

→ TYPES of Computer Network.

→ IP address.

→ Software and TYPES of Software.

→ IPV4 and IPV6.

→ A Computer network is a system that connects numerous independent computers in order to share information and resources.

A computer network is a collection of two or more computer systems that are linked together.

A network connection can be established using either cable or wireless media. Hardware and software are used to connect computers and tools in any network.

Types of computer network are

Based on communication medium we have:

→ wired Network

→ wireless network.

Based on Area covered we have:

→ Local Area Network (LAN) - covers area of 10 km.
Ex: A college network→ Metropolitan Area Network (MAN) - covers an entire city.
Ex: Cable Television network

→ Wide Area Network (WAN) - connects countries or continents.

Based on Types of Communication we have:

→ Point to Point Networks - Direct link between two devices such as computer and printer.

→ Broadcast Network - In Broadcast network, a signal method in which numerous parties can hear a single sender. Ex: Radio Station

Based on Architecture we have:

→ P2P Networks - Peer to Peer network are computer systems that are connected to each other Internet without the use of central server files can be shared directly.

→ Client-Server Network - Client ask services from server which service provider. Servers manage databases.

→ Hybrid network - It is a combination of Client-Server and peer-to-peer architecture. Ex: Torrent.

→ IP Address :

An IP address is a unique address that identifies a device on the internet or a local network. IP stands for Internet Protocol, which is the set of rules governing the format of data sent via internet or local network.

IPv4 and IPv6 : The main difference between these two are the size of IP addresses. The IPv4 is a 32-bit address where IPv6 is a 128-bit Hexadecimal address. IPv6 provides a large address space and it contains a simple header as compared to IPv4.
IPV = Internet Protocol version .

→ Software is a set of instructions data or program used to operate computers and execute specific tasks. Software is a generic term used to refer to applications, script and programs that run on a device. It can be thought of as the visible part of computers, while hardware is invisible part.

→ Two main categories of software are Application Software and System Software. An application is software that fulfills specific need or performs tasks. System software is designed to run a computer's hardware and provides a platform for application to run on top off.

Other types of software are :

Programming Software : Which provides the programming tools software developers need

Middle ware : Which sits between system software and application.

Driver Software : Which operates computer devices and peripherals .

a/4/22

file management system is a software which helps to Read & write file.

A server is a machine which will have capability to respond to a request.

Assignment :

what is Database ?

What is DBMS.

Types of DBMS.

What is Client Server Architecture ?

→ Data is a collection of distinct small ^{unit} amount of information. It can be used in a variety of forms like text, numbers, media, bytes etc, it can be stored in piece of paper or electronic memory etc.

Database is an organized collection of data, so that it can be easily accessed and managed.

You can organize data into tables, rows, columns and index it to make it easier to find relevant information. Database handlers create a database in such a way that only one set of program provides access of data to all the users.

Types of databases available are MySQL, Sybase, Oracle, MongoDB, Informix, PostgreSQL, SQL Server.

→ DBMS - Data Base Management System is a software which is used to store and retrieve the data base. For example, oracle, MySQL etc.

* DBMS provides the interface to perform various operations like creation, deletion, modification etc.

* DBMS allows the user to create their database as per their requirement.

* It provides security to the database.

→ Types of DBMS are

Relational DBMS

NoSQL DBMS

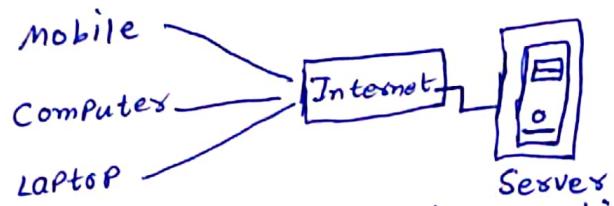
In-Memory DBMS

Columnar DBMS

Cloud-based DBMS.

→ Client-Servers Database Architecture in DBMS:

In Client-Servers Architecture many clients connected with one server. The server is center lines. It provides services to all clients. All client's request to the server for different service. The server displays the result according to client's request.



It is also known as 2-Tier Architecture.

9/4/2022

→ what is a Software bug?

→ what is Middle ware?

→ what is webserver?

→ what is Application Server?

→ what is Load Balancer?

→ what is 2-Tiers Architecture?

→ what is 3-Tiers Architecture?

→ what is n-Tiers Architecture?

→ A Software bug is a problem causing a program to crash or produce invalid output. The problem is caused by insufficient or erroneous logic. A bug can be an error, mistake, defect or fault, which may cause failure or deviation from expected results.

→ Middle ware is software that is used to bridge the gap between applications and other tools or databases. Middle ware sits between an operating system and

the applications that run on it.
Middle ware appears in many locations however organizations and developers make specific use of middle ware to more efficiently build applications.

→ A web server is nothing but software and hardware that uses the Hypertext Transfer protocol, commonly known as http, and some other protocols that respond to requests from clients made on world wide web. The main job that the web server performs is to display the content of the website, which does it by storing, processing and eventually delivering the web pages to the user who has requested to it.

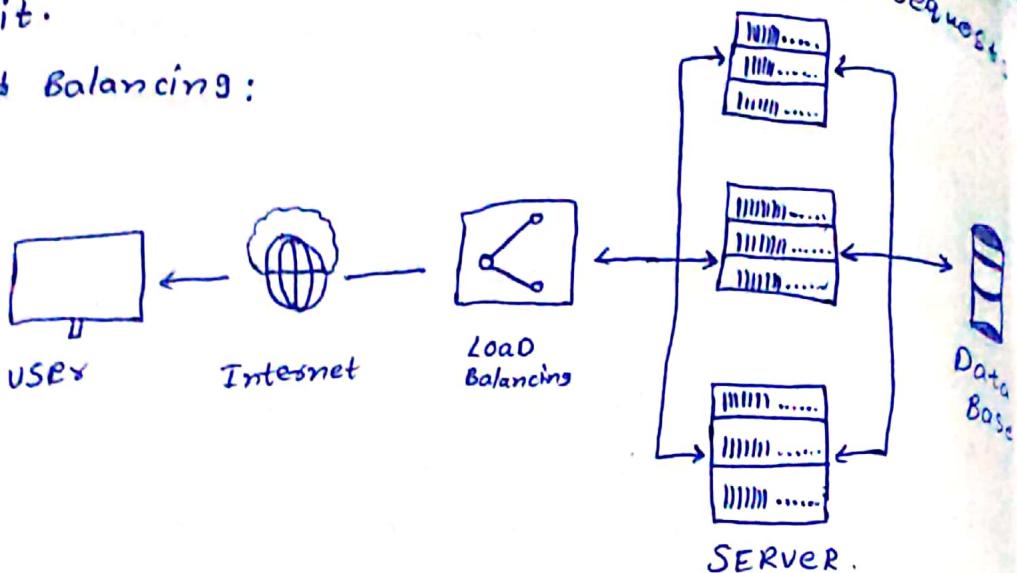
Two types of servers are dynamic and static web servers.

→ Application server is a type of server designed to install, operate, and host applications. An application server is a program that resides on server-side and it's a server providing business logic behind any application. The server can be a part of the network or the distributed network.

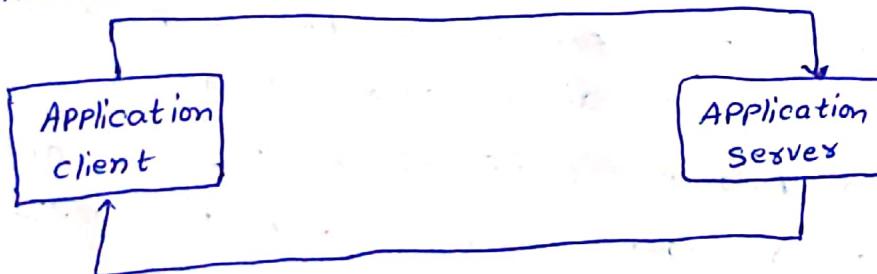
→ A load balancer acts as a "Traffic cop" sitting in front of your servers and routing clients requests across all servers capable of fulfilling those requests in a manner that maximizes speed and capacity utilization and ensures that no one server is over worked, which could degrade performance. If a single server goes down, the load balancer redirects traffic to the remaining online servers. When a new

Server is added to the Server group, the load balancer automatically starts to send requests to it.

Load Balancing:

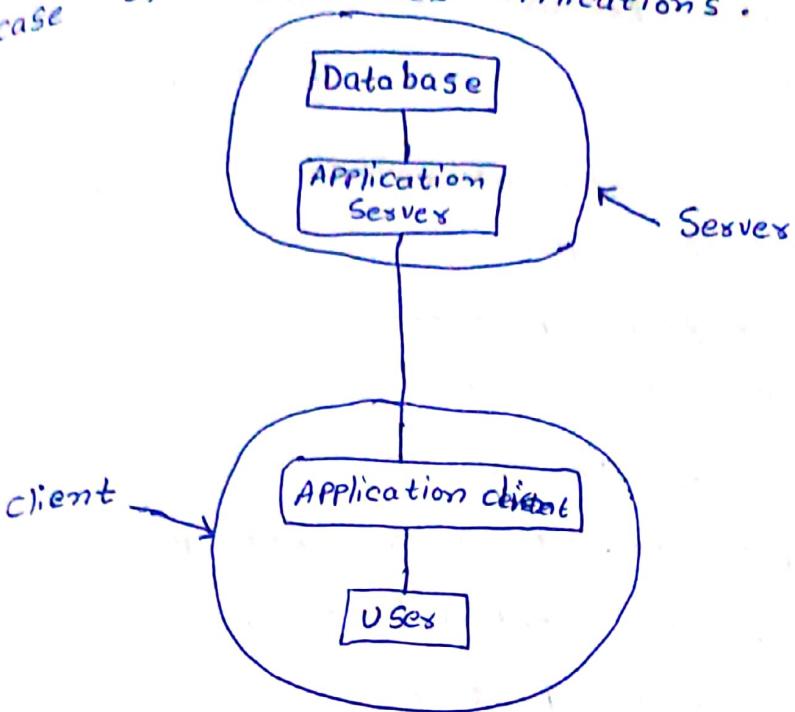


→ Two-Tier Architecture is similar to basic client-server Model. The application at the client end directly communicates with the data base at the server-side. API's like ODBC, JDBC are used for this interaction. The server side is responsible for providing query processing and Transaction Management functionalities. On the client side the user interfaces and application programs are run. The application on the client-side establishes a connection with the server-side in order to communicate with DBMS.

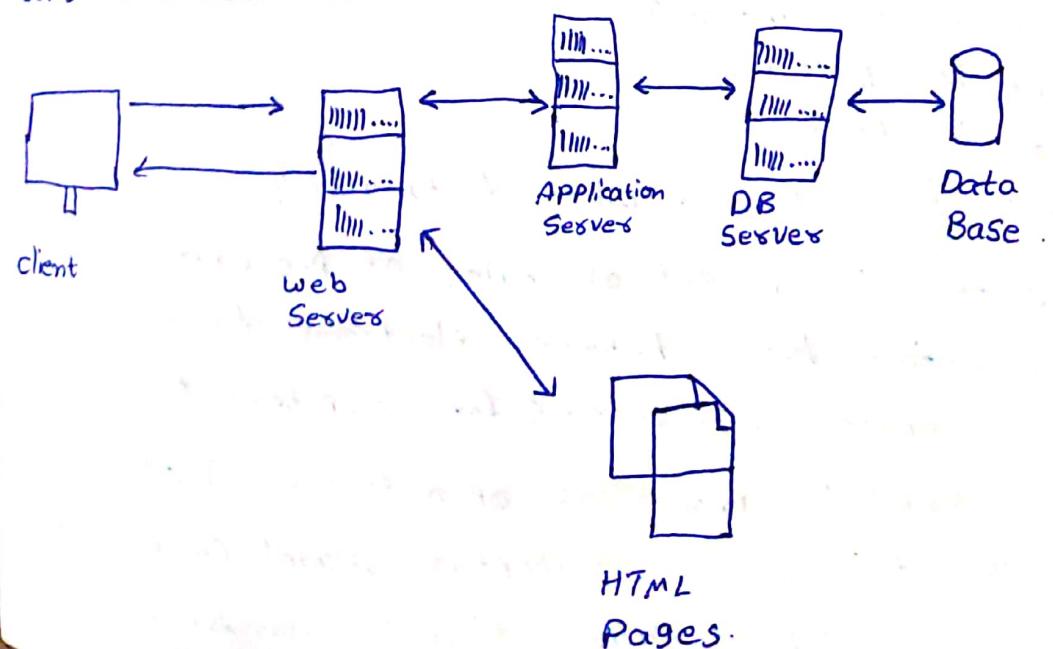


→ Three-Tier Architecture, there is another layer between client and the server. The client does not directly communicate with the server. Instead, it interacts with an application server which further communicates with the database system and then the query processing and Transaction Management takes place. The intermediate layer acts as a medium for the

exchange of partially processed data between Server and the client. This type of architecture is used in case of large web applications.



→ N-Tier Architecture is also known as Multi-Tier Architecture, because the Software is engineered to have the processing, data management and presentation functions physically and logically separated. These different functions are hosted on several machines or clusters, ensuring that services are provided without resources being shared and, as such these services are delivered at top capacity. The 'N' in the name n-Tier Architecture refers to any number from 1.



11/4/22

Monday

while Browsing

URL - Uniform Resource Locator.

HTTP - Hyper Text Transfer Protocol.

Protocol means set of rules for communication.
Types of Protocols are

UDP - User Datagram Protocol.

FTP - File Transfer Protocol.

SMTP - Simple Mail Transfer Protocol.

SNMP - Simple Network Management Protocol.

TCP - Transmission Control Protocol.

IP - Internet Protocol.

Assignment:

→ what is a Protocol?

→ what is OSI Model?

→ what is TCP/IP Model

→ what is the difference between OSI model and TCP/IP _{Model}?

→ what is HTTP?

→ what is HTTPS?

→ what is SSL?

→ what is encryption?

→ what is DNS?

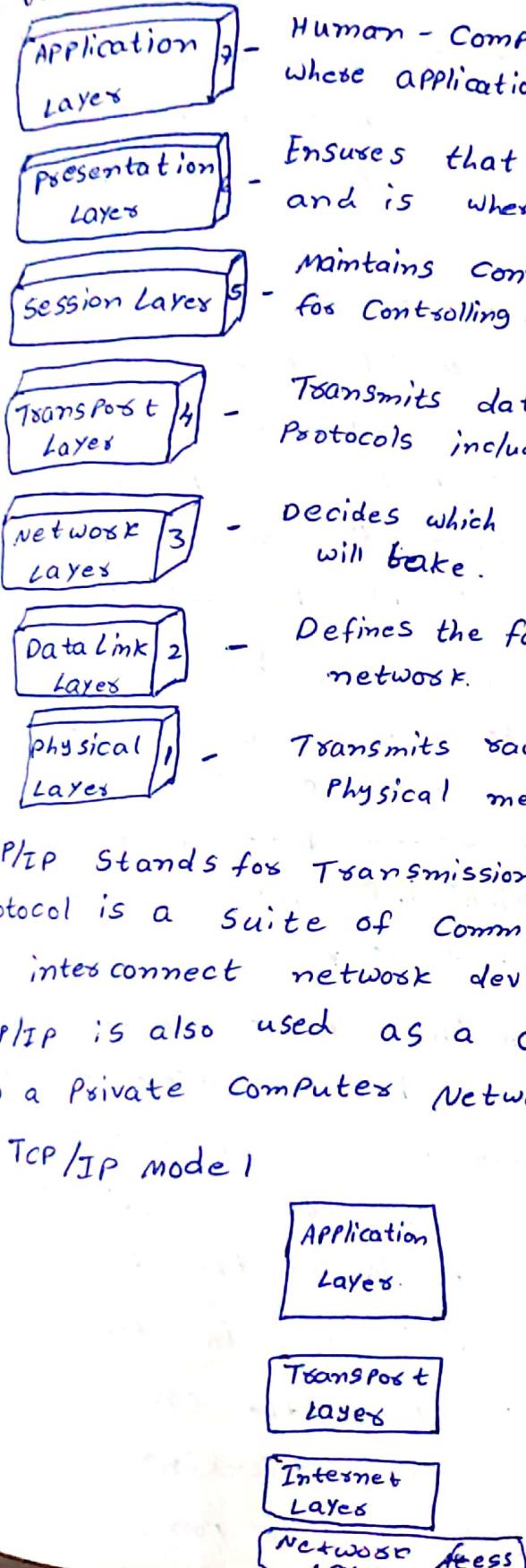
→ what is Router?

→ what is ISP and what do they do?

→ A Protocol is a set of rules or procedures for transmitting data between electronic devices, such as computers. In order for computers to exchange

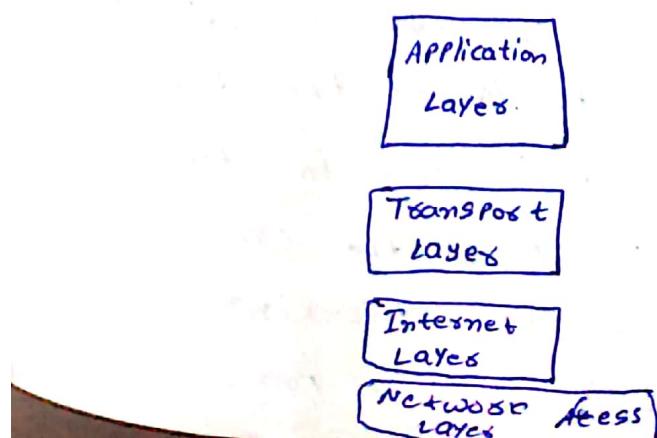
→ OSI Model is known as open systems Interconnection model this is a conceptual model created by the International Organization for Standardization

which enables diverse communication systems to communicate using standard protocols. The OSI Model can be seen as universal language for computers networking. It is based on the concept of splitting up a communication system into seven abstract layers

- 
 - Application Layer - Human-Computer interaction layer where applications can access network service.
 - Presentation Layer - Ensures that data is in a usable format and is where data encryption means.
 - Session Layer - Maintains connections and is responsible for controlling ports and sessions.
 - Transport Layer - Transmits data using Transmission Protocols including TCP and UDP.
 - Network Layer - Decides which Physical Path the data will take.
 - Data Link Layer - Defines the format of Data on the network.
 - Physical Layer - Transmits raw bit stream over the Physical medium.

→ TCP/IP Stands for Transmission Control Protocol / Internet Protocol is a suite of communication protocols used to interconnect network devices on the Internet. TCP/IP is also used as a communication protocol in a Private Computer Network.

→ TCP / IP model



- HTTP is a Protocol for fetching resources such as HTML documents. It is the foundation of any data exchange on the web and it is client-server protocol, which means requests are initiated by the recipient, usually the web browser.
- HTTPS which means Hypertext Transfer Protocol secure which is a combination of the Hypertext Transfer Protocol (HTTP) with the Secure Socket Layer (SSL), Transport Layer Security (TLS) Protocol. TLS is an Authentication and Security Protocol widely implemented in Browsers and web servers.
- SSL stands for Secure Sockets Layer and, in short it's the standard technology for keeping an internet connection secure and safeguarding any sensitive data that is being sent between two systems, preventing criminals from reading and modifying any information transferred, including potential personal details.
- Encryption means securing data by encoding it mathematically such that it can be read or decrypted by those with the correct key or cipher. Digital encryption process translates data using an algorithm that makes the original information unreadable except for authorized users.
- Domain Name System (DNS) turns domain names into IP addresses, which browsers used to load Internet pages. Every device connected to the Internet has its own IP address, which is used by other devices to locate the device.
- A Router is a device that is used for forwarding the Internet connection to all the connected devices. A wifi combines the networking functions of a router and a wireless access point.

→ ISP defines Internet Service Providers that provides Internet Connections and Services to Individuals and organizations. In order to providing access to the Internet ISP's may also provide software packages such as browsers, e-mail accounts, and a personal web.

12/04/22

Tuesday.

Assignment Questions.

- what is Local host?
- what is 127.0.0.1 IP address?
- what do you mean by loopback?
- what is a Port?
- what are reserved ports?
- what port is reserved for http?
- what port is reserved for https?
- When you call an IP address on your computer, you try to contact another computer on the Internet but when you call the IP address 127.0.0.1 then you are communicating with the local host. Your computer does not always directly identify the local host. Localhost can be seen as a server that is used on your own computer. Local host is not just the name for the virtual server but it is also its domain name. Just like, example, test or invalid. Local host is a top-level domain reserved for documentation and testing purposes.
- The IP address 127.0.0.1 is a special purpose IP-4 address and is called the local host. All computers use this address as their own, but it doesn't let computers communicate with other devices as a real IP address does.

→ Loopback address has been built into the IP domain system in order to allow for a device to send and receive its own data packets. Loop Back Address can be useful in various kinds of analysis like testing and debugging, or in allowing routers to communicate in specific ways. In IPV4, 127.0.0.1 is the most commonly used Loopback address, however, this range can be extended to 127.255.255.255.

→ A Port is a number used to uniquely identify a transaction over a network by specifying both the host and the service. They are necessary to differentiate between many different IP addresses, such as web service (HTTP), mail service (SMTP), and file transfer (FTP).

→ Port numbers in the range 1 to 1023 are considered "reserved" or "privileged". TCP/IP conventions require that a connection using such low port numbers have special privileges such as root privileges on the originating machine.

→ The port number identifies what type of port it is. For example port 80 is used for HTTP traffic.

→ The port 443, a web browsing port is primarily used for HTTPS services. It is another type of HTTP that provides encryption and transport over secure ports.

→ Protocol : // www . host . Domain : Port : URI

https : // www . facebook . com : 80 .

Total number of ports in system used are 0 - 65535

URI - Uniform Resource Identifier.

13/4/22.

wednesday.

Assignment Questions.

- What is difference between IP address and MAC address?
- what is the default Port for Apache?
- What is JDK?
- What is JRE?
- The IP address of a device mainly helps in identifying the connection of a network (using which the device is connecting to the network). The MAC Address, on the other hand, ensures the computer's device's physical location. It helps us to identify a given device on the available network uniquely. MAC means Media Access Control Address.
- Port 80 is the default Port for Apache. During Installation, Port 80 is required to install the Apache webserver. If you have another product installed that uses Port 80. You must change the Apache HTTP Port to another Port number before you start the application this using Port 80.
- The JDK is a development environment for building applications, applets and components using the Java Programming Language. The JDK includes tools used for developing and testing programs written in the Java Programming Language and running on Java platform.
- A Java Runtime Environment (JRE) is a set of components to create and run a Java application. A JRE is a part of Java development kit (JDK). A JRE is made up of Java virtual machine (JVM), Java class libraries and Java class loaders.

14/4/22.

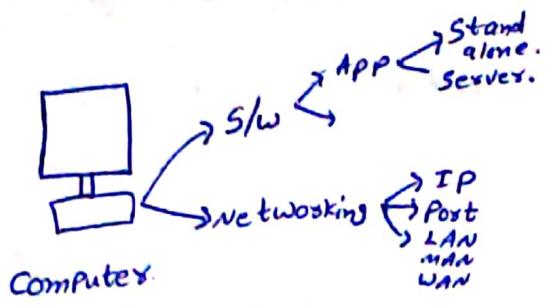
Thursday

- what is data center?
- what are different types of environment discussed in class?
- What are different operation teams discussed in class?
- Who are Deployment/Build Engineers?
- what kind of work is done by developers?
- what kind of work is done by Testers?
- Change the Tomcat Port to 9999, 7777, 8888 and Test?
- A data center is a facility that provides shared access to applications and data using a complex network, compute and storage infrastructure. Industry Standards exists to assist in designing, constructing, and maintaining data center facilities and infrastructures to ensure the data is both secure and highly available.
- Types of Environment discussed in class are
 - Development Environment
 - Test Environment
 - UAT Environment
 - Production Environment.
- Different operation Teams discussed in class are
 - Developers Create Code.
 - Build and Deploy team Puts the Code on Server.
 - Developers tests the code.
 - Find Bugs
 - Testing Eng Test.
 - If they find Bugs
 - UAT
 - Find Bugs

- A Deployment Engineer is responsible for the deployment of releases into the Production Environment.
- A deployment engineer is responsible for the safe development of one or more releases into the production environment. A deployment engineer deploys releases into Production. A build engineer is a computer software engineer who is focused mainly on developing a line from a program's source code to a publicly available product.
- Software developers conceive of, design and build computer programs. Some develop new applications for mobile or desktop use, while others build underlying operating systems. Either way, software developers identify user needs, build programs, test out new software and make improvements.
- As a Software Tester, you'll be involved in the quality assurance stage of software development and deployment. You'll conduct automated and manual tests to ensure the software created by developers is fit for purpose and any bugs or issues are removed within a product before it deployed to everyday users.
- Tomcat Port
 - server.xml
 - Connector Port.
 - services.msc in windows + R.

15/4/22.

Friday,



Assignment:

- what is Java Archive File?
- what do you mean by Compiling a code?
- what happens when you compile a code?
- what are JAR, WAR, EAR files and differences?
- JAR (JAVA Archive) is a platform-independent file format that aggregates many files into one. Multiple Java applets and their requisite components (class files, images and sounds) can be bundled in a JAR file and subsequently downloaded to a browser in a single HTTP Transaction; greatly improving download & speed
- compile refers to the act of converting programs written in high level programming language which is understandable and written by humans, into a low level binary language understand only by the computer..
- A compiler takes the program code (source code) and converts the source code to a machine language module (called an object file). Another specialized program, called a linker, combines this object file with other previously compiled object files to create an executable file.

→

JAR	WAR	EAR.
<ul style="list-style-type: none"> → JAVA ARchive is a package file format typically used to aggregate many Java class files and associated metadata and resources into one file for distribution. 	<ul style="list-style-type: none"> → web Application Archive → Servlet and JSP API → web-based resources such as images, HTML property and Compiled Java Code → Java Web Profile-compliant Application Servers such as Liberty or Tomcat. → web.xml 	<ul style="list-style-type: none"> → Enterprise Application Archive → JAVA EE API. → Other Java EE archive Such as WAR, RAR, EJB-JAR and JAR files → JAVA EE-compliant, application servers such as J-Boss or websphere. → application.xml

16/4/22.

Saturday.

- How do you Deploy a war file on a Tomcat Server?
- How do you access custom html file from Tomcat Server?
- Download war file from the Internet. After downloading open Tomcat by using <http://localhost:port>. After opening Tomcat move where u find select file to Deploy Click on it and browse and select war file after Deploy in it. & we can see OK in Tomcat application. Hence WAR File is deployed.
- Create a folder in webapps folder. Put your html and css in that folder and name the html file, which you want to be the starting page for your application, index. Start Tomcat and point your browser to URL "http://localhost:8080/folder". Your Index.html page will pop up in the browser.

18/4/22

Monday

- what is virtualization?
- Download and Install Vmware Workstation Player
- Set Virtualization Enabled or On on your Laptop/Desktop. Download Ubuntu ISO Image.
- Virtualization is technology that lets you create useful IT services using resources that are traditionally bound to hardware. It allows you to use a physical machine's full capacity by distributing its capabilities among many users or environments.
- Search Vmware Workstation Player in Google Chrome and download Vmware Workstation 16.2.3 Player for Windows 64-bit operating system. After downloading go to downloads and install Vmware on your Desktop or laptop.

19/4/22

Tuesday

- Create Windows 10 on Vmware.
- Download Windows 10 on Computer. Open Vmware and browse Windows 10 on Vmware. Hence Windows 10 is created on Vmware.

20/4/22

Wednesday

- Who manages the Port?
- Who manages IP address in a network?
- What is Hypervisor?
- What are the pre-requisites for installing a Hypervisor?
- What are the steps required to create a VM?
- What are drawbacks of Hypervisor?

→ Port is used to uniquely identify a transaction over a network by specifying both the host and the service.

→ Internet Assigned numbers authority (IANA) manages IP address in a network.

→ A Hypervisor is also known as virtual machine monitor or VMM, is a software that creates and runs virtual machines (VM's). A hypervisor allows one host computer to support multiple guest VM's by virtually sharing its resources such as memory and processing.

→ Pre-Requisites for installing Hypervisor are

1. Hardware Setting
2. Hypervisor Software.
3. VM ware Download and Install.

→ To Create a VM

1. ISO
2. Choose CPU, Memory & Hard Disk.
3. Install / Create VM.

→ Draw backs of Hypervisor are

→ Because of OS CPU - 20% full utilize.

→ Memory 60-80%.

→ HO - 50%.

→ Takes time to Create VM.

21/4/22.

Assignment.

Thursday

- what is cloud ?
- what is difference between cloud and Internet?
- what are the 2 Models available in cloud?
- What is a Service Model?
- What is a deployment Model?
- What is IAAS, Explain?
- What is PAAS, Explain?
- What is SAAS, Explain?
- What are the advantages of cloud ?
- What is Private, Public, Hybrid and Community cloud.

- cloud computing is on-demand access, via the Internet to computing resources, applications, servers, data storage, development tools, networking capabilities and more hosted at a remote data center managed by a cloud services provider (CSP). The CSP makes those resources available for a monthly subscription fee or bills them according to usage .
- Internet is a network of networks , which provides software/hardware infrastructure to establish and maintain connectivity of the computers around the world, while cloud computing is a new technology that delivers many types of resources over the Internet .
- Two Models available in cloud are
 - i) Based on Services.
 - ii) Based on Deployment.
- In services Model there are
 - IAAS - Infrastructure as a service .
 - PAAS - Platform as a service .
 - SAAS - Software as a service .

- A cloud deployment model is defined according to where the Infrastructure for the deployment resides and who has control over the Infrastructure. Deciding which deployment Model You will go with is one of the most Important cloud decisions You will make.
- IAAS is a type of cloud computing service that offers essential Compute, Storage and networking resources on demand, on a Pay-as-you-go basis.
- Paas is a complete development and deployment environment in the Cloud, with resource that enable You to deliver everything from simple cloud-based APPS to Sophisticated, Cloud-enable enterprise applications.
- Saas is a way of delivering applications over the Internet-as a Service . Instead of Installing and Maintaining Software , You Simply access it via the Internet, freeing Yourself from Complex Software and Hardware Management.
- The Private cloud is defined as computing services offered either over Internet or a private Internal network and only to Select users instead of the General Public.
- Public cloud is a cloud deployment model where Computer resources are owned and Operated by a provider and Shared across multiple tenants via Internet.
- A Hybrid cloud is one in which applications are running in a combination of different environments. Hybrid Cloud computing approaches are widespread because Almost no one today relies entirely on public.
- Community cloud computing refers to a Shared cloud Computing Service environment that is targeted to a limited set of organizations or employees.