SAN

**SAN** is an abbreviation of the **Storage Area Network**. Storage Area Network is a dedicated, specialized, and high-speed network which provides block-level data storage. It delivers the shared pool of storage devices to more than one server.

The main aim of SAN is to transfer the data between the server and storage device. It also allows for transferring the data between the storage systems.

Storage Area networks are mainly used for accessing storage devices such as tape libraries and disk-based devices from the servers.

It is a dedicated network which is not accessible through the LAN. It consists of hosts, switches, and storage devices which are interconnected using the topologies, protocols, and technologies.

Protocols of SAN

Following are the most common protocols of SAN (Storage Area Network):

* FCP (Fibre Channel Protocol)
* iSCSI
* FCoE
* NVMe

FCP (Fibre Channel Protocol)

It is the most commonly used protocol of the Storage Area Network. It is a mapping of SCSI command over the Fibre Channel (FC) network.

ISCSI

It stands for Internet SCSI or Internet Small Computer System Interface. It is the second-largest block or SAN protocol. It puts the SCSI commands inside an ethernet frame and then transports them over an [Internet protocol (IP)](https://www.javatpoint.com/ip) ethernet.

FCoE

FCoE stands for "Fibre Channel Over Internet". It is a protocol which is similar to the iSCSI. It puts the Fibre channel inside the ethernet datagram and then transports over an IP Ethernet network.

NVMe

NVMe stands for Non-Volatile Memory Express. It is also a protocol of SAN, which access the flash storage by the PCI Express bus.

How SAN is different from NAS

The following table describes the difference between Storage Area Network and [Network Attached Storage](https://www.javatpoint.com/nas):

|  |  |
| --- | --- |
| **SAN** | **NAS** |
| 1. SAN stands for Storage Area Network. | 1. NAS is an abbreviation of Network Attached Storage. |
| 2. It uses the fibre channel for connecting the several data storage devices. | 2. It is a hardware device which attaches to LAN through an ethernet connection. |
| 3. It is used in enterprise and professional environments. | 3. It is typically used in homes. |
| 4. It needs more administration for managing. | 4. It is managed easily. |
| 5. In this, data is identified by the disk block. | 5. In NAS (Network Attached Storage), both file name and byte offset are used for identifying the data. |
| 6. Storage Area Network is more complex than the Network Attached Storage. | 6. Network Attached Storage is less complex than the Storage Area Network. |
| 7. It is more costly than the Network Attached Storage. | 7. Its cost is less than the SAN. |
| 8. It depends on the Local Area Network and requires the TCP/IP network. | 8. It does not depend on the Local Area Network but uses the high-speed fibre channel network. |
| 9. ISCSI, FCoE, FCP, and Fc-NVMe are the protocols used in SAN. | 9. AFP, NFS, and SMB are the protocols used in NAS. |
| 10. In SAN, block by block technique is used for backup and recovery. | 10. Files in NAS are used for backup and recovery. |
| 11. It works easily with the virtualization technique. | 11. NAS is a file storage device that does not work with the virtualization technique. |
| 12. The file system is managed and controlled by the servers in SAN. | 12. The file system is managed by the head unit in NAS. |

Difference Between SAN and DAS

The following table describes the differences between the [Direct Attached Storage (DAS)](https://www.javatpoint.com/das) and Storage Area Network (SAN):

|  |  |
| --- | --- |
| **SAN** | **DAS** |
| 1. SAN is a short form of Storage Area Network. | 1. DAS is a short form of Direct Attached Storage. |
| 2. It uses block by block copying technique for backup and recovery. | 2. It uses sectors for backup and recovery. |
| 3. This storage Device is complex than the DAS device. | 3. This storage device is simple, not complex. |
| 4. Storage Area Network is slightly difficult to install and set up. | 4. Direct attached Storage is easy to set up and install. |
| 5. The cost of this storage device is higher than the DAS device. | 5. Its cost is low as compared to SAN. |
| 6. The capacity of SAN is more than the 1012 bytes. | 7. The capacity of DAS is only 109 bytes. |
| 7. This storage device allows users to share the files on different OS. | 7. This storage device does not allow users to share the files on different OS. |
| 8. It uses Internet Protocol and Fibre Channel for transmission of data. | 8. It uses IDE/SCSI for the transmission of data. |

Advantages of SAN

Following are the advantages or benefits of a Storage Area Network (SAN):

* It is more scalable.
* Security is also a main advantage of SAN. If users want to secure their data, then SAN is a good option to use. Users can easily implement various security measures on SAN.
* Storage devices can be easily added or removed from the network. If users need more storage, then they simply add the devices.
* The cost of this storage network is low as compared to others.
* Another big advantage of using the SAN (Storage Area Network) is better disk utilization.