Implementing Server Storage

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Understanding DAS, NAS, and SAN

Direct Attached Storage (DAS)

Server

Hard Disk Drive(s)

SAS, SATA, SCSI

Direct Attached Storage (DAS)

Server

Disk/Storage Array

SCSI/Fiber Channel
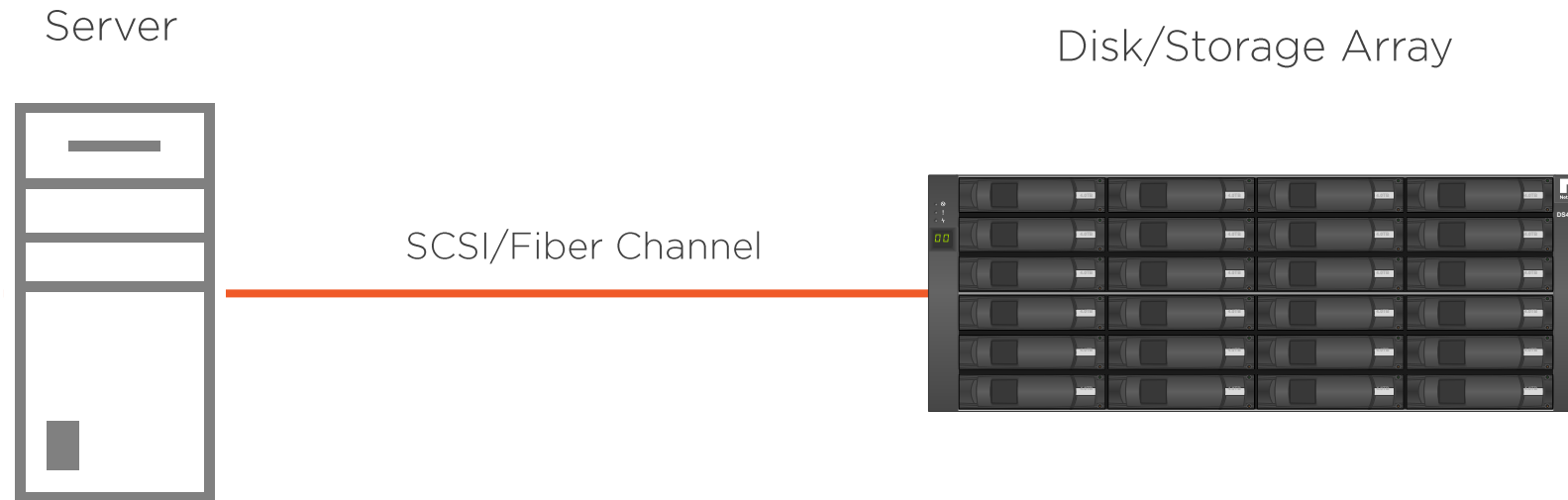
Network Attached Storage

Makes storage available over the IP network
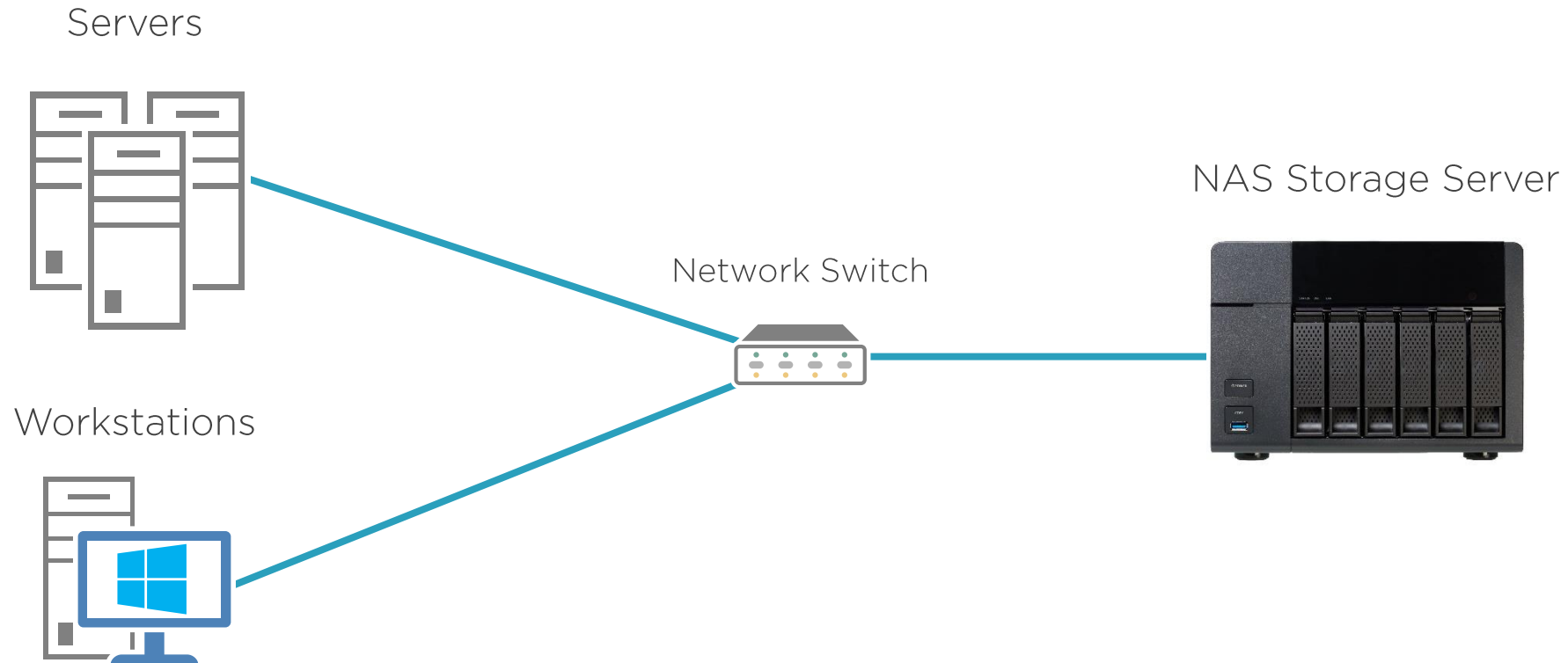
Provides centralized management

Typically supports multiple protocols such as NFS, SMB, or CIFS
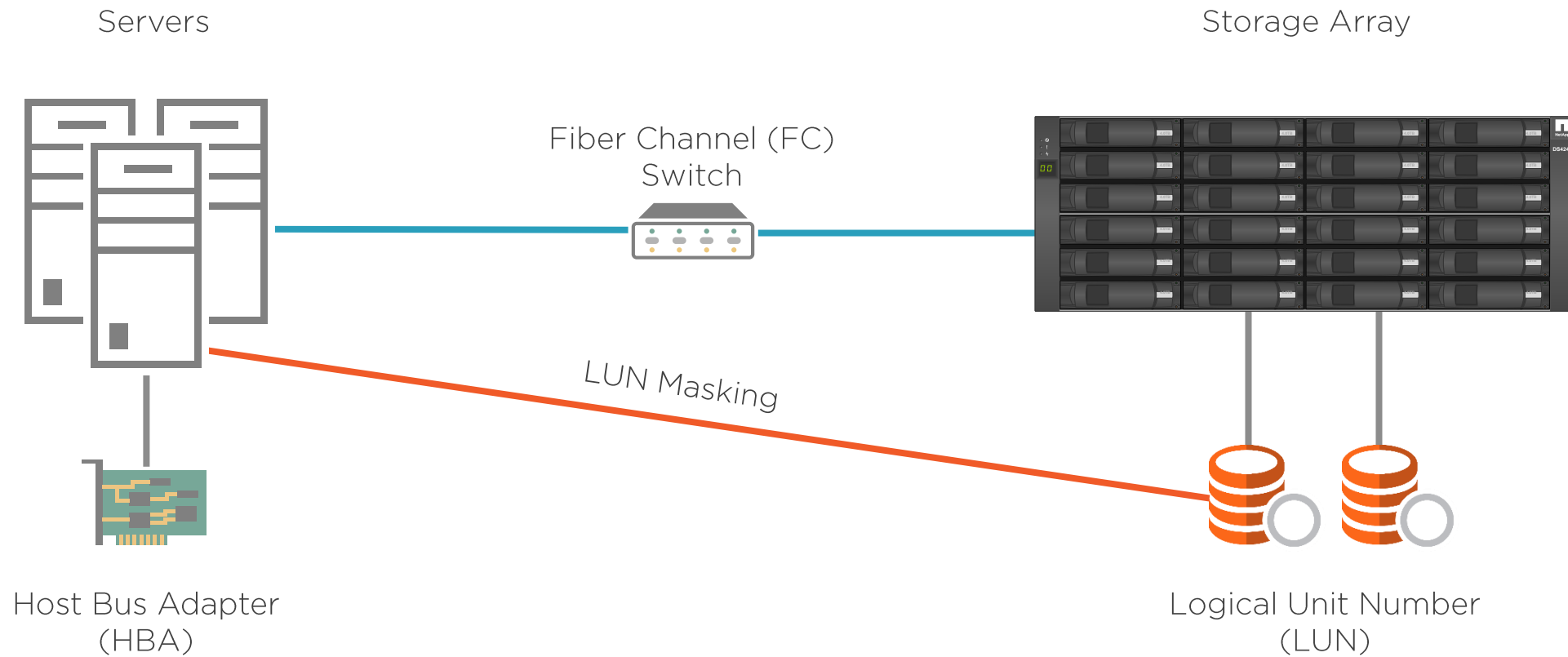
Fairly inexpensive and easy to setup

Slow performance, not really an enterprise solutions for storage

Network Attached Storage (NAS)

Servers

Workstations

Network Switch

NAS Storage Server

Storage Area Network (SAN)

Servers

Storage Array

Fiber Channel (FC)
Switch

LUN Masking

Host Bus Adapter
(HBA)

Logical Unit Number
(LUN)

Block-level vs. File-level Storage

Block-level Storage

Provides good performance

Typically SAN-based

Presents LUNs to servers

Higher cost compared to NAS-based solutions

File-level Storage

Accessed via NAS or file server

Uses NFS, SMB, or CIFS

Connects to backend block-level storage

Typically more cost effective

Working with Fibre Channel and iSCSI Storage

FC

Fiber Channel used with HBA and FC switch
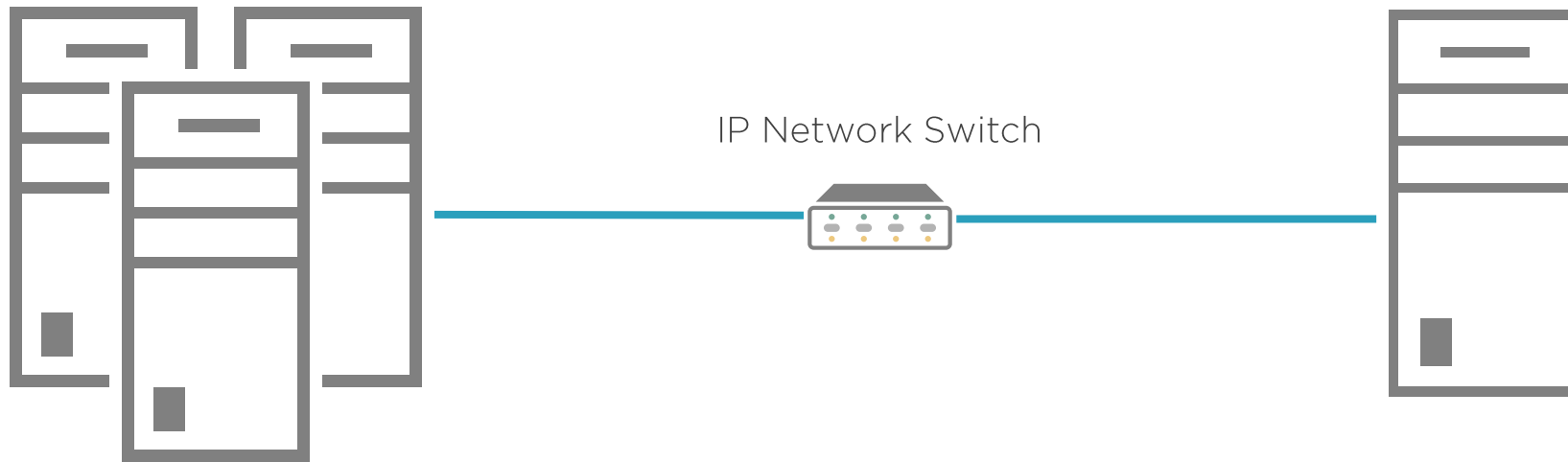
FCoE

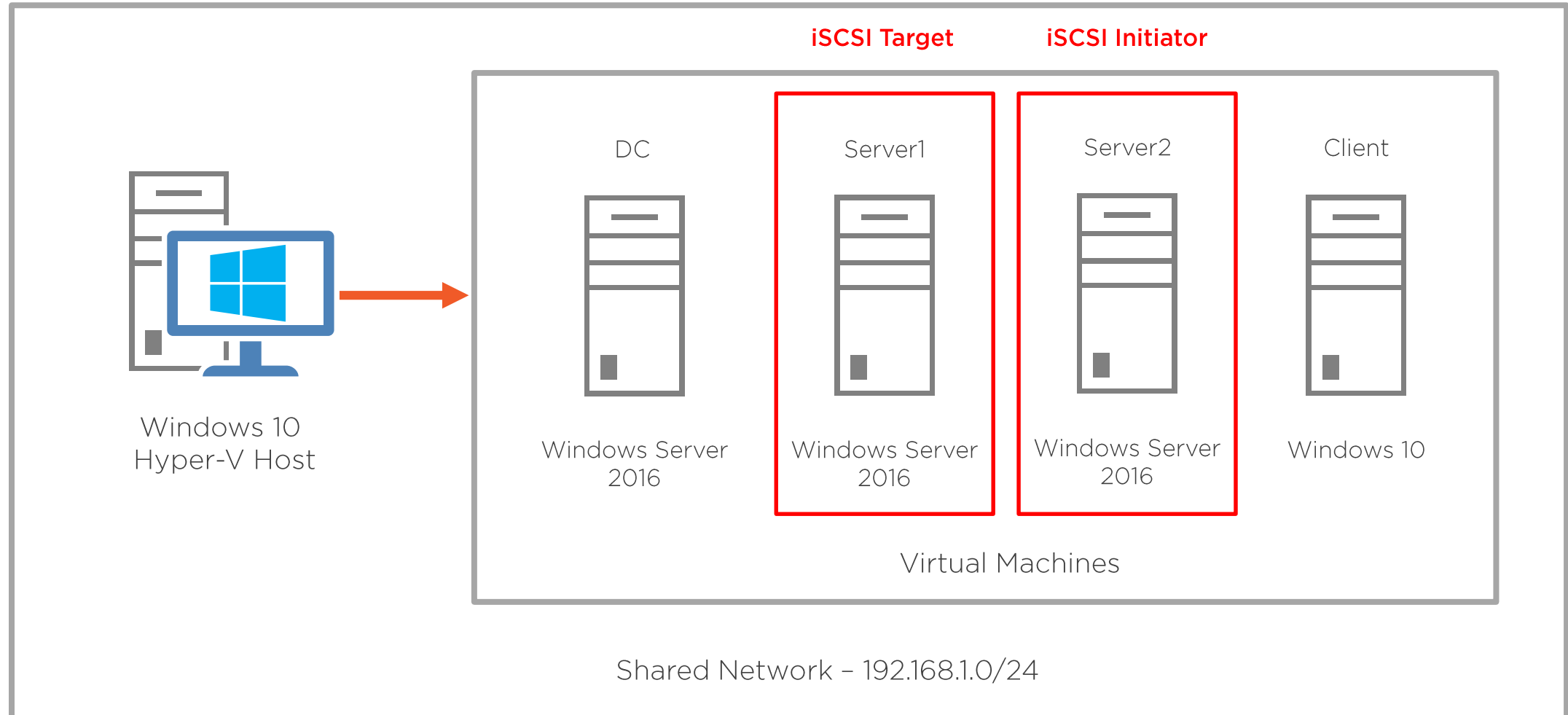Fiber Channel over Ethernet

iSCSI

Internet SCSI

iSCSI Overview

Servers (iSCSI Initiator)

Server (iSCSI Target)

IP Network Switch

Hyper-V Lab Update

iSCSI Target   **iSCSI Initiator**

DC   Server1   Server2   Client

Windows Server 2016   Windows Server 2016   Windows Server 2016   Windows 10

Virtual Machines

Windows 10 Hyper-V Host

Shared Network – 192.168.1.0/24

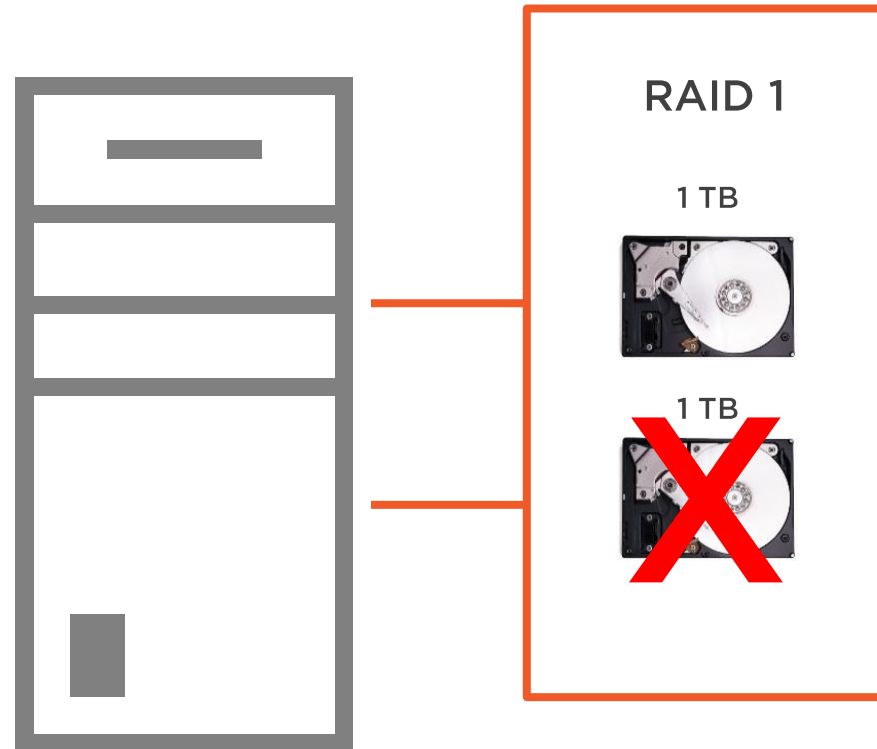# Understanding iSNS, DCB, and MPIO

iSNS

Reduces administrative overhead
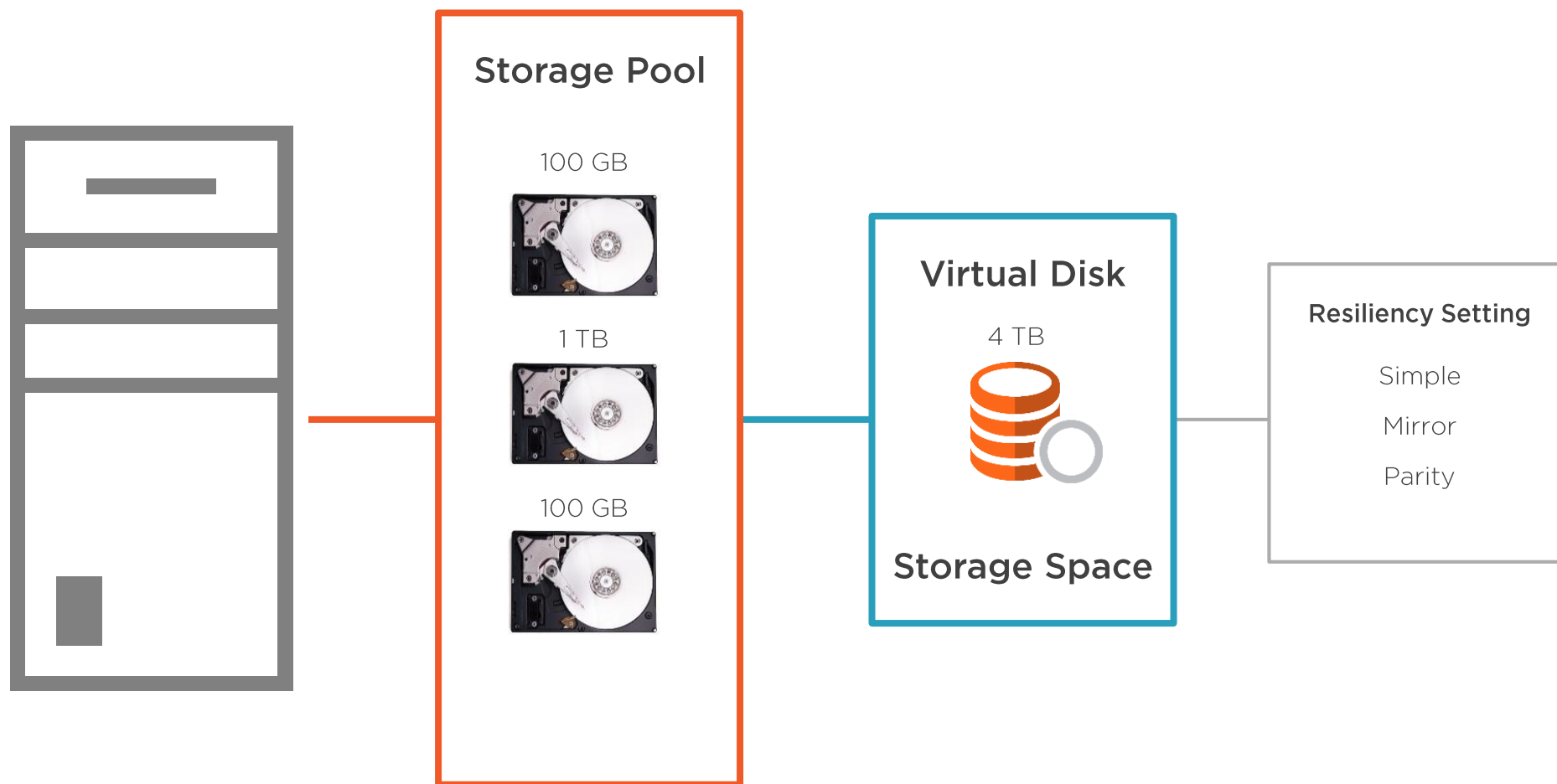
DCB

Traffic enhancement for storage networks

MPIO
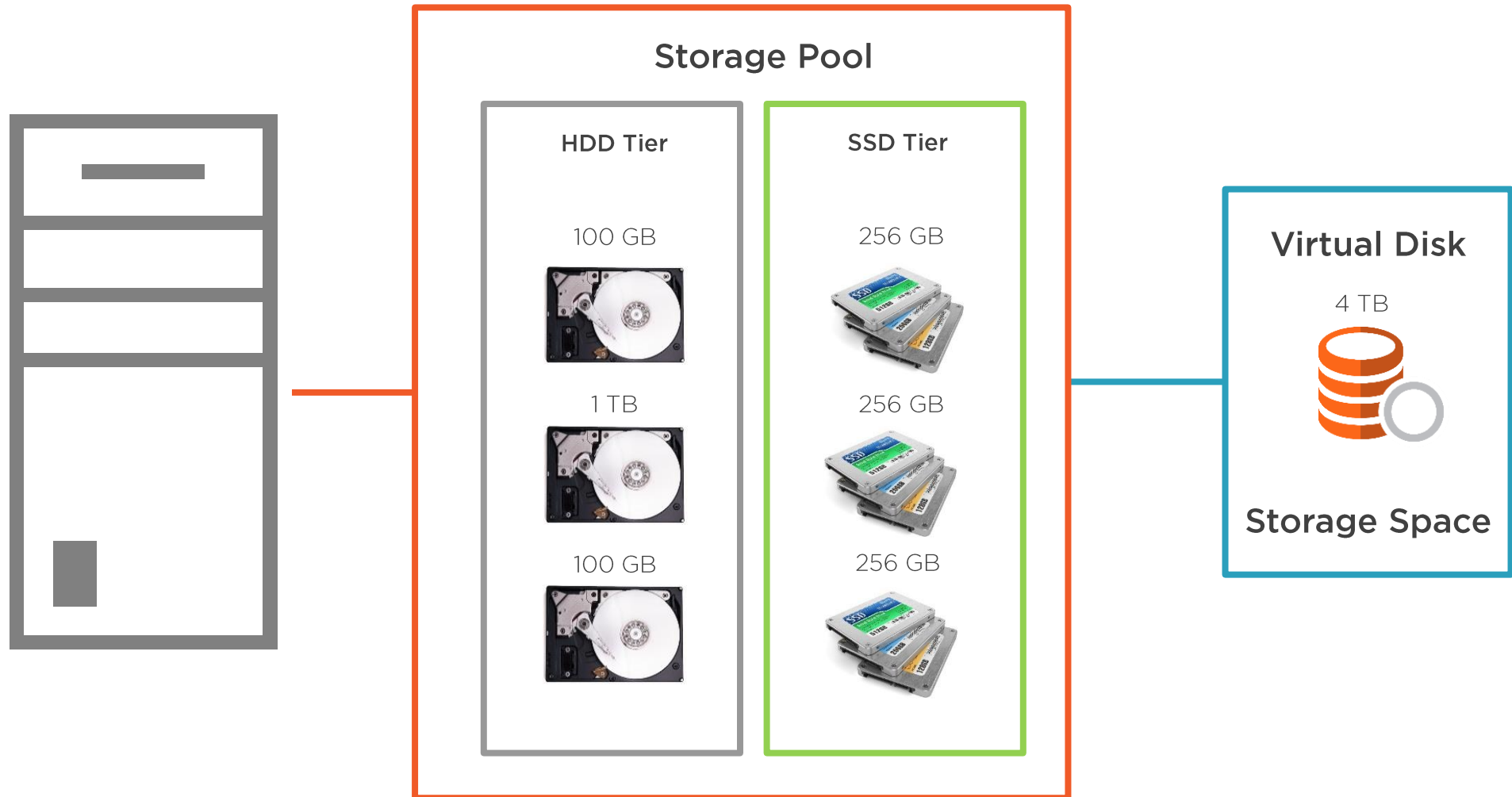
Provides multiple paths to block storage

Understanding Storage Spaces

RAID 1

1 TB

1 TB

Understanding Storage Spaces

Understanding Storage Spaces

Storage Pool

HDD Tier

100 GB

1 TB

100 GB

SSD Tier

256 GB

256 GB

256 GB

Virtual Disk

4 TB

Storage Space

Implementing SMB and NFS Shares
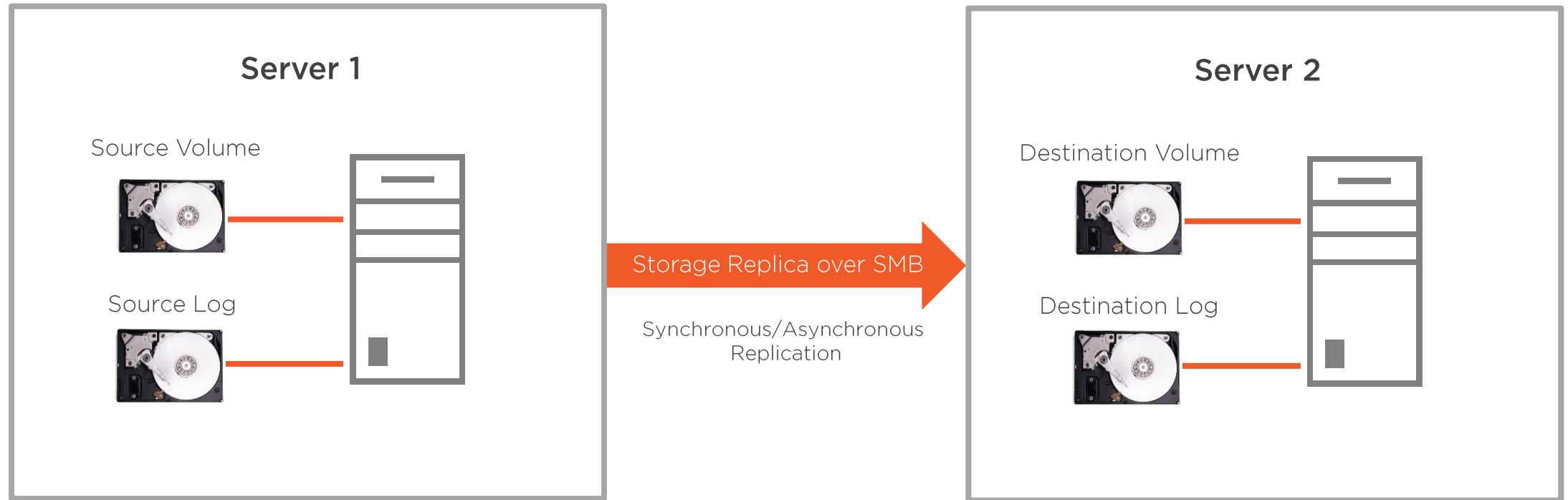
Understanding SMB

Operating system	SMB version
Windows 10 and Windows Server 2016	SMB 3.1.1
Windows 8.1 and Windows Server 2012 R2	SMB 3.0.2
Windows 8 and Windows Server 2012	SMB 3.0
Windows 7 and Windows Server 2008 R2	SMB 2.1
Windows Vista and Windows Server 2008	SMB 2.0.2
Previous versions	SMB 1.x

Understanding SMB

Share Permissions

All Users = Full Control

NTFS Permissions

All Users = Read Only

Finance = Read/Write

D:\Data\Finance

\\server2\finance

Setting up Server to Server Storage Replication

Summary

Understanding DAS, NAS, and SAN

Configuring iSCSI Storage

Working with Storage Spaces

Implementing SMB and NFS Shares

Understanding Storage Replica