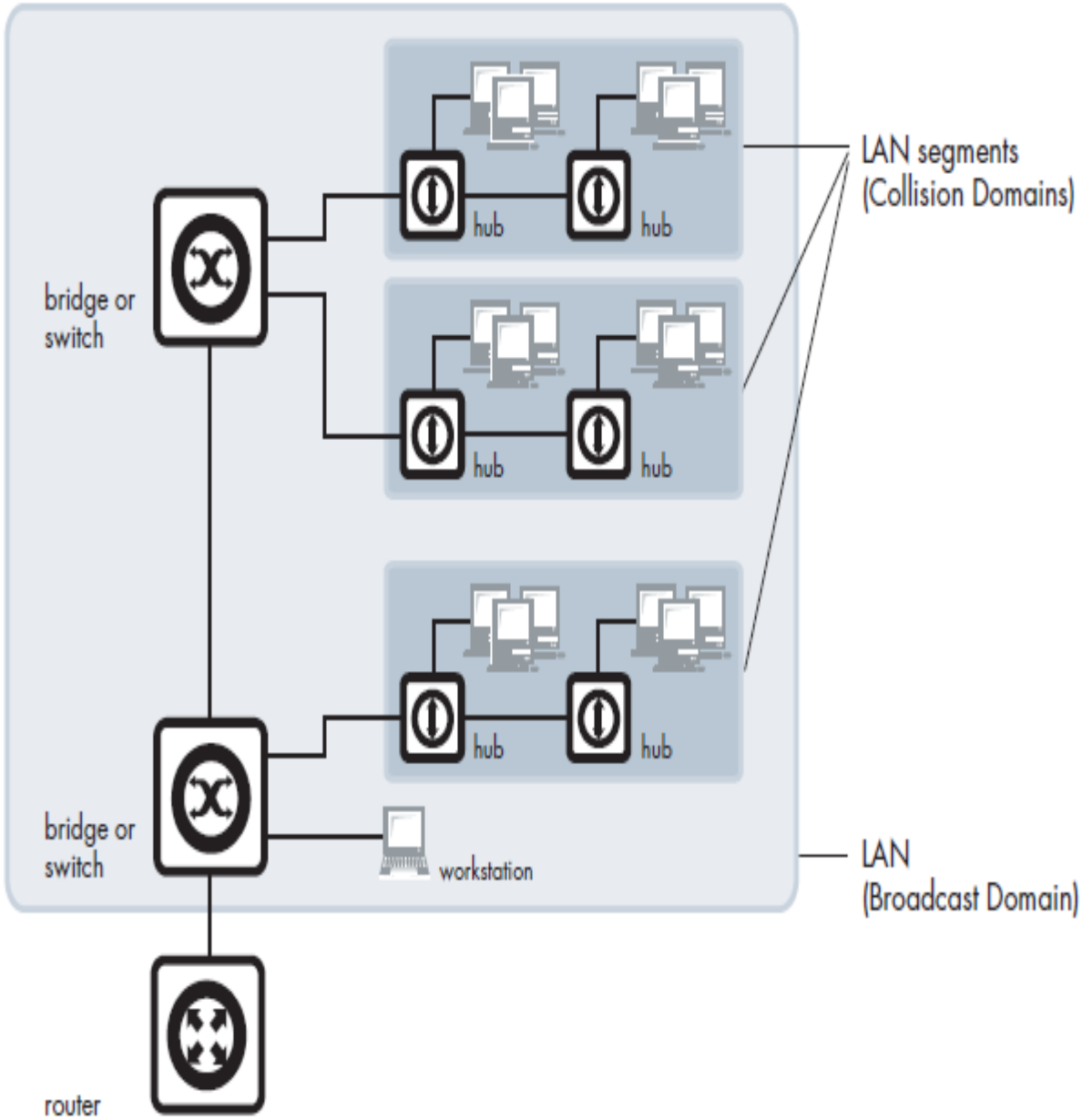
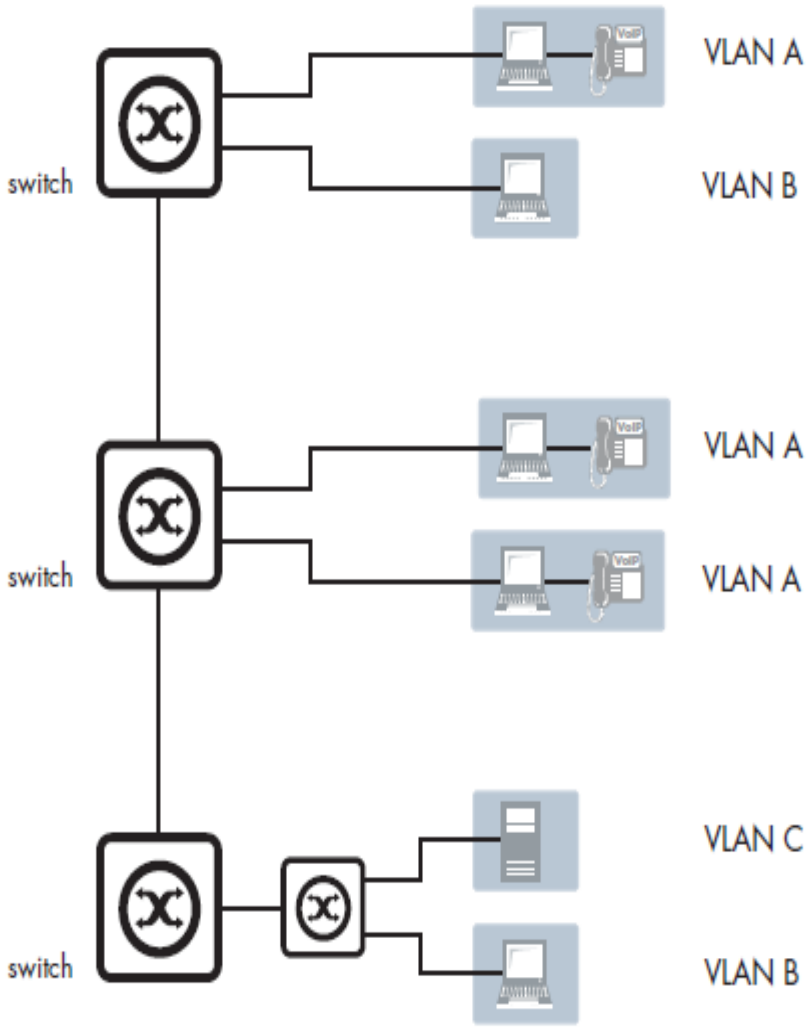
Concept of VLAN (Virtual LAN) and Benefits

- Virtual LAN is a logical segmentation of local area network (LAN) into different set of broadcasting domains. Because the segmentation is not physical it is called *virtual.* Different Users in same location or in different locations can use the same LAN.


LAN segments
(Collision Domains)
hub
hub
hub
hub
hub
hub
bridge or
switch
bridge or
switch
workstation
LAN
(Broadcast Domain)
router


VLAN A
VLAN B
switch
VLAN A
VLAN A
switch
VLAN C
VLAN B
switch

Advantages

- High Performance:

Generally, switches and routers need more processing time for incoming traffic because as the traffic passes through the routers, latency increases and the network performance decreases. If VLAN is used, then there is no need of extra routers since VLAN creates broadcasting domains.

- Virtual workgroups:

In current scenario, most of the communication within the organization takes place in small workgroups (e.g. development team , marketing team , accounting team) to manage broadcast and multi-cast functionality within the workgroups, VLAN can be used to enable communication.

- cost effective

The cost of routers can be reduced when VLANs are used like broadcasting domains

- Easy administration

Traditional LAN has many access management issues, including LAN cabling, new station setup and addressing, and configuration of hubs and routers. While using vLAN this access management effort can be reduced because user movement within vLAN requires no reconfiguration of routers and hubs.

- Enhanced security

VLAN is also used to set firewalls, restrict access permission for outside access, adding an extra layer of security for intrusion detection and controlling broadcasting domain.

Concept of SAN (Virtual SAN) and Benefits

- When a Logical partition is created within a physical storage area network (SAN), it is called virtual storage area network (VSAN). Virtualization technology enables division and allocation of entire storage area network into more logical SANs

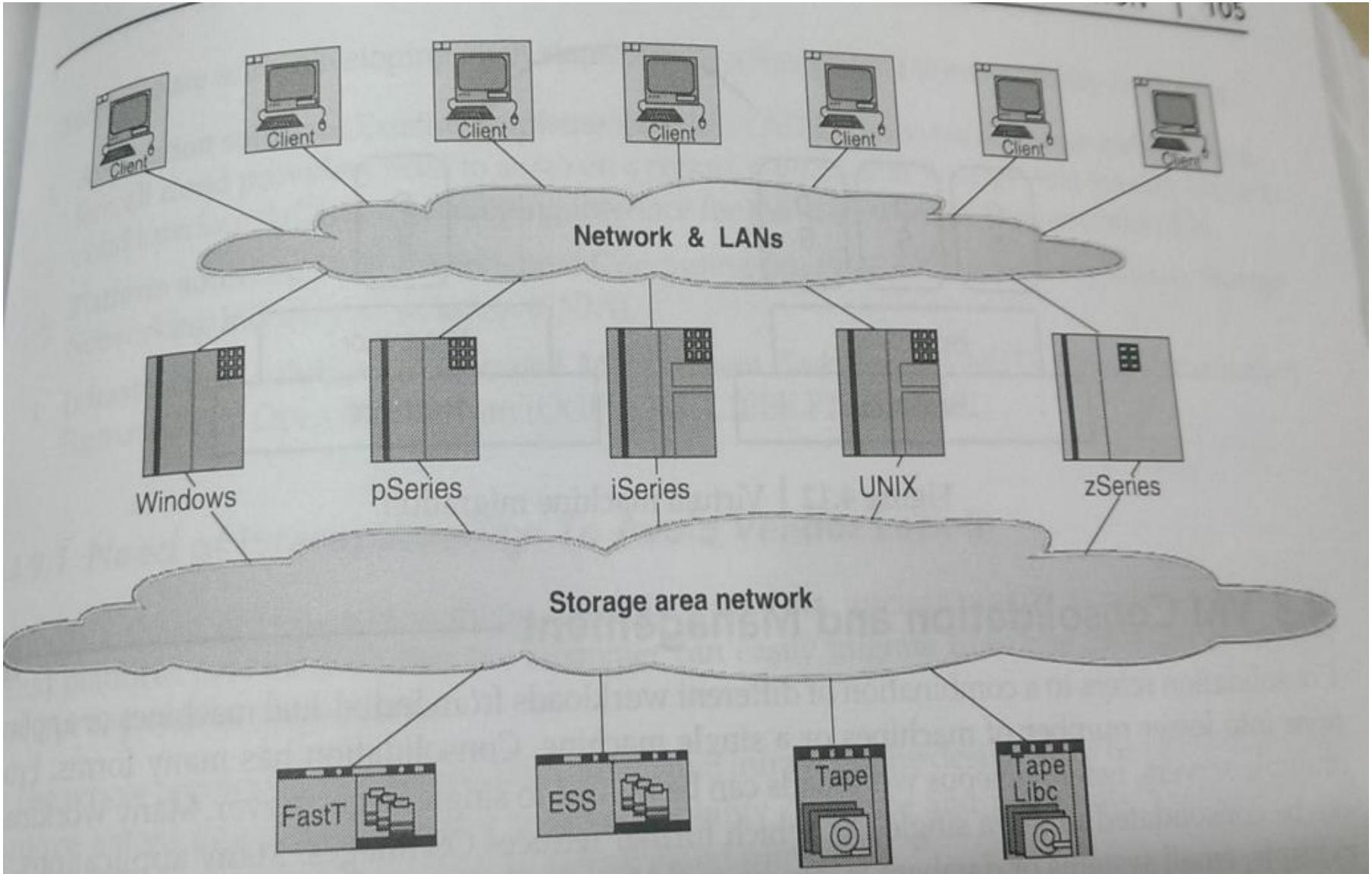


Figure 4.11 | Storage area network.

Benefits of SAN

- Enhanced application availability
- Higher application performance
- Centralized and consolidated storage
- Data transfer and vaulting to remote sites
- Simplified centralized management

VM Migration

- It refers to the movement or transfer between different physical machines without any discontinuity

VM consolidation and management

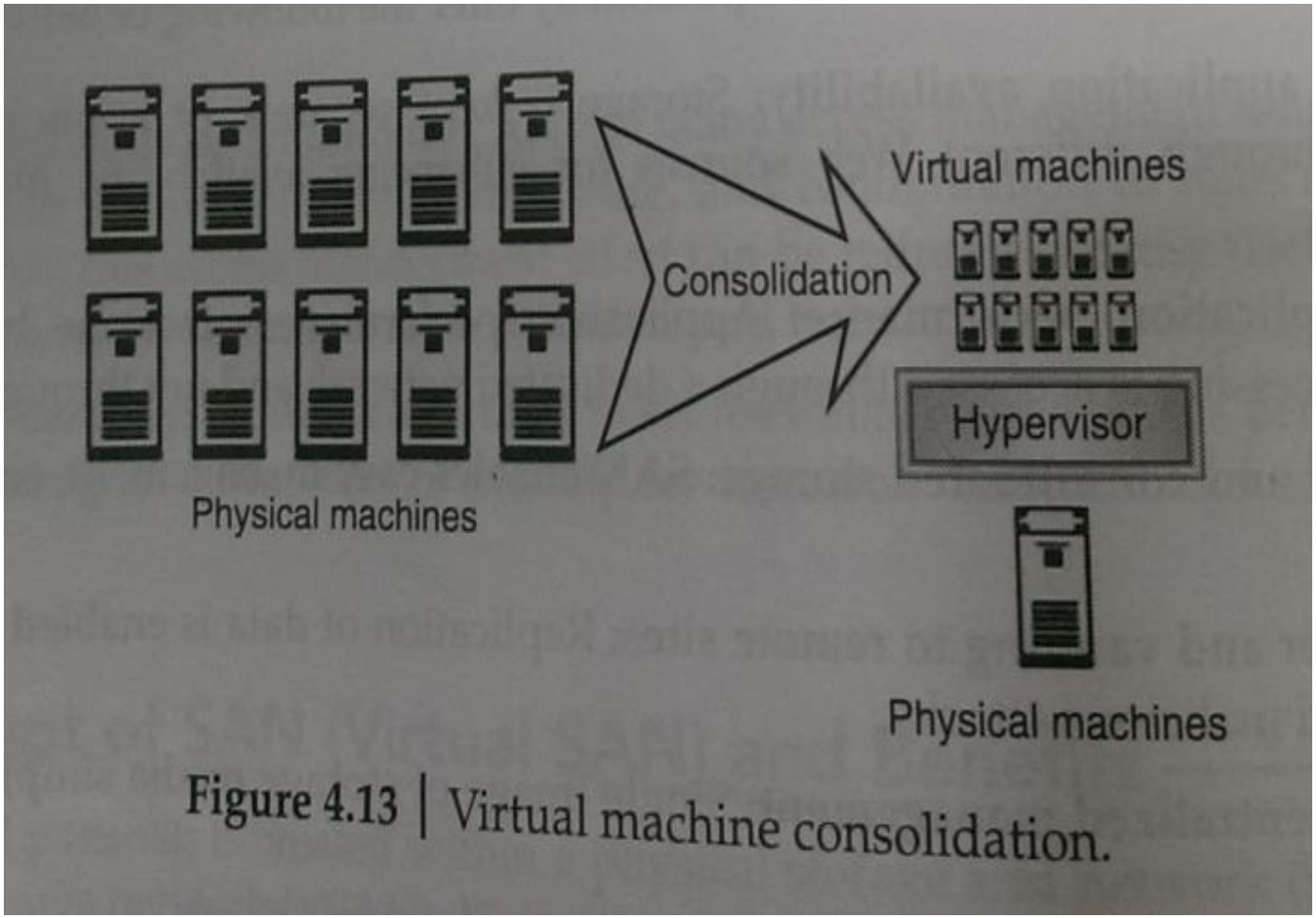


Figure 4.13 | Virtual machine consolidation.

What is Interoperability?

- The ability of IT systems, as well as the business processes they support, to exchange data and enable the sharing of information and knowledge – UK Govt definition
- Interoperability means enabling the Cloud ecosystem so that multiple cloud platforms can exchange information
- Interoperability means being able to seamlessly exchange data at different layers between cloud service providers
- Interoperability is the capability of two systems understanding each others' intents in exchange of communications
- Interoperability is an enabler for interchange ability (replacement of one element with another)
- Interoperability is the goal of standards but standards do not guarantee interoperability
- You can achieve interoperability without standards

Cloud Interoperability standards

- There is a strong need for the development of integrated interoperability authentication among all provider.
- **Several organizations such as** the **Cloud Computing Interoperability Forum (CCIF) have been w**orking on **solutions to address cloud interoperability challenges. The Cloud standards Customer Council (CSCC) provides the opportunity to convert and synchronize client needs and** specified **requirement into standards of development cloud** firms **and also for cloud users. It provides** standard **research materials and documents**

Categories of Interoperability

- ***When*** consumer wish to migrate from one cloud Provider to another. interoperability falls into these categories:
  1. ***Data and application portability***: It means by running applications and data, consumers should be able to migrate *easily* from one **cloud p**rovides to another without any lock-in *issue.*
  2 ***Platform portability****: It* means application development environment or IDE should be capable enough to run over any type of cloud infrastructure.
  3. ***Infrastructure portability***: it means virtual server or machine images should have the freedom of portability They should he able to migrate from one cloud provider to another.

Policy Objectives (background information)

- Right to move applications between Cloud providers
- Right to port data (quickly) between Cloud providers
- Right of user to own their data
- Keep overhead of certification and compliance to a minimum
- Apply open access/open source policies that allow extension of APIs and specs
- Demand side: Interoperability between Cloud services from different providers to prevent vendor lock-in
- Open and flexible market to provide choice for consumers
- Transparency and technology neutrality

Open standards for solving cloud interoperability challanges

- ***Application solution***: UCI- uniform cloud interface is developing interface for the unification of various cloud APIs.
- ***Platform solution***: CCIF, open cloud computing interface (OCCI) working group.
- ***Infrastructure solution***: distributed management task force(DMTF), OVF etc.

Open virtualization format

Characterstics:

1)Open standard

2)Portable VM packaging

3)Optimized for distribution

4)Multiple VM support

5)Vendor and plateform indepedent