Kalki.io Advanced Front-End Processor(FEP) Software for Telemetry and IoT Applications

Challenges

Industries, utilities, and enterprises are constantly looking for ways to improve the operational efficiency, reliability; and optimize the return on investment of their assets through Digitalization. Seamless interaction of SCADA systems, Enterprise software applications and AI/ML based advanced analytics applications hosted on cloud platforms are required to achieve this. For achieving this, operational and non-operational data required to be collected persistently from field assets over standard/ legacy/ IoT based telemetry protocols.
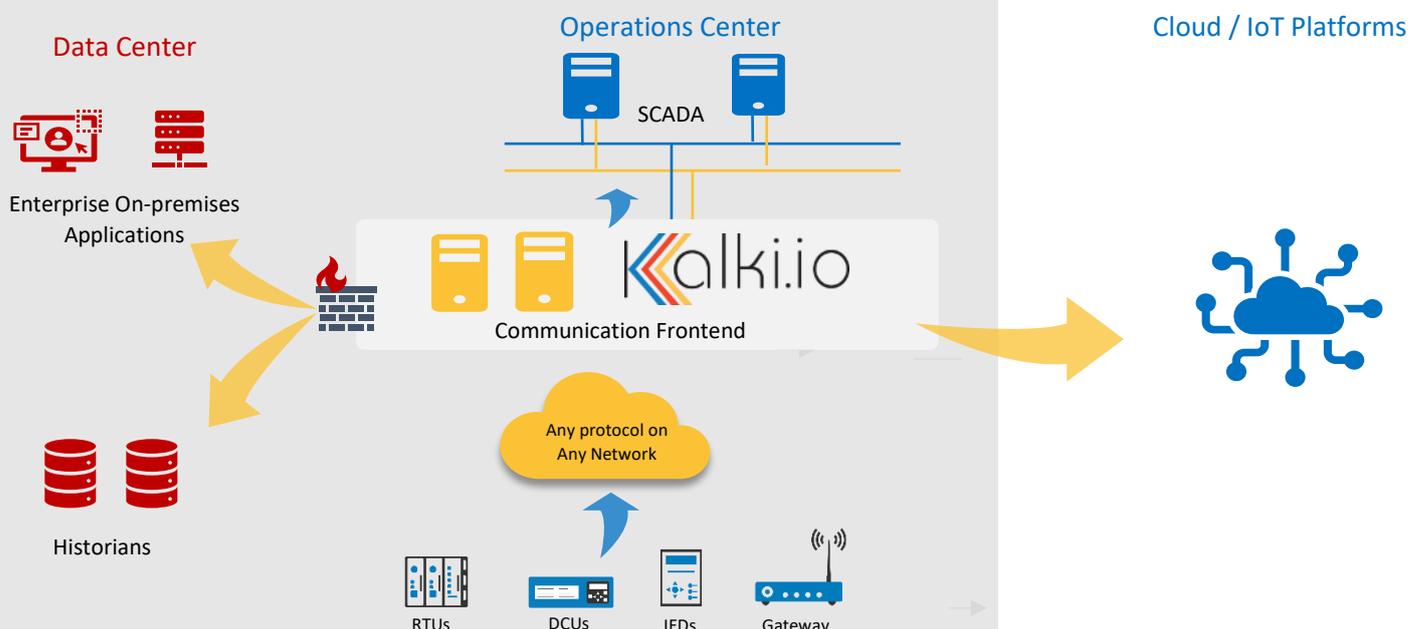
Traditionally the key purpose of telemetry data acquisition and front-end processing of the device data used to be entirely focused on operational monitoring requirements supported by SCADA applications. Emergence of advanced analytics applications for asset management and the need for creation of digital twins of the assets resulted in requirements for significant revamping of the data acquisition and front-end processing applications. The major reasons behind for this revamping are to perform device management functions as an integral part of the digitalization process to ensure comprehensive security of connected devices. Traditional Front End Processor applications that come bundled with SCADA systems are not capable of supporting these extra needs and is not possible to easily integrate it with advanced analytics applications are deployed on-premises or on the cloud.

Solution

KALKI.IO is an advanced front end processing gateway software which can collect operational and non-operational data from field assets such as remote terminal units (RTU), data concentrators/controller, IEDs, sensors, gateways over telemetry protocol using 40+ built in protocol adaptors. Kalki.io also supports Internet of Things (IoT) protocols which helps in connecting latest IoT based sensors/edge devices in the field. Kalki.io device profile based modeling help to create virtual replica of the devices and perform remote setting and configuration management of the field devices. Grouping of devices and group-based management of devices helps to roll out configuration and firmware updates faster.

Kalki.io enable highly secure and reliable communication with on-premises enterprise applications, historians, data-lakes or with IoT applications deployed on public/private or hybrid cloud infrastructure. Kalki.io provides various connectors on JSON, REST APIs, MQTT etc for integrating with IT applications, it also has native connectors for popular cloud platforms and asset performance management applications. These specialized connectors of Kalki.io accelerates the creation of IoT solutions using both telemetry and IoT data.

Utility Premise

Data Center

Enterprise On-premises Applications

Historians

Operations Center

SCADA

Kalki.io

Communication Frontend

Any protocol on Any Network

RTUs   DCUs   IEDs   Gateway

Cloud / IoT Platforms

Features

- The Frontend supports both serial and network (TCP/IP) communications

  - IEC 60870-5-101 /104
  - IEC 61850
  - IEC 60870-6 TASE.2 (ICCP)
  - DLMS
  - DNP 3.0 (TCP/IP & Serial)

  - IEEE2030.5
  - Modbus (TCP/IP & Serial)
  - OPC UA
  - MQTT
  - Additional 40+ telemetry and automation protocols

- Built-in device management and provisioning to connect and manage devices at scale.
- Optional M2M function enables support for multiple WAN communication technologies.
- REST API support to exchange data with enterprise applications.
- Specialized built-in connectors to exchange data with historians or data lakes.
- MQTT/OPC UA/ REST based connectors to exchange data with IoT or IIoT platforms & perform IT integration.
- Enhanced cyber-security by end-to-end encryption for both northbound and southbound links.
- Enhanced security with integrated network proxy application
- For serial devices FEP service encapsulates serial data in TCP/IP packets and provides the interface to modems, radios, and other communication technologies.
- Protocol specific authentication support e.g., IEC62351-5 DNP3.0 Secure authentication
- Support for device profiles and meta model definition
- Device provisioning and on-boarding support from enterprise applications
- Secure and role-based access for remote maintenance of field devices and gateways
- Logical grouping of devices and perform settings, firmware management etc. for device groups.
- High availability and disaster recovery functions
- Supports link redundancy with automatic communication fail-over.
- Legacy devices with bit protocol can be integrated using bit-to-byte (isosynchronous bit-oriented frame to asynchronous bytes) converter from ASE/Kalkitech.

Benefits

Lower the overall cost of ownership for data exchange and device management.

Reduce Integration cost & Complexity

Reduces your integration cost and time significantly in connecting field assets to SCADA system and IT/Analytics applications using proven plug and play adaptors / connectors in KALKI.IO.

Improve asset Reliability

Centralized data collection, device management, and maintenance helps in improving the asset life and there by reliability of the whole system.

Improve Security

As a front end for all communication, advanced FEP improves security by preventing any unwanted intrusion to utility network. It logs, tracks, and reports all user access for auditing purposes, and helps to meet system level security requirements like NERC CIP.

Explore new Possibilities

Advanced connectors for IoT platforms or enterprise applications explore new possibilities to build Digital Twins, new AI/ML based analytics and gain access to information and insight and explore new business model.

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