**SAP Stands for Systems Application and Products for Data Processing**

SAP --- YES AP not SAAAAAAAAAAAAAAAAAP

**SAP GUI:**it is an Interface to Login to the SAP System.

it requires Client,Userid and Password

**Transaction Code:** it is a Shortest Code to Navigate to the Desired Program without having to use long confusing German Program Names. These are executed in Command Window.

**Check List(Basic Pulse Check):** it provides a Comprehensive List of Transactions that are used by a Basis Consultant to Ensure that SAP Systems Health is Maintained and they are Highly Available for the Business.

This Check List is Executed Hourly once,for every 8 Hours,or for every 24 Hours Based on the Criticality of the System.Up on Checks This List is sent to L2,L3,L4,Project Manager or to whom ever Concerned in the Public Distribution List(basis@apple.com).

Generally These Checks are performed by Consultants(L1/T1 Camp Graduates)

**Hardware:** it is a Computer Hardware that Facilitiates various input and output devices to handle the User Requests and Display or Output the response to a Monitor or Printer.

**CPU:** Central Processing Unit

it is used to process the Requests by allocating a dedicated or shared Process-ID/Thread-ID to the User.

The Processor power is measured by using mhz(Mega Hertz)/ghz(Giga Hertz).

To Provide High Availability Dual/Quad/Multiple CPU are installed for Failover and Load Balancing

Each Vendor CPU Speed Differs from Model to Model.(DELL,IBM,HP)

CPU can be monitored on Windows by using Task Manager

CPU is monitored on Linux by using command "top"

CPU is monitored in SAP System by using Transaction "ST06".

CPU Fetches the Data from Disk into Memory and holds as long as it is committed/roll back.

**Memory:**it is used to Perform the Calculations/Data Manipulations. it is a temporary work Area.The Data on the Memory will be lost when the system is powered off.Volatile memory is computer storage that only maintains its data while the device is powered. Mostly RAM (Random Access Memory) is used for primary storage in personal computers which is a volatile memory.

To Provide High Availability the memory is inserted into different slots.(Do not buy a 32GB RAM stick instead 4 sticks of 8gb is Recommended)

Memory is Measured in Mega Bytes(mb) and GB(Giga Bytes).

**Computer Storage:**

The Data is stored in Bits and Bytes(Bits are 0 and 1)

8Bits =1 Byte

1024 Bytes= 1 KB

1024 Kilo Bytes= 1 MB

1024 Mega Bytes= 1 GB

1024 Giga Bytes= 1 TB

3 543 779 334 242 bytes is

3 543 779 334 KB

 GB

3 543 779 MB

3 543 GB

3.5 TB

498 645 678 641 986 bytes

**Storage:** it is used to store the Data persistently and it is non-volatile. it is measured in GB,TB,PB,EXB,ZB,YB etc.

The Disk Performance depends upon the Disk Speed rpm(revolutions/rotations per minute). 5600/7200/10000/15000 rpm.

Servers generally use 15K(15000)rpm and laptops uses 5600 rpm

**Hard Disk are of various Types:**

IDE---Obsoleted--No more

SCSI--skuzzy(Small Computer System Interface)

SATA-Serial Attachment

SAS-Serial Attachment SCSI

SSD(Solid State Drive) upto 100 times more optimised then normal Disks.

To Get More Performance(IOPS-input output per second)(eye OPS) buy more disks then a single Disk.

Example:One TB Disk is not recommended,instead (300GB \*4) are recommended which will be also used for failover.

**Network Cord:** it is a gateway for the Computer to communicate with external world.it is used to provide connectivity with External Systems.

it could be either LOCAL(WIDE)(METRO) AREA NETWORK.LAN/WAN/MAN

To Provide High Availability More then one Network cord is Installed.

Each Network Cord is Unique and Contains its Own MAC(Media Access Control) Address.

**System:** The collaboration of CPU,Memory,Disk and Ethernet Cord plugged on to a Mother Board is referred as SYSTEM.

The System is identified by its unique Name referred as HostName.

The Host Name details are maintained in a file /etc/hosts.

The System is a Hardware which requires software to operate it.

**Software:**it is a set of commands,libraries,binaries,executables which are programmed in C,C++,VC++ and Java etc.These are used to drive the Hardware such as motherboard,network,printer,graphics and audio etc....

**Operating System:** it is a software that is used to operate the System.

Operating Systems are of various Types:

**GUI:** Graphical User Interface(Most of the Operating Systems are Windows based and Currently Linux Operating Systems like SUSE|RHEL|CENTOS|OLES|UBUNTU)

**Command Line Interface(CLI):**Command Line Interface are more Secured Operating Systems as most of the Viruses are designed for executables(Microsoft).

CLI OS Version works based on Libraries,Binaries and Scripts.Some of them are AIX,Linux,HP Unix and Oracle's Sun-Solaris.

**Character Based Operating Systems:**These are also Command Line Interface Operating Systems but works based on Characters and Numbers.Easy to operate and navigate to the system.

Ex: AS400/OS400.

**HostName:** Each System/Device(printer,laptop,webtop,mobile devices,fax or any other machines in the data center are identified by unique name which is called as hostname.without Hostname the System could not be communicated over the Network.They are maintained in the file /etc/hosts.

**IP Address:** Internet Protocol Address: it is a numerical label assigned to each machine(device) that is going to participate in the Network Communication.

Current IP are four Bit,it ranges between 0-255.0-255.0-255.0-255(4 bit)

2^8= 2\*2\*2\*2\*2\*2\*2\*2=256=0-255

Private IP Addresses: These are used internally with in the Company

A Class IP Address starts with 10.0.0.1 (Large Companies uses this range)

B Class IP Address Start with 172.16.0.1(Mid sized companies)

C Classs IP Address starts with 192.168.0.1(Small companies mostly R&D)

self ping(loop back) 127.0.0.1

Addresses D and E are Reserved by ARPANET....

These are used internally with out any registration/payment

Other then the above all the addresses are Public IP Addresses.These IP addresses are obtained from Network Carriers.

**Static IP Address:** The Address that is assigned to servers permanently so that addressing to the server is constant..

SAP Servers,File Server,Web Server,Mail Server and Print Server.

**Dynamic IP Address:** The Addresess that are Assigned dynamically which can be renewed for every 14 days based on DHCP(Dynamic Host Configuration Protocol).These are assigned to all desktops/laptops/work station/mobile devices/tv/tabs etc.

**Intranet:**The group of computers connected with in the organization using LAN (IP Addresses 10,172,192).

**Internet:**The Computers which are connected outside the Company Network using MAN(Metro)/WAN(WIDE) Area Network using Public IP Address.

**Router:** it is a Physical Device that is an Entry/Exit point to the Network.Router can be set with Predefined Rules.

**Firewall:**It is a Software/Hardware/Server that is used to restrict/prohibit the access to websites,IP Addresses, Hostnames, Ports and Protocols.

**Protocol:** it is used to Monitor(govern) the data transmission between the systems.TCP/IP is a base protocol which is used to derive further protocols. Set of rules that govern transmission of data.

TCP-Transmission Control Protocol(TCP)

FTP---File Transfer Protocol(ftp)

SMTP--Simple Mail Transfer Protocol(smtp)

HTTP--Hyper Text Transfer Protocol(http)

HTTPS--Secured Hyper Text Transfer Protocol(http) using SSL

SOAP--Simple Object Access Protocol(soap)

WAP--Wireless Application Protocol(wap)

**Port:** it is a Terminating/Accesing/Entry point to access the Software /Device/ Application/Service.

http:80/8080

https:443

smtp:25

ftp:21

telnet :23

2^8\*2^8=256\*256=65536

The port Number ranges between 0- 65535. The Applications reserve the port number to avoid the port conflict.

These ports and Protocols are maintained in the file **/etc/services**.

**Server:** The System with High Availability peripherals(parts) to serve the Users is called a Server. The Operating System distinguishes between desktop and server version.

The Server version provides a robust,scalable,consistent and reliable platform to host the Applications,Databases and Services etc..

**Domain Server:** Used to host the Domain in the Company. it maintains the Complete Company Users,devices,computers etc.

**File Server:** it is used to provide File Storage services in the Company

**Mail Server:** Used to Provide Mail service for Communication from Internal and External Users.

**FTP Server :** Used to upload the files(ex:naukri)

**DHCP Server:** Used to Release and renew IP Addresses for all the systems/devices that are logged on to the Domain.

**WEB Server:** Provides web services in the company

**Print Server:** Used to host all the printers and provides collaborative print facilities to the users.

**Client:** it is a system which is used by end users to communicate with the servers.

Client can be a desktop/laptop/webtop/device with installed software to communicate with server.

Ex: MS Outlook,Outlook Express,Internet Explorer(browser),Lotus Notes,SAPGUI..Mobile Apps etc...

Client is a software which contains set of Commands/Programs/ Executables/Libraries that are used to communicate with Server. it is also referred as Front End to communicate with Backend.

Client Requests and Server Responds. Client is referred as a Service Requestor and Server is referred as a Request Processor.

In the Client Server Communication the Clients are overloaded along with Servers due to the Following reasons.

1.There is no Queue Mechanism to process the requests. The server has to handle the Queues Explictly.

2.There are no inbuilt Interpreters.(client and server has to Interpret seprately).No Intermediate Interpreters.

3.There are no Intermediate Buffers/Cache to reduce hits on the Server. Every Requests hits the Server.

4.Every Client requires DB Client to communicate with Server.

There is a need to deploy an intermediate layer to address the above issues.

The Above architecture is also referred as Two Tier Architecture.

Application Server/Layer/Tir:

it is introduced between client and server to address the above Issues of Two Tier Architecture.

**Three Tier Acrhitecture:**

it consists of Three Layers(Servers)

**1.Presentation Layer(Server)**

**2.Application Layer(Server)**

**3.Database Layer(Server)**

**The Request Flow in Three Tier Architecture**

1.The User Submit the Request using SAP GUI With Application Server Host Name and Instance Number(Port).

2.The Requests are received by the dispatcher and Kept in the Wait Queue

3.Dispatcher maintains the Work Processes and identifies the Load handled by Work Processes.

4.The Dispatcher allocates a freely available process to the User Request based on FIFO(First-in First-out).

5.The Work Process Contains Inbuilt Task Handlers to Interpret the Request.The User Context is rolled into WP Task Handler

6.The Screen in the User request is Interpreted by Screen Handler(Interpreter) TASK HANDLER

7.The Programming Language in the User request is Interpreted by ABAP Handler(Interpreter)TASK HANDLER

8.The SQL Scripts(commands) in the User request are Interpreted by SQL Handler(Interpreter)TASK HANDLER

9.The Request Checks whether the Content is available in R3 Buffer.

R3 Buffer is used to store the most frequently used Content and Less Frequently Modified(updated) Content.(ST02)

10.if the Response is not available in R3 Buffer then the Process goes to the Database using DB Specific Client and SAP Kernel(OS and DB Specific)

11.Database Provides the response to the SAP Work Process after necessary Interpretations.

12.The SAP Work Process Checks whether the Response(Content) is eligible for buffering,So that a copy can be kept in R3 Buffer to handle Similar Requests in future.

13.The Work Process roll out the User Related information into User Context.

**User Context:** it is a small memory Area where the User Related information is stored.it contains user Authorizations, parameters, common user attributes etc.. it is lost when the user is logged out. it is specific to User only.

**R3 Buffer** builds when the Instance(Application Server) is started and R3 buffer is lost when the Application Server is Stopped

14.The Response is sent to User.

**Roll-in:** it is the Process of Copying the User Context into WP Task Handler.When User is logging for the first time the Roll-in is not available.

**Roll-out:** it is the Process of Copying the User Specific Information into User Context while sending the Response to the User by a Process.

**Kernel:** Set of Executables,Binaries and Libraries to communicate with OS,DB and Hardware.These are provided by SAP.

**DB Client**: Set of executables,binaries and libraries to communicate with Database in the Native Language. it is provided by Database vendors(Oracle,IBM,SAP)

Port is derived from a two digit Instance Number where SAP Application Server is installed.

Instance Number is a two digit ID which ranges between 00-99(where 97,98 and 99 are reserved).

The Host Names and Ports are resolved from /etc/hosts and /etc/services. Most of the Companies Uses DNS(Domain Name Server)for Name/service(port)Resolution.