* Internet is a **networking infrastructure** that provides services to **distributed applications (**These applications include electronic mail, Web surfing, social networks, instant messaging, Voiceover-IP (VoIP), video streaming, distributed games, peer-to-peer (P2P) file sharing, television over the Internet, remote login, and much, much more. The applications are said to be distributed applications, since they involve multiple end systems that exchange data with each other.)
* The Internet is a **computer network** that interconnects hundreds of millions of computing devices throughout the world.
* In Internet jargon, all of these devices are called **hosts or end systems**
* End systems are connected together by a network of **communication links** and **packet switches**
* **Communication links**, which are made up of different types of physical media, including coaxial cable, copper wire, optical fiber, and radio spectrum. Different links can transmit **data at different rates**, with the transmission rate of a link measured in bits/second
* When one end system has data to send to another end system, the sending end system **segments the data** and **adds header** bytes to each segment. The resulting packages of information, known as **packets**, are then sent through the network to the destination end system, where they are reassembled into the original data.
* A **packet switch** takes a packet arriving on one of its incoming communication links and forwards that packet on one of its outgoing communication links. two most prominent types in today’s Internet are **routers** and **link-layer switches.**
* Link-layer switches are typically used in **access networks**, while routers are typically used in the **network core**
* The sequence of communication links and packet switches traversed by a packet from the sending end system to the receiving end system is known as a **route**
* End systems access the Internet through **Internet Service Providers (ISPs).** Each ISP is in itself a network of packet switches and communication links.
* ISPs provide a variety of types of network access to the end systems, including
  1. residential broadband access such as cable modem or DSL,
  2. high-speed local area network access,
  3. wireless access, and
  4. 56 kbps dial-up modem access.
  5. ISPs also provide Internet access to content providers, connecting Web sites directly to the Internet
* End systems, packet switches, and other pieces of the Internet run **protocols** that control the sending and receiving of information within the Internet. The Internet’s principal protocols are collectively known as **TCP/IP.**
* **Internet standards** are developed by the Internet Engineering Task Force (IETF). The IETF standards documents are called **requests for comments** (RFCs). As it’s important that everyone agree on what each and every protocol does, so that people can create systems and products that interoperate
* Internet applications run on end systems—they do not run in the packet switches in the network core.
* **Packet switches** facilitate the exchange of data among end systems, they are not concerned with the application that is the source or sink of data

**an infrastructure that provides services to applications**

* you are developing a distributed Internet application, the programs running on the different end systems will need to send data to each other
* How does one program running on one end system instruct the Internet to deliver data to another program running on another end system?
* End systems attached to the Internet provide an **Application Programming Interface** (API) that specifies how a program running on one end system asks the Internet infrastructure to deliver data to a specific destination program running on another end system. This Internet API is a set of rules that the sending program must follow so that the Internet can deliver the data to the destination program.