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1  |----- MODULE XJupiterExtended -----|
   | XJupiter extended with serial views. This is used to show that XJupiter implements CJupiter. |
6  | EXTENDS XJupiter |
7  |-----|
8  | VARIABLES |
   | Simulating the behavior of propagating original operations in CJupiter. |
12 |   cincomingCJ,   cincoming for CJupiter which contains original operations |
13 |                   instead of transformed ones in XJupiter |
14 |   sincomingCJ,   (not used) |
   | For edge ordering in CSS. |
18 |   serial,   serial[r]: the serial view of replica r ∈ Replica about the server |
19 |   cincomingSerial, cincomingSerial[c]: the serial view received by client c ∈ Client |
20 |                   from the Server |
21 |   sincomingSerial (not used) |
23 | commCJVars ≜ ⟨cincomingCJ, sincomingCJ⟩ |
24 | serialVars   ≜ ⟨serial, cincomingSerial, sincomingSerial⟩ |
25 | varsEx ≜ ⟨commCJVars, serialVars, vars⟩ |
26 |-----|
27 | commCJ ≜ INSTANCE CSComm WITH Msg ← Seq(Cop), |
28 |                   cincoming ← cincomingCJ, sincoming ← sincomingCJ |
29 | commSerial ≜ INSTANCE CSComm WITH Msg ← Seq(Oid), |
30 |                   cincoming ← cincomingSerial, sincoming ← sincomingSerial |
31 |-----|
32 | TypeOKEx ≜ |
33 |   ∧ TypeOK |
34 |   ∧ commCJ! TypeOK |
35 |   ∧ serial ∈ [Replica → Seq(Oid)] |
36 |   ∧ commSerial! TypeOK |
37 |-----|
38 | InitEx ≜ |
39 |   ∧ Init |
40 |   ∧ commCJ! Init |
41 |   ∧ serial = [r ∈ Replica ↦ ⟨⟩] |
42 |   ∧ commSerial! Init |
43 |-----|
44 | DoEx(c) ≜ |
45 |   ∧ Do(c) |
46 |   ∧ UNCHANGED ⟨commCJVars, serialVars⟩ |
48 | RevEx(c) ≜ |
49 |   ∧ Rev(c) |
50 |   ∧ commCJ! CRev(c) |
51 |   ∧ commSerial! CRev(c) |
52 |   ∧ serial' = [serial EXCEPT ![c] = Head(cincomingSerial[c])] |

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54  $SRevEx \triangleq$ 
55    $\wedge SRev$ 
56    $\wedge \text{LET } cop \triangleq Head(sincoming)$ 
57      $c \triangleq cop.oid.c$ 
58      $\text{IN } \wedge commCJ!SSendSame(c, cop)$ 
59        $\wedge serial' = [serial \text{ EXCEPT } ![Server] = Append(@, cop.oid)]$ 
60        $\wedge commSerial!SSendSame(c, serial'[Server])$ 
61    $\wedge \text{UNCHANGED } \langle sincomingCJ, sincomingSerial \rangle$ 
62 ───────────────────────────────────────────────────────────────────────────────────┐
63  $NextEx \triangleq$ 
64    $\vee \exists c \in Client : DoEx(c) \vee RevEx(c)$ 
65    $\vee SRevEx$ 
67  $SpecEx \triangleq InitEx \wedge \Box [NextEx]_{varsEx}$ 
68    $\wedge \text{WF}_{varsEx}(SRevEx \vee \exists c \in Client : RevEx(c))$ 
69 ───────────────────────────────────────────────────────────────────────────────────┘
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