

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

October 23 - 25, Moscow

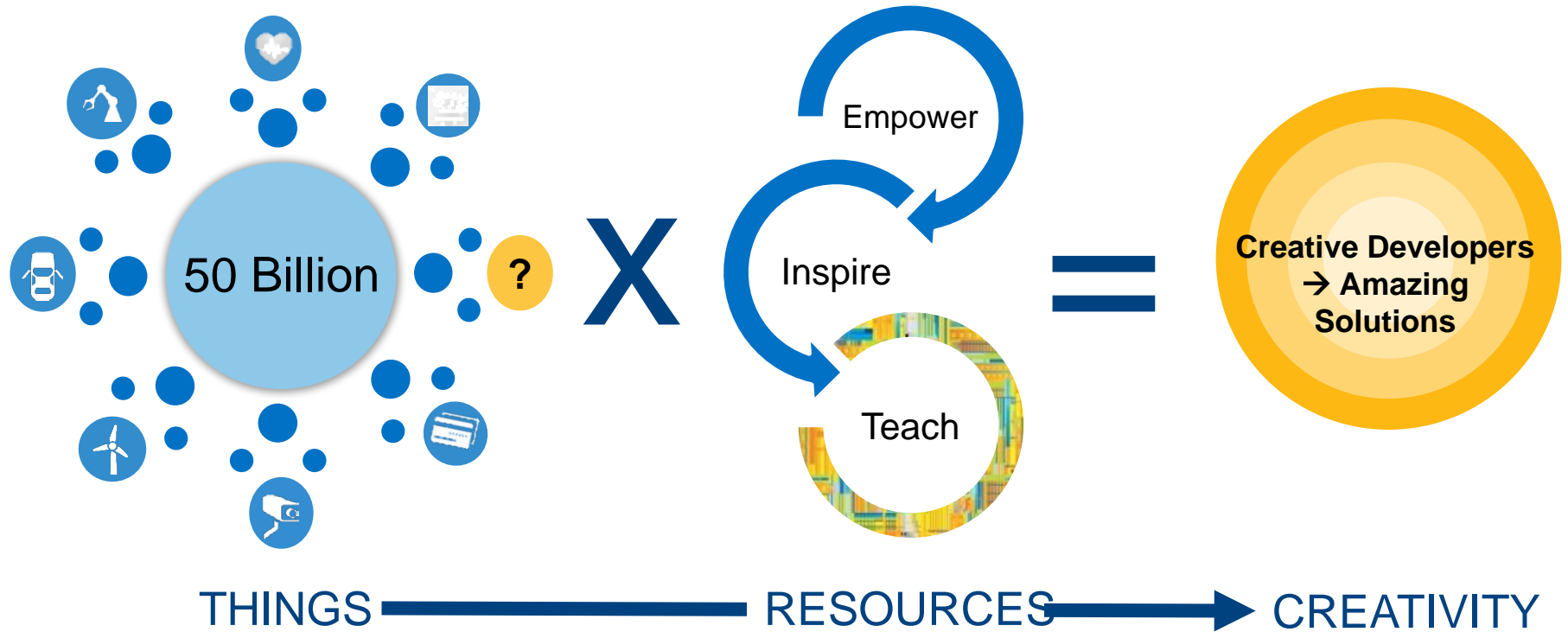


Интернет вещей: возможности Intel Galileo Gen 2 и Intel Edison

Роман Хатько

Intel

Internet of Things x Resources = Unprecedented Opportunity



Sources: AMS Research, Gartner, IDC, McKinsey Global Institute, and various other industry analysts and commentators

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 I²C/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



Get the Intel IoT Developer Kit (Beta)

Boards, sensors and software tools to get your dev environments ready for coding.

[Get the Hardware >](#)
[Download the Software >](#)



Get up and Running

Dive into starter guides and sample projects to help get your development environment up and talking to your hardware.

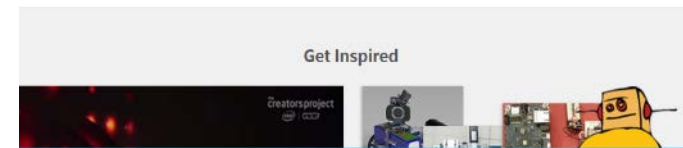
[Getting Started Guides >](#)
[Code Samples for Sensors and More >](#)





Get Help

Need help with code or hardware? Have a comment? Just want to see what everyone is talking about?

[IoT Forum >](#)
[Browse our Library >](#)



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 (Wylodrin)	Wylodrin 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

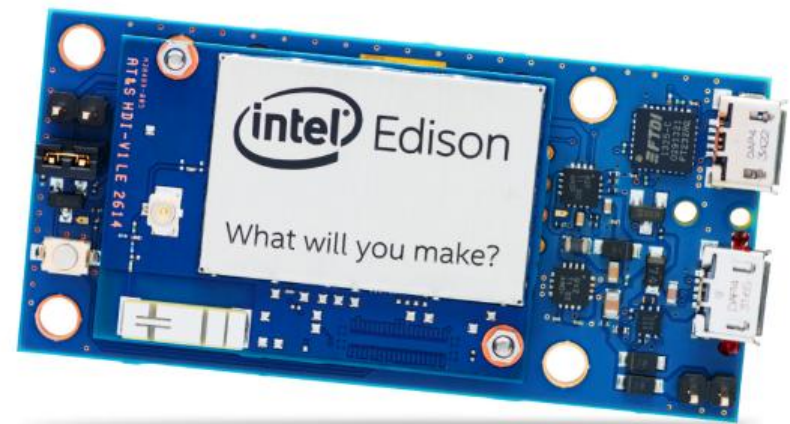
The Intel® IoT Developer Kit is a complete hardware & software solution that allows developers who are looking to explore and innovate in the IoT space to create exciting new solutions with Intel® Galileo board and Intel® Edison board

Intel® IoT Developer Kit with Intel® Galileo board



Intel® Edison module

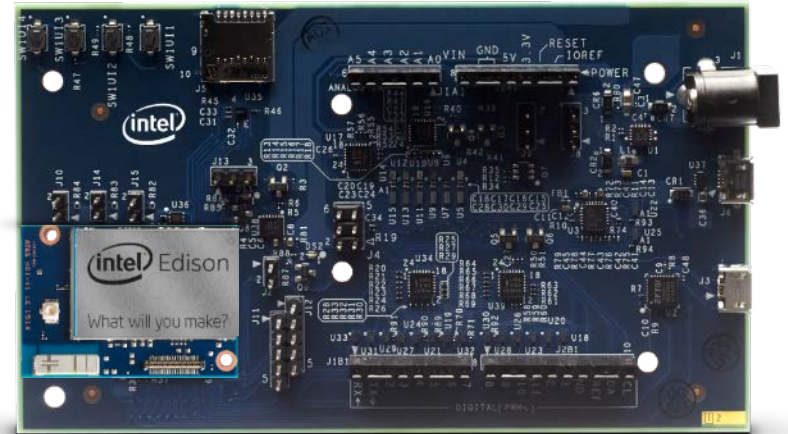
- 22 nm Intel® SoC that includes a dual-core, dual-threaded Intel® Atom™ CPU at 500 MHz and 32-bit Intel® Quark™ microcontroller at 100 MHz
- 1 GB LPDDR3 POP memory
- Flash storage 4 GB eMMC
- WiFi and Bluetooth® Low Energy
- 35.5 × 25.0 × 3.9 mm
- 40 GPIOs: UART, I2C, SPI, I2S, GPIO(PWM), USB, Sd card



Intel® Edison - Arduino Development Board

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

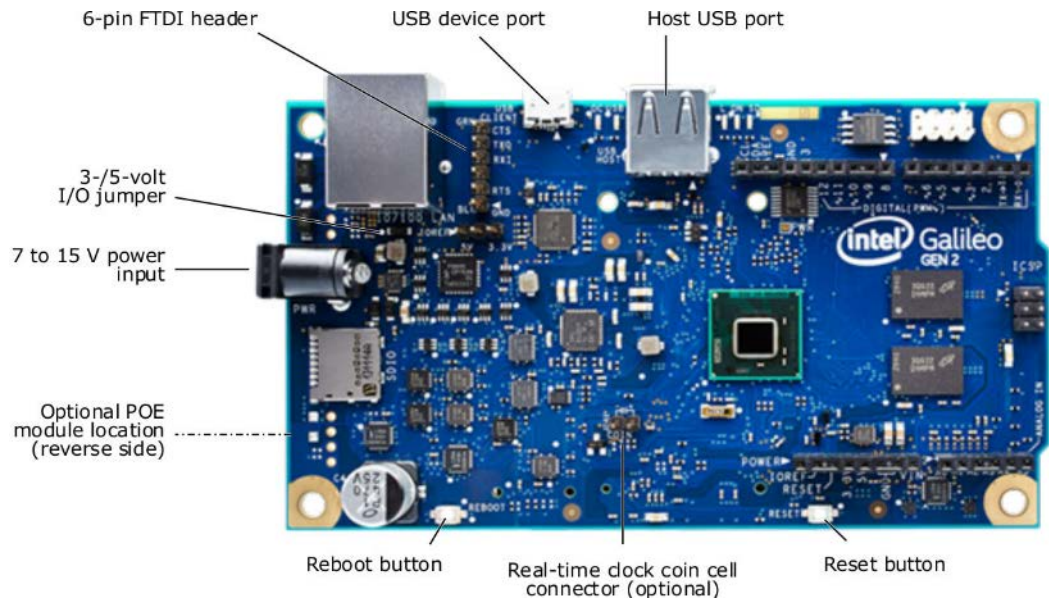
- 20 digital input/output pins including 4 pins as PWM outputs
- 6 analog inputs
- 1 UART (RX/TX)
- 1 I2C
- 1 ICSP 6-pin header (SPI)
- Micro USB device connector OR (via mechanical switch) dedicated standard size USB host Type-A connector
- Micro USB device (connected to UART)
- SD Card connector
-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

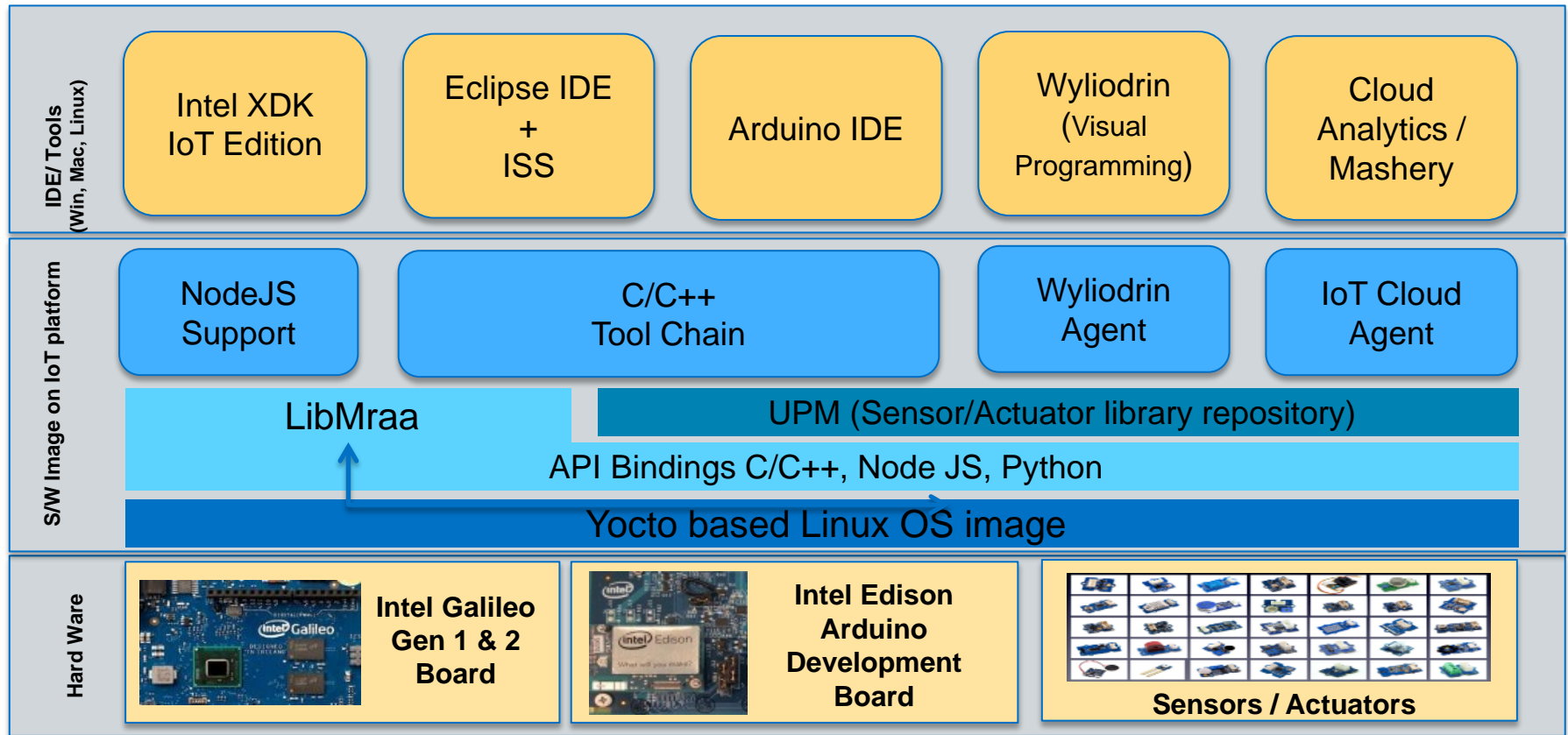
DIP LED Green-Green

DIP LED Red-Red

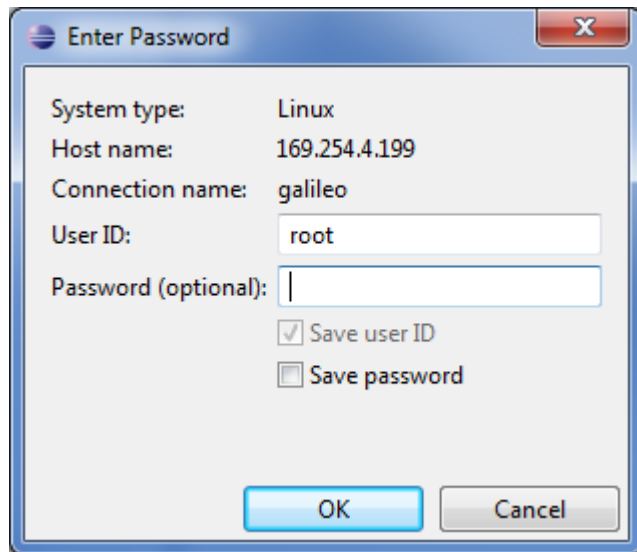
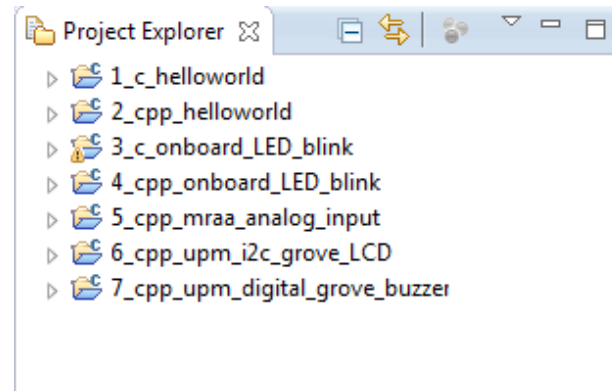
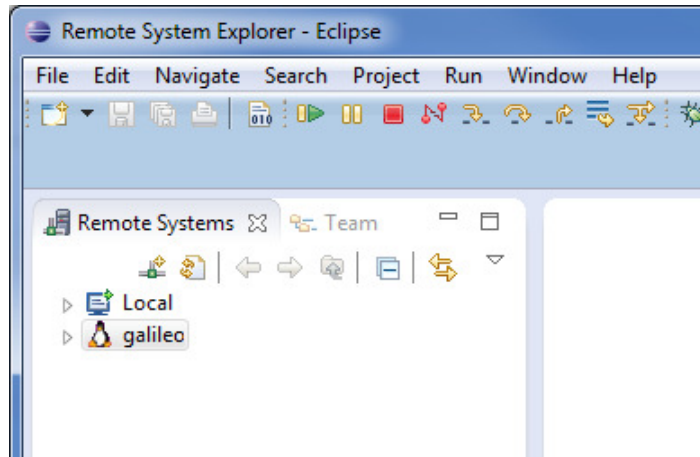
LCD RGB Backlight



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/IntelGalile>



The screenshot shows the Arduino IDE window titled "Blink | Arduino 1.5.3-Intel.1.0.3". The menu bar includes "Файл", "Правка", "Скетч", "Сервис", and "Справка". The toolbar contains icons for file operations and execution. The sketch name is "Blink \$". The code in the editor is as follows:

```
int led = 13;

void setup() {
  // initialize the digital pin as an output.
  pinMode(led, OUTPUT);
}

void loop() {
  digitalWrite(led, HIGH); // turn the LED on (HIGH is the voltage level)
  delay(1000);             // wait for a second
  digitalWrite(led, LOW);  // turn the LED off by making the voltage LOW
  delay(1000);             // wait for a second
}
```

The status bar at the bottom indicates "Intel® Galileo on COM1".

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/loT>
- Register and attend Intel IoT RoadShow
Moscow, November 22-23
<https://iotroadshow.intel.com/>

