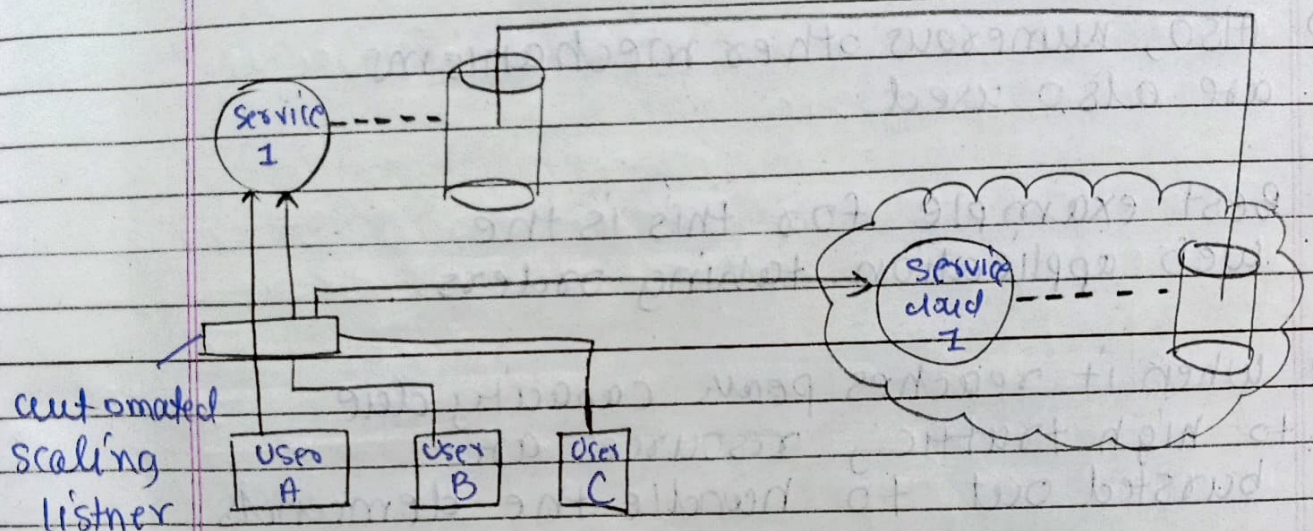
CS451 → Advance Computing (U.T.-I)

Q-1 = Write a case study on the use of Cloud Bursting Architecture with diagram.

→ The cloud bursting architecture establishes a form of dynamic scaling that scales or to be precise "bursts out" on premise IT resources into a cloud whenever a capacity limit is reached.



→ Here, the scaling monitor watches the usage of on-premise Service 1, and then redirects the user C to another implementation in the cloud.

→ This is done because Service 1's usage threshold has been reached

→ To keep a synchronization between the databases, a resource replication system is used.

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→ This is a flexible scaling architecture.
→ This architecture provides an option to the consumers to use resources only to meet higher demands.
→ One thing to note here is that the main components are automated scaling listeners & the resource application logic.
→ Also, numerous other mechanisms are also used.
→ Best example for this is the web application taking orders.
→ When it reaches peak capacity due to high traffic, resources are bursted out to handle the demands.

Q-2 = What is hypervisor clustering? Explain the architecture in detail.

→ Hypervisors are the main components, responsible for creating and hosting multiple virtual servers.

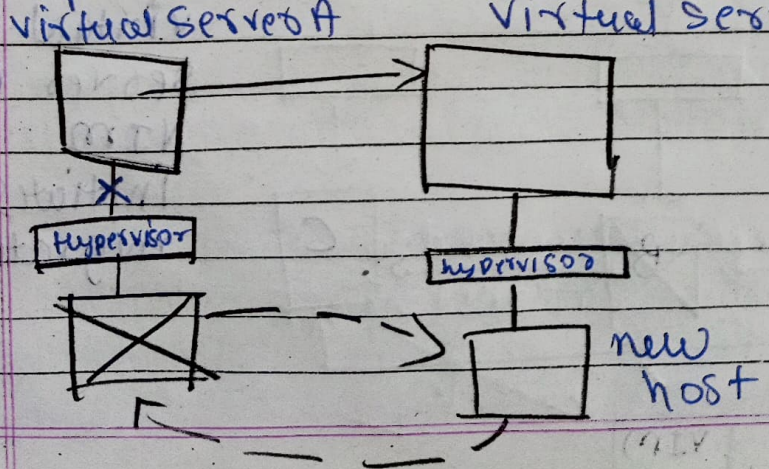
→ This dependency makes the hypervisor vulnerable.

→ If the hypervisor fails, then it can affect the entire architecture.

→ Hence, another architecture is deduced.

→ The hypervisor clustering establishes a high availability clusters of hypervisors across multiple physical servers.

→ So, if one of the hypervisors becomes unavailable, then the hosted virtual servers can be moved to another hypervisor to maintain the runtime operations.

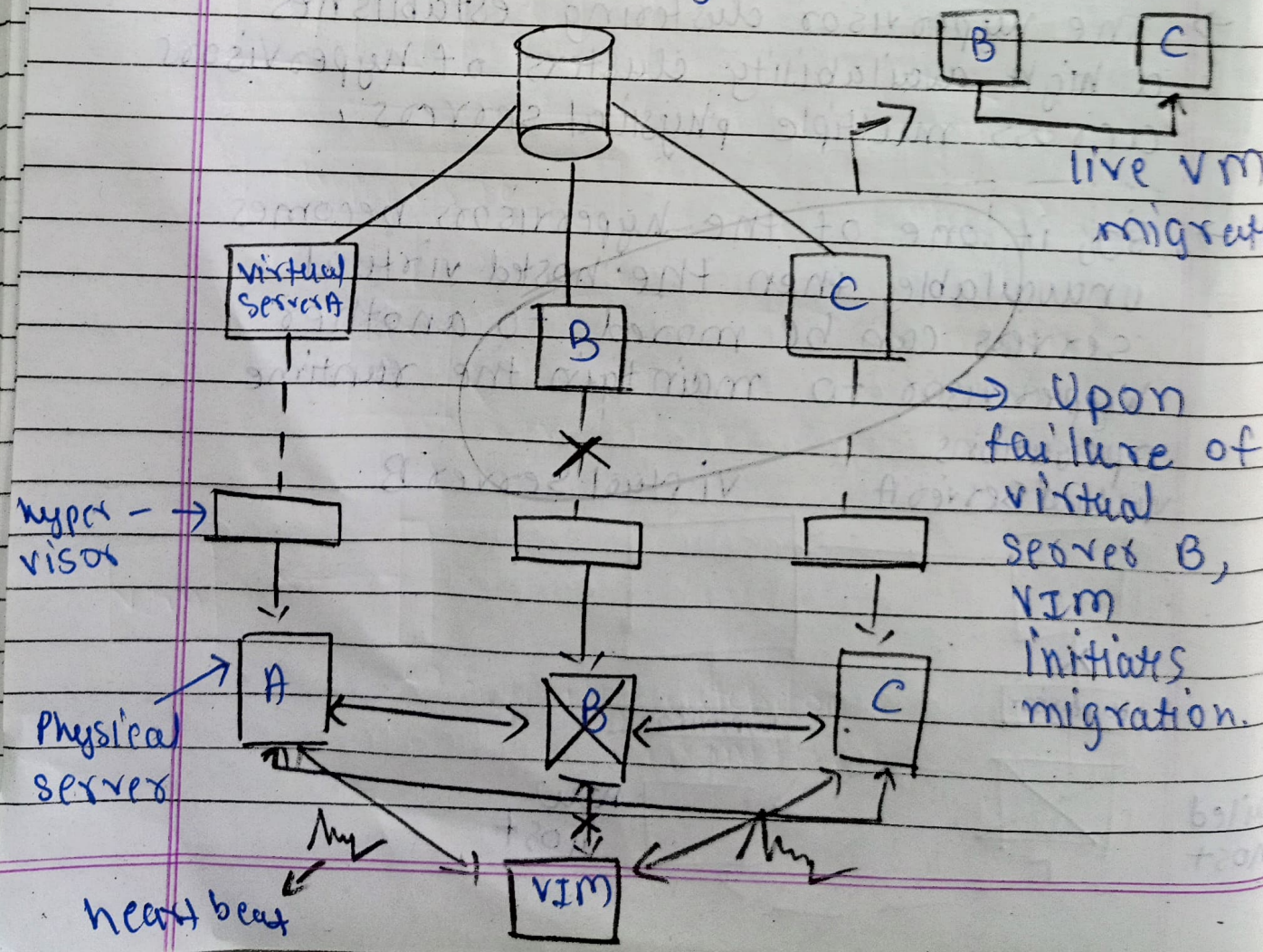


→ The cluster is controlled via a central VIM, which sends regular heartbeat to the hypervisor to confirm that they are up & running.

→ ~~Una~~ Here, heart beats are system-level messages exchanged between hypervisors.

→ Unacknowledged heartbeat messages cause the VIM to initiate the live VM migration program.

→ The cluster uses a shared cloud storage device to live-migrate virtual servers.



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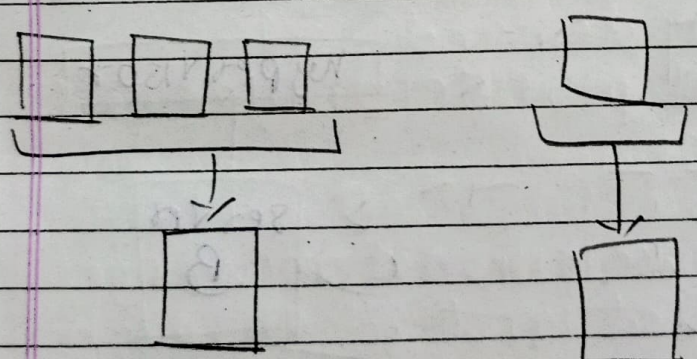
Q-3 Write a note on Load Balanced Virtual Server Instances Architecture with diagram

→ Keeping cross-servers workloads evenly balanced between physical servers whose operations & management are isolated is a challenge.

→ It is clear that a physical server can easily hosts more virtual servers than its neighbours.

→ So, there might be a case where, few servers are more utilized while others are under utilized.

→ This leads to constant wastage of resources.



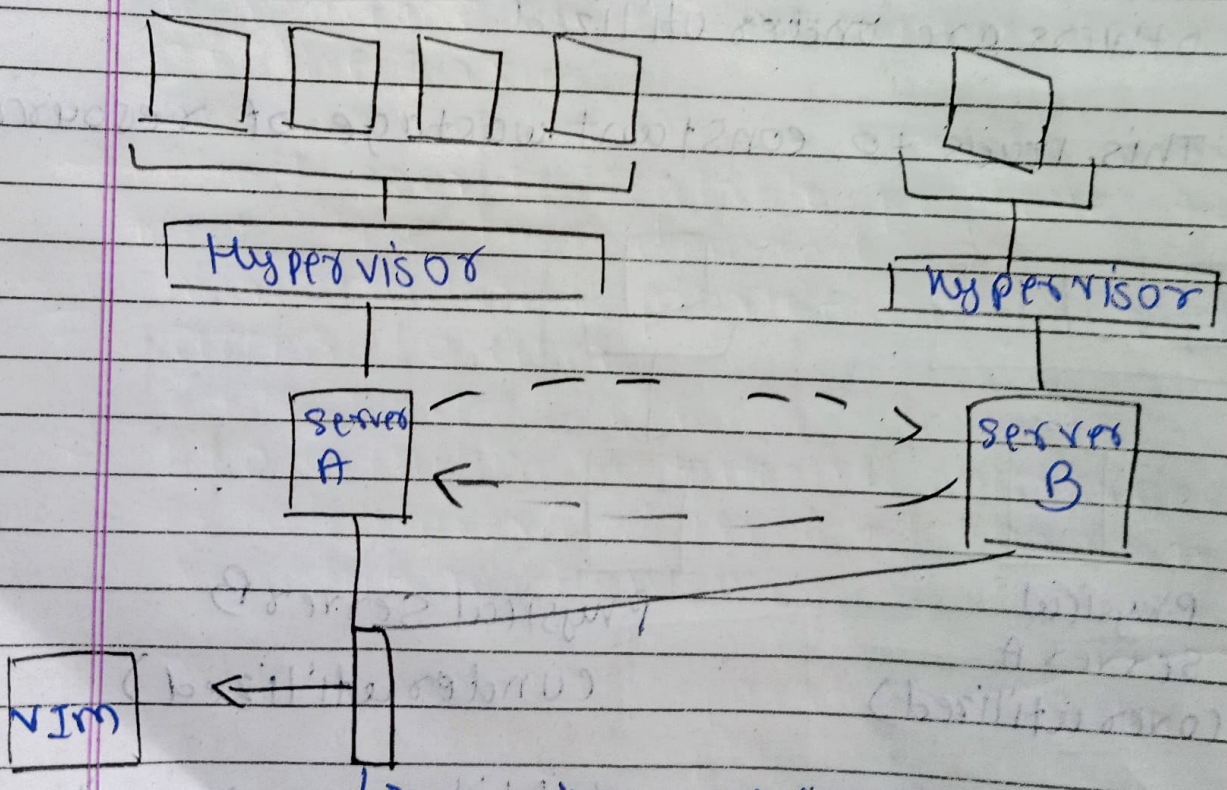
→ This architecture establishes a capacity watchdog system that dynamically calculates virtual server instances & associated workloads, before distributing

process across them.

→ This system has cloud usage monitor, live VM migration program & a capacity planner.

→ This monitor tracks physical & virtual server usage and reports significant fluctuations.

→ If the planner decides to move the virtual servers, then live VM program is signalled.



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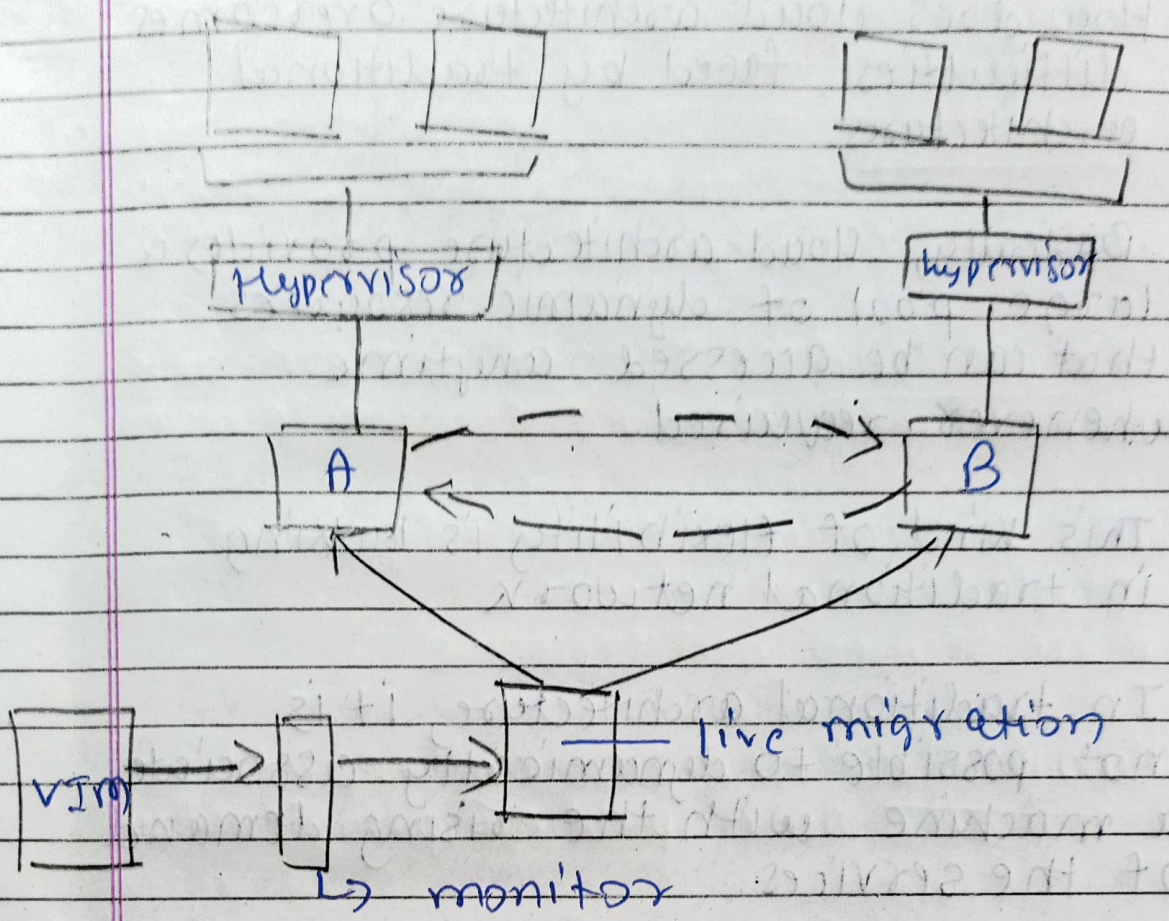

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Q-4 How does cloud architecture overcomes difficulties faced by traditional architectures.

→ Basically, cloud architecture provides a large pool of dynamic resources that can be accessed anytime whenever required.

→ This kind of flexibility is lacking in traditional network

→ In traditional architecture, it is not possible to dynamically associate a machine with the rising demand of the services.

→ Cloud provides scalable properties to meet the high demand of infrastructure & provide on-demand access to user.

→ Also, failure detection & recovery is also provided in cloud through versatile mechanisms.

Q-5 What is cloud computing? explain its services & deployment models.

→ Cloud computing is a virtualization based technology that allows us to create, configure, and customize applications via the internet.

→ Following are the services:-

(1) Iaas:-

→ Infrastructure as a Service
→ This service provides computing resources which are hosted in private, public or hybrid cloud.

(2) PaaS:-

→ Platform as a Service

→ This provides customers a complete cloud platforms for running, developing & managing applications.

(3) SaaS:-

→ Software as a Service.

→ ~~Baset~~ Basically, it is a software distribution model which a cloud provider hosts applications & makes them available to end users

* Deployment models :-

(1) Public Cloud => It is possible for anybody to access systems & services.
→ It is less secured.

(2) Private cloud => It is a one-on-one environment reserved for single user.
→ No sharing with common/general people.
→ More secured but expensive.

(3) Hybrid cloud → combination of both public & private clouds.
→ Here, more security & access is provided.
→ ~~So~~

Q-6 Explain virtualization & its type.

→ It is a technique which allows to share a single physical instance of a resource or an application among multiple consumers.

→ It is a process of separating a service from underlying physical delivery of the service.

* Benefits:-

(1) More flexible
(2) Lowers the cost
(3) Remote access
(4) Rapid Scalability
(5) Disaster Recovery

* Types:-
  (1) Application virtualization
  (2) Network virtualization
  (3) Storage virtualization
  (4) Server virtualization
  (5) Data virtualization