
MODULE *JupiterCtx*

Definitions for context-based *Jupiter* protocols, including *AbsJupiter*, *CJupiter*, and *XJupiter*.
EXTENDS *JupiterInterface*, *OT*

VARIABLES

cseq, *cseq*[*c*]: local sequence number at client *c* ∈ *Client*
ds *ds*[*r*]: document state (*i.e.*, a set of *Oids*) of replica *r* ∈ *Replica*

ctxVars $\triangleq \langle cseq, ds \rangle$

Oid $\triangleq [c : Client, seq : Nat]$ operation identifier
Cop $\triangleq [op : Op \cup \{Nop\}, oid : Oid, ctx : SUBSET\ Oid]$ context-based *op*

ClientOf(*cop*) $\triangleq cop.oid.c$

COT(*lcop*, *rcop*) \triangleq OT of *lcop* ∈ *Cop* against *rcop* ∈ *Cop*
 $[lcop\ \text{EXCEPT}\ !.op = OT(lcop.op, rcop.op), !.ctx = @ \cup \{rcop.oid\}]$

UpdateDS(*r*, *oid*) \triangleq update *ds*[*r*] to include new *oid* ∈ *Oid*
 $ds' = [ds\ \text{EXCEPT}\ ![r] = @ \cup \{oid\}]$

TypeOKCtx \triangleq
 $\wedge cseq \in [Client \rightarrow Nat]$
 $\wedge ds \in [Replica \rightarrow SUBSET\ Oid]$

InitCtx \triangleq
 $\wedge cseq = [c \in Client \mapsto 1]$
 $\wedge ds = [r \in Replica \mapsto \{\}]$

DoCtx(*c*) \triangleq
 $\wedge cseq' = [cseq\ \text{EXCEPT}\ ![c] = @ + 1]$
 $\wedge UpdateDS(c, [c \mapsto c, seq \mapsto cseq[c]])$ *oid* for newly generated operation

RevCtx(*c*) \triangleq
 $\wedge UNCHANGED\ cseq$
 $\wedge UpdateDS(c, Head(cincoming[c]).oid)$

SRevCtx \triangleq
 $\wedge UNCHANGED\ cseq$
 $\wedge UpdateDS(Server, Head(sincoming).oid)$

ClientConstraint \triangleq Each client generates at most 2 operations.
 $\forall c \in Client : cseq[c] \leq 3$

\ * Modification History
\ * Last modified *Tue Jan 29 10:11:36 CST 2019* by anonymous
\ * Created *Wed Dec 05 20:03:50 CST 2018* by anonymous