
MODULE *SEC*

EXTENDS *Naturals*, *CRDTInterface*

CONSTANTS *Read*(-) *Read*($r \in \text{Replica}$): the read operation at r

$UMsg \triangleq [aid : Aid, update : \text{SUBSET } Aid]$ *SEC* message type

VARIABLES

uset, *uset*[r]: set of updates at replica $r \in \text{Replica}$

uincoming *uincoming*[r]: incoming channel for updates at $r \in \text{Replica}$

SECTypeOK \triangleq

$\wedge \text{uset} \in [\text{Replica} \rightarrow \text{SUBSET } Aid]$

$\wedge \text{uincoming} \in [\text{Replica} \rightarrow \text{SUBSET } UMsg]$

SECInit \triangleq

$\wedge \text{uset} = [r \in \text{Replica} \mapsto \{\}]$

$\wedge \text{uincoming} = [r \in \text{Replica} \mapsto \{\}]$

SECDo(r) \triangleq

$\wedge \text{uset}' = [\text{uset} \text{ EXCEPT } ![r] = @ \cup \{[r \mapsto r, seq \mapsto seq[r]]\}]$

$\wedge \text{UNCHANGED } \langle \text{uincoming} \rangle$

SECSend \triangleq UNCHANGED $\langle \text{uset} \rangle$ implemented by *OpSEC* and *StateSEC*

SECDeliver(r, aid) \triangleq choose the *SEC* message m according to aid

$\wedge \text{LET } m \triangleq \text{CHOOSE } m \in \text{uincoming}[r] : m.aid = aid$ m is unique

IN $\text{uset}' = [\text{uset} \text{ EXCEPT } ![r] = @ \cup m.update]$

$\wedge \text{UNCHANGED } \langle \text{uincoming} \rangle$

SEC $\triangleq \forall r1, r2 \in \text{Replica} : \text{uset}[r1] = \text{uset}[r2] \Rightarrow \text{Read}(r1) = \text{Read}(r2)$

\ * Modification History

\ * Last modified *Tue Jun 18 12:22:30 CST 2019* by *xhdn*

\ * Last modified *Mon May 06 16:50:42 CST 2019* by *jjywellin*

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