CHAP 3: E-COMMERCE INFRASTRUCTURE

# K E Y C O N C E P T S

Discuss the origins of, and the key technology concepts behind, the Internet.  
• The Internet has evolved from a collection of mainframe computers located on a few U.S. college campuses to an interconnected network of thousands of networks and millions of computers worldwide.  
• The history of the Internet can be divided into three phases: the Innovation Phase (1961–1974), the Institutionalization Phase (1975–1995), and the Commercialization Phase (1995 to the present).  
• Packet switching, TCP/IP, and client/server technology are key technology concepts behind the Internet.  
• The mobile platform has become the primary means for accessing the Internet.  
• Cloud computing refers to a model of computing in which firms and individuals obtain computing power and software applications over the Internet, rather than purchasing the hardware and software and installing it on their own computers.

• Internet protocols and utility programs such as BGP, HTTP, SMTP and POP, SSL and TLS, FTP, Telnet, Ping, and Tracert provide a number of Internet services. Explain the current structure of the Internet.

• The main structural elements of the Internet are the backbone (composed primarily high-bandwidth fiber optic cable), IXPs (hubs that use high-speed switching computers to connect to he backbone), CANs (campus/corporate area networks), and ISPs (which deal with the “last mile” of service to homes and offices).

• *Governing bodies*, such as IAB, ICANN, IESG, IETF, ISOC, and W3C, have influence over the Internet and monitor its operations, although they do not control it. Understand the limitations of today’s Internet and the potential capabilities of the Internet of the future.

• To envision what the Internet of tomorrow will look like, we must first look at the limitations of today’s Internet, which include bandwidth limitations, quality of service limitations, network architecture limitations, language limitations, and limitations arising from the wired nature of the Internet.  
• Internet2 is a consortium working together to develop and test new technologies for potential use on the Internet. Other groups are working to expand Internet bandwidth via improvements to fiber optics. Wireless and cellular technologies are providing users of mobile devices with increased access to the Internet and its various services. The increased bandwidth and expanded connections will result in a number of benefits, including latency solutions; guaranteed service levels; lower error rates; and declining costs. The Internet of Things will be a big part of the Internet of the future, with more and more sensorequipped machines and devices connected to the Internet.  
Understand how the Web works.

• The Web was developed during 1989–1991 by Dr. Tim Berners-Lee, who created a computer program that allowed formatted pages stored on the Internet to be linked using keywords (hyperlinks). In 1993, Marc Andreessen created the first graphical web browser, which made it possible to view documents on the Web graphically and created the possibility of universal computing.  
• The key concepts you need to be familiar with in order to understand how the Web works are hypertext, HTTP, URLs, HTML, XML, web server software, web clients, and web browsers.  
Describe how Internet and web features and services support e-commerce.  
• Together, the Internet and the Web make e-commerce possible by allowing computer users to access product and service information and to complete purchases online.  
• Some of the specific features that support e-commerce include communication tools such as e-mail, messaging applications, online message boards, Internet telephony, video conferencing, video chatting, and telepresence; search engines; and downloadable and streaming media.  
• Web 2.0 applications and services include social networks, blogs, and wikis.  
• Virtual reality, augmented reality and artificial intelligence technologies have begun to enter the consumer market and attract significant attention. Understand the impact of mobile applications.  
• The mobile app phenomenon has spawned a new digital ecosystem.  
• Smartphone and tablet users spent the majority of their time using mobile apps rather than the mobile Web.

• There are a variety of different platforms for mobile application development including Objective-C (for iOS devices), Java (Android smartphones), and C and C++ (Windows mobile devices).  
• Mobile apps for the iPhone are distributed through Apple's App Store, for Android devices through Google Play, and for Windows mobile devices through Microsoft’s Windows Phone Marketplace. There are also third-party vendors such as Amazon's Appstore.

# QUESTIONS

1. What are the three basic building blocks of the Internet?
2. What is latency, and how does it interfere with Internet functioning?
3. Explain how packet switching works.
4. How is the TCP/IP protocol related to information transfer on the Internet?
5. What technological innovation made client/server computing possible?
6. What is cloud computing, and how has it impacted the Internet?
7. Why are smartphones a disruptive technology?
8. What role does a Tier 1 ISP play in Internet infrastructure?
9. What function do the IXPs serve?
10. What is the goal of the Internet2 project?
11. Compare and contrast intranets and the Internet as a whole.
12. What are some of the major limitations of today’s Internet?
13. What are some of the challenges of policing the Internet? Who has the final say when it comes to content?
14. Compare and contrast the capabilities of Wi-Fi and cellular wireless networks.
15. What are the basic capabilities of a web server?
16. What are the major technological advancements that are anticipated to accompany the Internet of the future? Discuss the importance of each.
17. Why was the development of the browser so significant for the growth of the Web?
18. What advances and features does HTML5 offer?
19. Name and describe five services currently available through the Web.
20. Why are mobile apps the next big thing?