Wireless Alerting System
Our road to DASH7

Trond Enger
Technical Manager

VESTFOLD AUDIO

Photo by Nicki Eliza Schinow on Unsplash
Norwegian company established in 1985

- Wireless Sound Field Systems
- Wireless Alerting Systems

“We have a driving force to improve people’s lives”
Wireless Alerting System

Initially designed for people with hearing loss
Keeping the neighborhood safe
Wireless Alerting System
Nurse call system

- Bed occupancy sensors
- Door sensors
- Calling/alarm buttons

Requires high reliability and low latency
Wireless Alerting System

Colleague alerting system

- Wristband alarm buttons
- Carry-on pagers
- Stationary displays
Wireless Alerting System
Dental calling system

- No-touch buttons
- Integration with dental chair
- Carry-on pagers
- Stationary displays
and a lot of other applications...

- School security
- Fire system for apartment buildings
- Alarm system for hotels
- Alert system for workplaces
- Wandering alarm for people with dementia
  and so on...
Background

1985 – 2019: The 142 MHz VHF System

Pros

• Long range
• Neighbor alert
• Simple installation

Cons

• Power consumption
• Limited data flexibility
• Large physical size
• Reduced scalability
Requirements for new system

Properties:
- Long range
- Simple installation
- Neighbor alert
- Small physical size

Scalability:
- Ability to support large buildings

Logistics
- Manufacturer independent COTS hardware
Alternatives

- Use existing COTS modules
  - Z-wave (Proprietary)
  - Lemongrass (Proprietary)
  - BLE (Proprietary, Range/Frequency)
  - Zigbee (Range/Frequency, cost, power consumption)
  - tinyMesh (Proprietary)
  - …

- Develop a new proprietary system on 868 MHz
  - Work-intensive
  - High risk

- Develop a system based on open standards for 868 MHz

VESTFOLD AUDIO
DASH7

- Open standard
- Hardware independent
- Extremely versatile
- Options for encryption and certification
- Frequency agility
- File-based (!)
VEA Wireless

- Reliable
  - Frequency agility
  - Decentralized/no controller necessary
  - Two-way monitored link
- Very simple commissioning
  - Easy to understand unison pairing
  - Self configuring infrastructure
  - Fully wireless backbone/core network
- Scalable

VESTFOLD AUDIO
Small-scale network
Small-scale network with uplink
Small-scale network

- Very simple pairing - no additional setup required
- No master or base station required
- One-to-all principle
- “Unlimited” amount of transmitters and receivers
- Immune to interference at channel-level
- Long range
Range example
Larger scale network
Larger scale network

Node Net A

Node Net B

Core Net

Repeater

Repeater

Rx

Tx

Rx

Rx

@
Nerdy D7 details

- Extensive use of ALP Queries and commands to minimize network load
- Frequency agility – several independent channels
- Advertising protocol with three different scan periods
- Four different access profiles
  - Service net 1024 ms Ch. set A
  - Node net 64 ms Ch. set A
  - Fast node net 16 ms Ch. set A
  - Core net 16 ms Ch. set B
Experiences

• DASH7 is very versatile - it may be adopted to virtually any use case.
• The file-based approach (ALP) is essentially a very powerful distributed wireless database.
• Some 37,000 devices shipped since summer 2019 – not a single issue with regards to DASH7 itself.
Thank you for your attention!

Photo by visitvestfold.com