Course: Computer and Communication Networks

THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
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Topic: X.25

Presentation by

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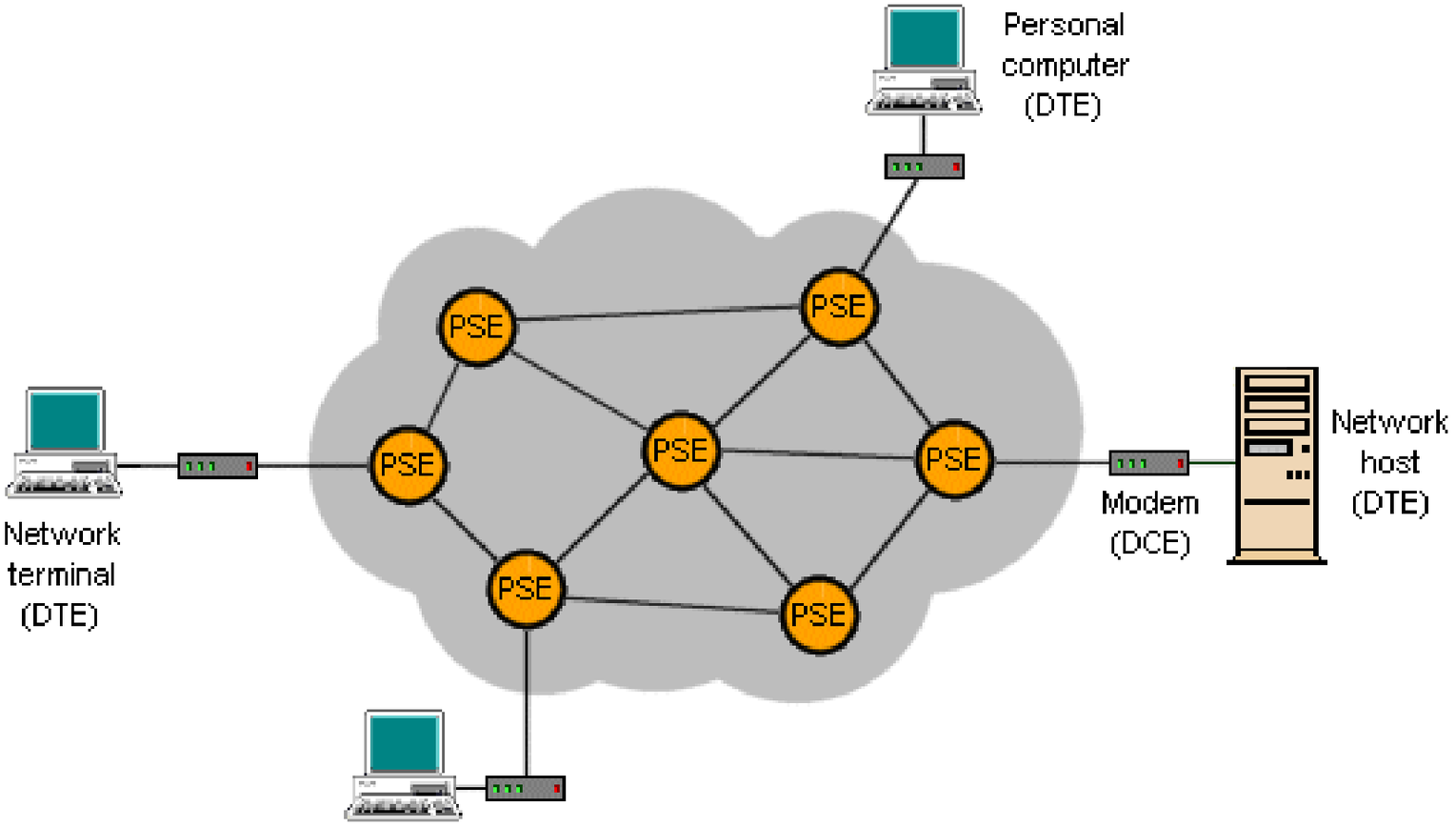
www.thapar.edu

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking, 2. Stallings William, Data and Computer Communication. 3. https://ieeexplore.ieee.org

X.25



X.25

- X.25 has a low 64-kbps data rate.
- X.25 is a three-layer protocol (physical, data link, and network/packet) similar but not exactly the same as the OSI model
- X.25 is the protocol that connects a DTE to a DCE, but only if the DTE is X.25 compatible
- Users connect at DTEs**(Data terminating equipment)**
- Network consists of DCEs **(Data circuit terminating equipment)** (nodes) and communication links

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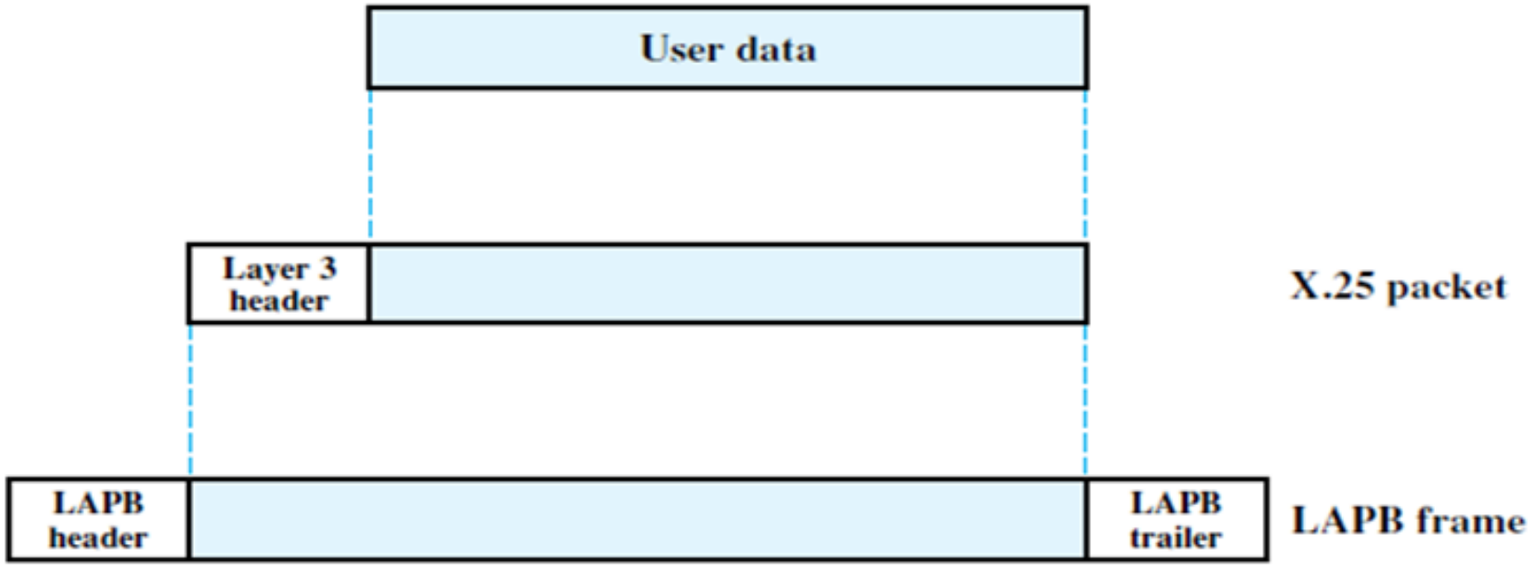
The Data Link Layer



User Data and X.25 Protocol Control Information

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Three Modes of Data Link Layer Operation

- SNRM (Set Normal Response Mode) – a multipoint protocol is used to perform polling and selecting.
- SARM (Set Asynchronous Response Mode) – used for half-duplex point-to-point connections.
- SABM (Set Asynchronous Balanced Mode) – Full-duplex and point-to-point connection

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Other Data Link Layer Frames

- DTEs and DCEs may also issue:
  - UA (Unnumbered Acknowledgement)
  - DISC (Disconnect)
  - FRMR (Frame reject)
  - RR (Receive ready)
  - DM (Disconnect mode)

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The X.25 Network Layer

- The third layer of X.25 is responsible for getting data through the PDN and making a connection with the two endpoints.

- The data is encapsulated into the various layers.

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Four Types of Network Connections

- ***Permanent virtual circuit*** – similar to a leased line in PSTN.

- Both ends reach an agreement on the connection and a logical connection number is assigned.

- All subsequent packets use this connection number

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Four Types of Network Connections

Virtual call

- First side issues a *call request*. If accepted, a *call accept* packet is returned.
- A logical connection number is assigned and all subsequent packets use this ID
- When call is complete, a *clear request* is issued
- Temporary connection

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Four Types of Network Connections

- ***Fast select*** – allows one DTE to transfer data to another DTE without the call establishment and termination procedures
- When a *fast select* is issued, up to 128 bytes of data may accompany the command
- Receiver may respond with *clear request*, which means I accept your data, thanks, see you later
- Receiver may also respond with *call accepted*, which means I accept your data and let's establish a connection for further data transfers
- In both cases, receiver may also attach 128 bytes of immediate data

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Four Types of Network Connections

- ***Fast select with immediate clear*** – same as fast select but receiver has only one choice when it receives data – thanks for the data and see you later

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X.25 and Frame layer

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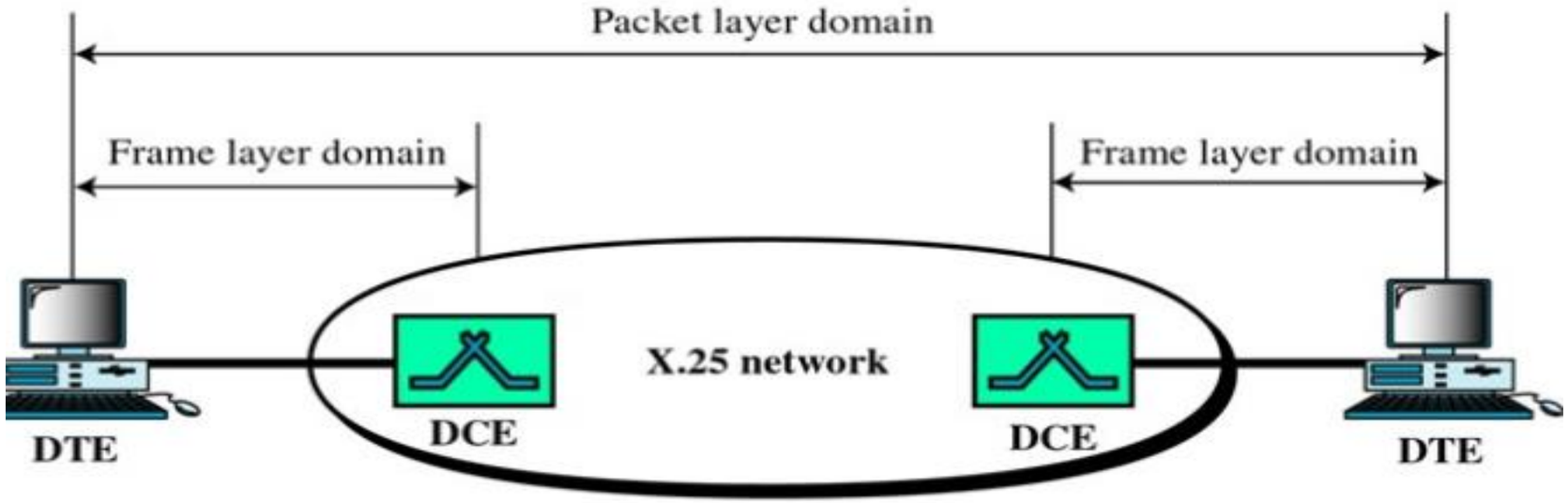
Frame Layer and Packet Layer Domains



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Thank You

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