

$$\begin{aligned}
& \wedge \text{mastership}[t].\text{master} \neq \text{Nil} \\
& \wedge \text{mastership}' = [\text{mastership} \text{ EXCEPT } ![t].\text{master} = \text{Nil}] \\
& \wedge \text{UNCHANGED } \langle \text{target} \rangle
\end{aligned}$$

Formal specification, constraints, and theorems.

$$\begin{aligned}
\text{InitSouthbound} & \triangleq \\
& \wedge \text{target} = [t \in \text{DOMAIN } \text{Target} \mapsto \\
& \quad [\text{path} \in \{\} \mapsto \\
& \quad \quad [\text{value} \mapsto \text{Nil}]]] \\
& \wedge \text{mastership} = [t \in \text{DOMAIN } \text{Target} \mapsto [\text{master} \mapsto \text{Nil}, \text{term} \mapsto 0]] \\
\text{NextSouthbound} & \triangleq \\
& \forall \exists n \in \text{Node} : \\
& \quad \exists t \in \text{DOMAIN } \text{Target} : \\
& \quad \quad \text{SetMaster}(n, t) \\
& \quad \forall \exists t \in \text{DOMAIN } \text{Target} : \\
& \quad \quad \text{UnsetMaster}(t)
\end{aligned}$$

$$\begin{aligned}
\text{ASSUME } & \wedge \text{IsFiniteSet}(\text{Node}) \\
& \wedge \forall n \in \text{Node} : \\
& \quad \wedge n \notin \text{DOMAIN } \text{Target} \\
& \quad \wedge n \in \text{STRING} \\
\text{ASSUME } & \wedge \forall t \in \text{DOMAIN } \text{Target} : \\
& \quad \wedge t \notin \text{Node} \\
& \quad \wedge t \in \text{STRING} \\
& \quad \wedge \text{Target}[t].\text{persistent} \in \text{BOOLEAN} \\
& \quad \wedge \forall p \in \text{DOMAIN } \text{Target}[t].\text{values} : \\
& \quad \quad \text{IsFiniteSet}(\text{Target}[t].\text{values}[p])
\end{aligned}$$

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