

The ZABBIX logo consists of the word "ZABBIX" in a bold, white, sans-serif font, centered within a solid red rectangular background. The background of the entire slide is a dark blue gradient with a faint, glowing network of white lines and dots overlaid on a silhouette of a world map.

**ZABBIX**

# Dashboards of Things

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Senior PHP Developer

# ZABBIX

And after  
the hard work...

# 7.0 is out!



# So, let's talk about -



New widgets in Zabbix 7.0



Widget communication and dynamic dashboards



Widget development by 3<sup>rd</sup> parties

# New **widgets** carefully packed



# New widgets

- Pie chart
- Gauge
- Honeycomb
- Top triggers
- Item history
- Host navigator
- Item navigator

**Host navigator**

- High 1
- ZBX backup 1 1
- Average 3
- Warning 1

**Item navigator**

- Available memory
- Available memory in %
- Memory utilization
- Total memory

**ZBX backup: Available memory in %**

2024-06-03 03:21:50 PM

**82.99%** ↓

Available memory in %

**Top hosts**

Host name	Utilization
Brazil MAIN	0.26 %
Zabbix server	0.27 %
ZBX backup	0.26 %

**Honeycomb**

Host	Interface	Speed
Brazil MAIN	Interface enp0s3...	0.00 bps
Brazil MAIN	Interface enp0s3...	16.00 bps
Brazil MAIN	Interface enp0s8...	655.63 Kbps
Brazil MAIN	Interface enp0s8...	70.13 Kbps
Zabbix server	Interface enp0s3...	48.00 bps
Zabbix server	Interface enp0s3...	24.00 bps
Zabbix server	Interface enp0s8...	688.79 Kbps
Zabbix server	Interface enp0s8...	69.25 Kbps
ZBX backup	Interface enp0s3...	48.00 bps
ZBX backup	Interface enp0s3...	16.00 bps
ZBX backup	Interface enp0s8...	688.82 Kbps
ZBX backup	Interface enp0s8...	69.34 Kbps

**Top triggers**

Host	Trigger	Severity	Number of problems
Brazil MAIN	Interface enp0s3: Link down	Average	2
ZBX backup	Power supply unstable	High	1
Zabbix server	Repetitive software crashes	Average	1
ZBX backup	Repetitive software crashes	Average	1

**Software exceptions**

**Brazil MAIN: Available memory in %**

Available memory in %

**Load average of Brazil MAIN**

Timestamp	Load average (1m avg)	Load average (5m avg)	Load average (15m avg)
2024-06-03 02:00:00 PM	0.05017	0.04067	0.01033
2024-06-03 01:00:00 PM	0.04917	0.03683	0.01467
2024-06-03 12:00:00 PM	0.0475	0.04942	0.01769

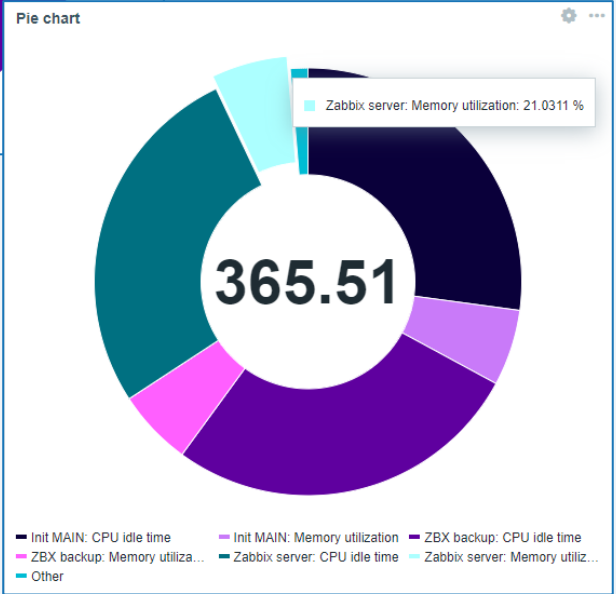
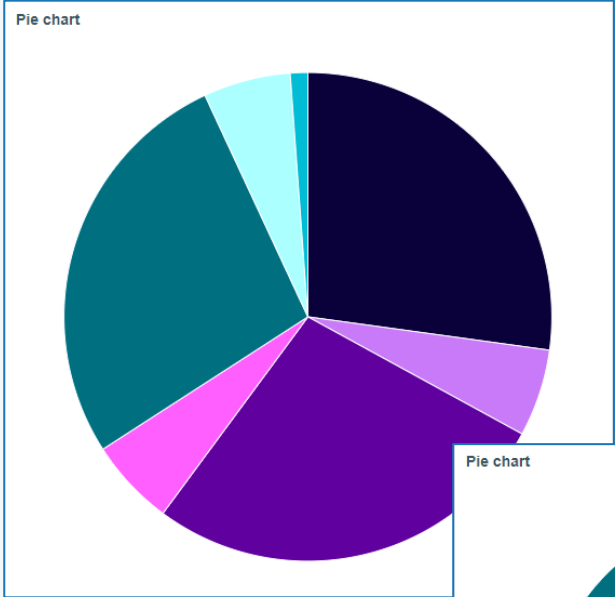
# New widget – Pie chart

Interactive data display

Breakdown of metrics by dimensions

- Separate data by host and item pattern
- Customize colors, sizing, units, and more
- Aggregate by item or data set
- Merge sectors below a threshold

Total value comparison



# New widget – Pie chart

**Edit widget**

Type: Pie chart

Name: default

Refresh interval: Default (1 minute)

Data set 1 | **Displaying options** | Time period | Legend

History data selection: Auto | History | Trends

Draw: Pie | Doughnut

Space between sectors: 1

Merge sectors smaller than 1 %

Show header

Data set 1 | **Displaying options** | Time period | Legend

Data set #1

Zabbix server x Brazil MAIN x ZBX backup x

host patterns

Aggregation function: max

Data set aggregation: not used

Data set label: Data set #1

Number of processes x

item patterns

Type: Pie chart

Name: default

Refresh interval: Default (1 minute)

Data set 1 | **Displaying options** | **Time period** | Legend

Time period: Dashboard | Widget | Custom

\* From: now/d-1d

\* To: now/d

+ Add new data set

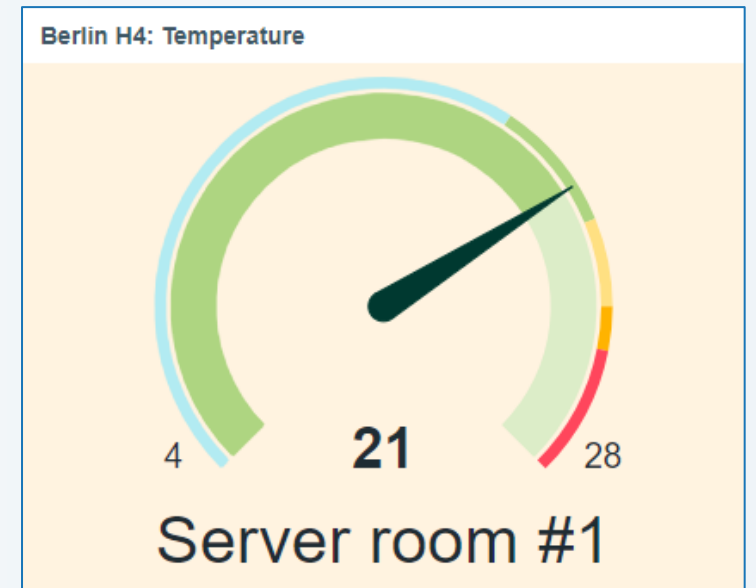
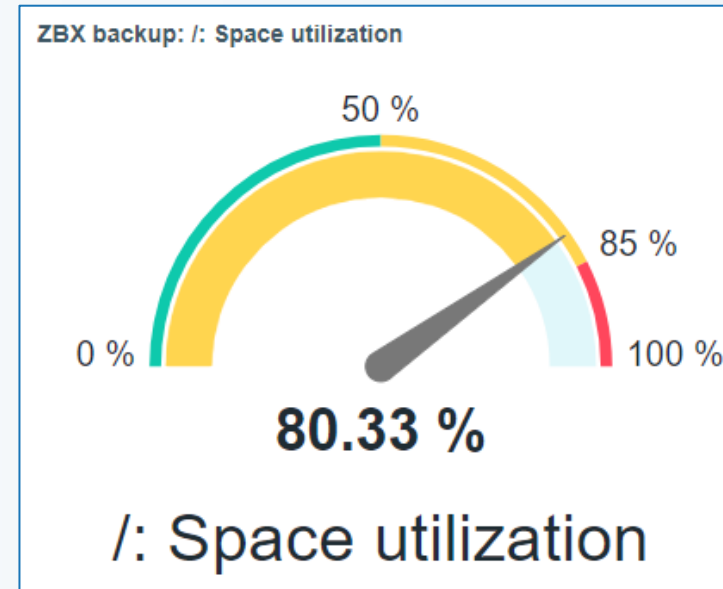
- Item patterns
- Item list
- Clone

# New widget – Gauge

Monitor a specific metric in relation to thresholds

Real-time performance monitoring

Customizable visual representation





# New widget – Gauge

Edit widget

Type: Gauge Show header:

Name: default

Refresh interval: Default (1 minute)

\* Item: Brazil MAIN: Available memory in % Select

\* Min: 0

\* Max: 100

Colors: Value arc: D Arc background: D Background: D

\* Show:  Description  Value  Value arc  
 Needle  Scale

Override host: type here to search Select

Advanced configuration

Thresholds	Threshold	Action
<span style="color: green;">■</span>	60	<a href="#">Remove</a>
<span style="color: orange;">■</span>	80	<a href="#">Remove</a>
<span style="color: red;">■</span>	90	<a href="#">Remove</a>
<a href="#">Add</a>		
Show labels: <input checked="" type="checkbox"/>		Show arc: <input checked="" type="checkbox"/>
		Arc size: 5 %

Advanced configuration

Angle: 180° 270°

\* Description: {ITEM.NAME}

Size: 15 % Vertical position: Top Bottom

Bold:  Color: D

Value: Decimal places: 2 Size: 25 %

Bold:  Color: D

Units:   
 Size: 25 % Bold:  Color: D

Position: After value

Value arc: Size: 20 %

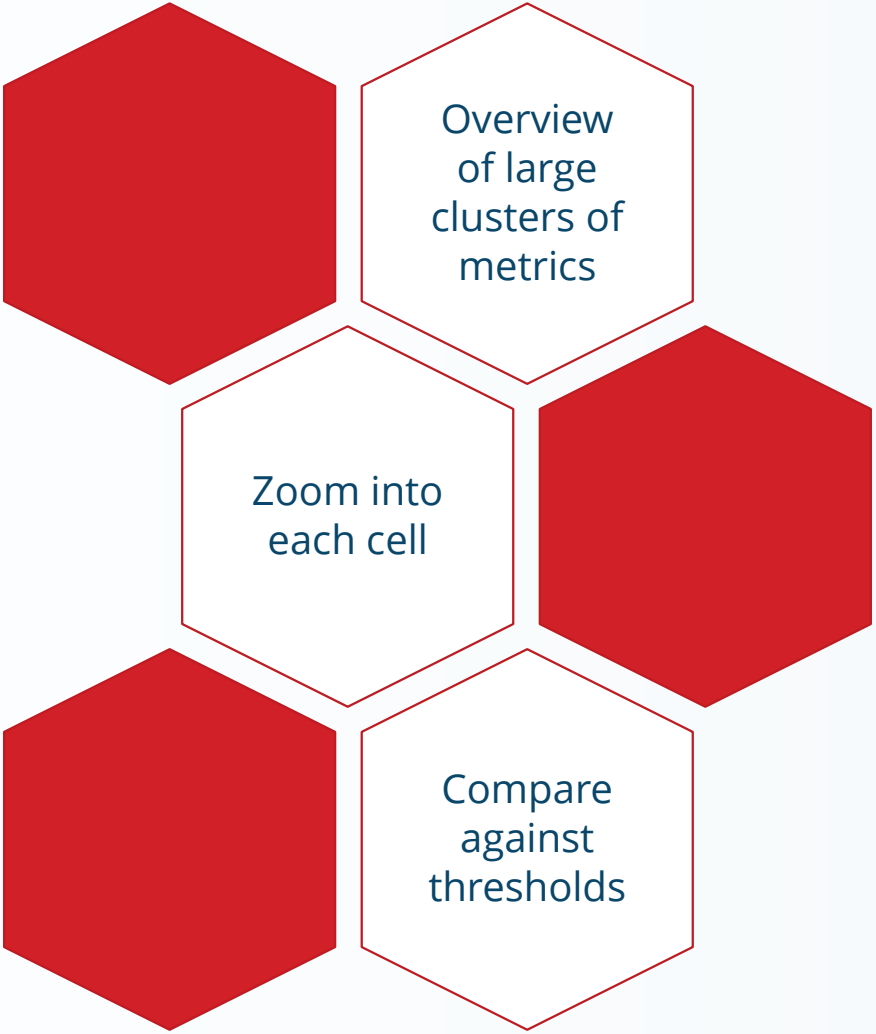
Scale: Show units:  Size: 15 %

Decimal places: 0

Thresholds: ■ 60 ■   
 Action: [Remove](#)

Apply Cancel

# New widget – Honeycomb



# New widget – Honeycomb

**Edit widget** [?] [X]

Type:  Show header:

Name:

Refresh interval:

Host groups:  Select [v]

Hosts:  Select [v]

Host tags:  Or

Contains [v]  Remove

[Add](#)

\* Item patterns:  Select

Item tags:  Or

Contains [v]  Remove

[Add](#)

Show hosts in maintenance:

\* Show  Primary label  Secondary label

**Advanced configuration**

Primary label

Type:

\* Text [?]

Size:   Bold:

Color:

Secondary label

Type:

Decimal places:

Size:   Bold:

Color:

Units  Position:

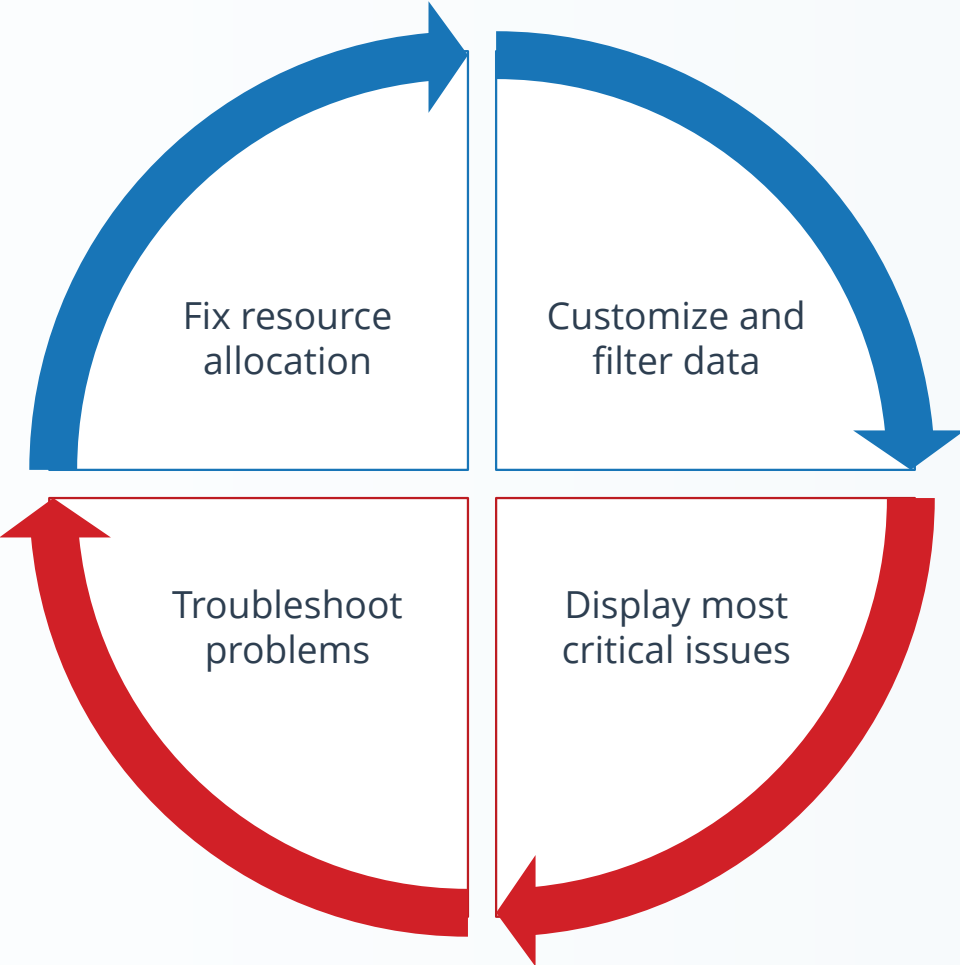
Background color:

Thresholds [i]  Color interpolation

Threshold	Action
<input type="text" value="90"/>	<a href="#">Remove</a>
<input type="text" value="80"/>	<a href="#">Remove</a>
<input type="text" value="70"/>	<a href="#">Remove</a>

[Add](#)

# New widget – Top triggers



Top triggers <span style="float: right;">🔄 ⚙️ ⋮</span>			
Host	Trigger	Severity	Number of problems
<a href="#">Brazil MAIN</a>	<a href="#">Interface enp0s3: Link down</a>	Average	2
<a href="#">ZBX backup</a>	<a href="#">Power supply unstable</a>	High	1
<a href="#">Zabbix server</a>	<a href="#">Repetitive software crashes</a>	Average	1
<a href="#">ZBX backup</a>	<a href="#">Repetitive software crashes</a>	Average	1
<a href="#">Brazil MAIN</a>	<a href="#">Repetitive software crashes</a>	Average	1
<a href="#">Zabbix server</a>	<a href="#">Room temperature too high</a>	Warning	1

# New widget – Top triggers

**Edit widget** ? X

Type: Top triggers  Show header

Name:

Refresh interval: Default (No refresh)

Host groups:

Hosts:

Problem:

Severity:  Not classified  Warning  High  
 Information  Average  Disaster

Problem tags: And/Or Or

Contains

[Add](#)

Time period: Dashboard Widget Custom

\* From:

\* To:

\* Trigger limit:

Trigger	Severity	Number of problems
<a href="#">Interface enp0s3: Link down</a>	Average	2
<a href="#">Power supply unstable</a>	High	1
<a href="#">Repetitive software crashes</a>	Average	1
<a href="#">Repetitive software crashes</a>	Average	1
<a href="#">Repetitive software crashes</a>	Average	1
<a href="#">Room temperature too high</a>	Warning	1

# New widget – Item history

Display data as is, bars or indicators

Set threshold colors for numeric items

Highlight textual data by matching regular expressions

Display browser items with screenshots

**My browser item** ⚙️ ⋮

Timestamp	/: Used space	/: Total space	Screenshot
2024-04-10 04:33:24 PM	18.58 GB	18.58 GB	
2024-04-10 04:32:24 PM	18.58 GB	18.58 GB	
2024-04-10 04:31:24 PM	18.58 GB	18.58 GB	
2024-04-10 04:30:24 PM	18.5		

**Item history**

Timestamp	Name	Value
2024-06-03 04:46:08 PM	Brazil MAIN: Interface enp0s3: Bits sent	24 bps
2024-06-03 04:46:02 PM	Brazil MAIN: Interface enp0s3: Bits received	48 bps
2024-06-03 04:45:56 PM	Brazil MAIN: Available memory in %	82.6561 %
2024-06-03 04:44:56 PM	Brazil MAIN: Available memory in %	82.6439 %
2024-06-03 04:43:56 PM	Brazil MAIN: Available memory in %	82.6486 %
2024-06-03 04:43:08 PM	Brazil MAIN: Interface enp0s3: Bits sent	16 bps
2024-06-03 04:43:02 PM	Brazil MAIN: Interface enp0s3: Bits received	0 bps
2024-06-03 04:42:56 PM	Brazil MAIN: Available memory in %	82.6532 %
2024-06-03 04:41:56 PM	Brazil MAIN: Available memory in %	82.6485 %
2024-06-03 04:40:56 PM	Brazil MAIN: Available memory in %	82.6426 %
2024-06-03 04:40:08 PM	Brazil MAIN: Interface enp0s3: Bits sent	24 bps
2024-06-03 04:40:02 PM	Brazil MAIN: Interface enp0s3: Bits received	48 bps
2024-06-03 04:39:56 PM	Brazil MAIN: Available memory in %	82.6351 %

# New widget – Item history

**Edit widget** ? x

Type:  Show header

Name:

Refresh interval:

Layout:  Horizontal  Vertical

\* Columns

Name	Data	Action
⋮ Brazil MAIN: Value cache, % used	Brazil MAIN: Value cache, % used	<a href="#">Edit</a> <a href="#">Remove</a>
⋮ Zabbix server: Value cache, % used	Zabbix server: Value cache, % used	<a href="#">Edit</a> <a href="#">Remove</a>

[Add](#)

\* Show lines:

Override host:

**Advanced configuration**

New values:  Top  Bottom

Show timestamp:

Show column header:  Off  Horizontal  Vertical

Time period:  Dashboard  Widget  Custom

**New column** x

\* Name:

\* Item:

Base color:

Display:  As is  Bar  Indicators

Min:

Max:

Thresholds

Threshold	Action
<input type="color" value="#ff0000"/> <input type="text" value="90"/>	<a href="#">Remove</a>
<input type="color" value="#ffff00"/> <input type="text" value="80"/>	<a href="#">Remove</a>
<input type="color" value="#00ff00"/> <input type="text" value="70"/>	<a href="#">Remove</a>

[Add](#)

History data:  Auto  History  Trends

Highlights

Regular expression	Action
<input type="color" value="#ffff00"/> <input type="text" value="linux"/>	<a href="#">Remove</a>

[Add](#)

Display ?  As is  HTML  Single line

Use monospace font

# New widgets – Host and Item navigators

Overview of hosts and items, and their problem count

Configurable multi-level grouping

Serves as navigators for other widgets

<b>Host1</b> Host groups: HostGroup1 Tags: City: Riga, Color: Red, Size: M, Color: Green Problems: 2	<b>Host2</b> Host groups: HostGroup2 Tags: City: Tokyo, Color: Red Problems: 1	<b>Host3</b> Host groups: HostGroup2 Tags: City: Riga Problems: -	<b>Host4</b> Host groups: HostGroup1, HostGroup2 Tags: City: Riga, Color: White Problems: 1, 2, 1, 1	<b>Host5</b> Host groups: HostGroup1 Tags: - Problems: -	<b>Host6</b> Host groups: HostGroup3 Tags: Color: Blue Problems: 2
---------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------	----------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------	-----------------------------------------------------------------------------



**Host navigator**

- HostGroup1 (2)
  - Riga (2)
    - Warning (2)
    - Host1 (2)
    - Host5
- HostGroup2 (1, 1, 3, 1)
  - Riga (1, 1, 2, 1)
    - Disaster (1)
    - Host4 (1, 1, 2, 1)
    - Warning (2)
    - Host4 (1, 1, 2, 1)
    - Information (1)
    - Host4 (1, 1, 2, 1)
    - Not classified (1)
    - Host4 (1, 1, 2, 1)
    - Host3
    - Tokyo (1)
      - Warning (1)
      - Host2 (1)
  - HostGroup3 (2)
    - Disaster (2)
    - Host6 (2)



# New widgets – Host and Item navigators

**Edit widget** ? x

Type: Host navigator  Show header

Name: default

Refresh interval: Default (1 minute)

Host groups: type here to search

Host patterns: patterns

Host status:  Any  Enabled  Disabled

Host tags:  And/Or  Or

tag  Contains

Severity:  Not classified  Warning  High  
 Information  Average  Disaster

Show hosts in maintenance:

Show problems:  All  Unsuppressed  None

Group by:

- 1: Host group
- 2: Tag value
- 3: Severity

\* Host limit:

**Edit widget** ? x

Type: Item navigator  Show header

Name: default

Refresh interval: Default (1 minute)

Host groups: type here to search

Hosts: type here to search

Host tags:  And/Or  Or

tag  Contains

Item patterns: patterns

Item tags:  And/Or  Or

tag  Contains

State:  All  Normal  Not supported

Show problems:  All  Unsuppressed  None

Group by:

- 1: Host group
- 2: Host name
- 3: Host tag value
- 4: Item tag value

\* Item limit:



Widget communication  
... and dynamic dashboards

In the beginning there was ...

[ DATA ]

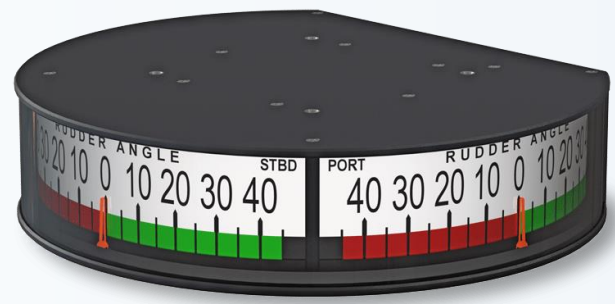
Now, that's *your* data



And that's your measuring device



# More precise devices were invented



The background of the slide is a repeating pattern of various monitoring dashboard elements. These include circular gauges with needles and scales, rectangular status indicators with colored bars (red, yellow, green), and control buttons with icons like gears and arrows. The elements are arranged in a grid-like fashion on a dark grey background.

# The wires got connected

### Host navigator

- High 1
- ZBX backup 1 1 1
- Average 3
- Warning 4

### Item navigator

- Available memory
- Available memory
- Available memory
- Available memory in %
- Available memory in %
- Available memory in %
- Mass notification

### Item value

Awaiting data

### Top hosts

Host name	Utilization
Brazil MAIN	0.25 %
Zabbix server	0.27 %
ZBX backup	0.24 %

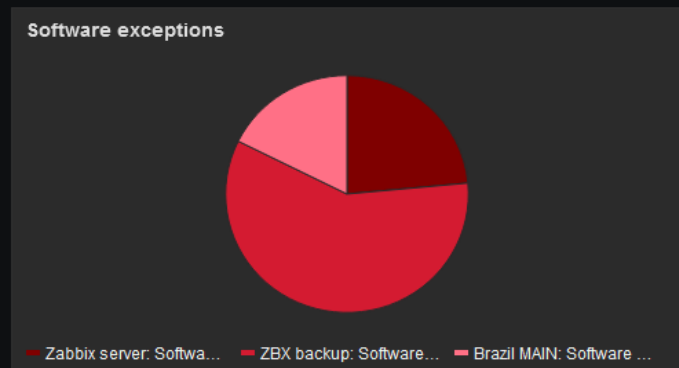
And voilà!

### Honeycomb

Host	Interface	bps	Kbps
Brazil MAIN	Interface enp0s3	0.00 bps	688.78 Kbps
	Interface enp0s8	0.00 bps	69.62 Kbps
Zabbix server	Interface enp0s3	48.00 bps	688.57 Kbps
	Interface enp0s8	24.00 bps	69.24 Kbps
ZBX backup	Interface enp0s3	48.00 bps	688.55 Kbps
	Interface enp0s8	0.00 bps	69.70 Kbps

### Top triggers

Host	Trigger	Severity	Number of problems
Brazil MAIN	Interface enp0s3: Link down	Average	2
ZBX backup	Power supply unstable	High	1
Zabbix server	Interface enp0s3: Link down	Average	1
Zabbix server	Repetitive software crashes	Average	1



### Item history

Timestamp	Name	Value
2024-06-03 08:29:56 PM	Brazil MAIN: Available memory in %	82.6007 %
2024-06-03 08:28:56 PM	Brazil MAIN: Available memory in %	82.5892 %
2024-06-03 08:28:08 PM	Brazil MAIN: Interface enp0s3: Bits sent	0 bps
2024-06-03 08:28:02 PM	Brazil MAIN: Interface enp0s3: Bits received	0 bps
2024-06-03 08:27:56 PM	Brazil MAIN: Available memory in %	82.6003 %
2024-06-03 08:26:56 PM	Brazil MAIN: Available memory in %	82.5864 %





We didn't stop there

We went further

We connected **widgets**

# Sharing data in common

**Host navigator**

- ▼ Brazil servers 1 4
- Brazil MAIN** 1 2
- Brazil secondary 1
- Brazil third 1
- ▶ Zabbix servers 3 3 7
- ▶ ZBX servers 2 2

**Item navigator**

- Load average (1m avg)
- Load average (5m avg)
- Load average (15m avg)**

**Brazil MAIN: Load average (15m avg)**

0 50 70 90 100

0.11

Load average (15m avg)

Hosts  Select

Host tags  Or

Contains  Remove

Add

- Hosts
- Widget**
- Dashboard

\* Item  Select

\* Min

\* Max

- Item
- Widget**

# Common principle

## The concept:

- ▶ One widget acts as **data source**.
- ▶ Another widget acts as **data listener**.
- ▶ Both widgets are **data-compatible**.
- ▶ The data source widget **impacts** the behavior of the listener.
- ▶ **Usability improved** with both widgets.



# Data communication

### Host-based widget

Top triggers

Host	Trigger	Severity	Number
Zabbix server	/var/snap/firefox/common/host-hunspell: Disk space is low	Warning	1
Zabbix server	Linux: Zabbix server has been restarted	Warning	1

Host ID

### Host and item-based widget

Metric	Value
Init MAIN CPU lowait time	0.24 %
Init MAIN CPU softirq time	0.13 %
Init MAIN CPU system time	0.51 %
Init MAIN CPU user time	0.50 %
Init MAIN CPU utilization	1.08 %
Init MAIN Memory utilization	20.48 %
Init MAIN Number of CPUs	4.00
Zabbix server CPU idle time	98.96 %
Zabbix server CPU lowait time	0.21 %
Zabbix server CPU softirq time	0.12 %
Zabbix server CPU system time	0.25 %
Zabbix server CPU user time	1.04 %
Zabbix server Memory utilization	20.48 %
Zabbix server Number of CPUs	4.00
ZBX backup CPU idle time	98.88 %
ZBX backup CPU lowait time	0.25 %
ZBX backup CPU system time	0.12 %
ZBX backup CPU softirq time	0.25 %
ZBX backup CPU user time	0.38 %
ZBX backup CPU utilization	0.35 %
ZBX backup Memory utilization	1.12 %
ZBX backup Number of CPUs	20.48 %

Item ID

### Item-based widget

50 %

20 % 80 %

0 % 100 %

**20.84 %**

Zabbix server: Memory utilization

### Host navigator

Host navigator

- HostGroup1 (2)
- Riga (2)
- Warning (2)
- Host1 (2)**
- Host5
- HostGroup2 (1, 1, 3, 1)
- Riga (1, 1, 2, 1)
- Disaster (1)

Host ID

### Item navigator

Item navigator

- Linux servers
  - Server 01
    - CPU Load
    - Free disk space on /**
- Windows servers
  - MS Exchange
    - AD status

Item ID

### Item-based widget

50 %

10 % 0 % 100 %

**79.16 %**

Linux: Available memory in %

# Widgets became **communicable**

Widget	Can be source of:	Can listen to:
Action log		Time period
Data overview		Host groups, Hosts
Gauge		Host, Item
Geomap	Host	Host groups, Hosts
Graph	Time period	Host, Time period
Graph (classic)	Time period	Item, Graph, Time period
Graph prototype	Time period	Host, Time period
Honeycomb	Host, Item	Host groups, Hosts
Host availability		Host groups
Host navigator	Host	Host groups
Item history	Item	Host, Time period

# Widgets became **communicable** #2

Widget	Can be source of:	Can listen to:
Item navigator	Item	Host groups, Hosts
Item value		Host, Item, Time period
Map	Host, Host group	Time period
Map navigation tree	Map	Host groups, Hosts
Problem hosts	Host group	Item
Problems	Event	Host groups, Hosts
Problems by severity	Host group	Time period
Top hosts	Host	Item, Graph, Time period
Top triggers		Time period
Trigger overview		Host groups, Hosts
URL		Host
Web monitoring	Host group	Host groups



Custom development of widgets

```
updateWidgetContainerPosition();

resize_widget.setPos(resize_pos, {is_managed: true});
resize_widget.resize();

this._resizeGrid(resize_pos.y + resize_pos.height + this._grid_pad_rows);
}

const widget_view = resize_widget.getView();

widget_view.style.left = `${dim.x}px`;
widget_view.style.top = `${dim.y}px`;
widget_view.style.width = `${dim.width}px`;
widget_view.style.height = `${dim.height}px`;
};

this._widget_resizing_events = {
  mouseDown: e => {
    if (e.button !== 0) {
      return;
    }

    resize_widget = null;

    for (const widget of this._widgets.keys()) {
      const widget_view = widget.getView();

      if (widget_view.contains(e.target)) {
        const resize_handle = e.target.closest(`.${widget.getCssClass('resize_handle')}`);

        if (resize_handle === null) {
          return false;
        }

        resize_widget = widget;
        resize_sides = resize_widget.getResizeHandleSides(resize_handle);

        break;
      }
    }
  }
}
```

# Custom widget development

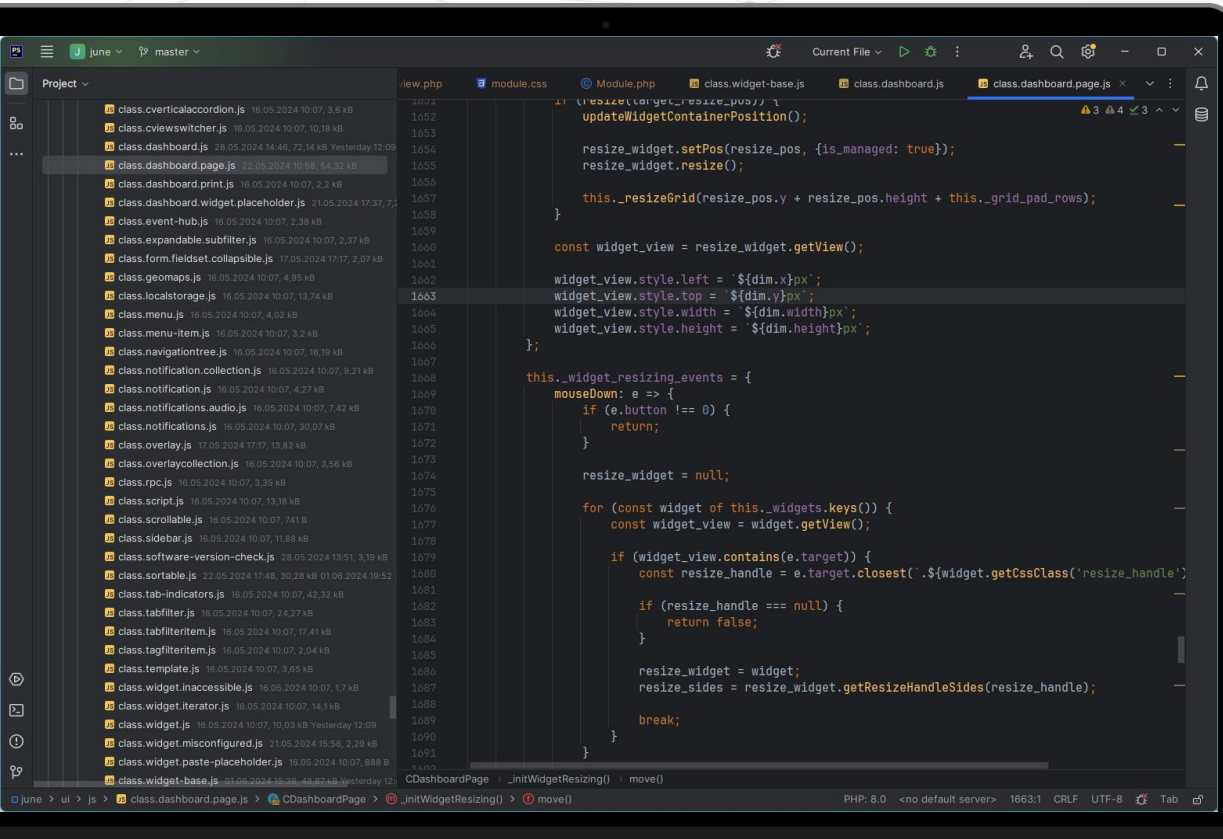
- ▶ Modular
  - Permissions adjustable
- ▶ Object-oriented programming
- ▶ Pure JavaScript
  - Extend base class, override defaults
- ▶ Pure PHP
  - MVC pattern for PHP
- ▶ Use Zabbix API



# The dashboard

## Responsibilities:

- ▶ Dashboard page navigation.
- ▶ Run slideshow.
- ▶ Manage properties of the dashboard, the pages and the widgets.
- ▶ Reload the dashboard on configuration update.
- ▶ Copy/paste widgets and dashboard pages.
- ▶ Maintain widget references.









# Developer center

ZABBIX

ZABBIX

Documentation

7.0 (devel)

English



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## Configuration

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This page describes classes that can be used to create a widget configuration view with custom configuration fields. The widget configuration view is the part of the widget that allows the user to configure widget parameters for [presentation](#).

### Widget

Primary widget class, extends the base class of all dashboard widgets - *CWidget*. Required for overriding the default widget behavior.

The *Widget* class should be located in the root directory of the widget (for example, *zabbix/ui/modules/my\_custom\_widget*).

#### Widget.php example

```
<?php
namespace Modules\MyCustomWidget;
use Zabbix\Core\CWidget;

class Widget extends CWidget {
    public const MY_CONSTANT = 0;

    public function getTranslationStrings(): array {
        return [
            'class.widget.js' => [
                'No data' => _('No data')
            ]
        ];
    }
}
```

### WidgetForm

The *WidgetForm* class extends the default class *CWidgetForm* and contains a set of *CWidgetField* fields that are required for defining widget configuration storage structure in the database and handling input validation.

The *WidgetForm* class should be located in the *includes* directory. If the class has a different name, the name should be specified in the *widget/form\_class* parameter in the *manifest.json* file.

#### includes/WidgetForm.php example

```
<?php
namespace Modules\MyCustomWidget\Includes;
```



# Zabbix API documentation

ZABBIX

ZABBIX

Documentation

7.0 (devel)

English



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## apiinfo.version

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### Description

`string apiinfo.version(array)`

This method allows to retrieve the version of the Zabbix API.

**Attention:** This method is only available to unauthenticated users and must be called without the `auth` parameter in the JSON-RPC request.

### Parameters

(array) The method accepts an empty array.

### Return values

(string) Returns the version of the Zabbix API.

**Note:** Starting from Zabbix 2.0.4 the version of the API matches the version of Zabbix.

### Examples

#### Retrieving the version of the API

Retrieve the version of the Zabbix API.

Request:

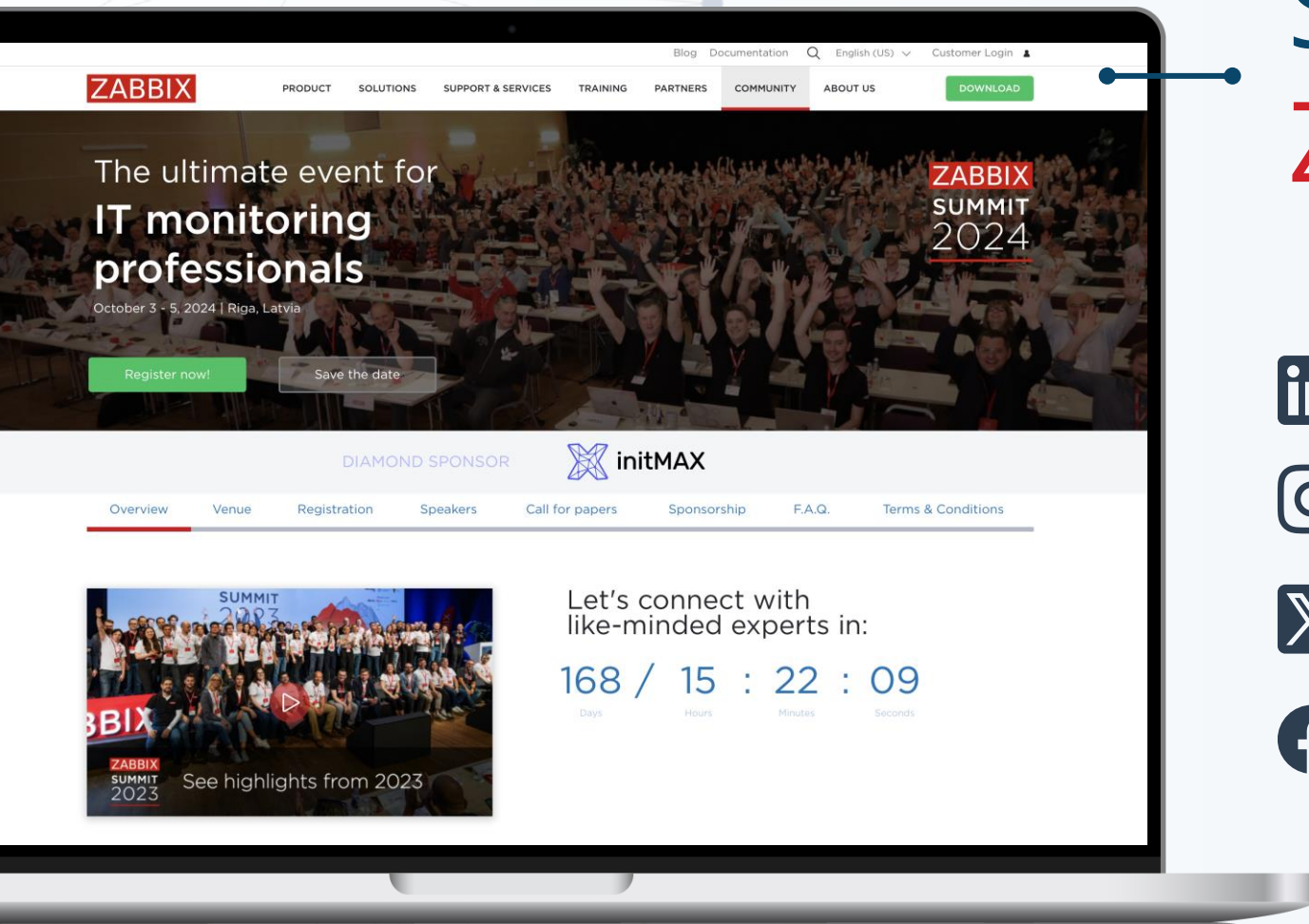
```
{
  "jsonrpc": "2.0",
  "method": "apiinfo.version",
  "params": [],
  "id": 1
}
```

Response:

```
{
  "jsonrpc": "2.0",
```

- apiinfo.version
- Description
- Parameters
- Return values
- Examples
  - Retrieving the version of the API
- Source

# Stay updated on Zabbix news:



Zabbix



zabbix\_official



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Zabbix

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**ZABBIX**

Thank you!

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**Andrejs Verza**

Senior PHP Developer



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**ZABBIX**

**Paldies!**

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**Andrejs Verza**

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