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1  ---------- MODULE AJupiterImplXJupiter ----------
   We show that AJupiter (specifically, AJupiterExtended) implements XJupiter.
5  EXTENDS AJupiterExtended, StateSpace
6  ----------
7  VARIABLES c2ss, s2ss

9  varsImpl ≜ ⟨varsEx, c2ss, s2ss⟩
10 ----------
11 TypeOKImpl ≜
12     ∧ TypeOKEx
13     ∧ ∀ c ∈ Client : IsSS(c2ss[c]) ∧ IsSS(s2ss[c])
14 ----------
15 InitImpl ≜
16     ∧ InitEx
17     ∧ c2ss = [c ∈ Client ↦ EmptySS]
18     ∧ s2ss = [c ∈ Client ↦ EmptySS]
19 ----------
20 DoOpImpl(c, op) ≜
21     ∧ DoOpEx(c, op)
22     ∧ LET cop ≜ [op ↦ op, oid ↦ [c ↦ c, seq ↦ cseq'[c]], ctx ↦ ds[c]]
23       IN   c2ss' = [c2ss EXCEPT ![c] =
24                          @ ⊕ [node ↦ {ds'[c]},
25                               edge ↦ {[from ↦ ds[c], to ↦ ds'[c], cop ↦ cop]}]]
26     ∧ UNCHANGED s2ss

28 DoImpl(c) ≜
29     ∧ DoCtx(c)
30     ∧ DoInt(DoOpImpl, c)  TODO: refactor to use DoEx(c)
31     ∧ UNCHANGED ⟨sbuf, srec⟩

33 RevImpl(c) ≜
34     ∧   RevEx(c)
35     ∧   LET m ≜ Head(cincoming[c])
36             cBuf ≜ cbuf[c]
37             cShiftedBuf ≜ SubSeq(cBuf, m.ack + 1, Len(cBuf))
38              xform ≜ xFormCopCopsSS(m.cop, cShiftedBuf)  [lss, xss]
39         IN   c2ss' = [c2ss EXCEPT ![c] = @ ⊕ xform.xss]
40     ∧   UNCHANGED s2ss

42 SRevImpl ≜
43     ∧ SRevEx
44     ∧ LET m ≜ Head(sincoming)
45           c ≜ ClientOf(m.cop)
46           cBuf ≜ sbuf[c]
47           cShiftedBuf ≜ SubSeq(cBuf, m.ack + 1, Len(cBuf))
48            xform ≜ xFormCopCopsSS(m.cop, cShiftedBuf)  [lss, xss]
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        IN   s2ss' = [cl ∈ Client ↦
                        IF cl = c THEN s2ss[cl] ⊕ xform.xss ELSE s2ss[cl] ⊕ xform.lss]
    ∧ UNCHANGED c2ss
----------------------------------------------------------------------------
NextImpl ≜
    ∨ ∃ c ∈ Client : DoImpl(c) ∨ RevImpl(c)
    ∨ SRevImpl

FairnessImpl ≜
    WF_varsImpl(SRevImpl ∨ ∃ c ∈ Client : RevImpl(c))

SpecImpl ≜ InitImpl ∧ □[NextImpl]_varsImpl ∧ FairnessImpl
----------------------------------------------------------------------------
XJ ≜ INSTANCE XJupiter WITH
            cincoming ← cincomingXJ, sincoming ← sincomingXJ

THEOREM SpecImpl ⇒ XJ!Spec
============================================================================
\* Modification History
\* Last modified Mon Dec 31 21:24:30 CST 2018 by hengxin
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