
MODULE *Configuration*

INSTANCE *Naturals*

INSTANCE *FiniteSets*

INSTANCE *Sequences*

INSTANCE *TLC*

An empty constant
CONSTANT *Nil*

Status constants
CONSTANTS
 Pending,
 Complete

Status \triangleq
 {*Pending*,
 Complete}

Variables defined by other modules.
VARIABLES
 mastership,
 conn,
 target

A record of per-target configurations
VARIABLE *configuration*

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

```

LOCAL State  $\triangleq$  [
  configuration  $\mapsto$  configuration,
  mastership     $\mapsto$  mastership,
  conns          $\mapsto$  conn,
  target          $\mapsto$  target]

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

Test  $\triangleq$  INSTANCE Test WITH
  File  $\leftarrow$  "Configuration.log"

```

This section models the *Configuration* reconciler.

```

ReconcileConfiguration(n)  $\triangleq$ 
   $\wedge \vee \wedge$  configuration.state = Pending
     $\wedge$  configuration.term = mastership.term
     $\wedge$  mastership.master = n
     $\wedge$  conn[n].id = mastership.conn
     $\wedge$  conn[n].connected
     $\wedge$  target.running
     $\wedge$  target' = [target EXCEPT !.values = configuration.applied.values]
     $\wedge$  configuration' = [configuration EXCEPT !.state = Complete,
                                                                !.applied.target = target.id]
   $\vee \wedge$  configuration.term < mastership.term
     $\wedge$  configuration' = [configuration EXCEPT !.state = Pending,
                                                                !.term = mastership.term]
   $\wedge$  UNCHANGED  $\langle$ target $\rangle$ 
   $\wedge$  UNCHANGED  $\langle$ mastership, conn $\rangle$ 

```
