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|----- MODULE SCTP -----|

LOCAL INSTANCE Naturals

LOCAL INSTANCE Sequences

LOCAL INSTANCE FiniteSets

LOCAL INSTANCE TLC

|-----|

CONSTANT Nil

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LOCAL Min(s)  $\triangleq$  CHOOSE  $x \in s : \forall y \in s : x \geq y$ 

LOCAL Max(s)  $\triangleq$  CHOOSE  $x \in s : \forall y \in s : x \leq y$ 

VARIABLE servers

VARIABLE conns

vars  $\triangleq$   $\langle servers, conns \rangle$ 

|----- MODULE Client -----|

Connect(c, s)  $\triangleq$ 
  LET maxId  $\triangleq$  Max(DOMAIN conns)
      connId  $\triangleq$  Min( $\{i \in 1..(maxId + 1) : i \notin \text{DOMAIN } conns\}$ )
  IN conns' = conns @@@ (connId :> [id  $\mapsto$  connId, src  $\mapsto$  c, dst  $\mapsto$  s, req  $\mapsto$   $\langle \rangle$ , res  $\mapsto$   $\langle \rangle$ ])

Disconnect(c)  $\triangleq$ 
  conns' = [ $x \in \text{DOMAIN } conns \setminus \{c.id\} \mapsto conns[x]$ ]

Send(c, m)  $\triangleq$ 
  conns' = [conns EXCEPT ![c.id] = [conns[c.id] EXCEPT !.req = Append(conns[c.id].req, m)]

Receive(c)  $\triangleq$ 
  conns' = [conns EXCEPT ![c.id] = [conns[c.id] EXCEPT !.res = SubSeq(conns[c.id].res, 2, Len(conns[c.id].res))]

Reply(c, m)  $\triangleq$ 
  conns' = [conns' EXCEPT ![c.id] = [conns'[c.id] EXCEPT !.req = Append(conns'[c.id].req, m)]

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

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Client  $\triangleq$  INSTANCE Client

Connections  $\triangleq$  {conns[c] : c  $\in$  DOMAIN conns}

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┌────────────────────────── MODULE Server ───────────────────────────┐

  Start(s)  $\triangleq$ 
     $\wedge$  servers' = servers  $\cup$  {s}
     $\wedge$  UNCHANGED  $\langle$ conns $\rangle$ 

  Stop(s)  $\triangleq$ 
     $\wedge$  servers' = servers  $\setminus$  {s}
     $\wedge$  conns' = [c  $\in$  DOMAIN conns  $\setminus$  {c  $\in$  conns : conns[c].dst  $\neq$  s}  $\mapsto$  conns[c]]

  Send(c, m)  $\triangleq$ 
    conns' = [conns EXCEPT ![c.id] = [conns[c.id] EXCEPT !.res = Append(conns[c.id].res, m)]]

  Receive(c)  $\triangleq$ 
    conns' = [conns EXCEPT ![c.id] = [conns[c.id] EXCEPT !.req = SubSeq(conns[c.id].req, 2, Len(conns[c.id].req)))]

  Reply(c, m)  $\triangleq$ 
    conns' = [conns' EXCEPT ![c.id] = [conns'[c.id] EXCEPT !.res = Append(conns'[c.id].res, m)]]

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

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Servers  $\triangleq$  servers

Server  $\triangleq$  INSTANCE Server

Init  $\triangleq$ 
   $\wedge$  servers = {}
   $\wedge$  conns = [c  $\in$  {}]  $\mapsto$  [e2n  $\mapsto$  Nil, e2t  $\mapsto$  Nil, req  $\mapsto$   $\langle \rangle$ , res  $\mapsto$   $\langle \rangle$ ]

Next  $\triangleq$ 
   $\vee$   $\wedge$  FALSE
   $\wedge$  UNCHANGED  $\langle$ servers, conns $\rangle$ 

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\ * Modification History
\ * Last modified Sat Aug 14 12:16:08 PDT 2021 by jordanhalterman
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