ZABBIX

What's new in Zabbix 7.0

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Zabbix 7.0

ZABBIX

Focus on enterprise grade features enabling new use cases, better performance and out-of-the-box scalability

ZABBIX

Synthetic end-user web monitoring

Synthetic end-user web monitoring

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Synthetic web monitoring

- Simulate an interaction by a real user with a real browser
- Performed by writing custom scripts
- Test various aspects of a website or web application – availability, performance, transaction statuses and more.

Synthetic end-user web monitoring

Synthetic web monitoring in Zabbix

- A Selenium Server or a plain WebDriver to perform synthetic web monitoring
- Selenium Server utilizes a headless browser to perform tests
- Selenium Server is not provided as a part of Zabbix packages
- Most simple way to get started – Selenium Docker containers

Synthetic end-user web monitoring

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Synthetic web monitoring in Zabbix

- Point Zabbix server at the WedDriver URL
- Browser pollers are responsible for polling Browser items

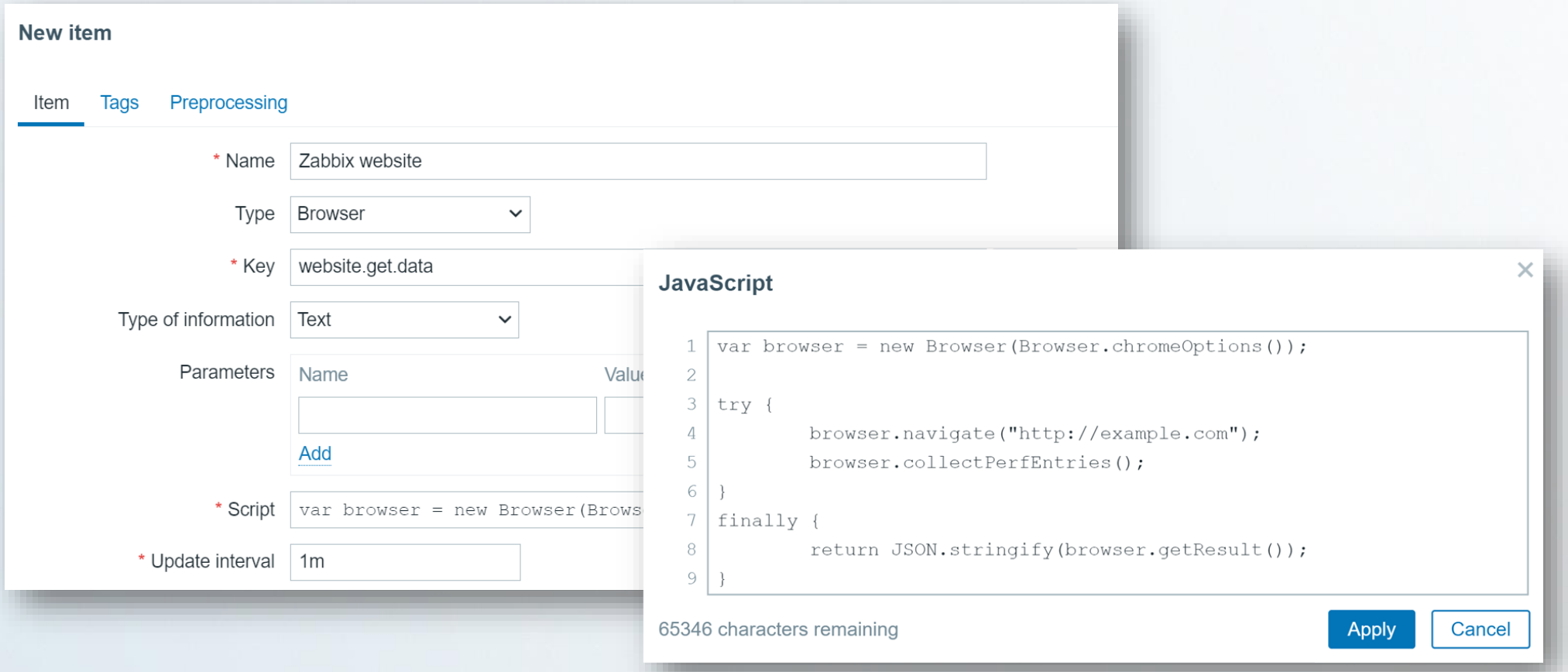
```
####### Browser monitoring #######

### Option: WebDriverURL
#       WebDriver interface HTTP[S] URL. For example http://localhost:4444 used with
#       Selenium WebDriver standalone server.
#
# Mandatory: no
# Default:
# WebDriverURL=
WebDriverURL=http://192.168.0.1:4444

### Option: StartBrowserPollers
#       Number of pre-forked instances of browser item pollers.
#
# Mandatory: no
# Range: 0-1000
# Default:
# StartBrowserPollers=1
StartBrowserPollers=3
```

Synthetic end-user web monitoring

New item type - Browser



Synthetic end-user web monitoring

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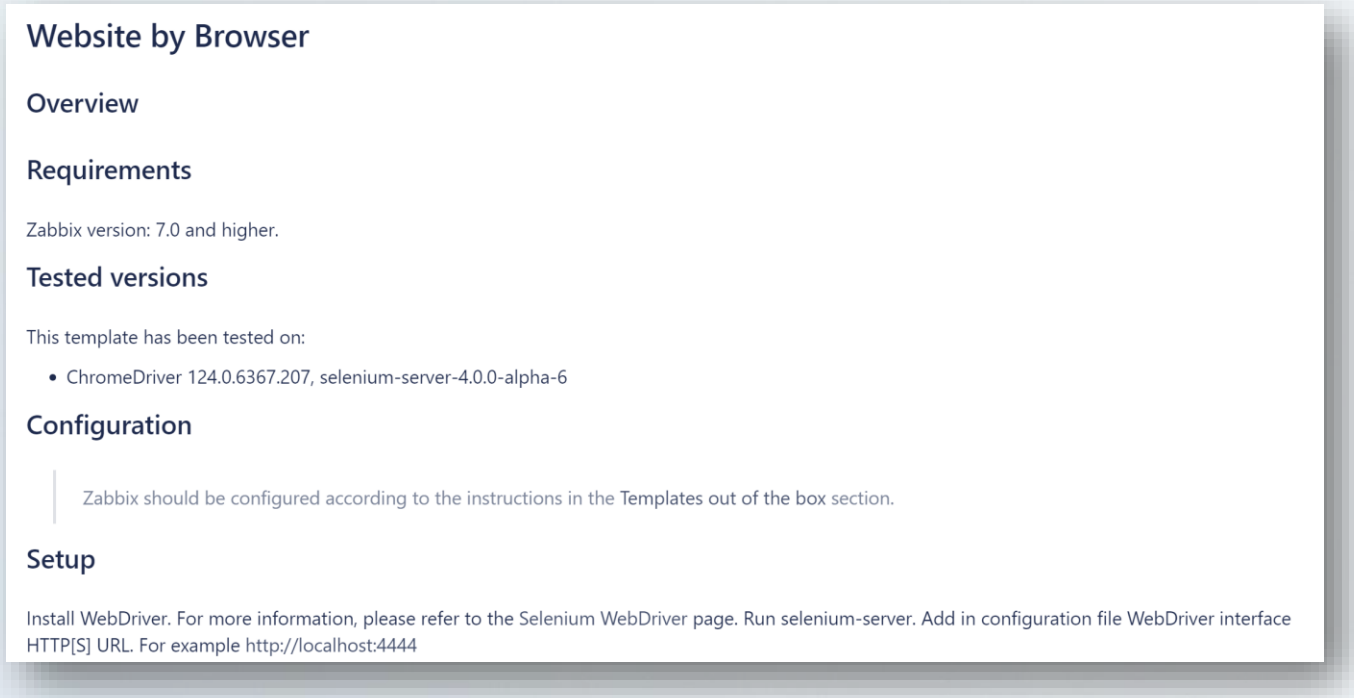
The Browser item uses JavaScript to collect data in JSON

- The default script collects performance entries and session statistics
- Website by Browser template is available for more complex scenarios



Website by Browser

Overview

Requirements

Zabbix version: 7.0 and higher.

Tested versions

This template has been tested on:

- ChromeDriver 124.0.6367.207, selenium-server-4.0.0-alpha-6

Configuration

> Zabbix should be configured according to the instructions in the **Templates out of the box** section.

Setup

Install WebDriver. For more information, please refer to the Selenium WebDriver page. Run selenium-server. Add in configuration file WebDriver interface HTTP[S] URL. For example http://localhost:4444

Synthetic end-user web monitoring

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Website by Browser template contains:

- Items for website navigation and resource statistics
- Current website screenshot
- Triggers for slow load times and website availability
- A dashboard displaying website screenshot and various performance statistics

Synthetic end-user web monitoring

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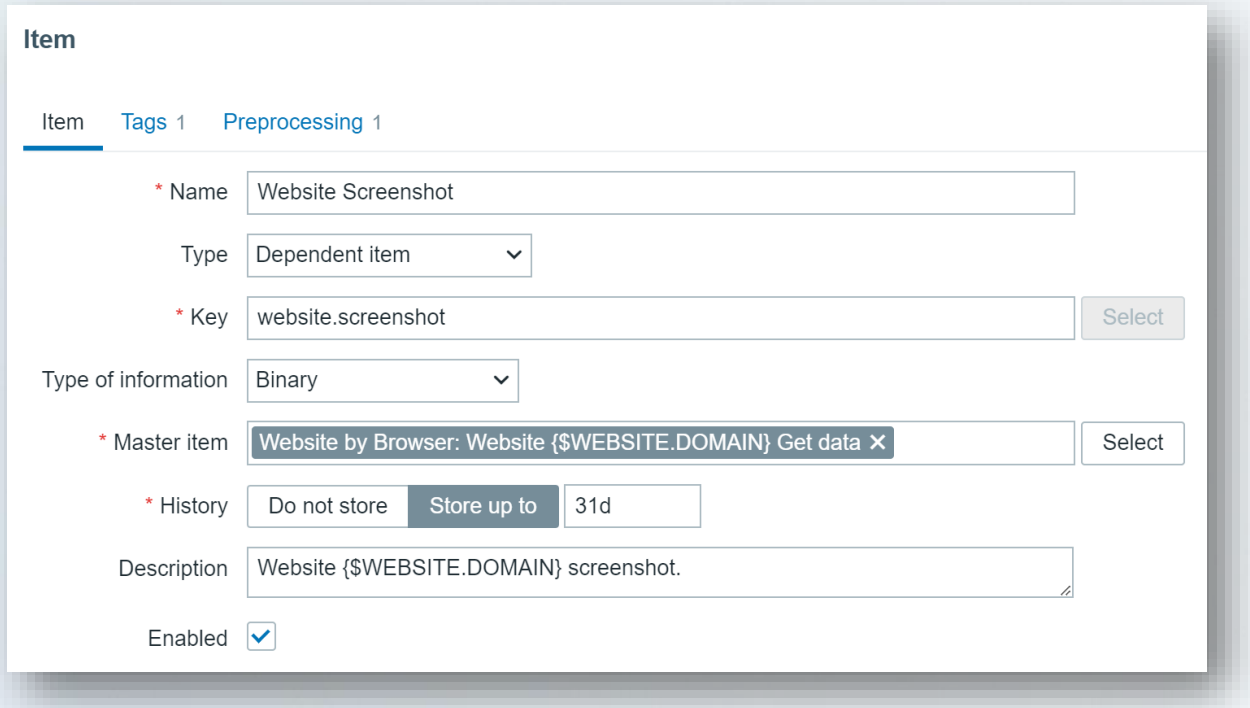
The new Binary type of information can be used to collect and store images

- Browser item can collect screenshots of the website in base64 format
- It can be stored in a binary dependent item



Synthetic end-user web monitoring

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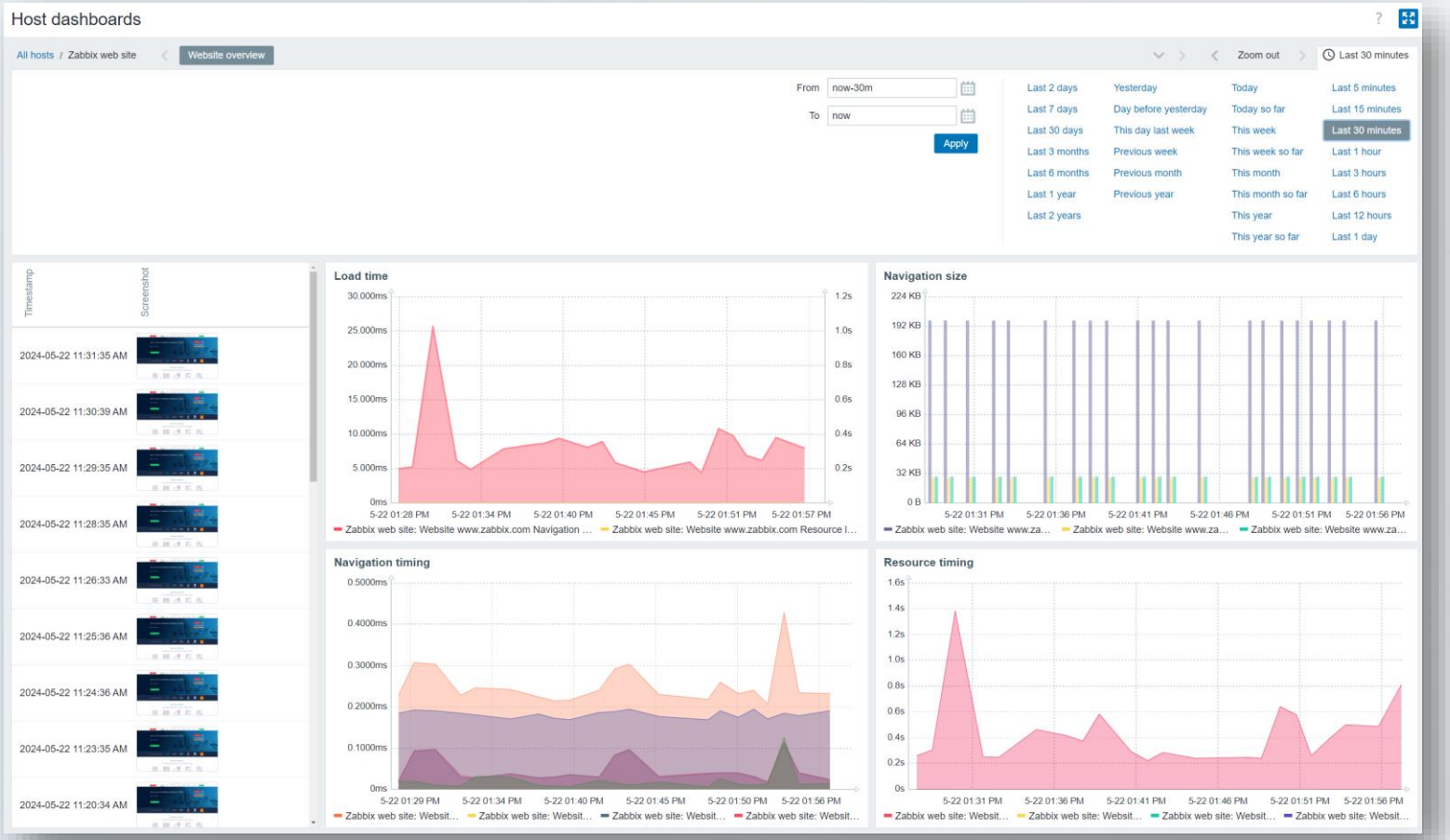
The Item history widget can now display screenshots:



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Asynchronous data polling

Data collectors

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Data in Zabbix is collected by various data collectors:

- Pollers
- Trappers
- Pingers
- etc.

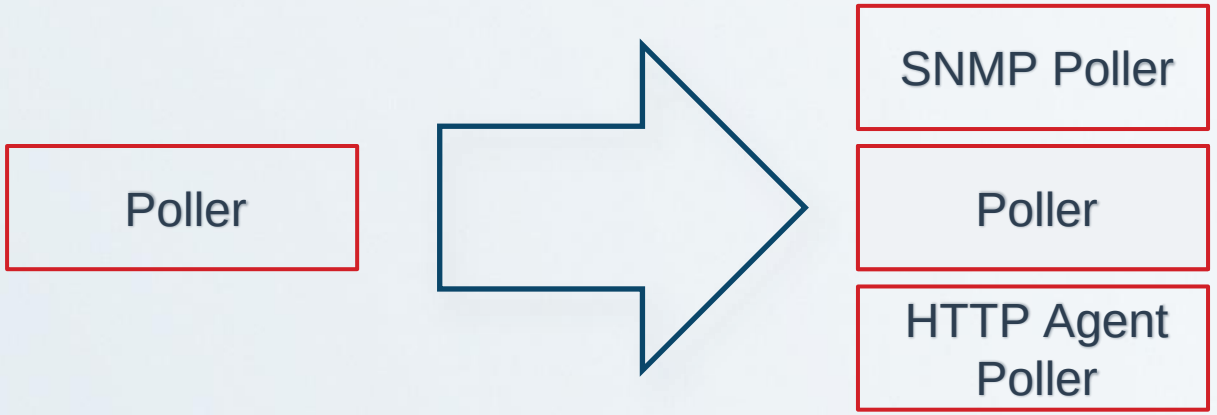
Poller processes can collect only a single metric at once:

- As a result, hundreds of pollers are required in some scenarios
- The maximum number of pollers is limited to 1000

Specific poller types

In Zabbix 7.0, specific poller types are introduced

- SNMP poller
- Zabbix Agent poller
- HTTP check poller



Zabbix 6.0

Zabbix 7.0

Asynchronous polling

Each poller type now is an asynchronous process:

- Up to 1000 values can be collected by each process in a single cycle
- A separate thread is started to synchronize with configuration cache

Asynchronous processes are a programming concept that allows tasks to be executed independently of each other and without blocking the main program's execution.

Number of concurrent checks

The maximum number of concurrent checks can be specified:

- Specified by the MaxConcurrentChecksPerPoller value
- The default value is 1000

```
### Option: MaxConcurrentChecksPerPoller
#       Maximum number of asynchronous checks that can be executed at once
#
# Mandatory: no
# Range: 1-1000
# Default:

MaxConcurrentChecksPerPoller=1000
```

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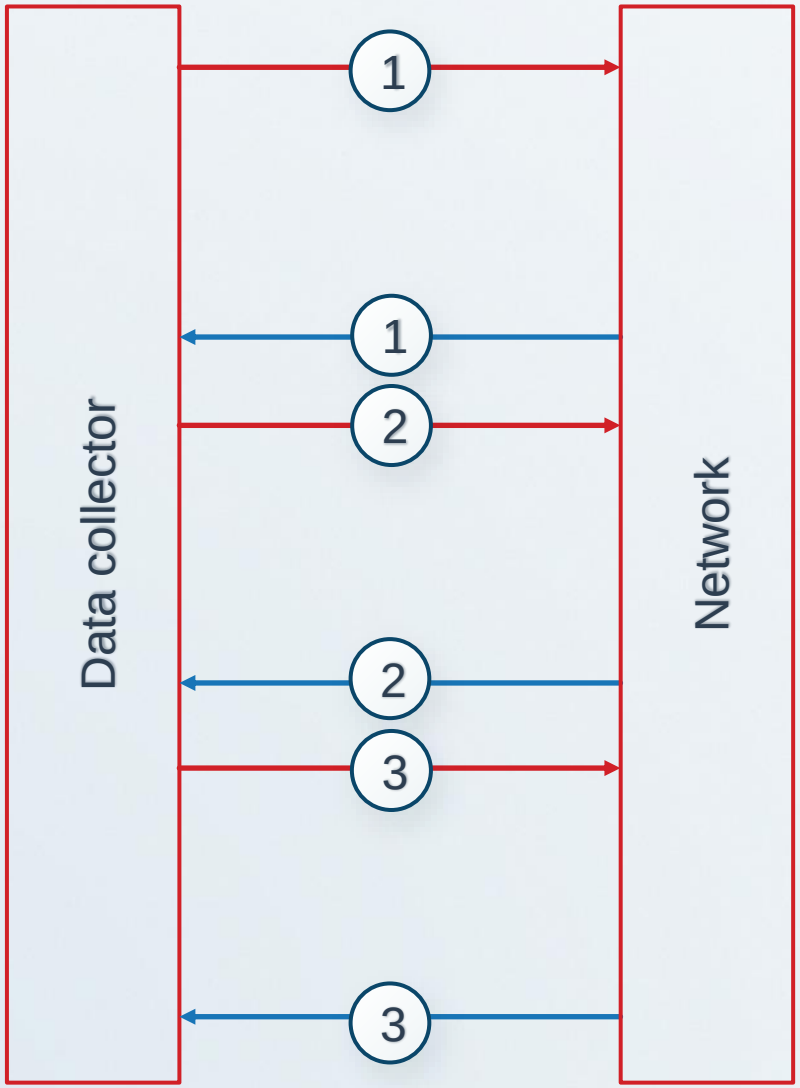
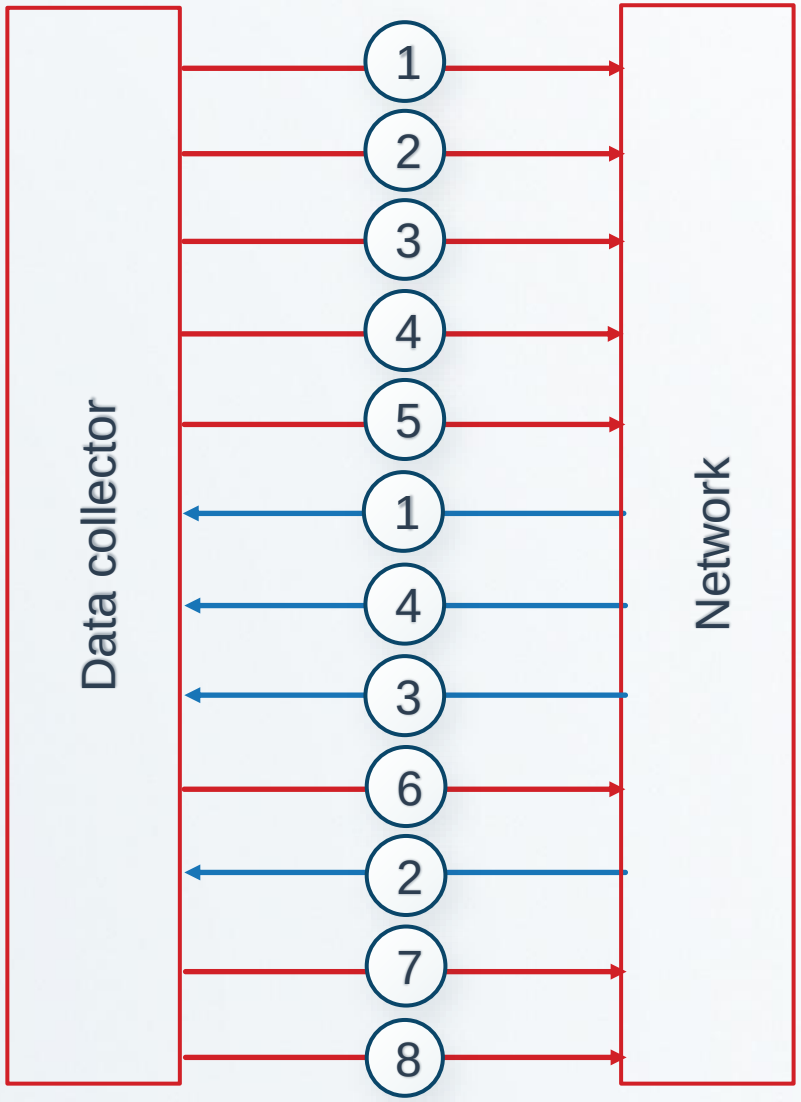
Synchronous data collection



Asynchronous data collection



Zabbix 6.0 vs 7.0

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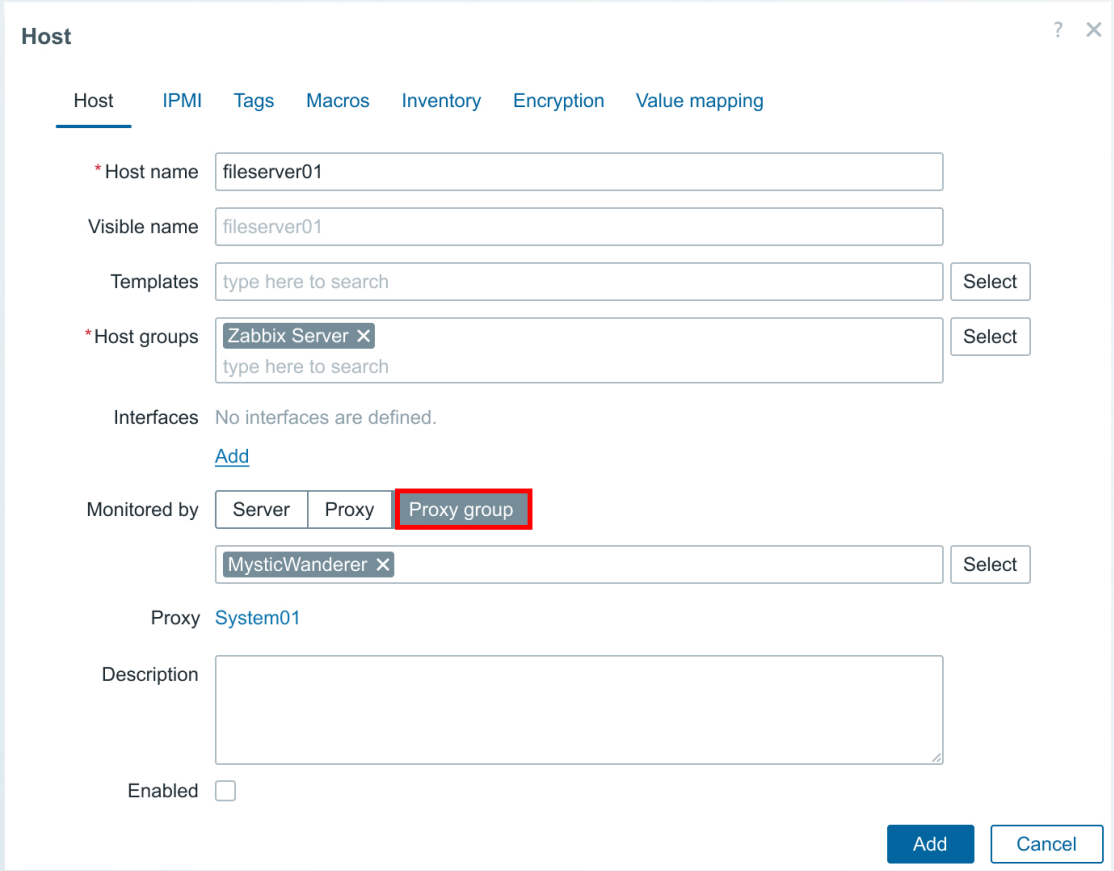
Proxy high availability and load balancing

Proxy groups

Proxy groups are introduced to support LB and HA logic

- Hosts can be monitored by a proxy group or a single proxy



Proxy groups

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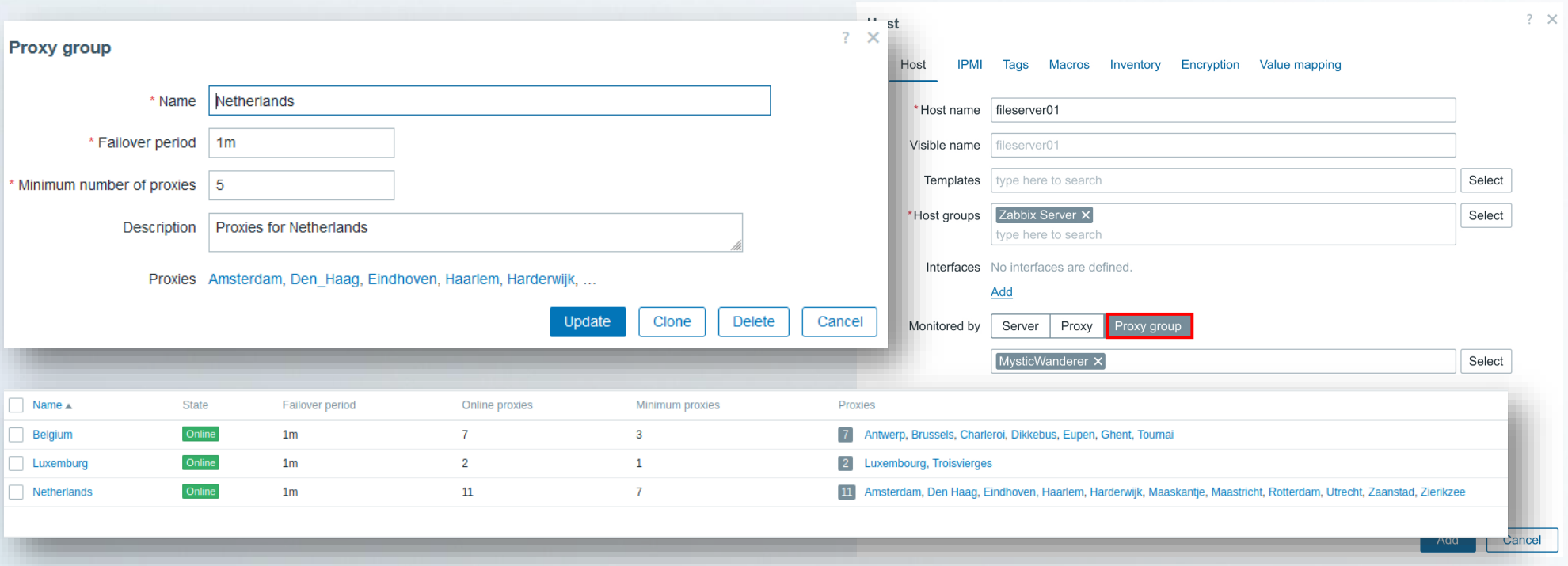

Proxy groups

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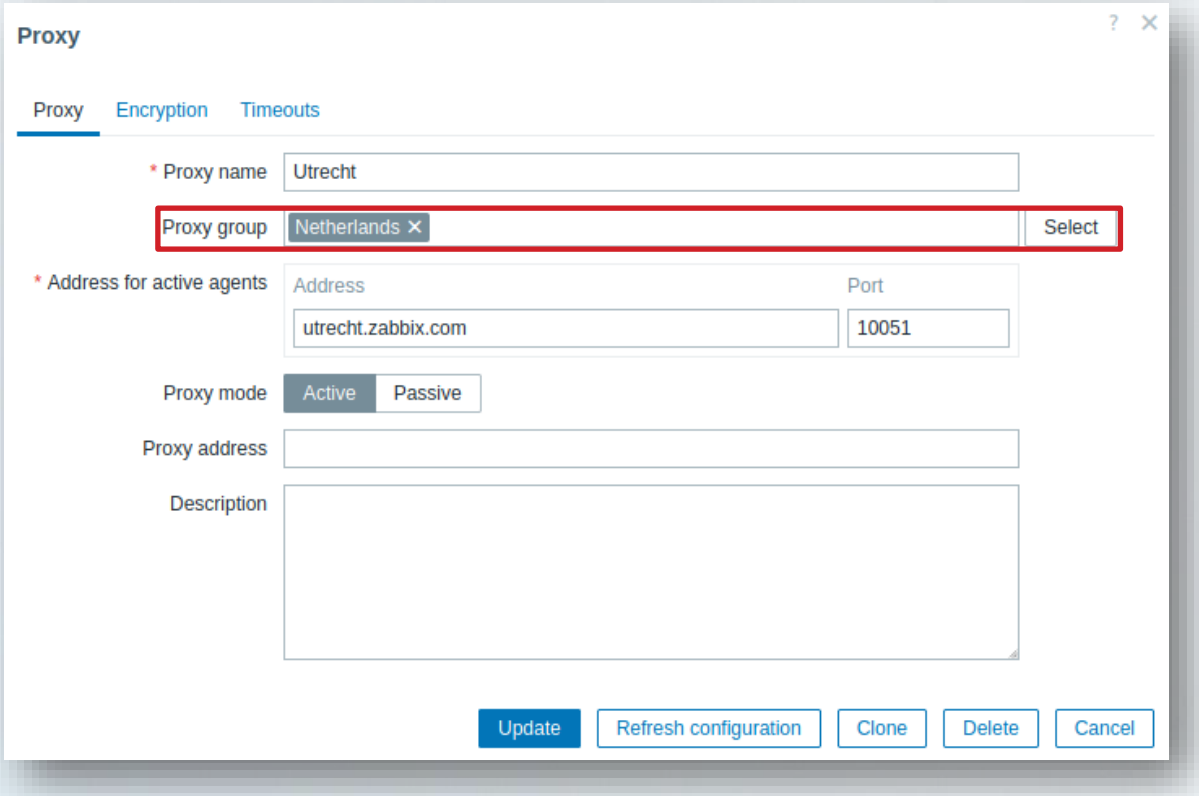
More about proxy groups:

- Failover period is used to decide when a proxy is online/offline
- A minimal number of online proxies can be configured for a proxy group to be online
- Proxies of older versions (and hosts assigned to them) will be excluded from host rebalancing
- If a proxy group is offline (less than minimum number of proxies online), hosts assigned to that group will stop being monitored

Proxy groups

Proxies are assigned to proxy groups using the proxy configuration form:



Proxy groups

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Hosts are rebalanced if the following conditions are met:

- The number of hosts assigned to a proxy differs from the average by twice or more
- Difference is not less than 10 hosts
- Hosts exceeding the average are unassigned from proxies
- The unassigned hosts are then assigned to proxies with fewer hosts

Proxy groups

Proxy rebalancing example:

20 35 60 20 15

Average = 30

Unbalanced
60 / 30 = 2

Unbalanced
15 / 30 = 0.5

Proxy groups

Proxy rebalancing example:

30 30 30 30 30

Average = 30

Proxy groups

When a new proxy is added, the group is automatically rebalanced

- New average is calculated
- Excess hosts are unassigned
- Unassigned hosts are reassigned between proxies

Zabbix Agent

Agents need to be configured to accept connections from proxies in a proxy group:

- For active agent mode, ServerActive needs to contain the IP of at least one (preferably multiple) proxy node groups
- For passive agent mode, Server parameter needs to include IP addresses of all proxy nodes in a proxy group

Proxy memory buffer

New proxy buffer modes

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Zabbix 7.0 will introduce new proxy buffer modes:

- Disk — Current behavior
- Memory — Data stored only in shared memory
- Hybrid — Buffer works in memory mode with DB as backup

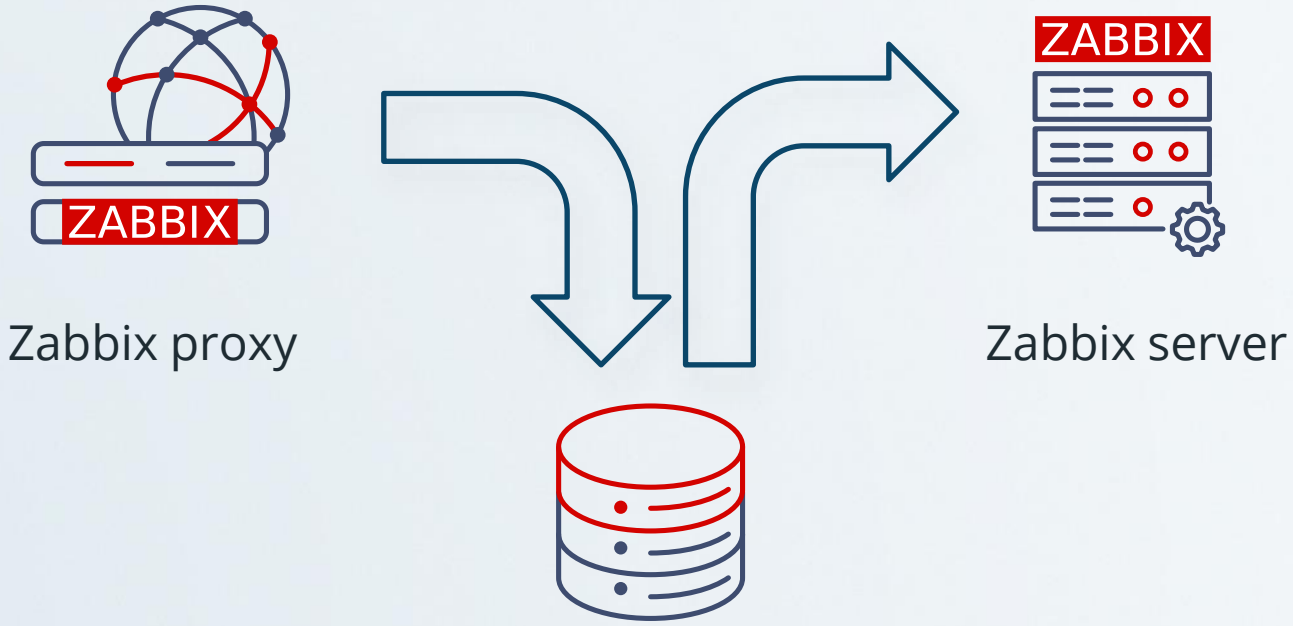
```
### Option: ProxyBufferMode
#     Specifies history, discovery and auto registration data storage mechanism:
#     disk    - data are stored in database and uploaded from database
#     memory  - data are stored in memory and uploaded from memory.
#     hybrid  - the proxy buffer normally works like in memory mode until it
#               runs out of memory or the oldest record exceeds the configured age
# Default:
# ProxyBufferMode=disk

ProxyBufferMode=hybrid
```

Disk mode

Each value collected by Zabbix proxy goes through a database:

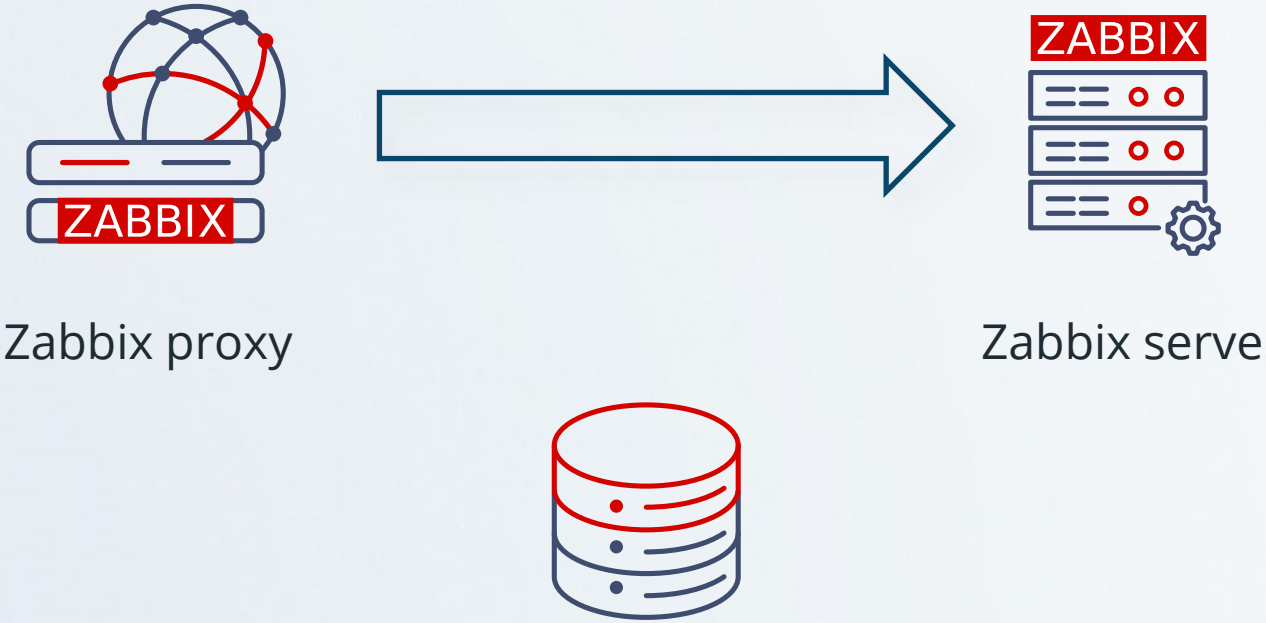
- Database (MySQL, Postgres, or SQLITE) required on each proxy
- This may cause a bottleneck on large proxies



Memory mode

Data is sent to Zabbix server directly:

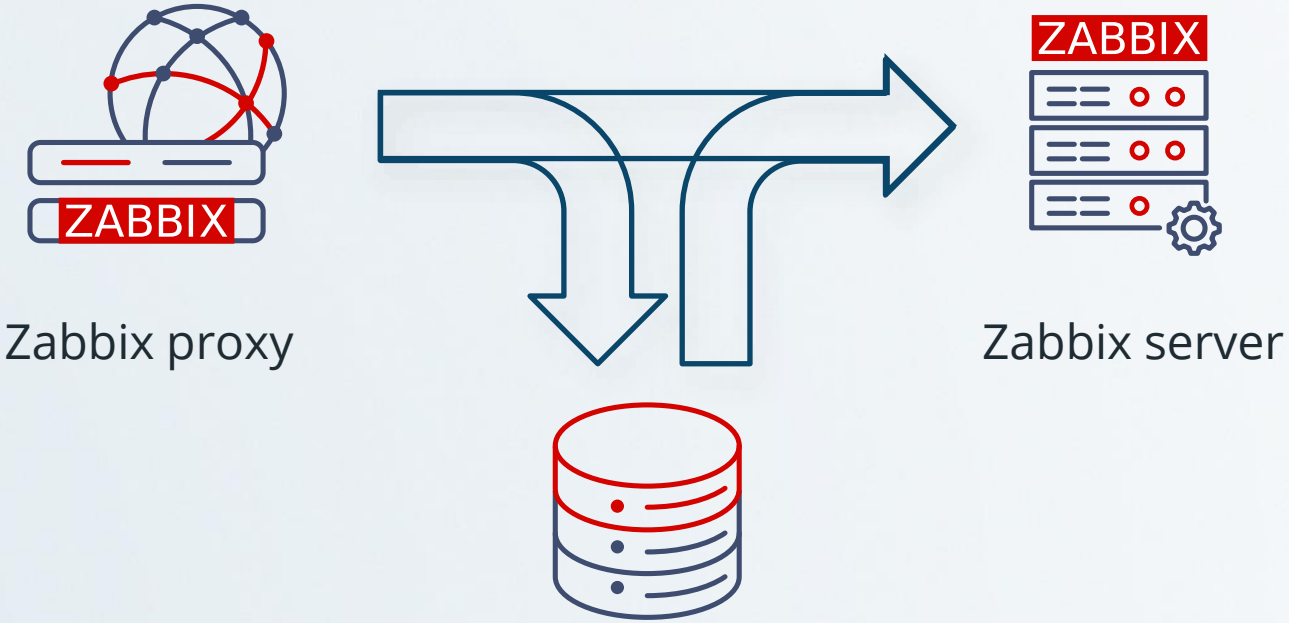
- The history data is being stored in shared memory and uploaded from it
- If buffer runs out of memory the old data will be discarded



Hybrid mode

Data is sent to the Zabbix server directly:

- Buffer normally works like in the memory mode
- The buffer is flushed in database if buffer does not have enough space



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Centralized control of data collection timeouts

Zabbix timeout

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Zabbix has a general timeout specified in the configuration file

- Timeout affects all data collection on Zabbix server or proxy
- Some item types have their own timeout (HTTP agent, Script)

```
### Option: Timeout
#       Specifies how long we wait for agent, SNMP device or external check
#
# Mandatory: no
# Range: 1-30
# Default:

Timeout=4
```

Item level timeout

Zabbix 7.0 will introduce item level timeout for most checks:

- Timeout is defined using Zabbix graphical user interface
- Range is from 1 to 600 seconds (10 minutes)

Timeout can be defined on multiple levels:

- On Zabbix server globally for all items
- Per proxy for items monitored by the proxy
- On each item individually

Global timeouts

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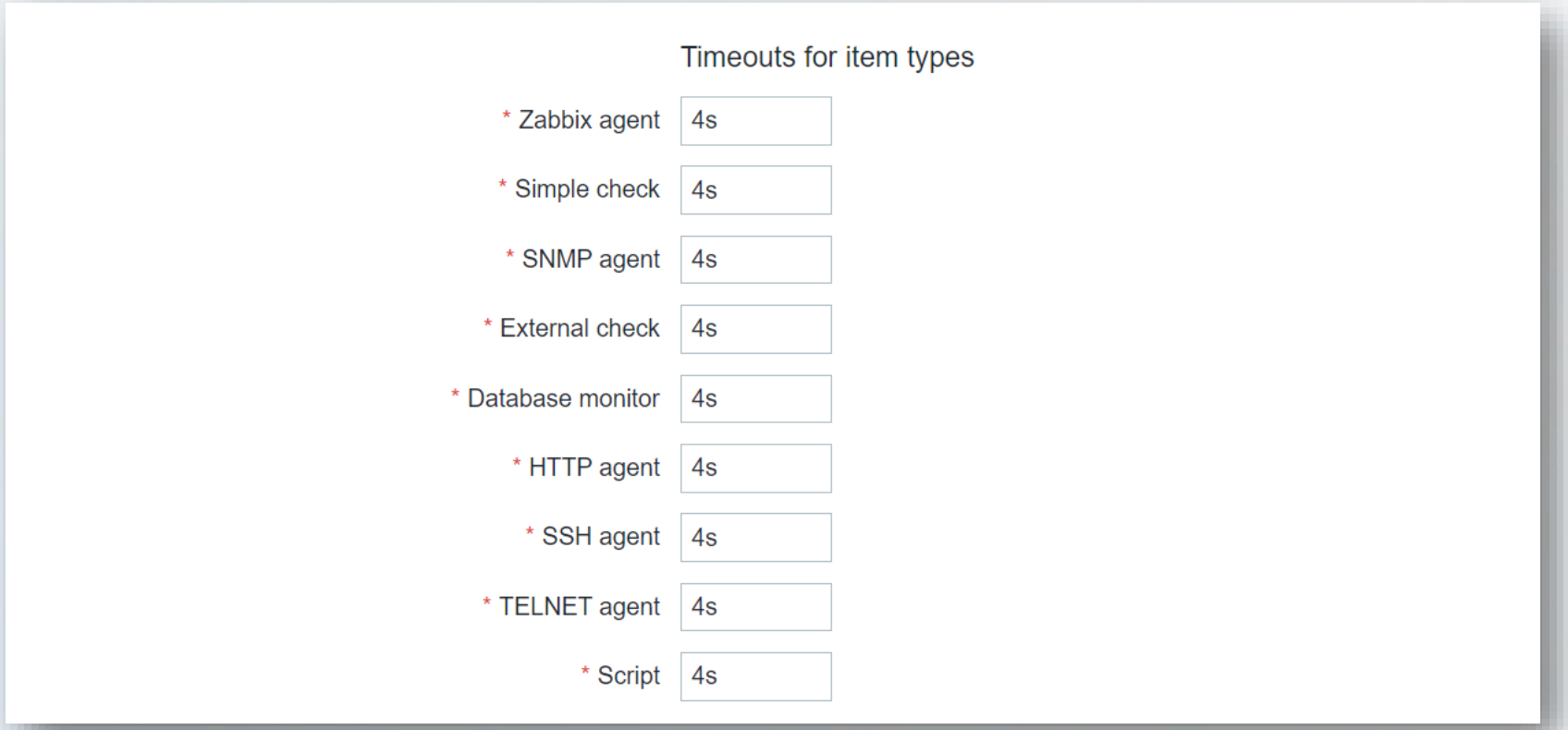
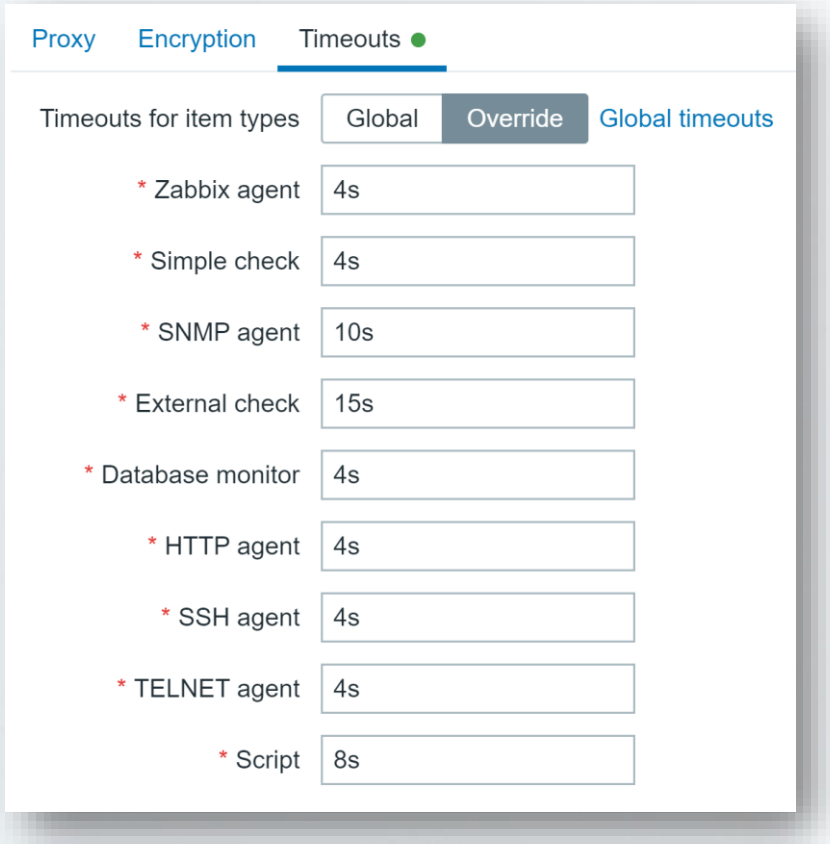
Global timeouts can be defined in the Administration > General section



Proxy level timeouts

A proxy level timeout will affect all items collected by a proxy

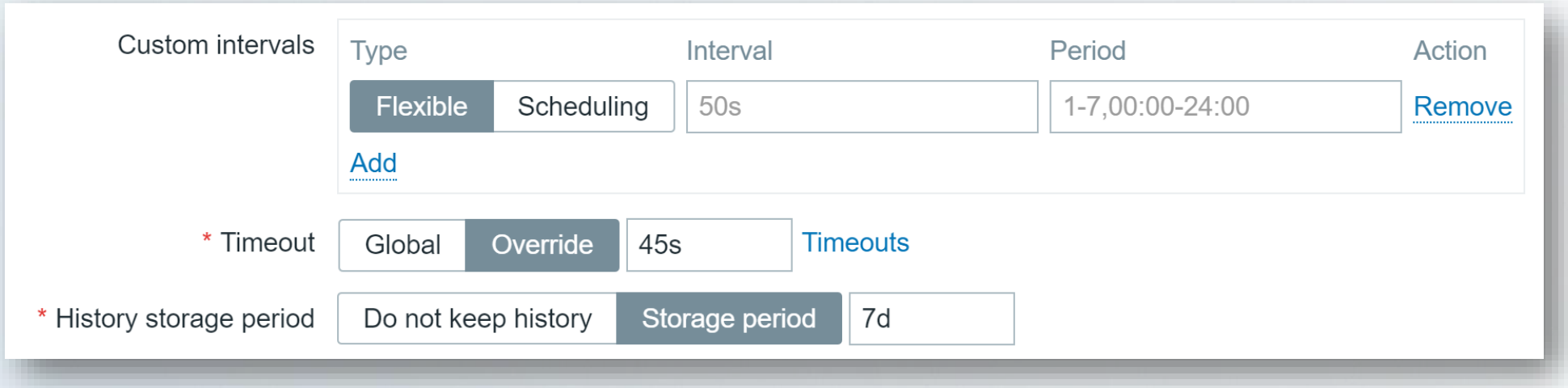
- Each type can be tuned individually
- Timeouts work as default values
- Forced override can be enabled



Individual timeouts

By using item level timeout, it is possible to tune individual items:

- Timeout defined globally or on proxy is used by default
- Can be adjusted if needed for a specific item



Timeout in the configuration file

The timeout setting from Zabbix server / proxy configuration file

- Will become a default value for item timeout during the upgrade process
- Will be used as a timeout for communication between server and proxy

```
### Option: Timeout
#       Specifies timeout for communications (in seconds).
#
# Mandatory: no
# Range: 1-30
# Default:

Timeout=4
```

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Concurrent network discovery

Network discovery

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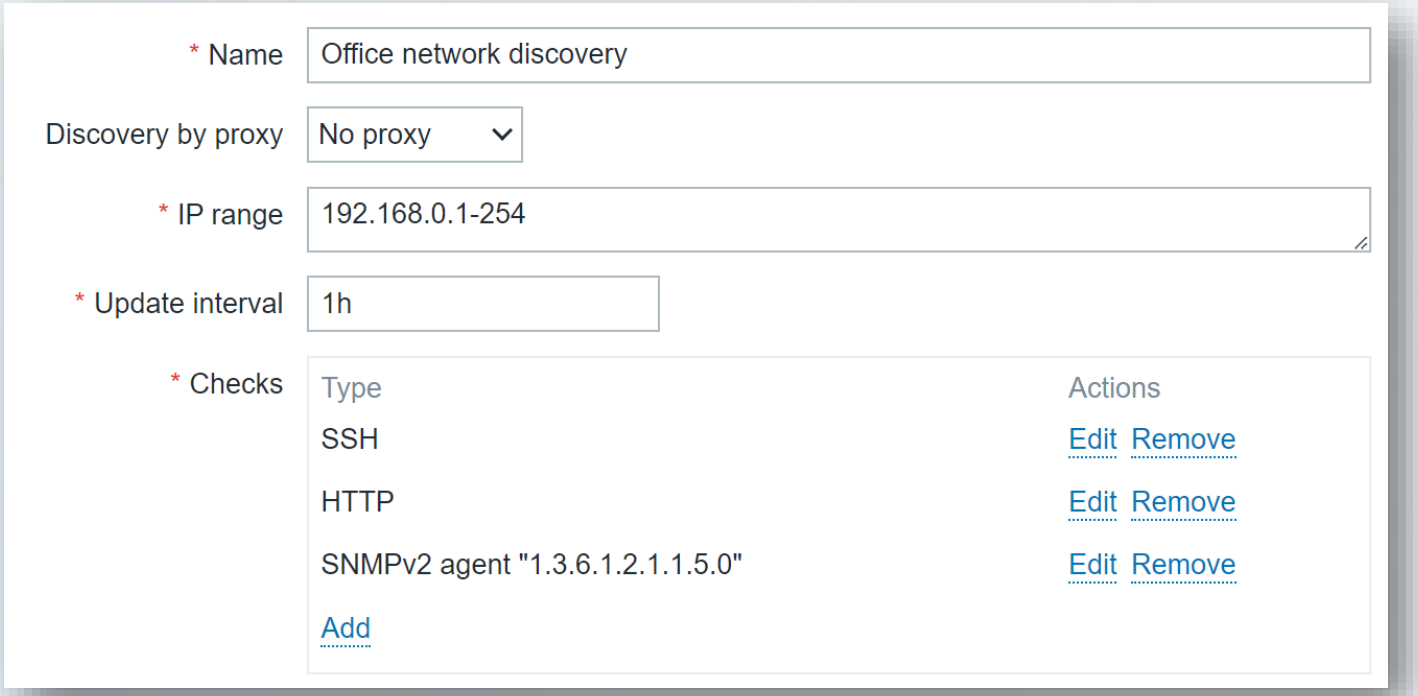
Network discovery can be quite slow on large segments:

- Each segment is processed by a single discoverer only
- Each IP address and service is processed sequentially



New processes

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Zabbix 7.0 introduces new processes

- Discovery manager
- Discovery worker (previously known as discoverer process)

```
### Option: StartDiscoverers
#       Number of pre-started instances of discovery workers.
#
# Mandatory: no
# Range: 0-1000
# Default:

StartDiscoverers=5
```

Discovery rule configuration

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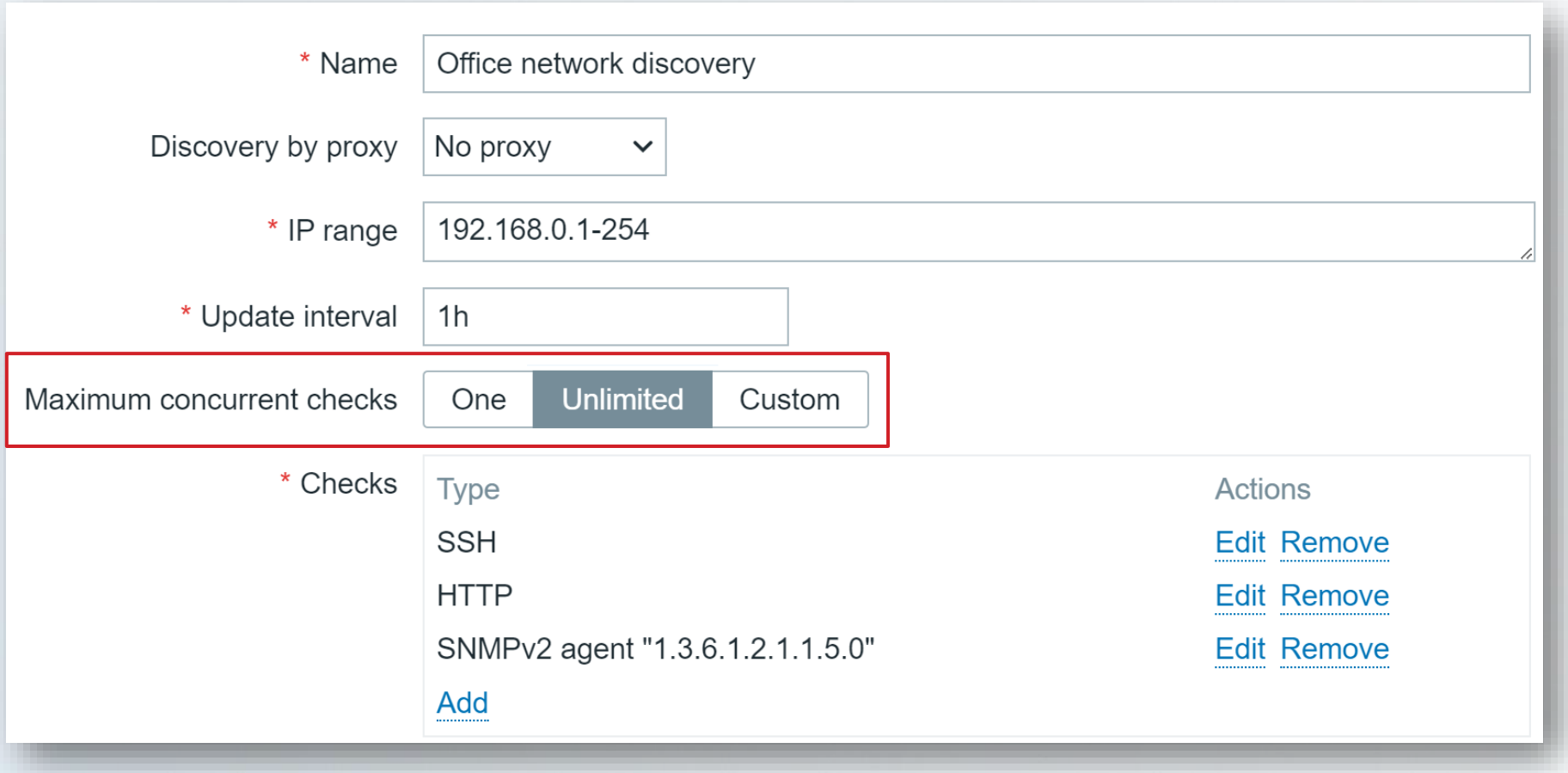
Concurrency is configured on discovery rule level



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Sending metrics over HTTP

history.push

New API method – history.push

- Data received by the history.push method can only be accepted by items of Zabbix Trapper type and HTTP Agent type with Enable trapping ON
- Sender's IP will be verified against the Allow hosts configuration parameter
- Permissions to execute the API method can be added/removed in user role configuration

history.push – example request

```
{
"jsonrpc": "2.0",
"method": "history.push",
"params": [
{
«itemid": 10600,
"value": 0.5,
"clock": 1690891294,
"ns": 45440940
},
{
"itemid": 10600,
"value": 0.6,
"clock": 1690891295,
"ns": 312431
},
{ "itemid": 10601,
"value": "[Tue Aug 01 15:01:35 2023] [error] [client 1.2.3.4] File does not exist:
/var/www/html/robots.txt"
},
{
"itemid": 999999,
"value": 123
}
],
"id": 1
}
```

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Passing custom input to frontend scripts

{MANUALINPUT} macro

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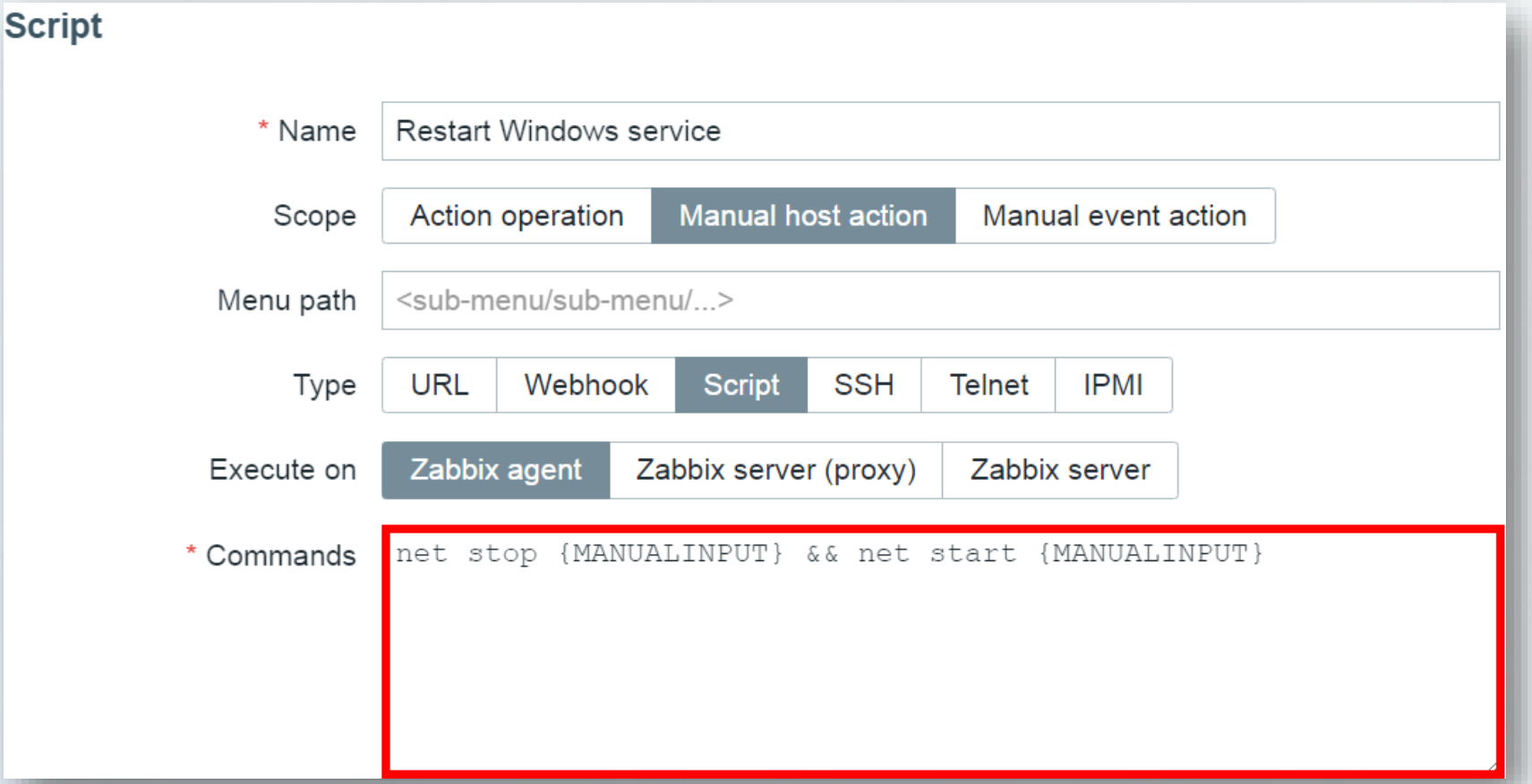
Scripts can use {MANUALINPUT} macros to reference custom input data



Custom input in frontend scripts

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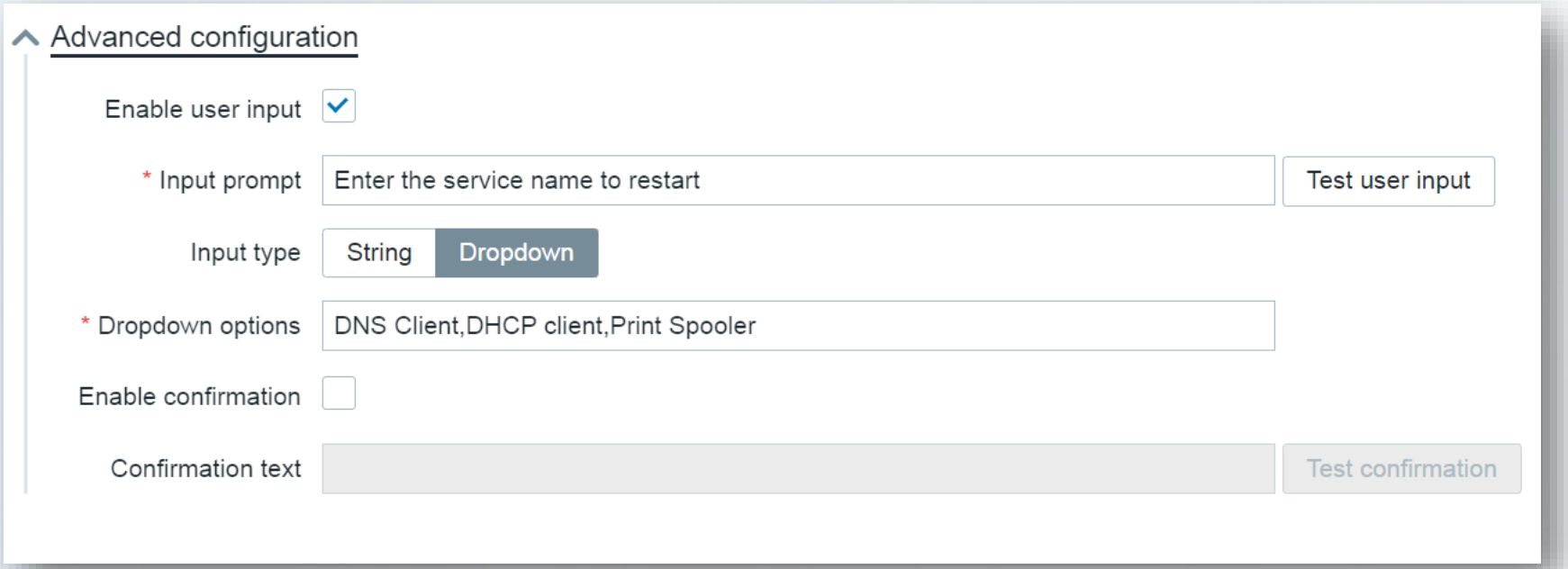
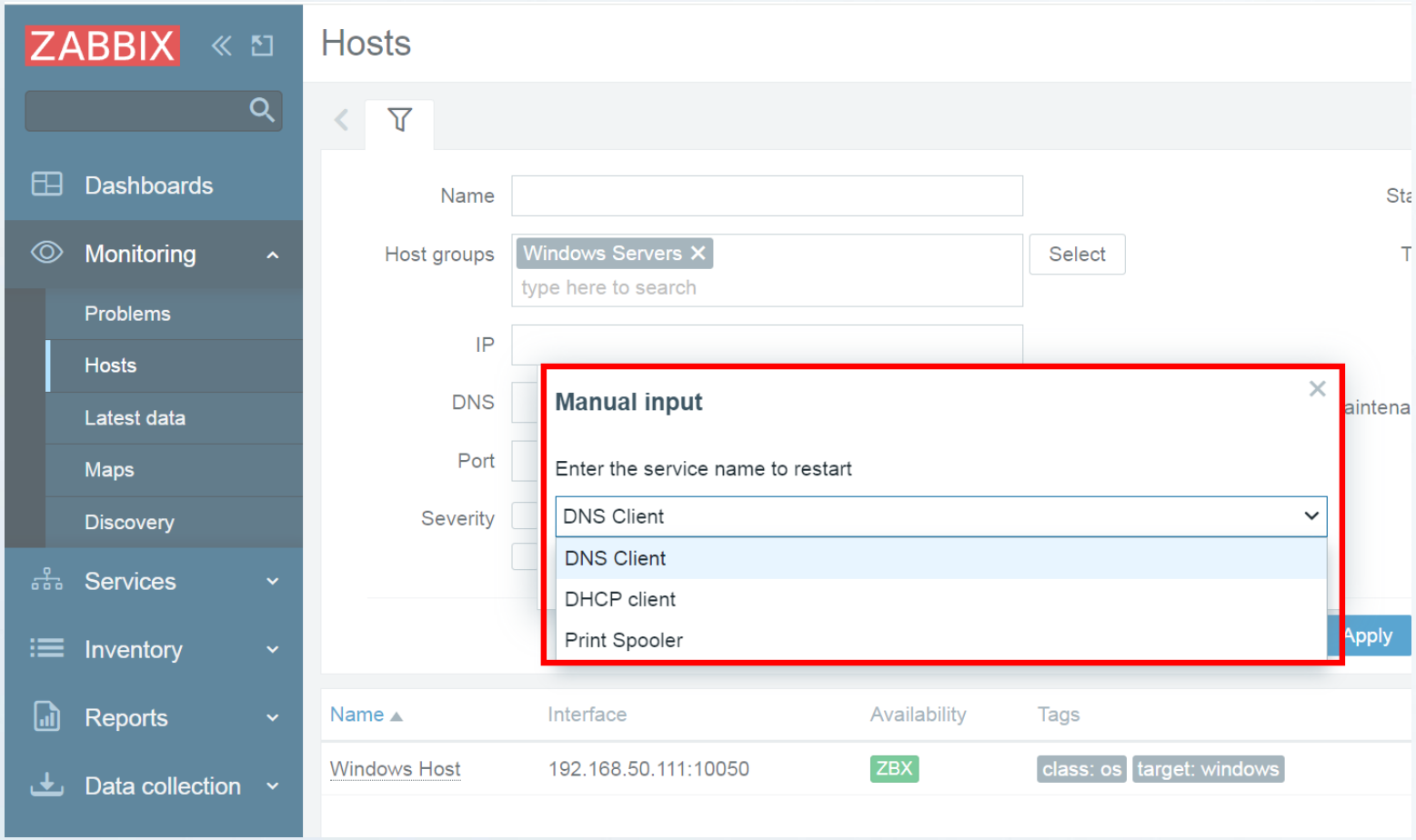
Input data can be specified in a comma-separated list of options, or use any string matching a pattern



Custom input in frontend scripts



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New ways to visualize your data

New widgets in Zabbix 7.0

Various new widgets are introduced in Zabbix 7.0

- Honeycomb
- Gauge
- Pie chart
- Host and item navigator
- Top triggers

New widgets in Zabbix 7.0

New widgets enable a variety of new visualization use-cases

Dynamic dashboard widget navigation

Dynamic dashboard widget navigation

A new communication framework has been introduced for dashboard widgets, enabling communication between widgets

- A widget can behave as a data source for other widgets
- Information displayed in dashboard widget is dynamically updated based on the data source
- Widgets can serve as a host or item data source

Dynamic dashboard widget navigation

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Dynamic dashboard widget navigation

ZABBIX

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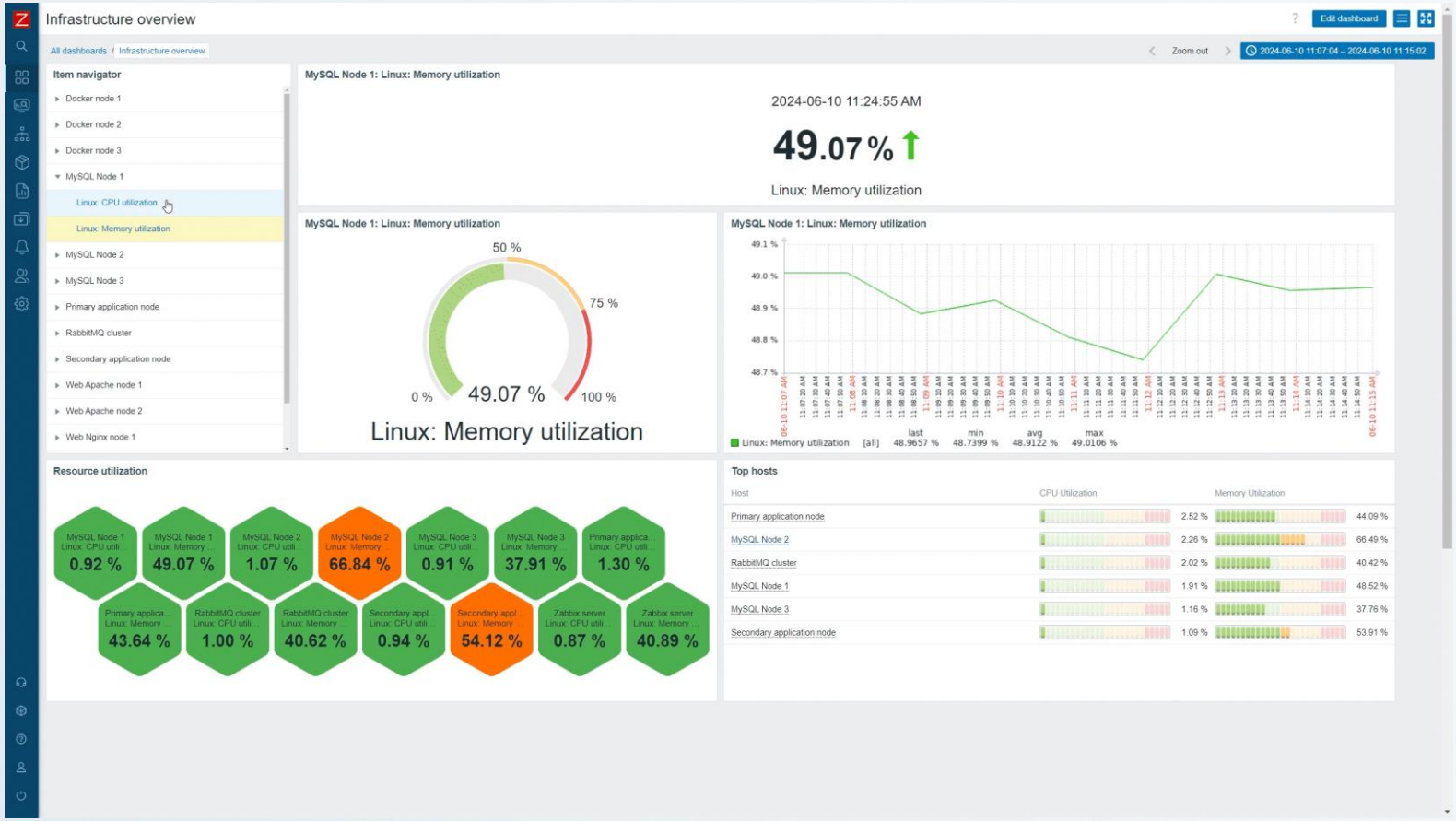

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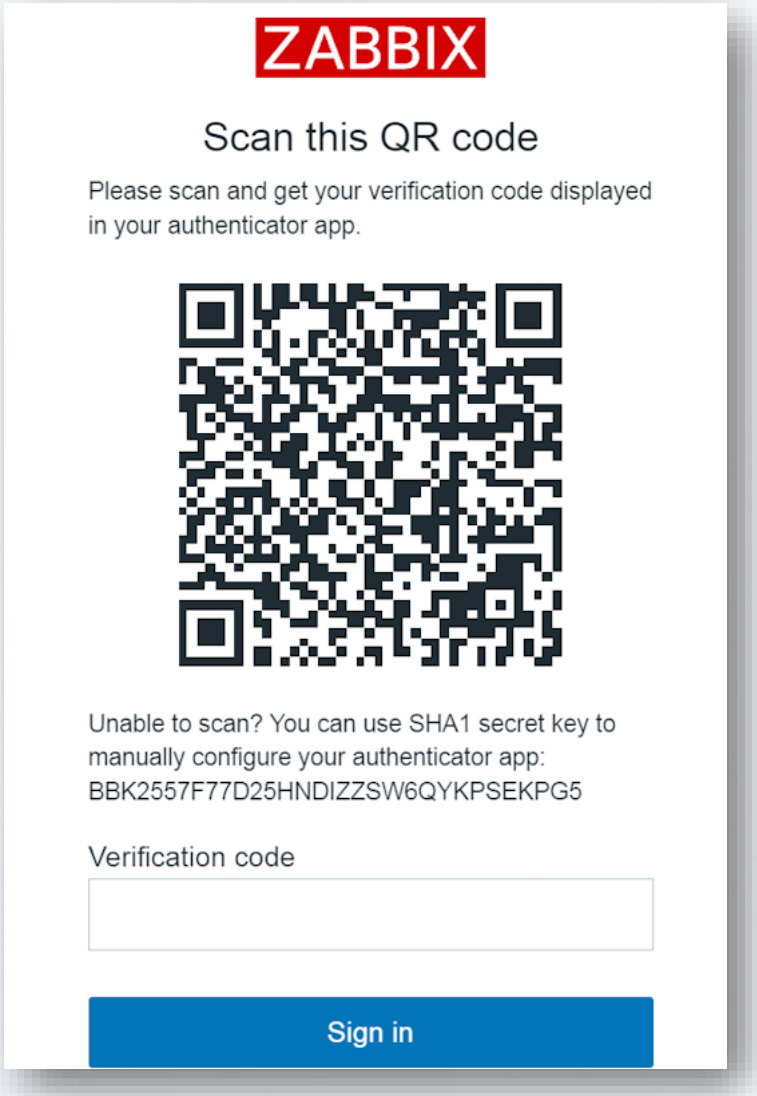
Multi-factor authentication

Multi-factor authentication

Out-of-the-box support of multi-factor authentication (MFA):

- Time-Based One-Time Password (TOTP) authentication
- Duo Universal Prompt authentication



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Other features and improvements

Other improvements

- The Zabbix licensing model has been updated to GNU Affero General Public License version 3 (AGPLv3)
- An optional Zabbix server and frontend update check has been introduced via the System information section/widget
- New net.dns.perf and net.dns.get items
- User macro support in item prototype and item names
- Ability to customize media for JIT provisioned users
- Major performance improvements for frontend permission checks
- HTTP connector for native Kafka topics
- Improved behavior when the same host group is discovered by multiple LLDs
- Faster recalculation of host maintenance status

Other improvements

- Remote command execution via active checks
- Improved not supported item handling in aggregation calculations
- Expanded aggregation calculation value matching and other improvements
- Ability to assign tags during host autoregistration
- Support of multi-page PDF report generation
- Enhanced handling of item error messages via validation preprocessing
- Command-line testing/validation of configuration files
- New jsonpath and xmlpath trigger functions
- Ability to turn off LLD/autoregistration/discovery logging

...And more!

New templates and integrations

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Google Cloud Platform	Microsoft Azure Cost Management	Microsoft Azure Cosmos DB for MongoDB	Amazon Elastic Container Service	AWS ELB Application Load Balancer
Oracle Cloud Infrastructure	Microsoft SQL by Zabbix agent 2	Microsot SQL by ODBC template improvements	CheckPoint Quantum Security Gateway	Nextcloud
Fortinet FortiGate	HPE iLO	Cisco SD-WAN	HashiCorp Nomad	PostgreSQL by ODBC
OpenStack Nova	Acronis Cyber Protect Cloud	YugabyteDB	Event-Driven Ansible Webhook	Mantis Bug Tracker


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Questions?