

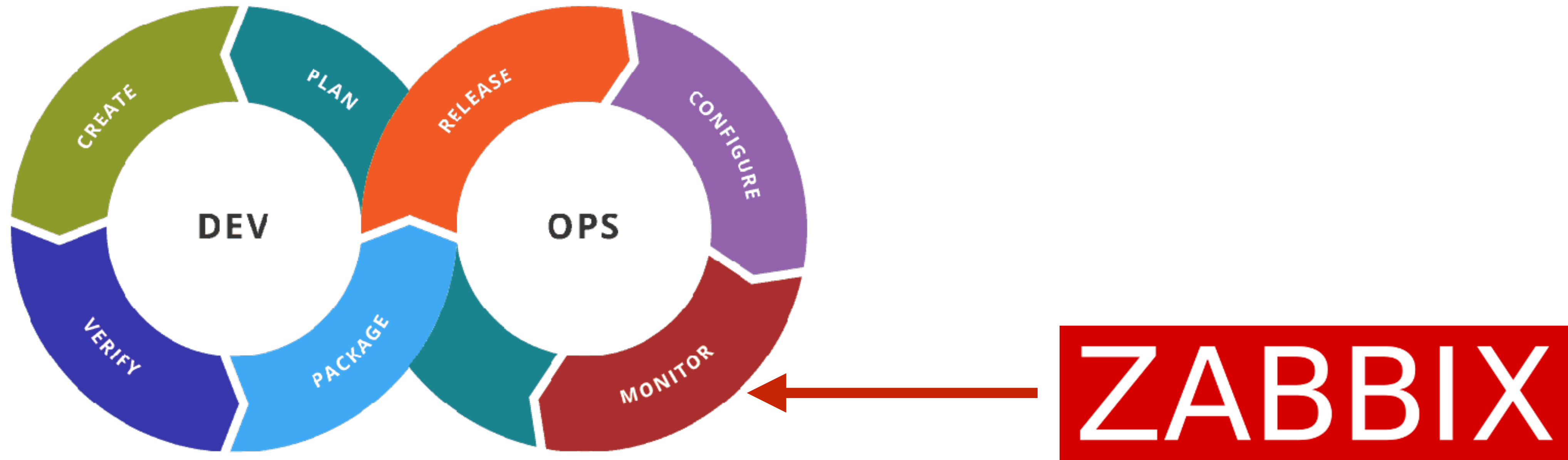
Zabbix 4.4 and plans for Zabbix 5.0



Alexei Vladishev
ZABBIX Founder & CEO

ZABBIX 2019
Conference
CHINA

Zabbix is an **Universal** Open Source
enterprise-level monitoring solution



Zabbix is an **Universal** Open Source enterprise-level monitoring solution



Quick recap of 2019

Growing number of large enterprise customers



Zabbix 4.2

April, 2019

High frequency monitoring with throttling

Data collection: HTTP agent, Prometheus

Preprocessing: validation and JavaScript!

Enhanced tag management

New platforms



Cloud



New OS



Where we are currently

3.0 LTS

4.0 LTS

4.2

4.4

5.0 LTS

ZABBIX

March, 2020

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

New platforms



Cloud



New OS





Zabbix 4.4

More than 30 new features and functional improvements

1

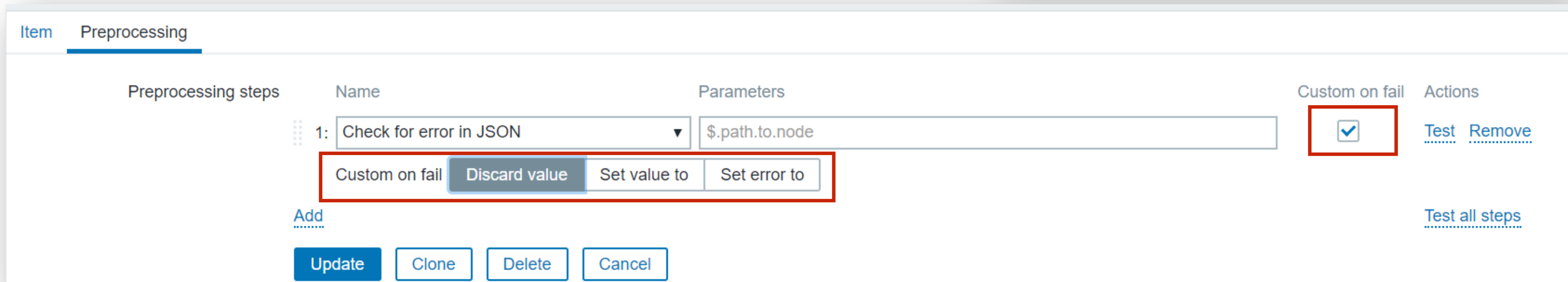
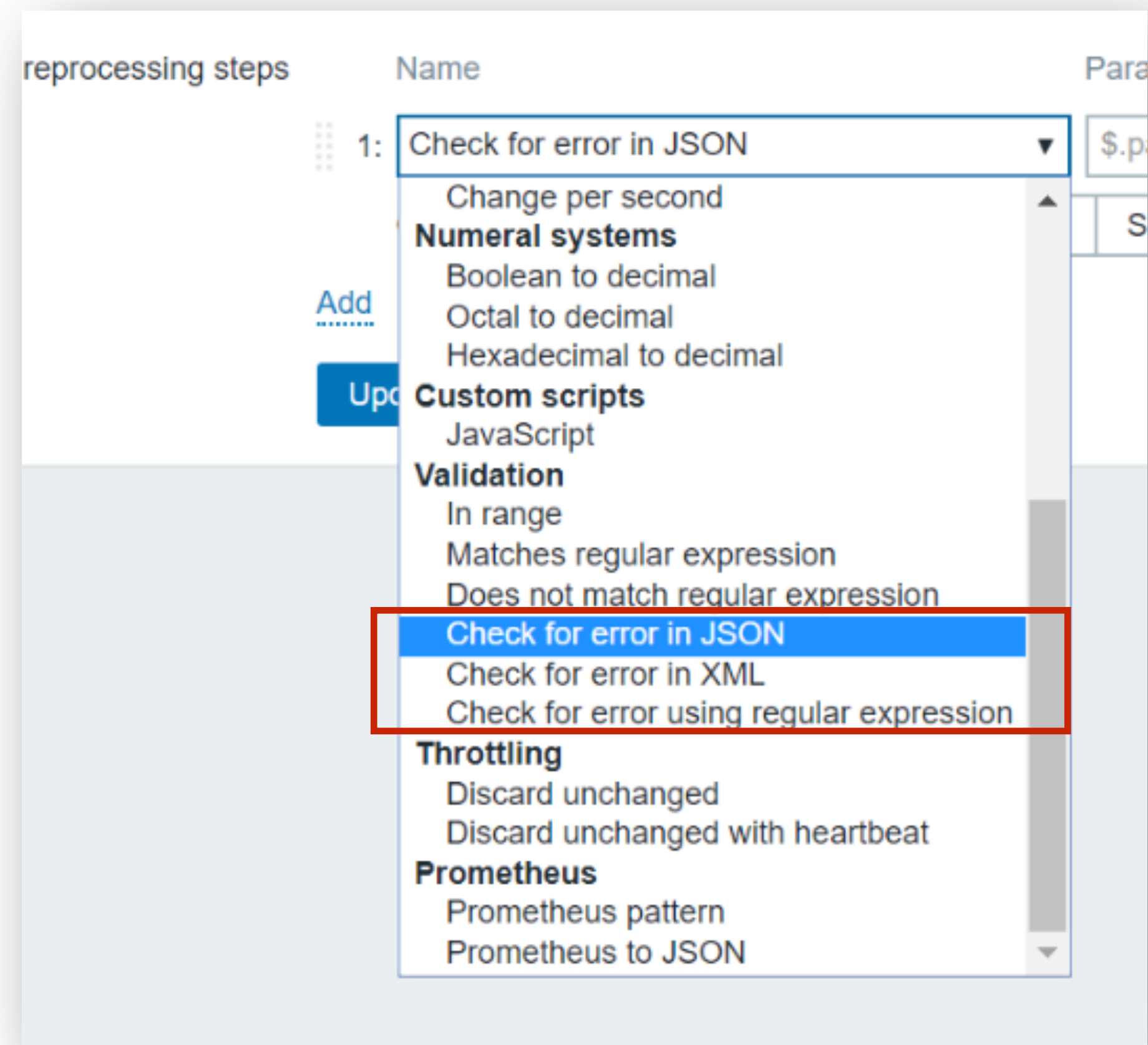
Enhanced preprocessing

Custom error handling

Check for error in JSON

Check for error in XML

Check for error using regular expression



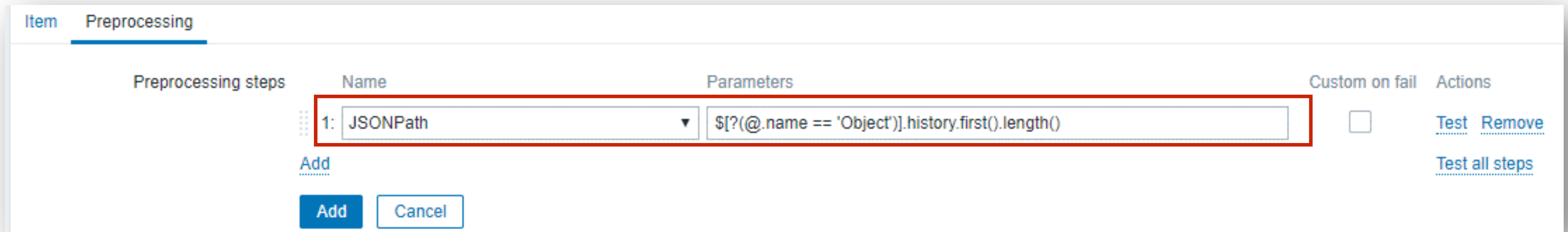
XML and JSON related enhancements

XML-related preprocessing options added to LLD

XML Xpath and Check for error in XML preprocessing options have been added to low-level discovery rules

Zabbix now supports advanced syntax for JSONPath

<https://www.zabbix.com/documentation/4.4/manual/appendix/items/jsonpath>



The screenshot shows the Zabbix LLD preprocessing configuration interface. It features a table with columns for 'Preprocessing steps', 'Name', 'Parameters', 'Custom on fail', and 'Actions'. A single step is listed with the name 'JSONPath' and the parameter '\$[?(@.name == 'Object')].history.first().length()'. The 'Custom on fail' checkbox is unchecked. Below the table are 'Add' and 'Cancel' buttons.

Preprocessing steps	Name	Parameters	Custom on fail	Actions
1:	JSONPath	<code>\$[?(@.name == 'Object')].history.first().length()</code>	<input type="checkbox"/>	Test Remove Test all steps

2

Advanced data
collection and discovery

Discovery and data collection

jmx.get[<discovery_mode>,<object_name>]

Compared to the `jmx.discovery[]` item from previous versions, that had to ignore encountered that JMX MBean properties contains hyphens, square brackets and non-ASCII characters (that could not be converted into a macro name) the new `jmx.get[]` item does not generate LLD macro names in the returned JSON

db.odbc.get[unique_description,data_source_name]

The new item is capable of returning values from multiple rows and columns, formatted as JSON.

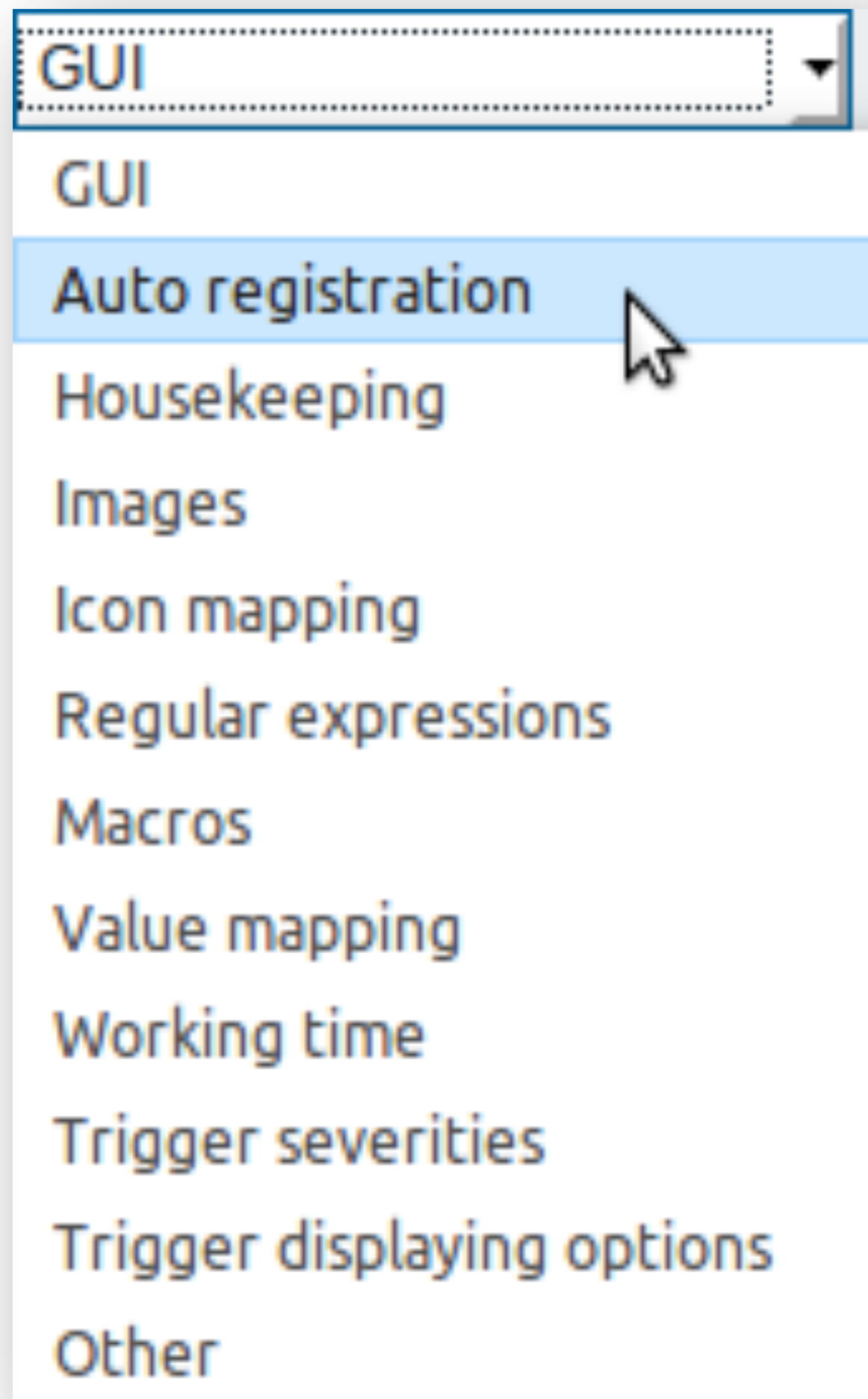
wmi.getall[<namespace>,<query>]

The new item is capable of returning the entire response of the query, formatted as JSON

3

Secure auto- registration

Auto-registration with PSK, unencrypted or both



The 'Auto registration' configuration page in Zabbix. It features a red-bordered box containing the following settings:

- Encryption level: No encryption, PSK
- * PSK identity:
- * PSK:

Below the input fields is a blue 'Update' button.

4

Description for
user macros

Discovery and data collection

The screenshot shows the Zabbix web interface. At the top, there is a navigation bar with the ZABBIX logo and menu items: Monitoring, Inventory, Reports, Configuration, and Administration. Below this is a secondary navigation bar with Host groups, Templates, Hosts, Maintenance, Actions, Event correlation, Discovery, and Services. The 'Hosts' section is active, and the breadcrumb trail shows 'All hosts / Kubernetes cluster: Kubernetes clu...'. The 'Enabled' status is shown, along with various monitoring protocols (ZBX, SNMP, JMX, IPMI) and statistics (Applications 3, Items 22, Triggers 8, Graphs, Discovery rules 3, Web scenarios). The 'Hosts' page has sub-tabs for Host, Templates, IPMI, Tags, Macros, Inventory, and Encryption. The 'Macros' tab is selected, showing 'Host macros' and 'Inherited and host macros'. A table lists a macro with the following details:

Macro	Value	Description
{ \$NAMESPACE }	kube-system	NS of system pods and services

Below the table, there is an 'Add' link and a row of buttons: Update, Clone, Full clone, Delete, and Cancel. A red box highlights the 'Description' column of the table and the 'Remove' link next to it.

4

Zabbix Agent

Zabbix Agent



Zabbix Server

Passive, Pull
→

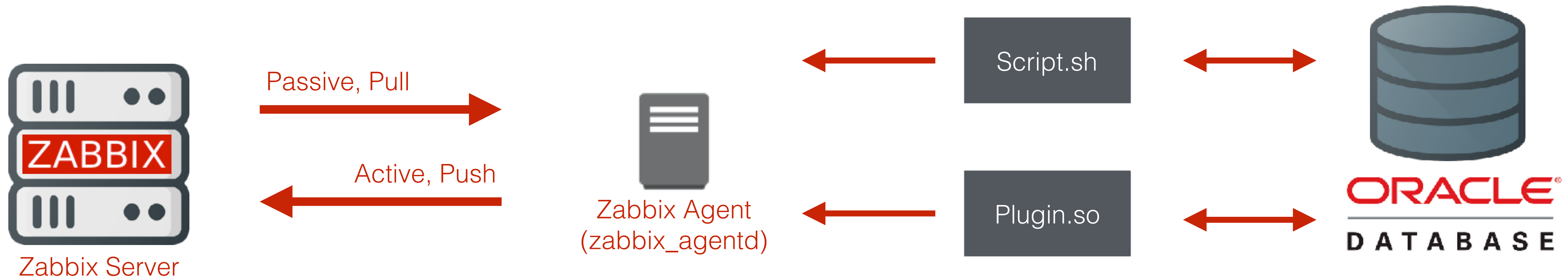
←
Active, Push



Zabbix Agent
(zabbix_agentd)



Zabbix Agent



Challenges

- Long running scripts
- Parallel active checks
- Support of flexible intervals
- Processing of traps
- Support of persistent connections
- Better plugin framework

Next Generation Zabbix Agent

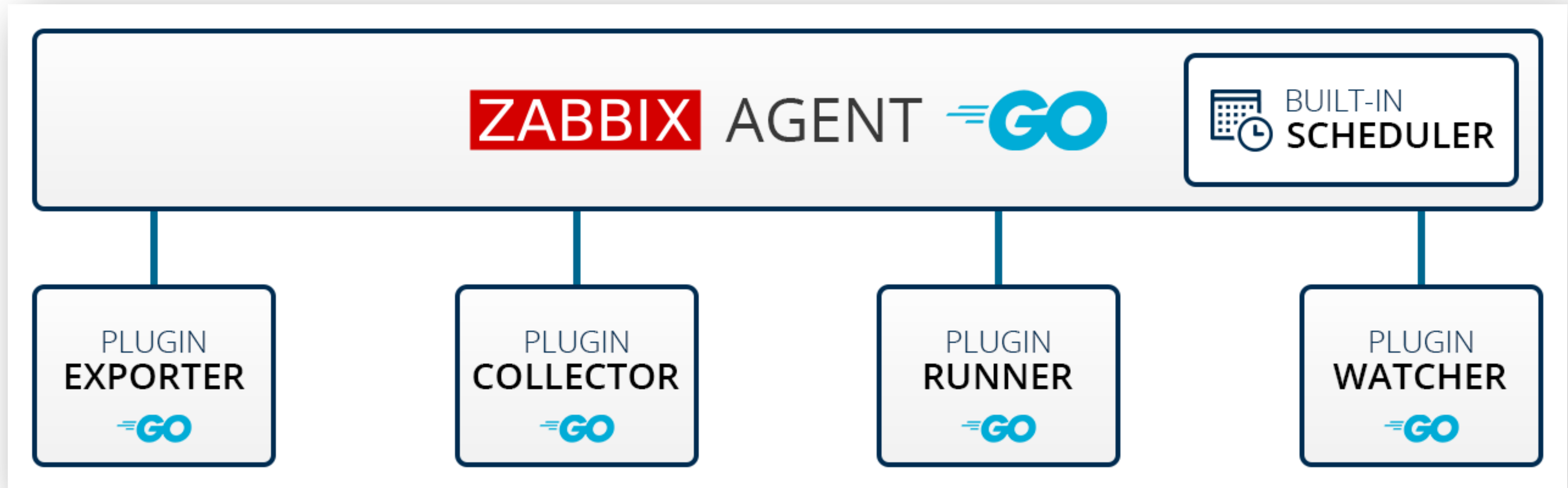


New Zabbix Agent
(zabbix_agent2)



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 service out of the box
Drop-in replacement of the existing agent!

Internal structure of the agent



Polling

Regular data
collection

Background
routines

Trapping

Availability of the new Zabbix Agent2



New Zabbix Agent
(zabbix_agent2)



4.4 – experimental, 5.0 – production ready

Older agents will be supported

Currently only Linux-like systems

Zabbix Agent 2 for Windows – already in development!

Check our git repository: <https://git.zabbix.com>

5

Alerting and notifications



Email

SMS

Script

Webhook with Embedded JavaScript

Notifications

Incidents

Events

Messaging



ITSM



Event streaming



* Name

Type

Parameters

Name	Value	Action
<input type="text" value="URL"/>	<input type="text" value="https://sd.example.com/api"/>	Remove
<input type="text" value="TicketName"/>	<input type="text" value="{ALERT.SUBJECT}"/>	Remove
<input type="text" value="TicketBody"/>	<input type="text" value="{ALERT.MESSAGE}"/>	Remove

[Add](#)

* Script

Timeout

Process tags

Include event menu entry

* Menu entry name

* Menu entry URL

Webhook

URL for API access

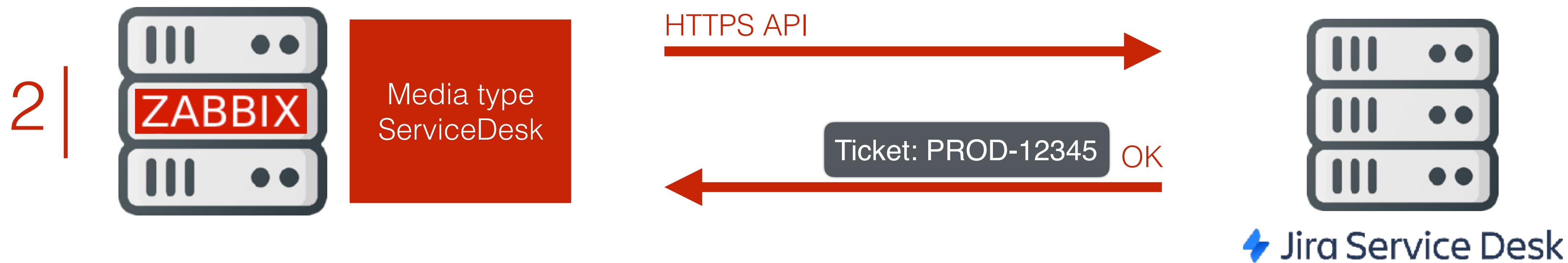
All logic in JavaScript

Process event tags

Add a menu entry for 2-way integration

Workflow

1 | Redis is not available
Datacenter: NY2 Service: Redis



3 | Redis is not available
Datacenter: NY2 Service: Redis Ticket: PROD-12345

3

Redis is not available

Datacenter: NY2

Service: Redis

Ticket: PROD-12345

4

Time	<input type="checkbox"/>	Severity ▼	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-10-01 11:13:26	<input type="checkbox"/>	High		PROBLEM		AWS N34	Service Redis stopped	1m	Yes	1 2	Datacenter: NY2 Service: Redis Ticket: PROD-12345

TRIGGER

Problems

Description

Configuration

LINKS

Service desk issue PROD-12345

HISTORY

Service status



Jira Service Desk

6

Built-in
knowledge base

Item details

Linux010	CPU (8 Items)		
<input type="checkbox"/>	CPU idle time ?	2019-10-10 10:05:08	89.8262 %
<input type="checkbox"/>	CPU interrupt time ?	2019-10-10 10:05:11	0 %
<input type="checkbox"/>	CPU iowait time ?	2019-10-10 10:05:12	0.1687 %
<input type="checkbox"/>	CPU nice time ?	2019-10-10 10:05:10	0 %
<input type="checkbox"/>	CPU softirq time ?	2019-10-10 10:05:10	0.928 %
<input type="checkbox"/>	CPU steal time ?	2019-10-10 10:05:09	0 %
<input type="checkbox"/>	CPU system time ?	2019-10-10 10:05:11	5.1788 %
<input type="checkbox"/>	CPU user time ?	2019-10-10 10:05:09	4.218 %

Amount of time the CPU has been waiting for I/O to complete.

Problem details

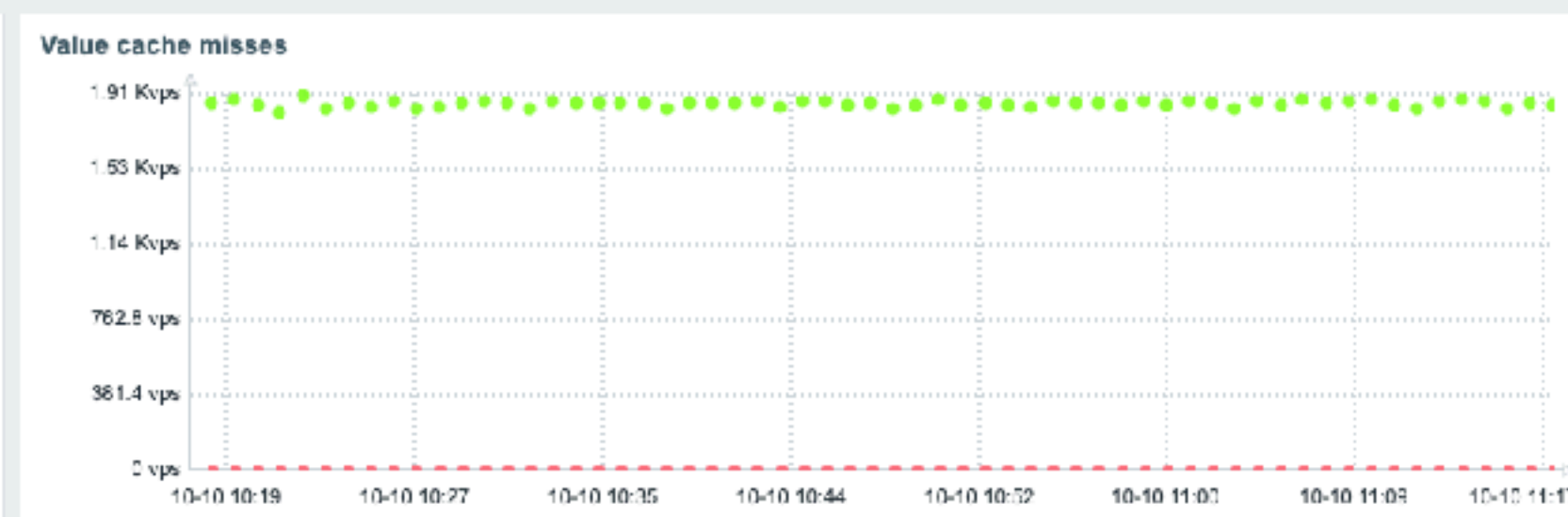
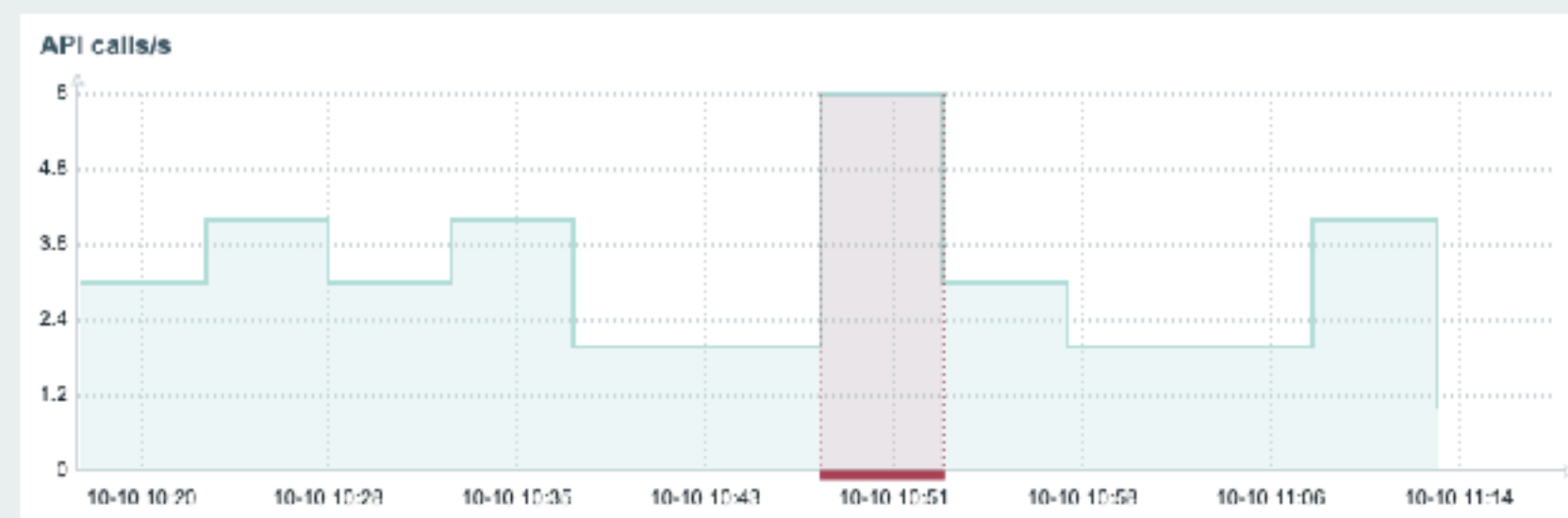
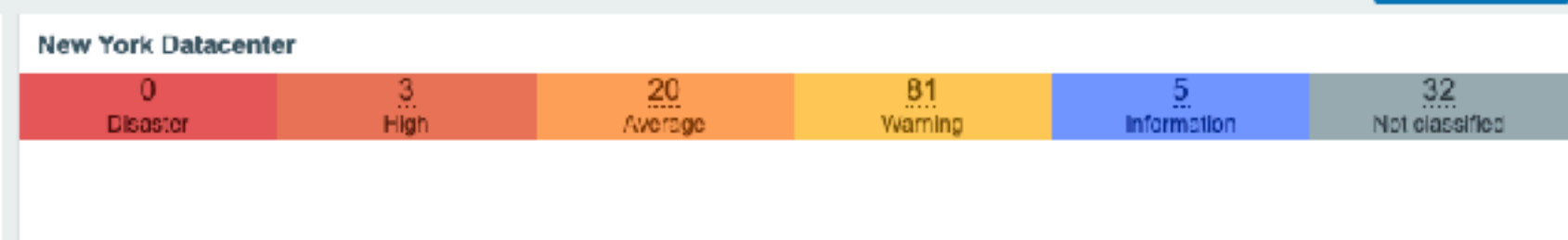
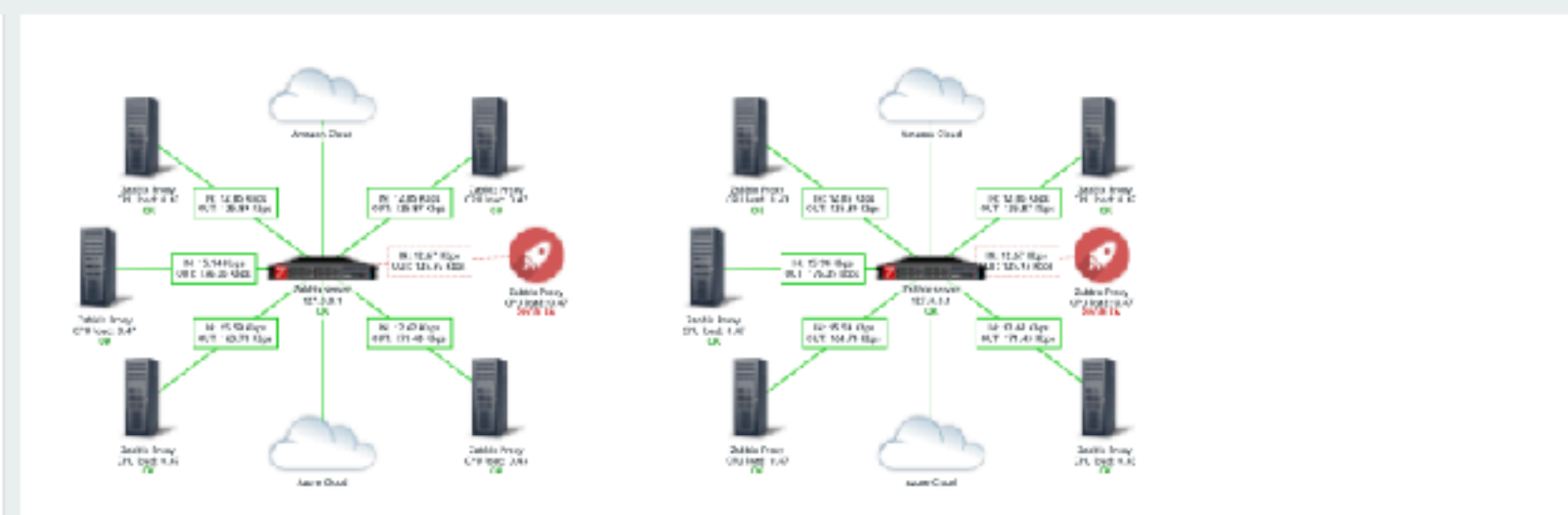
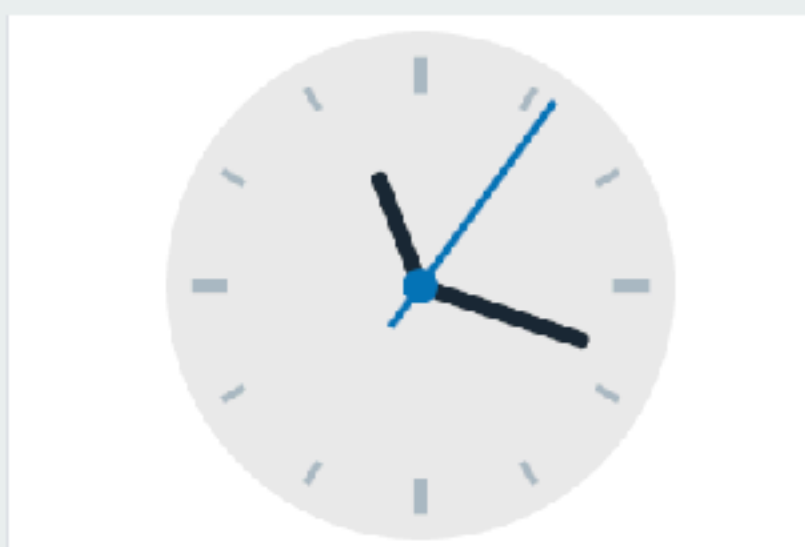
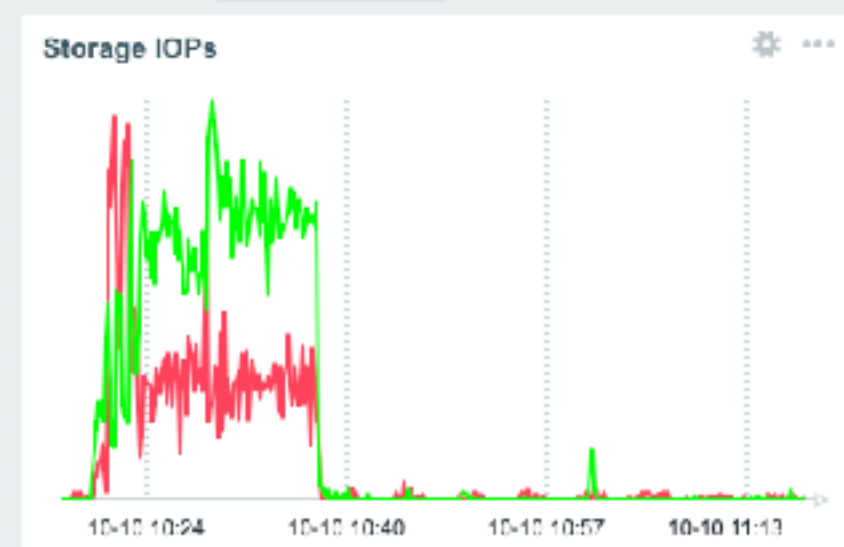
Time ▲	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	Tags
2019-05-23 16:37:00	Average		PROBLEM		Linux907	Zabbix agent on Linux907 is unreachable for 5 minutes	1y 4m 19d	No		Service: Zabbix agent
September										
2019-09-30 12:45:45	Information		PROBLEM		AZ M08	Low CPU utilization on host machines	1y 9d	Yes	1	Service: Kubernetes Datacenter: FR2
2019-09-30 12:45:45	Information		PROBLEM		AZ M18	Slow query execution time	1y 9d	No	1	Service: AWS Dynam... Datacenter: NY1 Env: Production
2019-09-30 13:45:45	Average		PROBLEM		AWS N30	Too many queries per second ?	1y 9d	Yes	1	Service: HTTP balancer Datacenter: NY1
2019-09-30 13:45:45	Average		PROBLEM		AZ					balancer Datacenter: NY1
October										
2019-10-01 12:25:11	High		PROBLEM		AW					Datacenter: FR2 Env: Staging
2019-10-01 12:25:11	High		PROBLEM		AWS N34	Service Redis stopped	1y 8d	Yes	1	Service: Redis Datacenter: FR2 Env: Staging
Today										
10:48:11	Information		PROBLEM		Zabbix server	Too many processes running on Zabbix server	3m 39s	No		Service: Zabbix OS: Linux Performance

Typical reasons of the high number of queries per second on HTTP balancer:

1. Insufficient number of worker nodes if all worker nodes stay busy
2. Network related issues

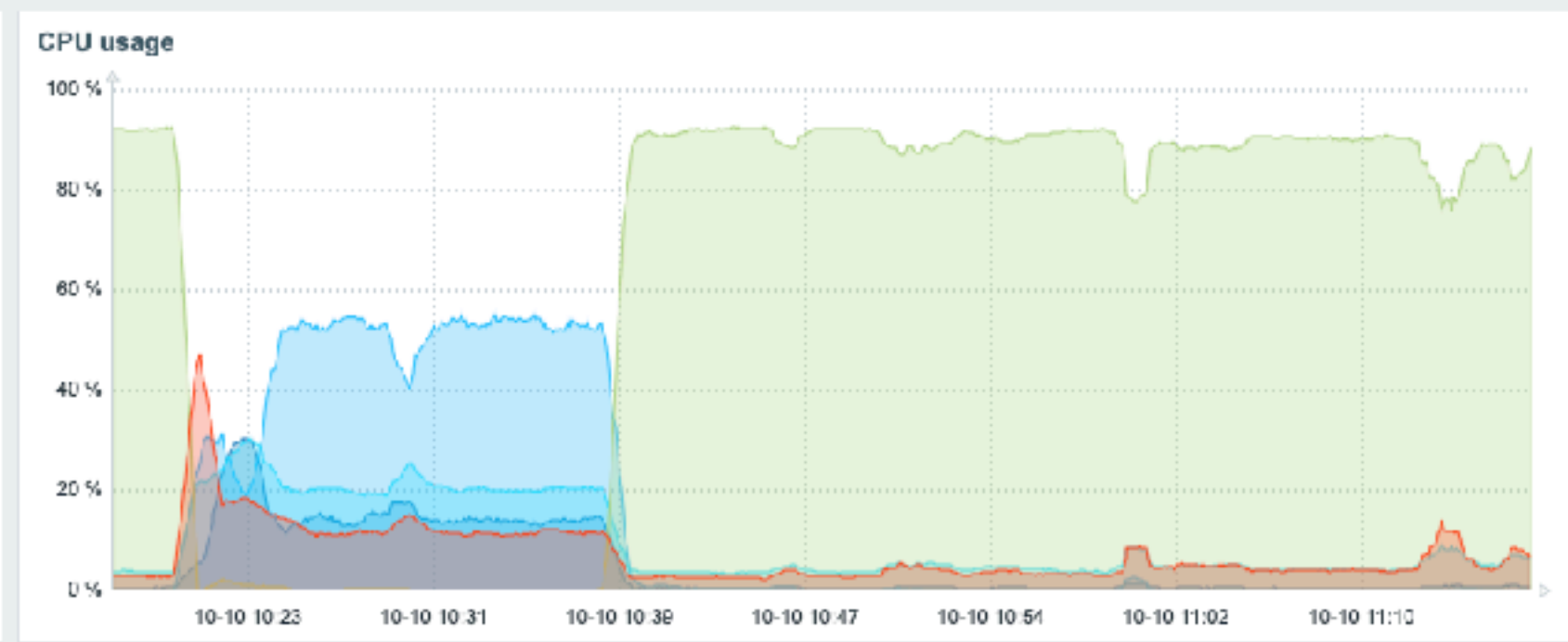
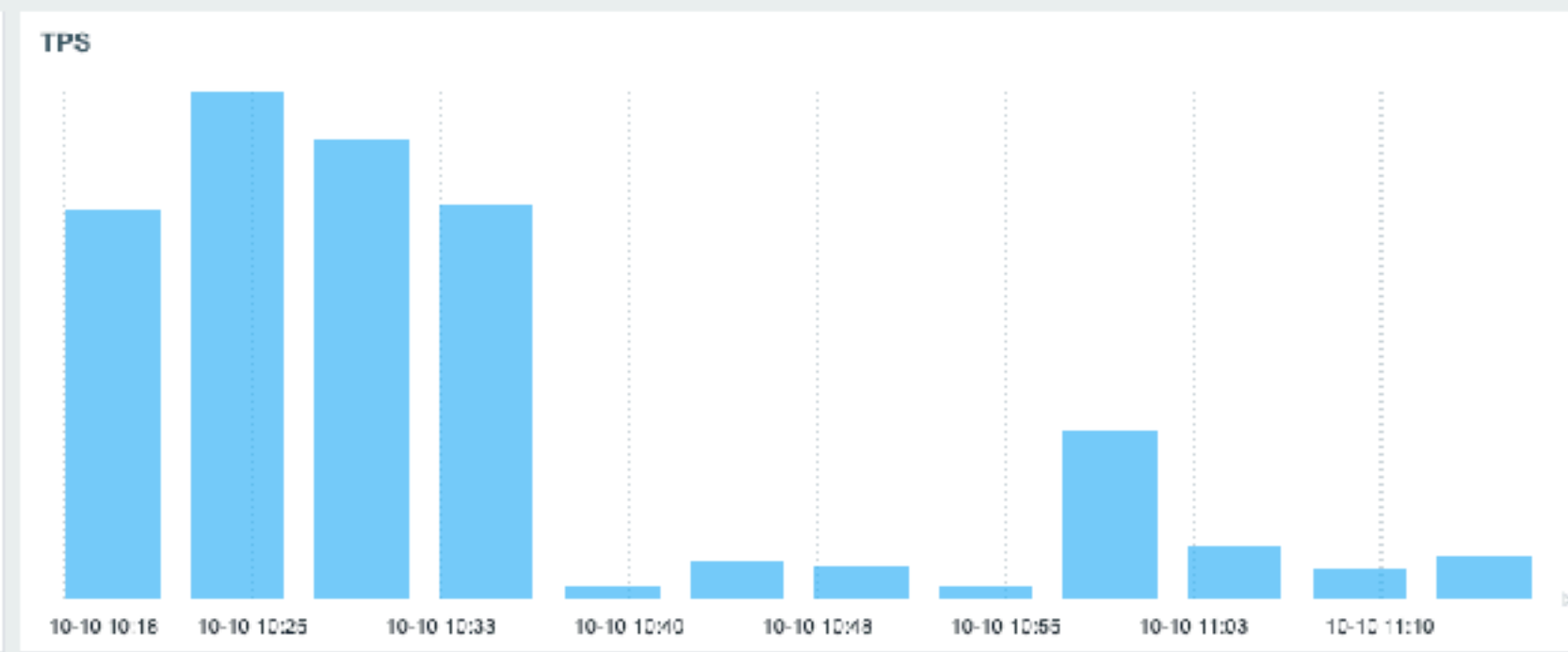
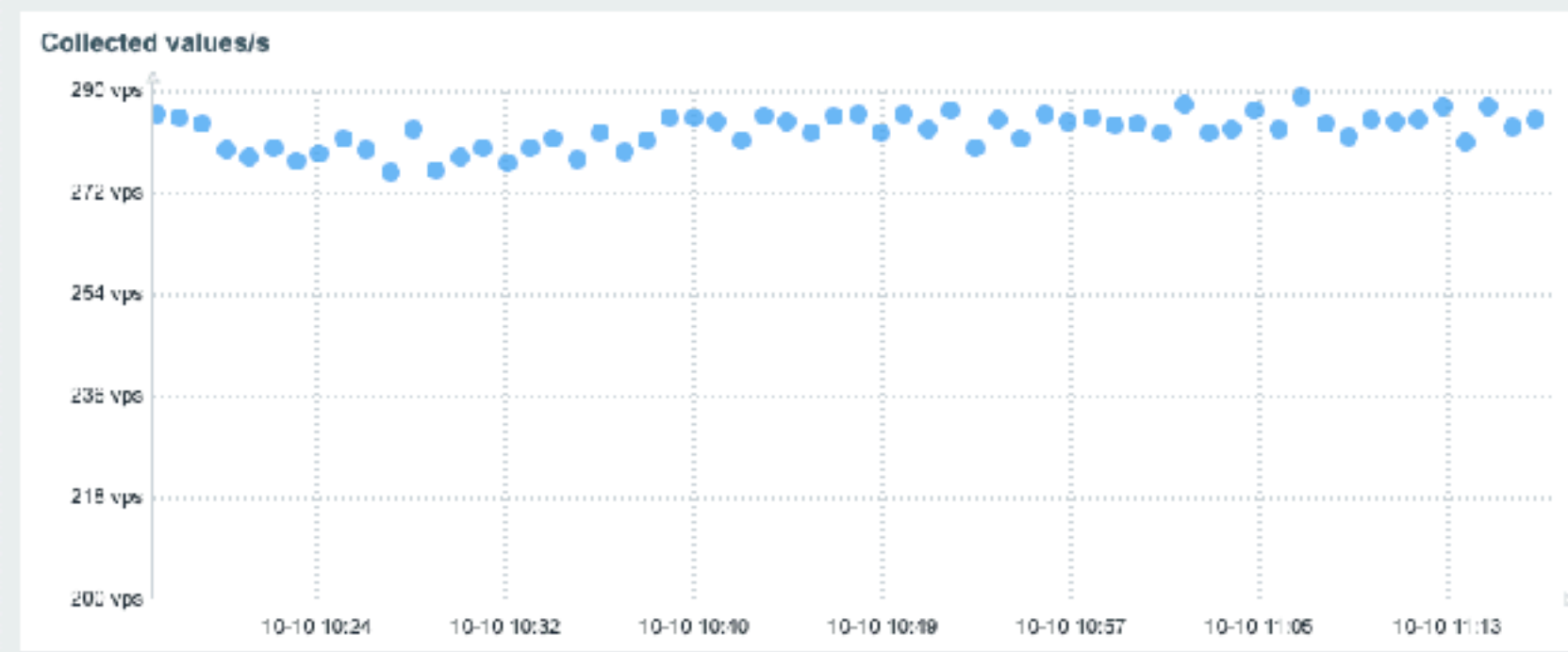
7

Visualization



Problems by severity

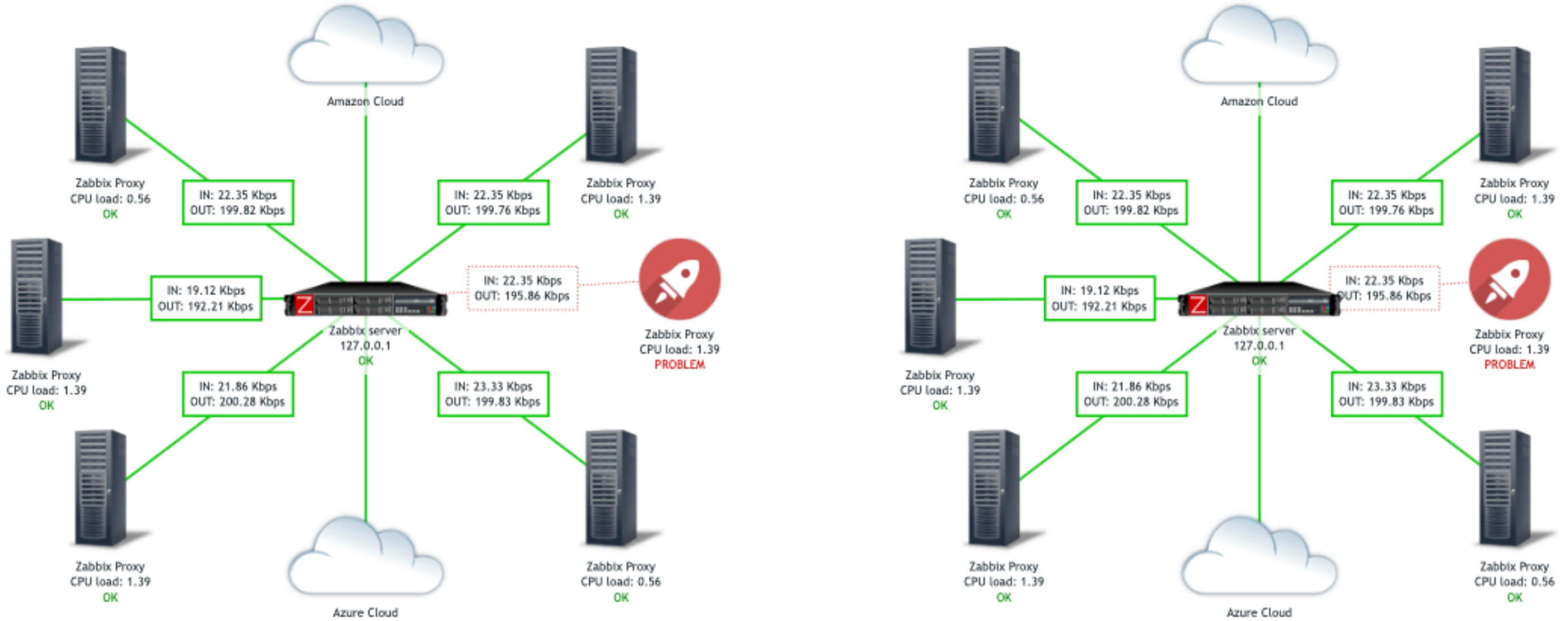
Host group	Disaster	High	Average	Warning	Information	Not classified
Cloud/AWS				1		
Cloud/Azure				1	1	
End user services			1	5		
Europe/Germany/Berlin						
HPC Cluster			2	27	1	
Internal infrastructure	2	3	41	2		
R&D Lab1						
R&D Lab2				1		
Region/Australia				1		
Region/Brazil						32
Region/China	1			1		



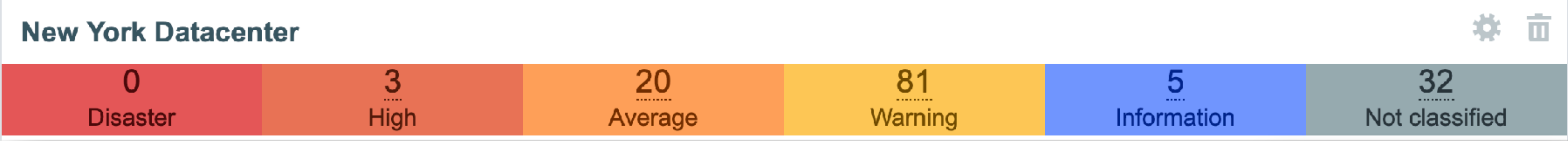
Detected problems

Time	Info	Host	Problem - Severity	Duration	Ack	Actions	Tags
2018-10-01 12:25:11		AWS N34	Service Redis stopped	1y 8d	Yes	1 2	Datacenter: FR2 Env: Staging Service: Redis
2018-10-01 12:25:11		AWS N90	Service Redis stopped	1y 8d	Yes	1 1	Datacenter: FR2 Env: Staging Service: Redis
2018-09-30 13:45:45		AZ M10	Too many queries per second	1y 8d	Yes	2 3	Datacenter: NY1 Env: Production Service: HTTP balancer
2018-09-30 13:45:45		AWS N30	Too many queries per second	1y 8d	Yes	1 2	Datacenter: NY1 Env: Production Service: HTTP balancer
2018-09-30 12:45:45		AZ M18	Slow query execution time	1y 8d	No	1	Datacenter: NY1 Env: Production Service: AWS Dynam...

Headerless widgets

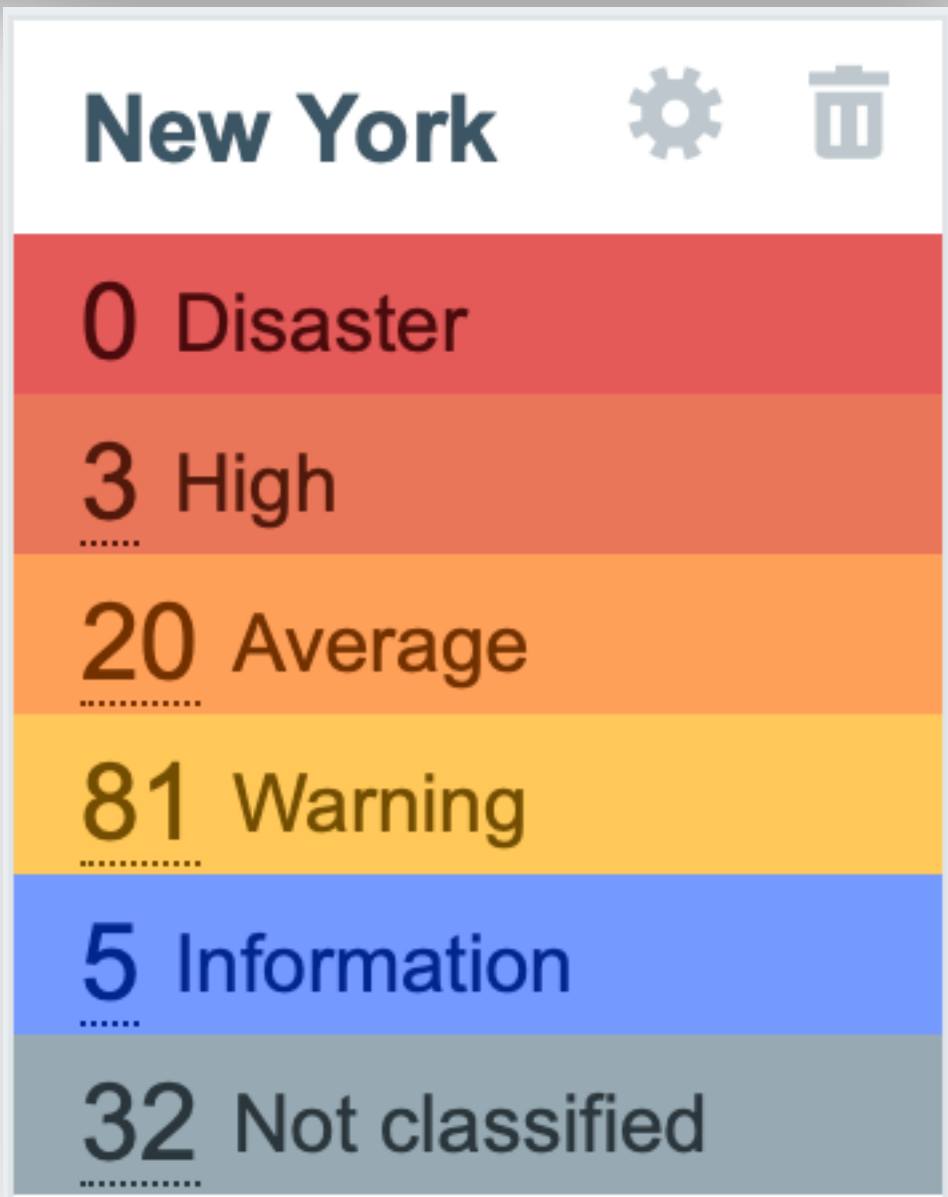


Compact problem view

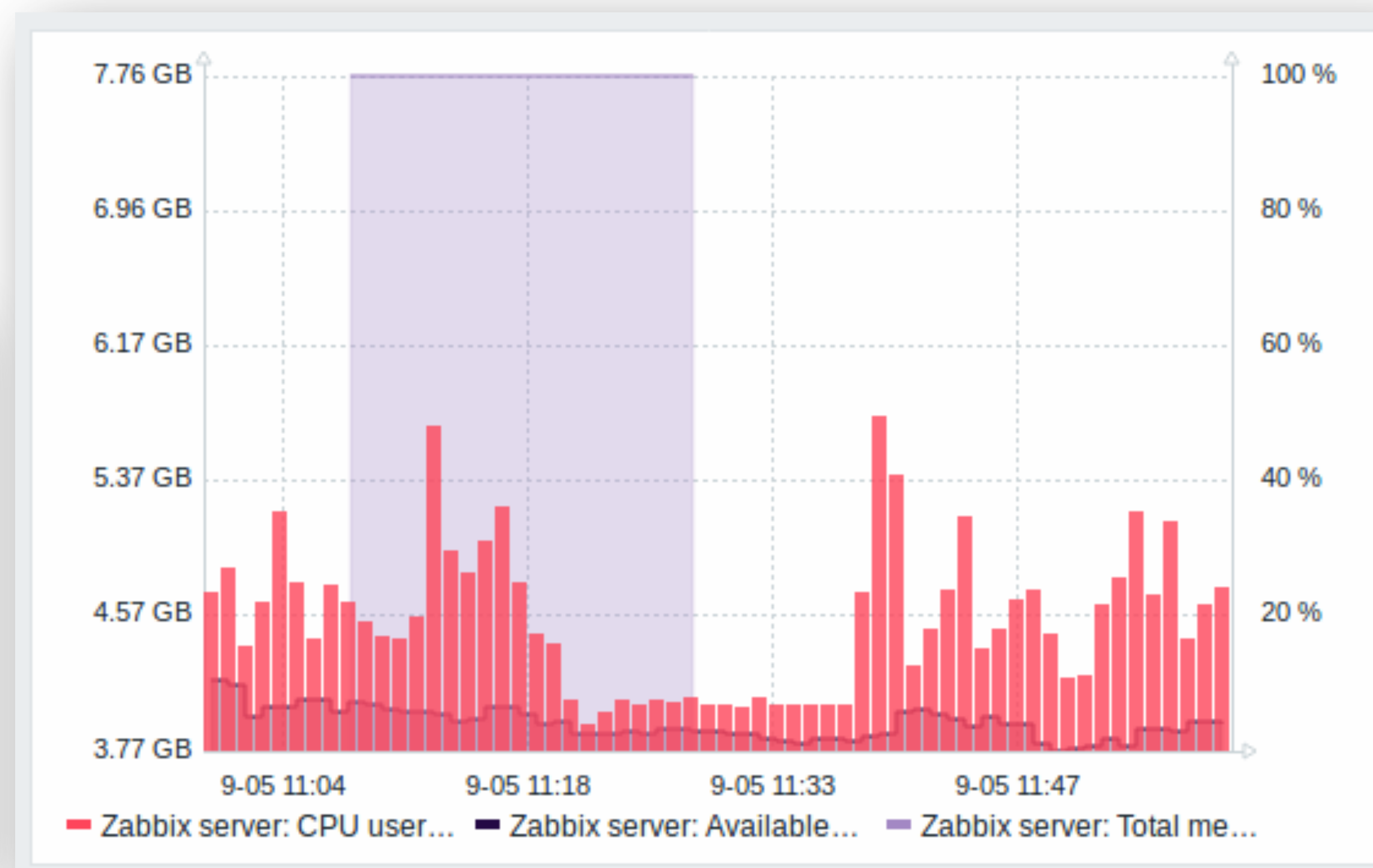
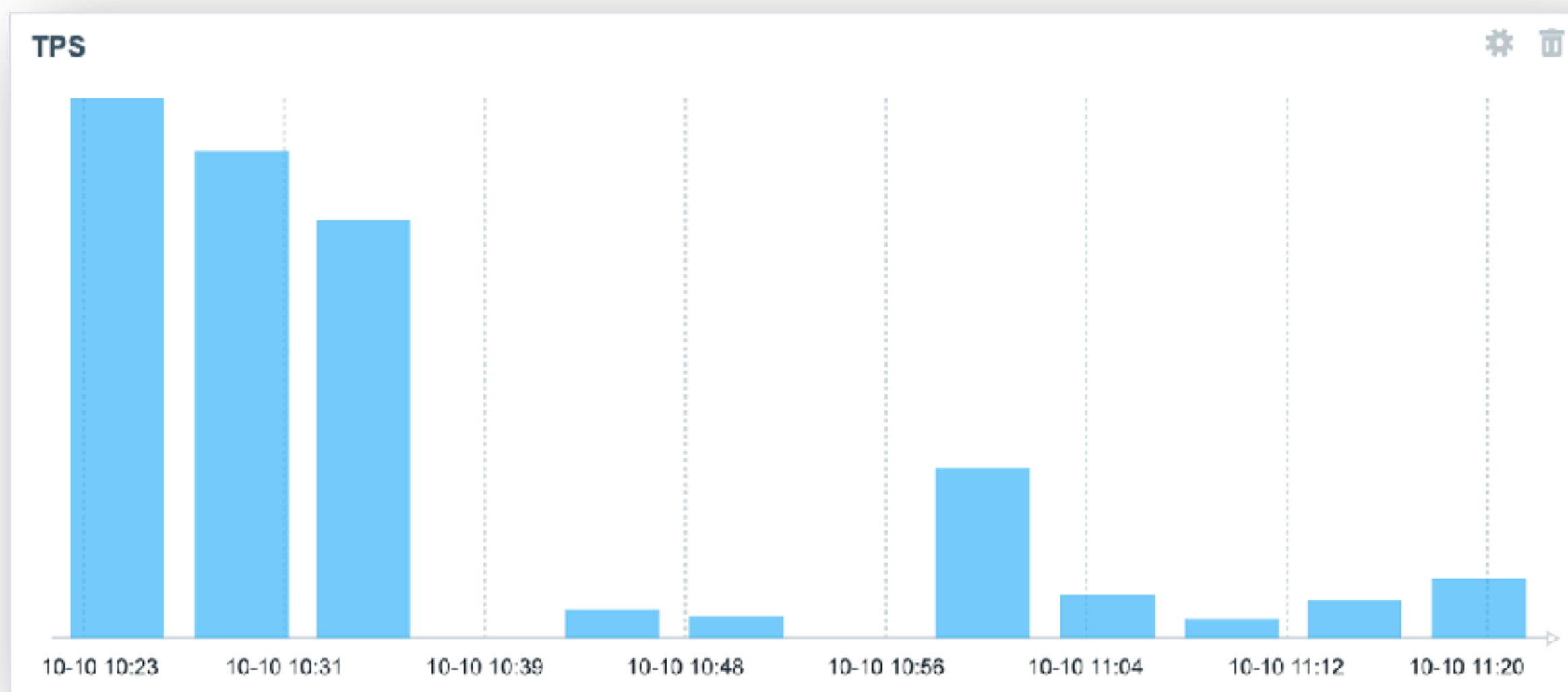
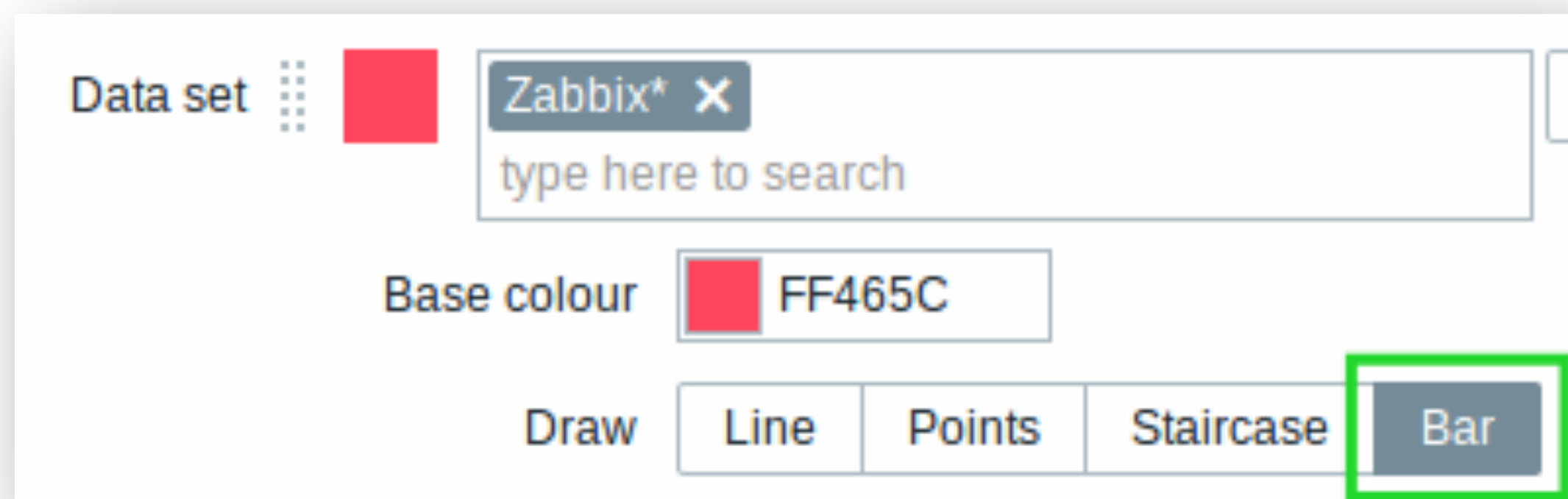


Problems by severity

Category	Disaster	High	Average	Warning	Information	Not classified
HPC Cluster	0	2	27	1	0	0
Internal infrastructure	2	3	41	2	0	0
R&D Lab1	0	0	0	0	0	0
R&D Lab2	0	0	1	0	0	0
Region/Australia	0	0	1	0	0	0
Region/Brazil	0	0	0	0	0	32
Region/China	1	0	1	0	0	0
Region/Europe	0	0	0	0	0	0
Region/Japan	0	5	0	0	0	0
Region/USA	0	3	1	0	0	0
SAP HANA Infra	0	0	1	1	0	0
Zabbix infrastructure	0	0	1	0	0	0



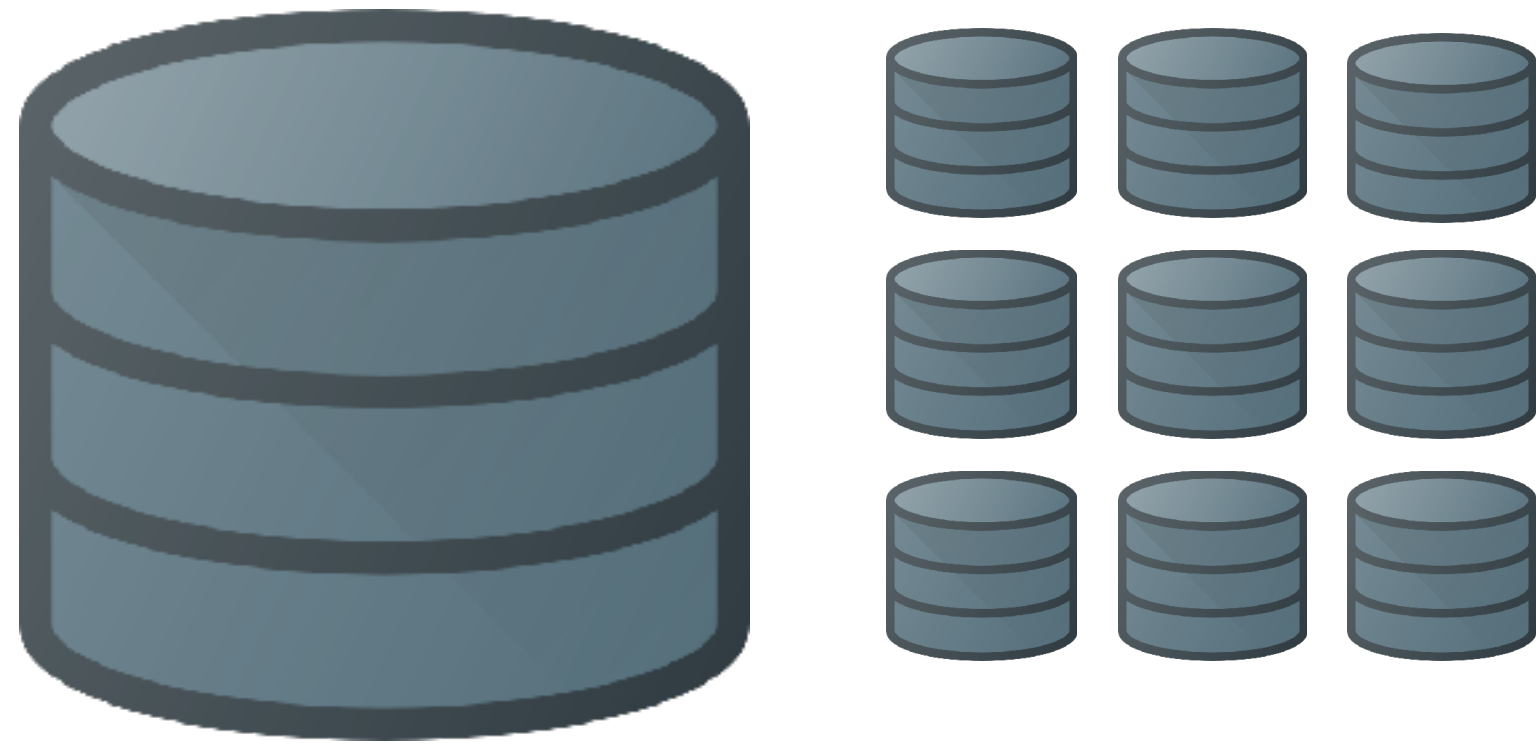
Aggregation of data and bar graphs



8

New storage options

Support of Timescale database



Advantages

- Automatic partitioning
- Zabbix manages removal of old data
- Performance oriented DB
- **Now officially supported by Zabbix!**



TIMESCALE

9

Standards for templates

So many templates to choose from!



Template DB MySQL

3rd party solutions

Link	Source	Compatibility	Type, Technology	Created Updated	Rating
<p>Template MySQL (800+ items) A huge template for monitoring MySQL without any triggers ✓ Zabbix Agent ✓ Zabbix Trapper</p> <p>share.zabbix.com/template-mysql-800-items</p>	<p>share.zabbix.com 👤 13207 🗨 65</p>	2.0	Template, External script, perl	2015-08-19 4 y	Popular Not maintained
<p>Zabbix template for monitoring Galera cluster Template for monitoring a Galera Cluster running on Linux. Tested on RHEL and CentOS 7. Created using 3.2 but may work with lower versions. Add Value Mapping, import Template and copy userparamater file to client, and restart zabbix agent service. ✓ Zabbix Agent</p> <p>github.com/MogiePete/zabbix-galera-template share.zabbix.com/galera-cluster-monitoring</p>	<p>share.zabbix.com 👤 884 🗨 13</p>	3.2	Template	2017-08-04 2 y	Popular
<p>MySQL-Monitoring-Proxy This tool can be utilized to gather behavioral measurement data or configuration data of MySQL servers in a efficient way. It can be used as an external check for the zabbix monitoring system. The benefit for using this tool is a very low overhead for gathering the measurements because this tool is written ... ✓ Custom Script</p> <p>github.com/scoopex/mysql_extend</p>	<p>share.zabbix.com</p>	3.4	External script, C	2015-09-27 1 y	

Template defines how to monitor a **resource**

OS

Application

Hardware device

Any IT infrastructure (services) consists of a set of **standard resources**



Templates is a **knowledge base!**

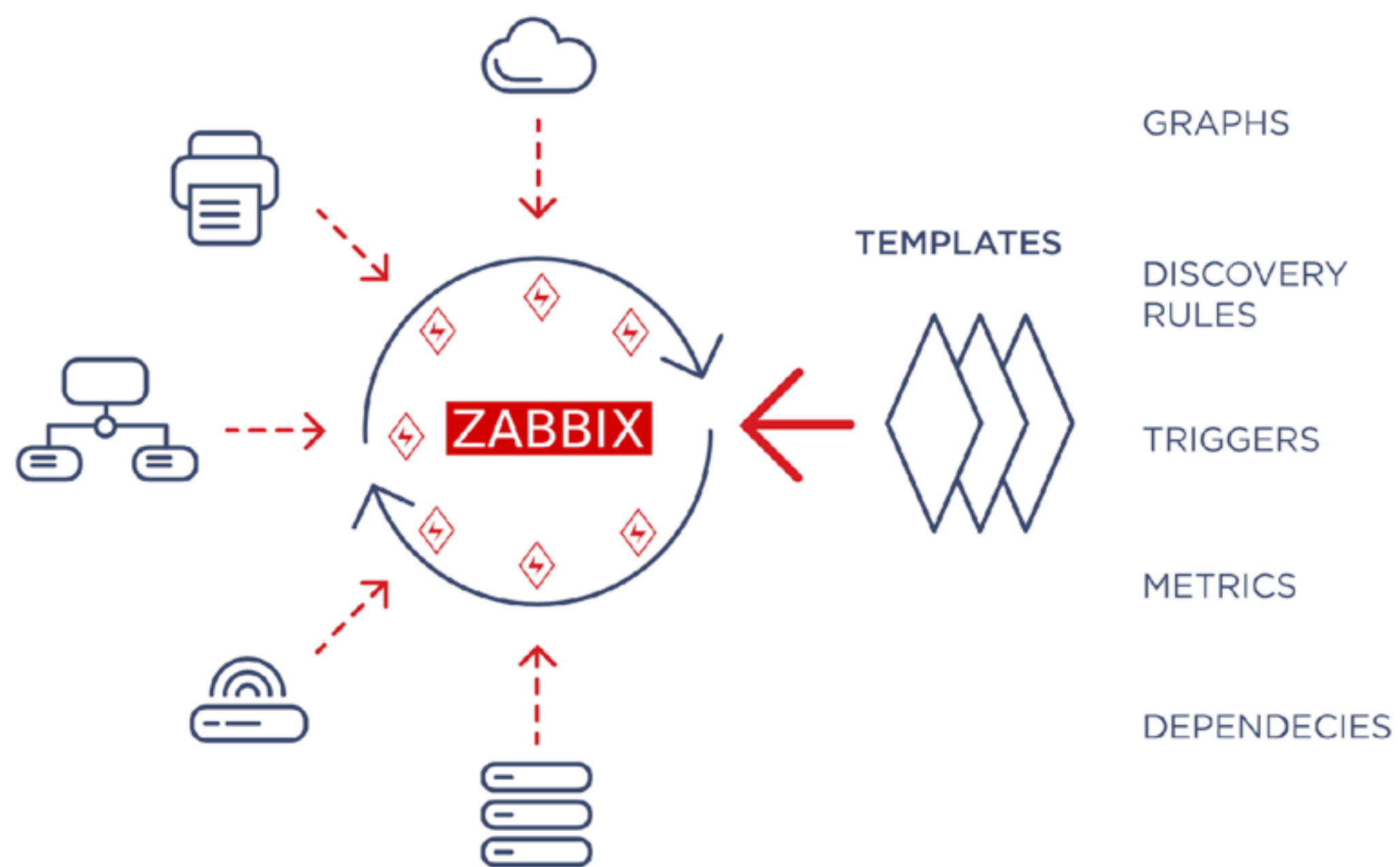
How to monitor a resource?

What resource metrics needs to be monitored?

What availability, performance and security related problems must be detected?

Description of all metrics and problems

Guidelines



Best practices on

Data collection: items

Problem detection: triggers
































































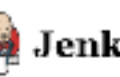





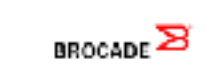




























































Problem classification: severity and tags

Knowledge

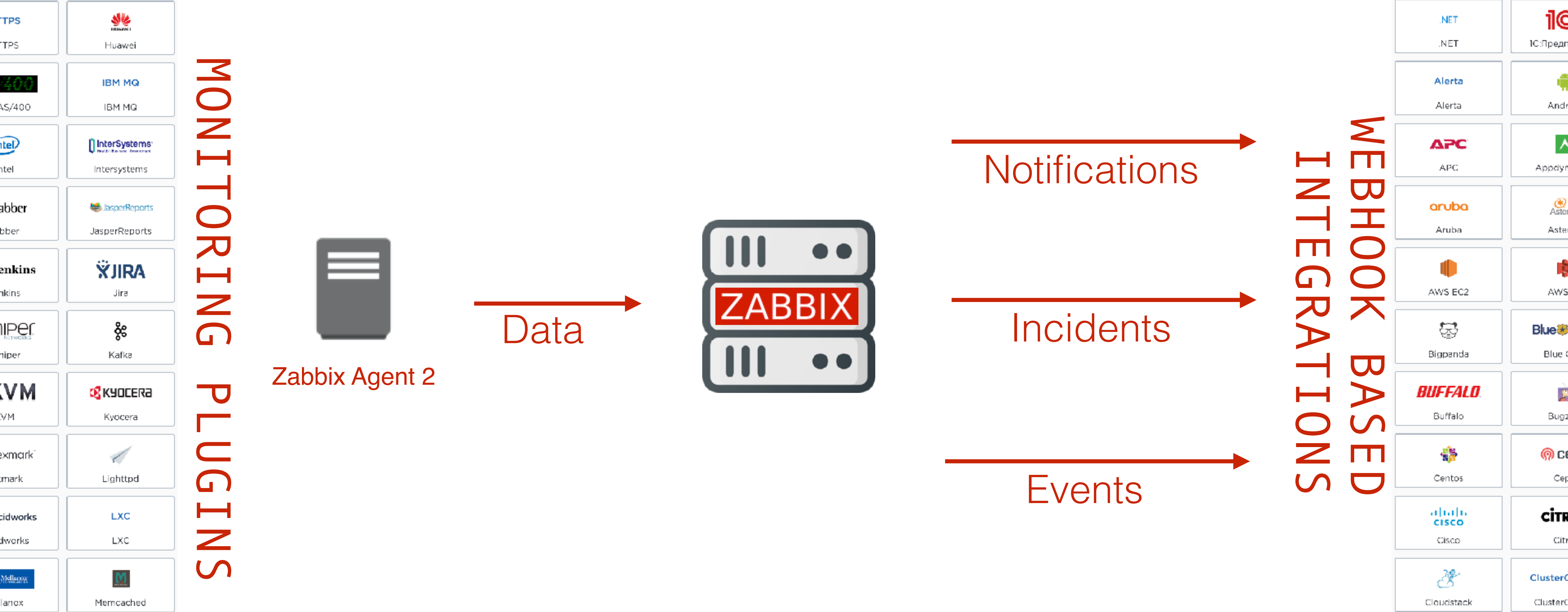
Visualization: host level screens (dashboards)

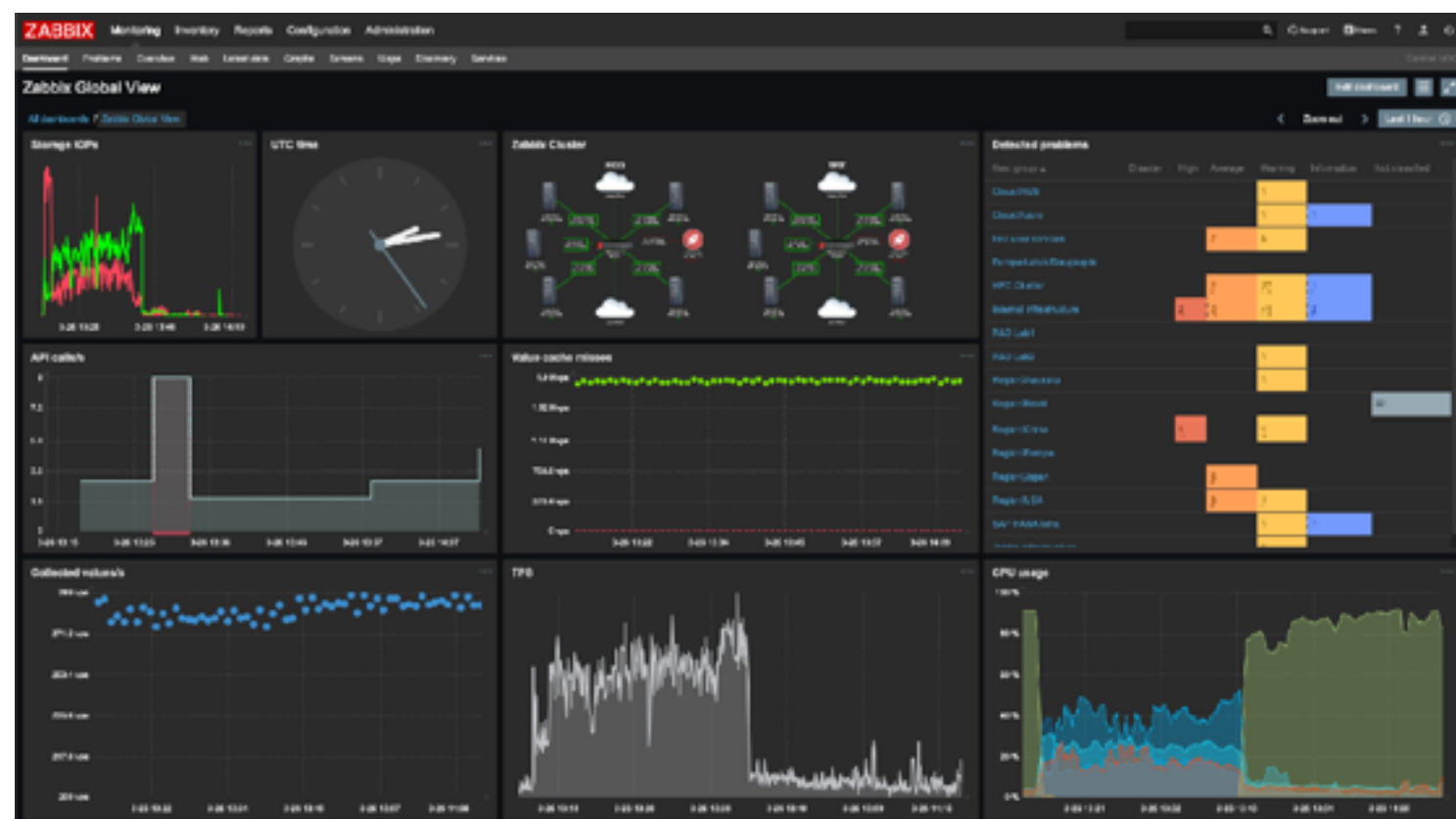
<https://www.zabbix.com/documentation/guidelines>

Various resources

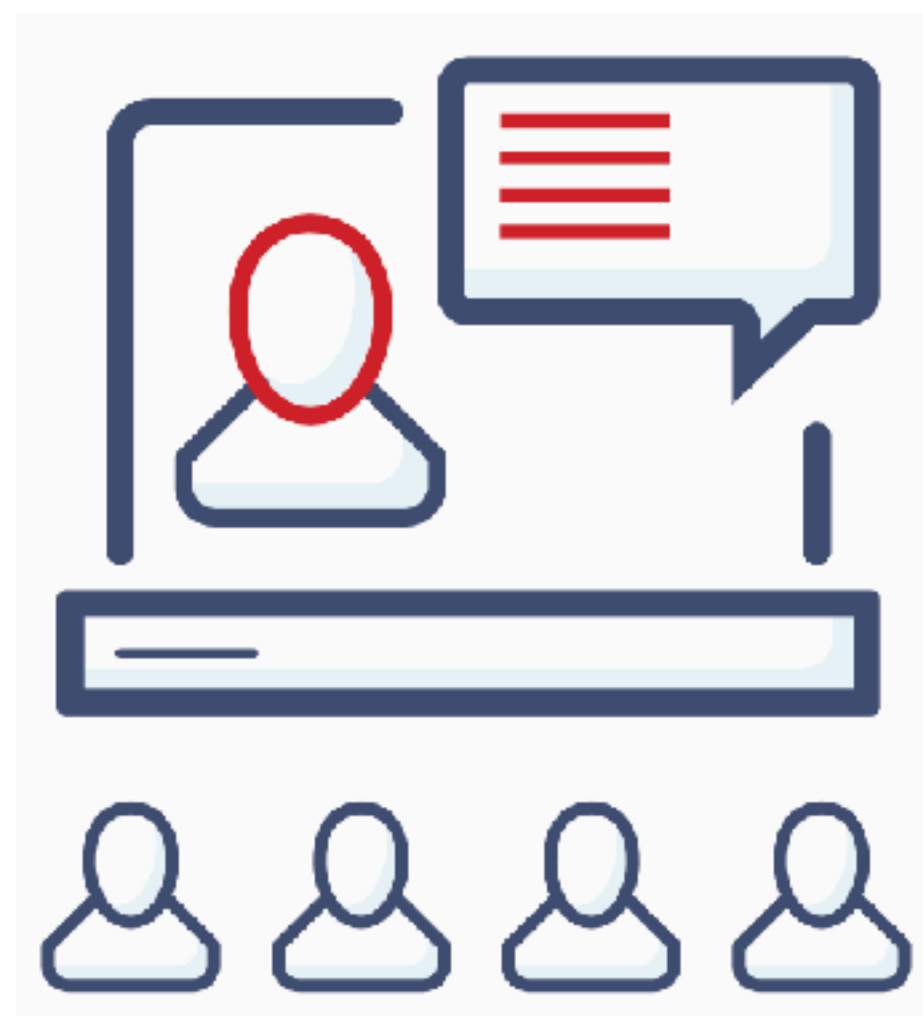
 NET	 IC:Предприятие	 Active Directory	 ActiveMQ	 Alcatel Lucent	 Cloudstack	 ClusterControl	 Confluence	 Cooling	 CoreOS	 HTTP	 HTTPS	 Huawei
 Alerta	 Android	 Ansible	 Antivirus	 Apache	 Couchbase	 cPanel	 D-Link	 Database monitoring	 Datacom	 IBM AIX	 IBM AS/400	 IBM MQ
 APC	 Appdynamics	 Application 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

Making a platform for high quality solutions





Zabbix Blog



Webinars



Youtube



Zabbix 5.0 LTS

Zabbix 5.0

March, 2020

Main directions

Out of the box monitoring and alerting

Ready for Cloud and Kubernetes monitoring

Baseline monitoring

Security monitoring

Vizualization and reporting

Performance and high availability

Modules for Zabbix UI

Support of user modules to extend Zabbix UI:

- extend functionality
- add new menu entries
- modify or improve existing functionality
- add new dashboard widgets (in 5.2?)

New Agent

zabbix_agent2



Support of Microsoft Windows



Two ways of deploying a plugin.

- compiled-in (supported currently)
- as a standalone module

Security monitoring

Detection of security related problems for a monitored **resource**:

- unsafe configuration options
- use of non secure connections
- other resource specific issues

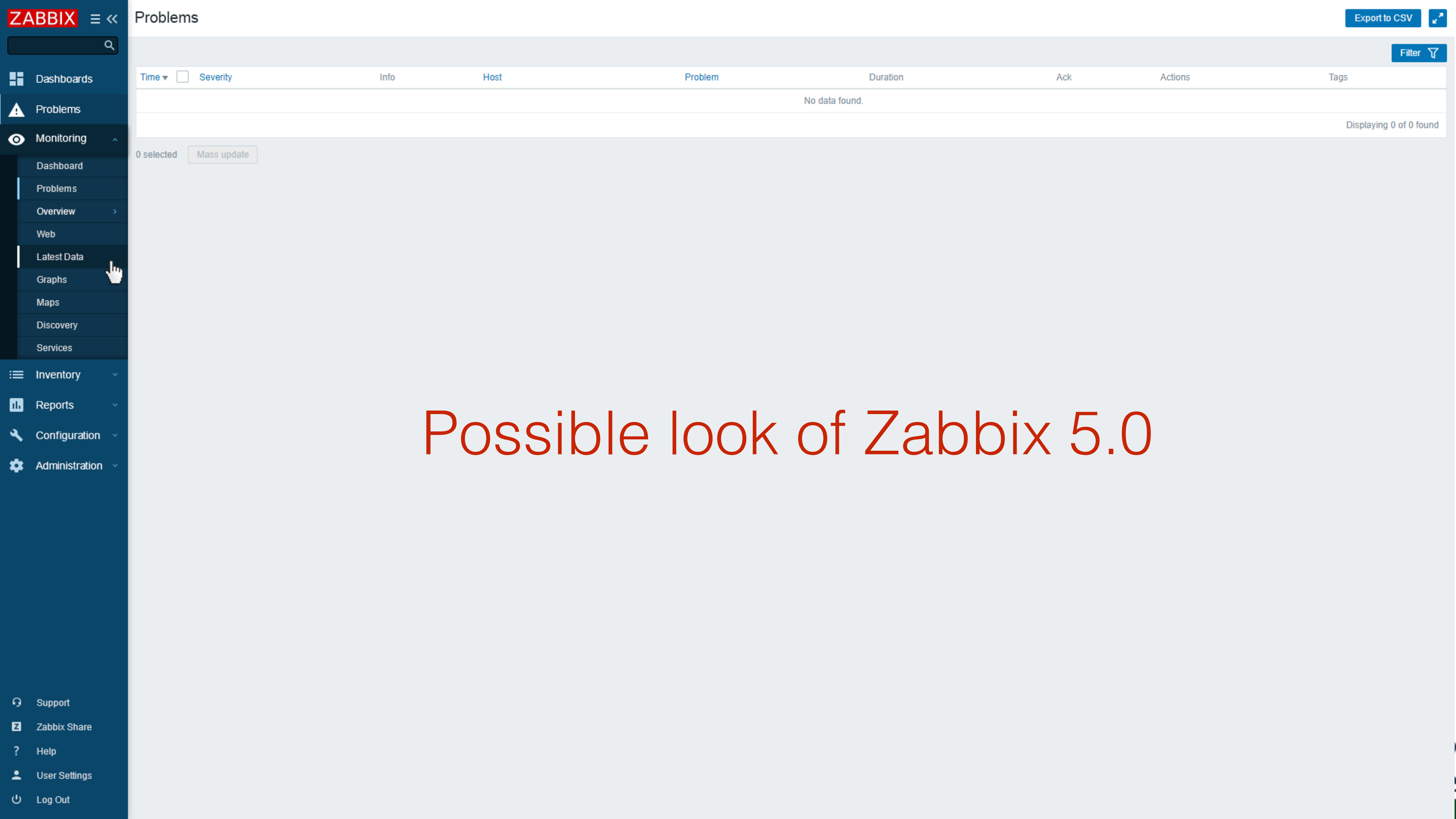
All problems classified (tagged) as availability, performance or **security related**

Policy for problem tags: list of mandatory tags for templates and hosts

Enabling code contributions

Process

1. Sign **Zabbix Contributor Agreement**
2. Develop **plugin** or a **new media type**
3. Zabbix Team will review it and provide feedback
4. Fix reported issues
5. **The new code will be included into Zabbix software and officially supported**



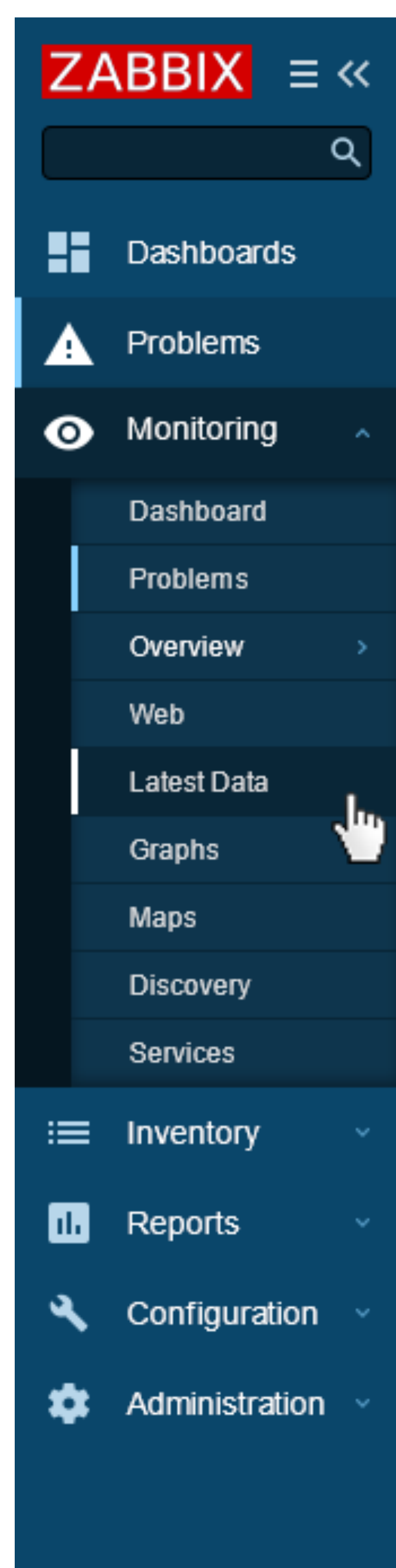
Possible look of Zabbix 5.0

UI modules

Extend functionality of Zabbix UI

3rd party modules and reporting

New dashboard widgets (5.2?)



Detailed roadmap will be published
next week!

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

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扫码入群



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关注微博



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www.zabbix.com/cn
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Zabbix开源社区

Thank you!