



**ZABBIX** 5.0 LTS

Freedom and integrity  
of monitoring



# Quick recap of Zabbix 4.2 and 4.4

# Zabbix 4.2

April, 2019

High frequency monitoring with throttling

Data collection: HTTP agent, Prometheus

Preprocessing: validation and JavaScript!

Preprocessing by Proxies

Enhanced tag management



# Zabbix 4.4

September, 2019

New Zabbix Agent: **plugins**, scheduler and more

**Web hooks** for alerting and notifications

Support of **TimescaleDB**

Built-in **knowledge base** for metrics and triggers



































































































































**Standard** for Zabbix Templates

A graphic for the Zabbix 5.0 LTS release. It features a red square on the left containing the text '5.0' in white. To the right of the square is a vertical red line. Further right, the text 'LTS release' is written in red, and 'May 12, 2020' is written in black.

5.0

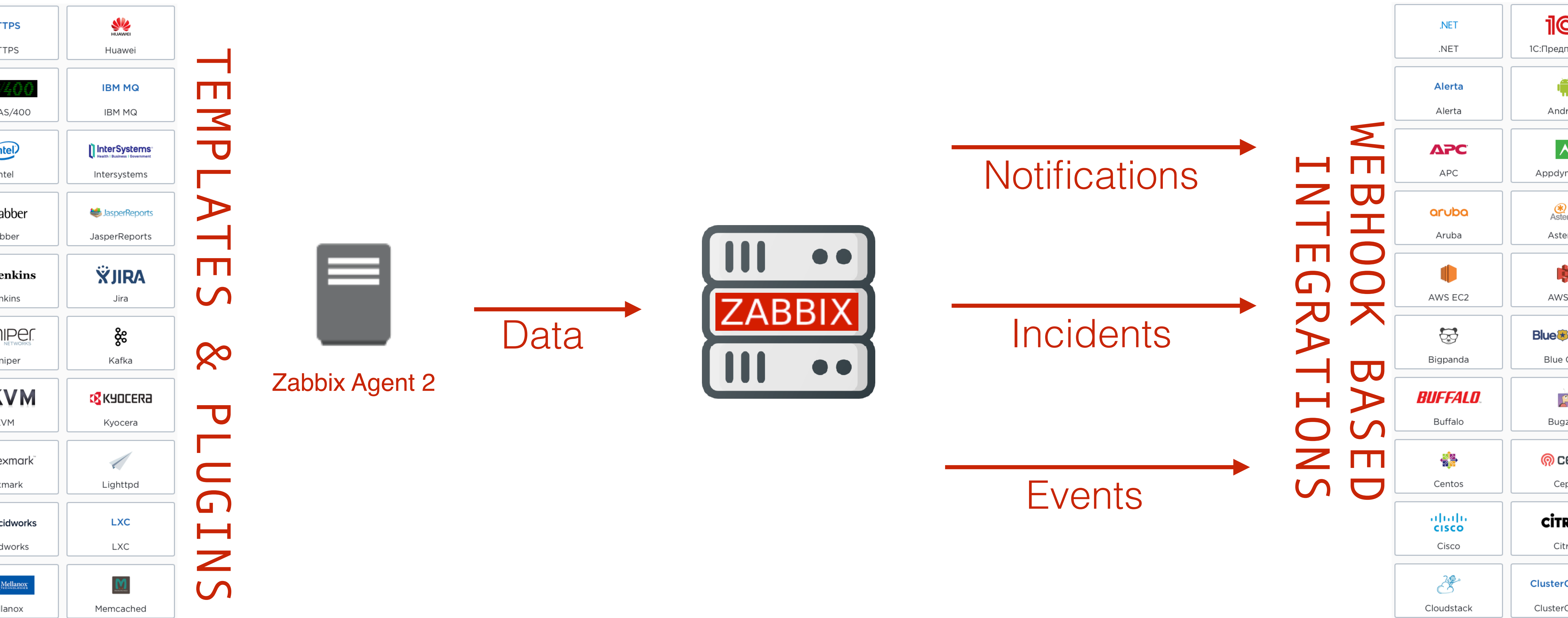
LTS release  
May 12, 2020

# Available templates for monitoring & integrations

 .NET	 1C:Предприятие	 Active Directory	 ActiveMQ	 Alcatel Lucent	 Cloudstack	 ClusterControl	 Confluence	 Cooling	 CoreOS	 HTTP	 HTTPS	 Huawei
 Alerta	 Android	 Ansible	 Antivirus	 Apache	 Couchbase	 cPanel	 D-Link	 Database monitoring	 Datacom	 IBM AIX	 IBM AS/400	 IBM MQ
 APC	 Appdynamics	 Application monitoring	 Arduino	 Arista	 DB2	 Debian	 Dell	 DNS	 Docker	 Ingress	 Intel	 InterSystems
 Aruba	 Asterisk	 Avaya	 AWS	 AWS CloudWatch	 Drupal	 Elasticsearch	 Eltex	 EMC	 Emerson	 IRC	 Jabber	 JasperReports
 AWS EC2	 AWS S3	 Backup	 Bacula	 Barracuda	 Exim	 Extreme Networks	 F5 Networks	 Facebook Messenger	 Fedora	 JBoss	 Jenkins	 Jira
 Bigpanda	 Blue Coat	 BMC Remedy	 BorgBackup	 Brocade	 firebird	 Firewalls	 Flowdock	 Fortinet	 FreeBSD	 Julia	 Juniper	 Kafka
 Buffalo	 Bugzilla	 C#	 Capacity planning	 Cassandra	 FreshDesk	 Fujitsu Siemens	 Galera cluster	 Geckoboard	 Git	 Kubernetes	 KVM	 Kyocera
 Centos	 Ceph	 Check Point	 Chef	 Chrome extension	 Glassfish	 GLPi	 Go	 Google Apps	 Google Cloud	 Lenovo	 Lexmark	 Lighttpd
 Cisco	 Citrix	 Cloud Foundry	 Cloud monitoring	 Cloudera	 Google Maps	 Grafana	 Graylog	 Hadoop	 HAProxy	 Logstash	 Lucidworks	 LXC
 Cloudstack	 ClusterControl	 Confluence	 Cooling	 CoreOS	 High Availability	 Hipchat	 Hitachi HDS, HNAS	 HP Enterprise	 HP-UX	 Mattermost	 Mellanox	 Memcached

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

# Making a platform for high quality solutions



Ticketing



Alerting











Monitoring

# Easy to contribute!

## 3 simple steps

Sign Zabbix Contributor Agreement (ZCA)

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

Make Zabbix Pull Request

<https://git.zabbix.com>

Zabbix Dev Team will review and accept if everything is fine



# Official support of Zabbix Agent2 for Linux and Windows

# Most advanced monitoring agent on the market!



New Zabbix Agent  
(zabbix\_agent2)



Plugin infrastructure

Support of long running scripts

Parallel active checks

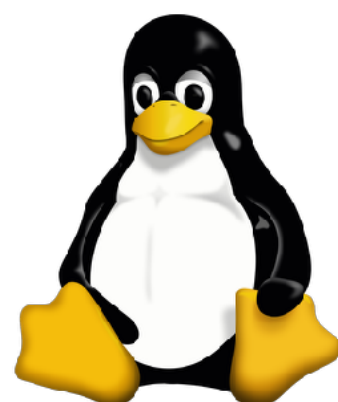
Support of flexible intervals for all checks

Support of persistent connections (DB connections)

Accepting incoming traps and events (MQTT subscribe, listening TCP/UDP ports, etc)

Monitoring of systemd services out of the box

Drop-in replacement of the existing agent!





# Persistent storage for Agent2



Zabbix Agent2

```
EnablePersistentBuffer=1  
PersistentBufferFile=/var/spool/zabbix/agent.db  
PersistentBufferPeriod=1d
```



No connection




Zabbix  
Server

Use cases






Unstable communications  
Monitoring of critical data  
Bursts of data

Your data is safe!



Secure by design

# Secret macros

Macros ▾			
Macro	Value		Description
{AWS_TOKEN}	.....	 ▾	Token to access AWS API
{SNMP_COMMUNITY}	.....	 ▾	SNMP community for network monitoring
{ZABBIX_URL}	https://zabbix.example.com	 ^	URL of Zabbix UI
{MACRO}	value	 Text	
		 Secret text	
<a href="#">Add</a>			

## Use cases

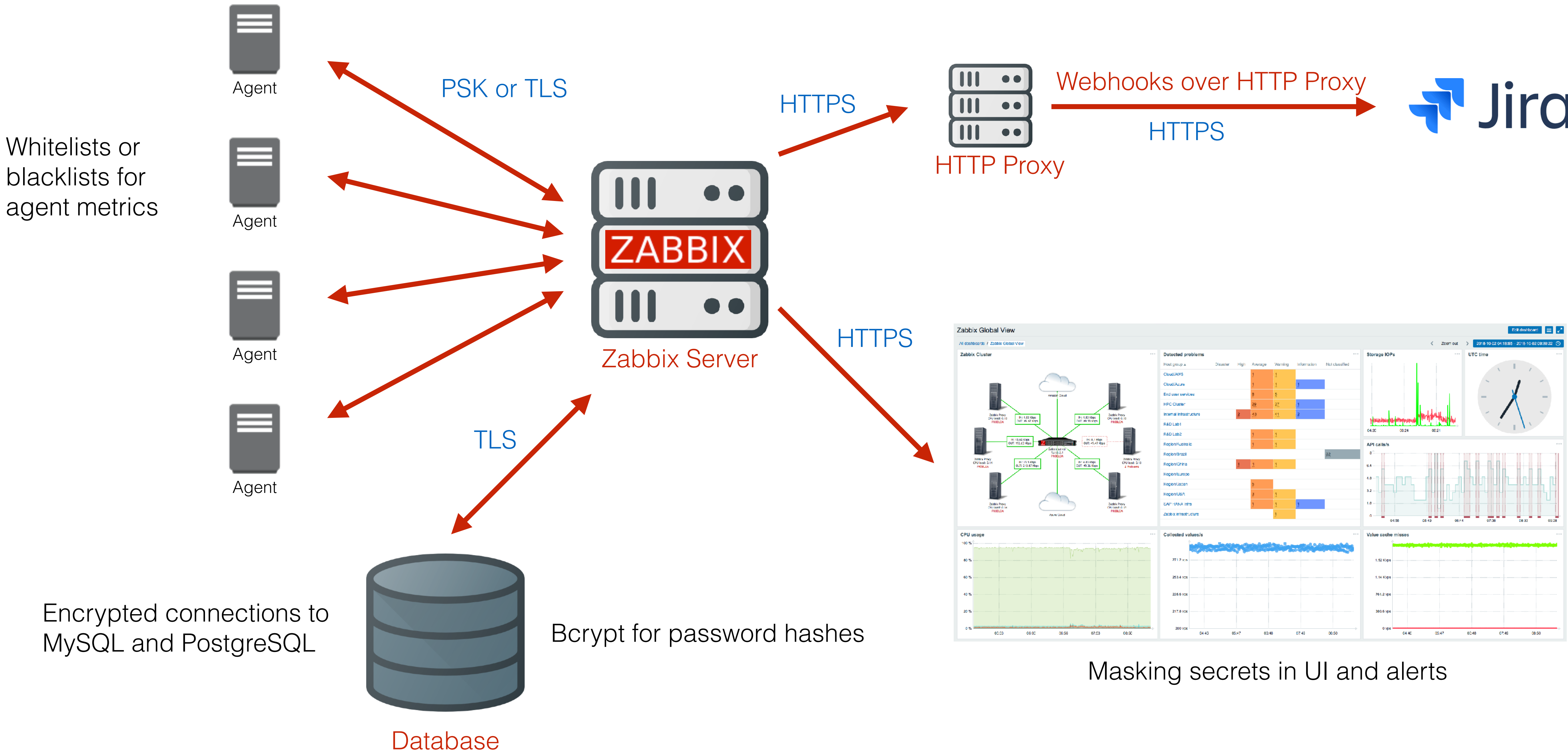
Hide any secrets: passwords, tokens, IDs

## Data protection

Secret text cannot be retrieved in UI and alerts, masked with **\*\*\*\*\***

No read access, can only be replaced with a new value

# Security and encryption







# SAML authentication for single sign-on

# Identity providers

ZABBIX

<<

Monitoring

Inventory

Reports

Configuration

Administration

General

Proxies

Authentication

User groups

Users

Media types

Scripts

Queue

Authentication

HTTP settings

LDAP settings

SAML settings

Enable SAML authentication

\* IdP entity ID

\* SSO service URL

SLO service URL

\* Username attribute

\* SP entity ID

SP name ID format

urn:oasis:names:tc:SAML:2.0:nameid-format:transient

Sign

Messages

Assertions

AuthN requests

Logout requests

Logout responses

Encrypt

Name ID

Assertions

Case sensitive login

Update

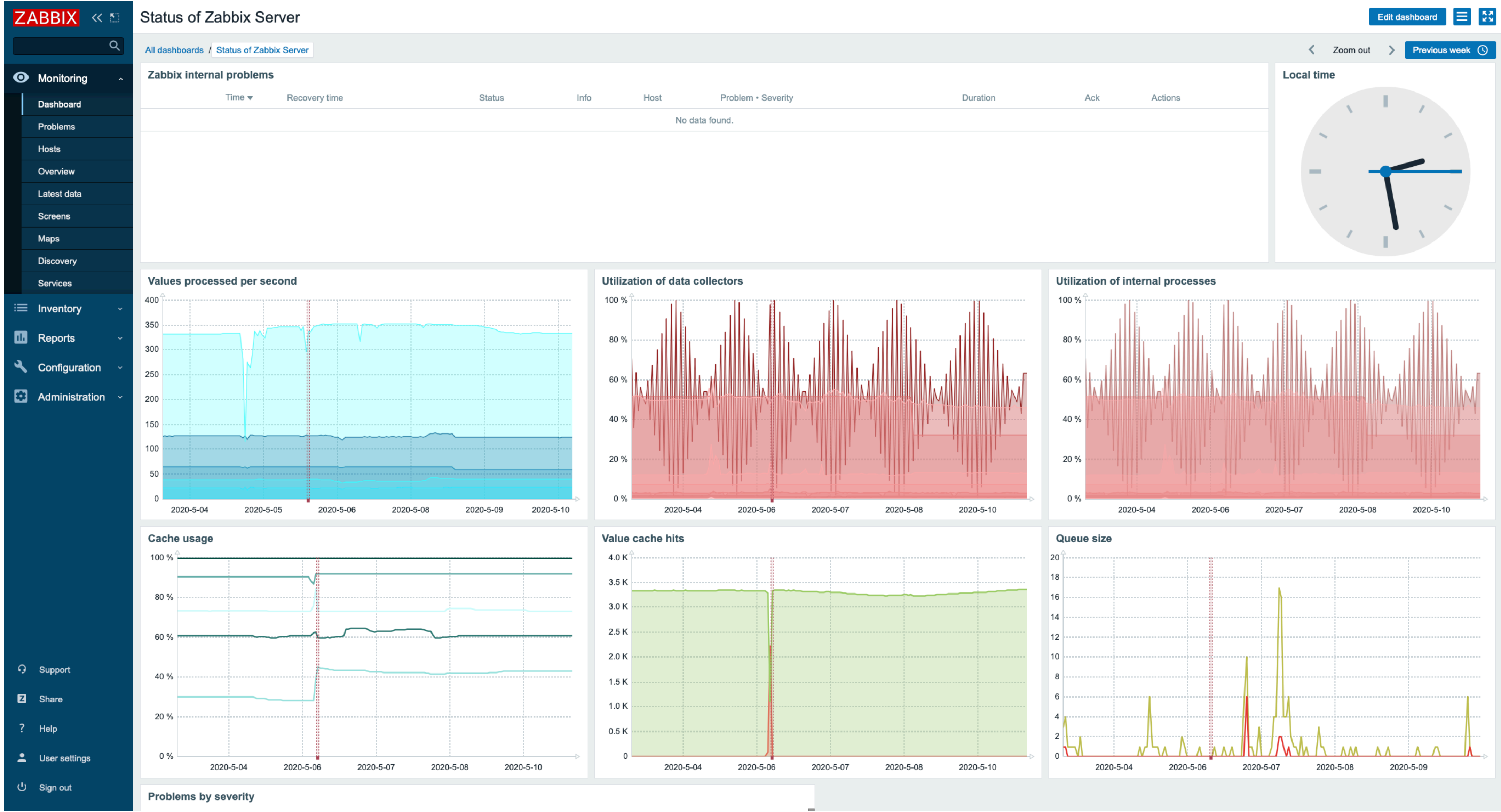




Usability

improvements

# Optimized for wide screens





# UI modules

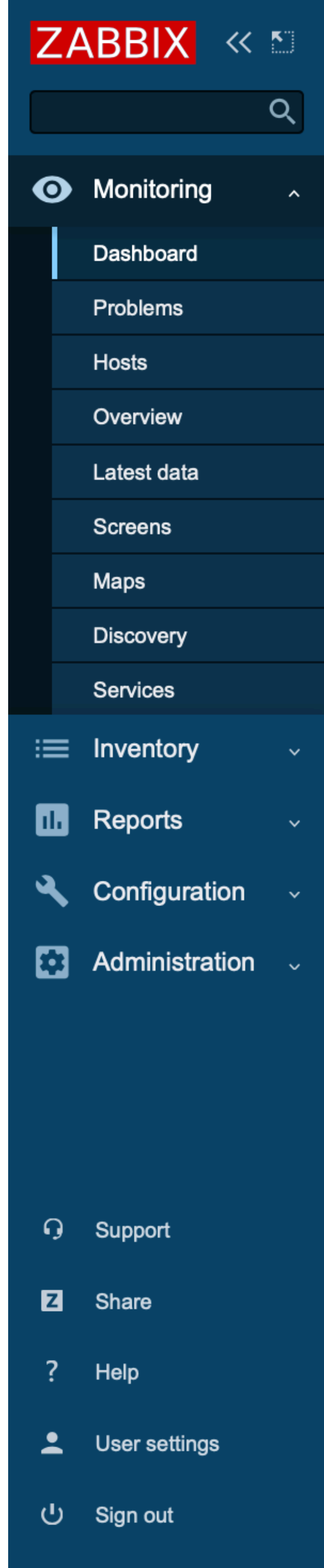
Create new menu entries

Create new pages

Extend existing functionality

Use and share 3rd party extensions

Permission control



# List of monitored devices

Monitoring->Hosts

Hosts

Filter

Name ▲	Interface	Availability	Tags	Problems	Status	Latest data	Problems	Graphs	Screens	Web
<a href="#">AWS N30</a>	127.0.0.1: 10050	ZBX SNMP JMX IPMI	OS: Linux Region: us-east-1 Service: Oracle Cluster	1	Enabled	<a href="#">Latest data</a>	<a href="#">Problems 1</a>	<a href="#">Graphs 14</a>	<a href="#">Screens 2</a>	<a href="#">Web</a>
<a href="#">AWS N34</a>	127.0.0.1: 10050	ZBX SNMP JMX IPMI	OS: Linux	1 1	Enabled	<a href="#">Latest data</a>	<a href="#">Problems 2</a>	<a href="#">Graphs 14</a>	<a href="#">Screens 2</a>	<a href="#">Web</a>
<a href="#">AWS N90</a>	127.0.0.1: 10050	ZBX SNMP JMX IPMI	OS: Linux	1 1 1	Enabled	<a href="#">Latest data</a>	<a href="#">Problems 3</a>	<a href="#">Graphs 14</a>	<a href="#">Screens 2</a>	<a href="#">Web</a>
<a href="#">AZ M08</a>	127.0.0.1: 10050	ZBX SNMP JMX IPMI	OS: Linux	1 1	Enabled	<a href="#">Latest data</a>	<a href="#">Problems 2</a>	<a href="#">Graphs 14</a>	<a href="#">Screens 2</a>	<a href="#">Web</a>
<a href="#">AZ M10</a>	127.0.0.1: 10050	ZBX SNMP JMX IPMI	OS: Linux	1 1	Enabled	<a href="#">Latest data</a>	<a href="#">Problems 2</a>	<a href="#">Graphs 14</a>	<a href="#">Screens 2</a>	<a href="#">Web</a>
<a href="#">AZ M18</a>	127.0.0.1: 10050	ZBX SNMP JMX IPMI	OS: Linux	1 1	Enabled	<a href="#">Latest data</a>	<a href="#">Problems 2</a>	<a href="#">Graphs 14</a>	<a href="#">Screens 2</a>	<a href="#">Web</a>
<a href="#">Linux001</a>	127.0.0.1: 10050	ZBX SNMP JMX IPMI	OS: Linux	1 1	Enabled	<a href="#">Latest data</a>	<a href="#">Problems 2</a>	<a href="#">Graphs 14</a>	<a href="#">Screens 2</a>	<a href="#">Web</a>

No more Monitoring->WEB and Monitoring->Graphs  
Easy navigation to host related resources

# Message templates for media types

# Templates for different message types

## Email media type

Media types

Media type

Message templates

Options

Message type	Template	Actions
Problem	Problem started at {EVENT.TIME} on {EVENT.DATE} Pro...	<a href="#">Edit</a> <a href="#">Remove</a>
Problem recovery	Problem has been resolved at {EVENT.RECOVERY.TIME}...	<a href="#">Edit</a> <a href="#">Remove</a>
Problem update	{USER.FULLNAME} {EVENT.UPDATE.ACTION} problem...	<a href="#">Edit</a> <a href="#">Remove</a>
Discovery	Discovery rule: {DISCOVERY.RULE.NAME} Device IP: {D...	<a href="#">Edit</a> <a href="#">Remove</a>
Autoregistration	Host name: {HOST.HOST} Host IP: {HOST.IP} Agent port:...	<a href="#">Edit</a> <a href="#">Remove</a>
<a href="#">Add</a>		

Add

Cancel

## Message template

Message template

Message type

Problem recovery

Subject

Resolved in {EVENT.DURATION}: {EVENT.NAME}

Message

<b>Problem has been resolved</b> at {EVENT.RECOVERY.TIME} on {EVENT.RECOVERY.DATE}<br><b>Problem name:</b> {EVENT.NAME}<br><b>Host:</b> {HOST.NAME}<br><b>Severity:</b> {EVENT.SEVERITY}<br><b>Original problem ID:</b> {EVENT.ID}<br>{TRIGGER.URL}

Update

Cancel



# Configure message format in on place!

Before

Actions

Action

Operations

Recovery operations

Update operations

\* Default operation step duration

1h

Default subject

Problem: {EVENT.NAME}

Default message

Problem started at {EVENT.TIME} on {EVENT.DATE}

Problem name: {EVENT.NAME}

Host: {HOST.NAME}

Severity: {EVENT.SEVERITY}

Original problem ID: {EVENT.ID}

{TRIGGER.URL}

Pause operations for suppressed problems

☒

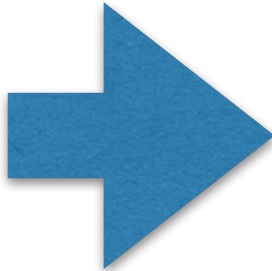
Operations

Steps	Details	Start in	Duration	Action
New				

\* At least one operation, recovery operation or update operation must exist.

Add

Cancel



After

Actions

Action

Operations

\* Default operation step duration

1h

Pause operations for suppressed problems

☒

Operations

Steps	Details	Start in	Duration	Action
Add				

Recovery operations

Details	Action
Add	

Update operations

Details	Action
Add	

\* At least one operation must exist.

Add

Cancel



CLI tool to test JS  
scripts

# Why

## Typical use cases

Test JavaScript code from **command line**:

- webhooks
- complex preprocessing scripts


# How to use it?

```
shell> zabbix_js -help
```

Execute script using Zabbix embedded scripting engine.

General options:

-s,--script script-file	Specify the filename of script to execute. Specify
- for	standard input.
-i,--input input-file	Specify input parameter file name. Specify - for
	standard input.
-p,--param input-param	Specify input parameter
-l,--loglevel log-level	Specify log level
-t,--timeout timeout	Specify timeout in seconds
-h --help	Display this help message
-V --version	Display version number



Triggers support  
**text** operations



# Text data

## Typical use cases

Working with software versions

Log file monitoring

Comparing string values of different items

Comparing last and previous values

Supported operators: = <>

## Comparing with text constant

```
{host:zabbix.version.last()}="5.0.0"  
{host:zabbix.version.last()}="{ $ZABBIX.VERSION}"
```

## Comparing last value with previous one


```
{host:text.last()}<>{host:text.prev()}
```

OR

```
{host:text.last(#1)}<>{host:text.last(#2)}
```

## Comparing values of different items

```
{hostA:textA.last()}={hostB:textB.last()}
```



Test item from UI

# For hosts and templates

Test item

Get value from host

Host address

Port

Proxy

Value

Time

Previous value

Prev. time

End of line sequence

Preprocessing steps

Result

Get value

now

1

1

Up

Test

Cancel

Test item

Get value from agent failed: cannot connect to [[192.168.3.2]:10050]: [111] Connection refused

Get value from host

Host address

Port

Proxy

Value

Time

Previous value

Prev. time

End of line sequence

Get value and test

Cancel

192.168.3.2

10050

(no proxy)

0.000000

now

LF

CRLF

Get value

Get value and test

Cancel

Do not forget to test media types too!

Media types

Create media typeImport

Filter

<input type="checkbox"/> Name ▲	Type	Status	Used in actions	Details	Action
<input type="checkbox"/> Discord	Webhook	<a href="#">Enabled</a>			<a href="#">Test</a>
<input type="checkbox"/> Mattermost	Webhook	<a href="#">Enabled</a>			<a href="#">Test</a>
<input type="checkbox"/> Opsgenie	Webhook	<a href="#">Enabled</a>			<a href="#">Test</a>
<input type="checkbox"/> Pushover	Webhook	<a href="#">Enabled</a>			<a href="#">Test</a>

Displaying 4 of 4 found



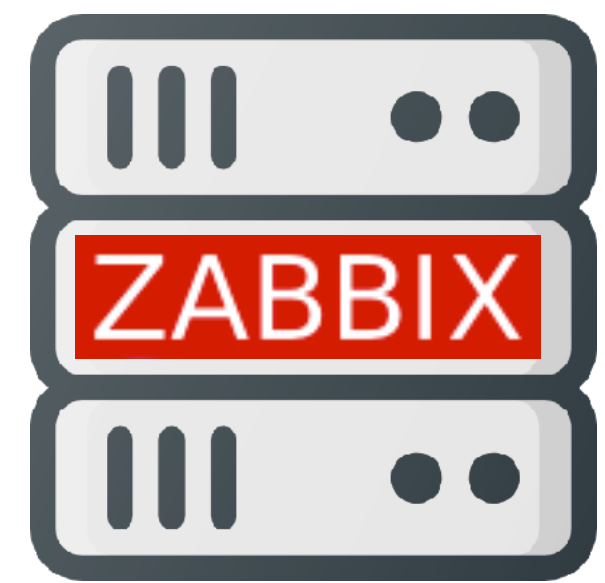


# Compression for efficiency

TimescaleDB = PostgreSQL + Extension



# Lower storage cost



Zabbix Server



Older than 7 days,  
Compressed, read-only



**TIMESCALE**

# Numbers from a production setup

Zabbix 4.x: 355GB

Zabbix 5.0: 43GB

# Overrides for LLD rules



# Discovery of filesystems

**ZABBIX** << ↗

Central NOC

Monitoring

Inventory

Reports

## Trigger prototypes

[Create trigger prototype](#)

[All templates](#) / [Template OS Linux](#) / [Discovery list](#) / [Mounted filesystem discovery](#) / [Item prototypes 5](#) / [Trigger prototypes 2](#) / [Graph prototypes 1](#) / [Host prototypes](#)

<input type="checkbox"/>	Severity	Name ▲	Operational data	Expression	Create enabled	Discover	Tags
<input type="checkbox"/>	Warning	Free disk space is less than 20% on volume {#FSNAME}		{Template OS Linux:vfs.fs.size[{#FSNAME},pfree].last(0)}<20	<a href="#">Yes</a>	<a href="#">Yes</a>	
<input type="checkbox"/>	Warning	Free inodes is less than 20% on volume {#FSNAME}		{Template OS Linux:vfs.fs.inode[{#FSNAME},pfree].last(0)}<20	<a href="#">Yes</a>	<a href="#">Yes</a>	
Displaying 2 of 2 found							

## Special treating of Oracle related filesystems

**Override**

\* Name

Stop processing next overrides if matches ☐

Filters

Type of calculation

Label	Macro	Regular expression	Action
A	{#FSNAME}	matches	oradata

[Add](#)

Operations

Condition

[Add](#)

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

**New operation**

Object

Condition

Create enabled ☐ Original

Discover ☐ Original

Severity ☒ Not classified ☐ Information ☐ Warning ☐ Average ☒ High ☐ Disaster

Tags ☐ Original

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

# Do not discover temporary filesystems

## Override

\* Name

Stop processing next overrides if matches ☐

### Filters

Type of calculation

Label Macro

A

Regular expression

Action

[Remove](#)

[Add](#)

### Operations

Condition

Trigger prototype equals

**Item prototype equals**

[Add](#)

## New operation

Object

Condition

Create enabled ☐ Original

Discover ☒

☐ Yes

☒ No

Update interval ☐ Original

History storage period ☐ Original

Trend storage period ☐ Original

[Add](#)

[Cancel](#)

5.2

Standard release



# Synthetic monitoring

# Why?

## Typical use cases

Support of complex multi-step scripted monitoring scenarios

Advanced availability checks

Complex interaction with different HTTP APIs



# New item type **Script**

## Items

[All hosts](#) / [web](#) [Enabled](#) [ZBX](#) [SNMP](#) [JMX](#) [IPMI](#) [Applications](#) 12 [Items](#) 109 [Triggers](#) 11 [Graphs](#) 13 [Discovery rules](#) 2 [Web scenarios](#) 1

Item

Preprocessing

\* Name

API availability status

Type

Script

\* Key

api.status

Select

Parameters

Name	Value	Action
API_URL	{URL}	<a href="#">Remove</a>
TOKEN	{TOKEN}	<a href="#">Remove</a>
<a href="#">Add</a>		

\* Script

try {

\* Timeout

10s

# Storage of secrets in external Vault

# Why?

## Benefits

All sensitive information is kept outside of Zabbix in a secure place

Therefore no secret data is stored in the database

Sensitive data: passwords, API tokens, user names, etc

# New macro type **Vault secret**

The screenshot shows the Zabbix web interface for configuring macros for a host named 'confluence'. The 'Hosts' page is active, and the 'Macros' tab is selected. The interface displays a table of macros with columns for Macro, Value, and Description. Two macros are listed: '{\$DBNAME}' with value 'zabbix/confluence/db:name' and '{\$DBPASSWORD}' with value 'zabbix/confluence/db:password'. Both macros are marked as secret. A red box highlights the macro table and the 'Vault secret' option in the dropdown menu.

Macro	Value	Description
{\${DBNAME}}	zabbix/confluence/db:name	Confluence Database Name
{\${DBPASSWORD}}	zabbix/confluence/db:password	Confluence Database Password

Buttons: Add, Update, Clone, Full clone, Delete, Cancel

Dropdown menu options: Text, Secret text, **Vault secret**



# Zabbix Insights

## Zabbix Insights

Average number of transactions  
increased by 24% in September

## Zabbix Insights

“Number of new user registrations  
is down 12% last week”



# Why?

## Benefits

Ability to analyze long term data efficiently using new trigger functions

Zabbix will provide you with information about anomalies



# Granular control of user permissions

# Why?

## Benefits

Control what parts of UI are accessible

Control user operations:

- problem acknowledgements
- creation and editing of maps and dashboards
- management of maintenance times
- etc

Control access to API and its methods



# IoT monitoring

# Support of modbus and MQTT protocols

# 5.2

ETA: October, 2020

# Do not miss Zabbix Summit 2020, it is **FREE!**



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



An abstract digital graphic on a blue background. A glowing red ring, resembling a torus or a thick wireframe circle, is the central focus. It is surrounded by a stream of blue and white binary code (0s and 1s) that appears to be flowing through it. The background is a deep blue with subtle, wavy patterns of light and dark blue, giving it a sense of depth and movement. The overall aesthetic is futuristic and technological.

# Thank you! Questions?