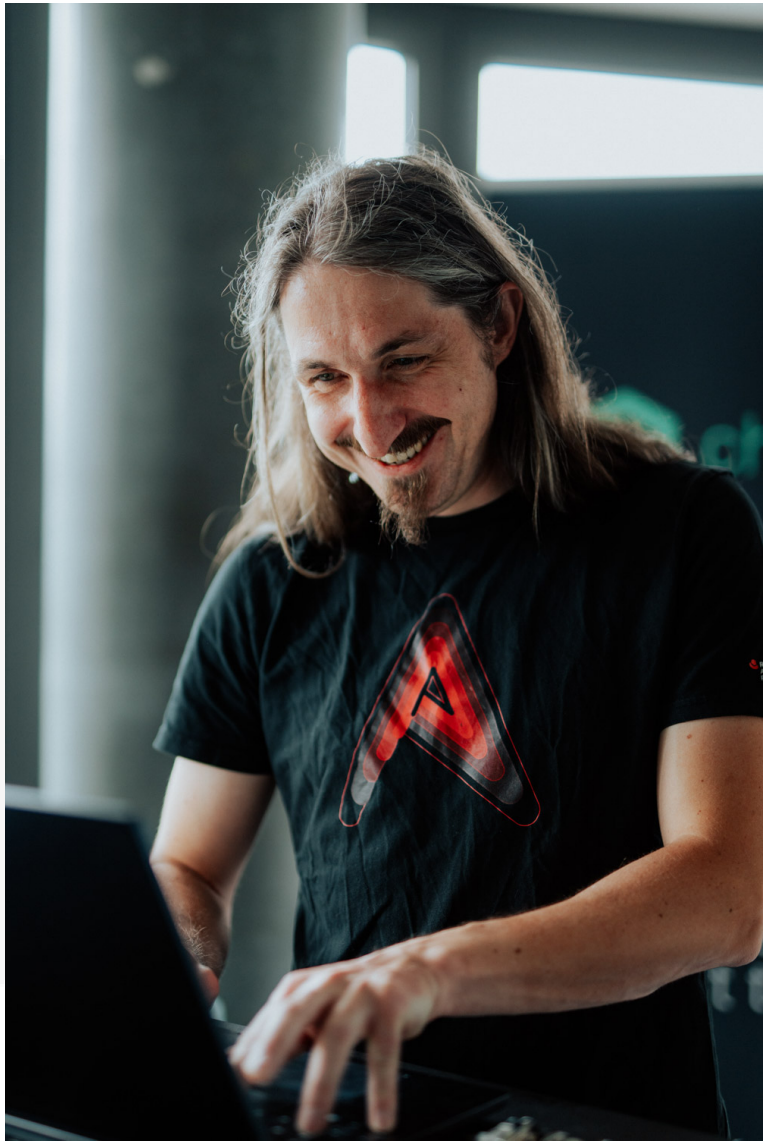
Self-healing with Checkmk and Event-Driven Ansible

How to resolve issues automatically

About me

- René Koch
- Self-employed consultant for:
  - Red Hat Ansible (Automation Platform)
  - Red Hat Enterprise Linux
  - Red Hat Satellite
  - Red Hat Identity Management (IPA)
- Experienced monitoring user (Nagios, Icinga, Checkmk)



About me

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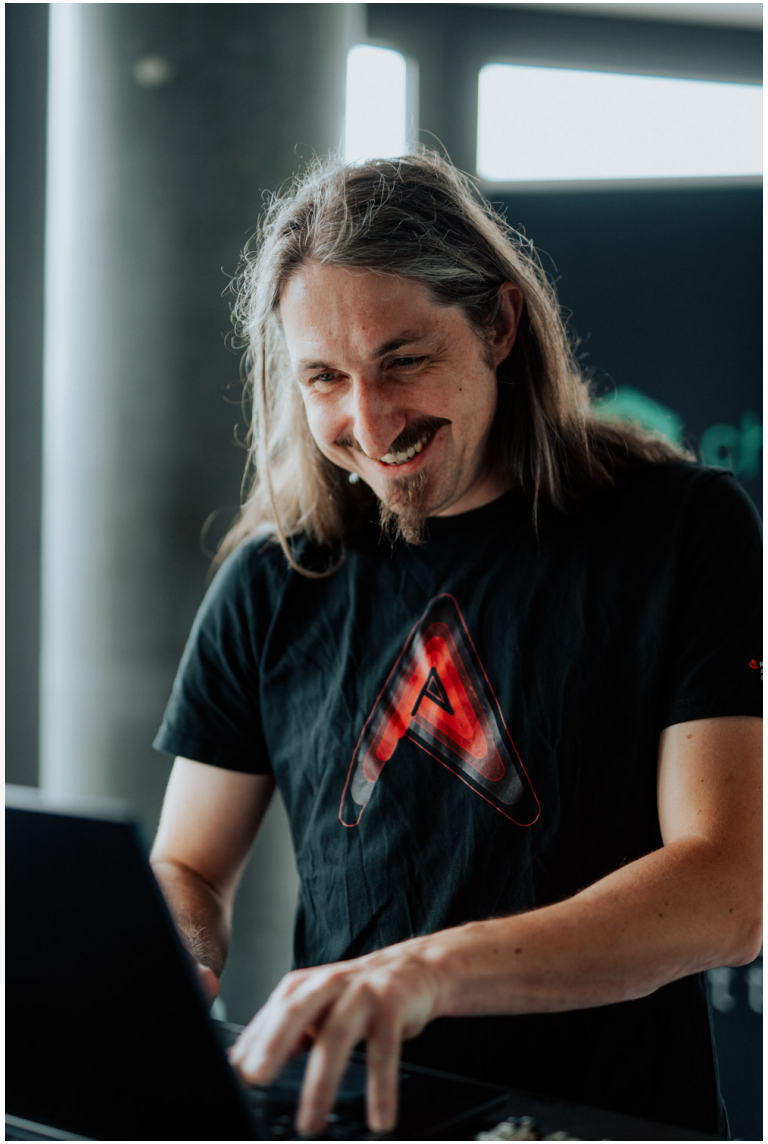
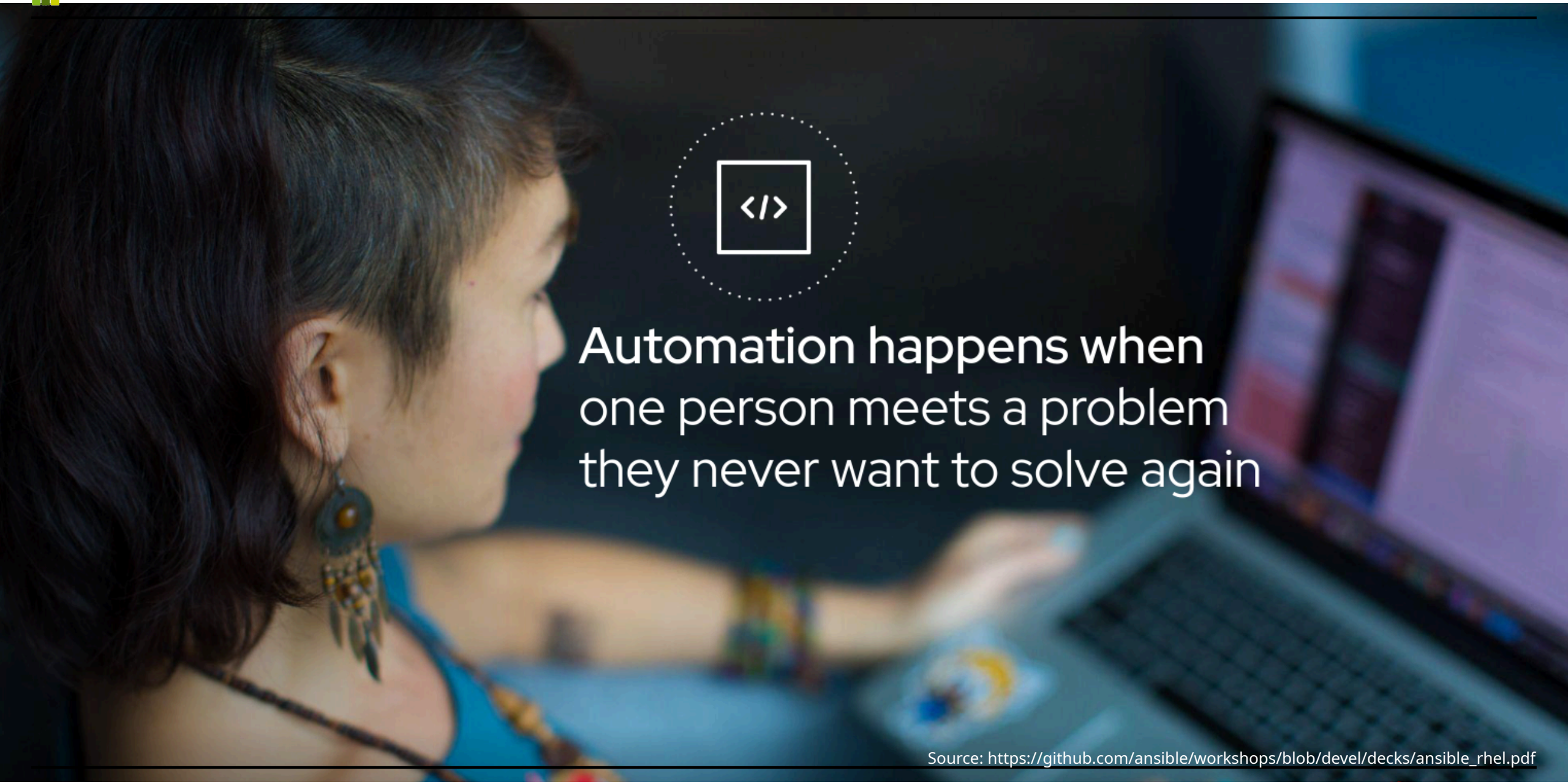


Agenda

- Monitoring: Short introduction
- What is Event-Driven Ansible (EDA)?
- Event-Driven Workflow
- Live Demonstration
- Use cases and best practices

Monitoring: Typical workflow

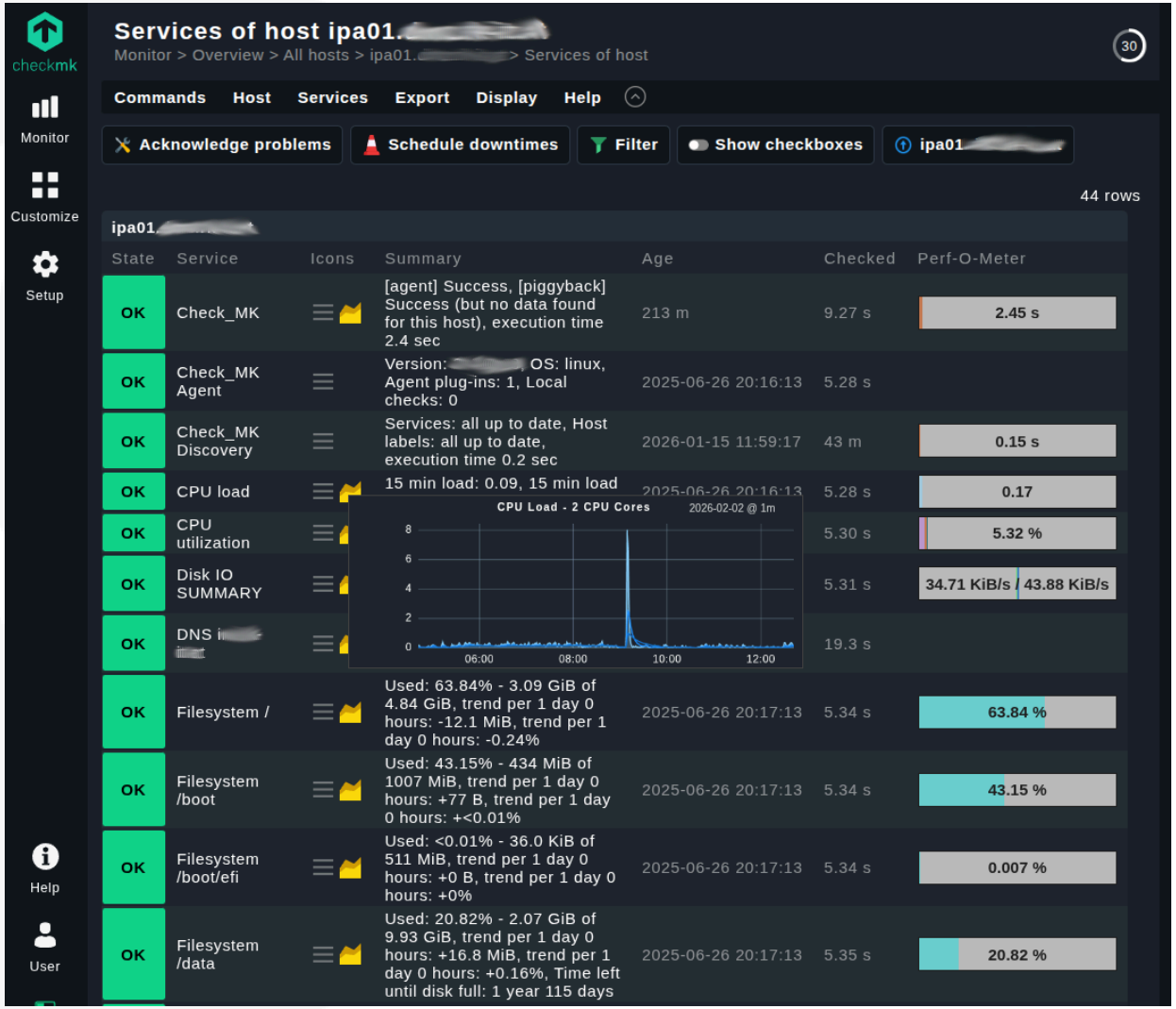
- 🕰️ 2005: Received email alerts from Nagios 2 for issues with Solaris machines
- 🧩 Manual workflow:
  - 📩 Read email
  - 🔐 Log in to the system
  - 🔎 Check if issue still exists
  - 🛠️ Fix the issue
  - 🤬 **Repeat the same procedure over and over again**
- 🕰️ 2026: Still the same workflow?



Source: https://github.com/ansible/workshops/blob/devel/decks/ansible_rhel.pdf

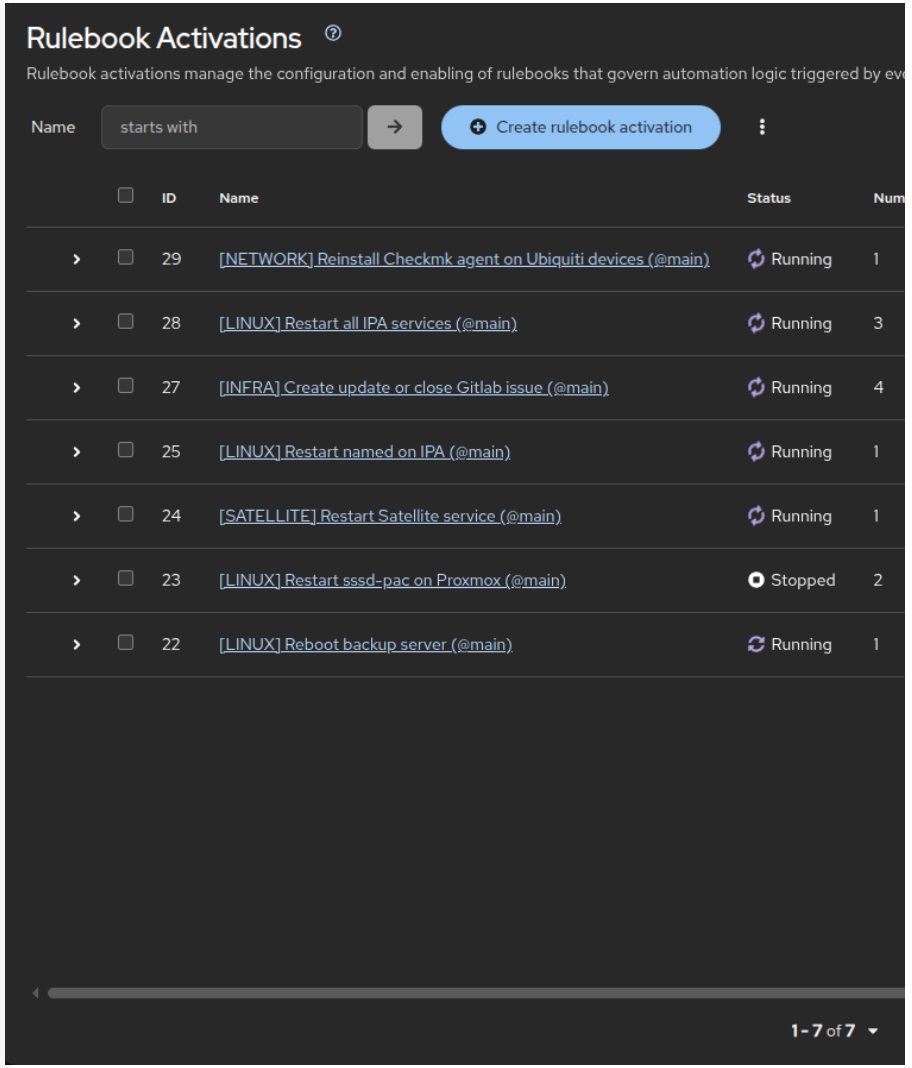
What is Checkmk?

- **Monitoring platform** for infra-structure, applications and services
- Provides **agent- and agentless** checks, dashboards, and alerting
- Built for **scale** with distributed monitoring and automation support
- Helps **detect, analyze, and remediate** issues faster



What is Event-Driven Ansible?

- **EDA is automation that reacts to events**, not schedules
- Events can come from monitoring, webhooks, message queues, logs or cloud services
- Rules decide **when** to run Ansible actions
- Goal: **faster response** and **consistent remediation**



What Is an "Event" (vs a Source Action)?

- ⚡ **Event**
  - a *state change* or *signal* that matters (e.g., alert fired, service down)
  - often noisy and hard to filter
  - not every event triggers an action
- 🔁 **Source action**
  - a *routine trigger* (e.g., "on every commit")
  - predefined target/action
- 🧪 Examples:
  - 🚫 *Update an AAP project after each commit* (not EDA)
  - ✅ *Send all monitoring alerts to a webhook; EDA decides what to do* (EDA)

Event-Driven Ansible vs. Ansible Playbook

- ⚡ **EDA** keeps a listener running and reacts to events in near real time
- 🧠 **EDA** evaluates event payloads and triggers automation only when rules match
- 📜 **Ansible Playbooks** do not listen for events out of the box
- 🔔 Without EDA, the monitoring source must trigger playbook runs directly
- 🧱 This increases load and complexity on the monitoring system

Event-Driven Ansible vs. AAP Controller

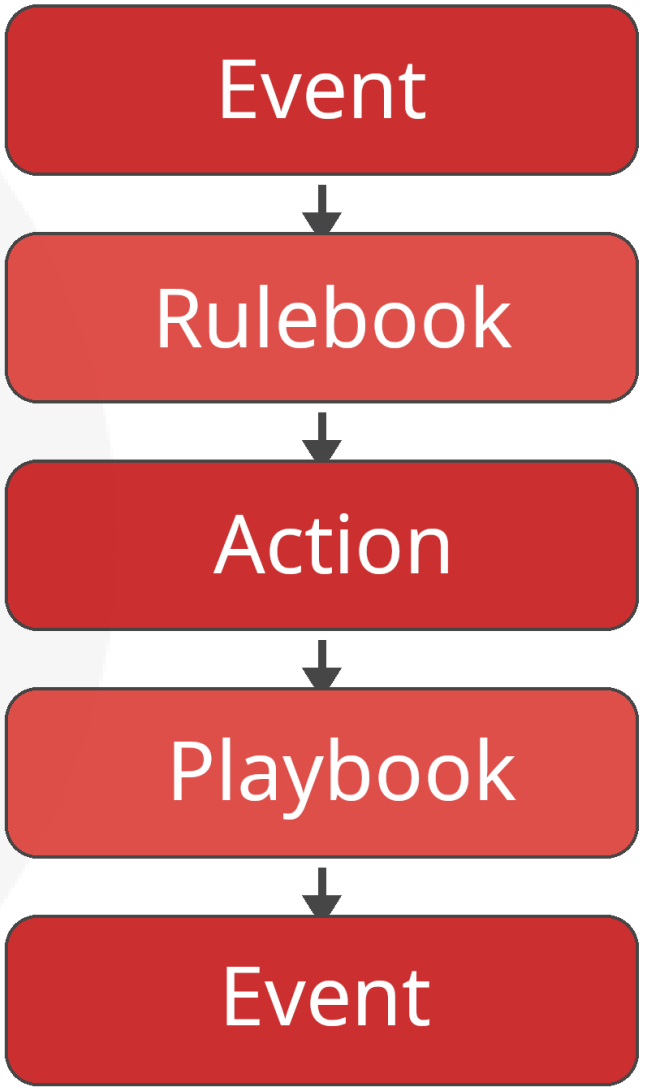
- ⚡ **EDA** keeps an event listener active and can trigger job templates immediately
- 🌐 **AAP Controller** can start jobs via webhook or API, but each job is a full run lifecycle
- 🐢 Job startup overhead (container start, project sync, inventory/collections) adds latency
- 🚦 Job execution may queue behind other jobs, which delays reaction time
- 🎯 Use EDA for fast event decisions; use Controller for governed execution of the actual remediation

Core Building Blocks

- 📡 **Event Sources**: where events originate (ansible.eda plugins for webhooks, Kafka, Alertmanager, etc.)
- 📘 **Rulebook**: Rulesets with conditions + actions
- 🔎 **Conditions**: Determine if a rule fires
- 🛠️ **Actions**: run playbooks, run job templates, run modules, etc.
- 🧭 **Controller** (optional): central execution and governance

Event-Driven Workflow

1. Event arrives from a source
2. Rulebook evaluates conditions
3. Matching rule triggers an action
4. Action runs playbook or other automation
5. Results can emit **new events** or update systems



Rulebook: Restart named

```
---

- name: Restart named on IPA server
  hosts: all
  gather_facts: false

  sources:
    - name: Listen on port 5000 for Checkmk events
      ansible.eda.webhook:
        port: 5000

  rules:
    - name: Restart named
      condition: >-
        event['payload']['servicename'] == "DNS example.com" and
        event['payload']['servicestate'] == "CRITICAL"
      action:
        run_job_template:
          name: "[LINUX] Restart named on IPA [@production] - Prompt"
          organization: "Default Organization"
          job_args:
            limit: "{{ event.payload.hostname }}"
```

Checkmk Notification Script

```
#!/usr/bin/env bash

HEADER="X-Checkmk-Token"
TOKEN="${NOTIFY_PARAMETER_1}"
URL="${NOTIFY_PARAMETER_2}"

JSON=`cat <<EOF
{
  "hostname": "${NOTIFY_HOSTNAME}",
  "hostoutput": "${NOTIFY_HOSTOUTPUT}",
  "hoststate": "${NOTIFY_HOSTSTATE}",
  "servicename": "${NOTIFY_SERVICEDESC}",
  "serviceoutput": "${NOTIFY_SERVICEOUTPUT}",
  "servicestate": "${NOTIFY_SERVICESTATE}",
  "date": "${NOTIFY_SHORTDATETIME}",
  "type": "${NOTIFY_NOTIFICATIONTYPE}",
  "what": "${NOTIFY_WHAT}"
}
EOF
`

curl -X POST -H "Content-Type: application/json" -H "${HEADER}: ${TOKEN}" -d "${JSON}" ${URL}
exit $?
```

Playbook: Restart named

```
---

- name: Restart named on IPA
  hosts: all
  become: true
  gather_facts: true

  tasks:
    - name: Restart named
      ansible.builtin.service:
        name: named
        state: restarted
```

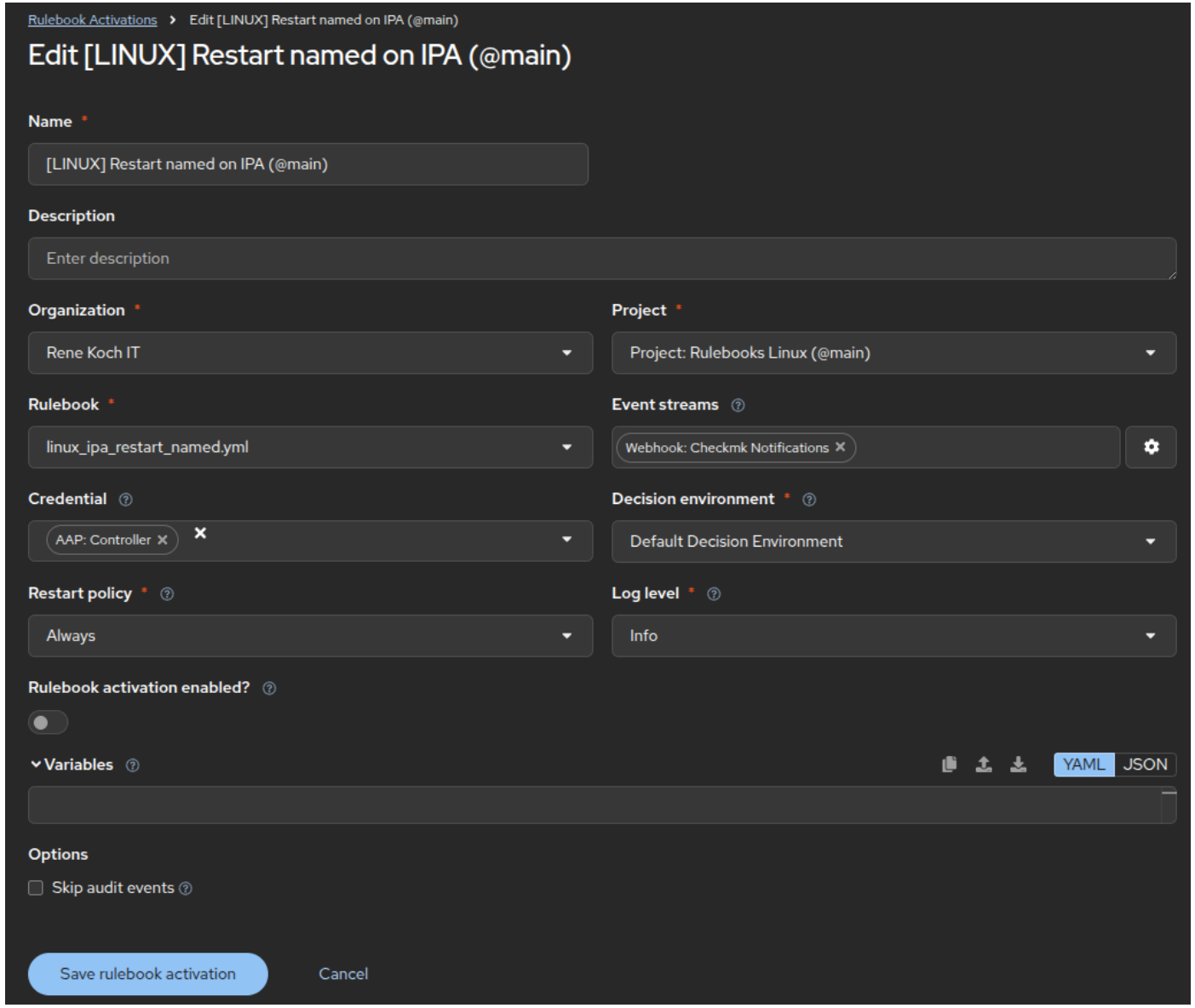
Run a Rulebook (CLI)

```
$ ansible-rulebook -r rulebooks/restart_named.yml -i localhost

PLAY [Restart named on IPA] ****************************************************

TASK [Gathering Facts] *********************************************************
ok: [ipa01.example.com]

TASK [Restart named] ***********************************************************
changed: [ipa01.example.com]

PLAY RECAP *********************************************************************
ipa01.example.com : ok=2 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
```

❗ Use the **run_playbook** action (instead of **run_job_template**) when running with ansible-playbook outside Ansible Automation Platform.

Ansible Automation Platform Integration

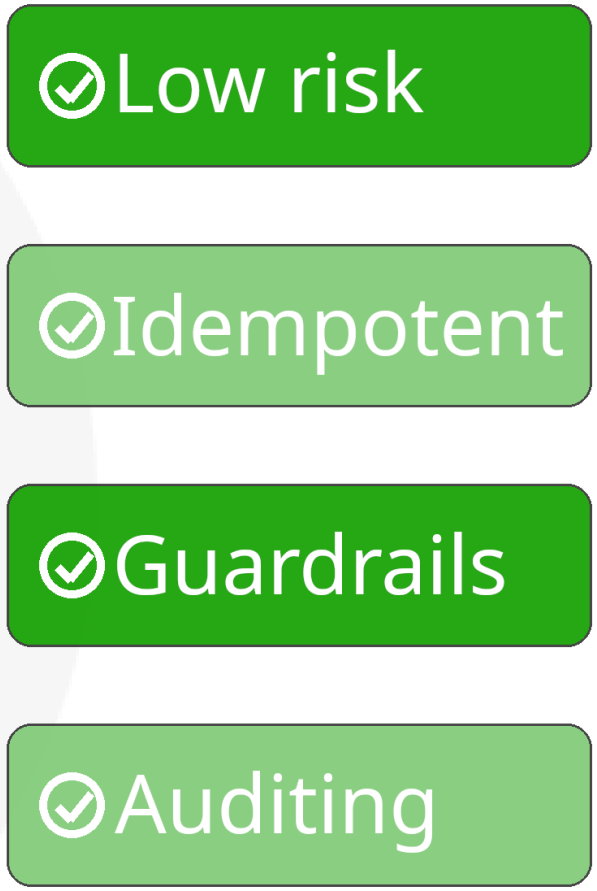
- 📦 **Projects**: Git repository configuration
- 🧪 **Decision Environments**: Container images to run rulebooks
- 🔐 **Credentials**: Secrets for Git, Controller, Hub, tokens, etc.
- 📡 **Event Streams**: Entry points for events (mapped to source definition in rulebook)
- 🚀 **Rulebook Activations**: Rulebook runs


Rulebook Activations
Edit [LINUX] Restart named on IPA (@main)
Edit [LINUX] Restart named on IPA (@main)
Name *
[LINUX] Restart named on IPA (@main)
Description
Enter description
Organization *
Rene Koch IT
Project *
Project: Rulebooks Linux (@main)
Rulebook *
linux_ipa_restart_named.yml
Event streams
Webhook: Checkmk Notifications
Credential
AAP: Controller
Decision environment *
Default Decision Environment
Restart policy *
Always
Log level *
Info
Rulebook activation enabled?
Variables
YAML
JSON
Options
Skip audit events
Save rulebook activation
Cancel

Live Demo: Fix DNS issue

Self-Healing Best Practices

- Start with **low-risk** automations
- Use **idempotent** playbooks (if possible)
- Add **guardrails** (approvals, maintenance windows, downtimes)
- Emit **metrics and logs** for auditing



Challenges with Self-healing

- 🔊 Triggering on noisy events (missing filtering)
- 🧪 Insufficient monitoring coverage
- 🧯 Healing the wrong host (issue caused by a backend dependency)
- 📚 Lack of knowledge or rulebooks
- 🕒 Triggering during maintenance windows due to missing downtime

Event-Driven Ansible Use Cases

- 🚨 **Monitoring alerts**: run remediation playbooks
- 🏗️ **Infrastructure events**: auto-scale or restart services
- 🔐 **Security findings**: isolate hosts or rotate credentials
- 🎟️ **Ticketing**: enrich and open incidents automatically
- 📘 **Documentation**: update asset database or documentation system

Additional Information

- **Products**:
  - Ansible Automation Platform: https://urlr.me/WcXZgR
  - Checkmk: https://urlr.me/BPJs98
- **Product Documentation**:
  - Ansible: https://urlr.me/2x4HfW
  - Automation Decisions: https://urlr.me/HejEDB
  - Rulebooks: https://urlr.me/Qb4TsB

Summary

- 🛰️ Checkmk **monitors** your IT landscape and **notifies** on state change
- ⚡ EDA turns these events into **real-time automation**
- 🤝 It complements traditional Ansible by **reacting** instead of **scheduling**
- 🎯 Start small, measure impact, and iterate

Thank you!

René Koch

Freelancer

Ansible Anwendertreffen Austria 18.02.2026

Slides: https://urlr.me/zCPcuK