

INTERNAL ASSESSMENT TEST 3 – NOVEMBER 2019

SCHEME AND SOLUTIONS

Sub:	STORAGE AREA NETWORKS					Sub Code:	15CS754	Branch:	CSE / ISE	
Date:	19 -11 -19	Duration:	90 min's	Max Marks:	50	Sem / Sec:	VII A ,B & C			OBE

Answer any FIVE FULL Questions

MARKS

CO

RBT

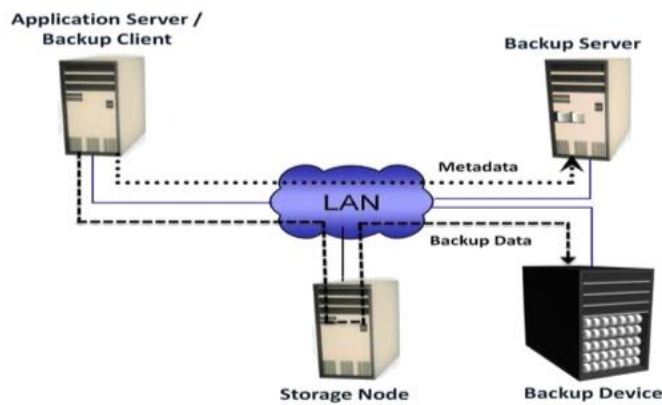
1. Explain the backup topologies with neat diagrams.

[10]

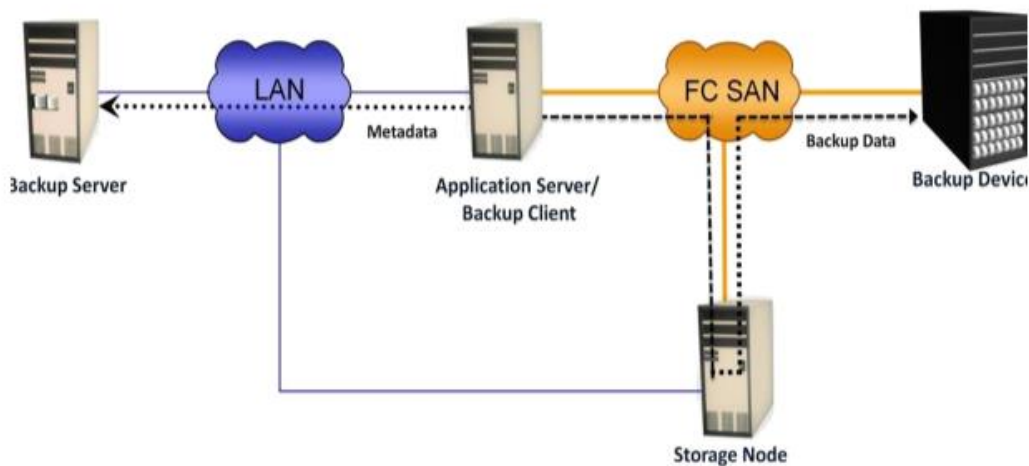
CO3

L2

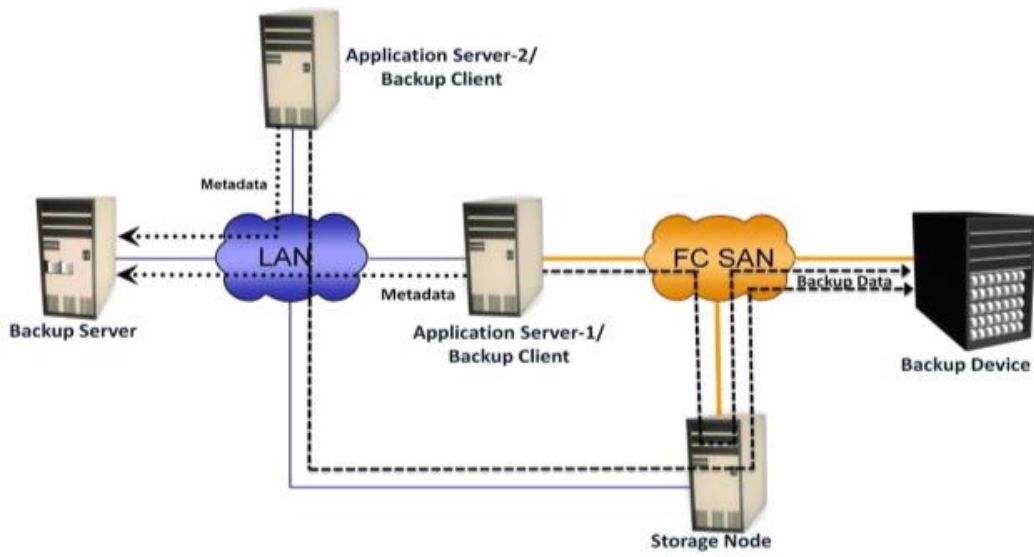
LAN-Based Backup



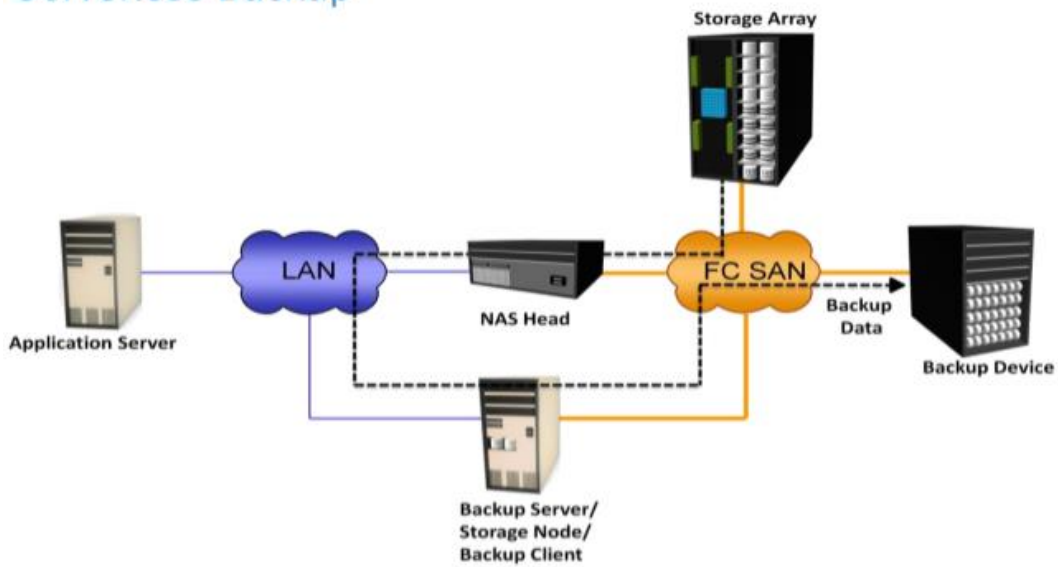
SAN-Based Backup



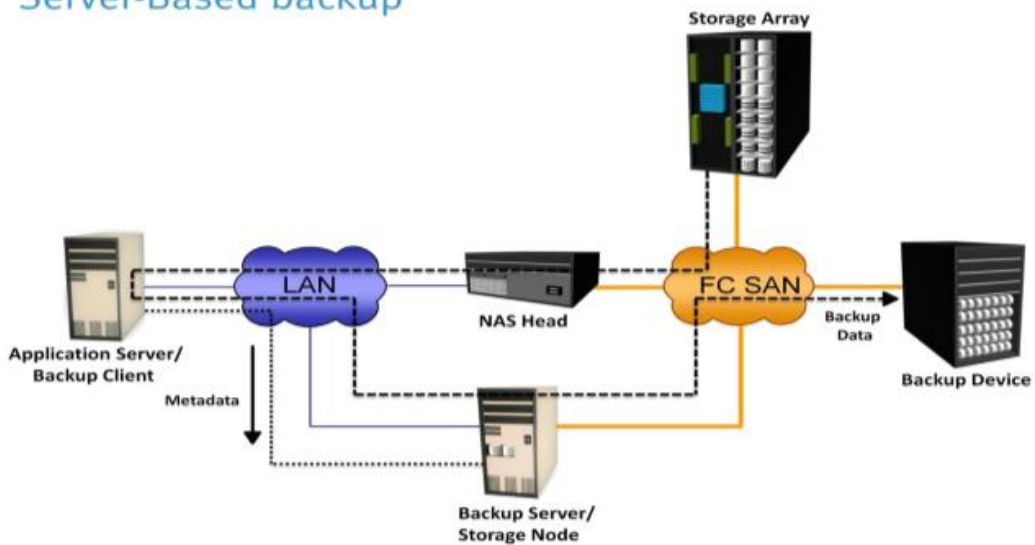
Mixed Backup Topology



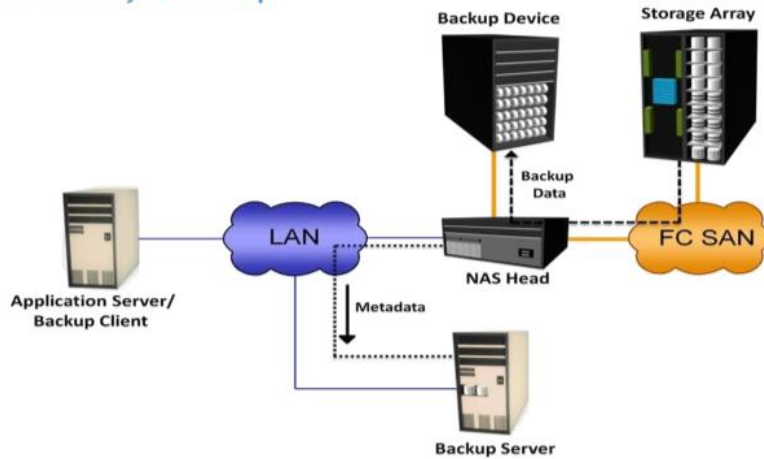
Serverless Backup



Server-Based backup



NDMP 2-way Backup



2. Explain the local replication technologies with diagrams.

[10] CO3 L2

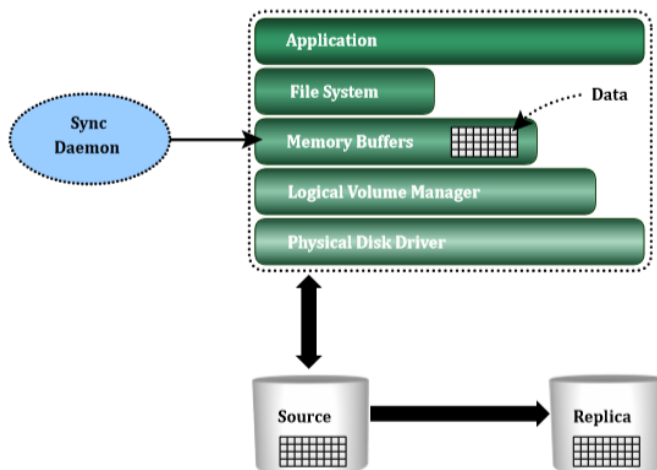
Replication

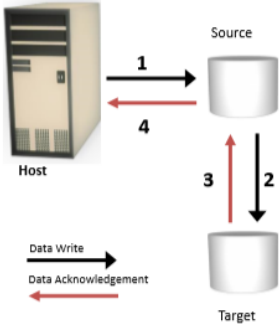

- Replica - An exact copy
- Replication - The process of reproducing data
- Local replication - Replicating data within the same array or the same data center

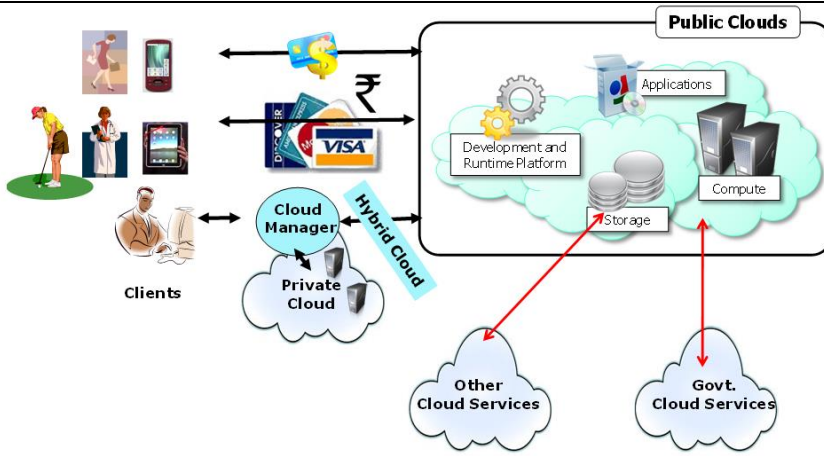


Host based – Logical Volume Manager (LVM) based replication (LVM mirroring) – File System Snapshot • Storage Array based – Full volume mirroring – Pointer based full volume replication – Pointer based virtual replication

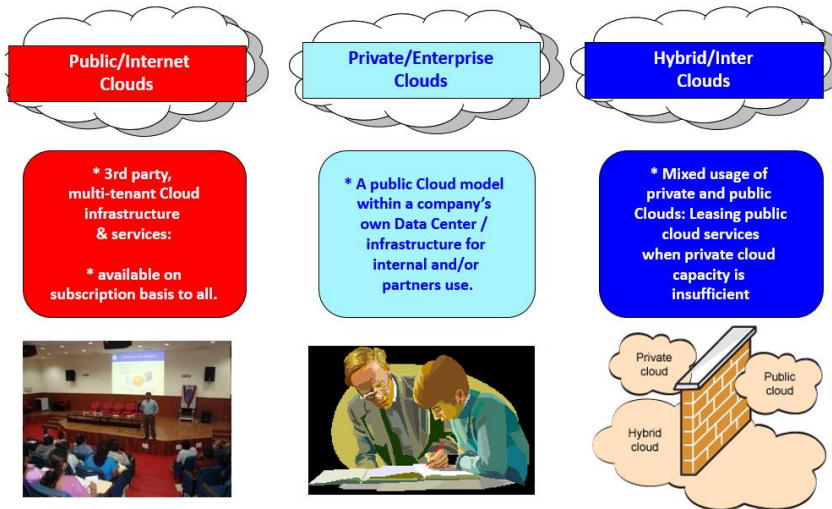
File System Consistency: Flushing Host Buffer



<p>3.</p>	<p>Explain the different ways of implementing three site remote replication.</p> <p>Replica is created at remote site</p> <ul style="list-style-type: none"> ◦ Addresses risk associated with regionally driven outages ◦ Could be a few miles away or half way around the globe □ Modes of remote replication (based on RPO requirement) <ul style="list-style-type: none"> ◦ Synchronous Replication ◦ Asynchronous Replication <p>Synchronous Replication</p> <ul style="list-style-type: none"> ▶ A write must be committed to the source and remote replica before it is acknowledged to the host ▶ Ensures source and remote replica have identical data at all times <ul style="list-style-type: none"> ◦ Write ordering is maintained <ul style="list-style-type: none"> • Replica receives writes in exactly the same order as the source ▶ Synchronous replication provides the lowest RPO and RTO <ul style="list-style-type: none"> ◦ Goal is zero RPO ◦ RTO is as small as the time it takes to start application on the target site  <p>Asynchronous Replication</p> <ul style="list-style-type: none"> ▶ Write is committed to the source and immediately acknowledged to the host ▶ Data is buffered at the source and transmitted to the remote site later <ul style="list-style-type: none"> ◦ Some vendors maintain write ordering ◦ Other vendors do not maintain write ordering, but ensure that the replica will always be a consistent re-startable image ▶ Finite RPO <ul style="list-style-type: none"> ◦ Replica will be behind the source by a finite amount ◦ Typically configurable 	<p>[10]</p>	<p>CO3</p>	<p>L2</p>
<p>4.</p>	<p>Discuss in detail the different cloud deployment models and service models</p> <p>Cloud computing is shared pools of configurable computer <u>system resources</u> and higher-level services that can be rapidly <u>provisioned</u> with minimal management effort, often over the <u>Internet</u>. Cloud computing relies on sharing of resources to achieve coherence and <u>economies of scale</u>, similar to a <u>public utility</u>.</p> <p>Private Public Hybird</p>	<p>[10]</p>	<p>CO4</p>	<p>L1, L2</p>



Cloud Deployment Models



5. Explain in detail in-band and out-of-band virtualization with neat diagrams.

[10]

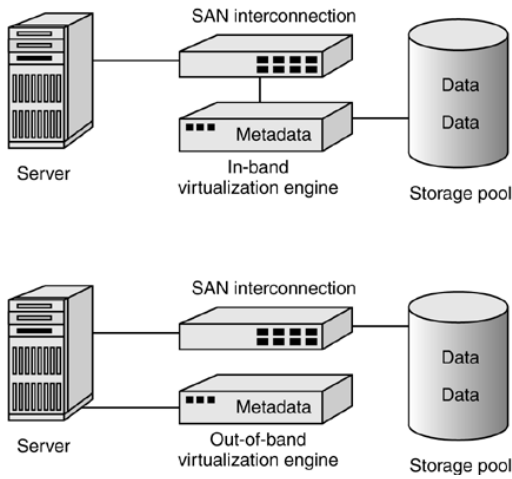
CO4 L2

The in-band architecture is the least intrusive from the standpoint of the server. Instead of discovering and attaching to multiple storage targets across the SAN, the server now sees only a single large storage resource in its path, represented by the virtualization appliance.

The in-band virtualization engine manages the disparate physical storage devices in the downstream SAN and presents a coherent image of metadata to the server.

The out-of-band architecture avoids in-band issues by placing metadata control outside the data transport path. Individual servers, however, must have virtualization software agents installed so that I/O requests can be redirected

to the out-of-band appliance.



6. What are the different threats in information security? Explain the FC SAN based security architecture with neat diagram.

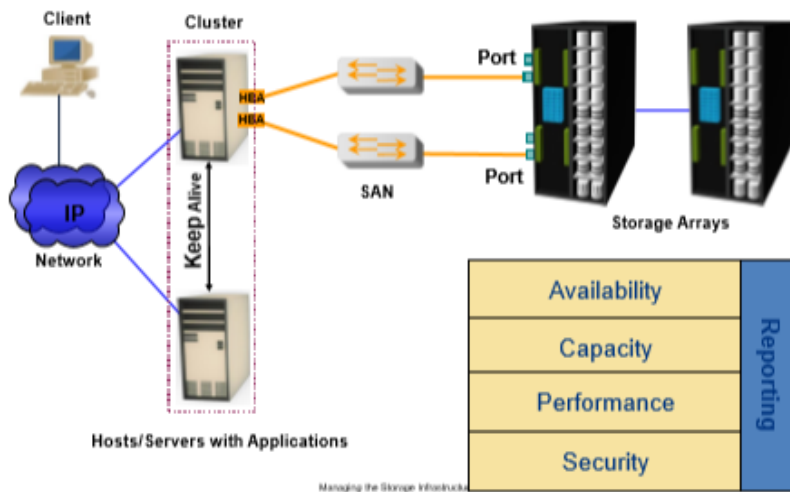
[10]

CO5

L1,
L2

Storage Area Network (SAN): Attaches remote storage devices to servers in a way that allows the devices to appear as local storage, using such protocols as SCSI/iSCSI, Fibre Channel Protocol (FCP), Fibre Channel over Ethernet, ATA over Ethernet

Storage Infrastructure Management Activities



7. Explain the various storage management activities.

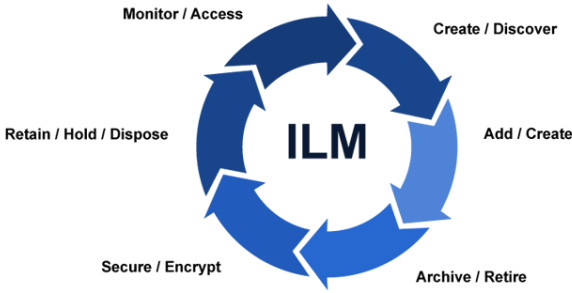
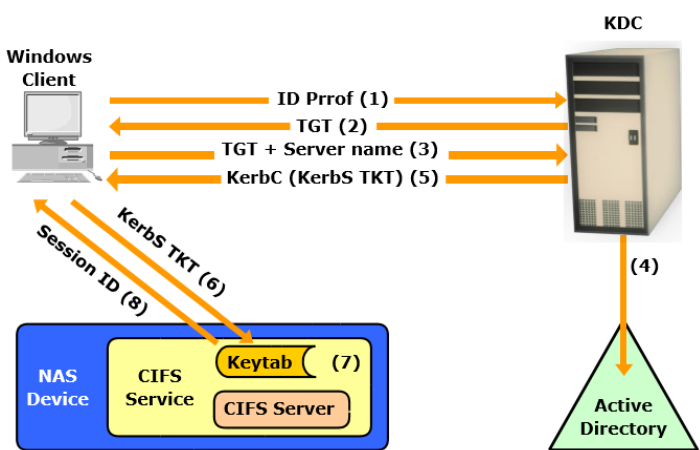
[10]

CO5

L2

Storage Infrastructure management defines the management and monitoring of the storage devices in the data centers. The three major areas of management are capacity, performance, and availability. These three areas can be easily summarized as good storage management, which is about making sure that the storage is always available, always has enough space, and is fast in terms of performance. Good storage management requires solid processes, policies, and tools.

- Service-Focused Approach
- Software-defined infrastructure aware
- End-to-end visibility
- Orchestrated Operations

<p>8. (a)</p>	<p>Explain ILM in detail with challenges. List its benefits.</p> <p>[05]</p> <p>CO5</p> <p>L2</p> <p>Information life cycle management (ILM) is a comprehensive approach to managing the flow of an information system's data and associated metadata from creation and initial storage to the time when it becomes obsolete and is deleted. Unlike earlier approaches to data storage management, ILM involves all aspects of dealing with data, starting with user practices, rather than just automating storage procedures, as for example, hierarchical storage management (HSM) does. Also in contrast to older systems, ILM enables more complex criteria for storage management than data age and frequency of access.</p> 	<p>[05]</p>	<p>CO5</p>	<p>L2</p>
<p>(b)</p>	<p>Explain the concept of Kerberos with neat diagram.</p> <p>[05]</p> <p>CO5</p> <p>L2</p> <p>A network authentication protocol – Uses secret-key cryptography. – A client can prove its identity to a server (and vice versa) across an insecure network connection – Kerberos client • An entity that gets a service ticket for a Kerberos service. • A client is can be a user or host – Kerberos server • Refers to the Key Distribution Center • Implements the Authentication Service (AS) and the Ticket Granting Service (TGS) – Application can make use of Kerberos tickets to verify identity and/or encrypt data</p> <h3 style="text-align: center;">Kerberos authorization</h3> 	<p>[05]</p>	<p>CO5</p>	<p>L2</p>