
MODULE *ReActor_Scheduler*

EXTENDS *Naturals, Sequences*
 CONSTANTS *Message, Process, MFA, Response*

VARIABLES *sid, ctl, processes, process_count, last_pid*
allvars $\triangleq \langle sid, ctl, processes, process_count, last_pid \rangle$

TypeInvariant $\triangleq \wedge sid \in [node \mapsto Nat, scheduler \mapsto Nat]$
 $\wedge processes \in Seq(Process)$

Init $\triangleq \wedge sid \in \langle Nat, Nat \rangle$
 $\wedge processes = \langle \rangle$
 $\wedge process_count = 0$

Spawn(*r, f*) $\triangleq \wedge process_count' = process_count + 1$
 $\wedge last_pid' = Append(sid, process_count')$
 $\wedge processes' = Append(processes, \langle last_pid, f \rangle)$
 $\wedge r' = last_pid'$
 $\wedge UNCHANGED \langle sid \rangle$

Info(*r*) $\triangleq \wedge r' = [process_count \mapsto process_count]$
 $\wedge UNCHANGED \langle sid, processes, process_count \rangle$

GC $\triangleq \wedge LET isAlive(x) \triangleq x.status = \text{"alive"}$ IN
 $processes' = SelectSeq(processes, isAlive)$
 $\wedge process_count' = Len(processes')$
 $\wedge UNCHANGED \langle sid \rangle$

Next $\triangleq \wedge \exists f \in MFA, res \in Response : Spawn(res, f)$
 $\wedge \exists res \in Response : Info(res)$
 $\wedge GC$

Spec $\triangleq Init \wedge \Box [Next]_{allvars}$

THEOREM *Spec* $\Rightarrow \Box TypeInvariant$

\ * Modification History
 \ * Last modified Sat Aug 25 17:57:24 CEST 2018 by *ostera*
 \ * Created Sat Aug 25 16:46:06 CEST 2018 by *ostera*