/data/influxdb/data"

# The directory where the TSM storage engine stores WAL files.
wal-dir = "/opt/data/influxdb/wal"

# The amount of time that a write will wait before fsyncing. A duration
# greater than 0 can be used to batch up multiple fsync calls. This is useful for slower
# disks or when WAL write contention is seen. A value of 0s fsyncs every write to the WAL.
# Values in the range of 0-100ms are recommended for non-SSD disks.
# wal-fsync-delay = "0s"

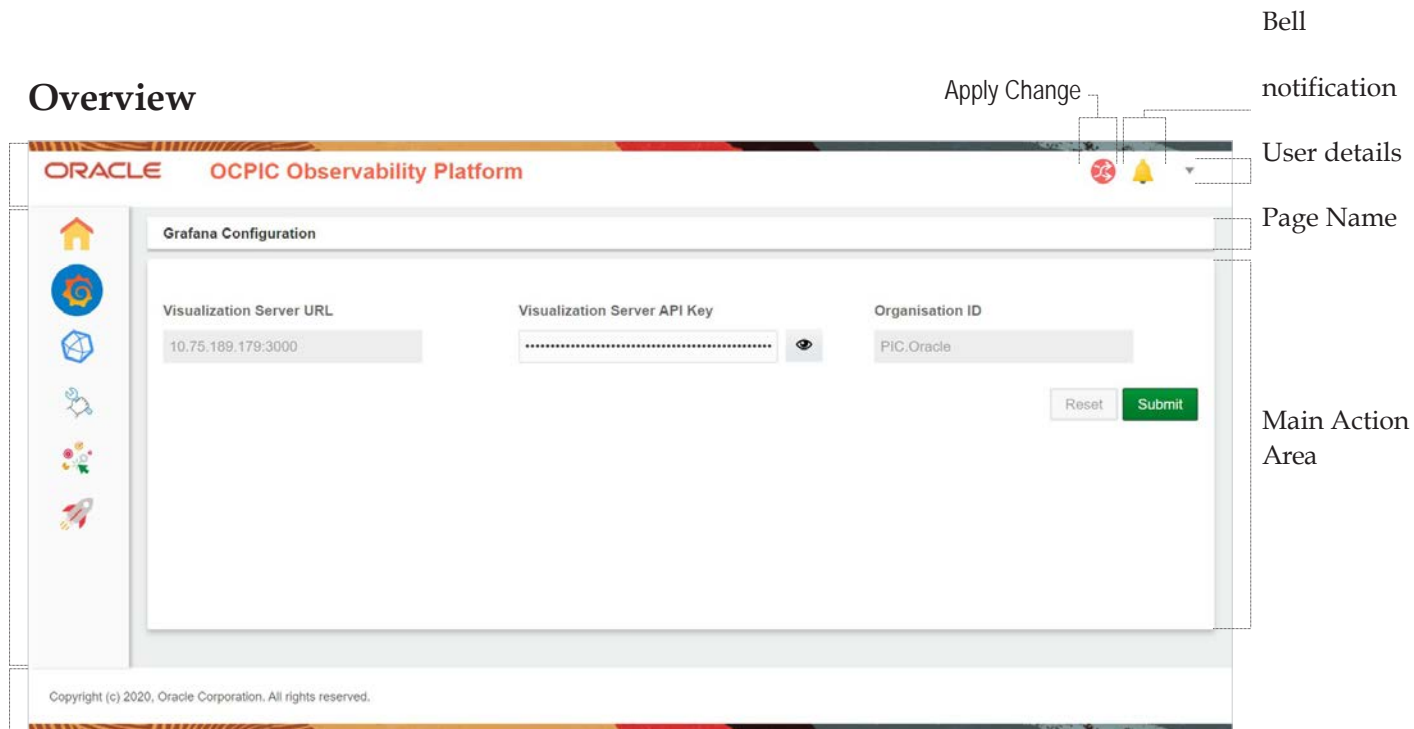
```

Note: This path should have the write permissions, otherwise InfluxDN service will not start.

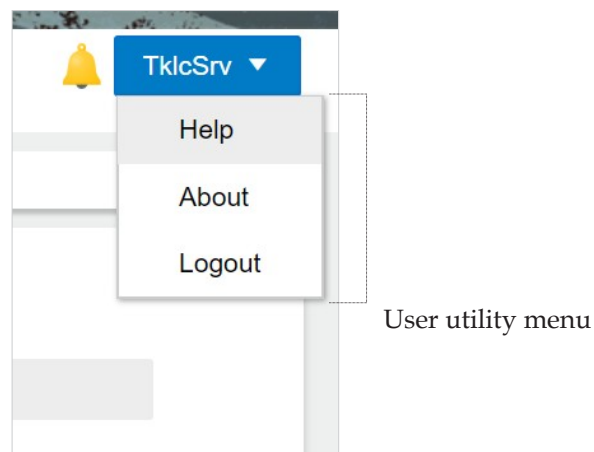
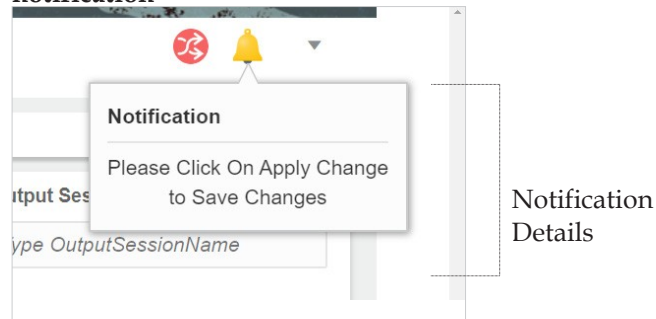
Refer <https://docs.influxdata.com/influxdb/v1.7/introduction/installation/#configuration-file>

Chapter 5: Application Screens & Workflows

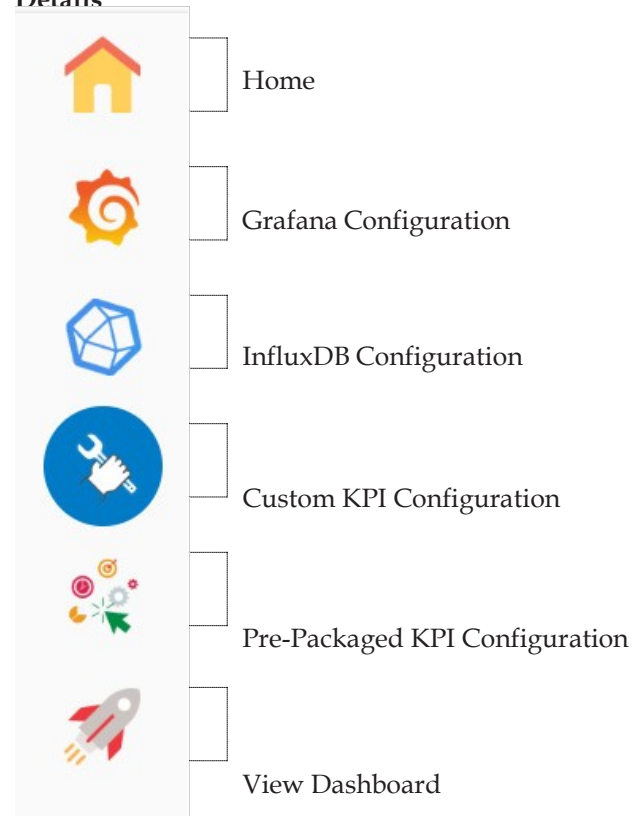
Overview



Bell notification



Side Menu Details

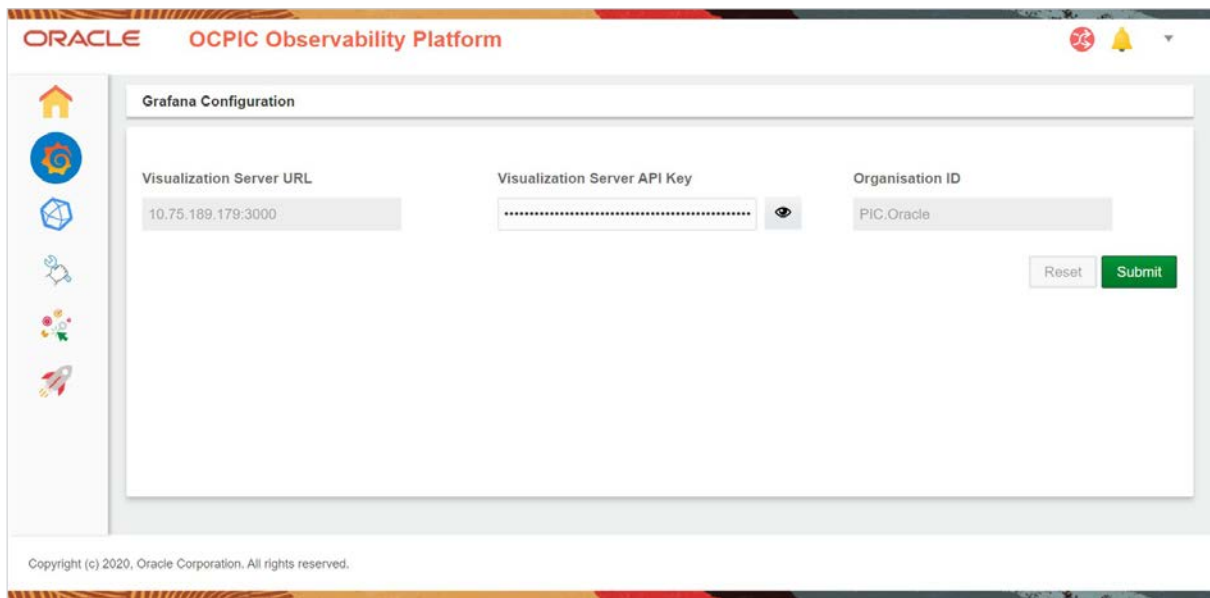


Grafana Configuration

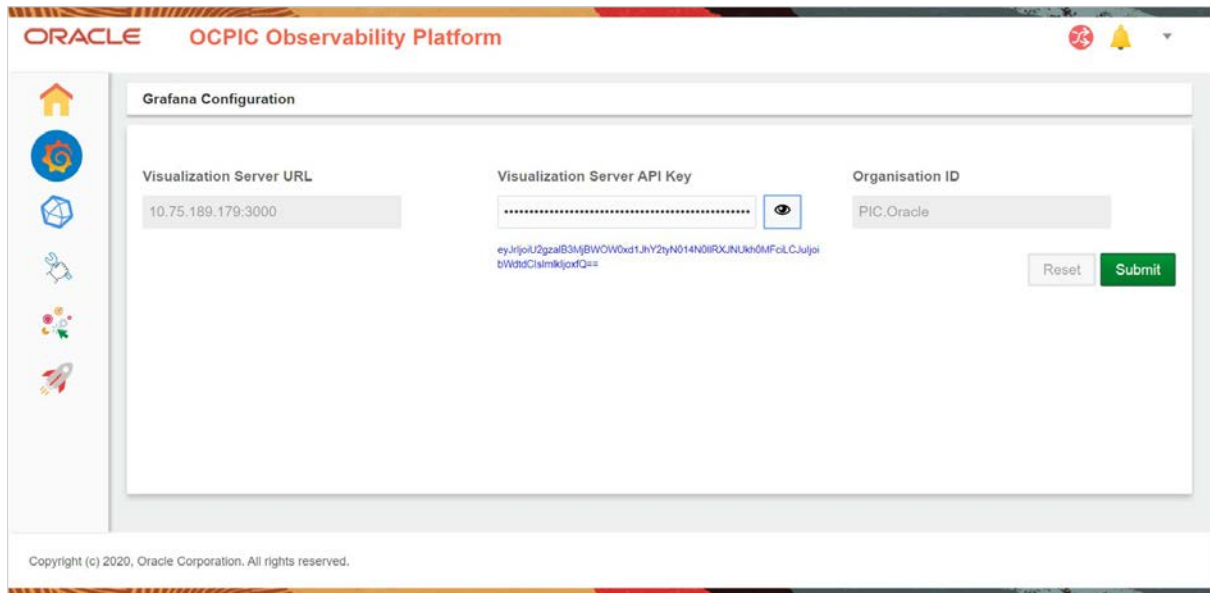
The Grafana Data source configuration shall be done from the new Observability Application. This is the first operation user will be required to perform. After the Grafana data source has been configured user shall be navigated to InfluxDB Configuration.

Refer [Appendix C: How to generate API Key in Grafana](#) for API key generation on Grafana server.

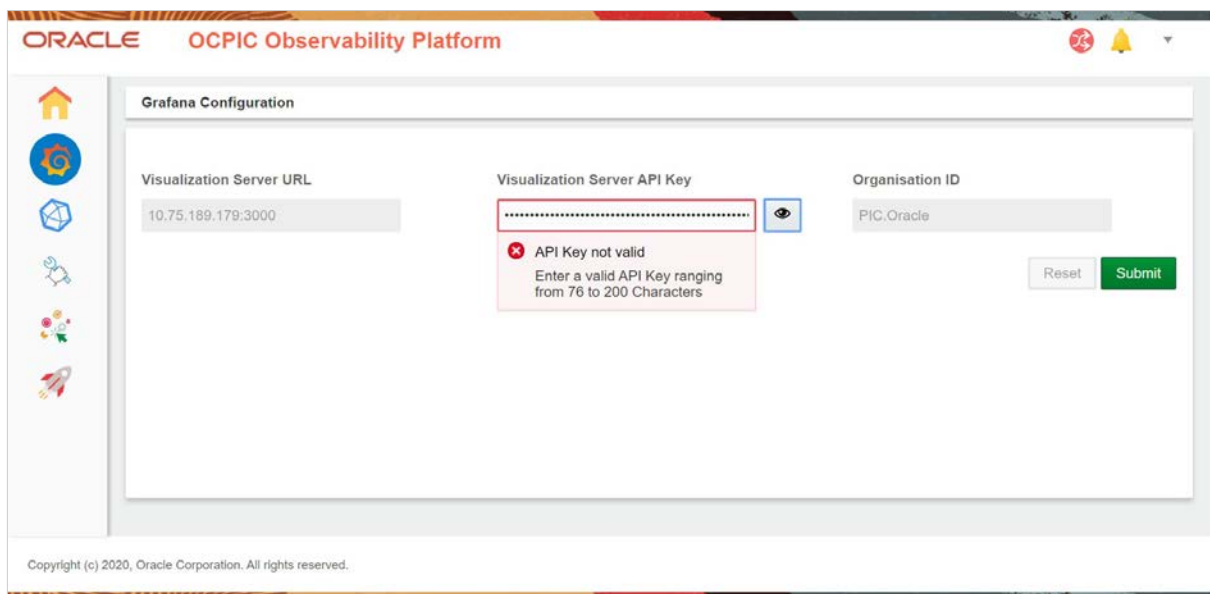
Please take caution to add Grafana server configuration, as once added it can't be deleted.



The screenshot displays the 'Grafana Configuration' page within the Oracle OCPIC Observability Platform. The page features a sidebar with navigation icons (home, gear, cube, puzzle, flowers, rocket) and a main content area. The main area contains three input fields: 'Visualization Server URL' with the value '10.75.189.179:3000', 'Visualization Server API Key' with a masked value '.....' and a toggle icon, and 'Organisation ID' with the value 'PIC.Oracle'. Below these fields are 'Reset' and 'Submit' buttons. The footer of the page reads 'Copyright (c) 2020, Oracle Corporation. All rights reserved.'



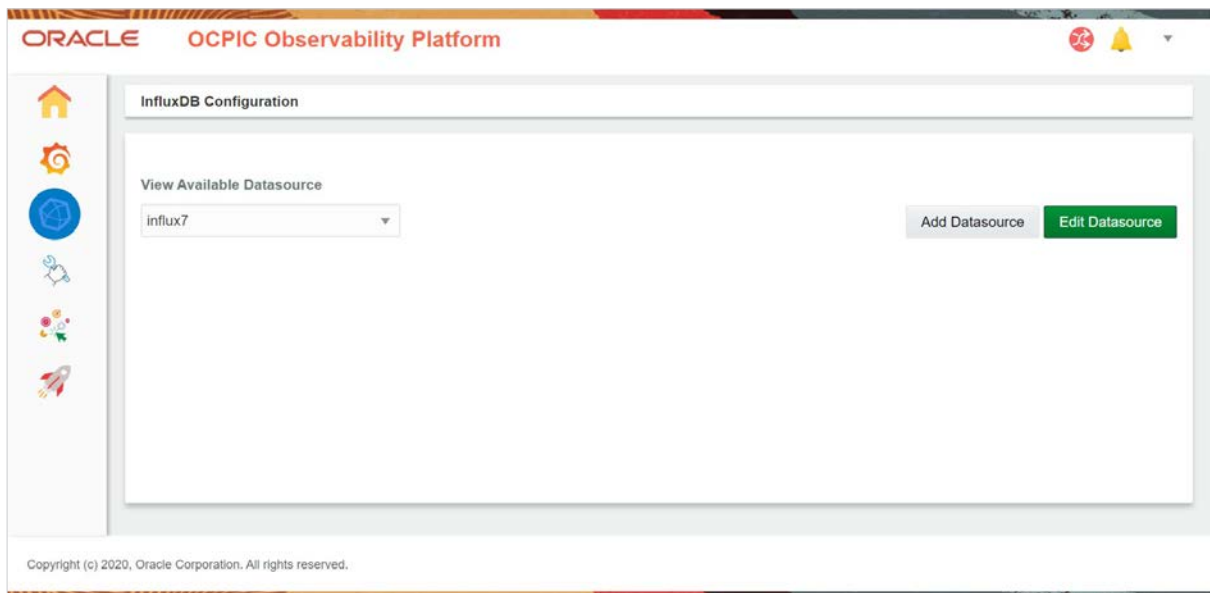
- The *eye/show* button beside the *Visualization Server API Key* field will help the user to view the API key.



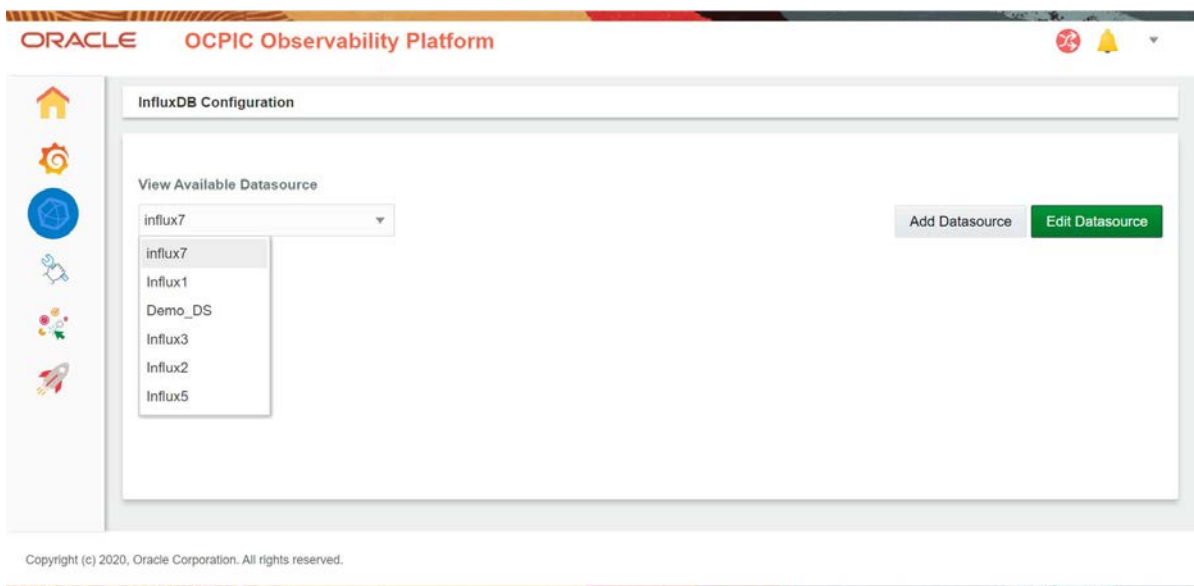
- If the user edits the pre-populated API key in the *Visualization Server API Key* field and enters any the wrong API key, then it will display the error message.

Influx DB Configuration

The user shall be required to configure the InfluxDB data source as the second step. Multiple data sources can be added.



- Either clicking on *Submit* button or clicking on the *InfluxDB Configuration* in the side menu bar, user will be redirected to the InfluxDB Configuration page.



- Here user can Add Datasource or Edit existing Dataaource.

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InfluxDB Configuration

View Available Datasource
influx7

Add Datasource Edit Datasource

Datasource Name Datasource URL Retention Time
Datasource Name Datasource URL 6 Hrs

Username Password
Username Password Reset Submit

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- To Add Datasource - User has to enter *Datasource Name* | *Datasource URL* | *Retention Time* | *Username* | *Password* and click *Submit* Button.

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InfluxDB Configuration

View Available Datasource
influx7

Add Datasource Edit Datasource

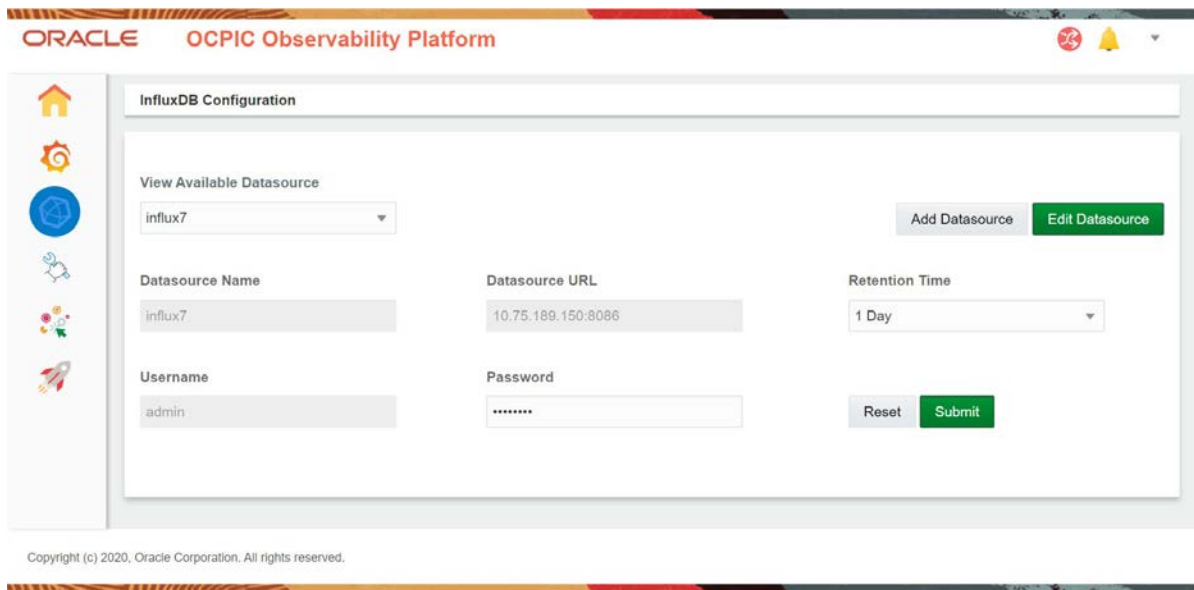
Datasource Name Datasource URL Retention Time for InfluxDB Retention Time
Datasource Name Datasource URL 6 Hrs

Username Password
Username Password Reset Submit

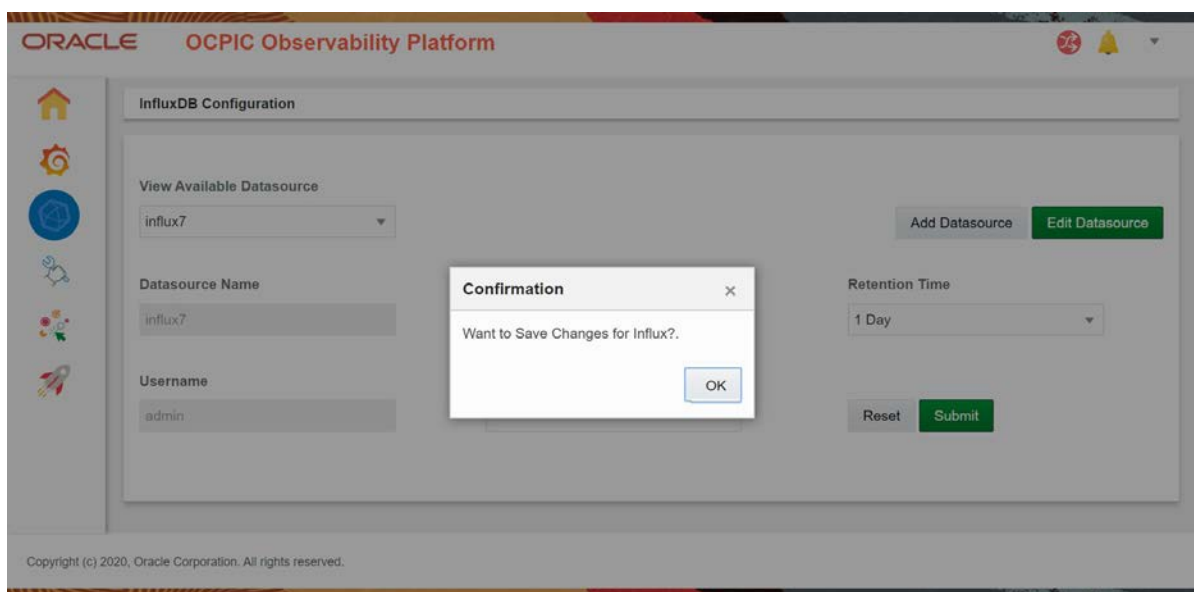
6 Hrs
9 Hrs
12 Hrs
1 Day
2 Days
3 Days
4 Days

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- User can select different Retention time while adding the Datasource from the *Retention Time* Dropdown field. This value determines how long InfluxDB stores data. Data older than the duration are automatically dropped from the database.



- To Edit any Datasource - User has to select the existing Datasource from the *View Available Datasource* dropdown and click on *Edit Datasource* Button.
- Only *Retention Time* & *Password* text-field is editable at this time.



- After making the changes if User click on *Submit* Button the Pop-up alert will display for Confirmation.

Custom KPI

Note: If the original KPI is modified, then corresponding custom KPI should be deleted and re-created again.

Custom KPI Configuration

DataSource: Input Session Name: Subsystem: Output Session Name:

Tag Key:

KPI Sessions List

Session Name	Subsystem Name	Protocol Name	Created/Modified	
Influx_CapacityMgmt	ixp	Generic FlowMonitor Stats_1.1.2	Invalid Date	
suvidha	ixp	Generic FlowMonitor Stats_1.1.2	Invalid Date	
charvi12	ixp	25862 DiameterS6_UpdateLoc_QOS	Invalid Date	
rekha	ixp	25862 DiameterS6_UpdateLoc_QOS	Invalid Date	

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- In Custom KPI Configuration page User can create KPI Sessions by selecting *DataSource*, *Input Session Name*, *Tag Key* and enter *Output Session Name*.
- *Subsystem* field is not editable for user.
- KPI Session List will display in a table format.

Custom KPI Configuration

DataSource: Input Session Name: Subsystem: Output Session Name:

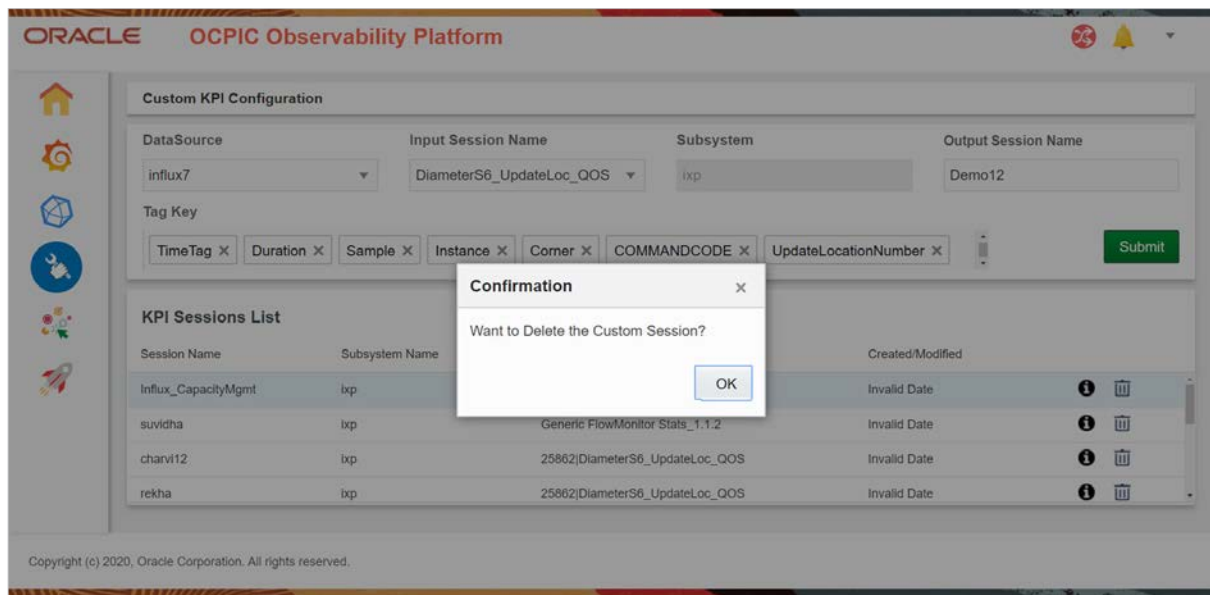
Tag Key:

KPI Sessions List

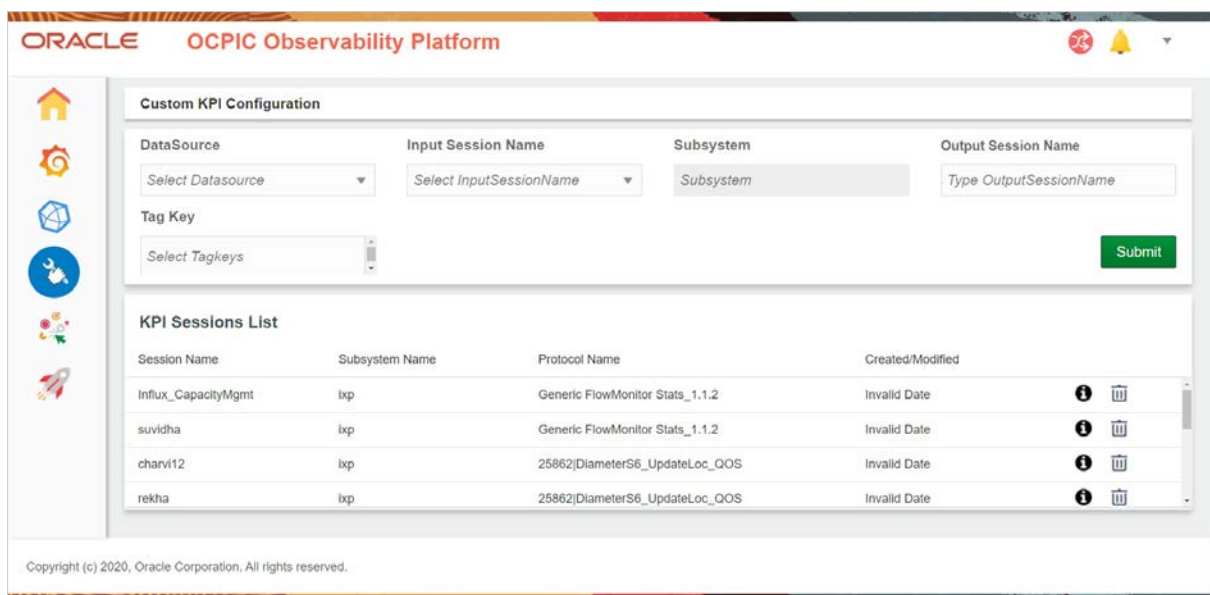
Session Name	Subsystem Name	Protocol Name	Created/Modified	
Influx_CapacityMgmt	ixp	Generic FlowMonitor Stats_1.1.2	Invalid Date	
suvidha	ixp	Generic FlowMonitor Stats_1.1.2	Invalid Date	
charvi12	ixp	25862 DiameterS6_UpdateLoc_QOS	Invalid Date	
rekha	ixp	25862 DiameterS6_UpdateLoc_QOS	Invalid Date	

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- In this page User can select either single or multiple Tag Keys form the filed.
- Based on the *Input Session Name* selection the *TAG Keys* will populate.



- If User wants to delete any KPI Session from the data table list, they have to click on the *Delete icon* in the right side of each row.
- After clicking on the Delete button, the Pop-up alert will display for *Confirmation*.



- In this page, after adding a KPI session, User also has the option to view TAG key details by clicking in the *information / i button* present in the *KPI Session List* Table, beside the delete button.

Pre-Packaged KPI Configuration

Pre-packaged KPI is the combination of KPI and the respective pre-defined dashboard. The user should select the dashboard and input session. On submit, the KPI will be generated on OCPIC and the corresponding dashboard will be pushed to the Grafana server. On Apply change, the mediation server will start writing into the output session on InfluxDB.

Note: Only one pre-packaged dashboard is allowed for the input session of the same dictionary.

To create another dashboard for the input session on the same dictionary refer [Reuse pre-packaged dashboard](#)

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Pre-Packaged KPI Configuration

Generation: Select Generation Builder Name: Select Builder Dashboard: Select Dashboard DataSource: Select DataSource Input Session Name: Select InputSession Subsystem: Subsystem

Submit

KPI Sessions List

KPI Name	Session Name	Subsystem Name	Protocol Name	Created/Modified
DIAMETER S6 UPD LOC QOS	IFXP_DIAMETER_UPD_LOC_QOS	ixp	30206 IFXP_DIAMETER_UPD_LOC_QOS	2/14/2020, 12:45:12 PM
DIAMETER QOS	IFXP_DIAMETER_QOS	ixp	30272 IFXP_DIAMETER_QOS	2/14/2020, 12:55:49 PM
SIP METHODS	IFXP_SIP_METHODS	ixp	30312 IFXP_SIP_METHODS	2/14/2020, 2:16:46 PM
5G QOS	IFXP_5G_QOS	ixp	30295 IFXP_5G_QOS	2/14/2020, 2:16:31 PM
DIAMETER ACCOUNTING	IFXP_DIAMETER_ACCOUNTING	ixp	30223 IFXP_DIAMETER_ACCOUNTING	2/14/2020, 12:45:49 PM

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- After clicking on the Pre-Packaged KPI Configuration inside menubar, User will be landed into Pre-Packaged KPI Configuration page.
- In this page based on the selection of the previous dropdown selection, the value of the next the dropdown field will change.
- *Subsystem* field is disabled.

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Prepackaging KPI Configuration

Generation: 3G Builder Name: SS7 MAP2 TDR_1...x Dashboard: MapMitSmsEffici... DataSource: influx7 Input Session Name: ga_map2_tdr_sess Subsystem: ixp

Submit

KPI Sessions List

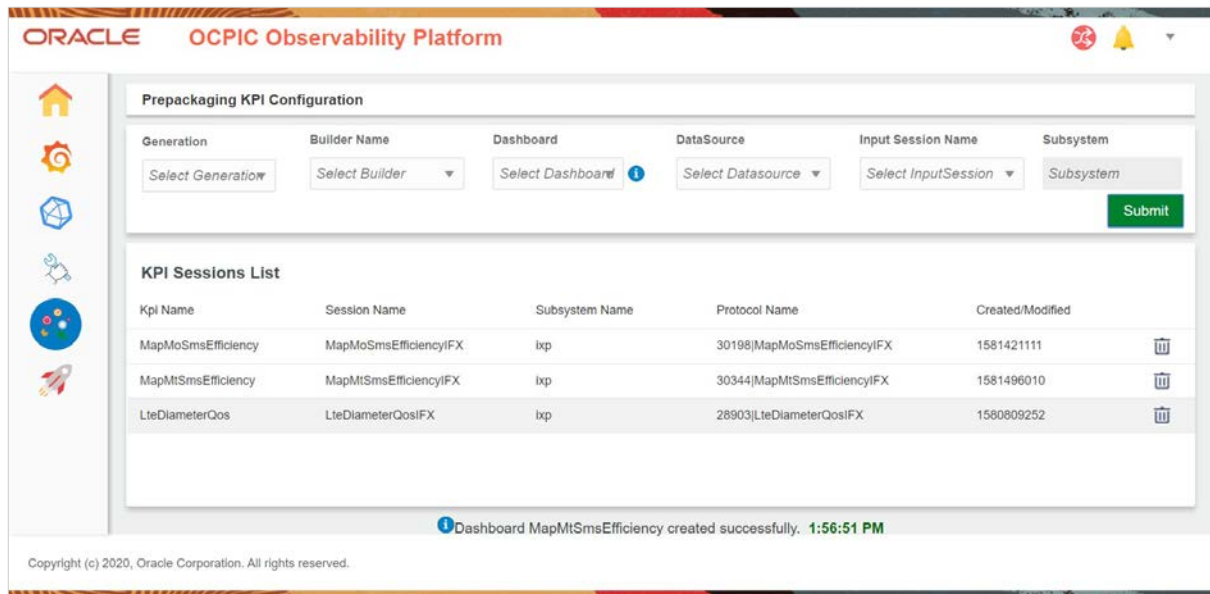
KPI Name	Session Name	Name	Created/Modified
MapMoSmsEfficiency	MapMoSmsEfficiencyIFX	MapMoSmsEfficiencyIFX	1581421111
LteDiameterQos	LteDiameterQosIFX	LteDiameterQosIFX	1580809252

KPI Description

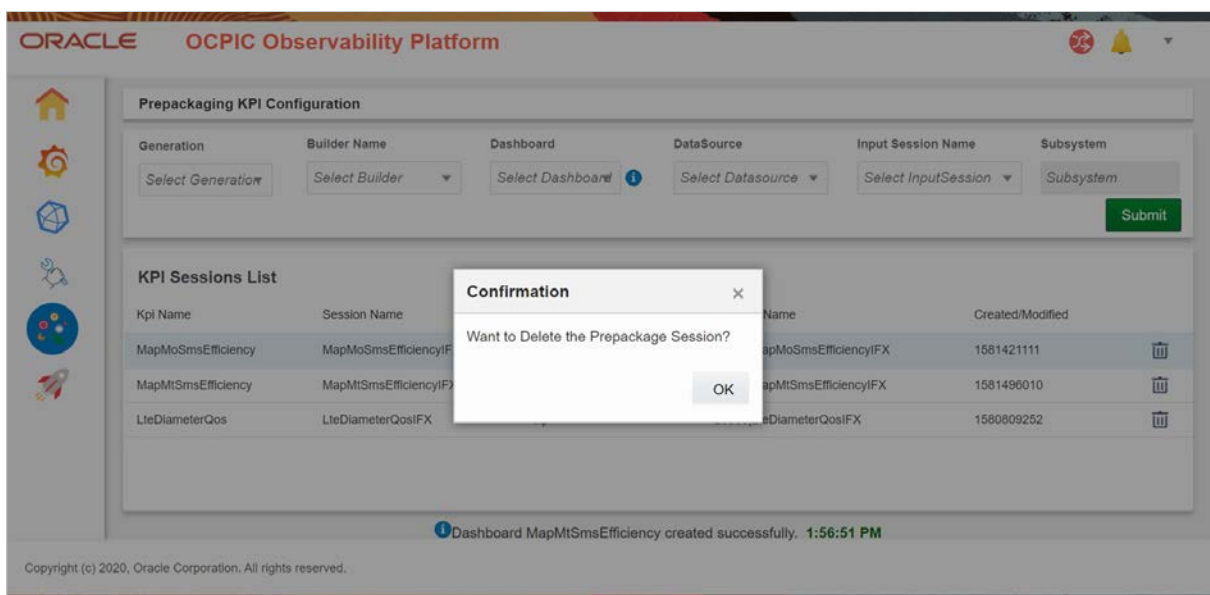
Details of MapMitSmsEfficiency

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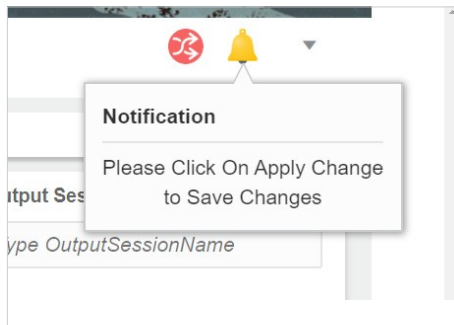
- User has to click on the “information icon / i button” beside the *Dashboard* select field to know the KPI Description details.



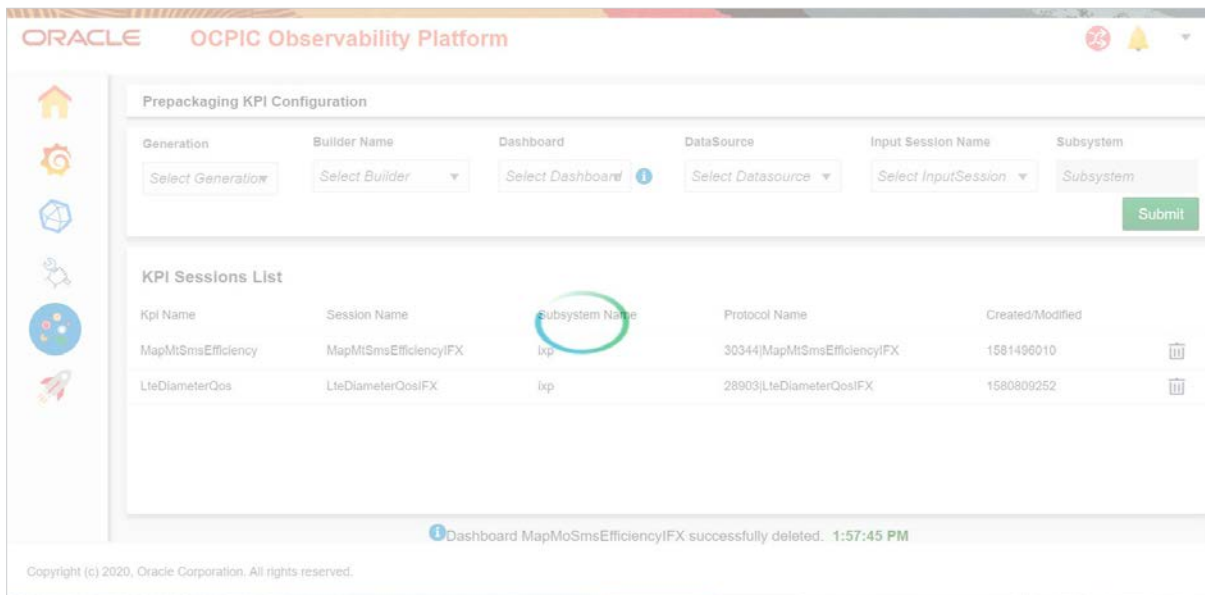
- If User wants to delete any KPI Session from the data table list, they have to click on the *Delete icon* in the right side of each row.



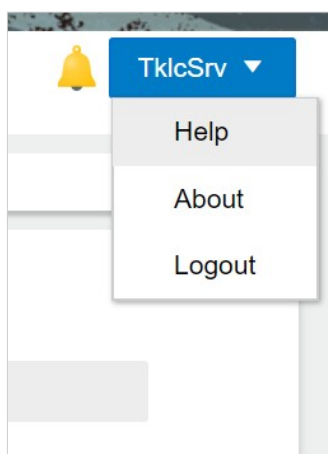
- After clicking on the Delete button, the Pop-up alert will display for *Confirmation*.



- The Bell icon is for Notifications. If there is any new notification for user, that will display in the **Notification Panel**.



- After getting the Notification, User has to click on the **Apply Change** Button on the **Top right corner section in the header** to sync the Management data with Mediation server.



- By default, the User details panel will display the Current Logged-in User Name.
- User has to click on the utility dropdown menu access the Help-file, About the application or to Logout from the application.

Supported Resolution

The autoscaling feature is not available in the current version of the application. It will be supported in the later releases. The supported resolutions are given below:

Browser	Supported Resolution
Internet Explorer	150%
Chrome	100%
Firefox	100%
EDGE	100%

Chapter 6: Troubleshooting

Grafana Troubleshooting

Refer the below URL for any Grafana server-specific troubleshooting.

<https://grafana.com/docs/grafana/latest/installation/troubleshooting/>
<https://grafana.com/docs/grafana/latest/administration/cli/>

InfluxDB Troubleshooting

Refer the below URL for any InfluxDB server-specific troubleshooting

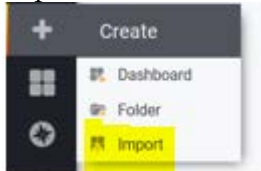
<https://docs.influxdata.com/influxdb/v1.7/troubleshooting/>

How to reuse pre-packaged dashboard

- Make sure one pre-packaged dashboard is already created for required dictionary using pre-packaged KPI
- Go to Custom KPI page
- Select a Datasource and input session name.
- Enter the output session name. (it is the measurement name of influxDB)
- Apply change once all your changes are done.
- Go to Grafana →select the dashboard you have created in step 1.
- Share dashboard→Export→Save to file
- Replace the highlighted measurement name with new output session name in the saved file.
e.g. isupac_ifx is the old name which you need to replace.

```
{  
  "measurement": "isupac_ifx",  
  "orderByTime": "ASC",  
  "policy": "default",  
  "query": "SELECT mean(\"IAMCnt\") FROM \"isupac_ifx\" GROUP BY time(1m) fill(null)",  
  "rawQuery": true,  
  "refId": "A",  
  "resultFormat": "time_series",  
}
```

- Import the saved file in Grafana by following below step



- You will be asked to change the dashboard name and if it asks, change the uid of the dashboard, which can be any String.

Browser Settings

Auto Refresh in Internet Explorer

The Observability Application might appear to function incorrectly if you use webpage caching in Internet Explorer 11. You must disable caching if you want to use this browser to access the Observability Application. Please refer the following link to disable the caching:

[Disable Webpage Caching in IE11](#)

Chapter 7: Appendices

Appendix A: My Oracle Support

MOS (<https://support.oracle.com>) is your initial point of contact for all product support and training needs. A representative at Customer Access Support (CAS) can assist you with MOS registration.

Call the CAS main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select 2 for New Service Request
2. Select 3 for Hardware, Networking and Solaris Operating System Support
3. Select 2 for Non-technical issue

You will be connected to a live agent who can assist you with MOS registration and provide Support Identifiers. Simply mention you are a Tekelec Customer new to MOS.

MOS is available 24 hours a day, 7 days a week.

Appendix B: Customize Pre-packaged Reports

It is recommended not to customize the pre-packaged reports. However, in case it is required then the following procedure can be used:

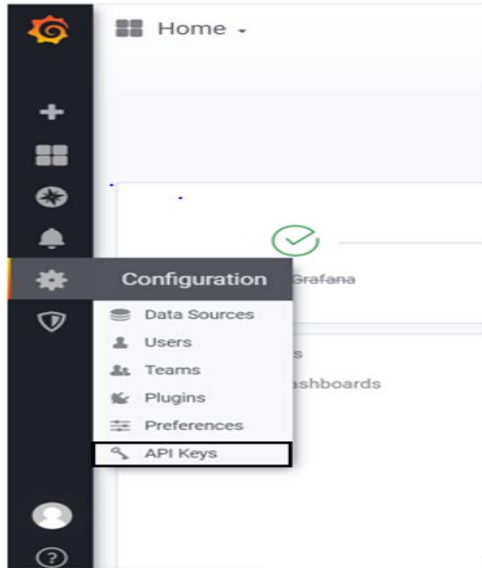
Note: Only new Line(s) can be added in the FSE config and no column addition/deletion/modification should be done. No modification should be done to the file name of the report.

- The report is already configured:
 1. Delete the configured report e.g ISUP ACCOUNTING
 2. Update the report configuration file at /opt/nsp/observer/ISUP ACCOUNTING.txt
Look for "FSECONTENT" in the configuration file, add one or more Lines
for example, following a new line can be added
SECTION:LINE:3:PASS:30:0:2
NAME:DataRow
 3. Save the file and reload the Observability application
 4. Configure the updated report.

- The report is not yet configured:
 1. Update the report configuration file at /opt/nsp/observer/ISUP ACCOUNTING.txt
Look for "FSECONTENT" in the configuration file, add one or more Lines
for example, following the new line can be added
SECTION:LINE:3:PASS:30:0:2
NAME:DataRow
 2. Save the file and reload the Observability application
 3. Configure the updated report.

Appendix C: How to generate API Key in Grafana

1. Log in as an admin user in Grafana
2. `http://<server_ip>:3000`
3. Create the API key using the following screenshot



4. Add API Key button
5. Give any API Key name
6. Give the role of admin and Time to live as "10y"