How Data Travels Across the Internet

KS4 COMPUTER SCIENCE Ages 11-14 ⏰ 3 min read

Breaking Data Into Tiny Pieces

When you send a message, photo, or video online, it doesn't travel as one whole thing. Instead, your **device breaks it into thousands of tiny pieces called packets**. Think of it like cutting up a jigsaw puzzle into individual squares before sending them on a journey.

Think of it like... mailing a giant poster to a friend by cutting it into smaller pieces, putting each piece in a separate envelope, and posting them all on different days. Your friend receives all the envelopes and glues the poster back together.

Each packet is **tiny—usually between 1,000 and 1,500 bytes** in size. Before they travel, your device adds important information to each packet, like where it came from (your **IP address**) and where it's going.

Finding the Best Route

Here's the clever part: your packets might not all travel the same route! **Routers are like traffic controllers** all over the internet. When a packet arrives at a router, the router looks at where it needs to go and sends it along the fastest available path.

Think of it like... **routers being postal workers** who decide which road is quickest to deliver your letter. If one road is busy, they choose another route instead.

This system is brilliant because if one route gets too crowded or breaks, your data can still reach its destination by another path. The internet was designed this way so that important information could always get through, even if parts of the network stopped working.

Travelling Through Cables and Signals

So how do packets physically travel? **Most long-distance data travels through underground fibre optic cables**—thin glass tubes that send information as pulses of light. These cables run under oceans and across continents, connecting countries together.

For shorter distances, data might travel through **copper cables** or as **wireless radio signals** (like **Wi-Fi** and **mobile networks**). Your home Wi-Fi router converts data into invisible radio waves that beam through the air to your laptop or phone.

Putting It Back Together

When all your packets reach their destination, they might arrive in a jumbled order. Your **receiving device puts them back in the correct sequence** using special information included in each packet. It's like reconstructing that jigsaw puzzle—the pieces know which order they belong in!

This whole process happens incredibly fast. A message can travel **thousands of miles in under a second**. The internet's brilliant packet system means data can be reliable, flexible, and speedy all at the same time.