14 Protocols and layers – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
protocol			
layers			
TCP/IP protocol suite			

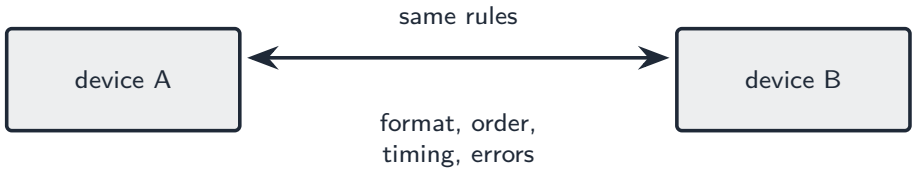
Recall

For two devices to talk, both must follow the same rules. A **protocol** is a set of rules for how devices communicate.

New ideas

Read these first. Each idea has a short worked example. Then do the Practice.

■ 1 What a protocol agrees

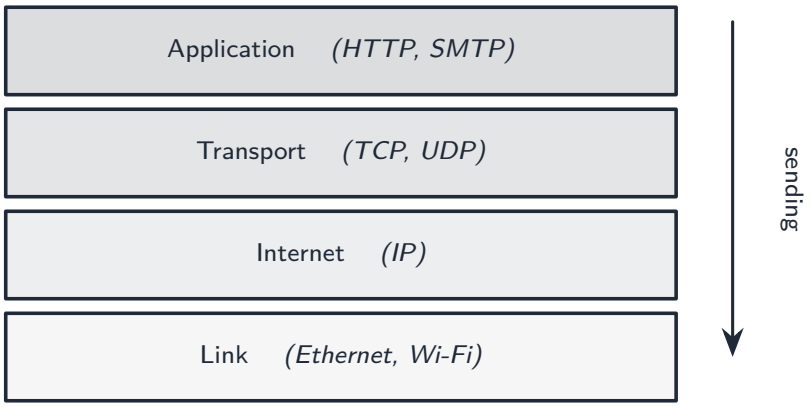


A protocol fixes the **format** of the data, the **order** of messages, the **timing**, and **what to do on error**. Without it, communication fails.

Worked example. When your browser fetches a web page it uses the HTTP protocol: it sends the request in the agreed format (`GET /page`), then waits for the server's reply

in the agreed format. Because both sides follow the same rules, they understand each other.

2 The TCP/IP layers



Networking is split into **layers** , each with one job. The internet uses the **TCP/IP protocol suite** of four layers.

Worked example. The four TCP/IP layers, top to bottom: Application (programs like a browser), Transport (TCP/UDP), Internet (IP addresses and routing), Link (the physical network). Each layer does one job and hands its work to the next.

Watch out: a protocol is an *agreement on rules*, not a piece of hardware or a single program. Splitting it into layers lets each layer be changed without disturbing the others.

Practice

Try these in order.

14.1 What is a *protocol*? [1]

14.2 Give one thing a protocol fixes. [1]

14.3 Why is networking split into *layers*? [1]

14.4 How many layers does the *TCP/IP* suite have? [1]

14.5 Name the top (application) and bottom (link) layers. [2]

14.6 Explain one advantage of splitting networking into layers, rather than writing one big program. [2]

14.7 Challenge. Two computers from different makers, running different software, can still exchange email. Explain how agreed protocols make this possible. [2]