LAB 3
CONFIGURING LOCAL STORAGE

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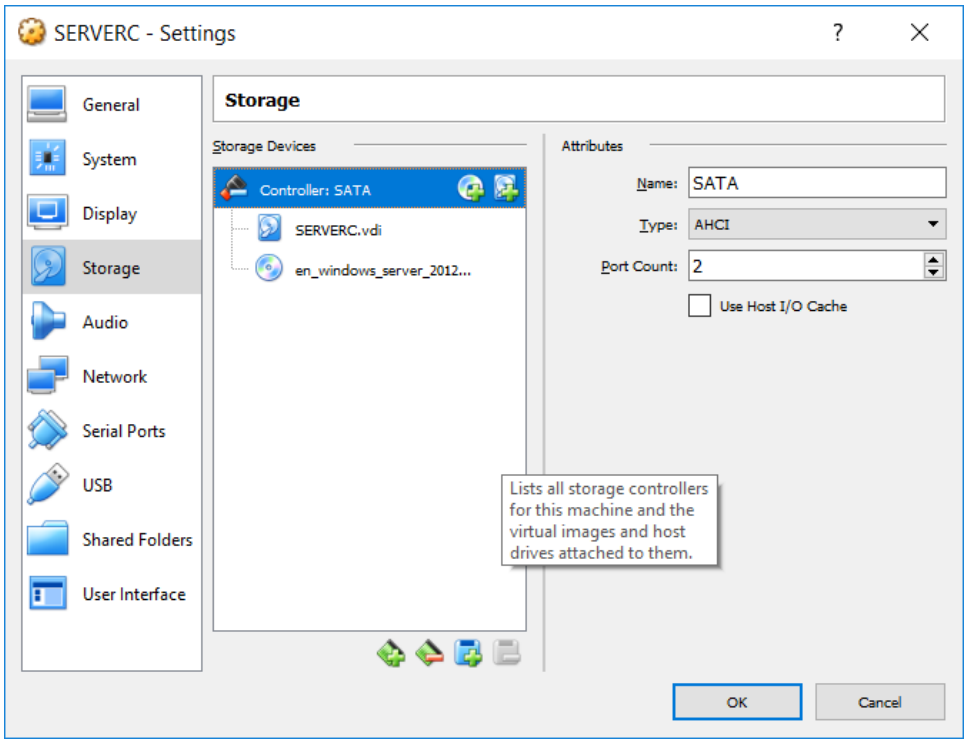
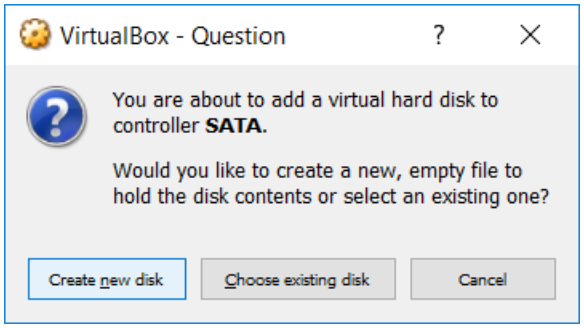
Preparing Three "Hard Disks" for SERVERC

In VirtualBox Manager, SERVERC -> Settings -> Storage -> "Adds hard disk"  icon.

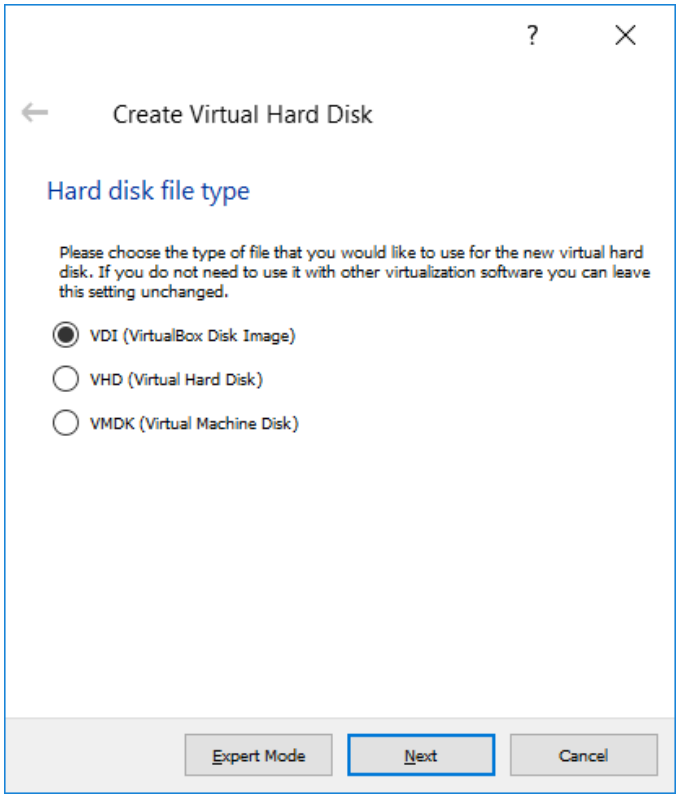
Note that "Controller: SATA" needs to be selected to see the "Adds hard disk" icon.



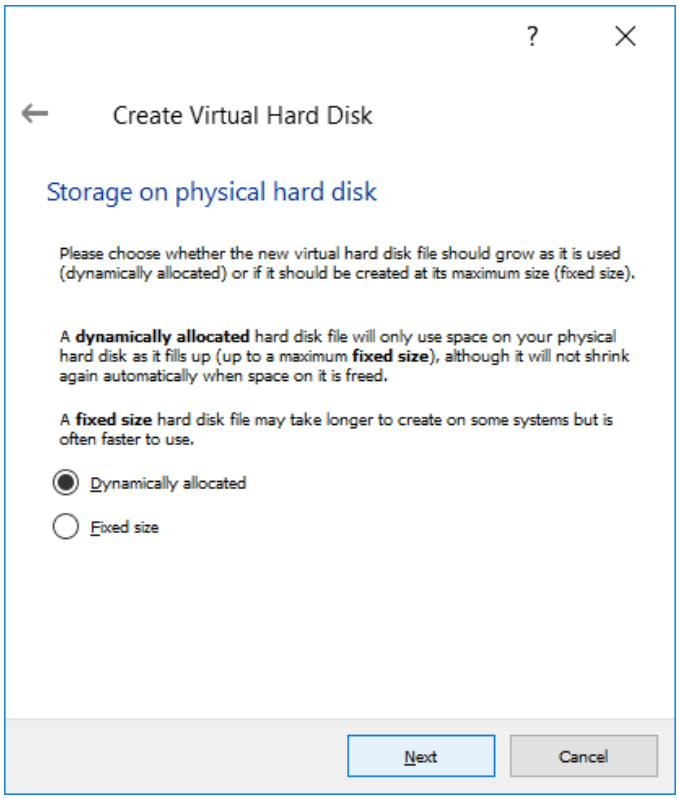
Create new disk



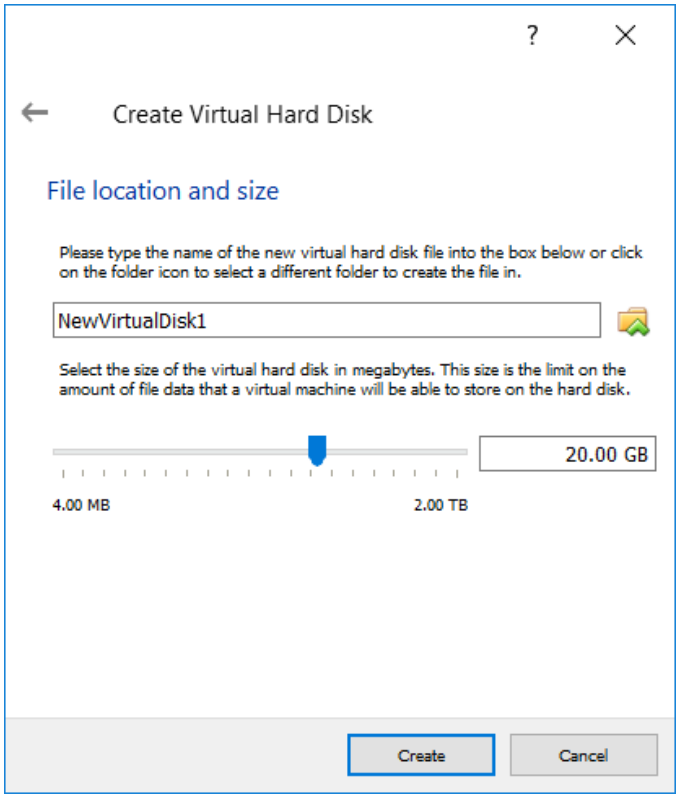
Hard disk file type (keep default)



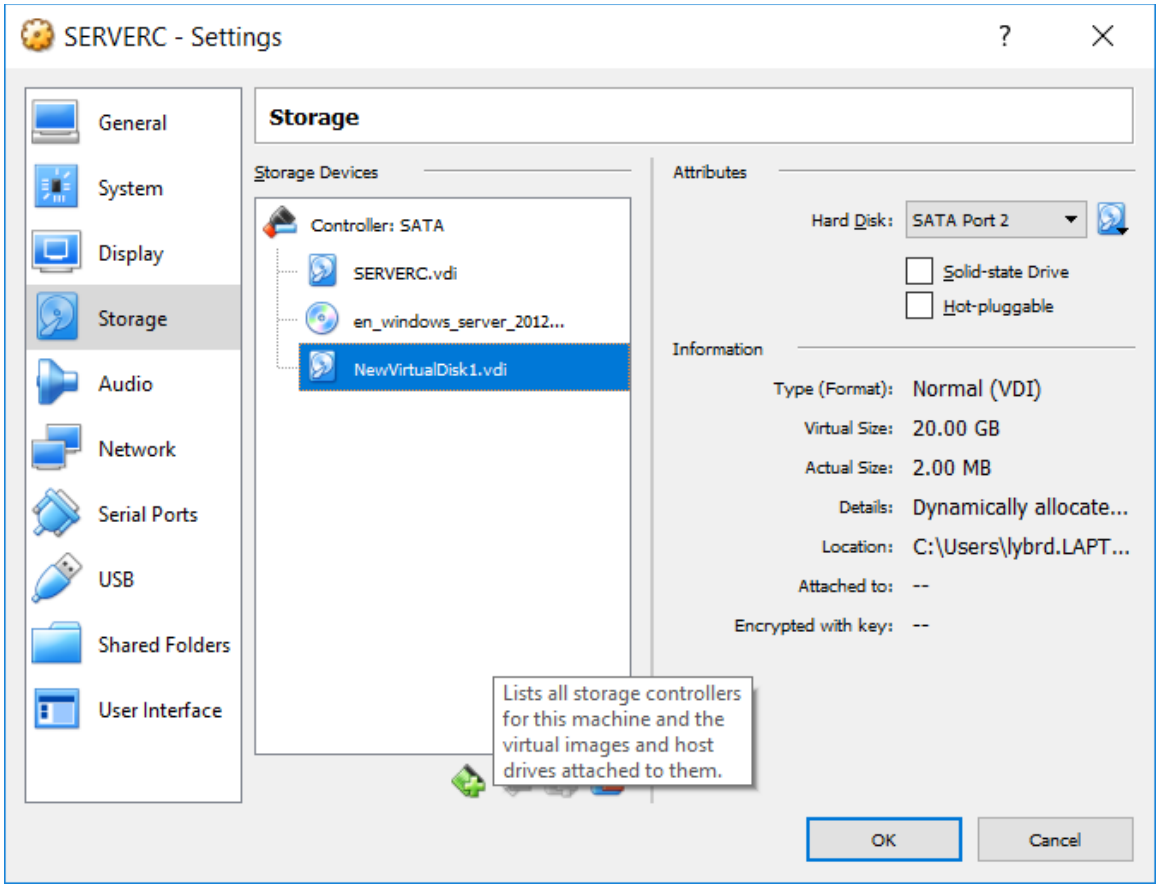
Storage on physical hard disk (keep default)



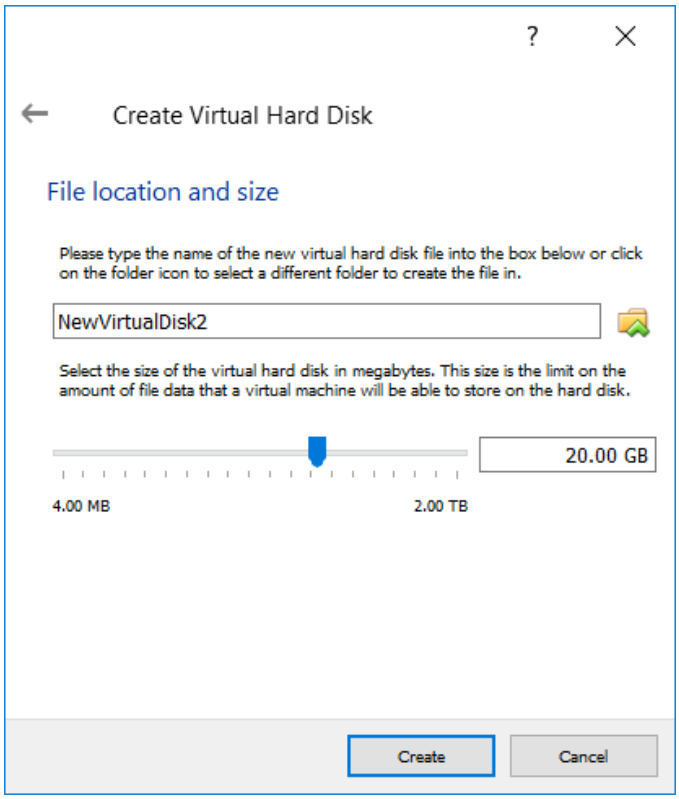
File location and size (change size to 20 GB)



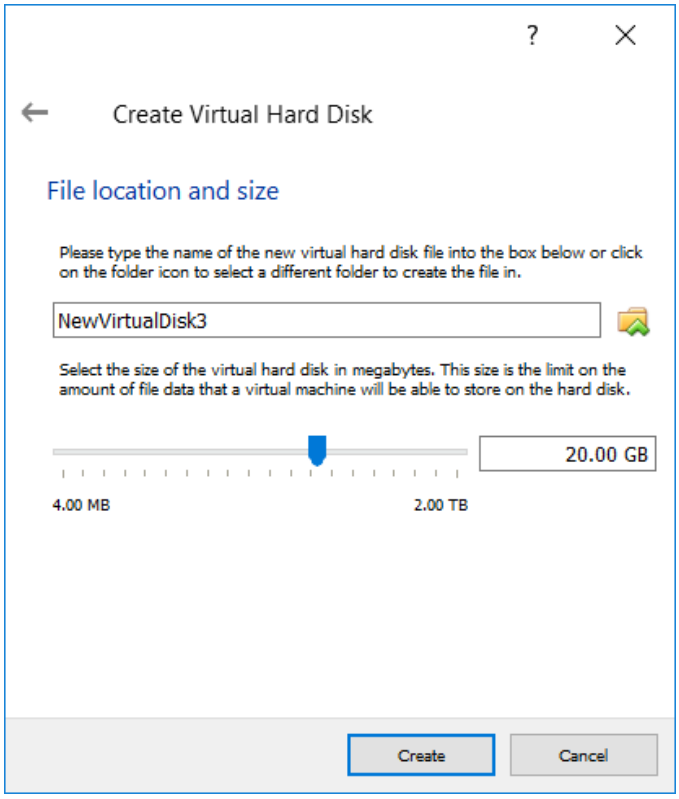
New hard disk created



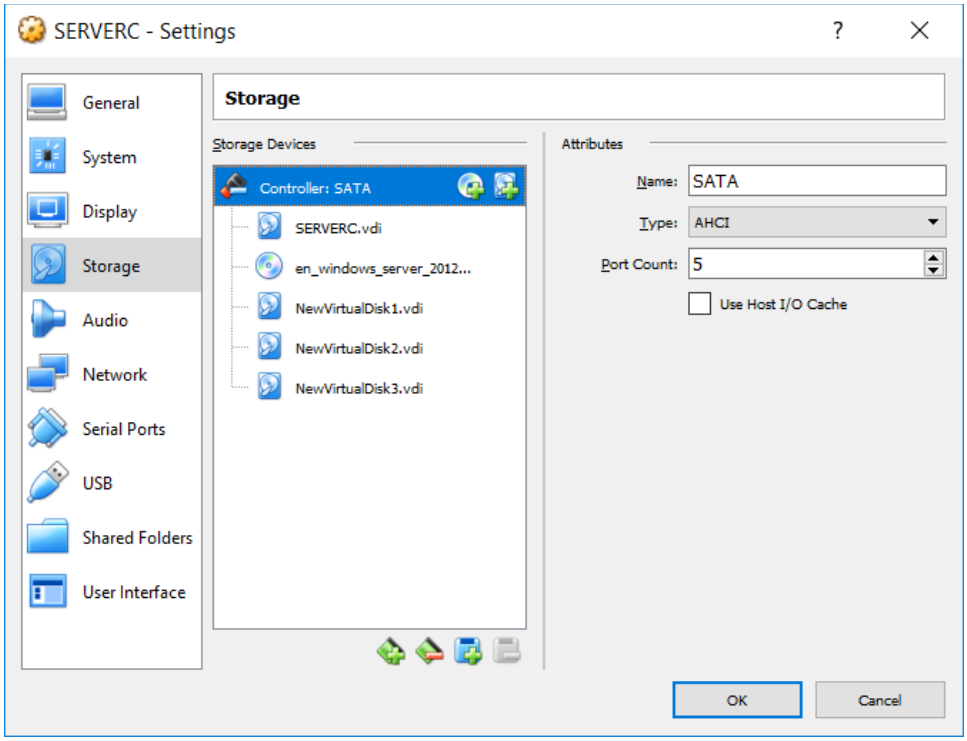
Similarly, create hard disk 2



Similarly, create hard disk 3



All three hard disks have been created



This lab contains the following exercises and activities:

Exercise 3.1 Initializing Disks

Exercise 3.2 Creating Simple Volumes

Exercise 3.3 Creating a Storage Pool

Lab Challenge Removing Storage Components

BEFORE YOU BEGIN

The lab environment consists of computers connected to a local area network, along with a server that functions as the domain controller for a domain called *adatum.com*. The computers required for this lab are listed in Table 3-1.

Table 3-1
Computers Required for Lab 3

Computer	*Operating System*	*Computer Name*

Domain controller	Windows Server 2016	SERVERA
Member server	Windows Server 2016	SERVERB
Member server with three additional SCSI hard drives	Windows Server 2016	SERVERC

In addition to the computers, you also require the software listed in Table 3-2 to complete Lab 3.

Table 3-2
Software Required for Lab 3

Software	***Location***
Lab 3 student worksheet	Lab03_worksheet.docx (provided by instructor)

Working with Lab Worksheets

Each lab in this manual requires that you answer questions, create screen shots, and perform other activities that you will document in a worksheet named for the lab, such as Lab03_worksheet.docx. It is recommended that you use a USB flash drive to store your worksheets, so you can submit them to your instructor for review. As you perform the exercises in each lab, open the appropriate worksheet file, fill in the required information, and save the file to your flash drive.

After completing this lab, you will be able to:

- Initialize new disks
- Create storage spaces, disks, and volumes with Server Manager
- Create volumes with the Disk Management snap-in

Estimated lab time: 60 minutes

Exercise 3.1	**Initializing Disks**
Overview	In this exercise, you use two different tools to bring three new disks online and initialize them in preparation for creating storage volumes.
Mindset	Adding disk drives is a common server hardware upgrade, requiring an administrator to prepare them for use.
Completion time	15 minutes

1. Log on to the **SERVERC** computer, then, in **Server Manager**, click **File and Storage Services**. A File and Storage Services submenu appears (see Figure 3-1).

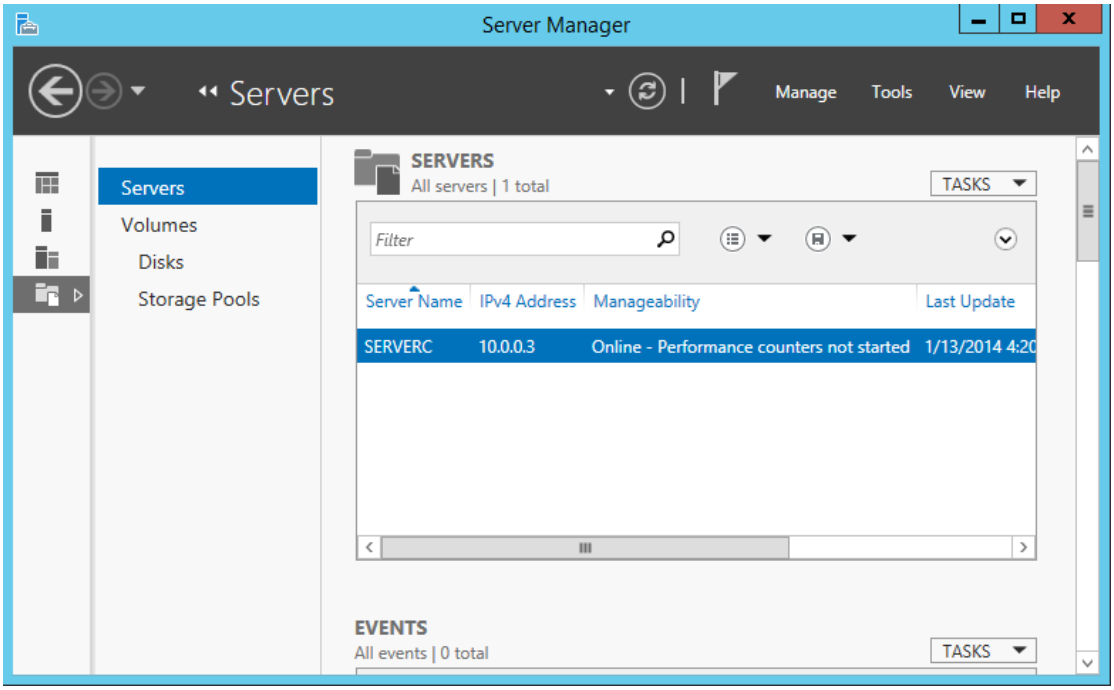


Figure 3-1
The File and Storage Services submenu in Server Manager

2. Click **Disks**. The Disks page appears, showing one online disk and three offline disks.

When using Windows Server 2016, the three disks have been brought to online. Then you don't need steps 3 and 4.

Question 1	*The three offline disks all use the SCSI bus type, whereas the online disk uses the ATA bus. Why can't the three offline disks use the ATA bus as well?*

3. Right-click the offline disk number 1 and, from the context menu, select Bring Online. A message box appears, warning you not to bring the disk online if it is already online and connected to another server.

4. Click Yes. The disk's status changes to Online.

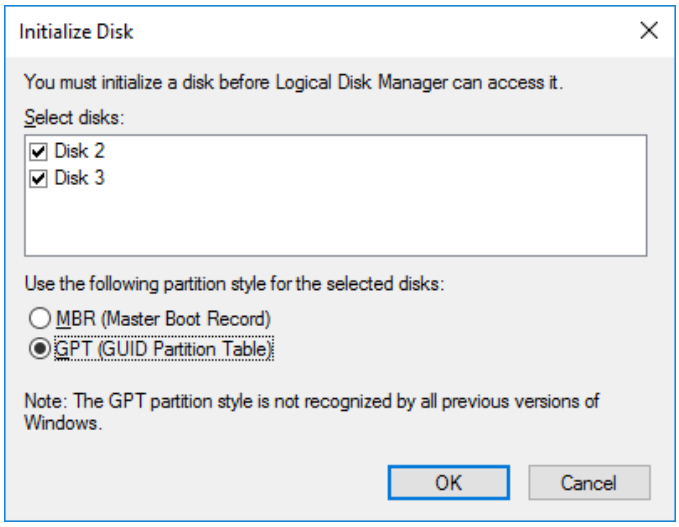
5. Right-click the same disk number 1 and, from the context menu, select **Initialize**. A message box appears, warning you that any data on the disk will be erased.

6. Click Yes. The disk is partitioned and ready to create volumes.

7. In Server Manager, click **Tools** > **Computer Management**. The Computer Management console appears.

8. In the left pane, click **Disk Management**. The Disk Management snap-in appears (see Figure 3-2).

In Windows Server 2016, it asks to initialize disk, select **GPT** type and click OK.



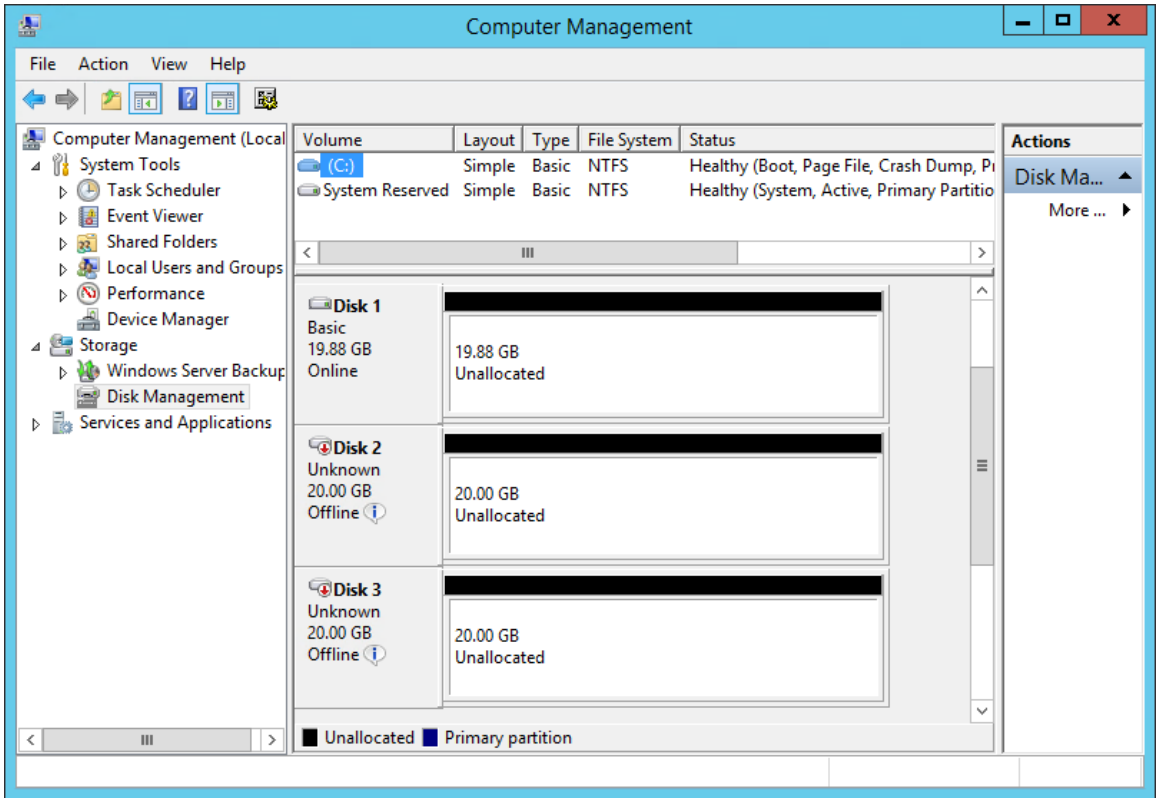


Figure 3-2
The Disk Management snap-in

9 – 12 not needed in Server 2016.

9. Right-click the Disk 2 tile and, from the context menu, select Online.

10. Right-click the Disk 2 tile a second time and, from the context menu, select Initialize Disk. The Initialize Disk dialog box appears.

11. Select the GPT (GUID Partition Table) option and click OK. The Disk 2 status changes to Online.

12. Repeat steps 9 to 11 to initialize Disk 3.

End of exercise. You can leave the windows open for the next exercise.

Question 2	*What advantage is there to using the Disk Management snap-in to initialize new disks, rather than Server Manager?*

Exercise 3.2	**Creating Simple Volumes**
Overview	In this exercise, you use two methods to create simple volumes, using Server Manager and the Disk Management snap-in.
Mindset	Server Manager and Disk Management both provide wizards for creating simple volumes, with similar capabilities.
Completion time	15 minutes

1. On SERVERC, in Server Manager, in the File and Storage Services submenu, click **Volumes**. The Volumes home page appears.
2. Click Tasks > New Volume. The New Volume Wizard appears, displaying the *Before you begin* page.
3. Click Next. The *Select the server and disk* page appears.
4. Select **Disk 1** and click **Next**. The *Specify the size of the volume* page appears.
5. In the *Volume size* text box, type **10** and click Next. The *Assign to a drive letter or folder* page appears.
6. Click Next. The *Select file system settings* page appears.
7. Click Next. The *Confirm selections* page appears.
8. Click Create. The *Completion* page appears.
9. Click Close. The new volume appears in the Volumes pane.
10. Switch to the Computer Management console. The new volume you just created appears in the Disk 1 pane of the Disk Management snap-in.
11. Right-click the unallocated space on **Disk 2** and, from the context menu, select **New Simple Volume**. The New Simple Volume Wizard appears, displaying the *Welcome* page.
12. Click Next. The *Specify Volume Size* page appears.
13. In the *Simple volume size in MB* spin box, type **10000** and click Next. The *Assign Drive Letter or Path* page appears.

14. Click Next. The *Format Partition* page appears.

15. Click Next. The *Completing the New Simple Volume Wizard* page appears.

16. Click Finish. The wizard creates the volume, and it appears in the Disk 2 pane.

Question 3	*What Windows PowerShell commands should you use to create a simple volume of the same size on disk 3 using the drive letter G:?*

17. Create a 10 GB simple volume on disk 3 with the drive letter G: using Windows PowerShell.

In PowerShell

List all disks

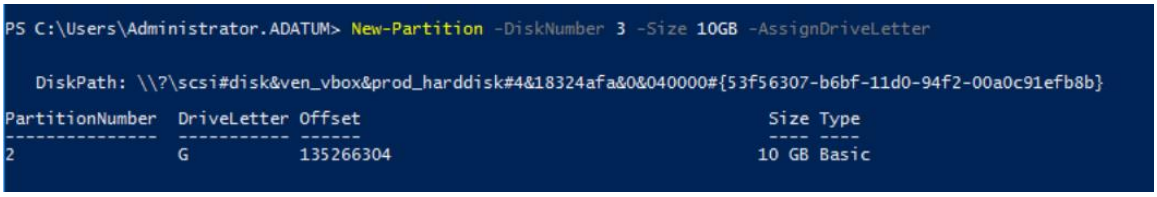
Get-Disk

Create simple volume

New-Partition –DiskNumber 3 -Size 10GB -AssignDriveLetter

Windows Server asks you to format the new volume. Go ahead and format to NTFS type.

18. **[SCREEN SHOT 1]** Press Alt+Prt Scr to take a screen shot of your PowerShell window that shows New-Partition command has successfully created a simple volume, similar to the following picture. Press Ctrl+V to paste the resulting image into the Lab 3 worksheet file in the page provided.



19. **[SCREEN SHOT 2]** Press Alt+Prt Scr to take a screen shot of the Disk Management snap-in, showing the three volumes you created, and then press Ctrl+V to paste the resulting image into the Lab 3 worksheet file in the page provided.

End of exercise. Close Computer Management and any formatting prompt windows, if needed, before you begin the next exercise.

Exercise 3.3	Creating a Storage Pool
Overview	In this exercise, you use the Server Manager console to create a storage pool, which consists of space from multiple physical disks.
Mindset	Storage pools are a new feature in Windows Server 2016, which enable you to create a flexible storage subsystem with various types of fault tolerance.
Completion time	15 minutes

1. On SERVERC, in Server Manager, on the File and Storage Services submenu, click Storage Pools. The Storage Pools home page appears (see Figure 3-3).

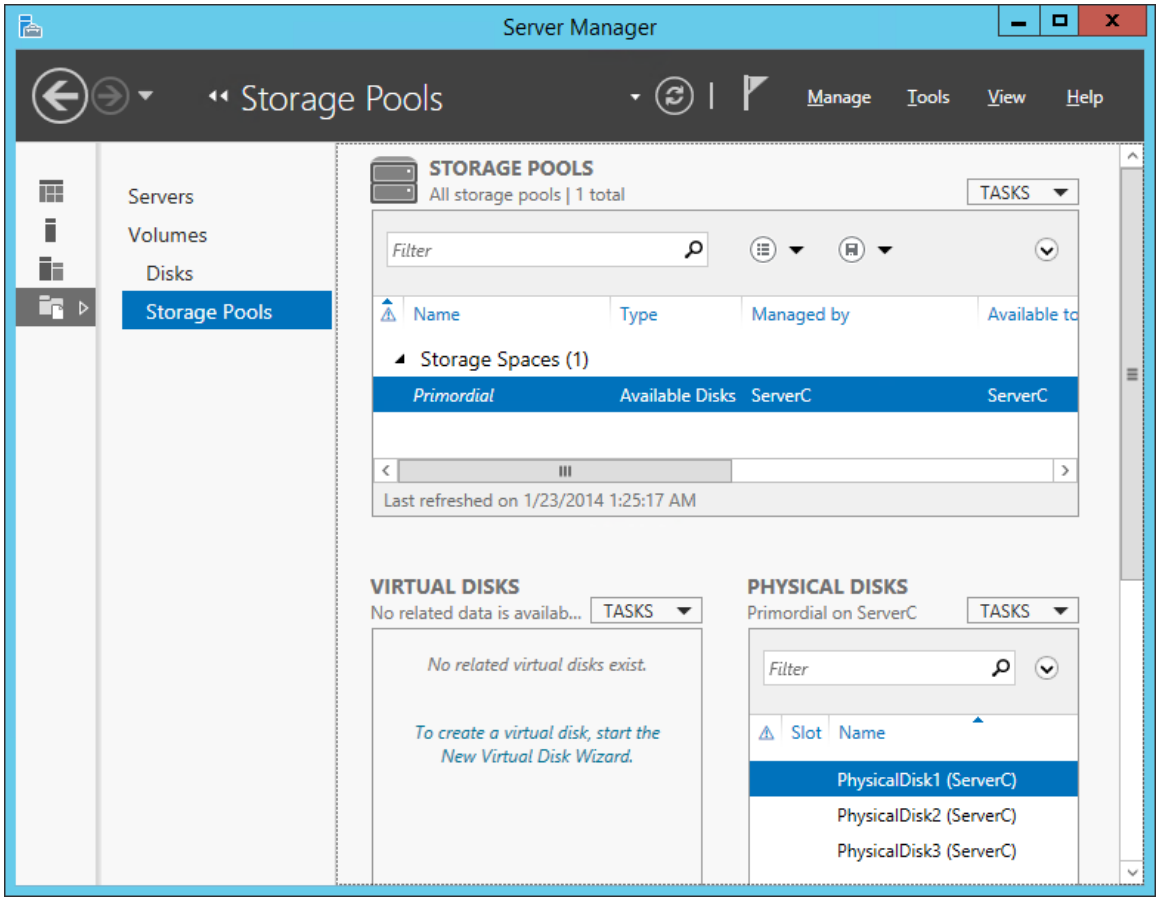


Figure 3-3
The Storage Pools home page

2. In the Storage Pools tile, click Tasks > **New Storage Pool**. The New Storage Pool Wizard appears, displaying the *Before you begin* page.

3. Click Next. The *Specify a storage pool name and subsystem* page appears.

4. In the Name text box, type **Pool1** and click Next. The *Select physical disks for the storage pool* page appears.

5. Select the check boxes for PhysicalDisk1 and PhysicalDisk2 in the list and click Next. The *Confirm selections* page appears.

   Server 2016: Select Chassis Port 2 and Port 3

6. Click Create. The wizard creates the storage pool.

7. Click Close. The new pool appears in the Storage Pools tile.

8. Select **Pool1**.

9. In the Virtual Disks tile, click Tasks > **New Virtual Disk**. The New Virtual Disk Wizard appears, displaying the *Before you begin* page.

10. Click Next. The *Select the storage pool* page appears. Pool1 is selected by default.

Click OK. New Virtual Disk Wizard appears.

11. Click Next. The *Specify the virtual disk name* page appears.

12. In the name text box, type **Data1** and click **Next**. Specify enclosure resiliency appears. Click Next. The *Select the storage layout* page appears.

13. In the layout list, select **Parity** and click Next. A warning appears, stating that the storage pool does not contain a sufficient number of physical disks to support the Parity layout.

Question 4	*Why can't the wizard create a virtual disk using the Parity layout when there are only two physical disks in the storage pool?*

14. In the layout list, select **Mirror** and click **Next**. The *Specify the provisioning type* page appears.

15. Leave the default **Fixed** option selected and click Next. The *Specify the size of the virtual disk* page appears.

16. Select the **Maximum size** option and click Next. The *Confirm selections* page appears.

17. Click **Create**. The wizard creates the virtual disk and the *View results* page appears. Clear the *Create a volume when this wizard closes* checkbox.

18. Click Close. The virtual disk appears on the Storage Pools page.

19. **[SCREEN SHOT 3]** Press Alt+Prt Scr to take a screen shot of the Storage Pools page, showing the storage pool and the virtual disk you created, and then press Ctrl+V to paste the resulting image into the Lab 3 worksheet file in the page provided.

20. In the Virtual Disks tile, right-click the **Data1** disk you just created and, from the context menu, select **New Volume**. The New Volume Wizard appears.

21. Using the wizard, create a volume on **Disk 4** (Data1) using all of the available space, the NTFS file system, and the drive letter J:.

End of exercise. Close any open windows before you begin the next exercise.

Question 5	*At this point in the lab, what would happen to any data stored on the E:, F:, G:, and J: drives if Disk 2 on the server was to fail?*

End of lab. You can log off or start a different lab. If you want to restart this lab, you'll need to click the End Lab button in order for the lab to be reset.