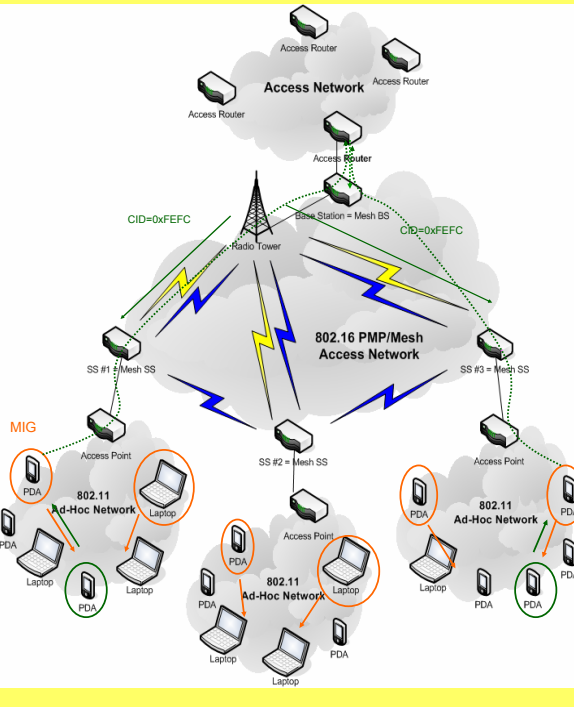


Why Ad Hoc Network Integration?

- Internet and Mobile Networks will merge in the future
- Increased interest in hot-spot scenarios
- Ad Hoc Networks can be used to extend hot-spots – an increasing market even in hard to reach locations

Network Architecture and Multicast

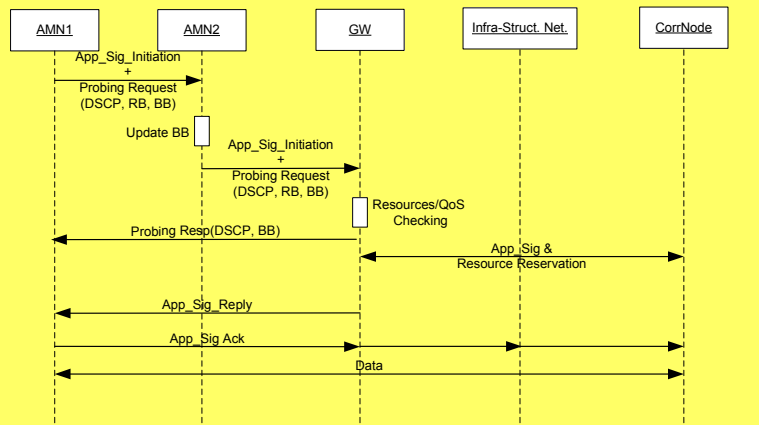
- Propose to use 802.16 links to connect Ad Hoc Islands to the Internet
- Access Router (AR) connects 802.16 BS to Access Network and Internet
- AR responsible for QoS mapping and Multicast connectivity
- 802.16 SS provides connectivity to the 802.11 based Ad Hoc Nodes
- Multicast IP Gateways (MIG)
 - Forward information on group membership in ad hoc fringe to AR
 - Periodically advertise themselves as gateway towards Ad Hoc nodes
- Standard Ad Hoc Nodes reactively create Multicast Mesh
- Gateway runs standard IP Multicast Protocol
- Gateway instructs BS about receivers interested in joining multicast groups
- BS sets up multicast delivery in 802.16 associated to the ad-hoc multicast groups.



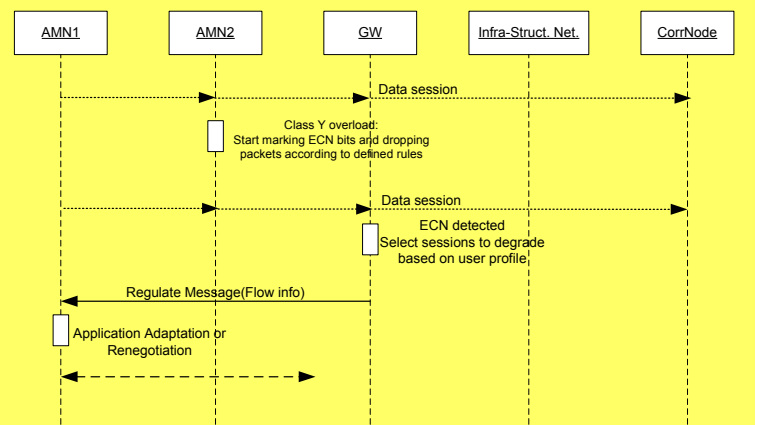
Network Integration and QoS

- IntServ and DiffServ not suitable for Ad Hoc networks due to frequent topology change,...
- INSIGNIA requires per-flow state in intermediate nodes. Dynamic fluctuations in Ad Hoc network would lead to frequent re-negotiation in infrastructure network
- FQMM does not comprise QoS admission control procedures. FQMM parameters, which are regulated in function of the effective local link bandwidth, do not reflect the link bandwidth between a source and a destination
- We adopt SWAN and abstract the ad-hoc path between an ad-hoc node and the gateway as a virtual link to the infrastructure side
- Admission control is performed with collaboration of the ad-hoc source nodes, as in the normal SWAN protocol.

Session Setup



Dynamic Session Regulation



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QoS Mapping for 802.16 Wireless Broadband

- In 802.16, each downlink/uplink CID has a service flow associated, configured with a set of QoS parameters
- A SS requests uplink bandwidth on a per connection basis
- Bandwidth is granted by the BS as an aggregate of all grants for an SS
- We use classifier to map between 802.16 QoS and DiffServ TOS
- In the downlink direction the classifier in the BS checks the fields that identify the flow and the TOS. Then it assigns this packet to the associated service flow
- In the uplink direction, SS checks these fields in packets coming from the ad-hoc network. It maps them to a specified service flow.

