MODULE *Network*

EXTENDS *Bags*, *Message*

VARIABLES
incoming,
msg

$vars \triangleq \langle incoming, msg \rangle$

CONSTANTS
Msg

$NotMsg \triangleq \text{CHOOSE } m : m \notin Msg$

$NInit \triangleq$
$\land\ Minit$
$\land\ incoming = [r \in Replica \mapsto EmptyBag]$
$\land\ msg = [r \in Replica \mapsto NotMsg]$

$NBroadcast(r, m) \triangleq$
$\land\ incoming' = [x \in Replica \mapsto$
IF $x = r$
THEN $incoming[x]$
ELSE $incoming[x] \oplus SetToBag(\{m\})]$
$\land\ MBroadcast$
$\land$ UNCHANGED $\langle msg \rangle$

$NDeliver(r) \triangleq$
$\land\ incoming[r] \neq EmptyBag$
$\land \exists\, m \in BagToSet(incoming[r]) :$
$\land\ msg' = [msg \text{ EXCEPT } ![r] = m]$
$\land\ MDeliver(r, m)$
$\land$ UNCHANGED $\langle incoming \rangle$

$EmptyChannel \triangleq incoming = [r \in Replica \mapsto EmptyBag]$

judge if two replicas receive the same set of update operations

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