MODULE *Channel*

EXTENDS *Naturals*

CONSTANT *Data*

VARIABLES *chan*

Records can also be viewed as functions with their fields specifying their domain

$$TypeInvariant \triangleq chan \in [val : Data,\ rdy : \{0, 1\},\ ack : \{0, 1\}]$$

$$\begin{aligned} Init \triangleq\ & \land TypeInvariant \\ & \land chan.ack = chan.rdy \end{aligned}$$ same notation as *chan*[“*rdy*”]

Definition of an action begins with its enabling *step.a*

$$\begin{aligned} Send(d) \triangleq\ & \land chan.rdy = chan.ack \\ & \land chan' = [chan\ \text{EXCEPT}\ !.val = d,\ !.rdy = 1 - @] \end{aligned}$$

Another way to define $chan' \land chan' = [val \mapsto d,\ rdy \mapsto 1 - chan.rdy,\ ack \mapsto chan.ack]$

$$\begin{aligned} Rcv \triangleq\ & \land chan.rdy \neq chan.ack \\ & \land chan' = [chan\ \text{EXCEPT}\ !.ack = 1 - @] \end{aligned}$$ the same as $[chan\ \ \text{EXCEPT}\ !\text{“}ack\text{”}\ = 1 -\ @]$

$$Next \triangleq (\exists\, d \in Data : Send(d)) \lor Rcv$$

$$Spec \triangleq Init \land \quad \Box[Next]_{chan}$$

THEOREM $Spec \Rightarrow \Box\, TypeInvariant$

\* Modification History
\* Last modified *Tue Jun* 04 20:07:37 *CEST* 2019 by *Naxxo*
\* Created *Thu Feb* 21 12:22:06 *CET* 2019 by *Naxxo*