



redhat.

Ansible, the missing piece

Managing agents and orchestrating
remediation

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- Introduction
- What is Ansible and Ansible Tower
- Using Zabbix as an inventory source
- Remediation of issues discovered by Zabbix

whoami

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Member of the Zabbix community for more than
15 years

Author of ZBXAPI, first ever Zabbix API library.

Maintainer of the original Zabbix bot in #zabbix
(now back online)

Linux user since 1996



Ansible and Ansible Tower

Ansible

- Tool for agentless orchestration and configuration management
 - Clients need to have at least Python 2.6
 - Default access method is via SSH
- Design is functional in nature.
- Playbooks use a yaml format which provide the parameters for modules
- Core libraries are written in Ansible, but modules can be written in any language.
- Leverages the Jinja2 templating engine

Ansible Tower

- Web based fronted to Ansible
 - Provides a separation of permissions via a Role Based Access Control model. User may have permissions to run a privileged playbook, but will not have permission to view privileged credentials.
 - Ability to go back in time and review playbook runs
 - Provides a REST API interface
- Upstream project is AWX
 - <https://github.com/ansible/awx>

A *brief* introduction to Ansible

Following snippet will add a welcome message when logging in.

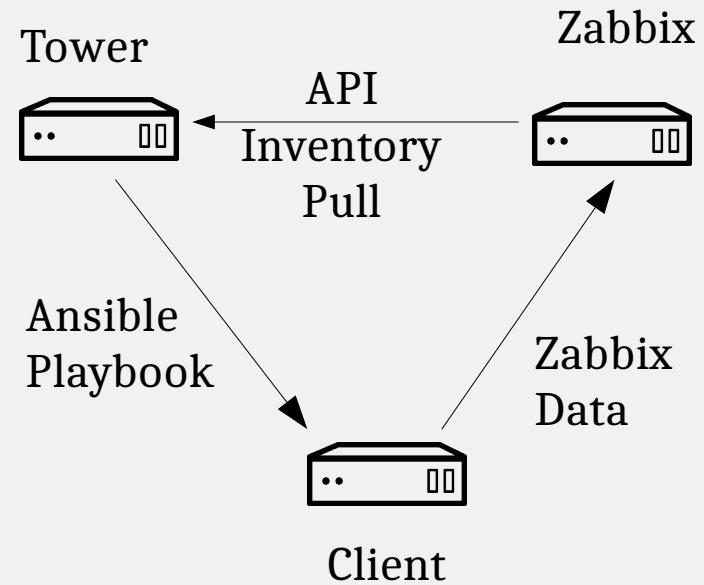
```
---
- hosts: all
  become: true

  tasks:
  - name: Change /etc/issue message
    copy:
      contents: "Hello Ansible world!"
      dest: /etc/issue
      perms: 0444
      owner: root
      seuser: system_u
      serole: object_r
      setype: etc_t
```

Using Zabbix as an Inventory Source

The Need

- Zabbix lacks agent configuration management.
- Configure Zabbix agents when hosts are added to Zabbix.
- Deploy additional client configurations if required by specific templates.



The Components

- Ansible provides a capability for dynamic inventories
- Scripting already exists for Ansible Core to use Zabbix as an inventory source
- Script requires modification to run in the current version of Tower.
 - Tower runs scripts in a dynamic /tmp directory, script needs the full path to it's credential ini file.
- Groups and host names in Zabbix can contain spaces, this may cause challenges in Ansible

The Approach

- Create repository for Zabbix playbooks

The screenshot shows a GitLab repository interface for a project named 'zabconf'. The repository has 0 stars and 0 forks. It contains 34 commits across 1 branch and 0 tags. The last commit was made by 'tower' a day ago, with the commit hash being 53483a62. The repository structure includes a 'screenshots' folder, a 'library' folder containing 'zabbix_api' files, a 'pictures' folder, a 'roles' folder, a '.gitignore' file, a 'Presentation.odp' file, a 'playbook-remediate-squid.yml' file, and a 'playbook-templates.yml' file. The 'library' file has a 'syntax error' note. The 'playbook-templates.yml' file notes 'library tested, added to playbook'.

| Name | Last commit | Last Update |
|------------------------------|---------------------------------------------------------|-------------|
| library | added zabbix_api | 2 days ago |
| pictures | screenshots | a day ago |
| roles | syntax error | 2 days ago |
| .gitignore | library tested, added to playbook | 2 days ago |
| Presentation.odp | screenshots | a day ago |
| playbook-remediate-squid.yml | changed default message | 2 days ago |
| playbook-templates.yml | split agent and template configs into their own play... | 2 days ago |

The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent

```
- hosts: all
  become: true

  roles:
    - zabbix_agent
```

The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent

```
- hosts: templ_Template_Squid  
become: true
```

```
roles:
```

```
- zabbix_squid
```

The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent
- Add project to Ansible Tower for playbooks

The screenshot shows the Ansible Tower web interface. At the top, there are navigation links: TOWER, PROJECTS, INVENTORIES, TEMPLATES, and JOBS. On the far right, there is a user icon labeled 'admin' and several small icons for settings and system management.

The main area is titled 'PROJECTS / zabbix-ansible'. Below this, a project named 'zabbix-ansible' is displayed. The 'DETAILS' tab is selected, showing the following fields:

- NAME:** zabbix-ansible
- DESCRIPTION:** (empty)
- ORGANIZATION:** Default
- SCM TYPE:** Git
- SCM URL:** git@gitlab.vm.mclean.red-tux.net:root/zabco
- SCM BRANCH:** (empty)
- SCM CREDENTIAL:** gitlab-ssh-key

Under 'SOURCE DETAILS', there are three checkboxes for 'SCM UPDATE OPTIONS':

- Clean
- Delete on Update
- Update on Launch

Below these options is a 'CACHE TIMEOUT (SECONDS)' input field set to 0, with up and down arrows for adjustment.

At the bottom right of the form are two buttons: 'CANCEL' and 'SAVE'.

The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent
- Add project to Ansible Tower for playbooks
- Add Zabbix inventory script to Tower

The screenshot shows the Ansible Tower interface for managing inventory scripts. The top navigation bar includes 'TOWER', 'PROJECTS', 'INVENTORIES', 'TEMPLATES', 'JOBS', and user account information ('admin'). The current page is 'SETTINGS / INVENTORY SCRIPTS / Zabbix Server'. The main form is titled 'Zabbix Server' and contains fields for 'NAME' (set to 'Zabbix Server'), 'DESCRIPTION' (empty), and 'ORGANIZATION' (set to 'Default'). Below these fields is a 'CUSTOM SCRIPT' section containing a Python script. The script is a standard Ansible inventory script for Zabbix, starting with shebang '#!/usr/bin/env python' and including copyright notices from 2017 and 2013.

```
#!/usr/bin/env python

# (c) 2017, Andrew Nelson
# (c) 2013, Greg Buehler
#
# This file is part of Ansible,
#
# Ansible is free software: you can redistribute it and/or modify
# it under the terms of the GNU General Public License as published by
# the Free Software Foundation, either version 3 of the License, or
# (at your option) any later version.
```

At the bottom right of the form are 'CANCEL' and 'SAVE' buttons.

The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent
- Add project to Ansible Tower for playbooks
- Add Zabbix inventory script to Tower
- Create Job templates for agent playbooks (2 job templates)

TEMPLATES / Zabbix Agent Configuration

Zabbix Agent Configuration

DETAILS COMPLETED JOBS PERMISSIONS NOTIFICATIONS ADD SURVEY

* NAME: Zabbix Agent Configuration
DESCRIPTION:
* JOB TYPE: Run
 Prompt on launch

* INVENTORY: Zabbix
 Prompt on launch
* PROJECT: zabbix-ansible
 Prompt on launch
* PLAYBOOK: playbook-zabbix-agent.yml

* MACHINE CREDENTIAL: Ansible User
 Prompt on launch
CLOUD CREDENTIAL:
NETWORK CREDENTIAL:

FORKS: 0
LIMIT:
 Prompt on launch
* VERBOSITY: 0 (Normal)
OPTIONS:
 Enable Privilege Escalation
 Allow Provisioning Callbacks
 Enable Concurrent Jobs

JOB TAGS:
 Prompt on launch

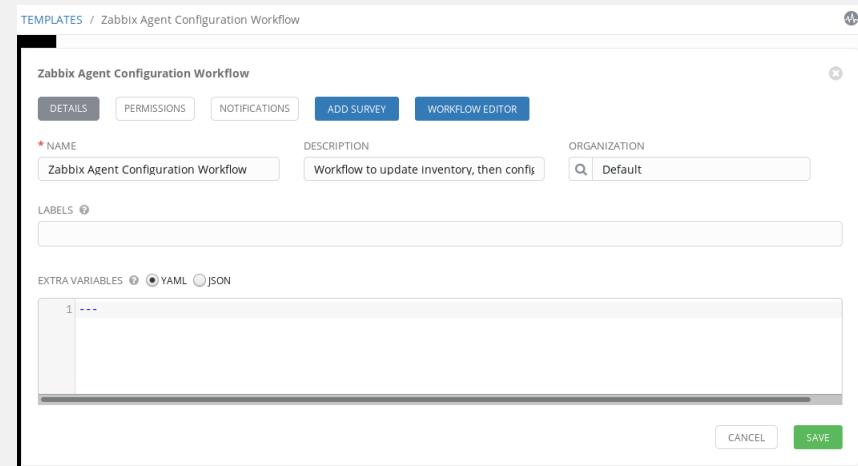
SKIP TAGS:
 Prompt on launch

LABELS:

EXTRA VARIABLES: YAML JSON
1 ...
 Prompt on launch

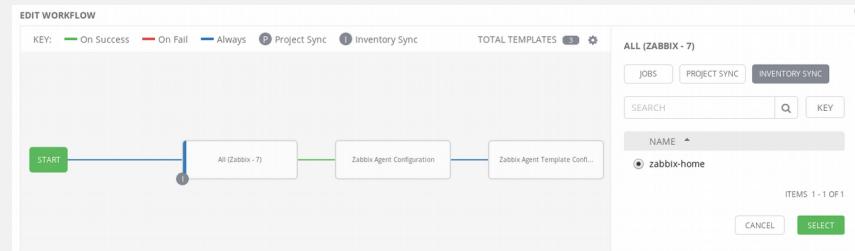
The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent
- Add project to Ansible Tower for playbooks
- Add Zabbix inventory script to Tower
- Create Job templates for agent playbooks (2 job templates)
- Create workflow job to run playbooks (Step 1 of 4)



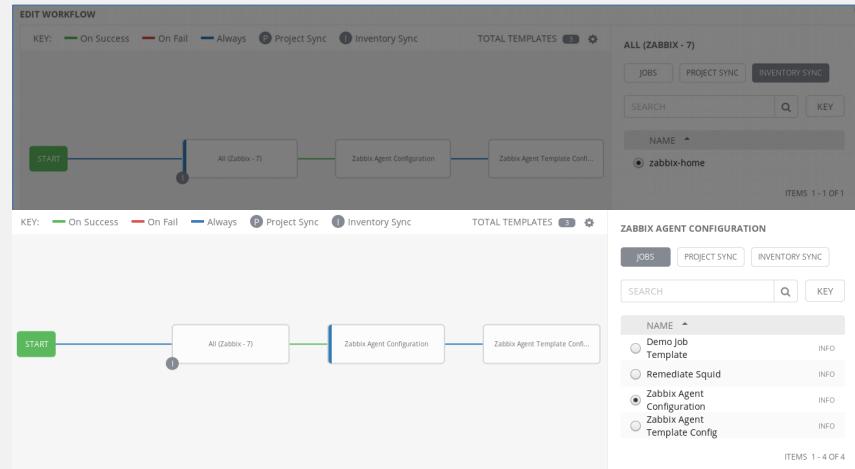
The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent
- Add project to Ansible Tower for playbooks
- Add Zabbix inventory script to Tower
- Create Job templates for agent playbooks (2 job templates)
- Create workflow job to run playbooks (Step 2 of 4)



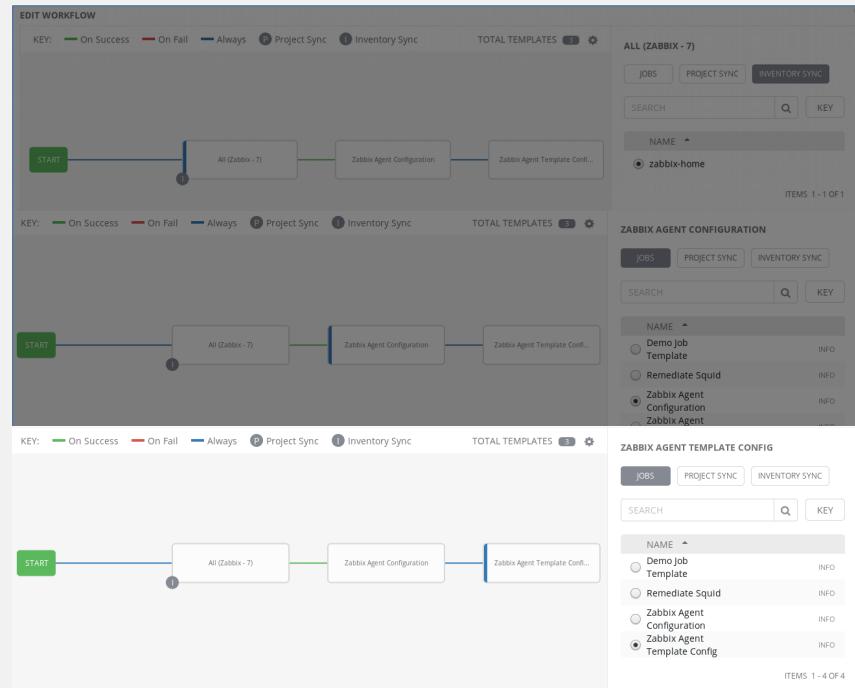
The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent
- Add project to Ansible Tower for playbooks
- Add Zabbix inventory script to Tower
- Create Job templates for agent playbooks (2 job templates)
- Create workflow job to run playbooks (Step 3 of 4)



The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent
- Add project to Ansible Tower for playbooks
- Add Zabbix inventory script to Tower
- Create Job templates for agent playbooks (2 job templates)
- Create workflow job to run playbooks (Step 4 of 4)



The Approach

- Create repository for Zabbix playbooks
- Write playbook to configure agent
- Write playbook to add template items to agent
- Add project to Ansible Tower for playbooks
- Add Zabbix inventory script to Tower
- Create Job templates for agent playbooks (2 job templates)
- Create workflow job to run playbooks
- Configure workflow job to run every hour.

TEMPLATES / Zabbix Agent Configuration Workflow / SCHEDULES / Hourly Zabbix Agent Configuration

Hourly Zabbix Agent Configuration

| | | |
|------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|
| * NAME Hourly Zabbix Agent Configuration | * START DATE 09/11/2017 | * START TIME (HH24:MM:SS) 00:00:00 |
| * LOCAL TIME ZONE America/New_York | * REPEAT FREQUENCY Hour | |
| FREQUENCY DETAILS | | |
| * EVERY 1 | HOURS | * END Never |
| SCHEDULE DESCRIPTION every hour | | |
| OCCURRENCES (Limited to first 10) DATE FORMAT <input checked="" type="radio"/> LOCAL TIME <input type="radio"/> UTC | | |
| 9/11/2017 00:00:00 EDT 9/11/2017 01:00:00 EDT 9/11/2017 02:00:00 EDT | | |

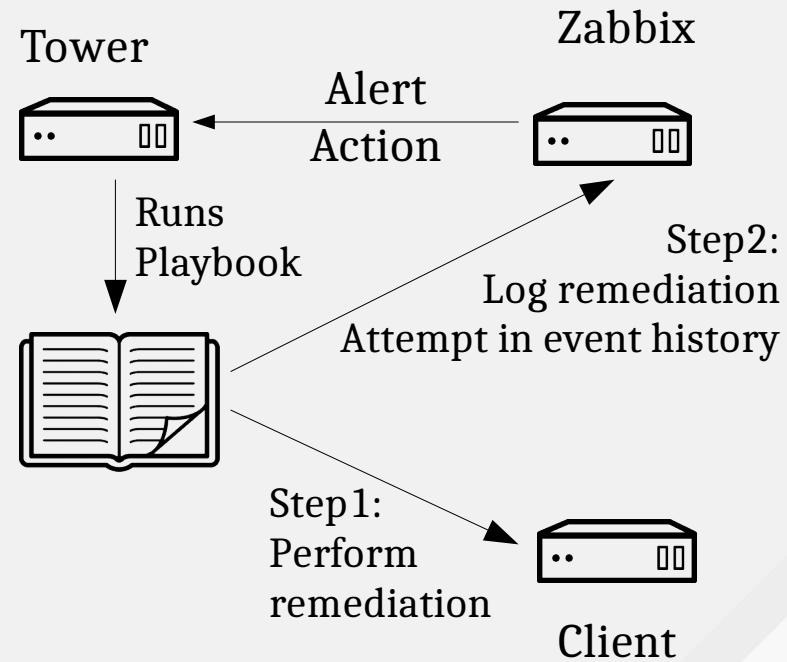
Brief Review

- Host added to Zabbix
- Agent configuration workflow runs hourly
 - Inventory updated
 - Agent configuration playbook is run
 - Playbook for template custom agent items is run
- Configuration workflow can be run at any time manually.

Automating Remediation

Remediating Issues with Tower

- Tower API can be leveraged to run playbooks from Zabbix
- tower-cli needs to be installed on Zabbix server.
- Remediation playbook will leave a message in Zabbix event history



Configuring Remediation

- Create remediation playbook
 - Custom module was required

```
---
- hosts: all
  become: true

  tasks:
    - name: Restart squid
      service:
        name: squid
        state: restarted

    - name: Acknowledge alert
      become: false
      local_action:
        module: zabbix_ack
        server_url: "{{ server_url }}"
        login_user: "{{ login_user }}"
        login_password: "{{ login_password }}"
        eventid: "{{ eventid }}"
        message: "Remediation attempted via Ansible
Playbook {{ ansible_date_time.date }}
{{ ansible_date_time.time }})"
        close_event: False
```

Configuring Remediation

- Create remediation playbook
 - Custom module was required
- Create Job template for remediation

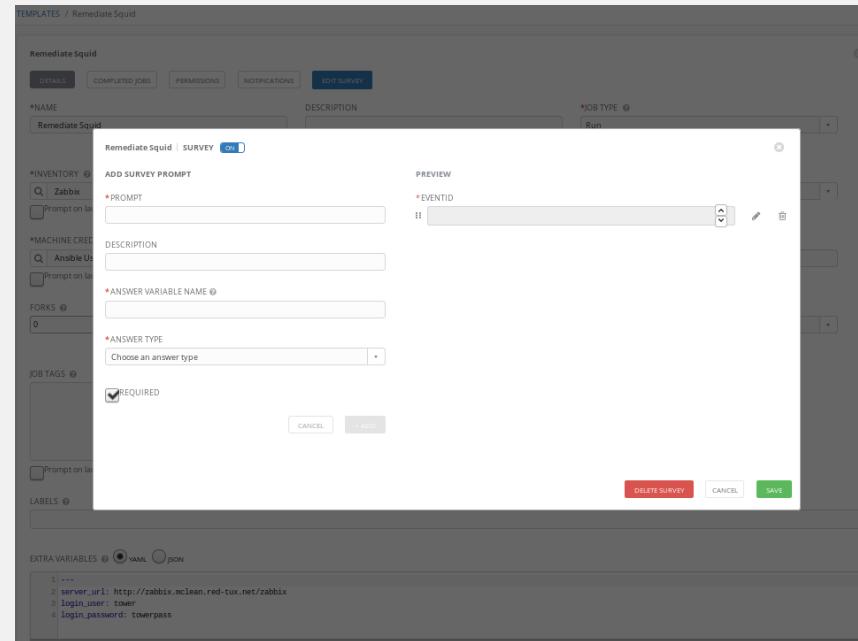
The screenshot shows the 'TEMPLATES / Remediate Squid' page in the Ansible web interface. The 'DETAILS' tab is selected. The configuration includes:

- NAME:** Remediate Squid
- DESCRIPTION:** Run
- INVENTORY:** Zabbix
- PROJECT:** zabbix-ansible
- PLAYBOOK:** playbook-remediate-squid.yml
- MACHINE CREDENTIAL:** Ansible User
- CLOUD CREDENTIAL:** (empty)
- NETWORK CREDENTIAL:** (empty)
- FORKS:** 0
- LIMIT:** (empty)
- VERBOSITY:** 0 (Normal)
- JOB TAGS:** (empty)
- SKIPTAGS:** (empty)
- OPTIONS:**
 - Enable Privilege Escalation (checkbox)
 - Allow Provisioning Callbacks (checkbox)
 - Enable Concurrent Jobs (checkbox)
- LABELS:** (empty)
- EXTRA VARIABLES:** (radio buttons for YAML or JSON)
 - YAML:

```
1 ...
2 server_url: http://zabbix.mclean.red-tux.net/zabbix
3 login_user: tower
4 login_password: towerpass
```
 - JSON: (empty)

Configuring Remediation

- Create remediation playbook
 - Custom module was required
- Create Job template for remediation
 - Ensure template requires eventid



Configuring Remediation

- Create remediation playbook
 - Custom module was required
- Create Job template for remediation
- Create Zabbix alert

The screenshot shows the Zabbix Actions configuration interface. The top navigation bar includes Host groups, Templates, Hosts, Maintenance, Actions (selected), Event correlation, Discovery, and Services. Below the navigation is a sub-header "Actions". The main content area has tabs for Action, Operations (selected), Recovery operations, and Acknowledgement operations. Under the Operations tab, there are fields for "Default operation step duration" (set to 1h) and "Default subject" (Problem: {TRIGGER.NAME}). A "Default message" box contains a template message with placeholders like {EVENT.TIME}, {EVENT.DATE}, {TRIGGER.NAME}, {HOST.NAME}, {TRIGGER.SEVERITY}, {EVENT.ID}, and {TRIGGER.URL}. A checkbox for "Pause operations while in maintenance" is checked. Below this is a table for "Operations" with one step: "Run remote commands on current host". The table columns are Steps, Details, Start in, Duration, and Action. Buttons at the bottom include Update, Clone, Delete, and Cancel. The footer of the page indicates "Zabbix 3.4.0. © 2001–2017, Zabbix SIA".

Configuring Remediation

- Create remediation playbook
 - Custom module was required
- Create Job template for remediation
- Create Zabbix alert
 - Make sure “tower-cli” is installed on Zabbix server

Operation details

Steps - (0 - infinitely)

Step duration (0 - use action default)

Operation type

Target list

| Target | Action |
|---------------------|------------------------|
| Current host | Remove |
| New | |

Type

Execute on Zabbix agent Zabbix server (proxy) Zabbix server

Commands `tower-cli job launch --job-template=18 --extra-vars="eventid={EVENT.ID}" --limit {HOST.NAME}`

Conditions

| Label | Name | Action |
|---------------------|------|--------|
| New | | |

[Update](#) [Cancel](#)

[Update](#) [Clone](#) [Delete](#) [Cancel](#)

Configuring Remediation

- Create remediation playbook
 - Custom module was required
- Create Job template for remediation
- Create Zabbix alert
- Test

| A TOWER | PROJECTS | INVENTORIES | TEMPLATES | J OBS |
|---------|-------------------------------------|----------------|-----------------------|-------|
| JOBS | | | | |
| ● 255 | Zabbix Agent Template Config | Playbook Run | 9/12/2017 2:01:28 AM | |
| ● 256 | zabbix-ansible | SCM Update | 9/12/2017 2:01:19 AM | |
| ● 252 | Zabbix Agent Configuration | Playbook Run | 9/12/2017 2:01:16 AM | |
| ● 253 | zabbix-ansible | SCM Update | 9/12/2017 2:01:02 AM | |
| ● 251 | zabbix-home (Zabbix) | Inventory Sync | 9/12/2017 2:00:58 AM | |
| ● 247 | Remediate Squid | Playbook Run | 9/12/2017 1:19:38 AM | |
| ● 248 | zabbix-ansible | SCM Update | 9/12/2017 1:19:24 AM | |
| ● 239 | Zabbix Agent Configuration Workflow | Workflow Job | 9/12/2017 1:01:43 AM | |
| ● 244 | Zabbix Agent Template Config | Playbook Run | 9/12/2017 1:01:42 AM | |
| ● 245 | zabbix-ansible | SCM Update | 9/12/2017 1:01:17 AM | |
| ● 241 | Zabbix Agent Configuration | Playbook Run | 9/12/2017 1:01:13 AM | |
| ● 242 | zabbix-ansible | SCM Update | 9/12/2017 1:00:59 AM | |
| ● 240 | zabbix-home (Zabbix) | Inventory Sync | 9/12/2017 1:00:55 AM | |
| ● 236 | Remediate Squid | Playbook Run | 9/12/2017 12:51:52 AM | |
| ● 237 | zabbix-ansible | SCM Update | 9/12/2017 12:51:08 AM | |
| ● 233 | Remediate Squid | Playbook Run | 9/12/2017 12:48:36 AM | |
| ● 234 | zabbix-ansible | SCM Update | 9/12/2017 12:47:52 AM | |
| ● 230 | Remediate Squid | Playbook Run | 9/12/2017 12:43:24 AM | |
| ● 231 | zabbix-ansible | SCM Update | 9/12/2017 12:42:39 AM | |

Configuring Remediation

- Create remediation playbook
 - Custom module was required
- Create Job template for remediation
- Create Zabbix alert
- Test

Event details

| Event source details | |
|----------------------|-----------------------------------------------------------|
| Host | akira.mclean.red-tux.net |
| Trigger | Squid Service not running |
| Severity | High |
| Problem expression | {akira.mclean.red-tux.net.net.tcp.listen[3128].last()}<>1 |
| Recovery expression | |
| Event generation | Normal |
| Allow manual close | No |
| Disabled | No |

Acknowledgements

| Time | User | Message | User action |
|---------------------|--------------------|------------------------------------------------------------------|-------------|
| 2017-09-12 01:19:33 | tower (Tower User) | Remediation attempted via Ansible Playbook (2017-09-12 01:19:30) | |

Message actions

| Step | Time | Type | Status | Retries left | Recipient | Message | Info |
|----------------|------|------|--------|--------------|-----------|---------|------|
| No data found. | | | | | | | |

Command actions

| Step | Time | Status | Command | Error |
|------|---------------------|----------|--------------------------------------------------------------------------------------------------------------------------------|-------|
| 1 | 2017-09-12 01:19:21 | Executed | akira.mclean.red-tux.net tower cli job launch --job-template=18 --extra-vars='eventId=389141' --limit akira.mclean.red-tux.net | |

Event list [previous 20]

| Time | Recovery time | Status | Age | Duration | Ack | Actions |
|---------------------|---------------------|----------|-----------|----------|-------|------------|
| 2017-09-12 01:19:20 | 2017-09-12 01:20:20 | RESOLVED | 2d 6h 41m | 1m | Yes 1 | Done 1 |
| 2017-09-12 01:09:20 | 2017-09-12 01:18:20 | RESOLVED | 2d 6h 51m | 9m | No | Failures 1 |

Conclusion

Source Code

Scripts are available on github:
<https://github.com/red-tux/zabconf2017>



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THANK YOU



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youtube.com/user/RedHatVideos



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