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|----- MODULE SEC -----|
| EXTENDS Naturals, CRDTInterface |
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| CONSTANTS Read(-)  Read( $r \in \text{Replica}$ ): the read operation at  $r$  |
|  $UMsg \triangleq [aid : Aid, update : \text{SUBSET } Aid]$   SEC message type |
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| VARIABLES |
|   uset,           uset[ $r$ ]: the set of updates seen by replica  $r \in \text{Replica}$  |
|   uincoming      uincoming[ $r$ ]: incoming channel for broadcasting/delivering updates at  $r \in \text{Replica}$  |
|  $SECTypeOK \triangleq$  |
|    $\wedge \text{uset} \in [\text{Replica} \rightarrow \text{SUBSET } Aid]$  |
|    $\wedge \text{uincoming} \in [\text{Replica} \rightarrow \text{SUBSET } UMsg]$  |
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|  $SECInit \triangleq$  |
|    $\wedge \text{uset} = [r \in \text{Replica} \mapsto \{\}]$  |
|    $\wedge \text{uincoming} = [r \in \text{Replica} \mapsto \{\}]$  |
|  $SECD_o(r) \triangleq$  |
|    $\wedge \text{uset}' = [\text{uset} \text{ EXCEPT } ![r] = @ \cup \{[r \mapsto r, seq \mapsto seq[r]]\}]$  |
|    $\wedge \text{UNCHANGED } \langle \text{uincoming} \rangle$  |
|  $SECSend(r) \triangleq \text{UNCHANGED } \langle \text{uset} \rangle$   implemented by OpSEC and StateSEC |
|  $SECDeliver(r, aid) \triangleq$   choose the SEC message um according to aid |
|    $\wedge \text{LET } um \triangleq \text{CHOOSE } m \in \text{uincoming}[r] : m.aid = aid$   um is unique |
|   IN  $\text{uset}' = [\text{uset} \text{ EXCEPT } ![r] = @ \cup um.update]$  |
|    $\wedge \text{UNCHANGED } \langle \text{uincoming} \rangle$  |
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|  $SEC \triangleq \forall r1, r2 \in \text{Replica} : \text{uset}[r1] = \text{uset}[r2] \Rightarrow Read(r1) = Read(r2)$  |
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| * Modification History |
| * Last modified Wed Jun 26 13:23:02 CST 2019 by xhdn |
| * Last modified Mon May 06 16:50:42 CST 2019 by jjywellin |
| * Created Sun May 05 15:42:13 CST 2019 by jjywellin

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