IoT Cloud Platform Enhances Medical Device Management

Success Story

To predict device failure by scaling data collection and storage, a Fortune 500 science & technology company developed an IoT cloud platform for transforming its medical device management processes by remotely monitoring 2500+ devices in real-time.

CitiusTech

Business Impact

The client, a leading global science and technology innovator, leveraged CitiusTech's engineering capabilities in the cloud and IoT expertise to manage the various types of devices in its group of companies across different geographies.

2500+ active devices managed remotely	**180+** data parameters generated per device	**400 GB** of telemetry data processed everyday	**200 M** data points ingested and stored everyday

Client Requirement

The client's printing & labelling solutions enable MedTech organizations to maintain their medical devices. It needed a IoT platform to remotely check devices for reducing downtime & minimize operating losses. The solution needed to:

- Store telemetry & event data
- Configure rules & notifications on event data
- Query telemetry data in real time
- Provide remote connectivity for devices
- Ensure secure & safe user management

The CitiusTech Advantage

CitiusTech setup a dedicated team to design the scalable and multi-tenant IoT cloud platform. The goal was to ensure **seamless data flow** and **real-time visibility** to prevent bottlenecks and enhance performance across processes.

Initiated with POC approach and built a scalable data ingestion solution with right open-source tech stack. Developed a CI/CD infrastructure to automate the entire delivery process.

A performance testing framework was established to ensure regular tests on data ingestion and platform APIs. It provided the client with insights on response time, scalability and module upgradation.

Technology Overview

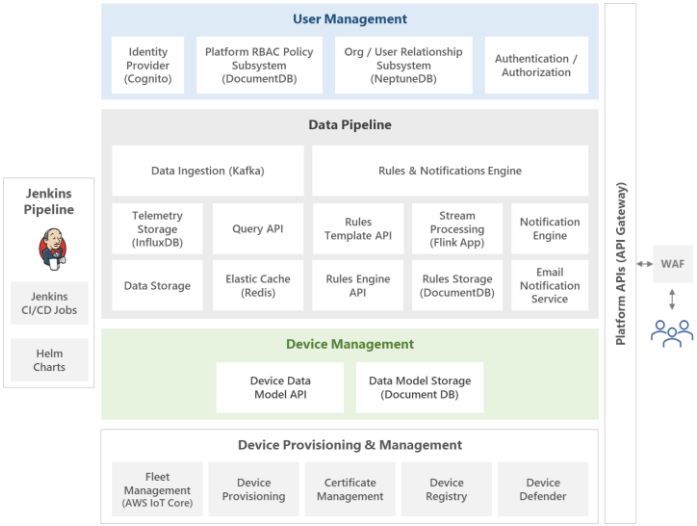
CitiusTech built the IoT cloud platform with close collaboration with the client's engineering team. The solution includes:

Data Pipeline Management

- Ingest **high volume telemetry and event data** using Kafka to various destinations such as Influx, AWS Elastic Cache - Redis and AWS S3
- Query telemetry and event data in **real time**
- Create **re-usable templates** for rules with conditional expression
- Workflow enablers such as **Notifications & Rule Engine** for execution of rules on device / group / device model using Kafka and Flink for stream processing

IoT Platform Services

- **IAM** for onboarding (users, groups, site) using AWS Cognito and AWS Neptune
- **Infrastructure management** with authentication and authorization service using AWS Cognito, AWS IoT Core and SSL/ACL with Kafka
- New **device identification and device provisioning** on the IoT platform using AWS IoT Core
- **RBAC policy** for limiting access to platform APIs at group / user level using AWS DocumentDB
- **Asset management** API to manage groups (associating / removing assets)
- **Query Management** API for querying the groups and assets



Solution Schematic – Medical Device Management

About CitiusTech

CitiusTech (www.citiustech.com) is a leading provider of healthcare technology services, AI/ML & analytics capabilities, platforms and end-to-end packaged solutions to over 120 organizations across the payer, provider, medical technology and life sciences markets. With over 5,400 healthcare technology professionals worldwide, CitiusTech powers healthcare digital transformation through next-generation technologies, solutions and accelerators. Key focus areas include healthcare interoperability data management, quality performance analytics, value-based care, omni channel member experience, connected health, virtual care delivery, real-world data solutions, clinical development, personalized medicine and population health management.

CitiusTech has two subsidiaries, FluidEdge Consulting (www.fluidedgeconsulting.com) and SDLC Partners (www.sdlcpartners.com) with deep expertise in healthcare consulting and payer technologies, respectively. CitiusTech's cutting-edge technology expertise, deep healthcare domain expertise and a strong focus on digital transformation enables healthcare organizations to reinvent themselves to deliver better outcomes, accelerate growth, drive efficiencies, and ultimately make a meaningful impact to patients.

Princeton | New York | Rochester | Dallas | Boston | Philadelphia | Mumbai | Bengaluru | Chennai | Dubai | Singapore | London