

Managing hosts with Zabbix LLD

ZABBIX

SUMMIT
2023

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THE PROBLEM

What is the problem?

Zabbix provides infrastructure for all training courses:

- Virtual machines for students
- Preinstalled virtual machines
- Trainer machine
- Shared Zabbix server instance
- Training resources to monitor (Databases, SNMP simulator, Applications)

Sometimes something goes wrong with these machines

What can go wrong?

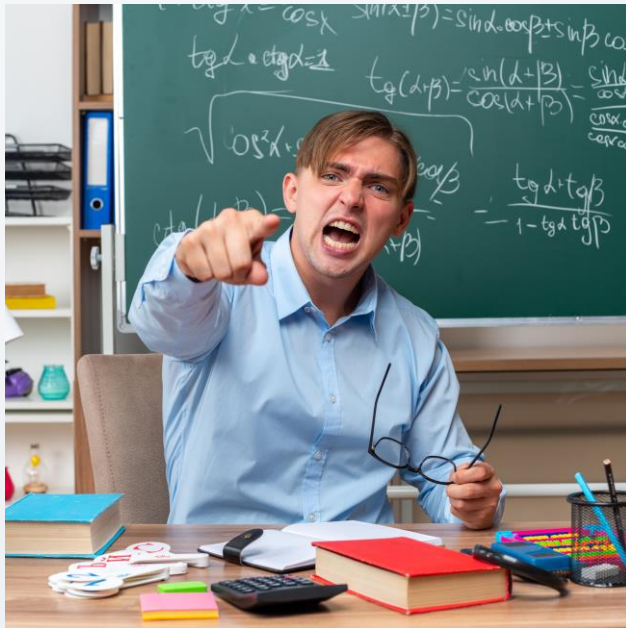
Machines are created automatically from a script

The job sometimes fails because of various reasons:

- 3rd party resources temporally unavailable
- Temporary networking problems
- Breaking changes in Zabbix
- Breaking changes in operating system or critical applications
- It just fails catastrophically for some other reason

What happens next?

10 AM in Sydney



Čau Vita!

2 AM in Riga



How to avoid this?

Monitor training infrastructure using



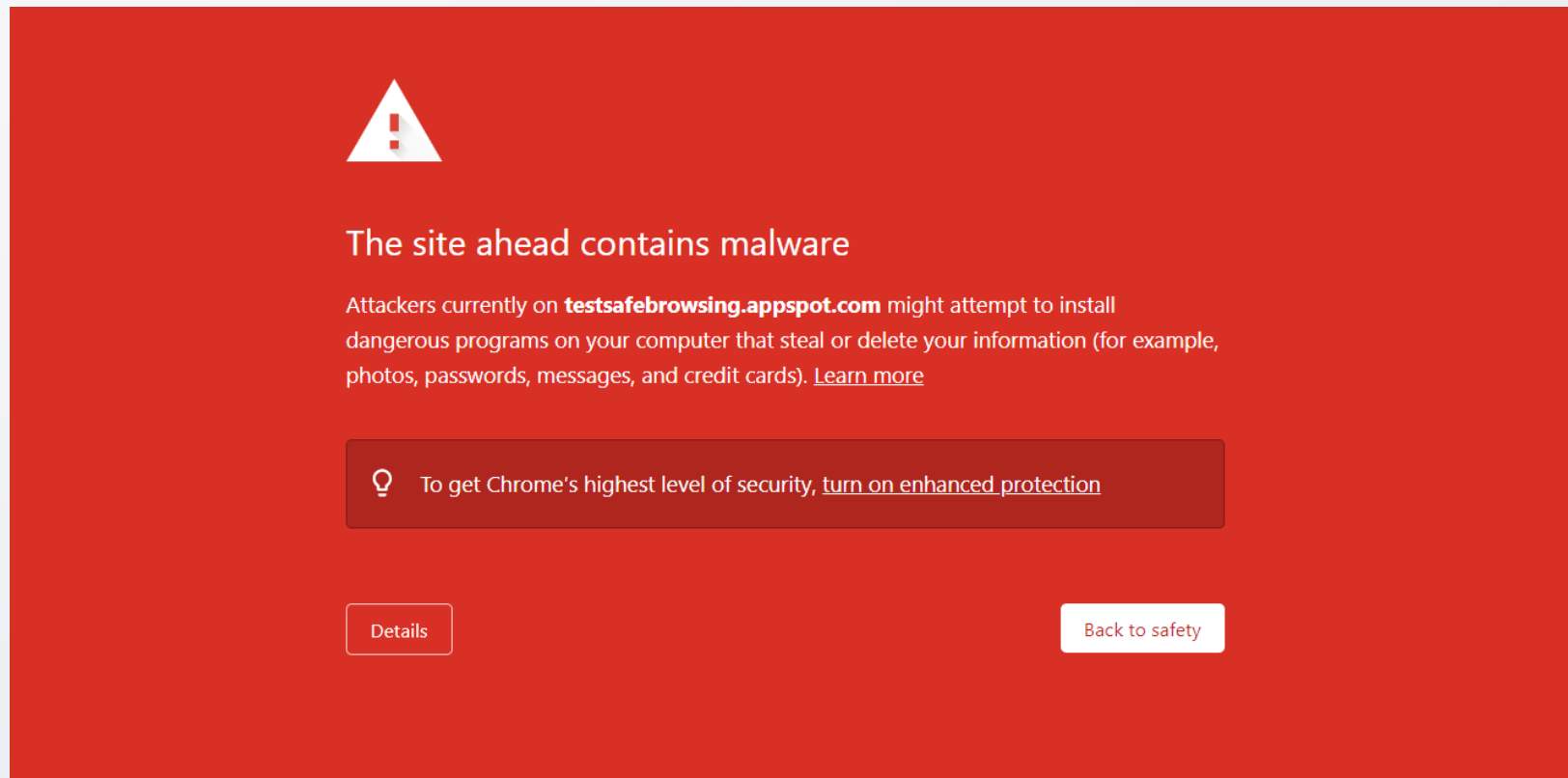
What needs to be monitored?

It depends on machine type and training course

- Virtual machine is successfully created at all
- Zabbix agent is accepting connections
- Zabbix server is up and running
- Zabbix frontend is accessible by http or https
- All containers are up and running

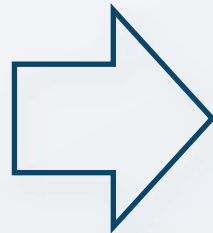
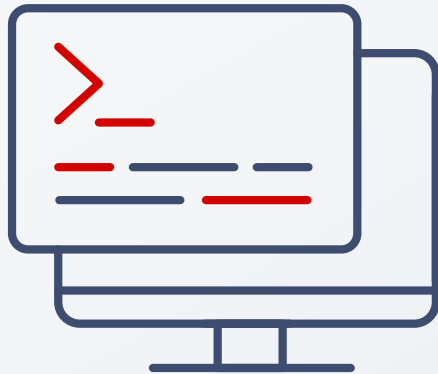
Some unexpected scenarios

Some IP addresses may appear in malware lists



SOLUTION

SOURCE DATA



VM Name: student-2023-01

DNS Name: student-01-zbxtr-2023.zabbix.training

IP Address: 192.22.207.89

Username: root

Password: aiNgahjahj6z

End date: 2023-10-07

VM Name: student-2023-02

DNS Name: student-02-zbxtr-2023.zabbix.training

IP Address: 112.71.79.109

Username: root

Password: aiNgahjahj6z

End date: 2023-10-07

....

HOST DISCOVERY

- Discovery rule transforms text data to JSON

Discovery rules

All hosts / Training infrastructure **Enabled** ZBX IPMI Discovery list / Training machines discovery Item prototypes 1 Trigger prototypes 1 Graph prototypes Host prototypes 1

Discovery rule **Preprocessing 1** LLD macros Filters Overrides 4

Preprocessing steps	Name	Parameters	Custom on fail	Actions
1:	JavaScript	function transformTextToJSON(textBlock) {...	<input type="checkbox"/>	Test Remove

[Add](#) [Update](#) [Clone](#) [Execute now](#) [Test](#) [Delete](#) [Cancel](#) [Test all steps](#)

- Templates are assigned using overrides

* Host name {#VM.NAME}

Visible name {#VM.NAME}

Templates type here to search

* Host groups Training X type here to search

Group prototypes {#ZBXTR}



LLD macros Filters **Overrides 4**

Overrides	Name	Stop processing	Action
1:	Student machines	No	Remove
2:	Student machines preinstalled	No	Remove
3:	Trainer machine	No	Remove
4:	training.lan machine	No	Remove

[Add](#) [Update](#) [Clone](#) [Execute now](#) [Test](#) [Delete](#) [Cancel](#)

OVERRIDE DETAILS

Edit operation ✕

Object

Host prototype

▼

Condition

contains

▼

student

Create enabled

☐

Original

Discover

☐

Original

Link templates

☒

Training virtual machine preinstalled ✕

type here to search

Select

Tags

☒

Name	Value	Action
<div>type</div>	<div>student</div>	Remove
Add		

Host inventory

☐

Original

Update

Cancel

TEMPLATES

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<input type="checkbox"/> Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Vendor	Version	Linked templates	Linked to templates	Tags
<input type="checkbox"/> Training virtual machine common services	Hosts	Items 4	Triggers 4	Graphs	Dashboards	Discovery	Web				Training virtual machine preinstalled, Training virtual machine standard, Training virtual machine trainer, Training virtual machine training.lan	
<input type="checkbox"/> Training virtual machine preinstalled	Hosts 21	Items 10	Triggers 6	Graphs	Dashboards	Discovery	Web			Training virtual machine common services		
<input type="checkbox"/> Training virtual machine standard	Hosts 97	Items 4	Triggers 4	Graphs	Dashboards	Discovery	Web			Training virtual machine common services		
<input type="checkbox"/> Training virtual machine trainer	Hosts 12	Items 4	Triggers 4	Graphs	Dashboards	Discovery	Web			Training virtual machine common services		
<input type="checkbox"/> Training virtual machine training.lan	Hosts 20	Items 53	Triggers 19	Graphs 7	Dashboards	Discovery 3	Web			Training virtual machine common services		
Displaying 5 of 5 found												

RESULT

Using Zabbix LLD and host prototypes

- Script sends a JSON object with all machines after finishing
- Zabbix creates a host for each virtual machine

<input type="checkbox"/> Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	Proxy	Templates	Status	Availability	Agent encryption	Info	Tags
<input type="checkbox"/> Training machines discovery: zbxmlatr174-student-01	Items 4	Triggers 4	Graphs	Discovery	Web	student-01-zbxmlatr174.zabbix.training:10050		Training virtual machine standard (Training virtual machine common services)	Enabled	ZBX SNMP	None	i	type: student ZBXMLATR174
<input type="checkbox"/> Training machines discovery: zbxmlatr174-student-02	Items 4	Triggers 4	Graphs	Discovery	Web	student-02-zbxmlatr174.zabbix.training:10050		Training virtual machine standard (Training virtual machine common services)	Enabled	ZBX SNMP	None	i	type: student ZBXMLATR174
<input type="checkbox"/> Training machines discovery: zbxmlatr174-student-03	Items 4	Triggers 4	Graphs	Discovery	Web	student-03-zbxmlatr174.zabbix.training:10050		Training virtual machine standard (Training virtual machine common services)	Enabled	ZBX SNMP	None	i	type: student ZBXMLATR174
<input type="checkbox"/> Training machines discovery: zbxmlatr174-student-04	Items 4	Triggers 4	Graphs	Discovery	Web	student-04-zbxmlatr174.zabbix.training:10050		Training virtual machine standard (Training virtual machine common services)	Enabled	ZBX SNMP	None	i	type: student ZBXMLATR174
<input type="checkbox"/> Training machines discovery: zbxmlatr174-student-05	Items 4	Triggers 4	Graphs	Discovery	Web	student-05-zbxmlatr174.zabbix.training:10050		Training virtual machine standard (Training virtual machine common services)	Enabled	ZBX SNMP	None	i	type: student ZBXMLATR174
<input type="checkbox"/> Training machines discovery: zbxmlatr174-student-06	Items 4	Triggers 4	Graphs	Discovery	Web	student-06-zbxmlatr174.zabbix.training:10050		Training virtual machine standard (Training virtual machine common services)	Enabled	ZBX SNMP	None	i	type: student ZBXMLATR174
<input type="checkbox"/> Training machines discovery: zbxmlatr174-student-07	Items 4	Triggers 4	Graphs	Discovery	Web	student-07-zbxmlatr174.zabbix.training:10050		Training virtual machine standard (Training virtual machine common services)	Enabled	ZBX SNMP	None	i	type: student ZBXMLATR174
<input type="checkbox"/> Training machines discovery: zbxmlatr174-trainer	Items 4	Triggers 4	Graphs	Discovery	Web	trainer-zbxmlatr174.zabbix.training:10050		Training virtual machine trainer (Training virtual machine common services)	Enabled	ZBX SNMP	None	i	type: trainer ZBXMLATR174

TRIGGERS

Trigger

Trigger

Tags

Dependencies

* Name

Host unreachable by ICMP ping

Event name

Host unreachable by ICMP ping

Operational data

Severity

Not classified

Information

Warning

Average

High

Disaster

* Problem expression

```
max(/Training virtual machine common services/icmppingsec[{HOST.IP}],10m)=0
and
count(/Training virtual machine common services/icmppingsec[{HOST.IP}],10m)>=5
and
date()<={ $VM.END.DATE }
```

Add

[Expression constructor](#)

OK event generation

Expression

Recovery expression

None

* Recovery expression

```
min(/Training virtual machine common services/icmppingsec[{HOST.IP}],10m)>0
or
date()>{ $VM.END.DATE }
```

Add

[Expression constructor](#)

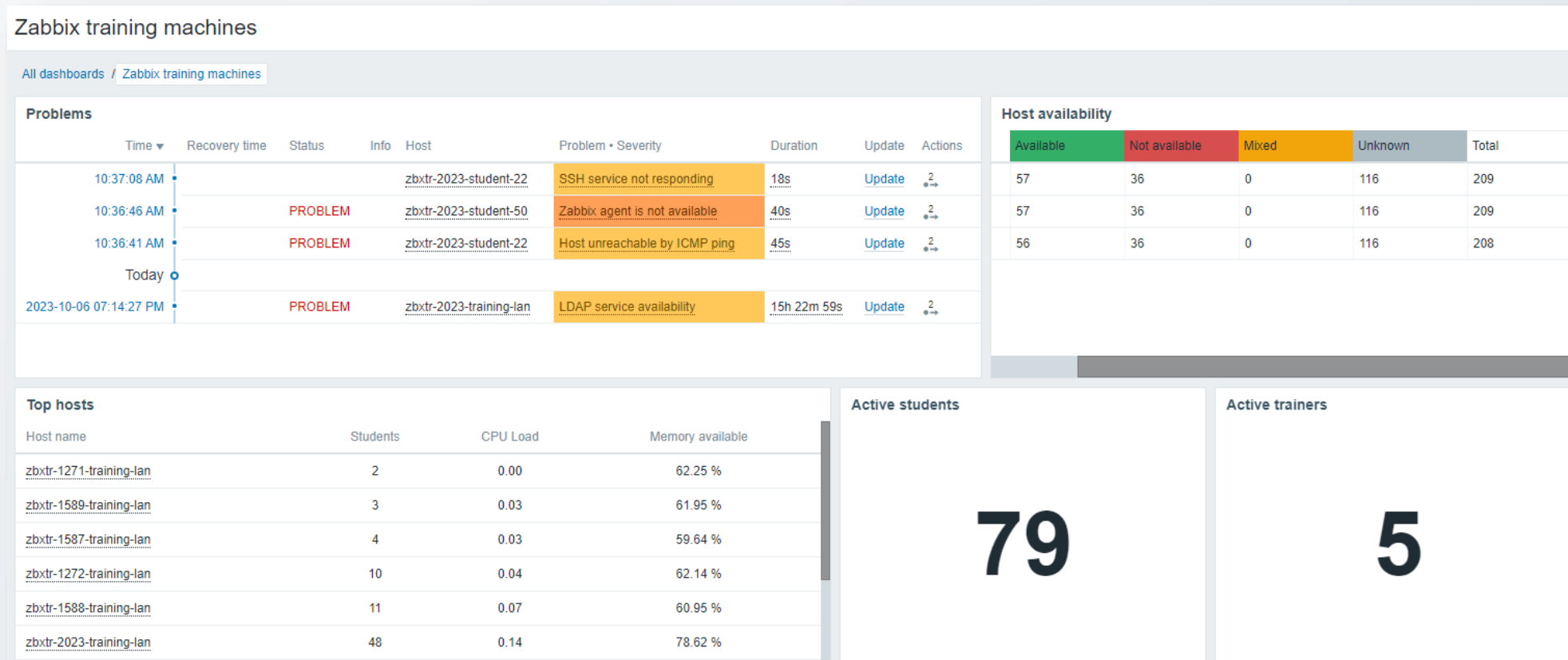
PROBLEM event generation mode

Single

Multiple

VISUALIZATION

A dashboard representing current infrastructure status



Thank You!

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