

8.1.25

CS 695

lecture #1

Q. what is cloud computing?

- computing-as-a-service (*) (*)
- decoupled usage/access from implementation of functionality
- up/down scaling of service/resources / ...
(flexible/elastic resources) on-demand.
- pay-as-you-use / fine-grained metering
- (*) - reliability/security)...

service models

- IaaS — infrastructure — compute infra.
cpu, mem, storage, ...
- PaaS — platform ~ dev. platform, app engine
postman
- SaaS — software ~ gmail, zotero, canva...
- FaaS — function/microservices
- *aaS — MLaaS
DBaaS
KVaaS

⑧ each of these service models need —

- ~ interface / APIs
- ~ abstractions — vms, containers, fr. (design & impⁿ.)
- ~ mechanisms, policies
 - └ resource mgmt., provisioning, ...

⑧

user-view

- ~ on-demand & elastic
- rapid / quick deployments
- ~ isolation, security
- pay-on-use
- ~ performant

provider-view

- ~ demand ~ plan ~ increase
- ~ utilization / efficiency
- ~ features
- ~ minimize SLA violations
- ~ reduce costs

↑
(focus of the course)
for the most part

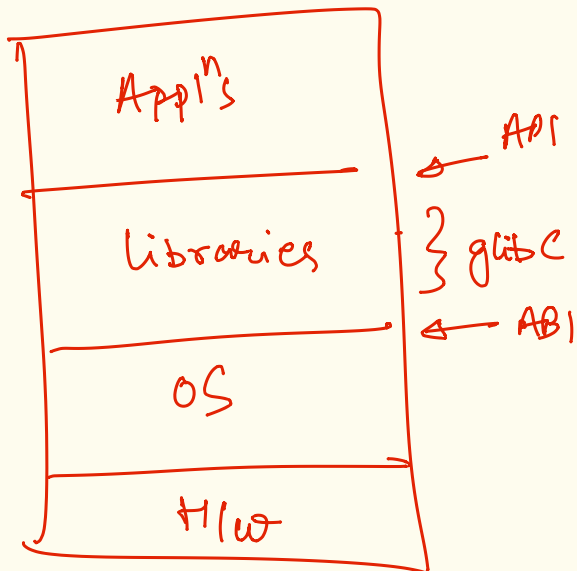
⑧

Q what is this connected to virtualization?
why

~ secret sauce
of computing

ABSTRACTIONS

- + encapsulate functionality
- + provide interfaces
- decouple access / implementation



OS abstractions
 ~ process, files
 address space, ports, n/w
 locks/sync. primitives,
 n/w interfaces.

process-view on a m/c

- ~ address space
(zero starting - max)
- ~ cpu registers
machine
- ~ files / directory
structure
- ~ n/w endpoints
- ~ IP

OS-view of a machine

- ~ physical memory / addresses
- ~ interconnects (pci 30, pci 40, sata, ...)
- ~ Cpu type (32-64, x86, risc)
- ISA

↑ OS exports to provide abstractions.

└ (machine) ←

⊛ virtualization / virtual machine

└ build an abstraction for the OS-view.
 (virtual machine)