

## Session 1

### **Deploying a practical and scalable cybersecurity solution for the IoT revolution**

Time: 9:00 – 9:40

Speaker: Asaf Ashkenazi, Rambus

An estimated 8.4 billion connected ‘things’ are deployed across the world today. However, the rise of the IoT exposes a wide range of vulnerabilities that can be exploited by cyber criminals and other malicious actors.

In this presentation, we will explore a number of emerging security challenges, including hijacked IoT devices that execute DDoS attacks against critical services. We will continue by presenting Rambus end-to-end IoT security solution to protect IoT endpoints and their services from various attacks. We will conclude by exploring how ST hardware security is leveraged by Rambus IoT security service to provide a rapid time to market solution that allows IoT players to securely unleash the economic benefits offered by the IoT revolution.

### **Implementing Authentication and Data Protection on STM32F7x0 Value Line MCUs for Real-Time IoT Devices**

Time: 9:50 – 10:30

Speaker: Drake Smith, secureRF

The STM32F7x0 line of high performance microcontrollers with secure architecture is well suited for use in connected devices. STM32F7x0 MCUs come with hardware acceleration for AES encryption, GCM/CCM, and SHA-2—cryptographic primitives that help perform data protection and digital signature verification.

This presentation will introduce a fast, small-footprint key agreement protocol and a digital signature algorithm that round-out the STM32F7x0’s security offering. Attendees will learn why these two public key methods are so critical to providing strong identification and authentication today, and how this easy to use software-only library can be quickly incorporated into their STM32-based products.

### **ST IPAD™ technology: a key enabler for IoT miniaturization**

Time: 10:40 – 11:20

Speaker: Jeff Halbig, STMicroelectronics

STMicroelectronics proprietary IPAD™ (Integrated Passive and Active Devices) technology is leading the way in reducing the footprint of peripheral electronics surrounding intelligent ICs. In addition to resistors, capacitors, and inductors, IPAD can also incorporate ESD diodes and TVS functions for high density protections, filters, and impedance matching circuits. In this discussion, attendees will learn how the broad ST portfolio can help reduce size and cost of their IoT devices.

### **Multi-Protocol STM32WB Wireless MCU brings advanced connectivity to the Connected-Home, Lighting, Wearables and more**

Time: 11:30 – 12:10

Speaker: Alec Bath, STMicroelectronics

Connecting your home, smartwatch, fitness gadget, medical device, even your cordless drill to your smart phone is becoming commonplace. Bluetooth low energy is becoming ever more pervasive across new devices and applications.

High-performance Bluetooth low energy applications require a solution that meets challenging requirements. The multi-core architecture of the STM32WB brings the same ARM Cortex-M4F core with large internal Flash and SRAM memories and the same flexible low power modes as our immensely popular STM32L4 series. What's more, you will also gain a second ARM Cortex-M0 core to manage the onboard 802.15.4 radio.

The STM32WB offers the capability to run Bluetooth low energy, Thread, Zigbee or your own 802.15.4-based protocol stack, and run them concurrently! This will allow you to run a Zigbee-based mesh network of smart lights and still maintain a Bluetooth low energy based smartphone connection using the same device!

This session covers a variety of wireless connectivity applications and wireless protocols available in the 2.4GHz ISM band. Other topics include security, multi-role applications, over-the-air firmware upgrade, benefits of multi-core and more!

### **Fault Prediction with Vibration Sensing**

Time: 1:00 – 1:40

Speaker: Vipin Bothra, STMicroelectronics

Concept of fault prediction has been around for many years and one classic example is the use of piezo sensors in checking motor health to predict wear down or use of ultrasound sensors to detect pipe leak. However not only that traditional sensors are bulky, and expensive, they are also very power hungry, leading to a very limited use case. STMicroelectronics is fueling innovation in predictive maintenance with a wide range of sensors that are compact, low power and accurate enough to implement fault prediction by means of Motion, Temperature, Humidity, Ultrasound and Vision sensors. Combining ST's sensor solutions with low power STM32 MCUs, power management and connectivity enables users to quickly start prototyping for sensing, analyzing, predicting and communicating important service information. This presentation will cover:

- Solutions for sensing, processing, connectivity and Security
- HW/SW for evaluation boards, low level drivers, middle ware libraries, SW functional packs.
- Latest developments in Sensors, Arm Cortex based STM32s and connectivity.

### **Bluetooth® Low Energy (BLE) for Industrial applications**

Time: 1:50 – 2:30

Speaker: Hary Radakichenane, STMicroelectronics

This class will focus on the key challenges of designing Bluetooth® low energy (BLE) IoT nodes for Industrial applications. Range, reliability, security, and proximity detection are among the most important aspects in this application space. To effectively address them, three key technologies will be discussed in details: Bluetooth Mesh, BLE Beacons, and simultaneous BLE and Sub-GHz

communication. Participants will learn how to understand their key performance indicators and how to leverage on ST solutions for developing their Industrial applications.

### **Ultrasound technologies for Non-Destructive Testing and Medical Imaging applications**

Time: 2:40 – 3:20

Speaker: Piercarlo Scimonelli, STMicroelectronics

Ultrasound can be used to measure distance, identify direction, and evaluate size, speed and movement of objects. In this presentation, the theoretical foundations of ultrasound imaging will be explored, the fundamentals of the underlying mathematical will be presented, and the theoretical and practical explanation of the basics of Ultrasound Imaging on the medical field will be described together with an introduction to the emerging industrial Non-Destructive Testing application.

ST Ultrasound pulsers, development boards, and tools will be presented in a live demonstration in order to reinforce key concepts.

### **Wireless Power Transfer: EMC Considerations for Inductive Wireless Charging**

Time: 3:45 – 4:25

Speaker: Shizen Shresta, Würth Elektronik

Introduction to wireless charging coil technologies and application challenges with a brief product overview of Würth Elektronik Qi inductors and coil selection tools.

### **Wireless charging in consumer applications**

Time: 4:30 – 5:15

Speaker: Paolo Battezzato, STMicroelectronics

Wireless Battery Charging transmitters are expected to become ubiquitous, allowing consumers to leave their cables at home and charge their portable/ wearable devices anywhere by means of electromagnetic induction used to transfer power from a WBC transmitter (TX) to a receiver (RX) in the device. This presentation will cover both the transmitter (STWBC family) and the receiver (STWLCxx family of Dual-Mode receivers) solutions for applications from 1W up to 15W.

## **Session 2**

### **Cloud Connected IoT Sensor Nodes with STM32**

Time: 9:00 – 9:40

Speaker: Manuel Cantone, STMicroelectronics

In this session, we will present the various solutions from ST to connect your IoT node to AWS IoT Core, Microsoft Azure IoT Hub and IBM Watson IoT. The IoT node will transmit sensor data and receive commands to and from Cloud services. These SW packages can jump-start any end-to-end

IoT development, saving time in the integration of the different basic functions needed for a sensor-to-cloud development environment.

### **Learn how to connect your next IoT design to the Cloud using IBM Watson IoT Platform and the ST Discovery Kit IoT node**

Time: 9:50 – 10:30

Speaker: John Walicki, IBM

This track will discuss how to integrate sensors, wireless connectivity (WiFi), a low-power microcontroller and sensor libraries into your next IoT design. You'll then learn to connect the Discovery Kit to IBM Cloud and Watson IoT Platform to create a new application in minutes using Node-RED.

### **Unicleo GUI to Evaluate and Configure SensorTile**

Time: 10:40 – 11:30

Speaker: Mauro Scandiuzzo, STMicroelectronics

The ST SensorTile is a tiny, square-shaped IoT module that packs powerful processing capabilities leveraging an 80 MHz STM32L476JGY microcontroller and Bluetooth low energy connectivity based on BlueNRG-MS network processor as well as a wide spectrum of motion and environmental MEMS sensors, including a digital microphone.

During this session, you will learn how to do fast evaluation and development based on SensorTile and UNICLEO GUI. Using UNICLEO GUI you can configure run time the sensors without debugger, without writing code in order to achieve a Fast Prototyping, reduce time to market in a plug a play small system solution. We will also give examples of how you can use the SensorTile platform to reduce the time to market using available HW, SW, GUI and algorithms.

### **Verizon STM32L4 LTE Cat-M1: Simplifying Cellular connectivity for IoT Embedded Devices**

Time: 11:30 – 12:10

Speaker: Mike Arenas, Verizon Wireless

The ThingSpace IoT Development Kit with STMicroelectronics combines the hardware and software you need to get your next cellular IoT project off the ground. This development kit enables a wide diversity of applications by combining best in class processing, cloud capabilities, credited Verizon open development end-device certification, and an IoT developer plan.

### **Accelerate your IoT Solution with LoRaWAN™ and machineQ™**

Time: 1:00 – 1:40

Speaker: Ross Gilson, machineQ™ - a Comcast company

LoRaWAN™ provides long range and low power wireless connectivity to sensors that can potentially be deployed for a decade or more. Hardware with this deployment lifespan needs to have a reliable and cost-effective way to be updated over the air (OTA).

This session will cover the various capabilities LoRaWAN provides to upgrade devices, how to transition between device “classes” and how updates to the firmware should be packaged before being sent to the end devices.

machineQ offers firmware update over-the-air (FUOTA) reference implementations on the ST Micro Discovery development kit, allowing customers to quickly get up to speed and quickly implement FUOTA on their end devices.

### **How to Design a NFC Reader Application: a Step-by-Step Approach**

Time: 1:50 – 2:30

Presenter: Daniel Merino, STMicroelectronics

This presentation will focus on the key challenges of designing a NFC reader application. Product selection, Antenna tuning, Layout optimization, Read Range, Noise reduction, Power Consumption optimization, Testing and Certification are among the most important aspects in this application design space. Participants will learn how to develop a NFC Reader application leveraging ST High Performance Reader ICs and evaluation tools.

### **Sensing at the Speed of Light: Introduction to ST’s Time of Flight Technology**

Time: 2:40 – 3:20

Speaker: John Kvam, STMicroelectronics

ST has developed and patented its own technology, called FlightSense™, using Time-of-Flight (ToF) principle in order to propose a new generation of high-accuracy proximity sensors. In this session you will learn how ST’s Time-of-Flight sensor works, how to integrate it into your design and understand key performance indicators. You will also go through an overview of the Evaluation Kit and supporting GUI.

### **New Developments in Stepper Motor Drivers**

Time: 3:45 – 5:00

Speaker: Giovanni Tomasello, STMicroelectronics

Stepper motors are widely used in several fields: automation, packaging machinery, labelers, medical diagnostic equipment, aircraft controls, camera and security systems... wherever position control is required. This presentation discusses products and tools (hardware and software), from the STSPIN family, that will allow the final user to easily configure and control a stepper motor. Practical examples will be discussed using an L6470 evaluation board and the SPINFamily evaluation tool 3.2

## **Session 3**

### **Teseo LIV3F GNSS Module for IoT Hands-on Training**

Time: 9:00 – 11:30

Speaker: Mike Slade, STMicroelectronics

During this hands-on training, attendees will gain familiarity with the Teseo-LIV3F GNSS module's key features and confidence to include positioning in your next IoT design. Attendees will interface to Teseo-LIV3F via the Teseo Suite Tool to configure, test, and visualize the Teseo-LIV3F GNSS Hardware & Software in action. During part of the session, you will also experience sample applications such as Geofencing, Periodic Power Moding, and others to get a quick real world feel for the capability.

SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED. Must be present, have a WINDOWS PC with administrator rights to participate fully.

### **STM32F7 Embedded Graphics Hands-On Training**

Time: 1:00 – 5:00

Speaker: STMicroelectronics Team

Empowering High-End Graphical User Interfaces for STM32 Microcontrollers – In this hands-on workshop, you will use a STM32F7 Discovery Board and the TouchGFX software framework to create cutting edge GUIs! TouchGFX is designed to take advantage of the graphical features of the STM32F7, STM32F4, STM32H7, and STM32L4+ families.

The hands-on training is a working session. Please bring your laptop either a Windows Laptop (Windows 7, Windows 8, or Windows 10) or MacBook running Windows (Parallels, VM Fusion). Note that Administrator rights are needed for software and driver installation. ST will provide the required eval board and the companion software.

SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED.

## **Hands-on Training Room**

### **Learn how to jump start your next IoT design with the BlueNRG-2 Bluetooth low energy (BLE) SOC and ST sensors - Hands-on training**

Time: 9:00 – 12:00

Speaker: STMicroelectronics Team

This hands-on workshop will show how to simplify the integration of sensors and Bluetooth low energy (BLE) connectivity into your next IoT design using the BlueNRG-2 low power Bluetooth low energy (BLE) System-on-Chip from ST.

The workshop will focus will focus on the BLE protocol and how to develop an embedded application running on BlueNRG-2 System-on-Chip. Participants will learn how to develop a Sensor to Cloud IoT application: acquire sensor data on the BlueNRG-2 evaluation board, transmit them over the BLE link to the ST “BlueMS” mobile application for iOS and Android, and finally post them on the IBM Watson cloud platform.

The hands-on training is a working session. Please bring your laptop either a Windows Laptop (Windows 7, Windows 8, or Windows 10) or MacBook running Windows (Parallels, VM Fusion). Note that Administrator rights are needed for software and driver installation. ST will provide the required eval board and the companion software.

SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED.

### **Rapid Prototyping with MEMS sensors and microcontrollers. A Hands-On Workshop introducing the ST AlgoBuilder**

Time: 1:00 – 3:20

Speaker: STMicroelectronics Team

ST's AlgoBuilder is a complete Development environment enabling quick prototyping of solution that can be built using MEMS Sensors, microcontroller and software building blocks such as algorithm libraries with user's own logic.

AlgoBuilder uses a simple graphical design approach (drag and drop, connect, set properties) for quick prototyping of applications for MEMS sensors and STM32 MCUs.

A wide range of function blocks are available in libraries including motion sensor algorithms, such as, sensor fusion, activity recognition and more. Function blocks can be also created by the user.

C code is generated from the graphical design and combined with binary libraries and FW template for selected STM32 microcontroller. The output of the application is fully functional FW project which can be compiled and immediately used with one of the NUCLEO board to test its functionality.

Unicleo-GUI can be used to visualize, store and playback sensor data and display outputs from running firmware generated by AlgoBuilder.

The Workshop will walk you through some different examples of prototypes using the AlgoBuilder platform and ST's development boards. All participants will receive a FREE STM32L4 Nucleo + X-NUCLEO-IKS01A2 eval boards. Space is limited, first come, first seated

All Participants must have a PC running Windows (7 or 10) with administrator privileges to participate. SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED.

### **Simplifying Integration of Sensors Data, Using the NFC Enabled Multi-Sensors Node, STEVAL-SMARTAG1**

Time: 3:40 – 5:45

Speaker: John Tran, STMicroelectronics

Learn how to simplify the integration of environmental and inertial sensors, NFC Dynamic Tag connectivity, and a low-power microcontroller into your next IoT design using the new STEVAL-SMARTAG1 development kit.

The STEVAL-SMARTAG1 is a sensor node that can sense temperature, humidity, pressure, motion and transmit the data when triggered by an NFC reader. It can be scaled down based on final application requirements. The platform can accelerate the design of applications such as Supply Chain/ Cold Chain monitoring for perishable and valuable goods, asset tracking, Healthcare, Smart Apparel and Smart Packaging and Smart Agriculture among others.

During this session, you will use the STEVAL-SMARTAG1 development kit and the GUI for the ST25R3911B (NFC High Performance Reader/Writer) to configure sensors without a debugger, and

without writing code in order to achieve a Fast Prototyping, reduce time to market in a plug a play small system solution. The workshop will walk through using the development kit and platform to reduce the time to market using available HW, SW, GUI and algorithms.

All participants will receive the Free STEVALSMARTAG1 and ST25R3911B-Discovery development kits and related SW. You must stay for the training session to receive a board.

SPACE IS LIMITED FOR THIS SESSION – FIRST COME, FIRST SEATED. All participants must have a PC running Windows8 or above with administrative privileges.