ZABBIX '25
CONFERENCE
BENELUX

Feeding Zabbix with MQTT data

Ivo Schooneman

Open-Source Consultant

Xifeo

About me

- Ivo Schooneman
- Open source consultant at Xifeo
- IoT enthusiast
- I monitor my home (network)

The case

Open water swimming around Hoofddorp

- Which water is the best
- What’s the air temperature
- Can we swim?

What we will talk about

MQTT: small introduction to MQTT

- What's MQTT
- Use cases

How to get MQTT data into Zabbix

- Configuring the agent
- Configuring Zabbix

Dashboards

- Showing your data

What’s MQTT

- A lightweight data transport protocol
- Reliable delivery
- Bi-directional
- Publish or Subscribe to topics

Terminology

Broker – the server

QoS levels to assure delivery

Client

- Publish
- Subscribe

Quality of Service

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0	1	2
Level 0	Level 1	Level 2
At most once	At least once	Exactly once

Topic hierarcy and filters

Publish:

- sensors/room1/temperature
- sensors/room1/humidity
- sensors/room2/temperature
- sensors/room2/humidity
- sensors/room.../...

Subscribe:

- sensors/room1/#
- sensors/+/temperature
- sensors/#

Topic hierarcy and filters 2

Publish:

- sensors/room1/temperature/sensor1
- sensors/room1/temperature/sensor2
- sensors/room2/temperature/sensor1
- sensors/room2/temperature/sensor2
- sensors/room1/humidity/sensor1
- Sensors/room.../humidity/sensor...

Subscribe:

- sensors/+/temperature/#

The payload

Single values:

- sensor/room1/temperature: 20.6
- sensors/room1/humidity: 78
- sensor/room1/status: online

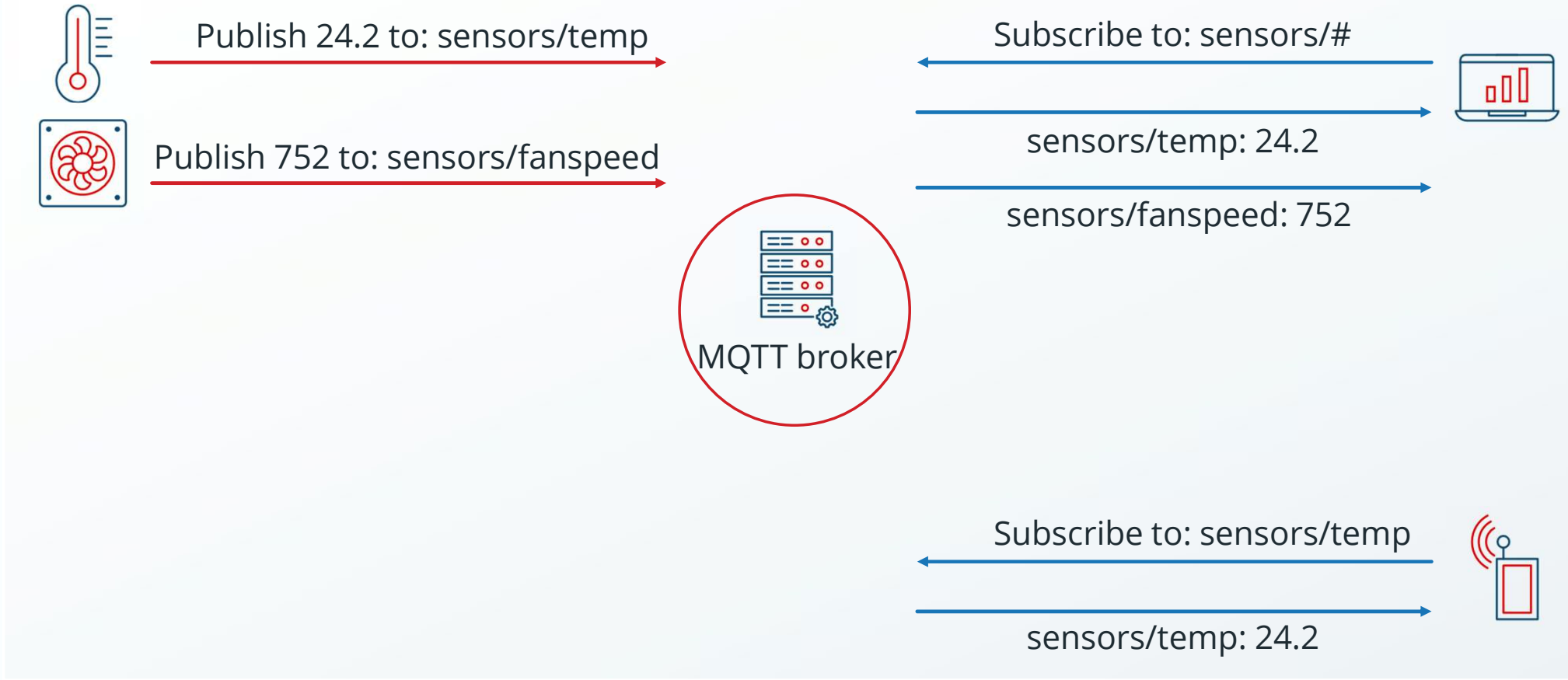
Multiple values:

- sensors/room1:

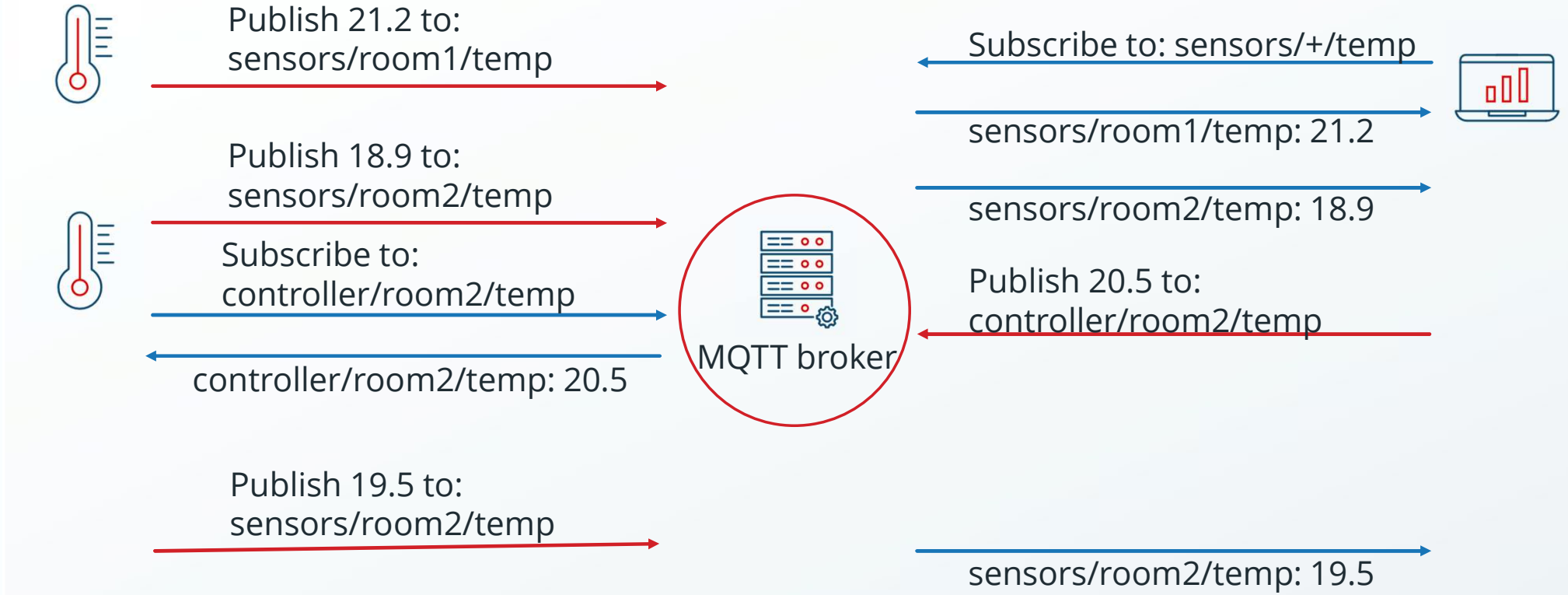
```
{
  "temperature": 20.6,
  "humidity": 78,
  "status": "online"
}
```

```
<?xml version="1.0" encoding="UTF-8" ?>
<root>
  <temperature>20.6</temperature>
  <humidity>78</humidity>
  <status>online</status>
</root>
```

Publish and Subscribe example 1

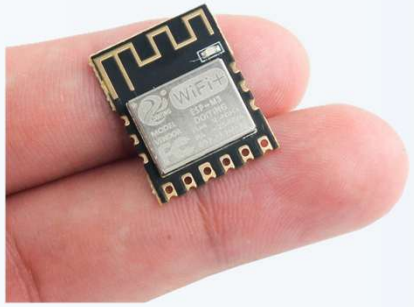


Publish and Subscribe example 2



Usecases

- Low-power devices
- Low-cpu devices
- Low-bandwidth devices



- Example: Delivery trucks to track position (and speed) over cellular
- Example: Measure soil pH and moisture over LoRa
- Example: Measure temperatures (LoRa/WiFi/Zigbee/Z-wave)

LoRa networks

- Devices connect to a gateway
- Gateway forwards message to a server
- In Europe over 433 and 868Mhz (915Mhz for America)
- Range up to 10km

Configuring the agent

- Agent2 is required to use MQTT plugin
- Configure the defaults
- Configure optional sessions

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Shell ⌘1

```
Plugins.MQTT.Default.Url=tcp://mqtt.example.com:1883
Plugins.MQTT.Default.User=zabbix
Plugins.MQTT.Default.Password=zabbix
Plugins.MQTT.Sessions.Toolenburgerplas.Topic=watertemp/toolenburg/status
Plugins.MQTT.Sessions.Haarlemmermeerbos.Topic=watertemp/haarlem/status
Plugins.MQTT.Sessions.Livingroom.Topic=temp/livingroom/#
Plugins.MQTT.Sessions.Bedroom.Topic=temp/bedroom/#
Plugins.MQTT.Sessions.3DPrinter.Topic=shellies/3dprinter/#
Plugins.MQTT.Sessions.3DPrinter.URL=tcp://shelly-mqtt.example.com:1833
Plugins.MQTT.Sessions.3DPrinter.User=shelly
Plugins.MQTT.Sessions.3DPrinter.Pass=shelly
~
~
~
~
~
~
~
~
~
~
~
~
~
                                                    12,0-1        All
```

Example mqtt.conf file for agent2

Configuring Zabbix

- Creating a master item
- Creating dependent items

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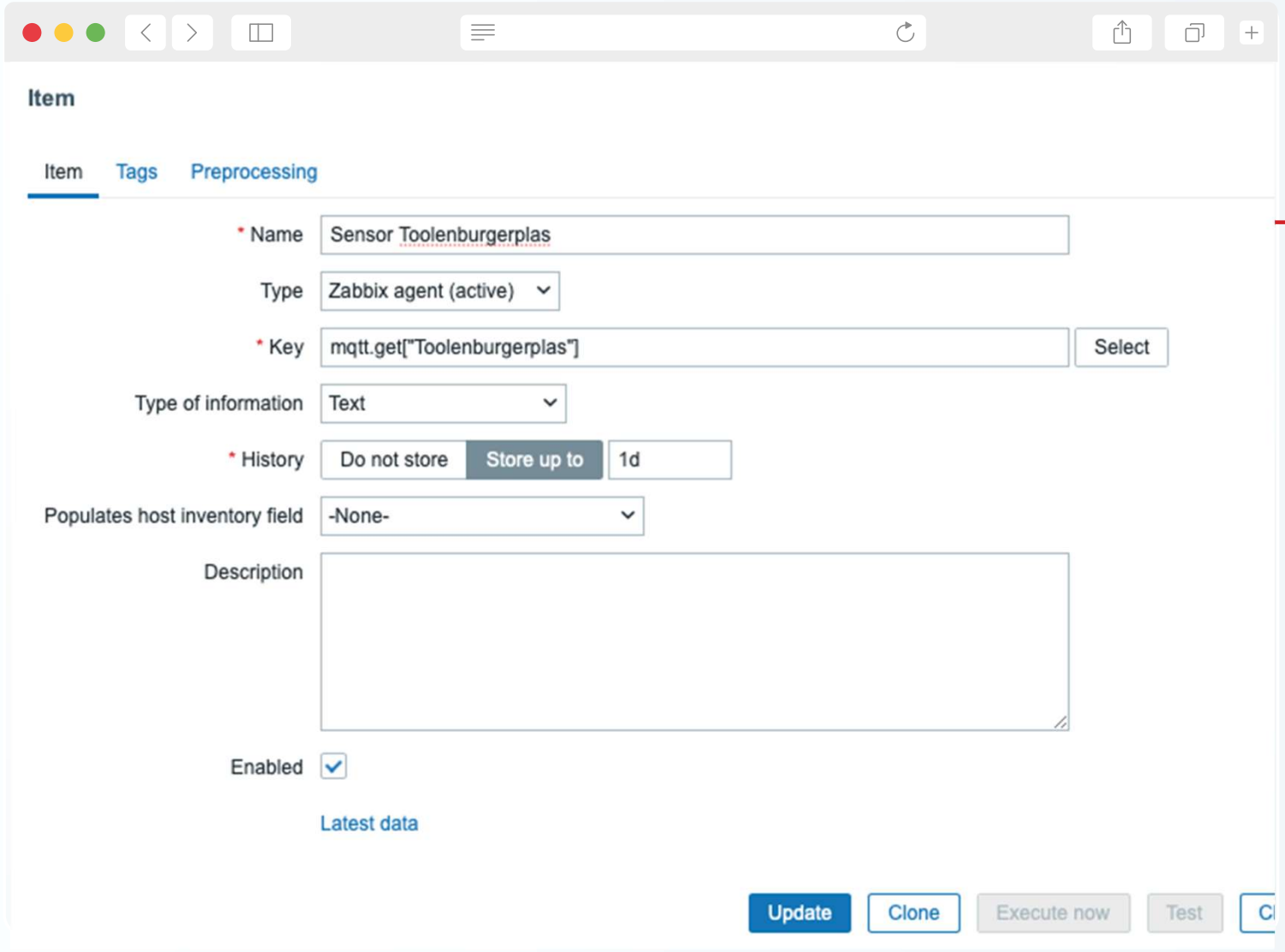
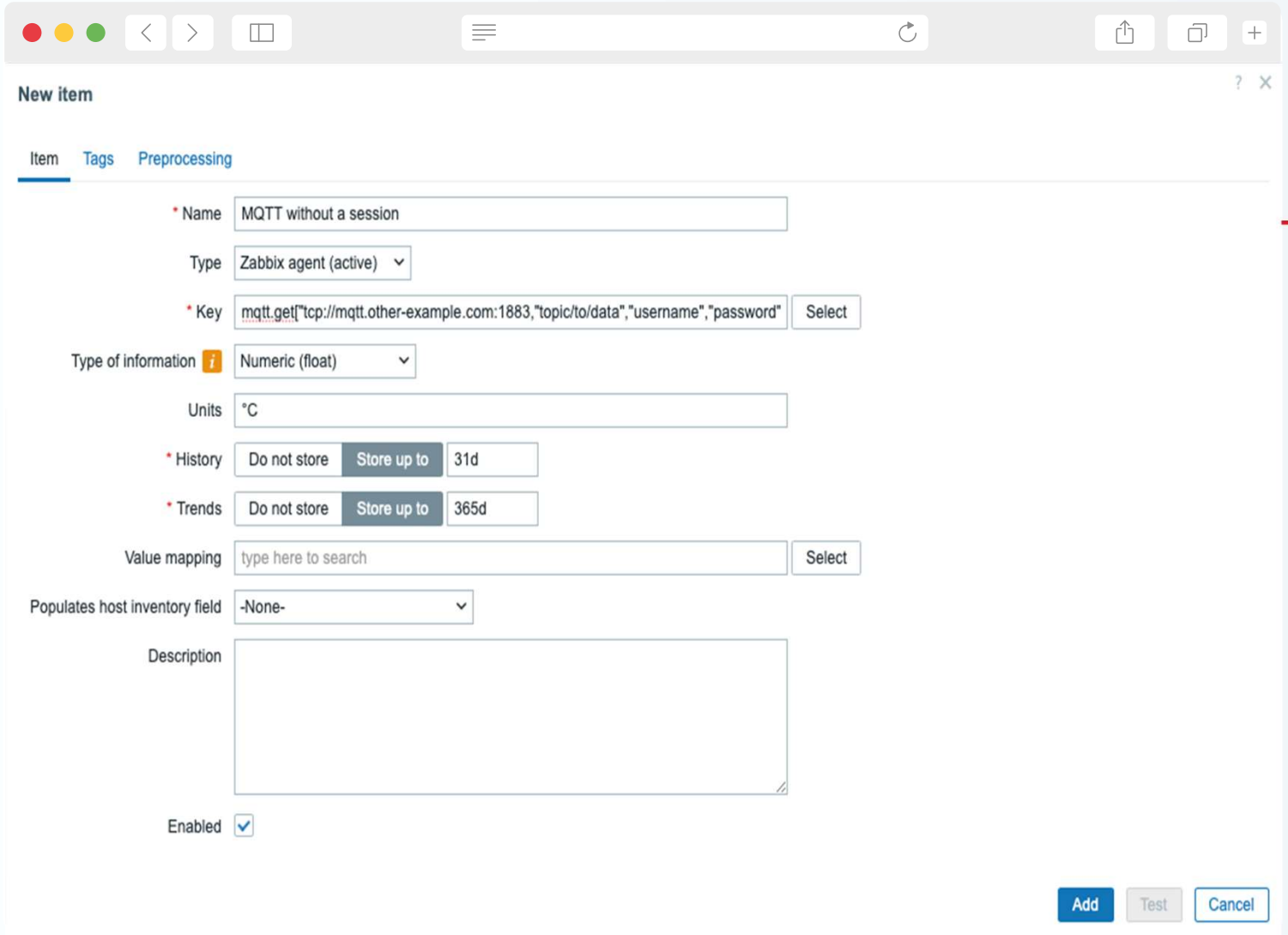


Item configuration

Mqtt.get[“Session”]



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Item configuration

Mqtt.get

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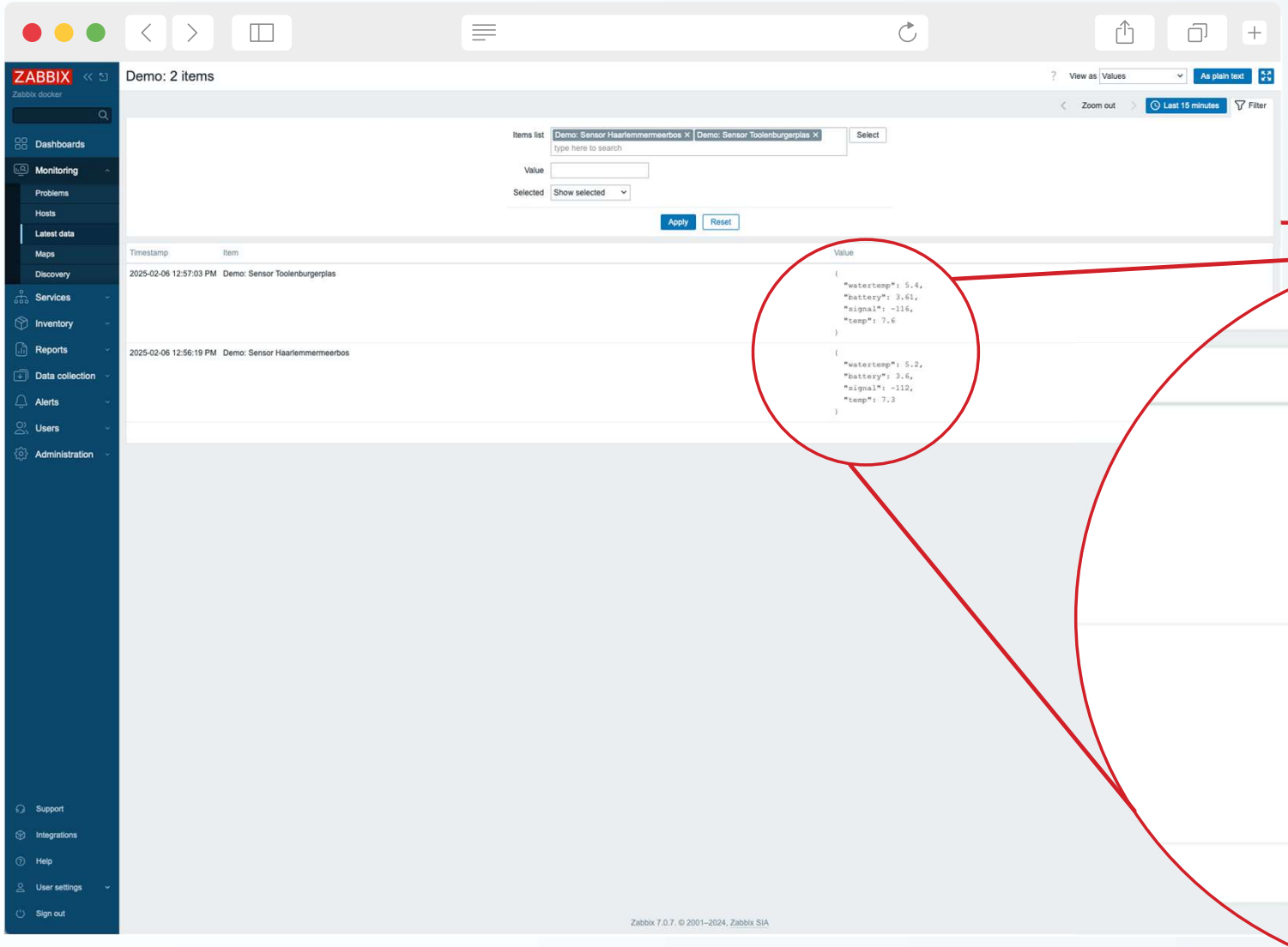

JSON data

Value

```
{
  "watertemp": 5.4,
  "battery": 3.61,
  "signal": -116,
  "temp": 7.6
}
```

```
{
  "watertemp": 5.2,
  "battery": 3.6,
  "signal": -112,
  "temp": 7.3
}
```

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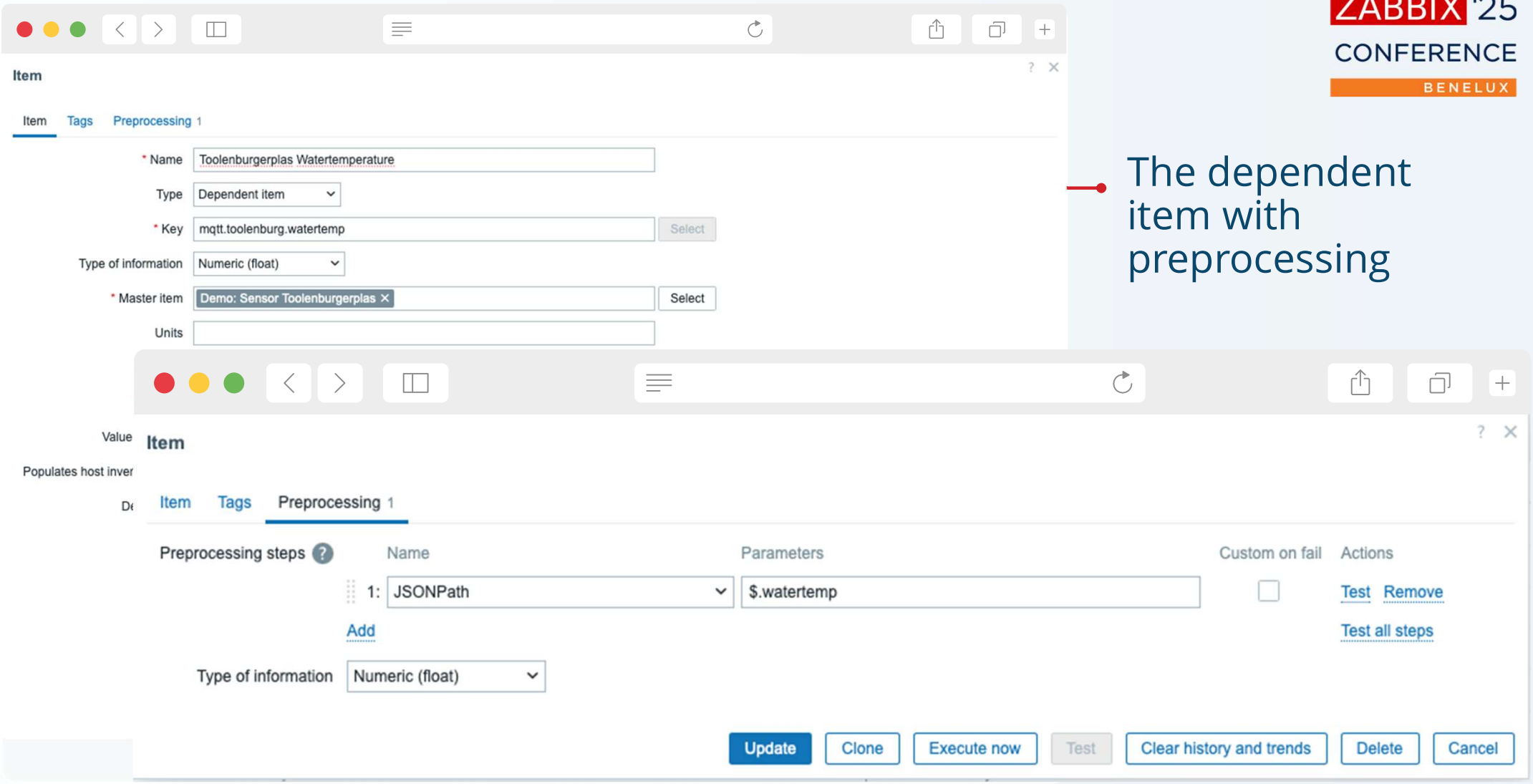
The dependent item with preprocessing



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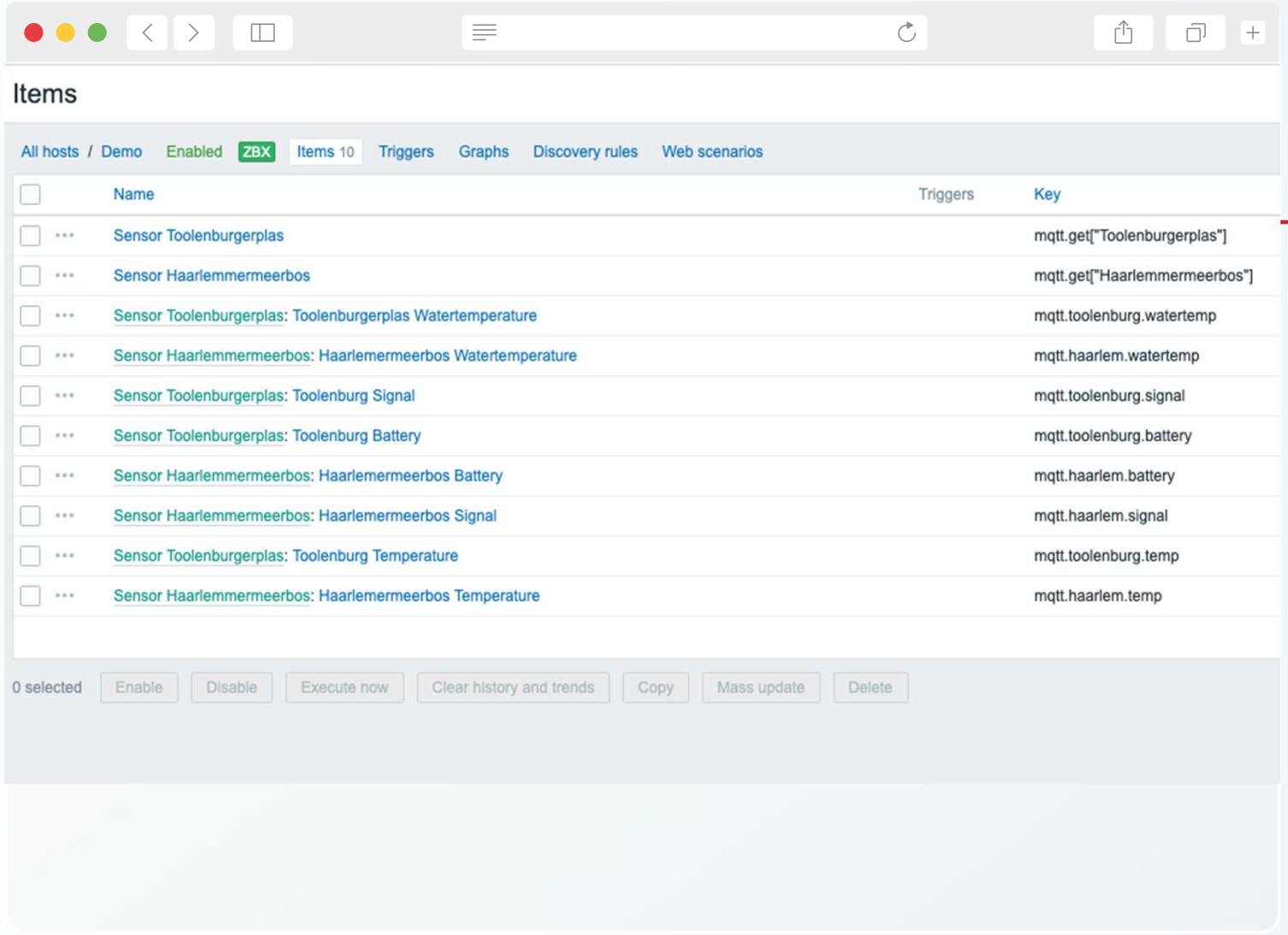
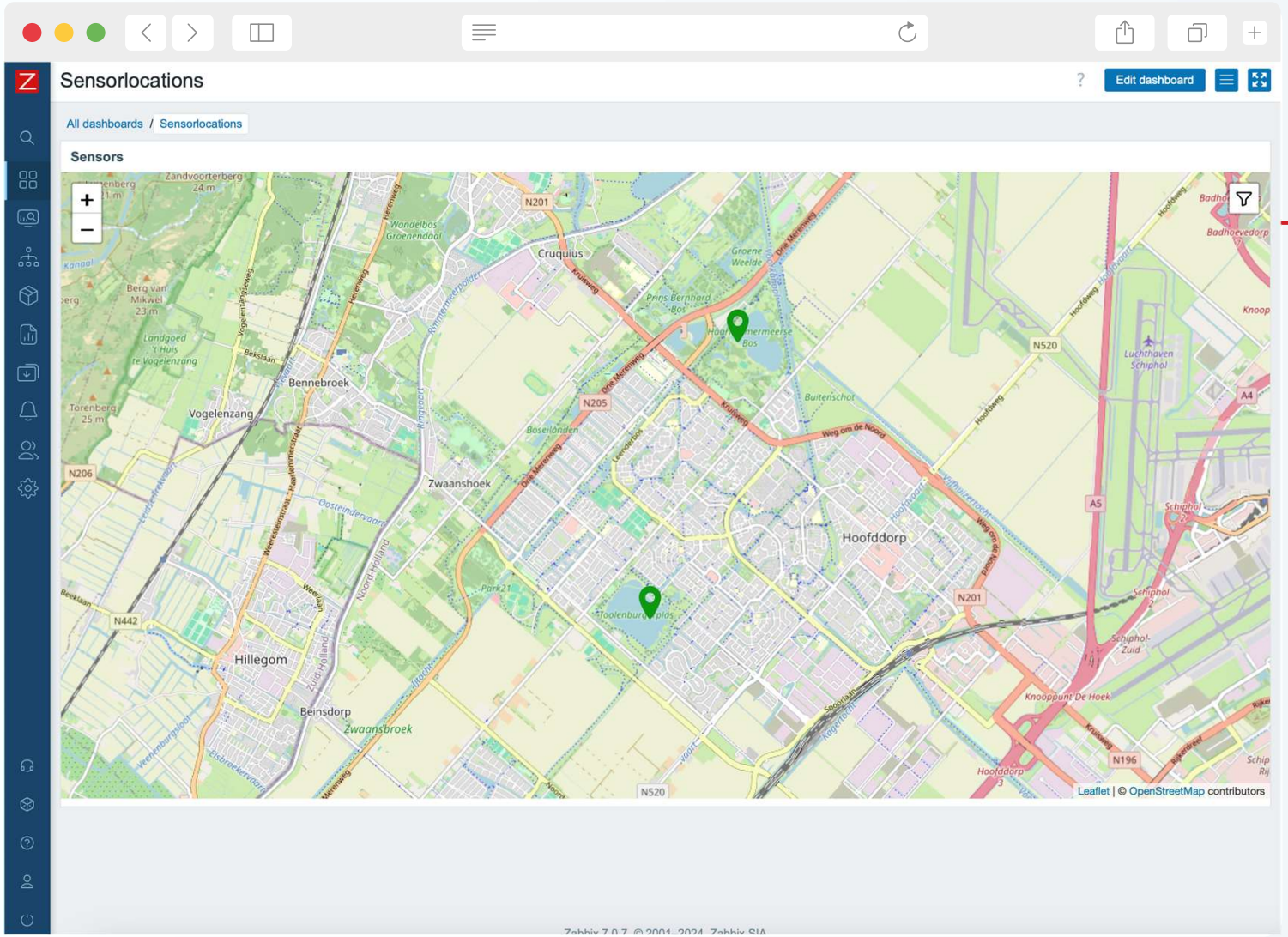
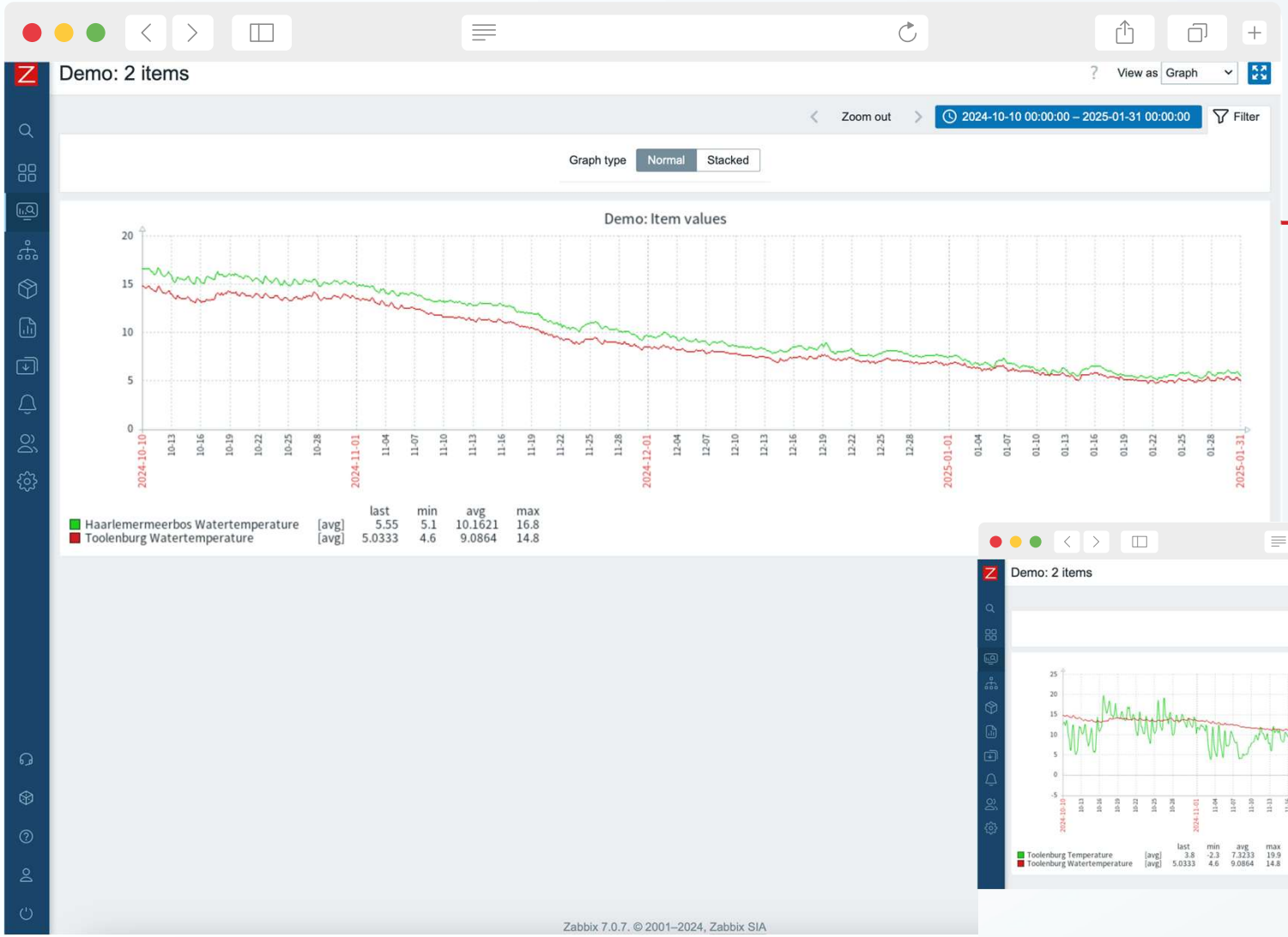


All items configured



About 3.5km apart


Demo: 2 items
View as Graph
Zoom out
2024-10-10 00:00:00 – 2025-01-31 00:00:00
Filter
Graph type
Normal
Stacked
Demo: Item values
Haarlemermeerbos Watertemperature [avg] 5.55 5.1 10.1621 16.8
Toolenburg Watertemperature [avg] 5.0333 4.6 9.0864 14.8
Zabbix 7.0.7. © 2001–2024, Zabbix SIA

Compared


Demo: 2 items
Demo: Item values
Toolenburg Temperature [avg] 3.8 -2.3 7.3233 19.9
Toolenburg Watertemperature [avg] 5.0333 4.6 9.0864 14.8

Questions?


Disk IO utilization
0%
7.14 %
70%
90%
100%
Availability
ZBX
SNMP
Monitored by
Templates
class: os
class: software
role: frontend
target: linux
target: server
Temperature
Items
Alpha
Beta
Gamma
Delta
D1
A2
B1
B2
A1
A3
C1
C2
A1
14.00
21.00
25.00
2.00
25.00
25.00
19.00
24.00
24.00
89.00
23.00
23.00
20.00
uplink: outgoing
2.12 Kbps

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Open Source Consultant

Xifeo

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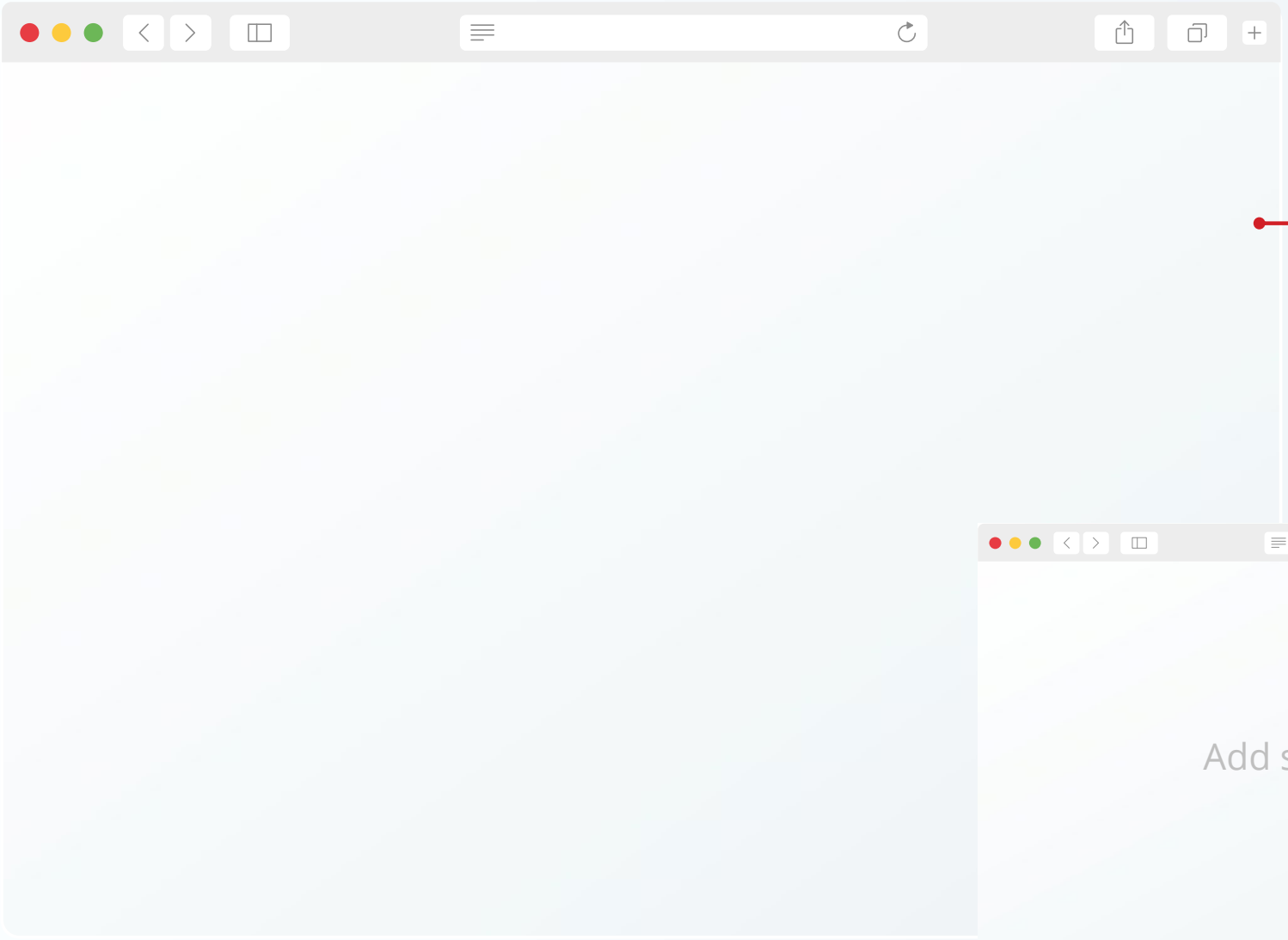

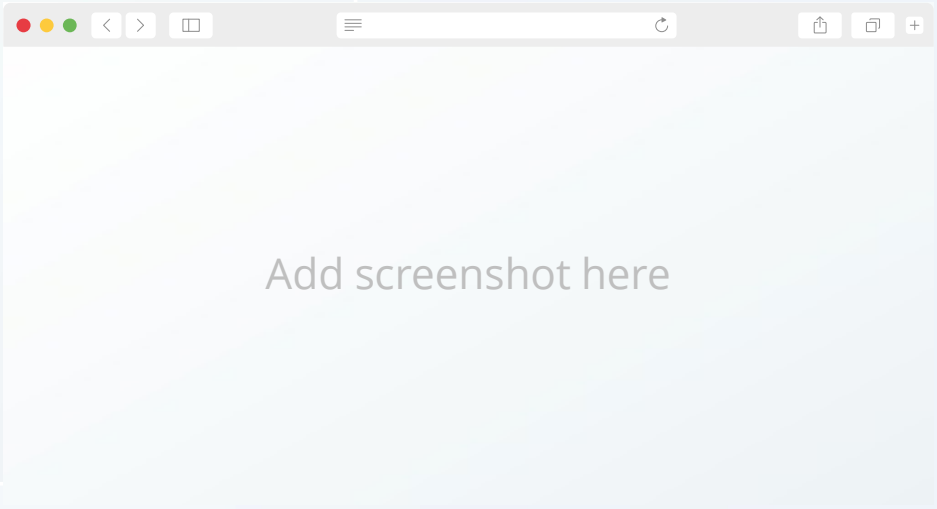

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Add title here

First level

- Second level
  - Third level

Add title here

First level

- Second level
  - Third level

Add title here

First level

- Second level
  - Third level

First level

- Second level
  - Third level

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Main title

Title V1

Title V2

SUBTITLE

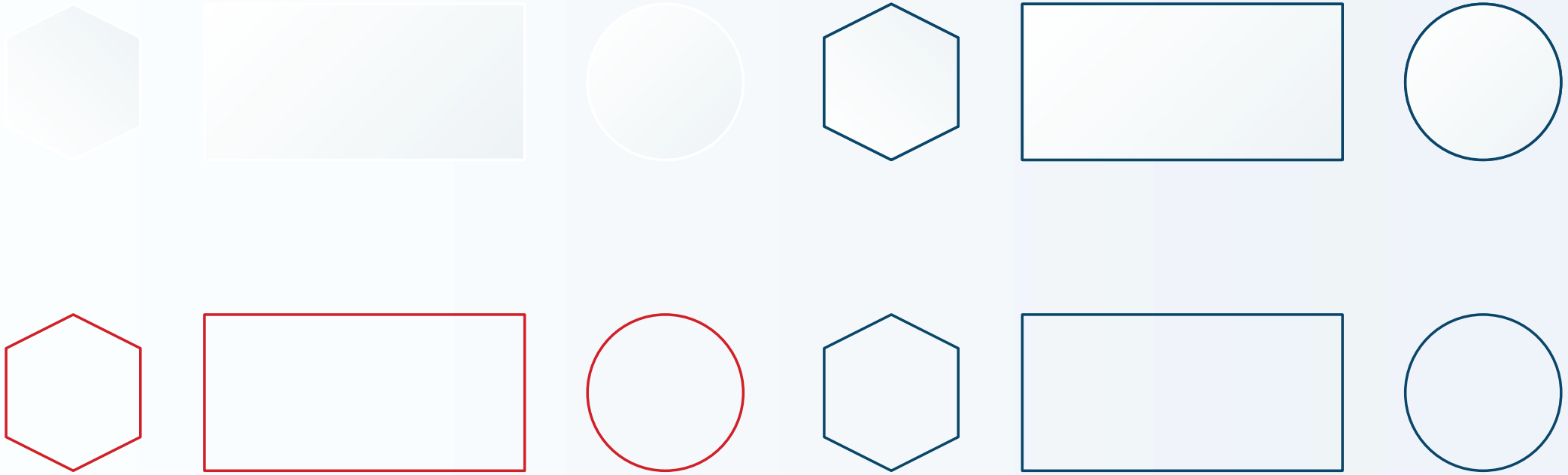
SUBTITLE

First level

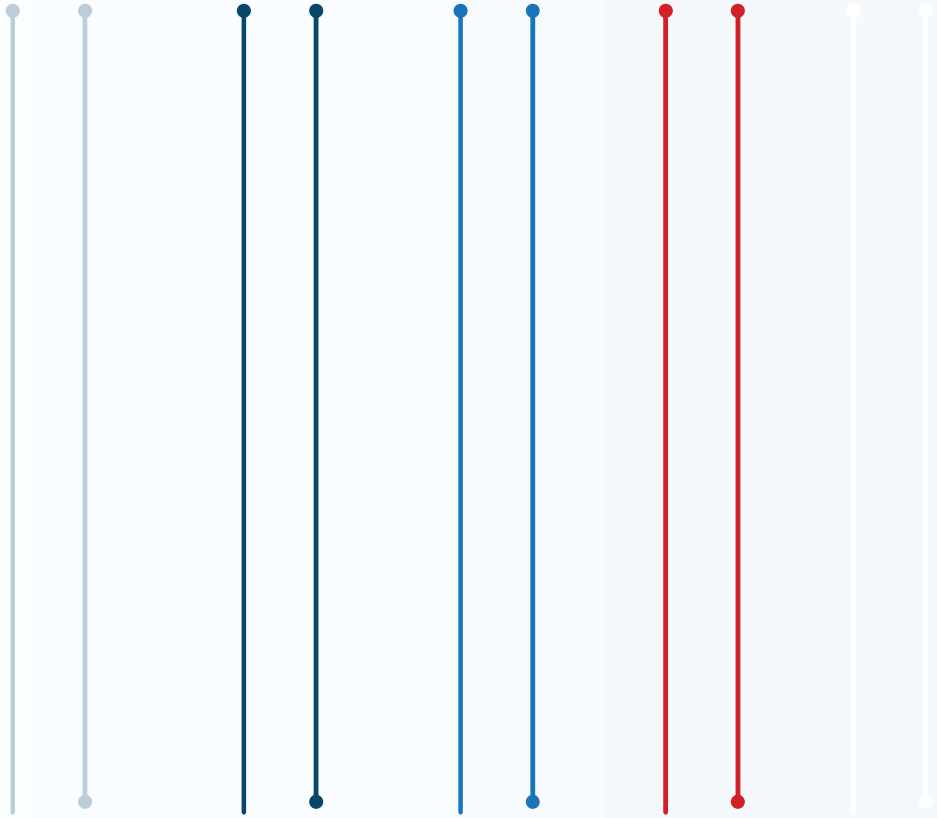
- Second level
  - Third level

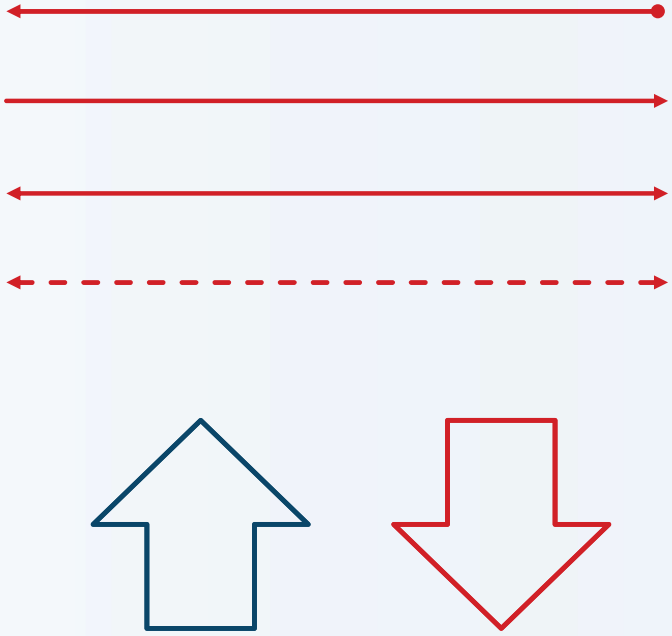
Text Text

Elements



Elements





Custom-made Zabbix icons

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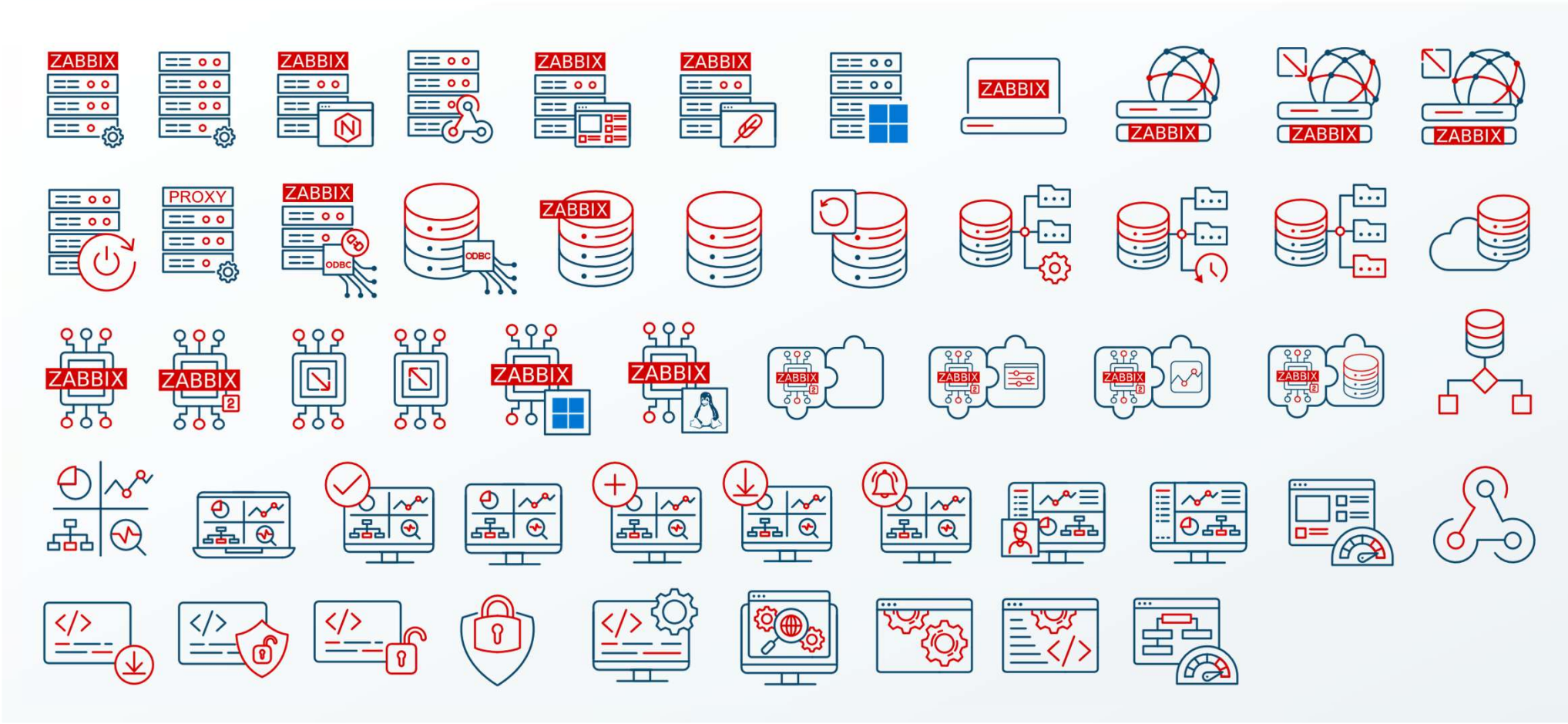

Custom-made Zabbix icons

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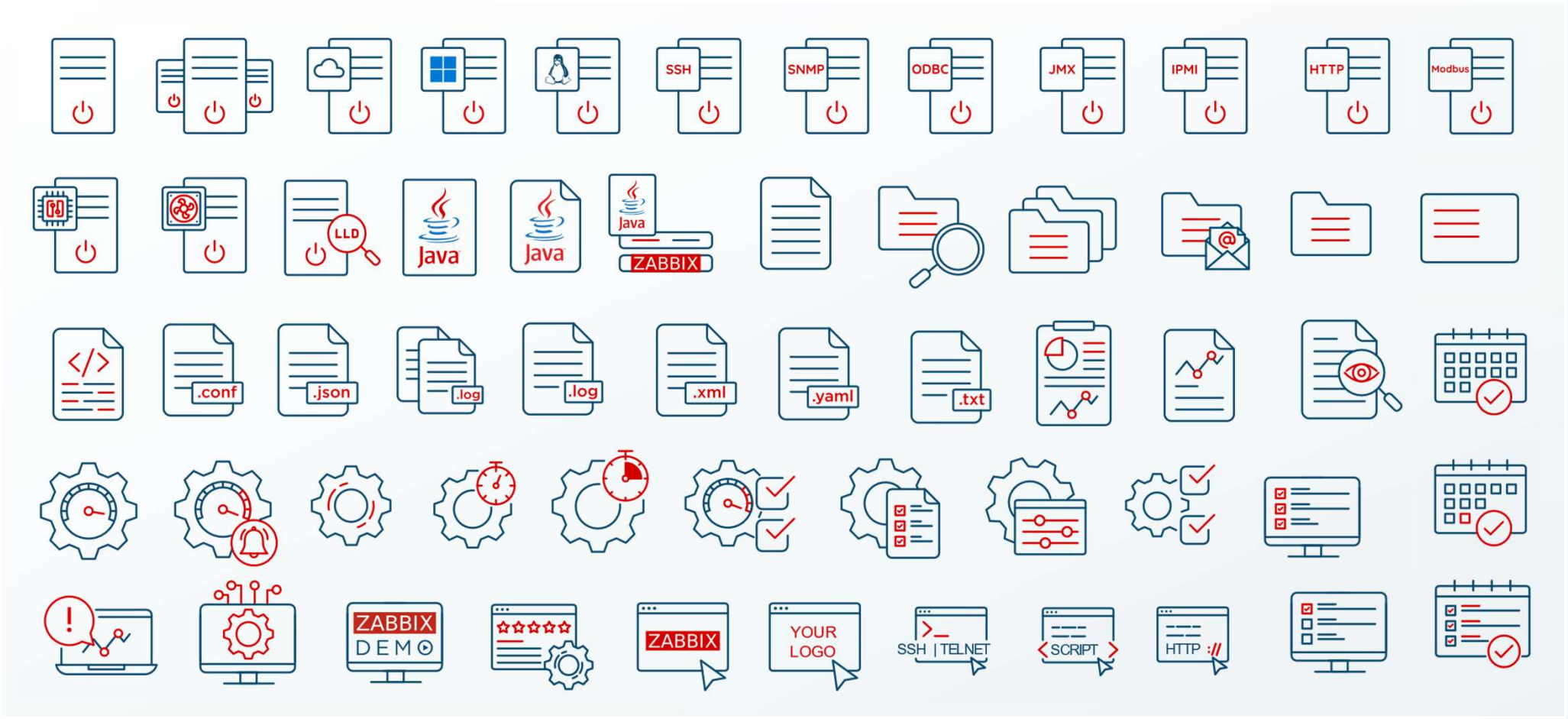

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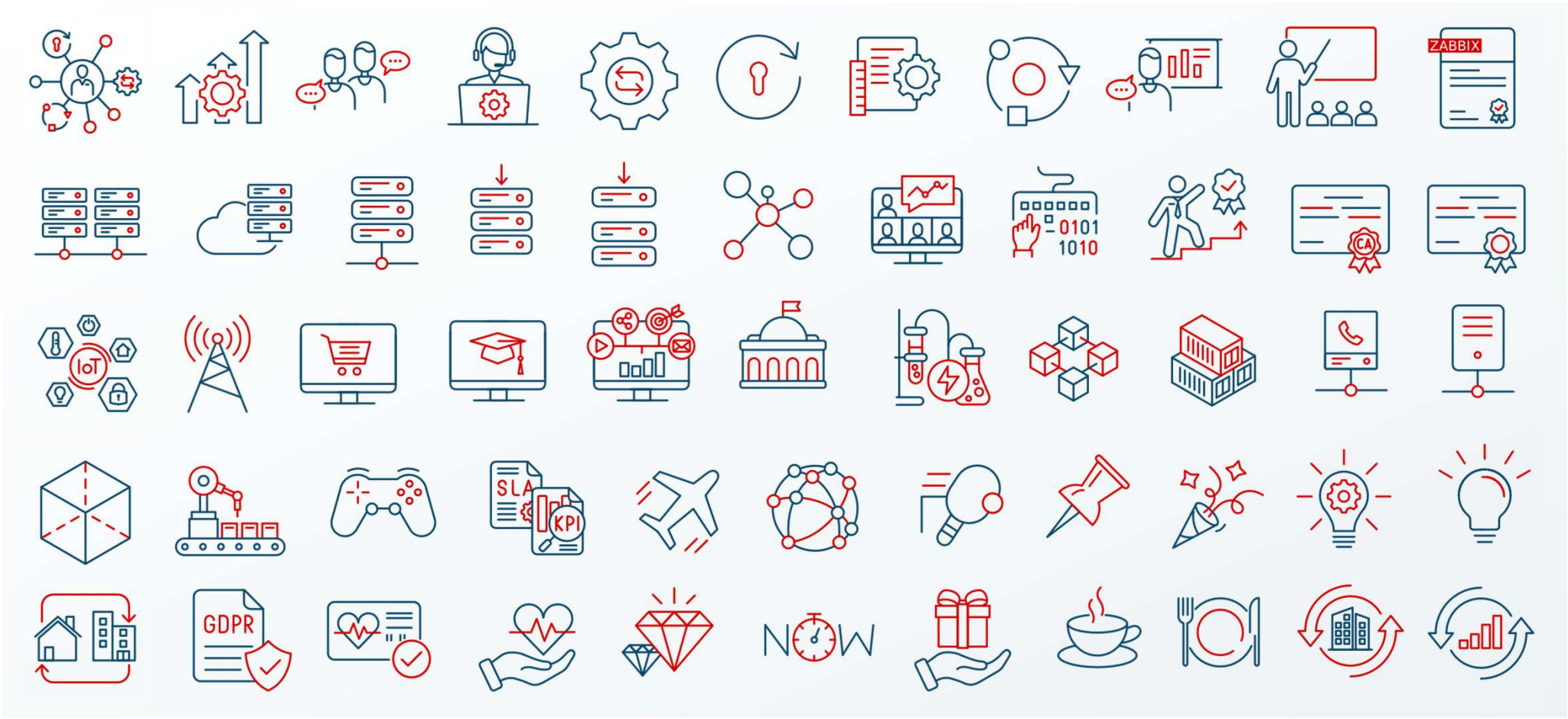

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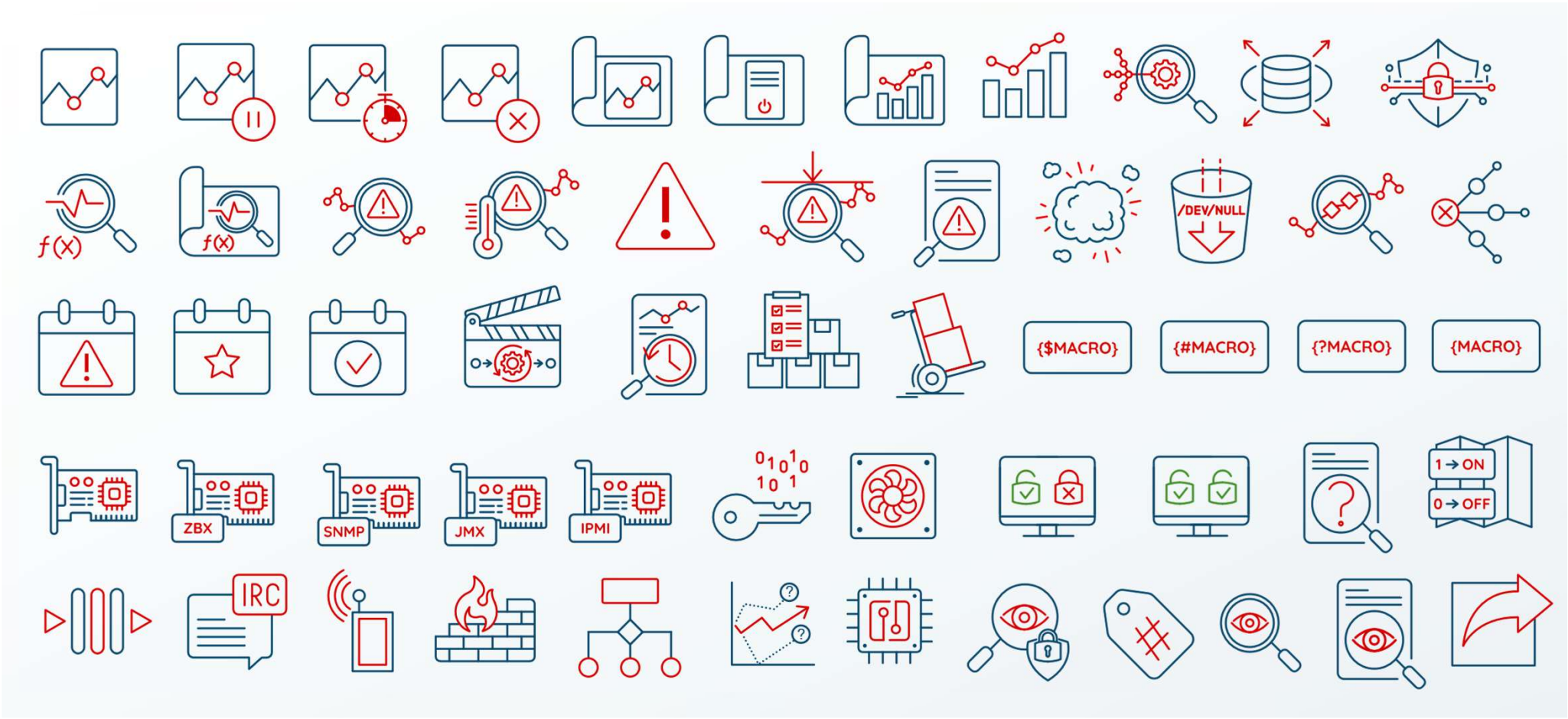

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