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1  |----- MODULE AJupiterImplXJupiter -----|
2  EXTENDS AJupiterExtended, GraphStateSpace
3  |-----|
4  VARIABLES c2ss, s2ss

6  varsImpl  $\triangleq$   $\langle \textit{varsEx}, c2ss, s2ss \rangle$ 
7  |-----|
8  TypeOKImpl  $\triangleq$ 
9     $\wedge$  TypeOKEx
10    $\wedge \forall c \in \textit{Client} : \textit{IsSS}(c2ss[c]) \wedge \textit{IsSS}(s2ss[c])$ 

12 InitImpl  $\triangleq$ 
13    $\wedge$  InitEx
14    $\wedge c2ss = [c \in \textit{Client} \mapsto \textit{EmptySS}]$ 
15    $\wedge s2ss = [c \in \textit{Client} \mapsto \textit{EmptySS}]$ 
16 |-----|
17 DoOpImpl(c, op)  $\triangleq$ 
18    $\wedge$  DoOpEx(c, op)
19    $\wedge$  LET cop  $\triangleq$  [op  $\mapsto$  op, oid  $\mapsto$  [c  $\mapsto$  c, seq  $\mapsto$  cseq[c], ctx  $\mapsto$  ds[c]]
20   IN   c2ss' = [c2ss EXCEPT ![c] =
21            $\textcircled{\text{@}} \oplus [\textit{node} \mapsto \{ds'[c]\},$ 
22            $\textit{edge} \mapsto \{[from \mapsto ds[c], to \mapsto ds'[c], cop \mapsto cop]\}]$ 
23    $\wedge$  UNCHANGED s2ss

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

30 ServerPerformImpl(m)  $\triangleq$ 
31    $\wedge$  LET c  $\triangleq$  ClientOf(m.cop)
32    $\wedge$  xform  $\triangleq$  xFormCopCopsShift(m.cop, sbuf[c], m.ack) [xcop, xss, lss]
33   IN   s2ss' = [cl  $\in$  Client  $\mapsto$  IF cl = c THEN s2ss[cl]  $\oplus$  xform.xss
34           ELSE s2ss[cl]  $\oplus$  xform.lss]
35    $\wedge$  UNCHANGED c2ss
36 |-----|
37 DoImpl(c)  $\triangleq$ 
38    $\wedge$  DoCtx(c)
39    $\wedge$  DoInt(DoOpImpl, c) [TODO: refactor to use DoEx(c); cannot use two DoInt]
40    $\wedge$  UNCHANGED  $\langle \textit{sbuf}, \textit{srec} \rangle$ 

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

46 SRevImpl  $\triangleq$ 
47    $\wedge$  SRevEx

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48       $\wedge SRevInt(ServerPerformImpl)$ 
49  |-----|
50   $NextImpl \triangleq$ 
51       $\vee \exists c \in Client : DoImpl(c) \vee RevImpl(c)$ 
52       $\vee SRevImpl$ 
54   $FairnessImpl \triangleq$ 
55       $WF_{varsImpl}(SRevImpl \vee \exists c \in Client : RevImpl(c))$ 
57   $SpecImpl \triangleq InitImpl \wedge \Box[NextImpl]_{varsImpl} \wedge FairnessImpl$ 
58  |-----|
59   $XJ \triangleq$  INSTANCE  $XJupiter$  WITH  $Msg \leftarrow Cop,$ 
60       $cincoming \leftarrow cincomingXJ, sincoming \leftarrow sincomingXJ$ 
62  THEOREM  $SpecImpl \Rightarrow XJ!Spec$ 
63  |-----|
    \ * Modification History
    \ * Last modified Sat Jan 19 10:54:42 CST 2019 by hengxin
    \ * Created Sat Dec 29 18:36:51 CST 2018 by hengxin

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