Proposed changes to add verification to Clause 99:

99.1.3 Functional Block Diagram

Figure 99–2 provides a functional block diagram of the MAC Merge sublayer.

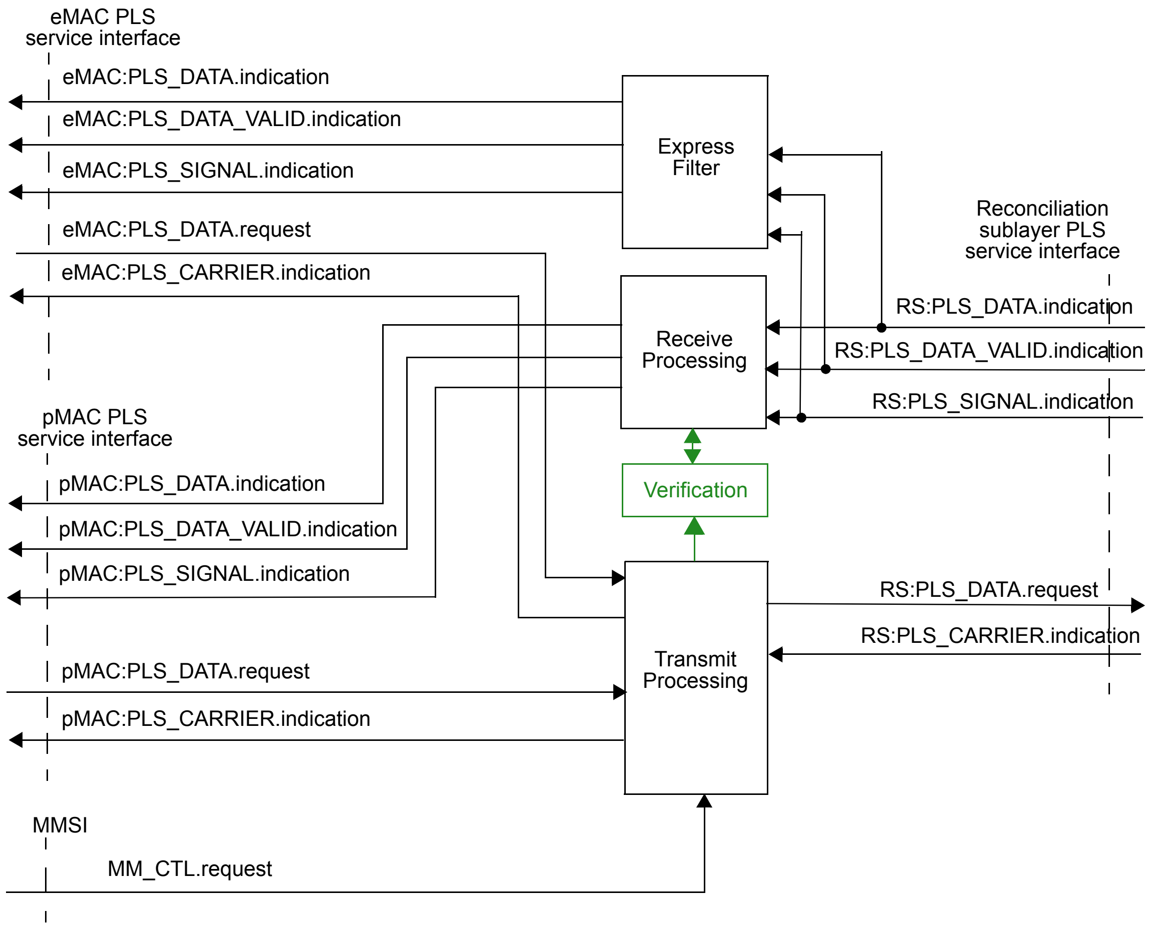

eMAC PLS service interface
eMAC:PLS_DATA.indication
eMAC:PLS_DATA_VALID.indication
eMAC:PLS_SIGNAL.indication
eMAC:PLS_DATA.request
eMAC:PLS_CARRIER.indication
Express Filter
Receive Processing
Verification
Transmit Processing
Reconciliation sublayer PLS service interface
RS:PLS_DATA.indication
RS:PLS_DATA_VALID.indication
RS:PLS_SIGNAL.indication
RS:PLS_DATA.request
RS:PLS_CARRIER.indication
pMAC PLS service interface
pMAC:PLS_DATA.indication
pMAC:PLS_DATA_VALID.indication
pMAC:PLS_SIGNAL.indication
pMAC:PLS_DATA.request
pMAC:PLS_CARRIER.indication
MMSI
MM_CTL.request

Figure 99–2—MAC Merge Functional Block Diagram

99.3.3 Start mFrame Delimiter (SMD)

The value of the SMD indicates whether the mFrame contains an express frame, the start of a preemptable frame or a non-initial fragment of a preemptable frame. An mFrame containing the start of a preemptable frame contains the whole frame if the frame is not preempted.

For mFrames carrying all or part of a preemptable frame, the SMD also indicates the frame count. The frame count prevents reassembling an invalid frame if the final mFrame of one preemptable frame and the initial fragment of the next preemptable frame are lost. The frame count is a modulo-4 count.

Two additional SMD values, SMD-V and SMD-R, identify a mFrames used to verify that a link can support preemption capability.

The SMD values are specified in Table 99–1.

Table 99–1—SMD values

mFrame type	Notation	Frame count	Encoding
verify frame	SMD-V	—	0x07
respond frame	SMD-R	—	0x19
express frame	SMD-E	—	0xD5
preemptable frame start	SMD-S0	0	0xE6
	SMD-S1	1	0x4C
	SMD-S2	2	0x7F
	SMD-S3	3	0x~~8~~B3
non-initial fragment	SMD-C0	0	0x61
	SMD-C1	1	0x52
	SMD-C2	2	0x9E
	SMD-C3	3	0xAD

The notation SMD-S is used to refer to any of the four SMD values in the initial mFrame of a preemptable frame. The notation SMD-C is used to refer to any of the four SMD values in a non-initial mFrame.

99.3.4 Verifying preemption operation

There are proprietary devices that forward a frame with the Nearest Bridge group address (e.g. media converters or switches that don't comply with IEEE 802.1Q). How such a device will handle an mFrame of a preemptable frame is indeterminate. A proprietary device might forward the mFrame unchanged, alter the mFrame (e.g. insert an SFD), or drop the mFrame. Verification checks that the the link can support preemption capability.

Preemption capability shall be active only if the capability has been enabled and verified.

If preemption capability is enabled and has not been verified, MAC Merge initiates transmission of a verify mFrame. A verify mFrame has 7 octets of preamble,(0x55) an SMD-V, 60 octets of 0x00 and an MCRC.

Transmission of a verify frame may be repeated to allow verification in the presence of noise causing bit errors.

When an mFrame with an SMD-V and a correct MCRC is received, a response mFrame is sent. A response frame has 7 octets of preamble (0x55), an SMD-R, 60 octets of 0x00 and an MCRC.

When an mFrame with an SMD-R and a correct MCRC is received, preemption capability is verified.

[Editor's note (to be removed prior to publication) - this is the most conservative verification alternative. The MAC Merge sublayer only checks for a response when it has sent a verify frame and each side must initiate verification before enabling preemption. Another alternative would be to set verified in response to receivign a verifiy mFrame in addition to when receiving a response mFrame.

~~Therefore, after enabling preemption, a preemptable frame that requires a response from the link partner should be sent to verify preemption operation. If no response is received preemption should be disabled.~~

~~*[Editior's note (to be removed prior to publication) - Further work is needed in this area. Some proprietary devices may convert the SMD to an SFD. For a preemptable frame that was not preempted, this converts the frame to an express frame which will be received and processed by the link partner. To detect that such a device is in the path requires that the response only be generated if the frame is received on the preemptable path. Possibly a MAC Control frame should be defined for this. Also the test frame should be repeated at least once in case the test or response was lost due to a bit error.]*~~

99.4.7 Detailed functions and state diagrams

Change and add constants, variables, functions and counters are shown.

99.4.7.1 Constants

verifyLimit
: the integer 3, the number of verification attempts

99.4.7.2 Variables

link_fail
: Boolean variable that is set TRUE by implementation dependent means when a link failure is detected.

pActive
: Boolean variable that is TRUE when preemption capability is active and FALSE otherwise. The value of pActive is pEnable $*$ verified.

pEnable
: Boolean variable that is TRUE when preemption capability is enabled and FALSE otherwise.

rcv_r
: Boolean that is set TRUE when an mFrame with SMD-R and a correct mCRC is received.

rcv_v
: Boolean that is set TRUE when an mFrame with SMD-V and a correct mCRC is received.

send_r
: Boolean that is set TRUE to initiate sending a response mFrame.

send_v
: Boolean that is set TRUE to initiate sending a verification mFrame.

verified
: Boolean that is set TRUE when the ability of the link to support preemption capability has been verified..

verify_fail
: Boolean that is set TRUE when verification attempts have failed.

99.4.7.3 Functions

SMD_DECODE

Decodes the value of 8 mPLS_DATA.indication primitives returning one of the following values based on the value of the primitives:

Preamble	0x55
E	SMD-E encoding
S	SMD-S encoding
C	SMD-C encoding
V	SMD-V encoding
R	SMD-R encoding
Error	Any other value.

If S is returned, the function sets rxFrameCnt equal to the frame count indicated by the SMD-S. If C is returned, the function sets cFrameCnt equal to the frame count indicated by the SMD-C.

TX_R

Produces 576 mPLS_DATA.requests to send a response mFrame: 7 octets of 0x55, 1 octet SMD-R, 60 octets of 0x00, mCRC followed by an mPLS_DATA.request with the value DATA_COMPLETE.

TX_V

Produces 576 mPLS_DATA.requests to send a verify mFrame: 7 octets of 0x55, 1 octet SMD-V, 60 octets of 0x00, mCRC followed by an mPLS_DATA.request with the value DATA_COMPLETE.

99.4.7.4 Counters

verifyCnt

a count of the number of verification tries that have completed.

99.4.7.5 Timers

verify_timer

A timer of time from when a verification mFrame was sent to initiating the next attempt. The timer will set verify_timer_done when it reaches 1 ms ± 20%.

response_timer

A timer for determining when verification has failed. The timer will set response_timer_done when it reaches 10 ms ± 20%

99.4.7.6 State diagrams

The Transmit Processing State Diagram is shown in Figure Figure 99–4. The Receive Processing State

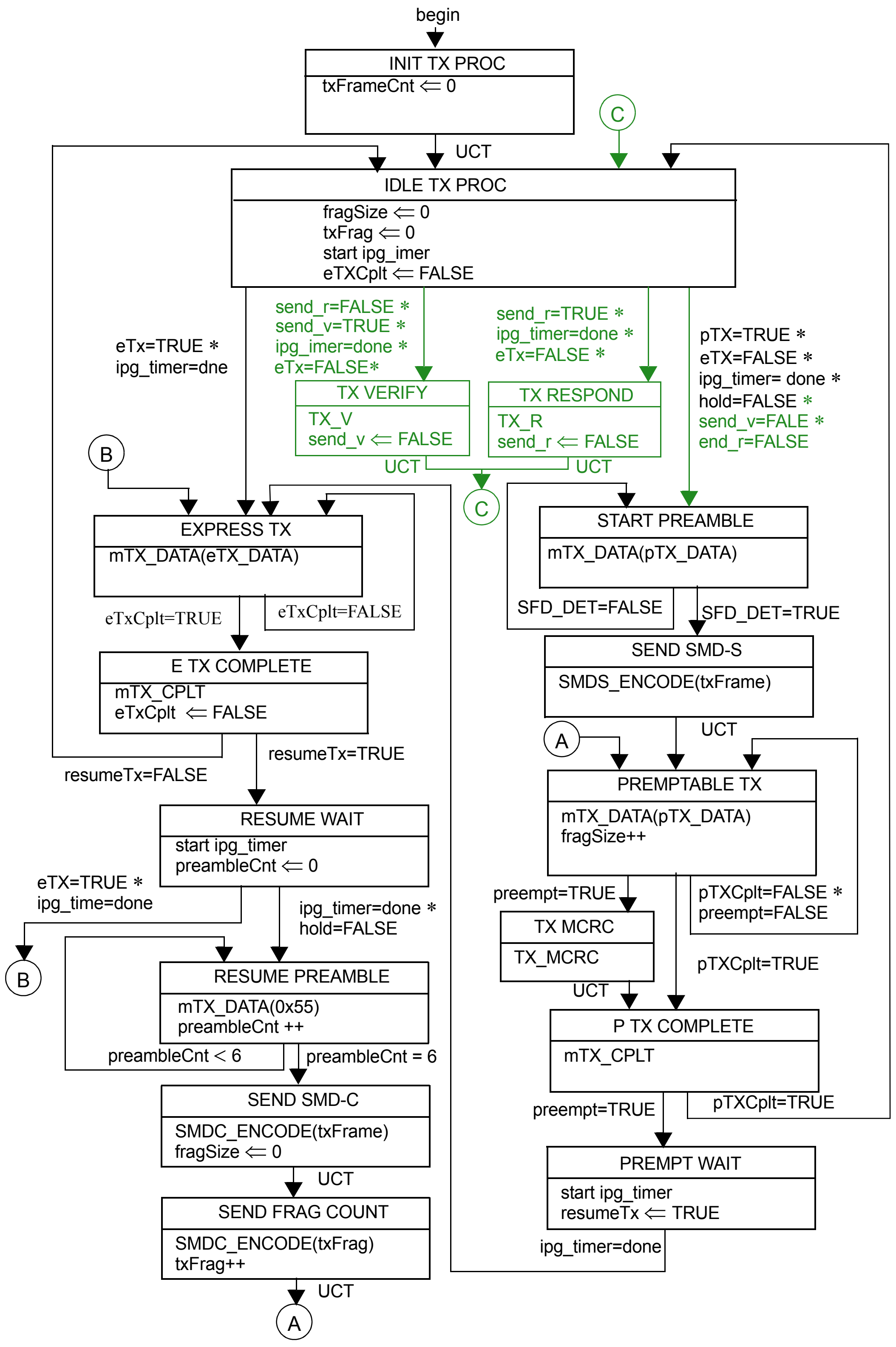


Figure 99–4—Transmit Processing State Diagram

Diagram is shown in Figure 99–5. The Express Filter State Diagram is shown in Figure 99–6. The Verify

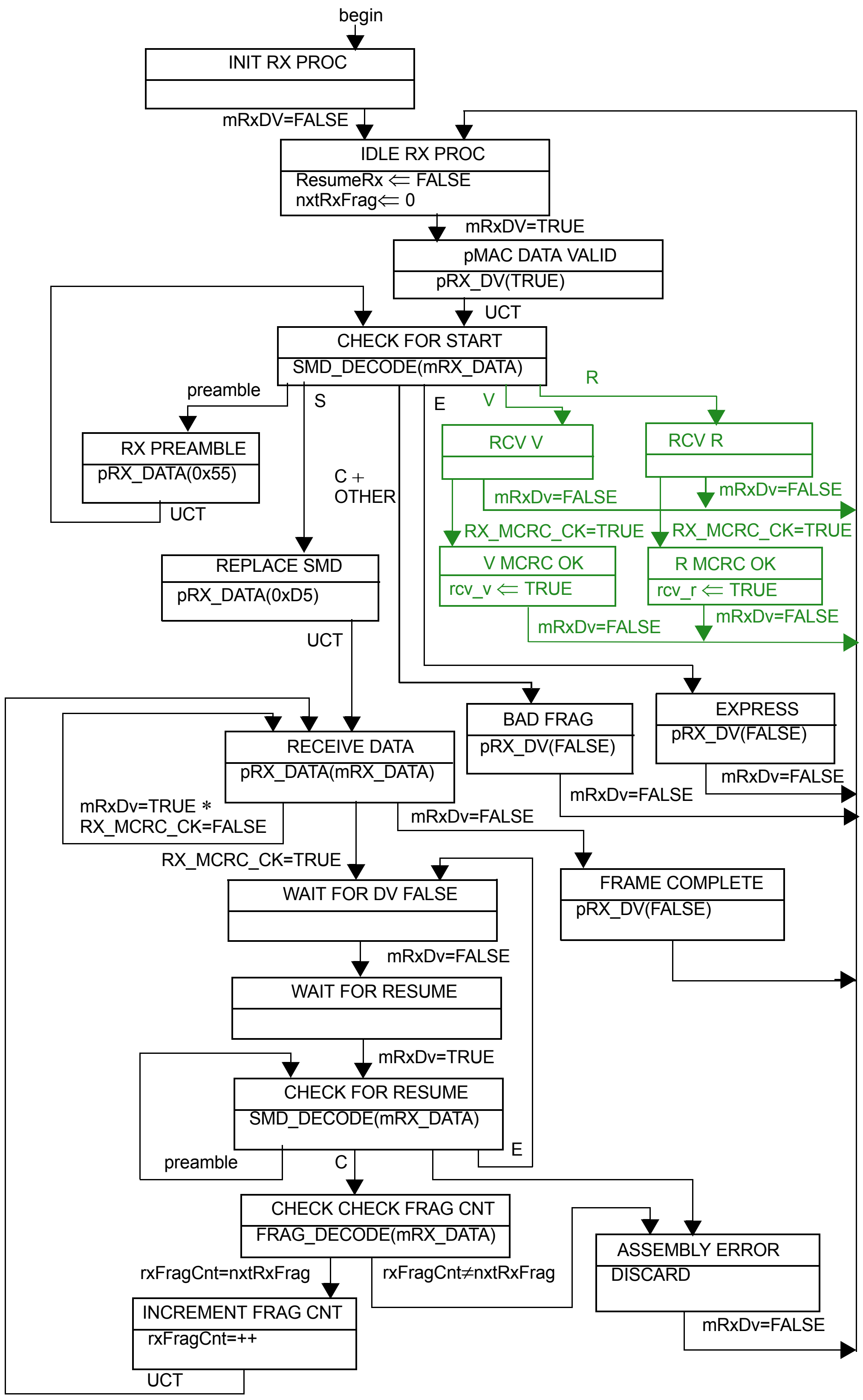


Figure 99–5—Receive Processing State Diagram

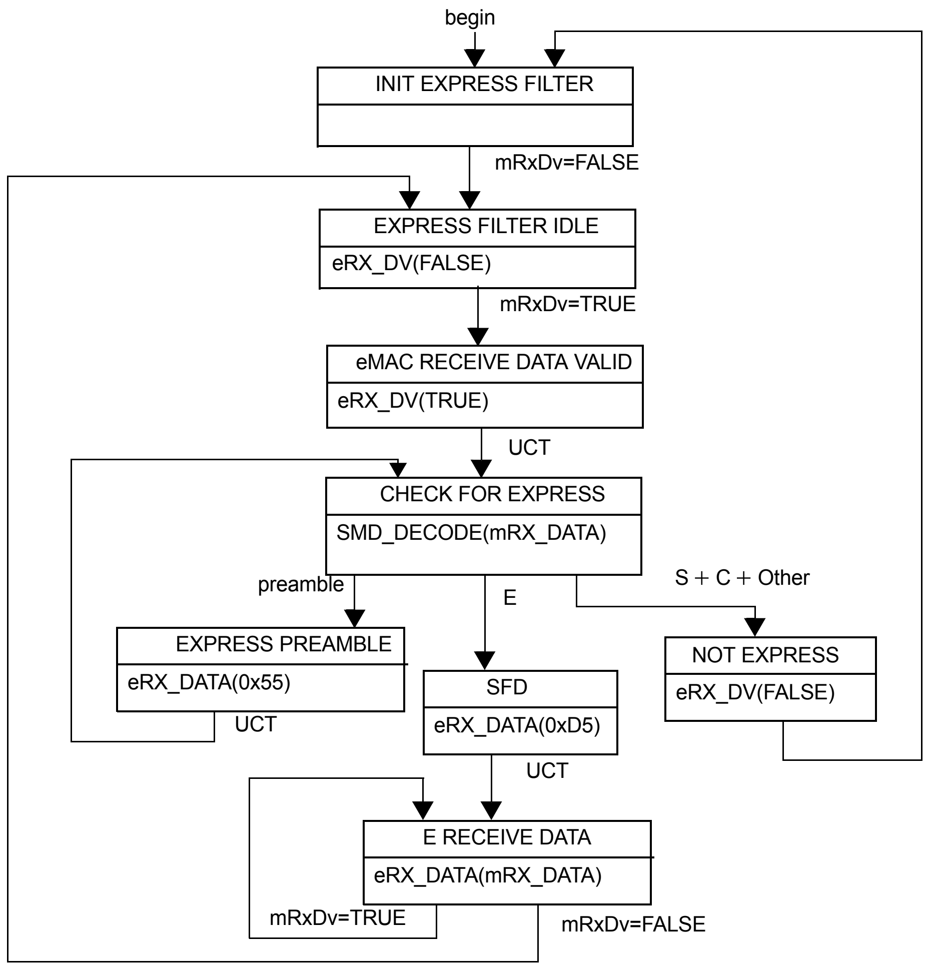
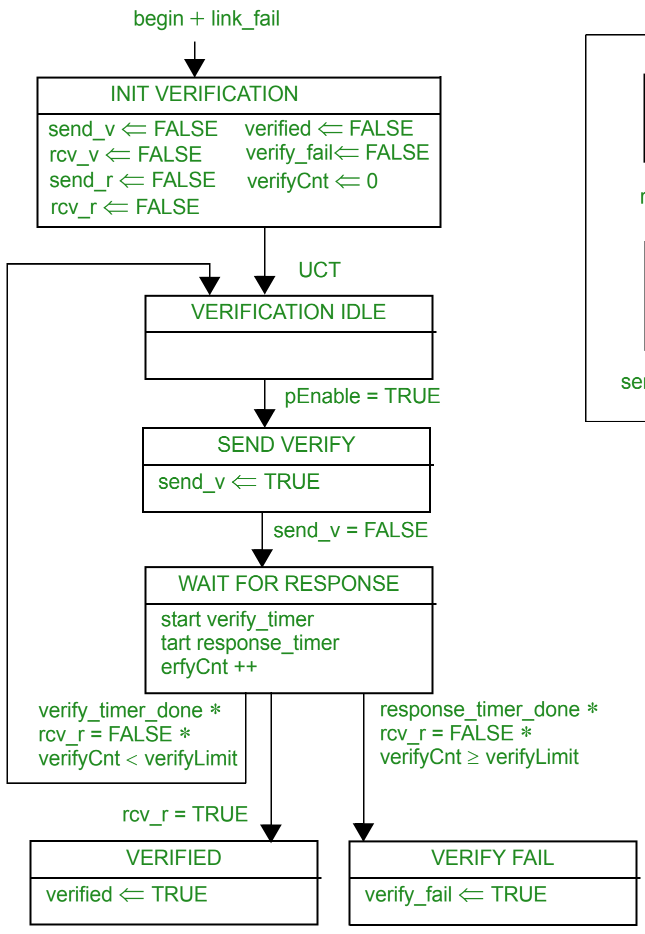


Figure 99–6—Express Filter State Diagram

State Diagram is shown in Figure 99–7.



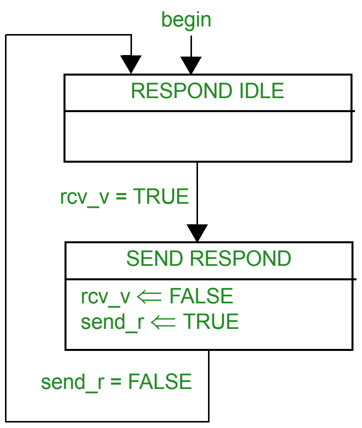


Figure 99–7—Verify State Diagram