

# Enabling the Real-Time Enterprise

[www.sensinode.com](http://www.sensinode.com)



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Zach Shelby, CTO



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Real-time Enterprise

“I have a dream”

The *Internet*

+

The *physical* world

=

The Internet of things



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# A bit of Internet & wireless history

Arpanet,  
Usenet,  
BBSs

**Internet**

Web 2.0

**Web Services**

**Sensor Networks**

802.15.4 + 6LoWPAN -> Web Services

Ethernet

Proprietary  
ISM Radios

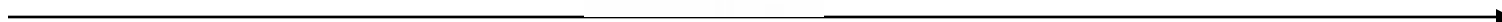


Modems  
Leased Lines  
RS232



IEEE  
802.15.4

**6LoWPAN**



80s

90s

2000

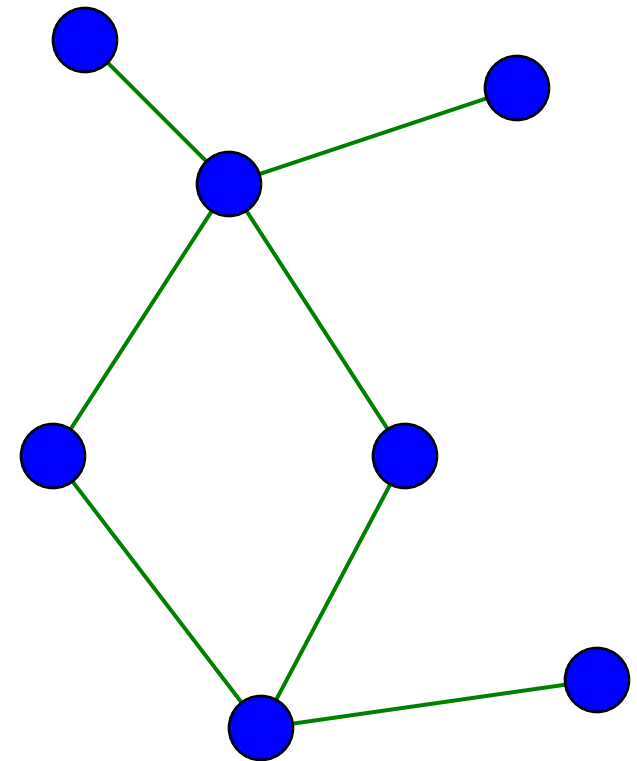
2003

2006



## IEEE 802.15.4 - The global standard

- Important standard for home networking, industrial control and building automation
- 802.15.4 Original
  - 250 kbps at 2.4 GHz (DSSS)
- 802.15.4a CSS and UWB
  - Up to 2 Mbps typical, accurate positioning
- Robust radio with flexible topology
  - Slotted CSMA algorithm
  - Beacon and beaconless modes
  - Reduced and full function nodes

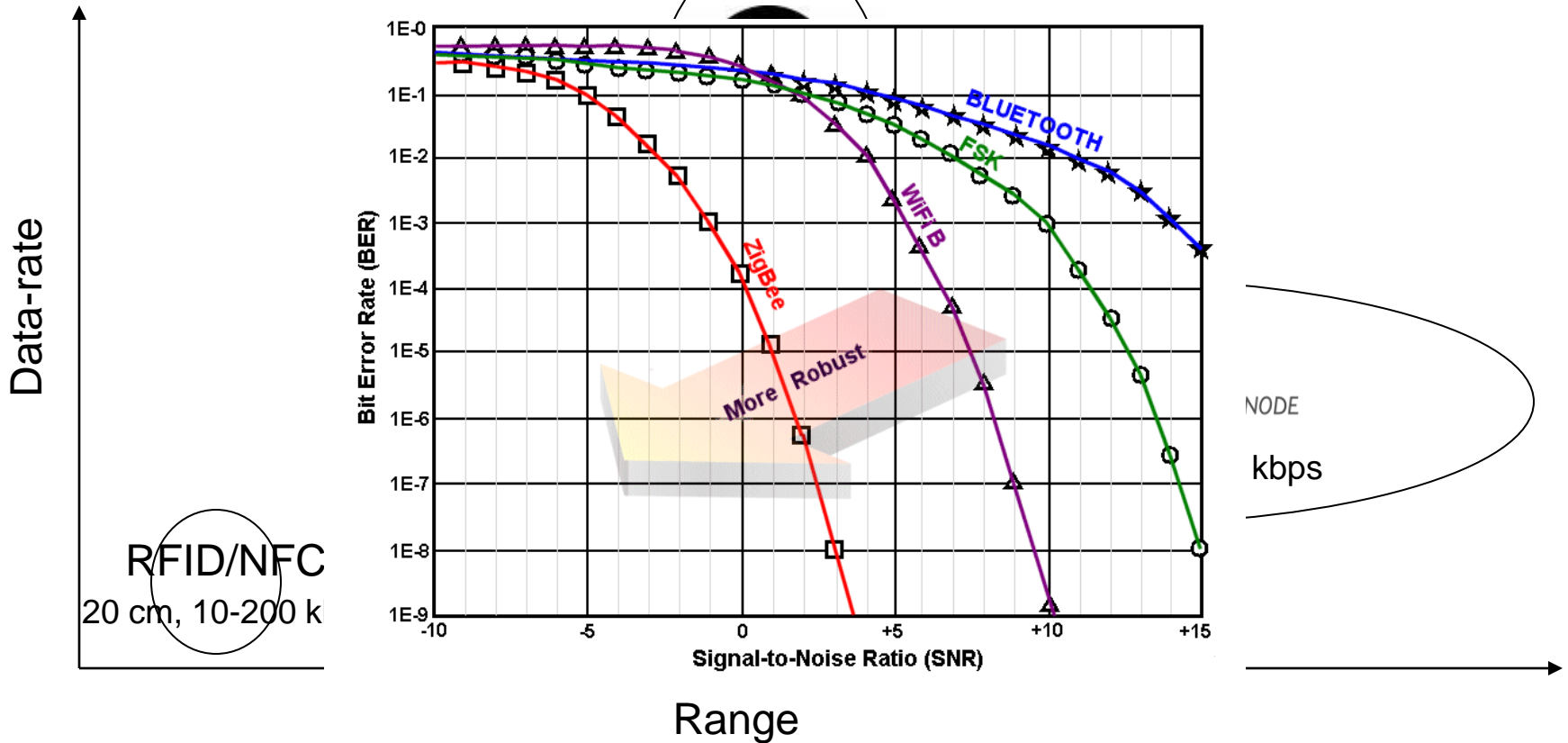




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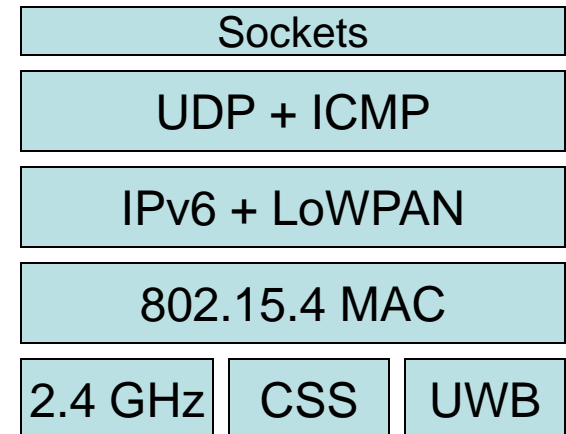
# Technology Comparison





# 6LoWPAN - IP for low-power devices

- IETF Standard for IPv6 over IEEE 802.15.4
- 80% compression of headers
- Rich and flexible features
  - Autoconfiguration
  - IPv6 fragmentation
  - UDP + ICMP
  - Mesh forwarding ready
- Socket API!
- Super compact implementation
- Direct end-to-end Internet integration
- Extremely scalable



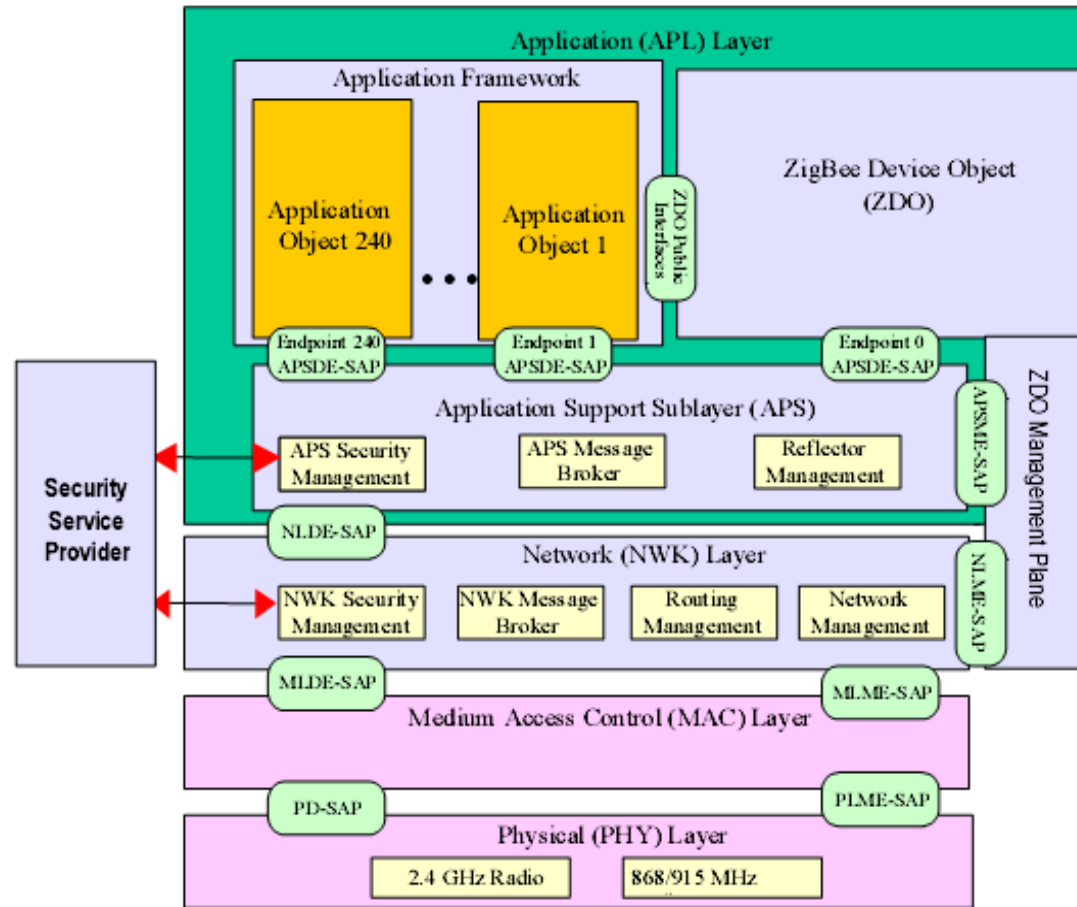
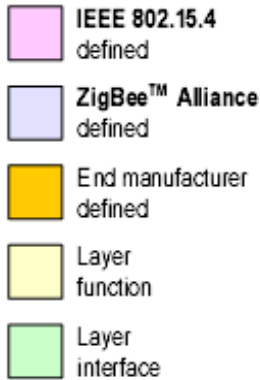


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# Enabling the Real-time Enterprise



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# Applications

First: Enterprise, industrial, commercial  
Later: Consumer

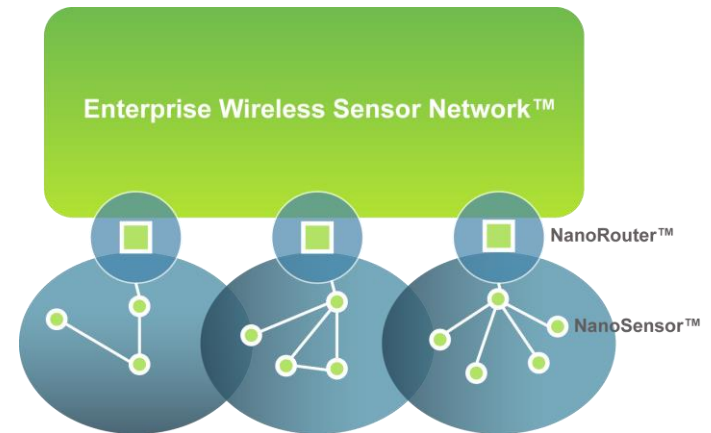
1. Cargo, warehouse, port logistics
2. Manufacturing and automation
3. Security and buildings





## About Sensinode

- Leading IP-based wireless sensor network company
- Products, Solutions and Services for Enterprise asset management & tracking
- OEM Products
  - For industrial and academic R&D
  - Sensor node platforms
  - NanoStack 6LoWPAN solution
- Enterprise Solutions
  - Logistics
  - Manufacturing
  - Security





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# Thank You!

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