



**Passerelles
numériques**
A Gateway for Life

OS & Maintenance

Chapter 3 – Partitioning



Objective

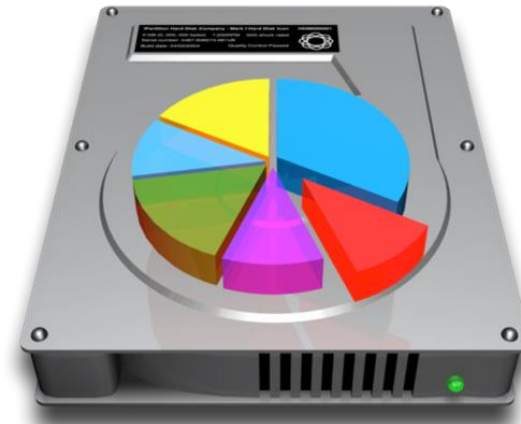
After finished this lesson students will be able to know:

- Overview of partition
- Purpose of partition
- Types of partitioning
- Tools for partitioning
- Practice partitioning



Overview of Partition

- When a hard disk is installed in a computer, it must be partitioned before being formatted and then used. You cannot use it immediately when you buy it and install it in a computer.
- Once a partition is created, it can be formatted so it can be used.

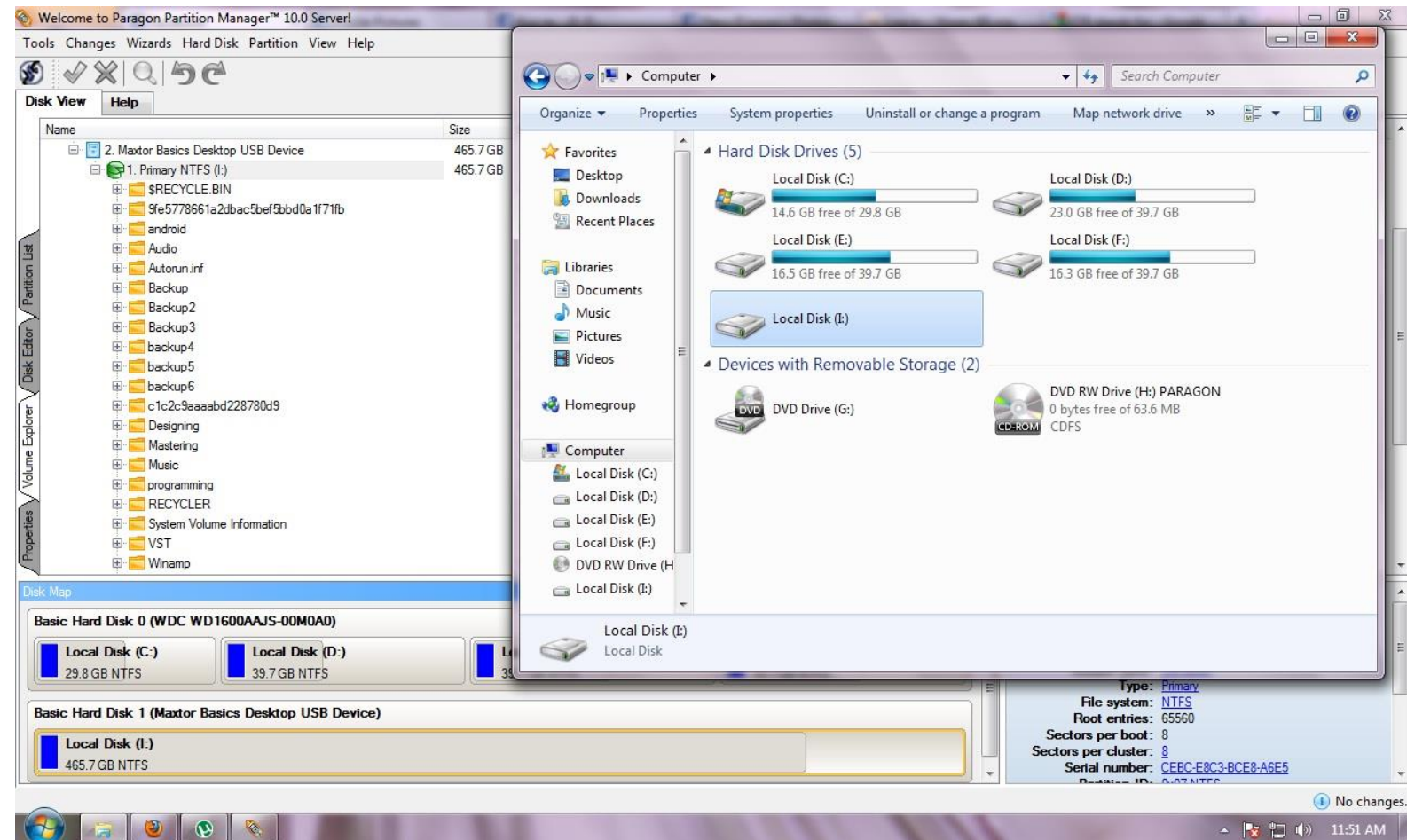


What is Partition?



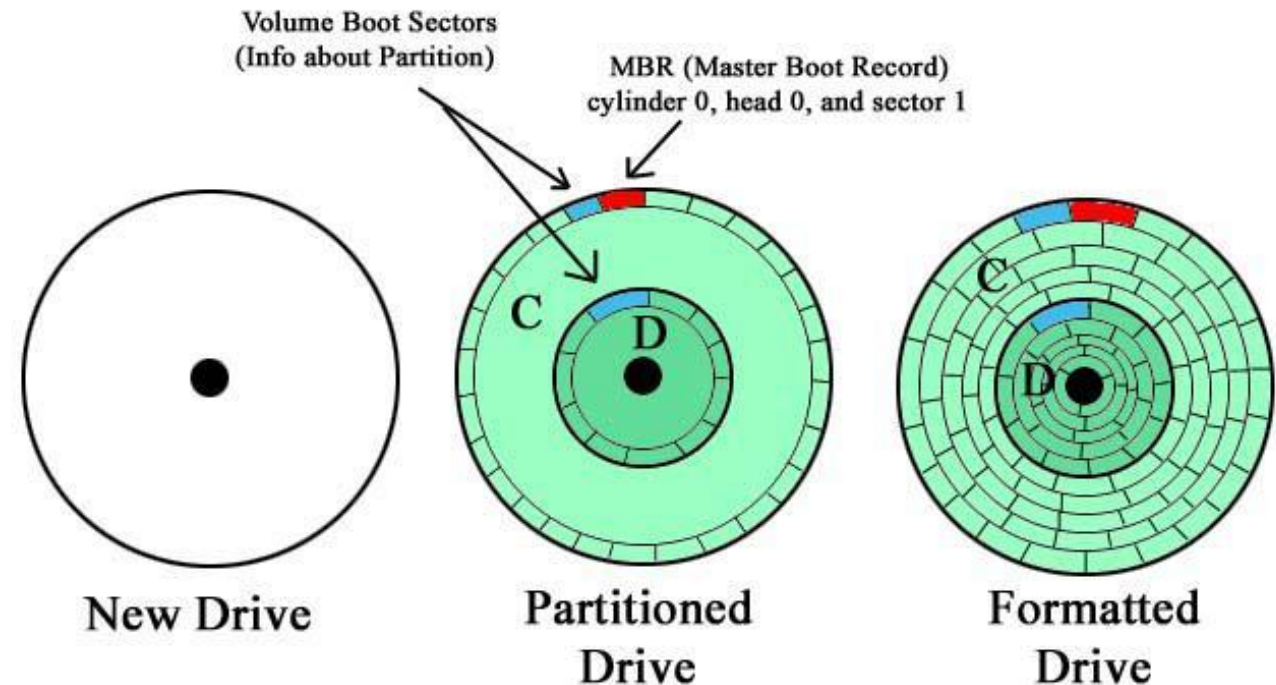
Overview of Partition

- **Disk partitioning** is the act of dividing a physical hard disk drive into multiple logical storage units.



Purpose of Partition

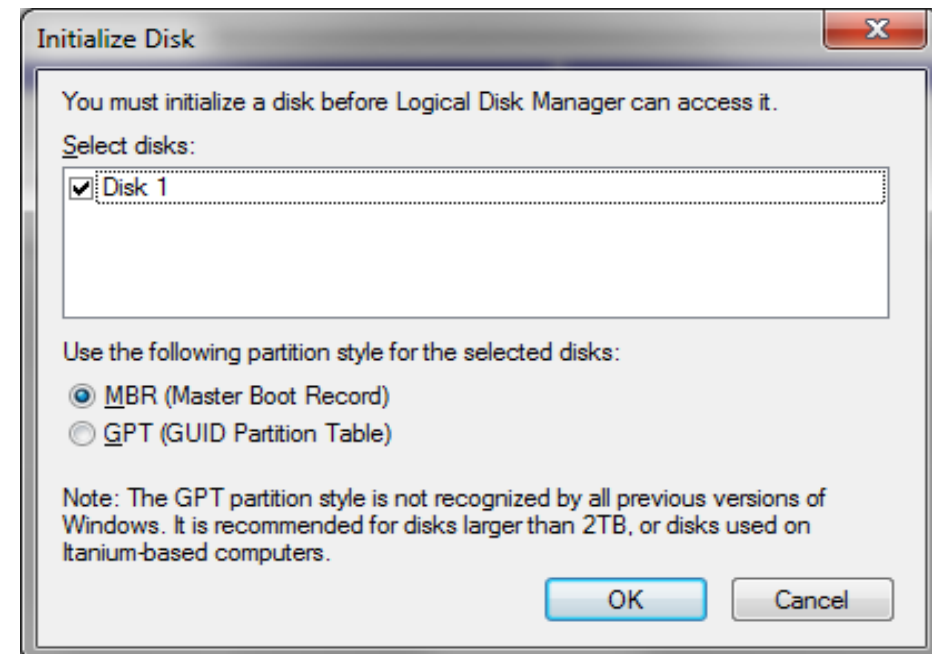
- A partition is simply a way to tell your computer that you want to **split** your hard disk into a number of **logical disks**. When you partition a hard disk, you tell the computer to treat each partition as a separate drive.



Types of partition structure

There are two types of partition structure (**Partition Style**):

- **MBR(Master Boot Record):** is a special boot sector located at the beginning of a drive, and it is the default partition table format.
 - ✓ Hard disk size maximum 2TB
 - ✓ Support 4 partitions primary or three partitions Primary and one Extended
 - ✓ Intergrade with BIOS



Types of partition structure



- **GPT (Guid Partition Table):** is a newer standard that's gradually replacing MBR.
 - ✓ The maximum size GPT support's 94000000000 TB
 - ✓ On windows allow up to 128 partitions
 - ✓ Doesn't support with extended partition
 - ✓ Intergrade with UEFI(Unified Extensible Firmware Interface)

```
Administrator: C:\Windows\system32\cmd.exe - diskpart
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows\system32>diskpart

Microsoft DiskPart version 6.1.7601
Copyright (C) 1999-2008 Microsoft Corporation.
On computer: W7U32

DISKPART> list disk

Disk ###  Status             Size             Free             Dyn  Gpt
-----  -
Disk 0    Online             8 GB             1024 KB
Disk 1    Online             8 GB             1024 KB
Disk 2    Online            24 GB             1024 KB
Disk 3    Online            16 GB             1024 KB
Disk 4    Online            55 GB              0 B              *

DISKPART> _
```

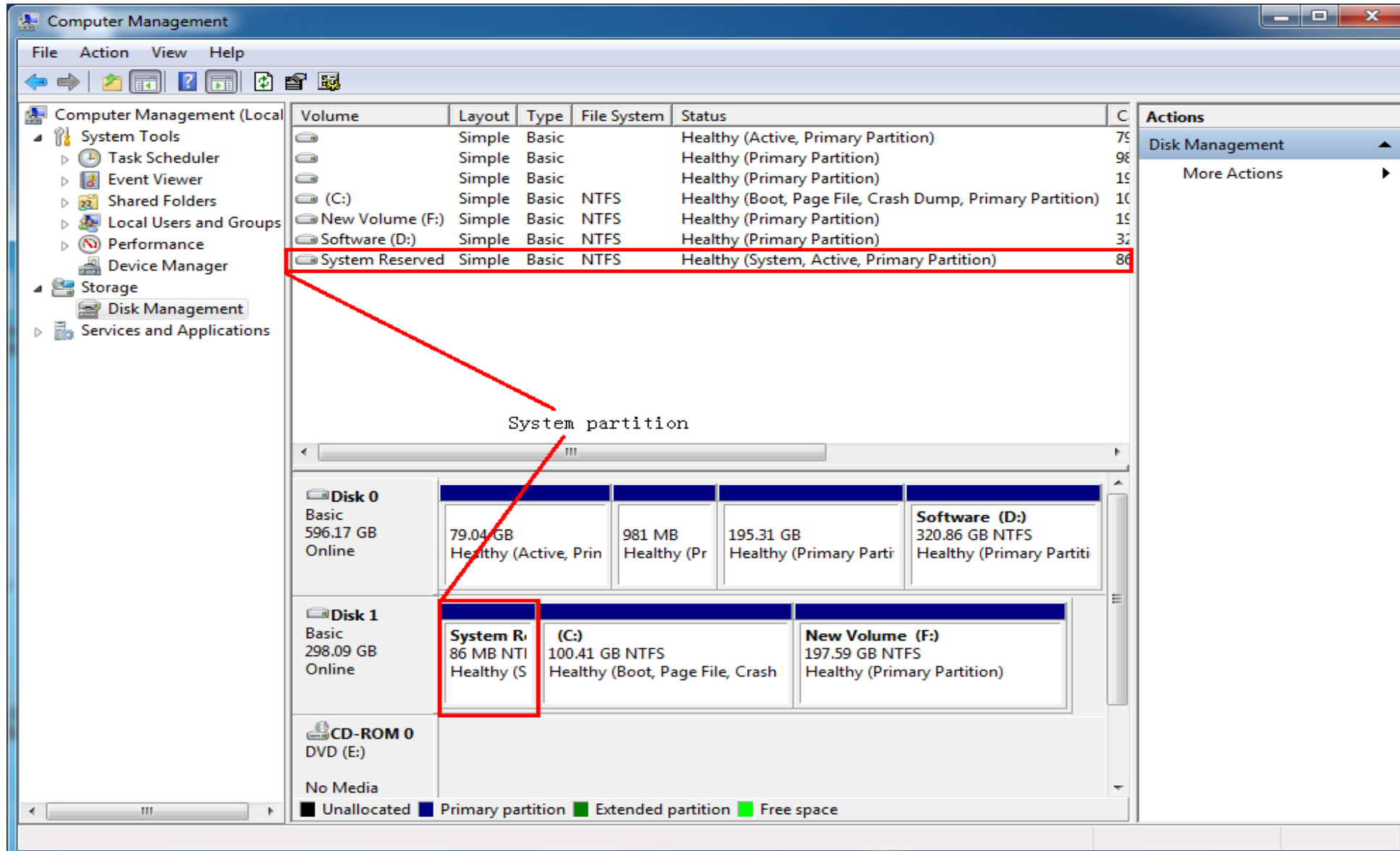

Types of partitioning



Understanding type of partition on windows:

- ✓ **Primary partition** : it's a partition type exists in MBR disk which can supports up to 4 primary partitions or 3 primary partitions plus 1 extended partition.
- ✓ **Boot partition**: it is also a primary partition which contains the operating system folder.
- ✓ **System partition**: it is a primary partition that contains the boot loader, a piece of procedure responsible for booting the OS.

Types of partitioning



The screenshot displays the Windows Computer Management console, specifically the Disk Management section. The main pane shows a table of volumes with the following data:

Volume	Layout	Type	File System	Status	C
	Simple	Basic		Healthy (Active, Primary Partition)	79
	Simple	Basic		Healthy (Primary Partition)	98
	Simple	Basic		Healthy (Primary Partition)	15
(C:)	Simple	Basic	NTFS	Healthy (Boot, Page File, Crash Dump, Primary Partition)	100
New Volume (F:)	Simple	Basic	NTFS	Healthy (Primary Partition)	15
Software (D:)	Simple	Basic	NTFS	Healthy (Primary Partition)	32
System Reserved	Simple	Basic	NTFS	Healthy (System, Active, Primary Partition)	86

A red box highlights the 'System Reserved' row. A red arrow points from this row to the graphical disk layout below. The graphical layout shows three disks: Disk 0, Disk 1, and CD-ROM 0. Disk 1 is divided into three partitions: 'System Reserved' (86 MB NTFS, Healthy), '(C:)' (100.41 GB NTFS, Healthy), and 'New Volume (F:)' (197.59 GB NTFS, Healthy). The 'System Reserved' partition on Disk 1 is also highlighted with a red box, corresponding to the highlighted row in the table above.

Legend: ■ Unallocated ■ Primary partition ■ Extended partition ■ Free space

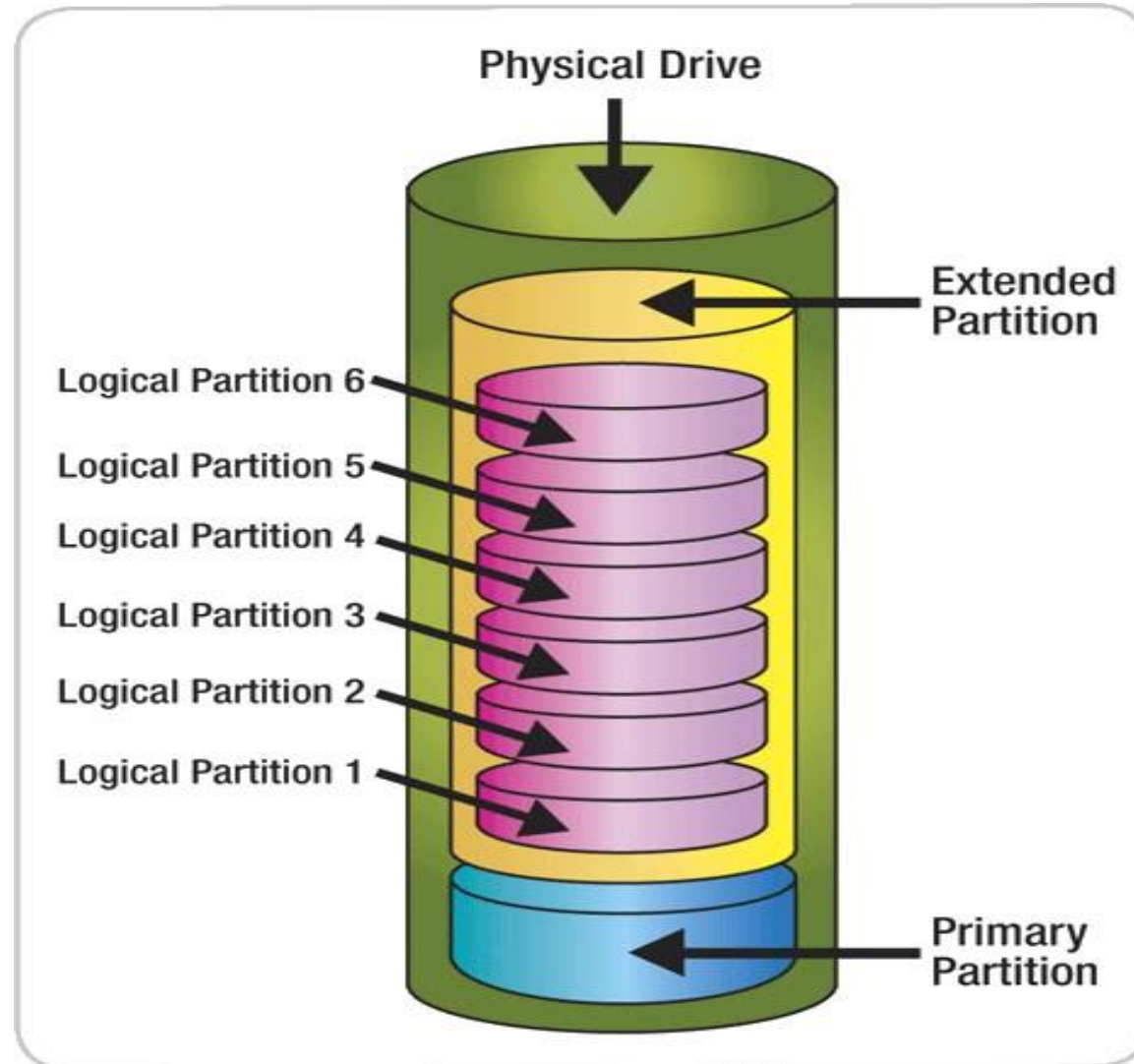
Types of partitioning



- ✓ **Extended partition:** is used to hold logical drives, and it can't be used directly unless we partition it to multiple logical partitions which can't be set as active.
- ✓ **Logical partition:** is hold files unrelated to the Operating System. Used to store data, audio, video, etc.

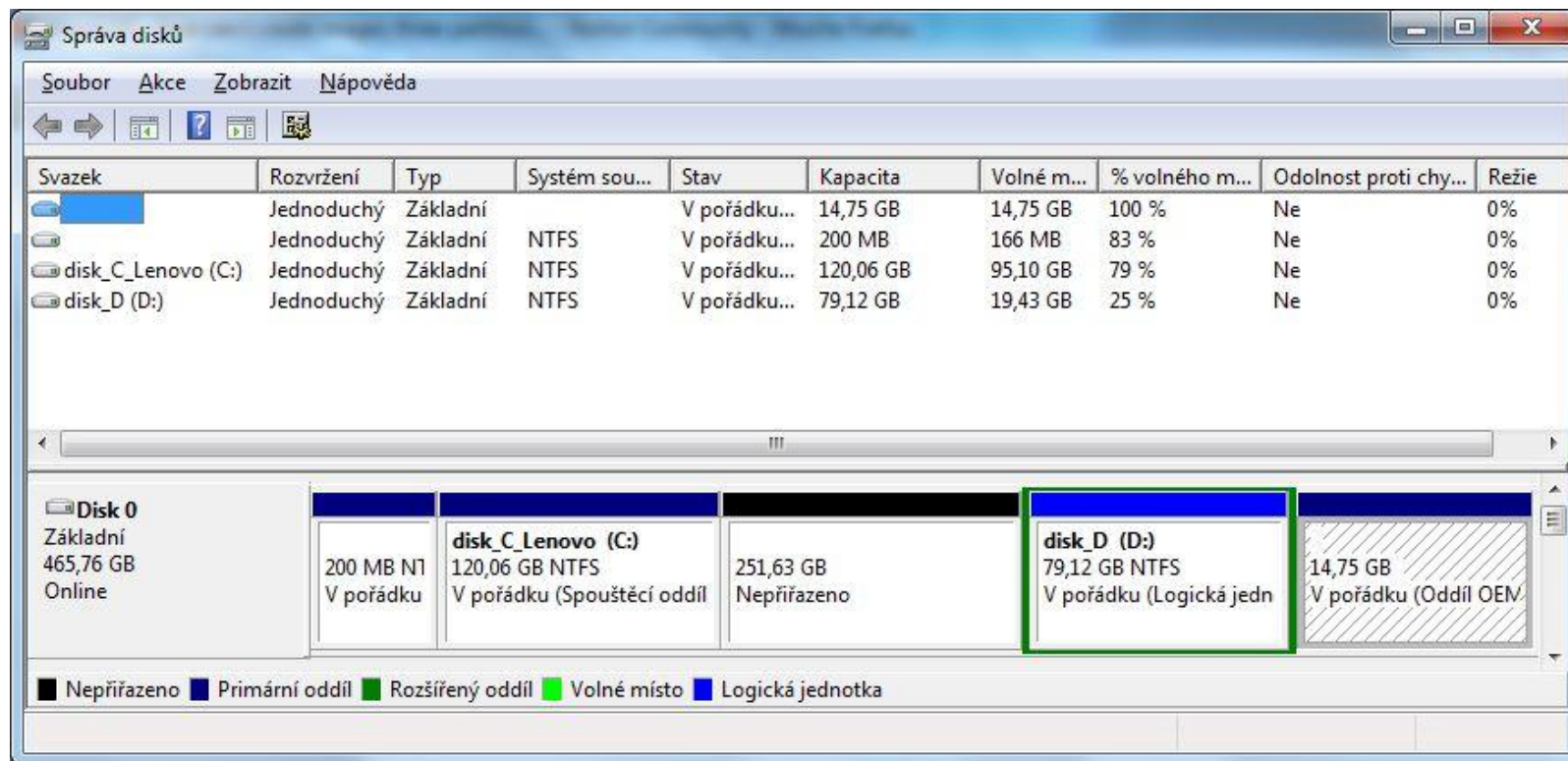
Disk 0 Basic 931.51 GB Online	System		(E:)	(F:)	(N:)	
	100 MB	292.87 GB NTFS	341.80 GB NTFS	9.77 GB RAW	286.98 GB	
	Healthy	Healthy (Primary Partitio	Healthy (Primary Partitio	Healthy (Logical	Free space	
Disk 1 Basic 931.51 GB Online	(C:)		Windows8 (G:)	(H:)	(D:)	
	244.14 GB NTFS	244.14 GB NTFS	244.14 GB NTFS	199.09 GB NTFS		
	Healthy (Boot, Page File,	Healthy (Primary Partitior	Healthy (Primary Partitior	Healthy (Logical Dr		
■ Unallocated ■ Primary partition ■ Extended partition ■ Free space ■ Logical drive						

Types of partitioning



Tools for partitioning

- **Diskmgmt.msc:** is an extension of the Microsoft Management Console that allows full management of the disk-based hardware recognized by Windows.



Instructor



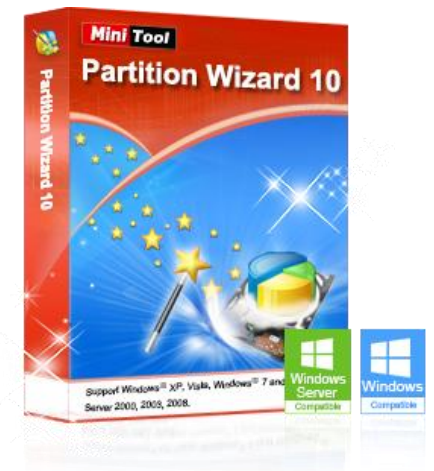
- Students will must to listen becarefully
- Instructor demo to students by using interface diskmgmt.msc:
 - Create primary partition
 - Create extended partition
 - Create logical partition
 - Format partition
 - Shrink partition, assign letter to partition
 - Extend partition



Software of Partitioning

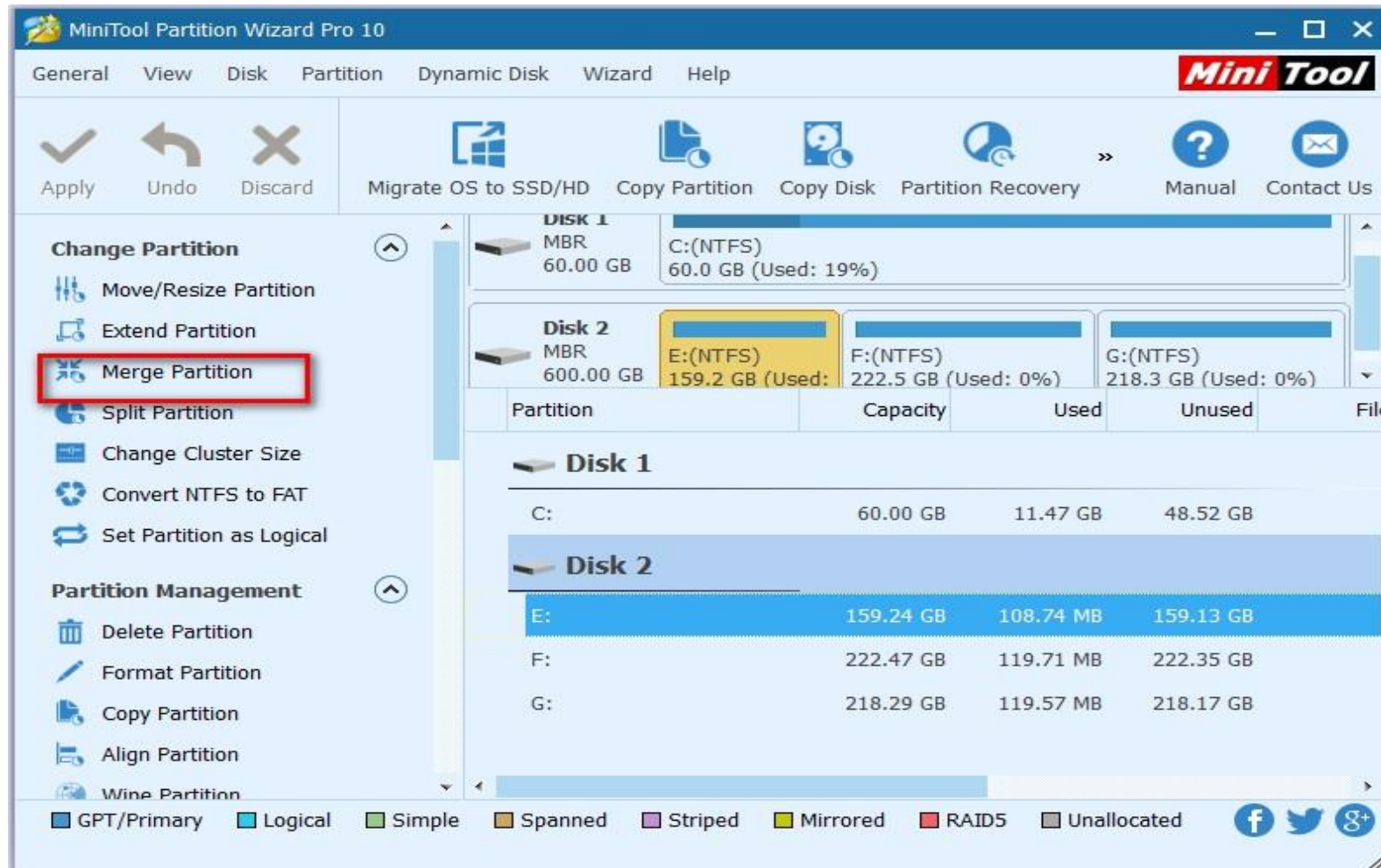
There are many software's or third-party that used to partitioning hard disk drive:

- ✓ MiniTool partition Wizard Free
- ✓ Active@partition manager
- ✓ Gparted



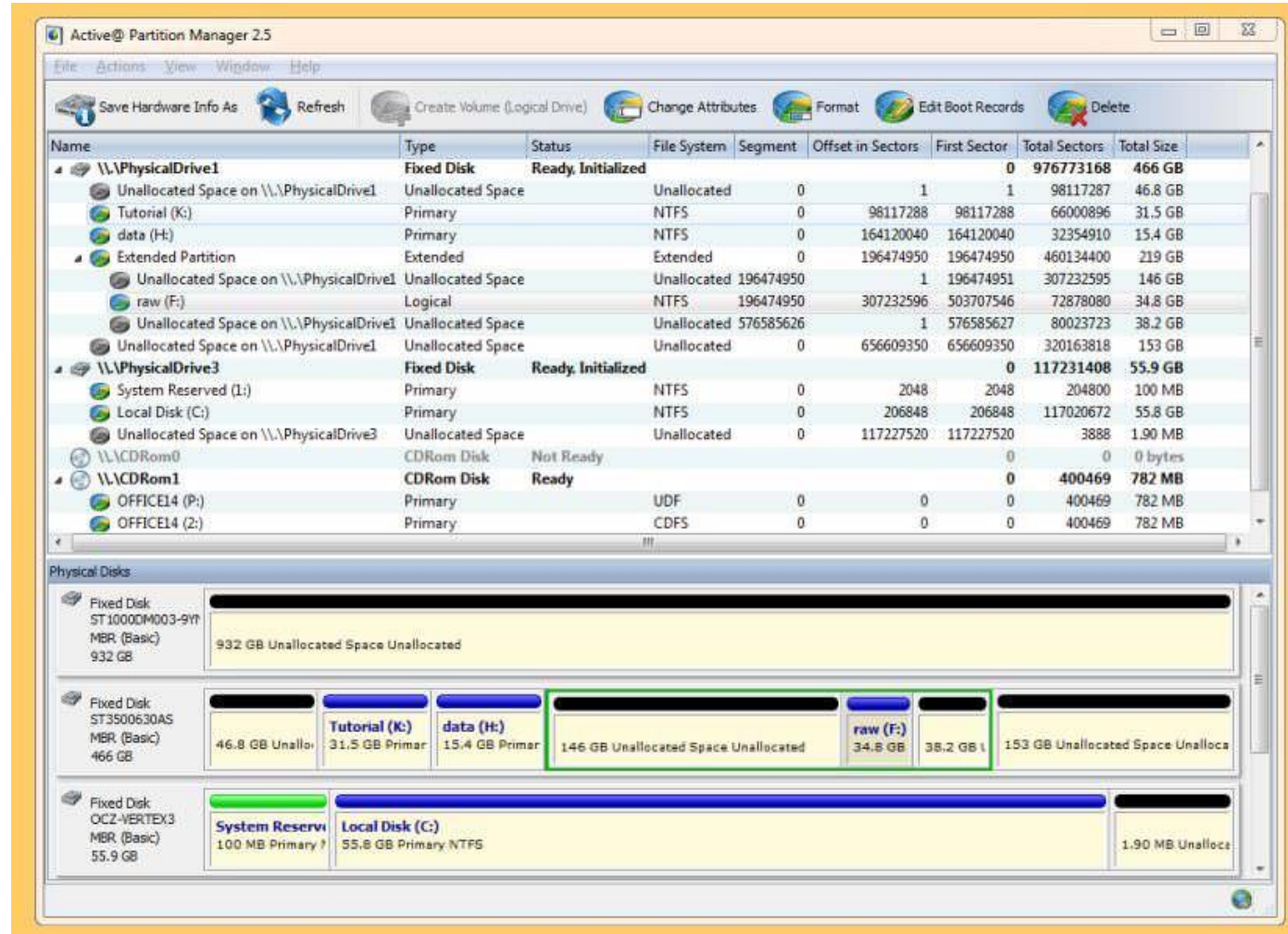
Software of Partitioning

- MiniTool partition Wizard Free



Software of Partitioning

- Active@partition manager



The screenshot displays the Active@ Partition Manager 2.5 software interface. The main window shows a list of partitions for three physical drives. The first drive, \\PhysicalDrive1, is a 466 GB Fixed Disk with a status of 'Ready, Initialized'. It contains several partitions, including unallocated space, a 31.5 GB NTFS partition (Tutorial (K:)), a 15.4 GB NTFS partition (data (H:)), an extended partition, and a 34.8 GB NTFS partition (raw (F:)). The second drive, \\PhysicalDrive3, is a 55.9 GB Fixed Disk with a status of 'Ready, Initialized'. It contains a 100 MB System Reserved (I:) partition, a 55.8 GB NTFS partition (Local Disk (C:)), and 1.90 MB of unallocated space. The third drive, \\CDRom1, is a 782 MB CDROM Disk with a status of 'Ready'. It contains two UDF partitions (OFFICE14 (P:) and OFFICE14 (Z:)).

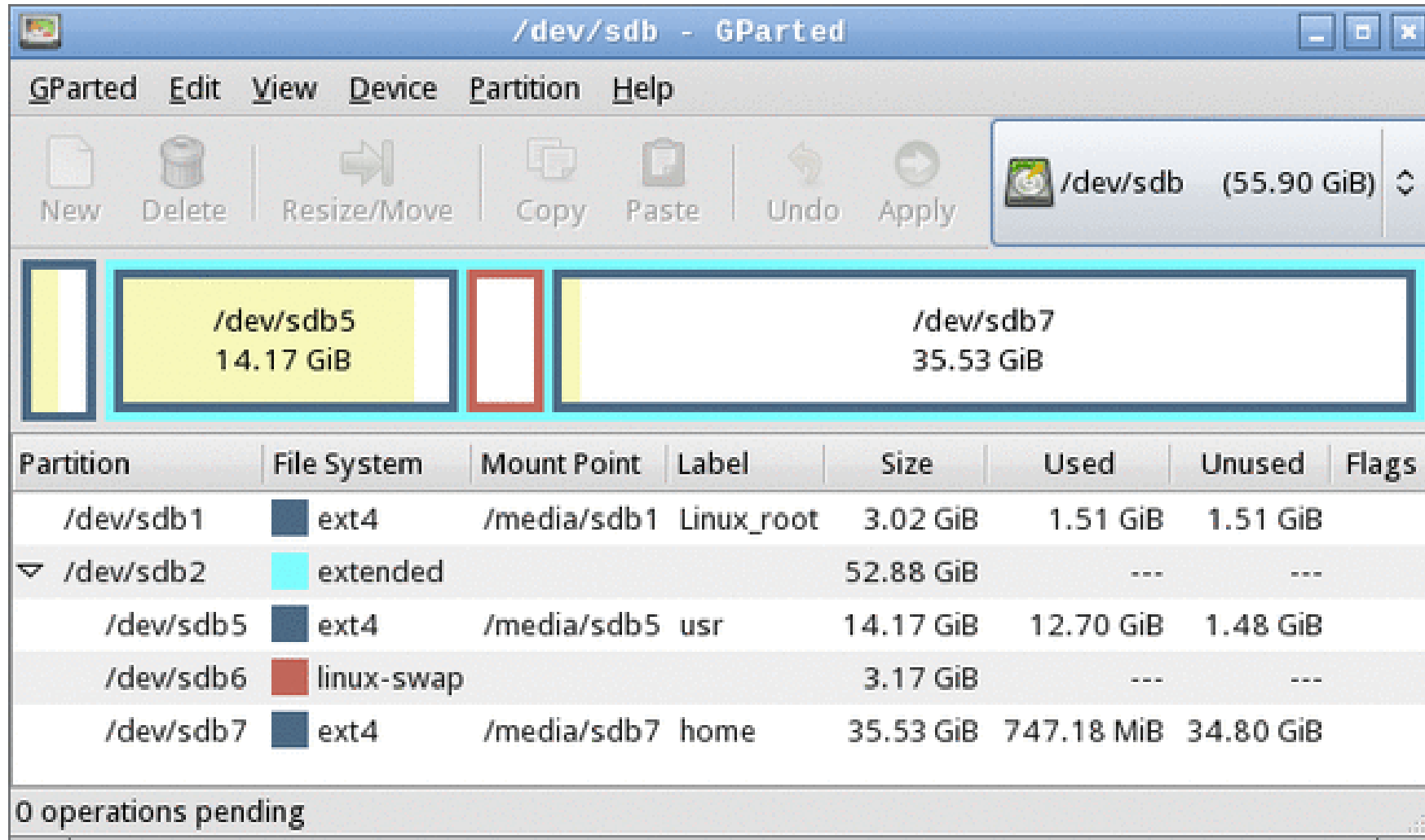
Name	Type	Status	File System	Segment	Offset in Sectors	First Sector	Total Sectors	Total Size
\\PhysicalDrive1	Fixed Disk	Ready, Initialized					976773168	466 GB
Unallocated Space on \\PhysicalDrive1	Unallocated Space		Unallocated	0	1	1	98117287	46.8 GB
Tutorial (K:)	Primary		NTFS	0	98117288	98117288	66000896	31.5 GB
data (H:)	Primary		NTFS	0	164120040	164120040	32354910	15.4 GB
Extended Partition	Extended		Extended	0	196474950	196474950	460134400	219 GB
Unallocated Space on \\PhysicalDrive1	Unallocated Space		Unallocated	196474950	1	196474951	307232595	146 GB
raw (F:)	Logical		NTFS	196474950	307232596	503707546	72878080	34.8 GB
Unallocated Space on \\PhysicalDrive1	Unallocated Space		Unallocated	576585626	1	576585627	80023723	38.2 GB
Unallocated Space on \\PhysicalDrive1	Unallocated Space		Unallocated	0	656609350	656609350	320163818	153 GB
\\PhysicalDrive3	Fixed Disk	Ready, Initialized					117231408	55.9 GB
System Reserved (I:)	Primary		NTFS	0	2048	2048	204800	100 MB
Local Disk (C:)	Primary		NTFS	0	206848	206848	117020672	55.8 GB
Unallocated Space on \\PhysicalDrive3	Unallocated Space		Unallocated	0	117227520	117227520	3888	1.90 MB
\\CDRom0	CDRom Disk	Not Ready					0	0 bytes
\\CDRom1	CDRom Disk	Ready					0	400469 782 MB
OFFICE14 (P:)	Primary		UDF	0	0	0	400469	782 MB
OFFICE14 (Z:)	Primary		CDFS	0	0	0	400469	782 MB

The Physical Disks section at the bottom shows three disks:

- Fixed Disk ST1000DM003-9Y1 (MBR, Basic) 932 GB: 932 GB Unallocated Space Unallocated.
- Fixed Disk ST3500630AS (MBR, Basic) 466 GB: 46.8 GB Unallo, 31.5 GB Primar, 15.4 GB Primar, 146 GB Unallocated Space Unallocated, 34.8 GB, 38.2 GB, 153 GB Unallocated Space Unalloca.
- Fixed Disk OCZ-VERTEX3 (MBR, Basic) 55.9 GB: System Reserv 100 MB Primary, Local Disk (C:) 55.8 GB Primary NTFS, 1.90 MB Unalloca.

Software of Partitioning

- Gparted software



The screenshot shows the GParted application window titled "/dev/sdb - GParted". The menu bar includes GParted, Edit, View, Device, Partition, and Help. The toolbar contains icons for New, Delete, Resize/Move, Copy, Paste, Undo, and Apply. A dropdown menu on the right shows the selected device as /dev/sdb (55.90 GiB). The main display area shows a visual representation of the disk layout with several partitions. A table below the visual area provides detailed information about each partition.

Partition	File System	Mount Point	Label	Size	Used	Unused	Flags
/dev/sdb1	ext4	/media/sdb1	Linux_root	3.02 GiB	1.51 GiB	1.51 GiB	
▼ /dev/sdb2	extended			52.88 GiB	---	---	
/dev/sdb5	ext4	/media/sdb5	usr	14.17 GiB	12.70 GiB	1.48 GiB	
/dev/sdb6	linux-swap			3.17 GiB	---	---	
/dev/sdb7	ext4	/media/sdb7	home	35.53 GiB	747.18 MiB	34.80 GiB	

0 operations pending

Instructor Demo



- Instructor demo to students how to used software for partitioning hard disk
- Create partition primary, extended partition, logical partition
- Delete partition and shrink partition, extend partition



- Practice using software for partitioning hard disk
- Create partition primary, extended partition, logical partition
- Delete partition, shrink partition, extend partition
- Change structure hard disk to GPT and testing practice

ANY QUESTION

