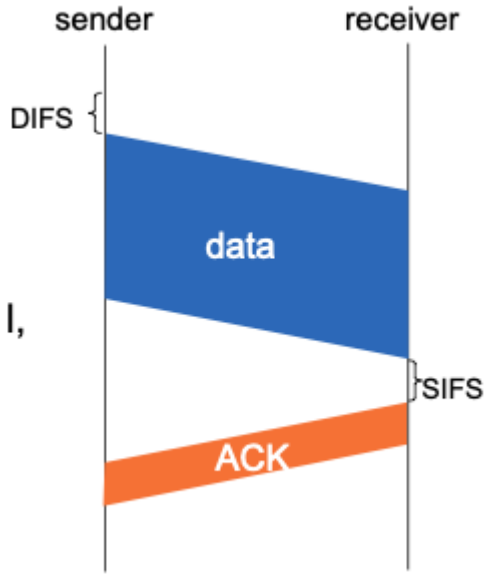
(1)(A) retransmission, after waiting a random time
(1)(B) binary exponential backoff

first collision: choose K from {0,1}; delay is K· 512 bit transmission times

after second collision: choose K from {0,1,2,3}…
after ten collisions, choose K from {0,1,2,3,4,…,1023

© Jam Signal: make sure all other transmitters are aware of collision

(2)



I,

802.11 sender

1 if sense channel idle for **DIFS** then
transmit entire frame (no CD)

2 if sense channel busy then
start random backoff time
timer counts down while channel idle
transmit when timer expires
if no ACK, increase random backoff interval, repeat 2

DI

802.11 receiver

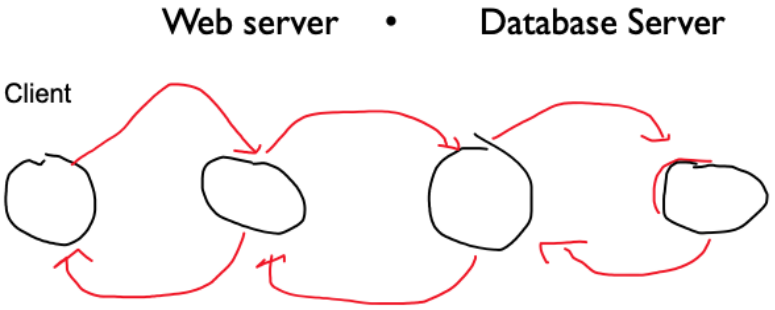
- if frame received OK

return ACK after **SIFS** (ACK needed due to hidden terminal problem)

(3) (a) because D is not in table, switch forwards frame into interfaces 2 and 3

(b) the hub forwards the frame to A, B, and interface 1 bit by bit .

(4) (a)



(b)TCP supports reliable data transfer but UDP does not

(5) any two of the following

coverage , system capacity , latency and cost

(6)