─────────── MODULE *epos4* ───────────

Possible *NMT* states

CONSTANT $NMT\_Booting$, $NMT\_PreOperational$, $NMT\_Operational$, $NMT\_Stopped$

$NMT \triangleq \{NMT\_Booting, NMT\_PreOperational, NMT\_Operational, NMT\_Stopped\}$

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VARIABLES nmt_state, $nmt\_requested$

$vars \triangleq \langle nmt\_state, nmt\_requested \rangle$

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$TypeOK \triangleq \land nmt\_state \in NMT$
$\qquad\qquad\quad \land nmt\_requested \in NMT$

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Received a *BootUp* message

$NMT\_BootUp \triangleq \land nmt\_state = NMT\_Booting$
$\qquad\qquad\qquad\quad \land nmt\_state' = NMT\_PreOperational$
$\qquad\qquad\qquad\quad \land \text{UNCHANGED } nmt\_requested$

State transmition confirmation

$NMT\_Transition\_Confirmed \triangleq \land nmt\_state \neq nmt\_requested$
$\qquad\qquad\qquad\qquad\qquad\qquad\quad \land nmt\_state' = nmt\_requested$
$\qquad\qquad\qquad\qquad\qquad\qquad\quad \land \text{UNCHANGED } nmt\_requested$

Request state transitions

$NMT\_EnterPreOperational \triangleq \land \lor nmt\_state = NMT\_Operational$
$\qquad\qquad\qquad\qquad\qquad\qquad\quad\; \lor nmt\_state = NMT\_Stopped$
$\qquad\qquad\qquad\qquad\qquad\quad \land nmt\_requested = nmt\_state$
$\qquad\qquad\qquad\qquad\qquad\quad \land nmt\_requested' = NMT\_PreOperational$
$\qquad\qquad\qquad\qquad\qquad\quad \land \text{UNCHANGED } nmt\_state$

$NMT\_ResetCommunication \triangleq \land \lor nmt\_state = NMT\_Operational$
$\qquad\qquad\qquad\qquad\qquad\qquad\quad \lor nmt\_state = NMT\_PreOperational$
$\qquad\qquad\qquad\qquad\qquad\qquad\quad \lor nmt\_state = NMT\_Stopped$
$\qquad\qquad\qquad\qquad\qquad \land nmt\_requested = nmt\_state$
$\qquad\qquad\qquad\qquad\qquad \land nmt\_requested' = NMT\_Booting$
$\qquad\qquad\qquad\qquad\qquad \land \text{UNCHANGED } nmt\_state$

$NMT\_ResetNode \triangleq \land \lor nmt\_state = NMT\_Operational$
$\qquad\qquad\qquad\qquad\quad\; \lor nmt\_state = NMT\_PreOperational$
$\qquad\qquad\qquad\qquad\quad\; \lor nmt\_state = NMT\_Stopped$
$\qquad\qquad\qquad\quad \land nmt\_requested = nmt\_state$

$$\land\ nmt\_requested' = NMT\_Booting$$
$$\land\ \text{UNCHANGED}\ nmt\_state$$

$$NMT\_StartRemoteNode\ \triangleq\ \land\ \lor\ nmt\_state = NMT\_PreOperational$$
$$\lor\ nmt\_state = NMT\_Stopped$$
$$\land\ nmt\_requested = nmt\_state$$
$$\land\ nmt\_requested' = NMT\_Operational$$
$$\land\ \text{UNCHANGED}\ nmt\_state$$

$$NMT\_StopRemoteNode\ \triangleq\ \land\ \lor\ nmt\_state = NMT\_Operational$$
$$\lor\ nmt\_state = NMT\_PreOperational$$
$$\land\ nmt\_requested = nmt\_state$$
$$\land\ nmt\_requested' = NMT\_Stopped$$
$$\land\ \text{UNCHANGED}\ nmt\_state$$

$$Init\ \triangleq\ \land\ nmt\_state = NMT\_Booting$$
$$\land\ nmt\_requested = NMT\_PreOperational$$

$$Next\ \triangleq\ \lor\ NMT\_BootUp$$
$$\lor\ NMT\_Transition\_Confirmed$$
$$\lor\ \lor\ NMT\_EnterPreOperational$$
$$\lor\ NMT\_ResetCommunication$$
$$\lor\ NMT\_ResetNode$$
$$\lor\ NMT\_StartRemoteNode$$
$$\lor\ NMT\_StopRemoteNode$$

$$Live\ \triangleq\ \forall\, s \in NMT:$$
$$(nmt\_requested = s) \rightsquigarrow (nmt\_state = s)$$

$$Spec\ \triangleq\ Init \land \Box[Next]_{\langle vars \rangle} \land \text{WF}_{vars}(Next)$$

\ * Modification History
\ * Last modified *Mon Jan* 13 20:42:49 *CET* 2020 by *martin*
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