

Data Link Layer

Jirasak Sittigorn

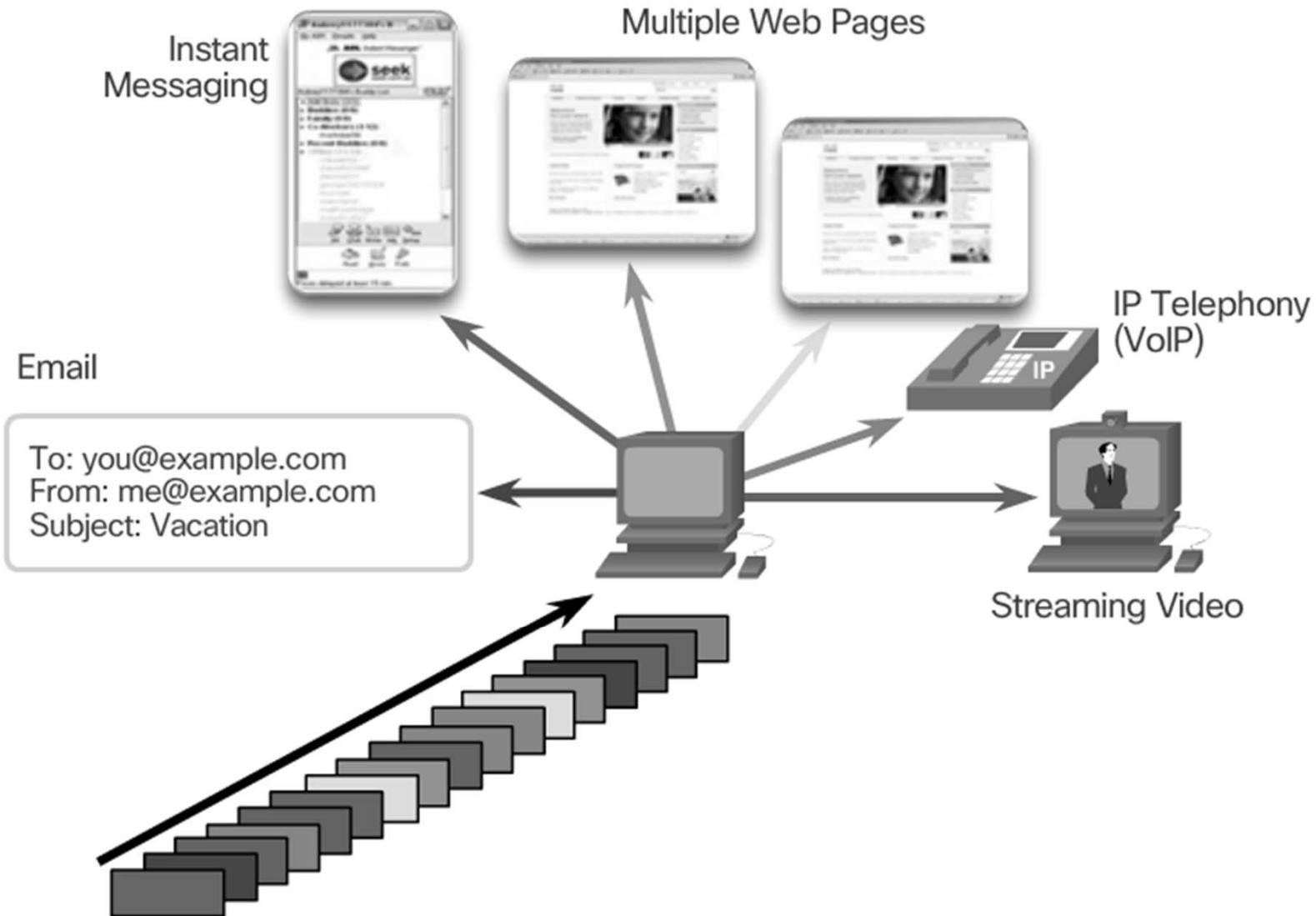
Department of Computer Engineering
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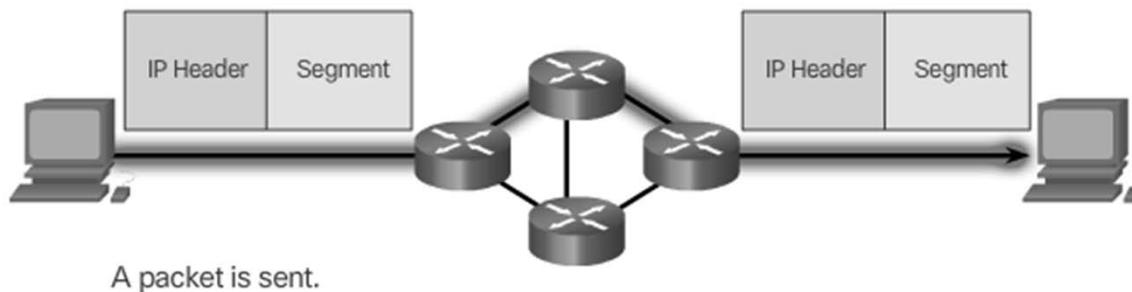
P20 Protocols

P44 HDLC

P57 PPP



Connectionless Communication



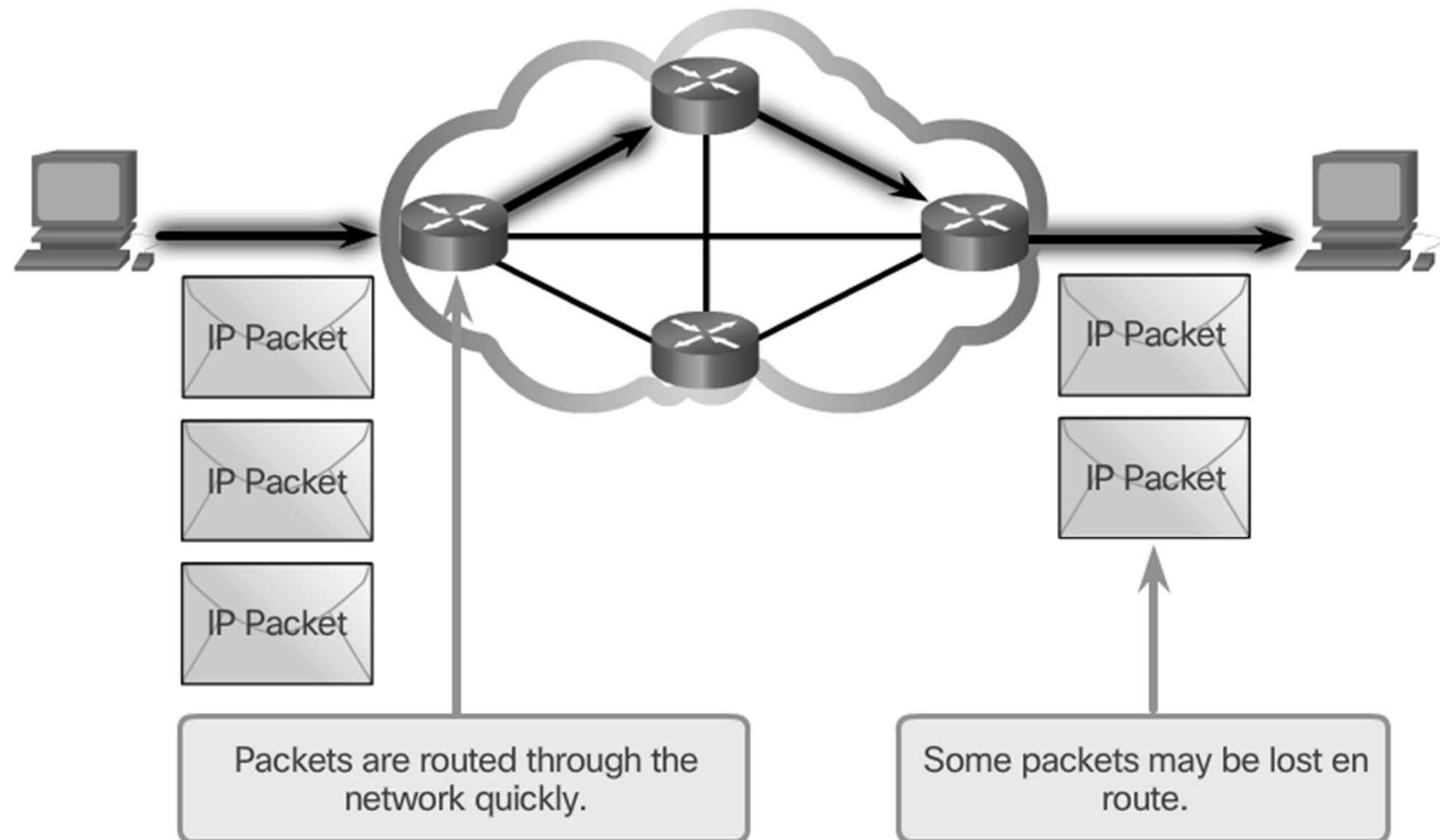
The sender doesn't know:

- If the receiver is present
- If the packet arrived
- If the receiver can read the packet

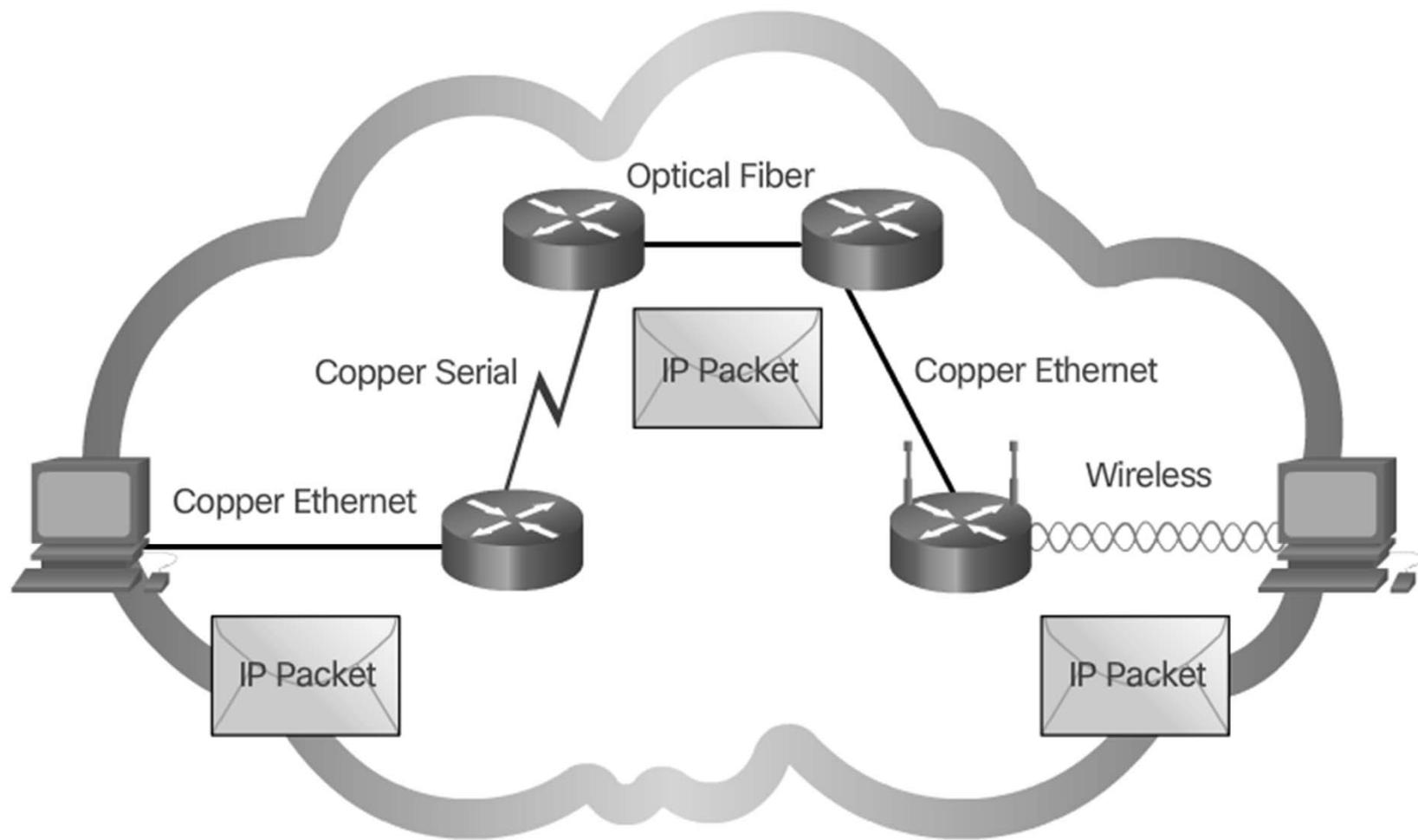
The receiver doesn't know:

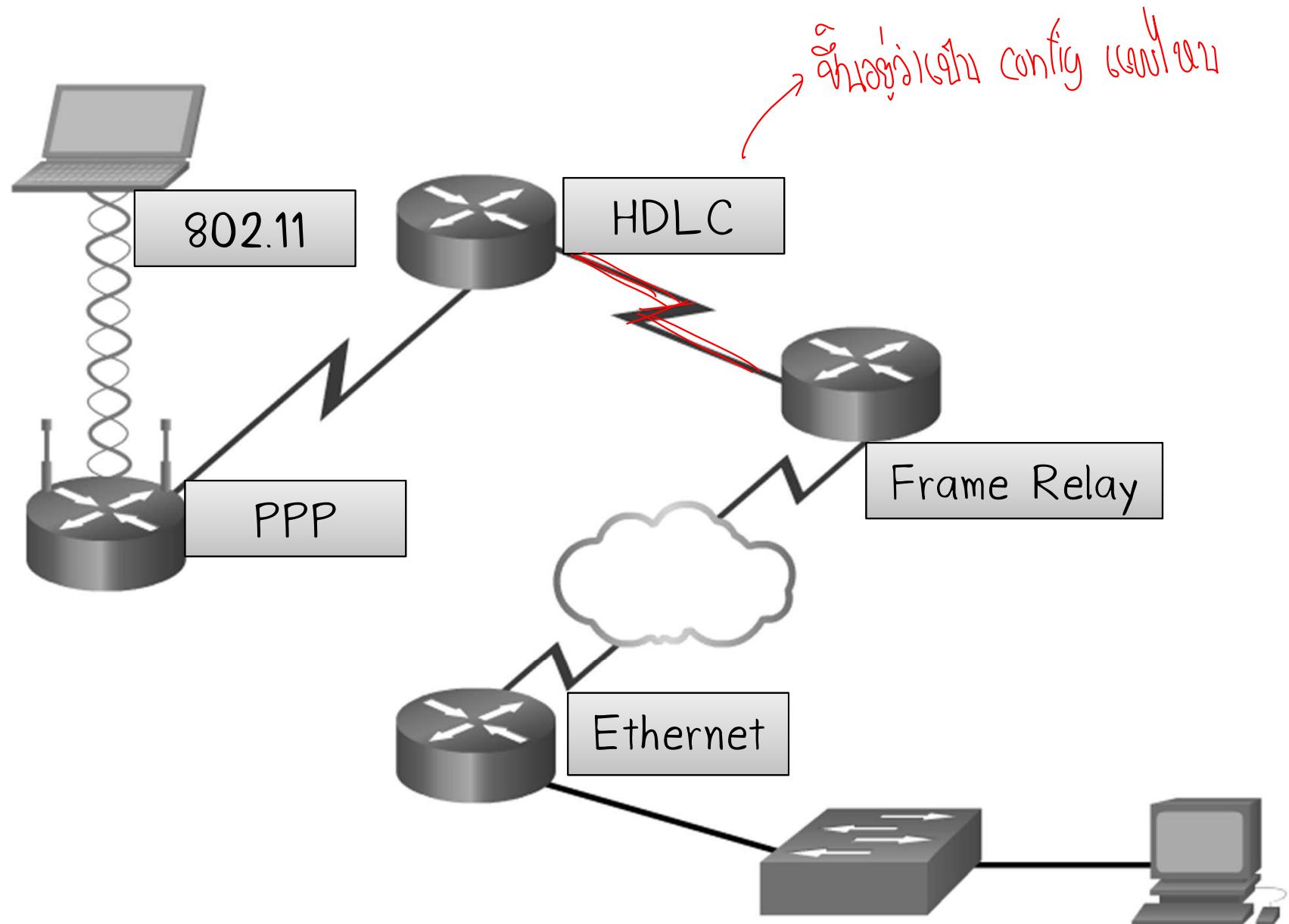
- When it is coming

Best Effort Process



Media Independent Process

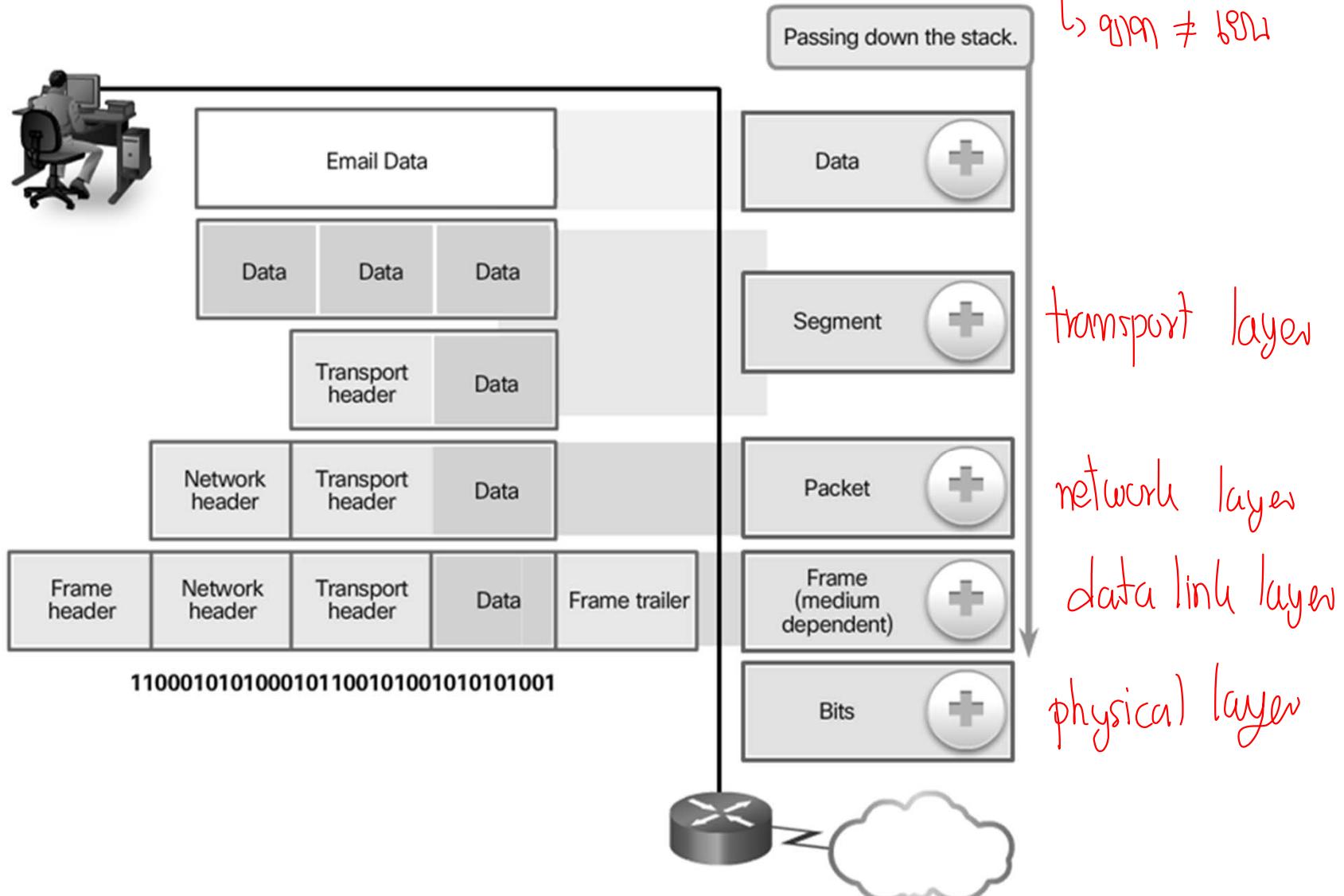




Protocol Data Units

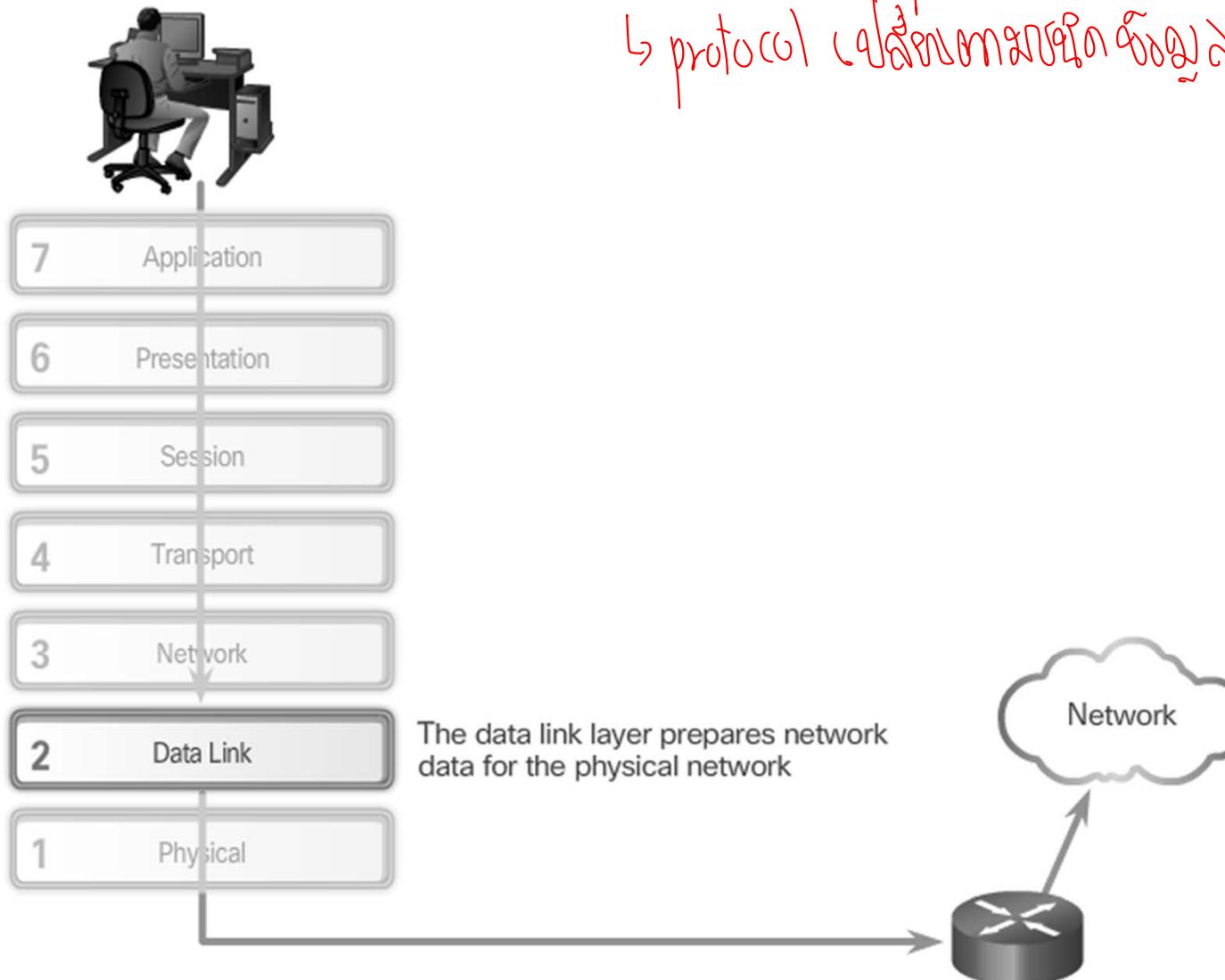
↳ passing down the stack

↳ PPP ≠ ISO

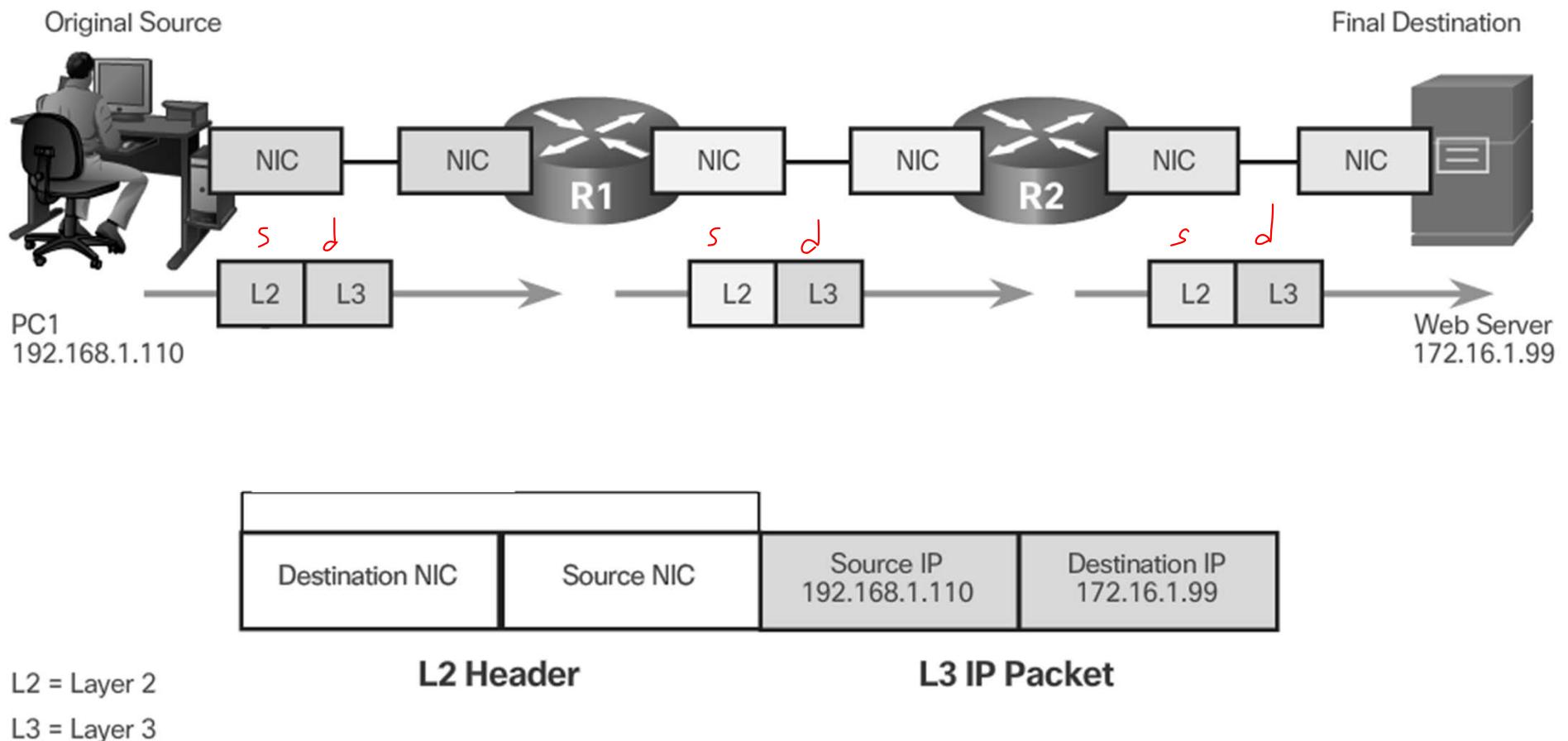


Data Link Layer

- ↳ new media dependent
- ↳ protocol (ការពារមានប្រភេទច្បាស់)



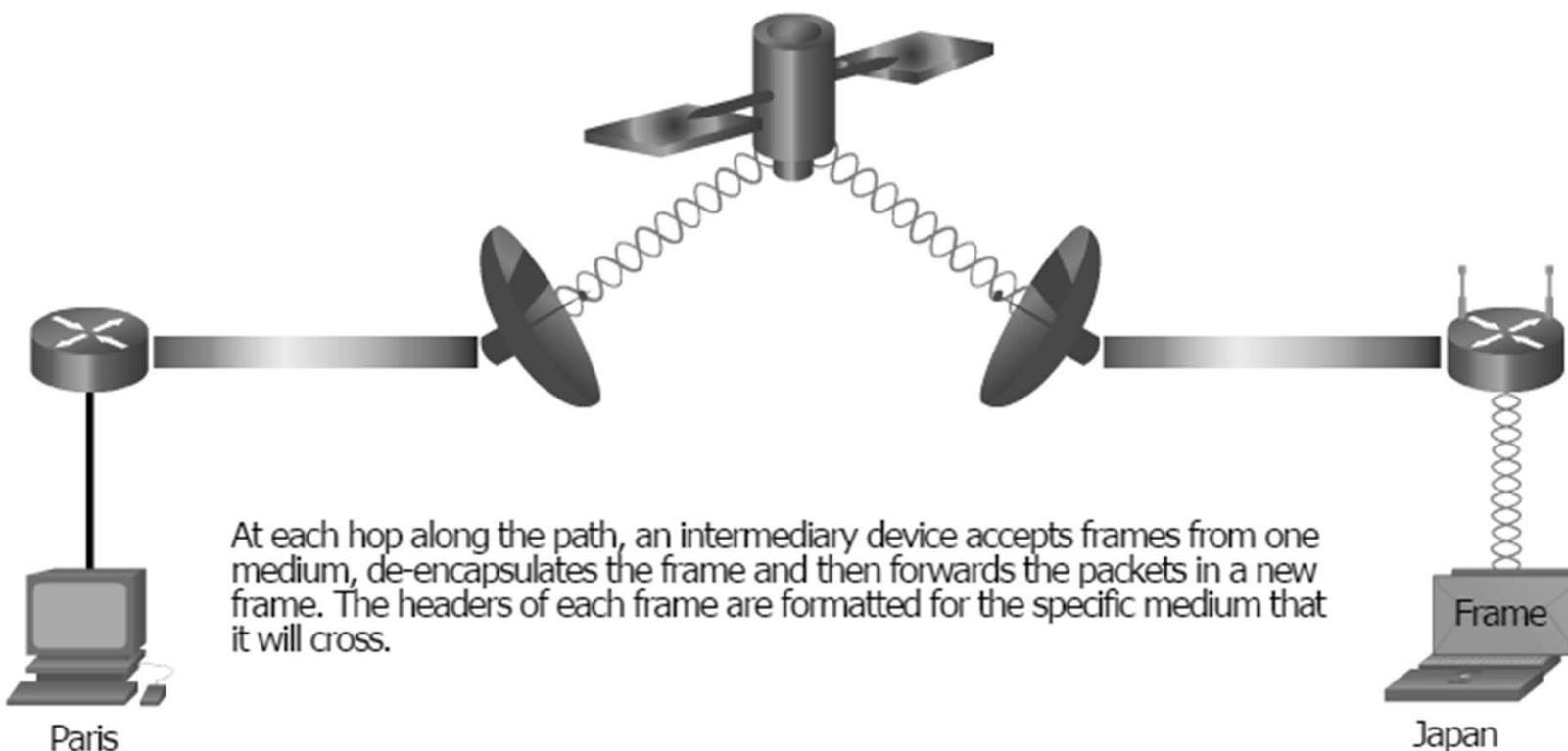
Data Link Layer



Data Link Layer

Data link layer protocols govern how to format a frame for use on different media.

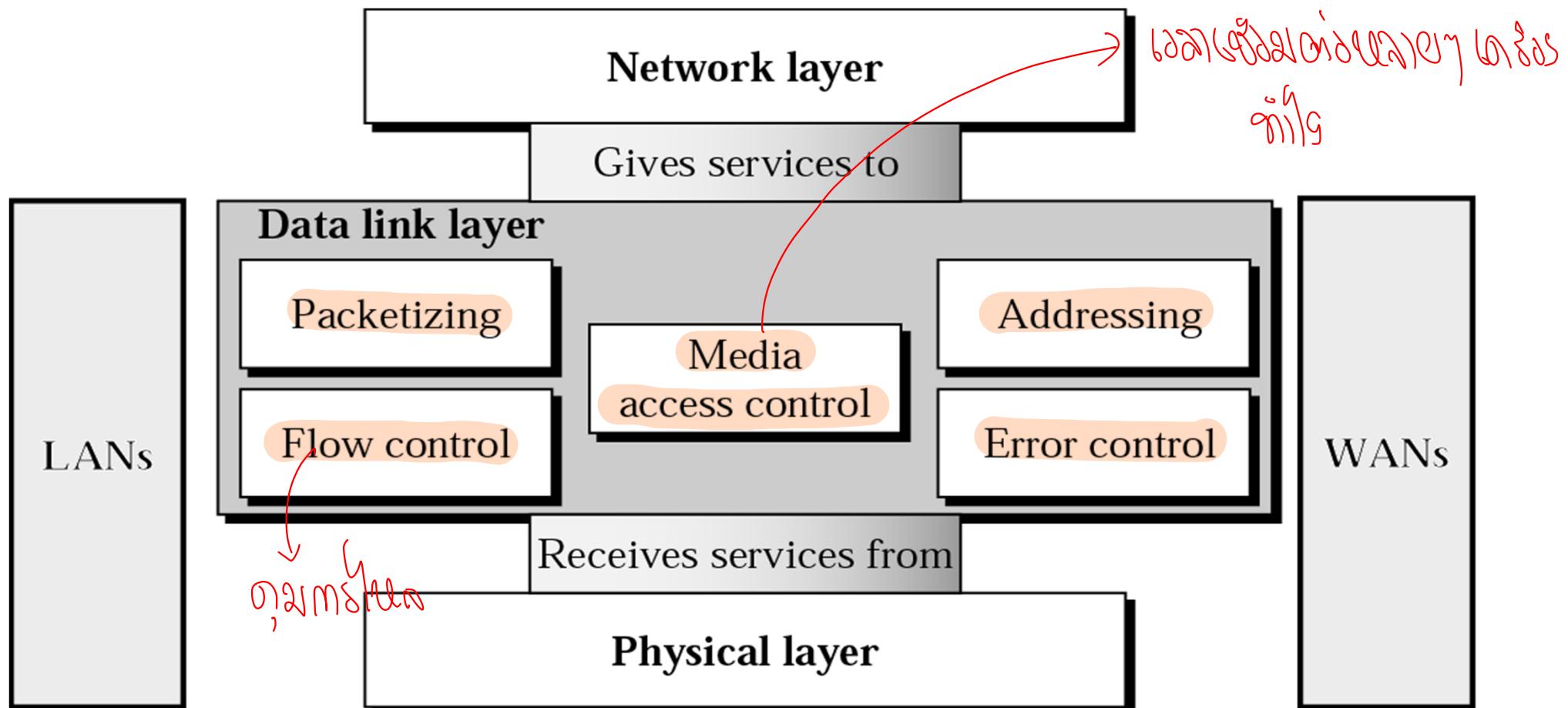
Different protocols may be in use for different media.



Position of the data-link layer

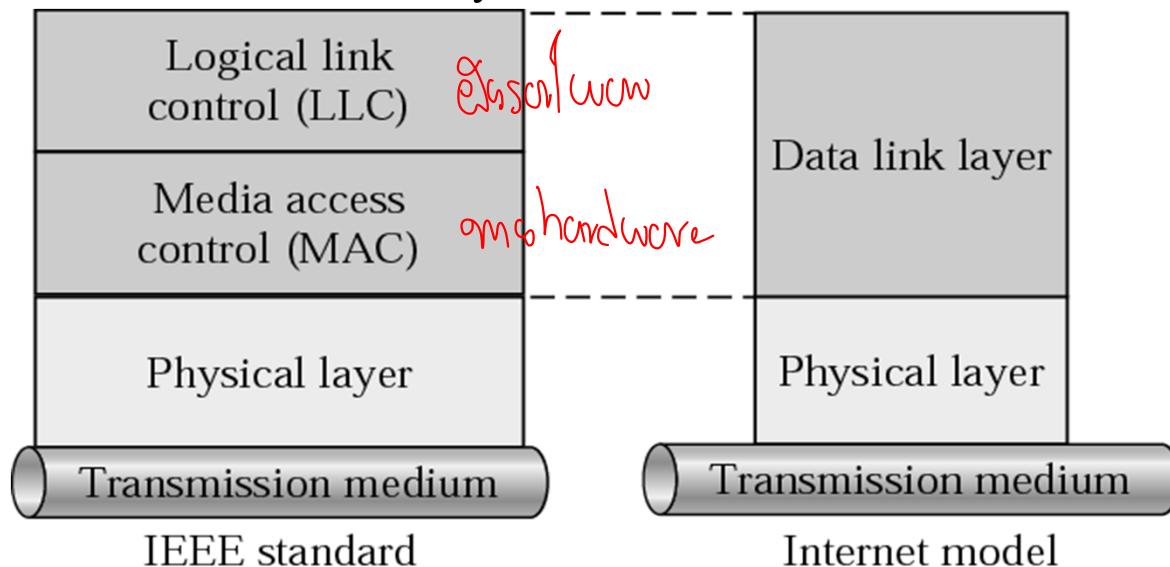
கிளை Focus

கிளை hardware & software

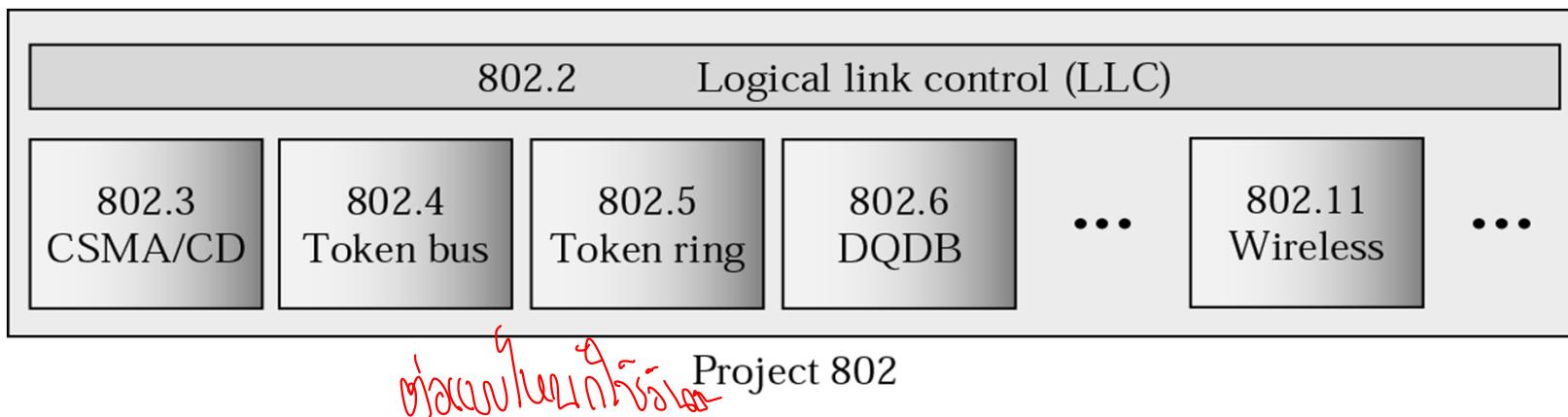


Sublayers

- LLC and MAC sublayers



- IEEE standards for LANs



Chapter 11

Data Link Control

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Data Link Layer

layer 2

- Main function

- Data link control : node-to-node comm.

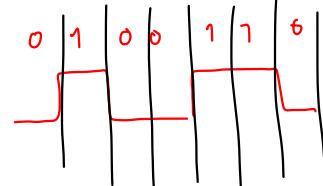
- Framing
 - Flow control
 - Error control
 - Software-implemented protocols

- Media access control : Share link comm.

wan bus

Framing

2 bits data 0 → 0V, 1 → 5V

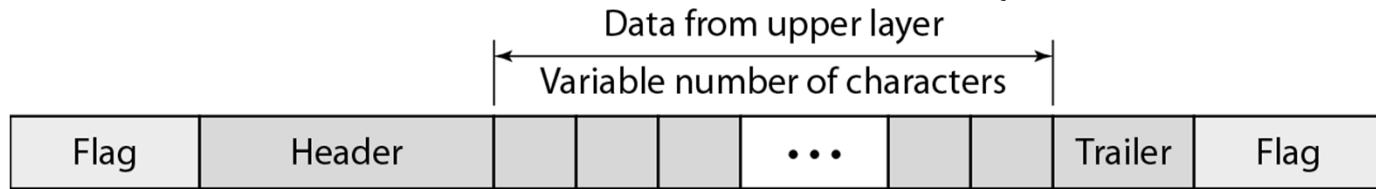
- Data Link Layer (bits) <-> Physical Layer (Signal)
 - Physical Layer
 - Bit Synchronization (bit duration & timing) է՛կ օգնի ի աշխատանք
 - Data Link Layer
 - Addressing (Destination & Source)
 - Flow control & Error control հեռախոսային լուսացում
 - Framing (Size)
 - Fixed-Size Framing (Fix վահանակ)
 - Variable-Size Framing (Վահանակ չէ)
- Գործադրություն ||
Համապատասխանություն → համապատասխանություն, բարեկարգություն
- 
- 

ԱՅՍ լ = 0 լ = 1

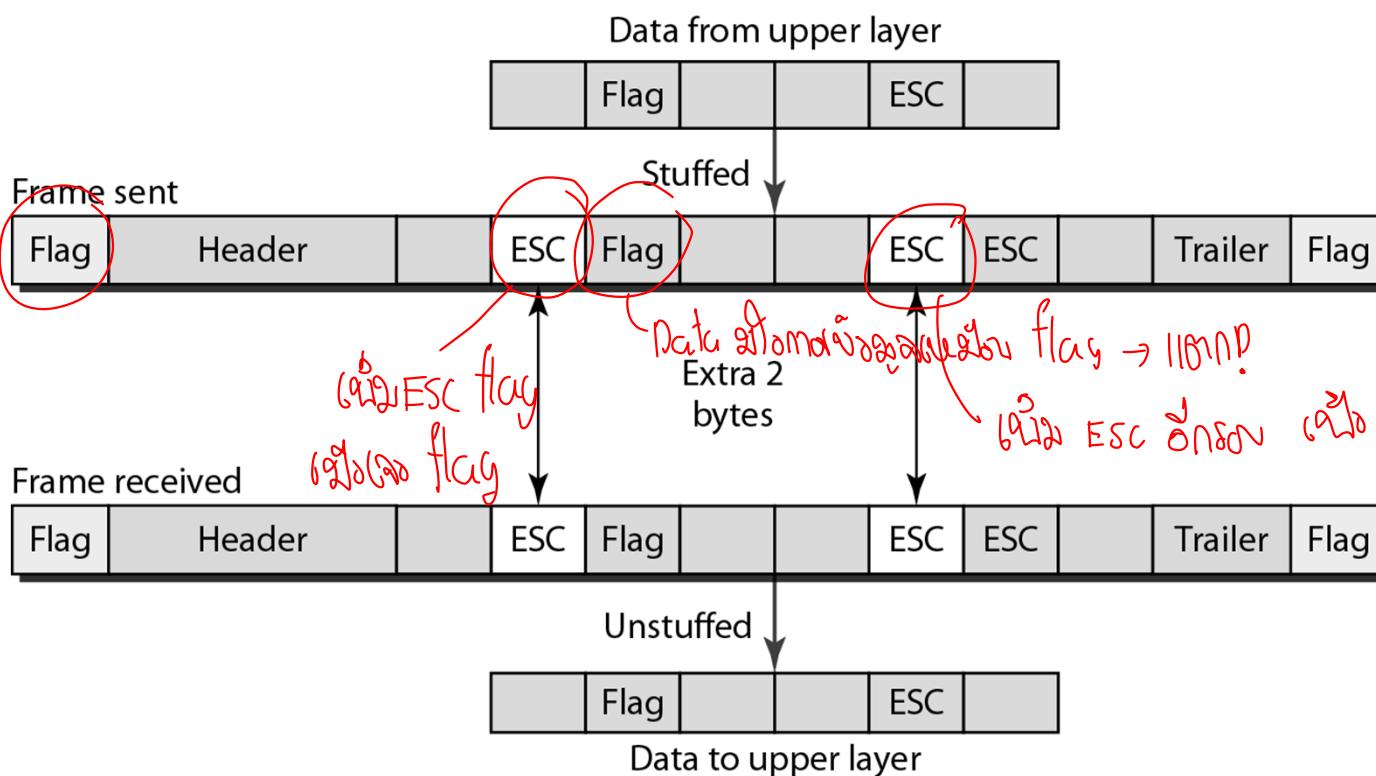
ԼՈՒՐ ~ ը

Character-oriented protocol

- A frame in a character-oriented protocol



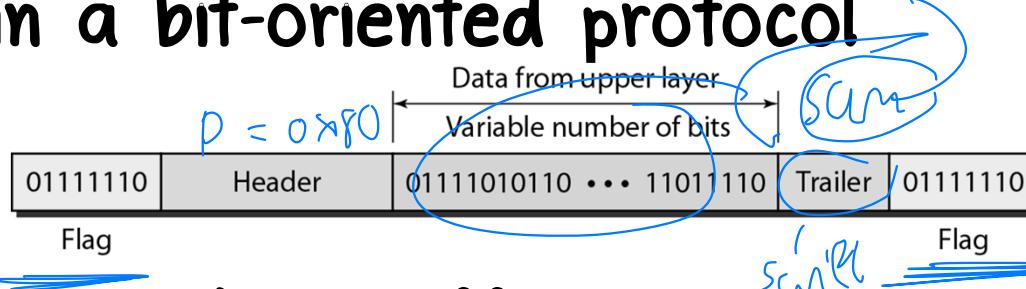
- Byte stuffing and unstuffing



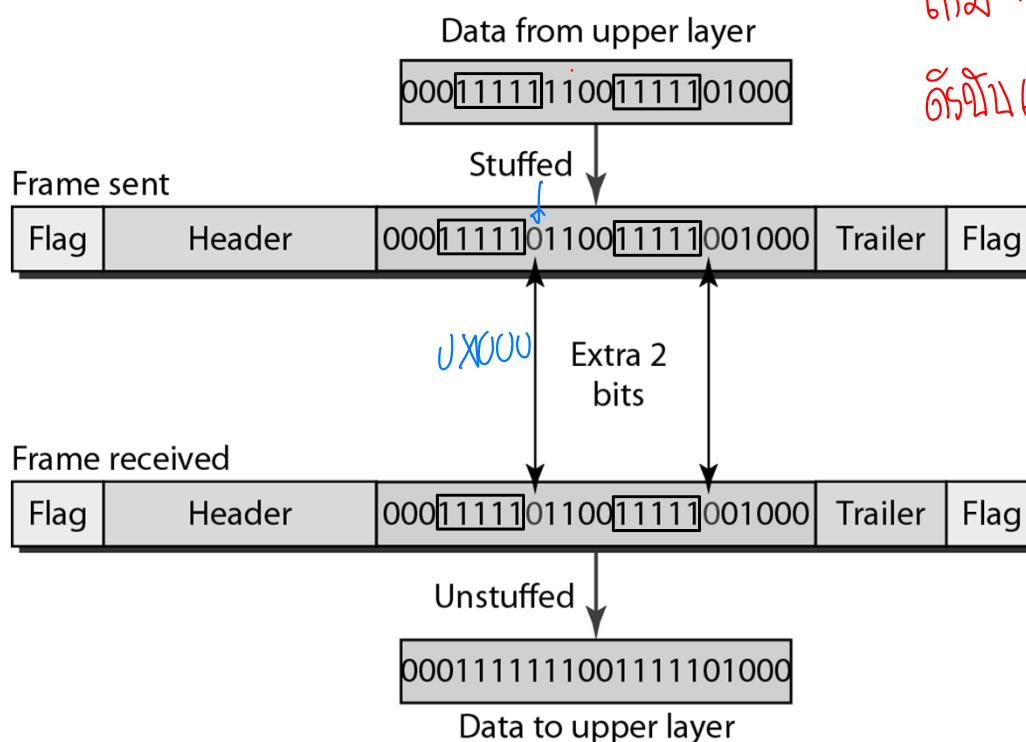
លទ្ធផលនេះជាមួយ ESC
↳ ពេលតាមរយៈ
↳ ក្រោមតូចខាងក្រោម
↳ ក្រោមតូចខាងក្រោម
↳ លើកក្នុង ESC ដើម្បី
↳ បង្កើតក្នុង
↳ ក្រោមតូចខាងក្រោម
ក្រោមតូចខាងក្រោម

Bit-Oriented Protocol

- A frame in a bit-oriented protocol



- Bit stuffing and unstuffing



ବିନ୍ଦୁ 1 ତିକ୍ତର 6 ଟାଇପ୍‌ରେଜ୍‌ମେଂଟ୍ ଫଲ୍

ବିନ୍ଦୁରେଖାରେ 1 5 ଅଟି ବ୍ୟକ୍ତିଗତି

0 ବ୍ୟକ୍ତିଗତିରେ

ବିନ୍ଦୁରେଖାରେ ଯାହାରେ ଫଲ୍

ବିନ୍ଦୁ → ବିନ୍ଦୁରେଖାରେ ଯାହାରେ

ବିନ୍ଦୁରେଖାରେ ଯାହାରେ

Flow & Error control

“ សេវាទូរសព្ទ ឬ ការបញ្ចូន ”

→ ឯកត្រាបន្ថែមដែលបានបញ្ជូន (buffer) ចិត្ត → buffer ត្រូវដឹង (cpu និង info ទីតាំង)

- Flow control refers to a set of procedures used to restrict the amount of data that the sender can send before waiting for acknowledgement.
- Error control in the data link layer is based on automatic repeat request, which is the retransmission of data.

(ដែលបានបញ្ជូន lost នូវឯកត្រា)

ឯកត្រា buffer
ចិត្ត

“ សេវាទូរសព្ទ ”

Protocols (Activity)

- ให้ออกแบบขั้นตอนในการรับส่งข้อมูล แล้วแสดงลำดับการส่งข้อมูล
 - ไม่มีช่องจ่าก็ใน การรับส่งข้อมูล
 - เครื่องรับมี Buffer ใน การรับข้อมูล
 - F. เครื่องรับมี Buffer ใน การรับข้อมูล & ข้อมูลหายในตัวกลาง (Channel)
 - ส่งข้อมูล 4 ชุด : ข้อมูลชุดที่ 3 หาย
 - ส่งข้อมูล 4 ชุด : ข้อมูลชุดที่ 2 และ 4 หาย
 - ส่งข้อมูล 4 ชุด : ข้อมูลไม่หาย / ACK ข้อมูลครึ่งที่ 3 หาย
 - ส่งข้อมูล 4 ชุด : ข้อมูลชุดที่ 3 / ACK ข้อมูลครึ่งที่ 2 หาย

R. A. Forouzan, Data Communications and Networking, 4th edition, McGRAW-HILL.

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วางไว้ timer ตั้งแต่ , จัดการเรียงลำดับ sequence number ms flow ของตัวเอง

