─────────────────── MODULE $E2Node$ ───────────────────

LOCAL INSTANCE $Naturals$

LOCAL INSTANCE $Sequences$

LOCAL INSTANCE $FiniteSets$

LOCAL INSTANCE TLC

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An empty value
CONSTANT Nil

Node states
CONSTANT $Stopped,\ Started$

The $E2$ node identifier
CONSTANT $E2Node$

A set of RIC node identifiers
CONSTANT RIC

ASSUME $\land\ IsFiniteSet(RIC)$
$\land\ \forall\, n \in RIC : n \in$ STRING

The state of the $E2$ node
VARIABLE $state$

The state of the network
VARIABLE $network$

The state of $E2AP$ connections
VARIABLE $conns$

Subscriptions
VARIABLE $subs$

$vars \triangleq \langle state,\ network,\ conns,\ subs \rangle$

LOCAL $E2AP \triangleq$ INSTANCE $E2AP$ WITH $conns \leftarrow network$

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$StartNode \triangleq$
$\quad \land\ state = Stopped$
$\quad \land\ state' = Started$
$\quad \land$ UNCHANGED $\langle network,\ conns,\ subs \rangle$

$StopNode \triangleq$

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$\land state = Started$
$\land state' = Stopped$
$\land$ UNCHANGED $\langle network,\ conns,\ subs \rangle$

$SendE2SetupRequest(conn) \triangleq$
    $\land$ UNCHANGED $\langle conns,\ subs \rangle$

$HandleE2SetupResponse(conn,\ res) \triangleq$
    $\land E2AP\,!\,Client(E2Node)\,!\,Receive\,!\,E2SetupResponse(conn,\ res)$
    $\land$ UNCHANGED $\langle conns,\ subs \rangle$

$HandleRICSubscriptionRequest(conn,\ req) \triangleq$
    $\land E2AP\,!\,Client(E2Node)\,!\,Receive\,!\,RICSubscriptionRequest(conn,\ req)$
    $\land$ UNCHANGED $\langle conns,\ subs \rangle$

$HandleRICSubscriptionDeleteRequest(conn,\ req) \triangleq$
    $\land E2AP\,!\,Client(E2Node)\,!\,Receive\,!\,RICSubscriptionDeleteRequest(conn,\ req)$
    $\land$ UNCHANGED $\langle conns,\ subs \rangle$

$HandleRICControlRequest(conn,\ req) \triangleq$
    $\land E2AP\,!\,Client(E2Node)\,!\,Receive\,!\,RICControlRequest(conn,\ req)$
    $\land E2AP\,!\,Client(E2Node)\,!\,Reply\,!\,RICControlAcknowledge(conn,\ [foo \mapsto \text{``bar''},\ bar \mapsto \text{``baz''}])$
    $\land$ UNCHANGED $\langle conns,\ subs \rangle$

$HandleE2ConnectionUpdate(conn,\ req) \triangleq$
    $\land E2AP\,!\,Client(E2Node)\,!\,Receive\,!\,E2ConnectionUpdate(conn,\ req)$
    $\land$ UNCHANGED $\langle subs \rangle$

$HandleE2NodeConfigurationUpdateAcknowledge(conn,\ res) \triangleq$
    $\land E2AP\,!\,Client(E2Node)\,!\,Receive\,!\,E2NodeConfigurationUpdateAcknowledge(conn,\ res)$
    $\land$ UNCHANGED $\langle subs \rangle$

$HandleRequest(c) \triangleq$
    $\land \lor E2AP\,!\,Client(E2Node)\,!\,Handle\,!\,RICSubscriptionRequest(c,\ HandleRICSubscriptionRequest)$
        $\lor E2AP\,!\,Client(E2Node)\,!\,Handle\,!\,RICSubscriptionDeleteRequest(c,\ HandleRICSubscriptionDeleteRequ$
        $\lor E2AP\,!\,Client(E2Node)\,!\,Handle\,!\,RICControlRequest(c,\ HandleRICControlRequest)$
        $\lor E2AP\,!\,Client(E2Node)\,!\,Handle\,!\,E2ConnectionUpdate(c,\ HandleE2ConnectionUpdate)$
        $\lor E2AP\,!\,Client(E2Node)\,!\,Handle\,!\,E2NodeConfigurationUpdateAcknowledge(c,\ HandleE2NodeConfigura$
    $\land$ UNCHANGED $\langle state \rangle$

$Init \triangleq$
    $\land E2AP\,!\,Init$
    $\land state\ = Stopped$
    $\land conns = [c \in \{\} \mapsto Nil]$

$$\land subs = [i \in \{\} \mapsto [id \mapsto Nil]]$$

$Next \triangleq$
  $\lor StartNode$
  $\lor StopNode$
  $\lor \exists\, node \in RIC : E2AP\,!\,Client(E2Node)\,!\,Connect(node)$
  $\lor \exists\, conn \in E2AP\,!\,Client(E2Node)\,!\,Connections : E2AP\,!\,Client(E2Node)\,!\,Disconnect(conn)$
  $\lor \exists\, conn \in E2AP\,!\,Client(E2Node)\,!\,Connections : SendE2SetupRequest(conn)$
  $\lor \exists\, conn \in E2AP\,!\,Client(E2Node)\,!\,Connections : HandleRequest(conn)$

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