COMPUTER NETWORKS

TEAM NETWORKS

Department of Computer Science and Engineering

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Transport Layer

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Transport Layer - Roadmap

3.1 Transport-layer Services

3.2 Multiplexing and Demultiplexing

3.3 Connectionless Transport: UDP

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3.1 Transport-layer Services

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3.3 Connectionless Transport: UDP

Transport Services and Protocols

- provide *logical communication* between application processes running on different hosts

- transport protocols actions in end systems:
  - sender: breaks application messages into *segments*, passes to network layer
  - receiver: reassembles segments into messages, passes to application layer

- two transport protocols available to Internet applications
  - TCP, UDP
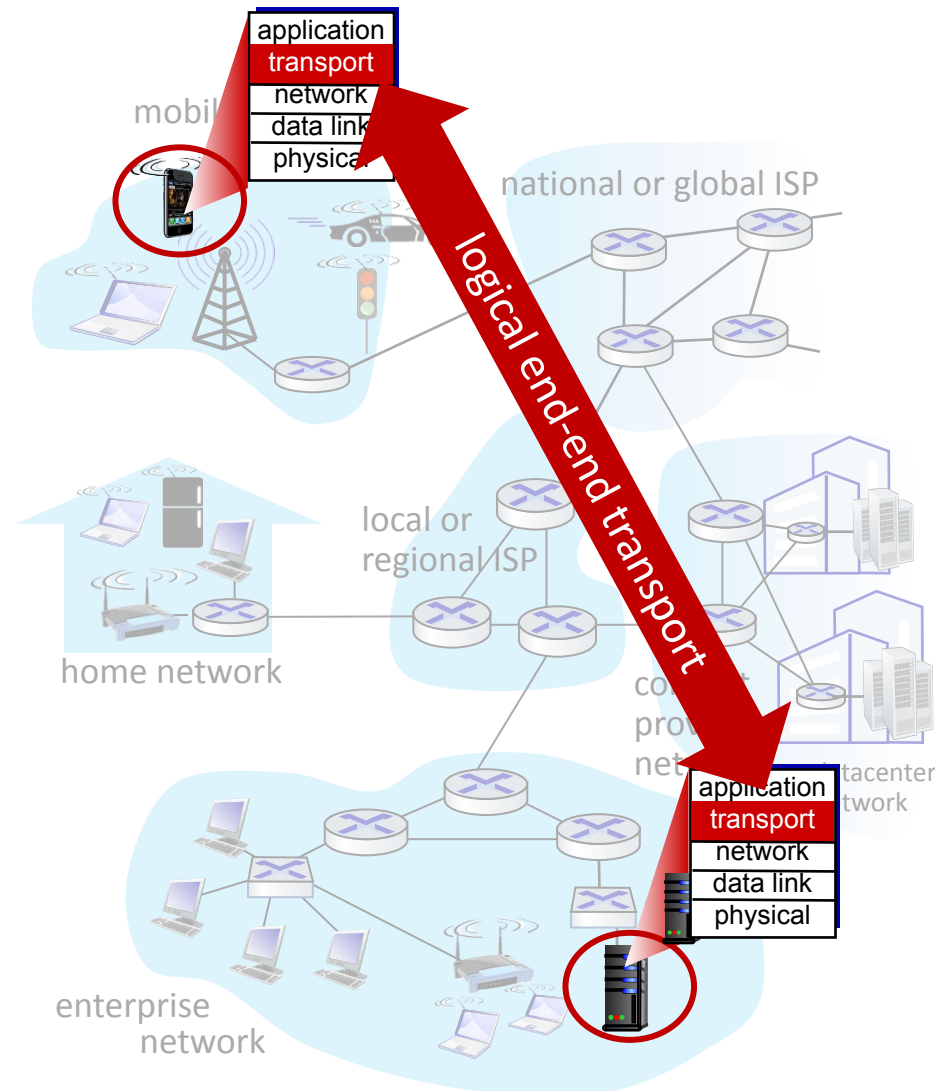
Transport vs. Network Layer Services and Protocols

household analogy:

12 kids in Ann's house sending letters to 12 kids in Bill's house:

- **hosts** = houses
- **processes** = kids
- **app messages** = letters in envelopes

Transport vs. Network Layer Services and Protocols

- network layer: logical communication between *hosts*

- transport layer*:* logical communication between *processes*
  - relies on, enhances, network layer services

┌─────── *household analogy:* ───────┐
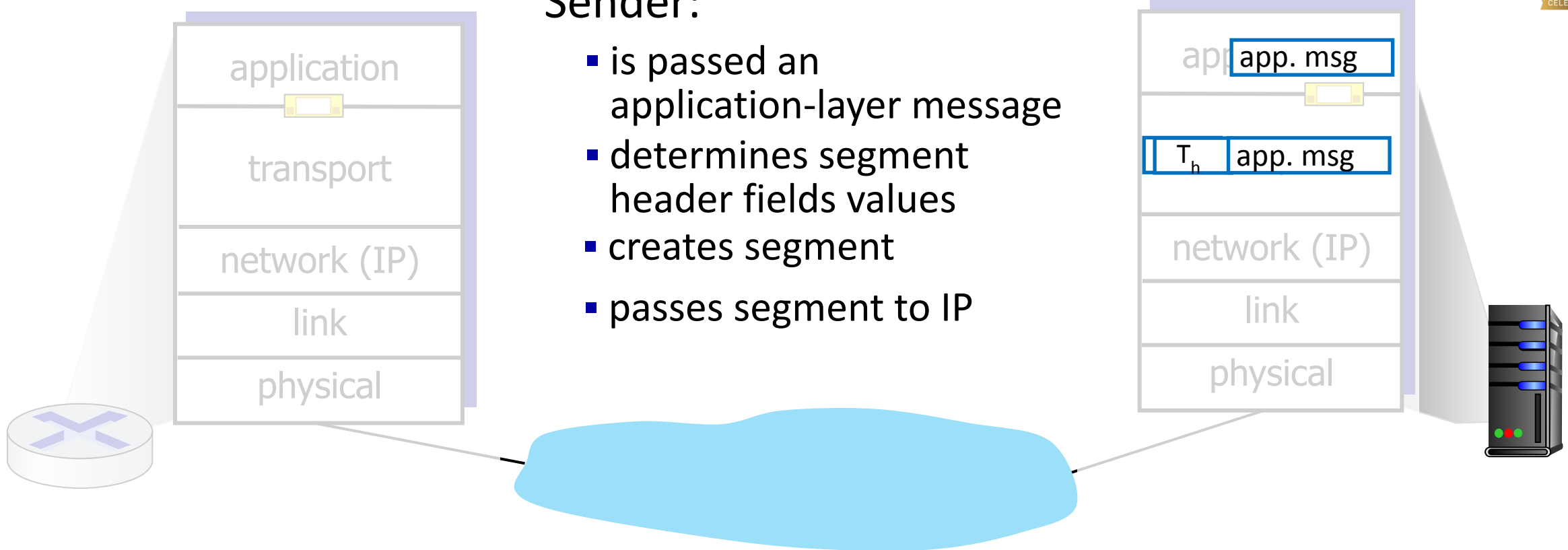
12 kids in Ann's house sending letters to 12 kids in Bill's house:

- **hosts** = houses
- **processes** = kids
- **app messages** = letters in envelopes

Sender:

- is passed an application-layer message
- determines segment header fields values
- creates segment
- passes segment to IP

application

transport

network (IP)

link

physical

app

app. msg

T_h app. msg

network (IP)

link

physical

application

app. msg

network (IP)

link

physical

T_h app. msg

Receiver:

- receives segment from IP
- checks header values
- extracts application-layer message
- demultiplexes message up to application via socket

application

transport

network (IP)

link

physical

## Principal Internet Transport Layer protocols
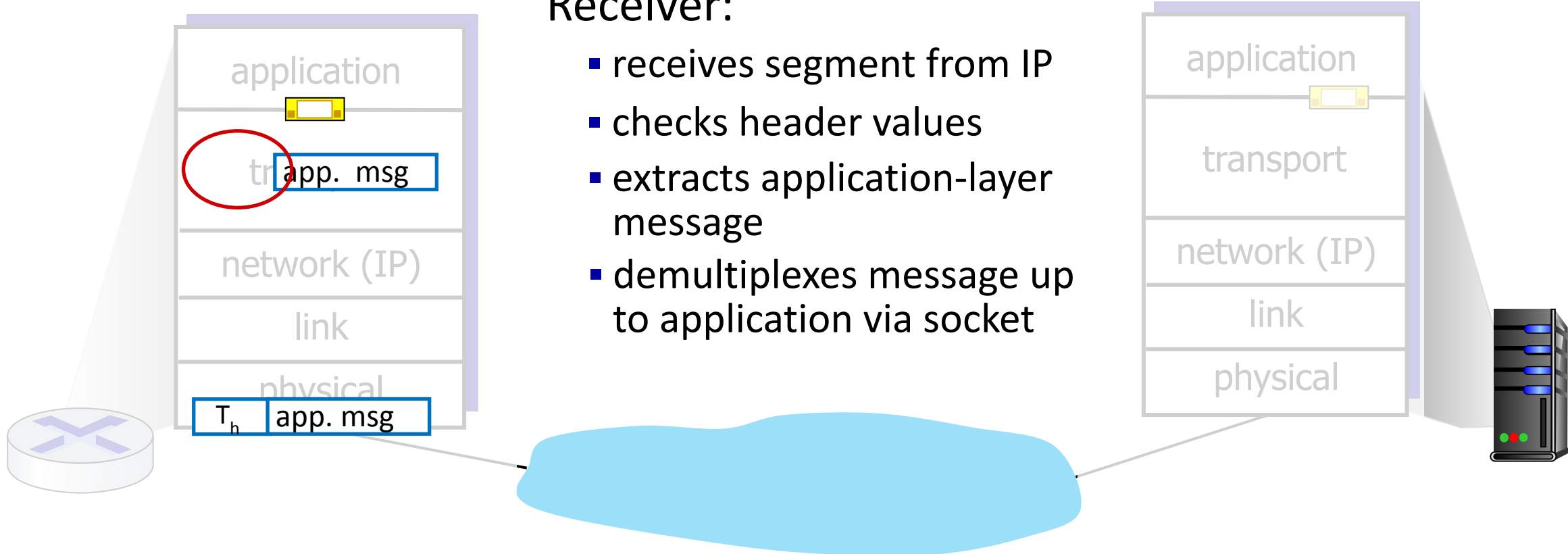
- **TCP:** Transmission Control Protocol
  - reliable, connection oriented
  - in-order delivery
  - congestion control
  - flow control
  - connection setup

- **UDP:** User Datagram Protocol
  - unreliable, connectionless
  - unordered delivery
  - no-frills extension of "best-effort" IP

- services not available:
  - delay guarantees
  - bandwidth guarantees

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Suggested Readings
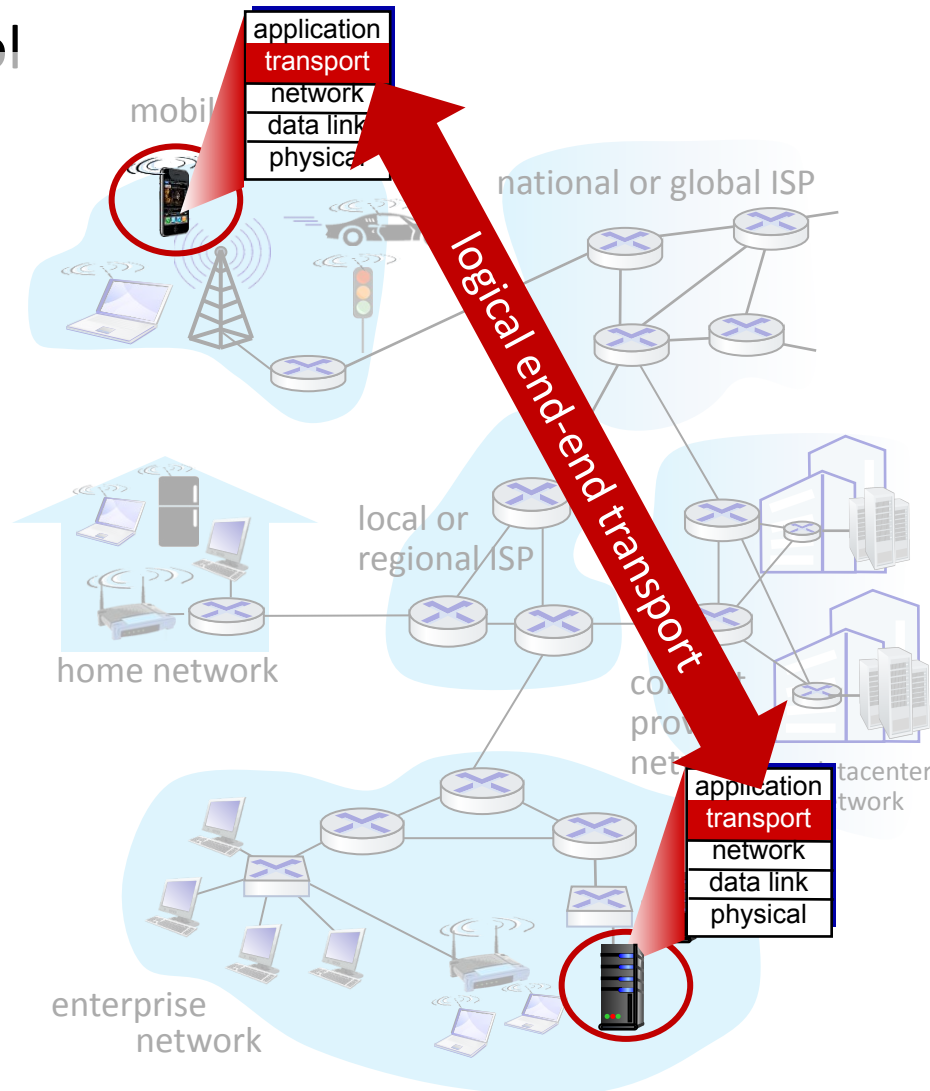
- Transport Layer – Explained – https://youtu.be/FxFJ1XlWtdI

- Transport Layer Services – IIT Kharagpur –https://youtu.be/8-3CSAkscYU

- Transport Layer – Process to Process Delivery – https://youtu.be/9e4vTcaEYCg

Thank You
For Your Attention

THANK YOU

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