

# MOBILE AD-HOC AND WIRELESS SENSOR NETWORKS

## Lesson 03

### Mobile Ad-hoc Network (MANET) Applications

# CONTENT DISTRIBUTION AND SYNCHRONIZATION

- Enterprise— A number of Bluetooth-enabled mobile handheld devices, PCs, laptops, and WiFi access-points
- MANET used for content-distribution, PIM, other information dissemination, information fusion, and file sharing in the enterprise

# MANET NODES IN MULTICAST TREE TOPOLOGY

- Disseminate data packets and form a multicasting network
- Clusters of the nodes used to give a multicast tree topology in MANET

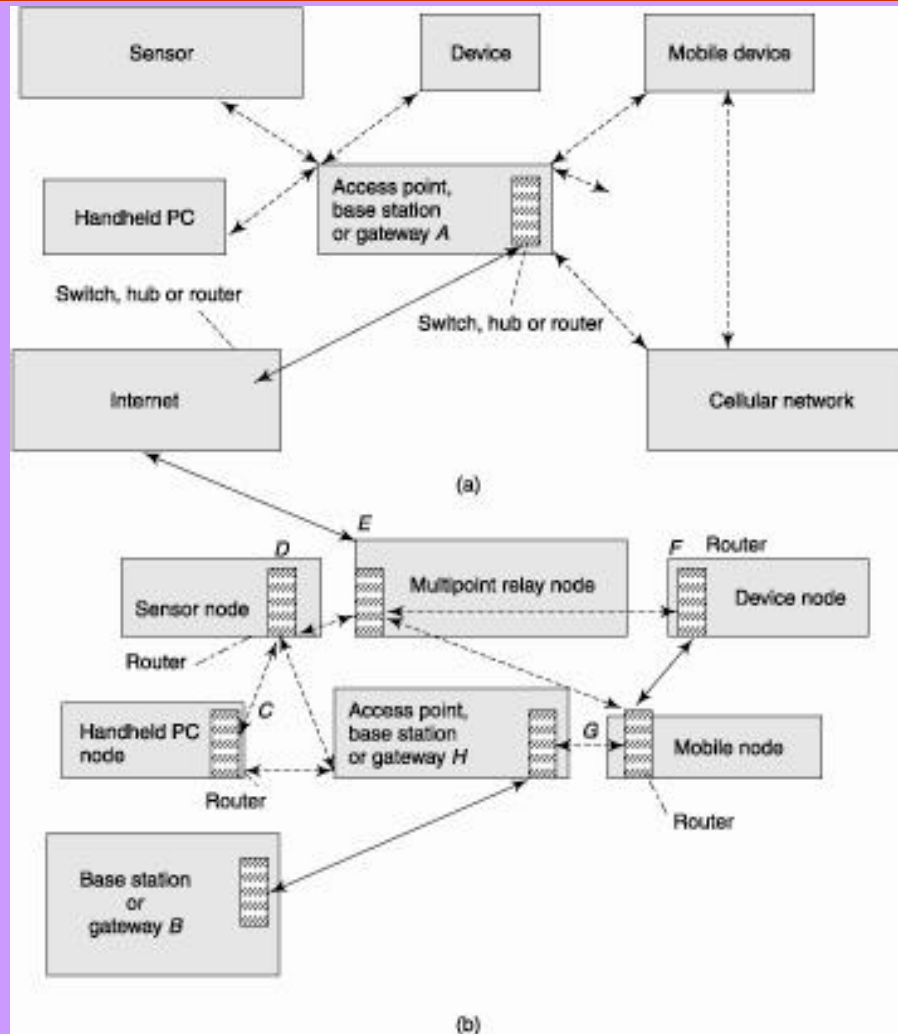
# MESH NETWORKING AND MOBILE SERVICE PROVIDER NETWORK

- Mesh-based mobile networks offer highly dynamic autonomous topology segments for the robust IP-compliant data services within the mobile wireless communication networks
- Inexpensive alternatives or improvement to infrastructure-based cellular CDMA or GSM mobile service provider

# MESH NETWORK

- A multicast tree network differs from mesh as it provides only a single path between a sender and a receiver
- Mesh network many paths

# MESH OF INTERCONNECTED MANETS AND FIXED INFRASTRUCTURE NETWORK



# PROTOCOL FOR UNIFIED MULTICASTING THROUGH ANNOUNCEMENTS (PUMA)

- A protocol that builds a mesh that connects MANET nodes with each other
- On the other mesh provides multiple paths between sender and receiver nodes

# NEEDS FOR PUMA

- MANETs have nodes which may be mobile and the wireless links are error-prone
- Certain packets may not be delivered to receivers through a multicast tree topology
- PUMA which send packets from senders to receivers through multiple paths may thus have a greater packet delivery ratio



# NEEDS FOR PUMA

- However, in benign conditions (low mobility and traffic load which leads to lesser collisions), sending packets is not needed and is a waste
- In such situations PUMA is able to reduce the redundancy
- PUMA adapts the amount of redundancy in the network depending on need

# IMAGE ACQUISITION, PROCESSING AND DISTRIBUTION USING MANET

- Number of imaging devices forming a MANET—low cost digital still camera with a wireless network interface, Wireless WebCam, mobile device connected to a digital still camera, mobile phones, and pocket PCs equipped with an image acquisition sensor

# APPLICATIONS OF IMAGE ACQUISITION USING MANET

- Remote viewfinder by security personals in an office
- Remote processing on a computer for a video stream from wireless WebCam and other devices

# APPLICATIONS OF IMAGE ACQUISITION USING MANET

- Image file transfer
- Messaging and data transmission to remote devices using 802.11b (Section 2.1.2)
- Remote controlling.

# IPv6 INTEGRATION AND WIRELESS SENSOR NETWORKS

- IPv6 is a new generation Internet and is used for Internet radio and real time video over the Internet
- IPv6 can be integrated with MANET and wireless sensor networks
- CDMA handsets and Apple iPhone are the examples of integration of the mobile phones with IPv4 and IPv6

# SUMMARY

- Content acquisition and distribution
- Multicasting
- Mesh networking
- PUMA
- Image acquisition
- IPv6 and IP4 integration

...

**End of Lesson 03**  
**Mobile Ad-hoc Network Applications**