

# Cloud and big data technology

Cloud Architecture

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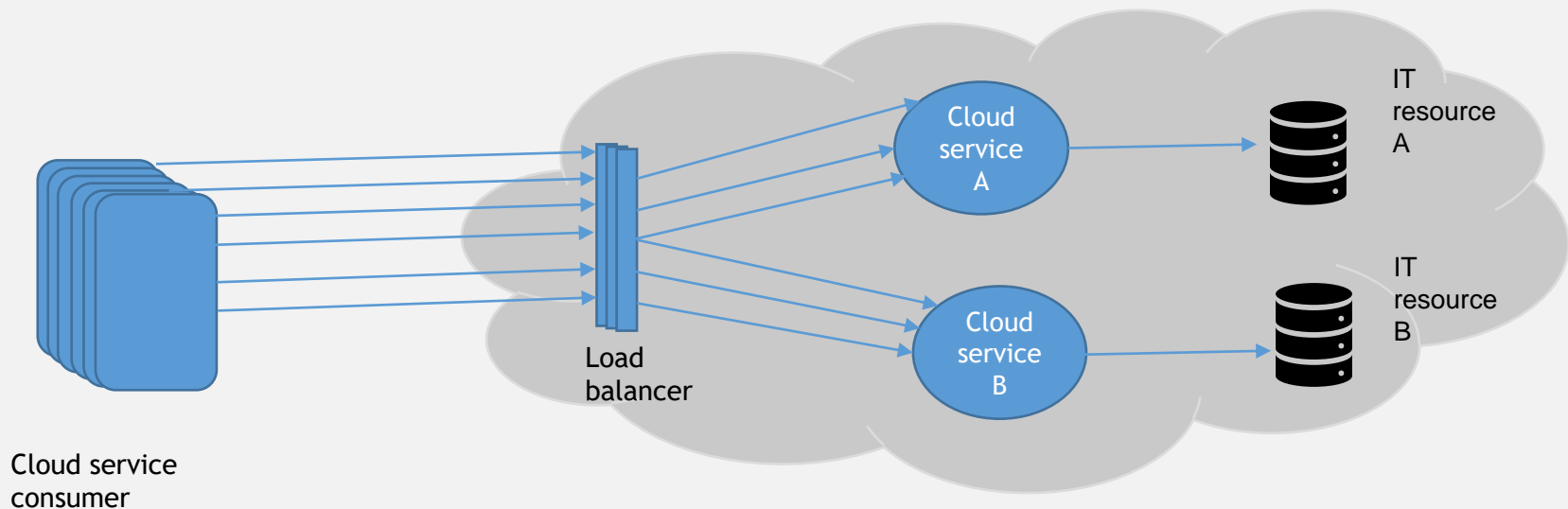
# Outline

- Overview
- Workload distribution architecture
- Resource pooling architecture
- Dynamic scalability architecture
- Redundant Storage architecture
- Cloud bursting architecture
- Hypervisor Clustering architecture
- Bare-metal provisioning architecture

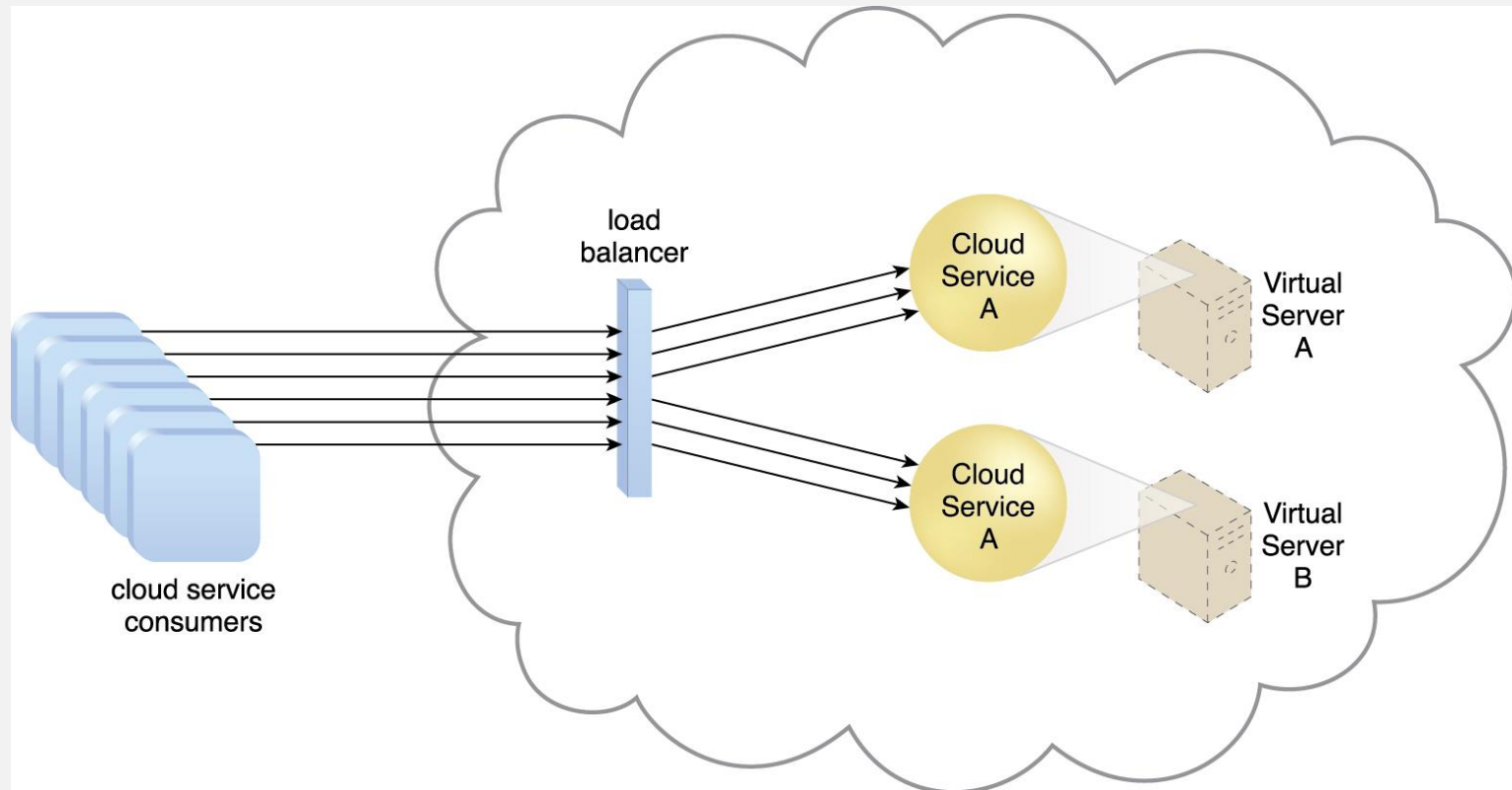


# Workload distribution architecture

- Whenever there is a shortage of IT resources, easiest way to overcome this additional resource need is by adding extra resources in horizontal scaling fashion.
- A load balancer will try to distribute the load evenly among the available IT resources.



# Workload distribution architecture



Audit Monitor, cloud usage monitor, hypervisor, etc can also be a part of this architecture

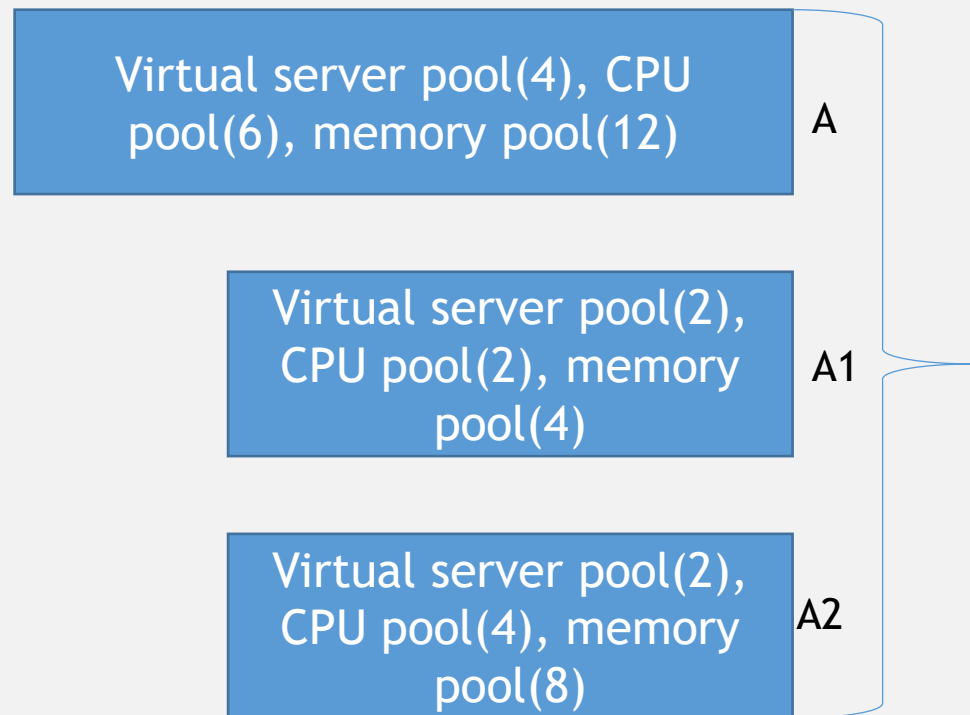
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# Resource pooling architecture

- Its based on the use of one or more resource pools, in which identical IT resources are grouped and maintained by a system that automatically ensures that they remain synchronized.

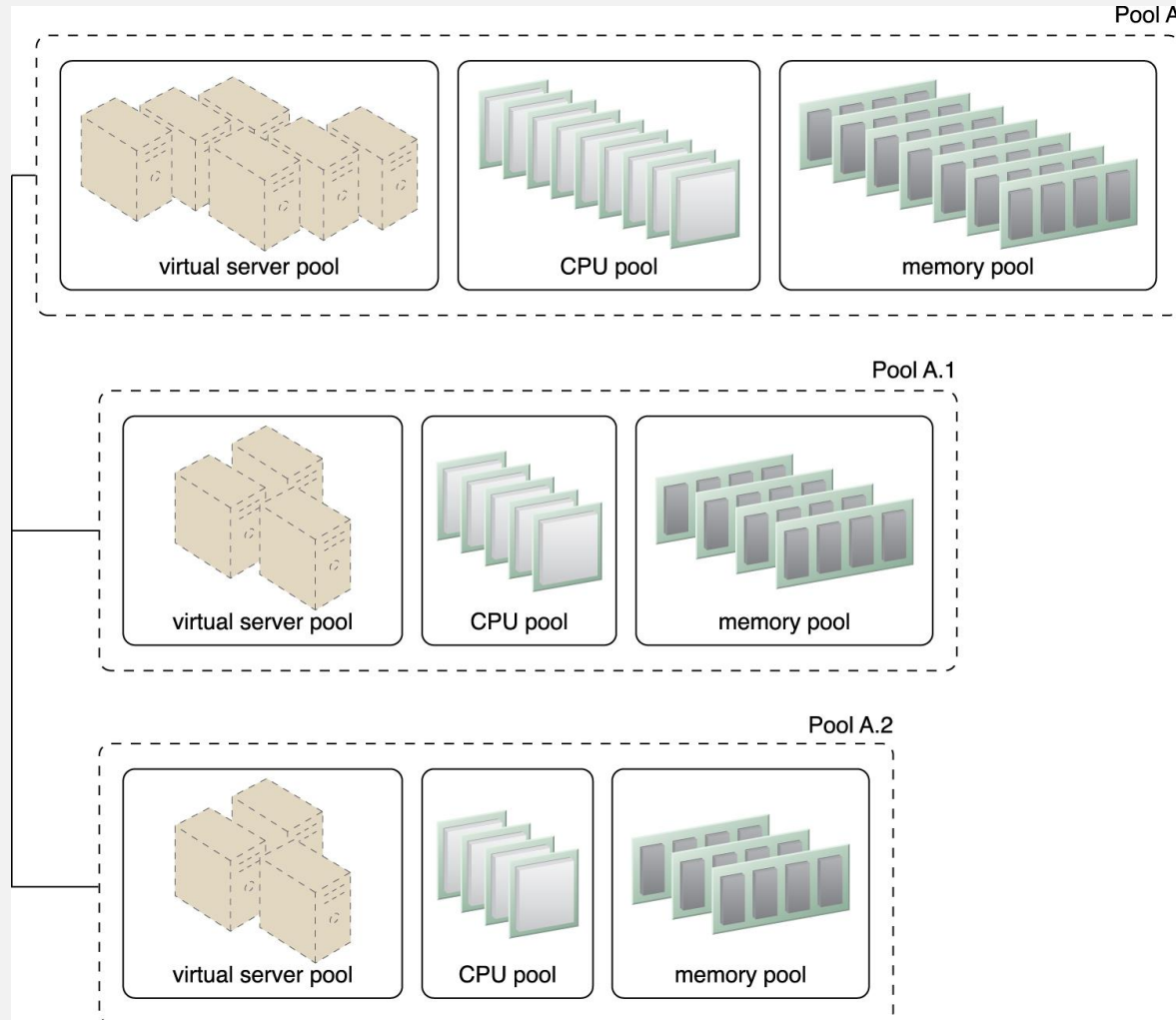
Examples of resource pool:

- Physical server pool
- Virtual server pool
- Storage pool
- Network pool
- CPU pool
- Memory pool



Nested pool A1 and A2 have same resource pool as pool A, but in diff. quantities

# Resource pooling architecture



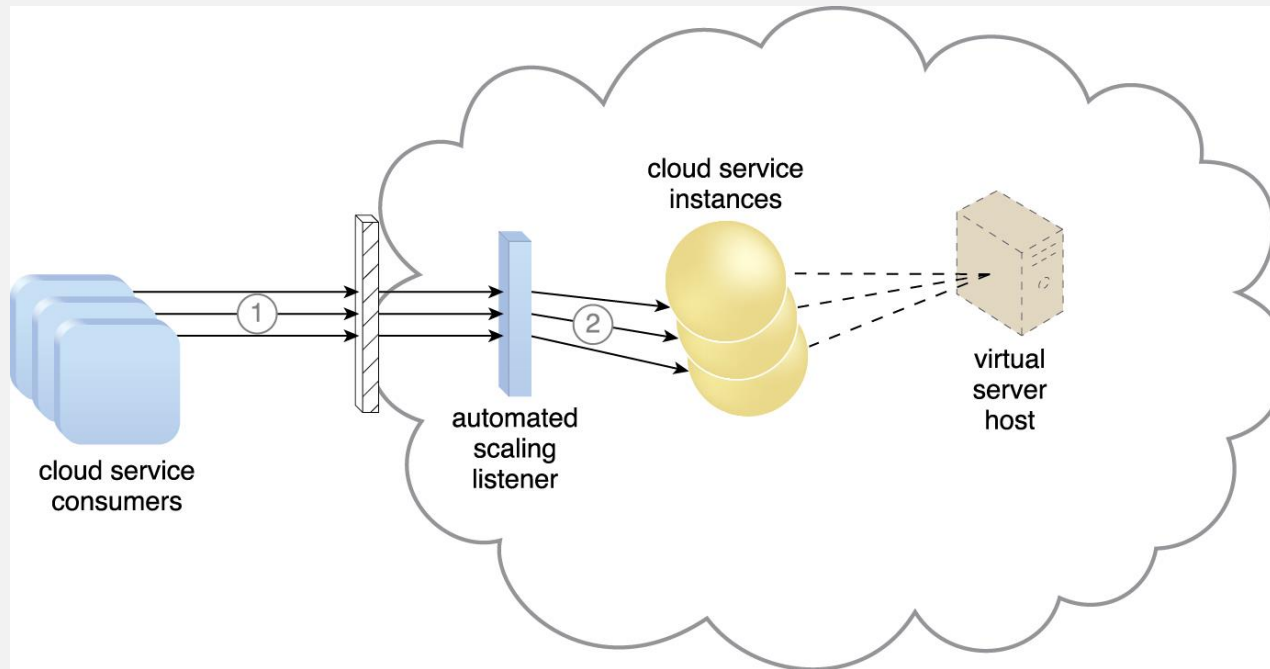
Audit Monitor, cloud usage monitor, hypervisor, etc can also be a part of this architecture

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# Dynamic scalability architecture

- It is based on pre-defined trigger conditions that trigger the dynamic allocation of IT resources from resource pools.
- Dynamic horizontal scaling - IT resource instances are scaled **out-and-in** to handle fluctuating workloads.
- Dynamic vertical scaling - IT resource instance are scaled up-and-down when there is a need to adjust the processing capacity of single IT resource.
- Dynamic relocation - IT resource is relocated to a host with more capacity.

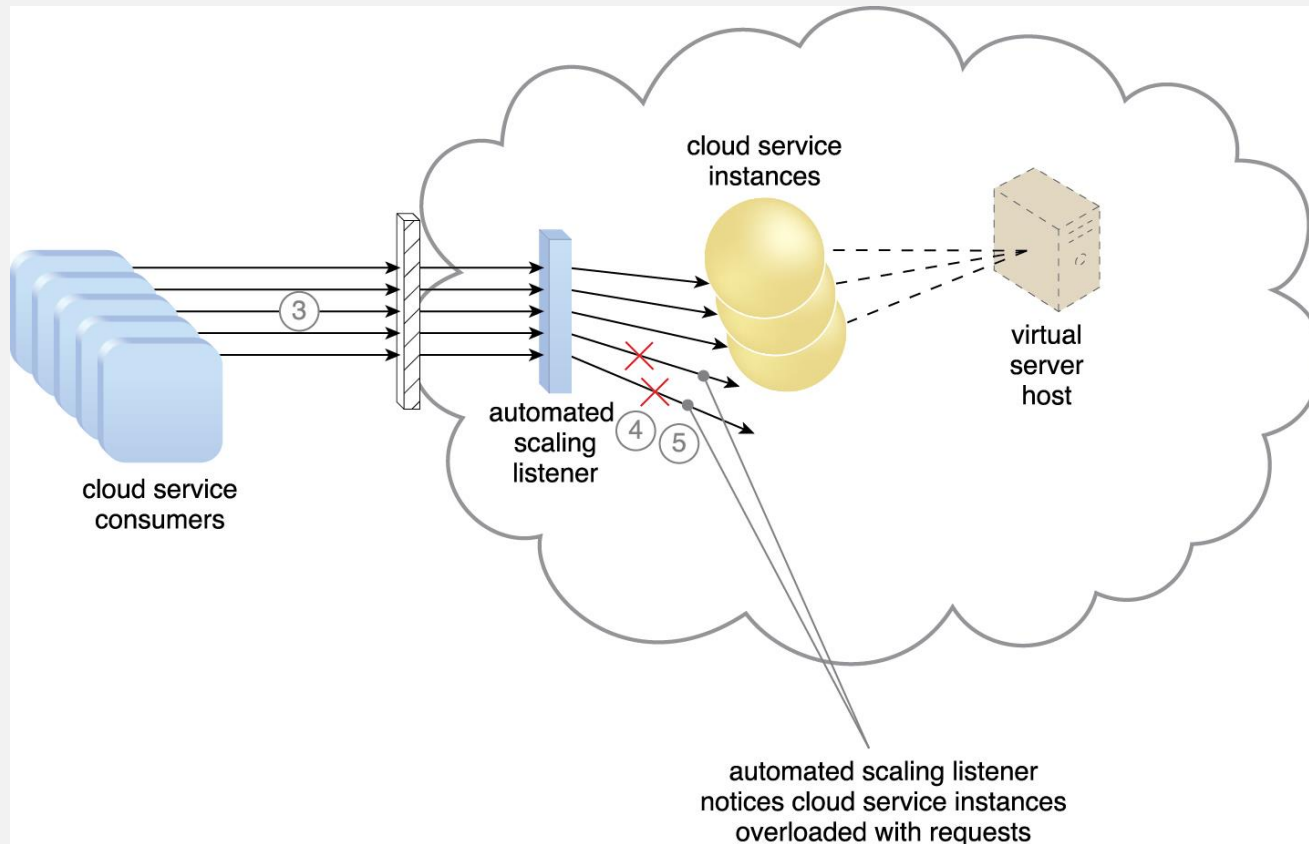
# Dynamic scalability architecture



1. Cloud service consumers sending requests to a cloud service
2. Automated scaling listener monitors the cloud service to determine if predefined capacity are being exceeded



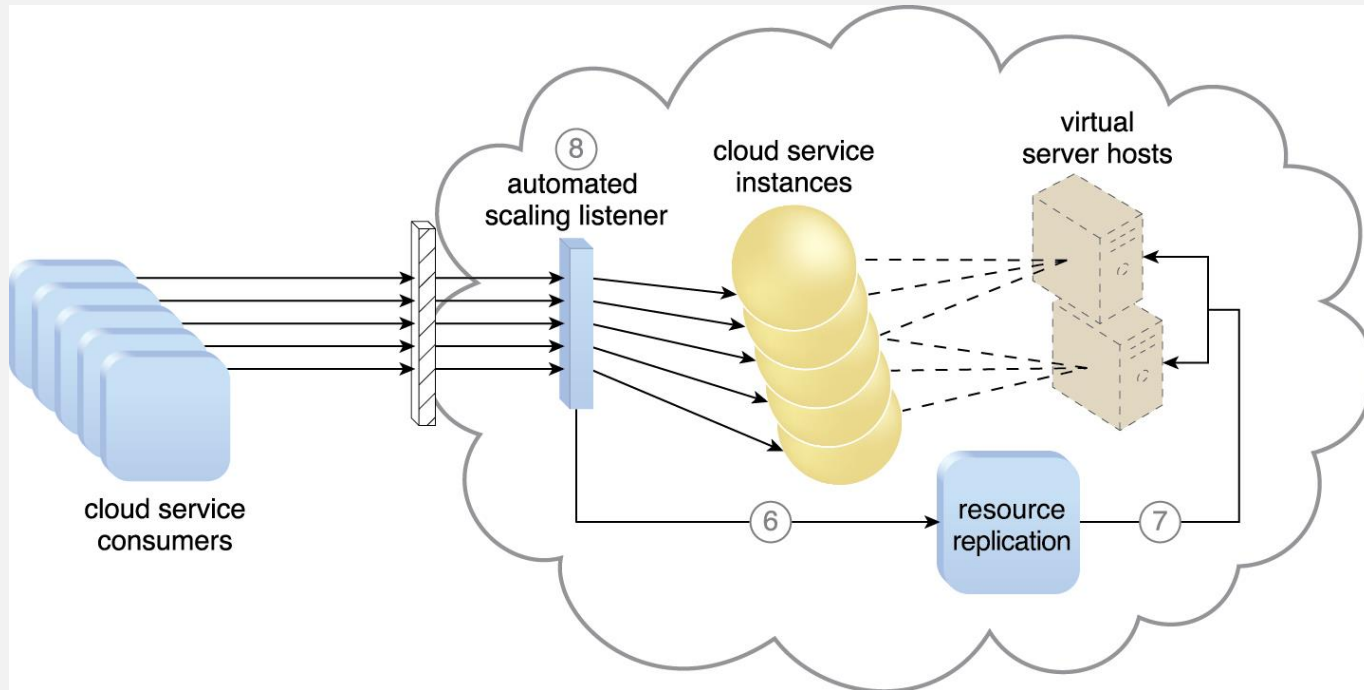
# Dynamic scalability architecture



Cloud usage monitor, hypervisor, Pay-per-use monitor can also be a part of this architecture

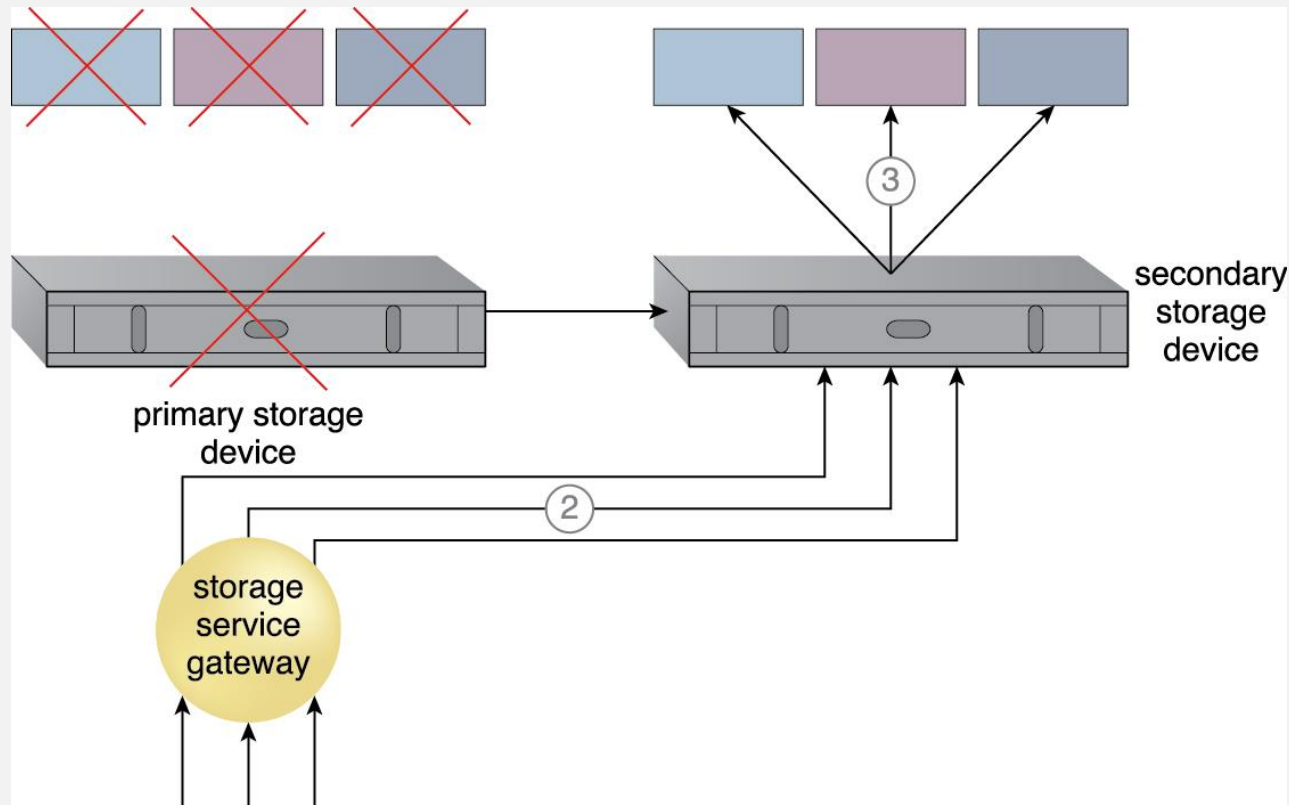
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# Dynamic scalability architecture



# Redundant Storage architecture

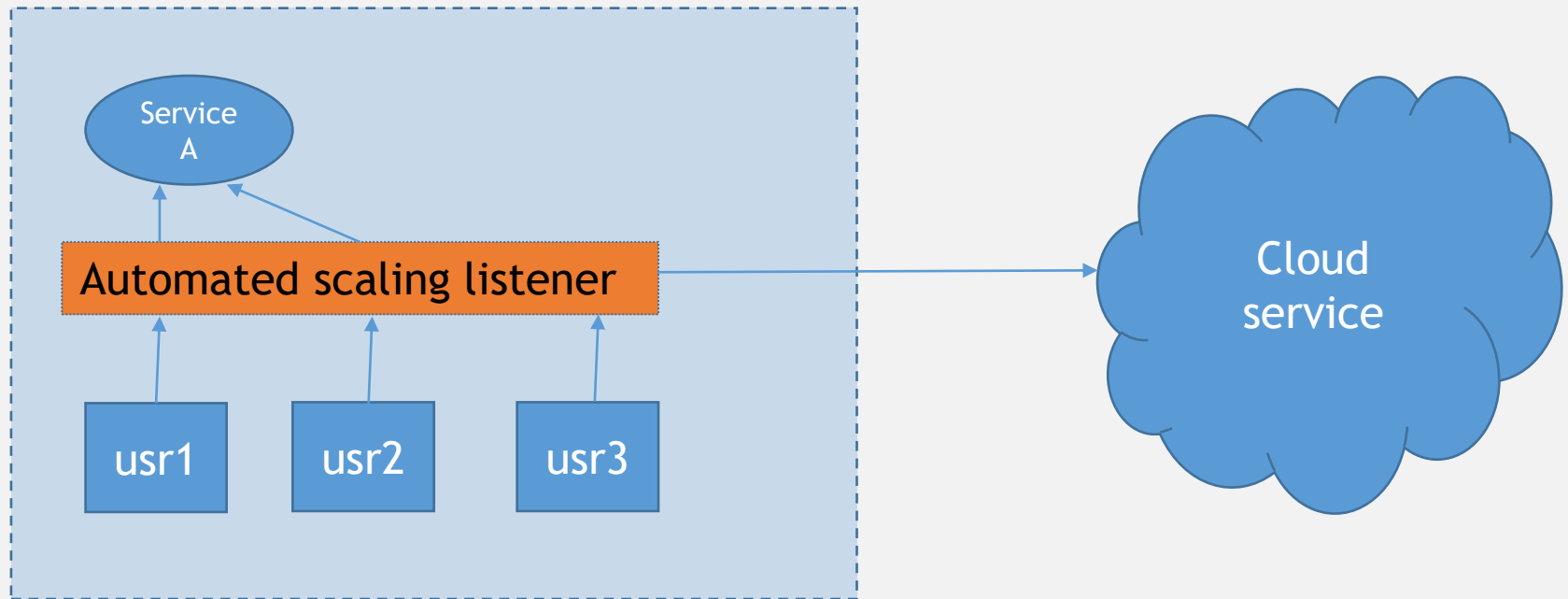
Cloud storage are occasionally subject to failure and disruptions that are caused by network connectivity failure, or security breaches, or hardware failure.



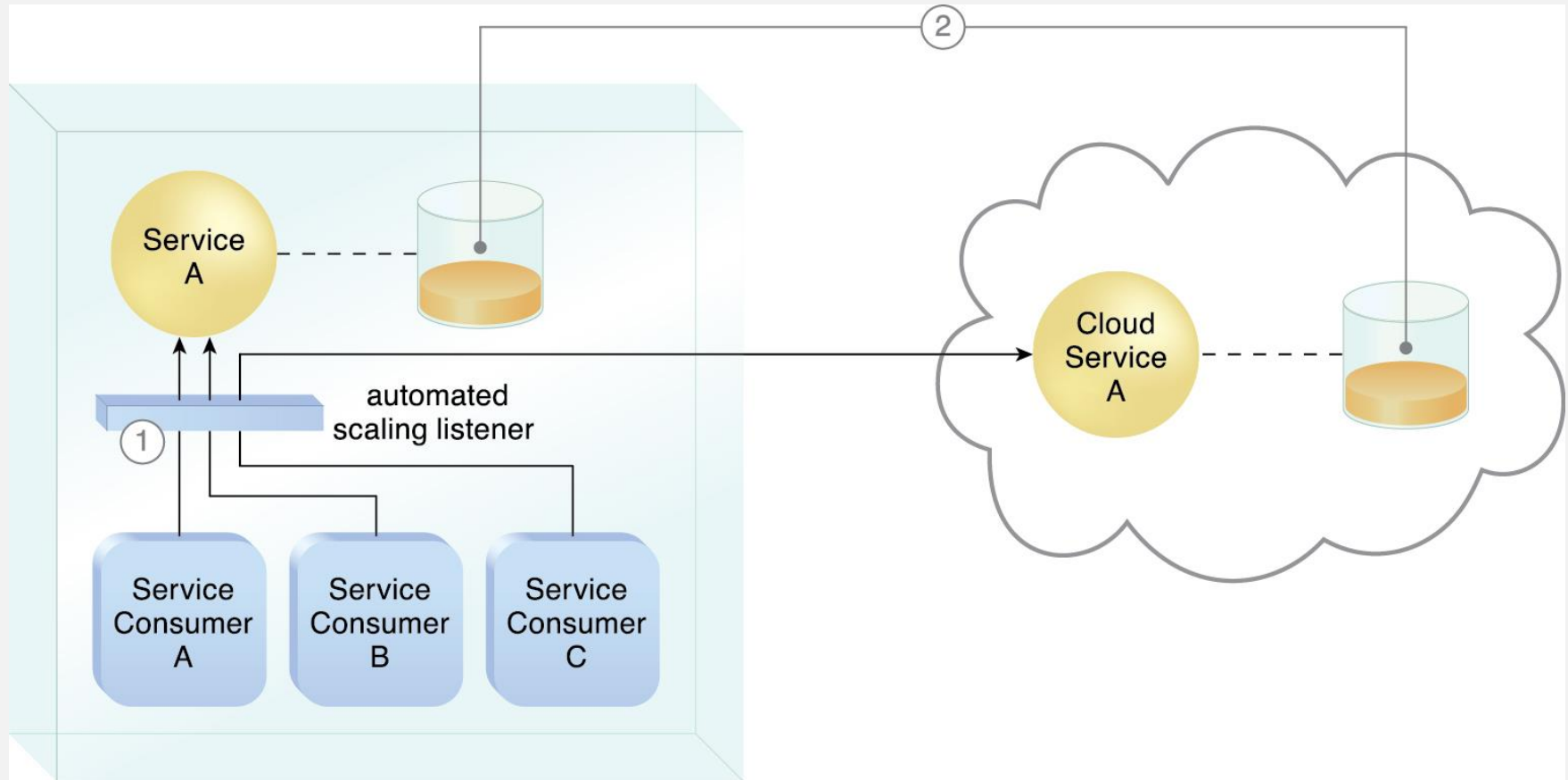
Storage service gateway is capable of automatically redirecting cloud consumer requests whenever location of requested data has changed

# Cloud bursting architecture

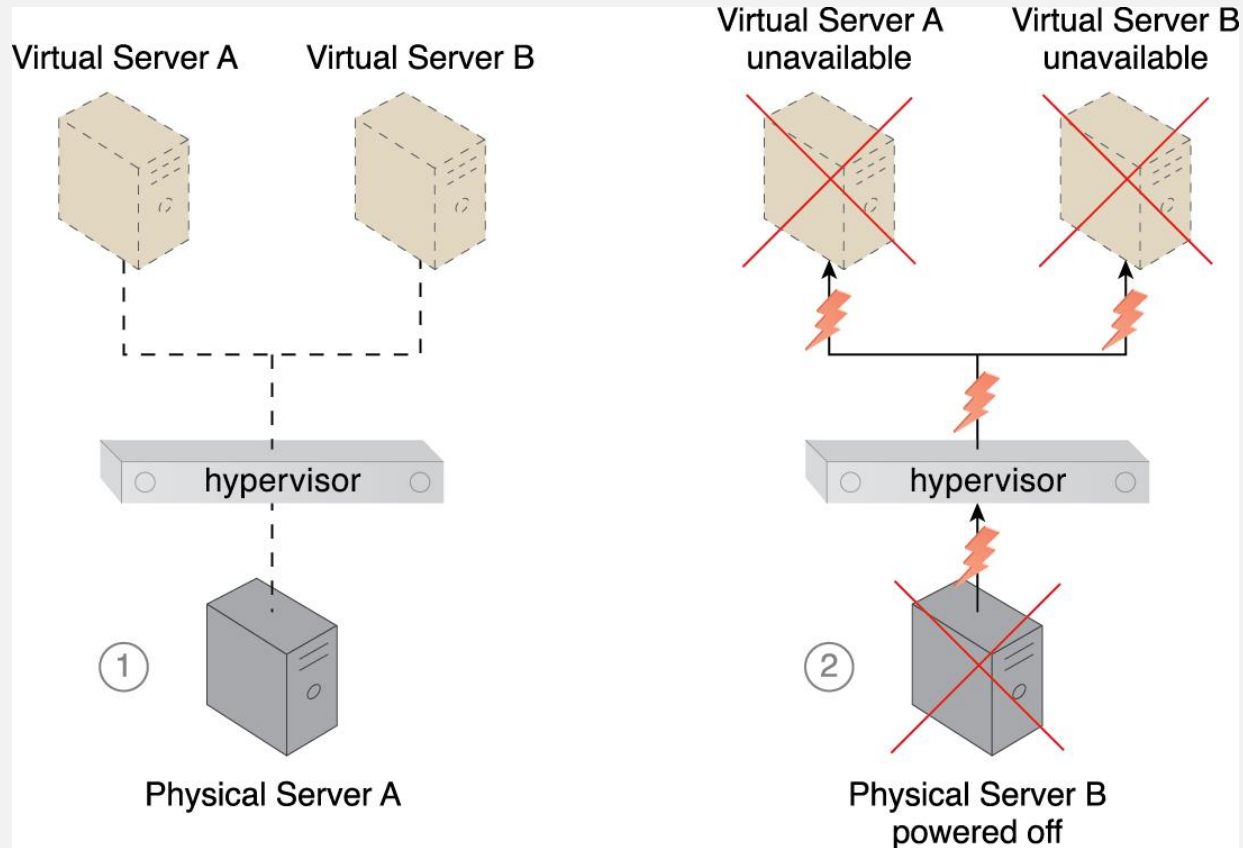
- It is based on pre-defined trigger conditions that trigger the dynamic scaling that scales or “burst out” on-premise IT resource into a cloud whenever the trigger condition like capacity threshold reached.



# Cloud bursting architecture

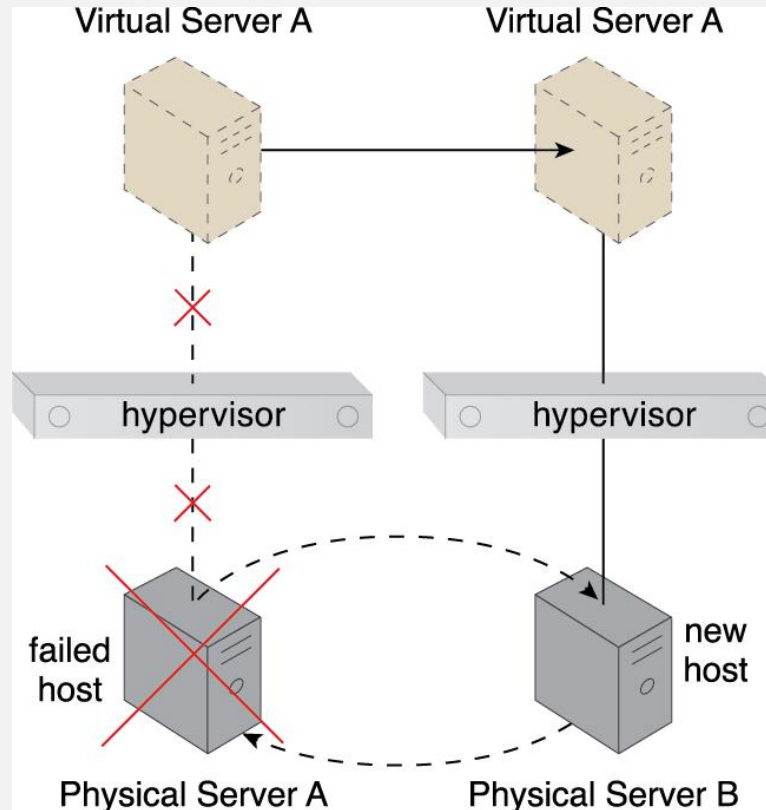


# Hypervisor Clustering architecture



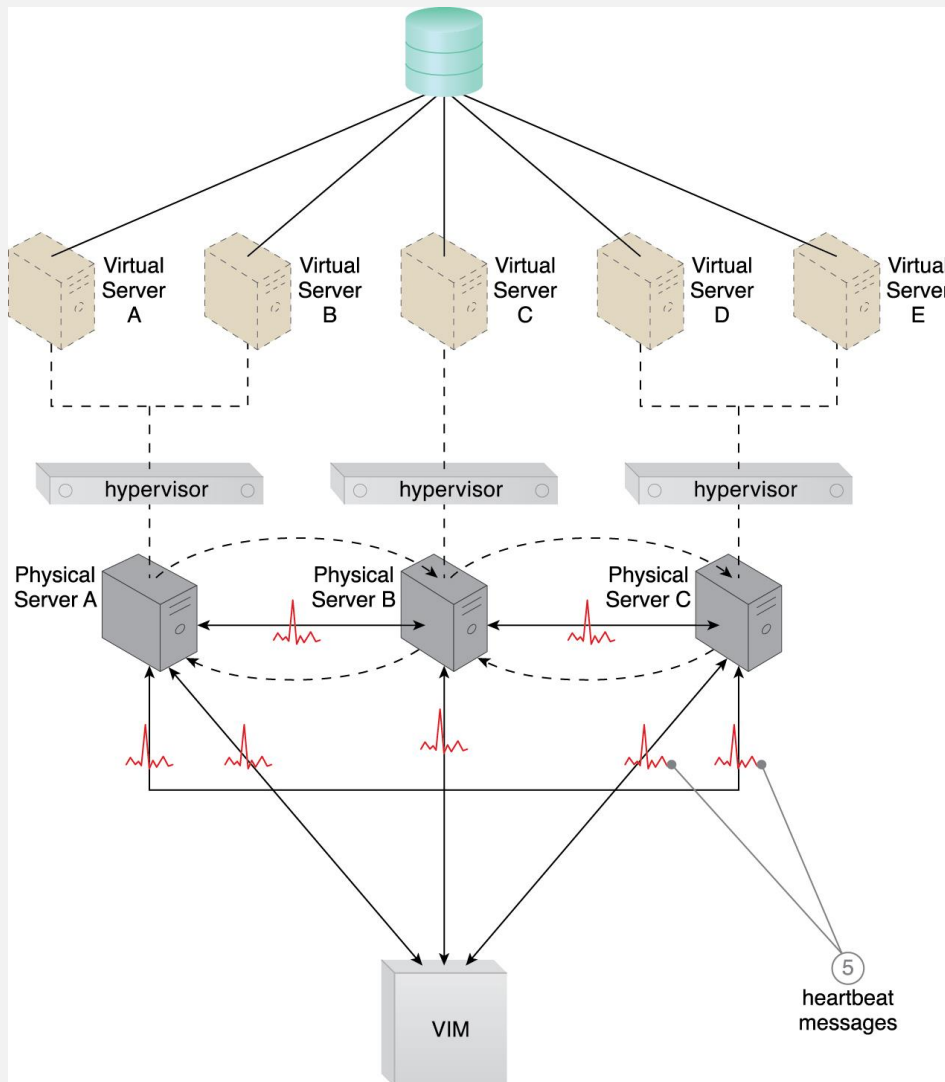
Hypervisor is a key component for VM creation so what if Hypervisor fails.

# Hypervisor Clustering architecture



Hypervisor is a key component for VM creation so what if Hypervisor fails. This architecture can be used to handle such situations

# Hypervisor Clustering architecture

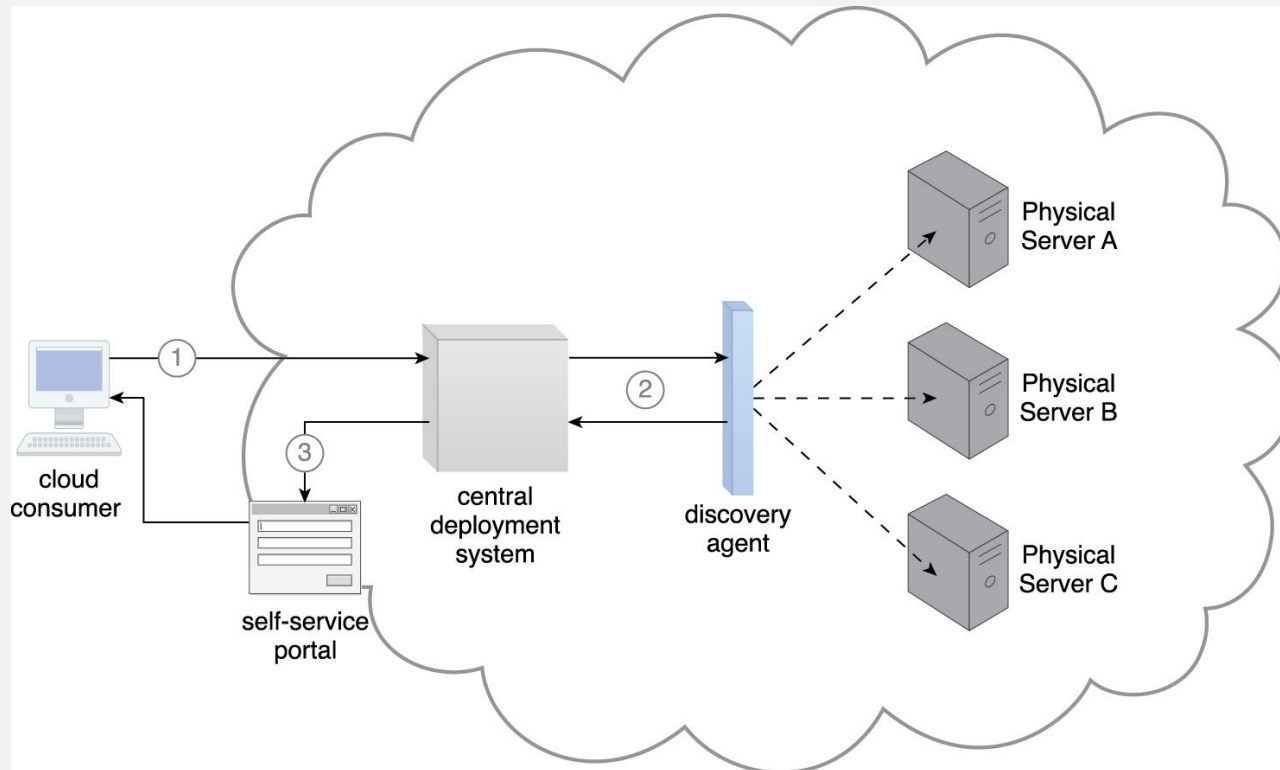


Heartbeats are system level messages exchanged between hypervisors and virtual servers, and hypervisors and VIMs





# Bare-metal Provisioning architecture



Bare-metal hypervisor(Type1)- where it is directly installed on the server hardware

Hypervisor(Type 2 or Hosted) is installed on top of the parent OS

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Thanks!

