

## Disk Analysis

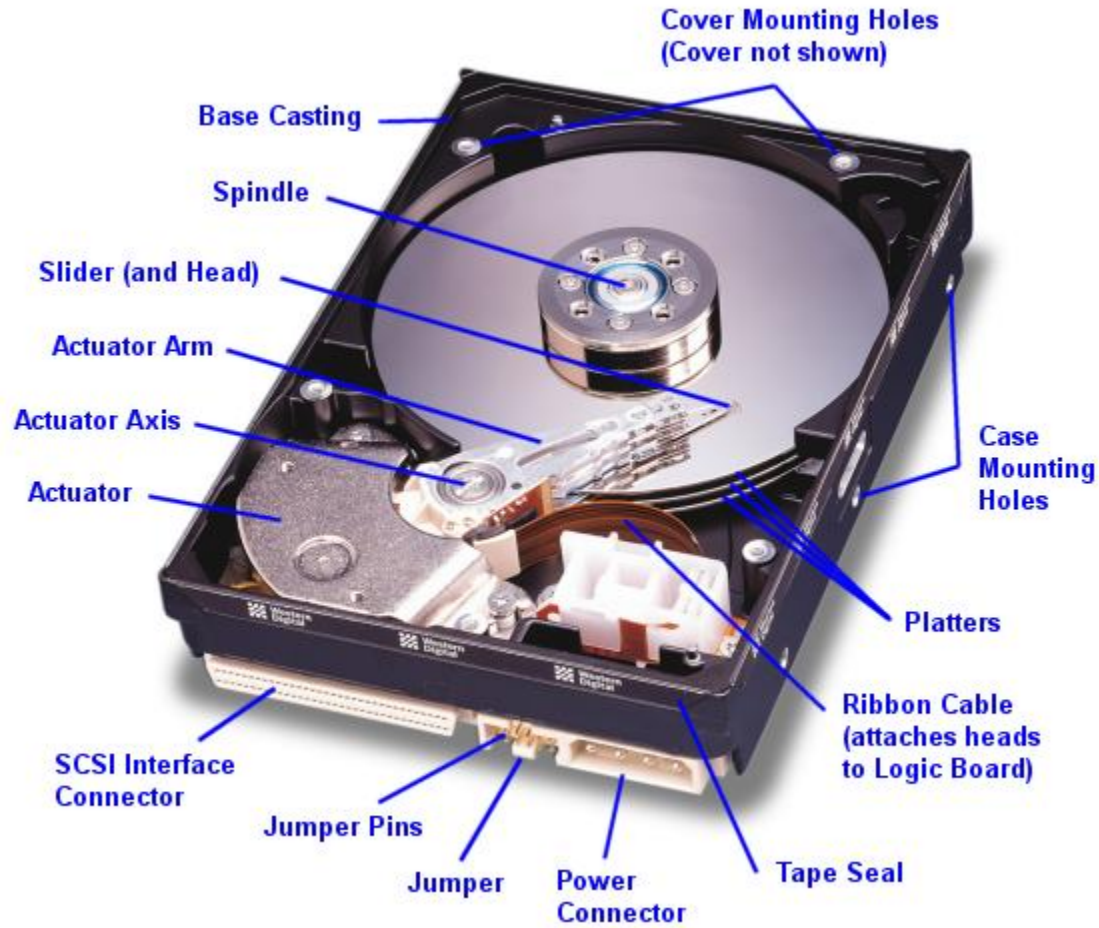
There was a time when the performance of disk drives was one of the most underrated aspects of overall system performance. Disk was considered only "a place to keep stuff" and little heed given to how they affected the operation of the server as a whole. Over the last few years this has changed dramatically, and disk drive performance issues are now getting the attention they deserve. There are many different issues in how performance is assessed and measured. There are interactions between components with which anyone seeking to really grasp hard disk performance must contend. And the technology changes so rapidly that what is the "fastest" today will probably be "second best" within a few months--or even weeks in many cases!

This StorFacts™ Report analyzes various System p, p5, OpenPower, pSeries and IntelliStation disk drives. Specifications discussed include the following:

1. MTBF reliability ratings
2. SCSI protocol and interface
3. Rotational Speed
4. Average Seek times
5. Data Buffers
6. Media transfer rates
7. Sustained data rates
8. Burst data rates
9. Connectivity and Replacement Drives (FRU).



For more information - <http://www.gstinc.com/store/DAS-C2473.aspx>





## Key Performance Factors & Definitions

### Performance

Disk drive speed can significantly impact the performance of your IBM server. Listed below, GST has listed critical factors that influence overall disk drive performance.

#### RPM

Short for Revolutions per Minute, RPM is used to help determine the access time on computer hard disk drives. RPM is a measurement of how many complete revolutions a computer's hard disk drive makes in a single minute. The higher the RPM, the faster the data will be accessed. For example, if you were comparing two hard disk drives, one with 10,000 RPM's and another with 15,000 RPM's. The hard disk with a 15,000 RPM will be capable of accessing data much faster than the 10,000 RPM drive.

#### Average Seek Time

The term *average seek time* is commonly used when describing the time required for a disk drive to locate data from the drive platters.

#### Data Buffer

An alternate location to store data while the disk drive is performing other operations.

#### Media Transfer Rate

The *media transfer rate* of a drive refers to the actual speed that the drive can read bits from the surface of the platter, or write bits to the surface of the platter. It is normally quoted in units of megabits per second, abbreviated Mbit/sec or Mb/s.

#### Sustained Data Rate

The *sustained data rate* is based upon the drive's media transfer rate, but includes the overheads required for head switch time and cylinder switch time. Is normally measured in MB/s and includes only data, not the overhead portions of each sector or track.

#### Burst Data Rate

The *burst data rate* of a drive refers to the actual speed that the drive can send and receive data from the host server. The two most common rates are Ultra3 (160MB/s) and Ultra320 (320MB/s).



# StorFacts™ Report

## Disk Connectivity > IBM System p, p5

p5 Servers	Max Disk > Base System		Max Disk > I/O Drawers		Max Disk > Combined	
	Disk Bays	Capacity > TB's	Disk Bays	Capacity > TB's	Disk Bays	Capacity > TB's
7037-A50	3	0.90	-	-	3	0.90
9115-505	2	0.60	-	-	2	0.60
9110-510	4	1.20	-	-	4	1.20
9110-51A	4	1.20	-	-	4	1.20
9111-520	8	2.40	48	14.40	56	16.80
9131-52A	8	2.40	48	14.40	56	16.80
9113-550	8	2.40	96	28.80	104	31.20
9133-55A	8	2.40	96	28.80	104	31.20
9116-561	12	3.60	-	-	12	3.60
9117-570	24	7.20	240	72.00	264	79.20
9118-575	2	0.60	16	4.80	18	5.40
9119-590	-	-	128	38.40	128	38.40
9119-595	-	-	192	57.60	192	57.60



# StorFacts™ Report

## Disk Connectivity > IBM pSeries

pSeries	Max Disk > Base System		Max Disk > I/O Drawers		Max Disk > Combined	
	Disk Bays	Capacity > TB's	Disk Bays	Capacity > TB's	Disk Bays	Capacity > TB's
7026-B80 (640)	5	1.50	-	-	5	1.50
7028-6C1 (610)	6	1.80	-	-	6	1.80
7028-6C4 (630)	4	1.20	24	7.20	28	8.40
7028-6E1 (610)	6	1.80	-	-	6	1.80
7028-6E4 (630)	4	1.20	-	-	4	1.20
7029-6C3 (615)	8	2.40	-	-	8	2.40
7029-6E3 (615)	8	2.40	-	-	8	2.40
7038-6M2 (650)	4	1.20	96	28.80	100	30.00
7039-651 (655)	2	0.60	16	4.80	18	5.40
7040-671 (670)	-	-	48	14.40	48	14.40
7040-681 (690)	-	-	128	38.40	128	38.40



# StorFacts™ Report

## Disk Connectivity > IBM OpenPower, IntelliStation, I/O Drawers

OpenPower	Max Disk > Base System		Max Disk > I/O Drawers		Max Disk > Combined	
	Disk Bays	Capacity > TB's	Disk Bays	Capacity > TB's	Disk Bays	Capacity > TB's
9123-710	4	1.20	-	-	4	1.20
9124-720	8	2.40	96	28.80	104	31.20

IntelliStation	Max Disk > Base System		Max Disk > I/O Drawers		Max Disk > Combined	
	Disk Bays	Capacity > TB's	Disk Bays	Capacity > TB's	Disk Bays	Capacity > TB's
7047-185	3	0.90	-	-	3	0.90
9111-285	4	1.20	-	-	4	1.20
9112-265	10	3.00	-	-	10	3.00
9114-275	4	1.20	-	-	4	1.20

I/O Drawer	Max Disk > I/O Drawers	
	Disk Bays	Capacity > TB's
2104-DS4	14	4.20
7031-D24	24	7.20
7040-61D	16	4.80
7311-D20	12	3.60
9119-5791	16	4.80
9119-5794	8	2.40