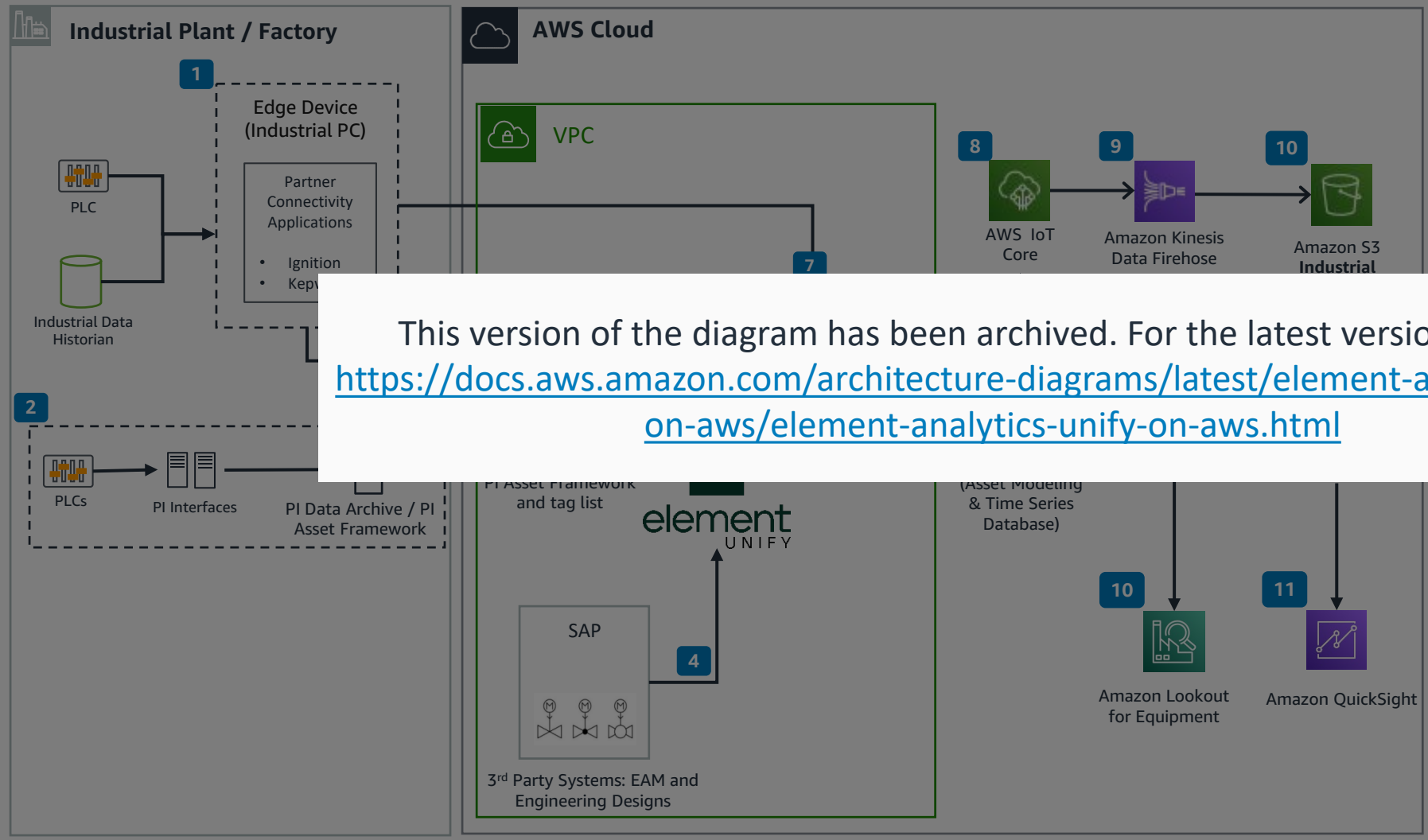
Centralized IT/OT Data Management Using Element Unify and AWS Industrial Machine Connectivity

Element Unify is the centralized IT/OT data management platform that integrates, contextualizes, and governs IT/OT information for consumption with AWS services.



This version of the diagram has been archived. For the latest version, refer to https://docs.aws.amazon.com/architecture-diagrams/latest/element-analytics-unify-on-aws/element-analytics-unify-on-aws.html

1. Partner connectivity applications Ignition and KepServerEx running on AWS Certified industrial PC ingests real-time sensor data and asset model data sent from PLC and industrial historians.
2. PI Interfaces/Connectors collect data sent from sensors, PLCs, SCADA, etc. into PI Server running at plants or regional data centers. Element Unify AF Management Tool retrieves, deploys, and manages PI Asset Framework asset models.
3. Element Unify ingests asset models and tag lists exported from edge applications (i.e. Ignition, Kepware, etc.).
4. Element Unify P&ID Productivity Tool deployed in **Amazon VPC** automates harvesting of asset information from graphical engineering designs. EAM and ERP systems (residing either on-premises or in an Amazon VPC), including SAP FLOC and work orders, connect to Element Unify through iPaaS layer.
5. Element Unify is the centralized IT/OT data management platform that integrates, contextualizes, and governs asset data I Asset Framework (bi-directional), ing at the edge, and IT data sources like erforms bidirectional model sync with
isting asset model data from **AWS IoT** visions the new, enriched asset model **T SiteWise**.
es the asset model data and ingests, processes all incoming data before storing both raw and processed data in a managed time-series data store. **AWS IoT SiteWise** publishes an MQTT message to **AWS IoT Core** each time the asset property value updates.
8. An **AWS IoT Core rule** publishes these asset property update messages it receives from **AWS IoT SiteWise** in near real-time into **Amazon Kinesis Data Firehose**.
9. **Amazon Kinesis Data Firehose** captures data from **AWS IoT Core**, transforms it, and delivers the data in near real-time to **Amazon S3** industrial data lake.
10. Once real-time and historical data is available in **Amazon S3** industrial data lake, **Amazon Lookout for Equipment** can use the data to detect abnormal equipment behavior, so that machine failures can be detected before failure occur and avoid unplanned downtime. Computed metrics can be written back into **Amazon S3** for storage and consumption.
11. **Amazon QuickSight** can be used with **Amazon Athena** to create and publish interactive BI dashboards.

Reviewed for technical accuracy May 20, 2021

AWS Reference Architecture