

Group Number: 10, 41

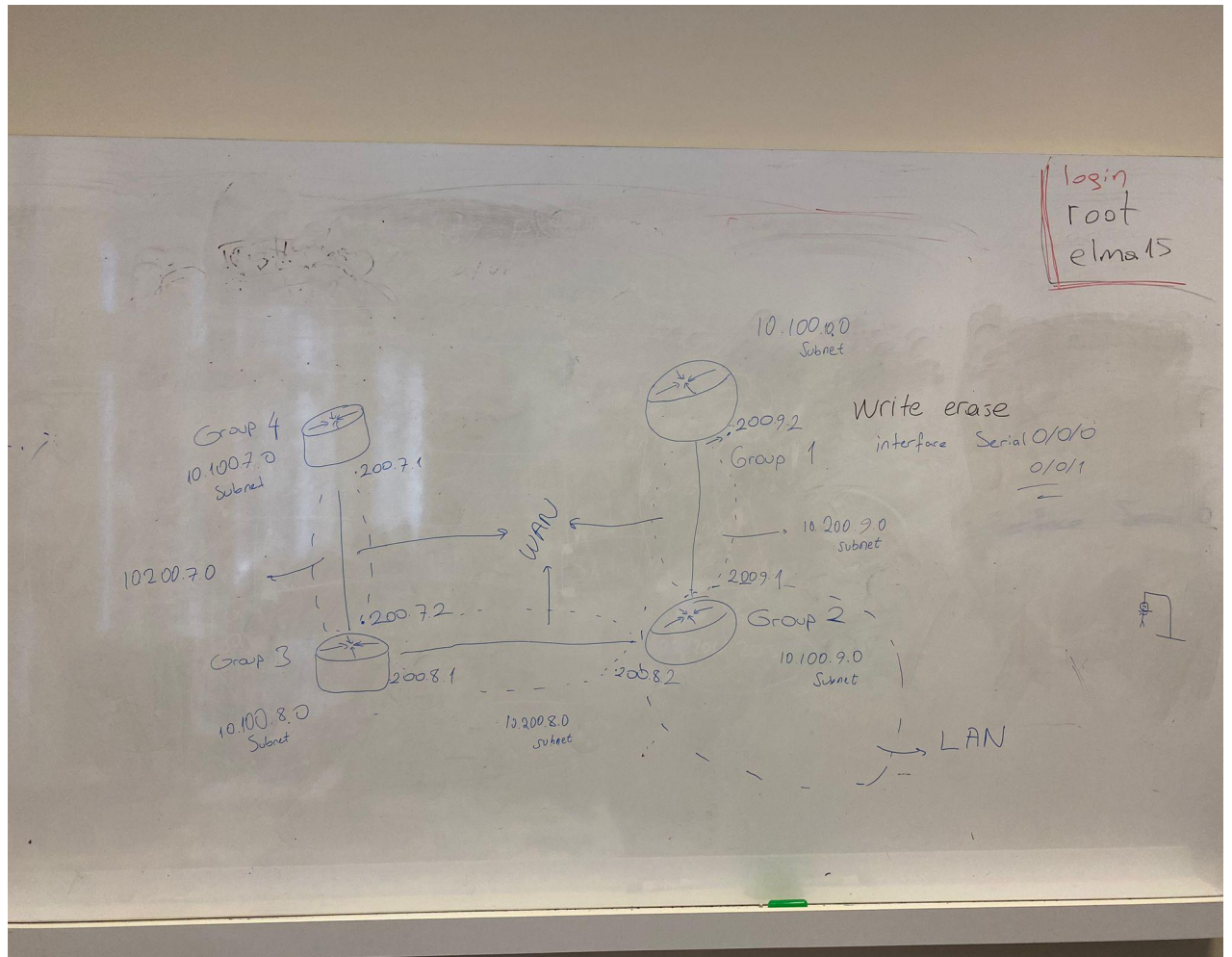
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## Lab10 Static Routing

### EXPERIMENT STEPS

#### Configuring interfaces



```
Router(config)#interface FastEthernet 0/0
Router(config-if)#ip address 10.100.9.254 255.255.255.0
Router(config-if)#encapsulation ?
% Unrecognized command
Router(config-if)#encapsulation HDLC
% Invalid input detected at '^' marker.

Router(config-if)#encap
Router(config-if)#exit
Router(config)#inter
Router(config)#interface Serial 0/0/0
Router(config-if)#encapsulation ?
frame-relay  Frame Relay networks
hdlc         Serial HDLC synchronous
lapb         LAPB (X.25 Level 2)
ppp          Point-to-Point protocol
sdwds        Switched Megabit Data Service (SMDS)
x25          X.25

Router(config-if)#encapsulation hdlc
Router(config-if)#
```

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial 0/0/1
Router(config-if)#ip add
Router(config-if)#ip address 10.100.9.254 255.255.255.0
Router(config-if)#no shut
Router(config-if)#no shutdown
Router(config-if)#clock rate 640000
Router(config-if)#exit
Router(config)#exit
```

We set IP address of the interface. Then we configured HDLC communication protocol for serial interfaces.

**router\_1#** show controllers serial 0/0/<port number>

We needed to find out serial cable property that is attached to your routers serial interface whether DCE or no cable.



```

Applications Places System
root@localhost:~

File Edit View Terminal Tabs Help

smds      Switched Megabit Data Service (SMDS)
x25       X.25

Router(config-if)#encapsulation hdlc
Router(config-if)#show controllers serial 0/0/0
^
% Invalid input detected at '^' marker.

Router(config-if)#exit
Router(config)#exit
Router#write erase
*Jan 1 00:21:14.415: %SYS-5-CONFIG I: Configured from console by console
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]^C
Router#show contr
Router#show controllers seri
Router#show controllers serial 0/0/0
Interface Serial0/0/0
Hardware is GT90K
No serial cable attached
1db at 0x62AD7390, driver data structure at 0x62ADEB54
wic info 0x62ADF150
Physical Port 0, SCC Num 0
MPSC Registers:
MMCR_L=0x00030400, MMCR_H=0x00000000, MPCR=0x00000000
CHR1=0x00FE007E, CHR2=0x80000000, CHR3=0x000005F4, CHR4=0x00000000
CHR5=0x00000000, CHR6=0x00000000, CHR7=0x00000000, CHR8=0x00000000
CHR9=0x00000000, CHR10=0x00000003
SDMA Registers:
SDC=0x00002201, SDCM=0x00000000, SGC=0x0000C000
CRDP=0x073BCEE0, CTDP=0x073BD120, FTDB=0x073BD120
Main Routing Register=0x0003FE38 BRG Conf Register=0x00490013
Rx Clk Routing Register=0x76543818 Tx Clk Routing Register=0x76543210
GPP Registers:
Conf=0x430002, Io=0x46C050, Data=0x7F7FFEAD, Level=0x100
Conf0=0x430002, Io0=0x46C050, Data0=0x7F7FFEAD, Level0=0x100
0 input aborts on receiving flag sequence
0 throttles, 0 enables
0 overruns
0 transmitter underruns
0 transmitter CTS losts
0 rxintr, 0 txintr, 0 rxerr, 0 txerr
0 mpsc_rx, 0 mpsc_rxerr, 0 mpsc_rlsc, 0 mpsc_rhnt, 0 mpsc_rfsc
0 mpsc_rcsc, 0 mpsc_rovr, 0 mpsc_rcdl, 0 mpsc_rckg, 0 mpsc_bper
0 mpsc_txerr, 0 mpsc_teidl, 0 mpsc_tudr, 0 mpsc_tctsl, 0 mpsc_tckg
0 sdma_rx_sf, 0 sdma_rx_mfl, 0 sdma_rx_or, 0 sdma_rx_abr, 0 sdma_rx_no
0 sdma_rx_de, 0 sdma_rx_cdl, 0 sdma_rx_ce, 0 sdma_tx_rl, 0 sdma_tx_ur, 0 sdma_tx_ctsl
0 sdma_rx_reserr, 0 sdma_tx_reserr
0 rx_bogus_pkts, rx_bogus_flag FALSE
0 sdma_tx_ur_processed

tx_limited = 1(2), errata19 count1 - 0, count2 - 0
Receive Ring
rxr head (0)(0x073BCEE0), rxr tail (0)(0x073BCEE0)
rmd(73BCEE0): nbd 73BCEF0 cmd_sts 80800000 buf_sz 06000000 buf_ptr 73BD9C0

```



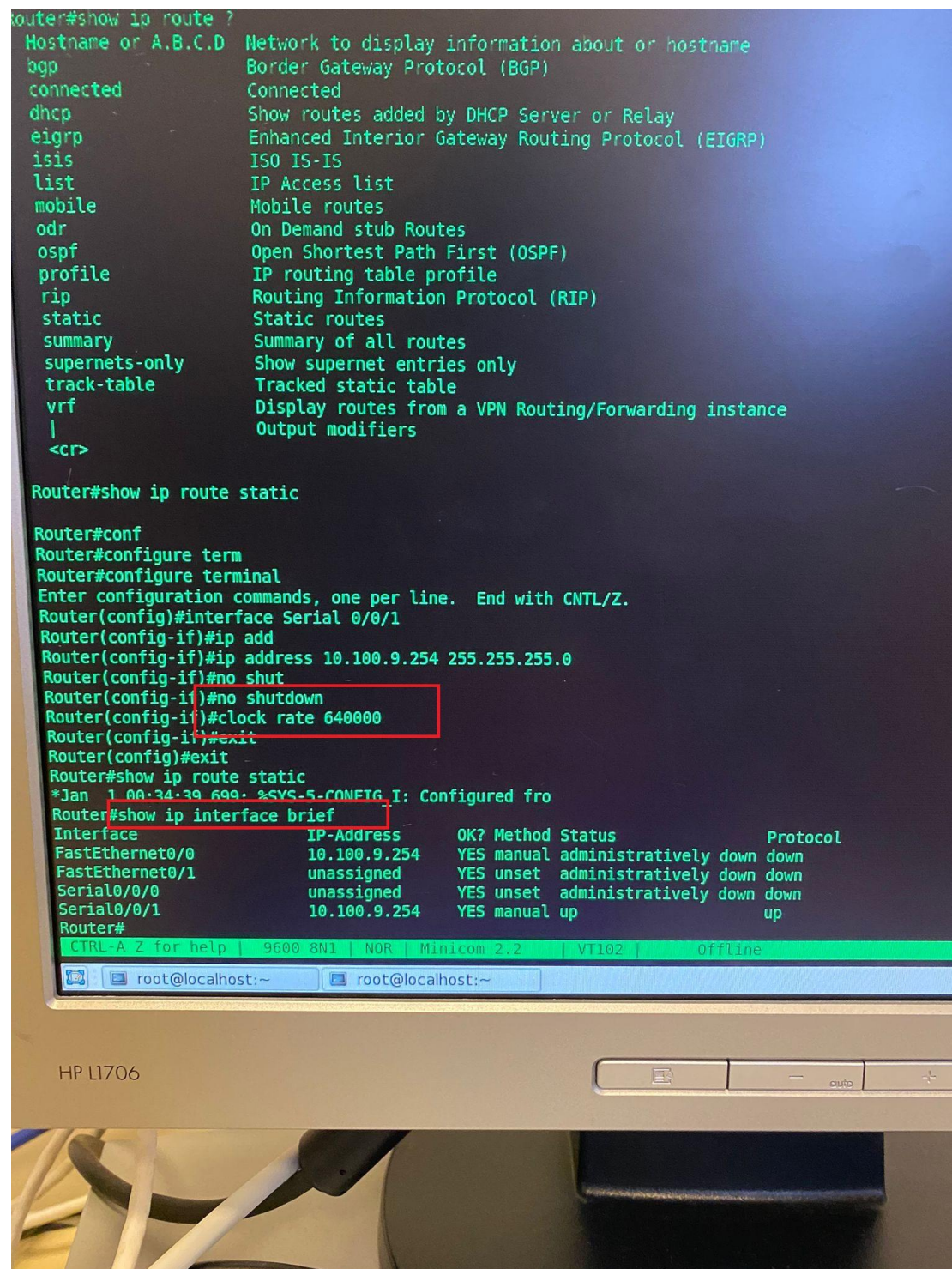
```
Applications Places System root@localhost:~
File Edit View Terminal Tabs Help
tmd(73BD310): nbd 73BD320 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD320): nbd 73BD330 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD330): nbd 73BD340 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD340): nbd 73BD350 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD350): nbd 73BD360 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD360): nbd 73BD370 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD370): nbd 73BD380 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD380): nbd 73BD390 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD390): nbd 73BD3A0 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD3A0): nbd 73BD3B0 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0
tmd(73BD3B0): nbd 73BD3C0 cmd sts 00C30000 byt cnt ABCDABCD buf_ptr 0

Router#show controllers serial 0/0/1
Interface Serial0/0/1
Hardware is G190K
DCE V.35, clock rate 2000000
idb at 0x62AE1648, driver data structure at 0x62AE8E0C
wic_info 0x62AE9408
Physical Port 2, SCC Num 2
MPSC Registers:
MMCR_L=0x00030400, MMCR_H=0x00000000, MPCR=0x00000000
CHR1=0x00FE007E, CHR2=0x00000000, CHR3=0x000005F4, CHR4=0x00000000
CHR5=0x00000000, CHR6=0x00000000, CHR7=0x00000000, CHR8=0x00000000
CHR9=0x00000000, CHR10=0x00002003
SDMA Registers:
SDC=0x00002201, SDCM=0x00000000, SGC=0x0000C000
CRDP=0x073D7390, CTDP=0x073D7550, FTDB=0x073D7550
Main Routing Register=0x0003FE38 BRG Conf Register=0x00490013
Rx Clk Routing Register=0x76543818 Tx Clk Routing Register=0x76543210
GPP Registers:
Conf=0x43 , Io=0x4C004C46, Data=0x337F7757, Level=0x8
Conf0=0x430002 , Io0=0x46C050 , Data0=0x7F7FEAD, Level0=0x100
33 input aborts on receiving flag sequence
0 throttles, 0 enables
6 overruns
0 transmitter underruns
0 transmitter CTS losts
127 rxintr, 23 txintr, 0 rxerr, 0 txerr
465 mp_sc_rx, 0 mp_sc_rxerr, 134 mp_sc_rlsc, 63 mp_sc_rhnt, 301 mp_sc_rfsc
12 mp_sc_rcsc, 0 mp_sc_rovr, 0 mp_sc_rcdl, 0 mp_sc_rckg, 0 mp_sc_bper
0 mp_sc_txerr, 24 mp_sc_teidl, 0 mp_sc_tudr, 0 mp_sc_tctsl, 0 mp_sc_tckg
0 sdma_rx_sf, 0 sdma_rx_mfl, 0 sdma_rx_or, 33 sdma_rx_abr, 10 sdma_rx_no
0 sdma_rx_de, 0 sdma_rx_cdl, 39 sdma_rx_ce, 0 sdma_tx_rl, 0 sdma_tx_ur, 0 sdma_tx_ctsl
0 sdma_rx_reserr, 0 sdma_tx_reserr
0 rx_bogus_pkts, rx_bogus_flag FALSE
0 sdma_tx_ur_processed

tx_limited = 1(2), errata19 count1 - 0, count2 - 0
Receive Ring
rxr head (31)(0x073D7390), rxr tail (0)(0x073D71A0)
rmd(73D71A0): nbd 73D71B0 cmd sts 80800000 buf_sz 06000000 buf_ptr 73E3560
rmd(73D71B0): nbd 73D71C0 cmd sts 80800000 buf_sz 06000000 buf_ptr 73E3BC0
--More--
CTRL-A Z for help | 9600 8N1 | NOR | Minicom 2.2 | VT102 | Offline
root@localhost:~ root@localhost:~
```

As we can visualize, DCE V.35 is attached to Serial 0/0/1. There is no cable attached to Serial 0/0/0 .

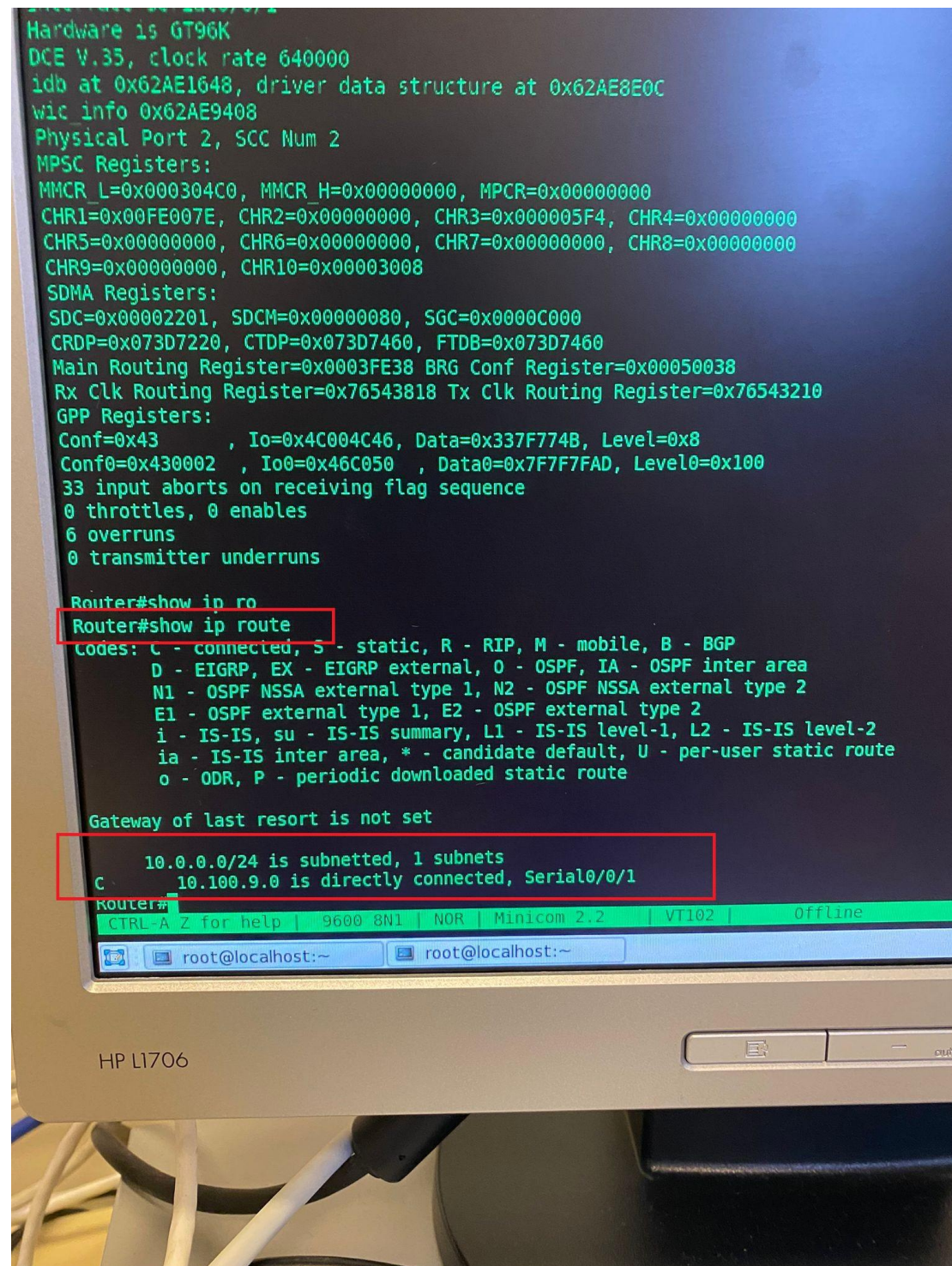




Clock generation is carried out over the corresponding V35 connection's clock output when **clock rate 6400** command is used. An interface is placed in the active state with **no shutdown** command. At the end part of the picture picture, we can see that IP address is connected with Serial 0/0/1 and Status is up.



## Configuring routings



When we execute the command **show ip route**, there is routing table and codes of the letter's meaning which gives us knowledge about the connections, routing protocol and etc. 10.100.9.0 is directly connected to Serial 0/0/1 which is shown with C sign at the table.





## Testing all connections

```
Welcome to minicom 2.2

OPTIONS: I18n
Compiled on Sep 25 2007, 06:13:56.
Port /dev/ttyS0

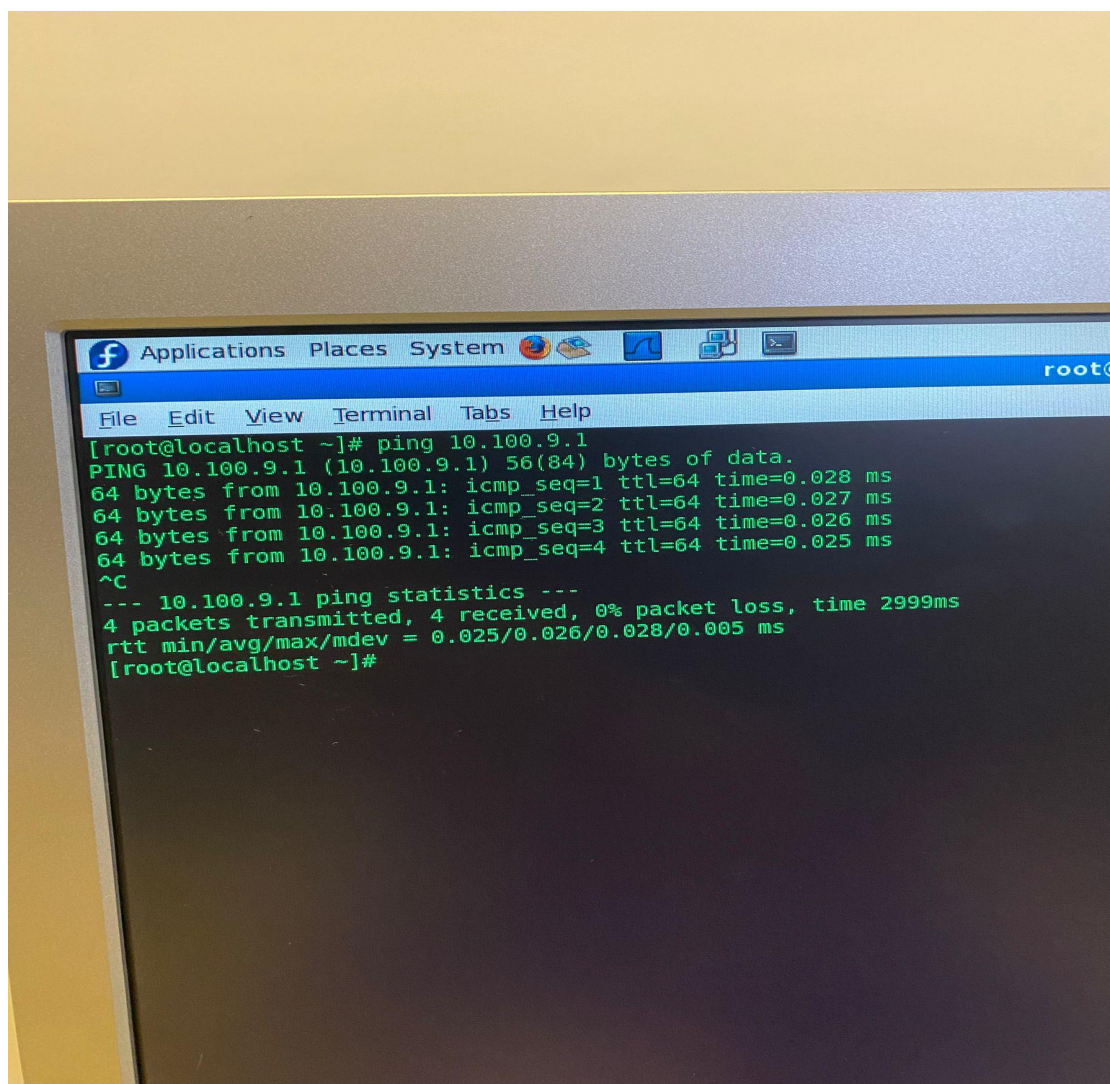
Press CTRL-A Z for help on special keys

Router#AT S7=45 S0=0 L1 V1 X4 &c1 E1 00
^
% Invalid input detected at '^' marker.

Router#ping 10.100.8.2

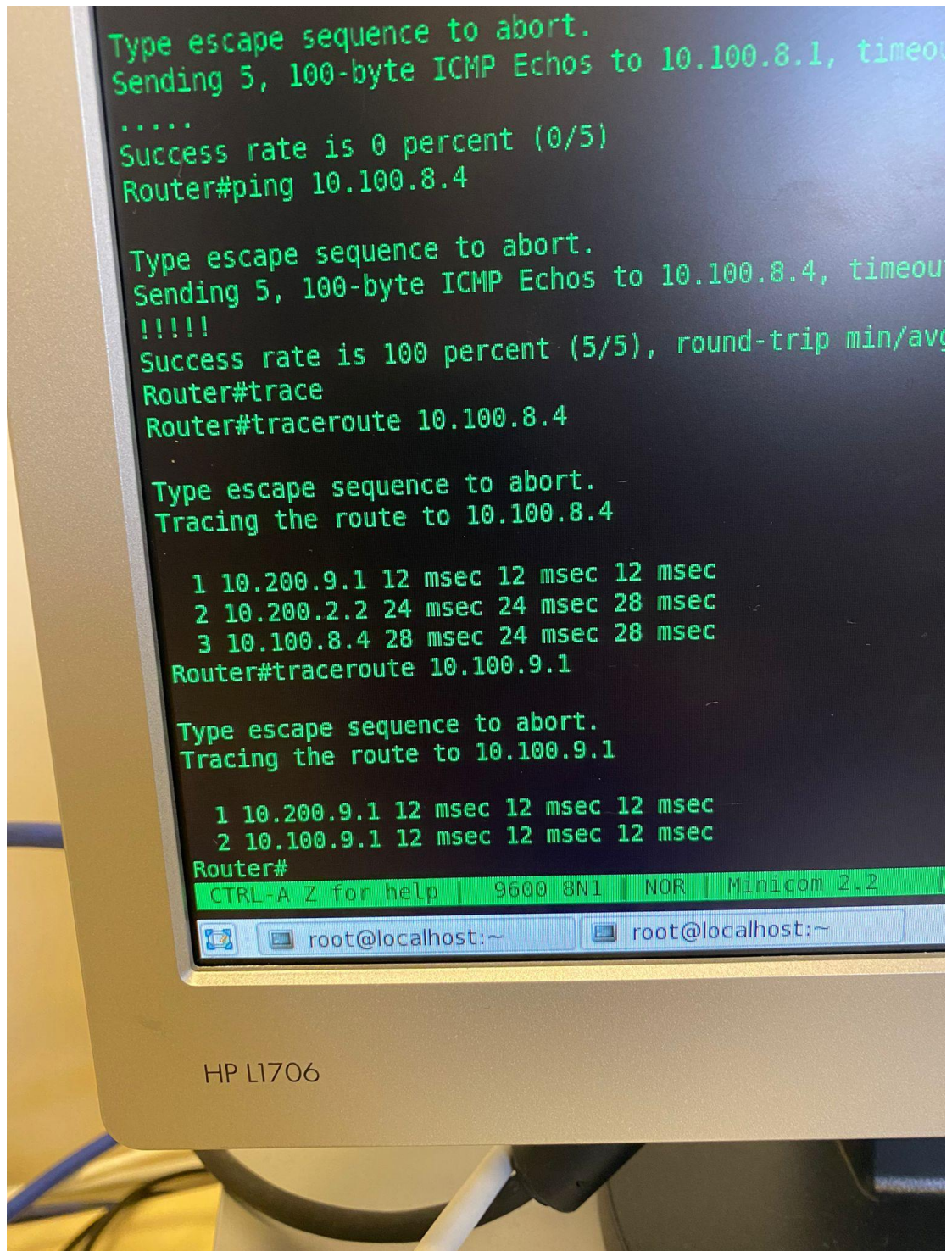
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.100.8.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 52/55/56 ms
Router#ping 10.100.9.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.100.9.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/28/32 ms
Router#ping 10.100.8.1
```



```
Applications Places System root@
File Edit View Terminal Tabs Help
[root@localhost ~]# ping 10.100.9.1
PING 10.100.9.1 (10.100.9.1) 56(84) bytes of data.
64 bytes from 10.100.9.1: icmp_seq=1 ttl=64 time=0.028 ms
64 bytes from 10.100.9.1: icmp_seq=2 ttl=64 time=0.027 ms
64 bytes from 10.100.9.1: icmp_seq=3 ttl=64 time=0.026 ms
64 bytes from 10.100.9.1: icmp_seq=4 ttl=64 time=0.025 ms
^C
--- 10.100.9.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2999ms
rtt min/avg/max/mdev = 0.025/0.026/0.028/0.005 ms
[root@localhost ~]#
```





We are able to ping from our router to neighbors. We are also able to ping from our computer to other groups computers. There were some neighbors whom we could not successfully ping due to some issues happening with their routers and computers. When we trace the routes, there did not happen any timeout and it traced successfully as shown in the last picture in which there is no asterisk(timeout) sign. Round trip time of 10.200.9.1 was lower than others.