Red Hat Summit

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# Sessione pomeridiana a cura di Red Hat

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# Agenda

**Attenzione: le demo non sono disponibili in questo file. Si rimanda al canale YouTube di ImpresaCity, dove verrà pubblicato un reportage con tutti i video della sessione plenaria e di Red Hat nel mese di dicembre 2024.**

| | |
|---|---|
| 14:00 - 15:00 | **Intelligenza Artificiale: modelli aperti, sviluppo, rilascio e gestione in ambienti cloud Ibridi** |
| 15:00 - 15:30 | **Il Machine Learning incontra Ansible Automation Platform: Un nuovo livello di automazione ITSM** |
| 15:30 - 16:00 | **Trusted Software Supply Chain.<br>Come rendere sviluppo applicativo e MLOps sicuri e tracciabili** |
| 16:00 - 16:30 | **Virtualizzazione Cloud Native, approccio dichiarativo e automazione del rilascio di workload virtualizzati** |
| 16:30 - 17:00 | **Dalla Strategia all'Azione: guidare la trasformazione digitale tramite la modernizzazione applicativa** |

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# Intelligenza Artificiale

## Modelli aperti, sviluppo, rilascio e gestione in ambienti cloud Ibridi


**Daniele Zonca**
Senior Principal
Software Engineer

**Marco Caimi**
Account Solution Architect

**Francesco Rossi**
Senior Specialist
Solution Architect


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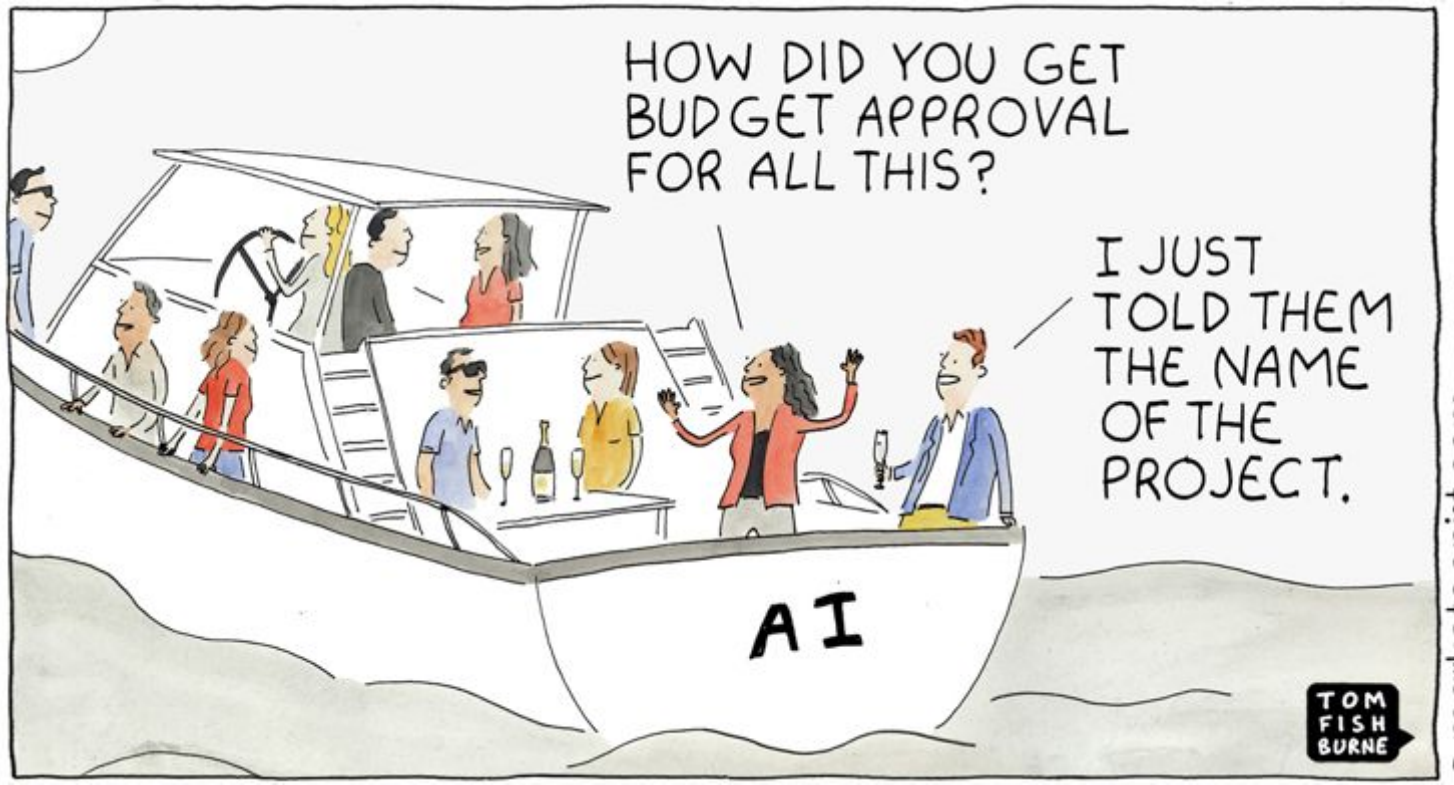
# Growing demand for AI solutions and services

**25%**

of the overall tech spending will be dedicated to AI within the next 12 months




Source:IDC : Worldwide Artificial Intelligence Software Forecast, 2023–2027

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# Red Hat's AI/ML engineering is 100% open source

Contributing to AI community projects since 2019

Red Hat OpenShift AI

## Integrated AI platform

Create and deliver gen AI and predictive models at scale across hybrid cloud environments.

Available as

- Fully managed cloud service
- Traditional software product on-site or in the cloud!

### Model development

Bring your own models or customize Granite models to your use case with your data. Supports integration of multiple AI/ML libraries, frameworks, and runtimes.

### Model serving and monitoring

Deploy models across any OpenShift footprint and centrally monitor their performance.

### Lifecycle management

Expand DevOps practices to MLOps to manage the entire AI/ML lifecycle.

### Resource optimization and management

Scale to meet workload demands of gen AI and predictive models. Share resources, projects, and models across environments.

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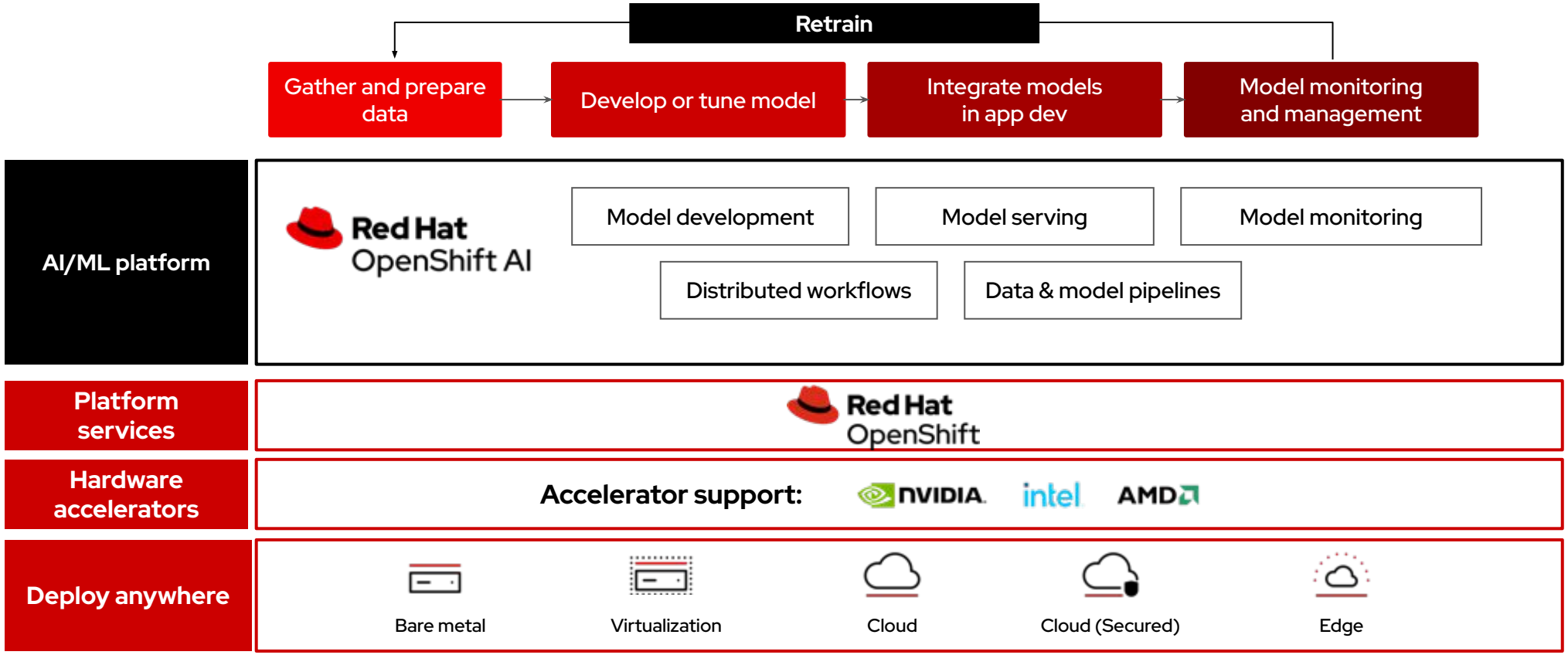
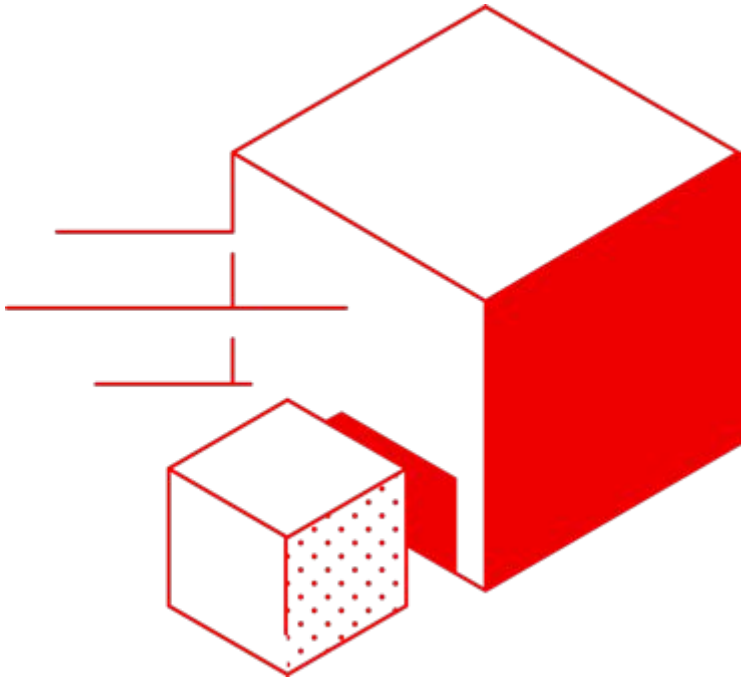
# Red Hat OpenShift AI

## Red Hat's AI/ML platform for predictive and gen AI applications



# Why containers, Kubernetes, and DevOps for AI/ML?



## Agility

Respond quickly with automated compute resource management.

## Flexibility

Provision AI/ML environments as and when you need them.

## Portability

Develop and deploy ML models consistently across datacenter, edge, and public clouds.

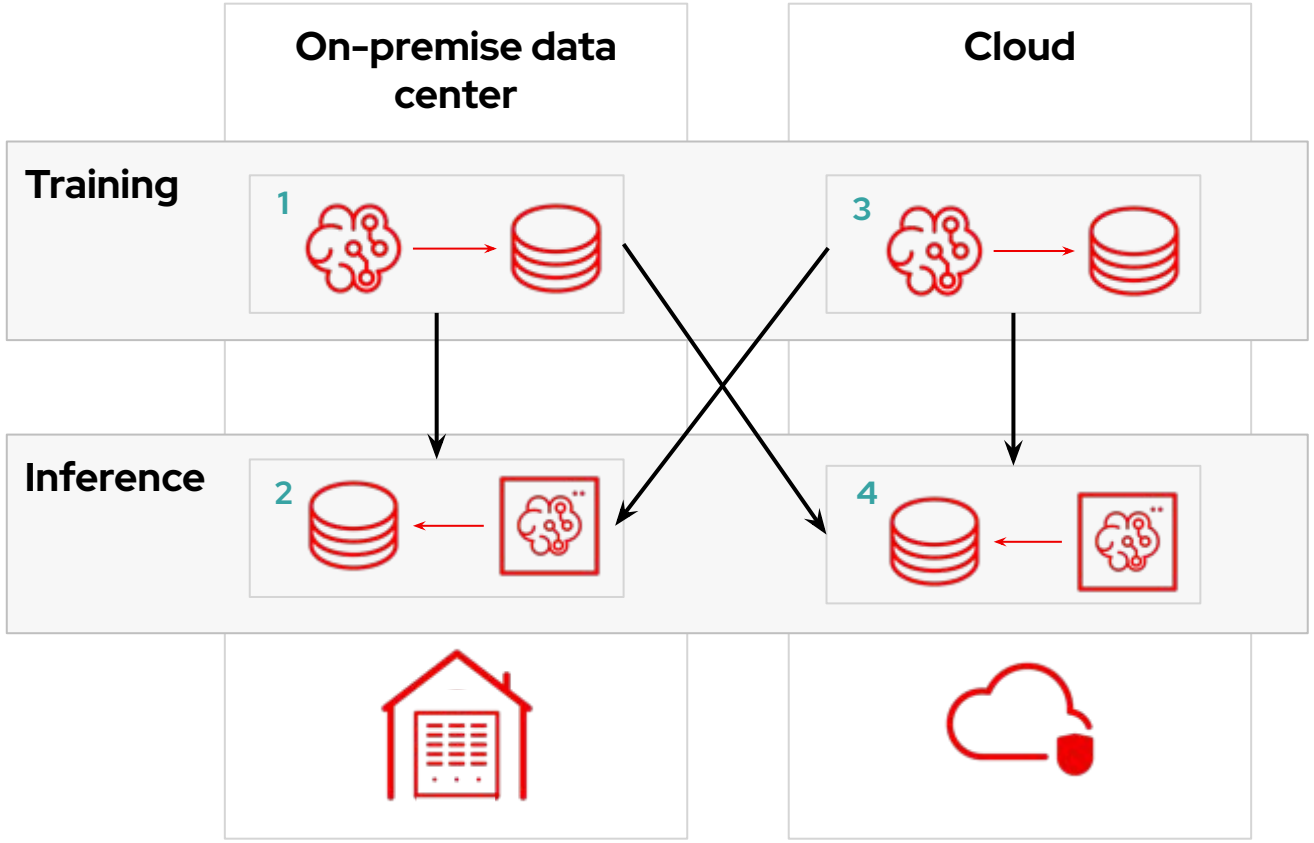
## Scalability

Autoscale and high availability of the AI/ML solution stack.

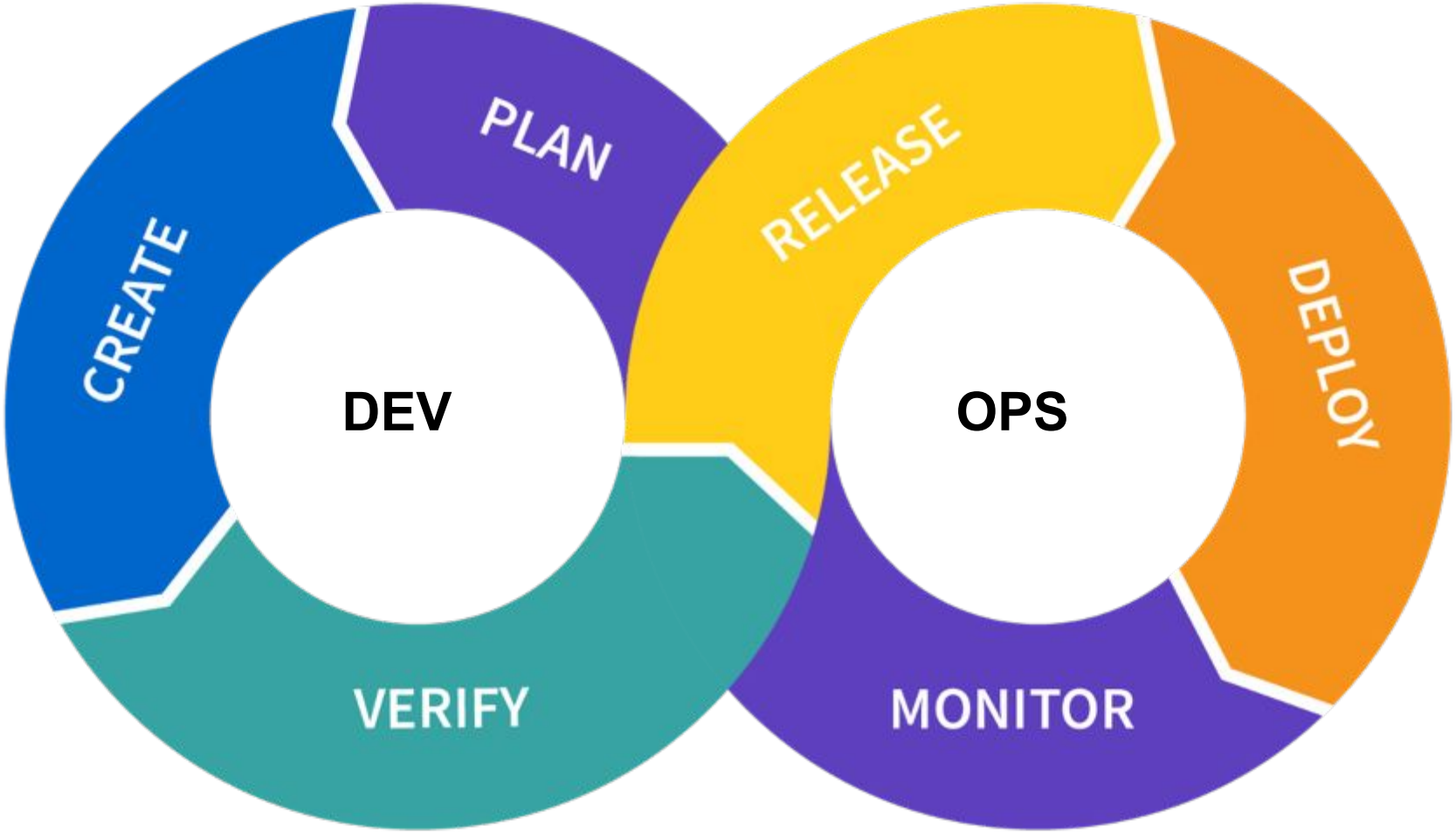
# Addressing data sovereignty, privacy and gravity

**What** you do should not dictate **where** you do it

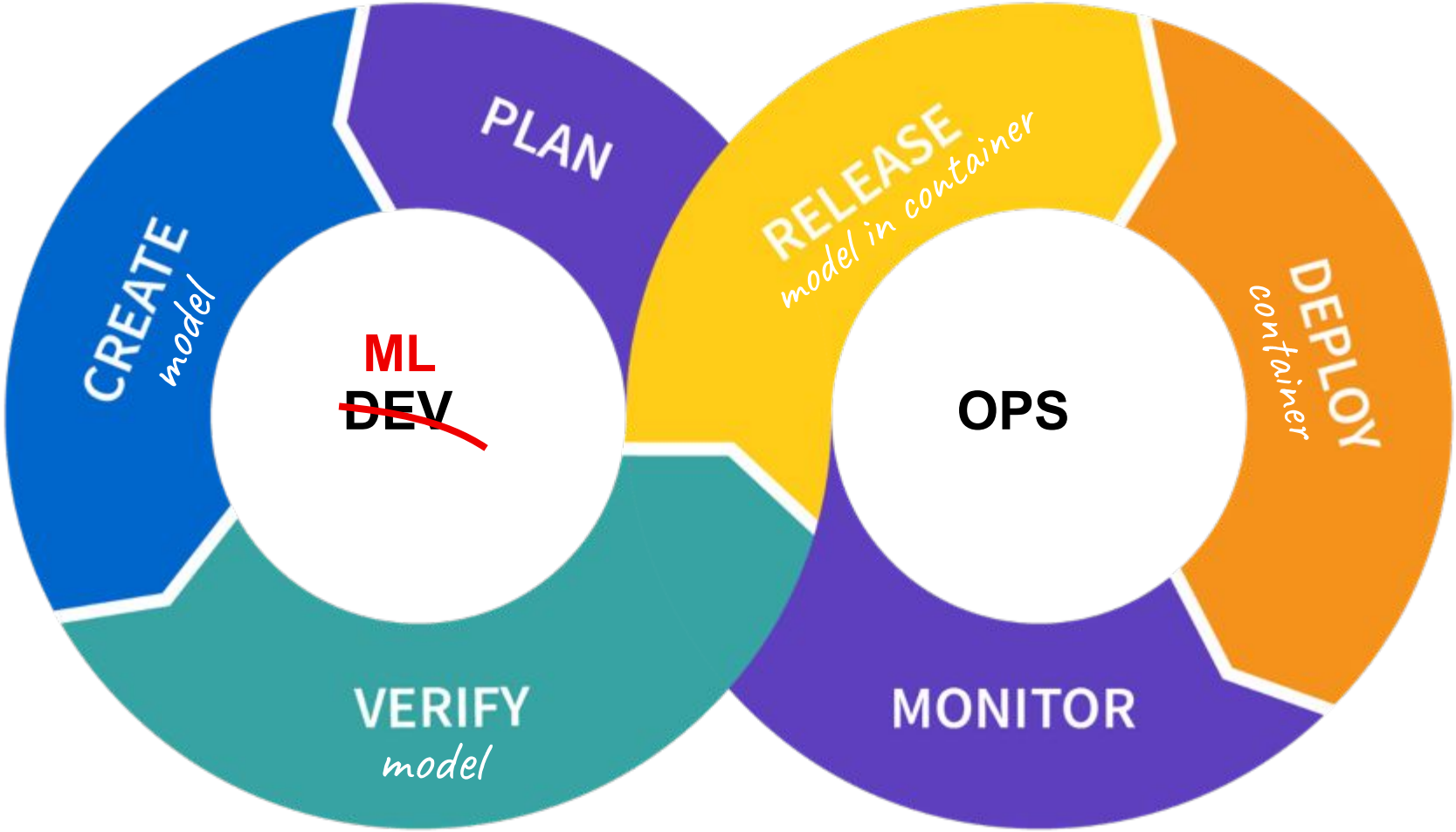
1. Data on-prem = Train on-prem
2. Data on-prem = Inference on-prem
3. Data in the cloud = Train on cloud
4. Data in the cloud = Inference on cloud



# Kubernetes - A DevOps platform

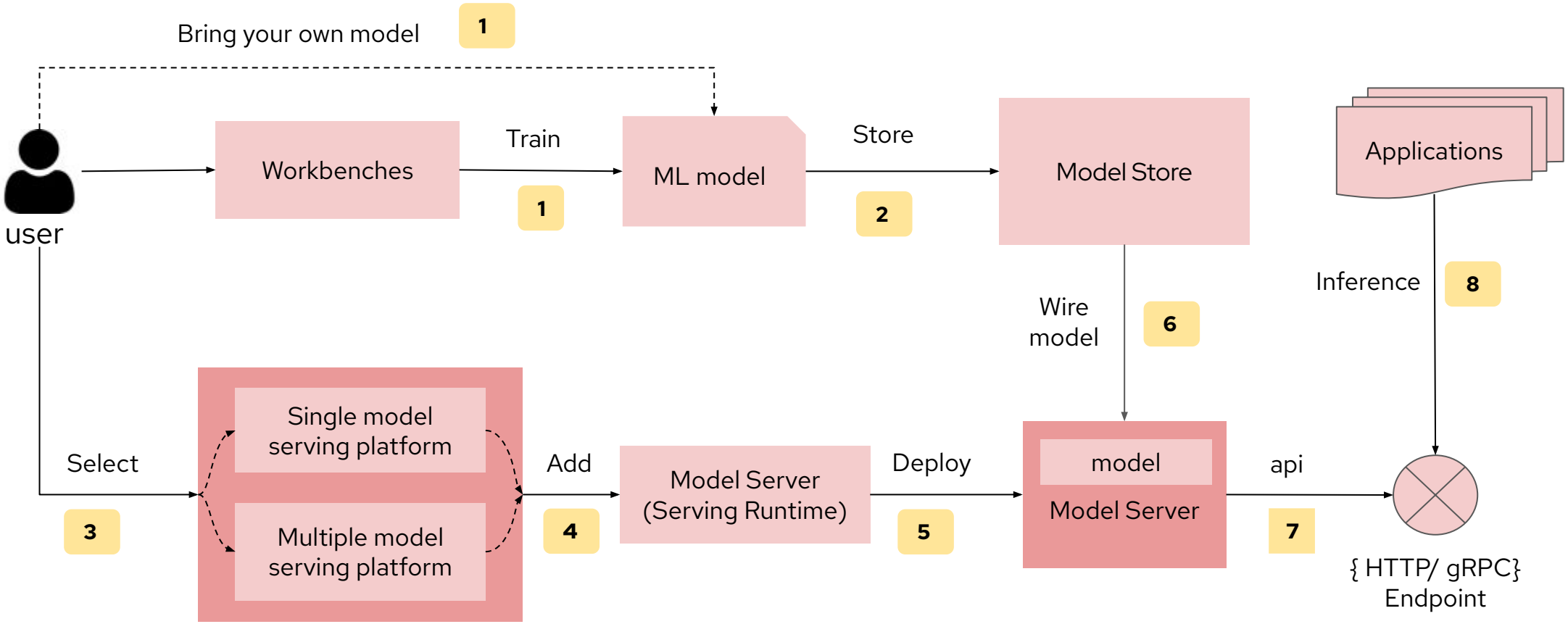


# Kubernetes - A ~~DevOps~~ MLOps platform



# MLOps Workflow

*From model development to serving through an API*



# Demo Introduction

Part 1

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# Business Context

Insurance company that needs to improve claims processing

## Proposed Improvements:

- Use various AI/ML tools and techniques to assist the claim adjusters
- Provide support for low-level, repetitive tasks
  - Point out areas in need of review
  - Help with parsing and data extraction
  - Reduce repetition fatigue

# Using an LLM for text summarization

Allows for faster reading by the claims adjuster

Hi there, XYZ Insurance Company,
I hope this email is okay and finds you okay. I had an accident, and I'm not exactly sure how to go about this, but I think it's something to do with a car accident claim, and my policy number is ABC12345, I think.

Okay, so here's what happened:

original, long-winded e-mail

Accident Stuff:

Date and Time: Um, so this accident thing happened on, like, October 15th, 2023, at, um, 2:30 PM, I think.

Location: So, it happened at this place, um, the intersection of Elm Street and Maple Avenue, near Smith Park in Springfield, Illinois. I heard you might need some coordinates? They're like 39.7476° N and 89.6960° W or something. Hope that helps.

The Accidenty Part:

Weather Conditions: Well, the weather was kinda not great, I guess. It was like, cloudy and a bit rainy. And the road was wet, you know?

Traffic Conditions: There were some cars around, like, moderate traffic, I guess. And I was driving, like, the speed limit, which is, um, 35 mph, I think.

Car Details: So, my car is a Honda Accord, I think, and the other car involved was a Ford Escape. Yeah, that's right.

What Happened: So, I had the green light, and I was driving through the intersection, you know? But the other car, coming from the north or something, ran a red light and hit the front of my car on the passenger side. I didn't really have time to react or anything.

Injuries: Good news, no one got hurt really bad, but our cars got pretty messed up. The police came and made a report, and the officer had a badge number, I guess, it's 12345. I can get you the report if you need it.

Witness Stuff: There were a few people who saw this happen, and I got their names.

human-readable summary

**Summary**:
The text is an email from John Smith to XYZ Insurance Company reporting a recent car accident involving his Honda Accord and a Ford Escape. The accident occurred on October 15, 2023, at approximately 2:30 PM at the intersection of Elm Street and Maple Avenue, near Smith Park, in Springfield, Illinois. John sustained minor injuries, but both vehicles sustained significant damage. He has taken photos of the accident scene and has the contact information of witnesses and the other party's insurance information. John is requesting that XYZ Insurance Company initiate a claim under his policy for the damages to his vehicle and is willing to provide any necessary documentation or information to process the claim efficiently.

# Using an LLM for information extraction

## Extract key pieces of information for better population of database

Hi there, XYZ Insurance Company,
I hope this email is okay and finds you okay. I had an accident, and I'm not exactly sure how to go about this, but I think it's something to do with a car accident claim, and my policy number is ABC12345, I think.

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| Date | Location | Item |
|---|---|---|
| 15 oct 2023 | Springfield, IL | Car |

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# Using an LLM for sentiment analysis

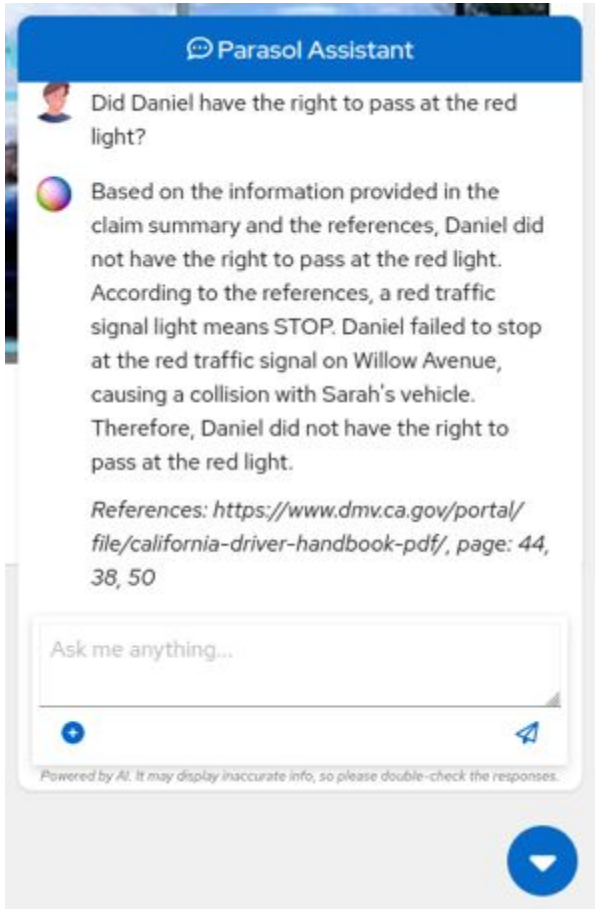
Detect tone of text, and potentially act on it

**Sentiment**:
The sentiment of the person writing this text appears to be calm, assertive, and cooperative.

**Sentiment**:
The sentiment expressed in this text seems to be assertive and frustrated.

# A virtual assistant to help operators

## Provide guidance on Claim by consulting Driver Handbook knowledge (RAG)

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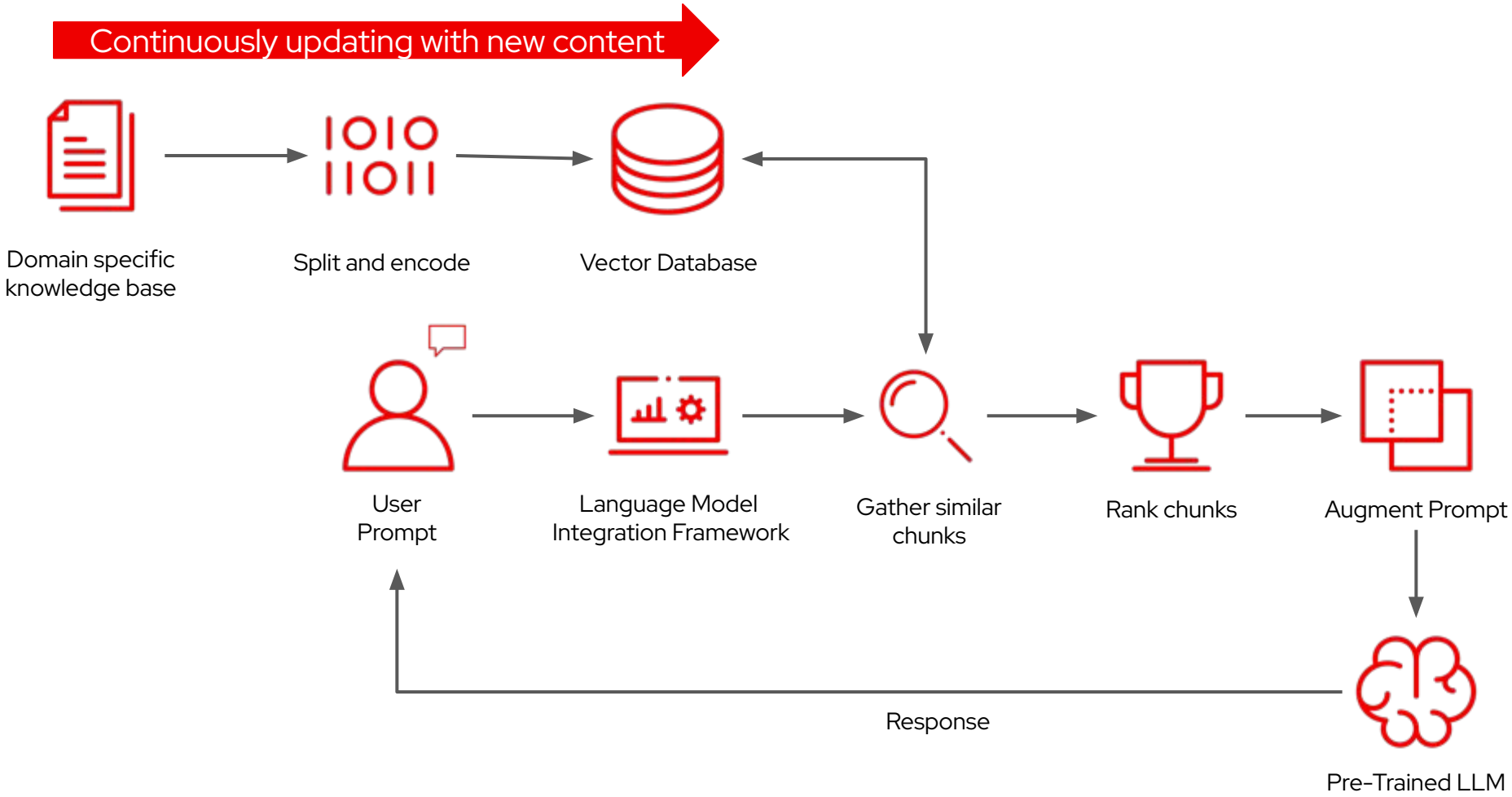
# Retrieval Augmented Generation (RAG)

Helps the model to “look up” external information to improve generated text responses

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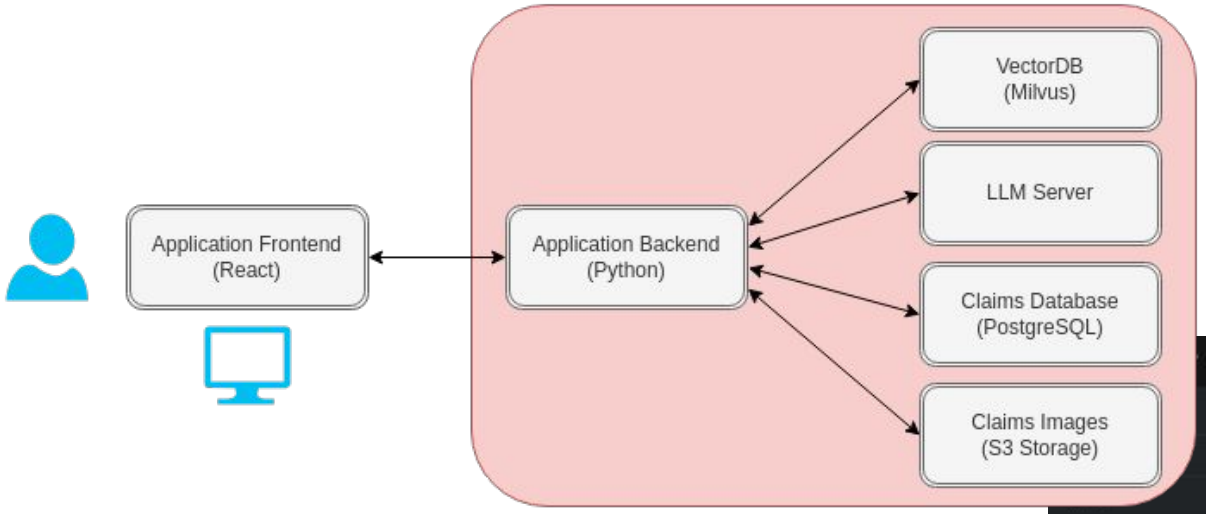
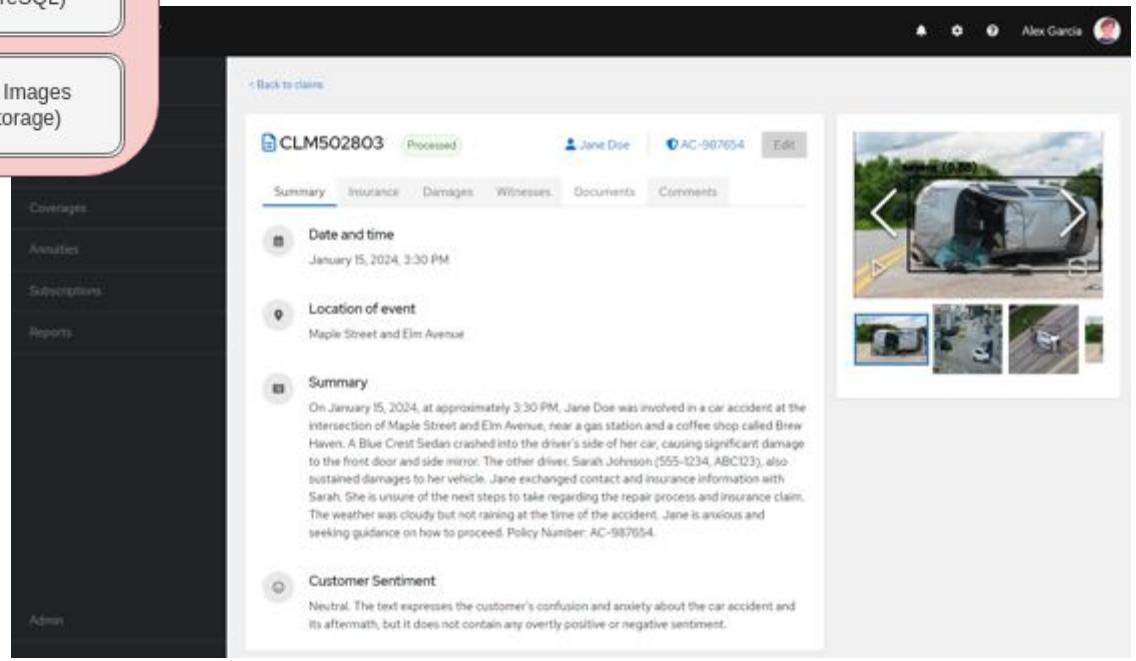
# Web Application to review/process claims



# Demo Introduction

Part 2

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# Demo Introduction

Part 3

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# Wrap-Up

## Foundation Models, RAG and Fine-Tuning

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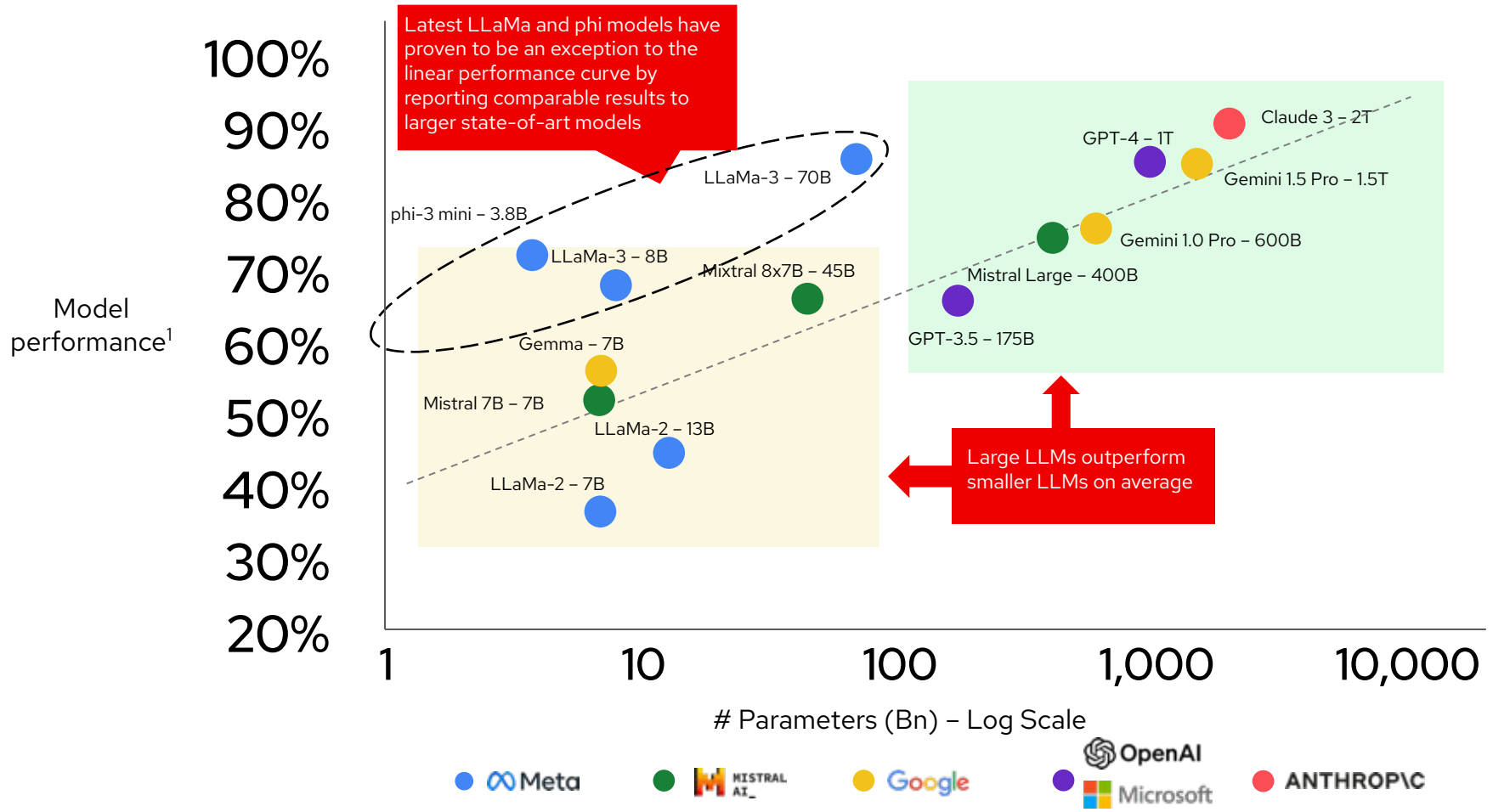
# Model Size vs. Performance – Large vs. Small LLMs

## IBM Granite Models target Small LLMs aligned to enterprise data/use case




[1]Model performance Calculation: Average of commonly utilized LLM benchmarks – MMLU (Multitask accuracy), HellaSwag (Reasoning), HumanEval (Python coding tasks), BBHard (Probing models for future capabilities), GSM8K (Grade school math)

Source: LLM Leaderboard 2024 (vellum.ai)

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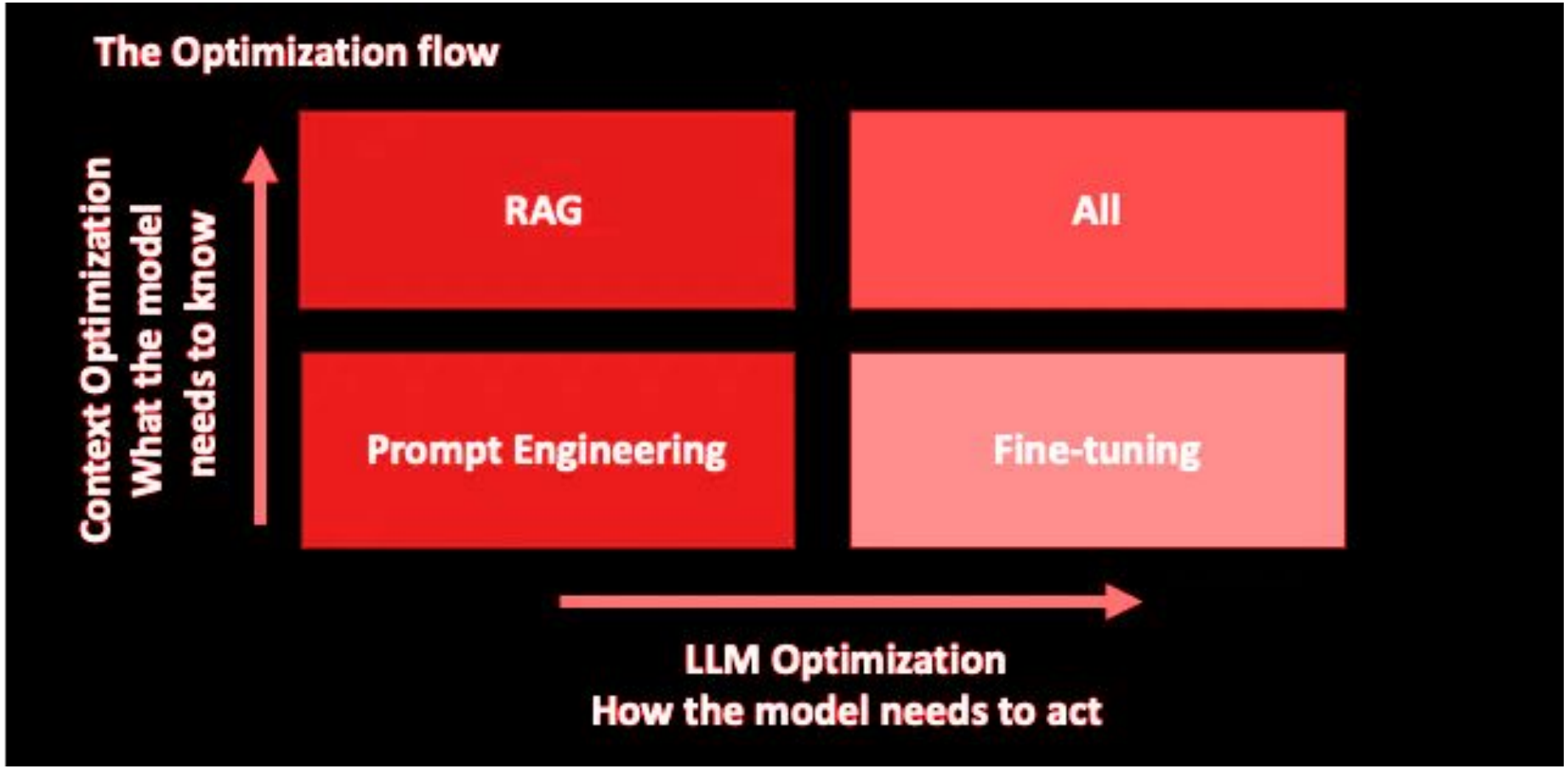
# Optimizing the performance of LLMs




Source:
Optimizing LLMs: Best Practices (Luv Verma on Medium, January 6, 2024)

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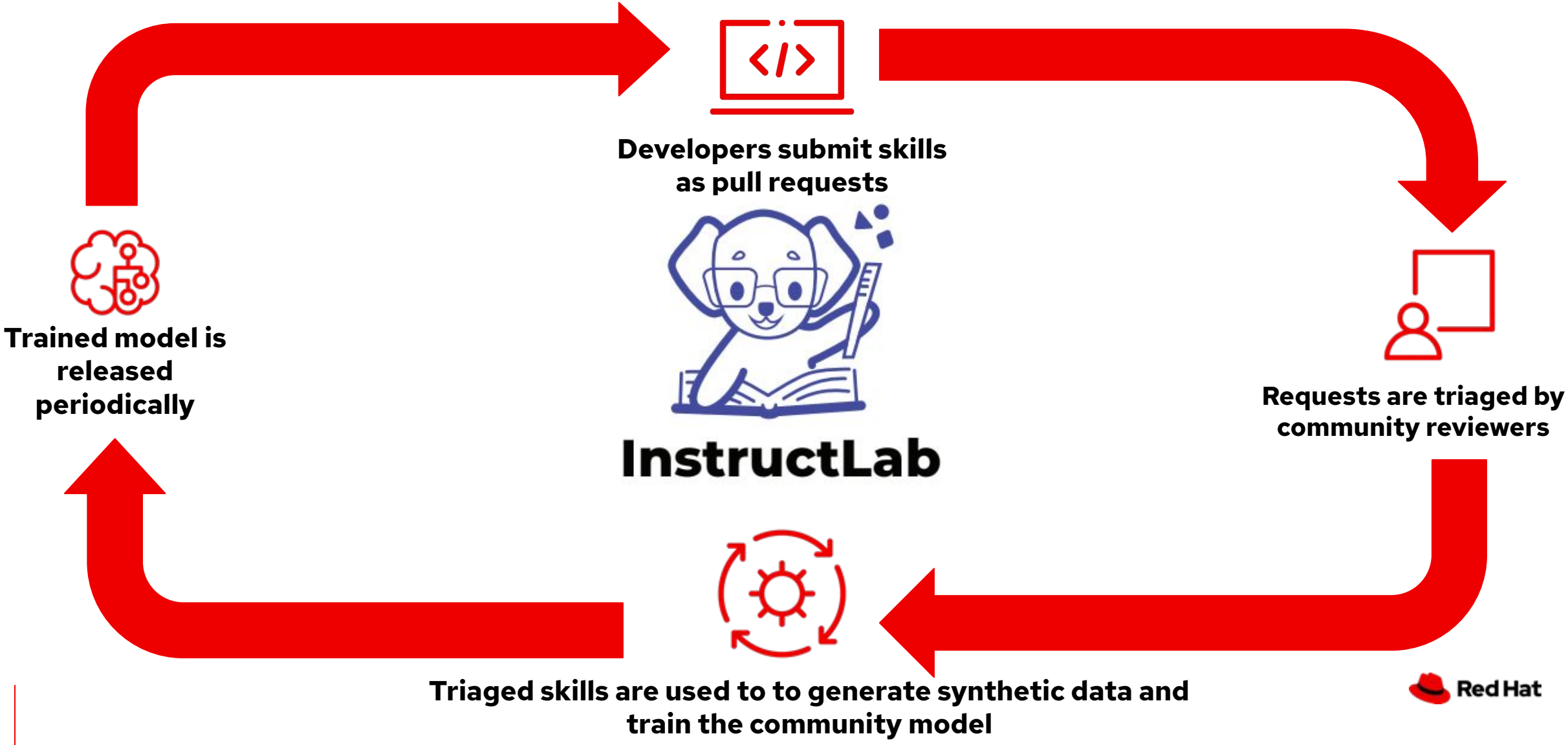
# Introducing: **InstructLab**

Open source community project for GenAI model development

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# InstructLab vs. Alternative Model Alignment Approaches

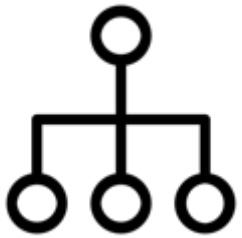
## InstructLab provides more accessible fine tuning & compliments RAG (RAFT pattern)

### RAG
(Retrieval Augmented Generation)

Enhance Gen AI model generated text by retrieving relevant information from external sources, improving accuracy and depth of model's responses.

NEW

### INSTRUCTLAB
(Large-scale Alignment for chatBots)



Leverage a taxonomy-guided synthetic data generation process and a multi-phase tuning framework to improve model performance.

### Fine-tuning
(Fine Tuning)

Adjust a pre-trained model on specific tasks or data, improving its performance and accuracy for specialized applications without full retraining.

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# Il Machine Learning incontra Ansible Automation Platform

## Un nuovo livello di automazione ITSM


Alessandro Arrichiello
Solution Architect
ale@redhat.com

Pietro Bertera
Solution Architect
pbertera@redhat.com


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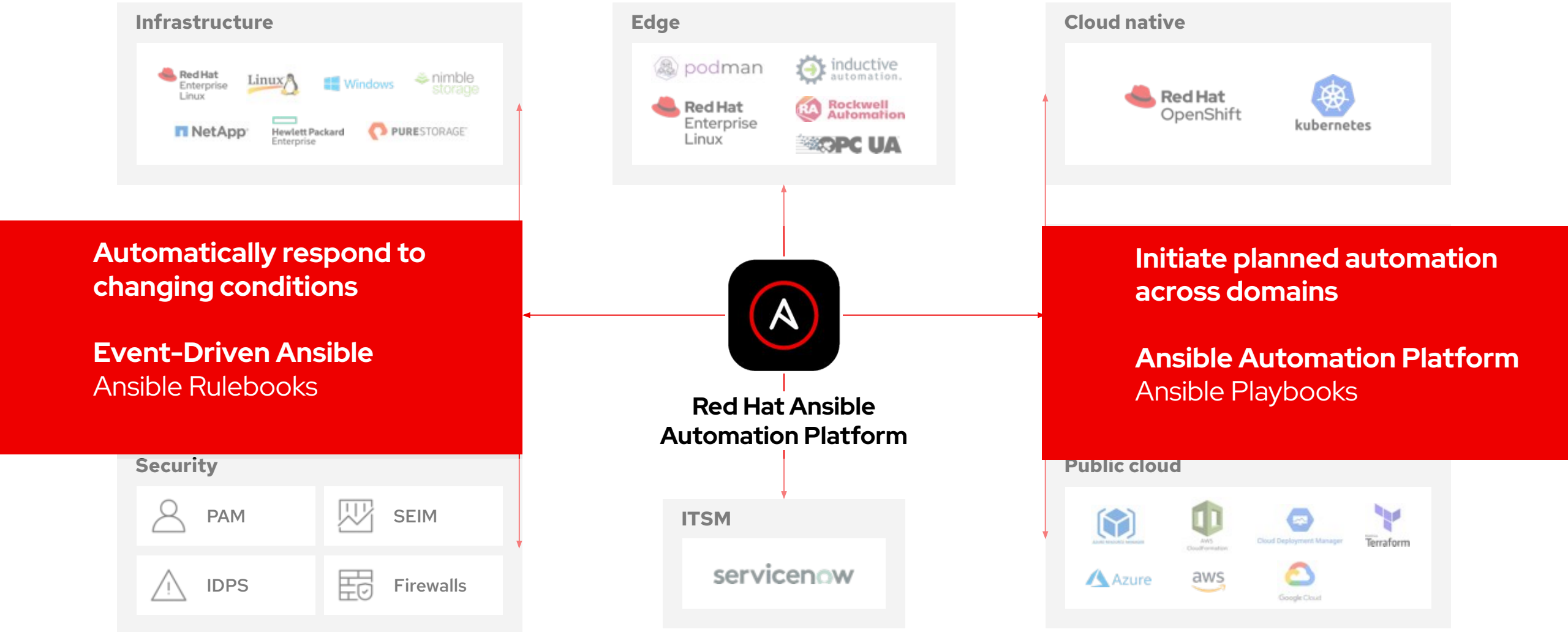
# Single enterprise platform now with more automation options



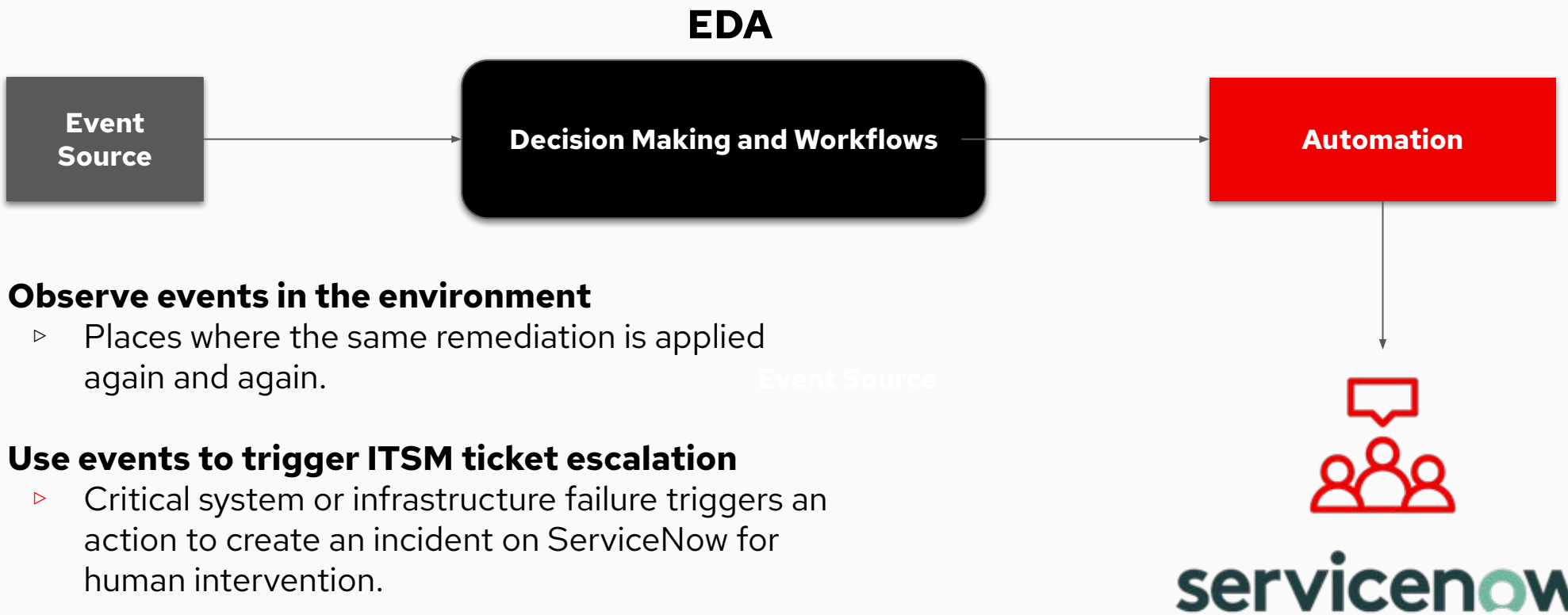

Red Hat Ansible Automation Platform

# Event-Driven Automation and ITSM Integration

Red Hat
Ansible Automation
Platform

# Event-Driven Ansible and ServiceNow ITSM integration

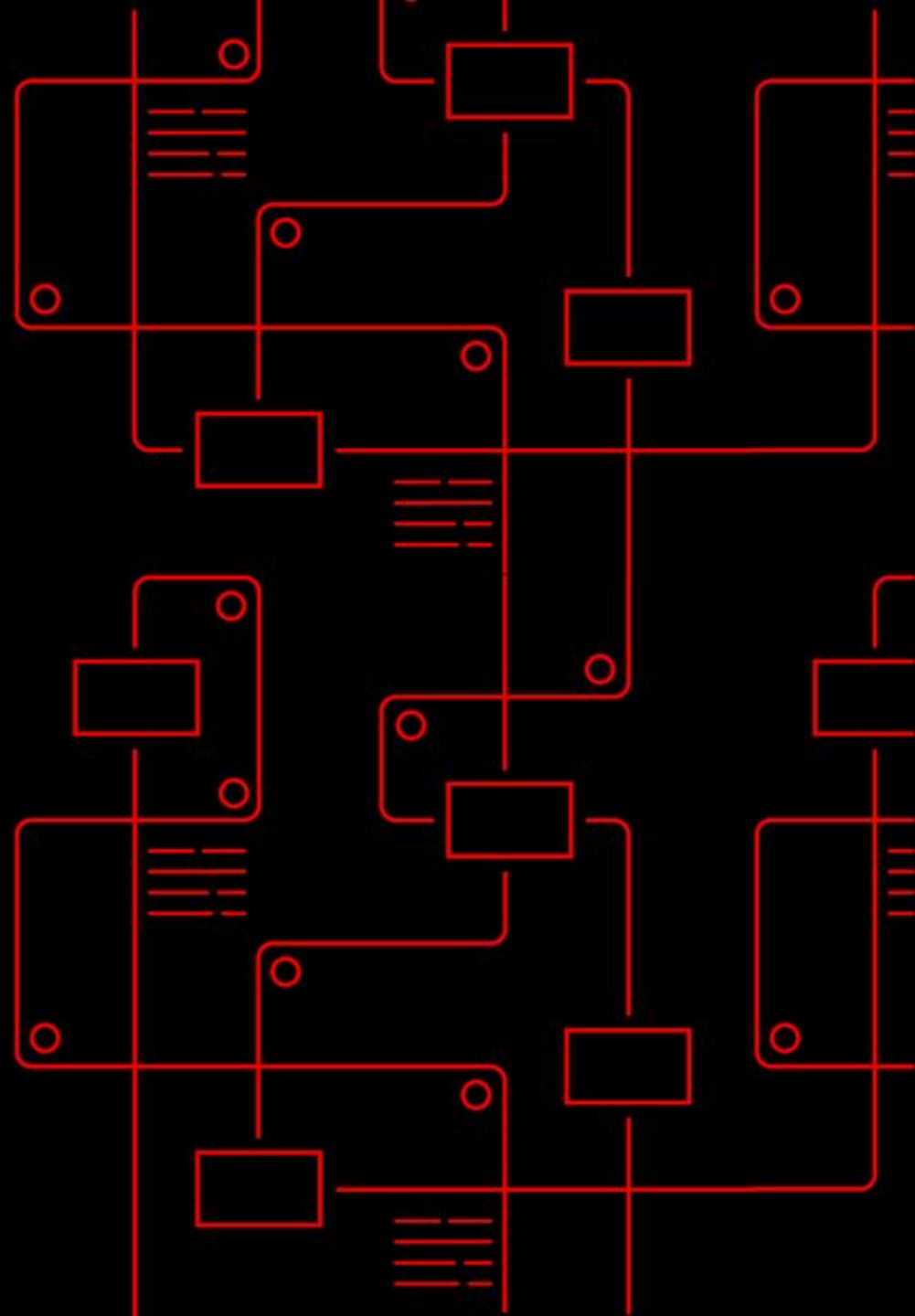
Events to human observation




- **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

# A gradual approach to ITSM Automation

That does not require a change to internal business processes



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Ansible Automation
Platform

# Manual Resolution via ServiceNow

Human operators identify and match the viable automation


- **Human operators interact with ITSM**
  - Analyze the informations on ServiceNow and execute a viable automation on AAP
- **AAP can then execute the automation and report**
  - After executing the automation Ansible Automation Platform can report back the status on ServiceNow incidents

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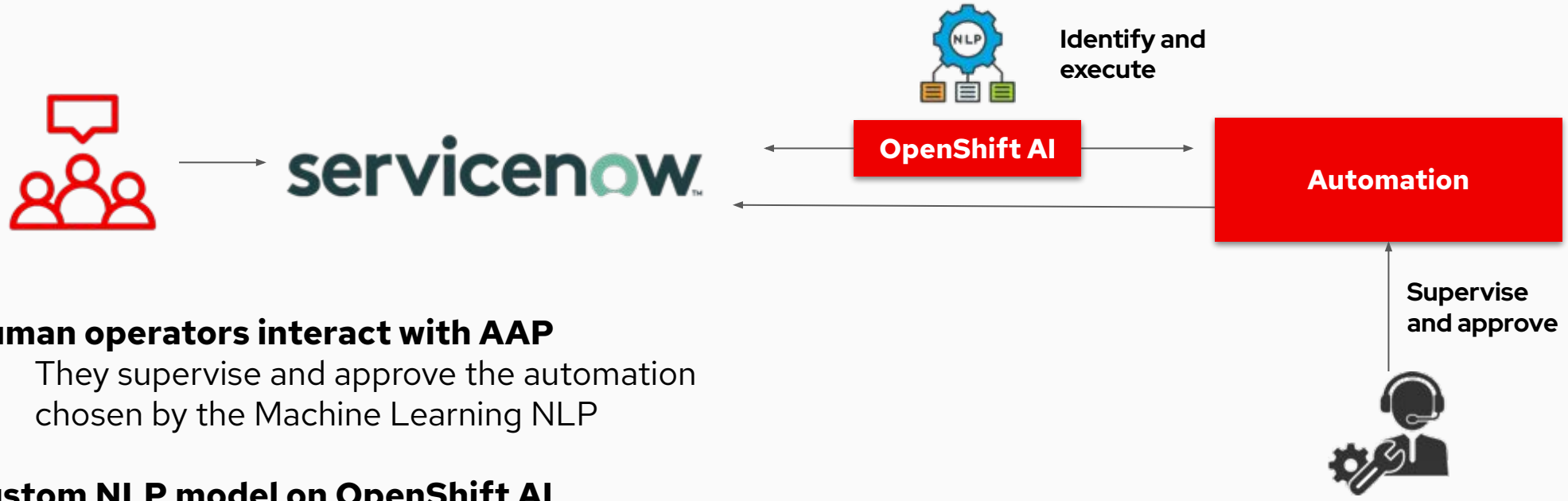
# ServiceNow ITSM integration

Human operator driven using just ITSM


- **Human operators interact with ServiceNow**
  - They work on the ServiceNow incidents and have integrations on the interface to call Ansible Automation Platform (AAP)
- **AAP can then execute the automation and report**
  - After executing the automation Ansible Automation Platform can report back the status on ServiceNow incidents

# AI/ML Resolution

Natural Language Processing for executing the proper Automation




- **Human operators interact with AAP**
  - They supervise and approve the automation chosen by the Machine Learning NLP
- **Custom NLP model on OpenShift AI**
  - OpenShift AI is serving the model trained on historical data extracted from ServiceNow (ITSM) to classify the text of the ticket and trying to match a viable automation on AAP
- **AAP can then execute the automation and report**
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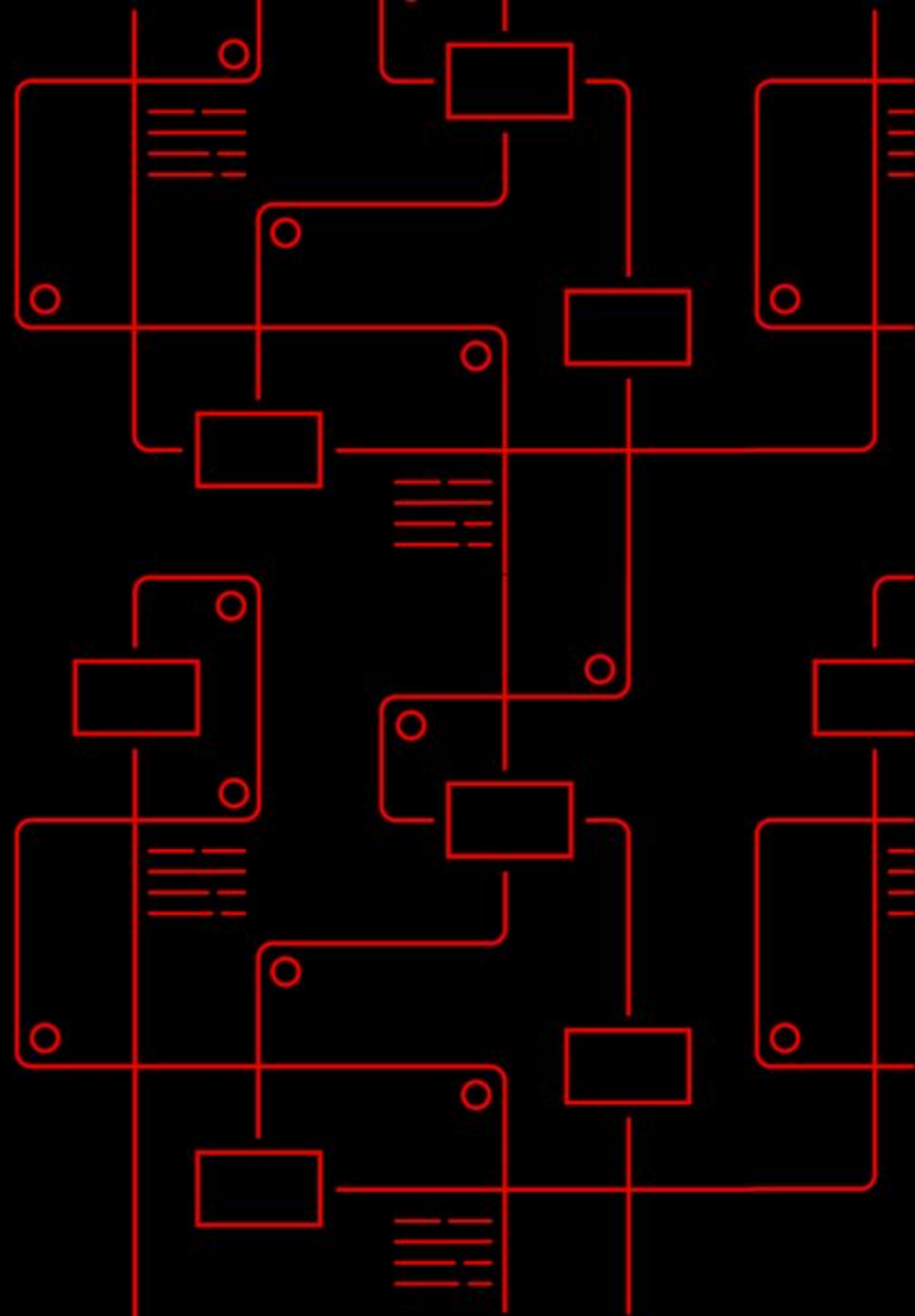
# Key Prerequisites For ITSM Automation



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Ansible Automation
Platform

# Key Prerequisites are vital for ITSM Automation Development

## Data Gathering and Categorization

- Historical ServiceNow data must be collected and categorized to understand incident patterns, enabling effective automation development and AI/ML model training.

## Ansible Automation Playbook Development

- Based on incident data analysis, Ansible playbooks should be created to automate the most frequent and time-consuming tasks, maximizing the return on automation investment.

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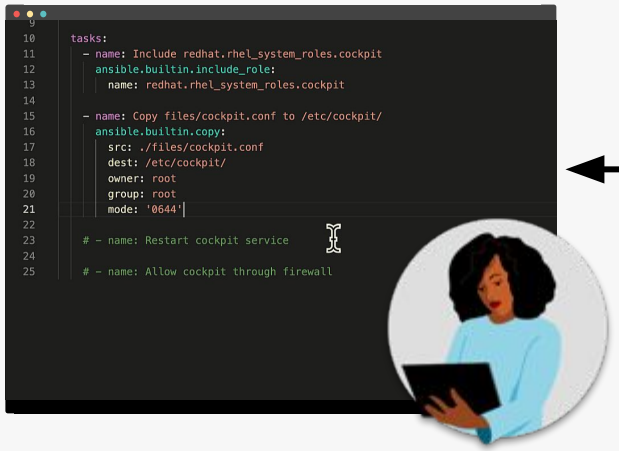
# Ansible Lightspeed enhances the automation development experience

## Integrated Development Experience

### Ansible content creation




VS Code extension

**Ansible Lightspeed**

Best - Practices

Anonymize

Post Processing

**IBM Watson Code Assistant**

**Red Hat OpenShift AI**

## Ansible Content Tools

Red Hat Ansible Automation Platform

# An Open and Collaborative Platform for AI and Apps

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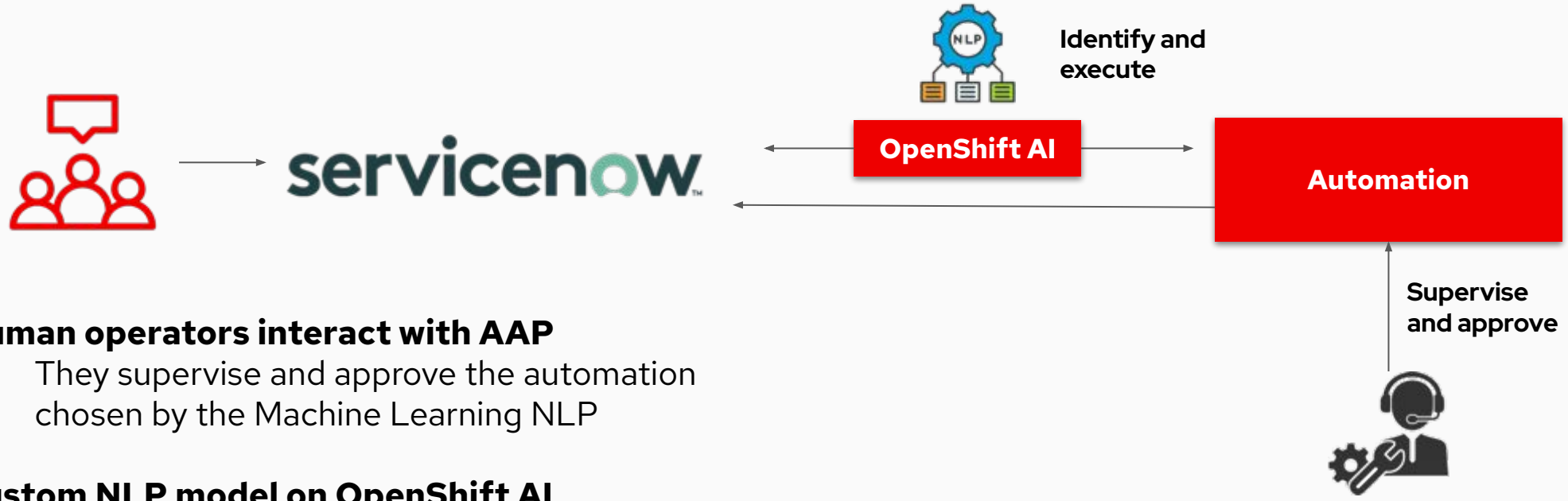
Platform

# AI/ML Resolution

Natural Language Processing for executing the proper Automation

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- **AAP can then execute the automation and report**
  - After executing the automation Ansible Automation Platform can report back the status on ServiceNow incidents

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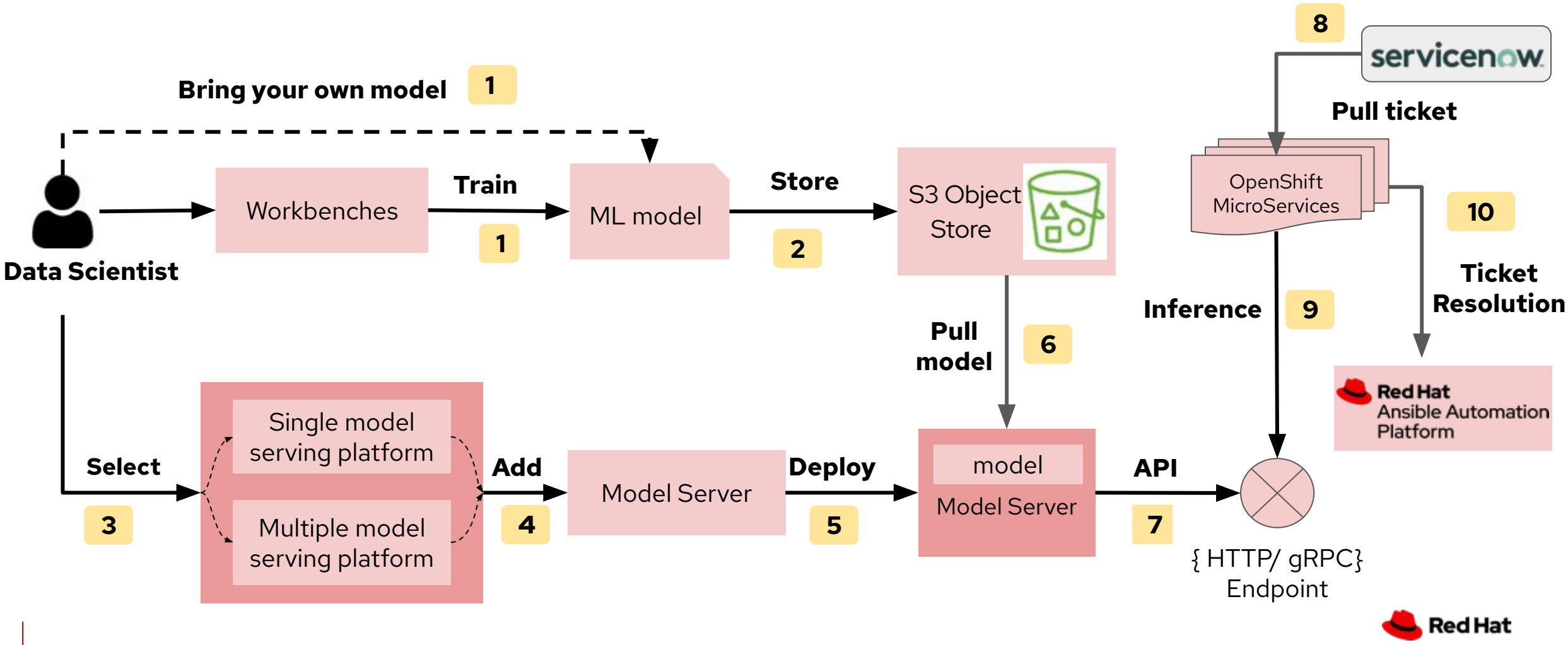
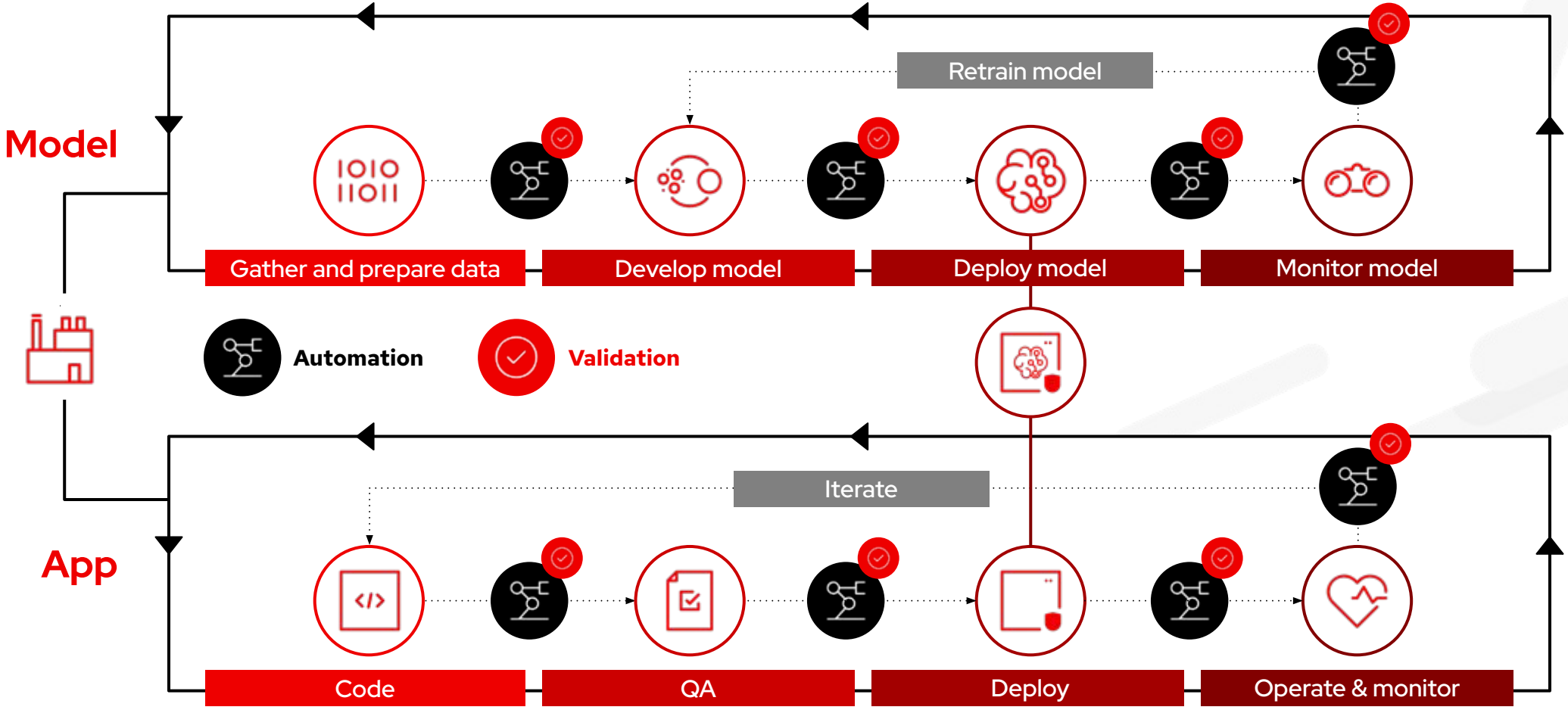
# Demo Workflow

*Training the model, serving it and let tickets to be classified to be resolved by the Automation Platform*



# AI Models and Automation in the same platform

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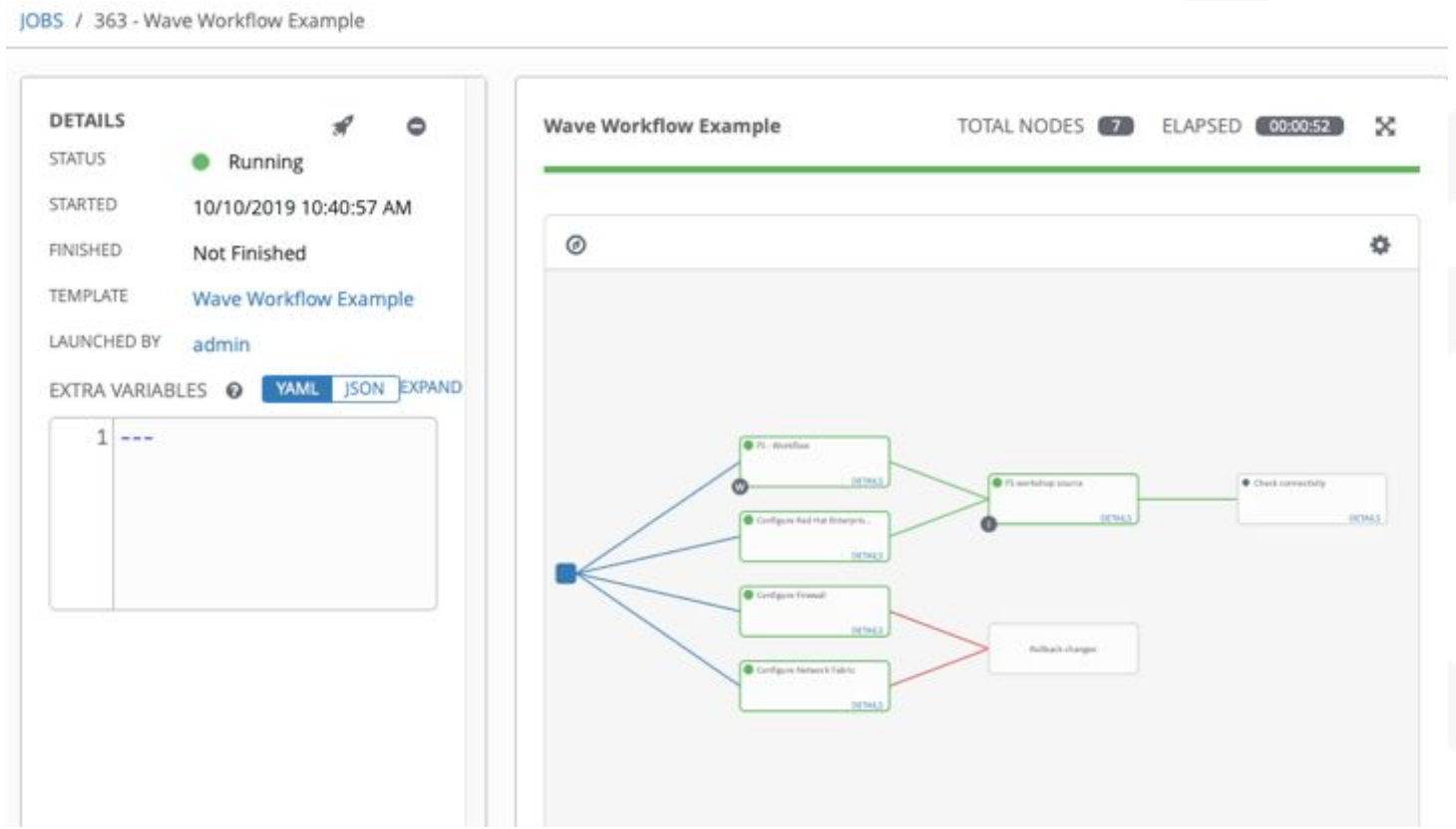
# Ansible workflows: solving complex problems

## What is it?

- Workflows enable the creation of powerful holistic automation, chaining together multiple pieces of automation and events
- Simple logic inside these workflows can trigger automation depending on the success or failure of previous steps
- Add approvals to your workflows to enhance governance
- Integrate other systems, such as ITSM to fit with your existing controls and processes

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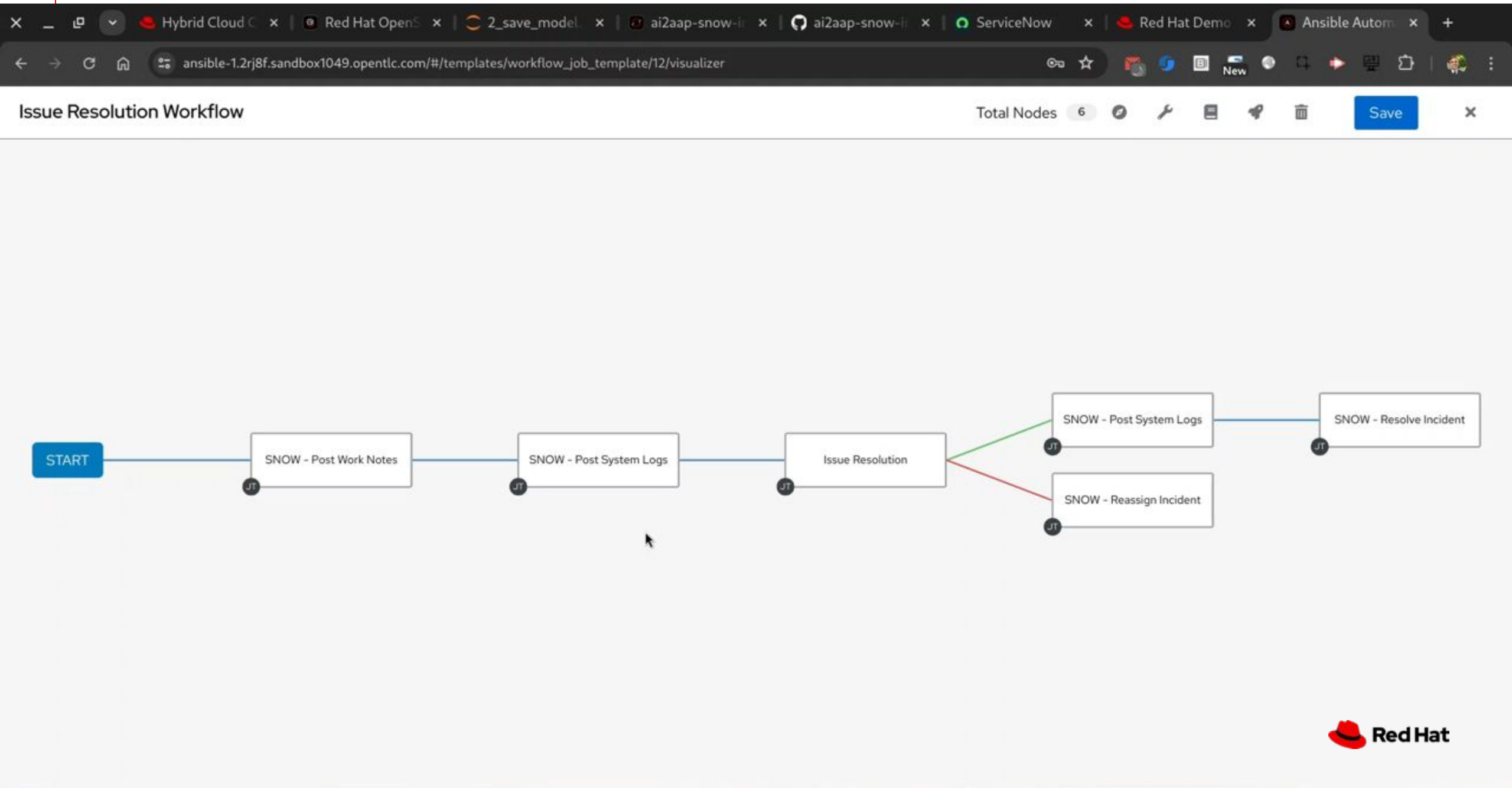
# Supercharge your Ansible Workflows!

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# Where to go next

## Learn more

- Transforming ITSM with Ansible Automation: A Gradual Approach
- Red Hat Developer Sandbox: Your Free OpenShift AI Playground
- How to train a BERT machine learning model with OpenShift AI
- Revolutionize IT automation with the new ServiceNow integration

## Get started

- Self-paced labs
- Evals
- console.redhat.com

## Get serious

- Red Hat Automation Adoption Journey
- Red Hat Training
- Red Hat Consulting

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# What's new in Red Hat Ansible Automation Platform 2.5?

Join us for **the webinar** on **November 20th** to unlock the potential of automation

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# Thank you

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# Trusted Software Supply Chain

## Come rendere sviluppo applicativo e MLOps sicuri e tracciabili


**Matteo Combi**
Senior Specialist Solution Architect

**Matteo Grimaldi**
Senior Account Solution Architect

**Matteo Mortari**
Principal Software Engineer


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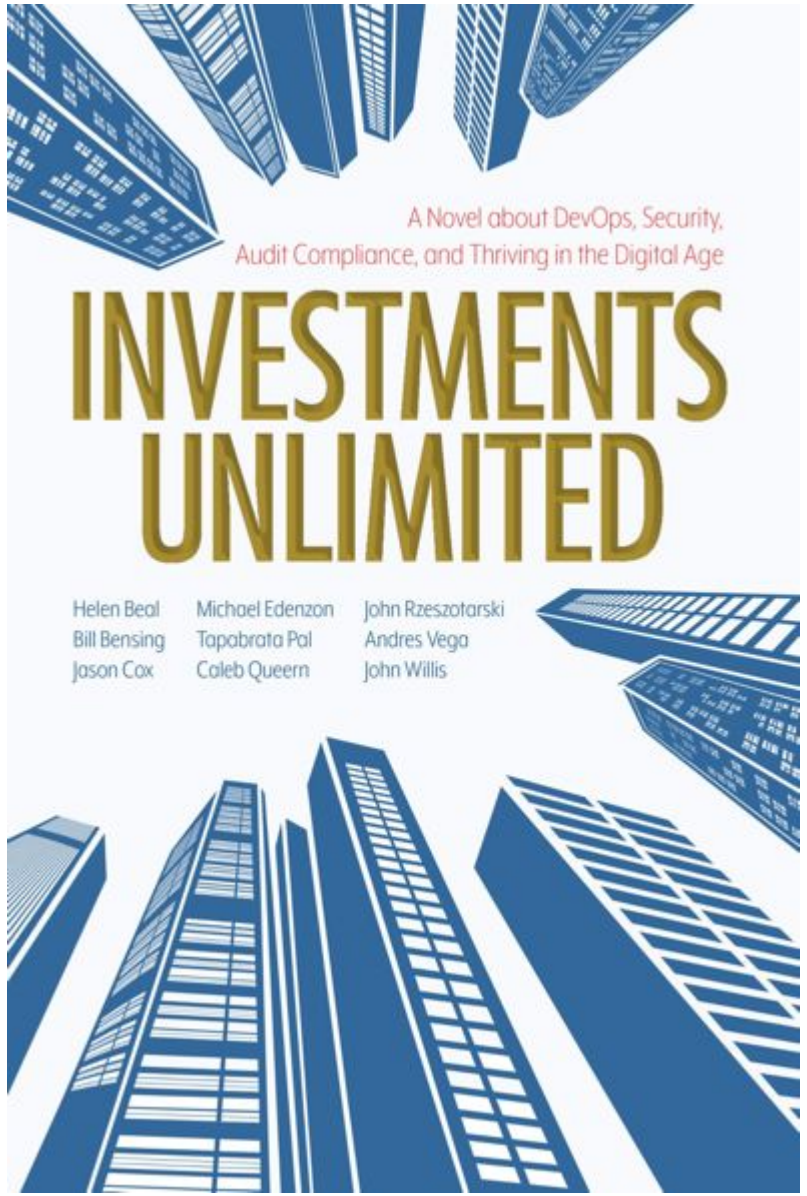
# Why we are here today



# Software supply chain attacks: a matter of when, not if

Ransom paid but a mere fraction to the overall downtime and recovery costs of a data breach

**742%**

average annual increase in software supply chain attacks over the past 3 years[1]

**20%**

data breaches are due to a compromised software supply chain[2]

**78%**

have initiatives to increase collaboration between DevOps and Security teams[3]

**92%**

say enterprise open source solutions are important as their business accelerates to the open hybrid cloud[4]

[1] State of the Software Supply Chain | [2] Cost of a Data Breach 2022 - IBM Report | [3]State of Kubernetes Security Report 2022 - Red Hat Report | [4]State of Enterprise Open Source 2022 - Red Hat Report

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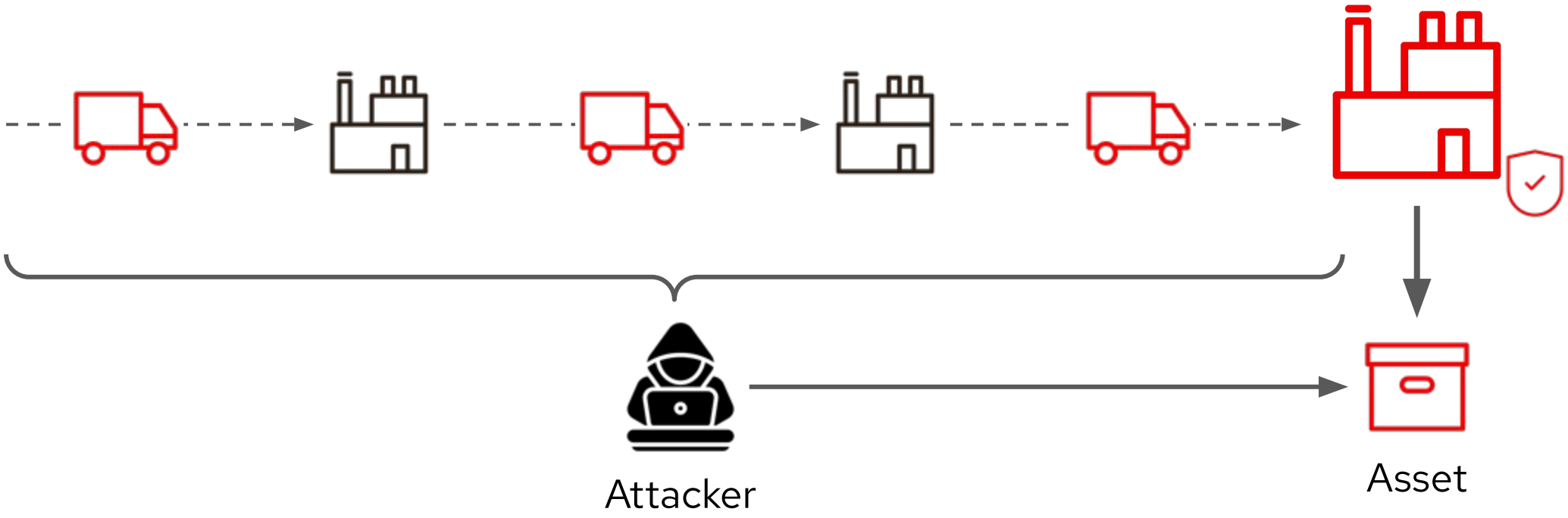
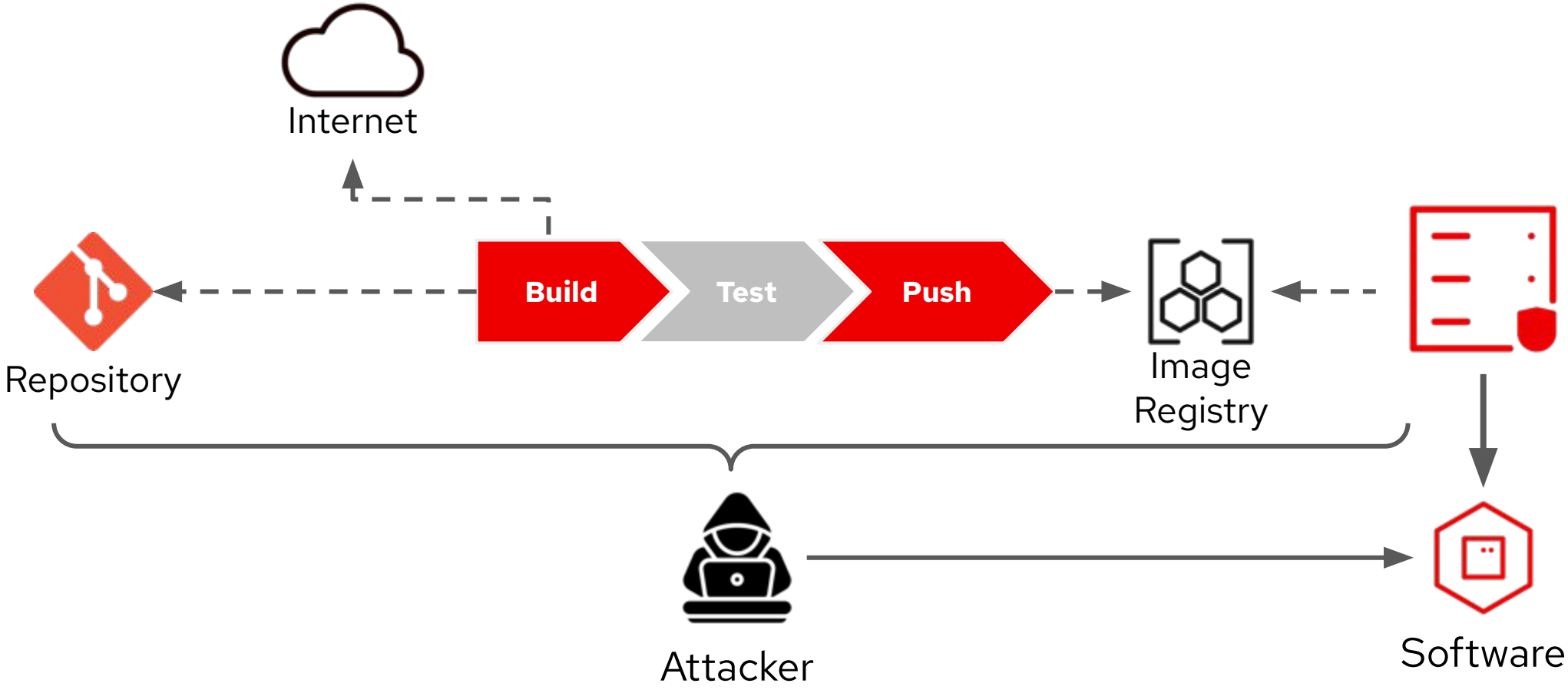
# Supply Chain Attack

## Hardware



# Supply Chain Attack

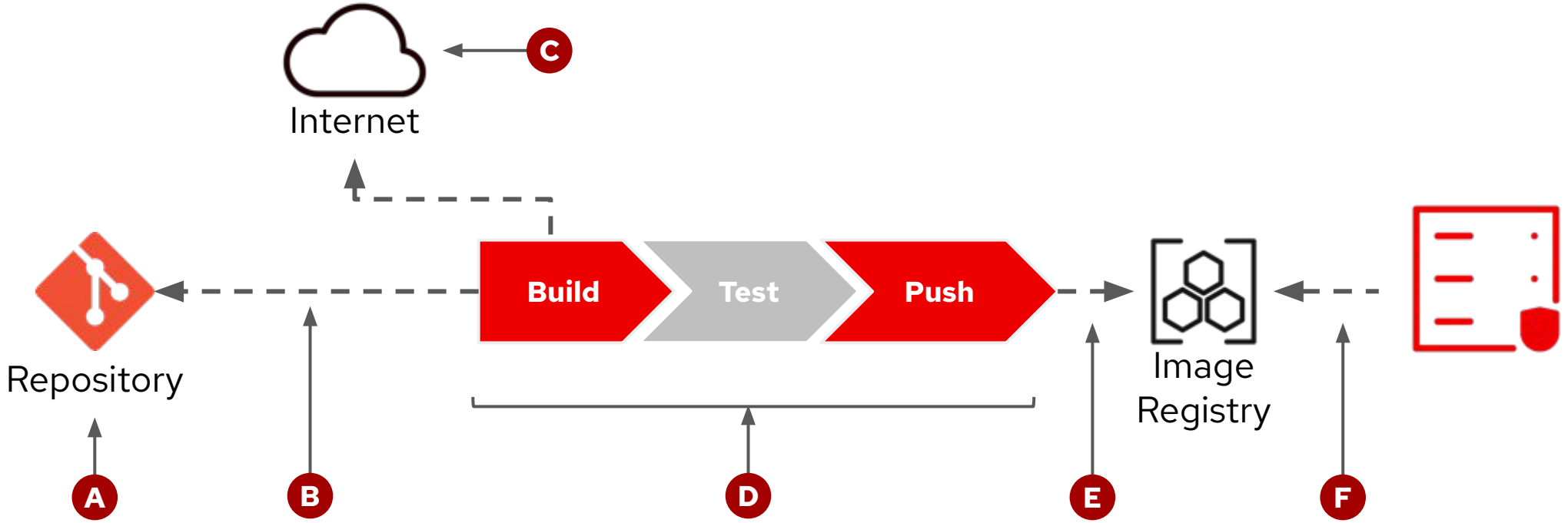
## Software



# Growing Attack Surfaces

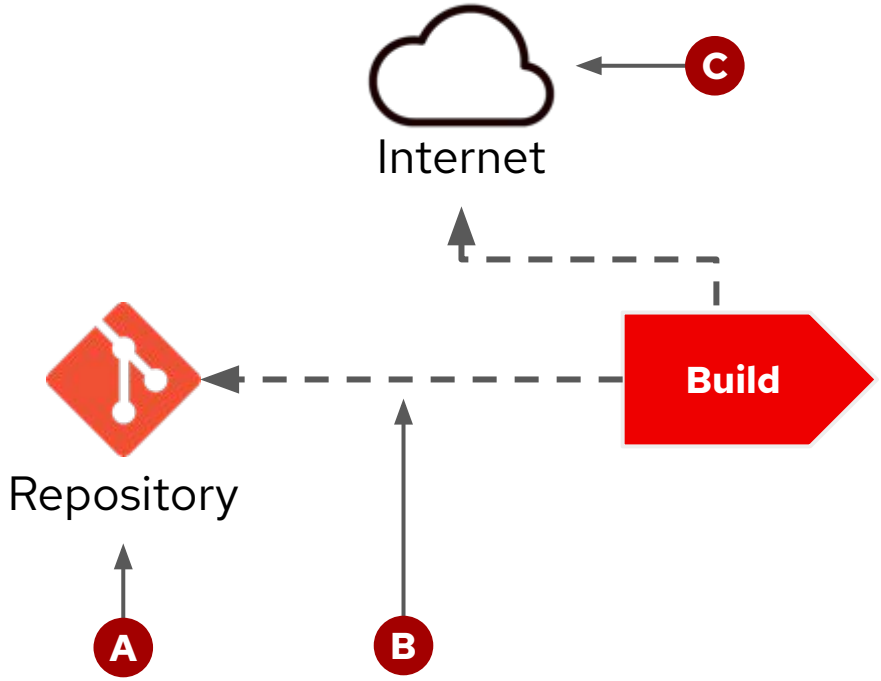
# Supply Chain Attack

## Attack surfaces



# Supply Chain Attack

## Attack surfaces

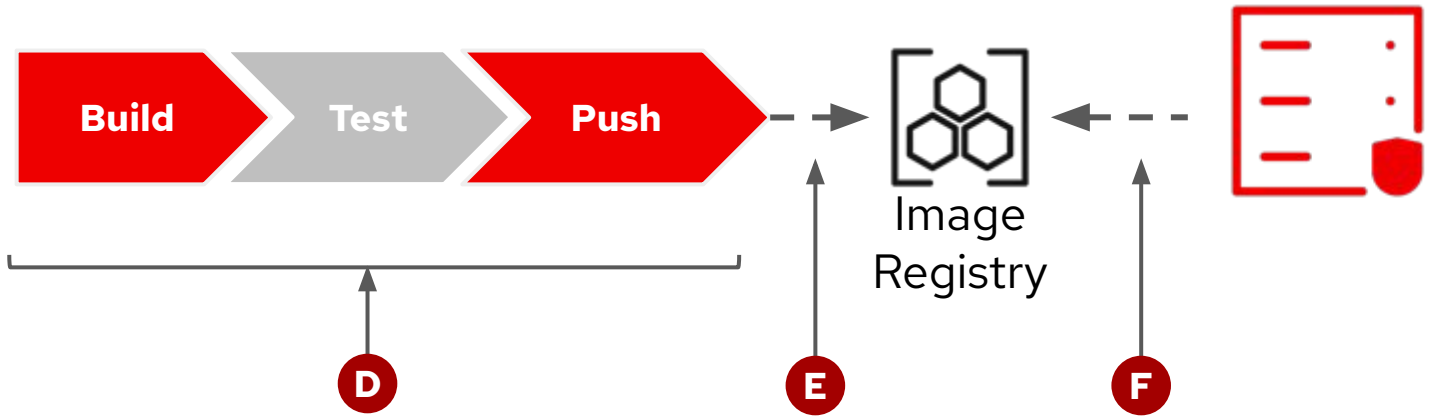



- **A** Bypass code review or compromised source control system
- **B** Source injection / alteration
- **C** Vulnerable dependencies injection

# Supply Chain Attack

## Attack surfaces

- **D** Compromised or bypassed CI/CD system
- **E** Source injection / alteration
- **F** Container image alteration



# What is SLSA ?

## Going beyond application security testing

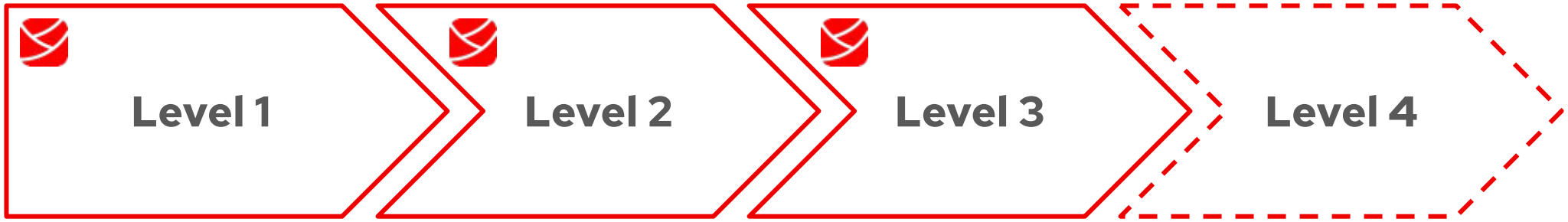

SLSA stands for **Supply Chain Levels for Software Artifacts**.

SLSA is a security framework and a common language for improving software security by **ensuring supply chain integrity**.

It is a cross-industry collaboration, maintained as part of the Open Source Security Foundation, that is based on concepts that have been used **since 2013**.

# Development-time controls

## Shifting left security and compliance




Preventing Mistakes

Automated Build Process

Generated provenance about source, build process, artifact and dependencies

Preventing tampering after the build

Generated, signed and verifiable provenance

Preventing tampering during the build

Detecting and preventing vulnerabilities at **code time**

Preventing non compliant software at **code time**

SLSA Levels (https://slsa.dev/spec/v1.0/levels)

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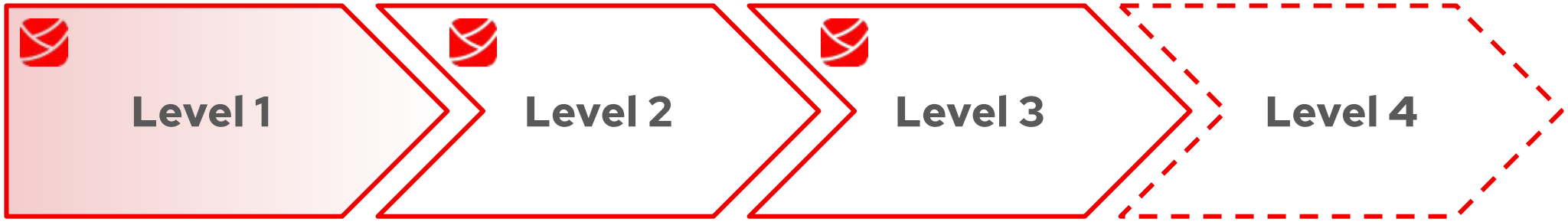
# Development-time controls

## Shifting left security and compliance

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Preventing non compliant software at **code time**

SLSA Levels (https://slsa.dev/spec/v1.0/levels)

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# SLSA concepts

## How to move forward

### SBOM

Or Software Bill of Materials, it lists all the components that went into making a given piece of software

### Provenance

It is the recording of origin, history and who made changes

### Attestation

Authenticated statement (metadata) about a software artifact or collection of software artifacts

# Accelerate Innovation that Safeguards User Trust

*Delivered with integrated security guardrails at every phase of the software development lifecycle*

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*Delivered with integrated security guardrails at every phase of the software development lifecycle*


Included in
Red Hat
OpenShift
Platform Plus
but also
available
separately

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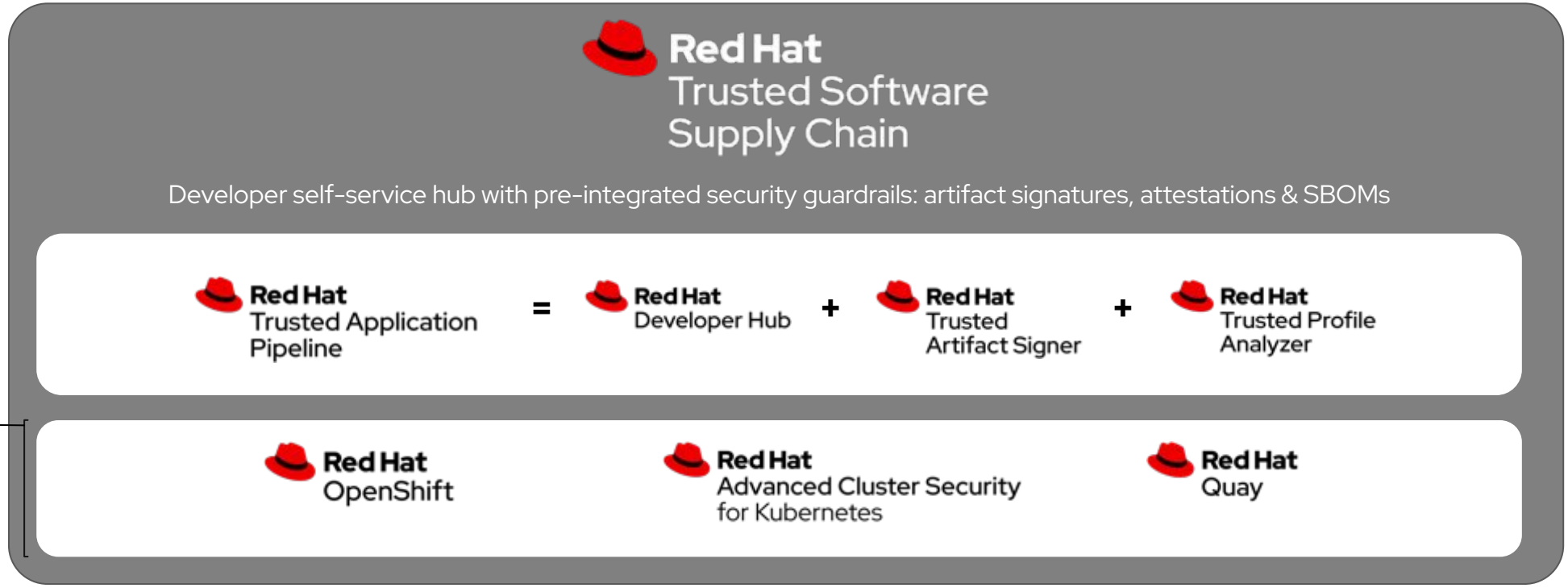
# Accelerate Innovation that Safeguards User Trust

*Delivered with integrated security guardrails at every phase of the software development lifecycle*

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# Accelerate Innovation that Safeguards User Trust

*Delivered with integrated security guardrails at every phase of the software development lifecycle*

# Relevant Upstream Projects

## Guac

Graph for Understanding Artifact Composition (GUAC) provides insights into artifact relationships and dependencies by aggregating SBOMs dependencies


## Sigstore

A combination of technologies to handle keyless signing (**cosign**), transparency log and verify signed artifacts for integrity and provenance.


## Tekton Chains

A Kubernetes Custom Resource Definition (CRD) controller to manage signing task run, task run result and OCI registry image using tools such as Sigstore cosign and securely store such signatures

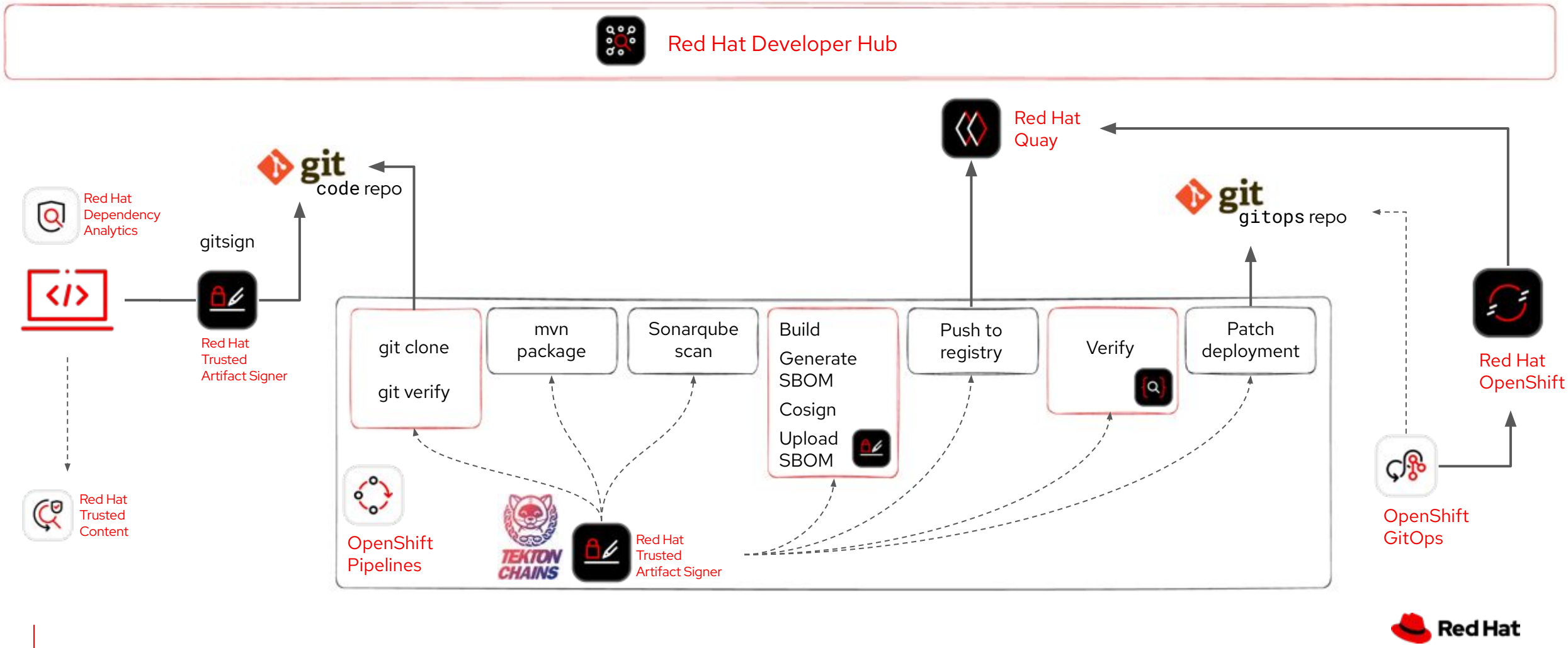
## Enterprise Contract

Workflow for verifying provenance by checking image signatures and attestations of OCI images

# Demo

## Traditional application

# Hands-on Scenario



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# Welcome back!

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Clear

## Quick Access

COMMUNITY

DEVELOPER TOOLS

Podman Desktop

CI/CD TOOLS

ArgoCD

SonarQube

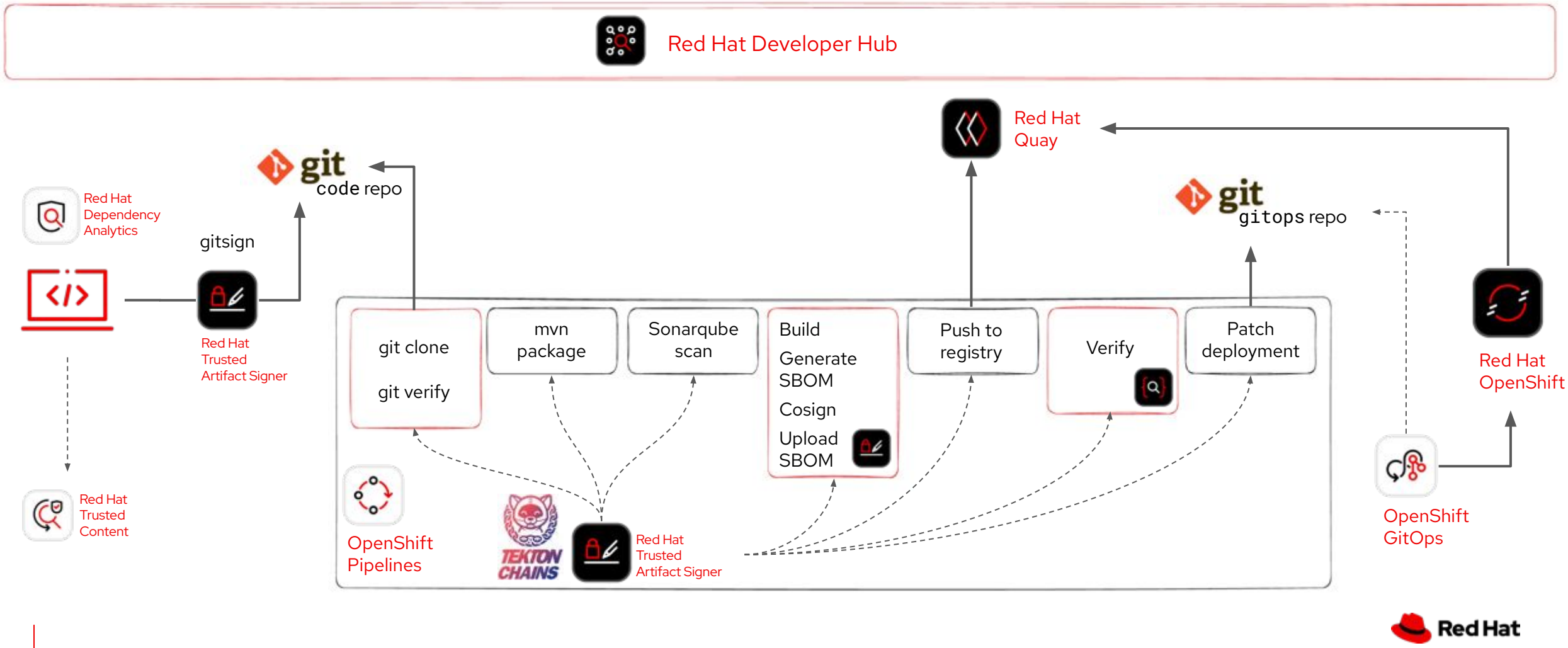
Quay.io

OPENSHIFT CLUSTERS

## Your Starred Entities

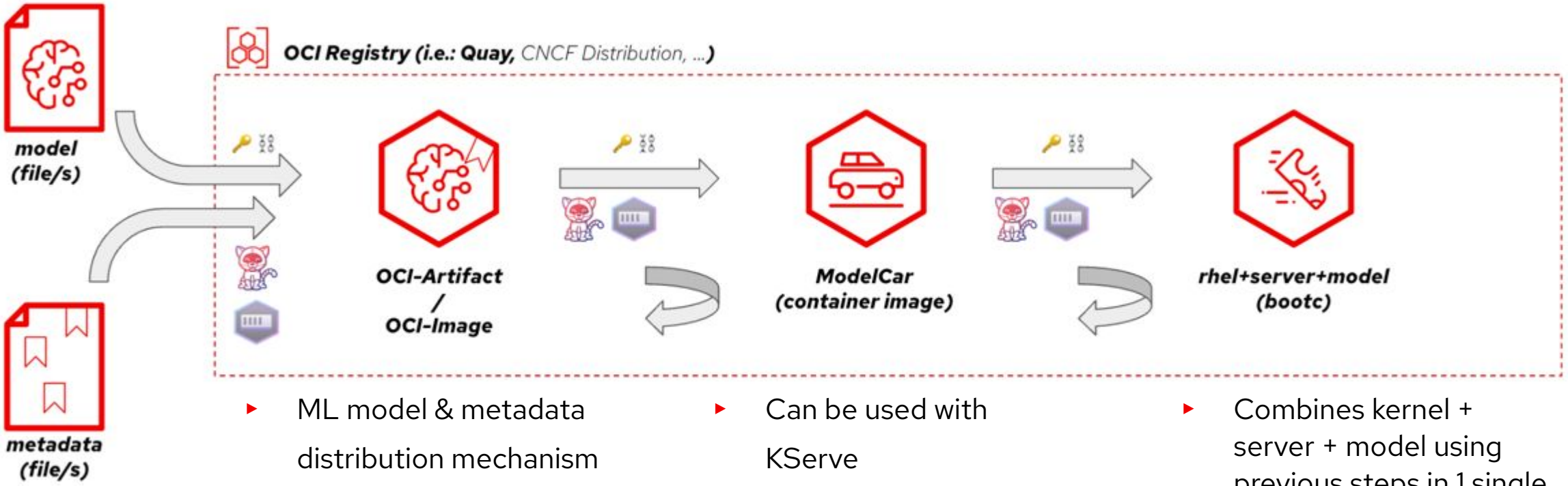
Click the star beside an entity name to add it to this list!

# Hands-on Scenario



# Demo

## MLOps




- ML model & metadata distribution mechanism using existing tooling
- As it's a OCI container too, can be signed using existing tooling
- KEP-4639 would enable direct consumption in K8s

- Can be used with KServe
- Could *also* be used as initContainer in bootc (see later)
- Could *also* be used in other deployment scenarios

- Combines kernel + server + model using previous steps in 1 single container
- Could be "lift & shift-ed"
- ...but also as it composes the previous steps, could be decomposed as needed

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# Virtualizzazione Cloud Native

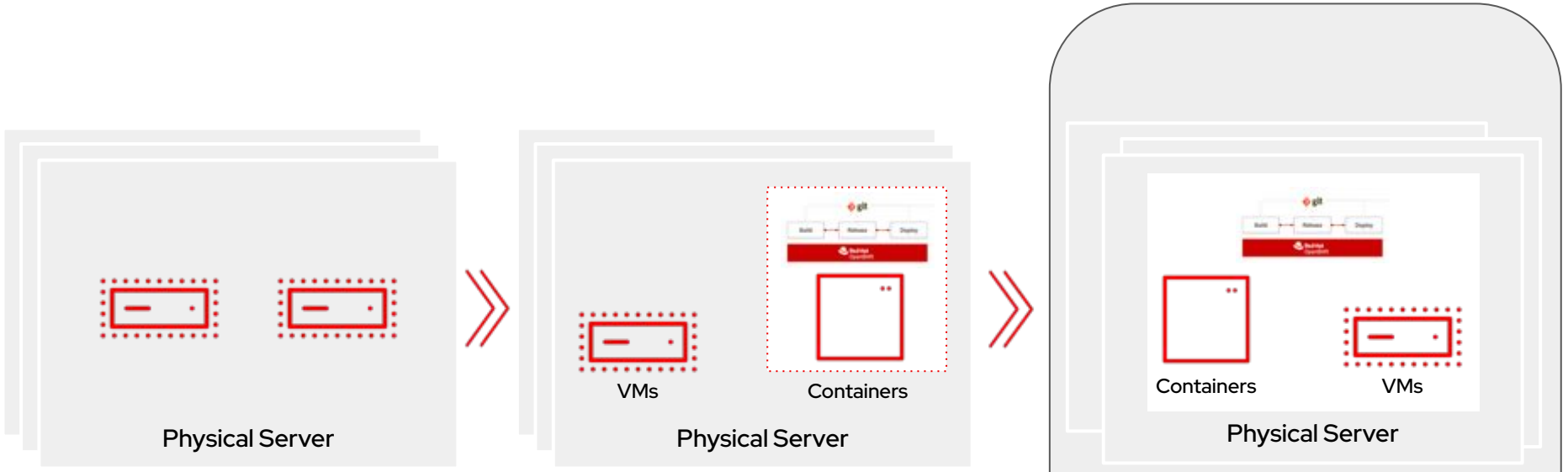
## Approccio dichiarativo e automazione del rilascio di workload virtualizzati

**Valentino Uberti**
Specialist Solution Architect

**Gianni Salinetti**
Senior Account Solution Architect

Red Hat

# Virtualization Evolution




Service uptime / easier maintenance

Segregated platforms to run modern applications

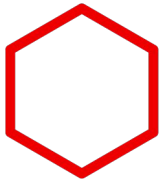
**Unified application platform**

**OpenShift Virtualization**

# Managing both VMs and containers

## Virtual machines

VMs have been built for decades, and they will not go away overnight.



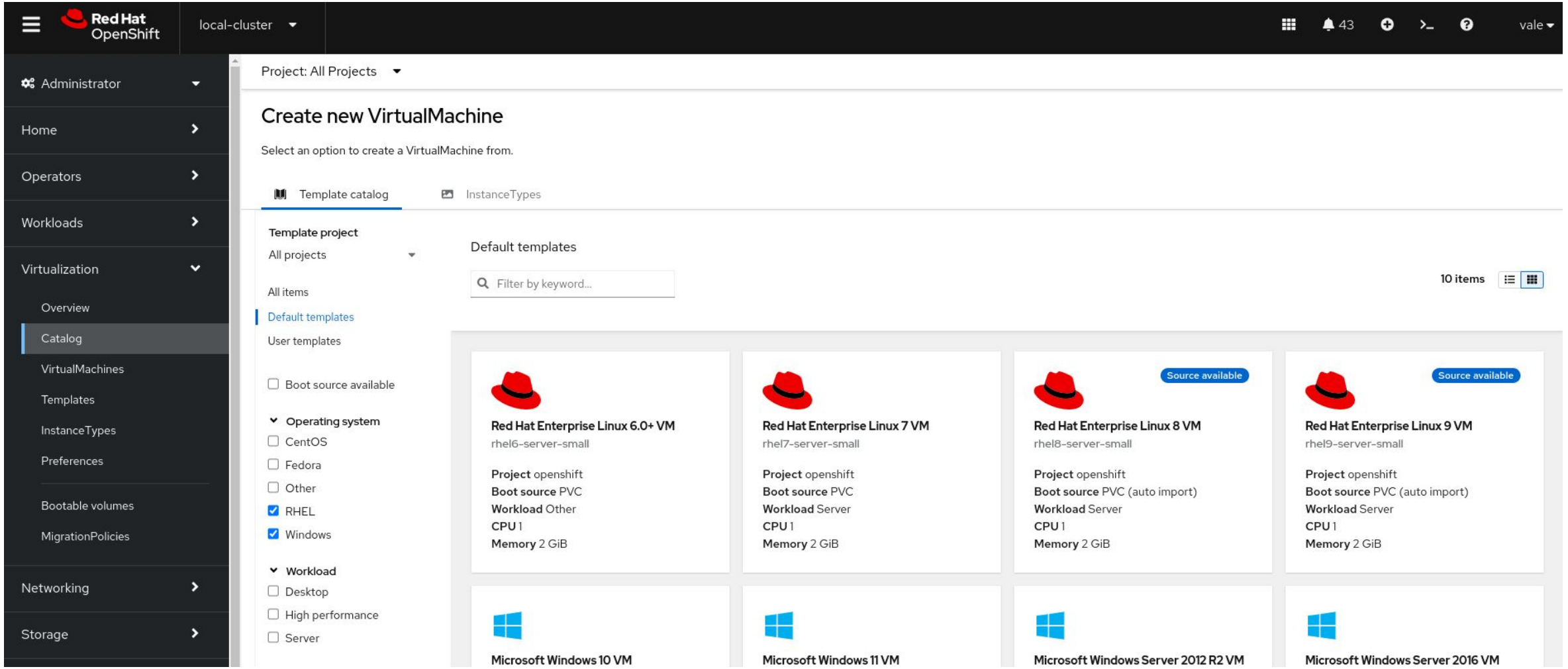
## Containers

Containers solve certain use cases and will continue to rise, but some VMs will remain.

## Applications

VMs and containers will be used to build applications, and some might even build on both.

# Managing both VMs and containers



# Deeper partnerships on OpenShift Virtualization

## On-Prem HW + Storage

Products for OpenShift Virt using CSI (container storage interface)

HITACHI Inspire the Next

portworx by Pure Storage

DELL Technologies

Red Hat OpenShift Data Foundation

Hewlett Packard Enterprise

intel

Lenovo

NetApp

IBM

NVIDIA

## Backup/DR

Products for OpenShift

storware BACKUP AND RECOVERY

veeam

portworx by Pure Storage

TRILIOVAULT

## Networking

Products for OpenShift Virt using CNI (container networking interface)

ISOVALENT

TIGERA

CISCO

f5

## Cloud Services

Current public cloud providers offering OpenShift virtualization

aws

## Additional Information

Red Hat Ecosystem Catalog

Listings of current partner products that are certified or completed statement of support.

Visit this source page to see the current 'in progress integrations' and to submit requests for additional partner product integrations.

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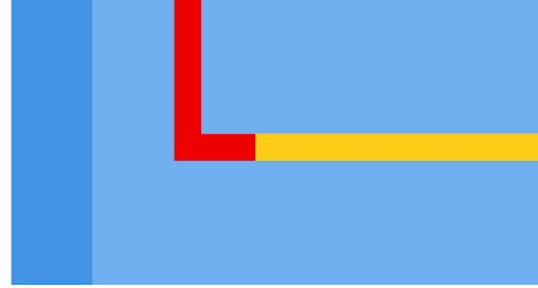
* This is not an exhaustive list of ISV partners, with new partners being added all the time.

# Technical Overview



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# Powered by KubeVirt

- Open Source, written in Go
- Initiated in 2016 by Red Hat
- Contributions by other companies
  e.g (v)GPU support by Nvidia
- CNCF sandbox project since 2019
- CNCF incubating project since 2022
- Provides an API for running KVM based virtual machines in Kubernetes
- Goal: run those VMs alongside with containerized workloads

# Red Hat Contributions to KubeVirt

Red Hat actively contributes to the KubeVirt project and is currently ranked at the first place as the most active company with the following stats:

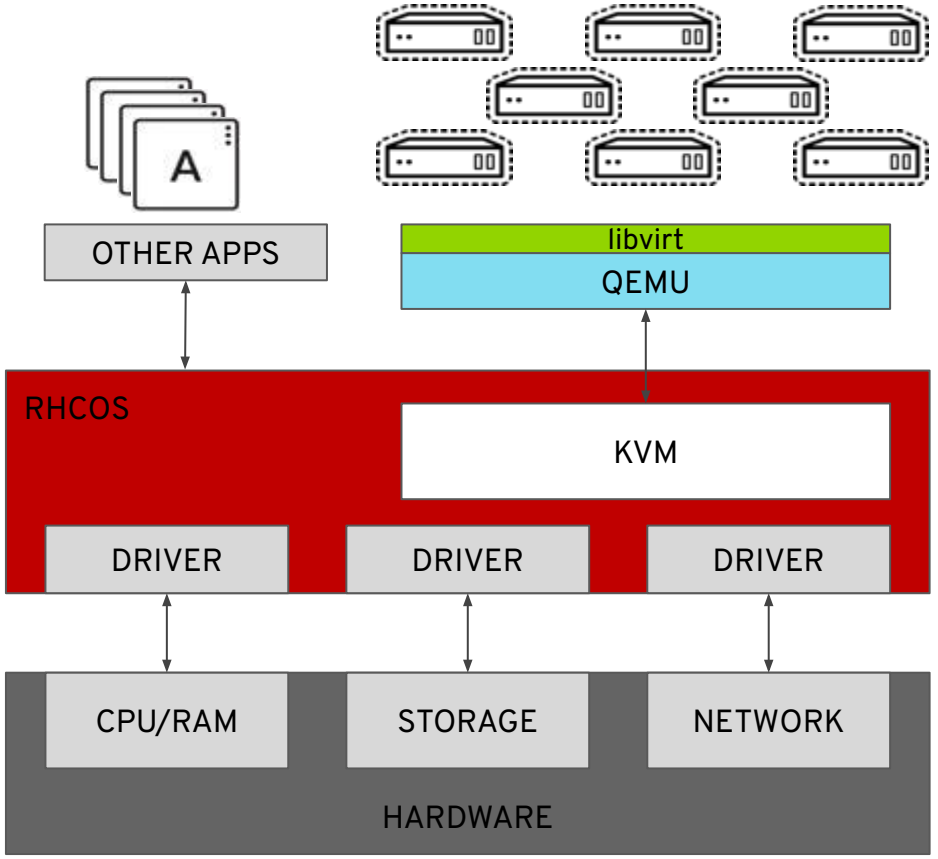
- **14.32k** contributions in the last quarter
- **836** pull requests in the last quarter

| All | min | max | avg | current | total |
|---|---|---|---|---|---|
| Red Hat Inc. | 3.22 K | 11.10 K | 7.16 K | 3.22 K | 14.32 K |
| International Business Machines Corporation | 167.00 | 703.00 | 435.00 | 167.00 | 870.00 |
| Gitpod GmbH | 69.00 | 395.00 | 232.00 | 69.00 | 464.00 |
| NVIDIA Corporation | 90.00 | 94.00 | 92.00 | 94.00 | 184.00 |
| Hashnode | 37.00 | 128.00 | 82.50 | 37.00 | 165.00 |
| Zyda | 17.00 | 129.00 | 73.00 | 17.00 | 146.00 |
| Google LLC | 0 | 81.00 | 40.50 | 0 | 81.00 |
| ARM | 13.00 | 37.00 | 25.00 | 13.00 | 50.00 |
| Ænix | 16.00 | 25.00 | 20.50 | 25.00 | 41.00 |
| SUSE LLC | 0 | 25.00 | 12.50 | 0 | 25.00 |
| GeekHaven IIIT Allahabad | 0 | 17.00 | 8.50 | 0 | 17.00 |
| Independent | 5.00 | 11.00 | 8.00 | 11.00 | 16.00 |
| The Linux Foundation | 0 | 13.00 | 6.50 | 0 | 13.00 |
| CNCF | 4.00 | 7.00 | 5.50 | 7.00 | 11.00 |
| AssetCues | 0 | 9.00 | 4.50 | 0 | 9.00 |
| Mirantis Inc. | 0 | 8.00 | 4.00 | 8.00 | 8.00 |
| NetApp Inc | 2.00 | 4.00 | 3.00 | 4.00 | 6.00 |
| Kasten | 0 | 6.00 | 3.00 | 0 | 6.00 |
| devguard GmbH | 0 | 5.00 | 2.50 | 0 | 5.00 |
| Jd.Com | 0 | 5.00 | 2.50 | 0 | 5.00 |
| Cloudbase | 0 | 3.00 | 1.50 | 0 | 3.00 |
| Kuzzle | 0 | 3.00 | 1.50 | 0 | 3.00 |

Source:https://kubevirt.devstats.cncf.io/d/4/company-statistics-by-repository-group?orgId=1&var-period=q&var-metric=contributions&var-repogroup_name=All&var-companies=All

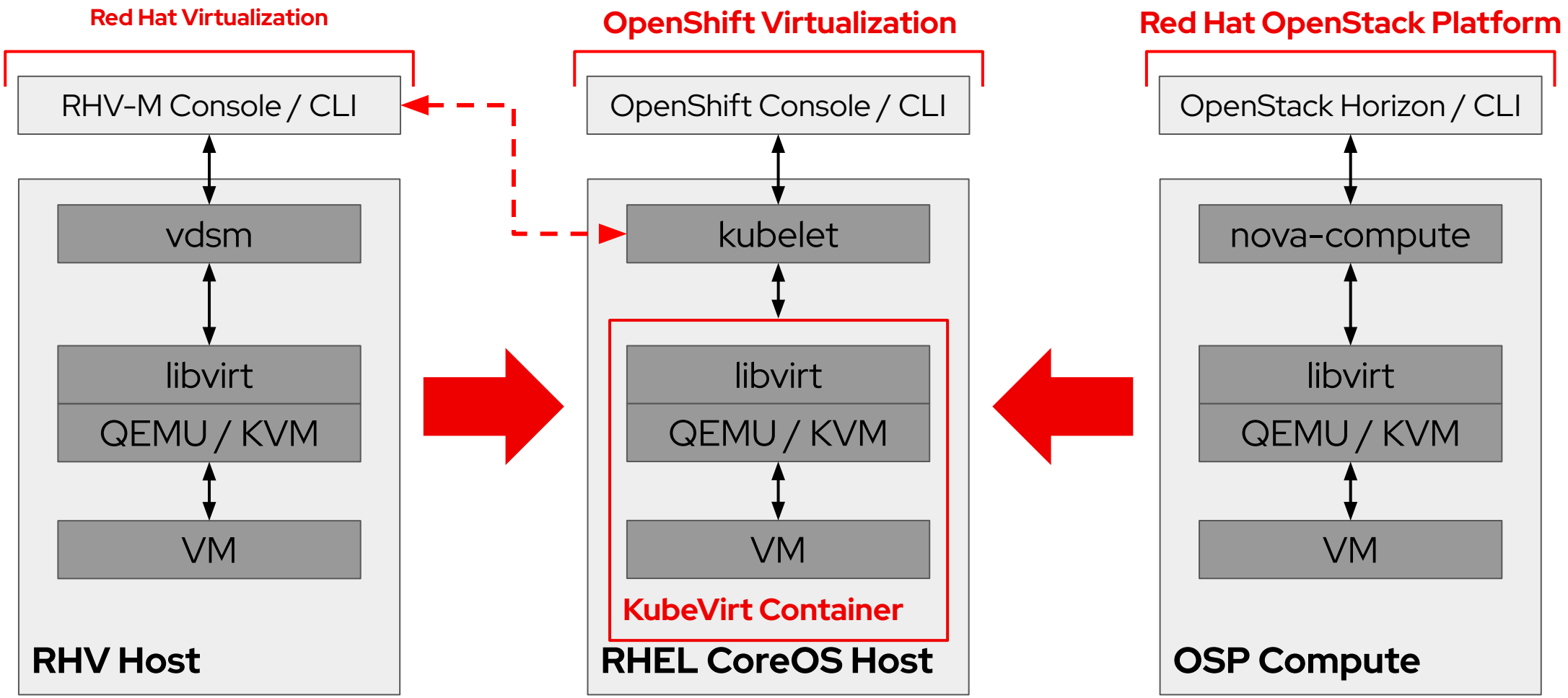
# OpenShift Virtualization uses KVM

- OpenShift Virtualization uses **KVM**, the Linux kernel hypervisor and a core component of Red Hat Enterprise Linux kernel with 10+ years of production use.
- **QEMU** uses KVM to execute virtual machines
- libvirt provides a management abstraction layer
- Available on Bare Metal and AWS
- Windows Server Virtualization Validation Program (**SVVP**) certification



# Containerizing KVM

Trusted, mature KVM wrapped in modern management and automation



# Dedicated API

vm.yaml

```yaml
apiVersion: kubevirt.io/v1alpha3
kind: VirtualMachine
metadata:
  name: testvm
spec:
  running: false
  template:
    metadata:
      labels:
        team: Tiger
    spec:
      domain:
        devices:
          disks:
          - disk:
              bus: virtio
            name: rootfs
          interfaces:
          - name: default
        resources:
          requests:
            memory: 1GB
```

## Declarative

Like anything in Kubernetes, the KubeVirt API is declarative, and follows Kubernetes API conventions.

## Domain-specific

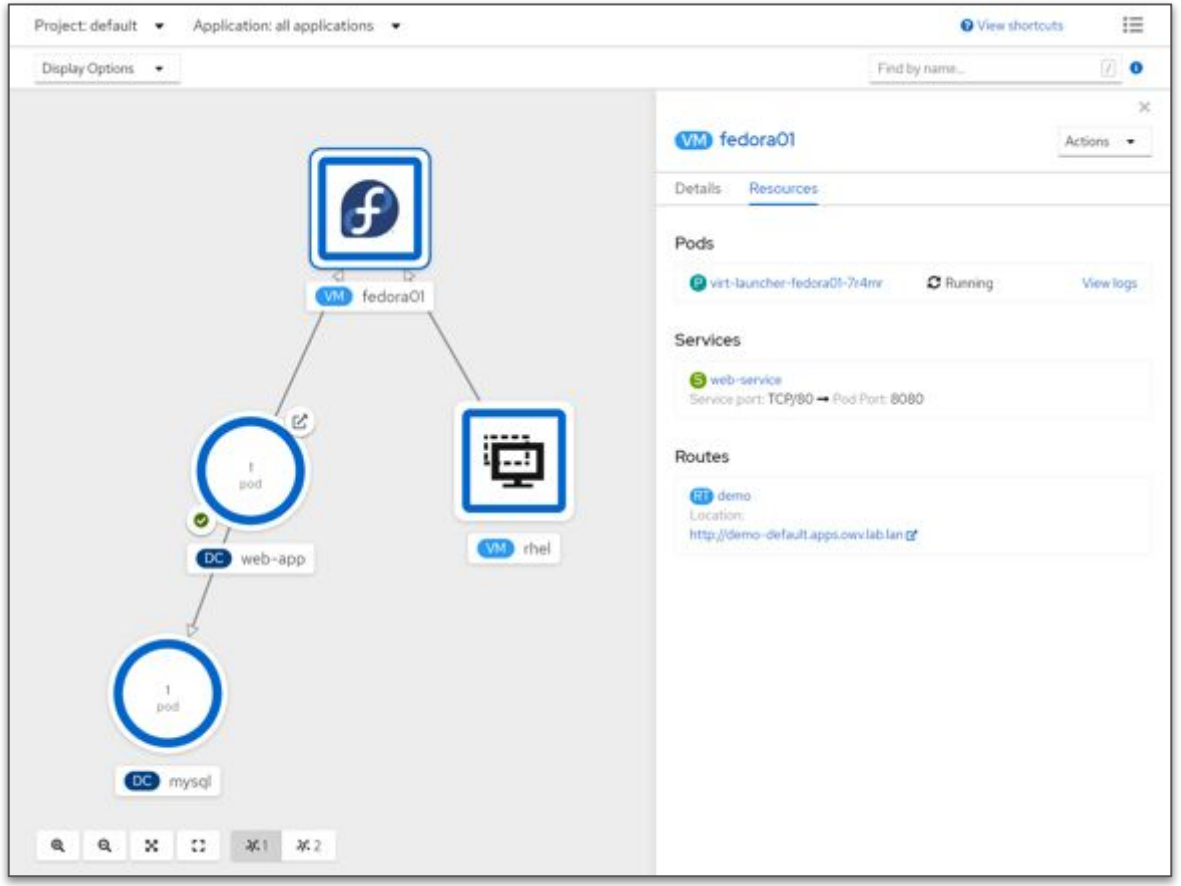
VMs are inherently differently defined than containers. Reusing the pod API is not explicit enough for all the necessary details–and due to differences.

## Divide and conquer

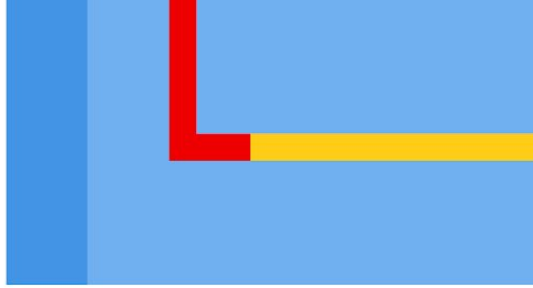
Due to the dedicated API, it is straightforward to add virtualization-specific functionality

# Using VMs and containers together

- Virtual Machines connected to pod networks are accessible using standard Kubernetes methods:
  - Service
  - Route
  - Pipelines
  - etc.
- Network policies apply to VM pods the same as application pods
- VM-to-pod, and vice-versa, communication happens over SDN or ingress depending on network connectivity



# IaC for Cloud Native Virtualization



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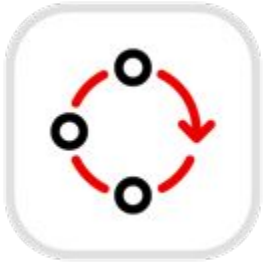
# Red Hat tools for GitOps & IAC

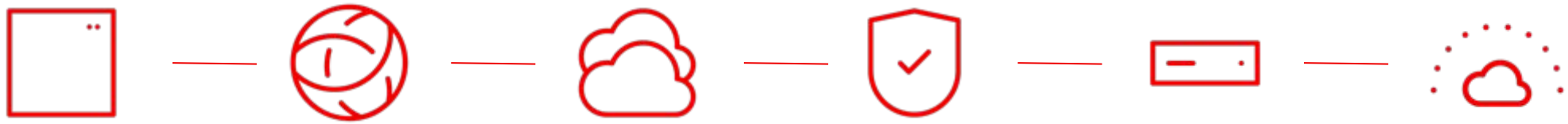

OpenShift GitOps based on Argo CD (Included in OpenShift Container Platform and OpenShift Platform Plus)




OpenShift Pipelines based on Tekton (Included in OpenShift Container Platform and OpenShift Platform Plus)


Ansible Automation Platform, a unified solution for strategic automation that combines the security, features, integrations, and flexibility needed to scale automation across domains.

# **Ansible** Automation **Platform capabilities**



| Applications | Network | Cloud | Security | Infrastructure | Edge |
|---|---|---|---|---|---|
| ▸ DevOps<br>▸ CI/CD<br>▸ GitOps | ▸ Configuration management<br>▸ Infrastructure awareness<br>▸ Network validation | ▸ Orchestration<br>▸ Operationalisation<br>▸ Governance | ▸ Investigation enrichment<br>▸ Threat hunting<br>▸ Incident response | ▸ Deployment<br>▸ Provisioning<br>▸ Management | ▸ Extend security<br>▸ Scalability<br>▸ Interoperability |

# Next Gen approach to VM provisioning

A process that can be optimized down to a few minutes

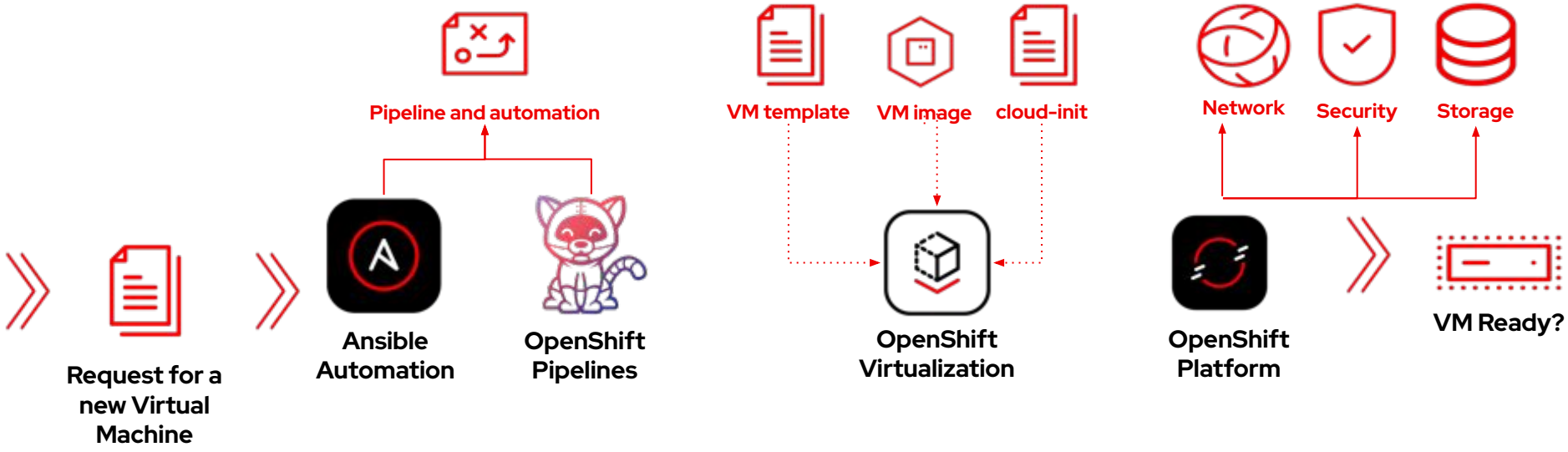
**Virtual Machine**
- CPU: 4 vCPU, 1 core
- Memory: 16GB
- Disk: 30 GB
- OS: RHEL

**Additional filesystems**
- data: 500GB, disk
- logs: 100GB, partition

**Application platform**
- JBoss 7.4 Update 11

**Firewall rules**
- Ingress: SSH, HTTPS
- Egress: *.redhat.com

**DNS & LB**
- api.service.org
- Healthcheck: HTTPS port




Automate VM image builds & updates

Automatically deploy VMs from code (Git repos)

Manage networks, storage, load balancers, etc.

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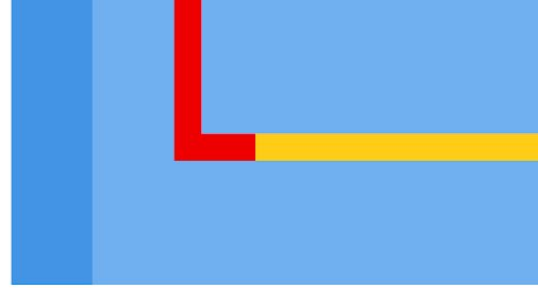
# Demo Time



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# Provisioning VMs with OpenShift GitOps

OVERVIEW: The GitOps way uses Git repositories as a single source of truth to deliver infrastructure as code.

During this demo ArgoCD is employed to keep the desired and the live state of clusters in sync at all times.

LEARN: How to manage the lifecycle of VMs using a purely declarative, GitOps approach.

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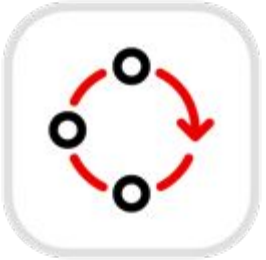
Ansible Automation
Platform

# Deploy VMs and configure external entities with Ansible Automation Platform

OVERVIEW: Ansible Automation Platform provides a complete framework to fully automate the provisioning tasks, from the creation of the virtual machine, up to software configuration.

During this demo Ansible Workflow Jobs are employed to deploy the VM and apply all the necessary configurations, including service desk management.

LEARN: How to fully manage the lifecycle of VMs using Ansible Automation Platform.

# Unattended Windows VM creation with Openshift Pipelines

OVERVIEW: Red Hat OpenShift Pipelines offers an efficient solution to manage the release lifecycle of virtual machine images.

LEARN: How to create and customize custom boot sources using a dedicated Tekton pipeline.

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# Dalla Strategia all'Azione: guidare la trasformazione digitale tramite la modernizzazione applicativa

**Andrea Cipriani**
Senior Consultant

Red Hat

**Matteo Rollandi**
IT Operation Supervisor

Ministero Dell' Interno - Dipartimento per le Libertà civili e l'immigrazione

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# Red Hat Services

From idea to deployment–and beyond, we help you streamline development, build agility, and maximize the value of your IT investment.

## Customized guidance when you need it

### Professional Services

We help you evaluate and implement the hybrid cloud solutions that work best for you. Deliver quickly and improve efficiency while reducing costs.

### Learning Services

Our Training and Certification products offer ongoing curriculum in a flexible platform to help teams build and validate skills. We offer specific learning for each role.

### Technical Account Management

TAMs act as your trusted point of contact and prioritize your organizations success. They provide operational guidance and advisory services for ongoing support and improvement.

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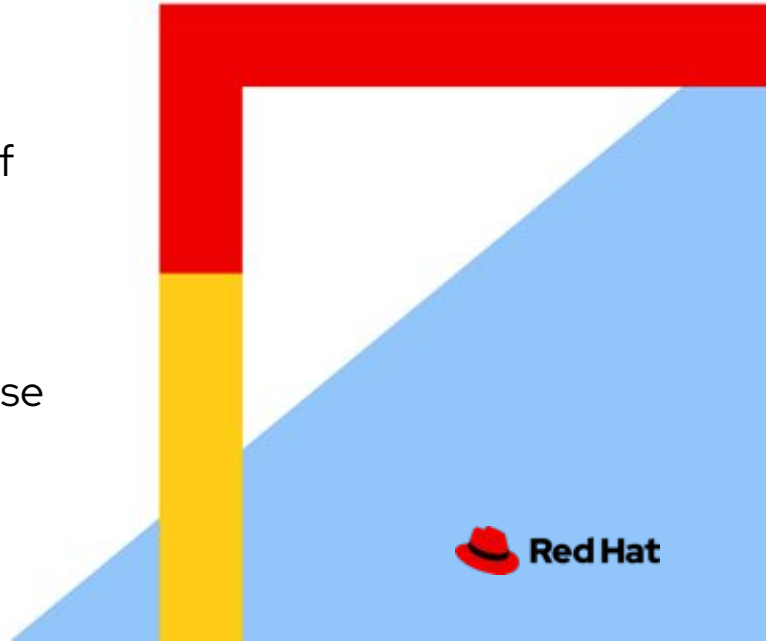
# Customer Introduction: **Department for Civil Liberties and Immigration**

The Department performs functions and duties related to the protection of civil rights, including those concerning immigration and asylum, citizenship, and religious denominations.

Within the Central Directorate for Planning and General Services, the IT Office is responsible for managing the Department's IT services.

- **Infrastructure Management** for the Department's four Data Processing Centers (CED) and its data network.
- **Application Development and management** used by the Department’s users, Prefectures, and other administrations involved in various processes.
- **Cybersecurity management** in close collaboration with the relevant structures of the Ministry of the Interior.
- **Workstations Management** for Department personnel.
- **Purchases Planning and management** of IT goods and services needed for these activities.



# Journey to Modernization: **Impact Mapping**

Impact Mapping is a strategic planning technique designed to

align projects with business objectives in a clear, results-oriented

way.

### 1. Why? (Objective)

Identifies the overarching goal or problem the project aims to solve. It's about understanding why the project exists and what business objective or problem it addresses.

### 2. Who? (Actors)

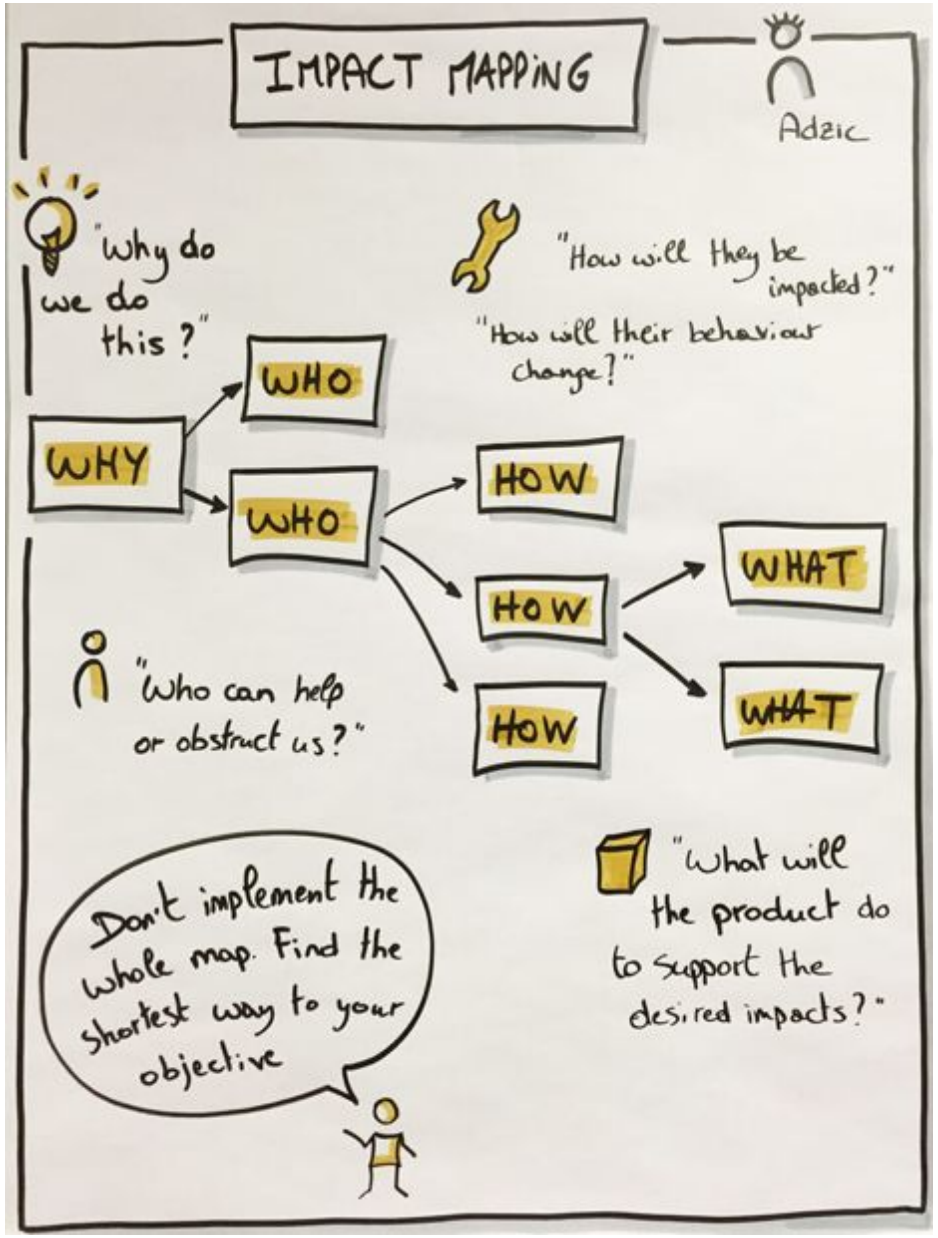
Identifies the people or entities that can influence or be impacted by the project. These are the "actors," which might include customers, users, stakeholders, or partners.

### 3. How? (Impact)

This question explores the behaviors or actions that must change to achieve the project goals. It focuses on the outcomes needed from each actor identified in the previous step.This step ensures that actions are meaningful and outcome-focused, not just tasks or features

### 4. What? (Deliverables)

This question determines the concrete tasks, deliverables, or features needed to achieve the desired impact for each actor. It's about defining "what" the project will produce.



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# Impact Map


A well-defined goal follows the SMART criteria:

**Specific:** The goal must be clear and precise, without ambiguity. For example, instead of saying “improve the IT system,” a specific goal might be “increase IT system resilience by 20% by reducing downtime.”

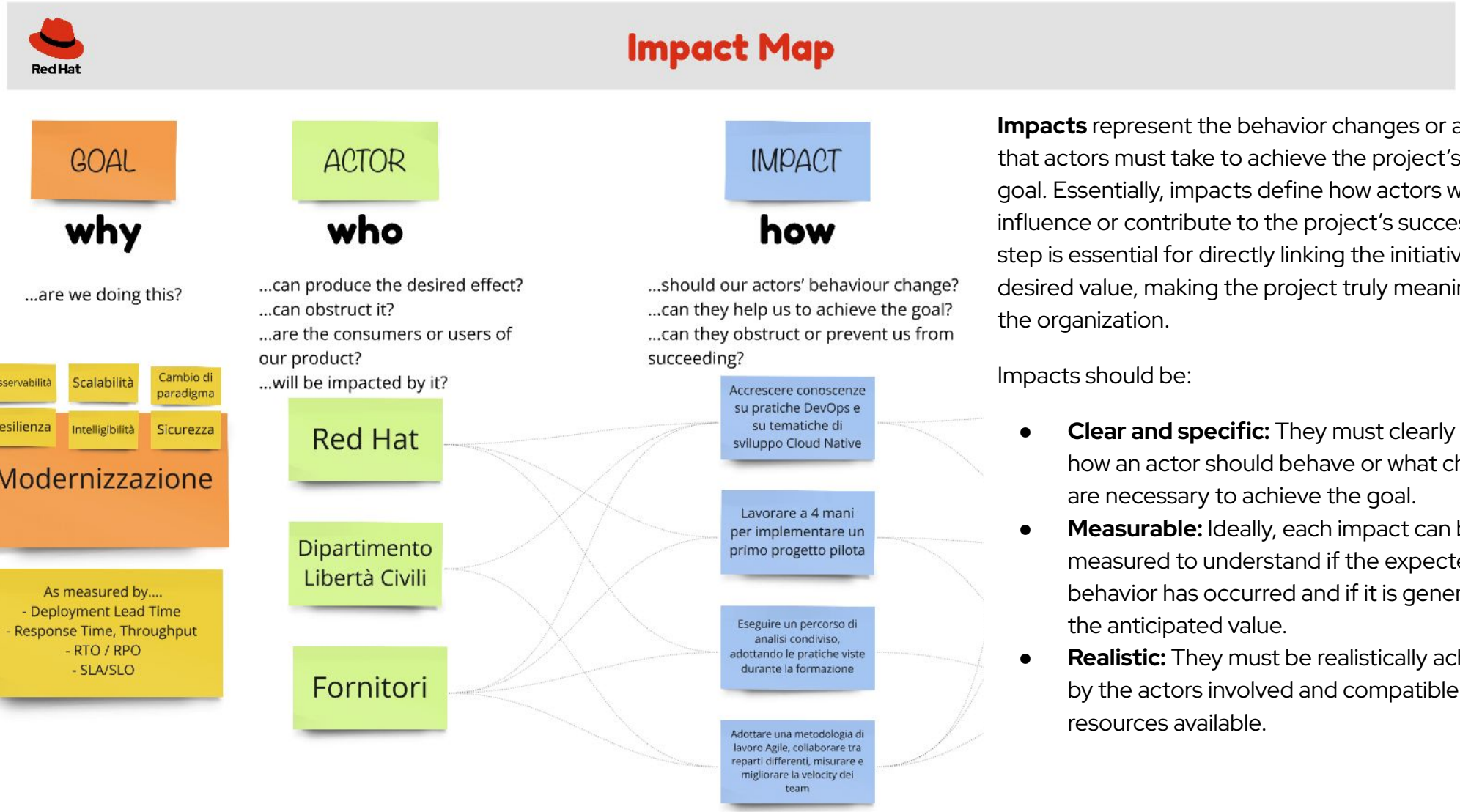
**Measurable:** To evaluate the project’s success, the goal must be quantifiable. Establishing metrics helps monitor progress, such as a 15% increase in operational efficiency.

**Attainable:** The goal should be realistic and achievable, considering the resources and skills available. For instance, if the team is unfamiliar with a technology, training may be required to make the goal more concrete.

**Relevant:** The goal should be closely tied to the company’s main objectives, addressing a key need or strategic challenge, ensuring the project’s impact is meaningful to the business.

**Timely:** An effective goal is time-bound, providing a clear timeframe for achievement. This encourages accountability and helps the team stay focused.

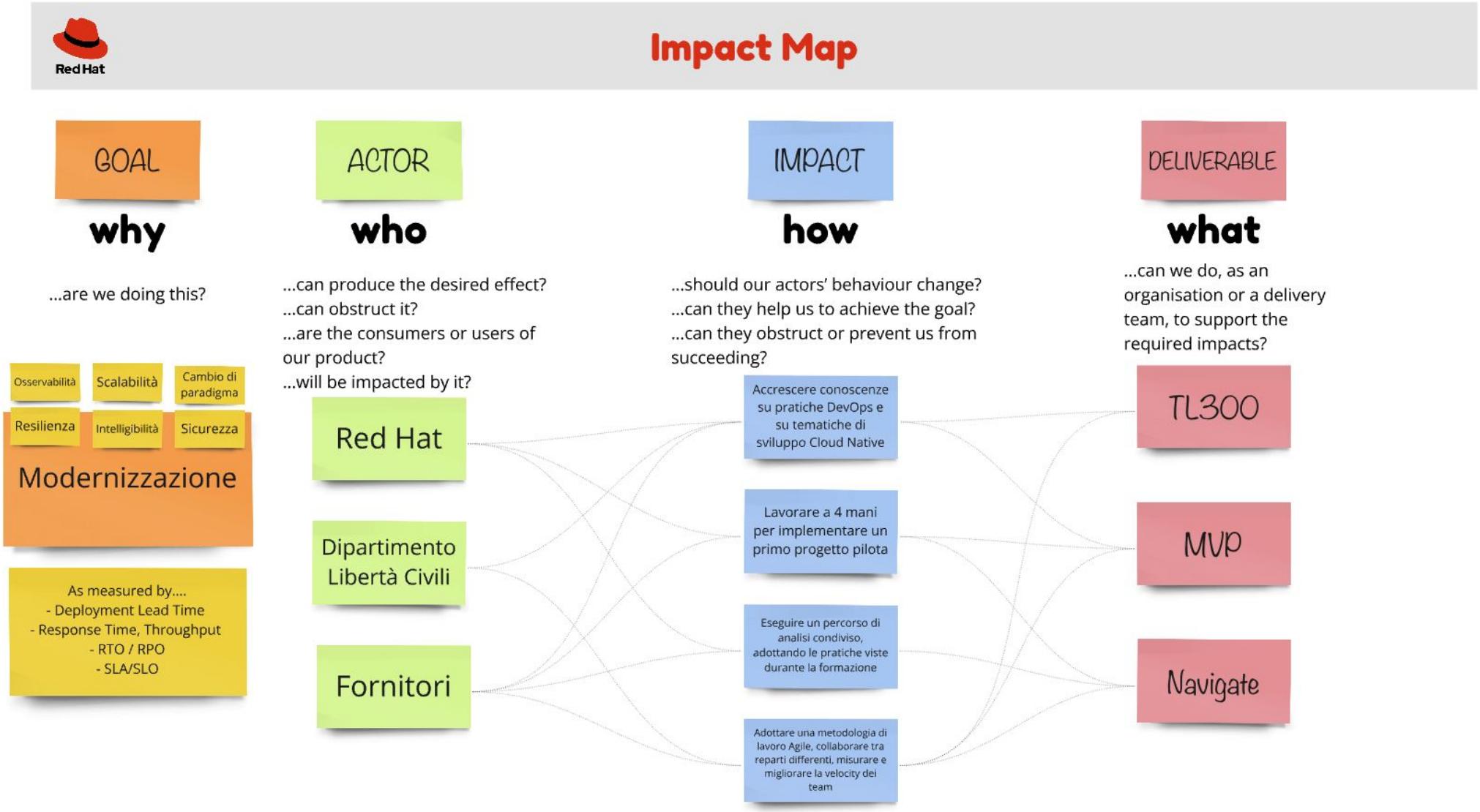

**Actors** are the people, groups, or entities that influence or are influenced by the project. They are essential because they represent the key recipients or participants who contribute to achieving the project's primary goal.




**Impacts** represent the behavior changes or actions that actors must take to achieve the project's primary goal. Essentially, impacts define how actors will influence or contribute to the project's success. This step is essential for directly linking the initiative to the desired value, making the project truly meaningful for the organization.

Impacts should be:

- **Clear and specific:** They must clearly indicate how an actor should behave or what changes are necessary to achieve the goal.
- **Measurable:** Ideally, each impact can be measured to understand if the expected behavior has occurred and if it is generating the anticipated value.
- **Realistic:** They must be realistically achievable by the actors involved and compatible with the resources available.


Red Hat
Impact Map
GOAL
why
...are we doing this?
ACTOR
who
...can produce the desired effect?
...can obstruct it?
...are the consumers or users of our product?
...will be impacted by it?
IMPACT
how
...should our actors' behaviour change?
...can they help us to achieve the goal?
...can they obstruct or prevent us from succeeding?
DELIVERABLE
what
...can we do, as an organisation or a delivery team, to support the required impacts?
Osservabilità
Scalabilità
Cambio di paradigma
Resilienza
Intelligibilità
Sicurezza
Modernizzazione
As measured by....
- Deployment Lead Time
- Response Time, Throughput
- RTO / RPO
- SLA/SLO
Red Hat
Dipartimento Libertà Civili
Fornitori
Accrescere conoscenze su pratiche DevOps e su tematiche di sviluppo Cloud Native
Lavorare a 4 mani per implementare un primo progetto pilota
Eseguire un percorso di analisi condiviso, adottando le pratiche viste durante la formazione
Adottare una metodologia di lavoro Agile, collaborare tra reparti differenti, misurare e migliorare la velocity dei team
TL300
MVP
Navigate

# TL300

A modern way to extract informations from stakeholders, prioritize requirements and focus on business priorities.

**Duration**: 5 days

## Inputs

Discovery Outcomes

## Activities

Open Practices Library Introduction

Miro Board adoption

Event Storming

User Story Mapping & Value Slicing

Impact Mapping

## Outcomes

Considerations that help next HLD

Exec Summary Deck

Scoping future phases

Starting Backlog



Red Hat

# Navigate

A modern way to extract informations from stakeholders, prioritize requirements and focus on business priorities.

**Duration**: 5 half days

## Inputs

Discovery Outcomes

## Activities

Open Practices Library Introduction

Miro Board adoption

Event Storming

User Story Mapping & Value Slicing

Impact Mapping

## Outcomes

Considerations that help next HLD

Exec Summary Deck

Scoping future phases

Starting Backlog


Scalability
Autoscaling
Performance
caching FE
Maintainability
Automazione
Observability
Log
Tracing
Metriche
Monitoring
Security
KeyManager
Vault
Analisi dinamica
Analisi Statica del codice
OWASP top ten
WAF
Reliability
RH ACM
DR - deploy su diverse location
DevOps
Strategia di deploy
Supportability
Testability
80% copertura del codice
Tests
Reusability
Diminuire il boilerplate
Auditability
audit log
anche da infra
Data Mesh
CQRS


Git Checkout

"Compile" codebase

unit test & coverage

Analisi Statica

Scan Dependencies


Bake Image

Scan Docker image

Push su Registry

Sign Image

Scan Image


Git Checkout

Update image version

ArgoCD commit for stage

Push

Check Image Signature

argo

DEV

Integration test


Git Checkout

Update image version

ArgoCD commit for stage

Push

argo

TEST

Load testing

Analisi Dinamica


Git Checkout

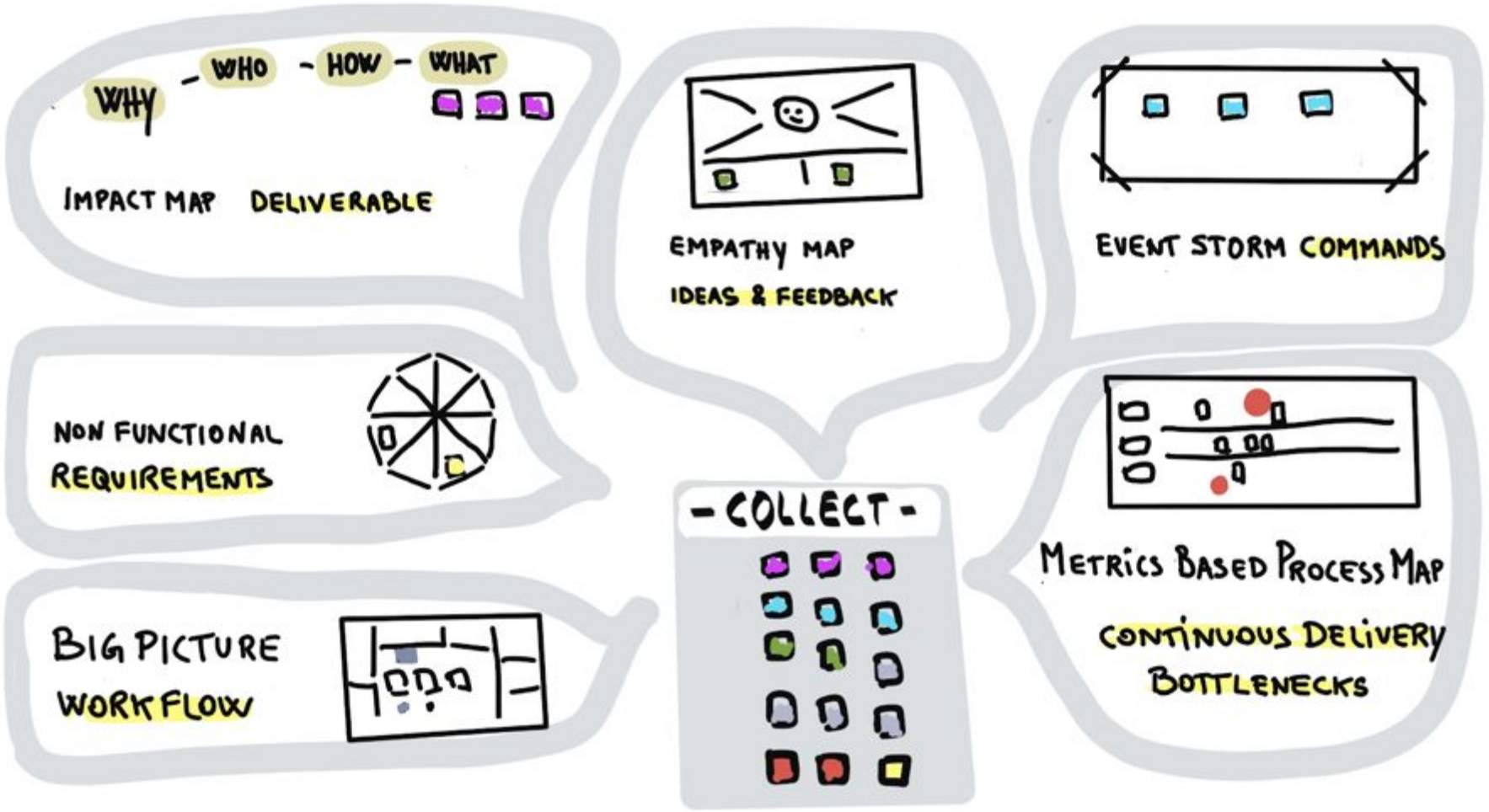
Update image version

ArgoCD commit for stage

Push

argo

PROD


WHY
WHO
HOW
WHAT
IMPACT MAP
DELIVERABLE
EMPATHY MAP
IDEAS & FEEDBACK
EVENT STORM COMMANDS
NON FUNCTIONAL REQUIREMENTS
- COLLECT -
METRICS BASED PROCESS MAP
CONTINUOUS DELIVERY BOTTLENECKS
BIG PICTURE WORKFLOW

# Minimum Viable Product

A six week immersive agile workshop, transforming your ideas into business outcomes.

**Duration**: 6/8 weeks

## Inputs

Navigate Outcomes

(Previous sprint retrospective)

## Activities

6 weekly sprints guided by Red Hat Engagement Lead

Sprint planning, daily meeting, demo and retrospective

## Outcomes

A minimum viable product

CI/CD pipelines

Observability (log, trace, metrics)

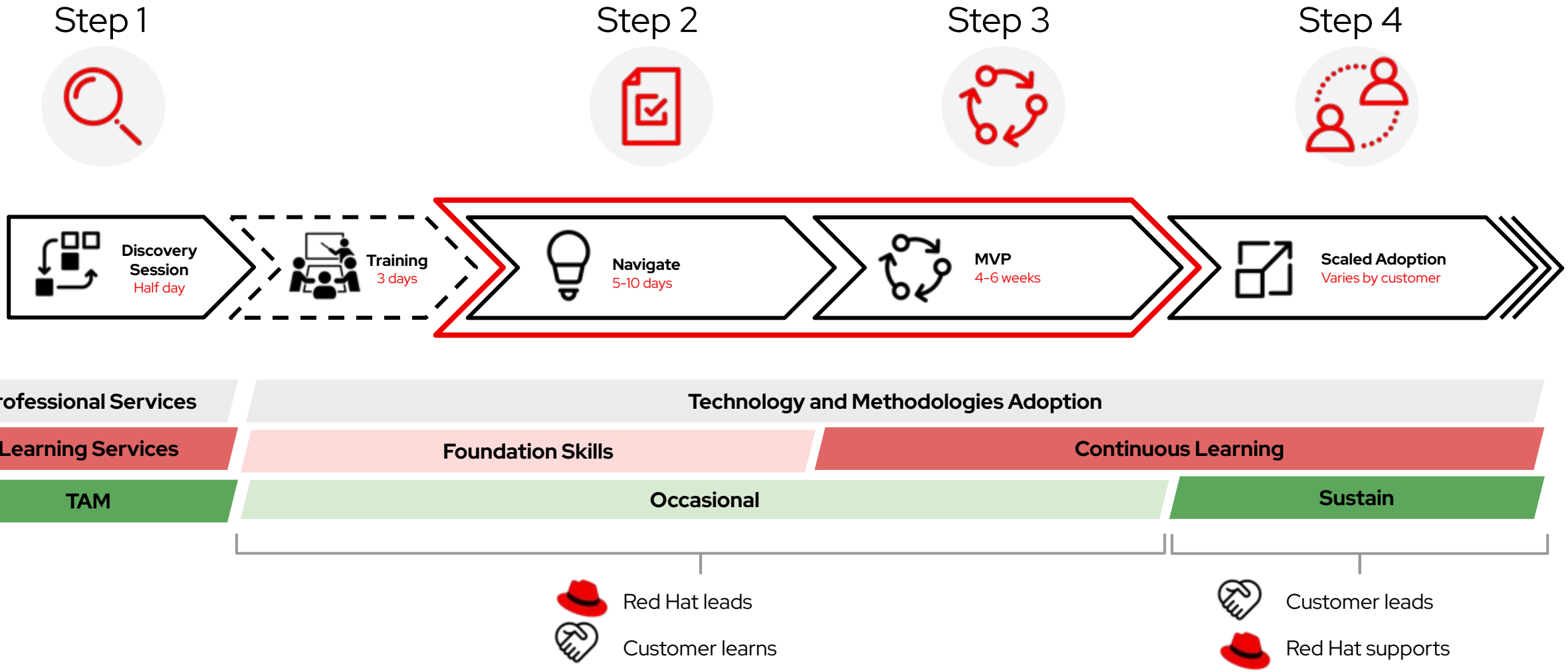
A brand new team able to scale the project

Technical and methodological autonomy



Red Hat

# Framework: MODERNIZATION JOURNEY



# Cloud Native Maturity Model: RH Journeys and Training Catalog for Modernization

CLOUD NATIVE COMPUTING FOUNDATION

Prepare | 1. BUILD | 2. OPERATE | 3. SCALE | 4. IMPROVE | 5. ADAPT | Ongoing Optimization

**RH Adoption Journey**

| 1. BUILD | 2. OPERATE | 3. SCALE | 4. IMPROVE | 5. ADAPT |
|---|---|---|---|---|
| Journey to Application Modernization | Journey to GitOps | Journey to Automation | Journey to Application Security | Journey to Cost Management |
|   |   |  |  |   |
| Journey to AI | Journey to Observability | Journey to Virtualization | Journey to Performance | Journey to Platform engineering |
|   |  |   |  |  |

Continued enhancements

| RH Technology | | | | | |
|---|---|---|---|---|---|
| | Openshift<br>Quarkus<br>AMQ *<br>3Scale<br>Camel<br>Keycloak<br>Openshift AI | Openshift<br>Tekton<br>Argocd<br>ACM<br>Open Telemetry | Openshift<br>Ansible Autom. Plat.<br>Openshift Virt. | Openshift<br>ACS<br>Trusted Supply Chain<br>HPA | Openshift<br>Cost Manag. Oper.<br>Developer Hub |



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