

# Inter-Layer Communication

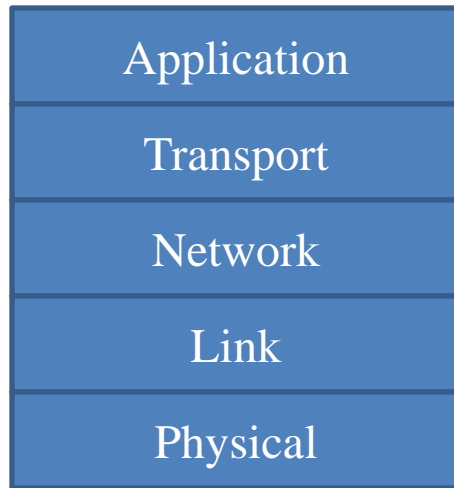
Kameswari Chebrolu

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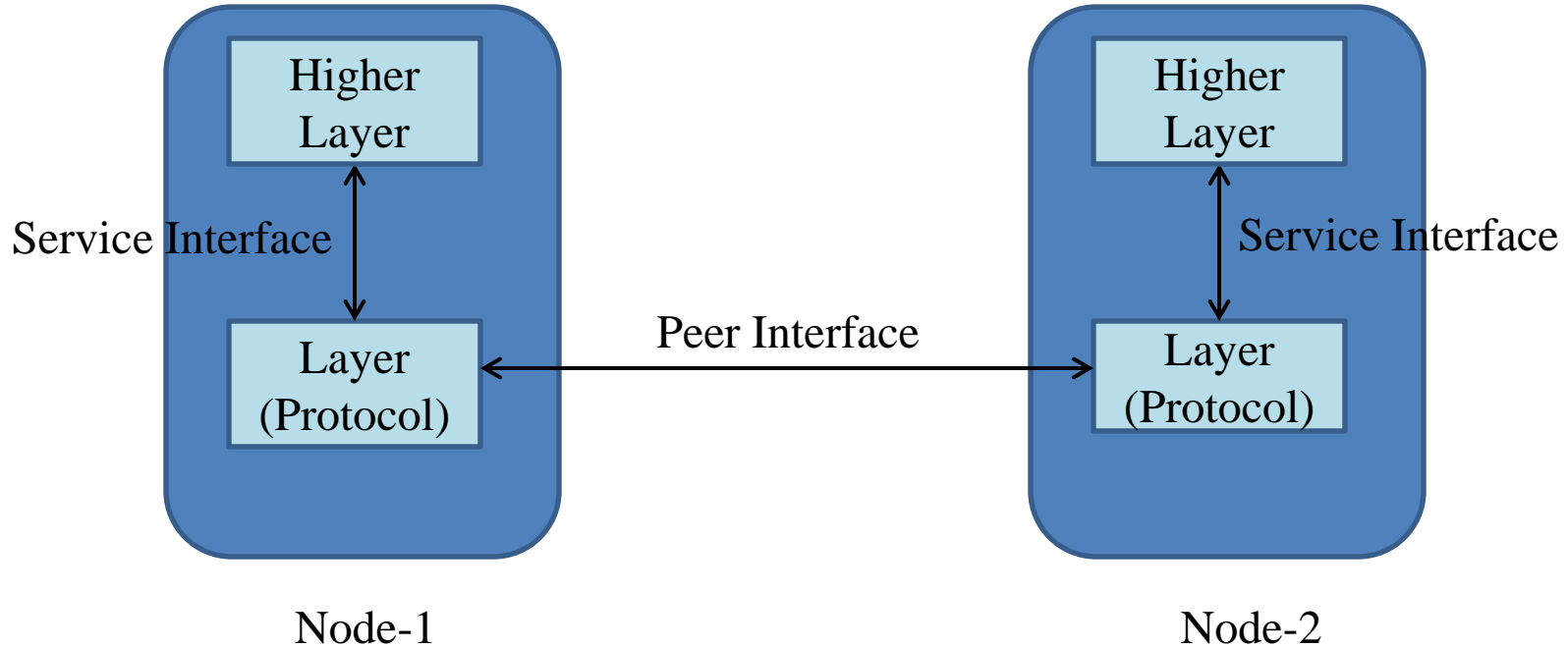
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# Recap: Internet Protocol Stack

- Application
  - Supports application processes which generate messages
  - E.g. Email, Web, File-transfer
- Transport
  - Supervises process to process communication (multiplexing/demultiplexing messages, reliability)
  - E.g. TCP, UDP
- Network
  - Enables end-to-end routing of messages (from source to destination hosts)
  - E.g. IP
- Link
  - Enables hop-to-hop message transfer (between neighbors)
  - E.g. Ethernet, 802.11
- Physical
  - Enables bit transmissions on media (wire/air)
  - E.g. 10Base-T, OFDM



# Layers and Interfaces

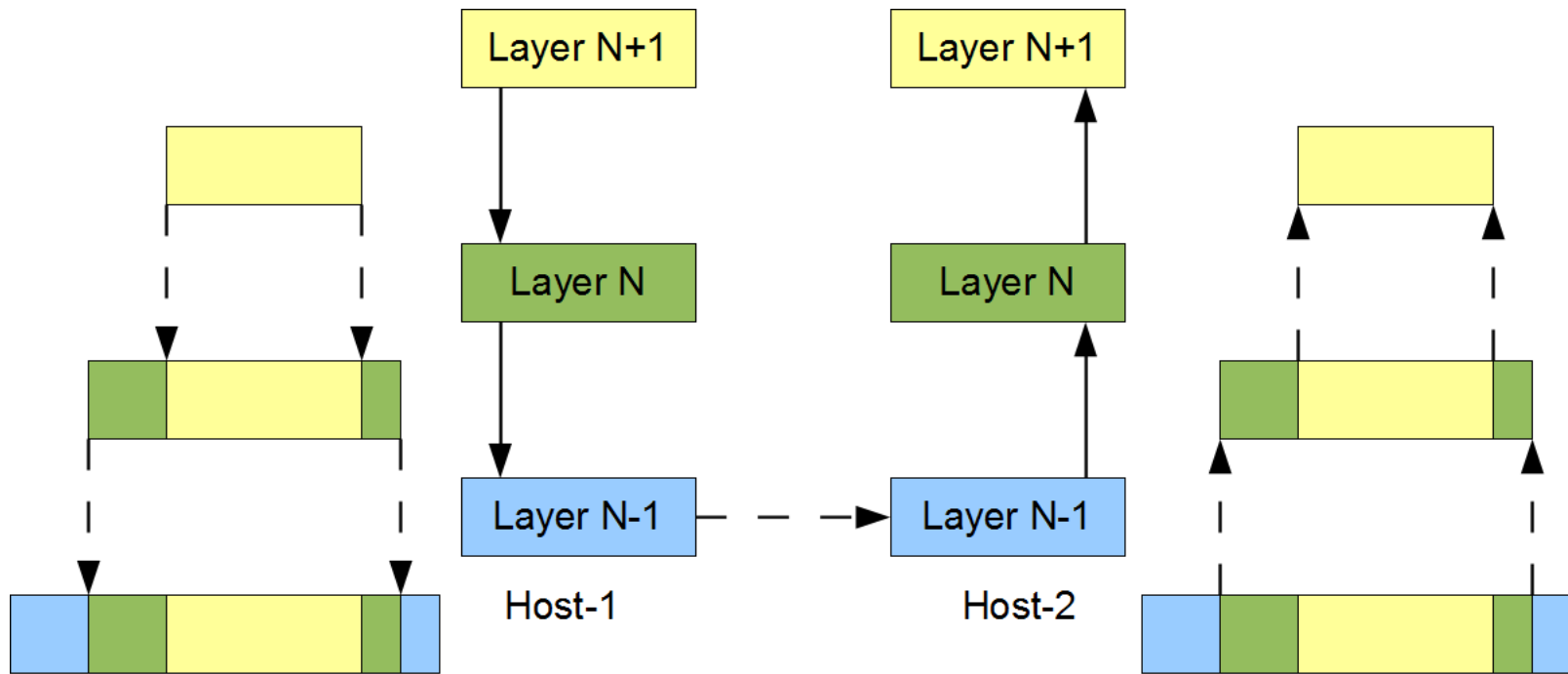


A layer (protocol) provides certain functionality.

Service Interface: Interface for users of the functionality provided by the layer

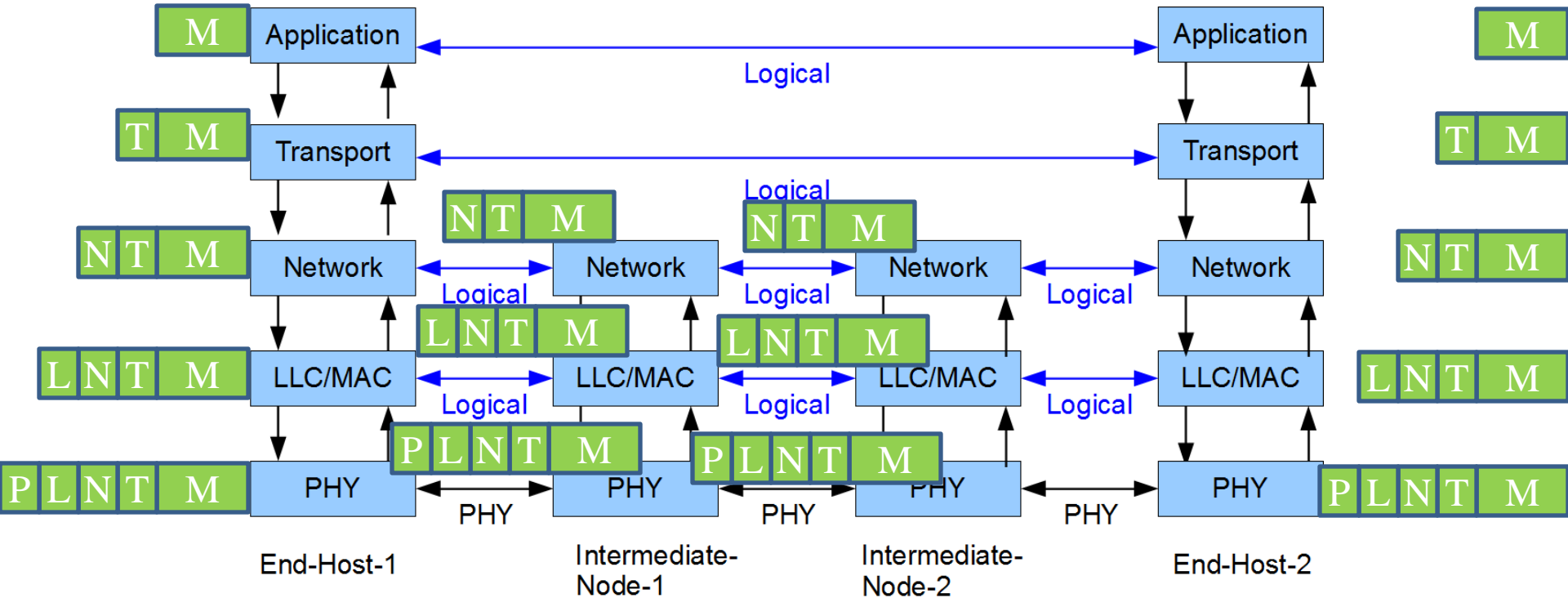
Peer Interface: Interact with peer (counterpart) to implement needed functionality

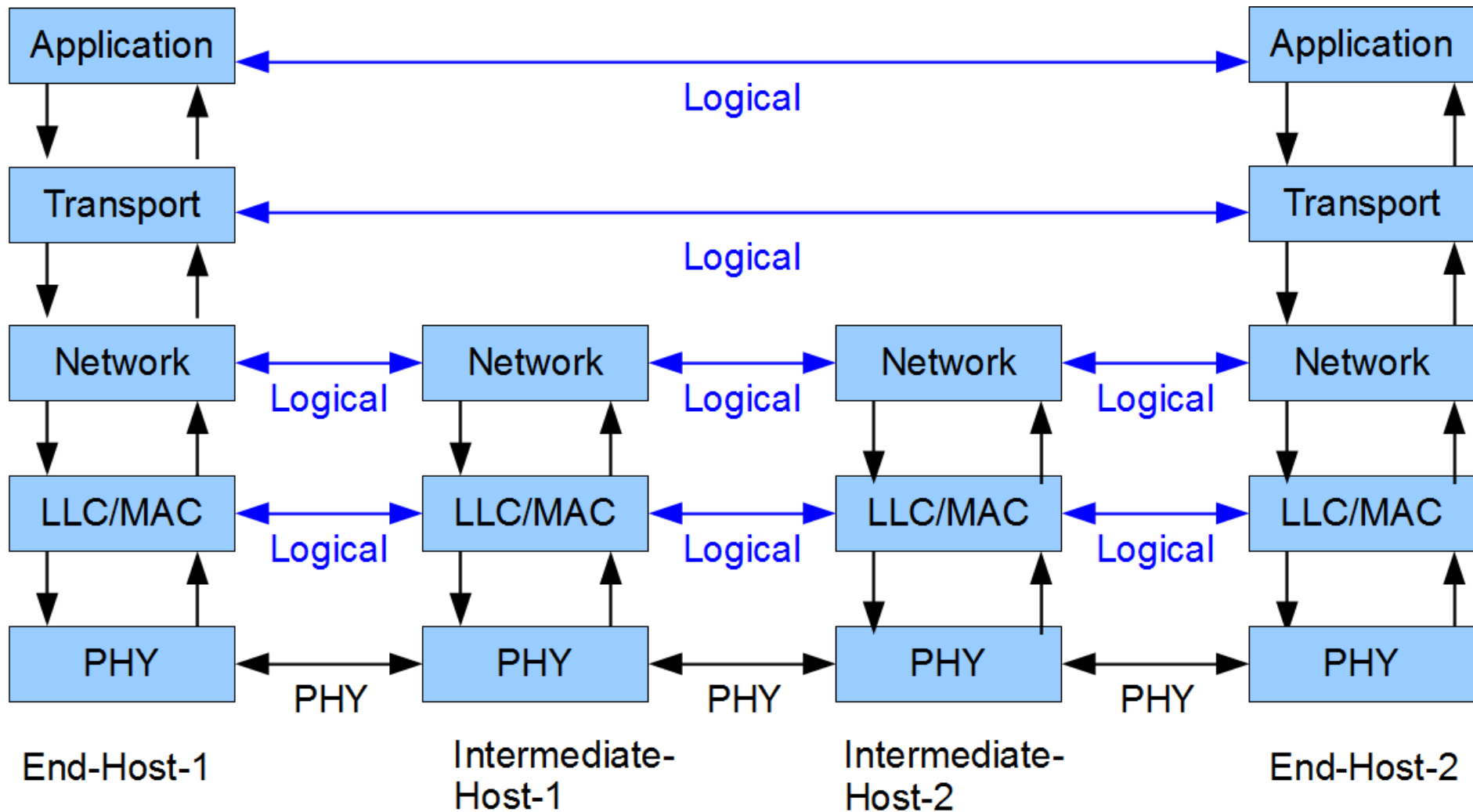
# Encapsulation/Decapsulation



*Each layer adds/removes its header*

# End to End vs Hop to Hop





# Protocols in Different Layers

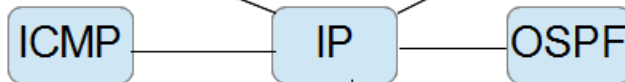
Application Layer



Transport Layer



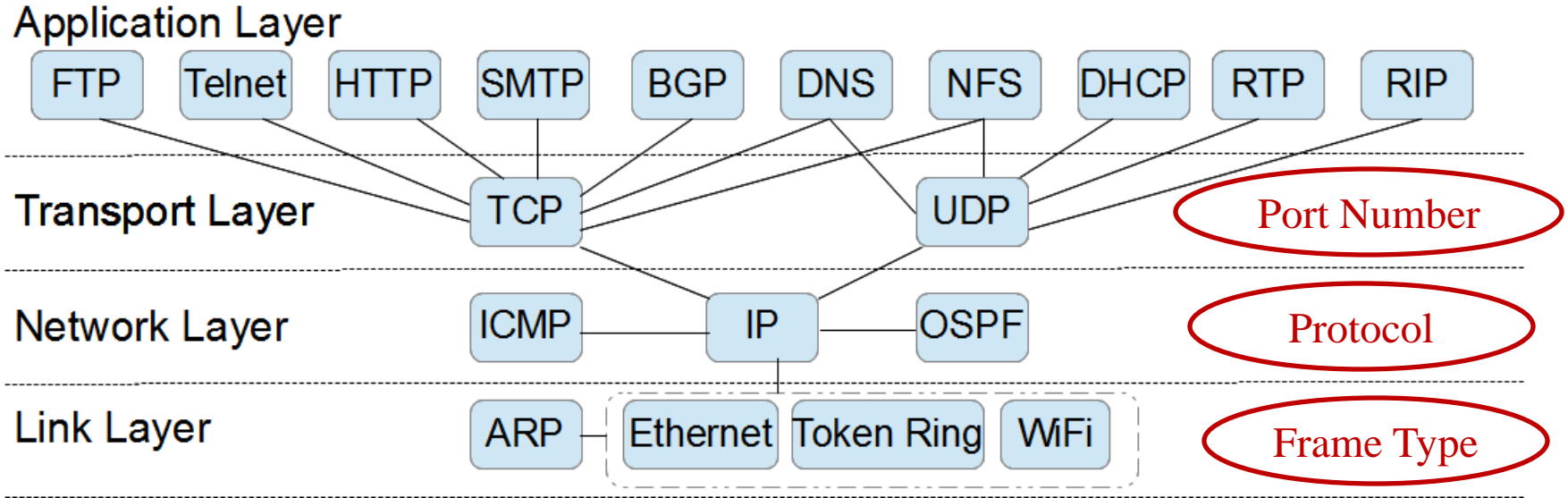
Network Layer



Link Layer



# Multiplexing/Demultiplexing





# Summary

- Layers implement protocols
- To achieve above, layers need to communicate
  - Two interfaces: service and peer
- Peer interface communication via encapsulation/decapsulation
- Passing message to right protocol/process via demultiplexing key