Internet Of Things
Marketing or real opportunity

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Sr Director, System Applications
Atmel Corporation
About Presenter

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*Senior Director, System Applications, Atmel*

**Education**
BSc, HiST
Master Management, NTNU (2015)

Trondheim Makers
Atmel Corporation
Trustix AS

About Atmel Norway

Founded: 1995
Location: Trondheim, Norway
Employees: 200
Subsidiary of Atmel Corporation (NASDAQ: ATML)

ATML revenue: $1.4Bn USD (2013)
Atmel’s Microcontroller Innovations

Driving innovation since 1995
Extraordinary Microcontroller Growth

$M

$1200

$1000

$800

$600

$400

$200

$100

$1114M

$893M


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The Next Big Evolution: Intelligent Connectivity

50B Connected Devices by 2020

Discrete
IC
Processing ~2 Billion
Cellular ~5 Billion
Internet ~3 Billion
IoT 50 Billion


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The Opportunity: Expected Market Acceleration for IOT

>50B  Connected devices by 2020  
   - ABI Research, 6/2013

~100  Expected # of connected devices per household  
   - Atmel Estimate

4.5B  # of smart phone Subscriptions by 2018  
   - Ericsson Mobility Report, 6/2013

42%  of World Wide Households will have Wi-Fi by 2016  
   - Strategy Analytics

50%  of IoT Solutions will be provided by startups which are less than 3 years old by 2019  
   - Gartner
The Challenge: Piecing IoT technologies together

<table>
<thead>
<tr>
<th>Smart Detector</th>
<th>Fitness Band</th>
<th>Smart Watch</th>
<th>Thermostat</th>
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<tbody>
<tr>
<td>MCU</td>
<td>MCU</td>
<td>BT Module</td>
<td>eMPU</td>
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<tr>
<td>ZigBee SoC</td>
<td>BLE SoC</td>
<td>MCU</td>
<td>Charging IC</td>
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<tr>
<td>Sensor Hub MCU</td>
<td>Accelerometer</td>
<td>BT Transceiver</td>
<td>ZigBee SoC</td>
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<tr>
<td>Wi-Fi Module</td>
<td>Charger IC</td>
<td>Chip Antenna</td>
<td>Nand Flash</td>
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<td>3-Axis Accelerator</td>
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<td>Wi-Fi Module</td>
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<td></td>
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<td>MCU</td>
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<td>DRAM</td>
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To Win: Seamless Connectivity to the Cloud

- Things
  - Short Range Connectivity
- Gateways
  - Local Networks
- Satellite
  - Cellular
  - Long Range Connectivity

Win: Seamless Connectivity to the Cloud
The Goal: Atmel at the Heart of Each IoT Node

### Connected Devices

<table>
<thead>
<tr>
<th>Wireless as a Standalone Solution</th>
<th></th>
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<tbody>
<tr>
<td><strong>Wireless MCU</strong></td>
<td>Light bulb, Key FOB</td>
</tr>
<tr>
<td><strong>Sensor</strong></td>
<td>Fitness band, Activity Tracker, Temp Sensor</td>
</tr>
<tr>
<td><strong>Wireless MCU</strong></td>
<td></td>
</tr>
<tr>
<td><strong>MCU/MPU</strong></td>
<td>Watches, Thermostat, Door Lock, Appliances</td>
</tr>
<tr>
<td><strong>Sensor</strong></td>
<td>Smart City Infrastructure, Smart Metering</td>
</tr>
<tr>
<td><strong>Wireless Modem</strong></td>
<td></td>
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<tr>
<td><strong>MCU/MPU</strong></td>
<td></td>
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<tr>
<td><strong>Energy source</strong></td>
<td></td>
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<tr>
<td><strong>Sensor</strong></td>
<td></td>
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<tr>
<td><strong>Wireless Modem</strong></td>
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</table>

### Gateways

<table>
<thead>
<tr>
<th>Satellite</th>
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</thead>
<tbody>
<tr>
<td><strong>Cellular</strong></td>
<td></td>
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<tr>
<td><strong>Local Networks</strong></td>
<td></td>
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<tr>
<td><strong>Long Range Connectivity</strong></td>
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</tbody>
</table>

### Long Range Connectivity

**Short Range Connectivity**
Internet of Things

The reality..
Lighting and home automation

Philips Hue, RGBW Color Mix
ATmega2564RFR2 + BitCloud 3.0
Lighting and home automation

AT86RF233 + ZigBee Green Power
Batteryless/Energy Harvester
Lighting and home automation

Lutron Wireless Remote
ATmega2564RFR2
Coincell powered
Consumer, Wearables

Agent Smartwatch
Atmel low-power MCU + BLE

Sleep Mode Power (μA)

Last Gen  AGENT

0  100  200  300
Wearables, Health Monitoring

Amulyte Pendant
Low-power SAM4L, GPS, WiFi

Waterproof

Easy to Press Help Button
Agriculture

Libelium Sensors
Atmel MCU + RF
6LowPan (IPv6 over 802.15.4)

Precision Agriculture
Leaf wetness, fruit diameter

Irrigation Systems
Soil moisture, leaf wetness

Greenhouses
Weather Stations
Anemometer, wind vane, pluviometer
Internet of Things

Opportunity to benefit for you..
50% of IoT Solutions will be provided by startups which are less than 3 years old by 2019 - Gartner
Your opportunity – The ecosystem

Embedded Connectivity Vendor

User Connectivity
- Remote UI experience
- Provisioning Standards
- Connectivity Standards

Cloud Services Solutions

Original Equipment Manufacturer
- CE Appliance
- Energy management
- Healthcare Wellness

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Your opportunity – The ecosystem

- Embedded Connectivity Vendor
- User Connectivity
- Cloud Services Solutions

Original Equipment Manufacturer
- CE Appliance
- Energy management
- Healthcare Wellness

Remote UI experience
- Provisioning Standards
- Connectivity Standards

Branded Solution

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Your opportunity – The ecosystem

- Embedded Connectivity Vendor
- Original Equipment Manufacturer
- User Connectivity
- Cloud Services Solutions

- Remote UI experience
- Provisioning Standards
- Connectivity Standards

Companies: Atmel, Honeywell, iRobot, GE, Haier, Samsung, Whirlpool, CHAMBERLAIN, Cisco, ORACLE, Windows Azure, iThingsquare, Ayla, ioBridge, electric imp, ARDUINO.
Your opportunity – The ecosystem

- Remote UI experience
- Provisioning Standards
- Connectivity Standards
Q & A