
MODULE *Target*

INSTANCE *Naturals*

An empty constant
 CONSTANT *Nil*

The set of possible master nodes
 CONSTANT *Node*

The target state
 VARIABLE *target*

A record of connections between nodes and the target
 VARIABLE *conn*

$TypeOK \triangleq$
 $\wedge target.id \in Nat$
 $\wedge \forall p \in \text{DOMAIN } target.values :$
 $\quad \wedge target.values[p].index \in Nat$
 $\quad \wedge target.values[p].value \in \text{STRING}$
 $\wedge target.running \in \text{BOOLEAN}$
 $\wedge \forall n \in \text{DOMAIN } conn :$
 $\quad \wedge n \in Node$
 $\quad \wedge conn[n].id \in Nat$
 $\quad \wedge conn[n].connected \in \text{BOOLEAN}$

This section specifies the behavior of configuration targets.

$Start \triangleq$
 $\wedge \neg target.running$
 $\wedge target' = [target \text{ EXCEPT } !.id = target.id + 1,$
 $\quad \quad \quad !.running = \text{TRUE}]$
 $\wedge \text{UNCHANGED } \langle conn \rangle$

$Stop \triangleq$
 $\wedge target.running$
 $\wedge target' = [target \text{ EXCEPT } !.running = \text{FALSE},$
 $\quad \quad \quad !.values = [p \in \{\} \mapsto [index \mapsto 0, value \mapsto Nil]]]$
 $\wedge conn' = [n \in Node \mapsto [conn[n] \text{ EXCEPT } !.connected = \text{FALSE}]]$

This section specifies the behavior of connections to the target.

$$\begin{aligned}
\textit{Connect}(n) &\triangleq \\
&\wedge \neg \textit{conn}[n].\textit{connected} \\
&\wedge \textit{target}.\textit{running} \\
&\wedge \textit{conn}' = [\textit{conn} \text{ EXCEPT } ![n].\textit{id} = \textit{conn}[n].\textit{id} + 1, \\
&\quad \quad \quad ![n].\textit{connected} = \text{TRUE}] \\
&\wedge \text{UNCHANGED } \langle \textit{target} \rangle \\
\textit{Disconnect}(n) &\triangleq \\
&\wedge \textit{conn}[n].\textit{connected} \\
&\wedge \textit{conn}' = [\textit{conn} \text{ EXCEPT } ![n].\textit{connected} = \text{FALSE}] \\
&\wedge \text{UNCHANGED } \langle \textit{target} \rangle
\end{aligned}$$
