1 ─────────────────────────── MODULE *JupiterSerial* ───────────────────────────

This module contains definitions and operators for *Jupiter* protocols, *i.e.*, *AbsJupiter* and *CJupiter*, which utilizes the serialization order at the *Server* to guide *OTs*.

7 EXTENDS *JupiterCtx*

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tb: Is *cop1* totally ordered before *cop2*? This can be determined according to the serial view (*sv*) of any replica.

13 $tb(cop1, cop2, sv) \triangleq$
14   LET $pos1 \triangleq FirstIndexOfElementSafe(sv, cop1)$
15          $pos2 \triangleq FirstIndexOfElementSafe(sv, cop2)$
16   IN IF $pos1 \neq 0 \land pos2 \neq 0$ at the server or both are remote operations
17   THEN $pos1 < pos2$
18   ELSE IF $pos1 = 0 \land pos2 = 0$ at a client: both are local operations (not happen in *CJupiter*)
19   THEN $cop1.seq < cop2.seq$
20   ELSE $pos1 \neq 0$ at a client: one is a remote operation and the other is a local operation

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22 VARIABLES
23   *serial*,   *serial[r]*: the serial view of replica $r \in Replica$ about the server
24   *cincomingSerial*, *sincomingSerial*

26 $serialVars \triangleq \langle serial, cincomingSerial, sincomingSerial \rangle$
27 $commSerial \triangleq$ INSTANCE *CSComm* WITH $Msg \leftarrow Seq(Oid)$,
28                      $cincoming \leftarrow cincomingSerial, sincoming \leftarrow sincomingSerial$

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30 $TypeOKSerial \triangleq$
31      $\land serial \in [Replica \rightarrow Seq(Oid)]$
32      $\land commSerial!TypeOK$

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34 $InitSerial \triangleq$
35      $\land serial = [r \in Replica \mapsto \langle\rangle]$
36      $\land commSerial!Init$

38 $DoSerial(c) \triangleq$
39   UNCHANGED $\langle serialVars \rangle$

41 $RevSerial(c) \triangleq$
42      $\land commSerial!CRev(c)$
43      $\land serial' = [serial$ EXCEPT $![c] = Head(cincomingSerial[c])]$

45 $SRevSerial \triangleq$
46      $\land$ LET $cop \triangleq Head(sincoming)$
47   IN $\land serial' = [serial$ EXCEPT $![Server] = Append(@, cop.oid)]$
48              $\land commSerial!SSendSame(cop.oid.c, serial'[Server])$
49      $\land$ UNCHANGED $\langle sincomingSerial \rangle$

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\ * Modification History

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