Containers, clusters, and Ansible meet event-driven automation

Overview

Challenge:

As the adoption of containers and Kubernetes increases to propel application modernization, IT organizations must find ways to efficiently deploy and manage multiple Kubernetes clusters across regions, both residing in the public cloud, on-premise, and all the way to the edge.

See how Red Hat OpenShift, Red Hat Advanced Cluster Management, and Red Hat Ansible Automation Platform work together.
Watch the video playlist

Close the gap between IT systems and modern cloud-native technologies

For many organizations, unifying people, processes, and technology among the rising complexity across hybrid environments is a challenge and a reality of modern business. Container technology has become essential in creating agile IT processes and Kubernetes has grown in popularity for developing cloud-native applications. The challenge for many organizations is the struggle to modernize applications and bridge the gap between existing IT systems and modern cloud-native technologies.

Developers need a user-friendly tool to set up and manage applications, but also help automate other tasks across the enterprise. This includes work that is not directly related to their Kubernetes deployments, so everything runs smoothly at every point where it interacts with the datacenter.

Red Hat provides integrated platforms and tools to help unify traditional and cloud-native IT with flexible automation. The combination of Red Hat® Ansible® Automation Platform, Red Hat OpenShift®, and Red Hat Advanced Cluster Management for Kubernetes—and now Event-Driven Ansible–help you build and automate truly hybrid environments and respond to changes in that environment more effectively.

Through integration, these platforms let you automate and efficiently manage your entire hybrid IT environment, from traditional infrastructure to cloud-native and containerized resources. As a result, you can adopt cloud-native technologies and approaches more efficiently and in less time. This combination also lets you move at your own pace, so you can migrate and modernize existing applications, deliver new security-focused cloud-native applications, and adapt your infrastructure and operations over time.

Event-driven automation is extending what these platforms can by automatically triggering when and how to respond based on an received event source. This helps IT teams respond with consistency and efficiency.

Connecting the dots across your IT environment

To help better understand how the combination of Red Hat OpenShift, Ansible Automation Platform, and Red Hat Advanced Cluster Management for Kubernetes helps you build and automate your hybrid environments, it is important to first understand what each platform does.

- **Red Hat OpenShift** provides a hybrid cloud platform for deploying containerized applications and microservices.
- **Ansible Automation Platform** delivers consistent, user-friendly automation for your entire IT environment and organization, now including Event-Driven Ansible to provide an even more powerful platform.
- **Red Hat Advanced Cluster Management for Kubernetes** can manage applications and supply life-management, policy-based governance and health monitoring for Red Hat OpenShift clusters at scale.

Together, the platforms help you manage multiple clusters at scale across multi and hybrid cloud environments. The integration of Ansible Automation Platform connects traditional IT ecosystems to cloud-native infrastructures by automating tasks at key stages in the life cycle.

Red Hat Ansible Automation Platform and event-driven automation

Red Hat Ansible Automation Platform has proven its value and effectiveness as an end-to-end automation platform used to configure systems, deploy software, and orchestrate advanced workflows.

Event-driven automation is the next step in an organization's automation journey. It is the process of responding automatically to changing conditions in an IT environment, to help resolve issues more quickly without the time and churn and can reduce routine, repetitive tasks. For example, if network traffic spikes beyond a certain threshold, automated processes can kick in to adjust bandwidth allocation, ensuring that operations remain smooth. Or, if a potential security threat is detected, automated defenses can spring into action even before human intervention.

Event-Driven Ansible is available beginning with the latest Ansible Automation Platform and provides the ability to listen to intelligent event sources, process them through a rules engine, and trigger an action automatically. Event-Driven Ansible operates based on 3 key components:

- **Sources:** All the sources of event data you want to see.
- **Rules:** Define the condition and jobs to be executed when an event occurs.
- **Actions:** When a condition or event is met, the Ansible Rulebook executes.

As a part of Ansible Automation Platform, Event-Driven Ansible provides the event-handling capability needed to automate time-consuming tasks and respond to changing conditions in any IT domain.

How Event-Driven Ansible enhances Red Hat OpenShift

To understand the benefits of Event-Driven Ansible when paired with the already effective combination of Red Hat OpenShift, Red Hat Advanced Cluster Management and Ansible Automation Platform, it can be helpful to think of what it can do in specific use cases.

The following are 7 practical applications for Event-Driven Automation that can apply to nearly any organization and go beyond automating application deployment and management to ensure fast, consistent, and efficient responses at every interaction point across your IT environment:

IT service management

Event-Driven Ansible makes it possible to automatically generate tickets for enhancement, remediation, and user management right in Red Hat OpenShift Container Platform. This gives you the flexibility to automate a variety of tasks across your IT environment by connecting analytics to automated actions, improving the resilience and responsiveness of IT, while freeing teams to focus on more valuable work.

Application healing

Event-Driven Ansible makes self-healing applications possible by automatically triggering tickets in OpenShift Container Platform. For example, if your observability tool that is watching applications and finds a root cause that a router is not responding, it recognizes this as an event. Event-Driven Ansible receives this event, finds the corresponding Ansible Rulebook, and matches the event with the desired action. This automatic action could be redirecting traffic, resetting the router, reapplying a configuration, or creating a service ticket. Event-Driven Ansible triggers the instructions in the rulebook and fixes the issue with the router, restoring it to normal function.

Network automation

OpenShift Container Platform uses Software Defined Network (SDN) controllers to manage specific networking domains. Ansible Automation Platform can "manage the managers" and use the same automation language across multiple network domains. Event-Driven Ansible takes automation a step further to automatically perform targeted maintenance, limit outages, address security risks, refresh service tickets, enforce standard configurations, and perform backups in less time.

Automation at the edge

Event-Driven Ansible can benefit the application life cycle across edge environments that frequently lack IT staff on site. A common use case for non cloud environments is the ability to automatically detect when nodes are added or removed from a Microshift or OpenShift cluster at a remote location, and trigger an automation job to add them to a load balancer. Additional options including ticket enrichment, and event-driven troubleshooting can also be automated to increase visibility and improve uptime at the edge.

Better together - Red Hat Advanced Cluster Management

Organizations that are already running Red Hat Advanced Cluster Management can extend its capabilities with Event-Driven Ansible. For example, when deploying or updating a cluster, you can automate critical setup tasks such as configuring cloud defined storage, static IP addresses, network firewall rules, and more.

Cluster life cycle integration

Once the cluster is created, Ansible Playbooks can be used to:

- Update network components.
- Renew databases.
- Modernize ticketing systems.
- Allow for flexible scaling, and more.

This helps you to coordinate the interactions between traditional and cloud-native technologies that may be running simultaneously.

Governance and risk integration

To maintain a desired state of compliance, playbooks can be configured and invoked to automatically remediate non-compliant conditions detected by Red Hat Advanced Cluster Management. Ansible Playbooks can also gather audit information about the clusters for analysis and to promote proactive measures that will prevent future violations.

Application life cycle management

When deploying or updating applications using Red Hat Advanced Cluster Management, automation of configurations like networking, databases, and more with the integration of Ansible Automation Platform can be initiated automatically using Event-Driven Ansible.

Extend what automation can do with Event-Driven Ansible

While automation can increase the speed and agility of IT teams across hybrid environments, some events are still done through manual troubleshooting and information gathering, which can be slow and disruptive to everyday operations.

Learn more

Take the next step toward effectively connecting your traditional IT ecosystems to cloud-native infrastructures by automating tasks and using Event-Driven Ansible to automatically respond to the changing conditions across your environment.

Read more, download "Connect your hybrid cloud environment with IT automation".

Learn more about Red Hat solutions, contact a Red Hatter.

About Red Hat

Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. A trusted adviser to the Fortune 500, Red Hat provides award-winning support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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