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Grafana, Helm and automatically generated and maintained dashboards

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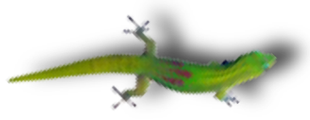
Timeline

- Introduction
- Configuration and Datasources
- Functionality
- Future Prospects
- Demonstration



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Introduction

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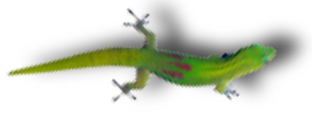
Preview Version

- Github-Link:

  https://github.com/pkremser/cmdbToGrafana

- Final release in october



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The problem

- Customers want to see their network workload
- Can‘t give them OpenNMS rights
- Manually maintain hosted Grafana dashboards

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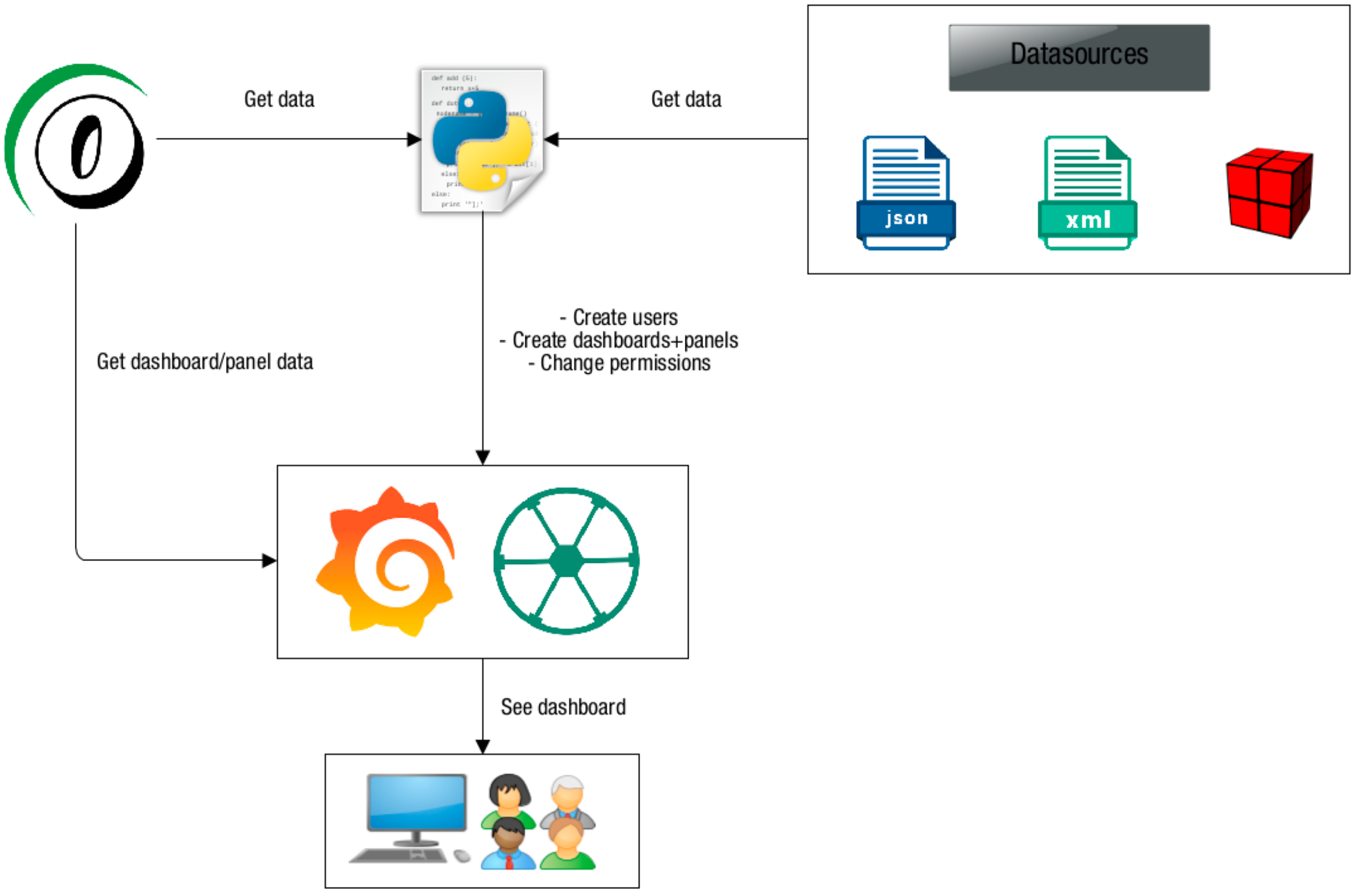
The Idea

- Grafana with OpenNMS Helm
- Python script
- Data from multiple datasources
- Generate dashboards from datasource information

The concept



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The solution

- Config for CMDB, Grafana and OpenNMS connection
- Templates for dashboard and panels
- Templates for XML and JSON
- The Script for datacollection, converting and dashboard creation

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Configuration and Datasources

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Configuration (CMDB)

- [CMDB]
- **user:** USERNAME
- **password:** PASSWORD
- **base_url**: REST-DATASOURCE.com
- **object_url_part**: /REST/OBJECTS
- **login_url_part**: /REST/USERINFORMATION
- **object_name**: OpenNMS-REQUISITION-NAME:
- **protocol**: http or https

Configuration (CMDB)

- [CMDB]
- user: Patrick
- password: BestPasswordAvailable
- base_url: cmdb.mycompany.com
- object_url_part: /rest.php/objectlist/by-objecttype/Customer-Routers
- login_url_part: /rest.php/objectlist/by-objecttype/Customers-Grafana
- object_name: cmdb-cust-routers:
- protocol: https

Configuration (OpenNMS)

- [OpenNMS]
- **user:** USERNAME
- **password:** PASSWORD
- **base_url:** OpenNMS-COMPANYNAME.com
- **path_to_send_event:** /opt/opennms/bin/
- **protocol:** http or https

Configuration (OpenNMS)

- [OpenNMS]
- user: Patrick
- password: BestPasswordAvailable
- base_url: MyOpenNMS.com
- path_to_send_event: /opt/opennms/bin/
- protocol: https

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Configuration (Grafana)

- [Grafana]
- **user:** USERNAME
- **password:** PASSWORD
- **url:** GRAFANA_URL
- **datasource:** OPENNMS_DATASOURCE_NAME
- **protocol:** http or https

Configuration (Grafana)

- [Grafana]
- user: Patrick
- password: BestPasswordAvailable
- url: localhost
- datasource: OpenNMS_Performance
- protocol: https

Configuration (templates)

- Create your own dashboard and panel templates
- Change them for use with the script
- Change the name in config

- [DashboardTemplates]
- dashboard: router_dashboard_template.json
- panel: router_panel_template.json

Datasources

- 3 possible datasources
  - CMDB
  - XML
  - JSON
- Example files for **XML** and **JSON**
- Datasource selectable from command line

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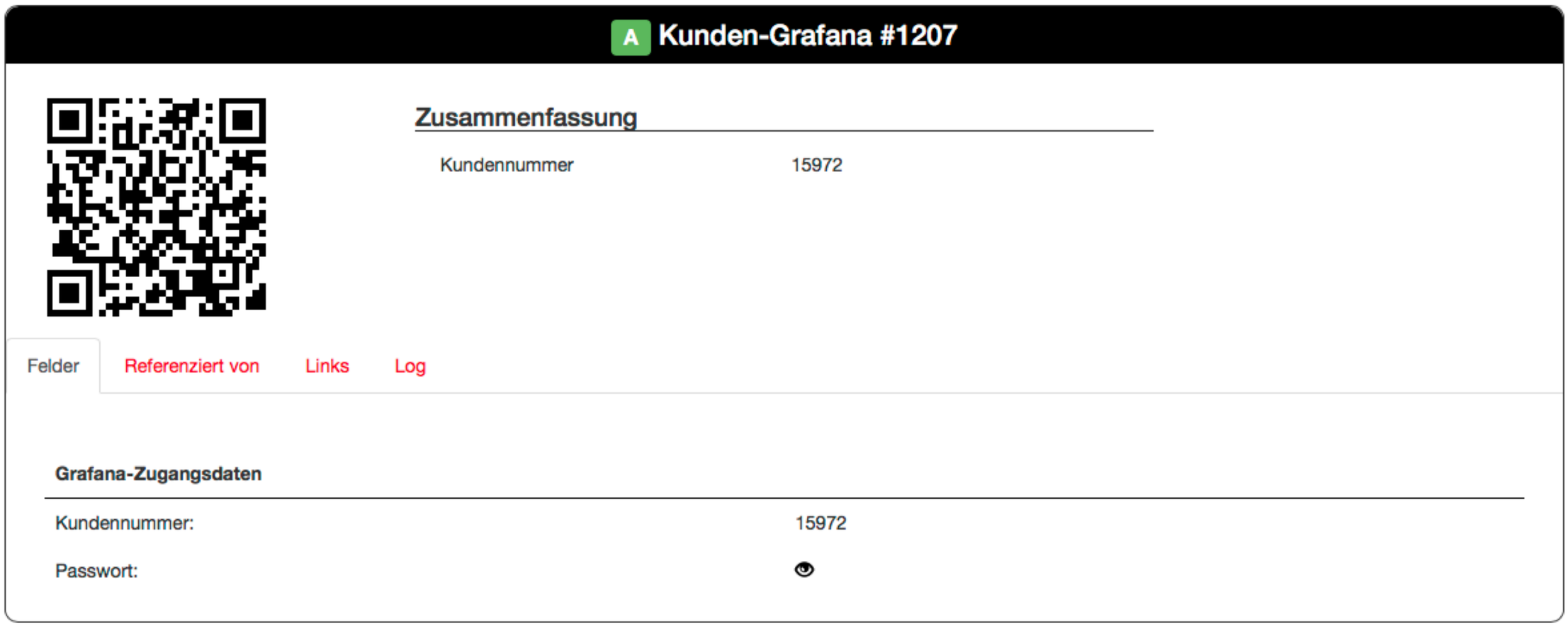
Datasources (CMDB)

- Grafana user password object



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Datasources (CMDB)

- Grafana object configuration
- Check for active, Monitoring active and correct ID
- Optional: IP-Address in panel header

Objektstatus

active ☑

Kunde

Kundennummer: 15972

Kundenname: Kunde 15972

Ansprechpartner:

Management

Management IP: IP-ADDRESS

Hostname: HOSTNAME

Monitoring: ☑

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Datasources (CMDB)

- Optional: Location for Panels

Standort

Bezeichnung:	
Strasse:	Bahnhofstraße
Hausnummer:	16
PLZ:	36037
Ort:	Fulda

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Datasources (CMDB)

- WAN-Interface like in OpenNMS shown
- Customized for use in Grafana

Kundenportal

active: ☑

WAN-Interface: Et0

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Datasources (XML)

- Objects grouped for each user id
- Information from OpenNMS node needed

```
<dashboard-hardware>
    <user_id id="" password="">
        <object>
                <parameter key="location" value="Network-Connection: LOCATION  || IP: 127.0.0.1" />
                <parameter key="nodeid" value="REQUISITION_NAME:OPENNMS_FOREIGEN_ID" />
                <parameter key="interface" value="OPENNMS_SNMP_INTERFACE" />
        </object>
    </user_id>
</dashboard-hardware>
```

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Datasources (JSON)

- Like in XML

```
[
  {
    "id": "",
    "password": "",
    "object": [
    {
      "parameter":
      {
        "location": "Network-Connection: LOCATION || IP: 127.0.0.1",
        "nodeid": "REQUISITION_NAME:OPENNMS_FOREIGEN_ID",
        "interface": "OPENNMS_SNMP_INTERFACE"
      }
    }
    ]
  }
]
```

Functionality

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Structure (I)

- __main__.py
  - Checks for datasource
  - Excutes all main functions
- config.py
  - Configparser
- opennms_event.py
  - Generates OpenNMS event

Structure (II)

- cmdb.py
  - Gathers all information from CMDB
- opennms_functions.py
  - Gathers information from OpenNMS
- information_converter.py
  - Converts datasource information to usable structure

Structure (III)

- grafana_dashboard.py
  - Creates dashboards from templates and gathered information
- grafana_functions.py
  - Create/delete users and delete dashboards
  - Change permissions

Executing

- **Shellcommand:** python3 –m grafana_script DATASOURCE
- Add cronjob for timed executions

```
root@grafana:~/cmdbToGrafana# python3 -m grafana_script cmdb

* Information collected and converted from cmdb
* Old users deleted
* New users created
* Old dashboards deleted
* New dashboards created
* User information collected
* Dashboard information collected
* Permissions updated
-----------------------------------------------
* All Done !!!
```

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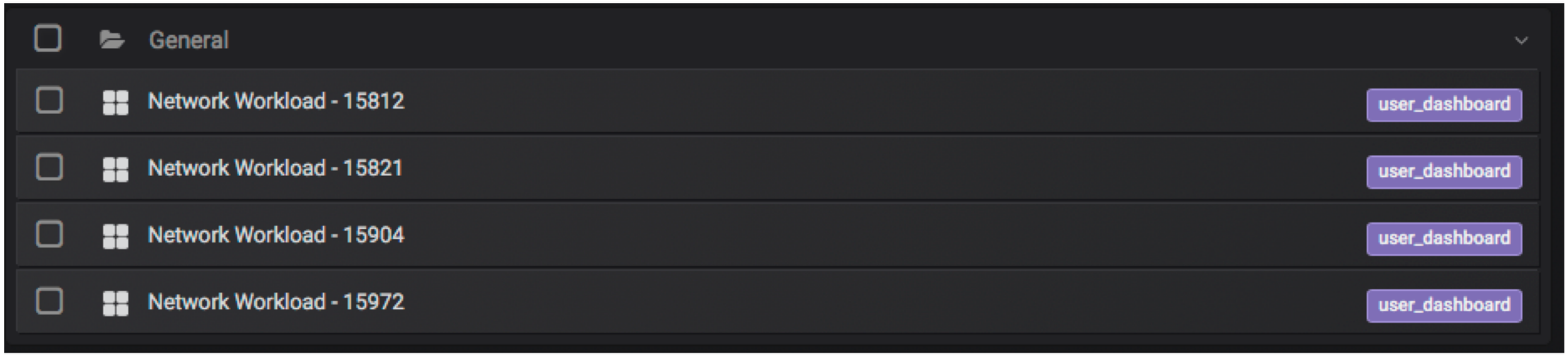
Dashboards (Admin)

- Every dashboard
- Every user



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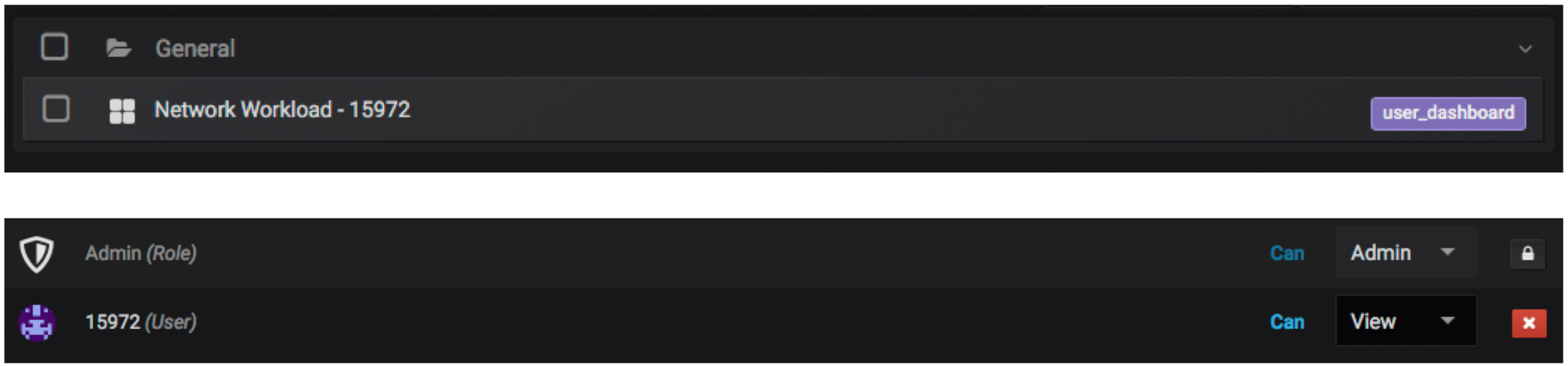
Dashboards (User)

- Only own dashboard
- Can‘t see other users



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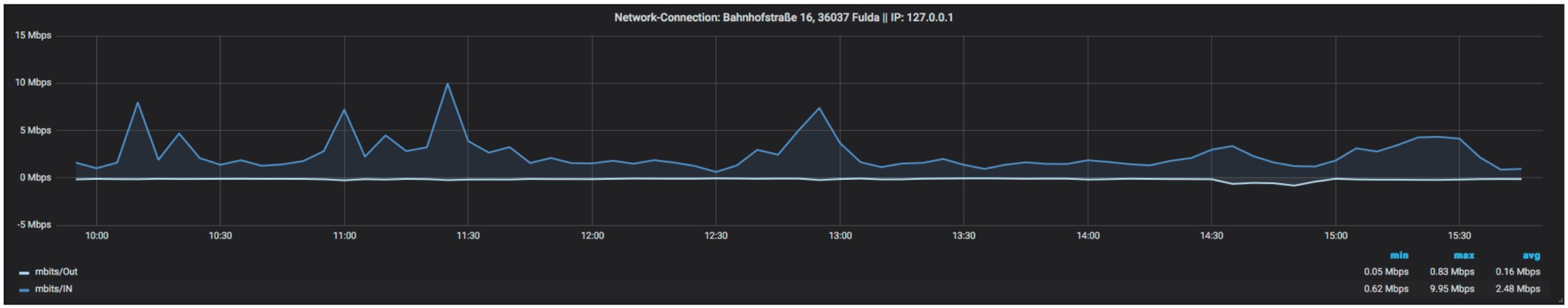
Dashboards (User)

- Dashboard not editable (security)
- No access via URL to other dashboards
- No Information via rest



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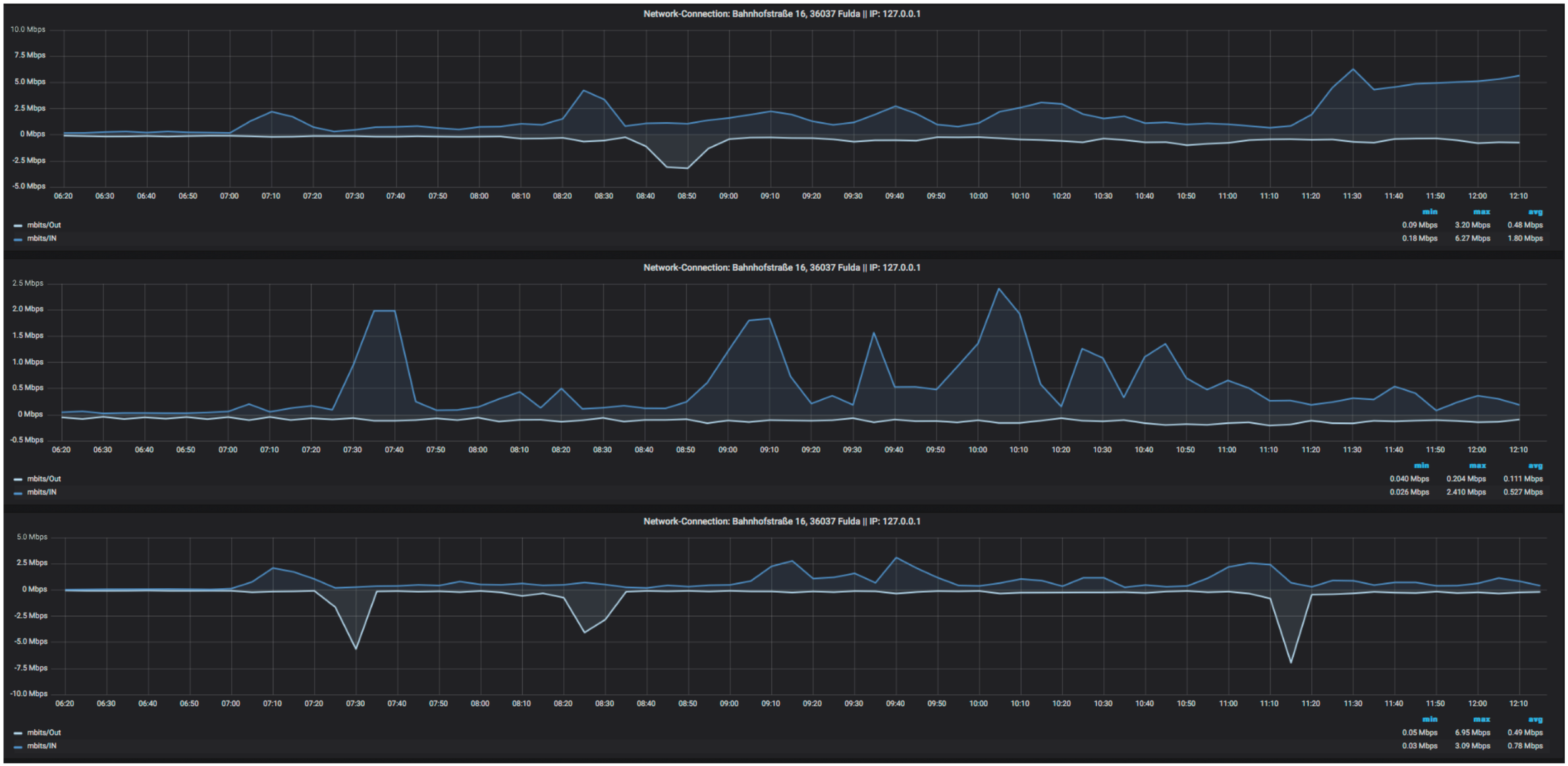
Dashboards (User)



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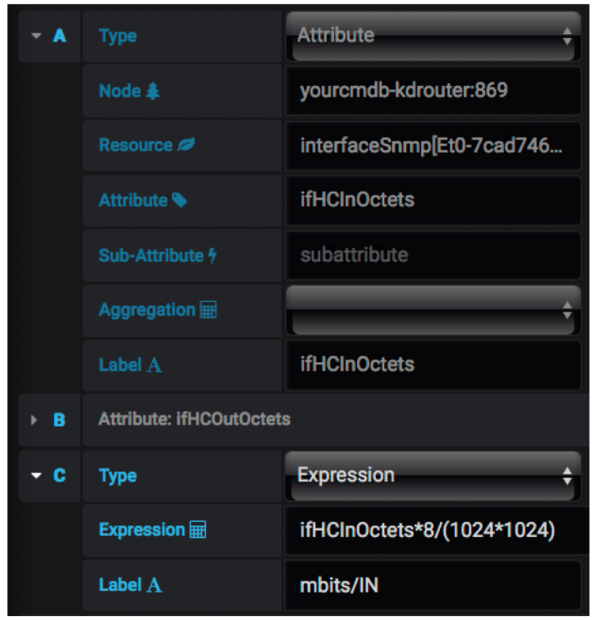
Panel (Metrics)

- Node and Resource from OpenNMS
- Octets into Mbits



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Future Prospects

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To-do-list

- More generated OpenNMS-Alarms
- Error handling
- Code compress

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Possibilities

- Other SNMP Objects (Switches, Server, etc ...)
- Multi dashboards (for each category) /with multi Interfaces
- Template-Generater-Tool
- A line for the max. Bandwidth
- A XML/JSON-Generator

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Conclusion

- No security issues
- Easy to configure
- Expandable
- Saves a lot of time

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Demonstration

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Questions and Answers

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