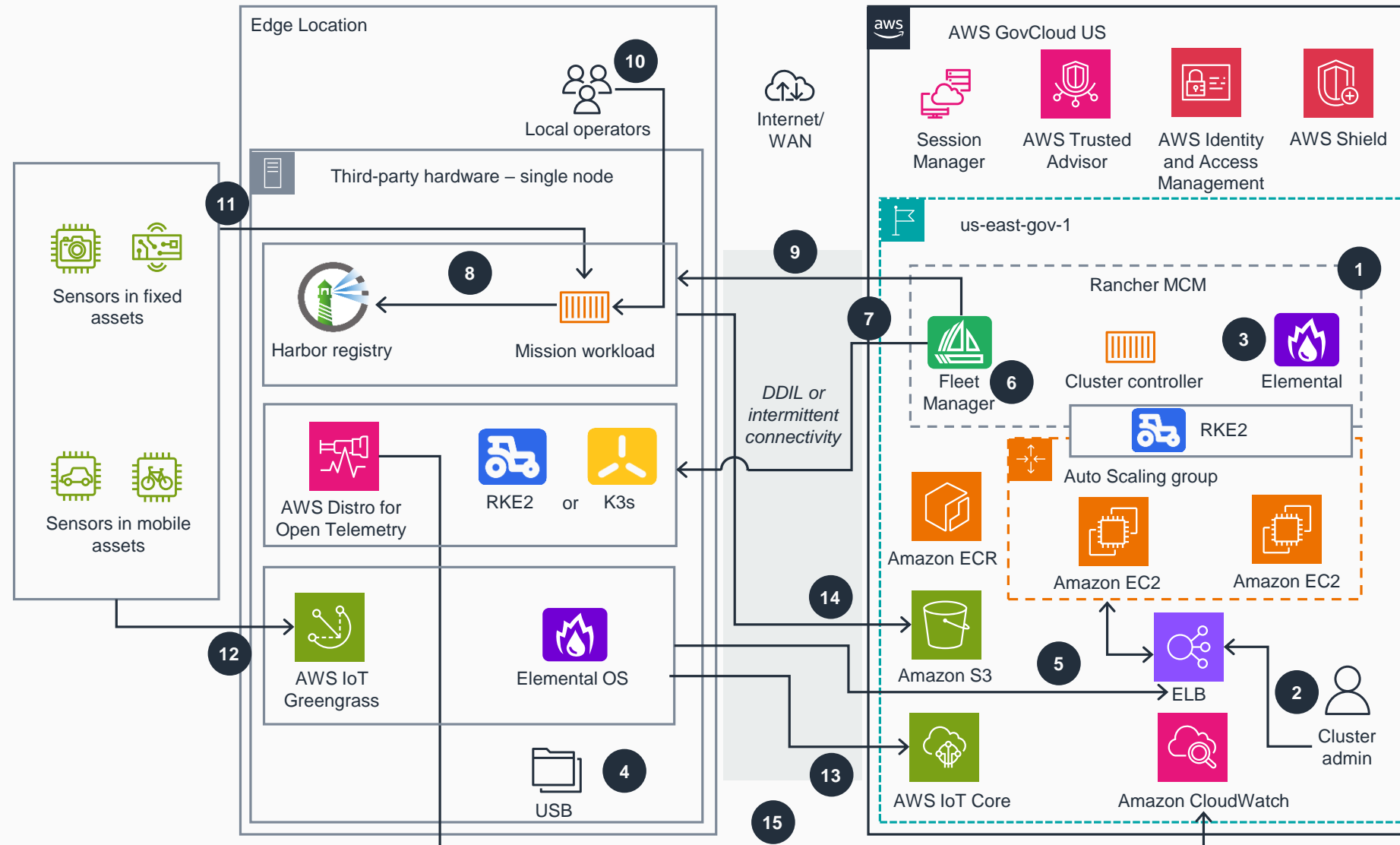


Guidance for Deploying Rancher RKE2 at the Edge on AWS

Single-node cluster

This architecture diagram shows an edge and cloud pattern to deploy containerized workloads on a single node cluster at the edge using RKE2 on any third party hardware in DDIL environments. This slide shows Steps 1-9.

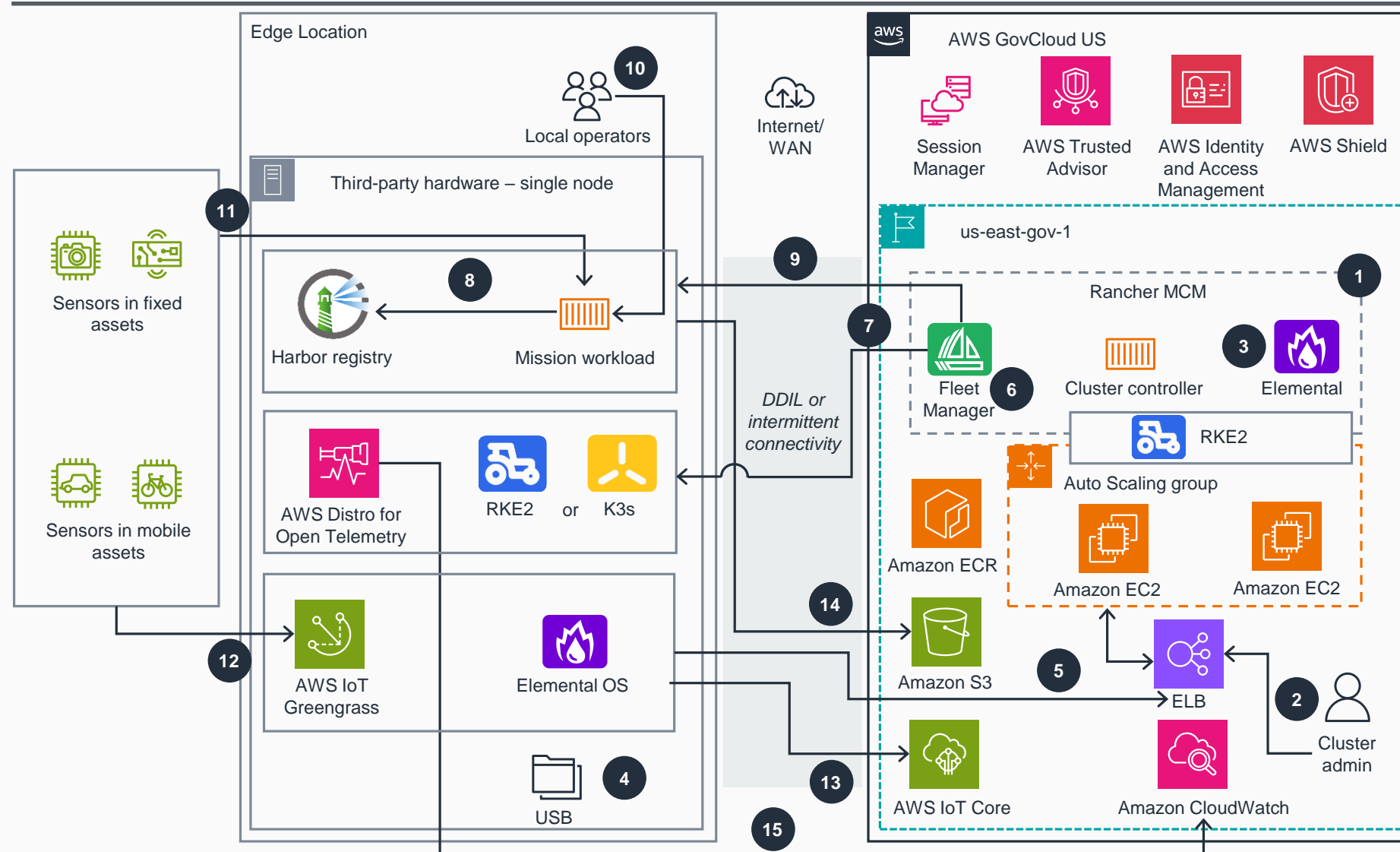


1. Rancher Multi-Cluster Manager (MCM) is deployed in AWS GovCloud (US) on an RKE2 cluster. RKE2 cluster will be deployed on Amazon Elastic Compute Cloud (Amazon EC2) instances running Suse Enterprise Linux Server (SLES) AMI hardened to Defense Information Systems Agency (DISA) Security Technical Implementation Guide (STIG) security standards.
2. Rancher MCM provides centralized administration for downstream RKE2 clusters on one or more edge devices through Elastic Load Balancing (ELB).
3. Elemental is an MCM extension which provides a full cloud-native OS management for edge devices. An endpoint is registered in Elemental, which creates a seed image and an initial registration config that contains a registration URL.
4. Elemental-built Suse Linux Enterprise Micro (SLE Micro) is installed along with the initial registration config on the edge device through a USB.
5. The device registers to Elemental in Rancher MCM.
6. Fleet Manager is a DevOps engine that polls container registries and Git repositories for declarative changes to infrastructure and applications.
7. Fleet Manager first deploys an RKE2 cluster or K3s in addition to Harbor registry at the edge. K3s is recommended for light-weight workloads while RKE2 is recommended for larger complex workloads.
8. Fleet Manager then orchestrates replication of contents from Amazon Elastic Container Registry (Amazon ECR) to Harbor registry.
9. Once RKE2 or K3s is available, Fleet Manager deploys mission workloads on the edge, pulling images from Harbor registry. Fleet Manager provides centralized deployment of initial workloads and Day 2 operations.

Guidance for Deploying Rancher RKE2 at the Edge on AWS

Single-node cluster

This architecture diagram shows an edge and cloud pattern to deploy containerized workloads on a single node cluster at the edge using RKE2 on any third party hardware in DDIL environments. This slide shows Steps 10-15.

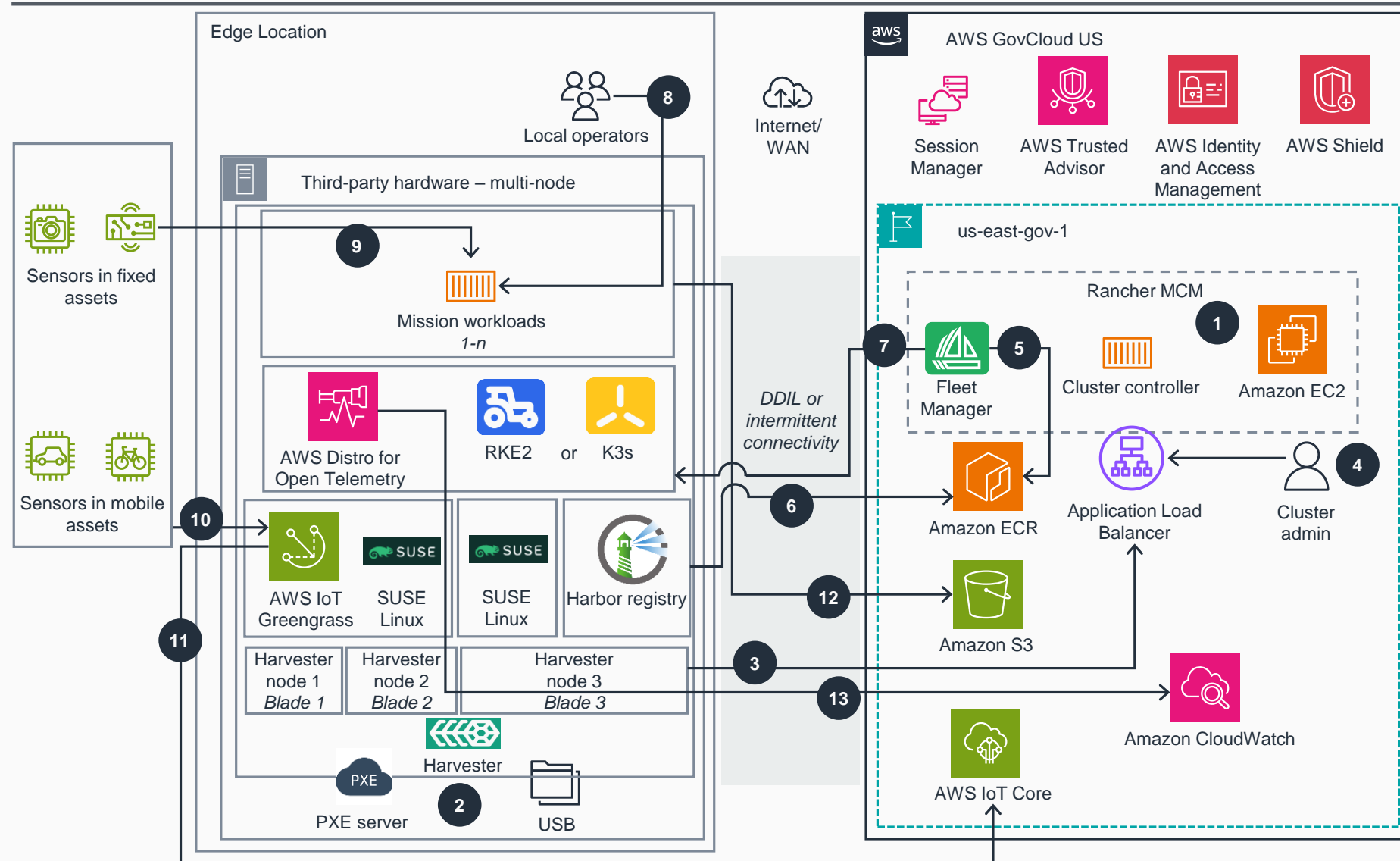


- 10 Operators interact with mission applications through exposed mission web applications.
- 11 Mission applications receive sensor data from the field.
- 12 An **AWS IoT Greengrass** client running on Elemental can also receive sensor data.
- 13 An **AWS IoT Greengrass** client forwards data to **AWS IoT Core** on the cloud.
- 14 Mission workloads connect with upstream AWS services such as **Amazon Simple Storage Service (Amazon S3)** to transfer data from edge to the cloud.
- 15 **AWS Distro for Open Telemetry** processes telemetry data at the edge and forwards this data to **Amazon CloudWatch** for performance monitoring of edge device and mission applications.

Guidance for Deploying Rancher RKE2 at the Edge on AWS

Multi-node cluster

This architecture diagram shows two distinct edge-to-cloud patterns for managing applications in tactical edge scenarios, illustrating how mission-critical workloads can be deployed on RKE2 in DDIL environments. This slide shows Steps 1-9.



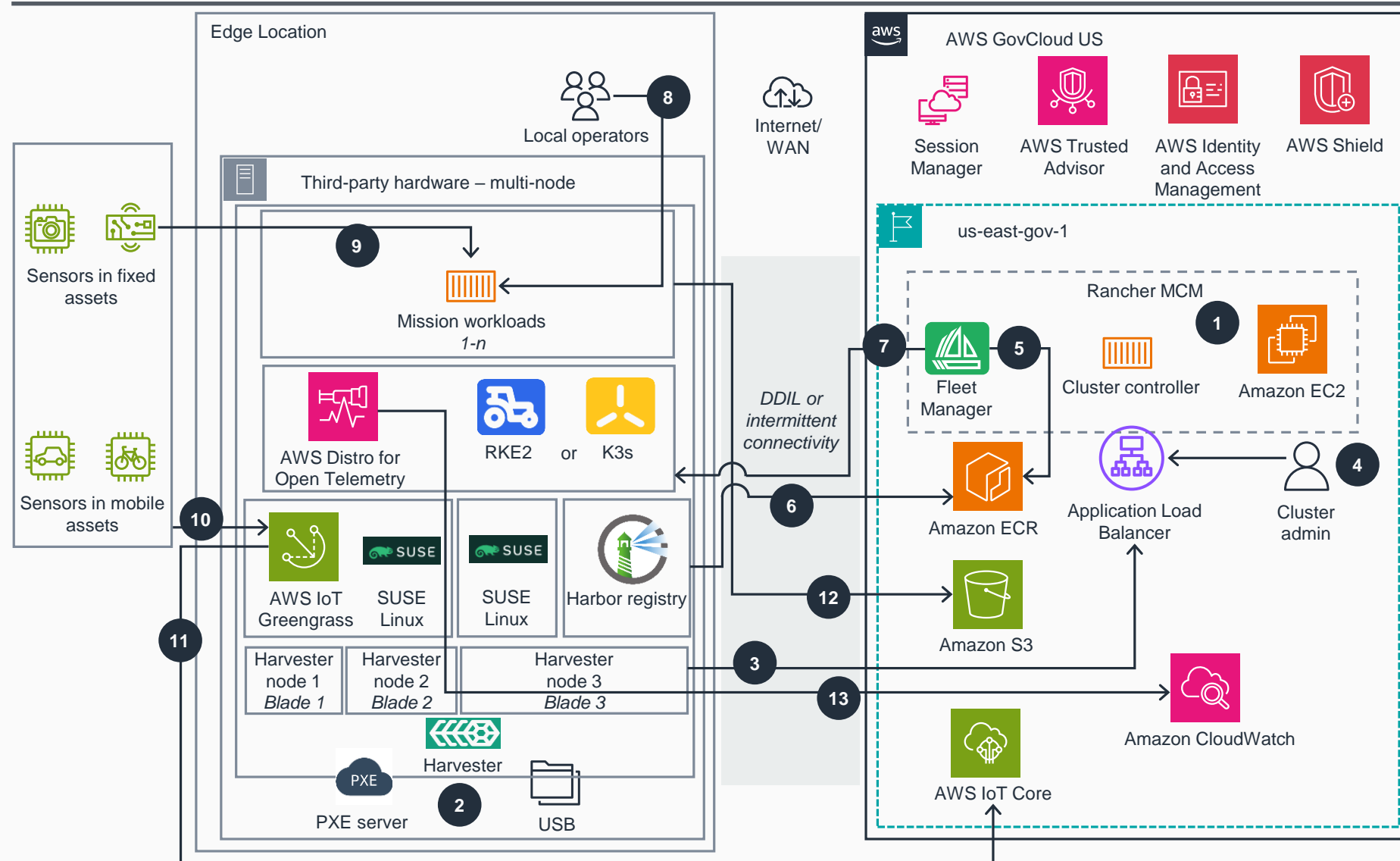
- 1 Rancher MCM is deployed in **AWS GovCloud (US)** on an RKE2 cluster. RKE2 cluster will be deployed on **Amazon EC2** instances running SLES AMI hardened to DISA STIG security standards. Alternately, MCM can be run on an **Amazon Elastic Kubernetes Service (Amazon EKS)** cluster.
- 2 Harvester, which provides Hyper Converged Infrastructure (HCI) and automation capabilities, is installed on the edge device through a USB or Preboot eXecution Environment (PXE) boot.
- 3 Harvester registers device to Rancher MCM in AWS GovCloud (US).
- 4 Rancher MCM provides centralized administration of downstream Harvester and RKE2 cluster deployments on one or more edge devices.
- 5 Fleet Manager is a DevOps engine that polls container registries and Git repositories for declarative changes to infrastructure and applications. Fleet Manager provides centralized deployment of initial workloads and Day 2 operations. Fleet Manager first deploys Harbor Registry at the edge.
- 6 Harbor registry at the edge replicates contents from **Amazon ECR**.
- 7 Fleet Manager deploys Suse Linux virtual machines (VMs), RKE2 cluster and/or K3s on Suse Linux VMs and mission workloads on the edge, pulling images from Harbor Registry. K3s is recommended for light-weight workloads while RKE2 is recommended for larger complex workloads.
- 8 Operators interact locally with mission web applications.
- 9 Mission applications receive sensor data from the field.



Guidance for Deploying Rancher RKE2 at the Edge on AWS

Multi-node cluster

This architecture diagram shows two distinct edge-to-cloud patterns for managing applications in tactical edge scenarios, illustrating how mission-critical workloads can be deployed on RKE2 in DDIL environments. This slide shows Steps 10-13.



- 10 An **AWS IoT Greengrass** client running on Suse Linux VM can also receive sensor data.
- 11 The **AWS IoT Greengrass** client forwards data to **AWS IoT Core** in the cloud.
- 12 Mission workloads connect with upstream AWS services, such as **Amazon S3** to transfer data from edge to the cloud.
- 13 **Distro for Open Telemetry** processes telemetry data at the edge and forwards this data to **CloudWatch** for performance monitoring of edge device and mission applications.

