

LV14 – WAN PPP enkapsulacija – rad na uređajima

PRIPREMA

1. Password Authentication Protocol (PAP):

Sloj djelovanja: PAP je sloj veze podataka (data link layer) protokol.

Opis: PAP je jednostavan i temelji se na lozinkama. Klijent šalje korisničko ime i lozinku poslužitelju.

Ako se korisničko ime i lozinka podudaraju, poslužitelj odobrava PPP sesiju. Međutim, PAP nije siguran jer lozinke putuju u otvorenom tekstu, što omogućava napadačima da ih presretnu.

Prednosti:

Jednostavan za implementaciju.

Podržan na svim operacijskim sustavima.

Nedostaci:

Lozinke se prenose nekritirano.

Ranjiv na napade kao što su pogađanje lozinki i prisluškivanje.

2. Challenge Handshake Authentication Protocol (CHAP):

Sloj djelovanja: CHAP također djeluje na sloju veze podataka.

Opis: CHAP koristi izazovno-ručni mehanizam za autentifikaciju. Periodički provjerava identitet korisnika. Evo kako CHAP funkcionira:

Klijent šalje zahtjev za autentifikacijom poslužitelju.

Poslužitelj generira nasumični izazov (challenge) i šalje ga klijentu.

Klijent koristi svoju lozinku i izazov za stvaranje kriptografskog hash-a.

Klijent šalje hash poslužitelju.

Poslužitelj provjerava hash. Ako se podudara s očekivanim hash-om, autentifikacija je uspješna.

Prednosti:

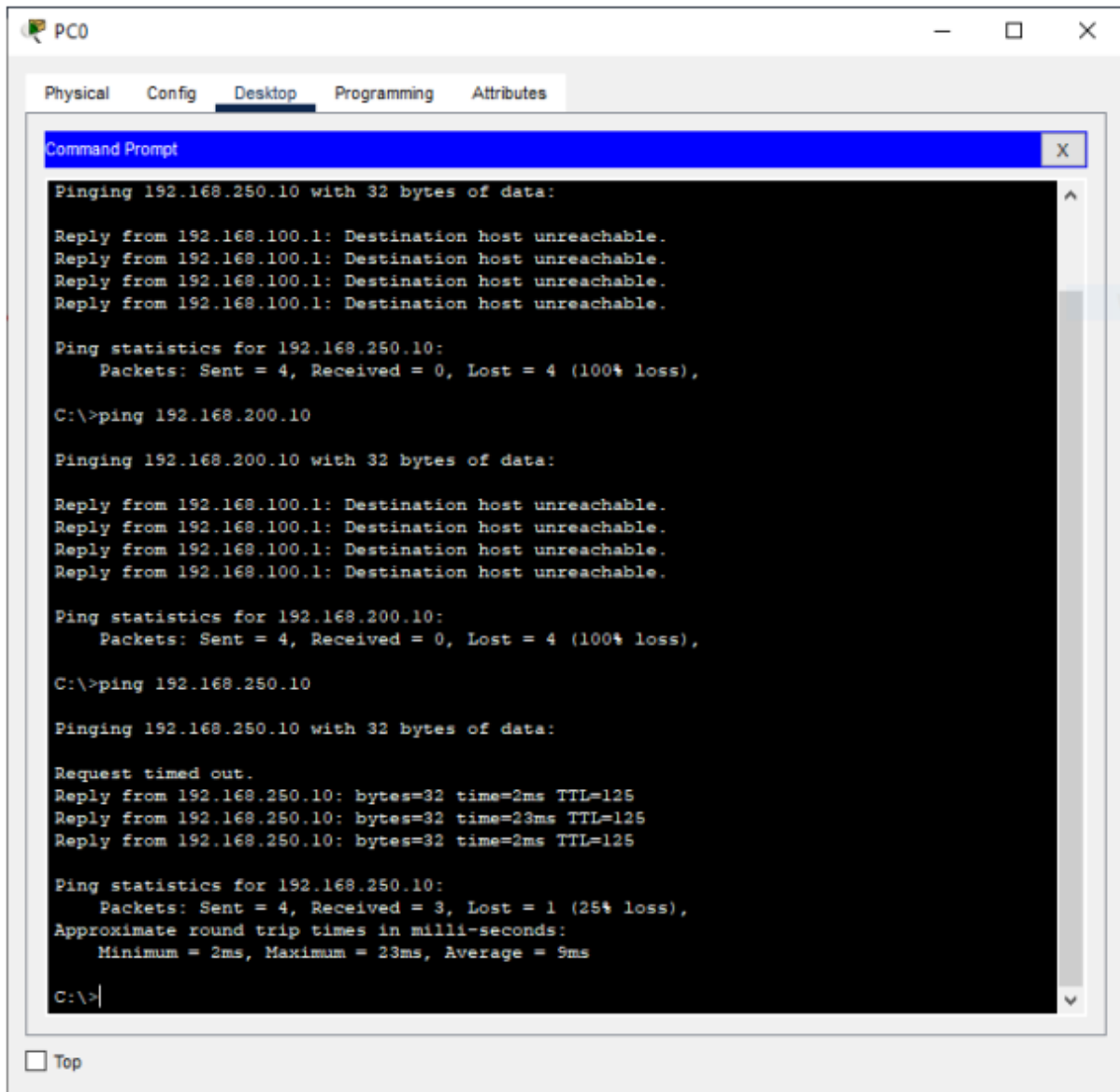
Koristi kriptografske hash funkcije za poboljšanu sigurnost. Sigurniji od PAP-a.

Nedostaci:

Ne podržava vrlo stare operacijske sustave.

IZVOĐENJE VJEŽBE

4.



The screenshot shows a PC0 desktop environment with a Command Prompt window open. The window title is "Command Prompt" and it has a close button (X). The desktop has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes", with "Desktop" selected. The Command Prompt displays the following text:

```
Pinging 192.168.250.10 with 32 bytes of data:  
Reply from 192.168.100.1: Destination host unreachable.  
Reply from 192.168.100.1: Destination host unreachable.  
Reply from 192.168.100.1: Destination host unreachable.  
Reply from 192.168.100.1: Destination host unreachable.  
  
Ping statistics for 192.168.250.10:  
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),  
  
C:\>ping 192.168.200.10  
  
Pinging 192.168.200.10 with 32 bytes of data:  
Reply from 192.168.100.1: Destination host unreachable.  
Reply from 192.168.100.1: Destination host unreachable.  
Reply from 192.168.100.1: Destination host unreachable.  
Reply from 192.168.100.1: Destination host unreachable.  
  
Ping statistics for 192.168.200.10:  
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),  
  
C:\>ping 192.168.250.10  
  
Pinging 192.168.250.10 with 32 bytes of data:  
Request timed out.  
Reply from 192.168.250.10: bytes=32 time=2ms TTL=125  
Reply from 192.168.250.10: bytes=32 time=23ms TTL=125  
Reply from 192.168.250.10: bytes=32 time=2ms TTL=125  
  
Ping statistics for 192.168.250.10:  
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 2ms, Maximum = 23ms, Average = 9ms  
  
C:\>|
```

At the bottom left of the Command Prompt window, there is a checkbox labeled "Top" which is currently unchecked.

5.

The screenshot shows a window titled "Router0" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal text is as follows:

```
Enter configuration commands, one per line. End with Ctrl/Z.
Router(config)#interface Serial2/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console
ip address 10.10.1.1 255.255.255.252
Router(config-if)#
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show interface serial 2/0
Serial2/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 10.10.1.1/30
  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 24 bits/sec, 0 packets/sec
  5 minute output rate 28 bits/sec, 0 packets/sec
    11 packets input, 1000 bytes, 0 no buffer
    Received 8 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    16 packets output, 1136 bytes, 0 underruns
    0 output errors, 0 collisions, 1 interface resets
    0 output buffer failures, 0 output buffers swapped out
--More-- |
```

Below the terminal window, there is a prompt "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". At the bottom left, there is a checkbox labeled "Top".

6.

IOS Command Line Interface

```
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 24 bits/sec, 0 packets/sec
5 minute output rate 28 bits/sec, 0 packets/sec
  11 packets input, 1000 bytes, 0 no buffer
  Received 8 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  16 packets output, 1136 bytes, 0 underruns
  0 output errors, 0 collisions, 1 interface resets
  0 output buffer failures, 0 output buffers swapped out
--More--      0 carrier transitions
  DCD=up DSR=up DTR=up RTS=up CTS=up

Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#encapsulation ppp
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down

Router(config-if)#
```

Ctrl+F6 to exit CLI focus

Copy

Paste

Router1

Physical Config CLI Attributes

IOS Command Line Interface

```
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
%SYS-5-CONFIG_I: Configured from console by console

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

Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#encapsulation ppp
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

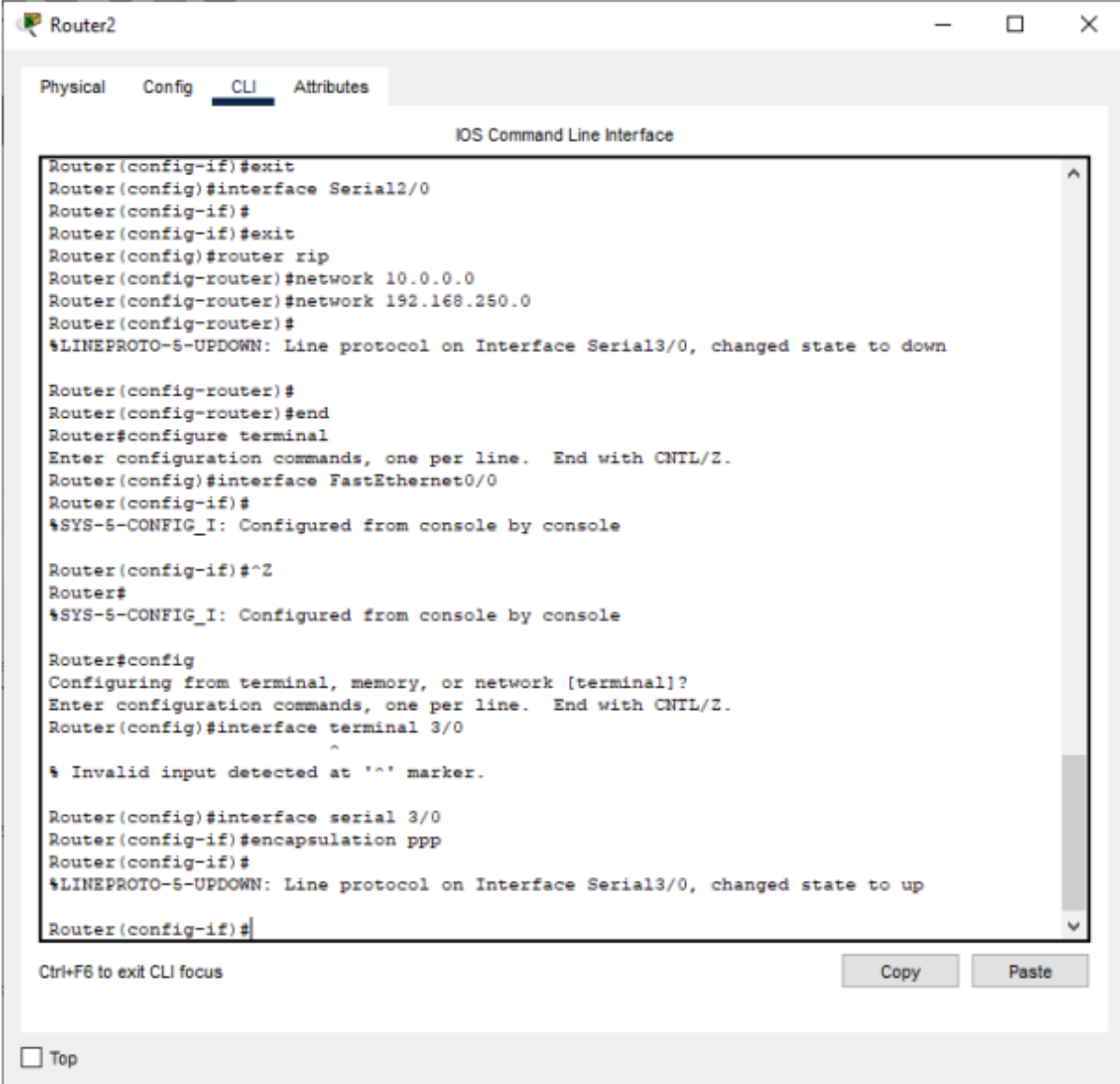
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 3/0
Router(config-if)#encapsulation ppp
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down

Router(config-if)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



The screenshot shows a window titled "Router2" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following sequence of commands and responses:

```
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.250.0
Router(config-router)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to down

Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console

Router(config-if)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface terminal 3/0
^
% Invalid input detected at '^' marker.

Router(config)#interface serial 3/0
Router(config-if)#encapsulation ppp
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router(config-if)#
```

At the bottom of the CLI window, there is a prompt "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". Below the CLI window, there is a checkbox labeled "Top".

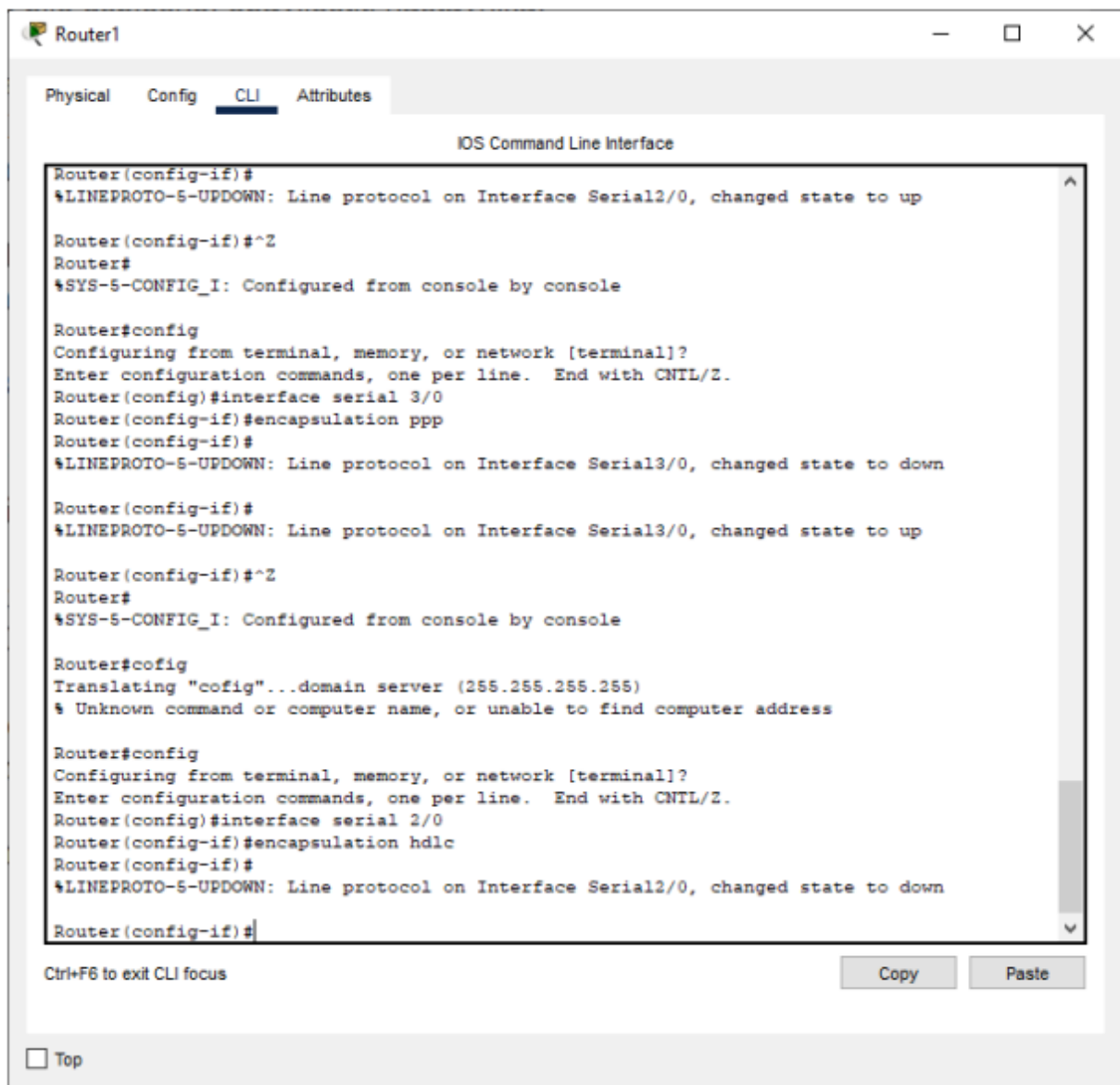
7.

The screenshot shows a window titled "Router2" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following sequence of commands and responses:

```
% Invalid input detected at '^' marker.  
Router(config)#interface serial 3/0  
Router(config-if)#encapsulation ppp  
Router(config-if)#  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up  
Router(config-if)#^Z  
Router#  
%SYS-5-CONFIG_I: Configured from console by console  
Router#show interface serial 3/0  
Serial3/0 is up, line protocol is up (connected)  
  Hardware is HD64570  
  Internet address is 10.10.2.2/30  
  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 Open  
  Open: IPCP, CDPCP  
  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 22 bits/sec, 0 packets/sec  
  5 minute output rate 12 bits/sec, 0 packets/sec  
    30 packets input, 2664 bytes, 0 no buffer  
    Received 24 broadcasts, 0 runts, 0 giants, 0 throttles  
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort  
    22 packets output, 1372 bytes, 0 underruns  
--More--
```

At the bottom of the CLI window, there is a prompt "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". Below the CLI window, there is a checkbox labeled "Top".

8.



9.

