

Storage Spaces Configuration with DataON JBOD

Cabling

SAS cables and HBA cards should all be labeled so that you can connect your JBOD(s) to your server(s). Cabling diagrams can also be found on our website here:

<http://www.dataonstorage.com/windows-server-2012-r2-storage-spaces.html>

Windows Server 2012 R2

Before setting up your storage spaces, it is required to go into Server Manager and install the following in every single server:

1. Failover Cluster Manager
2. MPIO
 - a. Enable SAS Device
 - b. MPIO Policy

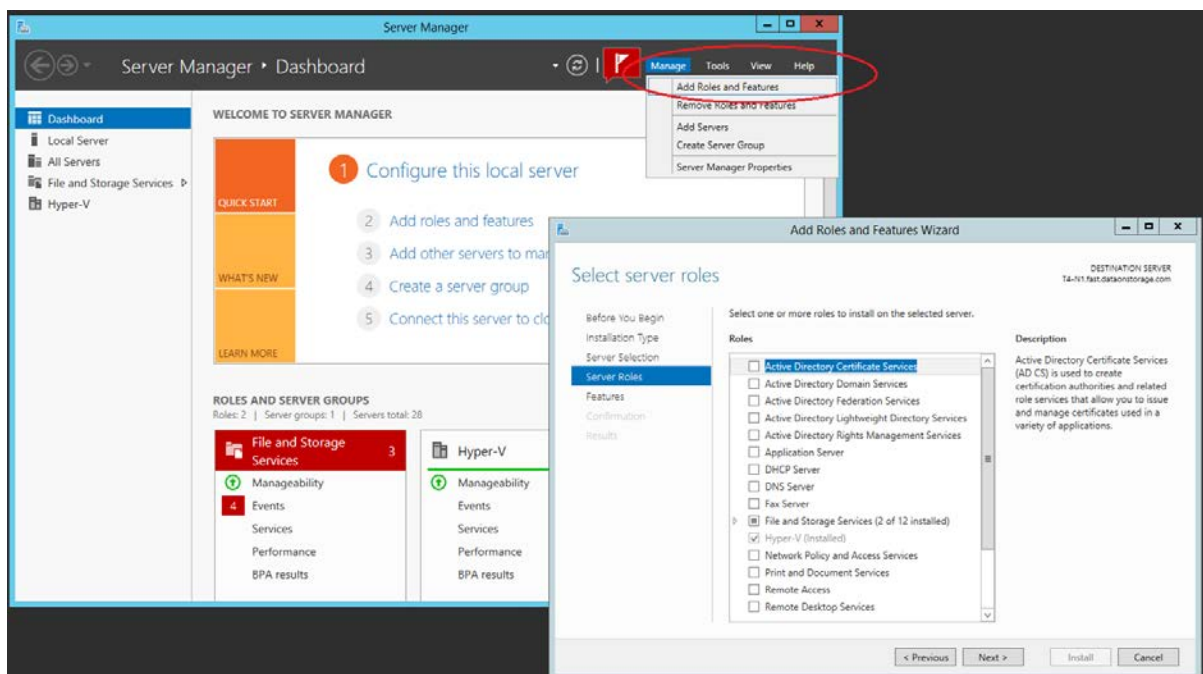
*Step-by-step guide on how to install MPIO and enable SAS devices can be found here: <https://dataon.freshdesk.com/support/solutions/folders/6000101726>

*Information about MPIO Policy:

<https://dataon.freshdesk.com/support/solutions/articles/6000014964-mpio-policy>

3. File and Storage Services
 - a. File and iSCSI Services
 - b. Storage Services
4. Hyper-V Manager (if needed)

All of these features will be under Server Roles in the Add Roles and Features Wizard.

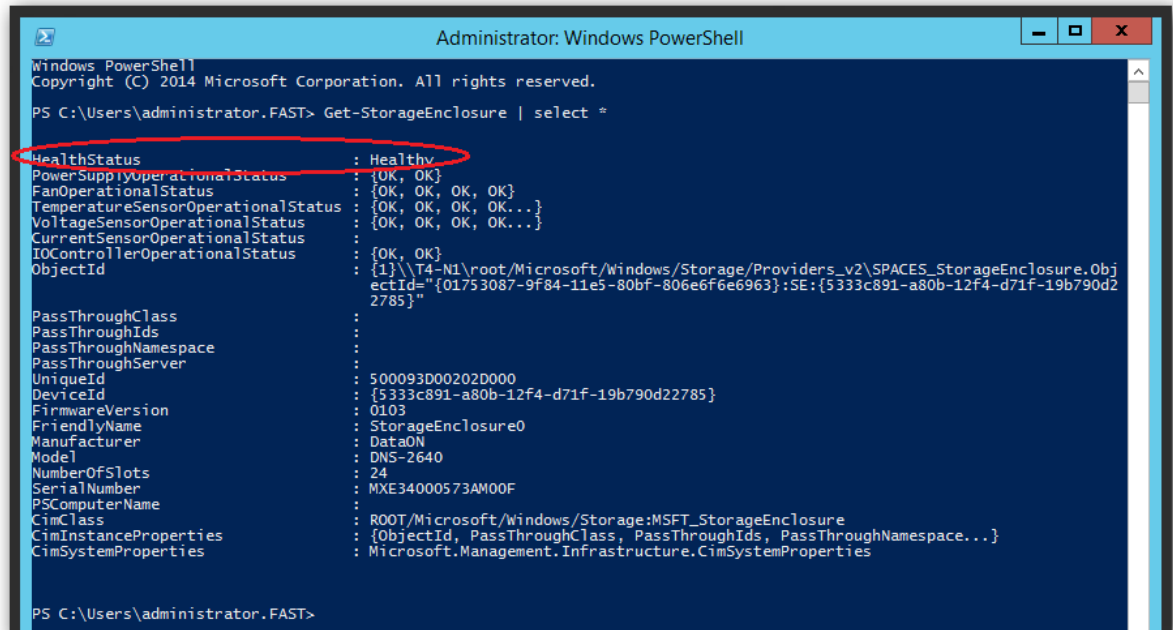


JBOD / Physical Disks

It is recommended that SAS devices are used with DataON JBODs.

1. Verify that the **HealthStatus** of all JBOD enclosures are **Healthy**. To do this, in PowerShell, run the following cmdlet:

Get-StorageEnclosure | select *



```
Administrator: Windows PowerShell
Windows PowerShell
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PS C:\Users\administrator.FAST> Get-StorageEnclosure | select *

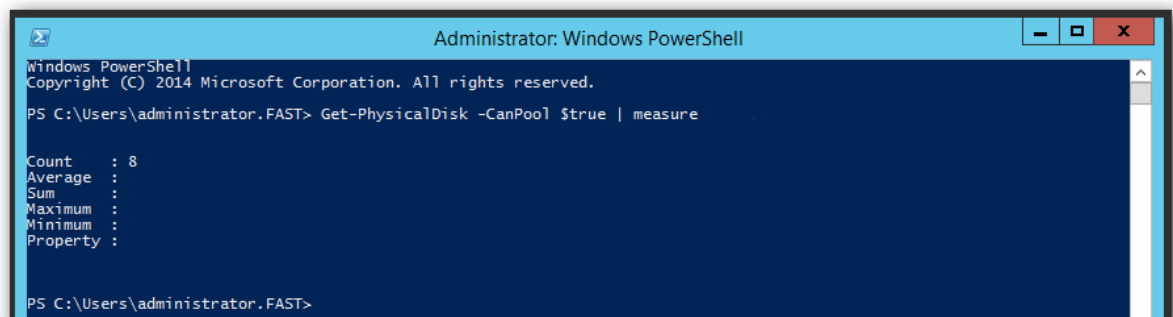
HealthStatus           : Healthy
PowerSupplyOperationalStatus : {OK, OK}
FanOperationalStatus    : {OK, OK, OK, OK}
TemperatureSensorOperationalStatus : {OK, OK, OK, OK...}
VoltageSensorOperationalStatus : {OK, OK, OK, OK...}
CurrentSensorOperationalStatus : {OK, OK, OK, OK...}
IOControllerOperationalStatus : {OK, OK}
ObjectId                : {1}\T4-N1\root\Microsoft\Windows\Storage\Providers_v2\SPACES_StorageEnclosure.ObjectId="{01753087-9F84-11e5-80bf-806e6f6e6963}:SE:{5333c891-a80b-12f4-d71f-19b790d22785}"
PassThroughClass        :
PassThroughIds          :
PassThroughNamespace    :
PassThroughServer       :
UniqueId                : 500093D00202D000
DeviceId                : {5333c891-a80b-12f4-d71f-19b790d22785}
FirmwareVersion         : 0103
FriendlyName            : StorageEnclosure0
Manufacturer            : DataON
Model                   : DNS-2640
NumberOfSlots           : 24
SerialNumber            : MXE34000573AM00F
PSComputerName          :
CimClass                : ROOT\Microsoft\Windows\Storage:MSFT_StorageEnclosure
CimInstanceProperties    : {ObjectId, PassThroughClass, PassThroughIds, PassThroughNamespace...}
CimSystemProperties      : Microsoft.Management.Infrastructure.CimSystemProperties

PS C:\Users\administrator.FAST>
```

This will get all storage enclosures that are recognized by the server, along with important information regarding the enclosure, including its health status.

2. Verify that all physical disks can be pooled. The following cmdlet lists the number of disks that are available to be added to a storage pool:

Get-PhysicalDisk -canpool \$true | measure



```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) 2014 Microsoft Corporation. All rights reserved.

PS C:\Users\administrator.FAST> Get-PhysicalDisk -CanPool $true | measure

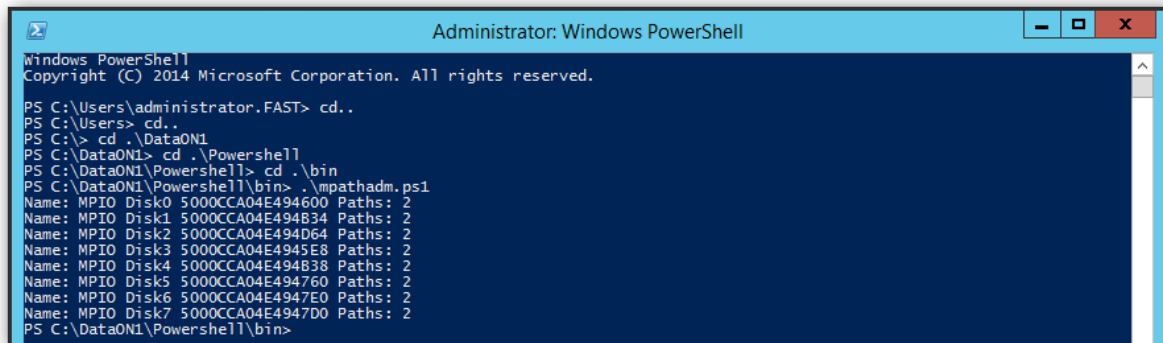
Count      : 8
Average    :
Sum        :
Maximum    :
Minimum    :
Property   :

PS C:\Users\administrator.FAST>
```

3. Verify each server has redundant paths to all the disks in each JBOD enclosure. Download the file in the following link which contains the cmdlet, **mpathadm.ps1**:

<https://dataon.freshdesk.com/support/solutions/articles/6000112437-windows-cmdlet-to-check-path-redundancy>

The cmdlet, **mpathadm.ps1**, returns how many paths each server has to each disk:



```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) 2014 Microsoft Corporation. All rights reserved.

PS C:\Users\administrator.FAST> cd..
PS C:\Users> cd..
PS C:\> cd .\Data0N1
PS C:\Data0N1> cd .\Powershell
PS C:\Data0N1\Powershell> cd .\bin
PS C:\Data0N1\Powershell\bin> .\mpathadm.ps1
Name: MPIO Disk0 5000CCA04E494600 Paths: 2
Name: MPIO Disk1 5000CCA04E494B34 Paths: 2
Name: MPIO Disk2 5000CCA04E494D64 Paths: 2
Name: MPIO Disk3 5000CCA04E4945E8 Paths: 2
Name: MPIO Disk4 5000CCA04E494B38 Paths: 2
Name: MPIO Disk5 5000CCA04E494760 Paths: 2
Name: MPIO Disk6 5000CCA04E4947E0 Paths: 2
Name: MPIO Disk7 5000CCA04E4947D0 Paths: 2
PS C:\Data0N1\Powershell\bin>
```

Creating Storage Spaces

Before creating the storage pool, reference the following guide on Microsoft's configuration limits for storage spaces:

*Configuration Limitations Recommended by Microsoft

<https://dataon.freshdesk.com/support/solutions/articles/6000008454-configuration-limitations-recommended-by-microsoft>

1. Create a Storage Pool - All available disks must be grouped into one or more storage pools
 - a. In Server Manager, click **File and Storage Services**
 - b. Click **Storage Pools**
 - c. Under **Storage Pools**, click **Tasks**, then **New Storage Pool**. The Storage Pool Wizard will open.
 - d. Name the storage pool.
 - e. Select each physical disk you wish to be added to the storage pool.
 - f. Confirm the settings of the storage pool are correct, then click **Create**.
 - g. The new storage pool should now be listed under **Storage Pools**.
2. Create the Quorum Disk - A Quorum disk must be created in a failover cluster to ensure that the cluster will continue to have high availability in an event of failure.
 - a. The New Virtual Disk Wizard should open after creating the storage pool. If not, under **Virtual Disks**, click **Tasks**, then **New Virtual Disk**.
 - b. On the storage pool page, select the storage pool you'd like to create the quorum disk from and then click Next.
 - c. Name the quorum disk **Q**.
 - d. Select your desired layout and then click Next.
 - e. Select the **Fixed** provisioning type.
 - f. Specify the size of the Quorum disk. The quorum disk should be the smallest virtual disk.
 - g. Confirm the settings of the quorum disk are correct, then click Create.
 - h. Follow **Step 4** below to create the volume for the quorum disk.
3. Create the Virtual Disk - You now must create one, or more virtual disks, from the storage pool.
 - a. Under **Virtual Disks**, click **Tasks**, then **New Virtual Disk**.

- b. On the storage pool page, select the storage pool you'd like to create the virtual disk from and then click Next.
- c. Name the virtual disk.
- d. Select your desired layout and then click Next.
- e. If **Mirror** is selected as the desired storage layout, the **Configure resiliency settings page** will appear and will ask for you to choose between:

-Two-way mirror

-Three-way mirror

*For more information on this, use the following guideline:

<https://dataon.freshdesk.com/support/solutions/articles/6000014952-what-types-of-storage-spaces-can-i-use-with-a-failover-cluster->

- f. Specify the provisioning type. The two options are: **Thin** and **Fixed**. The **Fixed** provisioning type is needed in order to use clustering.

*For more information on provisioning types, refer to the following guideline:

<https://dataon.freshdesk.com/support/solutions/articles/6000015373-what-properties-can-i-change-after-creating-a-storage-space-thin-or-fixed->

- g. Specify the size of the virtual disk
 - h. Confirm the settings of the virtual disk are correct, then click Create.
 - i. After the creation of the virtual disk is completed, closing the wizard will open the wizard to create a volume.
4. Create the Volume
 - a. Select the server and virtual disk in which you want to create the volume.
 - b. Specify the size of the volume and then click Next.
 - c. On the **Assign to a drive letter or folder** page, select your option and click Next.
 - d. Select your desired file system settings and click Next.
 - e. Confirm that the volume settings are correct, then click Create.
 - f. In Server Manager, click the **Volumes** page to verify the volume was created.

*Repeat steps 2 and 3 for however many virtual disks you decide to create.

Creating the Failover Cluster

1. On one of the available nodes, open **Failover Cluster Manager** in the **Tools** drop-down in Server Manager.
2. Under Management, select **Validate Configuration** to validate the cluster. If the validation tests are successful, you may proceed to create the cluster
3. Select Create cluster
 - a. Select the servers you wish to be clustered.
 - b. Name the cluster.
 - c. Verify that the **Add all eligible storage** to the cluster box is checked.
 - d. Confirm the cluster settings, then click Create.
3. After the cluster is created, expand **Storage**, click Disks. All of the virtual disks that were created should be shown. Select all of the disks and click the **Add to clustered shared volume option**.
4. All of the volumes are now shared between the clustered servers. If failure with one server would occur, the workload will be distributed to another server in the cluster.

We recommend that users regularly manage their storage spaces making sure the status is always Healthy. To do this, Microsoft provides a script that automatically generates a report indicating the operational status of your storage spaces. The link to download the script is as follows:

After running the script, the report will be generated.

[illegible]