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5.4

**TRIGGERS,
CALCULATED AND
AGGREGATED ITEMS**

AIGARS KADIKIS
TECHNICAL SUPPORT ENGINEER

ZABBIX



WHY THIS TOPIC?

Calculated items | Aggregated items | Triggers

Each one using own syntax

Let's have unified syntax



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TRIGGER VS CALCULATED ITEM

Trigger = do calculation and if it's true then generate event

Calculated item = do calculation and store result in database



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WHAT'S
DIFFERENT
IN 5.4?



EACH ITEM HAS A «TAG:TAGVALUE»

Latest data Filter

Host groups Tags

Hosts

Name Show details Show items without data

<input type="checkbox"/> Host	Name ▲	Last check	Last value	Change	Tags	
<input type="checkbox"/> Zabbix server	/: Used space ?	2021-05-16 18:06:24	980.68 MB	+128 KB	Application: Filesystem /	Graph
<input type="checkbox"/> Zabbix server	/boot: Used space ?	2021-05-16 18:06:26	55.39 MB		Application: Filesystem /boot	Graph
<input type="checkbox"/> Zabbix server	/tmp: Used space ?	2021-05-16 18:06:27	39.52 MB		Application: Filesystem /tmp	Graph
<input type="checkbox"/> Zabbix server	/var/lib/mysql: Used space ?	2021-05-16 18:06:25	748.64 MB		Application: Filesystem /var/lib/mysql	Graph

0 selected Displaying 4 of 4 found



TIME SUFFIX IS NOW MANDATORY

It means:

- ✓ number «600» will be converted into «10m»
- ✓ number «#600» will change to «600»

We still can use and import templates from an older version of Zabbix

No hashtag anymore



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PERIOD AND TIME SHIFT IS ONE ARGUMENT NOW

Previously 2 arguments:

<period>,<time shift>

Now 1 argument with a colon in the middle:

<period:time shift>

1h – in the last one hour

1h:now-1d – during same hour one day ago

1d:now/d – whole yesterday



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STR(), REGEX(), IREGEX() => FIND()

Search type of functions will be converted into one function: find()

Don't worry about RegEx case-sensitive search and incase-sensitive search.
The «find()» function will now have an argument for case sensitiveness.



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NEW SYNTAX

Previously :

```
{host:key.max(15m)}
```

Now:

```
max(/host/key,15m)
```

New syntax is used in trigger expressions and for Calculated Items.



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EXAMPLES



ABSOLUTE TIME PERIODS

It's already 10:00 AM **today**, but noone has turned the workstation ON:

`sum(/host/key, 1d:now/d+1d) = 0 and time() > 100000`

All templates / Windows by Zabbix agent Items 32 Triggers 14 Graphs 5 Dashboards 1 Discovery rules 4 Web scenarios

Trigger Tags Dependencies

* Name

Event name

Operational data

Severity Not classified Information Warning Average High Disaster

* Expression



ABSOLUTE TIME PERIODS

Yesterday, workstation was online for more than 10h

`trendmax(/host/key, 1d:now/d)>10h`

All templates / Windows generic by Zabbix agent Items 7 Triggers 3 Graphs Dashboards Discovery rules Web scenarios

Trigger Tags Dependencies

* Name Yesterday, the workstation was online for more than 10h

Event name Yesterday, the workstation was online for more than 10h

Operational data

Severity Not classified Information Warning Average High Disaster

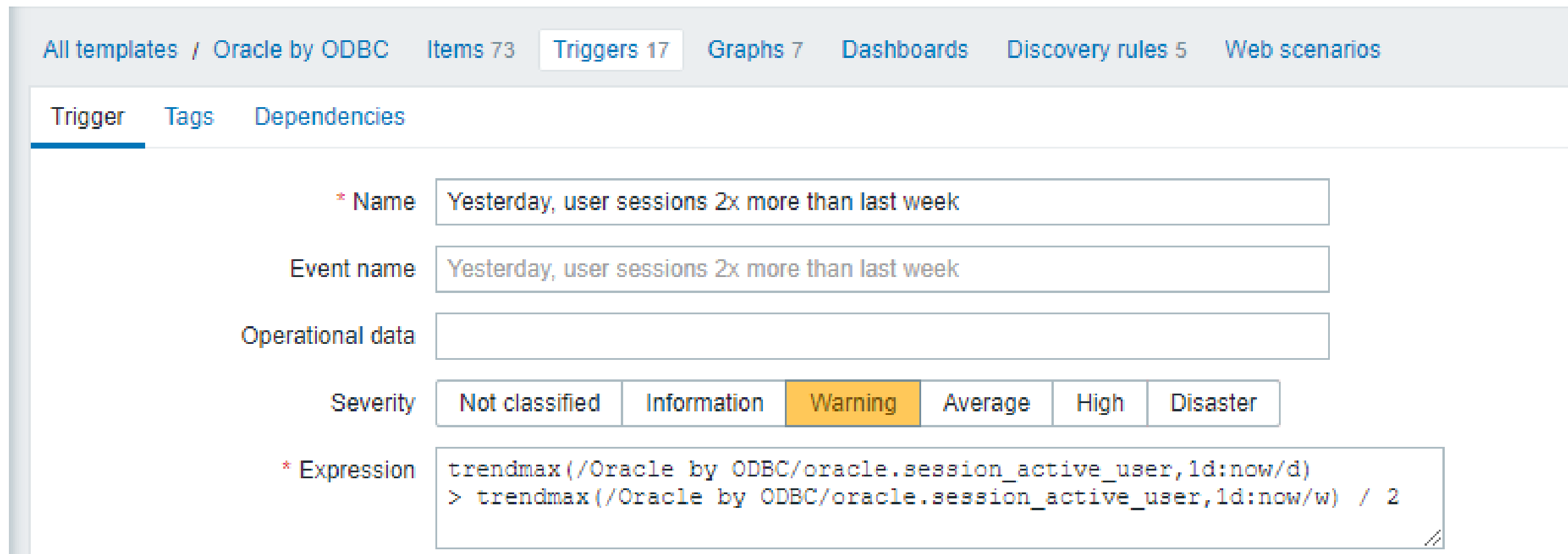
* Expression `trendmax(/Windows generic by Zabbix agent/system.uptime,1d:now/d)>10h` Add



ABSOLUTE TIME PERIODS

Yesterday, a maximum number of user sessions were 2x more than it was **last week**.

`trendmax(/host/key, 1d:now/d) > trendmax(/host/key, 1d:now/w) / 2`



The screenshot shows the Zabbix web interface for configuring a trigger. The breadcrumb navigation at the top reads: All templates / Oracle by ODBC / Items 73 / Triggers 17 / Graphs 7 / Dashboards / Discovery rules 5 / Web scenarios. Below this, there are tabs for Trigger, Tags, and Dependencies. The main configuration area includes:

- * Name:** Yesterday, user sessions 2x more than last week
- Event name:** Yesterday, user sessions 2x more than last week
- Operational data:** (empty field)
- Severity:** A row of buttons: Not classified, Information, Warning (highlighted in yellow), Average, High, Disaster.
- * Expression:** `trendmax(/Oracle by ODBC/oracle.session_active_user,1d:now/d) > trendmax(/Oracle by ODBC/oracle.session_active_user,1d:now/w) / 2`



ABSOLUTE TIME PERIODS

In the **previous month**, the server did not utilize half of available memory

`trendmax(/host/key1, 1M:now/M) < last(/host/key2) / 2`

All templates / Windows memory by Zabbix agent Items 12 Triggers 5 Graphs 2 Dashboards Discovery rules Web scenarios

Trigger Tags Dependencies

* Name Server did not utilize half of available memory

Event name Server did not utilize half of available memory

Operational data

Severity Not classified Information Warning **Average** High Disaster

* Expression `trendmax(/Windows memory by Zabbix agent/vm.memory.size[used],1M:now/M) < last(/Windows memory by Zabbix agent/vm.memory.size[total])/2`



COMPARE STRING BETWEEN TWO HOSTS

```
last(/node1/agent.version) <> last(/node2/agent.version)
```

Trigger	Tags	Dependencies
* Name	Version do not match ({ITEM.VALUE1} VS {ITEM.VALUE2})	
Event name	Version do not match ({ITEM.VALUE1} VS {ITEM.VALUE2})	
Operational data		
Severity	Not classified Information Warning Average High Disaster	
* Expression	last(/node1/agent.version) <> last(/node2/agent.version)	Add



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AGGREGATED CHECKS (FOREACH)



AGGREGATION ON CURRENT HOST

Average web page response time:

```
avg(last_foreach(//web.test.time[check performance,*,resp]))
```

All templates / [blog.zabbix.com monitoring](#) **Items 1** Triggers 3 Graphs Dashboards Discovery rules Web scenarios 1

Item Tags Preprocessing

* Name

Type

* Key

* Formula



AGGREGATION ON CURRENT HOST

Total used space on all drives:

```
sum(last_foreach(//vfs.fs.size[*],used))
```

All templates / Linux filesystems by Zabbix agent **Items 1** Triggers Graphs Dashboards Discovery rules 1 Web scenarios

Item Tags 1 Preprocessing

* Name

Type

* Key

* Formula



AGGREGATION BY **HOST GROUP**

MySQL queries per second:

```
sum(last_foreach(/*/mysql.queries.rate?[group="MySQL servers"]))
```

All hosts / MySQL servers statistics Enabled Items 1 Triggers Graphs Discovery rules Web scenarios

Item	Tags	Preprocessing
* Name		<input type="text" value="total.queries.per.second[{\$HG.NAME}]]"/>
Type		<input type="text" value="Calculated"/>
* Key		<input type="text" value="total.queries.per.second[{\$HG.NAME}]]"/> <input type="button" value="Select"/>
* Formula		<input type="text" value="sum(last_foreach(/*/mysql.queries.rate?[group='{\$HG.NAME}']))"/>



AGGREGATION BY TAG:VALUE

Used space on domain controllers:

```
sum(last_foreach(/*/vfs.fs.size[*],used)?[tag="Role:Domain Controller"])
```

All hosts / Windows servers statistics **Enabled** Items 4 Triggers Graphs Discovery rules Web scenarios

Item	Tags	Preprocessing
* Name	Used space DCs	
Type	Calculated	▼
* Key	used.space[DC]	Select
* Formula	sum(last_foreach(/*/vfs.fs.size[*],used)?[tag="Role:Domain Controller"])	



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THANK YOU!
QUESTIONS?

