Unit-II

Message Passing

Introduction

Two basic methods for for information sharing as as follows

1. Shared Data Approach

Figure: Shared Data Approach
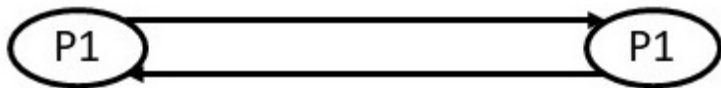
2. Message Passing Approach

Figure: Message Passing Approach

Desirable Features of a good Message Passing System

1. Simplicity
2. Uniform Semantics
   - Local Communication
   - Remote Communication

3. Efficiency

4. Reliability

5. Correctness
   Issues related to correctness are
   - Atomicity
   - Ordered Delivery
   - Survivability

6. Flexibility

7. Security

8. Portability

Issues in IPC by Message Passing I

A message is a block of information formatted by a sending process
in such a manner that it is meaningful to the receiving process.
In the designing of an IPC protocol for message-passing system, the
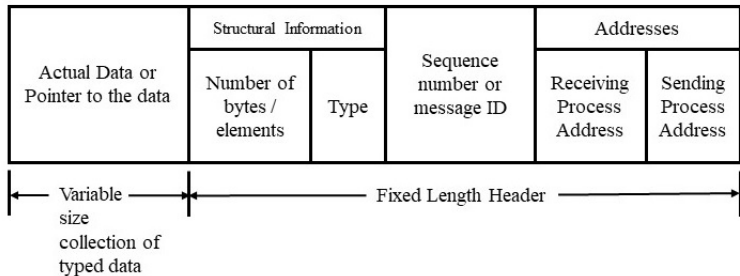following important issues need to be considered.

Figure: A Typical Message Structure

Issues in IPC by Message Passing II

In designing of an IPC for MPS, the following important issues need to be considered:

1. Who is the sender?
2. who is the receiver?
3. Is there one receiver or many receivers?
4. Is the message guaranted to have been accepted by its receiver?
5. Does the sender need to wait for a reply?
6. What should be done is a catastrophic event such as a node crash of a communication link failure occurs during the course of communication?
7. What should be done if the receiver is not ready to accept the message:Will the message be discarded or stored in a buffer? In case of buffering,what shoul be done if athe buffer is full?
8. is there are several outstanding messages for a receiver, can it choose the order in which to service the outstanding messages?

Synchronization I

A central issue in the communication structure is the synchronization. The semantics used synchronization may be broadly classified as

- Blocking
- Non-Blocking

When both the send and receive primitives of a communication between two processes use blocking semantics, the communication is said to be synchronous; otherwise it is asynchronous.
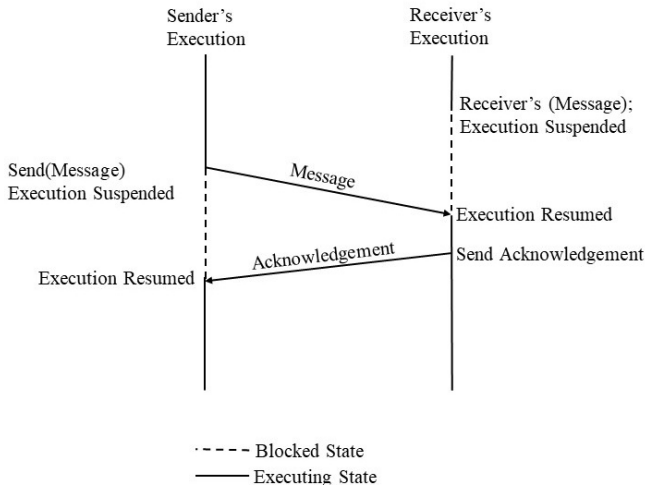
Synchronization II

Figure: Synchronous Mode of Communication with send and receive primitives having blocking type semantics.