

Computer Networks

Introduction to the Internet Protocol (IP)

Lecture Contents

- ARPANet
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ARPANet

- United States *Department of Defense* started a research agency called the *Defense Advanced Research Projects Agency* (**DARPA**) on 7 February 1958.
 - Has contributed to: Internet, GPS, drones; even Moderna COVID-19 vaccine
- DARPA funded the *Advanced Research Projects Agency Network* (**ARPAnet**), 1966, the precursor to the Internet
 - First computers connected 1969
 - Declared operational 1971
 - Decommissioned 1990

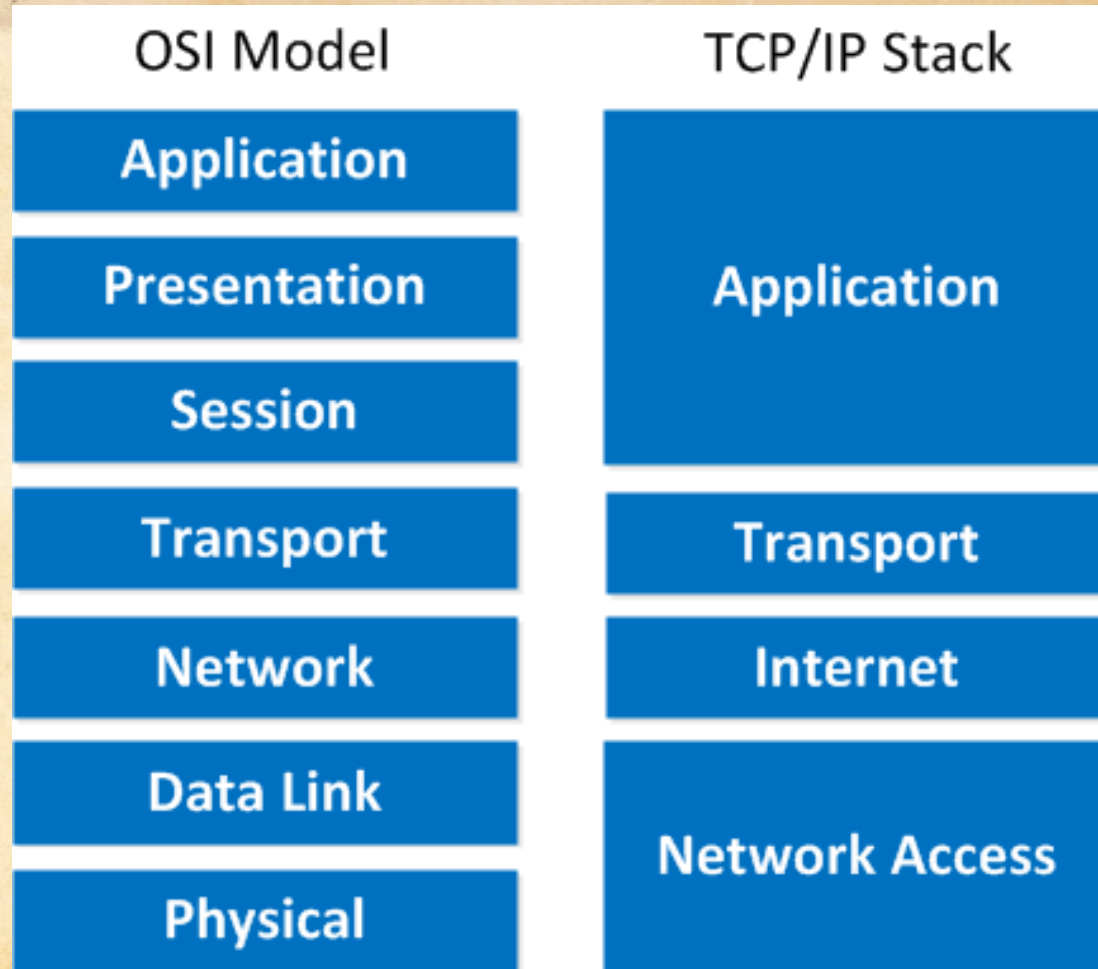
Internet Development Documentation

- **RFC** – *Request For Comment*
 - Originally for ARPAnet
 - RFC 1 (7 April 1969, Steve Crocker of UCLA); still publishing
 - Currently managed by the *Internet Engineering Task Force* (IETF), 1986
 - <https://www.rfc-editor.org>
- **IEN** – *Internet Experimental Note*
 - Sequentially numbered documents for development of the internet
 - IEN 1 (29 July 1977) to IEN 212 (September 1982)
 - IEN are no longer published; now all published as RFC
 - <https://www.rfc-editor.org/ien/ien-index.html>

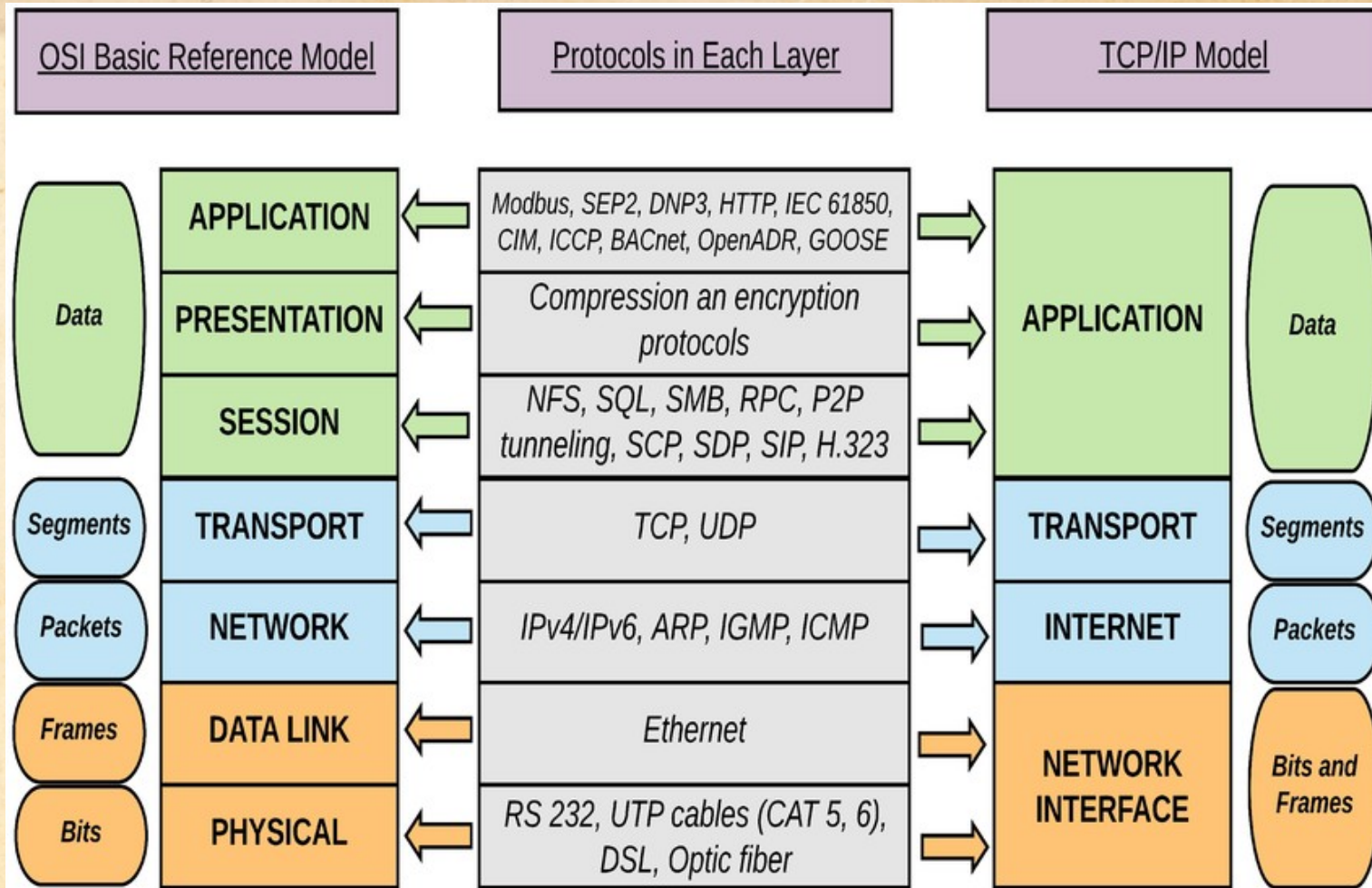
Internet Protocol Origins

- The *Transmission Control Program*, 1974; modularized, 1977, into
 - *Transport Layer* (OSI Model layer 4)
 - Connection oriented *Transmission Control Protocol* (TCP)
 - Connectionless *User Datagram Protocol* (UDP)
 - *Network Layer* (OSI Model layer 3)
 - *Internet Protocol* (IP)
- } *Internet Protocol Suite*
(Informally *TCP/IP*)

Internet Protocol Origins



Internet Protocol Origins



Internet Protocol Origins

- **IPv1** through **IPv3** experimental
 - 1977 August: IEN 2 – proposes first version of IP header – IPv1
 - 1978 February: IEN 28 – IPv2
- **IPv4**
 - 1978 June: IEN 41, 44 – first drafts of IPv4 header
 - 1978 September: IEN 54 – IPv4 header
 - 1980 January: **RFC 760** standardized IPv4 header version in IEN 54

Internet Protocol Basics

- Network Layer (Layer 3)
- Packet delivery from source to destination
- Defines
 - Packet structures to encapsulate data
 - Addressing methods

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