INTERNET INFRASTRUCTURE

PART 1. INTRODUCTION TO THE INTERNET INFRASTRUCTURE

One of the greatest things about the Internet is that nobody really owns it. It is a global collection of networks, both big and small. These networks connect together in many different ways to form the single entity that we know as the Internet. In fact, the very name comes from this idea of interconnected networks.

Since its beginning in 1969, the Internet has grown from four host computer systems to tens of millions. However, just because nobody owns the Internet, it doesn't mean it is not monitored and maintained in different ways. The Internet Society, a non profit group established in 1992, oversees the formation of the policies and protocols that define how we use and interact with the Internet.

In this article, you will learn about the basic underlying structure of the Internet. You will learn about domain name servers, network access points and backbones. But first you will learn about how your computer connects to others.

PART 2. THE INTERNET: COMPUTER NETWORK HIERARCHY

Every computer that is connected to the Internet is part of a network, even the one in your home. For example, you may use a modem and dial a local number to connect to an Internet Service Provider (ISP). At work, you may be part of a local area network (LAN), but you most likely still connect to the Internet using an ISP that your company has contracted with. When you connect to your ISP, you become part of their network (Fig. 1). The ISP may then connect to a larger network and become part of their network. The Internet is simply a network of networks.

Most large communications companies have their own dedicated backbones connecting various regions. In each region, the company has a Point of Presence (POP). The POP is a place for local users to access the company's network, often through a local phone number or dedicated line. The amazing thing here is that there is no overall controlling network. Instead, there are several high level networks connecting to each other through Network Access Points or NAPs.

Here's an example. Imagine that Company A is a large ISP. In each major city, Company A has a POP. The POP in each city is a rack full of modems that the ISP's customers dial into. Company A leases fiber optic lines from the phone company to connect the POPs together.

Imagine that Company B is a corporate ISP. Company B builds large buildings in major cities and corporations locate their Internet server machines in these buildings. Company B is such a large company that it runs its own fiber optic lines between its buildings so that they are all interconnected.

In this arrangement, all of Company A's customers can talk to each other, and all of Company B's customers can talk to each other, but there is no way for Company A's customers and Company B's customers to intercommunicate. Therefore, Company A and Company B both agree to connect to NAPs in various cities, and traffic between the two companies flows between the networks at the NAPs.

In the real Internet, dozens of large Internet providers interconnect at NAPs in various cities, and trillions of bytes of data flow between the individual networks at these points. The Internet is a collection of huge corporate networks that agree to all intercommunicate with each other at the NAPs. In this way, every computer on the Internet connects to every other.

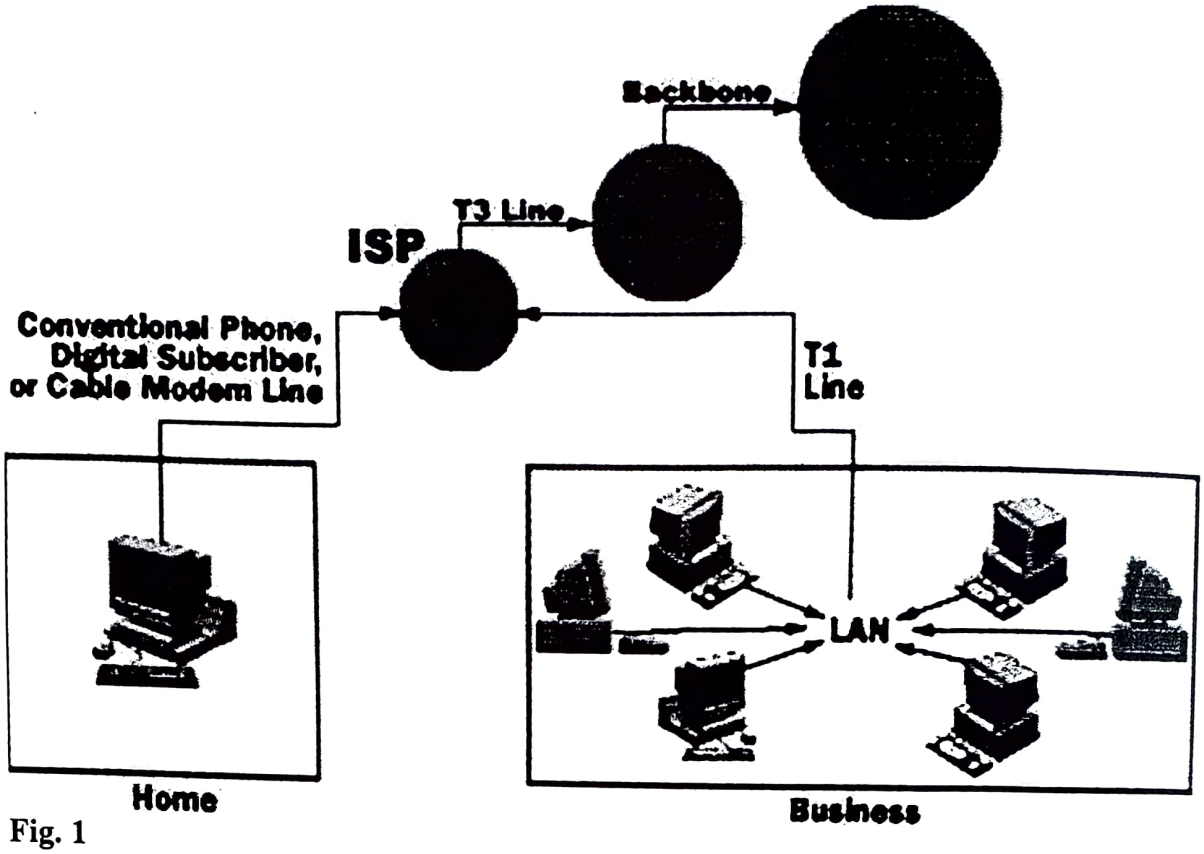

Fig. 1

When you connect to the Internet, your computer becomes part of a network

Essential vocabulary (1), (2)

Words

amazing *adj*
come (from) *v*
contract (with) *v*
conventional *adj*
customer *n*
dedicated *adj*
define *v*
dial (up) *v*
entity *n*
flow (about traffic) *v*
hierarchy *n*
huge *adj*
infrastructure *n*
intercommunicate *v*
interconnected *adj*
lease (to/from) *v*
locate *v*
maintain *v*
major *adj*
mean *v*
monitor *n*, *v*
non_profit *adj*
overall *adj*
oversee *v*
own *v*
rack *n*
LAN
NAP
POP

Word Combinations

to connect in many different ways
to form the single entity
to interact with the Internet
underlying structure
computer network hierarchy
to dial a local number
to be (become) part of smth.
to access smth. through smth.
dedicated line
to talk to each other
high–level network
individual network
corporate network

1. Find in parts 1 and 2 of text 2 English equivalents for the following words and phrases:

никто в действительности не владеет Интернетом; совокупность сетей во всём мире; единое целое; следить за созданием норм и протоколов; некоммерческая организация, учрежденная в 1992 году; цифровая абонентская линия; обычная телефонная линия; подключаться к большей по размеру сети; выделенная линия; точка доступа к сети; крупный поставщик услуг Интернета; стеллаж, полностью заставленный модемами; брать

в аренду оптико волоконные линии у телефонной компании; корпоративный Интернет провайдер; размещать серверы в этих зданиях; соединять свои собственные оптико волоконные линии между своими зданиями; в этой схеме; нет никакого способа; соглашаться; множество крупных Интернет провайдеров соединяются в точках доступа к сети; огромные корпоративные сети; таким образом.

2. Answer the following questions using the information from parts 1 and 2 of text 2.

1. Who really owns the Internet? 2. How much has the Internet grown since its beginning in 1969? 3. Who oversees the formation of the policies and protocols that define how we use and interact with the Internet? 4. What do we connect to when, for example, we use a modem and dial a local number? 5. What do large communications companies have in each region? 6. What is POP? 7. How are the high level networks connected to each other? 8. How does the POP in each city look like?

3. Make summary of parts 1 and 2 of text 2

План составления аннотации на английском языке к статье !

1. (*Название статьи...)*
The title of the article is ... .
(The article is entitled...)
(The article is headlined ...)
2. (Перевод названия статьи: ...)
The translation of its title is ... .
3. (*Автор статьи ...)*
The author of the article is ... .
(Если автор неизвестен - The author of the article is unknown).
(The article is written by ...)
4. (Выходные данные)
The article was published in ... .
(the title of the magazine (journal, No., year)
5. (Графическое оформление)
There are two illustrations and one graph in the article but there are no tables and charts.
There are (no) tables, graphs, charts, illustrations.
6. (Тема статьи и предметная область)
The article is about ... .
(The topic of the article is...)
(The essential information in the article deals with ...)
The subject area of the article is ... .
7. (Актуальность статьи ...)
The article is (not) up-to-date because ... .

Пример обоснования актуальности статьи.

This article is up-to-date because ...(information security) is really (extremely) important nowadays. ...(cloud services) are used more and more. And ... (data protection) is as relevant as ever.

In my opinion (to my mind, I think) ,..

The paper (article) is interesting (not interesting), of importance, valuable (invaluable), up-to-date (out-of-date), useful (useless)

Пример :

The title of the article is A victim of its own success. The translation of its title is Жертва собственного успеха. The author of the article is Bill Bryson. The article was published in The Economist on the 1st of September, 2018. There are two illustrations and one graph in the article but there are no tables and charts. The article is about Silicon Valley. The subject area of the article is economy. The article is up-to-date because Silicon Valley represents innovation processes in the world economy, so its functioning is important for further development of information technologies.

Extract 3

In 1975 an article in *Business Week* predicted that we would be doing most of our business electronically by 1990.[25] This idea is known as the "paperless office." Ideally, IT would make it possible for all data to be stored and retrieved electronically; all correspondence would be electronic.

The idea seems to have a great deal of merit. A business could save storage space by eliminating paper files; it could save money on storage space, storage equipment, and paper purchases. The idea of saving trees and saving the energy needed to produce paper is very attractive, especially when we consider the current push to reduce an organization's "carbon footprint." However, although technology makes it possible to use less paper, most businesses are far from a purely paperless office.

Through at least the early 2000s, paper use actually increased.[26] The introduction of high-speed photocopiers and laser printers made it easier to produce more paper documents more easily. Email and the web didn't cut down on paper either; people often would print out their email and the web sites they visited. But why do people print out documents that they receive online? That seems to be significantly counterproductive.

The problem is that the theory of the paperless office doesn't take into account the way people feel about pape Some people don't think that a document is "real" unless they can feel it in their hands; paper is often easier t read than a computer screen; paper is portable, can be folded to fit into a pocket, and can be marked up with a pen. There is therefore a great deal of resistance to doing away with paper documents entirely.

[25] "The office of the future". *Business Week*, June 30, 1975.
[26] See http://earthtrends.wri.org/features/view_feature.php?theme=6&fid=19

Harrington, J. (2009). *Technology and society*. Sudbury, MA: Jones and Bartlett.