TOCANDIRA

Bringing the modern monitoring solutions to Industrial clients

Who we are

We are a deep tech startup that uses data to help clients reach operational excellence in industry 4.0 world solving complex problems though scientific computing, artificial intelligence and machine learning.
This journey lead us to help our clients unlock their data to ensure industrial observability through an open technology. That at the same time can be adaptable, modern, robust and cloud native. **Making impossible possible this is our way to work.**

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The context behind Tocandira

Why it came to be

Bringing open technologies to observe industry

- Collecting and displaying data is a fundamental part of the 4.0 industry.

- Adoption of new technologies in industry is usually slow and with high TCO due to proprietary solutions

- Integration is hard because each vendor have it's own protocols and standards

- World is changing fast and to keep up with it data availability and open standards are needed ensuring interoperability between different technologies

- Open Source cloud and edge technologies demonstrated it's robustness through the years and are well adopted in IT wold to build several kinds of solutions

Bringing open technologies to observe industry

- To overcome this we are bring into the industry 4.0 world:

  - Open source

  - Intuitive

  - Based on open standards (openTSDB, APIs, protocols, etc)

  - Cloud native

  - Runs in everywhere (PCs, Edge, IPCs, Single Board Computers, etc)

  - Highly integrable with a large number of protocols and open API to extend functionalities

  - Based on well established applications to collect and observe data

How to tackle the problem

It is <u>not</u> a new problem!

For quite some years the IT community has been focusing on observability, thus several open–source projects now exist to handle each part of the problem.

Tocandira comes into picture to:

- Gather those IT tools and help you configure a scalable and open source historian;

- Collect data from different PLC vendors;

- Save it as much as the hardware allows to;

- Grant the user all the connectivity it deserves.

Simplified View

Key technologies and their connections

Deploy

Easy deployment of the whole tool with **Docker** Containers, be it locally or in the Cloud !

Connect

Bring your Automation Network together with **Eclipse 4diac Forte**, an IEC61499 service with a layered network interface and several protocols available to fit your needs.
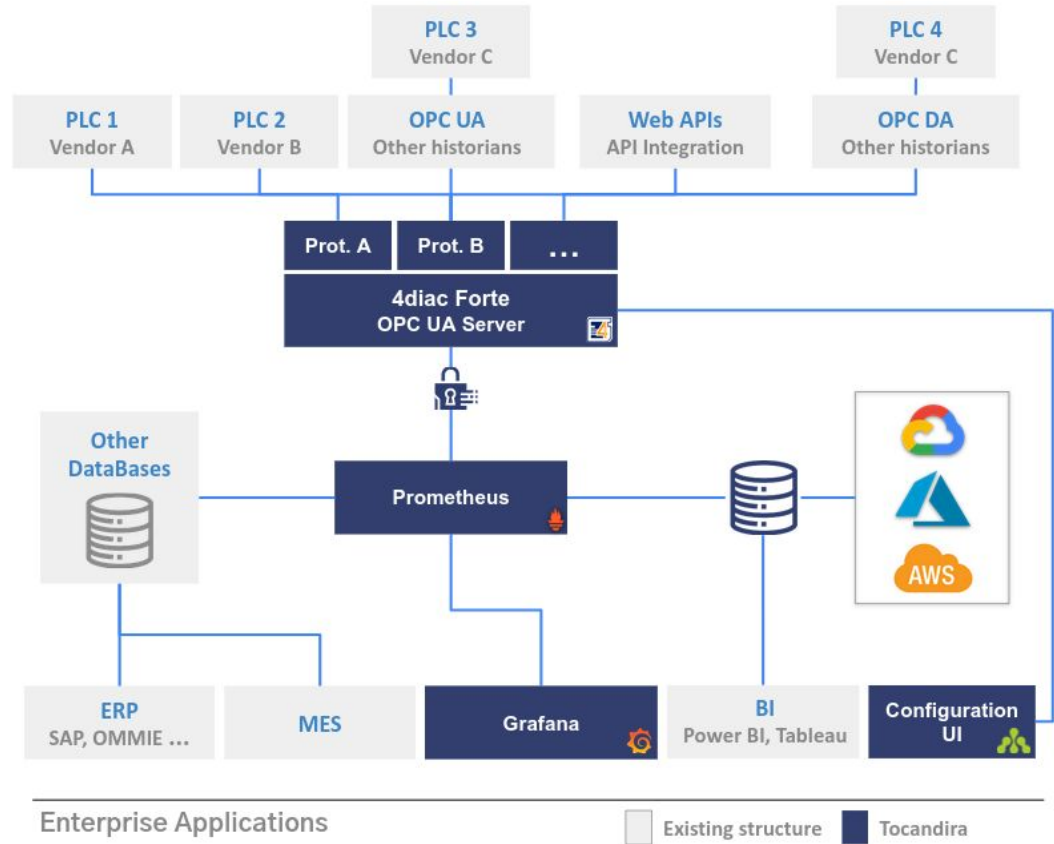
Gather & Store

Keep your data with **Prometheus**, one of the most reliable and performatic tools of the category.

Analise

Build your custom dashboards and reports with **Grafana**, an intuitive and powerful tool to monitor just everything.

Sensors, Devices and Automation Systems

PLC 3
Vendor C

PLC 4
Vendor C

PLC 1
Vendor A

PLC 2
Vendor B

OPC UA
Other historians

Web APIs
API Integration

OPC DA
Other historians

Prot. A   Prot. B   ...

4diac Forte
OPC UA Server

Other
DataBases

Prometheus

ERP
SAP, OMMIE ...

MES

Grafana

BI
Power BI, Tableau

Configuration
UI

Enterprise Applications

Existing structure   Tocandira

Key Features

Why it is proposed this way

NOT Reinventing the Wheel
Every technology chosen for this stack is the cutting edge of it's field and the majority of them are well known in the IT world.

NO huge servers needed
It's components can run though several machines and consume little resources. It even runs on single board computers.

Micro-Service Based
All services composing this application are truly independent and linked only by configurations.

NO tag Limits
Enough of charging for every variable read, the limit is only your hardware or the cloud capacity.

Cloud Native Architecture
These packages are usually applied for observability in IT world, and are therefore fully compatible with cloud environments, from instances to databases.

License FREE
None of the components have any commercial licencing, not even the OS !

How to deploy on Industries

A successful use case of Tocandira

The Client

Fats and oils industry

6 extraction industries and **2** refineries

Supporter of family farming and organic production

Brazilian top Palm Oil refiner with **170 thousand tons** produced per year

12 international sustainability certificates

5300 Employees

Their problems

Lack of Process Data visibility and Historical Analysis
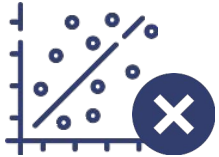
Lack of correlation between Process Variables & Quality measurements

Inconsistencies in SAP system that could not be easily explained

Observability & Integration

Solution Design

Hardwares with embedded Software

Tocandira Main

x86_64, 8Gb Ram, 2Ghz Cpu

- ○ Small PC with a storage enough to handle 2 years of data.
- ○ Prometheus, Grafana the and Configuration UI

Tocandira Edge

Armv7, 2Gb Ram, 1.8GHz Cpu

- ○ Single board computer in a Din-Rail Enclosure
- ○ Eclipse 4diac Forte
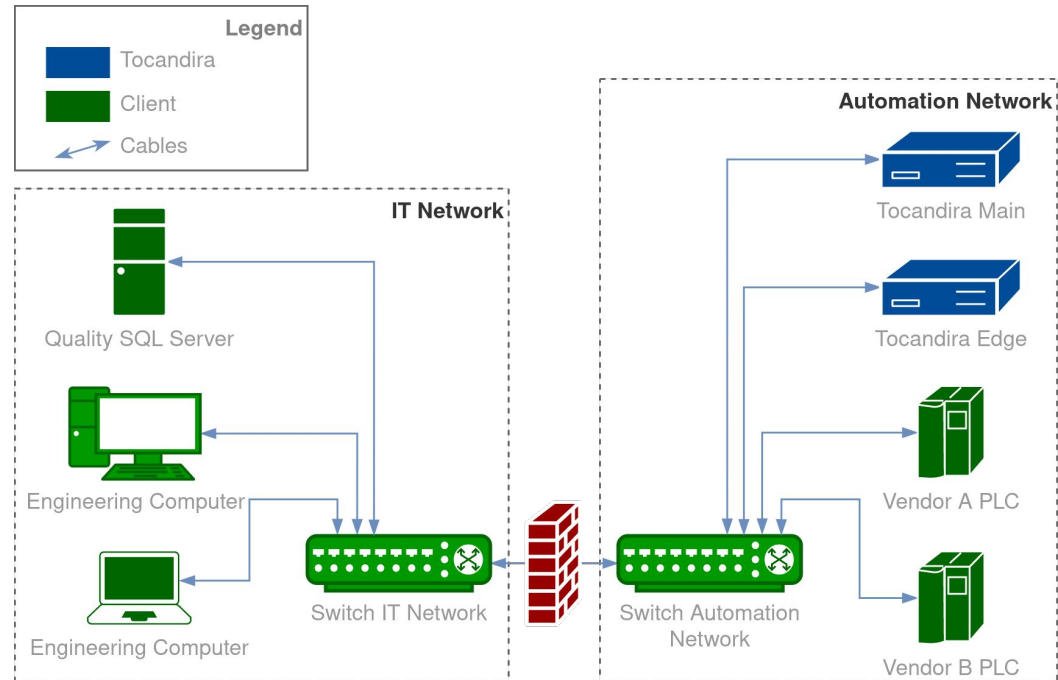
Implantation Schedule

Hardwares assembly and setup with Tocandira (**2 days**)

Training the Automation Team to configure, add and remove TAGs (**1 day**)

Training the Engineering Team to consume the Data and build Dashboards (**2 days**)

Tocandira's connection to other DataBases (**imediate**)

Instantaneous benefits

Flexibility to include/edit TAGs, including from new PLCs

Dashboards to monitor data in real time

Process variables available to be correlated with Laboratorial data

Agility to investigate process deviations

Historical data available for analysis

Client Usage

How it started

2 PLCs

80 Tags

4 Dashboards

3 Users

How is it going
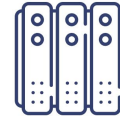
7 PLCs

494 Tags

32 Dashboards

26 Users

Client Usage

- Configuration UI

- Process data Dashboards
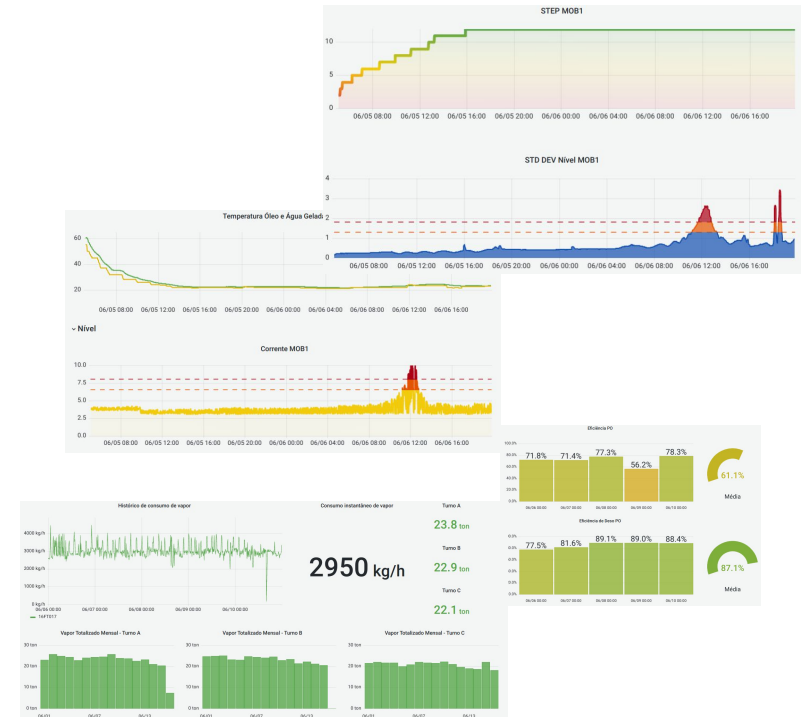
So it is online, now what is next?

Climbing the steps towards industry 4.0

- To know your process and own your Data is one of the requirements on the journey to have a 4.0 Industry.

- On such a basic step we don't think that it is worth charging for the tool. That's why this is an **Open Source** project.

- Once you can really observe what is happening, it will be evident that some parts need improvements. That is where we begin to insert more technologies:

  - Advanced Controls

  - Real Time Optimizations

  - Digital Twins

  - Smart sensors & IoT devices

Thank you !

https://github.com/Aimirim-STI/Tocandira

https://projects.eclipse.org/projects/iot.tocandira

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