Consider the following snapshot of a system

written 7.3 years ago by snehalb (/u/30290/sneh: • 790

modified 3.5 years ago by prashantsaini (/u/62805/prasl • 0

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

With reference to Bankers algorithm

i) What is the content of the matrix need ?

ii) Is the system in a safe state?

iii) If a request from process P1 arrives for (0,4,2,0),can the request be granted immediately?

operating systems (/t/operating systems/)

4

154k views

ADD COMMENT FOLLOW SHARE EDIT (/p/edit/3750/)

1 Answer

written 7.3 years ago by snehalb (/u/30290/sneh: • 790

Need matrix is calculated by subtracting Allocation Matrix from the Max matrix

	Need(Max-Allocation)			
	A	B	C	D
P_0	0	0	0	0
P_1	0	7	5	0
P_2	1	0	0	2
P_3	0	0	2	0
P_4	0	6	4	2

To check if system is in a safe state

- The Available matrix is $[1520]$.
- A process after it has finished execution is supposed to free up all the resources it hold.
- We need to find a safety sequence such that it satisfies the criteria need $Need \leq Available$.
- Since $Need(P0) \leq Available$, we select $P0.[Available] = [Available] + [Allocation(P0)]$

$Available = [1520] + [0012] = [1532]$

- Need(P2) ≤ Available →Available=[1 5 3 2]+[1 3 5 4]=[2 8 8 6]
- Need(P3) ≤ Available→ Available=[2 8 8 6]+[0 6 3 2]=[2 14 11 8]
- Need(P4) ≤ Available→Available=[2 14 11 8]+[0 0 1 4]=[2 14 12 12]
- Need(P1) ≤ Available→Available=[2 14 12 12]+[1 0 0 0]=[3 14 12 12]
- Safe Sequence is <p0,p2,p3,p4,p1>

A request from process P1 arrives for (0,4,2,0)

- System receives a request for P1 for $Req(P1)[0420]$
- First we check if Req(P1) is less than $Need(P1) \rightarrow [0420] < [0750] istrue$
- Now we check if Req(P1) is less than $Available \rightarrow [0420] < [1520] istrue.$
- So we update the values as:
  - $Available = Available - Request = [1520] - [0420] = [1100]$
  - $Allocation = allocation(P1) + Request = [1000] + [0420] = [1420]$
  - $Need = Need(P1) - Request = [0750] - [0420] = [0330]$

	Allocation				Max				Need				Available			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	0	0	0	0	1	1	0	0
P_1	1	4	2	0	1	7	5	0	0	3	3	0				
P_2	1	3	5	4	2	3	5	6	1	0	0	2				
P_3	0	6	3	2	0	6	5	2	0	0	2	0				
P_4	0	0	1	4	0	6	5	6	0	6	4	2				

- This is the modified table
- On verifying, we see that the safe sequence still remains the same .The system continues to remain in a safe state.