
MODULE *JupiterInterface*

Interface of a family of *Jupiter* protocols.

EXTENDS *Op*

VARIABLES

<i>aop</i> ,	<i>aop</i> [<i>r</i>]: the actual operation applied at replica <i>r</i> ∈ <i>Replica</i>
<i>state</i> ,	<i>state</i> [<i>r</i>]: state (the list content) of replica <i>r</i> ∈ <i>Replica</i>
<i>chins</i>	a set of chars allowed to insert; this is for model checking

intVars \triangleq $\langle aop, state, cincoming, sincoming, chins \rangle$

SetNewAop(*r*, *aopr*) \triangleq
 $aop' = [aop \text{ EXCEPT } ![r] = aopr]$

ApplyNewAop(*r*) \triangleq
 $state' = [state \text{ EXCEPT } ![r] = Apply(aop'[r], @)]$

TypeOKInt \triangleq
 $\wedge aop \in [Replica \rightarrow Op \cup \{Nop\}]$
 $\wedge state \in [Replica \rightarrow List]$
 $\wedge Comm!TypeOK$
 $\wedge chins \subseteq Char$

InitInt \triangleq
 $\wedge aop = [r \in Replica \mapsto Nop]$
 $\wedge state = [r \in Replica \mapsto InitState]$
 $\wedge Comm!Init$
 $\wedge chins = Char$

DoIns(*DoOp*(−, −), *c*) \triangleq Client *c* ∈ Client generates and processes an “*Ins*” operation.
 $\exists ins \in Ins :$
 $\wedge ins.pos \in 1 \dots (Len(state[c]) + 1)$
 $\wedge ins.ch \in chins$
 $\wedge ins.pr = Priority[c]$
 $\wedge DoOp(c, ins)$
 $\wedge chins' = chins \setminus \{ins.ch\}$ We assume that all inserted elements are unique.

DoDel(*DoOp*(−, −), *c*) \triangleq Client *c* ∈ Client generates and processes a “*Del*” operation.
 $\exists del \in Del :$
 $\wedge del.pos \in 1 \dots Len(state[c])$
 $\wedge DoOp(c, del)$
 $\wedge UNCHANGED chins$

DoInt(*DoOp*(−, −), *c*) \triangleq Client *c* ∈ Client generates an operation.
 $\wedge \vee DoIns(DoOp, c) \quad DoOp(c \in Client, op \in Op)$
 $\vee DoDel(DoOp, c)$

$\wedge \text{ApplyNewAop}(c)$
 $\text{RevInt}(\text{ClientPerform}(-, -), c) \triangleq \text{Client } c \in \text{Client receives and processes a message.}$
 $\wedge \text{Comm!CRev}(c)$
 $\wedge \text{ClientPerform}(c, \text{Head}(\text{cincoming}[c])) \text{ClientPerform}(c \in \text{Client}, m \in \text{Msg})$
 $\wedge \text{ApplyNewAop}(c)$
 $\wedge \text{UNCHANGED } \text{chins}$
 $\text{SRevInt}(\text{ServerPerform}(-)) \triangleq \text{The Server receives and processes a message.}$
 $\wedge \text{Comm!SRev}$
 $\wedge \text{ServerPerform}(\text{Head}(\text{sincoming})) \text{ServerPerform}(m \in \text{Msg})$
 $\wedge \text{ApplyNewAop}(\text{Server})$
 $\wedge \text{UNCHANGED } \text{chins}$

\ * Modification History
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