MODULE *Configuration*

EXTENDS *Mastership*

INSTANCE *Naturals*

INSTANCE *FiniteSets*

LOCAL INSTANCE *TLC*

Status constants

CONSTANTS
ConfigurationInProgress,
ConfigurationComplete,
ConfigurationFailed

CONSTANT *TraceConfiguration*

A record of per-target configurations

VARIABLE *configuration*

LOCAL *InitState* $\triangleq$
$[configurations \mapsto configuration,$
$\ targets \mapsto target,$
$\ masterships \mapsto mastership,$
$\ nodes \mapsto node]$

LOCAL *NextState* $\triangleq$
$[configurations \mapsto configuration',$
$\ targets \mapsto target',$
$\ masterships \mapsto mastership',$
$\ nodes \mapsto node']$

LOCAL *Trace* $\triangleq$ INSTANCE *Trace* WITH
Module $\leftarrow$ "Configurations",
InitState $\leftarrow$ *InitState*,
NextState $\leftarrow$ *NextState*,
Enabled $\leftarrow$ *TraceConfiguration*

This section models the *Configuration* reconciler.

$ReconcileConfiguration(n) \triangleq$
$\land\ mastership.master = n$
$\land\ \lor\ \land\ configuration.state \neq ConfigurationInProgress$

$\land$ $configuration.applied.term < mastership.term$
$\land$ $configuration' = [configuration$ EXCEPT $!.state = ConfigurationInProgress]$
$\land$ UNCHANGED $\langle target \rangle$
$\lor$ $\land$ $configuration.state = ConfigurationInProgress$
$\land$ $configuration.applied.term < mastership.term$
$\land$ $node[n].connected$
$\land$ $target.running$
$\land$ $target' = [target$ EXCEPT $!.values = configuration.applied.values]$
$\land$ $configuration' = [configuration$ EXCEPT $!.applied.term = mastership.term,$
$!.state = ConfigurationComplete]$
$\land$ UNCHANGED $\langle mastership, node \rangle$

Formal specification, constraints, and theorems.

$InitConfiguration \triangleq$
$\land$ $configuration = [$
$state \mapsto ConfigurationInProgress,$
$committed \mapsto [$
$index \mapsto 0,$
$revision \mapsto 0,$
$term \mapsto 0,$
$values \mapsto [$
$path \in \{\} \mapsto [$
$path \mapsto path,$
$value \mapsto Nil,$
$index \mapsto 0,$
$deleted \mapsto$ FALSE$]]],$
$applied \mapsto [$
$index \mapsto 0,$
$revision \mapsto 0,$
$term \mapsto 0,$
$values \mapsto [$
$path \in \{\} \mapsto [$
$path \mapsto path,$
$value \mapsto Nil,$
$index \mapsto 0,$
$deleted \mapsto$ FALSE$]]]]$
$\land$ $Trace!Init$

$NextConfiguration \triangleq$
$\lor \exists\, n \in Node :$
$Trace!Step(ReconcileConfiguration(n), [node \mapsto n])$

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* Modification History

\ * Last modified *Fri Apr* 21 12:46:55 *PDT* 2023 by *jhalterm*
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