Chapter Exam

Chapter 6 – Storage and Other I/O Topics

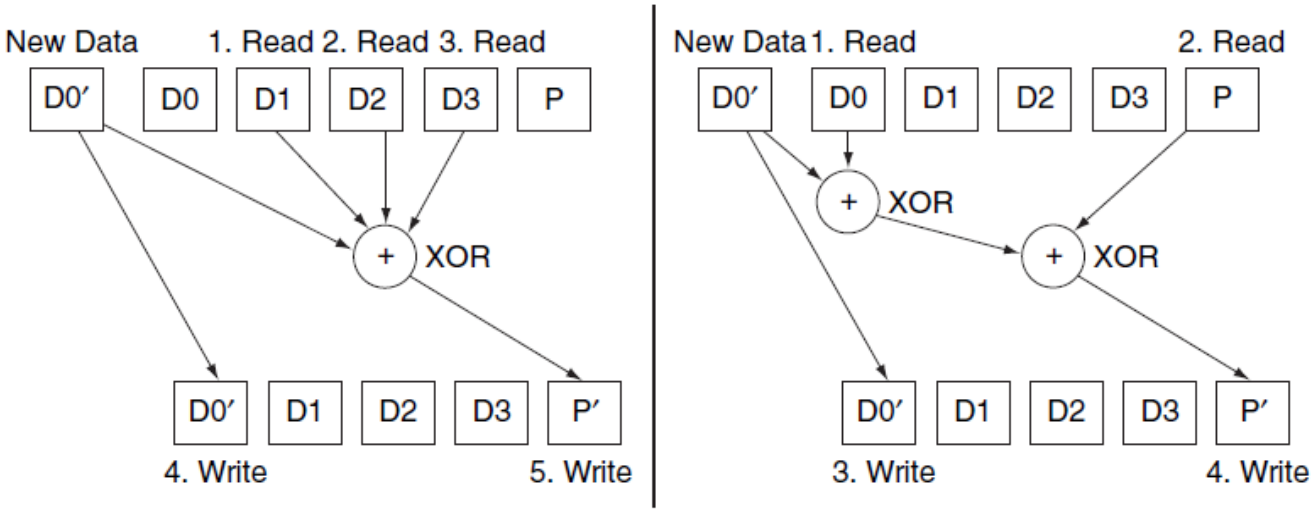
2014/06/17

1. Average and minimum times for reading and writing to storage devices are common measurements used to compare devices.Calculate values related to read and write time for disks with the following characteristics.

	Average Seek Time	RPM	Disk Transfer Rate	Controller Overhead
a	12ms	7500	100 MB/s	0.5ms
b	10ms	15000	200 MB/s	0.5ms

(1) Calculate the average time to read or write a 1024-byte sector for each disk in the table. (20%)
(2) Calculate the average time to read or write a 2048-byte sector for each disk in the table. (20%)

2. RAID 3, RAID 4, and RAID 5 all use parity system to protect blocks of data.Specifically, a parity block is associated with a collection of data blocks. Each row in the following table shows the values of the data and parity blocks, as described in follow(left : RAID3 right : RAID4).



	New D0	**D0**	**D1**	**D2**	**D3**	**P**
a	CEFE	10FE	A386	F745	EF01	8583
b	AC9C	1456	3778	12FE	2EAF	A2D3

(1) Calculate the new RAID 3 parity value P’ for data in lines a and b in the table. (20%)
(2) Calculate the new RAID 4 parity value P’ for data in lines a and b in the table. (20%)

3. Metrics for I/O performance may vary dramatically from application to application.Where the number of transactions processed dominates performance in some situations, data throughput dominates in others. Explore I/O performance evaluation by answering the questions for the following applications.

   a. Web Browsing

   b. Sound Editing

   (1) For each application in the table, does I/O performance dominate system performance? (10%)

   (2) For each application in the table, is I/O performance best measured using raw data throughput? (10%)