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CoreTEC Converts Electrical Transformers into IoT Devices by Capturing, Aggregating, and Persisting Sensor and Other Data

Executive Summary

ABB's solutions connect engineering know-how and software to optimize how things are manufactured, moved, powered, and operated. ABB is developing next-generation transformers that are smart, connected, industrial IoT devices.

Client's Key Challenges

Working with ABB, VividCloud developed a list of challenges to tackle:

- Large transformers on the electrical power grid are complex devices withnumerous sensors that capture performance and device health data.

- Historically, that data has remained inside the device unless captured by a manual download process.

- ABB developed next-generation transformers that are smart, connected,industrial IoT devices. This required a major upgrade in the software resident in the transformers' embedded computers.
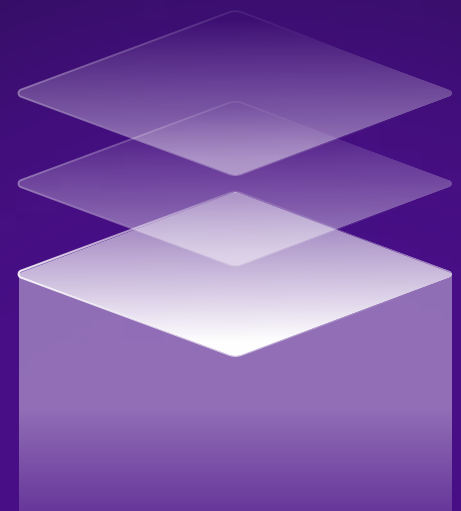
ABB

ABB is a technology leader in electrification and automation, enabling a more sustainable and resource-efficient future.

Industry: IoT

Location: Zurich, Switzerland

Service: Automation

Website: global.abb

VividCloud's Solution

ABB engaged VividCloud to architect, design, and develop a new software platform to convert these transformers into IoT devices.

✔ New CoreTec System

Designed with an architecture that includes a Runtime Executive, License Agent,Persistence Engine, Logging Engine, Algorithm Engine, and proxies of devices to enable the persistence of data.

✔ A New UI Application

Allows operators to configure, control, and monitor the transformers.

✔ New Ways to Manage Data

The new CoreTEC system receives data from numerous sensors and sources,aggregates it as necessary, stores timestamped data in relational and time-series databases, performs local analysis and analytical calculations, and sends the data to remote servers for storage.

✔ New Ways to Communicate Data

The aggregation and persistence engines allow the CoreTEC system to communicate with SCADA systems, embedded devices, and remote storage and compute platforms using multiple communication paths, such as the Modbus, DNP3, RS-485, and 61850 industrial protocols, and the MQTT message-based protocol popular with IoT systems.

✔ Modern Deployment Packaging

The project also required firmware development of the Ubuntu-embedded Linux board support package. In addition to modifications of several device drivers and bootstrap c omponents, Yocto was used for deployment packaging.
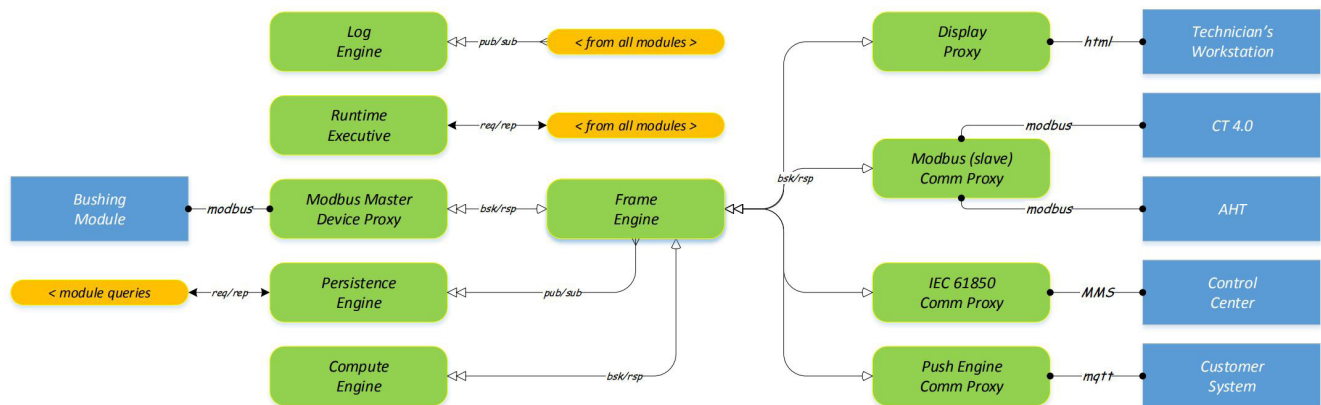
Power Transformers as IoT Devices

The client's large class of power transformers are now smart, connected, IoT devices.

Results

The new CoreTEC software was successfully deployed after 9 months of development, at a cost dramatically lower than the client had estimated for an internally-developed effort. It was immediately deployed to over 30 customers in a pilot program. No serious issues or feature gaps were discovered during this comprehensive and intensive pilot program.

About VividCloud

VividCloud is a software development company focused on cloud and IoT. AWS is our cloud platform of choice, and we are an Advanced Tier APN Services Partner. We bring fully managed teams that free our client s from day to day oversight responsibilities.

VividCloud is based in Brunswick Maine, with 100% of our people onshore in the US.

Contact Us

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