Verifying Cisco HDLC Encapsulation

Cisco HDLC encapsulation is the default encapsulation on all Cisco router Serial interfaces.

Lab Topology

Devices:

- R1 (Router)
- R2 (Router)

1. Assuming the devices, Router R1 and R2 are 1841/ 2811 routers.

2. Configuring hostnames :

Configuring R1 :

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#
R1(config)#
R1(config)#
```

Configuring R2:

```
Router>enable
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
R2(config)#
R2(config)#
```

The Serial0/0 interface on R2 is identified as the DCE in the topology. Configuring DCE on R2 to provide clocking to R1, with clock rate speed as 256 Kbps.

Enabling Serial interfaces on R1 and R2.

Configure IP addressing on R1 and R2 Serial0/0 interfaces as illustrated in the topology.

For Router R1 :

```
R1#
R1#
R1#
R1#enable
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface Serial0/0/0
R1(config-if)#ip address 192.168.10.1 255.255.255.0
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#exit
R1(config)#no shutdown
                ^
% Invalid input detected at '^' marker.

R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

For Router R2:

```
R2(config)#interface Serial0/0/0
R2(config-if)#ip address 192.168.10.2 255.255.255.0
R2(config-if)#copy running-config startup-config
               ^
% Invalid input detected at '^' marker.

R2(config-if)#
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

R2(config-if)#copy running-config startup-config
               ^
% Invalid input detected at '^' marker.

R2(config-if)#copy running-config startup-config
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

               ^
% Invalid input detected at '^' marker.

R2(config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

Verifying interface encapsulation to be set to HDLC

```
R1#show interface Serial0/00
%Invalid interface type and number

R1#show interface Serial0/0/0
Serial0/0/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 192.168.10.1/24
  MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 96 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

```
R2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R2#show interface Serial0/0/0
Serial0/0/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 192.168.10.2/24
  MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 96 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

- Using the commands,

  debug serial interface
  debug serial

- Enable debugging on the Cisco router to validate that HDLC keepalive messages are being sent between the two routers.

- HDLC messages are sent in the keepalive interval that is listed under the interface, which should be approximately every 10 seconds.