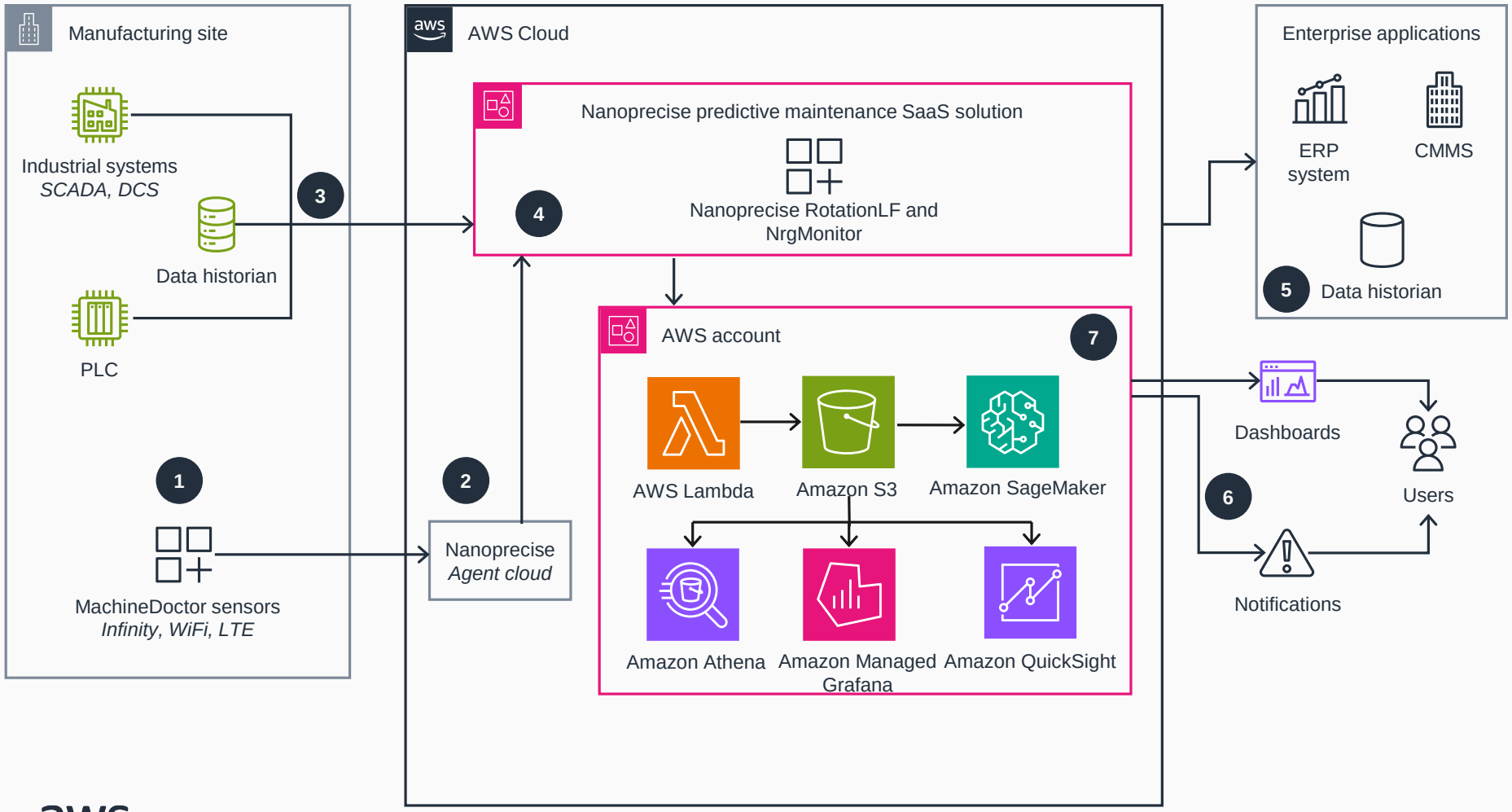
Guidance for Asset Maintenance and Reliability with Nanoprecise MachineDoctor on AWS

This architecture diagram shows how to set up the data flow and AWS service integration for Nanoprecise, which offers real-time predictive information about the health and performance of industrial assets.



1. Installed on industrial assets, MachineDoctor wireless battery-operated edge sensors measure and collect data for six parameters: triaxial vibration, acoustic emission, surface temperature, humidity, true RPM, and magnetic flux. They also perform anomaly detection at the edge.
2. Edge sensors send their telemetry data to the tenant-specific *Nanoprecise Predictive Maintenance SaaS solution* through an *Agent cloud* on a predefined schedule and when anomalies are detected. This solution aligns with the System and Organization Controls (SOC) 2 Type II examination.
3. Existing industrial systems, such as Supervisory Control and Data Acquisition (SCADA), data historians, Programmable Logic Controllers (PLCs), and third-party sensors, can also send their data to the Nanoprecise platform through open APIs.
4. Data is analyzed by Nanoprecise RotationLF using statistical and physics-based models for anomaly detection, fault identification, fault characterization, potential causes and suggested actions, estimated energy loss, and estimated remaining useful life. NrgMonitor uses the telemetry data to track power consumption and CO_2 emissions, enabling energy-centered maintenance.
5. The Nanoprecise SaaS platform provides an open API that allows you to integrate telemetry data and insights with your existing enterprise applications, such as computerized maintenance management systems (CMMS), data historians, and enterprise resource planning (ERP) systems.
6. You can monitor your industrial assets and access the insights generated through pre-built dashboards available on the Nanoprecise SaaS platform. You can be alerted with just-in-time notifications and alerts through email and/or SMS.
7. Export telemetry data and insights into your own cloud environment using **AWS Lambda**. Store the data in **Amazon Simple Storage Service (Amazon S3)**. Hydrate the industrial data lake with asset maintenance data to use and train machine learning models on **Amazon SageMaker**. Query the data in **Amazon S3** with **Amazon Athena**. Visualize, analyze, and gain business insights on your data with **Amazon Managed Grafana** and **Amazon QuickSight**.

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AWS Reference Architecture