

Module 8

Overview of IPC

Overview

- Objectives
- Relevance

System V Interprocess Communications

- `ipcs` – Lists all current IPC objects
- `ipcrm` – Removes all IPC objects

Sun Educational Services Interprocess Communication (IPC) Mechanisms

IPC	Characteristics	Machine Range	Rendezvous (how do the processes make contact?)	Handle used in Program
Exit status	Integer value	Same host	Child to parent	None
Signal	Signal number	Same host	Destination PID	Signal number
mmap system call	Data region mapped into VAS	Same host (or mounted FS)	File name	Virtual address
Anonymous pipe	Data stream; first-in, first-out	Same host	None (related processes inherit <i>f.d</i>)	File descriptor
Named pipe (FIFO)	Data stream; first-in, first-out	Same host	File name (FIFO)	File descriptor
System V IPC message queue->> shared memory->> semaphore->>	<-> Messages <-> like mmap <-> synchronization	Same host	Existing file name (not used for communication) <i>or</i> IPC_PRIVATE	IPC ID
Socket	Data stream, first-in, first-out; <i>or</i> messages	Same host or network	File name or Internet address	File descriptor
Transport Layer Interface (TLI)	Data stream; first-in, first-out; <i>or</i> messages	Same host or network	File name or Internet address	File descriptor



System V Interprocess Communications

\$ **ipcs**

IPC status from <running system> as of Fri Sep 3 08:50:16 BST 1999

T	ID	KEY	MODE	OWNER	GROUP
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Message Queues:

q	00xdead	-rw-rw-rw-	marcusginstruct
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q	10xbeef	-Rrw-rw-rw-	marcusginstruct
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Shared Memory:

m	00xfeed	--rw-rw-rw-	marcusginstruct
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m	10xdeaf	--rw-rw-rw-	marcusginstruct
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Semaphores:

s	20xcafe	--ra-ra-ra-	marcusginstruct
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s	30xface	--ra-ra-ra-	marcusginstruct
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\$ **ipcrm -q0 -m1 -s2**

\$ **ipcs**

IPC status from <running system> as of Fri Sep 3 08:51:04 BST 1999

T	ID	KEY	MODE	OWNER	GROUP
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Message Queues:

q	10xbeef	-Rrw-rw-rw-	marcusginstruct
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Shared Memory:

m	00xfeed	--rw-rw-rw-	marcusginstruct
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Semaphores:

s	30xface	--ra-ra-ra-	marcusginstruct
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\$



API Features Common to System V IPC

- `key_t key` – Used to specify the IPC object at create and get time
- `int id` – Handle used to access the IPC object
- `ftok(3C)` – Generates a key from a filename and numeric value
- `xxxget(2)` – “Get” function that takes a key and returns an id
- `xxxctl(2)` – “Control” function for setup, delete, admin, and debugging