

Extending and Customizing PMM

Michael Coburn
Percona



Michael Coburn

- Product Manager for PMM (as well as for Percona Toolkit)
- At Percona for 6 years across multiple MySQL roles
 - *Principal Architect, Managing Consultant, Technical Account Manager*

What is PMM

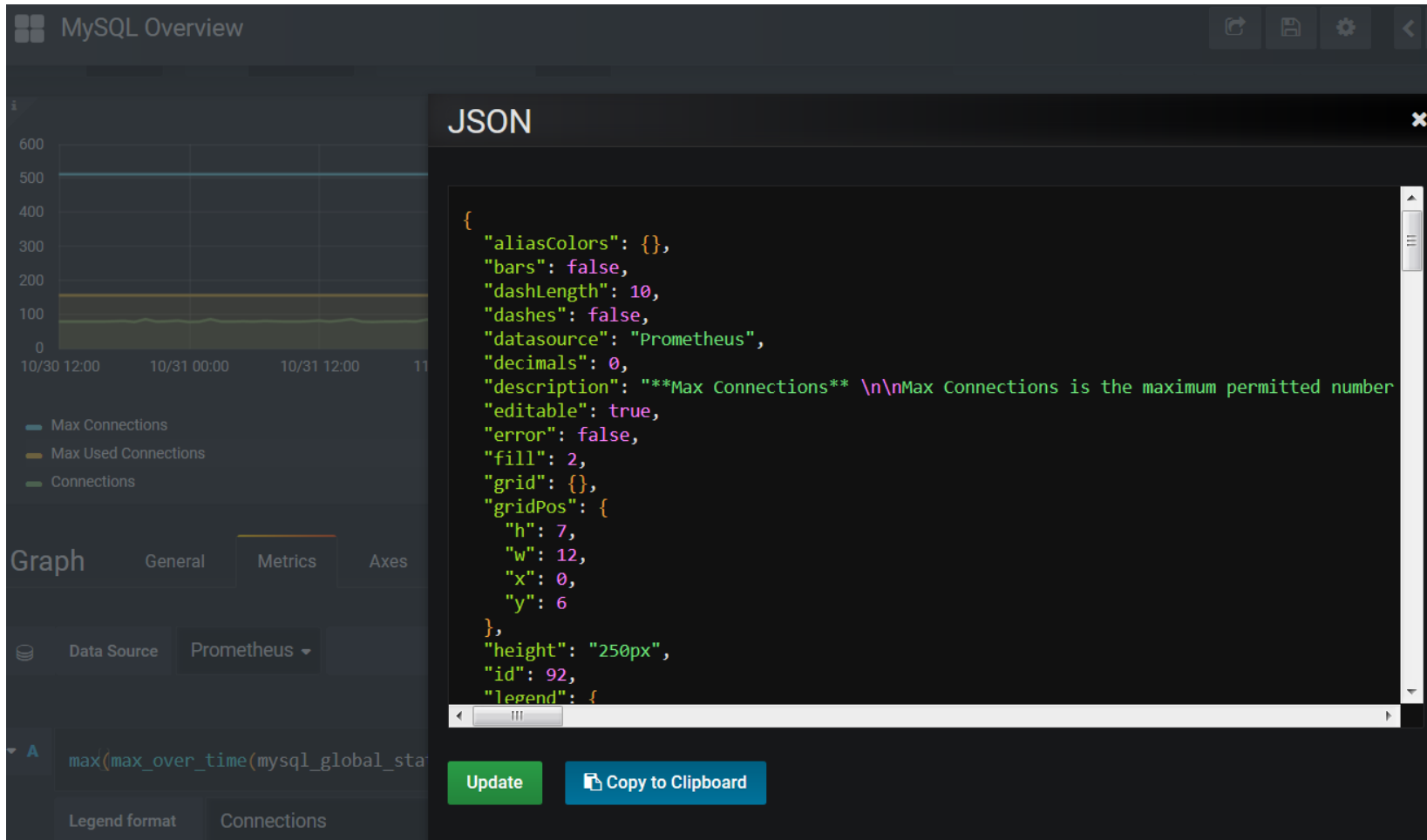
- Free, Open Source database troubleshooting and performance optimization platform for MySQL, MongoDB, and PostgreSQL
 - *We also support:*
 - ProxySQL
 - Amazon RDS MySQL & Aurora MySQL
 - Remote MySQL & PostgreSQL instances
- Runs in **your** secure environment (this is not a SaaS product!) and on **your** equipment
- Secured with SSL between client and server

Customizing Dashboards

Grafana in a Nutshell

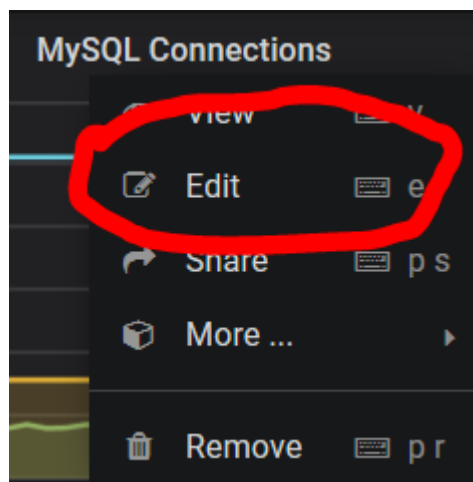
- Open Source data visualisation tool
- Dashboards are just JSON
- Popular datasources
 - *Prometheus*
 - *CloudWatch*
 - *Graphite*
 - *Elasticsearch*
- Templated Variables
 - *Define your graph metrics, and let the hosts get filled in automatically*
 - *GREAT for large, dynamic environments where hosts are considered ephemeral*

Dashboard Example - MySQL Overview

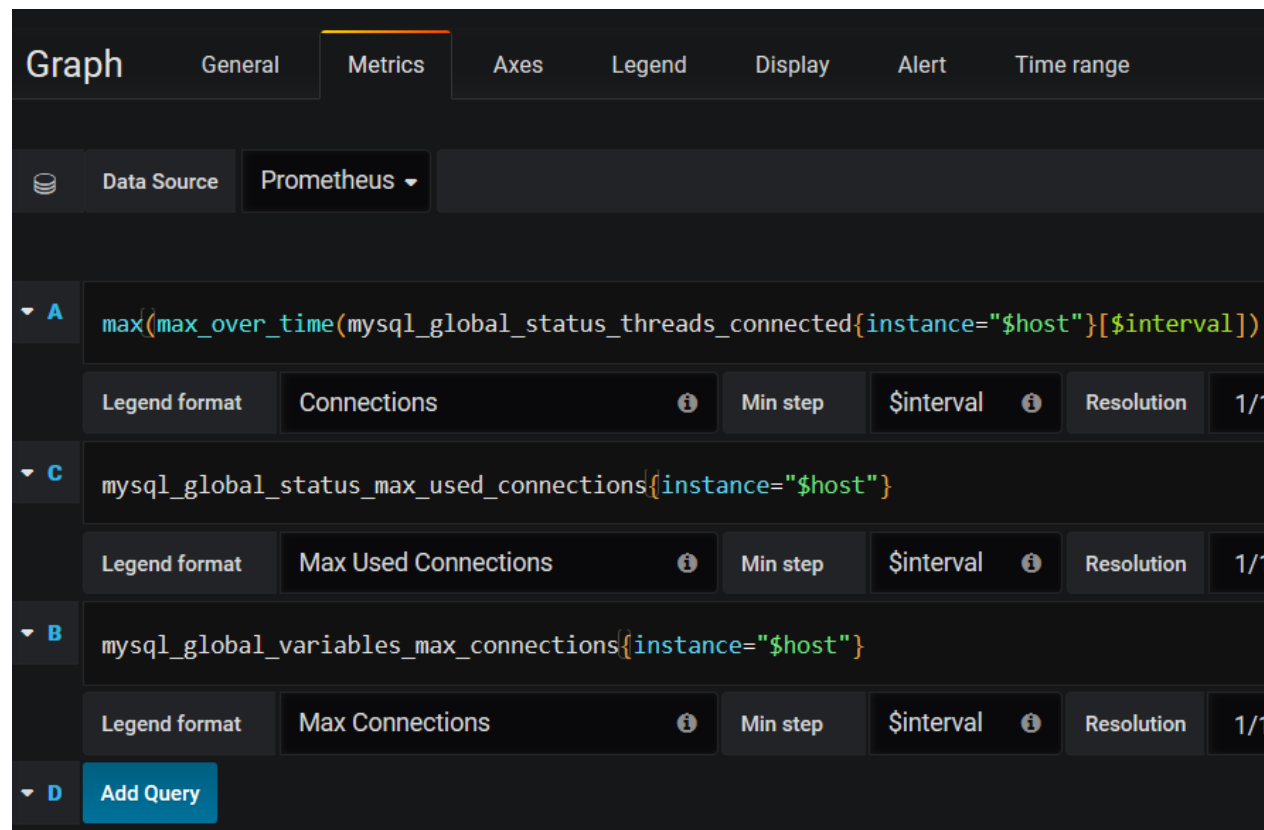


Editing a Dashboard

- Enter into Edit mode



- Review Metrics formulas & define graph characteristics



Collect Metrics from anywhere

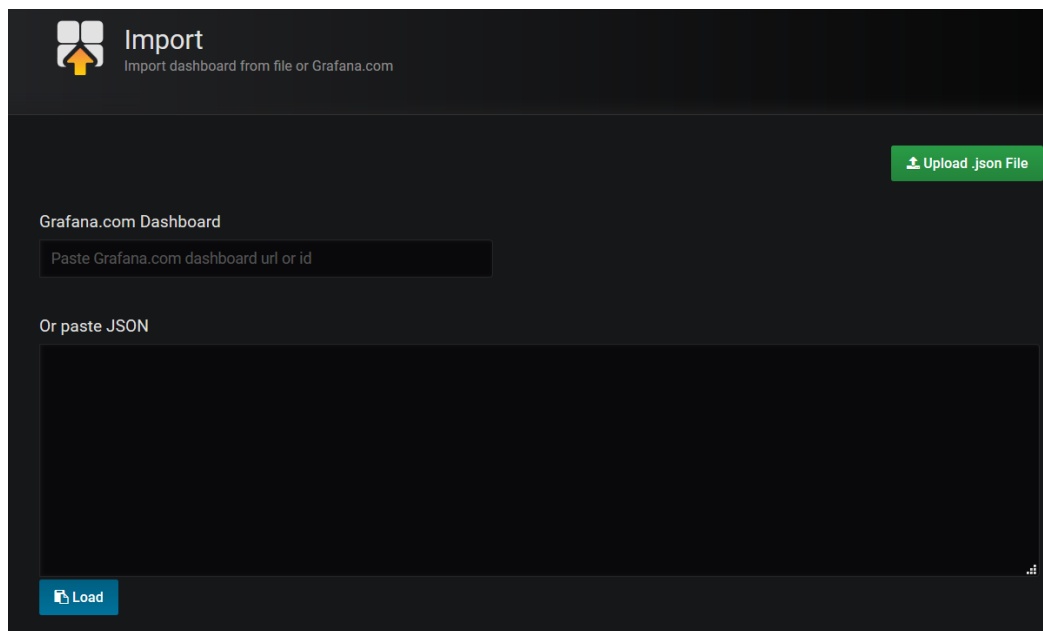
External Exporters

- Prometheus is a very active community, hundreds of exporters exist
- First configure an Exporter to run, then notify PMM to scrape the new Exporter
- `pmm-admin add external:service --service-port=9187 postgresql`



Adding Dashboards

- Create your own!
- Or use one from grafana.com/dashboards and edit as needed
 - *Datasource name (change to Prometheus)*
 - *Edit instance variables to match PMM variable names (i.e. \$host when most grafana.com Dashboards use \$instance)*



The image shows the 'Import' dashboard in Grafana. At the top, there's a header with the Grafana logo and the text 'Import' and 'Import dashboard from file or Grafana.com'. Below this, there's a green button labeled 'Upload .json File'. Underneath, there's a section titled 'Grafana.com Dashboard' with a text input field labeled 'Paste Grafana.com dashboard url or id'. Below that, there's a section titled 'Or paste JSON' with a large text area for pasting the dashboard JSON. At the bottom left, there's a blue button labeled 'Load'.

Custom Queries

Available for MySQL and PostgreSQL

Custom Queries

- MySQL and PostgreSQL support the concept of Custom Queries - run SELECT statements in order to create Prometheus metric series that you can then plot on a graph
- Configuration is enabled by default and executed by the Exporter
- Runs every 60 seconds

Users table - MySQL view

```
SELECT * FROM `users`
```

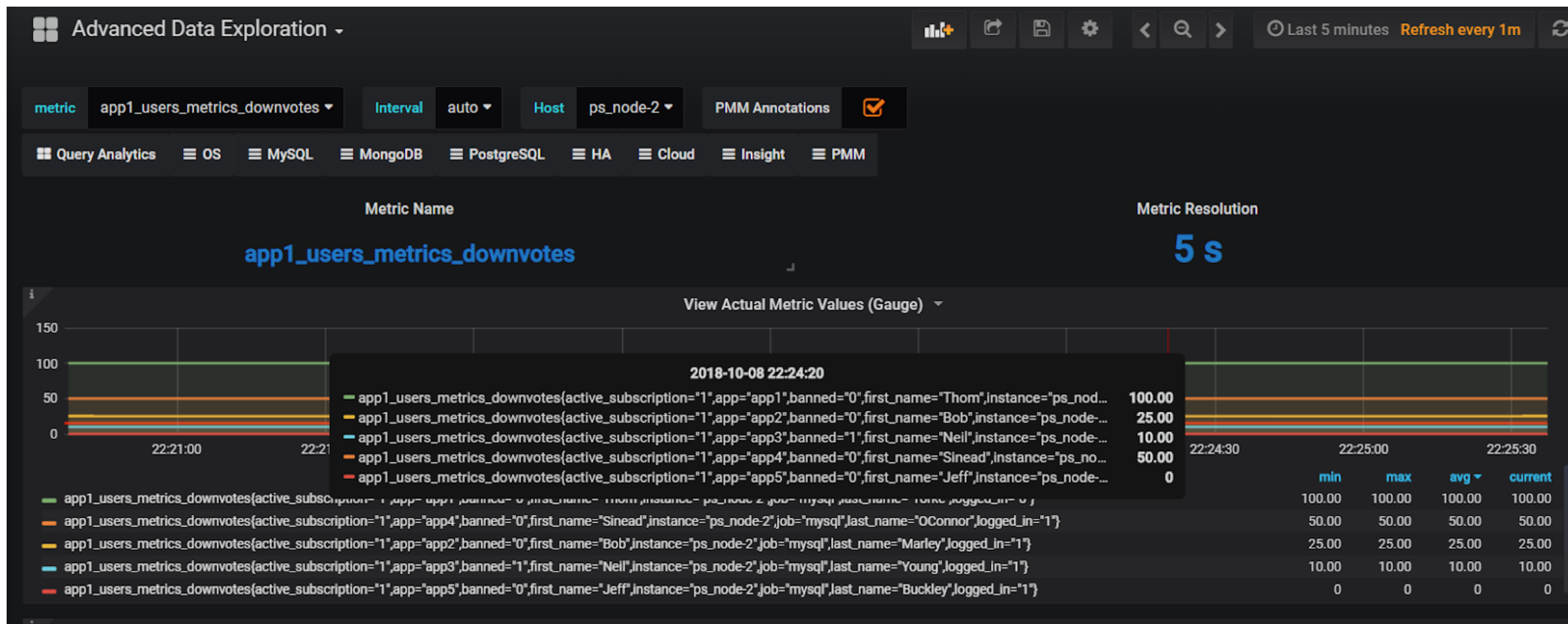
id	app	user_type	last_name	first_name	logged_in	active_subscription	banned	upvotes	downvotes
1	app2	unprivileged	Marley	Bob	1	1	0	100	25
2	app3	moderator	Young	Neil	1	1	1	150	10
3	app4	unprivileged	OConnor	Sinead	1	1	0	25	50
4	app1	unprivileged	Yorke	Thom	0	1	0	100	100
5	app5	admin	Buckley	Jeff	1	1	0	175	0

Users table - queries-mysqld.yml

- Configuration is stored in `/usr/local/pmm-client/`

```
---
app1_users_metrics:
  query: "SELECT app,first_name,last_name,logged_in,active_subscription,banned,upvotes,downvotes FROM app1.users"
  metrics:
    - app:
        usage: "LABEL"
        description: "Name of the Application"
    - user_type:
        usage: "LABEL"
        description: "User's privilege level within the Application"
    - first_name:
        usage: "LABEL"
        description: "User's First Name"
    - last_name:
        usage: "LABEL"
        description: "User's Last Name"
    - logged_in:
        usage: "LABEL"
        description: "User's logged in or out status"
    - active_subscription:
        usage: "LABEL"
        description: "Whether User has an active subscription or not"
    - banned:
        usage: "LABEL"
        description: "Whether user is banned or not"
    - upvotes:
        usage: "COUNTER"
        description: "Count of upvotes the User has earned. Upvotes once granted cannot be revoked, so the number can only increase as more upvotes are granted"
    - downvotes:
        usage: "GAUGE"
        description: "Count of downvotes the User has earned. Downvotes can be revoked so the number can increase as more downvotes are granted or decrease as downvotes are revoked"
  ...
```

Users table - Advanced Data Exploration



Customizing Exporter Options

Exporter Options

- Exporters have multiple collectors - specific code to collect specific metrics from the service being monitored
- Percona balances maximum data collection with minimum impact on the observed system
- This leads to some Exporter collectors being disabled

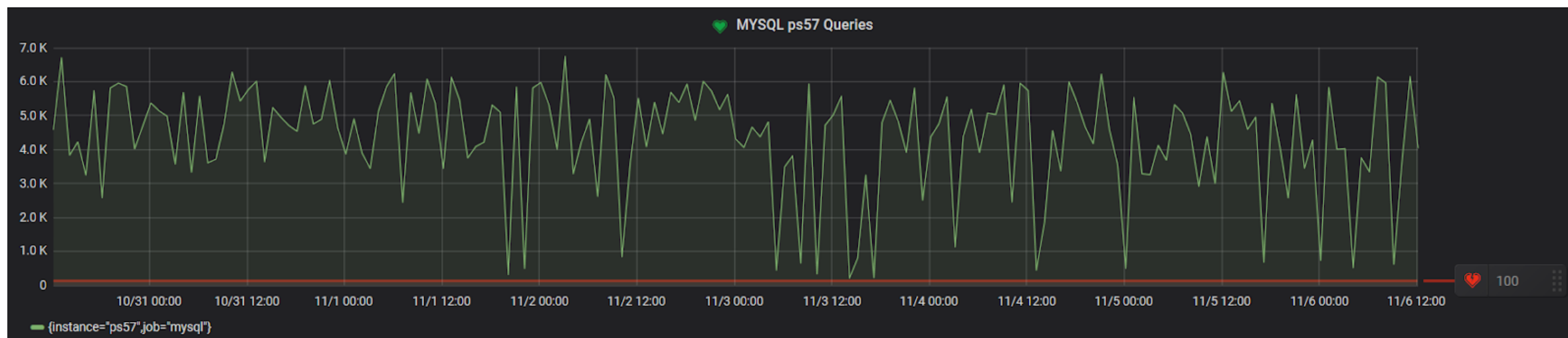
node_exporter Example

- 48 total collectors: 32 are enabled by default, 16 disabled
- We want to enable monitoring of NTP
 - *pmm-admin remove linux:metrics*
 - *pmm-admin add linux:metrics -- --collectors.enabled=...,ntp*
 - *ps aux | grep node_exporter*

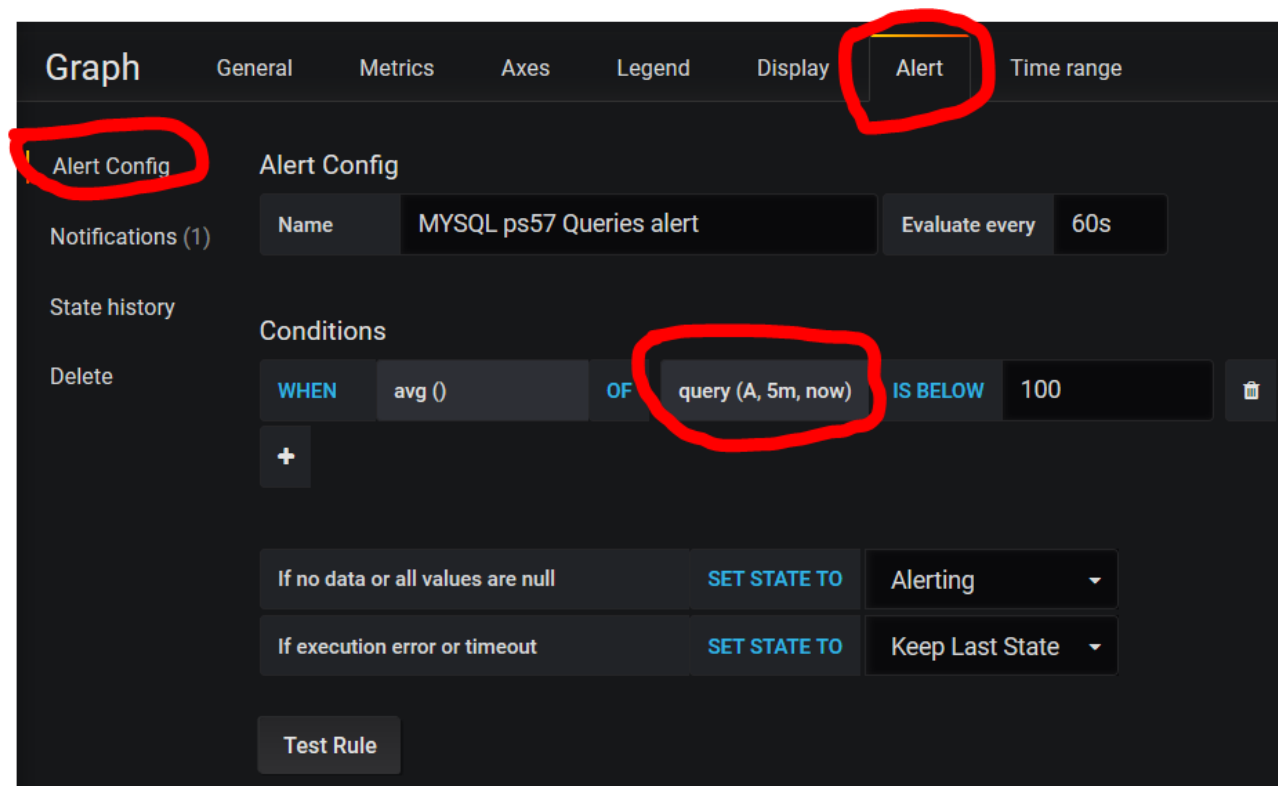
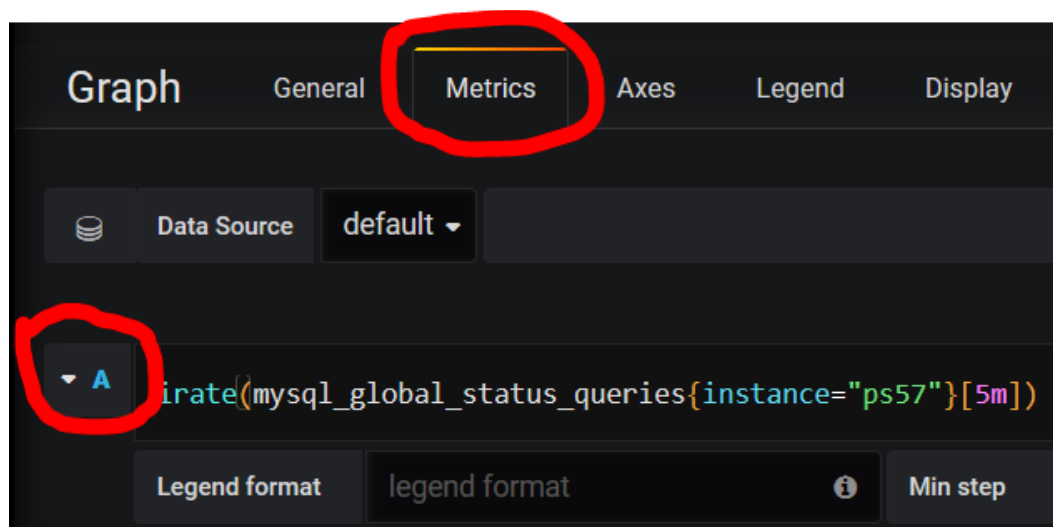
Using Grafana Alerting

Grafana Alerting

- Rules are added to graphs that react based on defined thresholds
- Alerts are sent to pre-defined Notification Channels
 - *You can have multiple channels defined*

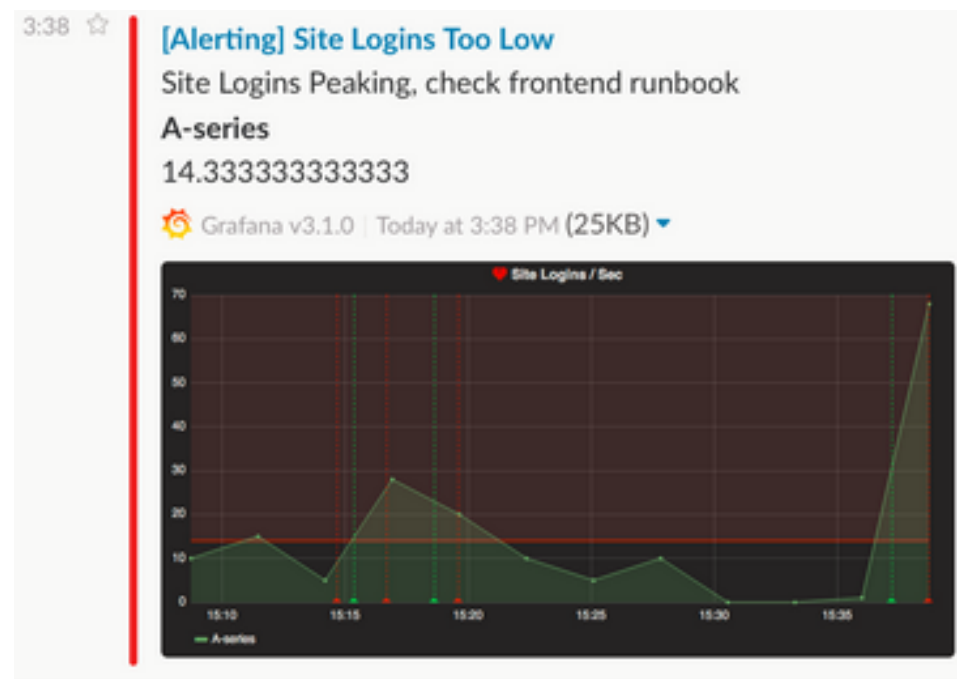


Grafana Alerting



Grafana Notification Channels

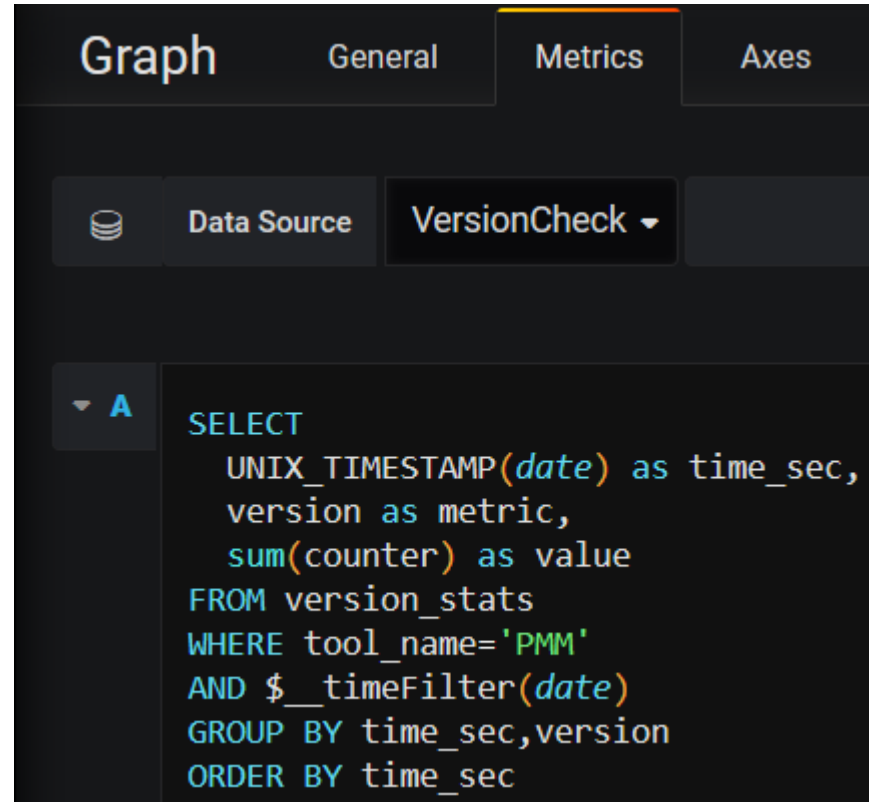
- Defines how you will learn about new alerts
- Over a dozen are available:
 - *Email*
 - *Slack*
 - *PagerDuty*
 - *AlertManager*
 - ...



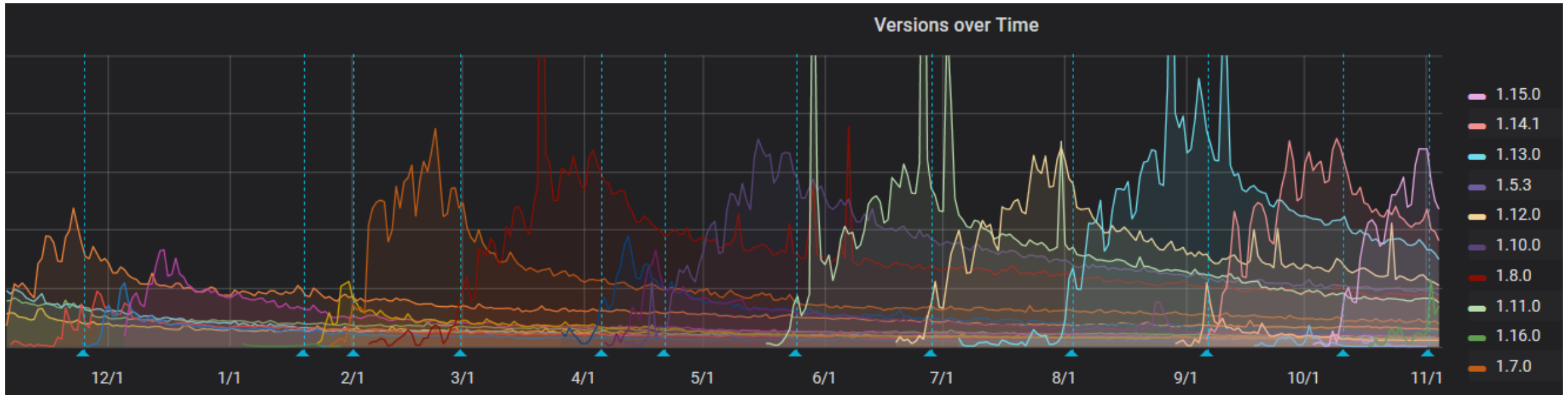
Using MySQL Data Source

MySQL Data Source

- Grafana feature which PMM inherits from upstream
- Results of a SELECT statement can draw graphs
- Our example is using Percona Production data



PMM Versions over Time



Do's and Don't's

PMM Best Practices

- Grafana Alerting works great for < 50 instances
 - *Over that it becomes prohibitive to manage the variable -> string mappings*
- Don't edit Percona-provided Dashboards - your changes will be overwritten at next upgrade!
 - *Instead copy the dashboard and edit your copy, and it will survive upgrades*
- Send us your ideas, and even better, your Dashboards
 - *Percona loves Pull Requests! Your changes can make it into a future release*
- Participate in the percona.com/forums !