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|----- MODULE AJupiterImplXJupiter -----|
| EXTENDS AJupiterExtended, GraphStateSpace |
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VARIABLES c2ss, s2ss

varsImpl  $\triangleq \langle \textit{varsEx}, c2ss, s2ss \rangle$ 
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TypeOKImpl  $\triangleq$ 
   $\wedge$  TypeOKEx
   $\wedge \forall c \in \textit{Client} : \textit{IsSS}(c2ss[c]) \wedge \textit{IsSS}(s2ss[c])$ 

InitImpl  $\triangleq$ 
   $\wedge$  InitEx
   $\wedge c2ss = [c \in \textit{Client} \mapsto \textit{EmptySS}]$ 
   $\wedge s2ss = [c \in \textit{Client} \mapsto \textit{EmptySS}]$ 
|-----|
DoOpImpl(c, op)  $\triangleq$ 
   $\wedge$  DoOpEx(c, op)
   $\wedge$  LET cop  $\triangleq [op \mapsto op, oid \mapsto [c \mapsto c, seq \mapsto cseq[c]], ctx \mapsto ds[c]]$ 
  IN  $c2ss' = [c2ss \text{ EXCEPT } ![c] =$ 
     $\quad @ \oplus [node \mapsto \{ds'[c]\},$ 
     $\quad \quad edge \mapsto \{[from \mapsto ds[c], to \mapsto ds'[c], cop \mapsto cop]\}]$ 
   $\wedge$  UNCHANGED s2ss

ClientPerformImpl(c, m)  $\triangleq$ 
   $\wedge$  LET xform  $\triangleq xFormCopCopsShift(m.cop, cbuf[c], m.ack)$  [xcop, xss, lss]
  IN  $c2ss' = [c2ss \text{ EXCEPT } ![c] = @ \oplus xform.xss]$ 
   $\wedge$  UNCHANGED s2ss

ServerPerformImpl(m)  $\triangleq$ 
   $\wedge$  LET c  $\triangleq \textit{ClientOf}(m.cop)$ 
   $\quad xform \triangleq xFormCopCopsShift(m.cop, sbuf[c], m.ack)$  [xcop, xss, lss]
  IN  $s2ss' = [cl \in \textit{Client} \mapsto \text{IF } cl = c \text{ THEN } s2ss[cl] \oplus xform.xss$ 
     $\quad \quad \quad \text{ELSE } s2ss[cl] \oplus xform.lss]$ 
   $\wedge$  UNCHANGED c2ss
|-----|
DoImpl(c)  $\triangleq$ 
   $\wedge$  DoCtx(c)
   $\wedge$  DoInt(DoOpImpl, c) TODO: refactor to use DoEx(c); cannot use two DoInt
   $\wedge$  UNCHANGED  $\langle sbuf, src \rangle$ 

RevImpl(c)  $\triangleq$ 
   $\wedge$  RevEx(c)
   $\wedge$  RevInt(ClientPerformImpl, c)

SRevImpl  $\triangleq$ 
   $\wedge$  SRevEx

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$$\wedge SRevInt(ServerPerformImpl)$$

$$NextImpl \triangleq$$

$$\vee \exists c \in Client : DoImpl(c) \vee RevImpl(c)$$

$$\vee SRevImpl$$

$$FairnessImpl \triangleq$$

$$WF_{varsImpl}(SRevImpl \vee \exists c \in Client : RevImpl(c))$$

$$SpecImpl \triangleq InitImpl \wedge \Box[NextImpl]_{varsImpl} \wedge FairnessImpl$$

$$XJ \triangleq \text{INSTANCE } XJupiter \text{ WITH } Msg \leftarrow Cop,$$

$$cincoming \leftarrow cincomingXJ, sincoming \leftarrow sincomingXJ$$

THEOREM $SpecImpl \Rightarrow XJ!Spec$

\ * Modification History
\ * Last modified Sat Jan 19 10:54:42 CST 2019 by anonymous
\ * Created Sat Dec 29 18:36:51 CST 2018 by anonymous