

System Model

The conditions are:

- Systems have only reusable resources.
- Processes are allowed only exclusive access to resources.
- There is only one copy of each resource.

Process can be in 2 states:

Running (Active)

Process has all the needed resources

Blocked

Process is waiting to acquire some resources.

Two types in deadlock

Resource Deadlock

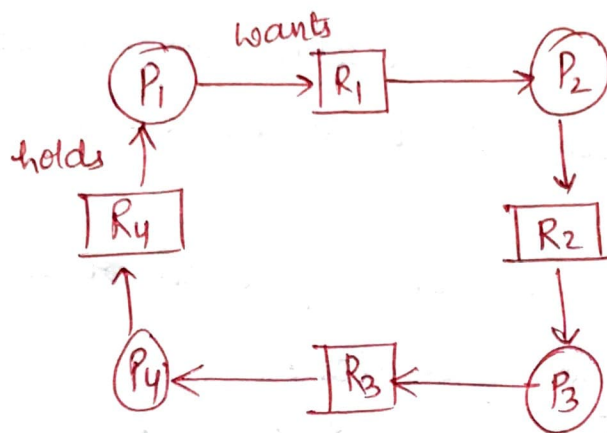
- Processes can simultaneously wait for several resources & cannot proceed until they have acquired all those resources.
- occurs when process are trying for exclusive access to devices, locks, servers

Communication Deadlock

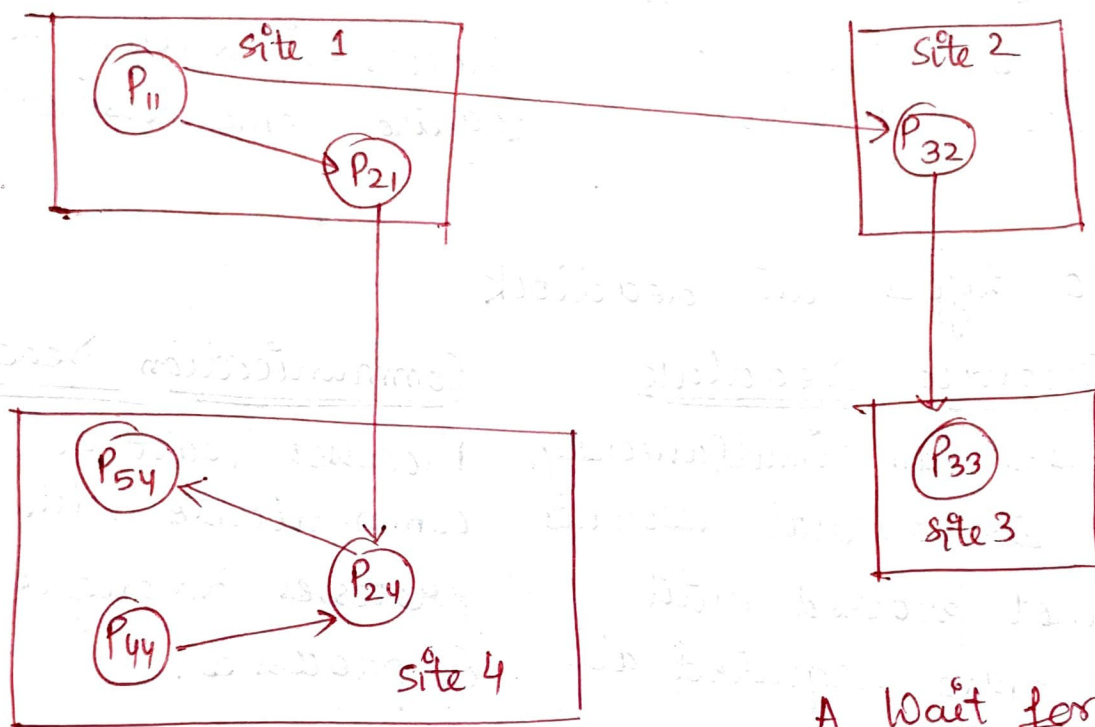
Processes wait to communicate with other processes among a set of processes.

- occurs when A is trying to send msg to B, B to C & C to A.

Wait for Graph



Deadlock



A Wait for Graph

- System state can be represented by WFG
- In WFG, nodes are processes & there is a directed edge from P_1 to P_2 if P_1 is blocked & is waiting for P_2 to release some resource.
- System is deadlocked if there exists a directed cycle or knot.