
MODULE *Node*

EXTENDS *Naturals*, *Reals*

CONSTANTS *Sensor*, *Actuator*, *Gateway*, *BaseStation*

Types $\triangleq \{\text{Sensor}, \text{Actuator}, \text{Gateway}, \text{BaseStation}\}$

Mode $\triangleq \{\text{"Active"}, \text{"Inactive"}\}$

Connectivity $\triangleq \{\text{"Connected"}, \text{"NotConnected"}\}$

DataRecord(type) returns a record whose fields depend on the node type.

DataRecord(type) \triangleq

IF *type* = *Sensor* THEN

[SnSensedDisaster \mapsto BOOLEAN ,
SnTransmittedDInfo \mapsto BOOLEAN]

ELSE IF *type* = *Gateway* THEN

[GwReceivedDInfo \mapsto BOOLEAN ,
GwRelayedDInfoToBS \mapsto BOOLEAN ,
GwRelayedDInfoToActuator \mapsto BOOLEAN]

ELSE IF *type* = *BaseStation* THEN

[BsReceivedDData \mapsto BOOLEAN ,
BsBroadcastDInfo \mapsto BOOLEAN]

ELSE

Actuator (or any other case)
[ActuatorReceivedDInfo \mapsto BOOLEAN]

Node(n,.nodeType) returns a node record for node id *n* and type *nodeType*. *nodeType* should be one of the constants: *Sensor*, *Actuator*, *Gateway*, *BaseStation*.

Node(n,.nodeType) \triangleq

[NodeID \mapsto *n*,
NodeType \mapsto *nodeType*,
NMode \mapsto CHOOSE *mode* \in *Mode* : TRUE,
NConnectivity \mapsto CHOOSE *con* \in *Connectivity* : TRUE,
DData \mapsto *DataRecord(nodeType)*

]
