Checkmk Conference #11

From discovery to integration: elevate your monitoring

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Who is ITeratio GmbH?

- Founded in 2001 by Rolf Assenmacher and Hardy Düttmann (#CMKConf9: Monitoring of Very Large Network Infrastructures)
- Core competence is Network and System Management
- Checkmk (2012) Partner since 2014
- Award-winning Checkmk Gold Partner

About Me

- Working for ITeratio since 2017
- Scientist in particle physics before that

Who is Kabelplus?

- Founded in 1978 as cable TV operator, First internet customer in 1997
- Implementation of Checkmk began in summer 2023
- Go-live in January 2024

kabelplus

About Me

- Working at Kabelplus since 2003
- 10+ years experience with Checkmk

Kabelplus Facts

130k+

TV customers

123k+

Internet Customers

~300 Gbit

Internet Traffic

Kabelplus Checkmk Environment

4

sites

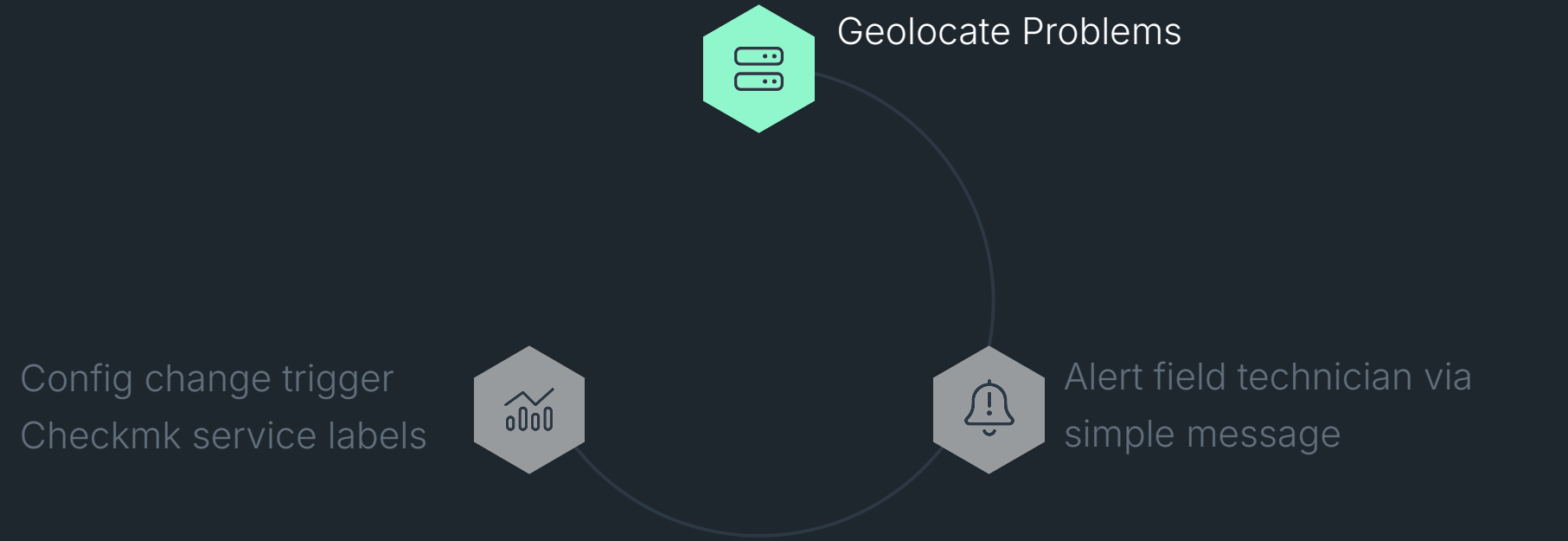
4,200+

hosts

100k+

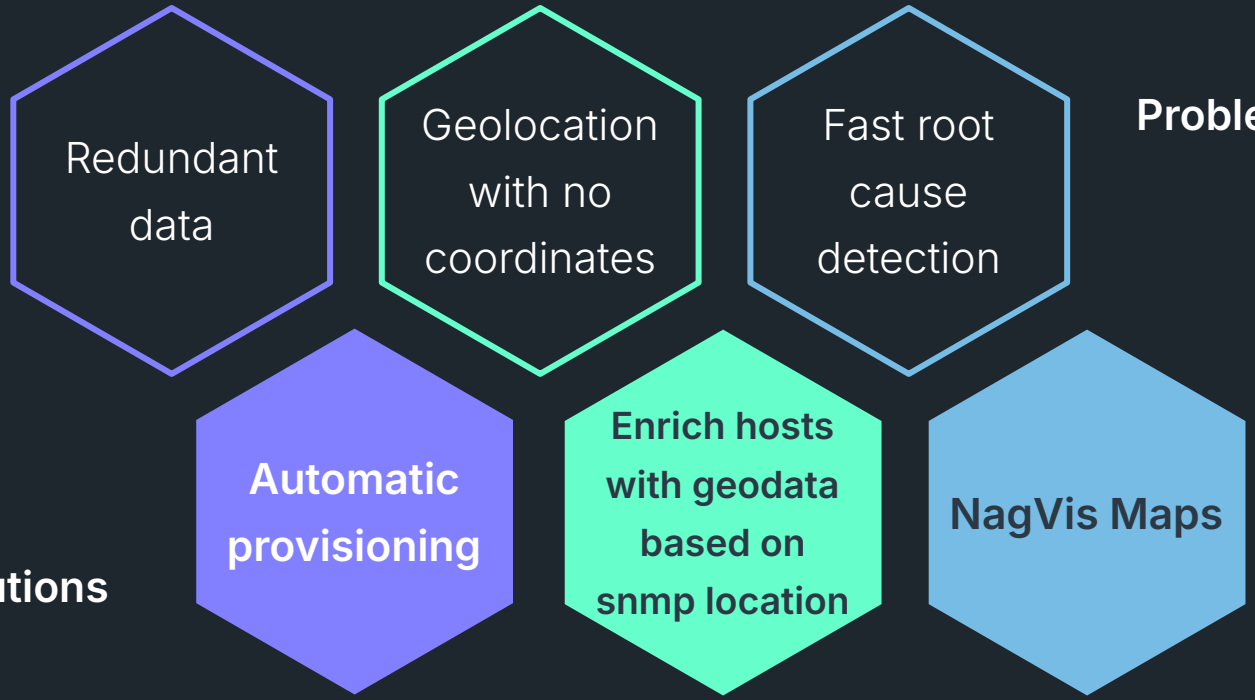
services

Problems we are trying to solve



Locate Problems?

How to get all the hosts

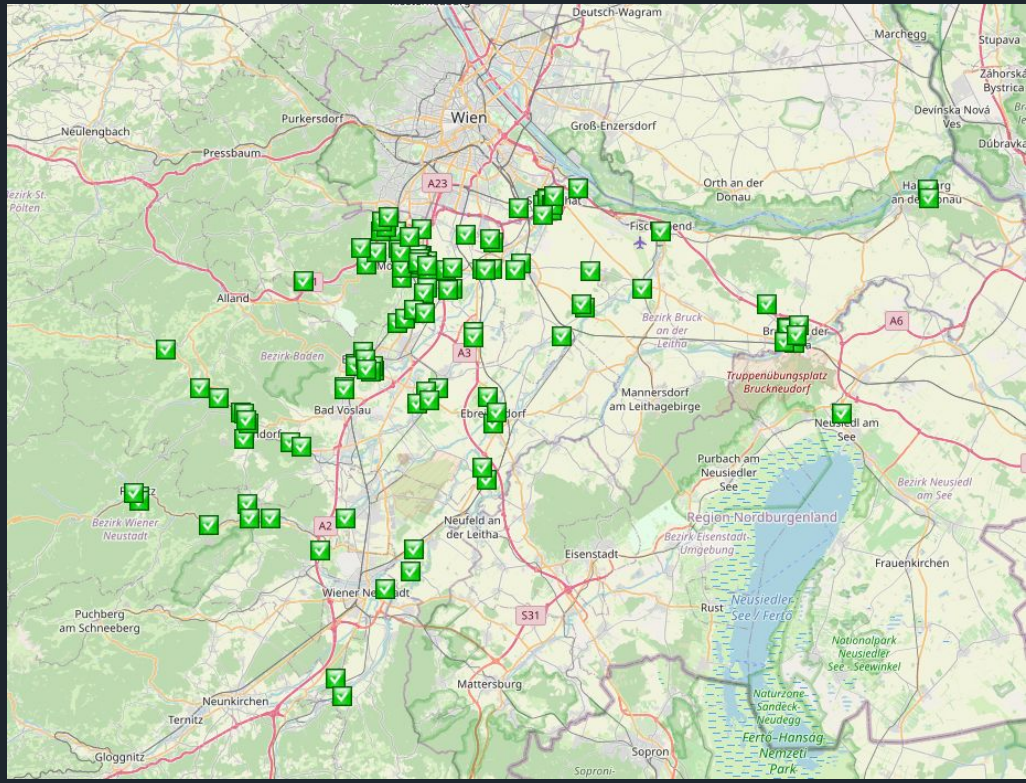


Automatic Provisioning

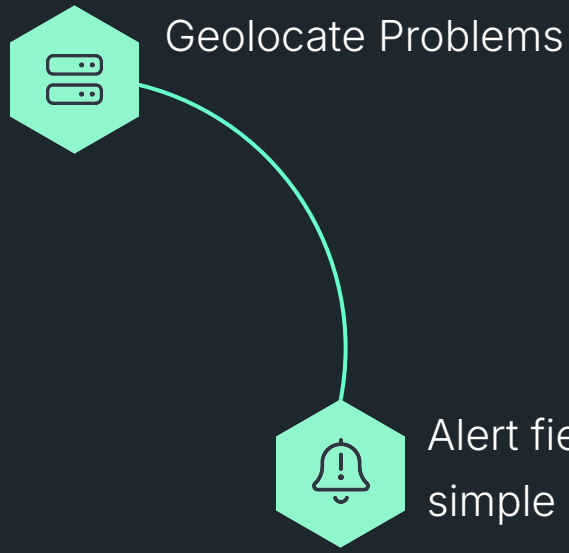
1. Provisioning via api from phpIPAM
2. Depending on device type, enrichment of host data via SNMP and phpIPAM
   - Classification of devices based on SNMP (switch type etc.)
   - Addresses, coordinates as Custom Host Attributes
   - Addresses are converted to geo coordinates via Google Maps API
3. Each team receives information about incorrectly set attributes from phpIPAM

Automatic Provisioning

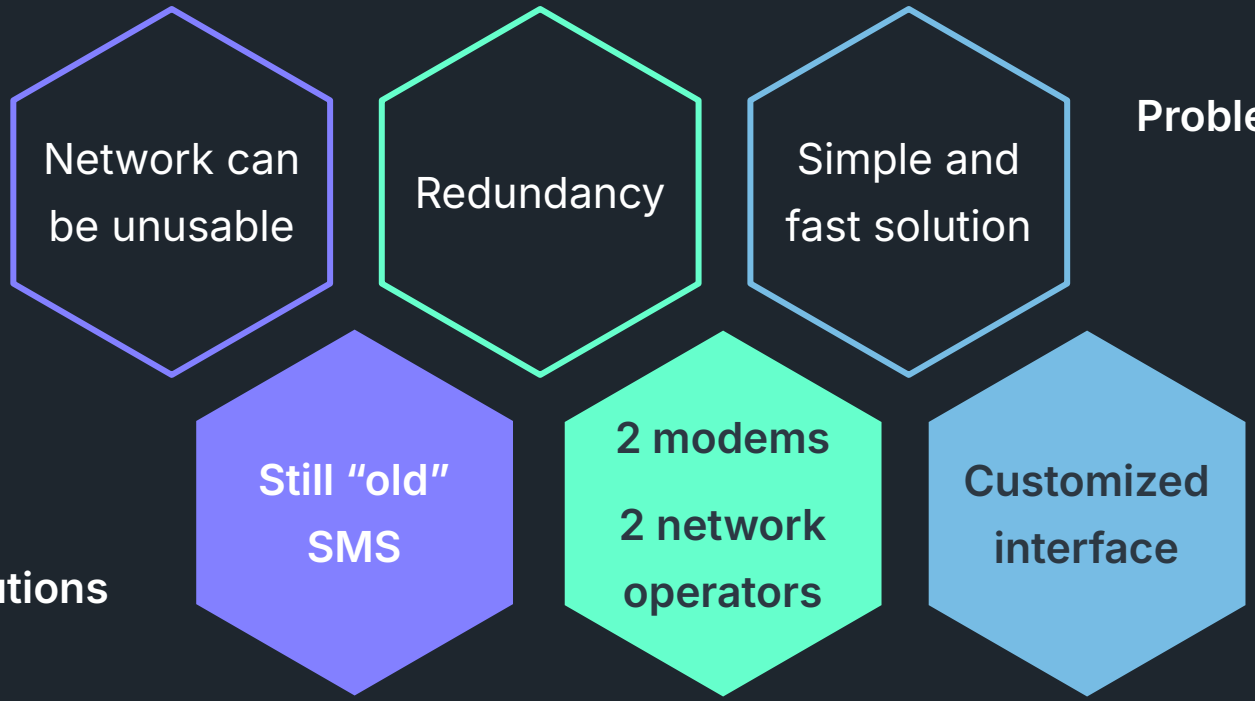
- All Hosts with locations are also provisioned into NagVis.
  - NagVis Worldmap → automatic Sqlite
  - very accurate representation on the map
- Host groups to display the different types.
- Helpful for root cause analyses
- Update of addresses via HW/SW inventory data



Problems we are trying to solve



Notification problems and solutions



SMS Alerting

Hardware

HWg-SMS-GW3
SMS modems

Notification

Develop notification plugin in order to work with API of modem and redundancy

Monitor

Check status and parameters of modems and alarm if necessary

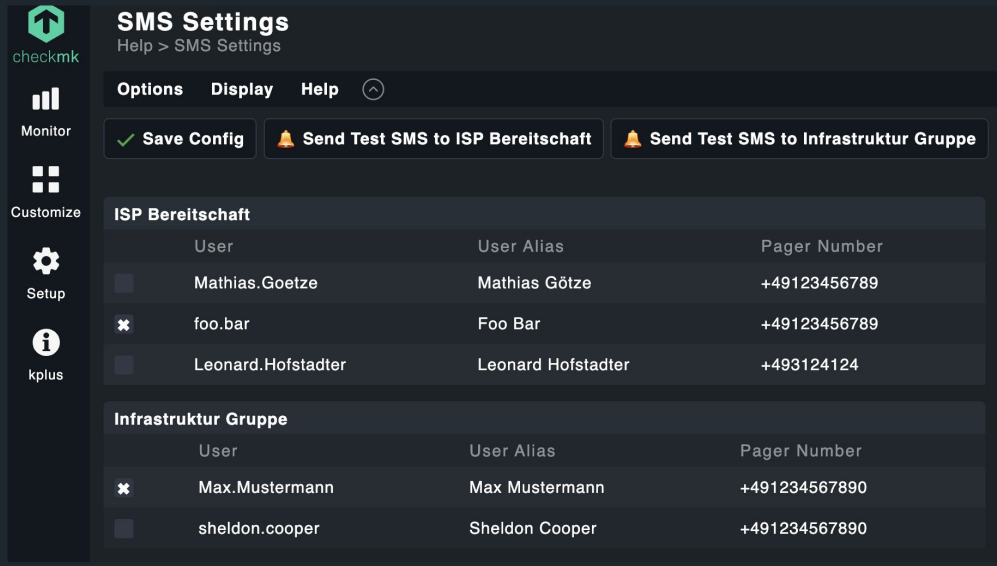
Configuration

Next step to configure who is in charge, the easy way

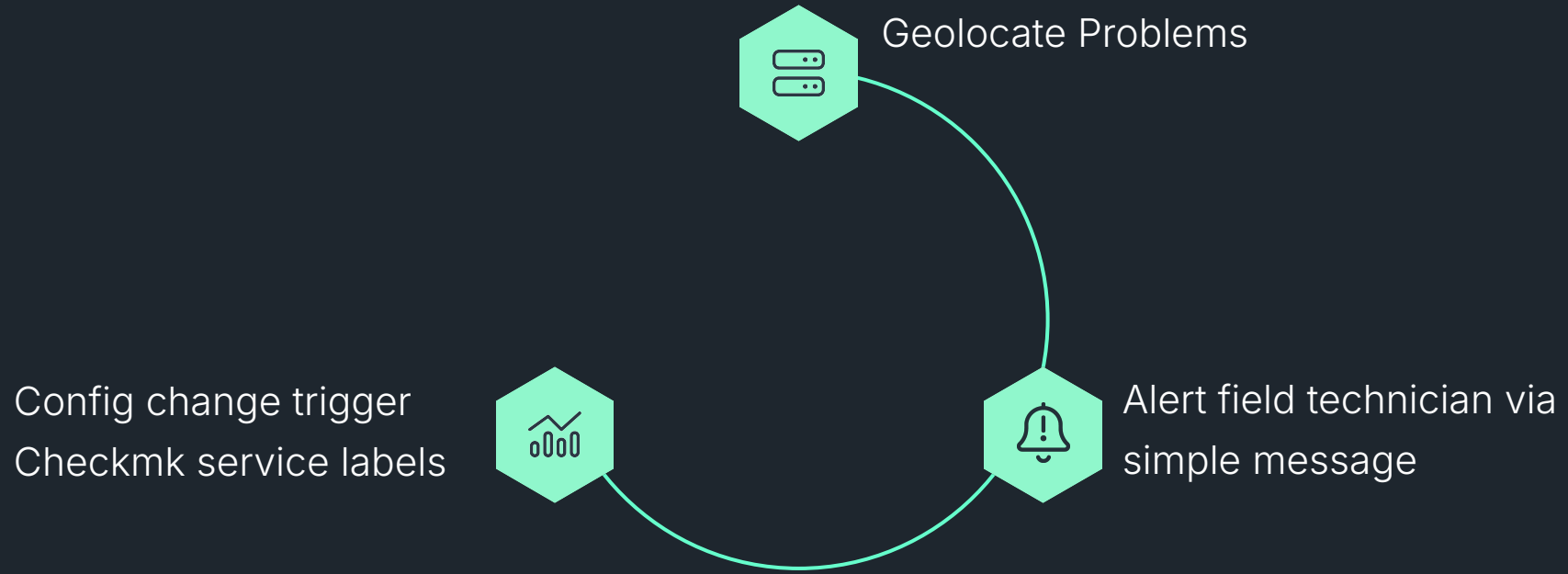
Extension to Notification Rules

Build your own configuration Website within Checkmk

- Dynamically reads config
- Extend Notification Plugin to work with Config file & distribute settings via scp
- Checks marked users
- “Send test” doing a Fake Check Result
- Regular SMS via cron job
- Support Checkmk 2.3/2.4 version
- Maybe extend GUI a little more (automatic refresh etc.)

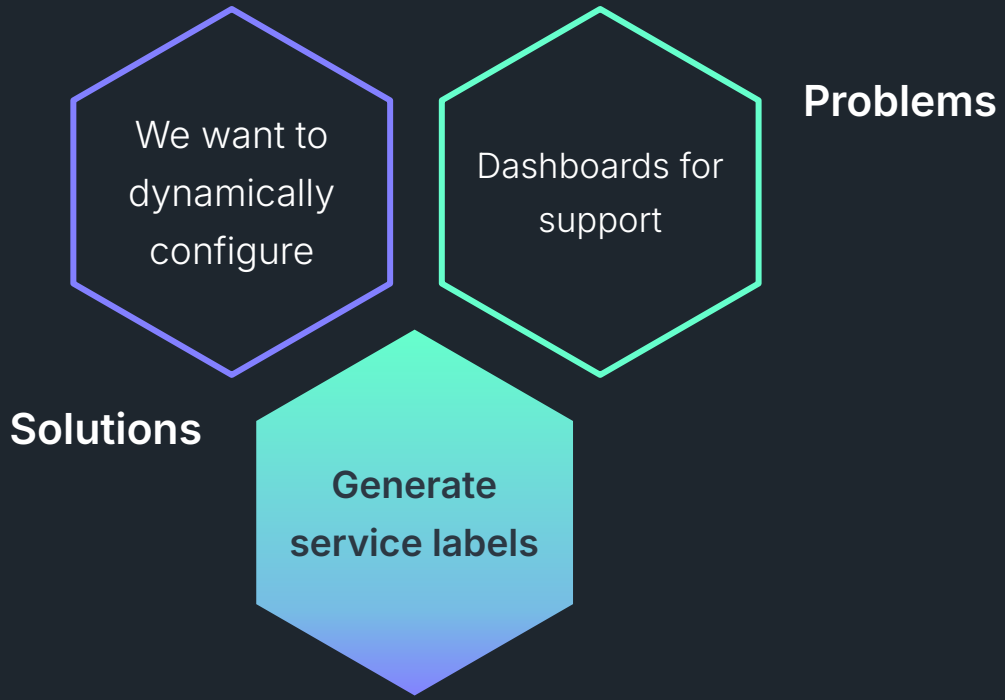


Problems we are trying to solve



Dynamic Configuration

Config change trigger Checkmk service labels



Interface description to service labels

State	Service	Icons	Summary	Service labels
OK	Interface TenGigabitEthernet0/0/26	16	[n540-zwe-02 via EVN-CaE #MON-BB# #ALERT_4800MBPS#], (up), MAC: 5C:A6:2D:D6:98:1A, Speed: 10 GBit/s, In average 20min: 533 MBit/s (5.33%), Out average 20min: 70.9 MBit/s (0.71%)	bandwith_alert:4800 send_carrier_sms_16h:yes
OK	Interface GigabitEthernet0/0/8		[ias:v4800b00 tags:KCPRI,HWICOTERA;name:[redacted]ctime:2024-11-26T10:03:27;], (up), MAC: 78:B4:6A:6C:45:D0, Speed: 1 GBit/s, In: 2.77 kBit/s (<0.01%), Out: 54.2 kBit/s (<0.01%)	ftth_customer_port:yes ias:v4800b00
OK	Interface TenGigE0/0/0/1	16	[asr920-horn-02_via_EVN_CaE #MON-BB# #ALERT_4800MBPS#], (up), MAC: D4:6A:35:A1:C0:04, Speed: 10 GBit/s, In average 20min: 67.7 MBit/s (0.68%), Out average 20min: 525 MBit/s (5.25%)	bandwith_alert:4800 send_carrier_sms_16h:yes
OK	Interface GigabitEthernet0/0/33		[ias:y14800a00;tags:KCPRI,HWAVM;name:[redacted];ctime:2024-01-02T15:58:04;], (up), MAC: F0:33:E5:C5:E8:D0, Speed: 1 GBit/s, In: 11.5 kBit/s (<0.01%), Out: 19.8 kBit/s (<0.01%)	ftth_customer_port:yes ias:y14800a00

Interface description

- Not manageable with switch port discovery rules
- Generate service labels based on interface description via livestatus
- Static labels for just text matching
- Keys with pattern matching
- >20k individual labels
- How to get them into checkmk?

```
pattern:
    ias:([a-zA-Z0-9]+);.*:
        ignore_values: ["none", "null"]
        static_labels:
            ias: "yes"
        custom_keys:
            Customer: "\\1"
```

OK	Interface 06		[ias:k1331d00;tags:KCPRI,HWAVM;name:[redacted];addr:7042 Antau,[redacted]/-/-;ctime:2023-10-05T09:15:25;], (up), MAC: 60:FA:9D:1D:2C:5C, Speed: 1 GBit/s, In: 0.00 B/s (0%), Out: 0.00 B/s (0%)
OK	Interface 07		[ias:p0042f00;tags:KCPRI,HWICOTERA;name:Kabelplus CARRIER DIENSTE;addr:7000 Eisenstadt,[redacted]/-/-;ctime:2024-02-19T11:12:05;], (up), MAC: 60:FA:9D:1D:2C:5C, Speed: 1 GBit/s, In: 0.00 B/s (0%), Out: 0.00 B/s (0%)

Labels and now?

20k Labels how to set them?

Rules via API

Setting Rules via REST API

- Set individual Interface and Switch Port rules
- Service Labels

Not usable, as GUI is no longer responsive or transparent to new rules

→ No Solution

Write own MK file in config directory

It is possible to write your own MK files with rule content

- Single File ~5 mb
- Core activation takes very long, we aborted after 5 minutes

→ No Solution

Extend interface check

- Simple loading of labels from the text file
- Works with the standard discovery rules
- Labels text file must be present on all sites

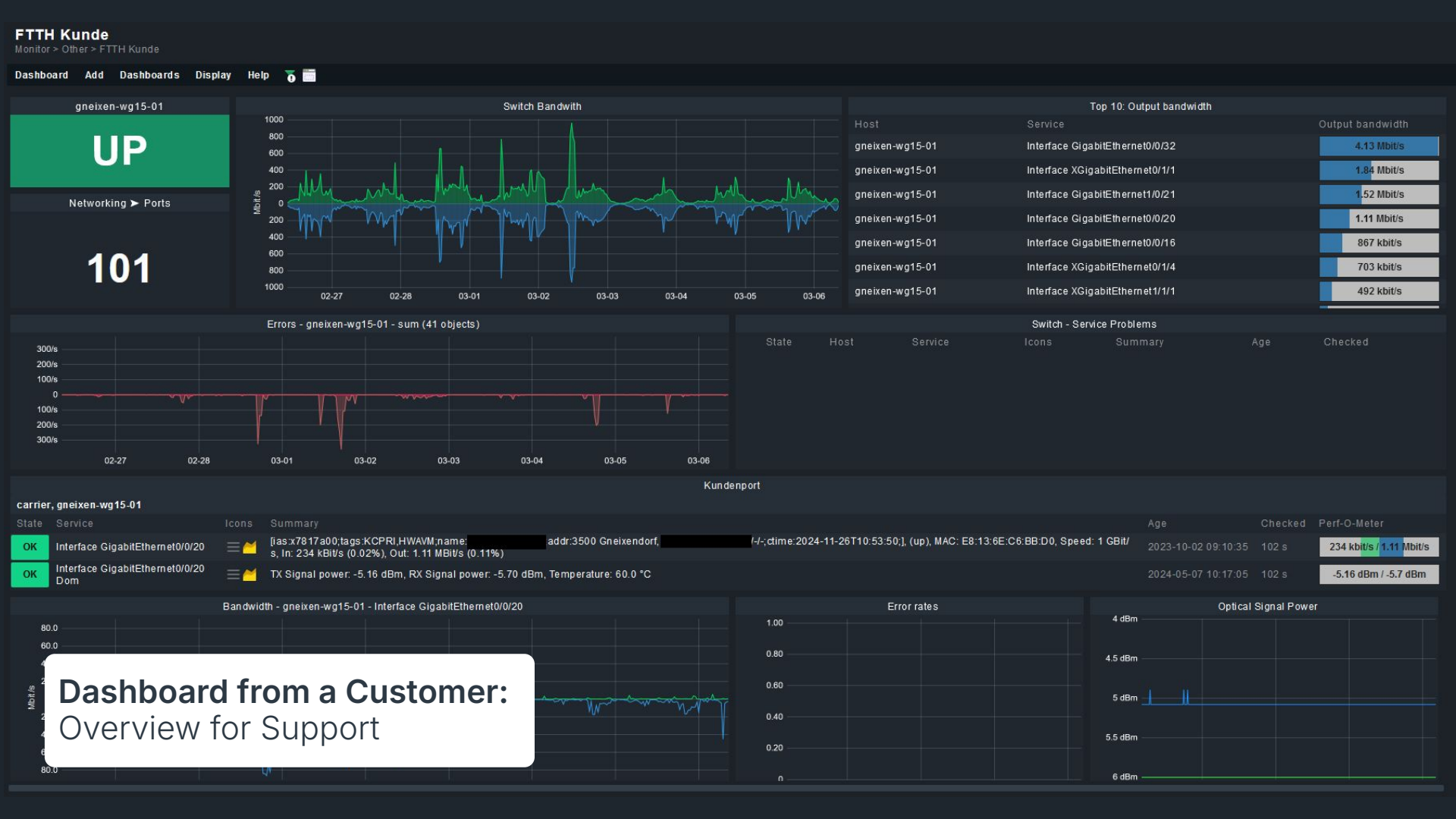
Extension of Interface Check

- Minimal extension of Interface library

  (lib/python3/cmk/plugins/lib/interfaces.py)

- Host name and interface name and new labels are there
  - Only a few modifications for updates

```
21 hidden lines
22  from functools import partial
23  from typing import Any, assert_never, Literal, ParamSpec, TypeVar
24+ from kplus_labels.utils import get_additional_external_labels
25+ from cmk.base.check_api import host_name
26  import pydantic
27  from typing_extensions import TypedDict
1087 hidden lines | discover_interfaces
1115          else:
1116              new_item = item
1117+         # Check for additional Labels
1118+         if additional := get_additional_external_labels(host_name=host_name(), item_name=new_item):
1119+             if labels:
1120+                 labels.update(additional)
1121+             else:
1122+                 labels = additional
1123          yield Service(
1124              item=new_item,
1058 hidden lines
```


FTTH Kunde
Monitor > Other > FTTH Kunde
Dashboard Add Dashboards Display Help
gneixen-wg15-01
UP
Networking ➤ Ports
101
Switch Bandwith
Mbit/s
1000 800 600 400 200 0 200 400 600 800 1000
02-27 02-28 03-01 03-02 03-03 03-04 03-05 03-06
Top 10: Output bandwidth
Host Service Output bandwidth
gneixen-wg15-01 Interface GigabitEthernet0/0/32 4.13 Mbit/s
gneixen-wg15-01 Interface XGigabitEthernet0/1/1 1.84 Mbit/s
gneixen-wg15-01 Interface GigabitEthernet1/0/21 1.52 Mbit/s
gneixen-wg15-01 Interface GigabitEthernet0/0/20 1.11 Mbit/s
gneixen-wg15-01 Interface GigabitEthernet0/0/16 867 kbit/s
gneixen-wg15-01 Interface XGigabitEthernet0/1/4 703 kbit/s
gneixen-wg15-01 Interface XGigabitEthernet1/1/1 492 kbit/s
Errors - gneixen-wg15-01 - sum (41 objects)
300/s 200/s 100/s 0 100/s 200/s 300/s
02-27 02-28 03-01 03-02 03-03 03-04 03-05 03-06
Switch - Service Problems
State Host Service Icons Summary Age Checked
Kundenport
carrier, gneixen-wg15-01
State Service Icons Summary Age Checked Perf-O-Meter
OK Interface GigabitEthernet0/0/20 [ias:x7817a00;tags:KCPRI,HWAVM;name: addr:3500 Gneixendorf, /-/-;ctime:2024-11-26T10:53:50;], (up), MAC: E8:13:6E:C6:BB:D0, Speed: 1 GBit/s, In: 234 kBit/s (0.02%), Out: 1.11 MBit/s (0.11%) 2023-10-02 09:10:35 102 s 234 kbit/s / 1.11 Mbit/s
OK Interface GigabitEthernet0/0/20 Dom TX Signal power: -5.16 dBm, RX Signal power: -5.70 dBm, Temperature: 60.0 °C 2024-05-07 10:17:05 102 s -5.16 dBm / -5.7 dBm
Bandwidth - gneixen-wg15-01 - Interface GigabitEthernet0/0/20
Mbit/s
80.0 60.0
Error rates
1.00 0.80 0.60 0.40 0.20 0
Optical Signal Power
4 dBm 4.5 dBm 5 dBm 5.5 dBm 6 dBm
Dashboard from a Customer:
Overview for Support

How we elevated the monitoring for Kabelplus

Provisioning

Get Host from phpIPAM, enrich information

Visualise in NagVis

Notifications

Implement SMS modem in Checkmk

Build a custom GUI for simple configuration

Service labels

Get Interface descriptions (K+ way) to a label

How to set >20k service labels with success

How can you benefit?

ITeRATIO

Provisioning

checkmk Features

Notifications

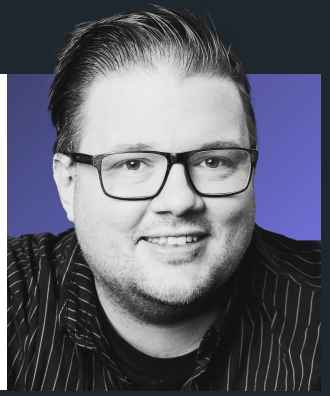
GitHub

Service labels

github.com/
iteratio-com/Exchange

Thank you!

Any Questions?



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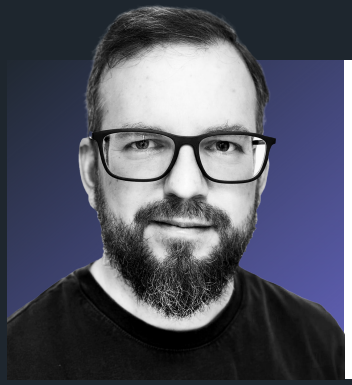

Stefan Novak

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