

ELEMENTS OF DAS, NAS, CAS AND SAN

DAS Elements:

1. Storage Device: (DAS) Directed Attached Storage consist of a storage device that is directly attached to a single computer or a service via a physical network cable. Block level access protocol is used to access data from cache.
2. HBA: An internal host bus adopter (HBA) available in PCI-express or PCI-X is referred to connect a DAS system via a cable that is usually no more than 5m. away from the server or workstation.

NAS Elements:

1. Storage Protocols: Industrial standard storage protocols to connect and manage physical disk resources like FC, SCSI, and ATA.
2. NAS head: NAS head to storage(memory and CPU), NAS head to network.
3. NIC: Network Interface card(NICs) for connectivity to the network.
4. Operating Systems: For managing NAS functionality there is an optimized operating systems.
5. Protocols: File sharing protocols like CIFS and NFS.

CAS Elements:

Content addressable storage (CAS) is a storage mechanism in which fixed data is assigned a permanent location on a hard disk and addressed with a unique content name, identifier or address. EMC Corporation initially launched CAS for its distributed data management (DDM) software.

CAS is also known as associative storage, content aware storage or Fixed Content Storage (FCS).The elements of CAS are as follows:

1. Storage devices: The devices used to store the data.
 - Storage node
 - Access node
2. Servers: Servers to which storage devices get connected. The devices are connected to each other to communicate.
3. Client: Clients are the system which are connected to server.

SAN Elements:

1. Node Ports: Nodes refers to devices like users, storage and tap libraries in fibre channel. All nodes are source or destination of information for other nodes.
2. File Server: Multiple servers, from different vendors, on different operating systems can all

be connected to a Storage Area Network (SAN). Unlike DAS (Direct Attached Storage), all servers connected to the Storage Area Network (SAN) can share all of the storage available, which reduces the overall cost per megabyte for your business.

3. Storage Area Network Fabric: The Storage Area Network (SAN) Fabric is effectively the SAN network that connects the servers to the storage. The Storage Area Network (SAN) Fabric is made up of 2Gb fibre channel switches (supplied by multiple vendors including CISCO, Brocade and IBM) which manage the connectivity from the servers HBA (Host Bus Adaptor) to the Storage Area Network (SAN) storage.

4. Host Bus Adaptors (HBA's): PCI adaptor connects a server to the SAN fabric. Each HBA installed is referred to as a host. Two HBA's can be installed into each server for additional resilience.

5. Fibre Cabling: High speed fibre optic cabling used to interconnect between servers, storage and tape backup devices.

6. Tape library: Linking a tape library into the Storage Area Network (SAN) Fabric provides a fast and reliable solution to backup critical data. Data stored on the Storage Area Network (SAN) is transferred directly to the tape library, using server less technology. This reduces the load on each server and ensures data is backed up within the time window available.

7. Management Software: The software enables individual components to be configured and optimized for performance. It monitors network for bottlenecks enabling IT Managers to preempt problems and adjust accordingly.

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