

Čo sa na seminári naučíte:



The goals

- Exploring IoT Data from End-To-End.
- Educate developers on the IoT stack offered by Microsoft
- Educate developers on the Universal Windows Platform (UWP)
- Educate developers on the Azure services related to IoT
- Educate Architects & Designers on Azure IoT Solutions

By the end of this Lab Extreme you will be able to

- Build an IoT device using the Raspberry Pi 3
- Build a UWP app for Windows IoT Core to run on the Raspberry Pi 3
- Use Windows IoT Core and the Raspberry Pi 3 to both capture input and present output
- Create and configure an Azure IoT Hub to manage device-to-cloud and cloud-to-device messaging
- Connect a UWP application running on the Raspberry Pi 3 to an Azure IoT Hub
- Build a data pipeline that captures and stores data coming into an IoT Hub
- Build a visualization of IoT data on Power BI Dashboard
- Build a client application that can send a command to the IoT device via Azure
- Create an Azure Functions for pre/post processing a non-telemetry data

You will have a full picture from the Device-To-Cloud and Back to build your Azure IoT Solution Sessions

- **Device** (1 day)
- **Azure IoT Infrastructure** (2 days)
- **Azure IoT Solutions** (1 day)

Session Device: **Raspberry - Windows IoT Core - Visual Studio 2017**

- Setting up Development machine and RPi3
- Using VS 2017 to build a UWP app for Windows IoT Core to run on the RPi3
- Using VS 2017 for deploying UWP app to the RPi3
- Using VS 2017 for Remote Debugging and Tracing a UWP device app
- Build an IoT Device using the Raspberry Pi3
- Connect the IoT Device to Azure IoT Hub
- Microsoft Azure Device SDK for developing an IoT Device
- MQTT Device protocol
- Sending telemetry to the Azure IoT Hub

Session Azure IoT Infrastructure: **Azure IoT Pipeline Components**



- Azure IoT message exchange patterns
- Telemetry and non-telemetry path
- Device-To-Cloud and Cloud-To-Device Messaging
- Azure IoT Data pipelines
- Setting up Azure IoT Hub, Stream Analytics, Service Bus, Storage, etc.
- Exploring Azure IoT Hub endpoints
- Using Azure IoT Hub to Route IoT Data
- Using Azure Stream Analytics to Process and Route IoT Data
- Create the Stream Analytics Job
- IoT tools (Device Explorer, IoT Hub Tester, Service Bus Tester, Storage Explorer, etc.)
- Using Azure Functions for IoT Data pre/post processing
- Visualize IoT Data with Power BI
- Using Virtual MQTT Devices in your IoT Solution

Session Azure IoT Solutions: **Architecture and design models for IoT Solutions**

- Azure IoT Stack Model
- Real demonstration of the End-To-End IoT Solution with RPi3 device
- Monitoring, troubleshooting and simulation of the Azure IoT Solutions
- IoT Decision Model
- Optimization and pricing Azure IoT Solutions
- Using Raspberry Pi3 for IoT Field Gateway
- Q&A

Software Technologies

Microsoft Windows Azure Platform with services such as Azure IoT Hub, Stream Analytics, Visualizing Data on the Power BI, Azure Service Bus, Storage, Azure functions, Azure IoT Hub Routes, Device Twin, Device Method, Device Job, etc.

Tools

Device Explorer Twin, Azure IoT Hub Tester, MQTTBox, Windows 10 IoT Core, Visual Studio 2015, Programming language C#, Microsoft Windows Azure.

What you will learn

- How to create a demo program for DHT 11 sensor (temperature + humidity) with c# programming using the UWP (Universal Windows Platform),
- How to create a bootable image package for microSD card of the Raspberry RPi3,
- How to remotely debug and trace a demo program with Visual Studio 2015,
- How to integrate Raspberry Pi3 with Azure IoT Hub,
- How to create a job for Azure Stream Analytics,
- How to visualize a real-time telemetry data for Power BI Dashboard,
- How to generate a broker message for Azure Service Bus Topic,
- How to create a job to send a message back to the device such as Raspberry Pi3,
- and ...