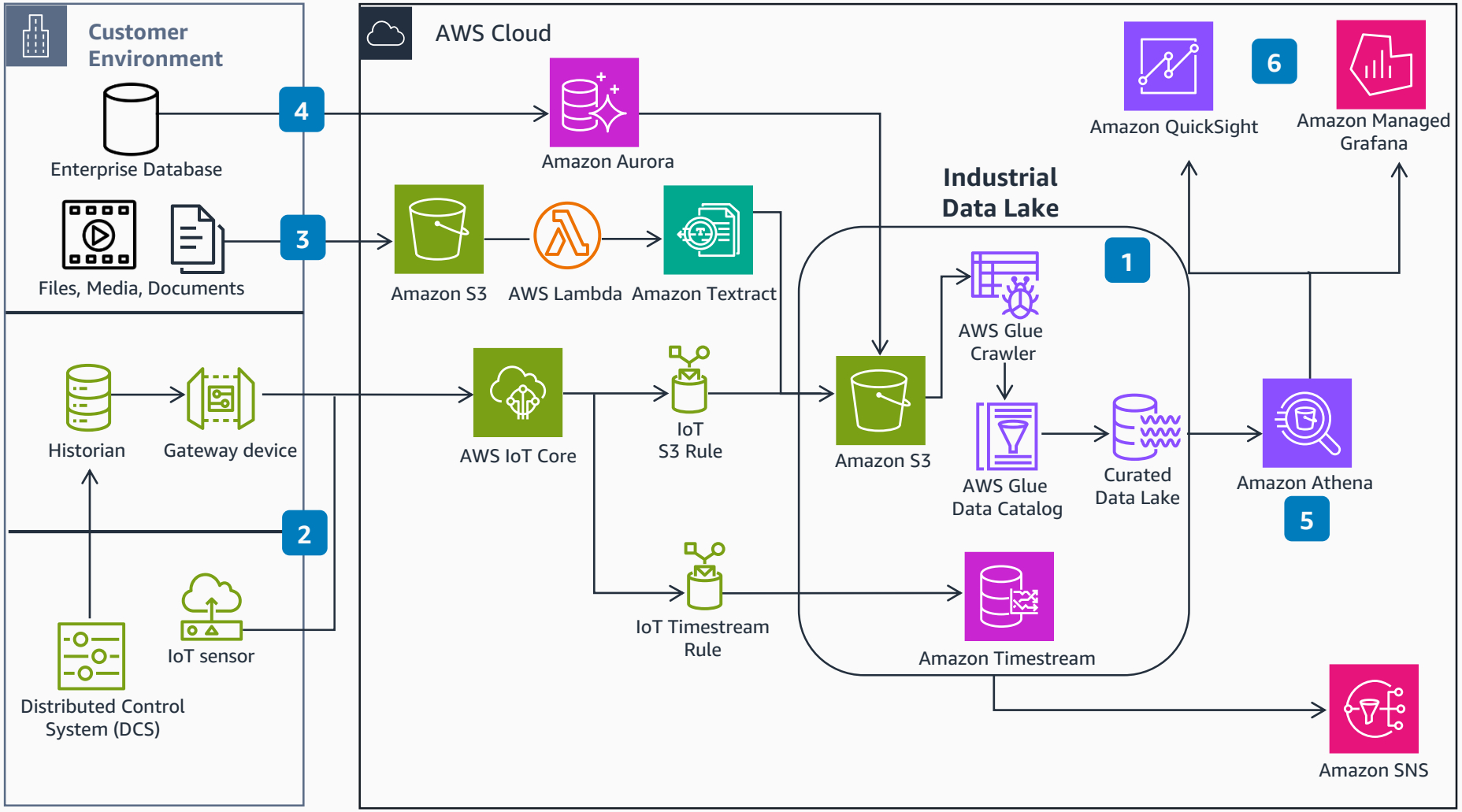
Guidance for Refinery Monitoring & Surveillance on AWS

This diagram shows how industrial energy customers can use AWS to ingest and analyze equipment sensor telemetry, asset hierarchy, and enterprise system data. It helps builders visualize the data flows and the AWS services used when building a secure and modernized industrial data environment.



1. This diagram shows how to deploy an industrial data lake using **Amazon Simple Storage Service** (Amazon S3), **AWS Glue**, and **Amazon Timestream**. These are purpose-built storage services for time series data. **AWS Glue** crawlers and AWS Glue Data Catalog organize data sources and relationships, and notify administrators using **Amazon Simple Notification Service** (Amazon SNS).

2. A partner Operational Technology (OT) gateway device extracts plant sensor data from the distributed control system (DCS) fed historian. **AWS IoT Core** brings messages into the AWS cloud from sensors and gateway device. **AWS IoT Core** rules route messages to **Amazon S3** and **Timestream**.

3. Paper and digital documents contain valuable operational data that uses an **Amazon S3** prompt to call an **AWS Lambda** function to analyze and structure document text using **Amazon Textract**. Results are stored in an industrial data lake.

4. Information Technology (IT) enterprise system data from on-premises databases is synchronized with **Amazon Aurora**. Data contains asset locations, maintenance history, lab samples, and critical contextual information for OT telemetry data patterns.

5. Data analytics capabilities from **Amazon Athena** provide contextualized datasets of OT data, joined with enterprise systems of record and static documents. Queries and views can be applied, reused, and shared in **Athena**.

6. Visualization and reporting is achieved with **Amazon QuickSight**, **Amazon Managed Grafana**, or partner business intelligence (BI) applications based on your preference. **Amazon Managed Grafana** provides real-time monitoring and **QuickSight** focuses on business key performance indicators (KPIs).

Reviewed for technical accuracy June 9, 2023

AWS Reference Architecture