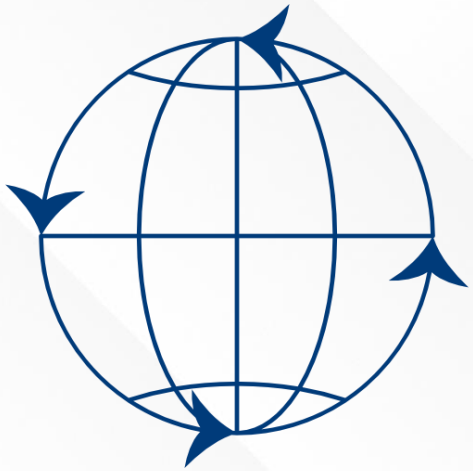


Opensource ICT Solutions

ZABBIX '23

CONFERENCE

GERMANY

Zabbix and Juniper Mist

Whoami

Brian van Baekel

Zabbix trainer / Consultant

Opensource ICT Solutions

Your Zabbix partner in:

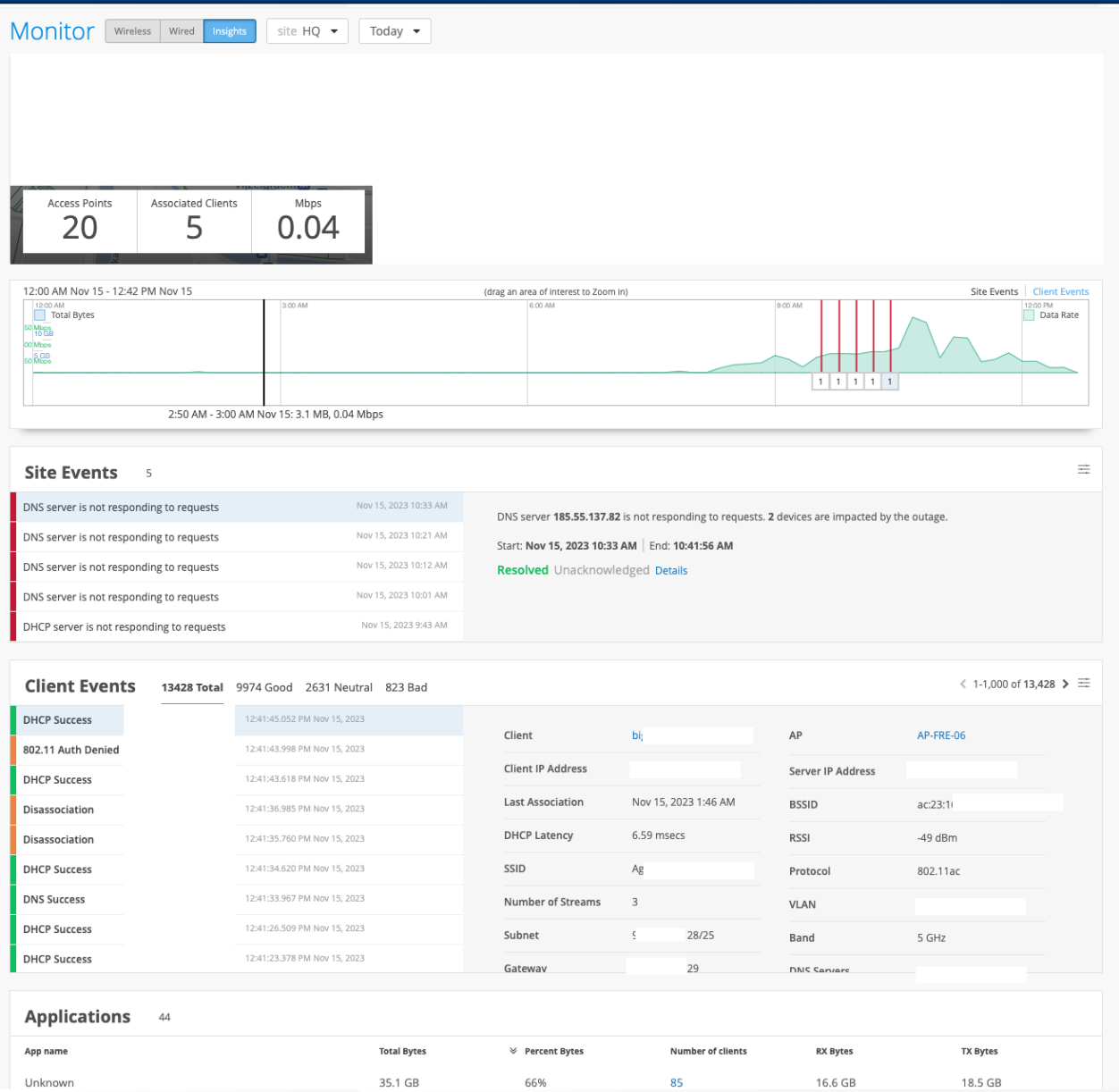
- The Netherlands
- United Kingdom
- United States

- Wireless AP's – cloud managed

Juniper Mist™ gives you more. Compare now.

	Juniper Networks	Cisco Meraki	Cisco
Deployment Flexibility and Cloud Management	●●●●●	●●●○○	●○○○○
Scalability	●●●●●	●●○○○	●○○○○
End-to-End Visibility	●●●●●	○○○○○	●○○○○
AI-Driven RF Optimization (RRM)	●●●●●	●●○○○	●○○○○
Root Cause Identification	●●●●●	●●○○○	●○○○○
Dynamic Packet Capture	●●●●●	○○○○○	○○○○○
Anomaly Detection	●●●●●	●●○○○	●●○○○
Cloud Native NAC	●●●●●	○○○○○	●○○○○
Virtual Network Assistant	●●●●○	○○○○○	●○○○○

Mist Insights

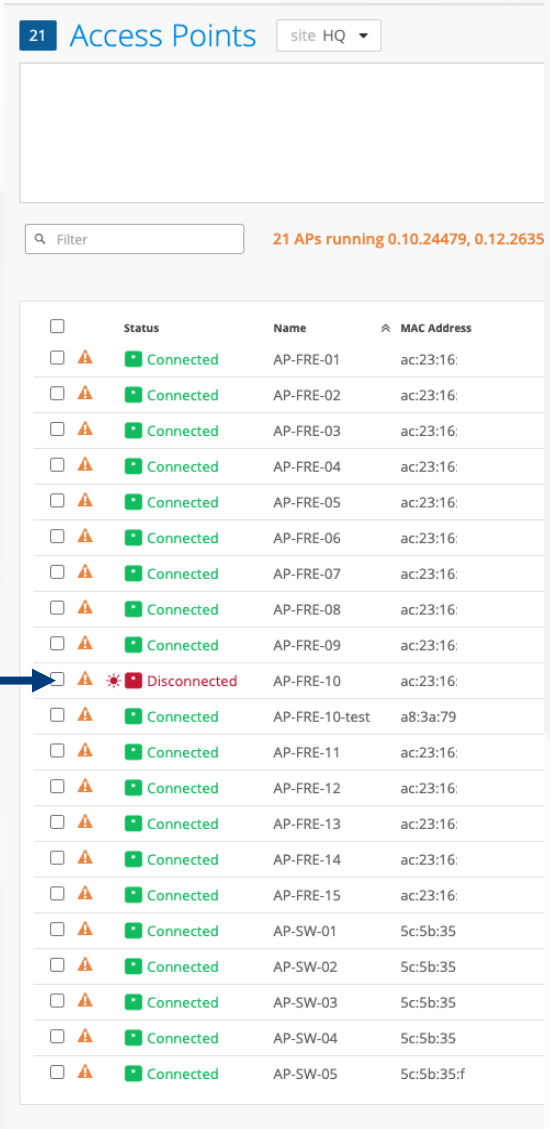


Cloud

- But cloud. Do we need monitoring?!
  - Yes. Of course.

- Even the cloud breaks sometimes
- Or you just want to see statistics
- Or get easy alerts
- Or… yes. We need monitoring.

Oops!



SNMP usage

- Monitoring. Network equipment. That’s gonna be SNMP!
  - Or not… it’s the cloud
- It turns out that Mist is only supporting their own “Mist Insights” solution which forces you to check their web portal or WebSockets

Integration with Zabbix

- We need middleware to setup the WebSocket
- We need some mechanism to get the hosts in, along with their data

- Solution was build together with Quanza Engineering BV, the first customer that approached us with this monitoring challenge.

QUANZA

Data flow

- Get all nodes to Zabbix
- Force the middleware to subscribe to information of the sites where the nodes are located
- Push the performance data into Zabbix

1 host in Zabbix…

Hosts

? Create host Import

Filter

Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	Proxy	Templates	Status	Availability	Agent encryption	Info	Tags
DEMO ORG Mist Inventory Discovery	Items	Triggers	Graphs	Discovery 1	Web	127.0.0.1:10050		Juniper Mist Host discovery	Enabled	ZBX	None		

Displaying 1 of 1 found

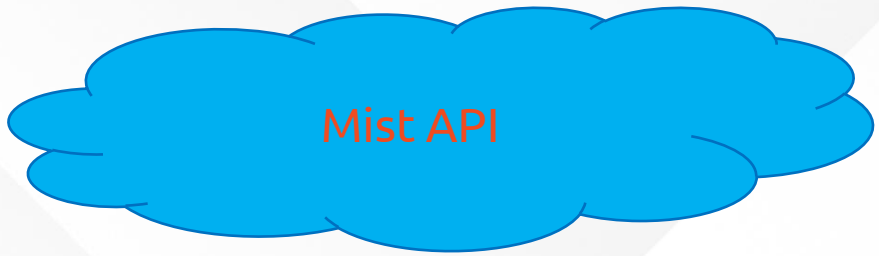
All templates / Juniper Mist Host discovery Items Triggers Graphs Dashboards Discovery rules 1 Web scenarios

Filter

Template	Name ▲	Items	Triggers	Graphs	Hosts	Key	Interval	Type	Status
Juniper Mist Host discovery	MIST Inventory	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes 1	mist_discover_inventory.py["--org", "{$MIST_ORG_ID}", "--token", "{$MIST_TOKEN}"]	1d	External check	Enabled

Displaying 1 of 1 found

Data flow: Get nodes



Request all nodes from the Mist API
via an external script

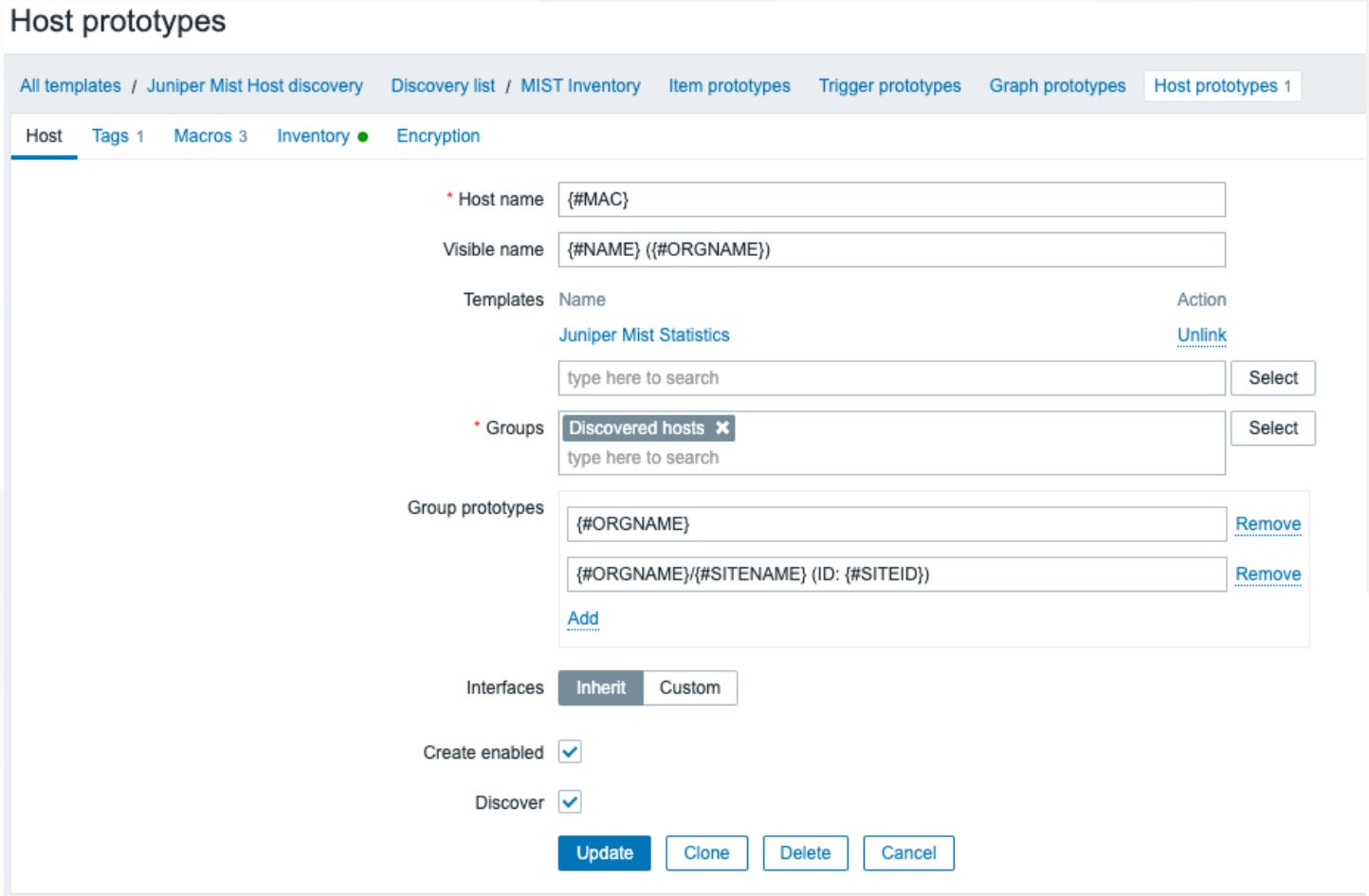
ZABBIX

Result:


```
[{
    "NODEID":” 3dbg0f41-104c-44e9-8697-67f4562a6ab4",
    "NAME":"AP-09",
    "SITENAME":"HQ",
    "SITEID":” 9222b478-9422-456b-89e1-e9ae9fd2ccd0",
    "MAC":"ac231620dfaa",
    "ORGNAME":”DEMO ORG"
 },
 {
    "NODEID":” 1ge434cf-19be-44e9-9ebb-d2f43421642d",
    "NAME":"AP-10",
    "SITENAME":"HQ",
    "SITEID":” 9222b578-9422-456b-89e1-e9ae9fd2ccd0",
    "MAC":"ac231630dfab",
    "ORGNAME":”DEMO ORG"
  },
....
]
```

Data flow: Make hosts

- Data format is very suitable for LLD with host prototypes.
- For each node:
  - Create a new host
  - Link the correct template
  - Create host groups
  - Add tags
  - Set user macros
  - Enable inventory



Data flow: hosts

- So we end up with a list of hosts, ready to receive data:

Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	Proxy	Templates
MIST Inventory: AP-FRE-01 (DEMO ORG)	Items 11	Triggers 1	Graphs	Discovery 2	Web	127.0.0.1:10050		Juniper Mist Statistics
MIST Inventory: AP-FRE-02 (DEMO ORG)	Items 11	Triggers 1	Graphs	Discovery 2	Web	127.0.0.1:10050		Juniper Mist Statistics
MIST Inventory: AP-FRE-03 (DEMO ORG)	Items 11	Triggers 1	Graphs	Discovery 2	Web	127.0.0.1:10050		Juniper Mist Statistics
MIST Inventory: AP-FRE-04 (DEMO ORG)	Items 11	Triggers 1	Graphs	Discovery 2	Web	127.0.0.1:10050		Juniper Mist Statistics
MIST Inventory: AP-FRE-05 (DEMO ORG)	Items 11	Triggers 1	Graphs	Discovery 2	Web	127.0.0.1:10050		Juniper Mist Statistics

- But now we need a way to get the data

Data flow: Middleware

- Connect to Zabbix API and extract information to subscribe to the Mist API
- Connect to Mist API and subscribe to all sites where a node is present
- Receive the data via an WebSocket and push it into Zabbix with Zabbix Sender

Get nodes/sites from Zabbix

```
def get_site_ids():
    zapi = ZabbixAPI(url=zabbix_url, user=zabbix_username, password=zabbix_password)
    site_ids = []
    template_ids = []

    templates = zapi.template.get(tags=[{"tag": "websocket", "value": "mist_websocket", "operator": "1"}])
    for template in templates:
        template_ids.append(template['templateid'])

    template_hosts = zapi.host.get(templateids=template_ids)
    for mist_host in template_hosts:
        for macro in zapi.usermacro.get(hostids=mist_host['hostid']):
            if macro['macro'] == "{$SITEID}":
                if macro['value'] not in site_ids:
                    site_ids.append(macro['value'])
    return site_ids
```

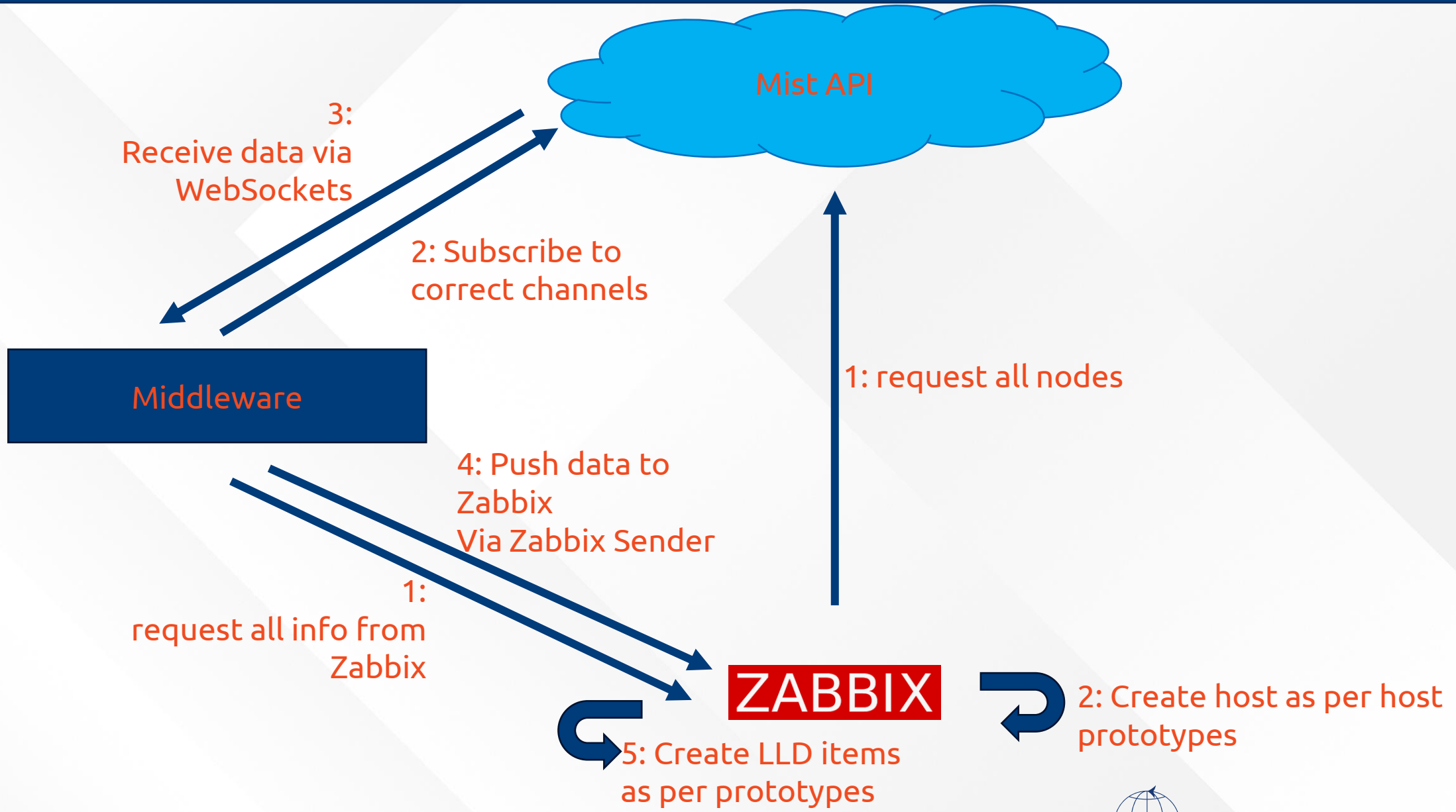
Subscribe to channels

{'event': 'channel_subscribed', 'channel': '/sites/97c26281-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/968d9149-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/def5ffaa-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/30a458fb--xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/287e4c55-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/c41fbb1e-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/11e6527d-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/ec03cf98-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/d5b9b1ef-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/a1473f9a-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/7e3e3f63-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/6ec7d6ab-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/e199442d-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/c74490ec-xxxxxxxxxxxxxxxxxx/stats/devices'}
{'event': 'channel_subscribed', 'channel': '/sites/7ea6785d-xxxxxxxxxxxxxxxxxx/stats/devices'}

Receive data


```
{
'event':
    'data',
    'channel': '/sites/97c26281-xxxxxxxxxxxxxxxxxx/stats/devices',
    'data': ‘
    {
       "mac": "ac231xxxxxx",
       "model": "AP32",
       "tx_bytes": 3201545491,
       "tx_pkts": 658057408,
       "rx_bytes": 3084198038,
       "rx_pkts": 556473825,
       "last_seen": 1699271399,
        ......
    }
}
```

Result


Mist API
3:
Receive data via
WebSockets
2: Subscribe to
correct channels
Middleware
1: request all nodes
4: Push data to
Zabbix
Via Zabbix Sender
1:
request all info from
Zabbix
ZABBIX
2: Create host as per host
prototypes
5: Create LLD items
as per prototypes

Template setup

All templates / Juniper Mist Statistics | Items 11 | Triggers 1 | Graphs | Dashboards | Discovery rules 2 | Web scenarios | Filter

Name ▲	Triggers	Key	Interval	History	Trends	Type	Status	Tags
Environment stats: Ambient temperature		mist.env.stats.ambient.temperature		90d	365d	Dependent item	Enabled	Object: Environment, Object: Generic
Environment stats: CPU temperature		mist.env.stats.cpu		90d	365d	Dependent item	Enabled	Object: Environment, Object: Generic
Performance Data: Environment stats		mist.env.stats		0		Dependent item	Enabled	Object: Generic
Environment stats: humidity		mist.env.stats.humidity		90d	365d	Dependent item	Enabled	Object: Generic
Performance Data: Last seen	Triggers 1	mist.last_seen		90d	365d	Dependent item	Enabled	Object: Generic
Performance Data: Model		mist.model		90d		Dependent item	Enabled	Object: Generic
Performance Data		performance_data		0		Zabbix trapper	Enabled	
Environment stats: pressure		mist.env.stats.pressure		90d	365d	Dependent item	Enabled	Object: Environment, Object: Generic
Performance Data: Total memory		mist.mem_total_kb		90d	365d	Dependent item	Enabled	Object: Generic
Performance Data: Total number of clients		mist.total_clients		90d	365d	Dependent item	Enabled	Object: Generic
Performance Data: Used memory		mist.mem_used_kb		90d	365d	Dependent item	Enabled	Object: Generic

Displaying 11 of 11 found

LLD

All templates / Juniper Mist Statistics | Items 11 | Triggers 1 | Graphs | Dashboards | Discovery rules 2 | Web scenarios | Filter

Template	Name ▲	Items	Triggers	Graphs	Hosts	Key	Interval	Type	Status
Juniper Mist Statistics	Performance Data: MIST Network stats	Item prototypes 8	Trigger prototypes	Graph prototypes	Host prototypes	jnpr.mist.discovery.network_stats		Dependent item	Enabled
Juniper Mist Statistics	Performance Data: MIST Radio stats	Item prototypes 16	Trigger prototypes	Graph prototypes	Host prototypes	jnpr.mist.discovery.radio_stats		Dependent item	Enabled

Displaying 2 of 2 found

All templates / Juniper Mist Statistics | Discovery list / MIST Network stats | Item prototypes 8 | Trigger prototypes | Graph prototypes | Host prototypes

Name ▲	Key	Interval	History	Trends	Type	Create enabled	Discover	Tags
Performance Data: Interface {#INTERFACE} Duplex status	duplex.status[{#INTERFACE}]		90d		Dependent item	Yes	Yes	Interface: {#INTERFA… Object: Network
Performance Data: Interface {#INTERFACE} RX bytes	interface.rx.bytes[{#INTERFACE}]		90d	365d	Dependent item	Yes	Yes	Interface: {#INTERFA… Object: Network
Performance Data: Interface {#INTERFACE} RX packets	interface.rx.packets[{#INTERFACE}]		90d	365d	Dependent item	Yes	Yes	Interface: {#INTERFA… Object: Network
Performance Data: Interface {#INTERFACE} speed	interface.speed[{#INTERFACE}]		90d	365d	Dependent item	Yes	Yes	Interface: {#INTERFA… Object: Network
Performance Data: Interface {#INTERFACE} status	interface.status[{#INTERFACE}]		90d		Dependent item	Yes	Yes	Interface: {#INTERFA… Object: Network
Performance Data: Interface {#INTERFACE} TX bytes	interface.tx.bytes[{#INTERFACE}]		90d	365d	Dependent item	Yes	Yes	Interface: {#INTERFA… Object: Network
Performance Data: Interface {#INTERFACE} TX errors	interface.tx.errors[{#INTERFACE}]		90d	365d	Dependent item	Yes	Yes	Interface: {#INTERFA… Object: Network
Performance Data: Interface {#INTERFACE} TX packets	interface.tx.packets[{#INTERFACE}]		90d	365d	Dependent item	Yes	Yes	Interface: {#INTERFA… Object: Network

Displaying 8 of 8 found

Zabbix result: Inventory

Host inventory overview

Filter

Host groups: type here to search — Select

Grouping by: Hardware

Apply — Reset

Hardware	Host count
AP12	18
AP32	14
EX2300-24P	3
EX2300-48P	2
AP45	1

Result: Latest data

☐	AP-FRE-09 (DEMO ORG)	Interface eth0 RX packets	18m 17s	8 packets	+1 packets
☐	AP-FRE-09 (DEMO ORG)	Interface eth0 speed	25m 23s	1 Gbps	
☐	AP-FRE-09 (DEMO ORG)	Interface eth0 status	25m 23s	Up (1)	
☐	AP-FRE-09 (DEMO ORG)	Interface eth0 TX bytes	18m 17s	193 Bps	+8 Bps
☐	AP-FRE-09 (DEMO ORG)	Interface eth0 TX errors	18m 17s	0 errors	
☐	AP-FRE-09 (DEMO ORG)	Interface eth0 TX packets	18m 17s	0 packets	
☐	AP-FRE-09 (DEMO ORG)	Interface eth1 Duplex status	25m 23s	Down (0)	
☐	AP-FRE-09 (DEMO ORG)	Interface eth1 RX bytes	18m 17s	0 Bps	
☐	AP-FRE-09 (DEMO ORG)	Interface eth1 RX packets	18m 17s	0 packets	
☐	AP-FRE-09 (DEMO ORG)	Interface eth1 speed	25m 23s	0 bps	
☐	AP-FRE-09 (DEMO ORG)	Interface eth1 status	25m 23s	Down (0)	
☐	AP-FRE-09 (DEMO ORG)	Interface eth1 TX bytes	18m 17s	0 Bps	
☐	AP-FRE-09 (DEMO ORG)	Interface eth1 TX errors	18m 17s	0 errors	
☐	AP-FRE-09 (DEMO ORG)	Interface eth1 TX packets	18m 17s	0 packets	
☐	AP-FRE-09 (DEMO ORG)	Last seen	18m 17s	2023-11-04 13:14:54	+00:01:00
☐	AP-FRE-09 (DEMO ORG)	Mac Address	18m 17s	ac23164cc680	
☐	AP-FRE-09 (DEMO ORG)	Mac Address			
☐	AP-FRE-09 (DEMO ORG)	Model	26m 25s	AP32	
☐	AP-FRE-09 (DEMO ORG)	Noise floor	18m 17s	-94 dBm	
☐	AP-FRE-09 (DEMO ORG)	Noise floor	18m 17s	-62 dBm	+1 dBm
☐	AP-FRE-09 (DEMO ORG)	Number of clients	25m 23s	0 clients	
☐	AP-FRE-09 (DEMO ORG)	Number of clients	25m 23s	0 clients	
☐	AP-FRE-09 (DEMO ORG)	Performance Data			
☐	AP-FRE-09 (DEMO ORG)	Power level	25m 23s	8 dBm	
☐	AP-FRE-09 (DEMO ORG)	Power level	25m 23s	0 dBm	

Dashboards

Total clients

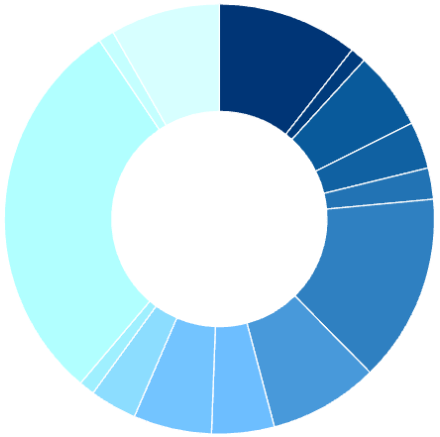
85.00

Total clients

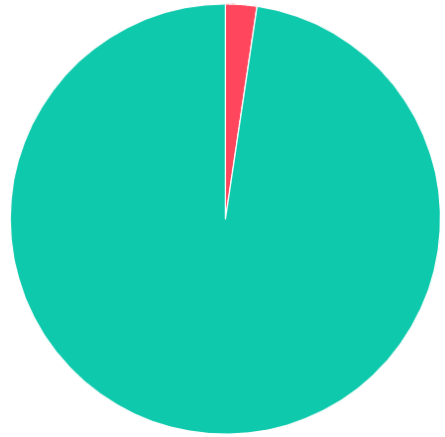
Top hosts

Host name	Clients
AP-FRE-06 (DEMO ORG)	25 clients
AP-FRE-11 (DEMO ORG)	12 clients
AP-FRE-01 (DEMO ORG)	9 clients
AP-FRE-13 (DEMO ORG)	7 clients
AP-FRE-04 (DEMO ORG)	7 clients
AP-FRE-03 (DEMO ORG)	5 clients
AP-FRE-10-test (DEMO ORG)	5 clients
AP-FRE-12 (DEMO ORG)	4 clients
AP-FRE-08 (DEMO ORG)	3 clients
AP-GLO-02 (DEMO ORG)	3 clients

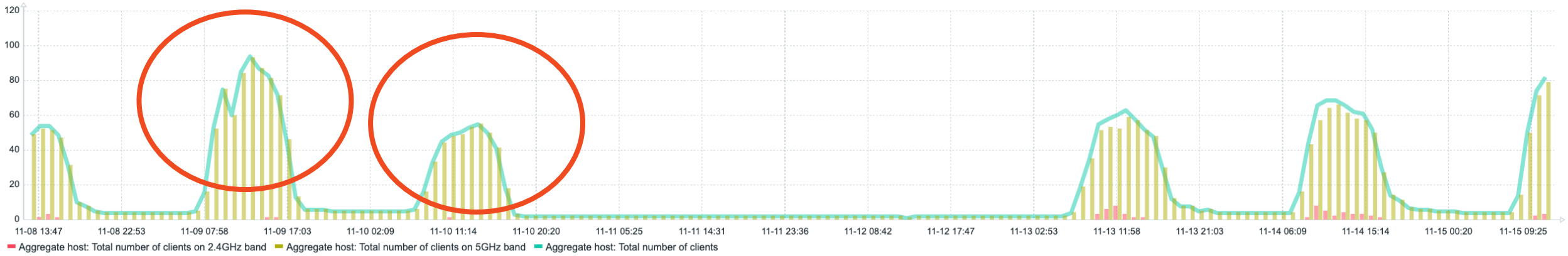
AP distribution



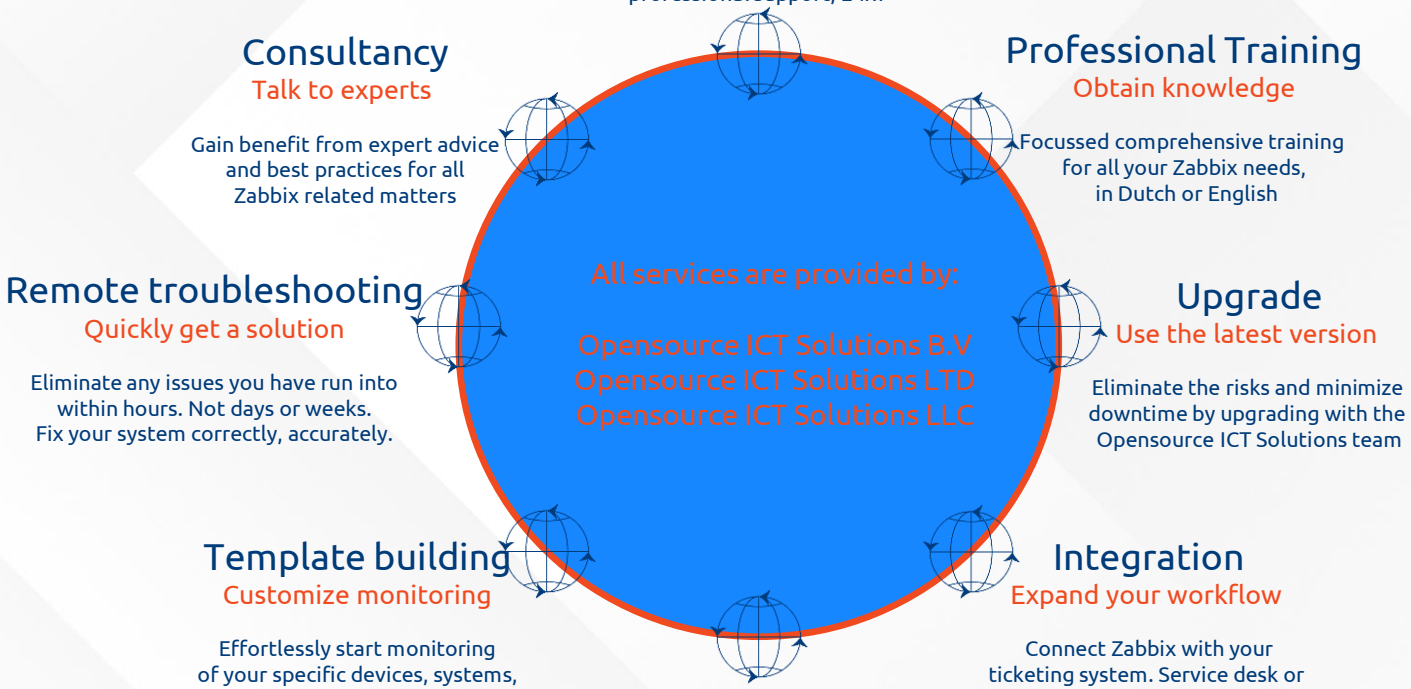
Band distribution



Graph



Services overview



https://oicts.com

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