

Briefing

This unit looks at ways in which data is transferred between computers. Vocabulary for talking about networks and networked computing is covered, as well as the following grammar points: present simple vs present continuous, defining relative clauses, zero and first conditionals, articles.

Internet browsing

This section looks at internet browsers and web addresses. While the terms **the internet** and **the World Wide Web** (usually shortened to 'the web') are often used interchangeably, knowledgeable students may raise the point that there is actually a significant difference. Technically, the World Wide Web refers only to pages that can be viewed in a browser, whereas the internet includes email along with several other ways of sending information, data and files between computers such as VoIP (Voice over Internet Protocol), which services such as Skype use. The internet developed from 1960s computer networks such as ARPANET (used by the US military) and networks in the UK and France. One of the systems for transferring data used on the internet (called protocols), HTTP (hypertext transfer protocol), developed by Tim Berners-Lee and Robert Cailliau at a research institution in Europe, became the basis of the World Wide Web.

Some other items mentioned in this section are: **web addresses** (for example, www.google.com), which are technically known as **URLs** (Uniform Resource Locators); **bookmarks**, sometimes known as 'favourites' (usually in AmE: favorites).

Networks

Computer networks are at the heart of many applications of IT in our everyday lives. Examples are numerous. Bank ATMs communicate securely with the bank's main computer to ensure that each transaction is recorded and that rules such as withdrawing more than the daily limit are not broken. Emergency services vehicles have computers which communicate with headquarters. On a possibly more familiar level, smartphones send and receive data using the mobile phone network (which is referred to in a variety of ways, including 'the 3G network', '4G network', 'cellular network', 'GPRS', 'CDMA', 'HSPDA' and so on).

Laptops and tablet computers such as the iPad often connect to the internet using **wi-fi**, a short-range network that, like the mobile phone network, uses radio signals. The hardware for connecting to wi-fi is usually built into laptop computers. For situations where a wi-fi signal is not available, a **dongle** (a small box which plugs into a USB or similar socket) can be used to send and receive data over the mobile phone network instead. Networks that use radio signals are known as **wireless networks**, while networks using cables (such as Ethernet cables, mentioned in the previous unit) are **wired**.

Networks are often categorised as two types: **Local Area Networks (LANs)** and **Wide Area Networks (WANs)**. As their names suggest, LANs establish short-range ('local') connections, perhaps covering a single office or company within a building, whereas WANs cover much larger areas. Computers in a home sharing the same network connection are on LANs, while the internet is the most obvious example of a WAN. LANs and WANs can both be wired or wireless.

Discussion about wired networks often involves network topology; that is, the way networks are connected. Various topologies exist, including **star networks**, **ring networks**, **bus networks** and **mesh networks**: see the text on page 22 for details. Note that this mostly does not apply to wireless networks, though it is sometimes said that wireless networks are mesh networks.

Many interactions between computers on networks involve a **client-server** relationship. In this, the client requests information from the server, then the server processes the information and sends it to the client. An example is email: email client software such as Microsoft Outlook or Mozilla Thunderbird regularly asks the email server whether there are any new messages. The email server checks whether any new messages have been received and if so, forwards ('serves') them to the email client. This is why you will often hear IT workers referring to software such as Outlook as an email client rather than an email program. In a workplace, a server is often on the premises; this can be an ordinary desktop computer or might be larger, similar to the one in photograph 4 on page 4 of the Course Book.

Security is an important issue with networks and the internet. One way to enhance security is to use **encryption**; that is, data sent across the network is

encoded so that even if it is intercepted, it cannot easily be read. A further level of security can be provided through a **Virtual Private Network (VPN)**, which is often described as being analogous to 'tunnelling' through the internet. It may be used between different offices of a company or by employees 'on the road' using their laptops to communicate with their office.

Mobile computing

This section looks at mobile devices such as mobile phones and tablets (iPad and similar), and **custom devices** such as those that traffic wardens, train conductors and courier company drivers use. There is a focus on how these make workers more efficient and flexible. Various features of mobile devices are mentioned, including:

- **GPS** (Global Positioning System), which uses signals from satellites orbiting Earth to work out the position of the device to a high degree of accuracy.
- **USB recharger**, which allows the device's battery to be recharged from any computer that has a USB socket. These are usually less bulky than the rechargers that plug into the mains (sometimes they are just a small cable) and are very convenient.
- **OCR (Optical Character Recognition)** software, which converts images, perhaps from the device's camera, to data (words, characters, numbers, etc.) that a computer can understand and use.
- **Accelerometer**, which detects and measures motion – for example, if the device is dropped or rotated. It is this that enables tablets and smartphones to change the orientation of the screen as it is turned around. Accelerometers should not be confused with motion sensors: accelerometers detect motion of themselves, whereas motion detectors are stationary and detect motion of other bodies. Motion sensors are used, for example, in burglar alarms.

Email

Most students will already be familiar with email in their own language. In case students ask, the screenshots from the unit are based on the Mozilla Thunderbird email.

In the screenshot, **CC** stands for 'Carbon Copy' and **BCC** stands for 'Blind Carbon Copy'.

Business matters

This involves a scenario in which students prepare a proposal to upgrade the electronic communications systems of an architecture firm. It applies the key vocabulary and grammar of this unit.

Further reading

Use the following keywords to search the internet for websites which give more in-depth information about the topics covered in this unit: web browser, internet, World Wide Web, network, LAN, WAN, wi-fi, VPN, GPS, OCR, accelerometer, smartphone, email.

Teacher's Notes

Warm-up

Ask students to share the lists of electronic communication methods that they made for homework. During feedback, put the words on the board to make one long list.

Internet browsing

Speaking

- 1 Begin by asking students about accessing websites in general, before they discuss the questions in pairs. Check that they know that we often refer to the World Wide Web as 'the web' and point out that we use *the* before *internet*, *web* and *World Wide Web*.

Vocabulary

- 2 In pairs, students match words for parts of a browser to a screenshot of Google's Chrome browser. After they finish, ask them to say what each item does (for example, the 'refresh' button reloads the page).

1 D 2 E 3 B 4 A 5 F 6 C

- 3 Students match verbs and nouns to form useful collocations related to web browsing.

1 h 2 d 3 a 4 c 5 g 6 e 7 f 8 b

Speaking

- 4 Students tell a partner what they do on the internet, using vocabulary and collocations from Activities 2 and 3. Encourage them to say as much as they can, changing partners or as a mingle to facilitate this.

Listening

- 5 ▶ 12 Students listen to an administration assistant telephoning an IT specialist for help with a new browser, then answer the questions.

Yes, the IT specialist solves his problem. He likes the fact that he can see all his bookmarks now.

- 6 Students listen again, this time for more detailed information: the three things the admin assistant needs help with.

- 1 finding the search bar 2 opening a tab
3 finding menus

Language

This Language box contrasts the present simple and present continuous tenses, as used for current (not future) actions, and also looks at stative verbs.

Stronger students might be interested to know that some verbs are sometimes stative and sometimes not, depending on how they are used. For example, *have* is only stative when used to indicate possession. But we often say, for example, *I'm having breakfast*.

- 7 Students identify the tenses in two example sentences and decide why those tenses were used by the speaker.

- 1 I'm having trouble with the new browser we're using on our PCs. (Present continuous in both cases: actions happening now. The first example could also be assumed to be a temporary situation.)
- 2 I understand that now. But something else is confusing me. (first verb: present simple: a stative verb; second verb: present continuous: a situation in progress now)

- 8 For further practice, students choose the correct forms of the verbs in the box to complete a telephone conversation between an IT help desk assistant and an employee seeking help.

- 1 type in 2 opens 3 isn't working 4 know
5 am checking

Speaking

- 9 For freer practice, students roleplay telephone conversations for three different situations, using the conversation in the previous activity as a model.

Listening

- 10 ▶ 13 This activity and the two which follow focus on saying web addresses, especially the symbols within them. Before students listen, put a common web address (for example, *www.google.com*) on the board and ask how they think it is said in English (*www* and *dot com* are said in a similar way in many languages.). Then see how many other symbols used in web addresses, such as slash, they already know. Finally, see how much of the example web

address in the Course Book they can say. Check that they can recognise items 1–5 being spoken before they begin listening.

Students then listen to the example being spoken and write the symbols next to the words.

1 - 2 . 3 / 4 _ 5 ?

- 11 ► 14 Students hear a web address being spoken and choose the correct option.

3

Speaking

- 12 In this information gap activity, students read web addresses to each other and write down what they hear.

Networks

Speaking

- 1 For students with little IT knowledge, the discussion questions provide a lead-in to the topic as they relate networking concepts to real life. More knowledgeable students could also suggest other networks in everyday life, such as cash registers and credit card machines in supermarkets, and mobile phones.

Reading

- 2 Students read a web page about networks and match the main ideas to the three paragraphs.

The information in the web page ensures that all students, whatever the extent of their IT knowledge, have the same basic information needed to talk about networks. If the development of reading skills is important to your students (for example, if they need to read long texts in English at work), you could set a time limit to practise the skill of skimming.

a 3 b 1 c 2

- 3 This activity looks at a type of cohesion, the linking of ideas in a written or spoken text so that it forms a cohesive whole without unnecessary repetition. Cohesion can be achieved in several different ways; this activity looks at the linking of ideas between sentences using words such as *this*, *it*, *he* and *another*. For example, in line 5 of this text, *They* refers to *computers*, a word which appeared in the previous line.

After going through the example with students, ask them to find the words in the text that the linking words refer to. Students could then check their answers in pairs.

1 type of wired network 2 star system
3 type of wired network 4 bus 5 mesh
6 the link to several other computers

- 4 Students match diagrams to types of networks described in the text. (Reading to relate text content to diagrams is a very useful skill for technical areas of ESP.)

1 ring 2 star 3 mesh 4 bus

Speaking

- 5 Students now apply the information from the web page to answer some questions. Question 1 uses information from the first paragraph (main types of network) and question 2 uses the final paragraph (the client–server distinction). Point out to students that they will not find the answers directly in the text; rather, they have to understand what LANs, WANs, clients and servers are from the text and then use that information to answer the questions.

1
a LAN (The computers are close together/in the same building.)
b WAN (They need to send data to the bank's main computer to know how much money someone can take out, for example.)
c WAN (Police cars can go anywhere.)
2
b, c and e are clients. They need to send data across a network to do their job.

Language

Care should be taken with this grammar point: while relative clauses are not too difficult to understand, they are tricky to produce. Many students at this level will not have been formally taught relative clauses before. For the sake of simplicity, some points have not been made in the box: for example, the box only includes defining relative clauses (sometimes called restrictive relative clauses), not non-defining relative clauses. Thus, if students encounter an example of a non-defining relative clause and ask about it here, explain simply that it is a different kind of relative clause. There are some differences: for example, *that* is not used in non-defining relative clauses. Non-defining

relative clauses are usually set between commas. A further simplification is that students only need generate subject relative clauses, that is, those where the verb follows immediately after the relative pronoun, with the relative pronoun acting as the subject of the relative clause.

- 6 Students identify the relative pronouns in the web page in Activity 2 and decide which word they refer to. This could be done in pairs. If you think your students will need help with this, you could draw their attention to the first relative pronoun in the text (*that*) and the word it refers to (*networks*).

There are two kinds of networks that are in common use. (*That* refers to *networks*.)

This is a network that has each computer linked to two others. (*That* refers to *network*.)

In a bus system there is a central cable which is called a bus ... (*Which* refers to *central cable*.)

In this, servers are special computers that store data ... (*That* refers to *special computers*.)

... the browser (the client) will ask the server for a web page, which then sends the web page back (*Which* refers to *server*.)

Speaking

- 7 Explain to students that the words and phrases in the box can be used with relative clauses to describe various concepts covered in the first three units. In pairs, students match these to items 1–6 and use them to describe the items. Less confident students may need to write these down before speaking.

Suggested answers

- 1 It's a program that shows internet pages.
- 2 It's a part of a browser that helps you find things.
- 3 It's a cable that links computers in a bus network.
- 4 It's a type of network that covers a wide area.
- 5 It's a network that uses cables.
- 6 It's a (peripheral) device that prints.

Listening

- 8 ▶ 15 Before students listen, ask what jobs the people in the photograph might have. If they suggest *sales person*, discuss alternative words or abbreviations for this job, such as *sales representative*, as here, *sales rep* and *rep*. Check

also that students remember what *connecting*, *plug into* and *secure/security* from the previous unit mean. *Wi-fi* is also mentioned; as this is a trademark used around the world, it may be familiar to students already.

Students then listen and answer general questions on the conversation.

- 1 not very secure 2 very secure
3 as easy as the current system

- 9 Students listen more closely this time, and take notes about the three items listed. They could compare their notes in pairs and then listen a third time to check and expand their notes to practise using relative clauses. Less confident students could read the audio script on page 74.

Suggested answers

- 1 A dongle is a device that plugs into laptop computers. You can send data through the mobile phone system with it.
- 2 Wi-fi is a type of network that doesn't use cables.
- 3 A VPN is a type of network that is very secure.

- 10 For further practice of relative clauses, students read their answers from Activity 9 randomly to a partner, who then says which device they are describing. This activity could also include the items mentioned in Activity 7.
- 11 This discussion question encourages students to address the bigger picture of the conversation they heard, not just the details.

Suggested answers

I disagree. You do have to think about security. People sometimes choose passwords that are easy to guess (e.g. 1234 or their birthday), write down their passwords, laptops can be stolen and the data found that way, etc.

Writing

- 12 To prepare, students look at the three paragraphs of the web page in Activity 2 and decide where the topic of each paragraph is clearly stated. Not every language organises writing in the same way, so this may be new to your students. Even if they are from a language background with similar patterns of text organisation to English, this way of looking at writing may be new and helpful.

a

- 13 Students practise writing a paragraph with a topic sentence using some of the information from the listening: what a VPN is and how it works. You could refer them to audio script 15 on page 74, though they should not copy phrases or sentences from there.

Extra activity

Students could write further paragraphs on other topics, possibly of their own choosing. If they are currently working in IT, they may already know the kinds of topics and writing tasks they need to do in their jobs and thus they might be able to choose their own topics (as long as this is not too difficult for their level). If suggestions are needed, here are some ideas from the previous unit:

- CPU
- motherboard
- operating system

Mobile computing

Speaking

- 1 These general questions ask students about their usage of mobile devices such as mobile phones and tablet computers. This should draw out vocabulary from their group discussions such as *smartphone, tablet, laptop, netbook*. If all of your students use smartphones, you could extend this so that they also discuss their favourite apps.
- 2 Students now look at three scenarios involving people at work and discuss how mobile devices might make these people's jobs easier. Check that they understand the scenarios before commencing the discussion; the photograph may help with item 3. In case students ask: the device on the screen is a colourimeter, used to ensure that the colours it displays are the same as other TVs that have been calibrated in this way (in most TVs there is a variation in the colour from one to another).

Suggested answers

Sales people might use mobile devices to take orders, check orders, update the customer database or keep track of expenses. Delivery drivers might use mobile devices to take signatures and find addresses. Entertainment systems installation technicians might use mobile devices to find customers or keep each customer's (specific) requirements.

- 3 This activity follows on from item 3 of the previous activity, looking at workflow for an entertainment systems installer. Students put steps a–f into a basic flowchart. Point out that the steps are given in note form, not full sentences. Elicit from students what they think *paperwork* means (the documents associated with work, such as order forms and invoices). Also point out that *admin* is short for *administration* and that *admin staff* are the office workers who do the administration. This activity can be done in the same pairs as before.

1 a 2 e 3 d 4 c 5 f 6 b

- 4 In pairs, students discuss how the workflow might change if the technician uses a mobile device. Students will listen to a similar workflow being described in the next activity, so this provides pre-listening prediction.

Suggested answers

- 1 admin staff send instructions to technician's mobile device
- 2 technician reads instructions
- 3 technician finds client and installs system
- 4 client signs paperwork using mobile device
- 5 technician sends information back to office electronically
- 6 admin staff send invoice asking for payment

Listening

- 5 ▶ 16 Students now listen to an IT specialist and a manager talking about new tablets and how these will affect the technician's workflow. While listening, students compare what they hear with the workflow they discussed in Activity 4. Emphasise that their discussions and flowchart may differ from what is said here. All they are doing here is comparing their thoughts with the listening.

With less confident students, you may want to have them listen one time for gist, then a second time to compare.

Language

The zero and first conditionals are contrasted here. Ask students to look at the examples and work out which tenses are used in the first as opposed to the zero conditional (Both use present simple in the *if*-clause. The zero conditional also uses the same tense in the main clause, whereas the first conditional uses future). From here, guide students to see the link between the tense usage and the usage of the

conditionals: present simple is used for actions that happen regularly and predictably, as is the zero conditional. *Will* is used for actions that you expect to happen in the future, as is the first conditional. You may want to point out that *when* can be substituted for *if* in zero conditional sentences.

Also point out the pattern of commas: if the *if*-clause comes first, there is a comma between the two clauses. If it comes second, there is no comma. A common mistake is to put a full stop between the two clauses. Make sure that students are aware they shouldn't do this.

- 6 This gap-fill activity is based on the scenario in the listening and provides controlled practice of the zero conditional.

1 doesn't know, uses 2 is, signs
3 changes, updates 4 needs, sends

Speaking

- 7 Words for two key concepts that are highly relevant to technology use are introduced here: *efficiency* and *flexibility*. Students will need explanations: efficiency is improved when the same work can be done in less time or by fewer people, and flexibility is improved when it is easy to change decisions or do things in a different way.

For freer practice of the zero conditional, students use the flowcharts they created in Activities 3 and 4 to suggest ways in which tablets will improve the company's efficiency and flexibility.

If your students might be working with speakers of American English, point out that a *torch* is called a *flashlight* in American English.

Suggested answer

In the old system, if a customer changes their order, the office can't send the new details easily. But with the tablets, if a customer changes their order, the office can update the installer's instructions straight away.

- 8 Students use conditionals to discuss how various functions and features common in mobile devices are useful.

Suggested answers

If the phone has a calculator, people can deal with money easily.

If the device has a calendar, people won't forget appointments.

If the phone has a camera, people don't need to carry another camera.

If the phone has an e-book reader, users can read books anywhere.

If the device has a GPS, users can find their way to and from places more easily.

If the battery life is long, we can use it for a long time/on long aeroplane flights.

If the phone has a torch, users can see what they are doing if the electricity stops working.

If the device has a USB recharger, people can recharge it from their laptops.

- 9 The topic now switches from installation technicians to other mobile workers such as traffic wardens. In this activity, students simply speculate about what the person in the photograph is doing and how a mobile device might help her. As not every country has traffic wardens (their job might be done by police, for example), students might need some hints.

Suggested answers

She's using a mobile device.

She's a traffic warden.

If she uses a mobile device, she won't have to carry much paper.

Vocabulary

- 10 Students read an advertisement for a company that produces customised mobile devices for mobile workers. They use context to match words to their definitions. Before students do the main activity here, you could do some reading work by putting the following gist and comprehension questions on the board.
- 1 Who is the advertisement for: consumers or businesses? (businesses)
- 2 Are the company's devices only for traffic wardens, or for other people as well? (They're for other people as well.)
- 3 How does the device improve traffic wardens' efficiency and safety? (Efficiency: the traffic warden doesn't have to enter data. Checking registration number, etc. is automated. Safety: if the traffic warden falls, the device sends a message to the control centre.)

1 customise 2 tag 3 location 4 optical
character recognition 5 report 6 exactly
7 record/data 8 accelerometer

Speaking

- 11 Students now imagine that they work for the company that produced the advertisement in Activity 10. In groups, they think of ways in which mobile devices can be customised for the three jobs listed. This activity recycles the vocabulary of mobile phone features and also gives more opportunity to talk about efficiency and flexibility.

Extra activity

Students discuss how mobile devices help them in their work or studies.

Email

Speaking

- 1 The scene for this section is set through introductory questions for small group discussion.

Vocabulary

- 2 In pairs or small groups, students match some email-related vocabulary to screenshots of emails. After feedback, check that students have worked out correctly that the recipient is the person who receives the email. If students do not already know, explain that the difference between the BCC (Blind Carbon Copy) and CC (Carbon Copy) addresses is that recipients can see the CC addresses but not the BCC addresses. Thus BCC addresses are used for privacy.

1 I 2 C 3 F 4 B 5 A 6 G 7 E
8 J 9 D 10 H

- 3 To practise the vocabulary in the previous activity, students make notes of the steps in sending an email. Then they explain their notes to each other and discuss any differences.

Extra activity

Students ask and answer questions about what the items in Activity 2 are for, for example:

A: *What is the subject line for?*

B: *It's for giving the topic of the email.*

Before they start, point out the *for* + gerund structure (similar to the *for* + noun structure on page 18 of the Course Book).

Suggested answers
giving own contact details, job title, etc.; sending big files; checking spelling; sending the email to another person who didn't get it before; sending the email to a person without showing their email address; sending a reply; sending to more than one person; deleting the email.

Language

Articles are an area of grammar where mistakes are made at many levels. With most classes, it will be possible to elicit the rules given here by putting the examples from the Language box on the board, with books closed. Note that *email* can be both countable and uncountable: *I get a lot of email/emails.*

- 4 This intranet post about email use guidelines provides accuracy practice of articles in context. You could also ask students to decide which rule from the box applies to each instance of a definite article.

1 an 2 the 3 the 4 the 5 an 6 a
7 the 8 the

Extra activity

In pairs or groups, students discuss which of the guidelines in Activity 4 are the most useful and which, if any, they disagree with. They could also think of other guidelines. If your students are confident but in need of accuracy practice, this activity (and many others) could be conducted in groups of three, with two people doing the talking and the other monitoring for use of the grammar point (in this case, articles). The monitor role would then be rotated.

A further alternative for confident students is to ask them to record the conversation (for example, on their mobile phones if they have a recording feature), play back the recording at the end of the activity and check for errors in the use of articles.

Business matters

This section revolves around a scenario in which students prepare and present a proposal for an IT upgrade for an architecture company.

Speaking

- 1 Students read a company profile and six comments from company employees about their needs and wants, then discuss and make decisions about possible hardware and software. These steps should bring out much of the vocabulary from this unit.

The final step provides a typical outline for a basic presentation: introduction, body and conclusion. If you think your students might need practice with this before embarking on the scenario activity, they can practise with basic, familiar topics such as their current job or favourite social activity. They should be given time to prepare; preparing in groups can help to build confidence.

The task itself has been deliberately left quite open so that changes in technology can be accommodated and to allow an opportunity for internet research, if facilities are available. The Course Book suggests presenting to the class. However, if your class is large, it may be better to have each group present to a small number of other groups.

Suggested answers

1

- tablets: don't work well due to security (C)
- software to show images and plans of new homes: needs video (D)
- email: sales rep gets too many (E)
- cameras: time-consuming to upload (F).

2

- suggested new hardware requirements: mobile devices for sales reps with: large screen (so customers can see more detail), GPS (to report back the location), network connectivity with VPN (network required for the reporting that people want; VPN needed for security), camera (to photograph sites, documents, etc.)
- suggested new software requirements: display software (to help with the requirement that customers can see more detail), OCR software (to turn photographs into documents), calendar software (to record appointments), cloud computing capability (to ensure that info is synced to meet everyone's requirements)

Preparing for the next unit

In preparation for **Unit 4**, students could:

- look at a catalogue of a seller of computer hardware such as DELL and list all the peripherals they can find (this will also review some vocabulary from Unit 2).
- try out a spreadsheet such as Microsoft Excel, to find out what it does, if they do not know already.
- list some uses of databases.
- look on Wikipedia to find out what a systems administrator does (the simple English version of Wikipedia, www.simple.wikipedia.org, might be easier for self-study at this level).