



PLC IoT gateway

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Application

At its very core, the Internet of things contain connected electronic devices, popularly known as **CPS (cyber physical systems)**. These devices have embedded microcontrollers sharing their data with other devices. As an automation professional, any one's reaction might be *“what's new about that? Haven't we been doing that for a long time?”* We've had devices exchanging data on the factory floor now for 30 years. Is this new generation unaware of Modbus?

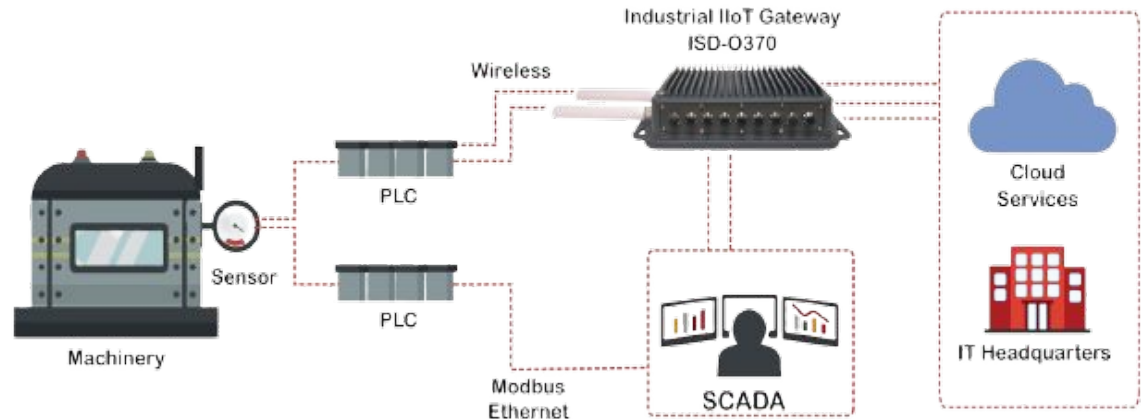
But **IoT** encompasses a facility much more than that. IoT is driven by a set of technologies that facilitates the transmission of data incredibly fast, archive, analyse and visualise it and turn that data into useful information. We now have an easy access to ever improving analytics, lightning fast networks, protocols built to collect data from thousands of devices, inexpensive cloud servers, fancy visualization tools and the ability to add Ethernet or some form of wireless communications to low-cost devices at an ever decreasing cost.

Objective

The objectives of the proposed artifact is to:

- Continuously fetch the data from PLC
- Post the acquired data in a SQL database
- UI application for trend monitoring of the data
- Application interface for cross platform solution

Integration of PLC with Industrial IoT



Objective 1

The first objective of this proposal i.e. the continuous capture of data through PLC will be realized using interfaces like MODBUS or CAN BUS. Data will be streamed from PLC to an IoT based microcontroller device.

Objective 2

The acquired data will be simultaneously **POST**ed in a SQL (RDBMS) system keeping the integration device in an internet connected zone.

Objective 3

An UI with an appreciatively modern look will enable the visualization of the data against a specific time period, which will be user chosen. The UI will allow downloading the data in excel file. It will also render a graphical representation of the variables captured in the data stream

Objective 4

The SQL data will be integrated into a google sheet which can be further used in COLAB or any Jupyter IDE for further analysis.

Schema



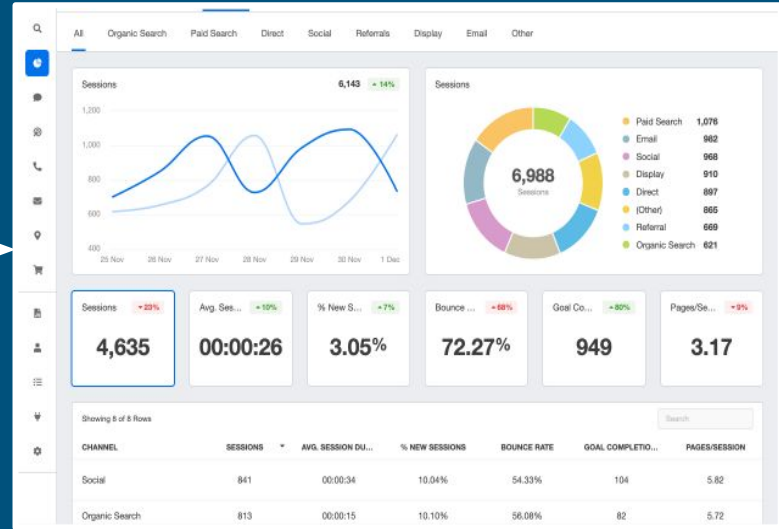
PLC



PLC IoT
interface



RDBMS



Visualization

Security aspects

Data security is a key aspect of any SaaS (software as a service) model. Any platform that we construct has the industrial security aspects threaded into it. We use static code analysis tools which are integrated through the development lifecycle to find security issues in real-time. It can be categorised by industry compliance and standard to prioritize the fixes by the

- ❖ OWASP Top 10
- ❖ SANS Top 25
- ❖ PCI-DSS
- ❖ HIPPA

Penetration test

The detailed vulnerability scans that we conduct on our platforms comprises of the following:

- Code Execution
- Command Execution
- Cross-Site Scripting
- Header Injection
- File Disclosure
- File Inclusion
- File Manipulation
- LDAP Injection
- SQL Injection
- Unserialize with POP
- XPath Injection
- ... other

Scan	Summary	Statistics	Issue Breakdown	Parent Comparison	Settings	Delete Code	Delete
Issue Breakdown							
Severity	Vulnerability Type	CWE	OWASP Top 10	SANS 25	PCI DSS	Issues	
All							
Critical	Command Execution	78	A1	2	6.5.1	6	
High	SQL Injection	89	A1	1	6.5.1	9	
High	File Inclusion	98	A4	13	6.5.8	1	
High	File Upload	434	A5	9	6.5.8	6	
High	PHP Object Injection	502	A4	18	6.5.1	1	
Medium	Cross-Site Scripting	79	A3	4	6.5.7	11	
Low	Session Fixation	384	A2		6.5.10	1	
Low	Cookie Misconfiguration	494	A5	0	6.5.10	5	
Low	Information Leakage	209	A6		6.5.5	2	

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*"When wireless is perfectly applied,
the whole earth will be converted into
a huge brain, which in fact it is, all
things being particles of a real and
rhythmic whole. We shall be able to
communicate with one another
instantly, irrespective of distance."*

~~Nikola Tesla
