

# Oracle® Enterprise Manager

## Oracle Enterprise Manager App for Grafana

### User's Guide



13c Release 5

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May 2023

The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

ORACLE®

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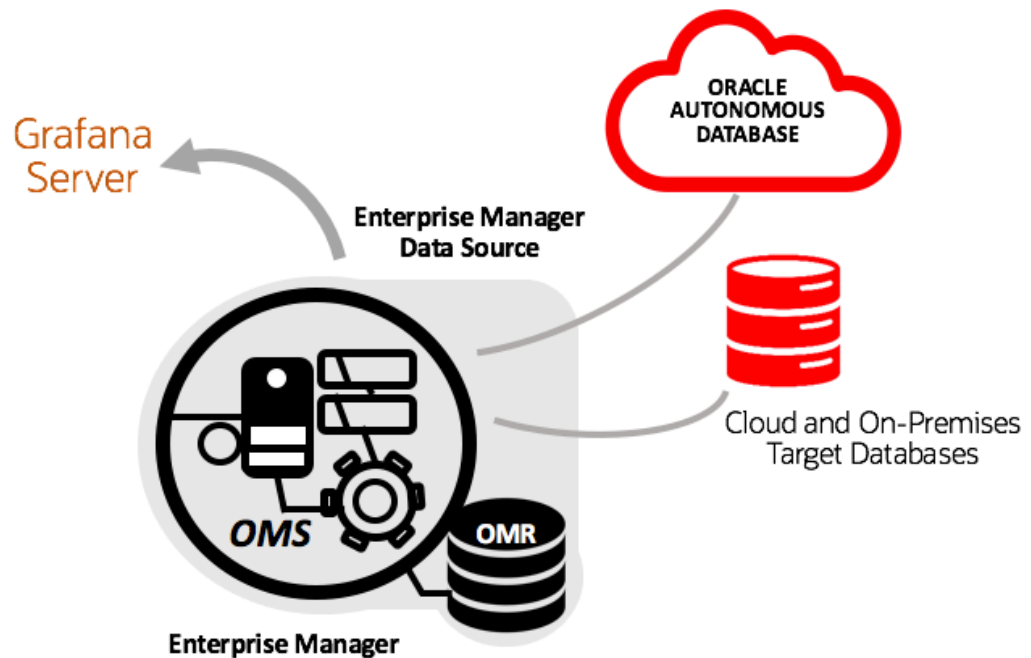
# 1

## About the Oracle Enterprise Manager App for Grafana

Grafana is an open source technology used for metric analytics & visualization. The Oracle Enterprise Manager App for Grafana allows you to integrate Enterprise Manager's metric data (collected from multiple managed targets and stored in the Enterprise Manager repository) with any other data sources you may have access to. You can create custom Enterprise Manager-based Grafana dashboards by simply browsing and selecting the Enterprise Manager metrics of interest, or running simple SQL queries against the Enterprise Manager repository tables, without a deep knowledge of the Enterprise Manager data model. Data from multiple Enterprise Manager sites, along with data from other data sources, can be easily displayed on a single dashboard.

### Deployment

When deployed, the Oracle Enterprise Manager App for Grafana lets Enterprise Manager become a data source for Grafana. The Enterprise Manager Oracle Management Service (OMS) is in direct communication with the Grafana server, transferring target metric and configuration data stored in the Oracle Management Repository (OMR).



# 2

## Before You Begin

Before you install and configure the Oracle Enterprise Manager App for Grafana, make sure the following prerequisites are met:

- Ensure you have a **Grafana Server** that has connectivity with the Enterprise Manager OMS and Repository. Set or make a note of your Grafana home directory (`$GRAFANA_HOME`) where your Grafana binary exists. Grafana 9.2.0 or later is supported for Oracle Enterprise Manager App for Grafana v4.0.0.

 **Note:**

For information on platforms for which the Oracle Enterprise Manager App for Grafana is certified, see [Oracle Enterprise Manager App for Grafana download page](#).

- Install and configure **Oracle Enterprise Manager Cloud Control 13c Release 5** (13.5). For more information, see [Oracle Enterprise Manager Downloads](#), Installation of Enterprise Manager Cloud Control and Advanced Installation and Configuration.
- Save the **Oracle Enterprise Manager App for Grafana** file from the [Oracle Enterprise Manager App for Grafana download page](#).

# 3

## Install the Oracle Enterprise Manager App for Grafana

You can install the Oracle Enterprise Manager App for Grafana using the Grafana command line interface (preferred) or manually.

### Using the Grafana CLI

1. Navigate to `$GRAFANA_HOME/bin`
2. Install the Oracle Enterprise Manager App for Grafana.  
**Using `--pluginUrl` option through `grafana-cli`**

```
./grafana-cli --pluginUrl <FULL_PATH>/oracle-emcc-app-<VERSION>.zip  
plugins install oracle-emcc-app
```

Example:

```
grafana-cli --pluginUrl /var/lib/grafana/plugins/emgrafana/work/oracle-  
emcc-app-1.0.0.zip plugins install oracle-emcc-app
```

3. Restart the Grafana server.

```
cd $GRAFANA_HOME/bin  
./grafana-server
```

### Without the Grafana CLI

1. Navigate to the Grafana *plugins* directory.

```
cd $GRAFANA_HOME/data/plugins
```

2. Extract the content of the Oracle Enterprise Manager App for Grafana zip file in the Grafana *plugins* directory. Create this directory if one does not exist.

```
cd $GRAFANA_HOME/data/plugins  
unzip <EM App for Grafana>.zip
```

3. Restart the Grafana server.

```
cd $GRAFANA_HOME/bin  
./grafana-server
```

 **Note:**

If you are installing Grafana 8 or above, you must complete an additional step in order to complete the configuration process. See [Grafana 8 and above Configuration](#).

# 4

## Enable the Oracle Enterprise Manager App for Grafana

After the App has been installed, you need to enable Grafana to work with your Enterprise Manager site.

1. Enable the Enterprise Manager App on the Grafana site.
  - a. From the Grafana home page, select **Configuration>Plugins**. A list of available Grafana plugins displays.
  - b. Choose **Oracle Enterprise Manager App** from the list. The Enterprise Manager App **Enable** and **Disable** options are displayed.
  - c. Click **Enable**.
2. Enable the Grafana Service on your Enterprise Manager site.

```
emctl set property -name oracle.sysman.db.restfulapi.grafana.enable -
value true -sysman_pwd <your sysman pwd>
emctl set property -name
oracle.sysman.db.restfulapi.grafana.executesql.repository.query.enable -
value true -sysman_pwd <your sysman pwd>
emctl set property -name
oracle.sysman.db.restfulapi.grafana.executesql.target.query.enable -value
true -sysman_pwd <your sysman pwd>
```

3. As a best practice, to optimize Enterprise Manager performance, you want to minimize resource demands placed on Enterprise Manager subsystems when Grafana fetches dashboard data.

Grafana communicates directly with the Enterprise Manager OMS to obtain data to render dashboards via REST API calls. In order to protect the performance of key Enterprise Manager subsystems, it has been designed to limit overuse of API end-points that could negatively impact performance. In addition to this protection, additional protection has been added to the Enterprise Manager Repository to prevent long running or resource intensive queries from compromising the operational performance of key Enterprise Manager subsystems.

Enterprise Manager provides two ways to manage dashboard resource usage.

- Repository Session (SQL) Throttling: You use Database Resource Manager to limit resource usage at the DB or PDB level.
- Application API Throttling: You set OMS properties to limit the number of concurrent API requests being executed by the OMS.

### Note:

Application API throttling only applies to Grafana dashboard creation.



4. Using your Grafana username and password, log in to the Grafana site using the following URL: `http://<host>:3000 (username/password : admin/admin)`

### Grafana 8 and above Configuration

An additional configuration step is required when installing Grafana 8 and above. You must add both *oracle-emcc-app* and *oracle-emcc-datasource* to the *allow\_loading\_unsigned\_plugins* list in the Grafana configuration file.

Set the following in the `conf/defaults.ini` file:

```
allow_loading_unsigned_plugins = oracle-emcc-app,oracle-emcc-datasource
```

### Alternate Method

If you do not want to edit the `defaults.ini` file, you can set

`GF_PLUGINS_ALLOW_LOADING_UNSIGNED_PLUGINS` to `oracle-emcc-app,oracle-emcc-datasource` using `EXPORT`, `SETENV`, or some other command line method for setting this environment variable.

# 5

## Using Grafana

Taking advantage of Grafana's flexible data display capability is easy. You can use dashboards that are included with the Oracle Enterprise Manager App for Grafana or create your own custom dashboards.

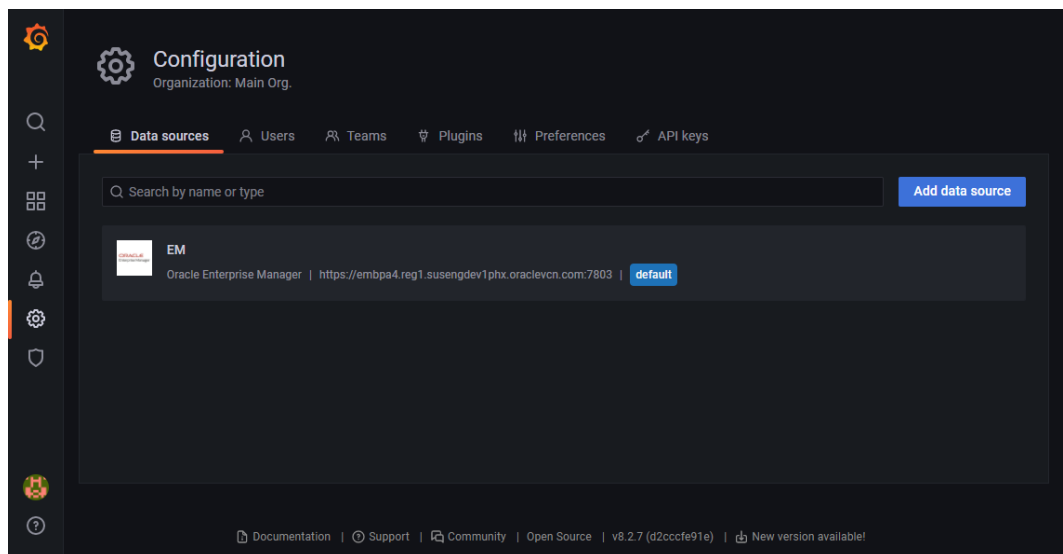
- [Add an Enterprise Manager Data Source](#)
- [View Predefined Dashboards](#)
- [Grafana Alerting](#)
- [Build Custom Dashboards](#)
- [Sample Dashboards](#)
- [Create Dashboards Using Predefined Templates](#)
- [Access Remote Repositories](#)
- [Accessibility](#)

### Add an Enterprise Manager Data Source

Before you can create a dashboard, you need to specify an Enterprise Manager site from which the dashboard will be pulling data.

To add an Enterprise Manager site as a data source:

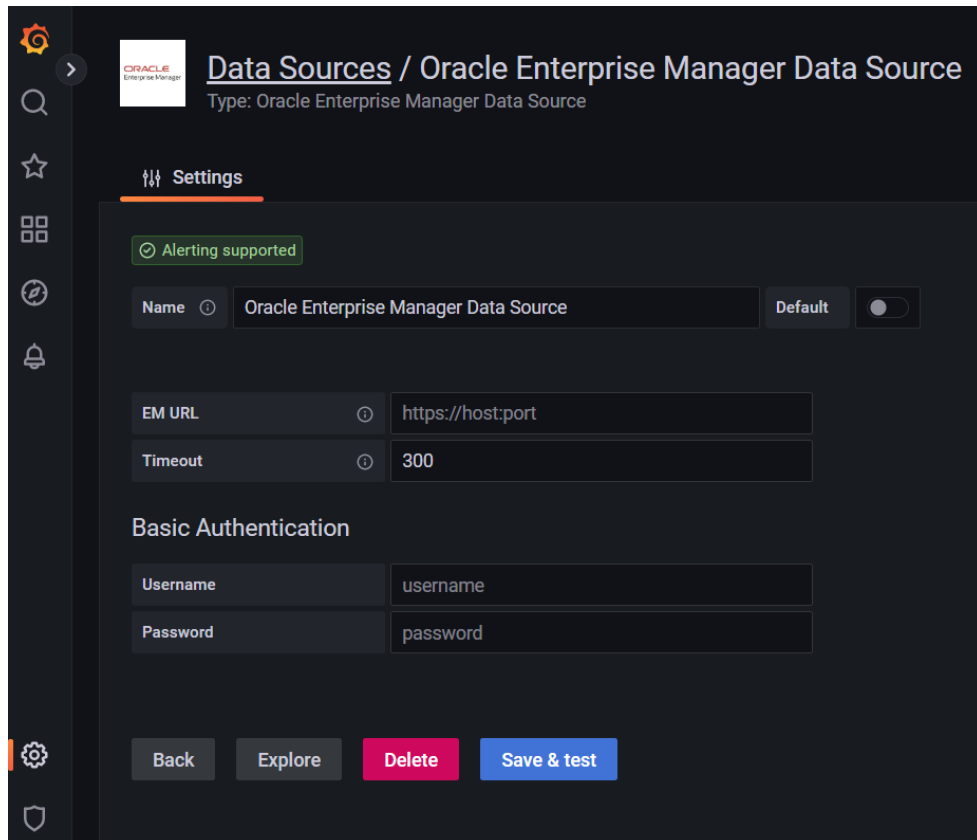
1. From the left tool bar, choose **Configuration > Data Sources**.
2. Click **Add data source**. A list of data source types is displayed.
3. Select **Oracle Enterprise Manager**.



4. Enter the requisite Enterprise Manager login information and click **Save & Test**.

 **Note:**

Do not use SYSMAN or Enterprise Manager users with Super Administrator privileges.



- Name: A descriptive name for your Enterprise Manager site.
- Default: Specifies that the Enterprise Manager site be used as the default data source when creating new dashboards or specifying queries. This option can be toggled on for only one Enterprise Manager site (if you are monitoring multiple sites).
- URL: The URL used to access the Enterprise Manager site. **Important:** If you are using a version of EM App for Grafana prior to v4.0.0, do not insert a slash at the end of the URL.  
Example: `http://myem.myhost.com:7788`
- Basic Authentication: Enterprise Manager user and password. Users will only be able to query those targets and metrics for which their Enterprise Manager accounts have permission. Specifying an appropriate Enterprise Manager user with the right level of target access privileges ensures adherence to Enterprise Manager security recommendations.

 **Note:**

The following information is applicable only if you are using a version of EM App for Grafana prior to v4.0.0.

- **Whitelisted Cookies:** The **grafana\_session** generates a unique session identifier that is passed to Enterprise Manager. This cookie is added by default and should not be removed. If not present, you **MUST** specify the **grafana\_session** when adding the Enterprise Manager data source. An error will occur if this cookie is not specified. The **grafana\_session** cookie is used specifically for SQL/Load throttling. See Controlling Resource Usage in the *Enterprise Manager Cloud Control Administrator's Guide*.
- **Remote Management Repository:** When switched on, this option allows you to connect to Enterprise Manager Repository data sources prior to EM 13.5 and additionally allows you to connect to additional Enterprise Manager Repositories that are not associated with the Enterprise Manager OMS configured for use with Grafana. For more information, see [Access Remote Repositories](#).

 **Note:**

The named credential for the repository database will be saved to the Enterprise Manager 13.5 installation. With this system dependency, the hostname/port/service or SID will be exposed to anyone with access to Grafana UI (Datasource page).

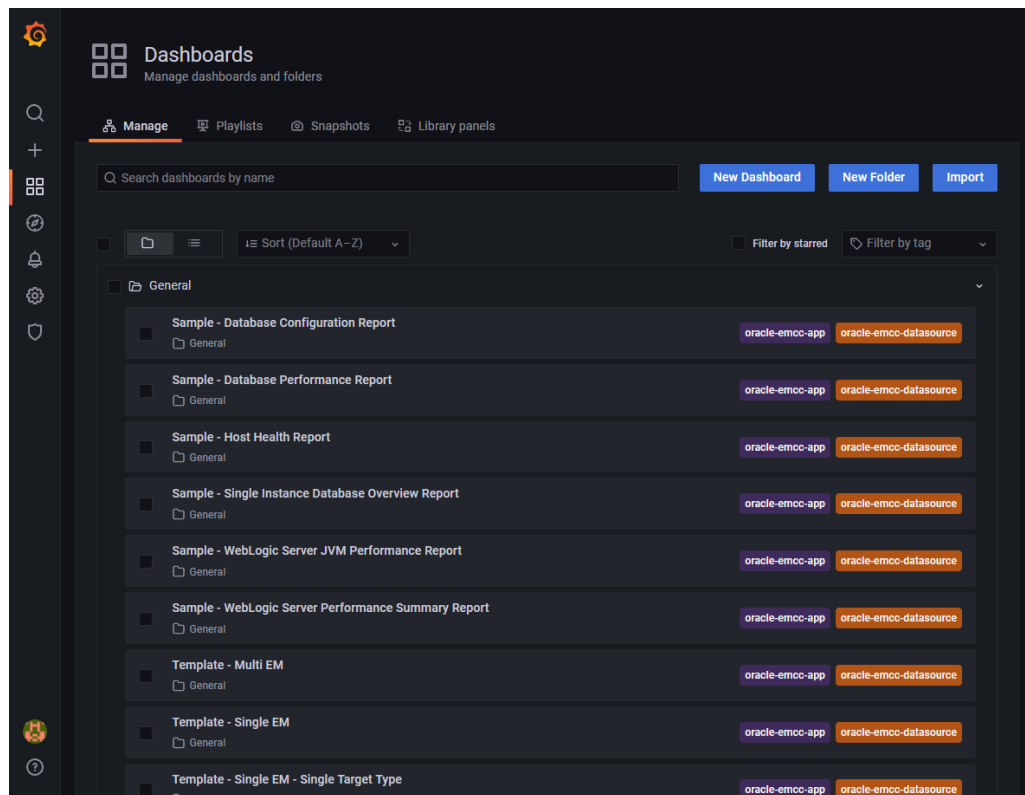
## View Predefined Dashboards

The Oracle Enterprise Manager App for Grafana ships with predefined dashboards that let you visualize key operational data about an Enterprise Manager site.

 **Note:**

For a demonstration of how to use out-of-box dashboards, you can view the video [Oracle Enterprise Manager App for Grafana Out-of--the-box Dashboards](#).

From the left tool bar, select **Dashboards** and then **Manage** to view all dashboards installed with the App.



Click on one of the sample dashboards:

- *Sample - Oracle Host Health Report*
- *Sample - Oracle Single Instance Database Overview Report*
- *Sample - Database Configuration Report*
- *Sample - Database Performance Report*
- *Sample - WebLogic Server JVM Performance Report*
- *Sample - WebLogic Server Performance Summary Report*
- *Sample - Exadata Capacity Planning Report*
- *Sample - ExaCloud Capacity Planning Report*

 **Note:**

If you want to make changes to the sample dashboards, you must first make a local copy of the dashboard using the **Save As** option. Click the (Settings) gear icon in the top toolbar to display dashboard settings and then click **Save As....**

## Grafana Alerting

Grafana Alerting is enabled by default and allows you to learn about problems in your systems moments after they occur, starting with EM App for Grafana v4.0.0.

Here is an example of a Grafana alert rule, which is triggered when the last value from the current logon count metric has exceeded a threshold value for a particular database"

The screenshot shows the 'Create alert rule' configuration in Grafana. The query is set to 'Oracle Enterprise Manager Data Source' with a time range of 'now-5d to now'. The query type is 'Time series', and the target is 'Database Instance' with target name 'Oemrep\_Database'. The metric is 'Current Logons Count (NUMBER)'. A threshold of 90 is set. A time series graph shows the 'response' metric fluctuating around a red threshold line at 90. A condition is defined as 'last() IS ABOVE 90'.

Here's an example of an alert notification, triggered by the alert rule above:

The screenshot shows a Slack alert notification from 'Personal EM Bot'. The notification title is '[FIRING:1] (Current Logon Count labelValue)'. The body contains details about the firing, including the value (111), labels, alert name, label key, annotations, source, and silence URL.

```

[FIRING:1] (Current Logon Count labelValue)
**Firing**
Value: [ metric='response' labels={} value=111 ]
Labels:
- alertname = Current Logon Count
- labelKey = labelValue
Annotations:
- Custom Info = Additional info attached here
- description = Custom description configurable
Source: http://localhost:3000/alerting/O548VZonk/edit
Silence: http://localhost:3000/alerting/silence/new?
alertmanager=grafana&matchers=alertname%3DCurrent+Logon+Count%2ClabelKey%
3DlabelValue
Show less

```

For more information, see Grafana Alerting documentation (<https://grafana.com/docs/grafana/latest/alerting/>).

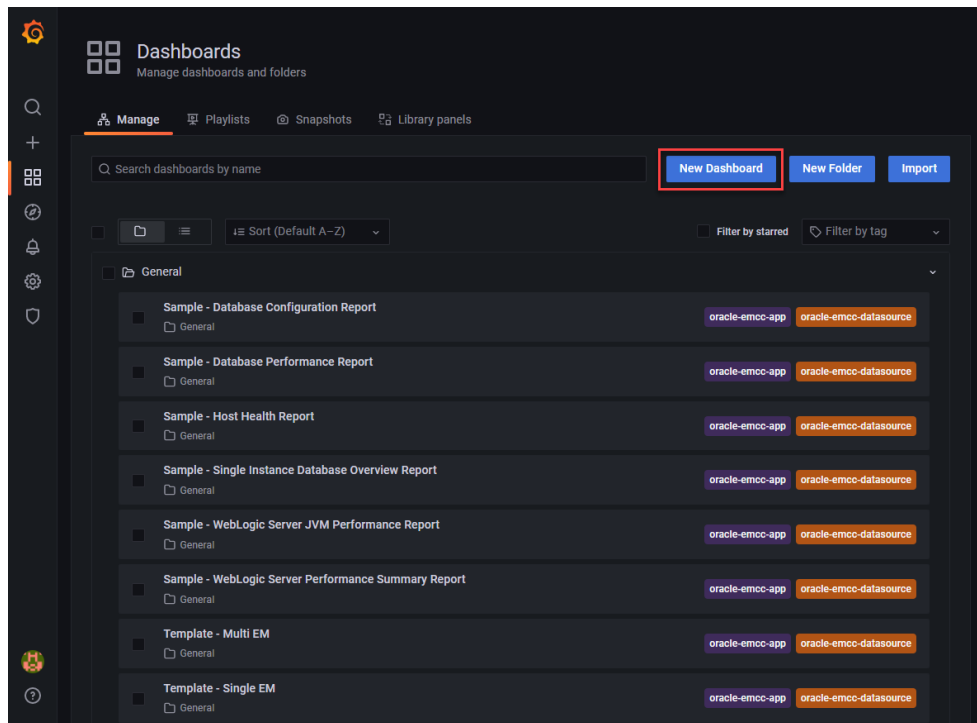
# Build Custom Dashboards

You can easily create your own dashboards to meet the unique monitoring needs for your environment.

## Note:

Ensure that the Enterprise Manager data source has already been defined before building a custom dashboard.

1. From the left tool bar, select **Manage** from the Dashboards menu.
2. Click **New Dashboard** to begin defining your custom dashboard.



3. If you haven't already, define your data source (Enterprise Manager site you are pulling data from), target types and names. For information on setting up data sources, see [Add an Enterprise Manager Data Source](#).

## Use SQL Queries

You can create visualization panels by querying the Enterprise Manager data.

### Query Builder

The Oracle Enterprise Manager App for Grafana supports pulling metric data from published Enterprise Manager `MGMT$` repository views, for example `MGMT$METRIC_DETAILS`, utilizing SQL queries.

**Note:**

*MGMT\$\_views* are only needed when extracting data from an Oracle Enterprise Manager Repository.

For more information about Enterprise Manager Management Views, see About Management Repository Views.

There are three built-in time series queries.

- **Raw:** Option pulls data from `sysman.MGMT$METRIC_DETAIL`. Usage Guideline: Data kept for a month.
- **Hourly:** Option pulls data from `sysman.MGMT$METRIC_HOURLY`. Usage Guideline: Data kept for three months.
- **Daily:** Option pulls data from `sysman.MGMT$METRIC_DAILY`. Usage Guideline: Data kept for six months.
- **Custom (Target)/Custom (Repository)** Option pulls data from any tables based on your own query. You extract data from an Enterprise Manager Repository using repository views.

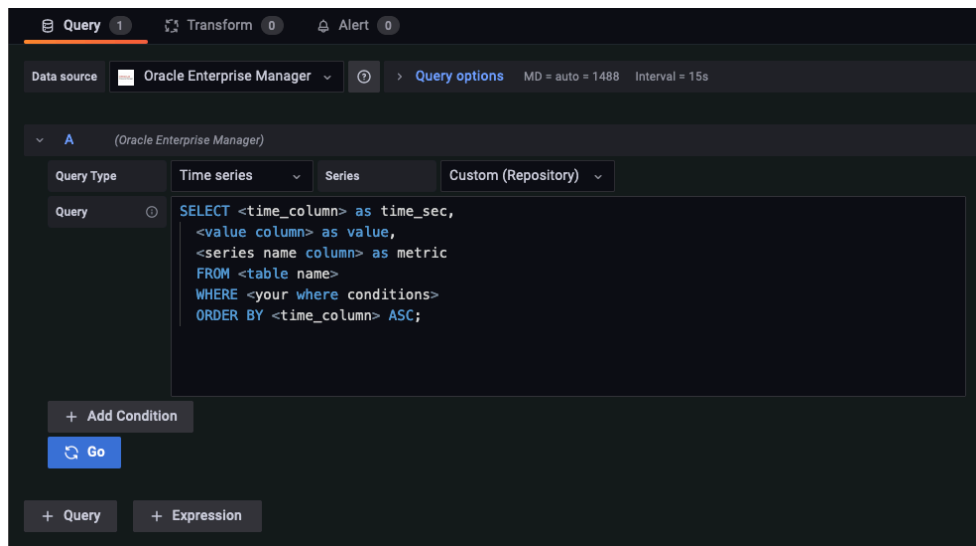


 **Note:**

When writing your own timeseries SQL query, it must have following column aliases:

- *time\_sec* - This column must be a date/timestamp data type column.
- *value* - This column must be a number data type column.
- *metric* - This column must be a string data type. It can also be a hard-coded string.

```
SELECT
<time_column> as time_sec,
<value column> as value,
<series name column> as metric
FROM <table name>
WHERE <your where conditions>
ORDER BY <time_column> ASC;
```

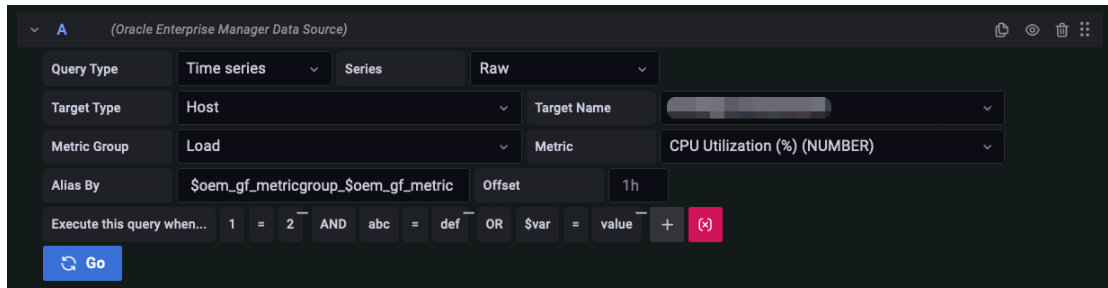


### Using Expressions

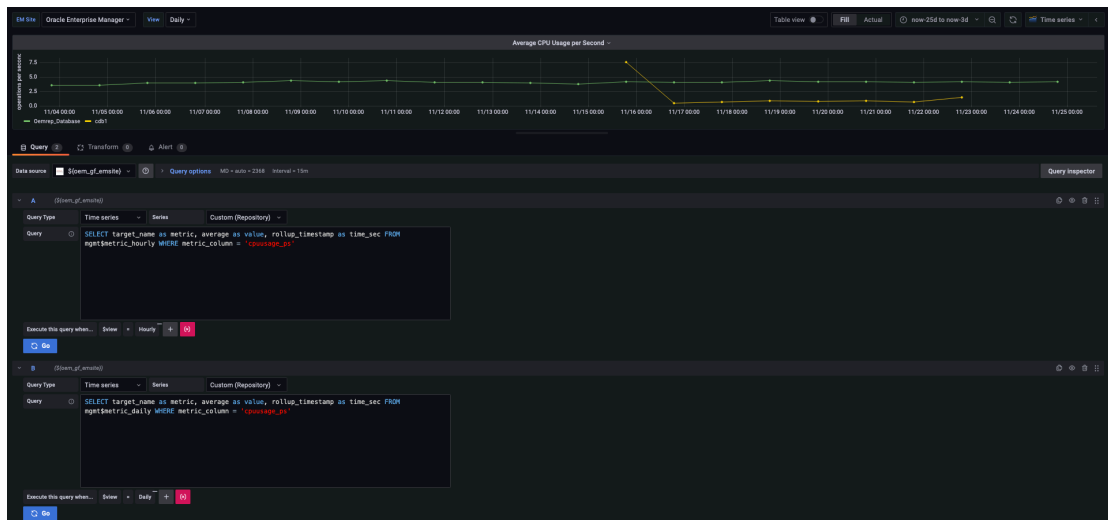
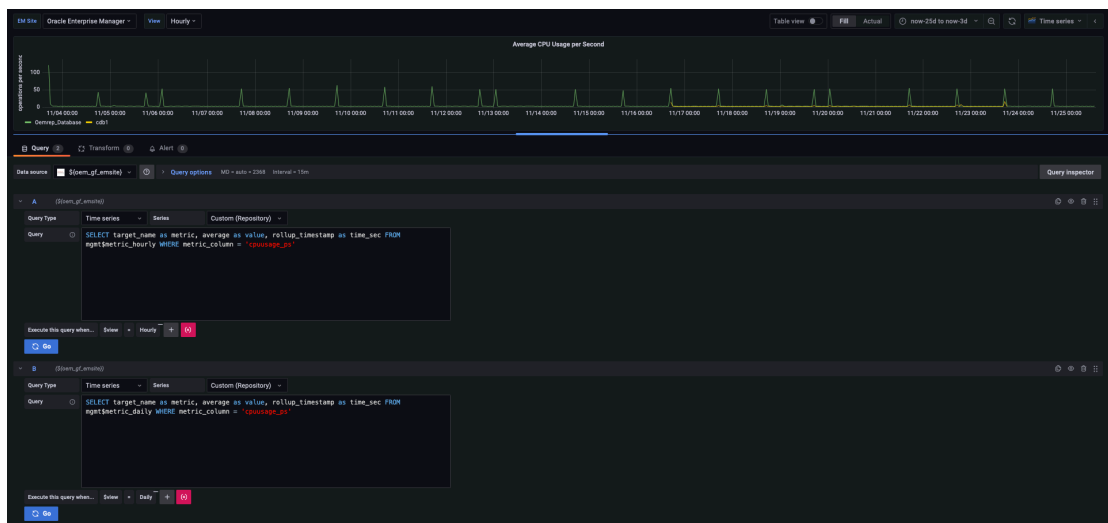
Starting with Enterprise Manager App for Grafana v4.0.0, users can condition the execution of their queries using expressions. The query will execute if and only if the expression evaluates to TRUE. The expressions are comparisons between two values, yet multiple expressions can be linked using logical operators (AND and OR). The supported comparison operators are:

- Equals: =
- Not equals: !=
- Greater than: >
- Greater than or equal to: >=
- Less than: <

- Less than or equal to: <=

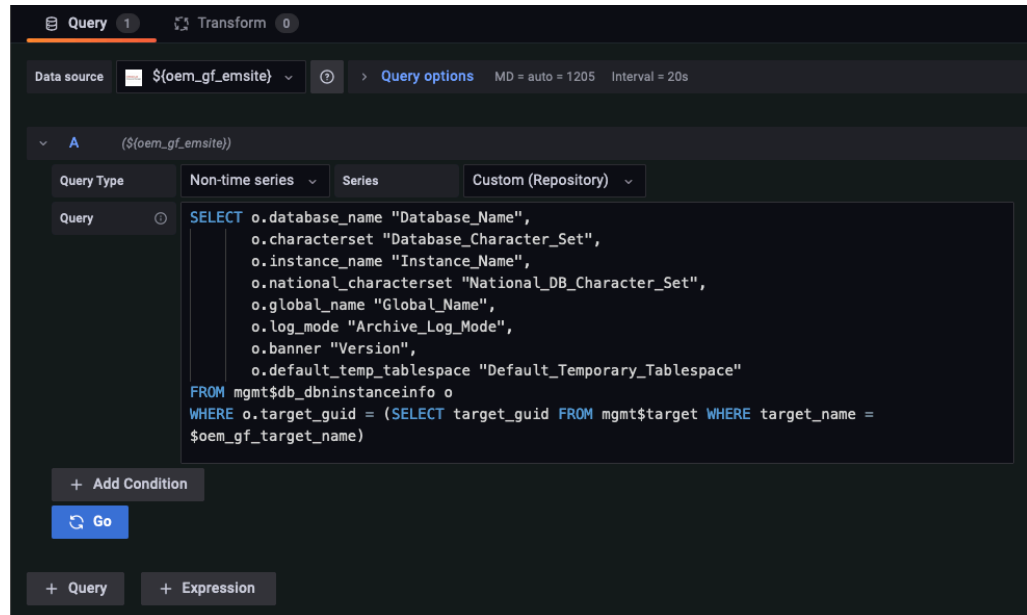


Here's an example of a single dashboard panel that utilizes these filters to render data from distinct tables based on the "View" selected by a dashboard viewer. This assists dashboard designers in creating a single pane view within the same dashboard panel to customize the data rendered.



## Non-time Series Query Type using MGMT\$ Views

Select the **Non-time series** Query Type to query from the Enterprise Manager repository tables:



The screenshot shows the Oracle Enterprise Manager Query Editor interface. At the top, there are tabs for "Query" (1) and "Transform" (0). Below the tabs, the "Data source" is set to "\$oem\_gf\_emsite". The "Query options" section shows "MD = auto = 1205" and "Interval = 20s". The "Query Type" is set to "Non-time series" and the "Series" is set to "Custom (Repository)". The "Query" field contains the following SQL query:

```
SELECT o.database_name "Database_Name",
       o.characterset "Database_Character_Set",
       o.instance_name "Instance_Name",
       o.national_characterset "National_DB_Character_Set",
       o.global_name "Global_Name",
       o.log_mode "Archive_Log_Mode",
       o.banner "Version",
       o.default_temp_tablespace "Default_Temporary_Tablespace"
FROM mgmt$db_instanceinfo o
WHERE o.target_guid = (SELECT target_guid FROM mgmt$target WHERE target_name =
$oem_gf_target_name)
```

Below the query field, there are buttons for "+ Add Condition", "Go", "+ Query", and "+ Expression".

### Note:

For more information about Enterprise Manager Management Views, see About Management Repository Views.

## Browse Enterprise Manager Metrics

The Oracle Enterprise Manager App for Grafana also supports browsing various Enterprise Manager metrics and selecting the type, group and names of metrics you want to visualize.

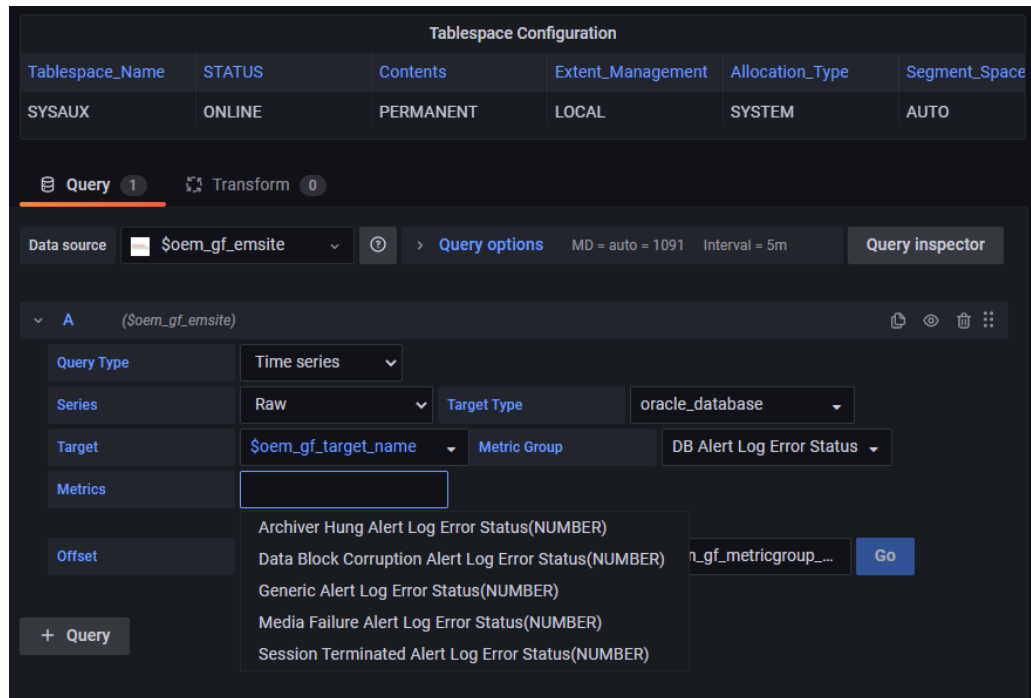
### Query Type - "Timeseries"

Select the format, **Raw, Hourly or Daily**, then select **Target Type, Target name, Metric Group** and **Metric** of interest:

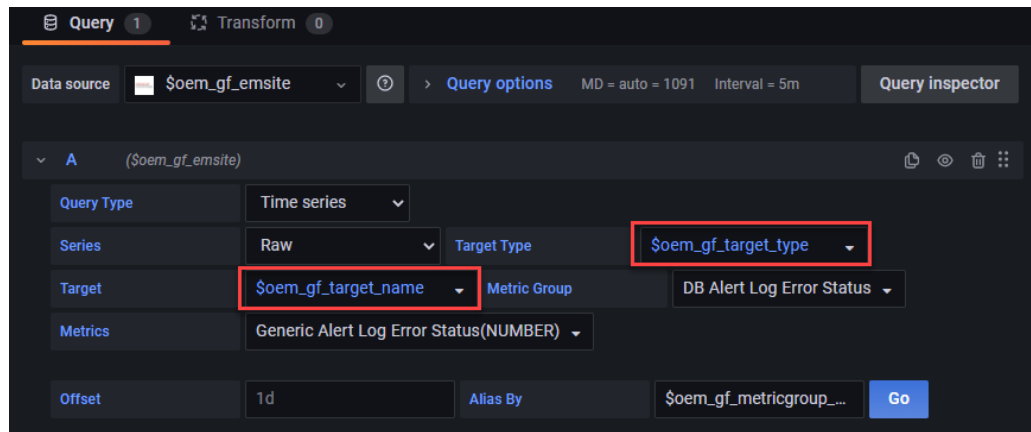
### Metric Group

The screenshot shows the Oracle Cloud Monitoring console interface. At the top, there is a 'Tablespace Configuration' section with columns: Tablespace\_Name, STATUS, Contents, Extent\_Management, and Allocation\_Type. Below this, there are tabs for 'Query' (1) and 'Transform' (0). The 'Query' tab is active, showing a data source of '\$oem\_gf\_emsite'. The query configuration includes: Query Type: Time series; Series: Raw; Target Type: oracle\_database; Target: \$oem\_gf\_target\_name; Metric Group: (dropdown menu open); Metrics: (dropdown menu); Offset: 1d; Alias By: \$. The dropdown menu for Metric Group lists the following options: DB Alert Log Error Status, adrAlertLogError, Alert Log, Alert Log Error Status, Archive Area - RAC Instance, AutoTask Client, Collect SQL Response Time, Control files, CPU Usage, Data Failure, and Database Components. A 'Go' button is visible below the configuration fields.

**Metric**



Using variables for target type and target name.



## Variables

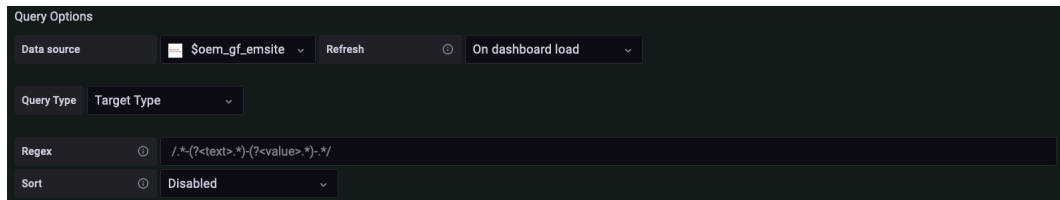
A variable is a placeholder for a value. You can use variables in queries, in panel titles, and when defining new dashboards. So when you change the value, using the dropdown, your panel's metric queries will change to reflect the new value.

The following variables are available:

- **Target Type**  
Fetches the list of all the target types.

 **Note:**

If you are using a version of EM App for Grafana prior to v4.0.0, you need to specify the variable as a JSON string.

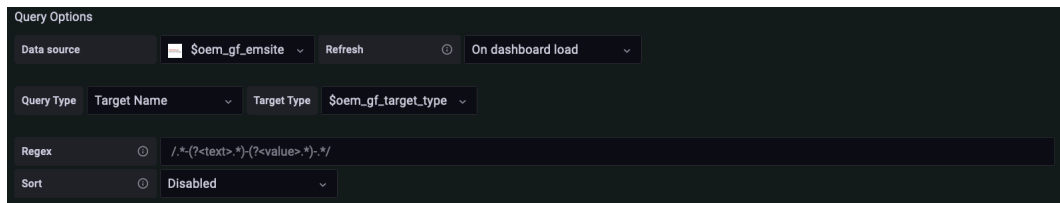


The screenshot shows the 'Query Options' panel in Grafana. The 'Data source' is set to '\$oem\_gf\_emsite'. The 'Query Type' is 'Target Name'. The 'Regex' field contains the pattern '/.\*(?<text>.\*)(?<value>.\*)/'. The 'Sort' option is set to 'Disabled'.

- **Target Name**  
Fetches the list of all the target names, given a specific target type.

 **Note:**

If you are using a version of EM App for Grafana prior to v4.0.0, you need to specify the variable as a JSON string.

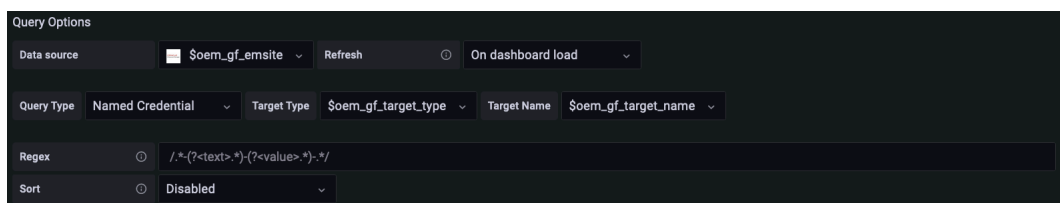


The screenshot shows the 'Query Options' panel in Grafana. The 'Data source' is set to '\$oem\_gf\_emsite'. The 'Query Type' is 'Named Credential'. The 'Target Type' is set to '\$oem\_gf\_target\_type'. The 'Regex' field contains the pattern '/.\*(?<text>.\*)(?<value>.\*)/'. The 'Sort' option is set to 'Disabled'.

- **Named Credential**  
Fetches the list of available EM named credentials defined for a given target, identified by the target type and target name.

 **Note:**

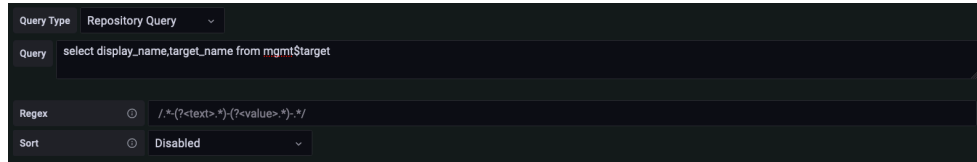
If you are using a version of EM App for Grafana prior to v4.0.0, you need to specify the variable as a JSON string.



The screenshot shows the 'Query Options' panel in Grafana. The 'Data source' is set to '\$oem\_gf\_emsite'. The 'Query Type' is 'Named Credential'. The 'Target Type' is set to '\$oem\_gf\_target\_type' and the 'Target Name' is set to '\$oem\_gf\_target\_name'. The 'Regex' field contains the pattern '/.\*(?<text>.\*)(?<value>.\*)/'. The 'Sort' option is set to 'Disabled'.

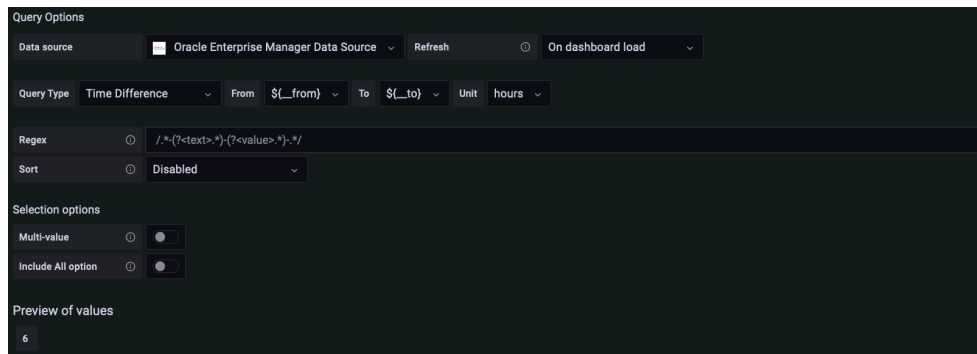
- **Repository Query Variable**

Starting with EM App for Grafana v4.0.0, the **Repository Query** variable is available, which is executed against the repository database. The values for this variable can later be referenced in other rawQuery's in the Query editors. If the specified SQL query only returns one column, it's used as both the `label` and value for the variable. If the specified SQL query returns 2 or more columns, the first column is used as the label, and the second column is used as the value. The label is displayed in the variable drop down for user to select, while the value is the string substituted when the variable is used.



- **Time Difference**

Starting with EM App for Grafana v4.0.0, the **Time Difference** variable is available, which can be defined to calculate the time difference between the specified **From** and **To** values in the specified **unit** of time. The values of the **From** and **To** properties can be other template variables or the Grafana built-in variable `$_from` and `$_to`. These built-in variables represent the time range chosen by the user in the time picker.

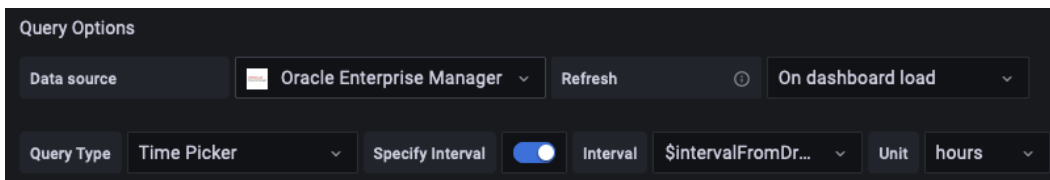
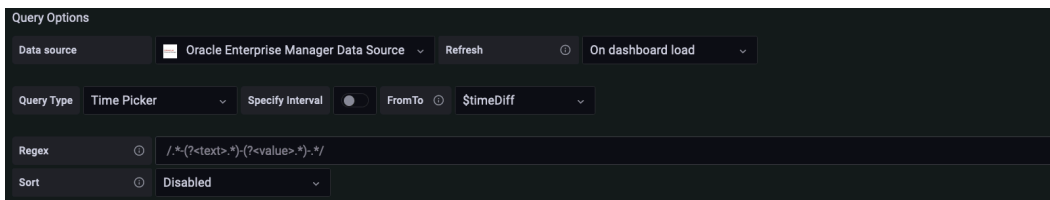


- **Time Picker**

Starting with EM App for Grafana v4.0.0, the **Time Picker** variable is available, which can be defined to modify the time picker automatically, without explicitly choosing it from the UI. The controls for this variable can either be a **FromTo** or an **Interval** and **Unit**. The values for both **FromTo** and **Interval** must come from other template variables because if the values are known constants at the time of variable defining, using this variable would be redundant. **FromTo** must resolve to a value in the form of `<from>;<to>` or `<from>;` where `<from>` and `<to>` are widely recognized datetime strings (e.g. ISO 8601, RFC 2822, unix timestamps) or relative Grafana strings (e.g. `now-6d`, `now-6h`). When the value resolves to a value of the form `<from>`, it is equivalent to `<from>;now`.

Here are some examples of acceptable value formats:

```
now-6d;now, now-6d, 1669158747;1669168747, 1669158747,
2022-01-01;2022-01-31, 2022-01-01
```



## Create Federated Data Dashboards

Grafana lets you unify monitoring data from multiple Enterprise Manager sites.

To visualize data across multiple sites:

1. Query data for one Enterprise Manager site and save that visualization.
2. Duplicate that panel, edit its data source to point to a new Enterprise Manager site.
3. Rename it and publish it to the same dashboard.

For example, you can visualize availability data from two separate Enterprise Manager sites in different regions, as shown below.

Availability Status - North America		Availability Status - EMEA	
AVAILABILITY_STATUS	COUNT(*)	AVAILABILITY_STATUS	COUNT(*)
Unreachable	76	Unreachable	4 K
Target Up	218	Target Up	21 K
Target Down	95	Target Down	2 K
Pending/Unknown	15	Remote Host Unreachable	7
Metric Error	7	Pending/Unknown	134
		Metric Error	11 K
		Blackout	3 K

Availability Status - Oceania		Availability Status - South America	
AVAILABILITY_STATUS	COUNT(*)	AVAILABILITY_STATUS	COUNT(*)
Target Up	63	Target Up	2
Target Down	11	Pending/Unknown	13

To create a custom federated dashboard, you can use the pre-defined **Multi-EM** template.

When using the **Multi-EM** template, you'll need to do the following:

1. In the General tab, select the **Repeat** option. This helps when the top-level site selection has multiple sites checked.
2. Select only one Enterprise Manager site from the top-level selection.

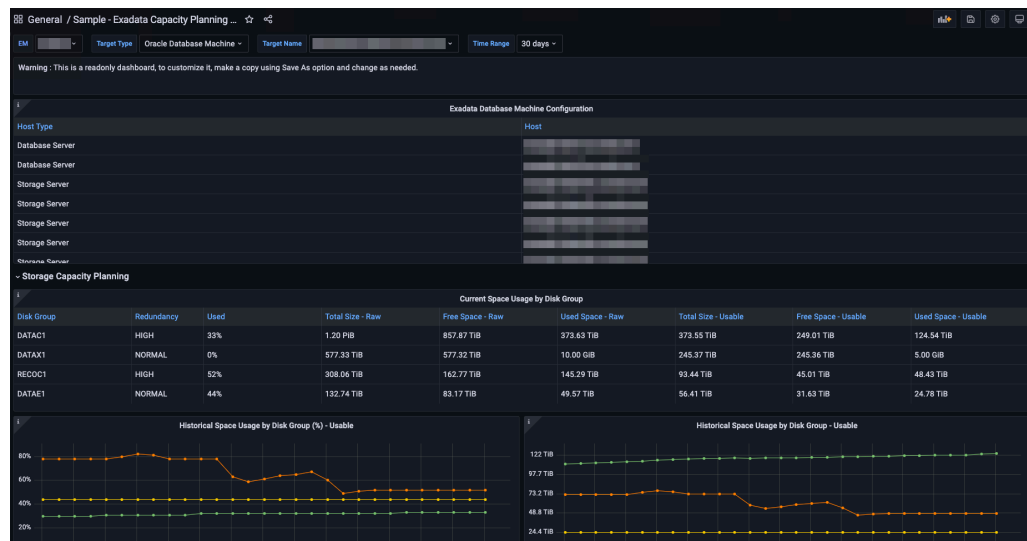


3. Set up a non-time series based query against a single repository within an Enterprise Manager instance.
4. Replicate the same setup/query across other instances of Enterprise Manager that are enabled as *Data Sources* by selecting other Enterprise Manager instances from the drop-down.

## Sample Dashboards

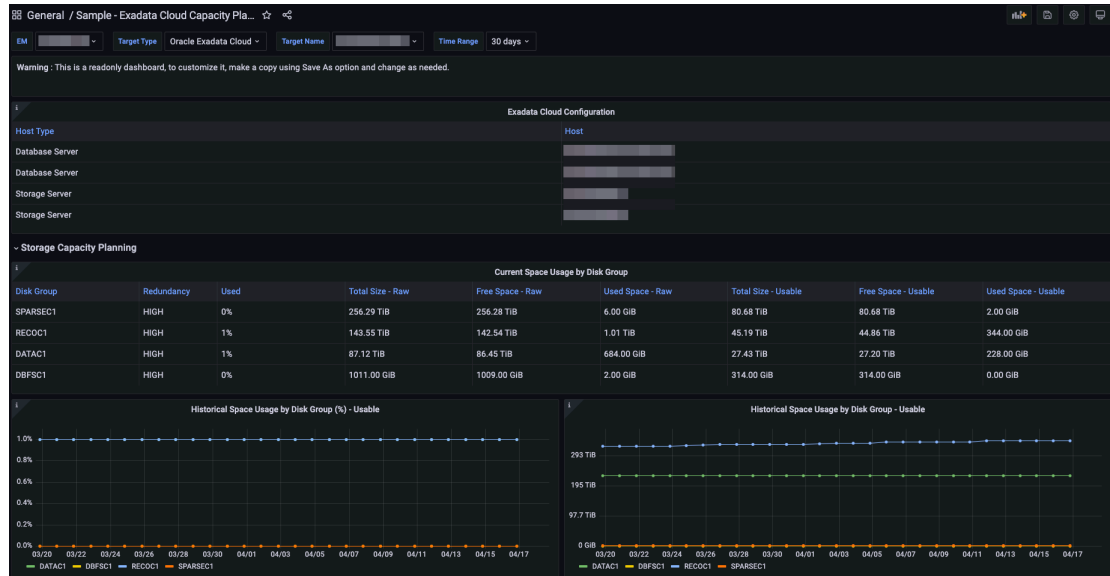
The following dashboards demonstrate the information display flexibility you have using Grafana.

### Exadata Capacity Planning Dashboard



Starting with EM App for Grafana v4.0.0 the new Exadata Capacity Planning Dashboard provides the historical resource consumption of Key Performance Indicators for Exadata Database Machine (On-Prem Exadata). Contains CPU, Memory, Storage, I/O(Input/Output) and Network utilisation graphs.

### Exadata Cloud Capacity Planning Dashboard



Starting with EM App for Grafana v4.0.0 the new Exadata Cloud Capacity Planning Dashboard provides the historical resource consumption of Key Performance Indicators for Exadata Cloud - Generation 1. (Cloud@Customer and Cloud Service) Contains CPU, Memory, Storage and I/O(Input/Output) utilisation graphs.

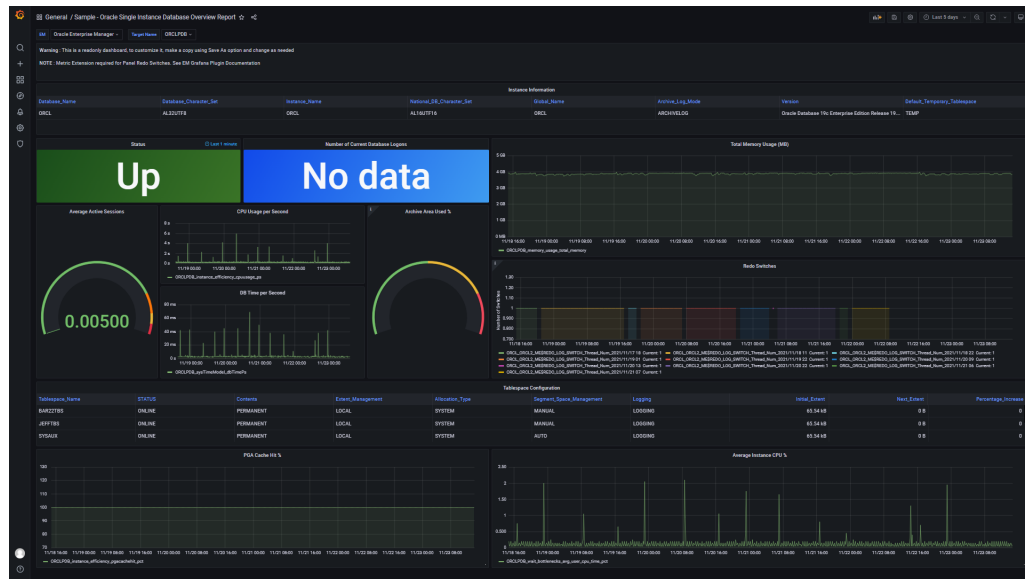
**Oracle Host Health Report dashboard provides a comprehensive view of the status and health of a host:**



 **Note:**

The panel *Number of OS Logons* in this dashboard is built using a custom SQL query to the repository database to get the number of users currently logged onto the host. The metric needs to be enabled from Enterprise Manager: **User > Number of Logons**.

**Oracle Single Instance Database Overview Report dashboard provides a comprehensive look at the status and health of a single instance database:**

 **Note:**

The *Redo Switches* panel in this dashboard requires a Metric Extension to be created and deployed to each database target you want to monitor from this dashboard. For information on creating a SQL Metric Extension, see *Using Metric Extensions in the Enterprise Manager Administrators Guide*.

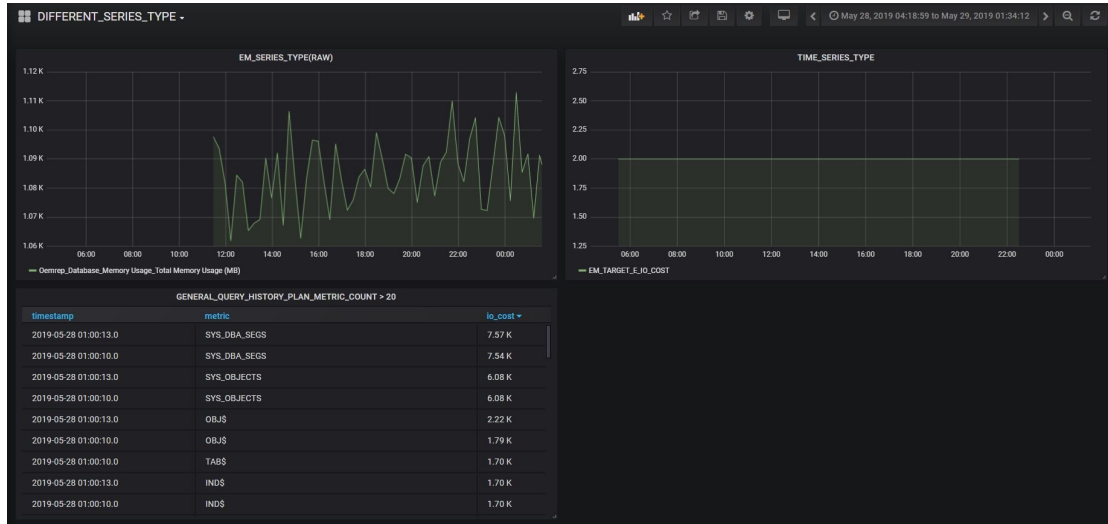
When creating the Metric Extension, use the following SQL:

```
select *
From (SELECT to_char(first_time,'YYYY/MM/DD HH24') day_hour,
count(*) "#"
      from v$log_history
      GROUP by to_char(first_time,'YYYY/MM/DD HH24')
      order by 1 DESC)
where rownum=1;
```

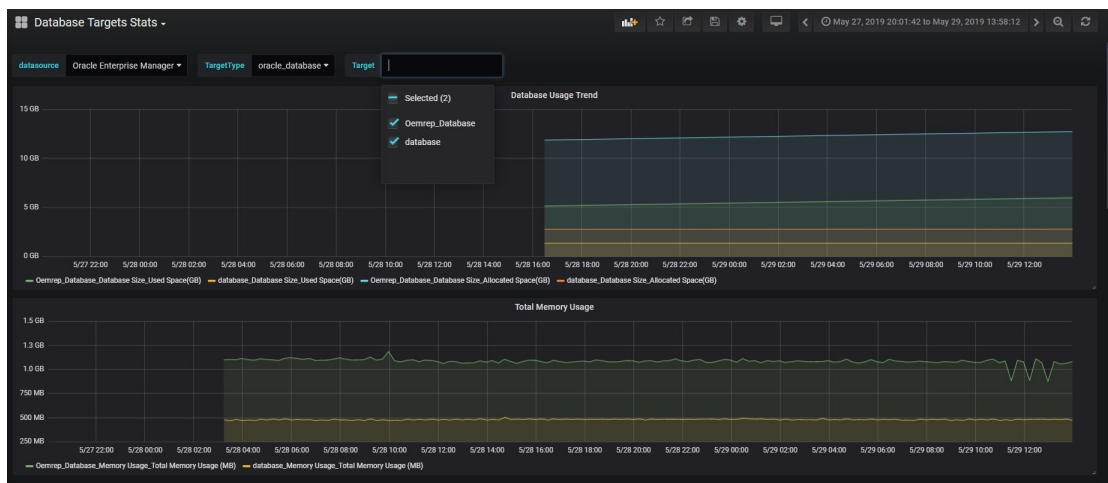
**Note:**

The *Archive Area Used %* panel in the Oracle Single Instance Database Overview Report dashboard requires the metric to be enabled from Enterprise Manager. Archiving must be configured on the database for value add.

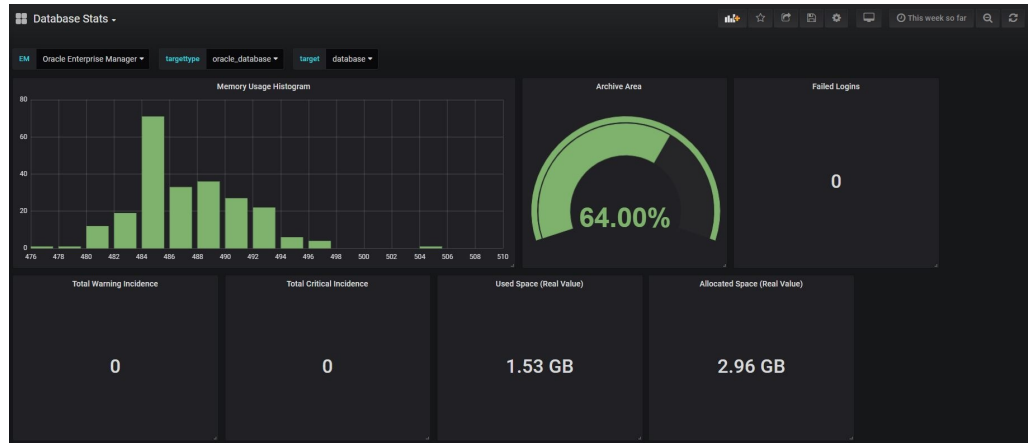
**Dashboard with different series types:**



**Dashboard with single target type and multiple targets ( Data from a Single Enterprise Manager site, multiple targets) :**



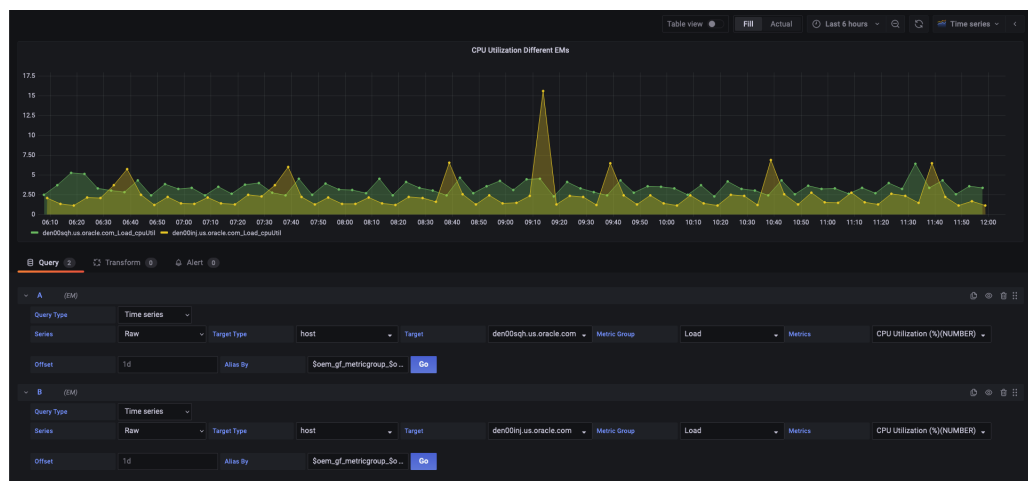
**Dashboard with single target type and single target selection( Data from a single Enterprise Manager site, single targets):**



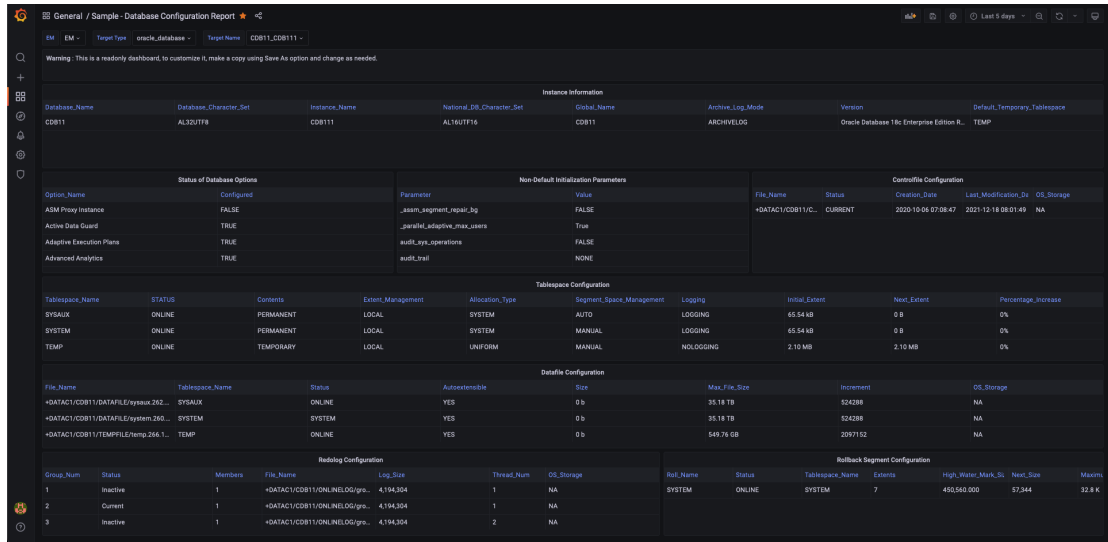
Dashboard with separate panels, pulling data from the different Enterprise Manager sites ( Data from multiple Enterprise Manager sites, multiple targets) :



Dashboard with a single panel pulling data from a different Enterprise Manager sites (Data from multiple Enterprise Manager sites , single panel):



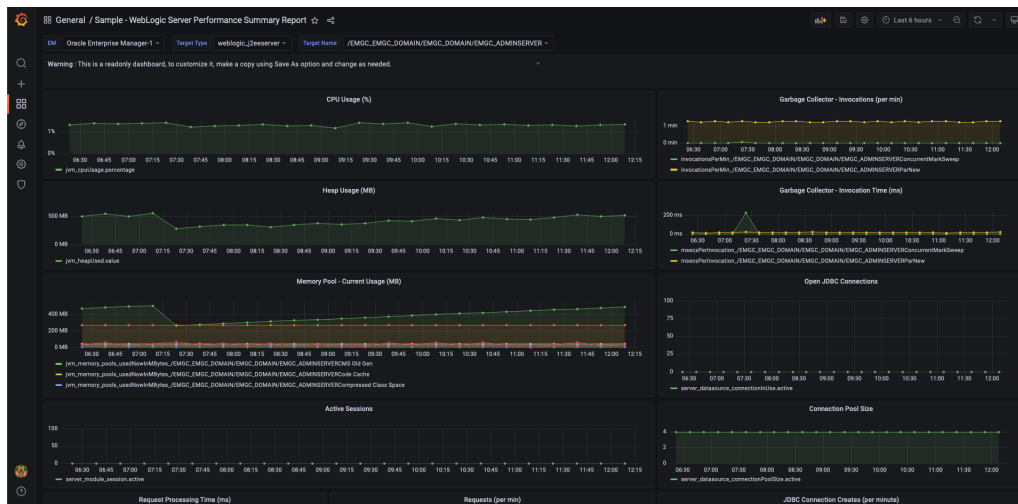
Database Configuration Dashboard



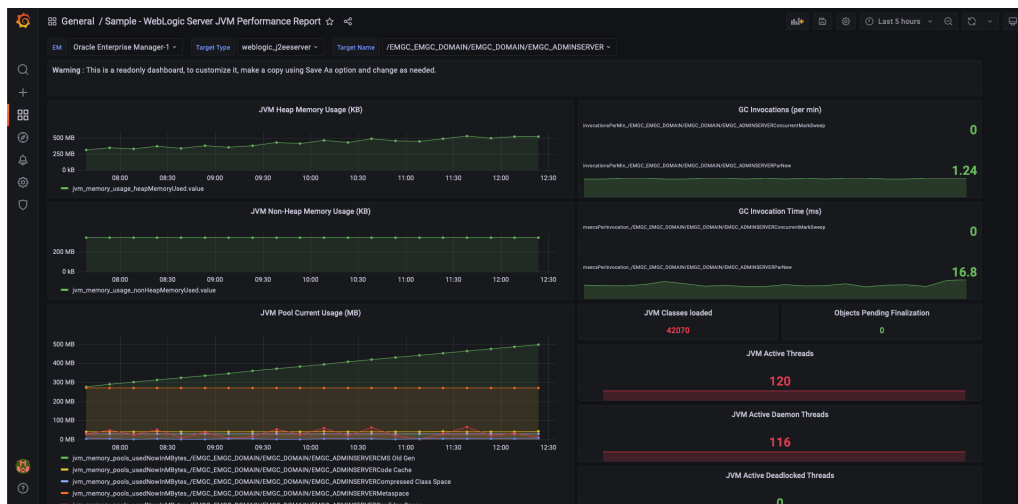
## Database Performance Dashboard



## WebLogic Server Performance Summary Dashboard



## WebLogic Server JVM Performance Dashboard

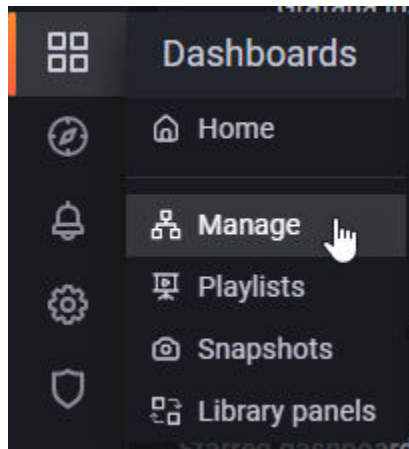


## Create Dashboards Using Predefined Templates

The Oracle Enterprise Manager App for Grafana comes with a set of predefined dashboard templates that you can use to create new Grafana dashboards without having to develop them from scratch.

To display the available templates and sample dashboards:

1. Select **Manage** from the Dashboards menu.



All available dashboard samples and templates are displayed.

2. Click on the desired template to begin using that template.

**IMPORTANT:** Before making any changes to a template dashboard, click **Save As** to clone it, otherwise your changes will be lost.

### Usage Tips

#### Template Variables

Dashboards inherit specific Enterprise Manager information via a set of variables shown in the following table.

**Table 5-1 Grafana-Enterprise Manager Variables**

Variable	Definition
\$oem_gf_emsite	Enterprise Manager Site
\$oem_gf_target_type	Target Type
\$oem_gf_target_name	Target Name
\$oem_gf_metricgroup	Metric Group
\$oem_gf_metric	Metric defined in the above metric group
\$oem_gf_named_credential	Named Credential of a target

When you clone a template dashboard, your dashboard will automatically inherit one or more of below template variables based on the template dashboard you have cloned it from: \$oem\_gf\_target\_type, \$oem\_gf\_target\_name, \$oem\_gf\_emsite, \$oem\_gf\_named\_credential.

There are query builder level variables tagged to the drop-down respectively. \$oem\_gf\_target\_type, \$oem\_gf\_target\_name, \$oem\_gf\_metricgroup, \$oem\_gf\_metric, \$oem\_gf\_named\_credential which can be used in case the template variables at the dashboard level are not created.

The following example demonstrates how to reference the Template Variables in a SQL query.

```
select <col1>, <col2>
from <table>
```



```
where target_type = $oem_gf_target_type  
and target_name in ( $oem_gf_target_name )
```

### Variable Scope

Variable scope determines the precedence with which the variable is used.

The precedence rules are:

1. Dashboard level scope always has the priority over the query builder level scope.
2. If no template variable of `$oem_gf_target_type`, `$oem_gf_target_name` is not available in the dashboard level, the value will be replaced with the query level scope values.
3. If a template variable is absent in the query builder scope. It will be replaced with an empty string.
4. The scope of query builder level variables is at the **Queries** tab only.

## Access Remote Repositories



### Note:

This feature is not available starting with EM App for Grafana v4.0.0.

The Oracle Enterprise Manager App for Grafana is only available with Enterprise Manager Cloud Control 13.5. If, in addition to your Enterprise Manager 13.5 installation, you are also maintaining older versions of Enterprise Manager in your environment, you can still use Grafana to create dashboards for these older Enterprise Manager Repositories. Be sure to check the [Oracle Enterprise Manager App for Grafana download page](#) for the versions of repositories supported.

**Important:** If you decide to upgrade your repository to Enterprise Manager Cloud Control 13c Release 4 update 3 or higher, you must turn off the Remote Management Repository feature. As part of this App, SSL/TCP connectivity is not supported for Remote Management Repository data sources.

When creating an Enterprise Manager data source in Grafana, you have the option of accessing a Remote Management Repository.

The screenshot shows the 'Data Sources / Oracle Enterprise Manager' configuration page. The 'Settings' section includes fields for Name (Oracle Enterprise Manager), URL (https://myemsite.com:7380), and Whitelisted Cookies (grafana\_session). The 'Basic Authentication Type' section includes fields for User (admin\_system) and Password (masked). The 'Remote Management Repository' section is highlighted with a red box and includes a toggle switch (checked), Host:Port (myhost.com:2321), Service Name (orcl281216.myhost.com), and Named Credential (masked). At the bottom, there are buttons for Back, Explore, Delete, and Save & test.

By defining a Remote Management Repository data source, you can have Grafana point to multiple non-13.5 repositories in your environment, thus providing you with the ability to visualize data from all Enterprise Manager installations in your managed environment.

When the Remote Management Repository is switched on, you need to specify the following information:

- **Host and Port** where the remote repository resides.
- **SID or Service Name** of the repository.
- **Named Credential:** The Global Named Credential used to log in to the remote repository. The Global Named Credential must already be defined in Enterprise Manager. These Global Named Credential must be defined in Enterprise Manager 13.5 and above only.

For more information about Global Named Credentials, see Named Credentials in the *Enterprise Manager Cloud Control Security Guide*.

## Accessibility

When inside the SQL raw query editor, the `TAB` key is used for indentation (instead of navigating to the next focusable element). In order to change this behavior, you can press `Ctrl+Shift+M`. Once pressed, `TAB` will not indent and instead move focus out of the SQL raw query editor.

In order to revert this behavior, you can press `Ctrl+Shift+M` again while inside the SQL raw query editor to once again use `TAB` for indentation instead of navigation

# 6

## Update the Oracle Enterprise Manager App for Grafana

You can update the App with the latest release by downloading the most recent distribution file and overwriting the existing content in your Grafana Server home directory.

The Oracle Enterprise Manager App for Grafana upgrade can be performed using either of the following methods:

- Upgrade using the Grafana command line interface (Recommended)
- Upgrade manually

To perform the update using the Grafana command line interface:

1. Remove the existing App.

```
./grafana-cli --pluginsDir <PLUGIN_DIR> plugins remove oracle-emcc-app
```

2. Install the new App.

```
/grafana-cli --pluginsDir <PLUGIN_DIR> --pluginUrl <FULL_PATH>/oracle-emcc-app-<VERSION>.zip plugins install oracle-emcc-app
```

Alternatively, instead of specifying the full path to the App distribution file, you can specify a download URL.

```
./grafana-cli --pluginsDir <PLUGIN_DIR> --pluginUrl <PLUGIN_URL> plugins install oracle-emcc-app
```

3. Restart the Grafana Server.

```
cd $GRAFANA_HOME/bin  
./grafana-server
```

To perform the update manually:

1. Download Oracle Enterprise Manager App for Grafana zip file *em-datasource-[<version>.zip](#)* from the [Oracle Enterprise Manager App for Grafana download page](#).
2. Extract the App files.

```
unzip em-datasource-<version>.zip
```

3. Move the existing App files from your Grafana home directory to a backup directory.

```
mv $GRAFANA_HOME/data/plugins/oracle-emcc-app/* <backup directory>
```

 **Note:**

As a best practice, you should always make a complete backup of this directory before updating directory content.

4. Copy the latest App files to your Grafana home directory.

```
cp -r oracle-emcc-app-<version>/* $GRAFANA_HOME/data/plugins/oracle-emcc-app
```

5. Restart the Grafana Server.

```
cd $GRAFANA_HOME/bin  
./grafana-server
```