

Operating Systems: Practice: Lesson 7

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IPC:

Inter-Process Communication

Our modern operating systems are multithreading and multiprocessing hence they need some sort of communication channels for synchronization and message exchange.

Message Queues

Message queue is a software engineering paradigm which is used in inter-process communication. They can be used in inter-thread communication as well.

2 main operations

SEND MESSAGE

RECEIVE MESSAGE

Other similar concepts

Pub / Sub Systems

Examples:

RabbitMQ

Kafka

Azure Service Bus

Amazon SNS

Redis (also in-memory database)

POSIX Message Queues

POSIX-compatible operating systems implement message queue as part of their functionality.

There are generally 2 different interfaces:

System V
POSIX

System V Interface

What is System V?

System V is one of the first commercially developed versions of UNIX by AT&T.

System V interfaces are generally considered the older interfaces whereas new POSIX standards offer more comfortable interfaces(questionable).

System V Interface Functions

```
int msgget(key_t key, int msgflg);
```

```
int msgsnd(int msqid,  
            const void *msgp,  
            size_t msgsz,  
            int msgflg)
```

```
ssize_t msgrcv(int msqid,  
               void *msgp,  
               size_t msgsz,  
               long msgtyp,  
               int msgflg);
```


POSIX Interfaces

https://man7.org/linux/man-pages/man7/mq_overview.7.html

mq_open(...)

mq_send(...)

mq_receive(...)

mq_close(...)

mq_unlink(...)

Homework 6:

Ping Pong

Create 2 processes:

ping_signaler

pong_signaler

ping_signaler sends “PING” message and waits for “PONG”. After receiving “PONG” it sends again “PING” and so on.

pong_signaler sends “PONG” message and waits for “PING” message. After receiving “PING” it sends again “PONG” and so on.

Use message queues with any interface you would like.

Homework 6:

Extra Point

Study semaphore POSIX interface and represent the its key features and differences comparing to System V interface.

Thank You