OSPF

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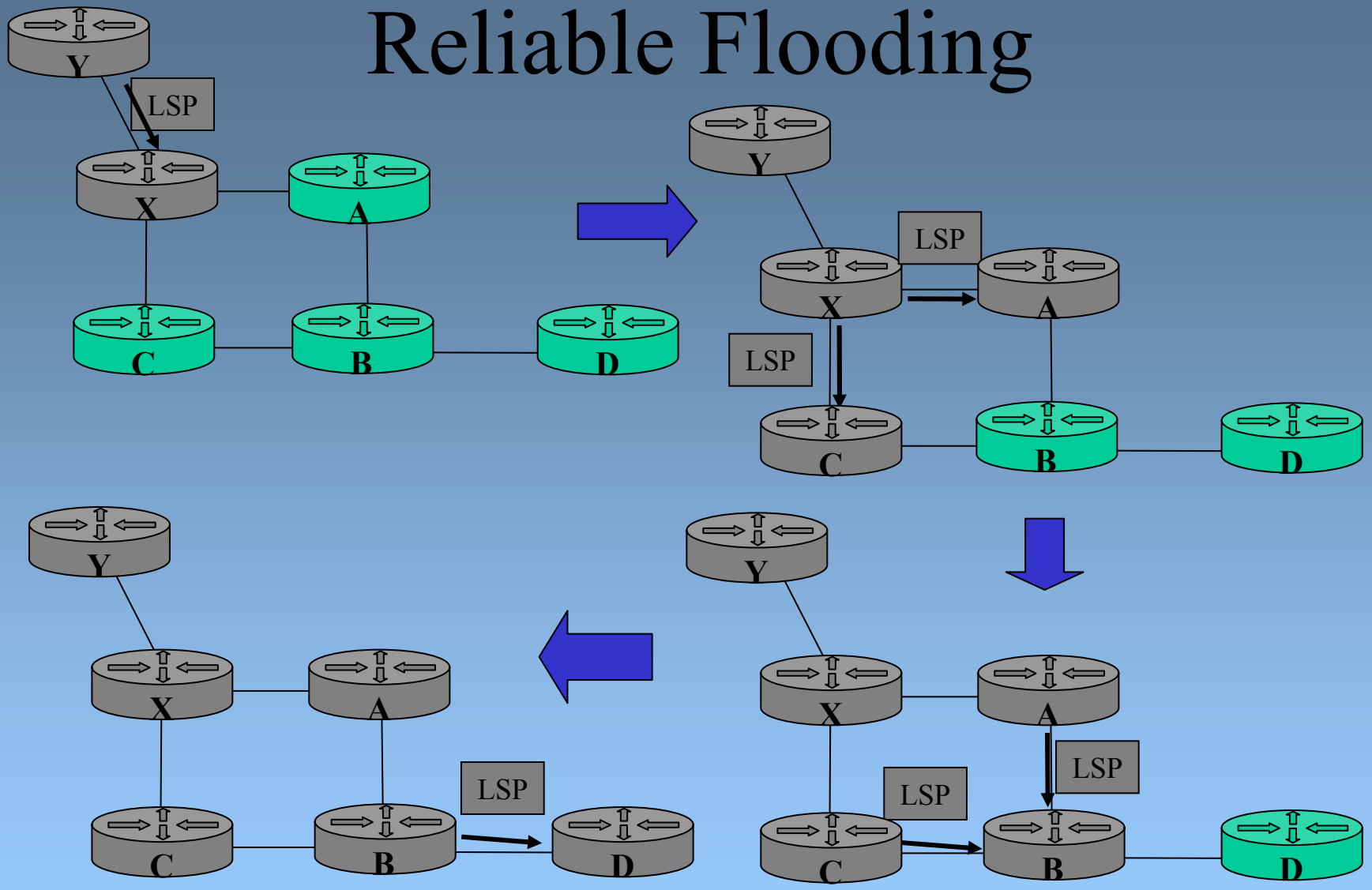
Link State

- Strategy
  - send to all nodes (not just neighbors) information about directly connected links (not entire routing table)
  - Each node creates a packet called link-state packet (LSP)
- Link State Packet (LSP) contains
  - id of the node that created the LSP
  - A list of directly connected neighbor of that node, with the cost of the link to each directly connected neighbor
  - sequence number (SEQNO)
  - time-to-live (TTL) for this packet

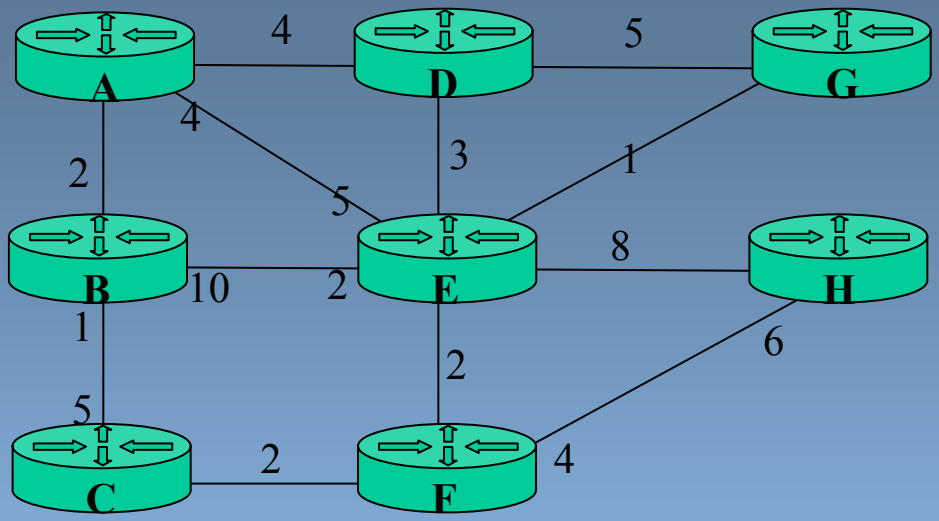
Link State (cont)

- Reliable flooding
  - store most recent LSP from each node
  - forward LSP to all nodes but one that sent it
  - generate new LSP periodically
    - increment SEQNO
  - start SEQNO at 0 when reboot
  - decrement TTL of each stored LSP
    - discard when TTL=0

Reliable Flooding



Link State



Router	Neighbor	Cost
A	B	2
A	D	4
A	E	4

Router	Neighbor	Cost
B	A	2
B	C	1
B	E	10

Router	Neighbor	Cost
D	A	4
D	E	3
D	G	5

Router	Neighbor	Cost
C	B	5
C	F	2

Router	Neighbor	Cost
E	A	5
E	B	2
E	D	3
E	F	2
E	G	1
E	H	8

Router	Neighbor	Cost
F	C	2
F	E	2
F	H	4

Router	Neighbor	Cost
G	D	5
G	E	1

Router	Neighbor	Cost
H	E	8
H	F	6

Djikstra Algorithm

Candidate	Cost total	Tree	Description
		A,A,0	Router A sebagai root
		A,A,0	
A,B,2	2		Candidate list dari A ke B, cost 2
A,D,4	4		Candidate list dari A ke D, cost 4
A,E,4	4		Candidate list dari A ke E, cost 4
		A,A,0	
		A,B,2	Cost terendah masuk ke Tree
A,D,4	4		
A,E,4	4		
B,C,1	3		Semua tetangga B Candidate list
B,E,10	**12**		Dibuang, kalah dari A,E,4

Djikstra Algorithm (2)

Candidate	Cost total	Tree	Description
		A,A,0	
		A,B,2	
		B,C,1	Cost terendah masuk ke Tree
A,D,4	4		
A,E,4	4		
C,F,2	3		Semua tetangga C Candidate list
		A,A,0	
		A,B,2	
		B,C,1	
		C,F,2	Cost terendah masuk ke Tree
A,D,4	4		
A,E,4	4		
F,E,2	**7**		Semua tetangga F Candidate list
F,H,4	9		F,E,2 kalah dari A,E,4

Djikstra Algorithm (3)

Candidate	Cost total	Tree	Description
		A,A,0	
		A,B,2	
		B,C,1	
		C,F,2	
		A,D,4	Cost terendah masuk ke Tree
A,E,4	4		
F,H,4	9		
D,E,3	**7**		Semua tetangga D Candidate list
D,G,5	9		D,E,3 kalah dari A,E,4

Djikstra Algorithm (4)

Candidate	Cost total	Tree	Description
		A,A,0	
		A,B,2	
		B,C,1	
		C,F,2	
		A,D,4	
		A,E,4	Cost terendah masuk ke Tree
F,H,4	9		
D,G,5	**9**		Kalah dari A,E,4 & E,G,1
E,B,2	**6**		Semua tetangga E Candidate list
E,D,3	**7**		E,B,2 & E,D,3 kalah dr A,B,2 & A,D,4
E,F,2	**6**		Kalah dari A,B-B,C-C,F
E,G,1	5		
E,H,8	**12**		Kalah dari F,H,4

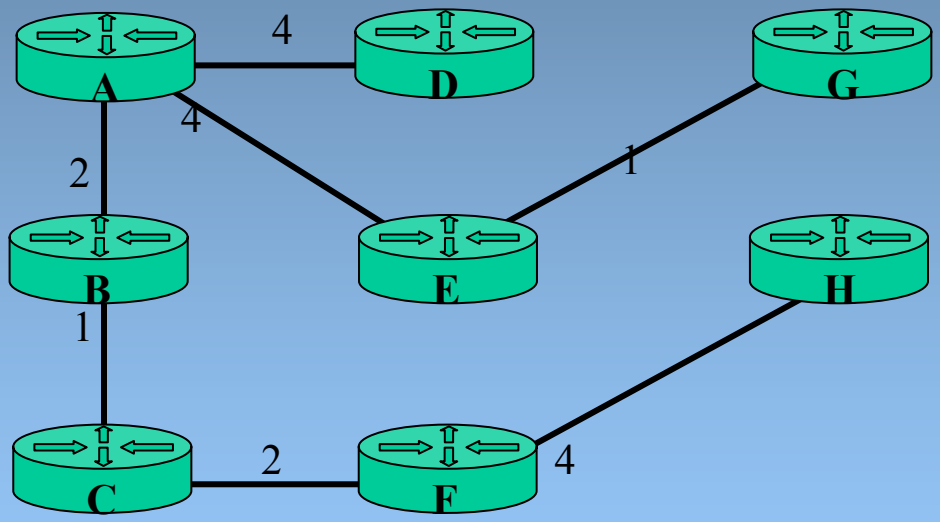
Djikstra Algorithm (5)

Candidate	Cost total	Tree	Description
		A,A,0 A,B,2 B,C,1 C,F,2 A,D,4 A,E,4 E,G,1	Cost terendah masuk ke Tree
F,H,4	9		

Djikstra Algorithm (6)

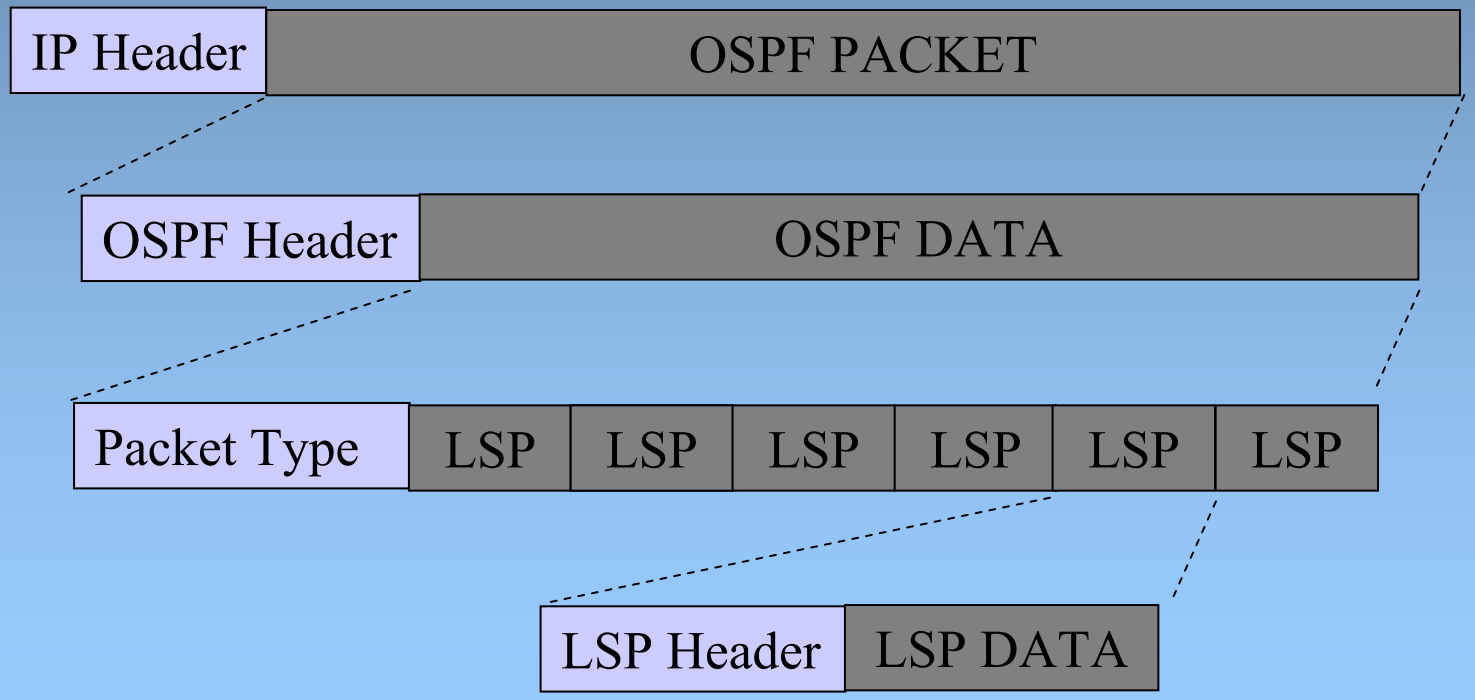
Candidate	Cost total	Tree	Description
		A,A,0 A,B,2 B,C,1 C,F,2 A,D,4 A,E,4 E,G,1 F,H,4	

Djikstra Algorithm (7)



Open Shortest First Protocol (OSPF)

- Menggunakan Prinsip Link-state
- Ukuran maks packet OSPF untuk Cisco = 1500 octets
- Encapsulated di dalam IP header (Protocol = 89)



OSPF Packet Header

