Thingsquare MIST Solutions
STM32L & SPIRIT1

WWW.EMCU.IT

life.augmented

6LoWPAN and Internet of Things

- Spirit1 + STM32L based platform
  - Availability: March 2013

- Developed and provided by Thingsquare
  - A pioneering provider of open-source software

- To connect SPIRIT1 to Internet or any other IP network
  - Adapting the packet size of the two networks
  - Adaptation layer for interoperability and packet form
  - Mesh Routing in the personal area network
  - ...

- Open source based on Contiki OS
  - Modest resources requirements
  - Over-the-air secure software updates
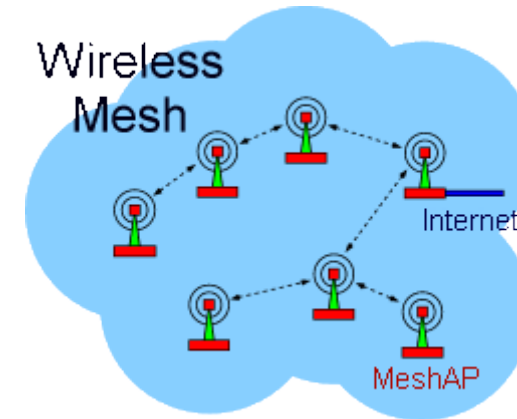
Enter Thingsquare
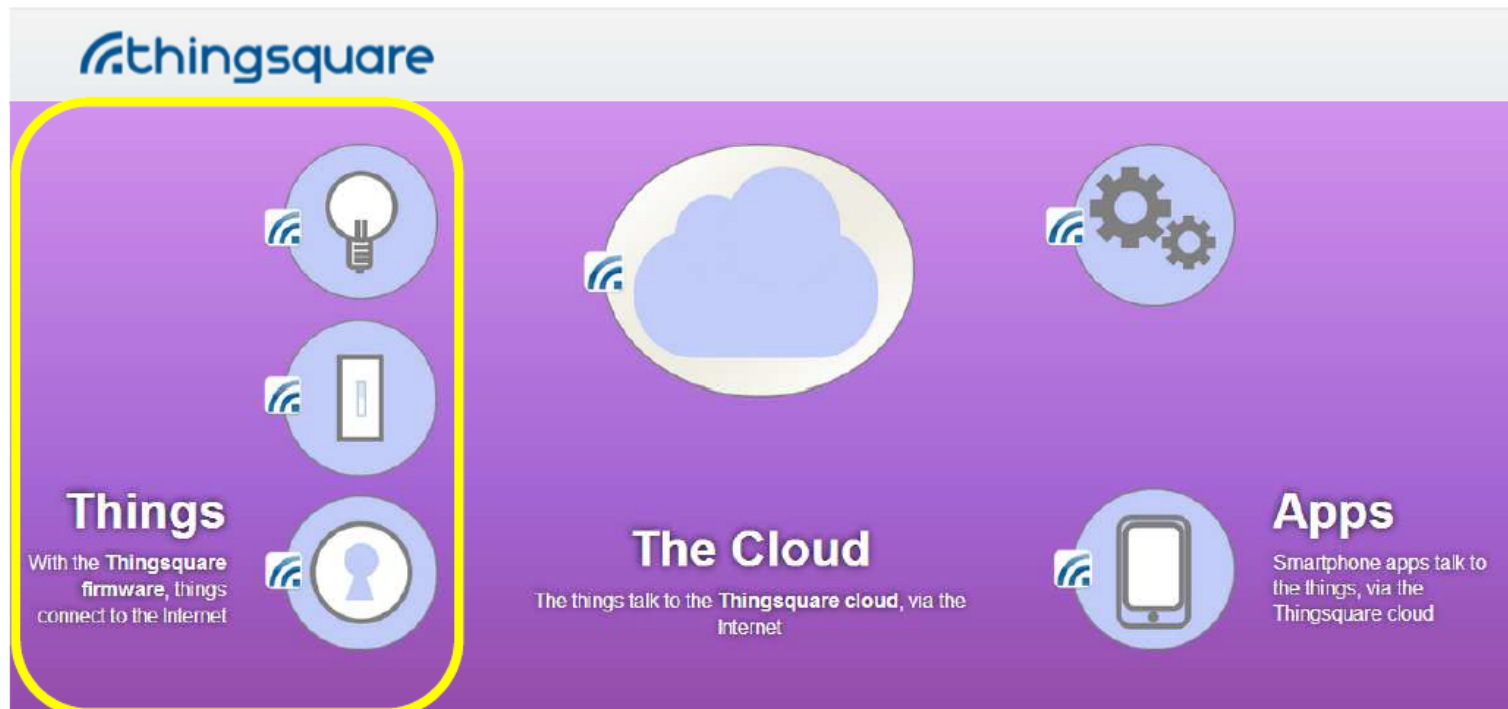
- Thingsquare Mist: the open source firmware that connects things to the Internet
  - Runs on SoCs, microcontrollers
  - Leverages the Contiki OS
  - IPv6 mesh + seamless IPv4 connectivity
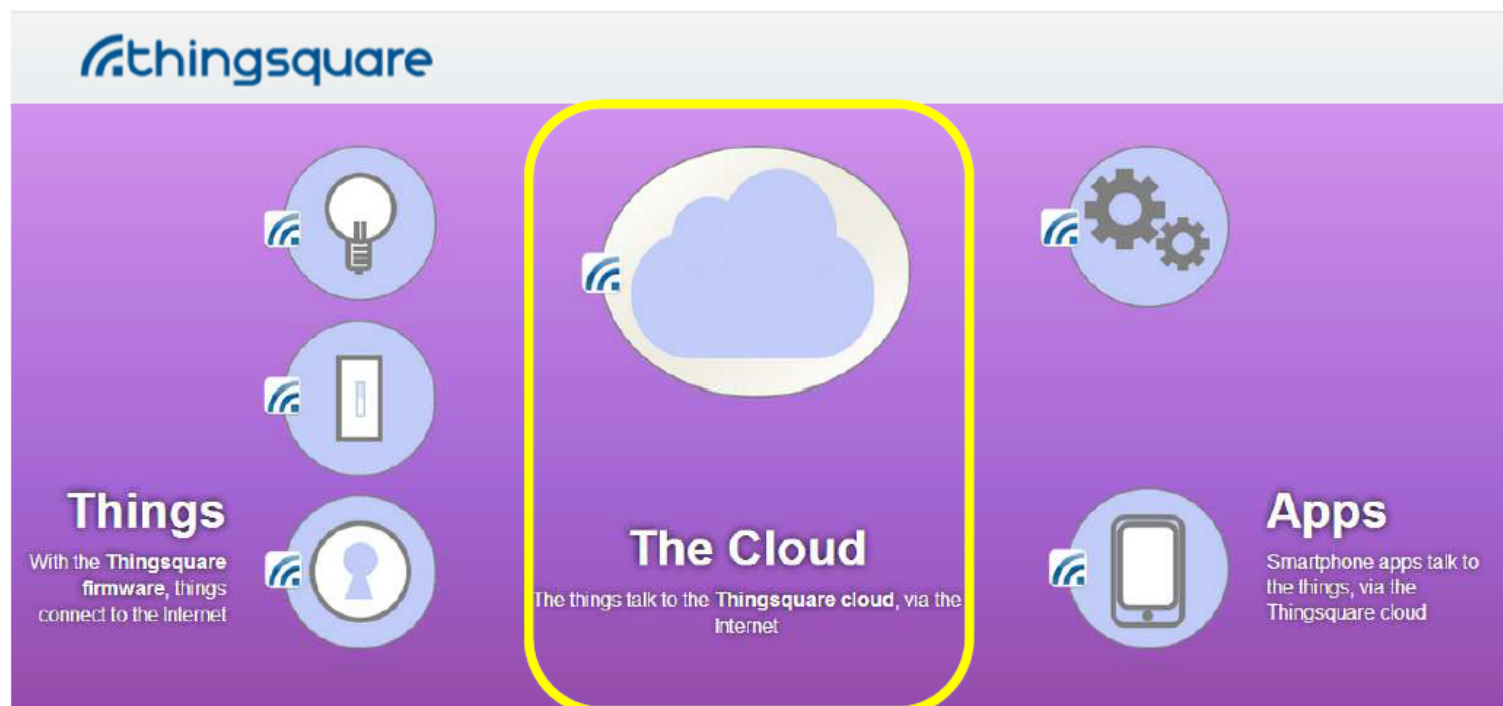
- Thingsquare Cloud backend:
  - Rendezvous, pairing, monitoring, data collection

- Smartphone / web apps
  - Reaches the things via the Thingsquare cloud API

Building an IoT product

- ## The Idea
  - "Everyone wants to have a smartphone-controlled lightbulb! I can sell millions of them!"

- ## What do you need?
  - An app
  - A chip

One possible solution
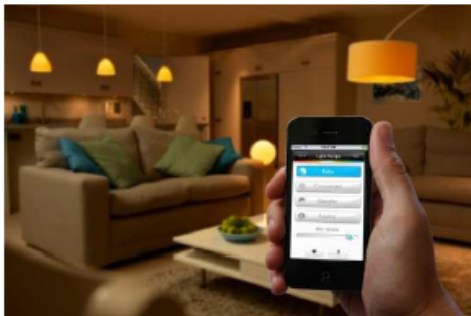
- Phone talks directly to chip
  - E.g. Bluetooth, BTLE, Ant+, ...
- The problem
  - Every user must configure their phone
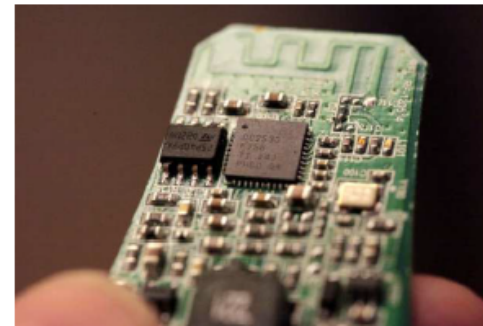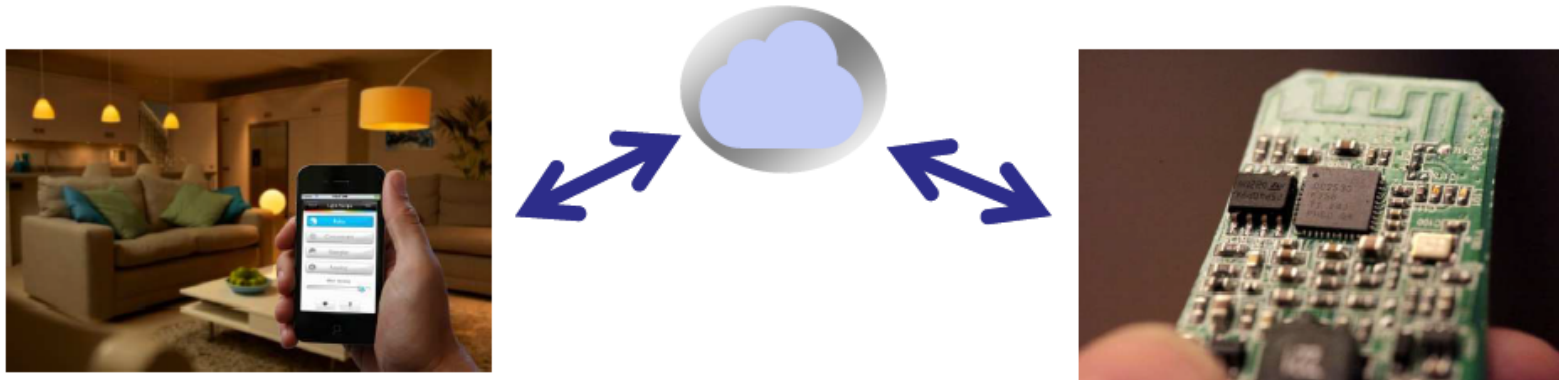 - Everyone must be in range
  - Chip must be compatible with *x* types of phones
    - Most of which don't have BTLE/Ant+/...

The IoT solution

- Phone and chip talks to cloud backend
  - Works with every phone, easy to extend, remote connectivity, new innovations, etc
- The problem
  - Connect the chip to the Internet

Thingsquare Mist features

- World's smallest IPv6 stack
- The world's smallest IPv4/IPv6 router
  - NAT64 and DNS64
- AES encryption
  - Software, may use hardware accelleration
- Network sniffer
- Frequency hopping protocol
  - Needed for sub-GHz legal requirements
- Portable duty cycling (ContikiMAC, Drowsie)
- WebSocket protocol
- Nicer UDP and TCP socket APIs

Thingsquare Code