WHYSECURITY
CYBER SECURITY

Zabbix for CyberSecurity

Different approaches to manage Cyber challenges

https://www.whysecurity.it

Who’s speaking?

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CyberSecurity Expert

WhySecurity CEO

Vincenzo Morrone

Software Engineer

Penetration Tester

WHYSECURITY

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Introduction

Zabbix is one of the crucial systems we use to deliver our **SOC** and **SNOC** services
In recent years, it has been necessary to developer integrations with third parties cybersecurity software
in order to have single pane of glass about “What’s going on”

We have worked on different methods in order to achieve our integration requirements.

Who are we?

We specialize in cybersecurity and much more; we develop applications and integrations.
Since 10 years already.

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Different approach for different challanges

- Broker approach:
  - Use external application to manage the orchestration of operations

- Serverless approach:
  - No external application required

We'll talk about:

Objectives

1) Global visibility — View **everything in one place**

2) Realtime monitoring — **Accurate data** and no time waste

3) Instant notification — **Alert the team** quickly in any way possible

4) Rapid response — **No long process**

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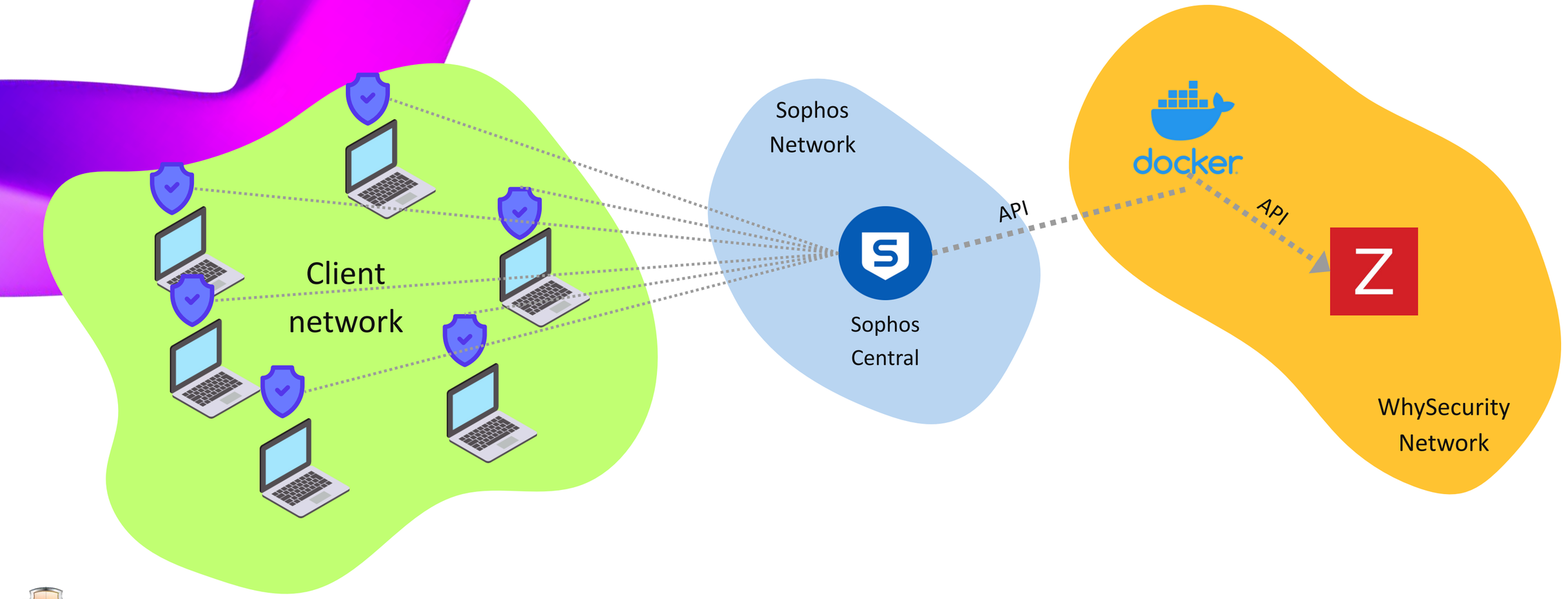
Event Detection by the Sophos Endpoints Security Agents

Using Sophos **APIs & Zabbix API.**

Application Flow



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Event Detection by the Sophos Endpoints Security Agents

Using Sophos **APIs & Zabbix API.**

What we see on Zabbix

Host	Name ▲	Last check	Last value
ME01_Mes2022	C_Sophos Alert		
ME01_Mes2022	C_Sophos Days Since Last Access	24s	1
ME01_Mes2022	C_Sophos Event		
ME01_Mes2022	C_Sophos Health	24s	good
ME01_Mes2022	HitmanPro.Alert service	33s	running
ME01_Mes2022	Sophos Clean		
ME01_Mes2022	Sophos Endpoint Defense	33s	running
ME01_Mes2022	Sophos Endpoint Defense Service	33s	running
ME01_Mes2022	Sophos File Scanner	33s	running
ME01_Mes2022	Sophos File Scanner Service	33s	running
ME01_Mes2022	Sophos MCS Agent	33s	running
ME01_Mes2022	Sophos MCS Client	33s	running
ME01_Mes2022	Sophos NetFilter	33s	running
ME01_Mes2022	Sophos Network Threat Protection	33s	running
ME01_Mes2022	Sophos Safestore		
ME01_Mes2022	Sophos System Protection Service	33s	running

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Event Detection by the Sophos Endpoints Security Agents

Using Sophos **APIs & Zabbix API.**

Thanks to the use of Zabbix APIs, we have automated the creation of:

- Hosts
- Items
- Triggers

We created a fully automatic and autonomous process for registering hosts from Sophos to Zabbix.

- **4000+** Hosts created using API.
- **0h** Time wasted by Humans.

Pros:

- Numerous methods provided by the Zabbix APIs.

Cons:

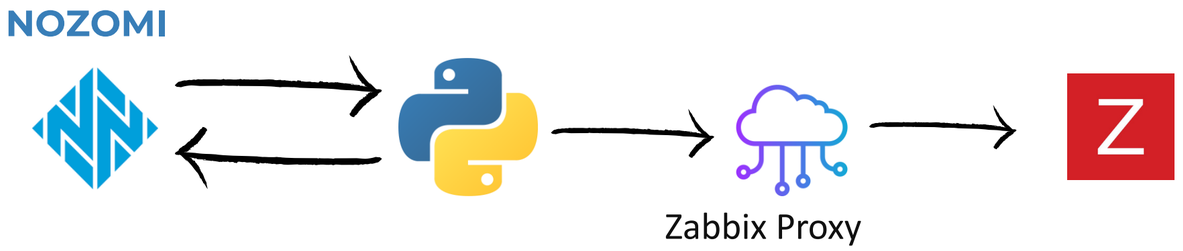
- It is necessary to create an external application for orchestrating the HTTP Calls.

SOC OT Vulnerabilities Detection

Using **Zabbix Trapper** and NOZOMI

Nozomi is a cybersecurity platform that provides solutions for monitoring and securing industrial control systems (ICS) and operational technology (OT) environments

Nozomi's technology uses network monitoring and artificial intelligence to gain visibility into complex industrial networks, identify vulnerabilities, and offer actionable insights to prevent potential security incidents.



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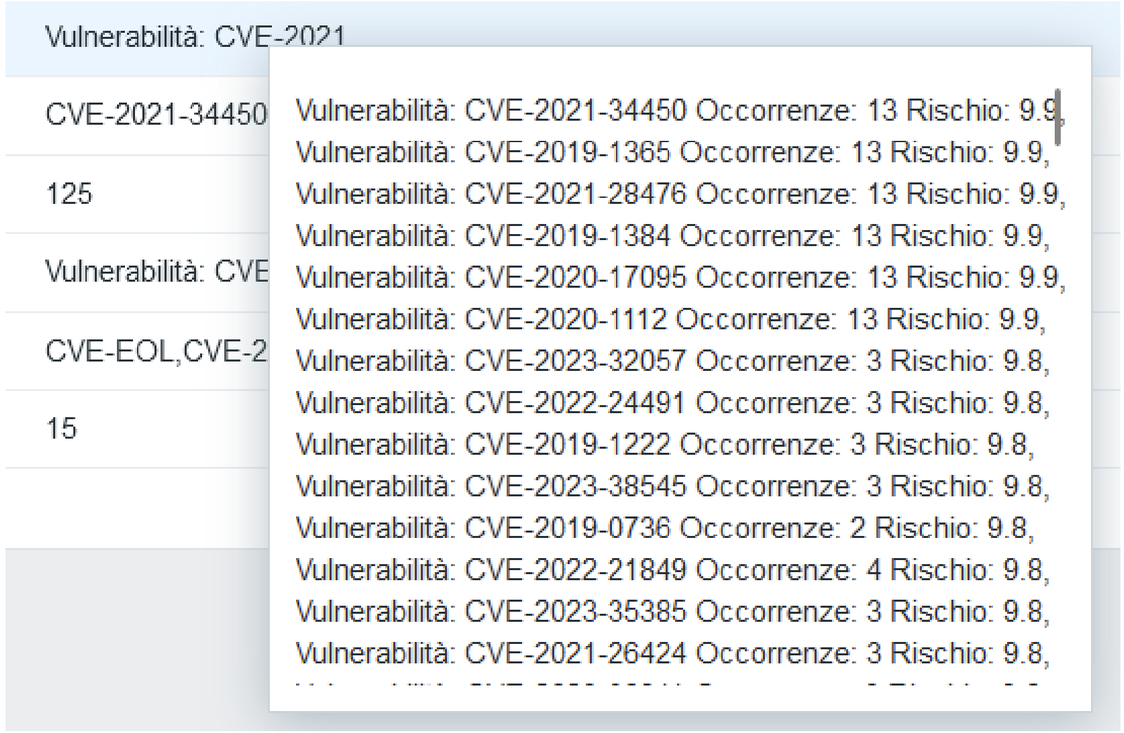
SOC OT Vulnerabilities Detection

Using **Zabbix Trapper** and **NOZOMI**

We used a Master item to collect the raw data and dependent item with **Javascript preprocessing.**



Master Item - Trapper

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SOC OT Vulnerabilities Detection

Using **Zabbix Trapper** and **NOZOMI**

Using Javascript we filter the vulnerabilities based on the score.

JavaScript

```
function (value) {
    var arrayResult = value.split(',').map(function(item) {
        return item.trim();
    }).filter(Boolean);


    var arrayNomiVulnerabilita = arrayResult
        .filter(function (element) {
            // Estrai il valore del campo "Rischio" dalla stringa
            var match = element.match(/Rischio: (\d+(\.\d+)?)/);

            // Se il match è valido e il valore del "Rischio" è uguale a 10.0, includi l'elemento nell'array risultante
            return match && parseFloat(match[1]) === 10.0;
        })
        .map(function (element) {
            // Estrai il nome della vulnerabilità dalla stringa usando una regex più specifica per la CVE
            var match = element.match(/CVE-\S+/);

            // Restituisci il nome della vulnerabilità
            return match ? match[0] : null;
        })
        .filter(Boolean);

    return arrayNomiVulnerabilita;
}
```

64727 characters remaining

Apply Cancel

Dependent Item - Trapper

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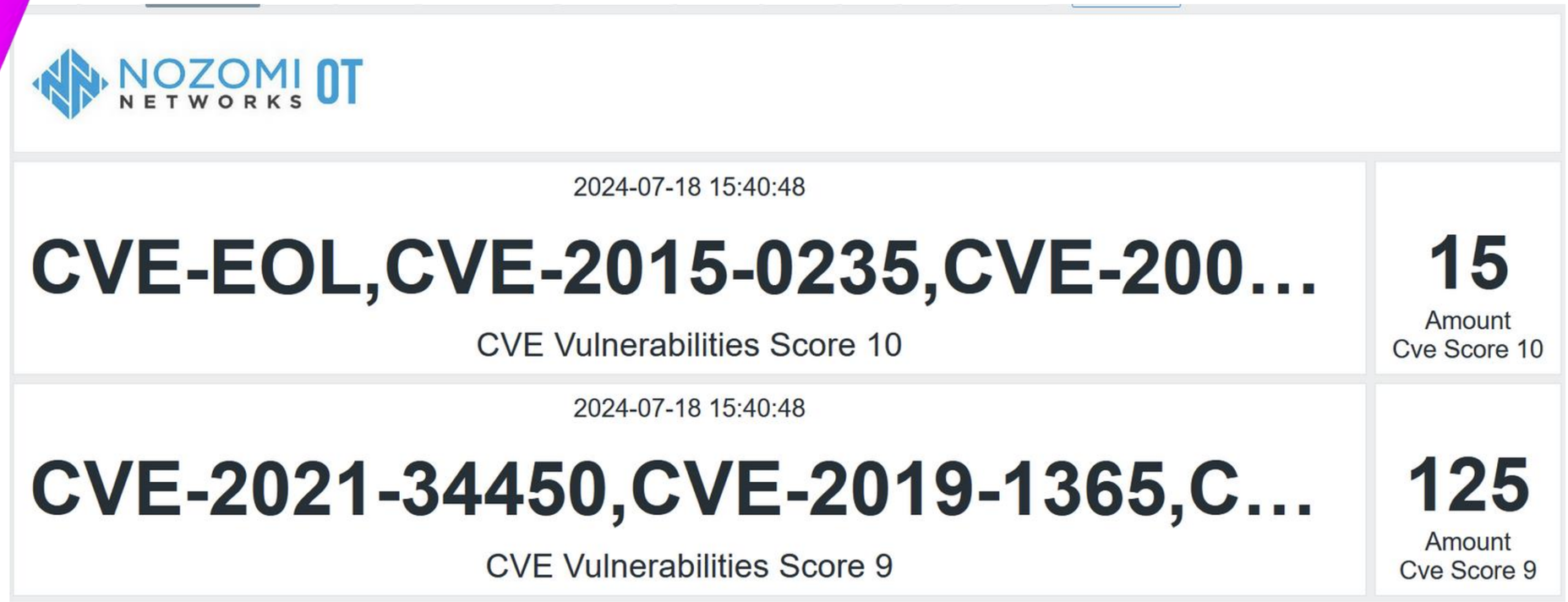
SOC OT Vulnerabilities Detection

Using **Zabbix Trapper** and **NOZOMI**

The final result is this.



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Cyber Resilience: Backup with Veeam

Using **HTML Report** and **Zabbix Trapper**.

We needed to integrate **Veeam Backup** statistics in **Zabbix** using Powershell, Zabbix API and Python.

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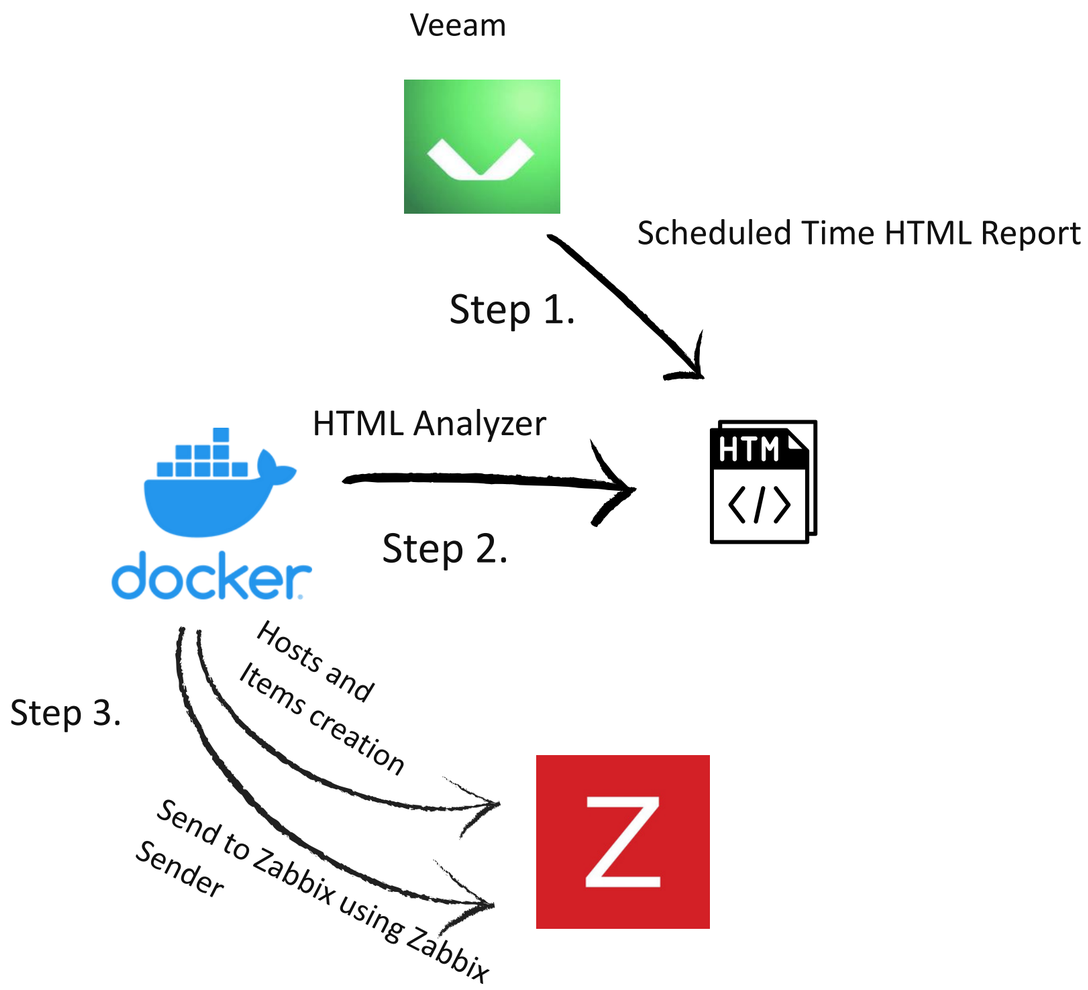
Cyber Resilience: Backup with Veeam

Using **HTML Report** and **Zabbix Trapper**.



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Cyber Resilience: Backup with Veeam

Using **HTML Report** and **Zabbix Trapper**.

We extract 35 properties with relevant VM information from each HTML report.

Name ▲	Triggers	Key	Interval	History	Trends	Type	Status	Tags
Backup Copy Job Status	Triggers 1	Copy_Job_Status		5d		Zabbix trapper	Enabled	FalconBackup
Backup Copy Results Summary - Failures	Triggers 1	Failures_Summary		7d		Zabbix trapper	Enabled	FalconBackup
Backup Copy Results Summary - Idle		Idle_Summary		7d		Zabbix trapper	Enabled	FalconBackup
Backup Copy Results Summary - Read (GB)		Read_GB_Summary		7d		Zabbix trapper	Enabled	FalconBackup
Backup Copy Results Summary - Successful		Successful_Summary		7d		Zabbix trapper	Enabled	FalconBackup
Backup Copy Results Summary - Total Sessions		Total_Sessions_Summary		7d		Zabbix trapper	Enabled	FalconBackup
Backup Copy Results Summary - Transferred (GB)		Transferred_GB_Summary		7d		Zabbix trapper	Enabled	FalconBackup
Backup Copy Results Summary - Warnings	Triggers 1	Warnings_Summary		7d		Zabbix trapper	Enabled	FalconBackup
Backup Copy Results Summary - Working		Working_Summary		7d		Zabbix trapper	Enabled	FalconBackup
Backup Results Summary - Failed		Failed		7d		Zabbix trapper	Enabled	FalconBackup
Backup Results Summary - Failures		Failures		7d		Zabbix trapper	Enabled	FalconBackup
Backup Results Summary - Read (GB)		Read_GB		7d		Zabbix trapper	Enabled	FalconBackup
Backup Results Summary - Running		Running		7d		Zabbix trapper	Enabled	FalconBackup
Backup Results Summary - Successful		Successful		7d		Zabbix trapper	Enabled	FalconBackup
Backup Results Summary - Total Sessions		Total_Sessions		7d		Zabbix trapper	Enabled	FalconBackup
Backup Results Summary - Transferred (GB)		Transferred_GB		7d		Zabbix trapper	Enabled	FalconBackup
Backup Results Summary - Warnings	Triggers 1	Warnings		7d		Zabbix trapper	Enabled	FalconBackup
Sure Backup Summary - Failures	Triggers 1	SB_Failures		90d	365d	Zabbix trapper	Enabled	FalconBackup
Sure Backup Summary - Running		SB_Running		90d	365d	Zabbix trapper	Enabled	FalconBackup
Sure Backup Summary - Successful		SB_Successful		90d	365d	Zabbix trapper	Enabled	FalconBackup
Sure Backup Summary - Total Sessions		SB_Total_Sessions		90d	365d	Zabbix trapper	Enabled	FalconBackup
Sure Backup Summary - Warnings	Triggers 1	SB_Warnings		90d	365d	Zabbix trapper	Enabled	FalconBackup
Tape Backup Results Summary - Failures		Failures_Tape		7d		Zabbix trapper	Enabled	FalconBackup
Tape Backup Results Summary - Idle		Idle_Tape		7d		Zabbix trapper	Enabled	FalconBackup
Tape Backup Results Summary - Read (GB)		Read_GB_Tape		7d		Zabbix trapper	Enabled	FalconBackup
Tape Backup Results Summary - Successful		Successful_Tape		7d		Zabbix trapper	Enabled	FalconBackup

Template items

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Cyber Resilience: Backup with Veeam

Using **HTML Report** and **Zabbix Trapper**.

We extract 35 properties with relevant VM information from each HTML report.

☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Failures	2m 53s	0
☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Idle	2m 57s	0
☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Read (GB)	2m 59s	0
☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Successful	2m 55s	0
☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Total Sessions	2m 59s	0
☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Transferred (GB)	2m 58s	0
☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Waiting	2m 56s	0
☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Warnings	2m 54s	0
☐	WHY01_BKP_VM_Veeam_ST1	Tape Backup Results Summary - Working	2m 55s	0
☐	WHY01_BKP_VM_Veeam_ST1	VM Backup Protection Summary - % Protected	3m 15s	100.00%*
☐	WHY01_BKP_VM_Veeam_ST1	VM Backup Protection Summary - Fully Protected VMs	3m 14s	60
☐	WHY01_BKP_VM_Veeam_ST1	VM Backup Protection Summary - Protected VMs w/Warnings	3m 13s	7
☐	WHY01_BKP_VM_Veeam_ST1	VM Backup Protection Summary - Unprotected VMs	3m 12s	0

Raw data example

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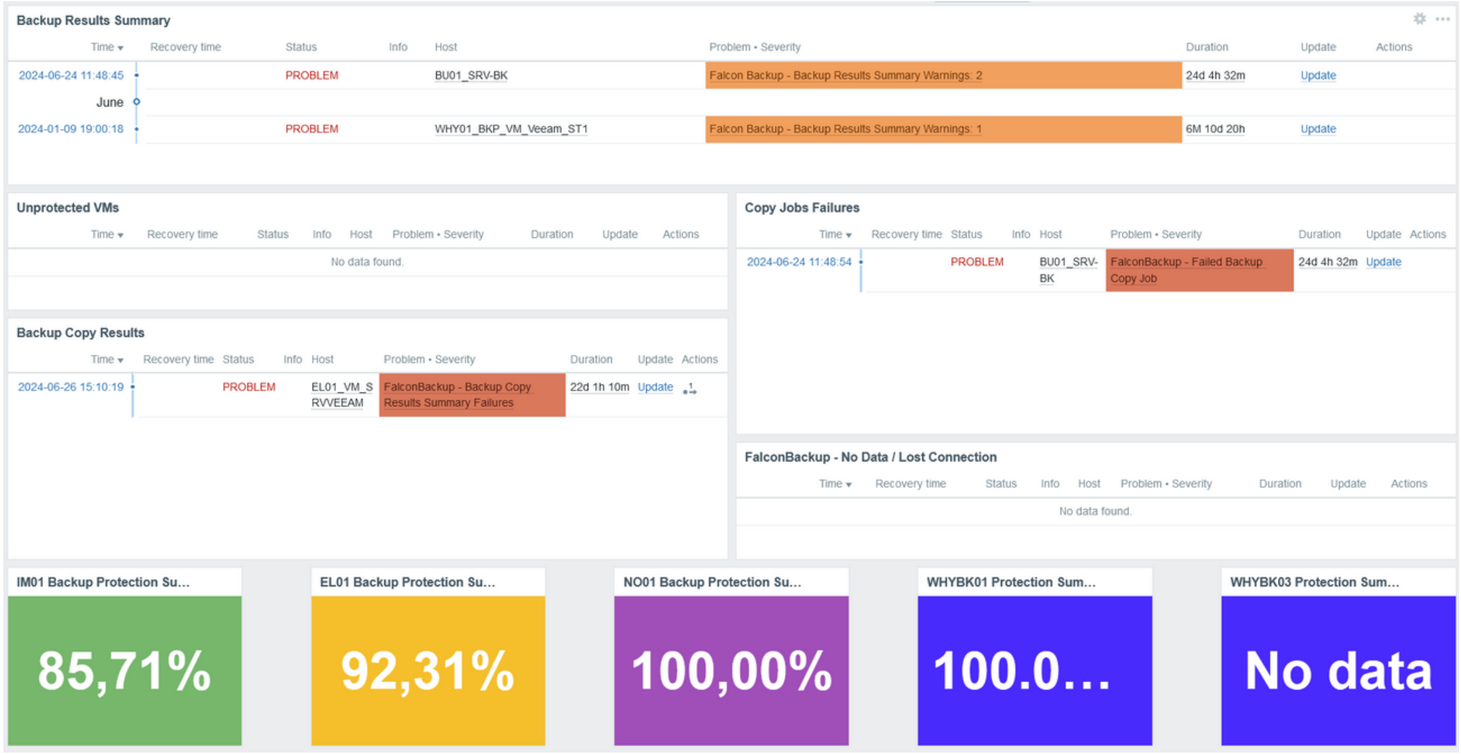
Cyber Resilience: Backup with Veeam

Using **HTML Report** and **Zabbix Trapper**.

With the Zabbix APIs, we create the hosts representing VM’s and populate the trappers with information obtained from the HTML Veeam Report.



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Serverless Approach

Using Zabbix only, *no external app required*.

Directly using HTTP Items we can make HTTP Calls to our technologies.

Pros:

- Easy to write
- Easy to debug
- Easy to change

Cons:

- No automatic host creation
- Manual application of the template/items to the hosts.

Shodan Vulnerabilities and network exposure

Using Zabbix only, *no external app required*.

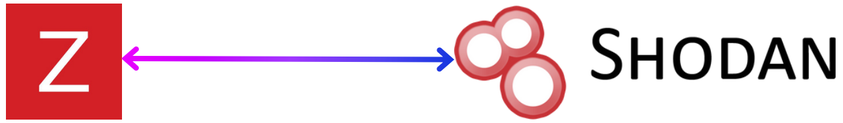
Let’s start with Shodan!

SHODAN

Shodan is a **internet search engine for** Internet-connected devices. It allows users to discover **security vulnerabilities**, monitor network exposure, and assess potential risks by providing detailed information about each device's open ports, services, and software versions.

We do cybersecurity, so it's obvious that we need it.

But how to integrate it into Zabbix?



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Shodan Vulnerabilities and network exposure

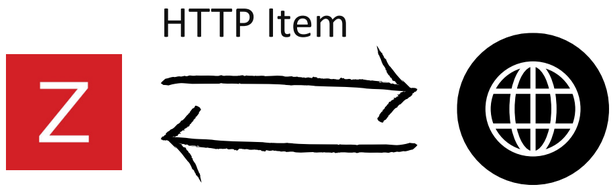
Using Zabbix only, *no external app required*.

By combining the power of HTTP items and JavaScript,
we can achieve a good results!

First, we created a template: **Shodan_Template**
then we created some HTTP Items like this:

Name ▲	Triggers	Key	Type	Status	Tags
Open Ports Found on WAN 1	Triggers 2	Open_Ports_1	HTTP agent	Enabled	Ports1
Open Ports Found on WAN 2	Triggers 2	Open_Ports_2	HTTP agent	Disabled	Ports2
Open Ports Found on WAN 3	Triggers 2	Open_Ports_3	HTTP agent	Disabled	Ports3
Public Netmask 1		public_netmask_1	Calculated	Enabled	PublicNetmask1
Public Netmask 2		public_netmask_2	Calculated	Enabled	PublicNetmask2
Vulnerabilities Found on WAN 1	Triggers 2	Vulns_Found_1	HTTP agent	Enabled	Vulns1
Vulnerabilities Found on WAN 2	Triggers 2	Vulns_Found_2	HTTP agent	Disabled	Vulns2
Vulnerabilities Found on WAN 3	Triggers 2	Vulns_Found_3	HTTP agent	Disabled	Vulns3

Shodan
Integration



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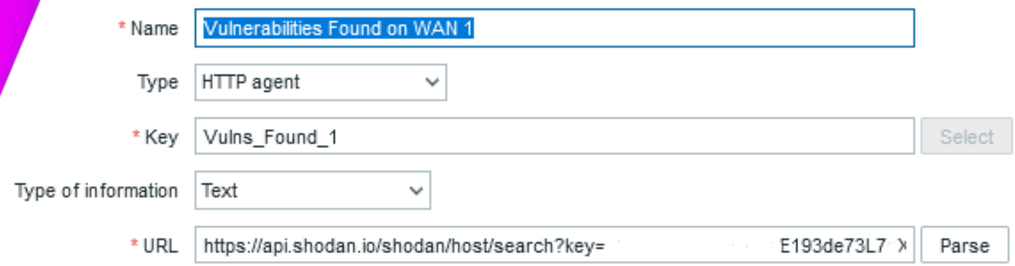
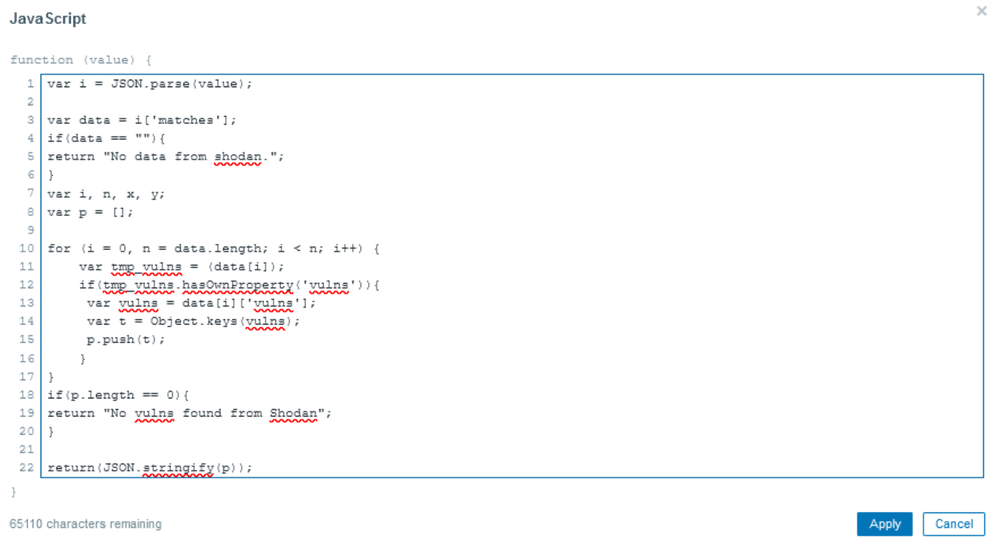
Shodan Vulnerabilities and network exposure

Using Zabbix only, *no external app required*.

Then we used Shodan API to get the informations.



And a bit of Macros and Javascript preprocessing.



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Shodan Vulnerabilities and network exposure

Using Zabbix only, *no external app required*.

Combined with the addition of a few triggers, this is the result

eneral Status of Public Firewall IP

SHODAN for WHYSECURITY CYBER SECURITY

Vulnerabilities

10 problems

Open Ports

10 problems

Vulnerabilities on Firewall Public IP

Hosts	Public Netmask 1	Public Netmask 2	Vulnerabilities Found on WAN 1
BES01_CORE_STS_FW	83.142.91		No vulns found from ...
BES01_FW_PROD	108.50.155.16		No vulns found from ...
BES02_RD_Mauritius	67.141.2/29		No data from shodan.
BES02_SHODAN_BANGKOK	8.137.182.243/2	71.100.57.34/30	No vulns found from ...
BES02_SHODAN_BRAZIL	79.191.125. :40/29	89.57.121.40/29	No vulns found from ...
BES02_SHODAN_BRAZIL_Manufacturing	189.38.10 .96/29	18 .44.100.104/29	No data from shodan.
BES02_SHODAN_BRUSSELS	9.89.29.68		No data from shodan.
BES02_SHODAN_CORE	89.142.91.228/28	3.172. 1.229/28	No data from shodan.
BES02_SHODAN_DROGENBOS	1.183. 66.179/29		No vulns found from ...
BES02_SHODAN_DUBAI	4.201. 7.77/32		No data from shodan.
BES02_SHODAN_GER_FW	21 .110.2 3.135/28	17.110.22 .136/28	No vulns found from ...

Open Ports On Firewall Public IP

Hosts	Open Ports Found on WAN 1
BES01_CORE_STS_FW	[8443]
BES01_FW_PROD	[443]
BES02_RD_Mauritius	No data from shodan.
BES02_SHODAN_BANGKOK	[123]
BES02_SHODAN_BRAZIL	[161]
BES02_SHODAN_BRAZIL_Manufacturing	No data from shodan.
BES02_SHODAN_BRUSSELS	No data from shodan.
BES02_SHODAN_CORE	No data from shodan.
BES02_SHODAN_DROGENBOS	[443,161]
BES02_SHODAN_DUBAI	No data from shodan.
BES02_SHODAN_GER_FW	[2222,8443,7001,161,...

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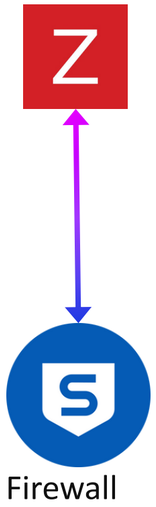
Sophos Firewall Surveillance

Using Zabbix only, *no external app required.*

We monitor **over 60 properties** using Zabbix HTTP items, without using external software.

What we used:

- **HTTP Items**
- Master & dependent item
- Javascript Preprocessing



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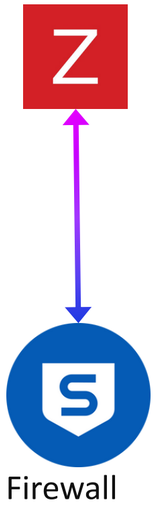
Sophos Firewall Surveillance

Using Zabbix only, *no external app required.*

These are some of the properties that we monitor:

- VPN Status
- HA Status
- SNMP Status
- SSH Port
- License Expiration

With Zabbix, we can monitor if some of these properties change over time and take action.



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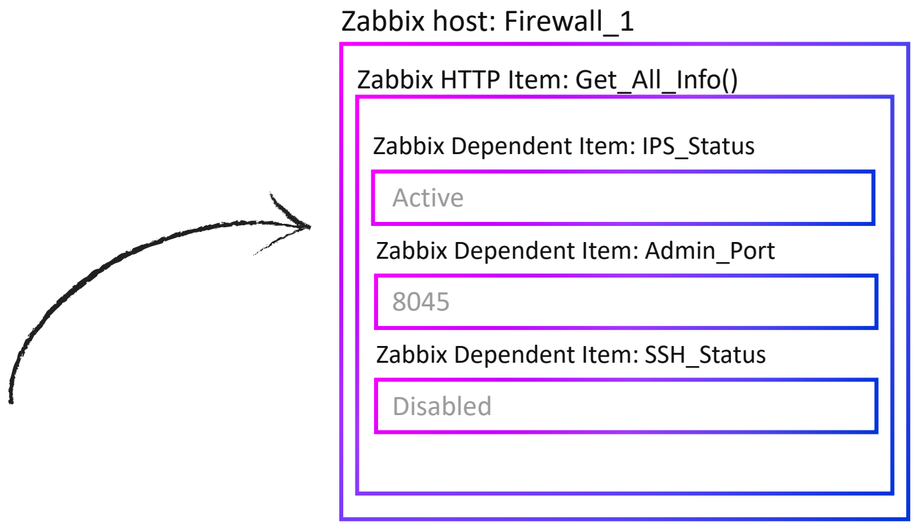
Sophos Firewall Surveillance

Using Zabbix only, *no external app required*.



We used an HTTP Item to get all infos from Sophos Firewall

- Each **host is autonomous in identifying its own changes**.
- No new container deployment is necessary in case of code changes.
- **Instant visualization of the HTTP call** result.

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Sophos Firewall Surveillance

Using Zabbix only, *no external app required.*

HTTP Items

Depend items

Host	Name ▲	Last check	Last value
WHY01_Sophos_Novara	1.Sophos_GetAllNodes	39m 23s	{"ipv6.nat64.status":false,"http.max...
WHY01_Sophos_Novara	2.Sophos_SSLVPN	5h 39m 21s	[{"_type":"ssl_vpn/remote_access_...
WHY01_Sophos_Novara	3.Sophos_GetHttpObj	3h 50m 18s	{"body":[{ "_locked": "", "_ref": "RE...
WHY01_Sophos_Novara	SophosSSLVPN2_name	5h 40m 12s	hub_and_spoke
WHY01_Sophos_Novara	SophosSSLVPN2_networks	5h 40m 12s	1
WHY01_Sophos_Novara	SophosSSLVPN2_status	5h 40m 12s	1
WHY01_Sophos_Novara	SophosSSLVPN3_name	5h 40m 12s	SOC
WHY01_Sophos_Novara	SophosSSLVPN3_networks	5h 40m 12s	0
WHY01_Sophos_Novara	SophosSSLVPN3_status	5h 40m 12s	1
WHY01_Sophos_Novara	SophosWebadmin_Language	40m 14s	english

Preprocessing is the key!

We used Javascript and JSON Path preprocessing.

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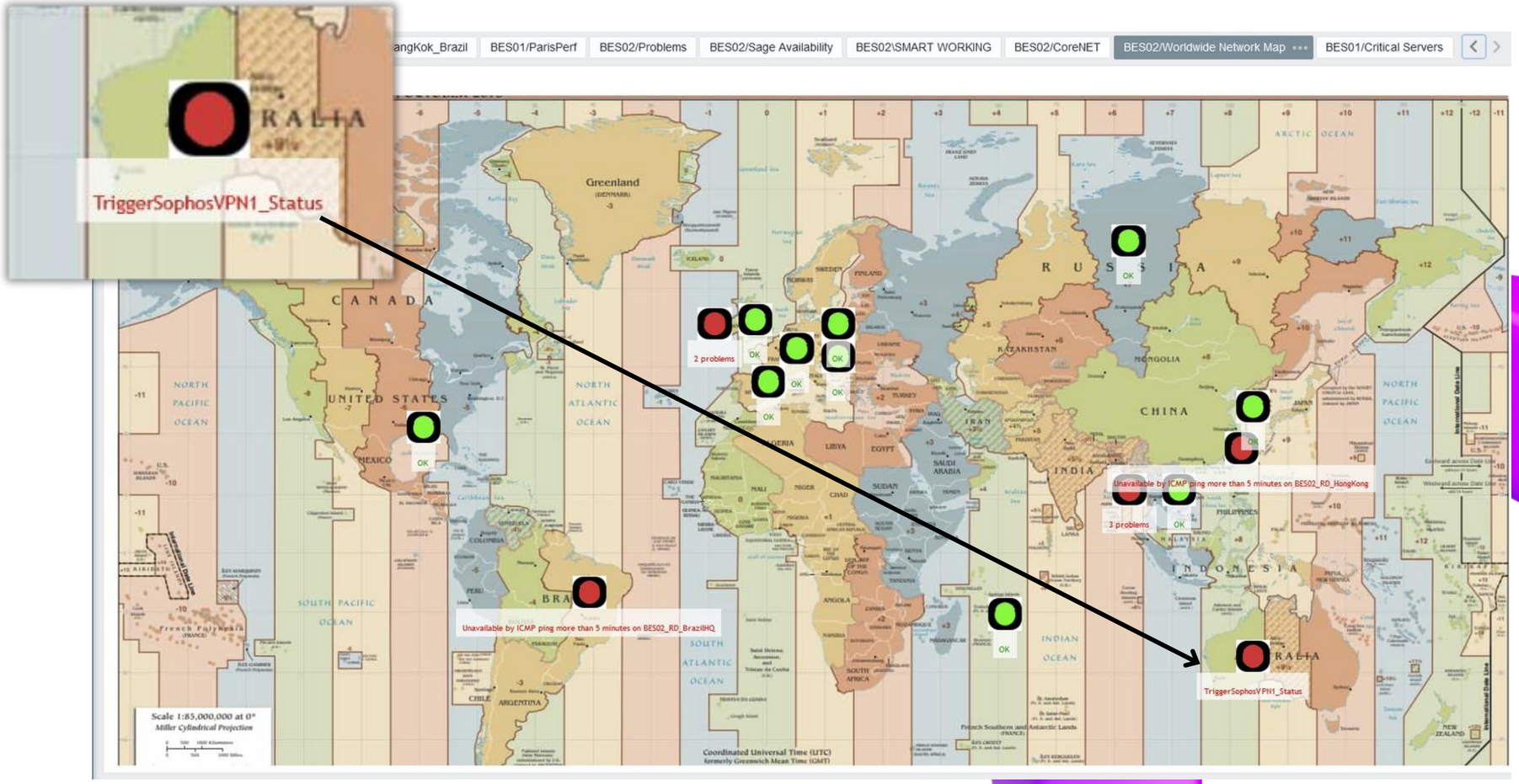
Sophos Firewall Surveillance

Using Zabbix only, *no external app required.*

We show all the information on a map.



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From Zabbix to Ticketing System

Open Ticket on CRM directly from Zabbix

Monitoring is crucial for identifying issues,

and once identified, they need to be handled by our team.

We have also integrated Zabbix with our CRM.

Zabbix

Our CRM

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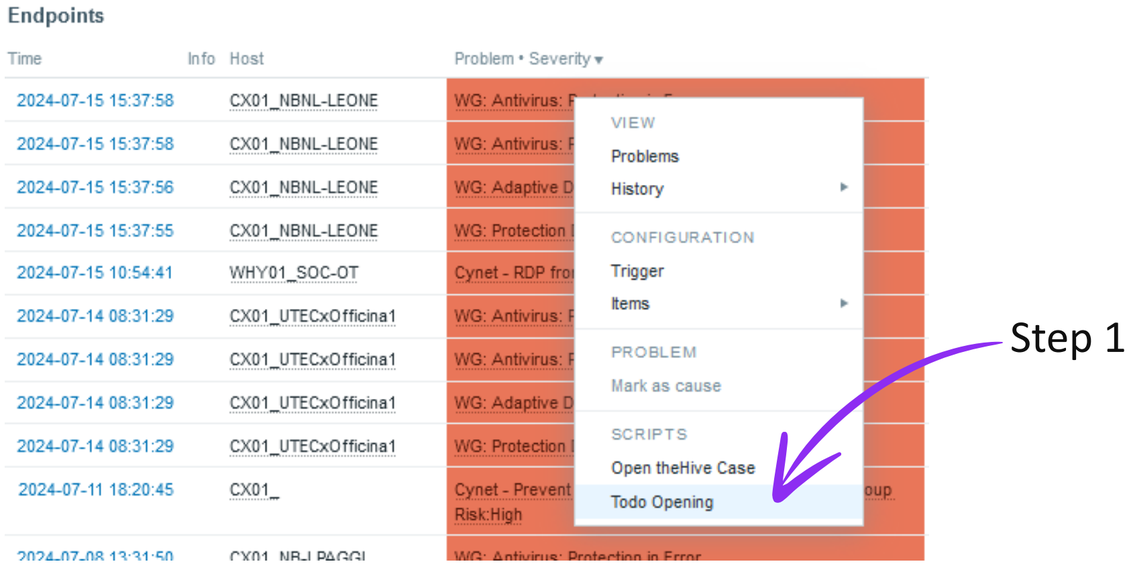
From Zabbix to Ticketing System

Open Ticket on CRM directly from Zabbix

By clicking on the problem, a manual action can be performed that results in the creation of a To-Do in our CRM.



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From Zabbix to Ticketing System

Open Ticket on CRM directly from Zabbix

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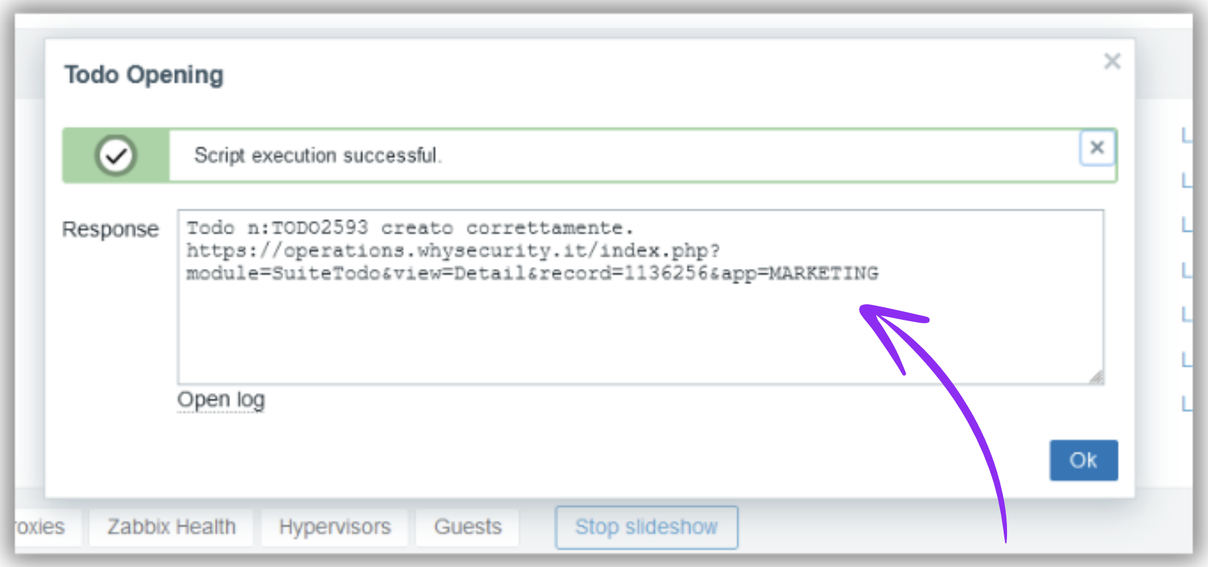

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From Zabbix to Ticketing System

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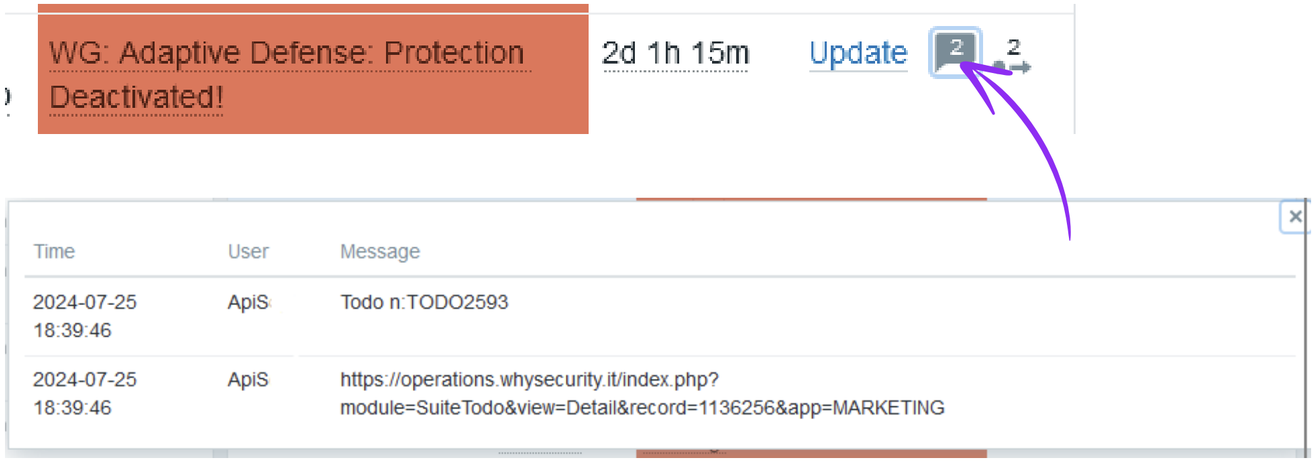

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From Zabbix to Ticketing System

Open Ticket on CRM directly from Zabbix

By clicking on the problem, a manual action can be performed that results in the creation of a To-Do in our CRM.

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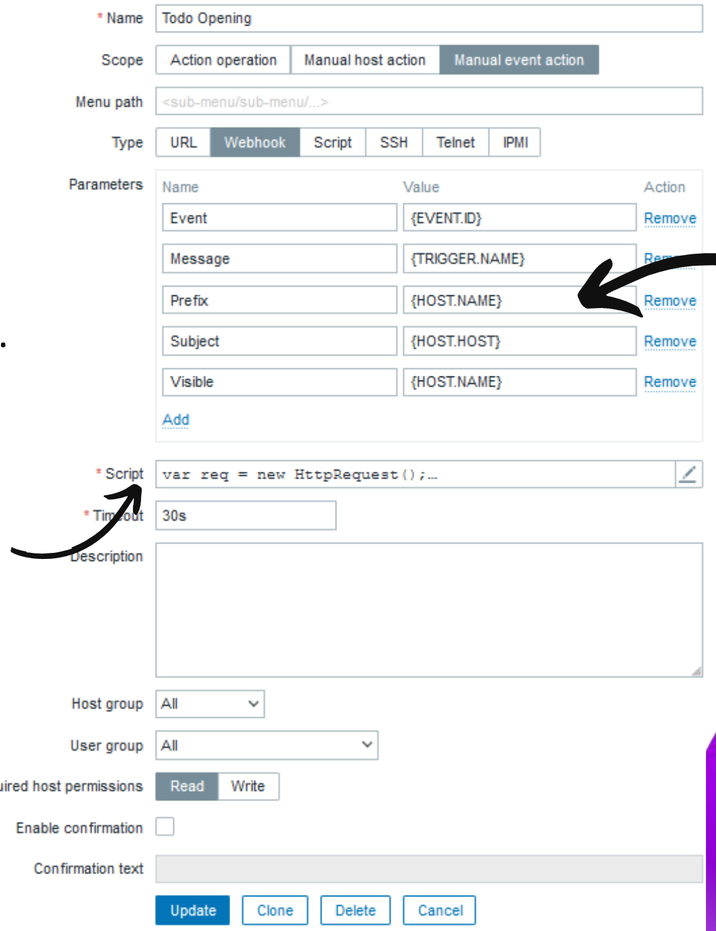
Open Ticket on CRM directly from Zabbix

We used a **manual script** and **some macros.**
Subsequently, an HTTP call handles contacting the CRM.



Macros

Script with HttpRequest() object to make HTTP Call.

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Much more is coming.

Thanks for your attention

Let’s keep in touch.

For any questions: info@whysecurity.it

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Vincenzo

Gabriele