

Dashboards of Things

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ZABBIX

And after the hard work...

 \mathbf{x}

7.0 is out!







So, let's talk about -

New widgets in Zabbix 7.0

Widget communication and dynamic dashboards

Widget development by 3rd parties



New widgets carefully packed



New widgets

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

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

	Data set 1 Displaying options Time period Legend
Edit widget	History data selection Auto History Trends
Type Pie chart V	Draw Pie Doughnut Show header 🗹
Name default	Space between sectors — 1
Refresh interval Default (1 minute) Y	Merge sectors smaller than 1 %
Data set 1 Displaying options Time period Legend	
Data set #1 Zabbix server × Brazil MAIN × ZBX backup × host patterns	Select Number of processes × Select × item patterns Select ×
Aggregation function 🕐 max 🗸	Type Pie chart V
Data set aggregation 🕐 not used 🗸	Name default
Data set label ? Data set #1	Refresh interval Default (1 minute)
+ Add new data set V	Data set 1 Displaying options Time period Legend
Item patterns	Time period Dashboard Widget Custom
	* From now/d-1d
Clone	* To now/d

New widget – Gauge

Monitor a specific metric in relation to thresholds

Real-time performance monitoring

Customizable visual representation

Server room #1

New widget – Gauge

Edit widget			? 🗙
Туре	Gauge	~	Show header 🗹
Name	default		
Refresh interval	Default (1 minute)		
* Item	Brazil MAIN: Available men	nory in % 🗙	Select 🗸
* Min	0		
* Max	100		
Colors	Value arc D	Arc background D	Background
* Show	Description	✓ Value	Value arc
	Needle	 Scale 	
Override host	type here to search		Select 🗸
Advanced cor	nfiguration		
	Thresholds	Threshold	Action
		60	Remove
		80	Remove
		90	Remove
		Add	
		Show labels	Show arc 🗹
			Arc size 5

Advanced confi	guration			
Angle	180° 270°			
* Description ?	{ITEM.NAME}			
				4
	Size	15 %	Vertical position	Top Bottom
	Bold		Color	D
Value	Decimal places	2	Size	25 %
	Bold		Color	D
	✓ Units			
	Size	25 %	Bold	
	Position 🕐	After value 🗸	Color	D
Value arc	Size	20 %		
Scale	Show units	✓	Size	15 %
	Decimal places	0		
Thresholds	Threshold		Act	ion
	60		Re	move
			A	oply Cancel

Init MAIN

CPU utilization 1.08 %

ZBX backup

CPU iowait time

0.25 %

Zabbix server

CPU system time

0.38 %

ZBX backup

Number of CPUs

4.00

Init MAIN

CPU user time

0.50 %

ZBX backup

CPU idle time

98.88 %

Zabbix server

CPU softirg time

0.12 %

ZBX backup

Memory utilization

20.48 %

New widget – Honeycomb

New widget – Honeycomb

					ΛA	dvanced configurati	ion		
						Primary label	Туре	Text Value	
Edit widget				?	2 ×		* Text ?	{HOST.NAME}	
Туре	Honeycomb	~	ę	Show header	 Image: A start of the start of				
Name	default								A
Refresh interval	Default (1 minute)						Size	Auto Custom	Bold
Host groups	type here to search			Select	~		Color	D	
Hosts	type here to search			Select	~	Secondary label	Туре	Text Value	
Host tags	And/Or Or						Decimal places	2	
	tag	Contains 🗸	value	Remove			Size	D	Bold
	Add						✓ Units		Position After value
* Item patterns	Load average* ×			Select]	Background color			
14						Background color			
item tags			[]			Thresholds i	Threshold	ation	Action
	tag	Contains V	value	Remove			90		Remove
Chave boots in maintenance							80		Remove
Show nosts in maintenance		_					70		Remove
* Show	 Primary label 	✓ 5	Secondary label				Add		
									Apply Cancel

New widget – Top triggers

Top triggers			4) \$
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
Brazil MAIN	Repetitive software crashes	Average	1
Zabbix server	Room temperature too high	Warning	1

New widget – Top triggers

Edit widget				?)
Туре	Top triggers	~		Show header 🗹
Name	default			
Refresh interval	Default (No refresh)			
Host groups	type here to search			Select
Hosts	type here to search			Select
Problem				
Severity	Not classified	Warning	High	
Problem tags	Information And/Or Or tag	Average	Disaster	Remove
	Add			
Time period	Dashboard Widget	Custom		
* From	now-1h			
* То	now	iii		
* Trigger limit	10		_	

		4) \$
Trigger	Severity	Number of problems
Interface enp0s3: Link down	Average	2
Power supply unstable	High	1
Repetitive software crashes	Average	1
Repetitive software crashes	Average	1
Repetitive software crashes	Average	1
Room temperature too high	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					٠٠٠ ئۇ <i>ي</i>	
Timestamp	/: Use	d 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			
		Item history				
0024 04 10 04:20:24 DM	18 5	Timestamp	Name	Value		
2024-04-10 04.30.24 PW	10.0	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 receiv	ed 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 receiv	ed Obps		
		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 receiv	ed 48 bps		
		2024-06-03 04:39:56 PM	Brazil MAIN: Available memory in %			82.6351 %

New widget – Item history

Edit widget		? 🗙	New column			×
Туре	Item history	Show header 🗸	* Name	Zabbix server: Value cache, % used		
Name	default		* Item	Zabbix server: Value cache, % used ×	Select	
Refresh interval	Default (1 minute)		Base color			
Lavout	Horizontal		Display	As is Bar Indicators		
* Columns		A - 6 - 17	Min	0		
Columns	Brazil MAIN: Value cache, % used Brazil MAIN: Value cache, % used	Edit Remove	Max	100 Action		
	Zabbix server: Value cache, % used Zabbix server: Value cache, % used	Edit Remove	meshous	90 Remove		
	Add			80 Remove		
* Show lines	25			Add 70 Remove		
Override host	type here to search	Select 🗸	History data	Auto History Trends		
Advanced configur	ation			Ac	d Canc	el
New values	Top Bottom		Highlight	ts Regular expression	Action	
Show timestamp				linux	Remove	
Show column header	Off Horizontal Vertical			Add		
Time period	Dashboard Widget Custom		Display 🧃	As is HTML Single line		
		Apply Cancel	Use monospace for	nt 🗌		

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

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

Host navigator	
▼ HostGroup1	2
▼ Riga	2
- Warning	
* 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		? ×	Edit widget		? X
East mager		_	Туре	Item navigator 🗸	Show header 💌
Туре	Host navigator	Show header ⊻	Name	default	
Name	default		Refresh interval	Default (1 minute)	
Refresh interval	Default (1 minute)		Refestivelya		
Host groups	type here to search	Select 🗸	Host groups	type here to search	Select V
Liset petterne	notione .	Calaat	Hosts	type here to search	Select 🗸
Host patterns	patterns	Select	Host tags	And/Or Or	
Host status	Any Enabled Disabled			tag Contains V value	Remove
Host tags	And/Or Or			Add	
	tag Contains V value	Remove	Item patterns	patterns	Select
	Add		Item tags	And/Or Or	
Severity	Not classified Warning High				
	Information Average Disaster			tag Contains Value	Remove
Show hosts in maintenance			State	All Nermel Net supported	
Show problems	All Unsuppressed None		State	Aii Normai Not supported	
		_	Show problems	All Unsuppressed None	
Group by	1: Host group	Remove	Group by	1: Host group	Remove
	2: Tag value V CITY	Remove		2: Host name	Remove
	3: Severity	Remove		3: Host tag value	Remove
	Add			4: Item tag value	Remove
* Host limit	100			Add	
	Appl	ly Cancel	* Item limit	100	

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In the beginning there was ...

Now, that's your data

And that's your measuring device

© ElectroBOOM

More precise devices were invented

The wires got connected

ZABBIX

Edit dashboard 📃 💱 New widgets in Zabbix 7.0 All dashboards / New widgets in Zabbix 7.0 Host navigator Item navigator Item value 🔻 High 1 Average 3 Warning 4 Honeycomb Top hosts And voilà! Top triggers 48.00 bps 24.00 bps 688.57 Kbps Brazil MAIN Interface enp0s3: Link down Average ZBX backup Interface enp0s3.. ZBX backup Power supply unstable High nterface enp0s3 Interface enp0s8 0.00 bps 48.00 bps Zabbix server Interface enp0s3: Link down Average 688.55 Kbps Zabbix server Repetitive software crashes Average Brazil MAIN: Available memory in % Software exceptions Item history 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 % 80 % 2024-06-03 08:28:08 PM Brazil MAIN: Interface enp0s3: Bits sent 0 bps 90 % 2024-06-03 08:28:02 PM Brazil MAIN: Interface enp0s3: Bits received 0 bps 82.60 % 0 % 📏 100 % 2024-06-03 08:27:56 PM Brazil MAIN: Available memory in % 82.6003 % Available memory in % 2024-06-03 08:26:56 PM Brazil MAIN: Available memory in % 82.5864 %

ZABBIX

We didn't stop there

We went further

We connected widgets

Sharing data in common

Common principle

The concept:

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

Data communication

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	ltem, 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	ltem	Host, Time period

Widgets became communicable #2

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

Custom development of widgets

Project v			o module.cs			📧 class.v	idget-base.js	🕫 class.dast		🕫 class.dash	iboard.page.j:	s ×	Ą
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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

2 Q 🚳 📃 🗾 june 🗸 🝄 master Is class.widget-base.is 🕫 class.dashboard.js 🛛 🕫 class.dashboard.page.js 🗵 Js class.cverticalaccordion.is updateWidgetContainerPosition(Js class.cviewswitcher.js 16.05.2024 10:0 18 class dashboard is 28.05.2024 14:46 resize_widget.setPos(resize_pos, {is_managed: true}) resize widget.resize(): us class.dashboard.print.is class dashboard widget placeholder is const widget_view = resize_widget.getView() widget_view.style.left = `\${dim.x}px` mouseDown: e => { Is class script is if (widget_view.contains(e.target)) { const resize_handle = e.target.closest(`.\${widget.getCssClass('resize_handle' resize_sides = resize_widget.getResizeHandleSides(resize_handle);

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.

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The dashboard page

Knowledge:

- Knows nothing about the dashboard.
 Responsibilities:
 - Maintain widgets state.
 - Drag / resize widgets.
 - Display new widget placeholder.
 - Listen for the events of widgets.
 - Execute commands from the dashboard.

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	Js class.notifications.audio.js 16.05.2024 10:07, 7,42 kB			if (e.hutt	-~ 1 ton !== 0) {				
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	Js class.overlay.js 17.05.2024 17:17, 13.82 kB								
	Js class.overlaycollection.js 16.05.2024 10:07, 3,56 kB								
	Js class.rpc.js 16.05.2024 10:07, 3,35 kB			resize_wid	dget = null;				
	Js class.script.js 16:05:2024 10:07, 13:18 kB								
	Js class.scrollable.js 16.05.2024 10:07, 741 B			TOP (CONST	widget of thisWit	gets.Reys()) {			
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	Js class.software-version-check.js 28.05.2024 13:51, 3:19 kB			if (wi	idget view.contains(e	e.target)) {			
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	Itass widnot-base is of 05 2024 15 25 45 27 15 Verterial	CDashboard	Page → initWid	daetResizina() → move	re()				

The widget base

Knowledge:

Knows nothing about the dashboard or the dashboard page.

Responsibilities:

- Activate when asked to by the dashboard page.
- Update when all configuration data is consolidated and ready.
- Provide the user class with connectivity methods.
- Provide the user class with default implementation of methods.

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	Project ~	/iew.php 🧧 modu			class.widget-base.js	us class.dashboard.js	Js class.dashboard.pag	e.js ×	Ą
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	JS class.dashboard.page.js 22.05.2024.10:58, 54,32 kB			resize_widget	.resize();				
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	US class.tabfilteritem.js 16.05.2024 10:07, 17,41 kB				eturn false;				
	JB class.tagfilteritem.js 16.05.2024 10:07, 2,04 kB								
	US class.template.js 16.05.2024 10:07, 3,65 kB			resiz	e widget = widget				
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	e > ui > is > us class dashhoard page is > 🕞 CDashhoardPage > 🍈					PHP: 8.0 < no default		ITE-8 🞢 Tab	

- User widget

Responsibilities:

Visualize data when asked to.

Developer center

ZABBIX Documentation 7.0 (de	vel) 🔹 English 🔹 🛓		Q Search
🗷 Zabbix Manual	Configuration	:= Table of Contents	· ^
Developer Center	5		
 Modules Module file structure Widgets Configuration Presentation 	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 - <i>CWidget</i> . Required for overriding the default widget behavior. The <i>Widget</i> class should be located in the root directory of the widget (for example, <i>zabbix/ui/modules/my_custom_widget</i>).	Configuration Widget WidgetForm CWidgetFormVi JavaScript	iew
Tutorials	Widget.php example	CWidgetField	
Examples Plugins Changes to extension development 	php<br namespace Modules\MyCustomWidget;		
 Zabbix manpages Book your ZABBIX training session 	<pre>use ZabDix\Core\CWidget; class Widget extends CWidget { public const MY_CONSTANT = 0; public function getTranslationStrings(): array { return [</pre>		

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

Zabbix API documentation

"jsonrpc": "2.0",

ZABBIX Documentation 7.0 (de	evel) 🔹 English 🔹 🛓		Q Search	
Zabbix Manual	apiinfo.version	:= Table of Conten	nts	~
1 Introduction				
2 Definitions	Description			
 3 Zabbix processes 	string apiinfo.version(array)	apiinfo.version		
4 Installation	This method allows to retrieve the version of the Zabhiy ADI	Description		
		Parameters		
6 Zabbix appliance	Attention: This method is only available to unauthenticated users and must be called without the auth parameter in the JSON-RPC request.	Return values	5	
		Examples		
	Parameters	Retrieving	g the version of the API	
9 Web monitoring	(array) The method accepts an empty array.	Source		
10 Virtual machine monitoring	Return values			
11 Maintenance	(string) Returns the version of the Zabbix API.			
12 Regular expressions				
13 Problem acknowledgment	Note: Starting from Zabbix 2.0.4 the version of the API matches the version of Zabbix.			
	Examples			
	Retrieving the version of the API			
17 Encryption	Retrieve the version of the Zabbix API.			
	Request:			
□ 19 API				പ
Method reference	{			ى
Action	"method": "apiinfo.version", "params": [].			
	"id": 1			
⊟ API info	3			
apiinfo.version	Response:			
 Audit log 				~

Authentication

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Thank you!

Andrejs Verza

Senior PHP Developer