



RAMA UNIVERSITY

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FACULTY OF ENGINEERING & TECHNOLOGY

DCS-503 Computer Networks

Lecture-27

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Computer Science & Engineering

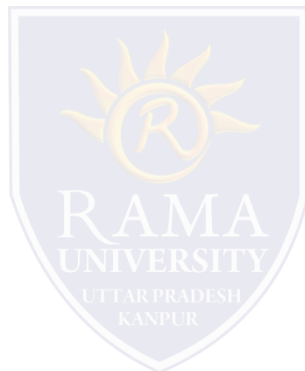
OUTLINE

➤ PHYSICAL LAYER STANDARDS

➤ WAN ENCAPSULATION PROTOCOLS

➤ HDLC FRAMING

➤ WAN LINK OPTIONS



PHYSICAL LAYER STANDARDS

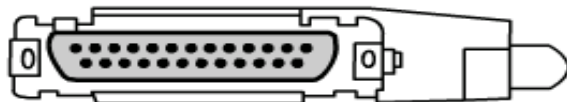
Standard	Description
EIA/TIA-232	Allows signal speeds of up to 64 Kbps on a 25 pin D connector over short distances. It was formerly known as RS-232. The ITU-T V.24 specification is effectively the same.
EIA/TIA-449/530	A faster (up to 2 Mbps) version of EIA/TIA-232. It uses a 36 pin D connector and is capable of longer cable runs. There are several versions. Also known as RS-422 and RS-423.
EIA/TIA-612/613	The High Speed Serial Interface (HSSI), which provides access to services at up to 52 Mbps on a 60 pin D connector.
V.35	An ITU-T standard for synchronous communications between a network access device and a packet network at speeds up to 48 Kbps. It uses a 34 pin rectangular connector.
X.21	An ITU-T standard for synchronous digital communications. It uses a 15 pin D connector.

PHYSICAL LAYER STANDARDS

The physical layer protocols describe how to provide electrical, mechanical, operational, and functional connections to the services provided by a communications service provider.



EIA/TIA-232 Male



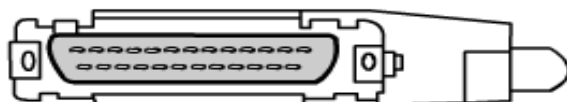
EIA/TIA-232 Female



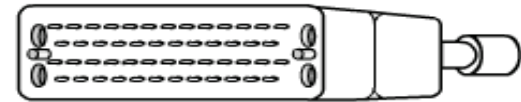
X.21 Male



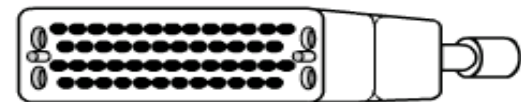
X.21 Female



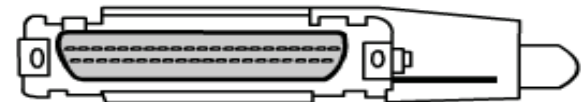
EIA-530 Male



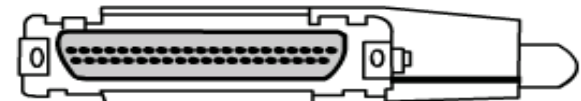
V.35 Male



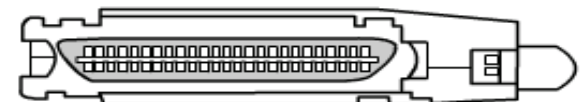
V.35 Female



EIA/TIA-449 Male



EIA/TIA-449 Female



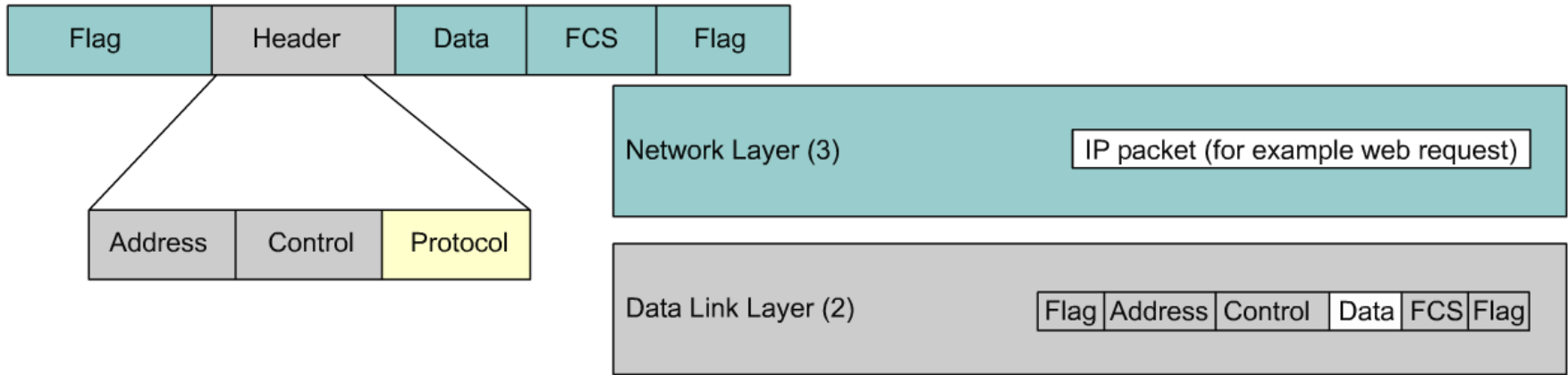
EIA-613 HSSI Male

WAN ENCAPSULATION PROTOCOLS

Protocol	Usage
Link Access Procedure Balanced (LAPB)	X.25
Link Access Procedure D Channel (LAPD)	ISDN D channel
Link Access Procedure Frame (LAPF)	Frame Relay
High-Level Data Link Control (HDLC)	Cisco default
Point-to-Point Protocol (PPP)	Dialup connections

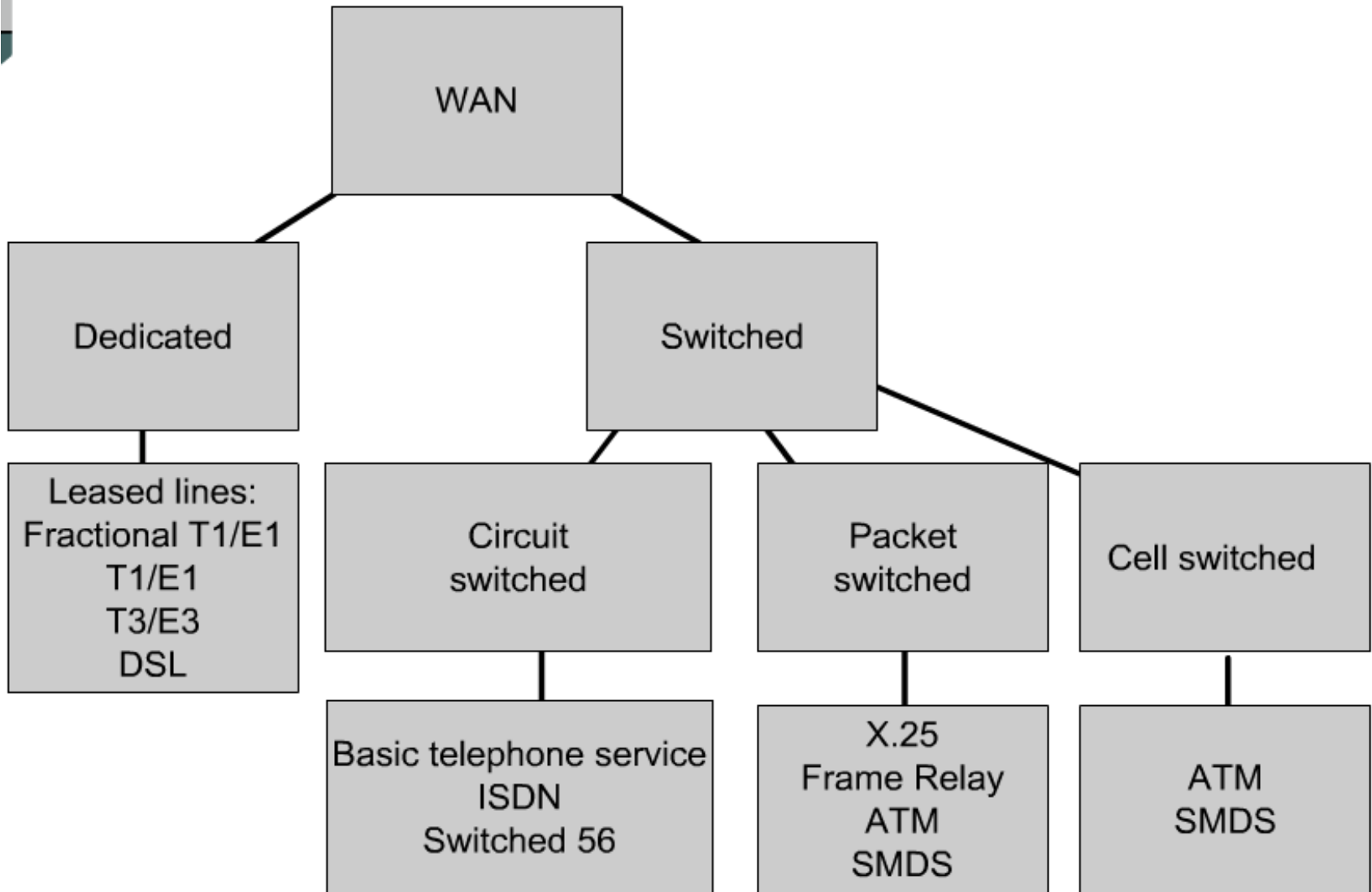
WAN ENCAPSULATION PROTOCOLS

WAN Connection	Protocol/Usage
Dedicated	PPP, HDLC – T1 Connection
Circuit-Switched	PPP, LAPD – Dialup connections and ISDN
Packet-Switched	LAPB, LAPF -- X.25, Frame Relay



- The choice of encapsulation protocols depends on the WAN technology and the equipment.
- Most framing is based on the HDLC standard.
- The address field is not needed for WAN links, which are almost always point-to-point. The address field is still present and may be one or two bytes long.
- Several data link protocols are used, including sub-sets and proprietary versions of HDLC.
- Vendors usually use their own proprietary version of HDLC.
- Both PPP and the Cisco version of HDLC have an extra field in the header to identify the network layer protocol of the encapsulated data.

WAN LINK OPTIONS



Multiple Choice Question

MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	In HTTP pipelining _____	multiple HTTP requests are sent on a single TCP connection without waiting for the corresponding responses	multiple HTTP requests can not be sent on a single TCP connection	multiple HTTP requests are sent in a queue on a single TCP connection	multiple HTTP requests are sent at random on a single TCP connection
2	FTP server listens for connection on port number _____	20	21	22	23
3	In FTP protocol, client contacts server using ____ as the transport protocol.	transmission control protocol	user datagram protocol	datagram congestion control protocol	stream control transmission protocol
4	The File Transfer Protocol is built on _____	data centric architecture	service oriented architecture	client server architecture	connection oriented architecture
5	In File Transfer Protocol, data transfer cannot be done in _____	stream mode	block mode	compressed mode	message mode

REFERENCES

- <http://www.engppt.com/2009/12/networking-fourzan-ppt-slides.html>

