
MODULE *Configuration*

INSTANCE *Naturals*

INSTANCE *FiniteSets*

INSTANCE *Sequences*

INSTANCE *TLC*

An empty constant
CONSTANT *Nil*

Status constants
CONSTANTS
 Pending,
 InProgress,
 Complete

Status \triangleq
 {*Pending*,
 InProgress,
 Complete}

Variables defined by other modules.
VARIABLES
 mastership,
 target

A record of per-target configurations
VARIABLE *configuration*

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

$$\wedge \text{configuration.applied.values}[p].\text{value} \neq \text{Nil} \Rightarrow \\ \text{configuration.applied.values}[p].\text{value} \in \text{STRING}$$

$\text{Test} \triangleq \text{INSTANCE } \text{Test} \text{ WITH}$
 $\text{File} \quad \leftarrow \text{"Configuration.log"},$
 $\text{CurrState} \leftarrow [$
 $\quad \text{configuration} \mapsto \text{configuration},$
 $\quad \text{mastership} \quad \mapsto \text{mastership},$
 $\quad \text{target} \quad \quad \mapsto \text{target}],$
 $\text{SuccState} \leftarrow [$
 $\quad \text{configuration} \mapsto \text{configuration'},$
 $\quad \text{mastership} \quad \mapsto \text{mastership'},$
 $\quad \text{target} \quad \quad \mapsto \text{target'}]$

This section models the *Configuration* reconciler.

$\text{ReconcileConfiguration}(n) \triangleq$
 $\wedge \vee \wedge \text{configuration.state} = \text{Pending}$
 $\quad \wedge \text{configuration.term} = \text{mastership.term}$
 $\quad \wedge \text{mastership.master} = n$
 $\quad \wedge \text{configuration}' = [\text{configuration} \text{ EXCEPT } !.\text{state} = \text{InProgress}]$
 $\quad \wedge \text{UNCHANGED } \langle \text{target} \rangle$
 $\vee \wedge \text{configuration.state} = \text{InProgress}$
 $\quad \wedge \text{configuration.term} = \text{mastership.term}$
 $\quad \wedge \text{mastership.master} = n$
 $\quad \wedge \text{target}' = [\text{target} \text{ EXCEPT } !.\text{values} = \text{configuration.applied.values}]$
 $\quad \wedge \text{configuration}' = [\text{configuration} \text{ EXCEPT } !.\text{state} = \text{Complete}]$
 $\vee \wedge \text{configuration.term} < \text{mastership.term}$
 $\quad \wedge \text{configuration}' = [\text{configuration} \text{ EXCEPT } !.\text{state} = \text{Pending},$
 $\quad \quad \quad !.\text{term} = \text{mastership.term}]$
 $\quad \wedge \text{UNCHANGED } \langle \text{target} \rangle$
 $\quad \wedge \text{UNCHANGED } \langle \text{mastership} \rangle$