# **Hierarchical Routing**



Deet	t Line Ilene				
Dest.	Line	Hops			
1A	-	-			
1B	1B	1			
1C	1C	1			
2A	1B	2			
2B	1B	3 3 4			
2C	1B				
2D	1B				
ЗA	1C	3 2 3 4 4			
3B	1C				
4A	1C				
4B 4C	1C				
	1C				
5A	1C	4			
5B	1C	5			
5C	1B	5			
5D	1C	6			
5E	1C	5			
(b)					

Full table for 1A

Hierarchical table for 1A

Dest.	Line	Hops		
1A	—	- 1		
1B	1B			
1C	1C	1 2 2 3 4		
2	1B			
3	1C			
4	1C			
5	1C			

(C)

(a)

### **Broadcast Routing**



Reverse path forwarding. (a) A subnet. (b) a Sink tree. (c) The tree built by reverse path forwarding.

## **Multicast Routing**



(a) A network. (b) A spanning tree for the leftmost router.
(c) A multicast tree for group 1. (d) A multicast tree for group 2.

# **Routing for Mobile Hosts**

A WAN to which LANs, MANs, and wireless cells



# Routing in Ad Hoc Networks

Possibilities when the routers are mobile: 1.Military vehicles on battlefield.

- No infrastructure.
- 2.A fleet of ships at sea.
  - All moving all the time
- 3. Emergency works at earthquake .
  - The infrastructure destroyed.
- 4.A gathering of people with notebook computers.
  - In an area lacking 802.11.

# **Route Discovery**



- (a) Range of A's broadcast.
- (b) After B and D have received A's broadcast.
- (c) After C, F, and G have received A's broadcast.
- (d) After E, H, and I have received A's broadcast.

Shaded nodes are new recipients. Arrows show possible reverse routes.

# **Route Discovery (2)**

Source Request I	Destination Source	irc	e	Dest.	Hop
address ID	address sequence #	enc	e #	sequence #	count

#### Format of a ROUTE REQUEST packet.