Reference Models and Related Business Cases for Ad-Hoc Networks

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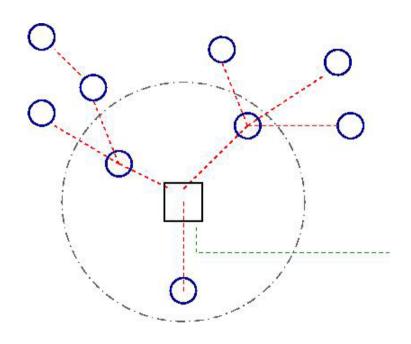
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Content

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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.
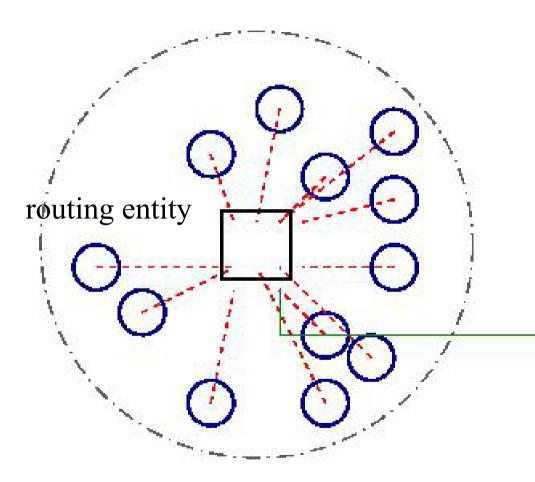
Terminology/Notation

bridging/routing:vertical connection:hopping mode

- T/AP bridging/routing entity
- W/WL wired or wireless vertical connection
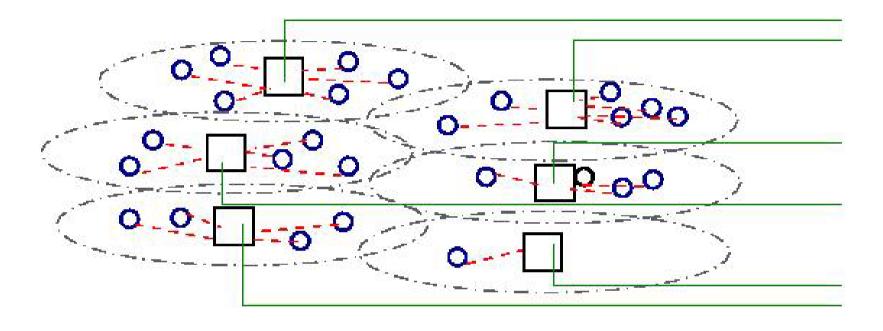- SH/MH single or multiple hops to the bridging/routing entity

AP/W/SH

routing entity

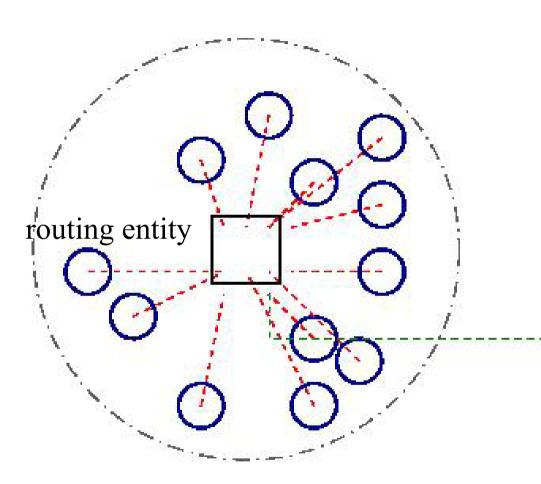Terminals are connected to a wired access point using one single hop

Business Case:
•Airport

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AP/W/SH

Achieve a higher coverage by multiple routing entities. Drawback: High cost for installation

AP/WL/SH

routing entity

Terminals are
connected with a
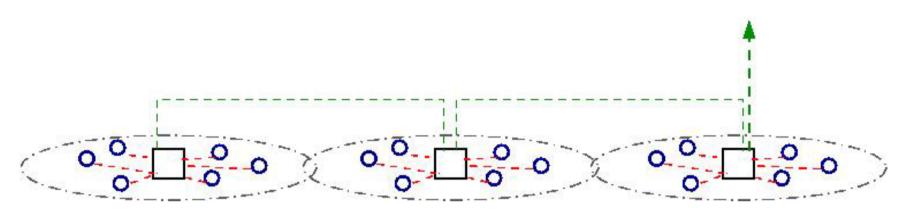wireless access
point using one
single hop

Business Case:
•eHome
•Train

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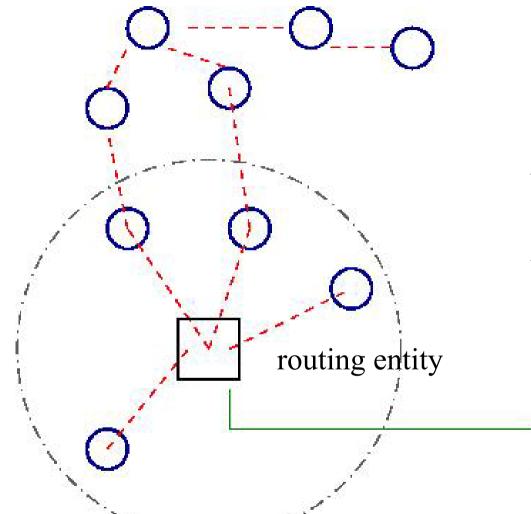
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Advantage: less investment costs
Disadvantage: less bandwidth

AP/W/MH

routing entity
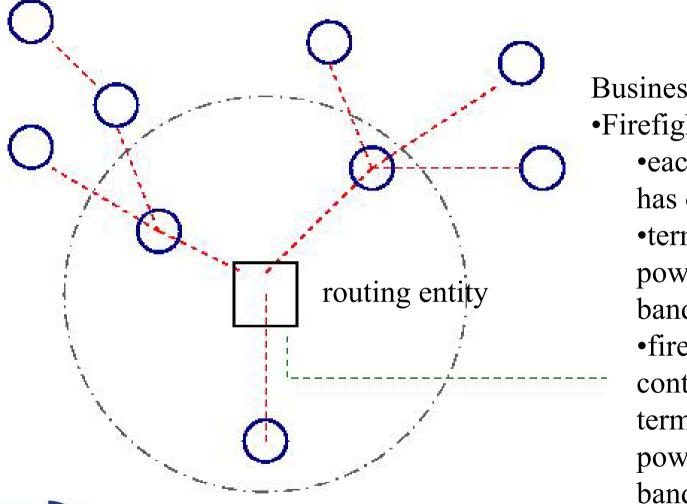
Increasing the coverage using multi-hop capability of the wireless terminals

Business Case:
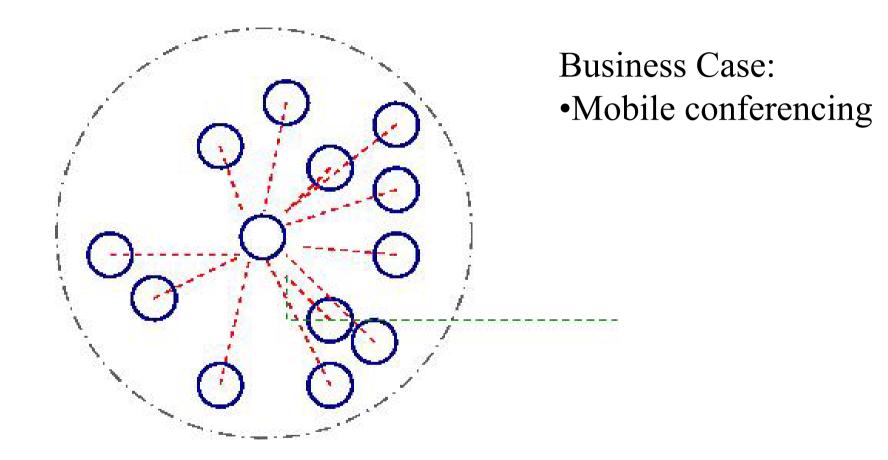• Gas station
• traffic jam (bridge)

routing entity

Business Case:
- Firefighters
  - each firefighter has one terminal
  - terminal: low power, low bandwidth
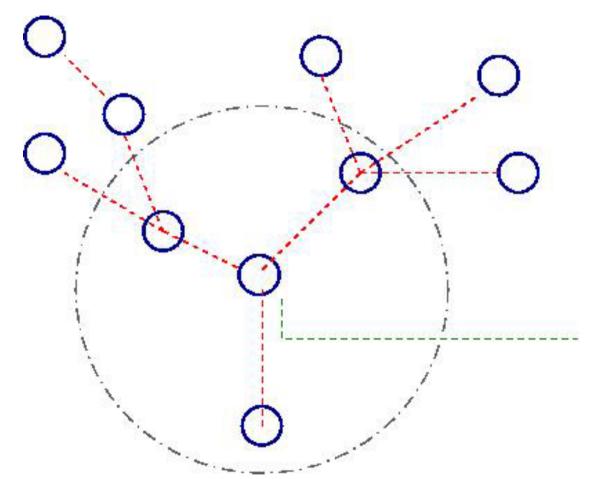 - fire engine contains routing terminal (more power and more bandwidth)

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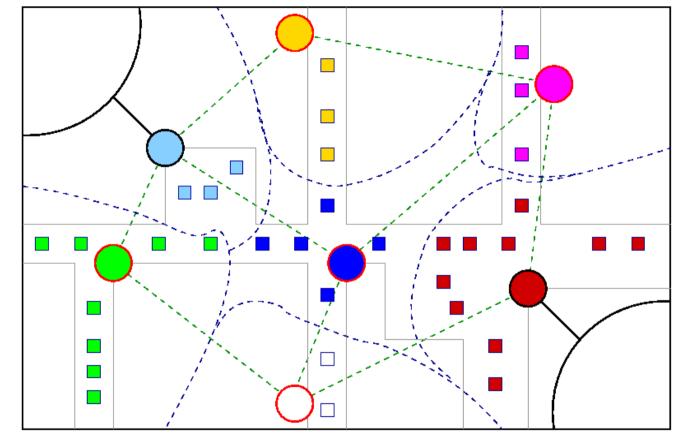Business Case:
•Mobile conferencing

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

access point

cell boundary

wireless link

virtual access point

wireless nodes

wired link

W-Ad-Hoc Terminal and Backbone

- 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

access point	
virtual access point	
cell boundary	
wireless nodes	
wireless nodes (multi–hop)	
wireless link	
wired link	

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