Optimized Memory for the Internet of Things

Paul Hill, Director of Product Marketing

Adesto Technologies

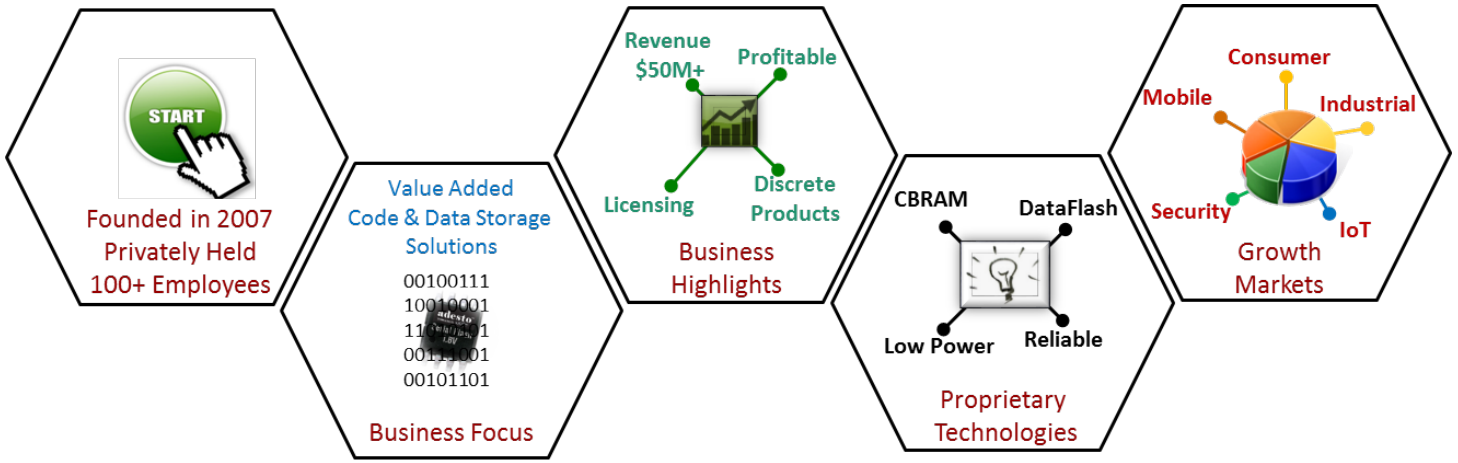
Corporate Overview

Adesto Technologies Develops and Markets

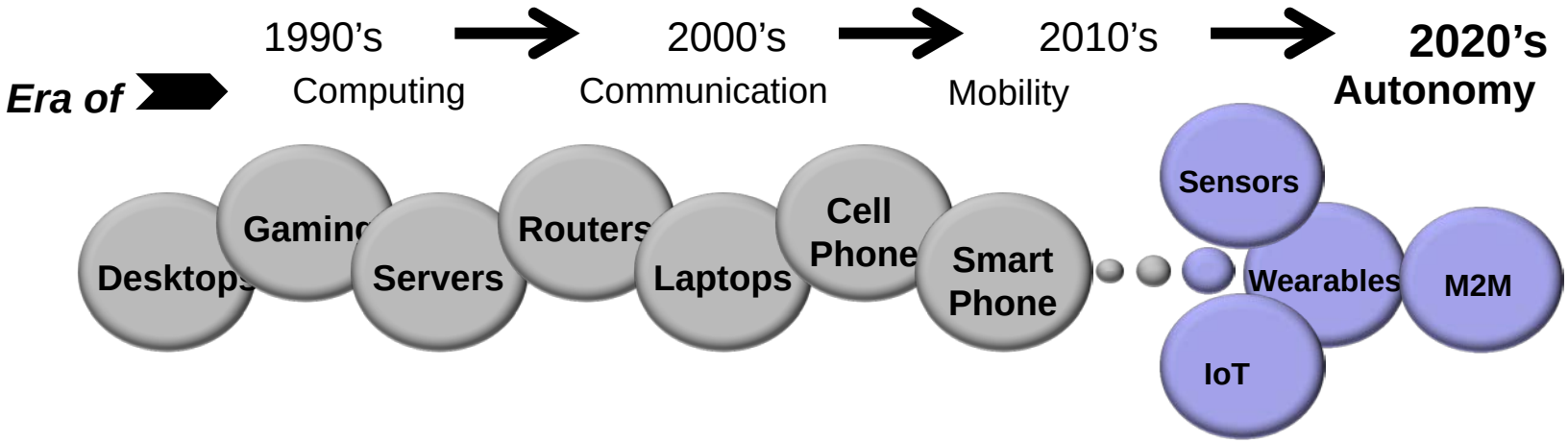
Differentiated **Application-Specific**

Code and Data Memory Solutions

Targeted for Integrated, Connected, Low Power Applications

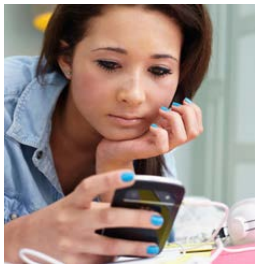


New Markets = New Requirements



Then

Now



Future

Speed + Density

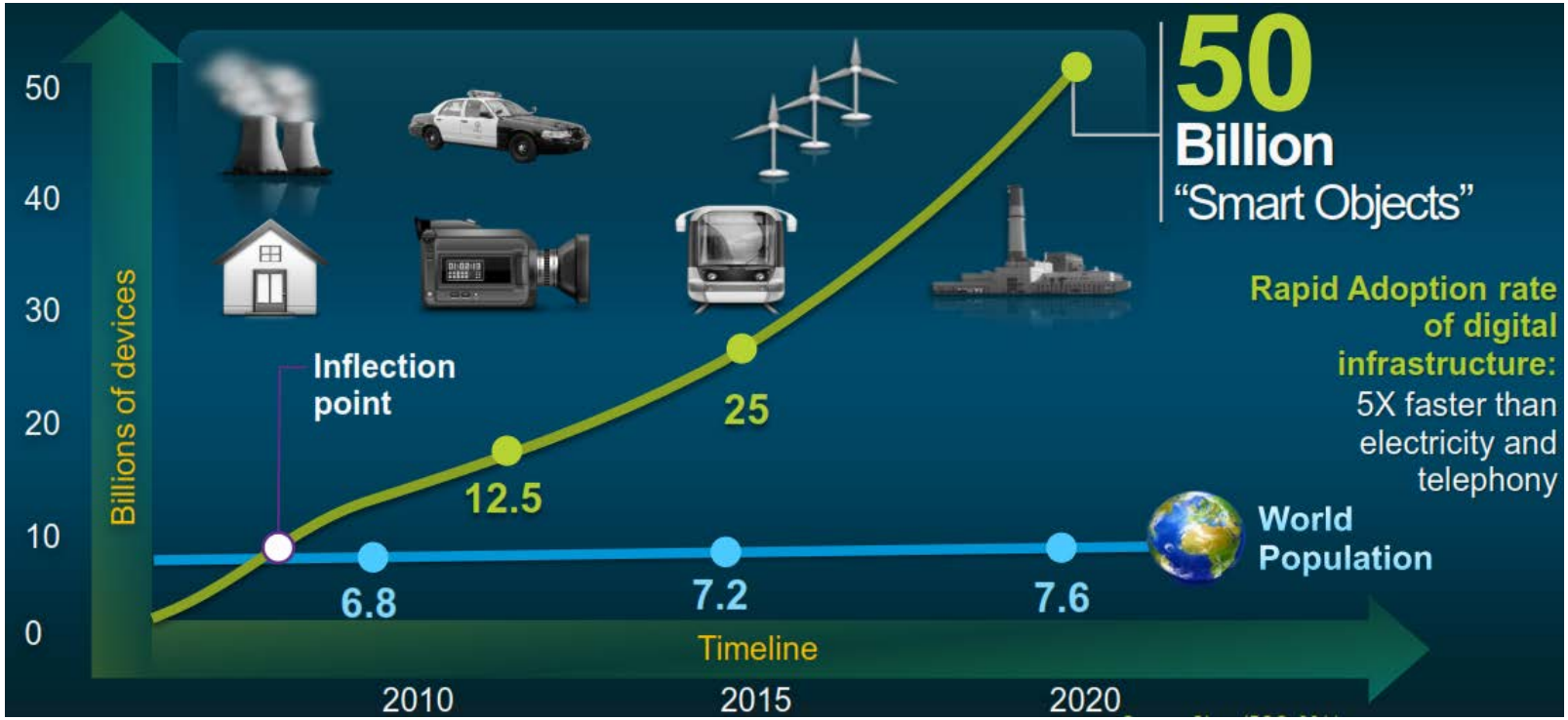
GHz & Gbits

Low Power, Integrated, Connected, Secure

pico-Joules & nano-Watts

The Internet of Things (IoT) According to Cisco

Many ‘Things’ Powered by Battery / Energy Harvesting



Data source : Cisco WSN Conference Berlin April 2014

Critical Factors:

Power Management, Energy Efficiency, NVM for Data and OTA Updates

What Do All of These “Things” Have in Common?

They are connected…

- Wireless (and wired) protocols

System Energy Consumption is Critical…

- Many run on batteries / or energy harvesting

They Need Application Memory…

- Embedded vs Discrete

Low Density

- **Industry has focused on Increasing Memory Density 128Mbit+**

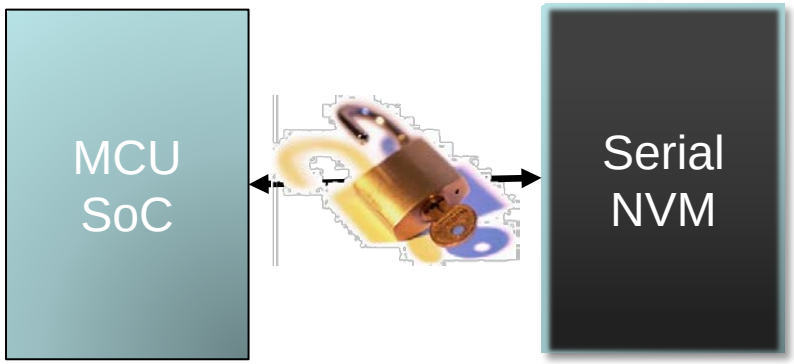
Low Energy

- **Lower Power has been sacrificed for streamlined, lower cost , higher density devices**

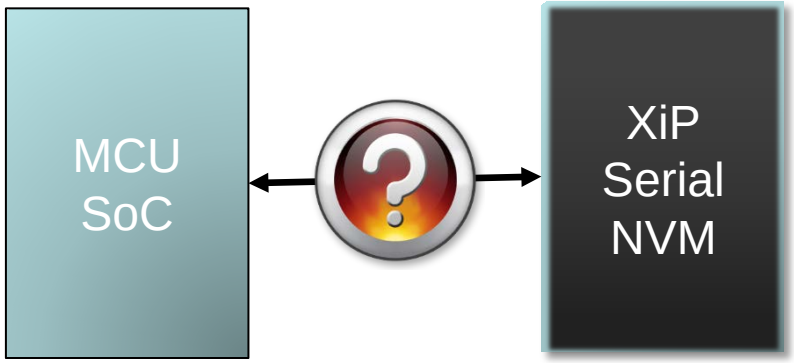
The Future of IoT Memory

Voltage Range	• Wide VCC to Maximise Battery Voltage Range
Power	• Reduce R/W Energy Consumption
Features	• How MCU Accesses Memory for Energy Savings
What's Next?	• Authenticated Access (Security) • New Lower Power / High Speed I/F • Enhanced Cached R/W Operations

Improved Security



New Interfaces & Features



Emerging Memory will Enable New IoT Capabilities

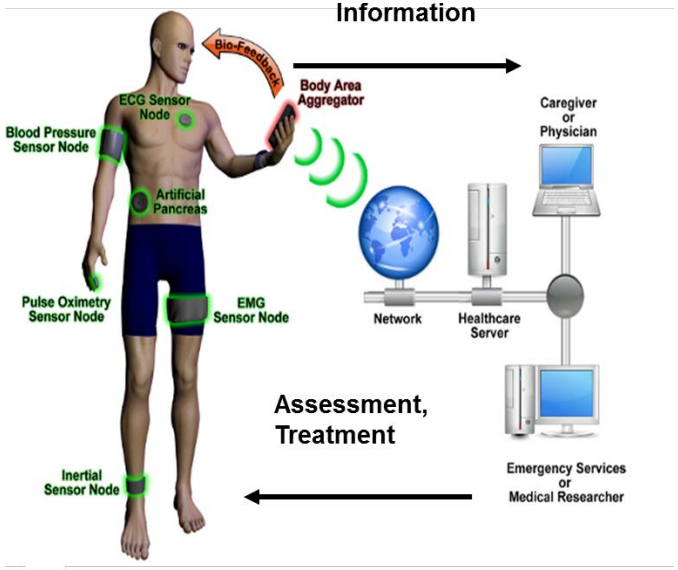
CBRAM: **World's *Lowest Energy Non-Volatile Memory Technology* Ever Demonstrated**

Adesto Technologies Demonstrates Non Volatile Memory Operating at sub 1V in a Body Sensor Chip

- VLSI Symposium 2013

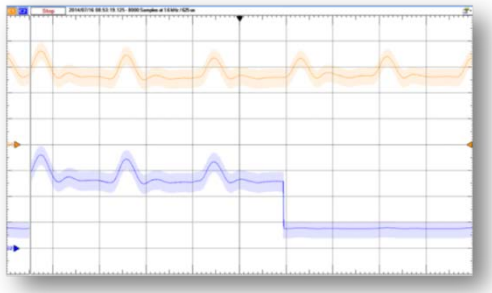
SENSOR CHIP with CBRAM® OPERATING by ENERGY HARVESTING

- **Battery Operated Wearable Electronics**
- **Ultra Low Power Embedded Devices**
- **Energy Harvesting Body Sensors**



Energy Consumption Demo

Adesto CBRAM® EEPROM #1 EEPROM #2

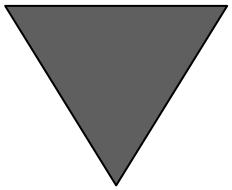


8X – longer life

12X – faster write

Thank You

Adesto Technologies



Re-inventing **Memory** for **Things™**