Managing the Edge with Ansible and RHEL OSTree

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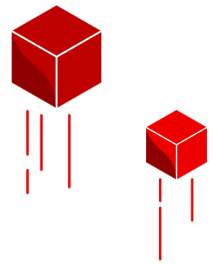
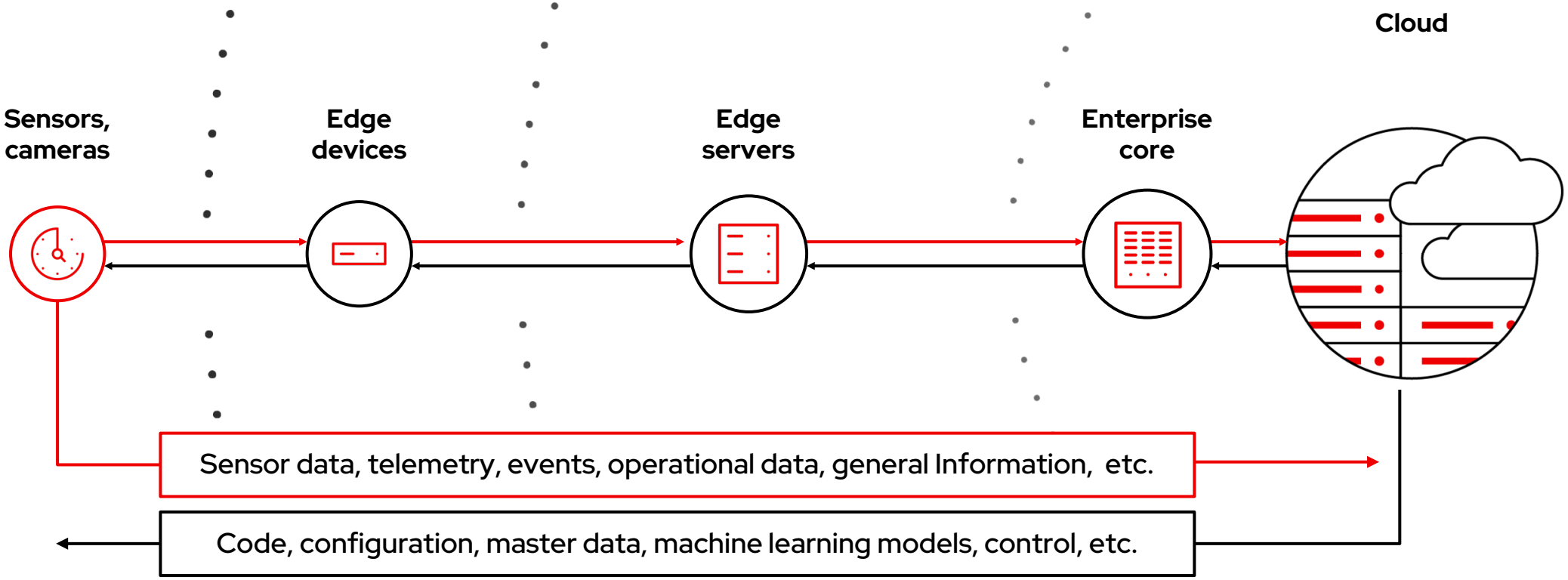


What and Where is the Edge?


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.

Retail Store Architecture

Back of Store (Site Premise)

- AAP: network automation
- RHDE management
- ODF: data aggregation
- Virtualization: legacy workloads

Store Network

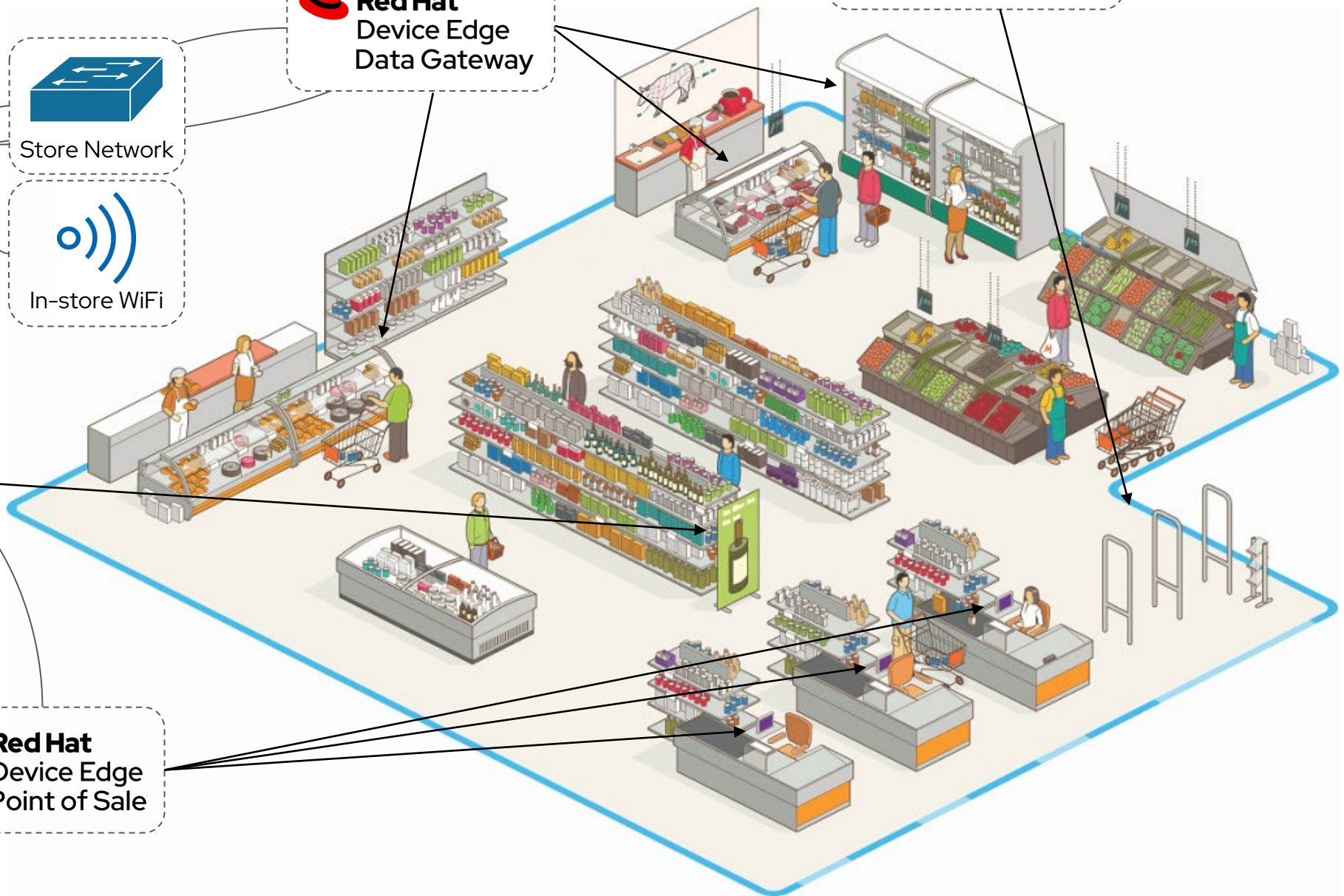
In-store WiFi

Red Hat Device Edge Data Gateway

Red Hat Device Edge Computer Vision

Red Hat Device Edge Intelligent Display

Red Hat Device Edge Point of Sale



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

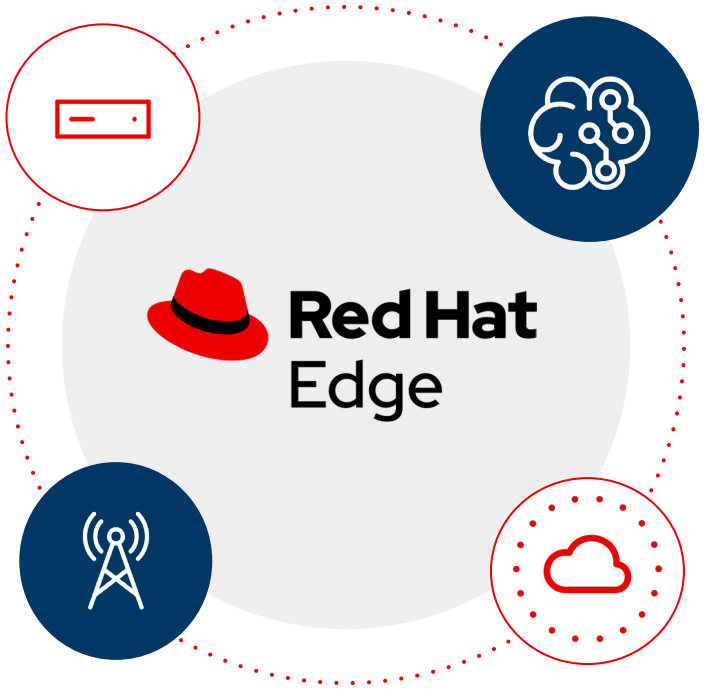
- Standardized and secured distributed operations
- Modernized application environments
- Modernized network infrastructure

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

Technology enabling

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.
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

Long Live Product availability

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

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® 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.

Hardware-enabled VNNI AI Acceleration

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

Real-time Computing

Time-Sensitive Networking (TSN)

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

Functional Safety

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

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.

Wide OEM Ecosystem

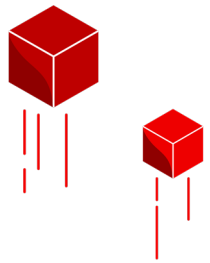
The solution that best suits the project, maintaining the advantages that the standardization of the Edge platform brings at the development level.

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.

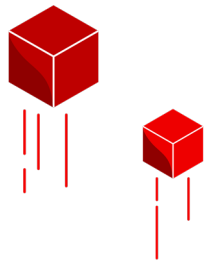
Pains:

1. Hard to manage consistency configurations across devices
2. Manual intervention, requiring to be on site most of the times
3. Missconfigurations across different devices
4. Upgrades are time demanding



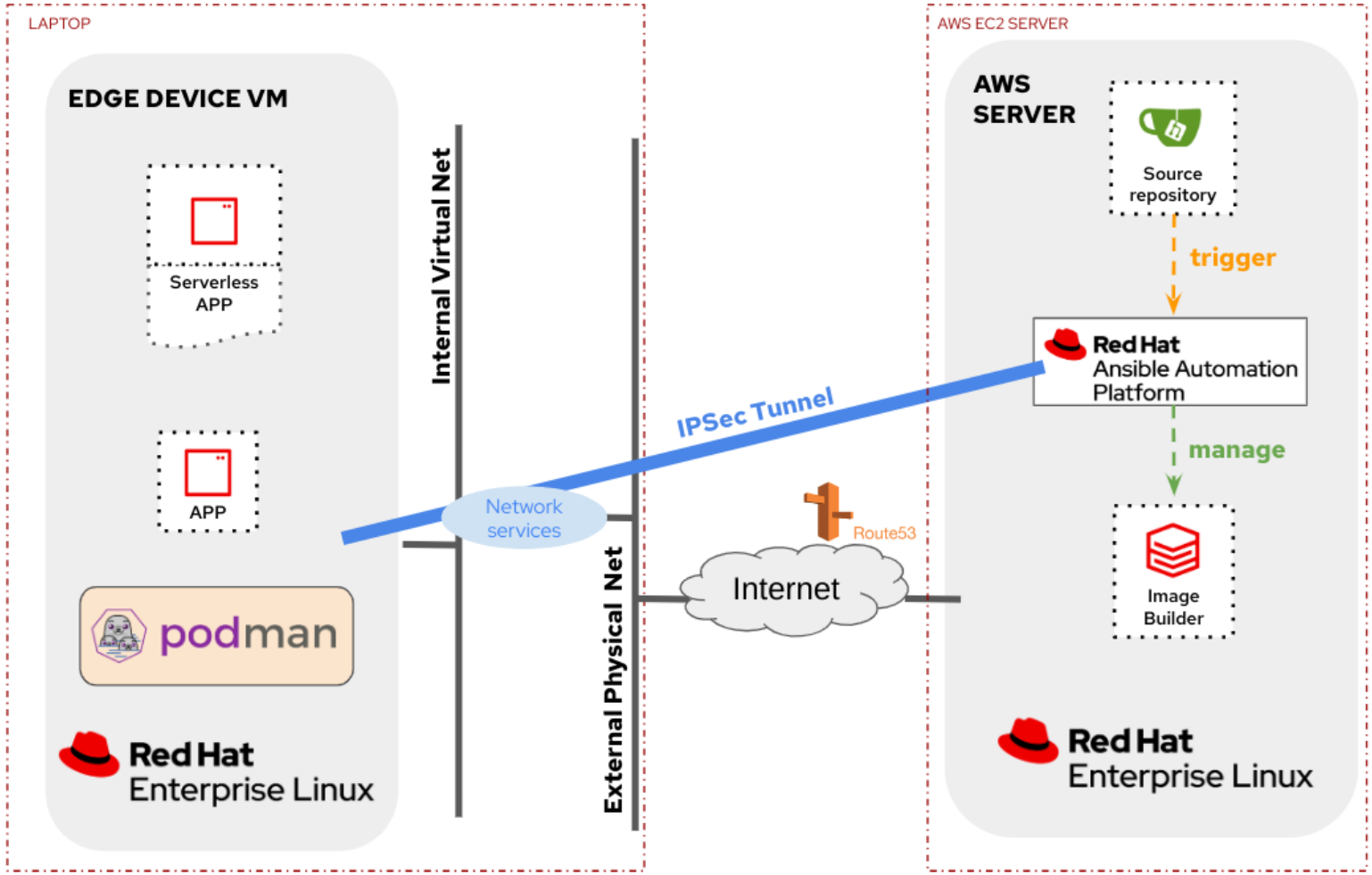
Goals:

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



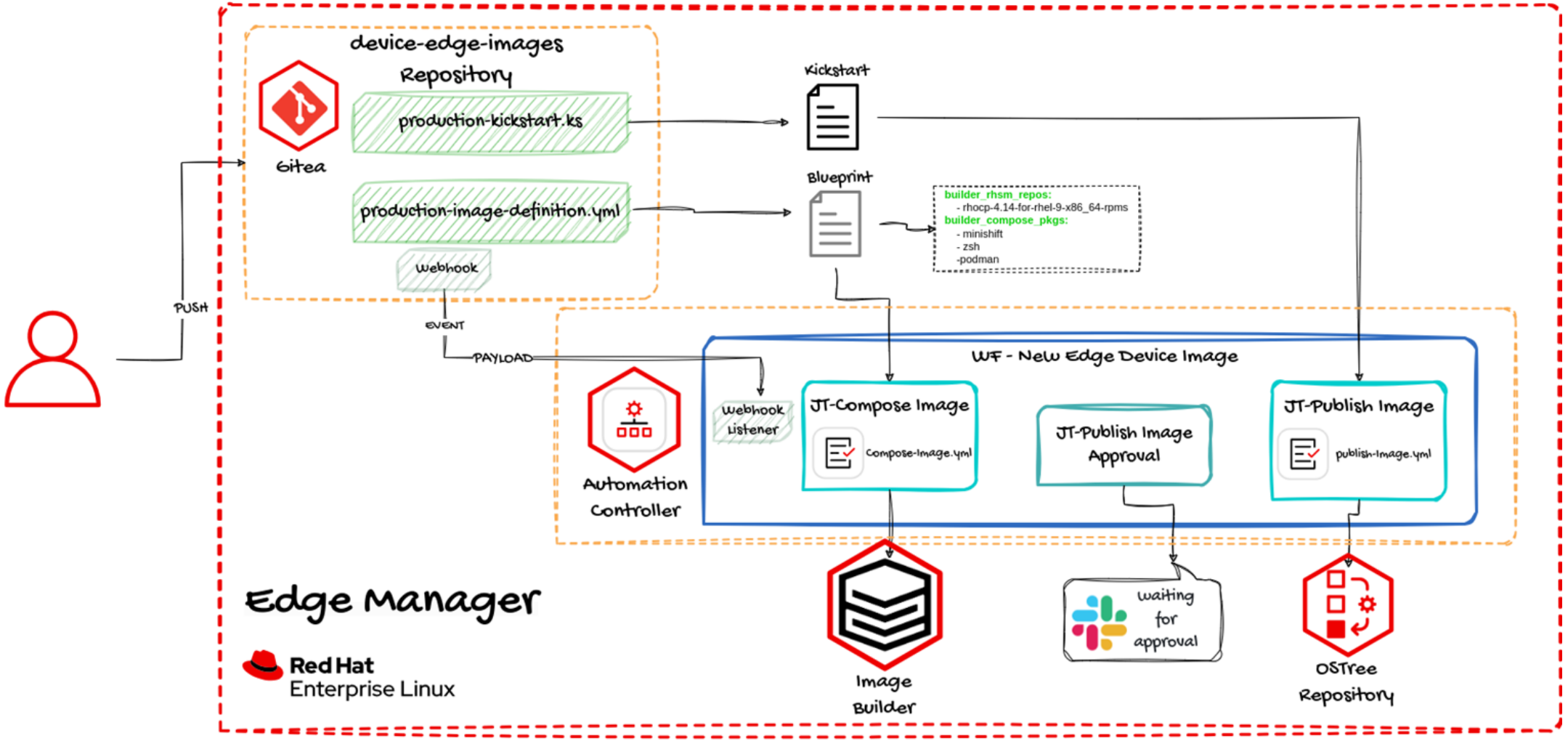
Laboratory Description

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



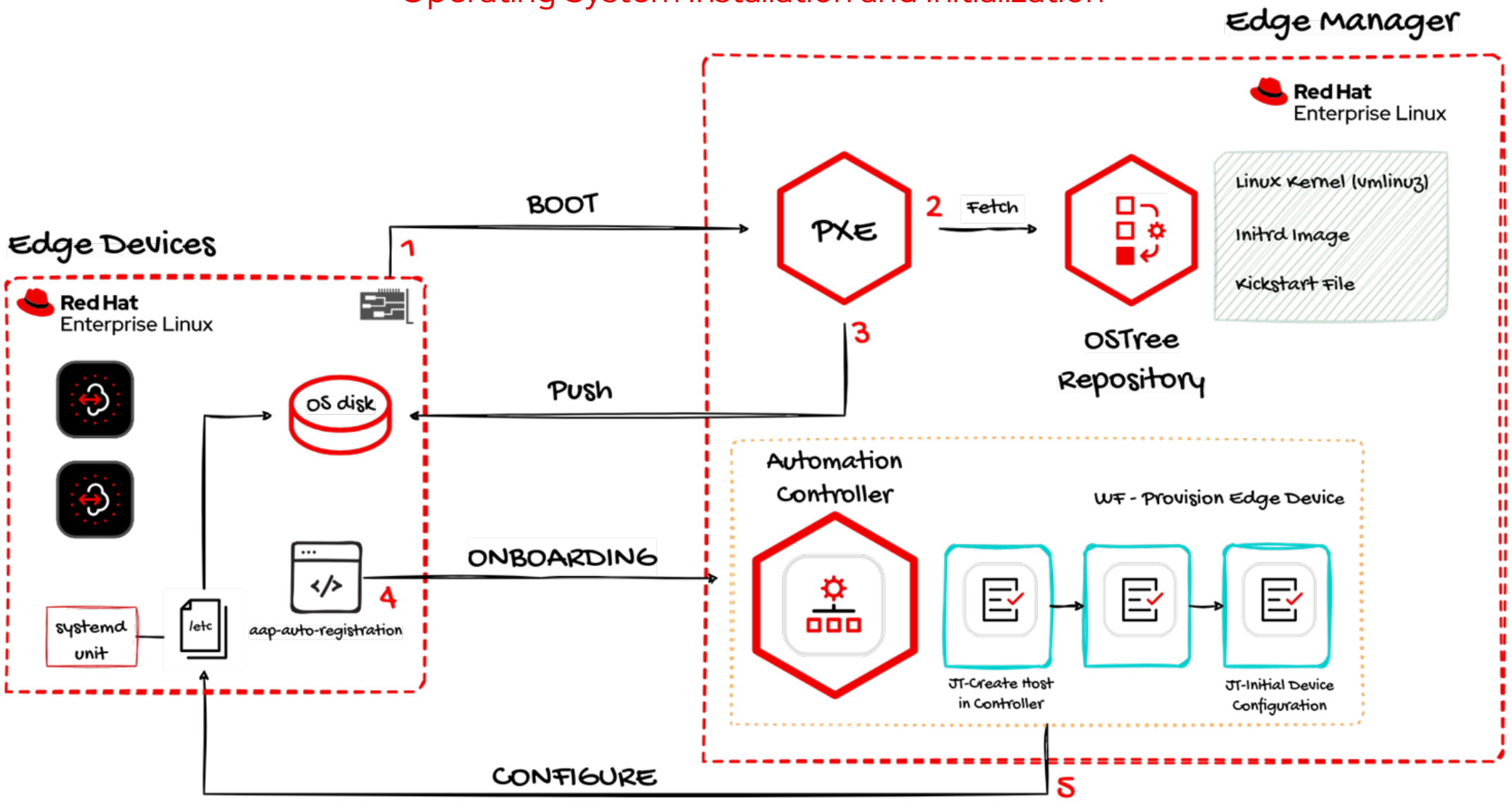
01 - Creating RHEL images

Using a GitOps approach



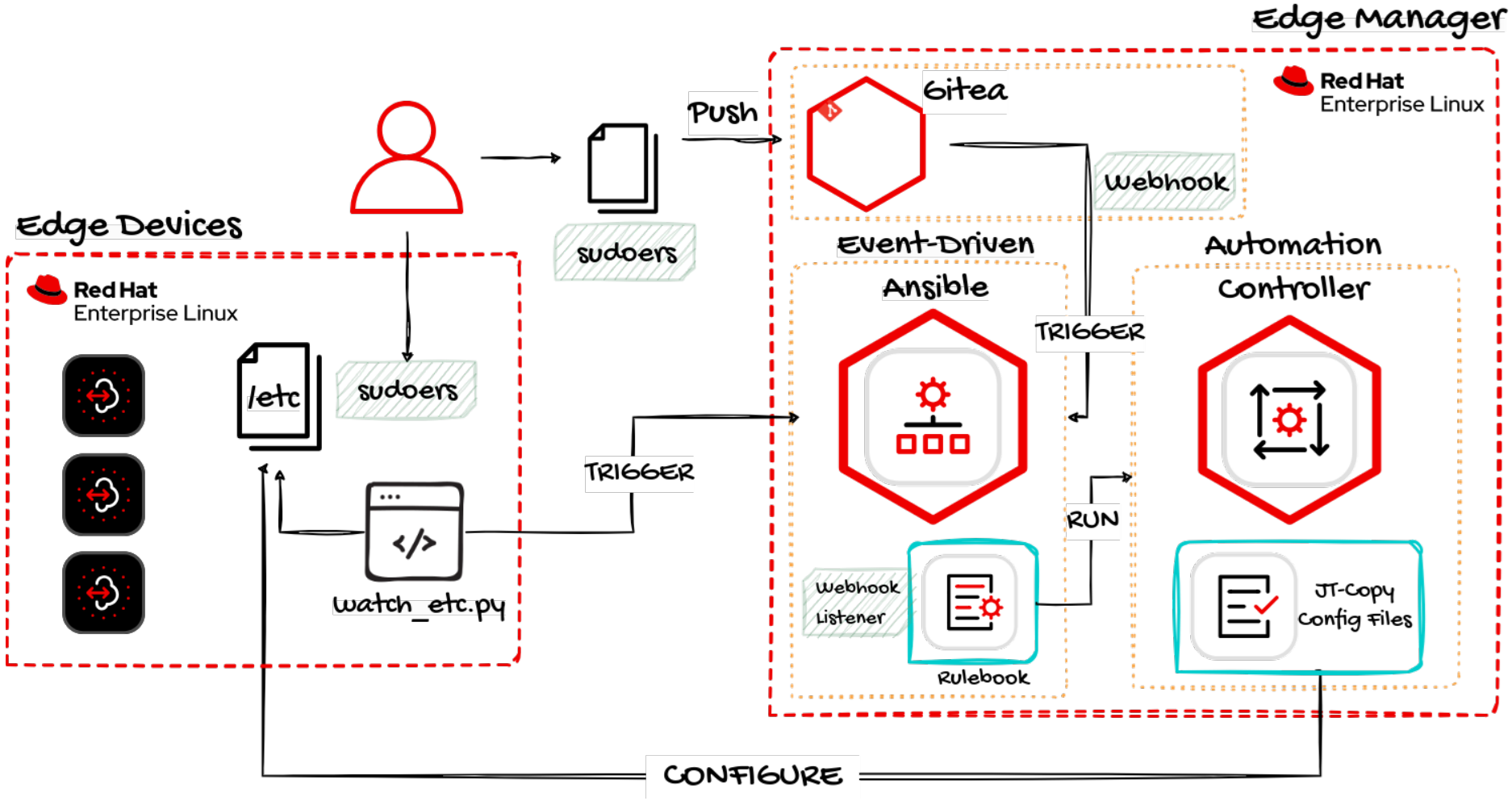
02 - Automated Device Onboarding

Operating System Installation and Initialization



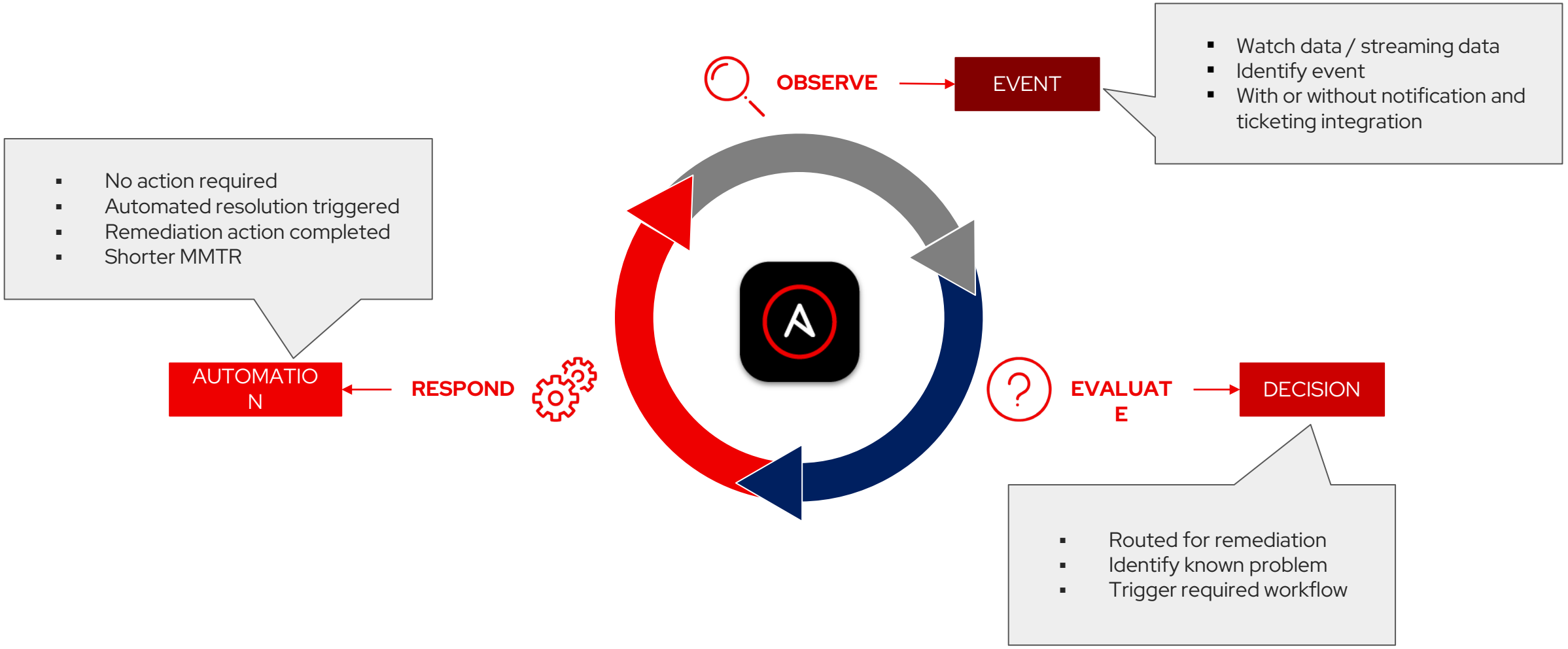
03 - Consistent Edge Device Configuration

Assure Consistency



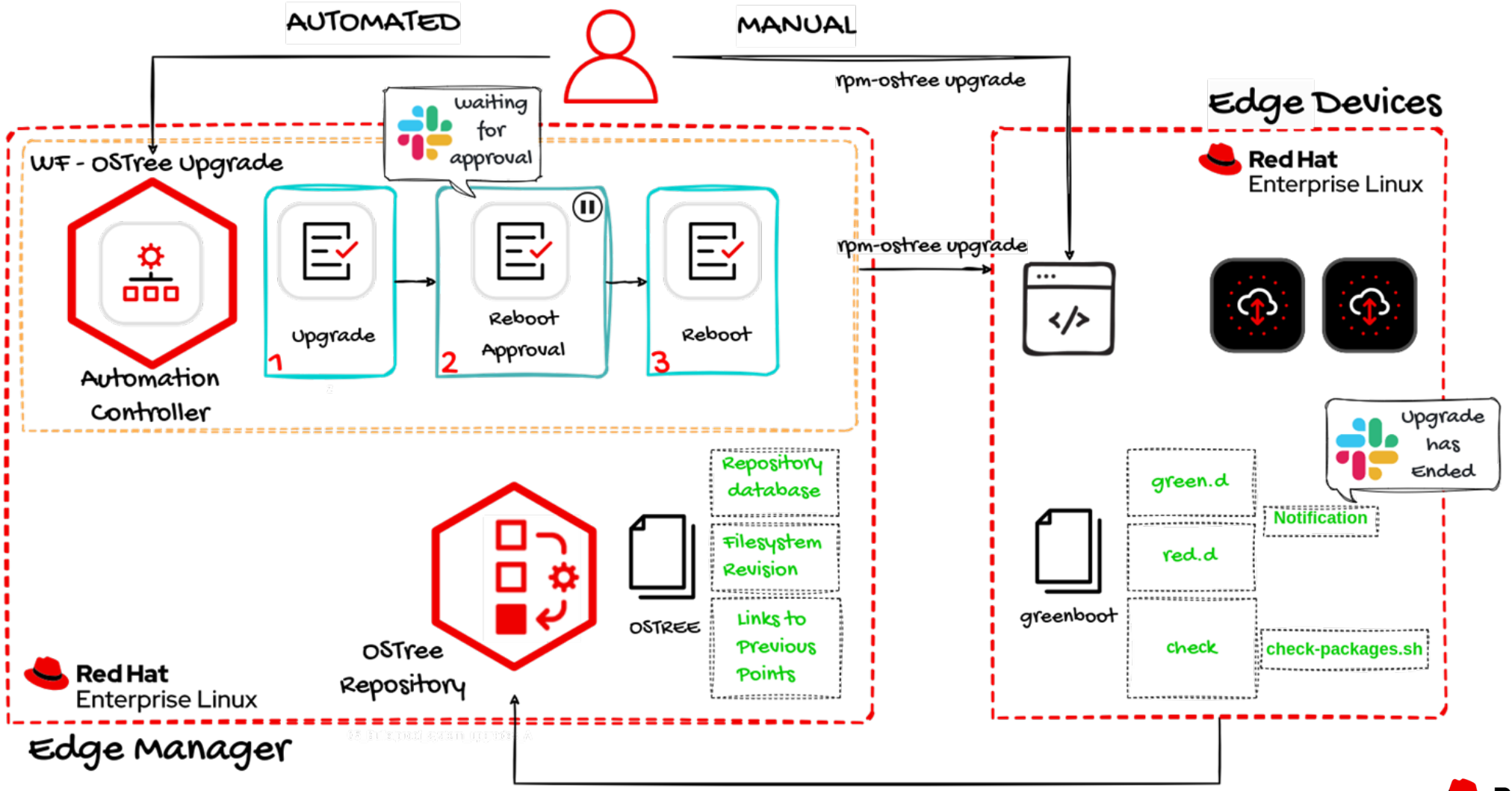
03 - Event-Driven Ansible

Automation Supporting Mission Critical Workloads



04 - Bulletproof System Upgrades

OSTree (Operating System) Upgrade



Another architecture example: Industrial Site

Red Hat Advanced Compute Platform

- Full IOT Automation: Network to PLCs

- Management of Device Edge Deployments

- Legacy and Next Generation Workload hosting

Plant Network

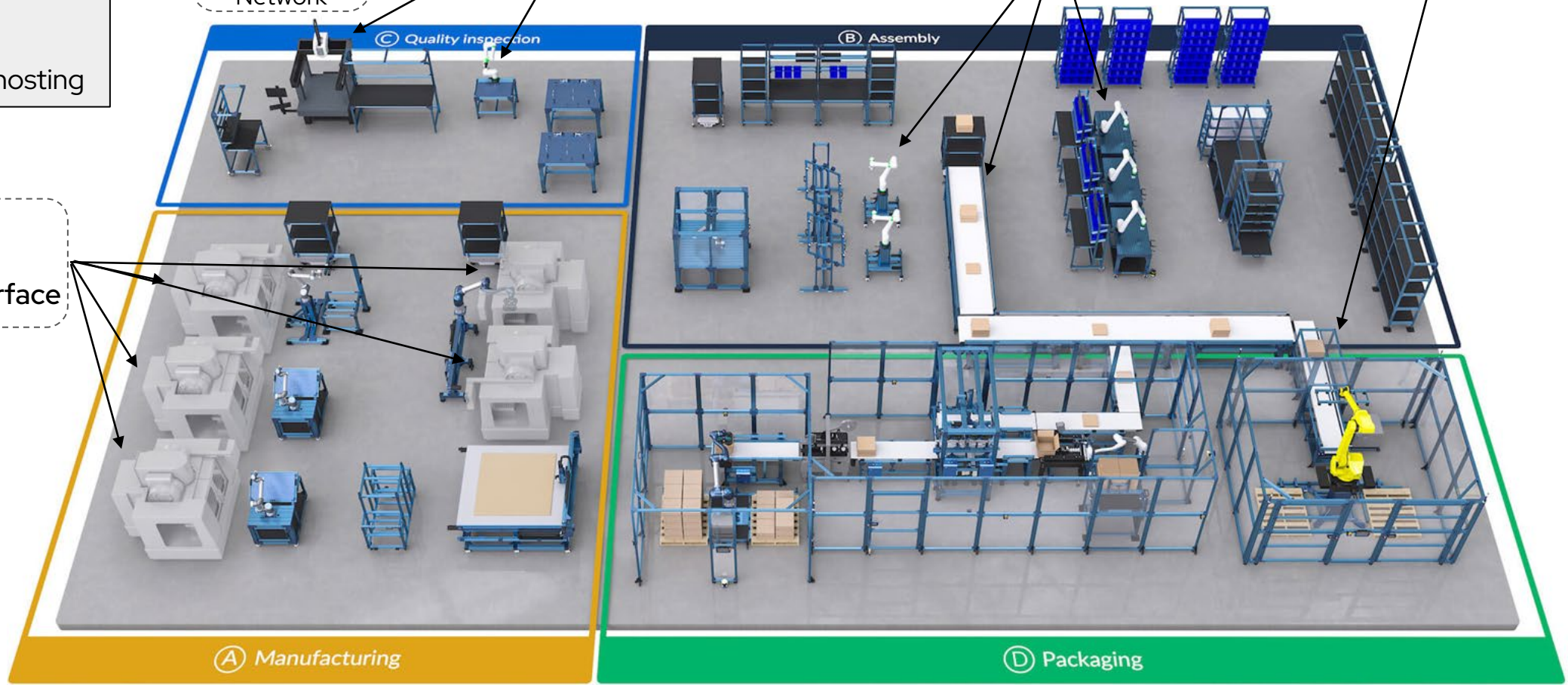
Process Network

Red Hat Device Edge Data Gateway

Red Hat Device Edge Distributed Control Node

Red Hat Device Edge Computer Vision

Red Hat Device Edge Human Machine Interface



Eskerrik asko

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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