

UNIT 03: VIRTUALIZATION IN CLOUD COMPUTING.

(Piyusha Supe 23C0315)

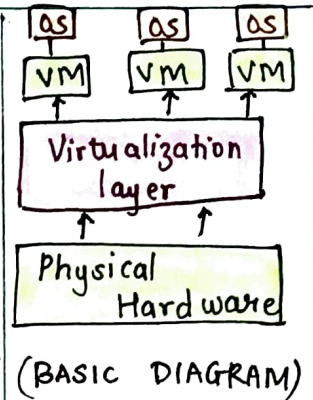
1) Definition - Virtualization is the creation of virtual versions of hardware, OS, storage or network.

• Why Adopt?

• Improves resource utilization, scalability, flexibility and cost efficiency.

TYPES (OF VIRTUALIZATION) -

1. **HARDWARE** - Abstract physical hardware.
2. **OS** - Multiple OS instances on one machine.
3. **STORAGE** - Pooling physical storage
4. **NETWORK** - Combine multiple N/W into one.
5. **DESKTOP, APPLICATION** - Access from anywhere.

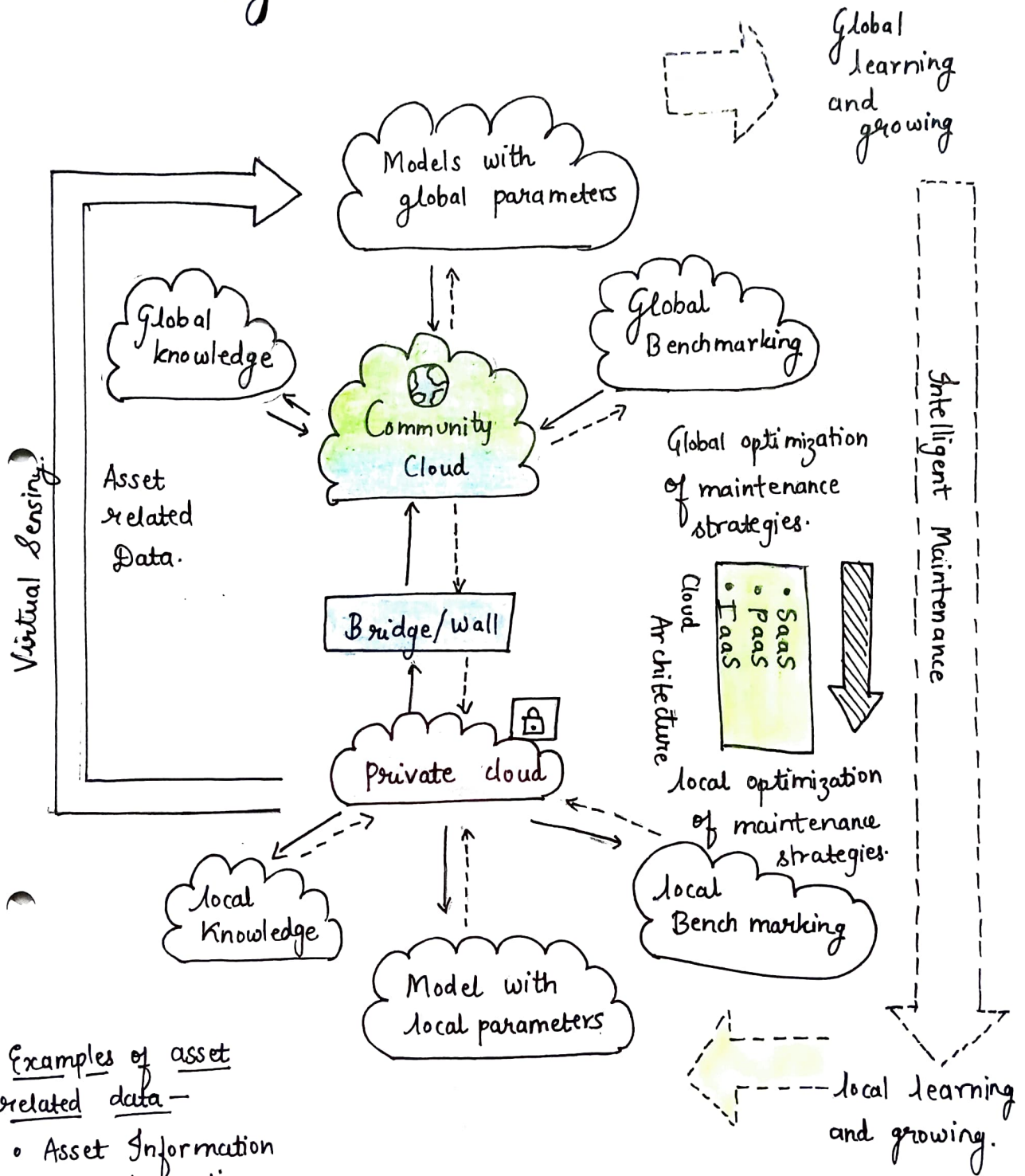


VIRTUALIZATION SOFTWARE	VIRTUAL CLUSTERING	APPLICATIONS -
<ul style="list-style-type: none"> • <u>HYPERVISOR BASE</u> - • TYPE 1 (Bare Metal) • TYPE 2 (Hosted) <p><u>TOOLS</u> - Hyperv, VirtualBox, KVM, VMWare</p>	<ul style="list-style-type: none"> • Linking virtual machines (VMs) to act as a cluster • Benefits - load Balancing, failover support, scalability. 	<ul style="list-style-type: none"> • Server Consolidation • Disaster recovery. • Software Testing. • Development requirements. • Running Legacy apps.
PITFALLS -	GRID AND CLOUD VIRTUALIZATION.	
<ul style="list-style-type: none"> • VM Sprawl • Security vulnerability • Performance over-head • Licensing issues. • Management Complexities. • Difficult to maintain. 	<ul style="list-style-type: none"> • <u>GRID COMPUTING</u> - • Allows grid nodes to run isolated environments. • Enhances flexibility, compatibility in distributed tasks. • <u>CLOUD COMPUTING</u> - • Core enabler for IaaS, PaaS. • On demand resource allocation. • <u>SECURITY IN VIRTUALIZATION</u> - • Risk. - VM Escape, Misconfigured hypervisors, shared. • Solutions - Strong isolation, access controls, tools VMM. 	

VIRTUALIZATION AND CLOUD COMPUTING.

Anatomy of Cloud Infrastructure:	Virtual Infrastructure:	CPU Virtualization:	Storage Virtualization:	Network Virtualization:
<ul style="list-style-type: none"> • Core: Virtualized servers, networks, and storage • Managed via APIs and orchestration tools. 	<ul style="list-style-type: none"> • Pool of virtualized computing resources. • Managed centrally via cloud platforms (eg. openstack, AWS) 	<ul style="list-style-type: none"> • Virtual CPU simulate physical CPU • Managed by hypervisor for multitasking efficiency. 	<ul style="list-style-type: none"> • Combines many storage devices in single logical units. • Eg: SAN, NAS, cloud storage (eg. S3) 	<ul style="list-style-type: none"> • Abstracts physical Network to software network. • Enables s/w defined networking (SDN)

Hybrid Cloud Model.



Examples of asset related data -

- Asset Information
 - description
 - Criticality.
- Work Order feedback
 - Order exactuation (CM)
 - Inspection (PM) • CBM (PdM)
- Fault Management and analysis.
- Maintenance strategies

UNIT - 01 Introduction to cloud Computing.

- Hybrid deployment model.

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UNIT - 01 - INTRODUCTION TO CLOUD COMPUTING.

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• — MIND-MAP — •

