downstream rates than would occur if two identical computers were used.

57. The T1 integrator, which is housed at the customer site, can be programmed to handle any combination of DS-o (64 kbit/s) channels for voice and data; for instance, a customer can dedicate 16 of the 24 DS-os channels that make up T1 access line voice traffic, which the other eight DS-os dedicate to data and Internet access.

Unit 30
Что такое резюме?

Резюме – краткое изложение сути написанного, сказанного или прочитанного; краткий вывод, заключительный итог чего-либо.

Целевое назначение резюме разнообразно. Его функции следующие:

1. Резюме отвечает на вопрос, какая основная информация заключена в рассматриваемом источнике.
2. Дает описание первоисточника.
3. Оповещает о выходе в свет и о наличии соответствующих работ.
4. Является источником для получения справочных данных.

Резюме является также одним из самостоятельных средств научной информации.

В резюме не используются доказательства, рассуждения и исторические экскурсы. Материал подается в форме описания фактов или консультации. Информация излагается точно, кратко, без искажений и субъективных оценок. Краткость достигается во многом за счет использования преимущественно терминологической лексики. Резюме, как правило, включает следующие части:

а) библиографическое описание первичного документа;

б) текст резюме;

в) справочный аппарат, т.е. дополнительные сведения и примечания.

Текст резюме рекомендуется строить по следующему плану:

а) цель и методика исследования или разработки:

б) конкретные данные о предмете исследования или разработки, его изучаемых свойствах;

в временные и пространственные характеристики исследования;
г) результаты и выводы.

Заглавие резюме не должно повторяться в тексте. Следует избегать лишних вводных фраз.

Примерный объем резюме находится в пределах 1/8 или 10-15% объема статьи. При необходимости объем может быть больше указанного.

Исходный текст для резюме

ı he End of A Monopoly Era

he GSM community is fond o talking about the benefits o competition. Competition between operators is said to be good Competition between handset suppliers is said to be good. And competition between ınfrastructure suppliers is said to be good.

he irony oı this is that throughout the ïrst hal of the 1990s GSM was itself a virtual wireless technology monopoly. Japan got a good Second Generation digital system up and running in the form o PDC. But it then found that a combination of the frequency band it operates in, and inflexible commercial acumen on the part of Japanese suppliers, meant that it could not succeed outside Japan. For it's part, North America floundered between fledgling TDMA and IS-95 CDMA systems. Neıther o them looked like succeeding in the United States, let alone anywhere further afield.

Durıng the first five years o commercial deployment, GSM has enjoyed startling success. But it has only done so by virtue of being the only credible Second Generation technology on the market. That comfortable position has changed during 1996 with the posing of the first serious challenges by alternative technologies. IS-95 CDMA has got off the ground and is alive and commercially kicking at last in the Far East and in the United States. IS-136 TDMA now looks like a far more serious option than IS-54. And Japan s cordless PHS has clearly stolen the wireless limelight rom GSM with its extraordinary take-up rates. All o a sudden, the world looks like a dif erent place. GSM can no longer assume continued success on the same scale as be ore. It is no longer the only credible digital wireless solution.

· his new reality necessitates a change o ' strategy on the part of the GSM community. The first thing which has to go is the negative mindset which some Europeans have had towards other digital technologies. True, some of the marketing of IS-95 has been highly derogatory about GS. But now that that seems to have peaked, there is no point pretending that the alternatives to GSM are not a lot more credible than they were a couple of years ago.

In any case it is childish to deny the hugely positive impact which the rise of these rivals has had on the GSM standard. But for the threat posed by IS-95, it is doubtful whether PCS-1900 operators in the US would have pushed so hard for an enhanced 13kbits/s vocoder – an enhancement which other GSM operators world-wide are now able to benefit from. It is also doubtful whether the migration towards Phase 2+ would now be moving as fast as it is were it not or the GSM camp s need to stay ahead o the game in the value added service, data and information stakes.

aced with a new competitive landscape, the GSM community also needs to be more thorough in its marketing. ' he IS-95 camp have been pushing themselves as much – if it not more – as wireless local loop suppliers. he GSM community, by contrast, has done very little to position itself for wireless local loop.

he evolution o regulatory and standardization policy or GSM has become a little less Euro-centric but it is still too wrapped up in the blue and yellow of the European Union. The American Way has definitely been a positive influence in the last couple of years. The doors should be opened still wider. Asia s GSM operators are also key to GSM future. Regrettably, the only Asian countries with su ficiently powerful and outward looking telecomms policy bodies are Japan and Korea, both of which are outside the GSM camp.

199 opens a new chapter - a Phase Two so to speak – in GSM's development. Europe s technology has done fantastically well without any real rivals. Now it must do ust as well in the face o real competition.

Patrick *World ocus 1997, p.7*

Резюме

Donegan P. The End of Monopoly Era. GSM World Focus, 1997, p.7

The End of Monopoly Era

The aim of the article is to show the reader that real competition in the GSM field is now a reality and should be faced both by producers and operators.

The research method used in the article is description.

Recognizing that in the first half of the 1990s GSM was a virtual wireless technology monopoly the author admits that nowadays that situation has changed dramatically due to the appearance of alternative technologies such as IS-95 CDMA, IS-136 TDMA, PHS.

This new reality leads to change of strategy in the GSM community. Measures should be taken to let some Europeans negative mindset towards other digital technologies go and to become more thorough in marketing; the doors should be opened for America's and Asia's GSM operators.

The article describes the period of GSM's development beginning with the first half of the 1990s and ending with 1997 which was mainly a Europe-centric one.

The author's conclusion is that GSM's development has entered a new chapter, i.e. the phase of competition. And it's up to GSM's technology to do as well in the face of real competition as it did without any real rivals.

Exercise 170

Read the following text and do the tasks given after it.

Data Communications, June 1997, A4-A5

Solving the SNA and LAN Problem Using Frame Relay

Robin Leyland

SNA networks are stable and reliable, and the business world depends on them. LANs are growing but require high maintenance. At first glance, combining the two into one integrated network seems like mixing oil and water, but this is exactly what network managers are under pressure to do. The reason is simple: Maintaining, installing, and managing two networks is an expensive headache. With budgets being stretched to provide ever-increasing support and band-width, network managers need a simple solution to the integration problem: frame relay.

Frame relay provides the look and eel of a leased line network by employing virtual circuits while delivering the performance. manageability, and cost savings oi a single network. Unfortunately, you still have to select the correct frame relay solution for your network, so that nothing can be difficult and time consuming. This challenge amplifies the selection process by presenting eight leading equipment vendors who show you how they integrate rame relay. This lets you compare their different solutions and techniques as they all respond to a common networking problem.

The Challenge

The network given here is based on a real corporation's national network. wo physically separate networks have grown up over time. The older SNA network serves SNA cluster controllers that are primarily 3174s but could ust as well be older 32 4s or AS/400s. This is a star network of leased lines connecting to FEPs at the company's data center in Atlanta. he line speeds are 19.2 and 56 kbps, supporting single 3174s or multidrop 3174s, depending on the size of the locations.

he second network is comprised of PCs and LAN servers. This network supports a range o applications from database inquiries to groupware and even SNA accessing using emulation software running on the PCs. Besides servers located at many of the remote sites, there is a large server farm at the headquarters location in Philadelphia.

he challenge as presented to vendors is to combine these two networks into one using frame relay. The irst part o this challenge o-cuses on the equipment needed at the remote sites. headquarters, and data center to support combined SNA and LAN networking over frame relay. The second part addresses the rame relay service portion of the problem.

Whose and what equipment should be used to connect the remote sites headquarters, and data center to the frame relay network? SU/DSU are not necessarily part of the challenge, but vendors can include them if they desire.

Network I etails

he network in the SNA-Frame Relav Challenge consists of 80 remote sites scattered across the United States, with the bulk on the East Coast.

I'hese 80 remote sites fall into two types. Sixty-one of the sites have both LAN and SNA cluster controllers (3174s). Twenty-eight o these sites need 56-kbps bandwidth to the frame relay network; 21 sites have a greater bandwidth need requiring a 128-kbps access line, and 12 require a 256-kbps access line. The LAN s a mixture of token ring and Ethernet, split approximately 50:50. This is the result o' a corporate merger in the past in which the two companies had different LAN standards. There are 19 sites that have only SNA cluster controllers. Sixteen o these smaller sites are currently supported with a 19.2-kbps link, while three use a 56-kbps link to the data center.

The traf ic rom the remote sites goes to two locations. The SNA traffic is destined for the main rame data center located in a suburb of Atlanta. Each site in the network needs a PVC from the site to the data center. A second PVC is needed from the sites that have a LAN. The LAN servers are located at the company's headquarters in Philadelphia. he second PVC, or LAN PVC, is rom the sites to the headquarters. he network manager has estimated that the company needs three ' 1s from the frame relay network to both the data center and the headquarters. Three lines were selected because the company wants to be sure that that is enough bandwidth. In addition, the equipment at the headquarters and data center must have ports installed for ive 1s so that it can be quickly upgraded if needed. The company is willing to pay extra for this future growth insurance.

The network manager has decided that the SNA traffic needs a guarantee of either 16 or 32 kbps rom each remote site, dependin on the number o attached stations at the site. In rame relay terms, this means that the committed information rate (CIR) - the amount o bandwidth guaranteed - needs to be either 16 or 32 kbps. The LAN traffic needs a CIR o either 16 or 32 kbps, again depending on the size of the LAN. Whatever the guarantee, the equipment needs to be able to support traffic bursts up to the maximum of the access line - 256 kbps in some cases. The reason of these guaranteed bandwidth requirements is to ensure that service levels are maintained in the combined network.

The data center has multiple IBM mainframes that are channel-attached to the two 3745s using an Escon channel connection. The FEP is running N P .2, and 1AM is at 4.2. The mainframe applications are CISC-based. with devices accessing the mainframes using the 3270 protocol (PU2 and LU2). The EP has a token ring connection ' I to a 16-Mbit backbone token ring LAN, with plants to add T1 ports or the frame relay connections if necessary.

Network manag ement or the SNA network is provided by IBM's Host Net View running on the mainframe. The LAN hubs are managed using one of the more popular SNMP managers, such as Hewlett-Packard s, IBM's, Cabletron s, or Sun s SNMP management platform.

Network Manager s oncerns

There are always concerns when integrating two different types o networks. Each solution given here should address the following:

- Response time: The solution should help the network manager meet the service-level commitment to the end-users. SNA end-users especially expect good and consistent response times. The solution should protect the SNA traffic from potentially bursty LAN trai ic.
- Reliability: One of the chie concerns is network reliability. How does the solution address this?
- Cost: The solution should be cost e .ective, not only in terms o equipment but also in relation to sta needs and network management requirements. While cost is a primary concern, this doesn t always mean that the lowest initial cost is always the best. The solution should strike a balance between providing the lowest cost with the most benefits while meeting the needs of the business.
- Network management and support: The solution should say how the vendor proposes to manage and monitor the network. It is safe to assume that there is no network technical support ot people at the remote sites. hus the pre erred solution is one that allows the manager to control the network rom the headquarters. Additional concerns involve the type of visibility into the frame relay network, the role o Host Net View, and the need or the operators to understand Inc relationship between the existing SNA networking and the vendor's solution.
- Service and problem resolution: The solution should outline how the

new software is installed and note whether the network needs to be taken down for any potential problem fixes. It should be easy to maintain and should accommodate central-site maintenance and problem determination. Also, the vendor should specify the type of support that will be provided.

Other Features

The real world is more complicated than the challenge presented here. Vendor's solutions can also solve more than just the basic problem outlined above. Examples of additional services or features include support for BSC devices in a banking environment or support for voice calls between the branch office and headquarters of a corporation. Vendors are free to explain how their solutions provide additional features that solve SNA-LAN networking problems.

Pricing Guidelines

The following rules are applied to all prices. The cost for the solution must cover the equipment and any software required, including any special network management software. The cost of network management software, however, does not include the SNMP manager or NetView, as it is assumed that the network already has these managers in place. If this is not the case with your particular setup, remember to add this cost into your network plans when you migrate to frame relay. The cost for any equipment or software must be based on the US list price. The cost of the WAN service is not part of the equipment challenge.

Tasks:

- Write down the imprint of the article and define its genre (scientific, methodical etc.).
- Find an extract where the main problem of the article is described. Give its summary.
- Name the main ways of solving the problems touched upon in the article.
- What are the main characteristics of the network?
- Write out specific terms used in the article and translate them into Russian.

- Give a written translation of the article into Russian. Use a dictionary. Try to do it as quickly as possible. Mark the time.
- Wrıte a resume of the article.

Exercise 172

Do the following tasks:

- Read the first extract o the text and express its main idea.
- Read the whole text. Name the main problems mentioned in it.
- Give the full version of the following abbreviations:
  ATM, AZA, Mbps, Md, VSAT, ITU, AZE.
  Translate them into Russian.
- Divide the text into logical parts and give their summaries.
- What are the author s conclusions?
- Give a written translation of the text into Russian. Use a dictionary. Try to do it within three hours.
- Write a resume of the article.

Banking on A M by satellite

By Renee Sounders, Washington correspondent

he general population probably thinks ATM by satellite means their favorite automated teller machine uses a satellite link to talk to an unseen computer brain. Well, in some instances that could be true, but it s another story or another time. In addition to the automated tellers, the acronym ATM represents a powerful telecommunications protocol aimed at making broadband communications a reality. The challenge o using this protocol in satellite transmissions captured the attention of scientists at the Clacrksburg, Md.-based omsat Laboratories several years ago. Now those scientists, and executives with Bethesda, Md. parent company Comsat Corp., are banking on A M via satellite in a whole new light.

ATM, or Asynchronous Transfer Mode, is a telecommunications protocol originally developed for use on terrestrial networks for simultaneous transmission of a phenomenal array of information, including seeing them being used or voice. As systems are perfected, this also will change.

Task 9

Find all the terms and abbreviations given in the text, write them down and give their meanings.

Task 10

Give a written translation of the extract beginning with "When electronics came along..." and ending "...in a digital (rather than analog) domain" and the extract beginning with "This system is called packet... and ending "... 100 percent efficient". While making your translation you may use a dictionary.

Task 11

Make up a plan of the text. Retell it using your plan.

Text 4

Read the text and find the endings of the following sentences in it. Translate them into Russian.

1. Technically known as unshielded...
2. However, this is the way...
3. These load coils...
4. For example, a drop wire...
5. Usually an outer insulating cover...
6. Whereas transmission over copper...
7. However, if a local loop...
8. The message is clear...
9. With single-mode fiber...
10. Most of the disruptions...
11. With microwave there is no...

Transmission Media

There are four types of media that can be used in transmittin information in the telecommunications world:

- copper wire;
- coaxial cable (actually an adaptation of copper wire);
- fiber;
- wireless.

In days of old, copper wire was the only means of transmitting information. Technically known as unshielded twisted pair (UTP), this consisted of a large number of pairs of copper wire of varying size in a cable. The cable did not have a shield and therefore the signal – primarily the high-frequency part of the signal – was able to leak out. Also, the twisting on the copper pair was very casual, designed as much to identify which wires belonged to a pair as to handle transmission problems. However, this is the way it was done, and for voice communications it was quite satisfactory. Consequently, there are millions of miles of copper in the PSTN – miles that must be used.

Not only did the copper cable itself have limitations, but things were done to this cable to make it even more unsuitable for high-speed data transmission. These actions primarily took two forms:

- **loading** – Load coils were frequently added to loops longer than 18,000 feet. These load coils were essentially low-pass filters. That is, they passed without attenuation all voice frequencies but effectively blocked frequencies above the voiceband. This is disastrous for data communications, which depend on high frequencies to achieve the desired speed of transmission.
- **bridge taps** – A bridge tap is any unterminated portion of a loop not in the direct talking path. A bridge tap may be a used cable pair connected at an intermediate point or an extension beyond the customer. For example, a drop wire that provided a second line to a home is left in place even after the second set of customer premises equipment (CPE) is removed. Records of this were not always kept and assigning a particular copper pair to a high-speed data circuit is far from a sure thing. Bridge taps do nasty things to data transmission.

Coaxial cable consists of a single strand of copper running down the axis of the cable. This strand is separated from the outer shielding by an insulator made of foam or other dielectrics. A conductive shield covers the cable. Usually an outer insulating cover is applied to the overall cable – this has nothing to do with the carrying capacity of the cable. Because of the construction of the cable, obviously coaxial in nature, very high frequencies can be carried without leaking out. In fact, dozens of TV channels, each 6 MHz wide, can be carried on a single cable.

The fact that a coaxial cable – or coax – can support a tremendous bandwidth has not been lost on the CATV folk. A leader of the CATV industry said, some years ago, "We have more bandwidth by accident than the telephone people have on purpose." Indeed, that is correct; piggybacking a telephone channel on a coax cable is no challenge at all.

Fiber is the third transmission medium, and it is unquestionably the transmission medium of choice. Whereas transmission over copper utilizes frequencies in the megahertz range, transmission over fiber utilizes frequencies a million times higher. This is another way of saying that the predominant difference between electromagnetic waves and light waves is the frequency. his difference, in turn, permits transmission speeds of immense magnitudes. 'ransmission speeds o as high as 9.9 Gbps have become commonplace in the industry today. At this speed, the entire fifteen-volume set of Encyclopedia Britannica can be transmitted in well under one second.

Laying fiber on a per-mile basis still costs somewhat more than laying copper. However, on a per-circuit basis there is no contest; fiber wins hands down. However, if a local loop is being laid to a residence, there is little justi ication to installing fiber – there will never be a need for more than one or two or three circuits. This realization has led to a transition in our thinking. Shortly after the commercialization of fiber, we talked about fiber-to-the-home (FTTH). It was then realized that there was little need to install fiber for a final several hundred yards, so the industry shied away from fiber-to-the-curb (FTTC). In such a system, fiber would carry a plurality of channels to the "curb," whereupon they would be broken down and applied to the copper drop leading to the home. In many cases even this was overkill, and fiber-to-the-neighborhood FTTN) is now being used. The message is clear: apply fiber when it is economical to do so, and otherwise rely on copper.

One final approach is being used in many areas, and it often proves workable. This is a combination of fiber and coax or, as it is known, hybrid iber/coax (HFC). As we have seen, coax has a greater bandwidth than copper but a smaller one than fiber. Also, in some 60 percent of the homes in the United States, coax in the orm of CATV goes to the home; tying fiber to coax for the final several hundred yards makes technological sense.

Fiber comes in several forms; the two predominant ones are multimode and single-mode (see Figure 3). As can be seen, the total strand diameter for both is about 125 microns (a micron is a millionth o a meter). However, the ultrapure glass that forms the core transmission medium is between 50 and 62.5 microns for the multimode fiber and about 8 to 10 microns for the single-mode fiber. One would think that the multimode fiber would have a greater carrying capacity; however, just the opposite is true. With single-mode iber, only one ray or mode can travel down the strand, and this makes for a simpler job in regenerating the signal at points along the span. In fact, single-mode fiber makes up the majority o today's long-distance network.

The tremendous capacity of fiber certainly makes for more e icient communications; however, placing so much traffic on a single strand makes for greater vulnerability. Most of the disruptions in the long-distance network are a result o physical interruption o a fiber run. It is called backhoe fade.

Wireless communications is the final option as a transmission medium. This can take several forms: microwave, synchronous satellites, low-earth-orbit satellites, cellular, personal communications service (PCS), etc. Some of these will be described in more detail later. In every case, however, a wireless system obviates the need or a complex wired infrastructure. In the case o synchronous satellites, transmission can take place across oceans or deserts. With microwave there is no need to plant cable, and in mountainous territories this is a significant advantage. Cellular and PCS afford mobility. There are advantages and disadvantages to each.

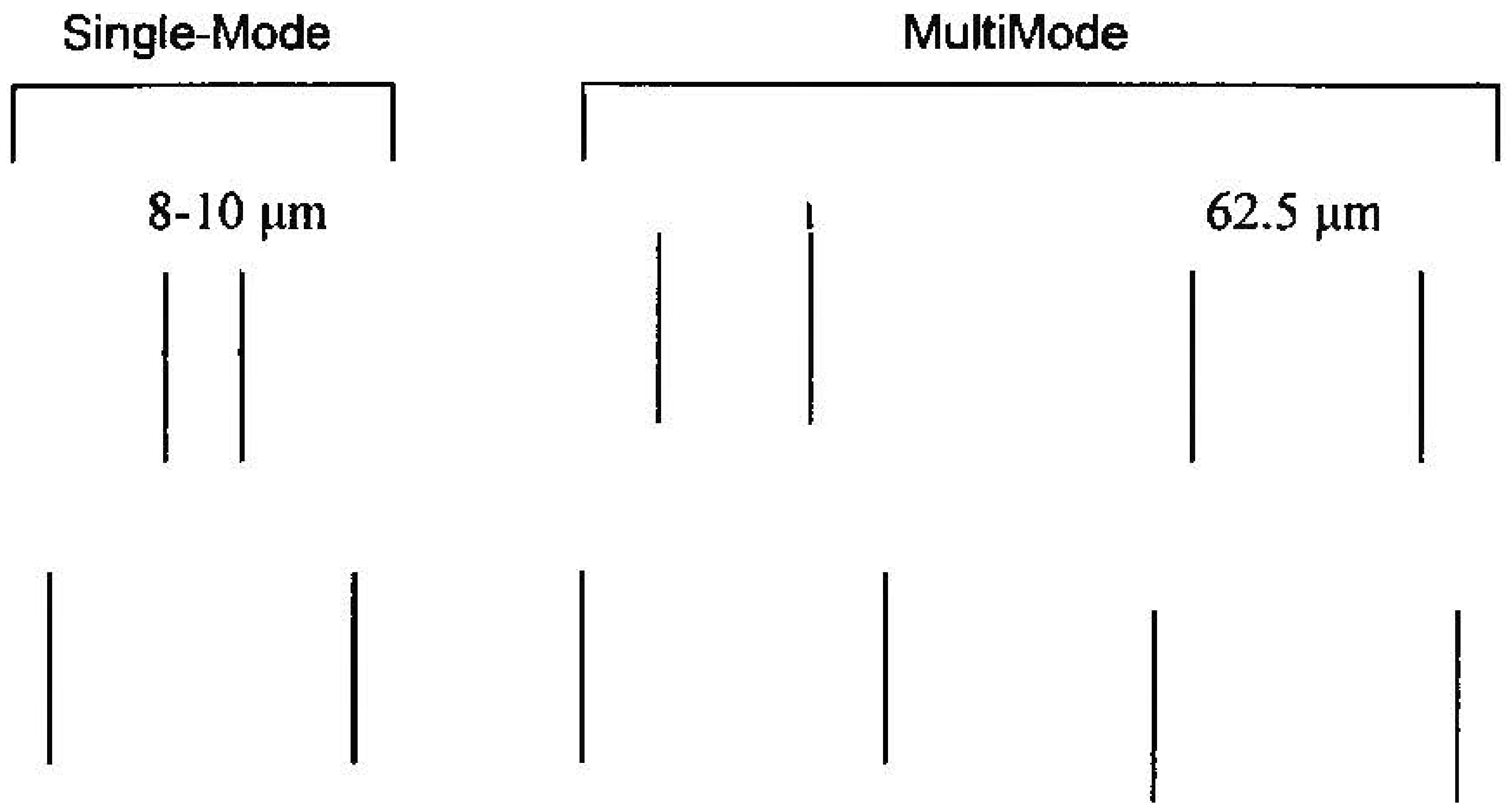

Figure 3. Optical Fiber Sizes

Task 12

Read the text again and find the sentences where the following terms are used. Translate them into Russian.

media, copper wire, cable, transmission, high-speed data transmission, load coils, data communications, customer premises, high frequency, coaxial cable, bandwidth, telephone channel, local loop, curb, multimode, single-mode, span, long-distance network, capacity, traffic, transmission medium, wireless system

Task 13

Find all the abbreviations in the text. Give their meanings.

Task 14

Discuss the text with your neighbor in a form of a dialogue