Reference Models and Related Business Cases for Ad-Hoc Networks

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• Goal
• Terminology
• Reference Models
• Examples
Goal

Identify business cases and reference models for ad-hoc networks to simplify the related problems in terms of routing, security, quality of service, MAC issues, etc.

Focus on interoperability of ad-hoc structures with overlay networks.
Terminology/Notation

bridging/routing:vertical connection:hopping mode

• T/AP bridging/routing entity
• W/WL wired or wireless vertical connection
• SH/MH single or multiple hops to the bridging/routing entity
Terminals are connected to a wired access point using one single hop

Business Case:
• Airport
Achieve a higher coverage by multiple routing entities. Drawback: High cost for installation
Terminals are connected with a wireless access point using one single hop.

Business Case:
• eHome
• Train
Advantage: less investment costs
Disadvantage: less bandwidth
Increasing the coverage using multi-hop capability of the wireless terminals

Business Case:
- Gas station
- Traffic jam (bridge)
Business Case:
- Firefighters
- Each firefighter has one terminal
- Terminal: low power, low bandwidth
- Fire engine contains routing terminal (more power and more bandwidth)
T/WL/SH

Business Case:
• Mobile conferencing
T/WL/MH

Business Case:
• Mobile gaming
• Mobile market
• Summer camp
• Traffic jam
(anywhere)
Wireless Ad-Hoc Backbone

- Routing for virtual access points (VAP) becomes easy due to limited mobility
- VAP = AP/WL/MH
- AP = AP/W/SH

Diagram:
- Access point
- Virtual access point
- Cell boundary
- Wireless link
- Wireless nodes
- Wired link
Routing of multi-hop terminals becomes also easy due to the small number of terminals per virtual access points.

Open issue: security and authentication of the terminals.