28-01-2025

Orientation Session.

24 days

2 break 2 T 1 lunch
15 min 30 min

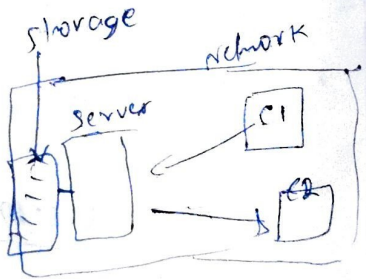
Training Data center

Trainer - Jithendra singh

IT infrastructure services

basic things

- server machine (windows, linux)
- storage available
- network



IT infrastructure:

- Components required to host and run your application.

chan ijan from mangalore
i complete my bca in c...

Cloud

3 major components:

- compute
- networking
- storage.

IT infrastructure (IT)

Infr includes networking equipment, servers and storage due to the important function they provide within specific business environment.

IP - Internet Protocal

uniquely identify To communicate through internet

Servers:

Key uses of servers:

- File servers (Ex: Google drive)
- Database servers
- web & Application servers
- E-mail server
- Domain controller
- Backup servers
- Firewall & monitoring servers.

Domain controller

- Authorization
- Authentication

Servers

- Physical Servers (ex:. tyrone server)
- Virtual:- Created using virtudization software (hypervisor)
- Cloud:- (combination of both.

Data center ?

A place, which contain several component; like Server, Storage unit, networking components like routers, firewall; racks

Hypervisor

A tool to active virtualization.

Types

Type - 1

Type - 2

Networking:- Switches :-

NIC cards - Network Interface card.
(has MAC address)

Switch

- has multiple ~~NIC~~ Port in it so, we can connect multiple devices (computer) within a LAN.
- Switch operates at the Data Link Layer (L2) or sometimes network layer of
- Switches Direct data to the correct destination by identifying unique address (MAC addresses)

OSI model

- Open System Interconnect
- It's a reference model

1) Physical layer
2) Data link layer —> Switches works here
3) Network layer —> Router works here, L3 Switches
4) Transport layer
5) Session Layer
6) Presentation layer
7) Application layer —> Sometimes firewalls work here

Networking - Routers:

- Connects Two different networks together
- works on network layer
- ensure that data travels to the corrct destination.

NAT - Network address Translation

- translating Private IP address to Public IP address

Public ← NAT (Router) → Private

Private IP - different/unique under a LAN or single network

Public IP - is different in the world. or unique.

MAC Address - Different in every device and we find it in NIC card.

Network - Firewall:

- monitor and control incoming or outgoing network traffic based on predefined security rules.

Types of firewall:

- Hardware
- Software
- next-Generation firewalls (NGFWs)

Storage:

Store or save your data.

- Types
  - Primary Storage
  - Secondary Storage - HDDs
  - Offsite Storage - Tape drive
  - network Storage - DAS, NAS
  - Cloud Storage - Public cloud storage.

Speed
HDD - 150 IOPS
SSD - 1.5M IOPS

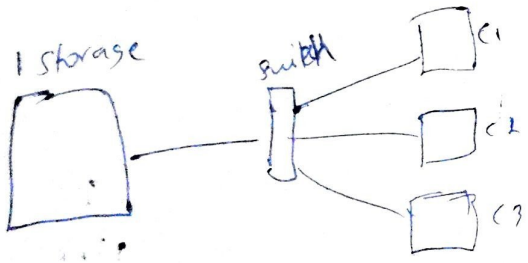
Storage - DAS

- Direct Attached Storage is a storage directly connected to comp or server without network.

Storage - NAS (not good for big company)

Network Attached Storage is a storage connected to the network

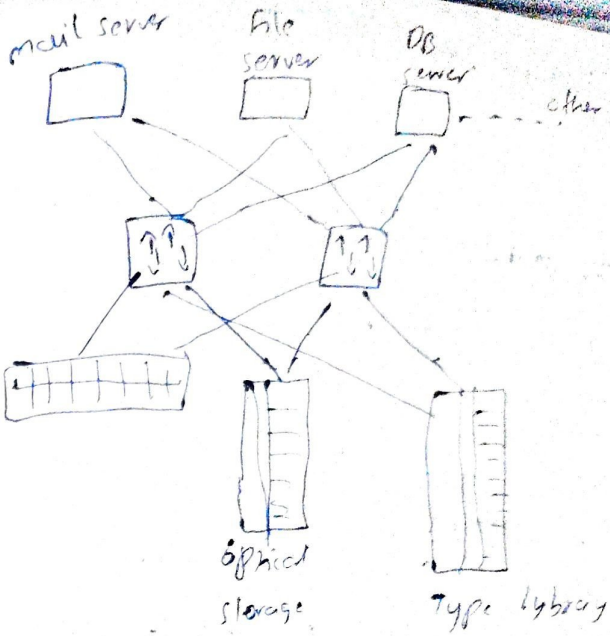
Ex:-
[Azure file share
5TB of size]



Storage - SAN:

Storage area network is dedicated high speed network that provides access

RAID - type of storage
Optical storage
Type Library



Monitoring Tools

Ex:- nagios
- prometheus
- zabbix
- Splunk.

monitoring tools are designed to continously observe the performance and health of IT system, networks, and applications.

Key feature
- performance monitoring
- Alerting
- logging
- visualization

Imp read.
Splunk/flunk

Troubleshooting Tools

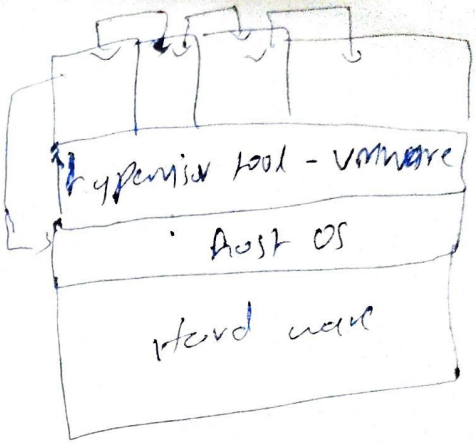
- Key features
  - Diagnostics utilities & System Recovery
  - Log & network Analysis

Example of Tools
- wireshark (allows users to capture and inspect network traffic) → view packets
- Ping (To check active or not)
- Traceroute - (traceroute google.com)
  - shows series of routers & hops your packet travels through to reach

Virtualization Basics :-

Visualization is a technology that allows the creation of multiple virtual instances of hardware or software resources on a single physical machine.

Key concepts of virtualization
- virtual machine (VMs)
- Hypervisor
- Hypervisor types
- virtualization Types

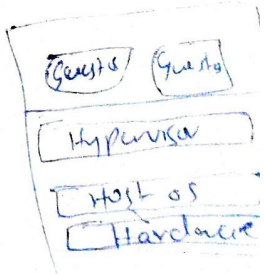


Virtualization - Hypervisor :

Hypervisor is a software or firmware that creates and manage VMs on a physical server. It allows multiple OS to run on same hardware simultaneously.

Type 1 (Hypervisor act as minimum os)
runs directly on the top of hardware
Ex: vmware ESXi, Citrix xen servers
- microsoft Hyper-V, oracle VM ser

Type 2
runs on the top of an existing OS
Ex: oracle virtualBox,
vmware workstation,
Parallels Desktop
oracle Solar zones



Virtualization Types:

- Server virtualization
  - multiple virtualization servers run on a single physical server. (full control like Ram, HDD, CPU, IP)
- Desktop virtualization
  - virtual desktop are provided to users, allowing them to access their work environment from any device (control only on the application like, Google chrome, Notepad++ Vscode, VLC)
- Network virtualization:
  - Abstracts physical network resources to create virtual networks, improving network management and flexibility
- Storage virtualization.
  Pools physical storage resources into a virtual storage environment, simplifying storage management.

Virtualization is overtaken by Containerization:

- Docker

Power on vm: 2 min.
Containerization: 2-3 sec

Introduction to cloud:

-> Cloud computing can be called a technology through which things like software, processing, and data storage are outsourced.

- On demand
- Pay as you go.
-

-> There is only need for an internet connection, an updated web browser, and compatible device.

-> Cloud is Renting the services over the ~~network~~. Internet.

Cloud computing:

- Central data center for providing services.
- on demand, scalable, unlimited computation & stora
- It is basically a data center