Wireless Mesh Networks: Issues

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Although Wireless Mesh Networks show a lot of potential, numerous issues still need to be addressed. Some identified issues concern the need for scalability, adaptation, and security.

Scalability

The route discovery and route selection should be efficient in terms of delay and bandwidth consumption and one may wonder if the algorithms currently developed for the Internet can suit the specific constraints of wireless mesh networks. The wireless routers are more likely to suffer from congestion than in wired environment, thus alternate paths need to be find without creating more congestion, and without degrading user experience. In order to have an effective mesh network, the physical layer, MAC layer and Network layer should cross talk to one another.

Adaptation

- ✓ **User data rate management**: The applications should be flexible and adapt to the connectivity they use. The bandwidth available can vary according to the technology in use, the surrounding interferences, the number of users in the vicinity sharing the same resources, etc. The devices should be able to interface with different types of radio environment.

- ✓ **QoS requirements**: Traffic may be generated by a variety of applications, ranging from Internet browsing, data backup, and telephony, to entertainment and gaming. These applications generate a range of traffic patterns and have different bandwidth requirements. Classification and prioritization should be established within the network and within the nodes in order to increase the bandwidth utilization and optimize the user experience. QoS should also be maintained during inter and intra technology handoffs.

- ✓ **Interconnectivity**: Networks should be able to coexist with minimum interference. One may imagine the case where multiple access points operating on the same frequency band operate at proximity of each other. Some transmission power modulation or channel adaptation may be envisioned in order to ensure peaceful coexistence.

Security

Security is a major concern as no centralized entity can be used for authentication.