

What is Computer Networking?

Anyone who has ever sent an e-mail has used computer networking. Less than a generation ago, computer use was still new, but today life would be unthinkable without the benefits computer networking provides. The computer network has become a fundamental tool of today's corporate environment. Companies can save millions of dollars by sharing resources via computer networks rather than by shipping or traveling. Individuals use computer networking to do their banking from home, communicate with relatives, and even to entertain themselves with audio or playing video games.

Computer networking is the connecting of two or more computers that allows them to share resources. It can be done between computers in a home, in a business, across a corporation, and even internationally. The Internet is the largest example of computer networking because it involves thousands of networks of computers that share information.

Computer networking has changed the lifestyle of Americans. People can work from home while they keep an eye on their children. Companies can conduct videoconferences and share software. Information on just about any conceivable subject is available at the click of a mouse. But computer networking has a downside as well. Hackers routinely try to break into company files, information is stolen from computer networks, and the networks themselves can have technical problems or crash completely.

As computer networking becomes an increasingly routine part of our daily lives, the jobs of computer networking specialists and administrators become more important. It is the job of the computer-networking specialist to keep the networks working. Once a network goes down, many businesses cease to function until it returns to normal. Computer networking specialists are being called upon more and more to safeguard individual, company, and government information through constantly changing security processes.

A career that barely existed a generation ago has become one of the more high-profile jobs in the world today. Computer networks have become the communications backbone of large and small businesses. The increasing spread of network technology combined with the complexity of that technology means that a graduate will be walking into a growing field that promises to continue to provide challenges and demands for many years to come.

What Does a Computer Networking Specialist Do?

Computer networks function on a local area (LAN) or a wide area (WAN) based upon the number of people and the geographic distances involved. These can include a small business with two or three employees to major corporations to the Federal government of the United States. But computer networks exist in realms beyond business. Virtually every aspect of today's society depends on information that is furnished through computer networks.

The priority of the computer networking specialist is the day-to-day support that keeps the network functioning. A small travel agency, for instance, cannot function if it does not have access to its computer network of airlines and travel databases. Plenty of businesses would be in the same predicament. The computer networking specialist maintains the software and hardware, monitors the system for potential disturbances, analyzes problems, and develops plans for potential solutions.

Problem solving is by far the number one activity for computer networking specialists, and the ability to solve problems quickly and creatively is essential. A solid technical support background helps in network administration because it exposes students to unexpected problems and brings them into contact with a broad range of products and computer activities. Networking specialists can anticipate problems and develop plans to prevent them or to reduce their effects when they do happen.

The computer networking specialist's early career responsibilities might involve monitoring and performing routine maintenance on the computer systems. They can advance into more senior-level positions and take on more responsibilities after gaining experience. These responsibilities might include presenting recommendations or developing technical requirements about the company's network based on available technology.

In some systems, the computer-networking specialist also oversees the security system for the network. Computer crime is a growing problem and networking specialists are constantly being challenged to find new ways to thwart potential information thieves. They must understand the nature of the information being protected, the type of software and hardware being used, and the myriad possible ways to breach its security.

A typical role for the computer-networking specialist is to train others how to use the system. The specialist must know the intricate details of the system but be capable of translating that information to the layman. Company employees must know what the system can and cannot do, and they must be shown what they can do to protect information and help prevent possible hacking from outsiders.

Computer networking specialists might also serve as the systems administrator for the network. Their role is to identify and evaluate the needs of a company and then develop the network requirements to implement a plan for meeting those needs. They must design a system with parts that fit together and work properly with the least potential for disruption. Administrators might become software engineers and take part in designing the system or network.

Computer networking specialists usually work in comfortable surroundings, but they have to be prepared for a variety of inconveniences. Network breakdowns can happen at any time and very few businesses can wait until the next working day to get it up and running again. This means that the networking specialist remains on-call during night and weekend hours in the event of an emergency. It also means the specialist must

handle some degree of stress. When the system is down, people are not working, and that means the pressure is on to get the system working again as soon as possible.

Trends in Computer Networking Careers

More than 250,000 people make their living as computer networking specialists or systems administrators. That number is expected to grow faster than average because more companies are investing heavily in computer networks. As this investment continues, the companies will be more interested in developing security features that prevent electronic attacks.

The number of companies conducting electronic commerce is also growing, and American consumers are becoming more comfortable with making purchases online. This trend is also good news for computer networking specialists because they will be called upon to develop the systems that allow the businesses to conduct e-commerce. Those who have strong computer skills and experience but do not have a bachelor's degree can qualify for some entry-level jobs. Certification in the appropriate technology might also be a requirement for anyone who does not have a degree.

Another unfortunate fact of life since the September 11th attacks is the continuing need for homeland security. The Federal government is pumping billions of dollars into research and development for security techniques. A part of this research and development will be in securing computer networks from terrorist attacks, or even using the networks to trace information.

Is an Advanced Degree Needed to Work in Computer Networking?

As the profession of computer networking develops, so will the requirements for specialists in the field. In days past, a person with computer experience could easily advance in the field. But as the field becomes more specialized, more employers are looking for workers with college degrees and experience in networking. Advanced degrees currently are not necessary to become a computer-networking specialist, but one can imagine that, as field specialization continues to evolve, advanced degrees will become necessary.

Computer networks are found in nearly every large and small business. They can be in startup companies or established industry leaders. The requirements and equipment available to the networking specialist will vary accordingly. Not all of the jobs will be limited to computer networking. In fact, those who work in various computer fields often work their way from one specialty to another. The following are some computer networking specialties, although many of the skills and assignments might overlap.

Computer Networking Specialities

Network administrators are responsible for keeping a network up and running -- like an auto mechanic for the network. They create user accounts and manage the folders and other resources on computers in the network. They correct problems with network communications, resource access, printers, and the computers. They also must address

issues about system expansion. Depending on the organization's size, number of locations and users, geographic reach, and purpose, a network administrator's job can include a wide variety of responsibilities.

Here are some basic tasks for which a network administrator may be responsible:

- Setting up and configuring network hardware and software
- Installing and configuring network media and connections
- Connecting user nodes and peripherals of all kinds to the network
- Adding users to and removing users from the network
- Managing user accounts, such as passwords, storage space, and file-access privileges
- Creating and maintaining a system for backing up data and program files
- Ensuring the security of the network
- Managing the organization's e-mail system
- Managing users' ability to access the Internet via the network
- Training users to utilize the network's resources

A **network engineer** designs and manages the groups of computers networked together. The network engineer performs tasks such as installing and configuring communication hardware, setting up of the network communication link, installing and configuring application software, troubleshooting operations to ensure continuous network availability, and providing technical support and assistance.

Network analysts support the computer network and the overall computer infrastructure. Job duties might involve installing network software and training the user in new applications. The analyst might be responsible for coordinating system enhancements between the software and hardware, documenting procedures, and producing policies and procedures.

Information systems administrators assist with the design, delivery, and maintenance of an information technology infrastructure within the organization. The person assists in strategic planning and in evaluating and recommending services, products, and projects. The job involves assisting in the planning, development, implementation, and maintenance of the information platform. The information platform might include Web servers and services, technological applications, and interactive applications. Administrators also provide instruction, user aids, and assistance in problem solving for library IT applications.

The **network technician** generally services network computers and troubleshoots for potential problems. Network technicians often work the help-desk services to repair or upgrade computers. Technicians need to be familiar with the different operating systems such as Microsoft, Novell, and Unix, as well as the basics of computer networking.

Companies of all sizes have networks and need knowledgeable individuals to manage those networks, but those companies that cannot afford, or do not require a full-time administrator, might contract with a computer company that provides administrative services. Computer networking presents an outstanding opportunity for the skilled professional or entrepreneur to work with a variety of companies to set up or possibly maintain a network.

The increasing use of computer networks has created a need for more **instructors** who have a solid networking background and can teach those skills to students. Unlike in some other academic fields, one need not have a Ph.D. to become a computer networking instructor. Although community colleges and four-year schools might prefer instructors to have a Master's degree, for-profit and certification schools usually only require substantial experience in the profession. It is also a way to remain a working professional while supplementing an income and contributing to the growth of the profession.