|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Messages | | | | | | | | | | | | | | | | | | | | | | |
|  | (m) | | | | - | | base algorithm message | | | | | | | | | | | | | | |  |
|  | (marker) | | | | - | | snapshot algorithm message | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Variables | | | | | | | | | | | | | | | | | | | | | | |
|  | recordedP | | | | - | | true if P takes local snapshot | | | | | | | | | | | | | | |  |
|  | makerp[c] | | | | - | | true if the marker message arrived to P through channel c | | | | | | | | | | | | | | |  |
|  | stateP[c] | | | | - | | a stack holding the messages to P arrived from channel c after the local snapshot in P | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Initialize | | | | | | | | | | | | | | | | | | | | | | |
|  | recordedP | | | | ← | false | | | | | | | | | | | | | | | |  |
|  | makerp[c] | | | | ← | false for all channel c | | | | | | | | | | | | | | | |  |
|  | stateP[c] | | | | ← | ∅ for all channel c | | | | | | | | | | | | | | | |  |
|  | if P wants to initiate snapshot | | | | | | | | | | | | | | | | | | | | |  |
|  |  | perform procedure TakeSnapshot | | | | | | | | | | | | | | | | | | | |  |
|  | end if | | | | | | | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Algorithm | | | | | | | | | | | | | | | | | | | | | |  |
|  | **if P receives a basic message *(m)* through incoming channel *c0*** | | | | | | | | | | | | | | | | | | | | |  |
|  | **if** ***recordedP*** = true and ***makerp[c]***= false | | | | | | | | | | | | | | | | | | | | |  |
|  |  | ***stateP[c]*** ← append(***stateP[c]***, ***(m)***) | | | | | | | | | | | | | | | | | | | |  |
|  | **end if** | | | | | | | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **if P receives *(marker)* through incoming channel *c0*** | | | | | | | | | | | | | | | | | | | | |  |
|  | perform procedure TakeSnapshot | | | | | | | | | | | | | | | | | | | | |  |
|  | ***makerp[c]***← true | | | | | | | | | | | | | | | | | | | | |  |
|  | **if** ***makerp[c]*** = true for all incoming channels | | | | | | | | | | | | | | | | | | | | |  |
|  |  | terminate | | | | | | | | | | | | | | | | | | | |  |
|  | **end if** | | | | | | | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Procedure TakeSnapshot** | | | | | | | | | | | | | | | | | | | | |  |
|  | **if** ***recordedP*** = false then | | | | | | | | | | | | | | | | | | | | |  |
|  |  | ***recordedP*** ← true | | | | | | | | | | | | | | | | | | | |  |
|  |  | send ***(marker)*** into each outgoing channel of ***P*** | | | | | | | | | | | | | | | | | | | |  |
|  |  | take local snapshot of the state of ***P*** | | | | | | | | | | | | | | | | | | | |  |
|  | **end if** | | | | | | | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |