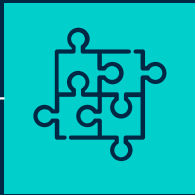


# The Journey of Windows Server 2019

The background of the slide is a dark blue field decorated with an abstract pattern of small, colorful squares (pink, orange, teal, and light blue) and thin white vertical lines of varying lengths, creating a modern, digital aesthetic.

# TABLE OF CONTENTS



01

## Virtualization

Learn about what is virtualization and why virtual ?



02

## Windows Server

One of Core technology for future



03

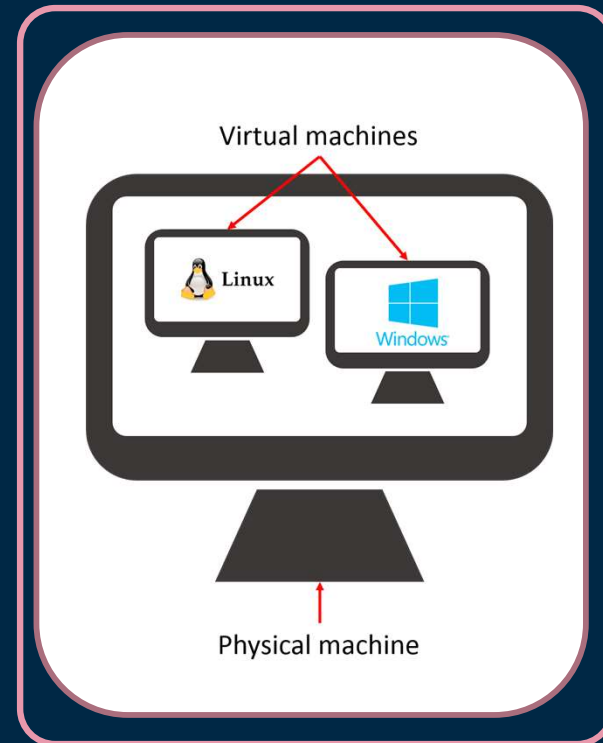
## Cloud Computing

All about cloud and virtual

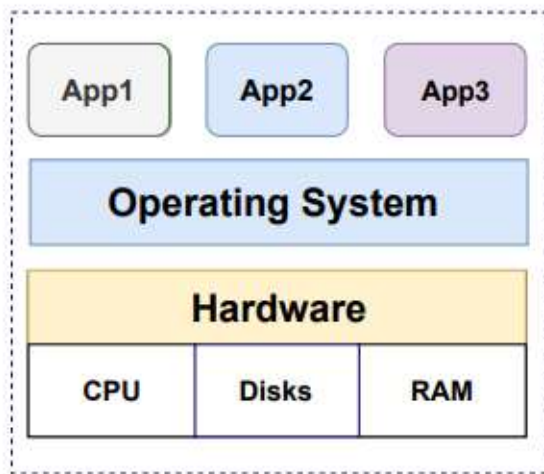
# Virtualisasi

**Virtualisasi** = "*Representasi*"

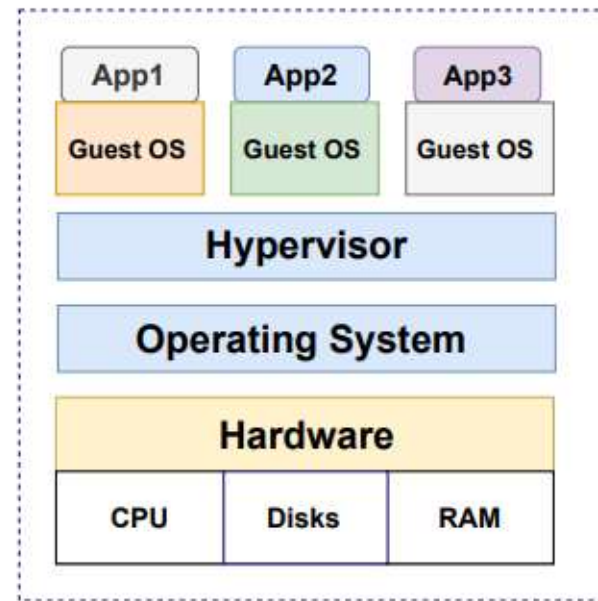
**Network, Server, Workstation**



# Tradisional VS Virtual

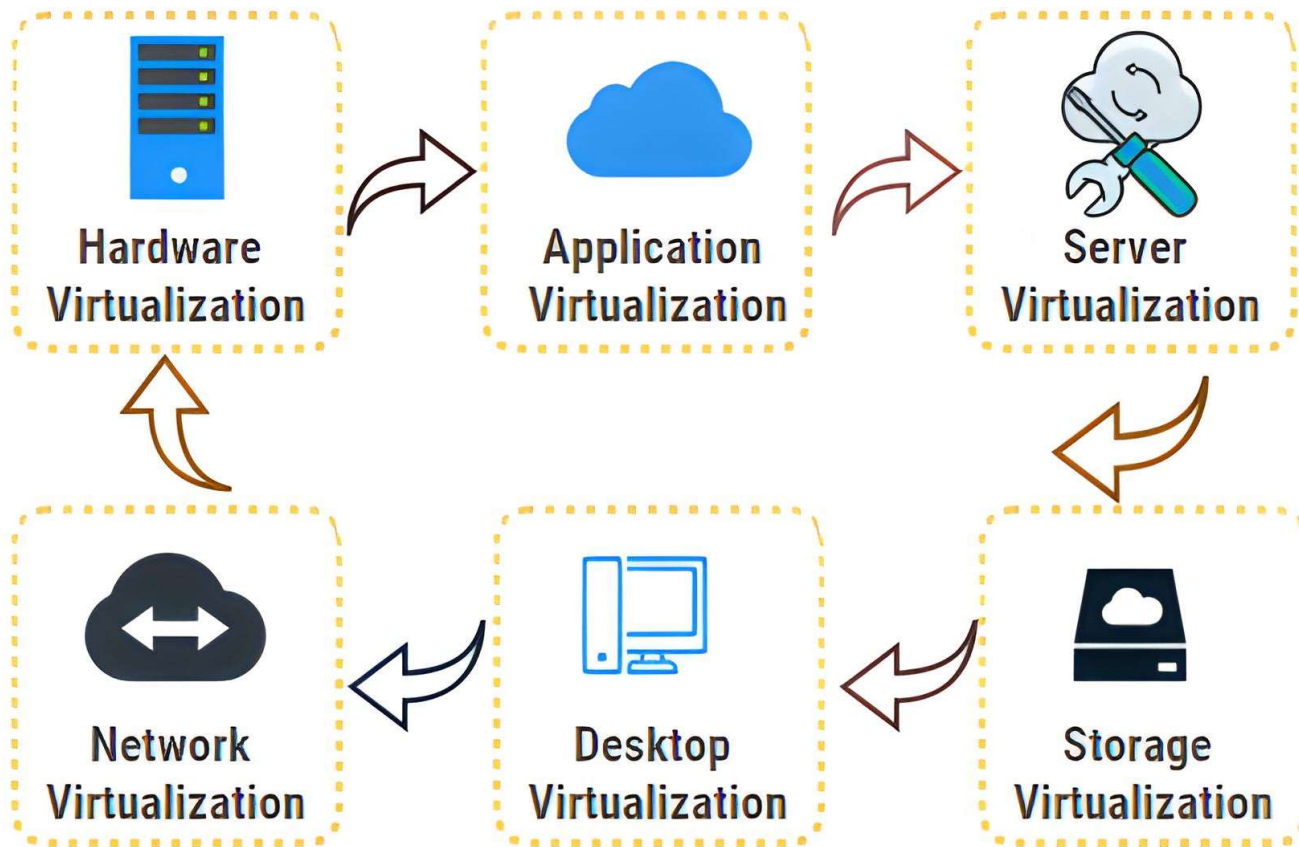


**Traditional Deployment**



**Virtualization**

# Types Of Virtualization

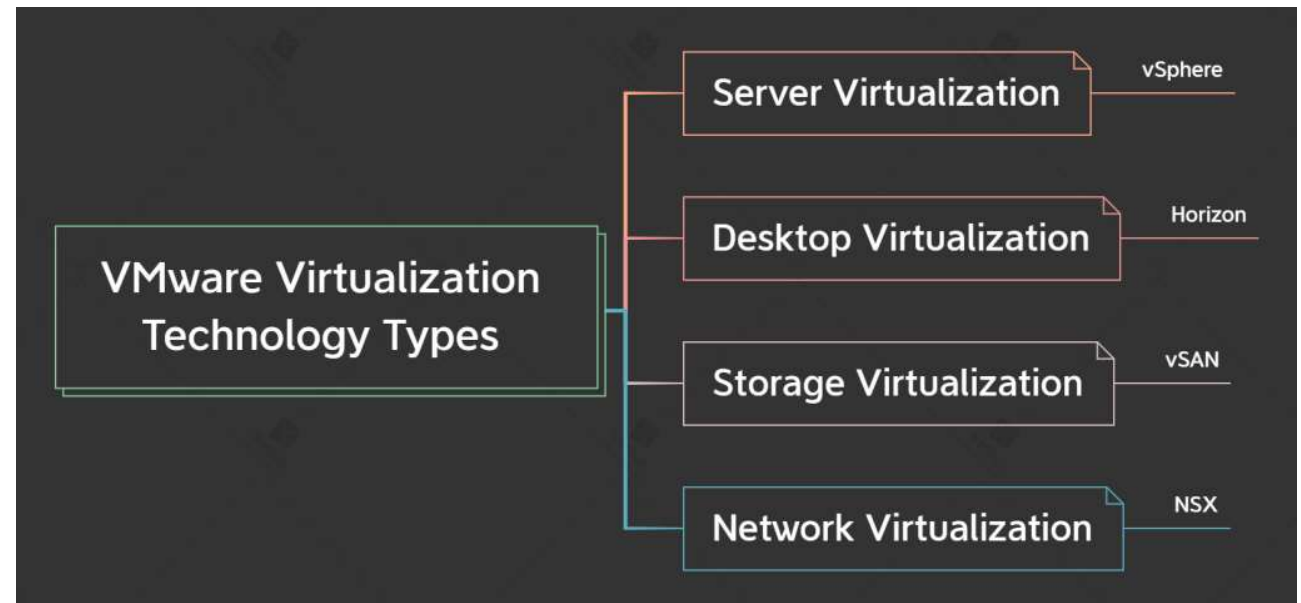


# Virtualization Product

**vmware**<sup>®</sup>



**CITRIX**<sup>®</sup>



# Virtualization Product

**vmware®**



Remote Desktop Services

**CITRIX®**

# Virtualization Product

**vmware**<sup>®</sup>



**CITRIX**<sup>®</sup>



**CITRIX**  
XenDesktop

**CITRIX**  
XenApp

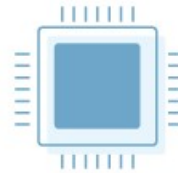


# Virtualization Benefit



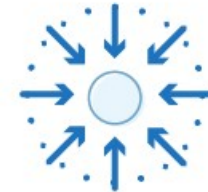
## **Operational flexibility**

Operate separate instances of multiple OS types



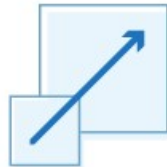
## **Reducing overhead**

Run multiple virtual machines on the same underlying hardware



## **Centralization**

Consolidate systems to simplify management



## **Scalability**

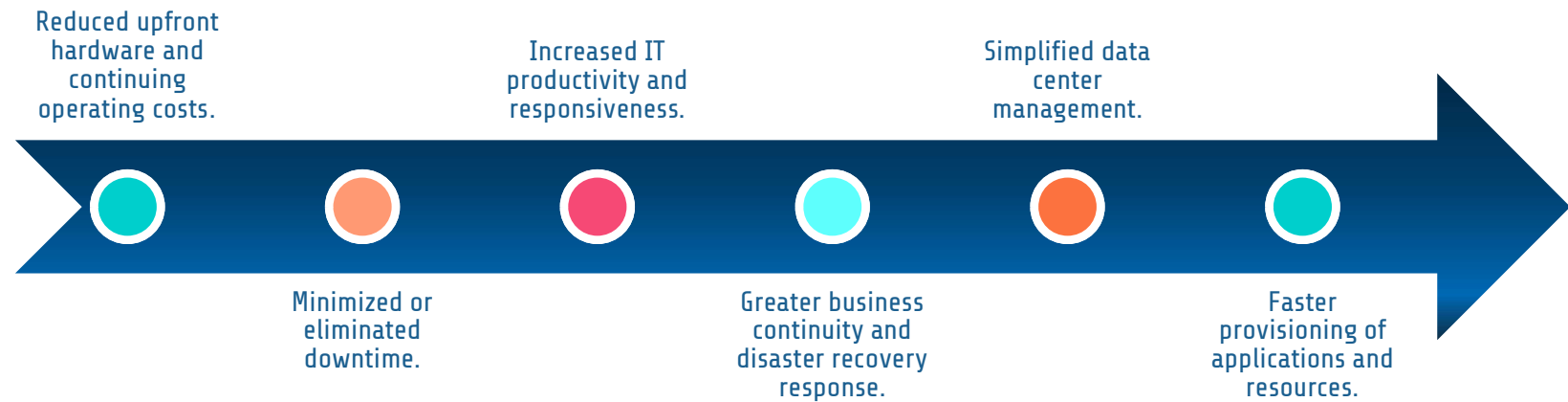
Easily scale your virtual environment as your business grows



## **Disaster recovery**

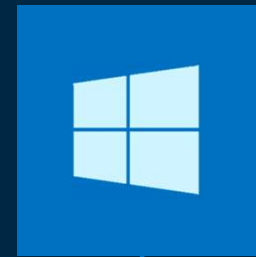
Restore data and system states from VM instances

# Virtualization Benefit



# Windows Server

Bring new journey in  
Technology



# Windows Server vs Windows Client

For  
business  
continuity

- For personal user purpose

Can give  
service to  
client

- Using service from server

Support  
high end  
hardware

- Have maximum limitation

# Windows Server Release

Windows NT Advanced Server 3.1		First version of Windows Server	32-bit system	Supports newer server hardware
Windows NT Server 3.5		Unix connectivity	Novell Netware connectivity	Ability to use with existing networks
Windows NT Server 3.51		Stability improvements	Support for Windows 95	Remote software license management
Windows NT Server 4.0		Microsoft Internet Information Server	Terminal Server Edition	Same look and feel as Windows 95
Windows Server 2000		Support for Extensible Markup Language	Active Server Pages	Integration with Active Directory for user authentication
Windows Server 2003		Updated security features	Ability to define server roles	Inclusion of .NET environment
Windows Server 2003 R2		Active Directory Federation Services	Improved data compression	Security Configuration Wizard
Windows Server 2008		Hyper-Virtualization System	Event Viewer	Server Manager
Windows Server 2008 R2		64-bit environment	Improved group policy implementation	Remote Desktop Services
Windows Server 2012		Support for use in the Cloud	Improved Hyper-V functionality	Inclusion of Essentials edition
Windows Server 2012 R2		Updates to PowerShell	Enhanced functionality for storage	Ability to serve software to mobile devices
Windows Server 2016		Inclusion of Nano Server	Network Controller	Support for using containers
Windows Server 2019		Windows Admin Center	Hyper-converged infrastructure	Advanced Threat Protection

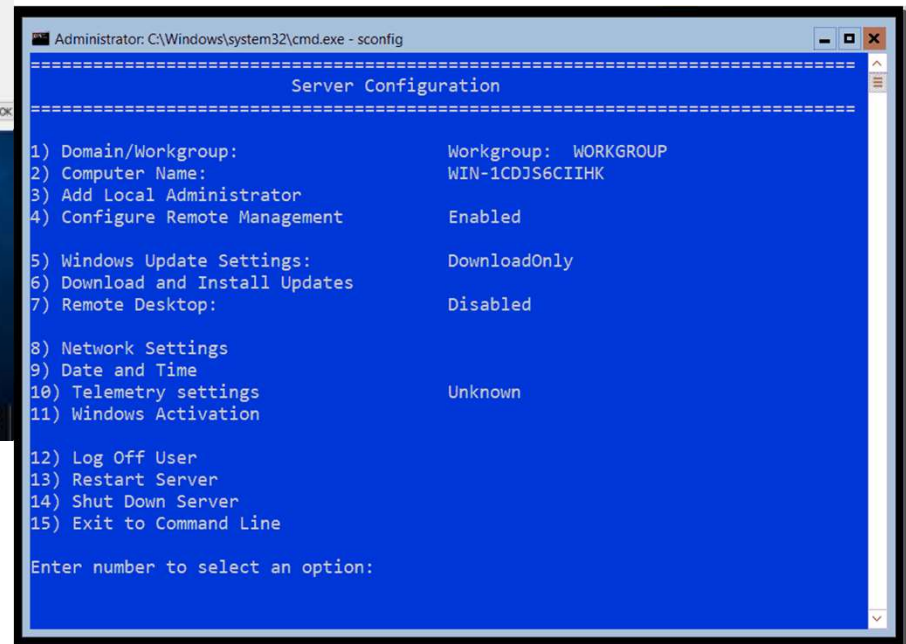
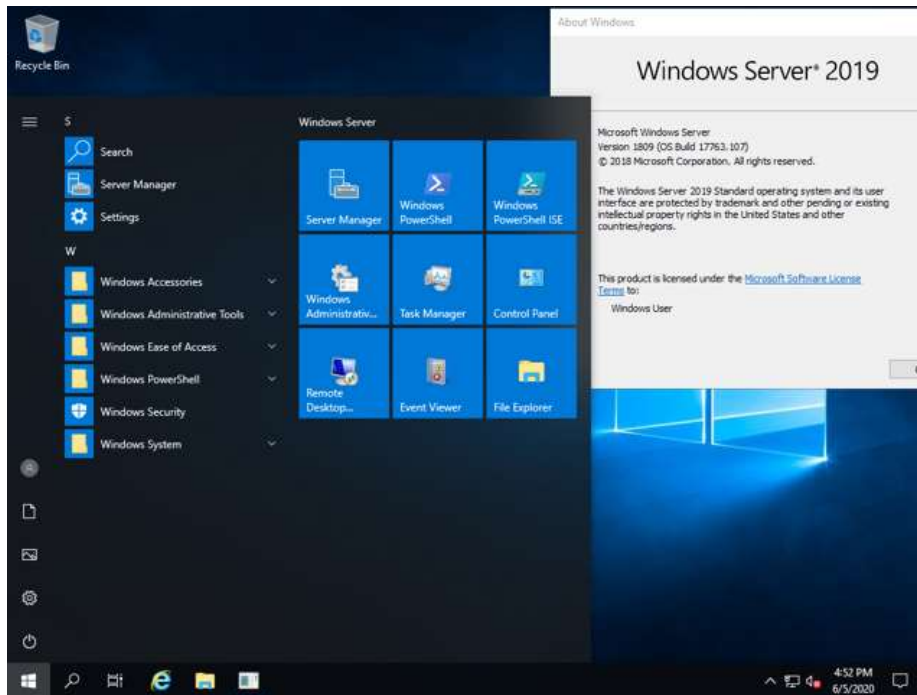
# Windows Server 2019 Edition

Editions	Description	Licensing model	CAL requirements	Pricing
Windows Server 2019 Datacenter	For highly virtualized datacenters and cloud environments	Core based	WS CAL	\$6,155
Windows Server 2019 Standard	For physical or minimally virtualized environments	Core based	WS CAL	\$972
Windows Server 2019 Essentials	For small businesses with up to 25 users and 50 devices	Specialty server	No CAL required	\$501
Microsoft Hyper-V Server 2019	Free hypervisor download.	N/A	N/A	N/A

# Standard vs Datacenter

Locks and Limits	Windows Server 2019 Standard	Windows Server 2019 Datacenter
Maximum number of 64-bit sockets	64	64
Maximum number of cores	Unlimited	Unlimited
Maximum RAM	24 TB	24 TB
Virtualization Guest	2 virtual machines, plus one Hyper-V host per license	unlimited virtual machines, plus one Hyper-V host per license

# Desktop Experience vs Server Core





# Service Option LTSC vs SAC

The Long-Term Servicing Channel (LTSC) provides a longer term option focusing on stability,

whereas the Semi-Annual Channel (SAC) provided more frequent releases enabling customers to take advantage of innovation more quickly.

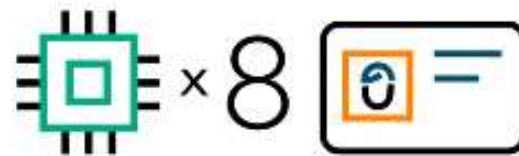
# Service Option LTSC vs SAC

Description	Long-Term Servicing Channel (Windows Server 2019)	Semi-Annual Channel (Windows Server)
Recommended scenarios	General purpose file servers, Microsoft and non-Microsoft workloads, traditional apps, infrastructure roles, software-defined Datacenter, and hyper-converged infrastructure	Containerized applications, container hosts, and application scenarios benefiting from faster innovation
New releases	Every 2–3 years	Every 6 months
Support	5 years of mainstream support, plus 5 years of extended support	18 months
Editions	All available Windows Server editions	Standard and Datacenter editions
Who can use it?	All customers through all channels	Software Assurance and cloud customers only
Installation options	Server Core and Server with Desktop Experience	Server Core for container host and image and Nano Server container image

# Windows server 2019 Licensing



Windows Server 2019  
Core-Based Licensing

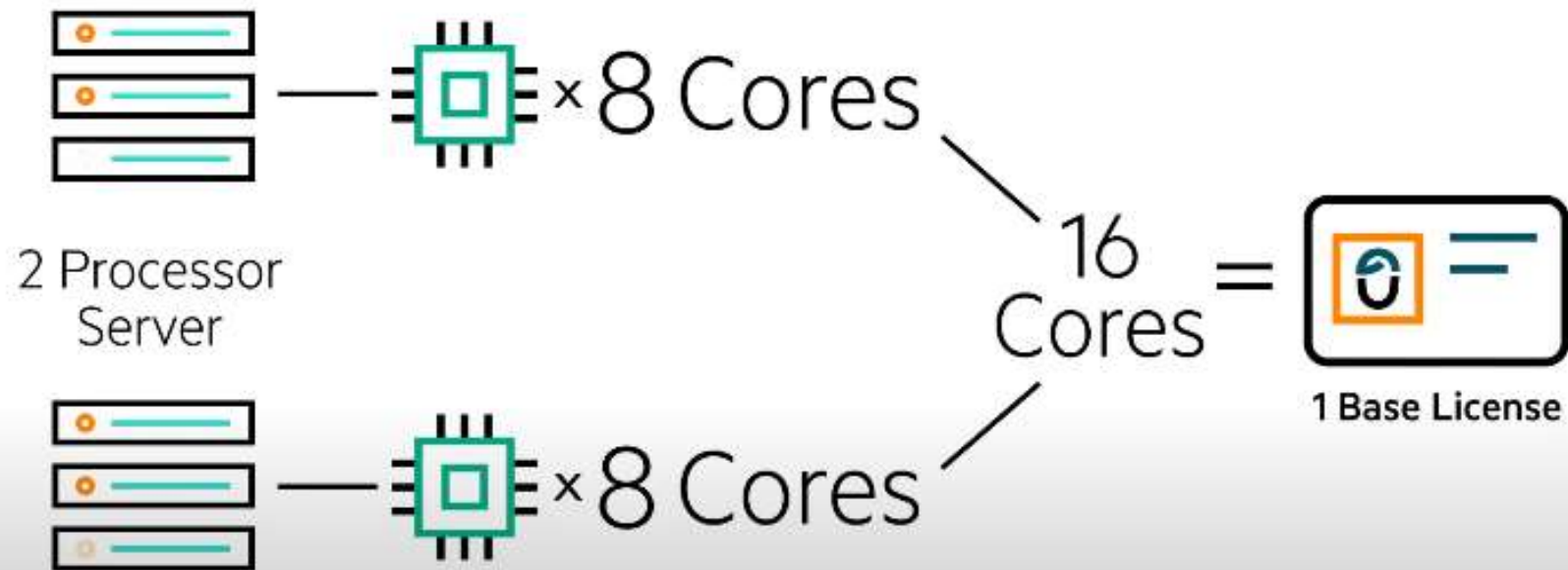


Minimum  
8 Core Licenses  
per Processor

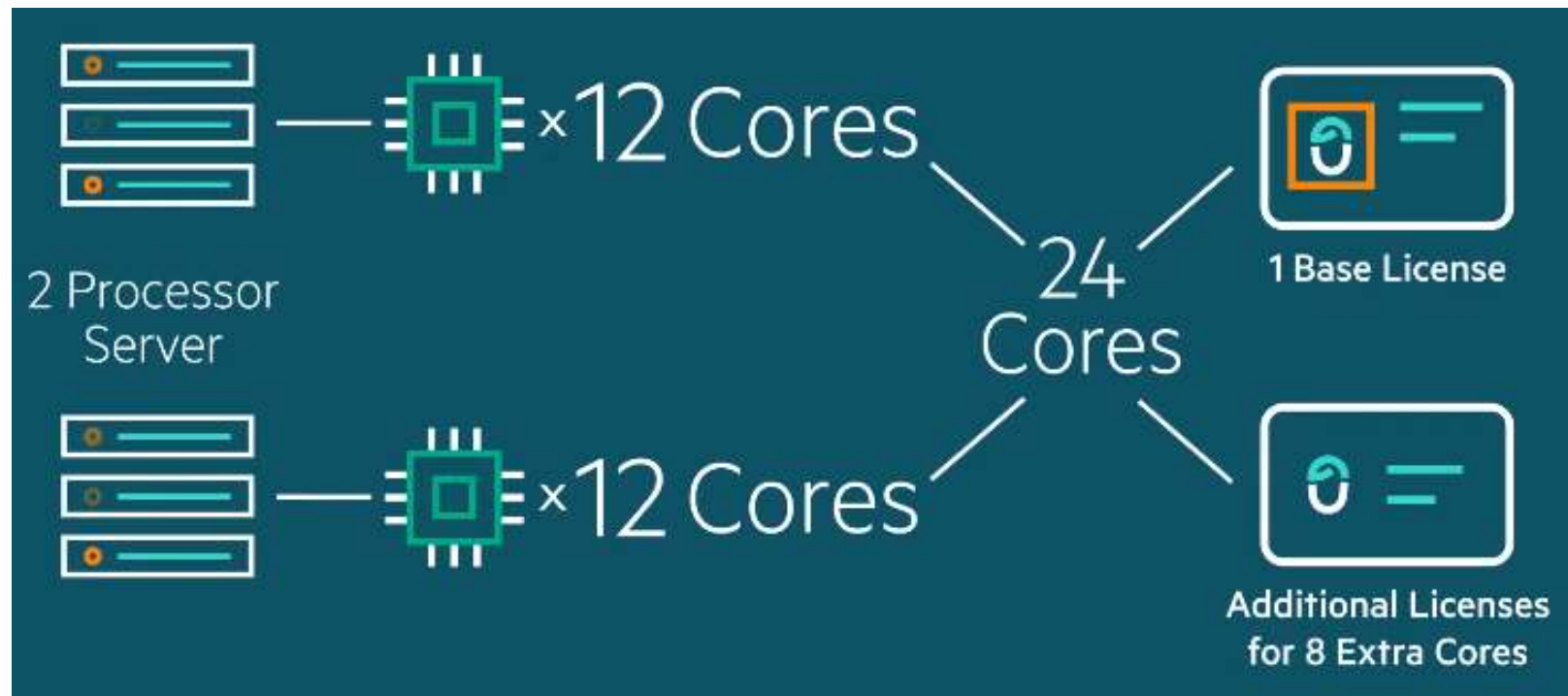


Minimum  
16 Core Licenses  
per Server

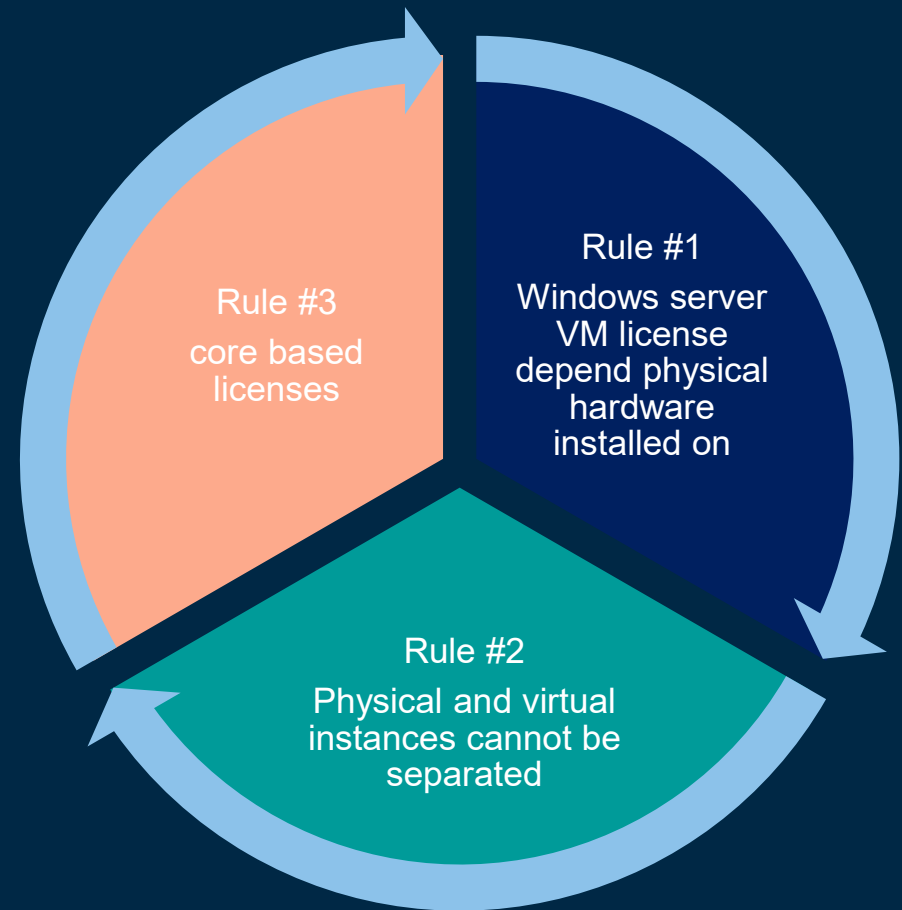
# Use Case



# Use Case



# The Golden Rule(s)



# What's New in WS 2019 ?

- Windows admin center
- System insight
- Feature on demand (Server core only)
- Windows defender advance threat protection
- Software define network
- Storage migration service
- Storage space direct
- Storage replica

# Windows admin center

The image displays a collection of Windows administrative tools. At the top, the 'Computer Management' window shows the 'Device Manager' tab with a tree view of hardware categories like 'Audio inputs and outputs', 'Disk drives', and 'Network adapters'. Below it, the 'Windows Defender Firewall with Advanced Security' window shows the 'Inbound Rules' list, which includes rules for 'AnyDesk', 'Chrome Remote Desktop Host', and 'Microsoft Lync'. To the left, the 'Event Viewer' window shows a list of events under 'Windows Logs > Application', with a detailed view of an event from 'Event 4097, CAPI2' showing a successful update. On the right, the 'Task Manager' window shows the 'Performance' tab with graphs and statistics for CPU (4% utilization, 1.98 GHz), Memory (4.6/29.9 GB), Disk 0 (D:) (HDD, 0%), and Disk 1 (C:) (SSD, 0%). It also lists network adapters like 'Ethernet Ethernet 2' and 'Ethernet VMware Network ...'.

**Computer Management (Local)**

- System Tools
  - Task Scheduler
  - Event Viewer
  - Shared Folders
  - Local Users and Groups
  - Performance
    - Monitoring Tools
    - Data Collector Sets
    - Reports
  - Device Manager
- Storage
  - Disk Management
- Services and Applications

**mywork**

- Audio inputs and outputs
- Bluetooth
- Computer
- Disk drives
- Display adapters
- Human Interface Devices
- IDE ATA/ATAPI controllers
  - Standard SATA AHCI Controller
- Keyboards
- Mouse and other pointing devices
- Monitors
- Network adapters
  - Bluetooth Device (Personal Area Network)
  - Fortinet SSL VPN Virtual Ethernet Adapter
  - Fortinet Virtual Ethernet Adapter
  - PPPoE WAN Adapter
  - Realtek 8188GU Wireless LAN 802.11n

**Windows Defender Firewall with Advanced Security**

**Inbound Rules**

Name	Group	Profile
AnyDesk		Public
AnyDesk		Private
AnyDesk		Private
AnyDesk		Domain
AnyDesk		Domain
AnyDesk		Public
AnyDesk		All
Chrome Remote Desktop Host		Public
Microsoft Lync		Public
Microsoft Lync		Public
Microsoft Lync UcMapi		Public
Microsoft Lync UcMapi		Public
Microsoft Office Outlook		Public
VMware Authd Service		Domain
VMware Authd Service (private)		Private

**Event Viewer (Local)**

**Application** Number of events: 20,544

Level	Date and Time
Information	02/08/2022 23:58:42
Information	02/08/2022 23:50:09
Information	02/08/2022 23:49:27
Information	02/08/2022 23:39:48
Information	02/08/2022 23:37:33
Information	02/08/2022 23:37:11
Information	02/08/2022 23:36:43
Information	02/08/2022 23:36:19
Information	02/08/2022 23:35:52
Information	02/08/2022 23:35:49
Information	02/08/2022 23:35:44

**Event 4097, CAPI2**

**General** Details

Successful auto update of third-party root certificate from OU=www.digicert.com, O=DigiCert Inc, CN=7E04DE896A3E666D00E687D33FFAD931

**Task Manager**

**Processes** Performance App history Startup Users Details Services

**CPU** AMD Ryzen 3 2200G with Radeon Vega Graphi...  
4% 1,98 GHz

**Memory** 4,6/29,9 GB (15%)

**Disk 0 (D:) HDD 0%**

**Disk 1 (C:) SSD 0%**

**Ethernet Ethernet 2 S: 0 R: 0 Kbps**

**Ethernet VMware Network ... S: 0 R: 0 Kbps**

**Ethernet VMware Network ... S: 0 R: 0 Kbps**

**% Utilization**

60 seconds

Utilization Speed Base speed: 3,50 GHz  
4% 1,98 GHz Sockets: 1  
Cores: 4  
Logical processors: 4  
Virtualization: Enabled  
L1 cache: 384 KB  
L2 cache: 2,0 MB  
L3 cache: 4,0 MB

Processes Threads Handles  
218 2418 84946

Up time  
0:00:35:48



# Windows admin center

real2019dtccore

## Tools

Search Tools

### Overview

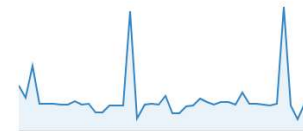
- Backup
- Certificates
- Devices
- Events
- Files
- Firewall
- Installed Apps
- Local Users & Groups
- Network
- Powershell
- Processes
- Registry
- Remote Desktop
- Roles & Features
- Scheduled Tasks
- Services
- Storage
- Storage Migration Service
- Storage Replica
- System Insights
- Updates
- Settings

## Overview

Restart Shutdown Disable Disk Metrics Edit Computer ID Refresh

Computer Name: real2019dtccore	Domain:	Operating System: Microsoft Windows Server 2019 Datacenter	Version: 10.0.17763
Disk Space (Free / Total): 12.69 GB / 19.4 GB	Processor: Intel(R) C		
Windows Defender Real-time protection: On	NIC(s) 1		

### CPU



60 seconds ago

### Ethernet (Ethernet)



## Add resources

Choose the type of resource that you want to manage or create.



### Windows Server

Connect to servers.

Add



### Windows PC

Connect to Windows 10 PCs.

Add



### Windows Server cluster

Connect to Windows Server clusters—including failover and hyperconverged clusters.

Add



### Azure VM

Connect to Azure virtual machines that run Windows Server.

Add

Create new

Started updating computer ID  
Started updating computer ID  
real2019dtccore 10/8/2018, 7:36:11 PM

# System Insight

CPU capacity  
forecasting

Network  
capacity  
forecasting

Total storage  
consumption  
forecasting

Volume  
consumption  
forecasting

## System Insights > CPU capacity forecasting overview

Invoke Settings Disable

### Overview

Status Forecast  
✓ Ok CPU usage is forecasted to remain within the available capacity.

### Forecast



### Forecast

DC\_x64FRE\_EN-U



## CPU capacity forecasting settings

Schedule

### Schedule

Actions

Scheduled predictions

Enabled

Schedule type

Daily

Daily schedule type

Days of week

# Windows Defender 2019

## Security operations

### Active alerts

180 days



High	7
Medium	22
Low	5
Informational	2

- Suspicious sequence of exploration activities
- Suspected credential theft activity
- Suspicious script execution
- Suspicious Remote WMI Execution detected on target machine
- Suspicious Remote WMI Execution detected on source machine

Low	12/17/18, 6:11 AM
Medium	10/29/18, 4:17 PM
Medium	9/16/18, 9:33 AM
Medium	9/15/18, 2:33 PM
Medium	9/15/18, 2:33 PM

### Active automated investigations

180 days



Pending action	0
Waiting for machine	0
Running	0

### Automated investigations statistics

180 days



4 Automated investigations



18:24h  
Average pending time



6 Alerts investigated



2 Remediated investigations



27:27m  
Average time to remediate



0.05  
Hours automated

### Machines at risk

Machines list

- cont-jonathanw
- cont-jacksonk
- cont-jayhardee
- cont-rital



### Users at risk

180 days

- contoso\jonathan.welcott
- contoso\jackson.kiefer
- azuread\jacobgall
- e0151781-f1wdagutilityaccount



# Built-in SDN

sa18n34cluster.sa18.nttest.microsoft.com

Tools

Search Tools

Dashboard

Compute

Virtual machines

Servers

Azure Kubernetes Service

Storage

Volumes

Drives

Storage Replica

Networking

SDN Infrastructure

Virtual switches

Tools

Azure Monitor

Updates

Diagnostics

Performance Monitor

Extensions

Dell EMC OpenManage Integration

1 Cluster settings 2 Deploy

### Cluster settings

This runs the Network Controller service on a cluster of virtual machines.

**Host**

Domain sa18.nttest.microsoft.com

Network controller cluster name \* ncsa18n34clust

VHD path \* C:\vhd\RSS\_RELEASE\_SVC\_HCI\_17784.1068.200716-14 Browse

VM Switch \* ConvergedSwitch

Number of cluster VMs \* 3 - Highly available

**Network**

VLAN ID \* 1001

VM network addressing ☒ DHCP ☐ Static

Network controller VMs \*

Name	IP address
ncsa18n34clust1	DHCP Assigned
ncsa18n34clust2	DHCP Assigned
ncsa18n34clust3	DHCP Assigned

```
Properties
{
    Space
    LocalNetwork
}

net
ar.VirtualSubnetProperties
vs.NetworkController.AccessControlList

ILists/AllowAll"

net
ar.VirtualSubnetProperties
vs.NetworkController.AccessControlList

ILists/AllowAll"

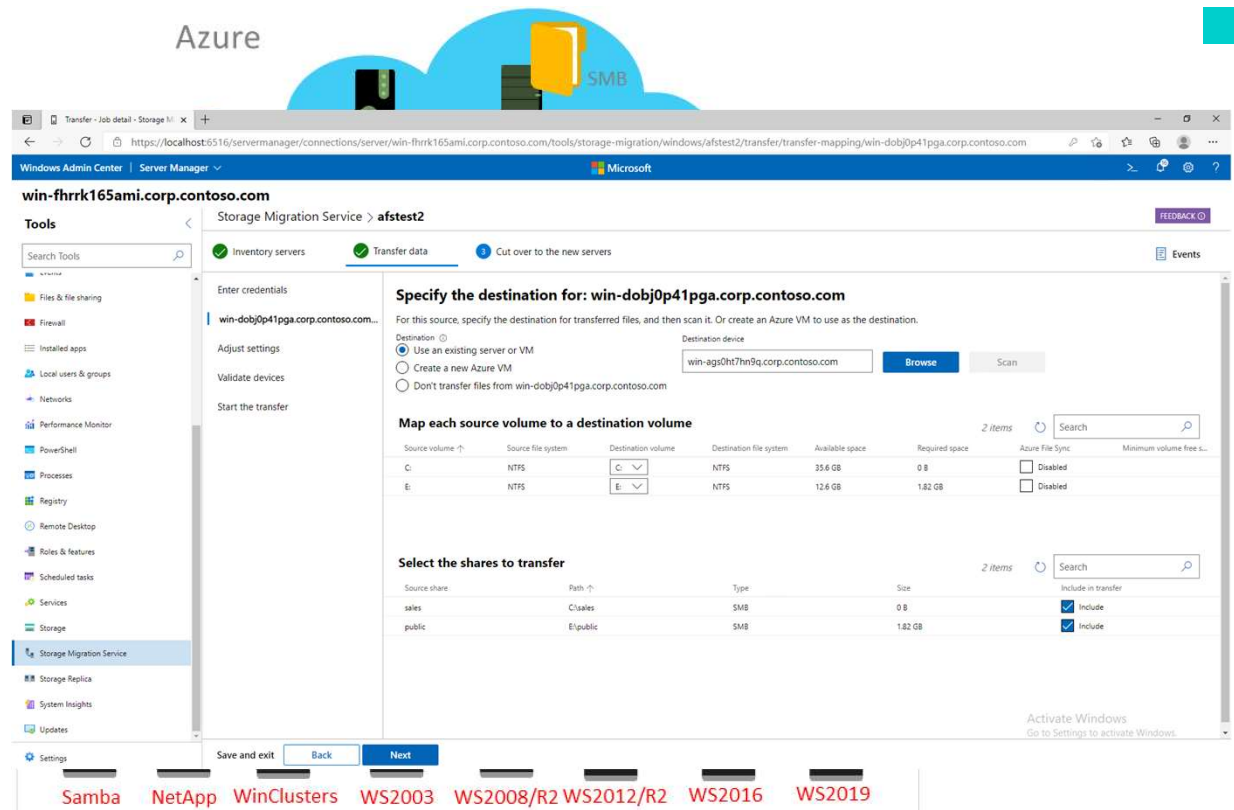
ies -ConnectionUri "https://sa18n22nc.sa18.nttest.microsoft.com" -force
```

# Storage Migration Service

## Why use Storage Migration Service ?

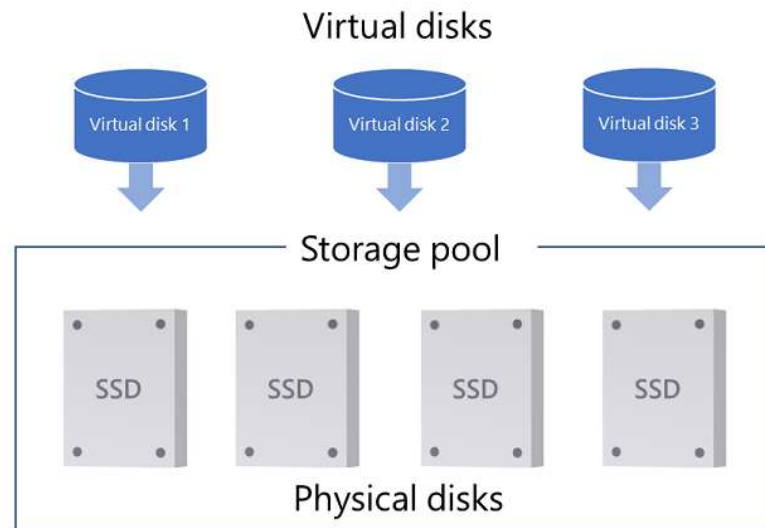
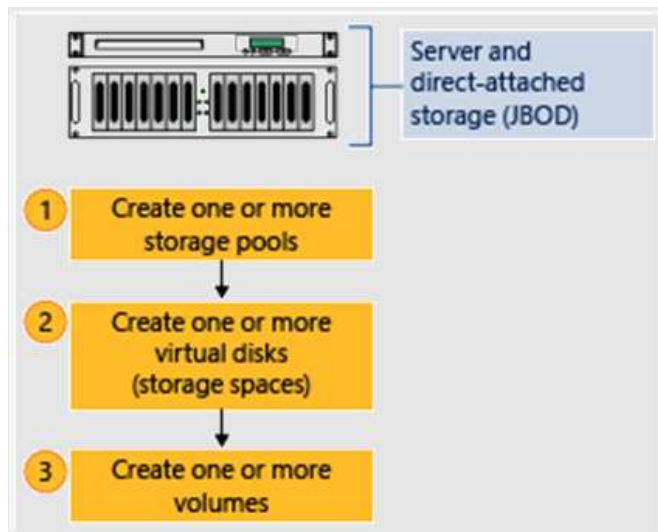
Use Storage Migration Service because you've got a server (or a lot of servers) that you want to migrate to newer hardware or virtual machines. Storage Migration Service is designed to help by doing the following:

1. Inventory multiple servers and their data
2. Rapidly transfer files, file shares, and security configuration from the source servers
3. Optionally take over the identity of the source servers (also known as cutting over) so that users and apps don't have to change anything to access existing data
4. Manage one or multiple migrations from the Windows Admin Center user interface

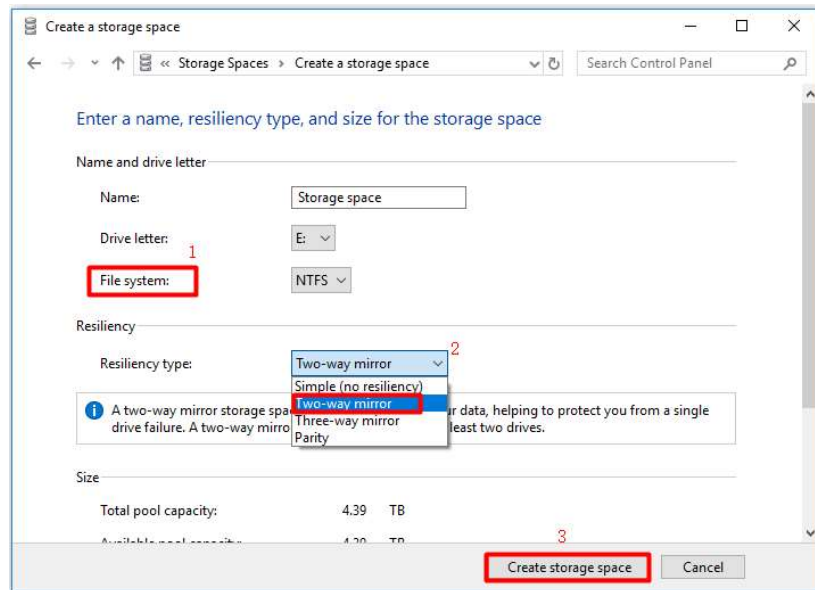


# Storage Space

Storage Spaces is a technology in Windows and Windows Server that can help protect your data from drive failures. It is conceptually similar to RAID, implemented in software. You can use Storage Spaces to group three or more drives together into a storage pool and then use capacity from that pool to create Storage Spaces.



# Storage Space Resiliency Type



## Simple

- Stripes data across physical disks
- Maximizes disk capacity and increases throughput
- No resiliency (does not protect from disk failure)

## Mirror

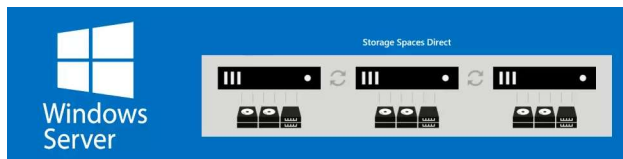
- Stores two or three copies of the data across the set of physical disks
- Increases reliability, but reduces capacity. Duplication occurs with every write. A mirror space also stripes the data across multiple physical drives.
- Greater data throughput

## Parity

- Stripes data and parity information across physical disks
- Increases reliability when it is compared to a simple space, but somewhat reduces capacity

# Storage Space Direct

While Windows Storage Spaces focused on a single server and its local storage, Storage Spaces Direct is able to pool storage across servers.



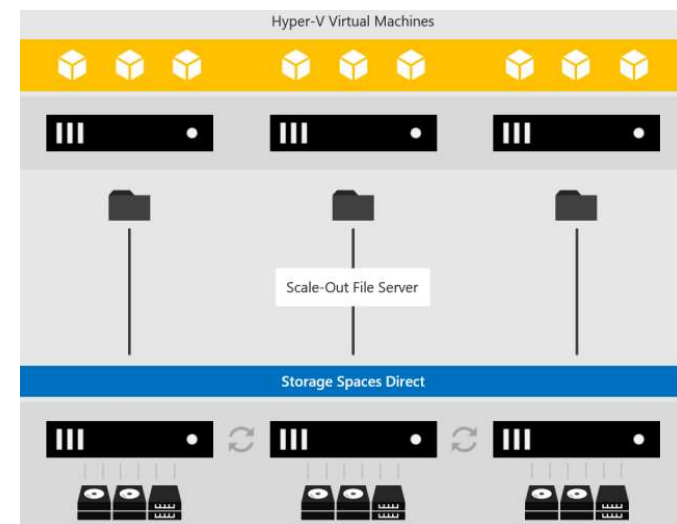
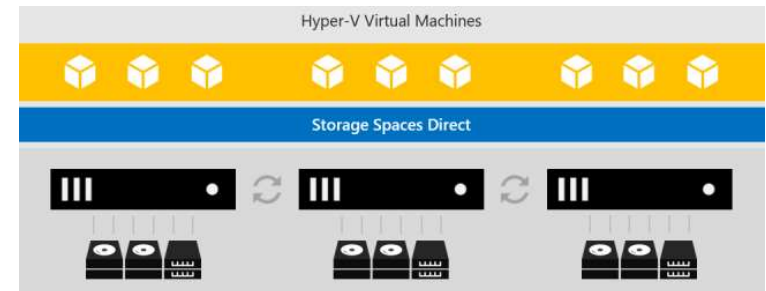
## Deployment Option:

### 1. Hyperconverged deployment

The hyperconverged deployment option runs Hyper-V virtual machines or SQL Server databases directly on the servers providing the storage—storing their files on the local volumes

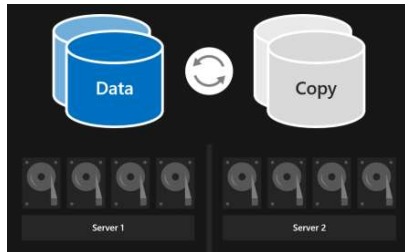
### 2. Converged deployment

The converged deployment option, also known as 'disaggregated,' layers a Scale-out File Server (SoFS) atop Storage Spaces Direct to provide network-attached storage over SMB3 file shares



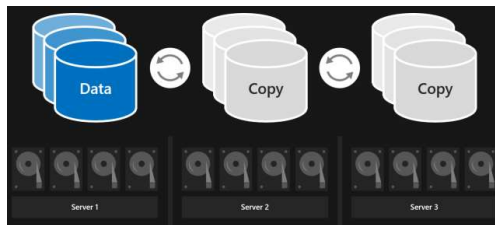


# Storage Space Direct Resiliency



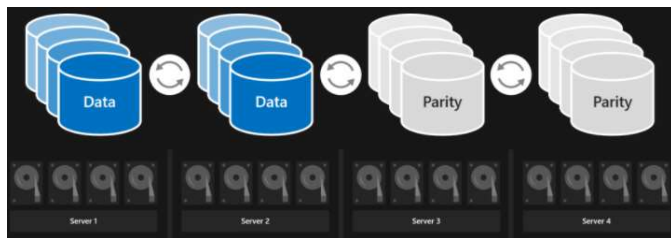
## Two-way Mirror

Two-way mirroring writes two copies of everything. Its storage efficiency is 50 percent – to write 1 TB of data, you need at least 2 TB of physical storage capacity



## Three-way Mirror

Three-way mirroring writes three copies of everything. Its storage efficiency is 33.3 percent – to write 1 TB of data, you need at least 3 TB of physical storage capacity.



## Parity

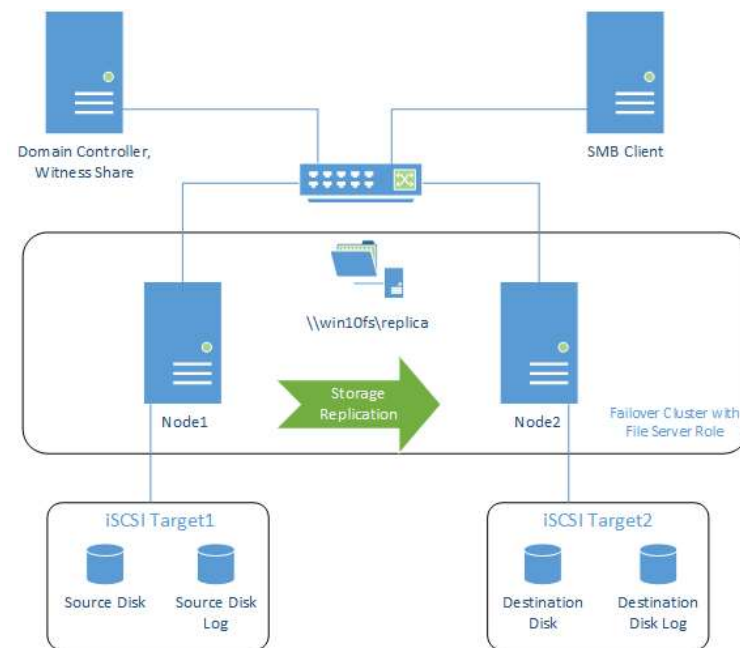
Providing the same fault tolerance as three-way mirroring (i.e. up to two failures at once), but with better storage efficiency. It most closely resembles RAID-6. To use dual parity, you need at least four hardware fault domains – with Storage Spaces Direct, that means four servers. At that scale, the storage efficiency is 50% – to store 2 TB of data, you need 4 TB of physical storage capacity.

# Storage Replica

Storage Replica is Windows Server technology that enables replication of volumes between servers or clusters for disaster recovery. It also enables you to create stretch failover clusters that span two sites, with all nodes staying in sync.

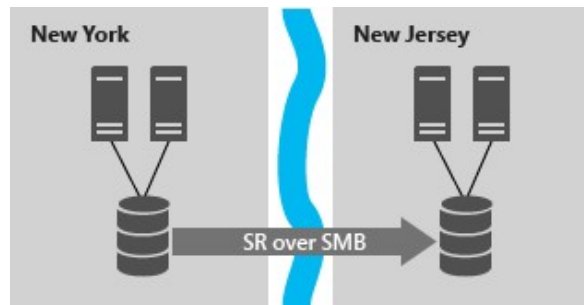
Storage Replica supports synchronous and asynchronous replication:

- **Synchronous replication** mirrors data within a low-latency network site with crash-consistent volumes to ensure zero data loss at the file-system level during a failure.
- **Asynchronous replication** mirrors data across sites beyond metropolitan ranges over network links with higher latencies, but without a guarantee that both sites have identical copies of the data at the time of a failure.

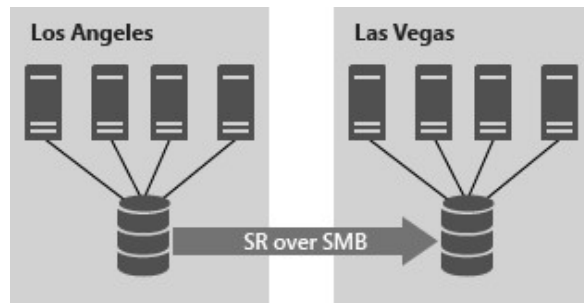


# Storage Replica Scenario

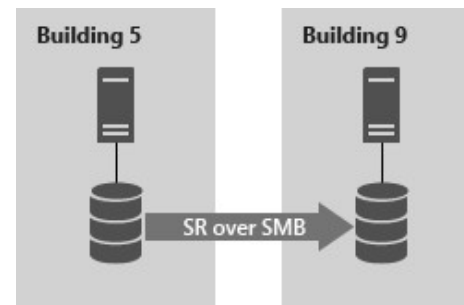
Stretch Cluster



Disaster Recovery



Server to Server



# Windows server role and feature

The screenshot displays the 'Add Roles and Features Wizard' for a destination server named 'MSTEAMDC01.MSTEAM.LAB'. The wizard is divided into two main sections: 'Select server roles' and 'Select features'.

**Select server roles:** The left sidebar shows the progression: Before You Begin, Installation Type, Server Selection, **Server Roles** (current), Features, Confirmation, and Results. The main area lists various roles with checkboxes. 'Active Directory' is selected, and 'DNS Server' is also checked. 'File and Storage' is partially visible.

**Select features:** The left sidebar shows: Before You Begin, Installation Type, Server Selection, **Features** (current), Confirmation, and Results. The main area lists various features with checkboxes. 'Group Policy Management (Installed)' is checked. Other features like 'Client for NFS', 'Containers', 'Data Center Bridging', etc., are listed but not selected.

**Description:** A description for 'Windows Server Backup' is provided: 'Windows Server Backup allows you to back up and recover your operating system, applications and data. You can schedule backups, and protect the entire server or specific volumes.'

**Navigation:** At the bottom, there are buttons for '< Previous', 'Next >', 'Install', and 'Cancel'.

The image features a dark navy blue background. In the center, the word "THANKS" is written in a large, white, sans-serif font. Surrounding the text are several thin, vertical white lines of varying lengths. Scattered throughout the background are small squares in various colors: light pink, light blue, orange, and teal. Some of these squares are solid, while others are outlined in a thin white border. The overall composition is minimalist and modern.

# THANKS