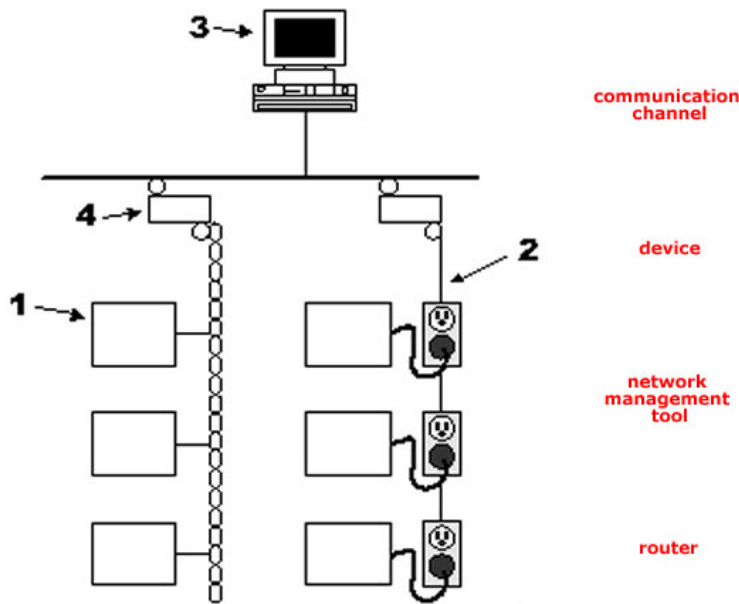


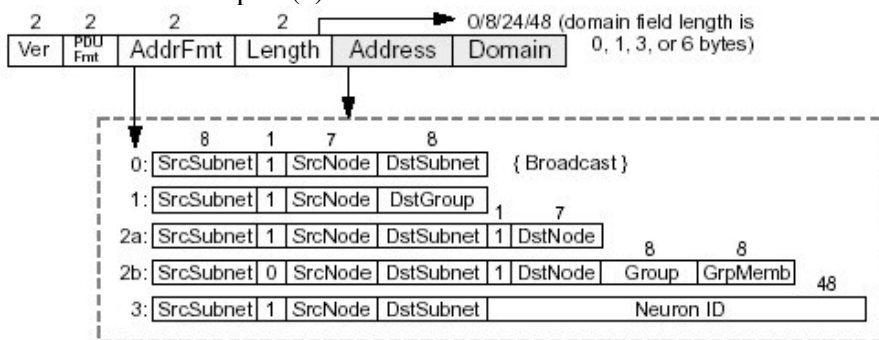


**Tutorial 4:**

1. Consider the following LonWorks control network in which the PC has **no** LonTalk NIC (network interface card):



- a) Match the name of the network component in the list on the right to its component in the drawing.
  - b) What is the network management tool used in LonWorks control network?
  - c) Suggest different channels used in the network and state their data rates.
  - d) Describe any **two** different ways to provide a HMI for the network.
2. Is it possible for two or more independent LonWorks systems to coexist on the same physical channel?
  3. The table and diagram below describe the network layer of the LonTalk protocol:
    - a) Delete inappropriate message type in the table.
    - b) The device of node 1/8 (Subnet ID/Node ID) sends a message to all nodes in subnet 2, what is the content of the address field?
    - c) What is data encoding method used by TP/FT-10? Sketch the waveform for the 2<sup>nd</sup> byte of the address field in part (b).

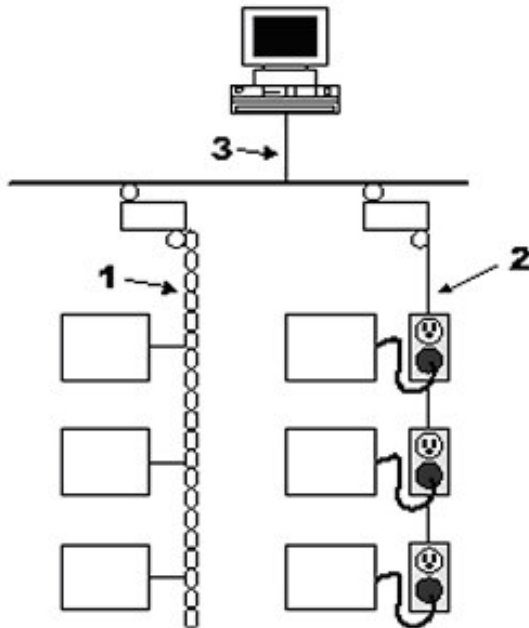


Type	Address Format	Delete inappropriate type
0	Domain – Subnet	unicast/multicast/broadcast
1	Domain – Group	unicast/multicast/broadcast
2a	Domain – Subnet – Node	unicast/multicast/broadcast
2b	Domain – Subnet – Node – Group – Member	unicast/multicast/broadcast
3	Domain – Neuron-ID	unicast/multicast/broadcast



**Solution Guide:**

- 1. a) 1 – device, 2 – communication channel, 3 – network management tool, 4 – router
- b) LonMaker for Windows
- c) 1 – TP/FT-10 (78kbps), 2 – PL – 20 (5.4kbps), 3 – IP-10 (10Mbps)



- d) Method 1: Directly use LonMaker for Windows by inserting appropriate background image with LNS text box.  
Method 2: Write an application program through LNS server or LNS DDE server.  
Method 3: Browse web pages stored in i.LON with web server.  
or any other possible solution

- 2. Yes, it is possible as long as each system has a unique domain ID.
- 3. a) Type 0 – broadcast, Type 1 – multicast, Type 2a – unicast, Type 2b – multicast & Type 3 – unicast.
- b) 018802 (hex)
- c) Differential Manchester Coding.

