

---

MODULE *Messaging*

---

LOCAL INSTANCE *Naturals*

LOCAL INSTANCE *Sequences*

LOCAL INSTANCE *FiniteSets*

LOCAL INSTANCE *TLC*

---

CONSTANT *Nil*

VARIABLES *conn*

---

*Connections*  $\triangleq \{conn[c] : c \in \text{DOMAIN } conn\}$

*Connect*(*n*, *m*)  $\triangleq$   
 $\wedge \text{LET } connId \triangleq \text{CHOOSE } i \in 1 \dots Cardinality(\text{DOMAIN } conn) : i \notin \text{DOMAIN } conn$   
 $\wedge conn' = conn @@ (connId' :> [id \mapsto connId', src \mapsto n, dst \mapsto m, msgs \mapsto \langle \rangle])$

*Disconnect*(*c*)  $\triangleq$   
 $\wedge conn' = [x \in \{y \in \text{DOMAIN } conn : y \neq c.id\} \mapsto conn[x]]$

*Send*(*c*, *m*)  $\triangleq$   
 $\wedge conn' = [conn \text{ EXCEPT } ![c.id] = [conn[c.id] \text{ EXCEPT } !.msgs = Append(conn[c.id].msgs, m)]]$

*Receive*(*c*)  $\triangleq$   
 $\wedge conn' = [conn \text{ EXCEPT } ![c.id] = [conn[c.id] \text{ EXCEPT } !.msgs = SubSeq(conn[c.id].msgs, 2, Len(conn[c.id].msgs))]]$

*Reply*(*c*, *m*)  $\triangleq$   
 $\wedge conn' = [conn \text{ EXCEPT } ![c.id] = [conn[c.id] \text{ EXCEPT } !.msgs = Append(SubSeq(conn[c.id].msgs, 2, Len(conn[c.id].msgs), m)]]$

*Handle*(*c*, *f*(-, -))  $\triangleq Len(c.msgs) > 0 \wedge f(c, c.msgs[1])$

---

*Init*  $\triangleq$   
 $\wedge conn = [c \in \{\} \mapsto [e2n \mapsto Nil, e2t \mapsto Nil, msgs \mapsto \langle \rangle]]$

*Next*  $\triangleq \exists c \in \text{DOMAIN } conn : Disconnect(c)$

---

\\* Modification History  
\\* Last modified *Thu Aug 12 17:18:32 PDT 2021* by *jordanhalterman*  
\\* Created *Tue Aug 10 05:35:32 PDT 2021* by *jordanhalterman*