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FACULTY OF ENGINEERING & TECHNOLOGY

BCA-302Computer Networks

Lecture-28

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OUTLINE

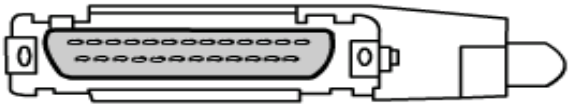
- PHYSICAL LAYER STANDARDS
- WAN ENCAPSULATION PROTOCOLS
- HDLC FRAMING
- WAN LINK OPTIONS

PHYSICAL LAYER STANDARDS

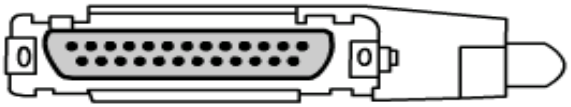
Standard	Description
EIA/TIA-232	Allows signal speeds of up to 64 Kbps on a 25 pin D connector over short distances. It was formerly known as RS-232. The ITU-T V.24 specification is effectively the same.
EIA/TIA-449/530	A faster (up to 2 Mbps) version of EIA/TIA-232. It uses a 36 pin D connector and 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

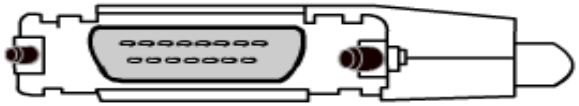
The physical layer protocols describe how to provide electrical, mechanical, operational, and functional connections to the services provided by a communications service provider.



EIA/TIA-232 Male



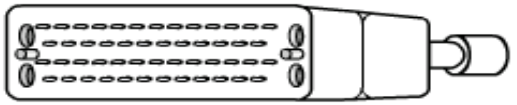
EIA/TIA-232 Female



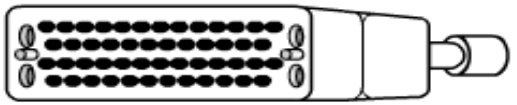
X.21 Male

X.21 Female

EIA-530 Male

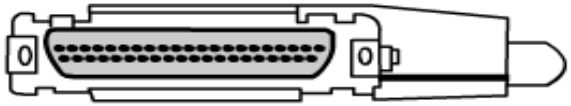


V.35 Male

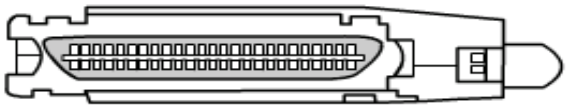


V.35 Female

EIA/TIA-449 Male



EIA/TIA-449 Female



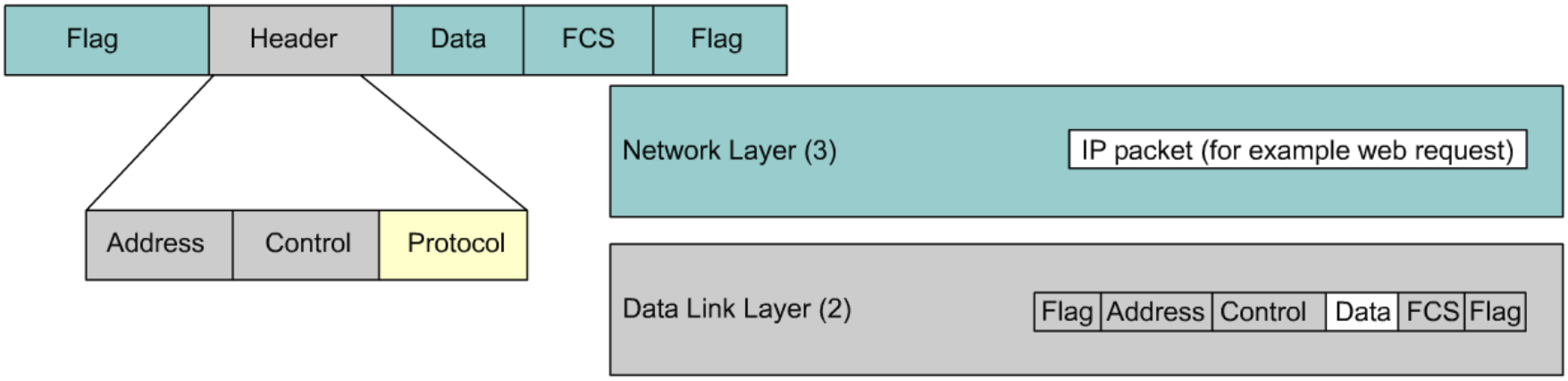
EIA-613 HSSI Male

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

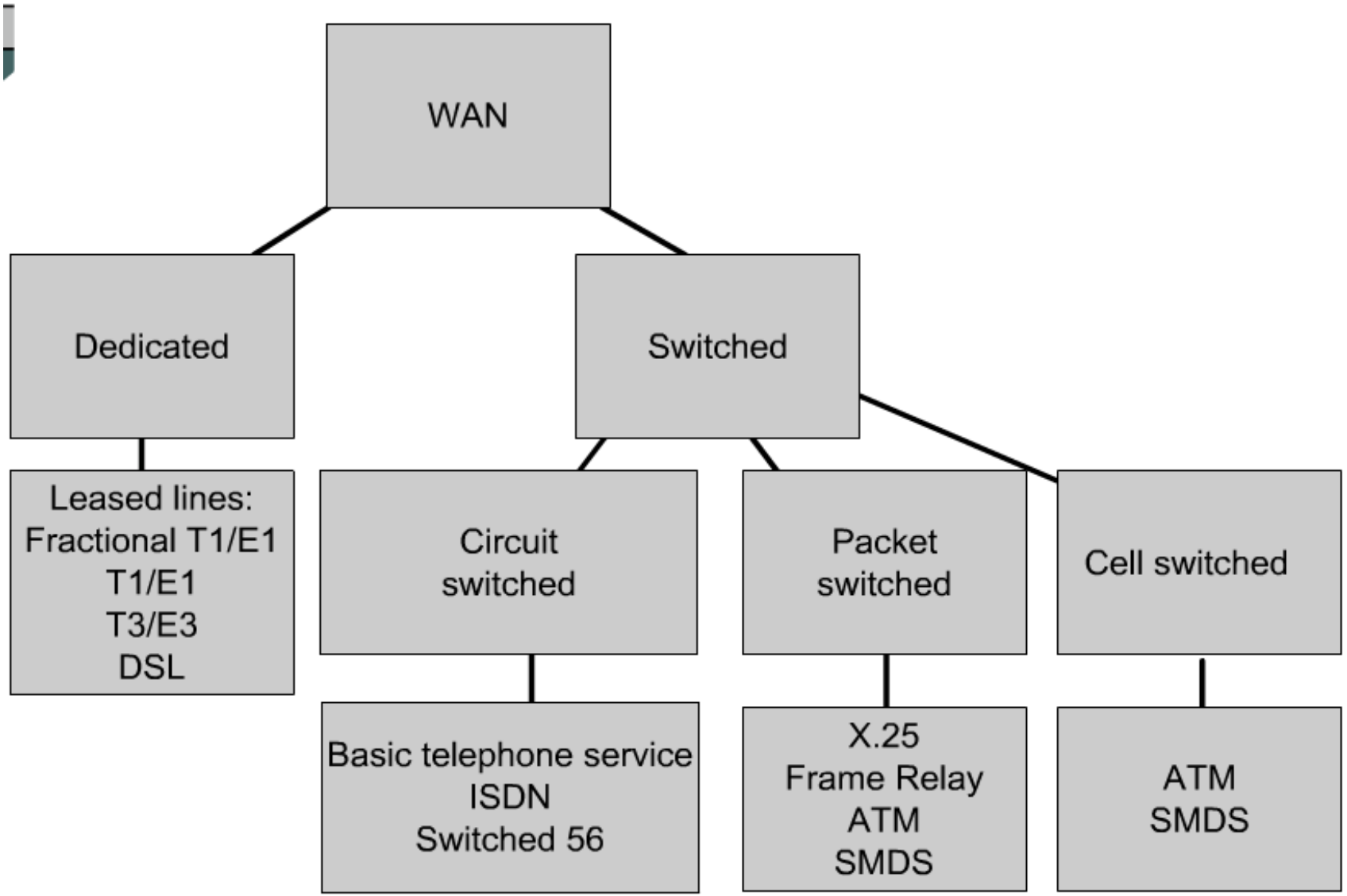
WAN ENCAPSULATION PROTOCOLS

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	Which of the following is not correct in relation to multi-destination routing?	is same as broadcast routing	contains the list of all destinations	data is not sent by packets	there are multiple receivers
2	A subset of a network that includes all the routers but contains no loops is called _____	spanning tree	spider structure	spider tree	special tree
3	Which one of the following algorithm is not used for congestion control?	traffic aware routing	admission control	load shedding	routing informatio n protocol
4	The network layer protocol for internet is _____	ethernet	internet protocol	hypertext transfer protocol	file transfer protocol
5	ICMP is primarily used for _____	error and diagnostic functions	addressing	forwarding	routing

REFERENCES

- http://www.engppt.com/2009/12/networking-fourozan-ppt-slides.html