SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE NAME :19IT401 COMPUTER NETWORKS

II YEAR /IV SEMESTER

Unit 2-**LINK LAYER**

Topic 1and 2 : Services- ARP

Data link layer Services

The data link control (DLC) deals with procedures for communication between two adjacent nodes—node-to-node communication—no matter whether the link is dedicated or broadcast.
 Services or functions:
1. *framing*
2. *flow control*
3. *error control.*
4. Congestion control

Services - ARP/Computer Networks/Dr.K.Periyakaruppan/CSE/SNSCE

Services- Frame

The data link layer needs to pack bits into frames, so that each frame is distinguishable from another.

Frame Size

Frames can be of fixed or variable size.

In *fixed-size framing, there is no need for defining* the boundaries of the frames; the size itself can be used as a delimiter. An example of this type of framing is the ATM WAN, which uses frames of fixed size called *cells.*

*variable-size framing, prevalent in* local-area networks.

In variable-size framing, we need a way to define the end of one frame and the beginning of the next.
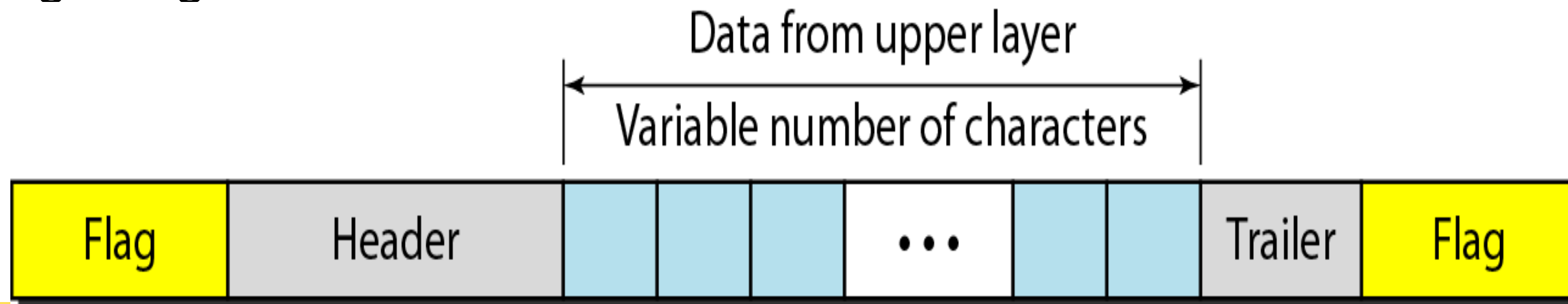
Services- flow control

✓The flow control communication can occur by sending signals from the consumer to the producer. When the buffer of the receiving data-link layer is full, it informs the sending data-link layer to stop pushing frames

✓One of the solutions is normally to use two *buffers; one at the sending data-link layer and the other at the receiving* data-link layer.

✓A buffer is a set of memory locations that can hold packets at the sender and receiver.

✓
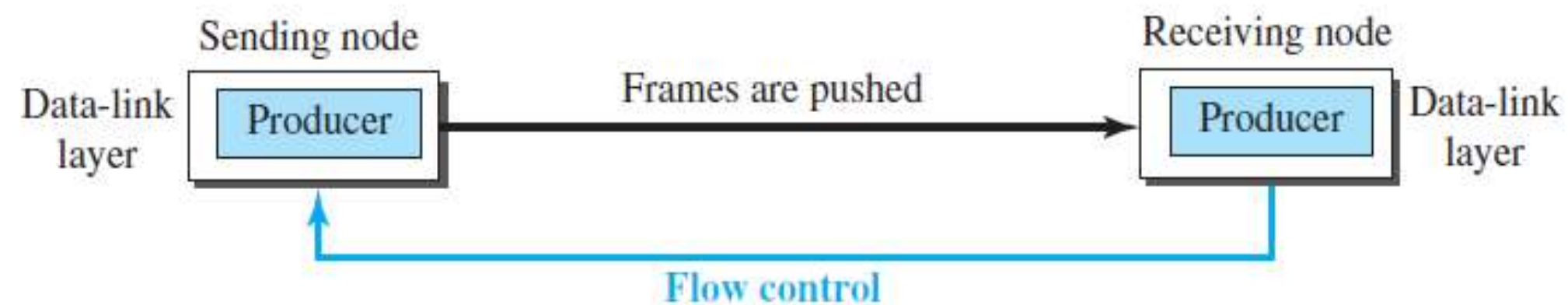
Services- Error control

✓Error control in the data link layer is based on automatic repeat request, which is the retransmission of data.

✓Error control at the data-link layer is normally very simple and implemented using one of the following two methods.

✓ In both methods, a CRC is added to the frame header by the sender and checked by the receiver.

✓ In the first method, if the frame is corrupted, it is silently discarded; if it is not corrupted, the packet is delivered to the network layer. This method is used mostly in wired LANs such as Ethernet.

✓In the second method, if the frame is corrupted, it is silently discarded; if it is not corrupted, an acknowledgment is sent (for the purpose of both flow and error control) to the sender.

Services -Congestion control

✓ link may be congested with frames, which may result in frame loss,

✓ most data-link-layer protocols do not directly use a congestion control to avoid congestion, although some wide-area networks do.

✓In general, congestion control is considered an issue in the network layer or the transport layer because of its end-to-end nature.

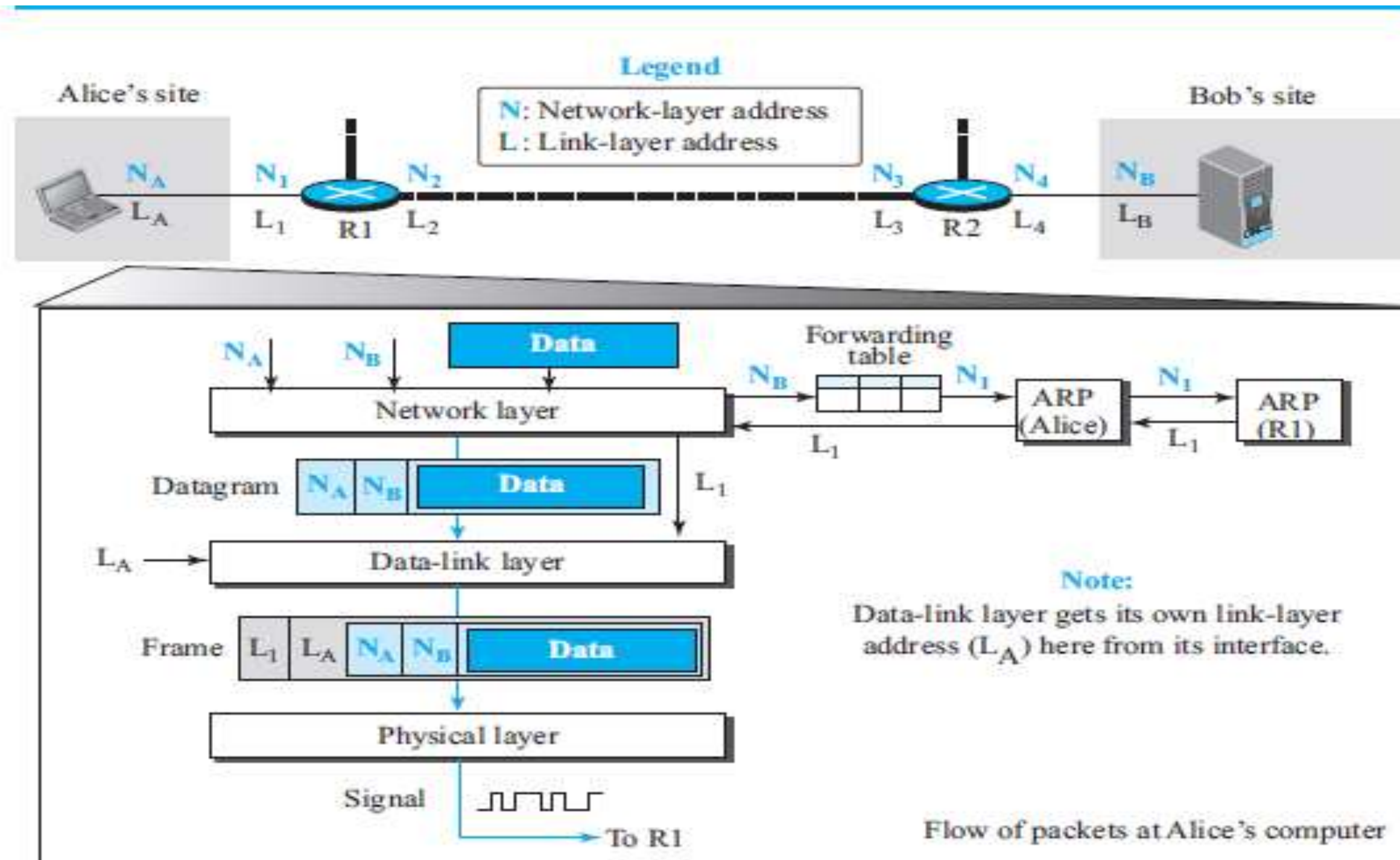Services - ARP/Computer Networks/Dr.K.Periyakaruppan/CSE/SNSCE

Address Resolution Protocol (ARP)

ARP accepts an IP address from the IP protocol, maps the address to the corresponding link-layer address, and passes it to the data-link layer.

ARP operation

a. ARP request is broadcast

b. ARP reply is unicast
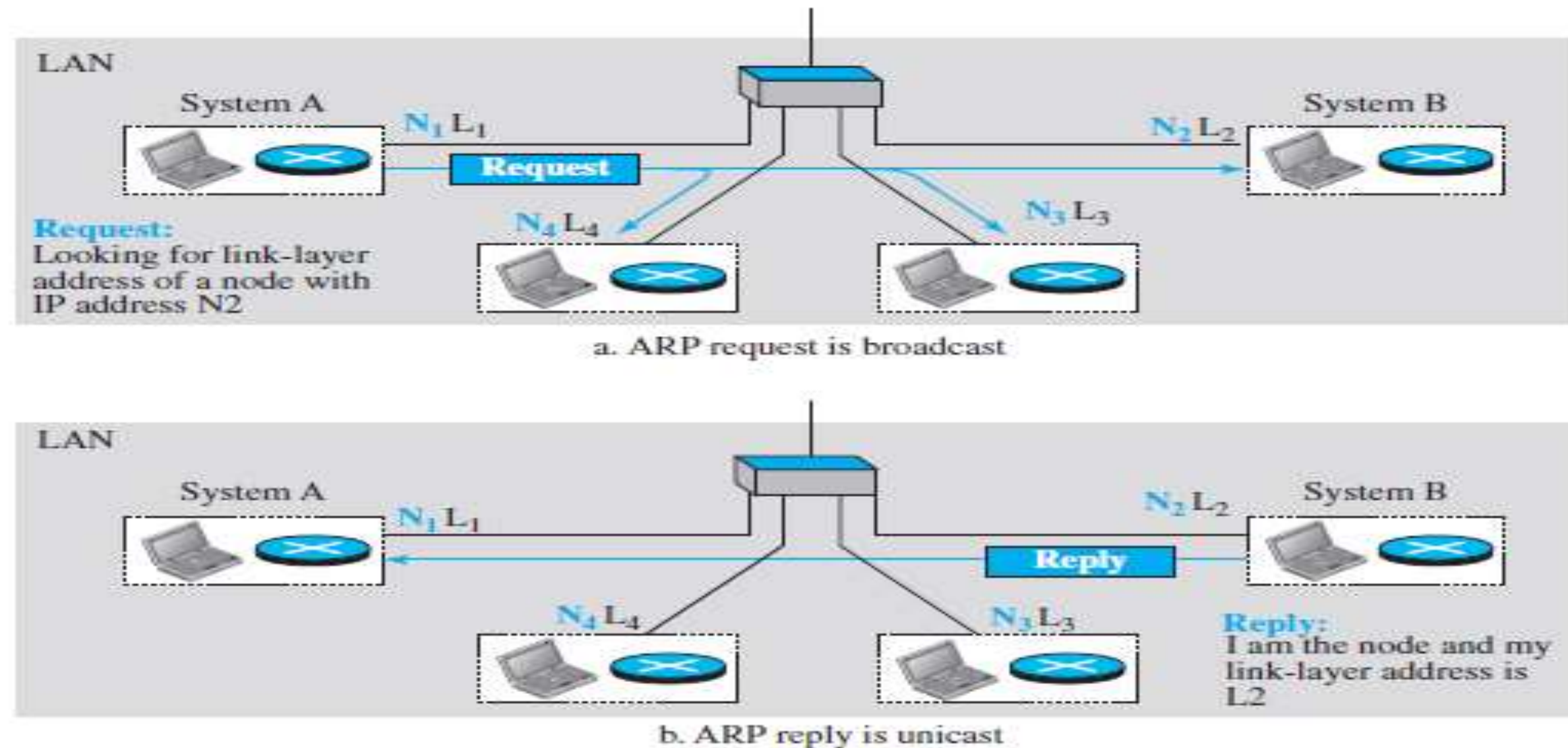
ARP – An example of communication

Assessment

a).What is Link layer address?
b) What are the services of link layer?
c) What is ARP?
d)What is the function of ARP?

Reference

TEXT BOOKS

Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH, 2013.

REFERENCES

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2. Andrew Tanenbaum, Computer Networks, Fifth Edition, Pearson (5th Edition) Education, 2013.
3. James F. Kurose, Keith W. Ross, Computer Networking, A Top-Down Approach Featuring the Internet, Sixth Edition, Pearson Education, 2013.
4. Larry L. Peterson, Bruce S. Davie, Computer Networks: A Systems Approach, Fifth Edition, Morgan Kaufmann Publishers Inc., 2012.