
MODULE *Northbound*

EXTENDS *Proposal*

INSTANCE *Naturals*

INSTANCE *FiniteSets*

INSTANCE *Sequences*

LOCAL INSTANCE *TLC*

CONSTANT *Changes*

Add change 'c' to the proposal log

$$\begin{aligned}
\text{Change}(i) \triangleq & \\
& \wedge \text{proposal}[i].\text{phase} = \text{Nil} \\
& \wedge i - 1 \in \text{DOMAIN } \text{proposal} \Rightarrow \text{proposal}[i - 1].\text{phase} \neq \text{Nil} \\
& \wedge \exists c \in \text{Changes} : \\
& \quad \wedge \text{proposal}' = [\text{proposal} \text{ EXCEPT } ![i] = [\text{phase} \mapsto \text{ProposalChange}, \\
& \quad \quad \text{change} \mapsto [\\
& \quad \quad \quad \text{values} \mapsto [p \in \text{DOMAIN } c \mapsto [\text{value} \mapsto c[p]]], \\
& \quad \quad \quad \text{commit} \mapsto \text{ProposalPending}, \\
& \quad \quad \quad \text{apply} \mapsto \text{ProposalPending}], \\
& \quad \quad \text{rollback} \mapsto [\\
& \quad \quad \quad \text{index} \mapsto 0, \\
& \quad \quad \quad \text{values} \mapsto [p \in \{\} \mapsto [\text{value} \mapsto \text{Nil}]], \\
& \quad \quad \quad \text{commit} \mapsto \text{Nil}, \\
& \quad \quad \quad \text{apply} \mapsto \text{Nil}]] \\
& \wedge \text{UNCHANGED } \langle \text{configuration}, \text{mastership}, \text{node}, \text{target} \rangle
\end{aligned}$$

Add a rollback of proposal 'i' to the proposal log

$$\begin{aligned}
\text{Rollback}(i) \triangleq & \\
& \wedge \text{proposal}[i].\text{phase} = \text{ProposalChange} \\
& \wedge \text{proposal}' = [\text{proposal} \text{ EXCEPT } ![i].\text{phase} = \text{ProposalRollback}, \\
& \quad \quad \quad ![i].\text{rollback.commit} = \text{ProposalPending}, \\
& \quad \quad \quad ![i].\text{rollback.apply} = \text{ProposalPending}] \\
& \wedge \text{UNCHANGED } \langle \text{configuration}, \text{mastership}, \text{node}, \text{target} \rangle
\end{aligned}$$

Formal specification, constraints, and theorems.

$$\text{InitNorthbound} \triangleq \text{TRUE}$$

$$\text{NextNorthbound} \triangleq$$

$$\begin{aligned}
& \exists i \in 1 \dots \text{NumProposals} : \\
& \quad \vee \text{Change}(i)
\end{aligned}$$

$\vee \textit{Rollback}(i)$

ASSUME $\forall c \in \textit{Changes}$:
 $\wedge \textit{Cardinality}(\text{DOMAIN } c) > 0$
 $\wedge \forall p \in \text{DOMAIN } c : c[p] \in \text{STRING}$

\ * Modification History
\ * Last modified *Fri Apr 21 16:42:15 PDT 2023* by *jhalterm*
\ * Last modified *Sun Feb 20 10:10:06 PST 2022* by *jordanhalterman*
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