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Open Tour

Plataformas con posibilidades ilimitadas

Lisboa

May 23, 2024

Managing the Edge with Ansible and RHEL OSTree

Adonis García Castro
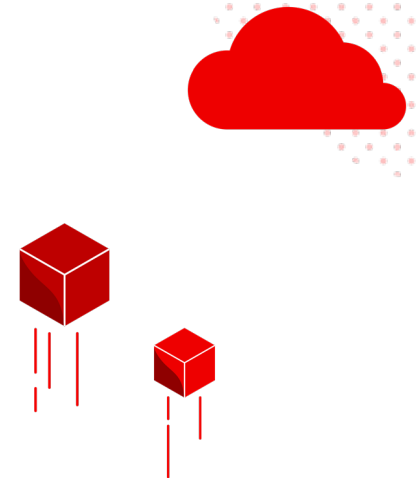
Red Hat
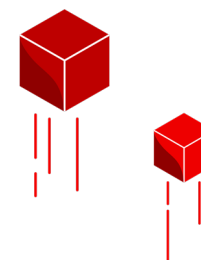
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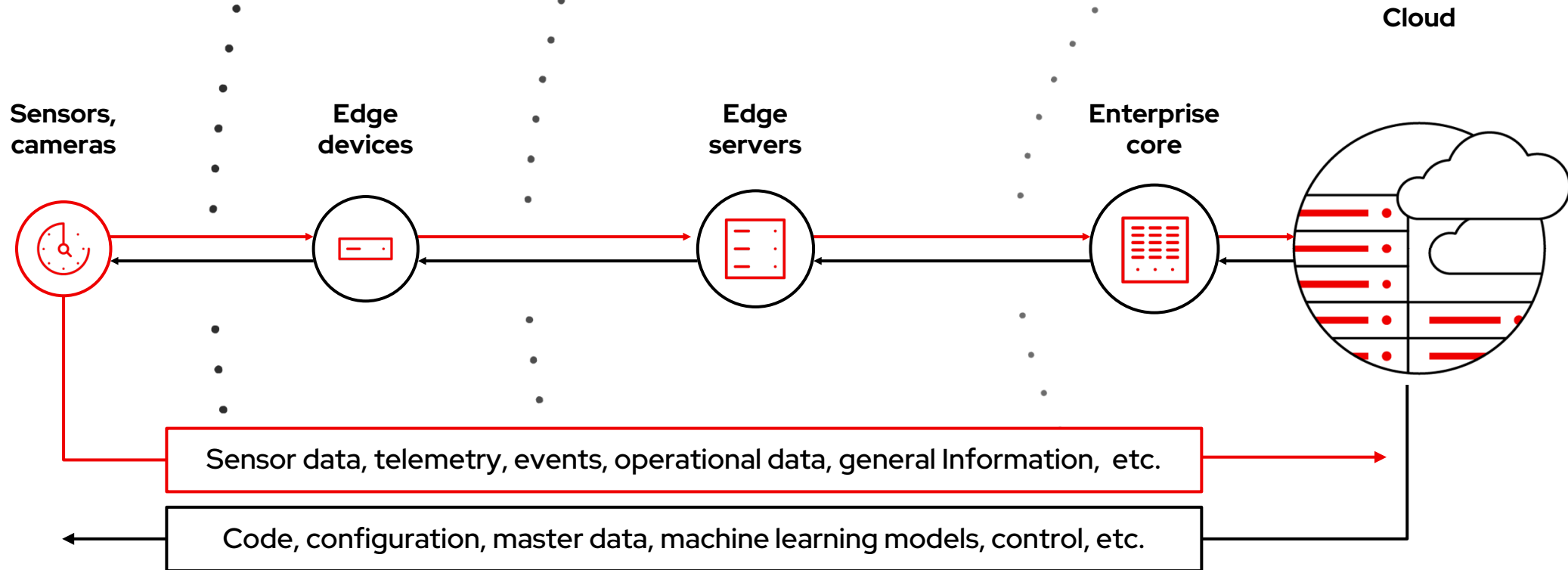
Paulo Pacífico

Red Hat

Consultant

Contents:

- Edge Overview

- Red Hat and Intel edge focus areas
    - Intelligent Edge & Industry 4.0

- Example Edge Architecture

- Demo

Edge Overview

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Cloud

Sensors,
cameras

Edge
devices

Edge
servers

Enterprise
core

Sensor data, telemetry, events, operational data, general Information, etc.

Code, configuration, master data, machine learning models, control, etc.

Red Hat & Intel
Focus Areas

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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

Red Hat Edge
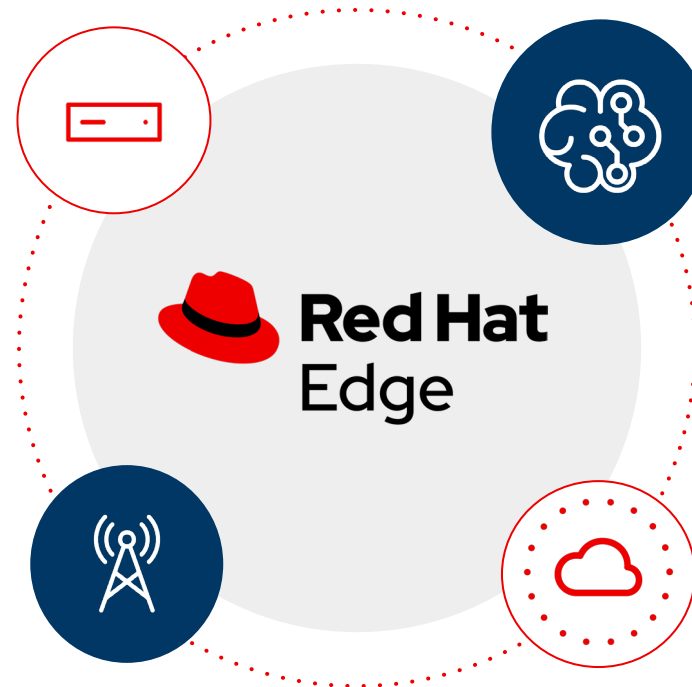
Intelligent Edge & Industry 4.0 Workstreams

Workstreams for developing optimized solutions for the Industry 4.0 customers

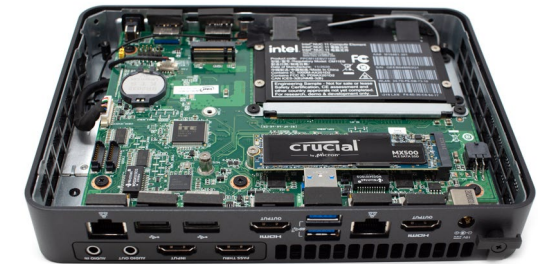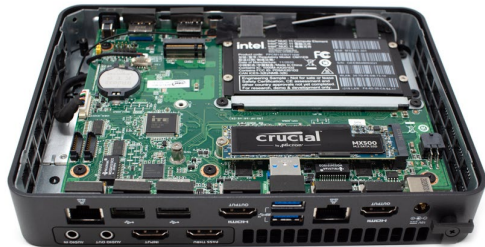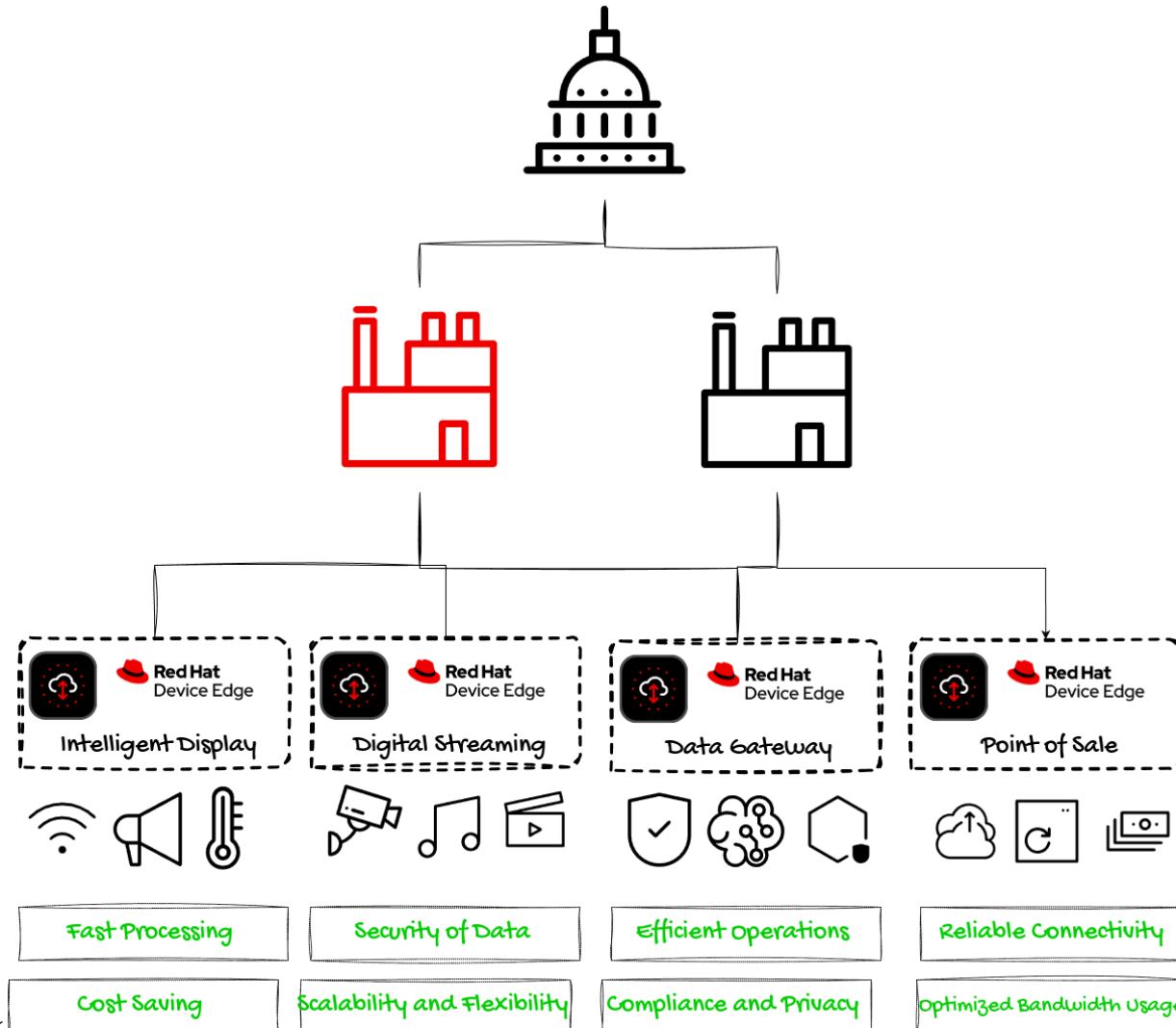|			
Solutions	**Private 5G Network**	Red Hat and Intel collaborate to create a cloud and edge-native private 5G solution for industrial and cross vertical deployments that is cost-effective and easier to adopt.	P5G network can provide the connectivity, tools and applications necessary to infuse AI on 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

OpenTour

Long Live Product availability
intel.

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

Hybrid Architecture
intel.

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® Iris Xe Graphics
intel.

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.

Hardware-enabled VNNI AI Acceleration
intel.

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

Real-time Computing
intel.

Time-Sensitive Networking (TSN)

To reduce latency and minimize jitter for synchronous process control and real time computing.

Functional Safety
intel.

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

Open-source Software
intel.

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

Wide OEM Ecosystem
intel.

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

Compact Size
intel.

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.

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Example
# Edge Architecture

Hostelry Architecture

Illustrative Hotel Scenario

Intelligent Display	Digital Streaming	Data Gateway	Point of Sale
Red Hat Device Edge	Red Hat Device Edge	Red Hat Device Edge	Red Hat Device Edge
Fast Processing	Security of Data	Efficient Operations	Reliable Connectivity
Cost Saving	Scalability and Flexibility	Compliance and Privacy	Optimized Bandwidth Usage

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Image: Intel NUC 11 Compute Element CM11EBv716W (intel.com)

Goals:

1. Consistent Operating System across Devices

2. Automated Device Onboarding

3. Consistent Edge Device Configuration

4. Bulletproof System Upgrades
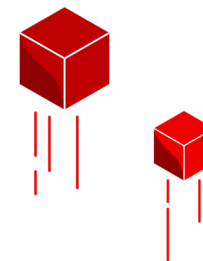
Let's enjoy a Demo Together!

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Laboratory Description

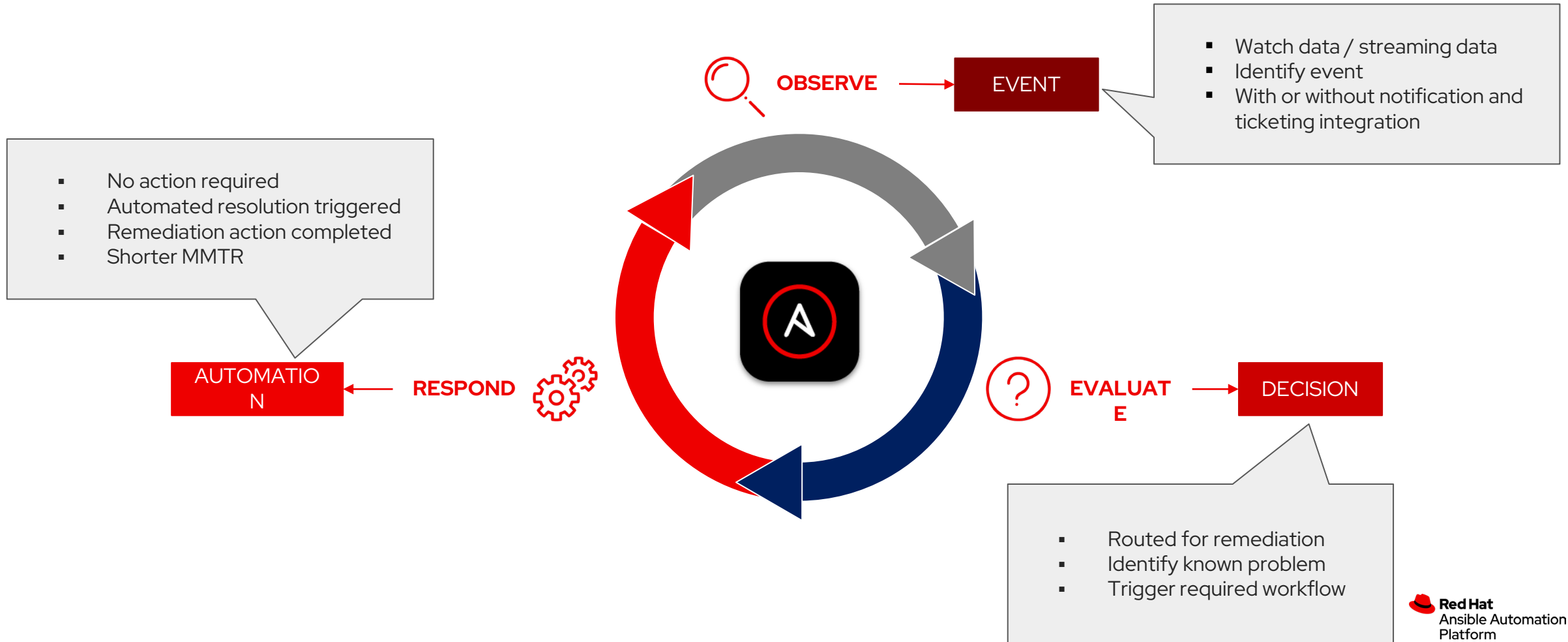## Managing the Edge with Ansible and RHEL OStree in a Virtualized Env
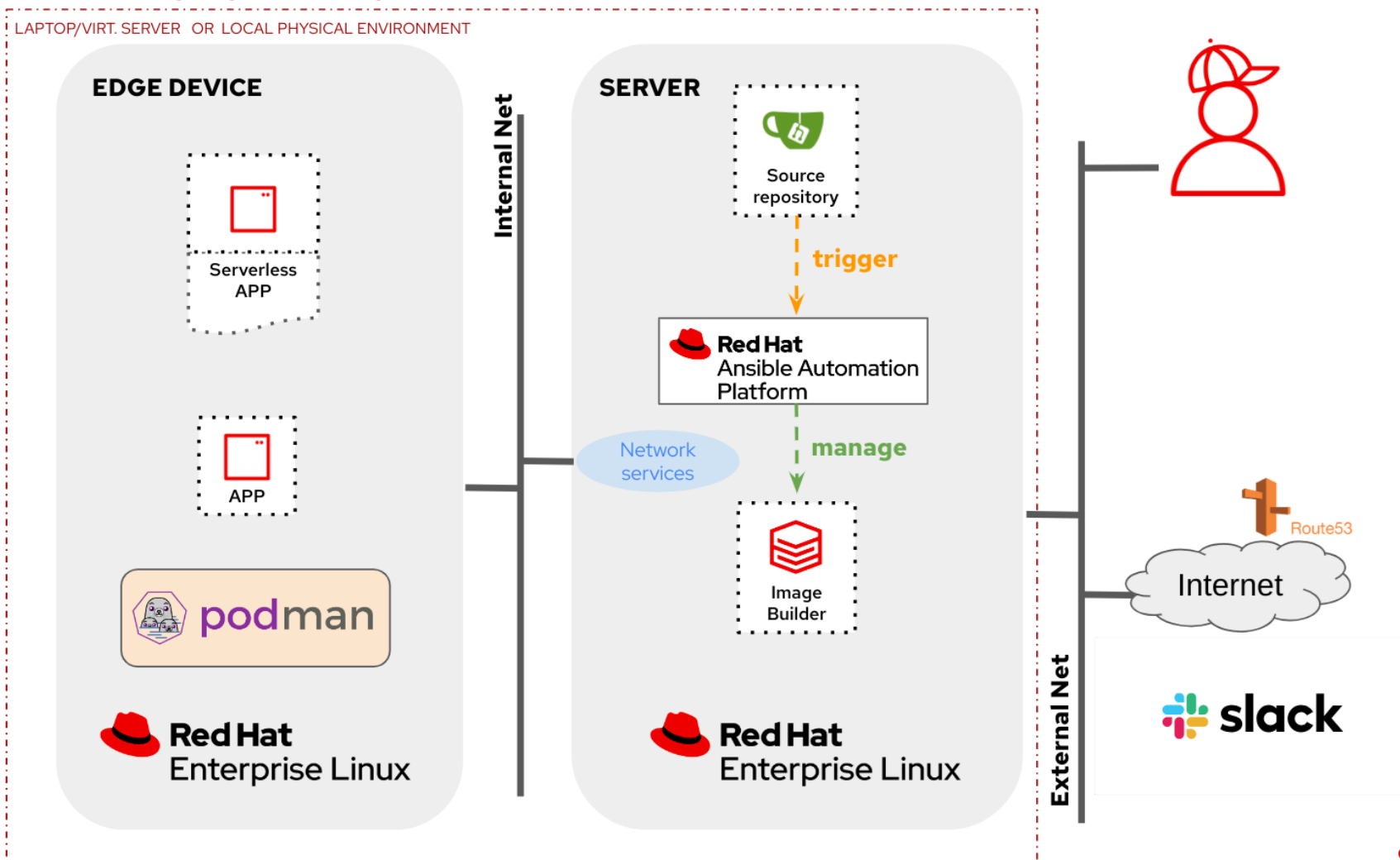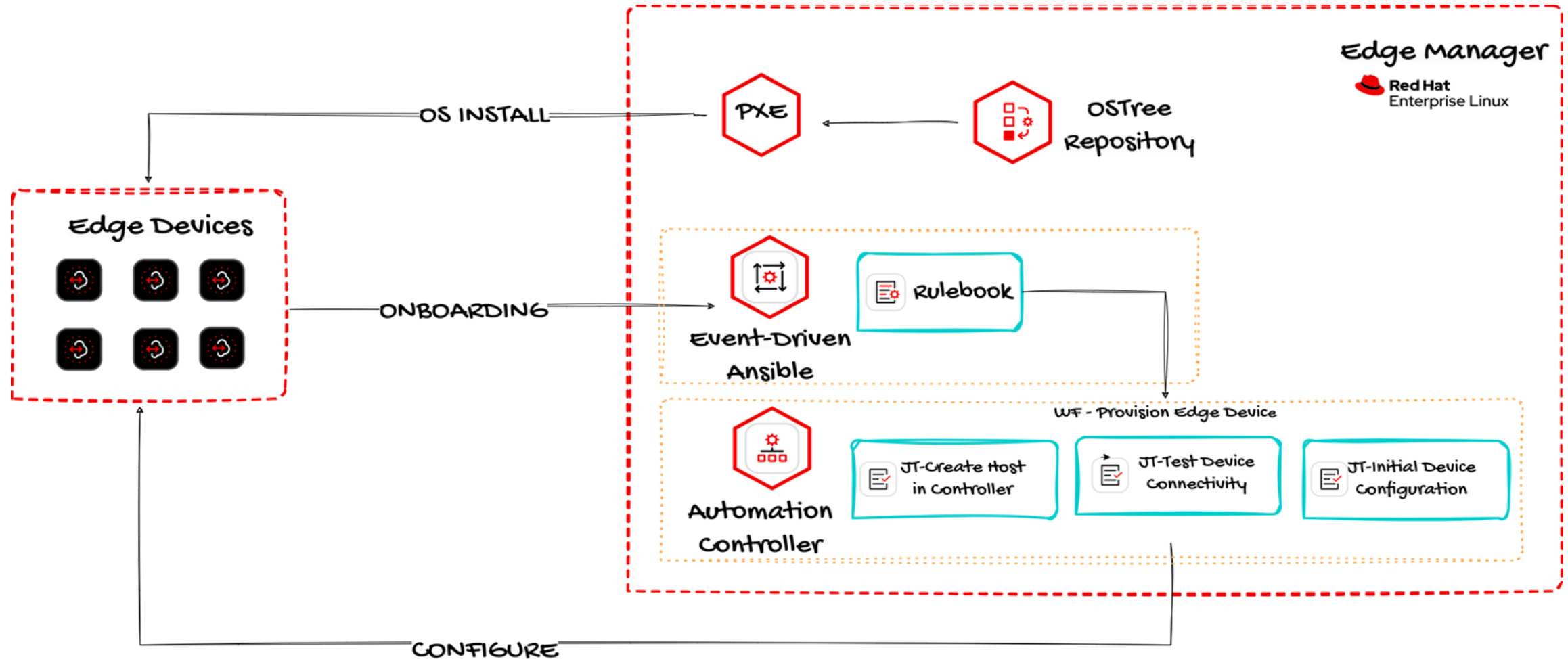
01 – Creating rhel images
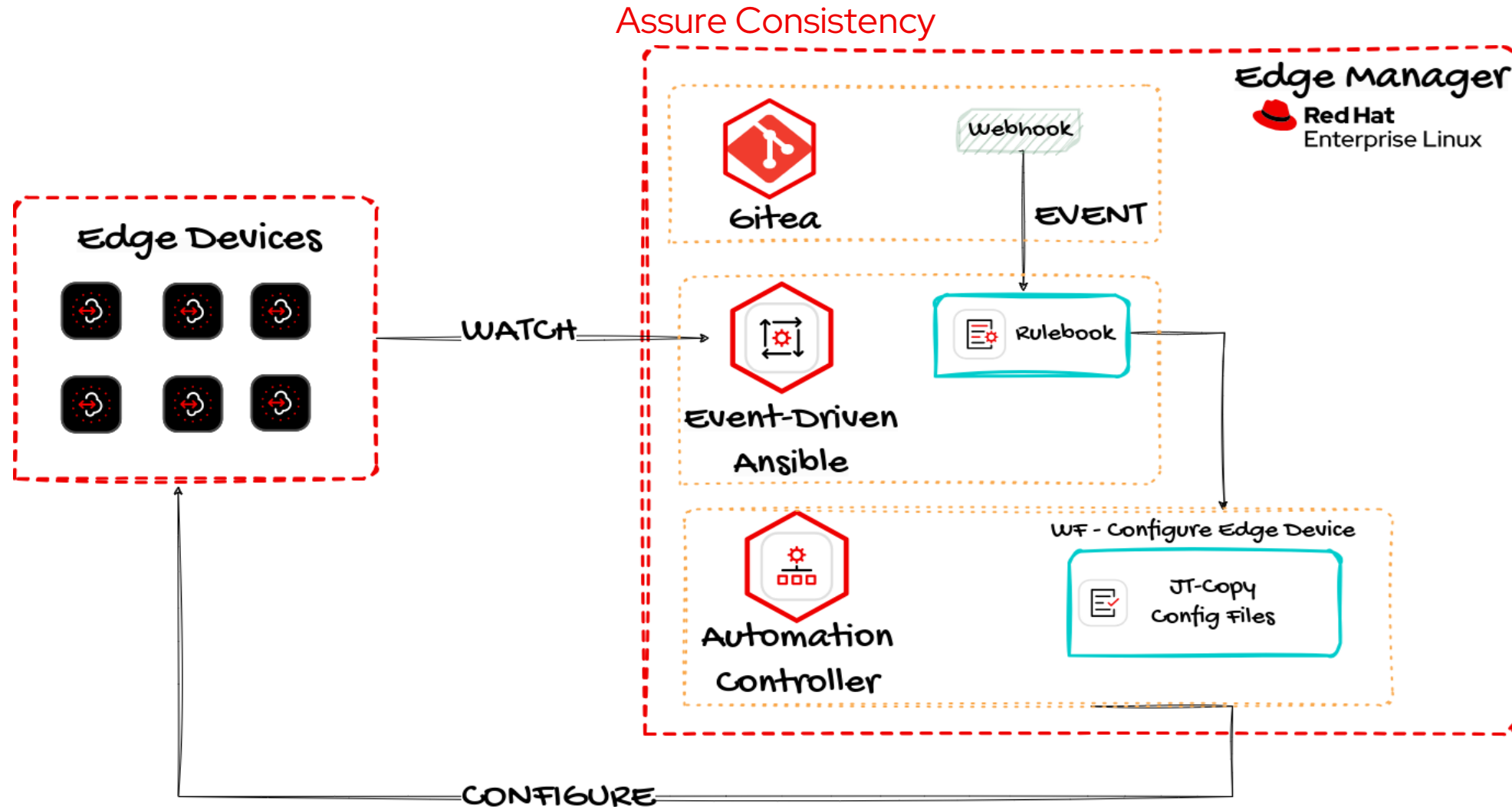
Using a GitOps approach
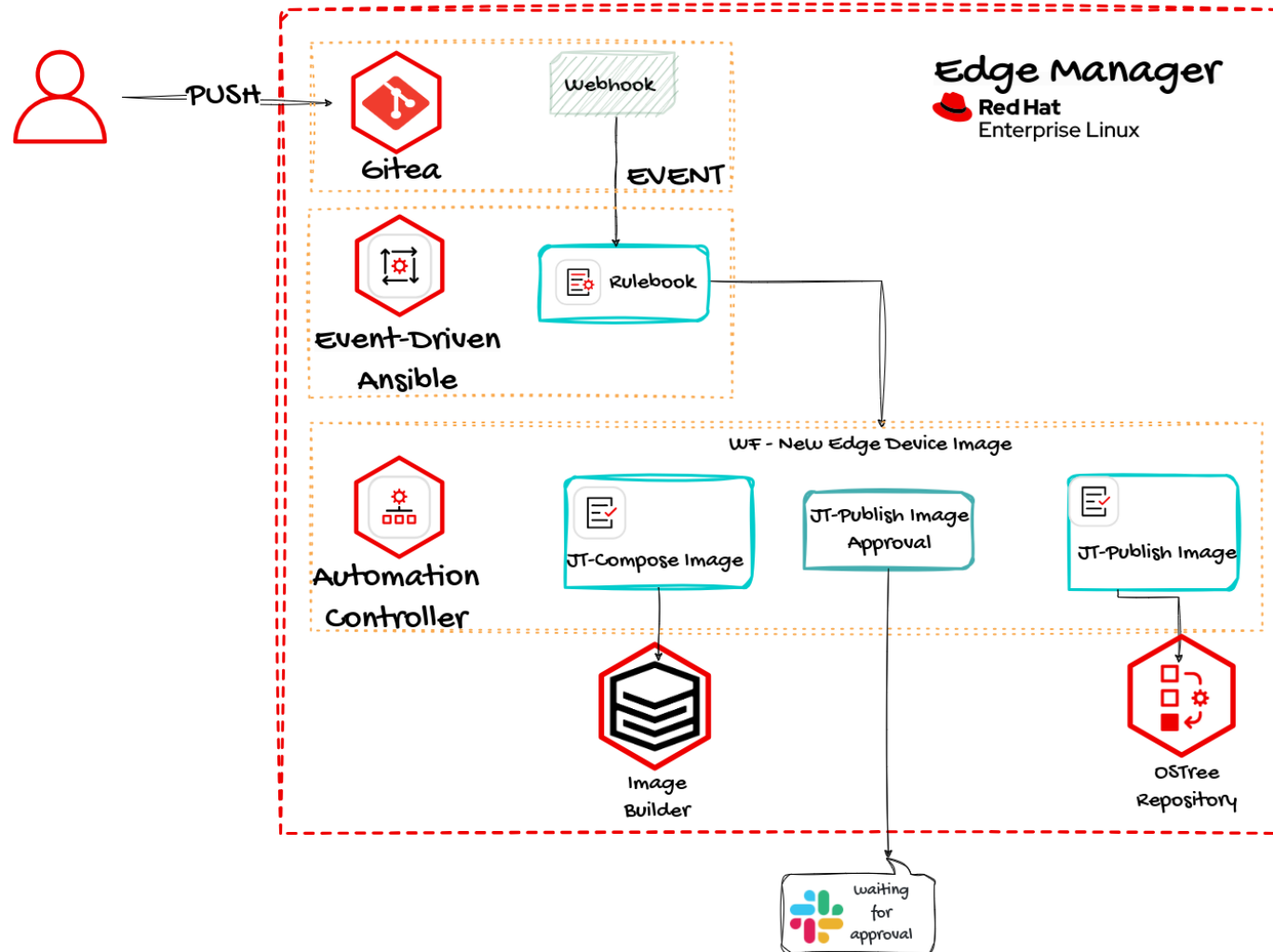
Event-Driven Ansible

## Automation Supporting Mission Critical Workloads

OBSERVE → EVENT

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

- No action required
- Automated resolution triggered
- Remediation action completed
- Shorter MMTR

AUTOMATION ← **RESPOND**

EVALUATE → DECISION

- Routed for remediation
- Identify known problem
- Trigger required workflow

Red Hat
Ansible Automation
Platform

02 – Automated Device Onboarding

03 – Consistent Edge Device Configuration

04 - Bulletproof System Upgrades

OSTree (Operating System) Upgrade
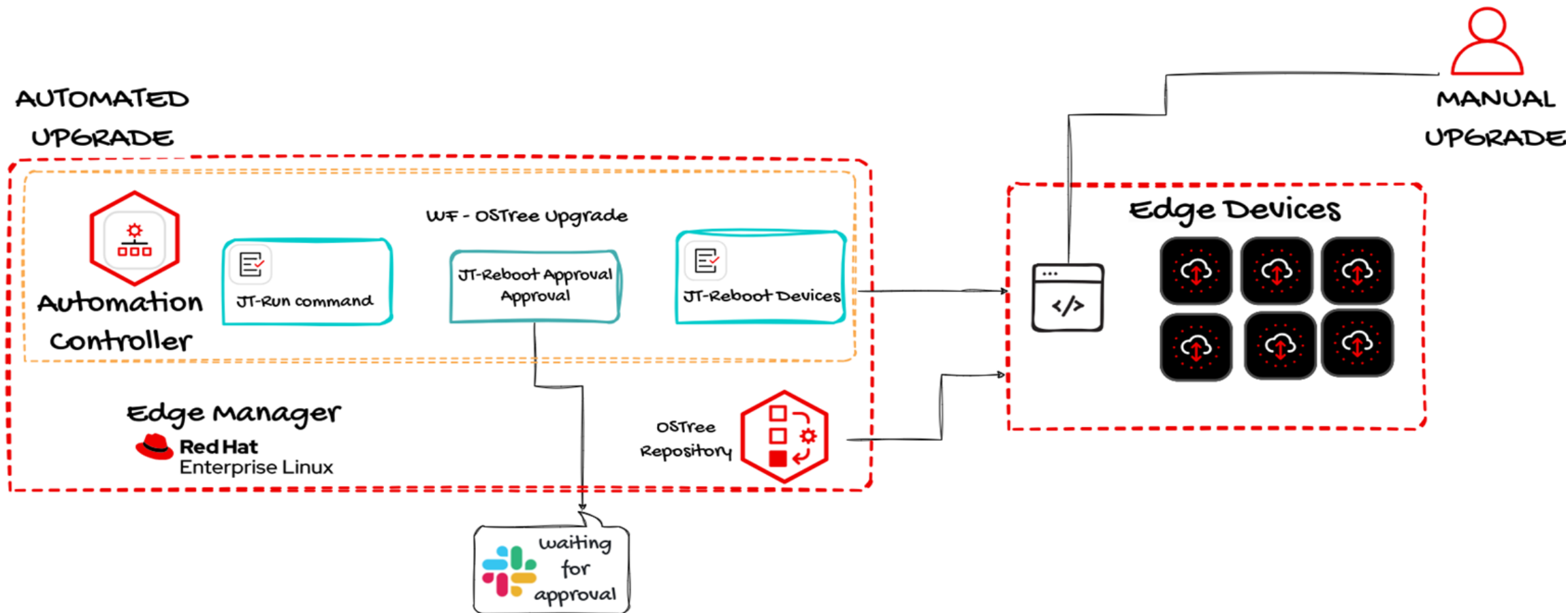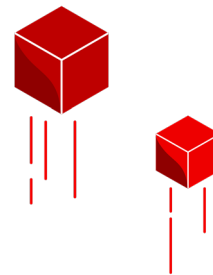
Obrigado

A Red Hat é a fornecedora líder mundial de soluções empresariais de código aberto com uma abordagem voltada para a comunidade e que permite fornecer tecnologias Linux, nuvem, contêiner e Kubernetes de alto desempenho. Ajudamos você a padronizar ambientes, desenvolver aplicativos nativos da nuvem, integrar, automatizar, proteger e gerenciar ambientes complexos com serviços premiados de suporte, treinamento e consultoria.

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