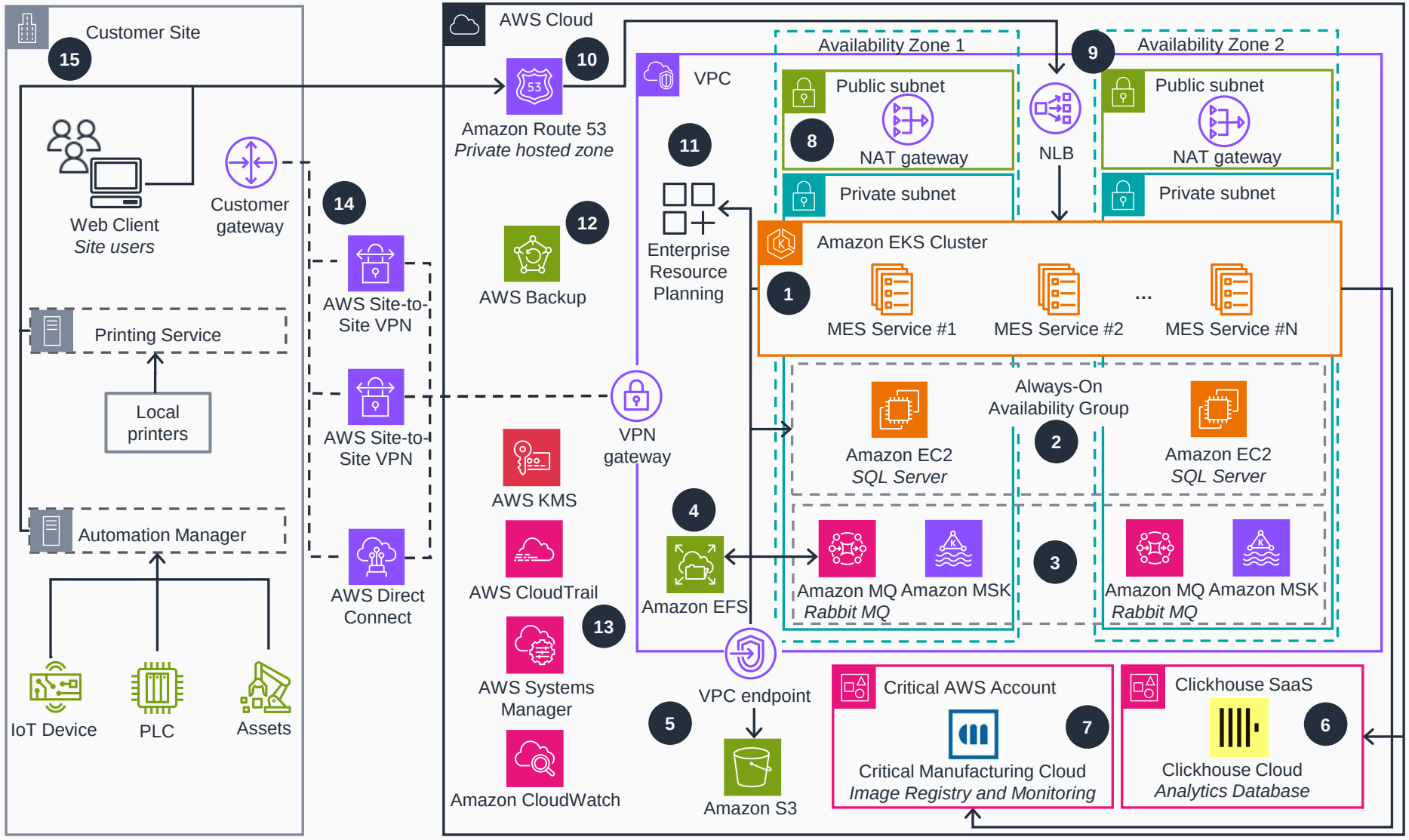
# Guidance for Deploying Critical Manufacturing MES on AWS

This architecture diagram illustrates how to deploy Critical Manufacturing MES on AWS. It helps manufacturers digitalize their operations and easily adapt to changes in demand, opportunity, or requirements. This slide shows Steps 1-8.




1. Critical Manufacturing MES helps manufacturers digitalize their operations effectively and easily adapt to changes in demand, opportunities, or requirements. It can be deployed on AWS on an **Amazon Elastic Kubernetes Service (Amazon EKS)** cluster in a private subnet in multiple Availability Zones (AZs) for high availability configuration. The cluster contains multiple pods and services for multiple MES functions.

2. The SQL Server is used as a relational database for MES and is deployed on **Amazon Elastic Compute Cloud (Amazon EC2)** instances in multiple AZs in an Always-On availability group for high availability.

3. **Amazon MQ** for Rabbit MQ is used by MES as a message broker and **Amazon Managed Streaming for Apache Kafka (Amazon MSK)** is used by MES for Kafka-based event streaming.

4. **Amazon Elastic File Systems (Amazon EFS)** is used as a file storage backend for **Amazon EKS** cluster volumes and for file share among containers.

5. **Amazon Simple Storage Service (Amazon S3)** is used for persistent storage of files. Pods in the **EKS** cluster connect to **Amazon S3** over a virtual private cloud (VPC) endpoint to keep the traffic private.

6. Critical Manufacturing MES uses ClickHouse for data persistence of analytical data processing. ClickHouse Cloud is available as a software as a service (SaaS) offering on **AWS Marketplace**.

7. Critical Manufacturing Cloud provides additional services, such as container image registry and application monitoring.

8. A NAT gateway in the public subnet allows application and database servers to reach the internet.

*Reviewed for technical July 2, 2025*



**AWS Reference Architecture**

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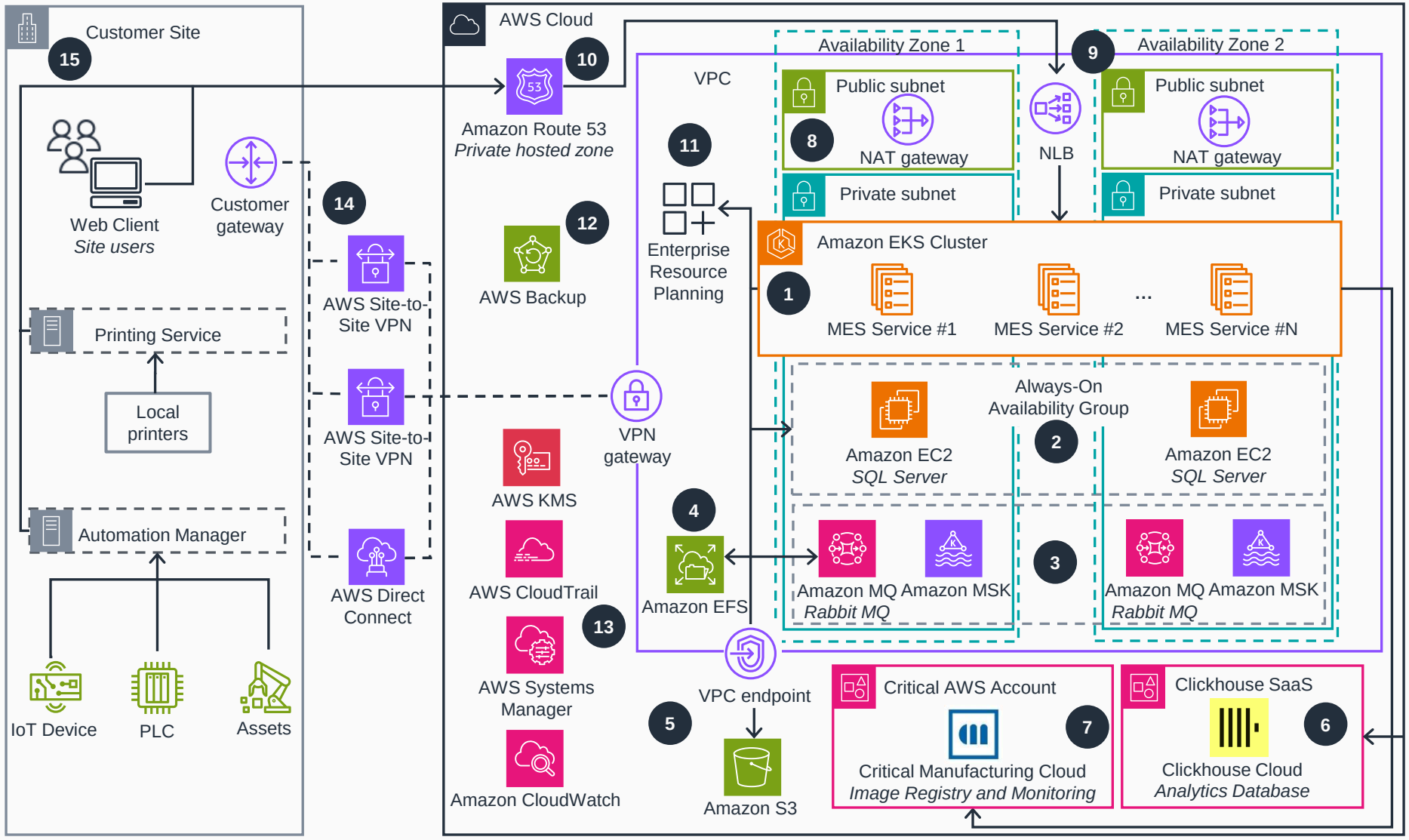
This architecture diagram illustrates how to deploy Critical Manufacturing MES on AWS. It helps manufacturers digitalize their operations and easily adapt to changes in demand, opportunity, or requirements. This slide shows Steps 9-15.




9 The Network Load Balancer (NLB) serves as an entry point to access the Critical Manufacturing MES application.

10 **Amazon Route 53** is used for routing to the NLB.

11 MES can integrate directly with enterprise applications, such as enterprise resource planning (ERP) hosted on AWS.

12 **AWS Backup** centralizes and automates data protection for all **EC2** instances, **Amazon EFS**, and **Amazon S3**.

13 **Amazon CloudWatch** monitors the health of the workload and the infrastructure. **AWS CloudTrail** collects audit logs for these workloads. **AWS Systems Manager** manages and accesses **Amazon EC2** servers in the private subnet. **AWS Key Management Service (AWS KMS)** manages data encryptions keys.

14 The network connectivity to the on-premises manufacturing and enterprise network is enabled by connecting the customer gateway and the VPN gateway through **AWS Site-to-Site VPN** or **AWS Direct Connect**.

15 On the shop floor, MES can connect with variety of programmable logic controllers (PLCs), IoT devices, and other industrial assets using native industrial protocols through a locally hosted automation manager. Any local printers can also be connected using the locally installed printing service provided by Critical Manufacturing. On-premises users access the MES application through web or thick client.

*Reviewed for technical July 2, 2025*



**AWS Reference Architecture**