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1 |----- MODULE JupiterCtx -----|
  |Definitions for context-based Jupiter protocols, including AbsJupiter, CJupiter, and XJupiter.|
5 | EXTENDS JupiterInterface, OT |
6 |-----|
7 | VARIABLES
8   cseq,   cseq[c]: local sequence number at client c ∈ Client
9   ds      ds[r]: document state (i.e., a set of Oids) of replica r ∈ Replica

11  ctxVars ≜ ⟨cseq, ds⟩
12 |-----|
13  Oid ≜ [c : Client, seq : Nat]   operation identifier

15  Oop ≜ [op : Op ∪ {Nop}, oid : Oid]   operation identified by oid
16  OOT(loop, roop) ≜   OT of loop ∈ Oop against roop ∈ Oop
17    [loop EXCEPT !.op = OT(loop.op, roop.op)]

19  Cop ≜ [op : Op ∪ {Nop}, oid : Oid, ctx : SUBSET Oid]   context-based op
20  ClientOf(cop) ≜ cop.oid.c
21  COT(lcop, rcop) ≜   OT of lcop ∈ Cop against rcop ∈ Cop
22    [lcop EXCEPT !.op = OT(lcop.op, rcop.op), !.ctx = @ ∪ {rcop.oid}]

24  UpdateDS(r, oid) ≜   update ds[r] to include new oid ∈ Oid
25    ds' = [ds EXCEPT ![r] = @ ∪ {oid}]
26 |-----|
27  TypeOKCtx ≜
28    ∧ cseq ∈ [Client → Nat]
29    ∧ ds ∈ [Replica → SUBSET Oid]

31  InitCtx ≜
32    ∧ cseq = [c ∈ Client ↦ 1]
33    ∧ ds = [r ∈ Replica ↦ {}]

35  DoCtx(c) ≜
36    ∧ cseq' = [cseq EXCEPT ![c] = @ + 1]
37    ∧ UpdateDS(c, [c ↦ c, seq ↦ cseq[c])   oid for newly generated operation

39  RevCtx(c) ≜
40    ∧ UNCHANGED cseq
41    ∧ UpdateDS(c, Head(cincoming[c]).oid)

43  SRevCtx ≜
44    ∧ UNCHANGED cseq
45    ∧ UpdateDS(Server, Head(sincoming).oid)
46 |-----|

  \ * Modification History
  \ * Last modified Mon Feb 25 21:26:20 CST 2019 by hengxin
  \ * Created Wed Dec 05 20:03:50 CST 2018 by hengxin

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