

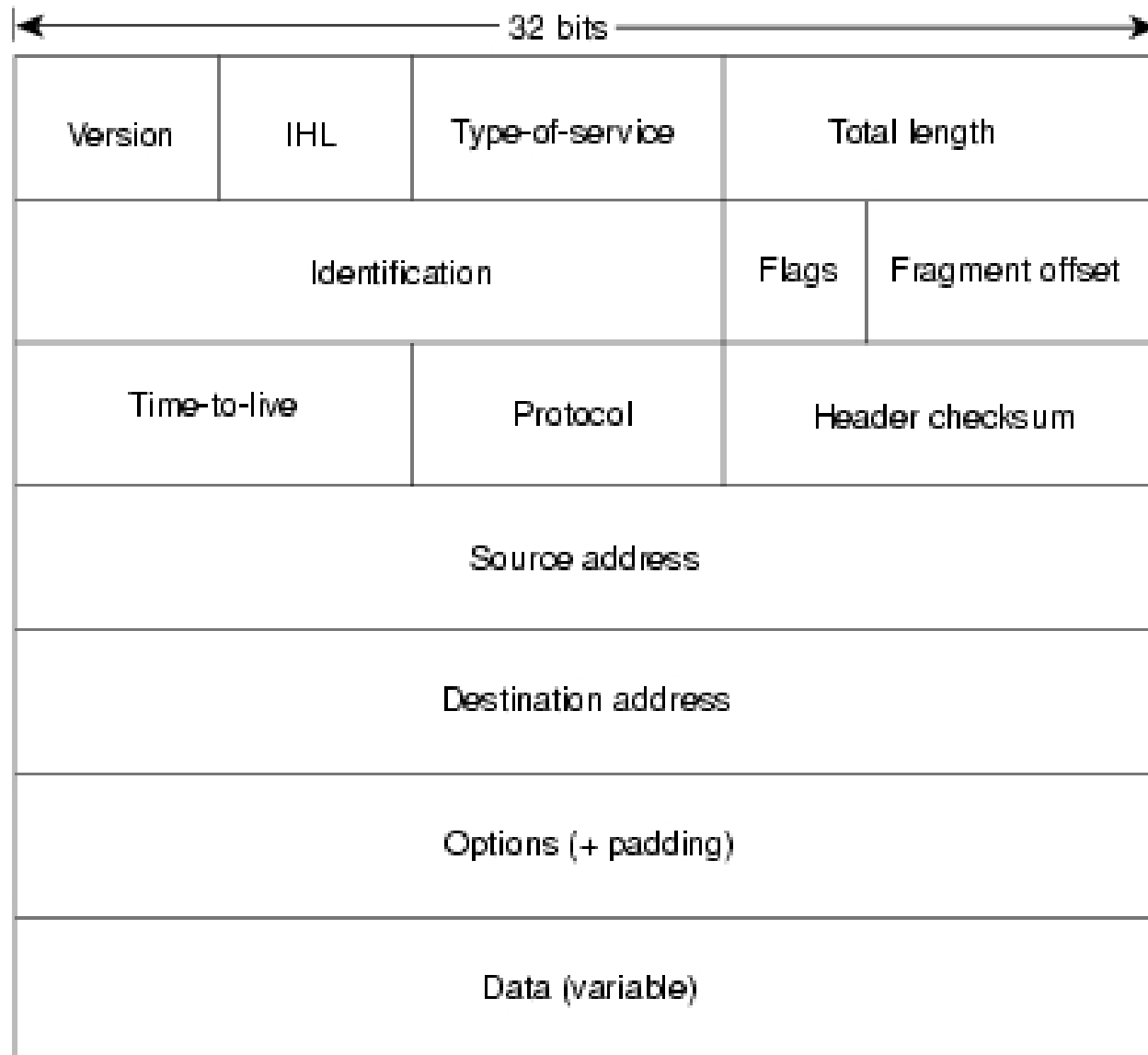
History of the Internet

- In 1969 ARPANet came into existence
 - ARPA – DOD Advanced Research Project Agency
 - Initially linked four computers
- Growth continued through the 70's and 80's
 - 80's - NSF funded the construction of high speed “backbone”
 - Name became “Internet”
- The Internet was privatized in the 90's

How the Internet Works

- It is a distributed network:
 - Each machine is connected to multiple other machines
 - If any one machine fails, the network continues to function
- It is “Packet Switched”
 - Messages are broken into smallish pieces that are routed individually
 - The packet protocol is called IP - “Internet Protocol”
 - Each computer has an IP address – 146.113.11.46
 - IP provides few guarantees...
 - traceroute...

IP Packet Format



9/25/99

TCP

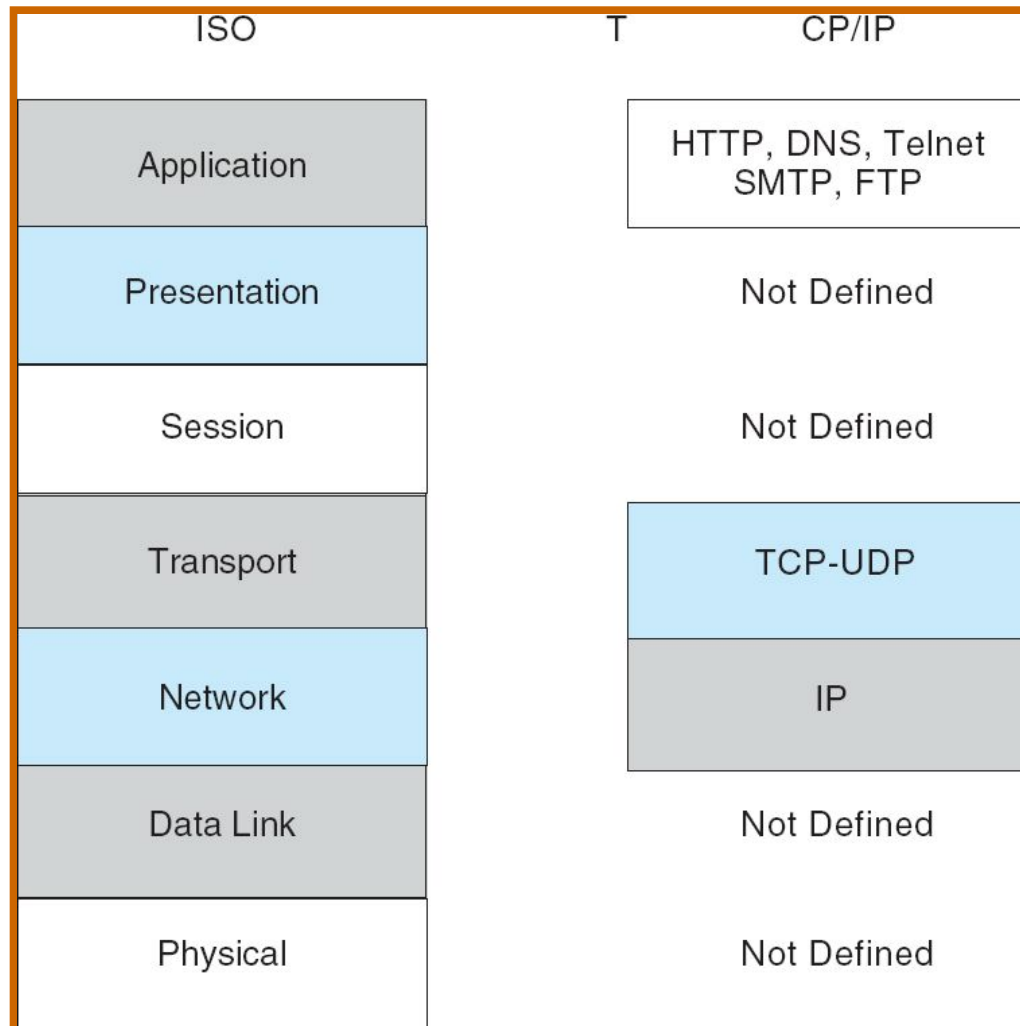
- Transmission Control Protocol
 - Built on top of IP – TCP/IP
 - Provides reliable, connection based transmission
- Internet Protocols are organized into layers...

TCP Packet Format

Source port		Destination port	
Sequence number			
Acknowledgment number			
Data offset	Reserved	Flags	Window
Checksum		Urgent pointer	
Options (+ padding)			
Data (variable)			

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TCP/IP Protocol Layers



DNS

- How do we translate from `www.kzoo.edu` to `10.40.0.240`?
- DNS – Domain Name Server
 - Computers that act as phone books for IP addresses.
 - `edu` – top level domain
 - `kzoo` – organization
 - `www` – specific server
- `nslookup...`

History of the World Wide Web

- The web is a network of information links that is built on top of the Internet
 - Exists at the application layer
- 1990 Tim Berners-Lee set up a working prototype of a web server and browser
- In 1993 NCSA Mosaic was released

How the Web Works

- HTTP - Hypertext Transfer Protocol controls how a page is sent over the Internet
- URL - Uniform Resource Locator describes where a page is located
- Example HTTP replies:

200 OK

404 NOT FOUND

301 MOVED PERMENTLY

302 MOVED TEMPORARILY

500 SERVER ERROR

- www.web-sniffer.net

Acknowledgments

- Portions of these slides are taken from Power Point presentations made available along with:
 - Silberschatz, Galvin, and Gagne. Operating System Concepts, Seventh Edition.
- Original versions of those presentations can be found at:
 - <http://os-book.com/>