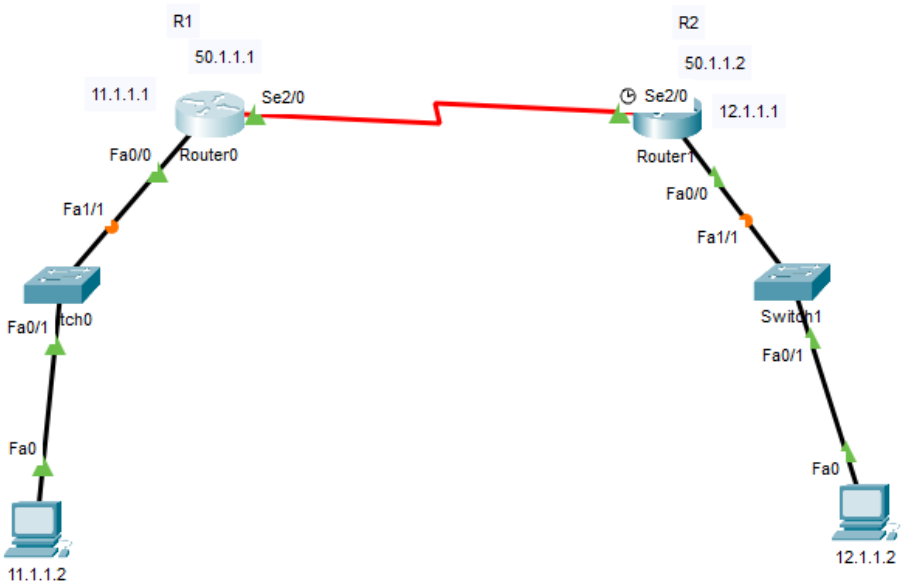
LAB – 10

18MIS7250

Amit Kumar Sahu

HDLC, PPP, PAP & CHAP

High-level Data Link Control (**HDLC**) is a group of communication protocols of the data link layer for transmitting data between network points or nodes. Since it is a data link protocol, data is organized into frames. A frame is transmitted via the network to the destination that verifies its successful arrival.



In computer networking, Point-to-Point Protocol (**PPP**) is a Data link layer (layer 2) communications protocol between two routers directly without any host or any other networking in between. It can provide connection authentication, transmission encryption, and compression

Configuring router 0

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#ip add 11.1.1.1 255.0.0.0
Router(config-if)#no shut
Router(config-if)#no shutdown
Router(config-if)#int s2/0
Router(config-if)#ip add 50.1.1.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#exit
Router(config)#ip route 0.0.0.0 0.0.0.0 50.1.1.2
Router(config)#
```

Configuring router 1

```
Router(config)#interface FastEthernet0/0
Router(config-if)#ip add 12.1.1.1 255.0.0.0
Router(config-if)#no shut
Router(config-if)#

Router(config)#int
% Incomplete command.
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#
```

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#int s2/0
Router(config-if)#ip add 50.1.1.2 255.0.0.0
Router(config-if)#no shut

ROUTER 0 Configuration there is default hdlc

Router#sh int serial 2/0
Serial2/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 50.1.1.1/8
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

ROUTER 1 aldso config default hdlc

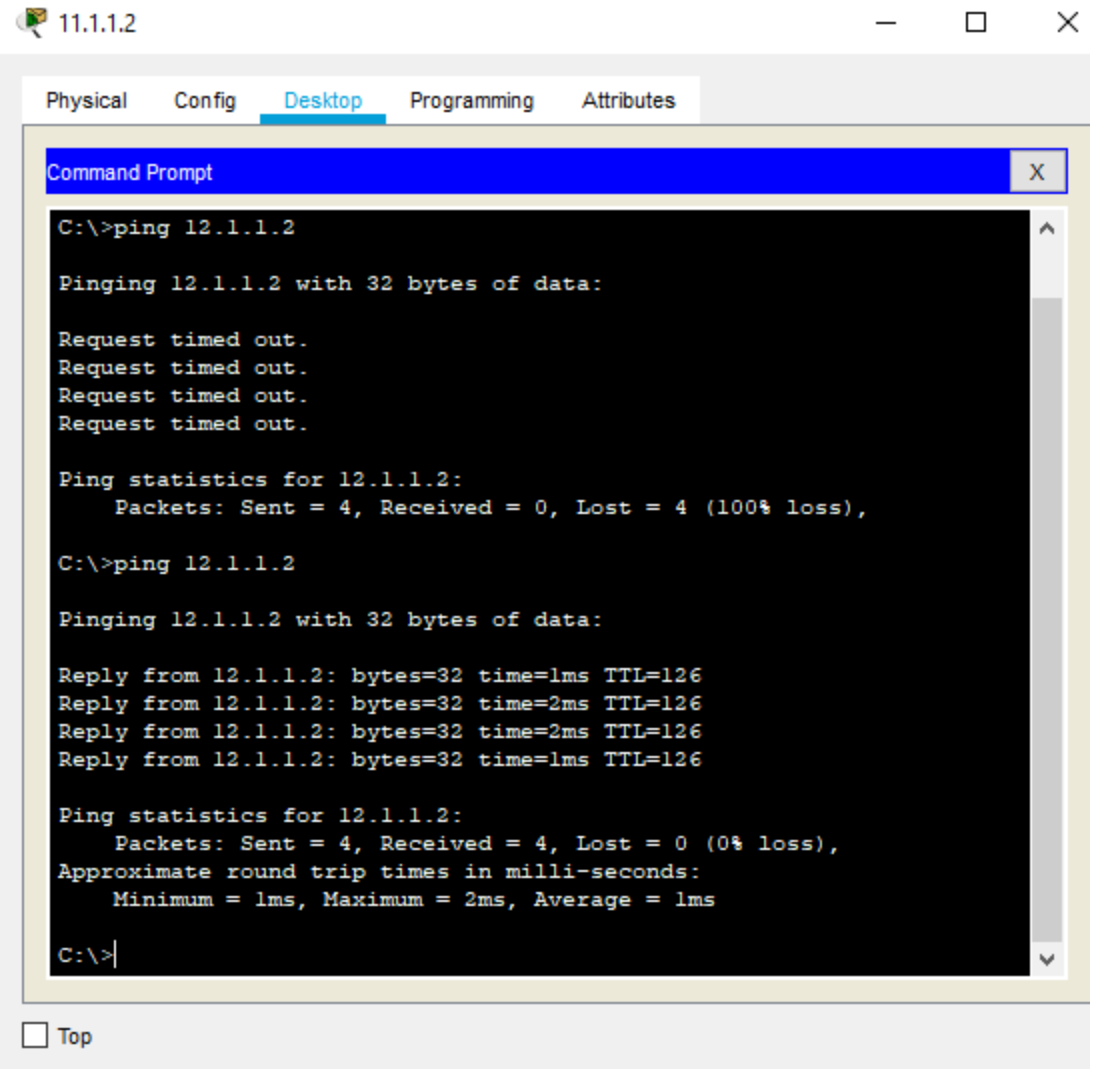
Router#sh int serial 2/0
Serial2/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 50.1.1.2/8
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,

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

Enabling PPP on both the routers

Router(config)#int s2/0
Router(config-if)#encapsulation PPP
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down

Checking if it’s working fine



Challenge-Handshake Authentication Protocol

In computing, the Challenge-Handshake Authentication Protocol authenticates a user or network host to an authenticating entity.

What if a person configures a same router as we have and tries to steal the encapsulated data.? So for this we will use PAP - Password Authentication Protocol

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#enable password cosco
R1(config)#username R2 password cosco
R1(config)#int s2/0
R1(config-if)#encapsulation PPP
R1(config-if)#ppp authentication ?
chap Challenge Handshake Authentication Protocol <CHAP>
pap Password Authentication Protocol <PAP>

R1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down

R1(config-if)#ppp pap sent-username R1 password cosco
R1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

Router 2nd configuration

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#hostname R2
R2(config)#enable password cosco
R2(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down

R2(config)#int s2/0
R2(config-if)#encapsulation ppp
R2(config-if)#ppp authentication pap
R2(config-if)#^Z
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#username R1 password cosco
```

R2(config)#

R2(config)#int s2/0
R2(config-if)#ppp pap sent-username R2 password cisco
R2(config-if)#

Restarting Both The Routers And Configuring CHAP

R1(config-if)#int s2/0

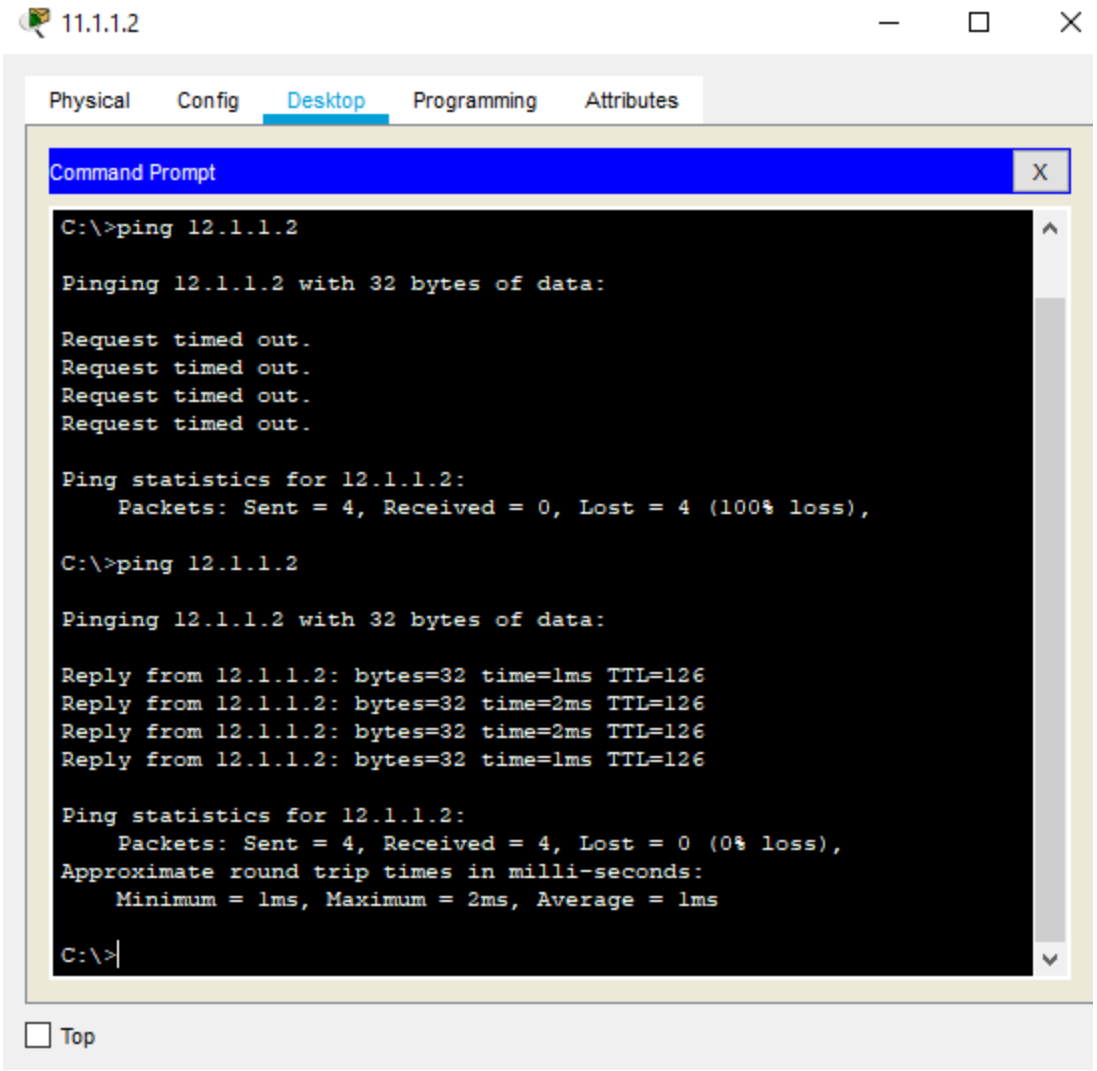
R1(config-if)#encapsulation ppp

R1(config-if)#ppp authentication chap

R1(config-if)#

R1(config-if)#exit

R1(config)#username R2 password cisco


11.1.1.2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
C:\>ping 12.1.1.2
Pinging 12.1.1.2 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 12.1.1.2:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 12.1.1.2
Pinging 12.1.1.2 with 32 bytes of data:
Reply from 12.1.1.2: bytes=32 time=1ms TTL=126
Reply from 12.1.1.2: bytes=32 time=2ms TTL=126
Reply from 12.1.1.2: bytes=32 time=2ms TTL=126
Reply from 12.1.1.2: bytes=32 time=1ms TTL=126
Ping statistics for 12.1.1.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 2ms, Average = 1ms
C:\>
Top