MODULE *TPaxosRefVoting*

EXTENDS *TPaxos*

VARIABLE *votes*

$varsR \triangleq \langle vars, votes \rangle$

$InitR \triangleq$

$\quad \land Init$

$\quad \land votes = [q \in Participant \mapsto \{\}]$

$PrepareR(p, b) \triangleq$

$\quad \land Prepare(p, b)$

$\quad \land votes' = votes$

$AcceptR(p, b, v) \triangleq$

$\quad \land Accept(p, b, v)$

$\quad \land votes' = [votes \text{ EXCEPT } ![p] = @ \cup \{\langle b, v \rangle\}]$

$OnMessageR(q) \triangleq$

$\quad \land OnMessage(q)$

$\quad \land \text{IF } state'[q][q].maxVBal \neq -1$

$\qquad \text{THEN } votes' = [votes \text{ EXCEPT } ![q] = @ \cup \{\langle state'[q][q].maxVBal, state'[q][q].maxVVal \rangle\}]$

$\qquad \text{ELSE UNCHANGED } votes$

$NextR \triangleq \exists p \in Participant :$

$\qquad \lor OnMessageR(p)$

$\qquad \lor \exists b \in Ballot : \lor PrepareR(p, b)$

$\qquad\qquad \lor \exists v \in Value : AcceptR(p, b, v)$

$SpecR \triangleq InitR \land \Box[NextR]_{varsR}$

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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 $\geq maxBal[a]$

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$maxBal \triangleq [p \in Participant \mapsto state[p][p].maxBal]$

$V \triangleq$ INSTANCE *EagerVoting* WITH $Acceptor \leftarrow Participant$

$votes \leftarrow votes, maxBal \leftarrow maxBal$

THEOREM $SpecR \Rightarrow V!Spec$

* Modification History

* Last modified *Wed Aug* 28 10:43:13 *CST* 2019 by *pure_*

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