

Service Name

AWS IoT SiteWise

Service Overview

AWS IoT SiteWise is a managed service that enables industrial enterprises to collect, store, organize, and monitor data from industrial equipment at scale to make better, data-driven decisions. It provides a resource modeling framework to create representations of industrial devices, processes, and facilities called asset models. The service ingests data through multiple methods including direct OPC UA connections, edge processing, MQTT messages, and APIs, then processes and transforms this raw industrial data into actionable insights. It offers three storage tiers for equipment data and includes capabilities for real-time monitoring, predictive analytics, and visualization through managed web applications.

Key Use Cases

- **Manufacturing:** Monitor operations across facilities, compute industrial performance metrics like OEE and MTBF, prevent costly equipment issues and reduce production gaps
- **Food and beverage:** Optimize production processes, ensure quality control, monitor equipment performance and maintain compliance with safety standards
- **Energy and utilities:** Monitor power generation equipment, optimize asset performance, predict equipment failures and manage distributed energy resources

Features

- **Data Ingestion:** Collect data through OPC UA, MQTT, edge gateways, AWS IoT Core rules, and API methods with support for buffered ingestion
- **Asset Modeling:** Create representations of industrial devices, processes, and facilities with asset models, hierarchies, and property definitions
- **Edge Processing:** Process, store, and analyze data locally at the edge using SiteWise Edge with data collection and processing packs
- **Time Series Storage:** Three-tier storage system (hot, warm, cold) with intelligent data lifecycle management for cost optimization
- **Analytics and Monitoring:** SQL queries, real-time dashboards, alarms through CloudWatch, and anomaly detection for predictive maintenance
- **Visualization:** No-code web applications through SiteWise Monitor and Grafana plugin for operational data visualization
- **AI Assistant:** Generative AI-powered industrial assistant for insights, troubleshooting, and operational guidance

Value Proposition

AWS IoT SiteWise provides a complete industrial IoT solution that eliminates the complexity of collecting and contextualizing industrial data at scale. Unlike building custom solutions, it offers managed infrastructure with automatic scaling, built-in security, and integration with the broader AWS ecosystem:

- The service reduces time to value through pre-built asset modeling frameworks, automated data processing, and ready-to-use visualization tools
- Its edge processing capabilities enable hybrid architectures for low-latency requirements while maintaining cloud connectivity
- The three-tier storage system optimizes costs automatically, and the AI-powered assistant accelerates troubleshooting and operational insights, making it ideal for enterprises seeking rapid industrial digital transformation

Service Integration

AWS IoT SiteWise integrates deeply with AWS IoT Core for device connectivity and MQTT messaging, Amazon S3 for data lake storage and bulk operations, and Amazon CloudWatch for alarms and monitoring. It connects with AWS IoT Greengrass for edge computing capabilities and AWS IoT Events for event-driven data processing:

- The service leverages Amazon Lookout for Equipment for predictive maintenance analytics and AWS IoT TwinMaker for digital twin synchronization
- Additional integrations include AWS Lambda for custom processing, Amazon DynamoDB for operational data storage, Amazon Athena for SQL analytics, Amazon QuickSight for business intelligence, and Grafana for advanced visualization and monitoring dashboards

Onboarding and Offboarding

Customers can begin with AWS IoT SiteWise through a quick start demo that creates sample asset models, assets, and a SiteWise Monitor portal with generated data. The service offers multiple tutorials covering data ingestion from IoT things, SiteWise Monitor visualization, and integration with other AWS services:

- Getting started requires an AWS account and selecting a supported region
- Customers can choose from various data ingestion methods including direct OPC UA connections, edge gateways, or MQTT through IoT Core
- The console-based asset modeling allows users to define equipment representations, while SiteWise Monitor provides immediate visualization capabilities for operational teams

Getting Started Guide: <https://docs.aws.amazon.com/iot-sitewise/latest/userguide/getting-started.html>

Data Removal

Offboarding involves deleting AWS IoT SiteWise resources including assets, asset models, gateways, and portals through the console or APIs. Historical asset property data can be exported before deletion using query APIs or bulk export to Amazon S3. The quick start demo automatically deletes itself after a specified period, while production resources require manual cleanup. Resource definitions can be backed up using Describe APIs before deletion to enable recreation if needed.

Backup/Restore and Disaster Recovery

AWS IoT SiteWise leverages highly available AWS services like Amazon S3 and operates across multiple availability zones for inherent resilience. Data backup is achieved through property value notifications to IoT Core with rules routing to S3 and DynamoDB. The service provides APIs to retrieve and backup historical asset property data and resource definitions for disaster recovery scenarios.

Backup Capabilities

AWS IoT SiteWise does not natively integrate with AWS Backup service. However, it provides backup capabilities through property notifications that publish MQTT messages to AWS IoT Core, which can be routed to storage services like Amazon S3 and DynamoDB using IoT Core rules for data persistence and backup purposes.

Disaster Recovery

AWS IoT SiteWise does not directly integrate with AWS Elastic Disaster Recovery. The service achieves disaster recovery through its multi-AZ architecture and integration with durable AWS services. Customers can implement disaster recovery by replicating IoT Core device registries, certificates, and policies to secondary regions using custom solutions with DynamoDB Global Tables and Lambda functions.

Recovery Objectives

AWS IoT SiteWise helps meet RPO and RTO objectives through its multi-AZ architecture providing high availability within regions. Data replication to other AWS services enables backup with RPO measured in minutes. For cross-region disaster recovery, customers can achieve RTO of hours through automated replication of device registries and asset configurations, combined with data export capabilities to restore historical information.

Service Constraints

Service Quotas: <https://docs.aws.amazon.com/iot-sitewise/latest/userguide/endpoints-and-quotas.html>

FAQ: <https://aws.amazon.com/iot-sitewise/faqs/>

Technical Requirements

Service Documentation: <https://docs.aws.amazon.com/iot-sitewise/latest/userguide/what-is-sitewise.html>

User Guide: <https://docs.aws.amazon.com/iot-sitewise/latest/userguide/>

API Reference: <https://docs.aws.amazon.com/iot-sitewise/latest/APIReference/Welcome.html>

Pricing Overview

Please see the AWS UK G Cloud 15 Pricing Document accompanying this service in the Digital Marketplace.

Public Pricing: <https://aws.amazon.com/iot-sitewise/pricing/>

Cost Optimization

AWS IoT SiteWise offers intelligent three-tier storage (hot, warm, cold) that automatically moves historical data to cost-optimized tiers based on user-defined policies, reducing storage costs significantly. Buffered ingestion allows defining data velocities for different use cases, optimizing messaging costs:

- Edge processing with SiteWise Edge reduces cloud compute and data transfer costs by processing data locally
- The service offers different pricing for near real-time versus buffered data ingestion, allowing cost optimization based on latency requirements
- Data export to S3 provides additional cost-effective storage options for long-term archival and analytics workloads

Savings Considerations

Primary cost savings come from the automated storage tiering system that keeps recent data in hot storage while moving historical data to lower-cost warm and cold tiers. Edge processing reduces cloud data transfer and compute costs by handling processing locally:

- Buffered ingestion provides lower-cost data ingestion compared to real-time streaming for non-critical use cases
- The managed service eliminates infrastructure overhead and maintenance costs compared to self-managed solutions
- Integration with other AWS services enables economies of scale and avoids data egress charges
- Predictive maintenance capabilities enabled by the service can prevent costly equipment failures and reduce operational expenses across industrial operations