



Webinar

Data visualization with zabbix

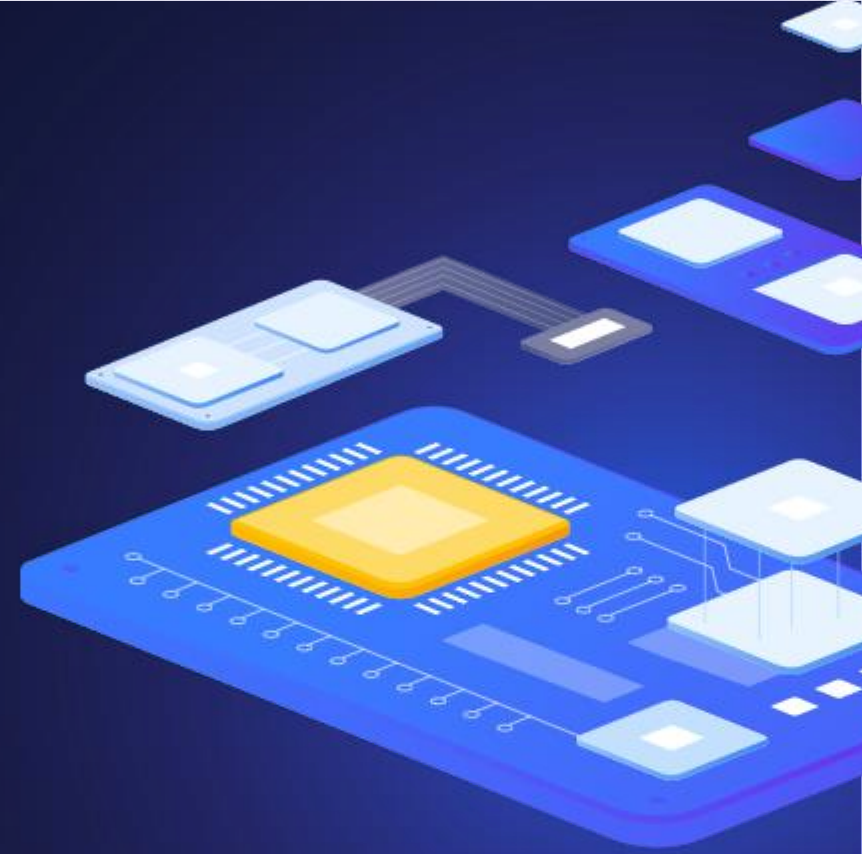
all our microphones are muted

ask your questions in Q&A, not in the Chat

use Chat for discussion, networking or applause

1

Latest Data



Data visualization with zabbix

LATEST DATA

Monitoring > Latest data

- ▶ Performance data for a selected server/group
- ▶ Simple graphs
- ▶ Plain text information
- ▶ Config details

Timestamp	Processor load (15 min average per core)
2022-04-13 15:52:15	0.045
2022-04-13 15:51:15	0.045
2022-04-13 15:50:15	0.045
2022-04-13 15:49:15	0.045
2022-04-13 15:48:15	0.035
2022-04-13 15:47:15	0.035
2022-04-13 15:46:15	0.04

Latest data

Host groups: Select

Hosts: Select

Name:

Tags: And/Or Or Contains value

Add

Show tags: None 1 2 3 Tag name: Full Shortened None

Tag display priority:

Show details:

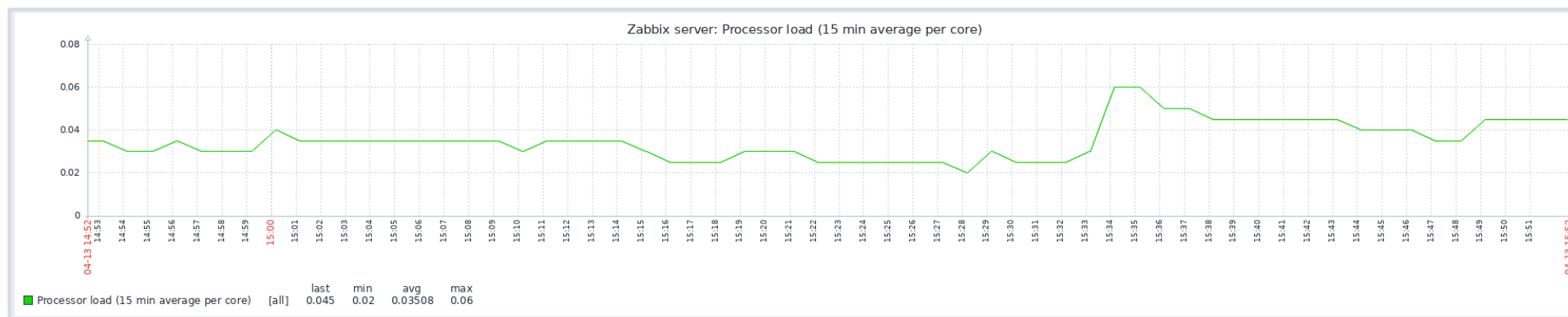
Subfilter affects only filtered data

TAGS
component 103 node-id 4 node-name 4

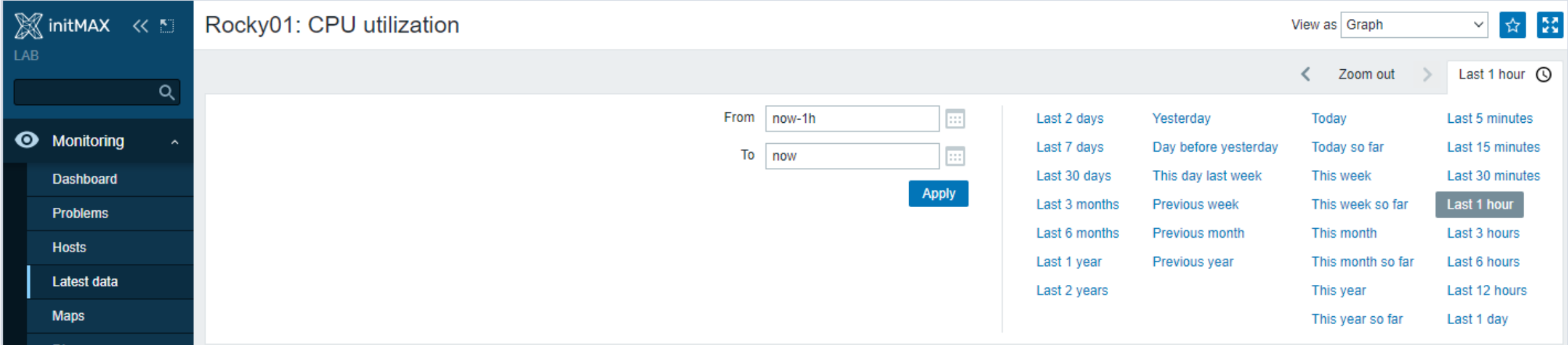
TAG VALUES
component: application 1 cluster 4 cpu 17 data-collector 13 environment 2 internal-process 20 memory 7 os 3 raw 1 storage 3 system 35
node-id: c11w239wq0014qnpj71vxceh 4
node-name: None 4

DATA
With data 53 Without data 50

<input type="checkbox"/>	Host	Name	Last check	Last value	Change	Tags	Info
<input type="checkbox"/>	Zabbix server	Available memory				component: memory	Graph
<input type="checkbox"/>	Zabbix server	Available memory in %				component: memory	Graph
<input checked="" type="checkbox"/>	Zabbix server	Checksum of /etc/passwd				component: environment	History
<input checked="" type="checkbox"/>	Zabbix server	Cluster node [1] Address	7h 57m 18s	localhost:10051		component: cluster node-id: c11w239wq00... node-name	History
<input type="checkbox"/>	Zabbix server	Cluster node [1] Last access age	18s	00:00:00		component: cluster node-id: c11w239wq00... node-name	Graph
<input type="checkbox"/>	Zabbix server	Cluster node [1] Last access time	18s	2022-04-13 15:50:25	+00:01:00	component: cluster node-id: c11w239wq00... node-name	Graph
<input type="checkbox"/>	Zabbix server	Cluster node [1] Status	7h 57m 18s	Active (3)		component: cluster node-id: c11w239wq00... node-name	Graph
<input type="checkbox"/>	Zabbix server	Context switches per second				component: cpu	Graph
<input type="checkbox"/>	Zabbix server	CPU guest nice time				component: cpu	Graph
<input type="checkbox"/>	Zabbix server	CPU guest time				component: cpu	Graph
<input type="checkbox"/>	Zabbix server	CPU idle time				component: cpu	Graph



LATEST DATA



The screenshot shows the Zabbix web interface for monitoring 'Rocky01: CPU utilization'. The interface includes a sidebar with navigation options like 'Monitoring', 'Dashboard', 'Problems', 'Hosts', 'Latest data', and 'Maps'. The main content area displays the title 'Rocky01: CPU utilization' and a 'View as' dropdown set to 'Graph'. Below this, there is a 'Zoom out' button and a time period selector. The time period selector consists of two input fields: 'From' (set to 'now-1h') and 'To' (set to 'now'), with an 'Apply' button. To the right of these fields is a grid of time period options, including 'Last 2 days', 'Yesterday', 'Today', 'Last 5 minutes', 'Last 7 days', 'Day before yesterday', 'Today so far', 'Last 15 minutes', 'Last 30 days', 'This day last week', 'This week', 'Last 30 minutes', 'Last 3 months', 'Previous week', 'This week so far', 'Last 1 hour' (which is highlighted), 'Last 6 months', 'Previous month', 'This month', 'Last 3 hours', 'Last 1 year', 'Previous year', 'This month so far', 'Last 6 hours', 'Last 2 years', 'This year', 'Last 12 hours', and 'This year so far', 'Last 1 day'.

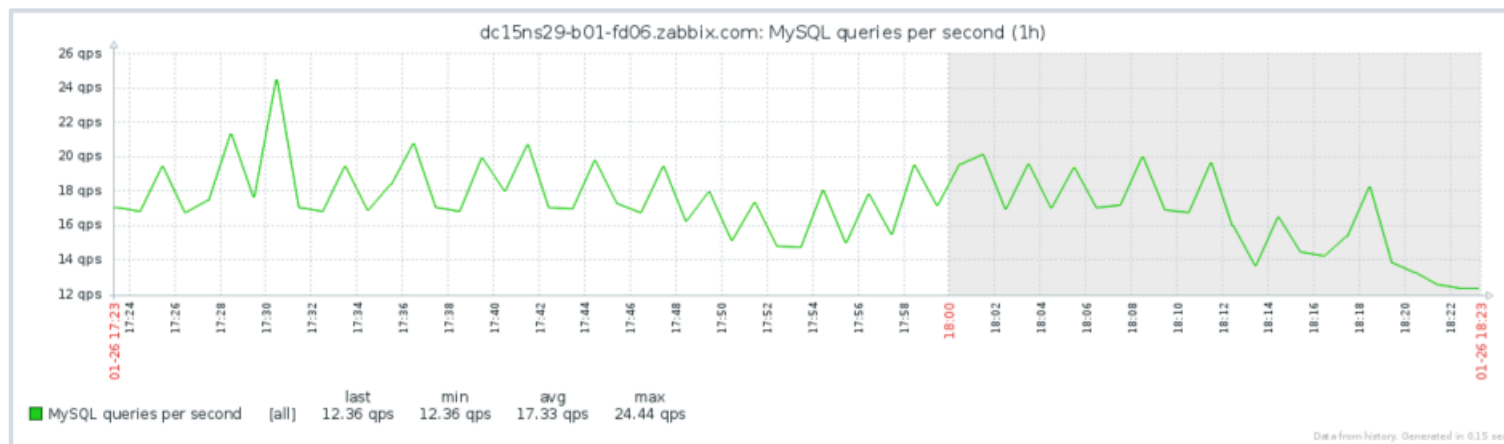
In the top right, there is a time period selector

- › It allows to select required period with a mouse click
- › This allows to show values for specific time period

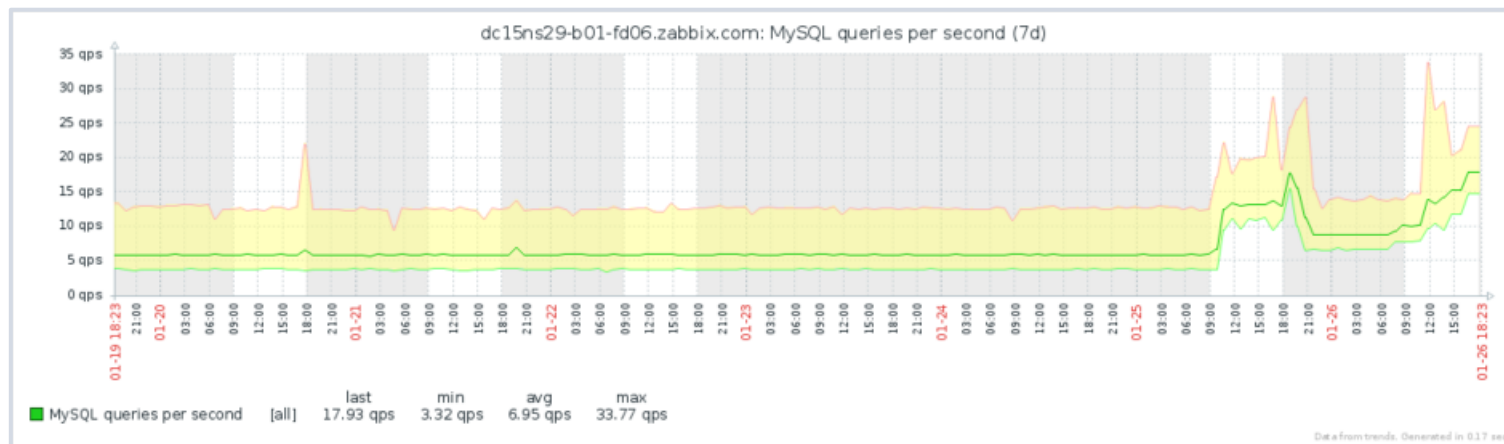
Data visualization with zabbix

SIMPLE GRAPHS


History (raw data)



Trends (min, max, avg)



SIMPLE GRAPHS


initMAX

Latest data

DEMO-SERVER

Host groups Select
type here to search

Hosts Select
type here to search

Name

Tags And/Or Or

Contains Remove

[Add](#)

Show tags None 1 2 3 Tag name Full Shortened None

Tag display priority

Show details

Update Apply Reset

Subfilter affects only filtered data

TAG VALUES

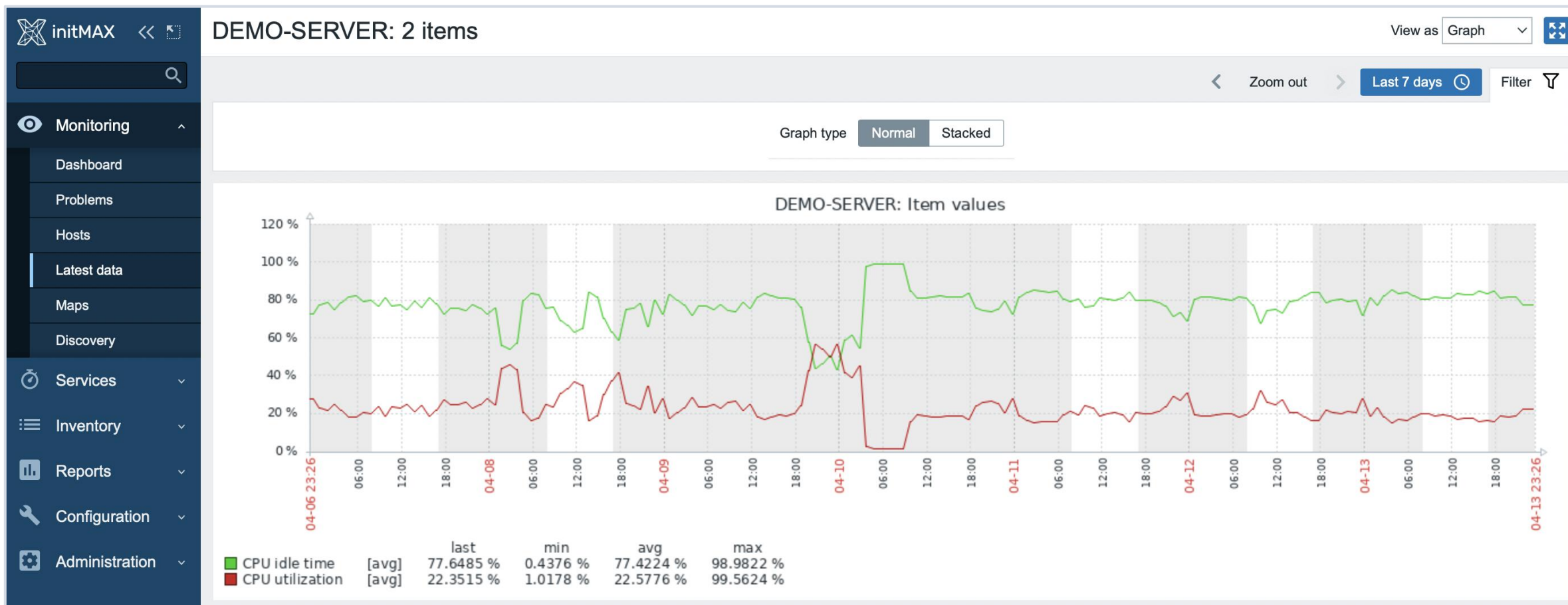
Application: CPU 2

<input checked="" type="checkbox"/>	Host	Name ▲	Last check	Last value	Change	Tags	Info
<input checked="" type="checkbox"/>	DEMO-SERVER	CPU idle time ?	15s	80.2008 %	+8.7639 %	Application: CPU	Graph
<input checked="" type="checkbox"/>	DEMO-SERVER	CPU utilization ?	15s	19.7992 %	-8.7639 %	Application: CPU	Graph

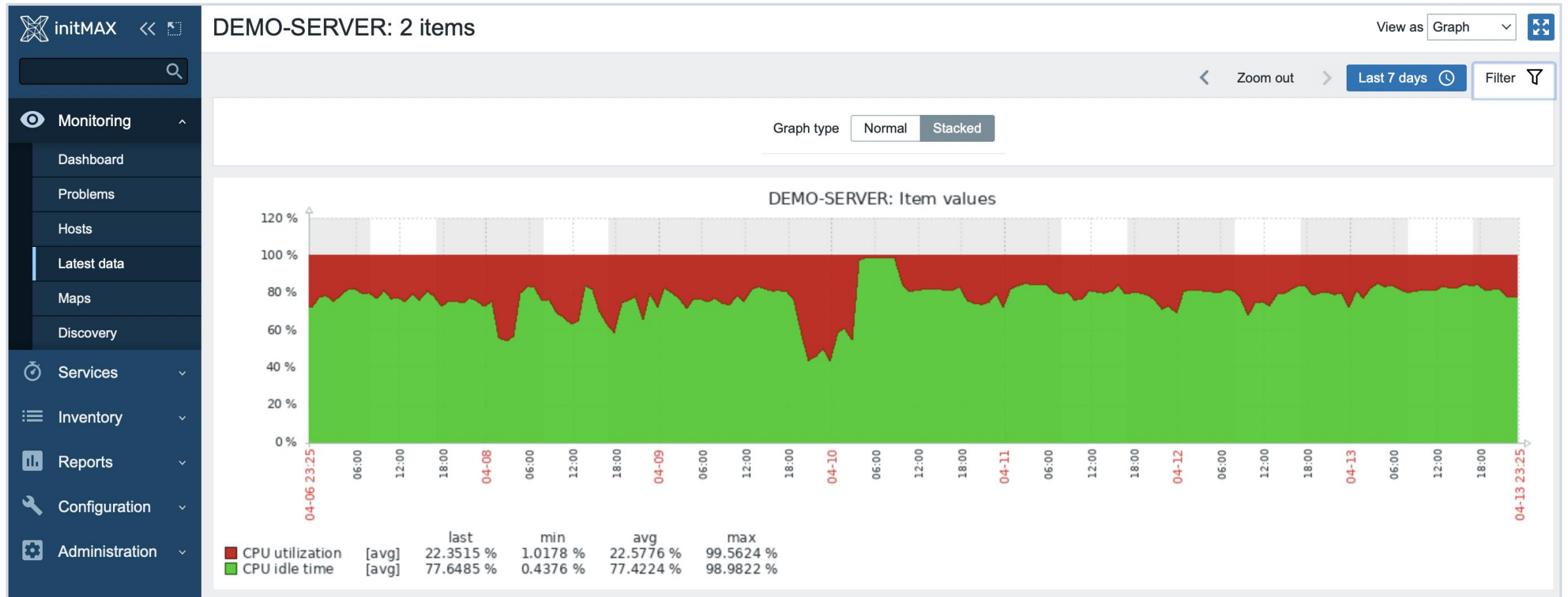
Displaying 2 of 2 found

2 selected
Display stacked graph
Display graph

SIMPLE GRAPHS



SIMPLE GRAPHS



Data visualization with zabbix

Tags vs Applications

Group of items

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

Since Zabbix 5.4 - Applications moved to Item Tags

Host groups Select

Hosts Select

Name

Tags And/Or Or

Application Equals Remove

Add

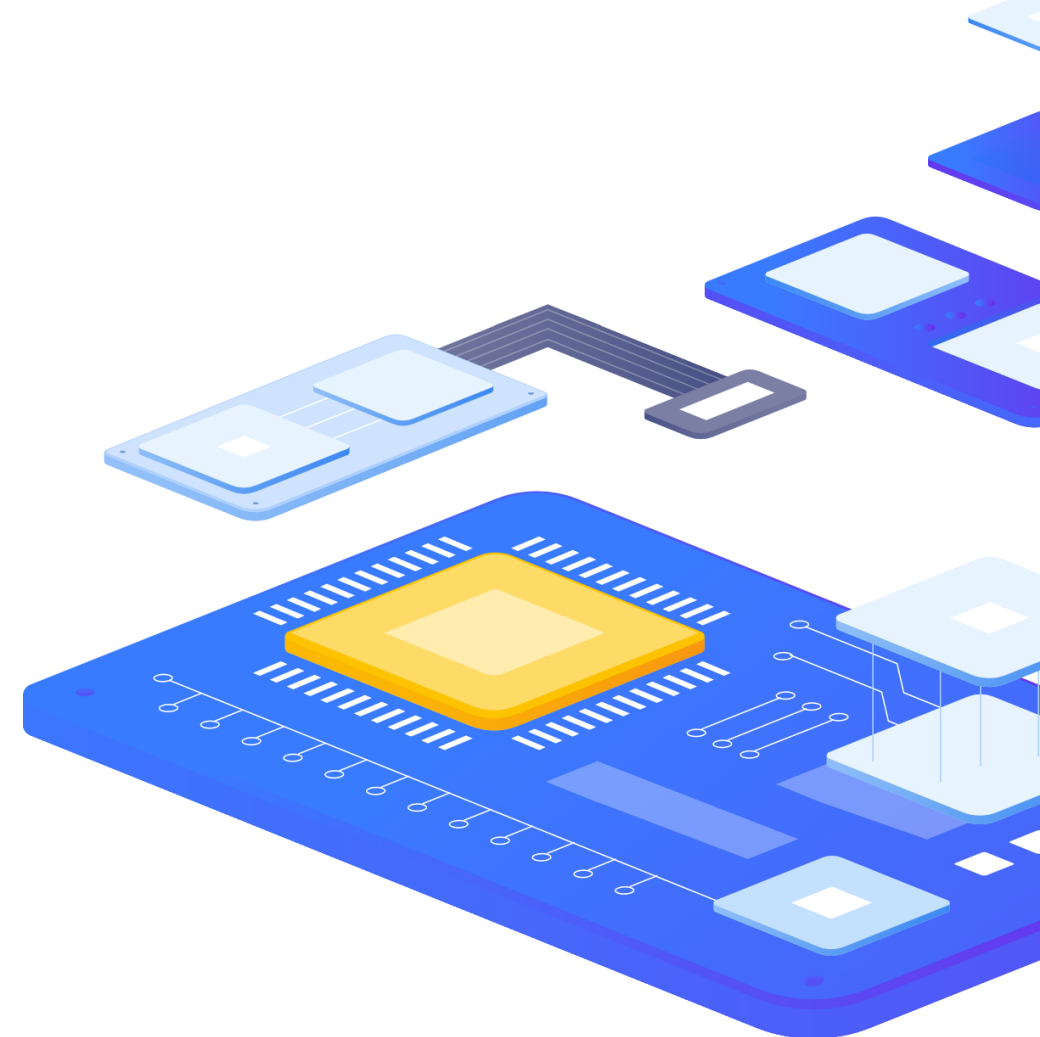
Show tags None 1 2 3 Filtered None

Tag display priority

Show details

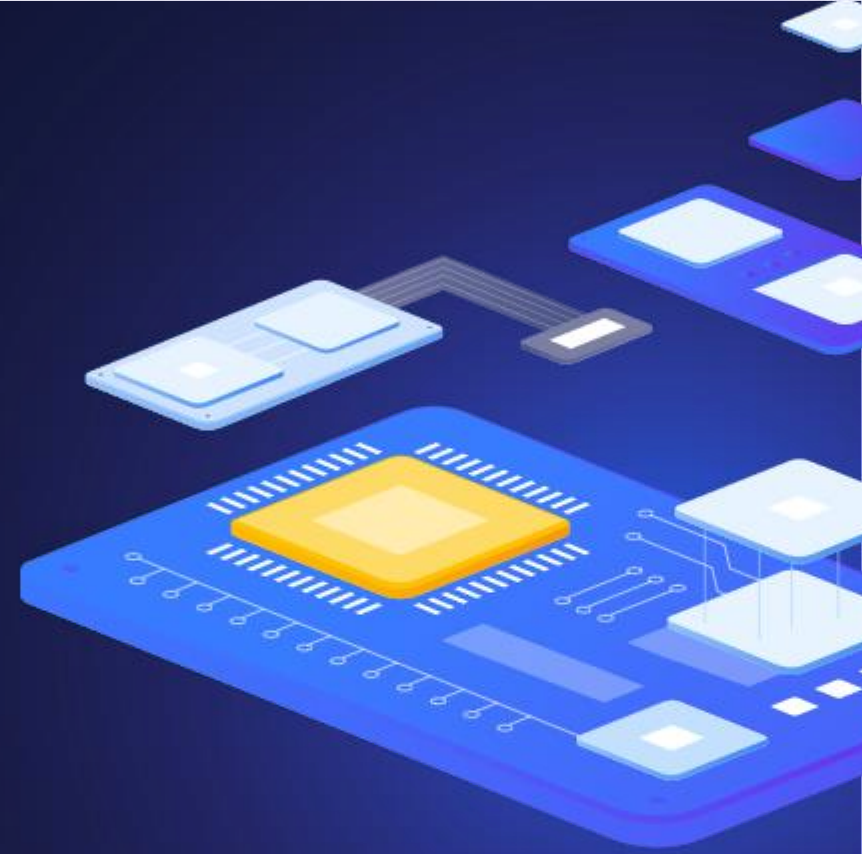
Save as Apply Reset

Name ▲	Last check	Last value	Change	Tags
Context switches per second	15s	921.9097	+146.2828	Application: CPU
CPU guest nice time [?]	14s	0 %		Application: CPU
CPU guest time [?]	13s	0 %		Application: CPU
CPU idle time [?]	5s	95.8894 %	-1.421 %	Application: CPU
CPU interrupt time [?]	11s	0.2256 %	+0.0168 %	Application: CPU
CPU iowait time [?]	16s	0.01671 %	+0.008357 %	Application: CPU



2

Graphs and Classic graphs



CUSTOM GRAPHS (LEGACY)

Configuration > Templates > Graphs

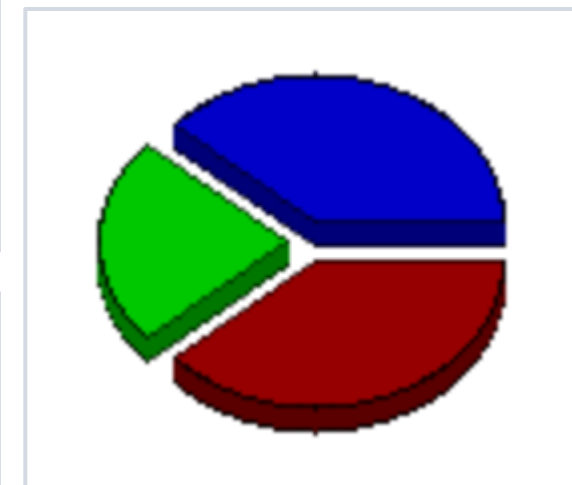
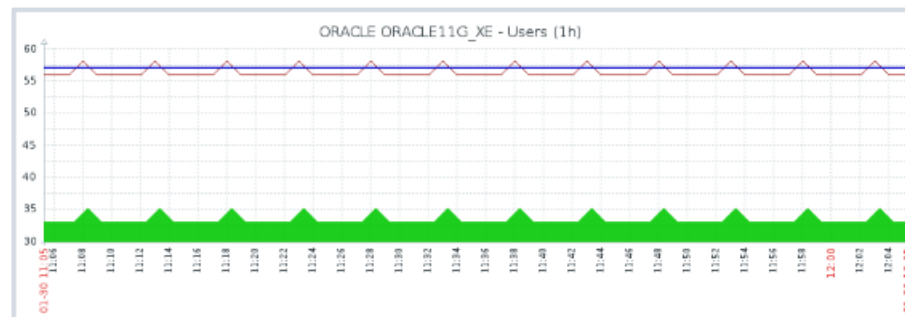
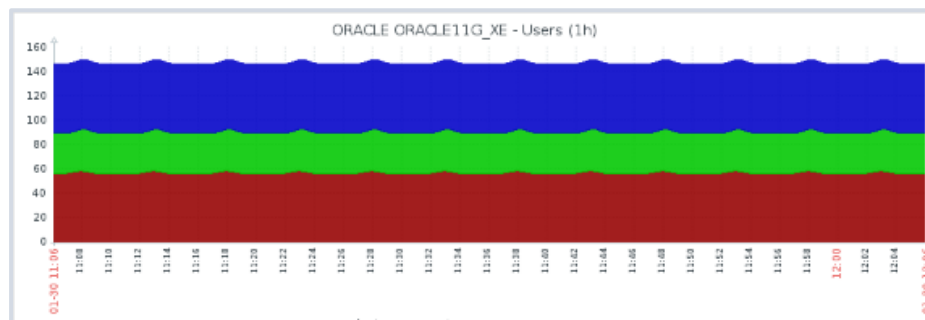
- ▶ Multiple items in a single customized graph
- ▶ Multiple graph types
- ▶ Normal
- ▶ Stacked
- ▶ Pie
- ▶ Exploded pie

Draw style

Line

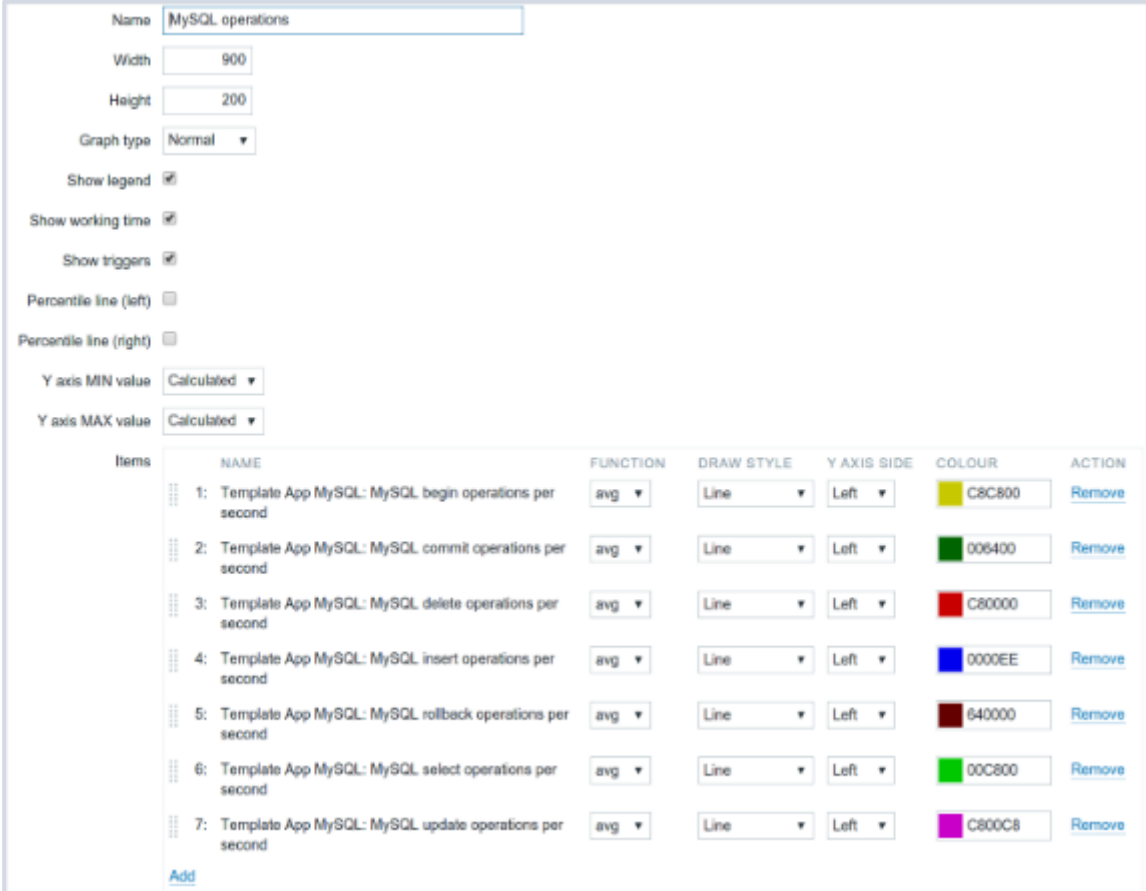
Filled region

Bold line



CUSTOM GRAPHS (LEGACY)

- ▶ Legend, working time, trigger line, percentile lines (left/right)
- ▶ Automatic, fixed or referenced Y axis min/max
- ▶ Multiple items on two axis with different colors & draw styles



The screenshot shows the configuration for a Zabbix custom graph named "MySQL operations". The graph is 900 pixels wide and 200 pixels high, with a "Normal" graph type. It has several options checked: "Show legend", "Show working time", and "Show triggers". Percentile lines for both left and right axes are disabled. The Y-axis minimum and maximum values are set to "Calculated".

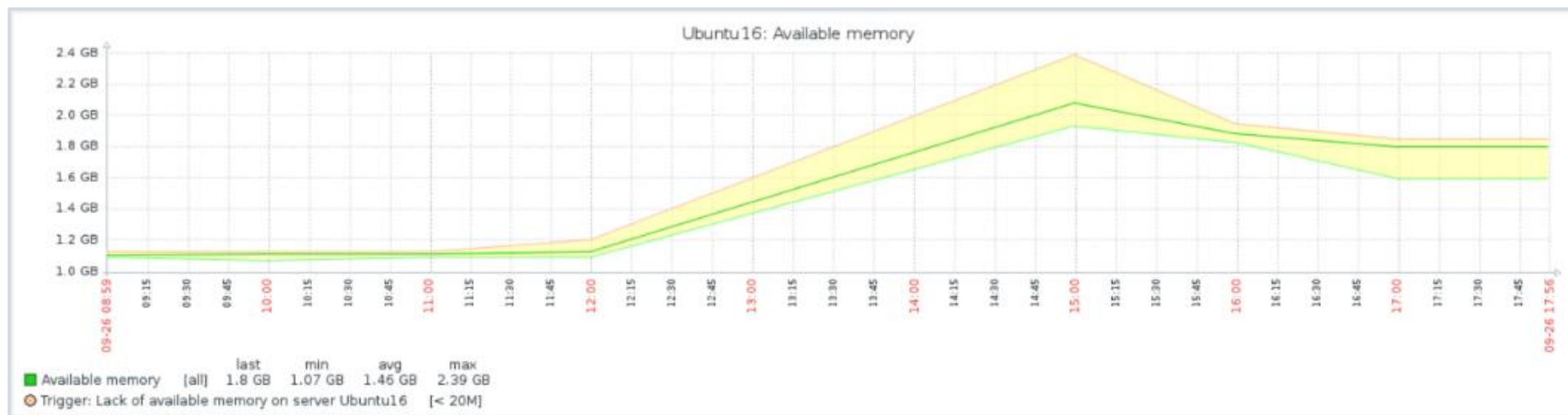
Items	NAME	FUNCTION	DRAW STYLE	Y AXIS SIDE	COLOUR	ACTION
1:	Template App MySQL: MySQL begin operations per second	avg	Line	Left	C8C800	Remove
2:	Template App MySQL: MySQL commit operations per second	avg	Line	Left	006400	Remove
3:	Template App MySQL: MySQL delete operations per second	avg	Line	Left	C80000	Remove
4:	Template App MySQL: MySQL insert operations per second	avg	Line	Left	0000EE	Remove
5:	Template App MySQL: MySQL rollback operations per second	avg	Line	Left	840000	Remove
6:	Template App MySQL: MySQL select operations per second	avg	Line	Left	00C800	Remove
7:	Template App MySQL: MySQL update operations per second	avg	Line	Left	C800C8	Remove

[Add](#)

CUSTOM GRAPHS (LEGACY)

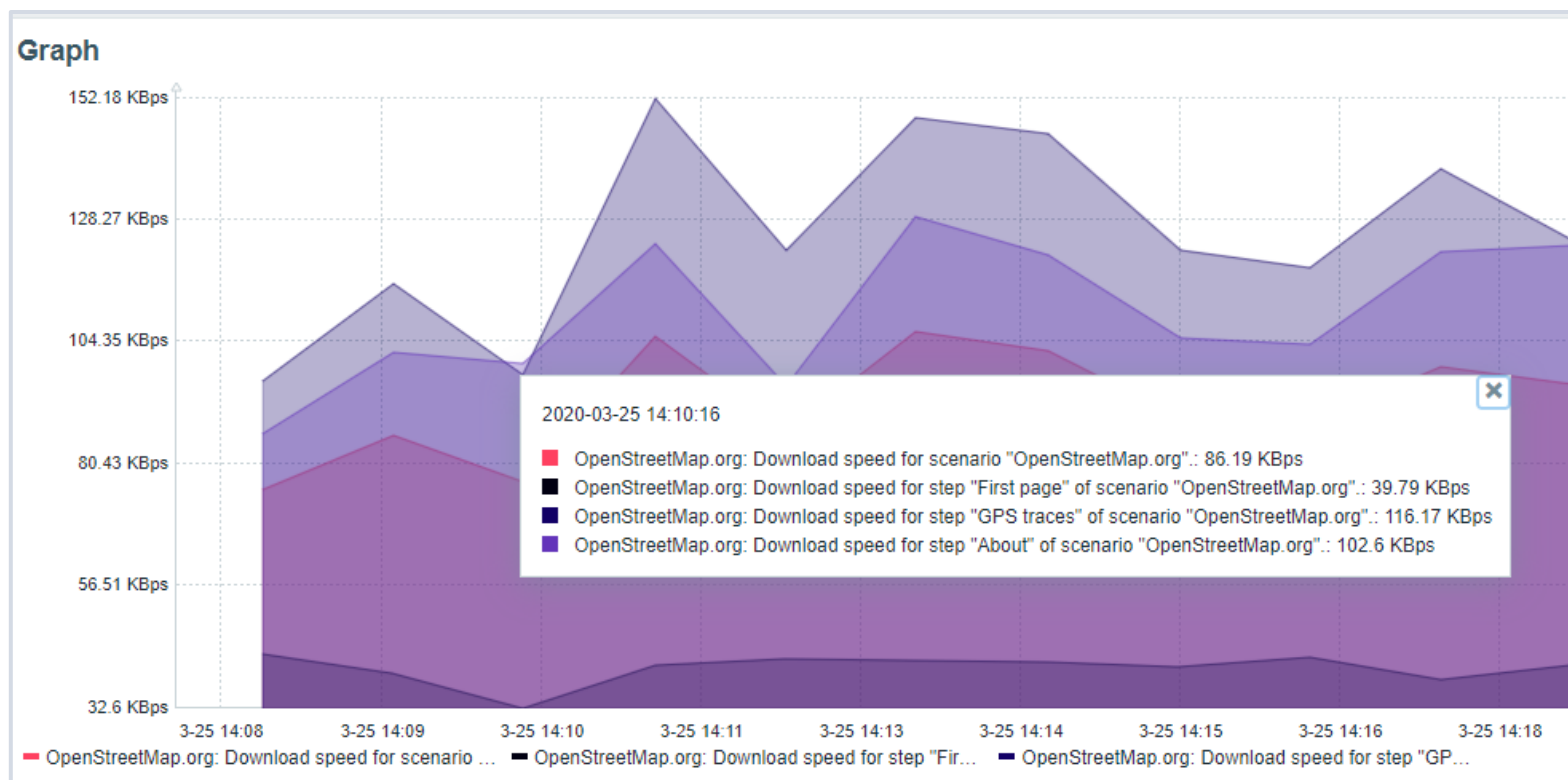
Ability to select what values will be displayed for Trend graphs:

- › avg - display the average values
- › last - display the latest values
- › max - display the maximum values
- › min - display the minimum values
- › all - display all possible values



CUSTOM GRAPHS (NEW)

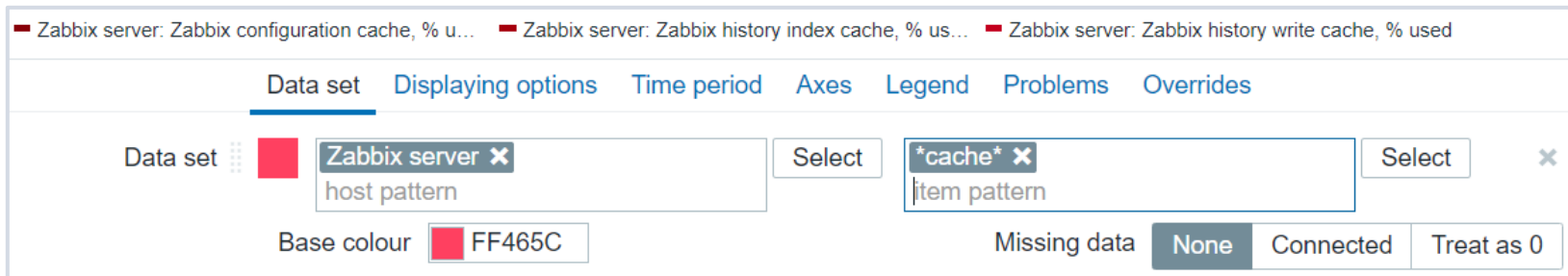
- ▶ In version 4.0 the graph widget was updated to use redesigned new graphs!
- ▶ Legacy graph widget has been renamed to Graph (classic)



Data visualization with zabbix

CUSTOM GRAPHS (NEW)

- ▶ Uses vector image file format
- ▶ Displaying of values is based on Data sets, which are comprised of hosts and items
- ▶ Wildcard use is supported when referencing hosts/items!



Legend: Zabbix server: Zabbix configuration cache, % u... Zabbix server: Zabbix history index cache, % us... Zabbix server: Zabbix history write cache, % used

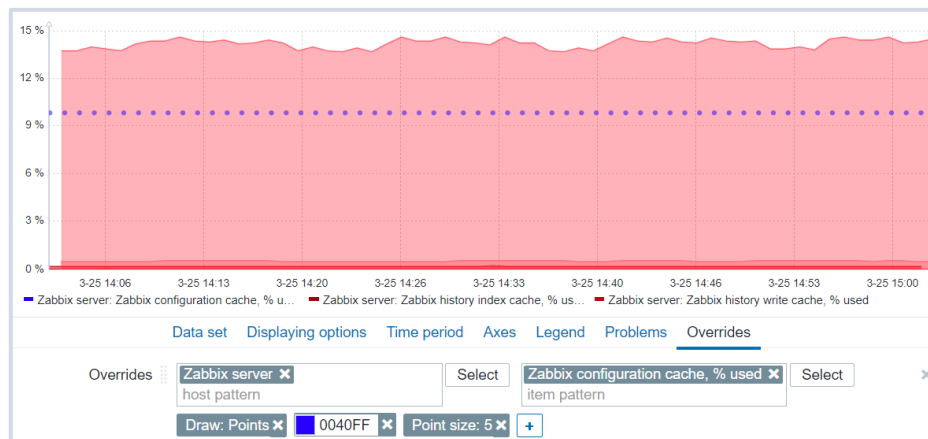
Navigation: Data set | **Displaying options** | Time period | Axes | Legend | Problems | Overrides

Data set: ■ Zabbix server Select Select

Base colour: ■ FF465C

Missing data:

- ▶ Parameters of a Data set element can be overridden in the “ Overrides ” section

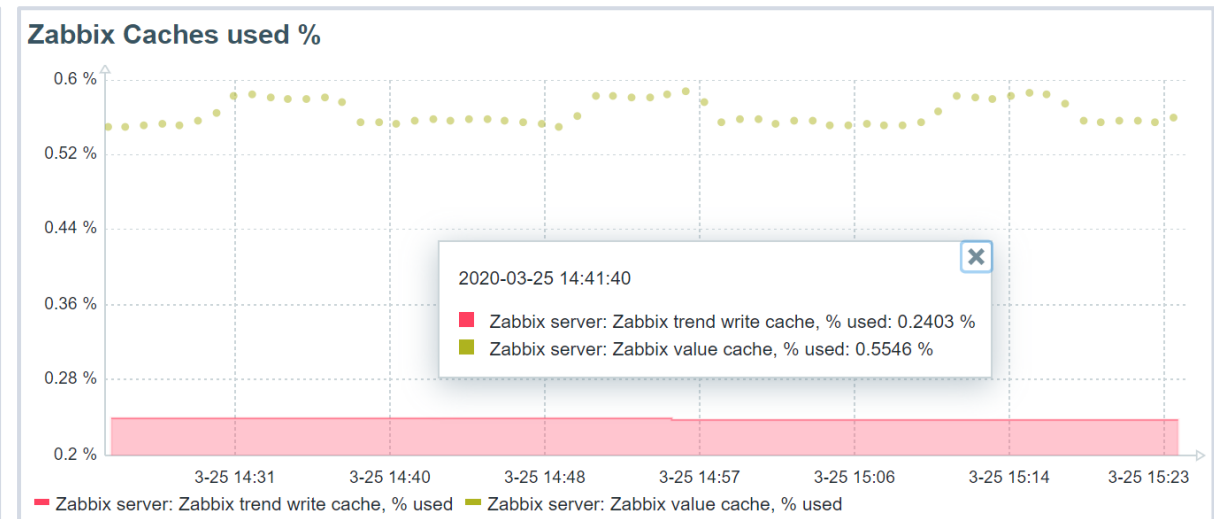
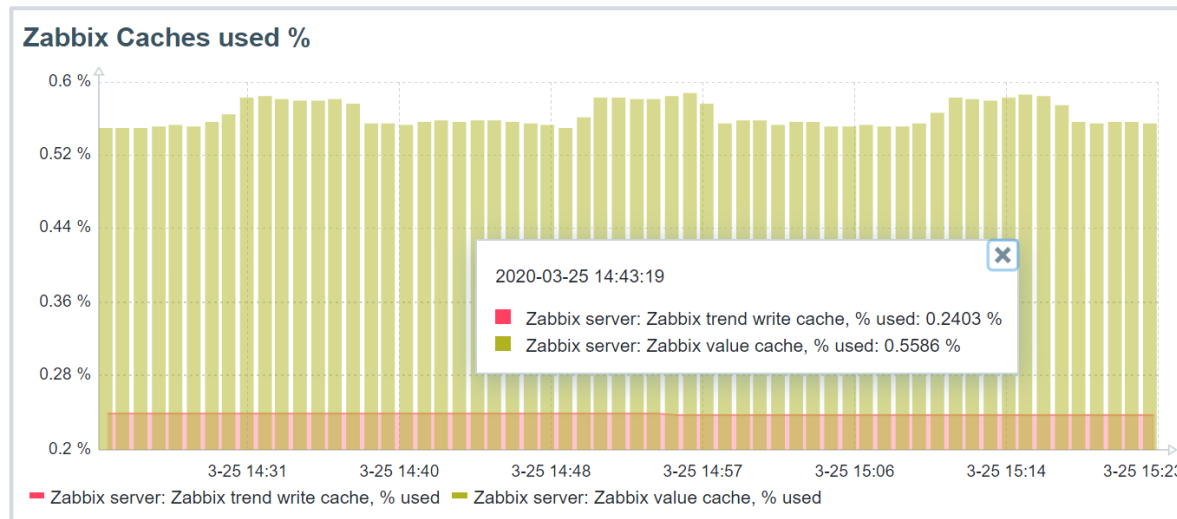


Data visualization with zabbix

CUSTOM GRAPHS (NEW)

The following graph types are supported for the New graph:

- ▶ Line
- ▶ Points
- ▶ Staircase
- ▶ Bar



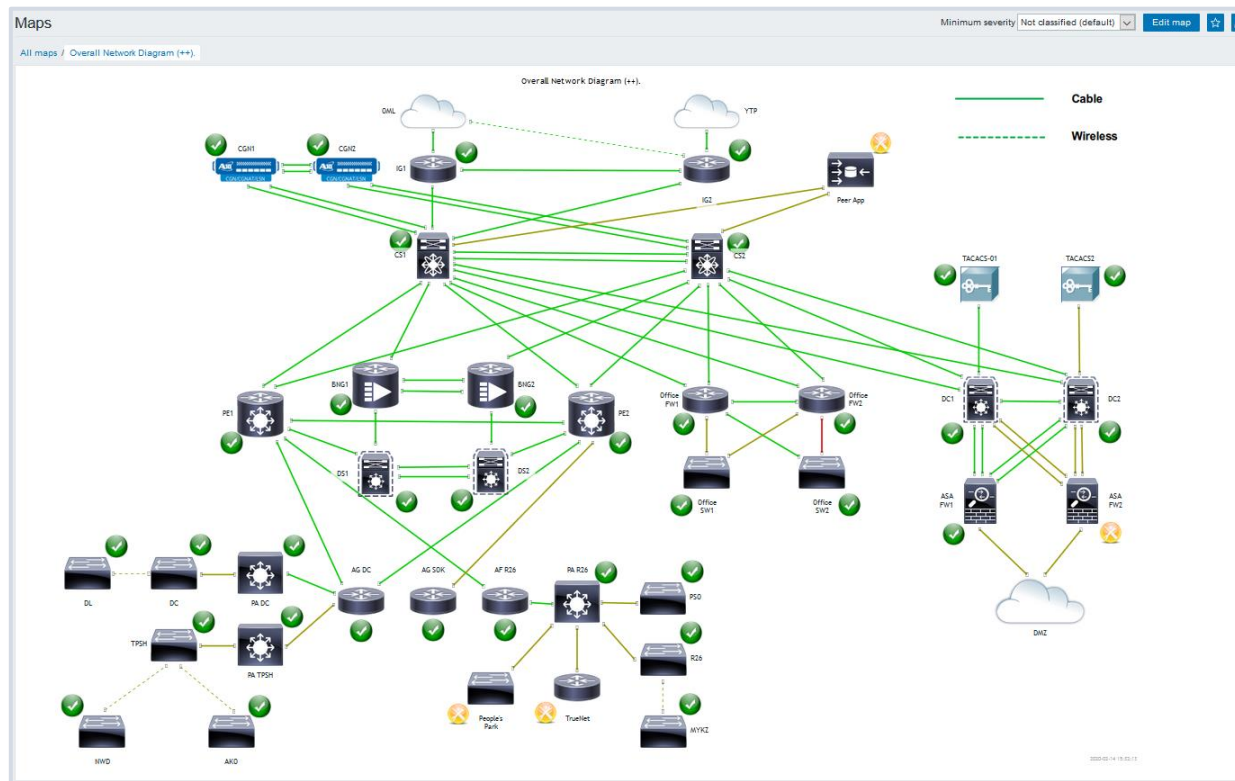
3

Maps



Data visualization with zabbix

MAPS



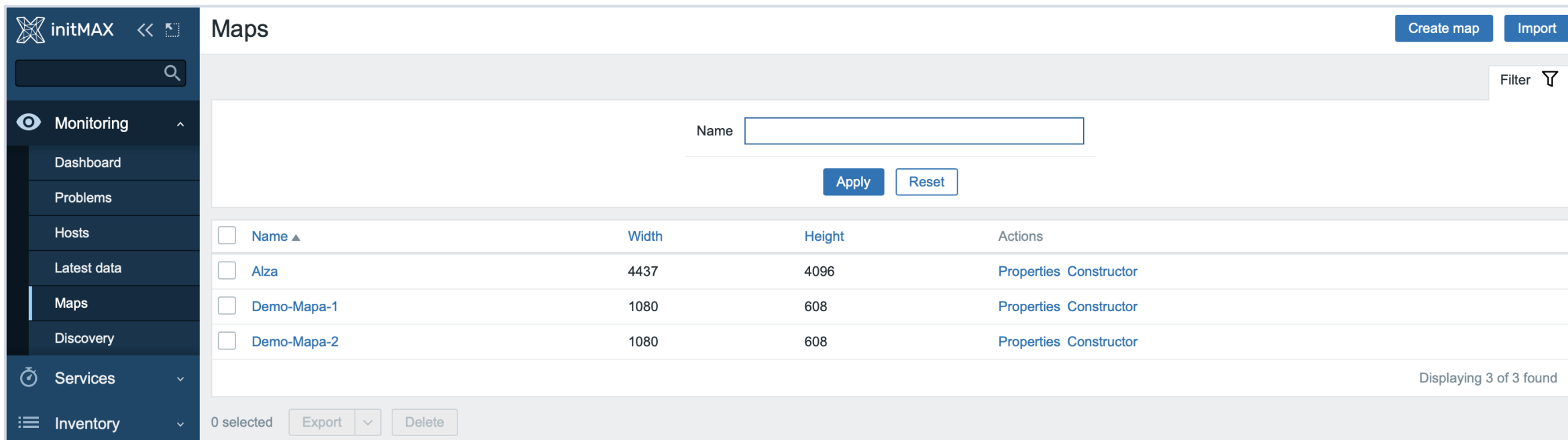
A Map is a graphical representation of data

- ▶ Real-time data can be shown (e.g. CPU load, bandwidth, etc.)
- ▶ If some event occurs, icon status or link color on the map is changed automatically
- ▶ Access to scripts, as well as links to other pages

Data visualization with zabbix

MAPS

- › Configuration for the entities is available under Monitoring
- › All users in Zabbix (including non-admin users) can create network maps



The screenshot shows the Zabbix web interface for managing network maps. On the left is a dark sidebar with navigation options: Monitoring (selected), Dashboard, Problems, Hosts, Latest data, Maps, Discovery, Services, and Inventory. The main content area is titled 'Maps' and includes a search bar, a 'Filter' button, and a 'Name' input field with 'Apply' and 'Reset' buttons. Below this is a table listing three maps: 'Alza', 'Demo-Mapa-1', and 'Demo-Mapa-2'. Each row shows a checkbox, the map name, width, height, and actions (Properties, Constructor). At the bottom, it indicates '0 selected' and provides 'Export' and 'Delete' buttons. The status 'Displaying 3 of 3 found' is shown in the bottom right.

<input type="checkbox"/>	Name ▲	Width	Height	Actions
<input type="checkbox"/>	Alza	4437	4096	Properties Constructor
<input type="checkbox"/>	Demo-Mapa-1	1080	608	Properties Constructor
<input type="checkbox"/>	Demo-Mapa-2	1080	608	Properties Constructor

Data visualization with zabbix

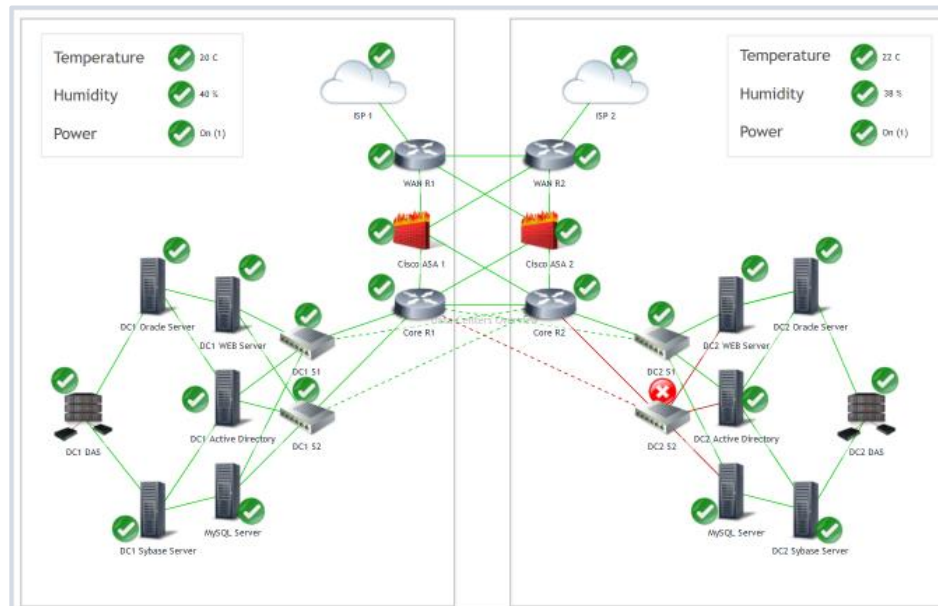
MAPS

Map properties:

- Name, dimensions
- Background image
- Icon highlighting
- Icon label type and location
- Icon mapping
- Min. trigger severity
- URLs

Map elements:

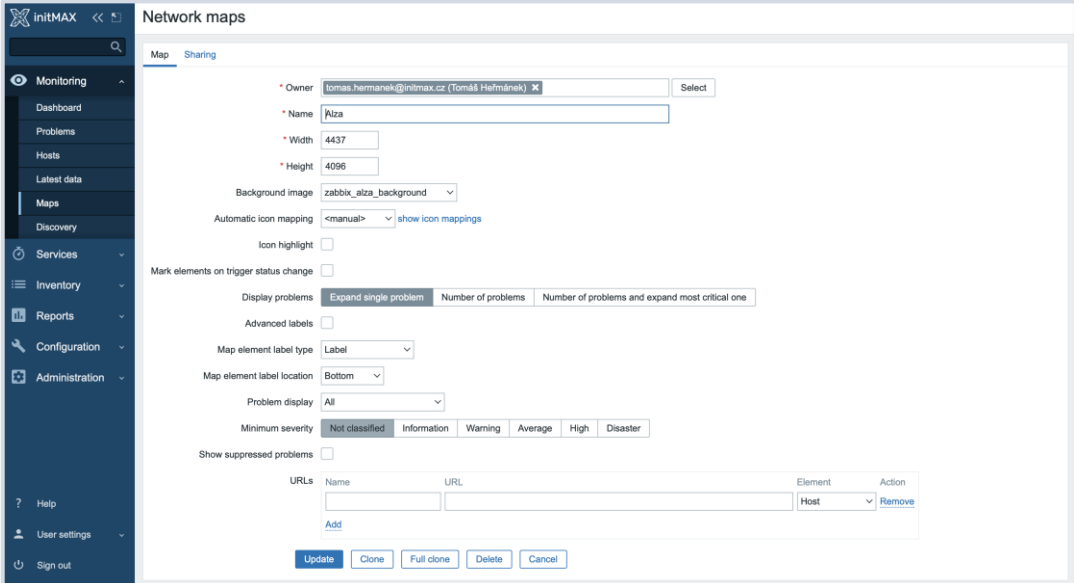
- Image
- Trigger
- Host
- Host group
- Map
- Shape



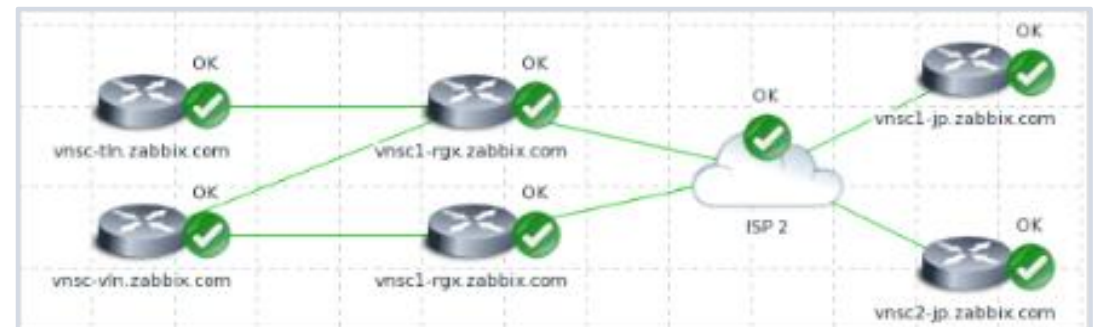
Data visualization with zabbix

MAPS

- › Different icons for different states
- › Custom URLs & labels
- › Drag and drop editing
- › Moving and copy-pasting
- › Icon alignment, macro expanding
- › Map links with labels and different styles
- › Macros in labels for elements and links



The screenshot shows the 'Network maps' configuration page in the Zabbix web interface. The left sidebar contains navigation options: Monitoring, Dashboard, Problems, Hosts, Latest data, Maps, Discovery, Services, Inventory, Reports, Configuration, Administration, Help, User settings, and Sign out. The main content area is titled 'Network maps' and has tabs for 'Map' and 'Sharing'. The configuration form includes fields for Owner (Tomas Hermanek), Name (Alza), Width (4437), Height (4096), Background image (zabbix_alza_background), Automatic icon mapping (<manual>), Icon highlight, and Mark elements on trigger status change. There are tabs for 'Display problems' (Expand single problem, Number of problems, Number of problems and expand most critical one), 'Advanced labels', 'Map element label type' (Label), 'Map element label location' (Bottom), 'Problem display' (All), 'Minimum severity' (Not classified, Information, Warning, Average, High, Disaster), and 'Show suppressed problems'. At the bottom, there is a table for 'URLs' with columns for Name, URL, Element, and Action, and buttons for Update, Clone, Full clone, Delete, and Cancel.

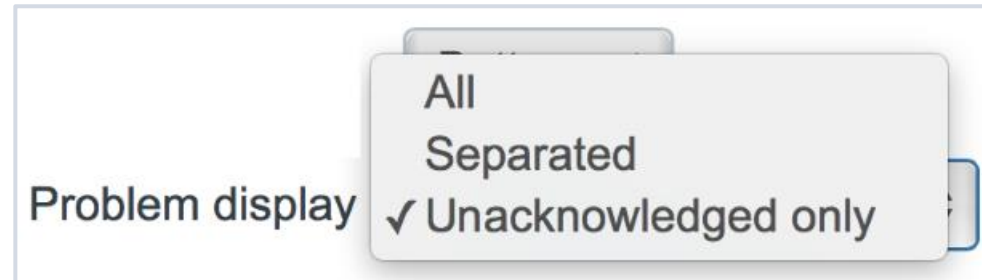


Data visualization with zabbix

MAPS

	None	Highlight	Mark	Don't expand	All
OK	 WIN-B5768P0N4TA OK	 WIN-B5768P0N4TA OK	 WIN-B5768P0N4TA OK	 WIN-B5768P0N4TA OK	 WIN-B5768P0N4TA OK
Disabled	 WIN-B5768P0N4TA DISABLED	 WIN-B5768P0N4TA DISABLED	 WIN-B5768P0N4TA DISABLED	 WIN-B5768P0N4TA DISABLED	 WIN-B5768P0N4TA DISABLED
Problem	 WIN-B5768P0N4TA Tomcat is Down	 WIN-B5768P0N4TA Tomcat is Down	 WIN-B5768P0N4TA Tomcat is Down	 WIN-B5768P0N4TA 1 Problem	 WIN-B5768P0N4TA 1 Problem
Recent problem	 WIN-B5768P0N4TA Tomcat is Down	 WIN-B5768P0N4TA Tomcat is Down	 WIN-B5768P0N4TA Tomcat is Down	 WIN-B5768P0N4TA 1 Problem	 WIN-B5768P0N4TA 1 Problem

MAPS - ACKNOWLEDGE Status



WIN-BS768P0N4TA
6 Problems



WIN-BS768P0N4TA
5 Unacknowledged



WIN-BS768P0N4TA
6 Problems
5 Unacknowledged

MAPS - Icons

Icons are used to represent map elements:

- ▶ Host - icon representing status of all triggers of the host
 - ▶ Map - icon representing status of all elements of a map
 - ▶ Trigger - icon representing status of one or more triggers
 - ▶ Host group - icon representing status of all triggers of all hosts belonging to the selected group or host group elements
 - ▶ Image - an icon, not linked to any resource
- ▶ To add an element to map user must have at least read permission
 - ▶ Map elements that user does not have read permission to are displayed with a greyed-out icon

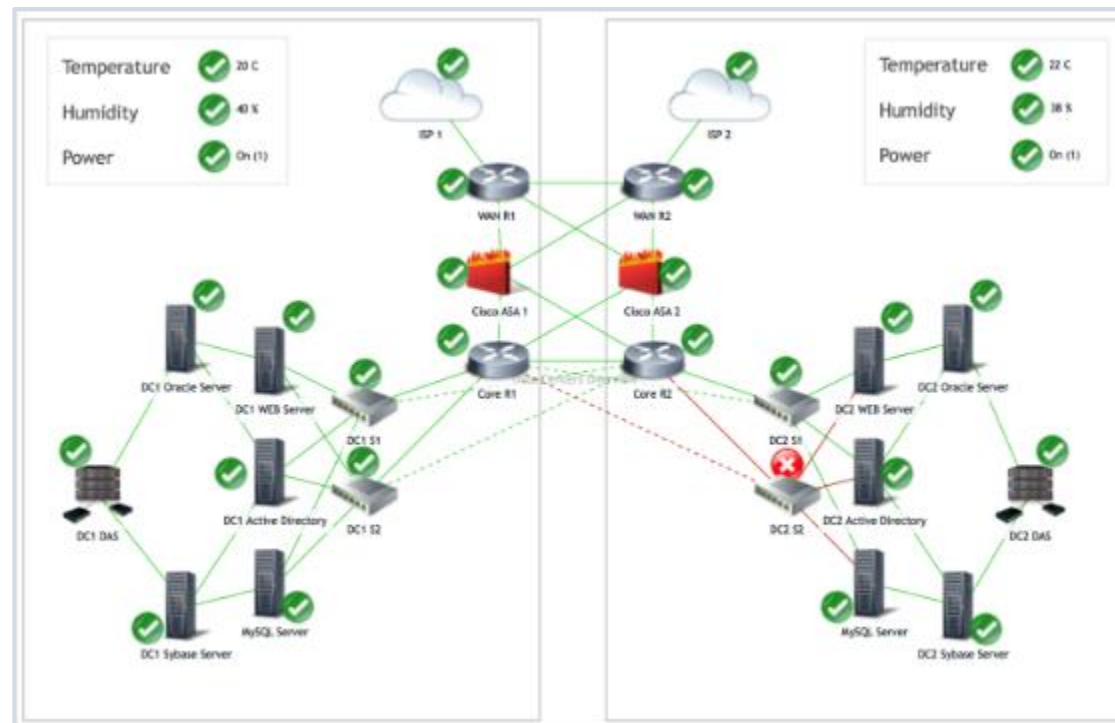


Data visualization with zabbix

MAPS - Shapes

In addition to icons, it is also possible to add shapes

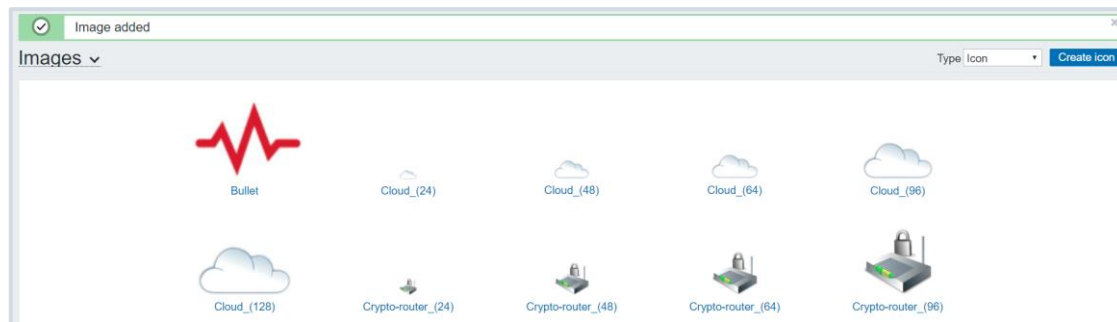
- ▶ Shapes are just a visual representation
- ▶ For example, a rectangle shape can be used as a background to group some hosts



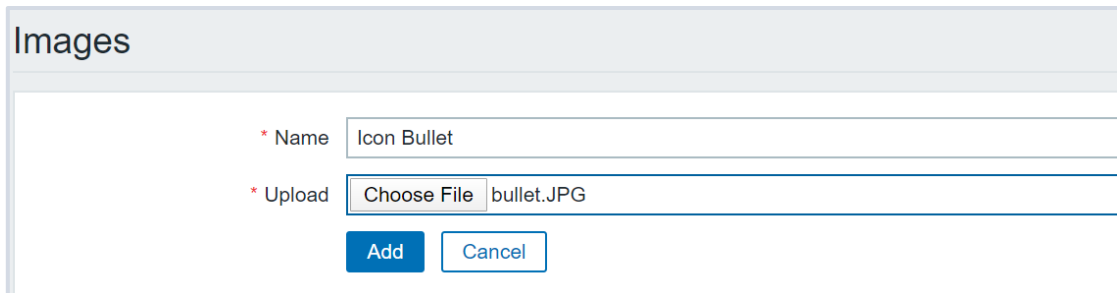
MAPS - CUSTOM ICONS AND BACKGROUNDS

You can upload your own custom icons/backgrounds in the Administration - General - Images section!

- ▶ Select the Type of the image that you wish to upload

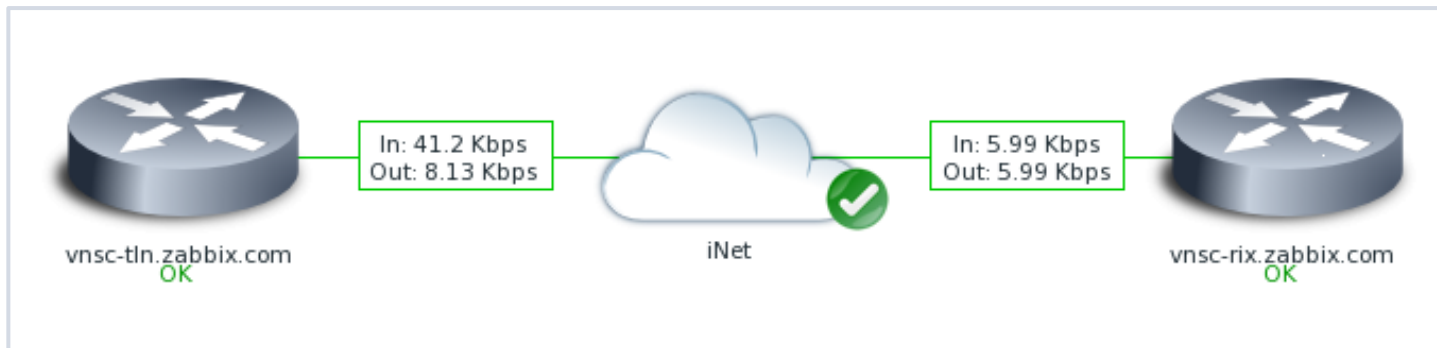


- ▶ Upload the image

A screenshot of the Zabbix Administration interface, specifically the 'Images' section. The form shows the following fields: '* Name' with the value 'Icon Bullet', and '* Upload' with a 'Choose File' button and the filename 'bullet.JPG'. There are 'Add' and 'Cancel' buttons at the bottom.

MAPS - HINTS

- ▶ You can define map hierarchy by using submaps
- ▶ To display data on Elements or links, use map labels, ex: `{?last(/{HOST.HOST}/system.cpu.load)}` or `{?last(/WiFi/net.if.out[ifHCOutOctets.1])}`
- ▶ If links are the same color as the background, they will appear only when a problem is active!
- ▶ Use macros in URL's: `{$HOST.CONN}`, `{$HOST.IP}`, `{$HOST.DNS}`
- ▶ By default the links are a straight line - route links by using invisible icons or shapes
- ▶ Use icon mappings to assign icons to matching hosts automatically



4

Icon Mapping



Icon Mapping

Map elements can have different icons assigned to them

- › It is possible to map Icons to host elements automatically by using icon mapping
- › Icon mapping is based on Host inventory values
- › Icon map has to be defined in Administration – Icon mapping
- › The specific Icon map has to be selected in the map Properties section

Maps

Name

<input type="checkbox"/> Name ▲	Width	Height	Actions
<input type="checkbox"/> Local network	680	200	Properties Constructor

Network maps

Map [Sharing](#)

* Owner

* Name

* Width

* Height

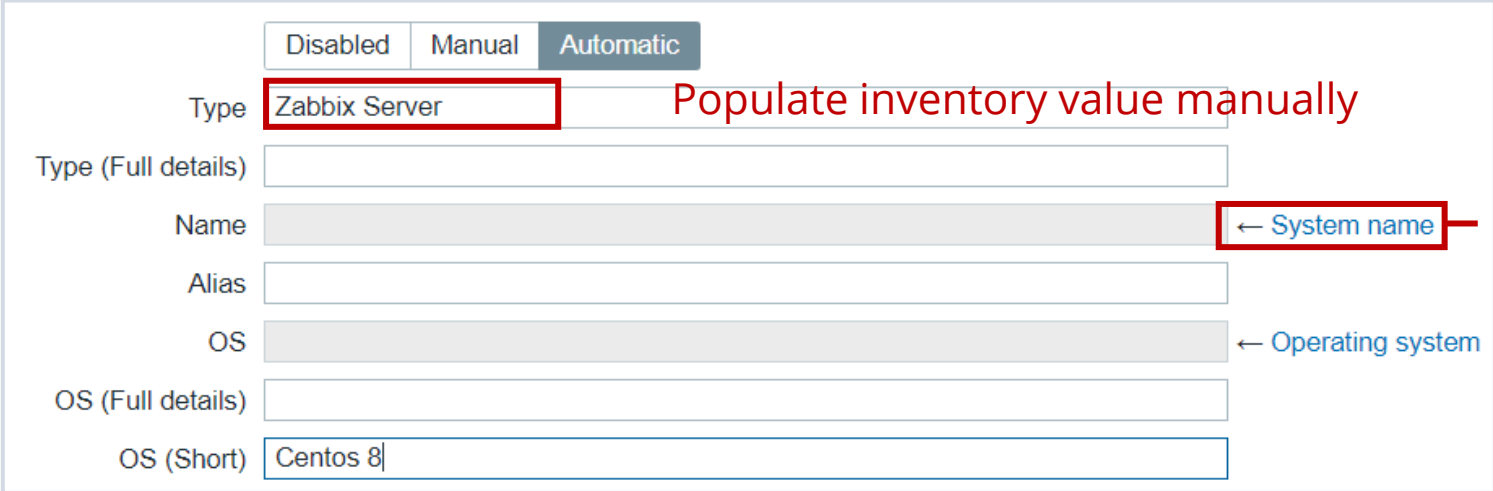
Background image

Automatic icon mapping [show icon mappings](#)

Data visualization with zabbix

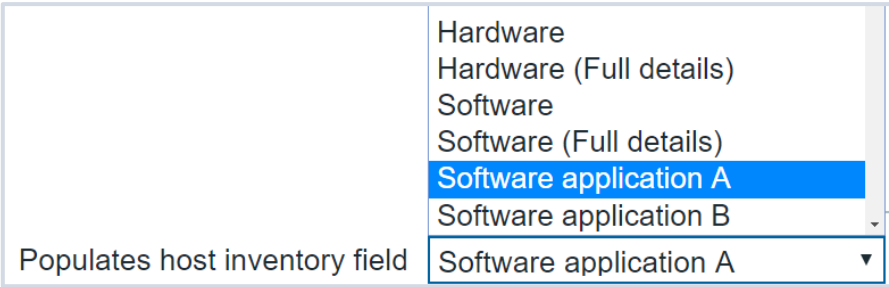
Icon Mapping

- ▶ You can use host inventory to either populate the inventory values manually or automatically



The screenshot shows the Zabbix host configuration form with the 'Automatic' mode selected. The 'Type' field is set to 'Zabbix Server' and is highlighted with a red box, with a red arrow pointing to it from the text 'Populate inventory value manually'. The 'Name' field is highlighted with a red box, with a red arrow pointing to it from the text 'Populate inventory value from item'. The 'OS' field is highlighted with a red box, with a red arrow pointing to it from the text '← Operating system'. The 'OS (Short)' field contains the text 'Centos 8'.

- ▶ In Automatic mode, the inventory values are obtained from any item on the host






The screenshot shows the 'Populates host inventory field' dropdown menu. The menu is open, showing a list of options: Hardware, Hardware (Full details), Software, Software (Full details), Software application A (highlighted in blue), Software application B, and Software application A. The dropdown arrow is pointing to the right.

Icon Mapping

▶ Create the Icon map

* Name

* Mappings

	Inventory field	Expression	Icon	Action
1:	Type	Linux Server	Server (64)	 Remove
2:	Type	Windows Host	Notebook (64)	 Remove
3:	Type	Zabbix Host	Workstation (64)	 Remove

▶ Assign the icon map to your map

▶ Select “Automatic icon selection” on your host element

Automatic icon selection

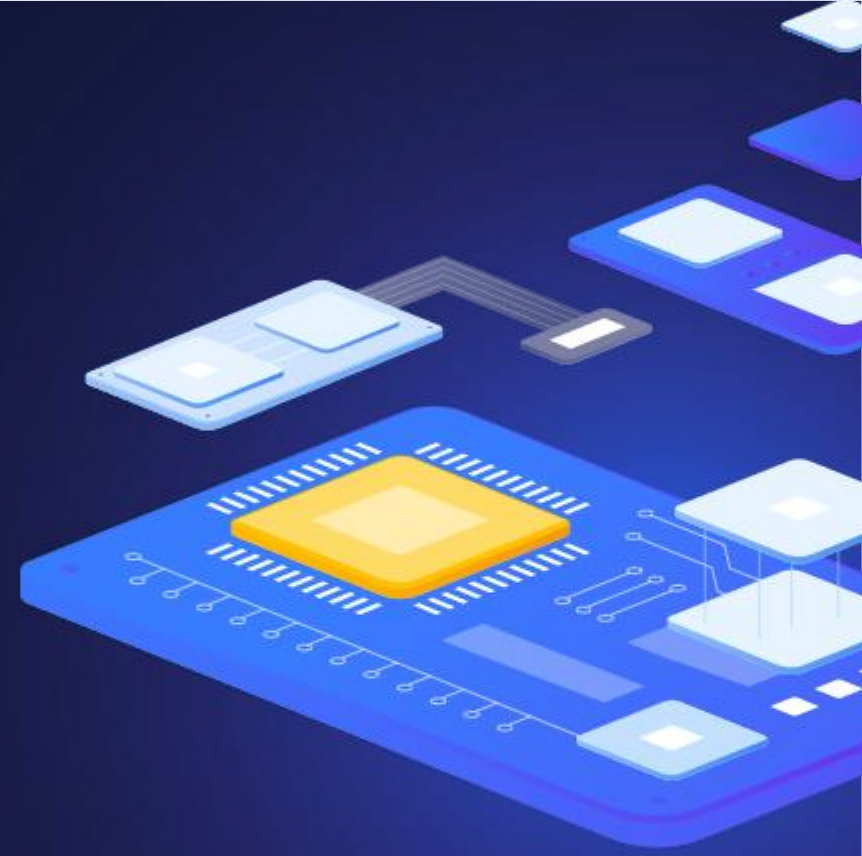
Icons

Default	<input type="text" value="Zabbix server 3D (128)"/>
Problem	<input type="text" value="Default"/>
Maintenance	<input type="text" value="Default"/>
Disabled	<input type="text" value="Default"/>

▶ If the “Automatic icon selection” is greyed out, make sure that the icon map is assigned in the map properties section!

5

Dashboards and Widgets



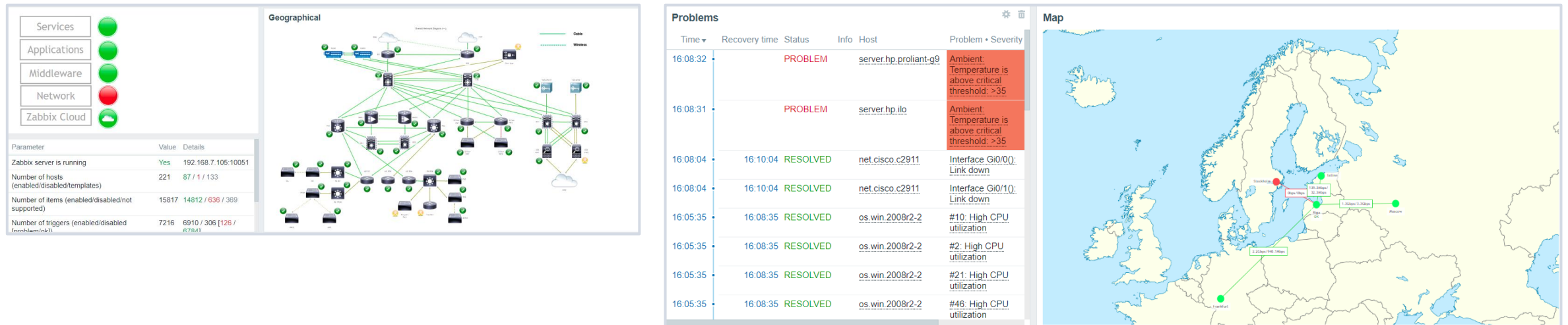
Data visualization with zabbix

Dashboards

Zabbix Dashboard is your central points of monitoring.

You can have a wide variety of different dashboards for different user groups:

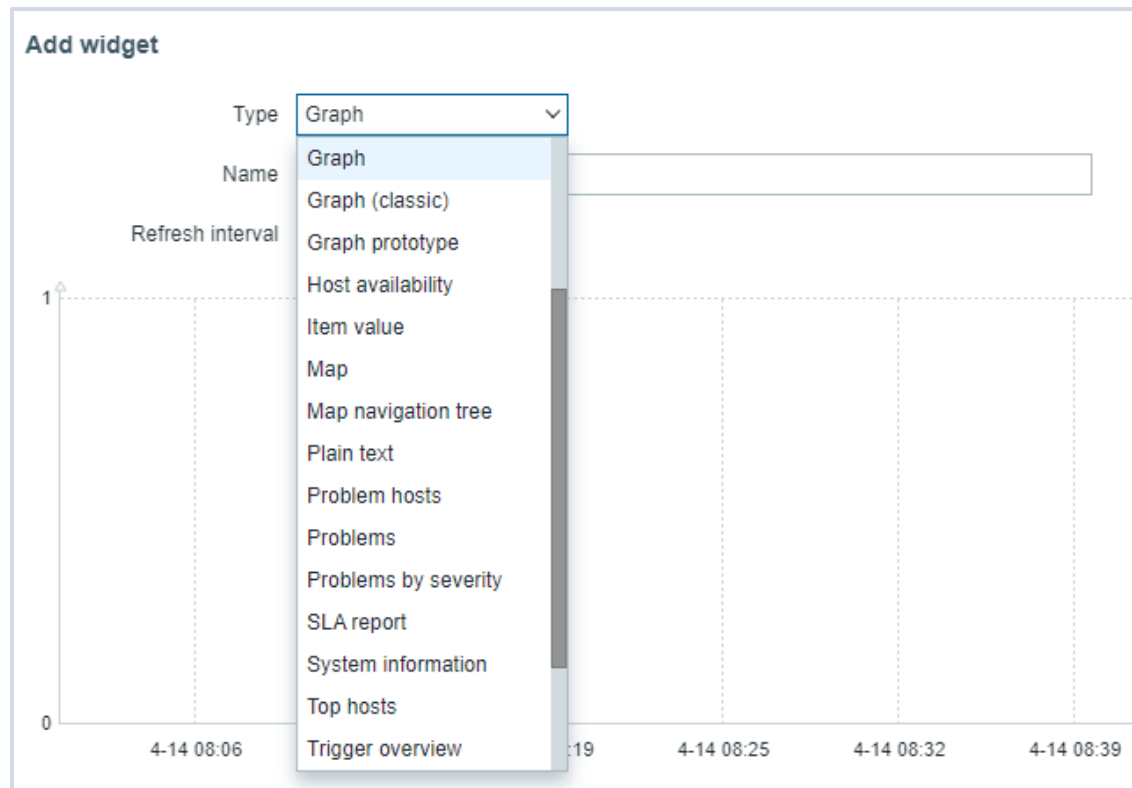
- ▶ A dashboard for your networking team
- ▶ An infrastructure overview dashboard based on your Zabbix maps
- ▶ A dashboard displaying live statistics of your business, e.g: website traffic
- ▶ And much, much more!



Widgets

Dashboards consist of widgets.

- › Widgets can represent data related to wide variety of different Zabbix elements, for example:
- › Graphs
- › Problems
- › Maps
- › Latest data
- › External sites
- ›



The screenshot shows the 'Add widget' dialog box in Zabbix. The 'Type' dropdown is set to 'Graph'. A list of widget types is shown, including Graph, Graph (classic), Graph prototype, Host availability, Item value, Map, Map navigation tree, Plain text, Problem hosts, Problems, Problems by severity, SLA report, System information, Top hosts, and Trigger overview. The background shows a graph with a y-axis from 0 to 1 and an x-axis with timestamps: 4-14 08:06, 4-14 08:19, 4-14 08:25, 4-14 08:32, and 4-14 08:39.

Data visualization with zabbix

Widgets

Most of the widgets can be filtered by hosts, host groups, items, triggers and customized in other ways:

Edit widget

Type: Show header

Name:

Refresh interval:

Show:

Host groups:
type here to search

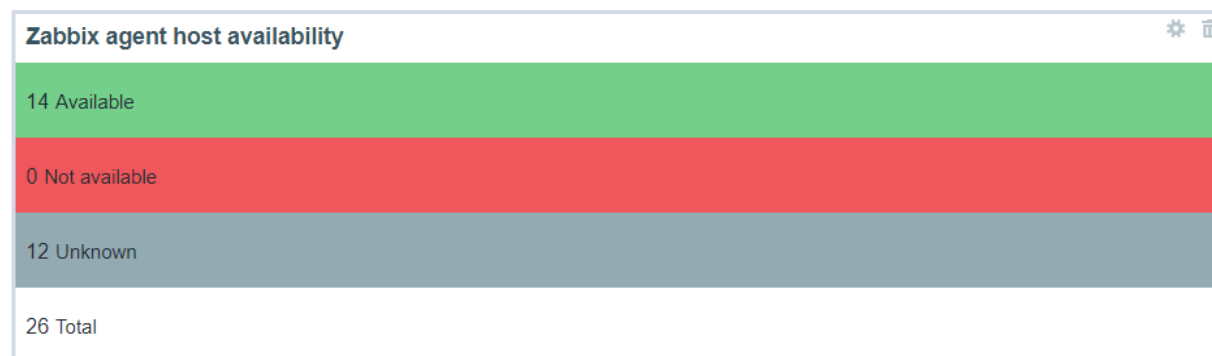
Exclude host groups:

Hosts:

Problem:

Severity: Not classified
 Information
 Warning
 Average
 High
 Disaster

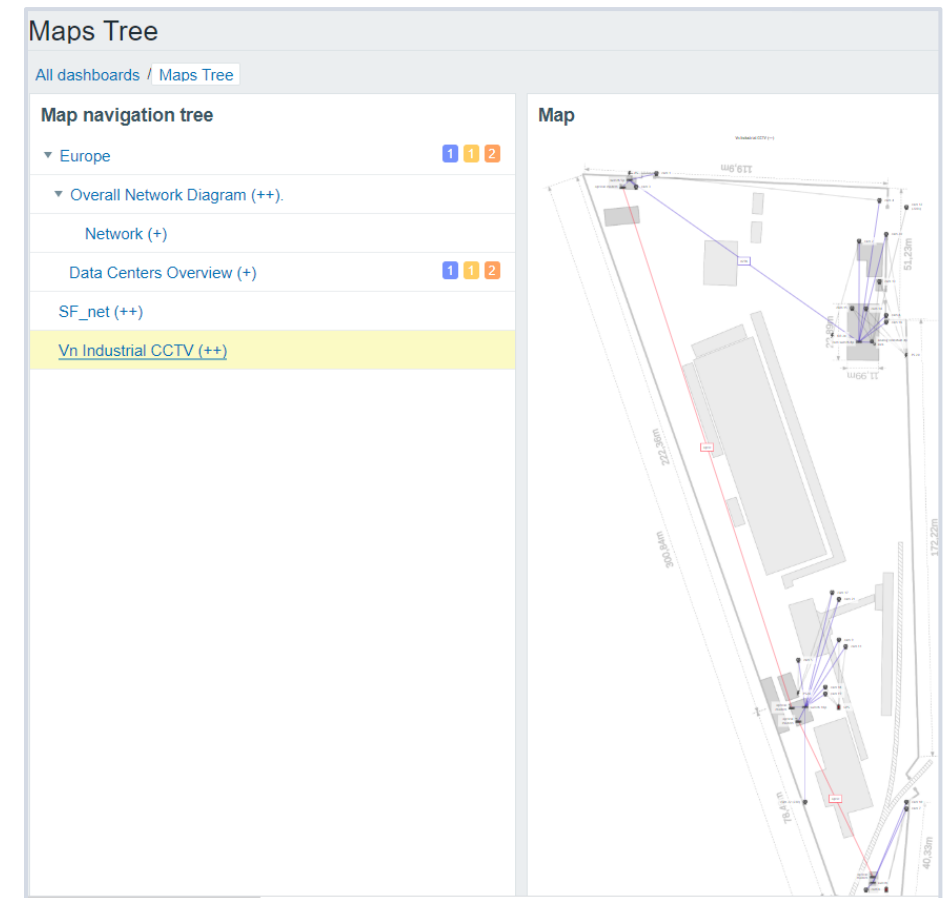
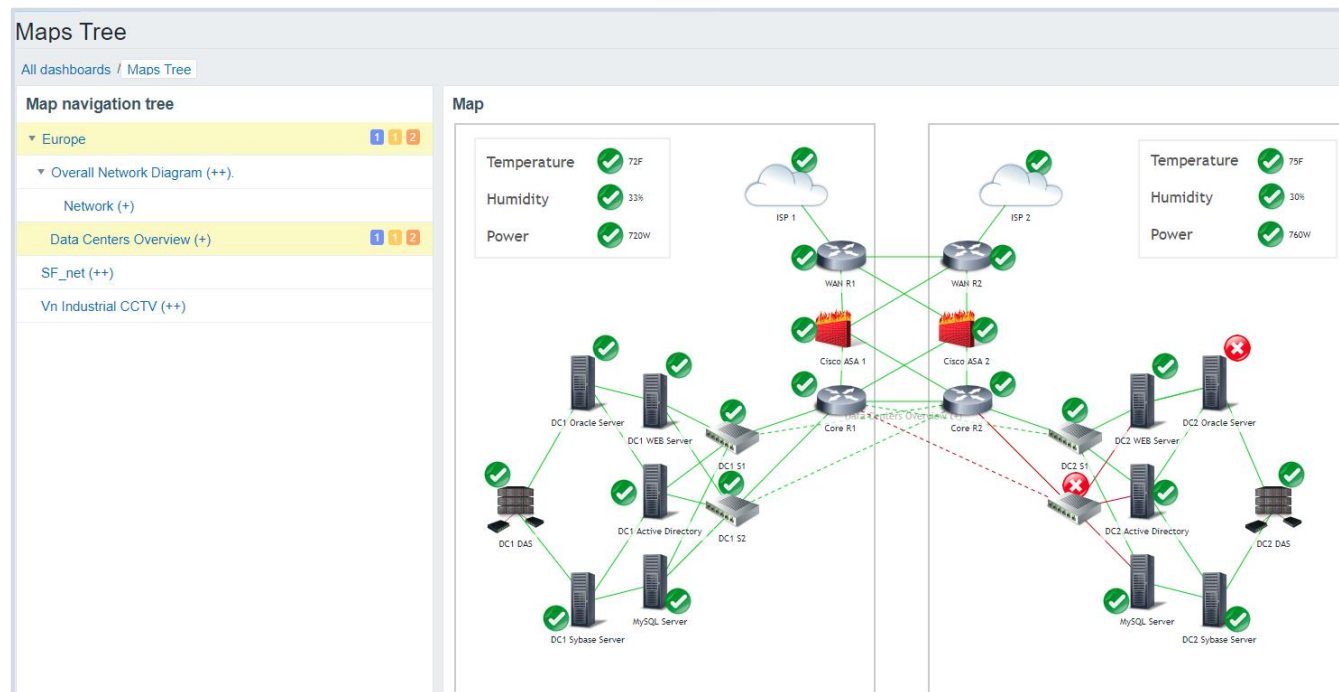
Tags:



Data visualization with zabbix

Widgets

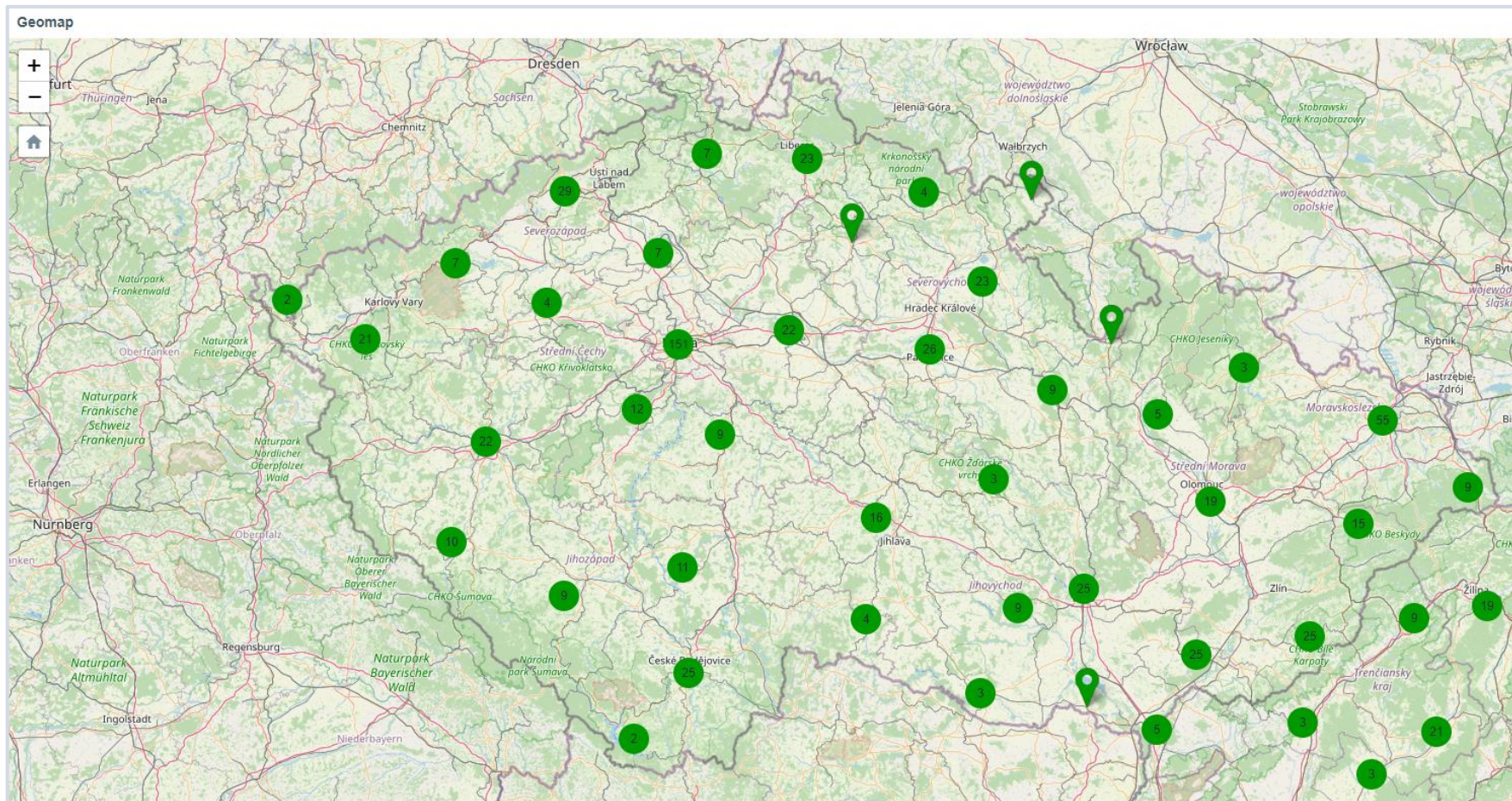
Some widgets are interactive. For example, you can use a Map navigation tree widget to switch between maps:



Data visualization with zabbix

Widgets - Geomap










The Geomap widget allows you to display your hosts and problems on a geographical map















Data visualization with zabbix

Widgets – Top Hosts

The Top hosts widget can be used to display a list of Top N or Bottom N hosts sorted by an item value

Host Name	CPU	Available MEM	disk /	MEM Util%	Agent		
Rocky01	1.4792 %		14.7753 %		19.7533 % 	85.2247 %	Up (1)
RockyDB	0.651 %		67.6285 %		27.1268 % 	32.3715 %	Up (1)
Rocky02	0.09176 %		73.0975 %		17.9863 % 	26.9026 %	Up (1)

Host	CPU	CPU BAR	MEM	Disk /	Zabbix Agent	
Server_0009.DEMO	21.1398 %		21.1398 %		32.1901 % 	25.916 %
Server_0002.DEMO	20.9575 %		20.9575 %		32.24 % 	25.916 %
Server_0007.DEMO	20.834 %		20.834 %		32.1861 % 	25.916 %
Server_0004.DEMO	20.4971 %		20.4971 %		32.1869 % 	25.916 %

Edit widget ✕

Type: Top hosts Show header

Name:

Refresh interval: Default (1 minute)

Host groups: Zabbix servers ✕ Select

Hosts: Select

Host tags: And/Or Or

Contains Remove

[Add](#)

Name	Data	Action
Host Name	Host name	Edit Remove
CPU	CPU user time	Edit Remove
Available MEM	Available memory in %	Edit Remove
disk /	/: Space utilization	Edit Remove
MEM Util%	Memory utilization	Edit Remove
Agent	Zabbix agent ping	Edit Remove

[Add](#)

Order: Top N Bottom N

* Order column: MEM Util%

* Host count:

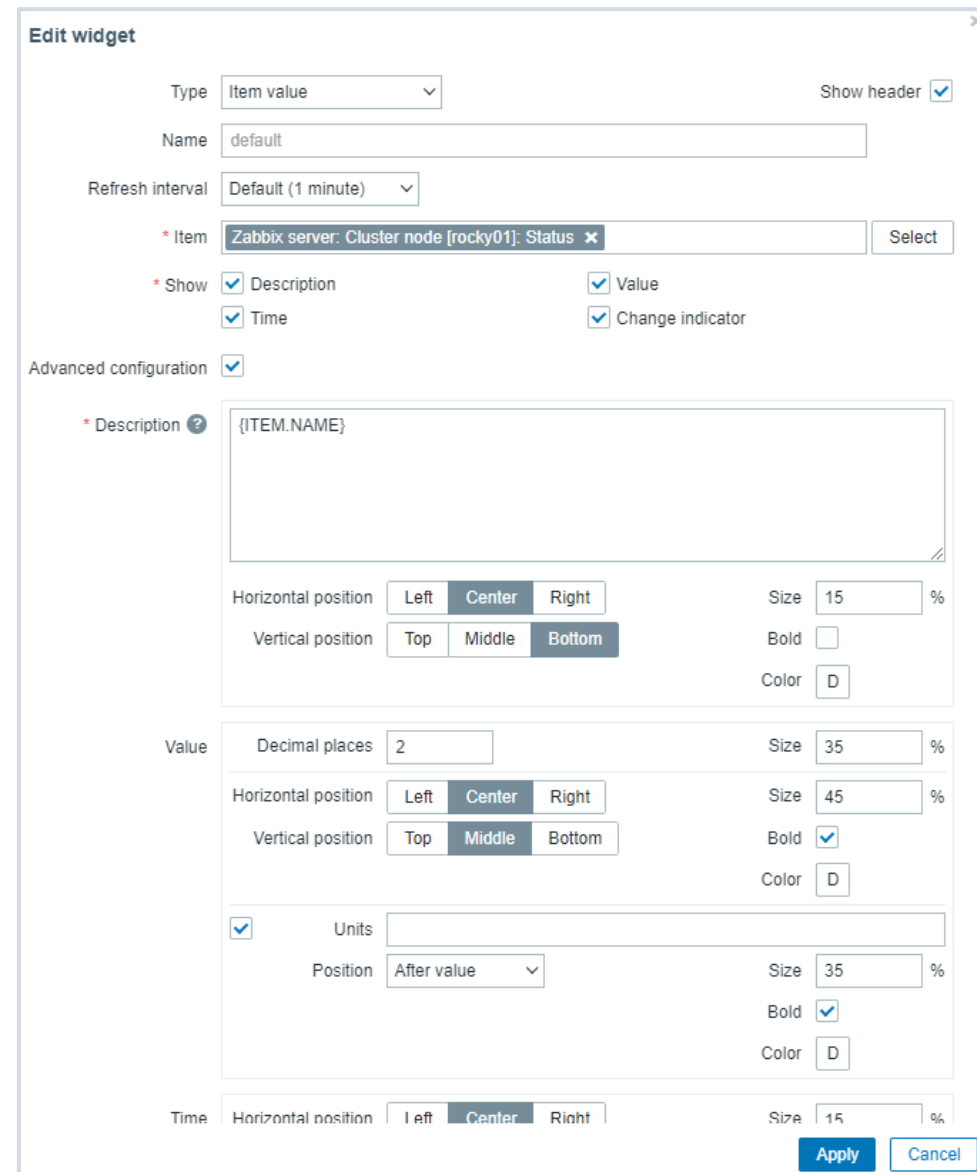
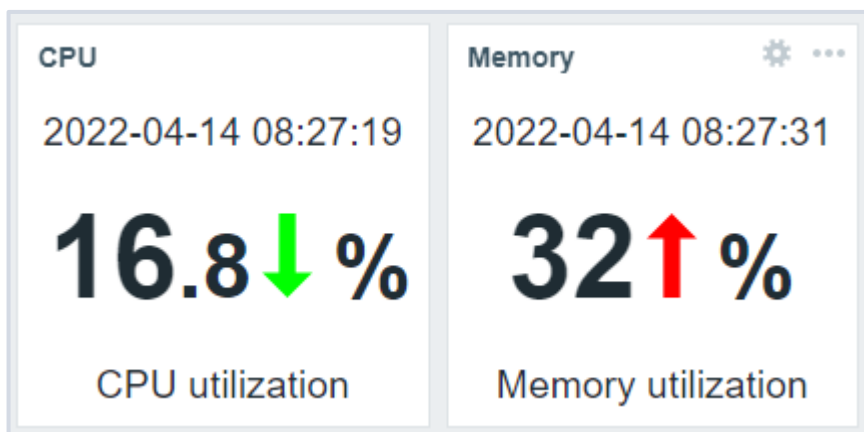
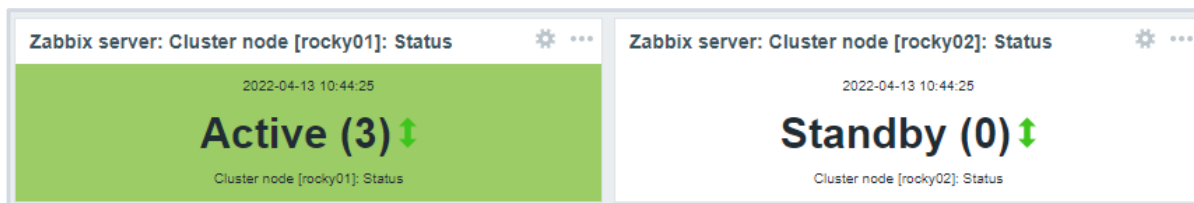
Apply Cancel

Data visualization with zabbix

Widgets – Item value

The single item widget allows you to display values for a single metric

- ▶ Can be used in template dashboard



Edit widget

Type: Show header:

Name:

Refresh interval:

* Item:

* Show: Description Value Time Change indicator

Advanced configuration:

* Description:

Horizontal position: Size: %

Vertical position: Bold: Color:

Value: Decimal places: Size: %

Horizontal position: Size: %

Vertical position: Bold: Color:

Units: Position: Size: %

Bold: Color:

Time: Horizontal position: Size: %

Data visualization with zabbix

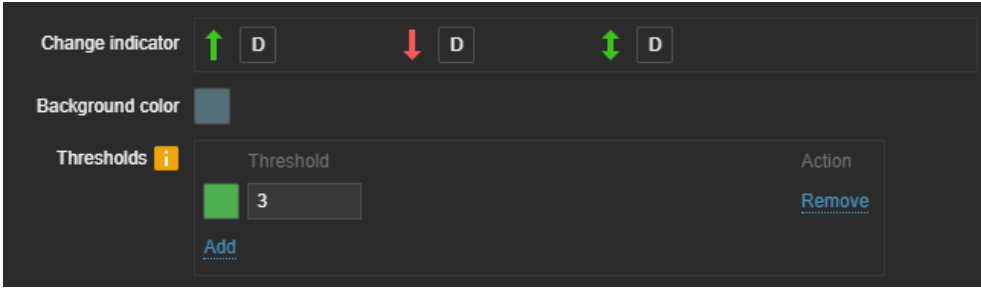
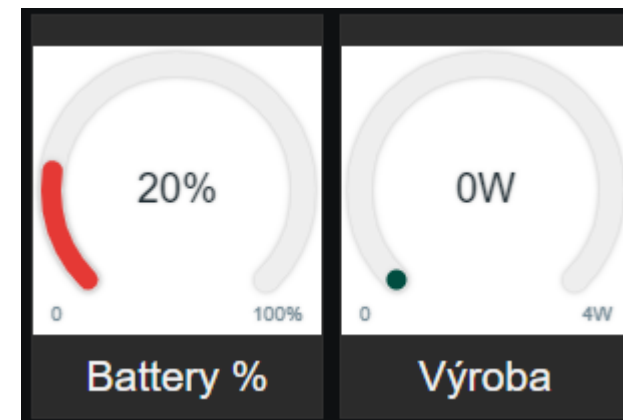
Widgets - 6.4

New Menu Layout

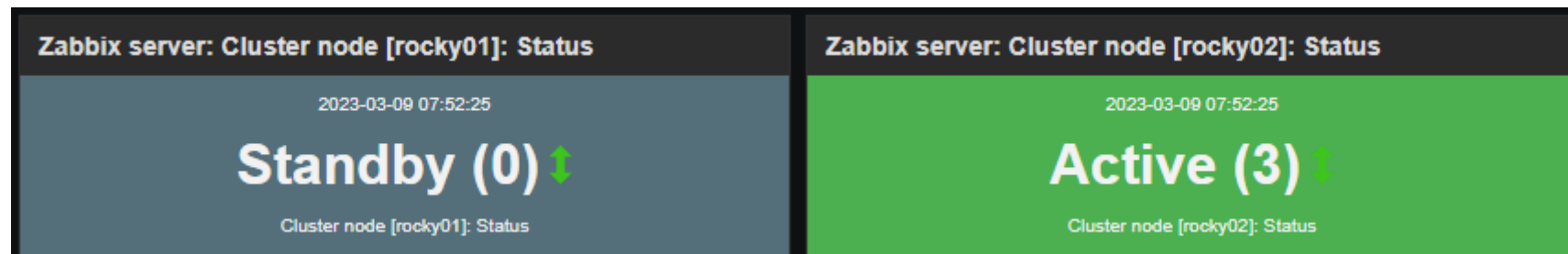
- ▶ New sections and structure

Widgets development

- ▶ Widgets as modules
- ▶ Item value improvement - color thresholds



The configuration interface for a Zabbix widget. It includes a "Change indicator" section with three options: a green up arrow, a red down arrow, and a green double arrow, each with a "D" button. Below is a "Background color" section with a blue color swatch. The "Thresholds" section has an information icon and a table with columns "Threshold" and "Action". A row shows a green square next to the value "3" and a "Remove" button. An "Add" button is located below the table.



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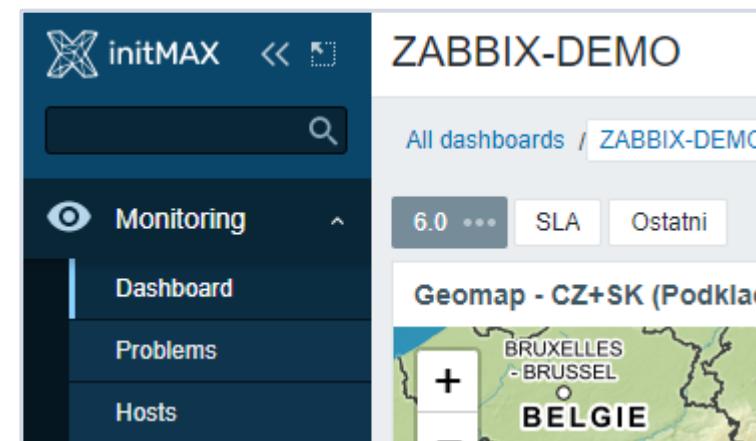
Rebranding



Rebranding

Customize your Zabbix instance to represent your organization.

- ▶ Replace the existing Zabbix branding and Help page URL with your own organization branding and a custom website URL.
- ▶ The rebranding feature does not violate the Zabbix license agreement - you're free to replace the Zabbix branding at your leisure!



```
local/conf/brand.conf.php
```

```
<?php
return [
    'BRAND_LOGO' => './images/custom_logo.png',
    'BRAND_LOGO_SIDEBAR' => './images/custom_logo_sidebar.png',
    'BRAND_LOGO_SIDEBAR_COMPACT' => './images/custom_logo_sidebar_compact.png',
    'BRAND_FOOTER' => ',© initMAX',
    'BRAND_HELP_URL' => 'https://www.initmax.cz/help/'
];
```

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Demonstration





Questions?



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