IOT TRAINING WORKSHOP FOR THE INDUSTRY

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Overview

The presence of IoT devices is exponentially growing. According to this trend, all systems will be virtually connected to the Cloud and the information will be managed by platforms hosted on Cloud Computing services.

The industrial environments don't escape this trend and it is expected, like in the rest of the fields, that the development of IoT solutions prevail in the coming years.

For this reason, it is of great importance that the industry professionals stay updated and learn about the implementation of IIoT solutions.

Learning environment

The workshop will be held online, in a virtual classroom, where students will be able to interact with the instructor and among their colleagues at any time. It's composed of lectures, Power Point presentations and practical exercises. It will be an open and friendly environment that encourages discussion and participation. Attendees will be able to expose their own connectivity issues in order to learn from each other.

Materials included

- Manual and exercise guide in digital format.
- Power points with extra material.
- Annexes in digital format.
- Access to the virtual classroom.
- Digital diploma of successful completion by VITC.

*All the necessary material will be sent by mail before the first day of Workshop.

Objetives

In this training the participant will learn how to implement a project from start to finish under the concepts of IIoT.
To achieve this the workshop is divided into technical objectives focused on 3 fundamental aspects of IIoT: SWN (wireless sensor networks), WLAN and WPLAN (wireless LAN and personal LAN), IIoT gateways and cloud computing services. This tools will give the participant the necessary knowledge to start using, designing and implementing IIoT solutions for the industry.

Practical exercises

The workshop has a predominant focus on practical exercises that are structured in a sequence that allows the participant to design their own IIoT project from scratch. At the end of this training the participant will have implemented their own application.
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Workshop schedule

Fundamental concepts of IoT

The IoT market today
IoT products and services
Verticals of IoT market
Brands involved in IoT

IIoT Architecture

Architecture diagram
Sensors level
Gateway and networks level
Service level
Application level

IIoT Networks

Wireless networks: LAN · WLAN · WAN · PAN, WPAN · LPWAN
ISM bands
ZigBee
6LoWPAN
LoRa
SigFox
Mobile networks
WIFI
Bluetooth
*Exercises

*There will be 3 "IoT Ready" wireless technology sensors for measuring temperature, humidity and air quality, as well as an LPWAN network coordinator that synchronizes sensors. The objective is to configure the sensor network from the start.
The student will participate in the sensors configuration, up until they are fully working.
This setting will be used for subsequent exercises.

Workshop schedule

IIoT Gateways

Data treatment
Edge computing
Protocol conversion
Typical architecture
IoT Gateway levels
*Exercises

*Each participant will have a virtual machine that will have its own IoT Gateway installed. The student will connect the IoT Gateway with the previously configured sensor data.
The participants will be able to do data processing such as structures, analysis, scaling and historization.

IIoT Application Protocols

Protocols structure
MQTT
OPC UA
REST API
JSON format
*Exercises

*Using the previously configured IoT Gateway, each participant will make 3 configurations:
- Data output by MQTT, which will be tested with the Virtual Machine test tools given to the students.
- Data output by OPC UA, which will be tested with the Virtual Machine test tools given to the students.
- Data output by REST API, which will be tested with the Virtual Machine test tools given to the students.
- JSON file analysis

Workshop schedule

IIoT architecture with classic industrial systems

Industrial devices
The cloud and the plant floor
IIoT Gateway function
*Exercises

*There will be an industrial PLC, the most traditional style of control systems in the industry.
Using the IoT Gateway, the PLC data will be connected to the IoT Gateway.
Conversion of plant protocol to IoT protocols will be checked.

Cloud services
Market data
Services model
Cloud computing features
IaaS, PaaS, SaaS
Edge computing services

Amazon IIoT Core example
AWS IIoT diagram
MQTT Broker
Rules engine
Device shadows
*Exercises

*This exercise will previously require that each student creates a free AWS IoT Core account.
Using the IoT Gateway configured and connected to the Internet, we will make a connection to the Amazon IoT Core through the MQTT Broker that Amazon has in the Cloud.
We will check message reception on Amazon.
Once the messages have been checked, a data processing rule will be created.
Once the rule is created, a notification service will be sent via email. The participant can receive the data generated via email from Amazon.

Workshop schedule

XaaS Example

Architecture diagram
EC2 Web hosting
PaaS Cloud hosted platforms
Saas Software hosted in the cloud
*Exercises

*There will be a PaaS platform hosted on Amazon. This platform will allow the student to perform the following exercises:
- Send sensor data to the cloud.
- Historical data.
- Store and forward data.
- Create web display screens such as graphics, real-time data, etc.
- View sensor data in a web page form a smartphone or any device with a web browser.

Workshop information

Training duration:

3 days

Format:

Online

Face to face

Private

Language:

English

Spanish

Contact:

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