──────────────── MODULE $P2PBroadcastSpec$ ────────────────

EXTENDS $Naturals$, $Sequences$

CONSTANT
  $Proc$, Set of processes
  $Data$

VARIABLES
  $sent$, All messages sent
  $received$ All messges received

───

$vars \triangleq \langle sent, received \rangle$

$Message \triangleq [from : Proc, data : Data]$

$Init \triangleq \land sent = \langle\rangle$
$\quad\quad\quad \land received \quad = [m \in Message \mapsto \{\}]$

$TypeOK \triangleq \quad \land sent \in Seq(Message)$
$\quad\quad\quad\quad \land received \in [Message \rightarrow \text{SUBSET } Proc]$

───

$Send \triangleq \land \exists\, m \in Message : sent' = Append(sent, m)$ Always enabled
$\quad\quad\quad \land \text{UNCHANGED } \langle received \rangle$

$Recv(m) \triangleq \quad \land sent \neq \langle\rangle$
$\quad\quad\quad\quad \land m = Head(sent)$
$\quad\quad\quad\quad \land sent' = Tail(sent)$
$\quad\quad\quad\quad \land \exists\, p \in Proc : received' = [received \text{ EXCEPT } ![m] = @ \cup \{p\}]$

$Next \triangleq \exists\, m \in Message : Send \lor Recv(m)$

───

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

───

FairSpec is *Spec* with the addition requirement that it keeps taking steps.

$FairSpec \triangleq Spec \land \text{WF}_{vars}(Next)$

───

\ * Modification History
\ * Last modified *Wed Apr* 05 10:50:15 *CEST* 2023 by *kulpreet*
\ * Created *Wed Apr* 05 09:47:12 *CEST* 2023 by *kulpreet*