ckp | Connectivity **A Made IT project**
Knowledge
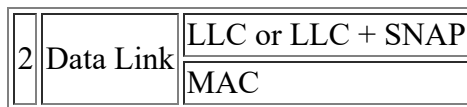**Platform**
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IEEE 802.2 LLC

General

The IEEE 802.2 standard is identical for all network topologies. It provides a general interface between the different protocols (IPX, TCP/IP, etc.) and the different network types (Ethernet, Token Ring, etc.). The positioning within the OSI Reference model:

2	Data Link	LLC or LLC + SNAP
		MAC

The LLC is responsible for the logical link functions of one or more logical links, hence the name Logical Link Control. The command packets generated by the LLC are called PDUs (Protocol Data Units).

The LLC provides the following services to the Network Layer (layer 3):

- Unacknowledged connectionless-mode (defined as Type 1 Operation)

   This means that the LLC has no idea of what is going on. It sends out a frame and hopes it makes it to the other end. It doesn't know to whom it is sending. The way the transfer takes place can be point-to-point, multicast, or broadcast.

- Connection-mode (defined as Type 2 Operation)

   This service is meant for connection-aware links between LLCs of end stations. It is responsible for establishing, using, resetting and terminating the connection.

What the LLC expects from the MAC sub-layer:

- MA-UNITDATA request
- MA-UNITDATA indication
- MA-UNITDATA-STATUS indication

Frame format

The LLC format looks like this:

DSAP address	SSAP address	Control field	Information field
8 bits	8 bits	8 or 16 bits	N * 8 bits

DSAP
   Destination Service Access Point
SSAP
   Source Service Access Point
N

Integer equal to or greater than 0

DSAP/SSAP
The DSAP field has 8 bits which contain the following information:

I/G	D	D	D	D	D	D	D

For I/G = 0 the address is individual and for I/G=1 it's a group address.

The SSAP field has 8 bits which contain the following information:

C/R	S	S	S	S	S	S	S

For C/R = 0 it indicates a command and for C/R=1 it's a response.

Notes on IEEE 802.2
The most common SAP values:

- 04 - IBM SNA
- 06 - IP
- 80 - 3Com
- AA - SNAP
- BC - Banyan
- E0 - Novell
- F4 - Lan Manager FE -CLNS

IEEE 802.2: SNAP

General
SNAP is the layer between the Network layer and the MAC layer. SNAP stands for SubNetwork Attachment Point and is part of the LLC 802.2 standard.

The main usage for SNAP/LLC is in Apple Macintosh networks using the AppleTalk protocol.

Frame format
The LLC indicates if there is a SNAP header. The entire header looks like this:

LLC			SNAP				
AA	AA	03	00	00	00	08	00
			3 octet OUI			2 octet TYPE-field	

The AAs are the DSAP and SSAP fields from the LLC and the 03 is the control field.

The OUI (Organizational Unique Identifier) identifies the standards organization and the TYPE field defines the protocol type of the information. In this case IP.

For AppleTalk phase II the packet would look like this:

LLC			SNAP				
AA	AA	03	00	00	00	08	9B
			3 octet OUI			2 octet TYPE-field	

Resources: