

Computación en Internet I

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2023-1

1 Network layer

- General picture
- Forwarding and routing
- Network service model

2 Workshop

1 Network layer

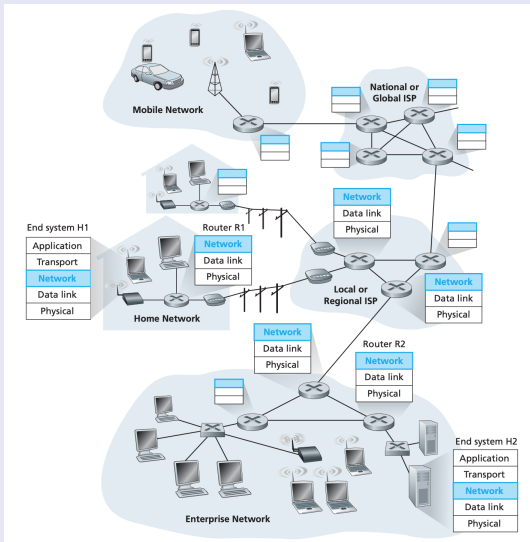
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How would a simple network between two hosts be?

General picture

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- The primary role of the routers is to forward datagrams from input links to output links.

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- Essentially, two functions:
 - ▶ Forwarding.
 - ▶ Routing.

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- Also it might be duplicated and sent over multiple outgoing links.

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- Routing is implemented in the control plane of the network layer.

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- Forwarding is the key function performed by the data-plane functionality of the network layer.

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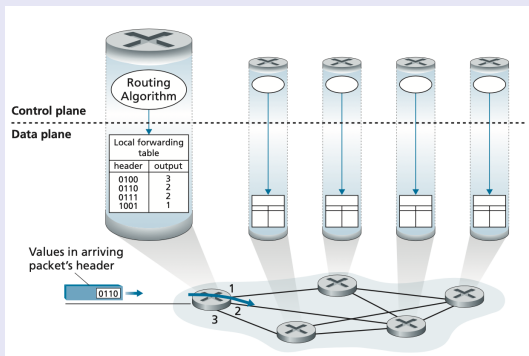
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 - ▶ The remote controller computes and distributes forwarding tables.
 - ▶ The remote controller might be implemented in a remote data center with high reliability and redundancy, and might be managed by the ISP or some third party.

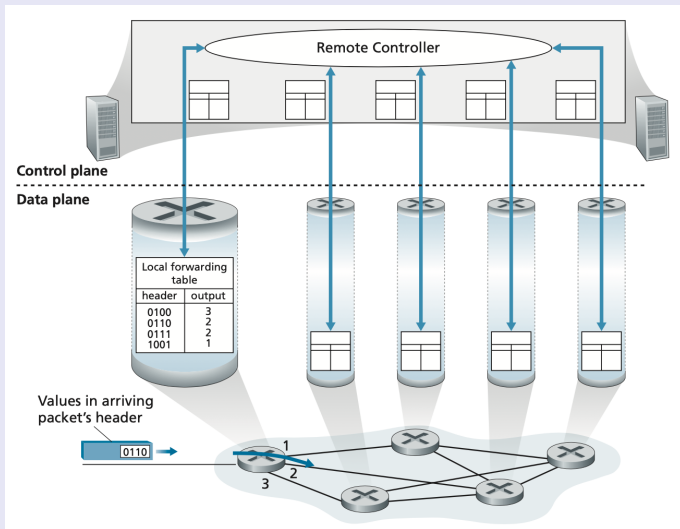
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- The network is “software-defined” because the controller that computes forwarding tables and interacts with routers is implemented in software.

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- Security.
 - ▶ Could encrypt all datagrams at the source and decrypt them at the destination, thereby providing confidentiality to all transport-layer segments.

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- Their eventual delivery is not even guaranteed.
- No guarantee on the end-to-end delay.
- There is no minimal bandwidth guarantee.
- Incredibly a network that delivered no packets to the destination would satisfy the definition of best-effort delivery service.

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In spite of these well-developed alternatives, the Internet's basic best-effort service model combined with adequate bandwidth provisioning and bandwidth-adaptive application-level protocols have proven to enable an amazing range of applications.

Workshop

Complete workshop for today's class. To be handed in the next class.