

How the Internet began

The origins of the Internet date back to the Cold War in the 1960s, when the US military was concerned that a nuclear attack would destroy vital communications. They began to design a communications system, based on computers, that could resist damage by nuclear weapons.

ARPANET (Advanced Research Projects Agency Network) was established in 1969. Dozens of military sites across the USA were linked in a network, each with computers programmed to relay a message. If one site were destroyed, the network could re-route messages using any other site still in operation. The military realised that the larger the network was, the more robust it would be in case of attack. They encouraged other organisations, such as academic institutions and large companies, to join ARPANET.

More rapid expansion of the Internet was made possible in 1974, when a common system of addresses and communications procedures, called 'TCP/IP', was created. This made it possible for the Internet to incorporate other networks which had developed in universities and other institutions.

During the late 1970s, it became obvious that the new network could be used for all sorts of communication, especially for university research and business. More and more sites, including those of institutions outside the USA, joined the network. The idea of an Internet, an international network, developed.



Until the early 1990s, the major users of the Internet were academic and research organisations and most information consisted only of text. The introduction to the Internet of a feature called the 'World Wide Web' in 1991 made it possible to include graphics, animation, video, and sound. With the arrival of these multimedia tools, large numbers of ordinary people began to use the Internet.

During the 1990s, the explosive growth in the sales of personal computers made the Internet accessible to more and more people. Commercial organisations began to see business opportunities. Specialist Internet companies developed and the web was increasingly used for advertising and sales.

Although at first the vast majority of Internet users were in the USA, by the year 2000 familiarity with the new medium had spread all around the world. Governments, companies and ordinary people almost everywhere were using the Internet to communicate, obtain information and do business.



7 **134 COMPREHENSION** Read or listen to the text and copy the table below. Fill in details of key moments in the development of the Internet.

Time	Development
.....
.....
.....
.....

EMPLOYABILITY SKILLS ACCESS AND EVALUATE INFORMATION

8 **Exam Practice** **WRITING** Use the notes in the table to write a summary of how the Internet developed (200 words).

EMPLOYABILITY SKILLS CIVIC LITERACY

9 **DIGITAL CITIZENSHIP** **SPEAKING** In pairs, discuss the questions.

- 1 Why did the Internet become so popular so quickly?
- 2 What advantages does it have compared to other means of communication?
- 3 Does it have any disadvantages as a method of communication?

VIDEOLINK

YouTube ▶ 'History of the Internet' (Life Noggin')

What contribution did the following people make to the development of the Internet?

1 Licklider 2 Tomlinson
3 Cerf 4 Berners-Lee

Internet services

The Internet is an international network of computers open to everybody and providing access to the vast amounts of information stored on them. Access is possible not only for computers but also a range of wireless devices such as tablets and smartphones. An Internet service provider (ISP) is an organisation which provides services for accessing and using the Internet.

Surfing

The most popular part of the Internet is the World Wide Web (WWW), a service for distributing multimedia data, including pictures, sound and video as well as text. Most businesses and other organisations have their own website to publicise their activities. Users can visit these sites by typing a special address code, called a 'universal resource locator' (URL). Documents published on websites are presented in a form known as hypertext mark-up language (HTML), which allows the inclusion of active links to other documents. By clicking on a link, you can view the related document on the screen or download files to your computer.

Special programs, called 'browsers', enable you to 'surf' the web, moving from one site to another. However, the web contains so much information that finding what you want can be difficult. Services called 'search engines' allow you to type in key words in order to seek out sites containing the type of information that you are looking for.

Watching video clips, films and TV programmes has grown enormously in popularity, both over the web and using specialised, higher quality Internet protocol television (IPTV) services such as Netflix®.

Communicating

Email is a method of sending and receiving messages through the net. An ISP provides you with a personal email address, which usually takes the following form: username@ISPname.it. Alternatively, you can obtain an email address by registering with a service such as Gmail™, not linked to a particular ISP. In addition to text, email messages can also carry attachments, such as pictures or documents.

The Internet offers a variety of other ways for people to communicate. Following the expansion of smartphones, many people use mobile messaging applications, such as WhatsApp®. Different instant messaging (IM) services and social networking websites enable the instantaneous exchange of opinions and information. Blogs (weblogs), newsgroups and newsletters make it possible to spread news to large groups of people and also engage in long-running group discussions. Cheap long-distance telephone calls can be made through a system called voice over Internet protocol (VoIP), including video calls on computers with webcams or cell phones with front-facing cameras.



10 COMPREHENSION Read the text and answer the questions.

- 1 Which three devices with Internet connectivity are identified in the text?
- 2 What is the abbreviation given to the 'address code' that identifies a website location?
- 3 What is meant by the term, 'key word'?
- 4 What is an IM application?
- 5 Which three modes of communication that facilitate dissemination of information are identified in the text?

EMPLOYABILITY SKILLS COMMUNICATE CLEARLY

- 11 Exam Practice** Using your own words explain the meaning of the words / expressions in blue.

EMPLOYABILITY SKILLS USE INFORMATION

- 12 Exam Practice WRITING** Write a paragraph explaining the different ways that people can communicate over the Internet.

VIDEOLINK

YouTube ▶ 'Let's Talk About Social Media (The Minimalists)'
Are the comments made about social media fair? How does his view of social media differ from your own?

How the Internet works

The core of the Internet consists of special routers, interconnected by high-speed links using fibre optics and other cables as well as satellites. The routers are connected, in turn, to thousands of smaller networks and, through them, millions of individual computers or other devices. Large institutions usually have direct Internet access

through their own Internet servers. Other users get access through an Internet service provider (ISP).

The creators of the Internet discovered

that data could be sent more efficiently when broken into smaller pieces, sent separately, and reassembled.

These pieces are called 'packets'. So, for example, when you send an email across the Internet, your full email message is broken down into packets, sent to your recipient, and reassembled. The same thing happens with photographs, videos, voice communications and any other form of data.

Each packet is digitally labelled with its destination address. A network of routers send each packet by the quickest available path until it reaches its destination. Once there, the packets are put back together in the right order to recreate the original file. As Internet traffic is constantly flowing, and there are many separate paths between routers, each packet may have made a completely different journey. But, since the splitting up and the reassembling happen in a split second, the process is not noticeable.



GRAMMARLINK

Adjective formation

- Noun + suffix:

hope → **hopeless**

fire → **fireproof**

danger → **dangerous**

experiment → **experimental**

- Verb + suffix:

use → **usable**

access → **accessible**

attract → **attractive**

► Grammar reference p. 276



FUTURE CAREERS

Career profile Network engineer

Name Filomena Pescara

Age 26

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'I studied English and IT at school, where I first heard about the Cisco® CCNA® course. They say there are no entry requirements, but you really need some knowledge of IT in English. After the course, I immediately found work as an apprentice but now run my own business. I do everything myself from the initial network design to the physical installation and firewall programming. I'm always very busy, but love the 'hands-on' aspect of my work: I could never imagine sitting in front of a computer all day.'



Internet bandwidth is an indication of the speed of the connection, the amount of data that can be sent per second. Faster connections have become possible with better physical infrastructure (such as fibre-optic cables that can send information close to the speed of light), as well as better ways to encode the information even when using an older medium like copper wires.

13 136 COMPREHENSION

Read or listen to the text and match the beginning of each sentence (1-8) with the correct ending (a-h).

- 1 At the heart of the Internet is
- 2 Routers are interconnected
- 3 Routers are also linked to
- 4 Many institutions have access
- 5 Most ordinary users get access
- 6 Data files sent over the Internet
- 7 Individual data packets may travel
- 8 When they arrive at their destination

- a are broken down into 'packets'.
- b a network of special routers.
- c by different routes across the network.
- d by very fast cable and microwave links.
- e smaller networks of computers.
- f the packets are reassembled.
- g through an Internet service provider.
- h through Internet servers.

EMPLOYABILITY SKILLS COMMUNICATE CLEARLY

14 Exam Practice Using your own words, explain the function of data 'packets'.

VIDEOLINK

YouTube ► 'How Does the Internet Actually Work? (London App Brewery)'

What is the function of a DNS server?