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АНГЛИЙСКИЙ ЯЗЫК В ПРОФЕССИОНАЛЬНОЙ ДЕЯТЕЛЬНОСТИ

Методические материалы

Рекомендованы учебно-методической комиссией специальности
10.05.03 Информационная безопасность автоматизированных систем
в качестве электронного издания для использования
в образовательном процессе

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Предисловие

Данные методические материалы составлены в соответствии с рабочей программой дисциплины «Иностранный язык в профессиональной деятельности» специальности 10.05.03 Информационная безопасность автоматизированных систем и предназначены для практических занятий и самостоятельной работы студентов.

Содержание данных методических материалов представлено следующими темами:

Тема 1: «Компьютерная архитектура».

Тема 2. «Аппаратное обеспечение».

Тема 3. «Программное обеспечение».

Тема 4. «Периферийное оборудование».

Тема 5: «Системы электронной коммуникации».

Тема 6: «Сети».

Тема 7: «Безопасность данных».

Каждая тема сопровождается системой коммуникативных и лексико-грамматических заданий, направленных на приобретение студентами компетенций, предусмотренных образовательным стандартом специальности 10.05.03 Информационная безопасность автоматизированных систем:

ОК-7: способность к коммуникации в устной и письменной формах на русском и иностранном языках для решения задач межличностного и межкультурного взаимодействия, в том числе в сфере профессиональной деятельности;

ПК-1: владеть способностью осуществлять поиск, изучение, обобщение и систематизацию научно-технической информации, нормативных и методических материалов в сфере профессиональной деятельности, в том числе на иностранном языке.

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Тема 1: «Компьютерная архитектура»

1. Name these different types of devices. Then match the possible users below to each type. Justify your choice.

1. student using a computer for entertainment while travelling
2. large company processing payroll data
3. travelling salesperson giving marketing presentations
4. large scientific organisation processing work on nuclear research
5. businessperson keeping in touch with clients while travelling
6. graphic designer
7. secretary doing general office work

2. What do these abbreviations mean? Use the Glossary if necessary.

CD-ROM, FSB, TFT, SDRAM, MB, XGA, GHz

3. Now study the text below to find this information:

1. What is the memory size of this PC?
2. What storage devices are supplied?
3. What size is the display screen?
4. How fast is the processor?
5. What is the capacity of the hard drive?
6. Which operating system does it use?
7. What multimedia features does the computer have?

How to read a computer ad

1. The main processing chip called a ‘Pentium 4’ that was designed and manufactured by the Intel Corporation. It operates at

a clock speed of three gigahertz and has a front-side bus that operates at a speed of eight hundred megahertz.

2. A small, tall and narrow style of case containing the computer system.

3. Synchronous dynamic random access memory with a capacity of one gigabyte. It is a high bandwidth, double data rate memory.

4. A hard drive with a capacity of two hundred gigabytes that uses a type of connection interface known as Serial ATA i.e. it has a serial data connection rather than the original parallel connection. It rotates at a speed of seven thousand, two hundred revolutions per minute.

5. Electronics for driving the graphics output that has a memory capacity of one hundred and twenty-eight megabytes and uses a type of connection interface known as PCI-Express.

6. Electronics for controlling the sound output that is built into the main electronics of the computer.

7. A compact disk read/write disk drive that operates at forty-eight times the speed of the original CD drives.

8. A nineteen inch, flat display screen made from thin film transistors with a resolution of 1024 by 768.

9. The operating system that is used to control the system.

4. Match each item in Column A with its function in Column B. Then describe its function in two ways.

A Item	B Function
RAM	controls the cursor
processor	inputs data through keys like a typewriter
mouse	displays the output from a computer on a screen
clock	reads DVD-ROMs
flash memory key	reads and writes to electronic chips on a card
monitor	holds instructions which are needed to start up the computer
keyboard	holds data read or written to it by the processor
DVD-ROM drive	provides extremely fast access for sections of a program and its data
cache	controls the timing of signals in the computer
ROM	controls all the operations in a computer

We can describe the function of an item in a number of ways. Study these examples.

1. ROM holds instructions which are needed to start up the computer.

2. ROM ***is used to*** hold instructions which are needed to start up the computer.

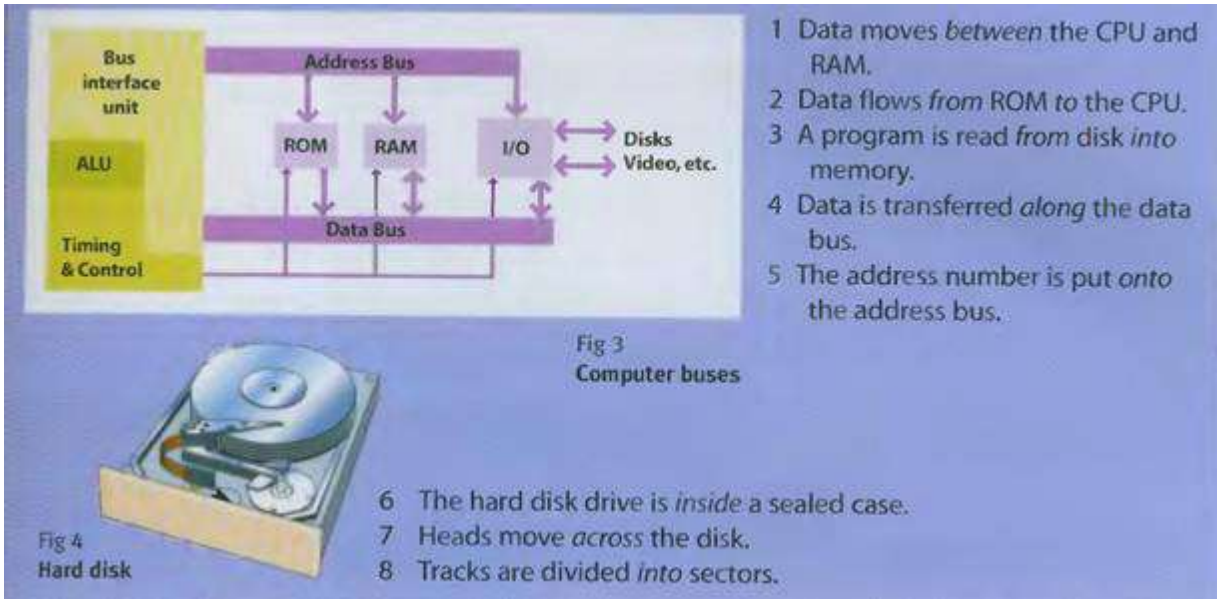
3. ROM ***is used for*** hold***ing*** instructions which are needed to start up the computer.

4. ***The function of*** ROM ***is to hold*** instructions which are needed to start up the computer.

5. With the help of the dictionary if necessary, describe the functions of these items.

scanner, supercomputer, printer, mainframe computer, ATM, barcodes, PDA, swipe cards, hard disk drive, memory

6. Study the examples of prepositions of place.



Complete each sentence using the correct preposition.

The CPU is a large chip ___ the computer.
Data always flows ___ the CPU ___ the address bus.
The CPU can be divided ___ three parts.
Data flows ___ the CPU and memory.
Peripherals are devices ___ the computer but linked ___ it.

The signal moves ___ the VDU screen ___ one side ___ the other.

The CPU puts the address ___ the address bus.

The CPU can fetch data ___ memory ___ the data bus.

Тема 2. «Аппаратное обеспечение»

1. Read and translate the text. Give the summery of the text using the professional vocabulary.

What is hardware?

Webster's dictionary gives us the following definition of the hardware – the devices composing a computer system. Computer hardware can be divided into four categories:

1) input hardware;
2) processing hardware;
3) storage hardware;
4) output hardware.

Input hardware

Input hardware collects data and converts them into a form suitable for computer processing. The most common input device is a keyboard. It looks very much like a typewriter. The mouse is a handheld device connected to the computer by a small cable. As the mouse is rolled across the desktop, the cursor moved across the screen. When the cursor reaches the desired location, the user usually pushes a button on the mouse once or twice to give a command to the computer. Another type of input hardware is optic-electronic scanner. Microphone and video camera can be also used to input data into the computer.

Processing hardware

Processing hardware directs the execution of software instructions in the computer. The most common components of processing hardware are the central processing unit and main memory. The central processing unit (CPU) is the brain of the computer. It

reads and interprets software instructions and coordinates the processing.

Memory is the component of the computer in which information is stored. These are two types of computer memory: RAM and ROM. RAM (random access memory) is the memory, used for creating, loading and running programs. ROM (read only memory) is computer memory used to hold programmed instructions to the system. The more memory you have in your computer, the more operations you can perform.

Storage hardware

The purpose of storage hardware is to store computer instructions and data and retrieve when needed for processing. Storage hardware stores data as electromagnetic signals. The most common ways of storing data are Hard disk, floppy disk and CD-ROM.

Hard disk is a rigid disk coated with magnetic material, for storing programs and relatively large amounts of data.

Floppy disk (diskette) – a thin, usually flexible plastic disk coated with magnetic material, for storing temporary computer data and programs. These are two formats for floppy disks: 5.25’ and 3.5’ disks are formatted 1.4 megabytes and are widely used.

CD-ROM (compact disk read only memory) is a compact disk on which a large amount of digitized data can be stored. CD-ROMs are very popular now because of the growing speed which CD-ROM drives can provide nowadays.

Output hardware

The purpose of output hardware is to provide the user with the means to view information produced by the computer system. Information produced by the computer system. Information is in either hardcopy of softcopy form. Hardcopy output can be held in your hand, such as paper with text (word or numbers) or graphics printed on it. Softcopy output is displayed on a monitor.

Monitor is display screen for viewing computer data, television programs, etc. Printer is a computer output device that produces a paper copy of data of graphics.

Modem is an example of communication hardware – an electronic device that makes possible the transmission of data to or from computer via telephone or other communication lines. Hardware comes in many configurations, depending on what you are going to do on your computer.

Тема 3. «Программное обеспечение»

1. Match the descriptions on the left with these famous applications.

1) word processor	a) Adobe Photoshop
2) spreadsheet	b) Internet Explorer
3) virus protection	c) Microsoft Word
4) browser	d) Microsoft Excel
5) image editor	e) Microsoft PowerPoint
6) media player	f) Norton AntiVirus
7) email software	g) Outlook Express
8) presentation software	h) Adobe PageMaker
9) graphic design software	i) RealPlayer

2. Match the type of software with the definition.

trial version	a) A **simplified** version which is cheaper to buy.
1) shareware	b) Software which is in the **public domain**. Anybody can use it without paying.
2) freeware	c) The **full version** with all the features.
3) home-use version	d) You can try it for a while for free. Then if you want to keep using it, you are expected to pay a small **fee** to the writer.
4) professional version	e) You can use it for free for a while (often a month). When the **trial period** finishes, you have to pay, or the program will **de-activate**.

3. Write the words into the spaces.

adding	displayed	screen
background	format	saver
customising	image	setting up
default	performance	tasks
digital	properties	wallpaper
		wireless

The control panel provides options for (1) customizing the appearance of your computer screen (2) ___ or removing programs and (3) ___ network connections. When you get a new computer, perhaps the first thing you will want to do is set the date and time. You can also choose the (4) ___ for dates and times. For example, November 4th 2007 can be (5) ___ as 04-11-2007, 2007-11-04 or in various other formats.

You may wish to change the desktop (6) ___ to a picture, for example a personal photo taken on a (7) ___ camera. A picture on the desktop background is also known as (8) ___.

If a computer screen shows the same (9) ___ for a very long time, it can leave a permanent impression. To avoid this, you can choose a (10) ___. This is usually a simple moving pattern which activates if the computer is not used for a set amount of time (for example, five minutes).

You can also use the control panel to set up or change internet and other network connections, including (11) ___ network connections.

In fact, you can change most aspects of your computer's (12) ___ through the control panel, such as the system (13) ___, modem settings, scheduled (14) ___, although most users prefer to leave on the (15) ___ settings rather than changing them.

4. Choose the best words from each pair in bold and translate sentences.

1. It's usually possible to (**import** / **introduce)** Adobe PageMaker files into Adobe In Design. The majority of graphic design applications can **export** / **send off** documents as PDF files, or as HTML web pages.

2. This box has a black (**frame** / **outside)**, also known as a «stroke». Inside the frame, the fill is a (**fade** / **gradient)** from dark grey to light grey. The difference between the two versions of «wave», is that (**curling** / **kerning)** has been applied to the top version.

3. A frame, graphic or block of text is known as (**an object** / **a thing)**. These are arranged in (**levels** / **layers)** – the top layer (**overlaps** / **overruns)** the layer below.

4. This image is (**blurred** / **soft)** at the edges. This (**result** / **effect)** is also known as **feathering** / **birding**.

5. (**Full bleed** / **total bleed)** means that the page is printed right up to the edges – there are no white margins. The (**snail** / **slug)** area is the area outside the area to be printed where instructions for the printer are written.

6. This image has been (**pulled** / **stretched)**.

7. Before a document goes (**to press** / **for printing)**, it's essential to check the (**examples** / **proofs)** for errors.

8. Like desktop printers, most colour printing (**machines** / **presses)** print in four colours: cyan (light blue), magenta (dark pink), yellow and black. Before printing, a document must be divided into the four colours. This process is called colour (**separation** / **division)**. These separations are then turned into (**plates** / **stamps)** – one for each of the inks that will be used.

9. Prior to colour separation, coloured images, graphics and text have to be (**transformed** / **converted)** from RGB (Red Green Blue), the colour format of computer displays, to CMYK (Cyan Magenta Yellow Black) the colour format of printing presses.

10. The process of preparing documents from a graphic designer for the printing press is called (**reprographics** / **reproduction)**.

5. Read and translate the text.

Types of Software

A computer to complete a job requires more than just the actual equipment or hardware we see and touch. It requires Software – programs for directing the operation of a computer or electronic data. Software is the final computer system component. These computer programs instruct the hardware how to conduct processing.

The computer is merely a general-purpose machine which requires specific software to perform a given task. Computers can input, calculate, compare, and output data as information. Software determines the order in which these operations are performed.

Programs usually fall in one of two categories: system software and applications software. System software controls standard internal computer activities. An operating system, for example, is a collection of system programs that aid in the operation of a computer regardless of the application software being used. When a computer is first turned on, one of the systems programs is booted or loaded into the computer's memory. This software contains information about memory capacity, the model of the processor, the disk drives to be used, and more. Once the system software is loaded, the applications software can start to work.

System programs are designed for the specific pieces of hardware. These programs are called drivers and coordinate peripheral hardware and computer activities. User needs to install a specific driver in order to activate his or her peripheral device. For example, if you intend to buy a printer or a scanner you need to worry in advance about the driver program which, though, commonly go along with your device. By installing the driver you «teach» your main board to understand the newly attached part.

Applications software satisfies your specific need. The developers of application software rely mostly on marketing research strategies trying to do their best to attract more users (buyers) to their software. As the productivity of the hardware has increased greatly in recent years, the programmers nowadays tend to include all kinds of gimmicks in one program to make software interface look more attractive to the user. These class of programs is the most numerous and perspective from the marketing point of view.

Data communication within and between computers systems is handled by system software. Communications software transfers data from one computer system to another. These programs usually provide users with data security and error checking along with physically transferring data between the two computer's memories. During the past five years the developing electronic network communication has stimulated more and more companies to produce various communication software, such as Web-Browsers for Internet.

6. Answer the following questions:

1) What is software?
2) In what two basic groups software (programs) could be divided?
3) What is system software for?
4) What is an operating system – system or application software?
5) What is a «driver»?
6) What is application software?
7) What are application software for?
8) What is the tendency in application software market in recent years?
9) What is the application of the communication software?

7. Decide whether the following statements are true or false in relation to the information in the text.

1) Computer programs only instruct the hardware how to handle data storage.
2) System software controls internal computer activities.
3) System software is very dependable on the type of application software being used.
4) The information about memory capacity, the model of the processor and disk drives is unavailable for system software.
5) The driver is a special device usually used by car drivers for Floppy disk driving.
6) It is very reasonable to ask for a driver when you buy a new piece of hardware.
7) Software developers tend to make their products very small and with poor interface to save computer resources.
8) Communication software is of great need now because of the new advances in communication technologies.
9) Application software is merely a general-purpose instrument.
10) Web-browsers is the class of software for electronic communication through the network.

8. Find the equivalents in the text.

1) Программное обеспечение определяет порядок выполнения операций.
2) Прикладные программы выполняют поставленную вами конкретную задачу (удовлетворяют вашу потребность).
3) Этот класс программ самый многочисленный и перспективный с точки зрения маркетинга.
4) Системные программы предназначены для конкретных устройств компьютерной системы.
5) Устанавливая драйвер, вы «учите» систему «понимать» вновь присоединенное устройство.
6) Когда компьютер впервые включается, одна из системных программ должна быть загружена в его память.
7) Развитие систем электронной коммуникации за последние пять лет стимулировала к производству многих соответствующих программных продуктов всё возрастающим числом компаний-разработчиков.

Тема 4. «Периферийное оборудование»

1. Study this description and answer these questions.

1) How do digital cameras differ from conventional cameras?
2) How do they work?
3) What are their advantages and disadvantages compared to conventional cameras?

A digital camera or digicam is a camera that encodes digital images and videos digitally and stores them for later reproduction. Most cameras sold today are digital, and digital cameras are incorporated into many devices ranging from PDAs and mobile phones (called camera phones) to vehicles.

Digital and film cameras share an optical system, typically using a lens with a variable diaphragm to focus light onto an image pickup device. The diaphragm and shutter admit the correct amount of light to the imager, just as with film but the image pickup device is electronic rather than chemical. However, unlike film cameras, digital cameras can display images on a screen immediately after being recorded, and

store and delete images from memory. Many digital cameras can also record moving videos with sound. Some digital cameras can crop and stitch pictures and perform other elementary image editing.

Digital cameras store images on memory cards so pictures can be transferred easily to a computer. A lens focuses the image on to a CCD unit or Charge-Coupled Device where the film would normally be.

So you can aim the camera accurately, there is an optical viewfinder.

So you can play back the images and decide which to keep and which to re-shoot, the image is passed to a small LCD screen on the back of the camera.

2. Read Part 1 of this discussion between A and B and complete this table of similarities and differences between conventional and digital cameras.

Part 1

A: What's the difference between an ordinary camera ... a conventional camera, and a digital camera?

B: At the most basic level, a digital camera isn't much different from a conventional camera. There's a lens, a viewfinder and it takes pictures. The only fundamental change is that a Charge-Coupled device – a CCD – is used in place of the film.

A: What's a CCD?

B: It's an assembly ... a set of thousands of photo-transistors – one for each pixel in the image. You know what a pixel is?

A: Yes, it's a kind of dot ... it makes up a picture, an image on a screen.

B: It's short for picture element. Well, each pixel in the CCD consists of three photo-transistors, one covered by a red filter, one by a blue one and one by a green. Three images – one for each of these colours – are built up. When they are combined, you get a full colour photograph.

A: What are the advantages, the plus points, of a digital camera?

B: You never have to buy another film: there's no film, there's no chemical processing involved. There's no delay waiting for the film to be developed. Instead of being held on film, the images

are written to solid state memory. Most cameras have an LCD on the back. You can see straight away what your last shot looks like. If you don't like it, you can delete it and take another. You can download the images to a PC for retouching, manipulating, or printing out.

A: Do you need any special software?

B: Yes, but it comes with the camera. It's not difficult to install. You can also use your TV to give slide shows and you can email copies to your friends.

Feature	Digital	Conventional
lens		
viewfinder		
require chemical processing		
film		
transfer images directly to PC		
can delete unsatisfactory images		

3. Read the both parts to find the answers to these questions:

1) What does a CCD contain?
2) What is a pixel?
3) How can you view pictures before they are downloaded to a PC?
4) When you have downloaded the images, what can you do with them?
5) Is special software required?
6) Why is the resolution important?
7) What does the capacity of a digital camera depend on?
8) Why is it worth getting a rechargeable battery?

Part 2

A: Any disadvantages? What's the down side?

B: Well, they're still pricey but they're getting cheaper. And the quality isn't usually as sharp as a good 35 mm. People forget too that if you want prints, you have to invest in a photo quality colour printer. That can be expensive and printing costs can also be high – the paper, the ink and so on.

A: Anything else?

B: Batteries. You get through them. Digitals are power-hungry, especially if you use the LCD a lot for playback.

A: If I wanted to buy one, what should I look for?

B: First of all, the resolution. It's like buying a monitor. The higher the resolution, the more details you'll be able to get in the picture. Don't buy anything less than three million pixels. A second major specification, and it's tied up with image quality, is the number of pictures you can store before the camera is full and you need to download to your PC. A 1280 by 960 image takes over a megabyte of memory. There's a limit to the number of shots you can store on a flashcard. Fortunately you can compress the data and squeeze a lot more lower resolution shots onto one card. It's worth considering too the type of battery used. Get one with rechargeable cells.

4. Study this comparison of digital and conventional cameras. Note how we can compare and contrast these types of cameras.

a) Comparing features which are similar:

1) ***Both*** cameras have lenses.
2) ***Like*** the conventional camera, the digital camera has a viewfinder.

b) Contrasting features which are different:

1) The conventional camera requires chemical processing ***whereas*** the digital camera does not.
2) The conventional camera uses film ***unlike*** the digital camera.
3) With a digital camera you can transfer images directly to a PC ***but*** with a conventional camera you need to use a scanner.
4) With digital cameras you can delete unsatisfactory images; ***however***, with conventional cameras you cannot.

Feature	Digital	Conventional
lens	+	+
viewfinder	+	+
requires chemical processing	×	+
film	×	+
transfer images directly to PC	+	×
can delete images	+	×

5. Study this data about storage devices. Then complete the blanks in the following sentences comparing and contrasting the different types.

Device	Read/ Write	Speed	Media capacity	Media removable	Cost / Mb
Fixed hard disk	Read and write	Fast	High to very high	No	Low
Removable hard disk	Read and write	Medium to fast	High	Yes	Medium to high
CD-ROM	Read-only	Medium	Low	Yes	Low
CD-/+RW	Read and write	Medium	Low	Yes	Low
DVD-ROM	Read-only	Medium	Medium	Yes	Low
DVD-/+RW	Read and write	Medium	Medium	Yes	Low
Magnetic tape	Read and write	Slow to medium	High to very high	Yes	Low
Flash drive	Read and write	Medium	Low to medium	Yes	Medium

1) You can write to hard disks ___ optical disks.
2) DVD-ROMs have a ___ capacity ___ CD-ROMs.
3) CD-ROM and CD-RW disks are ___ low priced.
4) Removable drives and flash drives cost ___ other storage media.
5) CD-ROMs cannot be re-recorded ___ some optical disks can.
6) ___ hard disks, you can read from and write to flash drives.
7) ___ fixed hard disks, DVD-ROMs are removable.
8) The cost of a fixed hard disk is ___ a removable one.
9) ___ magnetic tapes and fixed hard disks can have very high capacities.
10) DVD-RW disks are cheap ___ removable hard disks are more expensive.

6. Write your own comparison of printer types.

Type	Speed	Text quality	Graphics capability	Colour quality	Cost
Ink-jet	Medium to fast	Good to excellent	Good to excellent	Good to very good	Low
Laser	Medium to very fast	Excellent	Good to excellent	Good in colour laser printers	Medium to high
Thermal Transfer	Medium to fast	Excellent	Good to excellent	Good to superior	Medium to high
Solid ink	Medium to fast	Excellent	Good to excellent	Good	Medium to high
Electro-static	Slow to fast	Fair to good	Fair to good	Fair to good	Low to high

7. Study this list of needs. Which type of peripheral would you advise in each case?

1) inputting printed graphics;
2) building cars;
3) controlling the screen cursor in a fast action game;
4) making choices on a screen in a public information terminal;
5) recording moving images;
6) recording a book loan in a library;
7) printing very high quality text and graphics;
8) creating drawings;
9) printing building plan drawings;
10) recording sound;
11) listening to music without disturbing others;
12) storing programs and data;
13) inputting a lot of text;
14) backing up large quantities of data.

Тема 5: «Системы электронной коммуникации»

1. Find the answers to these questions in the following text.

1) Into what units is data subdivided by the following layers?
a) transport layer
b) network layer
2) What is the purpose of a transmission checksum test?
3) How long does the data-link layer keep a copy of each packet?
4) What processes can be carried out at intermediate nodes?
5) Which network communications layer is described by each of the following statements?
a) Makes sure that the message is transmitted in a language that the receiving computer can understand
b) Protects the data being sent
c) Encodes and sends the packets
d) Supervises the transmission
e) The part of a communications process that a user sees
f) Starts communications and looks after communications among network nodes
g) Chooses a route for the message
h) Makes backup copies of the data if required
i) Confirms the checksum, then addresses and duplicates the packets

Network Communications

The application layer is the only part of a communications process that a user sees, and even then, the user doesn't see most of the work that the application does to prepare a message for sending over a network. The layer converts a message's data from human-readable form into bits and attaches a header identifying the sending and receiving computers.

The presentation layer ensures that the message is transmitted in a language that the receiving computer can interpret (often ASCII). This layer translates the language, if necessary, and then compresses and perhaps encrypts the data. It adds another header specifying the

language as well as the compression and encryption schemes. The session layer opens communications and has the job of keeping straight the communications among all nodes on the network.

It sets boundaries (called bracketing) for the beginning and end of the message, and establishes whether the messages will be sent half-duplex, with each computer taking turns sending and receiving, or full-duplex, with both computers sending and receiving at the same time. The details of these decisions are placed into a session header.

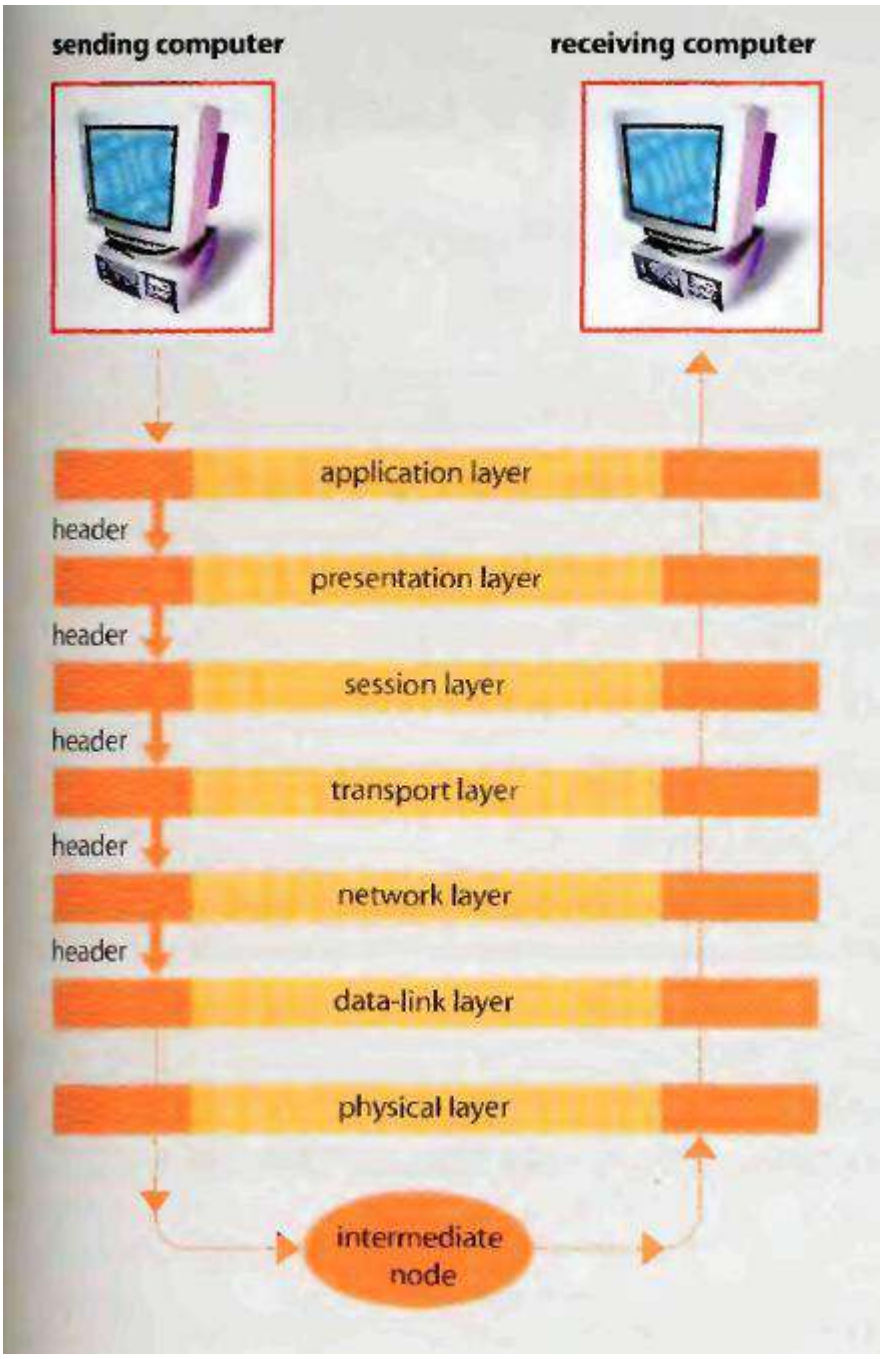
The transport layer protects the data being sent. It subdivides the data into segments, creates checksum tests – mathematical sums based on the contents of data – that can be used later to determine if the data was scrambled. It can also make backup copies of the data. The transport header identifies each segment's checksum and its position in the message.

The network layer selects a route for the message. It forms data into packets, counts them, and adds a header containing the sequence of packets and the address of the receiving computer.

The data-link layer supervises the transmission. It confirms the checksum, then addresses and duplicates the packets. This layer keeps a copy of each packet until it receives confirmation from the next point along the route that the packet has arrived undamaged.

The physical layer encodes the packets into the medium that will carry them - such as an analogue signal, if the message is going across a telephone line - and sends the packets along that medium. An intermediate node calculates and verifies the checksum for each packet. It may also reroute the message to avoid congestion on the network.

At the receiving node, the layered process that sent the message on its way is reversed. The physical layer reconverts the message into bits. The data-link layer recalculates the checksum, confirms arrival, and logs in the packets. The network layer recounts incoming packets for security and billing purposes. The transport layer recalculates the checksum and reassembles the message segments. The session layer holds the parts of the message until the message is complete and sends it to the next layer. The presentation layer expands and decrypts the message. The application layer converts the bits into readable characters, and directs the data to the correct application.



5. Match the terms with the statements below.

a) Bracketing c) Full-duplex
b) Half-duplex d) Checksum

1) Transmission mode in which each computer takes turns sending and receiving.
2) Mathematical calculations based on the contents of data.
3) Set boundaries for the beginning and end of a message.

4) Transmission mode in which both computers send and receive at the same time.

6. Mark the following statements as True or False:

1) Most of the work that an application does to prepare a message for sending over a network is not seen by the user.
2) ASCII is always used to transmit data.
3) The encryption layer compresses the message.
4) The network layer keeps track of how many packets are in each message.
5) The network layer keeps a copy of each packet until it arrives at the next node undamaged.
6) Analogue signals are used on ordinary telephone lines.
7) When a message arrives at its destination, it passes through the same seven network communications layers as when it was sent, but in reverse order.

7. Match each of the Internet services in Column A with the uses in Column B.

Column A		Column B	
1	IRC	a	logging on to your computer at a distance
2	MOOs	b	sending and receiving messages
3	email	c	downloading a file from a server
4	FTP	d	chatting to other users in real-time
5	WWW	e	accessing newsgroups
6	Telnet	f	browsing webpages
7	Usenet	g	taking part in simulations in a shared environment

Тема 6: «Сети»

1. Carry out a survey of mobile phone use amongst your classmates. Find out:

1) How many have mobile phones.
2) What they use them for.
3) What makes they have.

4) How often they use them per day.

5) What additional features their phones have, e.g. phone book, messages, calls register, games, calculator, alarm call.

2. Study these examples of abbreviations used in mobile phone text messages. Try to guess the meaning of the other abbreviations.

1	ATB	*All the best*
2	BCNU	*Be seeing you*
3	CU	*See you*
4	CU L8R	
5	Luv	
6	Msg	
7	NE	*Any*
8	NE1	
9	NO1	
10	PPL	
11	RUOK	
12	THNQ	
13	Wknd	
14	4	

3. What do these abbreviations mean? Use the Glossary to help if necessary.

ADSL, ITSP, MP3, spit, VoIP.

4. Find the answers in the text below to these questions.

1) What is the main benefit of VoIP?
2) What do codecs do?
3) How does VoIP deal with the problem of packet loss?
4) How does VoIP combat jitter?
5) What is latency?

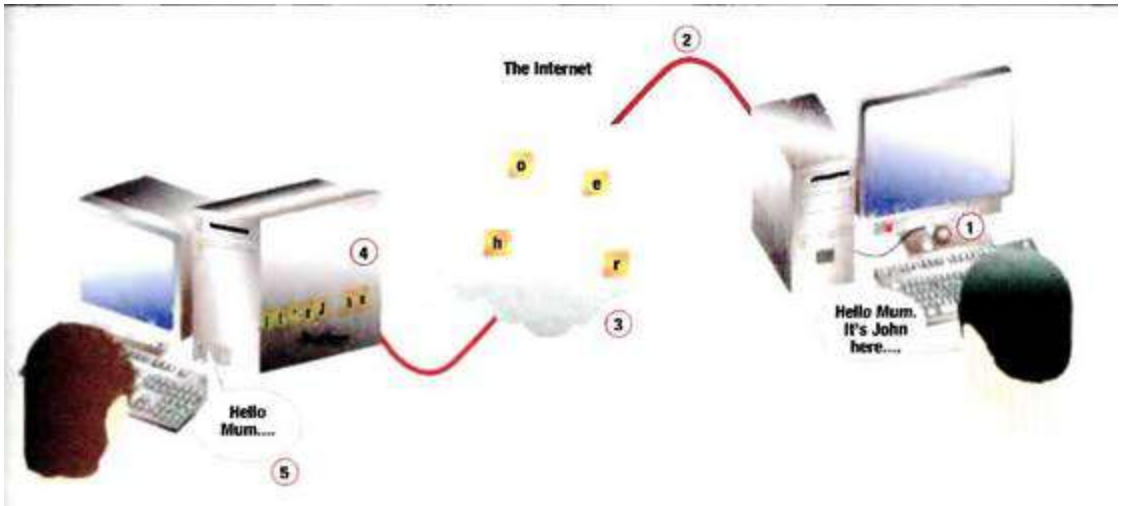
Voice over IP

Voice over Internet Protocol (VoIP) is a way of making phone calls using the Internet. It could dramatically reduce the cost of long

distance calls. Japan has the most VoIP users but it is likely that the US and Europe will catch up fast.

How does VoIP work?

VoIP fust digitizes your voice signal. The digital data is then reduced by audio compression using codecs (coder/decoder software and hardware). These operate in a similar way to MP3, which compresses music files. The compressed data is then broken into packets and sent across the Internet. At the other end, it is reconverted into audio data.



Because the data rate is high, for good audio quality a broadband connection works best.

Each packet of data is delivered by any route the network can find. Packets can be delayed or lost. VoIP deals with loss by dividing the data into 30-millisecond packets. If such a small packet is lost, you won't notice.

Jitter is the term used for differences in the time packets take to arrive. VoIP uses a buffer at the receiving end to store and sequence packets. In this way, the differences are smoothed out but this can cause delays. Latency is the delay between the packets reaching the receiver and you hearing the sound. If the delay is too long, it makes conversation difficult.

When VoIP was first introduced, the connection had to be made between PCs online at the same time. This is no longer necessary.

Gateways provided by ITSPs (Internet Telephony Service Providers) make it possible to link your PC to a standard phone. For better sound quality, you can use a VoIP phone wherever there is a broadband connection.

Broadband Communications

Integrated Services Digital Network (ISDN)

ISDN services can be carried over existing telephone network infrastructure to terminal adapters (TAs) in the client machine. A common ISDN interface standard has a digital communications line consisting of three independent channels: two Bearer (B) channels, each at 64Kbit/s, and one Data (D) channel at 16Kbit/s. The D channel is used to carry signalling and supervisory information to the network, while the B channels carry the data and can be linked to provide a 128Kbit/s data channel.

Wireless connections

The wireless alternatives come in two forms: satellite and cellular. Satellite systems require the use of a modem to maintain the upload. Downstream bandwidth is provided via a dedicated satellite dish, connector hardware and proprietary software. Cellular systems use assigned radio frequencies and are based around a network of transmitters that are arranged in a cellular network, much like cellular mobile phone systems.

The cable alternative

Cable companies can also offer affordable broadband services over copper coaxial or fibre infrastructure networks. The connection is shared by several customers on a branch, so actual connection rates are variable, unlike ISDN and DSL.

Digital Subscriber Line (DSL)

DSL technology capitalises on theexisting network of copper infrastructure, but allows digital signals to be carried rather than analogue. It allows the full bandwidth of the copper twisted-pair telephone cabling to be utilised. With splitter-based services, the DSL signal is pulled out from the phone line as it enters your premises and is wired separately to a DSL modem. This involves additional hardware and installation by the service provider at the customer site. The shielded option involves no installation, but the telephone

company's equipment and some of your equipment might need upgrading.

With Asymmetric Digital Subscriber Line (ADSL), most of the duplex bandwidth is devoted to the downstream direction, with only a small proportion of bandwidth being available for upstream. Much Internet traffic through the client's connection, such as Web browsing, downloads and video streaming, needs high downstream bandwidth, but user requests and responses are less significant and therefore require less on the upstream.

In addition, a small proportion of the downstream bandwidth can be devoted to voice rather than data, allowing you to hold phone conversations without requiring a separate line. DSL-based services are a very low-cost option when compared to other solutions offering similar bandwidth, so they can be made available to the customer at extremely competitive price.

7. Match the terms with the statements below.

a) ISDN b) Bearer channel c) DSL
d) TA e) Data channel f) Splitter-based services ADSL

1) DSL system that separates the digital signals from the analogue signals.
2) Digital channel used to carry ISDN signalling and supervisory information to the network.
3) Device installed on a PC to allow it to receive ISDN signals.
4) Integrated Services Digital Network.
5) Asymmetric Digital Subscriber Line.
6) Digital channel used to carry ISDN data.
7) Digital Subscriber Line.

8. Mark the following statements as True or False:

1) ISDN can only operate over a special digital telephone line.
2) Two ISDN channels can be combined to give the user double the bandwidth.
3) Computers connected to a satellite system do not need a modem.

4) Cellular networks work in a similar way to mobile phone systems.

5) DSL systems require a special digital telephone line.

6) DSL systems use analogue signals.

7) You need a separate line to hold normal phone conversations on an ADSL system.

Тема 7: «Безопасность данных»

1. Read the text to find the answers to these questions.

1) How are computer viruses like biological viruses?
2) What is the effect of a virus patching the operating system?
3) Why are some viruses designed to be loaded into memory?
4) What examples of payload does the writer provide?
5) What kind of programs do viruses often attach to?
6) Match each virus routine to its function.
7) How does a Trojan differ from a virus?

The anatomy of a virus

A biological virus is a very small, simple organism that infects living cells, known as the host, by attaching itself to them and using them to reproduce itself. This often causes harm to the host cells. Similarly, a computer virus is a very small program routine that infects a computer system and uses its resources to reproduce itself. It often does this by patching the operating system to enable it to detect program files, such as COM or EXE files. It then copies itself into those files. This sometimes causes harm to the host computer system.

When the user rims an infected program, it is loaded into memory carrying the virus. The virus uses a common programming technique to stay resident in memory. It can then use a reproduction routine to infect other programs. This process continues until the computer is switched off.

The virus may also contain a payload that remains dormant until a trigger event activates it, such as the user pressing a particular key. The payload can have a variety of forms. It might do something relatively harmless such as displaying a message on the monitor

screen or it might do something more destructive such as deleting files on the hard disk.

When it infects a file, the virus replaces the first instruction in the host program with a command that changes the normal execution sequence. This type of command is known as a JUMP command and causes the virus instructions to be executed before the host program. The virus then returns control to the host program which then continues with its normal sequence of instructions and is executed in the normal way.

To be a virus, a program only needs to have a reproduction routine that enables it to infect other programs. Viruses can, however, have four main parts. A misdirection routine that enables it to hide itself; a reproduction routine that allows it to copy itself to other programs; a trigger that causes the payload to be activated at a particular time or when a particular event takes place; and a payload that may be a fairly harmless joke or may be very destructive. A program that has a payload but does not have a reproduction routine is known as a Trojan.

2. Find the answers to these questions in the following text.

1) What does data encryption provide?
a) privacy
b) integrity
c) authentication
2) A message encrypted with the recipient's public key can only be decrypted with:
a) the sender's private key
b) the sender's public key
c) the recipient's private key
3) What system is commonly used for encryption?
4) What is the opposite of encrypt?
5) A message-digest function is used to:
a) authenticate a user
b) create a MAC
c) encrypt a message
6) What information does a digital certificate give to a client?

Safe Data Transfer

Secure transactions across the Internet have three goals. First, the two parties engaging in a transaction (say, an email or a business purchase) don't want a third party to be able to read their transmission. Some form of data encryption is necessary to prevent this. Second, the receiver of the message should be able to detect whether someone has tampered with it in transit. This calls for a message-integrity scheme. Finally, both parties must know that they're communicating with each other, not an impostor. This is done with user authentication. Today's data encryption methods rely on a technique called public-key cryptography.

Everyone using a public-key system has a public key and a private key. Messages are encrypted and decrypted with these keys. A message encrypted with your public key can only be decrypted by a system that knows your private key.

For the system to work, two parties engaging in a secure transaction must know each other's public keys. Private keys, however, are closely guarded secrets known only to their owners. When I want to send you an encrypted message, I use your public key to turn my message into gibberish. I know that only you can turn the gibberish back into the original message, because only you know your private key. Public- key cryptography also works in reverse – that is, only your public key can decipher your private key's encryption.

To make a message tamper-proof (providing message integrity), the sender runs each message through a message-digest function. This function within an application produces a number called a message-authentication code (MAC). The system works because it’s almost impossible for an altered message to have the same MAC as another message. Also, you can't take a MAC and turn it back into the original message.

The software being used for a given exchange produces a MAC for a message before it's encrypted. Next, it encrypts the MAC with the sender's private key. It then encrypts both the message and the encrypted MAC with the recipient's public key and sends the message.

When the recipient gets the message and decrypts it, they also get an encrypted MAC. The software takes the message and runs it

through the same message-digest function that the sender used and creates its own MAC. Then it decrypts the sender's MAC. If the two are the same, then the message hasn't been tampered with.

The dynamics of the Web dictate that a user-authentication system must exist. This can be done using digital certificates. A server authenticates itself to a client by sending an unencrypted ASCII-based digital certificate. A digital certificate contains information about the company operating the server, including the server's public key. The digital certificate is 'signed' by a trusted digital-certificate issuer, which means that the issuer has investigated the company operating the server and believes it to be legitimate. If the client trusts the issuer, then it can trust the server. The issuer 'signs' the certificate by generating a MAC for it, and then encrypts the MAC with the issuer's private key. If the client trusts the issuer, then it already knows the issuer's public key.

The dynamics and standards of secure transactions will change, but the three basic tenets of secure transactions will remain the same. If you understand the basics, then you're already three steps ahead of everyone else.

5. Consider these examples of computer disasters. How could you prevent them or limit their effects?

1) You open an email attachment which contains a very destructive virus.

2) Someone guesses your password (the type of car you drive plus the day and month of your birth) and copies sensitive data.

3) Your hard disk crashes and much of your data is lost permanently.

4) Someone walks into your computer lab and steals the memory chips from all the PCs.

5) Your backup tapes fail to restore properly.

6. Find words or phrases which mean:

1) copies of changes to files made to reduce the risk of loss of data

2) software available for a short time on a free trial basis; if adopted a fee is payable to the author

3) cannot be disrupted or cut

4) put at risk

5) deciphered, worked out

6) protect data by putting it in a form only authorized users can understand

7) a combination of hardware and software to protect networks from unauthorized users

8) observe and record systematically

9) measuring physical characteristics such as distance between the eyes

10) at regular intervals

7. Decide on the relationship between these events.

1) Anti-virus program

a) A user runs anti-virus software.

b) The software checks files for virus coding.

c) Coding is matched to a known virus in a virus database.

d) A message is displayed to the user that a virus has been found.

e) The user removes the virus or deletes the infected file.

f) The virus cannot spread or cause further damage.

2) Face recognition

a) You approach a high-security network.

b) Key features of your face are scanned.

c) The system matches your features to a database record of authorized staff.

d) Your identity is verified.

e) You can log on.

f) Your identity is not verified.

g) You cannot use the system.

3) Voice recognition

a) Computers without keyboards will become more common.

b) These computers are voice-activated.

c) The user wants to log on.

d) She speaks to the computer.
e) It matches her voice to a database of voice patterns
f) The user has a cold or sore throat.
g) She can use the system.
h) Stress and intonation patterns remain the same.

8. Study these phrasal verbs:

break into grow up throw away
get into phone up logon
hack into run up find out
go about keep at track down
set about shut down hand over
keep ahead

9. Now complete each blank with the appropriate phrasal verb in the correct form. In some cases, more than one answer is possible.

1) Hackers try to ... passwords so they can penetrate a system.
2) Don't ... your password to anyone who asks for it.
3) The police ... Ralph ... by talking to his friends and acquaintances.
4) Some hackers ... systems to get commercially valuable information.
5) When you ... to a network, you have to provide an ID.
6) How do you ... hacking into a system?
7) Hackers may ... , pretending to be from your company, and ask for your password.
8) Never ... your credit card receipts where someone can find them.
9) Ralph was a hacker as a teenager but he's ... now and become more responsible.
10) ... a system is strictly illegal nowadays.
11) It's a constant race to ... of the hackers.

10. Replace the verb in italics with a phrasal verb of similar meaning.

Don't *discard* your credit card receipts; they could help fraudsters.

Trying to *penetrate* computer systems is against the law.

The typical hacker is a young person who has not *matured* yet.

The best way to *begin* hacking into a system is to try to get hold of a password.

If someone telephones you and asks for your password, don't *provide* it.

Hackers *closed* Hotmail for five hours.

The difficult thing was to *determine* how the website would look.

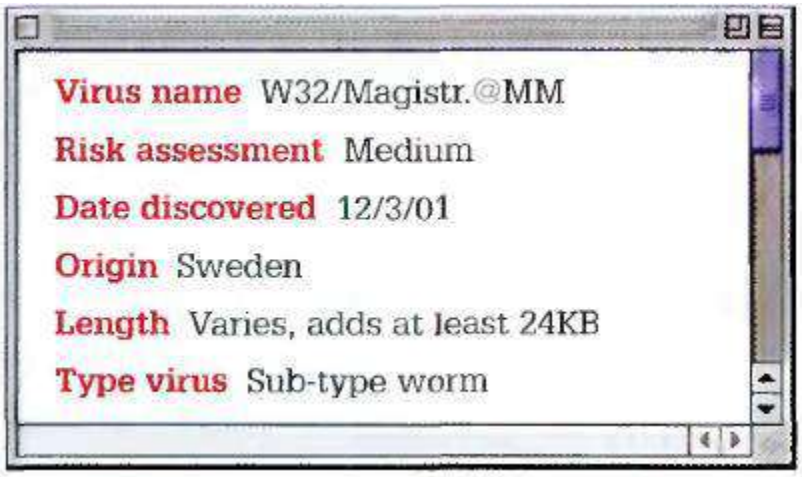
So you won't forget, *record* the ID number the support technician gives you.

Examine the manufacturers' websites before you phone for help.

11. Study this extract from a virus information database. Then make a flowchart to show each step in the method of infection for this virus. Steps 1 and 2 are done for you.

Step 1: An infected .EXE file arrives as an email attachment.

Step 2: The infected .EXE file is opened.



Method of infection

This is a combination of a files infector virus and an email worm. The virus arrives as an EXE file with varying filenames. When

you execute the attachment, your machine is infected and in turn is used to spread the virus.

When first run, the virus may copy one EXE file in the Windows or Windows System directory using the same name but with the final character of the filename decreased by a factor of 1. For example, EHGEDI 57.EXE will become EHGEDI 56.EXE, TCONTRACT.EXE will become TCONTRACS.EXE.

This copy is then infected and a WIN.INI entry, or registry run key value may be created, to execute the infected file when the system starts up.

This copied executable infects other 32 bit .EXE files in the Windows directory and subdirectories, when run.

Five minutes after the file is opened, the email worm attempts a mailing routine. It creates a DAT file hidden somewhere on the hard disk. This contains strings of the files used to grab email addresses from address books and mailboxes. The DAT file name will be named after the machine name in a coded fashion. For example, y becomes a, x becomes b. Numbers are not changed. The worm uses mass mailing techniques to send itself to these addresses. The subject headings, text and attachments will vary. The text is taken from other files on the victim's computer.

This worm may also alter the REPLY-TO email address when mailing itself to others. One letter of the address will be changed. This makes it difficult to warn the victim that their machine is infecting others as the message will be returned to sender.