Networks

1 Speaking: Understanding Networks

Discuss the following questions:

A. How would you define a computer network?
B. What are the main advantages and limitations of using computer networks?

2 Listening 1: "How Computer Networks Connect and Operate?"

🎧 The listening recording and questions are available on Moodle.

3 Reading 1: Wide Area Networks "How the Internet Came to Be?"

📖 Read the passage and then answer the questions below:

The Internet underpins contemporary society and is relied on daily by people across the globe. According to the World Wide Web Foundation, it now supports more than one billion active websites, while billions of users carry out over three and a half billion Google searches and send approximately 155 billion emails each day. As growing numbers of individuals log on, these figures continue to climb. Having come to stand as the backbone of the twenty-first century, the Internet is likely to remain a defining force in social, political, and cultural life. For this reason, gaining insight into its origins - who set it up and for what purpose - has become increasingly necessary.

At its core, the Internet is the world's most widely used computer network system, taken up by well over three billion people worldwide. A computer network system refers to a telecommunications framework that enables multiple computers to link up and share data. The information sent back and forth across this network ranges from the last message typed into a Facebook chat window to the sophisticated programs that keep Google's search engine running. The Internet is neither owned by any single entity nor brought about by the work of one individual. Instead, it was gradually built up through the combined efforts of numerous computer scientists operating within universities, research institutions, and private corporations. This cooperative model reflects the way technological innovation is typically driven forward through cumulative and shared expertise.

Despite the absence of a clearly identifiable creator, the Internet does have a definite point at which it started out. Its origins can be traced back to ARPANET, an academic research initiative funded by the United States Department of Defense. The concept grew out of the work of computer scientists Donald Davies, Ivan Sutherland, and Bob Taylor, who sought to come up with a network based on the newly emerging principle of packet switching. This technology breaks data down into small units, known as packets, which are transmitted independently across multiple routes before being reassembled at their destination. The route taken does not need to be direct, and information can be sent out to several computers and locations simultaneously.

Before packet switching was developed, computer networks relied on circuit switching. This approach involved setting up a dedicated communication channel through which data could travel directly from one device to another. Information was confined to that fixed path and could only be accessed by the two machines linked up within the circuit. Bob Taylor later reflected on these limitations in a 1999 New York Times article, in which he looked back on his experiences during the mid-1960s. At that time, he worked with three separate computer terminals, each tied to a different circuit-switched system. If he was communicating with someone at S.D.C. and wanted to get in touch with a colleague at Berkeley or M.I.T., he had to get up, move to another terminal, log in again, and reach out from there. Switching between conversations was cumbersome and inefficient. Taylor argued that the solution was self-evident: if multiple networks existed, there should be a single terminal capable of connecting

to all of them. This line of reasoning ultimately led to the creation of ARPANET.

Although early forms of "talking online" were limited to sending typed messages from one computer to another, contemporary communication allows users to log off one device, pick up another, and still pull up the same data. This shift illustrates just how transformative ARPANET proved to be. In 1969, four computers were successfully linked up, forming the first operational network. From that point on, development accelerated. Additional machines were connected, and by 1972, researchers had begun to work on applications designed to operate across the network. One of the earliest of these was electronic mail, which quickly caught on as a practical and efficient means of communication.

A further turning point came in 1989, when Tim Berners-Lee set up the World Wide Web. This innovation made it possible to create and view websites and introduced the now-familiar "www" prefix in web addresses. It rapidly developed into one of the primary tools users rely on when going online. The World Wide Web enables information to be set out in the form of web pages - predominantly text-based documents written in Hypertext Markup Language (HTML). This language allows computers to display not only text but also images, audio, video, and interactive features. Through embedded hyperlinks, users can move from one uniquely identified page to another, gradually building up an extensive web of interconnected content.

The Internet in its modern form did not fully take shape until these applications came into widespread use. Nevertheless, many users continue to mix up the Internet and the World Wide Web, assuming the two terms are interchangeable. In reality, the Internet refers to the global network infrastructure, whereas the Web is merely one application that runs on it. Mobile applications such as Facebook and Instagram transmit data over the Internet without depending on web pages, while their browser-based versions rely directly on Web technology.

Originally, the Internet was brought about to make it easier for computer scientists to communicate with one another. Over time, however, it has opened up entirely new avenues for global interaction, largely through email and the interconnected services that make up the World Wide Web. Not set up by any central authority and owned by no single group, the Internet can ultimately be said to belong to everyone.

Source (adapted): https://docslib.org/doc/13501554/commonlit-how-the-internet-came-to-be

1. Why does the writer argue that understanding the Internet's origins is essential rather than merely historical?

2. What does the range of information transmitted over the Internet reveal about its functional scope?

3. Why does the author stress that the Internet has no single creator or owner, and how does this reinforce the passage's central argument?

4. In what ways does packet switching enhance both the efficiency and robustness of data transmission compared with circuit switching?

5. Why is Bob Taylor's personal anecdote particularly effective in illustrating the shortcomings of early network systems?

6. How did ARPANET alter the underlying concept of communication rather than simply refining existing technologies?

7. How did the creation of the World Wide Web transform users' interaction with the Internet without modifying its underlying infrastructure?

8. Why do many users conflate the Internet with the World Wide Web, and why does the author consider this confusion significant?

3 Language Work: Phrasal Verbs