

Manage Failover Clustering



Tim Warner

Microsoft Azure Solutions Architect

@TechTrainerTim TechTrainerTim.com



Overview



Implement cluster-aware updating

Recover a failed cluster node

Upgrade a node to Windows Server 2022

Failover workloads between nodes

Install Windows updates on cluster nodes

Manage failover clusters using Windows Admin Center



Windows Server 2022: Implement and Manage Windows Server High Availability

Implement a Windows Server Failover Cluster

Configure a Windows Server Failover Cluster

Manage a Windows Server Failover Cluster

Manage Failover Clustering

Implement and Manage Storage Spaces Direct



Cluster-Aware Updating (CAU)



Cluster-Aware Updating



Maintains cluster availability during Microsoft Update patching cycles

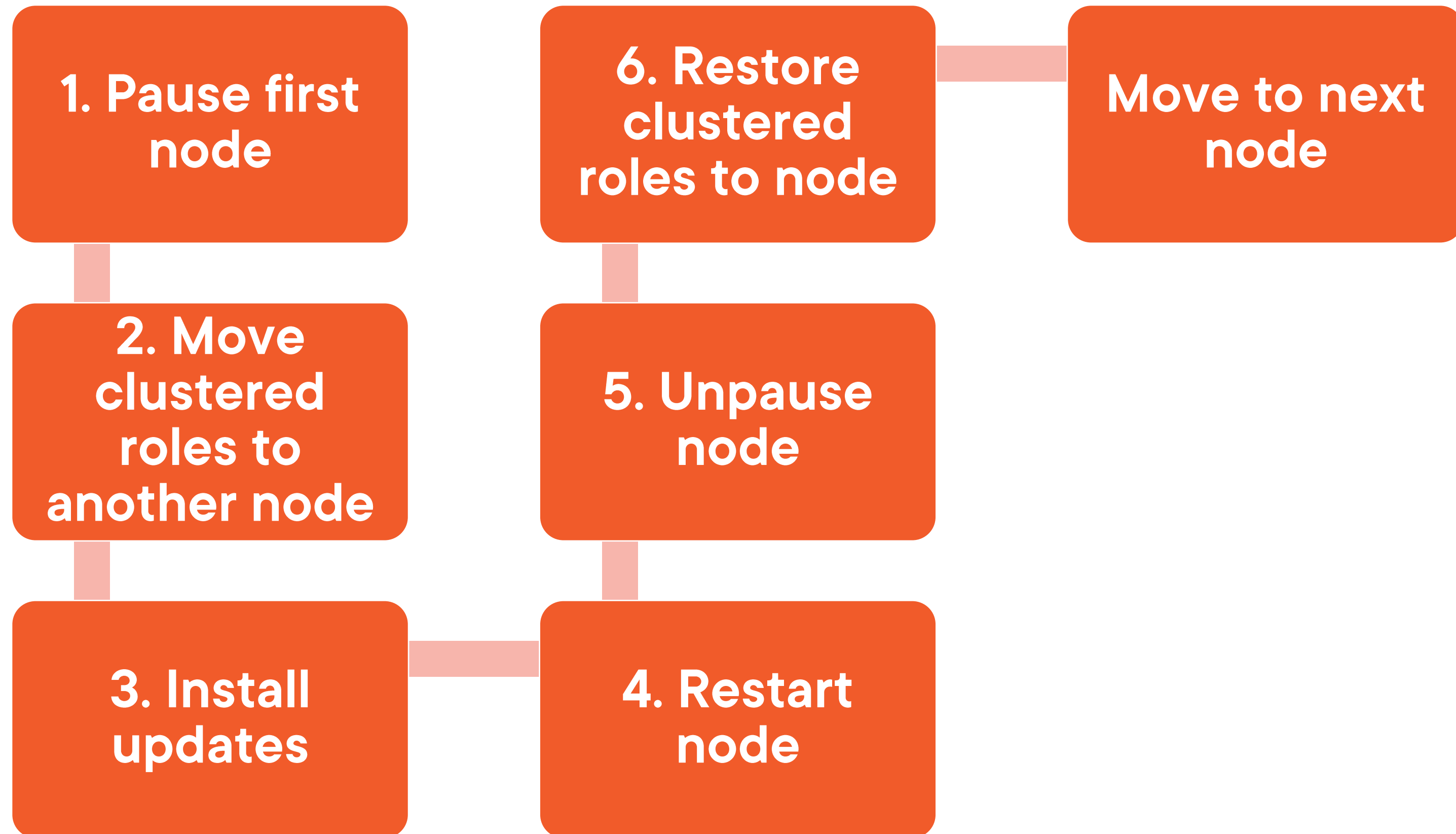
Plug-in model:

- Microsoft Update
- Windows Server Update Services (WSUS)

Updating runs:

- Manual
- Self-updating via schedule

CAU Update Workflow



Cluster-Aware Updating

clhv1 - Cluster-Aware Updating

Connect to a failover cluster:

clhv1

Cluster nodes:

Node name	Last Run status	Last Run time
svhv1	Failed	4/15/2014 4:42 AM
svhv2	Succeeded	4/15/2014 4:16 AM

Last Cluster Update Summary | Log of Updates in Progress

Cluster name: clhv1
Last Updating Run: 4/15/2014 4:43 AM
Last updating status: Failed

Cluster Actions

- Apply updates to this cluster
- Preview updates for this cluster
- Create or modify Updating Run Profile
- Generate report on past Updating Runs
- Configure cluster self-updating options
- Analyze cluster updating readiness
- Manage this cluster



Cluster-Aware Updating

```
Administrator: Windows PowerShell
PS C:\Users\tim> Get-Command -Module ClusterAwareUpdating
```

CommandType	Name	Version	Source
Cmdlet	Add-CauClusterRole	2.0.0.0	ClusterAwareUpdating
Cmdlet	Disable-CauClusterRole	2.0.0.0	ClusterAwareUpdating
Cmdlet	Enable-CauClusterRole	2.0.0.0	ClusterAwareUpdating
Cmdlet	Export-CauReport	2.0.0.0	ClusterAwareUpdating
Cmdlet	Get-CauClusterRole	2.0.0.0	ClusterAwareUpdating
Cmdlet	Get-CauDeviceInfoForFeatureUpdates	2.0.0.0	ClusterAwareUpdating
Cmdlet	Get-CauPlugin	2.0.0.0	ClusterAwareUpdating
Cmdlet	Get-CauReport	2.0.0.0	ClusterAwareUpdating
Cmdlet	Get-CauRun	2.0.0.0	ClusterAwareUpdating
Cmdlet	Invoke-CauRun	2.0.0.0	ClusterAwareUpdating
Cmdlet	Invoke-CauScan	2.0.0.0	ClusterAwareUpdating
Cmdlet	Register-CauPlugin	2.0.0.0	ClusterAwareUpdating
Cmdlet	Remove-CauClusterRole	2.0.0.0	ClusterAwareUpdating
Cmdlet	Save-CauDebugTrace	2.0.0.0	ClusterAwareUpdating
Cmdlet	Get-CauClusterRole	2.0.0.0	ClusterAwareUpdating
Cmdlet			
Cmdlet			
Cmdlet			

```
PS C:\Users\tim> Invoke-CauRun -ClusterName "CONTOSO-FC1"  
-CauPluginName "Microsoft.WindowsUpdatePlugin"  
-MaxFailedNodes 1 -MaxRetriesPerNode 3  
-RequireAllNodesOnline -Force
```



Failover and Cluster Management



Recover from Reparable Failure

**Allow failover
to occur**

**Fix problem on
failed node**

**Manually fail
back role to
original node**



Recover from Irreparable Failure

**Allow role
failover to
take place**

**Evict the
failed node**

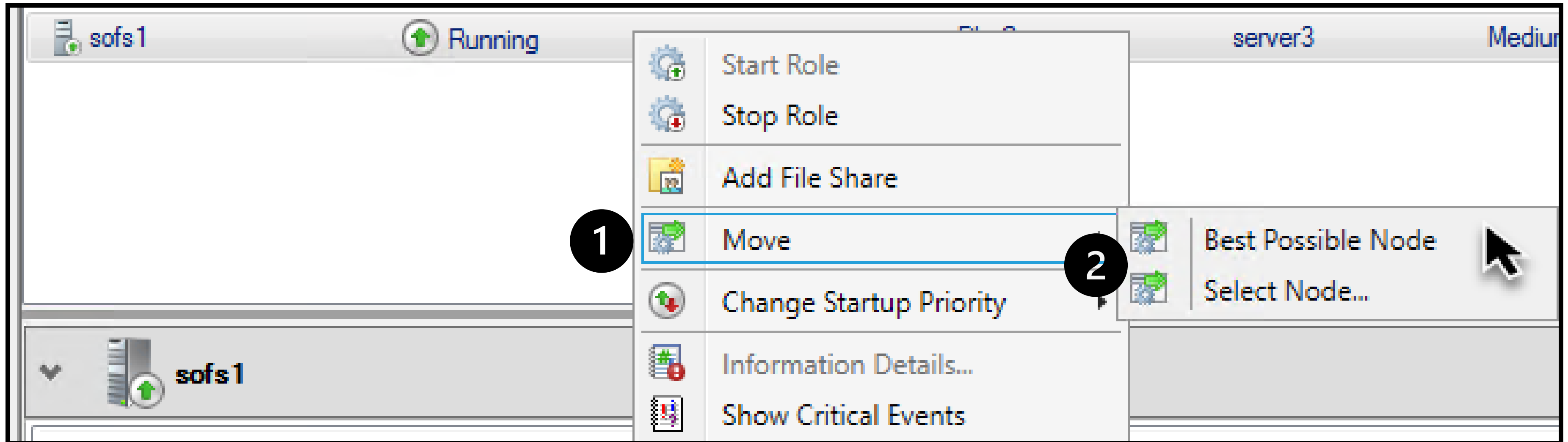
**Replace the
failed node
with new
hardware**

**Add the
new node
to the
cluster**

**Transfer
roles to the
new node**



Fail over Workloads



Fail over Workloads

sofs1 Properties

General Failover

Failover

Specify the number of times the Cluster service will attempt to restart or fail over the clustered role in the specified period.

If the clustered role fails more than the maximum in the specified period, it will be left in the failed state.

Maximum failures in the specified period: 1

Period (hours): 6

Failback

Specify whether the clustered role will automatically fail back to the most preferred owner (which is set on the General tab).

☒ Prevent failback

☐ Allow failback


☐ Immediately

☐ Failback between: 0 and 0 hours

OK Cancel Apply

sofs1 Properties

General Failover

 sofs1

Name: sofs1

Preferred Owners

Select the [preferred owners](#) for this clustered role. Use the buttons to list them in order from most preferred at the top to least preferred at the bottom.

☐ server2

☐ server3

Up Down

Priority: Medium

Status: Running

Node: server3

OK Cancel Apply



Fail over Workloads

1

nestvm

SDDC Group

sofs1

Running

Running

Running

Connect...

Start

Save

Shut Down

Turn Off

Settings...

Manage...

Replication

2

Move

Cancel Live Migration

Change Startup Priority

Information Details...

Virtual Machine

server2

server2

server3

Live Migration

Quick Migration

3

Virtual Machine Storage

Medium

High

Medium

Best Possible Node

Select Node...

nestvm

Name

Storage

Cluster Virtual Disk (vm-disk)

Virtual Machine



Install Windows Updates on Cluster Nodes

```
Suspend-ClusterNode -Name "node1"
```

```
Get-ClusterNode -Name "NodeA" |  
Get-ClusterGroup -Name "SOFS1" | Move-ClusterGroup
```

```
# Install updates > restart  
Resume-ClusterNode -Name "node1"
```

```
Move-ClusterGroup -Name "SOFS1"  
-Node "node1"
```



Windows Admin Center (WAC)

The screenshot displays the Windows Admin Center (WAC) interface for a Hyper-V cluster. The top navigation bar shows 'Windows Admin Center | Cluster Manager'. The main content area is titled 'vmcluster.contoso.com' and includes a notification about an extension update. The left sidebar, labeled 'Tools', contains a search bar and a list of categories: Compute (Virtual machines, Servers, Azure Kubernetes Service), Storage (Volumes, Drives, Storage Replica), and Networking (SDN Infrastructure, Virtual switches). The main dashboard area shows sections for Alerts, Servers, and Virtual machines. Four orange callout boxes with black borders are overlaid on the interface, each with a line pointing to a specific feature: 'Dedicated cluster UI' points to the top navigation bar; 'Extension model' points to the update notification; 'Azure integration' points to the 'Azure Kubernetes Service' item in the left sidebar; and 'Subset of MMC capabilities' points to the 'Settings' item at the bottom of the left sidebar.

Windows Admin Center | Cluster Manager

vmcluster.contoso.com

An update is available for this extension. [Update now](#)

Tools

Search Tools

Dashboard

Compute

- Virtual machines
- Servers
- Azure Kubernetes Service

Storage

- Volumes
- Drives
- Storage Replica

Networking

- SDN Infrastructure
- Virtual switches

Settings

Dashboard

Alerts (Total 1)

- CLUSTER VMCLU Windows Server

Servers (Total 4)

All servers healthy

Virtual machines (Total 3)

Running

Volumes healthy



Demo



1

Install and configure CAU

Fail over and fail back

Windows Admin Center cluster admin



Summary



Windows Server failover clustering is a reliable, self-contained high availability ecosystem

Consider leveraging PowerShell automation if you haven't already begun to do so

- PowerShell features prominently on the AZ-800 and AZ-801 certification exams



Up Next:

Implement and Manage Storage Spaces
Direct

