

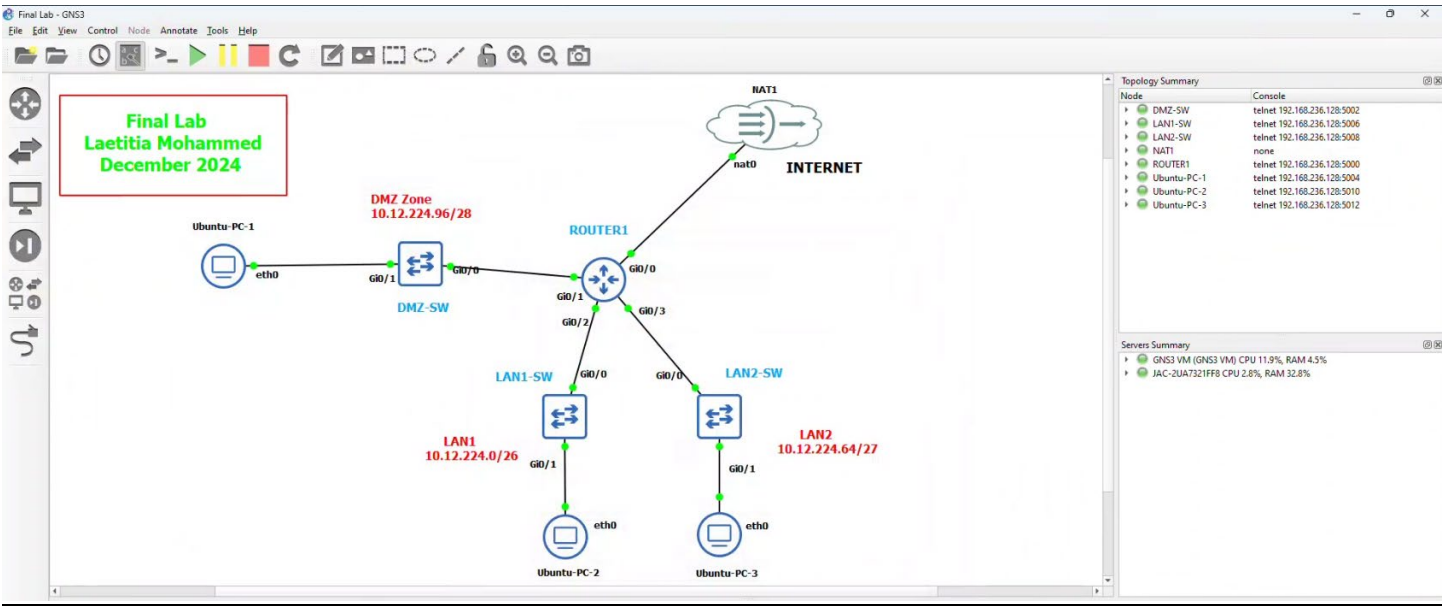
Final Lab

*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 255.255.255.0
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
```

```
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:

```
CiscoRouter-1 CiscoSwitch-1 CiscoSwitch-1
*Dec 5 21:41:40.209: %GRUB-5-CONFIG_WRITING: GRUB configuration is being updated on disk. Please wait...
*Dec 5 21:41:40.991: %GRUB-5-CONFIG_WRITTEN: GRUB configuration was written to disk successfully.
ROUTER1#show ip ssh
SSH Disabled - version 1.99
%Please create RSA keys to enable SSH (and of atleast 768 bits for SSH v2).
Authentication methods:publickey,keyboard-interactive,password
Authentication Publickey Algorithms:x509v3-ssh-rsa,ssh-rsa
Hostkey Algorithms:x509v3-ssh-rsa,ssh-rsa
Encryption Algorithms:aes128-ctr,aes192-ctr,aes256-ctr
MAC Algorithms:hmac-sha2-256,hmac-sha2-512,hmac-sha1,hmac-sha1-96
KEX Algorithms:diffie-hellman-group-exchange-sha1,diffie-hellman-group14-sha1
Authentication timeout: 120 secs; Authentication retries: 3
Minimum expected Diffie Hellman key size : 2048 bits
IOS Keys in SECSH format(ssh-rsa, base64 encoded): NONE
ROUTER1#no ip domain-lookup
^
% Invalid input detected at '^' marker.

ROUTER1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ROUTER1(config)#no ip domain-lookup
ROUTER1(config)#ip domain-name cisco.com
ROUTER1(config)#username cisco secret class
ROUTER1(config)#login local
^
% Invalid input detected at '^' marker.

ROUTER1(config)#crypto key generate rsa
The name for the keys will be: ROUTER1.cisco.com
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...
[OK] (elapsed time was 1 seconds)

ROUTER1(config)#
*Dec 5 22:17:11.490: %SSH-5-ENABLED: SSH 1.99 has been enabled
ROUTER1(config)#line vty 0 4
ROUTER1(config-line)#transport input ssh
ROUTER1(config-line)#login local
ROUTER1(config-line)#end
ROUTER1#
*Dec 5 22:18:27.165: %SYS-5-CONFIG_I: Configured from console by console
ROUTER1#do sh ip int br
^
% Invalid input detected at '^' marker.

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
```

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
```

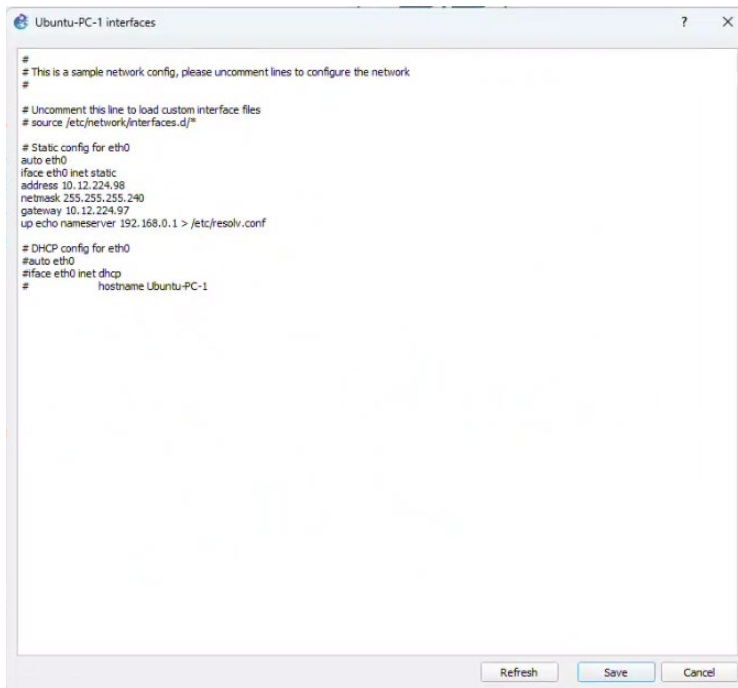
LAN1-SW switch configuration:

```
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
```

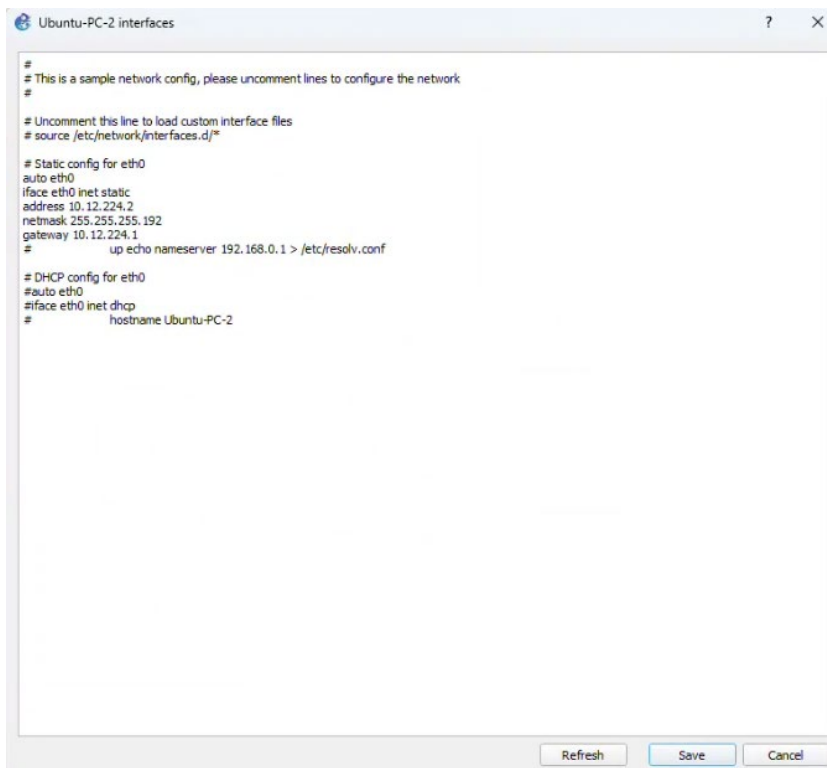

LAN2-SW switch configurations:

```
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
```

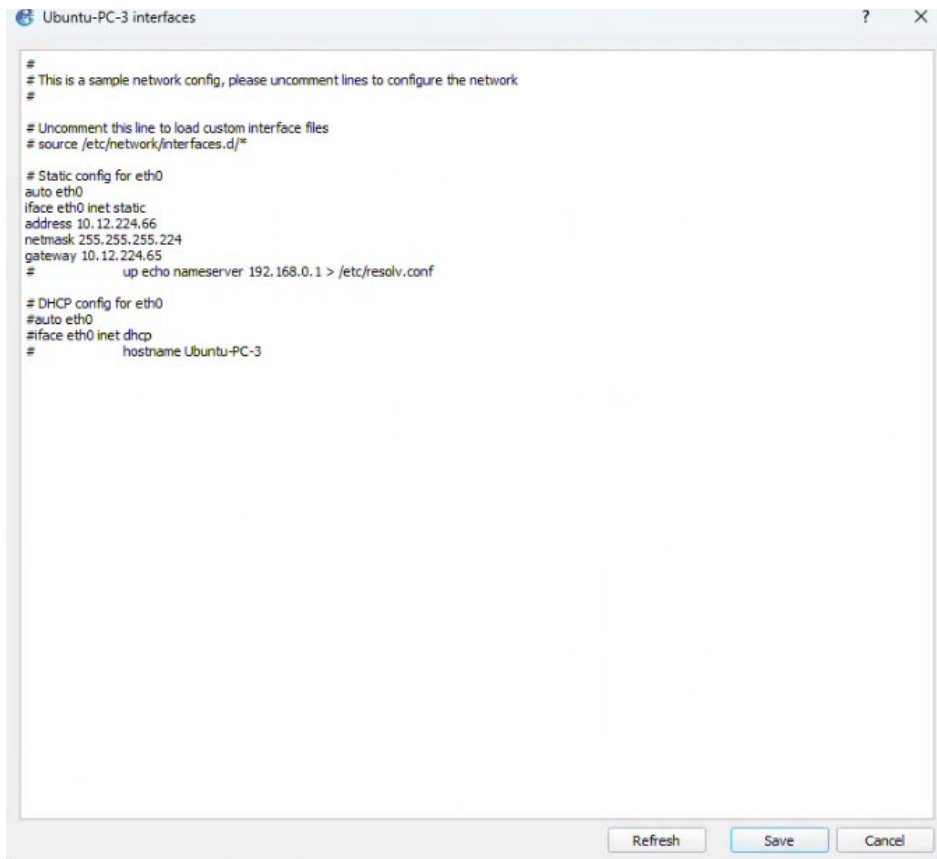

Ubuntu-PC-1 IP configuration



Ubuntu-PC-2



Ubuntu-PC-3



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$0Uhq$3xAavcs.2619CZ72H61Qk1
!
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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*****^C
banner incoming ^C
*****
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*****^C
banner login ^C
*****
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*****
```

```

banner incoming ^C
*****
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*****^C
banner login ^C
*****
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*****^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#

```

Sh run:

```

!
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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*****AC
banner incoming ^C
*****
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*****AC
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 *
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*****AC
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 runs, 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
DMZ-SW#

```


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$PF5gVjaFzBPA/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 pvs
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, *
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*****^C
banner incoming ^C
*****
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*****^C
banner login ^C
*****
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* purposes is expressly prohibited except as otherwise authorized by *
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*****^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 runs, 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$97wB$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
negotiation auto
!
```

```

!
!
!
!
!
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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* of the IOSv Software or Documentation to any third party for any *
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*****^C
banner incoming ^C
*****
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*****^C
banner login ^C
*****
* IOSv is strictly limited to use for evaluation, demonstration and IOS *
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* 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 141418180F0B
 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:

```
root@Ubuntu-PC-1:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.12.224.90 netmask 255.255.255.240 broadcast 0.0.0.0
    inet6 fe80::42:24ff:fe9f:7600 prefixlen 64 scopeid 0x20<link>
    ether 02:42:24:9f:76:00 txqueuelen 1000 (Ethernet)
    RX packets 3570 bytes 280309 (280.3 KB)
    RX errors 0 dropped 9 overruns 0 frame 0
    TX packets 258 bytes 29436 (29.4 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: 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 8 bytes 672 (672.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 8 bytes 672 (672.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

ifconfig from Ubuntu-PC-2

```
root@Ubuntu-PC-2:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.12.224.2 netmask 255.255.255.192 broadcast 0.0.0.0
    inet6 fe80::42:7fff:fe4a:f200 prefixlen 64 scopeid 0x20<link>
    ether 02:42:7f:4a:f2:00 txqueuelen 1000 (Ethernet)
    RX packets 3390 bytes 255959 (255.9 KB)
    RX errors 0 dropped 9 overruns 0 frame 0
    TX packets 22 bytes 1692 (1.6 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: 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 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 0 overruns 0 carrier 0 collisions 0
```

ifconfig from Ubuntu-PC-3

```
root@Ubuntu-PC-3:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.12.224.66 netmask 255.255.255.224 broadcast 0.0.0.0
    inet6 fe80::42:9fff:fe3f:ff00 prefixlen 64 scopeid 0x20<link>
    ether 02:42:9f:3f:ff:00 txqueuelen 1000 (Ethernet)
    RX packets 3380 bytes 255359 (255.3 KB)
    RX errors 0 dropped 9 overruns 0 frame 0
    TX packets 22 bytes 1692 (1.6 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: 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 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 0 overruns 0 carrier 0 collisions 0
```

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:~#
```

```
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:

```
root@Ubuntu-PC-1:~#
root@Ubuntu-PC-1:~# ssh -o HostKeyAlgorithms=+ssh-rsa -o KexAlgorithms=+diffie-hellman-group14-sha1 cisco@10.12.224.62
The authenticity of host '10.12.224.62 (10.12.224.62)' can't be established.
RSA key fingerprint is SHA256:9Zm47c/BNT6g2Av0xs2D+ViUX9m30Ra/uqvqihqqfxs.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.12.224.62' (RSA) to the list of known hosts.

*****
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* purposes is expressly prohibited except as otherwise authorized by *
* Cisco in writing. *
(cisco@10.12.224.62) Password: *****

(cisco@10.12.224.62) Password:
Dont touch my switchy
*****
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*****
```

LAN2-SW:

```
Connection to 10.12.224.62 closed.
root@Ubuntu-PC-1:~# ssh -o HostKeyAlgorithms=+ssh-rsa -o KexAlgorithms=+diffie-hellman-group14-sha1 cisco@10.12.224.94
The authenticity of host '10.12.224.94 (10.12.224.94)' can't be established.
RSA key fingerprint is SHA256:ik+HqTMAhB+XhzbHJhDPaaPVV3GSClunv9HmyXPLHcQ.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.12.224.94' (RSA) to the list of known hosts.

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(cisco@10.12.224.94) Password: *****

(cisco@10.12.224.94) Password:
Dont touch my switchy
*****
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*****
LAN2-SW>
```


DMZ-SW:

```
root@Ubuntu-PC-1:~# ssh -o HostKeyAlgorithms=+ssh-rsa -o KexAlgorithms=+diffie-hellman-group14-sha1 cisco@10.12.224.110
The authenticity of host '10.12.224.110 (10.12.224.110)' can't be established.
RSA key fingerprint is SHA256:gdmbSFsZaDXg+NbuP28kK11Fc677vMcOG+Yx8iCjlrM.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? YES
Warning: Permanently added '10.12.224.110' (RSA) to the list of known hosts.

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(cisco@10.12.224.110) Password: *****
(cisco@10.12.224.110) Password:
(cisco@10.12.224.110) Password:
Dont touch my switchy
*****
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* purposes is expressly prohibited except as otherwise authorized by *
* Cisco in writing. *
*****
DMZ-SW>
```

Router1:

```
LAN2-SW>exit
Connection to 10.12.224.94 closed.
root@Ubuntu-PC-1:~# ssh -o HostKeyAlgorithms=+ssh-rsa -o KexAlgorithms=+diffie-hellman-group14-sha1 cisco@10.12.224.97
The authenticity of host '10.12.224.97 (10.12.224.97)' can't be established.
RSA key fingerprint is SHA256:QcRoMws7eSSLSFEZjb1e5sVvyF9x0CSD45dfTB5PX0E.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.12.224.97' (RSA) to the list of known hosts.

*****
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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. *
(cisco@10.12.224.97) Password: *****
No touchie my router
*****
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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. *
*****
ROUTER1>
```

Wireshark Captures:

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

52	84.742888	10.12.224.98	10.12.224.97	ICMP	98 Echo (ping) request	id=0x0028, seq=1/256, ttl=64 (reply in 53)
53	84.748017	10.12.224.97	10.12.224.98	ICMP	98 Echo (ping) reply	id=0x0028, seq=1/256, ttl=255 (request in 52)
54	84.954211	0c:23:e8:cb:00:01	Spanning-tree-(for~	STP	60 Conf. Root = 32768/1/0c:23:e8:cb:00:00	Cost = 0 Port = 0x8002
55	85.744596	10.12.224.98	10.12.224.97	ICMP	98 Echo (ping) request	id=0x0028, seq=2/512, ttl=64 (reply in 56)
56	85.748974	10.12.224.97	10.12.224.98	ICMP	98 Echo (ping) reply	id=0x0028, seq=2/512, ttl=255 (request in 55)
57	86.746682	10.12.224.98	10.12.224.97	ICMP	98 Echo (ping) request	id=0x0028, seq=3/768, ttl=64 (reply in 58)
58	86.750998	10.12.224.97	10.12.224.98	ICMP	98 Echo (ping) reply	id=0x0028, seq=3/768, ttl=255 (request in 57)
59	86.988596	0c:23:e8:cb:00:01	Spanning-tree-(for~	STP	60 Conf. Root = 32768/1/0c:23:e8:cb:00:00	Cost = 0 Port = 0x8002
60	87.749055	10.12.224.98	10.12.224.97	ICMP	98 Echo (ping) request	id=0x0028, seq=4/1024, ttl=64 (reply in 61)
61	87.753735	10.12.224.97	10.12.224.98	ICMP	98 Echo (ping) reply	id=0x0028, seq=4/1024, ttl=255 (request in 60)
62	89.000832	0c:23:e8:cb:00:01	Spanning-tree-(for~	STP	60 Conf. Root = 32768/1/0c:23:e8:cb:00:00	Cost = 0 Port = 0x8002
63	89.967086	02:42:24:9f:76:00	0c:e2:8d:f5:00:01	ARP	42 Who has 10.12.224.97? Tell 10.12.224.98	
64	89.971353	0c:e2:8d:f5:00:01	02:42:24:9f:76:00	ARP	60 10.12.224.97 is at 0c:e2:8d:f5:00:01	
65	91.813570	0c:23:e8:cb:00:01	Spanning-tree-(for~	STP	60 Conf. Root = 32768/1/0c:23:e8:cb:00:00	Cost = 0 Port = 0x8002
> Frame 52: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface -, id 0						0000 0c e2 8d f5 00 01 02 42 24 9f 76 00 08 00 45 00B
> Ethernet II, Src: 02:42:24:9f:76:00 (02:42:24:9f:76:00), Dst: 0c:e2:8d:f5:00:01 (0c:e2:8d:f5:00:01)						0010 00 54 e4 39 40 00 40 01 81 93 0a 0c e0 62 0a 0c ..T.9@.
> Internet Protocol Version 4, Src: 10.12.224.98, Dst: 10.12.224.97						0020 e0 61 08 00 00 dc 00 28 00 01 28 5a 53 67 00 00 ..a.....
> Internet Control Message Protocol						0030 00 00 bc 66 00 00 00 00 00 00 10 11 12 13 14 15f.....
						0040 16 17 18 19 1a 1b 1c 1d 1e 1f 20 21 22 23 24 25&'()*+,-./
						0050 26 27 28 29 2a 2b 2c 2d 2e 2f 30 31 32 33 34 3567
						0060 36 37

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

11	19.615212	10.12.224.98	10.12.224.97	SSH	118 Client: Encrypted packet (len=64)	
12	19.622764	10.12.224.97	10.12.224.98	SSH	118 Server: Encrypted packet (len=64)	
13	19.623029	10.12.224.98	10.12.224.97	TCP	54 51772 → 22 [ACK] Seq=65 Ack=65 Win=63908 Len=0	
14	19.719106	10.12.224.98	10.12.224.97	SSH	118 Client: Encrypted packet (len=64)	
15	19.725448	10.12.224.97	10.12.224.98	SSH	118 Server: Encrypted packet (len=64)	
16	19.725592	10.12.224.98	10.12.224.97	TCP	54 51772 → 22 [ACK] Seq=129 Ack=129 Win=63908 Len=0	
17	20.099321	10.12.224.98	10.12.224.97	SSH	118 Client: Encrypted packet (len=64)	
18	20.107788	10.12.224.97	10.12.224.98	SSH	118 Server: Encrypted packet (len=64)	
19	20.107931	10.12.224.98	10.12.224.97	TCP	54 51772 → 22 [ACK] Seq=193 Ack=193 Win=63908 Len=0	
20	20.164943	0c:23:e8:cb:00:01	Spanning-tree-(for-bridges)_00	STP	60 Conf. Root = 32768/1/0c:23:e8:cb:00:00	Cost = 0 Port = 0x8002
21	20.289758	10.12.224.98	10.12.224.97	SSH	118 Client: Encrypted packet (len=64)	
22	20.297028	10.12.224.97	10.12.224.98	SSH	118 Server: Encrypted packet (len=64)	
23	20.297152	10.12.224.98	10.12.224.97	TCP	54 51772 → 22 [ACK] Seq=257 Ack=257 Win=63908 Len=0	
24	20.415312	10.12.224.98	10.12.224.97	SSH	118 Client: Encrypted packet (len=64)	
25	20.422525	10.12.224.97	10.12.224.98	SSH	118 Server: Encrypted packet (len=64)	
26	20.422703	10.12.224.98	10.12.224.97	TCP	54 51772 → 22 [ACK] Seq=321 Ack=321 Win=63908 Len=0	
27	20.521064	10.12.224.98	10.12.224.97	SSH	118 Client: Encrypted packet (len=64)	
28	20.528501	10.12.224.97	10.12.224.98	SSH	118 Server: Encrypted packet (len=64)	
29	20.528654	10.12.224.98	10.12.224.97	TCP	54 51772 → 22 [ACK] Seq=385 Ack=385 Win=63908 Len=0	