Network Setup – Group project documentation

Group participants

Greater Omorose

Karthik Pai Kakode

Kyle Pearson

Alex Hindmoor

Ummair Haq

Ollie Afia

Contents

Subnetting

Base Address:

- 172.20.0.0/16 - 11111111-11111111-00000000-00000000
- 172.20.0.0/17 - 11111111-11111111-10000000-00000000
- 172.20.0.0/18 - 11111111-11111111-11000000-00000000
- 172.20.0.0/19 - 11111111-11111111-11100000-00000000
- 172.20.0.0/20 - 11111111-11111111-11110000-00000000
- 172.20.0.0/23 - 172.20.0.1 - 172.20.1.254 - 255.255.254.0
- 172.20.2.0/26 - 172.20.2.1 - 172.20.2.62 - 255.255.255.192
- 172.20.2.64/29 - 172.20.2.65 - 172.20.2.70 - 255.255.255.248

IP addressing & Subnetting:

Network	Subnet	First	Last	Broadcast	VLAN	Usable Hosts
172.20.0.0/23	255.255.254.0	172.20.0.1	172.20.1.254	172.20.1.255	10 Production	510
172.20.2.0/26	255.255.255.192	172.20.2.1	172.20.2.62	172.20.2.63	99 IT	62
172.20.2.64	255.255.255.248	172.20.2.65	172.20.2.70	172.20.2.71	69 Remote Manage	6

Vlans:

Vlans	Description	IP Range	Hosts
10	Production	172.20.0.3 - 172.20.1.254	500
99	IT	172.20.2.3 - 172.20.2.62	50
52	Parking_Lot	N/A	N/A
9	Native	N/A	N/A
69	Remote Manage	172.20.2.65 - 172.20.2.70	6

Interface Assignments

Internet Host

- 210.1.1.1/24

BRI

- S0/0/0: 192.168.1.2/30
- G0/0/1: 210.1.1.2/24

LON

- G0/0/1.10: 172.20.0.1/23
- G0/0/1.99: 172.20.2.1/26
- G0/0/1.69: 172.20.2.65/29
- S0/0/0: 192.168.1.1/30

Sw1

- F/06: 172.20.0.4/23
- F/018: 172.20.2.4/26
- VLAN 10 PROD SW1: 172.20.0.2/23
- VLAN 99 IT SW1: 172.20.2.2/26
- VLAN 69 Remote Manage SW1: 172.20.2.66/29

Sw2

- F/06: 172.20.0.5/23
- F/018: 172.20.2.5/26
- VLAN 10 PROD SW2: 172.20.0.3/23
- VLAN 99 IT SW2: 172.20.2.3/26
- VLAN 69 Remote Manage SW1: 172.20.2.67/29

Configuration

Configuration Requirements:

Routers:

Basic Config (Hostname, Banner, Enable pass, encryption, vty password, console password and telnet access.) !"

IP addresses for all interfaces !" clock rate for serial interfaces !"

Static Routes !"

Host Tables. !"

Telnet from Router to Router. !"

Inter-Vlan Routing !"

Switch:

Basic Config (See Above) !"

VLAN's using 802.1q encapsulation !"

VLAN Trunking !"

EtherChannel !"

Ports fa0/6 & fa0/18 should be configured with port security to allow only one host. (If port security violated the port should shut down) 👍 👍

Security:

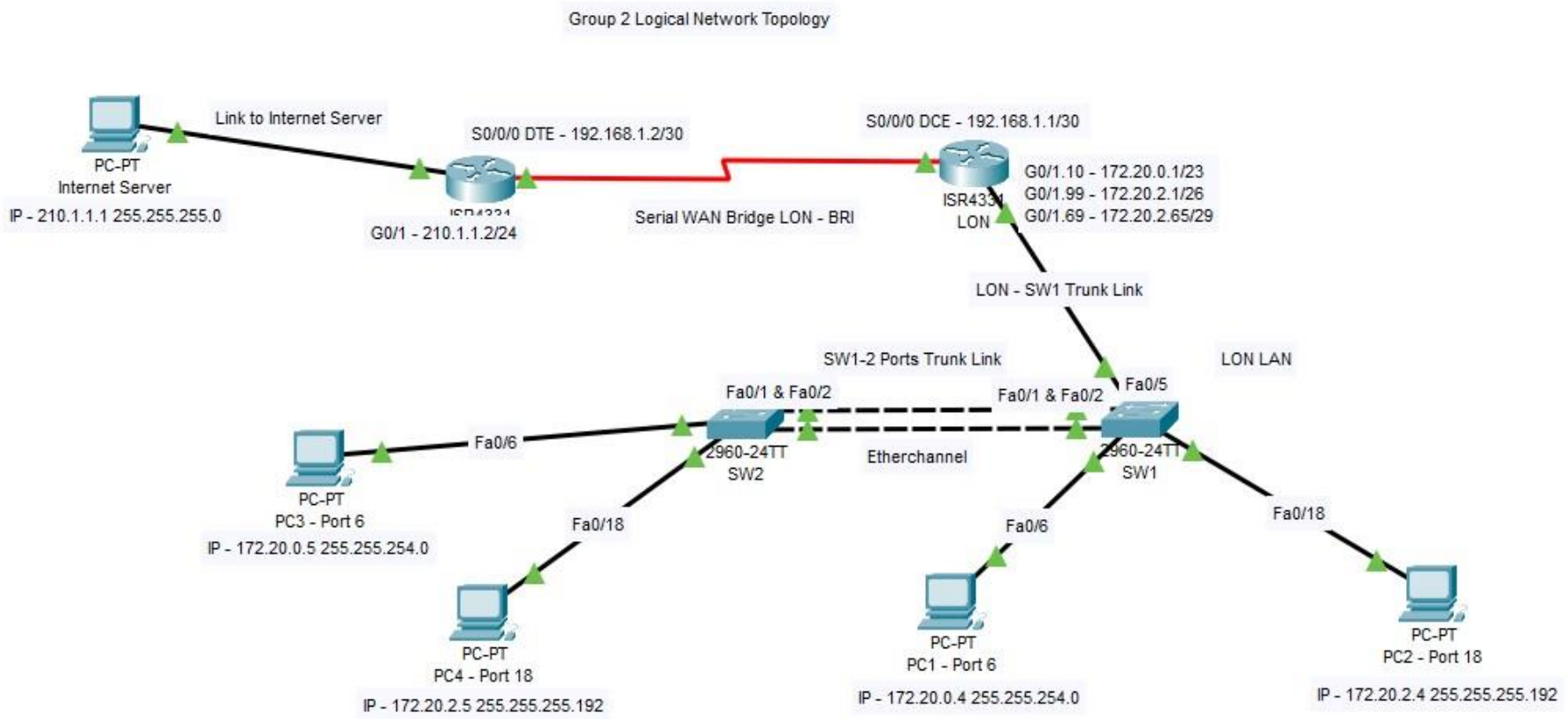
- SSH Secure access
- Port Security
- DTP Mitigation
- CDP disabling on BRI router
- Port Shutdown and Parking

Roles

Name	Role
Alex	Cabling + Switch Security + Internet server + Troubleshooting
Karthik	Cabling + Switch Security + Troubleshooting
Greater	London Router + PC **IP:** 172.20.0.5 **MASK:** 255.255.254.0 **GATE:** 172.20.0.1
Ummair	Brighton Router + PC **IP:** 172.20.2.5 **MASK:** 255.255.255.192 **GATE:** 172.20.2.1
Kyle	Switch 1 + PC **IP:** 172.20.0.4 **MASK:** 255.255.254.0 **GATE:** 172.20.0.1
Ollie	Switch 2 + PC **IP:** 172.20.2.4 **MASK:** 255.255.255.192 **GATE:** 172.20.2.1

Network Documentation

Network Topology



LON Router

Running configurations

```
LON#

LON#shou run
Building configuration...

Current configuration : 2102 bytes
!
! Last configuration change at 13:16:23 UTC Fri May 3 2024
!
version 15.4
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname LON
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$AD/N$pS3utKWQi9jBnBCRO5YMnO
!
no aaa new-model
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
no ip domain lookup
ip domain name cisco.com
ip cef
no ipv6 cef
!
multilink bundle-name authenticated
!
!
cts logging verbose
!
!
license udi pid CISCO2911/K9 sn FCZ19187OJ1
!
!
username cisco secret 5 $1$ting$MtEYBBuizhe74XN8MEVzJ1
!
redundancy
!
!
!
!
!
ip ssh time-out 60
ip ssh version 2
!
!
!
!
!
!
!
!
!
!
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 description Trunk Link to SW1
 no ip address
 duplex auto
 speed auto
!
interface GigabitEthernet0/1.10
 description Default Gateway for vlan 10
 encapsulation dot1Q 10
 ip address 172.20.0.1 255.255.254.0
!
interface GigabitEthernet0/1.69
```

```
interface GigabitEthernet0/1.10
 description Default Gateway for vlan 10
 encapsulation dot1Q 10
 ip address 172.20.0.1 255.255.254.0
!
interface GigabitEthernet0/1.69
 description Default Gateway for VLAN 69
 encapsulation dot1Q 69
 ip address 172.20.2.65 255.255.255.248
!
interface GigabitEthernet0/1.99
 description Default gateway for vlan 99
 encapsulation dot1Q 99
 ip address 172.20.2.1 255.255.255.192
!
interface GigabitEthernet0/2
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 192.168.1.1 255.255.255.252
 clock rate 2000000
!
interface Serial0/0/1
 no ip address
 shutdown
 clock rate 2000000
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 192.168.1.2
ip route 210.1.1.0 255.255.255.0 192.168.1.2
!
!
!
!
control-plane
!
!
banner motd ^CAuthorized access only^C
!
line con 0
 password 7 00071A150754
 logging synchronous
 login
line aux 0
line 2
 no activation-character
 no exec
 transport preferred none
 transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
 stopbits 1
line vty 0 4
 password 7 01100F175804
 logging synchronous
 login local
 transport input ssh
!
scheduler allocate 20000 1000
!
end
```

The first router within this topology has been name the LON router using the *hostname LON* command, as per the assignment specification.

During the initial setup, passwords were set to access both the privileged exec mode and the console terminal, for security precautions to prevent access to unauthorised persons. By default, the password is clear text, and so the clear text passwords were encrypted with the service password-encryption command.

No IP (Internet Protocol) domain lookup was used to disable the DNS (Domain Name Server) hostname resolution to ensure that unrecognised commands were not being resolved as domain names.

A Banner MOTD (Message of the Day) was set to ensure that unauthorised users know that they should not be connecting or using this device.

The IP domain name cisco.com was used as a placeholder for a proper DNS to ensure the functionality of SSH (Secure Shell). Furthermore, an account was created for SSH using the username: cisco and the secret password: class. SSH version 2 was enable don this device as a more secure method compared to telnet to be able to remote connect between the routers and switches within the network. SSH was configures with a time-out of 60 seconds to ensure that the connection is closed after no activity for 60 seconds.

Interface G0/1 was selected to be the trunk link to Switch 1. As per the Router-on a stick method of inter-vlan routing, this interface was then divided into the G0/1.10, G0/1.69, and G0/1.99 sub-interfaces. Each interface was configured with descriptions of their use for easy-to-follow config and encapsulated using 802.1q encapsulation to ensure inter-vlan routing.

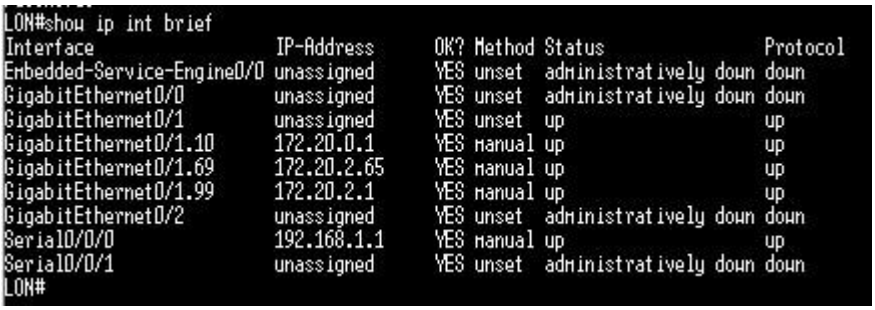
The G0/1.10 sub-interface was assigned the IP address 172.20.0.1 255.255.254.0 and encapsulated to allow traffic from vlan 10.

The G0/1.69 sub-interface was assigned the IP address 172.20.2.65 255.255.255.248 and encapsulated to allow traffic from vlan 69.

The G0/1.99 sub-interface was assigned the IP address 172.20.2.1 255.255.255.192 and encapsulated to allow traffic from vlan 99.

Serial0/0/0 is the port that is connected to the BRI router, simulating a WAN (Wide Area Network). It was assigned the IP 192.168.1.1 255.255.255.252 as per the assignment specification. The DCE was set on this side of the connection and the clock rate has been set to 2,000,000 bits per second to ensure that there is no throttling to the connection out of the network. This could potentially be an issue without proper security such as ACL's (Access Control Lists) or IDS (Intrusion Defence Systems) being installed, however within this assignment specification 2,000,000 bits seemed appropriate.

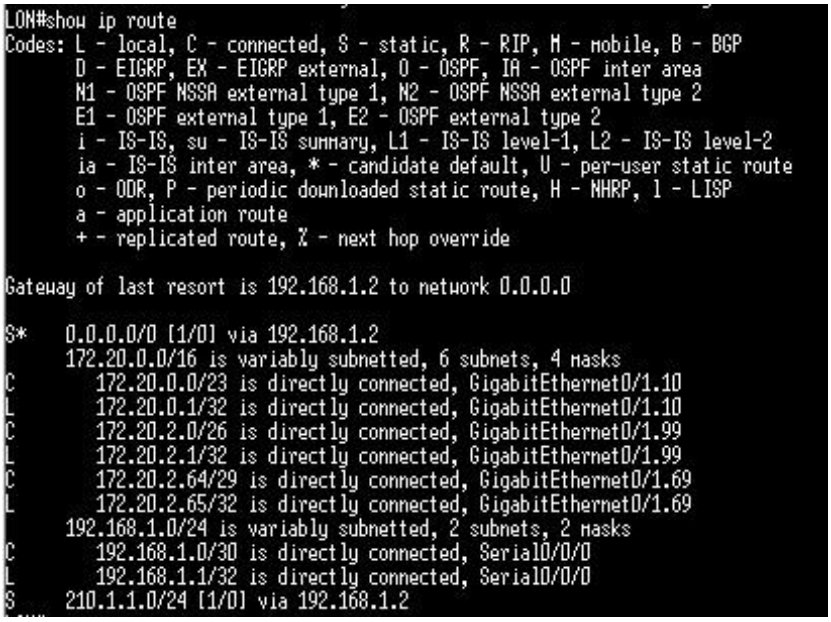
IP Interface



```
LON#shou ip int brief
Interface                  IP-Address      OK? Method Status                Protocol
Embedded-Service-Engine0/0 unassigned      YES unset  administratively down down
GigabitEthernet0/0         unassigned      YES unset  administratively down down
GigabitEthernet0/1         unassigned      YES unset  up                    up
GigabitEthernet0/1.10      172.20.0.1      YES manual up                    up
GigabitEthernet0/1.69      172.20.2.65     YES manual up                    up
GigabitEthernet0/1.99      172.20.2.1      YES manual up                    up
GigabitEthernet0/2         unassigned      YES unset  administratively down down
Serial0/0/0                192.168.1.1     YES manual up                    up
Serial0/0/1                unassigned      YES unset  administratively down down
LON#
```

This is the output from the IP interface brief, as per the previous config, G0/1, its sub-interfaces and Serial 0/0/0 are the only ports active. All other ports have been administratively disabled for security purposes.

Show IP Route



```
LON#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override

Gateway of last resort is 192.168.1.2 to network 0.0.0.0

S*    0.0.0.0/0 [1/0] via 192.168.1.2
      172.20.0.0/16 is variably subnetted, 6 subnets, 4 masks
C        172.20.0.0/23 is directly connected, GigabitEthernet0/1.10
L        172.20.0.1/32 is directly connected, GigabitEthernet0/1.10
C        172.20.2.0/26 is directly connected, GigabitEthernet0/1.99
L        172.20.2.1/32 is directly connected, GigabitEthernet0/1.99
C        172.20.2.64/29 is directly connected, GigabitEthernet0/1.69
L        172.20.2.65/32 is directly connected, GigabitEthernet0/1.69
      192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.1.0/30 is directly connected, Serial0/0/0
L        192.168.1.1/32 is directly connected, Serial0/0/0
S     210.1.1.0/24 [1/0] via 192.168.1.2
```

In the IP route the wild card 0.0.0.0 was used in creating the gateway of the last resort to ensure that any packet can reach the internet via the interface port with IP address 192.168.1.2 without being dropped at London router. To ensure a connection from the LON LAN (Local Area Network) through to the Internet Server, a direct static route was configured to the 210.1.1.0 network with a subnet mask of 255.255.255.0 or /24.

The routes directly connected to the LON router are the 3 subnets for VLANs 10,69 and 99 connected using the router-on-a-stick method of inter-vlan routing as well as the serial connection to the BRI router.

BRI Router

Show Run

```
*May  3 14:40:00.599: %SYS-5-CONFIG_I: Configured from console by console
BRI#show run
Building configuration...

Current configuration : 1666 bytes
!
! Last configuration change at 14:40:00 UTC Fri May 3 2024
!
version 15.4
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname BRI
!
boot-start-marker
boot-end-marker
!
!
enable secret 5 $1$OSaV$eQ/pnFzcJ.w/sBabnJcZj.
!
no aaa new-model
!
!
!
!
!
!
!
!
!
!
!
!
ip domain name cisco.com
ip cef
no ipv6 cef
!
multilink bundle-name authenticated
!
cts logging verbose
!
!
license udi pid CISCO1921/K9 sn FCZ2141B1GD
license boot module c1900 technology-package securityk9
!
!
username cisco secret 5 $1$bojc$KHP9yo7k1XA/7GujIIDup0
!
redundancy
!
!
!
!
no cdp run
!
ip ssh version 2
!
!
!
!
!
!
!
!
!
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 ip address 210.1.1.2 255.255.255.0
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 192.168.1.2 255.255.255.252
!
interface Serial0/0/1
 no ip address
 shutdown
 clock rate 2000000
!
!
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 ip address 210.1.1.2 255.255.255.0
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 192.168.1.2 255.255.255.252
!
interface Serial0/0/1
 no ip address
 shutdown
 clock rate 2000000
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 172.20.0.0 255.255.254.0 192.168.1.1
ip route 172.20.2.0 255.255.255.192 192.168.1.1
ip route 172.20.2.0 255.255.255.192 172.20.2.1
!
!
!
!
control-plane
!
!
banner motd ^Cuthorized access only #
 ^C
!
line con 0
 password 7 14141B180F0B
 logging synchronous
 login
line aux 0
line 2
 no activation-character
 no exec
 transport preferred none
 transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
 stopbits 1
line vty 0 4
 password 7 030752180500
 logging synchronous
 login local
 transport input ssh
!
scheduler allocate 20000 1000
!
end
```

The second router within this topology has been name the BRI router using the *hostname BRI* command, as per the assignment specification.

As per the LON router, during the initial setup, passwords were set to access both the privileged exec mode and the console terminal, for security precautions to prevent access to unauthorised persons. By default, the password is clear text, and so the clear text passwords were encrypted with the service password-encryption command.

No IP (Internet Protocol) domain lookup was used to disable the DNS (Domain Name Server) hostname resolution to ensure that unrecognised commands were not being resolved as domain names.
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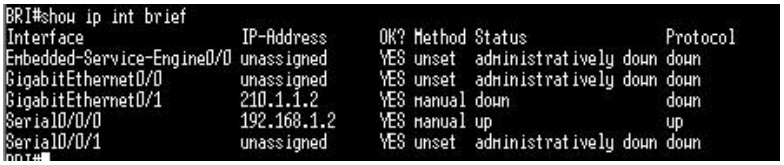
The IP domain name cisco.com was used as a placeholder for a proper DNS to ensure the functionality of SSH (Secure Shell). Furthermore, an account was created for SSH using the username: cisco and the secret password: class. SSH version 2 was enable don this device as a more secure method compared to telnet to be able to remote connect between the routers and switches within the network. SSH was configures with a time-out of 60 seconds to ensure that the connection is closed after no activity for 60 seconds.

G0/1 was the port assigned to the Internet server, as per the assignment specification. The IP address and subnet mask used for this was 210.1.1.2 255.255.255.0 or /24.

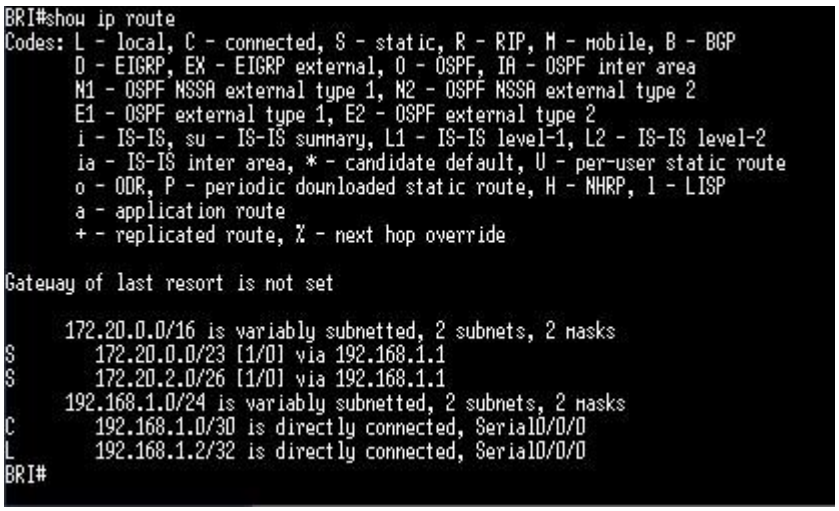
Furthermore, S0/0/0 was configured as the DTE connection simulating a WAN to the LON router. The IP address and subnet mask used was 192.168.1.2 255.255.255.252 or /30. The clock rate has been set via the DCE as 2,000,000.

IP Interface



This is the output from the IP interface brief, as per the previous config, G0/1 and Serial 0/0/0 are the only ports active. All other ports have been administratively disabled for security purposes. In this figure, G0/1 is down due to us unplugging the connection for internet requirement whilst taking screenshots.

Show IP route



Two static routes were configured on the BRI router to connect to our two subnets in the LON LAN. These are the networks as follows:

- 172.20.0.0/23
- 172.20.2.0/26

The commands for these are: ip route (Network Address) (Subnet Mask) (Next Hop/Forwarding Port)

As a note, the network 210.1.1.0 is not currently shown in this IP route statement due to the connection being disconnected during screenshots due to an internet connection requirement.

Switch 1

Show running-config:

```
Current configuration : 4298 bytes
!
! Last configuration change at 00:41:23 UTC Tue Mar 2 1993
!
version 15.2
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname SW1
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$iy/6$TAl523ophGBgXTRwlIZRyl
!
username cisco secret 5 $1$zh43$3sHFZ3bWLNfUul99c4tfR1
no aaa new-model
system mtu routing 1500
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name cisco.com
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending
!
!
!
!
!
!
interface Port-channel1
 switchport access vlan 52
 switchport trunk native vlan 9
 switchport trunk allowed vlan 9,10,69,99
 switchport mode trunk
!
interface FastEthernet0/1
 switchport access vlan 52
 switchport trunk native vlan 9
 switchport trunk allowed vlan 9,10,69,99
 switchport mode trunk
 channel-group 1 mode active
!
interface FastEthernet0/2
 switchport access vlan 52
 switchport trunk native vlan 9
 switchport trunk allowed vlan 9,10,69,99
 switchport mode trunk
 channel-group 1 mode active
!
interface FastEthernet0/3
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/4
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/5
 switchport access vlan 52
 switchport trunk native vlan 9
 switchport trunk allowed vlan 9,10,69,99
 switchport mode trunk
!
interface FastEthernet0/6
 switchport access vlan 10
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky a08c.fde5.69d4
 switchport port-security aging time 60
 switchport port-security aging type inactivity
 switchport port-security
!
interface FastEthernet0/7
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/8
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/9
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/10
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/11
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/12
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/13
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/14
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/15
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/16
 switchport access vlan 52
 switchport mode access
 shutdown
```

```
interface FastEthernet0/17
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/18
 switchport access vlan 99
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky a08c.fde5.6ad0
 switchport port-security aging time 60
 switchport port-security aging type inactivity
 switchport port-security
!
interface FastEthernet0/19
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/20
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/21
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/22
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/23
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/24
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface GigabitEthernet0/1
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface GigabitEthernet0/2
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface Vlan1
!
interface Vlan10
 ip address 172.20.0.2 255.255.254.0
!
interface Vlan69
 ip address 172.20.2.66 255.255.255.248
!
interface Vlan99
 ip address 172.20.2.2 255.255.255.192
!
```

The first section of the running configuration shows the basic configuration of Switch 1 showing the set hostname, with a secret password that is encrypted for security reasons.

The next part within the running configuration shows all the ports on the switch and their custom configs. There is also the ether channel config just before each port, named as ‘portchannel 1’.

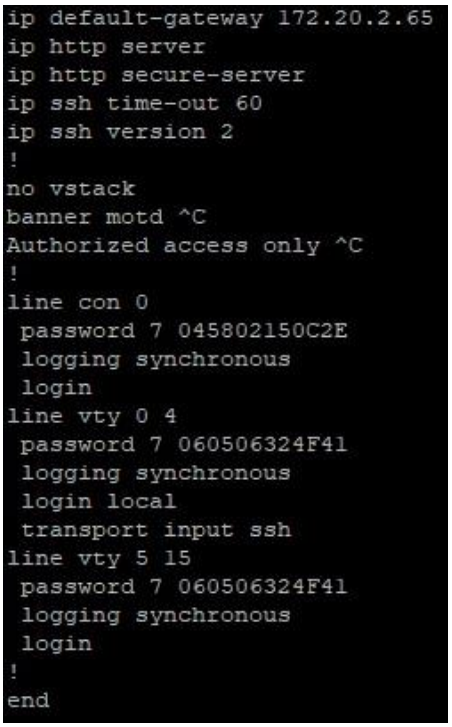
All ports at the beginning were moved to vlan 52 and shutdown, so that if any host would connect, it would be shutdown. Ports 1 and 2 were involved in a trunk between switches, allowing for all vlans and a native vlan of 9. these two ports were also included in ether channel, which is what the ‘channel-group 1 mode active’ command does.

Port 5 was also involved in a trunk to the router, which would allow for all vlans and have a native vlan of 9.

Port 6 and 18 were customised to be set to a specific vlan. Port 6 on vlan 10(production) and port 18 on vlan 99 (IT). These are the hosts connected to the hosts which shows that they also have port security implemented onto them. This port security allowed for only 1 MAC address to be allowed on a port so if a different host was to connect to that port, it would be allowed on the network as the MAC address set on the port, doesn't match. The aging time on the port security has an aging time of 60, meaning it will update every 60 minutes. It also has an aging time inactivity, meaning that if it has not heard from the pc for some time, it will drop that MAC address to allow for another host.

Next is the vlans with their given ip addresses and subnet masks which had been subnetted.

The default gateway allows for access through ssh, which has been implemented into the network for added security.



Here, it also shows the banner which comes up when you type the wrong password, entering the network.

'line con 0' is used to access the terminal through the console connection

Line vty 0 4 has ssh enabled and both vty 0 4 and 5 15 have encrypted passwords, also they have logging synchronous which prevents log messages from interfering with command inputs.

Additionally, telnet is disabled on both terminal lines for security purposes.

Show ip interface brief:

```
Interface              IP-Address      OK? Method Status                Protocol
Vlan1                  unassigned      YES unset  up                    down
Vlan10                 172.20.0.2      YES manual up                    up
Vlan69                 172.20.2.66     YES manual up                    up
Vlan99                 172.20.2.2      YES manual up                    up
FastEthernet0/1        unassigned      YES unset  up                    up
FastEthernet0/2        unassigned      YES unset  up                    up
FastEthernet0/3        unassigned      YES unset  administratively down down
FastEthernet0/4        unassigned      YES unset  administratively down down
FastEthernet0/5        unassigned      YES unset  up                    up
FastEthernet0/6        unassigned      YES unset  down                  down
FastEthernet0/7        unassigned      YES unset  administratively down down
FastEthernet0/8        unassigned      YES unset  administratively down down
FastEthernet0/9        unassigned      YES unset  administratively down down
FastEthernet0/10       unassigned      YES unset  administratively down down
FastEthernet0/11       unassigned      YES unset  administratively down down
FastEthernet0/12       unassigned      YES unset  administratively down down
FastEthernet0/13       unassigned      YES unset  administratively down down
FastEthernet0/14       unassigned      YES unset  administratively down down
FastEthernet0/15       unassigned      YES unset  administratively down down
FastEthernet0/16       unassigned      YES unset  administratively down down
FastEthernet0/17       unassigned      YES unset  administratively down down
FastEthernet0/18       unassigned      YES unset  down                  down
FastEthernet0/19       unassigned      YES unset  administratively down down
FastEthernet0/20       unassigned      YES unset  administratively down down
FastEthernet0/21       unassigned      YES unset  administratively down down
FastEthernet0/22       unassigned      YES unset  administratively down down
FastEthernet0/23       unassigned      YES unset  administratively down down
FastEthernet0/24       unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Port-channel1          unassigned      YES unset  up                    up
```

The show ip interface brief shows that all ports are administratively down as they were initially sent to vlan 52 which shuts down the ports, unless they were sent to other vlans after or for trunking. Ports 6 and 18 are down in this are down due to them being disconnected to allow for internet usage on this document. It also shows the custom ip addresses set for the different vlans. Lastly is the ‘port-channel 1’ which is the ether channel.

Show Vlan:

```
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active
9    Native                           active
10   Production                       active    Fa0/6
52   ParkingLot                       active    Fa0/3, Fa0/4, Fa0/7, Fa0/8
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                Fa0/17, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24, Gi0/1
                                                Gi0/2
69   Remote_Manage                    active
99   IT                               active    Fa0/18
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
9    enet  100009     1500  -      -      -        -    -        0      0

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
10   enet  100010     1500  -      -      -        -    -        0      0
52   enet  100052     1500  -      -      -        -    -        0      0
69   enet  100069     1500  -      -      -        -    -        0      0
99   enet  100099     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

Remote SPAN VLANs
------------------------------------------------------------------------------


Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
```

Ports 6 and 18 are set to their own vlan with every other port being on vlan 52 for security reasons. Port 1,2 and 5 aren't on the show vlan as they are used for trunking, 1 and 2 for connection between switches and 5 for the connection to the London router.

Show interface trunk:

```
Port        Mode             Encapsulation  Status        Native vlan
Fa0/5       on               802.1q         trunking      9
Po1         on               802.1q         trunking      9

Port        Vlans allowed on trunk
Fa0/5       9-10,69,99
Po1         9-10,69,99

Port        Vlans allowed and active in management domain
Fa0/5       9-10,69,99
Po1         9-10,69,99

Port        Vlans in spanning tree forwarding state and not pruned
Fa0/5       9-10,69,99
Po1         9-10,69,99
```

This section shows the trunking ports used in the network with the vlans allowed on the trunk, being all vlans. ‘po1’ is the ether channel trunking which is ports 1 and 2 which allows for data to be sent across 2 ports instead of just 1. This would mean that data can share bandwidth across two ports, helping in load balancing and redundancy.

Spanning tree isn't used as loops won't happen with the use of ether channel.
Encapsulation 802.1q has been used as a part of inter-VLAN routing and the router on a stick method to encapsulate packets traveling over VLANs and enable communication between devices on different VLANs.

Show port security:

```
Secure Port  MaxSecureAddr  CurrentAddr  SecurityViolation  Security Action
                (Count)       (Count)          (Count)
-----------------------------------------------------------------------------
      Fa0/6              1            1                  0         Shutdown
     Fa0/18              1            1                  0         Shutdown
-----------------------------------------------------------------------------
Total Addresses in System (excluding one mac per port)     : 0
Max Addresses limit in System (excluding one mac per port) : 8192
```

This section shows which ports have implemented port security onto them. This shows how many addresses should be on the port, being 1 in this case. It also shows how many addresses are on the port which is 1. there shouldn't be more than one current address on the port as only a maximum of 1 has been configured. It also shows how many violations have occurred on the ports. The ports have been set to shut down so if any new host with a different MAC connects to that port, it will then shut the port down as a security measure.

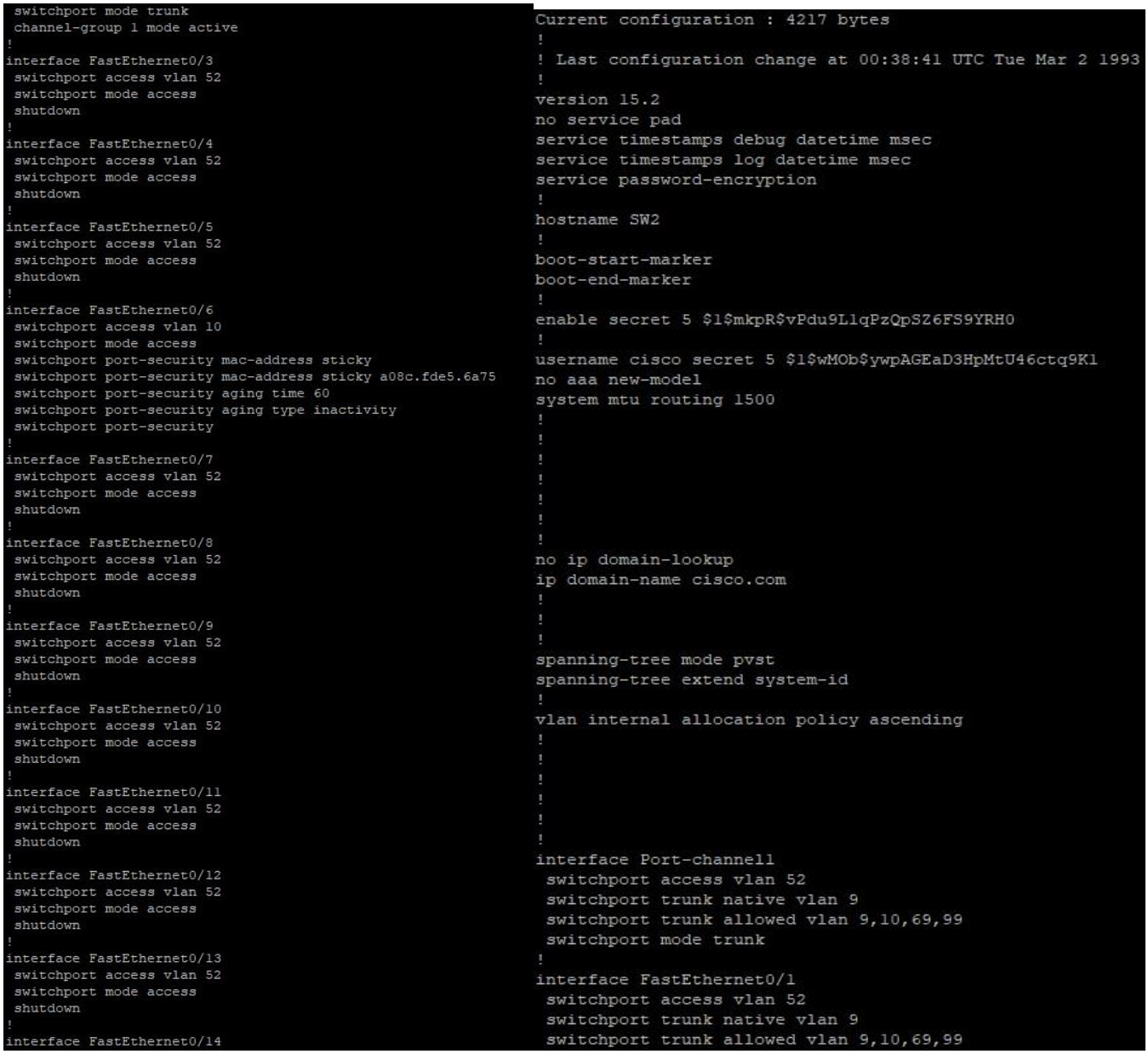
Show cdp neighbours:

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
                  D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID        Local Intrfce     Holdtme    Capability  Platform  Port ID
SW2.cisco.com    Fas 0/1           167              S I   WS-C2960+ Fas 0/1
SW2.cisco.com    Fas 0/2           140              S I   WS-C2960+ Fas 0/2
LON.cisco.com    Fas 0/5           124            R B S I CISCO2911 Gig 0/1

Total cdp entries displayed : 3
```

CDP configurations show which devices the switch is connected to, in this config we can see that switch 1 is connected to both switch 2 and LDN router.

Switch 2

Running config



```
 switchport mode trunk
 channel-group 1 mode active
!
interface FastEthernet0/3
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/4
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/5
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/6
 switchport access vlan 10
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky a08c.fde5.6a75
 switchport port-security aging time 60
 switchport port-security aging type inactivity
 switchport port-security
!
interface FastEthernet0/7
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/8
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/9
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/10
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/11
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/12
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/13
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/14
```

```
Current configuration : 4217 bytes
!
! Last configuration change at 00:38:41 UTC Tue Mar 2 1993
!
version 15.2
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname SW2
!
boot-start-marker
boot-end-marker
!
enable secret 5 $1$mkpR$vPdu9L1qPzQpSZ6FS9YRH0
!
username cisco secret 5 $1$wMOb$ywpAGEaD3HpMtU46ctq9K1
no aaa new-model
system mtu routing 1500
!
!
!
!
!
!
!
no ip domain-lookup
ip domain-name cisco.com
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending
!
!
!
!
!
!
interface Port-channel1
 switchport access vlan 52
 switchport trunk native vlan 9
 switchport trunk allowed vlan 9,10,69,99
 switchport mode trunk
!
interface FastEthernet0/1
 switchport access vlan 52
 switchport trunk native vlan 9
 switchport trunk allowed vlan 9,10,69,99
```

This part of the running configuration shows the addition of passwords and the encryption of those passwords to ensure the security of our terminal lines.

Next, we implement VLAN 52 which we've named 'Parking Lot', The parking lot is used to group up the unused ports, this makes the process of securing these unused ports easier.

For switch 2 we have configured ports 1 and 2 to trunk ports to allow data from multiple VLANs to pass through helping with inter-VLAN communication.

VLAN 9 has been specified as the 'Native' VLAN. This configuration is to ensure that any untagged traffic doesn't interfere with the defined VLANs.

The VLANs allowed across these trunk ports are the Native VLAN 9 the Production VLAN 10 the remote management VLAN 69 and the IT department VLAN 99.

```
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/15
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/16
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/17
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/18
 switchport access vlan 99
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky a08c.fde2.f506
 switchport port-security aging time 60
 switchport port-security aging type inactivity
 switchport port-security
!
interface FastEthernet0/19
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/20
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/21
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/22
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/23
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface FastEthernet0/24
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface GigabitEthernet0/1
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface GigabitEthernet0/2
 switchport access vlan 52
 switchport mode access
 shutdown
!
interface Vlan1
```

```
!
interface Vlan10
 ip address 172.20.0.3 255.255.254.0
!
interface Vlan69
 ip address 172.20.2.67 255.255.255.254
!
interface Vlan99
 ip address 172.20.2.3 255.255.255.192
!
ip default-gateway 172.20.2.65
ip http server
ip http secure-server
ip ssh version 2
!
no vstack
banner motd ^C
Authorised Access Only! ^C
!
line con 0
 password 7 02050D480809
 logging synchronous
 login
line vty 0 4
 password 7 14141B180F0B
 logging synchronous
 login local
 transport input ssh
line vty 5 15
 password 7 14141B180F0B
 logging synchronous
 login
!
end
```

In this section of the running configuration, the banner of the day is defined as “Authorised Access Only! ‘line

con 0’ is used to access the terminal through the console connection

Line vty 0 4 has ssh enabled and both vty 0 4 and 5 15 have encrypted passwords, also they have logging synchronous which prevents log messages from interfering with command inputs.

Additionally, telnet is disabled on both terminal lines for security purposes.

Ports 6 and 18 are the only host ports as per the topology brief, switch 2 only has 2 devices connected to it.

Port 6 is on production VLAN (VLAN 10) and Port 18 is on IT VLAN (VLAN 99). Both ports have port security enabled

IP interface

```
SW2#show ip int brief
Interface              IP-Address      OK? Method Status                Protocol
Vlan1                  unassigned      YES unset  up                    down
Vlan10                 172.20.0.3      YES manual up                    up
Vlan69                 172.20.2.67     YES manual up                    up
Vlan99                 172.20.2.3      YES manual up                    up
FastEthernet0/1        unassigned      YES unset  up                    up
FastEthernet0/2        unassigned      YES unset  up                    up
FastEthernet0/3        unassigned      YES unset  administratively down down
FastEthernet0/4        unassigned      YES unset  administratively down down
FastEthernet0/5        unassigned      YES unset  administratively down down
FastEthernet0/6        unassigned      YES unset  down                  down
FastEthernet0/7        unassigned      YES unset  administratively down down
FastEthernet0/8        unassigned      YES unset  administratively down down
FastEthernet0/9        unassigned      YES unset  administratively down down
FastEthernet0/10       unassigned      YES unset  administratively down down
FastEthernet0/11       unassigned      YES unset  administratively down down
FastEthernet0/12       unassigned      YES unset  administratively down down
FastEthernet0/13       unassigned      YES unset  administratively down down
FastEthernet0/14       unassigned      YES unset  administratively down down
FastEthernet0/15       unassigned      YES unset  administratively down down
FastEthernet0/16       unassigned      YES unset  administratively down down
FastEthernet0/17       unassigned      YES unset  administratively down down
FastEthernet0/18       unassigned      YES unset  down                  down
FastEthernet0/19       unassigned      YES unset  administratively down down
FastEthernet0/20       unassigned      YES unset  administratively down down
FastEthernet0/21       unassigned      YES unset  administratively down down
FastEthernet0/22       unassigned      YES unset  administratively down down
FastEthernet0/23       unassigned      YES unset  administratively down down
FastEthernet0/24       unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  administratively down down
GigabitEthernet0/2     unassigned      YES unset  administratively down down
Port-channel1          unassigned      YES unset  up                    up
```

This is the IP interface brief which shows assigned IP addresses to VLANs, and which ports are up and down

NOTE: port 6 and 18 are down in this picture as we disconeccted the PCs to take these screenshots and add them to our group document

VLANS

```
VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active
9    Native                            active
10   Production                        active    Fa0/6
52   ParkingLot                        active    Fa0/3, Fa0/4, Fa0/5, Fa0/7
                                                 Fa0/8, Fa0/9, Fa0/10, Fa0/11
                                                 Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                                 Fa0/16, Fa0/17, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                 Gi0/1, Gi0/2
69   Remote_Access                     active
99   IT                                active    Fa0/18
1002 fddi-default                      act/unsup
1003 token-ring-default                act/unsup
1004 fddinet-default                   act/unsup
1005 trnet-default                     act/unsup

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
9    enet  100009     1500  -      -      -        -    -        0      0

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
10   enet  100010     1500  -      -      -        -    -        0      0
52   enet  100052     1500  -      -      -        -    -        0      0
69   enet  100069     1500  -      -      -        -    -        0      0
99   enet  100099     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

Remote SPAN VLANs
------------------------------------------------------------------------------


Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
```

This screenshot identifies the VLANs setup.

VLAN 9 is the Native VLAN and is used to ensure that any untagged traffic doesn't interfere with the defined VLANs.

VLAN 10 is the Production VLAN as defined in the assignment brief, it has port 6 assigned to it.

VLAN 52 is the parking lot, as stated before this holds the unused ports that have been shut down for security reasons

VLAN 69 is the Remote_Access VLAN which helps with the use to remotely manage the switches using SSH VLAN

99 is the IT department VLAN as defined in the assignment breif, it has port 18 assigned to it.

Trunk interface

```
SW2#show int trunk

Port        Mode             Encapsulation  Status        Native vlan
Po1         on               802.1q         trunking      9

Port        Vlans allowed on trunk
Po1         9-10,69,99

Port        Vlans allowed and active in management domain
Po1         9-10,69,99

Port        Vlans in spanning tree forwarding state and not pruned
Po1         9-10,69,99
```

In the trunk configurations we can see that all VLANs use trunking which allow traffic to be sent throughout the network.

We have chosen not to implement spanning tree as there is no need as loops should not occur with Ether channel enabled.

Encapsulation 802.1q has been used as a part of inter-VLAN routing and the router on a stick method to encapsulate packets traveling over VLANs and enable communication between devices on different VLANs.

Port Security

```
SW2# show port-security
Secure Port  MaxSecureAddr  CurrentAddr  SecurityViolation  Security Action
               (Count)       (Count)          (Count)
-----------------------------------------------------------------------------
      Fa0/6             1            1                  0         Shutdown
     Fa0/18             1            1                  0         Shutdown
-----------------------------------------------------------------------------
Total Addresses in System (excluding one mac per port)     : 0
Max Addresses limit in System (excluding one mac per port) : 8192
```

Port security has been setup to shut down if it has been violated, when a device with a different mac address connects to the port, it will automatically shut down.

CDP Neighbours

```
SW2# show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
                  D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID        Local Intrfce     Holdtme    Capability  Platform  Port ID
SW1.cisco.com    Fas 0/2           143              S I   WS-C2960+ Fas 0/2
SW1.cisco.com    Fas 0/1           171              S I   WS-C2960+ Fas 0/1

Total cdp entries displayed : 2
```

CDP configurations show which devices the switch is connected to, in this config we can see that switch 2 is only connected to switch 1.

Configuration Commands

Router Configuration

LON Router:

Erase all previous configurations:

erase startup-config reload

Basic Configuration:

Router>enable
Router#configure terminal
Router(config)#hostname LON
LON(config)#no ip domain lookup
LON(config)#enable secret class
LON(config)#line console 0
LON(config-line)#password cisco
LON(config-line)#login
LON(config-line)#logging synchronous
LON(config-line)#exit
LON(config)#line vty 0 4
LON(config-line)#password cisco
LON(config-line)#login
LON(config-line)#logging synchronous
LON(config-line)#transport input telnet
LON(config-line)#exit
LON(config)#banner motd #Authorized Access Only!#
LON(config)#service password-encryption
LON(config)#end

Configure Interfaces

LON#configure terminal
LON(config)#interface Serial0/0 /0
LON(config-if)#ip address 192.168.1.1 255.255.255.252
LON(config-if)#clock rate 2000000
LON(config-if)#no shutdown
LON(config)#end **NOTE: The clock rate should be set to 2 million.**

Configuring the Sub-Interfaces

LON#configure terminal
LON(config)#interface g0/1.10
LON(config-subif)#Description Default Gateway for vlan 10
LON(config-subif)#encapsulation dot1q 10
LON(config-subif)#ip address 172.20.0.1 255.255.254.0
LON(config-subif)#exit

LON(config)#interface g0/1.99
LON(config-subif)#Description Default Gateway for vlan 99

```
LON(config-subif)#encapsulation dot1q 99
LON(config-subif)#ip address 172.20.2.1 255.255.255.192
LON(config-subif)#exit

LON(config)#interface g0/1.69
LON(config-subif)#Description Default Gateway for vlan69
LON(config-subif)#encapsulation dot1q 69
LON(config-subif)#ip address 172.20.2.65 255.255.255.248
LON(config-subif)#exit

LON(config)#interface g0/1
LON(config-if)#description Trunk Link to SW1
LON(config-if)#no shutdown
LON(config-if)#end
```

IP Static Routing

```
LON#configure terminal
LON(config)#ip route 210.1.1.0 255.255.255.0 192.168.1.2 LON(config)#ip
route 0.0.0.0 0.0.0.0 192.168.1.2-
```

BRI Router:

Erase all previous configurations:

```
erase startup-config
reload
```

Basic Configuration:

```
Router>enable
Router#configure terminal
Router(config)#hostname BRI
BRI(config)#no ip domain lookup
BRI(config)#enable secret class
BRI(config)#line console 0
BRI(config-line)#password cisco
BRI(config-line)#login
BRI(config-line)#logging synchronous
BRI(config-line)#exit
BRI(config)#line vty 0 4
BRI(config-line)#password cisco
BRI(config-line)#login
BRI(config-line)#logging synchronous
BRI(config-line)#transport input telnet
BRI(config-line)#exit
BRI(config)#banner motd #Authorized Access Only!#
BRI(config)#service password-encryption
BRI(config)#end
```

Configure Interfaces

```
BRI(config)#interface Serial0/0 /0
BRI (config-if)#ip address 192.168.1.2 255.255.255.252
BRI(config-if)#clock rate 2000000
BRI(config-if)#no shutdown

BRI(config)#interface g0/1
BRI(config-if)#ip address 210.1.1.2 255.255.255.0
BRI(config-if)#no shutdown
```

IP Static Routing

```
BRI#configure terminal
BRI(config)#ip route 172.20.0.0 255.255.254.0 192.168.1.1
BRI(config)#ip route 172.20.2.0 255.255.255.192 192.168.1.1
BRI(config)#ip route 172.20.2.0 255.255.255.192 172.20.2.1
```

Switch Configuration:

Switch 1:

Erase all previous configurations:

```
erase startup-config  delete
flash:vlan.dat  reload
```

Basic Configuration:

```
switch>enable  switch#configure
terminal  switch(config)#no ip
domain lookup
switch(config)#hostname SW1
SW1(config)#enable secret class
SW1(config)#service password-encryption
SW1(config)#banner motd #Authorized Access Only#
SW1(config)#line console 0
SW1(config-line)#password cisco
SW1(config-line)#login
SW1(config-line)#logging synchronous
SW1(config-line)#exit
SW1(config)#line vty 0 15
SW1(config-line)#password cisco
SW1(config-line)#login
SW1(config-line)#logging synchronous
SW1(config-line)#end
```

Creating vlan 52 (parking lot):

```
SW1(config)#vlan 52
SW1(config-vlan)#name ParkingLot
SW1(config-vlan)#exit
NOTE: do a show vlan to see the ports in vlan 1 in order to switch to vlan 52
SW1(config)#int range  f0/1-24,g0/1-2
SW1(config-if-range)#switchport mode access
SW1(config-if-range)#switchport access vlan 52
SW1(config-if-range)#shutdown
SW1(config-if-range)#exit
```

Create Vlans:

```
SW1(config)#vlan 10
SW1(config-vlan)#name Production
SW1(config-vlan)#exit
SW1(config)#interface vlan 10
SW1(config-if)#ip address 172.20.0.2 255.255.254.0
SW1(config-if)#exit
SW1(config)#vlan 99
SW1(config-vlan)#name IT
SW1(config-vlan)#exit
SW1(config)#interface vlan 99
SW1(config-if)#ip address 172.20.2.2 255.255.255.192
SW1(config-if)#exit
SW1(config)#vlan 69
SW1(config)#name Remote_Manage
SW1(config)#exit
SW1(config)#interface vlan 69
SW1(config)#ip address 172.20.2.66 255.255.255.248
SW1(config)#exit
SW1(config)#vlan 9
SW1(config-vlan)#name Native
SW1(config-vlan)#exit
```

Move the ports to the vlans:

```
SW1(config)#interface f0/6
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 10
SW1(config-if)#No shut
SW1(config-if)#exit

SW1(config)#interface f0/18
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 99
SW1(config-if)#No shut
```

```
SW1(config-if)#end
```

Enable trunking:

```
SW1(config)#interface range f0/1-2
SW1(config-if-range)#switchport mode trunk
SW1(config-if-range)#switchport nonegotiate
SW1(config-if-range)#switchport trunk allowed vlan 9,10,69,99
SW1(config-if-range)#switchport trunk native vlan 9
SW1(config-if-range)#no shut
SW1(config-if-range)#end
```

```
SW1(config)#interface f0/5
SW1(config-if)#switchport mode trunk
SW1(config-if)#switchport nonegotiate
SW1(config-if)#switchport trunk allowed vlan 9,10,69,99
SW1(config-if)#switchport trunk native vlan 9
SW1(config-if)#no shut
SW1(config-if)#end
```

Enable EtherChannel:

```
SW1(config)#interface range f0/1-2
SW1(config-if-range)#channel-group 1 mode active
SW1(config-if-range)#exit
```

Switch 2:

Erase all previous configurations:

```
erase startup-config  delete
flash:vlan.dat  reload
```

Basic Configuration:

```
switch>enable  switch#configure
terminal  switch(config)#no ip
domain lookup
switch(config)#hostname SW2
SW2(config)#enable secret class
SW2(config)#service password-encryption
SW2(config)#banner motd #Authorized Access Only. #
SW2(config)#line console 0
SW2(config-line)#password cisco
SW2(config-line)#login
SW2(config-line)#logging synchronous
SW2(config-line)#exit
```

```
SW2(config)#line vty 0 15
SW2(config-line)#password cisco
SW2(config-line)#login
SW2(config-line)#logging synchronous
SW2(config-line)#end
```

VLAN 52 (Parking Lot):

```
SW2(config)#vlan 52
SW2(config-vlan)#name ParkingLot
SW2(config-vlan)#exit
NOTE: do a show vlan to see the ports in vlan 1 in order to switch to vlan 52
SW2(config)#int range f0/1-24,g0/1-2
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#switchport access vlan 52
SW2(config-if-range)#shutdown
SW2(config-if-range)#exit
```

Create Vlans:

```
SW2(config)#vlan 10
SW2(config-vlan)#name Production
SW2(config-vlan)#exit
SW2(config)#interface vlan 10
SW2(config-if)#ip address 172.20.0.3 255.255.254.0
SW2(config-if)#exit

SW2(config)#vlan 99
SW2(config-vlan)#name IT
SW2(config-vlan)#exit
SW2(config)#interface vlan 99
SW2(config-if)#ip address 172.20.2.3 255.255.255.192
SW2(config-if)#exit
SW2(config)#vlan 69
SW2(config)#name Remote_Manage
SW2(config)#exit
SW2(config)#interface vlan 69
SW2(config)#ip address 172.20.2.67 255.255.255.248
SW2(config)#exit


SW2(config)#vlan 9
SW2(config-vlan)#name Native
SW2(config-vlan)#exit
```

Move the ports to the vlans:

```
SW2(config)#interface f0/6
SW2(config-if)#switchport mode access
SW2(config-if)#switchport access vlan 10
```

SW2(config-if)#No shut
SW2(config-if)#exit

SW2(config)#interface f0/18
SW2(config-if)#switchport mode access
SW2(config-if)#switchport access vlan 99
SW2(config-if)#No shut
SW2(config-if)#end

Enable trunking:

SW2(config)#interface range f0/1-2
SW2(config-if-range)#switchport mode trunk
SW2(config-if-range)#switchport nonegotiate
SW2(config-if-range)#switchport trunk allowed vlan 9,10,69,99
SW2(config-if-range)#switchport trunk native vlan 9
SW2(config-if-range)#no shut
SW2(config-if-range)#end

Enable EtherChannel:

SW2(config)#interface range f0/1-2
SW2(config-if-range)#channel-group 1 mode active
SW2(config-if-range)#end

Troubleshooting ether channel
SW2(config)# interface port channel 1

Port security

SW1&2

SW1&2: int range fa0/6, fa0/18

SW1&2: switchport port-security

SW1&2: switchport port-security maximum 1

SW1&2: switchport port-security mac-address sticky

SW1&2: switchport port-security violation shutdown

SW1&2: switchport port-security aging time 60

SW1&2: switchport port-security aging type inactivity

Port Shutdown
After demonstrating port shutdown Do

as follows:

SW1

SW1: int range fa0/16, fa0/18
SW1: shutdown

SW1: no shutdown

SW2

SW2: int range fa0/16, fa0/18

SW2: shutdown

SW2: no shutdown

All Devices

SSH

(config)# ip domain-name cisco.com

(config)# crypto key generate rsa general-keys modulus 2048

(config)# username cisco secret class

(config)# ip ssh version 2

(config) ip ssh time-out 60

(config)# line vty 0 4

(config-line)# transport input ssh

(config-line)# login local

SSH Connection Command

ssh-l cisco (*Insert ip address*)

BRI Router CDP Shutdown

BRI(config)#no cdp run