Final Lab

Course 420-EB6-AB – Cisco IV

December 6, 2024

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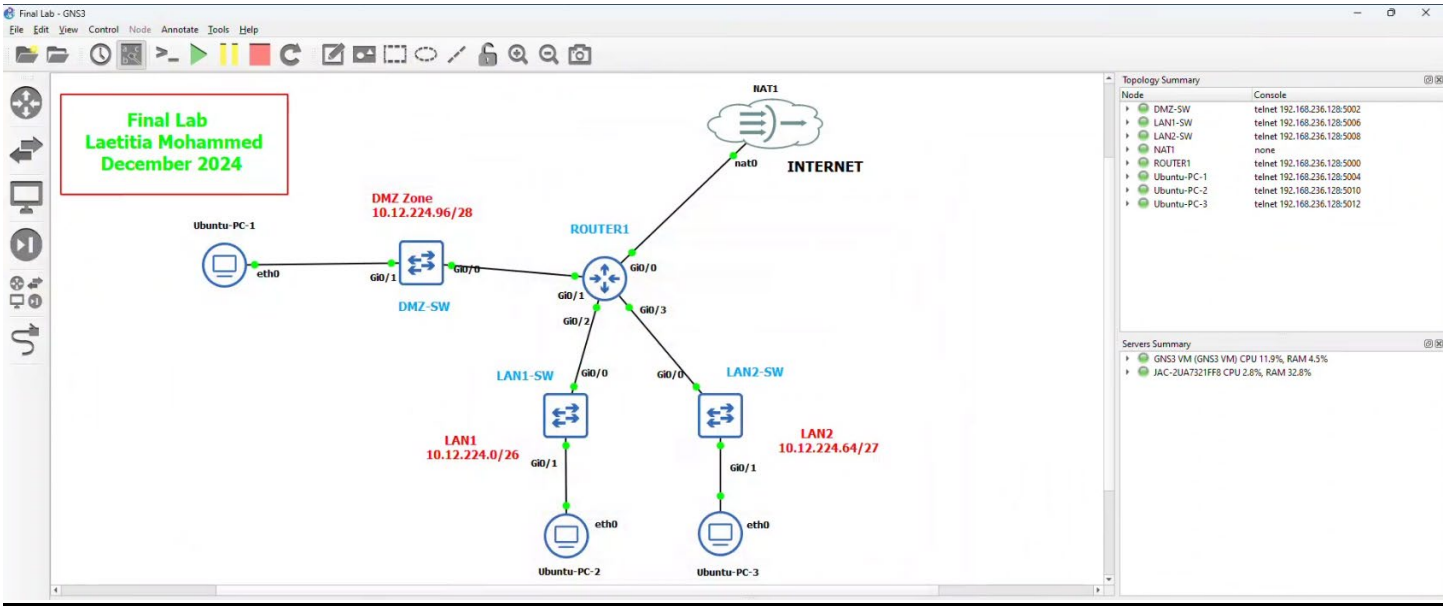
Topology:



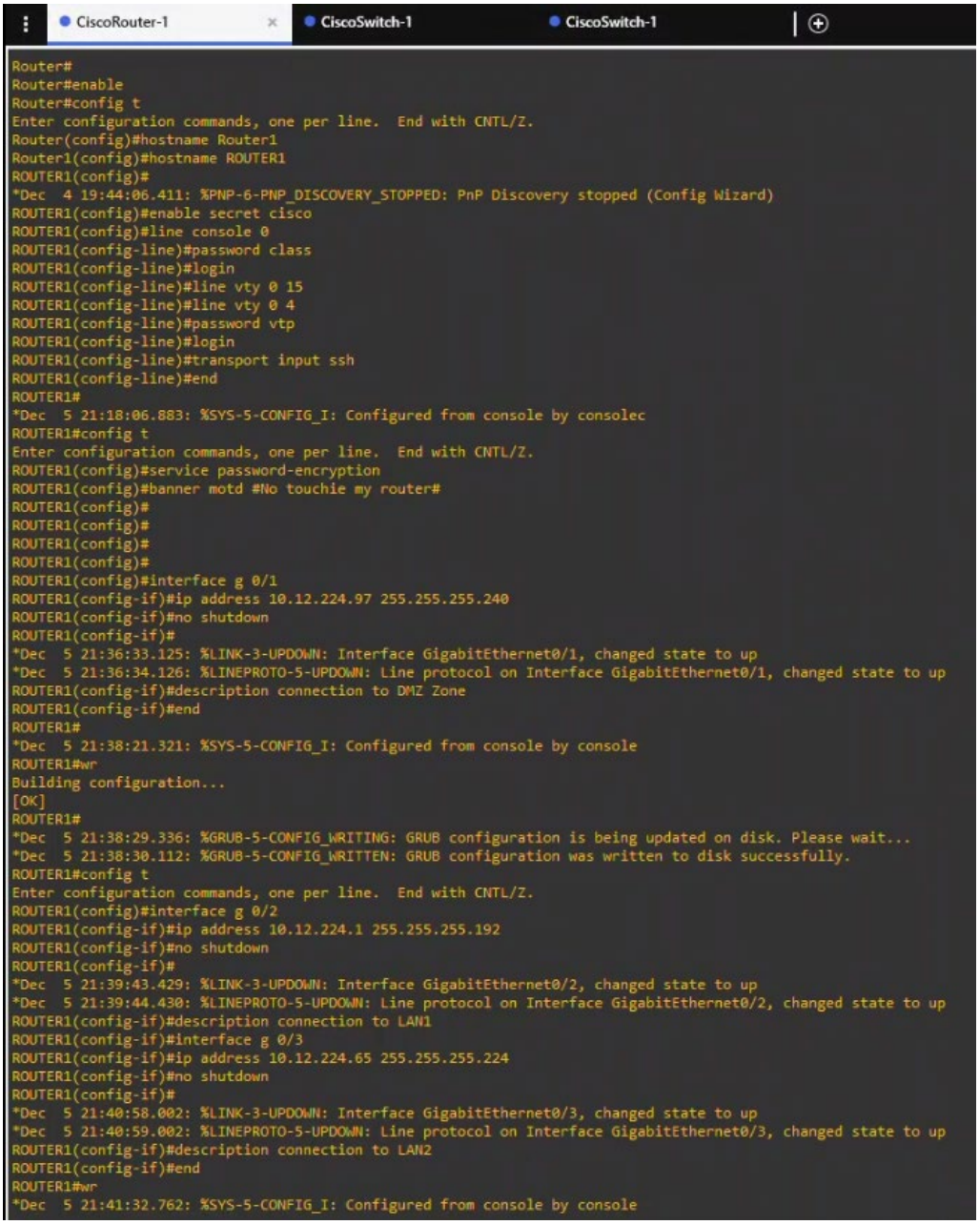
IP Addressing Table:

Device	Interface	IP Address	Subnet Mask	Default Gateway
Router1	Go/0	192.168.197.129	255.255.255.0	N/A
	Go/1	10.12.224.97	255.255.255.240	N/A
	Go/2	10.12.224.1	255.255.255.192	N/A
	Go/3	10.12.224.65	255.255.255.224	N/A
LAN1-SW	SVI	10.12.224.62	255.255.255.192	10.12.224.1
LAN2-SW	SVI	10.12.224.94	255.255.255.224	10.12.224.65
DMZ-SW	SVI	10.12.224.110	255.255.255.240	10.12.224.97
Ubuntu PC-1	NIC	10.12.224.98	255.255.255.240	10.12.224.97
Ubuntu PC-2	NIC	10.12.224.2	255.255.255.192	10.12.224.1
Ubuntu PC-3	NIC	10.12.224.66	255.255.255.224	10.12.224.65

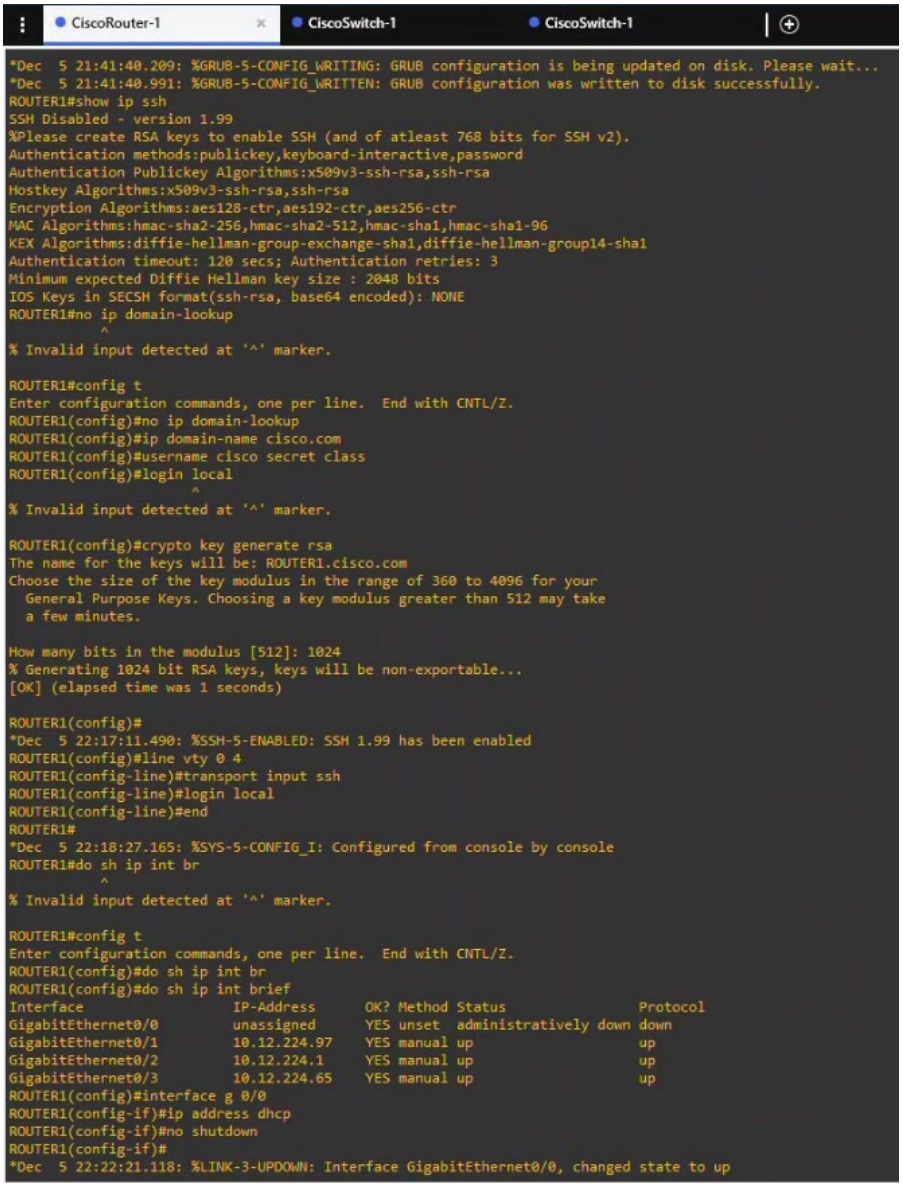
Configuration Router1:

```
ROUTER1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ROUTER1(config)#do sh ip int br
ROUTER1(config)#do sh ip int brief
Interface                  IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0         unassigned      YES unset  administratively down down
GigabitEthernet0/1         10.12.224.97    YES manual up                    up
GigabitEthernet0/2         10.12.224.1     YES manual up                    up
GigabitEthernet0/3         10.12.224.65    YES manual up                    up
ROUTER1(config)#interface g 0/0
ROUTER1(config-if)#ip address dhcp
ROUTER1(config-if)#no shutdown
ROUTER1(config-if)#
*Dec  5 22:22:21.118: %LINK-3-UPDOWN: Interface GigabitEthernet0/0, changed state to up
*Dec  5 22:22:22.118: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
ROUTER1(config-if)#do
*Dec  5 22:22:33.707: %DHCP-6-ADDRESS_ASSIGN: Interface GigabitEthernet0/0 assigned DHCP address 192.168.197.129, mask 255.2

ROUTER1(config-if)#do sh ip int br
ROUTER1(config-if)#do sh ip int br
ROUTER1(config-if)#do sh ip int br
Interface                  IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0         192.168.197.129 YES DHCP   up                    up
GigabitEthernet0/1         10.12.224.97    YES manual up                    up
GigabitEthernet0/2         10.12.224.1     YES manual up                    up
GigabitEthernet0/3         10.12.224.65    YES manual up                    up
ROUTER1(config-if)#wr
```


CiscoRouter-1
CiscoSwitch-1
CiscoSwitch-1
Router#
Router#enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Router1
Router1(config)#hostname ROUTER1
ROUTER1(config)#
*Dec 4 19:44:06.411: %PNP-6-PNP_DISCOVERY_STOPPED: PnP Discovery stopped (Config Wizard)
ROUTER1(config)#enable secret cisco
ROUTER1(config)#line console 0
ROUTER1(config-line)#password class
ROUTER1(config-line)#login
ROUTER1(config-line)#line vty 0 15
ROUTER1(config-line)#line vty 0 4
ROUTER1(config-line)#password vtp
ROUTER1(config-line)#login
ROUTER1(config-line)#transport input ssh
ROUTER1(config-line)#end
ROUTER1#
*Dec 5 21:18:06.883: %SYS-5-CONFIG_I: Configured from console by consolec
ROUTER1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ROUTER1(config)#service password-encryption
ROUTER1(config)#banner motd #No touchie my router#
ROUTER1(config)#
ROUTER1(config)#
ROUTER1(config)#
ROUTER1(config)#
ROUTER1(config)#interface g 0/1
ROUTER1(config-if)#ip address 10.12.224.97 255.255.255.240
ROUTER1(config-if)#no shutdown
ROUTER1(config-if)#
*Dec 5 21:36:33.125: %LINK-3-UPDOWN: Interface GigabitEthernet0/1, changed state to up
*Dec 5 21:36:34.126: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
ROUTER1(config-if)#description connection to DMZ Zone
ROUTER1(config-if)#end
ROUTER1#
*Dec 5 21:38:21.321: %SYS-5-CONFIG_I: Configured from console by console
ROUTER1#wr
Building configuration...
[OK]
ROUTER1#
*Dec 5 21:38:29.336: %GRUB-5-CONFIG_WRITING: GRUB configuration is being updated on disk. Please wait...
*Dec 5 21:38:30.112: %GRUB-5-CONFIG_WRITTEN: GRUB configuration was written to disk successfully.
ROUTER1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ROUTER1(config)#interface g 0/2
ROUTER1(config-if)#ip address 10.12.224.1 255.255.255.192
ROUTER1(config-if)#no shutdown
ROUTER1(config-if)#
*Dec 5 21:39:43.429: %LINK-3-UPDOWN: Interface GigabitEthernet0/2, changed state to up
*Dec 5 21:39:44.430: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
ROUTER1(config-if)#description connection to LAN1
ROUTER1(config-if)#interface g 0/3
ROUTER1(config-if)#ip address 10.12.224.65 255.255.255.224
ROUTER1(config-if)#no shutdown
ROUTER1(config-if)#
*Dec 5 21:40:58.002: %LINK-3-UPDOWN: Interface GigabitEthernet0/3, changed state to up
*Dec 5 21:40:59.002: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/3, changed state to up
ROUTER1(config-if)#description connection to LAN2
ROUTER1(config-if)#end
ROUTER1#wr
*Dec 5 21:41:32.762: %SYS-5-CONFIG_I: Configured from console by console

SSH enabled and secured:



DMZ-SW switch configuration:

```
Switch>en
Switch#config t
Switch(config)#hostname DMZ-SW
DMZ-SW(config)#enable secret class
DMZ-SW(config)#line vty 0 15
DMZ-SW(config-line)#password vtp
DMZ-SW(config-line)#login
DMZ-SW(config-line)#line con 0
DMZ-SW(config-line)#password cisco
DMZ-SW(config-line)#login
DMZ-SW(config-line)#exit
DMZ-SW(config)#banner motd #Dont touch my switchy#
DMZ-SW(config)#service password-encryption
DMZ-SW(config)#interface vlan 1
DMZ-SW(config-if)#ip address 10.12.224.110 255.255.255.240
DMZ-SW(config-if)#no shutdown
DMZ-SW(config-if)#description Switch to DMZ Zone
DMZ-SW(config-if)#end
DMZ-SW(config)#ip default-gateway  10.12.224.97
DMZ-SW(config)#no ip domain-lookup
DMZ-SW(config)#ip domain-name DMZ.com
DMZ-SW(config)#username cisco secret class
DMZ-SW(config)#crypto key generate rsa
DMZ-SW(config)# 1024
DMZ-SW(config)#line vty 0 15
DMZ-SW(config-line)#transport input ssh
DMZ-SW(config-line)#login local
DMZ-SW(config-line)#end
```

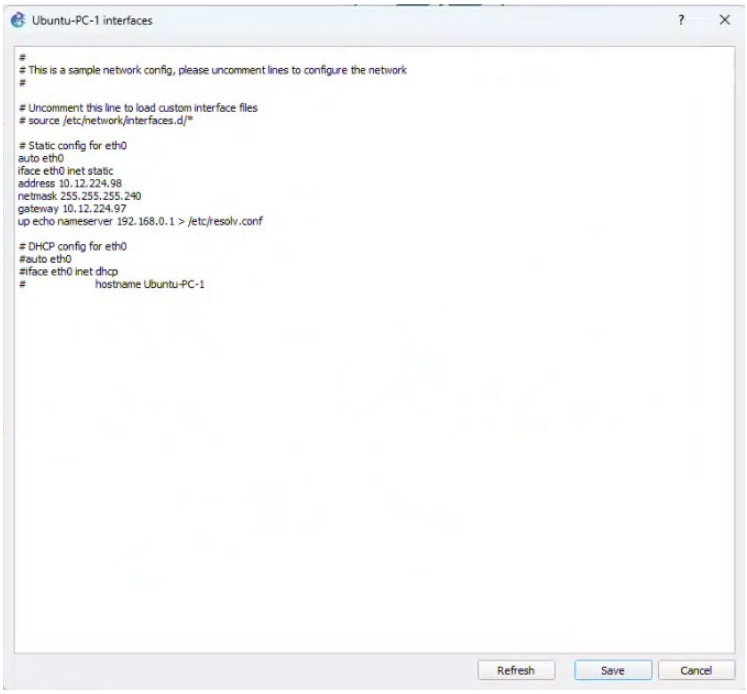
LAN1-SW switch configuration:

```
Switch>en
Switch#config t
Switch(config)#hostname LAN1-SW
LAN1-SW(config)#enable secret class
LAN1-SW(config)#line vty 0 15
LAN1-SW(config-line)#password vtp
LAN1-SW(config-line)#login
LAN1-SW(config-line)#line con 0
LAN1-SW(config-line)#password cisco
LAN1-SW(config-line)#login
LAN1-SW(config-line)#exit
LAN1-SW(config)#banner motd #Dont touch my switchy#
LAN1-SW(config)#service password-encryption
LAN1-SW(config)#interface vlan 1
LAN1-SW(config-if)#ip address 10.12.224.62 255.255.255.192
LAN1-SW(config-if)#no shutdown
LAN1-SW(config-if)#description Switch to LAN1
LAN1-SW(config-if)#end
LAN1-SW(config)#ip default-gateway 10.12.224.1
LAN1-SW(config)#end
LAN1-SW(config)#no ip domain-lookup
LAN1-SW(config)#ip domain-name Lan1.com
LAN1-SW(config)#username cisco secret class
LAN1-SW(config)#crypto key generate rsa
LAN1-SW(config)# 1024
LAN1-SW(config)#line vty 0 15
LAN1-SW(config-line)#transport input ssh
LAN1-SW(config-line)#login local
LAN1-SW(config-line)#end
```

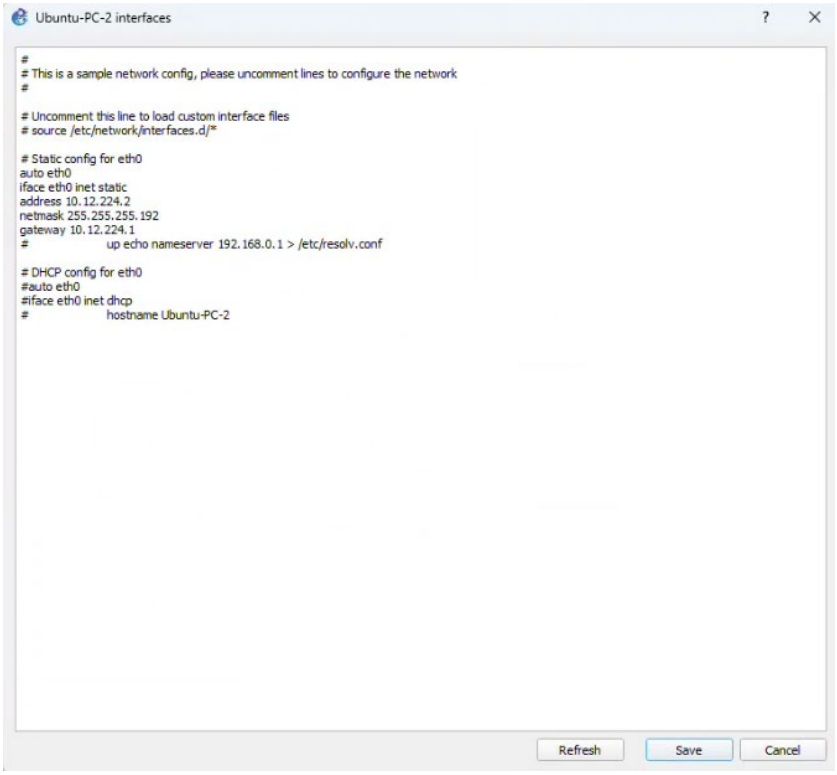
LAN2-SW switch configurations:

```
Switch>
Switch>en
Switch#config t
Switch(config)#hostname LAN2-SW
LAN2-SW(config)#enable secret class
LAN2-SW(config)#line vty 0 15
LAN2-SW(config-line)#password vtp
LAN2-SW(config-line)#login
LAN2-SW(config-line)#line con 0
LAN2-SW(config-line)#password cisco
LAN2-SW(config-line)#login
LAN2-SW(config-line)#exit
LAN2-SW(config)#banner motd #Dont touch my switchy#
LAN2-SW(config)#service password-encryption
LAN2-SW(config)#interface vlan 1
LAN2-SW(config-if)#
LAN2-SW(config-if)#ip address 10.12.224.94 255.255.255.224
LAN2-SW(config-if)#no shutdown
LAN2-SW(config-if)#
LAN2-SW(config-if)#description Switch to LAN2
LAN2-SW(config-if)#end
LAN2-SW#config t
LAN2-SW(config)#ip default-gateway 10.12.224.1
LAN2-SW(config)#end
LAN2-SW#config t
LAN2-SW(config)#no ip domain-lookup
LAN2-SW(config)#ip domain-name lan2.com
LAN2-SW(config)#username cisco secret class
LAN2-SW(config)#crypto key generate rsa
How many bits in the modulus [512]: 1024
LAN2-SW(config)#
LAN2-SW(config)#line vty 0 15
LAN2-SW(config-line)#transport input ssh
LAN2-SW(config-line)#login local
LAN2-SW(config-line)#end
```

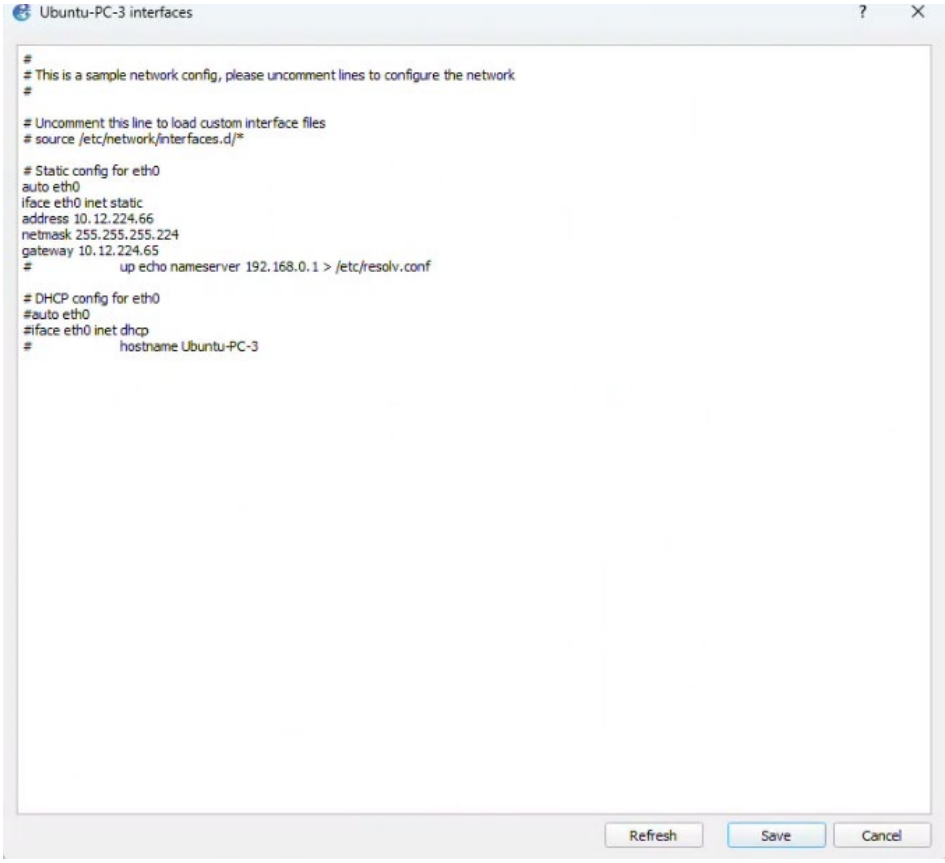
Ubuntu-PC-1 IP configuration



Ubuntu-PC-2



Ubuntu-PC-3

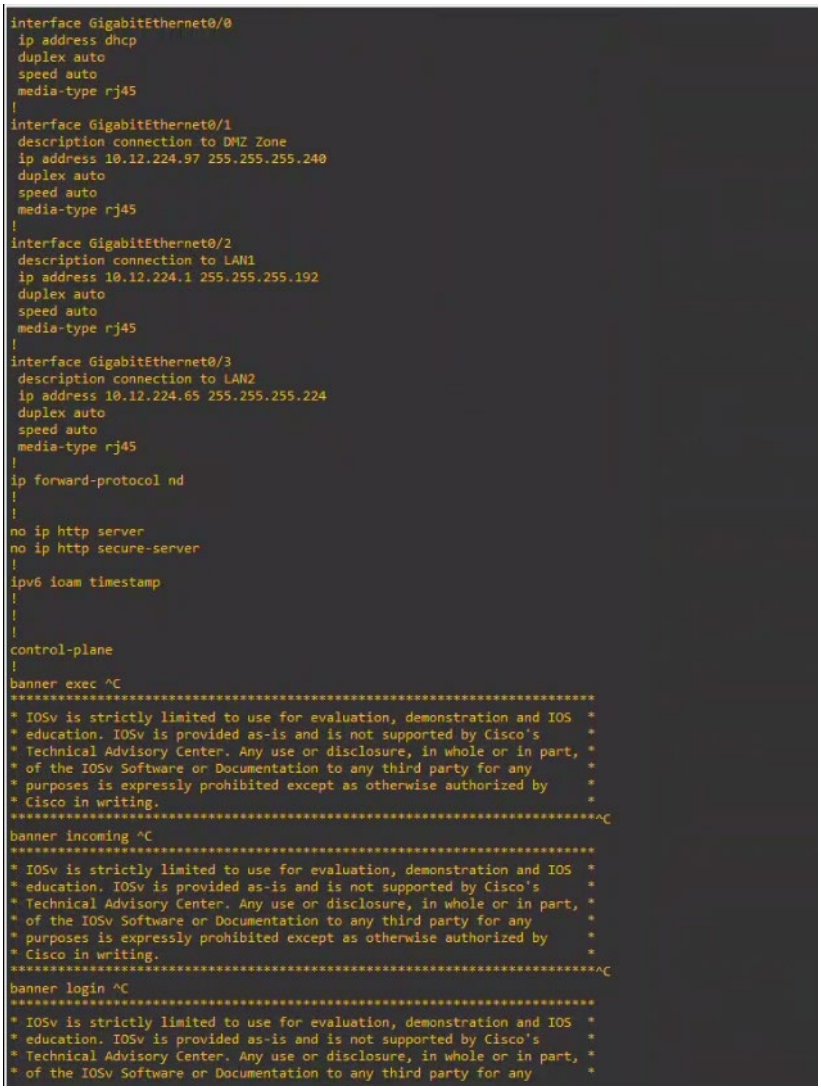

Ubuntu-PC-3 interfaces
#
This is a sample network config, please uncomment lines to configure the network
#
Uncomment this line to load custom interface files
source /etc/network/interfaces.d/*
Static config for eth0
auto eth0
iface eth0 inet static
address 10.12.224.66
netmask 255.255.255.224
gateway 10.12.224.65
up echo nameserver 192.168.0.1 > /etc/resolv.conf
DHCP config for eth0
#auto eth0
#iface eth0 inet dhcp
hostname Ubuntu-PC-3
Refresh
Save
Cancel

Tests:

Router1 sh run:

```
ROUTER1#sh run
Building configuration...


Current configuration : 3489 bytes
!
version 15.7
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname ROUTER1
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$69xD$9qVtN8ktWRbh9vGeySas9.
!
no aaa new-model
!
!
!
mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
!
!
!
!
!
no ip icmp rate-limit unreachable
!
!
!
!
!
!
no ip domain lookup
ip domain name cisco.com
ip cef
no ipv6 cef
!
multilink bundle-name authenticated
!
!
!
!
username cisco secret 5 $1$OUhq$3xAavcs.26l9CZ72H61Qk1
!
redundancy
!
no cdp log mismatch duplex
!
ip tcp synwait-time 5
!
!
!
!
!
!
```



```
interface GigabitEthernet0/0
 ip address dhcp
 duplex auto
 speed auto
 media-type rj45
!
interface GigabitEthernet0/1
 description connection to DMZ Zone
 ip address 10.12.224.97 255.255.255.240
 duplex auto
 speed auto
 media-type rj45
!
interface GigabitEthernet0/2
 description connection to LAN1
 ip address 10.12.224.1 255.255.255.192
 duplex auto
 speed auto
 media-type rj45
!
interface GigabitEthernet0/3
 description connection to LAN2
 ip address 10.12.224.65 255.255.255.224
 duplex auto
 speed auto
 media-type rj45
!
ip forward-protocol nd
!
!
no ip http server
no ip http secure-server
!
ipv6 ioam timestamp
!
!
!
control-plane
!
banner exec ^C
**********************************************************************
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* education. IOSv is provided as-is and is not supported by Cisco's      *
* Technical Advisory Center. Any use or disclosure, in whole or in part, *
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* Cisco in writing.                                                      *
**********************************************************************^C
banner incoming ^C
**********************************************************************
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* Cisco in writing.                                                      *
**********************************************************************^C
banner login ^C
**********************************************************************
* IOSv is strictly limited to use for evaluation, demonstration and IOS  *
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* Technical Advisory Center. Any use or disclosure, in whole or in part, *
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```

```
banner incoming ^C
**************************************************************************
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* education. IOSv is provided as-is and is not supported by Cisco's      *
* Technical Advisory Center. Any use or disclosure, in whole or in part, *
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* Cisco in writing.                                                      *
**************************************************************************^C
banner login ^C
**************************************************************************
* IOSv is strictly limited to use for evaluation, demonstration and IOS  *
* education. IOSv is provided as-is and is not supported by Cisco's      *
* Technical Advisory Center. Any use or disclosure, in whole or in part, *
* of the IOSv Software or Documentation to any third party for any       *
* purposes is expressly prohibited except as otherwise authorized by     *
* Cisco in writing.                                                      *
**************************************************************************^C
banner motd ^CNo touchie my router^C
!
line con 0
 exec-timeout 0 0
 privilege level 15
 password 7 0822404F1A0A
 logging synchronous
 login
line aux 0
 exec-timeout 0 0
 privilege level 15
 logging synchronous
line vty 0 4
 password 7 0837585E
 login local
 transport input ssh
line vty 5 15
 login
 transport input none
!
no scheduler allocate
!
end
```
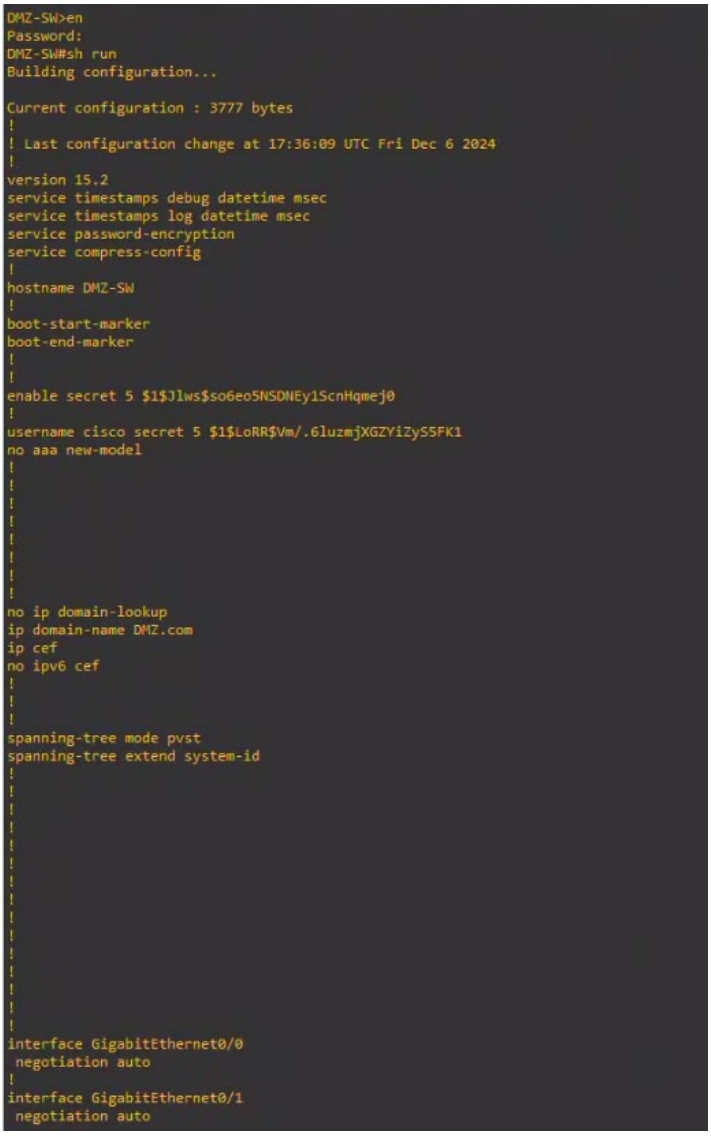

Sh ip int br:

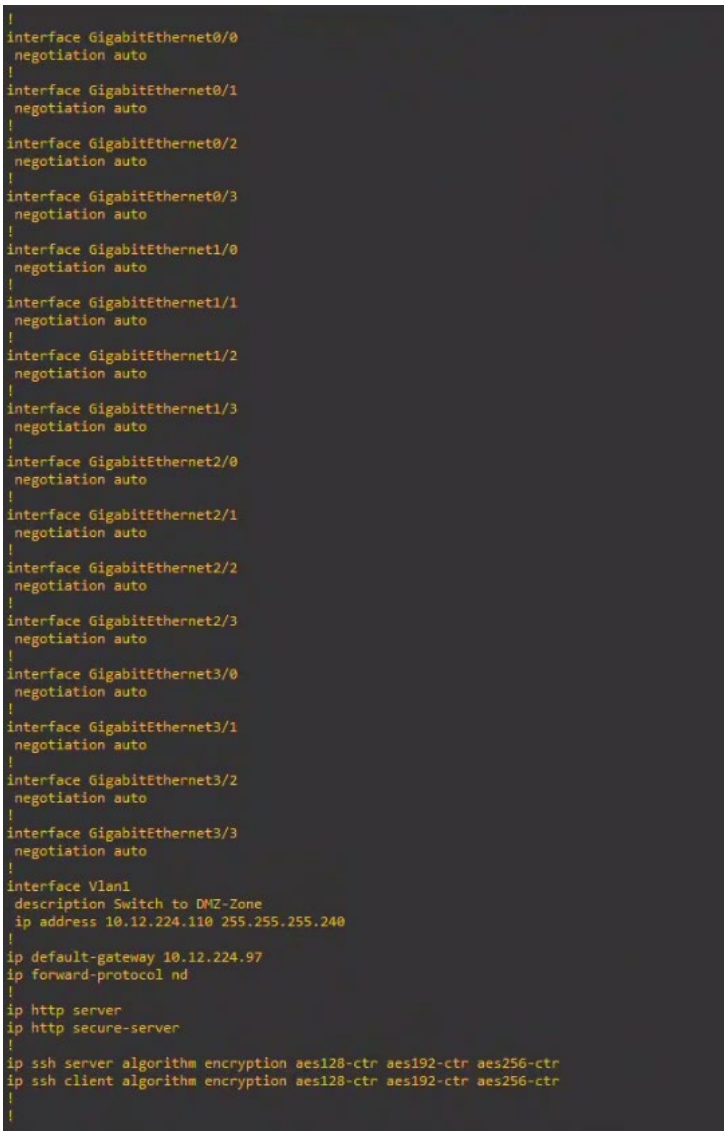
```
ROUTER1#sh ip int brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     192.168.197.129 YES DHCP   up                    up
GigabitEthernet0/1     10.12.224.97    YES NVRAM  up                    up
GigabitEthernet0/2     10.12.224.1     YES NVRAM  up                    up
GigabitEthernet0/3     10.12.224.65    YES NVRAM  up                    up
ROUTER1#
```

DMZ-SW:

Sh run:



```
DMZ-SW>en
Password:
DMZ-SW#sh run
Building configuration...

Current configuration : 3777 bytes
!
! Last configuration change at 17:36:09 UTC Fri Dec 6 2024
!
version 15.2
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
service compress-config
!
hostname DMZ-SW
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$Jlws$so6eo5NSDNEy1ScnHqmej0
!
username cisco secret 5 $1$LoRR$Vm/.6luzmjXGZYiZyS5FK1
no aaa new-model
!
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name DMZ.com
ip cef
no ipv6 cef
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
interface GigabitEthernet0/0
 negotiation auto
!
interface GigabitEthernet0/1
 negotiation auto
```



```
!
interface GigabitEthernet0/0
 negotiation auto
!
interface GigabitEthernet0/1
 negotiation auto
!
interface GigabitEthernet0/2
 negotiation auto
!
interface GigabitEthernet0/3
 negotiation auto
!
interface GigabitEthernet1/0
 negotiation auto
!
interface GigabitEthernet1/1
 negotiation auto
!
interface GigabitEthernet1/2
 negotiation auto
!
interface GigabitEthernet1/3
 negotiation auto
!
interface GigabitEthernet2/0
 negotiation auto
!
interface GigabitEthernet2/1
 negotiation auto
!
interface GigabitEthernet2/2
 negotiation auto
!
interface GigabitEthernet2/3
 negotiation auto
!
interface GigabitEthernet3/0
 negotiation auto
!
interface GigabitEthernet3/1
 negotiation auto
!
interface GigabitEthernet3/2
 negotiation auto
!
interface GigabitEthernet3/3
 negotiation auto
!
interface Vlan1
 description Switch to DMZ-Zone
 ip address 10.12.224.110 255.255.255.240
!
ip default-gateway 10.12.224.97
ip forward-protocol nd
!
ip http server
ip http secure-server
!
ip ssh server algorithm encryption aes128-ctr aes192-ctr aes256-ctr
ip ssh client algorithm encryption aes128-ctr aes192-ctr aes256-ctr
!
!
```

```
 ip address 10.12.224.110 255.255.255.240
!
ip default-gateway 10.12.224.97
ip forward-protocol nd
!
ip http server
ip http secure-server
!
ip ssh server algorithm encryption aes128-ctr aes192-ctr aes256-ctr
ip ssh client algorithm encryption aes128-ctr aes192-ctr aes256-ctr
!
!
!
!
!
!
control-plane
!
banner exec ^C
**********************************************************************
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banner incoming ^C
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**********************************************************************^C
banner login ^C
**********************************************************************
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* of the IOSv Software or Documentation to any third party for any       *
* purposes is expressly prohibited except as otherwise authorized by     *
* Cisco in writing.                                                      *
**********************************************************************^C
banner motd ^CDont touch my switchy^C
!
line con 0
 password 7 045802150C2E
 login
line aux 0
line vty 0 4
 password 7 00120716
 login local
 transport input ssh
line vty 5 15
 password 7 00120716
 login local
 transport input ssh
!
!
end
```
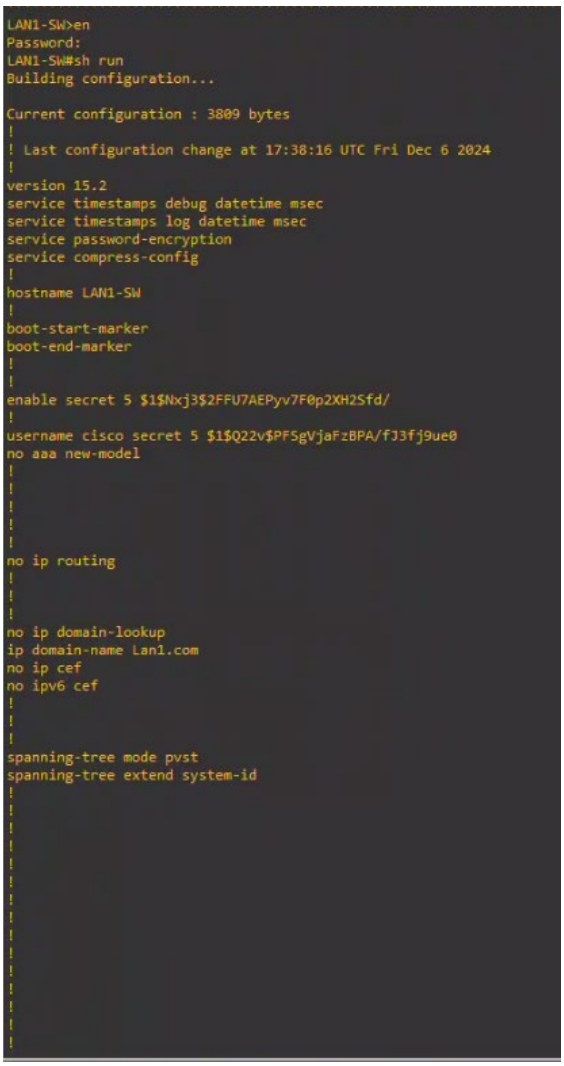

Sh int vlan 1:

```
DMZ-SW#
DMZ-SW#sh int vlan 1
Vlan1 is up, line protocol is up
  Hardware is Ethernet SVI, address is 0c23.e8cb.8001 (bia 0c23.e8cb.8001)
  Description: Switch to DMZ-Zone
  Internet address is 10.12.224.110/28
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:06:06, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     20 packets input, 1481 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     4 packets output, 240 bytes, 0 underruns
     0 output errors, 0 interface resets
     0 unknown protocol drops
     0 output buffer failures, 0 output buffers swapped out
```

LAN1-SW:

Sh run:



```
LAN1-SW>en
Password:
LAN1-SW#sh run
Building configuration...

Current configuration : 3809 bytes
!
! Last configuration change at 17:38:16 UTC Fri Dec 6 2024
!
version 15.2
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
service compress-config
!
hostname LAN1-SW
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$Nxj3$2FFU7AEPyv7F0p2XH2Sfd/
!
username cisco secret 5 $1$Q22v$PFSgVjaFzBPA/fJ3fj9ue0
no aaa new-model
!
!
!
!
!
no ip routing
!
!
!
no ip domain-lookup
ip domain-name Lan1.com
no ip cef
no ipv6 cef
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
```

```
!
interface GigabitEthernet0/0
 negotiation auto
!
interface GigabitEthernet0/1
 negotiation auto
!
interface GigabitEthernet0/2
 negotiation auto
!
interface GigabitEthernet0/3
 negotiation auto
!
interface GigabitEthernet1/0
 negotiation auto
!
interface GigabitEthernet1/1
 negotiation auto
!
interface GigabitEthernet1/2
 negotiation auto
!
interface GigabitEthernet1/3
 negotiation auto
!
interface GigabitEthernet2/0
 negotiation auto
!
interface GigabitEthernet2/1
 negotiation auto
!
interface GigabitEthernet2/2
 negotiation auto
!
interface GigabitEthernet2/3
 negotiation auto
!
interface GigabitEthernet3/0
 negotiation auto
!
interface GigabitEthernet3/1
 negotiation auto
!
interface GigabitEthernet3/2
 negotiation auto
!
interface GigabitEthernet3/3
 negotiation auto
!
interface Vlan1
 description Switch to LAN1
 ip address 10.12.224.62 255.255.255.192
 no ip route-cache
!
ip default-gateway 10.12.224.1
ip forward-protocol nd
!
ip http server
ip http secure-server
!
ip ssh server algorithm encryption aes128-ctr aes192-ctr aes256-ctr
ip ssh client algorithm encryption aes128-ctr aes192-ctr aes256-ctr
!
```

```
!
!
!
!
!
control-plane
!
banner exec ^C
**********************************************************************
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* education. IOSv is provided as-is and is not supported by Cisco's      *
* Technical Advisory Center. Any use or disclosure, in whole or in part, *
* of the IOSv Software or Documentation to any third party for any       *
* purposes is expressly prohibited except as otherwise authorized by     *
* Cisco in writing.                                                      *
**********************************************************************^C
banner incoming ^C
**********************************************************************
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* of the IOSv Software or Documentation to any third party for any       *
* purposes is expressly prohibited except as otherwise authorized by     *
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**********************************************************************^C
banner login ^C
**********************************************************************
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* Technical Advisory Center. Any use or disclosure, in whole or in part, *
* of the IOSv Software or Documentation to any third party for any       *
* purposes is expressly prohibited except as otherwise authorized by     *
* Cisco in writing.                                                      *
**********************************************************************^C
banner motd ^CDont touch my switchy^C
!
line con 0
 password 7 110A1016141D
 login
line aux 0
line vty 0 4
 password 7 0837585E
 login local
 transport input ssh
line vty 5 15
 password 7 0837585E
 login local
 transport input ssh
!
!
end
```
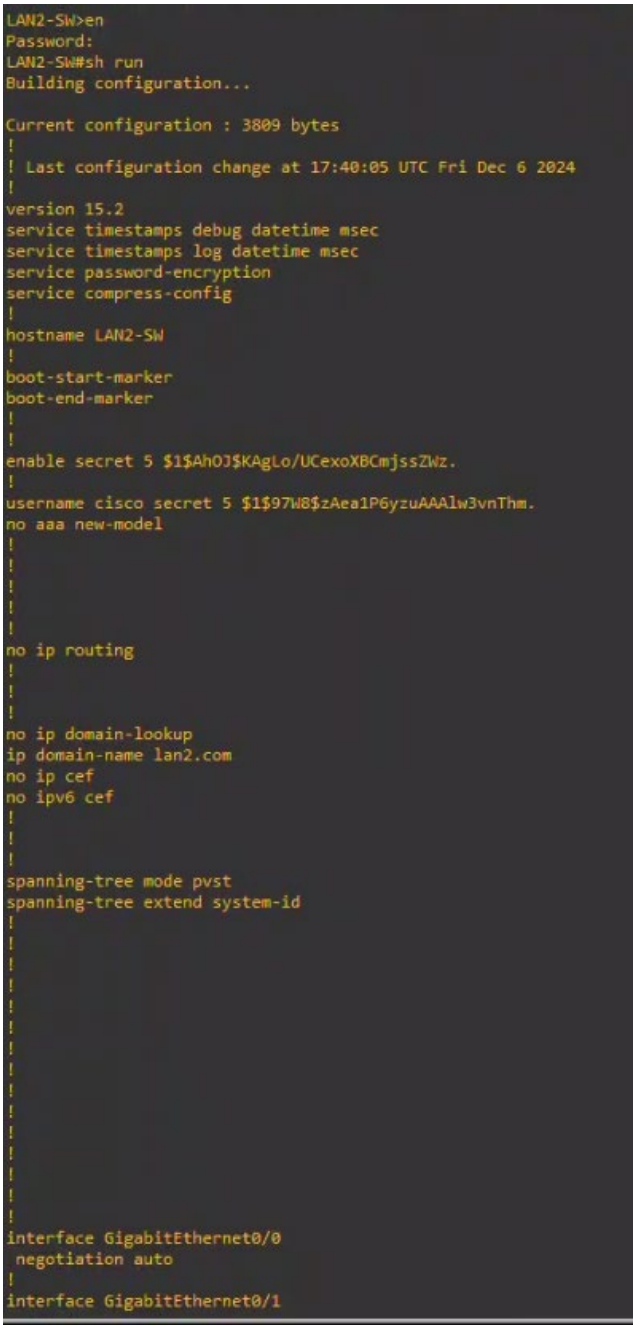

Sh int vlan 1:

```
LAN1-SW#sh int vlan 1
Vlan1 is up, line protocol is up
  Hardware is Ethernet SVI, address is 0c54.3ab4.8001 (bia 0c54.3ab4.8001)
  Description: Switch to LAN1
  Internet address is 10.12.224.62/26
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:05:42, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     102 packets input, 12687 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     84 packets output, 10838 bytes, 0 underruns
     0 output errors, 0 interface resets
 --More--
```

LAN2-SW

Sh run:



```
LAN2-SW>en
Password:
LAN2-SW#sh run
Building configuration...

Current configuration : 3809 bytes
!
! Last configuration change at 17:40:05 UTC Fri Dec 6 2024
!
version 15.2
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
service compress-config
!
hostname LAN2-SW
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$AhOJ$KAgLo/UCexoXBCmjssZWz.
!
username cisco secret 5 $1$97W8$zAea1P6yzuAAAlw3vnThm.
no aaa new-model
!
!
!
!
!
no ip routing
!
!
!
no ip domain-lookup
ip domain-name lan2.com
no ip cef
no ipv6 cef
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
interface GigabitEthernet0/0
 negotiation auto
!
interface GigabitEthernet0/1
```

```
interface GigabitEthernet0/0
 negotiation auto
!
interface GigabitEthernet0/1
 negotiation auto
!
interface GigabitEthernet0/2
 negotiation auto
!
interface GigabitEthernet0/3
 negotiation auto
!
interface GigabitEthernet1/0
 negotiation auto
!
interface GigabitEthernet1/1
 negotiation auto
!
interface GigabitEthernet1/2
 negotiation auto
!
interface GigabitEthernet1/3
 negotiation auto
!
interface GigabitEthernet2/0
 negotiation auto
!
interface GigabitEthernet2/1
 negotiation auto
!
interface GigabitEthernet2/2
 negotiation auto
!
interface GigabitEthernet2/3
 negotiation auto
!
interface GigabitEthernet3/0
 negotiation auto
!
interface GigabitEthernet3/1
 negotiation auto
!
interface GigabitEthernet3/2
 negotiation auto
!
interface GigabitEthernet3/3
 negotiation auto
!
interface Vlan1
 description Switch to LAN2
 ip address 10.12.224.94 255.255.255.224
 no ip route-cache
!
ip default-gateway 10.12.224.1
ip forward-protocol nd
!
ip http server
ip http secure-server
!
ip ssh server algorithm encryption aes128-ctr aes192-ctr aes256-ctr
ip ssh client algorithm encryption aes128-ctr aes192-ctr aes256-ctr
!
!
```

```
!
!
!
!
!
control-plane
!
banner exec ^C
**********************************************************************
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* education. IOSv is provided as-is and is not supported by Cisco's      *
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* purposes is expressly prohibited except as otherwise authorized by     *
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**********************************************************************^C
banner incoming ^C
**********************************************************************
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* Technical Advisory Center. Any use or disclosure, in whole or in part, *
* of the IOSv Software or Documentation to any third party for any       *
* purposes is expressly prohibited except as otherwise authorized by     *
* Cisco in writing.                                                      *
**********************************************************************^C
banner login ^C
**********************************************************************
* IOSv is strictly limited to use for evaluation, demonstration and IOS  *
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* Technical Advisory Center. Any use or disclosure, in whole or in part, *
* of the IOSv Software or Documentation to any third party for any       *
* purposes is expressly prohibited except as otherwise authorized by     *
* Cisco in writing.                                                      *
**********************************************************************^C
banner motd ^CDont touch my switchy^C
!
line con 0
 password 7 14141B180F0B
 login
line aux 0
line vty 0 4
 password 7 0837585E
 login local
 transport input ssh
line vty 5 15
 password 7 0837585E
 login local
 transport input ssh
!
!
end
```
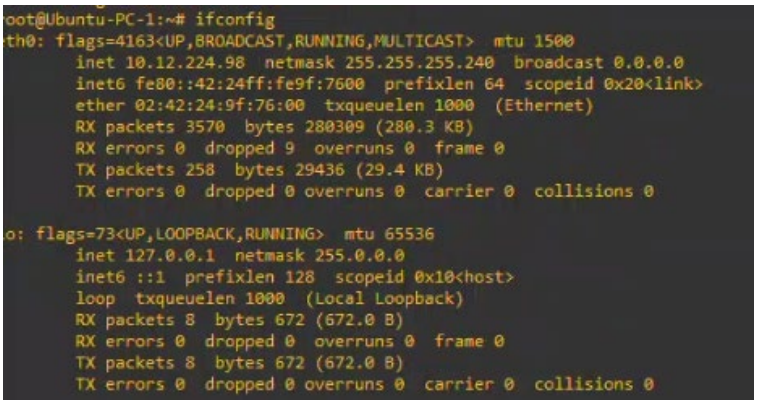

Sh int vlan 1:

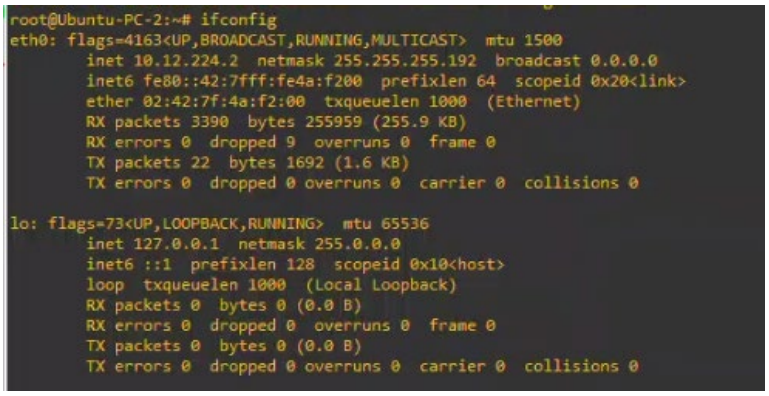
```
LAN2-SW#sh int vlan 1
Vlan1 is up, line protocol is up
  Hardware is Ethernet SVI, address is 0cec.68db.8001 (bia 0cec.68db.8001)
  Description: Switch to LAN2
  Internet address is 10.12.224.94/27
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:47, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     111 packets input, 11140 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     78 packets output, 8938 bytes, 0 underruns
     0 output errors, 0 interface resets
     0 unknown protocol drops
```

PC tests:

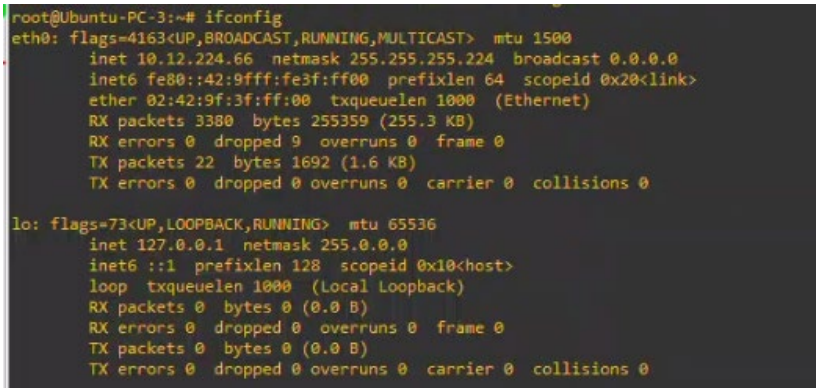
ifconfig from Ubuntu-PC-1:



ifconfig from Ubuntu-PC-2



ifconfig from Ubuntu-PC-3



Pings

Ubuntu-PC-1:

```
Connection to 10.12.224.97 closed.
root@Ubuntu-PC-1:~# ping 10.12.224.97
PING 10.12.224.97 (10.12.224.97) 56(84) bytes of data.
64 bytes from 10.12.224.97: icmp_seq=1 ttl=255 time=4.88 ms
64 bytes from 10.12.224.97: icmp_seq=2 ttl=255 time=4.57 ms
64 bytes from 10.12.224.97: icmp_seq=3 ttl=255 time=4.00 ms
64 bytes from 10.12.224.97: icmp_seq=4 ttl=255 time=5.30 ms
^C
--- 10.12.224.97 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 3.996/4.687/5.303/0.476 ms
root@Ubuntu-PC-1:~#
```

```
root@Ubuntu-PC-1:~# ping 10.12.224.1
PING 10.12.224.1 (10.12.224.1) 56(84) bytes of data.
64 bytes from 10.12.224.1: icmp_seq=1 ttl=255 time=4.73 ms
64 bytes from 10.12.224.1: icmp_seq=2 ttl=255 time=3.79 ms
64 bytes from 10.12.224.1: icmp_seq=3 ttl=255 time=5.01 ms
64 bytes from 10.12.224.1: icmp_seq=4 ttl=255 time=3.90 ms
^C
--- 10.12.224.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 3.785/4.356/5.012/0.526 ms
root@Ubuntu-PC-1:~#
```

```
root@Ubuntu-PC-1:~# ping 10.12.224.94
PING 10.12.224.94 (10.12.224.94) 56(84) bytes of data.
64 bytes from 10.12.224.94: icmp_seq=1 ttl=254 time=14.6 ms
64 bytes from 10.12.224.94: icmp_seq=2 ttl=254 time=7.90 ms
64 bytes from 10.12.224.94: icmp_seq=3 ttl=254 time=6.64 ms
64 bytes from 10.12.224.94: icmp_seq=4 ttl=254 time=8.65 ms
^C
--- 10.12.224.94 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 6.644/9.448/14.596/3.057 ms
root@Ubuntu-PC-1:~#
```

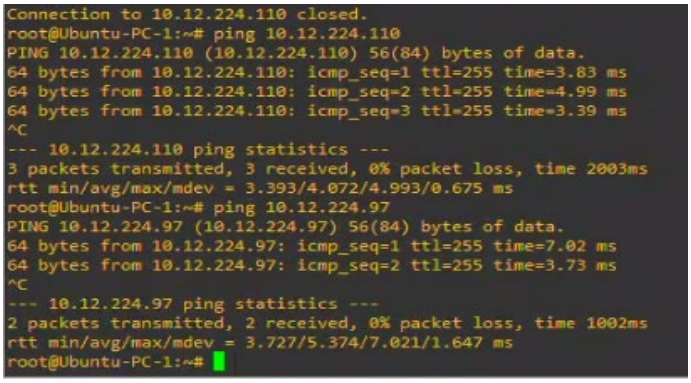
```
root@Ubuntu-PC-1:~# ping 10.12.224.98
PING 10.12.224.98 (10.12.224.98) 56(84) bytes of data.
64 bytes from 10.12.224.98: icmp_seq=1 ttl=64 time=0.021 ms
64 bytes from 10.12.224.98: icmp_seq=2 ttl=64 time=0.024 ms
64 bytes from 10.12.224.98: icmp_seq=3 ttl=64 time=0.051 ms
64 bytes from 10.12.224.98: icmp_seq=4 ttl=64 time=0.032 ms
^C
--- 10.12.224.98 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3067ms
rtt min/avg/max/mdev = 0.021/0.032/0.051/0.011 ms
root@Ubuntu-PC-1:~#
```

```
root@Ubuntu-PC-1:~# ping 10.12.224.2
PING 10.12.224.2 (10.12.224.2) 56(84) bytes of data.
64 bytes from 10.12.224.2: icmp_seq=1 ttl=63 time=21.4 ms
64 bytes from 10.12.224.2: icmp_seq=2 ttl=63 time=6.96 ms
64 bytes from 10.12.224.2: icmp_seq=3 ttl=63 time=8.15 ms
64 bytes from 10.12.224.2: icmp_seq=4 ttl=63 time=6.66 ms
^C
--- 10.12.224.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3003ms
rtt min/avg/max/mdev = 6.662/10.788/21.385/6.143 ms
```

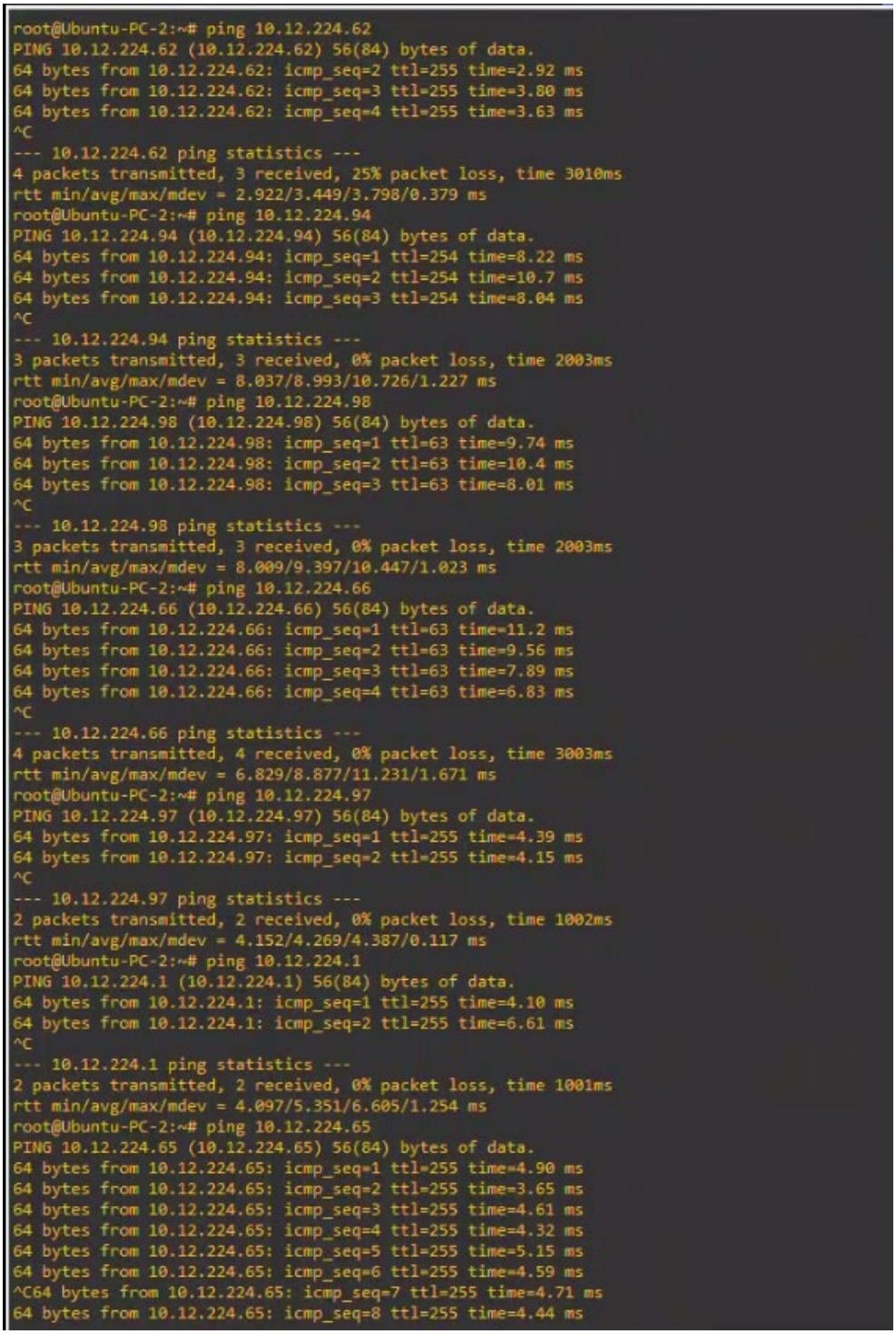
```
root@Ubuntu-PC-1:~# ping 10.12.224.66
PING 10.12.224.66 (10.12.224.66) 56(84) bytes of data.
64 bytes from 10.12.224.66: icmp_seq=1 ttl=63 time=22.2 ms
64 bytes from 10.12.224.66: icmp_seq=2 ttl=63 time=8.28 ms
64 bytes from 10.12.224.66: icmp_seq=3 ttl=63 time=6.18 ms
64 bytes from 10.12.224.66: icmp_seq=4 ttl=63 time=9.28 ms
^C
--- 10.12.224.66 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3003ms
rtt min/avg/max/mdev = 6.178/11.487/22.209/6.290 ms
root@Ubuntu-PC-1:~#
```

```
root@Ubuntu-PC-1:~# ping 10.12.224.1
PING 10.12.224.1 (10.12.224.1) 56(84) bytes of data.
64 bytes from 10.12.224.1: icmp_seq=1 ttl=255 time=6.43 ms
64 bytes from 10.12.224.1: icmp_seq=2 ttl=255 time=6.45 ms
64 bytes from 10.12.224.1: icmp_seq=3 ttl=255 time=5.47 ms
64 bytes from 10.12.224.1: icmp_seq=4 ttl=255 time=3.90 ms
^C
--- 10.12.224.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 3.901/5.561/6.445/1.037 ms
root@Ubuntu-PC-1:~#
```

```
root@Ubuntu-PC-1:~# ping 10.12.224.65
PING 10.12.224.65 (10.12.224.65) 56(84) bytes of data.
64 bytes from 10.12.224.65: icmp_seq=1 ttl=255 time=4.44 ms
64 bytes from 10.12.224.65: icmp_seq=2 ttl=255 time=4.02 ms
64 bytes from 10.12.224.65: icmp_seq=3 ttl=255 time=4.64 ms
64 bytes from 10.12.224.65: icmp_seq=4 ttl=255 time=4.59 ms
64 bytes from 10.12.224.65: icmp_seq=5 ttl=255 time=4.67 ms
^C
--- 10.12.224.65 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 4.017/4.470/4.668/0.240 ms
root@Ubuntu-PC-1:~#
```


Connection to 10.12.224.110 closed.
root@Ubuntu-PC-1:~# ping 10.12.224.110
PING 10.12.224.110 (10.12.224.110) 56(84) bytes of data.
64 bytes from 10.12.224.110: icmp_seq=1 ttl=255 time=3.83 ms
64 bytes from 10.12.224.110: icmp_seq=2 ttl=255 time=4.99 ms
64 bytes from 10.12.224.110: icmp_seq=3 ttl=255 time=3.39 ms
^C
--- 10.12.224.110 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 3.393/4.072/4.993/0.675 ms
root@Ubuntu-PC-1:~# ping 10.12.224.97
PING 10.12.224.97 (10.12.224.97) 56(84) bytes of data.
64 bytes from 10.12.224.97: icmp_seq=1 ttl=255 time=7.02 ms
64 bytes from 10.12.224.97: icmp_seq=2 ttl=255 time=3.73 ms
^C
--- 10.12.224.97 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 3.727/5.374/7.021/1.647 ms
root@Ubuntu-PC-1:~#

Ubuntu-PC-2



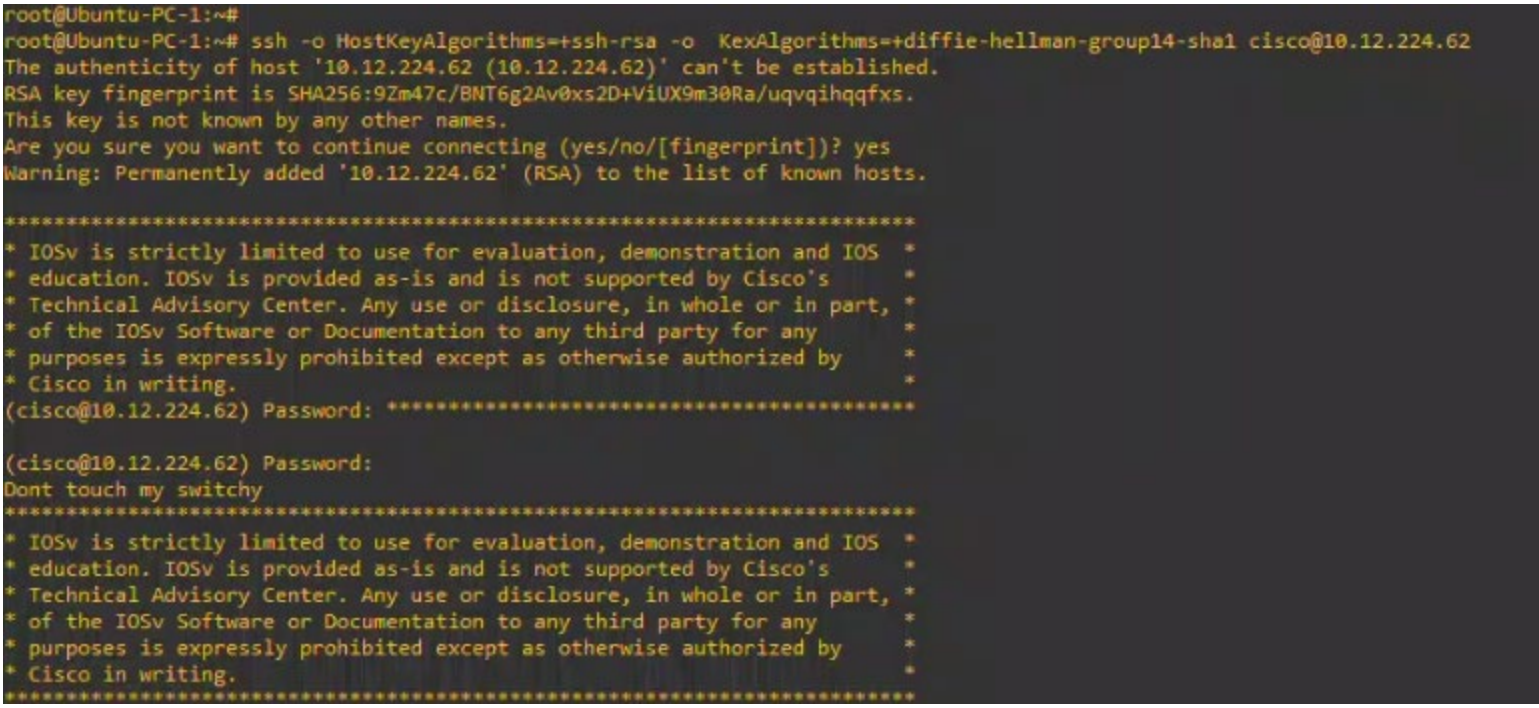
```
root@Ubuntu-PC-2:~# ping 10.12.224.62
PING 10.12.224.62 (10.12.224.62) 56(84) bytes of data.
64 bytes from 10.12.224.62: icmp_seq=2 ttl=255 time=2.92 ms
64 bytes from 10.12.224.62: icmp_seq=3 ttl=255 time=3.80 ms
64 bytes from 10.12.224.62: icmp_seq=4 ttl=255 time=3.63 ms
^C
--- 10.12.224.62 ping statistics ---
4 packets transmitted, 3 received, 25% packet loss, time 3010ms
rtt min/avg/max/mdev = 2.922/3.449/3.798/0.379 ms
root@Ubuntu-PC-2:~# ping 10.12.224.94
PING 10.12.224.94 (10.12.224.94) 56(84) bytes of data.
64 bytes from 10.12.224.94: icmp_seq=1 ttl=254 time=8.22 ms
64 bytes from 10.12.224.94: icmp_seq=2 ttl=254 time=10.7 ms
64 bytes from 10.12.224.94: icmp_seq=3 ttl=254 time=8.04 ms
^C
--- 10.12.224.94 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 8.037/8.993/10.726/1.227 ms
root@Ubuntu-PC-2:~# ping 10.12.224.98
PING 10.12.224.98 (10.12.224.98) 56(84) bytes of data.
64 bytes from 10.12.224.98: icmp_seq=1 ttl=63 time=9.74 ms
64 bytes from 10.12.224.98: icmp_seq=2 ttl=63 time=10.4 ms
64 bytes from 10.12.224.98: icmp_seq=3 ttl=63 time=8.01 ms
^C
--- 10.12.224.98 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 8.009/9.397/10.447/1.023 ms
root@Ubuntu-PC-2:~# ping 10.12.224.66
PING 10.12.224.66 (10.12.224.66) 56(84) bytes of data.
64 bytes from 10.12.224.66: icmp_seq=1 ttl=63 time=11.2 ms
64 bytes from 10.12.224.66: icmp_seq=2 ttl=63 time=9.56 ms
64 bytes from 10.12.224.66: icmp_seq=3 ttl=63 time=7.89 ms
64 bytes from 10.12.224.66: icmp_seq=4 ttl=63 time=6.83 ms
^C
--- 10.12.224.66 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3003ms
rtt min/avg/max/mdev = 6.829/8.877/11.231/1.671 ms
root@Ubuntu-PC-2:~# ping 10.12.224.97
PING 10.12.224.97 (10.12.224.97) 56(84) bytes of data.
64 bytes from 10.12.224.97: icmp_seq=1 ttl=255 time=4.39 ms
64 bytes from 10.12.224.97: icmp_seq=2 ttl=255 time=4.15 ms
^C
--- 10.12.224.97 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 4.152/4.269/4.387/0.117 ms
root@Ubuntu-PC-2:~# ping 10.12.224.1
PING 10.12.224.1 (10.12.224.1) 56(84) bytes of data.
64 bytes from 10.12.224.1: icmp_seq=1 ttl=255 time=4.10 ms
64 bytes from 10.12.224.1: icmp_seq=2 ttl=255 time=6.61 ms
^C
--- 10.12.224.1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 4.097/5.351/6.605/1.254 ms
root@Ubuntu-PC-2:~# ping 10.12.224.65
PING 10.12.224.65 (10.12.224.65) 56(84) bytes of data.
64 bytes from 10.12.224.65: icmp_seq=1 ttl=255 time=4.90 ms
64 bytes from 10.12.224.65: icmp_seq=2 ttl=255 time=3.65 ms
64 bytes from 10.12.224.65: icmp_seq=3 ttl=255 time=4.61 ms
64 bytes from 10.12.224.65: icmp_seq=4 ttl=255 time=4.32 ms
64 bytes from 10.12.224.65: icmp_seq=5 ttl=255 time=5.15 ms
64 bytes from 10.12.224.65: icmp_seq=6 ttl=255 time=4.59 ms
^C64 bytes from 10.12.224.65: icmp_seq=7 ttl=255 time=4.71 ms
64 bytes from 10.12.224.65: icmp_seq=8 ttl=255 time=4.44 ms
```

Ubuntu-PC-3

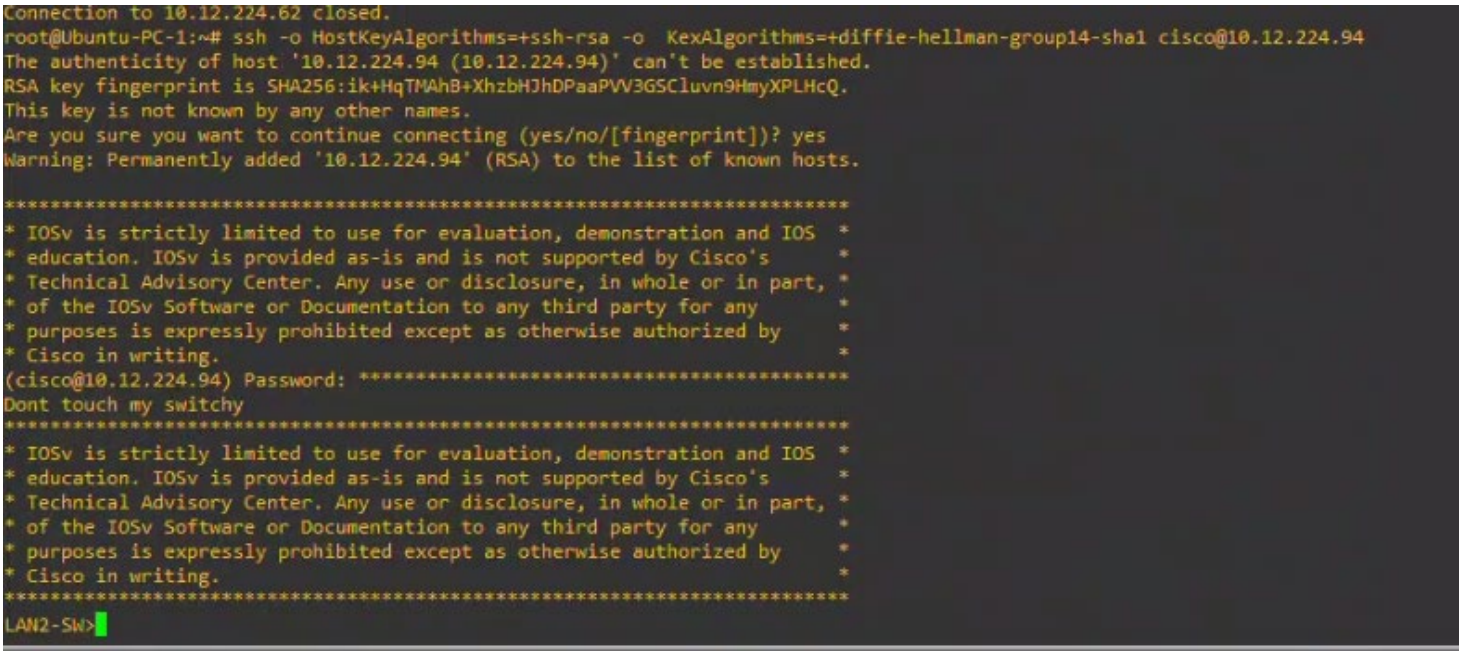
```
root@Ubuntu-PC-3:~# ping 10.12.224.62
PING 10.12.224.62 (10.12.224.62) 56(84) bytes of data.
64 bytes from 10.12.224.62: icmp_seq=1 ttl=254 time=11.5 ms
64 bytes from 10.12.224.62: icmp_seq=2 ttl=254 time=7.12 ms
^C
--- 10.12.224.62 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 7.124/9.293/11.463/2.169 ms
root@Ubuntu-PC-3:~# ping 10.12.224.94
PING 10.12.224.94 (10.12.224.94) 56(84) bytes of data.
64 bytes from 10.12.224.94: icmp_seq=2 ttl=255 time=3.41 ms
64 bytes from 10.12.224.94: icmp_seq=3 ttl=255 time=3.40 ms
64 bytes from 10.12.224.94: icmp_seq=4 ttl=255 time=3.45 ms
^C
--- 10.12.224.94 ping statistics ---
4 packets transmitted, 3 received, 25% packet loss, time 3032ms
rtt min/avg/max/mdev = 3.400/3.420/3.449/0.020 ms
root@Ubuntu-PC-3:~# ping 10.12.224.98
PING 10.12.224.98 (10.12.224.98) 56(84) bytes of data.
64 bytes from 10.12.224.98: icmp_seq=1 ttl=63 time=9.43 ms
64 bytes from 10.12.224.98: icmp_seq=2 ttl=63 time=10.2 ms
64 bytes from 10.12.224.98: icmp_seq=3 ttl=63 time=8.13 ms
64 bytes from 10.12.224.98: icmp_seq=4 ttl=63 time=5.51 ms
^C
--- 10.12.224.98 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 5.511/8.313/10.186/1.778 ms
root@Ubuntu-PC-3:~# ping 10.12.224.2
PING 10.12.224.2 (10.12.224.2) 56(84) bytes of data.
64 bytes from 10.12.224.2: icmp_seq=1 ttl=63 time=9.67 ms
64 bytes from 10.12.224.2: icmp_seq=2 ttl=63 time=9.83 ms
64 bytes from 10.12.224.2: icmp_seq=3 ttl=63 time=9.27 ms
64 bytes from 10.12.224.2: icmp_seq=4 ttl=63 time=8.04 ms
^C
--- 10.12.224.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 8.042/9.201/9.829/0.699 ms
root@Ubuntu-PC-3:~# ping 10.12.224.97
PING 10.12.224.97 (10.12.224.97) 56(84) bytes of data.
64 bytes from 10.12.224.97: icmp_seq=1 ttl=255 time=4.54 ms
64 bytes from 10.12.224.97: icmp_seq=2 ttl=255 time=3.87 ms
64 bytes from 10.12.224.97: icmp_seq=3 ttl=255 time=4.10 ms
^C
--- 10.12.224.97 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2004ms
rtt min/avg/max/mdev = 3.872/4.170/4.542/0.278 ms
root@Ubuntu-PC-3:~# ping 10.12.224.1
PING 10.12.224.1 (10.12.224.1) 56(84) bytes of data.
64 bytes from 10.12.224.1: icmp_seq=1 ttl=255 time=6.09 ms
64 bytes from 10.12.224.1: icmp_seq=2 ttl=255 time=4.95 ms
64 bytes from 10.12.224.1: icmp_seq=3 ttl=255 time=3.51 ms
^C
--- 10.12.224.1 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2002ms
rtt min/avg/max/mdev = 3.513/4.851/6.086/1.052 ms
root@Ubuntu-PC-3:~# ping 10.12.224.65
PING 10.12.224.65 (10.12.224.65) 56(84) bytes of data.
64 bytes from 10.12.224.65: icmp_seq=1 ttl=255 time=6.15 ms
64 bytes from 10.12.224.65: icmp_seq=2 ttl=255 time=4.30 ms
64 bytes from 10.12.224.65: icmp_seq=3 ttl=255 time=4.54 ms
^C
--- 10.12.224.65 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
```

SSH connectivity from Ubuntu-PC-1

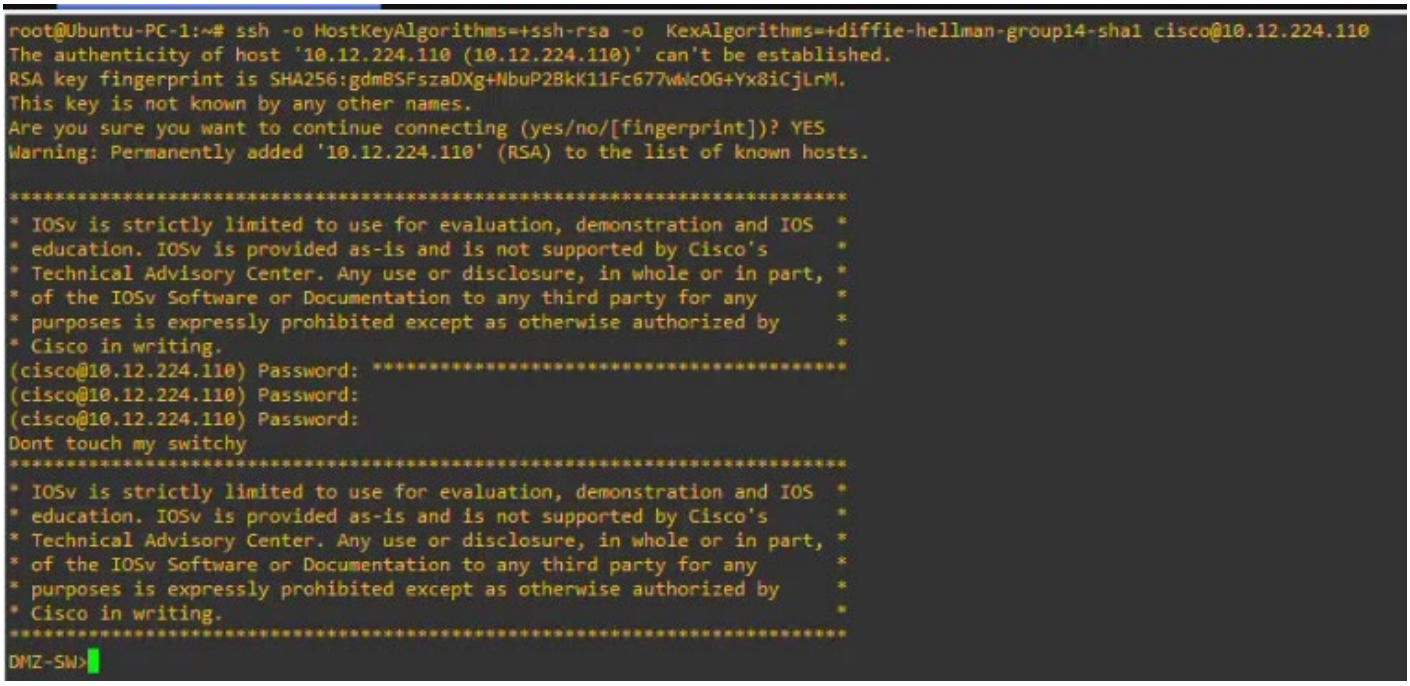
LAN1-SW:



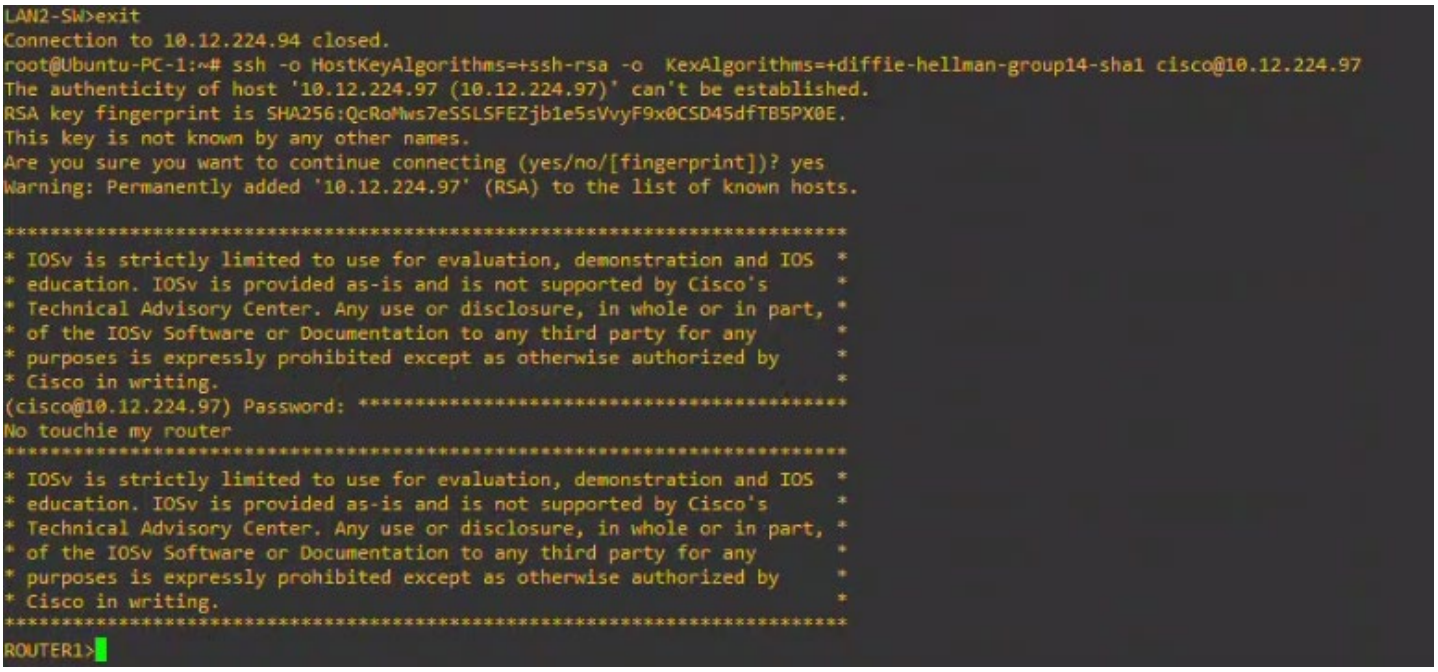
LAN2-SW:



DMZ-SW:

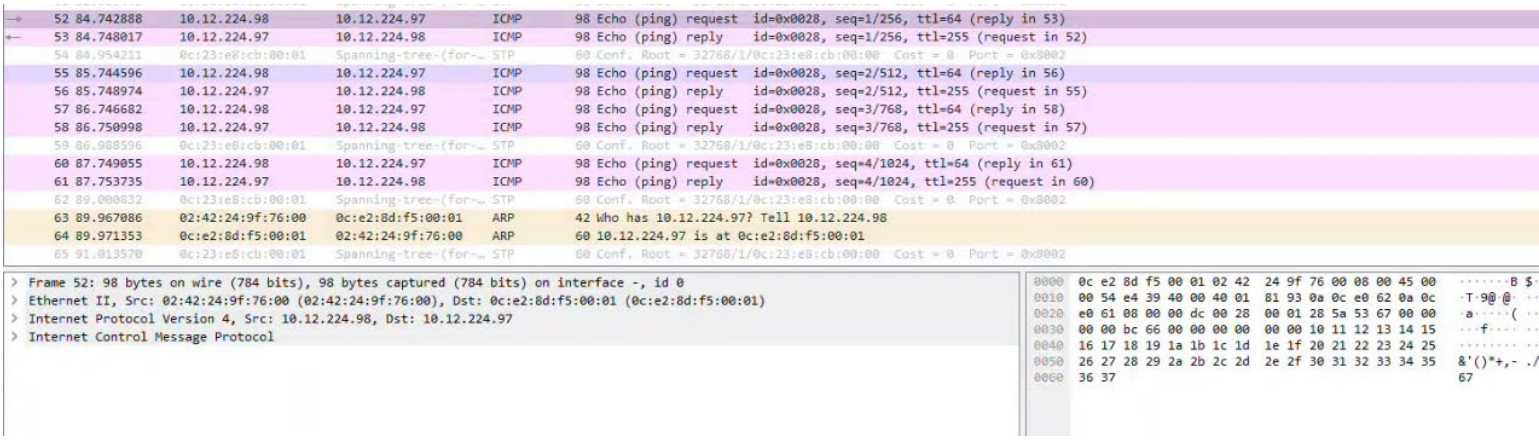


Router1:



Wireshark Captures:

ICMP traffic between Ubuntu-PC-1 and default gateway:



SSH traffic between Ubuntu-PC-1 and default gateway: