# 10 IPCS Command Examples (With IPC Introduction)

IPC stands for Inter-process Communication.

This technique allows the processes to communicate with each another.

Since each process has its own address space and unique user space, how does the process communicate each other?

The answer is Kernel, the heart of the Linux operating system that has access to the whole memory. So we can request the kernel to allocate the space which can be used to communicate between processes.  
  
The process can also communicate by having a file accessible to both the processes. Processes can open, and read/write the file, which requires lot of I/O operation that consumes time.

### Different Types of IPCS

There are various IPC’s which allows a process to communicate with another processes, either in the same computer or different computer in the same network.

* Pipes – Provides a way for processes to communicate with each another by exchanging messages. Named pipes provide a way for processes running on different computer systems to communicate over the network.
* Shared Memory – Processes can exchange values in the shared memory. One process will create a portion of memory which other process can access.
* Message Queue – It is a structured and ordered list of memory segments where processes store or retrieve data.
* Semaphores – Provides a synchronizing mechanism for processes that are accessing the same resource. No data is passed with a semaphore; it simply coordinates access to shared resources.

### 10 IPCS Command Example

ipcs is a UNIX / Linux command, which is used to list the information about the inter-process communication ipcs command provides a report on System V IPCS (Message queue, Semaphore, and Shared memory).

### IPCS Example 1: List all the IPC facility

ipcs command with -a option lists all the IPC facilities which has read access for the current process. It provides details about message queue, semaphore and shared memory.

# ipcs -a

------ Shared Memory Segments --------

key shmid owner perms bytes nattch status

0xc616cc44 1056800768 oracle 660 4096 0

0x0103f577 323158020 root 664 966 1

0x0000270f 325713925 root 666 1 2

------ Semaphore Arrays --------

key semid owner perms nsems

0x0103eefd 0 root 664 1

0x0103eefe 32769 root 664 1

0x4b0d4514 1094844418 oracle 660 204

------ Message Queues --------

key msqid owner perms used-bytes messages

0x000005a4 32768 root 644 0 0

All the IPC facility has unique key and identifier, which is used to identify an IPC facility.

### IPCS Example 2: List all the Message Queue

ipcs with option -q, lists only message queues for which the current process has read access.

$ ipcs -q

------ Message Queues --------

key msqid owner perms used-bytes messages

0x000005a4 32768 root 644 0 0

### IPCS Example 3. List all the Semaphores

ipcs -s option is used to list the accessible semaphores.

# ipcs -s

------ Semaphore Arrays --------

key semid owner perms nsems

0x0103eefd 0 root 664 1

0x0103eefe 32769 root 664 1

0x4b0d4514 1094844418 oracle 660 204

### IPCS Example 4. List all the Shared Memory

ipcs -m option with ipcs command lists the shared memories.

# ipcs -m

------ Shared Memory Segments --------

key shmid owner perms bytes nattch status

0xc616cc44 1056800768 oracle 660 4096 0

0x0103f577 323158020 root 664 966 1

0x0000270f 325713925 root 666 1 2

### IPCS Example 5. Detailed information about an IPC facility

ipcs -i option provides detailed information about an ipc facility.

# ipcs -q -i 32768

Message Queue msqid=32768

uid=0 gid=0 cuid=0 cgid=0 mode=0644

cbytes=0 qbytes=65536 qnum=0 lspid=0 lrpid=0

send\_time=Not set

rcv\_time=Not set

change\_time=Thu Aug 5 13:30:22 2010

Option -i with -q provides information about a particular message queue. Option -i with -s provides semaphore details. Option -i with -m provides details about a shared memory.

### IPCS Example 6. Lists the Limits for IPC facility

ipcs -l option gives the system limits for each ipc facility.

# ipcs -m -l

Shared Memory Limits --------

max number of segments = 4096

max seg size (kbytes) = 67108864

max total shared memory (kbytes) = 17179869184

min seg size (bytes) = 1

The above command gives the limits for shared memory. -l can be combined with -q and -s to view the limits for message queue and semaphores respectively.

Single option -l gives the limits for all three IPC facilities.

# ipcs -l

### IPCS Example 7. List Creator and Owner Details for IPC Facility

ipcs -c option lists creator userid and groupid and owner userid and group id. This option can be combined with -m, -s and -q to view the creator details for specific IPC facility.

# ipcs -m -c

--- Shared Memory Segment Creators/Owners --------

shmid perms cuid cgid uid gid

1056800768 660 oracle oinstall oracle oinstall

323158020 664 root root root root

325713925 666 root root root root

### IPCS Example 8. Process ids that accessed IPC facility recently

ipcs -p option displays creator id, and process id which accessed the corresponding ipc facility very recently.

# ipcs -m -p

Shared Memory Creator/Last-op --------

shmid owner cpid lpid

1056800768 oracle 16764 5389

323158020 root 2354 2354

325713925 root 20666 20668

-p also can be combined with -m,-s or -q.

### IPCS Example 9. Last Accessed Time

ipcs -t option displays last operation time in each ipc facility. This option can also be combined with -m, -s or -q to print for specific type of ipc facility. For message queue, -t option displays last sent and receive time, for shared memory it displays last attached (portion of memory) and detached timestamp and for semaphore it displays last operation and changed time details.

# ipcs -s -t

------ Semaphore Operation/Change Times --------

semid owner last-op last-changed

0 root Thu Aug 5 12:46:52 2010 Tue Jul 13 10:39:41 2010

32769 root Thu Aug 5 11:59:10 2010 Tue Jul 13 10:39:41 2010

1094844418 oracle Thu Aug 5 13:52:59 2010 Thu Aug 5 13:52:59 2010

### IPCS Example 10. Status of current usage

ipcs with -u command displays current usage for all the IPC facility. This option can be combined with a specific option to display the status for a particular IPC facility.

# ipcs -u

-- Shared Memory Status --------

segments allocated 30

pages allocated 102

pages resident 77

pages swapped 0

Swap performance: 0 attempts 0 successes

-- Semaphore Status --------

used arrays = 49

allocated semaphores = 252

------ Messages: Status --------

allocated queues = 1

used headers = 0

used space = 0 bytes