Zabbix supports Ops
Clever use of Event Tags in Remote Commands

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www.intellitrend.de
Simple Use Case
Basic Remote Action

- Monitoring
  - Webserver availability
  - Certificate validity

- Webserver

- Remote Command
  - Restart Webserver
Simple Use Case
Basic Item/Trigger Configuration

### Items

<table>
<thead>
<tr>
<th>Name</th>
<th>Triggers</th>
<th>Key</th>
<th>Interval</th>
<th>History</th>
<th>Trends</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTPS certificate valid</td>
<td>Triggers 1</td>
<td>certificate.isvalid(&quot;-h&quot;,&quot;{HOST.CONN}&quot;)</td>
<td>1m</td>
<td>1w</td>
<td>365d</td>
</tr>
<tr>
<td>HTTPS service is running</td>
<td>Triggers 1</td>
<td>net.tcp.service[https]</td>
<td>1m</td>
<td>1w</td>
<td>365d</td>
</tr>
</tbody>
</table>

### Trigger

<table>
<thead>
<tr>
<th>Severity</th>
<th>Name</th>
<th>Operational data</th>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>HTTPS certificate is invalid on {HOST.NAME}</td>
<td>{IntelliTrend App HTTPS Service.certificate.isvalid(&quot;-h&quot;,&quot;{HOST.CONN}&quot;).max(#3)}=0</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>HTTPS service is down on {HOST.NAME}</td>
<td>{IntelliTrend App HTTPS Service.net.tcp.service[https].max(#3)}=0</td>
<td></td>
</tr>
</tbody>
</table>
Simple Use Case
Basic Action Configuration

Action

<table>
<thead>
<tr>
<th>Action</th>
<th>Operations</th>
<th>Recovery operations</th>
<th>Update operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td>Restart Webserver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of calculation</td>
<td>And/Or ▼ A or B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conditions

<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Trigger equals <strong>IntelliTrend App HTTPS Service: HTTPS certificate is invalid on IntelliTrend App HTTPS Service</strong></td>
</tr>
<tr>
<td>B</td>
<td>Trigger equals <strong>IntelliTrend App HTTPS Service: HTTPS service is down on IntelliTrend App HTTPS Service</strong></td>
</tr>
</tbody>
</table>

Condition filtered by trigger
Simple Use Case
Basic Action Configuration

Command is specific to app
How to manage different types of webservers and techniques?
Simple Use Case
Mix of different types and techniques

- Webserver availability
- Certificate validity

Items and trigger can be the same
Basic Use Case
Mix of different types and techniques

- Webserver
  - Debian/Apache2
- Webserver
  - Debian/Nginx
- Docker
  - MyWebContainer
- Kubernetes
  - MyWebService

Remote Command
- Restart Webserver

But, how do Remote Commands look like?
Basic Use Case
Mix of different types and techniques

- Webserver
  - Debian/Apache2
  - Debian/Nginx
  - RHEL/Apache2

- Docker
  - MyWebContainer

- Kubernetes
  - MyWebService

Remote Command
- Restart Webserver

Remote Commands differ...
- systemctl restart apache2
- systemctl restart httpd.service
- service httpd restart
- systemctl restart nginx
- service nginx reload
- kubectl scale deployment <myWebDeployment> --replicas=0
- kubectl scale deployment <myWebDeployment> --replicas=1
Simple Use Case
Mix of different types and techniques

The challenge

- How can we still use Templates to define items and trigger and separate actions to execute the proper Remote Command?
- How can we pass additional specific information to the Remote Command?
Simple Use Case
Help with Event Tags

What are Event Tags and how can they help?
Event Tags

Quick overview

In Zabbix 3.2, Event Tags were introduced on trigger level. In Zabbix 4.2, Event Tag support was added on host and template level.

Event Tags allow to:
- ... identify problems in a log file and close them separately.
- ... see Event Tag information in the frontend.
- ... use information extracted from item value as tag value.
- ... identify problems better in notifications.
- ... simplify configuration tasks by using tags on the template level.
- ... create triggers with tags from low-level discovery (LLD).
- ... automatically close problems using global event correlation.
- ... filter Actions and provide Event Tag macros in actions.
### Event Tags

#### Examples

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Tags</th>
<th>Dependencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trigger tags</strong></td>
<td>Inherited and trigger tags</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Value</td>
<td>Action</td>
</tr>
<tr>
<td>Service</td>
<td>Webserver</td>
<td>Remove</td>
</tr>
<tr>
<td><strong>Add</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Update</td>
<td>Clone</td>
<td>Delete</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Host</th>
<th>Templates</th>
<th>IPMI</th>
<th>Tags</th>
<th>Macros</th>
<th>Inventory</th>
<th>Encryption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Value</td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC</td>
<td>On</td>
<td>Remove</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Add</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Update</td>
<td>Clone</td>
<td>Full clone</td>
<td>Delete</td>
<td>Cancel</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Event tag on trigger level**

**Event tag on host level**

**Event tag in problem view**
Simple Use Case
Design and Implementation

- Define Event Tags on host level to enable / select actions.
- Define Macros on host level to use the proper service name and mechanism in the Remote Commands.
- Use Event Tags as a filter condition in Zabbix Actions.
Design and Implementation
Host Macros and Tags

Host based macros

<table>
<thead>
<tr>
<th>Macro</th>
<th>Value</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SERVICE$MGRT</td>
<td>systemctl</td>
<td>used in actions</td>
<td>Remove</td>
</tr>
<tr>
<td>$WEB$SERVER</td>
<td>apache2</td>
<td>used in actions</td>
<td>Remove</td>
</tr>
</tbody>
</table>

Host based tags

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC</td>
<td>On</td>
<td>Remove</td>
</tr>
<tr>
<td>Service</td>
<td>Webserver</td>
<td>Remove</td>
</tr>
</tbody>
</table>
## Design and Implementation

### Action Conditions

**Name**: Restart Webserver ET

**Type of calculation**: And [A and B]

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Label</th>
<th>Name</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Value of tag Service contains Webserver</td>
<td>Remove</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Value of tag RC contains On</td>
<td>Remove</td>
<td></td>
</tr>
</tbody>
</table>
Design and Implementation

Action Command

Target = C-Host
# Design and Implementation

## Problem View

### Problem view with Action Information

<table>
<thead>
<tr>
<th>Severity</th>
<th>Recovery time</th>
<th>Status</th>
<th>Info</th>
<th>Host</th>
<th>Problem</th>
<th>Duration</th>
<th>Ack</th>
<th>Actions</th>
<th>Tags</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td></td>
<td>www1.intellitrend.de</td>
<td></td>
<td>HTTPS certificate is invalid on www1.intellitrend.de</td>
<td>24s</td>
<td>No</td>
<td></td>
<td>Service: Webserver</td>
</tr>
</tbody>
</table>

### Corresponding Action Log

<table>
<thead>
<tr>
<th>Action</th>
<th>Type</th>
<th>Recipient</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restart Webserver ET</td>
<td></td>
<td></td>
<td>Command:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>www1.intellitrend.de: if &quot;systemctl&quot; == &quot;systemctl&quot; then \</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>logger &quot;Zabbix Action restarting apache2 for Service Webserver&quot;; \</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>systemctl restart apache2 \</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>if [ &quot;systemctl&quot; == &quot;service&quot; ]; then \</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>logger &quot;Zabbix Action restarting apache2 for Service Webserver&quot;; \</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>service apache2 restart \</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Status: Executed
What about a service on Kubernetes?
### Design and Implementation

**Host Macros and Tags**

#### Host based macros

<table>
<thead>
<tr>
<th>Macro</th>
<th>Value</th>
<th>Description</th>
<th>Remove</th>
</tr>
</thead>
<tbody>
<tr>
<td>$DEPLOYMENT</td>
<td>nginx-deployment</td>
<td>used in actions</td>
<td></td>
</tr>
</tbody>
</table>

#### Host based tags

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kubernetes</td>
<td>value</td>
<td>Remove</td>
</tr>
<tr>
<td>RC</td>
<td>On</td>
<td>Remove</td>
</tr>
<tr>
<td>Service</td>
<td>Webserver</td>
<td>Remove</td>
</tr>
</tbody>
</table>
# Design and Implementation

## Action Conditions

<table>
<thead>
<tr>
<th>Action</th>
<th>Operations</th>
<th>Recovery operations</th>
<th>Update operations</th>
</tr>
</thead>
</table>

### Update previous Action conditions

- **Name**: Restart Webserver ET
- **Type of calculation**: And (A and B) and C
- **Conditions**:
  - **Label**: A, **Name**: Value of tag Service contains Webserver, **Action**: Remove
  - **Label**: B, **Name**: Value of tag RC contains On, **Action**: Remove
  - **Label**: C, **Name**: Tag name does not contain Kubernetes, **Action**: Remove

### Add new Action

- **Name**: Restart Webserver Kubernetes
- **Type of calculation**: And (A and B) and C
- **Conditions**:
  - **Label**: A, **Name**: Value of tag Service contains Webserver, **Action**: Remove
  - **Label**: B, **Name**: Value of tag RC contains On, **Action**: Remove
  - **Label**: C, **Name**: Tag name contains Kubernetes, **Action**: Remove
Design and Implementation
Action Command

Target = K-Manager
Design and Implementation

Problem View

Problem view with Action Information

<table>
<thead>
<tr>
<th>Severity</th>
<th>Recovery time</th>
<th>Status</th>
<th>Info</th>
<th>Host</th>
<th>Problem</th>
<th>Duration</th>
<th>Ack</th>
<th>Actions</th>
<th>Tags</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td>PROBLEM</td>
<td>www2.intellitrend.de</td>
<td>HTTPS certificate is invalid on www2.intellitrend.de</td>
<td>16s</td>
<td>No</td>
<td></td>
<td>Kubernetes</td>
<td></td>
</tr>
</tbody>
</table>

Corresponding Action Log

<table>
<thead>
<tr>
<th>Action</th>
<th>Type</th>
<th>Recipient</th>
<th>Message</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restart Webserver Kubernetes</td>
<td>Command</td>
<td></td>
<td>Command: Kubernetes Manager: logger &quot;Zabbix Action restarting kubernetes deployment nginx-deployment&quot;, \</td>
<td>Executed</td>
</tr>
<tr>
<td>1. kubectl scale deployment nginx-deployment --replicas=0 &amp; &amp;</td>
<td></td>
<td></td>
<td>2. kubectl scale deployment nginx-deployment --replicas=1</td>
<td></td>
</tr>
</tbody>
</table>
Clever use of Event Tags in Remote Commands

Can we do better?
Advanced use of Remote Commands Using a Taskrunner

Execute Remote Commands through a Taskrunner by Zabbix

Zabbix Action
Remote Command

Taskrunner

Remote Host
Command 1
Command 2
... 
Command n
Advanced use of Remote Commands

Easier Integration

Advantages

✔ Soft migration from standard Ops actions to Zabbix Remote Commands.
✔ Easier overall maintenance of Actions, no duplicated sets of commands.
✔ Less error prone definition of Remote Commands.
✔ Easier testing of Zabbix Remote Commands.
✔ Preserved output from executed remote actions.
✔ Central location for access credentials and keys.
Advanced use of Remote Commands
Simplified Actions with Taskrunner

Zabbix Trigger A

Zabbix Trigger B

Zabbix Trigger ...

Zabbix Action

Middleware
Extracts Macros and Event Tags

Middleware
Ack. Event via Zabbix-API

Execute Task via Taskrunner-API

Zabbix Acknowledges
Zabbix supports Ops
Clever use of Event Tags in Remote Commands

Thank You!

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