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The role of international telecommunication standards in an education program of the SPbSUT

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The Internet of Things Laboratory

■ In December, 27 2013 the first in Russia Internet of Things Laboratory was opened

IoT laboratory equipment

EMBER EM35X-DEV
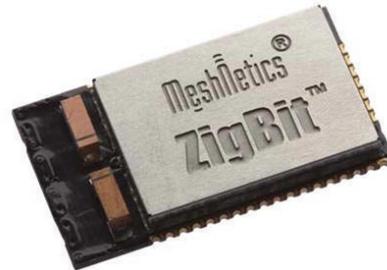
# Simple «Cubes» to create the IoT

4xRaspberry Pi

Arduino DUE

Before
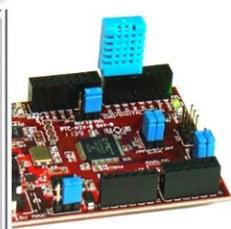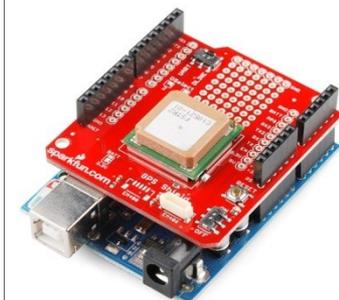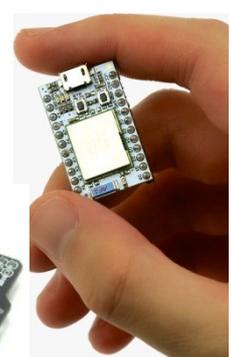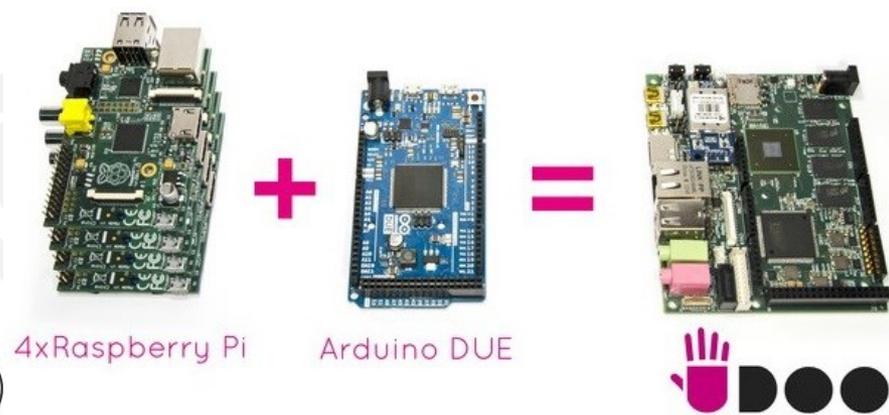
Now

Software Tools

- Traffic generator
  - IXIA IxChariot

- Impairment Emulator Software for IP Networks
  - NetDisturb (latency, delay, jitter, bandwidth limitation, loss, duplication and modification of the packets) and more...

- Simulation Modeling
  - Opnet Modeler
  - Opnet Modeler Wireless suite
  - Anylogic

- Sniffer
  - Ember WSN sniffer
  - CommView

The ITU Global Standards Initiative on the Internet of Things (1)

Y.2XXX (NGN)

Standard:

- Overview of Internet of Things (ITU–T Y.2060)

Recommendations:

- Framework for the Web of Things (ITU–T Y.2063)
- Terms and definitions for the Internet of Things (ITU–T Y.2069)

The ITU Global Standards Initiative on the Internet of Things (2)

- Framework of object-to-object communication for ubiquitous networking (ITU–T Y.2062)
- Requirements for the support of machine oriented communication applications (ITU–T Y.2061)

Multimedia systems
Ubiquitous Sensor Networks

- Framework aspects (ITU–T F.744)

- Sensor network management (ITU–T H.641)

- Tag-based retrieval of object information (ITU–T H.642.x series)

- Cross-sector applications for sensors in smart grid applications (ITU–T F.747.1)

- Climate change mitigation applications (ITU–T F.747.2)

Testing the Internet of Things

- Q.3950 : Testing and model network architecture for tag-based identification systems and functions
- ???

- IoTLAB SPb SUT
  - 1. Test sensor
  - 2. Testing radio/network interface
  - 3. Testing interoperability
  - 4. Testing vulnerability

Researches conducted by Masters, PhD students and PhDs

- Development of algorithms for self-organization

- Testing of network convergence in case of change of the head unit

- Testing of data transmission in terms of Intentional Electromagnetic Interference

- Testing of traffic types generated by M2M networks

- Stress testing of the sensor network

- Studying of quality of service requirements for sensor networks

Thank you for your attention!
www.iotlab.ru