Computer Networks Lab

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Experiment -15

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L2 - SWE

Aim: To configure PPP configuration using CLI.

Theory:

a. The Point-to-Point Protocol (PPP) is an encapsulation protocol for transporting IP traffic across point-to-point links.
b. PPP is made up of three primary components:

i.Link Control Protocol (LCP)—Establishes working connections between two points.

ii.Authentication protocol—Enables secure connections between two points.

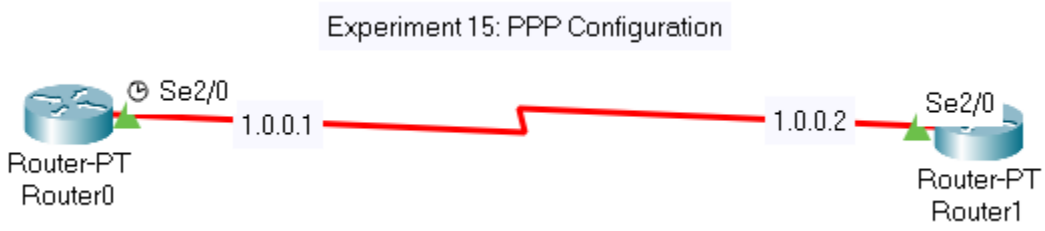
iii.Network control protocol (NCP)—Initializes the PPP protocol stack to handle multiple Network Layer protocols, such as IPv4, IPv6, and Connectionless Network Protocol (CLNP).

c. LCP is responsible for establishing, maintaining, and tearing down a connection between two endpoints. LCP also tests the link and determines whether it is active.
d. PPP's authentication layer uses a protocol to help ensure that the endpoint of a PPP link is a valid device. Authentication protocols include the Password Authentication Protocol (PAP), the Extensible Authentication Protocol (EAP), and the Challenge Handshake Authentication Protocol (CHAP). CHAP is the most commonly used.

i.CHAP ensures secure connections across PPP links. After a PPP link is established by LCP, the PPP hosts at either end of the link initiate a three-way CHAP handshake. Two separate CHAP handshakes are required before both sides identify the PPP link as established.

e. After authentication is completed, the PPP connection is fully established. At this point, any higher-level protocols (for example, IP protocols) can initialize and perform their own negotiations and authentication.

Setup:



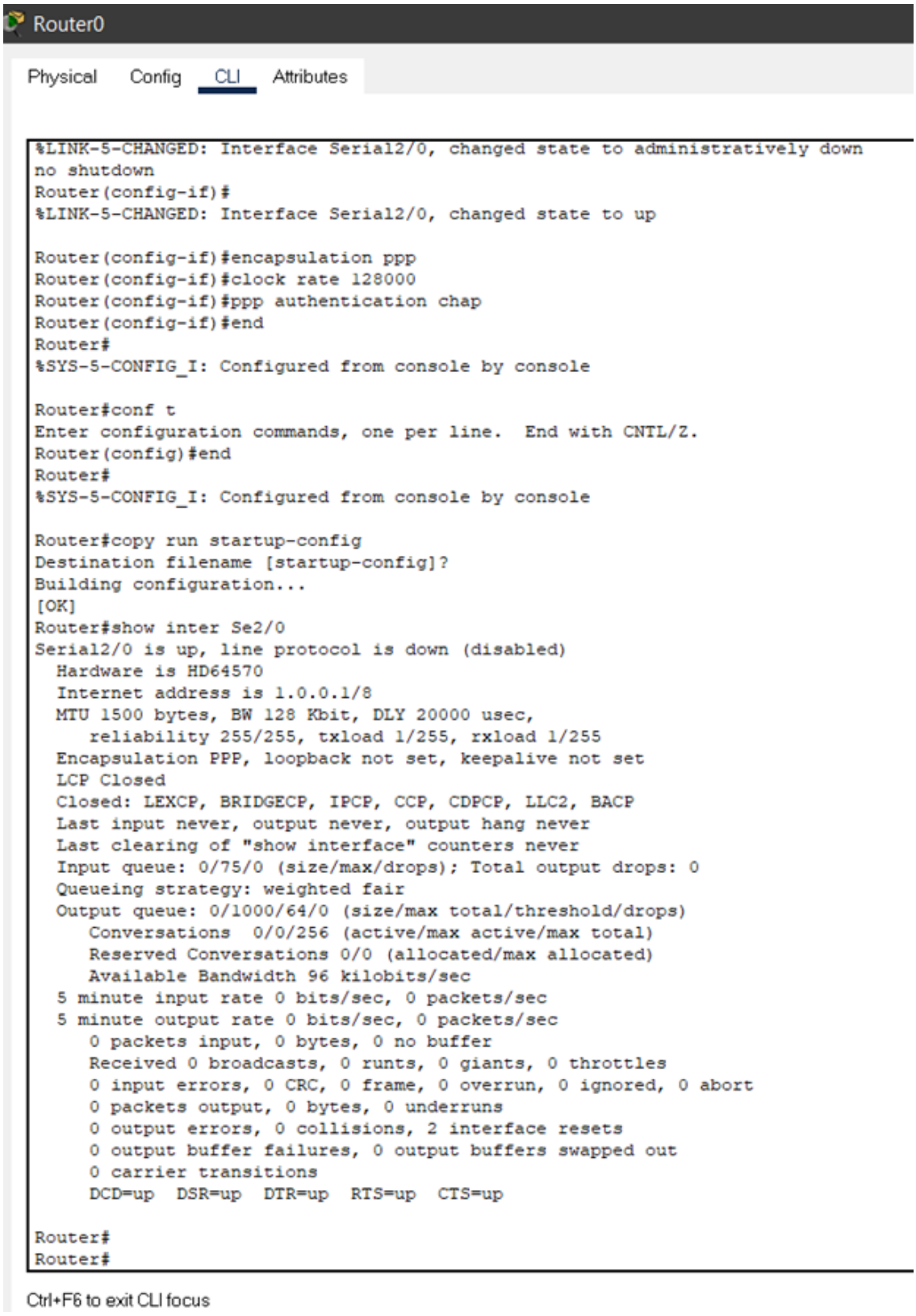
CLI:

Router1

Physical Config CLI Attributes

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 1.0.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down

Router(config-if)#encapsulation ppp
Router(config-if)#ppp authentication chap
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy run startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#show interface se2/0
Serial2/0 is up, line protocol is down (disabled)
  Hardware is HD64570
  Internet address is 1.0.0.2/8
  MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, loopback not set, keepalive set (10 sec)
  LCP Closed
  Closed: LEXCP, BRIDGECP, IPCP, CCP, CDPCP, LLC2, BACP
  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
 --More--
```

Ctrl+F6 to exit CLI focus



Result: PPP Configuration was successfully verified.