
MODULE *Controller*

LOCAL INSTANCE *Naturals*

LOCAL INSTANCE *Sequences*

LOCAL INSTANCE *TLC*

VARIABLE *time*

Clock \triangleq INSTANCE *Clock*

A queue of requests to reconcile

VARIABLE *requests*

Enqueue(*id*) \triangleq
 $\wedge \text{requests}' = \text{Append}(\text{requests}, [id \mapsto id, time \mapsto 0])$

Retry(*request*) \triangleq
 $\wedge \text{requests}' = \langle [id \mapsto request.id, time \mapsto 0] \rangle \circ \text{requests}'$

Requeue(*request*) \triangleq
 $\wedge \text{requests}' = \text{Append}(\text{requests}', [id \mapsto request.id, time \mapsto 0])$

RequeueAfter(*request*, *duration*) \triangleq
 $\wedge \text{LET } t \triangleq \text{Clock!Time} + \text{duration}$
 IN
 $\wedge \text{requests}' = \text{Append}(\text{requests}', [id \mapsto request.id, time \mapsto t])$

LOCAL *ReconcileRequest*(*R*(_)) \triangleq
 $\wedge \exists r \in \text{DOMAIN } \text{requests} :$
 $\text{LET } request \triangleq \text{requests}[r]$
 IN
 $\wedge request.time = 0$
 $\wedge \forall x \in \text{DOMAIN } \text{requests} :$
 $\quad \vee \text{requests}[x].time \neq 0$
 $\quad \vee r \leq x$
 $\wedge \text{requests}' = \text{SubSeq}(\text{requests}, 0, r) \circ \text{SubSeq}(\text{requests}, r + 1, \text{Len}(\text{requests}))$
 $\wedge R(request)$

LOCAL *ReconcileDelayed*(*R*(_)) \triangleq
 $\wedge \exists r \in \text{DOMAIN } \text{requests} :$
 $\text{LET } request \triangleq \text{requests}[r]$
 IN
 $\wedge request.time \neq 0$
 $\wedge request.time \leq \text{Clock!Time}$
 $\wedge \forall x \in \text{DOMAIN } \text{requests} :$

$$\begin{aligned}
& \vee request.time < requests[x].time \\
& \vee \wedge request.time = requests[x].time \\
& \quad \wedge r \leq x \\
& \wedge requests' = SubSeq(requests, 0, r) \circ SubSeq(requests, r + 1, Len(requests)) \\
& \wedge R(request)
\end{aligned}$$

$$\begin{aligned}
Reconcile(R(-)) & \triangleq \\
& \vee ReconcileRequest(R) \\
& \vee ReconcileDelayed(R)
\end{aligned}$$

$$\begin{aligned}
Init & \triangleq \\
& \wedge requests = \langle \rangle
\end{aligned}$$

$$\begin{aligned}
Next & \triangleq \\
& \vee FALSE
\end{aligned}$$

\ * Modification History
\ * Last modified *Fri Aug 20 02:30:56 PDT 2021* by *jordanhalterman*
\ * Created *Fri Aug 20 02:17:50 PDT 2021* by *jordanhalterman*