



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: type here to search Select

Hosts: Select

Name:

Tags: And/Or Or Contains Remove

Add

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

Tag display priority: comma-separated list

Show details: ☐

Save as Apply Reset

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

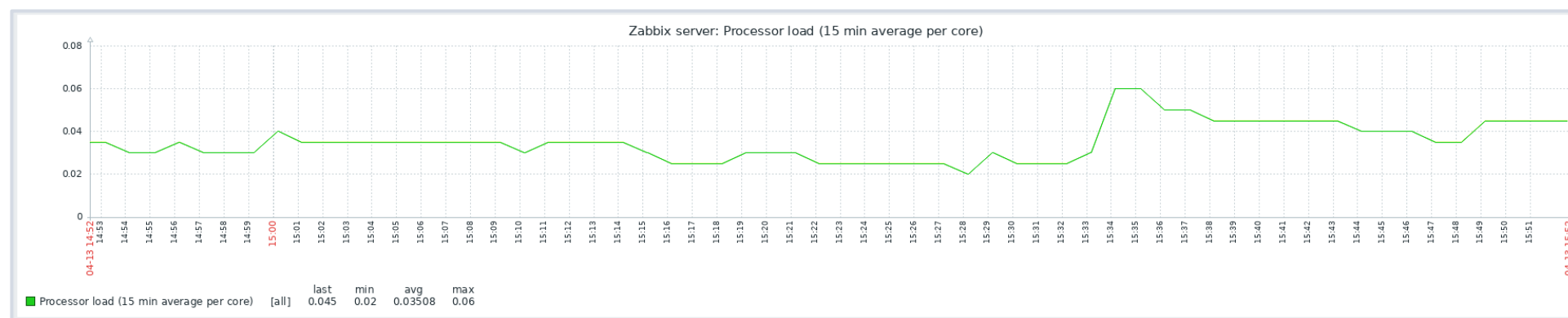
node-id: c1w239wq0014qnp71vxcch 4

node-name: None 4

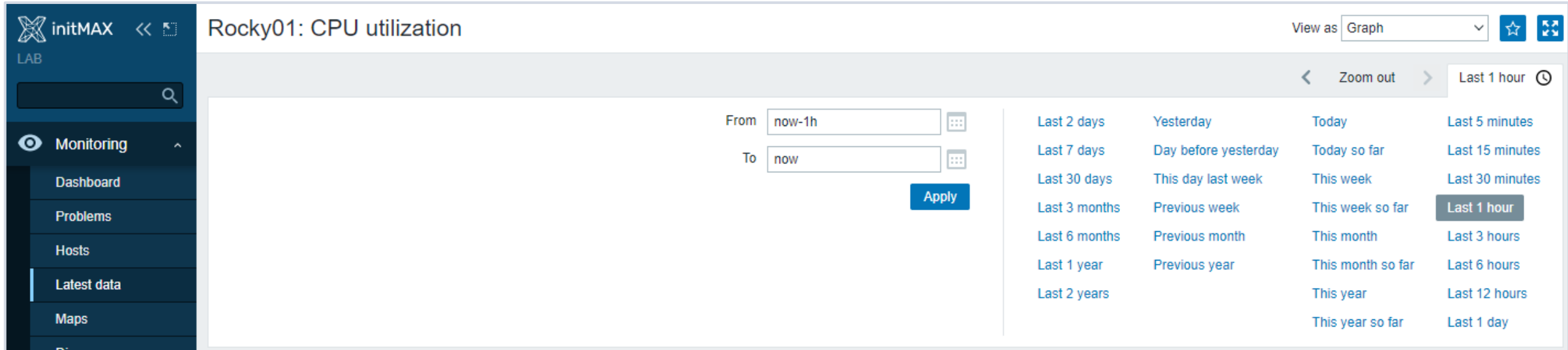
DATA

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 [i] Address	7h 57m 18s	localhost:10051		component: cluster node-id: c1w239wq00... node-name	History
<input type="checkbox"/> Zabbix server	Cluster node [i] Last access age	18s	00:00:00		component: cluster node-id: c1w239wq00... node-name	Graph
<input type="checkbox"/> Zabbix server	Cluster node [i] Last access time	18s	2022-04-13 15:50:25	+00:01:00	component: cluster node-id: c1w239wq00... node-name	Graph
<input type="checkbox"/> Zabbix server	Cluster node [i] Status	7h 57m 18s	Active (3)		component: cluster node-id: c1w239wq00... 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



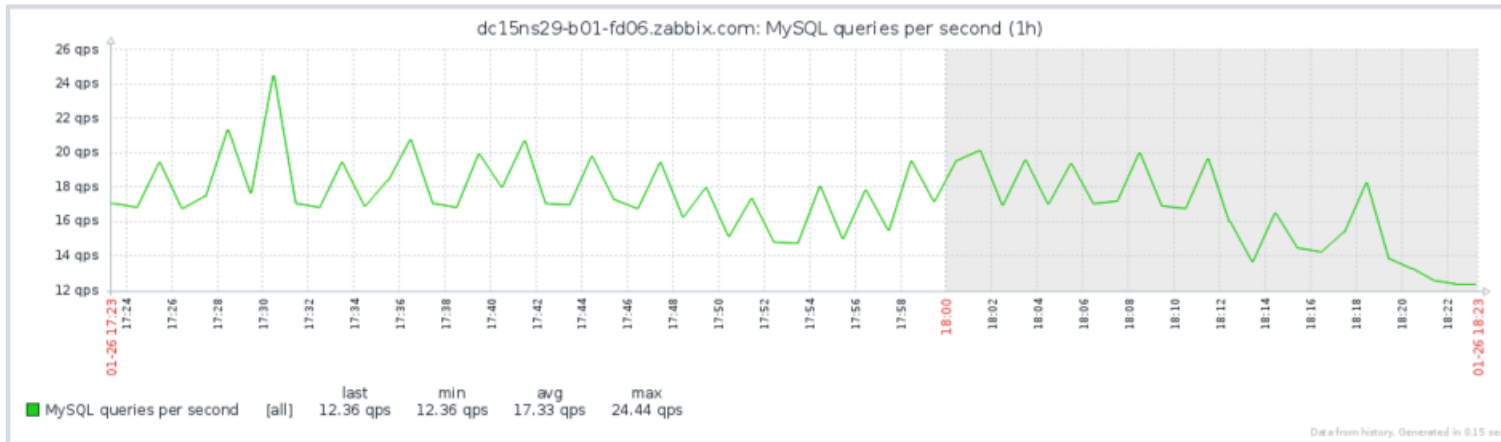
In the top right, there is a time period selector

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

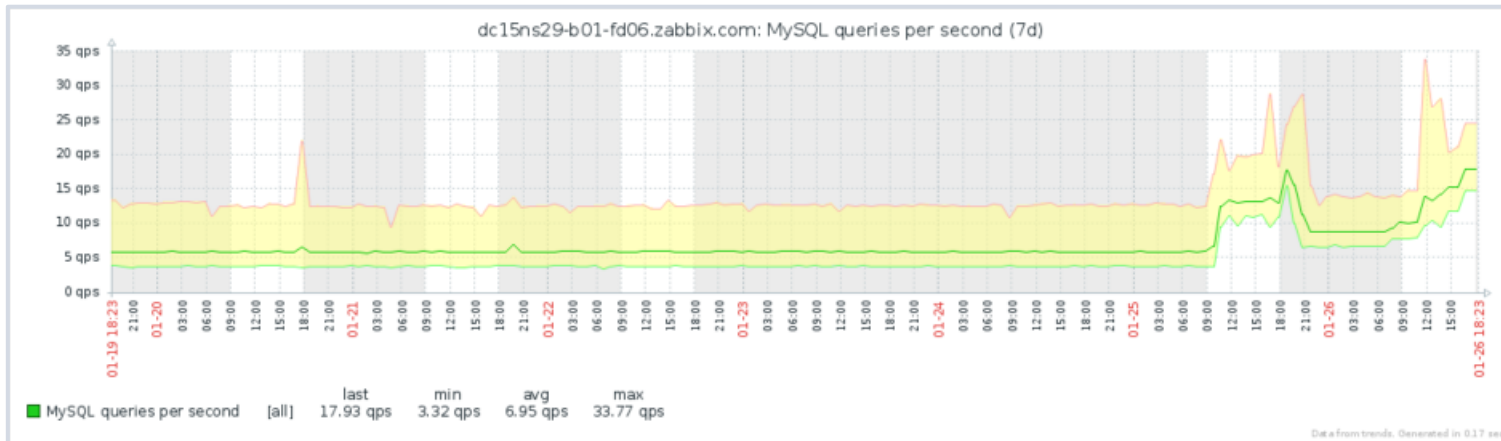
Data visualization with zabbix

SIMPLE GRAPHS


History (raw data)



Trends (min, max, avg)



SIMPLE GRAPHS

 initMAX <<

Monitoring ^

Dashboard

Problems

Hosts

Latest data

Maps

Discovery

Services v

Inventory v

Reports v

Configuration v

Administration v

Latest data

< DEMO-SERVER

Host groups

DEMO/hosts x

 type here to search

Select

Hosts

DEMO-SERVER x

 type here to search

Select

Name CPU

Tags And/Or Or

tag Contains value [Remove](#)

[Add](#)

Show tags None 1 2 3 Tag name Full Shortened None

Tag display priority comma-separated list

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

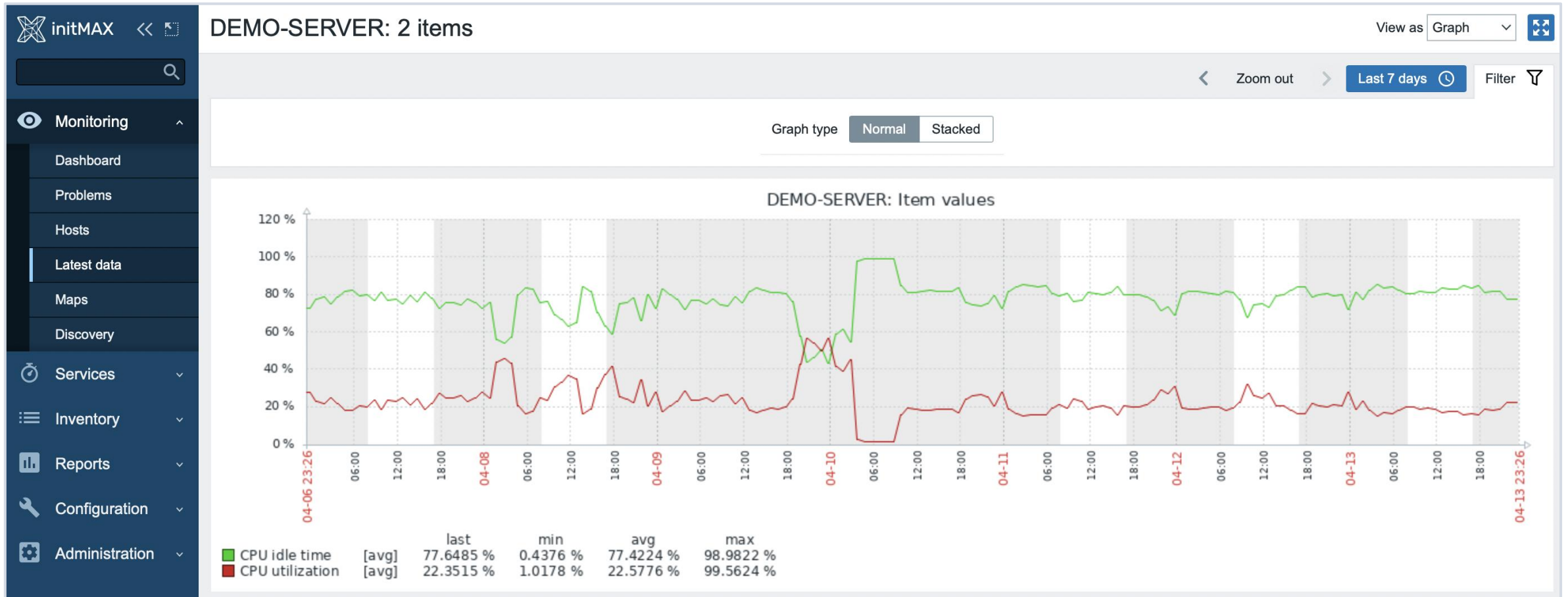
2 selected

Display stacked graph

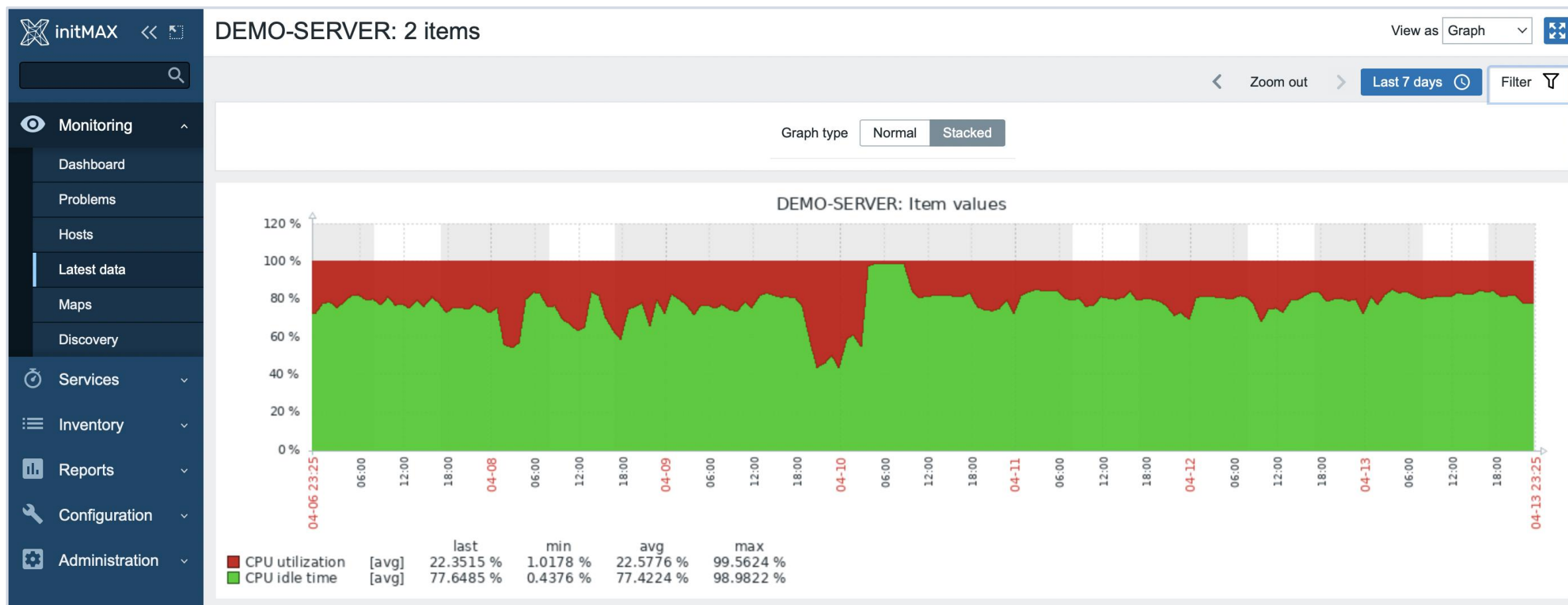
Display graph

Displaying 2 of 2 found

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

Hosts

Name

Tags And/Or Or

Application

Add

Show tags None 1 2 3

Tag display priority

Show details ☐

Exists

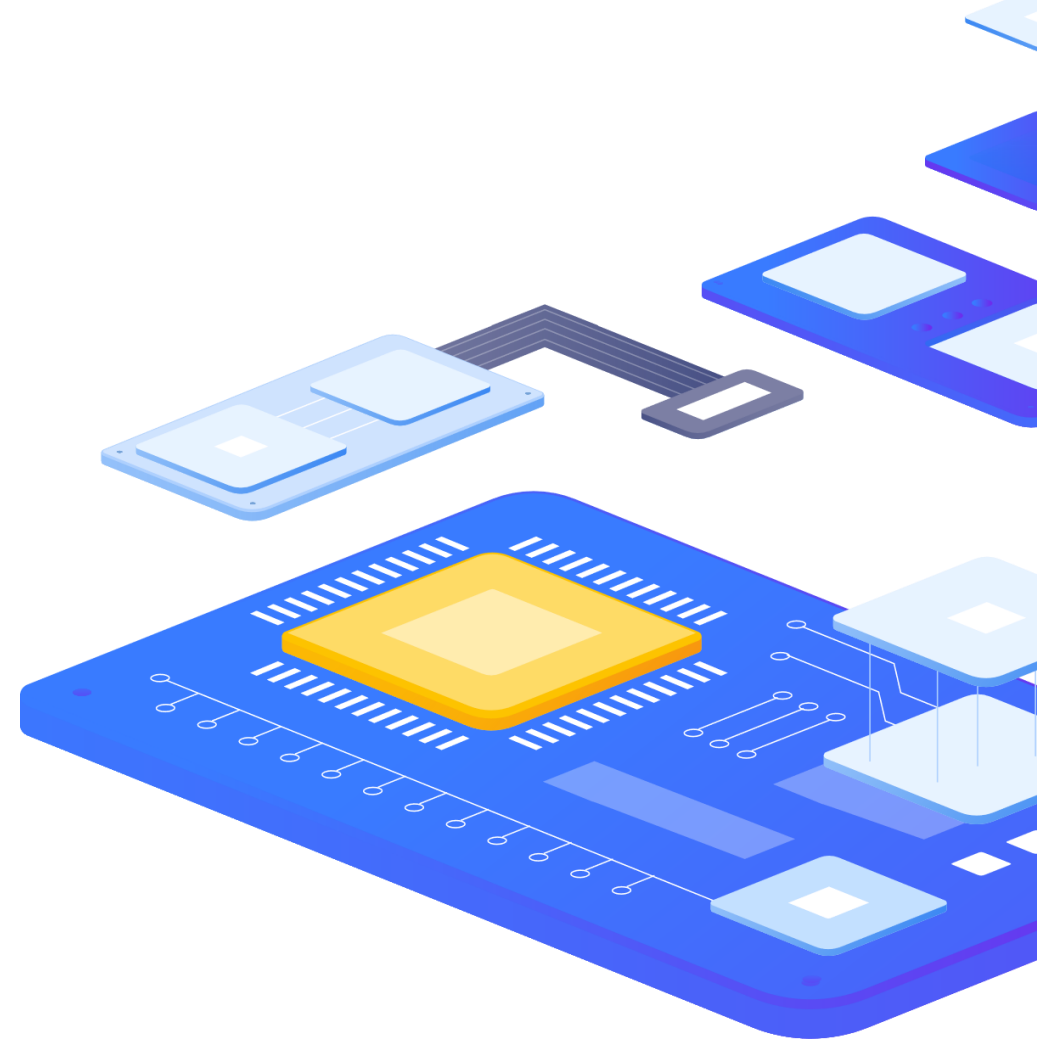
Equals

Contains

Does not exist

Does not equal

Does not contain



2

Graphs and Classic graphs



CUSTOM GRAPHS (LEGACY)

Configuration > Templates > Graphs

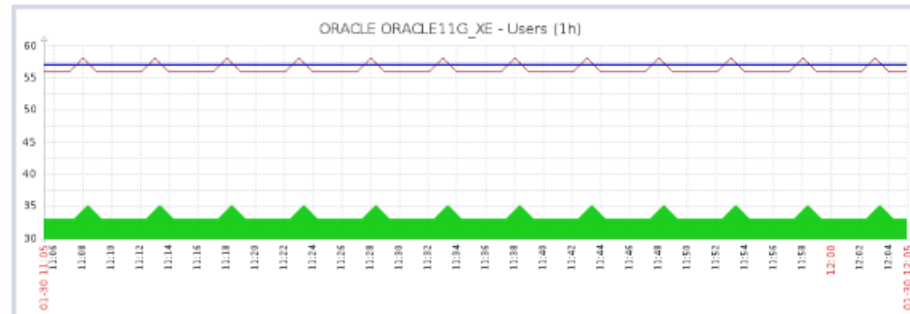
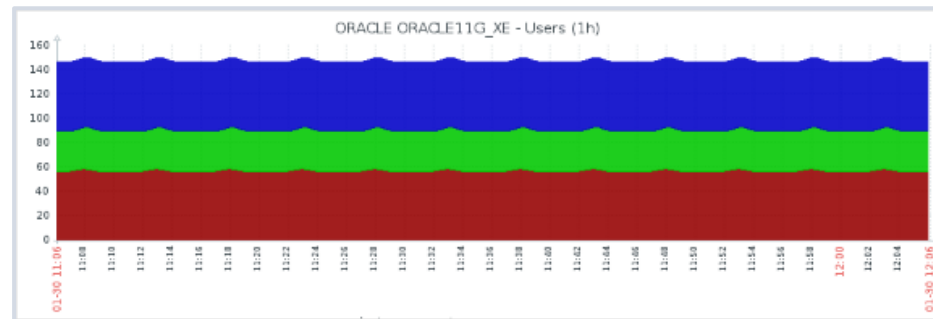
- › Multiple items in a single customized graph
- › Multiple graph types
- › Normal
- › Stacked
- › Pie
- › Exploded pie

Draw style

Line

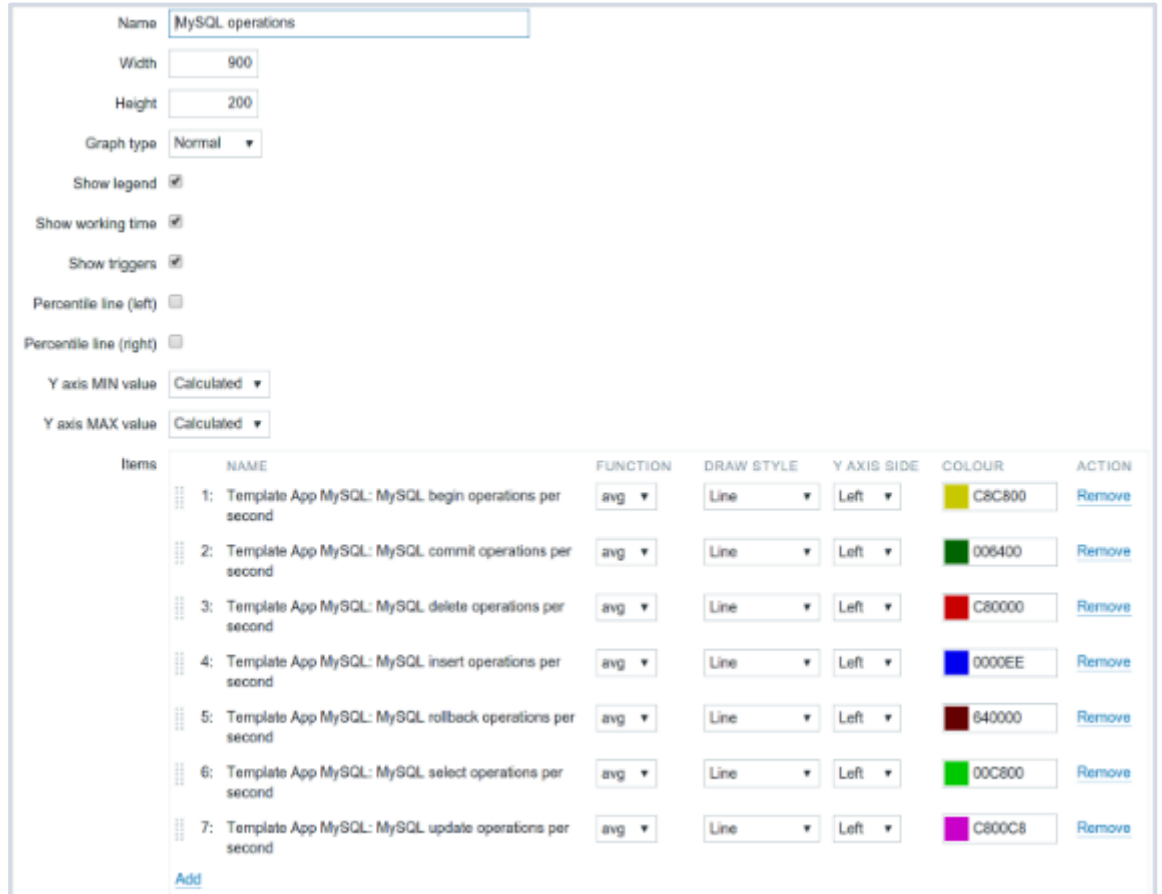
Filled region

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



Name: MySQL operations

Width: 900

Height: 200

Graph type: Normal

Show legend: ☒

Show working time: ☒

Show triggers: ☒

Percentile line (left): ☐

Percentile line (right): ☐

Y axis MIN value: Calculated

Y axis MAX value: Calculated

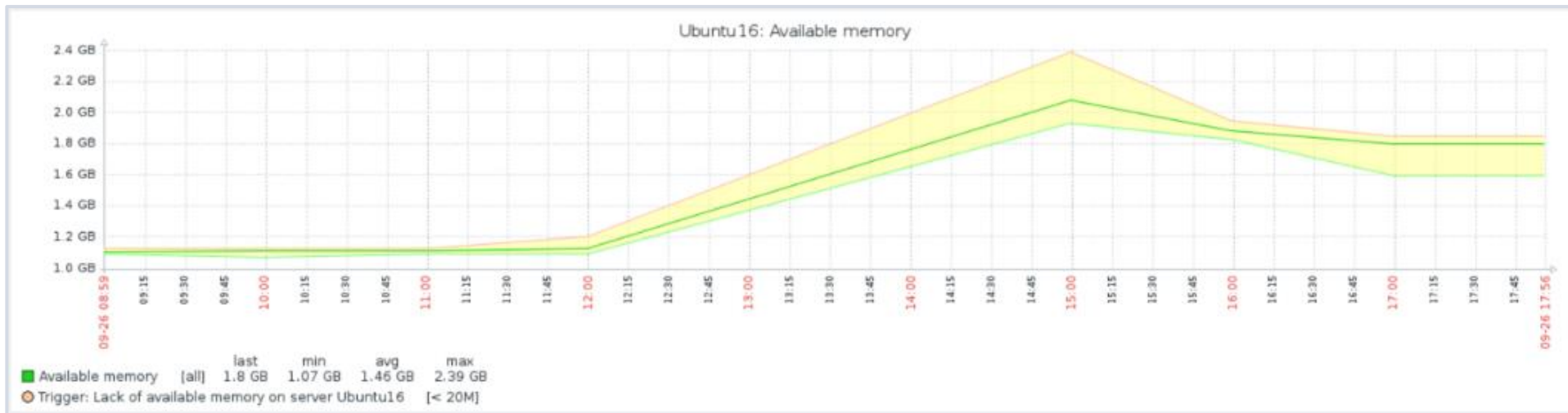
Items	NAME	FUNCTION	DRAW STYLE	Y AXIS SIDE	COLOUR	ACTION
1:	Template App MySQL: MySQL begin operations per second	avg	Line	Left	C8C800	Remove
2:	Template App MySQL: MySQL commit operations per second	avg	Line	Left	006400	Remove
3:	Template App MySQL: MySQL delete operations per second	avg	Line	Left	C80000	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:

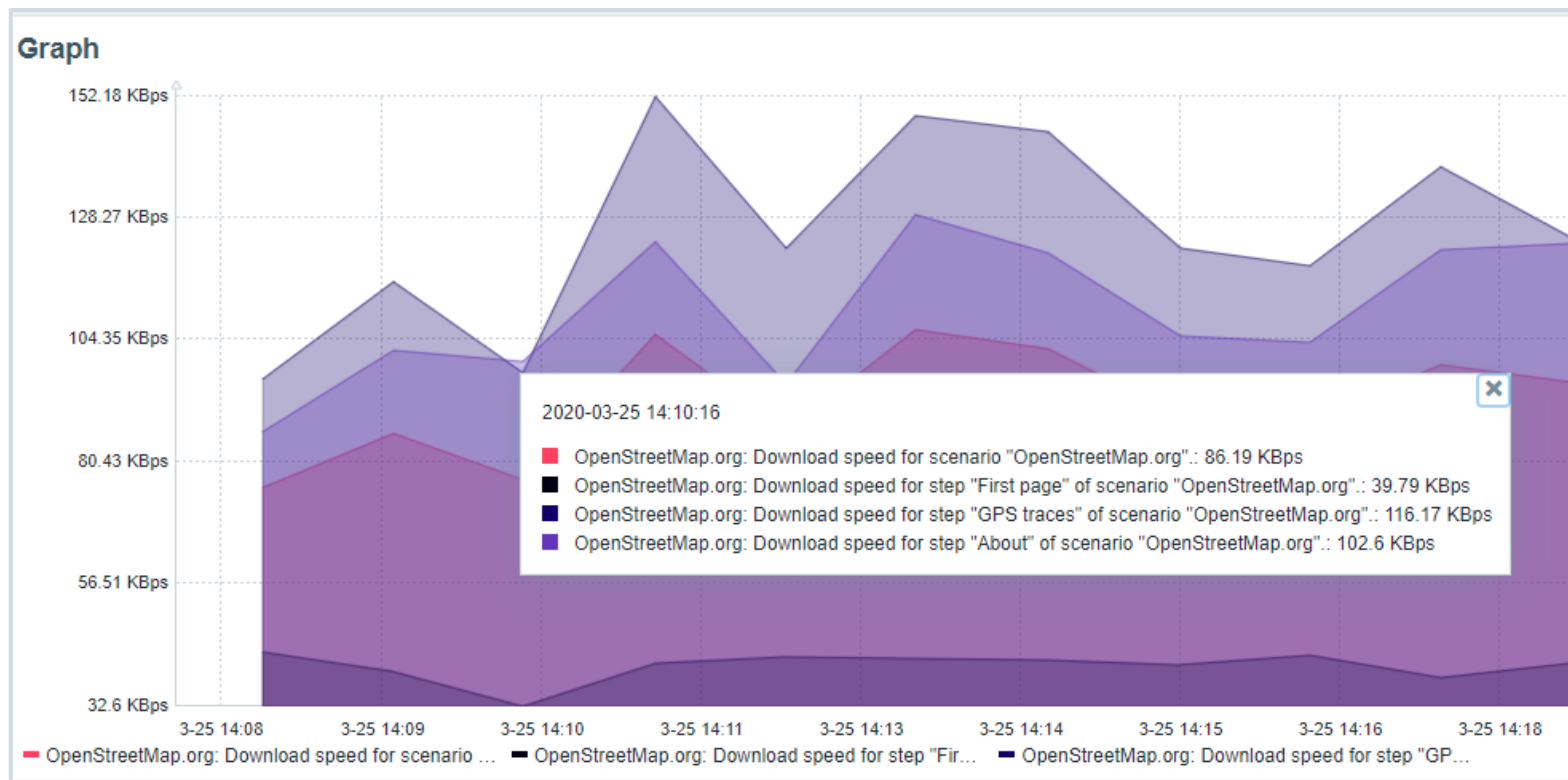
- › avg - display the average values
- › last - display the latest values
- › max - display the maximum values
- › min - display the minimum values
- › all - display all possible values



Data visualization with zabbix

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!

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

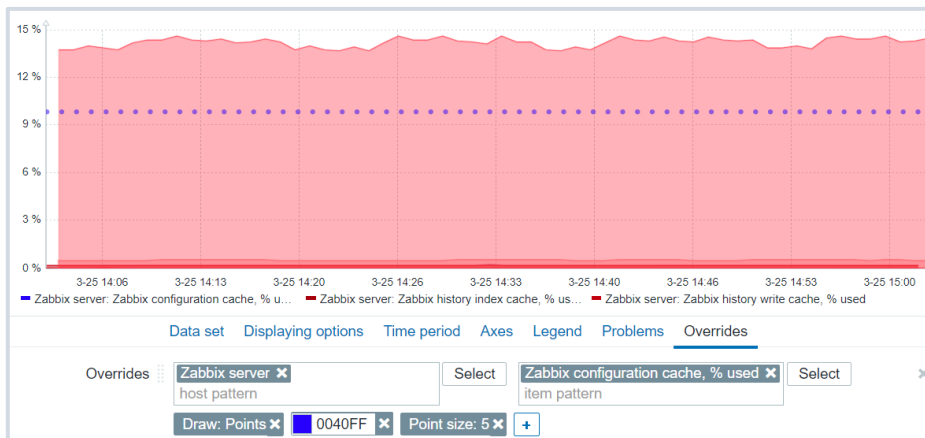
[Data set](#)
[Displaying options](#)
[Time period](#)
[Axes](#)
[Legend](#)
[Problems](#)
[Overrides](#)

Data set: ■

Base colour: ■ FF465C

Missing data: None Connected Treat as 0

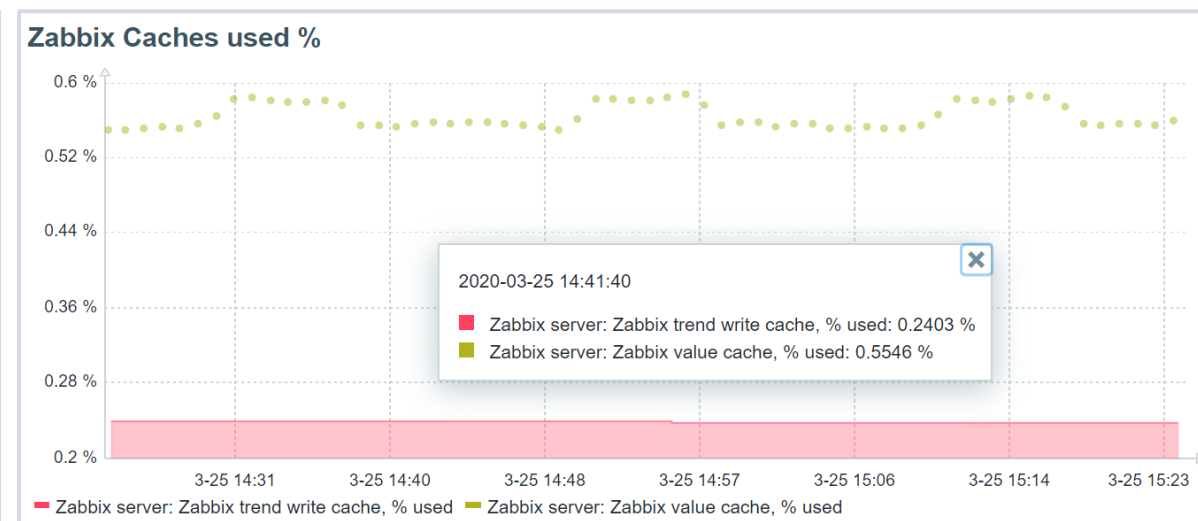
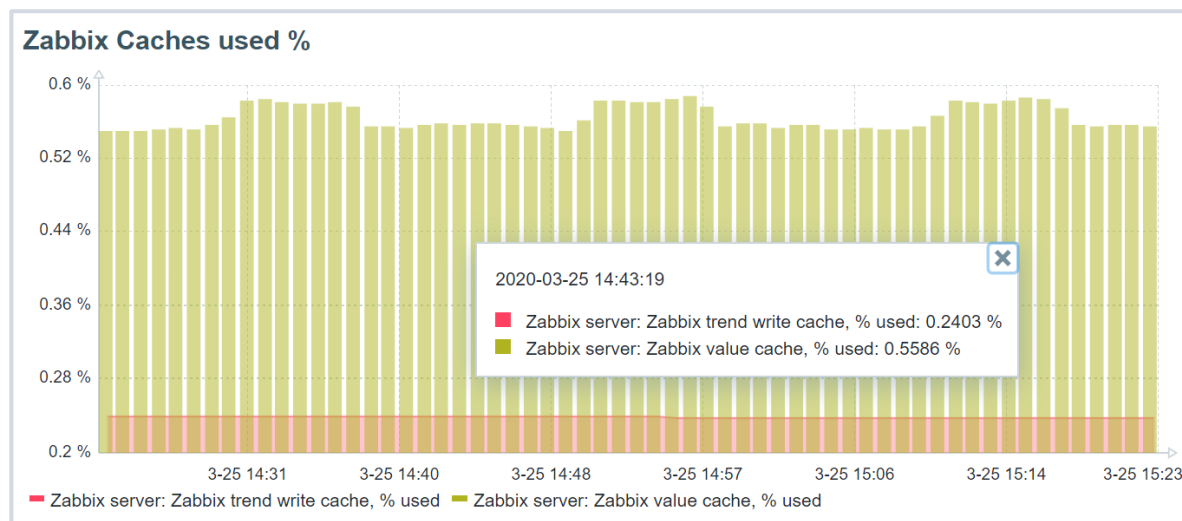
- › Parameters of a Data set element can be overridden in the “Overrides” section



CUSTOM GRAPHS (NEW)

The following graph types are supported for the New graph:

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



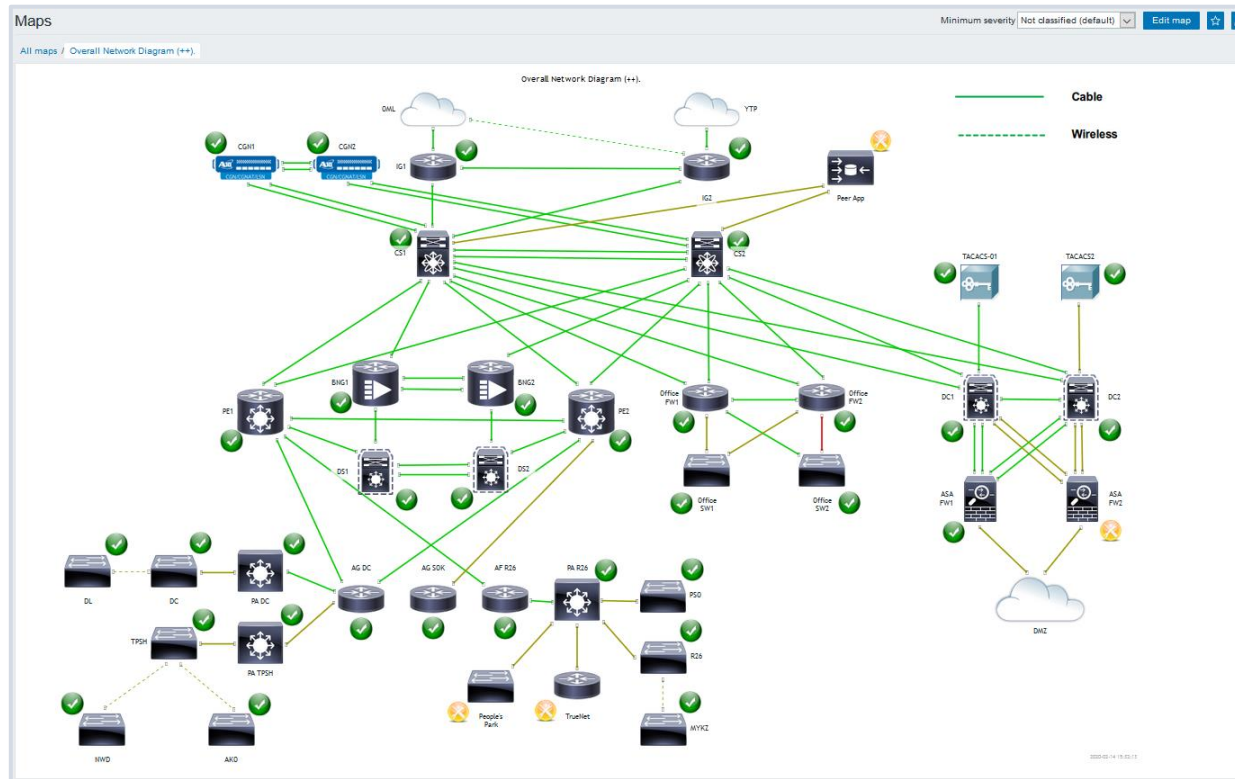
3

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

 initMAX

Monitoring

Dashboard

Problems

Hosts

Latest data

Maps

Discovery

Services

Inventory

Maps

Create mapImport

Filter

Name

ApplyReset

<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

0 selectedExportDelete

Displaying 3 of 3 found

Data visualization with zabbix

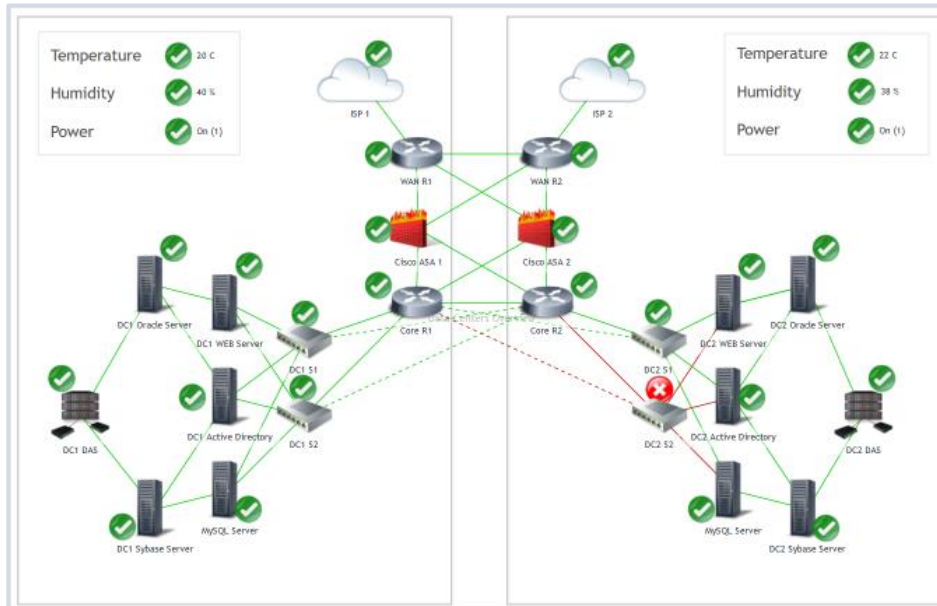
MAPS

Map properties:

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

Map elements:

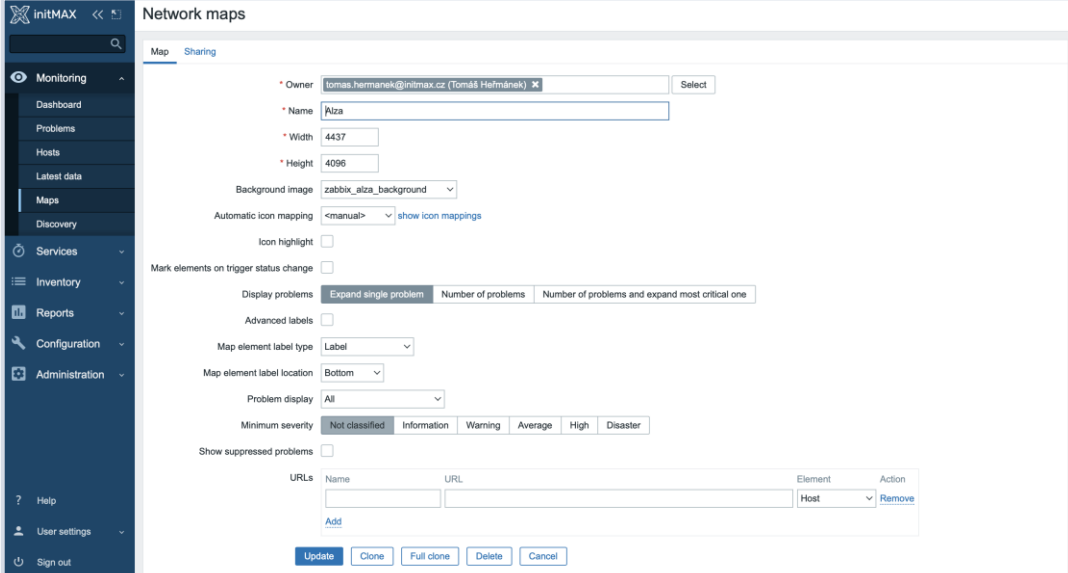
- Image
- Trigger
- Host
- Host group
- Map
- Shape



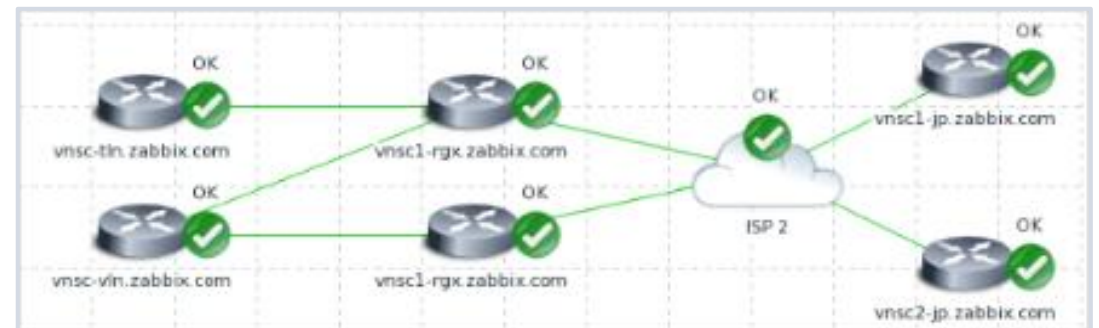
Data visualization with zabbix

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 Zabbix. The left sidebar contains navigation links: Monitoring, Dashboard, Problems, Hosts, Latest data, Maps (selected), Discovery, Services, Inventory, Reports, Configuration, and Administration. The main area is titled 'Network maps' and has tabs for 'Map' and 'Sharing'. The 'Map' tab is active, showing configuration fields for a map named 'Alza'. Fields include Owner (tomas.hermanek@initmax.cz), Name (Alza), Width (4437), Height (4096), Background image (zabbix_alza_background), Automatic icon mapping (<manual>), Icon highlight (unchecked), Mark elements on trigger status change (unchecked), Display problems (Expand single problem, Number of problems, Number of problems and expand most critical one), Advanced labels (unchecked), 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 (unchecked). At the bottom, there is a table for URLs with columns for Name, URL, Element, and Action. The table has one row with 'Host' as the element and 'Remove' as the action. Buttons for Update, Clone, Full clone, Delete, and Cancel are at the bottom right.

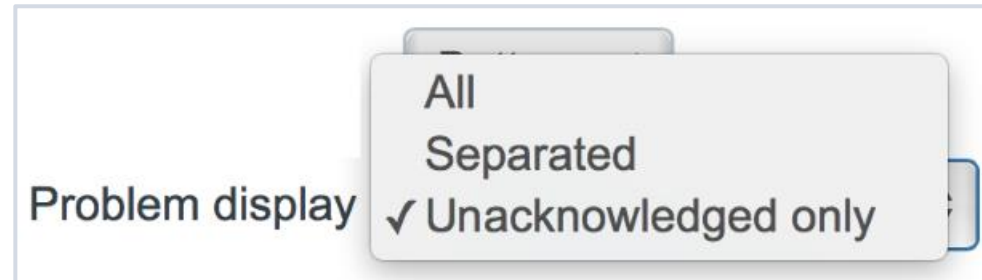


Data visualization with zabbix

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:

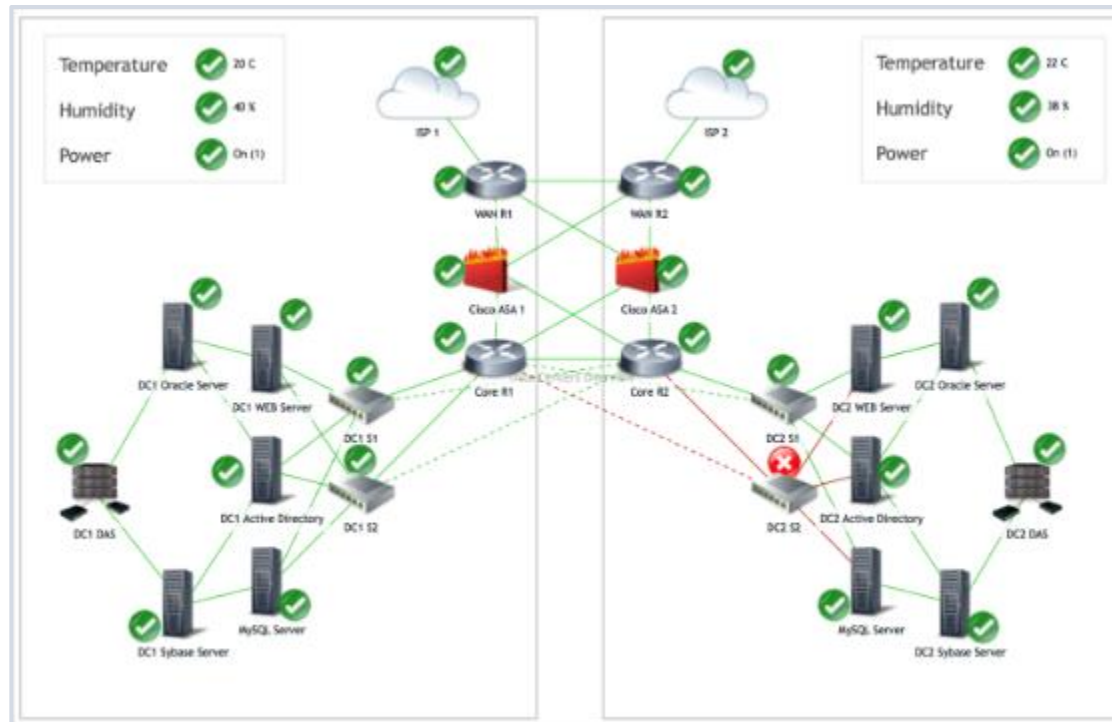
- ▶ Host - icon representing status of all triggers of the host
- ▶ Map - icon representing status of all elements of a map
- ▶ Trigger - icon representing status of one or more triggers
- ▶ Host group - icon representing status of all triggers of all hosts belonging to the selected group or host group 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



MAPS - Shapes

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

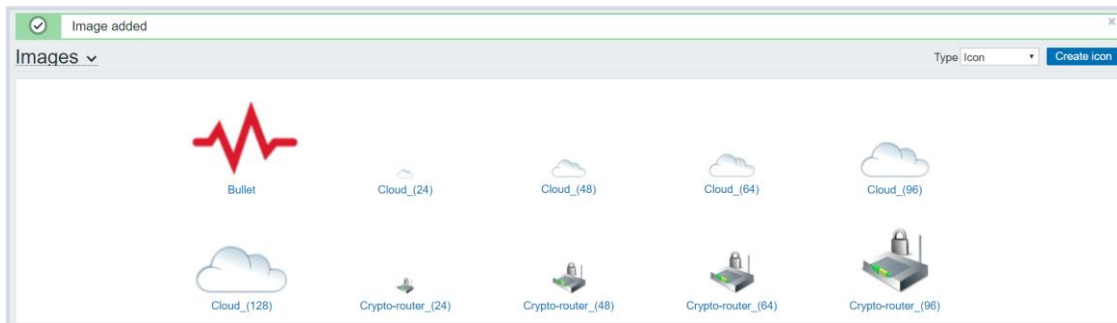
- › Shapes are just a visual representation
- › For example, a rectangle shape can be used as a background to group some hosts



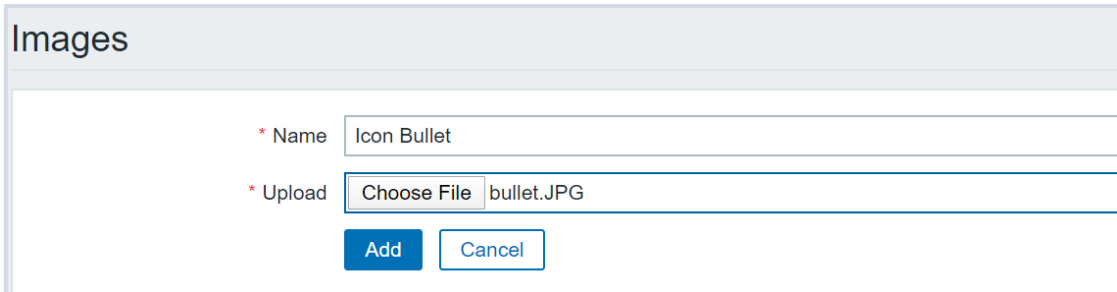
MAPS - CUSTOM ICONS AND BACKGROUNDS

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

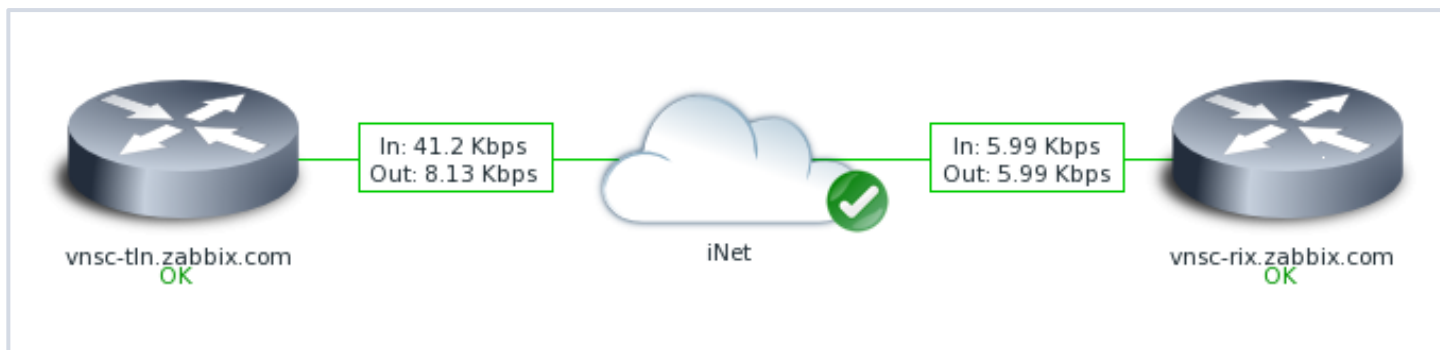


- ▶ Upload the image

A screenshot of the Zabbix Administration - General - Images section showing the upload form. The "Images" tab is selected. The form has two required fields: "Name" and "Upload". The "Name" field contains the text "Icon Bullet". The "Upload" field contains a "Choose File" button and the filename "bullet.JPG". At the bottom of the form, there are two buttons: "Add" and "Cancel".

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

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

Network maps

Map

Sharing

* Owner

Admin (Zabbix Administrator) ✕

Select

* Name

Local network

* Width

680

* Height

200

Background image

No image ▼

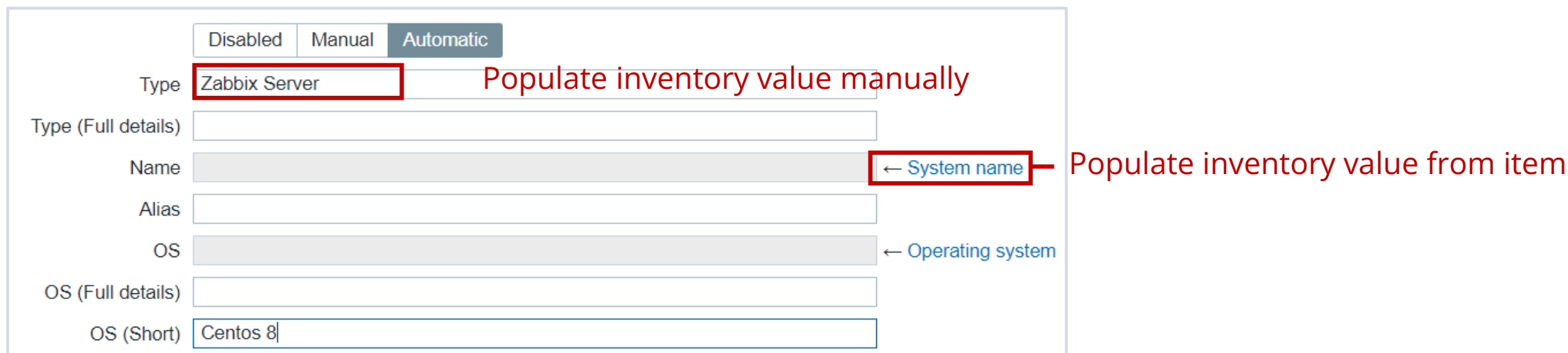
Automatic icon mapping

Server mapping ▼

[show icon mappings](#)

Icon Mapping

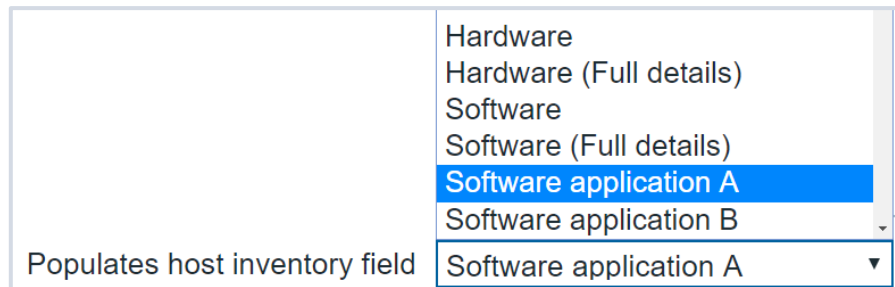
- ▶ You can use host inventory to either populate the inventory values manually or automatically



The screenshot shows the Zabbix host inventory configuration interface. At the top, there are three tabs: 'Disabled', 'Manual', and 'Automatic'. The 'Automatic' tab is selected. Below the tabs, there are several input fields and labels:

- Type:** A dropdown menu showing 'Zabbix Server'. A red box highlights this field, and a red arrow points to it with the text 'Populate inventory value manually'.
- Type (Full details):** An empty text input field.
- Name:** A greyed-out text input field. A red box highlights this field, and a red arrow points to it with the text 'Populate inventory value from item'.
- Alias:** An empty text input field.
- OS:** A greyed-out text input field. A blue arrow points to it with the text '← Operating system'.
- OS (Full details):** An empty text input field.
- OS (Short):** A text input field containing 'Centos 8'.

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



The screenshot shows the Zabbix host inventory configuration interface with the dropdown menu open. The dropdown menu lists the following options:

- Hardware
- Hardware (Full details)
- Software
- Software (Full details)
- Software application A (highlighted in blue)
- Software application B
- Software application A (selected)

Below the dropdown menu, there is a label 'Populates host inventory field' and a dropdown menu showing 'Software application A'.




Data visualization with zabbix

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 ☒

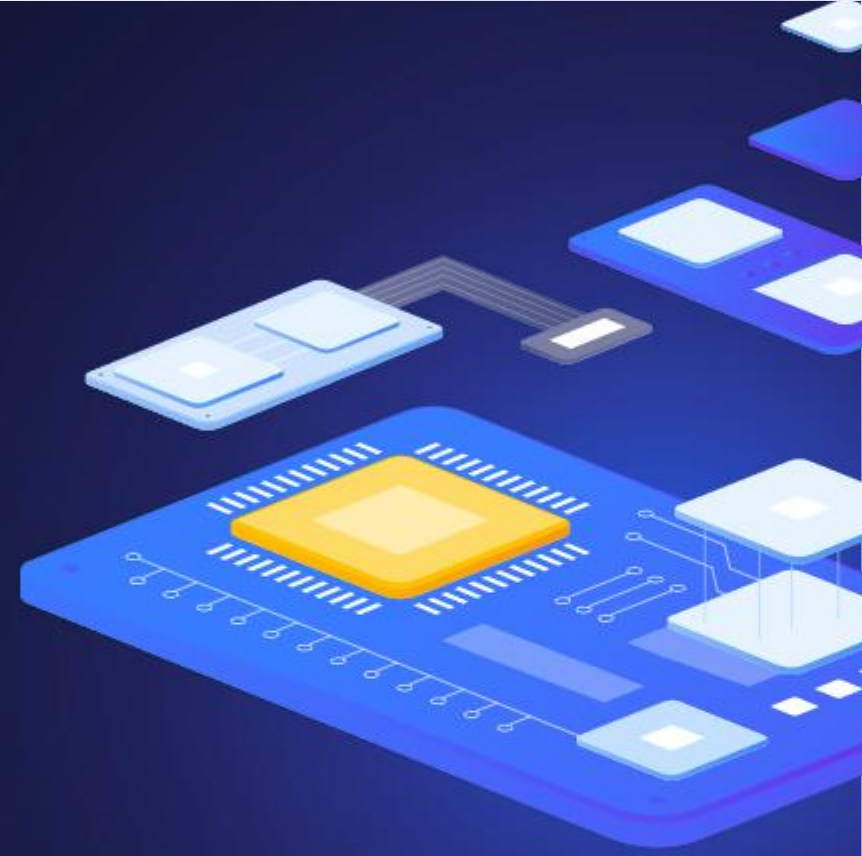
Icons

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



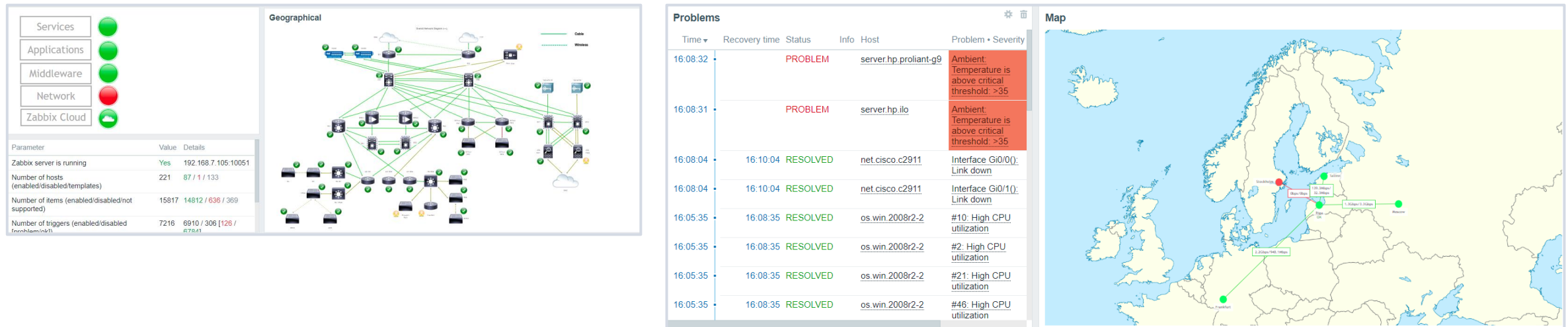
Data visualization with zabbix

Dashboards

Zabbix Dashboard is your central points of monitoring.

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

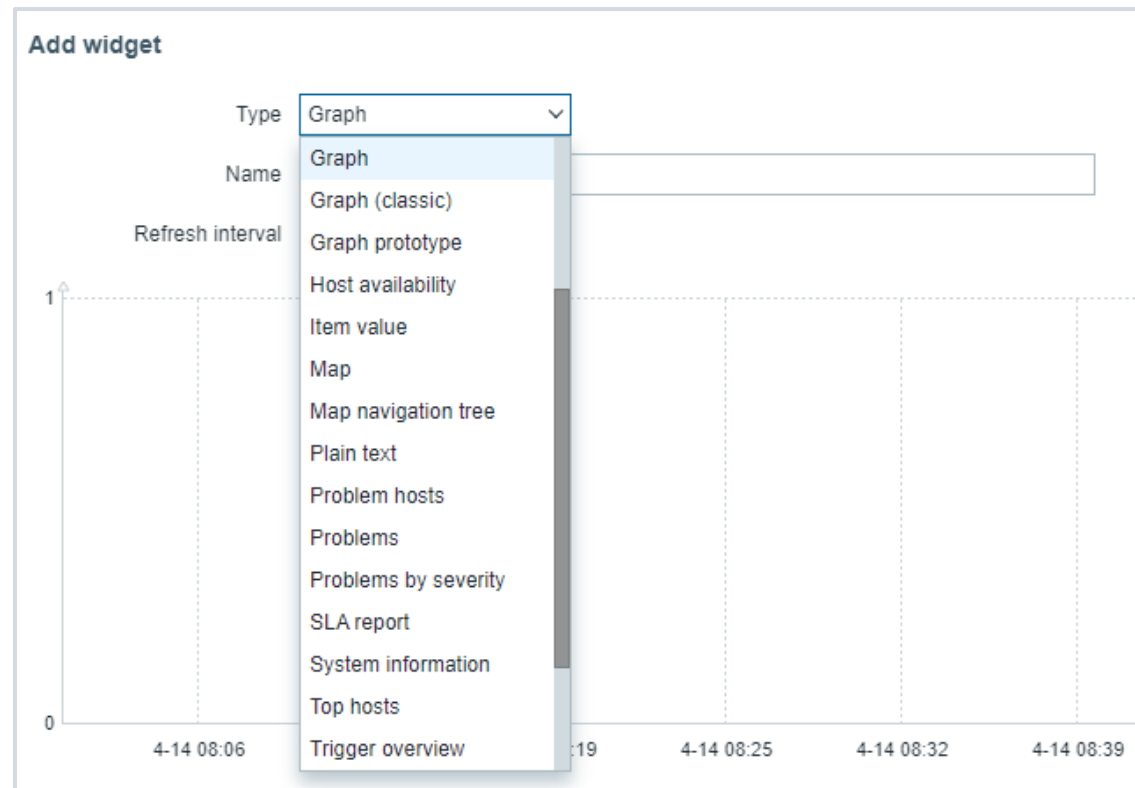
- › A dashboard for your networking team
- › An infrastructure overview dashboard based on your Zabbix maps
- › A dashboard displaying live statistics of your business, e.g: website traffic
- › And much, much more!



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
- ›



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: Problems Show header ☒

Name:

Refresh interval: Default (1 minute)

Show: Recent problems Problems History

Host groups: Select
type here to search

Exclude host groups: Select

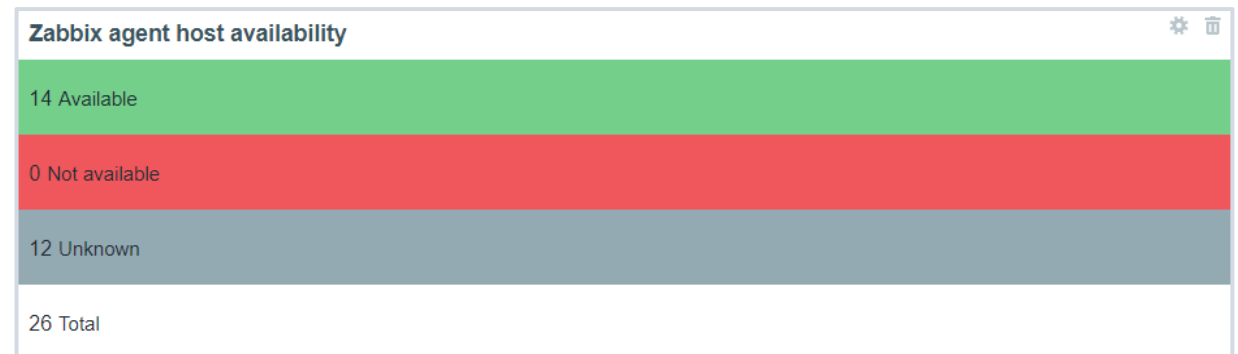
Hosts: Select

Problem:

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

Tags: And/Or Or

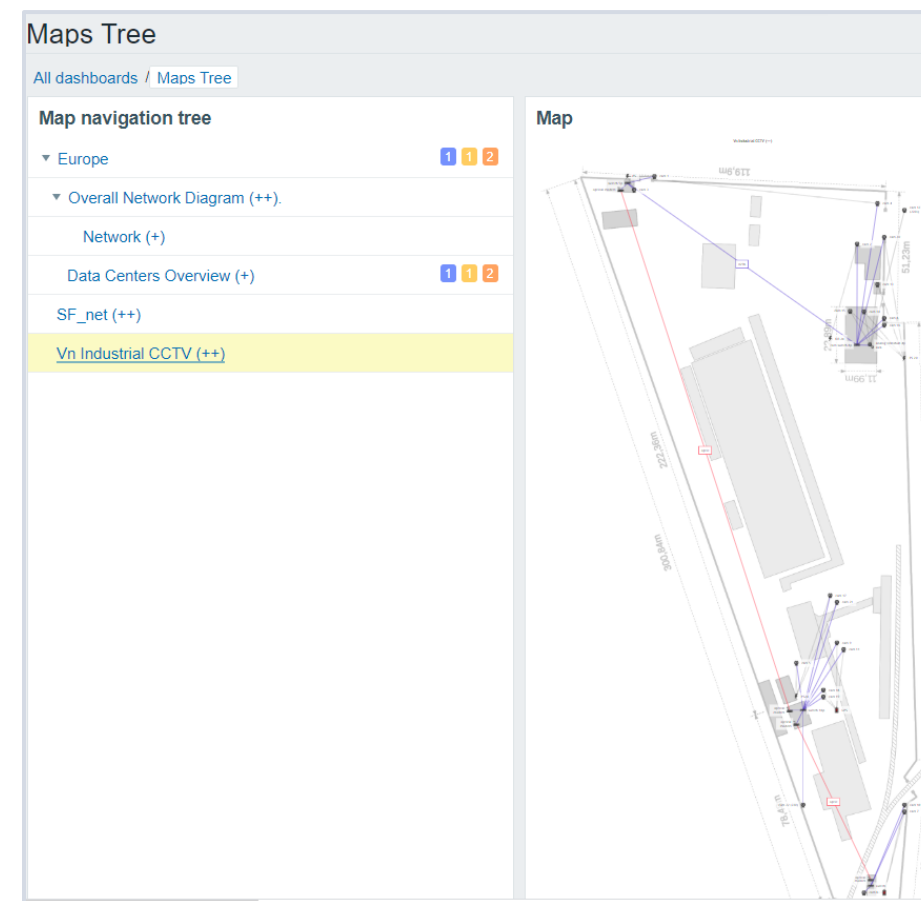
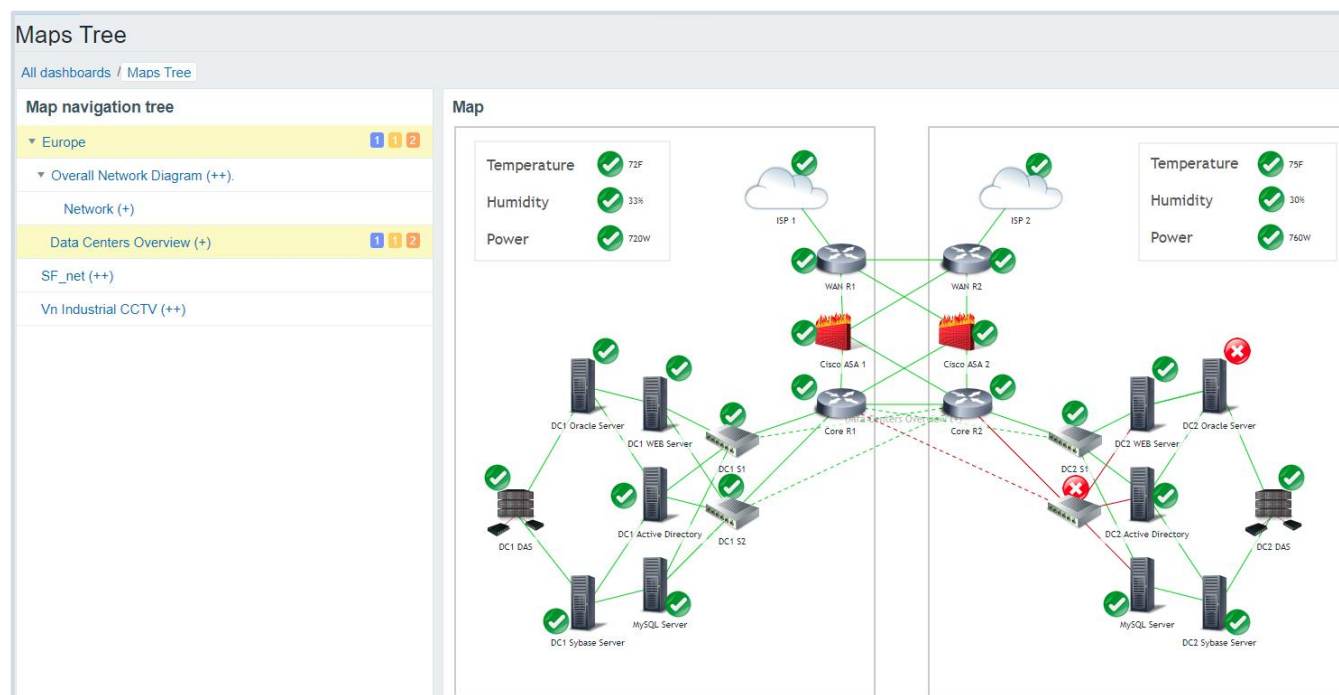
Contains Equals Remove



Data visualization with zabbix

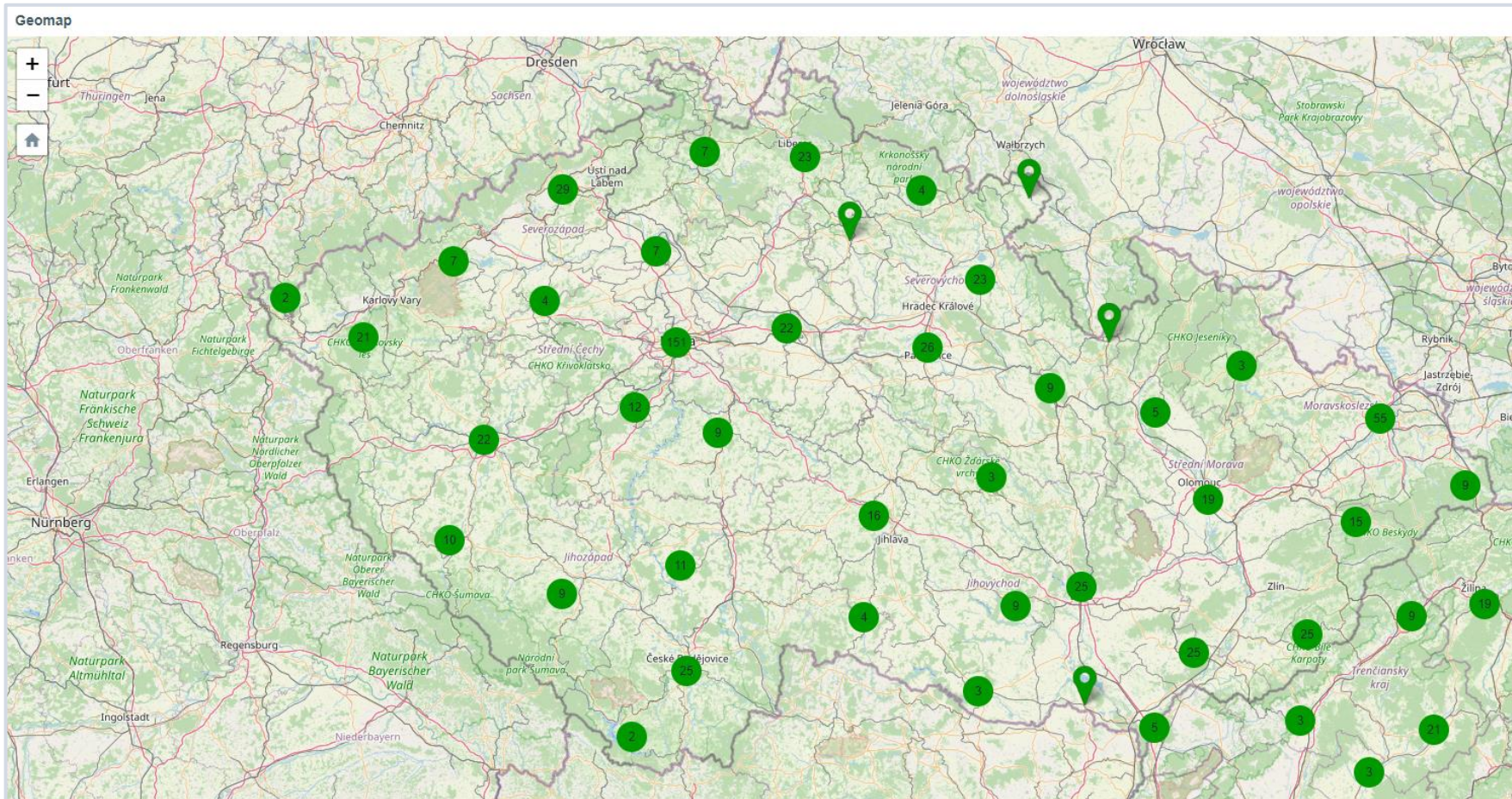
Widgets

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



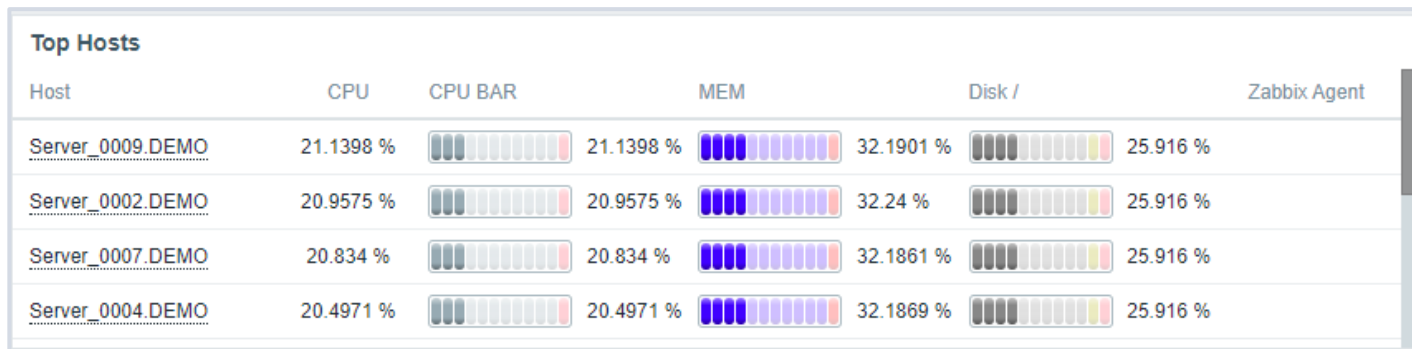
Widgets - Geomap

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



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



Edit widget

Type

Top hosts

Show header

☒

Name

default

Refresh interval

Default (1 minute)

Host groups

Zabbix servers

type here to search

Select

Hosts

type here to search

Select

Host tags

And/Or

Or

tag

Contains

value

Remove

Add

* Columns

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

10

Apply

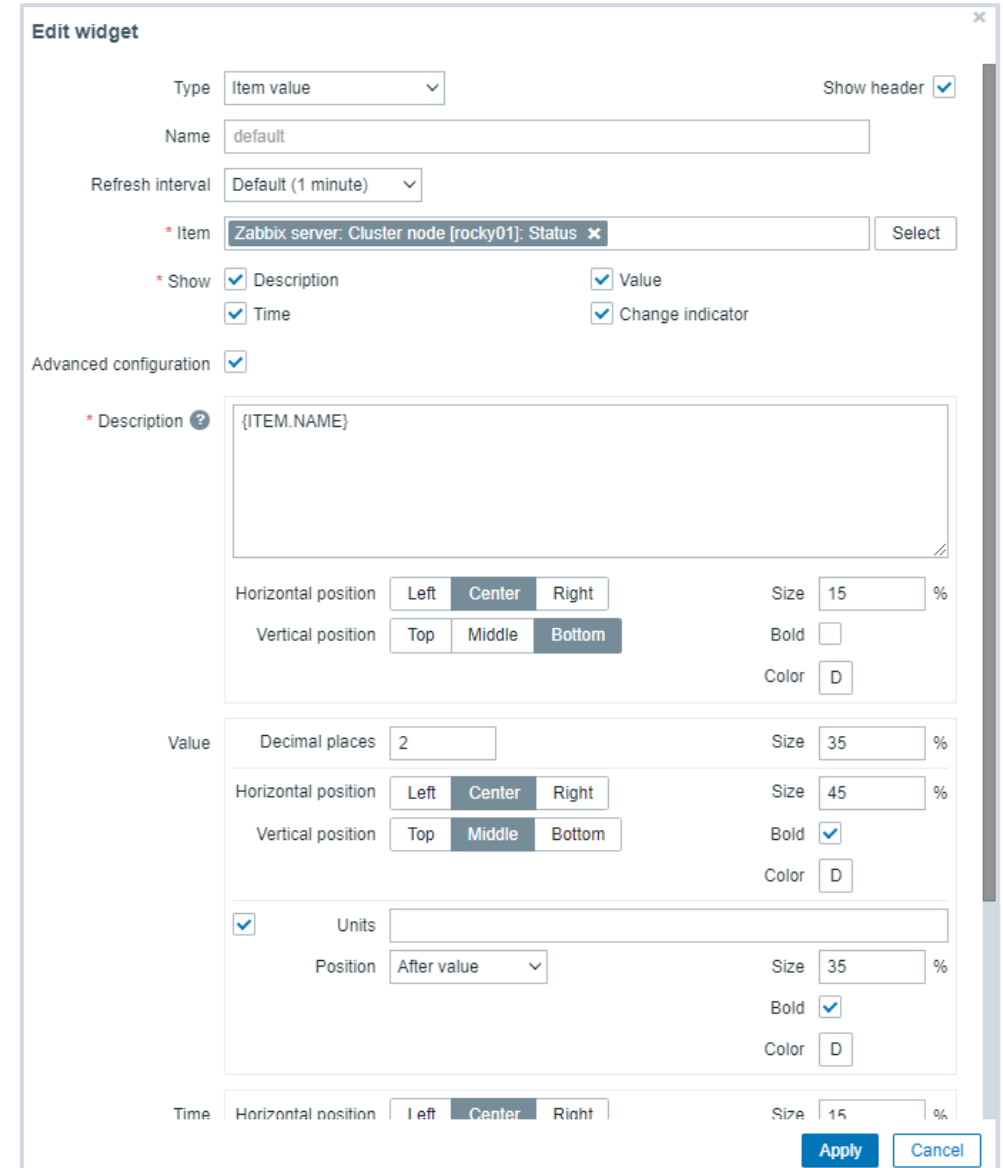
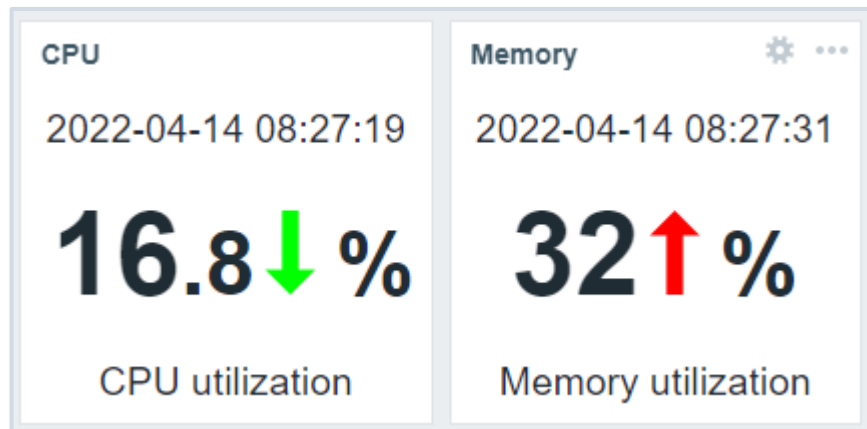
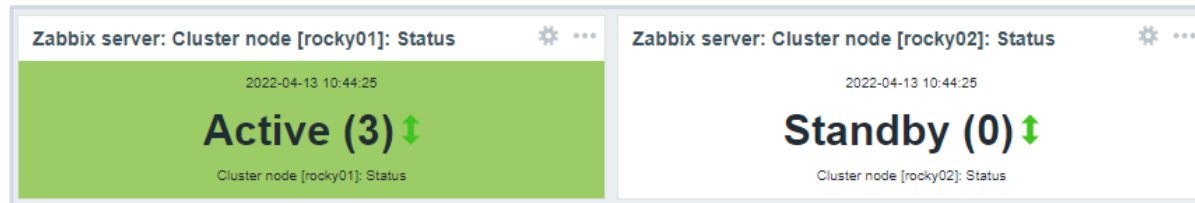
Cancel

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



The 'Edit widget' configuration window shows the following settings:

- Type: Item value
- Show header: ☒
- Name: default
- Refresh interval: Default (1 minute)
- * Item: Zabbix server: Cluster node [rocky01]: Status
- * Show: ☒ Description, ☒ Time, ☒ Value, ☒ Change indicator
- Advanced configuration: ☒
- * Description: `{ITEM.NAME}`
- Horizontal position: Left, Center, Right (Center selected)
- Vertical position: Top, Middle, Bottom (Bottom selected)
- Size: 15 %
- Bold: ☐
- Color: D
- Value: Decimal places: 2
- Horizontal position: Left, Center, Right (Center selected)
- Vertical position: Top, Middle, Bottom (Bottom selected)
- Size: 35 %
- Bold: ☒
- Color: D
- Units: ☒ Position: After value
- Size: 35 %
- Bold: ☒
- Color: D
- Time: Horizontal position: Left, Center, Right (Center selected)
- Size: 15 %

Buttons: Apply, Cancel

6

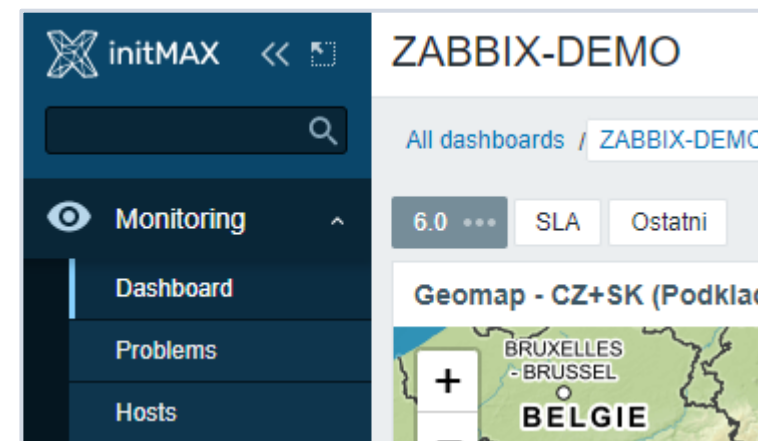
Rebranding



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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