Infrastructure for E-Commerce

Chapter- 02

Internet

Internet is an electronic communications network that connects computer networks and organizational computer facilities around the world.

The Internet, sometimes called simply "the Net," is a worldwide system of computer networks -- a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers).

*“**Internet** is the global system of interconnected computer networks that uses the Internet protocol suite to communicate between networks and devices.”*

-Wikipedia

The Evolution of Internet

1. **Innovation**

   1961-1974

2. **Institutionalization**

   1975-1995

3. **Commercialization**

   1995-Present

The Internet: Key Technology

- Packet Switching
- Transmission Control Protocol/Internet Protocol(TCP/IP)
- IP Addresses
- Domain Names, Domain Name System(DNS), Uniform Resource Locator(URL)
- Client/Server Computing

Cloud Computing

Cloud computing is the delivery of different services through the Internet. These resources include tools and applications like data storage, servers, databases, networking, and software.

Rather than keeping files on a proprietary hard drive or local storage device, cloud based storage makes it possible to save them to a remote database. As long as an electronic device has access to the web, it has access to the data and the software programs to run it.

Cloud computing is a popular option for people and businesses for a number of reasons including cost savings, increased productivity, speed and efficiency, performance, and security.

“Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user. The term is generally used to describe data centers available to many users over the Internet.”

-Wikipedia

Why Cloud Computing?

- Inexpensive
- Elasticity & Flexibility
- Auto Updating
- Increased Collaboration
- Agility & Speed

Types of Clouds

- ❑ Private Cloud
- ❑ Community Cloud
- ❑ Public Cloud
- ❑ Hybrid Cloud

Cloud Computing Services

1. Software as a Service(SaaS)
2. Platform as a Service(PaaS)
3. Infrastructure as a Service(IaaS)

Virtualization & Cloud Computing

- Network Virtualization
- Storage Virtualization
- Server Virtualization

Grid Computing VS Cloud Computing

Cloud Computing	Grid Computing
Cloud Computing follows client-server computing architecture.	Grid computing follows a distributed computing architecture.
Scalability is high.	Scalability is normal.
Cloud Computing is more flexible than grid computing.	Grid Computing is less flexible than cloud computing.
Cloud operates as a centralized management system.	Grid operates as a decentralized management system.
In cloud computing, cloud servers are owned by infrastructure providers.	In Grid computing, grids are owned and managed by the organization.
Cloud computing uses services like Iaas, PaaS, and SaaS.	Grid computing uses systems like distributed computing, distributed information, and distributed pervasive.
Cloud Computing is Service-oriented.	Grid Computing is Application-oriented.
It is accessible through standard web protocols.	It is accessible through grid middleware.

Utility Computing VS Cloud Computing

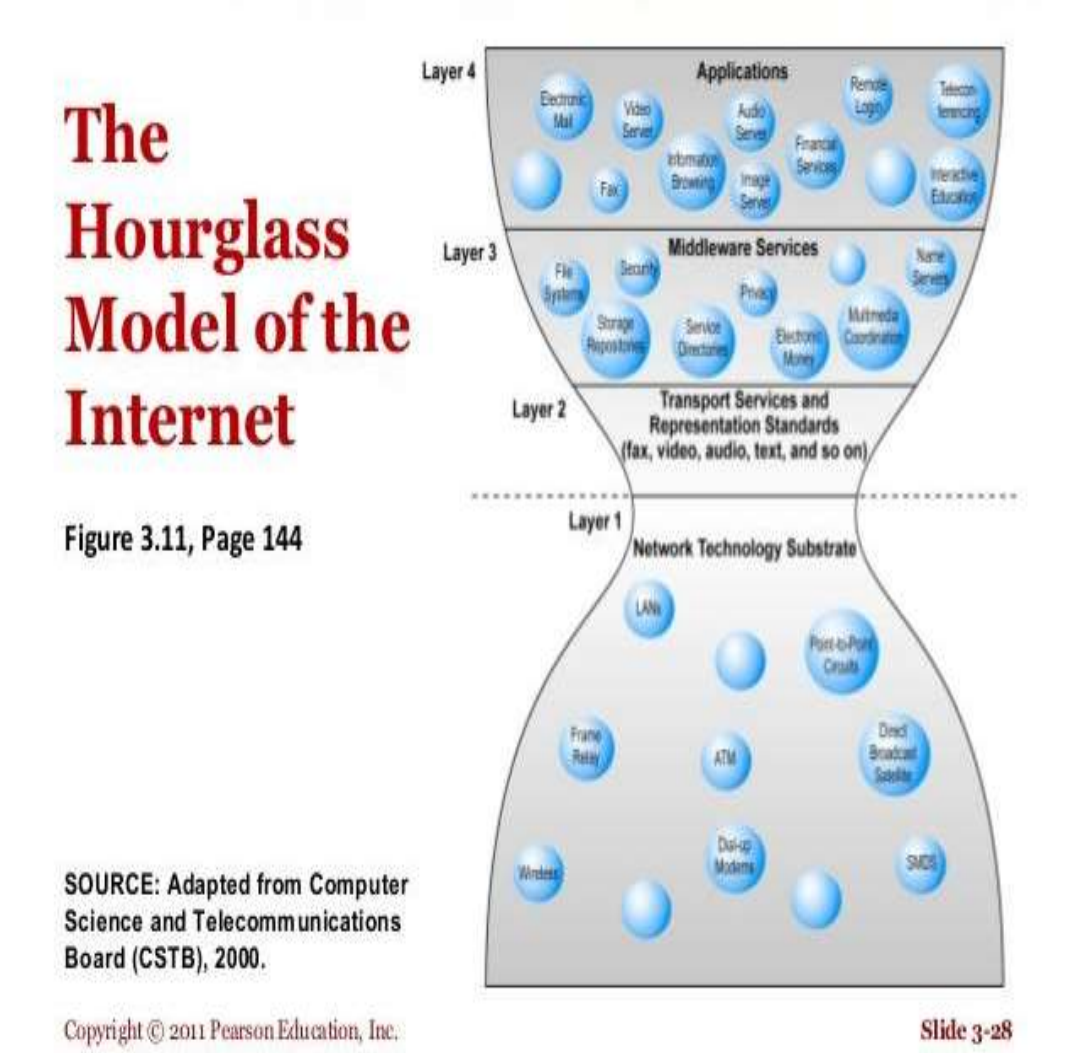
Cloud Computing	Utility Computing
Cloud Computing also works like utility computing, you pay only for what you use but Cloud Computing might be cheaper, as such, Cloud based app can be up and running in days or weeks.	Utility computing refers to the ability to charge the offered services, and charge customers for exact usage
In cloud computing, provider is in complete control of cloud computing services and infrastructure	Utility computing users want to be in control of the geographical location of the infrastructure
Cloud computing is great and easy to use when the selection infrastructure and performance is not critical	Utility computing is more favorable when performance and selection infrastructure is critical
Cloud computing is a good choice for high resource demanding	Utility computing is a good choice for less resource demanding
Cloud computing refers to the underlying IT architecture	Utility computing refers to a business model

Different Types of Protocols

- TCP (Transmission Control Protocol)
- HTTP (Hypertext Transfer Protocol)
- FTP (File Transfer Protocol)
- POP (Post Office Protocol)
- SMTP (Simple Mail Transfer Protocol)
- Ethernet
- Wi-Fi
- IP (Internet Protocol)

Internet Today

- Network Technology Substrates
- Transport Services & Representation Standards
- Middleware Services Layer
- Applications Layer



Network Service Providers(NSPs)

A network service provider (NSP) is a company that owns, operates and sells access to Internet backbone infrastructure and services. The primary customers of NSPs are other service providers, including internet service providers (IPS), which, in turn, sell internet access to businesses and consumers.

“A network service provider (NSP) is a business or organization that sells bandwidth or network access by providing direct Internet backbone access to internet service providers and usually access to its network access points (NAPs).”

-Wikipedia

A network service provider (NSP) is a business entity that provides or sells services such as network access and bandwidth by allowing access into its backbone infrastructure or access to its network access points (NAP), which consequently also means access to the Internet.

Internet Access Technologies

- Dial-Up Internet Access
- DSL(Digital Subscriber Loop)
- Cable Internet
- Wireless Broadband(WiBB)
- Wi-Fi Internet
- ISDN(Integrated Services Digital Network)
- Ethernet

Who Governs the Internet?

- The internet Corporation for Assigned Names & Numbers(ICANN)
- The Internet Engineering Task Force(IETF)
- The Internet Research Task Force(IRTF)
- The Internet Engineering Steering Group(IESG)
- The Internet Architecture Board(IAB)
- The Internet Society

The Future Internet Infrastructure

- Differentiated quality of service (diffserv)
- Guaranteed Service Levels and Lower Error Rates
- Declining Costs
- The Internet of Things

Limitations of the Current Internet

- Bandwidth limitations
- Quality of service limitations
- Network architecture limitations
- Wired Internet

Internet2

Internet2 is a U.S.-based and international nonprofit networking consortium led by researchers, academia and industry/government leaders. Launched in 1996, Internet2 works to advance the development of networking education and global partnering to facilitate innovative Internet technologies.

Internet2 manages the Internet2 Network, a next-generation optical and Internet Protocol network.

Internet2 is a not-for-profit United States computer networking consortium led by members from the research and education communities, industry, and government.

Requirement for Internet

- Hardware Requirement
- Software Requirement

Web

The Web is the common name for the World Wide Web, a subset of the Internet consisting of the pages that can be accessed by a Web browser.

*“The **World Wide Web** (**WWW**), commonly known as the **Web**, is an information system where documents and other web resources are identified by Uniform Resource Locator (URL), which may be interlinked by Hyperlink and are accessible over the Internet.”*

-Wikipedia

Internet VS Web

Estimated year of Origin	1969, though opening of the network to commercial interests began only in 1988	1993
Name of the first version	ARPANET	NSFnet
Comprises	Network of Computers, copper wires, fibre-optic cables & wireless networks	Files, folders & documents stored in various computers
Governed by	Internet Protocol	Hyper Text Transfer Protocol
Dependency	This is the base, independent of the World Wide Web	It depends on Internet to work
Nature	Hardware	Software

HTTP

Hyper **T**ext **T**ransfer **P**rotocol(HTTP) the communications protocol used to connect to Web servers on the Internet or on a local network (intranet). The primary function of HTTP is to establish a connection with the server and send HTML pages back to the user's browser. It is also used to download data from the server either to the browser or to any requesting application that uses HTTP.

*“The **Hypertext Transfer Protocol** (**HTTP**) is an application layer protocol for distributed, collaborative, hypermedia information systems.”*

-Wikipedia

The Hypertext Transfer Protocol is an application protocol for distributed, collaborative, hypermedia information systems that allows users to communicate data on the World Wide Web.

HTTPS

HTTPS stands for Hypertext Transfer Protocol Secure. It is the protocol where encrypted HTTP data is transferred over a secure connection. By using secure connection such as Transport Layer Security or Secure Sockets Layer, the privacy and integrity of data are maintained and authentication of websites is also validated.

*“**Hypertext Transfer Protocol Secure** (**HTTPS**) is an extension of the Hypertext Transfer Protocol (HTTP). It is used for secure communication over a computer network, and is widely used on the Internet.”*

-Wikipedia

Hypertext Transfer Protocol Secure (HTTPS) is a variant of the standard web transfer protocol (HTTP) that adds a layer of security on the data in transit through a secure socket layer (SSL) or transport layer security (TLS) protocol connection.

HTTPS enables encrypted communication and secure connection between a remote user and the primary web server.

HTTP VS HTTPS

Parameter	HTTP	HTTPS
Protocol	It is hypertext transfer protocol.	It is hypertext transfer protocol with secure.
Security	It is less secure as the data can be vulnerable to hackers.	It is designed to prevent hackers from accessing critical information. It is secure against such attacks.
Port	It uses port 80 by default	It was use port 443 by default.
Starts with	HTTP URLs begin with http://	HTTPs URLs begin with https://
Used for	It's a good fit for websites designed for information consumption like blogs.	If the website needs to collect the private information such as credit card number, then it is a more secure protocol.
Speed	Fast	Slower than HTTP
Vulnerability	Vulnerable to hackers	It Is highly secure as the data is encrypted before it is seen across a network.

Web Software Servers

- Security Server
- FTP(File Transfer Protocol)
- Search Engine
- Data Capture
- Web Server

The Internet & The Web: Features & Services

- E-mail
- Instant Messaging
- Search Engines
- Online Forums
- Streaming Media
- Cookies

Web Features & Services

- Online Social Network
- Blogs
- Really Simple Syndication(RSS)
- Podcasting
- Wikis
- Music & Video Services
- Internet Telephony
- Video Conferencing, Video Chatting & Telepresence
- Online Software & Web Services: Web Apps, Widgets & Gadgets
- Intelligent Personal Assistant

Mobile Apps

- Mobile App Functions
- Operating System Compatibility
- Why Mobile Apps Are Different from Regular Apps
- “Mobile First” Development
- Finding & Installing Mobile Apps
- Installation is Fast & Easy


THANK YOU