

Supercharge Zabbix with Powerful Insights



Aleksandrs Kalimulins, C
Developer, Zabbix, Latvia

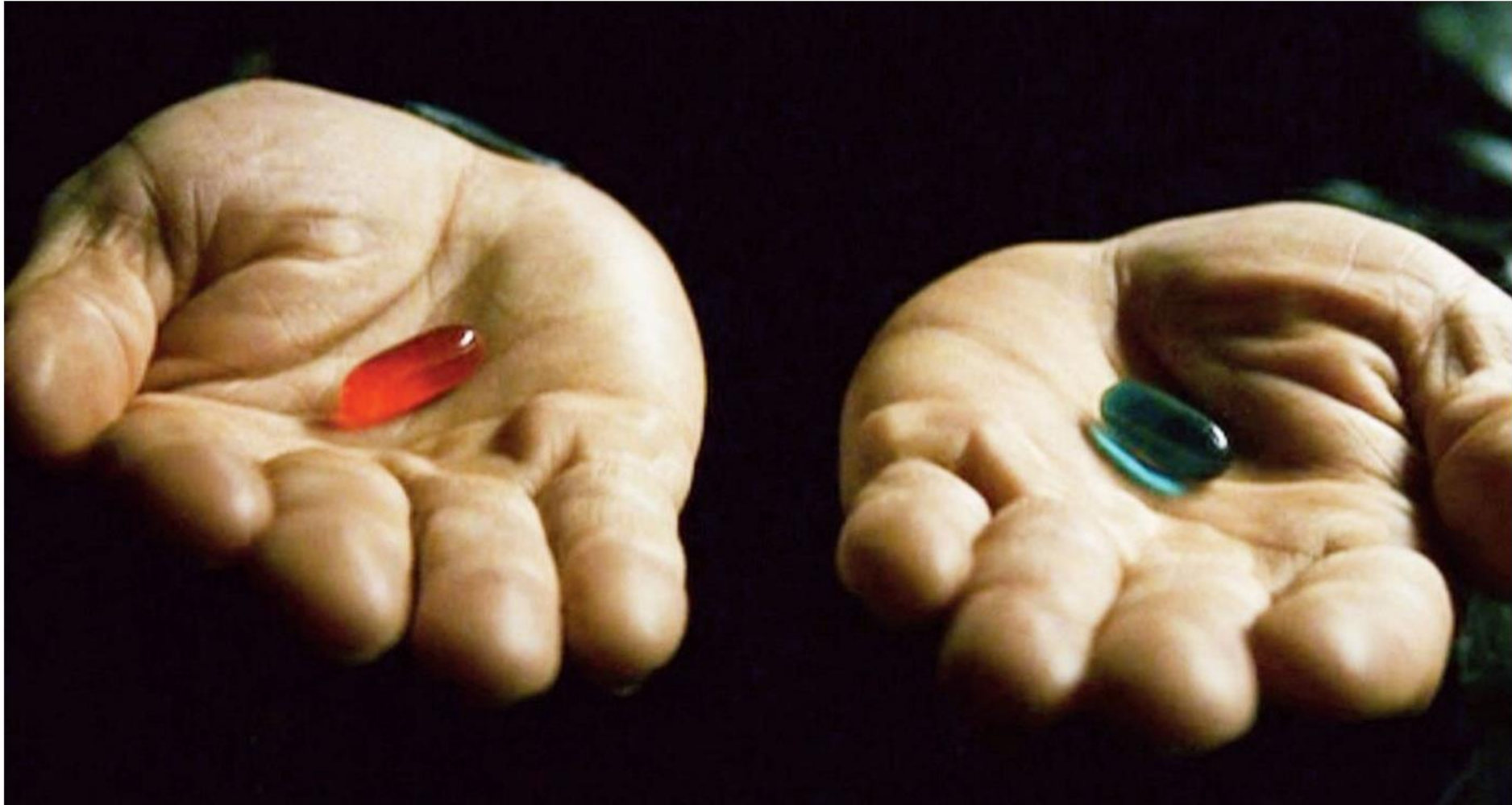
ZABBIX 2020
Conference
JAPAN

KINDS OF MONITORING

- ✓ Compare values to known thresholds

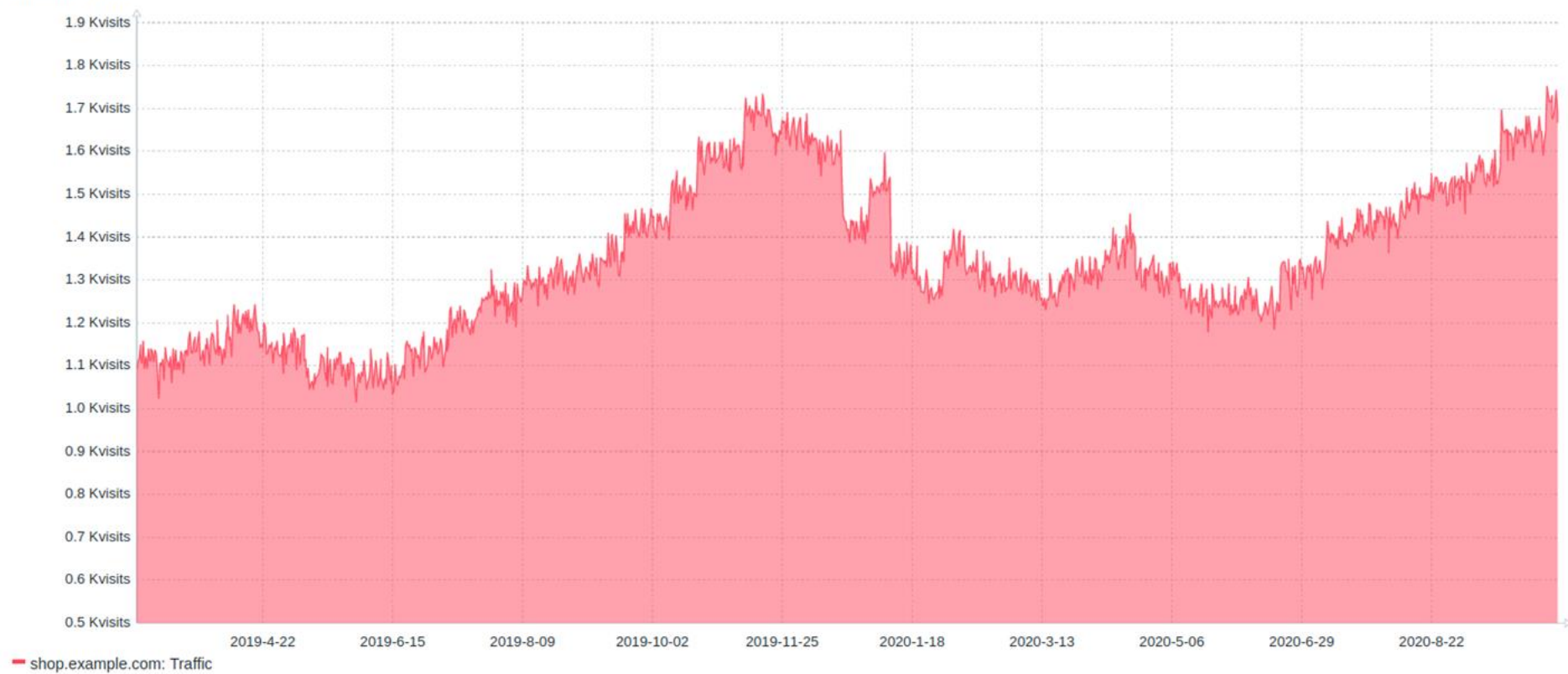
```
{Host:cpu.temp.avg(5m)} > 100
```


IT DEPENDS...



WEB TRAFFIC MONITORING

Webiste visits



KINDS OF MONITORING

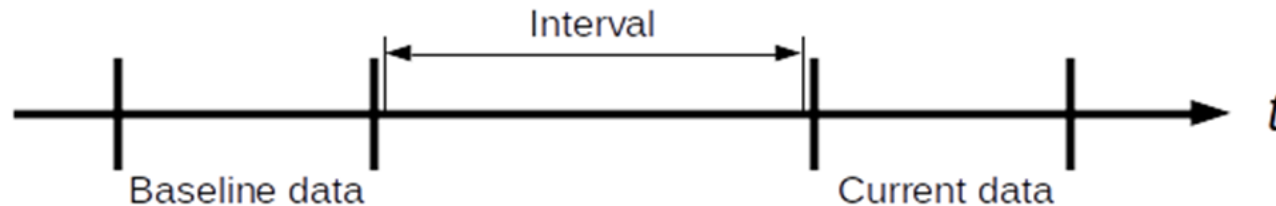


KINDS OF MONITORING

- ✓ Compare values to known thresholds

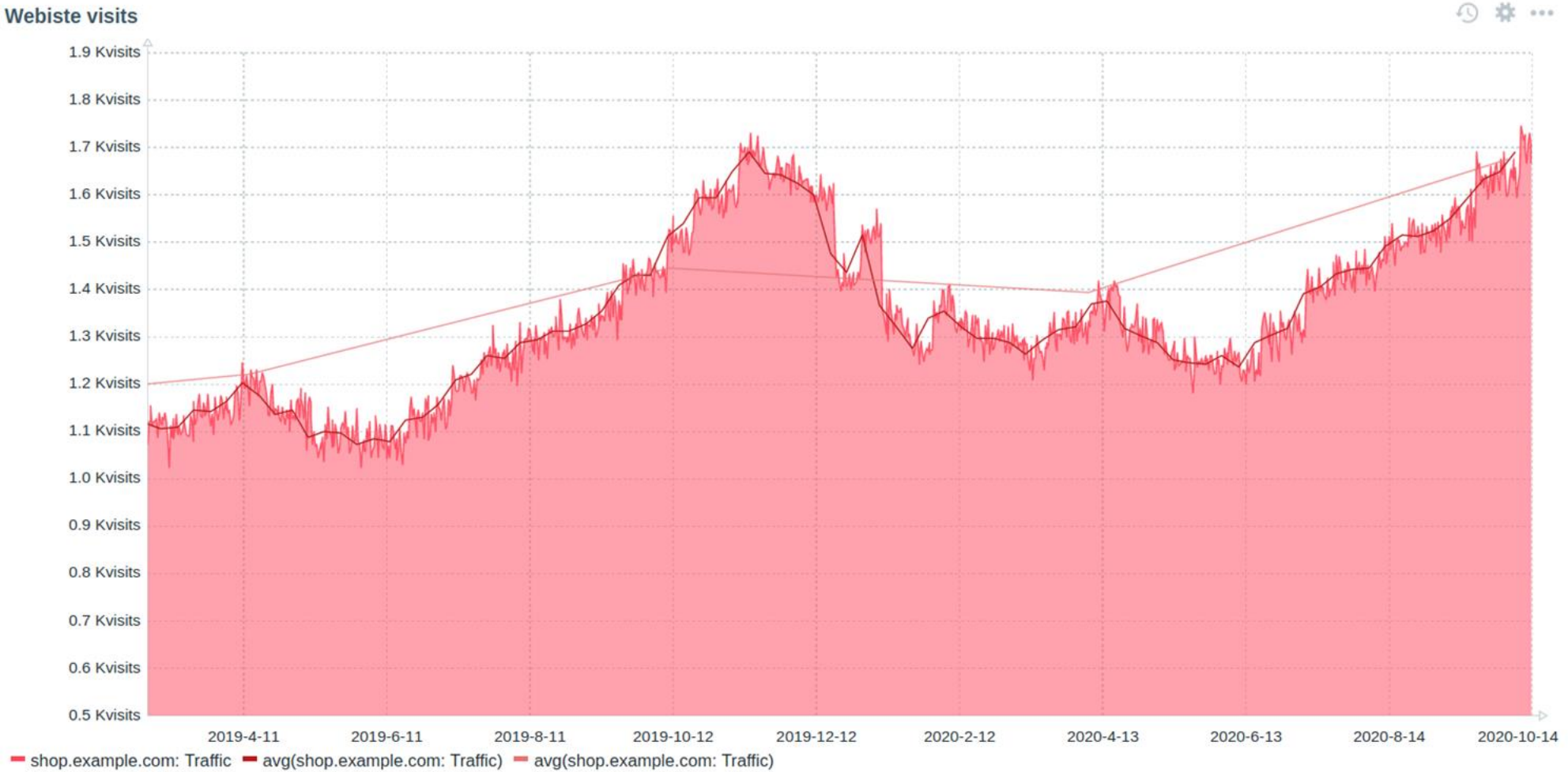
```
{Host:cpu.temp.avg(5m)} > 100
```

- ✓ Baseline – compare to unknown thresholds

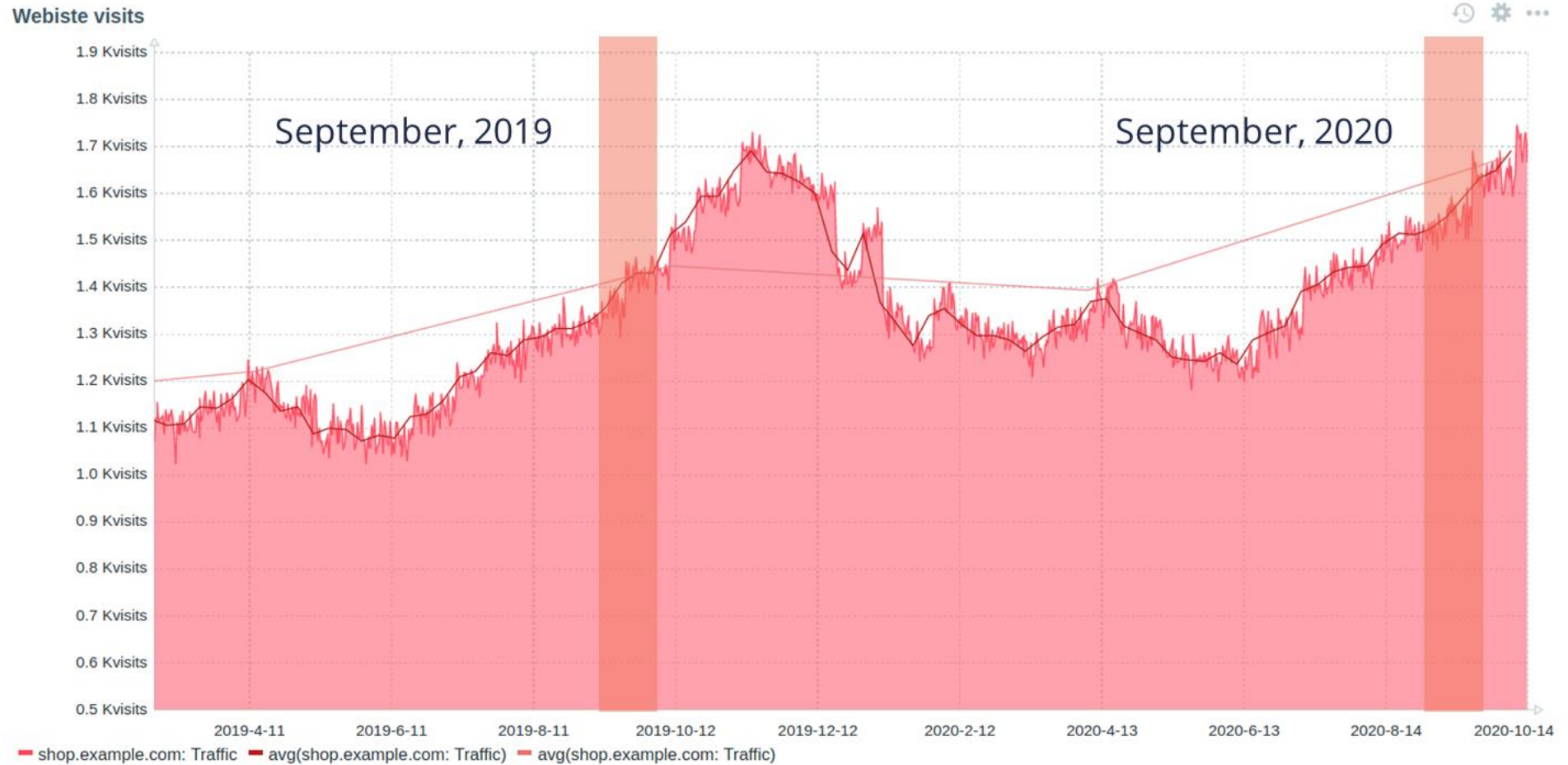


WEB TRAFFIC MONITORING

Webiste visits



WEB TRAFFIC MONITORING



ZABBIX 5.0

* Expression

```
{shop.example.com:traffic.data.avg(30d)} >  
{shop.example.com:traffic.data.avg(30d,365d)} *  
{$GROWTH_FACTOR}
```

Expression constructor

ZABBIX 5.0

* Expression

```
{shop.example.com:traffic.data.avg(30d)} >  
{shop.example.com:traffic.data.avg(30d,365d)} *  
{$GROWTH_FACTOR}
```

Expression constructor

Trigger status (the expression) is recalculated every time Zabbix server receives a new value that is part of the expression.

Triggers are evaluated based on [history](#) data only; trend data are never considered.

If time-based functions (`nodata()`, `date()`, `dayofmonth()`, `dayofweek()`, `time()`, `now()`) are in the expression, the trigger is recalculated every 30 seconds by a Zabbix *history syncer*.

ZABBIX 5.0

- 30d and 365d are just 187200 and 68328000 seconds
- avg() depends on time of calculation

* Expression

```
{shop.example.com:traffic.data.avg(30d)} >
{shop.example.com:traffic.data.avg(30d,365d)} *
{$GROWTH_FACTOR}
```

[Expression constructor](#)

ZABBIX 5.2 - NEW FUNCTIONS

```
trendavg(period, period_shift)
```

```
trendcount(period, period_shift)
```

```
trenddelta(period, period_shift)
```

```
trendmax(period, period_shift)
```

```
trendmin(period, period_shift)
```

```
trendsum(period, period_shift)
```


ZABBIX 5.2 - NEW FUNCTIONS

✓ Use trends tables instead of history

- Don't forget to set:

Trends

Enable internal housekeeping ☒

Override item trend period ☒

* Data storage period

✓ Use Gregorian calendar for period and period_shift

- h (hour), d (day), w (week), M (month) and y (year)

✓ Calculate upon the end of a period

ZABBIX 5.2 - NEW FUNCTIONS

- Customized event name:
 - New field in trigger definition
 - Optional, can use trigger Name instead
 - Use to display problem with a context
 - New macro `{? ... }` (“Expression macro”)

ZABBIX 5.2 - NEW FUNCTIONS

Triggers

All hosts / shop.example.com Enabled ZBX SNMP JMX IPMI Applications Items 1 Triggers 2 Graphs Discovery

Trigger Tags Dependencies

* Name

Abnormal traffic on {HOST.HOST}

Event name

Abnormal traffic on {HOST.HOST}, exceeded by {?({{HOST.HOST}:traffic.data.trendavg(1M,now/M)} / {{HOST.HOST}:traffic.data.trendavg(1M,now/M-1y)} -1)*100}%

Operational data

Severity

Not classified

Information

Warning

Average

High

Disaster

* Expression

```
{shop.example.com:traffic.data.trendavg(1M,now/M)} >
{shop.example.com:traffic.data.trendavg(1M,now/M-1y)} *
{$ABNORMALITY_FACTOR}
```

Add

[Expression constructor](#)

ZABBIX 5.2 - NEW FUNCTIONS

Triggers

All hosts / shop.example.com Enabled ZBX SNMP JMX IPMI Applications Items 1 Triggers 2 Graphs Discovery

Trigger Tags Dependencies

* Name

Abnormal traffic on {HOST.HOST}

Event name

Abnormal traffic on {HOST.HOST}, exceeded by $\{?(\{\{HOST.HOST\}:traffic.data.trendavg(1M,now/M)\} / \{\{HOST.HOST\}:traffic.data.trendavg(1M,now/M-1y)\} - 1) * 100\}\%$

Operational data

Severity

Not classified Information Warning Average High Disaster

* Expression

```
{shop.example.com:traffic.data.trendavg(1M,now/M)} >
{shop.example.com:traffic.data.trendavg(1M,now/M-1y)} *
{$ABNORMALITY_FACTOR}
```

Add

[Expression constructor](#)

ZABBIX 5.2 - NEW FUNCTIONS

Problems

Time ▼	Info	Host	Problem • Severity
15:14:17	•	shop.example.com	Abnormal traffic on shop.example.com, exceeded by 14.851131675138941%

ZABBIX 5.2 - NEW FUNCTIONS

- `fmtnum(digits)`
 - applicable to `ITEM.VALUE`, `ITEM.LASTVALUE` and expression macros
 - `fmtnum(2)` gives 14.85 instead of 14.8512345
- `fmttime(format, time_shift)`
 - applicable to `{TIME}`
 - uses strftime format codes
 - `{TIME}.fmttime("%B,%Y")` gives October,2020

ZABBIX 5.2 - NEW FUNCTIONS

Triggers

[All hosts](#) / [shop.example.com](#) Enabled ZBX SNMP JMX IPMI [Applications](#) [Items 1](#) [Triggers 2](#) [Graphs](#) [Discovery](#)

[Trigger](#) [Tags](#) [Dependencies](#)

* Name

Abnormal traffic on {HOST.HOST}

Event name

Abnormal traffic on {HOST.HOST}, exceeded by $\frac{\{?\{ \{ \{ \text{HOST.HOST} \} : \text{traffic.data.trendavg}(1\text{M}, \text{now}/\text{M}) \} \}}{\{ \{ \text{HOST.HOST} \} : \text{traffic.data.trendavg}(1\text{M}, \text{now}/\text{M}-1\text{y}) \} - 1} * 100\}$. $\text{fmtnum}(2)\%$ (compared to $\{ \{ \text{TIME} \} . \text{fmttime}(\text{"\%D,\%Y",-13M}) \}$)

Operational data

Severity

Not classified

Information

Warning

Average

High

Disaster

* Expression

$\{ \text{shop.example.com} : \text{traffic.data.trendavg}(1\text{M}, \text{now}/\text{M}) \} > \{ \text{shop.example.com} : \text{traffic.data.trendavg}(1\text{M}, \text{now}/\text{M}-1\text{y}) \} * \{ \$\text{ABNORMALITY_FACTOR} \}$

Add

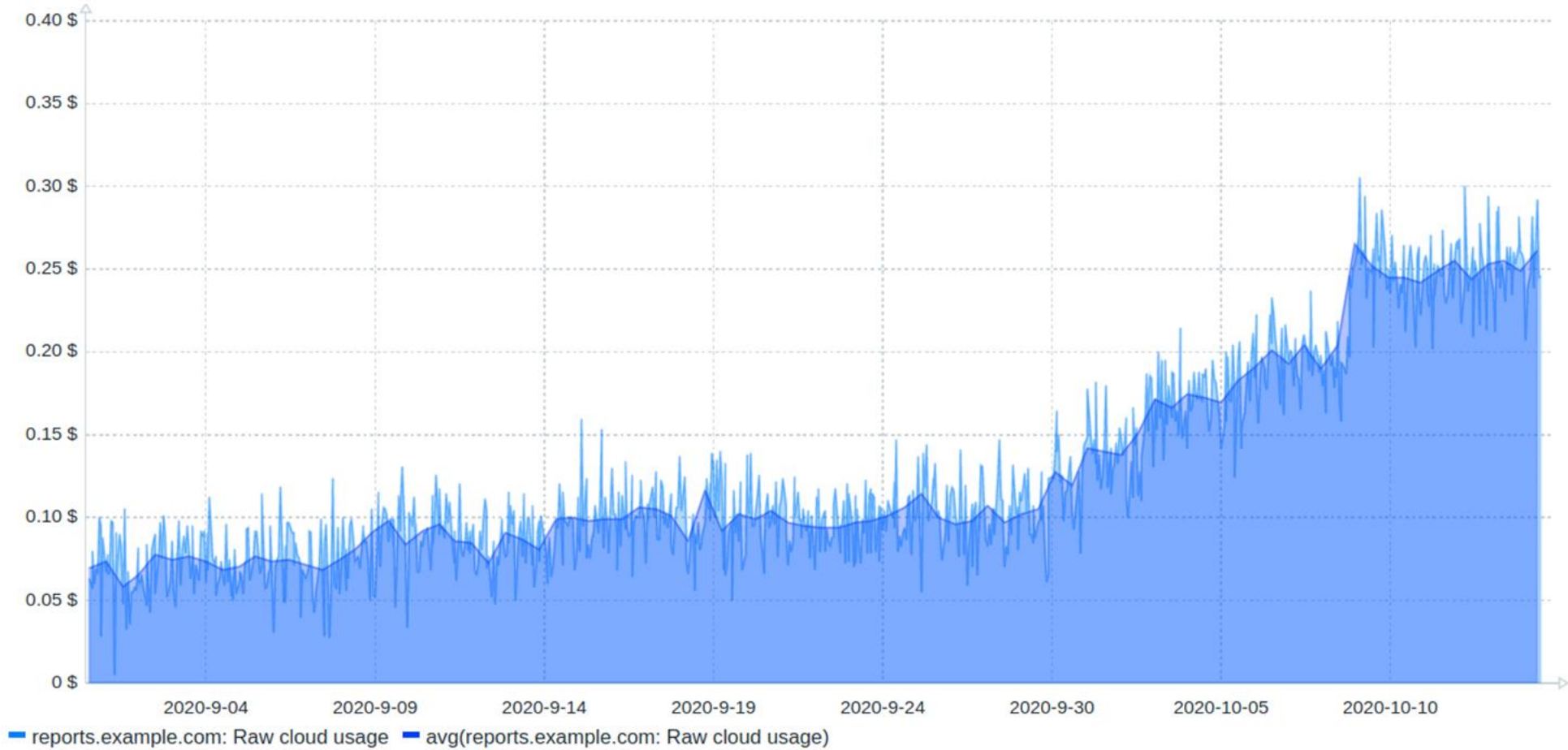
ZABBIX 5.2 - NEW FUNCTIONS

Problems

Time ▼	Info	Host	Problem • Severity
15:14:17	•	<u>shop.example.com</u>	<u>Abnormal traffic on shop.example.com, exceeded by</u> <u>14.851131675138941%</u>

CLOUD BUDGET MONITORING

Cloud usage cost (10 minute interval)

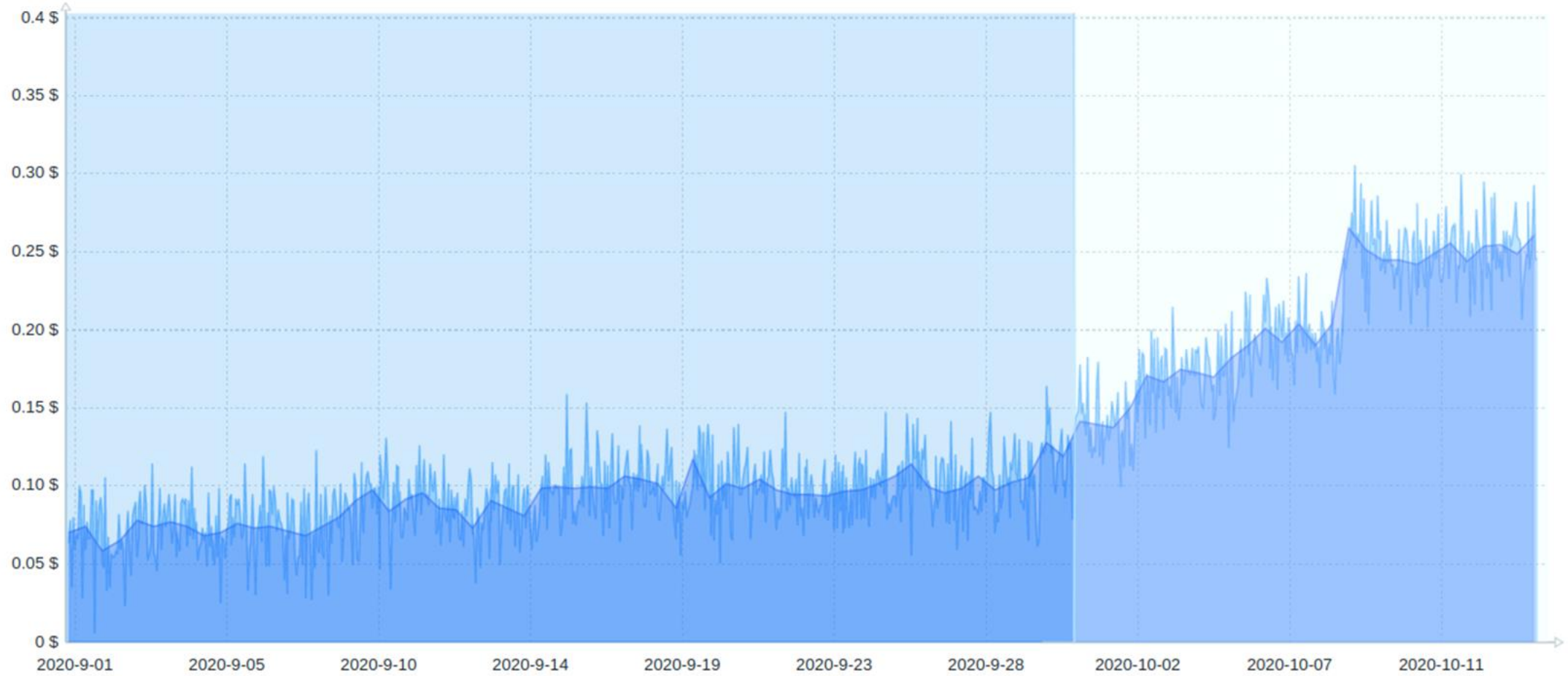


CLOUD BUDGET MONITORING

- Set period_shift to future to calculate current month
 - trendsum(1M,now/M+1M)
- Use calculated items to calculate current periods

CLOUD BUDGET MONITORING

Cloud usage cost (10 minute interval)



CLOUD BUDGET MONITORING

Items

[All hosts](#) / [reports.example.com](#) Enabled ZBX SNMP JMX IPMI Applications 2 Items 3 Triggers 1

Item

Preprocessing

*

Name

Current cloud monthly cost

Type

Calculated

*

Key

current.monthly.cost

*

Formula

trendsum("report.data", 1M, now/M+1M)

Type of information

Numeric (float)

Units

\$

*

Update interval

1d

CLOUD BUDGET MONITORING



[All hosts](#) / [reports.example.com](#) Enabled ZBX SNMP JMX IPMI Applications 2 Items 3 Triggers 1 Graphs

Trigger

Tags

Dependencies

*

Name

Monthly cloud budget exceeded

Event name

Monthly cloud budget exceeded on {HOST.HOST} by \${{?{{HOST.HOST}}:current.monthly.cost.last()}} - {{\$MONTHLY_BUDGET}}.fmtnum(2)}

Operational data

Severity

Not classified

Information

Warning

Average

High

Disaster

*

Expression

{reports.example.com:current.monthly.cost.last()} > {{\$MONTHLY_BUDGET}}

USE CASES

- Use trend functions for IT metrics and non-IT KPIs
- Real world applications:
 - Business performance
 - Sales and marketing
 - Warehousing
 - Human resources
 - Customer support

IN A NUTSHELL

- Analyze history without storing historical data
- Calendar hours days, weeks, months, years
- Trigger field Event name – events with context
- New formatting functions
- Long term data analysis better with Zabbix 5.2



Thank You!