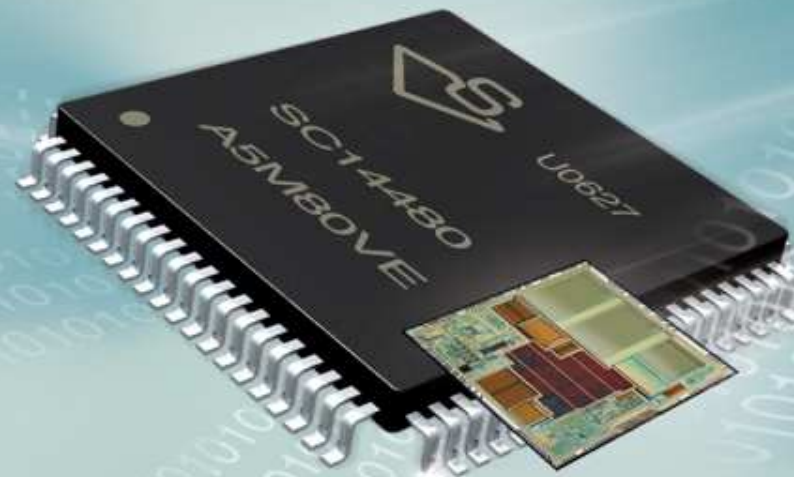




Selling points and challenges DECT Ultra Low Energy (ULE)

Steven Leussink
SiTel Semiconductor



Hooked on Cordless

Overview

- Wireless sensors: what, why and who
- Comparing application spaces
- Strengths and challenge DECT ULE



Wireless sensors

What, why and who



What: Clear vision

- Star Trek like vision agreed by all
 - fridge tells you when to buy milk
 - energy companies decide when to charge car
- Don't forget... Star Trek has been right!

1966



2007



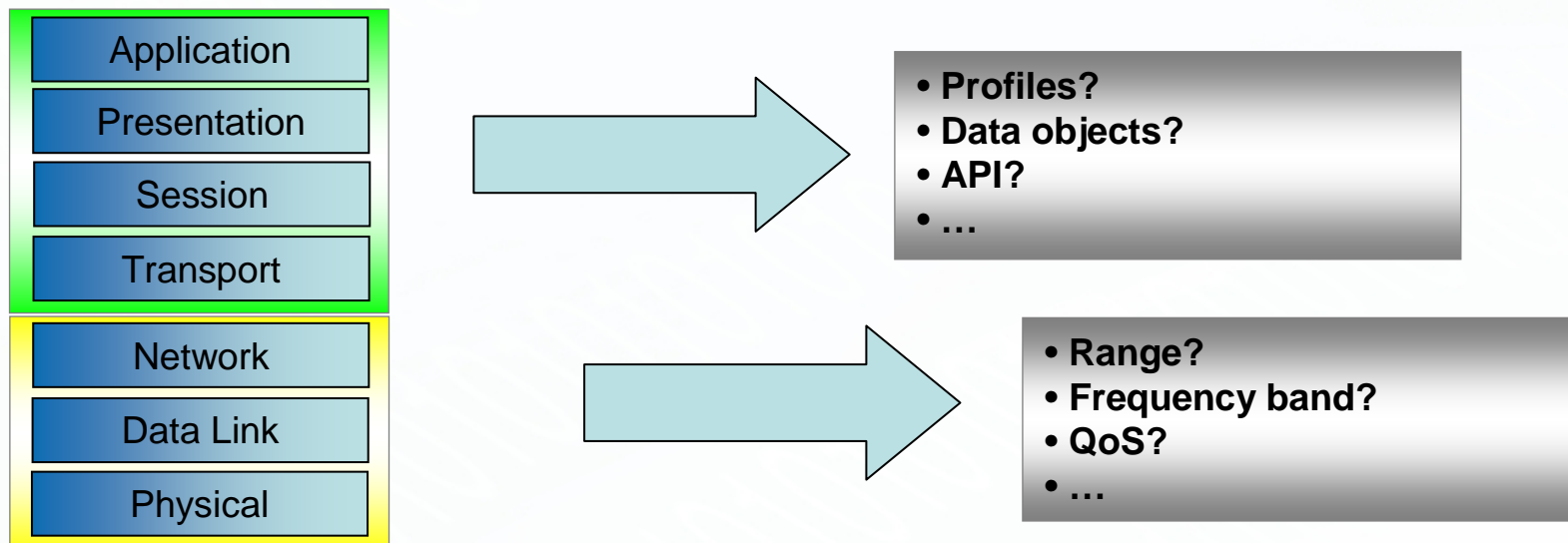
Why: Market drive

- Development needs to be market driven
- Strong initiatives
 - Home Care – cost of aging population
 - Industrial – reduce cost by automatization
 - Smart Energy – 20/20/20 agreement

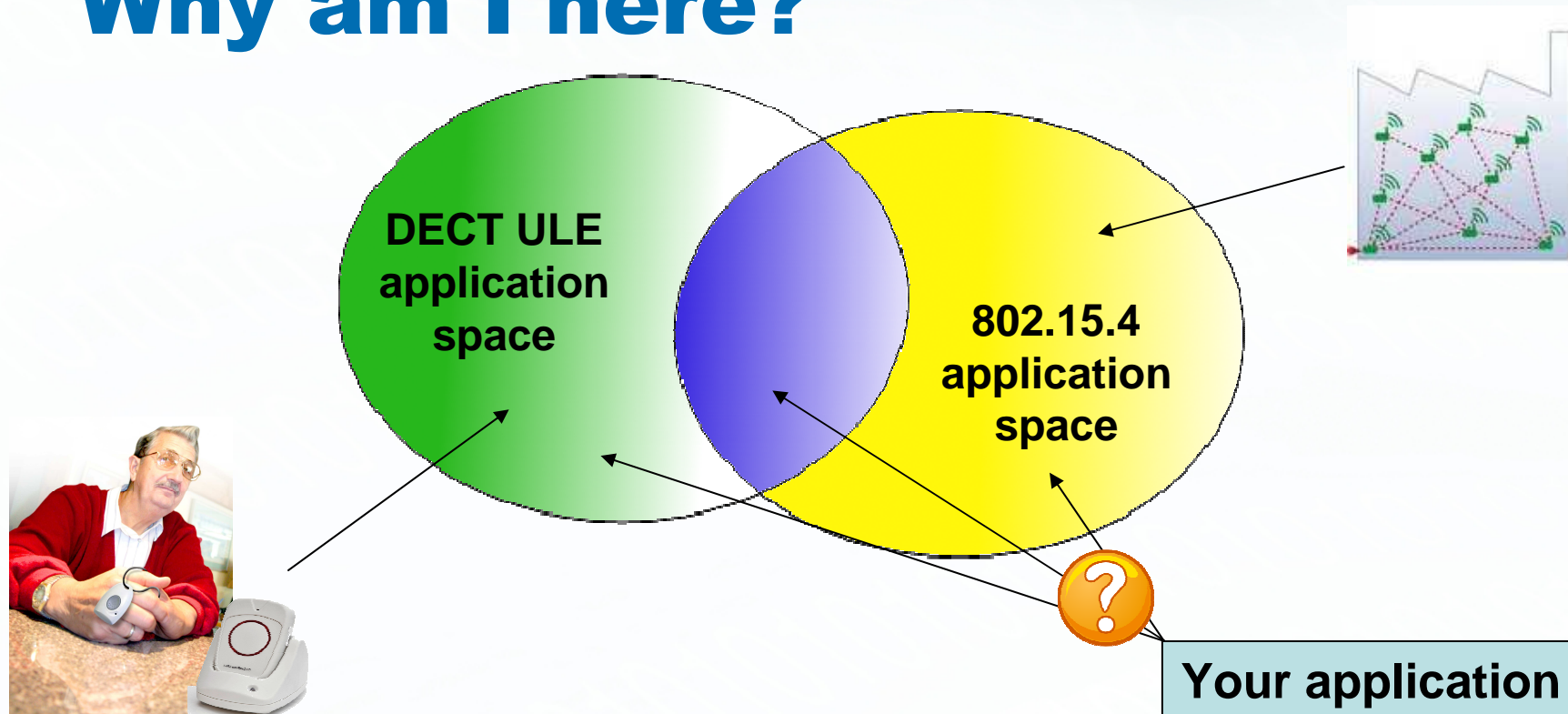


Who: Solution providers

- Many vendors offer wireless RF solution
- Which problem goes with which solution?
- Know your technologies



Why am I here?



- Clarify DECT ULE unique technical strengths
- Link these to application space / markets

Comparing application spaces



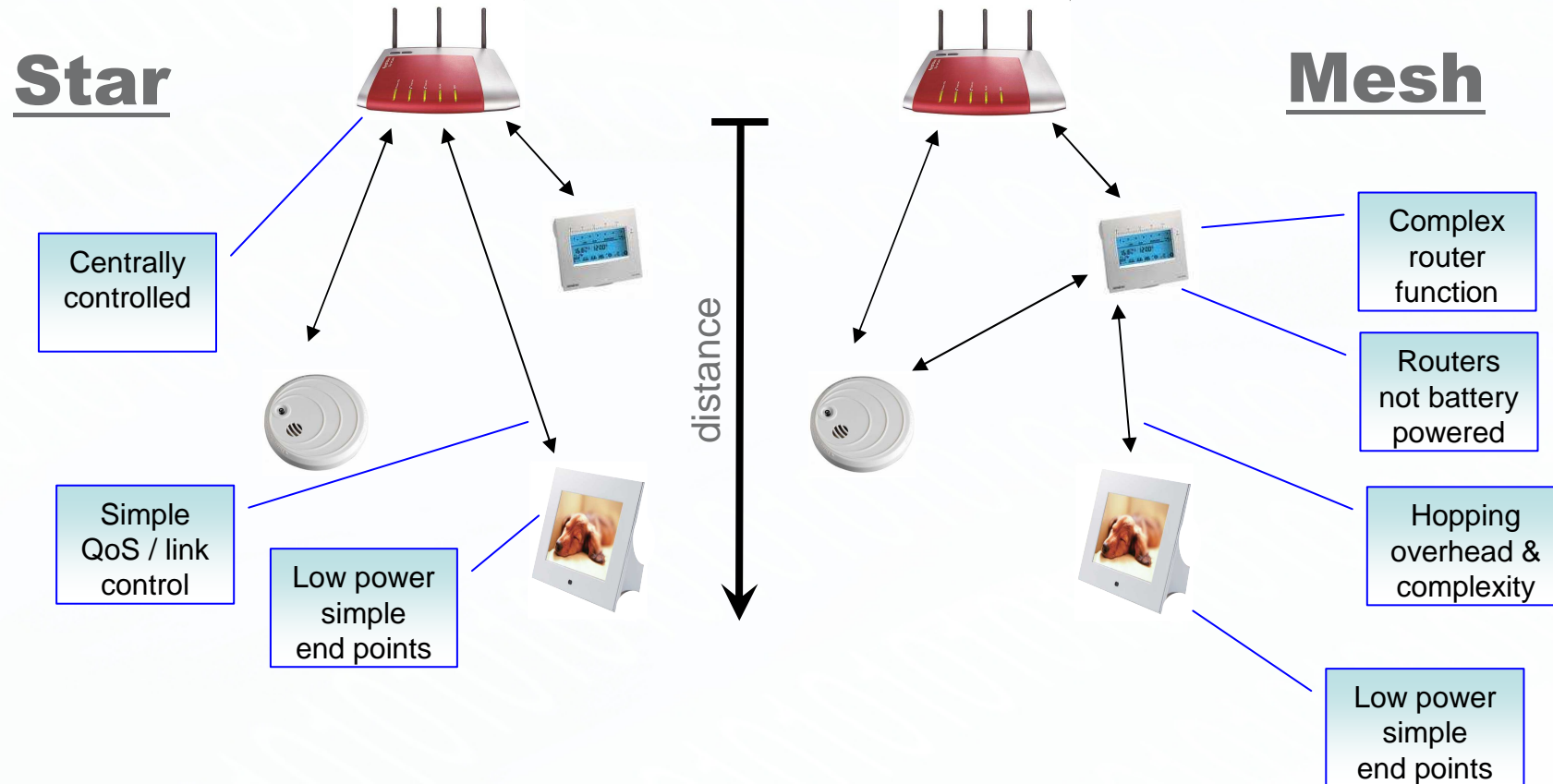
Feature comparison

- Focus on impact for application / system
- Comparison between
 - 802.15.4 2.4GHz based systems
 - DECT (ULE) based systems

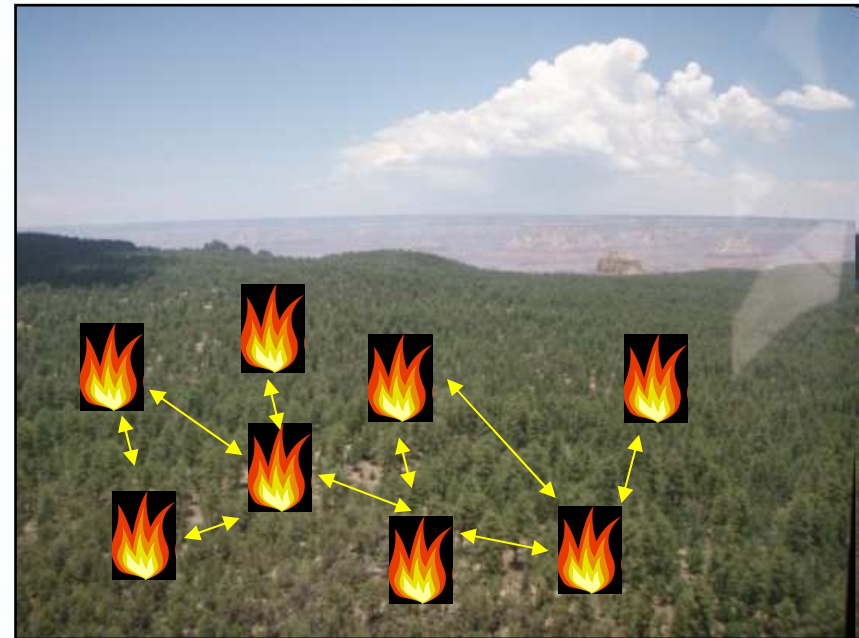
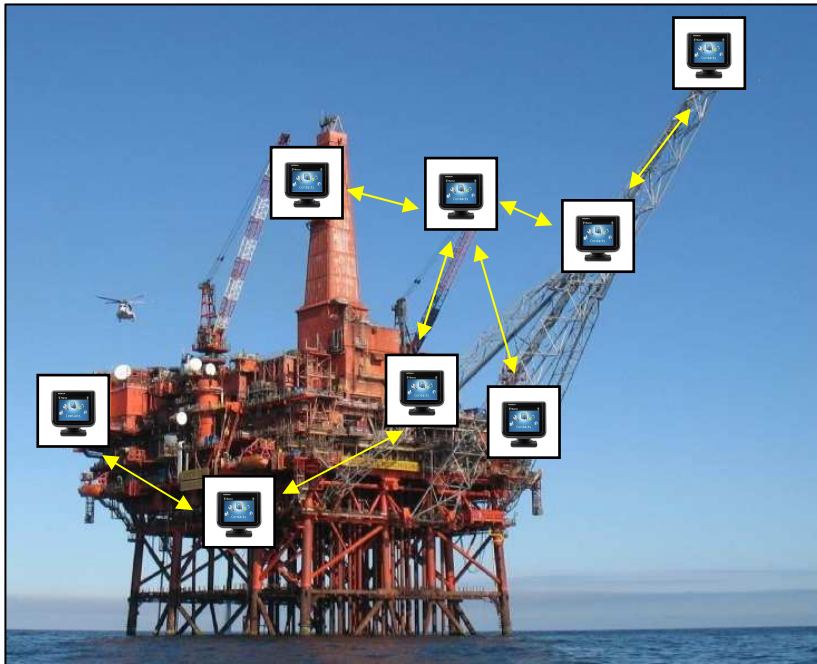
Range and network

- Practical range
 - DECT 50-100m indoors
 - 802.15.4 radio's (EU) 20-30m indoors
- DECT covers the whole house
 - proven in > 250M installed systems
- 802.15.4 systems expand range through meshing
 - Range scalable

System architecture



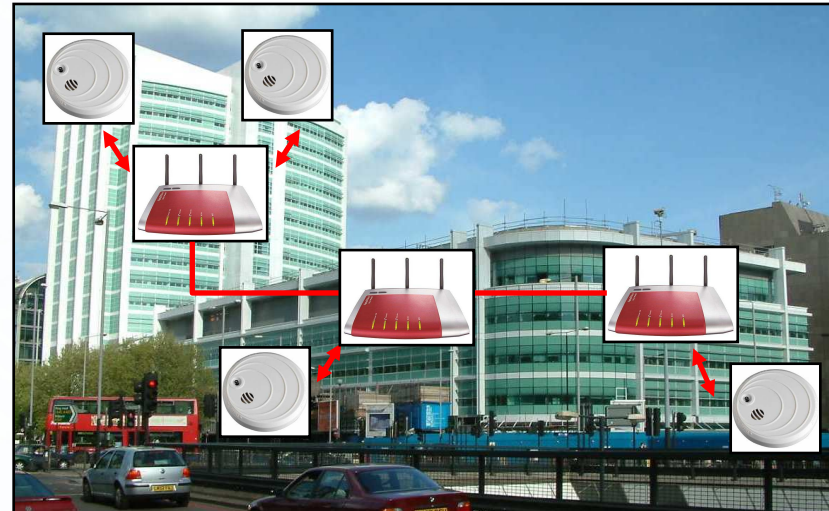
When to consider mesh



- Long range wireless networks
- Tree network installation not possible (PABX/WLL)

When to consider star

- Whenever you can! Keep it simple!
- If PABX present use it (Hospital / office)



Application impact

DECT	802.15.4
<ul style="list-style-type: none">• Star network<ul style="list-style-type: none">• 1 central powered master• Simple architecture• Range bounded (tree network extension)	<ul style="list-style-type: none">• Mesh network<ul style="list-style-type: none">• Powered Routers• Complex architecture• Range scalable

→ DECT simplicity reduces cost

→ DECT avoids overly complex systems

Frequency band

- DECT 1.9GHz band virtually worldwide
 - Interference free
 - High output power allowed (250mW)
 - No network planning
- 802.15.4 operates in interference prone band
 - Bluetooth / WiFi / Microwaves
 - Nasty neighbors without frequency hopping
 - Fire & forget transmission

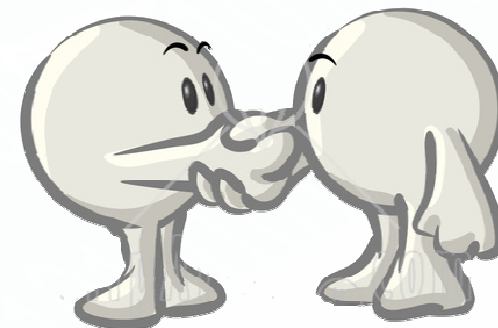
Interference issues

- Hard to predict if interference will become issue
 - If 802.15.4 success → more crowded band
 - Business wise better to avoid risk
- DECT dynamic channel allocation
 - No interference
 - No network planning
 - Proven dense system installation
 - ...



Cost of playing nice

- DECT systems interference free because:
 - RSSI scanning
 - Dynamic channel selection
 - Synchronous system – TDMA
- Provides high QoS but also overhead:
 - Node needs to know timing and frequency
 - No fire & forget → scan first



System performance

- 2.4GHz band allows for less overhead
 - Send asynchronously – Router RX always on
 - Send on channel without scanning
- Less overhead not always good
 - No guaranteed QoS → data/voice link
 - Retransmissions
 - ...

Application impact

- DECT band offers
 - Reliability
 - Low risk
 - Application bandwidth (ULE to 1MBit/s raw)
- Power performance ISM band may be better
 - Trade off on system level needed

→ DECT offers more possibilities

→ DECT proven reliable



Strenghts and challenge ULE



Summary

- Each technology has ideal application space
- DECT ULE has many unique offerings
 - Star network
 - Voice / Data / ULE / ...
 - High QoS
- 1.9GHz band has inherent overhead
 - Smart protocols still allow Ultra Low Energy
 - Performance determined at system level

Questions



or

Steven.Leussink@SiteSemi.com

Hooked on Cordless

Thank you

