



OpenT^{III}our

Plataformas con posibilidades ilimitadas

A Coruña

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Managing the Edge with Ansible and RHEL OSTree

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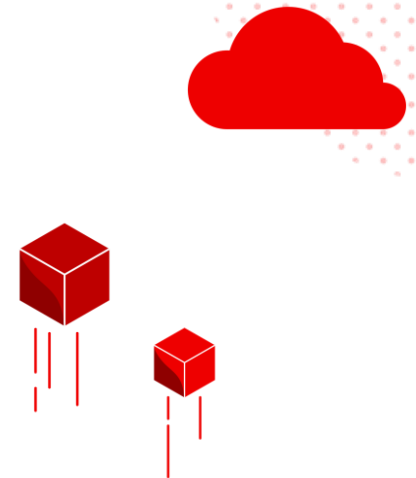
Red Hat

Architect

Adonis García Castro

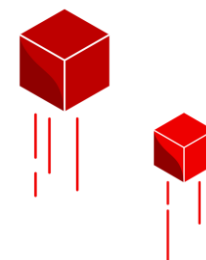
Red Hat

Consultant

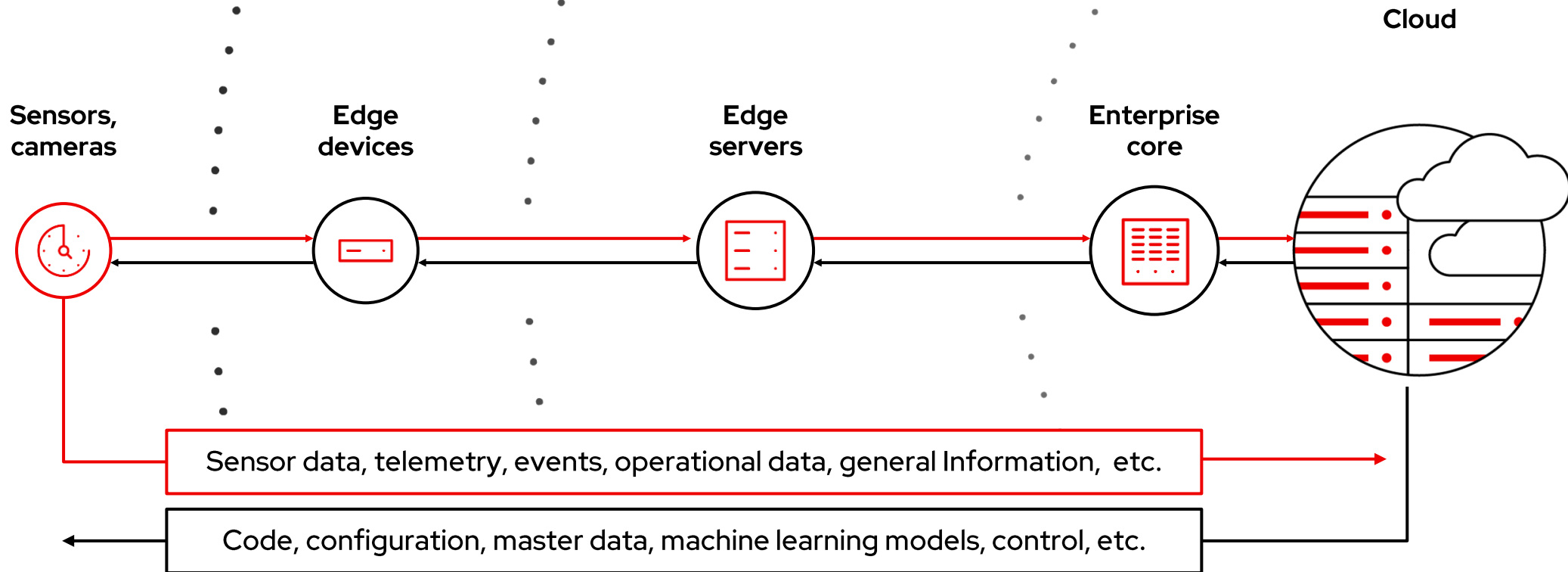


Contents:

- Edge Overview
- Red Hat and Intel edge focus areas
 - Intelligent Edge & Industry 4.0
- Example Edge Architecture
- Demo



Edge Overview



Red Hat & Intel

Focus Areas

How Red Hat & Intel see edge

Market overview

Traditional business

Enterprise IT edge

Second- and third-tier data centers, cloud gateways, colo facilities, offices connected

- ▶ Standardized and secured distributed operations
- ▶ Modernized application environments
- ▶ Modernized network infrastructure

Telco

5G Network Transformation

Telco-owned compute infrastructure and cloud-like hosting for business applications

- ▶ Aggregation, access, and edge devices
- ▶ Business applications through the service provider network

Industrial and horizontal

Artificial Intelligence

Local networks of smart things, local compute, remotely deployed gateways

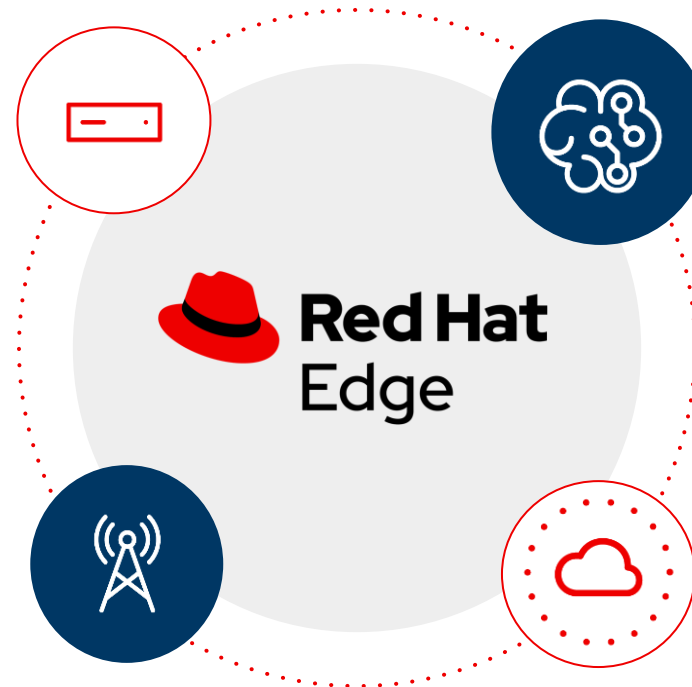
- ▶ Automation and integration of monitoring and control processes
- ▶ Predictive analytics (AI/ML based inferencing)
- ▶ Production and supply chain optimization

Intelligent Edge

Consumer edge

Globally distributed compute systems that deploy engagement apps to customers wherever they are

- ▶ Connected vehicles
- ▶ Consumer VR and gaming



Intelligent Edge & Industry 4.0 Workstreams

Workstreams for developing optimized solutions for the Industry 4.0 customers

Solutions	Private 5G Network	Red Hat and Intel collaborate to create a cloud and edge-native private 5G solution for industrial and cross vertical deployments that is cost-effective and easier to adopt.	P5G network can provide the connectivity, tools and applications necessary to infuse AI on the factory floor by running on a modernized, automated, scalable and manageable cloud-native platform with a stronger security stance.
	Power Substation Digitalization	Enabling containerization in utilities for substation power distribution environments.	Enabling automation and control ecosystem partners on OpenShift, create a demonstrable solution for the utility market.
Technology enabling	OpenVINO toolkit	OpenVINO™ to enable easy deployment and management of AI inference services at the edge in heterogeneous environments. Integrated in in OpenShift AI.	OpenVINO™ Toolkit includes notebooks for development and OpenVINO™ Model Server for deployment.
	Edge Control for Industrial (ECI)	Transitioning custom, fixed-function hardware to a best-in-breed software defined architecture.	Deliver blueprint solutions that integrates real-time deterministic compute using standards-based connectivity and orchestration.
	Edge Insights for Industrial (EII)	SW Stack to enable AI-powered, Industry 4.0 operations for machine vision and time series data.	Deliver blue print solutions that integrates Time series analytics, video analytics/ingestion and orchestration



Edge Technologies for today and tomorrow needs

intel. Long Live Product availability

Extended product availability, Embedded & Industrial Use Conditions, SKUs with Extended Temperature.

intel. Hybrid Architecture

The 12th Gen Intel® Core IoT processor transforms the industry with performance hybrid architecture combining Performance-cores and Efficient-cores into a single die.

intel. Intel® Iris Xe Graphics

Intel® Iris® Xe graphics with up to 96 execution units that will deliver up to 2.95x1 the graphics performance of 8th Gen Intel® Core™ processors.

intel. Hardware-enabled VNNI AI Acceleration

Supports Intel® Distribution of OpenVINO™ toolkit including various pre-trained AI models and software tools for inference acceleration.

intel. Real-time Computing

Time-Sensitive Networking (TSN)
To reduce latency and minimize jitter for synchronous process control and real time computing.

intel. Functional Safety

Functional Safety plumbing + Intel® Functional Safety Essential Design Package (Intel® FSEDP).

intel. Open-source Software

Intel is one of the main contributors to Linux (#1) to achieve optimal performance while also emphasizing its scalability, energy efficiency and security.

intel. Wide OEM Ecosystem

The solution that best suits the project, maintaining the advantages that the standardization of the Edge platform brings at the development level.

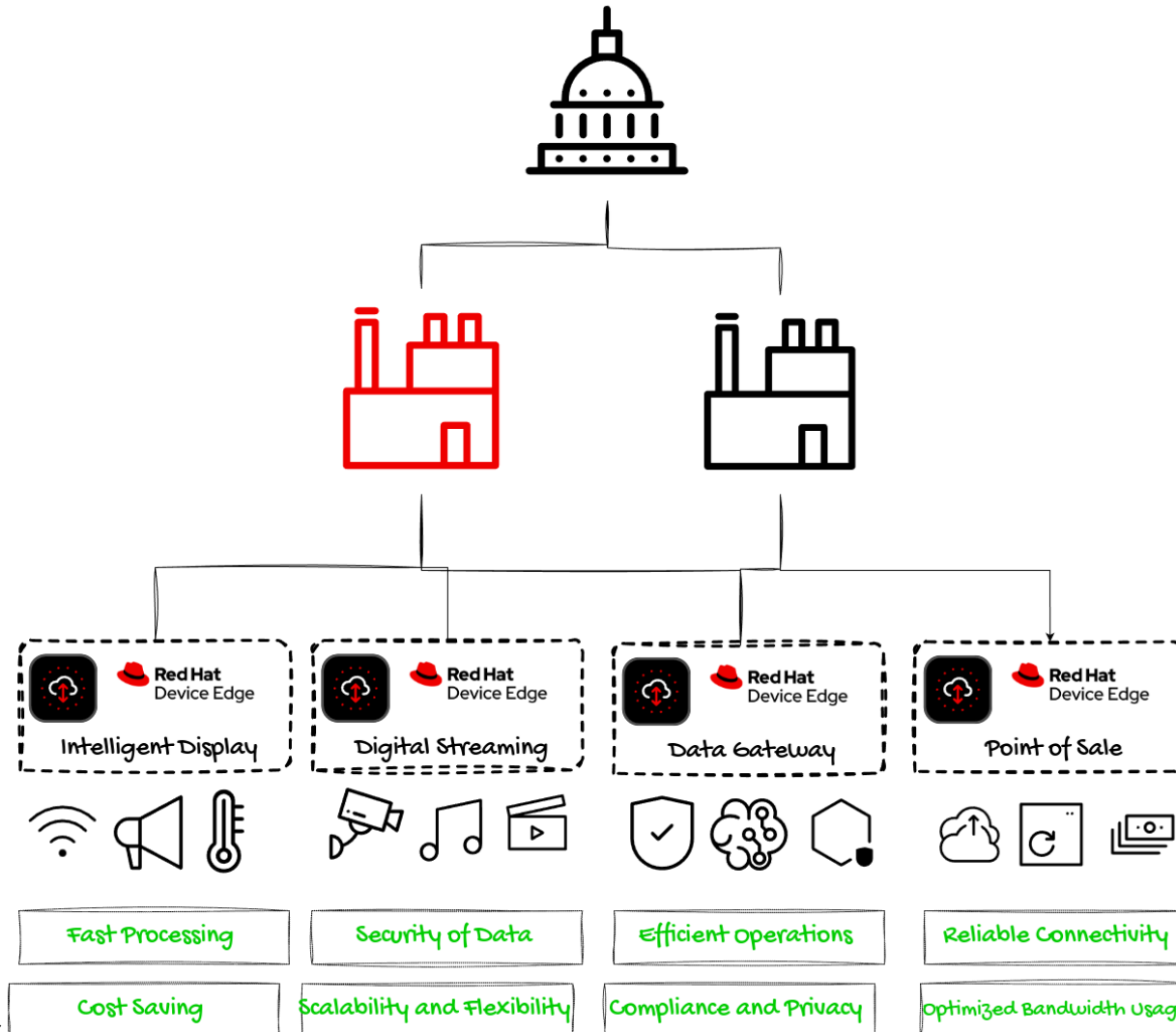
intel. Compact Size

With small form factor and slim design, Advantech system solutions are suitable for installation in factory automation, smart city and retail fields. Fan less options.

Example Edge Architecture

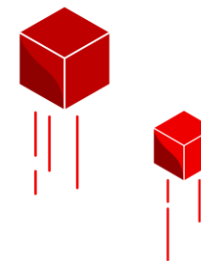
Hostelry Architecture

Illustrative Hotel Scenario



Goals:

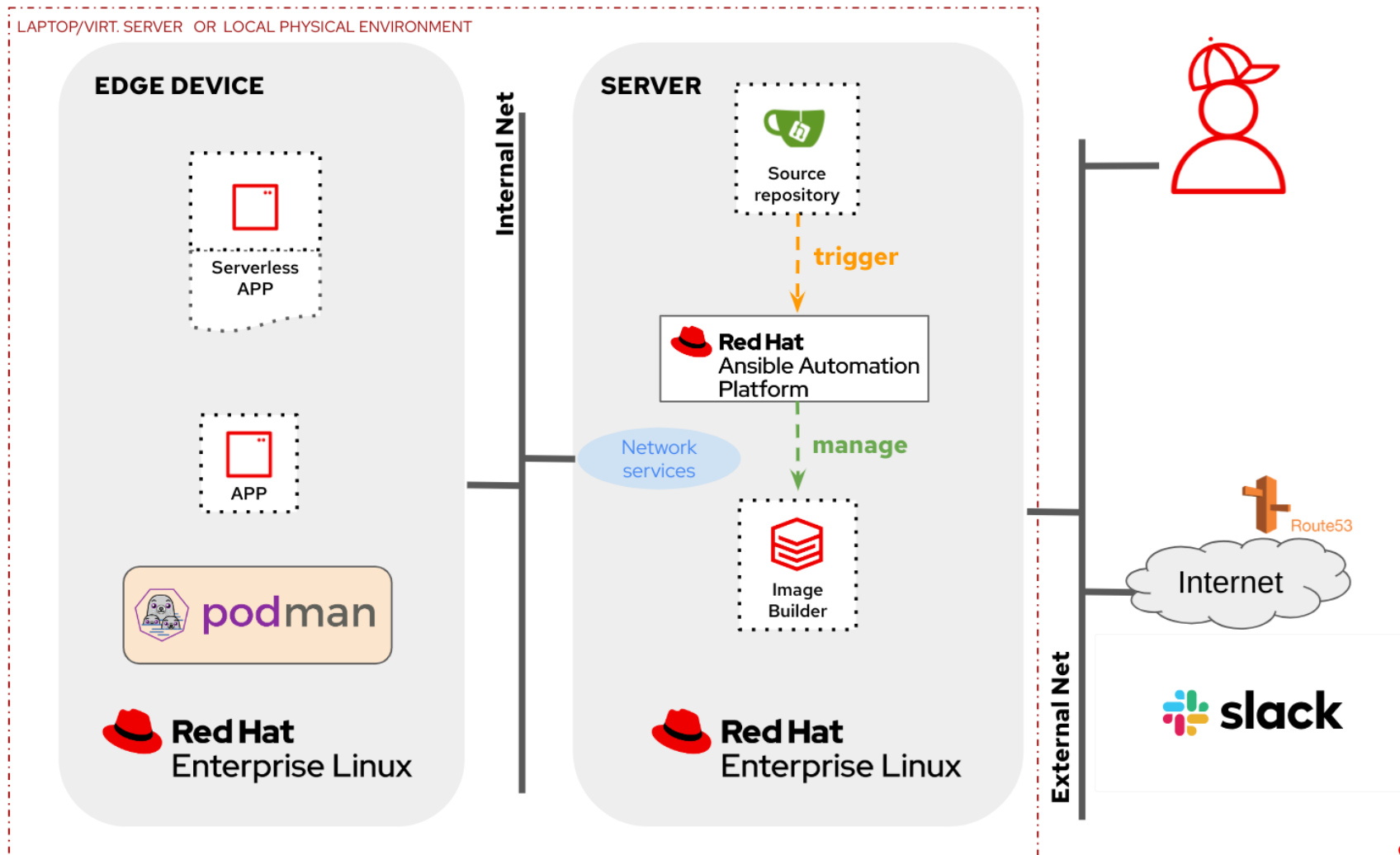
1. Consistent Operating System across Devices
2. Automated Device Onboarding
3. Consistent Edge Device Configuration
4. Bulletproof System Upgrades



Let's enjoy a Demo
Together!

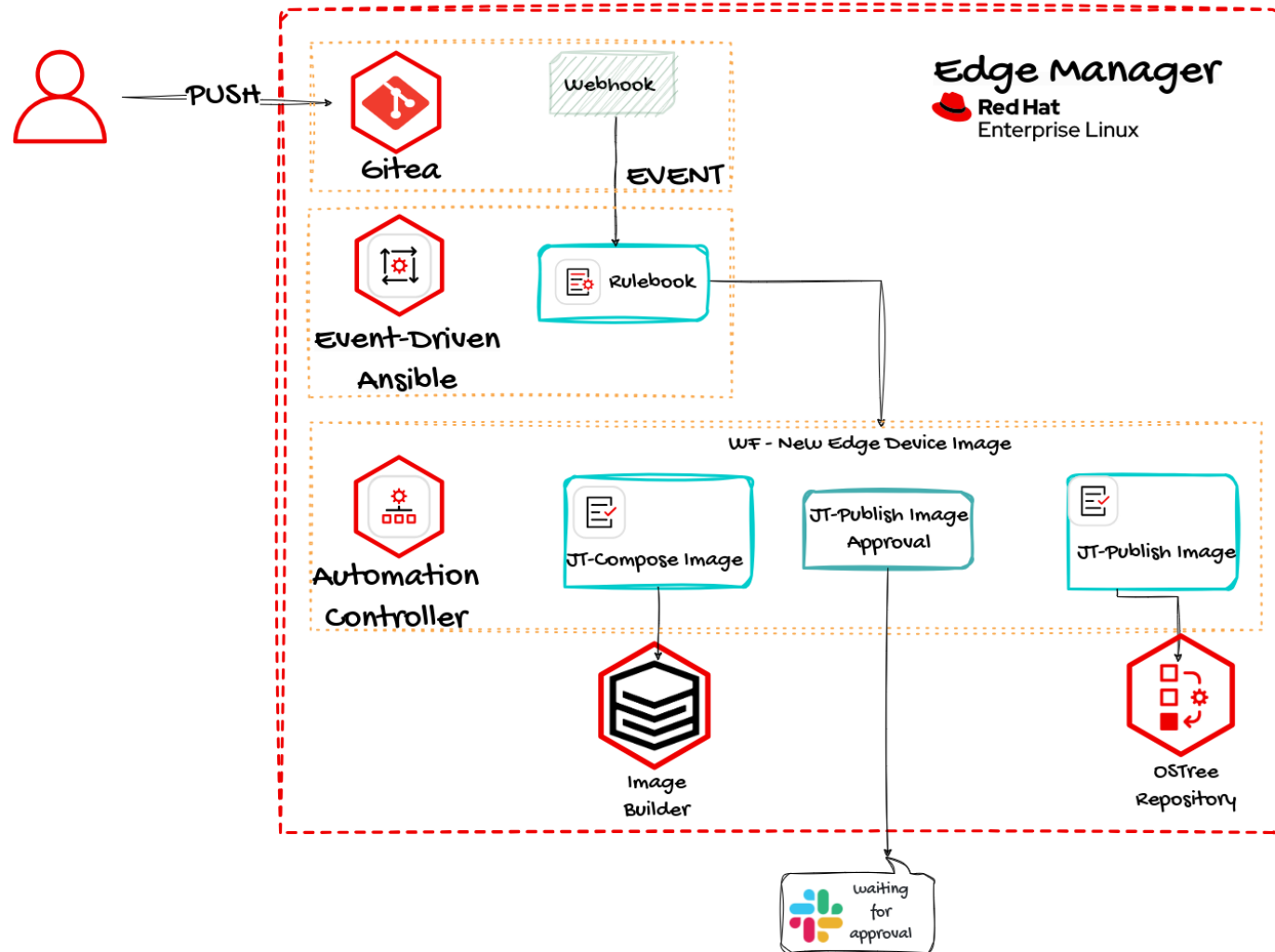
Laboratory Description

Managing the Edge with Ansible and RHEL OStree in a Virtualized Env



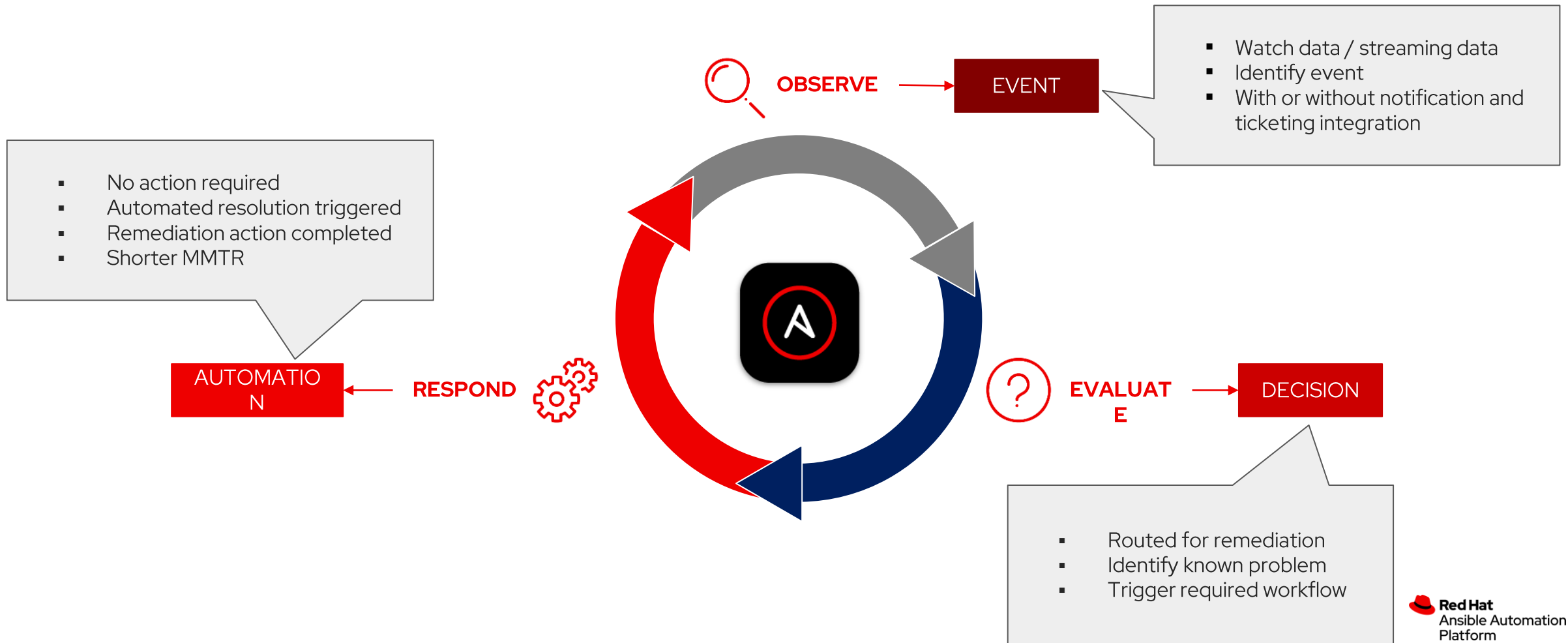
01 - Creating rhel images

Using a GitOps approach



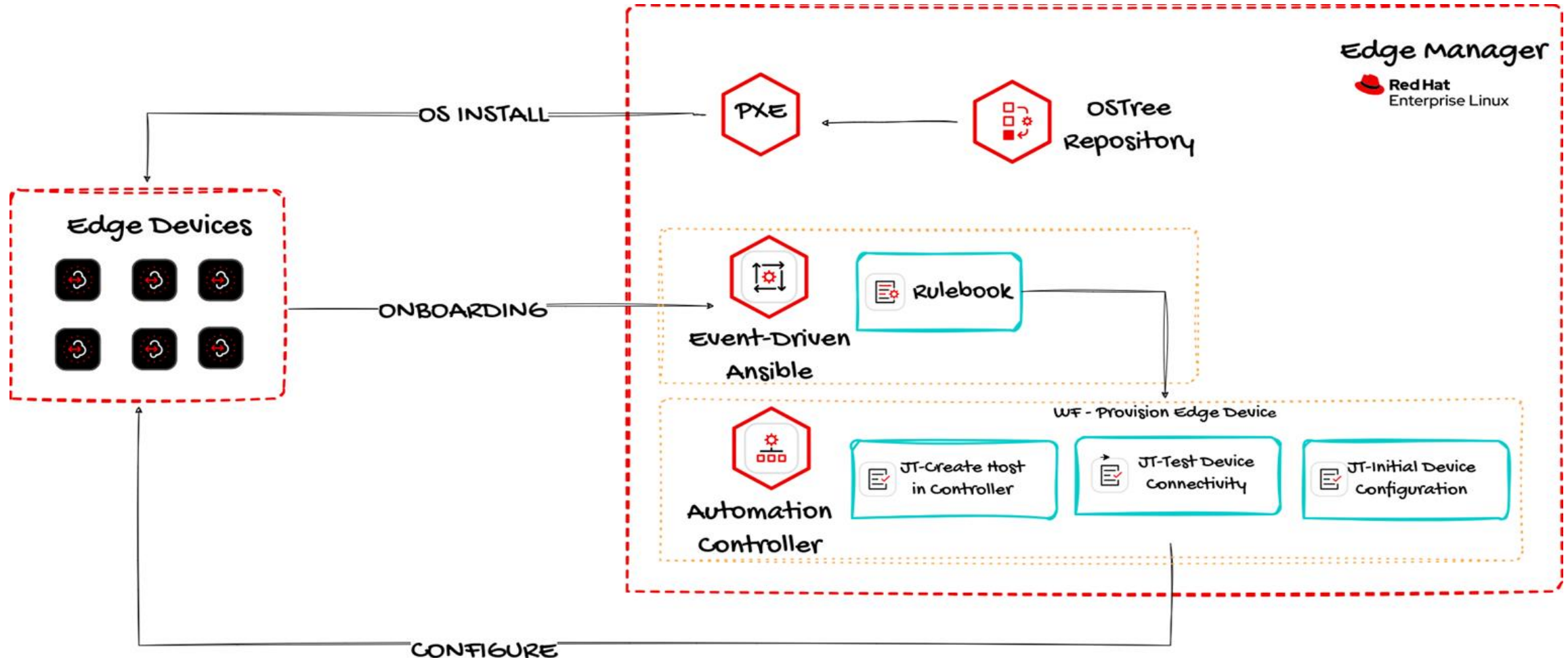
Event-Driven Ansible

Automation Supporting Mission Critical Workloads

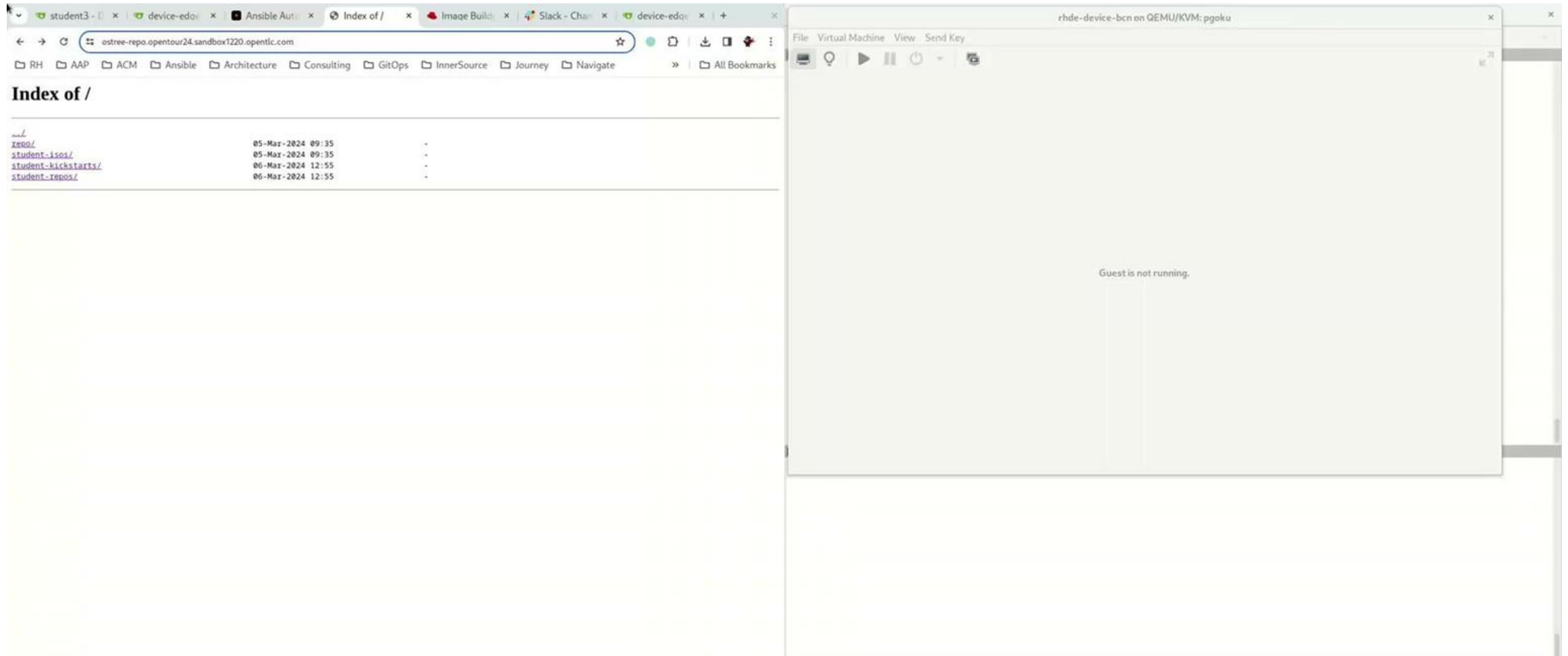


02 - Automated Device Onboarding

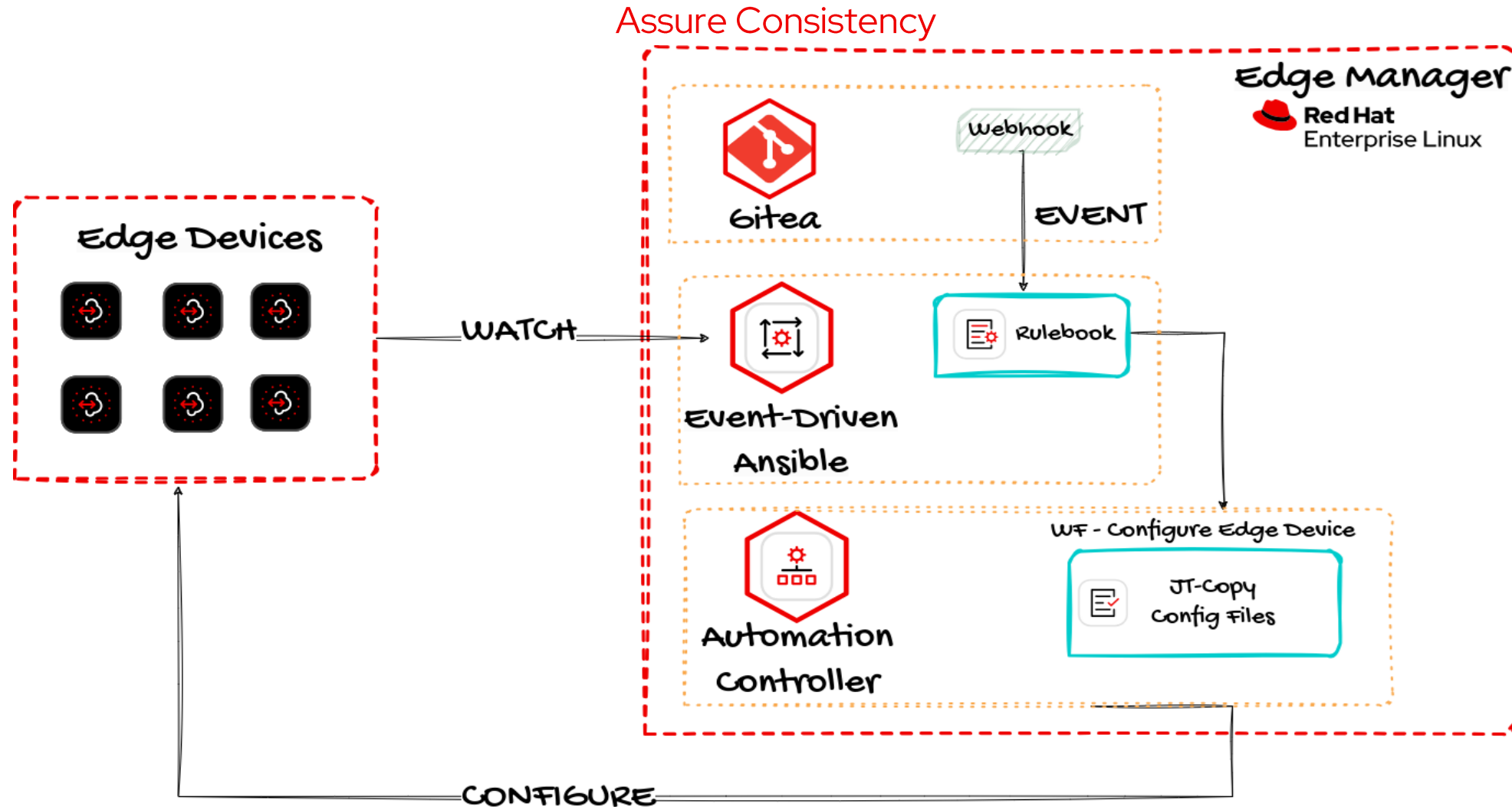
Operating System Installation and Initialization



02 – Automated Device Onboarding



03 - Consistent Edge Device Configuration



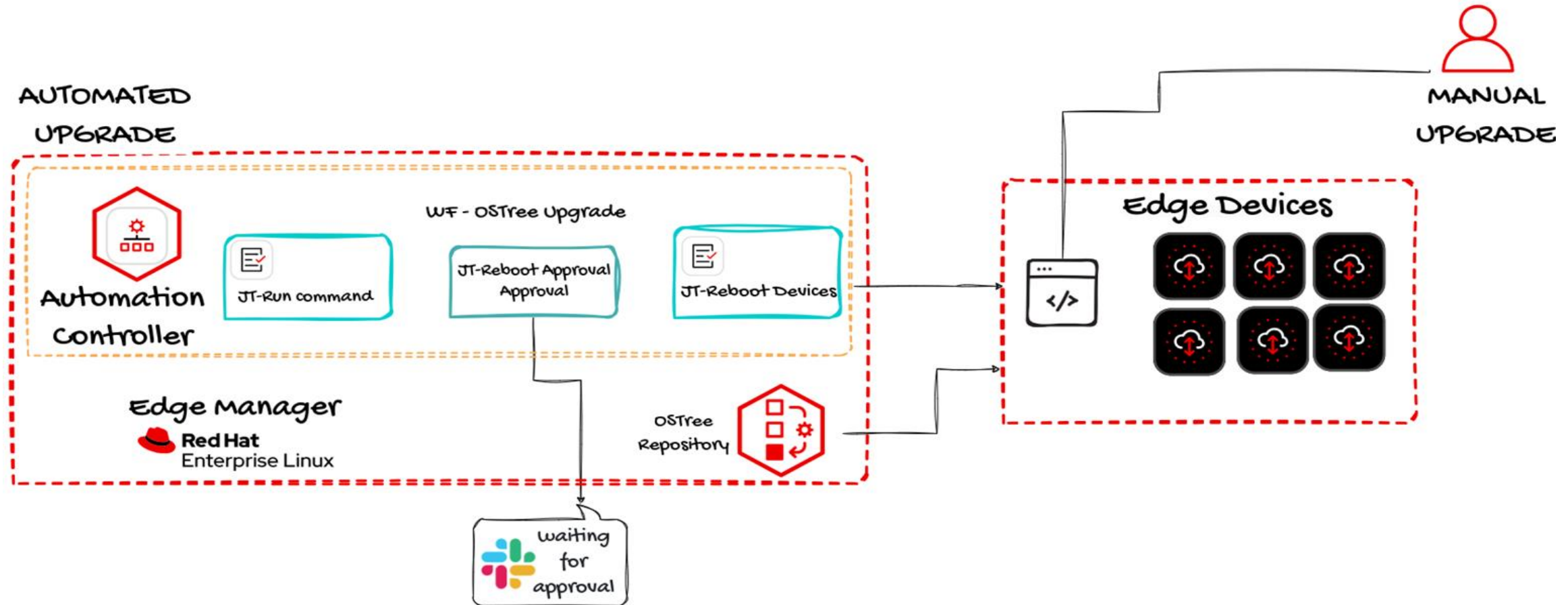
03 – Consistent Edge Device Configuration

Assure Consistency

The image shows a web browser window on the left displaying a GitHub repository page for 'student1'. The repository is 'student1/device-edge-images'. The page shows a commit history with several entries, including 'rollback initial state', 'Create new image version', 'Create new image', 'New Microshift image', 'Test video', and 'change version latest'. On the right side of the browser, there is a sidebar showing the repository list for the organization 'student1', including 'device-edge-images', 'device-edge-configs', and 'device-edge-automation'. To the right of the browser is a terminal window showing a shell prompt '[student3@edge-manager-local ~]\$'.

04 - Bulletproof System Upgrades

OSTree (Operating System) Upgrade



04 - Bulletproof System Upgrades

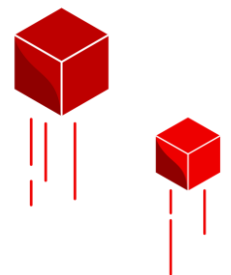
OSTree Upgrade and Checking

The screenshot shows the Red Hat Ansible Automation Platform interface. On the left is a navigation sidebar with sections: Views (Dashboard, Jobs, Schedules, Activity Stream, Workflow Approvals), Resources (Templates, Credentials, Projects, Inventories, Hosts), Access (Organizations, Users, Teams), and Administration (Credential Types, Notifications, Instance Groups, Applications, Execution Environments). The main 'Jobs' page displays a table of job execution results:

Name	Status	Type	Start Time	Finish Time	Actions
102 - Run command	Successful	Playbook Run	3/6/2024, 8:13:27 PM	3/6/2024, 8:13:34 PM	
101 - Publish Image	Successful	Playbook Run	3/6/2024, 8:08:00 PM	3/6/2024, 8:09:26 PM	
97 - OSTree Upgrade	Successful	Workflow Job	3/6/2024, 8:04:11 PM	3/6/2024, 8:05:44 PM	
100 - Reboot devices	Successful	Playbook Run	3/6/2024, 8:04:45 PM	3/6/2024, 8:05:43 PM	
98 - Run command	Successful	Playbook Run	3/6/2024, 8:04:12 PM	3/6/2024, 8:04:18 PM	
93 - OSTree Upgrade	Successful	Workflow Job	3/6/2024, 8:01:43 PM	3/6/2024, 8:03:04 PM	
96 - Reboot devices	Successful	Playbook Run	3/6/2024, 8:02:03 PM	3/6/2024, 8:03:04 PM	


On the right, a terminal window shows the command prompt: `[student3@edge-manager-local ~] device-edge-images` and the prompt `[student3@edge-manager-local ~] device-edge-images`.

¿Se ajusta a su modelo de negocio?




Muchas gracias


Red Hat es el principal proveedor mundial de soluciones empresariales de código abierto con un enfoque impulsado por la comunidad que permite ofrecer tecnologías de alto rendimiento de Linux, nube, contenedor y Kubernetes. Le ayudamos a estandarizar en todos los entornos, a desarrollar aplicaciones nativas de la nube, a integrar, automatizar, asegurar y gestionar entornos complejos gracias al soporte, training y servicios de consultoría galardonados.

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