Zabbix meets Ops / Rundeck

Integrate Zabbix trigger based actions into a taskrunner like rundeck

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Customer ticketsystem uses a “search service”. When the search service fails:

- Login to server running the search service.
- Remove corrupt indices.
- Rebuild search indices.

We use Zabbix for monitoring the search service :-)

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Zabbix meet Ops / Rundeck

Typical scenario

Zabbix alerts

Problem start

Zabbix: fire trigger

Zabbix: send email (create ticket)

Ops Team: run default action

Opt: Acknowledge triggered event in zabbix

Problem persists?

Ops Team: escalate
Zabbix meet Ops / Rundeck
Advanced Scenario

Zabbix alerts and executes a command

Problem start

Zabbix: fire trigger

Zabbix: send email (create ticket)

Zabbix: execute remote command

Opt: Acknowledge triggered event in zabbix

Problem persists?

Zabbix: escalate
Zabbix meet Ops / Rundeck
Reaction on trigger based event

Zabbix action / Ops action

- Commands are similar / identical
- Command execution requires a valid user account on target system

If default action will not solve the problem, command output from default action would be helpful for further escalation.
Different ways to react:

Non standard tasks - Direct access:

![Command 1
Command 2
... Command n]

Default / frequent tasks - Taskrunner:

![Taskrunner]
What is a taskrunner?
Zabbix meet Ops / Rundeck

What is a taskrunner

- Executes commands on remote hosts.
- Defines jobs as a reusable sequences of commands.
- Provides central storage of credentials / keys.
- Preserves output from executed commands.
- Maintains a history of job executions.
- Separates access to job executions from direct access to remote hosts.
Zabbix meet Ops / Rundeck
What is a taskrunner

Executing a task through “Rundeck” (http://rundeck.org)
Zabbix meet Ops / Rundeck
Taskrunner Rundeck – Job definition

**Rebuild ticketsystem search indices**

Ticketsystem uses elastic search. Sometimes internal marvel indices lead to failure. To fix this, those indices must be removed and the ticketsystem indice must be rebuilt.

### Prepare and Run...

**Definition**

**Steps:**
1. `sudo /etc/init.d/elasticsearch stop
   Stop elastic search service`
2. `sudo rm -r /var/lib/elasticsearch/elasticsearch/nodes/0/indices/.marvel-2*
   Remove marvel indices`
3. `sudo /etc/init.d/elasticsearch start
   Start elasticsearch service`
   Rebuild search index in ticketsystem`

If a step fails: Stop at the failed step.
Strategy: Execute all steps on a node before proceeding to the next node.

**Nodes:**
Include nodes matching: `name:iscsrv`
Execute on up to 1 Node at a time.
If a node fails: Continue running on any remaining nodes before failing the step.
Sort nodes by name in ascending order.
Node selection: Target nodes are selected by default
Zabbix meet Ops / Rundeck
Taskrunner Rundeck – Job result

Succeeded after 1m 49s at Tue 7:14 pm started at Tue 7:12 pm by zabbix 0.01:49

---

**Summary**

<table>
<thead>
<tr>
<th>Node Summary</th>
<th>COMPLETE</th>
<th>FAILED</th>
<th>INCOMPLETE</th>
<th>NOT STARTED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Node</th>
<th>Start time</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>iscrv</td>
<td>7:12:50 pm</td>
<td>0.00:02</td>
</tr>
<tr>
<td></td>
<td>7:12:52 pm</td>
<td>0.00:01</td>
</tr>
<tr>
<td></td>
<td>7:12:54 pm</td>
<td>0.00:01</td>
</tr>
<tr>
<td></td>
<td>7:12:55 pm</td>
<td>0.01:43</td>
</tr>
</tbody>
</table>
Zabbix meet Ops / Rundeck
Taskrunner Rundeck – Log output

Succeeded after 1m 49s at Tue 7:14 pm started at Tue 7:12 pm by zabbix ☑ 0.01:49

**Summary**

- 1. Stop elasticsearch service
- 3. Start elasticsearch service
- 4. Rebuild search index in ticketsystem

**Log Output**

- Stopping Elasticsearch Server
  ...done.
- Starting Elasticsearch Server
  ...done.
- Started rebuilding index...
- PHP Warning: Illegal string offset 'data' in
- PHP Warning: Illegal string offset 'name' in
- PHP Warning: Illegal string offset 'fileId' in

Indexation

- wiki page: 81
- forum post: 0
- forum: 0
- blog post: 0
- article: 0
- file: 7
- file gallery: 4
- trackeritem: 1070
Activity for this Job

- Execution Id
- Date, Duration
- Who executed
- Command output available
Zabbix meet Ops / Rundeck
Execute via taskrunner

Execute job through taskrunner by Ops

- Ops Team selects host on taskrunner.
- Ops Team selects job on taskrunner.
- Ops Team executes job on taskrunner.

- Taskrunner executes pre defined set of commands against target host(s).
- Taskrunner preserves result state and output of executed commands.

Remote Host

Command 1
Command 2
...
Command n
Zabbix meet Ops / Rundeck
Execute via taskrunner

Execute job through taskrunner by Zabbix

- **Zabbix** selects host on taskrunner.
- **Zabbix** selects job on taskrunner.
- **Zabbix** executes job through taskrunner.

- Taskrunner executes pre defined set of commands against target host(s).
- Taskrunner preserves result state and output of executed commands.

Remote Host

Command 1
Command 2
...
Command n
Integration
Zabbix <-> Rundeck
Zabbix meet Ops / Rundeck
Integration Zabbix - Rundeck

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.
Zabbix meet Ops / Rundeck Integration Zabbix - Rundeck

Requirements

- Map Zabbix host to Rundeck nodes.
- Map Zabbix trigger names to Rundeck job names.
- On trigger event, pass related host and trigger from Zabbix to Rundeck.
- Bonus: Return job execution status from Rundeck as an event acknowledgment in Zabbix.
Zabbix meet Ops / Rundeck
Integration Zabbix - Rundeck

- Zabbix hosts -
- Map hosts to nodes -
  - Zabbix API -

- Zabbix triggers -
- Map triggers to jobs -
  - Zabbix Action -

- Zabbix event -
- Zabbix action calls rundeck job -
  - Rundeck API -

- Rundeck nodes -
- Rundeck jobs -
- Rundeck execution -

Bonus: Rundeck acknowledges event in Zabbix
Zabbix meet Ops / Rundeck
Integration Zabbix - Rundeck

Hosts and Hostgroups
Integration
Zabbix meet Ops / Rundeck
Integration Zabbix – Rundeck: Hosts

Zabbix as node(host) provider for Rundeck

Rundeck calls middleware as a node provider

Get hosts, hostgroups, interfaces and meta information from Zabbix

```
{
  "nodename": "iscsrv",
  "hostname": "172.20.20.21",
  "username": "serveradmin",
  "tags": "Isc Hosts,PP Servers",
  "editUrl": "http:\/\/172.20.20.161\/
zabbix\(/
  "description": "Isc Support Server",
  "osName": "Linux",
  "osFamily": "unix",
  "contact": "Wolfgang Alper",
  "location": "RZ Bielefeld Rack2"
}
```
Zabbix meet Ops / Rundeck
Integration Zabbix - Rundeck

Trigger and Action
Integration
Zabbix meet Ops / Rundeck Integration Zabbix – Rundeck: Trigger

Execute Rundeck job from Zabbix - simple

Action A:

<table>
<thead>
<tr>
<th>Conditions</th>
<th>LABEL</th>
<th>NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>Maintenance status not in <em>maintenance</em></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Trigger value = <em>PROBLEM</em></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Trigger name like [RD]Ticketsystem search service down on</td>
</tr>
</tbody>
</table>

Action B:

<table>
<thead>
<tr>
<th>Conditions</th>
<th>LABEL</th>
<th>NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<tr>
<td>B</td>
<td></td>
<td>Trigger value = <em>PROBLEM</em></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>Trigger name like [RD]Http Service down on</td>
</tr>
</tbody>
</table>
Zabbix meet Ops / Rundeck
Integration Zabbix – Rundeck: Trigger

Execute Rundeck job from Zabbix - simple

Zabbix Trigger
Select specific Zabbix action by trigger name

Zabbix Action calls Rundeck API
Call Rundeck API with hardcoded jobname in action

Rundeck-API

Action A:

Commands
```
rdcommand "Zabbix_Action_Manager"
"Rebuild_ticketsystem_search_indices" "
{HOST.HOST}" {EVENT.ID}
```

Action B:

Commands
```
rdcommand "Zabbix_Action_Manager"
"Restart_Http_service" "{HOST.HOST}" {EVENT.ID}
```
Zabbix meet Ops / Rundeck
Integration Zabbix – Rundeck: Trigger

- Zabbix Trigger A
- Zabbix Action A

- Zabbix Trigger B
- Zabbix Action B

- Zabbix Trigger C
- Zabbix Action C

- Zabbix Trigger ...
- Zabbix Action ...

✓ Simple implementation

Each trigger requires its own Zabbix action
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Integration Zabbix - Rundeck

Trigger and Action Integration
We can do better ;-)

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Zabbix meet Ops / Rundeck Integration Zabbix – Rundeck: Trigger

Execute Rundeck job from Zabbix - advanced

Zabbix Trigger

Select default Rundeck Zabbix action and pass trigger description

Zabbix Action calls middleware

Zabbix actions call Rundeck API through middleware

Rundeck-API

Name: [RD]Ticketsystem search service down on {HOST.NAME}

Expression: 

{tpl-ticketsystem:searchservice.status.min(#3)}=0

Expression constructor

s generation

Description: [RD:Rebuild_ticketsystem_search_indices]

Ticketsystem uses elastic search.
Zabbix meet Ops / Rundeck
Integration Zabbix – Rundeck: Trigger

Execute Rundeck job from Zabbix - advanced

- **Zabbix Trigger**
  - Select default Rundeck Zabbix action and pass trigger description

- **Zabbix Action calls middleware**
  - Zabbix actions call Rundeck API through middleware

- **Rundeck-API**

<table>
<thead>
<tr>
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<th>LABEL</th>
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<td>B</td>
<td></td>
<td>Trigger value = <em>PROBLEM</em></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Trigger name like [RD]</td>
</tr>
</tbody>
</table>

- **Type**: Custom script
- **Execute on**: Zabbix agent, Zabbix server
- **Commands**:
  ```
  zab2rd "Zabbix_Action_Manager" "
  {TRIGGER.DESCRIPTION}" "{HOST.HOST}"
  {EVENT.ID}
  ```
Zabbix meet Ops / Rundeck
Integration Zabbix – Rundeck: Trigger

Middleware extracts job name from trigger desc.

Zabbix Trigger A
Zabbix Trigger B
Zabbix Trigger C
Zabbix Trigger ...

Zabbix Action RD

Rundeck-API

All trigger share one Zabbix action
Zabbix meet Ops / Rundeck
Integration Zabbix – Rundeck

Summary

To execute a rundeck job form a zabbix trigger event:

- Add “[RD]” to trigger name (optional).
- Add “[RD:<Rundeck-Job-Name>]” to trigger description.
- Done :-)

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Zabbix meet Ops / Rundeck
Integration Zabbix - Rundeck

Bonus:
Automatic acknowledgment through executed tasks
Zabbix meet Ops / Rundeck
Automatic acknowledgment

To consider

- Remote actions can take longer than a few seconds, however Ops team should “see” that there is a remote action and the initial state.
- Ops Team should “see” the current execution ID of the job or get a http link to it.
- Zabbix event should show the acknowledge as the user “rundeck”.

Overall – Acknowledgment from Rundeck jobs give more transparency of what is going on.
Zabbix meet Ops / Rundeck
Automatic acknowledgment - Design

Zabbix Trigger A

Zabbix Trigger B

Zabbix Trigger C

Zabbix Trigger ...

Zabbix Action RD

+Pass event ID

+Get job execution ID from Rundeck API

Middleware extracts job name from trigger desc.

Rundeck-API

+Middleware Ack. event via Zabbix API

Zabbix Acknowledges

+API User “rundeck”
Zabbix meet Ops / Rundeck
Automatic acknowledgment - Result

Zabbix Event:

[RD] Ticketsystem search service down on iscsrv

PROBLEM High 7m 54s Yes 1 1

Zabbix event info: Remote action

Command actions

<table>
<thead>
<tr>
<th>STEP</th>
<th>TIME</th>
<th>STATUS</th>
<th>COMMAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2016-08-21</td>
<td>Executed</td>
<td>:zab2rd &quot;Zabbix_Action_Manager&quot; &quot; [RD:Rebuild_ticketsystem_search_indices] &quot;iscsrv&quot; 1354</td>
</tr>
</tbody>
</table>

Zabbix event info: Acknowledgment info with link to rundeck job execution

Acknowledges

<table>
<thead>
<tr>
<th>TIME</th>
<th>USER</th>
<th>MESSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-08-21</td>
<td>rundeck</td>
<td>Rundeck-Execution id:253, status:succeeded, host:iscsrv, job:Rebuild_ticketsystem_search_indices, project:Zabbix_Action_Manager</td>
</tr>
<tr>
<td>23:18:26</td>
<td>(Rundeck)</td>
<td>Info: <a href="http://172.20.20.80:4440/project/Zabbix_Action_Manager/execution/show/253">http://172.20.20.80:4440/project/Zabbix_Action_Manager/execution/show/253</a></td>
</tr>
</tbody>
</table>
Zabbix meets Ops / Rundeck

Thank You!