MODULE *XJupiterImplCJupiter*

EXTENDS *XJupiterExtended* — *XJupiter* extended with *JupiterSerial*

VARIABLES

*op2ss*, — a function mapping an operation (identifier) to the 2*D* state space created during it is transformed

*c2ssX* — *c2ssX*[*c*]: redundant (*eXtra*) 2*D* state space maintained for client $c \in Client$

$varsImpl \triangleq \langle varsEx,\ op2ss,\ c2ssX \rangle$

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$TypeOKImpl \triangleq$
$\quad \land\ TypeOKEx$
$\quad \land\ \forall\, oid \in \text{DOMAIN}\ op2ss : oid \in Oid \land IsSS(op2ss[oid])$
$\quad \land\ \forall\, c \in Client : IsSS(c2ssX[c])$

$InitImpl \triangleq$
$\quad \land\ InitEx$
$\quad \land\ op2ss = \langle\rangle$
$\quad \land\ c2ssX = [c \in Client \mapsto EmptySS]$

$DoImpl(c) \triangleq$
$\quad \land\ DoEx(c)$
$\quad \land\ \text{UNCHANGED}\ \langle op2ss,\ c2ssX \rangle$

$RevImpl(c) \triangleq$
$\quad \land\ \ RevEx(c)$
$\quad \land\ \ \text{LET}\ cop \triangleq Head(cincoming[c])$
$\qquad \text{IN}\ \ c2ssX' = [c2ssX\ \text{EXCEPT}\ ![c] = @ \oplus op2ss[cop.oid]]$
$\quad \land\ \ \text{UNCHANGED}\ op2ss$

$SRevImpl \triangleq$
$\quad \land\ SRevEx$
$\quad \land\ \text{LET}\ cop \triangleq Head(sincoming)$
$\qquad\qquad c \triangleq ClientOf(cop)$
$\qquad\ xform \triangleq xForm(NextEdge,\ Server,\ cop,\ s2ss[c])$ — *TODO*: performance!!!
$\qquad \text{IN}\ \ op2ss' = op2ss\ @@\ cop.oid :> xform.xss$
$\quad \land\ \text{UNCHANGED}\ c2ssX$

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$NextImpl \triangleq$
$\quad \lor\ \exists\, c \in Client : DoImpl(c) \lor RevImpl(c)$
$\quad \lor\ SRevImpl$

$FairnessImpl \triangleq$
$\quad \text{WF}_{varsImpl}(SRevImpl \lor \exists\, c \in Client : RevImpl(c))$

$SpecImpl \triangleq InitImpl \land \Box[NextImpl]_{varsImpl}$ — $\land\ FairnessImpl$

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$CJ \triangleq$ INSTANCE $CJupiter$
WITH $cincoming \leftarrow cincomingCJ$, *sincoming* needs no substitution
$css \leftarrow [r \in Replica \mapsto$ IF $r = Server$
THEN $SetReduce(\oplus, Range(s2ss), EmptySS)$
ELSE $c2ss[r] \oplus c2ssX[r]]$

THEOREM $SpecImpl \Rightarrow CJ!Spec$

* Modification History
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