

14 TCP, UDP and routing – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
TCP	传输控制协议	_____
UDP	用户数据报协议	_____
address	地址	_____
routers	路由器	_____

Recall

Inside TCP/IP, the transport layer has two main protocols, and the internet layer moves packets between networks.

New ideas

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

■ 1 TCP vs UDP

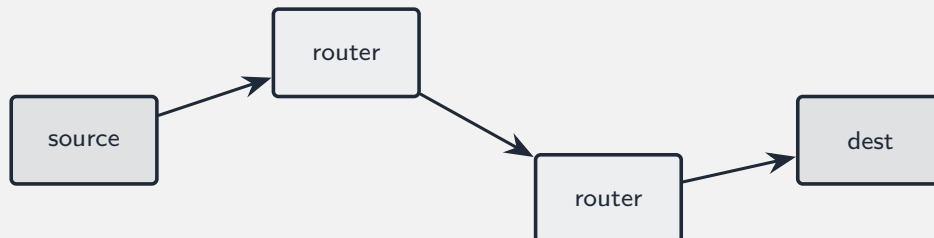
TCP
connection set up
all data arrives in order
reliable, more overhead

UDP
no connection
send and forget
fast, no guarantees

- **TCP** 传输控制协议 sets up a connection and makes sure all data arrives in order —reliable, with overhead;
- **UDP** 用户数据报协议 just sends and forgets —fast, but no guarantees (good for streaming).

Worked example. Downloading a document uses TCP: every byte must arrive, in order, or the file is broken. A live video call uses UDP: if one frame is lost it is better to skip it than to pause and wait, so speed wins.

■ 2 Routing packets



each packet carries a source and destination IP address

Each packet carries a source and destination **IP address** (its **address** 地址 on the internet), and **routers** 路由器 forward it onward.

Worked example. A packet leaves your computer with the destination IP written on it. Each router reads that address and passes the packet one hop closer, until it reaches the destination network —like a parcel moving through sorting offices.

Watch out: TCP guarantees delivery and order but adds overhead and delay; UDP is fast but may lose or reorder data. Choose the one that fits the job —neither is "best" for everything.

Practice

Try these in order.

14.1 Which protocol makes sure all data arrives in order —TCP or UDP? [1]

14.2 Which protocol "sends and forgets"? [1]

14.3 Give one use where *UDP* is a good choice. [1]

14.4 What two addresses does each packet carry? [1]

14.5 What device forwards packets between networks?

[1]

14.6 A live video call drops the odd frame but never freezes; a file download never loses a byte but can pause. Explain which protocol each one uses and why.

[2]

14.7 Challenge. TCP is reliable, yet it is not always the better choice. Explain why its reliability comes at a cost.

[2]