



“十三五”普通高等教育本科规划教材

科技英语 基础阅读

龚玲莉 王纪红 主编

BASIC READINGS IN
SCIENTIFIC ENGLISH



中国电力出版社
CHINA ELECTRIC POWER PRESS



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内 容 提 要

本书为“十三五”普通高等教育本科规划教材。

本书分为8个单元，每单元设置一个主题，涉及计算机、机器人、能源、环境科学、材料工程、土木工程、通信、健康等多个领域，选材多来自于国外报刊、专业期刊和网络。每单元由四部分组成：第一部分是导入，通过听力理解引出本单元，听力材料选自最新的科技报道，如VOA等；第二部分是单元主体，由两篇阅读和相关练习构成。课后练习形式多样，分别针对各篇章和细节理解、科技词汇、语法及翻译设置任务；第三部分是与单元主题相关的英语视频讲座，旨在提高理解能力和科技口语听说能力；第四部分为词汇测试，巩固学生语言基石。每单元后面另附一则科学笑话。本书突出科技英语的特点，体现基础英语、科技英语和专业知识的三结合，语言现象丰富，可读性较强，有利于教学，便于自学。

本书不仅适合工程专业本科生学习，还可以作为英语专业科技英语类课程的教材或研究生教材，以及英语爱好者的参考书。

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前 言

Preface

大学英语是高等教育的一个有机组成部分，是大学生一门必修的基础课程。中国大学英语教学完成了从结构语言学向认知语言学语境的转变，成绩有目共睹；但中国大学外语教学正经历新的危机，根源就是大学英语教学和专业人才培养的断裂。大学英语教学并不是一个独立的体系，它是专业人才培养体系的亚体系，必须呼应学习目标、专业指向的个性化诉求。

“卓越工程师大学外语”系列教材是为适应我国高等教育发展、工程人才培养和大学外语教学改革需要而开发的。该系列教材是编者多年思考和实践的成果，分为“外语技能提升”、“工程文化拓展”、“工程学科认知”三大类。“外语技能提升”类主要针对学生听、说、读、写、译等单项技能培养，密切关注社会等级考试和外语能力证书考试。“工程文化拓展”类目的是拓展学生的国际视野，培养学生跨文化意识，密切关注时事背后的文化动因。“工程学科认知”类以专业学科为基础，培养学生以国际的眼光认识所从事的学科和基本学术规范。

《科技英语基础阅读》为“工程学科认知”类教材，旨在通过地道、原汁原味的科技时文，提高学生科技英语阅读和理解能力；同时，开拓学生的视野，提升学生的英语科学思辨能力。本书适用于有一定大学英语基础的本科学生，建议修读学期为第二、第三学期。

本书由天印外语教育工作室组织编写，是教育部重点课题“卓越计划视野下的大学英语教学改革”（GPA11051）和南京工程学院教改重点课题“新形势下应用型本科高校大学英语教学改革”（JG201331）的阶段性成果。本书编写任务如下：王纪红编写第1单元、第8单元；曹恒林编写第2单元、第7单元；庄卫编写第4单元、第5单元；赵海晶编写第3单元、第6单元；龚玲莉编写每个单元的科学笑话。徐斌、张瑜、秦小青、薛舒、袁小明、白海龙等也参与了编写。龚玲莉、王纪红负责全书的统编定稿。

本书力求探索全新的教学模式，不妥之处在所难免，敬请各位同行和使用者批评指正。

编 者

2015年6月

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Unit 1 Computers and Network

Part I Listening for technology



Task 1 Here is a technology report from VOA *Learning English*. Complete the following missing words or phrases according to what you have heard.

Facebook and other social media sites are free for everyone. But a new social media site promises to be more 1 by only permitting people who are rich to join. The site is called Netropolitan. To join, users must pay 2. This includes a \$6,000 entry fee plus \$3,000 for the 3.

James Touchi-Peters is the founder of Netropolitan. He is a composer and 4 conductor from the eastern American state of New York. He says he believes there is a need and an audience for this service. He says he had trouble finding people like him on other social sites.

He says Netropolitan is a place where rich people can talk about what he calls “the finer things in life”. In his words, “Netropolitan is an online country club focused on connecting members around the world.” He says it is “for people with more money than time.”

Unlike Facebook, everything on Netropolitan is private. The site is not included—or 5—by search engines like Google or Bing. Non-members can only see the log-in screen when they visit the site. Information to and from the site is hidden, or 6. This gives the site’s members even more privacy.

Netropolitan does not have any 7. And it will employ monitors to prevent bad behavior. Members must be 21 or older. And they must use their 8 to register. Once they have registered, members can do things like create groups and join discussions on the site.

Mr. Touchi-Peters has not said how big he hopes the site’s 9 will grow. And he has not said how many members the site has. He does say it has a small group of “pre-qualified members”.

The website says it “will never publicly state the exact number of members in the club. And especially, we will NEVER release or 10 the identity of any of our members—ever.”



Task 2 Answer the following questions based on the above listening passage.

1. According to the news above, what are the features of Netropolitan?

2. What is Facebook?

3. How do you understand network security? Is privacy important? Why or why not?

Part II Reading for exploration

Passage A

Lead-in



Task 3 Work in groups and find information on the Internet about wearable computers; then, fill in the graph and report the information you have found by giving a PowerPoint presentation to the class.

KWL

| KWL | | |
|--|--|--|
| <div style="text-align: center; font-weight: bold; font-size: 0.8em;">K</div> <div style="text-align: center; padding: 5px;">What I know</div> | <div style="text-align: center; font-weight: bold; font-size: 0.8em;">W</div> <div style="text-align: center; padding: 5px;">What I want to know</div> | <div style="text-align: center; font-weight: bold; font-size: 0.8em;">L</div> <div style="text-align: center; padding: 5px;">What I have learned</div> |



Task 4 Find out the Chinese meaning of the following scientific words or phrases with the help of dictionaries.

- | | |
|-----------------------------|---------------------------------|
| 1. analog circuit _____ | 2. interface _____ |
| 3. wearable computers _____ | 4. video display terminal _____ |
| 5. speech recognition _____ | 6. Windows _____ |
| 7. central processors _____ | 8. head-up display _____ |

Text

Wearable Computers Will Transform Language

By Ariel Bleicher[●]

Smart clothes and accessories will let us share thoughts and sensations as well as words.

THE FUTURE WE DESERVE



Background

In August of 1961, fabled **mathematicians** Edward O. Thorp and Claude Shannon, of MIT, walked into a Las Vegas casino. They intended to try their luck at **roulette**, a game in which players bet on where a whirling ball will land after falling from an outer stationary track onto an inner spinning wheel. But they weren't typical gamblers.

They worked as a team. Shannon watched the wheel, **clandestinely** clocking the speeds of the rotor and the ball by flipping **microswitches** in his shoe with his big toe. The signals coursed through wires that ran up his pant leg to a small computer strapped to his waist. The machine calculated the ball's final resting position and then transmitted this prediction wirelessly to a receiver under Thorp's shirt. Through a tiny speaker in his ear, Thorp heard one of eight distinct tones that advised him on how to bet. To his and Shannon's delight, he reported years later, this newfound faculty increased the duo's odds of winning by 44 percent, and they "often turned a few dimes into a pile".

① Engineers widely regard this invention as the first wearable computer—an early glimpse at today's fitness trackers, smart watches, and **augmented-reality** eyewear, and their possible descendants: electronic contact lenses, haptic undergarments, brain-reading caps, body-monitoring tattoos, gesture-recognizing rings, speech-detecting tongue piercings, and touch-sensitive sleeves, pleats, buttons, and zippers. Compared with today's powerful all-purpose processors, the MIT mathematicians' machine wasn't much—just 12 transistors hand-soldered in an analog circuit. Yet the impact on its wearers was profound—foretelling, perhaps, a future when we depend on our electronic devices to experience life as much as we rely on our eyes, ears, and skin.

② "We will get to a point when we stop thinking of technologies as external to our bodies," says

● Ariel Bleicher is a freelance writer based in New York City. His work has appeared in Scientific American, Discover, IEEE Spectrum, and other publications. He has got a Master's in science, health, and environmental reporting from New York University.

Desney Tan, an expert in computer **interfaces** at Microsoft Research, in Redmond, Wash. Wearables will always be on and immediately accessible. **Donning** them, he forecasts, will allow us to “sense and capture many more things about the world” and to communicate those sensations in new ways. For example, on-body displays could let people use images to express ideas in face-to-face conversations. Brain-activity monitors could capture emotions and add them automatically to text messages. Haptic fabrics could let a father-to-be experience the kicking of his unborn baby.

WHAT COULD
POSSIBLY
GO WRONG?

[sidebar]

③ Electric circuits are creeping ever closer to us—from our desktops to our laps, our pockets, and now our faces and wrists. And many engineers predict the trend will continue: In the coming decades, computers will be **seamlessly** woven into our clothing, fashioned into our jewelry, and painted on our skin. Eventually, we may not be able to distinguish their capabilities from our own.

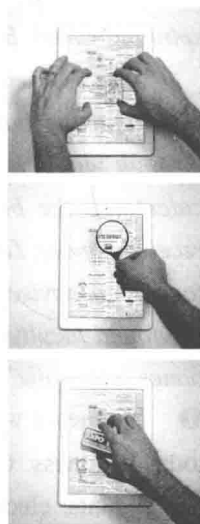
④ Electronic communication has long been limited not by computing power but by the ability of machines to understand us. The human and the computer possess “enormously powerful information-processing capabilities”, wrote Edward Tufte, a **data-visualization** pioneer now at Yale University, in 1989. “Yet communication between the two must pass through the low-resolution, low-information, narrow-band user interface of a **video display terminal.**” Your phone, in other words, may be able to send a message in a split second, but you can type only so fast.

⑤ At first glance, it seems the problem gets worse with wearables. “We can put a really powerful computer in a smart watch, or into Google Glass, or whatever the next form factor will be,” says Chris Harrison, an assistant professor of human-computer interaction at Carnegie Mellon University, in Pittsburgh. “So the question is, how do you get input into something so small?”

⑥ In the coming era of wearable computing, as Harrison foresees it, we will manipulate digital bits the same way we do real objects—with our hands. “Touch is a really powerful, wonderfully intuitive thing,” he says, adding that although the touch screens on today’s smartphones, tablets, and watches are a step in the right direction, “they’re pretty lame.” The gestures they recognize are disappointingly few, including one-and **multifinger** taps, swipes, and pinches. “We don’t do things in the real world based on the number of fingers we poke at things,” he quips. “There are all these other, really rich dimensions of touch that touch screens ignore”—such as pressure, contact area, the shape of your hand, and whether you use a pad, knuckle, or nail.

⑦ In fact, future consumers may choose from many different kinds of interfaces, mixing and matching to satisfy their style and fancy. Other researchers are now investigating smart glasses that track eye movements, wristbands that capture hand gestures, tongue implants that recognize whispers, even neck tattoos that pick up subvocalizations—the subtle vibrations your throat muscles make when you imagine how a word sounds.

⑧ The gadgets we’ll wear won’t just be handier than those we now have to carry. Wearables will be truly revolutionary, some experts say, because they’ll learn things about us that we never tell



them or that we might not think to find out for ourselves.

⑨ The seeds of such a future are already here. Google's digital personal assistant, Now, has the smarts to figure out the locations of your home and workplace just by tracking your movements during the day. Because it knows this information, it can, for instance, display on its own initiative traffic updates on your phone 5 minutes before you begin your commute.

⑩ Known as brain-computer interfaces, or BCIs, these systems are found mostly in research laboratories. For many researchers who work in wearable computing, the ultimate goal is to design machines that use data from the brain and body to understand the world in human terms.

⑪ In the future, people will wear BCIs constantly while also sporting cameras, microphones, and other sensors that will simultaneously record everything they see, hear, and feel. The network of computers on a person's body will then use these data to build digital representations of how he or she perceives the world. For instance, your wearables might track every gesture that calms you, every sound that surprises you, every remark that makes you swear under your breath. Over time, these machines will learn to anticipate your actions and emotions and will automatically tailor your environment to suit your needs—muting your alerts when you're in an important meeting, dimming the lights when you drift off to sleep. They may even recognize subtle cues you don't notice or can't sense, such as early signs of depression or the onset of a migraine.

⑫ Thad Starner, a professor at Georgia Tech and a technical lead for Google Glass, has worn some version of a computerized head-up display for 21 years. He uses a one-handed keyboard to take notes and browse the Web. One day, he's sure, he will no longer need to search for **pertinent** information because his Glass will listen to his conversations and **intuitively** fetch the data for him. It will appear before his eyes as quickly and **unobtrusively** as if he were recalling a memory. "Your computer will act as an extension of your own mind," he **prophesies**.

⑬ Sooner or later, our electronic **gizmos** will no longer be possessions we take or leave behind. They will be us.

(1,081 words)

Vocabulary & Notes

1. mathematicians [ˌmæθəməˈtɪʃən] *n.* a person who is trained in the study of numbers and calculations 数学家

2. roulette [ruˈlet] *n.* a gambling game in which a ball is dropped onto a wheel with numbered holes in it while the wheel is spinning round. The players bet on which hole the ball will be in when the wheel stops spinning. 轮盘赌

3. clandestinely [klænˈdestɪnlɪ] *adv.* something that is clandestine is hidden or kept secret, often because it is illegal. 秘密地, 暗中地

4. microswitch [ˈmaɪkrəswɪtʃ] *n.* 微型开关

5. augmented-reality [ɔːɡˈmentriˈælɪti] *adj.* 增强现实的

6. haptic [ˈhæptɪk] *adj.* of or relating to or proceeding from the sense of touch 触觉的,
同 tactile

7. interface ['ɪntəfeɪs] *n.* If you refer to the user interface of a particular piece of computing software, you are talking about its presentation on screen and how easy it is to operate 界面

8. don [dɒ:n] *v.* put clothing on one's body 穿上; 戴上; 披上

9. seamlessly ['simlɪsli] *adv.* not having or joined by a seam or seams; perfectly consistent and coherent; 无缝地; 无空隙地; 无停顿地

10. visualization [ˌvɪʒʊəlaɪzəʃən] *n.* a mental image that is similar to a visual perception 形象化, 可视化

11. video display terminal ['vɪdɪ'ɒdɪ'sple'tɒmənəl] 视屏显示终端

12. multifinger ['mʌltɪfɪŋgə] *n.* 多触点的

13. intuitively [ɪn'tjuɪtɪvli] *adv.* 直觉地

14. unobtrusively [ˌʌnəb'trusɪvli] *adv.* not obtrusive or undesirably noticeable; synonym: unnoticeable; antonym: obtrusive, noticeable 不突出地

15. prophesy ['prɒ:fəsai] *vt.* predict or reveal through, or as if through, divine inspiration. 预告, 预言

16. gizmo ['gɪzmo] *n.* A gizmo is a device or small machine which performs a particular task, usually in a new and efficient way. People often use gizmo to refer to a device or machine when they do not know what it is really called. 小发明

Post-reading Tasks



Task 5 Fill in the blanks with the main ideas.

| | |
|--|--|
| <p>Fabled mathematicians' experience in a Las Vegas casino</p> | <p>A. Their experience in the casino: _____ B. Engineers widely regard this _____ C. Desney Tan forecasts _____ D. Electric circuits are creeping ever closer to us: _____</p> |
| <p>Some interesting things about electronic communication</p> | <p>A. What seems the problem which gets worse with wearables? _____ B. Chris Harrison explores the new ways of interacting with screens _____ C. Different interfaces: _____</p> |
| <p>The gadgets we'll wear</p> | <p>A. Google's digital personal assistant: _____ B. Brain-sensing and brain-modeling technologies: _____</p> |
| <p>Google Glass</p> | <p>Thad Starner prophesies: _____</p> |



Task 6 The following statements are incomplete. Search the missing information in the passage and fill in the blanks.

1. Compared with today's powerful all-purpose processors, the MIT mathematicians' machine wasn't much—just 12 transistors hand-soldered in _____.
2. The human and the computer possess “enormously powerful information-processing capabilities,” wrote Edward Tufte, _____, in 1989.
3. The gestures they recognize are disappointingly few, including _____.
4. For many researchers who work in wearable computing, the ultimate goal is to _____.
5. The network of computers on a person's body will then use these data to _____ of how he or she perceives the world.
6. They may _____ you don't notice or can't sense, such as early signs of depression or the onset of a migraine.
7. Thad Starner, a professor at Georgia Tech and a technical lead for Google Glass, has worn some version of _____ for 21 years.
8. To his and Shannon's delight, he reported years later, this newfound faculty increased the duo's odds of winning by _____.



Task 7 Give the correct form of the word according to the indication in the brackets. Then complete the sentences by using the right form of each word. Use each word once.

wear----(suffix)

math----(suffix)

touch----(prefix)

seam----(antonym)


obtrusive----(antonym)

visualize----(noun)

face----(prefix)

prophecy----(verb)

1. In computing, _____ refers to the ability of a surface to recognize the presence of more than one or more than two points of contact with the surface.
2. As many as 67 percent of Chinese consumers are likely to buy _____ fitness monitors and 73 percent wants smart watches in the coming five years, more than doubled 32 percent and 27 percent in the United States.
3. The secret service agents in charge of protecting the President tried to be as _____ as possible.
4. The first explosion of the atomic bomb _____ of change and a new age.
5. Leonardo is often credited with being a greater _____ than he actually was.
6. Although _____ often consumes more space, its capability to clearly communicate is well worth the pixels.
7. A metallic bellows is made from a thin _____ tube.
8. The new version of the program comes with a much better user _____ than original.


 **Task 8** There is a passage with ten blanks. Choose one word for each blank from the word bank. You may not use any of the words in the bank more than once.

A computer is a machine designed to perform work 1 and to store and select information that has been 2 into it. It is run by either mechanical or electronic mean. These machines can do a great deal of 3 work in a very short time. A large computer, for example, can add or 4 nine thousand times a second, multiply a thousand times a second, or divide five hundred times a second. Its 5 of error is about one in a billion billion digits. It has been estimated that human beings making 6 average about one mistake per two hundred digits.

The heart of an electronic computer lies in its vacuum tubes, or 7. Its electronic circuit works a thousand times faster than the nerve cells in the human brain. A problem that might take a human being two years to solve can be solved by a computer in one minute, but in order to work properly, a computer must be given instructions—it must be 8.

Computers can be designed for many 9 purposes—they can be used to prepare payrolls, guide airplane flights, direct traffic, even to play chess. Computers play an essential role in modern 10 in many plants and factories throughout the world.

- | | |
|-------------------|-----------------|
| A) percentage | I) screens |
| B) multiply | J) multiply |
| C) fed | K) automation |
| D) mathematically | L) incomparably |
| E) percent | M) complicated |
| F) subtract | N) specialized |
| G) transistors | O) calculations |
| H) programmed | |

 **Task 9** Identify the grammatical meanings of the underlined parts of the following sentences according to the context of the passage, and translate the sentences into Chinese.

1. In the coming decades, computers will be seamlessly woven into our clothing, fashioned into our jewelry, and painted on our skin.

2. The network of computers on a person's body will then use these data to build digital representations of how he or she perceives the world.

3. Thad Starner, a professor at Georgia Tech and a technical lead for Google Glass, has worn some version of a computerized head-up display for 21 years.

4. In fact, future consumers may choose from many different kinds of interfaces, mixing and matching to satisfy their style and fancy.

5. Known as brain-computer interfaces, or BCIs, these systems are found mostly in research

laboratories.

Passage B

Text

Network Security

By Unnamed Author

*Network **Security** systems are one of the key players in contemporary business life. Some networks are private while others are open to public access. The obvious example of a public network is the Internet. Conversely, most big companies today prefer private networking accessed locally by limited number of people. Rapidly growing networks became even **portable** and dynamic and now may be accessed from homes or hotel rooms while on the road through normal telephone lines.*

No matter whether your network is private or public it should have robust security and be safely protected. In this article we will discuss where network security starts and will describe common measures taken for its safety.

Why to secure?

❶ This question might always come to your mind especially when you deal with public networks. For example, you may state that not Internet but you as a user should secure yourself from it on client side (personal PC with **antivirus** or spyware) not to grab a Trojan or **malware** threat into your system. And of course, you seem to be right from user's point of view. The problem of network security becomes a more serious issue when you deploy a private network system which targets and serves particular group of people to communicate, collaborate and share.

Planning Security

❷ Network Security is a process which involves all activities, provisions and policies that organizations and system administrators undertake to protect the integrity and continuity of operations, communications, data and their values in their network. A . Planning and **elaboration** of such strategy is the preparatory part which guarantees a stable and targeted safety for your network. It assumes monitoring of the system, identification of threats and their solutions.

a. Identification of Threats

❸ To heal the patient you should first know his disease and its source. Though providing network security is a complicated task but it may be ensured in this quite simple logic. Revealing threats is one of the key points in planning.

Threats to networks may be of different essence.

Viruses and Infections

❹ Viruses occur in programs developed by **fraudulent** programmers and are designed to replicate themselves and infect systems when triggered by a specific event or service.

Trojan Horse

⑤ Software containing Trojans are a malware. Trojans seem to be harmless and even useful but instead they facilitate **unauthorized** access to the system and change **system configuration** or infect it. Examples of such applications may be games, converters, browser toolbars, desktop gadgets, widgets etc. B .

Vandal Applications or Applets

⑥ Vandals are software applications or applets that cause destruction to networks and systems. Unlike Trojan horse programs vandals exceptionally aim at crashing or destructing the system to the “pieces” without accessing or manipulating any data.

Attacks

⑦ Network Systems are attacked for different purposes:

—**Reconnaissance** attacks aim at information-gathering and data collecting to compromise networks.

—Access attacks exploit network vulnerabilities to gain entry to e-mail, databases and to manipulate the data.

—Denial-of-service attacks, also known as DoS attacks, block access to part or all of a computer system. Such attacks are theoretically almost impossible to track and stop.

Data Interception

⑧ Data interception is **eavesdropping** of networks communications. Interception may also be used for not only catching the data being transmitted over a network but also altering those data packets.

Unauthorized Access and Intrusion

⑨ User **authentication** is the base activity for network security. C . There are also some other types of authentication such as authentication via user’s mobile phone, ATM card, fingerprints etc. Any unauthorized access to network may be considered as intrusion to system.

Social engineering

⑩ It is another form of obtaining **confidential** information related to network security such as posing as a technical support person and asking for people’s passwords. E-mail spoofing is one of the popular means in social engineering. It is an attempt to trick the user into making a damaging statement or releasing sensitive information such as password.

⑪ This list of threats may be expanded endlessly and be frustrating. If one has ever faced any of these threats (and you might have at least one case still being a simple PC user) then damages and loss caused to your insecure network may be really tangible and **irretrievable**.

b. Risk Management

⑫ Risk management is one of the essentials of network security planning. It is very important to understand risks and know how to handle them. Certainly risks and their definitions vary for different organizations and business areas. It depends on the security priorities and the policy adopted by the company. Risk management for network security is a periodic activity which contains network analyzing and monitoring for vulnerability and threats.

c. Firewall

⑬ When we speak about network security we immediately associate it with concept of firewall.

Firewall is like “supervisor” enforcing access control policy between two connected networks. Once user is authenticated, firewall enforces access policies to establish what services are allowed to be used by users. Tools such as firewalls and intrusion detection systems provide protection for all areas of the network and enable secure connections. Network Firewalls are of two types—software based and hardware based. Typically, individual PC stations use Firewall Software meanwhile networks use dedicated Firewall Devices. Firewall Devices are designated for protecting many computers connected through a network. Thus choosing and deploying optimal firewall solution for your networking is so significant. D.

d. Backups

14 Even in case of effective security your system is not ensured against technical and electronic faults, often caused by hardware failure. E. This will help easily recover your data in the event of such system failures. It is more than obvious... better to live with backups than to suffer of loss.

e. Software

15 Let's assume you have already identified your threats, setup risks management policy, and deployed an effective firewall for your network. What is next? Now you need a software system which will enable managing and centralized control over all ongoing measures and activities in your network system.

16 Nowadays IT market is rich in different network solutions software and it makes difficult to choose amongst them. For obtaining an optimal software solution for your network security you might first want to consider such factors as targeted solution, ability to handle voluminous data, ability to generate various reports on system status and security, **customizability** and of course easy-to use feature.

17 Today many companies specialize in reviewing and rating of software and applications available in market. Rating is provided through such factors as features, user-friendliness, performance, support, value for money etc. So if you are interested in **deploying** effective Software And Tools for your Network Security you should have closer look at some popular Ratings By Authoritative Reviewers.

P.S.

18 None of these approaches alone will be sufficient to protect a network, but when they are layered together, they can be highly effective in keeping a network safe from attacks and other threats to security. In addition, well-thought-out corporate policies are critical to determine and control access to various parts of the network.

(1,280 words)

Vocabulary & Notes

1. security [sə'kjʊəti] *n.* Security refers to all the measures that are taken to protect a place, or to ensure that only people with permission enter it or leave it. 安全
2. portable ['pɔ:rtəbl] *adj.* easily or conveniently transported 手提的, 轻便的
3. robust [rou'bast] *adj.* physically strong; antonym: frail; strong enough to withstand