Manufacturing on AWS

This architectural blueprint shows how the AWS Cloud can enable digital transformation for manufacturers, and highlights how a smart factory, smart products, enterprise applications, and engineering and design workloads can be integrated using a data lake.
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Data Ingestion
Architectural view of data ingestion from industrial and automation devices in the factory, and contextualization with data from manufacturing and enterprise applications.
For industrial IoT and automation equipment data ingested through AWS IoT Core, use Amazon Kinesis Data Analytics for streaming analytics such as anomaly detection.

Utilize AWS Lake Formation or Amazon Simple Storage Service to establish a data lake structure.

For near real-time analytics, use AWS Lambda to run analytical functions.

Process, transform and analyze data in the data lake using Amazon EMR.

Develop, train, and deploy machine learning models with Amazon SageMaker.

For demand forecasting use cases, use Amazon Forecast.

Store structured data sets and analytics results in a data warehouse using Amazon Redshift.

Create business intelligence reports and visualize data with Amazon QuickSight from Amazon Redshift, and from Amazon S3 using Amazon Athena.
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Application hosting

Architecture view for hosting application on an integrated, resilient, and scalable architecture that connects AWS to an on-premises environment.

1. For latency sensitive and high data processing cloud-native workloads, extend the AWS Cloud into on-premises data centers with AWS Outposts.

2. For use cases that have a disconnected state or need ruggedized hardware, use AWS Snowball Edge to host the application.

3. Host your enterprise application on Amazon EC2 instances within a virtual private cloud (VPC) using AWS Auto Scaling and Elastic Load Balancing to provide availability and scalability.

4. For high performance computing (HPC) workloads, utilize Amazon FSx and Amazon EC2 instances with Amazon AppStream 2.0 to run computer-aided engineering (CAE) and computer-aided design (CAD) applications in the cloud.
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Smart Products
Architectural view of how smart products can be built on AWS and integrated into a manufacturing data lake.

1. Use **AWS IoT Core** to connect to products and machines using Message Queuing Telemetry Transport (MQTT), ingest telemetry data, and send commands.

2. Ingest telemetry data into **Amazon S3** using **Amazon Kinesis Data Firehose** from **AWS IoT Core**.

3. Define event based logic and actions for connected devices using **AWS IoT Events** and **Amazon Simple Notation Service**.

4. Build microservice applications for connected products and machines using **AWS Lambda** functions and **Amazon DynamoDB**.