MODULE *Mastership*

INSTANCE *Naturals*

INSTANCE *FiniteSets*

INSTANCE *Sequences*

INSTANCE *TLC*

An empty constant
CONSTANT *Nil*

The set of possible master nodes
CONSTANT *Node*

Variables defined by other modules.
VARIABLES
conns

A record of target masterships
VARIABLE *mastership*

$$TypeOK \triangleq$$
$$\land\ mastership.term \in Nat$$
$$\land\ mastership.master \neq Nil \Rightarrow mastership.master \in Node$$
$$\land\ mastership.conn \in Nat$$

$$\text{LOCAL } State \triangleq [$$
$$mastership \mapsto mastership,$$
$$conns \mapsto conns]$$

$$\text{LOCAL } Transitions \triangleq$$
$$\text{IF } mastership' \neq mastership \text{ THEN } [mastership \mapsto mastership'] \text{ ELSE } \langle\rangle$$

$$Test \triangleq \text{INSTANCE } Test \text{ WITH}$$
$$File \leftarrow \text{“Mastership.log”}$$

This section models *mastership* for the configuration service.

Mastership is used primarily to track the lifecycle of individual configuration targets and react to state changes on the southbound. Each target is assigned a master from the *Node* set, and masters can be unset when the target disconnects.

$$ReconcileMastership(n) \triangleq$$
$$\land\ \lor\ \land\ conns[n].connected$$

$$
\begin{array}{l}
\quad \land\ mastership.master = Nil \\
\quad \land\ mastership' = [\\
\qquad\quad master \mapsto n, \\
\qquad\quad term \quad \mapsto mastership.term + 1, \\
\qquad\quad conn \quad \mapsto conns[n].id] \\
\lor\ \land\ \lor \neg conns[n].connected \\
\qquad\ \lor conns[n].id \neq mastership.conn \\
\quad \land\ mastership.master = n \\
\quad \land\ mastership' = [mastership \text{ EXCEPT } !.master = Nil] \\
\land \text{ UNCHANGED } \langle conns \rangle
\end{array}
$$