MIL-STD 188-220B Class A (Type 1) Link Layer Estelle Specification

The Class A Estelle specification is documented by several diagrams and tables. They are:

- Datalink Layer Interface - an abstract view of the datalink layer's interface with its upper (Network) layer, its lower layer (Physical), and a proposed peer representing an operator or management component. This diagram summarizes all service primitives that define the information flow between the datalink layer and its neighboring layers.

- Datalink Layer Class A Architecture - an abstract, yet more detailed, view of the proposed internal structure of the datalink layer. This architecture is modeled after ISO 8802 Link Layer specification, in particular, in the definition of a Station Component containing a Type 1 SAP Component. Three other components are defined : Ack Timer - a timer needed for acknowledgments, Busy Timers - several timers keeping record of which other stations on the net are ready/not ready to receive Type 1 packets. TP Timer - a timer needed by the Station Component for the timing of transmissions when coupled acknowledgments are being processed (introduced Aug 97).

- Class A Station Component: This component contains only a Type 1 SAP Component. The Station Component accepts interactions from the Network and Physical layers and properly passes these interactions to the Type 1 SAP Component. For example, when a DL_Unitdata.Request arrives from the Network layer, it is forwarded to the Type 1 SAP Component for processing either with or without a coupled acknowledgment depending on the desired QOS. Prior to June 1996, the Station Component operation was divided into 3 phases: *initialization* when a station tries to join a net; *active* during normal operation communicating with other nodes; and *leave net* when a station leaves the network, either gracefully or abruptly. After June 1996, the CNR WG decided to replace joining/leaving the net via link layer with Network Layer XNP messages; thus the Station Component was reduced to a single active phase. The active phase has an EFSM diagram and a transition table. Additionally the Station Component has a few of common transitions; these are transitions that define global independent actions (i.e., actions that may occur either for all states or for a large subset of states). This set was significantly reduced with the removal of XID PDUs from the link layer.[1]

- The Type 1 Service Box has three components. They are: Type 1 SAP Component - performs all functionality to process incoming and outgoing Type 1 packets; Busy Timers - timers that keep record of which other stations on the net are ready/not ready to receive Type 1 packets; Ack Timer - a timer needed for acknowledgments TP Timer - a timer needed by the Station Component to time transmissions in the presence of coupled acknowledgments. (A previous component: NETCON was moved to the Network Layer when XID was replaced with XNP messages.)

- Type 1 SAP Component EFSM and State Transition Table - the Type 1 SAP Component has primary responsibility for processing DL_PDUs, i.e., managing destination lists, starting and stopping timers for PDUs requiring retransmission, monitoring which destinations are ready to receive and which are not, etc. Each DL_Unitdata.Request is handled with or without a coupled ack depending on the QOS Reliability Requested argument.

- Busy Timer; Ack Timer; TP Timer EFSMs and State Transition Tables - these diagrams and tables summarize the behaviors of timers needed to manage acknowledgments.

- Estelle Specification - 13 double pages defining the architecture and behavior of Class A Link Layer service.

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[1] To avoid possible confusion from renaming/renumbering transitions following the removal of XID handling, transitions kept their original names/numbers. The removal of XID handling thus results in some numbering gaps.