

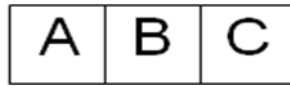
Broadcast and dissemination

LECTURE 5

Broadcast:

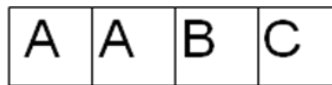
Organization of Broadcast data

- ✚ Flat: broadcast the union of the requested data cyclic.



- ✚ Skewed (Random):

- broadcast different items with different frequencies.
- goal is that the inter-arrival time between two instances of the same item matches the clients' needs.

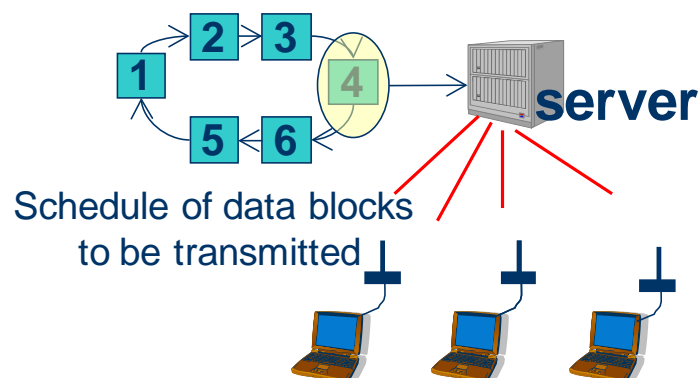


- ✚ Multi-Disks Organization [Acharya et. al, SIGMOD95]

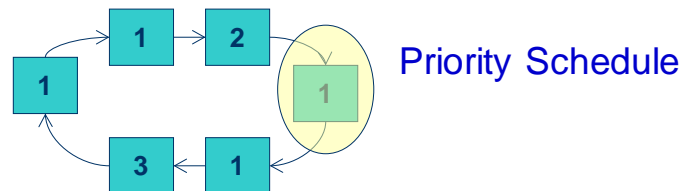
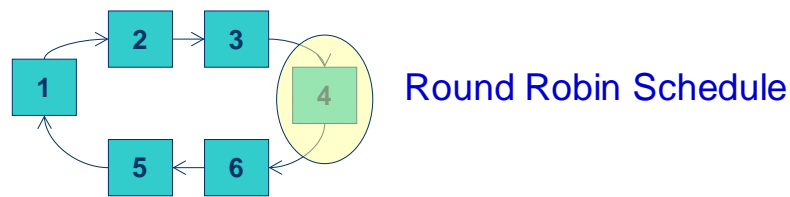
- The frequency of broadcasting each item depends on its access probability.
- Data broadcast with the same frequency are viewed as belonging to the same disk.
- Multiple disks of different sizes and speeds are superimposed on the broadcast medium.
- No variant in the inter-arrival time of each item.



Broadcast Disks



Broadcast Disks: Scheduling



1. Round-Robin Scheduling

- The Round-Robin is designed especially for time sharing systems.
- It is similar FCFS but add preemption concept
- A small unit of time, called time quantum
- Each process gets a small unit of CPU time (*time quantum*), usually 10-100 milliseconds. After this time has elapsed, the process is preempted and added to the end of the ready queue.

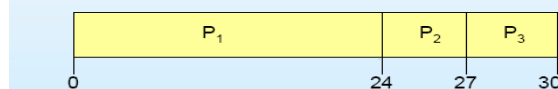
Process Burst time

P1 24

P2 3

P2 3

Suppose that the processes arrive in the order: P_1, P_2, P_3
The Gantt Chart for the schedule is:



Example of Round-Robin Scheduling

Process Burst Time

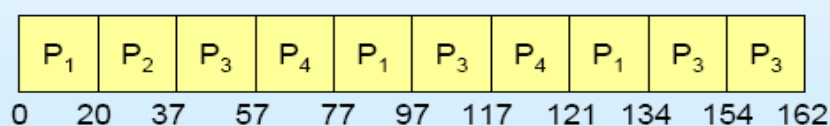
P_1 53

P_2 17

P_3 68

P_4 24

The Gantt chart is:



2. Priority Scheduling

A priority number (integer) is associated with each process
The CPU is allocated to the process with the highest priority
(smallest integer \equiv highest priority)

Problem : Starvation – low priority processes may never execute

Solution : Aging – as time progresses increase the priority of the process

Example of Priority Scheduling

<u>Processes</u>	<u>Burst time</u>	<u>Priority</u>
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

The average waiting
time = $(1 + 6 + 16 + 18 + 0) / 5 = 8.2$

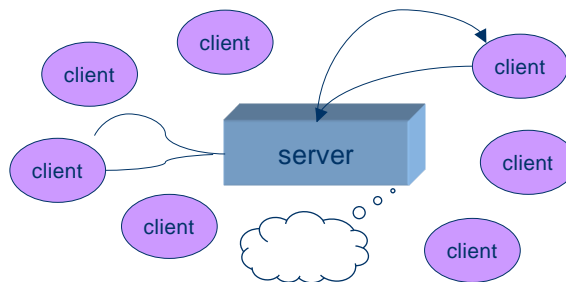
Dissemination

1. Dissemination: Pull

2. Dissemination: Push

1. Dissemination: Pull

- Pull-oriented dissemination can run into trouble when demand is extremely high
 - Web servers crash
- Bandwidth is exhausted



2. Dissemination: Push

- Server pushes data to clients
- No need to ask for data

