
阅码场
YOMOCODE

多进程编程(3)

麦当劳喜欢您来，喜欢您再来

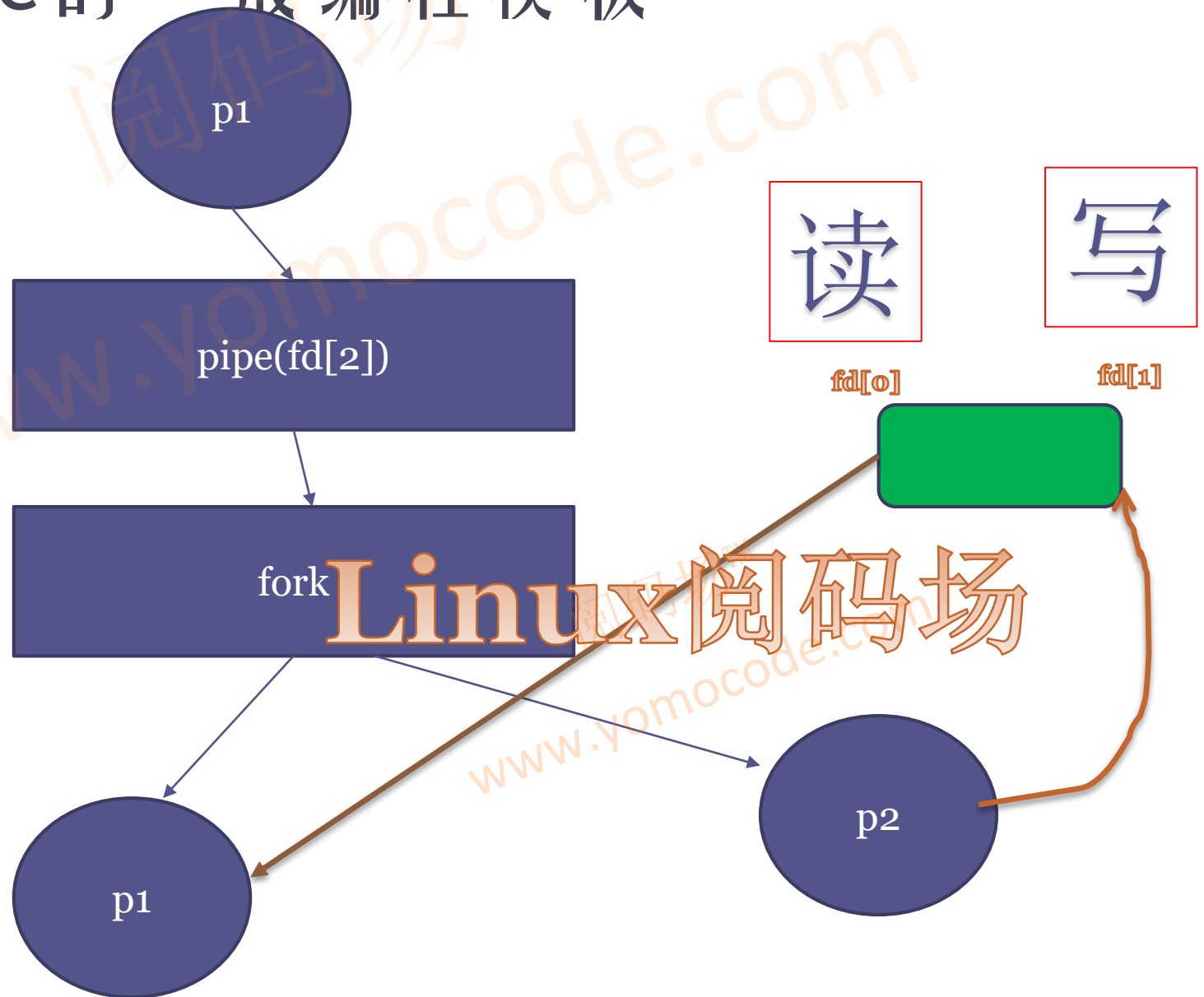
扫描关注
Linux阅码场

多进程编程(3)

3.1 管道(shell pipe的原理) -> fifo
3.2 信号的捕获、忽略与缺省
3.3 信号的block和pending
3.4 Sys V信号量、共享内存、消息队列
3.5 POSIX信号量、共享内存、消息队列

过渡到
UNIX域Socket, Socket Pair..

管道pipe的一般编程模板



信号的三种处理方法

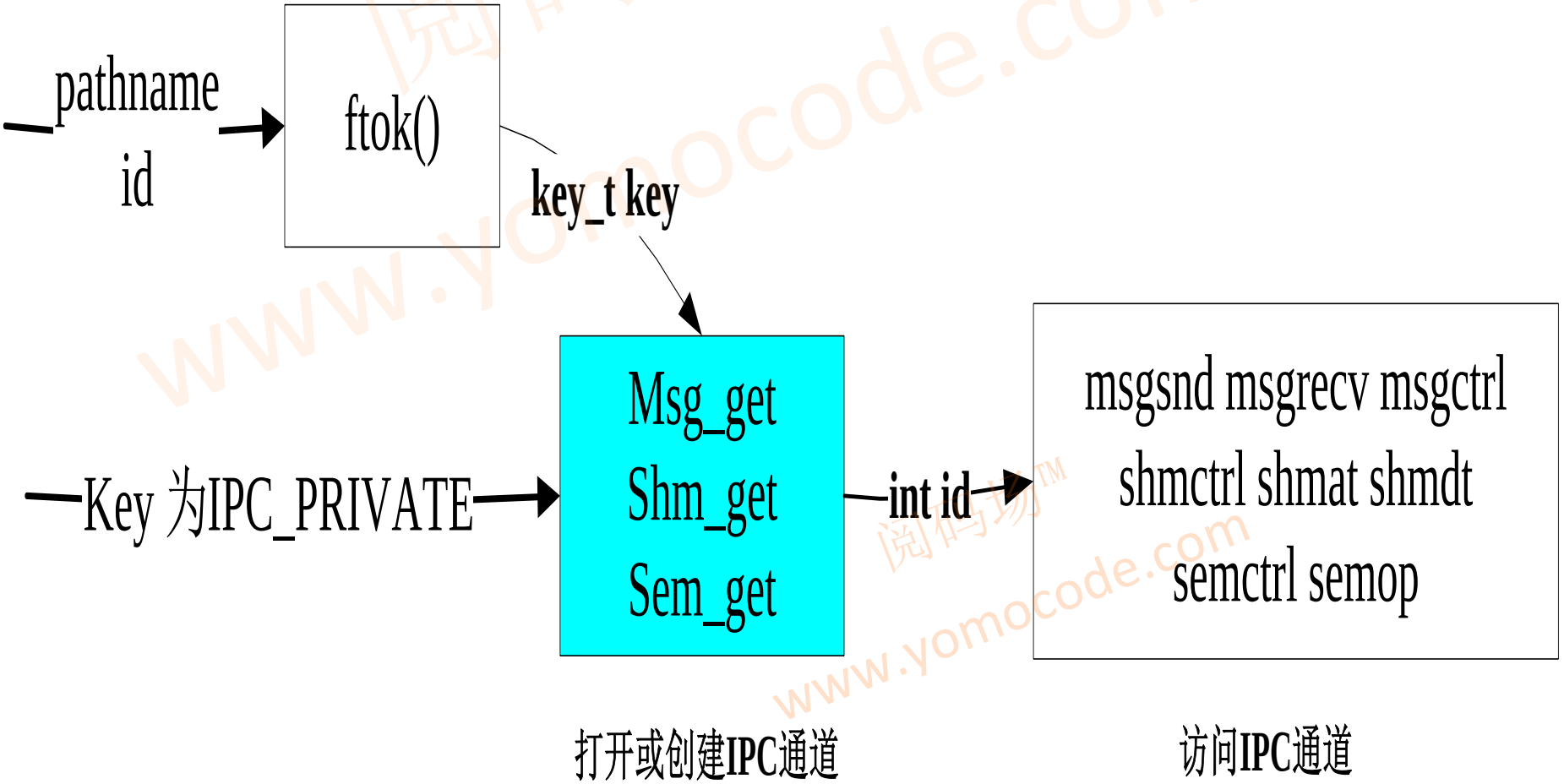
- 缺省
- 捕获
- 忽略

```
barry@barryUbuntu:~$ ps s
  UID   PID       PENDING        BLOCKED        IGNORED          CAUGHT
 1000  1446 0000000000000000 0000000000000000 0000000000001000 0000000180014000
 1000  1448 0000000000000000 0000000000000000 0000000000001000 00000001c18066ef
 1000  1459 0000000000000000 0000000000000000 0000000000001000 0000000180014a02
 1000  1656 0000000000000000 0000000000000000 0000000001001000 0000001820144f8
 1000  1736 0000000000000000 0000000000000000 0000000001001000 0000000180010000
 1000  1740 0000000000000000 0000000000000000 0000000001001000 0000000180000000
 1000  1741 0000000000000000 0000000000000000 0000000001001000 0000000180000000
 1000  1745 0000000000000000 0000000000000000 0000000001001000 0000000180004002
 1000  1892 0000000000000000 0000000000000000 0000000000001000 0000000180000000
 1000  1893 0000000000000000 0000000000000000 0000000000001000 0000000180000000
 1000  1895 0000000000000000 0000000000000000 0000000000001000 0000000180000000
 1000  1896 0000000000000000 0000000000000000 0000000000001000 0000000180000000
 1000  1898 0000000000000000 0000000000000000 0000000000001000 0000000180000000
 1000  1902 0000000000000000 0000000000000000 0000000000001000 0000000180000000
```

信号会引起RACE CONDITION

- 信号是异步的
- 信号访问其他线程正在访问的资源....
- 可以考虑屏蔽信号

SYS V IPC



POSIX

- "Unix System V, commonly abbreviated SysV (and usually pronounced—though rarely written—as "System Five"), is one of the first commercial versions of the Unix operating system. It was originally developed by American Telephone & Telegraph (AT&T) and first released in 1983.“

- "POSIX or "Portable Operating System Interface [for Unix]" is the name of a family of related standards specified by the IEEE to define the application programming interface (API)"

POSIX sem

- sem_init(semp, pshared, value): initialize semaphore pointed to by semp to value
- sem_post(semp): add 1 to value
- sem_wait(semp): subtract 1 from value
- sem_destroy(semp): free semaphore, release resources back to system
- sem_open(): open/create semaphore
- sem_unlink(): remove semaphore pathname

POSIX共享内存实例

```
int main(int argc, char **argv)
{
        /* Create shared memory object and set its size */
        fd = shm_open(argv[1], O_CREAT | O_RDWR, S_IRUSR | S_IWUSR);
        if (fd == -1) {
                perror("shm open failed\n"); /* Handle error */;
                return -1;
        }

        if (ftruncate(fd, sizeof(struct region)) == -1) {
                perror("ftruncate failed\n")    /* Handle error */;
                return -1;
        }

        /* Map shared memory object */
        rptr = mmap(NULL, sizeof(struct region),
                        PROT_READ | PROT_WRITE, MAP_SHARED, fd, 0);
        if (rptr == MAP_FAILED) {
                perror("mmap failed\n") /* Handle error */;
                return -1;
        }

        /* Now we can refer to mapped region using fields of rptr;
           for example, rptr->len */
        memset(rptr->buf, 0, MAX_LEN);
        rptr->len=1000;
        strcpy(rptr->buf, "hello world");
}
```

亲缘关系进程间mmap共享内存

```c
int main(int argc, char **argv)
{
        pid_t pid;
        char *p;

        p = (char *)mmap(NULL, 4096, PROT_READ | PROT_WRITE,
                        MAP_SHARED | MAP_ANONYMOUS, -1, 0); //vma

        strcpy(p, "XXXXXXXXXXXXXXXX");

        pid = fork();
        if (pid == -1) {
                exit(-1);
        } else if (pid == 0) {
                sprintf(p, "%s", "Hello World");
                munmap(p, 4096);
                _exit(0);
        } else {
                sleep(2);
                printf("%s\n", p);
                munmap(p, 4096);
        }

        return 0;
```

改为MAP_PRIVATE会怎样?

UNIX domain socket

- address family为AF_UNIX，UNIX Domain socket不需要IP和端口，取而代之的是文件路径来表示“网络地址”。UNIX Domain socket用结构体sockaddr_un表示，是一个socket类型的文件在文件系统中的路径：需要明确bind一个地址
- 分为三类：pathname、unnamed、abstract

谢谢!

阅码场出品