



F10.9 Project: reliable delivery

Networks · GCSE · OCR J277 1.3.2, AQA 8525 3.5, Edexcel 1CP2 4.1.6 ·
about 25 min

Name _____

Class _____

Date _____

What this lesson is about

Deliver a report over a lossy radio with packets, acknowledgements and resending.

- The protocol
- Try one packet
- Plan it first

Questions

5 marks in all

- What does an acknowledgement tell the sender? [1 mark]
 - ☐ A That the packet arrived safely
 - ☐ B That the packet was lost
 - ☐ C The route the packet took
 - ☐ D The receiver's IP address
- Which protocol resends lost packets? [1 mark]
 - ☐ A TCP
 - ☐ B UDP
 - ☐ C IP
 - ☐ D HTTP
- Why does the sender wait for a limited time, not forever? [1 mark]
 - ☐ A A reply may never come if the packet or the reply was lost
 - ☐ B It saves battery
 - ☐ C Protocols require exactly one second
 - ☐ D To make the message shorter
- A message is sent in 3 packets and packet 2 has to be sent 3 times. How many transmissions is that? [1 mark]

- Why would a live video call use UDP? [1 mark]
 - ☐ A A late packet is useless, so waiting to resend it only adds delay
 - ☐ B UDP encrypts the video
 - ☐ C UDP guarantees every packet arrives
 - ☐ D UDP uses less electricity

The task: deliver the report

Split `message` into packets of 14 characters, in the form `<number>/<total>:<piece>`. Deliver them to the Base with stop-and-wait. Print `sent <number>` each time you send a packet (including when you send it again) and print each reply you get. Never send the next packet before the last one is acknowledged. When every packet is acknowledged, print `delivered in <n> transmissions`, and turn the LED green.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()

message = "robot 7 reporting: mat clear, battery ok"
```

Plan your program here, then type it in and press Run.



Do it on the robot

www.bugbotlab.com/learn/f10-9-project-reliable-delivery/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Give up after 5 tries of the same packet, and print `failed at packet <n>`.
2. Send all three packets at once, then resend only the ones not acknowledged. How many transmissions does that take?
3. Why would a live video call use UDP rather than waiting for acknowledgements?