MODULE *SPMDRemote*

A Single Program Multi Data remote finish See *FinishState.RemoteFinishSPMD* for the actual implementation

EXTENDS *Sequences*, *Integers*

VARIABLES *fid*, *fstates*, *msgs*, *thrds*, *mseq*, *p0adoptSet*
CONSTANTS *PLACE*, *MXFINISHES*, *PROG_HOME*, *MXTHREADS*, *NBLOCKS*, *MXSTMTS*
INSTANCE *Commons*

$Alloc(type, here, parent, root) \triangleq$ parent not used here
$\land fstates[fid].status = \text{“unused”}$
$\land fstates' = [fstates \text{ EXCEPT } ![fid].id = fid,$
$\quad ![fid].count = 1,$
$\quad ![fid].status = \text{“waiting”},$
$\quad ![fid].type = type,$
$\quad ![fid].here = here,$
$\quad ![fid].root = root]$

$PushException(e) \triangleq$
$\land fstates' = [fstates \text{ EXCEPT } ![fid].excs = Append(@, e)]$

$NotifySubActivitySpawn(dst) \triangleq$
$\land fstates[fid].here = dst$
$\land fstates' = [fstates \text{ EXCEPT } ![fid].count = @ + 1]$

$NotifySubActivitySpawnError(dst) \triangleq$
$\land fstates[fid].here \neq dst$
$\land PushException([err \mapsto \text{“SpawnRemoteAsync”},$
$\quad from \mapsto fstates[fid].here])$

$NotifyRemoteActivityCreation(src, activity, inMsg) \triangleq$
$\land fstates' = fstates$ always true in *SPMD* finish
$\land RecvMsg(inMsg)$

$NotifyLocalActivitySpawnAndCreation(here, activity) \triangleq$
$\land fstates[fid].here = here$
$\land fstates' = [fstates \text{ EXCEPT } ![fid].count = @ + 1]$

$LastActivity \triangleq$
$\land fstates[fid].count = 1$

$NotifyActivityTermination \triangleq$
$\land fstates[fid].count > 0$
$\land \text{IF } LastActivity$
$\quad \text{THEN } fstates' = [fstates \text{ EXCEPT } ![fid].count = @ - 1,$
$\quad\quad ![fid].status = \text{“finished”}]$
$\quad \text{ELSE } fstates' = [fstates \text{ EXCEPT } ![fid].count = @ - 1]$

$$
\begin{array}{l}
SendTermMsg \triangleq \\
\quad \text{LET } pid \triangleq fstates[fid].root \\
\qquad pidHome \triangleq GetFinishHome(pid) \\
\qquad here \triangleq fstates[fid].here \\
\quad \text{IN} \quad \wedge\, pidHome \neq here \\
\qquad \wedge\, fstates' = [fstates \text{ EXCEPT } ![fid].status = \text{“forgotten”}] \\
\qquad \wedge\, SendMsg([mid \mapsto mseq, \\
\qquad\qquad\qquad src \mapsto here, \\
\qquad\qquad\qquad dst \mapsto pidHome, \\
\qquad\qquad\qquad type \mapsto \text{“asyncTerm”}, \\
\qquad\qquad\qquad fid \mapsto pid, \\
\qquad\qquad\qquad excs \mapsto fstates[fid].excs]) \\
\qquad \wedge\, mseq' = mseq + 1
\end{array}
$$

$ProcessChildTermMsg(msg) \triangleq$ FALSE remote does't need this action

* Modification History
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