

# Zabbix in your home environment

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Opensource ICT Solutions

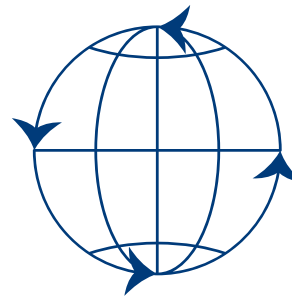
Zabbix Conference BeNeLux 2019  
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# whoami

Brian van Baekel

- Zabbix consultant
- Zabbix trainer
- Network engineer

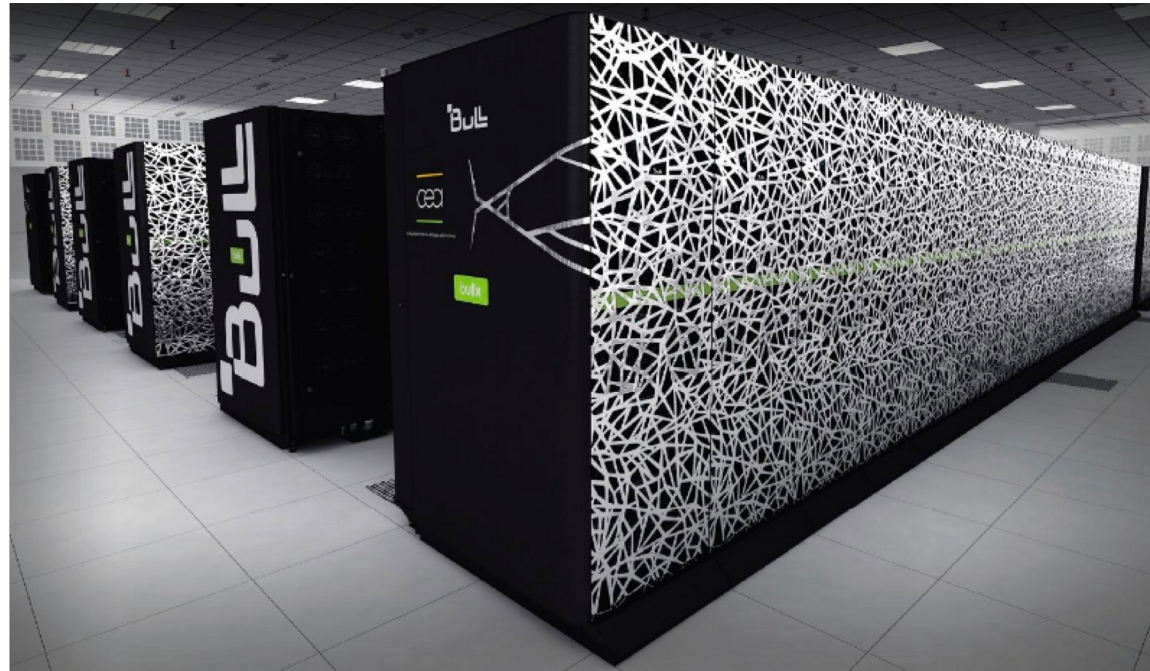


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# Why

Just because it's possible.

# Hardware





# Full blown server

## Pro's

- Hardware
- Temperature management
- Reliability

## Cons

- Power consumption
- Noise
- Price
- Size



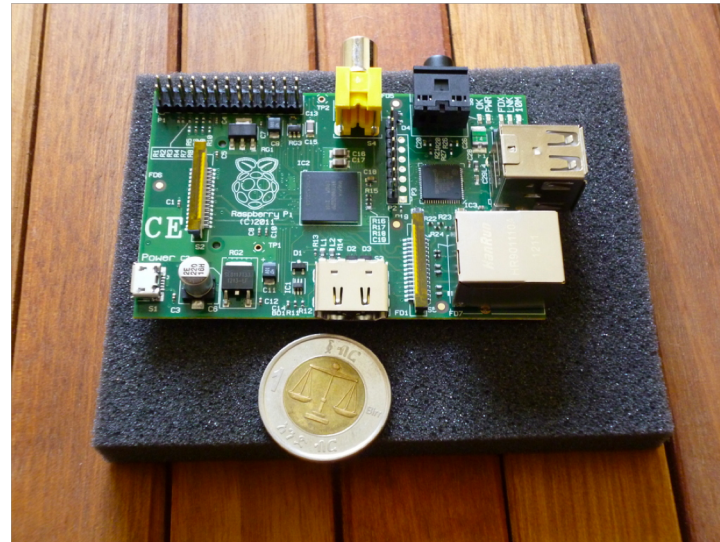
# Raspberry pi

## Pro's

- Price
- Size
- GPIO pins
- Flexible!

## Cons

- Hardware
- Reliability



# Something in between

## Pro's

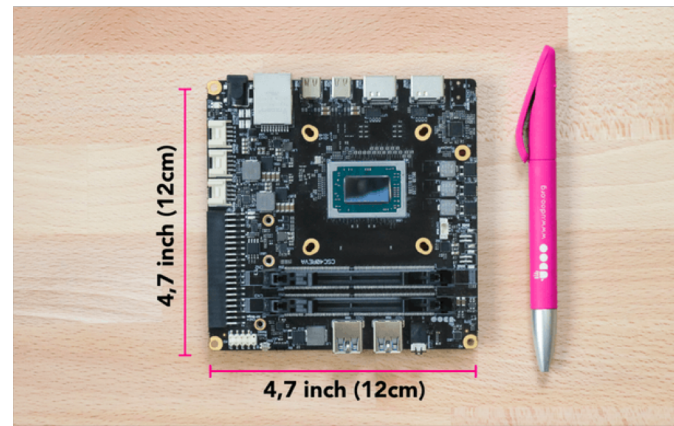
- Price
- Size
- Hardware
- Power usage

## Cons

- Reliability

# But what?

- Intel NUC
- Gigabyte Brix
- UDOO bolt v8
- ODROID-H2



# Zabbix

Which version, and what setup?

# Setup

- Latest and greatest
- All on the same machine
- no redundancy
- A lot of “playground” configuration

# What to monitor?

- Philips Hue?
- Google Nest?
- Sonoff?
- 3D Printer?
- Power consumption?
- Plants?

# Philips hue

## What?

- Are the lights on or off
- Which lights are on, and which color
- Are there updates available
- Model ID

## How?

- Zabbix agent with a UserParameter
- New HTTP agent item



# Philips hue - UserParameter

## How?

\* Name

Type

\* Key

Type of information

\* Update interval

Custom intervals

Type	Interval	Period	Action
Flexible	Scheduling	50s	1-7,00:00-24:00 <a href="#">Remove</a>

[Add](#)

History storage period

UserParameter=hue.get[\*],curl -s http://\$1/api/\$2

## Result

```
{
  "lights":{
    "1":{
      "state":{
        "on":false,
        "bri":254,
        "alert":"none",
        "mode":"homeautomation",
        "reachable":true
      },
      "swupdate":{
        "state":"noupdates",
        "lastinstall":"2019-01-05T12:53:29"
      },
    },
  },
  ....
}
```

# Philips hue – HTTP Agent

## How?

\* Name

Type

\* Key

\* URL

Query fields

Name	Value
<input type="text" value="name"/>	<input type="text" value="value"/>

[Add](#) [Remove](#)

## Result

```

{
  "lights":{
    "1":{
      "state":{
        "on":false,
        "bri":254,
        "alert":"none",
        "mode":"homeautomation",
        "reachable":true
      },
      "swupdate":{
        "state":"noupdates",
        "lastinstall":"2019-01-05T12:53:29"
      },
    },
    ....
  }
}

```

# Philips hue – Master/dependent item

\* Name

Type

\* Key

\* Master item

Type of information

Units

\* History storage period

# Philips hue – Preprocessing

## What?

Preprocessing steps

Name	Parameters	Action
JSON Path	\$.lights.14.state.on	<a href="#">Remove</a>
Boolean to decimal		<a href="#">Remove</a>

[Add](#)

## Value mapping

Name Hue

Mappings

Value	Mapped to	Action
1	ON	<a href="#">Remove</a>
0	OFF	<a href="#">Remove</a>

[Add](#)

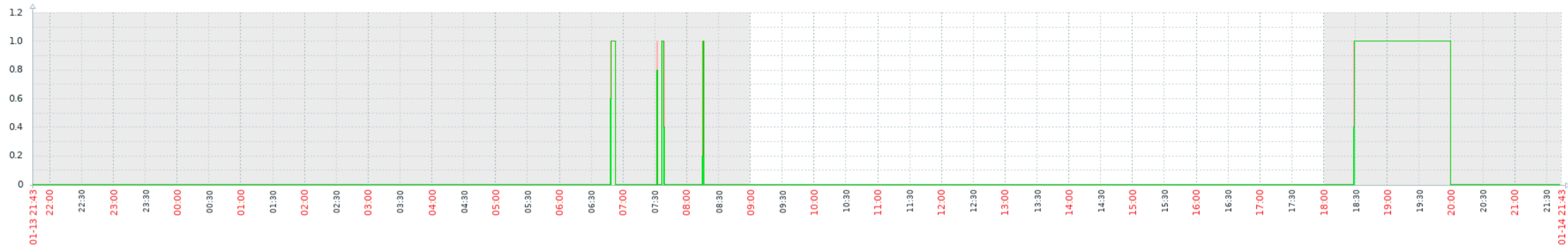
## Result

```
{  
  "lights":{  
    "14":{  
      "state":{  
        "on":false,  

```

True => 1  
False => 0

# Philips hue – Result



# Philips hue – Controlling

## Action

Name:

Label	Name	Action
A	Trigger equals Home automation: Lamp overloop staat aan	<a href="#">Remove</a>

New condition

[Add](#)

## Operation

Default operation step duration:

Steps	Details	Start in	Duration	Action
2	Run remote commands on current host	00:01:00	Default	<a href="#">Edit</a> <a href="#">Remove</a>

Operation details

Steps:  -  (0 - infinitely)

Step duration:  (0 - use action default)

Operation type:

Target list

Target	Action
Current host	<a href="#">Remove</a>

[New](#)

Type:

Execute on:

Commands

```
curl -s -X PUT http://{SHUE_BRIDGE}/api/{SHUE_AUTH_CODE}/lights/4/state -d '{"on":false}'
```

# Philips hue – Presentation

All lights off



Lights in my home office on



# Philips hue – Controlling

Frontend scripts to the rescue...





# Preventing damage

**If temperature < 4 C**  
**Trigger goes into problem state**  
**Action must be taken.**

# Sonoff

## Pro's

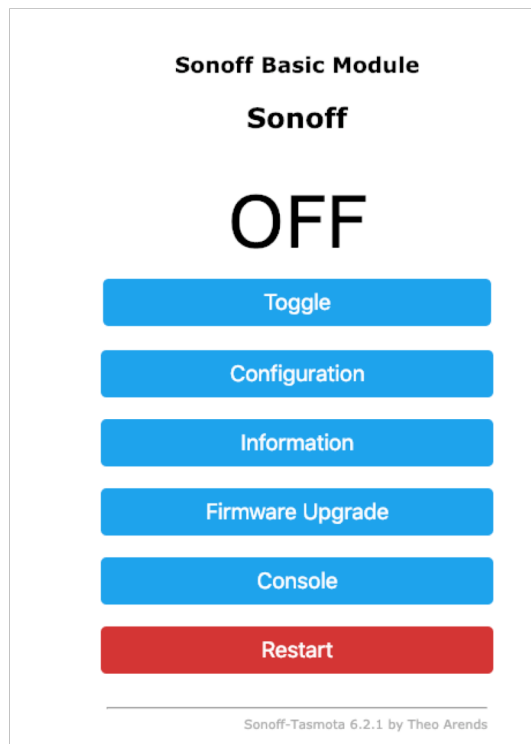
- Small
- Cheap ( ± €4)
- Custom firmware (tasmota)

## Cons

- Fragile
- Unsafe?????



# Sonoff - Tasmota



```
curl -sL http://<IP>/cm?cmd=Power%20on
```

```
curl -sL http://<IP>/cm?cmd=Power%20off
```

```
curl -sL http://<IP>/cm?cmd=Power%20toggle
```

# Sonoff in Zabbix

Operation details

Steps  -  (0 - infinitely)

Step duration  (0 - use action default)

Operation type

\* Target list

Target	Action
Current host	<a href="#">Remove</a>
<a href="#">New</a>	

Type

Execute on

\* Commands

Conditions

Label	Name	Action
<a href="#">New</a>		

[Update](#) [Cancel](#)

# Temperature

## What?

- Temperature

## How?

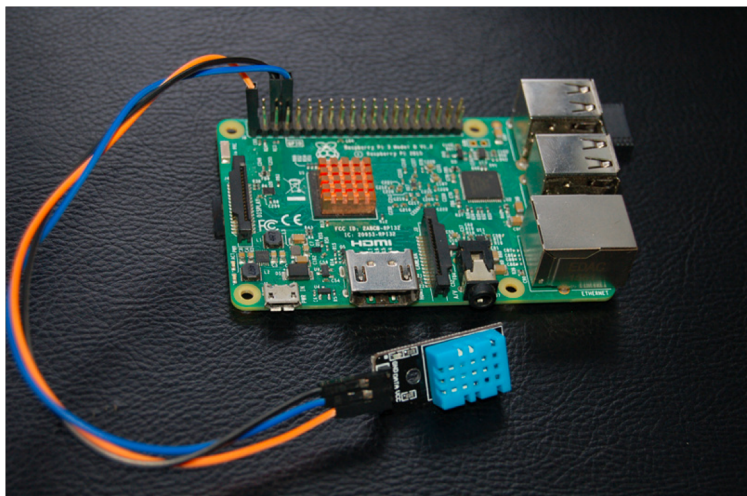
- Raspberry PI
- DHT22 / DS18B20
- Python + Zabbix Sender

# Setup

Sensor is connected to GPIO ports

Python script reads the output

Calls Zabbix Sender once per minute



```
import os
import glob
import time
import sys

os.system('modprobe w1-gpio')
os.system('modprobe w1-therm')
sender = "/usr/bin/zabbix_sender"
host = "Home automation"
server = "192.168.1.101"

base_dir = '/sys/bus/w1/devices/'
device_folder = glob.glob(base_dir + '28*')[0]
device_file = device_folder + '/w1_slave'

def read_raw():
    name_file=device_folder+'name'
    f = open(name_file,'r')
    return f.readline()

def read_temp_raw():
    f = open(device_file, 'r')
    lines = f.readlines()
    f.close()
    return lines

def read_temp():
    lines = read_temp_raw()
    while lines[0].strip()[-3:] != 'YES':
        time.sleep(0.2)
        lines = read_temp_raw()
    equals_pos = lines[1].find('t=')
    if equals_pos != -1:
        temp_string = lines[1][equals_pos+2:]
        temp_c = float(temp_string) / 1000.0
        return temp_c

while True:
    os.system(sender + ' -z ' + server + ' -s "' + host + '" -k temp.bijkeuken.pi -o ' + '%3.3f' % read_temp())
    sys.exit()
```

# Result



# Notifications

Problem: Your house is on fire! on host Home monitoring ----- Problem started at 10:53:55 on 2019.01.27

Problem name: Your house is on fire!

Host: Home monitoring

Severity: Disaster

Original problem ID: 616829



# Email

Media types

Media type Options

Name

Type

SMTP server

SMTP server port

SMTP helo

SMTP email

Connection security  None  STARTTLS  SSL/TLS

SSL verify peer

SSL verify host

Authentication  None  Username and password

Username

Password

Enabled

# SMS

## Pro's

- Reliable
- Fast
- Independent of internet access

## Cons

- Expensive hardware
- Based on cell service
- Monthly fee / price per sms



# Pushover

“Simple notifications for Android, iOS and Desktop”

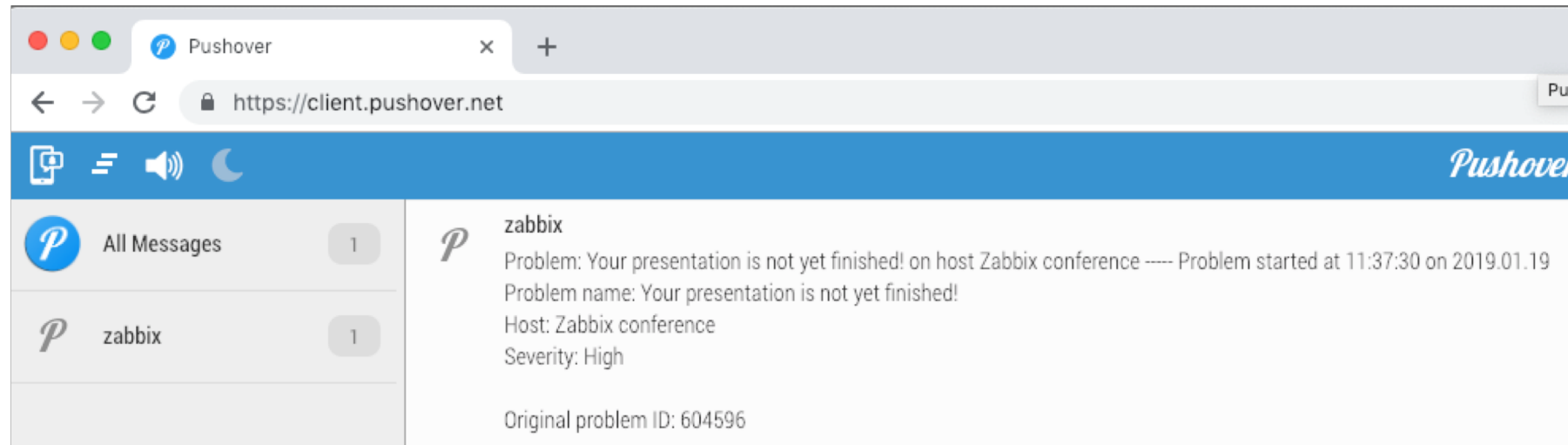
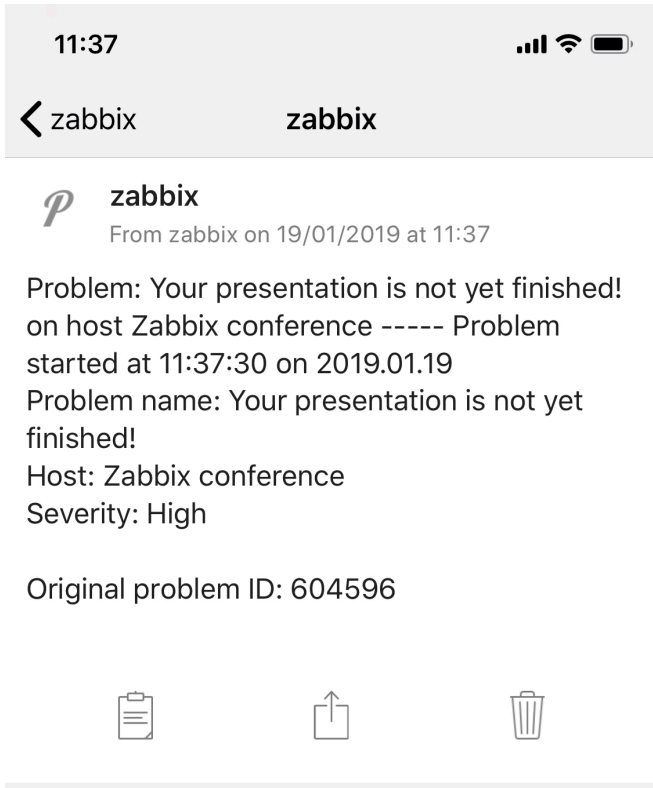
## Pro's

- API
- Cheap
- Both desktop and phone

The screenshot shows the 'Media types' configuration page in Zabbix. The 'Media type' tab is selected, and the configuration is for a 'pushover' notification. The 'Name' field is 'pushover', the 'Type' is 'Script', and the 'Script name' is 'pushover.sh'. The 'Script parameters' section contains three entries: '{ALERT.SUBJECT}', '-----', and '{ALERT.MESSAGE}', each with a 'Remove' link. The 'Enabled' checkbox is checked. At the bottom, there are buttons for 'Update', 'Clone', 'Delete', and 'Cancel'.

Parameter	Action
{ALERT.SUBJECT}	<a href="#">Remove</a>
-----	<a href="#">Remove</a>
{ALERT.MESSAGE}	<a href="#">Remove</a>

# Pushover



# Thank you

Questions?