Architecture Diagrams

Kelvin AI on AWS

Kelvin AI on AWS: Architecture Diagrams

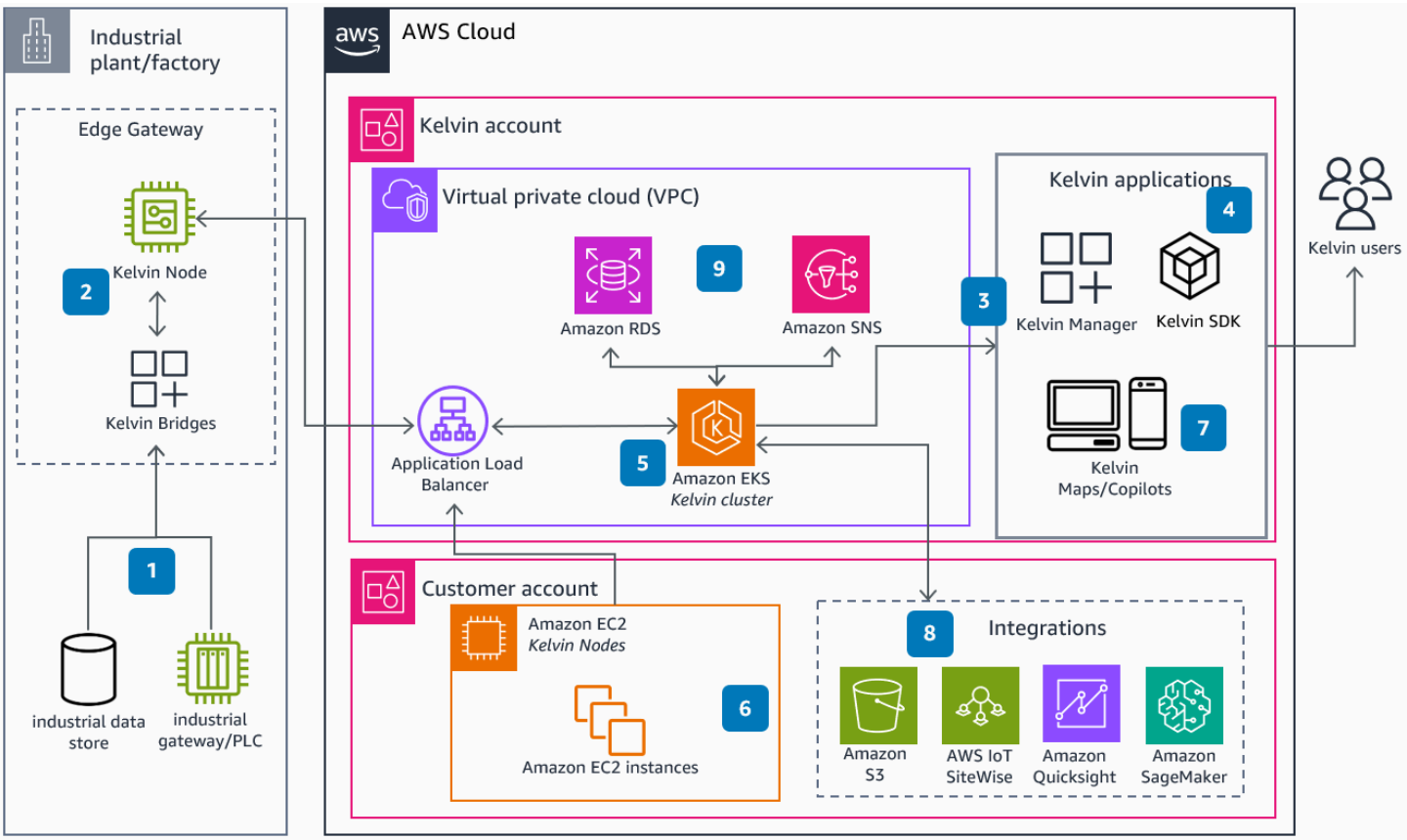
Table of Contents

Kelvin AI on AWS

Publication date: **October 20, 2023 (Diagram history)**

Kelvin's solution, built on AWS Cloud, allows enterprises to scale faster, optimize their industrial operations in real time, and accelerate their digital transformation initiatives.

Kelvin AI on AWS Diagram



1. Time-series data from industrial historians or industrial gateway/programmable logic controllers (PLCs) leveraging MQTT, OPC-UA, and Modbus protocols are sent to the edge nodes.
2. The solution consists of a streaming data broker for time series data, a node historian for short-term time series data store, an edge sync module that syncs edge node with the cloud after loss of connectivity. The solution also manages workload orchestration using connectivity brokers, node telemetry, and services for asset models and their configuration.
3. Kelvin Manager manages the edge nodes and deploys Kelvin Bridges (connectors) or custom Python apps, users, assets, and metric definitions.

4. Kelvin SDK is used to develop, configure, deploy and manage services, with both a CLI and a library framework to develop apps.
5. Kelvin cluster is built on **Amazon Elastic Kubernetes Service** (Amazon EKS) and hosts the Kelvin platform. It consists of streaming data brokers, cloud historians, APIs, and integration services. Control changes are processed and sent to the industrial gateway/PLC through edge nodes from the platform.
6. Kelvin Nodes run on **Amazon Elastic Compute Cloud** (Amazon EC2) to ingest telemetry data already in the AWS account.
7. Kelvin Maps allows users to visualize processes, asset performance, time-series data, and alarms. Copilots is a specialized user experience solution aimed at specific tasks or industries.
8. **Amazon Simple Storage Service** (Amazon S3) can be used to store asset hierarchy and time-series data that is ingested by Kelvin Nodes. Kelvin can push data to **AWS IoT SiteWise**. It integrates with **Amazon QuickSight** as an alternative to Kelvin Maps. Integration with **Amazon SageMaker AI** allows for creating and importing customer algorithms to deploy on Kelvin Nodes.
9. The Kelvin platform in the cloud stores asset information and user profiles in **Amazon Relational Database Service** (Amazon RDS), while **Amazon Simple Notification Service** (Amazon SNS) is used to initiate alarm notifications to end users.

Download editable diagram

To customize this reference architecture diagram based on your business needs, download the ZIP file which contains an editable PowerPoint.

Create a free AWS account

Sign up now

Sign up for an AWS account. New accounts include 12 months of AWS Free Tier access, including the use of Amazon EC2, Amazon S3, and Amazon DynamoDB.

Further reading

For additional information, refer to

- AWS Architecture Icons
- AWS Architecture Center
- AWS Well-Architected

Contributors

Contributors to this reference architecture diagram include:

- Avinash Venkatagiri, Partner Solutions Architect, Amazon Web Services
- Madhu Pai, Principal Partner Solutions Architect, Amazon Web Services

Diagram history

To be notified about updates to this reference architecture diagram, subscribe to the RSS feed.

Change	Description	Date
Initial publication	Reference architecture diagram first published.	October 20, 2023

Note

To subscribe to RSS updates, you must have an RSS plugin enabled for the browser you are using.