

Name :- Nikhil Kumar
Course code :- CS7479

Roll no :- 1806055

Branch :- CSE I

Saathi

Date ___/___/___

1) (c) From the question we have the following events:
There are 5 acceptors and 1 proposer to reach consensus.

The first primary p_1 proposes a value w for L , it receives majority promise responses.

p_1 sends accept request for w and it fails before sending majority request. So w is not fully accepted but at least 1 acceptor has accepted w and p_3 has listened to that accepted message. So p_3 is aware of w .

Since p_1 failed, p_2 is now primary and since w is not accepted it proposes v for L .

Now it sends propose request for v and for promise request it will receive at least 1 message that says that w was proposed earlier by p_1 .

Now p_2 will propose w for L since it now knows about w being proposed.

It will receive promise responses, send accept responses and w will be accepted.

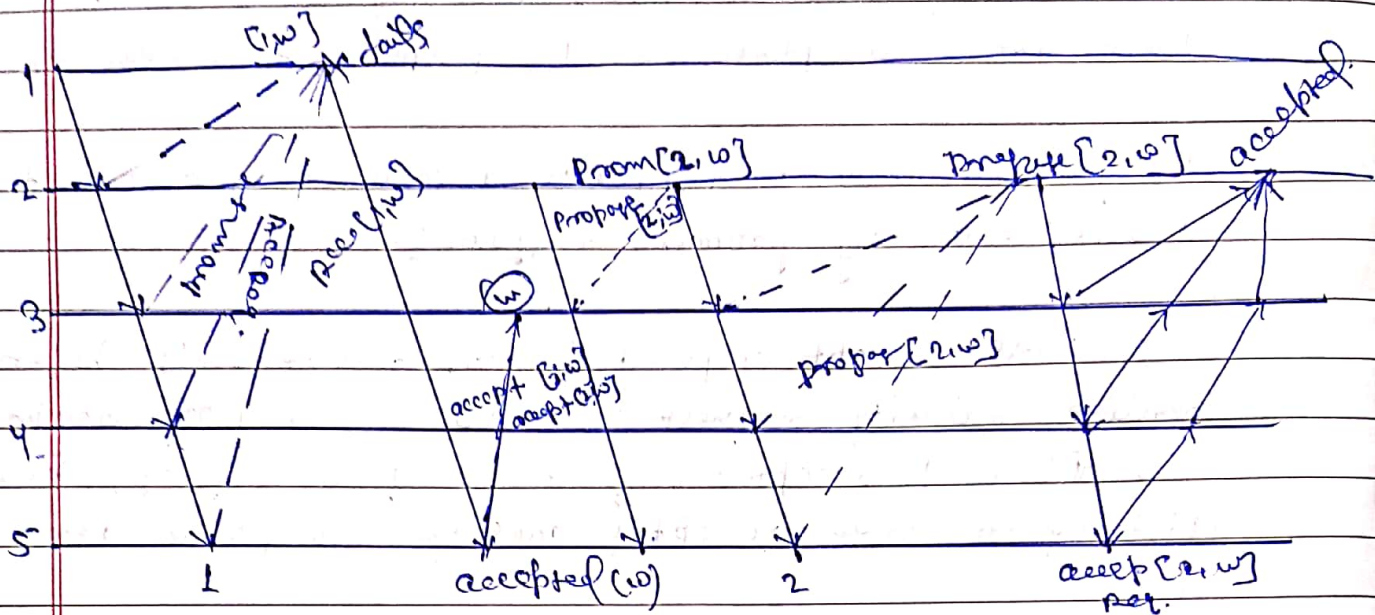
\therefore Consensus has been reached with w for L .

Name :- Nikhil Kumar
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Branch :- cse1

Saathi

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from this figure we can see the events.

P_1 proposes w_1 , receive majority promises send accept and fail, atleast 1 accept w_1 . P_3 listen about w_1 accepted.

P_2 proposes w_2 . listen about w_1 proposed w_1 , receive promise from w_1 , sends accepts requests for w_2 and w_2 will accepted. P_2 may fail after sending accept requests but majority still accepts w_2 .

1(b) case 1 :- P_3 does not learn about w_1 .

from part a, P_1 failed after sending atleast 1 accept request, if P_1 failed after proposing and before accept request.

P_3 will not learn about w_1 , however w_1 has still been proposed and accepted and aware of that.

Name :- Nilesh Kumar
Branch :- CSE-1

Roll no :- 1806055
course code :- CS7479

Saathi

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proposed, so when p_2 proposes v for L , then it will still receive responses stating w was proposed by p_1 and it will propose w which will be accepted, even if p_3 does not learn about w as the majority will accept w .

\therefore consensus will be reached and w will be accepted.

case 2: p_3 does not learn about v .

Again from part 1 similar events follow till the last accept stage at which point due to some error p_3 does not learn about v , however the majority still get propose message since n machines left after failure of p_1 and event without p_3 majority is still present.

So even if p_3 does not learn about v , p_2 will eventually propose w after learning about from another and w will be accepted.

\therefore consensus will be reached with w for L .

case 3: p_3 does not learn about both w or v

In this case since p_3 does not learn about either value, this can be treated simply as p_3 having failed since p_3 is not participating in the consensus process.

Now we still have 3 replicas at gs , so majority can still be achieved, so p_2 will propose v , learn about w propose w , and w will be accepted.

\therefore consensus will be reached with w for L .

\therefore for each consensus will be reached with w .