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Test Project

Module Quest

Cloud Computing

Submitted by:
Amazon Web Service, Independent Test Project Designer

Contents

This Test Project consists of the following documentation/files:

- WSC2026_TP53_MB_actual (this document)

Use of AI Tools and Models

You may not use any AI tool or service to produce, debug, or explain your work at any point. This includes external services, personal accounts, and any model self-hosted on competition infrastructure.

Description of project and tasks

Quest Module: This comprehensive challenge evaluates your cloud computing skills by assessing your ability to architect, implement, and troubleshoot complex cloud environments.

Technical Details

Quest

IoT Device Monitoring Platform

Summary

Company Background

XYZ is a large industrial manufacturer with multiple modern production lines. Each line deploys many sensor-capable IoT devices (identified by device_id) that continuously report operational observations such as temperature, battery level, and signal strength.

As production scale grows, traditional on-premises data collection and monitoring systems face serious challenges: surging data volume increases processing latency, device anomalies cannot be detected and responded to in time, historical data lacks structured archival and analytics capability, and operations teams struggle to pinpoint root causes quickly. The enterprise urgently needs a scalable, real-time cloud IoT data processing platform.

XYZ decided to build an end-to-end IoT data processing pipeline on AWS, covering the full chain from data ingestion, real-time processing, historical archival and analytics, intelligent alerting, to automated incident handling. The platform will be delivered in phases, with each task mapping to a core capability module. The platform must be highly available, observable, and secure to ensure stable production operation.

The overall system must meet the following design requirements:

- The ingestion layer must support RESTful API access and reliably write to an event streaming system
- The real-time processing layer must automatically consume stream data and persist device state
- The archival layer must organize historical data by time and support interactive SQL queries
- The alerting layer must automatically notify on device anomalies and record alert-handling logs; normal reports that do not cross thresholds should remain silent to avoid false-alarm noise for operations

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- The handling layer must implement an event-driven automated handling closed loop so device anomalies are automatically classified, recorded, and notified; handling must trigger only when a device is truly in an anomalous handling state, avoiding false handling of healthy devices

Information security is a high priority for this project. Configure least-privilege IAM policies for each service and use CloudWatch and related monitoring to ensure observability. All task validations run automatically on a fixed interval—watch your platform ScoreEvents.

REMINDER

This is a Quest Challenge.

Please use us-east-1 region.

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