

Server ip: 192.168.0.102

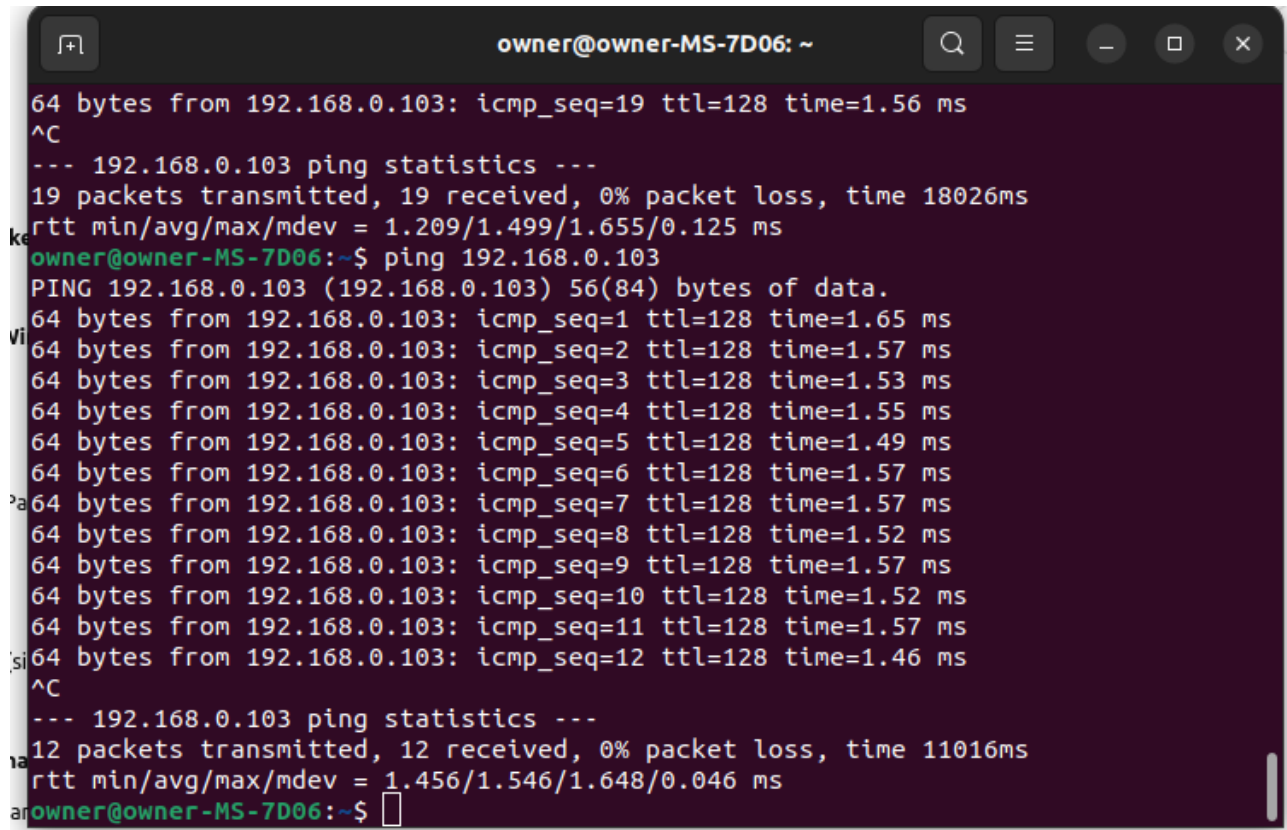
Client ip: 192.168.0.103

```
owner@owner-MS-7D06: ~  
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
device memory 0xa0600000-a06fffff  
  
Hlo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
inet 127.0.0.1 netmask 255.0.0.0  
inet6 ::1 prefixlen 128 scopeid 0x10<host>  
loop txqueuelen 1000 (Local Loopback)  
RX packets 27270 bytes 16181210 (16.1 MB)  
RX errors 0 dropped 0 overruns 0 frame 0  
TX packets 27270 bytes 16181210 (16.1 MB)  
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
vxlan.calico: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1450  
inet 10.1.246.0 netmask 255.255.255.255 broadcast 0.0.0.0  
inet6 fe80::64a6:a0ff:fe2e:3279 prefixlen 64 scopeid 0x20<link>  
ether 66:a6:a0:2e:32:79 txqueuelen 0 (Ethernet)  
RX packets 0 bytes 0 (0.0 B)  
RX errors 0 dropped 0 overruns 0 frame 0  
TX packets 0 bytes 0 (0.0 B)  
TX errors 0 dropped 51 overruns 0 carrier 0 collisions 0  
  
owner@owner-MS-7D06:~$ hostname -I  
192.168.0.102 172.17.0.1 10.1.246.0  
owner@owner-MS-7D06:~$
```

```
owner@owner-MS-7D06: ~  
inet6 fe80::64a6:a0ff:fe2e:3279 prefixlen 64 scopeid 0x20<link>  
ether 66:a6:a0:2e:32:79 txqueuelen 0 (Ethernet)  
RX packets 0 bytes 0 (0.0 B)  
RX errors 0 dropped 0 overruns 0 frame 0  
TX packets 0 bytes 0 (0.0 B)  
TX errors 0 dropped 51 overruns 0 carrier 0 collisions 0  
  
owner@owner-MS-7D06:~$ hostname -I  
192.168.0.102 172.17.0.1 10.1.246.0  
owner@owner-MS-7D06:~$ arp-scan  
pcap_activate: enp7s0: You don't have permission to capture on that device  
(socket: Operation not permitted)  
owner@owner-MS-7D06:~$ sudo arp-scan --localnet  
[sudo] password for owner:  
Interface: enp7s0, type: EN10MB, MAC: 2c:f0:5d:e9:83:75, IPv4: 192.168.0.102  
Starting arp-scan 1.9.7 with 256 hosts (https://github.com/royhills/arp-scan)  
192.168.0.1 9c:53:22:05:1c:6a (Unknown)  
192.168.0.101 dc:f5:05:69:7e:25 AzureWave Technology Inc.  
192.168.0.103 c4:65:16:91:3f:f9 Hewlett Packard  
  
3 packets received by filter, 0 packets dropped by kernel  
Ending arp-scan 1.9.7: 256 hosts scanned in 1.867 seconds (137.12 hosts/sec). 3  
responded  
owner@owner-MS-7D06:~$
```

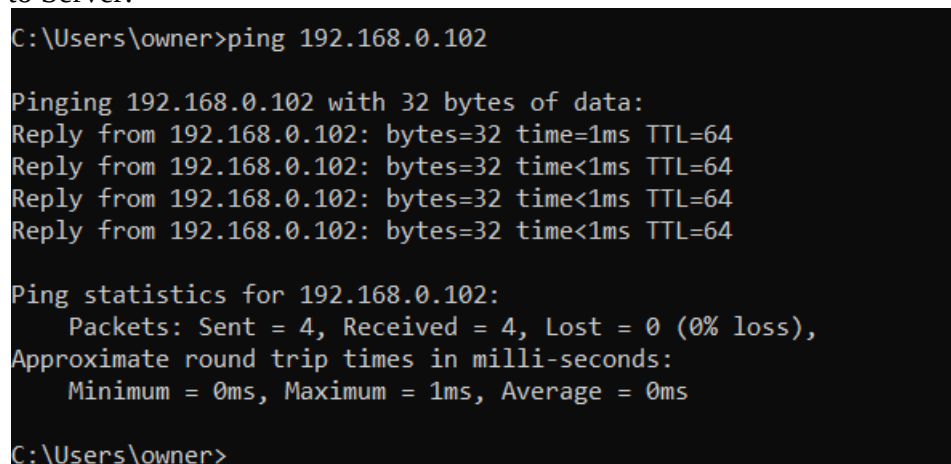
(10 p) Router is routing, return a screenshot of working ping between laptop and server IP addresses.

From Server to Client:

A screenshot of a terminal window titled "owner@owner-MS-7D06: ~". The terminal shows the output of a ping command from the server to the client. It displays 19 packets transmitted with 0% packet loss and a total time of 18026ms. The round-trip times (rtt) are listed as min/avg/max/mdev = 1.209/1.499/1.655/0.125 ms. The user then presses Ctrl+C to stop the ping and runs the command "ping 192.168.0.103" again. This time, 12 packets are transmitted with 0% packet loss and a total time of 11016ms. The rtt is min/avg/max/mdev = 1.456/1.546/1.648/0.046 ms. The terminal window has a dark background with light-colored text and standard window controls at the top.

```
owner@owner-MS-7D06: ~
64 bytes from 192.168.0.103: icmp_seq=19 ttl=128 time=1.56 ms
^C
--- 192.168.0.103 ping statistics ---
19 packets transmitted, 19 received, 0% packet loss, time 18026ms
rtt min/avg/max/mdev = 1.209/1.499/1.655/0.125 ms
owner@owner-MS-7D06:~$ ping 192.168.0.103
PING 192.168.0.103 (192.168.0.103) 56(84) bytes of data.
64 bytes from 192.168.0.103: icmp_seq=1 ttl=128 time=1.65 ms
64 bytes from 192.168.0.103: icmp_seq=2 ttl=128 time=1.57 ms
64 bytes from 192.168.0.103: icmp_seq=3 ttl=128 time=1.53 ms
64 bytes from 192.168.0.103: icmp_seq=4 ttl=128 time=1.55 ms
64 bytes from 192.168.0.103: icmp_seq=5 ttl=128 time=1.49 ms
64 bytes from 192.168.0.103: icmp_seq=6 ttl=128 time=1.57 ms
64 bytes from 192.168.0.103: icmp_seq=7 ttl=128 time=1.57 ms
64 bytes from 192.168.0.103: icmp_seq=8 ttl=128 time=1.52 ms
64 bytes from 192.168.0.103: icmp_seq=9 ttl=128 time=1.57 ms
64 bytes from 192.168.0.103: icmp_seq=10 ttl=128 time=1.52 ms
64 bytes from 192.168.0.103: icmp_seq=11 ttl=128 time=1.57 ms
64 bytes from 192.168.0.103: icmp_seq=12 ttl=128 time=1.46 ms
^C
--- 192.168.0.103 ping statistics ---
12 packets transmitted, 12 received, 0% packet loss, time 11016ms
rtt min/avg/max/mdev = 1.456/1.546/1.648/0.046 ms
owner@owner-MS-7D06:~$
```

From Client to Server:

A screenshot of a Windows command prompt window. The user has entered the command "ping 192.168.0.102". The output shows four successful replies from 192.168.0.102, each with 32 bytes of data, a time of less than 1ms, and a TTL of 64. The ping statistics for 192.168.0.102 are displayed, showing 4 packets sent, 4 received, and 0% loss. The approximate round-trip times are listed as Minimum = 0ms, Maximum = 1ms, and Average = 0ms. The command prompt window has a black background with white text.

```
C:\Users\owner>ping 192.168.0.102

Pinging 192.168.0.102 with 32 bytes of data:
Reply from 192.168.0.102: bytes=32 time=1ms TTL=64
Reply from 192.168.0.102: bytes=32 time<1ms TTL=64
Reply from 192.168.0.102: bytes=32 time<1ms TTL=64
Reply from 192.168.0.102: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.0.102:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\owner>
```

(10 p) DNS is working, return a screenshot of working ping between laptop and server using server domain name as ping destination.

Server:

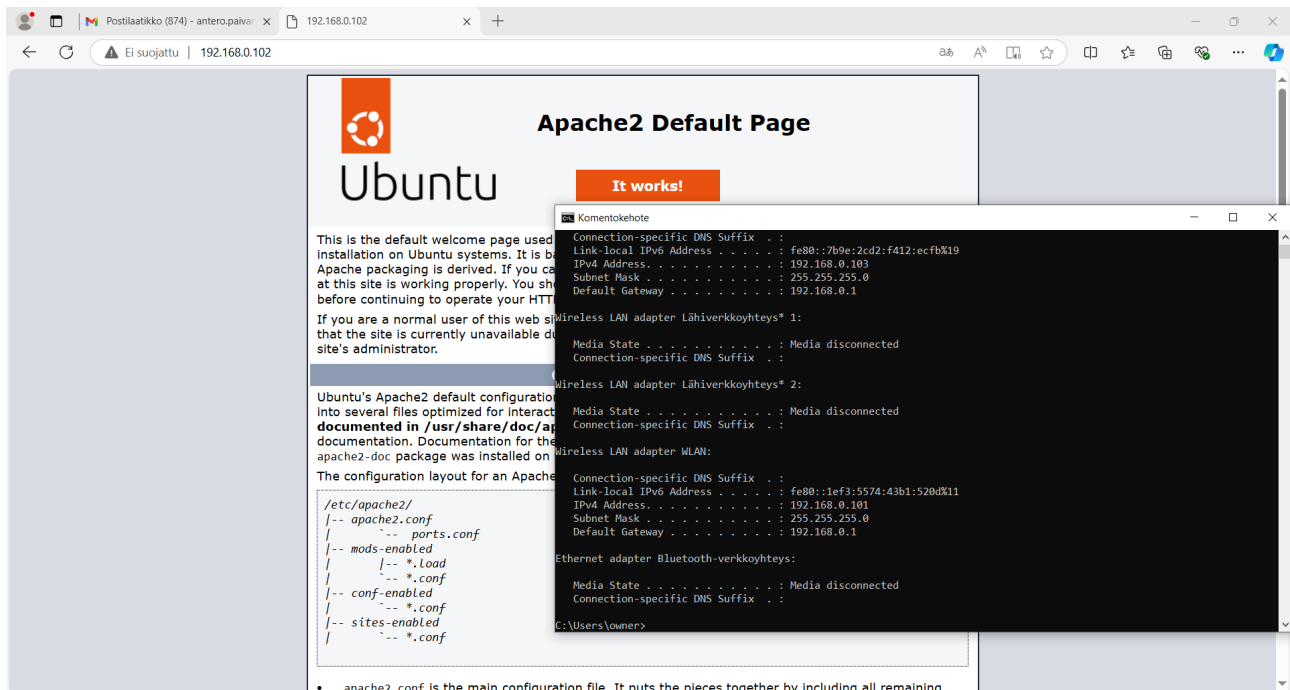
```
owner@owner-MS-7D06: ~  
owner@owner-MS-7D06: ~ 80x24  
64 bytes from owner-MS-7D06 (192.168.0.102): icmp_seq=4 ttl=64 time=0.067 ms  
^C  
--- sovellusprotokolla.com ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3063ms  
rtt min/avg/max/mdev = 0.047/0.074/0.113/0.024 ms  
owner@owner-MS-7D06:~$ ping 192.168.0.103^C  
owner@owner-MS-7D06:~$ ^C  
owner@owner-MS-7D06:~$ ping sovellusprotokolla.com  
PING sovellusprotokolla.com (192.168.0.102) 56(84) bytes of data.  
64 bytes from owner-MS-7D06 (192.168.0.102): icmp_seq=1 ttl=64 time=0.083 ms  
64 bytes from owner-MS-7D06 (192.168.0.102): icmp_seq=2 ttl=64 time=0.087 ms  
^C  
--- sovellusprotokolla.com ping statistics ---  
2 packets transmitted, 2 received, 0% packet loss, time 1063ms  
rtt min/avg/max/mdev = 0.083/0.085/0.087/0.002 ms  
owner@owner-MS-7D06:~$ ping 192.168.0.103  
PING 192.168.0.103 (192.168.0.103) 56(84) bytes of data.  
64 bytes from 192.168.0.103: icmp_seq=1 ttl=128 time=1.58 ms  
64 bytes from 192.168.0.103: icmp_seq=2 ttl=128 time=1.64 ms  
^C  
--- 192.168.0.103 ping statistics ---  
2 packets transmitted, 2 received, 0% packet loss, time 1002ms  
rtt min/avg/max/mdev = 1.584/1.610/1.636/0.026 ms  
owner@owner-MS-7D06:~$
```

Reserve time for yourself and inquire free times from the lecture

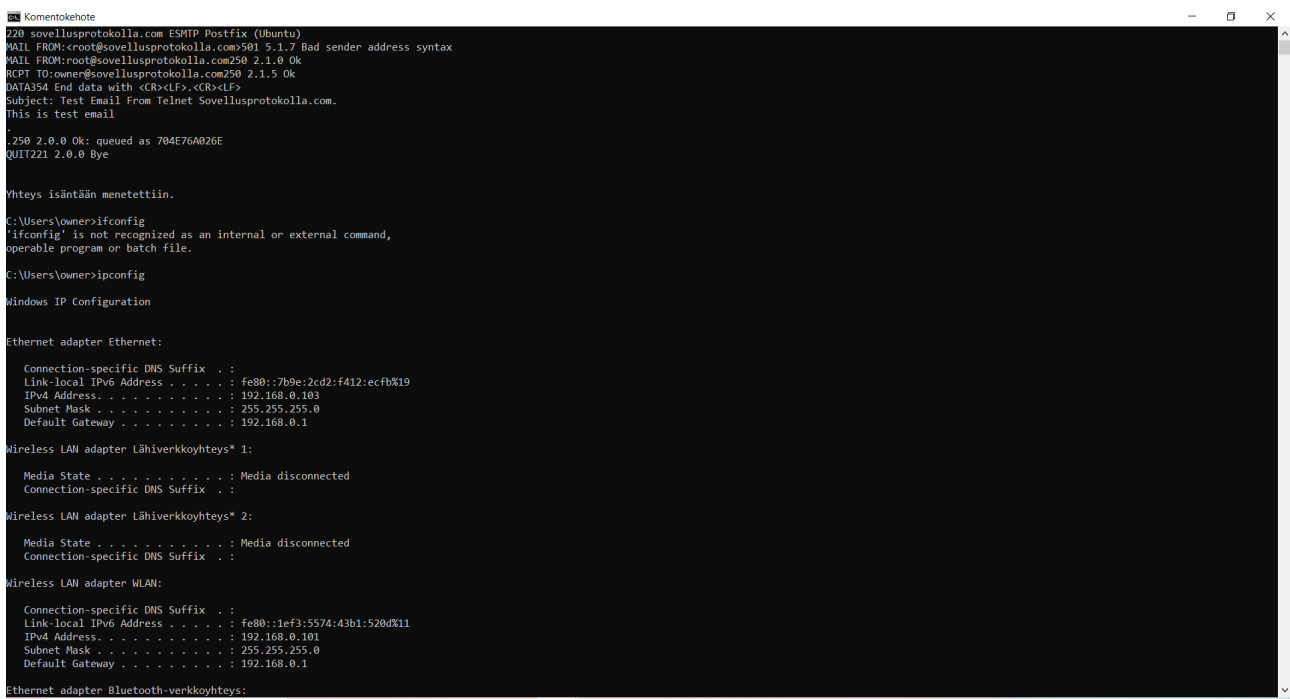
client:

```
C:\Users\owner>ipconfig  
  
Windows IP Configuration  
  
Ethernet adapter Ethernet:  
  
    Connection-specific DNS Suffix  . :  
    Link-local IPv6 Address . . . . . : fe80::7b9e:2cd2:f412:ecfb%19  
    IPv4 Address. . . . . : 192.168.0.103  
    Subnet Mask . . . . . : 255.255.255.0  
    Default Gateway . . . . . : 192.168.0.1  
  
Wireless LAN adapter Lähiverkkoyhteys* 1:  
  
    Media State . . . . . : Media disconnected  
    Connection-specific DNS Suffix  . :  
  
Wireless LAN adapter Lähiverkkoyhteys* 2:  
  
    Media State . . . . . : Media disconnected  
    Connection-specific DNS Suffix  . :  
  
Wireless LAN adapter WLAN:  
  
    Connection-specific DNS Suffix  . :  
    Link-local IPv6 Address . . . . . : fe80::1ef3:5574:43b1:520d%11  
    IPv4 Address. . . . . : 192.168.0.101  
    Subnet Mask . . . . . : 255.255.255.0  
    Default Gateway . . . . . : 192.168.0.1  
  
Ethernet adapter Bluetooth-verkkoyhteys:  
  
    Media State . . . . . : Media disconnected  
    Connection-specific DNS Suffix  . :  
  
C:\Users\owner>ping sovellusprotokolla.com  
  
Pinging sovellusprotokolla.com [192.168.0.102] with 32 bytes of data:  
Reply from 192.168.0.102: bytes=32 time=1ms TTL=64  
Reply from 192.168.0.102: bytes=32 time=1ms TTL=64  
Reply from 192.168.0.102: bytes=32 time=1ms TTL=64  
  
Ping statistics for 192.168.0.102:  
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),  
    Approximate round trip times in milli-seconds:  
        Minimum = 1ms, Maximum = 1ms, Average = 1ms  
Control-C  
^C  
C:\Users\owner>
```

(10 p) Web server is working, return a screenshot of laptop retrieving a web page from the server domain.



(10 p) Email sending is working, return a screenshot of laptop sending an email via telnet (or equivalent) using SMTP.



(10 p) Email receiving is working, return a screenshot of laptop retrieving an email via telnet (or equivalent) using POP3 or IMAP4.

```
Komentekehote
Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::7b9e:2cd2:f412:ecfb%19
    IPv4 Address. . . . . : 192.168.0.103
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1

Wireless LAN adapter Lähiverkkoyhteys* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Wireless LAN adapter Lähiverkkoyhteys* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Wireless LAN adapter WLAN:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::1ef3:5574:43b1:520d%11
    IPv4 Address. . . . . : 192.168.0.101
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1

Jos haluat nähdä kaikki viestit, klikkaa:

Edelliset 7 näivää
```

```
Telnet sovellusprotokolla.com

* OK [CAPABILITY IMAP4rev1 SASL-IR LOGIN-REFERRALS ID ENABLE IDLE LITERAL+ AUTH=PLAIN AUTH=LOGIN] Dovecot (U
a001 LOGIN owner root1478a001 OK [CAPABILITY IMAP4rev1 SASL-IR LOGIN-REFERRALS ID ENABLE IDLE SORT SORT=DISP
REFERENCES THREAD=REFS THREAD=ORDEREDSUBJECT MULTIAPPEND URL-PARTIAL CATEWATE UNSELECT CHILDREN NAMESPACE URI
TENDED I18NLEVEL=1 COMSTORE QRESYNC ESEARCH ESORT SEARCHRES WITHIN CONTEXT-SEARCH LIST-STATUS BINARY MOVE S
PREVIEW=FUZZY PREVIEW STATUS=SIZE SAVEDATE LITERAL+ NOTIFY SPECIAL-USE] Logged in
a002 SELECT INBOX* FLAGS (\Answered \Flagged \Deleted \Seen \Draft)
* OK [PERMANENTFLAGS (\Answered \Flagged \Deleted \Seen \Draft \*)] Flags permitted.
* 3 EXISTS
* 1 RECENT
* OK [UNSEEN 2] First unseen.
* OK [UIDVALIDITY 1728330193] UIDs valid
* OK [UIDNEXT 4] Predicted next UID
a002 OK [READ-WRITE] Select completed (0.037 + 10.700 + 10.736 secs).
a003 FETCH 1:* (ENVELOPE)* 1 FETCH (ENVELOPE ("Mon, 7 Oct 2024 18:19:00 +0300 (EEST)" "Testiviesti" ((NIL NIL
sovellusprotokolla.com))) ((NIL NIL "root" "sovellusprotokolla.com"))) ((NIL NIL "root" "sovellusprotokolla.co
NIL NIL "<20241007151905.1D8DF6A0247@sovellusprotokolla.com>"))
* 2 FETCH (ENVELOPE (NIL "Test Email From Telnet SoSovellusprotokolla.com" NIL NIL NIL NIL NIL NIL NIL NIL))
* 3 FETCH (ENVELOPE (NIL "Testausta" NIL NIL NIL NIL NIL NIL NIL NIL))
a003 OK Fetch completed (0.003 + 8.139 + 0.002 secs).
QUITQUIT BAD Error in IMAP command: Invalid command name (0.001 + 1.136 + 1.135 secs).
* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
```

## Telnet sovellusprotokolla.com

```
* 3 FETCH (ENVELOPE (NIL "Testausta" NIL NIL NIL NIL NIL NIL NIL NIL))
a003 OK Fetch completed (0.003 + 8.139 + 0.002 secs).
QUITQUIT BAD Error in IMAP command: Invalid command name (0.001 + 1.136 + 1.135 secs).
* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
a003 FETCH 1 )a003 BAD Error in IMAP command FETCH: Unexpected ')' (0.001 + 6.033 + 6.032 secs).
a003 FETCH 1 (BODY.PEEK[HEADER])* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
a003 FETCH 1 (BODY.PEEK[HEADER])* 1 FETCH (BODY[HEADER] {514}
Return-Path: <root@sovellusprotokolla.com>
X-Original-To: owner@sovellusprotokolla.com
Delivered-To: owner@sovellusprotokolla.com
Received: from sovellusprotokolla.com (owner-MS-7D06 [192.168.0.102])
    by sovellusprotokolla.com (Postfix) with SMTP id 1D8DF6A0247
    for <owner@sovellusprotokolla.com>; Mon, 7 Oct 2024 18:19:00 +0300 (EEST)
Subject: Testiviesti
Message-Id: <20241007151905.1D8DF6A0247@sovellusprotokolla.com>
Date: Mon, 7 Oct 2024 18:19:00 +0300 (EEST)
From: root@sovellusprotokolla.com
)
a003 OK Fetch completed (0.001 + 14.471 secs).
* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
a003 FETCH 3 )a003 BAD Error in IMAP command FETCH: Unexpected ')' (0.001 + 8.249 + 8.248 secs).
a003 FETCH 3 (BODY.PEEK[HEADER])* 3 FETCH (BODY[HEADER] {362}
Return-Path: <root@sovellusprotokolla.com>
X-Original-To: owner@sovellusprotokolla.com
Delivered-To: owner@sovellusprotokolla.com
Received: from sovellusprotokolla.com (unknown [192.168.0.103])
    by sovellusprotokolla.com (Postfix) with ESMTP id 9A1396A026E
    for <owner@sovellusprotokolla.com>; Thu, 10 Oct 2024 16:53:16 +0300 (EEST)
Subject: Testausta.
)
a003 OK Fetch completed (0.001 + 23.711 secs).
a003 FETCH 2 (BODY.PEa003 BAD Error in IMAP command FETCH: Invalid characters in atom (0.001 + 11.798 + 11.797
a003 FETCH 2 (BODY.PEEK[HEADER])* BAD Error in IMAP tag: Invalid tag (0.001 + 0.000 secs).
a003 FETCH 2 (BODY.PEEK[HEADER])* 2 FETCH (BODY[HEADER] {393}
Return-Path: <root@sovellusprotokolla.com>
X-Original-To: owner@sovellusprotokolla.com
Delivered-To: owner@sovellusprotokolla.com
Received: from unknown (unknown [192.168.0.103])
    by sovellusprotokolla.com (Postfix) with SMTP id 704E76A026E
    for <owner@sovellusprotokolla.com>; Thu, 10 Oct 2024 16:31:20 +0300 (EEST)
Subject: Test Email From Telnet SoSovellusprotokolla.com
)
a003 OK Fetch completed (0.001 + 12.653 secs).
```