
MODULE *PaxosStoreRefVoting*

EXTENDS *UniversalPaxosStoreQuorum*

VARIABLE *voted*
varsR $\triangleq \langle vars, voted \rangle$

InitR $\triangleq \wedge Init$
 $\wedge voted = [q \in Participant \mapsto \{\}]$

PrepareR(*p*, *b*) $\triangleq \wedge Prepare(p, b)$
 $\wedge voted' = voted$

AcceptR(*p*, *b*, *v*) $\triangleq \wedge Accept(p, b, v)$
 $\wedge voted' = [voted \text{ EXCEPT } ![p] = @ \cup \{\langle b, v \rangle\}]$

OnMessageR(*q*) $\triangleq \wedge OnMessage(q)$
 $\wedge \text{IF } state'[q][q].maxVBal \neq -1$
 $\text{THEN } voted' = [voted \text{ EXCEPT } ![q] = @ \cup \{\langle state'[q][q].maxVBal, state'[q][q].maxV \rangle\}]$
 $\text{ELSE UNCHANGED } voted$

NextR $\triangleq \exists p \in Participant : \vee OnMessageR(p)$
 $\vee \exists b \in Ballot : \vee PrepareR(p, b)$
 $\vee \exists v \in Value : AcceptR(p, b, v)$

SpecR $\triangleq InitR \wedge \square [NextR]_{varsR}$

 To verify *Spec* \Rightarrow Voting, we should define votes and *maxBal*
 votes, \ * votes[*a*] is the set of votes cast by *Participant a*
 maxBal \ * maxBal[*a*] is a ballot number. Participant *a* will cast
 \ * further votes only in ballots numbered $\geq maxBal[a]$

V \triangleq INSTANCE *EagerVoting* WITH *Acceptor* $\leftarrow Participant$,
votes $\leftarrow voted$,
maxBal $\leftarrow [p \in Participant \mapsto state[p][p].maxBal]$

THEOREM *SpecR* $\Rightarrow V!Spec$

\ * Modification History
 \ * Last modified *Thu Aug 15 21:25:10 CST 2019* by *pure_*
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