

INE5418 Distributed Systems - Mutual Exclusion Policy
Bruno Marques do Nascimento

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Chapter 1

Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

IPC	7
message_t	10
Process	11
MulticastMutualExclusionPolicy	10
ServerMutualExclusionPolicy	12
TokenRingMutualExclusionPolicy	12

Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

IPC	Class that supports the user with the IPC API usage	7
message_t	. . . . .	10
MulticastMutualExclusionPolicy	. . . . .	10
Process	. . . . .	11
ServerMutualExclusionPolicy	. . . . .	12
TokenRingMutualExclusionPolicy	. . . . .	12

Chapter 3

File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

include/ const_data.h	??
include/ ipc.h	
High level approach to the low level IPC API	15
include/ message.h	??
include/ multicast_policy.h	??
include/ process.h	??
include/ server_policy.h	??
include/ token_ring_policy.h	??

Chapter 4

Class Documentation

4.1 IPC Class Reference

Class that supports the user with the [IPC](#) API usage.

```
#include "ipc.h"
```

Public Member Functions

- [IPC](#) (int id)
Constructor.
- void [init](#) ()
Call the file descriptor initialization.
- void **start** ()
- void [start_listening](#) ()
Start listening for other process messages.
- [message_t](#) [receive_msg](#) ()
Receive a message from other process.
- void [send_msg](#) ([message_t](#))
Send a message to another process.

Private Member Functions

- void [create_process_fd](#) ()
Create process socket file descriptor.
- void [configure_process_fd](#) ()
Configure process socket file descriptor.

Private Attributes

- int `id_`
Process id attached to this IPC.
- int `opt_`
Always 1, relative to socket operation.
- int `rcv_process_fd_`
File descriptor, to received messages.
- int `send_process_fd_`
File descriptor, to send messages.
- int `address_length_`
Length of the address.
- int `socket_port_`
Socket port that Process will be bind.
- struct sockaddr_in `address_`
Struct responsible to configure sockets.

4.1.1 Detailed Description

Class that supports the user with the IPC API usage.

4.1.2 Constructor & Destructor Documentation

4.1.2.1 IPC (int id)

Constructor.

Set initial attributes values.

Parameters

<code>id</code>	the id of the process that this IPC will be responsible for.
-----------------	--

4.1.3 Member Function Documentation

4.1.3.1 void configure_process_fd () [private]

Configure process socket file descriptor.

4.1.3.2 void create_process_fd () [private]

Create process socket file descriptor.

4.1.3.3 void init ()

Call the file descriptor initialization.

4.1.3.4 `message_t receive_msg ()`

Receive a message from other process.

Returns

the received message.

4.1.3.5 `void send_msg (message_t msg)`

Send a message to another process.

Parameters

<i>msg</i>	message to be sent.
------------	---------------------

4.1.3.6 `void start_listening ()`

Start listening for other process messages.

4.1.4 Member Data Documentation

4.1.4.1 `struct sockaddr_in address_ [private]`

Struct responsible to configure sockets.

4.1.4.2 `int address_length_ [private]`

Length of the address.

4.1.4.3 `int id_ [private]`

[Process](#) id attached to this [IPC](#).

4.1.4.4 `int opt_ [private]`

Always 1, relative to socket operation.

4.1.4.5 `int rcv_process_fd_ [private]`

File descriptor, to received messages.

4.1.4.6 int send_process_fd_ [private]

File descriptor, to send messages.

4.1.4.7 int socket_port_ [private]

Socket port that [Process](#) will be bind.

The documentation for this class was generated from the following files:

- include/[ipc.h](#)
- src/ipc.cpp

4.2 message_t Struct Reference

Public Attributes

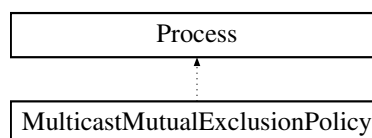
- char **source** [4]
- char **destination** [4]
- char **type** [4]
- char **data** [100]

The documentation for this struct was generated from the following file:

- include/message.h

4.3 MulticastMutualExclusionPolicy Class Reference

Inheritance diagram for MulticastMutualExclusionPolicy:



Public Member Functions

- **MulticastMutualExclusionPolicy** (int id, int n_process)
- void **run** ()

Private Member Functions

- void **process_message** ()
- int **destination** ()
- void **send_token** ()
- void **server_resource_request** ()
- void **server_resource_release** ()
- void **client_resource_request** ()
- void **client_resource_release** ()
- void **start_broadcast** ()

Private Attributes

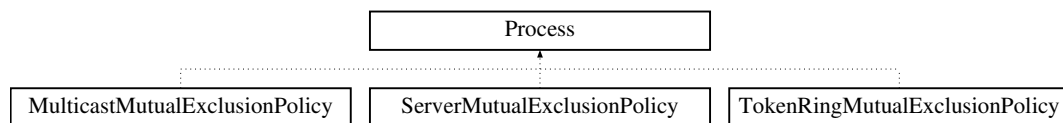
- std::queue< int > **work_queue**

The documentation for this class was generated from the following files:

- include/multicast_policy.h
- src/multicast_policy.cpp

4.4 Process Class Reference

Inheritance diagram for Process:



Public Member Functions

- **Process** (int id, int n_process)

Protected Member Functions

- void **compute** ()
- int **random_computation_time** ()

Protected Attributes

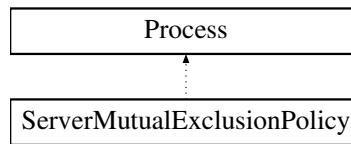
- int **id_**
- int **n_process_**
- int **computation_time_**
- **IPC** **ipc_**
- **message_t** **received_message_**

The documentation for this class was generated from the following files:

- include/process.h
- src/process.cpp

4.5 ServerMutualExclusionPolicy Class Reference

Inheritance diagram for ServerMutualExclusionPolicy:



Public Member Functions

- **ServerMutualExclusionPolicy** (int id, int n_process)
- void **run** ()

Private Member Functions

- void **process_message** ()
- int **destination** ()
- void **send_token** ()
- void **server_resource_request** ()
- void **server_resource_release** ()
- void **client_resource_request** ()
- void **client_resource_release** ()
- void **start_broadcast** ()

Private Attributes

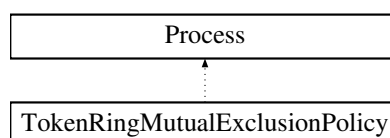
- std::queue< int > **work_queue**

The documentation for this class was generated from the following files:

- include/server_policy.h
- src/server_policy.cpp

4.6 TokenRingMutualExclusionPolicy Class Reference

Inheritance diagram for TokenRingMutualExclusionPolicy:



Public Member Functions

- **TokenRingMutualExclusionPolicy** (int id, int n_process)
- void **run** ()

Private Member Functions

- void **process_message** ()
- int **destination** ()
- void **send_token** ()

Additional Inherited Members

The documentation for this class was generated from the following files:

- include/token_ring_policy.h
- src/token_ring_policy.cpp

Chapter 5

File Documentation

5.1 include/ipc.h File Reference

High level approach to the low level IPC API.

```
#include <netinet/in.h>
#include "message.h"
```

Classes

- class [IPC](#)
Class that supports the user with the [IPC](#) API usage.

5.1.1 Detailed Description

High level approach to the low level IPC API.

Author

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Date

29/04/2018

Version

1.0

This file is a header file that contains the functions and variables of a high level approach to the IPC API.

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