

Unit 2: World Wide Web

WWW:

The World Wide Web—usually called the Web for short—is a collection of different websites you can access through the Internet.

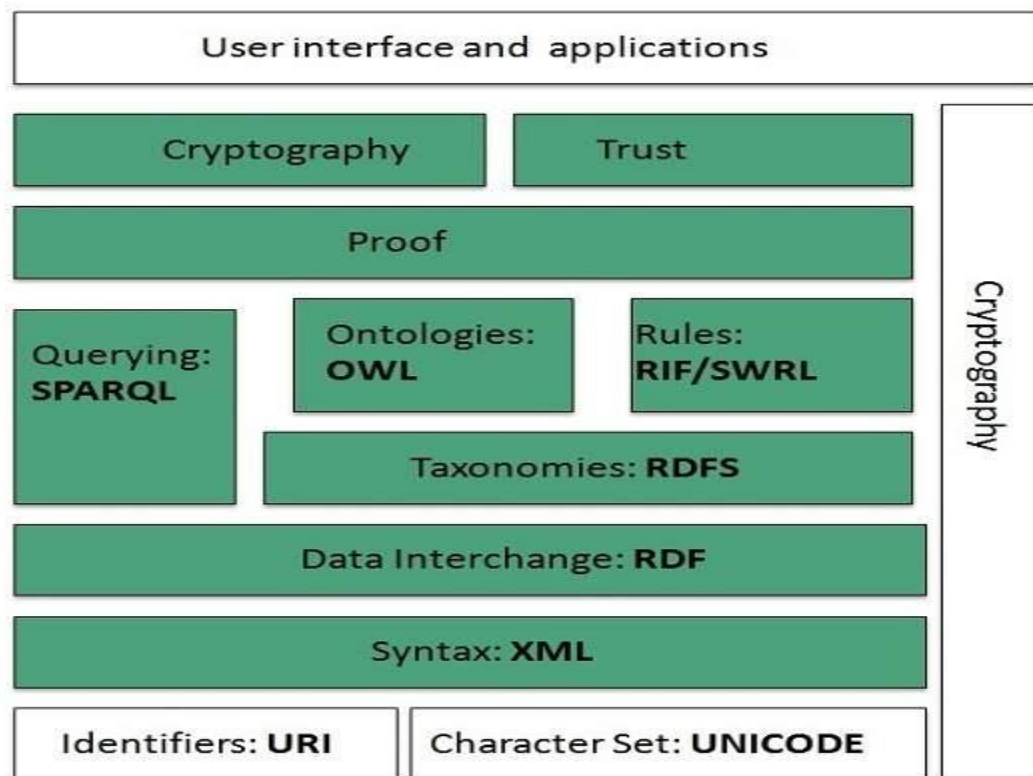
A website is made up of related text, images, and other resources. Websites can resemble other forms of media—like newspaper articles or television programs—or they can be interactive in a way that's unique to computers.

The purpose of a website can be almost anything: a news platform, an advertisement, an online library, a forum for sharing images, or an educational site.

Once you are connected to the Internet, you can access and view websites using a type of application called a web browser.

WWW Architecture

WWW architecture is divided into several layers as shown in the following diagram:



Identifiers and Character Set

Uniform Resource Identifier (URI) is used to uniquely identify resources on the web and UNICODE makes it possible to built web pages that can be read and write in human languages.

Syntax

XML (Extensible Markup Language) helps to define common syntax in semantic web.

Data Interchange

Resource Description Framework (RDF) framework helps in defining core representation of data for web. RDF represents data about resource in graph form.

Taxonomies

RDF Schema (RDFS) allows more standardized description of taxonomies and other ontological constructs.

Ontology

Web Ontology Language (OWL) offers more constructs over RDFS. It comes in following three versions:

- OWL Lite for taxonomies and simple constraints.
- OWL DL for full description logic support.
- OWL for more syntactic freedom of RDF

Rules

RIF and SWRL offers rules beyond the constructs that are available from RDFs and OWL. Simple Protocol and RDF Query Language (SPARQL) is SQL like language used for querying RDF data and OWL Ontologies.

Proof

All semantic and rules that are executed at layers below Proof and their result will be used to prove deductions.

Cryptography

Cryptography means such as digital signature for verification of the origin of sources is used.

User Interface and Applications

On the top of layer User interface and Applications layer is built for user interaction.

Internet Protocols:

Transmission Control Protocol (TCP):

TCP is a connection oriented protocol and offers end-to-end packet delivery. It acts as backbone for connection. It exhibits the following key features:

- Transmission Control Protocol (TCP) corresponds to the Transport Layer of OSI Model.
- TCP is a reliable and connection oriented protocol.
- TCP offers:
 - Stream Data Transfer.
 - Reliability.
 - Efficient Flow Control
 - Full-duplex operation.
 - Multiplexing.
- TCP offers connection oriented end-to-end packet delivery.
- TCP ensures reliability by sequencing bytes with a forwarding acknowledgement number that indicates to the destination the next byte the source expect to receive.
- It retransmits the bytes not acknowledged within specified time period.

Internet Protocol (IP):

Internet Protocol is connectionless and unreliable protocol. It ensures no guarantee of successful transmission of data. In order to make it reliable, it must be paired with reliable protocol such as TCP at the transport layer.

Internet protocol transmits the data in form of a datagram.

User Datagram Protocol (UDP):

UDP is connectionless and unreliable protocol. It doesn't require making a connection with the host to exchange data. Since UDP is unreliable protocol, there is no mechanism for ensuring that data sent is received.

- UDP transmits the data in form of a datagram.
- UDP is used by the application that typically transmit small amount of data at one time.
- UDP provides protocol port used i.e. UDP message contains both source and destination port number, that makes it possible for UDP software at the destination to deliver the message to correct application program.

File Transfer Protocol (FTP):

FTP is used to copy files from one host to another. FTP offers the mechanism for the same in following manner:

- FTP creates two processes such as Control Process and Data Transfer Process at both ends i.e. at client as well as at server.
- FTP establishes two different connections: one is for data transfer and other is for control information.
- FTP uses **port 21** for the control connection and **Port 20** for the data connection.

Trivial File Transfer Protocol (TFTP):

Trivial File Transfer Protocol is also used to transfer the files but it transfers the files without authentication.

Unlike FTP, TFTP does not separate control and data information. Since there is no authentication exists, TFTP lacks in security features therefore it is not recommended to use TFTP.

Hyper Text Transfer Protocol (HTTP):

HTTP is a communication protocol. It defines mechanism for communication between browser and the web server.

It is also called request and response protocol because the communication between browser and server takes place in request and response pairs.

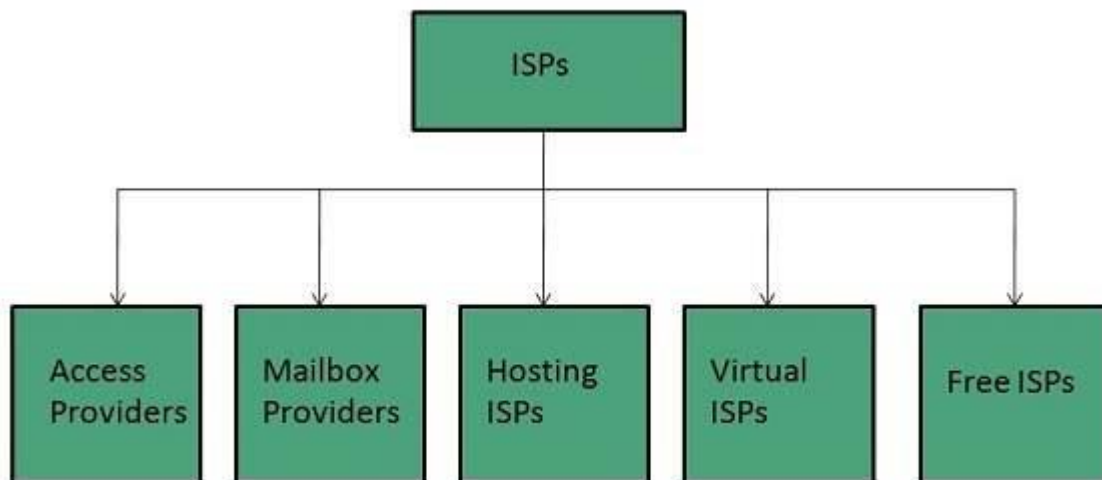
ISP (Internet Service Provider)

Internet Service Provider (ISP) is a company offering access to internet. They offer various services:

- Internet Access
- Domain name registration
- Dial-up access
- Leased line access

ISP Types

ISPs can broadly be classified into six categories as shown in the following diagram:



Access providers

They provide access to internet through telephone lines, cable wi-fi or fiber optics.

Mailbox Provider

Such providers offer mailbox hosting services.

Hosting ISPs

Hosting ISPs offers e-mail, and other web hosting services such as virtual machines, clouds etc.

Virtual ISPs

Such ISPs offer internet access via other ISP services.

Free ISPs

Free ISPs do not charge for internet services.

Applications of Internet

1. Communication

Computer users around the world extensively use the email service on internet to communicate with each other. Pictures, documents and other files are sent as email attachments. Emails can be cc-ed to multiple email addresses

Internet telephony is another common communications service made possible by the creation of the Internet. VoIP stands for Voice-over-Internet Protocol, referring to the protocol that underlies all Internet communication.

2. Job search

Nowadays, many people search for their jobs online as it is quicker and there is a larger variety of job vacancies present. People can publish resume online for prospective job. Some of the web sites providing this service are naukri.com, monster.com, summerjob.com, recuritmentindia.com etc.

3. Online Shopping

The internet has also facilitated the introduction of a new market concept consisting of virtual shops. They provide information about products or services for sale through www servers. Using the internet services customers can submit specific product queries and request specific sales quotes. For example amazon.com is a www based bookshop on the internet where information on all types of international books can be found and books can be ordered online.

4. Stock market updates

You can sell or buy shares while sitting on computer through internet. Several websites like ndtvprofit.com, moneypore.com, provide information regarding investment.

5. Travel

One can use internet to gather information about various tourist place . it can be used for booking Holiday tours , hotels, train,bus, flights and cabs. Some of the web sites providing this service are goibibo.com, makemytrip.com, olacabs.com.

6. Research

Research papers are present online which helps in the researcher doing literature review

7. Video Conferencing:

It enables direct face-to-face communication across networks via web cameras, microphones, and other communication tools. Video conferencing can enable individuals in distant locations to participate in meetings on short notice, with time and money savings. The technology is also used for telecommuting, in which employees work from home. When video Conferencing is used in education, it is easier to have interactive communications between teacher to teacher, teacher to classroom, or classroom to classroom with students in different places.

8. E-Commerce

E-commerce (electronic **commerce** or EC) is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, primarily the Internet. These business transactions occur either business-to-business, business-to-consumer, consumer-to-consumer or consumer-to-business. Largest e-commerce companies in India are Flipkart, Snapdeal, Amazon India, Paytm.

9. On-line payments

The rising boom of online payments in India has given way to many new entrants in the industry such as Paytm, Mobikwik, oxigen etc who are majorly wallet driven payment companies. this growth has been driven by rapid adoption led by the increasing use of smartphones, tablets and speedy access to internet through broadband, 3G etc

10. Social networking

Social networking is the use of internet-based social media programs to make connections with friends, family, classmates, customers and clients. Social networking can be done for social purposes, business purposes or both. The programs show the associations between individuals and facilitate the acquisition of new contacts. Examples of social networking have included Facebook, LinkedIn, Classmates.com and Yelp.