

## 4-14

顺序空闲块: 10k, 40k, 20k, 18k, 7k, 9k, 12k, 15k  
请求序列: 12k, 10k, 9k

### (1) 首次适应算法

12k

空闲队列: 10k, 28k, 20k, 18k, 7k, 9k, 12k, 15k

10k

空闲队列: 28k, 20k, 18k, 7k, 9k, 12k, 15k

9k

空闲队列: 19k, 20k, 18k, 7k, 9k, 12k, 15k

### (2) 最佳适应算法

12k

空闲队列: 10k, 40k, 20k, 18k, 7k, 9k, 15k

10k

空闲队列: 40k, 20k, 18k, 7k, 9k, 15k

9k

空闲队列: 40k, 20k, 18k, 7k, 15k

### (2) 最佳适应算法

12k

空闲队列: 10k, 28k, 20k, 18k, 7k, 9k, 12k, 15k

10k

空闲队列: 10k, 18k, 20k, 18k, 7k, 9k, 12k, 15k

9k

空闲队列: 10k, 18k, 11k, 18k, 7k, 9k, 12k, 15k

4-15

页号 =  $A \text{ div } L$       页内偏移:  $A \text{ mod } L$

物理地址 = 块号  $\times$  页大小 + 页内偏移

(1) 20

$$\begin{aligned} \text{页号} &= 20 / 4096, & \text{页内偏移} &= 20 \text{ mod } 4096 \\ &= 0, & &= 20 \end{aligned}$$

$$\text{物理地址} = 2 \times 4096 + 20 = 8212$$

(2) 5100

$$\begin{aligned} \text{页号} &= 5100 / 4096, & \text{页内偏移} &= 5100 \text{ mod } 4096 \\ &= 1, & &= 1004 \end{aligned}$$

$$\text{物理地址} = 1 \times 4096 + 1004 = 5100$$

(3) 8300

$$\begin{aligned} \text{页号} &= 8300 / 4096, & \text{页内偏移} &= 8300 \text{ mod } 4096 \\ &= 2, & &= 108 \end{aligned}$$

$$\text{物理地址} = 6 \times 4096 + 108 = 24684$$

(4) 47000

$$\begin{aligned} \text{页号} &= 47000 / 4096 & \because 1177, & \text{页号越界} \\ &= 11 \end{aligned}$$

$$\begin{aligned} \text{页内偏移} &= 47000 \text{ mod } 4096 \\ &= 1944 \end{aligned}$$

0, 1, 2, 3, 0, 1, 4, 0, 1, 2, 3, 4

1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5

## 4-16

页访问串顺序: 0, 1, 7, 2, 3, 2, 7, 1, 0, 3, 2, 5, 1, 7  
4个主存块

(1) FIFO

0	1	7	2	3	3	3	0	0	0	5	1	7
	0	1	7	2	2	2	3	3	3	0	5	1
		0	1	7	7	7	2	2	2	3	0	5
			0	1	1	1	7	7	7	2	3	0

缺页产生9次页中断

(2) LRU

0	1	7	2	3	3	3	3	0	0	0	0	1	1
	0	1	7	2	2	2	2	2	3	3	3	3	7
		0	1	7	7	7	7	7	7	2	2	2	2
			0	1	1	1	1	1	1	5	5	5	5

缺页产生11次页中断

(3) OPT

0	0	0	0	3	3	3	3	3	3	3	3	7
	1	1	1	1	1	1	1	1	1	1	1	1
		7	7	7	7	7	0	0	0	0	0	0
			2	2	2	2	2	2	5	5	5	5

缺页产生8次页中断

## 4-17

(1) 0, 430

$$\therefore 219 + 430 = 649$$

(2) 1, 10

$$\therefore 2300 + 10 = 2310$$

(3) 2, 500

$\therefore 500 > 100$ , 段内地址越界

(4) 3, 400

$$\therefore 1326 + 400 = 1726$$

(5) 4, 112

$\therefore 112 > 96$ , 段内地址越界

#### 4-18

$$(1) \because 65536 / 4096 = 16$$

$\therefore$  总共有16页

$$\text{程序代码段占 } 32768 / 4096 = 8 \text{ 页}$$

$$\text{数据段占 } 16386 / 4096 = 5 \text{ 页}$$

$$\text{栈段段占 } 15870 / 4096 = 4 \text{ 页}$$

$$\therefore 8 + 5 + 4 = 17 > 16 \text{ 页, 因此不适合}$$

$$(2) \because 65536 / 512 = 128 \text{ 页}$$

$$\text{程序代码段占 } 32768 / 512 = 64 \text{ 页}$$

$$\text{数据段占 } 16386 / 512 = 33 \text{ 页}$$

$$\text{栈段段占 } 15870 / 512 = 31 \text{ 页}$$

$$\therefore 64 + 33 + 31 = 128 = 128 \text{ 页, 因此适合}$$

#### 4-19

$$\therefore 512 * 16 = 8192 \text{ 位}$$

用9位表示页号, 10位表示页内地址 ( $2^{10}$ )

#### 4-20

(1) 缺页中断 50次; 5000次

(2) 缺页中断 100次; 10000次

#### 4-21

内存的有效存取时间

$$= (0.9)(0.75 \times 1 + 0.25 \times 8) + (0.1)(8 + 5000 + 8) + 8$$

$$= 512.075$$

#### 4-23

$$8192 / 4 = 2048 \text{ B} = 2^{11}, 64 - 11 = 53, \text{一页可装 } 2048 / 4 = 2^9 \text{ 个页表项}$$

$\therefore 9 * 6753$ , 至少需要6级页表

