Week 2 – Introduction to Networking Continued

COMP90007

Internet Technologies

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OSI Reference Model

- Open Systems Interconnection (OSI)
- ISO, Day (revised 1995)
- 7 Layers
- Layer divisions based on principled decisions

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OSI Layer Division Principles

1. A layer should be created where a different abstraction is needed
2. Each layer should perform a well defined function
3. The function of each layer should be chosen with a view toward defining internationally standardised protocols
4. The layer boundaries should be chosen to minimise the information flow across the interfaces
5. The number of layers should be large enough that distinct functions need not to be thrown together in the same layer out of necessity, and small enough that the architecture does not become unwieldy

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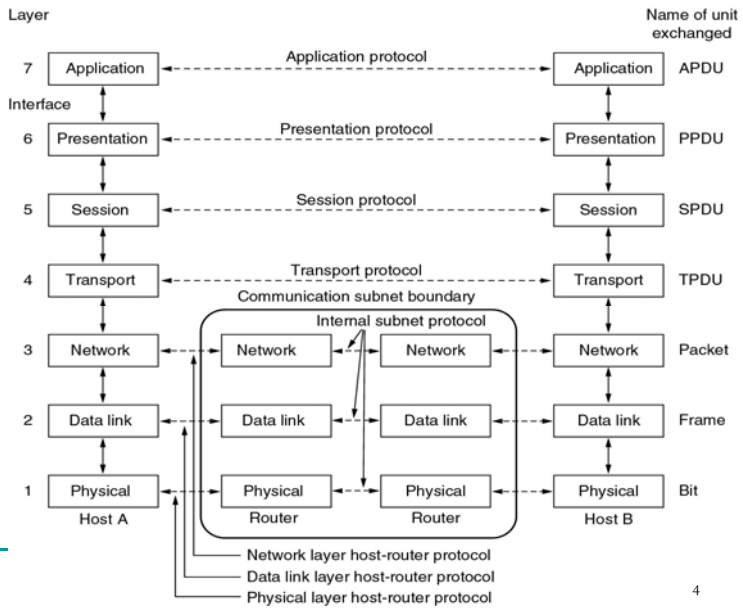
Reference Models

The OSI reference model



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TCP/IP Reference Model

- Transmission Control Protocol/Internet Protocol
- Cerf & Kahn (1974)
- 4 layers

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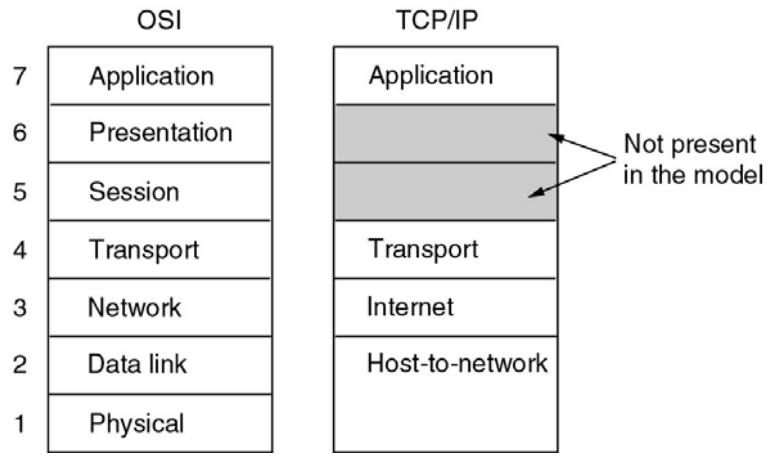
TCP/IP Model Illustrated

- The TCP/IP reference model.



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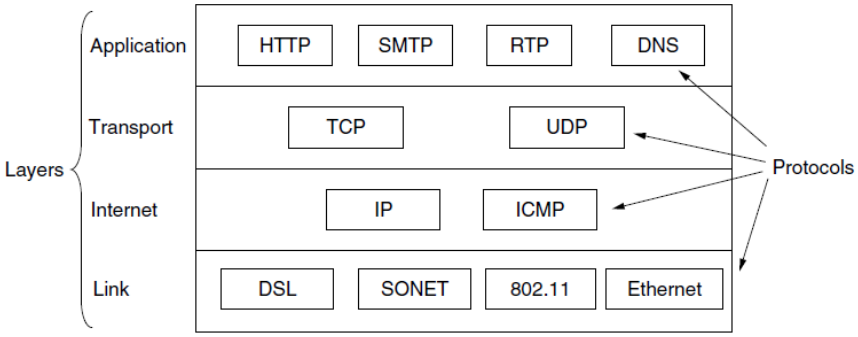
Reference Models (3)



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Comparing OSI and TCP/IP Models

- Concepts central to the OSI model
- Services
- Interfaces
- Protocols

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A Critique of the OSI Model and Protocols

- Why OSI did not take over the world?
- Bad timing
- Bad technology
- Bad implementations
- Bad politics

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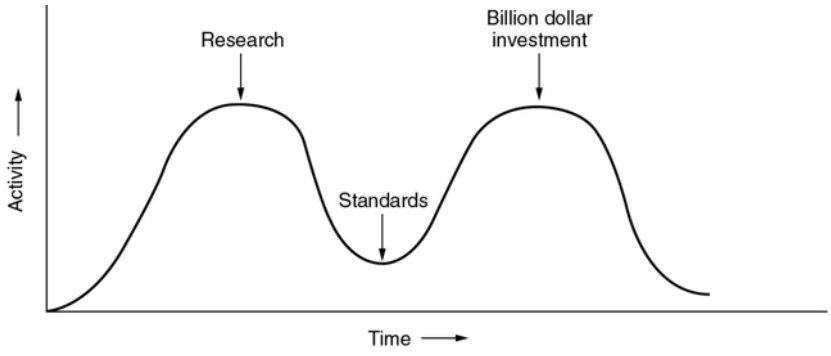
Bad Timing

- The apocalypse of the two elephants



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A Critique of the TCP/IP Reference Model

Problems:

- Service, interface, and protocol not distinguished
- Not a general model
- Host-to-network “layer” not really a layer – interface between network and data link layers
- No mention of physical and data link layers
- Minor protocols deeply entrenched, hard to replace

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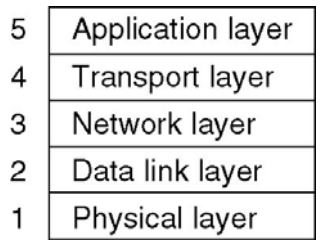
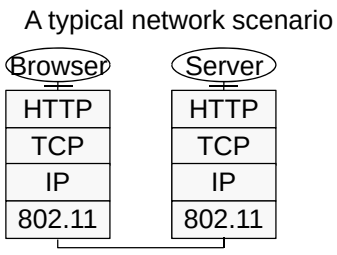
Hybrid Model

- The hybrid reference model to be used in this book. We follow this in this semester





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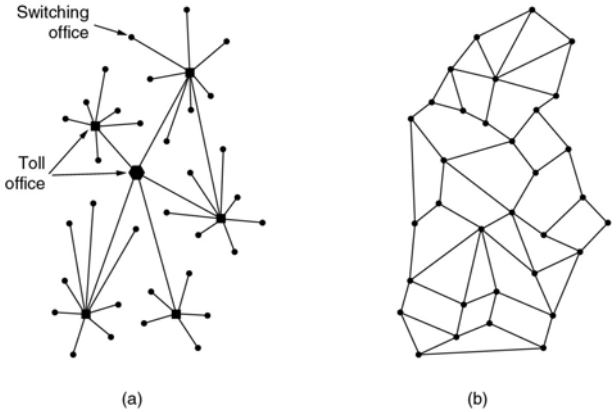
Origins of Internet: The ARPANET



- **(a)** Structure of the telephone system.
- **(b)** Baran's proposed distributed switching system.

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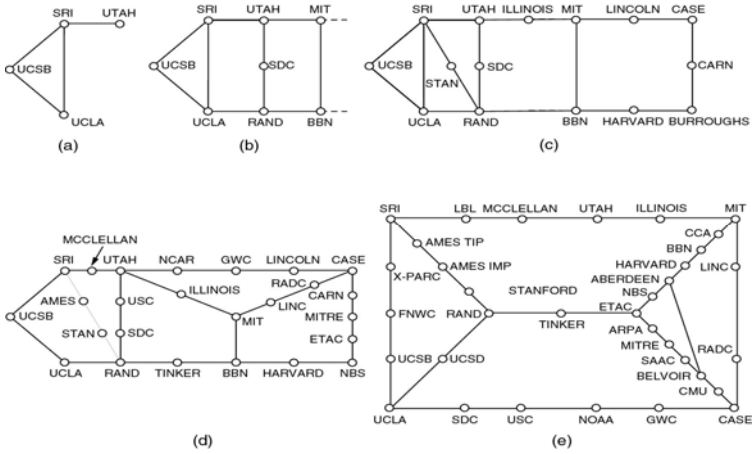
The ARPANET



- Growth of the ARPANET (a) December 1969. (b) July 1970.
- (c) March 1971. (d) April 1972. (e) September 1972.

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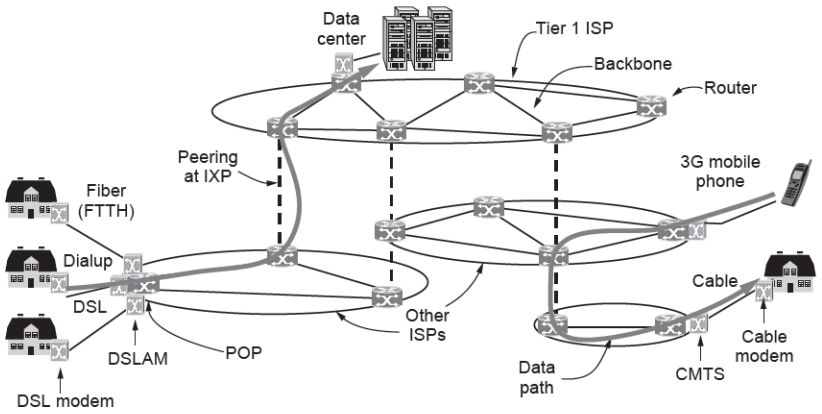
Architecture of the Internet



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Network Standardization

Body	Area	Examples
ITU (International Telecommunication Union)	Telecommunications	ADSL PON MPEG4
IEEE (Institute of Electrical and Electronics Engineers)	Communications	Ethernet, WiFi
IETF (Internet Engineering Task Force)	Internet	HTTP/1.1 DNS
W3C (The World Wide Web Consortium)	Web	HTML5 standard

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