10th Central and Eastern European Software Engineering Conference in Russia - CEE-SECR 2014

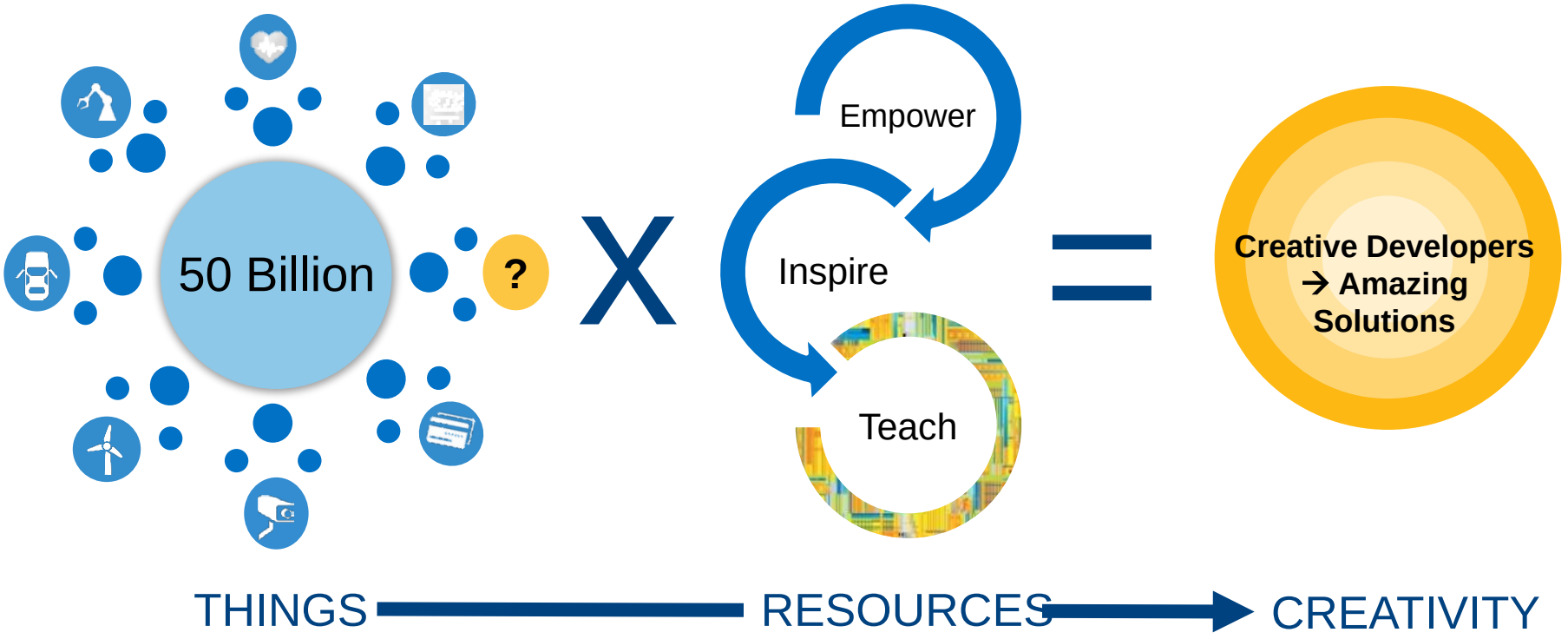
October 23 - 25, Moscow

Интернет вещей: возможности Intel Galileo Gen 2 и Intel Edison

Роман Хатько

Intel

Internet of Things x Resources = Unprecedented Opportunity



Sources: AMS Research, Gartner, IDC, McKinsey Global Institute, and various outher industry analysts and commentarors

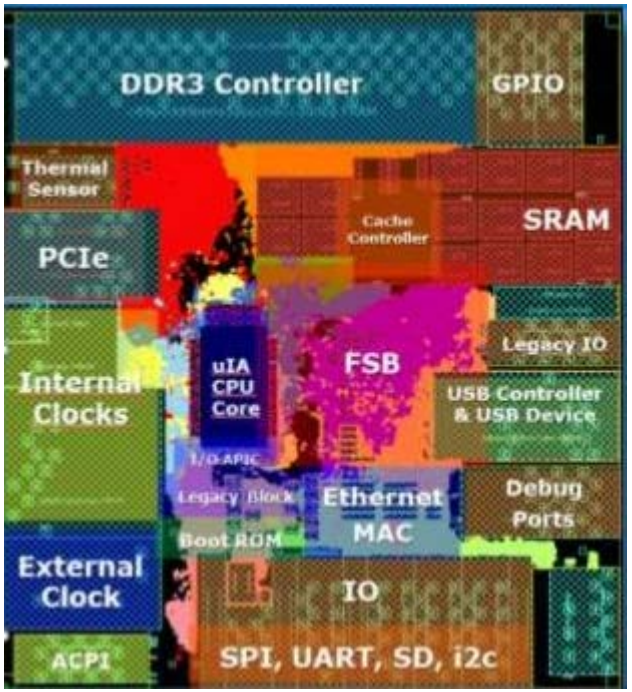
Intel® Quark™ SoC

- Cores/Threads: 1/1
- Rich I/O features include 2 on-chip Ethernet interfaces, PCI Express, USB 2.0, SD/SDIO/eMMC, SPI, UART, and I^2C/GPIO.
- Available ECC, HW-based Secure Boot, extended temperature options (-40° C - +85° C).
- Lithography: 32nm
- Max TDP: 2.3W

15mm x 15mm

Intel® Quark X1000 Core

- **ISA**: Pentium 586, 32-bit, in-order
- **Frequency**: 400 MHz
- **Memory**: DDR3-800, ECC available



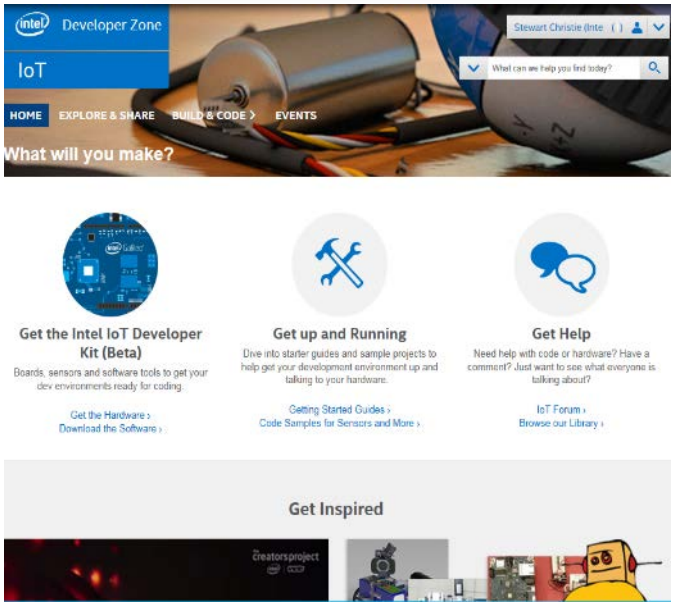
Quark™ X1000 - ark.intel.com

Intel® IoT Developer Program

A comprehensive developer program for hobbyists, students and entrepreneurial developers with outreach, training and tools required to rapidly develop, test and deploy applications for the Internet of Things (IoT).

Program includes:

- Developer kit based on Intel® Galileo and Edison Technology with package of easy to use hardware, software tools, libraries and cloud services
- 10 City IoT Roadshow distributing 1,000 kits
- On-line community for learning, building, sharing



Join the community today at software.intel.com/IoT

Intel® IoT Developer Kit

Developer Kits	Intel® IoT Developer Kit with Intel® Galileo board	Intel® IoT Developer Kit with Intel® Edison board
Hardware		
What's included in box	Board, power supply, cables, LEDs, and other sensors	
	Ethernet	Built-in Bluetooth & WiFi
OS/Image	EGLibC OS Image (Yocto 1.6)	S/W package for Edison
LibMraa/ UPM	Access to low-level I/O + Sensor libs	Access to low-level I/O + Sensor libs Included in Edison S/W stack
C/C++ (Eclipse)	Eclipse IDE (64-bit) for C/C++ dev on Win, Linux, Mac (TBD)	
Java script (XDK)	Java script Daemon	Included in Edison S/W stack
Visual (Wyliodrin)	Wyliodrin Component	-
Arduino	Multi-lib support for Arduino	Included in Edison S/W stack
VxWorks	TBD	-
IoT Cloud Analytics	IoT Cloud Analytics component	Included in Edison S/W stack

The Intel® IoT Developer Kit is a complete hardware & software solution that allows developers who are looking to explore and innovate in the IoT space to create exciting new solutions with Intel® Galileo board and Intel® Edison board

Intel® IoT Developer Kit with Intel® Galileo board

Intel® Edison module

- 22 nm Intel® SoC that includes a dual-core, dual-threaded Intel® Atom™ CPU at 500 MHz and 32-bit Intel® Quark™ microcontroller at 100 MHz
- 1 GB LPDDR3 POP memory
- Flash storage 4 GB eMMC
- WiFi and Bluetooth® Low Energ
- 35.5 × 25.0 × 3.9 mm
- 40 GPIOs: UART, I2C,
  SPI, I2S, GPIO(PWM), USB, Sd card

Intel® Edison - Arduino Development Board

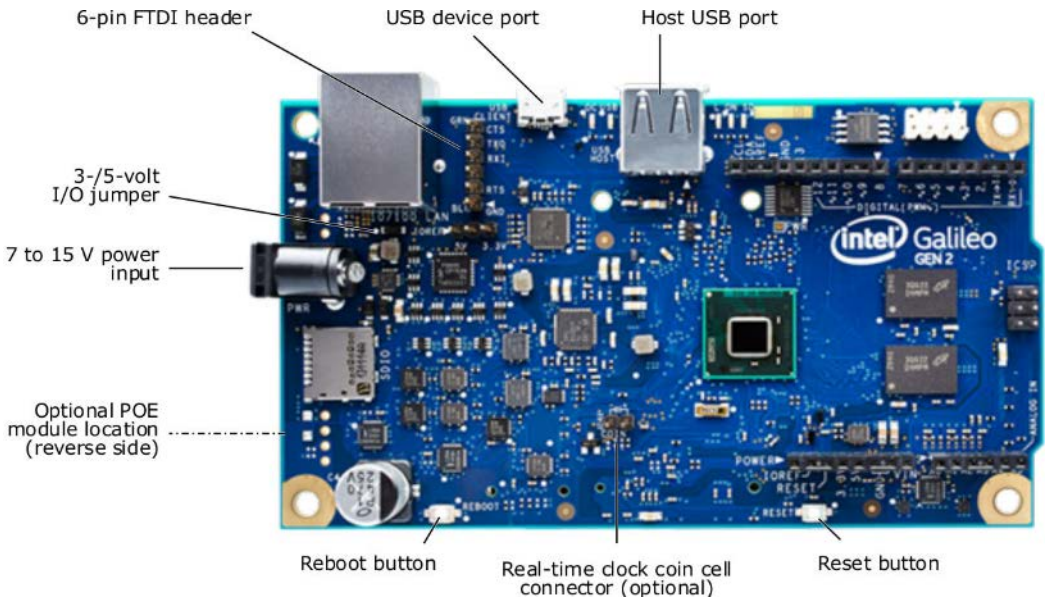
Board I/O: Compatible with Arduino Uno (except only 4 PWM instead of 6 PWM)

- 20 digital input/output pins including 4 pins as PWM outputs
- 6 analog inputs
- 1 UART (RX/TX)
- 1 I2C
- 1 ICSP 6-pin header (SPI)
- Micro USB device connector OR (via mechanical switch) dedicated standard size USB host Type-A connector
- Micro USB device (connected to UART)
- SD Card connector
- DC power jack (7V – 15V DC input)

Intel® Galileo Development Board – Gen 2

Board I/O:

- Mechanically compatible with Arduino Uno
- 20 digital input/output pins including 6 pins as PWM outputs
- 6 analog inputs
- 2 UART (RX/TX)
- 1 I2C
- 1 ICSP 6-pin header (SPI)
- USB device connector (Host)
- Micro USB device connector (client)
- SD Card connector
- DC power jack (7V – 15V DC input)

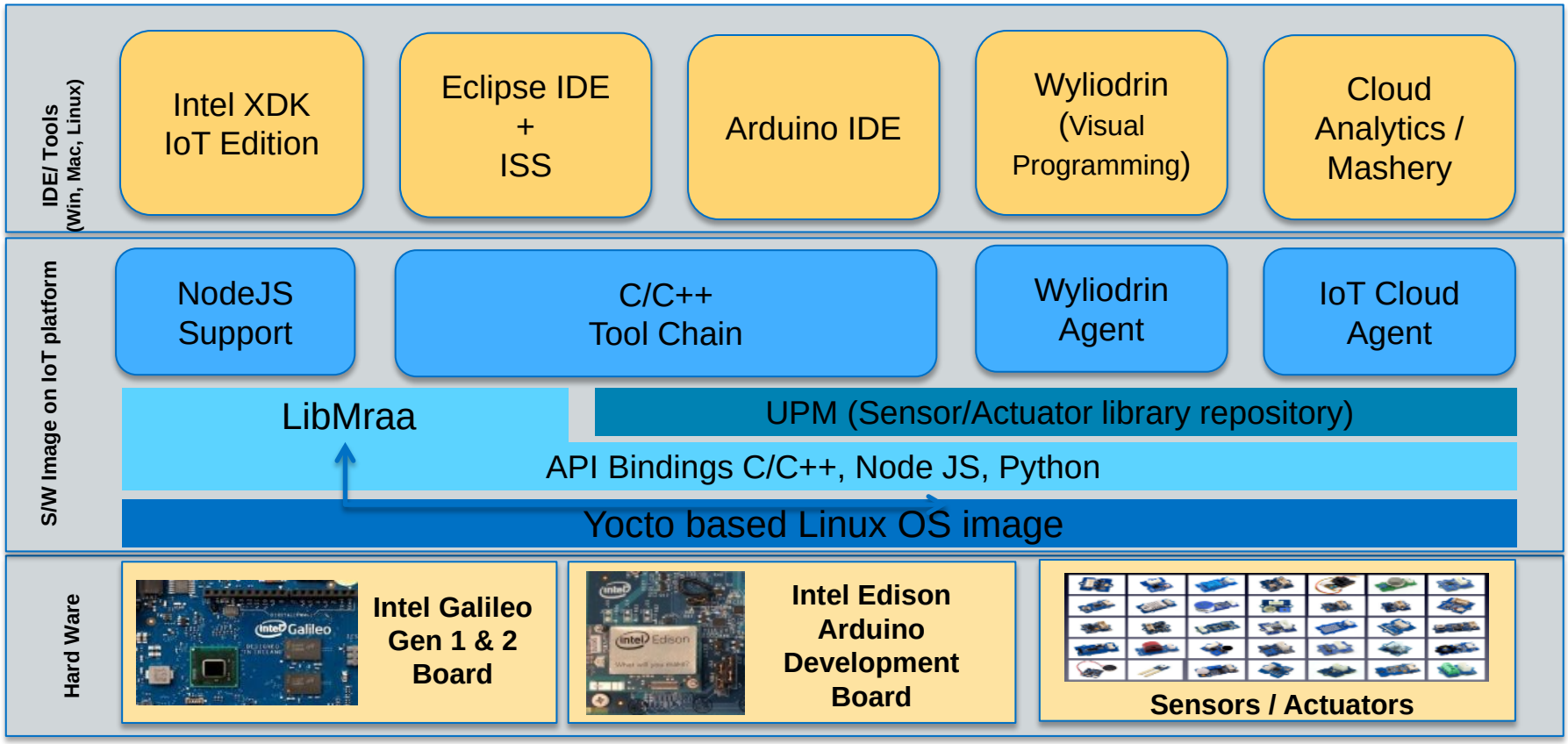


http://arduino.cc/en/ArduinoCertified/IntelGalileo

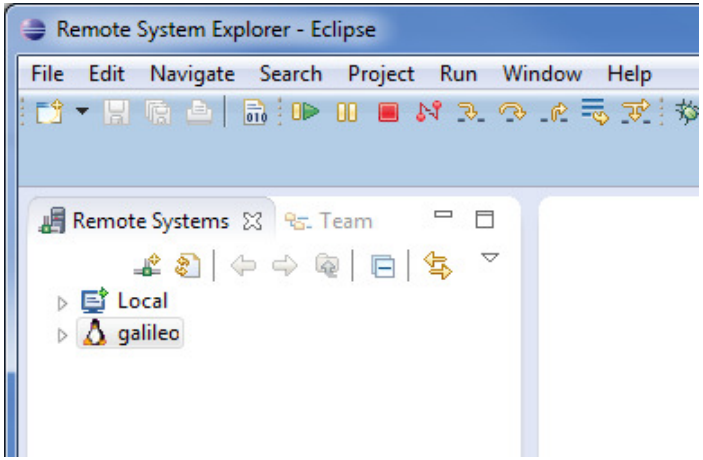
Grove Starter Kit Plus - Intel® IoT Edition

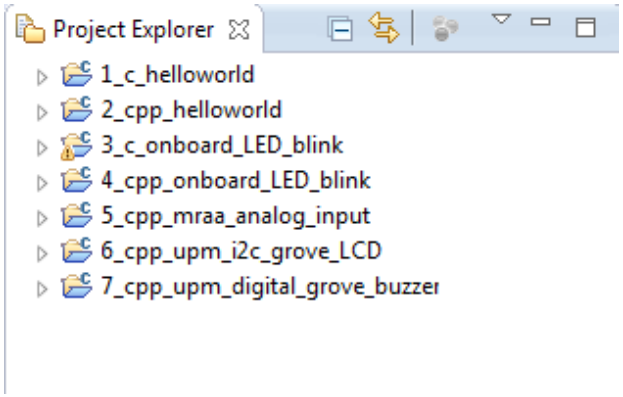
Base Shield
Buzzer
Button
Grove-LED
Sound Sensor
Rotary Angle Sensor
Touch Sensor
Smart Relay
Light Sensor
Temperature Sensor
Grove Cables
Mini Servo
9V to Barrel Jack Adapter - 126mm
DIP LED Blue-Blue
DIP LED Green-Green
DIP LED Red-Red
LCD RGB Backlight

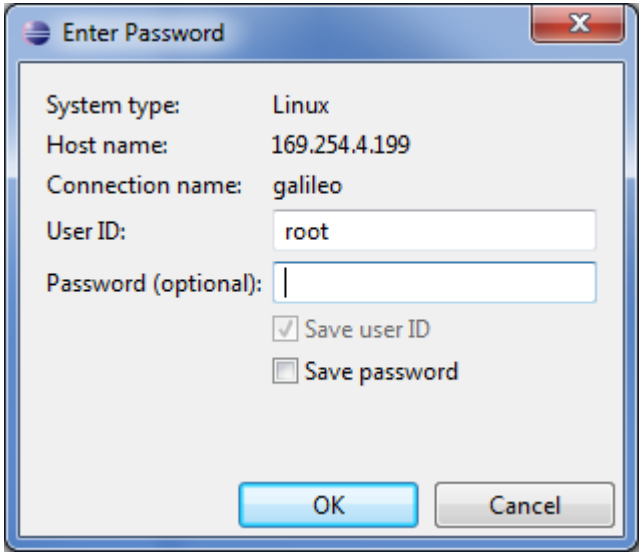
Intel® IoT Developer Kit Components



Developer Kit C++ Tools (beta)



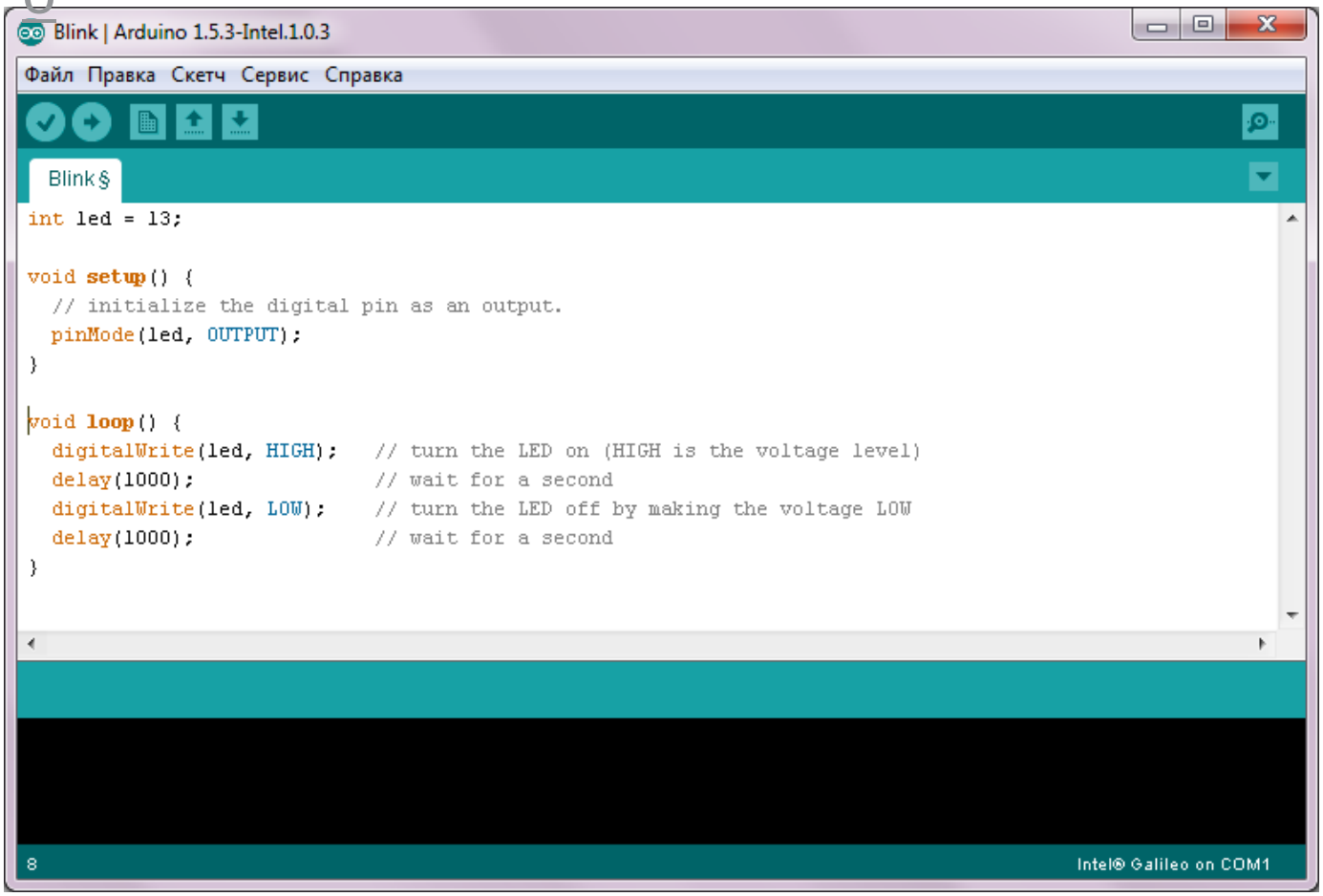




- SSH Connection to developer board for remote GDB server.
- Eclipse tools also work for Arduino Sketch code build and debug
- One IDE for all three supported boards
- Ready to run sample code

Arduino IDE

http://arduino.cc/en/ArduinoCertified/IntelGalileo



Intel® IoT Roadshows

iotroadshow.intel.com

Moscow

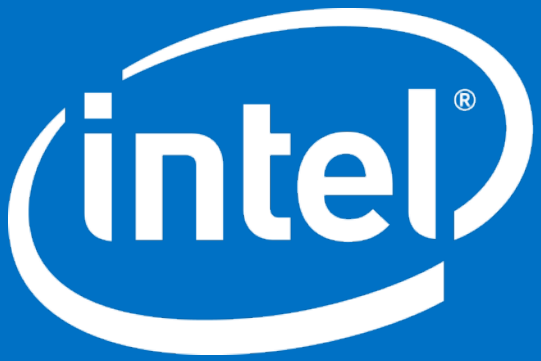
November 22-23

Skolkovo Foundation
Moscow Region
Skolkovo, Hypercube

Join our hackathon and get a **FREE** dev kit!

Next steps

- Visit https://software.intel.com/IoT
- Register and attend Intel IoT RoadShow
  Moscow, November 22-23
  https://iotroadshow.intel.com/


intel