

Even More Flexible Discovery

Workshop



about:me



about:me

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about:config

student-0x-ws-disc.zabbix.training

passwd



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passwd



Workshop agenda

Quick LLD refresher

Workshop agenda

Quick LLD refresher

1st task – discovery prototype (creation separate tablespace discovery rule for each database)

Workshop agenda

Quick LLD refresher

1st task – discovery prototype (creation separate tablespace discovery rule for each database)

2nd task – implement Nested type

Workshop agenda

Quick LLD refresher

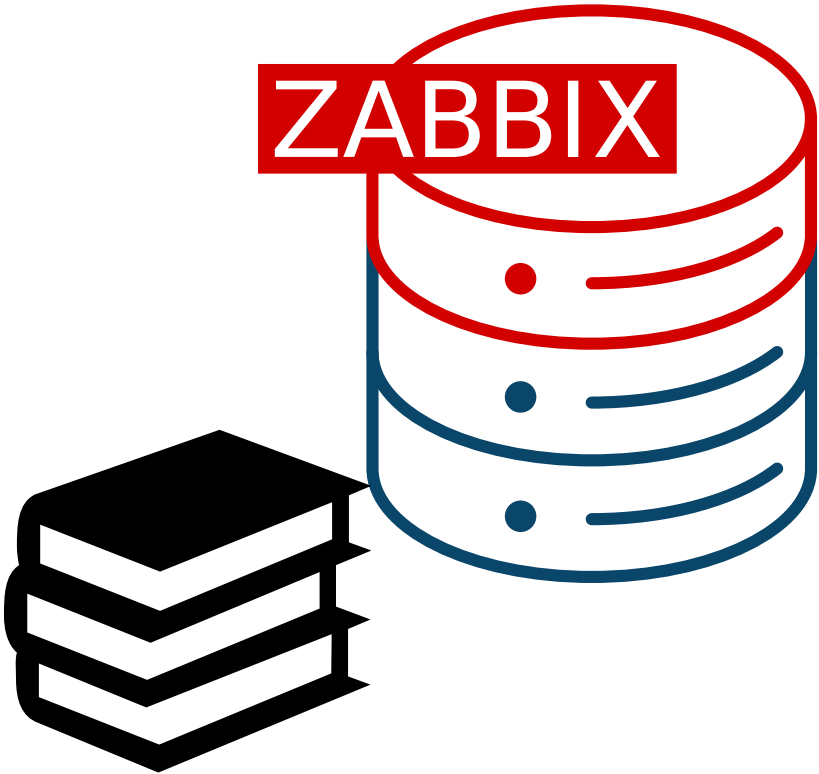
1st task – discovery prototype (creation separate tablespace discovery rule for each database)

2nd task – implement Nested type

3rd task – involve items, discovery and template

LLD refresher

ZABBIX



LLD refresher

```
modules/6.18.33.2-microsoft-standard-WSL2/rw/upper,workdir=/lib/modules/6.18.33.
n 0 0
none /mnt/wsl tmpfs rw,relatime 0 0
drivers /usr/lib/wsl/drivers 9p ro,nosuid,nodev,noatime,aname=drivers;fmask=222;
65536,trans=fd,rfd=8,wfd=8 0 0
/dev/sdd / ext4 rw,relatime,discard,errors=remount-ro,data=ordered 0 0
none /mnt/wslg tmpfs rw,relatime 0 0
/dev/sdd /mnt/wslg/distro ext4 ro,relatime,discard,errors=remount-ro,data=ordere
none /usr/lib/wsl/lib overlay rw,nosuid,nodev,noatime,lowerdir=/gpu_lib_packaged
er,workdir=/gpu_lib/rw/work,uuid=on 0 0
rootfs /init rootfs ro,size=8043976k,nr_inodes=2010994 0 0
none /dev devtmpfs rw,nosuid,relatime,size=8043976k,nr_inodes=2010994,mode=755 0
sysfs /sys sysfs rw,nosuid,nodev,noexec,noatime 0 0
proc /proc proc rw,nosuid,nodev,noexec,noatime 0 0
devpts /dev/pts devpts rw,nosuid,noexec,noatime,gid=5,mode=620,ptmxmode=000 0 0
none /run tmpfs rw,nosuid,nodev,mode=755 0 0
none /run/lock tmpfs rw,nosuid,nodev,noexec,noatime 0 0
none /run/shm tmpfs rw,nosuid,nodev,noatime 0 0
none /dev/shm tmpfs rw,nosuid,nodev,noatime 0 0
none /run/user tmpfs rw,nosuid,nodev,noexec,noatime,mode=755 0 0
binfmt_misc /proc/sys/fs/binfmt_misc binfmt_misc rw,relatime 0 0
cgroup2 /sys/fs/cgroup cgroup2 rw,nosuid,nodev,noexec,relatime,nsdelegate 0 0
none /mnt/wslg/versions.txt overlay rw,relatime,lowerdir=/systemvhd,upperdir=/sy
id=on 0 0
none /mnt/wslg/doc overlay rw,relatime,lowerdir=/systemvhd,upperdir=/system/rw/u
none /tmp/.X11-unix tmpfs ro,relatime 0 0
C:\134 /mnt/c 9p rw,noatime,aname=drvfs;path=C:\;uid=0;gid=0;symlinkroot=/mnt/,c
=fd,rfd=6,wfd=6 0 0
none /run/user tmpfs rw,relatime 0 0
```

LLD refresher



*** Mounted filesystem discovery: Get filesystems: FS [/boot]: Get data		vfs.fs.dependent[/boot,data]	1h		Dependent item	Enabled	component: raw component: storage filesystem: /boot ***
*** Mounted filesystem discovery: FS [/boot]: Get data: FS [/boot]: Inodes: Free, in %	Triggers 2	vfs.fs.dependent.inode[/boot,pfree]	31d	365d	Dependent item	Enabled	component: storage filesystem: /boot fstype: ext4
*** Mounted filesystem discovery: FS [/boot]: Get data: FS [/boot]: Option: Read-only	Triggers 1	vfs.fs.dependent[/boot,readonly]	31d	365d	Dependent item	Enabled	component: storage filesystem: /boot fstype: ext4
*** Mounted filesystem discovery: FS [/boot]: Get data: FS [/boot]: Space: Available		vfs.fs.dependent.size[/boot,free]	31d	365d	Dependent item	Enabled	component: storage filesystem: /boot fstype: ext4
*** Mounted filesystem discovery: FS [/boot]: Get data: FS [/boot]: Space: Total		vfs.fs.dependent.size[/boot,total]	31d	365d	Dependent item	Enabled	component: storage filesystem: /boot fstype: ext4
*** Mounted filesystem discovery: FS [/boot]: Get data: FS [/boot]: Space: Used		vfs.fs.dependent.size[/boot,used]	31d	365d	Dependent item	Enabled	component: storage filesystem: /boot fstype: ext4
*** Mounted filesystem discovery: FS [/boot]: Get data: FS [/boot]: Space: Used, in %	Triggers 2	vfs.fs.dependent.size[/boot,pused]	31d	365d	Dependent item	Enabled	component: storage filesystem: /boot fstype: ext4
*** Mounted filesystem discovery: Get filesystems: FS [/tmp]: Get data		vfs.fs.dependent[/tmp,data]	1h		Dependent item	Enabled	component: raw component: storage filesystem: /tmp ***
*** Mounted filesystem discovery: FS [/tmp]: Get data: FS [/tmp]: Inodes: Free, in %	Triggers 2	vfs.fs.dependent.inode[/tmp,pfree]	31d	365d	Dependent item	Enabled	component: storage filesystem: /tmp fstype: xfs
*** Mounted filesystem discovery: FS [/tmp]: Get data: FS [/tmp]: Option: Read-only	Triggers 1	vfs.fs.dependent[/tmp,readonly]	31d	365d	Dependent item	Enabled	component: storage filesystem: /tmp fstype: xfs
*** Mounted filesystem discovery: FS [/tmp]: Get data: FS [/tmp]: Space: Available		vfs.fs.dependent.size[/tmp,free]	31d	365d	Dependent item	Enabled	component: storage filesystem: /tmp fstype: xfs
*** Mounted filesystem discovery: FS [/tmp]: Get data: FS [/tmp]: Space: Total		vfs.fs.dependent.size[/tmp,total]	31d	365d	Dependent item	Enabled	component: storage filesystem: /tmp fstype: xfs
*** Mounted filesystem discovery: FS [/tmp]: Get data: FS [/tmp]: Space: Used		vfs.fs.dependent.size[/tmp,used]	31d	365d	Dependent item	Enabled	component: storage filesystem: /tmp fstype: xfs
*** Mounted filesystem discovery: FS [/tmp]: Get data: FS [/tmp]: Space: Used, in %	Triggers 2	vfs.fs.dependent.size[/tmp,pused]	31d	365d	Dependent item	Enabled	component: storage filesystem: /tmp fstype: xfs
*** Mounted filesystem discovery: Get filesystems: FS [/var/lib/mysql]: Get data		vfs.fs.dependent[/var/lib/mysql,data]	1h		Dependent item	Enabled	component: raw component: storage filesystem: /var/lib/mysql ***
*** Mounted filesystem discovery: FS [/var/lib/mysql]: Get data: FS [/var/lib/mysql]: Inodes: Free, in %	Triggers 2	vfs.fs.dependent.inode[/var/lib/mysql,pfree]	31d	365d	Dependent item	Enabled	component: storage filesystem: /var/lib/mysql fstype: xfs
*** Mounted filesystem discovery: FS [/var/lib/mysql]: Get data: FS [/var/lib/mysql]: Option: Read-only	Triggers 1	vfs.fs.dependent[/var/lib/mysql,readonly]	31d	365d	Dependent item	Enabled	component: storage filesystem: /var/lib/mysql fstype: xfs
*** Mounted filesystem discovery: FS [/var/lib/mysql]: Get data: FS [/var/lib/mysql]: Space: Available		vfs.fs.dependent.size[/var/lib/mysql,free]	31d	365d	Dependent item	Enabled	component: storage filesystem: /var/lib/mysql fstype: xfs
*** Mounted filesystem discovery: FS [/var/lib/mysql]: Get data: FS [/var/lib/mysql]: Space: Total		vfs.fs.dependent.size[/var/lib/mysql,total]	31d	365d	Dependent item	Enabled	component: storage filesystem: /var/lib/mysql fstype: xfs
*** Mounted filesystem discovery: FS [/var/lib/mysql]: Get data: FS [/var/lib/mysql]: Space: Used		vfs.fs.dependent.size[/var/lib/mysql,used]	31d	365d	Dependent item	Enabled	component: storage filesystem: /var/lib/mysql fstype: xfs
*** Mounted filesystem discovery: FS [/var/lib/mysql]: Get data: FS [/var/lib/mysql]: Space: Used, in %	Triggers 2	vfs.fs.dependent.size[/var/lib/mysql,pused]	31d	365d	Dependent item	Enabled	component: storage filesystem: /var/lib/mysql fstype: xfs
*** Mounted filesystem discovery: Get filesystems: FS [/]: Get data		vfs.fs.dependent[/,data]	1h		Dependent item	Enabled	component: raw component: storage filesystem: / ***
*** Mounted filesystem discovery: FS [/]: Get data: FS [/]: Inodes: Free, in %	Triggers 2	vfs.fs.dependent.inode[/,pfree]	31d	365d	Dependent item	Enabled	component: storage filesystem: / fstype: xfs
*** Mounted filesystem discovery: FS [/]: Get data: FS [/]: Option: Read-only	Triggers 1	vfs.fs.dependent[/,readonly]	31d	365d	Dependent item	Enabled	component: storage filesystem: / fstype: xfs
*** Mounted filesystem discovery: FS [/]: Get data: FS [/]: Space: Available		vfs.fs.dependent.size[/,free]	31d	365d	Dependent item	Enabled	component: storage filesystem: / fstype: xfs
*** Mounted filesystem discovery: FS [/]: Get data: FS [/]: Space: Total		vfs.fs.dependent.size[/,total]	31d	365d	Dependent item	Enabled	component: storage filesystem: / fstype: xfs
*** Mounted filesystem discovery: FS [/]: Get data: FS [/]: Space: Used		vfs.fs.dependent.size[/,used]	31d	365d	Dependent item	Enabled	component: storage filesystem: / fstype: xfs
*** Mounted filesystem discovery: FS [/]: Get data: FS [/]: Space: Used, in %	Triggers 2	vfs.fs.dependent.size[/,pused]	31d	365d	Dependent item	Enabled	component: storage filesystem: / fstype: xfs

more metrics...

LLD refresher



☐	*** Linux by Zabbix agent: Get filesystems : FS [{#FSNAME}]: Get data	vfs.fs.dependent[{#FSNAME},data]
☐	*** Linux by Zabbix agent: FS [{#FSNAME}]: Get data : FS [{#FSNAME}]: Inodes: Free, in %	vfs.fs.dependent.inode[{#FSNAME},pfree]
☐	*** Linux by Zabbix agent: FS [{#FSNAME}]: Get data : FS [{#FSNAME}]: Option: Read-only	vfs.fs.dependent[{#FSNAME},readonly]
☐	*** Linux by Zabbix agent: FS [{#FSNAME}]: Get data : FS [{#FSNAME}]: Space: Available	vfs.fs.dependent.size[{#FSNAME},free]
☐	*** Linux by Zabbix agent: FS [{#FSNAME}]: Get data : FS [{#FSNAME}]: Space: Total	vfs.fs.dependent.size[{#FSNAME},total]
☐	*** Linux by Zabbix agent: FS [{#FSNAME}]: Get data : FS [{#FSNAME}]: Space: Used	vfs.fs.dependent.size[{#FSNAME},used]
☐	*** Linux by Zabbix agent: FS [{#FSNAME}]: Get data : FS [{#FSNAME}]: Space: Used, in %	vfs.fs.dependent.size[{#FSNAME},pused]

Item prototype

Item prototype Tags 4 Preprocessing 1

Parent items Linux by Zabbix agent

* Name FS [{#FSNAME}]: Get data

Type Dependent item

* Key vfs.fs.dependent[{#FSNAME},data]

Type of information Text

* Master item Zabbix server: Get filesystems X

Select

Select prototype

* History Do not store Store up to 1h

Description Intermediate data of `{#FSNAME}` filesystem.

Create enabled ☒

Discover ☒

Update

Clone

Test

Delete

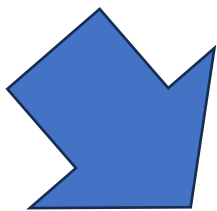
Cancel

LLD refresher



Discovery rules

[All hosts](#) / [Zabbix server](#) Enabled ZBX [Items 167](#) [Triggers 93](#) [Graphs 20](#) [Discovery rules 6](#) [Web scenarios](#)



Linux by Zabbix agent : Block devices discovery	Item prototypes 9	Trigger prototypes 1	Graph prototypes 3
Zabbix server health : Zabbix stats cluster : High availability cluster node discovery	Item prototypes 5	Trigger prototypes 1	Graph prototypes
Linux by Zabbix agent : Get filesystems : Mounted filesystem discovery	Item prototypes 7	Trigger prototypes 5	Graph prototypes 2
Linux by Zabbix agent : Network interface discovery	Item prototypes 9	Trigger prototypes 4	Graph prototypes 1
Zabbix server health : Zabbix proxies stats : Zabbix proxy discovery	Item prototypes 12	Trigger prototypes 4	Graph prototypes
Zabbix server health : Zabbix proxy groups stats : Zabbix proxy groups discovery	Item prototypes 7	Trigger prototypes 6	Graph prototypes

LLD in 7.0...

Capability	7.0
Item, trigger, graph and host prototypes	Available

LLD in 7.0...



☐	Name ▲	Triggers	Key	Interval	History	Trends	Type	Status	Tags
☐	*** Linux by Zabbix agent: Available memory	Triggers 1	vm.memory.size[available]	1m	Stored	Stored	Zabbix agent	Enabled	component: memory
☐	*** Linux by Zabbix agent: Available memory in %		vm.memory.size[pavailable]	1m	Stored	Stored	Zabbix agent	Enabled	component: memory
☐	*** Linux by Zabbix agent: Checksum of /etc/passwd	Triggers 1	vfs.file.cksum[/etc/passwd,sha256]	15m	Stored		Zabbix agent	Enabled	component: security
☐	*** Linux by Zabbix agent: Context switches per second		system.cpu.switches	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU guest nice time		system.cpu.util[,guest_nice]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU guest time		system.cpu.util[,guest]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU idle time		system.cpu.util[,idle]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU interrupt time		system.cpu.util[,interrupt]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU iowait time		system.cpu.util[,iowait]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU nice time		system.cpu.util[,nice]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU softirq time		system.cpu.util[,softirq]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU steal time		system.cpu.util[,steal]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU system time		system.cpu.util[,system]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU user time		system.cpu.util[,user]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: CPU idle time: CPU utilization	Triggers 1	system.cpu.util		Stored	Stored	Dependent item	Enabled	component: cpu
☐	*** Linux by Zabbix agent: Free swap space		system.swap.size[,free]	1m	Stored	Stored	Zabbix agent	Enabled	component: memory component: storage
☐	*** Linux by Zabbix agent: Free swap space in %	Triggers 1	system.swap.size[,pfree]	1m	Stored	Stored	Zabbix agent	Enabled	component: memory component: storage
☐	*** Linux by Zabbix agent: Get filesystems		vfs.fs.get	1m	Not stored		Zabbix agent	Enabled	component: raw
☐	*** Linux by Zabbix agent: Host name of Zabbix agent running		agent.hostname	1h	Stored		Zabbix agent	Enabled	component: system
☐	*** Linux by Zabbix agent: Interrupts per second		system.cpu.intr	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: Load average (1m avg)	Triggers 1	system.cpu.load[all,avg1]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: Load average (5m avg)	Triggers 1	system.cpu.load[all,avg5]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: Load average (15m avg)	Triggers 1	system.cpu.load[all,avg15]	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: Maximum number of open file descriptors	Triggers 1	kernel.maxfiles	1h	Stored	Stored	Zabbix agent	Enabled	component: system
☐	*** Linux by Zabbix agent: Maximum number of processes	Triggers 2	kernel.maxproc	1h	Stored	Stored	Zabbix agent	Enabled	component: system
☐	*** Linux by Zabbix agent: Available memory in %: Memory utilization	Triggers 1	vm.memory.utilization		Stored	Stored	Dependent item	Enabled	component: memory
☐	*** Linux by Zabbix agent: Number of CPUs	Triggers 1	system.cpu.num	1m	Stored	Stored	Zabbix agent	Enabled	component: cpu
☐	*** Linux by Zabbix agent: Number of installed packages	Triggers 1	system.sw.packages.get	1h	Stored	Stored	Zabbix agent	Enabled	component: os

LLD in 7.0...

Capability	7.0
Item, trigger, graph and host prototypes	Available

LLD in 7.0...

Capability	7.0
Item, trigger, graph and host prototypes	Available



... And LLD in 7.0 and 7.4

Capability	7.0	7.4
Item, trigger, graph and host prototypes	Available	Available
Discovery rule prototypes	Unavailable	Available
Nested type reusing parent discovery data	Unavailable	Available
Host prototypes inherited by discovered hosts	Unavailable	Available

Task one



Task one

Discovery recurrence



Task one

Discovery recurrence



**<VM-machine-#>
password**

Task one

Discovery recurrence



New host group



* Group name

Lab/Student LLD

Add

Cancel

Group name: Lab/Student LLD

↓

Data collection

^

Template groups

Host groups

Templates

Hosts

Maintenance

Event correlation

Discovery

Alerts

⌵

Task one

Discovery recurrence



↓

Data collection

^

Template groups

Host groups

Templates

Hosts

Maintenance

Event correlation

Discovery

New host

Host IPMI Tags Macros Inventory Encryption Value mapping

* Host name

LLD Student DB

Visible name

LLD Student DB

Templates

type here to search

Select

* Host groups

Lab/Student LLD X

type here to search

Select

Interfaces

No interfaces are defined.

[Add](#)

Description

Monitored by

Server

Proxy

Proxy group

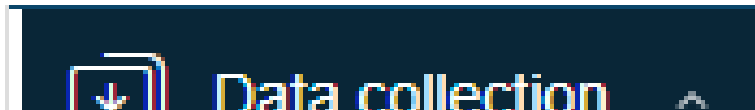
Enabled

☒

Field	Values
Host name	LLD Student DB
Host groups	Lab/Student LLD
Monitored by	Server
Interfaces	None
Templates	None
Enabled	Selected

Task one

Discovery recurrence



New host

New host



- Host
- IPMI
- Tags
- Macros 1
- Inventory
- Encryption
- Value mapping

- Host macros
- Inherited and host macros

Macro	Value		Description	
{ \$LAB.URL }	http://127.0.0.1:18080	T v	description	Remove

[Add](#)

Add

Cancel

Monitored by

Server

Proxy

Proxy group

Enabled☒

Field	Values
Host name	LLD Student DB
Host groups	Lab/Student LLD
Monitored by	Server
Interfaces	None
Templates	None
Enabled	Selected
{ \$LAB.URL }	http://127.0.0.1:18080

Task one

Discovery recurrence

ZABBIX

↓

Data collection

^

Template groups

Host groups

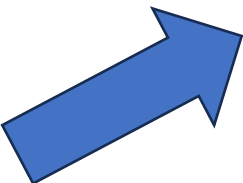
Templates

Hosts

Maintenance

Event correlation

Discovery



☐	Name ▲	Items	Triggers	Graphs	Discovery	Web
☐	... LLD Student DB	Items	Triggers	Graphs	Discovery	Web



?

Create discovery rule

Filter

Task one

Discovery recurrence



Discovery rules

All hosts / LLD Student DB

Enabled

Items

Triggers

Graphs

Discovery rules

Web scenarios

Discovery rule

Preprocessing

LLD macros

Filters

Overrides

* Name

Discover databases

Type

HTTP agent

* Key

student.db.discovery

* URL

{\$LAB.URL}/discovery/databases

Parse

Query fields

Name

Value

name

⇒

value

Remove

Add

Request type

GET

Request body type

Raw data

JSON data

XML data

Request body

Headers

Name

Value

name

⇒

value

Add

Field	Value
Name	Discover databases
Type	HTTP agent
Key	student.db.discovery
URL	{\$LAB.URL}/discovery/databases

Task one

Discovery recurrence



Discovery rules

[All hosts](#) / [LLD Student DB](#) Enabled [Items](#) [Triggers](#) [Graphs](#) [Discovery rules](#) [Web scenarios](#)

[Discovery rule](#) [Preprocessing](#) [LLD macros 1](#) [Filters](#) [Overrides](#)

LLD macros

LLD macro	JSONPath	
{#DB}	\$.database	Remove
Add		

[Add](#) [Test](#) [Cancel](#)

Field	Value
LLD Macro	{#DB}
JSONPath	\$.database

Task one

Discovery recurrence



Test item

Get value from host ☒

Host address

Port

Test with

ServerProxy

Get value

Value

[...]

Time

now

Previous value

Prev. time

End of line sequence

LFCRLF

Macros

{\$LAB.URL}

=>

http://127.0.0.1:18080

Result

Result converted to Text [{"database":"db1","tablespaces":[{"name":"data","used_pct":42}, {"name":"logs","used_pct":42}]}]

Get value and test

Cancel

Task one

Discovery recurrence



Discovery rules

[?](#) [Create discovery rule](#)

✓

Discovery rule updated

×

[All hosts](#) / [LLD Student DB](#) Enabled [Items](#) [Triggers](#) [Graphs](#) [Discovery rules 1](#) [Web scenarios](#) [Filter](#)

Host groups

Select

Hosts

LLD Student DB ×

Select

Name

Key

Type

All

▼

Update interval

Delete lost resources

All

Never

Immediately

After

Disable lost resources

All

Never

Immediately

After

State

All

Normal

Not supported

Status

All

Enabled

Disabled

Apply

Reset

☐	Host	Name ▲	Items	Triggers	Graphs	Hosts	Discovery rules	Key	Interval	Type	Status	Info
☐	LLD Student DB	Discover databases	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes	student.db.discovery	1h	HTTP agent	Enabled	

Displaying 1 of 1 found

Task one

Discovery recurrence



Discovery rules

[?](#) [Create discovery rule](#)

✓

Discovery rule updated

×

[All hosts](#) / [LLD Student DB](#) Enabled [Items](#) [Triggers](#) [Graphs](#) [Discovery rules 1](#) [Web scenarios](#) [Filter](#)

Host groups

Select

Hosts

LLD Student DB ×

Select

Name

Key

Type

All

▼

Update interval

Delete lost resources

All

Never

Immediately

After

Disable lost resources

All

Never

Immediately

After

State

All

Normal

Not supported

Status

All

Enabled

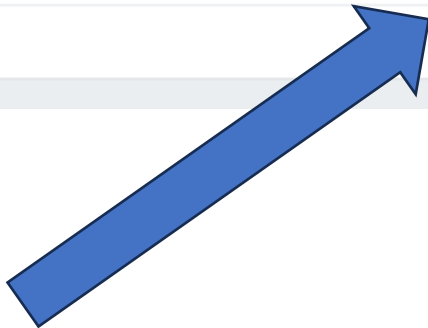
Disabled

Apply

Reset

☐	Host	Name ▲	Items	Triggers	Graphs	Hosts	Discovery rules	Key	Interval	Type	Status	Info
☐	LLD Student DB	Discover databases	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes	student.db.discovery	1h	HTTP agent	Enabled	

Displaying 1 of 1 found



?

Create discovery prototype

Task one

Discovery recurrence



Discovery prototypes

All hosts / LLD Student DB Enabled Discovery list / Discover databases Item prototypes Trigger prototypes Graph prototypes Host prototypes Discovery prototypes

Discovery prototype Preprocessing LLD macros Filters Overrides

* Name

Discover databases

Type

HTTP agent

* Key

student.ts.discovery[{#DB}]

* URL

{\$LAB.URL}/discovery/databases

Parse

Query fields

Name	Value
name	value

Add

Remove

Request type

GET

Request body type

Raw dataJSON dataXML data

Request body

Headers

Name
name

Add

Received status codes

Field	Value
Name	Discover tablespaces for {#DB}
Type	HTTP agent
Key	student.ts.discovery[{#DB}]
URL	{\$LAB.URL}/discovery/databases
Update interval	30s

Task one

Discovery recurrence



Discovery prototypes

All hosts / LLD Student DB Enabled Discovery list / Discover databases Item prototypes Trigger prototypes Graph prototypes Host prototypes Discovery prototypes

Discovery prototype Preprocessing 1 LLD macros Filters Overrides

Preprocessing steps

1:

JSONPath

▼

\$[?(@.database=="{#DB}")].tablespaces.first()

☐

Custom on fail

Test

Remove

Add

Add

Test

Cancel

Test all steps

Field	Value
JSONpath	<code>\$[?(@.database=="{#DB}")].tablespaces.first()</code>

Task one

Discovery recurrence



LLD macros

LLD macro

JSONPath

{#TS}

\$.name

Remove

Add

Add

Test

Cancel

Field	Value
LLD macro	{#TS}
JSONPath	\$.name

Task one

Discovery recurrence



Host groups

Select

Hosts

LLD Student DB ×

type here to search

Select

Name

Key

Type

All

Update interval

Delete lost resources

All

Never

Immediately

After

Disable lost resources

All

Never

Immediately

After

State

All

Normal

Not supported

Status

All

Enabled

Disabled

Apply

Reset

☒	Host	Name ▲	Items	Triggers	Graphs	Hosts	Discovery rules	Key	Interval	Type	Status	Info
☒	LLD Student DB	Discover databases	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes 1	student.db.discovery	1h	HTTP agent	Enabled	

1 selected

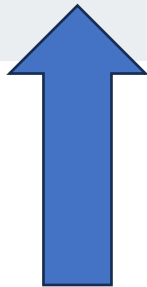
Enable

Disable

Execute now

Delete

Displaying 1 of 1 found



Task one

Discovery recurrence



Data collection

Template groups

Host groups

Templates

Hosts

Maintenance

Event correlation

Discovery



☐	Name ▲	Items	Triggers	Graphs	Discovery
☐	... LLD Student DB	Items	Triggers	Graphs	Discovery 3

Task one

Discovery recurrence



☐	Host	Name ▲
☐	LLD Student DB	Discover databases
☐	LLD Student DB	Discover databases : Discover tablespaces for db1
☐	LLD Student DB	Discover databases : Discover tablespaces for db2

Discovery rules	Key	Interval	Type	Status	Info
Discovery prototypes 1	student.db.discovery	1h	HTTP agent	Enabled	
Discovery prototypes	student.ts.discovery[db1]	30s	HTTP agent	Enabled	
Discovery prototypes	student.ts.discovery[db2]	30s	HTTP agent	Enabled	

Displaying 3 of 3 found

Task two

Reach the bottom



Task two

Reach the bottom



⌵

Data collection

⌵

Template groups

Host groups

Templates

Hosts

Maintenance

Event correlation

Discovery

Hosts

Host groups

type here to search

Templates

type here to search

Name

DNS

IP

Port

☐	Name ▲	Items	Triggers	Graphs	Discovery
☐	... LLD Student DB	Items	Triggers	Graphs	Discovery 3
☐	... Zabbix server	Items 167	Triggers 93	Graphs 20	Discovery 6

0 selected

Enable

Disable

Export

▼

Mass update

Delete

Task two

Reach the bottom



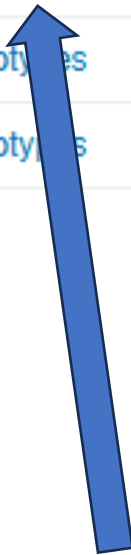
☐	Host	Name ▲	Items	Triggers	Graphs	Hosts	Discovery rules	Key
☐	LLD Student DB	Discover databases	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes 1	student.db.discovery
☐	LLD Student DB	<u>Discover databases</u> : Discover tablespaces for db1	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes	student.ts.discovery[db1]
☐	LLD Student DB	<u>Discover databases</u> : Discover tablespaces for db2	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes	student.ts.discovery[db2]

Task two

Reach the bottom



☐ Host	Name ▲	Items	Triggers	Graphs	Hosts	Discovery rules	Key
☐ LLD Student DB	Discover databases	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes 1	student.db.discovery
☐ LLD Student DB	<u>Discover databases</u> : Discover tablespaces for db1	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes	student.ts.discovery[db1]
☐ LLD Student DB	<u>Discover databases</u> : Discover tablespaces for db2	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes	student.ts.discovery[db2]



Task two

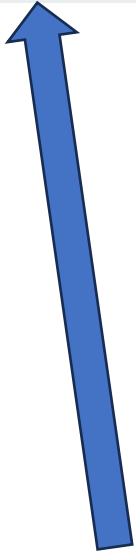
Reach the bottom



Discovery prototypes

[All hosts](#) / [LLD Student DB](#) Enabled [Discovery list](#) / [Discover databases](#) [Item prototypes](#) [Trigger prototypes](#) [Graph prototypes](#) [Host prototypes](#) [Discovery prototypes 1](#)

☐ Name ▲	Items	Triggers	Graphs	Hosts	Discovery rules
☐ Discover tablespaces for {#DB}	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes



Task two

Reach the bottom



Discovery prototype

Preprocessing 1

LLD macros 1

Filters

Overrides

* Name

Discover tablespaces for {#DB}



Type

Nested



* Key

student.ts.discovery[{#DB}]

* Delete lost resources ?



Never

Immediately

After

7d

* Disable lost resources ?



Never

Immediately

After

Description

Create enabled



Discover



Update

Clone

Test

Delete

Cancel

Task two

Reach the bottom



Discovery prototypes

All hosts / LLD Student DB Enabled

Discovery list / Discover databases

Item prototypes

Trigger prototypes

Graph prototypes

Host prototypes

Discovery prototypes 1

Discovery prototype

Preprocessing 1

LLD macros 1

Filters

Overrides

Preprocessing steps	Name	Parameters	Custom on fail	Actions
1:	JSONPath	<code>\${?(@.database=="{#DB}")}.tablespaces.first()</code>	☐	Test Remove

Add

Update

Clone

Test

Delete

Cancel

[Test all steps](#)

Task two

Reach the bottom



Discovery prototypes

All hosts / LLD Student DB Enabled

Discovery list / Discover databases

Item prototypes

Trigger prototypes

Graph prototypes

Host prototypes

Discovery prototypes 1

Discovery prototype

Preprocessing 1

LLD macros 1

Filters

Overrides

Preprocessing steps	Name	Parameters	Custom on fail	Actions
1:	JSONPath	\$.tablespaces	☐	Test Remove

Add

Update

Clone

Test

Delete

Cancel

[Test all steps](#)

Task two

Reach the bottom



Test item

? X

Value



Time

☐

Not supported

Error



Previous value



Prev. time

End of line sequence

LF

CRLF

Preprocessing steps

Name	Result
1: JSONPath	No value

Test

Cancel

Task two

Reach the bottom

ZABBIX

Test item

?

×

×

```
1 {
2   "database": "db1",
3   "tablespaces": [
4     {"name": "data", "used_pct": 42},
5     {"name": "logs", "used_pct": 87}
6   ]
7 }
```

122 characters

Apply

Cancel

Preprocessing steps

Name

Result

1: JSONPath

No value

Test

Cancel

```
{
  "database": "db1",
  "tablespaces": [
    {"name": "data", "used_pct": 42},
    {"name": "logs", "used_pct": 87}
  ]
}
```

Task two

Reach the bottom



Test item

Value

{...

Time

now

☐

Not supported

Error

error text



Previous value



Prev. time

End of line sequence

LF

CRLF

¹ Preprocessing steps

Name		Result
1: JSONPath	[{"used_pct":42,"name":"data"},"{"used_pct":87,"name":"logs"}]	

Test

Cancel

Task two

Reach the bottom



Discovery prototypes

LLD macros

LLD macro	JSONPath	
{#TS}	\$.name	Remove
Add		

UpdateCloneTestDeleteCancel

Task two

Reach the bottom



Discovery prototypes

All hosts / LLD Student DB Enabled Discovery list / Discover databases Item prototypes Trigger prototypes Graph prototypes Host prototypes **Discovery prototypes 1**

Discovery prototype Preprocessing 1 **LLD macros 1** Filters Overrides

LLD macros

LLD macro	JSONPath	
{#TS}	\$name	<a href="#">Remove
<a href="#">Add		

UpdateCloneTestDeleteCancel

The child extracts {#TS} from each tablespace. The parent supplies {#DB}, so do not add a child mapping for \$.database: that property is absent from the tablespace objects. Parent LLD macros remain available to nested discovery

Task two

Reach the bottom



☐ Host	Name ▲	Key	Interval	Type	Status
☐ LLD Student DB	Discover databases	student.db.discovery	1h	HTTP agent	Enabled
☐ LLD Student DB	<u>Discover databases</u> : Discover tablespaces for db1	student.ts.discovery[db1]		Nested	Not supported
☐ LLD Student DB	<u>Discover databases</u> : Discover tablespaces for db2	student.ts.discovery[db2]		Nested	Not supported
Displaying 3 of :					
0 selected					
Enable Disable Execute now Delete					

Task two

Reach the bottom



Discovery prototypes

All hosts / LLD Student DB Enabled Discovery list / Discover	
☐ Name ▲	Items
☐ Discover tablespaces for {#DB}	Item prototypes

Task two

Reach the bottom



Item prototype

Item prototype

Tags 2

Preprocessing 1

* Name

Tablespace {#DB}/{#TS}: used

Type

HTTP agent

* Key

student.ts.used[{#DB},{#TS}]

Type of information

Numeric (float)

* URL

{\$LAB.URL}/metrics/{#DB}/{#TS}

Query fields

Name

Value

name

⇒

value

Add

Request type

GET

Request body type

Raw data

JSON data

XML data

Request body

Headers

Name

Value

name

⇒

value

Add

Remove

Required status codes

200

Follow redirects

☒

Retrieve mode

Body

Headers

Body and headers

FIELD	Value
Name	Tablespace {#DB}/{#TS}: used
Type	HTTP agent
Key	student.ts.used[{#DB},{#TS}]
Type of information	Numeric (float)
URL	{\$LAB.URL}/metrics/{#DB}/{#TS}
Units	%

Task two

Reach the bottom



Item prototype



Item prototype Tags 2 **Preprocessing 1**

Preprocessing steps

	Name	Parameters	Custom on fail	Actions
1:	JSONPath	\$.used_pct	☐	Test Remove
Add				Test all steps

Type of information

Numeric (float)

Update

Clone

Test

Delete

Cancel

Field	Value
Name	JSONPath
Parameters	\$.used_pct

Task two

Reach the bottom



Item prototype

? X

Item prototype Tags 2 Preprocessing 1

Item tags

Inherited and item tags

Tags

Name	Value	
database	{#DB}	Remove
tablespace	{#TS}	Remove
Add		

Update

Clone

Test

Delete

Cancel

Field	Value
Database	{#DB}
tablespace	{#TS}

Task two

Reach the bottom



? X

Item prototype

Item prototype Tags 2 Preprocessing 1

Item tags

Inherited and item tags

Tags

Name	Value	
database	{#DB}	Remove
tablespace	{#TS}	Remove
Add		

Update

Clone

Test

Delete

Cancel

Field	Value
Database	{#DB}
tablespace	{#TS}

Task two

Reach the bottom



Host groups

Select

Hosts

LLD Student DB ×

Select

Name

Key

Type

All

Update interval

Delete lost resources

All

Never

Immediately

After

Disable lost resources

All

Never

Immediately

After

State

All

Normal

Not supported

Status

All

Enabled

Disabled

Apply

Reset

☐	Host	Name ▲	Items	Triggers	Graphs	Hosts	Discovery rules	Key	Interval	Type	Status	Info
☒	LLD Student DB	Discover databases	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes 1	student.db.discovery	1h	HTTP agent	Enabled	
☐	LLD Student DB	Discover databases : Discover tablespaces for db1	Item prototypes 1	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes	student.ts.discovery[db1]		Nested	Enabled	
☐	LLD Student DB	Discover databases : Discover tablespaces for db2	Item prototypes 1	Trigger prototypes	Graph prototypes	Host prototypes	Discovery prototypes	student.ts.discovery[db2]		Nested	Enabled	

Displaying 3 of 3 found

1 selected

Enable

Disable

Execute now

Delete



Task two

Reach the bottom

⌵

Data collection

⌶

Template groups

Host groups

Templates

Hosts

Maintenance

Event correlation

Discovery

☐	Name ▲	Items
☐	... LLD Student DB	Items 4

Task two

Reach the bottom



TAGS

database: db1 2

database: db2 2

tablespace: archive 1

tablespace: data 2

tablespace: logs 1

☐	Name ▲	Triggers	Key
☐	... Discover tablespaces for db1: Tablespace db1/data: used		student.ts.used[db1,data]
☐	... Discover tablespaces for db1: Tablespace db1/logs: used		student.ts.used[db1,logs]
☐	... Discover tablespaces for db2: Tablespace db2/archive: used		student.ts.used[db2,archive]
☐	... Discover tablespaces for db2: Tablespace db2/data: used		student.ts.used[db2,data]



Task two

Reach the bottom



Item

?

Item Tags 2 Preprocessing 1

Discovered by Discover tablespaces for db1

* Name Tablespace db1/logs: used

Type HTTP agent

* Key student.ts.used[db1,logs]

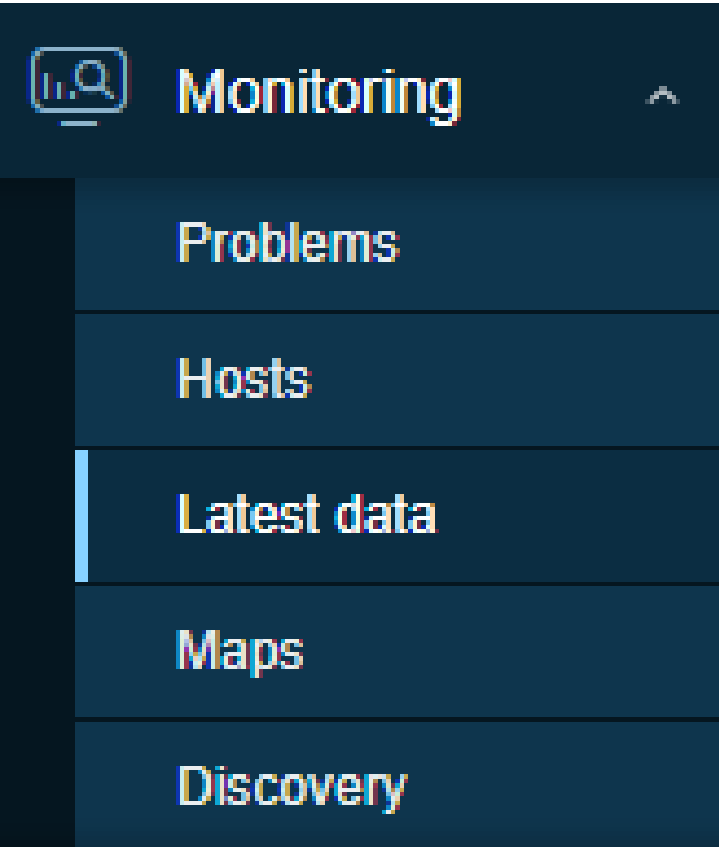
Type of information Numeric (float)

* URL {\$LAB.URL}/metrics/db1/logs Parse

http://127.0.0.1:18080/metrics/db1/logs

Task two

Reach the bottom



Host groups	type here to search	Select
Hosts	LLD Student DB X type here to search	Select
Name		

Tag (

Task two

Reach the bottom



☐	Host	Name ▲	Last check	Last value
☐	LLD Student DB	Tablespace db1/data: used	2s	42 %
☐	LLD Student DB	Tablespace db1/logs: used	1s	87 %
☐	LLD Student DB	Tablespace db2/archive: used	10s	23 %
☐	LLD Student DB	Tablespace db2/data: used	10s	61 %

Task two

Reach the bottom



☐	Host	Name ▲	Last check	Last value
☐	LLD Student DB	Tablespace db1/data: used	2s	42 %
☐	LLD Student DB	Tablespace db1/logs: used	1s	87 %
☐	LLD Student DB	Tablespace db2/archive: used	10s	23 %
☐	LLD Student DB	Tablespace db2/data: used	10s	61 %

You have one HTTP parent discovery rule, two Nested discovery rules, and four working metric items on LLD Student DB.

Question - Where does {#DB} come from?

Task two

Reach the bottom



☐	Host	Name ▲	Last check	Last value
☐	LLD Student DB	Tablespace db1/data: used	2s	42 %
☐	LLD Student DB	Tablespace db1/logs: used	1s	87 %
☐	LLD Student DB	Tablespace db2/archive: used	10s	23 %
☐	LLD Student DB	Tablespace db2/data: used	10s	61 %

You have one HTTP parent discovery rule, two Nested discovery rules, and four working metric items on LLD Student DB.

Question - **Where does {#DB} come from?**

Question - **Where does {#TS} come from?**

Task three

Hosts creating further hosts



Task three

Hosts creating further hosts



↓

Data collection

^

Template groups

Host groups

Templates

Hosts

Maintenance

Event correlation

Discovery



New host

Host

IPMI

Tags

Macros

Inventory

Encryption

Value mapping

* Host name

LLD Student Infrastructure

Visible name

LLD Student Infrastructure

Templates

type here to search

Select

* Host groups

Lab/Student LLD ×

type here to search

Select

Interfaces

No interfaces are defined.

Add

Description

Monitored by

Server

Proxy

Proxy group

Enabled



Field	Value
Host name	LLD Student Infrastructure
Host groups	Lab/Student LLD

Task three

Hosts creating further hosts



New host

Host IPMI Tags **Macros 1** Inventory Encryption Value mapping

- Host macros
- Inherited and host macros

Macro	Value		Description	
{ \$URL }	http://127.0.0.1:18080	T v	description	Remove

[Add](#)

Field	Value
Macro	{ \$URL }
Value	http://127.0.0.1:18080

Task three

Hosts creating further hosts



New host

Host IPMI Tags **Macros 1** Inventory Encryption Value mapping

Host macros Inherited and host macros

Macro	Value		Description	
{ \$LAB.URL }	http://127.0.0.1:18080	T v	description	Remove

Add

Field	Value
Macro	{ \$LAB.URL }
Value	http://127.0.0.1:18080

Task three

Hosts creating further hosts

↓

Data collection

^

Template groups

Host groups

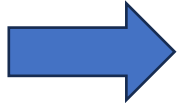
Templates

Hosts

Maintenance

Event correlation

Discovery



Create template

New template

? x

- Template
- Tags
- Macros
- Value mapping

* Template name

LLD Student Hypervisor

Visible name

LLD Student Hypervisor

Templates

type here to search

Select

* Template groups

Templates/Student LLD x

type here to search

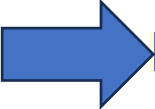
Select

Description

Task three

Hosts creating further hosts



Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery
LLD Student Hypervisor	Hosts	Items	Triggers	Graphs	Dashboards	 Discovery

Discovery rules

All templates / LLD Student Hypervisor Items Triggers Graphs Dashboards **Discovery rules** Web scenarios

Discovery rule Preprocessing LLD macros Filters Overrides

* Name

Discover VMs

Type

Nested ▼

* Key

student.vm.discovery

* Delete lost resources ?

Never

Immediately

After

7d

* Disable lost resources ?

Never

Immediately

After

Description

Enabled

☒

Add

Test

Cancel

Field	Value
Name	Discover VMs
Type	Nested
Key	student.vm.discovery

Task three

Hosts creating further hosts



Discovery rules

All templates / LLD Student Hypervisor

Items

Triggers

Graphs

Dashboards

Discovery rules

Web scenarios

Discovery rule

Preprocessing 1

LLD macros

Filters

Overrides

Preprocessing steps

1:

JSONPath

\$.vms

Add

Add

Test

Cancel

Field	Value
Name	JSONPath
Parameters	\$.vms

Task three

Hosts creating further hosts



Discovery rules

[All templates](#) / [LLD Student Hypervisor](#) [Items](#) [Triggers](#) [Graphs](#) [Dashboards](#) [Discovery rules](#) [Web scenarios](#)

[Discovery rule](#) [Preprocessing 1](#) [LLD macros 1](#) [Filters](#) [Overrides](#)

LLD macros

LLD macro

{#VM}

JSONPath

\$.vm

Remove

[Add](#)

Add

Test

Cancel

Field	Value
LLD macro	{#VM}
JSONPath	\$.vm

Task three

Hosts creating further hosts



Discovery rules

[All templates](#) / [LLD Student Hypervisor](#) [Items](#) [Triggers](#) [Graphs](#) [Dashboards](#) [Discovery rules](#) [Web scenarios](#)

[Discovery rule](#) [Preprocessing 1](#) [LLD macros 1](#) [Filters](#) [Overrides](#)

LLD macros

LLD macro

{#VM}

JSONPath

\$.vm

Remove

[Add](#)

Add

Test

Cancel

Field	Value
LLD macro	{#VM}
JSONPath	\$.vm

Task three

Hosts creating further hosts



Discovery rules

All templates / LLD Student Hypervisor / It

Discovery rule

Preprocessing 1

LLD m

Preprocessing st

1 {

2 "hypervisor": "hv-a",

3 "vms": [

4 {"vm": "vm-a1"},

5 {"vm": "vm-a2"}

6]

7 }

83 characters

Apply

Cancel

Test

Cancel

Task three

Hosts creating further hosts



Discovery rules

All templates / LLD Student Hypervisor / It

Discovery rule

Preprocessing 1

LLD m

Preprocessing st

Test item

Value

{...

Time

now

Previous value

Prev. time

End of line sequence

LF

CRLF

Preprocessing steps

Name	Result
1: JSONPath	[{"vm": "vm-a1"}, {"vm": "vm-a2"}]

Test

Cancel

1 {

2 "hypervisor": "hv-a",

3 "vms": [

4 {"vm": "vm-a1"},

5 {"vm": "vm-a2"}]

6 }

Apply

Cancel

est

Cancel

Task three

Hosts creating further hosts



↓

Data collection

^

Template groups

Host groups

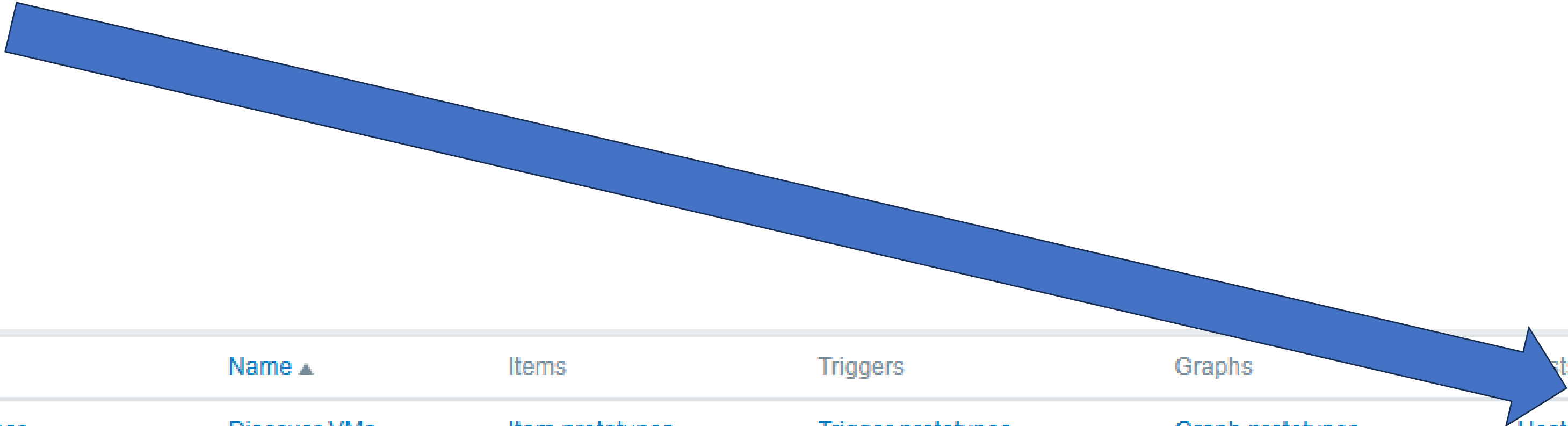
Templates

Hosts

Maintenance

Event correlation

Discovery



☐ Template	Name ▲	Items	Triggers	Graphs	Hosts
☐ LLD Student Hypervisor	Discover VMs	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes

Task three

Hosts creating further hosts



Host prototypes

All templates / LLD Student Hypervisor Discovery list / Discover VMs Item prototypes Trigger prototypes Graph prototypes **Host prototypes** Discover

Host Tags Macros Inventory Encryption

* Host name

student-#{HV}-#{VM}

Visible name

Student VM {#HV}/{#VM}

Templates

type here to search

Select

* Host groups

Lab/Student LLD ×

type here to search

Select

Group prototypes

{#MACRO}

Remove

Add

Interfaces

Inherit

Custom

No interfaces are defined.

Add

Create enabled

☒

Discover

☒

Add

Cancel

Field	Value
Host name	student-#{HV}-#{VM}
Visible name	Student VM {#HV}/{#VM}
Host groups	Lab/Student LLD
Interfaces	Custom, with no interface rows

Task three

Hosts creating further hosts



Host prototypes

[All templates](#) / [LLD Student Hypervisor](#) [Discovery list](#) / [Discover VMs](#) [Item prototypes](#) [Trigger prototypes](#) [Graph prototypes](#) **[Host prototypes](#)** [Discover](#)

[Host](#) **[Tags 1](#)** [Macros](#) [Inventory](#) [Encryption](#)

Tags

Name	Value	
hypervisor	{#HV}	Remove
Add		

Field	Value
Name	hypervisor
Value	{#HV}

Task three

Hosts creating further hosts



↓

Data collection

^

Template groups

Host groups

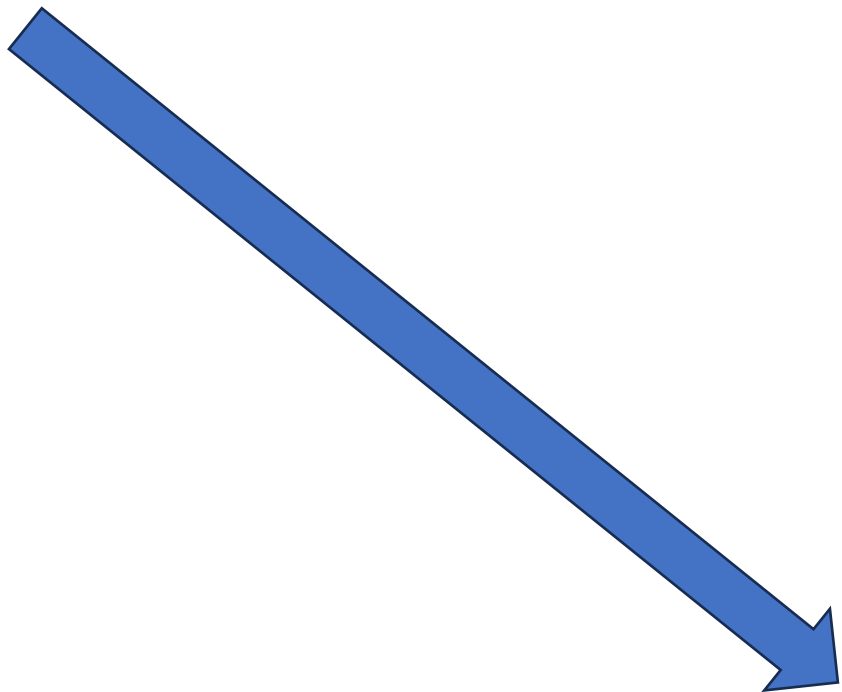
Templates

Hosts

Maintenance

Event correlation

Discovery



Task three

Hosts creating further hosts



Discovery rules

All hosts / LLD Student Infrastructure

Enabled

Items

Triggers

Graphs

Discovery rules

Web scenarios

Discovery rule

Preprocessing

LLD macros

Filters

Overrides

* Name

Discover hypervisors

Type

HTTP agent

* Key

student.hv.discovery

* URL

{SLAB.URL}/discovery/hypervisors

Parse

Query fields

Name

Value

name

⇒

value

Remove

Add

Request type

GET

Request body type

Raw data

JSON data

XML data

Request body

Field	Value
Name	Discover hypervisors
Type	HTTP agent
Key	student.hv.discovery
URL	{SLAB.URL}/discovery/hypervisors

Task three

Hosts creating further hosts



Discovery rules

All hosts / LLD Student Infrastructure

Enabled

Items

Triggers

Graphs

Discovery rules

Web scenarios

Discovery rule

Preprocessing

LLD macros 1

Filters

Overrides

LLD macros

LLD macro

JSONPath

{#HV}

\$.hypervisor

Remove

Add

Add

Test

Cancel

Field	Value
Name	Discover hypervisors
Type	HTTP agent
Key	student.hv.discovery
URL	{\$LAB.URL}/discovery/hypervisors

Task three

Hosts creating further hosts



☐	Host	Name ▲	Items	Triggers	Graphs	Hosts
☐	LLD Student Infrastructure	Discover hypervisors	Item prototypes	Trigger prototypes	Graph prototypes	 Host prototypes

Task three

Hosts creating further hosts



Host prototypes

All hosts / LLD Student Infrastructure

Enabled

Discovery list / Discover hypervisors

Item prototypes

Trigger prototypes

Graph prototypes

Host

IPMI

Tags

Macros

Inventory

Encryption

* Host name

student-#{HV}

Visible name

Student hypervisor {#HV}

Templates

LLD Student Hypervisor X

Select

* Host groups

Lab/Student LLD X

Select

Group prototypes

#{MACRO}

Add

Remove

Interfaces

Inherit

Custom

No interfaces are defined.

Add

Monitored by

Server

Proxy

Proxy group

Create enabled

☒

Discover

☒

Add

Cancel

Field	Value
Host name	student-#{HV}
Visible name	Student hypervisor {#HV}
Host groups	Lab/Student LLD
Interfaces	Custom, with no interface rows
Templates	LLD Student Hypervisor
Create enabled	Selected
Discover	Selected

Task three

Hosts creating further hosts



Discovery rules

All hosts / LLD Student Infrastructure

Enabled

Items

Triggers

Graphs

Discovery rules 1

Web scenarios

Host groups

type here to search

Hosts

LLD Student Infrastructure ×

type here to search

Name

Key

☒	Host	Name ▲	Items	Triggers
☒	LLD Student Infrastructure	Discover hypervisors	Item prototypes	Trigger prototypes

1 selected

Enable

Disable

Execute now

Delete

Task three

Hosts creating further hosts



Data collection ^

Template groups

Host groups

Templates

Hosts

Maintenance

Event correlation

Discovery

☐	Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	F
☐	... LLD Student DB	Items 4	Triggers	Graphs	Discovery 3	Web		
☐	... LLD Student Infrastructure	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-a	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-b	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a1	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a2	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-b/vm-b1	Items	Triggers	Graphs	Discovery	Web		

Task three

Hosts creating further hosts



☐	Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	F
☐	... LLD Student DB	Items 4	Triggers	Graphs	Discovery 3	Web		
☐	... LLD Student Infrastructure	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-a	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-b	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a1	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a2	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-b/vm-b1	Items	Triggers	Graphs	Discovery	Web		

Hosts creating further hosts



Host

Host

IPMI

Tags

Macros 1

Inventory

Encryption

Discovered by

Discover hypervisors

* Host name

student-hv-a

Visible name

Student hypervisor hv-a

Templates ?

Name

Actions

LLD Student Hypervisor (linked by host discovery)

type here to search

Select

* Host groups

Lab/Student LLD x

Select

Interfaces

No interfaces are defined.

Description

Monitored by

Server

Proxy

Proxy group

Enabled

☒

Update

Clone

Delete

Cancel

Task three

Hosts creating further hosts



☐	Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	F
☐	... LLD Student DB	Items 4	Triggers	Graphs	Discovery 3	Web		
☐	... LLD Student Infrastructure	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-a	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-b	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a1	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a2	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-b/vm-b1	Items	Triggers	Graphs	Discovery	Web		

Task three

Hosts creating further hosts



☐	Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	F
☐	... LLD Student DB	Items 4	Triggers	Graphs	Discovery 3	Web		
☐	... LLD Student Infrastructure	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-a	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-b	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a1	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a2	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-b/vm-b1	Items	Triggers	Graphs	Discovery	Web		

Key	Interval	Type	Status
student.vm.discovery		Nested	<u>Enabled</u>

Task three

Hosts creating further hosts



☐	Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	F
☐	... LLD Student DB	Items 4	Triggers	Graphs	Discovery 3	Web		
☐	... LLD Student Infrastructure	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-a	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-b	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a1	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a2	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-b/vm-b1	Items	Triggers	Graphs	Discovery	Web		

Key	Interval	Type	Status
student.vm.discovery		Nested	<u>Enabled</u>

Task three

Hosts creating further hosts



☐	Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	F
☐	... LLD Student DB	Items 4	Triggers	Graphs	Discovery 3	Web		
☐	... LLD Student Infrastructure	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-a	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover hypervisors</u> : Student hypervisor hv-b	Items	Triggers	Graphs	Discovery 1	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a1	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-a/vm-a2	Items	Triggers	Graphs	Discovery	Web		
☐	... <u>Discover VMs</u> : Student VM hv-b/vm-b1	Items	Triggers	Graphs	Discovery	Web		

Task three

Hosts creating further hosts



Host

? x

Host IPMI Tags 1 Macros 1 Inventory Encryption

Discovered by Discover VMs

* Host name student-hv-a-vm-a1

Visible name Student VM hv-a/vm-a1

Templates ? type here to search Select

* Host groups Lab/Student LLD x Select

Interfaces No interfaces are defined.

Description

Monitored by Server Proxy Proxy group

Enabled ☒

Update Clone Delete Cancel

Task three

Hosts creating further hosts



Host

? X

Host IPMI Tags 1 Macros 1 Inventory Encryption

Tags

Name	Value	
hypervisor	hv-a	(created by host discovery)
Add		

Update

Clone

Delete

Cancel

Task three



☐ Host	Name ▲	Items	Triggers	Graphs	Hosts	Discovery rules	Key	Interval	Type	Status	Info
☐ Student hypervisor hv-a	LLD Student Hypervisor: Discover VMs	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes 1	Discovery prototypes	student.vm.discovery		Nested	Enabled	
Displaying 1 of 1 found											

Host discovery

Level	Expected hosts	Count
Manual root	LLD Host Demo	1
Discovered hypervisors	hv-a, hv-b	2
Discovered VMs	vm-a1, vm-a2, vm-b1	3

Check the discovery origin and linked template on each level.

Troubleshooting by layer

Symptom	First check
No child rule	Parent JSON, parent macro, discovery prototype status
JSONPath returns no result	Test the child with one parent object
Duplicate key error	Include parent and child identity in the item key
Item exists but has no value	HTTP endpoint, preprocessing and numeric value type
Second host level is missing	Template link, Nested input and inherited host prototype

about:questions



Thank you!

