Resource Sharing

- To increase the Utilization rate resources run on pools of resources
- Avg. utilization can be increased by sharing them among applications, users and servers
- All application do not use their peak demand
- Implementation need Architectural support
- Resources are shared among several VMs

Resource Sharing

- Challenges:
- Quality of service(QoS)
- Performance Isolation
- Sharing may affect run time behavior
- Multiple application may compete for the same set of resources
- **Resource management strategies required**

Resource Sharing

- Multi Tenancy:
  - Serve different tenants in isolation from each other
  - Available in public cloud
  - No pre-occupy of any resources
  - Temporary basis
  - Ownership free resource sharing
  - Lower computation cost
  - Not limited for IaaS
  - Can be for PaaS and SaaS

Resource Provisioning

- Autonomic resource provisioning:
  - No of VMs for demand
  - Automatic process by AI
  - Rapid resource provision and release with minimum management
  - **Static Approach**
    - Once at the beginning, causes problem when demand crosses limit
  - **Dynamic Approach:** On demand, elasticity on cloud
  - **Hybrid Approach**

Resource Provisioning

- Under Provisioning
- Over Provisioning
- **Cloud Resource provision plan**
  - **Short term on demand plan**
    - Dynamic approach, pay-per-use
  - **Long term plan**
    - Static approach, charged one time for fixed period

Resource Provisioning

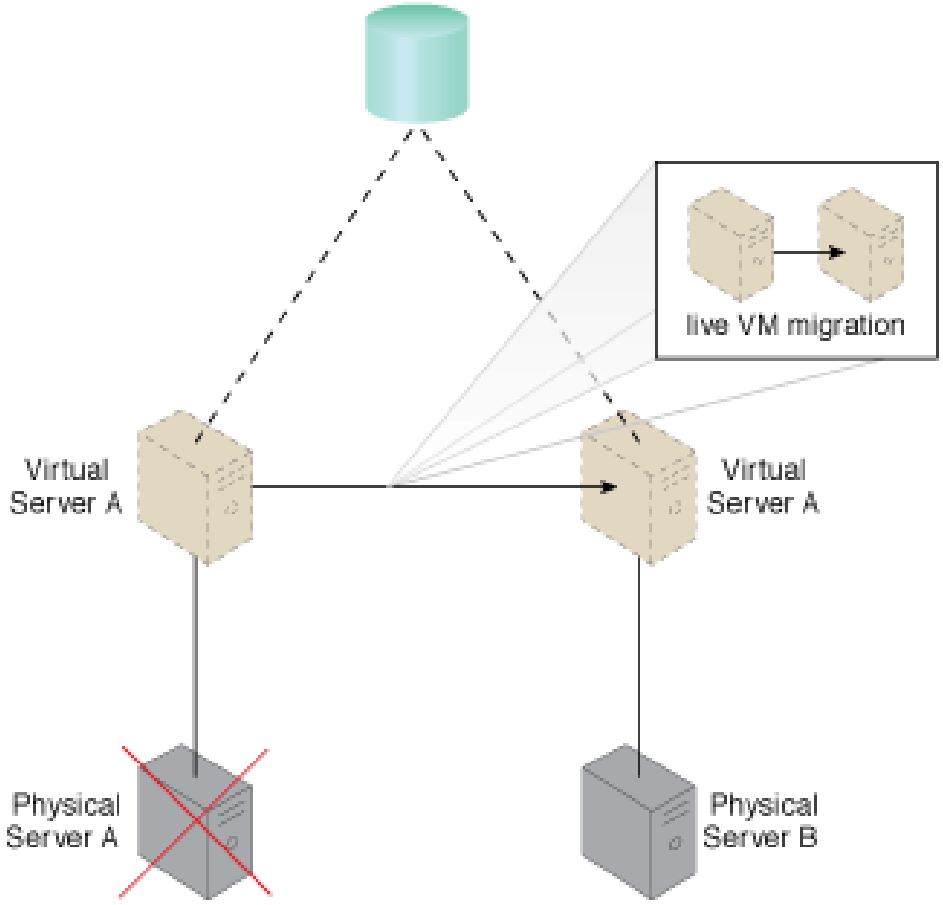
- Under Provisioning
- Over Provisioning
- **Cloud Resource provision plan**
  - **Short term on demand plan**
    - Dynamic approach, pay-per-use
  - **Long term plan**
    - Static approach, charged one time for fixed period

VM Sizing

- Amount of resource for VM
- VM capacity always remain proportionate with load
- Static Approach: fixed at the beginning
- Dynamic: size changes with time and load
- **Individual-VM based**
  - Static at the beginning and allocated as required
- **Joint-VM based**
  - Dynamic

Dynamic Provisioning and Fault Tolerance

- **Zero Downtime Architecture:**
- **VM Migration**
- Physical Server A fails, triggering the live VM migration program to dynamically move Virtual Server A to Physical Server B.



References

- *Cloud Computing*, Sandeep Bhowmik
- https://patterns.arcitura.com/cloud-computing-patterns/design_patterns/zero_downtime