

IoTOS For System Integrators | Facilitate Rapid Repeatable IoT/IIoT Deployments

Preamble

Real world sensor data is a the source of big data for on-premise/cloud/hybrid storage, artificial intelligence (AI), descriptive-, prescriptive-, preventative-, predictive-analytics and dash-boarding processes that result in streamlining, increasing efficiencies and optimizations of business operations that save costs as well as have the potential to provide early warnings and hence save lives and property.

However, securely accessing, capturing, storing, transmitting sensor data, as well as the integration of especially legacy (brownfield) sensors, devices, equipment at the edge has proven to be complicated, complex exercises and undertakings that have led to very high rate of IoT/IIoT project failures.

Systems Integrators (SIs) and Solutions Suppliers (SSs) build custom solutions as per client requirements, deliver and are responsible for IoT/IIoT/Web4.0 deployments, sometimes with corresponding/complementary transmission, storage, analytics and IT solutions world-wide for the captured sensor data.

As the IoT/IIoT/Web4.0 momentum shifts to the edge, the demand for skilled professionals in in the IT/OT integration space and platforms is above available supply and costly, making the promise of most IoT/IIoT projects beyond proofs of concept (PoC) stages into production unattainable.

SIs, SSs and their clients want to interface with, configure and re-configure additional diverse range of environmental and detection sensors that are not usually supported in monitoring systems. As well to integrate sensors and stove-pipe subsystems, they want bring to life 'capex' legacy and brownfield (trove of Trojan horses of) sensors and equipment that they never envisaged continuing to utilize, put to use again and/or connect to. Thus, they can successfully deliver on the promise of IoT/IIoT of digital transformation, IT2OT, business productivity and operations streamlining and optimizations.

The need for COTS gateway software and appliances that support rapid solution design and deployment into production cannot be overemphasized. In fact this initiative is being well received by SIs and SSs as IntelR embarks on its RRK Program. There's a need for an IoTOS of sorts that helps SIs and SSs to not only rapidly prototype solutions but successfully deliver such into production: a sort of 'Android' OS for IoT we refer to as IoTOS.

The Challenge

Experience from building solutions over the years comprising sensor arrays with switches, relays, micro-controllers at best have delivered custom, expensive and mostly non-reusable solutions.

SIs and SSs encounter and realize the following:

- Difficulty of integrating diverse range of manufacturers' and types of sensors and subsystems
- Sensors are everywhere but nowhere without a technician, engineer or programmer to program and qualify the data.
- Increased proprietary knowledge and maintenance and support costs.
- Reduced availability and higher overhead of program, software, operational and maintenance personnel and engineers.

Billions of Dollars in Assets To Go On-Line

Mobile Equipment



Water Treatment Equipment



Oil Refinery Equipment



Manufacturing Equipment



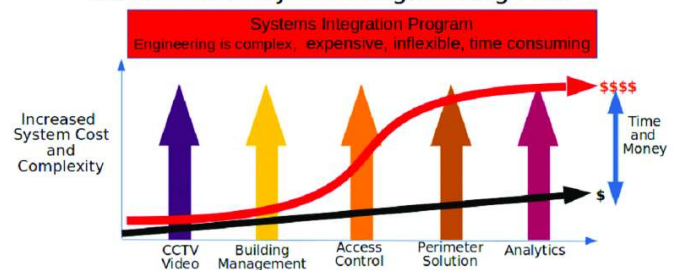
Legacy Control Systems



Integration Challenge

Complexity & High \$\$

Conventional System Engineering Plan



To rapidly cost-effectively build and deploy repeatable robust IoT/IIoT sensor to dashboard solutions that connect to AI and analytics engines, SIs and SSs want a unifying software system that does not need to be programmed, can interface to existing legacy and new sensor technologies which are analog and digital devices: preferably a No Code software system that allows sensor integration out of the box so they can focus on delivery of other aspects of the overall mostly complex solutions; and is based on widely supported Open Standards, increasing the ability to adapt to the integration of future changes in a cost effective manner.

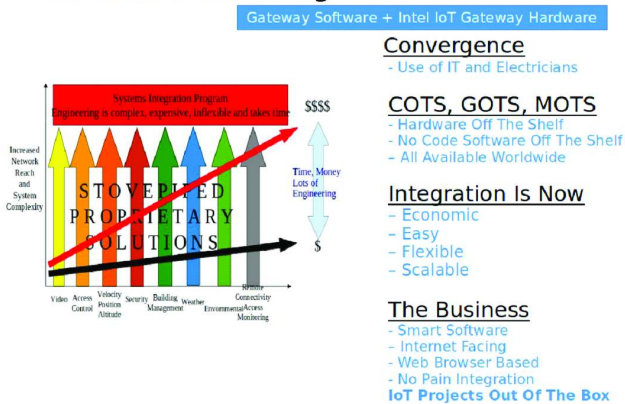
The modern SIs and SSs seek secure software tools wherein the clients could eventually operate the system independently of the original vendor through a cloud/on-premise/hybrid based sensor array IoT dashboard. The proposed software system tools would also have to be reliable, have high availability and level of reporting capabilities for the operational, maintenance and support departments, as well as provide for various levels of cross-enterprise-wide functionalities. For example:

- A pump time of operation data (derive from on/off times) for maintenance schedules.
- Time of operation is multiplied by flow rate to derive volume of product utilized or produced for the supervisor (middle management).
- Volume of material is multiplied by cost per unit for accounting department for almost real-time consumption/production costs, invoicing and bill payments as maybe needed.

The No Code Smart Connect RRK Gateway Software For Integration

The Smart Connect No Code IoT/IIoT edge gateway integration and solution deployment software is extremely useful. It allows companies to quickly prototype, test and iterate their solutions to get production ready with very little or no high-end engineering and/or technical support with easy solution replication capability.

Cost Effective Integration



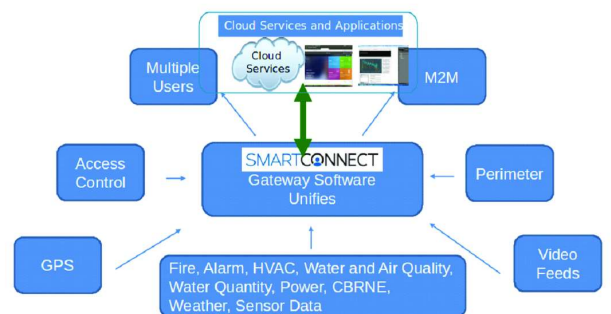
When introduced to the No Code Smart Connect Gateway Software™, system integration and supplier proprietors and program managers quickly realize, from deployed solutions in use by researchers, National Labs, and solutions deployed by other SIs and SSs, that the secured but communications agnostic and data delivery interface with a correspondingly agnostic diverse cloud platforms connectivity, solves the dilemma of custom engineering and integration - not having to program but only configure, the integration and connectivity problem is solved out of the box and they could now focus on other aspects of the project.

The number of steps to successful project completion and commissioning is been drastically reduced.

The Smart Connect Gateway Software™ unifies and accepts sensor feeds from a diverse range of manufacturers’ sensor and subsystem products. Being able to rapidly integrate a diverse range of subsystems, equipment, devices, sensors and cameras from a multitude of manufacturers out of the box with the Smart Connect Gateway Software™ solves the issues and problems of custom solutions.

Feedback is that in addition to meeting solution requirements, SIs and SSs are impressed with the ease of use of the Smart Connect Gateway Software™ product interface and that the system worked out of the box as stipulated – no programming needed as is the case with substantial programming and engineering needs of conventional integration tools.

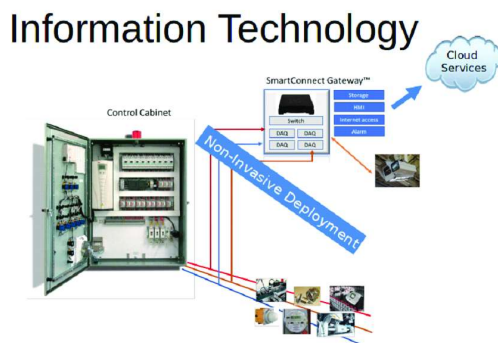
Capturing and Streaming Sensor Data



SIs and SSs have been building custom solutions that required much software programming for each installation. Built Internet facing from the ground up to address the shortcomings of integration projects, the Smart Connect Gateway Software™ integrates all subsystems out of the box, is deployed as a single system and/or could be tied into a Central Command Center, capturing data from all devices so that early warnings of undesirable possible failures, improper operations and intrusions could be captured, acted upon and reported/propagated to the relevant staff in real-time; and operational characteristics and failure rates could be later analyzed as the sensor data is streamed for further on-premise/cloud/hybrid AI, analytics processing and dash-boarding.

Brad Bartz of ABCSolar said, “...I connected sensors to the system, turned the dial, and the buzzer and light went on in order by temperature control with respective alerts going out. For an early warning this starts the escalation trigger mechanism - all out of the box - I did not have to program, just wired the sensors in and configured for ‘early warning’ and real-time alerts, data storage, implemented the REST-API and streamed data into our repository for AI analytics and dash-boarding....”.

Simple Straightforward Implementation



An enclosure comprising Smart Connect Gateway Software(TM) environment appropriate Intel x86 appliance/gateway, Data Acquisition modules ready for non-invasive wiring and securely streaming sensor data feeds, delivers a secure everywhere/anytime solution controlled from one dashboard so SIs and SSs could now focus on other aspects of the the project.

The Intel x86 servers/computers/gateways used to run the Smart Connect Gateway Software™ are COTs and can be purchased locally, in country or supplied; local licensed electricians and panel builders can be utilized in projects with minimal supervision. Systems can be built and shipped for installation by local staff on arrival.

Operations Technology

Each implementation is an on-premise local area network of sensors managed by a Smart Connect Gateway Software™ installed on an Intel x86 gateway, that can be linked to a central Command and

Control Centre, any cloud/on-premise/hybrid repository for AI, analytics and dash-boarding, or to another Smart Connect Gateway Software™ appliance for a ‘system of systems’ architecture, wherein one gateway appliance can link to other Smart Connect Gateway Software™ appliance/gateway or other appliances and machines - an inherent M2M capability.

The Smart Connect Gateway Software™ repeatable, turnkey and cookie-cutting solutions implementation by SIs and SSs in IoT/IIoT projects include the following stages:

- **Planning** - our engineers develop a standard implementation model, including cabling designs and diagrams, which are used for the secured whole system of systems deployments on premise with cloud/hybrid connectivity for data access, storage, AI, analytics engines and dashboard.
- **Installation and Testing** - the devices are connected (wired up) by licensed electricians, configured by IT staff (to be possibly reconfigured by knowledgeable end user), and tested (possibly ‘owned’ by) by local staff.
- **Training and Deployment** - to gain user acceptance the system needs to be both useful and easy to operate. The Smart Connect Gateway Software™’s browser-based software and system RESTful API delivers on this outcome out of the box, as well as provides a source of big data for cloud storage, analytics engines, AI and dash-boarding.

The number of steps to successful project completion and commissioning is drastically reduced, repeatable, turnkey and cookie-cutting.

In essence, the No Code Smart Connect Gateway Software™ appliance facilitates rapid on-premise sensor data capture and integration deployments for IoT/IIoT solutions and projects with inherent cloud repository access for AI, further operational analytics that streamline and optimize business operations.

A project introduces an Open Standard, IP-VPN gateway appliance technology platform infrastructure on premise which is deployed by a licensed electrician, can be remotely configured/reconfigured or by local personnel, thus maintaining individual site security and operational capability, with possibility of remote HQ or Central Command overrides. This also enables clients to use commercial off the shelf (COTS) devices facilitating independent expansion while maintaining the distributed, covert capability and nature of the infrastructure.

Outcomes: Successful Desirable Repeatable IoT/IoT Solutions Deployed

The entire Smart Connect Gateway Software™ architecture solution is deployed and operational out of the box on day of delivery. A food processing plant in North Carolina received their enclosure in the morning, the plant maintenance electrician non-invasively wired the sensors in and presto, data was flowing into asset health system that provided job orders and other plant reports; shipped enclosure to an island port authority – picked up at airport in the afternoon and deployed in the evening.

In addition to cameras, the Smart Connect Gateway Software™ can interface with any Open Standard device which gives almost limitless options.

An SI partner had this to say, “....Smart Connect Gateway Software™ is a unifying force that makes future residential deployment the mass-market potential. Various sensors from different applications are making penetration into homes, offices, schools and more. Unifying disparate sensor data into sensible dashboard views and operating out of the box liberates SIs, solution/product developers, RandD efforts and eventually consumers. ...”

Recognized benefits SI and SS Partners and their clients tout include:

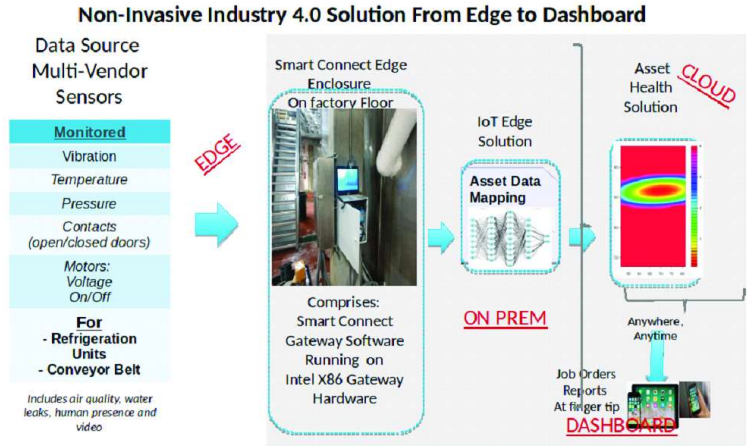
- Ease of use of the browser based UI Smart Connect Gateway Software makes training of personnel simple and fast, and access from anywhere, anytime.
- Installation by qualified electricians make the project less expensive and time consuming compared to retaining engineer(s) proving to be less available.
- Commercial off the shelf (COTS) products as components require upgrading or replacing can be sourced locally or brought in as needed.
- Extensive and superior coverage with fewer staff resources.
- Communications with staff through smart phones anywhere/anytime over XG.
- Staff informed and alerted by text messages, hence free to undertake other tasks - no need to sit in local control room looking at lights/siren enunciation.
- Flexible IP based Smart Connect Gateway Software™ scales very economically and makes solutions adaptable.
- Projects are reportedly 9 times less expensive and 6 times quicker to completion than alternative quoted integration solutions.
- Plug’n Play legacy and new sensor to dashboard without downtime.
- Manufacturers agnostic allows any analog or digital, including video and audio, feeds to be captured and routed to dashboard.
- Secure Embedded Linux x86.
- Aligned with AI, analytics, microservices, commerce engines, advanced imaging and the need to adapt internal security policies as companies adapt their information systems accordingly.
- Cross-platform technology rapidly.
- Bridging IT and OT enhance customer service and experience and multi-use cases – research, facility management, maintenance, middle management, finance/accounting teams and departments.
- Source of real-world big data.
- Strongly aligned and complements rapid secure access, capture and transmission of big data from the edge to support focus of Data Sciences, Data scientist, Data analyst, Data engineer, Cloud engineer, Cybersecurity experts, Machine Learning, AI, analytics, dash-board, asset management tools, predictive maintenance analytics and generating job orders and relevant operational reports.

- Traceability, reproducibility, testability, rapid deployment of COTs turnkey solutions.
- Easy documentation, metadata and delivery of timely real time reports and data feeds to help Artificial Intelligence to gather operational cues.

No Code integration software tool as powerful, functional and easy to utilize as the Smart Connect Gateway Software™ increase the rate of repeatable and successful IoT/IIoT solution projects complete deployments into production.

Rapid non-custom, turnkey, repeatable deployments of IoT/IIoT solutions are cost effective, support missions to provide operational streamlining and optimizations, advanced warnings and situational awareness in the form of edge to dashboard solution that comprise and are equipped with sensors, gateways, communications, storage, AI, analytics, dash-boarding, as promised by IoT implementations.

Asset Health Solution Deployed at Food Processing Plant



About Smart Connect RRK Gateway Software

Smart Connect RRK delivers a no code software solution that captures, normalizes, aggregates and delivers disparate IoT device data to any analytic platform improving operational efficiency while significantly reducing cost.

Find out more:

SmartConnectInc.com