Transport Layer – Overview

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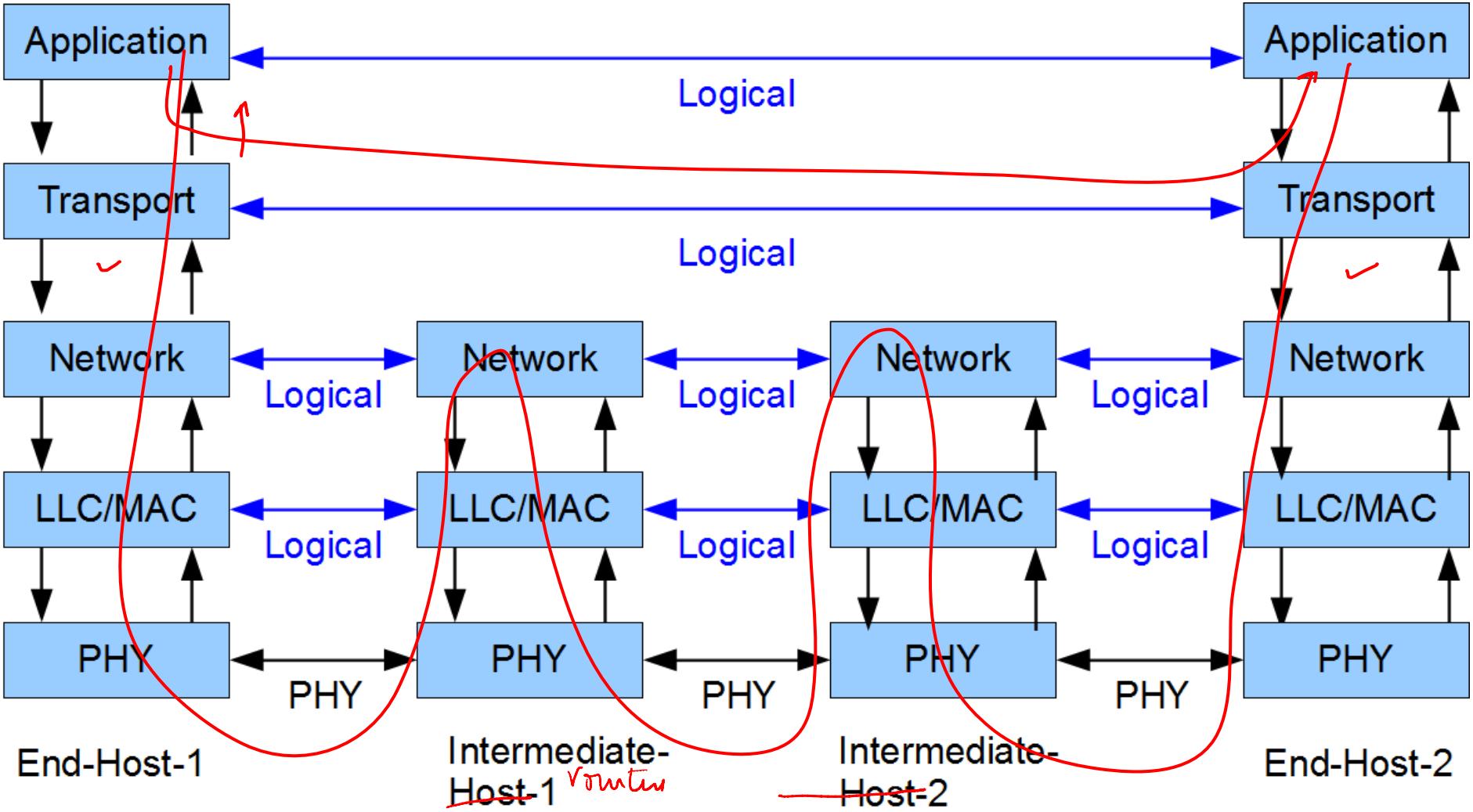
Transport Layer Service

- Hosts run many application processes
- Transport layer provides logical communication between processes
  - Help multiplex/demultiplex packets to deliver to right process
  - Enhance network layer services
- Transport protocols also called end-to-end protocols since they are implemented on end hosts
- The unit of data at transport layer is termed ‘segment’


Application
Application
Logical
Transport
Transport
Logical
Network
Network
Network
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Logical
Logical
Logical
LLC/MAC
LLC/MAC
LLC/MAC
LLC/MAC
Logical
Logical
Logical
PHY
PHY
PHY
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PHY
End-Host-1
Intermediate-Host-1
Intermediate-Host-2
End-Host-2

Application Layer Expectations

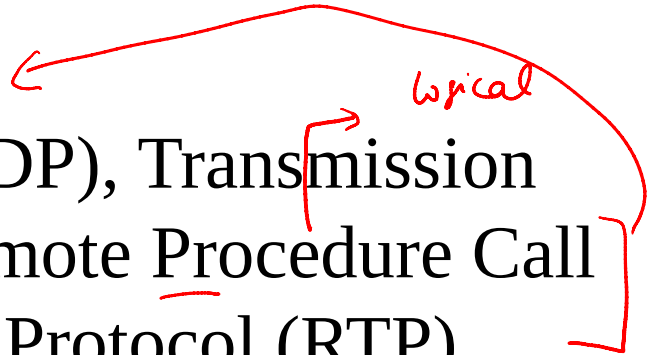
- Guaranteed message delivery
- Ordered delivery
- Delay guarantees
- No duplication
- Support arbitrarily large messages
- Support flow control

Network Layer Limitations

- Best effort service model
- Packet Losses
- Re-ordering
- Duplicate copies
- Limit on maximum message size → MTU
- Long delays

Challenge

- Enhance network layer services to meet application expectations
  - Cannot provide services that inherently cannot be supported by network layer (e.g. delay guarantees)
- Different transport protocols offer different tradeoffs
  - User Datagram Protocol (UDP), Transmission Control Protocol (TCP), Remote Procedure Call (RPC), Real-time Transport Protocol (RTP)



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