



# Checkmk 2.3 at a glance



**Martin Hirschvogel**

Chief Product Officer  
Checkmk GmbH

# Beyond features...



Major news this year





# Synthetic Monitoring

Monitor > Synthetic Monitoring > Synthetic Monitoring

Dashboard Add Dashboards Display Help  



Test nodes

Scheduler status

2/2

State

Test node

Summary

OK

munch

Plan scheduling

OK

atlanta

Plan scheduling

OK tests

12/14

Plans

State

Test node

Application

Variant

Summary

Runtime-limit ratio

OK

munch

Webshop

DE

Runtime: 18 seconds, Limit: 1 minute 0 seconds, Ratio: 30.00%, Last execution: 2024-06-08 13:13:00 (UTC+00:00)

30 %

OK

atlanta

Webshop

DE

Runtime: 18 seconds, Limit: 1 minute 0 seconds, Ratio: 30.00%, Last execution: 2024-06-08 13:13:00 (UTC+00:00)

30 %

OK

munch

Webshop

EN

Runtime: 17 seconds, Limit: 1 minute 0 seconds, Ratio: 28.33%, Last execution: 2024-06-08 13:12:00 (UTC+00:00)

28.33 %

OK

atlanta

Webshop

EN

Runtime: 17 seconds, Limit: 1 minute 0 seconds, Ratio: 28.33%, Last execution: 2024-06-08 13:12:00 (UTC+00:00)

28.33 %

OK

munch

checkmk.com

Runtime: 10 seconds, Limit: 1 minute 0 seconds, Ratio: 16.67%, Last execution: 2024-06-08 13:13:00 (UTC+00:00)

16.67 %

OK

atlanta

checkmk.com

Runtime: 10 seconds, Limit: 1 minute 0 seconds, Ratio: 16.67%, Last execution: 2024-06-08 13:13:00 (UTC+00:00)

16.67 %

Top 5: Test runtime

Host	Service	Test runtime
munch	RMK play.checkmk.com_demo Test: Open Dashboards	7.03 s
atlanta	RMK play.checkmk.com_demo Test: Open Dashboards	7.03 s
munch	RMK Webshop_checkout_EN Test: Search Item And Add To Basket	6.59 s
atlanta	RMK Webshop_checkout_EN Test: Search Item And Add To Basket	6.59 s
munch	RMK play.checkmk.com_demo Test: Open Host Details	4.36 s

Test runtime

7.03 s

7.03 s

6.59 s

6.59 s

4.36 s

Tests

State

Test node

Application

Variant

Test

Summary

Runtime

CRIT

munch

Webshop

DE

Search Item And Add To Basket

FAIL

CRIT

atlanta

Webshop

DE

Search Item And Add To Basket

FAIL

OK

munch

Webshop

EN

Search Item And Add To Basket

PASS, Runtime: 7 seconds

6.59 s

OK

atlanta

Webshop

EN

Search Item And Add To Basket

PASS, Runtime: 7 seconds

6.59 s

OK

munch

checkmk.com

Download software

PASS, Runtime: 1 second

1.04 s

OK

atlanta

checkmk.com

Download software

PASS, Runtime: 1 second

1.04 s

OK

munch

checkmk.com

Open Homepage

PASS, Runtime: 61 milliseconds

61 ms

OK

atlanta

checkmk.com

Open Homepage

PASS, Runtime: 61 milliseconds

61 ms

OK

atlanta

boards

PASS, Runtime: 2 seconds

PASS, Runtime: 2 seconds

1.57 s

OK

atlanta

boards

PASS, Runtime: 2 seconds

PASS, Runtime: 2 seconds

1.57 s

OK

atlanta

boards

PASS, Runtime: 7 seconds

PASS, Runtime: 7 seconds

7.03 s

OK

munch

boards

PASS, Runtime: 7 seconds

PASS, Runtime: 7 seconds

7.03 s

OK

munch

boards

PASS, Runtime: 4 seconds

PASS, Runtime: 4 seconds

4.36 s


Test runtime

8 s

## Synthetic Monitoring has arrived

Gain deep insights into your applications' user experience.






checkmk

Login

Email

Password



[Forgot Password?](#)

**Log in**

[New to Checkmk? Try it for free](#)

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## Software-as-a-Service version of Checkmk

Zero to monitoring in 5 minutes.





# Beyond features...

Major news this year



**Checkmk  
Synthetic Monitoring**

Dedicated talk  
June 11th, 3pm



**Checkmk Software-as-a-  
Service**

Dedicated talk  
June 12th, 2pm



# Beyond features...

Major news this year



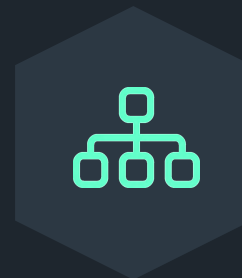
**Checkmk  
Synthetic Monitoring**

Dedicated talk  
June 11th, 3pm



**Checkmk Software-as-a-  
Service**

Dedicated talk  
June 12th, 2pm



**Checkmk MSP**

# Checkmk MSP

## Major upgrade for the 'CME'



### Raw

Free and open source IT monitoring for mid-sized infrastructures.

#### Monitor your entire IT:

- Auto-discover your IT
- Monitor out-of-the-box with 2000+ plug-ins
- Auto-detect issues
- 100% Open Source

and more

**Support:** Checkmk Community

### Enterprise

Scalable and automated enterprise-wide IT monitoring.

#### Everything in Raw, plus:

- Accelerate and scale up your monitoring
- Automate monitoring operations
- Monitor dynamic workloads
- Visualize your IT

and much more

**Support included**

### Cloud

State-of-the-art IT monitoring for cloud and hybrid infrastructures.

#### Everything in Enterprise, plus:

- Monitor cloud workloads
- Deploy from cloud marketplaces
- Auto-register any load
- Push and pull agents
- Visualize your cloud

and much more

**Support included**

### MSP

Monitor your customers' hybrid IT. Designed for IT service providers.

#### Everything in Cloud, plus:

- Multi-customer management & dashboards
- Data segregation
- Data loss protection, if customer connections fail
- White label branding

and much more

**Support included**

New

# Cloud meets Checkmk MSP

All new features



**Monitor your customers' IT**

Less network worries

Less work

**Agent  
push mode**

# Cloud meets Checkmk MSP

All new features



**Monitor your customers' IT**

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Less work

**Agent  
push mode**

**Self-service  
agents**

# Cloud meets Checkmk MSP

All new features



## Monitor your customers' IT

Less network worries

Less work

**Agent  
push mode**

**Self-service  
agents**

**Cloud  
monitoring &  
dashboards**

**Grafana  
Cloud  
integration**

## Monitor the cloud

Enable all your  
customers

# What's new in Checkmk 2.3

# Our focus for Checkmk 2.3



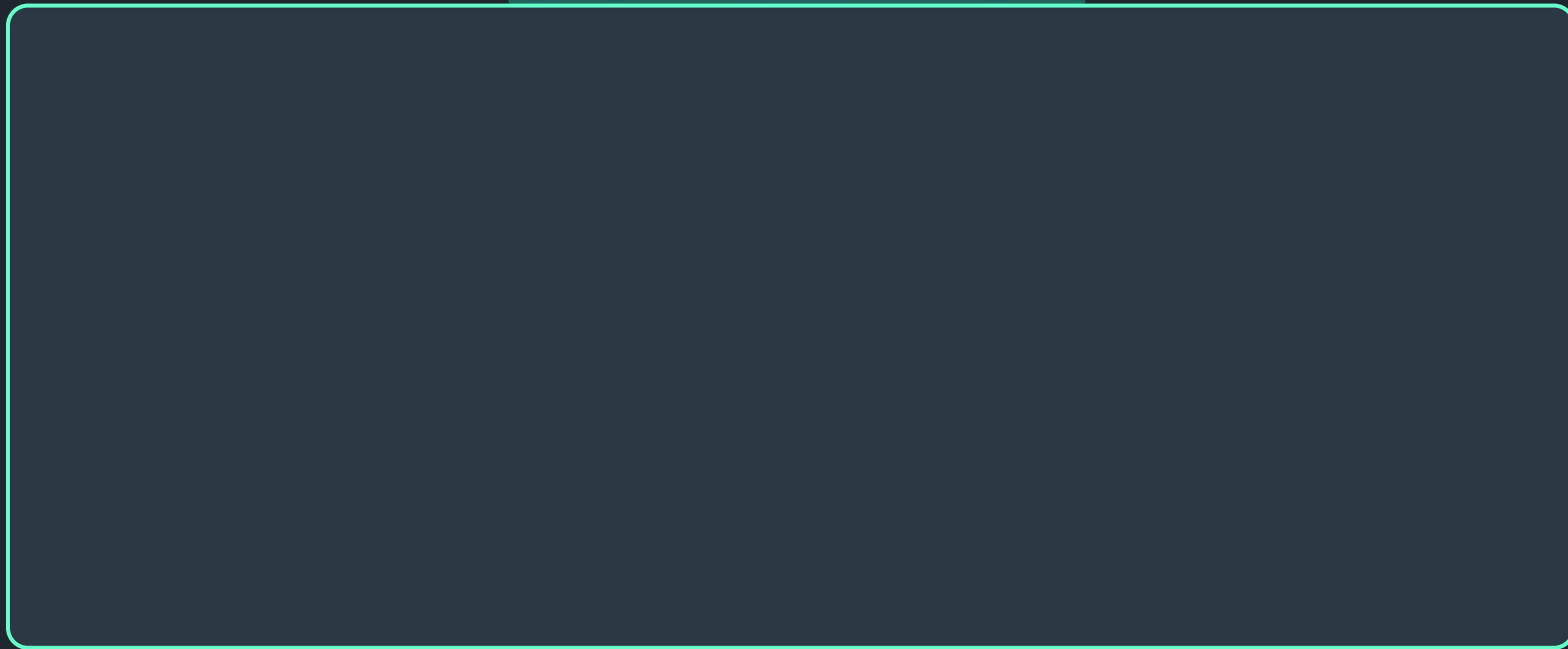
Cloud



Data Center



IoT





# Our focus for Checkmk 2.3



Cloud



Data Center



IoT

**Monitor anything**



# Our focus for Checkmk 2.3



Cloud



Data Center



IoT

**Monitor anything**



**Powerful configuration**



# Our focus for Checkmk 2.3



Cloud



Data Center



IoT

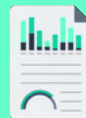
**Monitor anything**



**Powerful configuration**



**Alerts & analytics**



# Our focus for Checkmk 2.3



Cloud

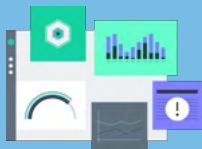


Data Center



IoT

**Great user experience**  
for beginners  
and experts



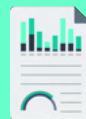
**Monitor anything**



**Powerful configuration**



**Alerts & analytics**



# Our focus for Checkmk 2.3



Cloud



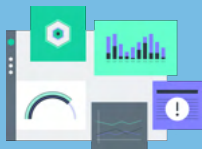
Data Center



IoT

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for beginners  
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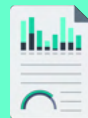
## Monitor anything



## Powerful configuration



## Alerts & analytics



## Extensible interfaces

for automation  
& development



# Our focus for Checkmk 2.3



Cloud



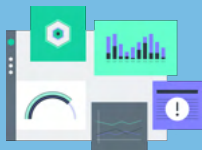
Data Center



IoT

## Great user experience

for beginners  
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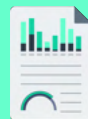
## Monitor anything



## Powerful configuration



## Alerts & analytics



## Extensible interfaces

for automation  
& development



## Monitoring platform

Secure & scalable

# Our focus for Checkmk 2.3



Cloud



Data Center

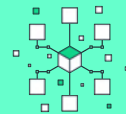


IoT

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and experts



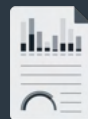
**Monitor anything**



**Powerful configuration**



**Alerts & analytics**



**Extensible interfaces**  
for automation  
& development



**Monitoring platform**  
Secure & scalable

# Modern web services monitoring

- Completely revised HTTP endpoint monitoring
  - Much more powerful configuration
  - Much better alerts and status info
- In-depth certificate monitoring
  - For all application protocols via TCP, e.g. web sites, LDAP, databases

## HTTP web service endpoints to monitor (required)

Service name

Prefix

Use protocol name: HTTP(S) ▾

Name (required)

App1

URL

https://\$HOSTNAME\$/app1

☐ Individual settings to use for this endpoint

Service name

Prefix

Use protocol name: HTTP(S) ▾

Name (required)

App2

URL

https://\$HOSTNAME\$/app2

☐ Individual settings to use for this endpoint

Add new endpoint

## Standard settings for all endpoints

☐ Connection buildup

☒ Response time
 

Fixed levels ▾

Warning at 0 s 300 ms

Critical at 0 s 600 ms

☐ Status code

☐ Certificate validity

☐ How to handle the document





# Modern web services monitoring

- ◆ Completely revised HTTP endpoint monitoring
  - ◇ Much more powerful configuration
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Use protocol name: HTTP(S) ▼

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App2

URL

https://\$HOSTNAME\$/app2

Individual settings to use for this endpoint

Add new endpoint

Standard settings for all endpoints

☐ Connection buildup

☒ Response time

Fixed levels ▼

Warning at 0 s 300 ms

Critical at 0 s 600 ms

☐ Status code

☐ Certificate validity

☐ How to handle the document



**New in 2.3: Powerful & efficient monitoring of web services**  
14:00 – 14:30 | Marcel Arentz (Product Manager, Checkmk)

# Monitor any MS SQL database

- ◆ Goal: drop-in replacement
- ◆ Auto-detection and high performance
- ◆ Support of a wide range of special MS SQL setups
- ◆ More powerful and fine-grained configuration options
- ◆ Any MS SQL database: locally or remote/in the cloud, e.g. Azure SQL

Deploy MSSQL Server plug-in

Monitor databases

Authentication

Local Integrated Authentication (Windows)

Connection

Data to collect (Sections)

Cache age for asynchronous checks

Map data to specific host (Piggyback)

Discovery mode of databases

Custom instances

Options

✕ Monitor databases on other hosts

Authentication

SQL Database User Credentials

User monitoring

Password .....

Connection

✕ Host name

some.sql-server.databse.windows.net

Fail over partner

Port

Timeout

Server certificate policy

Data to collect (Sections)

Cache age for asynchronous checks

Map data to specific host (Piggyback)

Discovery mode of databases

Custom instances

Options

Add config to monitor MS SQL database on other hosts

# Monitor any MS SQL database

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- ◆ Any MS SQL database: locally or remote/in the cloud, e.g. Azure SQL



**New in 2.3: Next generation database monitoring**

16:15 – 16:35 | Marcel Arentz (Product Manager, Checkmk)

Deploy MSSQL Server plug-in

Monitor databases

Authentication

Local Integrated Authentication (Windows)

Connection

Data to collect (Sections)

Cache age for asynchronous checks

Map data to specific host (Piggyback)

Discovery mode of databases

Custom instances

Options

✕ Monitor databases on other hosts

Authentication

SQL Database User Credentials

User monitoring

Password .....

Connection

✕ Host name

some.sql-server.database.windows.net

Fail over partner

Port

Timeout

Server certificate policy

Data to collect (Sections)

Cache age for asynchronous checks

Map data to specific host (Piggyback)

Discovery mode of databases

Custom instances

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Add config to monitor MS SQL database on other hosts

# Monitor any Kubernetes Setup



## Supported platforms



'Vanilla'  
Kubernetes



Google  
Kubernetes  
Engine



AWS EKS



Azure  
AKS



# Monitor any Kubernetes Setup



## Supported platforms



'Vanilla'  
Kubernetes



Google  
Kubernetes  
Engine



New

Google  
Kubernetes  
Engine Autopilot



AWS EKS



Azure  
AKS



New

VMware  
Tanzu



New

K3S



# Monitor any Kubernetes Setup



## Supported platforms



'Vanilla'  
Kubernetes



Google  
Kubernetes  
Engine



New

Google  
Kubernetes  
Engine Autopilot



AWS EKS



Azure  
AKS



New

VMware  
Tanzu



New

K3S



Red Hat  
OpenShift\*



# Monitor any Kubernetes Setup



## Supported platforms



'Vanilla'  
Kubernetes



Google  
Kubernetes  
Engine



New

Google  
Kubernetes  
Engine Autopilot



AWS EKS



Azure  
AKS



New

VMware  
Tanzu



New

K3S



Red Hat  
OpenShift\*

**Added support for versions: 1.27 + 1.28**

**Many bug & usability fixes**

(e.g. better handling of node conditions)



# Monitor any Kubernetes Setup



## Supported platforms



'Vanilla'  
Kubernetes



Google  
Kubernetes  
Engine



Google  
Kubernetes  
Engine Autopilot

New



AWS EKS



Azure  
AKS



VMware  
Tanzu

New



K3S

New



Red Hat  
OpenShift\*

**Added support for versions: 1.27 + 1.28**

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(e.g. better handling of node conditions)





# Checkmk now an official Google Cloud Partner



- Autopilot: highly managed Kubernetes service by Google Cloud
- Checkmk Kubernetes collectors reviewed by Google security team
- Checkmk one of only 16 workloads allowlisted

Google Cloud

Documentation

Technology areas

Cross-product tools

Related sites

Google Kubernetes Engine (GKE)OverviewGuidesReferenceSamplesResources

## Allowlisted Autopilot partner workloads

The following table describes the allowlisted partner workloads for Autopilot. The partner workload of your clusters depends on the GKE version of the cluster.

Partner	Description
Aqua	Aqua supports securing and ensuring compliance for the full lifecycle of workload, specifically the Kubernetes pods, which run multiple containers with shared sets of resources.  For more information, refer to <a href="#">Protecting Cloud Native Workloads on GKE Autopilot</a> .
Checkmk	Checkmk helps organizations monitor the reliability and availability of their applications, usage, and proactively address issues that may arise. Checkmk can automatically collect wide data providing visibility into GKE Autopilot performance and health, and visualize it in out-of-the-box dashboards.

# Just another pull request



Checkmk / checkmk

Q Type to search

+ -

<> Code

Pull requests 55

Actions

Security 23

Insights

Settings

## Migrated old Nutanix and added some real checks #521

Edit

<> Code

Closed

Yogibaer75 wants to merge 32 commits into `Checkmk:master` from `Yogibaer75:nutanix2`

Conversation 40

Commits 32

Checks 0

Files changed 90

+5,198 -470

Changes from all commits

File filter

Conversations

0 / 90 files viewed

Review in codespace

Review changes

prism\_cluster\_cpu.py

prism\_cluster\_io.py

prism\_cluster\_mem.py

prism\_containers.py

165 cmk/special\_agents/agent\_prism.py

Viewed

115 62 `LOGGING.debug("do request..")`

116 63 `obj = requester.get("cluster")`

117 64 `LOGGING.debug("got %d keys", len(obj.keys()))`

65 + `with SectionWriter("prism_info") as w:`

# Just another pull request



Checkmk / checkmk

Search: Type to search

Code Pull requests 55 Actions Security 23 Insights Settings

## Migrated old Nutanix and added some real checks #521

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Conversation 40 Commits 32 Checks 0 Files changed 90 +5,198 -470

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cmk/special\_agents/agent\_prism.py

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Checkmk / checkmk

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```

# Added some checks?



**Before**

## Nutanix

Type of Check	Plugin Name
Nutanix Prism: Containers	<code>prism_containers</code>
Nutanix Prism: Storage Pools	<code>prism_storage_pools</code>
Nutanix Prism: Alerts	<code>prism_alerts</code>
Nutanix Prism: General Info about a Cluster	<code>prism_info</code>

# Added some checks?

## Nutanix

Type of Check	Plugin Name
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Nutanix Prism: General Info about a Cluster	<code>prism_info</code>

Before



## Nutanix

Type of Check	Plug-in Name
Nutanix Prism: Alerts	<code>prism_alerts</code>
Nutanix Prism: Cluster CPU	<code>prism_cluster_cpu</code>
Nutanix Prism: Cluster Memory	<code>prism_cluster_mem</code>
Nutanix Prism: Containers	<code>prism_containers</code>
Nutanix Prism: General Info about a Cluster	<code>prism_info</code>
Nutanix Prism: High Availability Info about a Cluster	<code>prism_ha</code>
Nutanix Prism: Host CPU	<code>prism_host_stats_cpu</code>
Nutanix Prism: Host Hardware Disks	<code>prism_host_disks</code>
Nutanix Prism: Host I/O	<code>prism_host_stats</code>
Nutanix Prism: Host IO	<code>prism_cluster_io</code>
Nutanix Prism: Host Memory	<code>prism_host_stats_mem</code>
Nutanix Prism: Host Network Interfaces	<code>prism_host_networks</code>
Nutanix Prism: Host Storage Capacity	<code>prism_host_usage</code>
Nutanix Prism: Hosts	<code>prism_hosts</code>
Nutanix Prism: Protection Domains	<code>prism_protection_domains</code>
Nutanix Prism: Remote Tunnel	<code>prism_remote_support</code>
Nutanix Prism: Storage Pools	<code>prism_storage_pools</code>
Nutanix Prism: VM CPU	<code>prism_vm_stats_cpu</code>
Nutanix Prism: VM I/O	<code>prism_vm_stats</code>
Nutanix Prism: VM Memory	<code>prism_vm_stats_mem</code>
Nutanix Prism: VM Status	<code>prism_vm_status</code>
Nutanix Prism: VM Tools	<code>prism_vm_tools</code>
Nutanix Prism: VM state	<code>prism_vms</code>

Now

# In-depth Nutanix monitoring now available!



## Cluster monitoring

OK	NTNX Alerts	≡	2 alerts, Last worst on 2022-10-06 16:16:27: 'It is recommended that NGT on the VM SRV-APP-01 with uuid 2da80b43-fe19-4750-bbc6-17eef8d90935 should be upgraded to the latest version supported by the cluster.NGT update contains bug fixes and improvements, which will improve the overall product experience.'	
OK	NTNX Cluster	≡	Name: Cluster, Version: 5.20.4.6, Nodes: 3	
OK	NTNX Cluster Controller IO	≡ 📁	I/O Bandwidth: 0.21 MB/s, IOPS: 0.01, I/O Latency: 1.5 ms	
OK	NTNX Cluster CPU	≡ 📁	Total CPU: 13.95%	<div><div></div></div> 1
OK	NTNX Cluster Memory	≡ 📁	Total Memory Usage: 27.26%	
OK	NTNX Container NutanixManagementShare	≡ 📁	Used: 0.08% - 12.4 GB of 16.2 TB, trend per 1 day 0 hours: +0 B, trend per 1 day 0 hours: +0%	<div><div></div></div> 0
OK	NTNX Container SelfServiceContainer	≡ 📁	Used: 0.04% - 5.77 GB of 16.2 TB, trend per 1 day 0 hours: +0 B, trend per 1 day 0 hours: +0%	<div><div></div></div> 0
OK	NTNX Container VMs	≡ 📁	Used: 22.35% - 4.66 TB of 20.8 TB, trend per 1 day 0 hours: +0 B, trend per 1 day 0 hours: +0%	<div><div></div></div> 2
OK	NTNX Host SRV-AHV-01	≡	has state NORMAL, Number of VMs 4, Memory 376 GiB, Boottime 2022-08-11 15:40:02	
OK	NTNX Remote Tunnel	≡	Remote Tunnel is disabled	
OK	NTNX Storage StoragePool	≡ 📁	Used: 22.42% - 9.35 TB of 41.7 TB, trend per 1 day 0 hours: +0 B, trend per 1 day 0 hours: +0%, SSD capacity: 41.7 TB, SSD free: 32.3 TB	<div><div></div></div> 2
OK	NTNX VM NTNX-SRV-AHV-01-CVM	≡	with status on - on Host SRV-AHV-01	
WARN	NTNX VM Nutanix-Move	≡	with status off - on Host None	<div><div></div></div> WARN



# In-depth Nutanix monitoring now available!



## Node monitoring

OK	NTNX CPU	☰ 📁	Total CPU: 11.64%
OK	NTNX HW Disk 1	☰	Model: SAMSUNG MZ7LH3T8HMLT-00005, Serial: S456NW0R504280, State: healthy, Mount state: disk is mounted
OK	NTNX HW Disk 2	☰	Model: SAMSUNG MZ7LH3T8HMLT-00005, Serial: S456NW0R504279, State: healthy, Mount state: disk is mounted
OK	NTNX HW Disk 4	☰	Model: SAMSUNG MZ7LH3T8HMLT-00005, Serial: S456NW0R504283, State: healthy, Mount state: disk is mounted
OK	NTNX HW Disk 5	☰	Model: SAMSUNG MZ7LH3T8HMLT-00005, Serial: S456NW0R504275, State: healthy, Mount state: disk is mounted
OK	NTNX I/O	☰ 📁	is 4.88 KiB read and 11.7 KiB write
OK	NTNX Memory	☰ 📁	Usage: 30.61% - 115 GiB of 376 GiB
OK	NTNX Storage Capacity	☰ 📁	Used: 23.96% - 3.33 TB of 13.9 TB, trend per 1 day 0 hours: +0 B, trend per 1 day 0 hours: +0%, Total SAS: 0 B, Free SAS: 0 B, Total SSD: 13.9 TB, Free SSD: 10.6 TB

## VM monitoring

OK	NTNX CPU	☰ 📁	CPU usage: 5.61%, CPU ready: <0.01%
OK	NTNX I/O	☰ 📁	is 10.7 KiB read and 8.79 KiB write
CRIT	NTNX Memory	☰ 📁	Usage: 95.89% - 76.7 GiB of 80.0 GiB (warn/crit at 80.00%/90.00% used)
OK	NTNX VM State	☰	is in state on, defined on SRV-AHV-03, CPUs: 16, Memory: 80.0 GiB
OK	NTNX VMTools	☰	Tools with version 2.1.5 installed, Tools enabled





checkmk



Monitor



Customize



Setup



Help

# Extension packages

Setup > Maintenance > Extension packages

Packages

Display

Help

Find on this site

Redfish compatible Mgmt Controller

New built-in extension package





## Enabled (active on this site)

No entries.

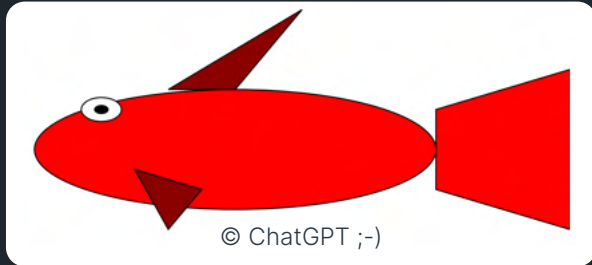
## Enabled (inactive on this site)

No entries.

## All packages (enabled or disabled)

Actions	Name	Version	Title	Author
 	redfish	2.3.38	Redfish Restful API Checks	Andreas Doehler

# What is Redfish?



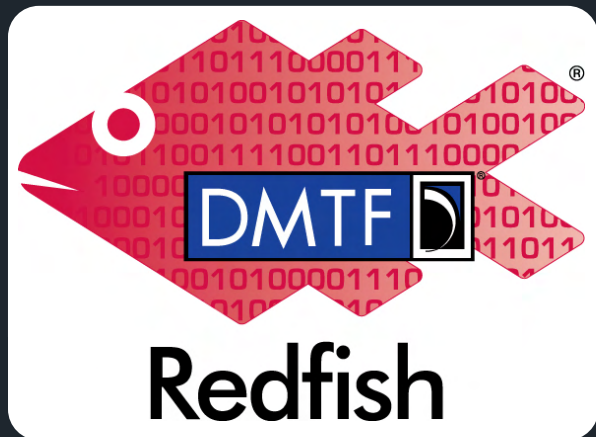
# What is Redfish?



DMTF's Redfish® is a standard designed to deliver simple and secure management for converged, hybrid IT and the Software Defined Data Center.

## Redfish support on server

- ◆ Advantech SKY Server BMC
- ◆ Dell iDRAC BMC
- ◆ Fujitsu iRMCS5 BMC
- ◆ HPE iLO BMC
- ◆ HPE Moonshot BMC
- ◆ Lenovo XClarity Controller (XCC) BMC
- ◆ Supermicro X10 & X11 BMC
- ◆ IBM Power Systems BMC
- ◆ IBM Power Systems Flexible Service Processor
- ◆ Cisco Integrated Management Controller
- ◆ Data center equipment, e.g. PDU



# Started with a few specific implementations



[browse](#)

[upload new package](#)

[how to upload](#)



## Lenovo XClarity Controller

by [Andreas-Doehler](#)

Lenovo XClarity Monitoring with **Redfish** REST API

👁 3083 📄 1804 📅 21 Jan 2022



## HPE iLO Restful API Checks

by [Andreas-Doehler](#)

HPE iLO Monitoring with **Redfish** REST API

👁 6680 📄 3624 📅 21 Jan 2022



## Dell iDRAC Restful API Checks

by [Andreas-Doehler](#)

Dell iDRAC Monitoring with **Redfish** REST API

👁 4716 📄 1853 📅 22 Apr 2022

# Too many single agents... let's build a universal one

It can't be that hard...



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## Lenovo XClarity Controller

by [Andreas-Doehler](#)

Lenovo XClarity Monitoring with **Redfish** REST API

👁 3083 📁 1804 📅 21 Jan 2022



## HPE iLO Restful API Checks

by [Andreas-Doehler](#)

HPE iLO Monitoring with **Redfish** REST API

👁 6680 📁 3624 📅 21 Jan 2022



## Dell iDRAC Restful API Checks

by [Andreas-Doehler](#)

Dell iDRAC Monitoring with **Redfish** REST API

👁 4716 📁 1853 📅 22 Apr 2022



## **Redfish** Restful API Checks

by [Andreas-Doehler](#)

Generic **Redfish** REST API Checks

👁 4710 📁 4769 📅 22 May 2023

# Server monitoring via Redfish has arrived



## Dell iDRAC7

OK	CPU CPU.Socket.1	≡	Type: CPU, Model: Intel(R) Xeon(R) Gold 6438N, Cores: 32, Threads: 64, Speed 2000 MHz	
OK	CPU CPU.Socket.2	≡	Type: CPU, Model: Intel(R) Xeon(R) Gold 6438N, Cores: 32, Threads: 64, Speed 2000 MHz	
OK	Drive Disk.Bay.0:Enclosure.Internal.0-0:RAID.Slot.3-1-Physical Disk 0:0:0	≡	Size: 1117GB, Speed 12 Gbs	
OK	Drive Disk.Bay.9:Enclosure.Internal.0-1:RAID.Slot.3-1-Physical Disk 0:1:9	≡	Size: 18626GB, Speed 6 Gbs	
OK	Fan System Board Fan1A	≡ 📉	Speed: 5520.0 rpm	5520 rpm
OK	Fan System Board Fan1B	≡ 📉	Speed: 4920.0 rpm	4920 rpm
OK	Memory DIMM.Socket.A1	≡	Size: 32GB, Type: DDR5-4800 MultiBitECC	
OK	Memory DIMM.Socket.A2	≡	Size: 32GB, Type: DDR5-4800 MultiBitECC	
OK	Memory Summary	≡	Capacity: 256GB, with State: Component State: Normal, Rollup State: Normal, This resource is enabled.	
OK	Network adapter NIC.Embedded.1	≡	Component State: Normal, Rollup State: Normal, This resource is enabled.	
OK	Network adapter NIC.Integrated.1	≡	Model: BCM 2P 25G SFP 57414S OCP NIC, SeNr: , PartNr: 024FG6	
OK	Physical port NIC.Embedded.1-1-1	≡	Link: LinkDown, Speed: 0Mbps, MAC: C4:CB:E1:B9:3F:48	
OK	Physical port NIC.Integrated.1-1-1	≡	Link: LinkUp, Speed: 10000Mbps, MAC: 04:32:01:1A:06:E0	

# Server monitoring via Redfish has arrived



## Dell iDRAC7

OK	Power supply 0-PS1 Status	≡ 📁	414.5 Watts input, 385.5 Watts output, 204.0 V input, Capacity 1400.0 Watts, Typ PWR SPLY,1400W,RDNT,LTON	414.5 Watt / 385.5 Watt
OK	Power supply 1-PS2 Status	≡ 📁	5.0 Watts input, 0.0 Watts output, 204.0 V input, Capacity 1400.0 Watts, Typ PWR SPLY,1400W,RDNT,LTON	5 Watt / 0 Watt
OK	Storage controller AHCI.Embedded.1-1	≡	Type: Sapphire Rapids SATA AHCI Controller, RaidLevels: , DeviceProtocols:	
OK	Storage controller AHCI.Embedded.2-1	≡	Type: Sapphire Rapids SATA AHCI Controller, RaidLevels: , DeviceProtocols:	
OK	Storage controller RAID.Slot.3-1	≡	Type: PERC H755 Adapter, RaidLevels: RAID0,RAID1,RAID5,RAID6,RAID10,RAID50,RAID60, DeviceProtocols: SAS,SATA,NVMe	
OK	System state	≡	System with SerialNr: MXXXXXXXXX, has State: Component State: Normal, Rollup State: Normal, This resource is enabled.	
OK	Temperature CPU1 Temp	≡ 📁	Temperature: 49.0 °C	49 °C
OK	Temperature System Board Exhaust Temp	≡ 📁	Temperature: 41.0 °C	41 °C
OK	Voltage CPU1 VCCD VR	≡ 📁	Location: CPU, SensorNr: 52, Value: 1.1 V	1.13 V
OK	Voltage PS2 Voltage 2	≡ 📁	Location: PowerSupply, SensorNr: 110, Value: 204.0 V	204 V
OK	Volume Disk.Virtual.238:RAID.Slot.3-1	≡	Raid Type: RAID6, Size: 186265.0GB	
OK	Volume Disk.Virtual.239:RAID.Slot.3-1	≡	Raid Type: RAID1, Size: 1117.2GB	

# Server monitoring via Redfish has arrived



## HPE iLO6

OK	CPU 1	≡	Type: CPU, Model: AMD EPYC 9374F 32-Core Processor , Cores: 32, Threads: 64, Speed maximum 4400 MHz		
OK	CPU 2	≡	Type: CPU, Model: AMD EPYC 9374F 32-Core Processor , Cores: 32, Threads: 64, Speed maximum 4400 MHz		
OK	Drive 0-1.92TB 16G NVMe SSD	OK	Physical port DE07A000	≡	Link: LinkUp, Speed: 10000Mbps, MAC: 30:3e:a7:xx:8c:4
OK	Drive 0-3.2TB 16G NVMe SSD	OK	Physical port DE080000	≡	Link: LinkUp, Speed: 25000Mbps, MAC: 30:3e:a7:xx:a4:3
OK	Drive 1-1.92TB 16G NVMe SSD	OK	Power supply 1-HpeServerPowerSupply	≡	0.0 Watts input, 229.0 Watts output, 228.0 V input, Capac Watts, Typ P38997-B21
OK	Fan 1	OK	Power supply 0-HpeServerPowerSupply	≡	0.0 Watts input, 209.0 Watts output, 229.0 V input, Capac Watts, Typ P38997-B21
OK	Fan 2	OK	Storage controller DA00000A	≡	Type: Embedded SATA Controller #1, RaidLevels: , Device SATA
OK	Memory proc1dimmm1	OK	Storage controller DA000015	≡	Type: Embedded SATA Controller #2, RaidLevels: , Device SATA
OK	Memory proc1dimmm2	OK	Storage controller DE045000	≡	Everything looks OK - 1 detail available
OK	Memory proc1dimmm3	OK	Storage controller DE044000	≡	Everything looks OK - 1 detail available
OK	Memory Summary	OK	System state	≡	System with SerialNr: CZ2331034R, has State: Componer Normal, Rollup State: Normal, This resource is enabled.
OK	Network adapter DE07A000	OK	Temperature 01-Inlet Ambient	≡	Temperature: 28.0 °C
OK	Network adapter DE080000	OK	Temperature 06-P1 DIMM 7-12	≡	Temperature: 43.0 °C
		OK	Volume 1	≡	Raid Type: RAID1, Size: 1788.5GB



# Modus operandi for Checkmk 2.3 and outlook

## Checkmk 2.3: available as built-in MKP

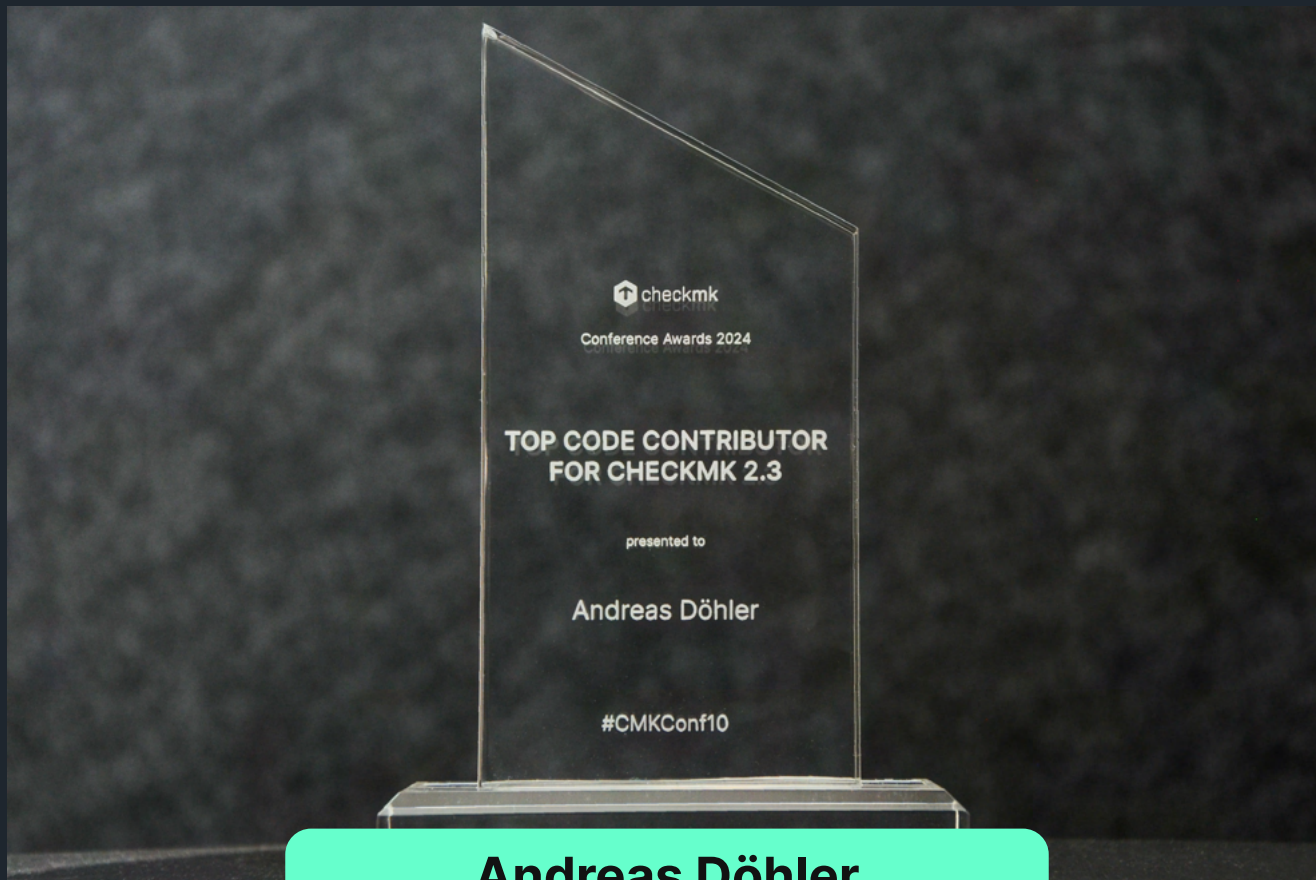
*'Experimental' feature*

- Proven by many users, but further feedback required for 'generic' solution
- Current mode allows Andreas to react quickly
  - ◊ Mainlining limits larger changes as incompatibilities need to be minimal
- Feedback (create issues) & updates (download MKPs) via [https://github.com/Yogibaer75/Check\\_MK-Things](https://github.com/Yogibaer75/Check_MK-Things)

## Checkmk 2.4: native support

*'Stable' feature*

Will be mainlined for 2.4  
and maintained then by  
Checkmk GmbH



**Andreas Döhler**  
Top code contributor



# Future-proof storage monitoring

## Pure Storage FlashArray monitoring

New major integration via Purity API

- Internal alerts
- Overall capacity
- Volume capacity
- Storage bay
- Ethernet, fibre channel & InfiniBand ports
- Fans

# Future-proof storage monitoring

## Pure Storage FlashArray monitoring

New major integration via Purity API

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- Ethernet, fibre channel & InfiniBand ports
- Fans

## NetApp ONTAP monitoring

Drop-in replacement for existing monitoring

- Previous *NetApp via WebAPI* monitoring based on ONTAPI (ZAPI)
  - ONTAPI not enabled by default anymore
  - NetApp planned removal for early 2024
- New *NetApp via Ontap REST API* monitoring based on NetApp ONTAP
  - Same check plug-ins as before
  - Future-proof

# ntopng integration for Network Flow Monitoring



## Early 2023: needs attention

- Originally built versus REST API v1
- Timeouts, buggy views, usability issues

# ntopng integration for Network Flow Monitoring



## Early 2023: needs attention

- ❖ Originally built versus REST API v1
- ❖ Timeouts, buggy views, usability issues

## Fixed and improved ntopng integration

- ❖ Built on REST API v2
- ❖ Everything works properly (views, filters, dropdowns)
- ❖ Many usability / error message fixes
- ❖ Better performance
  - ❖ Re-architecture to handle long API calls (incl. implementation of pagination)

# 75+ improvements to existing integrations



## Examples

---



More checks

Cisco Meraki: power supplies

Linux bonding interfaces: expected bonding mode

# 75+ improvements to existing integrations



## Examples

---



More checks

Cisco Meraki: power supplies  
Linux bonding interfaces: expected bonding mode



More info

Connection state of interface on Windows  
Microsoft Azure tags imported as service labels



# 75+ improvements to existing integrations



## Examples

---



More checks

Cisco Meraki: power supplies  
Linux bonding interfaces: expected bonding mode



More info

Connection state of interface on Windows  
Microsoft Azure tags imported as service labels



Improved  
configuration

check\_mail: enable EWS and OAuth2 for Microsoft Mail monitoring\*  
CPU load: alert on 1 & 5-min average (before: only 15-min average)

# Better controls for CPU load monitoring

Example for improved configuration

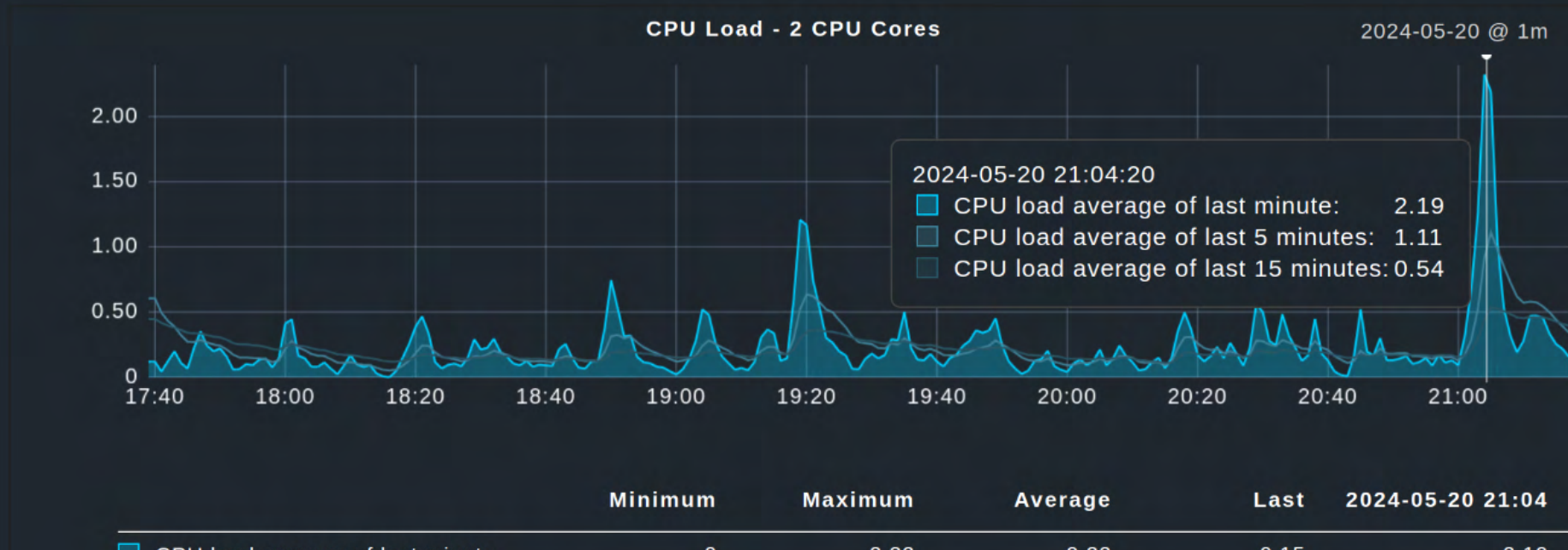


15 min load: 0.40

15 min load per core: 0.20 (2 cores)

Alerting limited to 15-min average

0.16



# Better controls for CPU load monitoring

Example for improved configuration

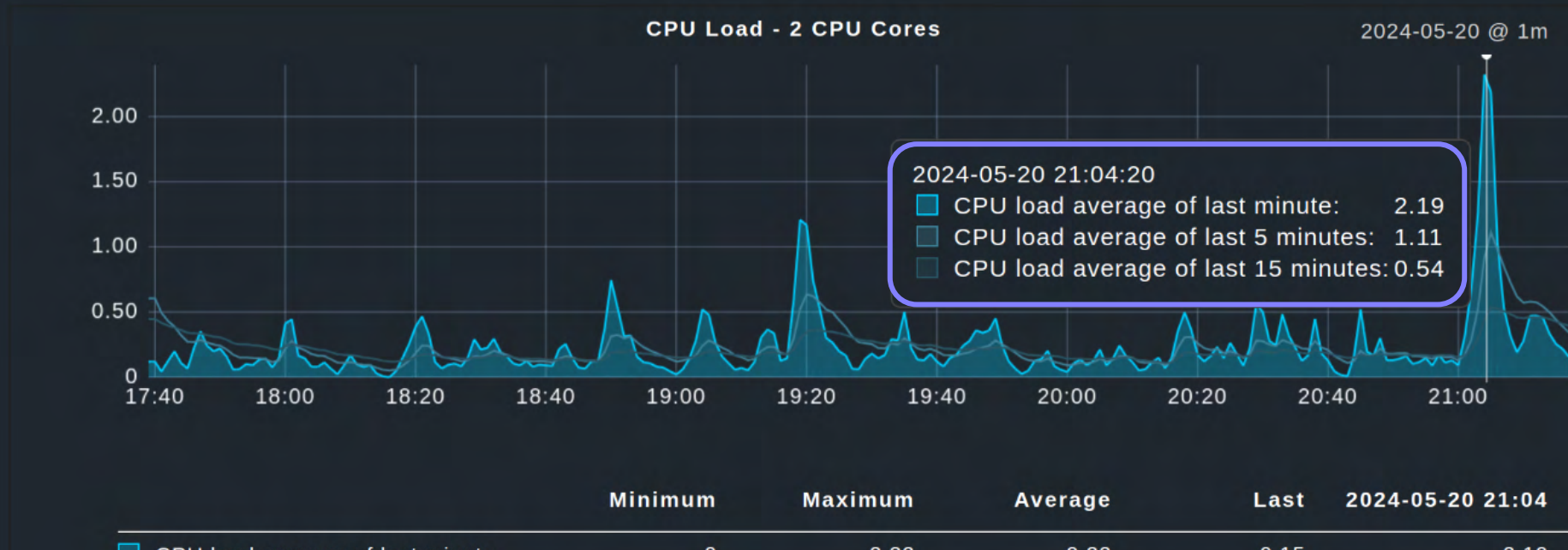


15 min load: 0.40

15 min load per core: 0.20 (2 cores)

Alerting limited to 15-min average

0.16



# Better controls for CPU load monitoring

Example for improved configuration

Before

▼ Value

Levels on CPU load

Fixed Levels ▼

Warning at 5.0 per core

Critical at 10.0 per core

# Better controls for CPU load monitoring

Example for improved configuration

Before

▼ Value

Levels on CPU load

Fixed Levels ▼

Warning at 5.0 per core

Critical at 10.0 per core

Now

▼ Value

☒ Levels on CPU load: 1 minute average

Fixed Levels ▼

Warning at 5.0 per core

Critical at 10.0 per core

☐ Levels on CPU load: 5 minutes average

☐ Levels on CPU load: 15 minutes average

# Better controls for CPU load monitoring

Example for improved configuration

Before

▼ Value

Levels on CPU load

Fixed Levels ▼

Warning at 5.0 per core

Critical at 10.0 per core

Now

▼ Value

☒ Levels on CPU load: 1 minute average

Fixed Levels ▼

Warning at 5.0 per core

Critical at 10.0 per core

☐ Levels on CPU load: 5 minutes average

☐ Levels on CPU load: 15 minutes average

This is not the default!

# Default parameters included in manpage now



checkmk



1

Help



User



## CPU Load

Setup > Services > Catalog of check plug-ins > Operating Systems > CPU, Memory and Kernel Performance > CPU Load

Related

Display

Help



Parameter rule set



CPU load (not utilization!)

Example for parameters



Levels on CPU load: 1 minute average



Levels on CPU load: 5 minutes average



Levels on CPU load: 15 minutes average

**Enable timespecific parameters**

Default parameters

Levels on CPU load: 1 minute average:

Do not impose levels, always be OK

Levels on CPU load: 5 minutes average:

Do not impose levels, always be OK

Levels on CPU load: 15 minutes average:

5.0 per core, 10.0 per core

# 100+ new and improved monitoring plug-ins



30+

new systems



# 100+ new and improved monitoring plug-ins



30+

new systems

75+

improvements

# 100+ new and improved monitoring plug-ins



**30+**

new systems

**75+**

improvements

**450+**

fixes

# 100+ new and improved monitoring plug-ins



30+

new systems

75+

improvements

450+

fixes



# Our focus for Checkmk 2.3



Cloud



Data Center



IoT

**Great user experience**  
for beginners  
and experts



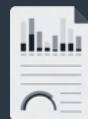
**Monitor anything**



**Powerful configuration**



**Alerts & analytics**



**Extensible interfaces**  
for automation  
& development



**Monitoring platform**  
Secure & scalable

# Host labels for 'all' operating systems

Label key	Description	Example values
cmk/os_type	Broad OS type category	windows linux unix
cmk/os_platform	Specific OS family	debian ubuntu
cmk/os_name	The name of the OS	Ubuntu AIX Microsoft Windows 10 Pro
cmk/os_version	The version of the operating system	22.04 10.0.19045

# Host labels for 'all' operating systems



Label key	Description	Example values
cmk/os_type	Broad OS type category	windows linux unix
cmk/os_platform	Specific OS family	debian ubuntu
cmk/os_name	The name of the OS	Ubuntu AIX Microsoft Windows 10 Pro
cmk/os_version	The version of the operating system	22.04 10.0.19045





Customize



Setup



Help



User



Before

## ▼ Conditions

Condition type .....

Explicit conditions ▼

Folder .....

Main ▼

Host tags .....



Add tag condition

Host labels .....

Add label condition



has ▼

cmk/os\_family:linux



has not ▼

environment:test

Explicit hosts ..... ☐

Item ..... ☐

Service labels .....

Add label condition



has ▼

app:foo



Customize



Setup



Help

Folder ..... Main

Host tags .....

Host labels .....

Label

is

cmk/os\_type:linux

or

cmk/os\_type:windows

and

(Select label)

and

is

cmk/aws/tag/environment:production

and

(Select label)



Add to condition

Explicit hosts ..... ☐

Item ..... ☐

Service labels .....

Label

is

app:foo

or

app:bar

or

(Select label)

Combine labels as you wish!

More flexible rule conditions







Customize



Setup



Help

u



Folder .....

Main

**Yes, also via the REST API!!!**

Host tags .....

Host labels .....

Label

is



cmk/os\_type:linux



or



cmk/os\_type:windows



and



(Select label)



and



is



cmk/aws/tag/environment:production



and



(Select label)



Add to condition

Explicit hosts .....



Item .....



Service labels .....

Label

is



app:foo



or



app:bar



or



(Select label)

**Combine labels as you wish!**

More flexible rule conditions





checkmk



Monitor



Customize



Setup

# Services of Host my-linux-server

Monitor > Overview > All hosts > my-linux-server > Services of Host

Commands

Host

Services

Export

Display

Help



## my-linux-server

State	Service	Icons	Summary
OK	Check_MK		[agent] Success, [piggyback] Success (but no data found for this host), executio
OK	Check_MK Agent		Version: 2.3.0-2024.05.15, OS: linux, TLS is not activated on monitored host (se plug-ins: 0, Local checks: 0
WARN	Check_MK Discovery		Services: all up to date, New host labels: 6 (check_mk: 5, omd_info: 1) <b>WARN</b>
OK	CPU load		15 min lo 0.19 (8 cores)
OK	CPU utilization		Total CP
OK	Disk IO SUMMARY		Read: 0.00 B/s, Write: 1.67 MB/s, Latency: 429 microseconds
OK	File /etc/check_mk/fileinfo.cfg		Size: 56 B, Age: 57 days 8 hours
OK	File /home/martinhirschvogel/test		Size: 0 B, Age: 57 days 8 hours
OK	Filesystem /		Used: 27.29% - 136 GB of 499 GB, trend per 1 day 0 hours: +418 GB, trend per +83.87%, Time left until disk full: 20 hours 48 minutes
OK	Filesystem /boot		Used: 24.37% - 420 MB of 1.73 GB, trend per 1 day 0 hours: +0 B, trend per 1 c

More labels →  
more clicks?

# Here comes the revised periodic service discovery



## Before

Automatically update service configuration

Mode

Add unmonitored services, new host labels ▲

Add unmonitored services, new host labels

Remove vanished services

Add unmonitored & remove vanished services and host labels

Refresh all services and host labels (tabula rasa)

## Limited control

- ❖ No option to only update host labels

# Here comes the revised periodic service discovery



## Before

Automatically update service configuration

Mode

Add unmonitored services, new host labels ▲

Add unmonitored services, new host labels

Remove vanished services

Add unmonitored & remove vanished services and host labels

Refresh all services and host labels (tabula rasa)

## Limited control

- ❖ No option to only update host labels

## Now

Automatically update service configuration

Parameters

Custom service configuration update ▼

- ☐ Monitor undecided services
- ☐ Remove vanished services
- ☐ Update service labels
- ☒ Update host labels

## Fine-grained control

- Combine options as you need
- Available also in bulk service discovery and REST API

# Here comes the revised periodic service discovery



## Before

Automatically update service configuration

Mode

Add unmonitored services, new host labels ▲

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Refresh all services and host labels (tabula rasa)

## Now

Automatically update service configuration

Parameters

Custom service configuration update ▼

☐ Monitor undecided services

☐ Remove vanished services

☒ Update service labels

☒ Update host labels

## Limited control

- ❖ No option to only update host labels

## Fine-grained control

- Combine options as you need
- Available also in bulk service discovery and REST API



Changed services: 4 | Undecided services: 0 | Vanished services: 0 | New host labels: 0 | Vanished host labels: 0 | Changed host labels: 0

	State	Service	Summary	Previously discovered	Newly discovered
	OK	Interface GigabitEthernet1/0/1	[SAUG01-02.A1(LI)], (up), MAC: 58:F3:9C:AD:E0:81, B/s (0%)	interface/alias:AUG03	interface/alias:SAUG01
	OK	Interface GigabitEthernet1/1/1	[Up_SAUG01-01.1/0/7], (up), MAC: 58:F3:9C:AD:E0:B1, 0.00 B/s (0%)		+ interface/alias:SAUG01
	OK	Interface GigabitEthernet1/1/4	[Up_SAUG01-01.3/0/1], (up), MAC: 58:F3:9C:AD:E0:B4, 0.00 B/s (0%)		+ interface/alias:SAUG01
	OK	Interface Port-channel1	[Up_SAUG01-01.PO3], (up), MAC: 58:F3:9C:AD:E0:B4, B/s (0%)		+ interface/alias:SAUG01

- No more 'tabula rasa' needed to update service labels
- New options in service discovery: update individual or all service labels
- Improved visualization of service label changes

Monitor

Customize

Setup

## Services of host switch-cisco-c3650

Setup > Hosts > Main > SNMP > Properties of host switch-cisco-c3650 > Services of host switch-cisco-c3650

Actions

Host

Settings

Display

Help

Changed services: 4

Undecided services: 0

Vanished services: 0

New host labels: 0

Vanished host labels: 0

Changed host labels: 0

?

x

OK

Interface GigabitEthernet1/0/1

[SAUG01-02.A1(LI)], (up), MAC: 58:F3:9C:AD:E0:81, B/s (0%)

interface/alias:AUG03

interface/alias:SAUG01

?

x

OK

Interface GigabitEthernet1/1/1

[Up\_SAUG01-01.1/0/7], (up), MAC: 58:F3:9C:AD:E0:B1, 0.00 B/s (0%)

interface/alias:SAUG01

?

x

OK

Interface GigabitEthernet1/1/4

[Up\_SAUG01-01.3/0/1], (up), MAC: 58:F3:9C:AD:E0:B4, 0.00 B/s (0%)

interface/alias:SAUG01

?

x


OK

Interface Port-channel1

[Up\_SAUG01-01.PO3], (up), MAC: 58:F3:9C:AD:E0:B4, B/s (0%)






interface/alias:SAUG01

- No more 'tabula rasa' needed to update service labels
- New options in service discovery: update individual or all service labels
- Improved visualization of service label changes

  
checkmk  
Monitor  
Customize  
Setup

















## Services of host switch-cisco-c3650


Setup > Hosts > Main > SNMP > Properties of host switch-cisco-c3650 > Services of host switch-cisco-c3650

Actions Host Settings Display Help      

 Changed services: 4 | Undecided services: 0 | Vanished services: 0 | New host labels: 0 | Vanished host labels: 0 | Changed host labels: 0

### Changed services (4)

	State	Service	Summary
   	OK	Interface GigabitEthernet1/0/1	[SAUG01-02.A1(LI)], (up), MAC: 58:F3:9C:AD:E0:81, B/s (0%)
   	OK	Interface GigabitEthernet1/1/1	[Up_SAUG01-01.1/0/7], (up), MAC: 58:F3:9C:AD:E0:B1, 0.00 B/s (0%)
   	OK	Interface GigabitEthernet1/1/4	[Up_SAUG01-01.3/0/1], (up), MAC: 58:F3:9C:AD:E0:B4, 0.00 B/s (0%)
   	OK	Interface Port-channel1	[Up_SAUG01-01.PO3], (up), MAC: 58:F3:9C:AD:E0:B4, B/s (0%)

Previously discovered	Newly discovered
interface/alias:AUG03	 interface/alias:SAUG01
	+ interface/alias:SAUG01
	+ interface/alias:SAUG01
	+ interface/alias:SAUG01

- No more 'tabula rasa' needed to update service labels
- New options in service discovery: update individual or all service labels
- Improved visualization of service label changes



# More service discovery improvements!



## More consistency

'Automatically update service configuration' enabled & 'Do not activate changes'  
→ Changes now appear in 'Activate pending changes' & audit log

# More service discovery improvements!



## More consistency

'Automatically update service configuration' enabled & 'Do not activate changes'  
→ Changes now appear in 'Activate pending changes' & audit log



## Better error messages:

'Rediscovery scheduled' (but rediscovery will not do anything!)  
→ 'Automatic rediscovery currently not possible due to failing data source(s).  
Please run service discovery manually' <sup>1)</sup>

# More service discovery improvements!



## More consistency

'Automatically update service configuration' enabled & 'Do not activate changes'  
→ Changes now appear in 'Activate pending changes' & audit log



## Better error messages:

'Rediscovery scheduled' (but rediscovery will not do anything!)  
→ 'Automatic rediscovery currently not possible due to failing data source(s).  
Please run service discovery manually' <sup>1)</sup>



## More transparent service discovery: <sup>2)</sup>



# Our focus for Checkmk 2.3



Cloud



Data Center



IoT

**Great user experience**  
for beginners  
and experts



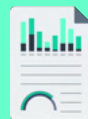
**Monitor anything**



**Powerful configuration**



**Alerts & analytics**



**Extensible interfaces**  
for automation  
& development



**Monitoring platform**  
Secure & scalable



## Top 10: CPU utilization

Host	CPU utilization
server-linux-diskstat-3	<div><div></div></div> 29.43%
localhost	<div><div></div></div> 27.75%
server-linux-veritas-3	<div><div></div></div> 23.19%
server-linux-mysql-3	<div><div></div></div> 13.82%
server-linux-job-3	<div><div></div></div> 12.95%
server-linux-heartbeat-3	<div><div></div></div> 12.91%
server-linux-oracle-3	<div><div></div></div> 7.65%
server-linux-oracle-13	<div><div></div></div> 6.67%
server-linux-web-3	<div><div></div></div> 4.44%
server-linux-13	<div><div></div></div> 2.21%

## Bottom 10: Used space %

Host	Service	Used space %
server-linux-docker-3	Filesystem /	<div><div></div></div> 6.84%
server-linux-ipmi-3	Filesystem /	<div><div></div></div> 7.82%
server-linux-multipath-3	Filesystem /	<div><div></div></div> 17.98%
server-linux-heartbeat-3	Filesystem /	<div><div></div></div> 26.26%
server-linux-13	Filesystem /	<div><div></div></div> 26.51%
localhost	Filesystem /	<div><div></div></div> 28.32%
server-linux-multipath-30	Filesystem /	<div><div></div></div> 31.67%
server-linux-job-3	Filesystem /	<div><div></div></div> 34.4%
server-linux-diskstat-3	Filesystem /	<div><div></div></div> 36.14%
server-linux-oracle-3	Filesystem /	<div><div></div></div> 36.69%

# Available as easily configurable dashlets






## Top lists dashlet


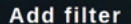
- Rank any metric
- Add to dashboards easily
- Filter via flexible host and service filters
- Find the right metric with helper functions
- Simple configuration
- Quick loading time, even in large environments


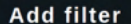
### Add element: Top list

Monitor > Other > Top consumers > Add element: Top list



Element Display Help   

#### Context / Search Filters

Host .....  

Service .....  

#### Properties


Metric ..... CPU utilization  

Filter metric selection by host name: (Select hostname)

Filter metric selection by service: (Select service)

Columns ..... ☐ Show service description

☒ Show bar visualization

Data range ..... Automatically adjusted to available data 

Ranking order ..... Top (highest) N 

Limit to ..... 10 entries (max. 50)

# Powered by new livestatus functionality

Enable Top lists and much more in the future

## New OrderBy header

```
$ lq 'GET hosts\nColumns: name\nOrderBy: name asc'  
ahost  
bhost  
...
```

```
$ lq 'GET hosts\nColumns: name\nOrderBy: name\nLimit: 1'  
ahost
```

# Powered by new livestatus functionality

Enable Top lists and much more in the future

## New column performance\_data

```
OMD[heute]:~$ lq << EOF
> GET services
> Columns: description performance_data
> Filter: description = CPU load
> OutputFormat: python
> EOF
[["CPU load", {"load1":0.62,"load5":0.64,"load15":1.13}]]
```



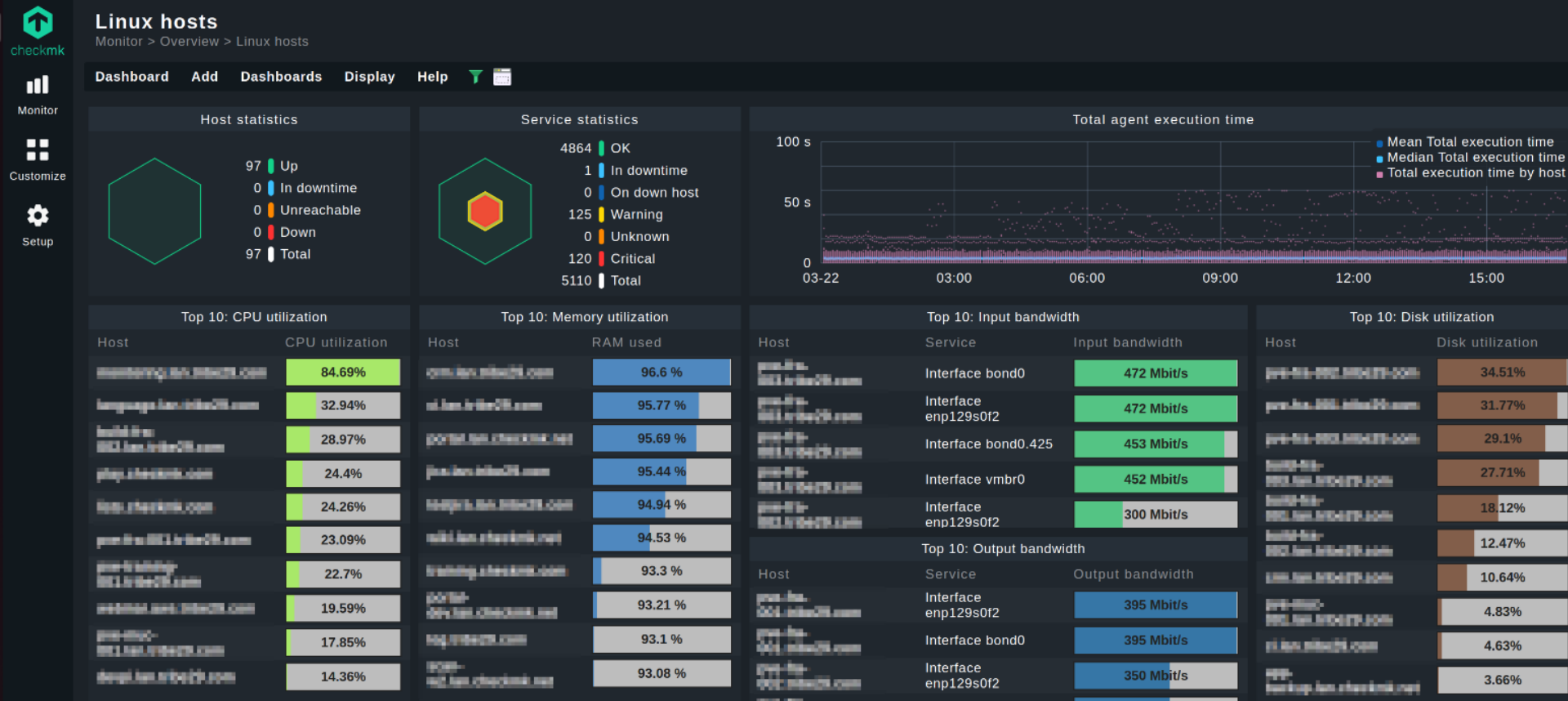


# Powered by new livestatus functionality

Enable Top lists and much more in the future

## Combination of new column performance\_data and OrderBy header

```
$ lq << EOF
GET services
Columns: host_name description performance_data
OrderBy: performance_data.user_time
EOF
...
```



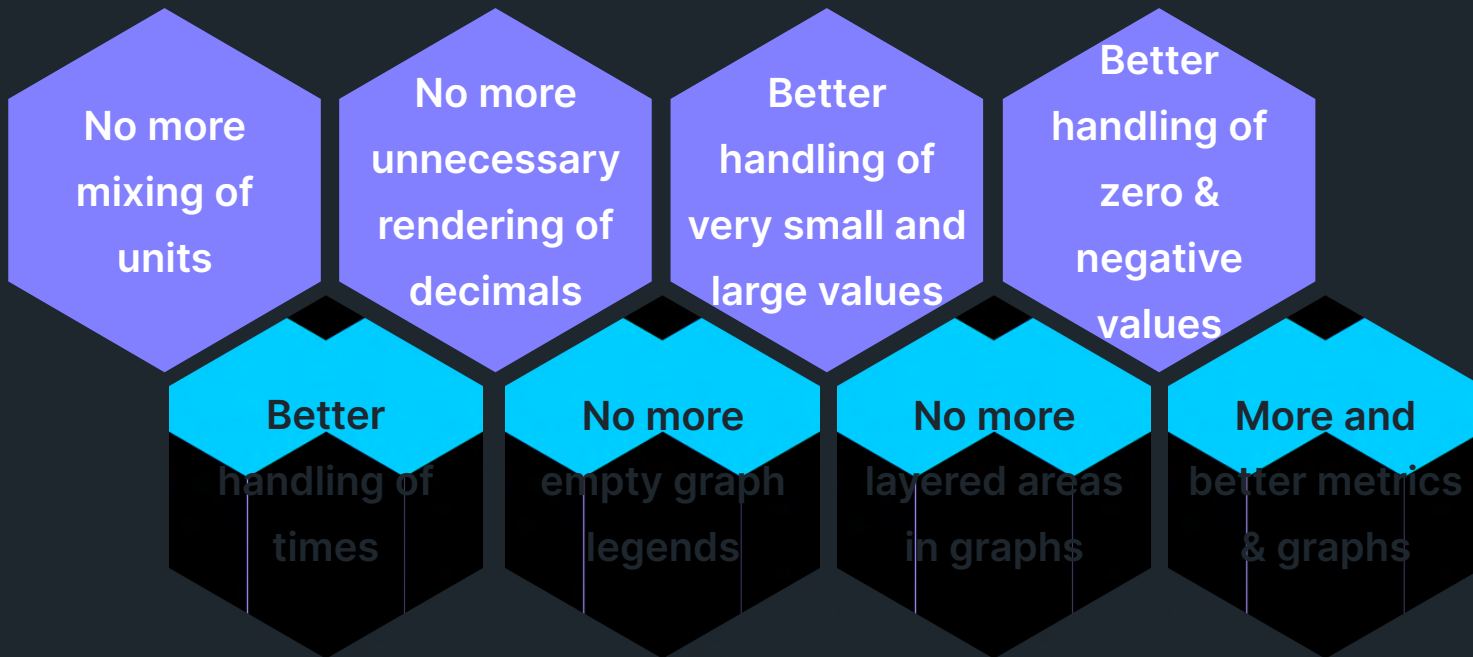
## New Linux and Windows overview dashboards

Utilizing Top lists to render quickly in any environment

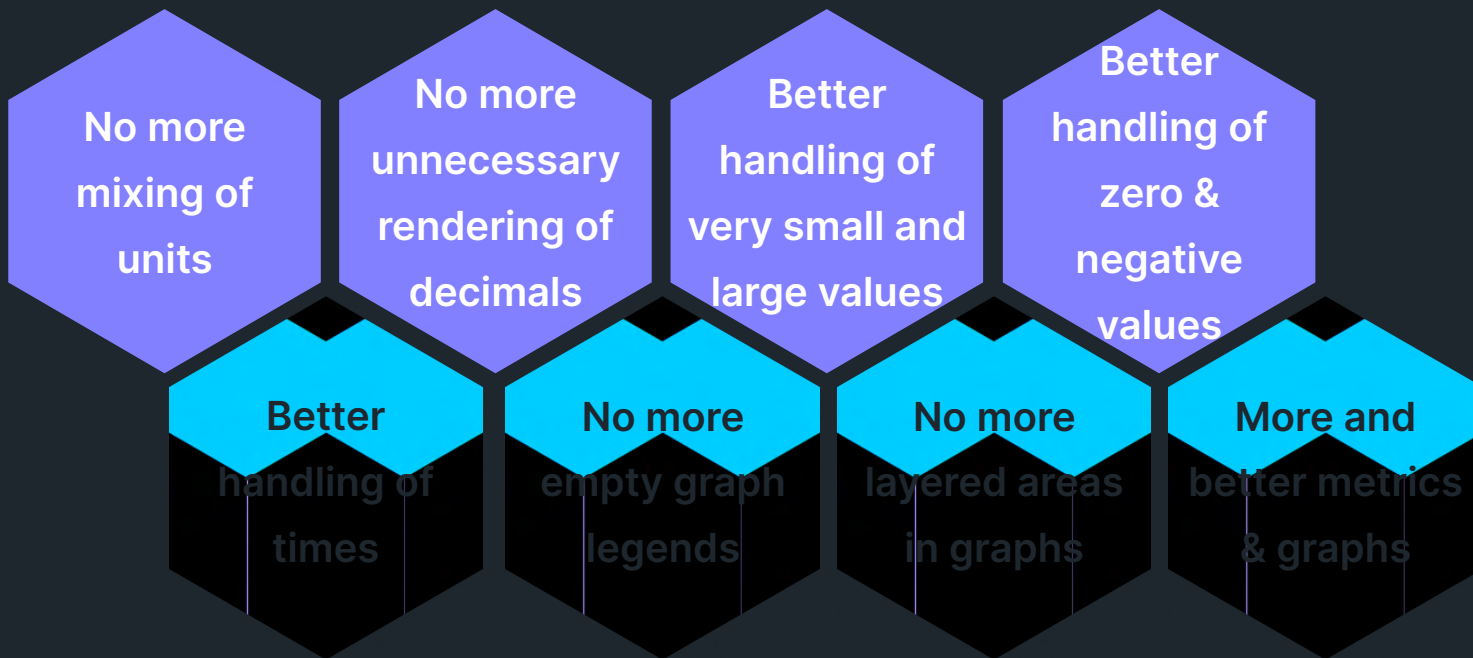


Disk IO		Uptime	
monitoring.lan.checkmk.net	Ubuntu 22.04	5.83 s	5.32%
monitoring.lan.checkmk.net	Ubuntu 22.04	5.82 s	3.24%

# Quality of Life improvements for graphs



# Quality of Life improvements for graphs



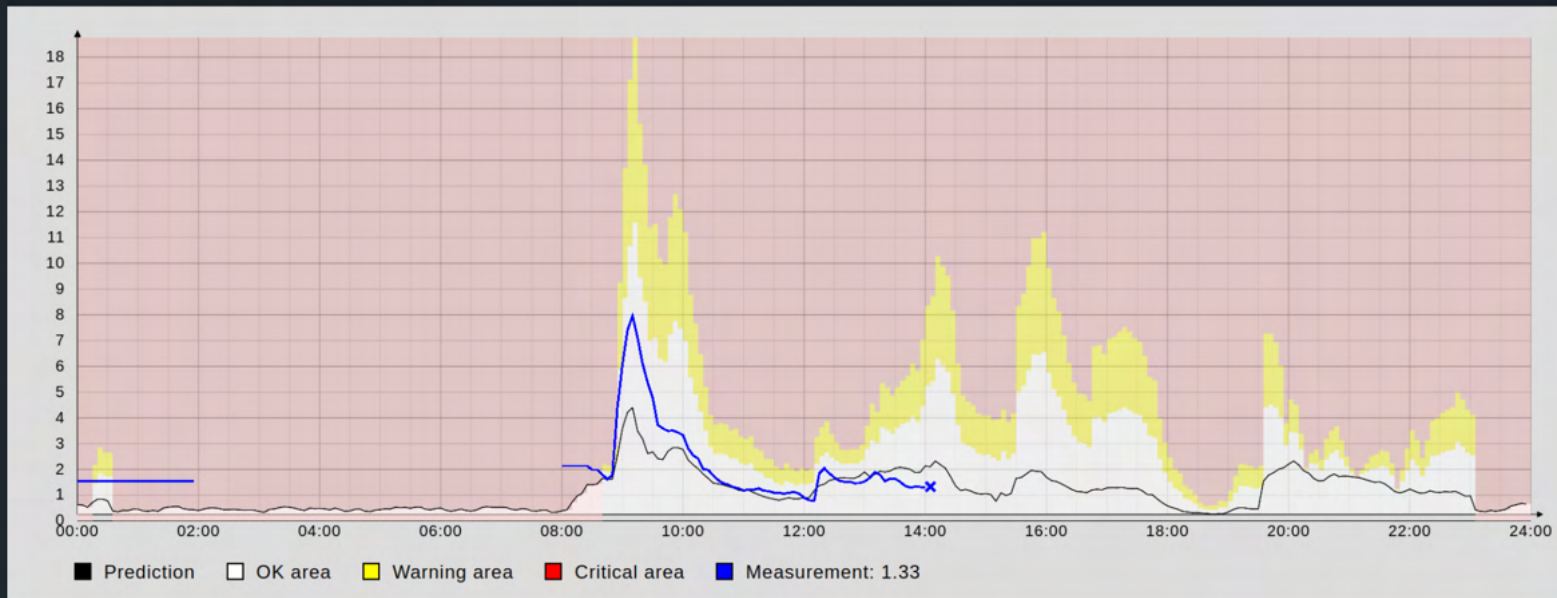
**New in 2.3: More developer APIs**

16:35 – 17:15 | Moritz Kiemer (Team Lead Development)

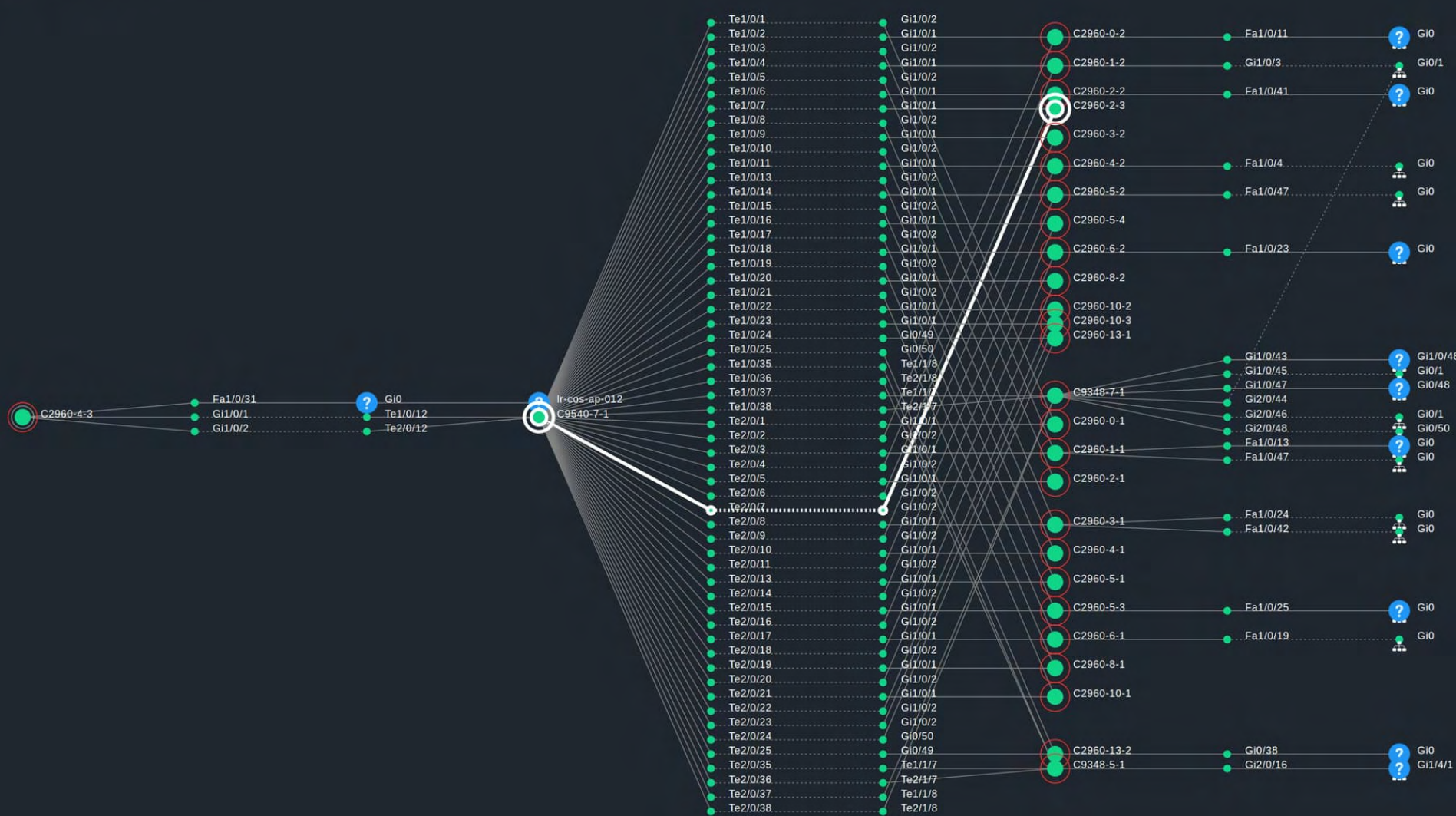
# Machine-learning based predictive monitoring



Show prediction for 2024-05-22 (hour of the day) ▾

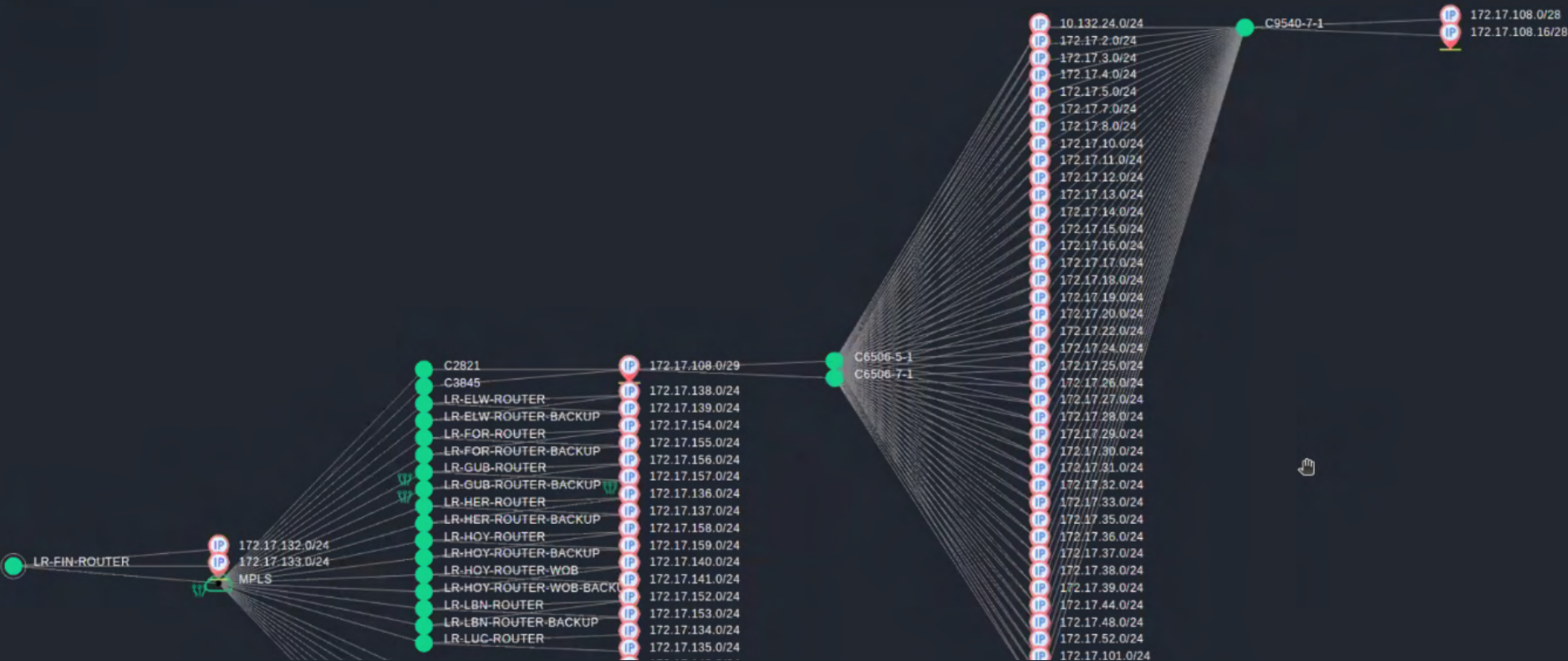


- Prediction graphs of remote sites can be viewed on central site
- Several Quality of Life improvements, e.g. more robust predictions, better UI



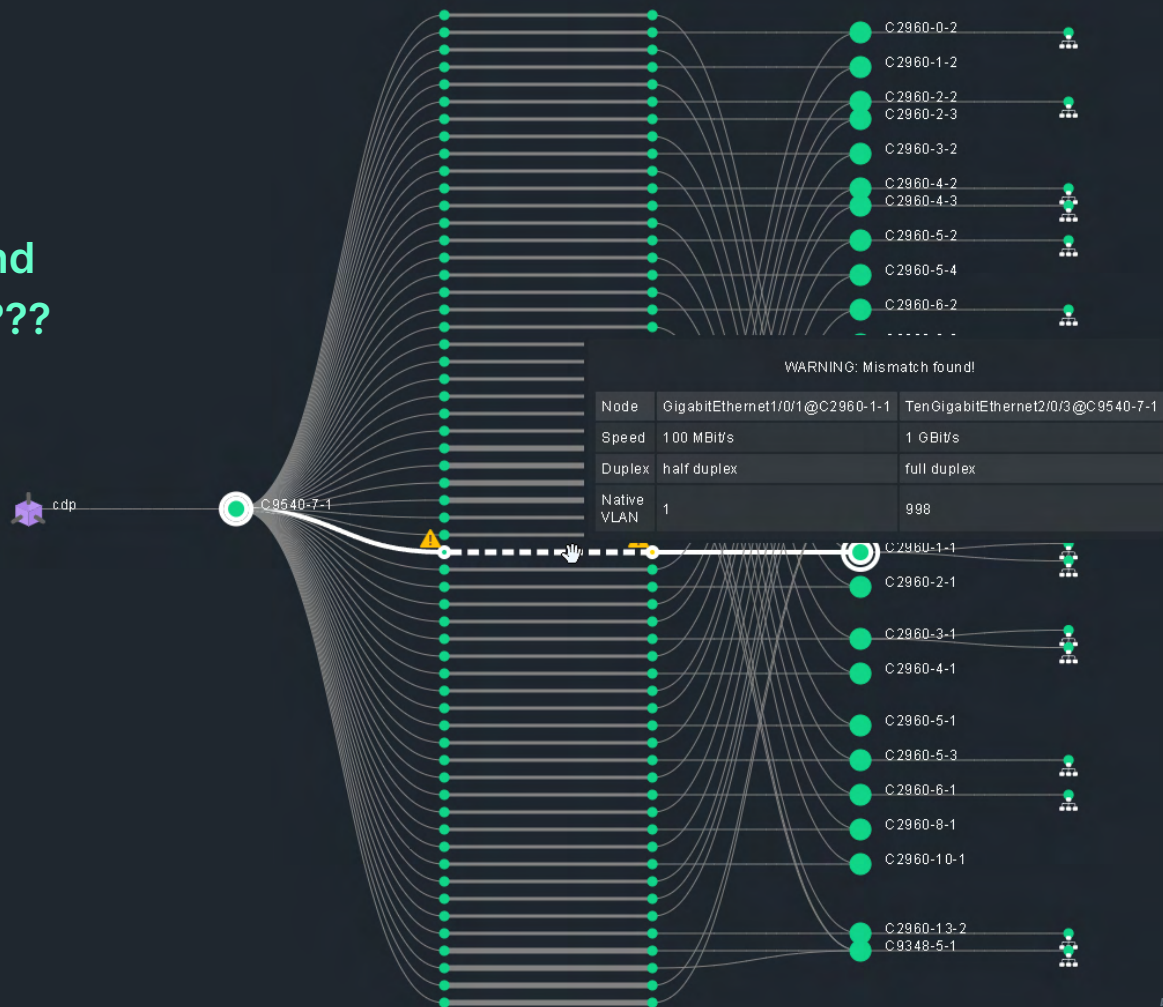


# This looks cool...



# This looks cool...

## What... Can Checkmk do L2 and L3 network visualization now???

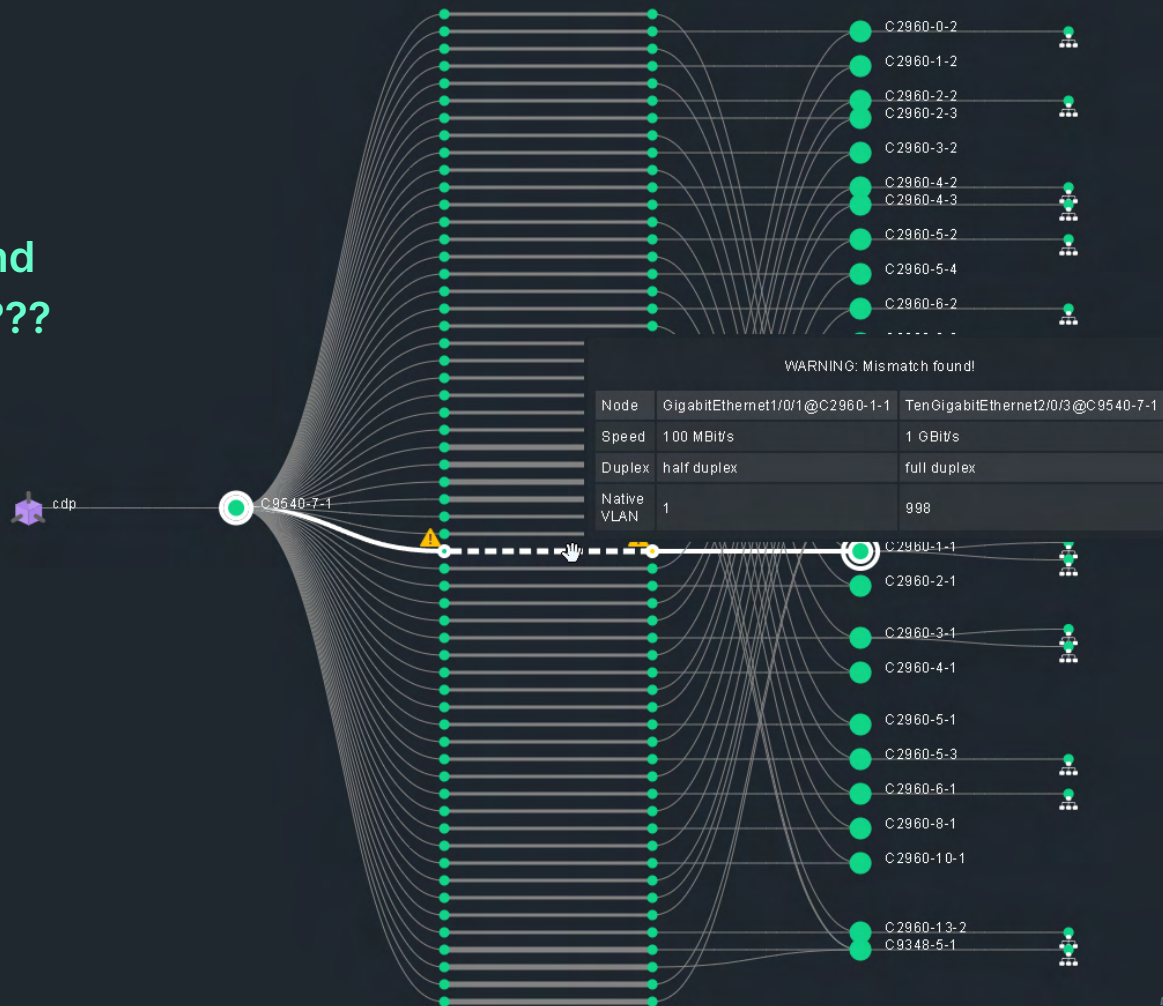




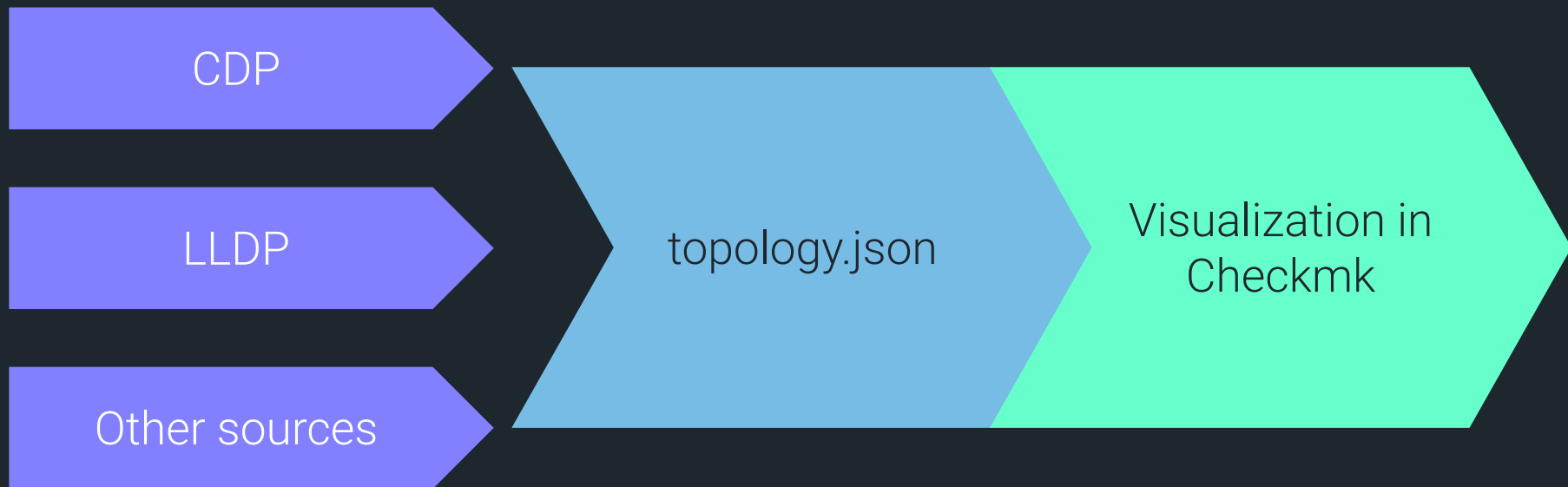
# This looks cool...

## What... Can Checkmk do L2 and L3 network visualization now???

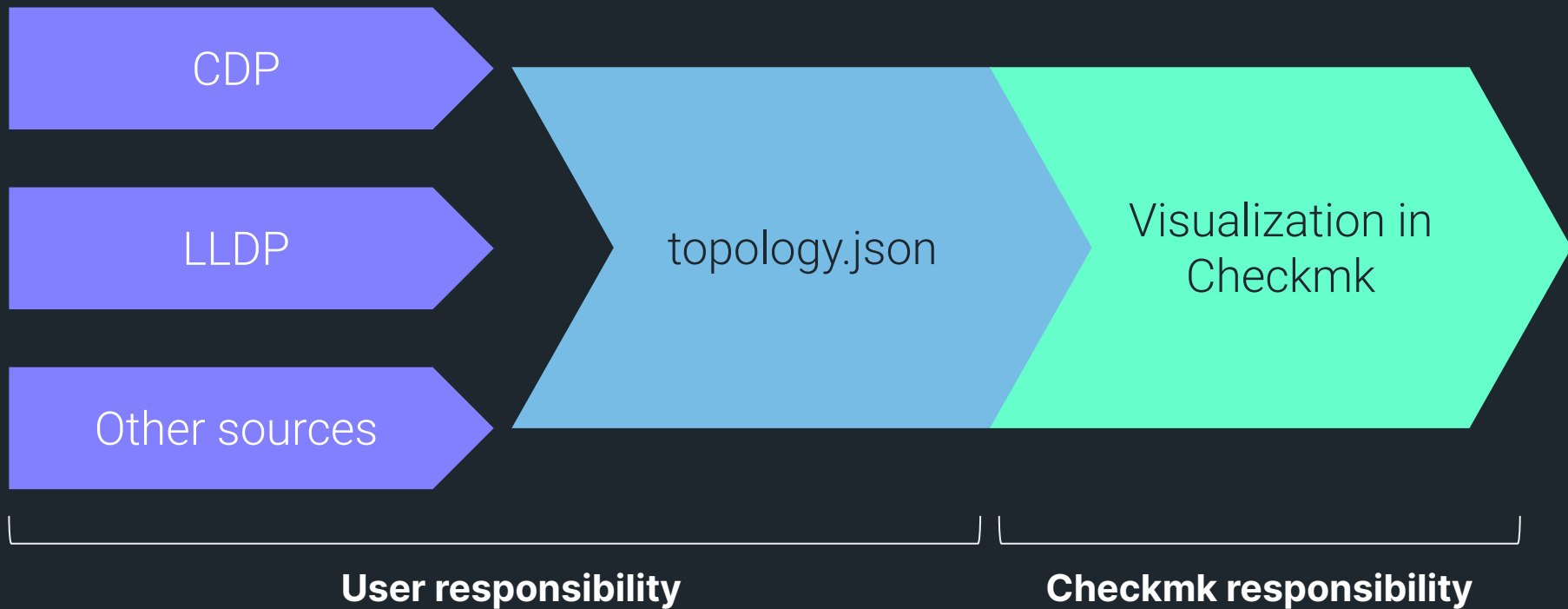
Kind of ...



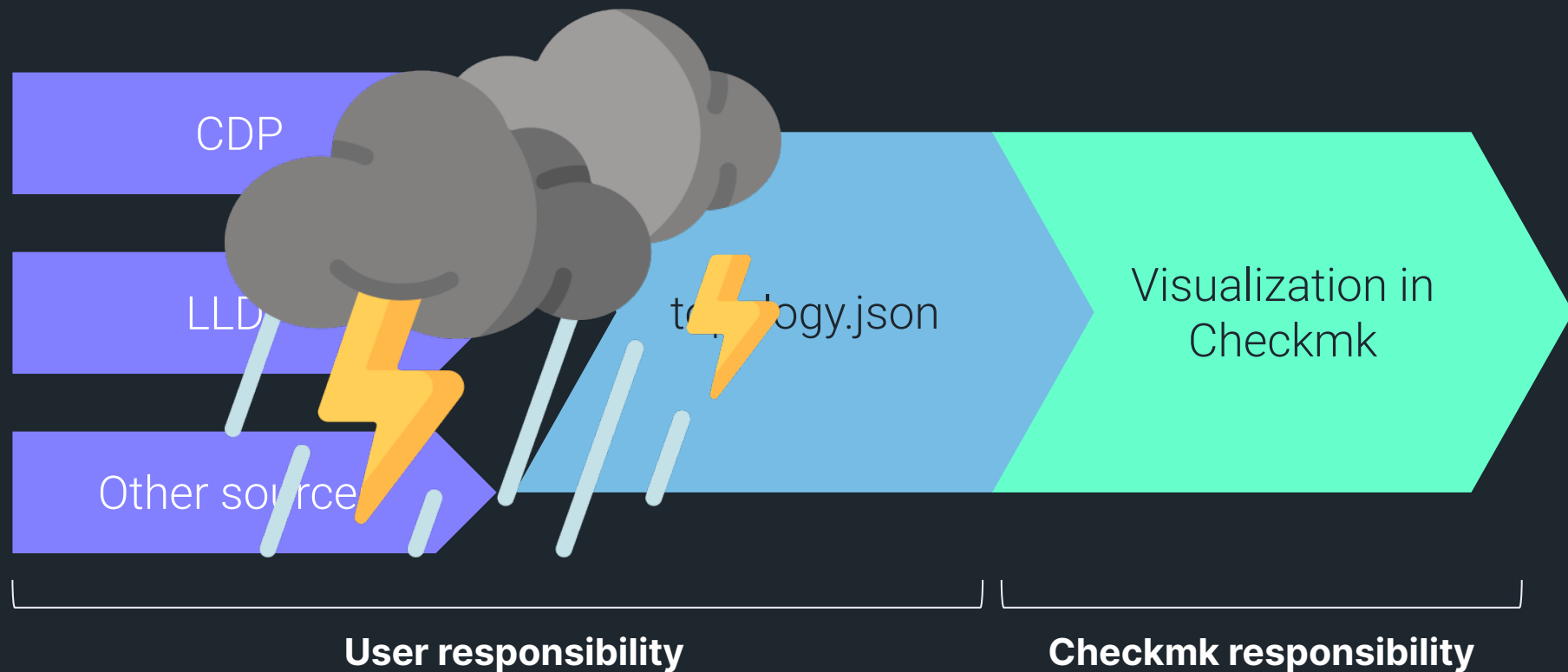
# We provide a powerful backend for visualizations



# We provide a powerful backend for visualizations



# We provide a powerful backend for visualizations



# Network Visualization data creation (or how to get the Network Visualization working) ✎

■ Checkmk Exchange



**thl-cmk** Code Contributor

3 ✎

Oct 20, 2023

@schnetz wrote in [Network Visualization](#) 10



Network Visualization



Where does the information of the connections come from?

Its up to you to provide this information via a json file - and it will be in the foreseeable future.

and



Network Visualization



If you can not provide the data mentioned above, the network layer visualization will not work at all.

Maybe there is a solution now. With my network visualization data creation plugin you can create the required `network_data.json` file from your Checkmk

# The solution for data creation

Network Visualization Data Creation Tool by `thl-cmk` 



# The solution for data creation

Network Visualization Data Creation Tool by **thl-cmk** 

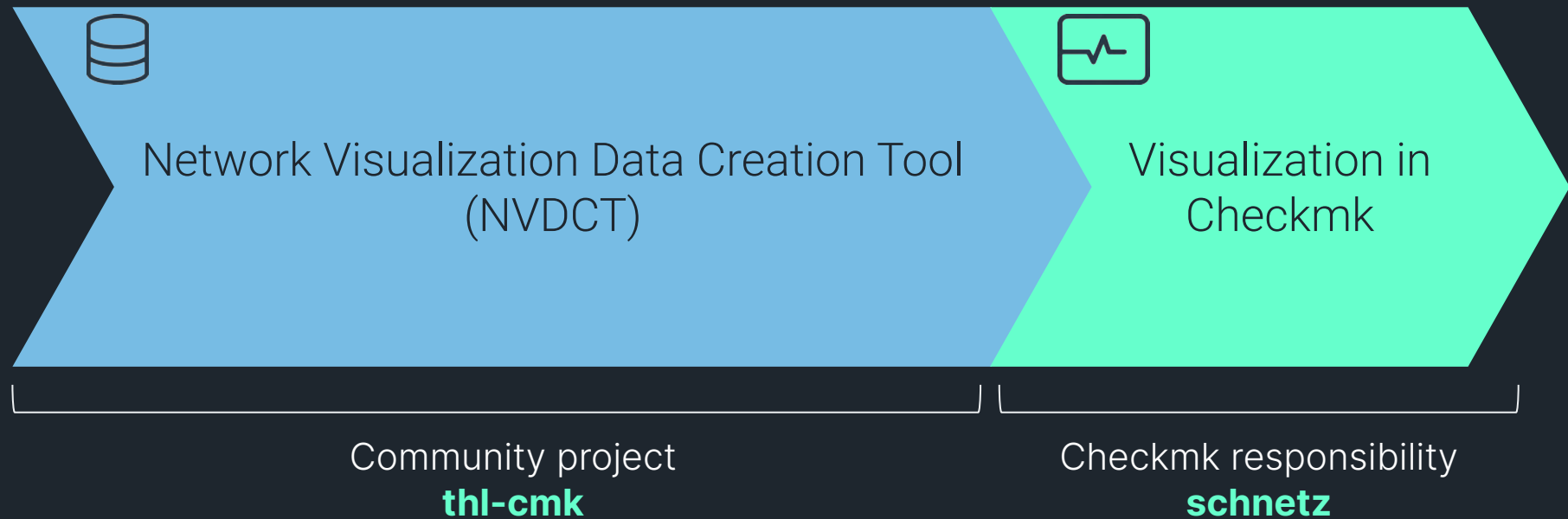


Visualization in  
Checkmk

Checkmk responsibility  
**schnetz**

# The solution for data creation

Network Visualization Data Creation Tool by **thl-cmk** 





# Network Visualization Data Creation Tool

by thl-cmk



Create Layer 2 (CDP/LLDP) topology

---

# Network Visualization Data Creation Tool

by thl-cmk



Create Layer 2 (CDP/LLDP) topology

---



Create Layer 3 (IPv4) topology

---

# Network Visualization Data Creation Tool

by thl-cmk



Create Layer 2 (CDP/LLDP) topology

---



Create Layer 3 (IPv4) topology

---



Highlight connection issues (speed, duplex/half duplex, native VLAN)

---

# Network Visualization Data Creation Tool

by thl-cmk



Create Layer 2 (CDP/LLDP) topology

---



Create Layer 3 (IPv4) topology

---



Highlight connection issues (speed, duplex/half duplex, native VLAN)

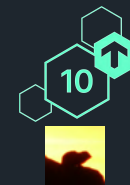
---



Custom connections (STATIC) for data that is not in Checkmk

# Plugin(s) for data collection

Components of Network Visualization Data Creation Tool by [thl-cmk](#)



Automatic  
population of **HW/  
SW inventory**  
with data

## Requires

[CDP cache plugin](#)

[LLDP cache plugin](#)

[IPv4 address plugin](#)

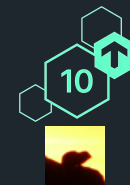
[Interface name plugin](#)

HW/SW inventory

Host labels

# Plugin(s) for data collection

Components of Network Visualization Data Creation Tool by [thl-cmk](#)



Automatic  
population of HW/  
SW inventory  
with data

## Requires

[CDP cache plugin](#)

[LLDP cache plugin](#)

[IPv4 address plugin](#)

[Interface name plugin](#)

HW/SW inventory

Host labels

Networking

Total interfaces	20
Ports	10
Ports available	8

IP Addresses ▼

Address	Device	Address Type	CIDR	Netmask	Network
169.254.200.200	Tu200	IPv4	24	255.255.255.0	169.254.200.0
169.254.201.200	Tu201	IPv4	24	255.255.255.0	169.254.201.0
169.254.202.200	Tu202	IPv4	24	255.255.255.0	169.254.202.0
172.20.200.254	Gi0.2200	IPv4	24	255.255.255.0	172.20.200.0
172.20.201.254	Gi0.2201	IPv4	24	255.255.255.0	172.20.201.0
172.20.202.254	Gi0.2202	IPv4	24	255.255.255.0	172.20.202.0
192.168.200.240	Fa8	IPv4	24	255.255.255.0	192.168.200.0

Network interfaces ▶

LLDP cache ▼

Local Name	CS200254
Local Id	74:80:00:00:00:00

LLDP Neighbours ▼


Neighbour Name	Neighbour Port	Local Port	Neighbour Address	Neighbour ID	Capabilities	Capabilities Supported	Neighbour Port De
CS200254	27	Fa8	192.168.200.254	00:11:11:11:11:11	Phone, WLAN AP	Phone, WLAN AP	B3
CS200254	28	Gi0	00:11:11:11:11:11	00:11:11:11:11:11	Phone, WLAN AP	Phone, WLAN AP	B4

# Plugin(s) for network data collection and analysis

Components of Network Visualization Data Creation Tool by thl-cmk



Automatic  
population of **HW/  
SW inventory**  
with data



## Requires

[CDP cache plugin](#)

[LLDP cache plugin](#)

[IPv4 address plugin](#)

[Interface name plugin](#)

HW/SW inventory

Host labels

# Plugin(s) for network data collection and analysis

Components of Network Visualization Data Creation Tool by thl-cmk



Automatic  
population of **HW/  
SW inventory**  
with data

**Configuration of**  
network  
visualization data  
creation tool

## Requires

[CDP cache plugin](#)

[LLDP cache plugin](#)

[IPv4 address plugin](#)

[Interface name plugin](#)

HW/SW inventory

Host labels

## Modify a copy of

~/local/bin/nvdct/  
nvdct.toml



# Plugin(s) for network data collection and analysis

Components of Network Visualization Data Creation Tool by thl-cmk



Automatic  
population of **HW/  
SW inventory**  
with data

**Configuration** of  
network  
visualization data  
creation tool

**Automatic  
analysis** of  
network  
connections

## Requires

[CDP cache plugin](#)  
[LLDP cache plugin](#)  
[IPv4 address plugin](#)  
[Interface name plugin](#)  
HW/SW inventory  
Host labels

## Modify a copy of

~/local/bin/nvdct/  
nvdct.toml

## Run

~/local/bin/nvdct/  
nvdct.py ...

# Plugin(s) for network data collection and analysis

Components of Network Visualization Data Creation Tool by thl-cmk



Automatic  
population of **HW/  
SW inventory**  
with data

**Configuration** of  
network  
visualization data  
creation tool

**Automatic  
analysis** of  
network  
connections

**Network  
visualization**

## Requires

[CDP cache plugin](#)  
[LLDP cache plugin](#)  
[IPv4 address plugin](#)  
[Interface name plugin](#)  
HW/SW inventory  
Host labels

## Modify a copy of

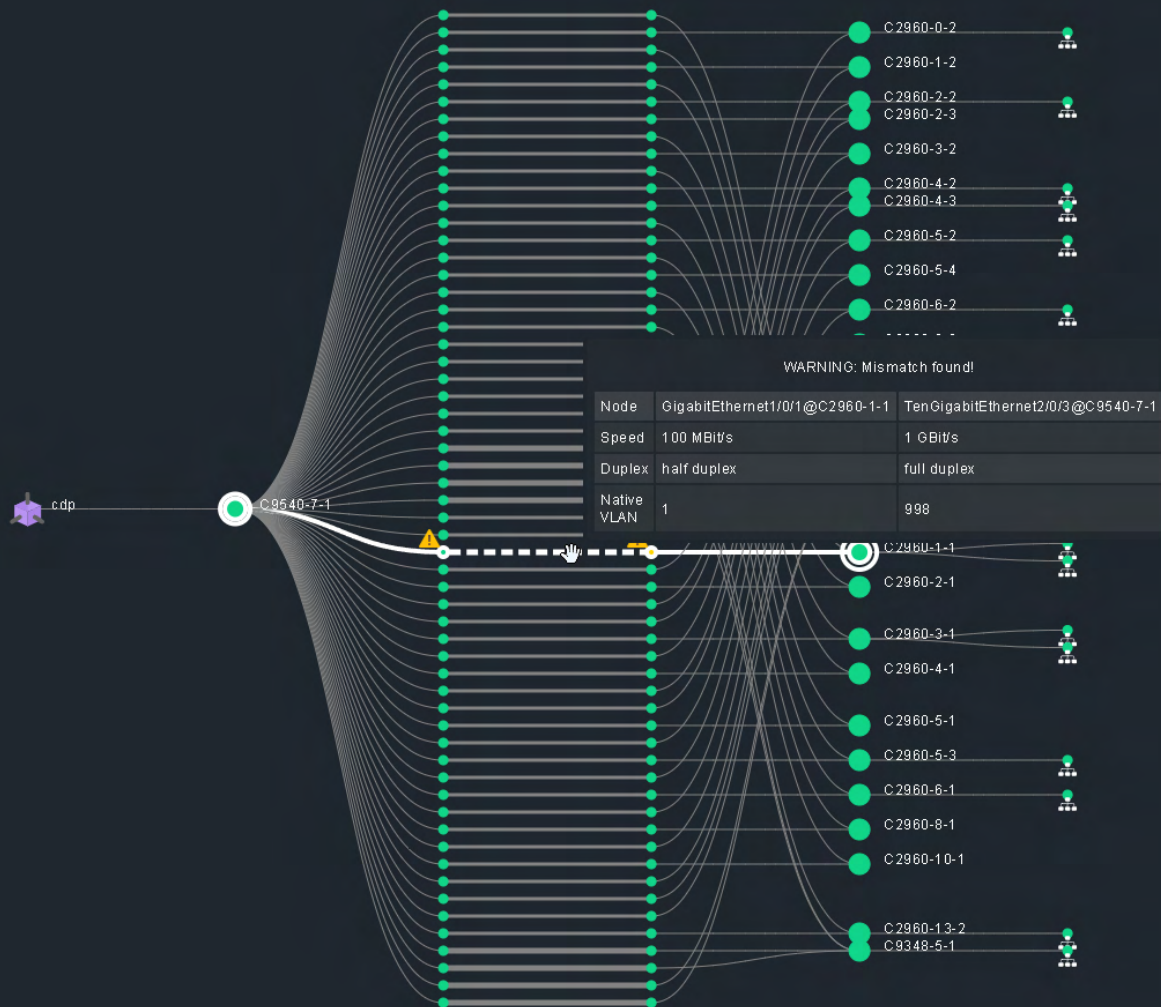
~/local/bin/nvdct/  
nvdct.toml

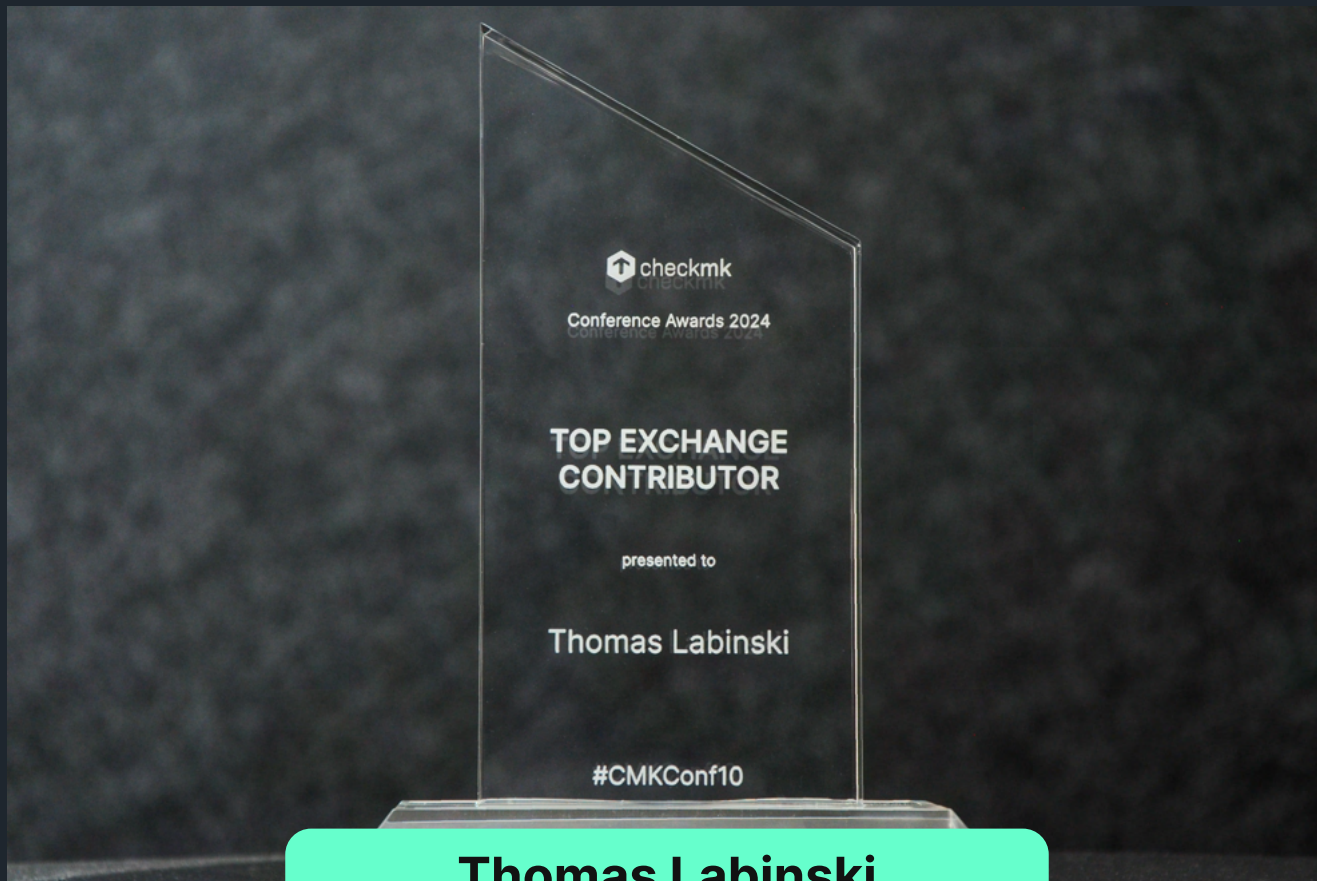
## Run

~/local/bin/nvdct/  
nvdct.py ...

## Accessible via host icon

Network layer topology  
  
Use as basis to further  
tune your nvdct.toml  
configuration





**Thomas Labinski**  
Top Exchange Contributor

# Our focus for Checkmk 2.3



Cloud

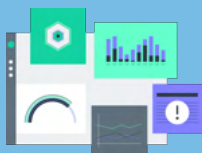


Data Center



IoT

**Great user experience**  
for beginners  
and experts



**Monitor anything**



**Powerful configuration**



**Alerts & analytics**



**Extensible interfaces**  
for automation  
& development



**Monitoring platform**  
Secure & scalable

# Numerous UX improvements in 2.3!



**Consistency**

# Numerous UX improvements in 2.3!



**Consistency**



**Efficiency**

# Numerous UX improvements in 2.3!



**Consistency**



**Efficiency**



**Error  
prevention &  
recovery**



# Numerous UX improvements in 2.3!



**Consistency**



**Efficiency**



**Error  
prevention &  
recovery**



**Accessibility**

# Numerous UX improvements in 2.3!



**Consistency**



**Efficiency**



**Error  
prevention &  
recovery**



**Accessibility**



**New in 2.3: Improved UX**

17:15 - 18:00 | Tanja Hohenstatt (UX Designer, Checkmk)

# Our focus for Checkmk 2.3



Cloud



Data Center



IoT

**Great user experience**  
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and experts



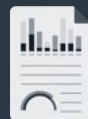
**Monitor anything**



**Powerful configuration**



**Alerts & analytics**



**Extensible interfaces**  
for automation  
& development



**Monitoring platform**  
Secure & scalable

# All aspects of a monitoring plug-in now covered

New developer APIs



## Special Agent / Active Check

Server-side calls API v1



## Check plug-in & HW/SW inventory

Agent-based API v2



## Metrics, Graphs, Perf-O-Meters

Graphing API v1



## Ruleset

Ruleset API v1

# All aspects of a monitoring plug-in now covered

New developer APIs



## Special Agent / Active Check

Server-side calls API v1



## Check plug-in & HW/SW inventory

Agent-based API v2



## Metrics, Graphs, Perf-O-Meters

Graphing API v1



## Ruleset

Ruleset API v1



## New in 2.3: More developer APIs

16:35 - 17:15 | Moritz Kiemer (Team Lead Development, Checkmk)

# Extended and reworked REST API



## New API endpoints

- Notification rules (5x)
- Dynamic configuration (3x)
- Audit logs (2x)
- Activate changes:  
show all pending changes<sup>1)</sup>
- Downtimes:  
modify scheduled downtime
- Rules: modify rule (preserving it)<sup>2)</sup>

# Extended and reworked REST API



## New API endpoints

- Notification rules (5x)
- Dynamic configuration (3x)
- Audit logs (2x)
- Activate changes:  
show all pending changes<sup>1)</sup>
- Downtimes:  
modify scheduled downtime
- Rules: modify rule (preserving it)<sup>2)</sup>

## Improvements

- Better handling of custom attributes for users and hosts
- Handling of distributed environments
- Uniqueness of operations
- Edition and version are exposed via HTTP headers<sup>2)</sup>
- Last seen for the REST API usage
- Better documentation



# Checkmk goes Ansible

Global Community checkmk-raw, checkmk-enterprise, ansible



**robin.gierse** Checkmk Consultant

2d


So this one took a while. ⏳

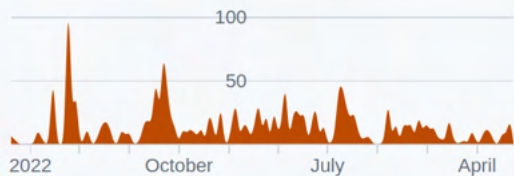
Announcing the Ansible Collection version 5.0.0! 🎉

As you can tell from the version number: This is a breaking release, so let me start by outlining the breaking changes:

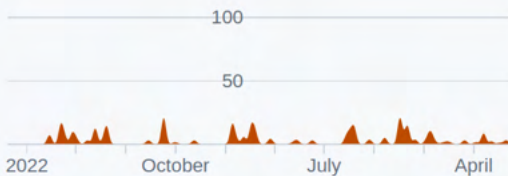
- The `lookup_folder` plugin now returns the full folder object, including the title and not only the attributes. To keep the current behavior in your playbooks, you want to use `{{ my_lookup_result.extensions }}` instead of `{{ my_lookup_result }}`. 🔍
- The agent role had an internal variable `checkmk_agent_server_ip` which is now `checkmk_agent_server_ips` and is used differently. It just came to my attention, that users might consider this breaking, so I am mentioning it here.
- Additionally, some changes listed below are quite significant, and although we could not detect any issues, we want to be safe and make you aware to pay heightened attention when rolling out this release. 🚧



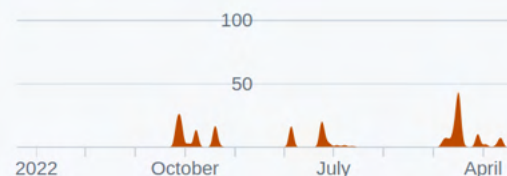
 **robin-checkmk** #1  
1,766 commits 111,326 ++ 56,146 --




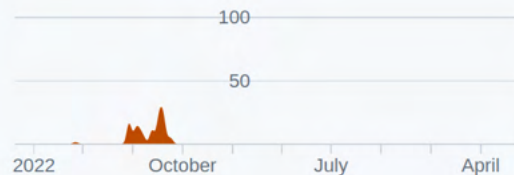
 **lgetwan** #2  
394 commits 26,157 ++ 11,966 --



 **msekania** #3  
301 commits 10,796 ++ 4,282 --



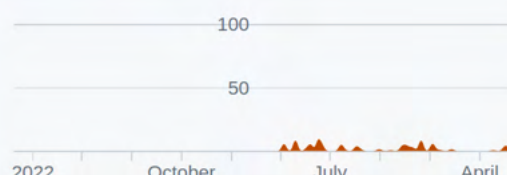
 **diademiemi** #4  
154 commits 3,126 ++ 1,054 --




 **muehlings** #5  
119 commits 4,711 ++ 1,954 --



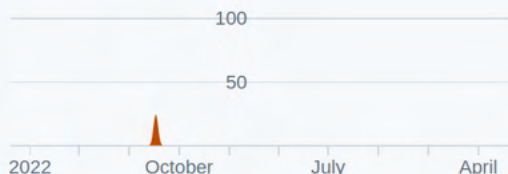
 **Max-checkmk** #6  
117 commits 6,225 ++ 2,943 --



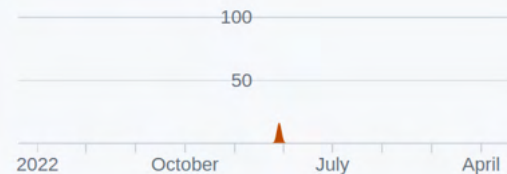
 **ogaida** #7  
60 commits 2,686 ++ 372 --



 **mto79** #8  
36 commits 254 ++ 190 --



 **godspeed-you** #10  
24 commits 655 ++ 583 --





**msekania**

Top Code Contributor  
Community Projects  
**Ansible Collection**

# Our focus for Checkmk 2.3



Cloud



Data Center



IoT

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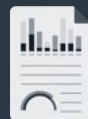
**Monitor anything**



**Powerful configuration**



**Alerts & analytics**



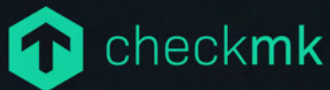
**Extensible interfaces**  
for automation  
& development



**Monitoring platform**  
Secure & scalable

# Two-Factor Authentication

Authenticator app support + overall better user experience



## Two-factor authentication

Enter the six-digit code from your authenticator app to log in.

Two-factor code:

Submit

# Security improvements: bits & pieces



Security best  
practices

**Default  
password policy**

**Improved  
symmetric  
agent  
encryption**

**Security log var/**

# Effective performance boosts for the UI (I/II)



## Faster loading of host / service views

'Add to report / dashboard' reworked

- Before: all reports and dashboards were 'read' for every host/service view
  - Higher loading time the more custom reports / dashboards

**Before**

checkmk

Monitor

Customize

Setup

### Services of Host localhost

Monitor > Overview > All hosts > localhost > Services of Host

Commands Host Services Add to Export Display Help

localhost	
State	Service
OK	Check_MK
WARN	Check_MK Agent
OK	Check_MK Discovery
OK	Check_MK HW/SW Invento
OK	CPU load
OK	CPU utilization
OK	Disk IO SUMMARY
OK	File /etc/check_mk/fileinfo.
OK	File /home/martinhirschvogel/te
OK	Filesystem /

Add to dashboard

- Windows hosts
- Main dashboard
- Problem dashboard
- Host & service problems
- Checkmk dashboard
- Site dashboard \$SITE\$
- Kubernetes
- Kubernetes Cluster
- Kubernetes Deployment
- Kubernetes DaemonSet
- Kubernetes Statefulset
- Kubernetes Namespace
- Alerts
- Flows
- Top Talkers
- Single Linux host
- Single Windows host
- Linux hosts



# Effective performance boosts for the UI (I/II)



Now

## Faster loading of host / service views

‘Add to report / dashboard’ reworked

- Before: all reports and dashboards were ‘read’ for every host/service view
  - Higher loading time the more custom reports / dashboards
- Now: only loading on-demand
  - Not as ‘cool’, but much faster in large setups!

checkmk

Monitor

Customize

Setup

### Services of Host server-linux-13

Monitor > Overview > All hosts > server-linux-13 > Services of Host

Commands Host Services Export Display Help

#### Add to report

(Select report)

- BI availability (bi\_availability)
- Default template for all reports (default)
- Report of host (host)
- Report of host performance graphs (host\_performance\_graphs)
- Template for PDF exporting (instant)
- Template for PDF exporting of availability views (instant\_availability)
- Template for PDF exporting of graph collections (instant\_graph\_collections)
- Template for PDF exporting of views (instant\_views)

OK

OK	CPU utilization	Total CPU: 3.17%
CRIT	CUPS Queue Default	disabled since Wed Nov 27 16:12:40 2003:00:41:42 2003 CRIT
CRIT	CUPS Queue jsnews	disabled since Wed Aug 12 10:53:12 2003:00:41:42 2003 CRIT

# Effective performance boosts for the UI (II/II)



## Faster loading of audit log

'Audit log' reworked

- Audit log rotation for files >300MB
  - Included in update mechanic
- Redesign of audit log page
  - Selector for audit log
  - Option to toggle columns
- Audit logs in large environments can be viewed MUCH faster

**Audit log**  
Setup > General > Audit log

**Audit log** Related Export **Display** Help

wato\_audit.log (current)

**Audit log for 2024-05-22**

This table is limited to show only 10 entries

Time	User	Host	Object
2024-05-22 16:17:23	cmkadmin		
2024-05-22 16:17:23	cmkadmin		
2024-05-22 16:17:13	cmkadmin		
2024-05-22 16:17:08	cmkadmin	Host	server-linux-web-3
2024-05-22 16:17:08	cmkadmin	Host	server-linux-veritas-3
2024-05-22 16:17:08	cmkadmin	Host	server-linux-oracle-3
2024-05-22 16:17:08	cmkadmin	Host	server-linux-oracle-3

**Details**

- Show details
- Show object type
- Show object

**Filter**

Filter view

**General display options**

- Show page navigation



# Performance boosts for distributed setups

Activate changes



## Very large distributed setups

Improved parallelization

→ More sites can perform activation at same time



## Checkmk MSP

Additional caching and improved storage of intermediate results

→ Preparation phase for distributing changes to remote sites faster

# Appliance 1.7.0 goes Debian 12



OS upgrade to  
Debian  
bookworm

# Appliance 1.7.0 goes Debian 12



OS upgrade to  
Debian  
bookworm



New  
filesystem:  
OverlayFS

# Appliance 1.7.0 goes Debian 12



OS upgrade to  
Debian  
bookworm

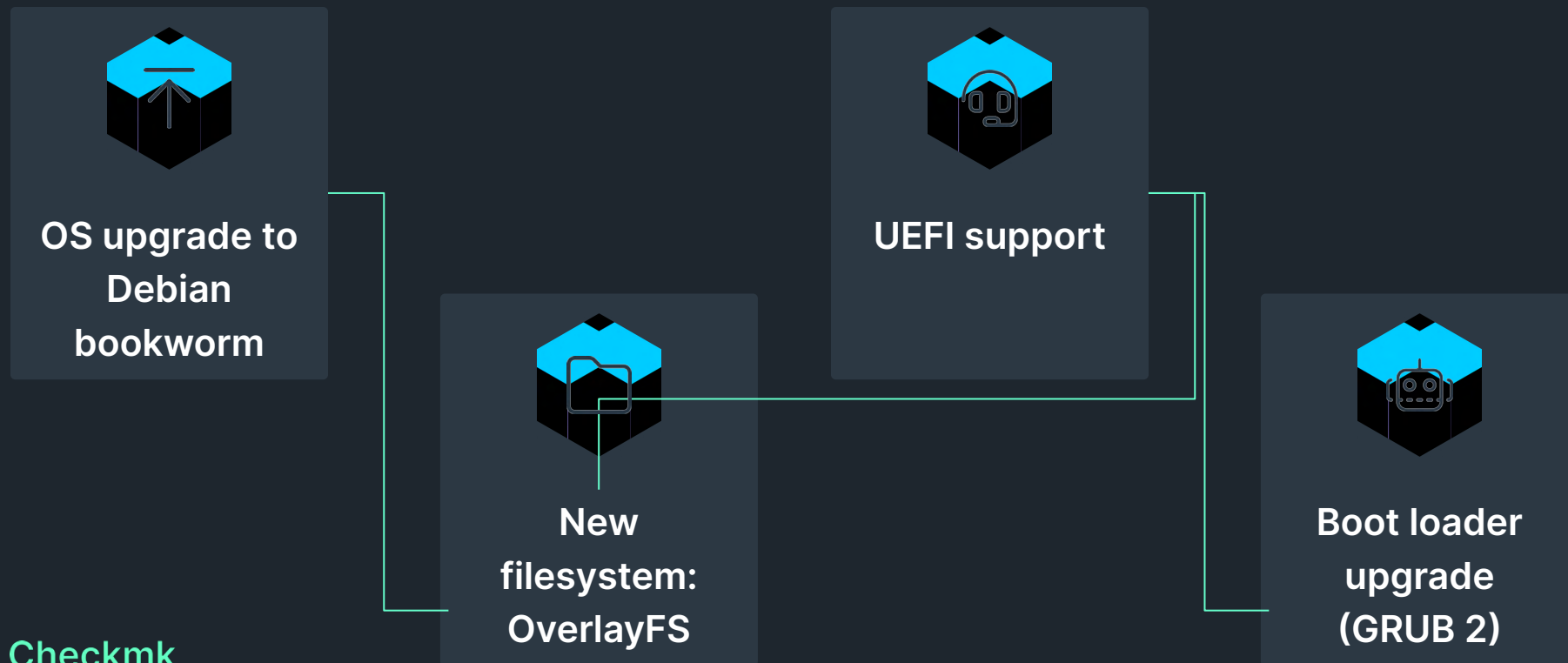


UEFI support



New  
filesystem:  
OverlayFS

# Appliance 1.7.0 goes Debian 12



```
-| 10/26 Rulesets...
-| + "Rulesets" failed
-| Traceback (most recent call last):
-|   File "/omd/sites/oldstable/lib/python3/cmk/update_config/main.py", line 223, in __call__
-|     action(self._logger, self.update_state.setdefault(action.name))
-|   File "/omd/sites/oldstable/lib/python3/cmk/gui/watolib/rulespecs.py", line 878, in _rulespec_value
-|     parameter_vs = _wrap_valuespec_in_timeperiod_valuespec(self._parameter_valuespec())
-|                                     ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
-|   File "<string>", line 35, in _parameter_valuespec_perfcalc
-| NameError: name 'ListOf' is not defined
-| 11/26 Autochecks...
-| 12/26 Remove unused host attributes....
-| 13/26 Convert persisted sections...
-| 14/26 Cleanup version specific caches...
-| 15/26 Background jobs...
-| 16/26 Extract remote sites CAs...
-| 17/26 Add a rule_id to each notification rule...
-| 18/26 Change absolute paths in registered hosts symlinks to relative...
-| 19/26 Synchronize automationuser secrets...
-| 20/26 Remove old custom logos...
-| 21/26 Check for incompatible password hashes...
-| 22/26 Update licensing folders or settings...
-| 23/26 Transform spool files...
-| 24/26 Update backup config...
-| 25/26 Event Console: Rewrite active config...
-| 26/26 Update Agent Bakery...
-| Done (with errors)
ERROR (exit code: 1)
```

# Improved pre-flight check for update

## ◆ **Already in 2.2**

Basic pre-flight check,  
but during (partially  
irreversible) site update

# Improved pre-flight check for update

## ● Already in 2.2

Basic pre-flight check,  
but during (partially  
irreversible) site update

## ● New

Proper pre-flight check  
Site updates now only  
happen after  
'completed verifying  
site configuration'

⇒ Reversible abort

```
2024-05-23 12:41:58 - Updating site 'test' from version 2.2.0p25.cee to 2.3.0-2024.05.20.cee
```

```
* Installed dir  etc/default
* Installed file etc/default/cmc
* Updated       etc/init.d/cmc
* Updated       etc/init.d/apache
* Updated       etc/init.d/redis
* Installed dir  local/lib/python3/cmk_addons
* Installed dir  local/lib/python3/cmk/plugins
* Installed dir  local/lib/python3/cmk_addons/plugins
* Vanished      etc/cron.d/cmk_discovery
```

```
Creating temporary filesystem /omd/sites/test/tmp...OK
```

### ATTENTION

```
Some steps may take a long time depending on your installation.
Please be patient.
```

```
Cleanup precompiled host and folder files
```

```
Verifying Checkmk configuration...
```

```
01/06 Legacy check plugins...
02/06 Rulesets...
03/06 UI extensions...
04/06 Agent based plugins...
05/06 Autochecks...
06/06 Deprecated .mk configuration of plugins...
```

```
Done (success)
```

```
Completed verifying site configuration. Your site now has version 2.3.0-2024.05.20.cee.
```



# Improved pre-flight check for update

## ● Already in 2.2

Basic pre-flight check,  
but during (partially  
irreversible) site update

## ● New

Proper pre-flight check  
Site updates now only  
happen after  
'completed verifying  
site configuration'

⇒ Reversible abort

```
2024-05-23 13:06:00 - Updating site 'stable' from version 2.3.0-2024.05.20.cee to 2.3.0-2024.05.20.cee

Creating temporary filesystem /omd/sites/stable/tmp...OK
ATTENTION
Some steps may take a long time depending on your installation.
Please be patient.

Cleanup precompiled host and folder files
Verifying Checkmk configuration...
 01/06 Legacy check plugins...
 02/06 Rulesets...
ERROR: Failed to load Ruleset: static_checks:perfcalc. There is likely an error in the implementation.
This is the exception:
Traceback (most recent call last):
  File "/omd/sites/stable/lib/python3/cmk/update_config/plugins/pre_actions/rulesets.py", line 10, in load_ruleset
    ruleset.valuespec()
  File "/omd/sites/stable/local/share/check_mk/web/plugins/wato/perfcalc.py", line 35, in _valuespec
    ('list', ListOf(
              ^^^^^
NameError: name 'ListOf' is not defined

You can abort the update process (A) or continue (c) the update. Abort update? [A/c]
A

Update aborted with Error: broken ruleset.
Your site has not been modified.
The update can be retried after the error has been fixed.
```

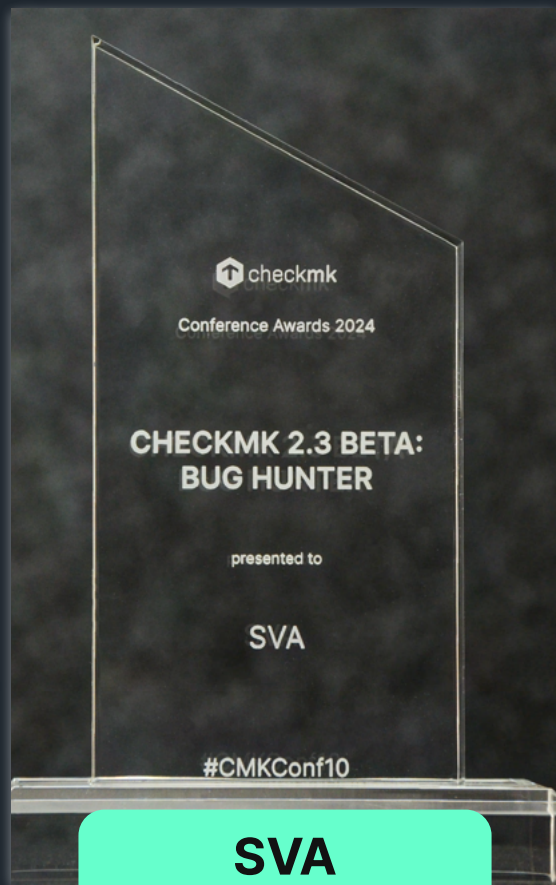
# Let's go!



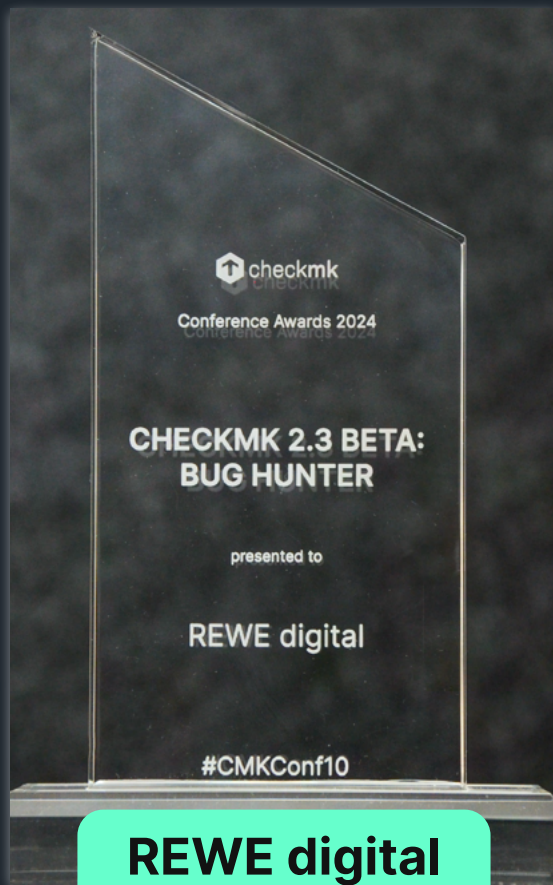
## Further reading materials

- ◆ Features overview <https://checkmk.com/product/latest-version>
- ◆ 2.3 blog collection <https://checkmk.com/blog/discover-checkmk-23>
- ◆ **1250+** werks in 2.3.0 <https://checkmk.com/werks>
- ◆ Release notes [https://docs.checkmk.com/2.3.0/en/release\\_notes.html](https://docs.checkmk.com/2.3.0/en/release_notes.html)
- ◆ Update guide [https://docs.checkmk.com/2.3.0/en/update\\_major.html](https://docs.checkmk.com/2.3.0/en/update_major.html)
- ◆ Forum announcements <https://forum.checkmk.com/c/announcements/>

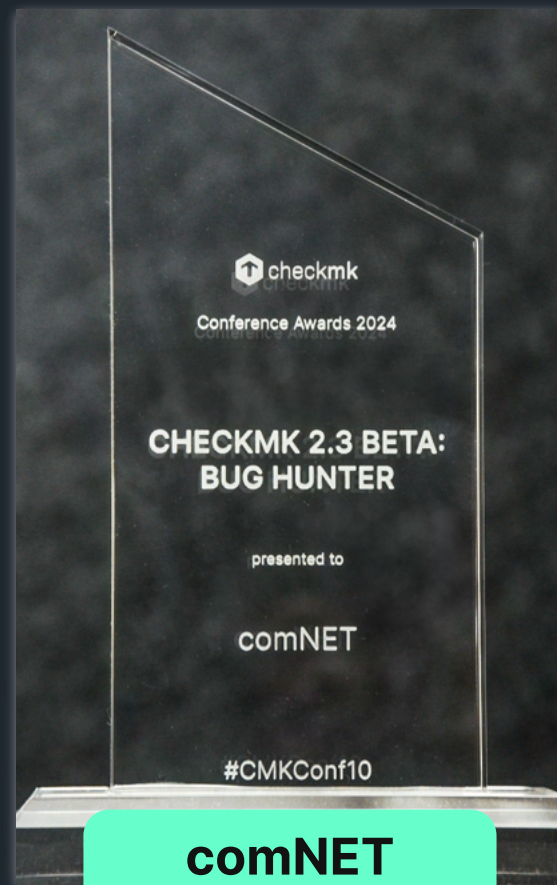
# One more thing



**SVA**  
2.3 Bug Hunter

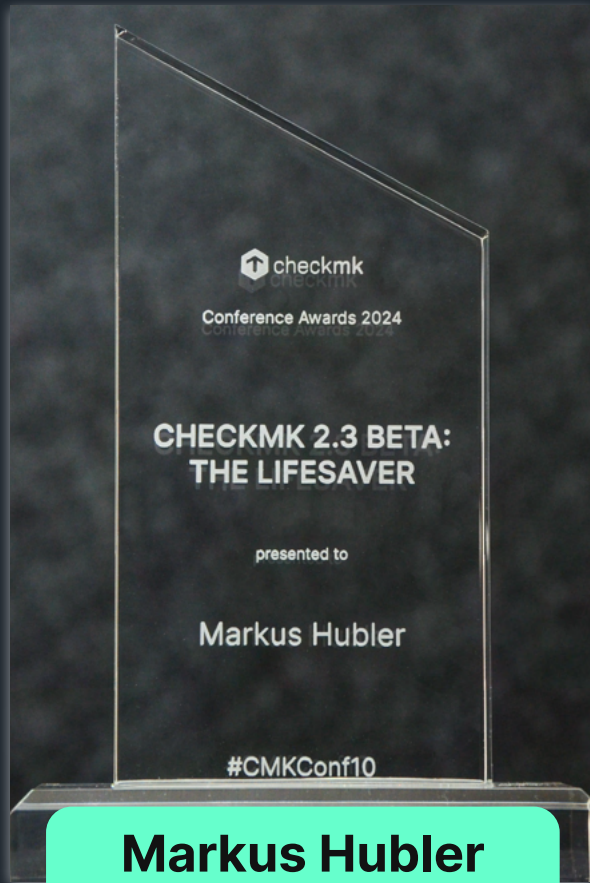


**REWE digital**  
2.3 Bug Hunter

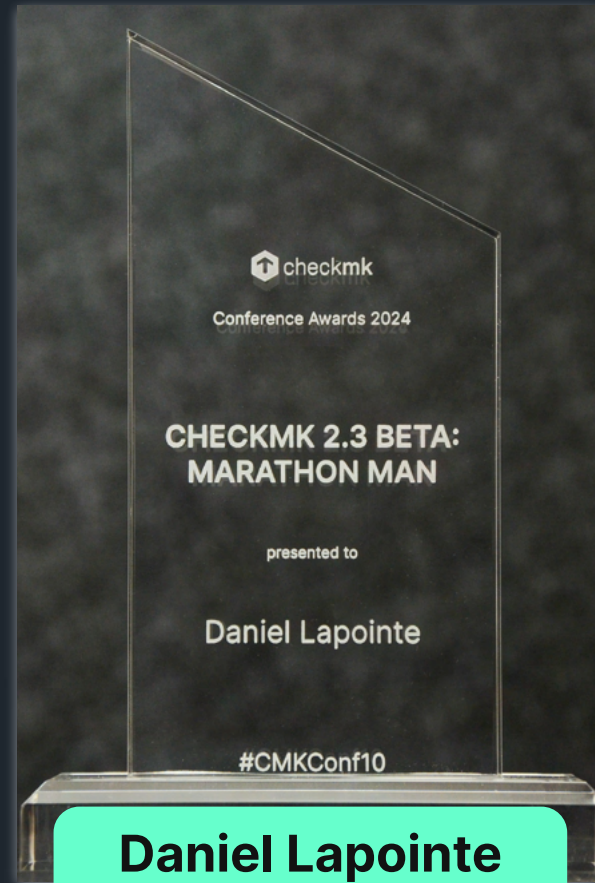


**comNET**  
2.3 Bug Hunter

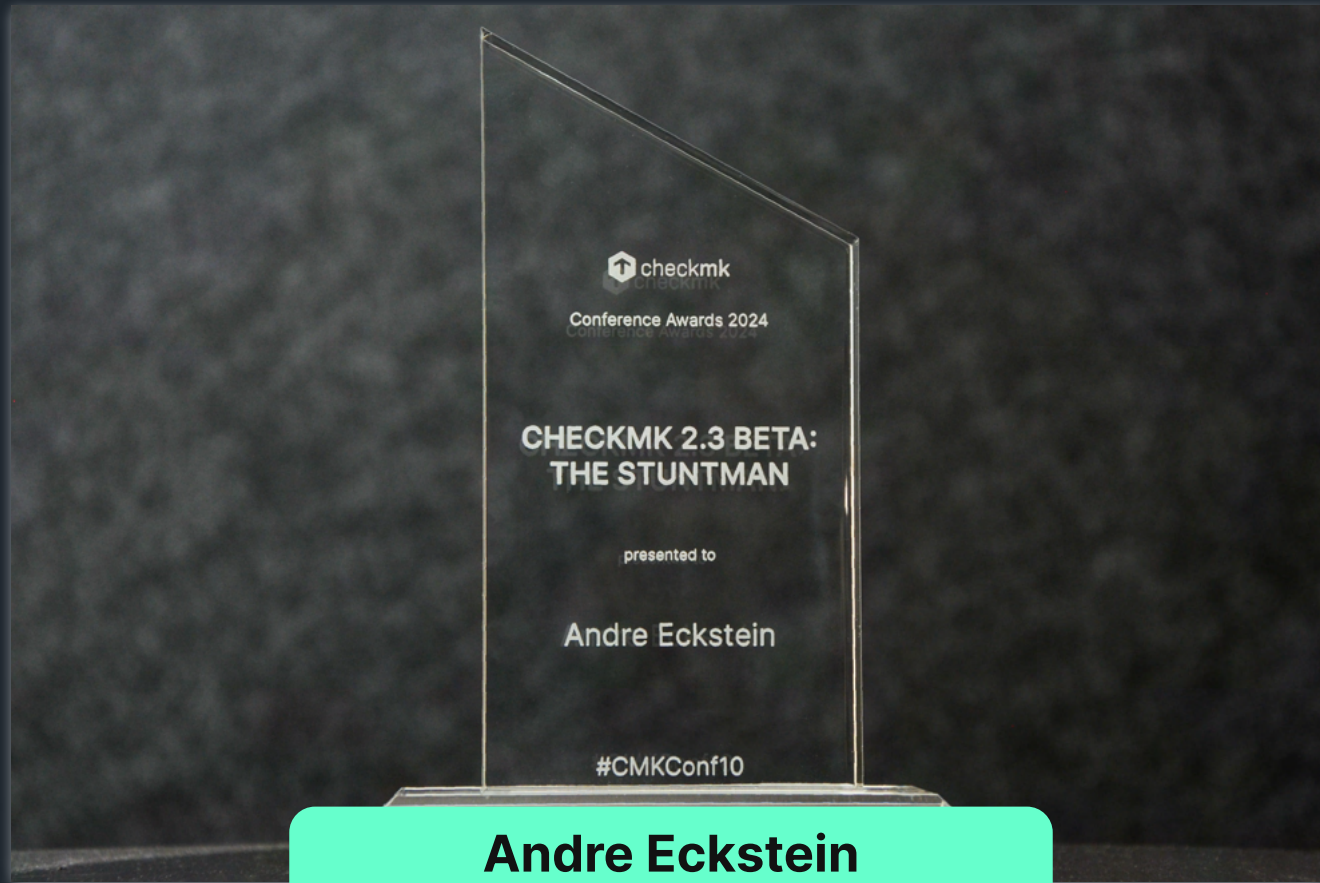




**Markus Hubler**  
2.3 Lifesaver



**Daniel Lapointe**  
2.3 Marathon Man



**Andre Eckstein**  
Oli-Kahn-Memorial Award

slido



# Audience Q&A Session



Click Present with Slido or install our [Chrome extension](#) to show live Q&A while presenting.

# Checkmk #10

Conference