ANDIJAN STATE PEDAGOGICAL INSTITUTE

Lecture materials · 2026–2027 academic year

SUBJECT

Information Systems and Digital Technologies

Lecture 17 · Internet and WWW

Part 2 of 2 · 2 hours

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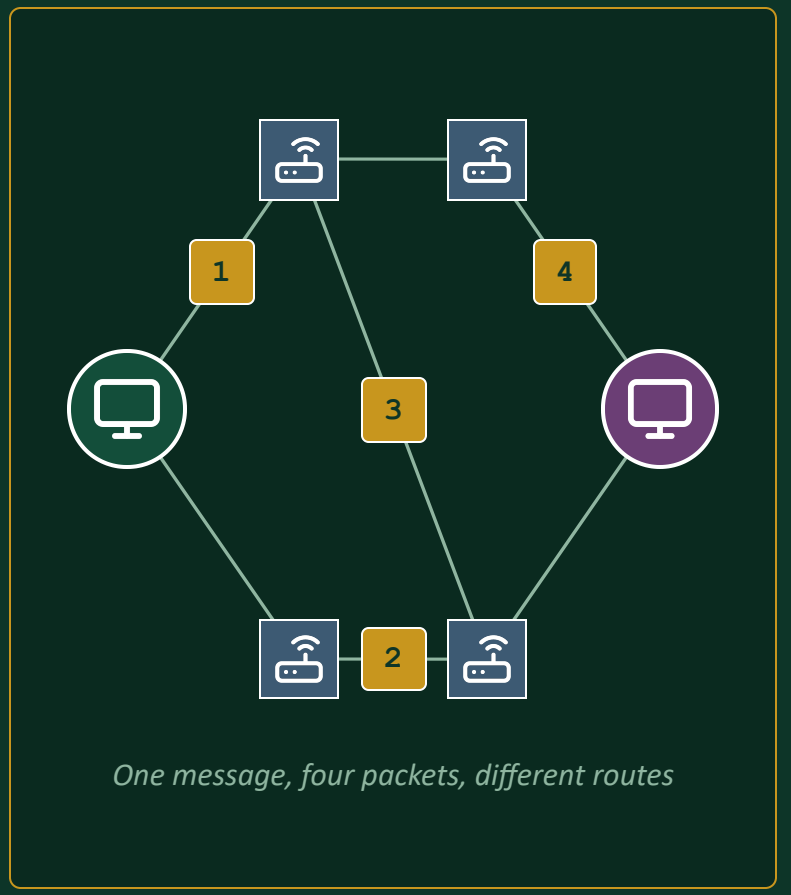
LECTURE 17 · 2 HOURS · PART 2/2

FUNDAMENTALS OF COMPUTERS · CHAPTER 15

The Internet and the World Wide Web

From ARPAnet in 1969 to the web page on your screen

http:// · www · @ · TCP/IP · DNS



One message, four packets, different routes

Are the Internet and the Web the same thing?

YES — They are two names for the same thing.

NO — They are different, but related.

Vote with your hands. We will check at the end.



Think – Pair – Share (3 min)

1. List five things you did online yesterday.
2. Which of them opened a web page?
3. Which did not? (Think: chat, e-mail, games)

By the end of this lesson, you can…

1. **Distinguish** the Internet from the World Wide Web.
2. **Trace** key milestones from ARPAnet (1969) to the Web.
3. **Classify** uses of the Internet, including the four e-business models.
4. **Explain** how browsers, URLs and search engines help us find information.
5. **Describe** an e-mail address and the two sections of an e-mail message.
6. **Explain** IP addresses, packets and DNS, and name the TCP/IP and OSI layers.

The Internet is the road. The Web is the goods.

The Internet

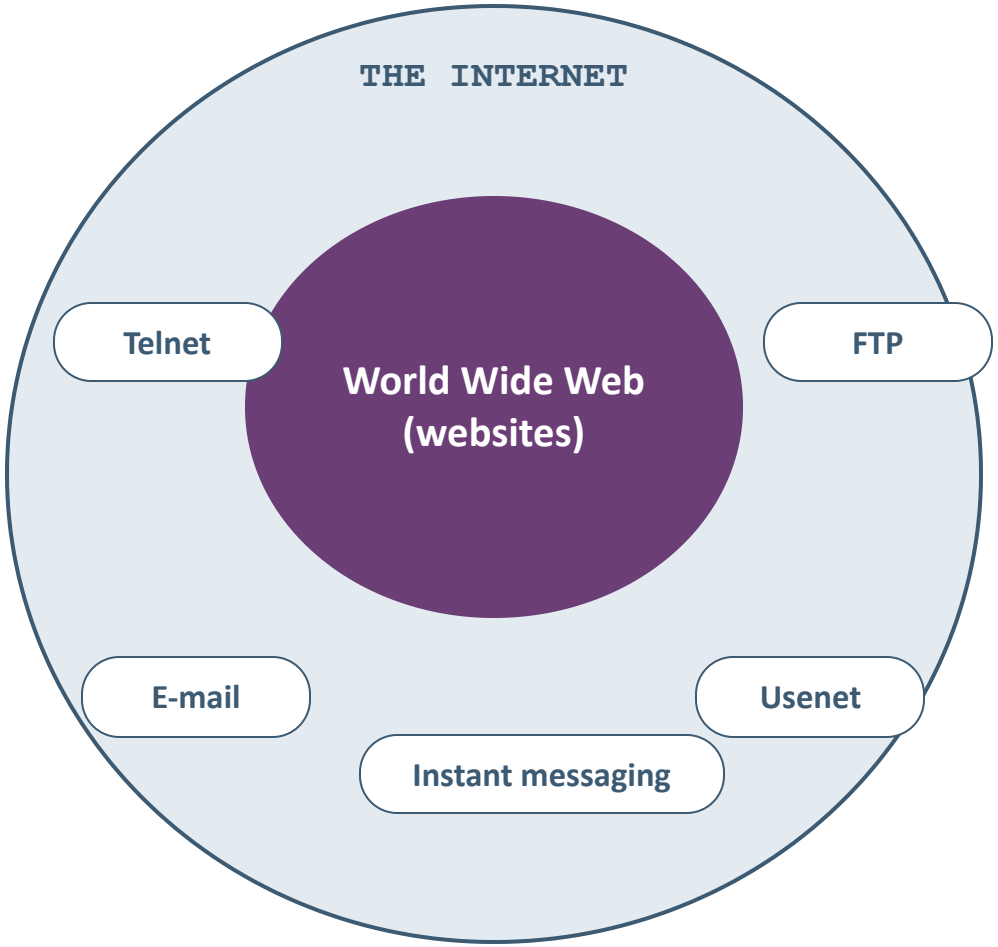
A network of networks linking millions of computers into one global communication system.

→ *Like a country's road network*

The World Wide Web

The network of all websites: hypertext documents with text, graphics, sound and video.

→ *Like goods stored in warehouses*



History, part 1: from ARPAnet to “the Internet”

1969 — ARPAnet

Links university researchers in the USA. Uses packet switching and NCP.

1974 — TCP/IP developed

Shares files, software and applications between hosts.

1976 — X.25 protocol

Hop-to-hop networking; smaller, more reliable packets.

1979 — Usenet

Research network over dial-up: Usenet News and mail servers.

1982 — Eunet

Connects networks of European countries.

1983 — TCP/IP standard

ARPAnet renamed the Internet; military part splits off as MILNET.

History, part 2: names, speed and the Web

1984 — DNS

Maps host names to IP addresses. Domains such as .edu, .com, .gov, .org.

1987 — NSFNET

National Science Foundation network at 56 Kbps.

1990 — ARPAnet ends

Archie, an FTP search tool, arrives from McGill University.

1991 — Gopher

Arranges documents; Veronica searches them.

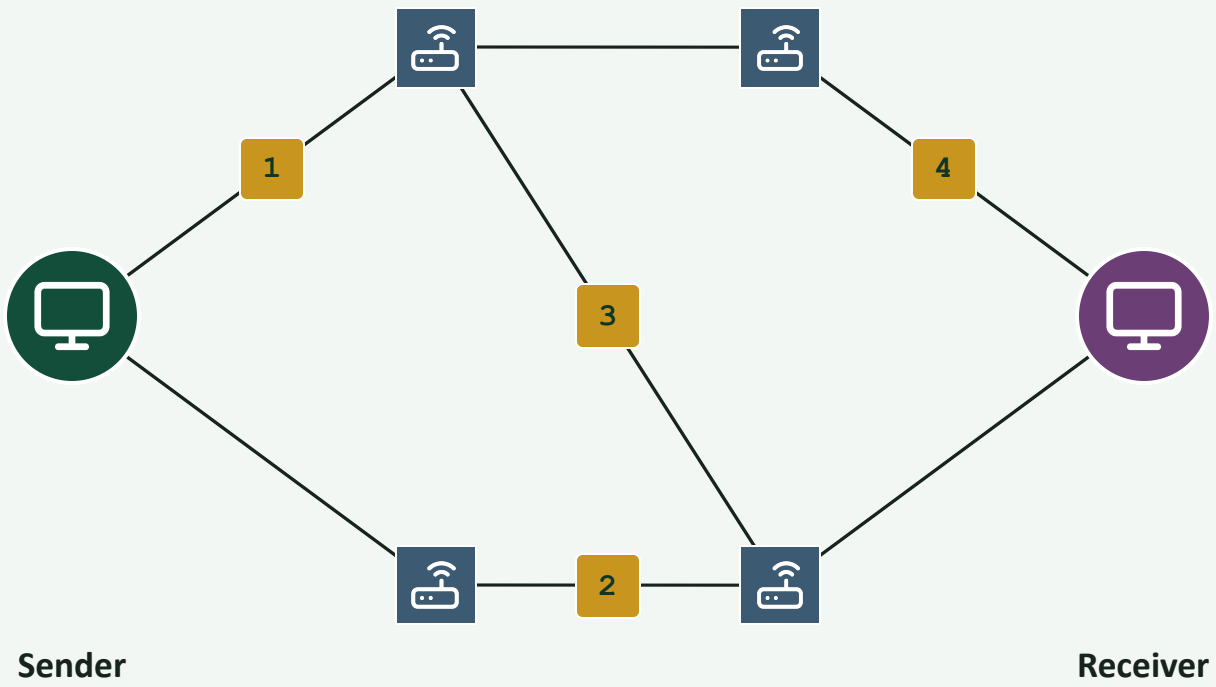
1992 — World Wide Web

Tim Berners-Lee: websites reached with HTTP and hypertext links.

1995 — Commercial ISPs

Companies sell Internet connections to everyone.

Two big ideas: packet switching and TCP/IP



Packets take different routes and can arrive out of order.

IP

routes each packet on the quickest path, and around broken parts of the network.

TCP

puts the packets back together, in the right order, at the destination.

Every packet carries the sender's and receiver's addresses.

CHECK FOR UNDERSTANDING

Put history in order

Oldest to newest:

A	The World Wide Web is introduced
B	ARPAnet is developed
C	DNS is developed
D	TCP/IP becomes the standard; ARPAnet is renamed the Internet

Quick questions

1. Which protocol routes each packet?
2. Which protocol reassembles the packets?
3. What problem did DNS solve?
4. Which protocol does the Web use to fetch pages?

Five fields that run on the Internet



Business

Product details, online sales and payment



Education

Distance learning, e-learning, newsgroups, forums



Communication

E-mail, instant messaging, Internet telephony



Entertainment

Games, music, videos, live sports scores



Government

Online forms, tax returns and services

Every field uses one or more Internet services.

E-business: who sells to whom?

SELLER ↓ \ BUYER →	Business	Consumer
Business	**B2B** A supplier sells raw materials to a factory through a marketplace website.	**B2C** A shop's website lets consumers order and pay online. e.g. Asian Sky Shop
Consumer	**C2B** People sell ad space or photos to companies. e.g. Google AdSense	**C2C** One consumer sells to another by bidding on a third-party site. e.g. eBay

Learning and talking online

	E-mail	Instant messaging
Timing	receiver reads it later	real-time: immediate reply
You need	an account on a mail server	to log on to a messaging server
You see	your messages	a chat room and online users

	Newsgroups	Discussion forums
Where	Usenet message boards	a forum website
Read with	a newsreader	posts shown by time or thread
Joining	users submit articles	some need membership and a login



Distance education: notes, lectures and syllabus on the institute's website; e-learning through simulations and Web Based Training (WBT). Result: virtual universities.

Playing, watching and e-governance

Entertainment

- Games: free, or for a small price
- MUD: players act as warriors, priests or thieves in a text world
- Music and videos to download; photos to share
- Live sports score updates

Government

- Most departments have a website
- Submit passport applications online
- File income tax returns online
- Agencies share data with each other

E-governance: using IT and the Internet to deliver government services better.

CHECK FOR UNDERSTANDING

Which model or field?

You buy a phone from a company’s online store. Answer: _____

A bakery orders flour from a supplier’s marketplace website. Answer: _____

A student sells her old bike to the best bidder on an auction website. Answer: _____

A blogger is paid for showing Google ads on her website. Answer: _____

Your father files his income tax return online. Answer: _____

Web pages, servers and URLs

Web server

stores the web pages of websites

Web page

written in HTML: text, hypertext, images, video

Web browser

runs the HTML and shows the page

Every web page has an address: its URL (Uniform Resource Locator).



Protocol

how the page is fetched (http or ftp)

Domain name

which server holds the page

Location

where the page sits on that server

Web browsers: text-based or GUI-based

	Text-based	GUI-based
Shows	unformatted text only	formatted text, images, sound, video
Inline images	not shown	shown with the text
Using it	simple; no expensive hardware	click to view or download media

The first page a browser opens is its home page.

In the textbook

Internet Explorer
Microsoft, 1995 · the most widely used

Netscape Navigator
popular in the 1990s · shows parts of a page while it loads

Mozilla Firefox
released 2004 · extensions and themes

OPTIONAL MODERN NOTE Internet Explorer was retired in 2022. Today most people use Chrome, Safari, Edge or Firefox, on computers and phones.

Browsing: from connection to web page

1. Connect through an ISP (with a modem)
2. Open the web browser
3. Type the URL in the address bar
4. Press Enter to see the home page

Favourites

Save sites you visit often; no need to remember URLs.

Search

Find sites on a topic when you do not know one.



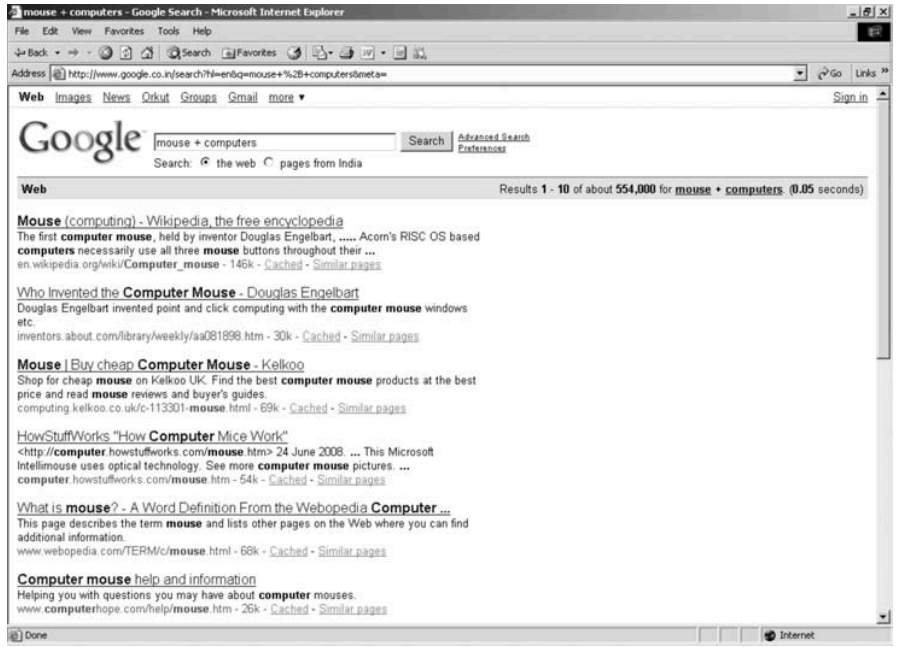
Accessing a website in Internet Explorer — textbook Fig. 15.4

Search engines: searching smarter

A search engine keeps an index of websites with a summary of each one.

Use	Finds pages…	Example
" "	with the exact phrase	`"types of computers"`
AND	with both words	`computer AND hard disk`
OR	with either word	`track ball OR touch ball`
NOT	without the next word	`mouse NOT animal`
+ −	with all words / without a word	`features + mouse`

OPTIONAL MODERN NOTE Google stopped using + in 2011. Quotes, OR and the minus sign still work.



Search results for "mouse + computers" — textbook Fig. 15.8

Blue text = hypertext link to the page. Green text = the site's URL.

CHECK FOR UNDERSTANDING

Write the search, read the URL

Write a search for pages…

1. with the exact phrase history of the Internet
2. about jaguars, but not the car
3. that mention either laptop or notebook

Label the three parts:

```
http://www.school.edu/timetable.html
```

4. What is the protocol?
5. What is the domain name? What kind of site is it?
6. Which part shows where the page is on the server?
7. Which browser type shows images inline?

E-mail: the address and the message

Get an account from an ISP, or register free on a site such as yahoo.com.

`shruti_garg` `@` `yahoo.com`

Unique user name

Website that gives the e-mail service

No two users can have the same address.

Log in with your user name and password each time.



Wrong user name or password = unauthorised user, no access.

HEADER

To: `teacher@school.edu`

Cc: `parent@mail.com`

Subject: `My homework`

BODY

Dear teacher, my homework is attached…

Signature block: Madina, Class 9B

CHECK FOR UNDERSTANDING

E-mail true or false

1 The part of an address before @ identifies the user. T / F

2 Two people can share the same e-mail address. T / F

3 The Subject field is part of the body section. T / F

4 Cc sends a copy of the message to other people. T / F

5 E-mail is real-time, like instant messaging. T / F

6 The signature block is at the end of the body. T / F

Protocols, IP addresses and gateways

Protocols are the rules for moving data from a source computer to a destination computer.

- Find the destination network
- Split data into packets
- Detect and correct errors and lost packets
- Spot a lost connection and reconnect

IP ADDRESS

192 . 168 . 10 . 25

Every computer on a network has a unique address: four numbers separated by dots. (This one is an example.)

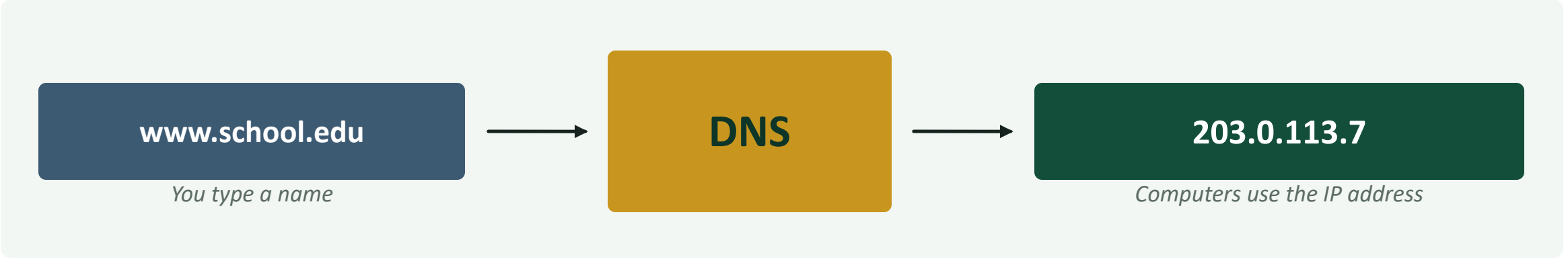


Gateway: a computer that reads the destination address and sends data across different networks.



TCP/IP suite: TCP and IP work with Telnet, UDP and other protocols.

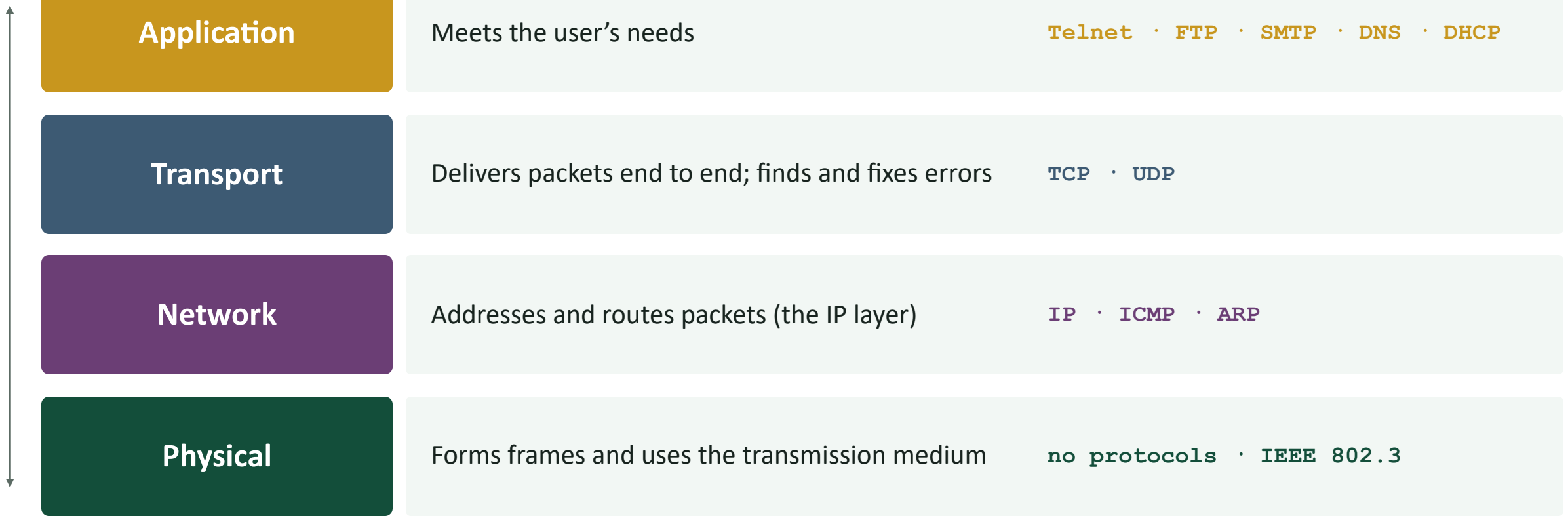
DNS: turning names into numbers



.edu	.com	.gov	.org	.uz .in
educational	commercial	governmental	organisations	country codes

Names are easier to remember than numbers. Before DNS (1984), one shared file listed every host.

The TCP/IP model: four layers

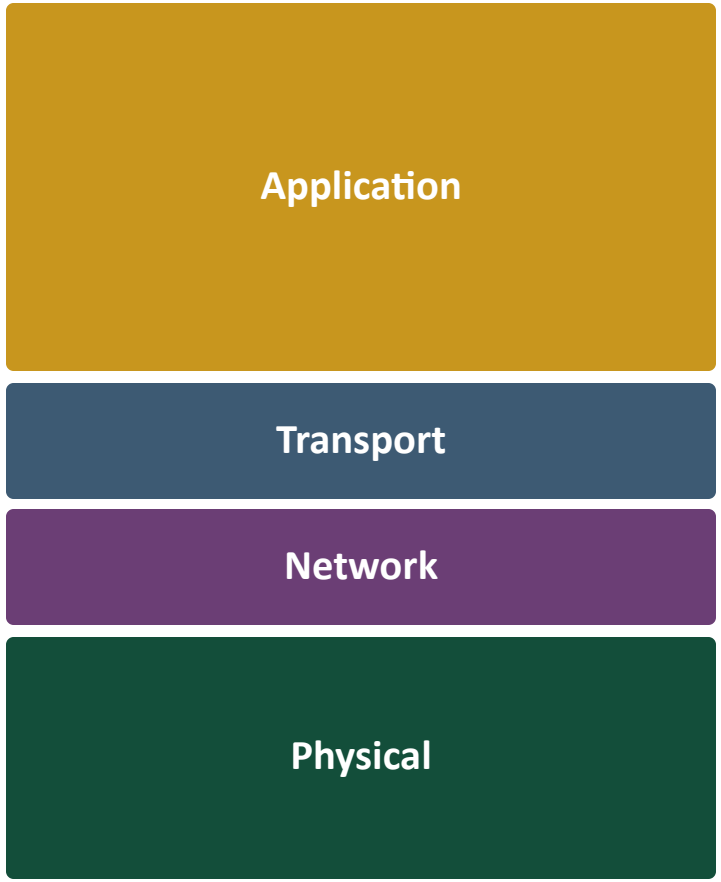


Developed by DARPA · also called the Internet Reference model or DoD model

The OSI model: seven layers

7	**Application**	lets users communicate and transfer data
6	**Presentation**	formats, encrypts and compresses data
5	**Session**	sets up and breaks connections
4	**Transport**	delivers packets in order; resends lost ones
3	**Network**	routes by IP address; prevents overloading
2	**Data link**	forms frames; corrects transmission errors
1	**Physical**	pins, hubs and cables; sends signals

COMPARE WITH TCP/IP



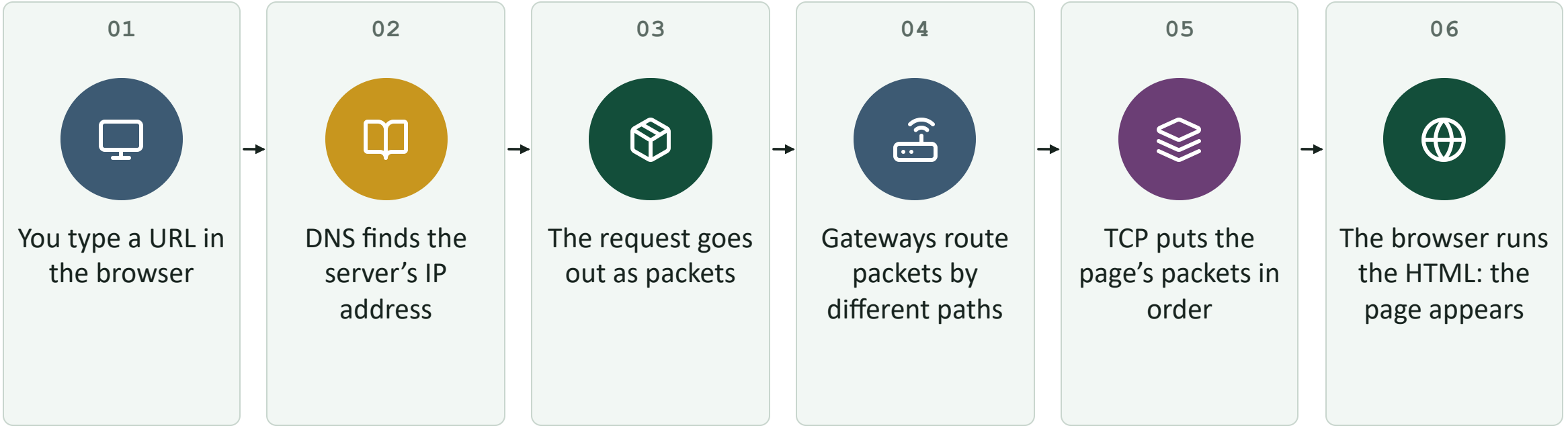
Memory aid (7 → 1): All People Seem To Need Data Processing

CHECK FOR UNDERSTANDING

Which layer?

OSI	Data is encrypted and compressed before sending.	Layer: _____
OSI	Lost packets are sent again, in the right order.	Layer: _____
OSI	Packets are collected into frames.	Layer: _____
OSI	The layout of pins and cables is specified.	Layer: _____
TCP/IP	ARP finds the MAC address for an IP address.	Layer: _____
TCP/IP	This layer has standards, but no protocols.	Layer: _____

What happens when you open a website?



All in about a second. The same journey happens for shopping, e-mail on the web, online tax forms and video lessons.

Review: can you answer these?

01 How is the Internet different from the WWW?

02 What was ARPAnet, and when was it developed?

03 What does DNS do, and why was it needed?

04 Give one example each of B2C and C2C.

05 Name the three parts of a URL.

06 How do double quotes change a search?

07 What are the two sections of an e-mail message?

08 Name the four layers of the TCP/IP model.

Exit ticket

Answer on a slip of paper before you leave.

1. In one sentence: why is the Web not the same as the Internet?

2. In the address student01@school.edu, what does each part tell you?

3. Packets arrive out of order. Which protocol routes them, and which puts them back in order?