Labyrinth Deception Platform

Labyrinth training program

Labyrinth Deception Platform

01: Architecture and Seeders

Labyrinth training program

Deception approaches

Full OS

is based on **deployment within a hypervisor of one or several virtual machines;**

OS/Service emulation

is based on **creation of imitations which recreate certain services or service combinations as separate instances within a single VM**;

https://labyrinth.tech/news/posts/full-os-vs-osservice-emulation

What is Labyrinth Deception Platform?

Saves your time

Labyrinth provides minimum manual configuration and allows to create 1 decoy as fast as a 100.

High scalability

Labyrinth does not need vast amounts of resources to work effectively.

Cuts operational costs

Does not collect tons of data, not generate false positive alerts, no need for special skills to operate.

Automated IR

Accelerates IR through 3rd party integrations that automate isolation, blocking, and threat hunting.

Stops advanced threats

Detects targeted and advanced attacks without requiring any prior knowledge of the threat form, type, or behavior.

Components

Admin VM (Management Console)

All information collected at the Points is forwarded to the Management Console for incident analysis and response.

Worker VM

The Worker VM is the host that hosts all the Points in Labyrinth. It can operate in multiple VLANs simultaneously.

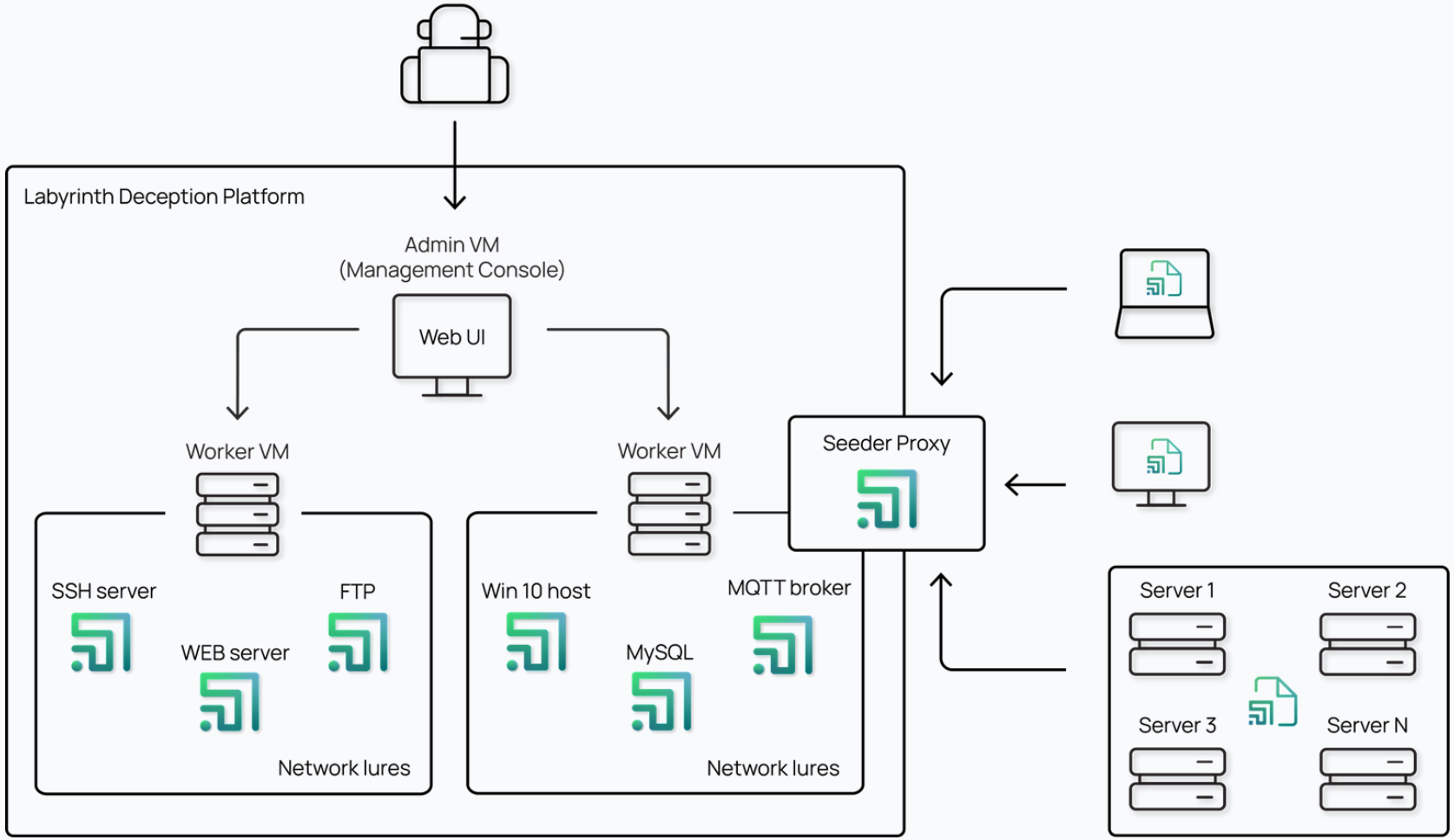
Point

Points simulate applications and services in a real-world IT environment and interact with attackers, keeping them inside the Labyrinth.

Host with Seeder Agent

Agents are deployed on real hosts and distribute attractive artifacts to them. The artifacts used by attackers direct them to Points.

Architecture



Worker location

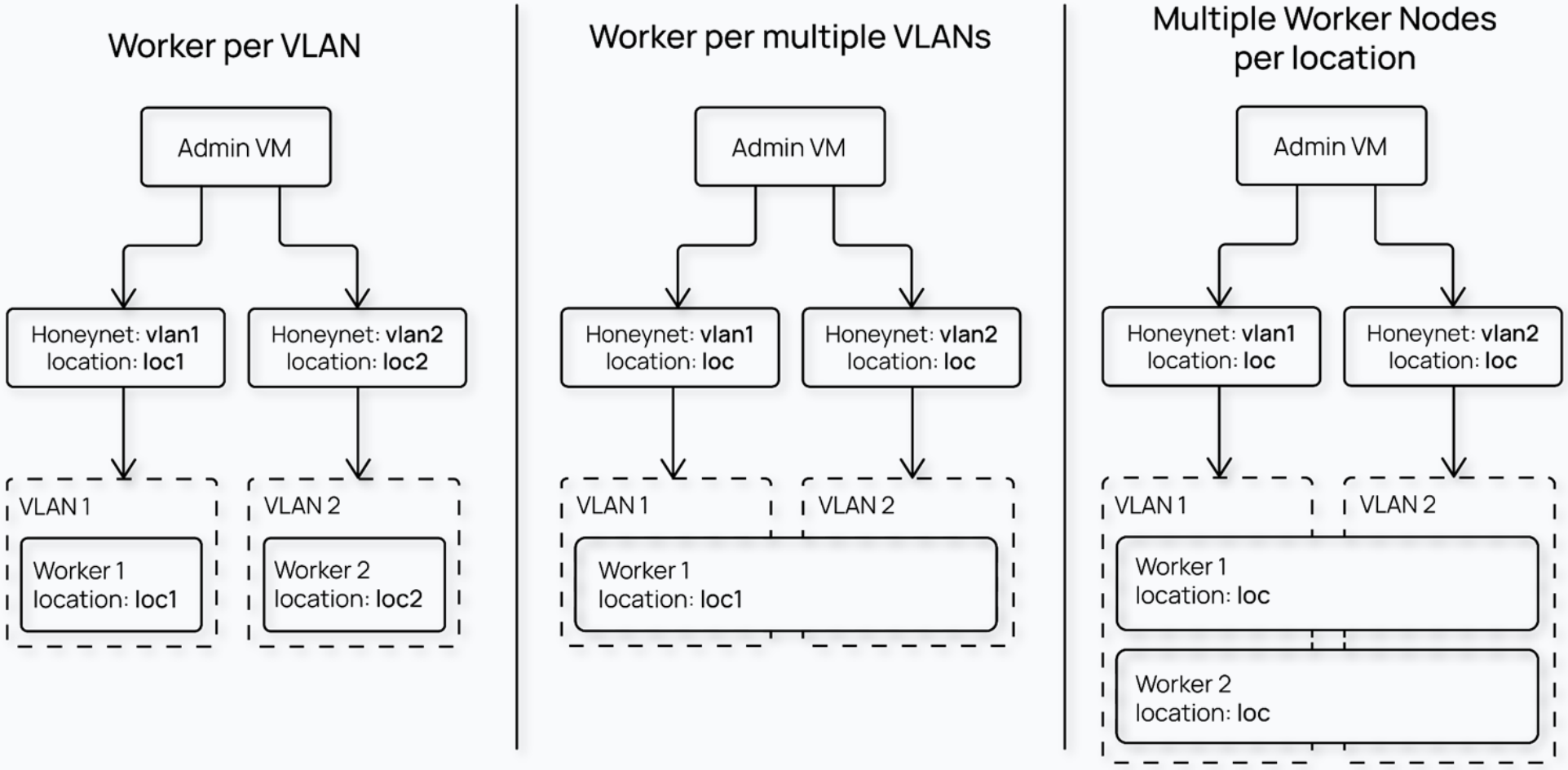
Edit

Type:	**static**
Id:	**honeynet01**
Location:	**labtest**
Description:	**Test**
Gateway:	**172.16.1.254**
Subnet:	**172.16.1.0/24**
VLAN ID:	**101**
Seeder Proxy:	
Seeder Proxy Id:	
Seeder Proxy Status:	
Allowed IP Addresses (CSV):	

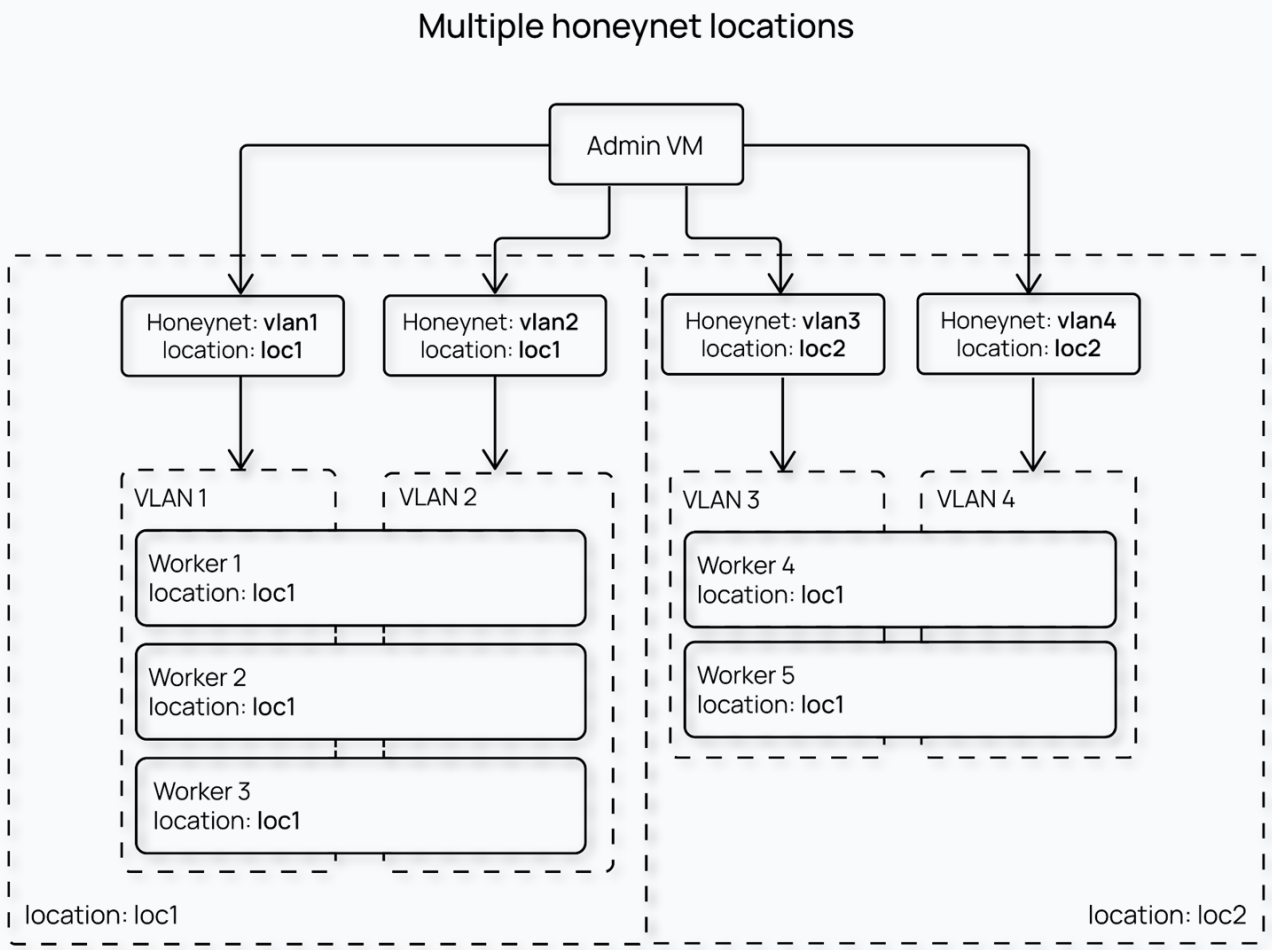
Nodes

Hostname	Type	Location	IP Address	Status
worker-demo	worker	labtest	192.168.200.6	ready
admin-demo	admin		192.168.200.5	ready

Deployments: p1

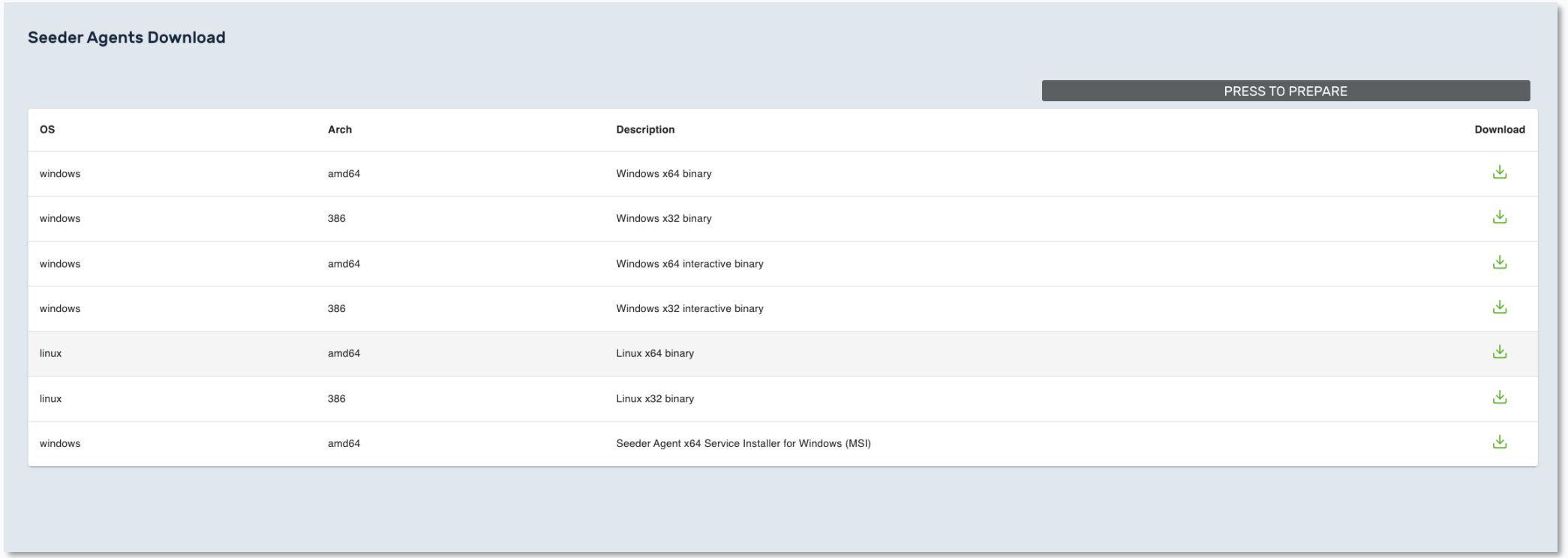


Deployments: p2

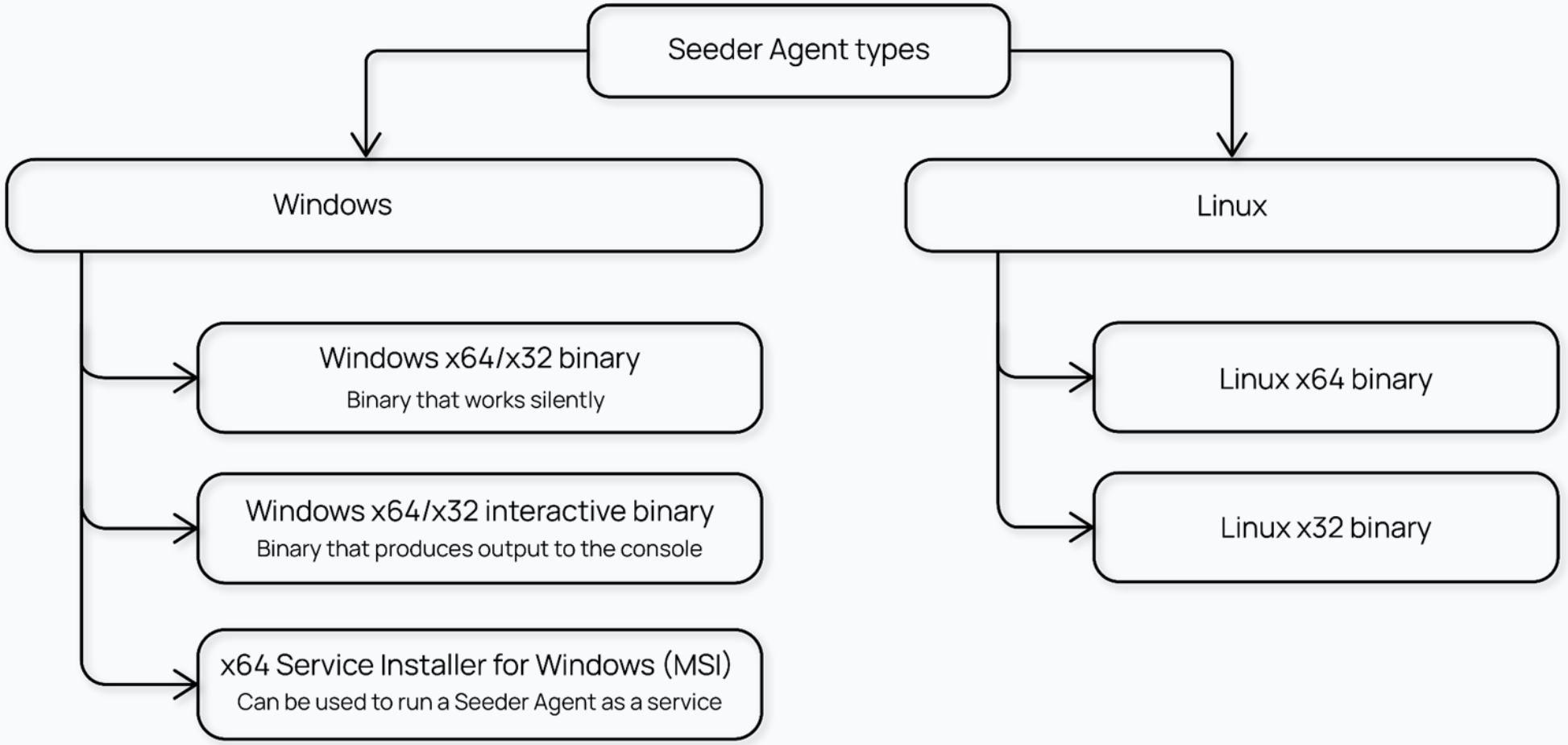


Press to prepare

Press to prepare button builds new version of Seeder Agents, adding to the certificates, signed by freshly created CA.



Seeder Agents



Seeder Agent usage

Windows:

- MSI:

  msiexec /i seeder_service_x64.msi SVCPROXY=<Seeder proxy IP>

- x32/x64 basic binary:

  seeder_x64.exe –-host <Seeder Proxy IP>

- x32/x64 interactive binary:

  seeder_x64.exe –-host <Seeder Proxy IP>

Linux:

- x32/x64 binary:

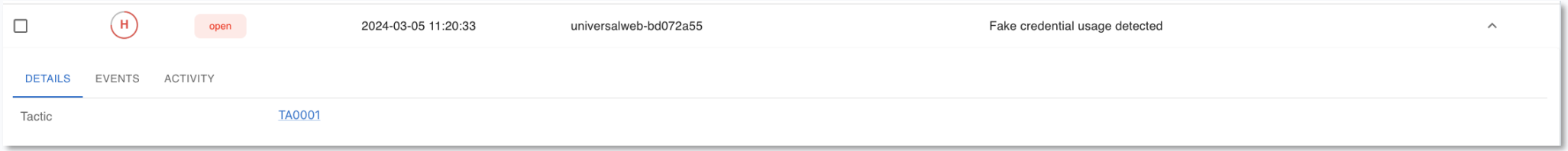
  ./seeder_x64.exe –-host <Seeder Proxy IP>

```
└─$ ./seeder_x64.bin --help
SYNOPSIS:
    seeder_x64.bin [--help|-h|-?] [--host <string>] [--location <string>]
                   [--nolog|-s] [--version|-v] [<args>]

OPTIONS:
    --help|-h|-?           (default: false)

    --host <string>        IP address or Domain name of seeder-proxy (default: "")

    --location <string>    Agent's location (default: "")

    --nolog|-s             Do not log to Event logging (default: false)

    --version|-v           Show Agent's version and exit (default: false)
```

Seeder Tasks

Seeder Tasks are extremely useful in combination with two-way integration with Splunk or IBM Qradar.

Hostnames	IP address	Point ID(s)	Type	Status	Path
poison	192.168.200.239	seeder-proxy-fb8f02a7	windows_link	deployed	/home/nastya/172-16-6-150.lnk
poison	192.168.200.239	mqtt-003acaf6,sshd-8200ed60	putty_config	deployed	/home/nastya/putty-sessions.bak
poison	192.168.200.239	mqtt-003acaf6,sshd-8200ed60	ssh_config	deployed	/home/nastya/ssh_config

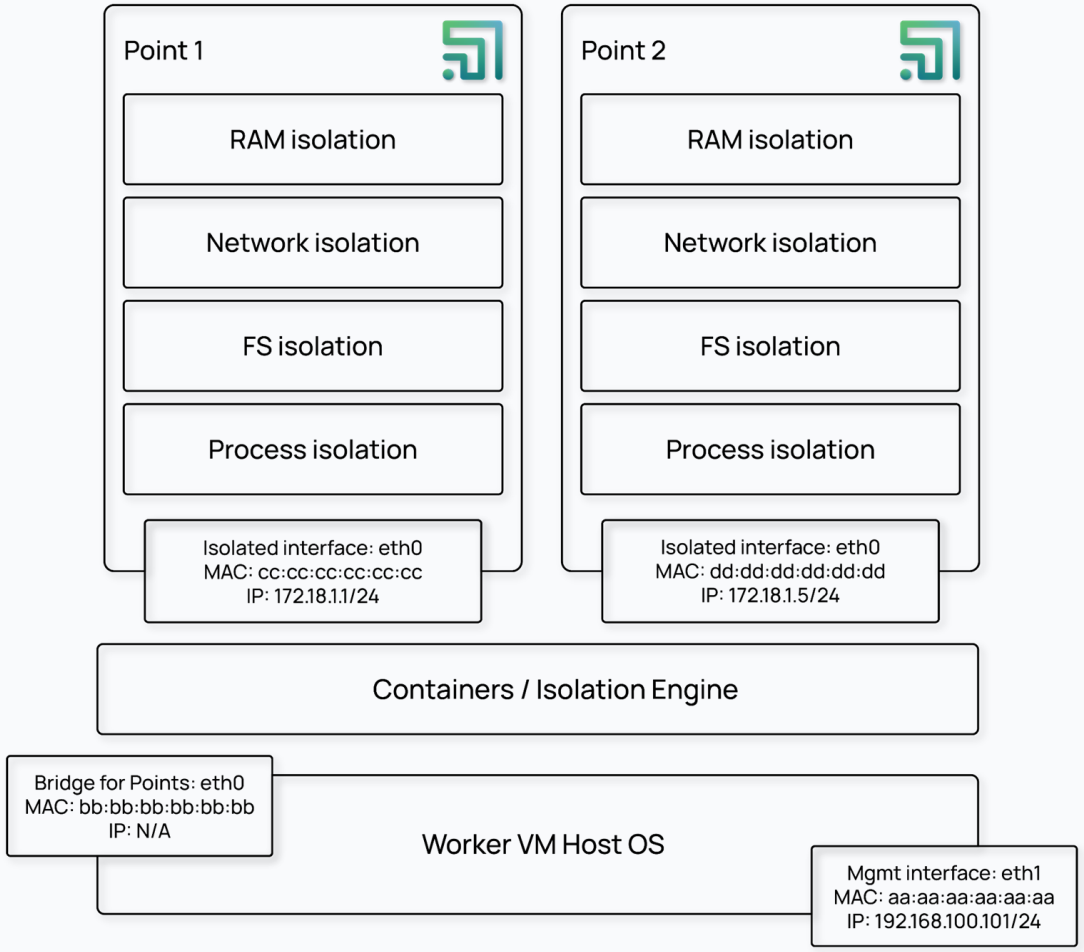


Labyrinth Deception Platform

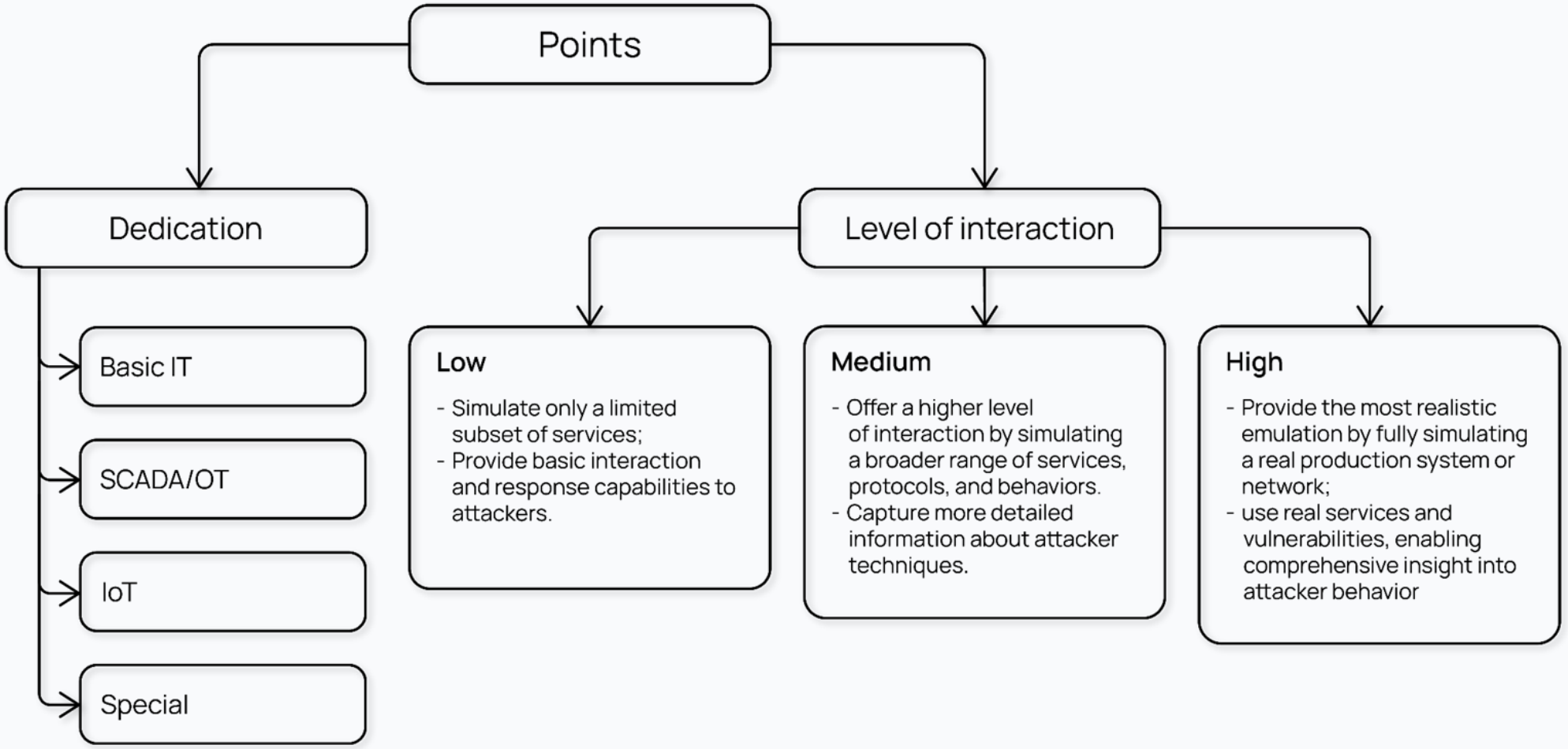
02 - Points

Labyrinth Training Program

What is a Point?



Classification



Some statistics

Distribution of interactivity levels

Distribution of Point dedication sectors

Low interaction Points

- ASKOD WEB
- Allen Bradley Ethernet Processor SLC-500
- Allen Bradley PLC
- Siemens SIMATIC HMI

Latest alerts 611

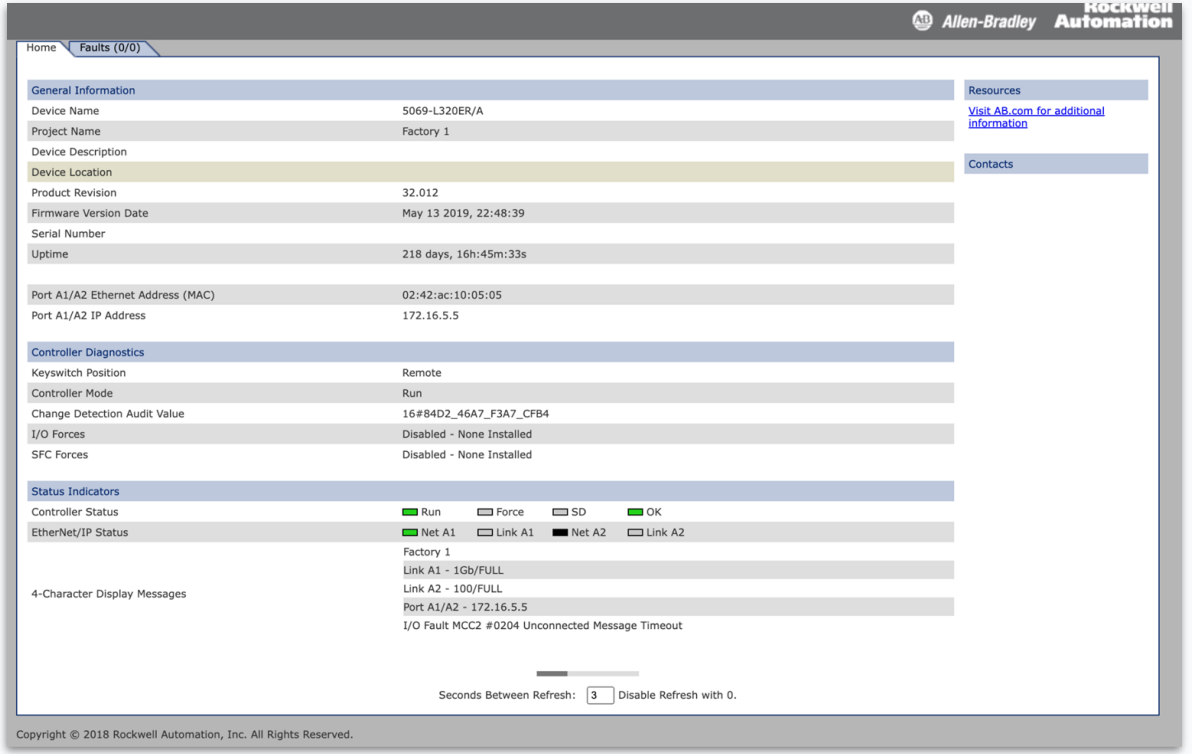
2

Port scan detected (TCP SYN, e.g. nmap -sS -T4)

2023-06-29 14:25:20

Source IP:	**172.16.254.8**
Point ID	**ab_plc-5ea777b6**
Honeynet	**ssh_test_4**
Location	**labdev**
Point IP	**172.16.5.5**
Point Type	**ab_plc**

open

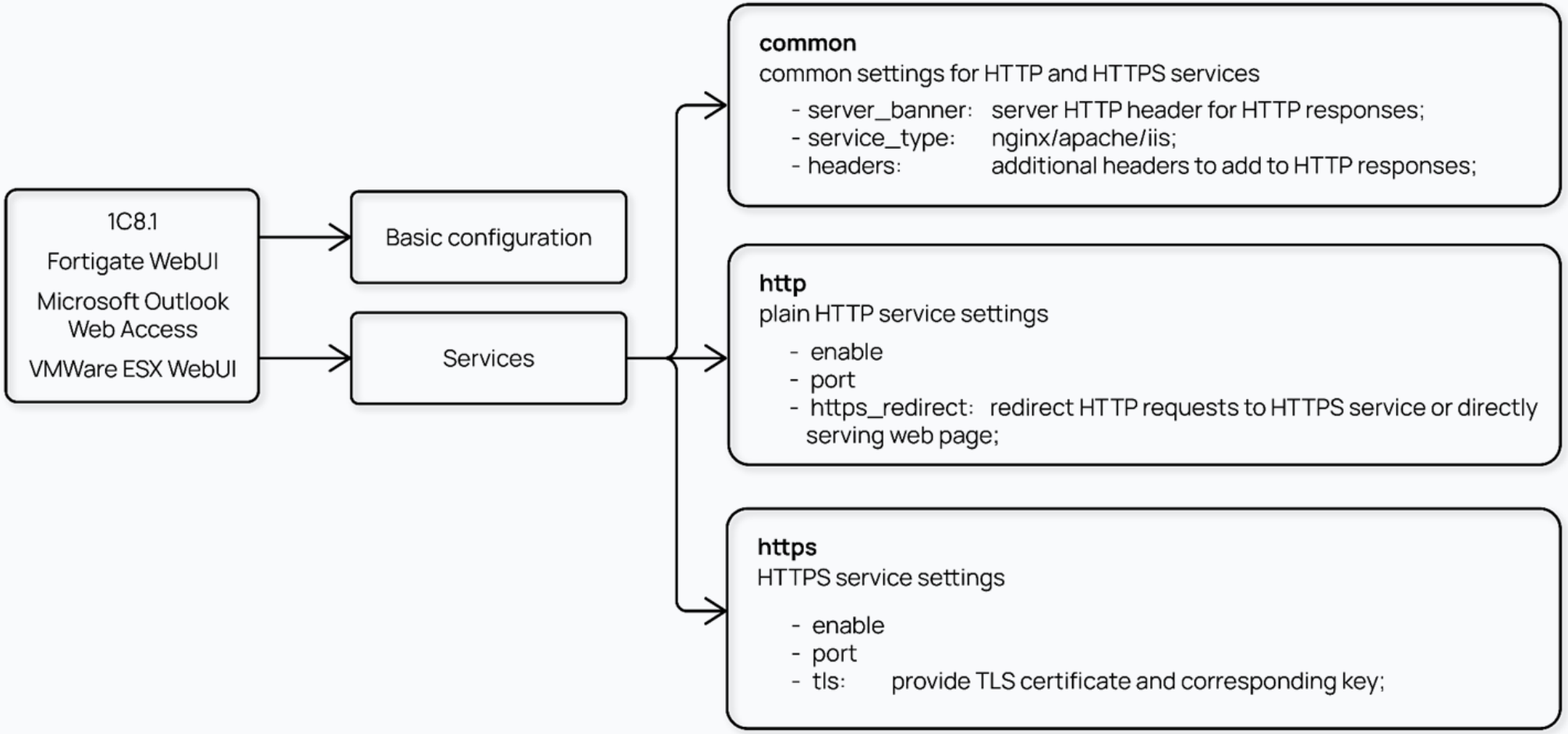


Mid interaction

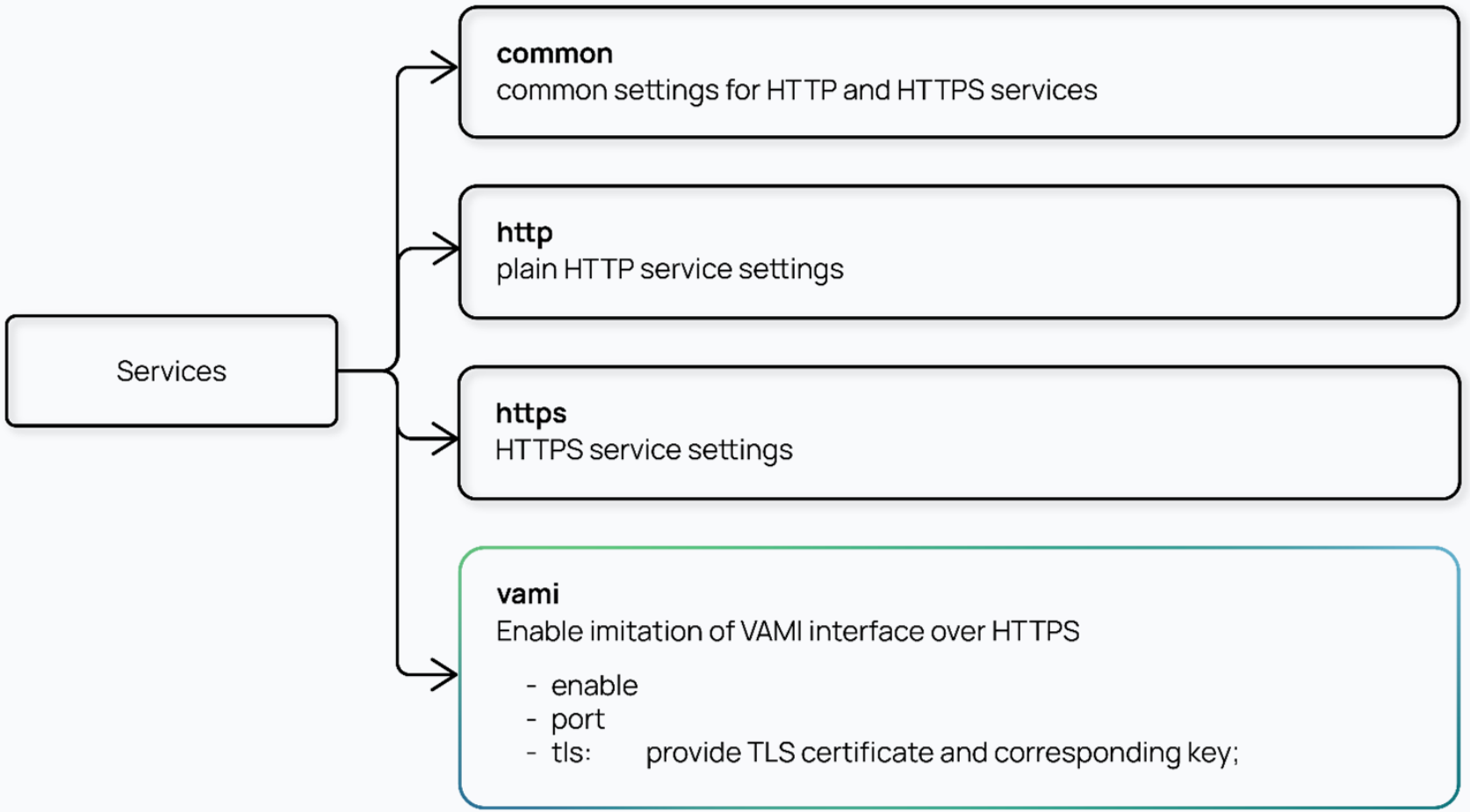
Basic IT
1C8.1
Fortigate WebUI
Microsoft Outlook Web Access
VMWare vCenter Virtual Appliance (log4shell)
VMWare ESX WebUI
QRadar Server imitation
SSH daemon
Windows 10 Host
Client OS

SCADA/OT
Modbus server
Siemens Simatic PLC S7-1200
Siemens Simatic PLC S7-1500
Siemens Simatic PLC S7-300

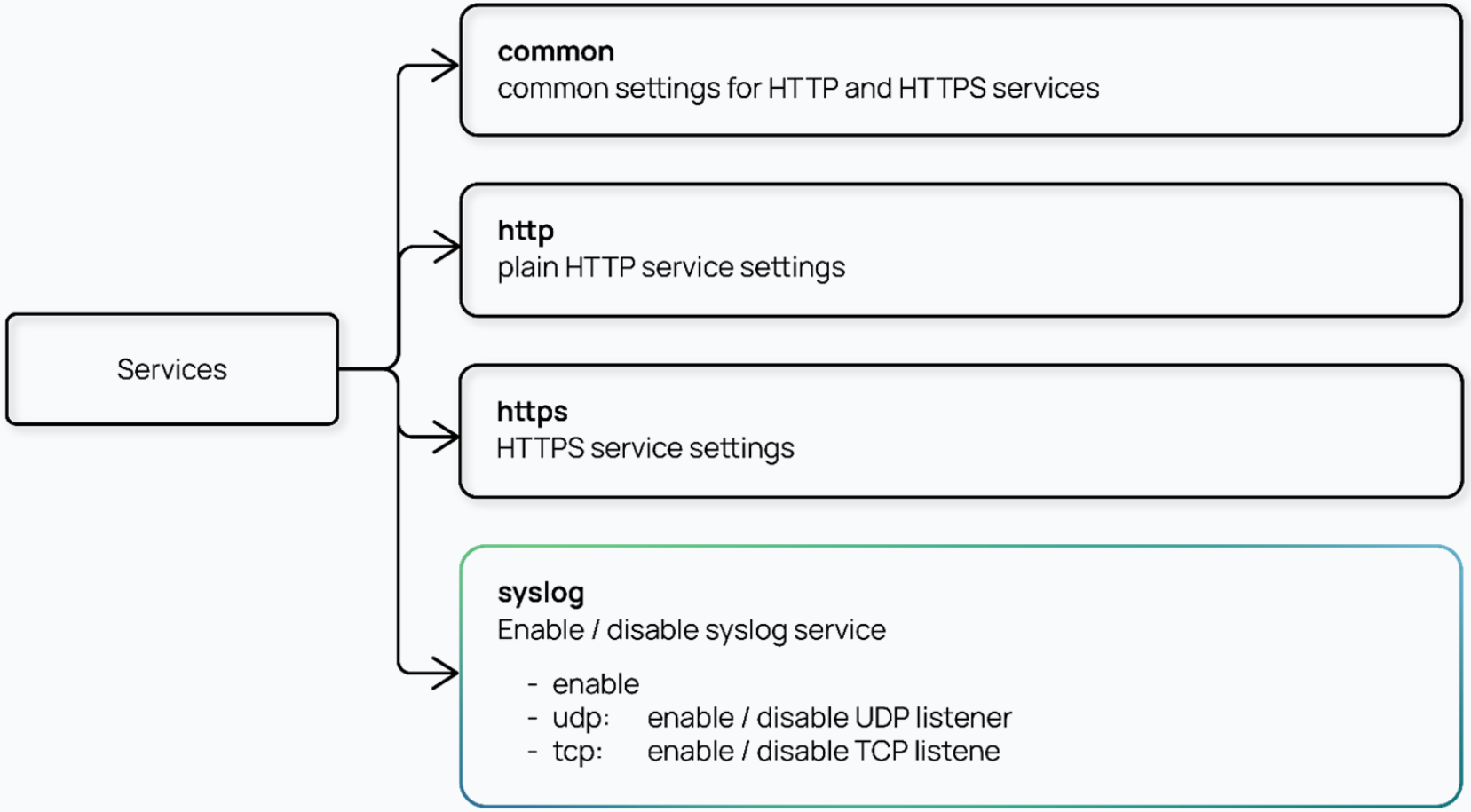
WEB services



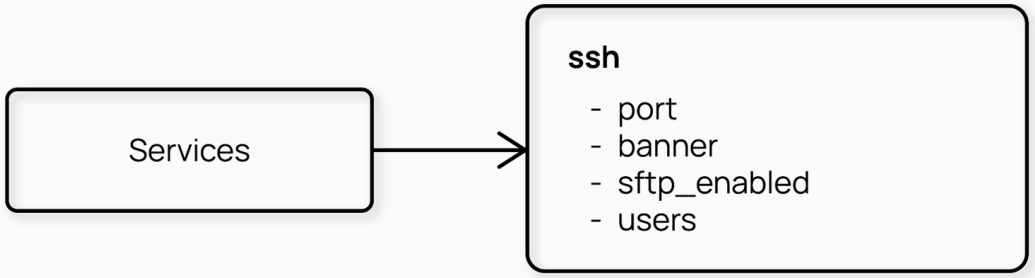
VMware vCenter virtual appliance



QRadar server imitation



SSH daemon



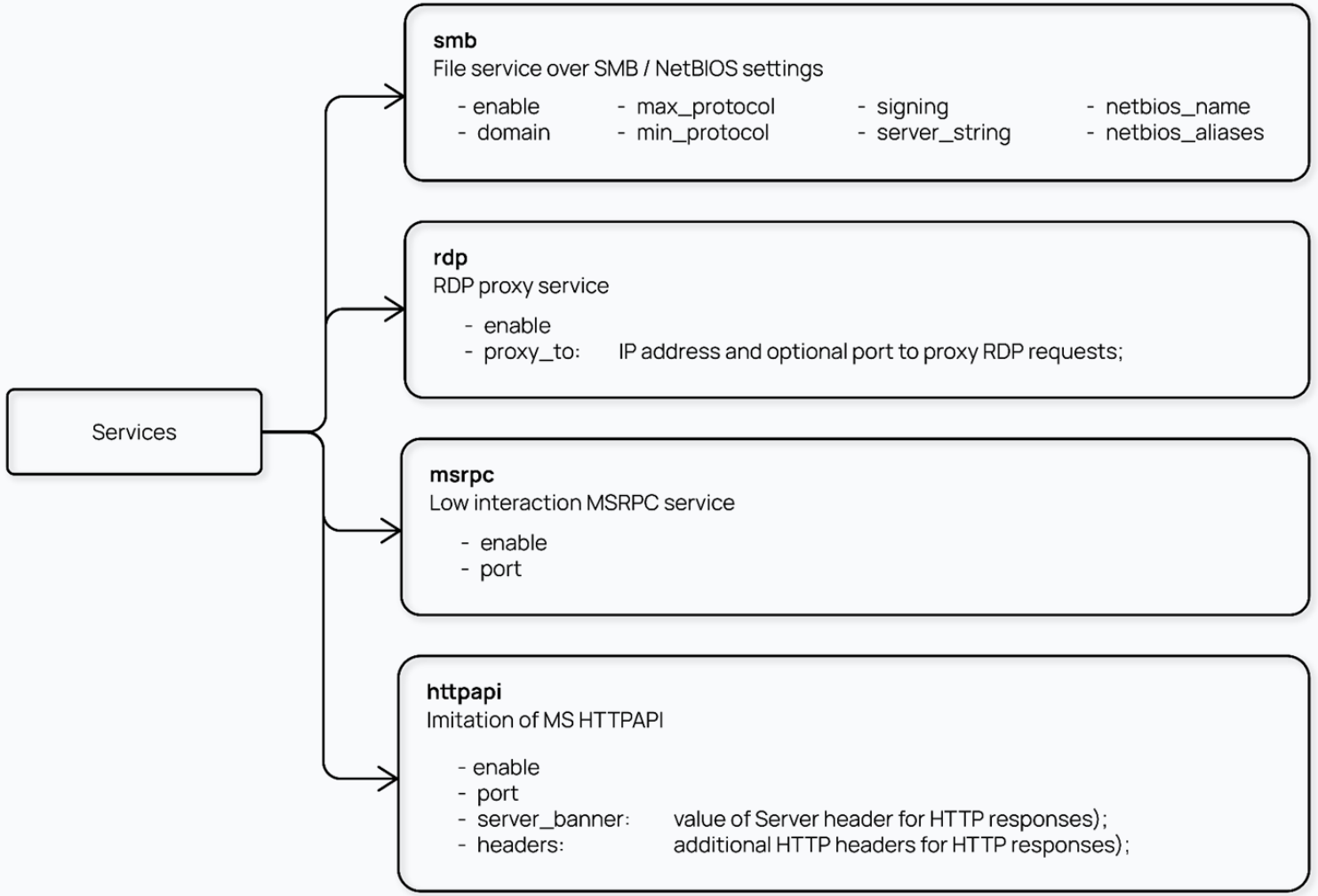
Users field may be one of:

- list of users (identified by `username` and `password` properties);
- or as a number of users to be selected from usernames and passwords wordlists;

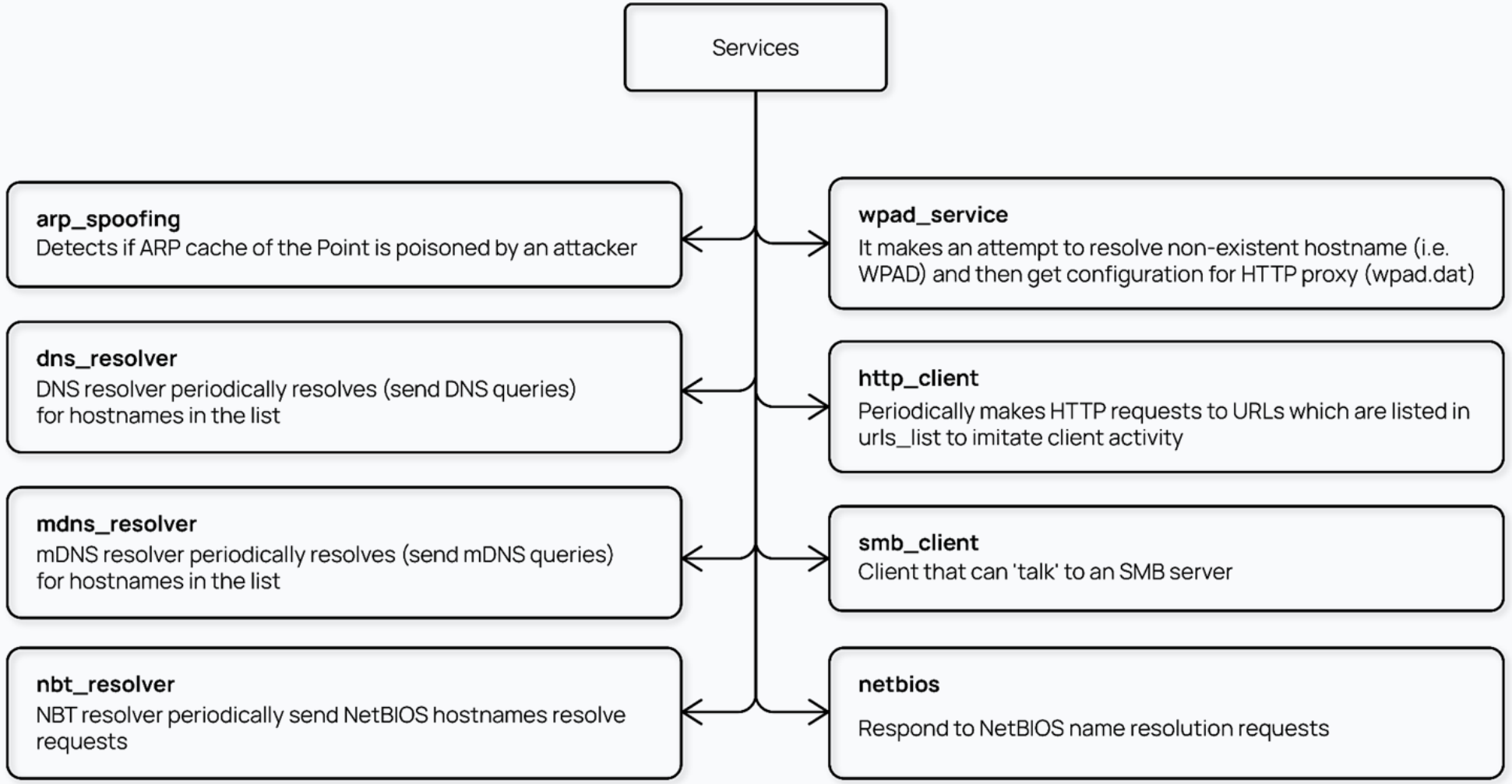
Point config

```
    exist. I.e. main Point's service.
48  services:
49    ## Option: ssh
50    ## Required: yes
51    ## Description: configuration for ssh service.
52    ssh:
53      ## Option: port
54      ## Required: yes
55      ## Description: SSH service will bind to provided TCP port.
56      port: 22
57      ## Option: banner
58      ## Required: no
59      ## Description: banner of SSH service which will be provided
        during clients connections.
60      ## Examples:
61      ##   * OpenSSH_8.4p1 Debian-5+deb11u1, OpenSSL 1.1.1n  15 Mar
        2022
62      ##   * OpenSSH_8.4p1 Debian-5+deb11u1, OpenSSL 1.1.1n
63      banner: SSH-2.0-SSH-2.0-OpenSSH_6.0p1 Debian-4+deb7u2
64      ##
```

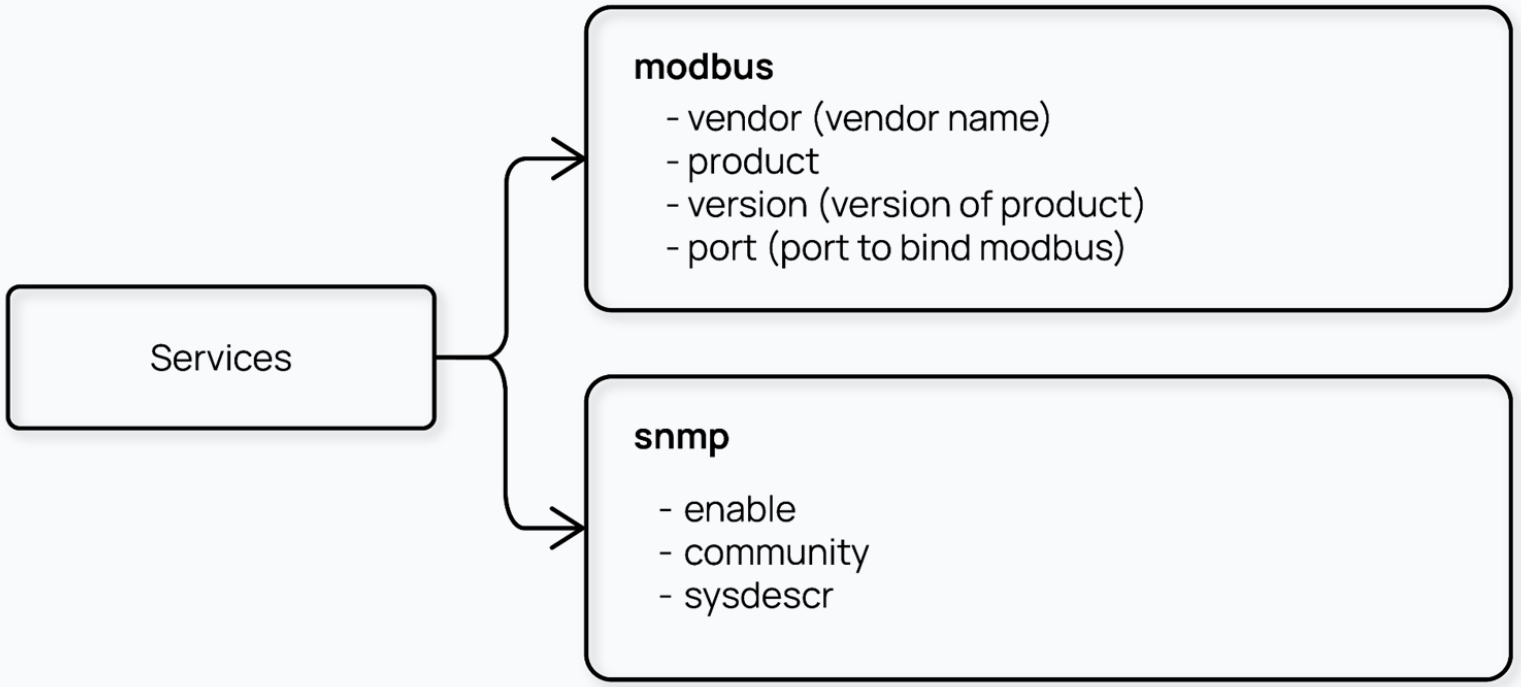
Win10 host


Services
smb
File service over SMB / NetBIOS settings
- enable
- domain
- max_protocol
- min_protocol
- signing
- server_string
- netbios_name
- netbios_aliases
rdp
RDP proxy service
- enable
- proxy_to: IP address and optional port to proxy RDP requests;
msrpc
Low interaction MSRPC service
- enable
- port
httpapi
Imitation of MS HTTPAPI
- enable
- port
- server_banner: value of Server header for HTTP responses);
- headers: additional HTTP headers for HTTP responses);

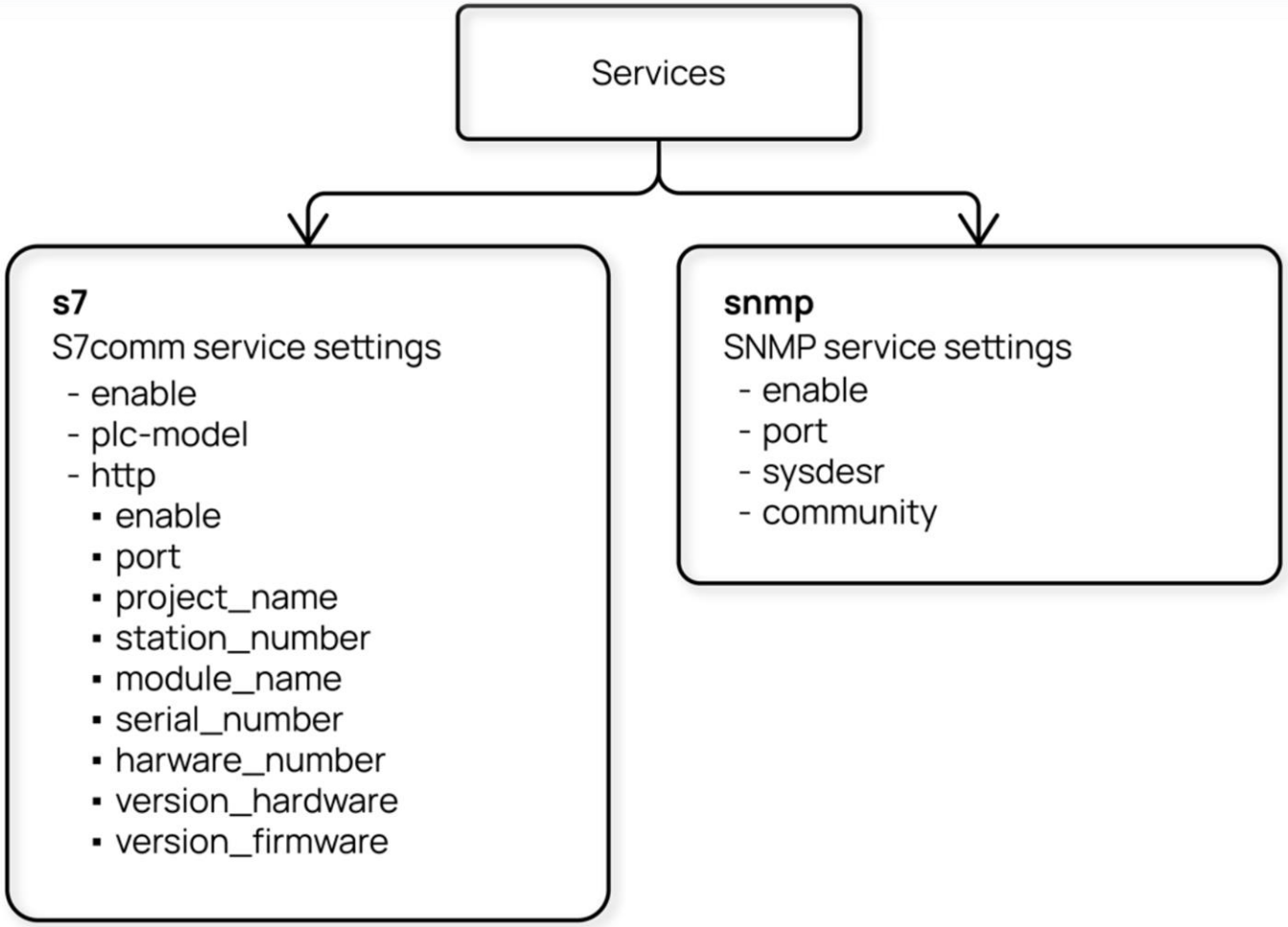
ClientOS


Services
arp_spoofing
Detects if ARP cache of the Point is poisoned by an attacker
dns_resolver
DNS resolver periodically resolves (send DNS queries) for hostnames in the list
mdns_resolver
mDNS resolver periodically resolves (send mDNS queries) for hostnames in the list
nbt_resolver
NBT resolver periodically send NetBIOS hostnames resolve requests
wpad_service
It makes an attempt to resolve non-existent hostname (i.e. WPAD) and then get configuration for HTTP proxy (wpad.dat)
http_client
Periodically makes HTTP requests to URLs which are listed in urls_list to imitate client activity
smb_client
Client that can 'talk' to an SMB server
netbios
Respond to NetBIOS name resolution requests

MODBUS server



SIEMENS PLCs



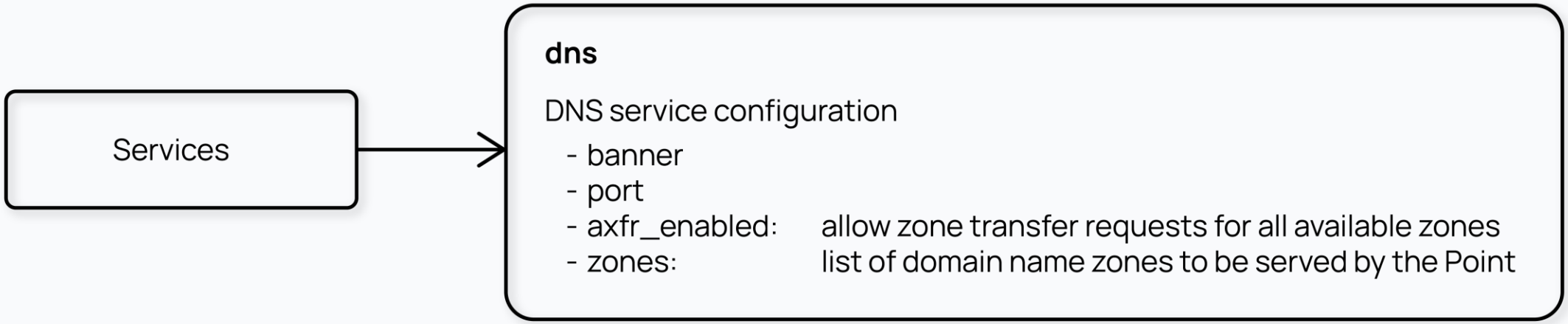
High interaction

- DNS server
- FTP server
- MQTT broker
- MySQL server
- PostgreSQL server
- Samba file server
- Universal Web Point

Id ↑	Location	Hostname	Honeynet	IP address
dns-fe650cfa	labtest	enid	demo_hn	172.16.12.13
mqtt-16c3c50e	labtest	patoka	demo_hn	172.16.12.20
mqtt-4254c339	labtest	dione	demo_hn	172.16.12.21
mysqld-6f20c51b	labtest	stump	demo_hn	172.16.12.16
postgresql-fde41334	labtest	burke	demo_hn	172.16.12.35
samba-c9795fde	labtest	sinclair	demo_hn	172.16.12.14
universalweb-8aeee01c	labtest	galileo	demo_hn	172.16.12.38

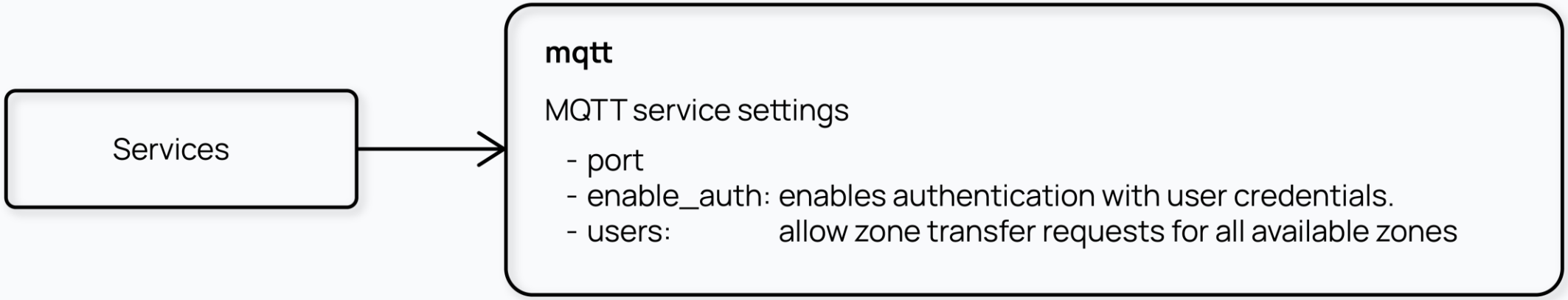
DNS server

dns_bind	DNS server with AX…	✔	dns	DNS server with AXFR enabled (zone transfer)	⋮
dns_bind_wo_axfr	DNS server (AXFR …	✔	dns	DNS server with AXFR disabled (zone transfer)	⋮

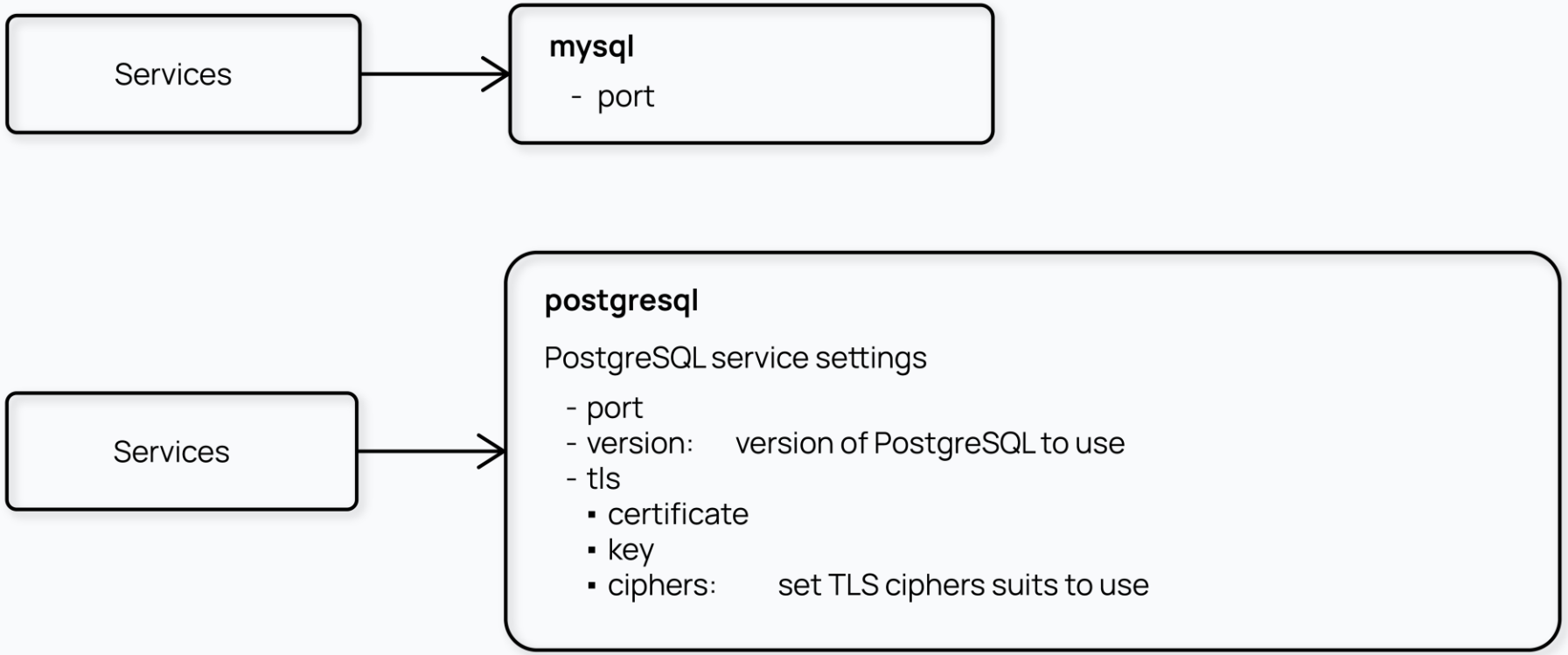


MQTT broker

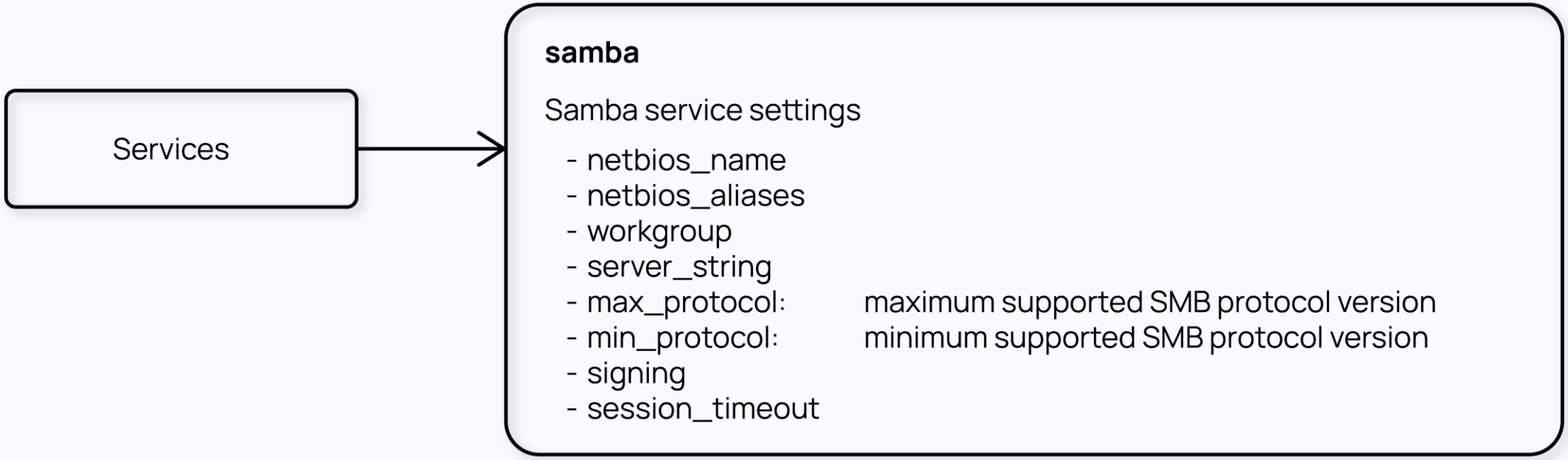
mqtt	MQTT Broker	✔	mqtt,linux,iot	MQTT Broker with anonymous access enabled
mqtt-auth	MQTT Broker with a…	✔	mqtt,linux,iot	MQTT Broker with anonymous access disabled



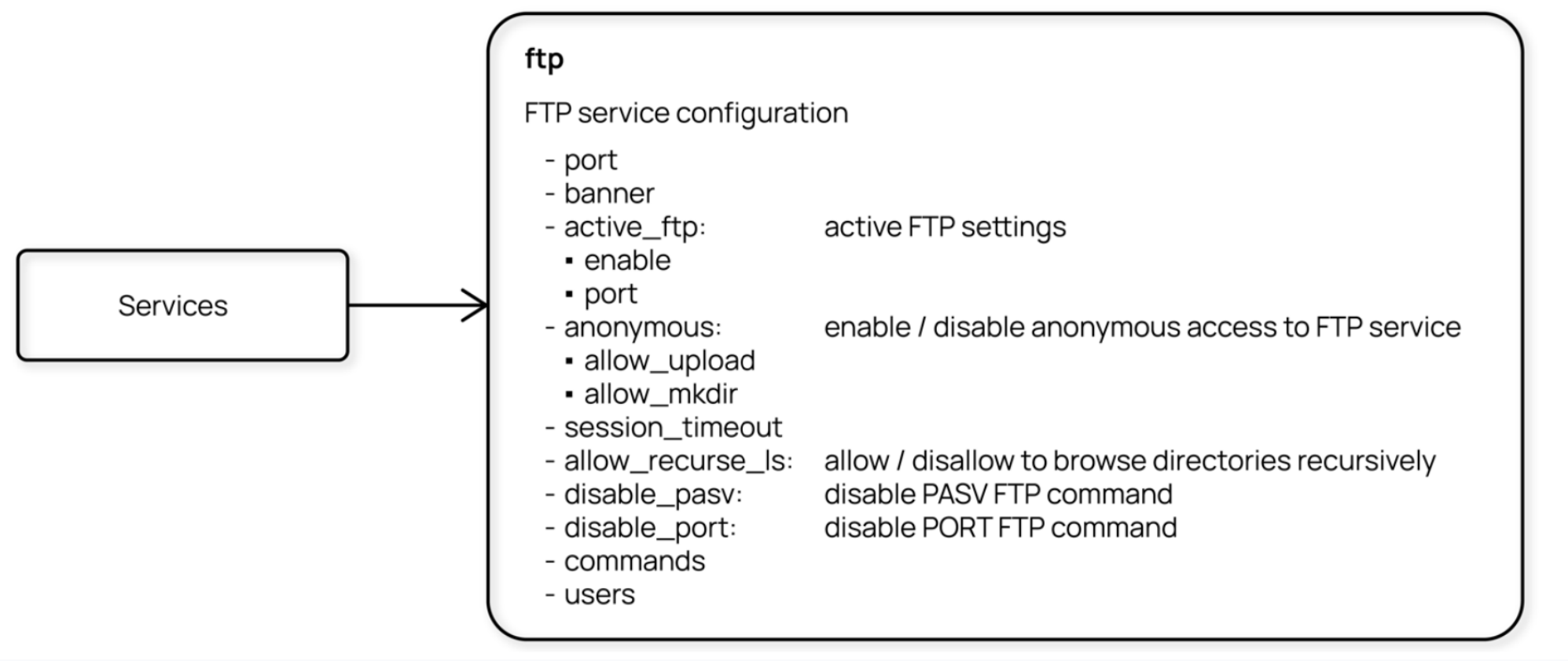
MySQL and PostgeSQL



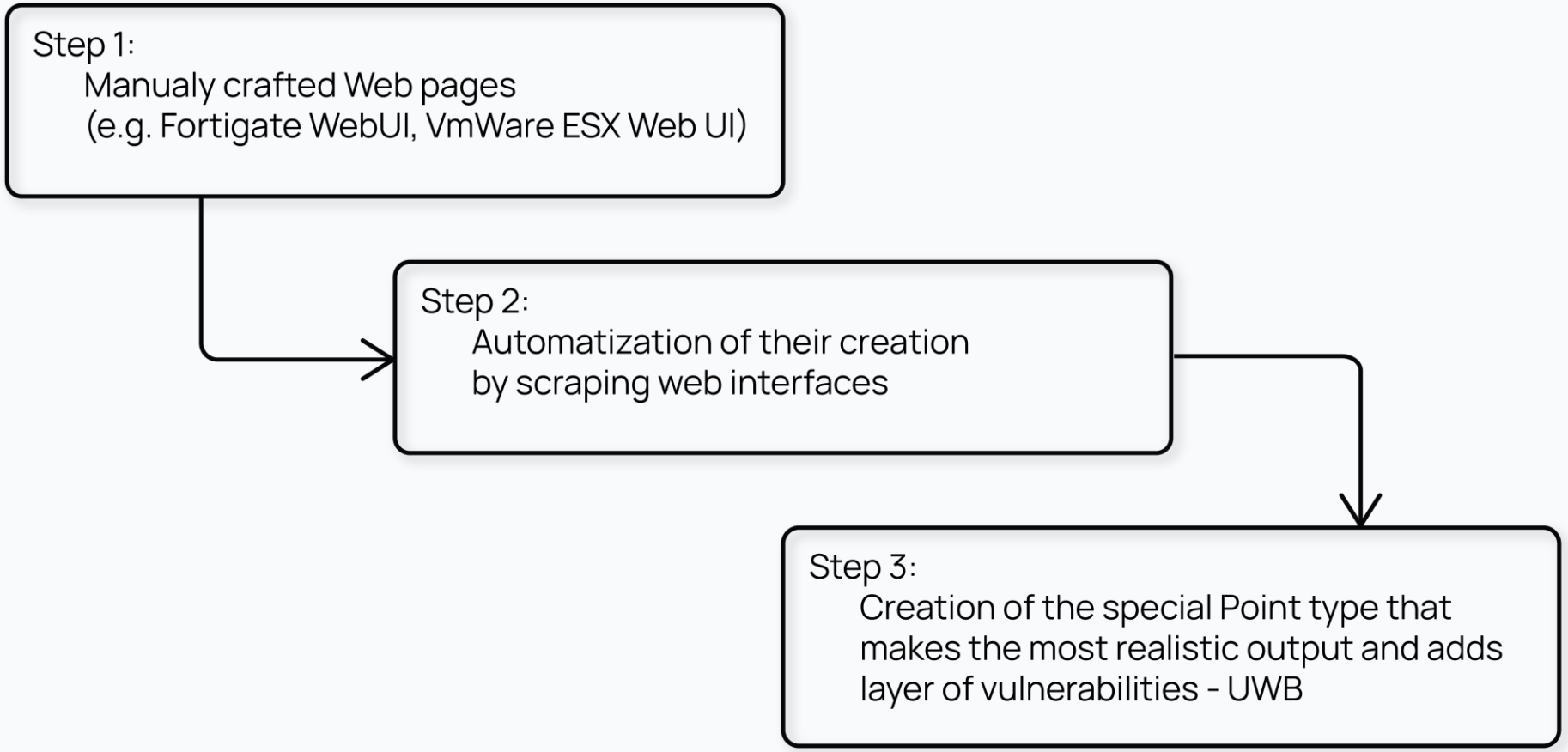
Samba file server



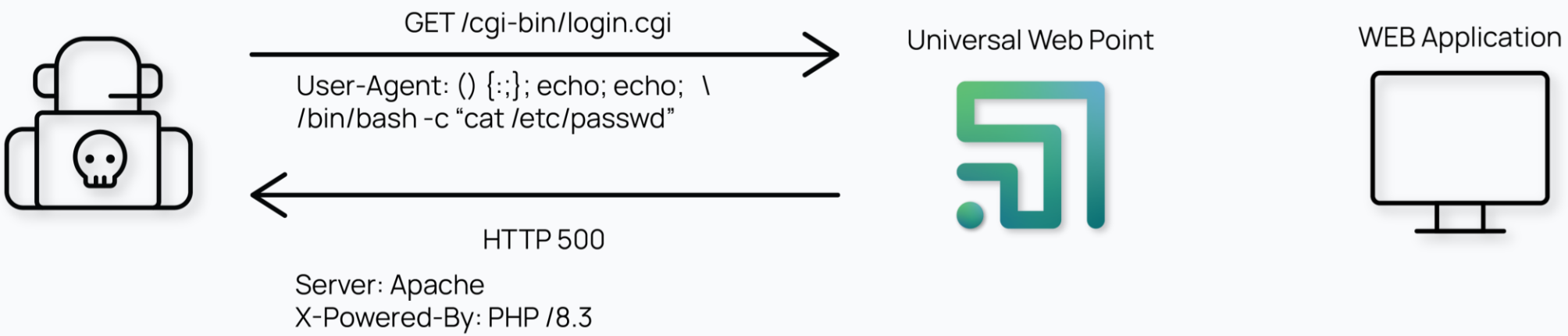
FTP server


Services
ftp
FTP service configuration
- port
- banner
- active_ftp: active FTP settings
▪ enable
▪ port
- anonymous: enable / disable anonymous access to FTP service
▪ allow_upload
▪ allow_mkdir
- session_timeout
- allow_recurse_ls: allow / disallow to browse directories recursively
- disable_pasv: disable PASV FTP command
- disable_port: disable PORT FTP command
- commands
- users

WEB deception



Universal Web Point

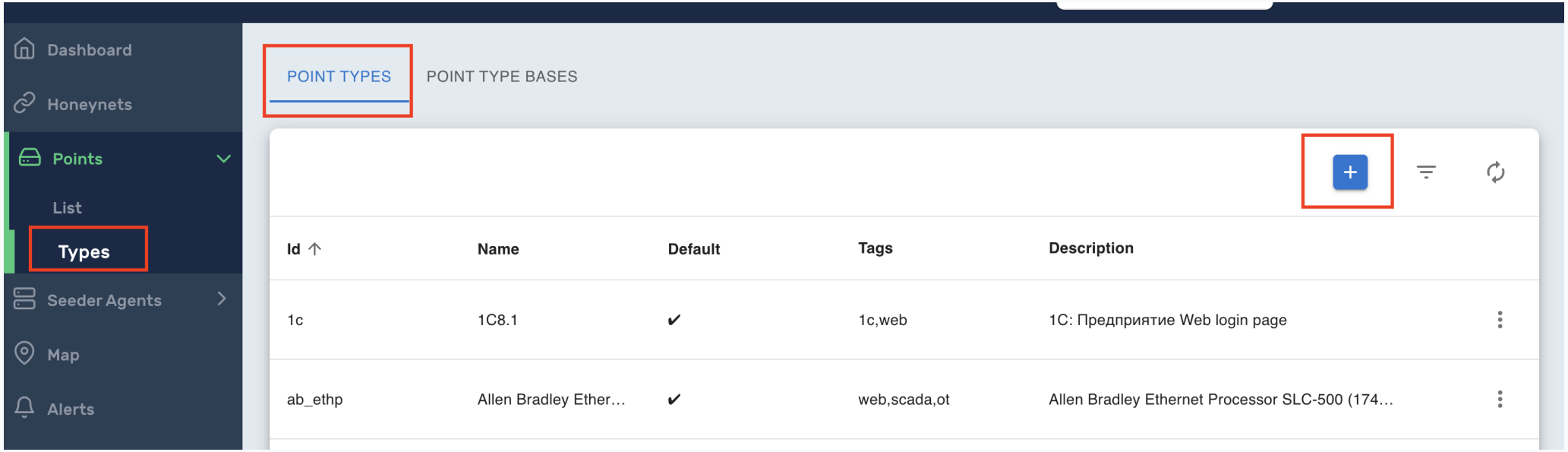


03 - Point customization

Labyrinth Training Program

How to create a new Point type

1. Go to the *“Points->Types->Point types”*
2. Click on *“Add”*



Configuration pattern

Options	Required	Description
Hostnames	No	Hostname value is short domain name or Fully Qualified Domain Name of the Point host. If omitted, hostname value will be generate for each instance of a Point: 1. from hostnames wordlist which is specified in Point Type configuration; 2. from hostnames wordlist which is specified in Honeynet configuration.
Fake_ports	No	Fake_ports are TCP and UDP ports which will be visible to network scanners as filtered ports. Although main goal is to simulate services which are binds to Point's ports but are filtered by firewall, actually there is no any service which is listening on fake ports. You may specify fake port group, which will be randomly chosen for each Point of that type.
Mac_oui_prefixes	No	Gives an ability to specify preferred MAC address OUI prefixes. The rest of the address is generated in a random manner.
Services	Yes	Contains configuration of services which are supported by the Point Type.

Case 1

Use DNS as the starting point

Preparation

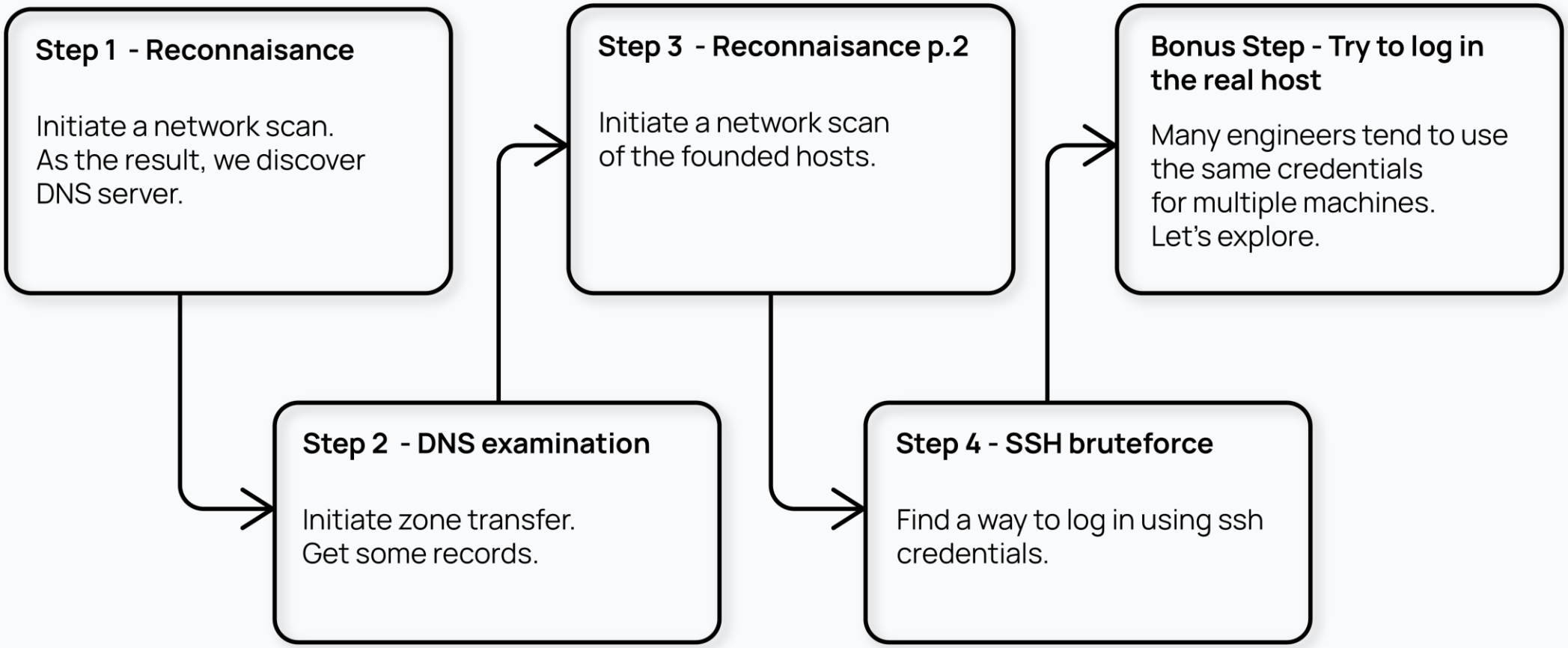
1. Create a Honeynet with a SSH Point in it
2. Create new DNS Point type with custom records
3. Create another Honeynet with the new DNS Point type

Type: **dns_ed7**

Configuration:

```
10    - name: tyrell.corp
11      records:
12      - name: ssh1
13        ttl: 300
14        type: A
15        value: 172.16.4.134
16      - name: yours
17        ttl: 300
18        type: CNAME
19        value: ssh
20      - name: ab_ethp
21        ttl: 300
22        type: A
23        value: 172.16.4.138
24      - name: ftp
```

Action plan

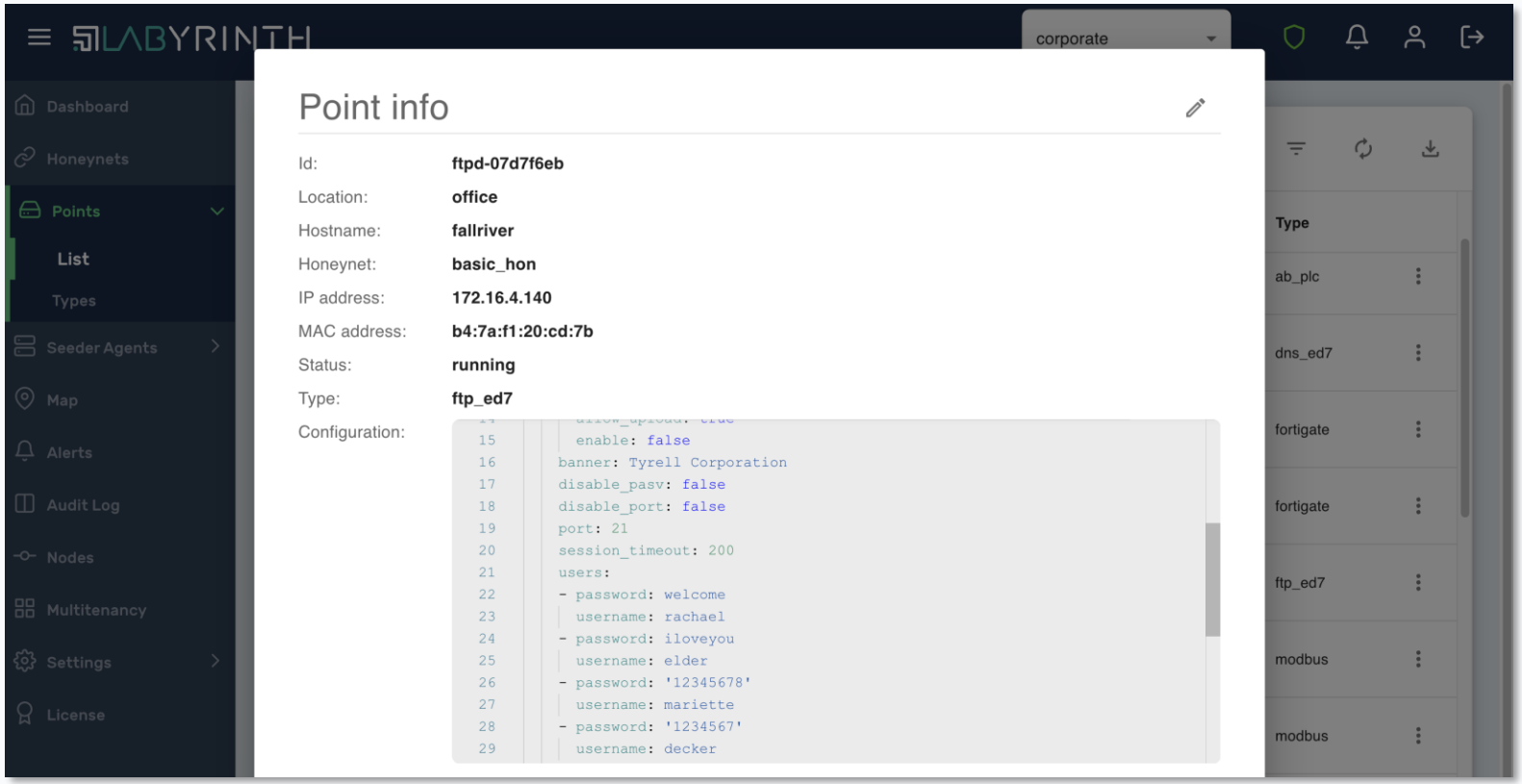

Step 1 - Reconnaisance
Initiate a network scan.
As the result, we discover
DNS server.
Step 2 - DNS examination
Initiate zone transfer.
Get some records.
Step 3 - Reconnaisance p.2
Initiate a network scan
of the founded hosts.
Step 4 - SSH bruteforce
Find a way to log in using ssh
credentials.
Bonus Step - Try to log in
the real host
Many engineers tend to use
the same credentials
for multiple machines.
Let's explore.

Case 2

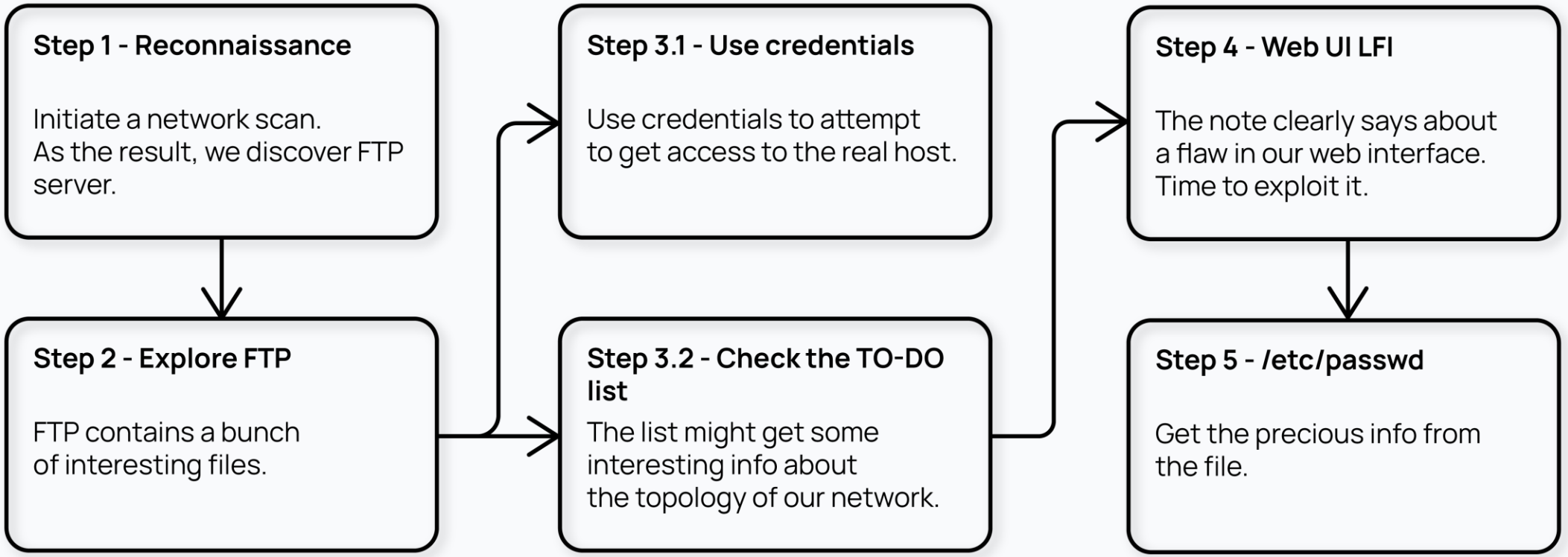
Use FTP as the starting point

Preparation

1. Create FTP server with disabled anonymous access
2. Put there file that leads to another Point



Action plan


Step 1 - Reconnaissance
Initiate a network scan.
As the result, we discover FTP server.
Step 2 - Explore FTP
FTP contains a bunch of interesting files.
Step 3.1 - Use credentials
Use credentials to attempt to get access to the real host.
Step 3.2 - Check the TO-DO list
The list might get some interesting info about the topology of our network.
Step 4 - Web UI LFI
The note clearly says about a flaw in our web interface. Time to exploit it.
Step 5 - /etc/passwd
Get the precious info from the file.

04 – Integrations and API

Labyrinth Training Program

LABYRINTH

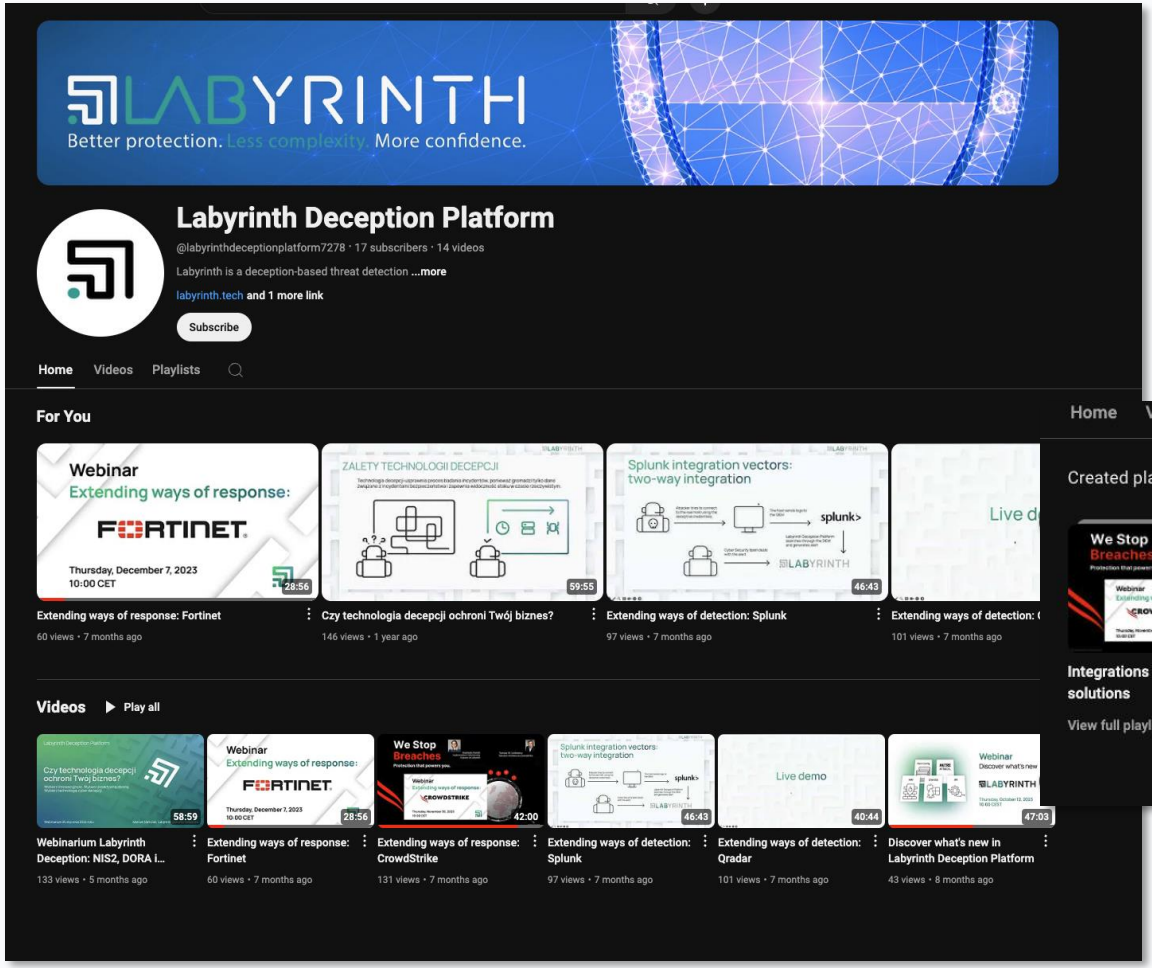
Integrations: overview

State	Name	Edit
○	CrowdStrike	✎
○	FortiGate	✎
○	Microsoft Teams Notifications	✎
○	IBM QRadar	✎
○	Slack Notification	✎
○	SMTP Notification	✎
●	Splunk	✎
●	SIEM Integration (Syslog forwarder)	✎
○	TheHive	✎
●	Webhook	✎

Classification

Type	Integration name
Integrations that perform host isolation	CrowdStrike
	FortiGate
Two-way integration	Splunk
	IBM QRadar
Notifications	Slack
	Microsoft Teams
	SMTP
	Webhook
Log forwarding to SIEM	Syslog Forwarder (SIEM integration)
IR platforms	The Hive

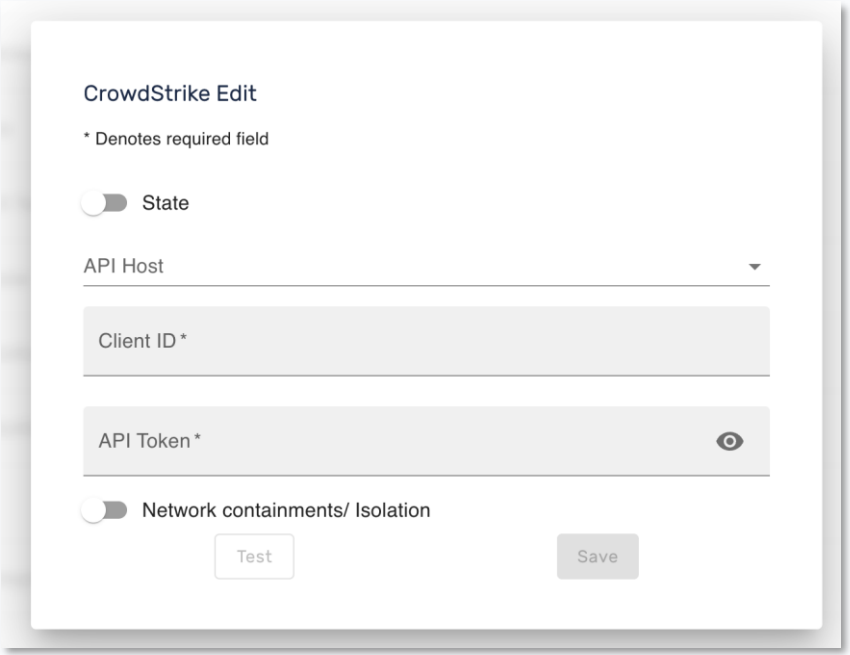
Labyrinth Deception Platform YouTube



https://www.youtube.com/@labyrinthdeceptionplatform7278

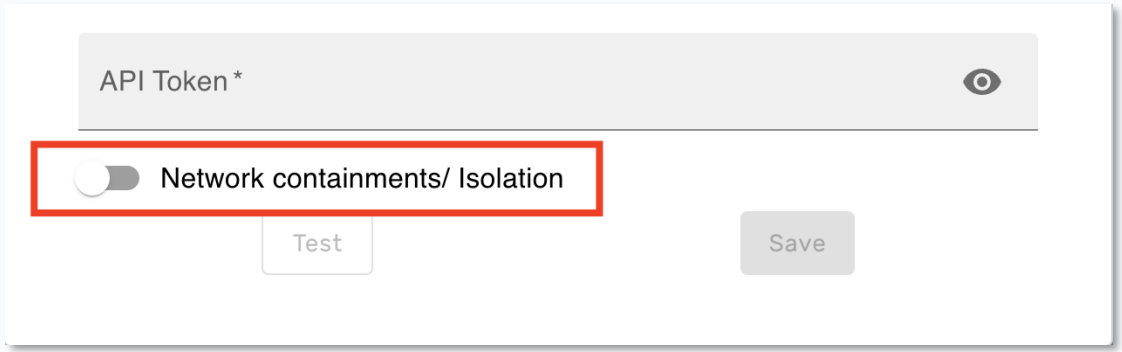
CrowdStrike

CROWDSTRIKE



1. Enriching the alert using the data about the attacking host from the system;

2. Isolating the host that appears in the Source IP of the alert (optional).

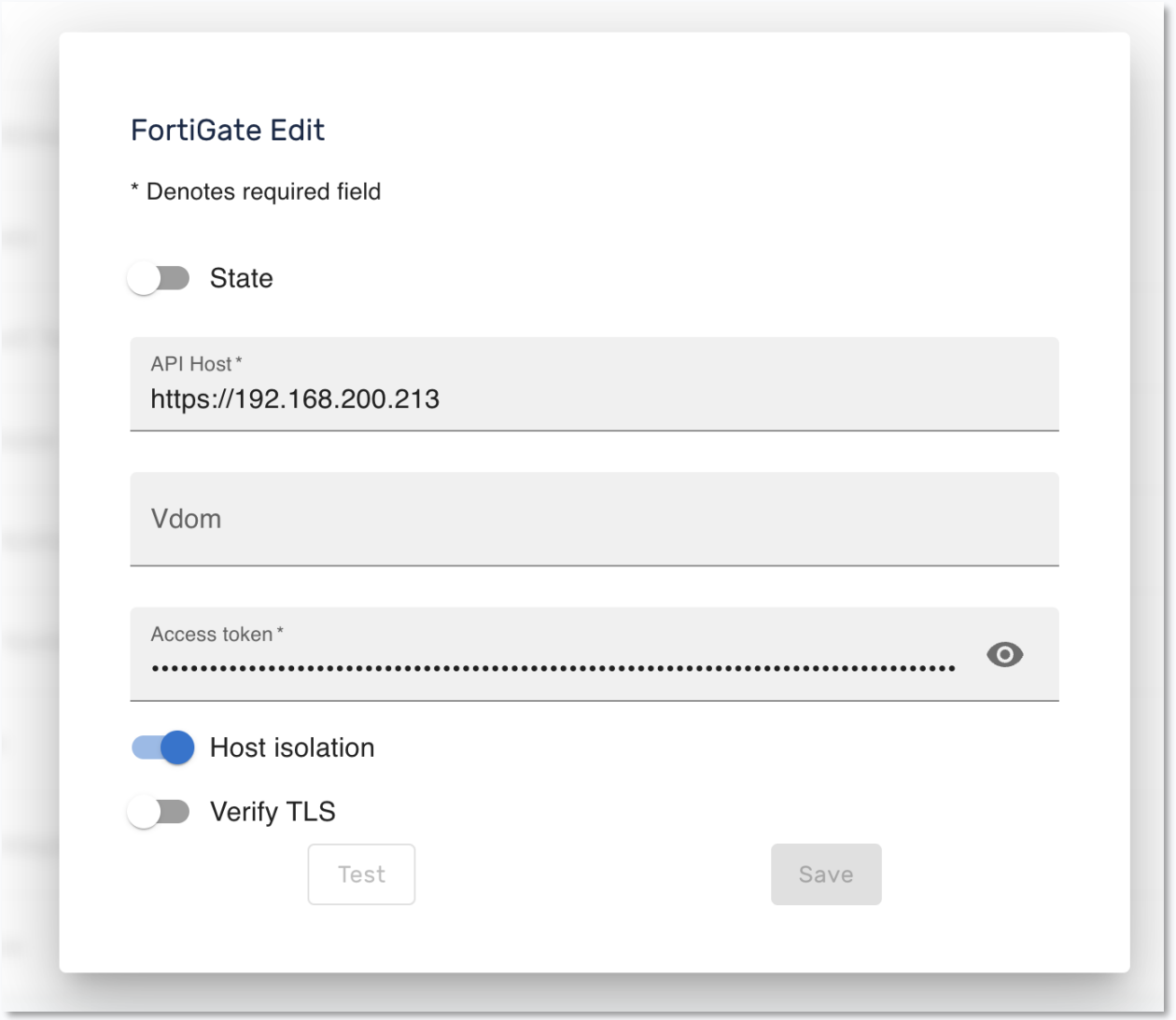


FortiGate

FORTINET®

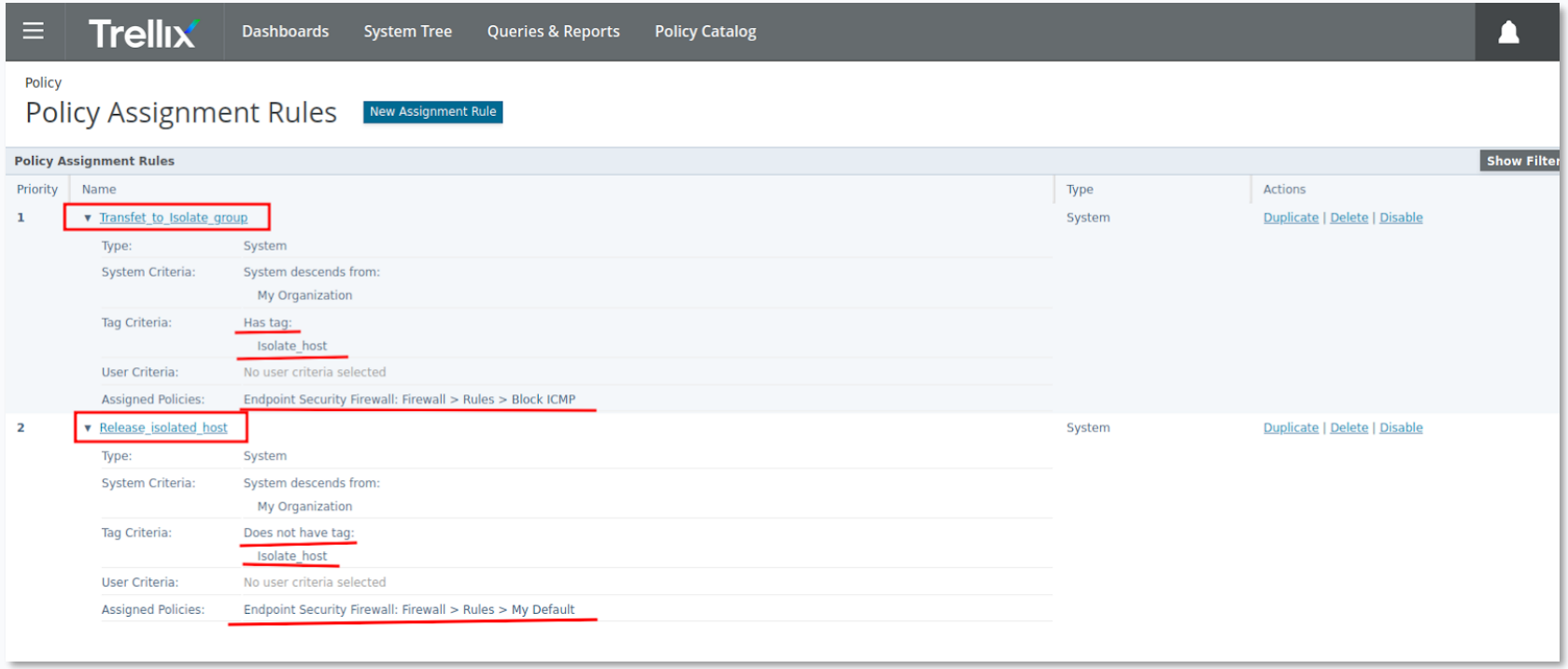
Isolates the host that appears in the Source IP of the alert.

YouTube Labyrinth Deception Platform
https://www.youtube.com/watch?v=nlLXkgwzZw4



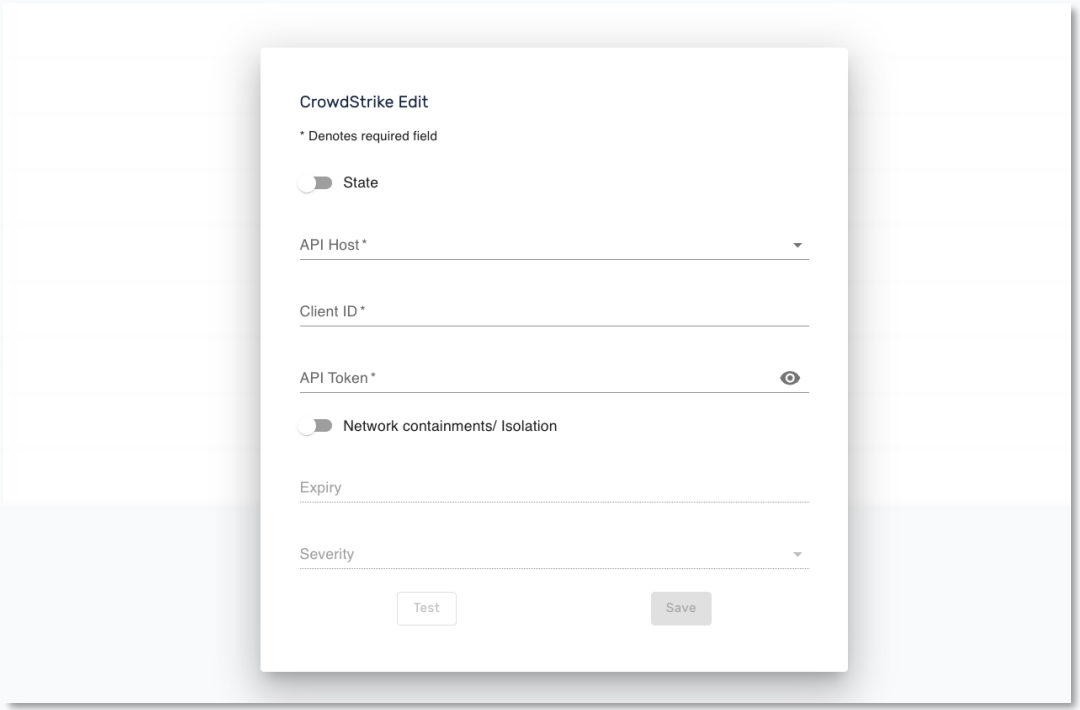
Trellix

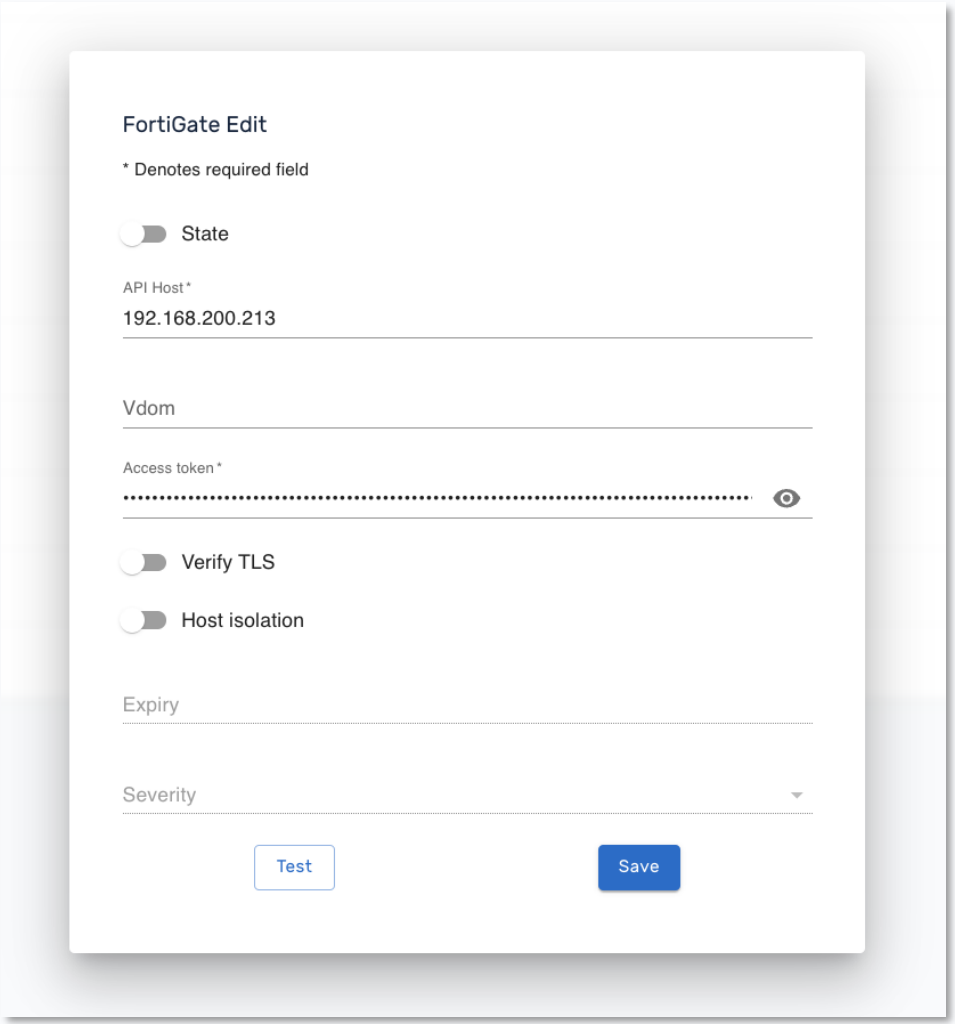
- Integration with Trellix ePO
- Performs Host isolation based on your policies



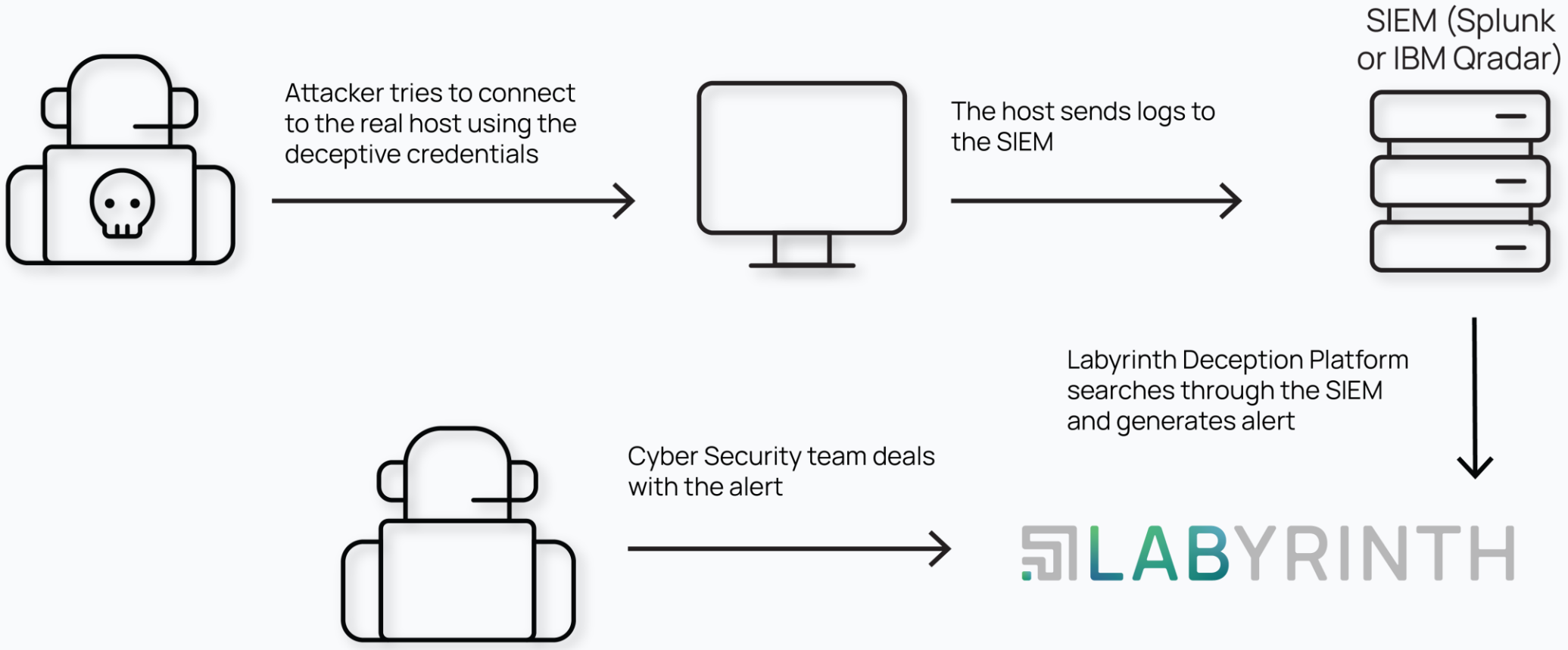
Some notes

1. Isolation requirements
2. Custom timeout for FortiGate integration





What is two-way integration?



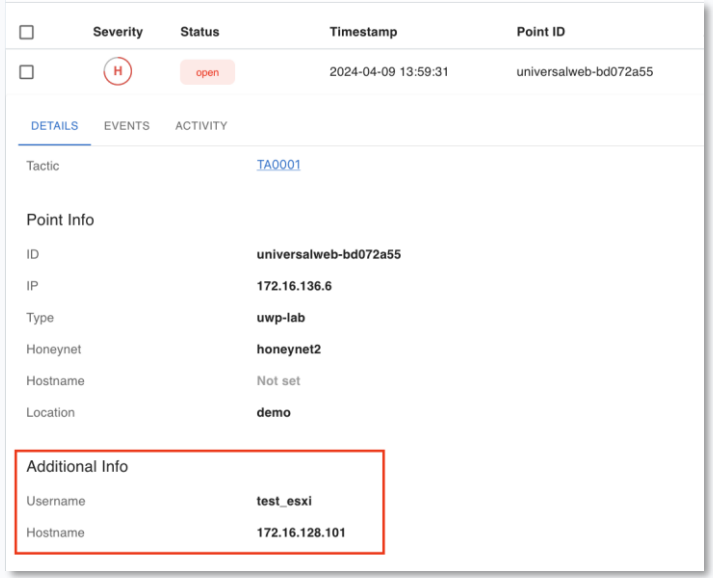
Splunk

1. Search in the SIEM for attempts to use logins and passwords that are not valid and appear in Seeder Tasks (breadcrumbs), that is, these logins and passwords are used in the configuration of network decoys (Points) and should not be used when trying to log in to real servers.

2. Enrichment of the alert that occurred on Point.

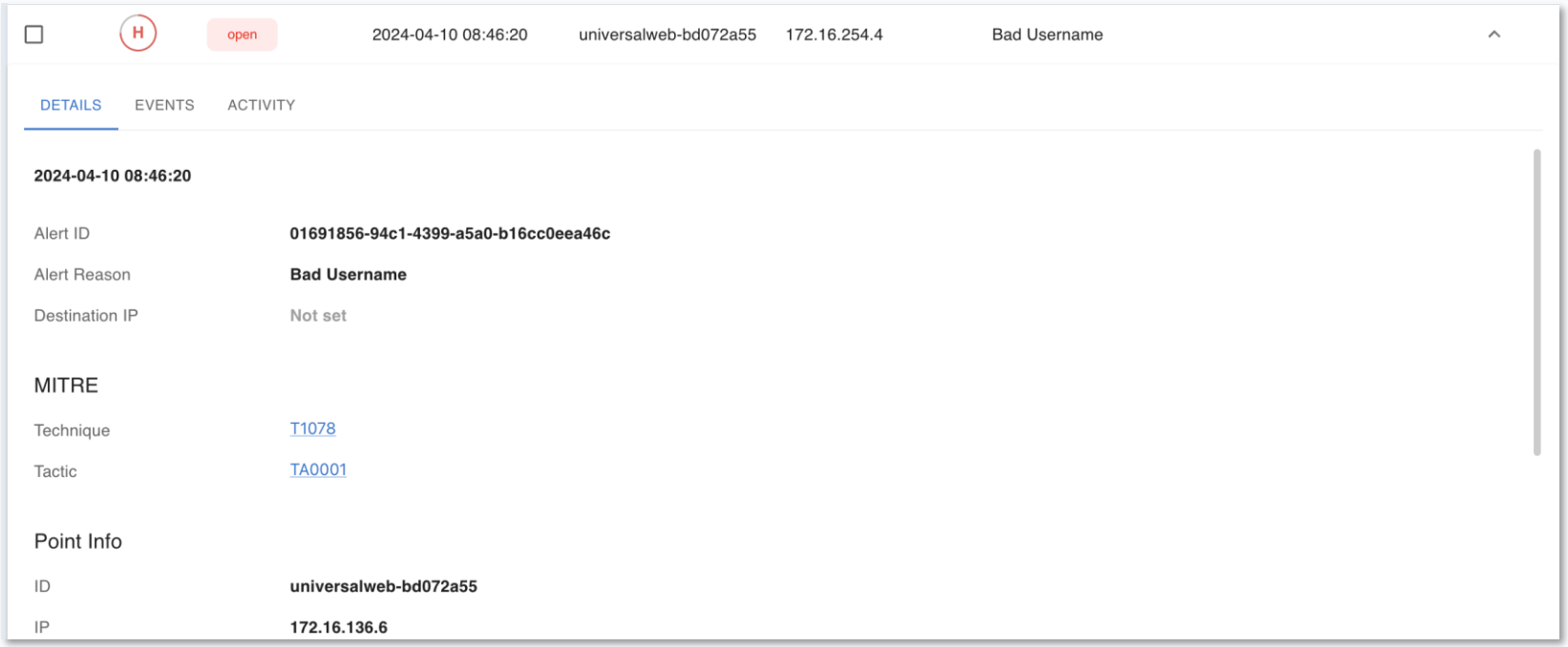
Since Splunk query in the integration setup form is not a query, but a template, these templates support the following template variables:

1. **${usernames}** - a template variable that contains a list of usernames that are part of the Seeder Tasks.
2. **${source_ip}** - IP address of an attacker. It should mostly be used for Alert enrichment.



IBM QRadar

- Allows to detect usage of credentials from bredcrumbs



SIEM integration (syslog forwarder)

Test message:

>	4/10/24 9:03:20.000 AM	Apr 10 09:03:20 192.168.200.231 2024-04-10T06:03:05Z AdminConsole CEF:v2.0.54-18|Labyrinth Technologies|Point|0|LAB_TESTING_ALERT|This is your test message. The parameters are correct.|1|src=192.168.1.2 dst=192.168.1.1 pointType=sshd honeynetID=honeynet01 location=the_location dvc=192.168.1.1 dvchost=test.host deviceExternalId=sshd-123456 severity=Low cs1=Action has been occured that fails to be categorised. cs1Label=Description cs2=Investigate surrounding alerts to identify potential source of and attack. Contact support of Labyrinth Technoogies. cs2Label=Playbook host = 192.168.200.231 | source = udp:514 | sourcetype = syslog

Alerts:

>	4/10/24 9:05:48.000 AM	Apr 10 09:05:48 192.168.200.231 2024-04-10T06:05:02Z AdminConsole CEF:v2.0.54-18|Labyrinth Technologies|Point|0|LAB_ALERT|Port scan detected (TCP SYN e.g. nmap -sS -T4)|1|src=172.16.254.4 dst=172.16.132.10 pointType=ab_ethp honeynetID=honeynet3 location=demo dvc=172.16.132.10 dvchost=hermes deviceExternalId=ab_ethp-7949fe95 severity=Low cs3=TA0043 cs3Label=Tactic cs4=T1595 cs4Label=Technique cs1=Port scan on specific Point has been detecetd cs1Label=Description cs2=Identify the host of the source IP. Identify the owner of this host. Recommendation: Verify previous activity from Source IP. Continue monitoring Source IP activity. cs2Label=Playbook host = 192.168.200.231 | source = udp:514 | sourcetype = syslog

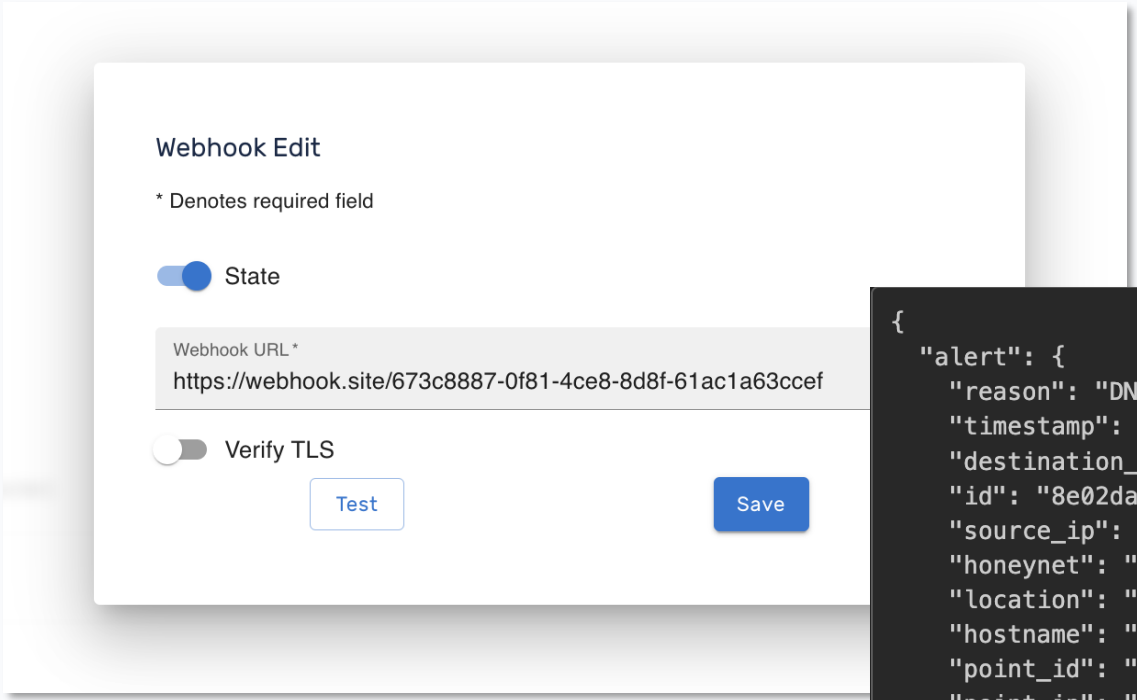
Audit Log:

>	4/10/24 8:58:14.000 AM	Apr 10 08:58:14 192.168.200.231 2024-04-10 05:57:59 AdminConsole CEF:0|Labyrinth Technologies|Tenant|0|LAB_AUDIT|change_state_for_integrations|10|src=172.16.254.4 event_type=change_state_for_integrations tenant=additional_tenant username=meow event_status=success host = 192.168.200.231 | source = udp:514 | sourcetype = syslog

Syslog: message fields

1. **Timestamp -** ISO 8601 format (always UTC);
2. **(UTC) AdminConsole CEF:<version>** - always static and indicates Labyrinth version;
3. **Labyrinth Technologies** - vendor, always static;
4. **Point** - Alert info always contains Point keyword;
5. **LAB_ALERT** - indicates that the source is Alerts;
6. **<Alert reason>;**
7. **<Severity in numerical form> -** may be from 0 to 10. 0 Low severity, 10 High Severity;
8. **CEF Extensions**:
    1. CEF Extensions:
    2. src - Source IP address of an attacker:
    3. dst - Destination IP address. In most cases it is the IP address of the attacked Point. In some cases it may differ from Point's for example during outgoing connections attempts.
    4. pointType - Point Type of the attacked Point.
    5. honeynetID - the Honeynet to which the attacked Point belongs.
    6. location - Honeynet location to which the attacked Point belongs.
    7. dvc - sctual IP address of the Point / network decoy which has been attacked.
    8. dvchost - hostname of the Point / network decoy
    9. deviceExternalId - unique ID of the Point in Labyrinth.
    10. severity – severity level;
    11. cs1 - details of an Alert / Description
    12. cs2 – recommendations
    13. cs3 - MITRE ATT&CK tactics
    14. cs4 - MITRE ATT&CK techniques

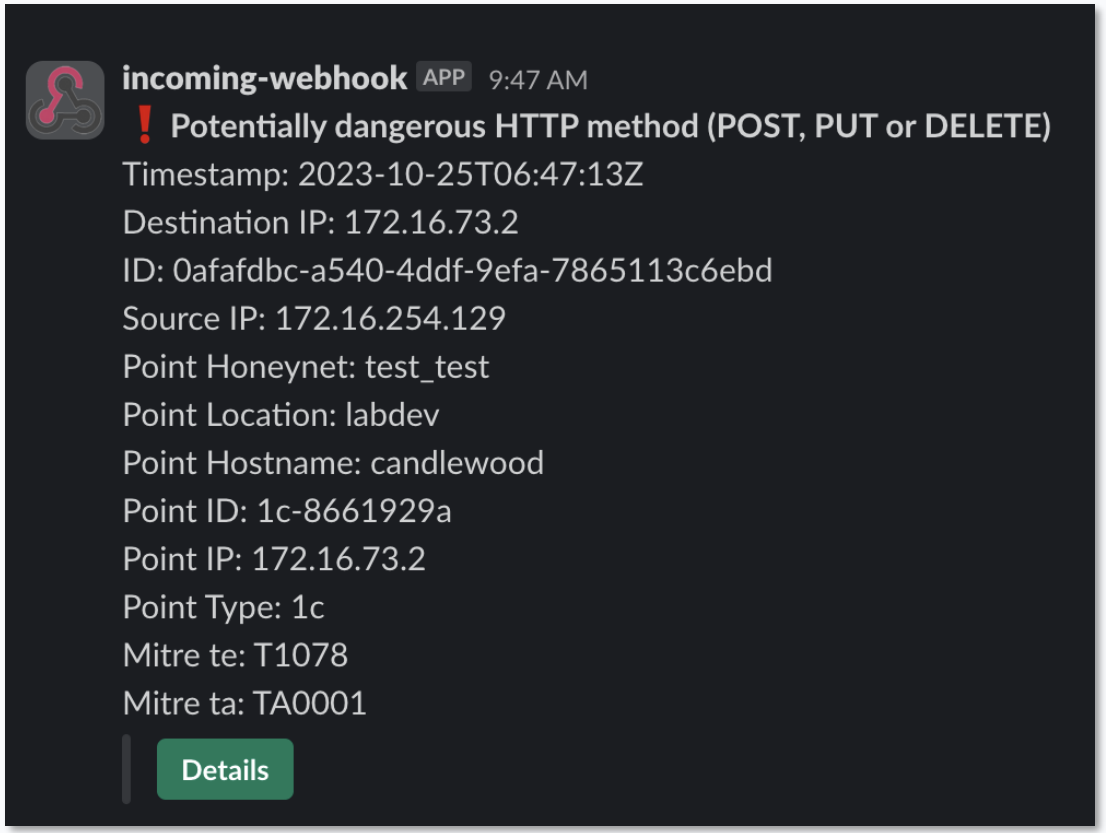
Webhooks



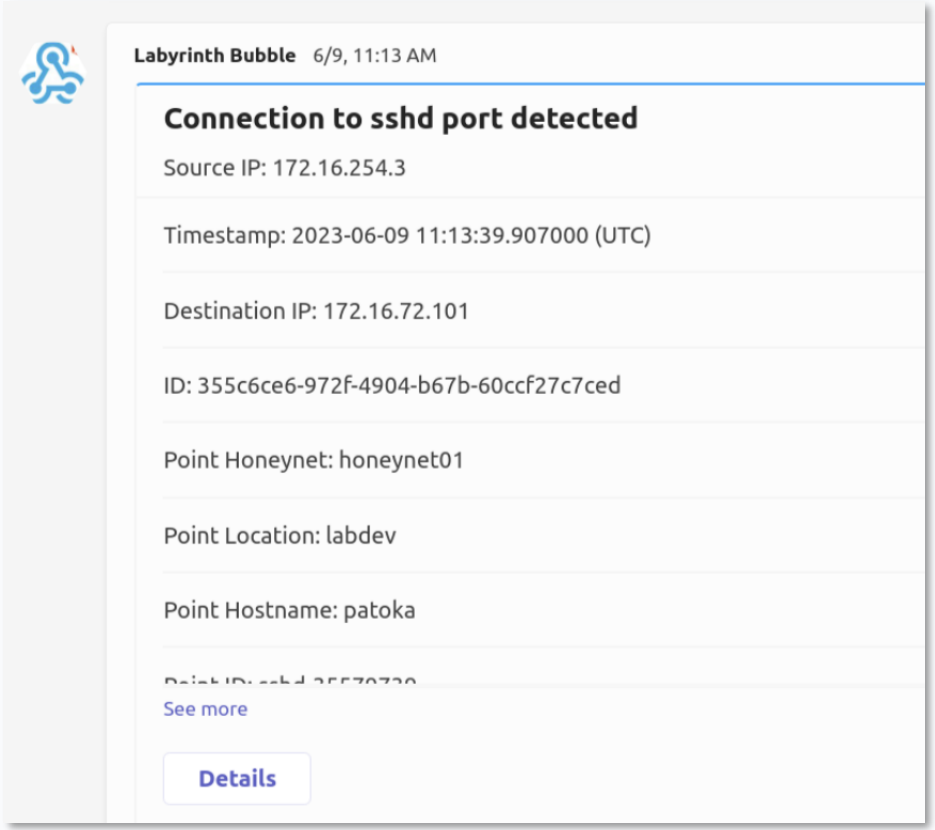

```
{
  "alert": {
    "reason": "DNS Query attempt detected",
    "timestamp": "2024-04-10T06:08:19Z",
    "destination_ip": "172.16.132.12",
    "id": "8e02da3f-fb79-4550-ae3a-12d4384b9eed",
    "source_ip": "172.16.254.4",
    "honeynet": "honeynet3",
    "location": "demo",
    "hostname": "stephano",
    "point_id": "dns-7b3769d4",
    "point_ip": "172.16.132.12",
    "point_type": "dns_bind",
    "severity": "Low",
    "mitre_te": "T1590.002",
    "mitre_ta": "TA0043"
  },
  "link": "https://192.168.200.231/lab/alerts?id=8e02da3f-fb79-4550-ae3a-12d4384b9eed"
}
```

Slack and Microsoft Teams

slack



Microsoft Teams



SMTP

SMTP

Alert: Port scan detected (TCP SYN, e.g. nmap -sS -T4) Inbox ×

[redacted]

to me

Labyrinth Alert

Reason: Port scan detected (TCP SYN, e.g. nmap -sS -T4)
Timestamp: 2023-09-27T10:18:10Z
Destination IP: 172.16.12.31
ID: 100c3379-e352-4ead-9615-cdce25c33145
Point Honeynet: demo_hn
Point Location: labtest
Point Hostname: echo
Point ID: clientos-0a3320e5
Point IP: 172.16.12.31
Point Type: clientos
Mitre te: T1595
Mitre ta: TA0043

Details

Labyrinth ALERT - Test message Inbox ×

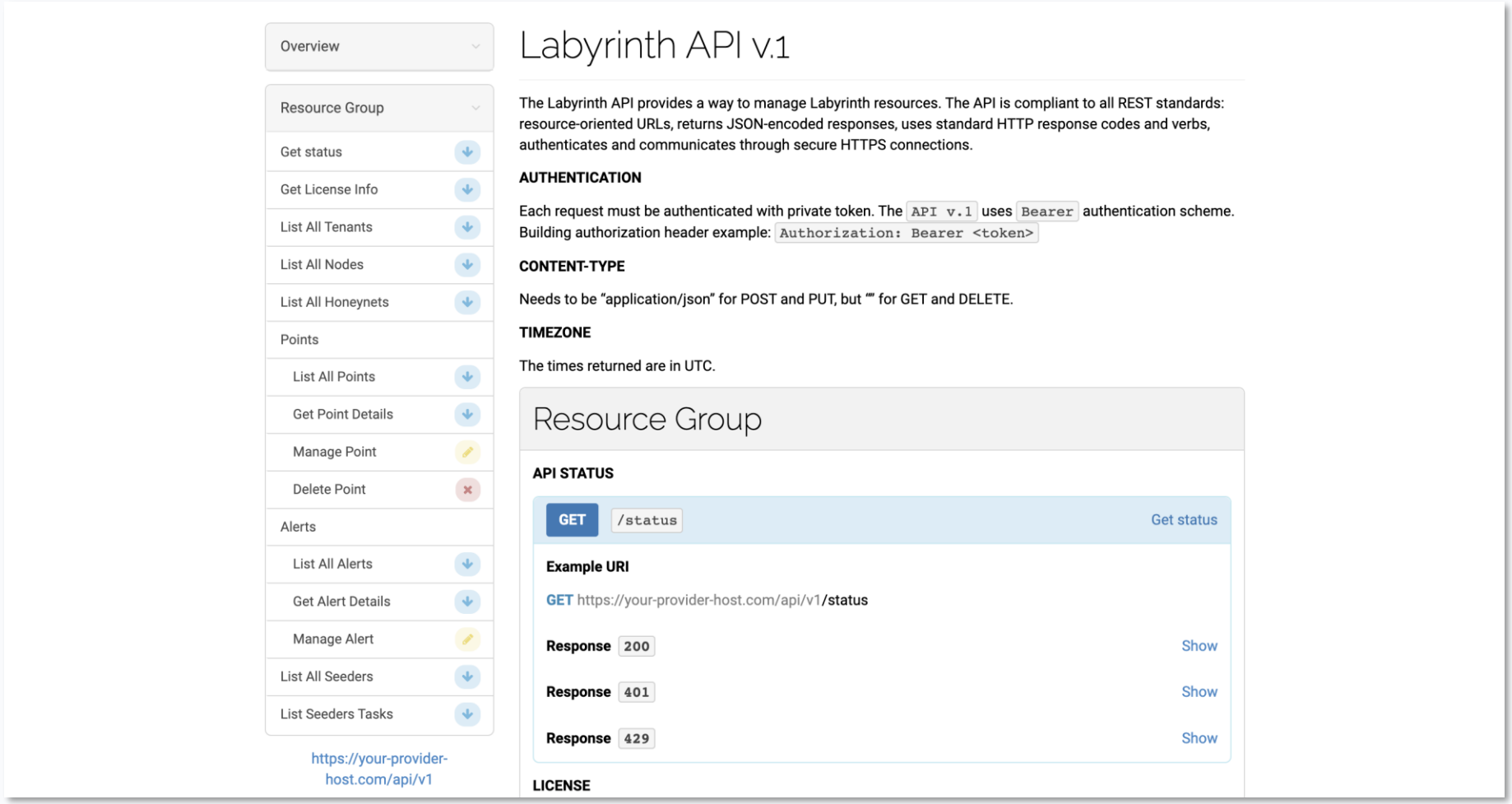
[redacted]

to me

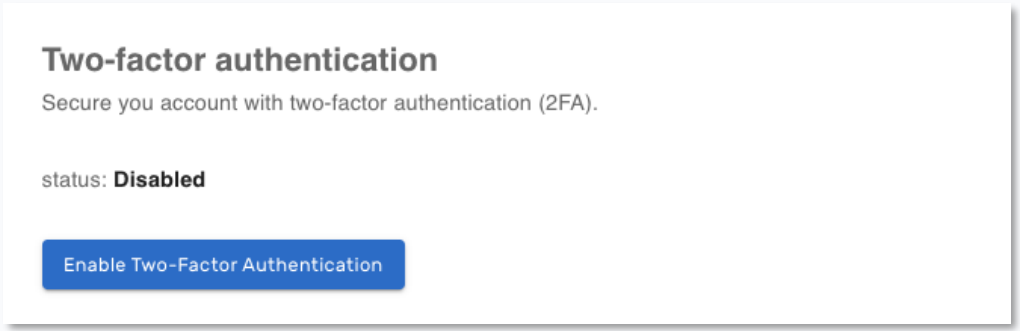
This is your test message. The parameters are correct.

Reply Forward

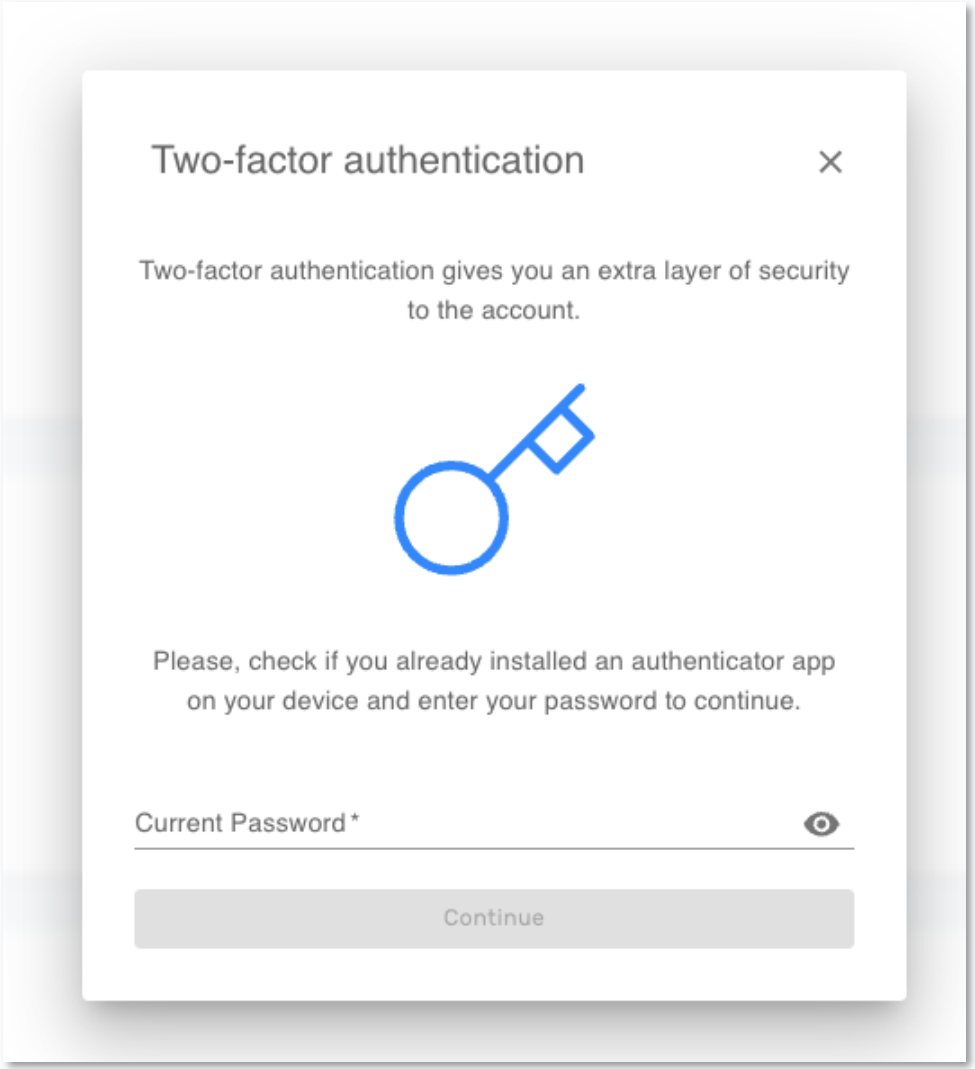
REST API


Overview
Resource Group
Get status
Get License Info
List All Tenants
List All Nodes
List All Honeynets
Points
List All Points
Get Point Details
Manage Point
Delete Point
Alerts
List All Alerts
Get Alert Details
Manage Alert
List All Seeders
List Seeders Tasks
https://your-provider-host.com/api/v1
Labyrinth API v.1
The Labyrinth API provides a way to manage Labyrinth resources. The API is compliant to all REST standards: resource-oriented URLs, returns JSON-encoded responses, uses standard HTTP response codes and verbs, authenticates and communicates through secure HTTPS connections.
AUTHENTICATION
Each request must be authenticated with private token. The API v.1 uses Bearer authentication scheme. Building authorization header example: Authorization: Bearer <token>
CONTENT-TYPE
Needs to be "application/json" for POST and PUT, but "" for GET and DELETE.
TIMEZONE
The times returned are in UTC.
Resource Group
API STATUS
GET /status Get status
Example URI
GET https://your-provider-host.com/api/v1/status
Response 200 Show
Response 401 Show
Response 429 Show
LICENSE

MFA


Two-factor authentication
Secure you account with two-factor authentication (2FA).
status: Disabled
Enable Two-Factor Authentication


Zoho
OneAuth


Two-factor authentication
Two-factor authentication gives you an extra layer of security to the account.
Please, check if you already installed an authenticator app on your device and enter your password to continue.
Current Password *
Continue

Roadmap

1. Adding new integrations:
    1. Checkpoint
    2. Integrations with Sandboxes (R&D)
    3. Integrations suggested by the customers
2. Updating the existing ones

LABYRINTH

Labyrinth is a team of experienced cybersecurity engineers and penetration testers, which specializes in the development of solutions for early cyber threat detection and prevention.

Follow us on:

Labyrinth Development

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https://labyrinth.tech

info@labyrinth.tech