Monitoring von Bienen & mehr

## 18. AUGSBURGER LINUX-INFOTAG 2019

checkmk
by tribe29

Agenda

checkmk

Óscar Nájera

- PhD in Strongly Correlated Electrons Systems

- Open-source contributor: e.g. Sphinx-Gallery

- Emacs and ArchLinux user

- Developing the monitoring software Check_MK at Mathias Kettner

- Currently working on capacity management for Check_MK

Wieso brauche ich das?

- "Aber in meinem System gibt es doch keine Fehler"

- Software oder Hardware ist fehleranfällig – irgendetwas ist schon oder geht immer kaputt

- Lieber proaktiv sein vs. Anrufe von Nutzern zu bekommen

- Man spart sich Geld, indem man das richtige Problem behebt - 5€ Patch-Kabel < Server upgrade
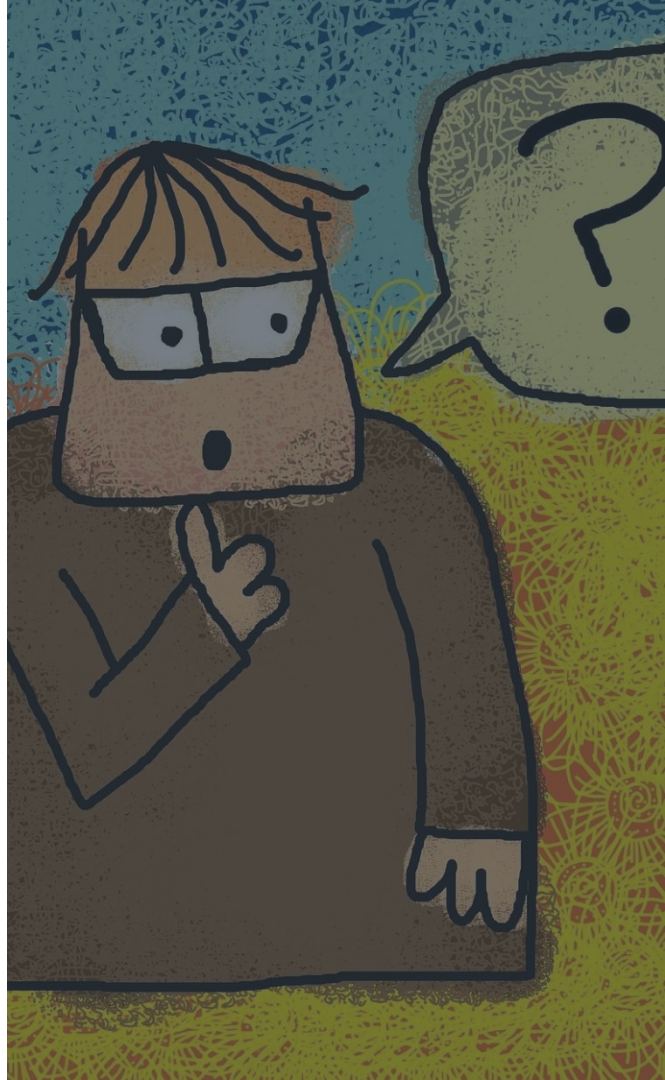
checkmk

Über Check_MK

- Vollständiges System für die Überwachung von IT Systemen

- Open Source und kommerzielle Version

- Aus München, 30 Leute, hauptsächlich Entwickler

- >35% aller DAX Unternehmen nutzen Check_MK, mehr als 1.700 bezahlende Kunden in 35 Ländern

Was kann ich überwachen?

Server

Application

Network

Cloud

Storage

Container

Database

Environment

Servermonitoring

Beispielmetriken

- CPU load
- Memory
- Filesysteme
- Mounts
- Interfaces
- Jobs
- Uptime
- Logs
- And much more

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Mailservermonitoring

Unterstützte Applikationen

- MS Exchange
  (siehe Screenshot)
- Postfix
- qmail
- nullmailer
- Oder via
  SMTP, IMAP …

Datenbankmonitoring

Unterstütze Datenbanken

- Oracle (screenshot)
- MySQL
- MS SQL
- MS Azure SQL
- AWS RDS
- PostgreSQL
- MongoDB
- IBM DB2
- …

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Cloudmonitoring
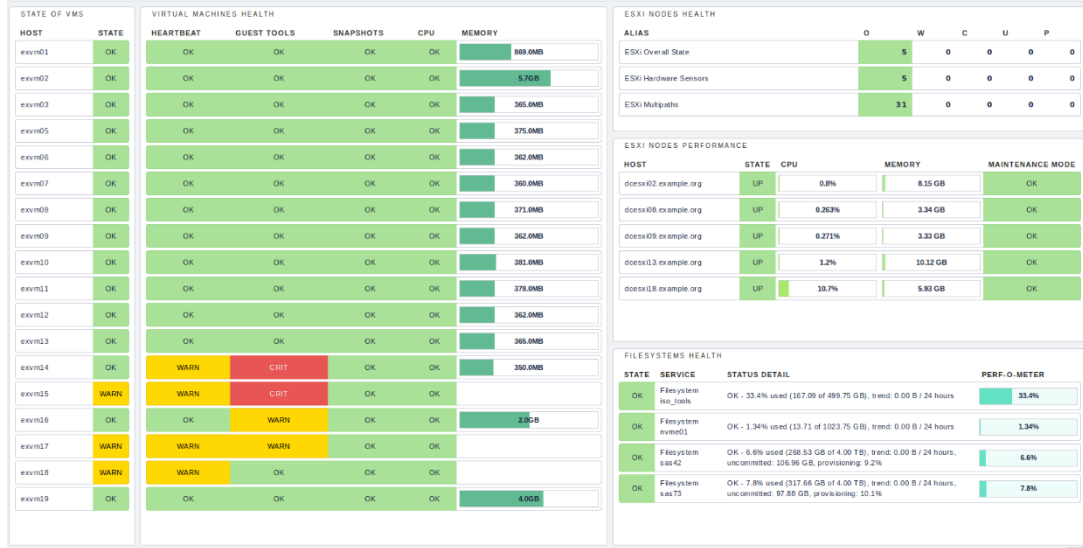
Unterstütze Systeme

- vSphere
- HyperV
- AWS
- Azure
- Docker
- Kubernetes
- …

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Was kann man mit Check_MK alles machen

IT Zustandsmonitoring
1700 Plugins 'out of the box'

Log- & ereignisbasiertes
Monitoring

Dynamisches Graphing &
effiziente Langzeitspeicherung

Benutzerdefinierbare
Dashboards

Reporting mit
Analysen zu Verfügbarkeit & SLA

Managementsicht:
Business Intelligence

Flexible Meldungs-
und Alarmsteuerungen

Dynamische Hardware- und
Softwareinventarisierung

Regelbasierte Konfiguration,
automatische Serviceerkennung

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Dashboard

HOST STATISTICS

Up	762
Down	7
Unreachable	0
In Downtime	0
Total	769

SERVICE STATISTICS
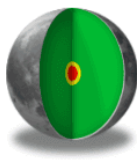
OK	31082
In Downtime	0
On Down host	0
Warning	57
Unknown	0
Critical	17
Total	31156

HOST PROBLEMS (UNHANDLED)

STATE	ALIAS	ICONS	AGE	STATUS DETAIL
DOWN	carsv0142ldap	☰	4 m	No IP packet received for 15.847799 s (deadline is 15.000000 s)
DOWN	mucap0213san	☰	38.4 s	No IP packet received for 15.998454 s (deadline is 15.000000 s)

SERVICE PROBLEMS (UNHANDLED)

STATE	ALIAS	SERVICE	ICONS	STATUS DETAIL	AGE	
CRIT	mucsv0456sql	DB2 Backup db2ufbmm:SLKQ04	☰	CRIT - Time since last backup: 314 days	5 m	
CRIT	carsv0234rdp	System Time	☰	CRIT - Offset is -47449396 sec (warn/crit at 30/60 sec)	5 m	
CRIT	wissv0532sql	MSSQL Blocked Sessions	☰	CRIT - Summary: 153 blocked by 1 ID(s) CRIT ,	5 m	
CRIT	mucsv0443sql	DB2 Tablespace db2ucfam:SHGT04.USERSPACE1	☰	CRIT - 1.3% free, only 1.3% left (warn/crit at 10.0%/5.0%) CRIT , 89.39 GB of 90.56 GB used, State: NORMAL, Type: DMS	4 m	
CRIT	lyosv0413jvm	JVM CBF Threads	☰	CRIT - ThreadRate: 0.00, ThreadCount: 103 CRIT (Levels at 80/100), DeamonThreadCount: 64, PeakThreadCount: 111, TotalStartedThreadCount: 798	4 m	
WARN	mucsv1228lic	Citrix_terminal_srv_licensing	☰	WARN - Remote Desktop Licensing: stopped (start type is auto)	4 m	
WARN	lyosv0413jvm	JVM LOGSERVER Threads	☰	WARN - ThreadRate: 0.00, ThreadCount: 92 WARN (Levels at 80/100), DeamonThreadCount: 90	4 m	

EVENTS OF RECENT 4 HOURS

	TIME	ALIAS	SERVICE	OUTPUT
🔊	4 m	lyosv0887sql	ASM Diskgroup DATA_MUCORA11	WARN - 80.3% used (1.57 of 1.95 TB), trend: 0.00 B / 24 hours, extern redundancy
⚠	4 m	lyosv0887sql	ASM Diskgroup DATA_MUCORA11	WARN - 80.3% used (1.57 of 1.95 TB), trend: 0.00 B / 24 hours, extern redundancy
🔊	4 m	lyosv0413jvm	JVM LOGSERVER Threads	WARN - ThreadRate: 0.00, ThreadCount: 92 WARN (Levels at 80/100), DeamonThreadCount: 90, PeakThreadCount: 129, TotalStartedThreadCount: 6047
⚠	4 m	lyosv0413jvm	JVM LOGSERVER Threads	WARN - ThreadRate: 0.00, ThreadCount: 92 WARN (Levels at 80/100), DeamonThreadCount: 90, PeakThreadCount: 129, TotalStartedThreadCount: 6047
🔊	4 m	lyosv0413jvm	JVM CBF Threads	CRIT - ThreadRate: 0.00, ThreadCount: 103 CRIT (Levels at 80/100), DeamonThreadCount: 64, PeakThreadCount: 111, TotalStartedThreadCount: 798
🔴	4 m	lyosv0413jvm	JVM CBF Threads	CRIT - ThreadRate: 0.00, ThreadCount: 103 CRIT (Levels at 80/100), DeamonThreadCount: 64, PeakThreadCount: 111, TotalStartedThreadCount: 798
🔊	5 m	mucsv1228lic	Citrix_terminal_srv_licensing	WARN - Remote Desktop Licensing: stopped (start type is auto)

Graphing

CHECK_MK Enterprise 1.5.0p13

Service ***.***.org, CPU load

TACTICAL OVERVIEW ✕ −

Hosts	Problems	Unhandled	Stale
58	3	1	0

Services	Problems	Unhandled	Stale
1449	68	24	17

Events	Problems	Unhandled	Stale
613	36	36	

QUICKSEARCH ✕ −

VIEWS ✕ −

▶ Overview
▶ Hosts
▶ Host Groups
▼ Services
  All services
  Favorite services
  Recently changed services
  Serv. by host groups
  Service check durations
  Service search
  Unmonitored services
▶ Service Groups
▶ Metrics
▼ Business Intelligence
  All Aggregations
  Hostname Aggregations
  Problem Aggregations
  Single-Host Aggregations
  Single-Host Problems
▶ Problems
▶ Event Console
▶ Inventory
▶ Other
▼ Blenen
  Gewichtsvergleich 1,2,4,5,6,8
  Stock1 - Gewicht-Temperatur

Service icons	
Service state	OK
Output of check plugin	OK - 15 min load 0.18 at 4 Cores (0.04 per Core)
Long output of check plugin (multiline)	
Service Perf-O-Meter	0.310
Service Graphs	

CPU Load - 4 CPU Cores 04/05/2019 @ 1m

	MINIMUM	MAXIMUM	AVERAGE	LAST
CPU load average of last 15 minutes	0.100	0.419	0.171	0.156
CPU load average of last minute	0	2.56	0.159	0.469
Warning				20.0
Critical				40.0

The last 4 hours

The last 25 hours

The last 8 days

The last 35 days

The last 400 days
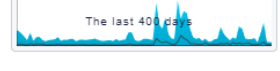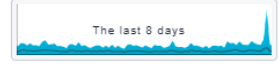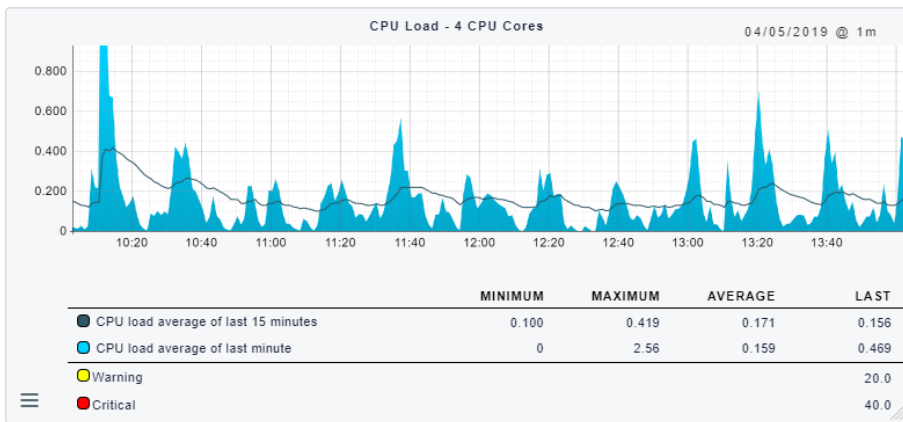
Service Metrics	

CPU load average of last 15 minutes:	0.180
CPU load average of last 5 minutes:	0.240
CPU load average of last minute:	0.310

Currently in downtime	no
Current check attempt	1/5
The age of the current service state	2016-04-25 15:06:59
The time since the last check of the service	3.65 s

TACTICAL OVERVIEW

Hosts	Problems	Unhandled	Stale
769	7	2	0

Services	Problems	Unhandled	Stale
31156	74	12	5

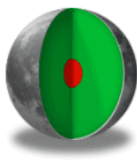| Events	Problems	Unhandled	Stale
8	8	4	

VIEWS

▶ Overview
▶ Hosts
▶ Host Groups
▶ Services
▶ Service Groups
▶ Metrics
▶ Business Intelligence
▶ Problems
▶ Event Console
▶ Inventory
▶ Other

··· EDIT

SITE STATUS

Cardiff (Slave)	online
Lyon (Slave)	online
Munich (Master)	online
Wiesbaden (Slave)	online

WATO · CONFIGURATION

🏠 Main Menu
📋 Monitoring Agents
🖥 Hosts
🏷 Host Tags

❌ Abort

▶ RULE PROPERTIES

▼ PARAMETERS

☒ Levels for filesystem

Enable timespecific parameters

◉ Levels for filesystem used space

[Dynamic levels ▼]

◉ Percentage used space

Warning if above [75.0] %

Filesystem larger than   Critical if above [85.0] %

[500] [MByte ▼]   ◯ Absolute used space

Warning if above [0] MB

Critical if above [0] MB

◉ Percentage used space

Warning if above [80.0] %

Filesystem larger than   Critical if above [90.0] %

[100] [GByte ▼]   ◯ Absolute used space

Service aggregtation (Business Intelligence)

TACTICAL OVERVIEW

Hosts	Problems	Unhandled	Stale
769	7	2	0

Services	Problems	Unhandled	Stale
31156	74	12	5

Events	Problems	Unhandled	Stale
8	8	4	

VIEWS

- ▶ Overview
- ▶ Hosts
- ▶ Host Groups
- ▶ Services
- ▶ Service Groups
- ▶ Metrics
- ▼ Business Intelligence
  - All Aggregations
  - Hostname Aggregations
  - Problem Aggregations
  - Single-Host Aggregations
  - Single-Host Problems
- ▶ Problems
- ▶ Event Console
- ▶ Inventory
- ▶ Other

··· EDIT

BI AGGREGATION GROUPS

- VDI Services

WATO · CONFIGURATION

- Main Menu
- Monitoring Agents
- Hosts

🔍 📝 🔧 ☑ | 1 | off | 📄 Export as PDF | ✏ Edit View | 🌐 Availability | ...

VDI Services

LINKS	STATE	TREE	HOSTS

OK ▼ VDI Services

  OK ▶ VDI Hardware Services

  OK ▼ VDI Application

    OK ▶ VDI Application Delivery Controller

    OK ▼ VDI Application Licensing Server

      OK ▼ VDI Application License Server mucsv1227lic

        OK 🌐 mucsv1227lic ◆ Citrix_licensing ◆ OK - Citrix Licensing: running (start type is auto)

        OK 🌐 mucsv1227lic ◆ Citrix_terminal_srv_licensing ◆ OK - Remote Desktop Licensing: running (start type is auto)

      WA ▼ VDI Application License Server mucsv1228lic

        OK 🌐 mucsv1228lic ◆ Citrix_licensing ◆ OK - Citrix Licensing: running (start type is auto)

        WA 🌐 mucsv1228lic ◆ Citrix_terminal_srv_licensing ◆ WARN - Remote Desktop Licensing: stopped (start type is auto)

    OK ▶ VDI Application Provisioning Server

    OK ▼ VDI Application Provisioning Server - DHCP

      OK 🌐 mucsv1245pvs ◆ DHCP_Server ◆ OK - DHCP Server: running (start type is auto)

      OK 🌐 mucsv1246pvs ◆ DHCP_Server ◆ OK - DHCP Server: running (start type is auto)

    OK ▶ VDI Application Storefront

    OK ▶ VDI Application XenApp Server

OK (left state column)

HOSTS: mucsv1245pvs mucsv1227lic mucsv1228lic mucsv1246pvs

Hardware- und Softwareinventarisierung

🔍	📝	🔧	☑	1	off	⚙ WATO	📄 Export as PDF	📊 Graphs	✏ Edit View	🔵 Availability

📊 Combined graphs   ...

Hostname	server-windows-inventory-2

Inventory Tree

🕷 Hardware
- ▶ Storage
- ▶ System
- ▼ BIOS

DATE	2015-09-21
MODEL	PhoenixBIOS 4.0 Release 6.0
VENDOR	Phoenix Technologies LTD
VERSION	6.00 2.4

- ▶ Graphic Cards
- ▶ Memory (RAM)
- ▶ Processor

🗄 Networking

PORTS AVAILABLE	0
HOSTNAME	zmucvcs05
PORTS	1
INTERFACES	1

▼ Interfaces   Open this table for filtering / sorting

INDEX	DESCRIPTION	ALIAS	STATUS	ADMIN	USED	SPEED	PHYSICAL ADDRESS (MAC)	TYPE
1	vmxnet3 Ethernet Adapter	Local Area Connection	up		used	10 Gbit/s	00:50:56:8A:46:22	6 - ethernetCsmacd

🖼 Software
- ▶ Applications
- 📦 Packages

Open this table for filtering / sorting

NAME	VERSION	ARCHITECTURE	TYPE	DESCRIPTION	INSTALL DATE	LANGUAGE	PATH	PUBLISHER	SIZE
Microsoft Visual J# 2.0 Redistributable Package - SE (x64)			registry	Microsoft Visual J# 2.0 Redistributable Package - SE (x64)			C:\Windows\Microsoft.NET\Framework64\v2.0.50727\	Microsoft Corporation	
				vCenter Server with an					

Implementierung von Check_MK

DEMO

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Wie Check_MK an Daten kommt
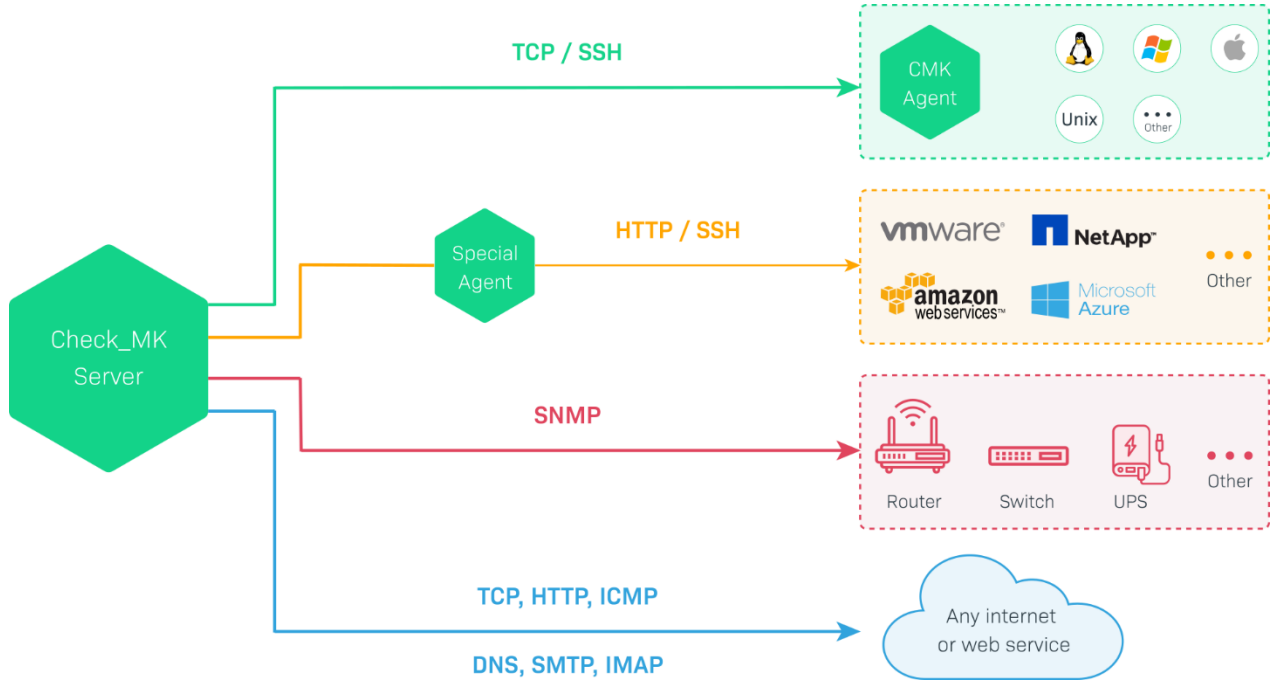
Ablauf

- Installation Check_MK Server (mein Laptop)

- Installation Agent auf Host (auch mein Laptop)

- „Host" aufnehmen im Monitoring
  (ich überwache mich selber!)

- Plug-Ins nutzen am Beispiel vom Filesystem Plugin

- Benachrichtigung mit Regel erstellen

Kurioses Monitoring in Action: Bienenmonitoring

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"NSA für Bienen"

- Kollege Alex Wilms = begeisterter Imker (der Grund für den Vortrag)

- Stockwaage, Innentemperatur, Außentemperatur, Lichteinfall

- Wieso etwas überhaupt messen?

  - Wieviele Bienen sind unterwegs…

  - Wieviel Nektor wurde geholt…

  - Haut mein Volk ab… (>2kg Gewichtsverlust ➜ Alarm!)

  - Wie gesund ist mein Volk… (Innentemperatur)

- https://www.imker-nettetal.de/

Vom Sensor zum Monitoring

Elektronik

ESP8266   HX711

Kommunikation

MQTT

Subscribe

Publish

Monitoring-Host

mqttwarn

checkmk
by tribe29
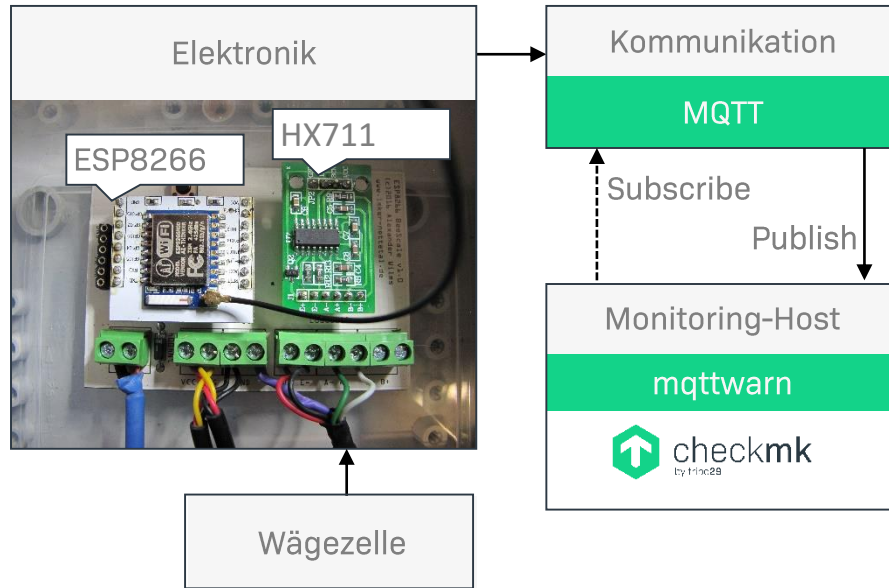
Wägezelle

Kommentar

Elektronik:
- Aktuell mit ESP8266 Microcontroller, ursprünglich Standard-Arduino
- Lässt sich mit Arduino IDE programmieren
- Wägezellenmessmodul HX711 zum Verarbeiten der Wägezellenwerte

Kommunikation
- Telemetrie + Updates per MQTT

Monitoring-Host
- Mqttwarn = Subscriber, erstellt Spoolfiles
- Asynchroner local spool check für das Monitoring

Anleitung:
https://community.hiveeyes.org/t/inbetriebnahme-von-node-wifi-mqtt-homie-mit-hiveeyes-anbindung/185
https://github.com/jpmens/mqttwarn

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BIENENMONITORING
Die Bienenwaage

Wägezelle

Einbaubeispiel
Wägeplatte
Anschlag
Biegesensor
Bodenplatte
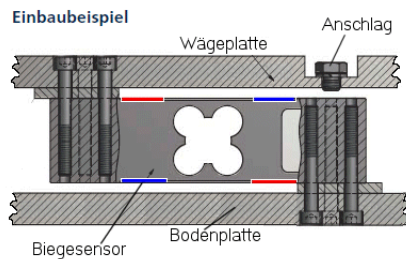
Kommentar

- Gewichtsmessung über Wägezelle

- Verformung durch Gewicht wird über Dehnungsmessstreifen gemssen

- Anleitung auf:
  https://www.euse.de/wp/blog/series/bienenwaage/

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MQTT Publish

```
homie/beute-2/temperature0/degrees 28.31
homie/beute-2/temperature1/degrees 10.00
homie/beute-2/weight/kilogram 48.31
homie/beute-2/battery/volt 3.30
homie/beute-2/data/__json__ {"Weight":48.31,"Temp1":28.31,"Temp2":10.00}
homie/beute-2/$stats/signal 44
homie/beute-2/$stats/uptime 2324966
homie/beute-2/temperature0/degrees 28.38
homie/beute-2/temperature1/degrees 9.94
homie/beute-2/weight/kilogram 48.31
homie/beute-2/battery/volt 3.30
homie/beute-2/data/__json__ {"Weight":48.31,"Temp1":28.37,"Temp2":9.94}
homie/beute-2/$stats/signal 46
homie/beute-2/$stats/uptime 2325035
```

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BIENENMONITORING
Local Checks


```
-rw-r--r-- 1 root root    78 Mär 28 15:31 300beute-2-t1
-rw-r--r-- 1 root root    77 Mär 28 15:31 300beute-2-up
-rw-r--r-- 1 root root    76 Mär 28 15:31 300beute-2-w
-rw-r--r-- 1 root root    69 Mär 28 15:31 300beute-5-sig
-rw-r--r-- 1 root root    79 Mär 28 15:31 300beute-5-t0
-rw-r--r-- 1 root root    80 Mär 28 15:31 300beute-5-t1
-rw-r--r-- 1 root root    75 Mär 28 15:31 300beute-5-up
-rw-r--r-- 1 root root    76 Mär 28 15:31 300beute-5-w
-rw-r--r-- 1 root root    69 Mär 28 15:31 300beute-6-sig
-rw-r--r-- 1 root root    79 Mär 28 15:31 300beute-6-t0
-rw-r--r-- 1 root root    80 Mär 28 15:31 300beute-6-t1
-rw-r--r-- 1 root root    75 Mär 28 15:31 300beute-6-up
-rw-r--r-- 1 root root    76 Mär 28 15:31 300beute-6-w
-rw-r--r-- 1 root root    69 Mär  7 09:11 300beute-7-sig
-rw-r--r-- 1 root root    83 Jun  1  2018 300beute-7-t0
-rw-r--r-- 1 root root    84 Jun  1  2018 300beute-7-t1
-rw-r--r-- 1 root root    67 Mär  7 09:11 300beute-7-up
-rw-r--r-- 1 root root    76 Jun  1  2018 300beute-7-w
-rw-r--r-- 1 root root    69 Mär  7 09:11 300beute-8-sig
-rw-r--r-- 1 root root    79 Aug 26  2018 300beute-8-t0
-rw-r--r-- 1 root root    80 Aug 26  2018 300beute-8-t1
-rw-r--r-- 1 root root    77 Mär  7 09:11 300beute-8-up
-rw-r--r-- 1 root root    76 Aug 26  2018 300beute-8-w
-rw-r--r-- 1 root root    94 Jul  3  2018 300heiz
-rw-r--r-- 1 root root    69 Mär  7 09:11 630beute-3-sig
-rw-r--r-- 1 root root    79 Feb  7  2018 630beute-3-t0
-rw-r--r-- 1 root root    80 Feb  7  2018 630beute-3-t1
-rw-r--r-- 1 root root    69 Mär  7 09:11 630beute-3-up
-rw-r--r-- 1 root root    75 Mär  7 09:11 630beute-3-volt
-rw-r--r-- 1 root root    76 Feb  7  2018 630beute-3-w
-rw-r--r-- 1 root root    69 Mär  7 09:11 630beute-4-sig
-rw-r--r-- 1 root root    77 Dez 17 07:39 630beute-4-t0
-rw-r--r-- 1 root root    78 Dez 17 07:39 630beute-4-t1
-rw-r--r-- 1 root root    65 Mär  7 09:11 630beute-4-up
-rw-r--r-- 1 root root    75 Mär  7 09:11 630beute-4-volt
-rw-r--r-- 1 root root    76 Dez 17 07:39 630beute-4-w
-rw-r--r-- 1 root root   153 Nov 25 15:13 honig
root@omd:/var/lib/check_mk_agent/spool#
```



```
root@omd:/var/lib/check_mk_agent/spool# cat 630beute-4-w
<<<beute-4>>>
<<<local>>>
0 Stock-Gewicht Gewicht=41.11 Gewicht: 41.11kg
```

Kommentar

- Aktuelle Daten für Beuten (Bienenstock) 1,2,5,6
- Keine Daten für Volk 3 (Testwaage) & Volk 7,8 (aktuell kein WLAN am Ort des Volks)
- Daten für asynchrone locale Checks werden im Monitoring-Host /var/lib/check_mk_agent/spool gelegt
- Zahl xxx vor Filename = Files, die älter als xxx Sekunden sind, werden ignoriert => Status Unknown
- Aufbau Check:
  0 Stock-Gewicht Gewicht=41.11 Gewicht = 41.11kg
  Status Servicename Metriken Statusdetail

Was passiert bei schönem Wetter?
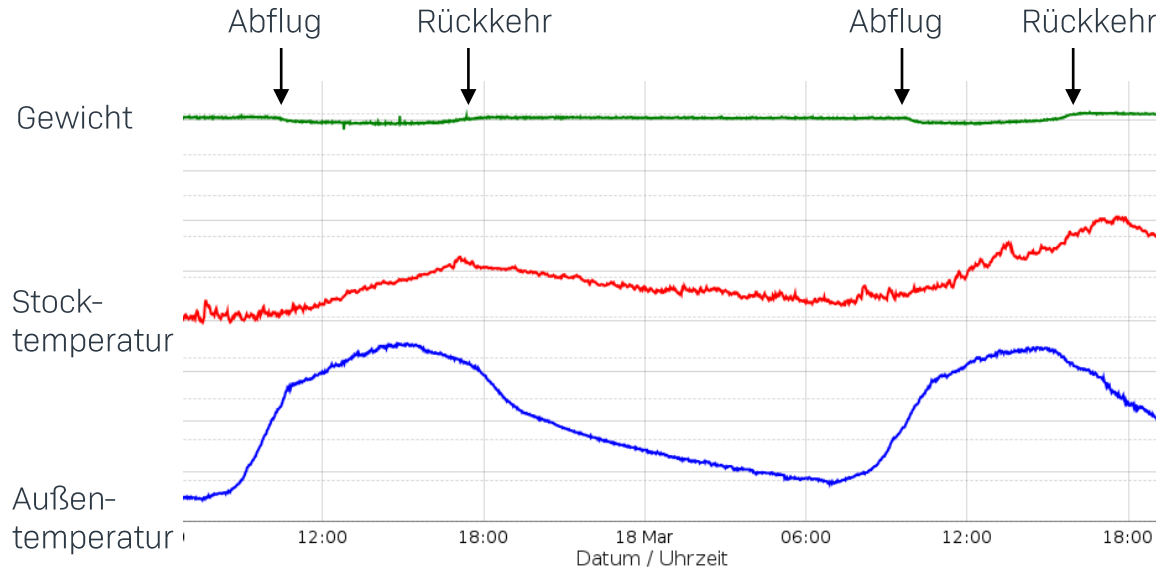
Kommentar

- Jeweils ca. um 11:30
  - Temperatur > 12°C
  - 300g Gewichtabnahme

- Abends wieder Gewichts-
  zunahme um ca. 300g

- Eine Biene wiegt ca. 120mg

- ➔ 2.5k Bienen unterwegs
  über den Tag
  (sehr approximativ…)

checkmk

Die Bienensaison geht langsam los

Normales Monitoring in Action II: „Typische" IT-Infrastruktur

DEMO

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Links / Weiterführendes

- Download und mehr Infos zu Check_MK unter:
  https://mathias-kettner.de

- Bienenmonitoring:
  https://www.imker-nettetal.de/nsa-fuer-bienen-wir-bauen-uns-eine-stockwaage/

- Mein Kontakt:
  - https://oscarnajera.com/
  - Email: hello AT oscarnajera DOT com
  - GitHub: https://github.com/Titan-C

checkmk

Thank you!

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by tribe29