MODULE *Mastership*

EXTENDS *Southbound*

INSTANCE *Naturals*

INSTANCE *FiniteSets*

LOCAL INSTANCE *TLC*

CONSTANT *LogMastership*

ASSUME *LogMastership* $\in$ BOOLEAN

A record of target masterships
VARIABLE *mastership*

LOCAL *CurrentState* $\triangleq$
$[nodes \mapsto node,$
$\ mastership \mapsto mastership]$

LOCAL *SuccessorState* $\triangleq$
$[nodes \mapsto node',$
$\ mastership \mapsto mastership']$

LOCAL *Log* $\triangleq$ INSTANCE *Log* WITH
File $\leftarrow$ "Mastership.log",
CurrentState $\leftarrow$ *CurrentState*,
SuccessorState $\leftarrow$ *SuccessorState*,
Enabled $\leftarrow$ *LogMastership*

This section models *mastership* reconciliation.
ReconcileMastership(n) $\triangleq$
$\land \lor \land node[n].connected$
$\land mastership.master = Nil$
$\land mastership' = [master \mapsto n,\ term \mapsto mastership.term + 1,\ conn \mapsto node[n].incarnation]$
$\lor \land \neg node[n].connected$
$\land mastership.master = n$
$\land mastership' = [mastership$ EXCEPT $!.master = Nil]$
$\land$ UNCHANGED $\langle node,\ target \rangle$

Formal specification, constraints, and theorems.
InitMastership $\triangleq$

$\land\ Log!Init$
$\land\ mastership = [master \mapsto Nil,\ term \mapsto 0,\ conn \mapsto 0]$

$NextMastership\ \triangleq$
$\lor\ \exists\, n \in Nodes :$
$Log!Action(ReconcileMastership(n),\ [node \mapsto n])$

* Modification History
* Last modified Sun *Feb* 20 09:09:52 *PST* 2022 by *jordanhalterman*
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