

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

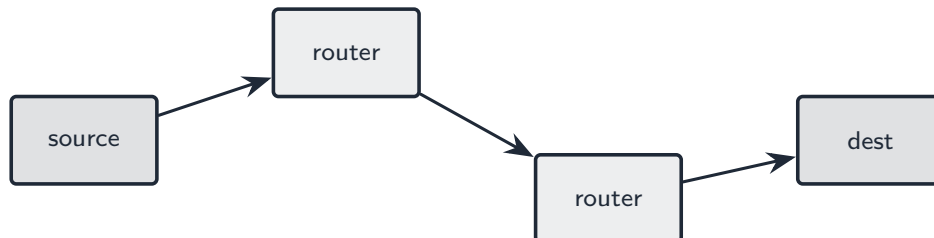
TCP
connection set up
all data arrives in order
reliable, more overhead

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]