



Chapter 11

Introduction to Computer Networks

11.1 Data Communication

11.2 Introduction to Computer Networks

11.3 Applications of Computer Networks

11.4 Categories of Networks

11.5 OSI and TCP/IP Reference Model

11.2 Introduction to Computer Networks

- **The concept** of the “computer center” as a room with a large computer to which users bring their work for processing **is now totally obsolete**.

该句主语为 the concept of the “computer center” as a room with a large computer to which users bring their work for processing, 其中 with a large computer 修饰 room。限制性定语从句 to which were being their work for processing 修饰名词 computer。

- “计算机中心”是一个拥有大型计算机的房间，用户可以将他们的工作带到大型计算机那里进行处理。“计算机中心”的概念现在已经完全过时了。

converge v.	融合	distribute v.	分发
sophisticated	复杂的	profound a.	意义深远的
obsolete a.	过时的		

11.2 Introduction to Computer Networks

- The old model of a single computer serving all of the organization's computational needs has been replaced by one in which a large number of separate but interconnected computers do the job.
- 旧的单台计算机满足组织所有计算需求的模式已被一种新模式所取代，在新模式中大量独立但相互连接的计算机完成任务。

media link	媒介链接		

11.2 Introduction to Computer Networks

- By requiring the computers to be autonomous, we wish to exclude from our definition systems in which there is a clear master/slave relation.
- 通过要求计算机是自主的，我们希望从我们的定义中排除存在明确的主从关系的系统。

autonomous	自治的	communication channel	通信信道
copper wire	铜线	fiber optics	光纤
microwave	微波	master/slave relation	主从关系

11.2 Introduction to Computer Networks

- A system with one control unit and many slaves is not a network; nor is a large computer with remote printers and terminals.
- 一个具有一台主控机和许多从属机的系统不是一个网络，一个带有远程打印机和终端的大型计算机也不是一个网络。

forcibly	强行地	remote	远程的
terminal	终端		

11.2 Introduction to Computer Networks

- Connectivity means that you can connect your microcomputer by telephone or other telecommunications links to other computers and information sources almost anywhere.
- 连通性意味着你可以通过电话或其他电信链路将微型计算机连接到几乎任何地方的其他计算机和信息源。

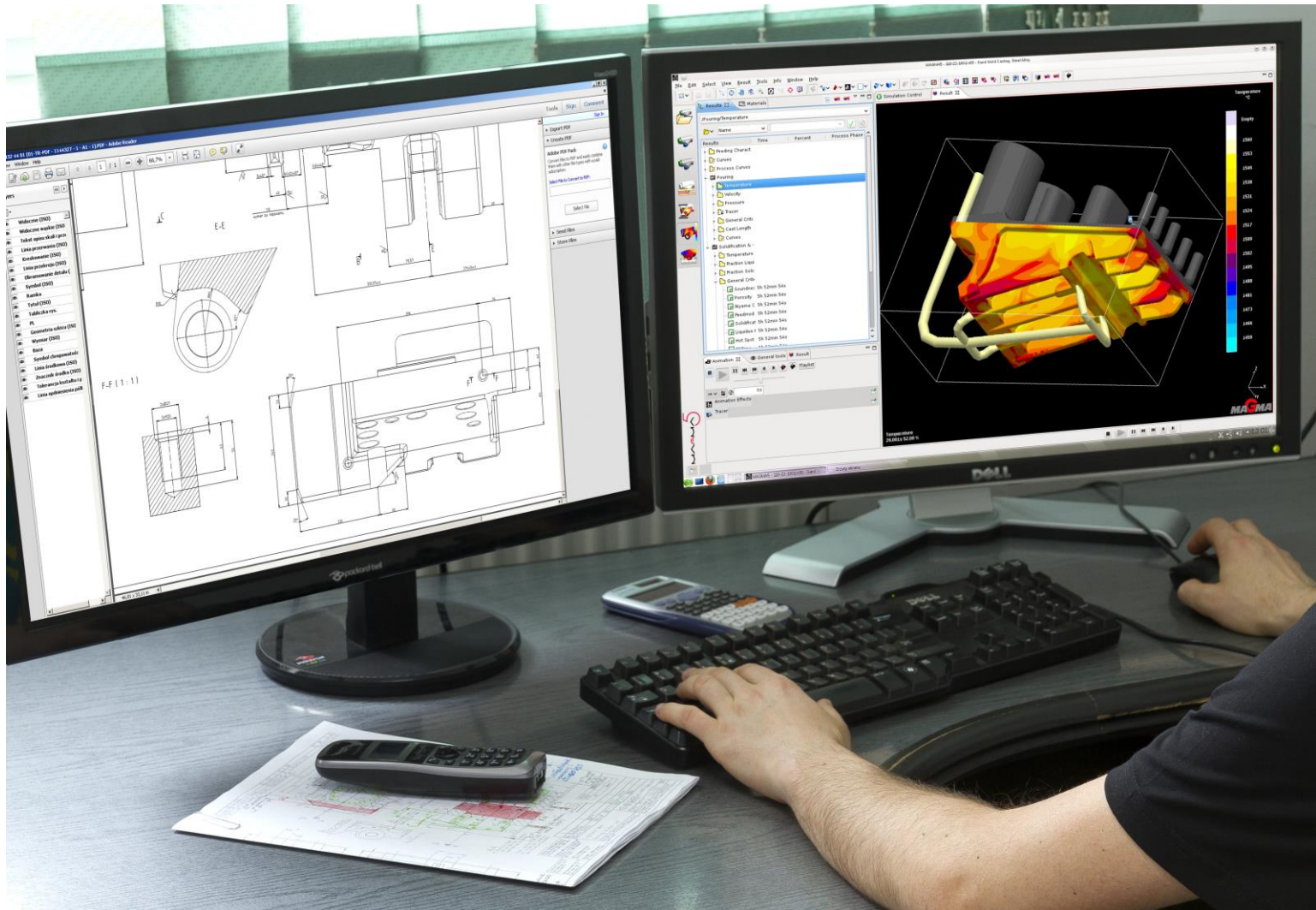
connectivity	连通性	air connection	无线连接

11.3 Applications of Computer Networks

- Computer networks have become an indispensable part of business, industry and entertainment in the short time they have been around.
- 计算机网络出现不久就成为商业、工业和娱乐业**不可或缺**的一部分。
- Most newspapers maintain an online presence and presentations related to current news stories.
- 大多数报纸都保持在线报道和与时事新闻相关的报道。

cybermall	数码广场	window shop	浏览橱窗;逛商店
stacks	书库	live concert	实况音乐会
CAD	计算机辅助设计	CAM	计算机辅助制造

11.3 Applications of Computer Networks



11.4 Categories of Networks

- Network architecture describes how a network is arranged and how resources are coordinated and shared.
- 网络体系结构描述了网络是如何安排的以及资源是如何协调和共享的。
- It encompasses a variety of different network specifics, including network configuration and strategies.
- 它(网络体系结构)包含各种不同的网络细节, 包括网络配置和策略。

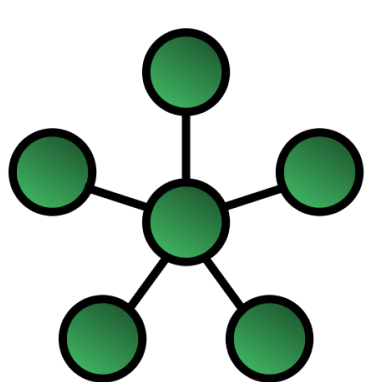
encompass	v. 包括	specific	细节, 具体情况

11.4 Categories of Networks

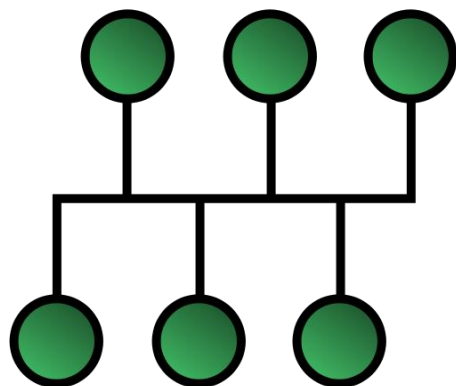
- Network configuration describe the physical arrangement of the network. Network strategies define how information and resources are shared.
- 网络配置描述网络的物理布局。网络策略定义了信息和资源的共享方式。
- This arrangement is called the network's topology.
- 这种布置称为网络拓扑结构。

topology	拓扑结构	star	星形
bus	总线	ring	环形
hierarchical	层次的		

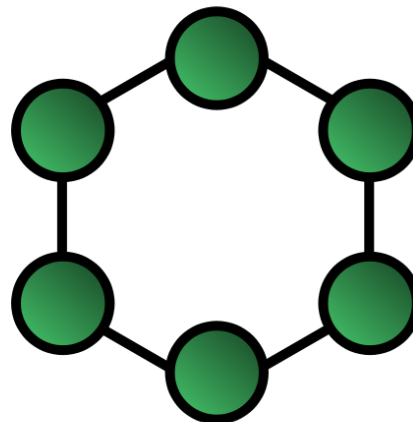
11.4 Categories of Networks



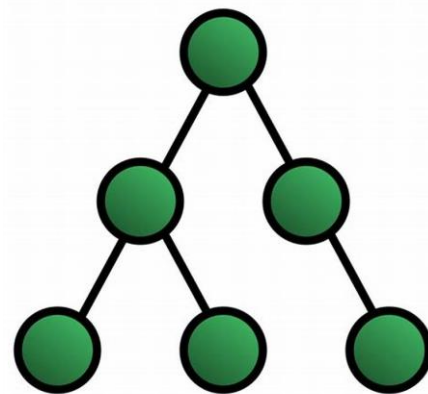
star



bus



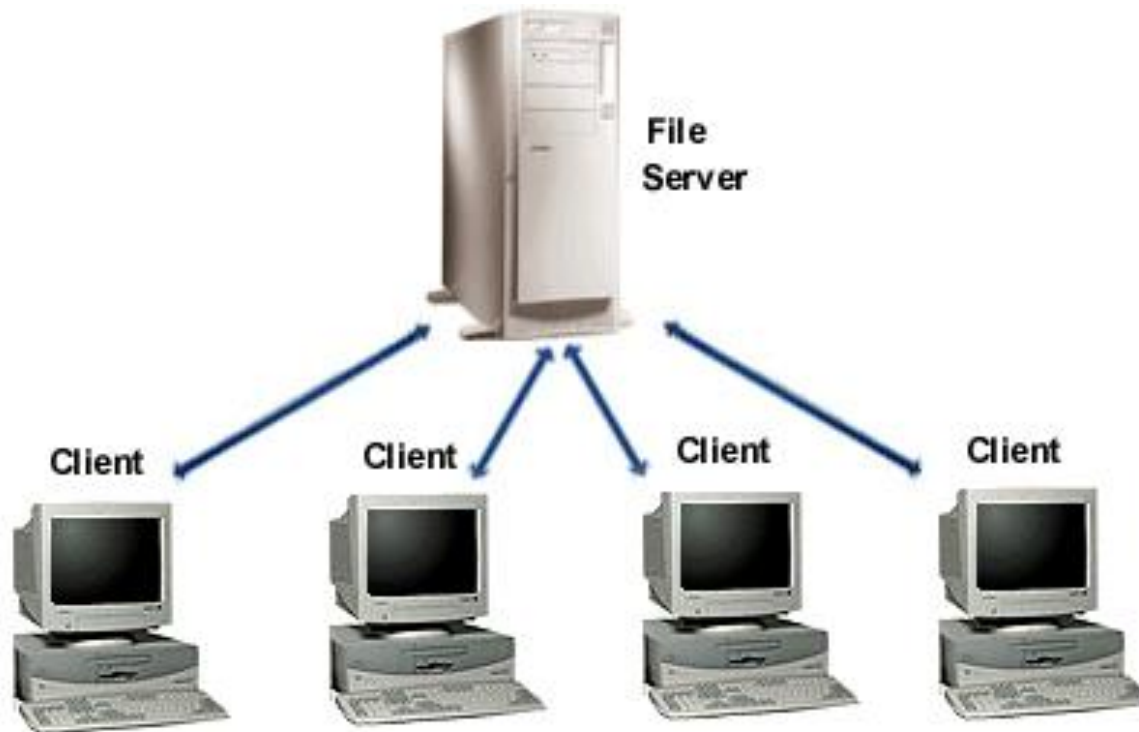
ring



hierarchical

peripheral	外围的	hub	中心；集线器
host computer	（计算机）主机	polling	轮询
in turn	依次		

11.4 Categories of Networks



time-sharing

分时

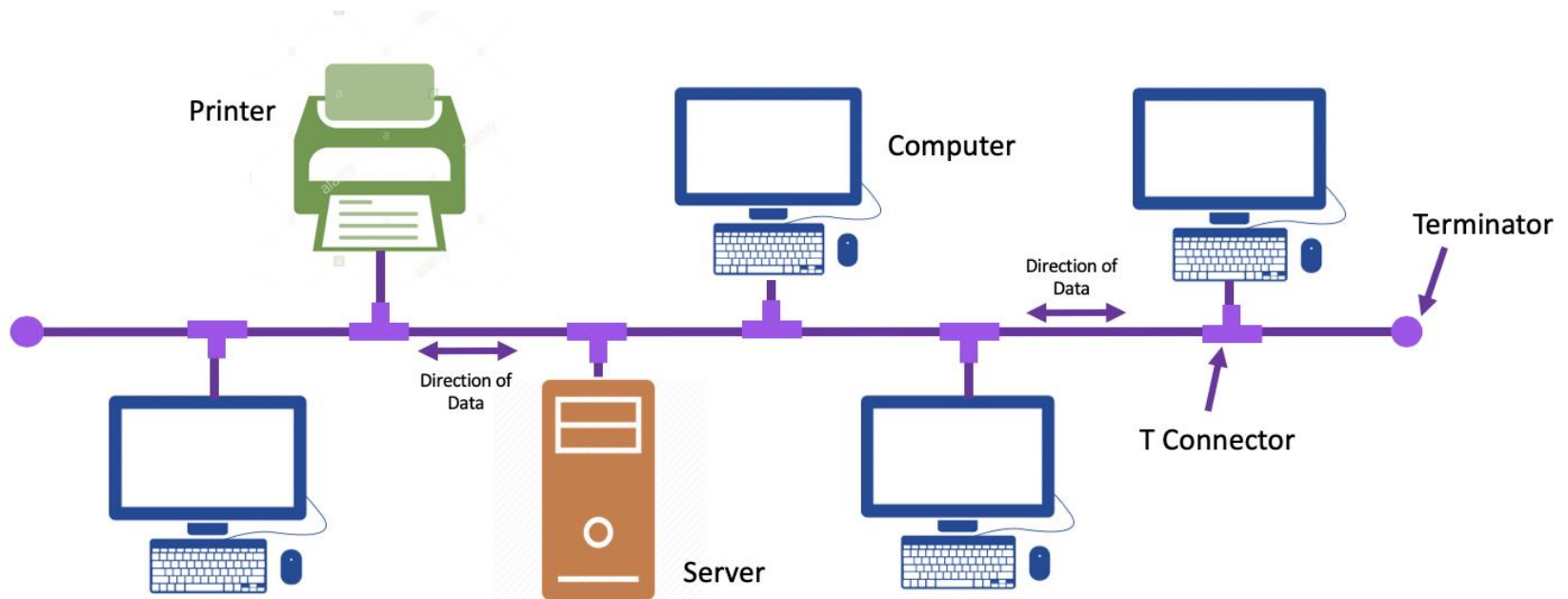
11.4 Categories of Networks

- The star is a common topology for linking microcomputers to a mainframe that allows access to an organization's database.
- 星形是一种常见的拓扑结构，用于将微型计算机连接到允许访问组织数据库的大型机。

mainframe	大型机		

11.4 Categories of Networks

Bus Network

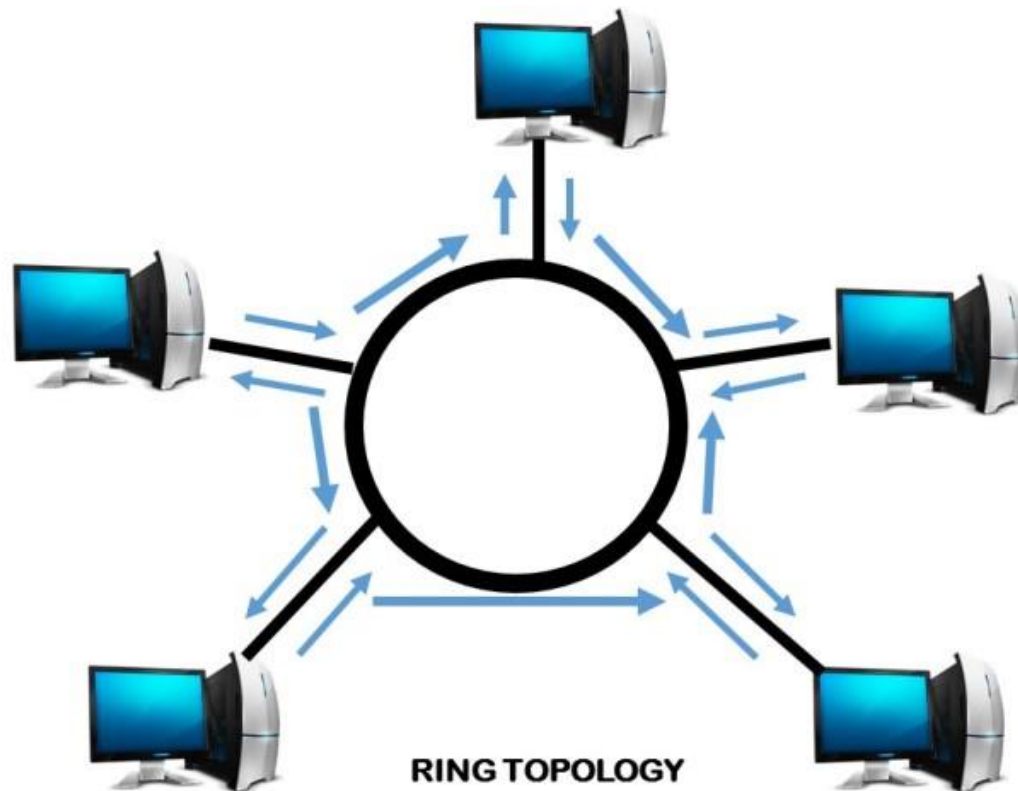


11.4 Categories of Networks

- As the information passes along the bus, it is examined by each device to see if the information is intended for it.
- 当信息沿着总线传输时，每个设备都会对其进行检查，以确定该信息是否是为它准备的。
- Because a star network typically provides a more direct path to shared resources, it is more efficient than a bus network for sharing these resources.
- 因为星型网络通常提供到共享资源的更直接路径，所以它比总线网络能更有效地共享这些资源。

backbone	骨干		

11.4 Categories of Networks



11.4 Categories of Networks

- They perform most or all of their own processing and only occasionally share data and programs with other mainframes.
- 它们(这些大型机)执行大部分或全部自己的处理，只是偶尔与其他大型机共享数据和程序。
- A ring network is useful in a decentralized organization because it make possible a distributed data processing system.
- 环形网络在分散的组织中很有用，因为它使分布式数据处理系统成为可能。

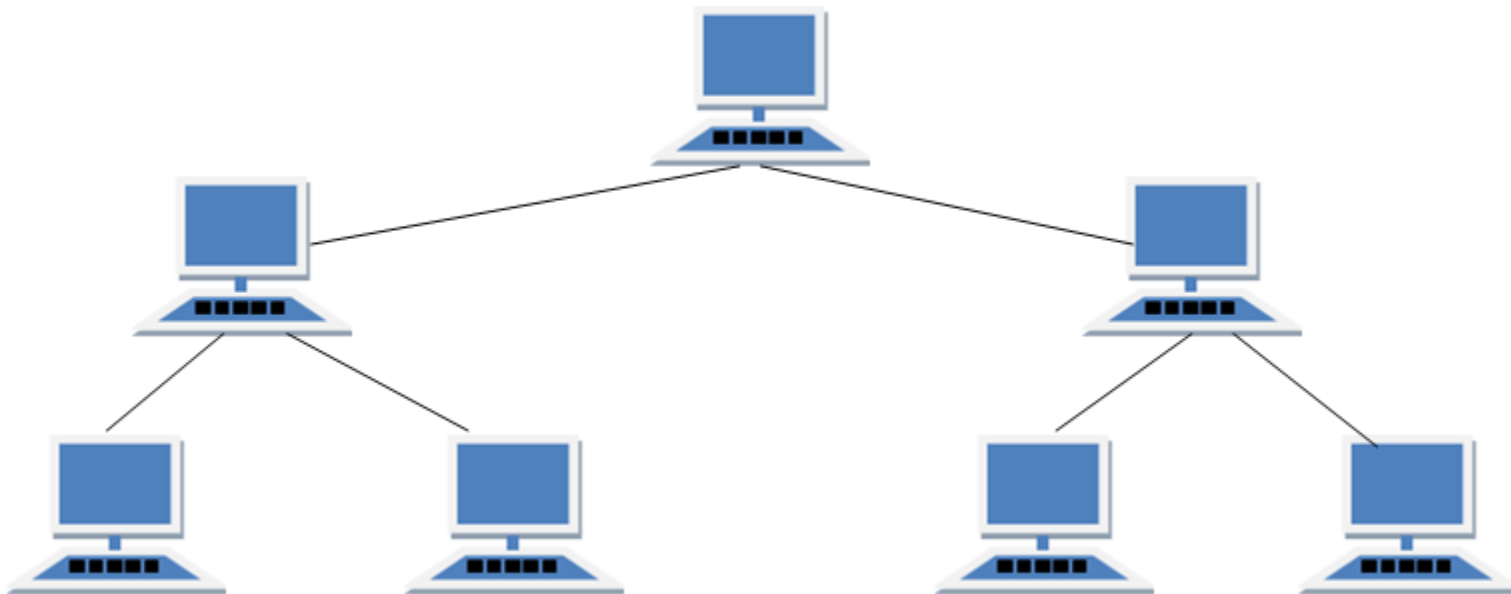
fairly	相当地	decentralized	分散的;非集中的
distributed	分布式的	dispersed	分散的

11.4 Categories of Networks

- The hierarchical network also called a hybrid network consists of several computers linked to a central host computer, just like a star network.
- 层次型网络也称为混合网络，由多台计算机组成，**这些计算机**与一台中央主机相连，就像星形网络一样。
- However, these computers are also hosts **to** others, smaller computers or **to** peripheral devices.
- 然而，**这些计算机**也是其他计算机、小型计算机或外围设备的主机。

hybrid	混合的		
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11.4 Categories of Networks



hierarchical network

11.4 Categories of Networks

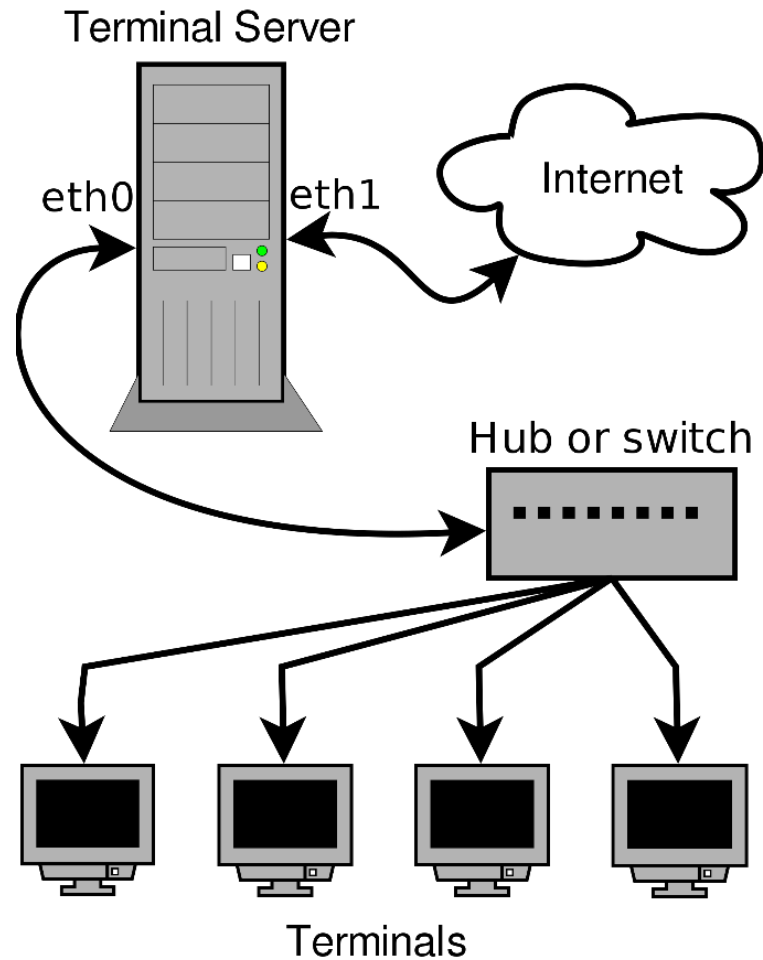
- The hierarchical network allows various computers to share databases, processing power, and different output devices.
- 层次型网络允许各种计算机共享数据库、处理能力和不同的输出设备。
- The minicomputers in turn may be connected to the corporation's mainframe, which contains data and programs accessible to all.
- 微型计算机可以继而连接到公司的大型机，这些大型机中包含所有部门都可以访问的数据和程序。

11.4 Categories of Networks

- Every network has a strategy, or way of coordinating the sharing of information and resources.
- 每个网络都有一个协调信息和资源共享的策略或方式。
- The most common network strategies are terminal, client/server, and peer-to-peer systems.
- 最常见的网络策略是终端、客户/服务器和对等系统。

client/server	客户/服务器	peer-to-peer	对等的

11.4 Categories of Networks



11.4 Categories of Networks

- The nodes connected to this host computer are either terminals with little or no processing capabilities or microcomputers running special software that allows them to act as terminals.
- 连接到这台主机的节点要么是只有很少或没有处理能力的终端，要么是运行特殊软件的微型计算机，这些软件允许它们充当终端。

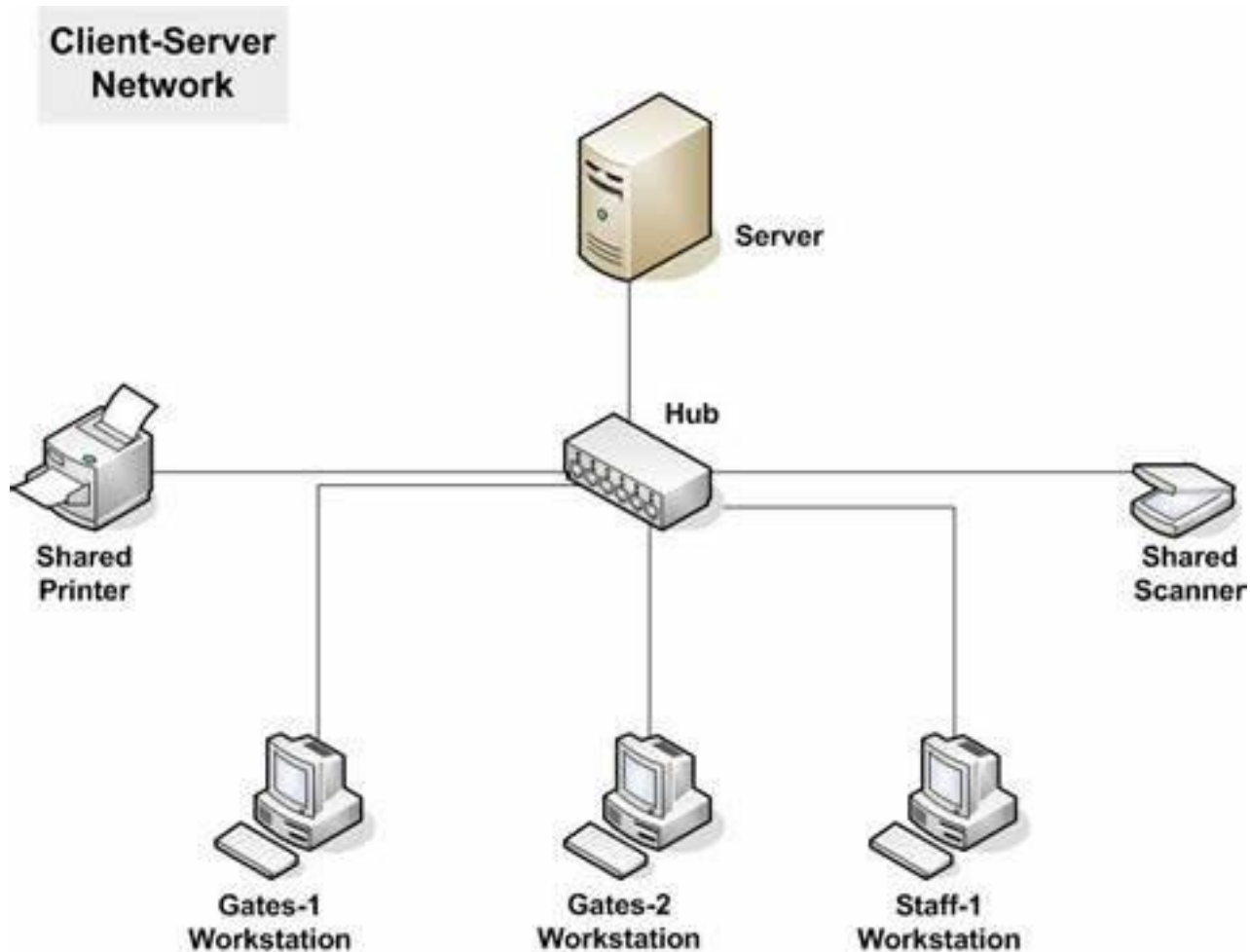
configuration	n. 配置	prime v.	把(事物)准备好
itinerary	行程		

11.4 Categories of Networks

- One advantage of terminal network systems is the centralized location and control of technical personnel, software, and data.
- 终端网络系统的一个优点是位置和技术人员、软件和数据控制的集中。
- Another disadvantage is that terminal systems do not use the full processing power available with microcomputers.
- 另一个缺点是终端系统没有使用微型计算机的全部处理能力。

flexibility	灵活性		

11.4 Categories of Networks



11.4 Categories of Networks

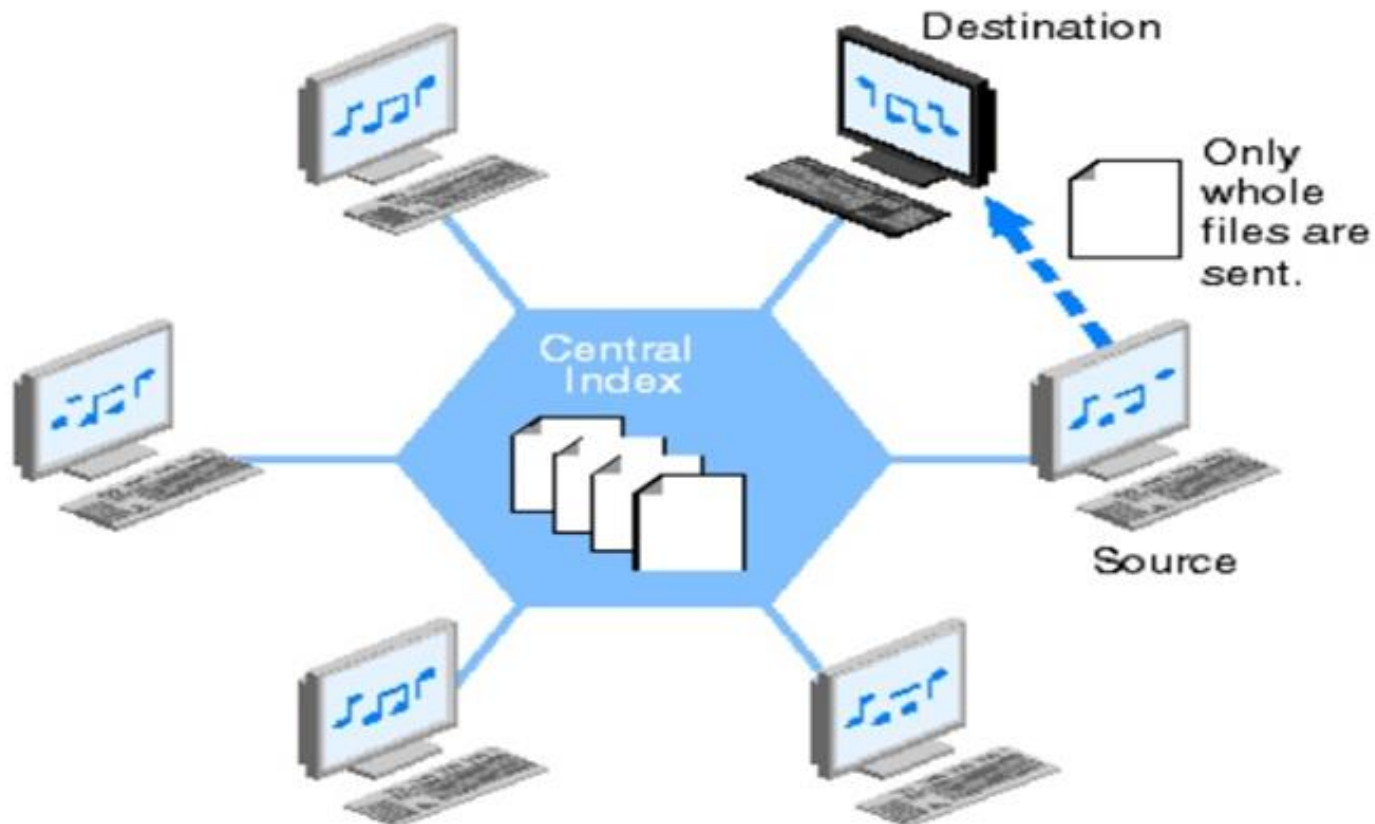
- The music enthusiasts were clients requesting services (information regarding the location of others willing to share music files) from Napster servers.
- 音乐发烧友是客户，他们从Napster服务器请求服务（关于愿意共享音乐文件的其他人的位置信息）。
- Another advantage is the availability of powerful network management software to monitor and control network activities.
- 另一个优点是可以使用功能强大的网络管理软件来监视和控制网络活动。

specialization	专业化	copyrighted a.	受版权保护的
monitor v.	监视		

11.4 Categories of Networks

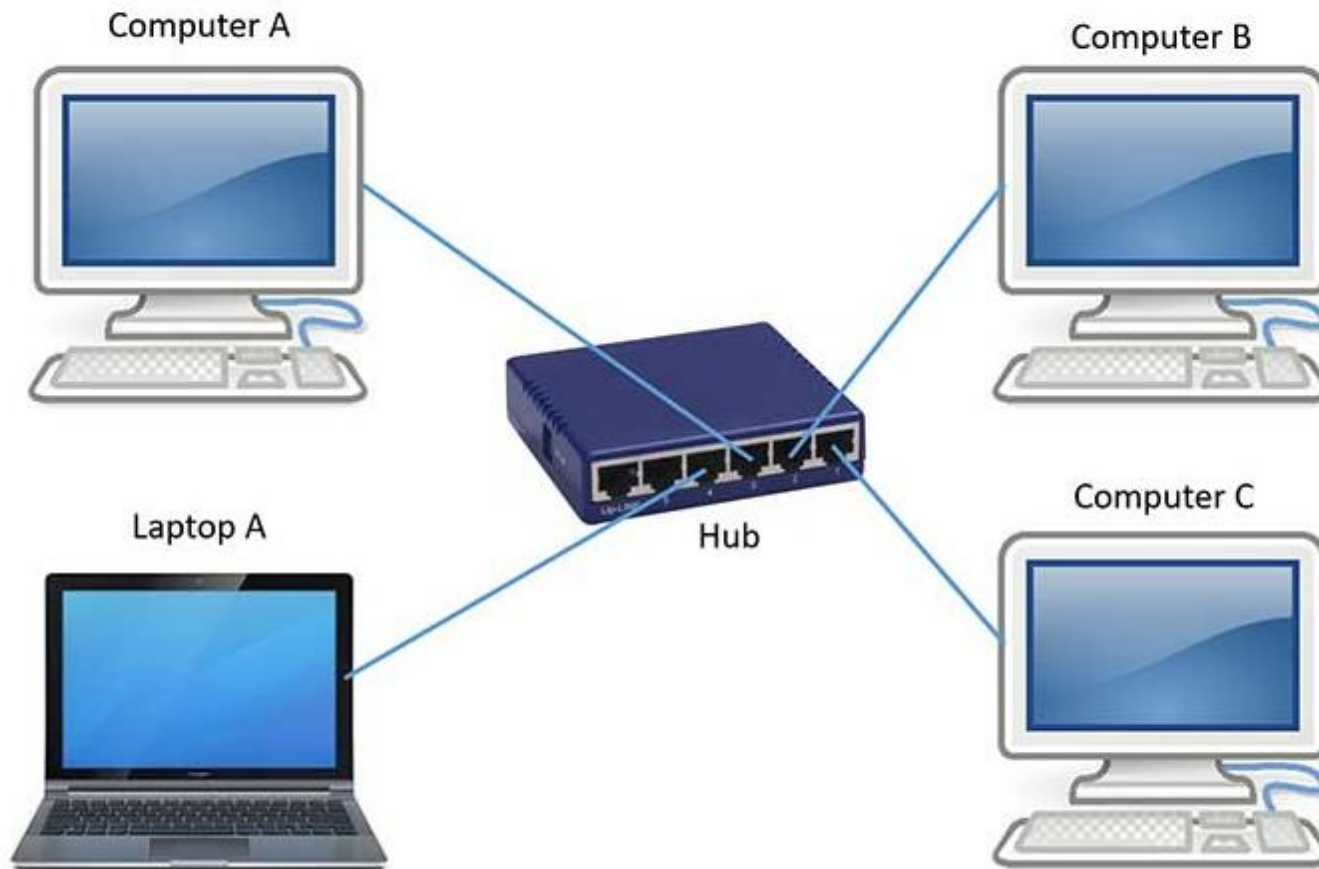
THE ORIGINAL NAPSTER

Napster provided a central directory of users who had files to share.



11.4 Categories of Networks

Peer to Peer Network



11.4 Categories of Networks

- One microcomputer can obtain files located on another microcomputer and can also provide files to other microcomputers.
- 一台微型计算机可以获取另一台微型计算机上的文件，也可以向其他微型计算机提供文件。
- In fact, the Napster approach was actually a hybrid network in which the Napster server worked in a client/sever environment providing a service to clients.
- 事实上，Napster方法实际上是一种混合网络，其中Napster服务器在客户/服务器环境中工作，为客户机提供服务。

authority n.

权利

11.4 Categories of Networks

- Once a Napster user had the location of requested music files, he or she could sign off the network and then connect directly to the source forming a very simple peer-to-peer network.
- 一旦Napster用户获得了所请求的音乐文件的位置，他或她就可以退出(客户/服务器)网络，然后直接连接到源，形成一个非常简单的对等网络。

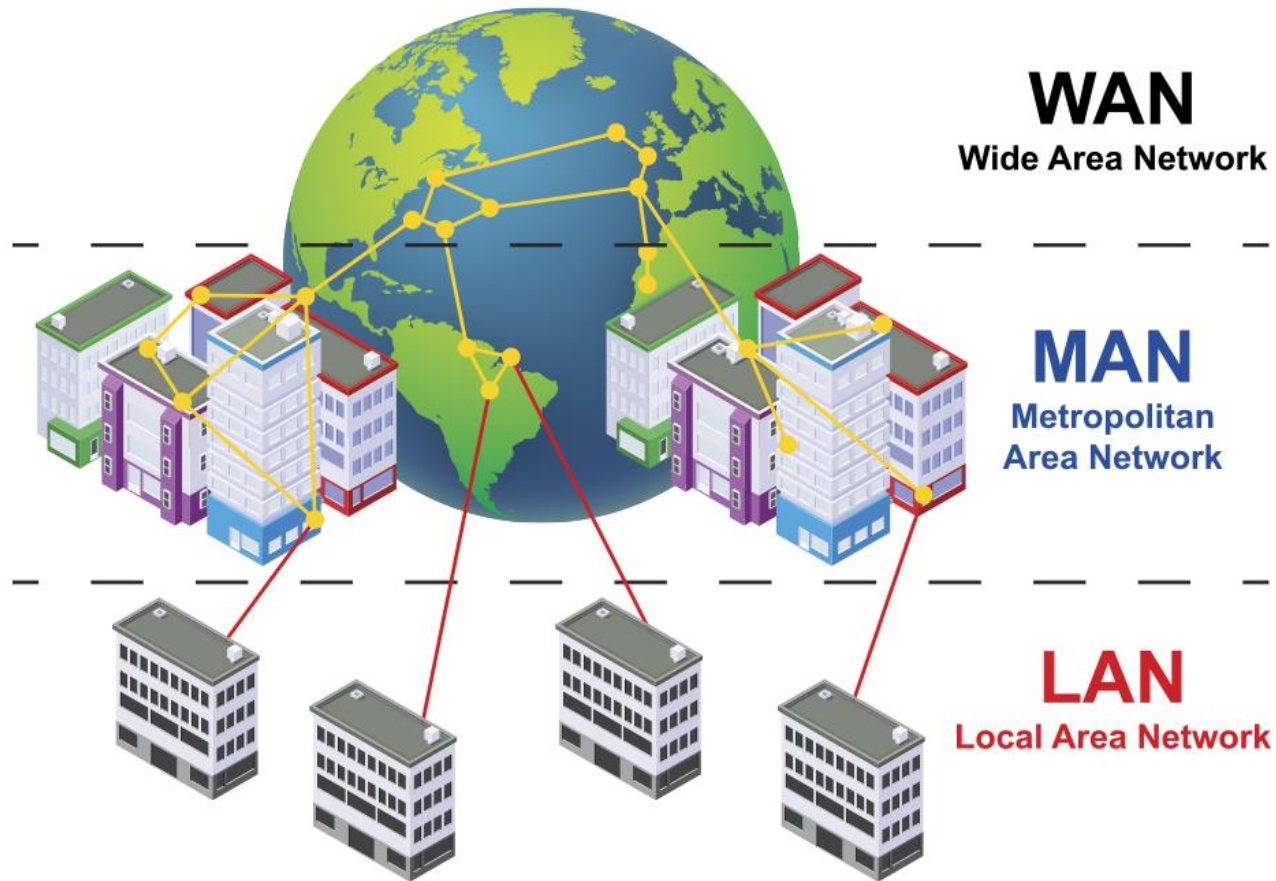
sign off	注销；退出		

11.4 Categories of Networks

- Each node could act as a server by providing access to music files and a client by receiving copies of music files.
- 每个节点都可以通过提供对音乐文件的访问来充当服务器，也可以通过接收音乐文件的副本来充当客户端。
- For these reasons, peer-to-peer networks are typically used by smaller networks within organizations and for sharing files on the Internet.
- 由于这些原因，点对点网络通常被组织内较小的网络使用，用于在因特网上共享文件。

focal point	焦点	decline v.	下降

11.4 Categories of Networks



scale

规模；范围

internetwork

互联网络

11.4 Categories of Networks



Internet

因特网

LAN

局域网

11.4 Categories of Networks

- Local area networks are privately owned networks within a single building or campus of up to a few kilometers in size.
- 局域网是一座建筑物或几公里大小的校园内的私有网络。
- They are widely used to connect personal computers and workstations in company offices and factories to share resources (e.g., printers) and exchange information.
- 它们广泛用于连接公司办公室和工厂的个人电脑和工作站，以共享资源（如打印机）和交换信息。

TCP, transmission control protocol			传输控制协议
transmission	传输	Mbps	megabit per second
microsecond	微秒	gigabit	Gb = 10^9 bits

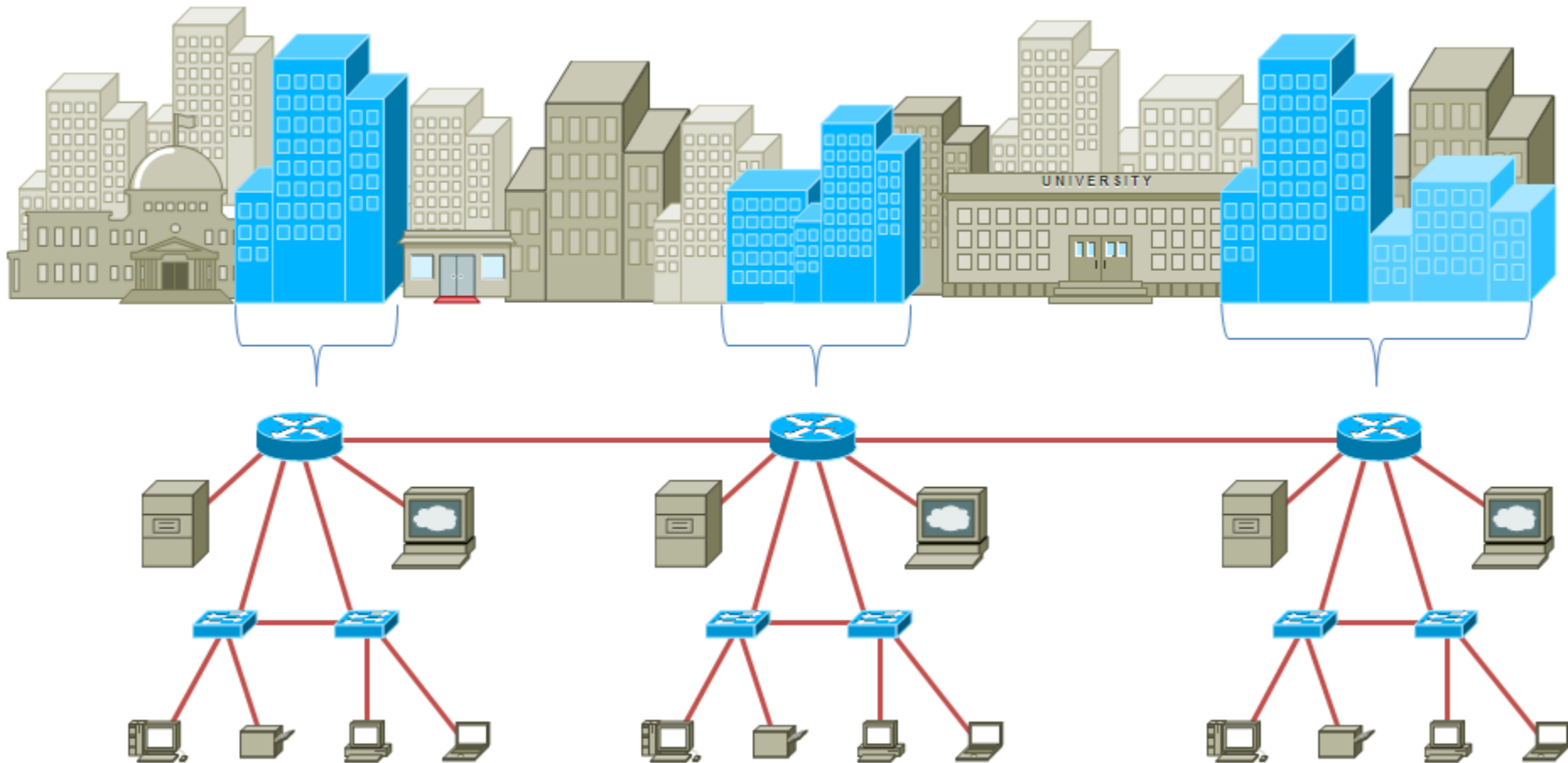
11.4 Categories of Networks

- Traditional LANs run at speeds of 10 to 100 Mbps, have low delay (tens of microseconds), and make very few errors.
- 传统的局域网以10到100 Mbps的速度运行，具有低延迟（几十微秒），并且很少出错。
- It may be a single network such as a cable television network, or it may be a means of connecting a number of LANs into a larger network so that resources may be shared LAN-to-LAN as well as device-to-device.
- 它可以是单个网络，例如有线电视网络，也可以是将多个局域网连接到一个更大的网络中，以便可以在局域网到局域网以及设备到设备之间共享资源。

MAN

城域网

11.4 Categories of Networks



11.4 Categories of Networks

- It provides long-distance transmission of data, voice, image, and video information over large geographical area.
- 它能在广大地理区域内提供数据、语音、图像和视频信息的远程传输。
- In contrast to LANs (which depend on their own hardware for transmission), WANs **may** utilize public, leased, or private communication devices, usually in combinations, and **can** therefore span an unlimited number of miles.
- 与局域网（依赖自己的硬件设备进行传输）不同，广域网可以使用公共、租赁或私人通信设备，通常是组合使用，因此可以覆盖无限的范围。

WAN

广域网

enterprise network

企业网

11.4 Categories of Networks

- A WAN that is wholly owned and used by a single company is often referred to as an enterprise network.
- 由一家公司完全拥有和使用的广域网通常被称为企业网。
- People connected to one network often want to communicate with people attached to a different one.

过去分词短语 `connected to one network` 作定语，修饰主语 `people`。`attached to a different one` 作定语，修饰介词 `with` 的宾语 `people`。`one` 指代 `network`。

- 连接到一个网络的用户通常希望与连接到另一个网络的用户进行通信。

enterprise network	企业网		

11.4 Categories of Networks

- This desire requires connecting together different, and frequently incompatible networks, sometimes by using machines called gateways to make the connection and provide the necessary translation, both in terms of hardware and software.

介词结构 by doing something 作状语，表方式、手段。called gateways 作定语，修饰 machines。不定式短语 to make the connection and provide the necessary translation 表目的。

- 这一愿望要求将不同的、经常不兼容的网络连接在一起，有时使用称为网关的机器进行**连接**，并在硬件和软件方面提供必要的**转换**。

incompatible	不兼容的	gateway	网关
router	路由器		

11.4 Categories of Networks

- One way is to apply Internet technologies to support communication within and between organizations using intranets and extranets.
- 一种方式是通过使用内联网和外联网，应用互联网技术支持组织内部和组织之间的通信。

intranet	内联网;内部网	extranet	外联网;外部网
integrate v.	整合	resemble v.	类似于
browser	浏览器	job opening	职位空缺
FTP	File Transfer Protocol		文件传输协议

11.4 Categories of Networks

- Employee find surfing their organizational intranets to be as easy and as intuitive as surfing the Internet.
- 员工发现浏览组织内部网与浏览互联网一样简单直观。
- By having access to the production schedules, suppliers can schedule and deliver parts as they are need at the General Motors assembly plants.
- 通过访问生产进度表，供应商可以根据通用汽车装配厂的需要安排和交付零件。

supplier	供应商	assembly plant	装配厂
inventory	库存		

11.4 Categories of Networks

