

	Cheetah 15K.5	Barracuda
Capacity	300 GB	1 TB
RPM	15,000	7,200
Average Seek	4 ms	9 ms
Max Transfer	125 MB/s	105 MB/s
Platters	4	4
Cache	16 MB	16/32 MB
Connects Via	SCSI	SATA

$\underbrace{\quad}_{s} \quad \underbrace{\quad}_{ms} \quad \underbrace{\quad}_{microsec.} \quad \underbrace{\quad}_{nanosec.}$
 $0,000 \quad 000 \quad 000$

$$T_{seekAverage} = T_{seek} / 3 = 4ms$$

$$T_{rotationAverage} = \frac{1}{RPM/60} / 2 = 0,004s / 2 = 0,002s$$

$$T_{transfer} = \text{size}_{transfer} / \text{maxrate}_{transfer} \quad | \quad \text{size}_{transfer} \text{ ist abhängig vom Workload (random/sequenziel)}$$

$$T_{i/o} = T_{seekAverage} + T_{rotationAverage} + T_{transfer}$$

$$R_{i/o} = \frac{\text{size}_{transfer}}{T_{i/o}}$$

Beispiel:

Random \rightarrow viele 16 KB Schreibvorgänge auf Cheetah

$$T_{seekAverage} = 4ms$$

$$T_{rotation} = \frac{1}{15000/60} / 2 = 2ms$$

$$T_{transfer} = \frac{(16KB/1024)}{125MB/s} = \frac{0,015625MB}{125MB/s} = 0,000125s = 0,125ms$$

$$T_{i/o} = 4ms + 2ms + 0,125ms = 6,125ms = 0,006125s$$

$$R_{i/o} = \frac{(16KB/1024)}{0,006125s} = \frac{0,015625MB}{0,006125s} = 2,5MB/s$$

Sequentiel \rightarrow ein 100 MB Schreibvorgänge auf Cheetah

$$T_{\text{seek Average}} = 4 \text{ ms}$$

$$T_{\text{rotation}} = 2 \text{ ms}$$

$$T_{\text{transfer}} = \frac{100 \text{ MB}}{125 \text{ MB/s}} = 0,8 \text{ s} = 800 \text{ ms}$$

$$T_{10} = 4 \text{ ms} + 2 \text{ ms} + 800 \text{ ms} = 806 \text{ ms}$$

$$R_{10} = \frac{100 \text{ MB}}{0,806 \text{ s}} = 124 \text{ MB/s}$$