Bahan Ajar

Chapter 6

Materi Pembelajaran

Matakuliah :

WIRELESS SENSOR NETWORKS

Kode Matakuliah : SKO 20428

Prodi : SISTEM KOMPUTER

Dosen Pengampu Matakuliah:

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Chapter 6

Tables of Content

Mobile Ad hoc Networks (MANET)

A MANET is an autonomous collection of mobile users communicating over a relatively bandwidth-constrained wireless link with limited battery power in highly dynamic environments.

The network topology, due to the mobility in the network is, in general, dynamic and may change rapidly and unpredictably over time.

Applications of MANET

Personal area networking
– cell phone, laptop, ear phone, wrist watch

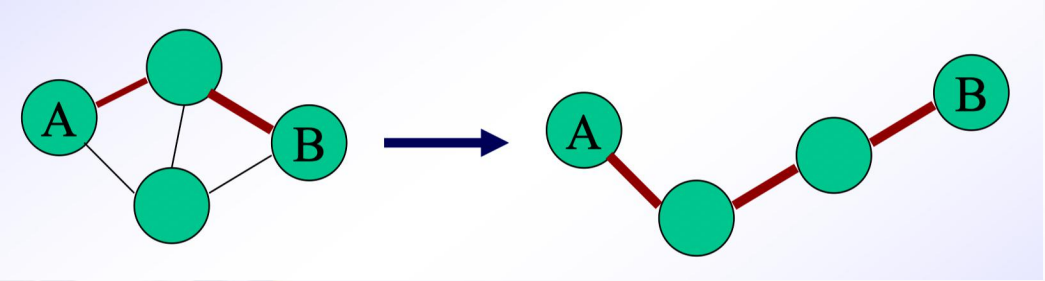
Military environments
– soldiers, tanks, planes

Civilian environments
– taxi cab network, meeting rooms, sports stadiums, boats, small aircraft

Emergency operations
– search-and-rescue, policing and fire fighting

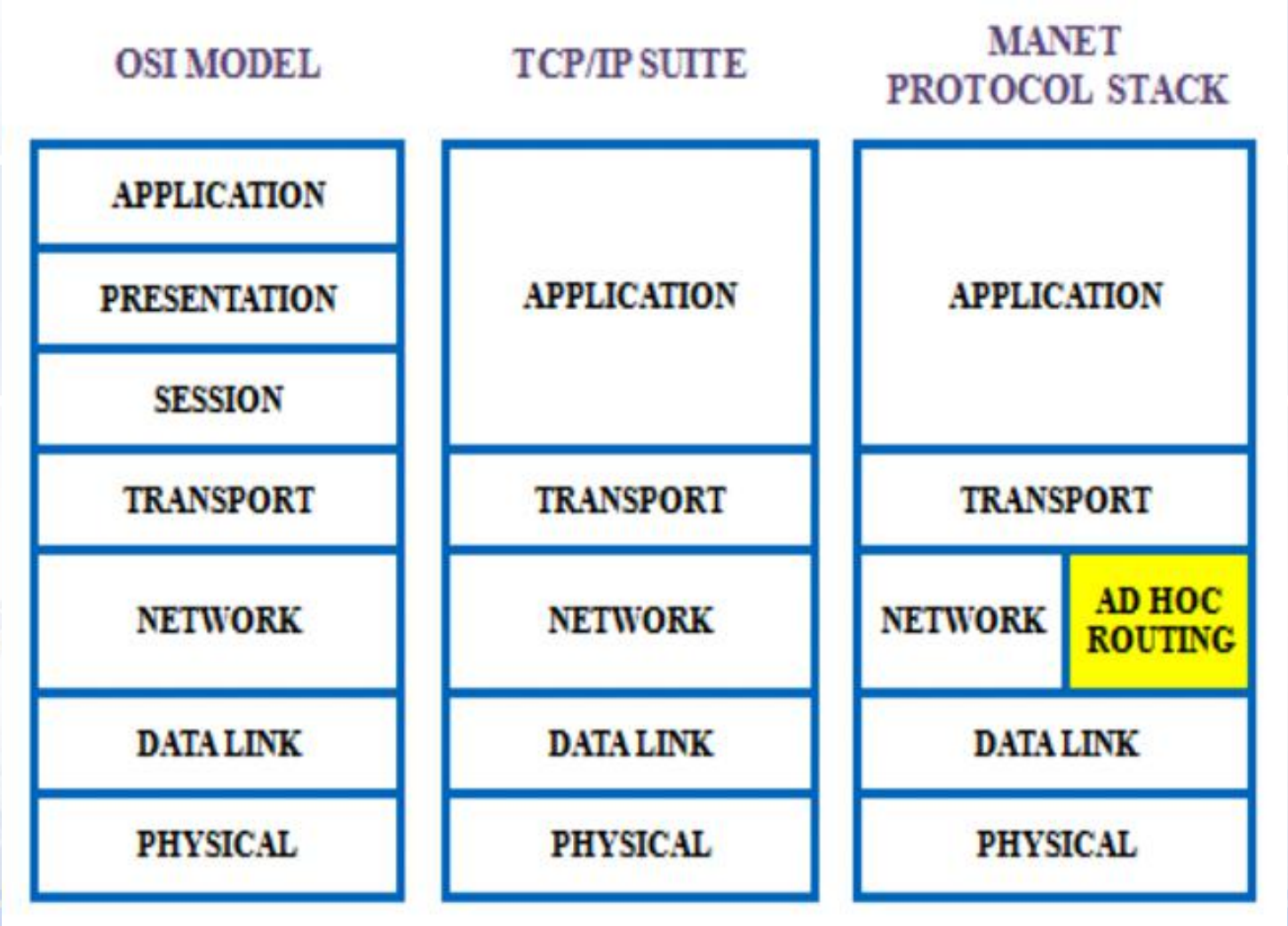
Basic Routing in MANET

- ✓ Host movement frequent
- ✓ Topology change frequent
- ✓ No cellular infrastructure. Multi-hop wireless links
- ✓ Data must be routed via intermediate nodes

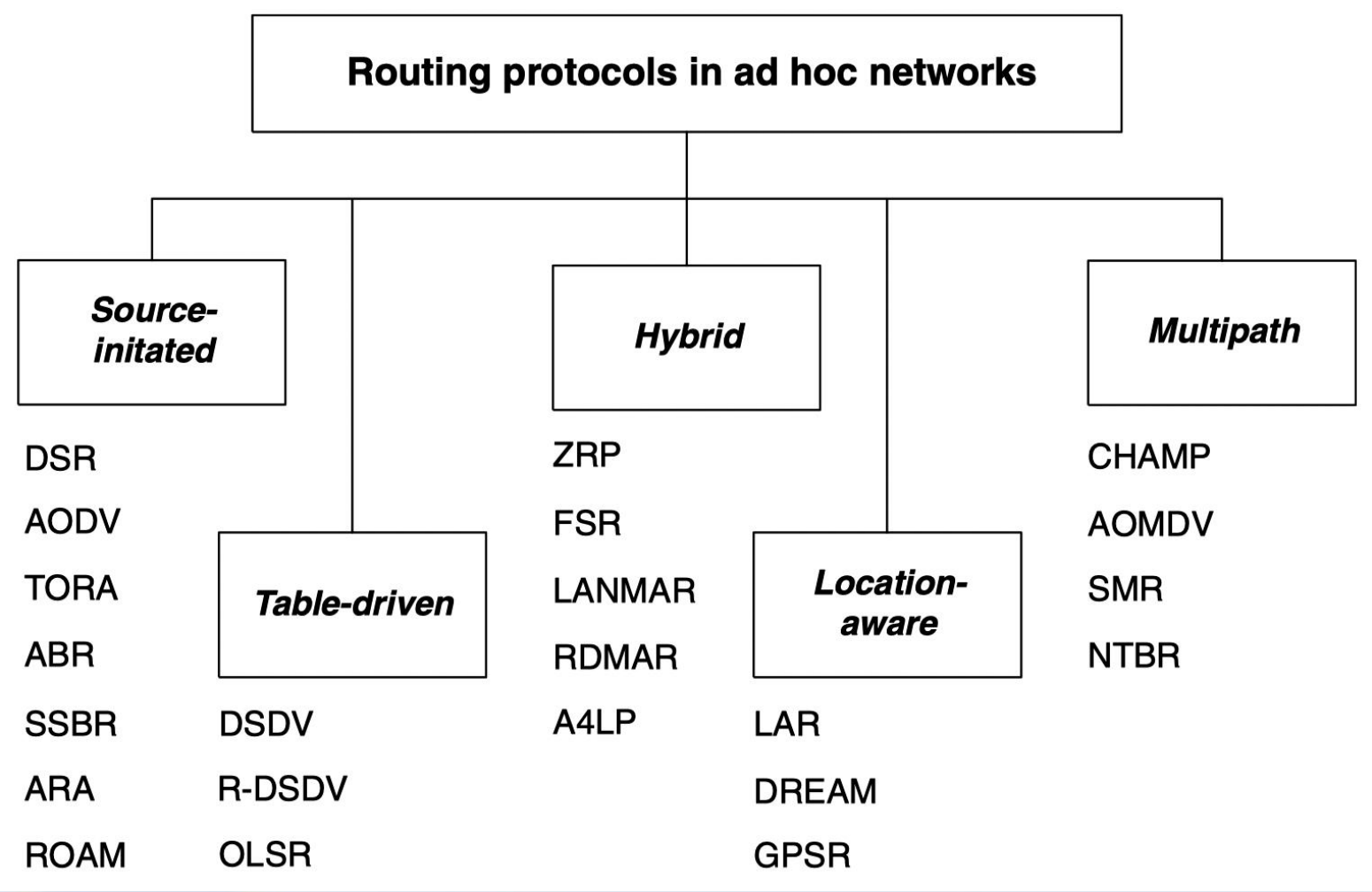


The basic goals have always been to devise a routing protocol that minimizes control overhead, packet loss ratio, and energy usage while maximizing the throughput.

Mobile Ad hoc Networks (MANET) PROTOCOL



Ad Hoc Routing for MANET



Ad Hoc Routing for MANET

The routing protocols in ad hoc networks can hence be divided into five categories based on their underlying architectural framework

- Source-initiated (reactive or on-demand)
- Table-driven (proactive)
- Hybrid
- Location-aware (geographical)
- Multipath

Ad Hoc Routing for MANET

Source-Initiated Protocols

Source-initiated routing represents a class of routing protocols where the route is created only when the source requests a route to a destination.

A route discovery procedure is invoked when the route is requested by the source and special route request packets are flooded to the network starting with the immediate neighbors. Route maintenance procedure maintains the active routes for the duration of their lifetimes.

Ad Hoc Routing for MANET

Table-Driven Protocols

Table-driven protocols always maintain up-to-date information of routes from each node to every other node throughout the network.

Routing information is stored in a routing table in each of the nodes and route updates are propagated throughout the network to keep the routing information as recent as possible.

Ad Hoc Routing for MANET

Hybrid Protocols

Hybrid routing schemes combine the power of on-demand and table-driven routing protocols. Static routing is generally used at the fringes of the network where route changes are not frequent while in the core of the network on-demand routing has more significance.

These schemes create a bridge between the two major types of routing protocols, and the overall performance obtained can be further improved.

Ad Hoc Routing for MANET

Location-Aware Protocols

Location-aware routing schemes in mobile ad hoc networks assume that the individual nodes are aware of the locations of all the nodes within the network.

The best and easiest technique is the use of the Global Positioning System (GPS) to determine exact coordinates of these nodes in any geographical location. This location information is then utilized by the routing protocol to determine the routes.

Ad Hoc Routing for MANET

Multipath Protocols

Multipath routing protocols create multiple routes from source to destination. The main advantage of discovering multiple paths is that the bandwidth between links is used more effectively with greater delivery reliability. It also helps during times of the network congestion.

Multiple paths are generated on demand or by using a proactive approach and are of great significance because routes generally get disconnected quickly due to node mobility

Tugas Mandiri (teori):

1. Jelaskan perbandingan koneksi jaringan wireless infrastruktur dengan koneksi jaringan wireless MANET.
2. Apa perbedaan antara Protokol Model OSI, TCP/IP, dan Stack Protocol ? Jelaskan.

Tugas Mandiri (praktikum):

Rancang komunikasi Ad Hoc node di Network Simulator.

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