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1  |----- MODULE XJupiterImplCJupiter -----|
   | We show that XJupiter (XJupiterExtended) implements CJupiter. |
5  | EXTENDS XJupiterExtended |
6  |-----|
7  VARIABLES
8      op2ss,    a function from an operation (represented by its Oid)
9                  to the part of 2D state space produced while the operation is transformed
10     c2ssX      c2ssX[c]: redundant (eXtra) 2D state space maintained for client c ∈ Client

12  varsImpl  $\triangleq$   $\langle \textit{varsEx}, \textit{op2ss}, \textit{c2ssX} \rangle$ 
13  |-----|
14  TypeOKImpl  $\triangleq$ 
15       $\wedge$  TypeOKEx
16       $\wedge \forall \textit{oid} \in \text{DOMAIN } \textit{op2ss} : \textit{oid} \in \textit{Oid} \wedge \textit{IsSS}(\textit{op2ss}[\textit{oid}])$ 
17       $\wedge \forall c \in \textit{Client} : \textit{IsSS}(\textit{c2ssX}[c])$ 

19  InitImpl  $\triangleq$ 
20       $\wedge$  InitEx
21       $\wedge \textit{op2ss} = \langle \rangle$ 
22       $\wedge \textit{c2ssX} = [c \in \textit{Client} \mapsto \textit{EmptyGraph}]$ 

24  DoImpl(c)  $\triangleq$ 
25       $\wedge$  DoEx(c)
26       $\wedge$  UNCHANGED  $\langle \textit{op2ss}, \textit{c2ssX} \rangle$ 

28  RevImpl(c)  $\triangleq$ 
29       $\wedge$  RevEx(c)
30       $\wedge$  LET cop  $\triangleq$  Head(cincoming[c])
31          IN  $\textit{c2ssX}' = [\textit{c2ssX} \text{ EXCEPT } ![c] = @ \oplus \textit{op2ss}[\textit{cop.oid}]]$ 
32       $\wedge$  UNCHANGED op2ss

34  SRevImpl  $\triangleq$ 
35       $\wedge$  SRevEx
36       $\wedge$  LET cop  $\triangleq$  Head(sincoming)
37          c  $\triangleq$  ClientOf(cop)
38          xform  $\triangleq$  xForm(cop, s2ss[c], ds[Server])  TODO: performance!!!
39          ss  $\triangleq$  xform.xss
40          IN  $\textit{op2ss}' = \textit{op2ss} @ @ (\textit{cop.oid} \rightarrow [\textit{node} \mapsto \textit{ss.node}, \textit{edge} \mapsto \textit{ss.edge}])$ 
41       $\wedge$  UNCHANGED c2ssX
42  |-----|
43  NextImpl  $\triangleq$ 
44       $\vee \exists c \in \textit{Client} : \textit{DoImpl}(c) \vee \textit{RevImpl}(c)$ 
45       $\vee$  SRevImpl

47  FairnessImpl  $\triangleq$ 
48       $\wedge \text{WF}_{\textit{varsImpl}}(\textit{SRevImpl} \vee \exists c \in \textit{Client} : \textit{RevImpl}(c))$ 

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50  $SpecImpl \triangleq InitImpl \wedge \Box[NextImpl]_{varsImpl} \wedge FairnessImpl$ 
51 |
52  $CJ \triangleq$  INSTANCE  $CJupiter$ 
53     WITH  $cincoming \leftarrow cincomingCJ$ ,  $sincoming$  needs no substitution
54      $css \leftarrow [r \in Replica \mapsto$ 
55         IF  $r = Server$ 
56         THEN  $SetReduce(\oplus, Range(s2ss), EmptyGraph)$ 
57         ELSE  $c2ss[r] \oplus c2ssX[r]$ 
58
59 THEOREM  $SpecImpl \Rightarrow CJ!Spec$ 
60 |
    \ * Modification History
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