GALGOTIAS UNIVERSITY

School of Computing Science and Engineering

Program: B.Tech.

Course Code: CSCN 4024

Course Name: Wireless and Mobile Security

Wireless Sensor Network(WSN) vs. Mobile Ad Hoc Network (MANET)

	WSN	MANET
Similarity	Wireless	Multi-hop networking
Security	Symmetric Key Cryptography	Public Key Cryptography
Routing	Support specialized traffic pattern. Cannot afford to have too many node states and packet overhead	Support any node pairs Some source routing and distance vector protocol incur heavy control traffic
Resource	Tighter resources (power, processor speed, bandwidth)	Not as tight.

Characteristics

- Power consumption constraints for nodes using batteries or energy harvesting
- Ability to cope with node failures (resilience)
- Mobility of nodes
- Heterogeneity of nodes
- Scalability to large scale of deployment
- Ability to withstand harsh environmental conditions
- Ease of use
- Cross-layer design

Factors Influencing WSN Design

- Fault tolerance
- Scalability
- Production costs
- Hardware constraints
- Sensor network topology
- Environment
- Transmission media
- Power Consumption
  - Sensing
  - Communication
  - Data processing

Applications

- Military Applications
- Environmental Applications
- Health Applications
- Home and Office Applications
- Automotive Applications
- Other Commercial Applications

Advantages

Less wiring

It can accommodate new devices at any time

It's flexible to go through physical partitions

It can be accessed through a centralized monitor

Disadvantages

- Lower speed compared to wired network.
- Less secure
- Gets distracted by various elements like Blue-tooth .
- Still Costly at large.
- It does not make sensing quantities in buildings easier.
- It does not cut costs for installation of sensors.

Challenges

- Heterogeneity
  - The devices deployed may be of various types and need to collaborate with each other.
- Distributed Processing
  - The algorithms need to be centralized as the processing is carried out on different nodes.
- Low Bandwidth Communication
  - The data should be transferred efficiently between sensors

- Large Scale Coordination
  - The sensors need to coordinate with each other to produce required results.
- Utilization of Sensors
  - The sensors should be utilized in a ways that produce the maximum performance and use less energy.
- Real Time Computation
  - The computation should be done quickly as new data is always being generated.

Operational Challenges of Wireless Sensor Networks

- Energy Efficiency
- Limited storage and computation
- Low bandwidth and high error rates
- Errors are common
  - Wireless communication
  - Noisy measurements
  - Node failure are expected
- Scalability to a large number of sensor nodes
- Survivability in harsh environments
- Experiments are time- and space-intensive


Thank You