Data visualization with Grafana
Time series data

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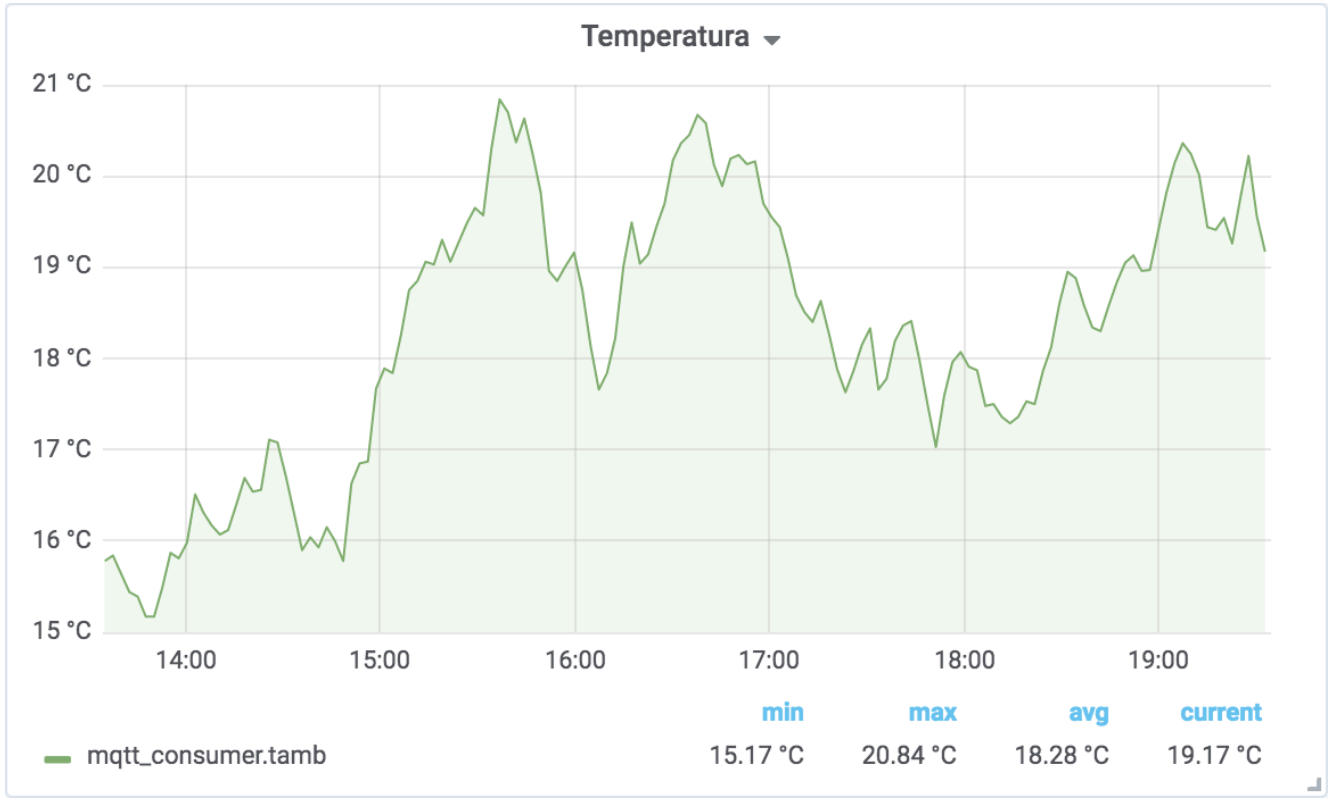
ACTION Webinar– Data Visualization (time series)

Why data visualization is important?

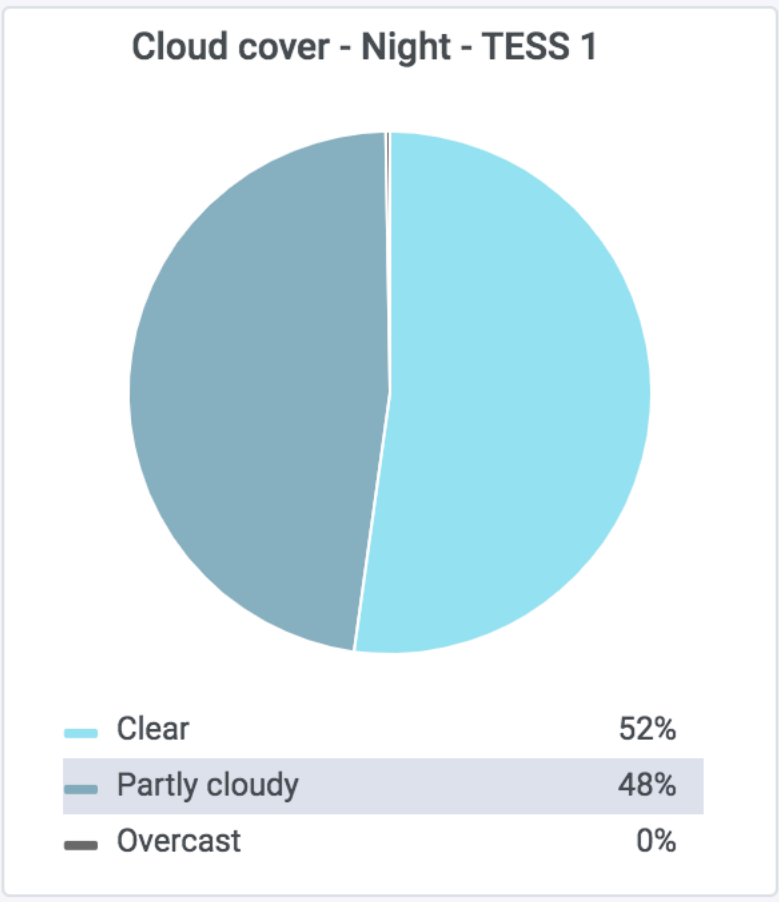
It makes my data **understandable** (for scientists and citizens)
Visualizations help us to identify patterns and to interpret results
Visualizations help us to communicate a result.

Graph



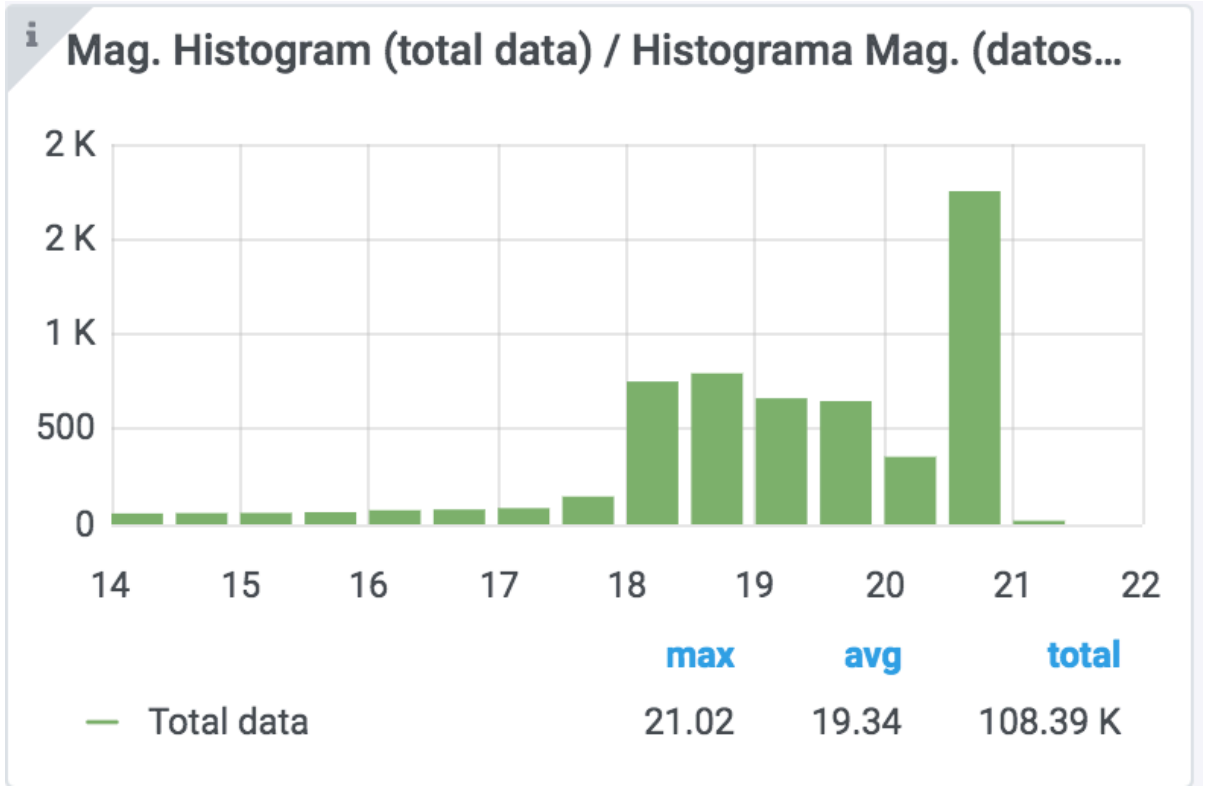
- X-AXIS: We represent a variable. In our case, date and times
- Y-AXIS: Represent another variable (temperature).
- You can represent the evolution of a variable (instant values) over the time
- You can use statistics to represent aggregated values such as average, median, etc … It reduces the amount of data visualized and *smooth* the changes
- You can add more data (sensors) to the graph
- You can represent another variable in the right side of the Y-AXIS
- Sensor oriented

Pie Chart



- It represents the different categories of a variable
- It is used to show percentages per category
- Very used to represent demographs

Histogram

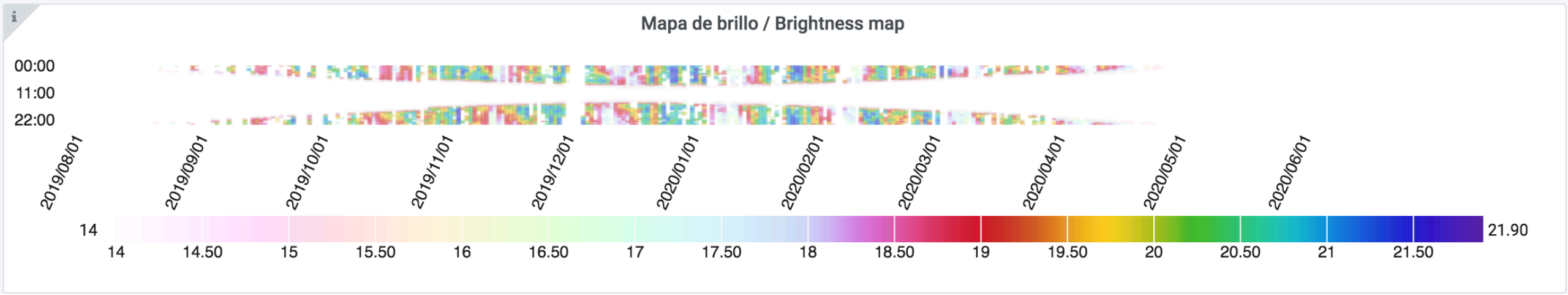


- X-AXIS: We represent a variable. In our case, magnitude of the sky brightness
- Y-AXIS: Number of occurrences
- You can observe the data distribution

Stats

- Numbers to represent stats
- Normally we use aggregated values such as averages, median, mean , mode, etc …
- Also percentages can be used.
- Attract the attention of the users

Heatmap



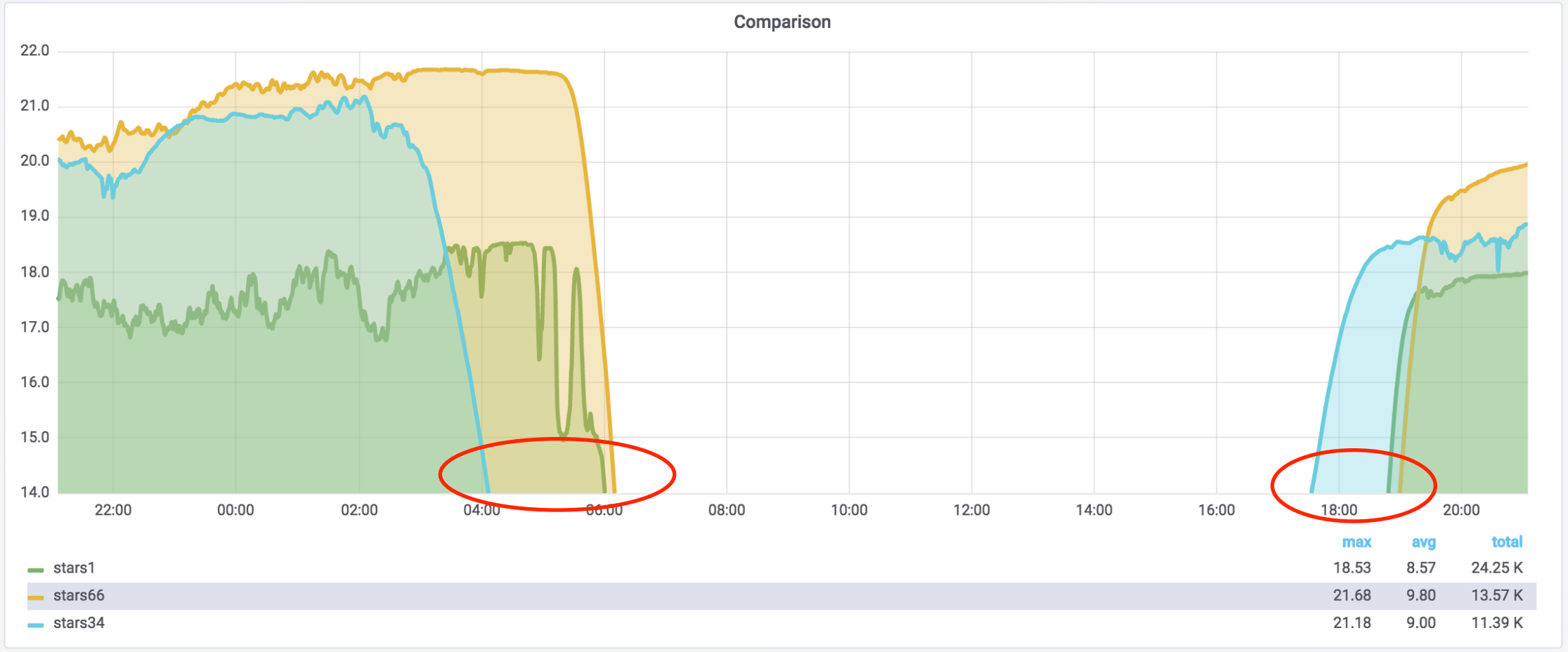
You can represent an extra variable using a color

Let’s see some examples

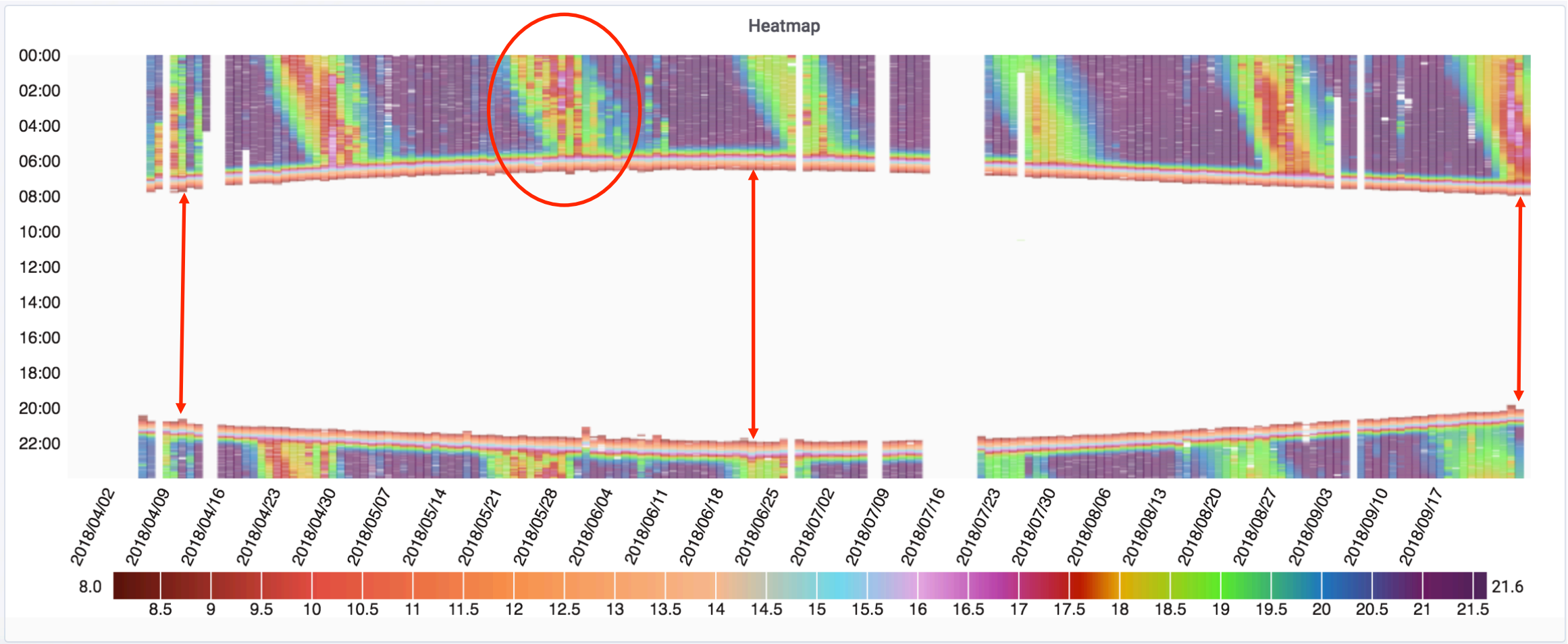
Using data of the STARS4ALL photometer network

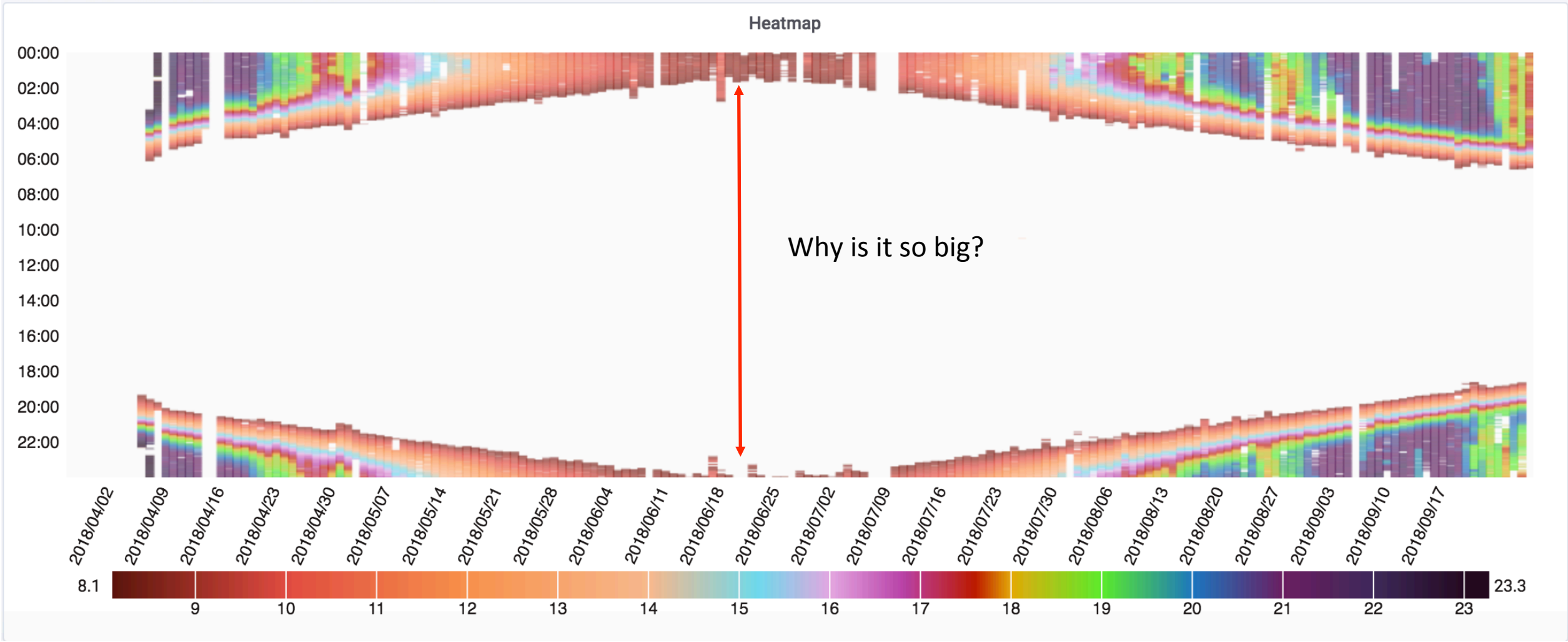
ACTION

TESS 1 stars1 - Coslada, Spain | TESS 2 stars66 - Hospedería de Monfragüe, Spain | TESS 3 stars34 - Skibotn Observatory, Norway




stars83 - Skarpnäck, Sweden
Skarpnäck (Stockholm, Sweden) - stars83
Sky brightness (mag/arcsec^2)
19.0
18.0
17.0
16.0
15.0
14.0
20:30
21:00
21:30
22:00
22:30
23:00
23:30
00:00
00:30
01:00
max
avg
current
mqtt_consumer.mag
18.86
17.87
18.84
Cloud cover
21:00
22:00
23:00
00:00
01:00
Clear (100%)


Heatmap
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
2018/04/02
2018/04/09
2018/04/16
2018/04/23
2018/04/30
2018/05/07
2018/05/14
2018/05/21
2018/05/28
2018/06/04
2018/06/11
2018/06/18
2018/06/25
2018/07/02
2018/07/09
2018/07/16
2018/07/23
2018/07/30
2018/08/06
2018/08/13
2018/08/20
2018/08/27
2018/09/03
2018/09/10
2018/09/17
8.0
8.5
9
9.5
10
10.5
11
11.5
12
12.5
13
13.5
14
14.5
15
15.5
16
16.5
17
17.5
18
18.5
19
19.5
20
20.5
21
21.5
21.6

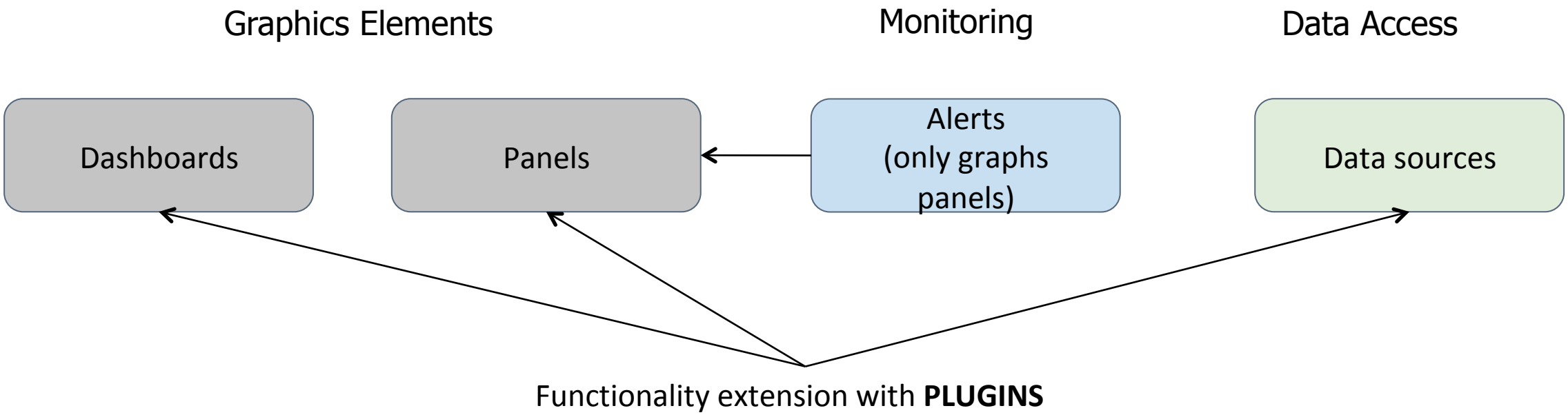

Heatmap
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Why is it so big?
2018/04/02
2018/04/09
2018/04/16
2018/04/23
2018/04/30
2018/05/07
2018/05/14
2018/05/21
2018/05/28
2018/06/04
2018/06/11
2018/06/18
2018/06/25
2018/07/02
2018/07/09
2018/07/16
2018/07/23
2018/07/30
2018/08/06
2018/08/13
2018/08/20
2018/08/27
2018/09/03
2018/09/10
2018/09/17
8.1
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
23.3

ACTION

Grafana

Platform to build dashboards

FEATURES


Graphics Elements
Monitoring
Data Access
Dashboards
Panels
Alerts
(only graphs
panels)
Data sources
Functionality extension with **PLUGINS**

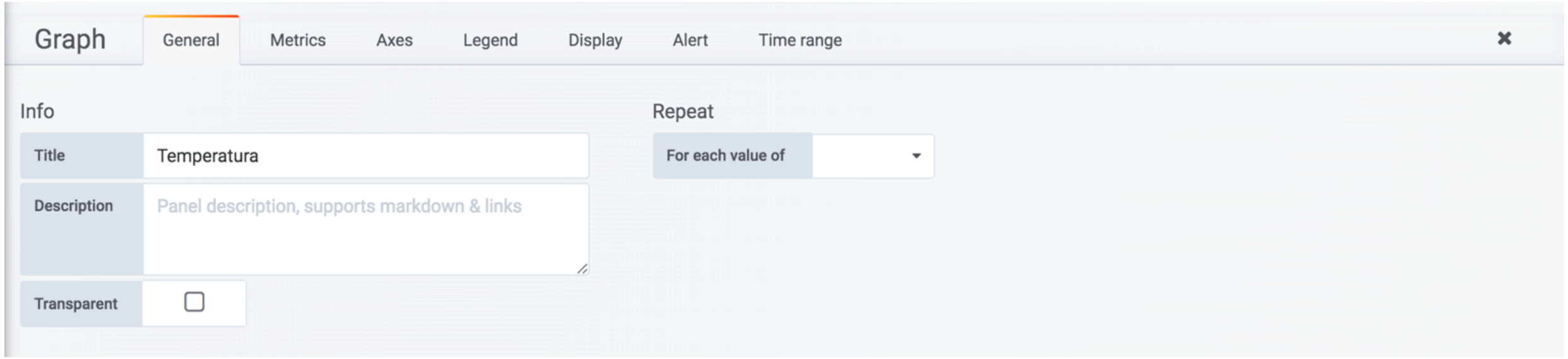
dashboard

alert

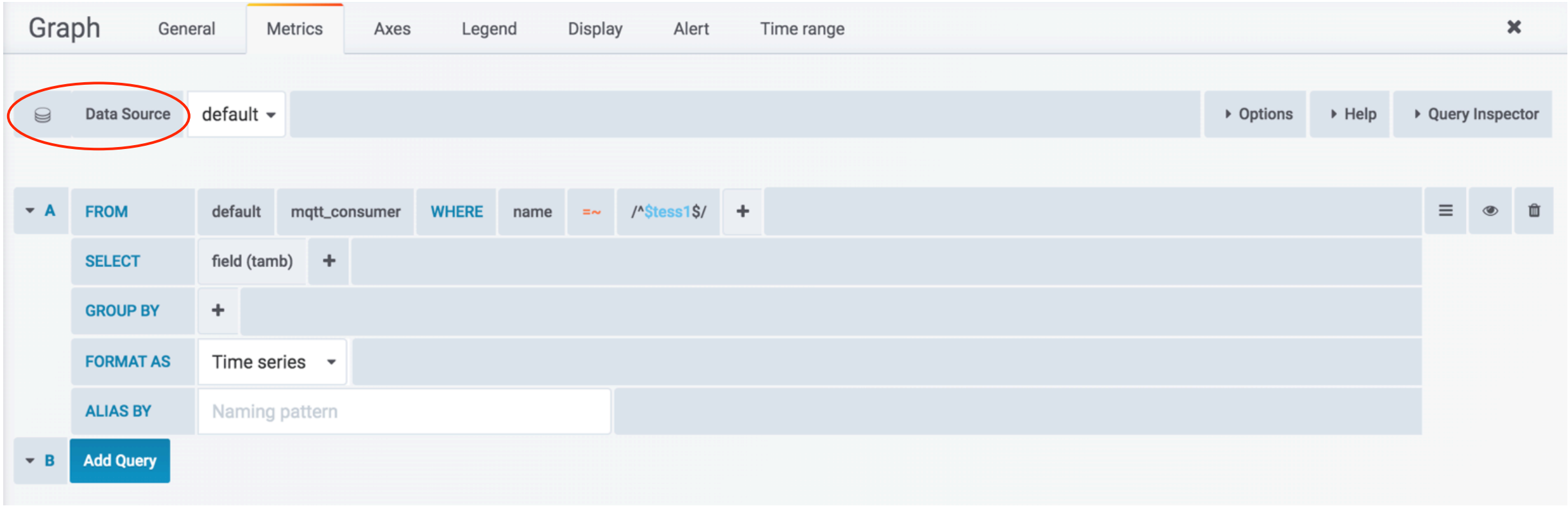
panel

time

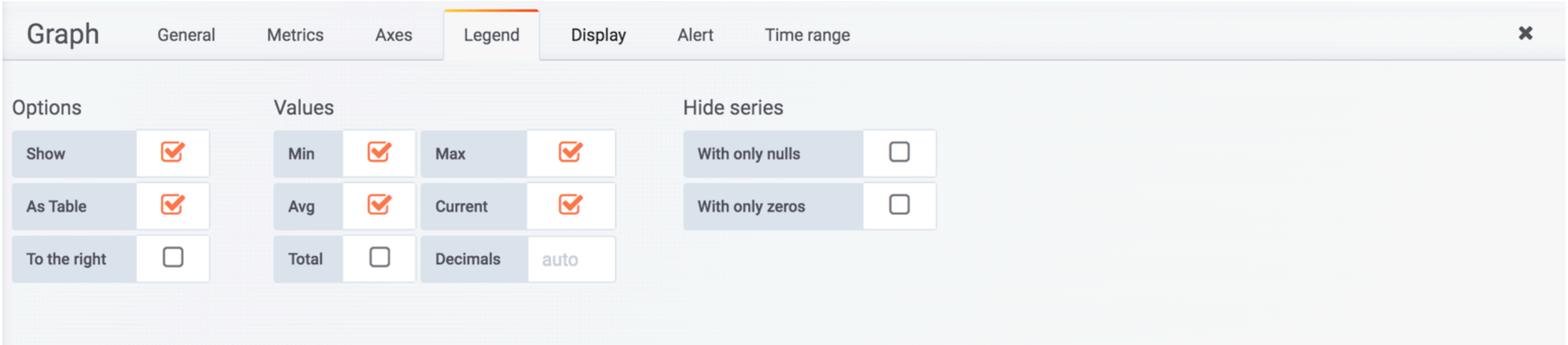
GENERAL INFORMATION



METRICS (DATA ACCESS)

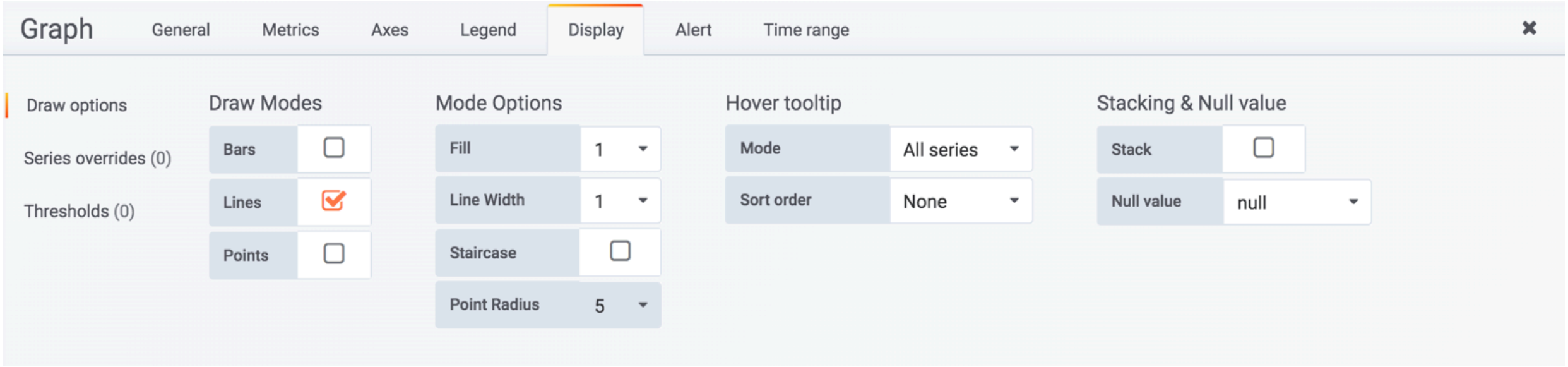


LEGEND

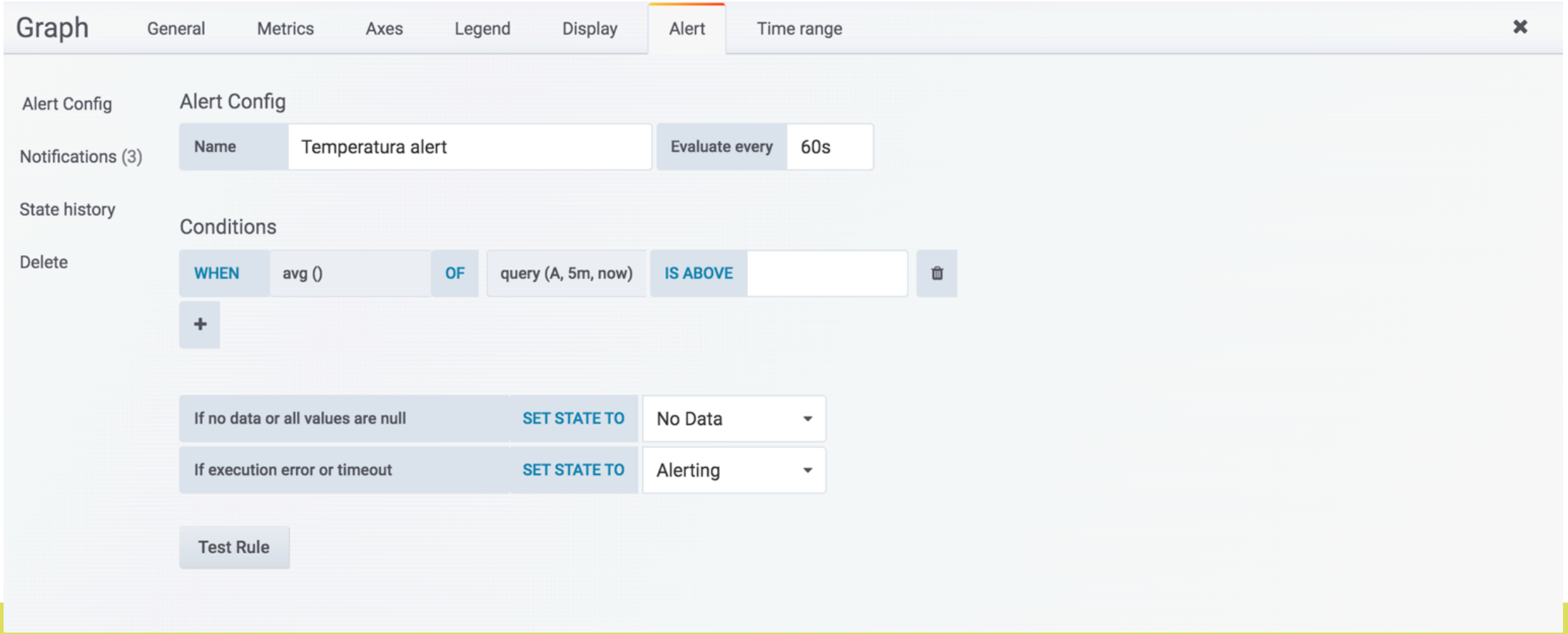

Graph
General
Metrics
Axes
Legend
Display
Alert
Time range
Options
Show
As Table
To the right
Values
Min
Max
Avg
Current
Total
Decimals
auto
Hide series
With only nulls
With only zeros

ACTION

VISUALIZATION



ALERT


Graph
General
Metrics
Axes
Legend
Display
Alert
Time range
Alert Config
Notifications (3)
State history
Delete
Alert Config
Name
Temperatura alert
Evaluate every
60s
Conditions
WHEN
avg ()
OF
query (A, 5m, now)
IS ABOVE
+
If no data or all values are null
SET STATE TO
No Data
If execution error or timeout
SET STATE TO
Alerting
Test Rule

In Grafana, view and data sources are decoupled. It means, the same panel can use multiple data sources and viceversa.

Plugins increment the diversity of panels and data sources used.

- WorldMap
- PieChart
- Clock
- Text
- Diagram
- FlowCharting

- Influxdb
- Mysql
- ElasticSearch
- PostgreSQL
- AzureMonitor
- Google Sheets

https://grafana.com/grafana/plugins

DEMO

https://dashboards.dataportal.actionproject.eu/

QUESTIONS?

ACTION

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