

This module specifies the logic for the configuration controller in *μONOS Config*.

MODULE *Configuration*

INSTANCE *Naturals*

INSTANCE *FiniteSets*

INSTANCE *Sequences*

INSTANCE *TLC*

An empty constant

CONSTANT *Nil*

Status constants

CONSTANTS

Pending,
Complete

Status \triangleq
 $\{ \textit{Pending},$
 $\textit{Complete} \}$

Variables defined by other modules.

VARIABLES

mastership,
conns,
target

A record of per-target configurations

VARIABLE *configuration*

This section models the *Configuration* reconciler.

ReconcileConfiguration(*n*) \triangleq
 $\wedge \vee \wedge \textit{configuration.state} = \textit{Pending}$
 $\wedge \textit{configuration.term} = \textit{mastership.term}$
 $\wedge \textit{mastership.master} = n$
 $\wedge \textit{conns}[n].\textit{id} = \textit{mastership.conn}$
 $\wedge \textit{conns}[n].\textit{connected}$
 $\wedge \textit{target.running}$
 $\wedge \textit{target}' = [\textit{target} \text{ EXCEPT } !.\textit{values} = \textit{configuration.applied.values}]$
 $\wedge \textit{configuration}' = [\textit{configuration} \text{ EXCEPT } !.\textit{state} = \textit{Complete}]$
 $\vee \wedge \textit{configuration.term} < \textit{mastership.term}$

$$\begin{aligned}
& \wedge \text{configuration}' = [\text{configuration} \text{ EXCEPT } !.state = \text{Pending}, \\
& \hspace{15em} !.term = \text{mastership.term}] \\
& \wedge \text{UNCHANGED } \langle \text{target} \rangle \\
& \wedge \text{UNCHANGED } \langle \text{mastership}, \text{conns} \rangle
\end{aligned}$$

$\text{TypeOK} \triangleq$
 $\wedge \text{configuration.state} \in \text{Status}$
 $\wedge \text{configuration.term} \in \text{Nat}$
 $\wedge \forall p \in \text{DOMAIN } \text{configuration.committed.values} :$
 $\quad \wedge \text{configuration.committed.index} \in \text{Nat}$
 $\quad \wedge \text{configuration.committed.revision} \in \text{Nat}$
 $\quad \wedge \text{configuration.committed.values}[p] \neq \text{Nil} \Rightarrow$
 $\quad \quad \text{configuration.committed.values}[p] \in \text{STRING}$
 $\wedge \text{configuration.applied.target} \in \text{Nat}$
 $\wedge \forall p \in \text{DOMAIN } \text{configuration.applied.values} :$
 $\quad \wedge \text{configuration.applied.index} \in \text{Nat}$
 $\quad \wedge \text{configuration.applied.revision} \in \text{Nat}$
 $\quad \wedge \text{configuration.applied.values}[p] \neq \text{Nil} \Rightarrow$
 $\quad \quad \text{configuration.applied.values}[p] \in \text{STRING}$

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

$\text{LOCAL Transitions} \triangleq$
 $\langle \rangle @@$
 $(\text{IF } \text{configuration}' \neq \text{configuration} \text{ THEN } [\text{configuration} \mapsto \text{configuration}'] \text{ ELSE } \langle \rangle) @@$
 $(\text{IF } \text{target}' \neq \text{target} \text{ THEN } [\text{target} \mapsto \text{target}'] \text{ ELSE } \langle \rangle)$

$\text{Test} \triangleq \text{INSTANCE Test WITH}$
 $\quad \text{File} \leftarrow \text{"Configuration.test.log"}$
