



ZABBIX 5.0

Certified Specialist Training

Day 1

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Facilities

Introduction

- ♥ Background/company
- ♥ Experience with CLI Unix like systems
- ♥ Experience with Zabbix
- ♥ Experience with other monitoring solutions
- ♥ Current Zabbix deployments

Questions at any moment are encouraged!

We suppose that attendees of this course have basic Linux knowledge.
For the practical tasks use the "Lab manual" - it provides all required details.

	Monday	Tuesday - Thursday	Friday
09.00-11.30			
10.00-11.30	Zabbix 5.0 Certified Specialist	Zabbix 5.0 Certified Specialist	
11.30-11.45		Break	
11.45-13.00		Zabbix 5.0 Certified Specialist	
13.00-14.00		Lunch Break; Q/A session	
14.00-15.30		Zabbix 5.0 Certified Specialist	Advanced Topics
15.30-15.45		Break	Certification and presentation of certificates
15.45-17.50		Zabbix 5.0 Certified Specialist	

AGENDA

Architecture



Interface
&
Users



Hosts
&
Host groups



Preparations



Definitions



Items
&
Preprocessing



Installation



Monitoring



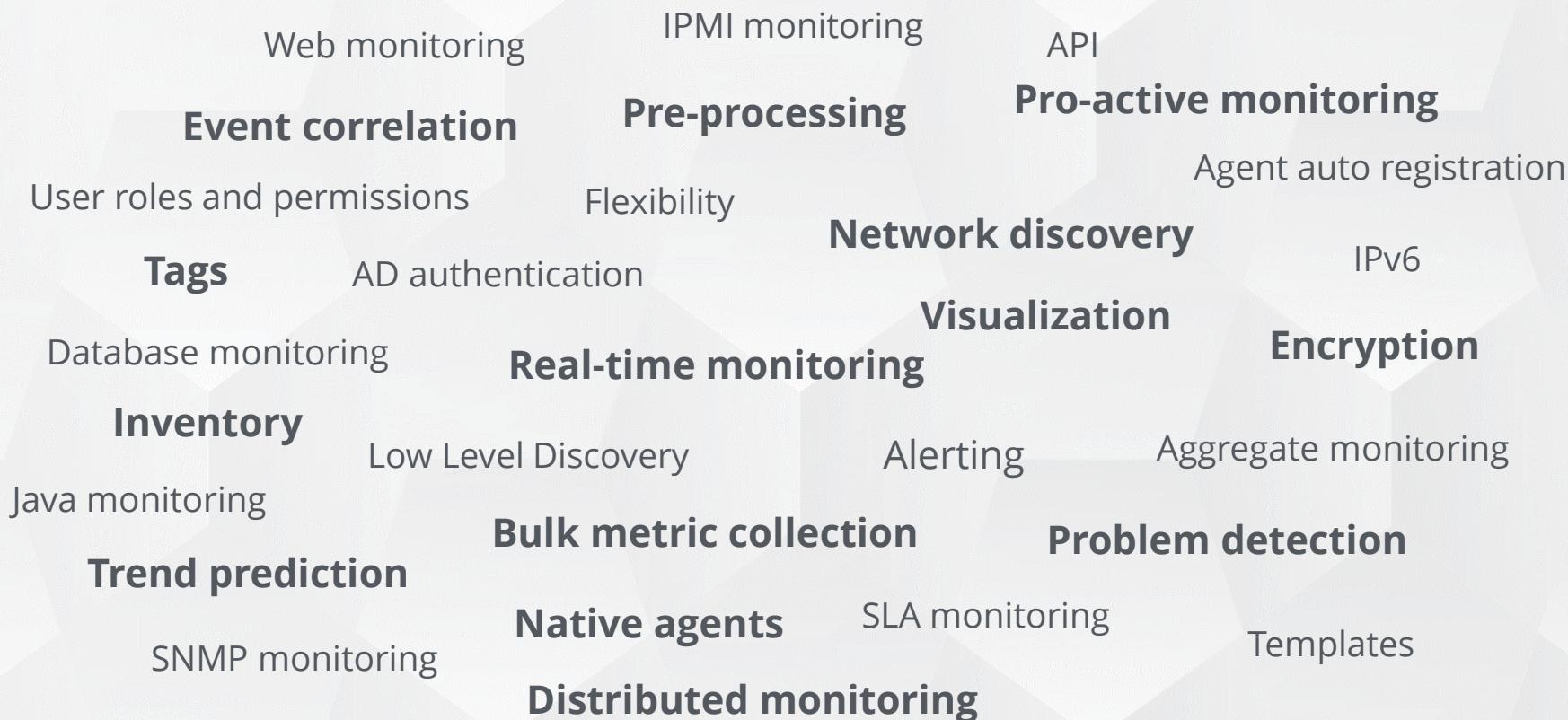
Agent-less
Checks





Intro

Zabbix is the ultimate enterprise - class monitoring platform





Keep things simple (KISS)

Be efficient: use as few system resources as possible (memory/CPU usage)

Very high performance and high-quality product

Low number of third-party dependencies

Written and distributed under the GPL (General Public License) version 2

Frontend

- ~ Open and customisable

Everything is stored in a relational database

C language for the server, proxy and agent

- ~ Best performance
- ~ Lowest footprint and resource usage
- ~ Linux agent uses less than a megabyte of RAM
- ~ (736K on 64bit; excluding shared libraries)

GO language for the agent 2

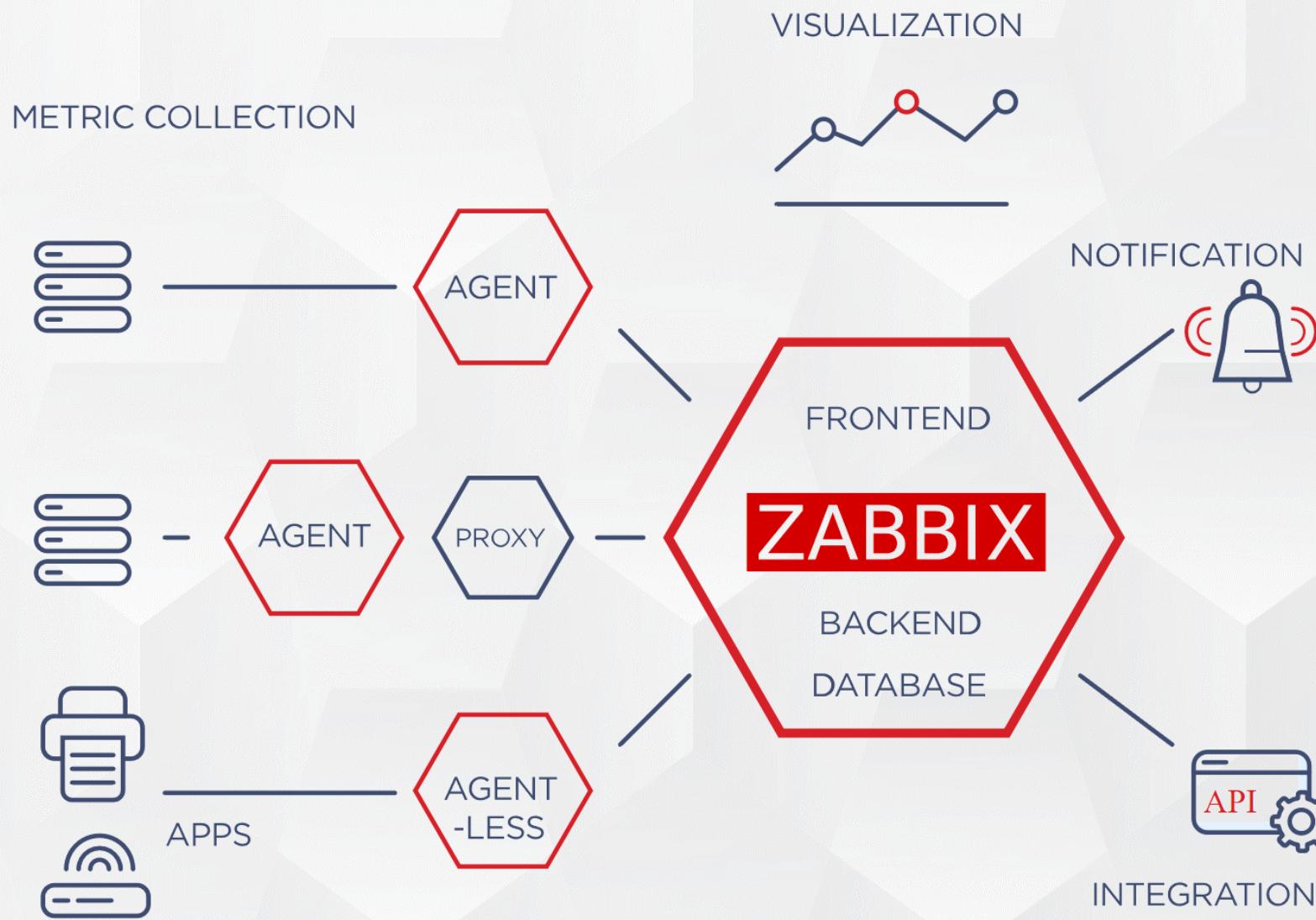
- ~ provides more options for plugin developers

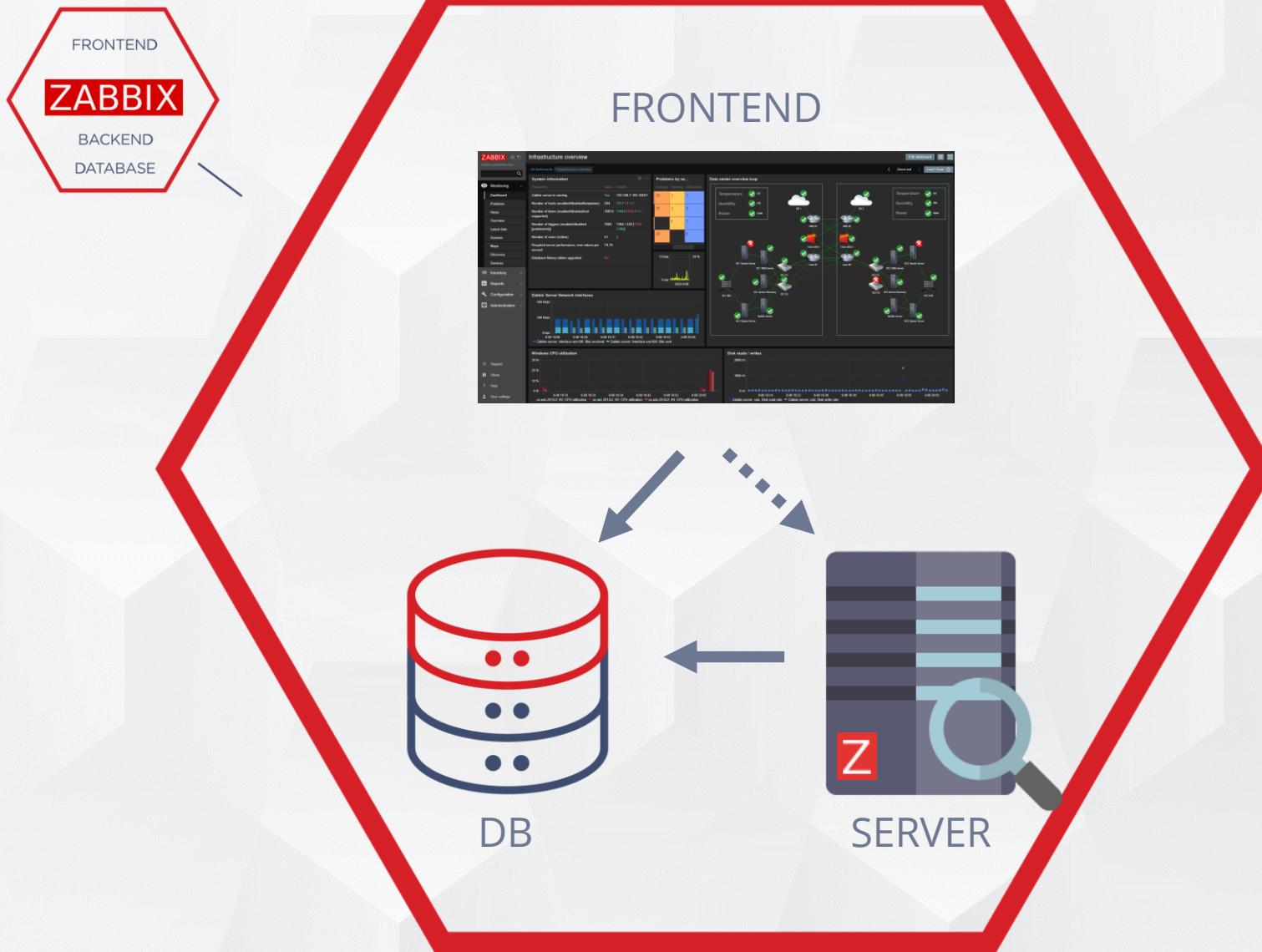
Can be used in an embedded environment

- ~ SQLite for proxy, very small footprint

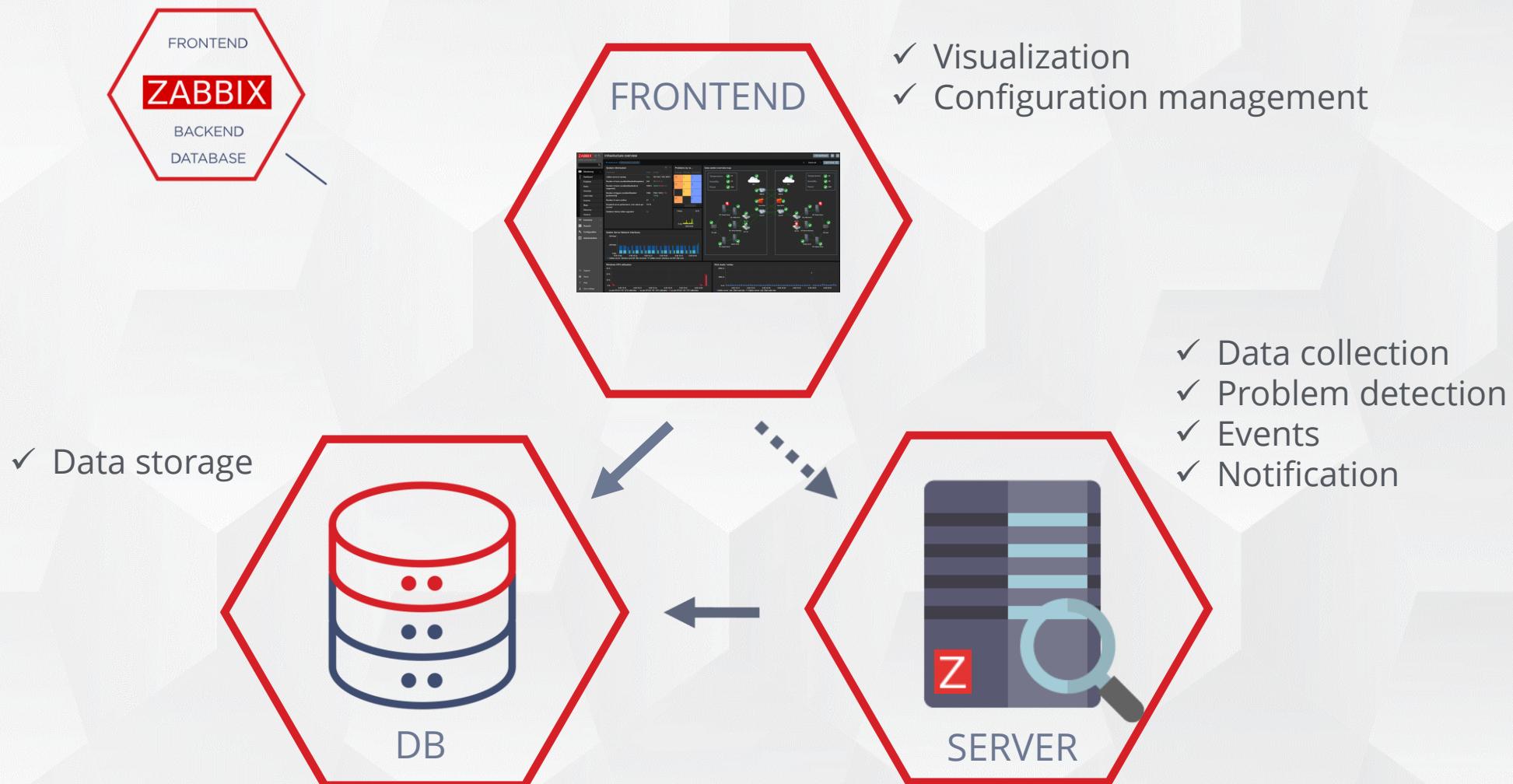


Architecture





INSTANCE ON SEPARATED SERVERS





Distributed monitoring

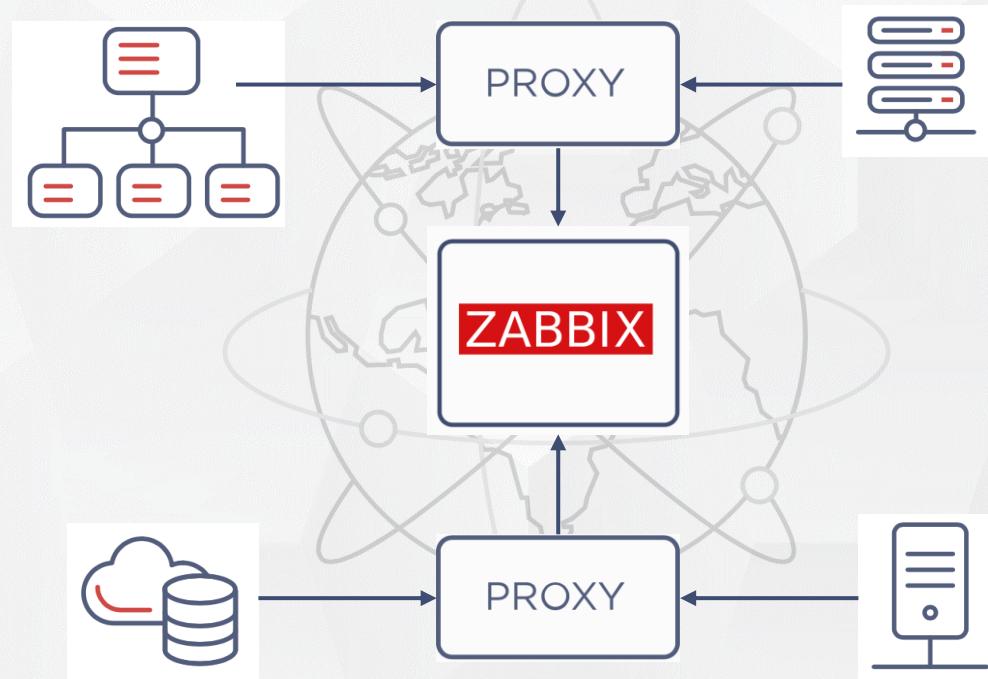
Zabbix provides an effective and reliable way of monitoring a distributed IT infrastructure using Zabbix proxies

- Monitor behind firewalls, DMZ
- Collect data in case of network issues
- Remotely run custom scripts on monitored hosts
- Collect data locally and push data to a central Zabbix server



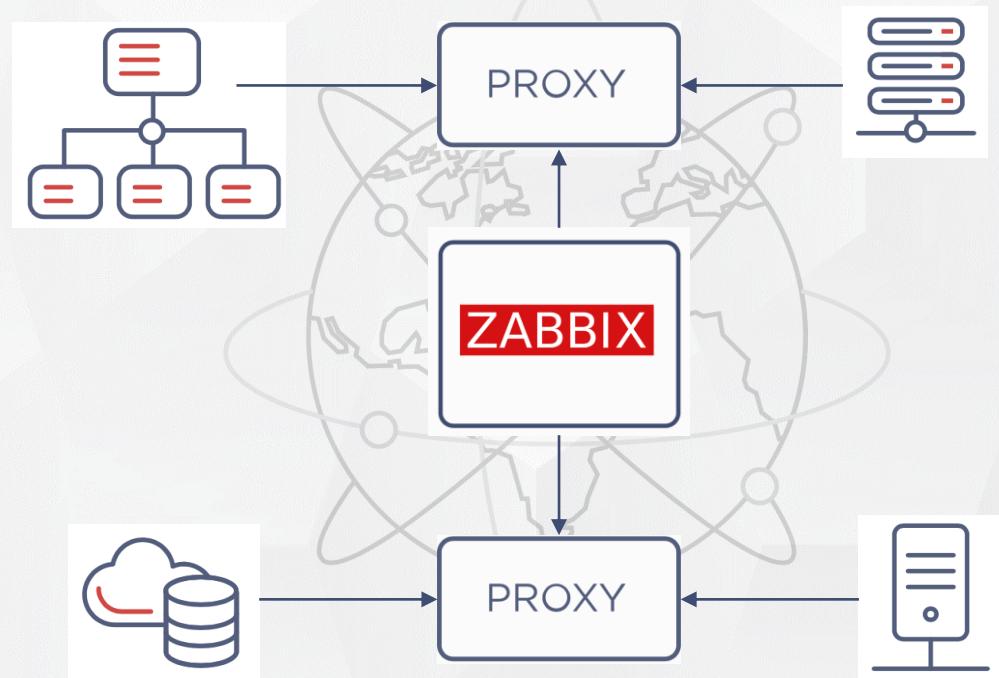
https://www.zabbix.com/documentation/current/manual/distributed_monitoring

⚠ Active proxy will connect to Zabbix server and request configuration data



DISTRIBUTED MONITORING - PASSIVE PROXY

- ~ Zabbix server connects to the passive proxy
- ~ The server requires only one TCP connection to the proxy.
 - Easier to get around a firewall as only one firewall rule is needed



- ~ Centralized monitoring
- ~ Proxy can collect data and perform preprocessing steps
- ~ Zabbix server controls configuration of all proxies
- ~ Supports any platform the server supports
- ~ Supports any database the server supports
- ~ Can use different DBs on the server & proxies
- ~ Can create SQLite DB automatically
- ~ Can buffer data in case of communication problems
- ~ Choose the direction of connection



Don't use the same DB and schema for proxy & server!!!



Preparations

For Zabbix server to operate properly, the OS must be prepared.

心脏病图标 Setup NTP client

- It is very important to have a precise system date
- It is strongly recommended to maintain synchronized system date on all systems Zabbix components are running on

心脏病图标 Change time zone

- To write correct timestamps in Zabbix logs
- Zabbix server time zone is used for maintenance periods, time-based trigger functions, etc.

心脏病图标 Firewall

- Zabbix server will have a lot of outgoing/incoming connections to different devices and network ports; a firewall must be configured to allow this interaction

心脏病图标 Built in access control systems may block Zabbix server components

- SELINUX
- AppArmor
- Other security tools

To setup NTP on Centos8 "Chrony" can be used:

心脏病图标 Install chrony

```
# dnf install chrony
```

心脏病图标 Enable and start

```
# systemctl enable chronyd --now
```

心脏病图标 Check pool servers

```
# chronyc sources
```

心脏病图标 Or use your own NTP server

```
# vi /etc/chrony.conf  
Add line: Server <IP/DNS>  
# systemctl restart chronyd
```

心脏病图标 If firewall is enabled:

```
# firewall-cmd --permanent --add-service=ntp  
# firewall-cmd --reload
```

Show current time zone setup

```
# timedatectl status
```

Show the list of time zones

```
# timedatectl list-timezones | grep <name>
```

Set time zone

```
# timedatectl set-timezone Europe/Riga
```

Wizard to find time zones

```
# tzselect
```

*Zabbix stores time for values in
unixtime

When done, check the settings again

```
# timedatectl status
```

```
Local time: Wed 2020-02-19 15:26:25 EET
Universal time: Wed 2020-02-19 13:26:25 UTC
RTC time: Wed 2020-02-19 13:26:25
Time zone: Europe/Riga (EET, +0200)
System clock synchronized: yes
NTP service: active
RTC in local TZ: no
```

Check status

```
# systemctl status firewalld
● firewalld.service - firewalld - dynamic firewall daemon
  Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled; vendor preset: enabled)
  Active: active (running) since Wed 2020-02-19 16:20:43 EET; 35min left
    Docs: man:firewalld(1)
 Main PID: 900 (firewalld)
```

Add exclusions for the web server, Zabbix server and Zabbix agent

```
firewall-cmd --permanent --add-service=http
firewall-cmd --permanent --zone=public --add-port=10051/tcp
firewall-cmd --permanent --zone=public --add-port=10050/tcp
firewall-cmd --reload
```



In this training, we will not use a firewall. It is considered a Professional level topic.

Check status

```
# sestatus  
SELinux status:                      enabled  
SELinuxfs mount:                     /sys/fs/selinux  
SELinux root directory:              /etc/selinux  
Loaded policy name:                 targeted  
Current mode:                       enforcing  
Mode from config file:              enforcing  
...  
...
```

If enabled (enforcing):

⚠ need to introduce policies to allow processes to run and interact with each other

To set it to permissive mode and disable on the next reboot

```
# setenforce 0  
# vi /etc/selinux/config  
SELINUX=disabled
```

Make sure you have the latest policies installed.



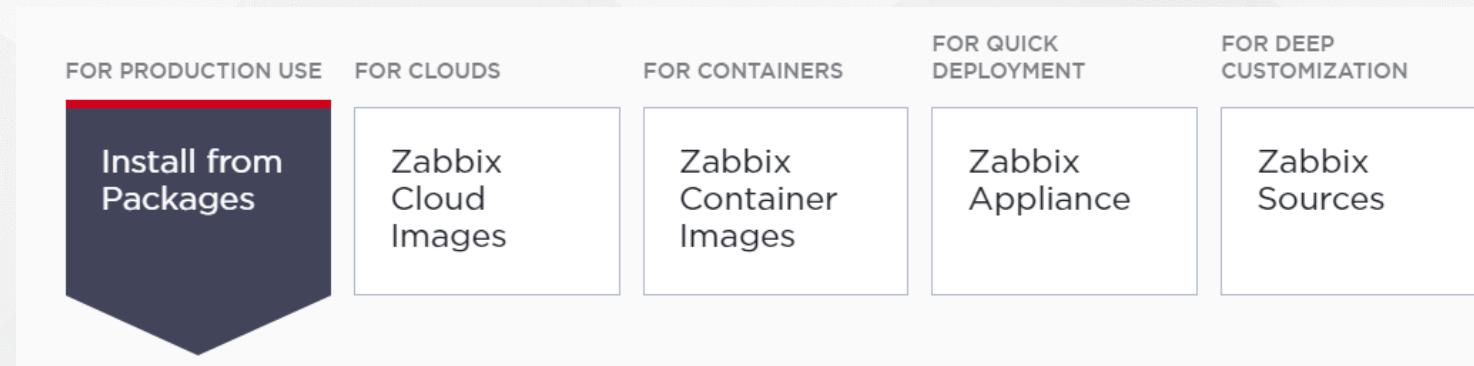
For this course, SELinux is disabled; its settings are covered in the Expert training.



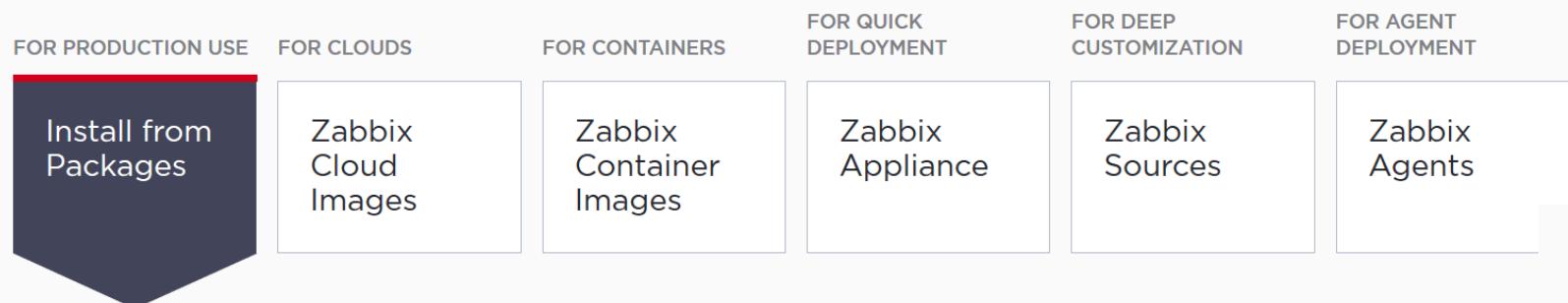
Server, DB, GUI installation

There are five ways of getting Zabbix:

- ✓ Install it from the official packages
- ✓ Use Zabbix Cloud images
- ✓ Deploy from containers
- ✓ Download the virtual appliance
- ✓ Download the latest source archive and compile it yourself



<https://www.zabbix.com/download>



1 Choose your platform

ZABBIX VERSION	OS DISTRIBUTION	OS VERSION	DATABASE	WEB SERVER
5.0 LTS	Red Hat Enterprise Linux	8	MySQL	Apache
4.4	CentOS	7	PostgreSQL	NGINX
4.0 LTS	Oracle Linux	6		
3.0 LTS	Ubuntu			
	Debian			

2 Install and configure Zabbix server

a. Install Zabbix repository

```
# rpm -Uvh https://repo.zabbix.com/zabbix
# dnf clean all
```

b. Install Zabbix server, frontend, agent

3 Start using Zabbix

Read in documentation: [Quickstart guide](#)

Watch video guide:



Zabbix server installation explained



Zabbix Cloud Images

 AWS	Zabbix Server 5.0 Mysql + Nginx	 Microsoft Azure	Zabbix Server 5.0 Mysql + Nginx	 Microsoft Azure	Zabbix Proxy 5.0 SQLite	 Google Cloud Platform	Zabbix Server 5.0 Mysql + Nginx
 Google Cloud Platform	Zabbix Proxy 5.0 SQLite	 DigitalOcean	Zabbix Server 4.4 Mysql + Nginx	 ORACLE	Zabbix Server 4.4 Mysql + Nginx	 Red Hat OpenShift	Zabbix Server 5.0 Mysql + Nginx
 Yandex Cloud	Zabbix Server 5.0 Mysql + Nginx						

 https://www.zabbix.com/cloud_images

FOR PRODUCTION USE

FOR CLOUDS

FOR CONTAINERS

FOR QUICK
DEPLOYMENT

FOR DEEP
CUSTOMIZATION

FOR AGENT
DEPLOYMENT

Install from
Packages

Zabbix
Cloud
Images

Zabbix
Container
Images

Zabbix
Appliance

Zabbix
Sources

Zabbix
Agents

Documentation

Zabbix Installation
from containers

[Read manual](#)

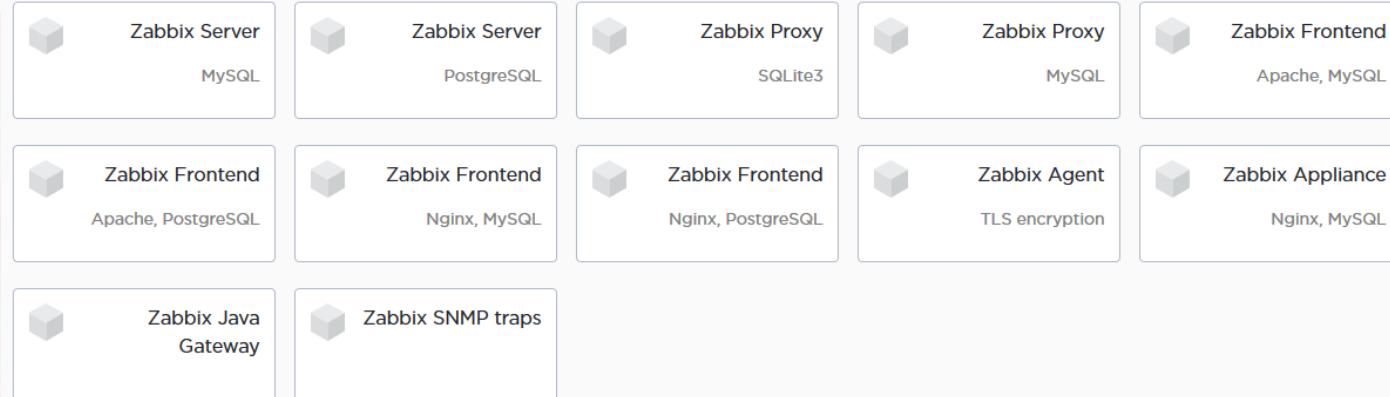
Zabbix Docker Repository GitHub



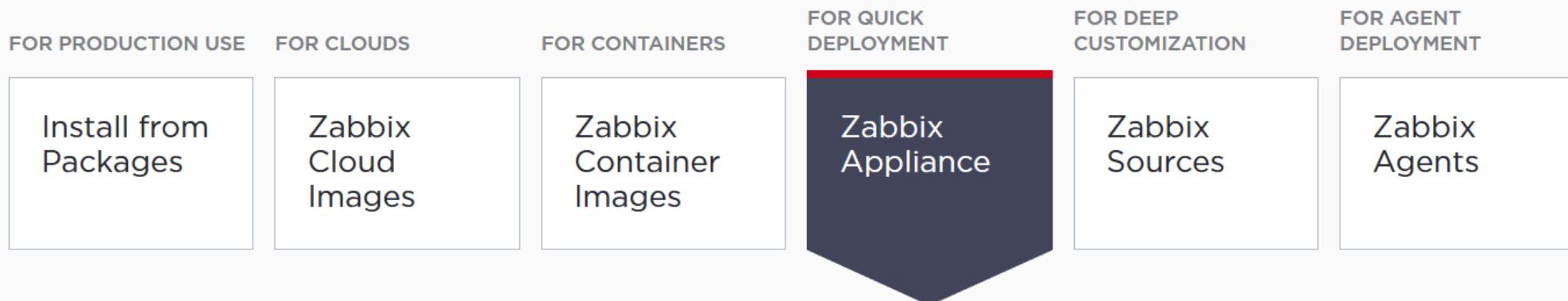
Zabbix Docker Component Repositories

[Zabbix Docker hub](#)

Video guide



https://www.zabbix.com/container_images



Install Zabbix Appliance

[Zabbix 5.0 LTS](#)
[Zabbix 4.4](#)
[Zabbix 4.0 LTS](#)
[Zabbix 3.0 LTS](#)

Version	Release	Date	Platform	Release Notes	Zabbix Manual	Download
Zabbix 5.0 LTS	5.0.0	May 12, 2020	Installation CD/DVD (.iso)	View	View	Download
Zabbix 5.0 LTS	5.0.0	May 12, 2020	VMWare (.vmx)	View	View	Download
Zabbix 5.0 LTS	5.0.0	May 12, 2020	Open virtualization format (.ovf)	View	View	Download
Zabbix 5.0 LTS	5.0.0	May 12, 2020	Microsoft Hyper-V 2012	View	View	Download



https://www.zabbix.com/download_appliance

Operating system	Database	Additional libraries
<ul style="list-style-type: none">~ Linux<ul style="list-style-type: none">~ Red Hat~ Debian/Ubuntu~ SUSE Linux~ Solaris~ AIX~ HP-UX~ FreeBSD~ OpenBSD~ MacOS	<ul style="list-style-type: none">~ MySQL (5.5.62 - 8.0.x)~ MySQL forks<ul style="list-style-type: none">~ MariaDB~ Percona~ PostgreSQL (9.2.24 or later)<ul style="list-style-type: none">~ TimescaleDB~ Oracle (11.2 or later)~ Elasticsearch<ul style="list-style-type: none">~ experimental~ only for history	<ul style="list-style-type: none">~ PCRE: libpcre3~ Bulk metrics: libevent~ Compression: zlib~ SNMP: net-snmp~ Web: libcurl~ SSH: libssh2~ IPMI: OpenIPMI~ VMware: libxml2~ ODBC: unixODBC~ Encryption: OpenSSL

! Use what is already familiar to you!

RHEL/CentOS

```
# dnf install https://repo.zabbix.com/zabbix/5.0/rhel/8/x86_64/zabbix-release-5.0-1.el8.noarch.rpm  
# dnf clean all  
# dnf install zabbix-server-mysql
```

Debian/Ubuntu/Raspbian

```
# wget https://repo.zabbix.com/zabbix/5.0/ubuntu/pool/main/z/zabbix-release/zabbix-release_5.0-  
1+focal_all.deb  
# dpkg -i zabbix-release_5.0-1+focal_all.deb  
# apt update  
# apt install zabbix-server-mysql
```

SUSE Linux Enterprise Server

```
# rpm -Uvh --nosignature https://repo.zabbix.com/zabbix/5.0/sles/15/x86_64/zabbix-release-5.0-  
1.el15.noarch.rpm  
# zypper --gpg-auto-import-keys refresh 'Zabbix Official Repository'  
# zypper install zabbix-server-mysql
```

Install MySQL Server

```
# dnf -y install mysql-server
```

Start MySQL and set a root password

```
# systemctl start mysqld
## On production systems secure your instance
# mysql_secure_installation
```

To connect to MySQL from the command line

```
# mysql -u<user_name> -p <database_name>
```

```
Enter password: <your_password>
```



If you use older MySQL distributive, check this setting: `innodb_file_per_table=on`

Log in to MySQL and create Zabbix database and user

```
# mysql -uroot -p<password>
mysql> create database zabbix character set utf8 collate utf8_bin;
mysql> create user 'zabbix'@'localhost' identified by 'P455w0RD';
mysql> grant all privileges on zabbix.* to 'zabbix'@'localhost';
mysql> quit;
```

- ♥ character set utf8 - support for multilingualism
- ♥ collate utf8_bin - case sensitiveness of stored data

 Missing collation is known to cause failed queries

Load compressed SQL files that contain

- ♥ DB schema
- ♥ Initial configuration
- ♥ Pictures

```
# cd /usr/share/doc/zabbix-server-mysql-5.*
# zcat create.sql.gz | mysql -uzabbix -pP455w0RD zabbix
```

Configure Zabbix server

```
# vi /etc/zabbix/zabbix_server.conf  
DBHost=localhost  
DBName=zabbix  
DBUser=zabbix  
DBPassword=P455w0RD
```

Start Zabbix server

```
# systemctl start zabbix-server
```

Enable auto start for the services

```
# systemctl enable zabbix-server  
# systemctl enable mysqld
```



If SELinux is in enforcing mode, new SELinux policies must be applied.

Check status

```
# systemctl status zabbix-server
● zabbix-server.service - Zabbix Server
   Loaded: loaded (/usr/lib/systemd/system/zabbix-server.service; enabled; vendor preset: disabled)
   Active: active (running) since Sun 2020-05-17 18:28:39 EEST; 17h ago
     Process: 7263 ExecStop=/bin/kill -SIGTERM $MAINPID (code=exited, status=0/SUCCESS)
     Process: 7266 ExecStart=/usr/sbin/zabbix_server -c $CONFFILE (code=exited, status=0/SUCCESS)
   Main PID: 7269 (zabbix_server)
     Tasks: 38
    Memory: 54.6M
```

Check the log file for errors

```
# tail /var/log/zabbix/zabbix_server.log
```



If you encounter critical error messages, resolve the problem before proceeding.

You can use the following command line parameters with Zabbix server

```
## to get more usage information:  
# zabbix_server -h  
## to get zabbix daemon version:  
# zabbix_server -V
```

Server can be started with a different configuration file or/and in the foreground

```
# zabbix_server -c /tmp/test_zabbix_server.conf  
# zabbix_server -f
```

Zabbix server runtime control options

```
# zabbix_server --runtime-control <option>  
# zabbix_server --runtime-control config_cache_reload  
# zabbix_server --runtime-control log_level_increase=1869  
# zabbix_server -R log_level_decrease="history syncer",4  
# zabbix_server -R housekeeper_execute  
# zabbix_server -R snmp_cache_reload
```



<https://www.zabbix.com/documentation/5.0/manual/concepts/server>



Frontend installation

Component	Requirement
Browser	Mozilla Firefox, Chrome, Safari, Edge, Opera Other browsers (Vivaldi) may work as well
Back-end	Apache (1.3.12 or later), Lighttpd, Nginx
PHP version	7.2.0 or later
PHP database support	php-mysql, php-pgsql, php-sqlora
PHP modules	php-bcmath, php-gd(2.0.28 or later), php-xml(2.6.15 or later), php-xmlreader, php-xmlwriter, php-session, php-net-socket, php-mbstring, PNG/JPEG/FreeType support, php-gettext, php-ldap
Other requirements	Some distributions might split out core PHP features in packages like php7-ctype, php-session or php7-xml/php7-dom



<https://www.zabbix.com/documentation/5.0/manual/installation/requirements>

RHEL/CentOS

```
# dnf install zabbix-web-mysql zabbix-apache-conf
```

心脏病图标 Edit /etc/php-fpm.d/zabbix.conf to configure PHP

- Uncomment and change time zone

```
; php_value[date.timezone] = Europe/Riga
```

心脏病图标 Enable and start

```
# systemctl start httpd php-fpm  
# systemctl enable httpd php-fpm
```

Debian/Ubuntu/Raspbian

```
# apt install zabbix-frontend-php
```

心脏病图标 Edit /etc/zabbix/apache.conf to configure PHP (the same change as for the RHEL)

SUSE Linux Enterprise Server

```
# zypper install zabbix-server-mysql zabbix-apache-conf
```

心脏病图标 Edit /etc/apache2/conf.d/zabbix.conf to configure PHP (the same change as for the RHEL)

Edit /etc/php-fpm.d/zabbix.conf

```
pm = dynamic      ## php-fpm settings
pm.max_children = 50
pm.start_servers = 5
pm.min_spare_servers = 5
pm.max_spare_servers = 35

php_value[session.save_handler] = files
php_value[session.save_path]    = /var/opt/rh/rh-php72/lib/php/session/

php_value[max_execution_time] = 300
php_value[memory_limit] = 128M
php_value[post_max_size] = 16M
php_value[upload_max_filesize] = 2M
php_value[max_input_time] = 300
php_value[max_input_vars] = 10000
php_value[date.timezone] = Europe/Riga
```

Start and enable auto start for Apache

```
# systemctl start httpd php-fpm
# systemctl enable httpd php-fpm
```

Open Zabbix frontend from a web browser

→ http://<DNS or IP>/zabbix



If a firewall is enabled, add new firewall rules to allow HTTP traffic

ZABBIX

Welcome
Check of pre-requisites
Configure DB connection
Zabbix server details
Pre-installation summary
Install

Check of pre-requisites

	Current value	Required	
PHP version	7.2.24	7.2.0	OK

ZABBIX

Welcome
Check of pre-requisites
Configure DB connection
Zabbix server details
Pre-installation summary
Install

ZABBIX Configure DB connection

Please create database manually, and set the configuration parameters for connection to this database.
Press "Next step" button when done.

Database type	<input type="button" value="MySQL ▾"/>
Database host	<input type="text" value="localhost"/>
Database port	<input type="text" value="0"/>
Database name	<input type="text" value="zabbix"/>
User	<input type="text" value="zabbix"/>
Password	<input type="password" value="*****"/>
TLS encryption	<input type="checkbox"/>

ZABBIX**Zabbix server details**

Please enter the host name or host IP address and port number of the Zabbix server, as well as the name of the installation (optional).

Host	<input type="text" value="localhost"/>
Port	<input type="text" value="10051"/>
Name	<input type="text" value="student-X"/>

Congratulations! You have successfully installed Zabbix frontend.

Configuration file "/etc/zabbix/web/zabbix.conf.php" created.

Back**Finish**

The wizard creates: /etc/zabbix/web/zabbix.conf.php

PRACTICAL SETUP

1. Install
 - ~ MySQL 8 server
 - ~ Zabbix Server
 - ~ Frontend
2. Create Zabbix DB
3. Configure:
 - ~ Zabbix server
 - ~ Frontend
4. Start and check status of
 - ~ Web server
 - ~ Zabbix server
5. Check log files to see if the server and all subprocesses have started
6. Login to the frontend using user: Admin, password: zabbix



Zabbix interface

In your browser open the URL:

→ http://<ip_or_name>/zabbix

The image shows the Zabbix login interface. A red box highlights the 'ZABBIX' logo at the top center. Another red box highlights the 'Username' field, which contains 'Admin'. A third red box highlights the 'Password' field, which contains five blue dots. To the right of the login form, a blue box contains the text 'Enter credentials' followed by 'Username: Admin' and 'Password: zabbix'. On the left side of the login form, a blue box contains the text 'Save cookie' and 'Sign in = Login'.

ZABBIX

Username
Admin

Password
•••••

Remember me for 30 days

Sign in

Help • Support

Enter credentials
Username: Admin
Password: zabbix

Save cookie
Sign in = Login

Main menu**Links**

ZABBIX < >

Zabbix production env

- Monitoring
- Dashboard
- Problems
- Hosts
- Overview
- Latest data
- Screens
- Maps
- Discovery
- Services
- Inventory
- Reports
- Configuration
- Administration

Main window

Global view

All dashboards / Global view

Zabbix agent host availability

Parameter	Value	Details
Zabbix server is running	Yes	192.168.7.105:10051
Number of hosts (enabled/disabled)	111	110 / 1
Number of templates	160	
Number of items (enabled/disabled/not supported)	16199	15196 / 638 / 365
Number of triggers (enabled/disabled [problem/ok])	7027	6710 / 317 [177 / 6533]
Number of users (online)	42	2
Required server performance, new values per second	75.8	
Database history tables upgraded	No	

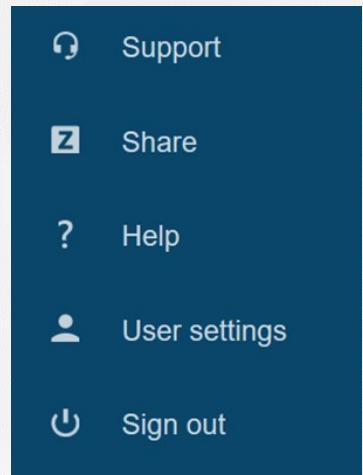
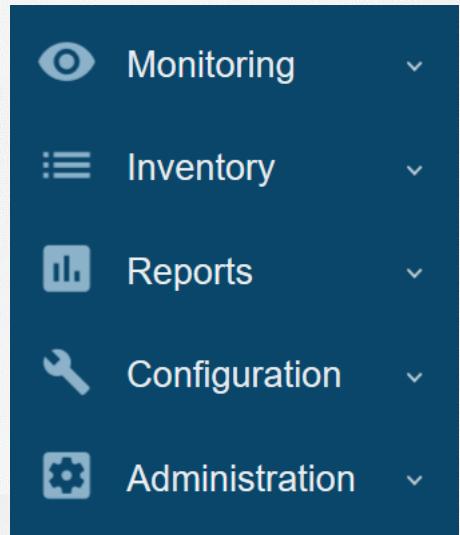
Problems by severity (Global)

Severity	Count
Disaster	0
High	2
Average	78
Warning	20
Information	11
Not classified	0

Problems

Time	Info	Host	Problem + Severity	Duration	Ack	Actions	Tags
15:38:08		Oracle Database 01 (11g Express)	System time is out of sync (diff with Zabbix server > 60s)	2m 31s	Yes	1 ↗	
15:37:06		Oracle Database 01 (11g Express)	/: Disk space is critically low (used > 90%)	3m 33s	No		
15:37:05		Linux server	Lack of free swap space on Linux server	3m 34s	No		

Local



Main menu:

- ~ Is all about displaying data
- ~ Provides an overview of inventory data
- ~ Contains a variety of predefined reports
- ~ Contains sections for setting up Zabbix
- ~ Is for administrative Zabbix functions

Links:

- ~ Contact Zabbix support
- ~ <https://share.zabbix.com>
- ~ Link to the documentation
- ~ Current user profile settings
- ~ Log out

Access to the frontend menu sections depends on the user type.

Zabbix User

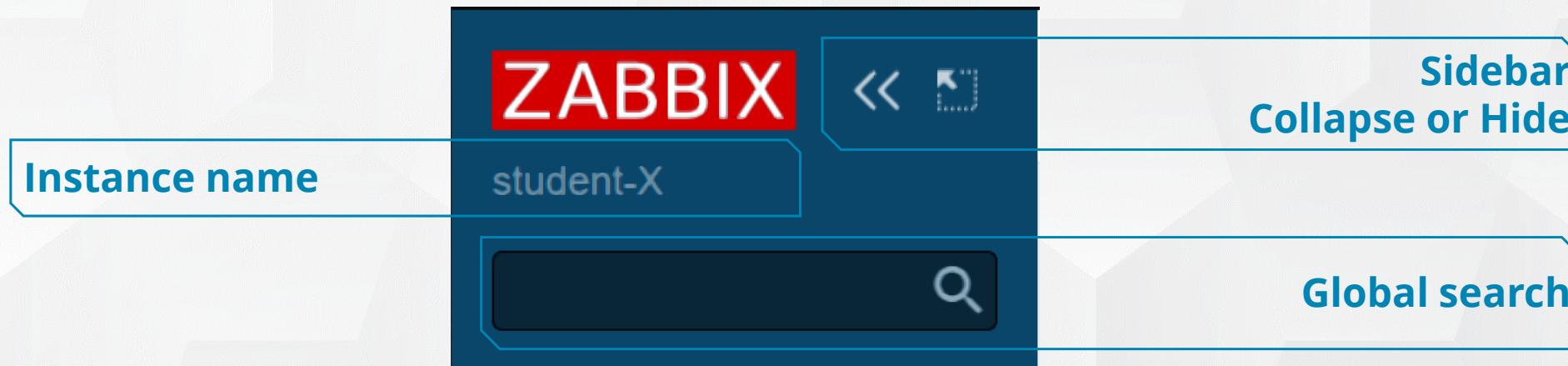
-  Monitoring ▾
-  Inventory ▾
-  Reports ▾

Zabbix Admin

-  Monitoring ▾
-  Inventory ▾
-  Reports ▾
-  Configuration ▾

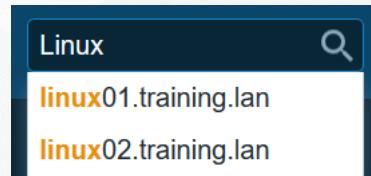
Zabbix Super Admin

-  Monitoring ▾
-  Inventory ▾
-  Reports ▾
-  Configuration ▾
-  Administration ▾



- ~ Menu can be collapsed to small icons or hidden completely
- ~ Global search is for hosts, host groups and templates
- ~ In the monitoring section, frontend can be switched to kiosk mode
- ~ To exit kiosk mode, point to the upper right corner and press

Type any string



心脏病图标 If there are hosts that include the string, a dropdown will appear, listing all matching hosts

Search: Linux

Hosts

Hosts													
Host	IP	DNS	Latest data	Problems	Graphs	Screens	Web	Applications	Items	Triggers	Graphs	Discovery	Web
linux01.training.lan	172.17.0.1	{HOST.HOST}	Latest data	Problems	Graphs	Screens	Web	Applications 16	Items 64	Triggers 23	Graphs 12	Discovery 5	Web
linux02.training.lan	172.17.0.1	{HOST.HOST}	Latest data	Problems	Graphs	Screens	Web	Applications 16	Items 64	Triggers 23	Graphs 12	Discovery 5	Web

Displaying 2 of 2 found

Host Groups

Host groups						
Host group	Latest data	Problems	Web	Hosts	Templates	
Linux servers	Latest data	Problems	Web	Hosts 2	Templates	

Displaying 1 of 1 found

Templates

Templates							
Template	Applications	Items	Triggers	Graphs	Screens	Discovery	Web
Template Module Linux block devices by Zabbix agent	Applications 2	Items 1	Triggers	Graphs	Screens	Discovery 1	Web
Template Module Linux block devices by Zabbix agent active	Applications 2	Items 1	Triggers	Graphs	Screens	Discovery 1	Web
Template Module Linux block devices SNMPv2	Applications 1	Items	Triggers	Graphs	Screens	Discovery 1	Web
Template Module Linux CPU by Zabbix agent	Applications 1	Items 17	Triggers 2	Graphs 4	Screens	Discovery	Web

- ~ Each entry provides links to monitoring and configuration data
- ~ A simple way to open items configuration or list of problems

Search: Linux

Hosts													
Host	IP	DNS	Latest data	Problems	Graphs	Screens	Web	Applications	Items	Triggers	Graphs	Discovery	Web
linux01.training.lan	172.17.0.1	{HOST.HOST}	Latest data	Problems	Graphs	Screens	Web	Applications 16	Items 64	Triggers 23	Graphs 12	Discovery 5	Web
linux02.training.lan	172.17.0.1	{HOST.HOST}	Latest data	Problems	Graphs	Screens	Web	Applications 16	Items 64	Triggers 23	Graphs 12	Discovery 5	Web
								configuration				Displaying 2 of 2 found	

Host groups													
Host group	Latest data	Problems	Web	Hosts	Templates								
Linux servers	Latest data	Problems	Web	Hosts 2	Templates	configuration							
								configuration				Displaying 1 of 1 found	

Templates											
Template	Applications	Items	Triggers	Graphs	Screens	Discovery	Web				
Template Module Linux block devices by Zabbix agent	Applications 2	Items 1	Triggers	Graphs	Screens	Discovery 1	Web				
Template Module Linux block devices by Zabbix agent active	Applications 2	Items 1	Triggers	Graphs	Screens	Discovery 1	Web				
Template Module Linux block devices SNMPv2	Applications 1	Items	Triggers	Graphs	Screens	Discovery 1	Web				
Template Module Linux CPU by Zabbix agent	Applications 1	Items 17	Triggers 2	Graphs 4	Screens	Discovery	Web				
configuration											



How to create a new user

Administration > Users

- Shows a list of existing users
- Filter section to find specific ones
- Single or multiple user: [Block]/[Unblock], [Delete]
- To add a new user: Press the [Create user] button in the upper right corner

Users User group All Create user

Alias Name Surname User type Any Zabbix User Zabbix Admin Zabbix Super Admin

Filter

<input type="checkbox"/>	Alias ▲	Name	Surname	User type	Groups	Is online?	Login	Frontend access	Debug mode	Status
<input type="checkbox"/>	Admin	Zabbix	Administrator	Zabbix Super Admin	Zabbix administrators	Yes (2020-04-20 13:49:10)	Ok	System default	Disabled	Enabled
<input type="checkbox"/>	guest			Zabbix User	Disabled, Guests	No	Ok	Internal	Disabled	Disabled
<input checked="" type="checkbox"/>	student-X			Zabbix Super Admin	Zabbix administrators	Yes (2020-04-20 13:48:54)	Ok	System default	Disabled	Enabled

Displaying 3 of 3 found

1 selected Unblock Delete

Fields in the user settings:

- ~ Alias will be used for login
- ~ Name, Surname
- ~ Groups
- ~ Password
- ~ Language
- ~ Theme
- ~ Auto login/logout
- ~ Refresh rate of some pages
- ~ How many rows to display
- ~ URL - redirection after login

Users

User Media Permissions

* Alias	student-X
Name	NAME (optional)
Surname	SURNAME (optional)
* Groups	Zabbix administrators <input type="button" value="Select"/> <input type="text" value="type here to search"/>
* Password	••••••••••••••
* Password (once again)	••••••••••••••
Password is not mandatory for non internal authentication type.	
Language	English (en_GB) <input type="button" value="▼"/>
Theme	System default <input type="button" value="▼"/>
Auto-login	<input type="checkbox"/>
Auto-logout	<input type="checkbox"/> 15m
* Refresh	30s
* Rows per page	50
URL (after login)	zabbix.php?action=host.view

User media settings:

- ~ Usually e-mail, phone number or other identifier
- ~ Active based on time period
- ~ Active based on severity
- ~ One or more user media
- ~ Not visible for Zabbix User

User profile: Zabbix User

User Media Messaging

Media	Type	Send to	When active	Use if severity	Enabled
	Email	user_email@private.home	6-7,00:00-24:00	N I V	<input checked="" type="checkbox"/>
	Email (HTML)	user@working.email	1-5,08:00-18:00	N I V A W H D	<input type="checkbox"/>
	Jira	username	1-7,00:00-24:00	N I W A H D	<input type="checkbox"/> Disabled
	SMS	+37109876543	1-7,00:00-24:00	N I W A H D	<input type="checkbox"/> Enabled
	Add				

Update Cancel

Media

Type: Email (HTML)

* Send to: your@email.address [Remove](#)

[Add](#)

* When active: 1-7,00:00-24:00

Use if severity:

- Not classified
- Information
- Warning
- Average
- High
- Disaster

Pick User type:

✓ Zabbix Super Admin: No limitations

✗ Zabbix User and Admin: Permissions are based on Host groups and Tags

The screenshot shows the Zabbix 'Permissions' configuration page for a user. The 'User type' is set to 'Zabbix Super Admin'. Under 'Permissions', 'Host group' is selected, and 'All groups' is chosen. The 'Permissions' column shows 'Read-write'. A note below states: 'Permissions can be assigned for user groups only'. At the bottom are 'Update', 'Delete', and 'Cancel' buttons.

User groups

User group	Permissions	Tag filter
All groups	Host group	Permissions
Linux servers	All groups	None
Training/Servers	Read-write	Read Deny None
Zabbix servers	Read-write	Read Deny None



Permissions will be reviewed later! For now we will use only Super Admin



User profile

User profile: Zabbix User

User Media Messaging

Support Share Help User settings Sign out

Password [Change password](#)

Language English (en_GB) ▾

Theme System default ▾

Auto-login

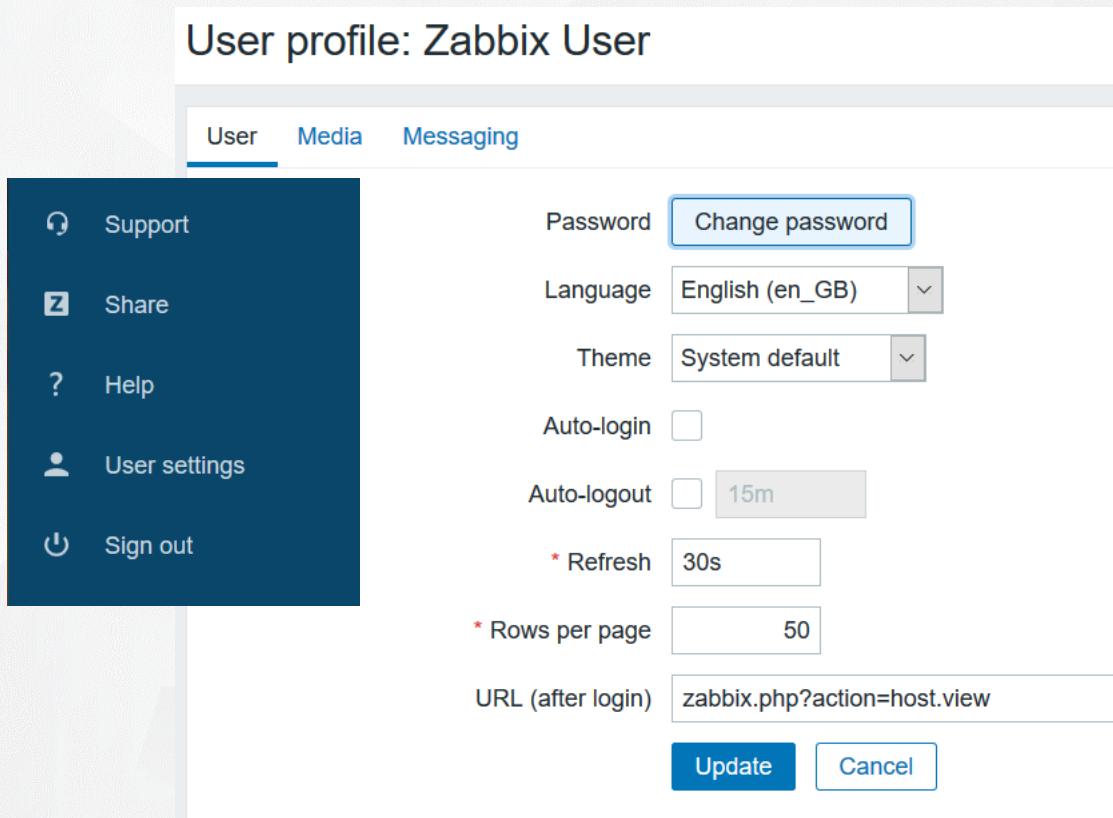
Auto-logout 15m

* Refresh 30s

* Rows per page 50

URL (after login) zabbix.php?action=host.view

[Update](#) [Cancel](#)



心脏病图标 Password

心脏病图标 Select the interface language

心脏病图标 Select a color theme

心脏病图标 Auto login/logout

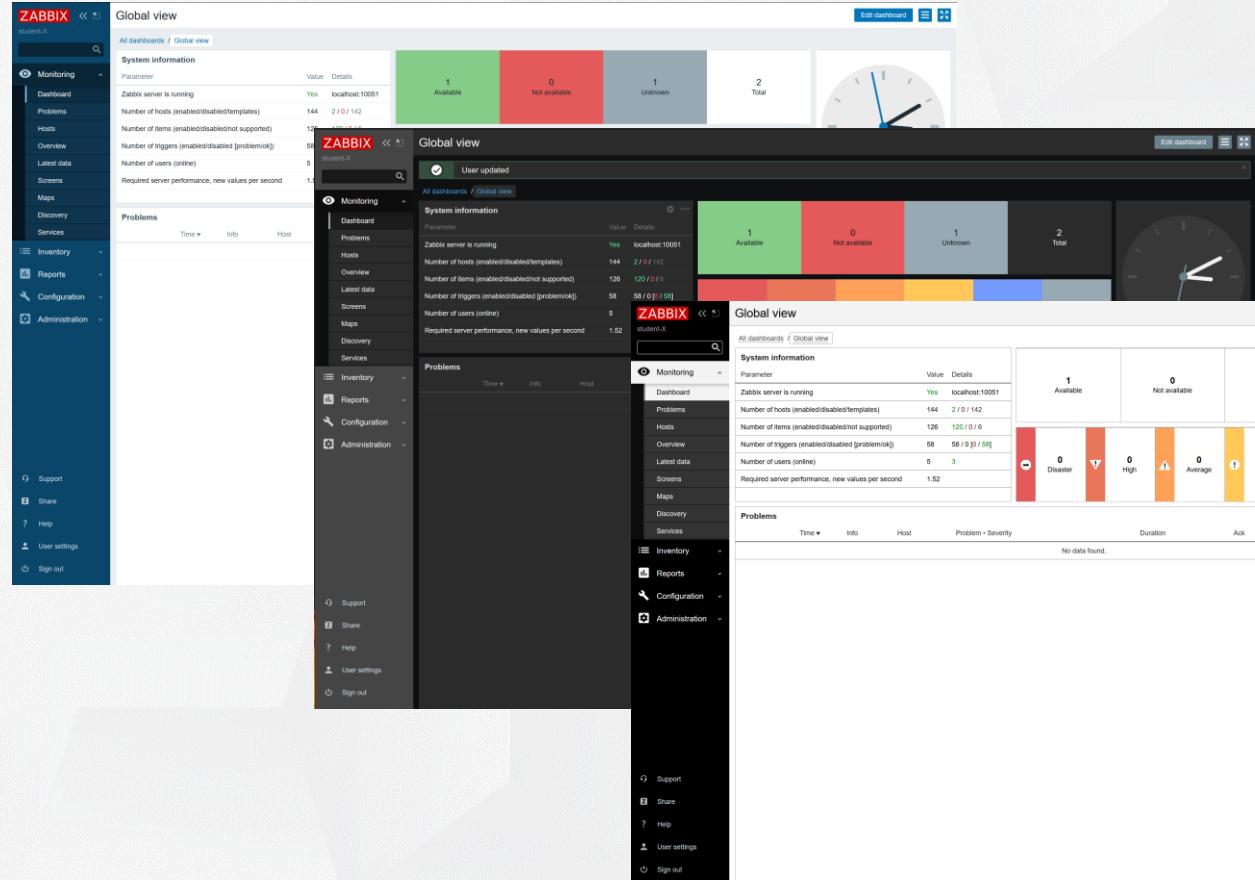
心脏病图标 Refresh interval for Monitoring menu

心脏病图标 Rows per page in the lists

心脏病图标 Specific URL after login (instead of Monitoring > Dashboard)

心脏病图标 For Zabbix internal links use relative paths

The system default theme can be set in the Administration > GUI section



GUI ▾

Default theme **System default**

System default
Blue
Dark
High-contrast light
High-contrast dark

User profile: Zabbix User

User Media **Messaging**

Frontend messaging

Message timeout

Play sound

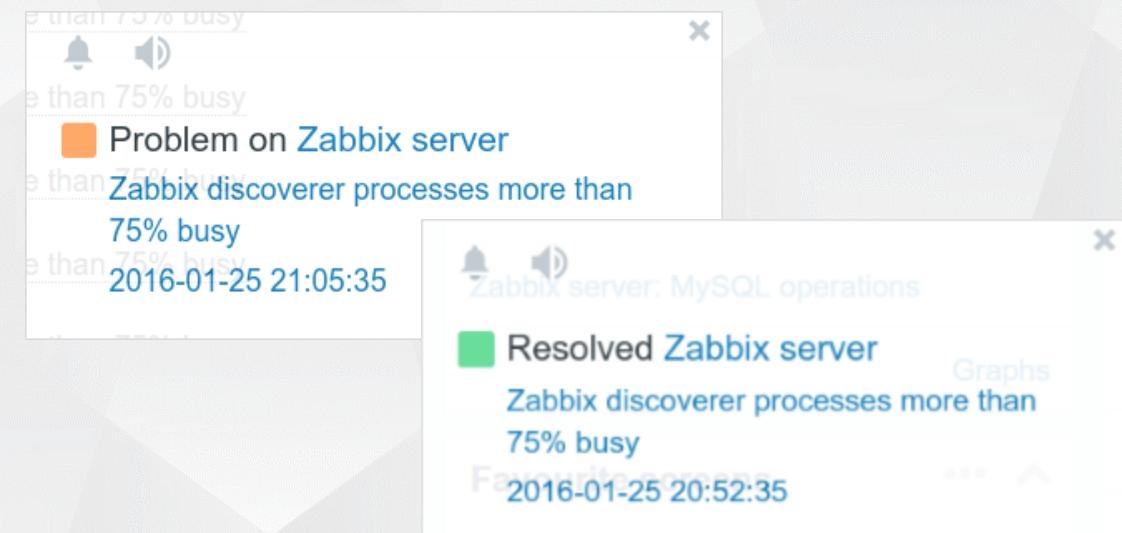
Trigger severity	<input checked="" type="checkbox"/> Recovery	<input type="text" value="alarm_ok"/> <input type="button" value="▼"/>	<input type="button" value="Play"/>	<input type="button" value="Stop"/>
<input checked="" type="checkbox"/> Not classified	<input type="text" value="no_sound"/> <input type="button" value="▼"/>	<input type="button" value="Play"/>	<input type="button" value="Stop"/>	
<input checked="" type="checkbox"/> Information	<input type="text" value="alarm_information"/> <input type="button" value="▼"/>	<input type="button" value="Play"/>	<input type="button" value="Stop"/>	
<input checked="" type="checkbox"/> Warning	<input type="text" value="alarm_warning"/> <input type="button" value="▼"/>	<input type="button" value="Play"/>	<input type="button" value="Stop"/>	
<input checked="" type="checkbox"/> Average	<input type="text" value="alarm_average"/> <input type="button" value="▼"/>	<input type="button" value="Play"/>	<input type="button" value="Stop"/>	
<input checked="" type="checkbox"/> High	<input type="text" value="alarm_high"/> <input type="button" value="▼"/>	<input type="button" value="Play"/>	<input type="button" value="Stop"/>	
<input checked="" type="checkbox"/> Disaster	<input type="text" value="alarm_disaster"/> <input type="button" value="▼"/>	<input type="button" value="Play"/>	<input type="button" value="Stop"/>	

Show suppressed problems

Update **Cancel**

Show desktop popup for events

- ~ Per user (can't be set by admin)
- ~ Timeout
- ~ Play sound once/10 sec/forever
- ~ Different sounds depending on severity
- ~ Snooze/mute
- ~ Show suppressed problems



PRACTICAL SETUP

1. Create a new user group: Training
2. Create a new Zabbix user
 - ~ Alias: use your training virtual machine hostname (student-XX)
 - ~ Create a secure password
 - ~ Other fields are optional
3. Add to the "Training" user group
4. User type: Zabbix Super Admin
5. Log out and log in with your newly created user
6. Change password for user "Admin" to "P455w0RD"



In all the following labs replace XX in names with your student number



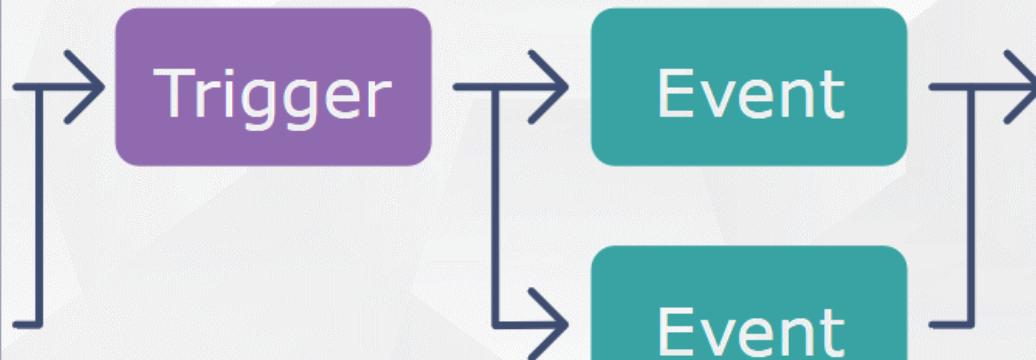
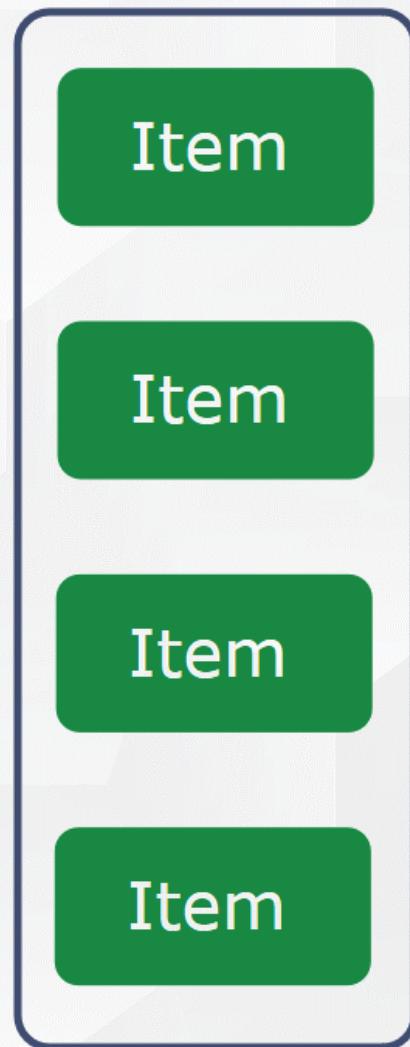
Definitions

Definition	Description
Host	Any device, system or application that you want to monitor
Host Group	Logical grouping of hosts or templates
Item	Source of information / metric
Application	Logical grouping of items
Trigger	Expression representing problem condition
Template	Set of entities (items, triggers, etc.) ready to be applied to one or several hosts
Event	Element state change
Tag	Pre-defined marker for an event
Action	Set of operations based on events filtered by conditions
Operation	Execution of a command (notification, remote command, configuration change)

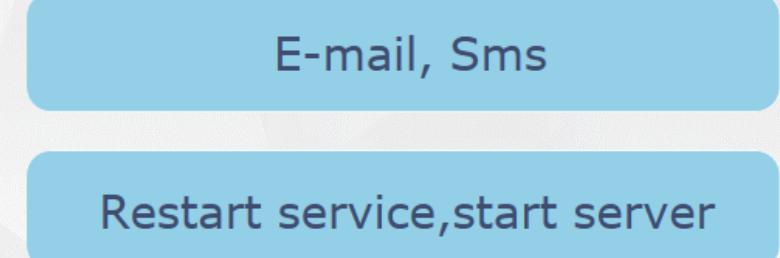
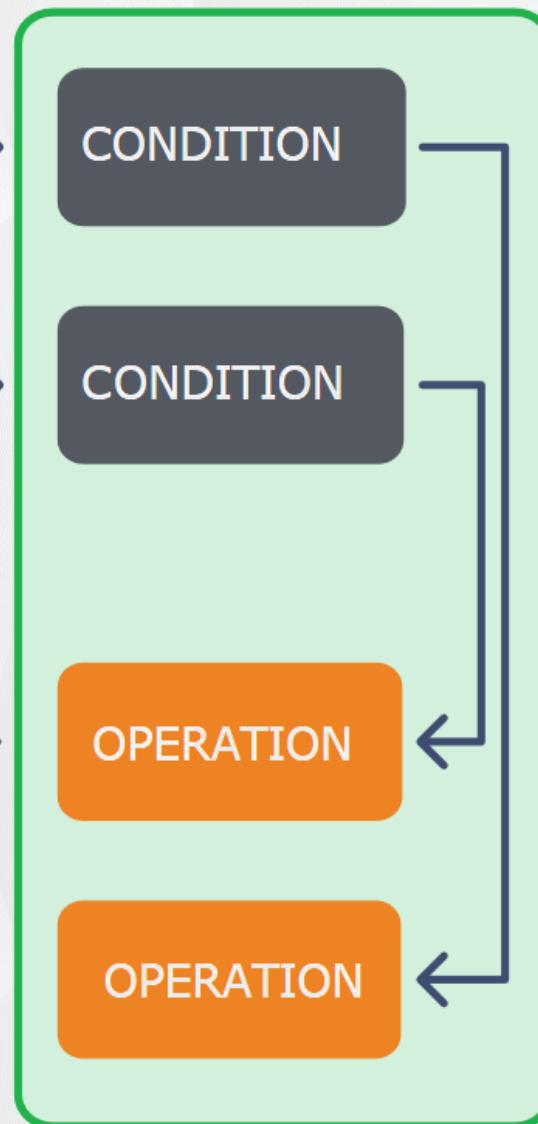


<https://www.zabbix.com/documentation/5.0/manual/definitions>

HOST



ACTION

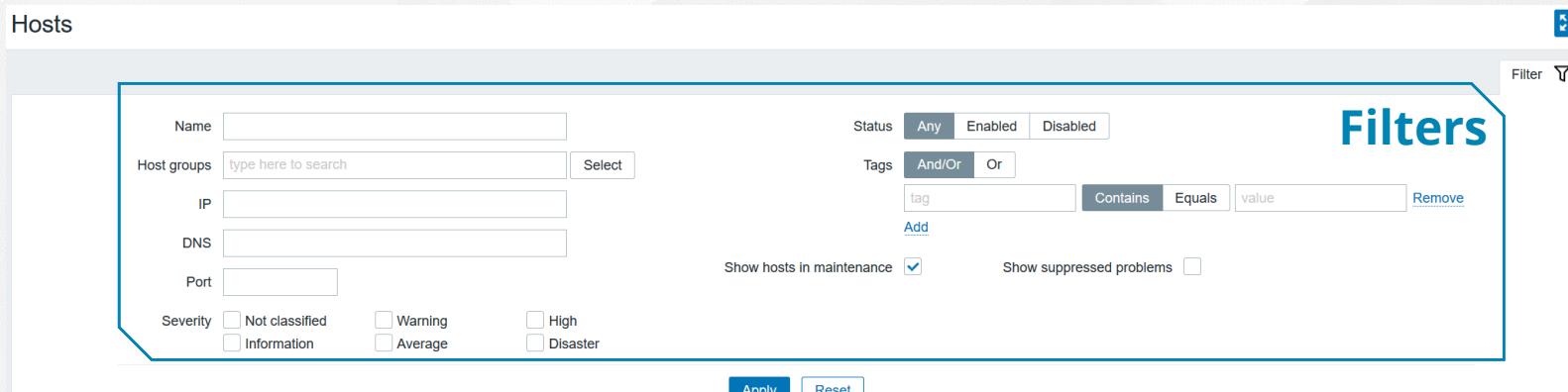




Monitoring > Hosts

Monitoring > Hosts

- ♥ Section provides an easy way to see the status
- ♥ Navigate to configuration, latest data, problems and other sections
- ♥ See tags and number of problems for specific hosts



The screenshot shows the 'Hosts' section of the Zabbix interface. At the top, there's a search bar and several filter options: 'Name', 'Host groups', 'IP', 'DNS', 'Port', 'Severity' (with categories: Not classified, Information, Warning, Average, High, Disaster), and 'Status' (Any, Enabled, Disabled). Below these are 'Tags' filters ('And/Or', 'Or') and checkboxes for 'Show hosts in maintenance' and 'Show suppressed problems'. A large blue box highlights the 'Filters' section. At the bottom of the filter area are 'Apply' and 'Reset' buttons.

Name	Interface	Availability	Tags	Problems	Status
Apache Node1	192.168.7.105: 10050	ZBX SNMP JMX IPMI	Service: Zabbix Type: Web Engine		Enabled
build-Inventory	HOST 7.0.0.1: 10050	ZBX SNMP JMX IPMI			Enabled
builds-Latest data	7.0.0.1: 10050	ZBX SNMP JMX IPMI			Enabled
Data-Host	7.0.0.1: 10050	ZBX SNMP JMX IPMI			Enabled
demo-Problems	7.0.0.1: 10050	ZBX SNMP JMX IPMI			Enabled
demo-Graphs	2.168.7.101: 10050	ZBX SNMP JMX IPMI		1	Enabled
demo-Screens	2.168.7.102: 10050	ZBX SNMP JMX IPMI			Enabled
demo-Web	2.168.7.102: 10050	ZBX SNMP JMX IPMI			Enabled
grafana-Configuration	7.0.0.1: 10050	ZBX SNMP JMX IPMI			Enabled
Kube-SCRIPTS	7.0.0.1: 10050	ZBX SNMP JMX IPMI			Enabled
Linux-Detect operating system	7.0.0.1: 10050	ZBX SNMP JMX IPMI			Enabled
Linux-Ping	7.0.0.1: 161	ZBX SNMP JMX IPMI			Enabled
Linux-Traceroute	2.168.7.101: 10050	ZBX SNMP JMX IPMI		1	Enabled

Links to other sections

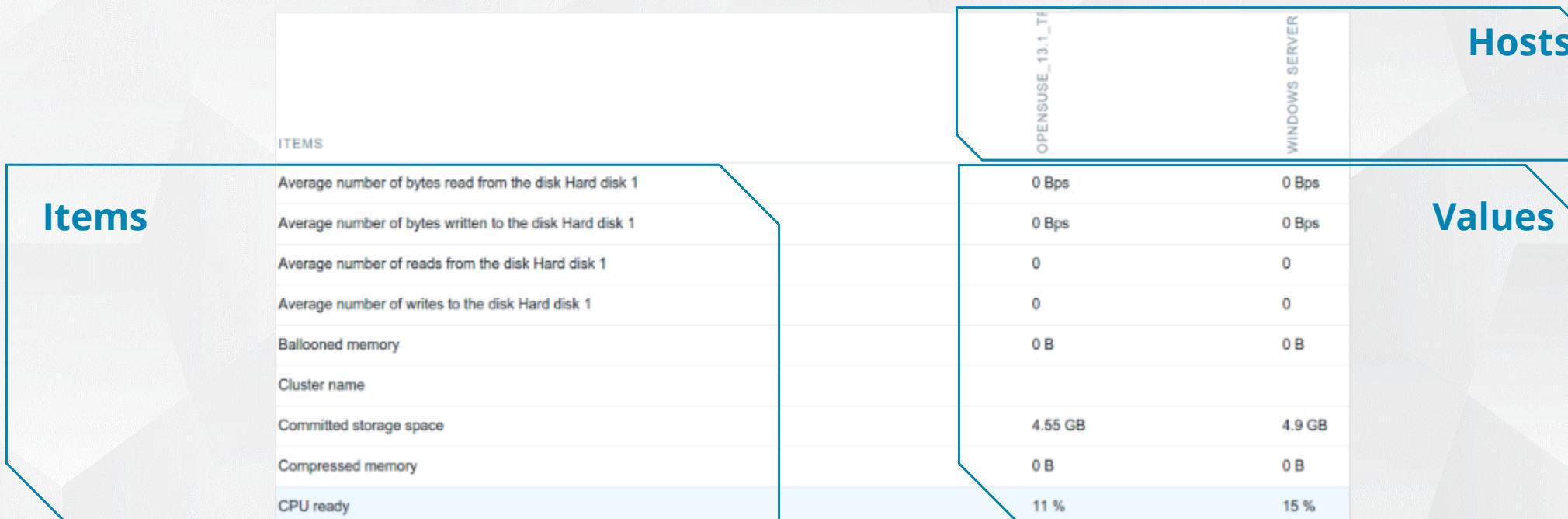
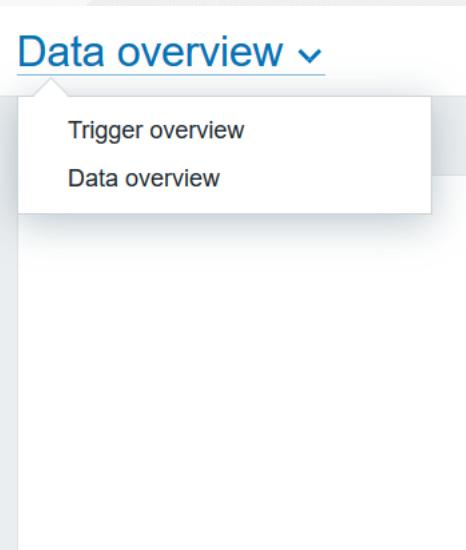
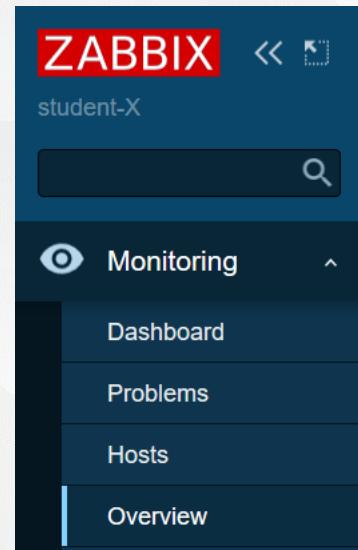
Filters will be adjusted automatically



Monitoring > Overview

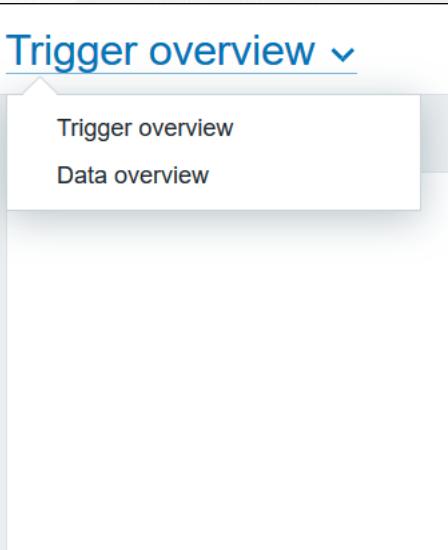
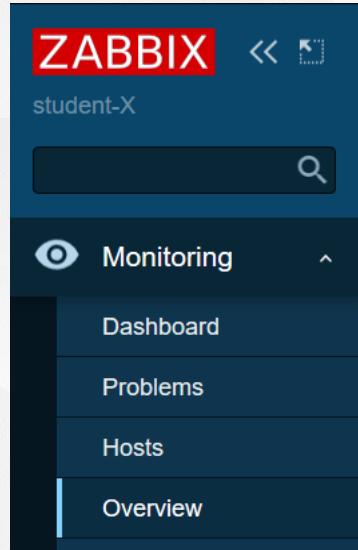
Monitoring > Overview > Data

- ♥ Performance data for a group of servers
- ♥ Displays problems
- ♥ Quick navigation to Graphs and Plain text data



Monitoring > Overview > Triggers

- 心脏病拍打 Status of a group of servers
- 心脏病拍打 Different colours for different trigger severities
- 心脏病拍打 Blinking on a change
- 心脏病拍打 Quick navigation to Events and Graphs



The screenshot shows the Zabbix Trigger Overview page. On the left, a list of triggers is displayed:

- Free disk space is less than 20% on volume Shared memory
- Lack of free swap space on {HOST.NAME}
- Zabbix agent on {HOST.NAME} is unreachable for 5 minutes
- Zabbix discoverer processes more than 75% busy
- {HOST.NAME} is not reachable

On the right, there is a host status visualization and two buttons:

- Problems**: A button with a blue border and a green 'OK' indicator.
- Acknowledge**: A button with an orange background and a checkmark icon.



Monitoring > Latest data

Monitoring > Latest data

心脏病图标 Performance data for a selected server/group

心脏病图标 Simple graphs

心脏病图标 Plain text information

心脏病图标 Configuration details

Latest data

Host groups Select Name

Hosts **HOST1** Select Show items without data
Application Select Show details

Apply **Reset**

<input type="checkbox"/> Host	Name	Last check	Last value	Change
HOST1	CPU (17 items)			
	Context switches per second	2020-05-11 00:36:16	419.1302	-0.843
	CPU guest nice time <small>?</small>	2020-05-11 00:36:18	0 %	Graph
	CPU guest time <small>?</small>	2020-05-11 00:36:17	0 %	Graph
	CPU idle time <small>?</small>	2020-05-11 00:36:19	94.1117 %	+0.1413 %
	CPU interrupt time <small>?</small>	2020-05-11 00:36:20	0 %	Graph

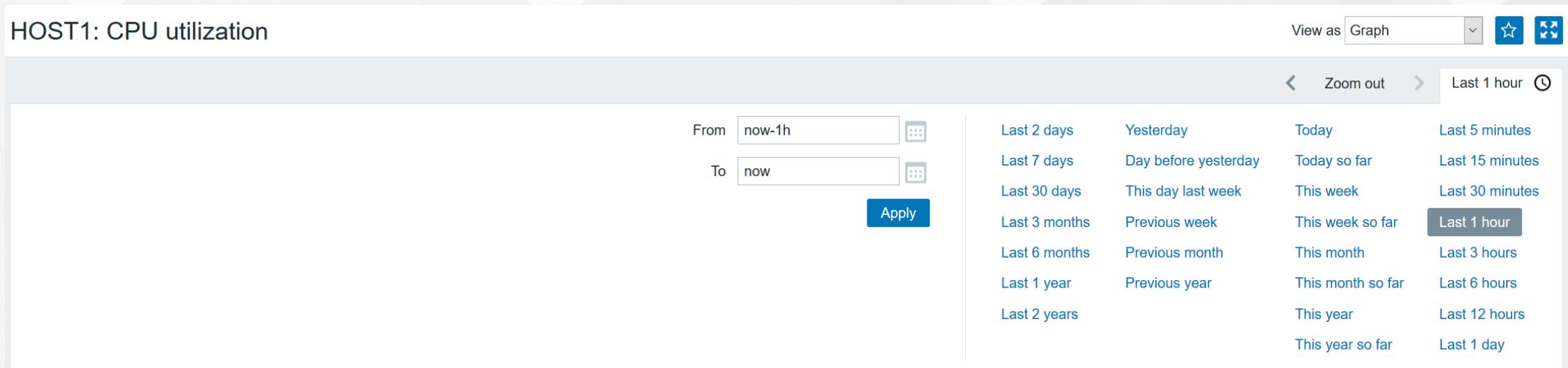
HOST1: CPU utilization

Timestamp CPU utilization

2020-05-11 00:49:19	6.7686
2020-05-11 00:48:19	6.2112
2020-05-11 00:47:19	13.0523
2020-05-11 00:46:19	7.8293
2020-05-11 00:45:19	12.5632
2020-05-11 00:44:19	12.1528
2020-05-11 00:43:19	6.6711

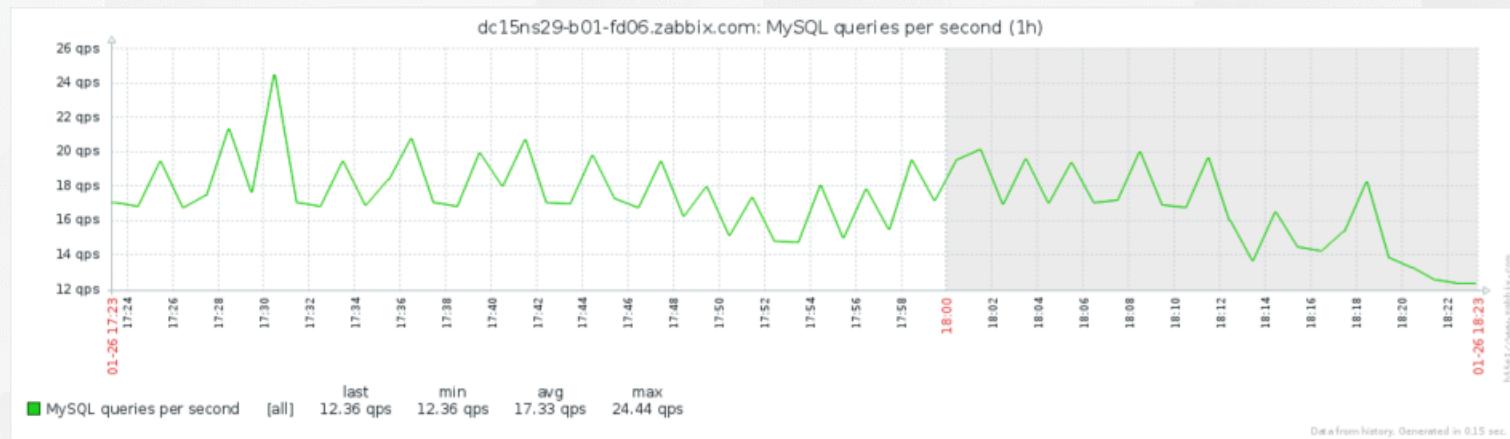
Time selector

- ~ There is a time period selector in the upper right corner
- ~ It allows to select the required period with a mouse click
- ~ This allows to show values for a specific time period

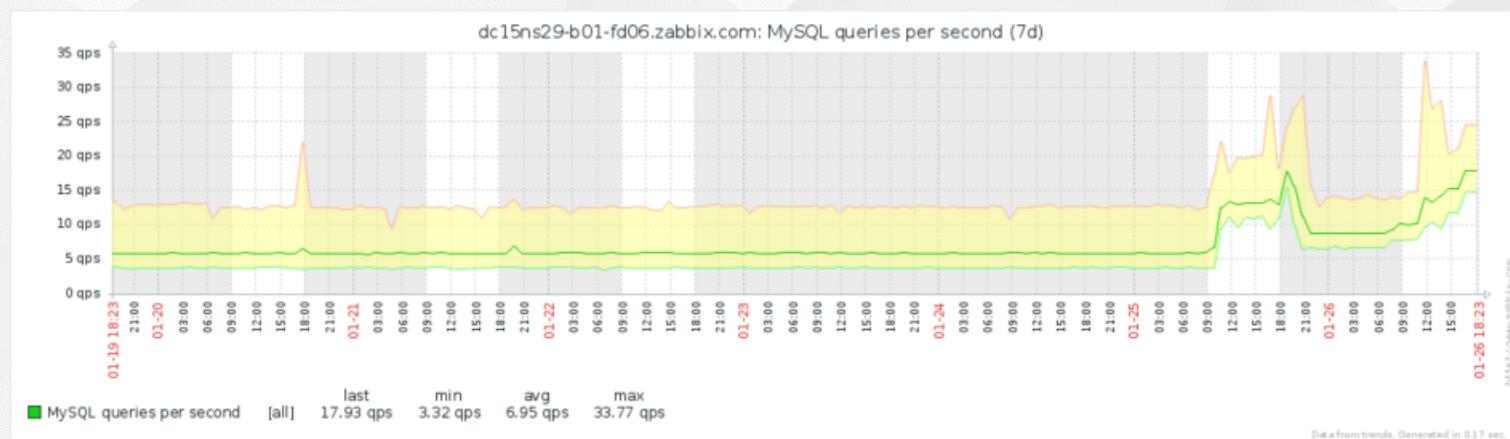


With [Zoom out] and arrows, users can shift or expand the graph time frame

History (raw data)



Trends (min, avg, max)



Latest data



Filter

Select
multiple
items

	Host	Name ▲	Last check	Last value	Change
▼	HOST1	Interface eth0 (2 Items)			
✓		Interface eth0: Bits received	2020-05-11 00:59:33	12.55 Kbps	+824 bps
✓		Interface eth0: Bits sent	2020-05-11 00:59:36	26.38 Kbps	+3.86 Kbps

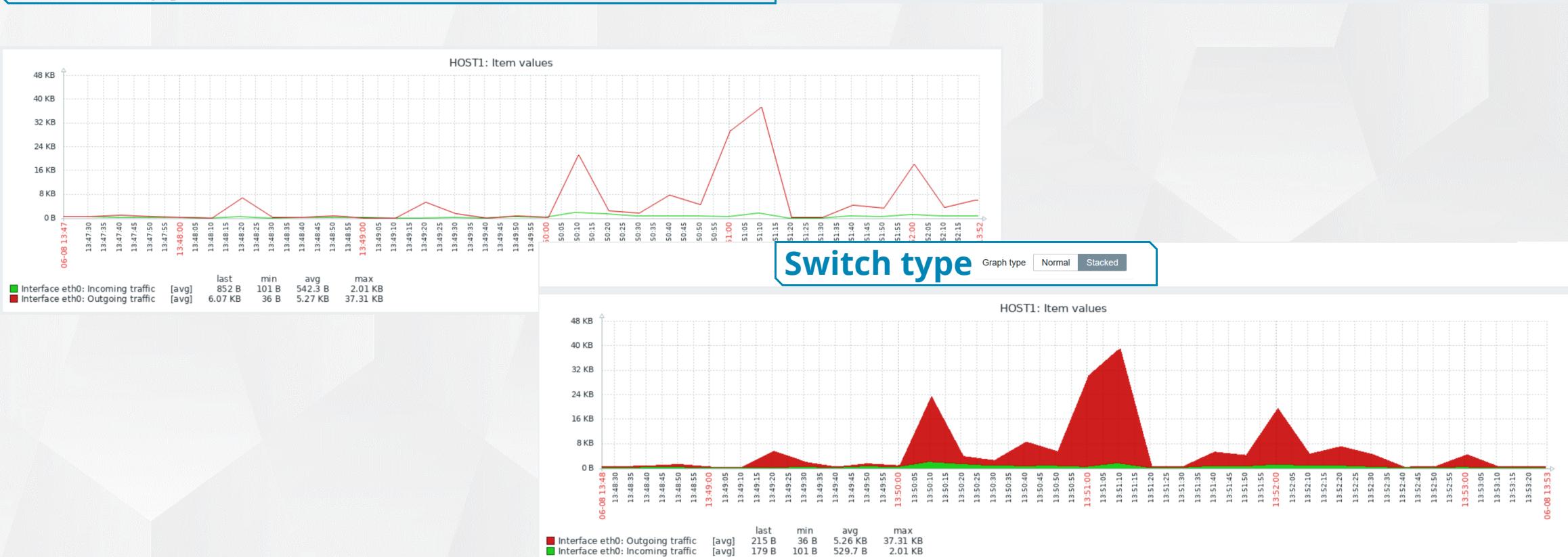
Displaying 2 of 2 found

Choose type

2 selected

Display stacked graph

Display graph



Group of items

- ♥ One application, many items
- ♥ One item, many applications

Collapse and expand items

Applications and items				
	Name ▲	Last check	Last value	Change
▼ Host				
▶ HOST1	CPU (17 Items)			
▼ HOST1	Filesystem / (4 Items)			
	/: Free inodes in %	2020-05-11 13:42:39	99.3087 %	-0.000016 %
	/: Space utilization ?	2020-05-11 13:42:40	22.6389 %	+0.002443 %
	/: Total space ?	2020-05-11 13:42:41	24.99 GB	
	/: Used space ?	2020-05-11 13:42:42	5.66 GB	+640 KB
▶ HOST1	General (9 Items)			
▶ HOST1	Interface eth0 (8 Items)			
▶ HOST1	Inventory (3 Items)			
▶ HOST1	Memory (5 Items)			
▶ HOST1	Monitoring agent (1 Item)			
▶ HOST1	Security (1 Item)			
▶ HOST1	Status (1 Item)			
▶ HOST1	Zabbix raw items (1 Item)			
1 2 ►				
Displaying 1 to 50 of 78 found				



Host groups

Host groups

- ~ Are used for logical grouping of hosts and/or templates
- ~ Permissions are assigned using host groups only
- ~ Can be used in filters based on a group name
- ~ Nested representation of host groups is accomplished by using the '/' forward slash to create multi-level grouping

Examples:

Applications
Network
Servers
Servers/Cloud
Servers/Windows

Location
Location/Africa
Location/Europe
Location/Japan
Location/North America

Templates
Templates/Official
Templates/Services
Templates/Vendors
Templates/Vendors/HP

- ~ A host group may contain multiple hosts
- ~ A host can belong to any number of host groups
- ~ Enable and Disable buttons will enable/disable all hosts belonging to the selected groups
- ~ Delete button:
 - Will unassign hosts from this group and delete the host group
 - An operation will fail if this is the only group for some hosts

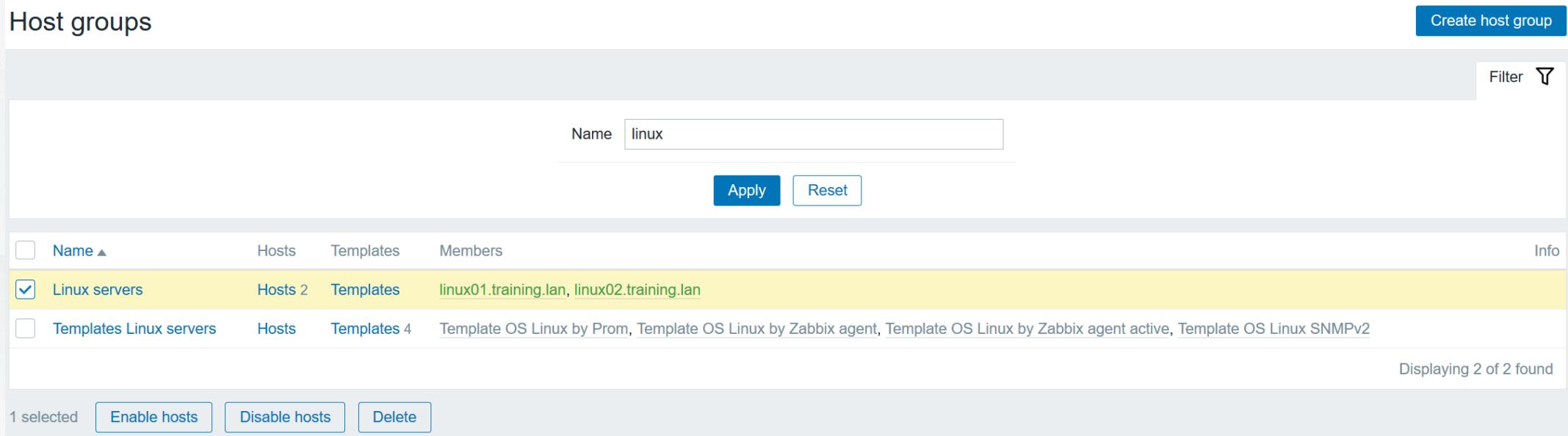
Host groups Create host group

Filter Filter icon

Name	Hosts	Templates	Members	Info
linux	2	4	linux01.training.lan, linux02.training.lan	
Linux servers	2	4	linux01.training.lan, linux02.training.lan	
Templates Linux servers	4	4	Template OS Linux by Prom, Template OS Linux by Zabbix agent, Template OS Linux by Zabbix agent active, Template OS Linux SNMPv2	

Displaying 2 of 2 found

1 selected Enable hosts Disable hosts Delete



Configuration > Host groups > [Create host group]

⚠ Type a unique name and press [Add]

The screenshot shows a modal dialog titled "Host groups". Inside, there is a field labeled "Group name" with the placeholder "New Host Group/Nested name". Below the field are two buttons: "Add" (in blue) and "Cancel".

Alternatively, the same can be done from the Host configuration form

Configuration > Hosts > [Create host]

⚠ Type a unique name like "New host group" and click on "New host group (new)"

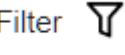
The screenshot shows the "Host" tab of the configuration form. In the "Groups" section, the "Groups" field contains "New host group" and a dropdown menu is open, showing "New host group (new)" as the selected option. Other options in the dropdown include "New host group (new)" and "New host group (new)". To the right of the dropdown is a "Select" button.



Hosts

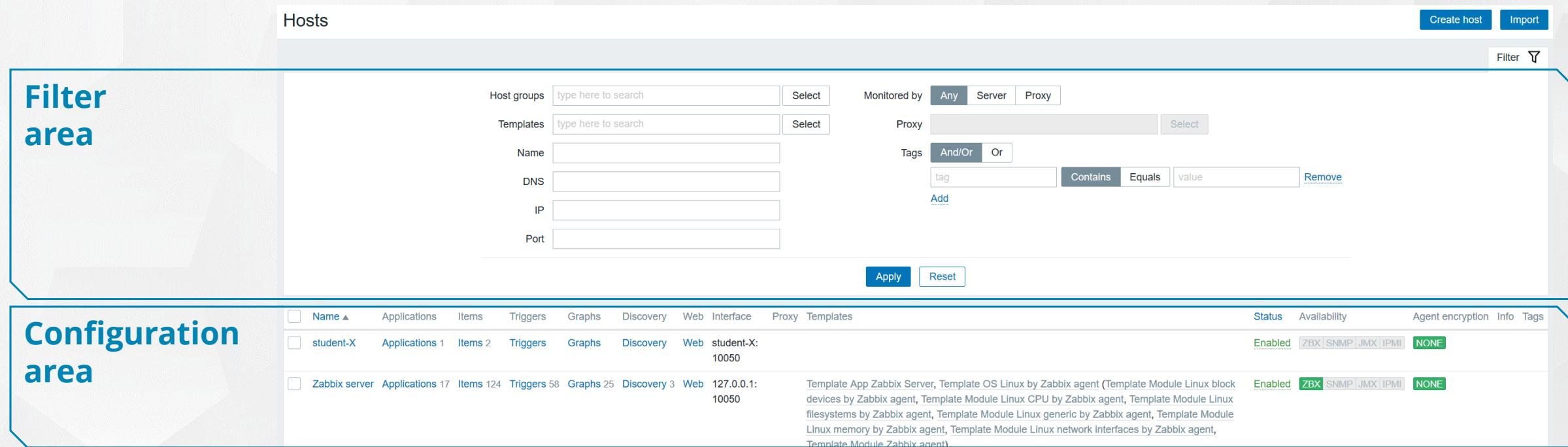
The section where users can create and configure hosts

~ Filter area allows to find specific hosts based on a host group, a host name, etc.

- The filter can be displayed or hidden by clicking on the filter sign 

~ Configuration area allows to change host properties

- Clicking on a host name will open the host configuration form
- Clicking on an entity name will open its configuration page



Filter area

The screenshot shows the 'Hosts' configuration page. On the left, a large blue box highlights the 'Filter area' containing the filter search interface. The interface includes fields for Host groups, Templates, Name, DNS, IP, Port, Monitored by (Any, Server, Proxy), Proxy, Tags (And/Or, Or), and a 'Select' button. Below these are 'Apply' and 'Reset' buttons. To the right of the filter area is the main host list table.

Configuration area

The main part of the page shows a table of hosts. The first host listed is 'student-X', which is currently selected. Its details are shown in a tooltip: 'student-X: 10050'. The second host listed is 'Zabbix server', also with its details shown in a tooltip: 'Template App Zabbix Server, Template OS Linux by Zabbix agent (Template Module Linux block devices by Zabbix agent, Template Module Linux CPU by Zabbix agent, Template Module Linux filesystems by Zabbix agent, Template Module Linux generic by Zabbix agent, Template Module Linux memory by Zabbix agent, Template Module Linux network interfaces by Zabbix agent, Template Module Zabbix agent)'. The table columns include Name, Applications, Items, Triggers, Graphs, Discovery, Web, Interface, Proxy, Templates, Status, Availability, Agent encryption, Info, and Tags.

The Host tab contains general host attributes

All mandatory input fields are marked with a red asterisk.

Hosts

All hosts / Zabbix server Enabled ZBX SNMP JMX IPMI Applications 16 Items 112 Triggers 60 Graphs 20 Discovery rules 3 Web scenarios

Configuration tabs Host Templates IPMI Tags Macros Inventory Encryption

General attributes

* Host name	Zabbix server				
Visible name					
* Groups	Zabbix servers <input type="button" value="X"/> <input type="button" value="Select"/>				
type here to search					
* Interfaces	Type IP address DNS name Connect to Port Default				
Agent	127.0.0.1			IP DNS 10050	<input checked="" type="radio"/> Remove
Add					
Description					
Monitored by proxy	(no proxy) <input type="button" value="▼"/>				
Enabled	<input checked="" type="checkbox"/>				

Update Clone Full clone Delete Cancel

The screenshot shows the Zabbix configuration interface for creating a new host. The 'Host' tab is selected. The host is named 'Zabbix server'. It has an interface defined with type 'Agent' and IP '127.0.0.1'. It is monitored by proxy '(no proxy)'. The host is enabled. A 'Description' field is empty. A 'Groups' dropdown shows 'Zabbix servers'.

Host name (must be defined)

- ~ Is case sensitive and must be unique
- ~ This is the "technical" name of the host
- ~ Alphanumeric characters, spaces, dots, dashes and underscores are allowed
- ~ Leading and trailing spaces are not allowed

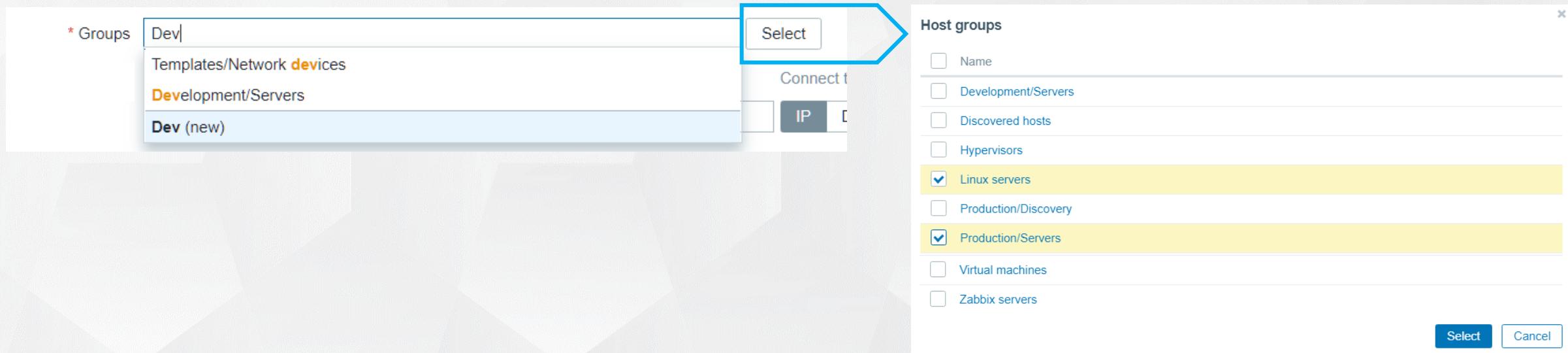
Visible name (optional)

- ~ Can be empty – a "Host name" will be used instead
- ~ If defined, it is also case sensitive and must be unique
- ~ If a "Visible name" is set, it will be used in all frontend sections for visualisation
- ~ Has UTF-8 support, local languages can be used

* Host name	Testing server
Visible name	Testēšanas vide

Host groups

- ⚠ A host must have at least one host group
- ⚠ Select button allows to select one or more existing groups
- ⚠ Groups input field can also be used to
 - Create and link the host to a new group - by typing a non-existing group name
 - Find and link the host to an existing group - by typing a part of the group name and selecting it



Host interfaces

⚠ Several host interface types are supported

- Zabbix Agent
- SNMP
- JMX
- IPMI

⚠ Interface used for monitoring cannot be removed

⚠ Use bulk requests option allows to enable/disable bulk data collection for SNMP

* Interfaces	Type	IP address	DNS name	Connect to	Port	Default
Agent	127.0.0.1			IP DNS	10050	<input checked="" type="radio"/> Remove
Agent		hostname.local.lan		IP DNS	10050	<input type="radio"/> Remove
SNMP	127.0.0.1			IP DNS	161	<input checked="" type="radio"/> Remove
* SNMP version	SNMPv2					
* SNMP community	\${SNMP_COMMUNITY}					
	<input checked="" type="checkbox"/> Use bulk requests					
JMX	127.0.0.1			IP DNS	12345	<input checked="" type="radio"/> Remove
IPMI	127.0.0.1			IP DNS	623	<input checked="" type="radio"/> Remove
Add						
Description	Agent SNMP JMX IPMI					



At least one interface must be defined for a host, even if it is not used

Templates

心脏病图标 In this section users can

- See linked templates
- Unlink
- Unlink and clear

心脏病图标 Link existing templates

- Auto lookup field
- Select from list

The screenshot shows the 'Host' configuration page with the 'Templates' tab selected. At the top, there are tabs for Host, Templates, IPMI, Tags, Macros, Inventory, and Encryption. Below the tabs, there are two sections: 'Linked templates' and 'Link new templates'. The 'Linked templates' section shows a table with one row: Name (Template OS Linux by Zabbix agent) and Action (Unlink, Unlink and clear). The 'Link new templates' section contains a search bar with the placeholder 'type here to search' and a 'Select' button. At the bottom, there are five buttons: Update, Clone, Full clone, Delete, and Cancel.

The screenshot shows a modal dialog box titled 'Templates'. At the top, it says 'Host group' followed by 'Templates/Applications' with a 'Select' button. Below that is a table with three rows, each with a checkbox and a template name: 'Name' (unchecked), 'Template App Apache by HTTP' (unchecked), and 'Template App Apache by Zabbix agent' (unchecked).

IPMI settings

Needed if a host has an IPMI interface

This section controls settings for

- Authentication algorithms
- Privilege level
- Username
- Password

Host Templates **IPMI** Tags Macros Inventory Encryption

Authentication algorithm

Default

None
MD2
MD5
Straight
OEM
RMCP+

Privilege level

Callback

User

Operator
Admin
OEM

Username

Password

Update Clone Full clone Delete Cancel

Host-level tags

❖ Event tags are realized as a pair of the tag name and value

❖ You can either use just the name or pair it with a value

- MySQL
- Service: MySQL
- Application: Java

❖ All problems of this host will be tagged with the values entered here

❖ Macros are supported in tags

The screenshot shows the 'Tags' tab of a host configuration in Zabbix. There are two entries in the table:

Name	Value	Action
Location	Riga	Remove
Environment	Training	Remove

Below the table are buttons for 'Add', 'Update', 'Clone', 'Full clone', 'Delete', and 'Cancel'.



Tags are covered in the problem detection topics

Host level user macros

Macros Inventory Encryption

Host macros Inherited and host macros

Macro	Value	Description	
{\$USER.MACRO}	Value	T	description
{\$USER.MACRO.MASKED}	🔒	description

Add

Remove Remove

A dropdown menu is open over the second row, showing two options: "Text" (selected) and "Secret text".

Two types:

- ♥ Text (visible to all users with Read-Write access)
- ♥ Secret text (masked - no way of seeing values)



Macros are covered in the upcoming topics

Host inventory

- ~ Manual or Automatic way of storing values from hosts for later use (like a variable)
- ~ Gives users an option to overview/find hosts by values in the fields
- ~ Stored information can be used later in the
 - Media (emails, SMS, etc.)
 - Tags
 - Scripts

Host	Templates	IPMI	Tags	Macros	Inventory	Encryption
					<input type="radio"/> Disabled <input type="radio"/> Manual <input checked="" type="radio"/> Automatic	
Type	Virtual server					
Type (Full details)	Linux student-X 3.10.0-1062.18.1.el7.x86_64					
Name	student-X					← Hostname



The inventory is covered in the upcoming topics

Configuration > Hosts

[Mass update] allows to modify

Host groups

Description

Proxy

Status

Templates

IPMI

Tags

Inventory

Encryption

Name	Applications	Items	Triggers	G
net.cisco.c7600.d2	Applications 9	Items 18	Triggers 9	G
net.cisco.c7600.d1	Applications 9	Items 18	Triggers 9	G

2 selected [Enable](#) [Disable](#) [Export](#) [Mass update](#)

Hosts

Host Templates IPMI Tags Inventory Encryption

Host groups [Add](#) [Replace](#) [Remove](#)

New Group (new) [Select](#)
type here to search

Description New description

Monitored by proxy (no proxy)

Status Enabled

[Update](#) [Cancel](#)

Availability is kept for 4 different types of checks separately

~~~ ZBX      Zabbix passive agent

~~~ SNMP     Simple Network Management Protocol

~~~ JMX      Java Management Extensions

~~~ IPMI     Intelligent Platform Management Interface

| AVAILABILITY |
|--------------------------------|
| ZBX SNMP JMX IPMI |
| ZBX SNMP JMX IPMI |
| ZBX SNMP JMX IPMI |

Error messages are preserved for each interface status

Calculated by the server internally

Shown in the list and the host properties

Green - available

Red - not available (error upon mouseover)

Gray - unknown or not configured

Get value from agent failed: cannot connect to [[student-xx]:10050]: [111] Connection refused X

Zabbix server will set the host availability icon to gray if

- ~ There are no enabled items on the corresponding interface
- ~ The host has been switched to be monitored by other server or proxy (until config cache updates)
- ~ The host is monitored by a proxy that appears to be offline
- ~ The host is disabled



PRACTICAL SETUP

1. Create new host groups:

- ~ Training
- ~ Training/Servers

2. Create a new host:

- ~ Host name: Training-VM-XX
- ~ Host group: Training/Servers

3. Add a Host-level tag:

- ~ Tag name: Location Value: <use your current Training location>



Items

Item (an individual metric) - gathers data from a host or performs calculations

Workflow usually is

- ~ Create a new host or use an existing one
- ~ Create a new item and set parameters
 - Name
 - Type
 - Key (must be unique on a host)
 - Data type
 - Update interval
 - Other (Authentication, data storage periods)

Some items will need 4-5 parameters, others - more than 10



<https://www.zabbix.com/documentation/5.0/manual/config/items/item>

Configuration > Hosts > Items

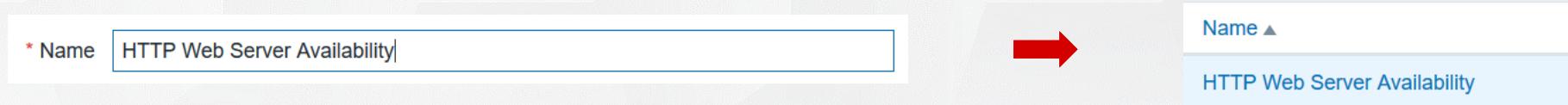
[Create item]

Item Preprocessing

| * Name | Processor load (1 min average per core) | | | | | | | | |
|--------------------------------|---|--------|-----------------|--------|--------|----------|------------|-----|-----------------|
| Type | Zabbix agent | | | | | | | | |
| * Key | system.cpu.load[percpu,avg1] Select | | | | | | | | |
| Type of information | Numeric (float) | | | | | | | | |
| Units | | | | | | | | | |
| * Update interval | 1m | | | | | | | | |
| Custom intervals | <table border="1"> <thead> <tr> <th>Type</th> <th>Interval</th> <th>Period</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>Flexible</td> <td>Scheduling</td> <td>50s</td> <td>1-7:00:00-24:00</td> </tr> </tbody> </table> Add | Type | Interval | Period | Action | Flexible | Scheduling | 50s | 1-7:00:00-24:00 |
| Type | Interval | Period | Action | | | | | | |
| Flexible | Scheduling | 50s | 1-7:00:00-24:00 | | | | | | |
| * History storage period | Do not keep history Storage period 1w | | | | | | | | |
| * Trend storage period | Do not keep trends Storage period 365d | | | | | | | | |
| Show value | As is show value mappings | | | | | | | | |
| New application | | | | | | | | | |
| Applications | <ul style="list-style-type: none"> -None- CPU Filesystems General Memory Network interfaces OS Performance Processes Security | | | | | | | | |
| Populates host inventory field | -None- | | | | | | | | |
| Description | The processor load is calculated as system CPU load divided by number of CPU cores. | | | | | | | | |

- 心脏病图标 All mandatory input fields are marked with a red asterisks
- 心脏病图标 The form changes according to the selected Type and other parameters
- 心脏病图标 Some values like an Update interval can be set to 0 or left blank
- 心脏病图标 [Select] button for the Key field displays list of keys for the selected item type
- 心脏病图标 Some items (such as SNMP and JMX) need to have corresponding interface on a host.

This is how the item will be named and displayed in the other frontend sections

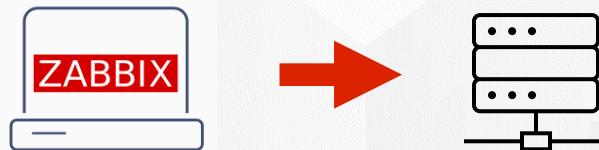


Naming guide:

- ♥ Choose a simple, descriptive name for each item.
- ♥ Prefix item names (metric) with object name (metric location):
 - <metric location>: <metric name>, for example:
 - Interface eth0: Bits in
 - Interface eth0: Bits out
- ♥ You may use the # if the metric location is just a number or index:
 - #0: CPU utilization
 - #1: CPU utilization
- ♥ Consider adding suffixes such as “per second”, “per hour”, etc., to describe the metric better.

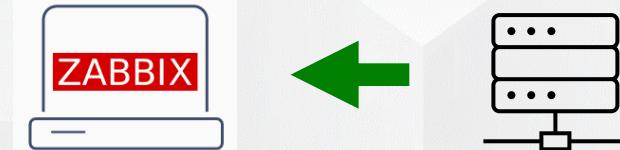


<https://www.zabbix.com/documentation/guidelines/doc>



Passive (Polling)

- ~~~ Zabbix agent
- ~~~ Simple check (agent-less)
- ~~~ SNMP agent (v1, v2, v3)
- ~~~ IPMI agent
- ~~~ JMX agent
- ~~~ HTTP agent
- ~~~ SSH agent (pass/key)
- ~~~ Telnet agent
- ~~~ Database monitor (ODBC)
- ~~~ External check



Active (Trapping)

- ~~~ Zabbix agent (active)
- ~~~ SNMP trap
- ~~~ Zabbix trapper
- ~~~ HTTP agent if "Enable trapping" is set



Other (processed internally)

- ~~~ Zabbix internal
- ~~~ Zabbix aggregated and calculated
- ~~~ Dependent item

General syntax:

* Key

`key[parameter1,parameter2,<parameter3>]`

Select

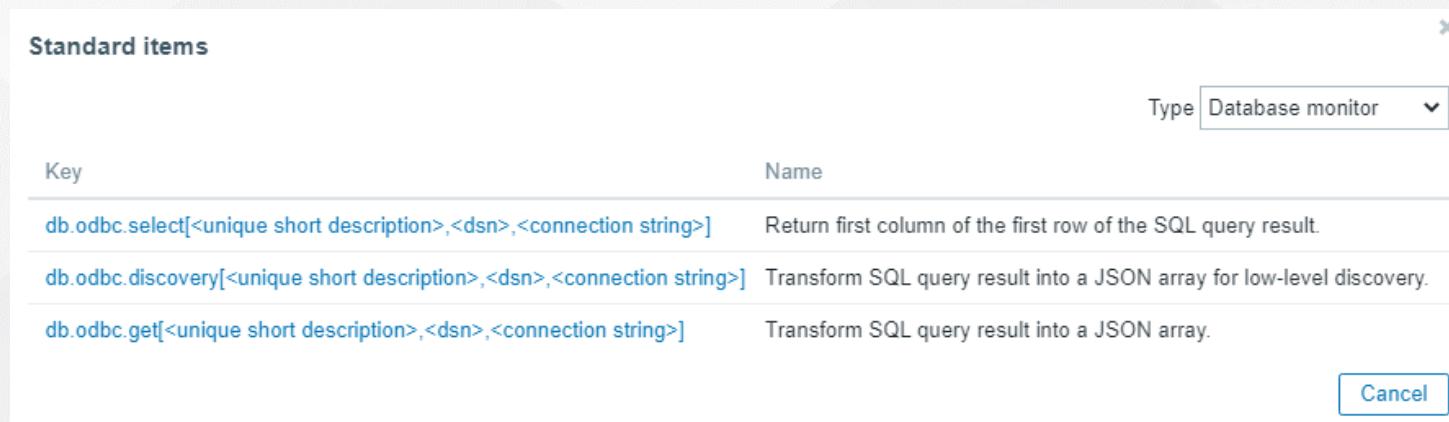
~ Key

- Predefined for some item types (Zabbix agent, Internal items, Simple checks, etc.)
- Free form string for other types (SNMP, Zabbix trapper, HTTP agent, etc.)
- Must be unique per host/template

~ Parameters

- Some parameters are mandatory and must be specified
- The "<>" means optional parameter

~ Quick reference in the frontend by pressing the [Select] button right to the item key field



https://www.zabbix.com/documentation/5.0/manual/config/items/itemtypes/zabbix_agent

| Flexible | Non-flexible |
|------------------------------------|-----------------|
| net.tcp.listen[631] | agent.ping |
| system.hw.cpu[<cpu>,<info>] | system.boottime |
| vfs.file.contents[file,<encoding>] | vfs.fs.get |

Examples:

`net.if.in[if,<mode>]`

`net.if.in[eth0]`

`net.if.in[eth0,]`

`net.if.in[eth0,errors]`

`proc.cpu.util[<name>,<user>,<type>,<cmdline>,<mode>,<zone>]`

`proc.cpu.util[zabbix_agentd]`

`proc.cpu.util[,root]`

`proc.cpu.util[,,nginx]`

Usage of quote marks:

| Correct | Wrong |
|---|---|
| <code>net.if.in["eth0",errors]</code> | <code>net.if.in["eth0,errors"]</code> |
| <code>log[/var/log/messages,"Error: [A-Za-z,.]"]</code> | <code>log[/var/log/messages,Error: [A-Za-z,.]]</code> |

Host interface

- ~ An agent interface is default, preselected and used when creating a new item
- ~ This field is available when opening an item on the host level
- ~ Some item types do not use it, for example: Zabbix agent (active), Calculated, etc.
- ~ If multiple interfaces exist on a host, they will be available in the dropdown list

The screenshot shows the Zabbix configuration interface for host interfaces. On the left, there is a table with four rows:

| Type | IP address | DNS name | Connect to | Port | |
|-------|------------|------------|------------|------|-------|
| Agent | | student-XX | IP | DNS | 10050 |
| Agent | 1.2.3.4 | | IP | DNS | 10050 |
| SNMP | 2.3.4.5 | | IP | DNS | 161 |

A blue arrow points from the 'Host interface' dropdown on the right towards the 'IP address' column of the table.

On the right, a dropdown menu titled 'Host interface' lists the available interfaces:

- * Host interface: student-XX : 10050
- Agent: student-XX : 10050
- 1.2.3.4 : 10050
- SNMP: 2.3.4.5 : 161
- IPMI: 3.4.5.6 : 623

Type of the data as stored in the database

- ♥ Numeric (unsigned) - 64bit unsigned integer
- ♥ Numeric (float) - floating point number (Float64)
- ♥ Character - short text data (255 characters)
- ♥ Log - data with optional log related properties: timestamp, source, severity, eventid (64 KB)
- ♥ Text - text data (64 KB)

If a wrong data type is selected, the item will become unsupported

- ♥ Example: data 0.0125 (float) and type Numeric(unsigned)

Before being stored in the database, the text values get truncated to match the database value type limit.



If upgrading from older versions, the "history" table must be manually upgraded to Float64

Units are used for the numeric data only (unsigned/float)

~ If set, K/M/G/T/P/E/Z/Y prefix will be added

- 5000 W -> 5 KW

~ Special processing to display B, Bps, unixtime, uptime, s

- 1024 B -> 1 KB
- 125 uptime -> 00:02:05
- 1589199730 unixtime -> 2020.05.11 12:22
- 61 s -> 1m 1s

~ Any unit can be prevented from being converted by using a <!> prefix

- 3500 !RPM -> 3500 RPM
- 10000 !W -> 10000 W
- 125 !uptime -> 125 uptime
- 61 !s -> 61 s



Units are processed by the frontend to display raw data in the human-readable format.

Retrieve a new value for this item every N seconds

- ~ Minimum update interval is 1 second
- ~ Maximum allowed update interval is 86400 seconds (1 day)
- ~ Time suffixes are supported, e.g. 30s, 1m, 2h, 1d
- ~ Defaults to seconds if a suffix is not used
- ~ Single user macro (variable) is supported
- ~ Can be set to 0 (never checked)

Update interval cannot be set for the following item types

- ~ Zabbix trapper
- ~ SNMP trapper
- ~ Dependent items

Passive item value can be collected immediately using the [Execute now] button.



<https://www.zabbix.com/documentation/5.0/manual/appendix/suffixes>

Flexible intervals

- Allows to override item update interval on a specific time period
- If multiple flexible intervals overlap, the smallest time is used
- Update interval of 0 can be used together with a flexible interval to emulate scheduling on a specific time of the day only

* Update interval

| Custom intervals | Type | Interval | Period | Action |
|------------------|----------|------------|--------|------------------------|
| | Flexible | Scheduling | 10m | 6-7,00:00-24:00 |
| | | | | Remove |

[Add](#)



Not supported for the C-based Zabbix agent active checks



https://.../5.0/manual/config/items/item/custom_intervals#Flexible%20intervals

Can be used to collect values at the specific time

~ A scheduling interval is defined as: md<filter>wd<filter>h<filter>m<filter>s<filter> where:

- md - month days
- wd - week days
- h - hours
- m - minutes
- s - seconds

* Update interval

| Type | Interval | Period | Action |
|----------|------------|---------|------------------------|
| Flexible | Scheduling | wd1-5h9 | Remove |

[Add](#)

Examples:

~ wd1-5h9 - every Monday till Friday at 9:00

~ h9m/30;h10 - execute at 9:00, 9:30, 10:00

~ h9-10m10-40/30 - execute at 9:10, 9:40, 10:10, 10:40

~ md1wd1h9m30 - every 1st day of each month at 9:30 if it is Monday

Scheduled checks are executed in addition to the "Update interval" checks

 Not supported for the C-based Zabbix agent active checks

 https://...5.0/manual/config/items/item/custom_intervals#Scheduling_intervals

History and trends are two ways of storing collected data in Zabbix

- ~ History keeps each collected value
- ~ Trends keep averaged information on hourly basis and therefore are less resource-hungry

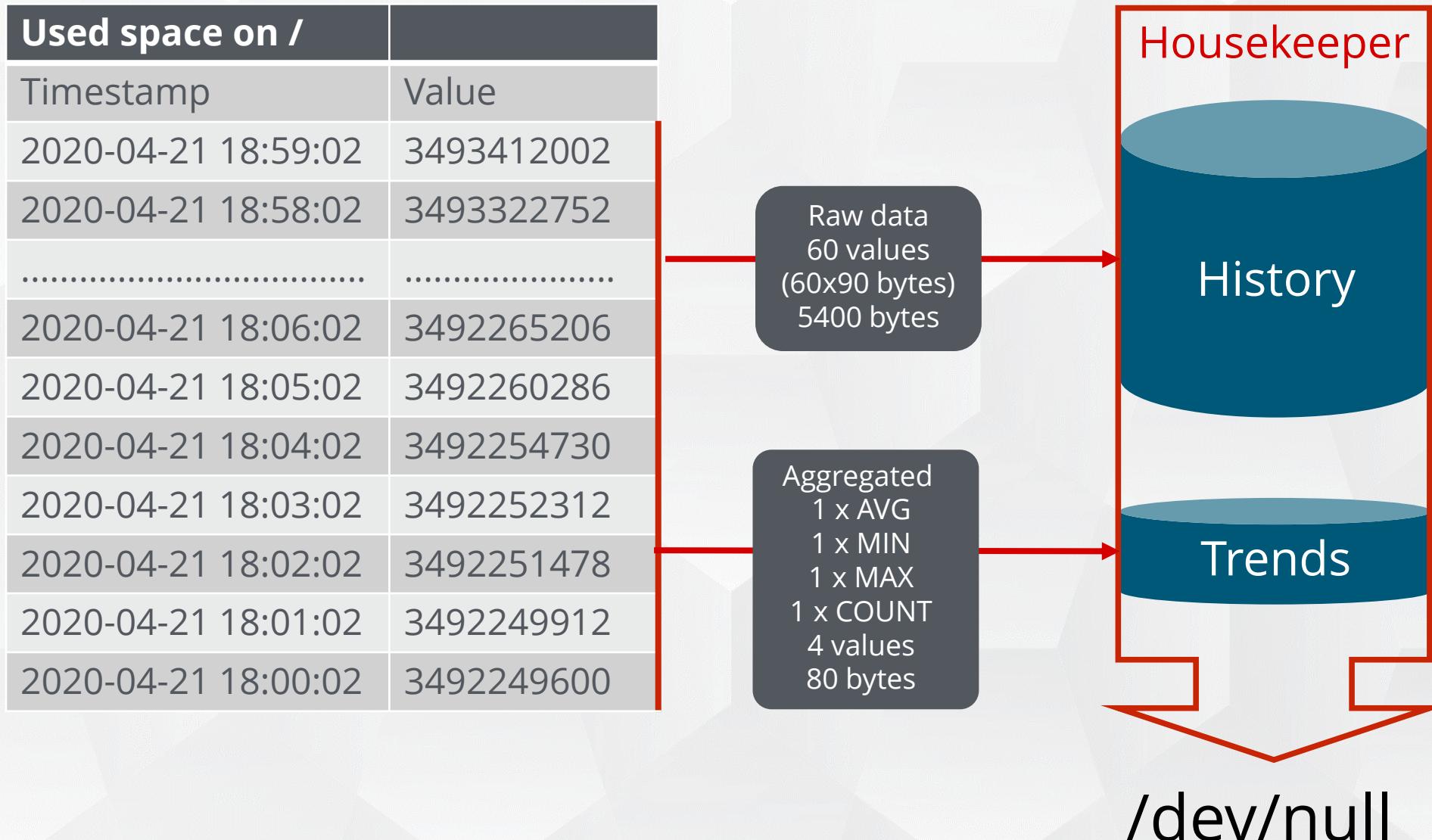
You can set for how many days history or trends will be kept

- ~ In the item properties form
- ~ When mass-updating items
- ~ When setting up housekeeper tasks

By default, the housekeeper removes older data once in an hour

If History is set to "Do not keep history"

- ~ The item will update only dependent items and inventory
- ~ Related triggers won't be evaluated



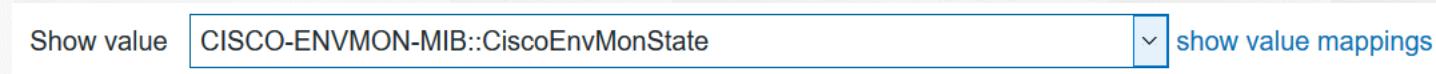
https://www.zabbix.com/documentation/5.0/manual/config/items/history_and_trends



Visualise or decode values in the human-readable format

- Used almost everywhere in the frontend and in notifications
- Matched numerical value can be represented as a string

Configuration > Hosts > {host} > Items > [Create New] or edit existing



Example: Monitoring > Latest data

| net.cisco.c2911 | Fans (5 Items) | | |
|--------------------------|-------------------|---------------------|--------------|
| <input type="checkbox"/> | Fan 1: Fan status | 2018-05-21 17:39:04 | normal (1) |
| <input type="checkbox"/> | Fan 2: Fan status | 2018-05-21 17:39:04 | normal (1) |
| <input type="checkbox"/> | Fan 3: Fan status | 2018-05-21 17:39:04 | shutdown (4) |

To create a new or modify an existing value map, go to
Administration > General > Value mapping

| Value mapping ▾ | | Create value map | Import |
|--------------------------|--------------------------------|-----------------------------------|------------------------|
| <input type="checkbox"/> | Name ▲ | Value map | Used in items |
| <input type="checkbox"/> | Alarm state | 0 => Ok
1 => Alarm | Yes |
| <input type="checkbox"/> | APC Battery Replacement Status | 1 => unknown
2 => notInstalled | |

Click [Create value map]

* Name

* Mappings

| Value | Mapped to | Action |
|-------|-----------------|------------------------|
| 123 | ⇒ One Two Three | Remove |
| 45 | ⇒ Four Five | Remove |

[Add](#)

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



<https://www.zabbix.com/documentation/5.0/manual/config/items/mapping>

Applications are used for logical sorting and grouping of items

Configuration > Hosts > {host} > Applications

Applications

All hosts / Example host - Applications Enabled ZBX SNMP JMX IPMI Applications 2 Items 6 Triggers Graphs Discovery rules Web scenarios Filter ▾

Host groups type here to search Select

Hosts Example host - Applications × Select

type here to search

Apply Reset

| Application | Items | Info |
|---|---------|------|
| <input checked="" type="checkbox"/> CPU | Items 1 | |
| <input type="checkbox"/> Network | Items 2 | |

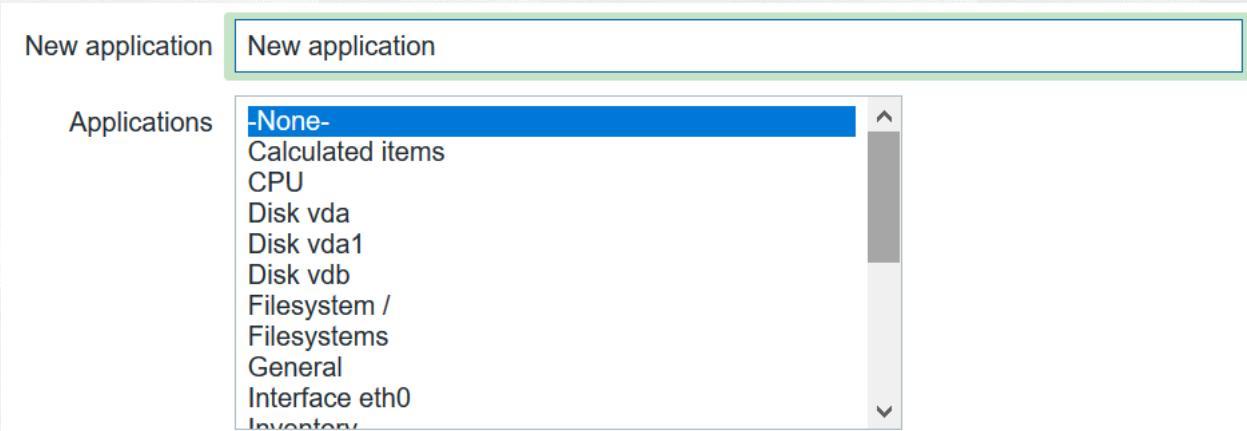
Displaying 2 of 2 found

1 selected

Configuration > Hosts > {host} > Applications > [Create new application]

* Name

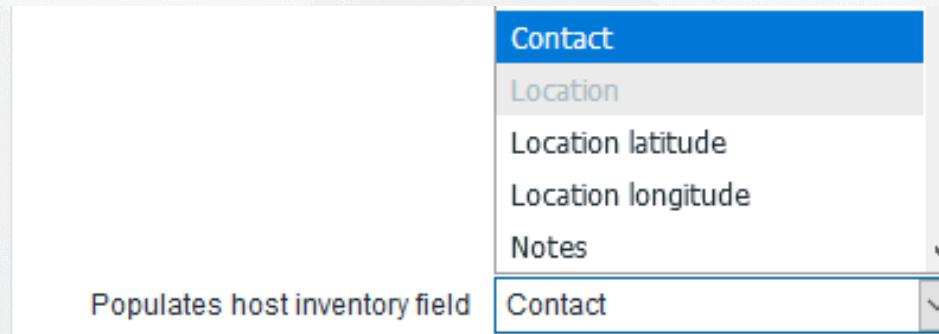
The same can be done during creating/modifying an item



<https://www.zabbix.com/documentation/5.0/manual/config/items/applications>

Select a host inventory field that the item value will populate

⚠️ Grayed out if another item on the host/template is using the field



⚠️ This will work if an automatic inventory population is enabled for the host

⚠️ This field is not available if the Type of information is set to "Log"



<https://www.zabbix.com/documentation/5.0/manual/config/hosts/inventory>

It is possible to test the item while creating/modifying it

- Item key and connection parameters must be set properly
- In the item configuration form, press the [Test] button
- Values are processed by the frontend and not saved to the database

If unselected allows manual input

Test item

Get value from host

Host address student-XX

Proxy (no proxy)

Port 10050

Value 0.570000

Time now

Previous value

Prev. time

End of line sequence LF CRLF

Result Result converted to Numeric (float)

raw value

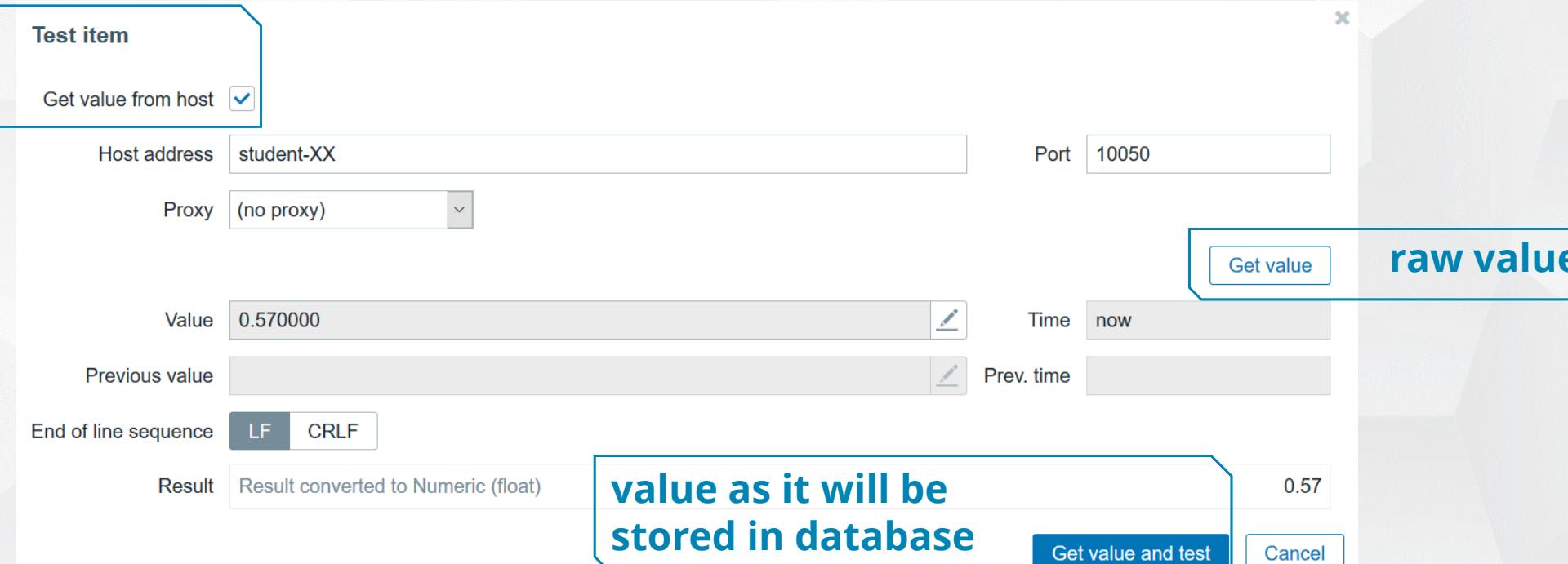
Get value

value as it will be stored in database

0.57

Get value and test

Cancel



Available only for passive items!

Configuration > Hosts > Items

- Find items from multiple hosts, host groups
- Find unsupported items
- Further drill down by sub-filters

Items

[Create item](#)

All hosts / Zabbix server Enabled ZBX SNMP JMX IPMI Applications 18 Items 124 Triggers 58 Graphs 25 Discovery rules 3 Web scenarios Filter 

| | | | | | | | |
|-------------|---|-----------------|--|---------------------|--|-----------|--|
| Host groups | <input type="text" value="type here to search"/> Select | Type | <input type="text" value="all"/>  | Type of information | <input type="text" value="all"/>  | State | <input type="text" value="all"/>  |
| Hosts | <input type="text" value="Zabbix server X type here to search"/> Select | Update interval | <input type="text"/> | History | <input type="text"/> | Status | <input type="text" value="all"/>  |
| Application | <input type="text"/> Select | | | Trends | <input type="text"/> | Triggers | <input type="text" value="all"/>  |
| Name | <input type="text"/> | | | | | Template | <input type="text" value="all"/>  |
| Key | <input type="text"/> | | | | | Discovery | <input type="text" value="all"/>  |

[Apply](#) [Reset](#)

Configuration > Hosts > Items

⚠ Select multiple items in the list and press [Mass update]

| <input type="checkbox"/> | Wizard | Name ▾ | Triggers | Key | Interval | History | Trends | Type |
|-------------------------------------|--------|------------------|------------|---------------------------|----------|---------|--------|--------------|
| <input type="checkbox"/> | ... | Total memory | Triggers 1 | vm.memory.size[total] | 1m | 7d | 365d | Zabbix agent |
| <input checked="" type="checkbox"/> | ... | System uptime | Triggers 1 | system.uptime | 30s | 2w | 0d | Zabbix agent |
| <input checked="" type="checkbox"/> | ... | System name | Triggers 1 | system.hostname | 1h | 2w | | Zabbix agent |
| <input checked="" type="checkbox"/> | ... | Available memory | Triggers 1 | vm.memory.size[available] | 1m | 7d | 365d | Zabbix agent |

- [Item](#)
- [Preprocessing](#)

- Type Original
- Host interface Original
- JMX endpoint Original
- URL Original
- Request body type Original
- Request body Original

3 selected

[Enable](#) [Disable](#) [Execute now](#) [Clear history](#) [Copy](#) [Mass update](#) [Delete](#)

To execute a passive check immediately, press [Execute now]

- 心脏病 In an existing item (or a discovery rule) configuration form
- 心脏病 For selected items/rules in the list of items/discovery rules

| <input type="checkbox"/> Wizard | Name ▾ | Triggers | Key | Interval | History | Trends | Type |
|-------------------------------------|-------------------|------------|-----------------------|----------|---------|--------|--------------|
| <input checked="" type="checkbox"/> | ... Total memory | Triggers 1 | vm.memory.size[total] | 1m | 7d | 365d | Zabbix agent |
| <input checked="" type="checkbox"/> | ... System uptime | Triggers 1 | system.uptime | 30s | 2w | 0d | Zabbix agent |

2 selected Enable Disable Execute now Clear history Copy Mass update Delete

Successfull execution will return a green message



Red message - something is wrong (check the Details)



! This functionality is supported for passive checks only.

i https://www.zabbix.com/documentation/5.0/manual/config/items/check_now

Configuration > Hosts > {host} > Items

- ~ Single item deletion from an item configuration form
- ~ Multiple items deletion by selecting many items

The screenshot shows a list of three selected items in a Zabbix interface:

| Item Description | Triggers | Time Step |
|--|--------------------------------|-----------|
| Template Module Zabbix agent: Zabbix agent availability | 1 zabbix[host,agent,available] | 1m |
| Template Module Zabbix agent: Zabbix agent ping | agent.ping | 1m |
| Template App Zabbix Server: Zabbix configuration cache, % used | 1 zabbix[rcache,buffer,pused] | 1m |

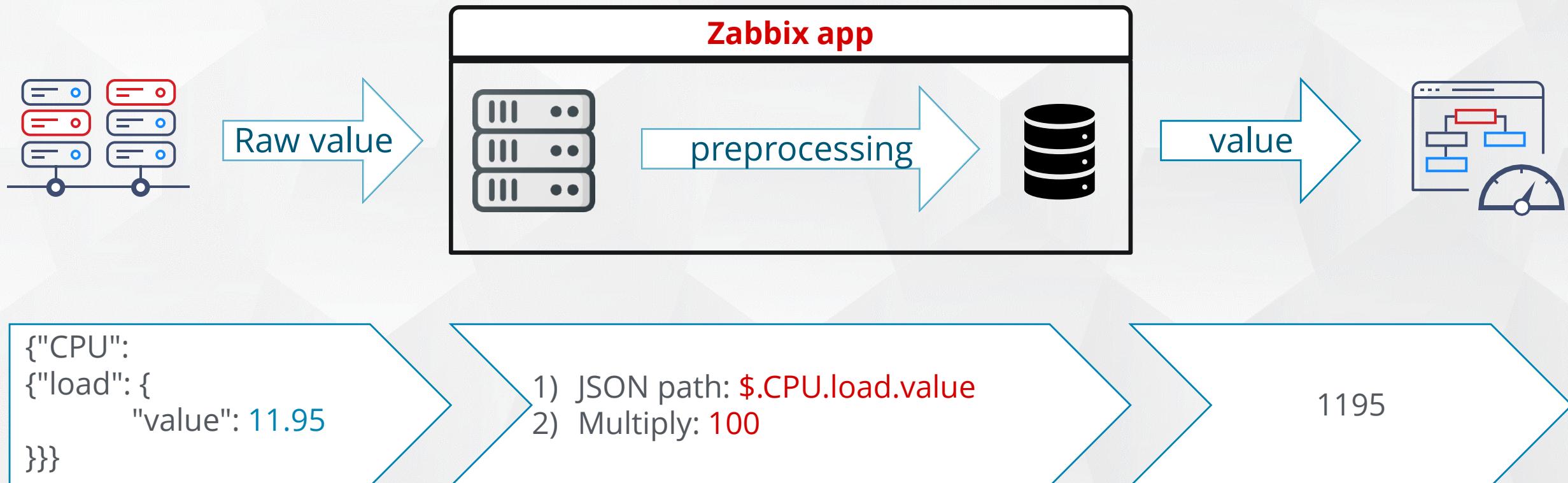
At the bottom left, there are buttons: Enable, Disable, Execute now, and Clear history. The Clear history button is highlighted. A modal dialog is open in the center, asking "Delete history of selected items?" with "OK" and "Cancel" buttons. The dialog has a page number indicator "2 3 ▶".



The history clean up starts immediately and might take a long time!



Preprocessing



Transformation rules for received values

Item Preprocessing

| Preprocessing steps | Name | Parameters | Custom on fail | Actions |
|---|--------------------|---|-------------------------------------|---|
| 1: | Regular expression | <input style="width: 200px; height: 25px; border: 1px solid #ccc; border-radius: 5px; padding: 5px; margin-bottom: 5px;" type="text" value="^a-zA-Z\w+(\d+)"/> <input style="width: 200px; height: 25px; border: 1px solid #ccc; border-radius: 5px; padding: 5px;" type="text" value="\\1"/> | <input checked="" type="checkbox"/> | Test Remove |
| 2: | Custom multiplier | <input style="width: 100px; height: 25px; border: 1px solid #ccc; border-radius: 5px; padding: 5px; margin-bottom: 5px;" type="text" value="0.125"/> <input style="width: 100px; height: 25px; border: 1px solid #ccc; border-radius: 5px; padding: 5px;" type="text" value="0"/> | <input checked="" type="checkbox"/> | Test Remove |
| 3: | Discard unchanged | | <input type="checkbox"/> | Test Remove |
| Add Update Clone Check now Clear history and trends Delete Cancel | | | | |

- 心脏病图标 Multiple transformations are possible
- 心脏病图标 Each type has its own set of parameters
- 心脏病图标 Custom on fail allows to discard/override value or an error
- 心脏病图标 Testing for all steps or a single step

⚠ Testing multiple steps

Test item

Get value from host

Value Time

Previous value Prev. time

End of line sequence LF CRLF

Preprocessing steps

| Name | Result |
|----------------------|--------|
| 1: Change per second | 1122 |
| 2: Custom multiplier | 8976 |

Result 8976

⚠ If some step fails - an error will give a clue about what's wrong

Preprocessing steps

| Name | Result |
|---|--|
| 1: Regular expression
Custom on fail | ! cannot perform regular expression "^[a-zA-Z]+(\d+)" match for value of type "string": pattern does not match <input type="button" value="X"/> |
| 2: Custom multiplier | |
| 3: Discard unchanged | |

- ~ Transformations are executed in the order in which they are defined
- ~ The order can be changed by dragging and dropping
- ~ All preprocessing is done by Zabbix server and proxies
- ~ An item will become unsupported if any of the preprocessing steps fails
- ~ It is possible to react on errors and introduce recovery options

| Don't change stored data | [!] Change stored data |
|--------------------------|-------------------------------------|
| Units | Data type (different history table) |
| Value mapping | Preprocessing |



<https://www.zabbix.com/documentation/5.0/manual/config/items/preprocessing>

| | | | | |
|-------------------|--------------------|--|-----------------------------------|-------|
| Text | Regular expression | Match regex pattern and customize output | | |
| | | Threads_cached 0
Threads_connected 39 | Threads_connected.(\d*) | 39 |
| | Replace | Find the search string and replace it with another (or nothing). | | |
| | | UP | Search string: Up; Replacement: 1 | 1 |
| | Trim | Removes provided symbols on both sides (right/left) | | |
| | | C 36 C | Parameters: C | 36 |
| | Right trim | Removes provided symbols on the right side | | |
| | | C 36 C | Parameters: C | C 36 |
| Arithmetic | Left trim | Removes provided symbols on left side | | |
| | Custom multiplier | Value * multiplier | | |
| Change | | 88 | Parameters: 0.125 | 11 |
| | Simple change | Value - previous value (used for counters) | | |
| | | 21 | Prev_value: 11 | 10 |
| | Change per second | Value - previous value / time - previous time | | |
| | | Value: now=21, prev=11
Time: now=1582207687, prev=1582207682 | (21-11)/(1582207687-1582207682) | 2 vps |

| | | | | |
|--------------------------|--|---|--|-------|
| Numerical systems | Boolean to decimal | Convert the value from boolean format to decimal. Textual representation is translated into either 0 or 1 | | |
| | TRUE/FALSE, up/down | => | 1/0 | |
| | Octal to decimal | | | |
| | 2322 | => | 1234 | |
| Structured data | Hexadecimal to decimal | 4D2 | => | 1234 |
| | XML Xpath | Extract value or fragment from XML data using XPath functionality. | | |
| | <book category="cooking">
<title>Zabbix manual</title>
<price>30.00</price></book> | number(/book/price) | | 30 |
| JSON Path | | | | |
| | {"store": {"bicycle": {
"color": "red",
"price": 19.95}}} | \$store.bicycle.price | | 19.95 |
| CSV to JSON | Convert CSV file data into JSON format | | | |
| | "parameter", "value"
diameter, 12 | , " | [{"\\"parameter\\": "diameter", "\\"value\\": "12"}] | |

| | | | | |
|-----------------------|---|--|-----------------------------|----|
| Custom scripts | JavaScript | JavaScript function with a single parameter 'value' and user provided function body.
Example: to perform Fahrenheit to Celsius conversion | | |
| | | 68 | return (value - 32) * 5 / 9 | 20 |
| Validation | In range
Matches regular expression
Does not match regex
Check for error in JSON
Check for error in XML
Check for error using regular expression | Multiple ways how to check received value.
+ <i>Custom on fail</i> => override value/error | | |
| | | 20 | min=10, max=21 | 20 |
| Throttling | Discard unchanged
Discard unchanged with heartbeat | Discard a value if it's same as previous one.
Received one is not saved in the database. | | |
| | v1=0, v2=0, v3=0 | v2 and v3 => discarded | | |
| | | v1=0 | | |

| Prometheus | Prometheus pattern | Extract required data from Prometheus metrics. | |
|------------|-------------------------------------|---|------|
| | cpu1{cpu="cpu-u",host="host1"} 1.19 | cpu1{cpu="cpu-u"} | 0.19 |
| | Prometheus to JSON | Convert required Prometheus metrics to JSON. | |
| | cpu1{cpu="cpu-u",host="host1"} 1.19 | [
{
"name": "cpu1",
"value": "0.19",
"line_raw": "cpu1{cpu=\"cpu-u\",host=\"host1\"} 0.19",
"labels": {
"cpu": "cpu-u",
"host": "host1"
},
"type": "untyped"
}
] | |

PREPROCESSING - THROTTLING

| mm:ss | Values | Discard unchanged | Discard unchanged with heartbeat 30s | |
|-------|--------|-------------------|--------------------------------------|--|
| 00:00 | 0 | 0 | 0 | No value because same as previous |
| 00:05 | 0 | | | |
| 00:10 | 0 | | | |
| 00:15 | 1 | 1 | 1 | Received different value |
| 00:20 | 1 | | | |
| 00:25 | 1 | | | |
| 00:30 | 1 | | | |
| 00:35 | 1 | | | |
| 00:40 | 0 | 0 | 0 | Received different value |
| 00:45 | 0 | | | |
| 00:50 | 0 | | | |
| 00:55 | 0 | | | |
| 01:00 | 0 | | | |
| 01:05 | 0 | | | |
| 01:10 | 0 | | | Value written because of heartbeat 30s |
| 01:15 | 0 | | | |
| 01:20 | 1 | 1 | 1 | Received different value |
| 01:25 | 1 | | | |
| 01:30 | 0 | 0 | 0 | Received different value |
| 01:35 | 0 | | | |
| 01:40 | 0 | | | |
| 01:45 | 0 | | | |
| 01:50 | 0 | | | |
| 01:55 | 0 | | | |
| 02:00 | 0 | | | Value written because of heartbeat 30s |
| 02:05 | 0 | | | |

Most common reasons, why an item becomes "Not supported"

- ~ Item key is not found
- ~ Item key does not allow parameters
- ~ Timeout during metric collection
- ~ Value is not available | wrong value type | too small or too large
- ~ No permissions | wrong credentials
- ~ Failed preprocessing steps

Not supported items are rechecked

- ~ Every 10 minutes by default
- ~ By pressing [Execute now]

Administration > General > Other

Other configuration parameters ▾

- ~ Define a refresh rate of the "Not supported" item checks

* Refresh unsupported items



Not supported items will negatively affect performance of Zabbix server



Data collection



Agent-less monitoring

Availability and performance of remote services

♥ Syntax

- net.tcp.service[service,<ip>,<port>]
- net.udp.service[service,<ip>,<port>]
- net.tcp.service.perf[service,<ip>,<port>]

♥ Examples

- net.tcp.service[ftp]
- net.tcp.service[ssh,,1022]
- net.tcp.service.perf[http,,8080]

Creates a TCP connection and expects specific response for

♥ sftp, imap, ldap, nntp, pop, smtp, ssh, telnet

Creates a TCP connection without expecting and sending anything

♥ http, tcp

Host accessibility by ICMP

Uses fping

- ~ Full path in the server configuration file
- ~ Correct uid/permission settings
- ~ SELinux can prevent Zabbix from running fping
- ~ Uses fping defaults (depends on the platform)

Source IP settings (the first default interface)

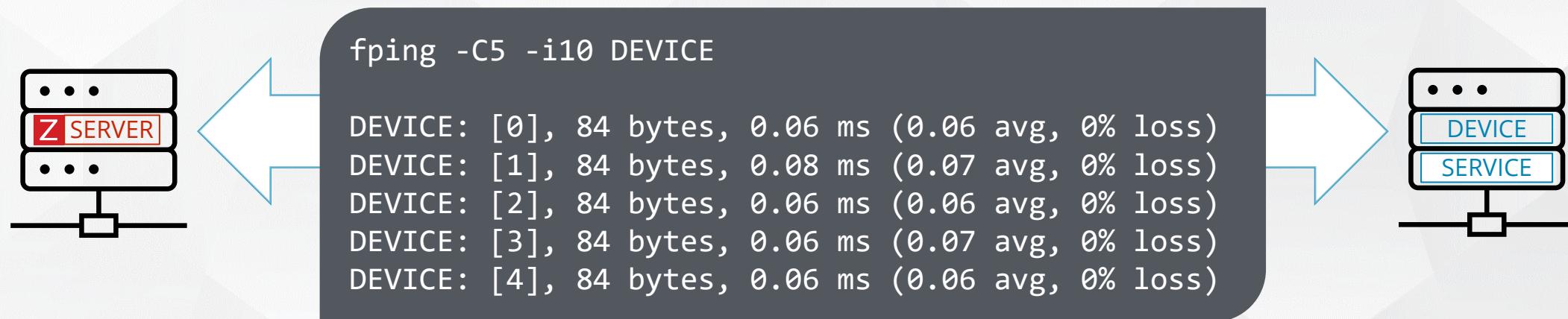
IPv6 supported by fping6 in most distributions

Supported item keys:

icmpping[<target>,<packets>,<interval>,<size>,<timeout>]
icmppingloss[<target>,<packets>,<interval>,<size>,<timeout>]
icmppingsec[<target>,<packets>,<interval>,<size>,<timeout>,<mode>]

Example key: icmpping[,5,10]

How it works (under the hood):



⌚ fping

- `-C n` count of pings to send, report results in the verbose format
- `-i n` interval between sending ping packets (in milliseconds)



https://www.zabbix.com/documentation/5.0/manual/config/items/itemtypes/simple_checks

PRACTICAL SETUP

1. Create new:
 - 1) Host: training.lan
 - ~ Visible name: Training Resources
 - ~ Add to group: Training/Servers
 - ~ Interface: DNS name training.lan
 - 2) Applications:
 - ~ Simple check, Service
 - 3) Items:
 - ~ ICMP ping
 - ~ Service Web performance
 - ~ Service NTP availability
 - 4) Add/assign new items to the corresponding applications
2. Make sure that the items are receiving data and the results are displayed in a human-readable format

 Advanced task: Introduce throttling for the NTP item with 1h heartbeat. Why?!



QUESTIONS?



Time for a break :)