

Event-Driven Ansible

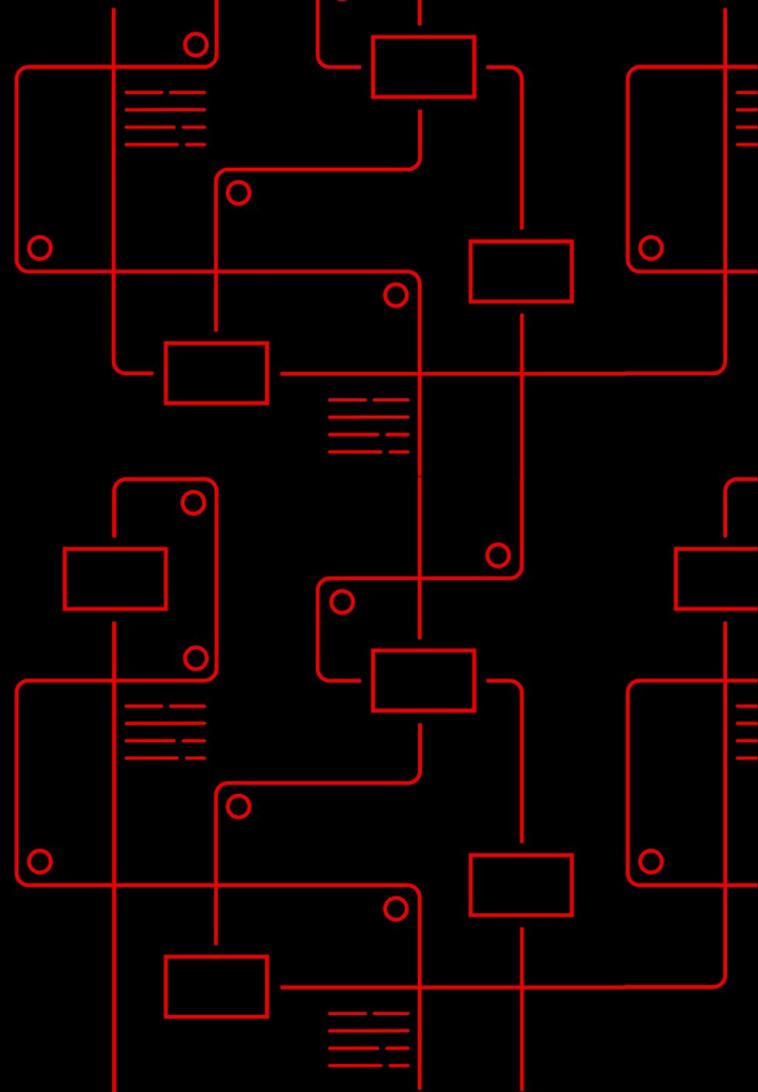
Smart IT delivered at the
speed of automation

#OpsAsCode

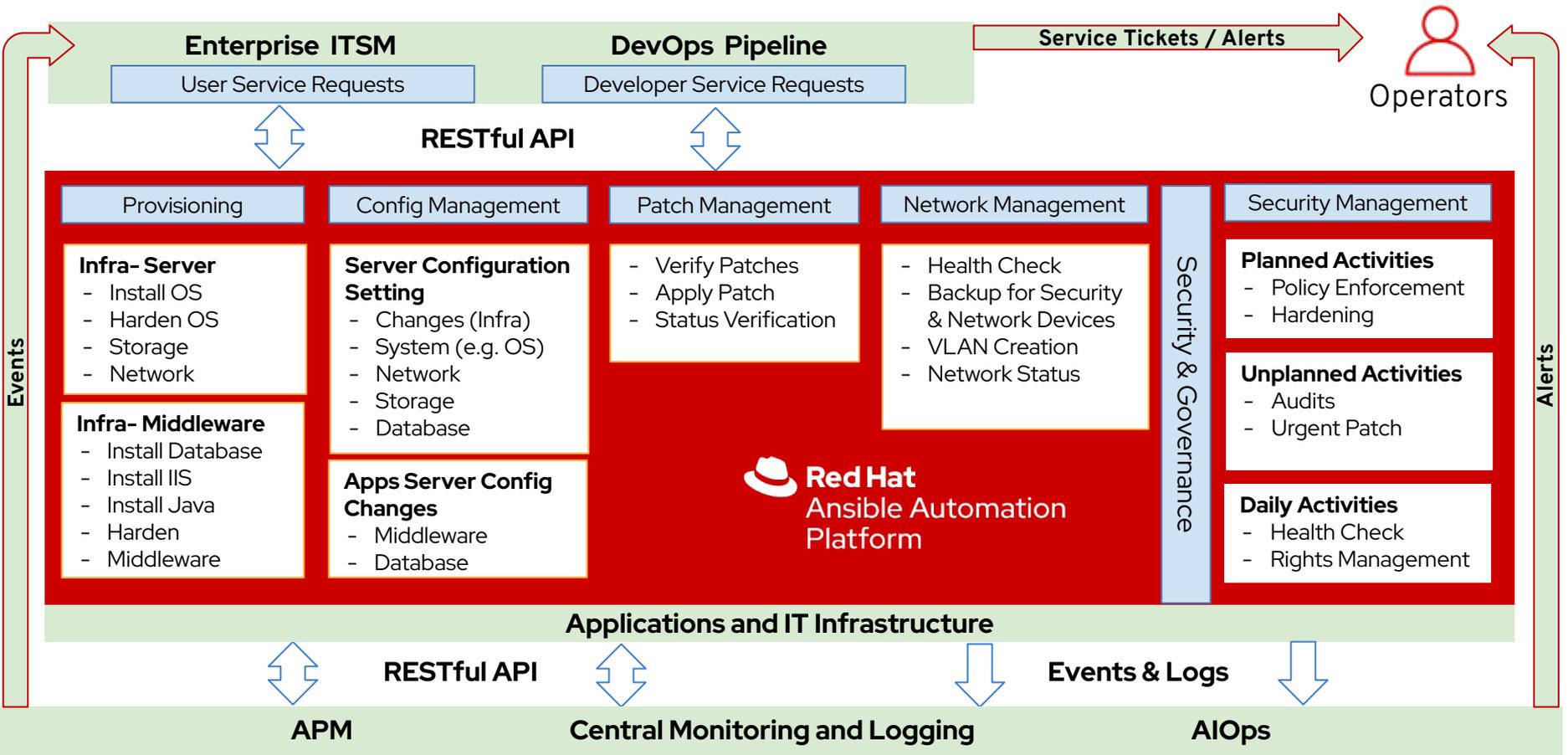
Yeo Keng Hua
Senior Solution Architect
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What is event-driven automation?

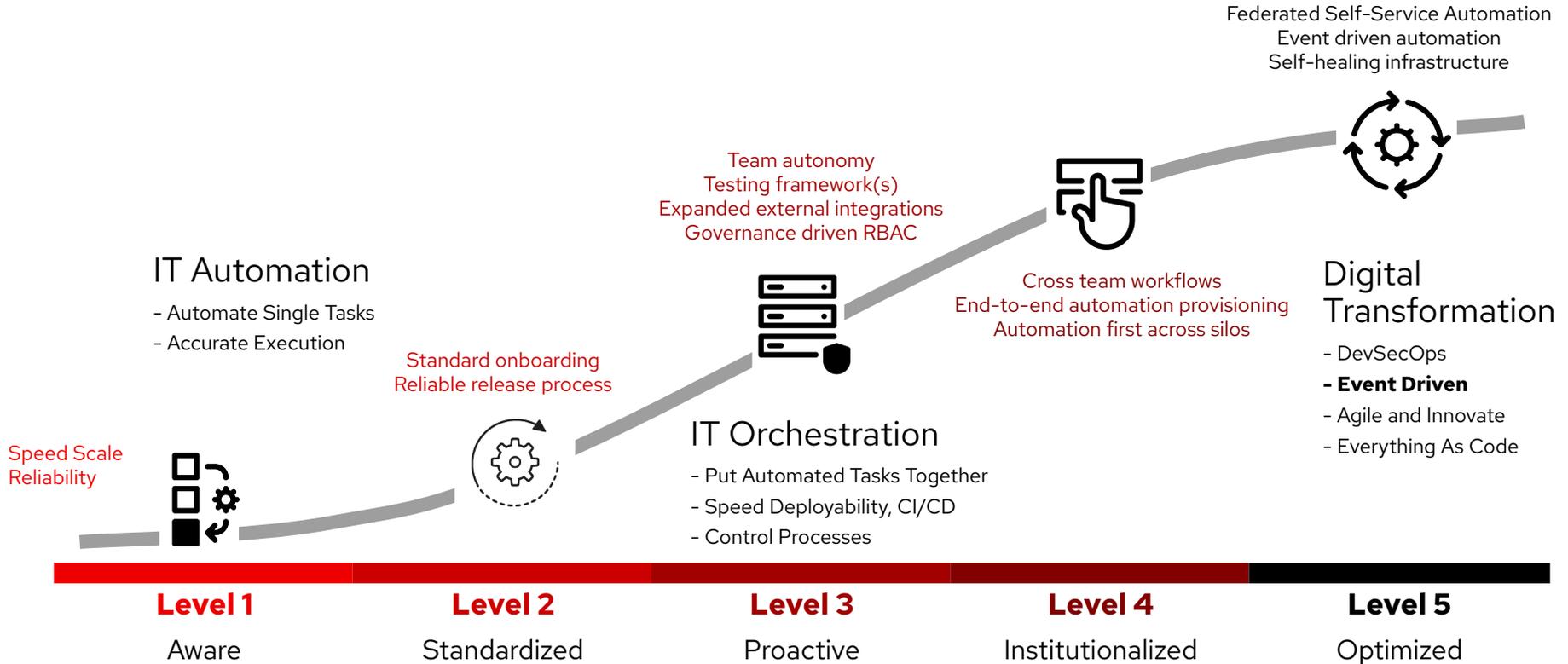
The ability to
connect intelligence, analytics and service requests
for an IT solution
to automated actions so that activities
can take place in a single motion.



Closed Loop Enterprise Automation - A Red Hat POV



Automation Maturity Curve

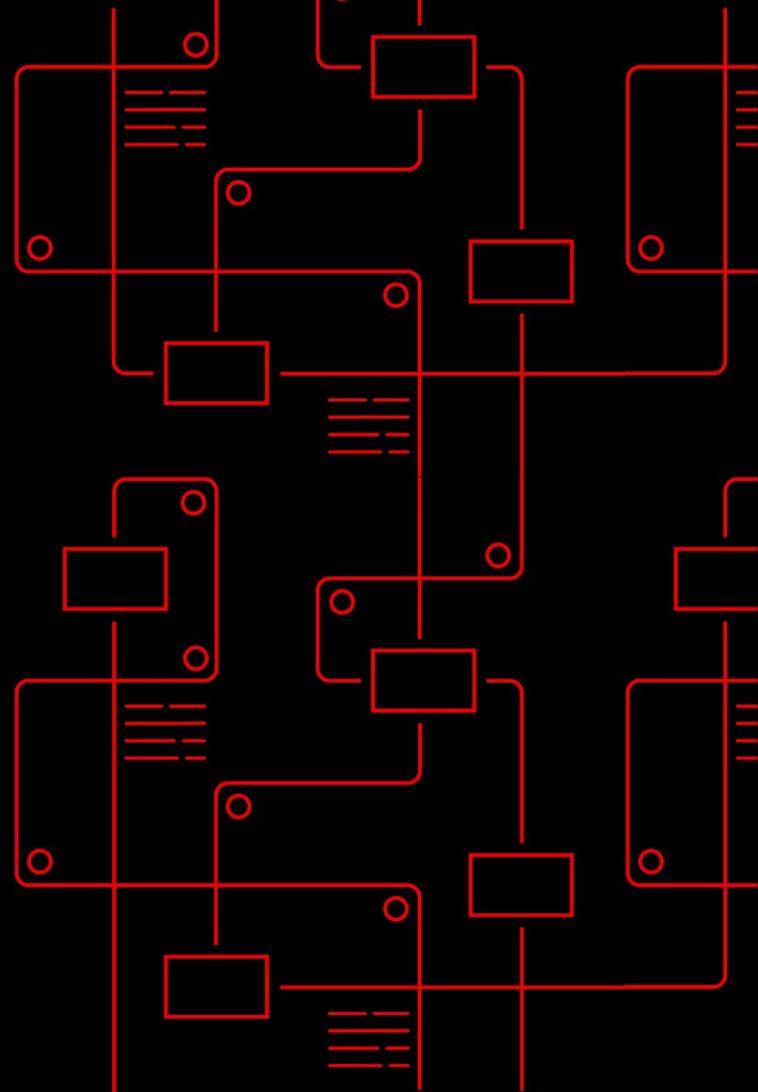


“Event-Driven Ansible is a possible game changer for digital enterprises needing to provide a highly resilient and consistent customer experience.

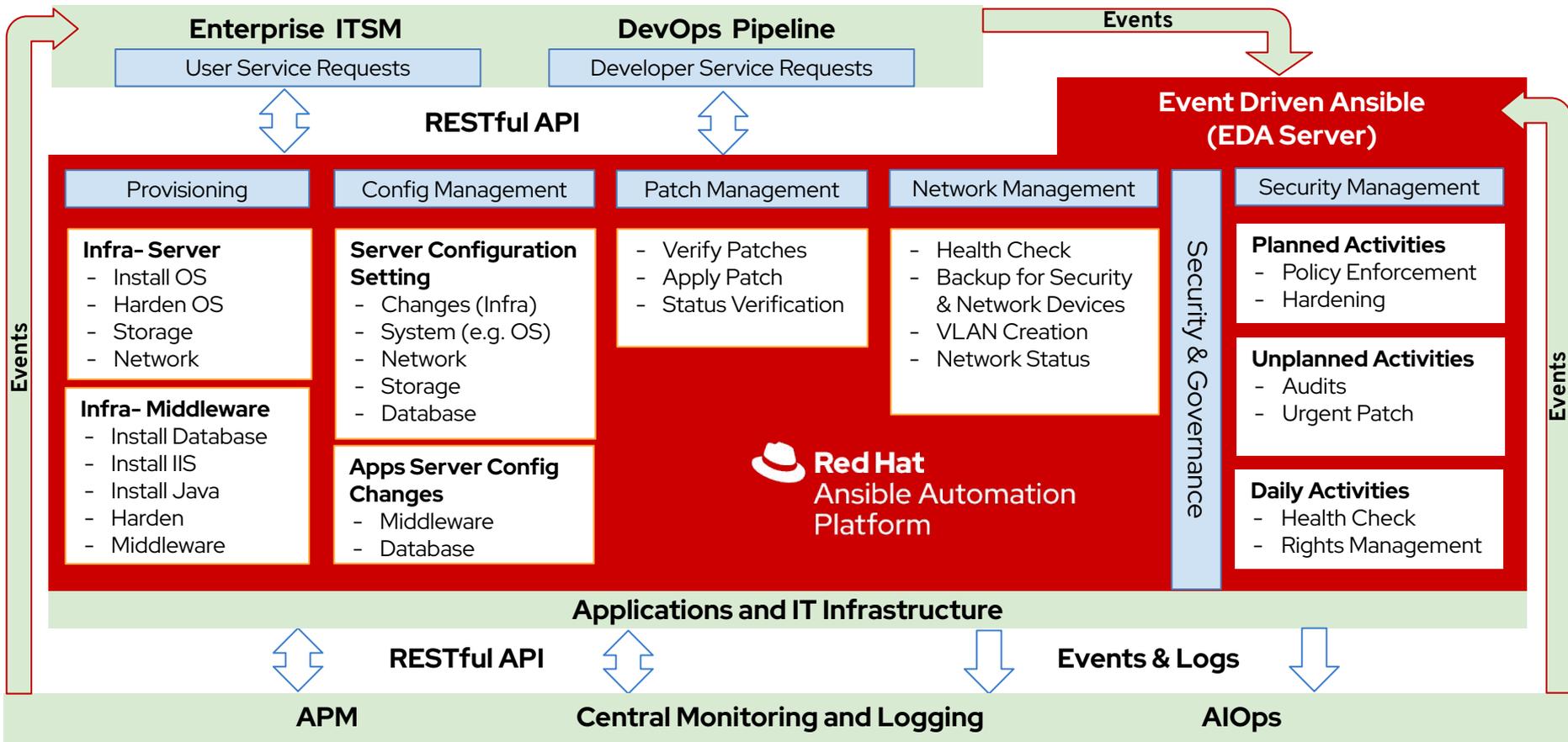
In addition, IT executives who need to move to a more proactive response to incidents will find Event-Driven Ansible a complement to existing observability solutions.”

Jevin Jensen

**Research Vice President, Infrastructure and Operations
IDC**



Event Driven Automation with Event Driven Ansible (EDA)



Achieve goals and focus teams with advanced automation techniques



Speed

Reduce the number of manual steps, enable orchestration of multiple tools and accelerate cross-tool interaction

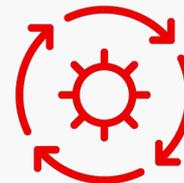
Become more agile



Consistency

Minimize risks with automated workflows, avoid human errors and use auditable and verifiable processes

Ensure resilience



Innovation

Innovate to more advanced levels of automation and free productivity for innovation and higher level projects

Transform IT

Advanced Automation

Build on existing automation

Tactical automation

- ▶ Remove the rote: automate low-value, high volume tasks
- ▶ Learn and assess benefits
- ▶ E.g., Security patching

Process automation

- ▶ Unify siloed processes for faster innovation / resilience
- ▶ Automation-first culture
- ▶ E.g. automated DevOps

Advanced automation

- ▶ Trusted data - AI/ML - action with event driven automation
- ▶ Edge use case management
- ▶ Validated operations (e.g enforced network environment)
- ▶ Hybrid cloud consistency

Journey to hybrid cloud and modernization

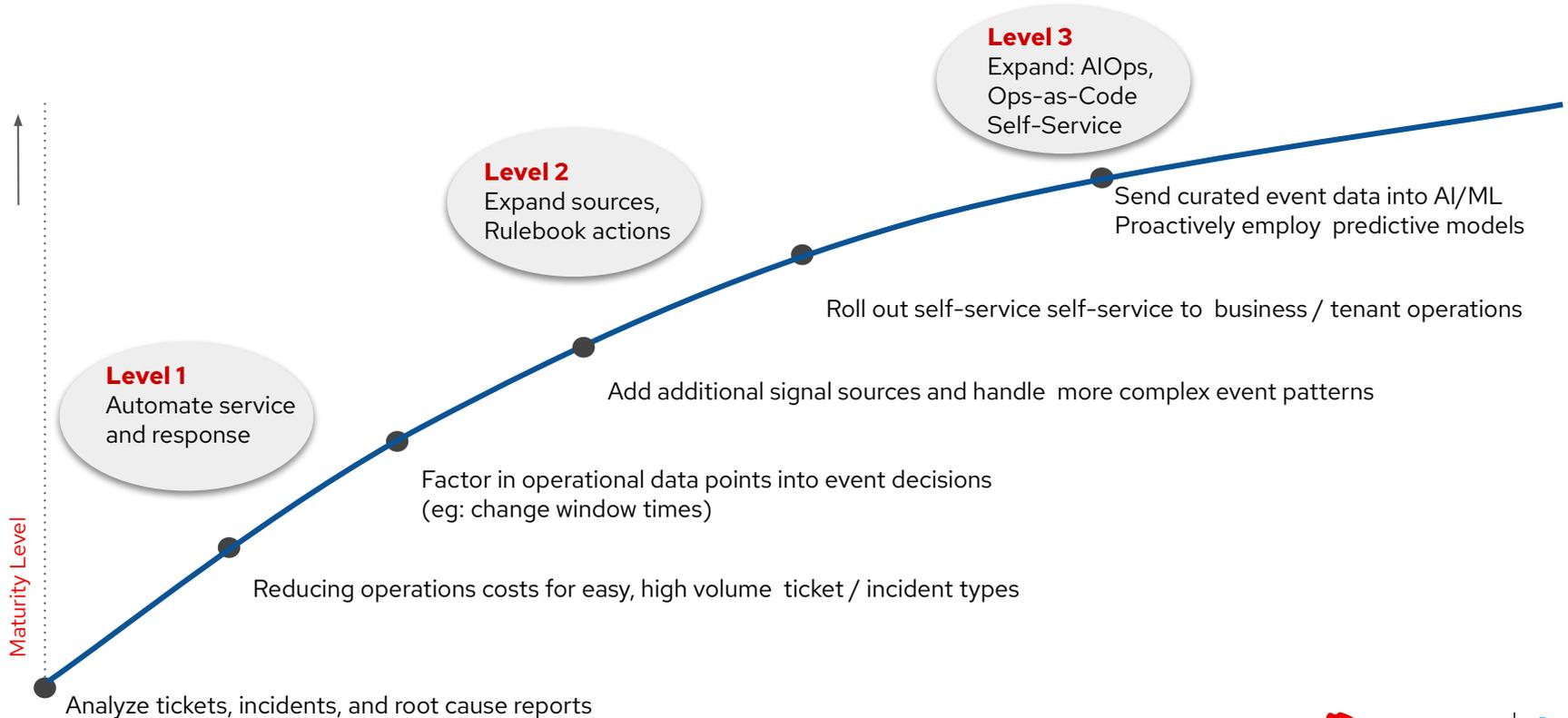
Multi-cloud, Edge, Event-driven, AIOps

Automation-first culture transformation

Simplicity and ROI

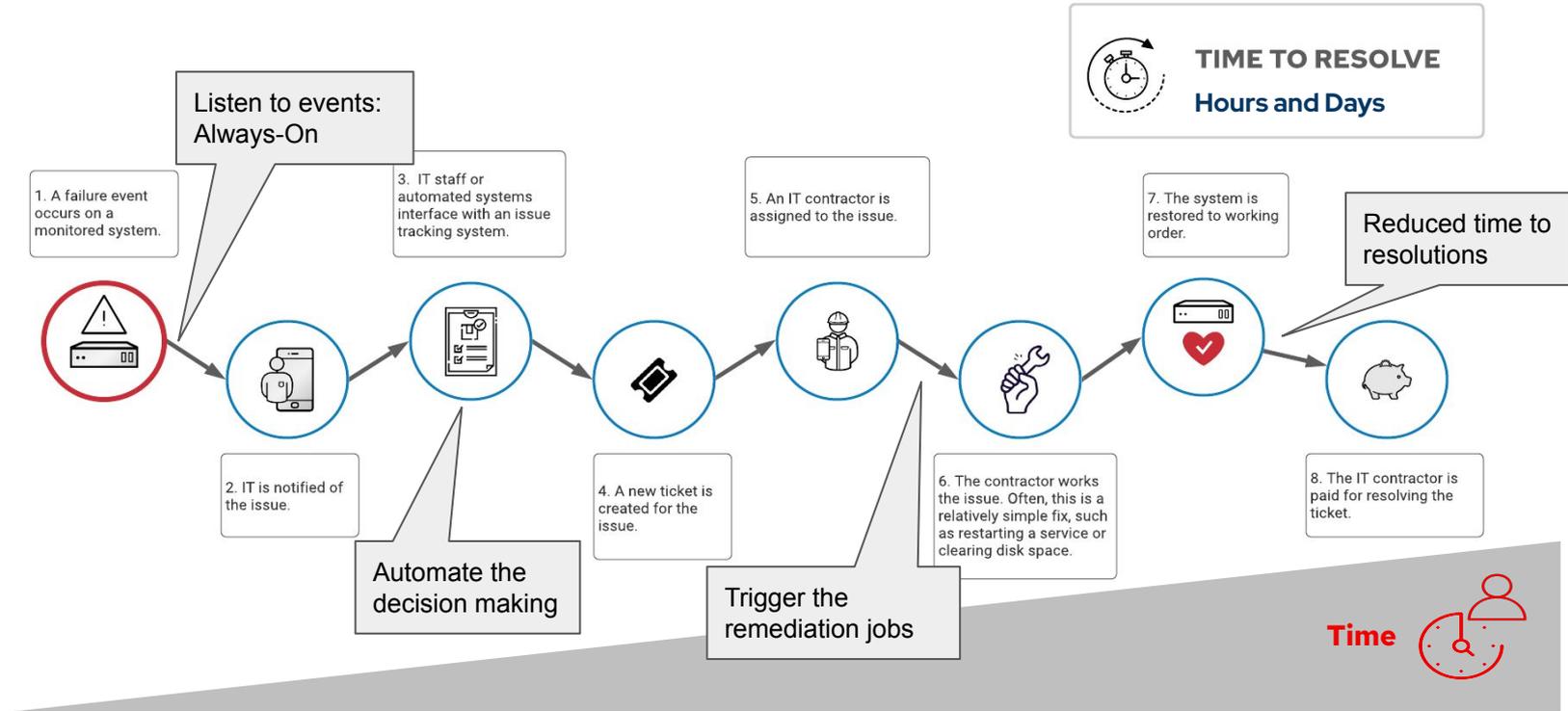
Suggested path to event-driven automation maturity

Simple to sophisticated use cases



Typical workflow: remediating issue on managed system

Time is spent on toil and churn



Event-driven workflow: Speed and shorter MTTR

Event driven automated remediation: same issue, fully automated workflow



TIME TO RESOLVE
Minutes and Hours



OBSERVE

Third party tools:

- Watch data / streaming data
- Identify event
- With or without notification and ticketing integration



EVALUATE

- Routed for remediation
- Known problem identified
- Required action identified

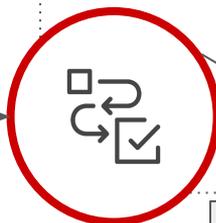


ACT

- Automated resolution triggered
- Remediation action completed
- Shorter MMTR



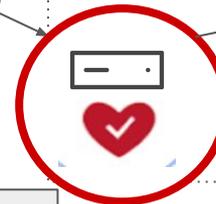
Monitor, filter and identify events directly from source



Codify the decision rules



Rules based actions



Speed

Event Driven Automation in Financial Services



"We've seen other banks use Ansible to automate tasks like patching or VM provisioning and greatly reduce the amount of time and human effort required.

Not only have other banks stimulated innovation, they've done it **while saving hundreds of millions of dollars.**"

- ▶ **90% of systems patched without human intervention, reducing risk of human error**
- ▶ Individuals went from managing 100's of servers to 1000's each
- ▶ Better infrastructure stability due to cross functional team collaboration
- ▶ Expected savings hundreds of millions due to less time and effort
- ▶ Shared syntax, collaboration, inspiration = transformed culture

Event-Driven Ansible (EDA)

Key building blocks in Event Driven Ansible

Flexible and interoperable from source to rule to action to automate IT



Certified Sources

- ▶ Define where events come from, consume events and pass to the rules engine.
- ▶ Source support includes Prometheus, Sensu, Red Hat, as well as webhooks and Kafka.
- ▶ "Custom source" plugin support.



Rules

Conditional structure for describing when actions should occur, based on information matching source file data.

Ansible Rulebooks



Actions

- ▶ Familiar Ansible actions such as playbooks, and "ad-hoc" tasks
- ▶ "Create Event" function allows system to still act on data not contained in a source file
- ▶ Automate any IT use case

Why Event-Driven Ansible?

Flexibility and Extensibility

Flexible from source to rule to action

- Real-time, multiple sources to feed actions
- Flexible integrations: event buses, webhooks or vendor-specific
- "Bring your own source" plugin creation

Robust automation handler

- Critical solution for acting on events, with decisioning
- Flexible ways to take action: Ansible Playbooks or direct modules
- Simple to complex rules development

IT environment-friendly

- Automate any IT use case quickly and simply
- Partner Content Collections model by Red Hat and partners

Single automation platform for all IT needs

- Choice of automation modes, manual or event-driven
- Familiar to existing Ansible users, with YAML-like Ansible Rulebook creation

AT GA

Get started with Event-Driven Ansible

Quick wins: solve these use cases fast, simply and cost-effectively



SERVICE TICKET AUGMENTATION

- ▶ Automate fact gathering
- ▶ Network administration, e.g. Update infrastructure awareness on network events
- ▶ Edge device management, e.g. Compliance & drift are managed post event



REMEDIATION

- ▶ Address drift issues
- ▶ Slow performance issues, e.g. Automate common port troubleshooting and shut/no shut the port
- ▶ Outage issue



USER MANAGEMENT

- ▶ User authentication + access, e.g., providing and troubleshooting access
- ▶ Login issues, e.g., reset password
- ▶ Group/role access, e.g., configuring access to network resources

Event-Driven Ansible is Use Case-Friendly

Apply to any of your IT domains for full automation of key tasks

Networking

- Basic network troubleshooting tasks
- Remediate configuration issues based on port events
- Infrastructure awareness based on routing events

Edge

- Remediate application deployment issues
- Trigger edge app redeployments
- Automate application scaling

Cloud

- Trigger cloud estate check from instance creation events
- Automate remediation tasks from service bus events

Infrastructure

- Escalate Infrastructure issues for improved observability
- Ensure compliance post change events

Security

- Automate log enrichment from a security event.
- Automate security responses from incidents.
- Escalate events for human intervention

Applications

- Allow applications to trigger remediation of issues from patterns
- Enrich healing capabilities of applications and their dependencies.

Event-Driven Ansible technical overview

Event-Driven Ansible

Automate decision making

Leverage numerous sources of events



Implement event-driven automation within and across multiple IT use cases

Achieve new milestones in efficiency, service delivery excellence and cost savings

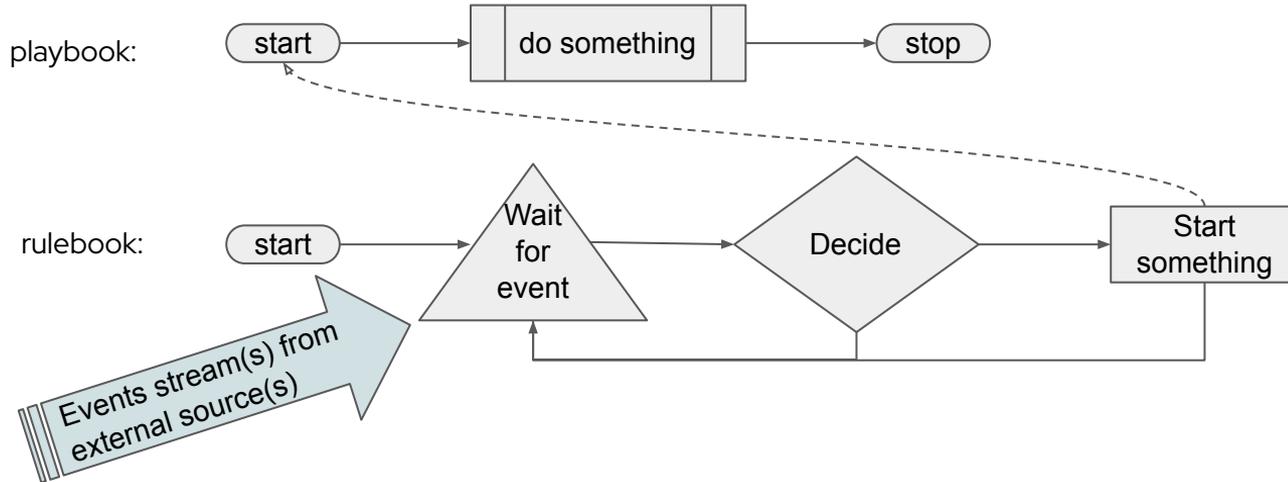
Ansible Rulebooks

Simple declarative decisions through rules

- ▶ **Events are processed by a rules engine**
 - ▶ Rules trigger based on conditions and actions can be carried out by the rules engine
 - ▶ Rules are organized into Ansible Rulebooks
 - ▶ Ansible rules can apply to events occurring on specific hosts or groups
- ▶ **Conditional management of actions to events**
 - ▶ Simple YAML structure for logical conditions
 - ▶ Events can trigger different types of actions:
 - Run Ansible Playbooks
 - Run Modules
 - Post new events to the event handler
- ▶ **YAML-like format familiarity**
 - ▶ Current Ansible users quickly learn and use Rulebook writing

```
- name: Automatic Remediation of a web server
hosts: all
sources:
  - name: listen for alerts
    ansible.eda.alertmanager:
      host: 0.0.0.0
      port: 8000
rules:
  - name: restart web server
    condition: event.alert.labels.job == "fastapi" and
event.alert.status == "firing"
    action:
      run_playbook:
        name: ansible.eda.start_app
```

Event Driven Ansible



Event-Driven Ansible Integration Technologies

Event source plugins

PARTNER SOURCE PLUGINS

- Prometheus/Alertmanager
- AppDynamics
- Sensu
- Dynatrace

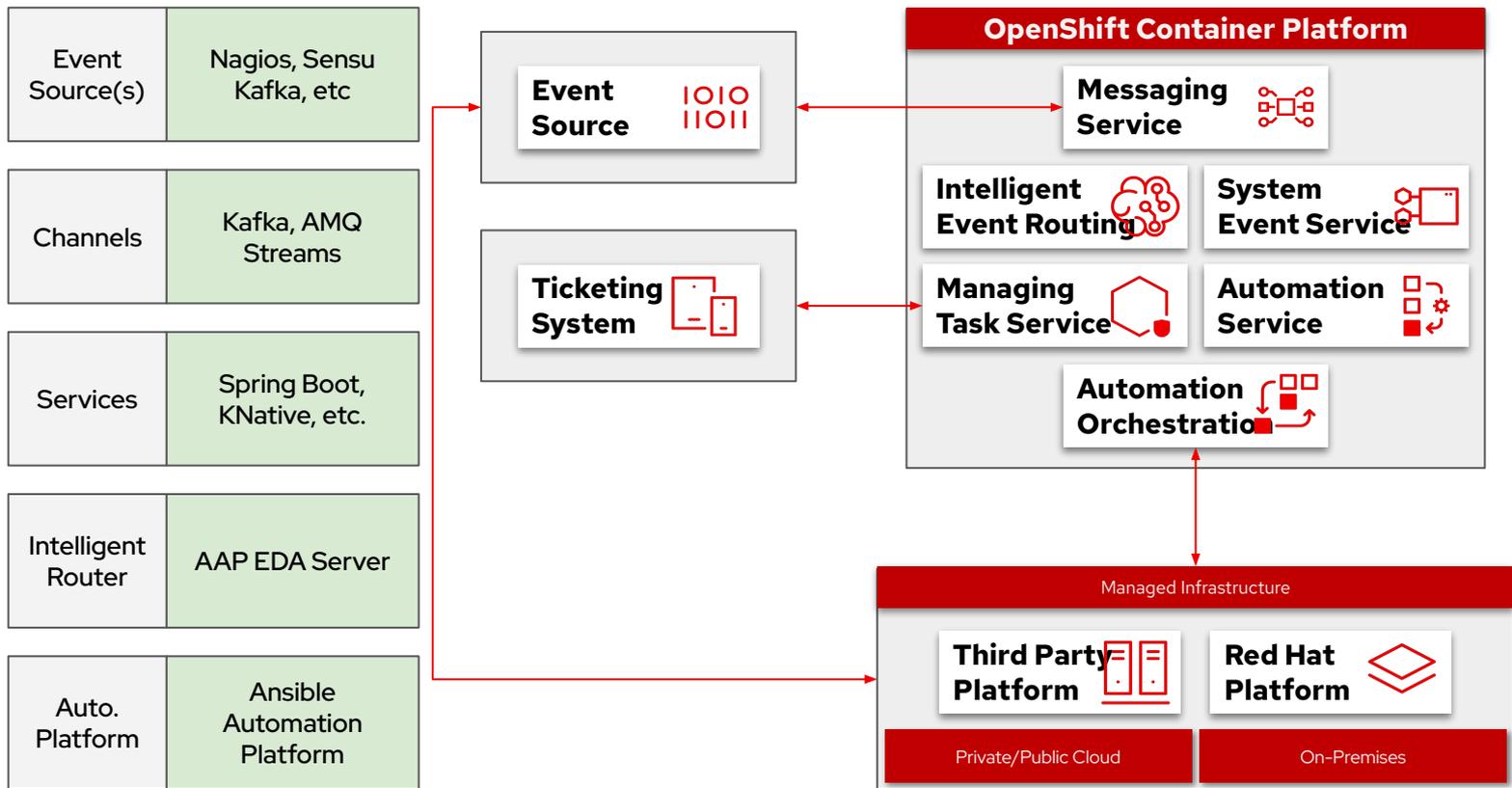
OPEN SOURCE PLUGINS

- Kafka (event streams)
- webhooks
- watchdog (file system watcher)
- url_check (url status check)
- range (event generation plugin)
- file (loading facts from yaml)

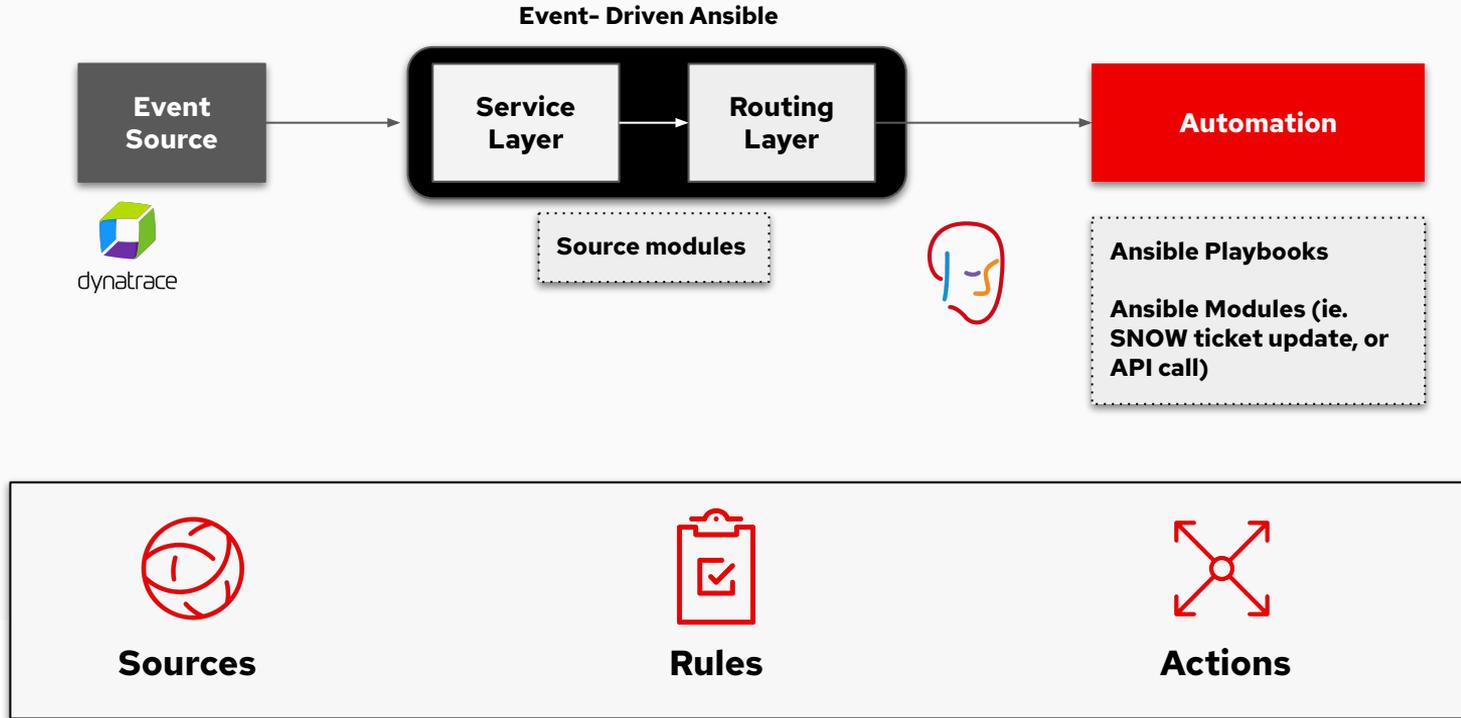
ROADMAP FOR INTEGRATIONS

- Azure Service Bus
- AWS EventBridge

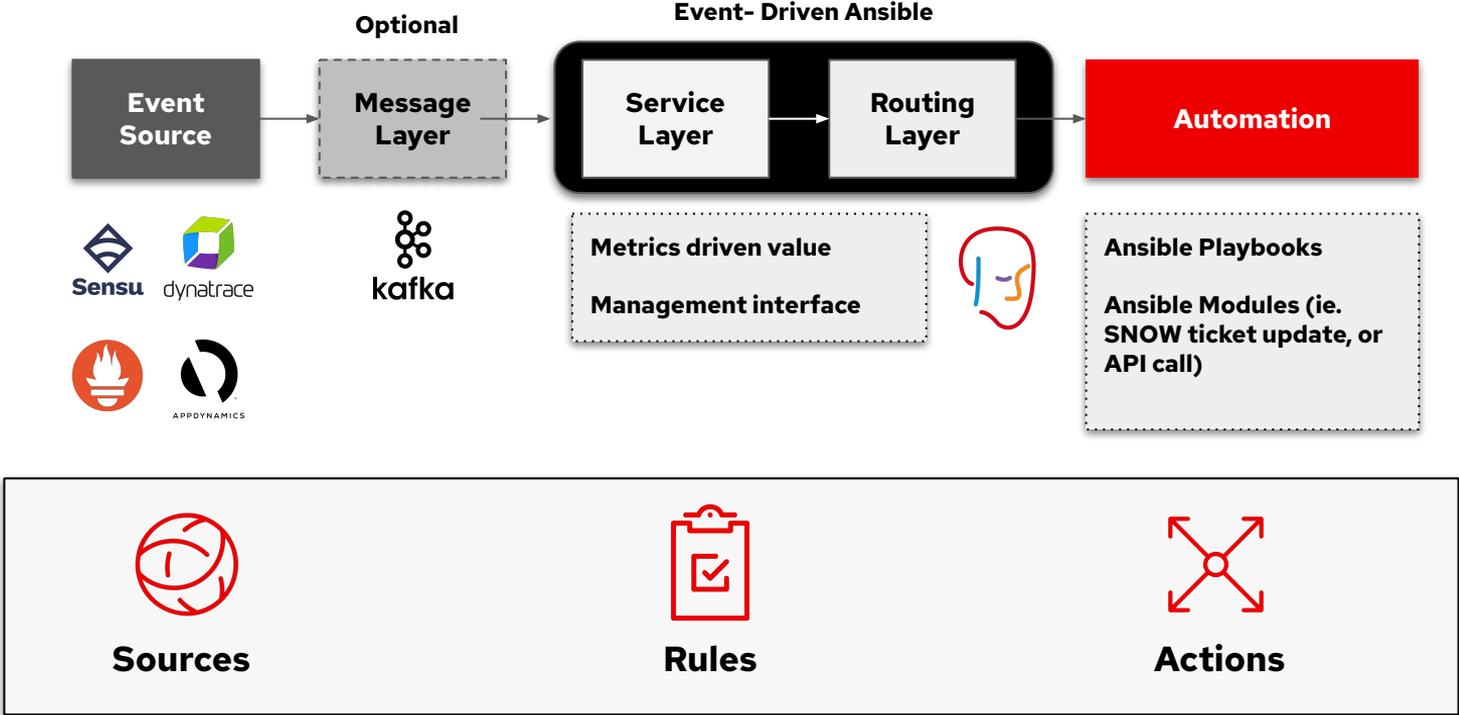
Business Solution: Runtime



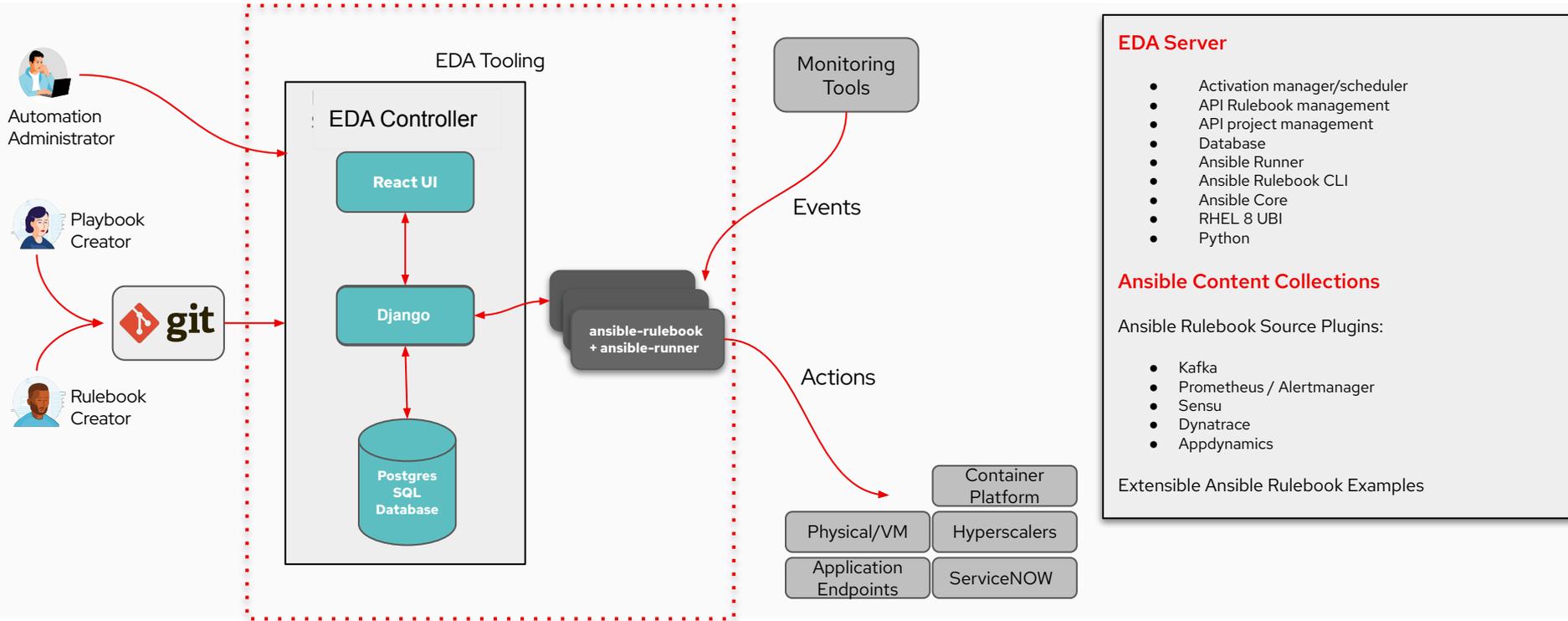
Execution layers of Event Driven Automation without messaging layer



Execution layers of Event Driven Automation

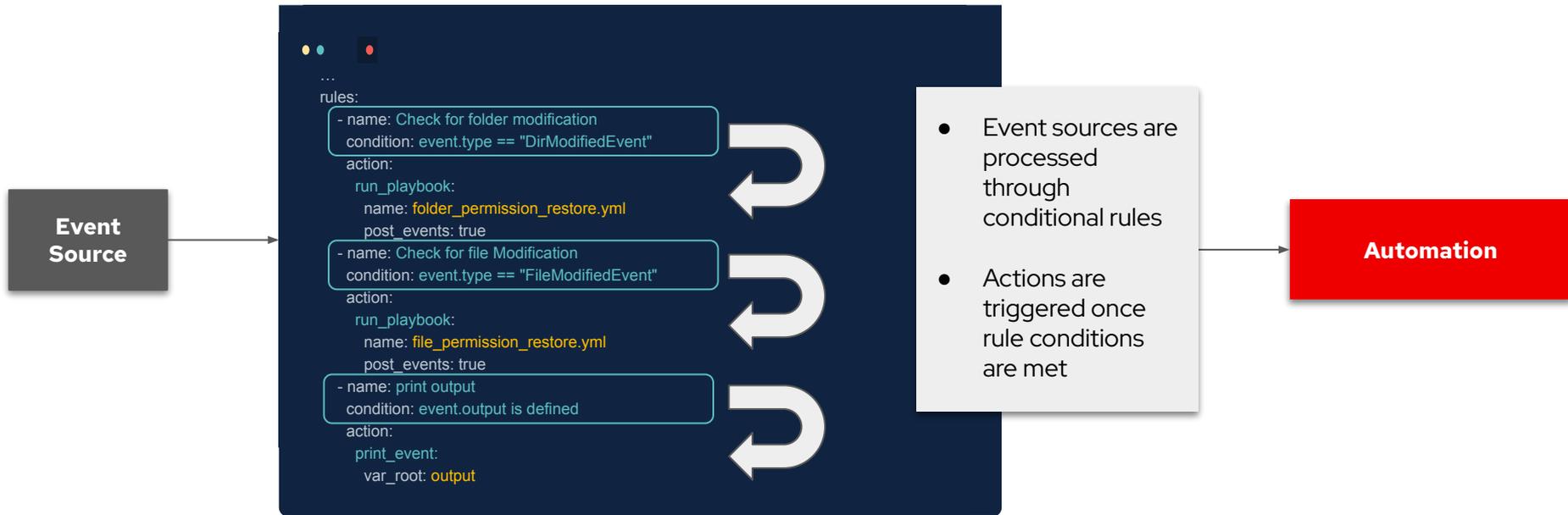


Event-Driven Ansible Components



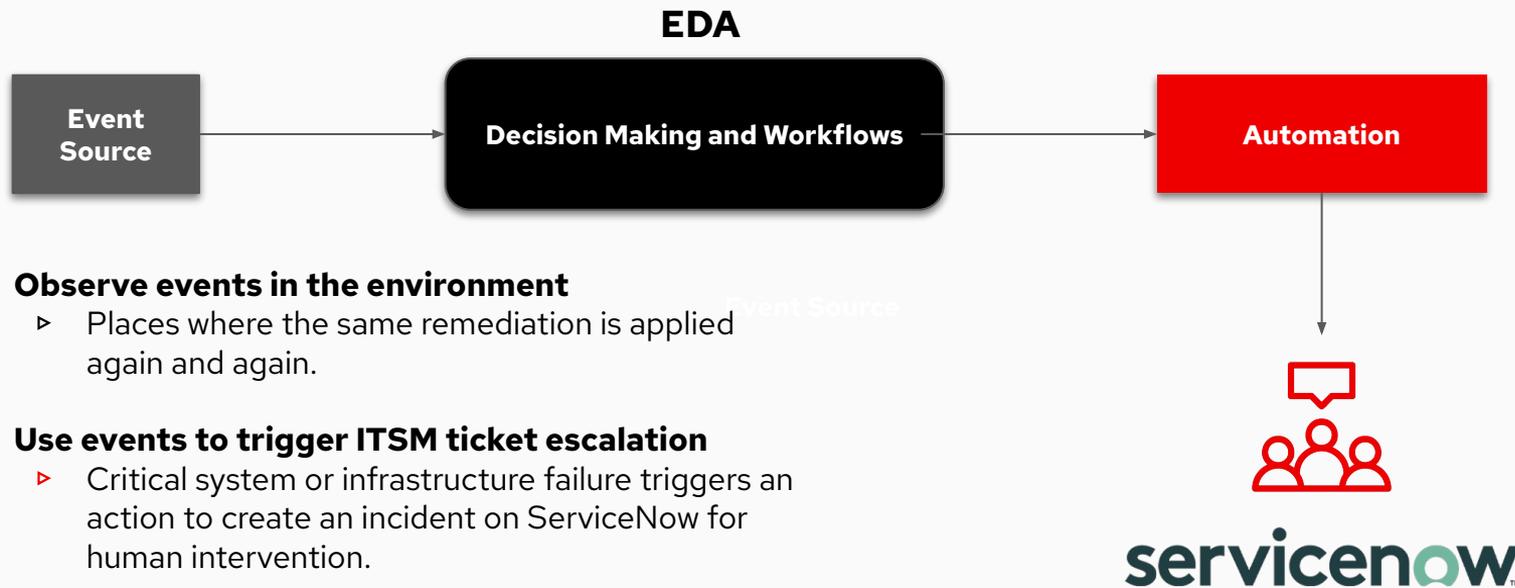
How does Ansible handle rules processing?

Smart automation from conditional rules



Event-Driven Ansible - ServiceNow ITSM integration

Events to human observation



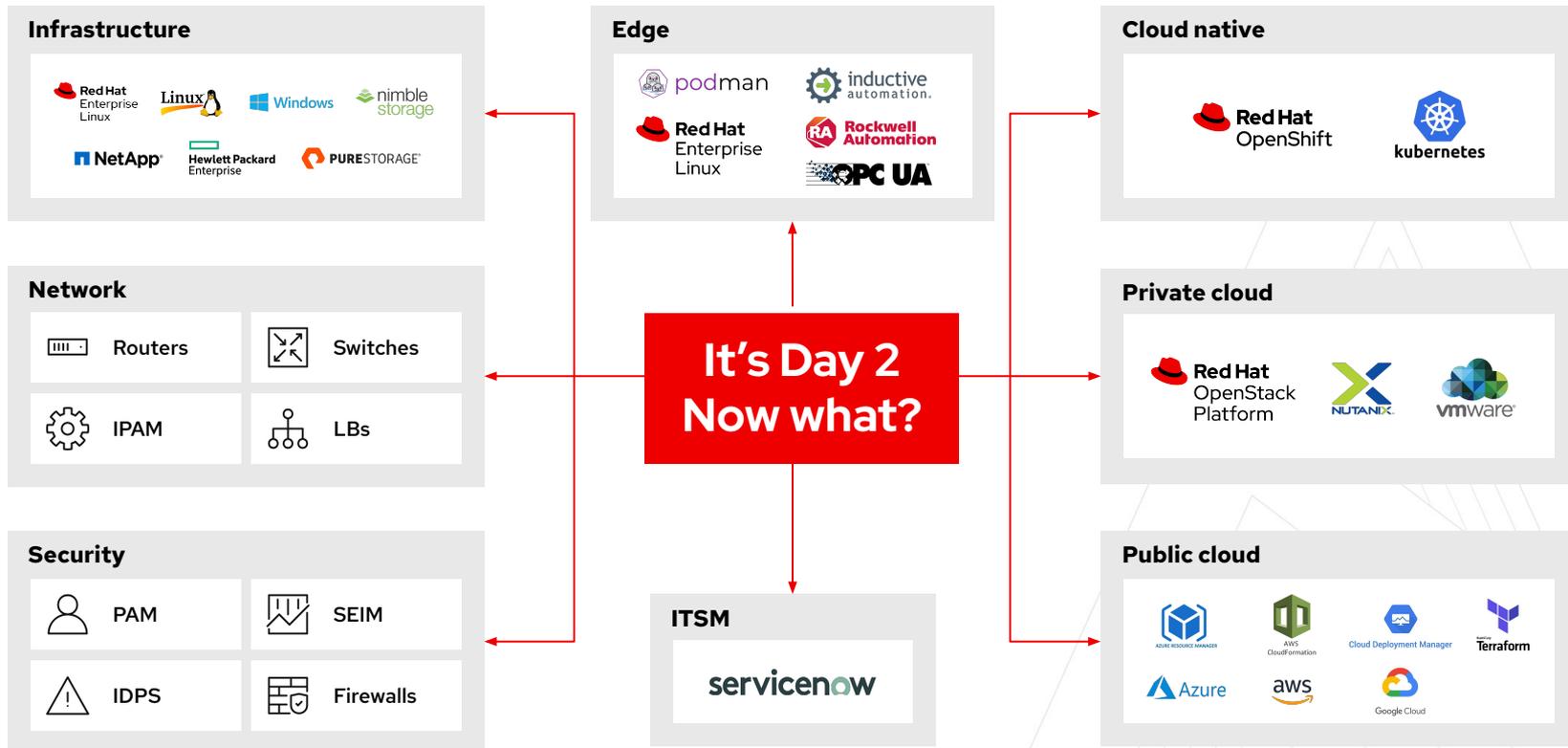
- ▶ **Observe events in the environment**
 - ▶ Places where the same remediation is applied again and again.
- ▶ **Use events to trigger ITSM ticket escalation**
 - ▶ Critical system or infrastructure failure triggers an action to create an incident on ServiceNow for human intervention.
- ▶ **Update ServiceNOW CMDB**
 - ▶ Infrastructure changes can be observed and used to trigger ServiceNow to update its inventory



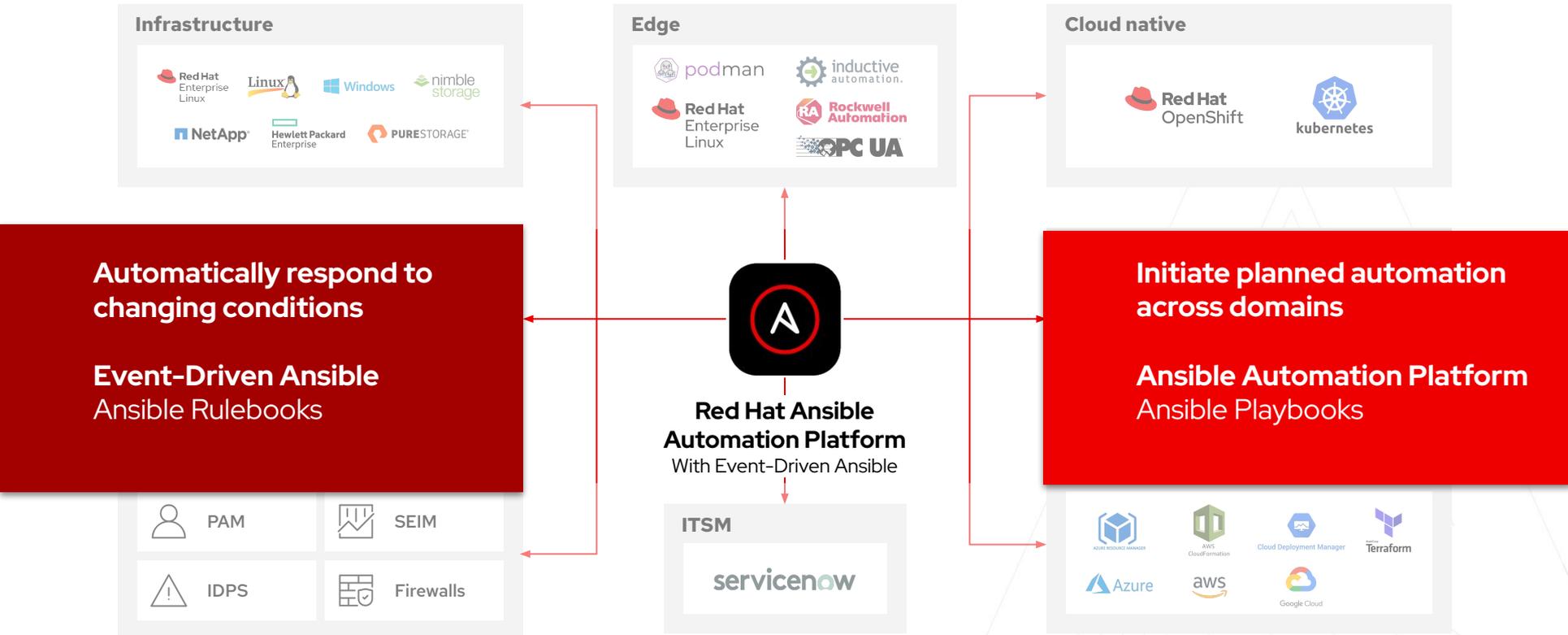
DEMO

Event-Driven Automation with Ansible

The reality of hybrid infrastructure



Single enterprise platform now with **more automation options**



Introducing Event-Driven Ansible

Achieve new milestones in IT service efficiency

Automate decision making

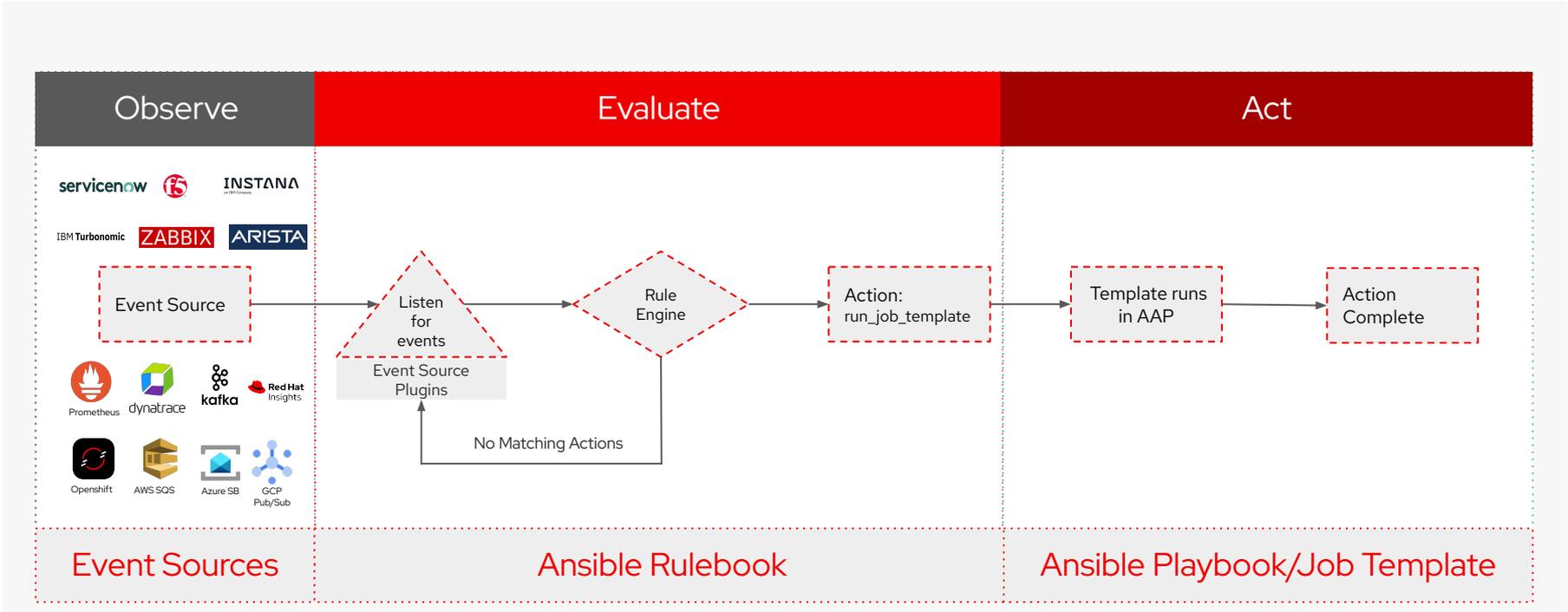
Leverage numerous sources of events



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Event-Drive Automation with Ansible



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Infrastructure

- ▶ **Escalate** infrastructure issues for improved observability
- ▶ **Ensure** compliance post change events



Security

- ▶ **Automate** log enrichment from a security event
- ▶ **Automate** security responses from incidents
- ▶ **Escalate** events for human intervention



Applications

- ▶ **Allow** applications to trigger remediation of issues from patterns
- ▶ **Enrich** healing capabilities of applications and their dependencies

Event-Driven Automation with Ansible

Managing IT operations more efficient and effectively

IT administrators faces a **multitude of issues** on a daily basis. From security to a operational incidents, operators is expected to have **deep knowledge of their environment** its operating dependencies. Such knowledge are often kept in the minds of highly experience administrators **remediation can be very challenging** especially on environments that has a **high volume of change**.

More often, just automating is not sufficient.



Is there an alternative to solve this issue?



Configuration Remediation

Bring non-production to production

Promoting applications from non-production to production often requires some heavy lifting from IT operation. The common process adopted by most enterprise is to re-provision the exact same virtual machines which was previously deployed in a non-production into a production environment.

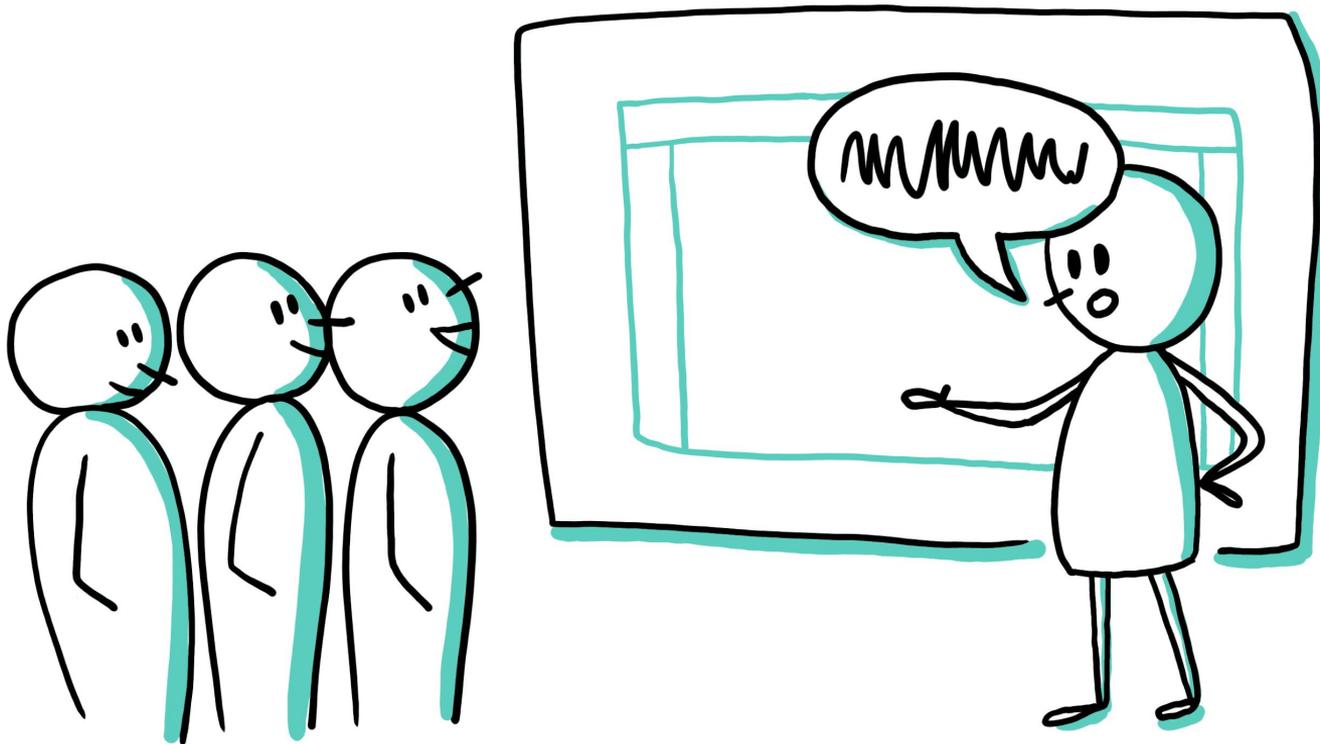
However, some software components may differ between the two distinct environments. Peripheral software such as remote access software typically used by software developers not allowed in production environments. Most often, administrators will need to manually uninstall which leaves an open windows for security breach.



Demo Showcase

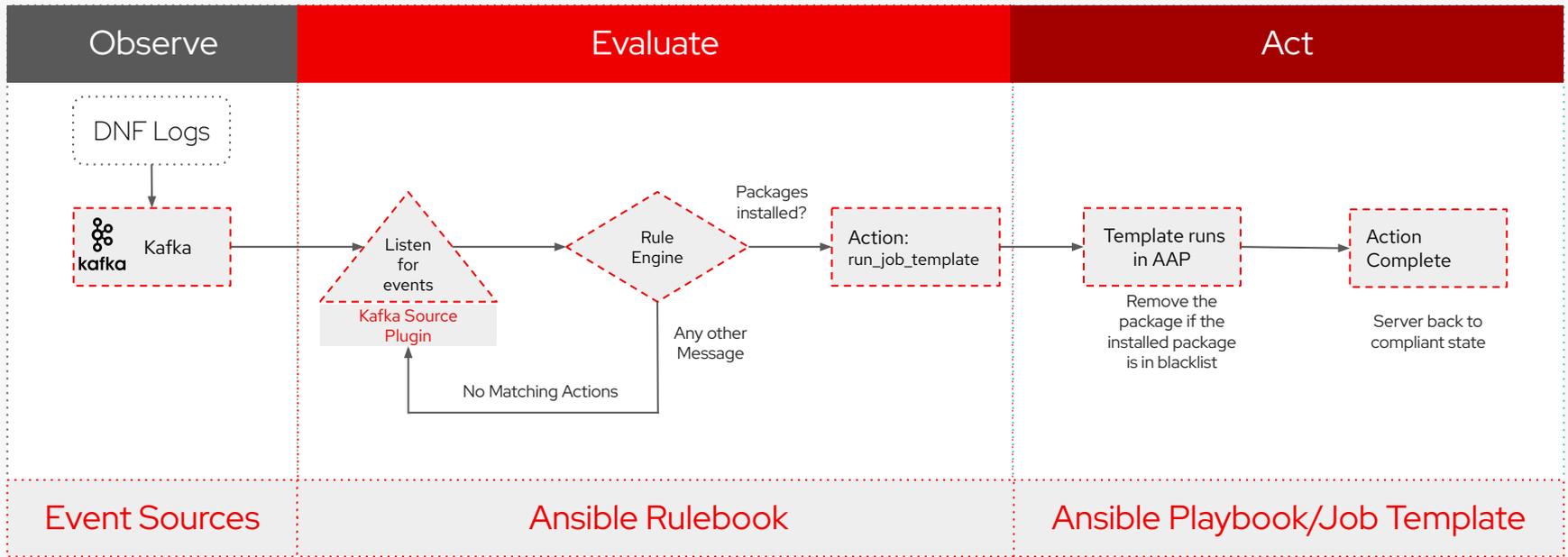
Event-Driven Ansible will detect an unauthorised package software that is being installed in a virtual machine in production and will perform an immediate remediation.

DEMO TIME



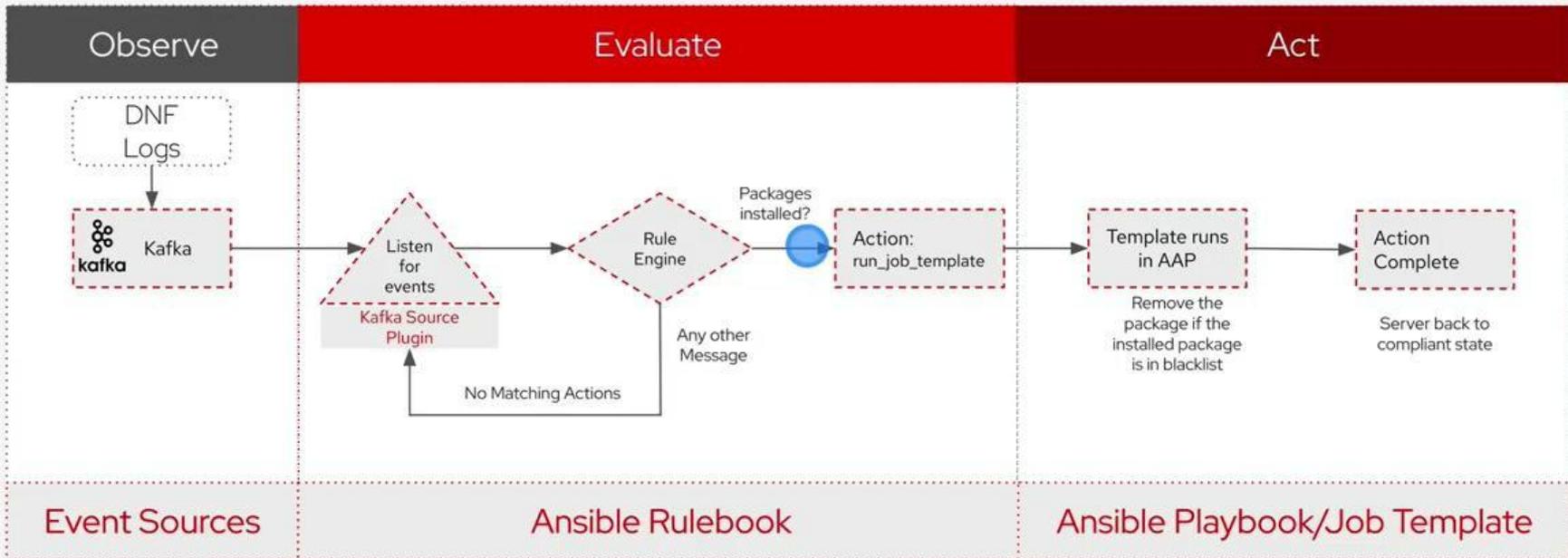
Event-Drive Automation with Ansible

Demo



Event-Drive Automation with Ansible

Demo



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<https://drive.google.com/file/d/1kBy3ZXKxCTjbgRG1EbDL-gPpLXIdPbo/view?usp=sharing>

In A Nutshell

the intent of EDA with Ansible is rapidly execute key IT actions

Providing a full end-to-end automation to achieve faster Mean-Time-To-Resolution (MTTR), increase operational productivity and increase consistency and predictability in enterprise-class IT environments.

Implement easily

Write automation rules via Ansible Rulebooks with a familiar YAML-like language, making changes easily when needed

Boost speed and responsiveness

Address festering problems rapidly, before they become urgent issues. Improve Mean-Time-To-Resolution

Work flexibly

Modular design that makes it easy to apply event-driven automation across your operation. Subscribe to events and implement actions in the ways you want

Adapt easily across IT

Automate repetitive tasks for networking, edge, infrastructure, DevOps, security, cloud, and more, with a single automation platform

Ensure consistency

Codify team knowledge in Ansible Rulebooks to act in the same way every time. Eliminate human errors that are often caused by high-volume repetitive tasks and tired staff

Innovate faster

Free teams to do their best and most critical work, so they can help deliver better value to the business from IT, whether it is applications, networks, the cloud, or the edge

Thank you

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