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The Linux & Open Source Company

Driving Efficiency with Event-Driven Ansible

An Introduction

April 30th 2024

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Agenda

- Configuration managament with Ansible
- Motivation for Event-Driven Ansible
- Components of Event-Driven Ansible
- Demonstration

Who am I?

- Ottavia Balducci
- IT consultant at ATIX AG

My focus:

- Ansible
- AWX/AAP
- orcharhino/Foreman

- Email: balducci@atix.de

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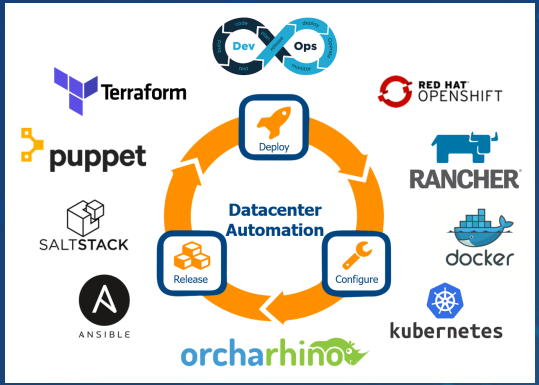

Open Source Linux & Automation:

- Consulting
- Engineering
- Support
- Training

What is configuration management?

Process for

- maintaining consistency across a datacenter
- ensure compliance
- improve performance
- correct mistakes
- maintain an overview of the current state (CMDB...)

Gets more and more complicated the larger the datacenter...

Automate Configuration Management!

- save time
  - no manual work
  - fire and forget
  - use resources efficiently
- scalability
  - as many hosts as you want
  - write code once, use forever
  - can be used by everyone in organization
- reproducible
  - same code, same result
  - trustworthy configuration
  - better collaboration
- avoid errors
  - test code
  - no distraction errors
  - keep under version control

Configuration management, the old way

- shell scripts
- complicated for heterogeneous landscapes
  - RHEL, Debian, SLES, ...
  - Windows (!)
- might change things even if not needed
- not so readable

```
#!/usr/bin/sh
set -e
# Install Apache on a server
yum install --quiet -y httpd httpd-devel
# Copy configuration files.
scp user@master-server:~/httpd.conf \
/etc/httpd/conf/httpd.conf
scp user@master-server:~/httpd-vhosts.conf \
/etc/httpd/conf/httpd-vhosts.conf
# Start and enable Apache
systemctl start httpd
systemctl enable httpd
```


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What is Ansible?

Ansible

- configuration management and automation tool
- clientless, daemonless
- idempotence: describe the final state
- parallel execution on all hosts by default
- execute specific tasks on a group of hosts

Ansible code: Example

```yaml
---
- hosts: all
  tasks:
    - name: Install Apache packages and deps
      become: true
      ansible.builtin.yum:
        name: "{{ packages }}"
        state: present
      vars:
        packages:
          - httpd
          - httpd-devel
    - name: Copy configuration files.
      ansible.builtin.copy:
        src: "{{ item.src }}"
        dest: "{{ item.dest }}"
        mode: 0644
      loop:
        - src: "/path/to/config/httpd.conf"
          dest: "/var/httpd/conf/httpd.conf"
        - src: "/path/to/config/httpd-vhosts.conf"
          dest: "/var/httpd/conf/httpd-vhosts.conf"
    - name: Make sure Apache is started on boot.
      become: true
      ansible.builtin.service:
        name: httpd
        state: started
        enabled: true
...
```

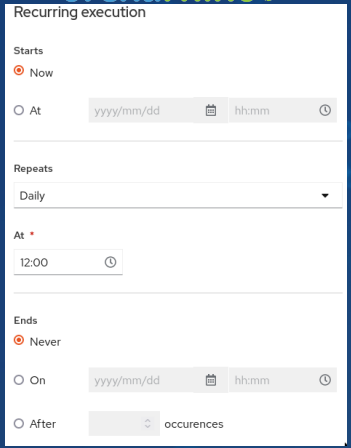
History of Ansible

History

- 2012: initial development
- 2015: acquired by RedHat
- 2017: AWX 1.0.0 is released
- 2020: Ansible 2.10.0 is released
  - collections must be installed separately
  - Fully Qualified Collection Name is best practice
- 2023: `ansible-rulebook` 1.0.0 is released

How can we run Ansible on a regular basis?

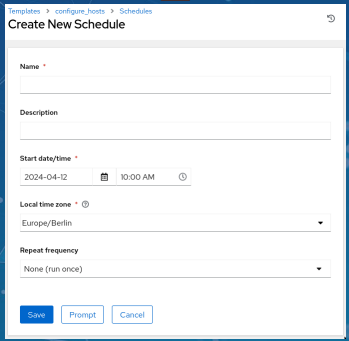
orcharhino



cronjob

```
# crontab -e
0 5 * * 0 ansible-playbook ...
```

AWX



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Better: Event-Driven Ansible

- respond to events
- run only if needed
- different processes for each possible event
- perfect for quick response to problems

History of Event-Driven Ansible

- October 2022: Event-Driven Ansible collection (developer preview)
- May 2023:
  - Event-Driven Ansible official release
  - EDA-Controller released

`https://github.com/ansible/event-driven-ansible`

Sources

- where to gather events
- some of the builtin sources:
  - url_check
  - webhook
  - journald
  - ...
- list is expected to grow

```
sources:
  - ansible.eda.url_check:
      urls:
        - https://<webserver_fqdn>
      delay: 10
```

Rules

- what actions should be taken depending on event
- some of the possible actions:
  - run playbook
  - shutdown
  - run job template
  - ...

```yaml
rules:
  - name: Restart Nginx
    condition: event.url_check.status == "down"
    action:
      run_playbook:
        name: atix.eda.restart_nginx
```

https://github.com/ansible/ansible-rulebook/tree/main/ansible_rulebook/action

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Putting it all together: Rulebooks

```yaml
# rulebook.yaml
---
- name: Check webserver
  hosts: all
  sources:
    - ansible.eda.url_check:
        urls:
          - https://<webserver_fqdn>
        delay: 10
  rules:
    - name: Restart Nginx
      condition: event.url_check.status == "down"
      action:
        run_playbook:
          name: atix.eda.restart_nginx
```

Executing rulebooks

CLI tool: `ansible-rulebook`

- Run with

```
ansible-rulebook --rulebook rulebook.yaml -i inventory.yaml --verbose
```

- Runs in foreground and listens for events

```
2023-11-29 13:53:07,183 - ansible_rulebook.rule_set_runner - INFO - Waiting for actions on events from Check url
2023-11-29 13:53:07 183 [drools-async-evaluator-thread] INFO
↪  org.drools.ansible.rulebook.integration.api.io.RuleExecutorChannel - Async channel connected
2023-11-29 13:53:07,184 - ansible_rulebook.rule_set_runner - INFO - Waiting for events, ruleset: Check url
```

Installing ansible-rulebook

- Java development kit required (>=17):

```
dnf install java-21-openjdk
```

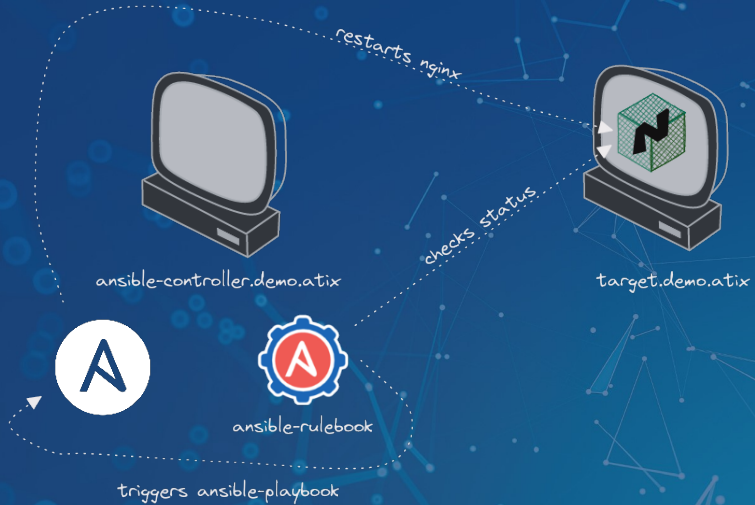
- with pip:

```
python -m pip install ansible-rulebook
```

- install required Ansible collection:

```
ansible-galaxy collection install ansible.eda
```

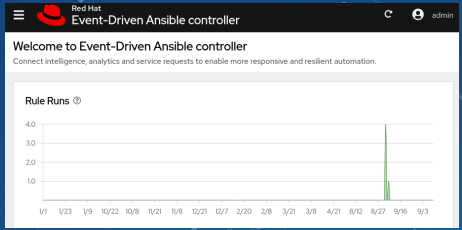
Nginx example



→ DEMO ←

EDA Controller

- web UI for ansible-rulebook
- part of Ansible Automation Platform
- available as standalone:
  `https://github.com/ansible/eda-server`
- can be used with AWX



Next Ansible training:

Ansible Fundamentals, Tuesday 4th June – Thursday 6th June
→ https://atix.de/schulungen/ansible/←

Next webinars:

- Designing self-hosted Kubernetes platforms for enhanced flexibility
  Dr. Pascal Fries, Thursday, May 23rd 2024, 15:00 – 16:00
- Die Kunst der DevOps-Teams: Eine Kultur der Zusammenarbeit und des Erfolgs schaffen
  Vincent Welker, Wednesday, June 12th 2024, 15:00 – 15:30
- Streamline Your Linux Servers: Automation for Patch & Release Management in Data Centers
  Dr. Jonas Trüstedt, Wednesday, July 3rd 2024, 15:00 – 16:00

→ https://atix.de/webinars/←

Thank you for your attention!

Any questions?