

2118459

by Cerys Joseph

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Good substantial list of figures

Element 1

Research

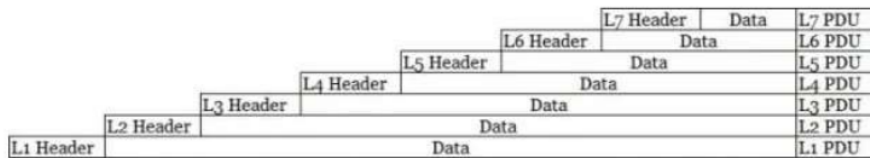
The term encapsulation is the process of adding headers and trailers around some of the data of a system. This process is explained by a four-layer TCP/IP model, with each of the step describing the role of the layer. In each packet, which includes a header and encapsulated data, is defined by each layer having a certain name.

The first layer is a frame, this can have both a header and a trailer. A frame has encapsulated data which is defined by the Network Access layer.

The next layer is a packet, this contains a header source and a destination IP address. A packet has capsulated which is defined by the Network layer.

The final layer is a segment, the source information and destination ports or sequence and acknowledgment numbers are included in the header. The segment has encapsulated data which is defined by the Transport layer. (Study CCNA, N/A) [Correct citation](#)

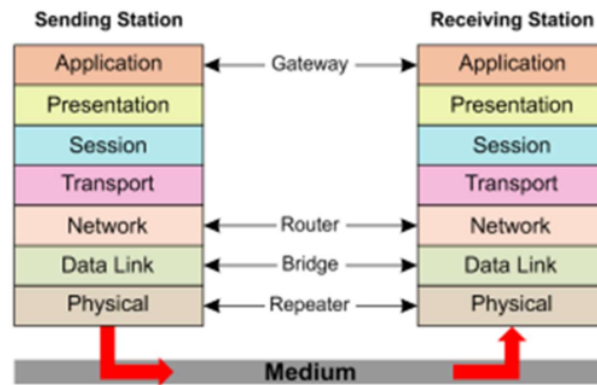
When a TCP/IP uses terms like segment, packet, and frame, which refers to a data packet defined by a particular layer. An OSI model has 7 layers and the PDUs are numbered 1 to 7 with the first layer being the physical layer. (Study CCNA, N/A)



Good supporting diagram

Figure 1 1 to 7 layers (Study CCNA, N/A)

The 7 layers can also be seen here showing each layer providing a unique service. The communication between two stations will begin at the application layer with the sending station initiating a message to a receiving station with a common medium. (Contemporary Control Systems Inc, 2011) [Correct citation](#)

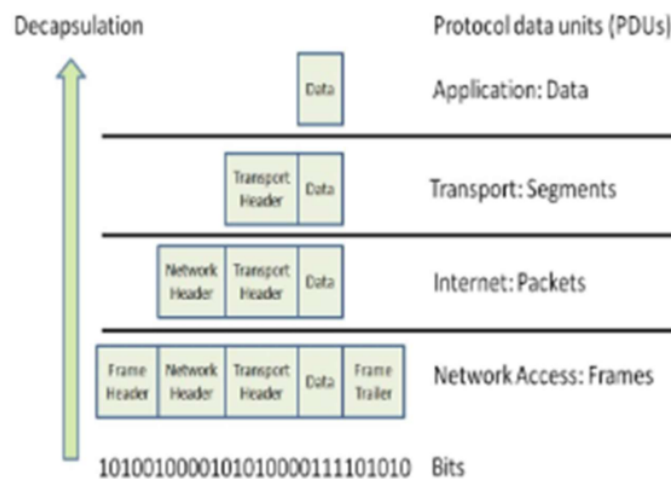


OSI 7 layer model is identified in the diagram.

Correct citation

Figure 2 1 to 7 layers (Contemporary Control Systems Inc, 2011)

Decapsulation is a process of opening up the encapsulation these are usually sent in the form of a packets over a communication network.



Good supporting diagram

Encapsulation and decapsulation is explained, but should not be mixed with the 7 and 4 layer models.

Figure 3 Decapsulation (Study CCNA, N/A)

Encapsulation and decapsulation are explained

The receive side and headers are taken off as the data goes through. The packet is the data with a header containing the source and a destination IP address. (Study CCNA, N/A)

There should be a heading here

The broadcasting is used to send information to a larger number of devices which are connected over the same network (LAN) or across multiple networks, however this depends on their type of broadcast. When a broadcast is performed across the LAN it is like a handshake function to access all the available IP and MAC addresses using ARP protocol. A unicast is when one sender and one receiver and a multicast is to send and receive but multiple devices over the networks. (G., 2009)Correct citation

Good point here

A problem with broadcasting is the volume of the broadcast can severely impact on a network performance. The answer is reduced in size of a broadcast domain, and the broadcast domain is a set of hosts which see each other's broadcast on the network. (G., 2009) *This is a good point*

There should be a heading here

The port number range is from 0 to 65535, however only port numbers 0 to 1023 are reserved for privileged services and for designated for known ports. The list of the known ports are used by server process as its contact port. The sending and receiving ports do not have to be the same for the transmission, the known port numbers will be HTTP port 80, FTP port 20 and DNS port 53. In computer networking, a port is where the communication point ends. Whereas for software level a port is for a logical construct which identifies as a specific process or a type of network service. There is a control port where the transmission is received on a particular switch, the source of the MAC address is stored in the database of the switch. (Contemporary Control Systems Inc, 2011)*Correct citation*

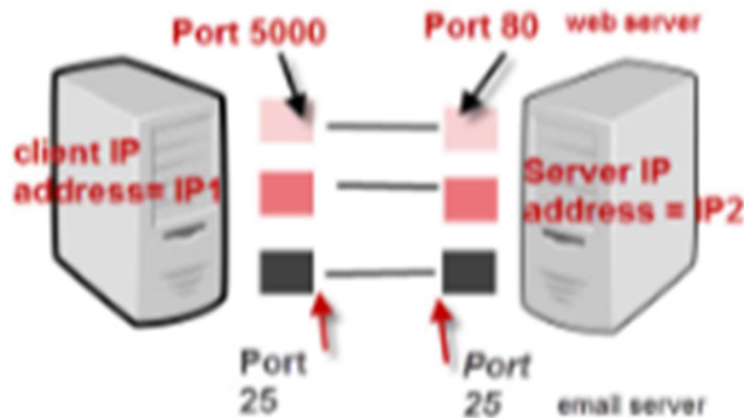


Figure 4 Explaining Ports (Contemporary Control Systems Inc, 2011)

The key points of the broadcasting are the data is sent to the nodes or the stations that are in the network domain. A special broadcast address will exist for every network that are used to receive a broadcast message. Not every device in the network will want to receive the broadcasted message, this generates network traffic because the broadcasted message is sent to each node in the network.

The advantage of broadcasting is the ease of communication through the network without establishing a point-to-point communication channel which saves times and process overhead. Trouble shooting can identify the corrupt resource or a potential security threat in a large network by any broadcasting message. Another advantage is reducing network traffic, unicast will send separate messages to each node whereas a multicast will send a message to every node in the network. The disadvantage of the broadcasting is a broadcast storm, this would cause a traffic if multiple messages were sent at the same time. A disadvantage of broadcasting is a limited control and security issue, and broadcasting can't support large number of devices on the network at the same time. (geeksforgeeks, 2023)

There's limited broadcasting, it's a simple broadcasting which means the message will be transmitted to every node in the same network, the broadcasting doesn't go beyond the local, network. Another limitation is directed broadcast this is when a message is sent to a specific group of network hosts, these hosts can be identified by their subnets. A subnet broadcast is used to create a smaller network in a large network which shares the common network address. A subnetting broadcast is when a message needs to be broadcasted to a specific subnet in the larger network. This sends the message to send the broadcast address of a specific subnet, the address of the subnet is the highest that the address can be. (geeksforgeeks, 2023)

Research has good significant points included, however, the content is disjointed and loses structure. Headings should be used for each separated research topic area.

Design Requirement

These below show the addresses for Class A, B & C.

Class C	
Net Address	192.168.4.0
Gateway Address	192.168.4.254
Initial Device Address	192.168.4.1

Class B	
Net Address	170.24.0.0
Gateway Address	170.24.0.254
Initial Device Address	170.24.0.1

Class A	
Net Address	104.0.0.0
Gateway Address	104.0.0.254
Initial Device Address	104.0.0.1

Router Addresses

Routers	
R0	10.0.0.1
R1	10.0.0.2 11.0.0.1
R2	11.0.0.2

Good address schema for the three different classes of networks

Implementation

The static routing using static addressing is shown below.

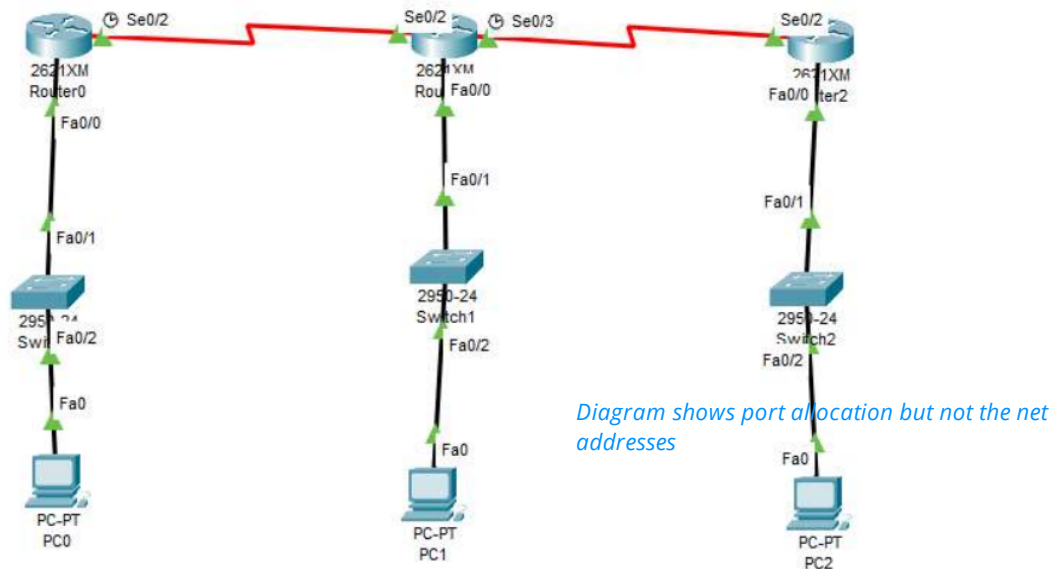


Figure 5 Static Routing

The static routing configuration for the three routers are shown in the screenshots below.

Network Address
104.0.0.0/8 via 10.0.0.2
170.24.0.0/16 via 10.0.0.2

Remove

Figure 6 Router 1 configuration

Network Address
192.168.4.0/24 via 10.0.0.1
170.24.0.0/16 via 11.0.0.2

Remove

Figure 7 Router 2 configuration

Network Address
104.0.0.0/8 via 11.0.0.1
192.168.4.0/24 via 11.0.0.1

Remove

Static routing tables are correct

Figure 8 Router 3 configuration

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC1	PC0	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC1	PC2	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC2	PC1	ICMP		0.000	N	3	(edit)	(delete)
	Successful	PC0	PC2	ICMP		0.000	N	4	(edit)	(delete)
	Successful	PC2	PC0	ICMP		0.000	N	5	(edit)	(delete)

Good set of test results

Figure 9 test configuration

The screenshot of the test shows the comms in both directions for all of the devices, it shows there are no failures. The test shows the ping commands in the packet tracer software that was used. The packet is transmitted from one of the devices to the other devices.

Good explanation

This needs a heading

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#do show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
        i - IS-IS, 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

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, Serial0/2
S    104.0.0.0/8 [1/0] via 10.0.0.2
S    170.24.0.0/16 [1/0] via 10.0.0.2
C    192.168.4.0/24 is directly connected, FastEthernet0/0

Router(config)#
```

Figure 10 Router 1

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#do show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
        i - IS-IS, 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

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, Serial0/2
C    11.0.0.0/8 is directly connected, Serial0/3
C    104.0.0.0/8 is directly connected, FastEthernet0/0
S    170.24.0.0/16 [1/0] via 11.0.0.2
S    192.168.4.0/24 [1/0] via 10.0.0.1

Router(config)#
```

Figure 11 Router 2

```
Router> en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#do show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
        i - IS-IS, 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

Gateway of last resort is not set

C    11.0.0.0/8 is directly connected, Serial0/2
S    104.0.0.0/8 [1/0] via 11.0.0.1
C    170.24.0.0/16 is directly connected, FastEthernet0/0
S    192.168.4.0/24 [1/0] via 11.0.0.1

Router(config)#
```

Figure 12 Router 3

Good evidence but needs a heading

Implementation

In the screenshots below, it shows the configuration of dynamic routing using Routing Information Protocol, also known as the RIP.

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#no ip route 170.24.0.0 255.255.0.0 10.0.0.2
Router(config)#no ip route 104.0.0.0 255.0.0.0 10.0.0.2
Router(config)#
Router(config)#router rip
Router(config-router)#ver 2
Router(config-router)#net 192.168.4.0
Router(config-router)#net 10.0.0.0
Router(config-router)#net 104.0.0.0
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router# conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#ver 2
Router(config-router)#170.0.0.0
^
% Invalid input detected at '^' marker.

Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Good evidence of RIP

Figure 13 Router 1

```
Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial0/2
C 11.0.0.0/8 is directly connected, Serial0/3
C 104.0.0.0/8 is directly connected, FastEthernet0/0
S 170.24.0.0/16 [1/0] via 11.0.0.2
S 192.168.4.0/24 [1/0] via 10.0.0.1

Router(config)#
Router(config)#
Router(config)#no ip route 170.24.0.0 255.255.0.0 11.0.0.2
Router(config)#no ip route 192.168.4.0 255.255.255.0 10.0.0.1
Router(config)#
Router(config)#router rip
Router(config-router)#ver 2
Router(config-router)#net 104.0.0.0
Router(config-router)#net 10.0.0.0
Router(config-router)#net 11.0.0.0
Router(config-router)#net 170.24.0.0
Router(config-router)#net 192.168.4.0
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router# conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

Ctrl+F6 to exit CLI focus

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Figure 14 Router 2

```

R1 - OSPF Encapsulator type 1, R2 - OSPF Encapsulator type 2, R3 - R3
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
F - periodic downloaded static route

Gateway of last resort is not set

C 11.0.0.0/8 is directly connected, Serial0/2
S 104.0.0.0/8 [1/0] via 11.0.0.1
C 170.24.0.0/16 is directly connected, FastEthernet0/0
S 192.168.4.0/24 [1/0] via 11.0.0.1

Router(config)#
Router(config)#
Router(config)#no ip route 104.0.0.0 255.0.0.0 11.0.0.1
Router(config)#no ip route 192.168.4.0 255.255.255.0 11.0.0.1
Router(config)#router rip
Router(config-router)#ver 2
Router(config-router)#net 170.0.0.0
Router(config-router)#net 11.0.0.0
Router(config-router)#net 104.0.0.0
Router(config-router)#*2
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router# conf t
Enter configuration commands, one per line. End with CTRL/Z.
Router(config)#router rip
Router(config-router)#ver 2
Router(config-router)#net 170.24.0.0
Router(config-router)#*2
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#

```

Ctrl+F8 to exit CLI focus

Copy Paste

Figure 15 Router 3

The screenshots below show the RIP table for the three routers.

Routing Table for Router0

Type	Network	Port	Next Hop IP	Metric
C	10.0.0.0/8	Serial0/2	---	0/0
R	11.0.0.0/8	Serial0/2	10.0.0.2	120/1
R	104.0.0.0/8	Serial0/2	10.0.0.2	120/1
R	170.24.0.0/16	Serial0/2	10.0.0.2	120/2
C	192.168.4.0/24	FastEthernet0/0	---	0/0

Figure 16 Routing Table

Routing Table for Router1

Type	Network	Port	Next Hop IP	Metric
C	10.0.0.0/8	Serial0/2	---	0/0
C	11.0.0.0/8	Serial0/3	---	0/0
C	104.0.0.0/8	FastEthernet0/0	---	0/0
R	170.24.0.0/16	Serial0/3	11.0.0.2	120/1
R	192.168.4.0/24	Serial0/2	10.0.0.1	120/1

Figure 17 Routing Table

Type	Network	Port	Next Hop IP	Metric
R	10.0.0.0/8	Serial0/2	11.0.0.1	120/1
C	11.0.0.0/8	Serial0/2	---	0/0
R	104.0.0.0/8	Serial0/2	11.0.0.1	120/1
C	170.24.0.0/16	FastEthernet0/0	---	0/0
R	192.168.4.0/24	Serial0/2	11.0.0.1	120/2

RIP tables are correct

Figure 18 Routing Table

The screenshot below shows the testing of the RIP ping command, the tests show all the communications in both directions.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC1	PC0	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC1	PC2	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC2	PC1	ICMP		0.000	N	3	(edit)	(delete)
	Successful	PC0	PC2	ICMP		0.000	N	4	(edit)	(delete)
	Successful	PC2	PC0	ICMP		0.000	N	5	(edit)	(delete)

Figure 19 Testing Table

Good test for RIP routing

Task 5 – Implementation

Headings must be used to identify content

Router 1

The screenshot below the router 1 configuration as the control router, routers 2 and 3 are configured without the helper address for the dynamic addressing using DHCP.

```
Router(config)#ip dhcp pool net1
Router(dhcp-config)#net 192.168.4.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.4.254
Router(dhcp-config)#dns-server 192.168.4.254
Router(dhcp-config)#exit
Router(config)#
Router(config)#ip dhcp pool net2
Router(dhcp-config)#net 104.0.0.0 255.0.0.0
Router(dhcp-config)#default-router 104.0.0.254
Router(dhcp-config)#dns-server 104.0.0.254
Router(dhcp-config)#exit
Router(config)#
Router(config)#ip dhcp pool net3
Router(dhcp-config)#net 170.24.0.0 255.255.0.0
Router(dhcp-config)#default-router 170.24.0.254
Router(dhcp-config)#dns-server 170.24.0.254
Router(dhcp-config)#exit
Router(config)#
Router(config)#
```

Good evidence of DHCP

Ctrl+F6 to exit CLI focus

Copy

Paste

Figure 20 Router Configuration

IP Configuration	
☒ DHCP	☐ Static
IPv4 Address	192.168.4.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.4.254
DNS Server	192.168.4.254

Figure 21 PC 0

The address configuration for PC1 and PC2 has not been set so a default address has been set. This is because the router has been given a helper address to get across the network, this helper address is from the control router serial port (10.10.10.1).

Good explanation



IP Configuration

☒ DHCP ☐ Static

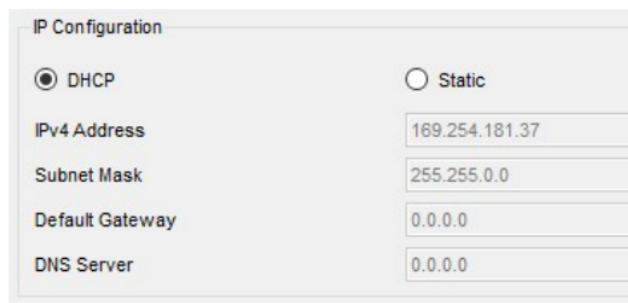
IPv4 Address: 169.254.86.49

Subnet Mask: 255.255.0.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Figure 22 PC 1



IP Configuration

☒ DHCP ☐ Static

IPv4 Address: 169.254.181.37

Subnet Mask: 255.255.0.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Errors are identified

Figure 23 PC 2

Configure of DHCP helper address for router 2 and router 3 for the cross-network comms

```
Router>
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#ip helper-address 10.0.0.1
Router(config-if)#exit
Router(config)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Figure 24 Router Configuration

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#in f0/0
Router(config-if)#ip helper-address 10.0.0.1
Router(config-if)#exit
Router(config)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Good evidence of helper address config

Figure 25 Router Configuration

The test dynamic addressing with the helper address configured in router 2 and router 3.

IP Configuration

☒ DHCP ☐ Static

IPv4 Address: 104.0.0.1

Subnet Mask: 255.0.0.0

Default Gateway: 104.0.0.254

DNS Server: 104.0.0.254

Figure 26 Device PC 1

Error has cleared

IP Configuration

☒ DHCP ☐ Static

IPv4 Address: 170.24.0.1

Subnet Mask: 255.255.0.0

Default Gateway: 170.24.0.254

DNS Server: 170.24.0.254

Figure 27 Device PC 2

The tests show that the devices PC 1 and PC 2 on both router 2 and router 3 are configured dynamically.

The address exclusion configuration using router 1 as the control device

```
Router>
Router#en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dhcp excluded-address 104.0.0.1 104.0.0.10
Router(config)#ip dhcp excluded-address 192.168.4.1 192.168.4.10
Router(config)#ip dhcp excluded-address 170.24.0.1 170.24.0.10
Router(config)#
Router(config)#
```

Good evidence

Ctrl+F6 to exit CLI focus

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Paste

Figure 28 Router 1

Test for excluded addresses

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IPv4 Address 192.168.4.11

Subnet Mask 255.255.255.0

Default Gateway 192.168.4.254

DNS Server 192.168.4.254

Figure 29 Device PC 0

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IPv4 Address 104.0.0.11

Subnet Mask 255.0.0.0

Default Gateway 104.0.0.254

DNS Server 104.0.0.254

Figure 30 Device PC 1

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IPv4 Address 170.24.0.11

Subnet Mask 255.255.0.0

Default Gateway 170.24.0.254

DNS Server 170.24.0.254

Figure 31 Device PC 2

Exclusions test is good. First 10 addresses are excluded.

Good explanation

The final test which will show the configuration of the routers

```
Router>en
Router#show run
Building configuration...

Current configuration : 1916 bytes
!
version 13.3
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
ip dhcp excluded-address 104.0.0.1 104.0.0.10
ip dhcp excluded-address 192.168.4.1 192.168.4.10
ip dhcp excluded-address 170.24.0.1 170.24.0.10
!
ip dhcp pool net1
network 192.168.4.0 255.255.255.0
default-router 192.168.4.254
dns-server 192.168.4.254
ip dhcp pool net2
network 104.0.0.0 255.0.0.0
default-router 104.0.0.254
dns-server 104.0.0.254
ip dhcp pool net3
network 170.24.0.0 255.255.0.0
default-router 170.24.0.254
dns-server 170.24.0.254
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
interface FastEthernet0/0
ip address 192.168.4.254 255.255.255.0
duplex auto
speed auto
shutdown
!
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0
no ip address
clock rate 2000000
shutdown
!
interface Serial0/1
no ip address
clock rate 2000000
shutdown
!
interface Serial0/2
ip address 10.0.0.1 255.0.0.0
clock rate 2000000
!
interface Serial0/3
no ip address
clock rate 2000000
shutdown
!
router rip
version 3
network 10.0.0.0
network 104.0.0.0
network 192.168.4.0
!
!
ip classless
!
!
ip flow-export version 5
!
!
!
!
!
!
line con 0
line aux 0
!
line vty 0 4
login
!
!
end
```

Figure 32 Router 1 running the configurations

```
interface Serial0/1
no ip address
clock rate 2000000
shutdown
!
interface Serial0/2
ip address 10.0.0.2 255.0.0.0
!
interface Serial0/3
ip address 11.0.0.1 255.0.0.0
clock rate 2000000
!
router rip
version 2
network 10.0.0.0
network 11.0.0.0
network 104.0.0.0
network 170.24.0.0
network 192.168.4.0
!
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
end
```

Figure 33 Router 2 running the configurations

```
ip address 170.24.0.254 255.255.0.0
ip helper-address 10.10.10.1
ip helper-address 10.0.0.1
duplex auto
speed auto
}
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
}
interface Serial0/0
no ip address
clock rate 2000000
shutdown
}
interface Serial0/1
no ip address
clock rate 2000000
shutdown
}
interface Serial0/2
ip address 11.0.0.2 255.0.0.0
}
interface Serial0/3
no ip address
clock rate 2000000
shutdown
}
router rip
version 2
network 11.0.0.0
network 104.0.0.0
network 170.0.0.0
network 170.24.0.0
}
ip classless
}
ip flow-swap version 9
}
}
}
}
line con 0
length 0
line aux 0
}
line vty 0 4
login
}
end
```

Figure 34 Router 3 running the configurations

London

Subnet Mask	1	1	1	1	0	0	0	0	255.255.255.240
	0	0	0	0	0	0	0	0	Not Used
Net Addr 16	0	0	0	1	0	0	0	1	Lowest Host Addr 17
Net Addr 16	0	0	0	1	0	0	0	0	Next Host Addr 18
Default Gateway	0	0	0	1	1	1	1	0	Fast Ethernet 0/0 addr 30
	0	0	0	1	1	1	1	1	Broadcast 31

Rome

Subnet Mask	1	1	1	1	0	0	0	0	255.255.255.240
	0	0	0	0	0	0	0	0	Not Used
Net Addr 32	0	0	0	1	0	0	0	1	Lowest Host Addr 33
Net Addr 32	0	0	0	1	0	0	0	0	Next Host Addr 34
Default Gateway	0	0	0	1	1	1	1	0	Fast Ethernet 0/0 addr 46
	0	0	0	1	1	1	1	1	Broadcast 47

Paris

Subnet Mask	1	1	1	1	0	0	0	0	255.255.255.240
	0	0	0	0	0	0	0	0	Not Used
Net Addr 48	0	0	0	1	0	0	0	1	Lowest Host Addr 49
Net Addr 48	0	0	0	1	0	0	0	0	Next Host Addr 50
Default Gateway	0	0	0	1	1	1	1	0	Fast Ethernet 0/0 addr 62
	0	0	0	1	1	1	1	1	Broadcast 63

WAN Networks 4, 5 and 6

London to Rome

London	0	1	0	0	1	1	0	1	Serial 0/0 Addr 77
Rome	0	1	0	0	1	1	1	0	Serial 0/1 Addr 78

Rome to Paris

Paris	0	1	0	1	1	1	0	1	Serial 0/0 Addr 93
Rome	0	1	0	1	1	1	1	0	Serial 0/1 Addr 94

Paris to London

Paris	0	1	1	0	1	1	0	1	Serial 0/0 Addr 109
London	0	1	1	0	1	1	1	0	Serial 0/1 Addr 110

Address schedule for /28 is correct

CIDR/27

CIDR/27 Networks 1, 2 and 3

Subnet mask	1	1	1	0	0	0	0	0	255.255.255.224
	0	0	0	0	0	0	0	0	Not used
Net addr 32	0	0	1	0	0	0	0	1	Lowest host addr 33 Rome 1
Net addr 32	0	0	1	0	0	0	1	0	Next host addr 34 Rome 2
Net addr 32	0	0	1	1	1	1	1	0	Highest Router addr 62 Rome Router
Net addr 64	0	1	0	0	0	0	0	1	Lowest host addr 65 London 1
Net addr 64	0	1	0	0	0	0	1	0	Next host addr 66 London 2
Net addr 64	0	1	0	1	1	1	1	0	Highest Router addr 94 London Router
Net addr 96	0	1	1	0	0	0	0	1	Lowest host addr 97 Paris 1
Net addr 96	0	1	1	0	0	0	1	0	Next host addr 98 Paris 2
Net addr 96	0	1	1	1	1	1	1	0	Highest Router addr 126 London Router

Address schedule for CIDR /27 is correct

CIDR/30 Networks 4, 5 and 6

Subnet mask	1	1	1	1	1	1	0	0	255.255.255.252
	0	0	0	0	0	0	0	0	Not used
Net addr 4	0	0	0	0	0	1	0	1	Lowest interface addr 5 Rome serial 0/0
Net addr 4	0	0	0	0	0	1	1	0	Highest interface addr 6 Paris serial 0/0
Net addr 8	0	0	0	0	1	0	0	1	Lowest interface addr 9 Rome serial 0/1
Net addr 8	0	0	0	0	1	0	1	0	Highest interface addr 10 London serial 0/0
Net addr 12	0	0	0	0	1	1	0	1	Lowest interface addr 13 London serial 0/1
Net addr 12	0	0	0	0	1	1	1	0	Highest interface addr 14 Paris serial 0/1

Address schedule for CIDR /30 is correct

These tables above show the address required for the subnetting. The subnetting will be run alongside each other in the circuit, unlike the CIDR/28, CIDR/27, and CIDR/30 as they don't. From the subnet mask the type of CIDR can be found, for example CIDR/27 is found by the subnet 255.255.255.224, whereas CIDR/28 is found by 255.255.255.240 and CIDR/30 is found by 255.255.255.252. These marks are shown below in the table. [This is not clear here.](#)

CIDR/28 Subnetting

The CIDR/28 is used for the RIP version 2 configuration, this is entered through the router CLI.

```
London>en
London#conf t
Enter configuration commands, one per line. End with CNTL/Z.
London(config)#router rip
London(config-router)#ver 2
London(config-router)#net 192.168.4.16
London(config-router)#net 192.168.4.64
London(config-router)#net 192.168.4.96
London(config-router)#exit
London(config)#
London(config)#end
London#
%SYS-5-CONFIG_I: Configured from console by console
```

Figure 36 CIDR/28 Configuration

```
Paris>en
Paris#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Paris(config)#router rip
Paris(config-router)#ver 2
Paris(config-router)#net 192.168.4.48
Paris(config-router)#net 192.168.4.96
Paris(config-router)#net 192.168.4.80
Paris(config-router)#exit
Paris(config)#
```

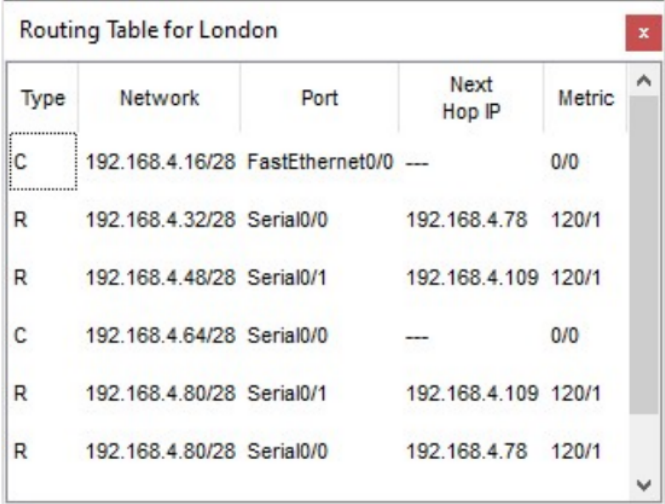
Figure 37 CIDR/28 Configuration

```
Rome>en
Rome#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Rome(config)#router rip
Rome(config-router)#ver 2
Rome(config-router)#net 192.168.4.32
Rome(config-router)#net 192.168.4.64
Rome(config-router)#net 192.168.4.80
Rome(config-router)#exit
Rome(config)#
Rome(config)#
```

Good evidence for /28 configuration

Figure 38 CIDR/28 Configuration

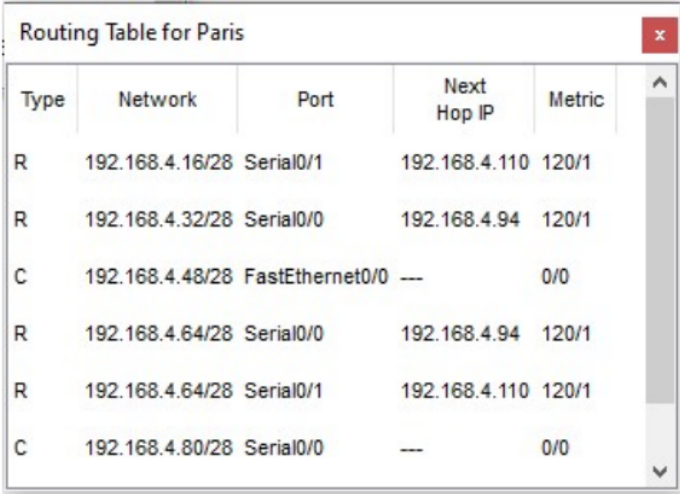
RIP Routing



A screenshot of a network configuration window titled "Routing Table for London". It contains a table with 5 columns: Type, Network, Port, Next Hop IP, and Metric. The first row is highlighted with a dashed border.

Type	Network	Port	Next Hop IP	Metric
C	192.168.4.16/28	FastEthernet0/0	---	0/0
R	192.168.4.32/28	Serial0/0	192.168.4.78	120/1
R	192.168.4.48/28	Serial0/1	192.168.4.109	120/1
C	192.168.4.64/28	Serial0/0	---	0/0
R	192.168.4.80/28	Serial0/1	192.168.4.109	120/1
R	192.168.4.80/28	Serial0/0	192.168.4.78	120/1

Figure 39 London Routing Table



A screenshot of a network configuration window titled "Routing Table for Paris". It contains a table with 5 columns: Type, Network, Port, Next Hop IP, and Metric.

Type	Network	Port	Next Hop IP	Metric
R	192.168.4.16/28	Serial0/1	192.168.4.110	120/1
R	192.168.4.32/28	Serial0/0	192.168.4.94	120/1
C	192.168.4.48/28	FastEthernet0/0	---	0/0
R	192.168.4.64/28	Serial0/0	192.168.4.94	120/1
R	192.168.4.64/28	Serial0/1	192.168.4.110	120/1
C	192.168.4.80/28	Serial0/0	---	0/0

Figure 40 Paris Routing Table

Type	Network	Port	Next Hop IP	Metric
R	192.168.4.16/28	Serial0/0	192.168.4.77	120/1
C	192.168.4.32/28	FastEthernet0/0	---	0/0
R	192.168.4.48/28	Serial0/1	192.168.4.93	120/1
C	192.168.4.64/28	Serial0/0	---	0/0
C	192.168.4.80/28	Serial0/1	---	0/0
R	192.168.4.96/28	Serial0/1	192.168.4.93	120/1

RIP tables for /28 are correct

Figure 41 Rome Routing Table

Headings must be used

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC1	PC5	ICMP		0.000	N	0	(edit)
	Successful	PC5	PC1	ICMP		0.000	N	1	(edit)
	Successful	PC4	PC3	ICMP		0.000	N	2	(edit)
	Successful	PC3	PC4	ICMP		0.000	N	3	(edit)
	Failed	PC2	PC0	ICMP		0.000	N	4	(edit)
	Successful	PC2	PC0	ICMP		0.000	N	5	(edit)
	Successful	PC0	PC2	ICMP		0.000	N	6	(edit)

Figure 42 Testing Table

Test for /28 is good with both directions tested across all nets

This needs a heading

CIDR/27 and CIDR/30

CIDR/27 and 30 are used throughout the CLI commands, these CIDRs are also known as variable length subnet masks. By using the addresses in the CIDR tables in the beginning of the report they can be implemented into each of the routers.

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#ver 2
Router(config-router)#net 192.168.4.4
Router(config-router)#net 192.168.4.8
Router(config-router)#net 192.168.4.32
Router(config-router)#net 192.168.4.32
Router(config-router)#exit
Router(config)#
```

Good evidence of /27 and /30 config

Figure 43 CIDR/27 Configuration

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#ver 2
Router(config-router)#net 192.168.4.96
Router(config-router)#net 192.168.4.12
Router(config-router)#net 192.168.4.4
Router(config-router)#exit
Router(config)#
```

Figure 44 CIDR/27 Configuration

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#ver 2
Router(config-router)#net 192.168.4.64
Router(config-router)#net 192.168.4.8
Router(config-router)#net 192.168.4.12
Router(config-router)#exit
Router(config)#
```

Figure 45 CIDR/27 Configuration

This is CIDR /27 and /30

Type	Network	Port	Next Hop IP	Metric
C	192.168.4.4/30	Serial0/1	---	0/0
C	192.168.4.8/30	Serial0/0	---	0/0
R	192.168.4.12/30	Serial0/1	192.168.4.6	120/1
R	192.168.4.12/30	Serial0/0	192.168.4.10	120/1
C	192.168.4.32/27	FastEthernet0/0	---	0/0
R	192.168.4.64/27	Serial0/0	192.168.4.10	120/1

Figure 46 Rome Routing Table

Type	Network	Port	Next Hop IP	Metric
R	192.168.4.4/30	Serial0/1	192.168.4.13	120/1
R	192.168.4.4/30	Serial0/0	192.168.4.9	120/1
C	192.168.4.8/30	Serial0/0	---	0/0
C	192.168.4.12/30	Serial0/1	---	0/0
R	192.168.4.32/27	Serial0/0	192.168.4.9	120/1
C	192.168.4.64/27	FastEthernet0/0	---	0/0

Figure 47 London Routing Table

Type	Network	Port	Next Hop IP	Metric
C	192.168.4.4/30	Serial0/0	---	0/0
R	192.168.4.8/30	Serial0/0	192.168.4.5	120/1
R	192.168.4.8/30	Serial0/1	192.168.4.14	120/1
C	192.168.4.12/30	Serial0/1	---	0/0
R	192.168.4.32/27	Serial0/0	192.168.4.5	120/1
R	192.168.4.64/27	Serial0/1	192.168.4.14	120/1

RIP tables for /27 and /30 are correct

Figure 48 Paris Routing Table

This needs a heading

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Peric
	Successful	PC3	PC4	ICMP		0.000	
	Successful	PC5	PC2	ICMP		0.000	
	Successful	PC2	PC0	ICMP		0.000	
	Successful	PC1	PC3	ICMP		0.000	
	Successful	PC1	PC5	ICMP		0.000	
	Successful	PC4	PC0	ICMP		0.000	

Good test results for /27 and /30

Figure 49 Testing Table

Heading needed

VLANs

VLANs are used to broadcast any information we needed across domain, any device on the LAN will receive the information that was broadcasted. This can reduce the board

This needs more explanation on what a Vlan offers

FastEthernet 0/0.1	0	1	0	1	1	1	1	0	Net addr 64 i/f addr 94
FastEthernet 0/0.2	1	0	0	1	1	1	1	0	Net addr 128 i/f addr 158
PC1	0	1	0	0	0	0	0	1	Net addr 64 i/f addr 65
PC2	1	0	0	0	0	0	0	1	Net addr 128 i/f addr 129

Additional address is identified

London Router – FastEthernet 0/0.1 ip address 192.168.30.94 255.255.255.224

London Router – FastEthernet 0/0.2 ip address 192.168.30.158 255.255.255.224

Inter-Vlan routing is identified

London Switch – FastEthernet 0/24 – linked to London Router with encapsulation VLAN 2 and VLAN 3

London Switch – FastEthernet 0/2 – set as VLAN 2 linked to PC1 London

London Switch – FastEthernet 0/3 – set as VLAN 3 linked to PC2 London

```

London#conf t
Enter configuration commands, one per line. End with CNTL/Z.
London(config)#vlan 2
London(config-vlan)#name vlan2
London(config-vlan)#exit
London(config)#vlan 3
London(config-vlan)#name vlan 3
^
% Invalid input detected at '^' marker.

London(config-vlan)#name vlan3
London(config-vlan)#exit
London(config)#
London(config)#

```

Figure 50 London Configuration

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/4, Fa0/5, Fa0/6 Fa0/7, Fa0/8, Fa0/9, Fa0/10 Fa0/11, Fa0/12, Fa0/13, Fa0/14 Fa0/15, Fa0/16, Fa0/17, Fa0/18 Fa0/19, Fa0/20, Fa0/21, Fa0/22 Fa0/23
2 vlan2	active	Fa0/2
3 vlan3	active	Fa0/3
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

Good evidence of configuration

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Transl	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
2	enet	100002	1500	-	-	-	-	-	0	0
3	enet	100003	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0

--More--

Figure 51 London Vlan

```

London#conf t
Enter configuration commands, one per line. End with CNTL/Z.
London(config)#int f0/2
London(config-if)#switchport mode access
London(config-if)#switchport access vlan 2
London(config-if)#exit
London(config)#int f0/3
London(config-if)#switchport mode access
London(config-if)#switchport access vlan 3
London(config-if)#exit
London(config)#
London(config)#^Z
London#
%SYS-5-CONFIG_I: Configured from console by console
London#

```

Figure 52 London Configuration

```

London#show ip int brief

```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	unassigned	YES	manual	up	up
FastEthernet0/0.2	192.168.4.94	YES	manual	up	up
FastEthernet0/0.3	192.168.4.158	YES	manual	up	up
FastEthernet0/1	unassigned	YES	unset	administratively down	down
Serial0/0	192.168.7.10	YES	manual	up	up
Serial0/1	192.168.7.13	YES	manual	up	up

```

London#

```

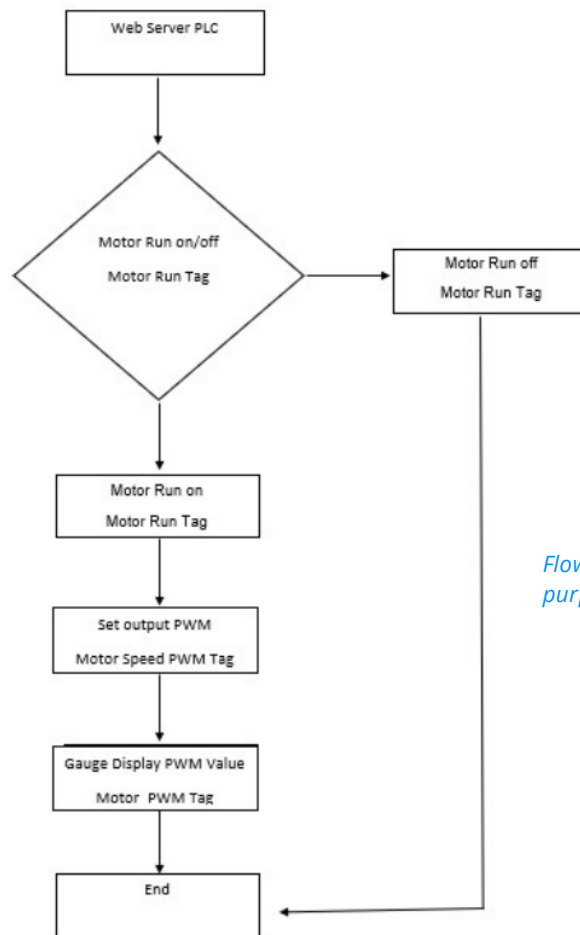
Figure 53 London Configuration

Good evidence of Vlan config

Missing test for Vlan and missing evaluation.

Element 3

For this element a new project is created, and a web server is configured.



Flow chart does not serve any purpose here.

Figure 54 Flow Chart

Web Server

This is the config for PLC on Vlan gateway

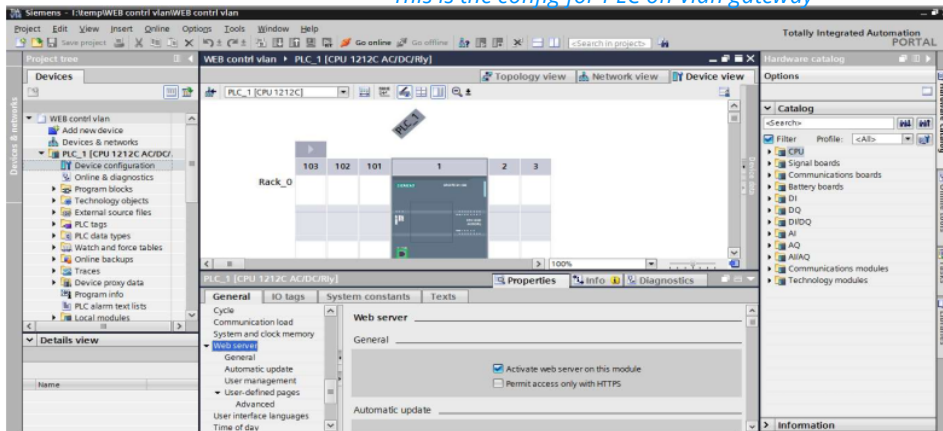
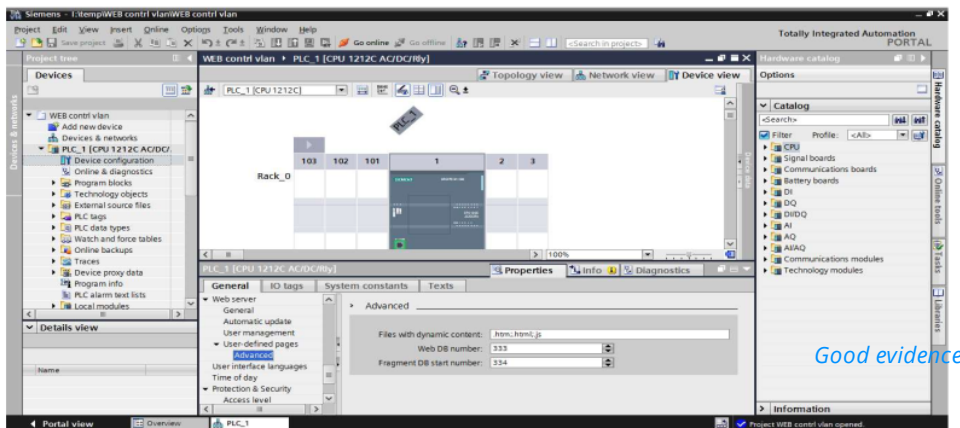


Figure 55 Activate the Web Server



Good evidence

Figure 56 File Extension

Program files for server on PLC

The file extension are .html, .htm and .js. Another file extension can be .json.

HTML – Hypertext Markup Language

HTM – Allowable short version of HTML, both of the extensions are permitted

.js – JavaScript (jquery, ajax)

.json – Extension of the JavaScript library

The .js extension is usually not accepted on a PLC model lower than 1500, so the .js program can be program can be embedded into the HTML or the HTM using the .json. The LED's are .png images and graphic extensions such as the .png and .gif can be embedded into the ajax script.

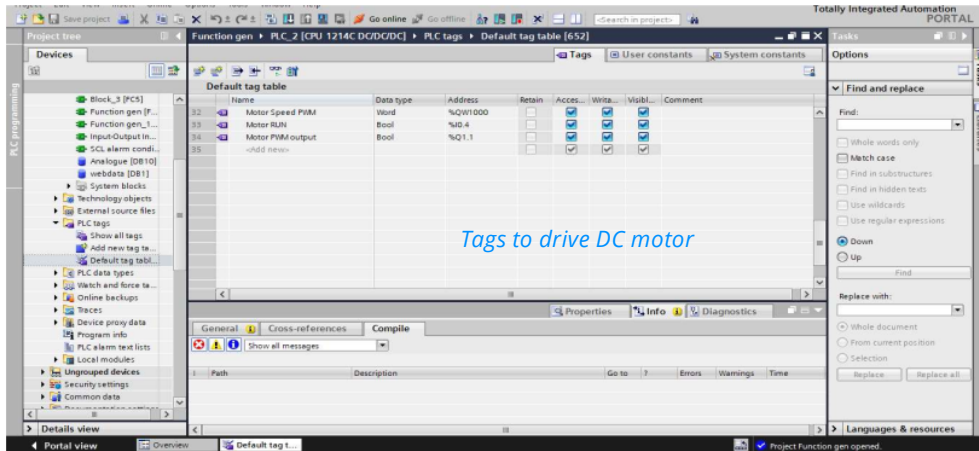


Figure 57 Default Tags

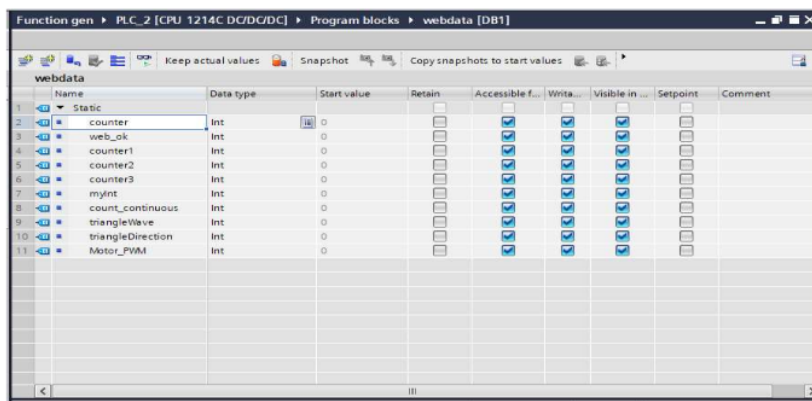
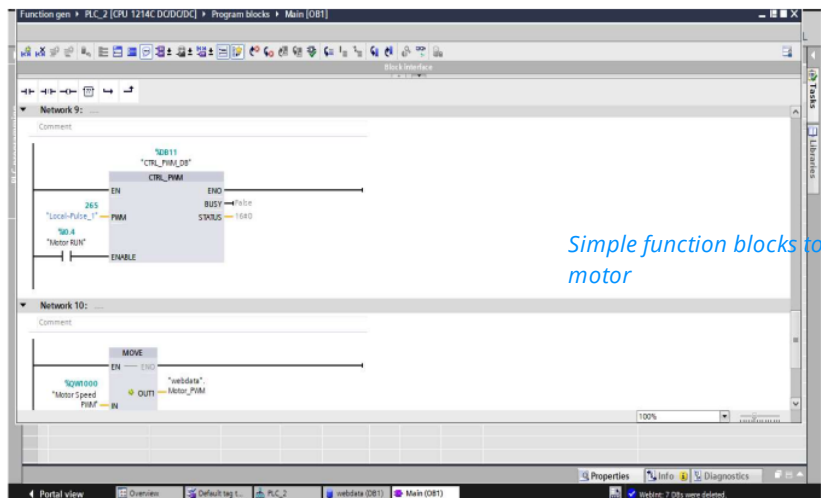
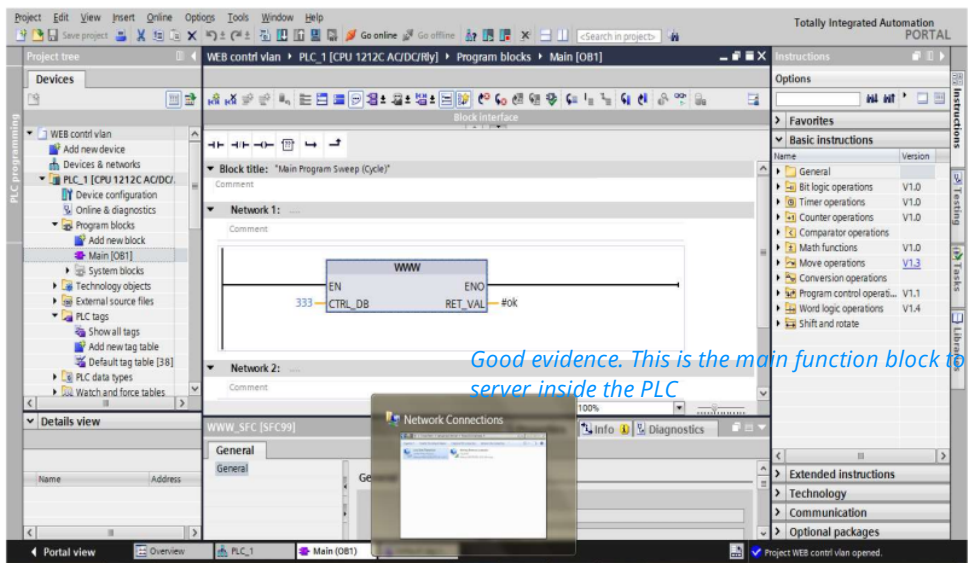


Figure 58 Tags in DB1 datablock



Simple function blocks to drive PWM to DC motor

Figure 59 PWM Function



Good evidence. This is the main function block to activate the server inside the PLC

Figure 60 Main Function Block

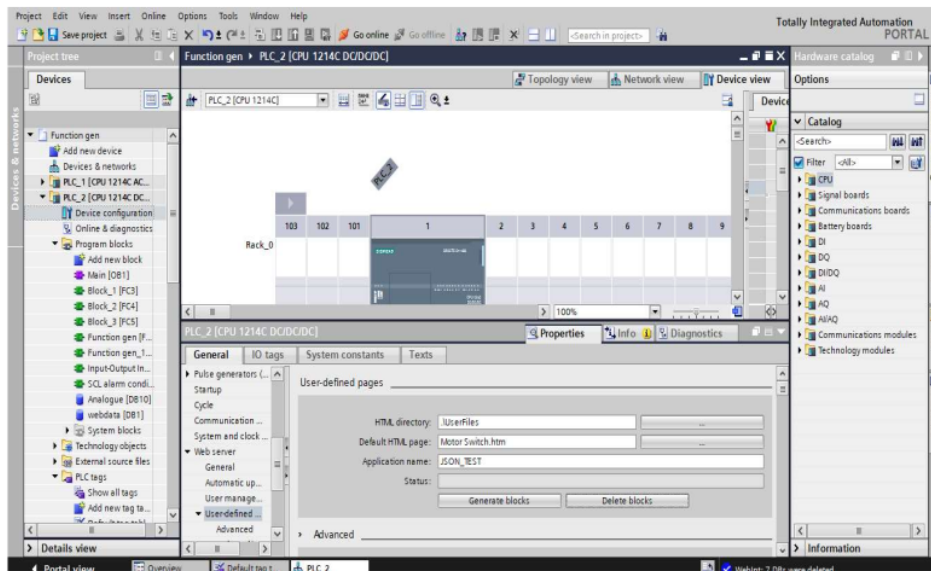
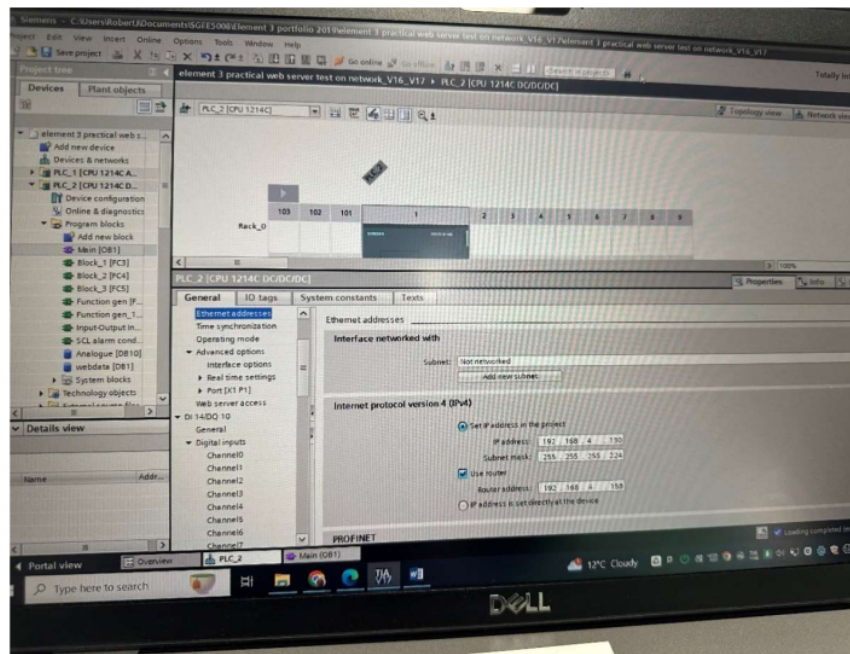


Figure 61 Web Server Configuration

When the page is ready, the web data web block can be downloaded.



Vlan gateway
address set in PLC
and via router.

Figure 62 PLC Subnet

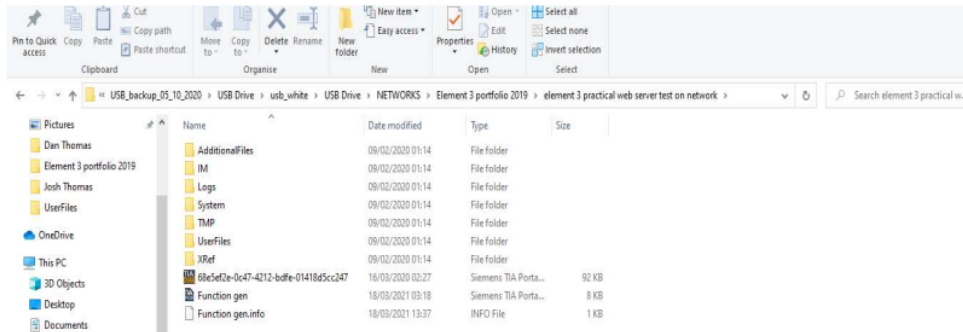


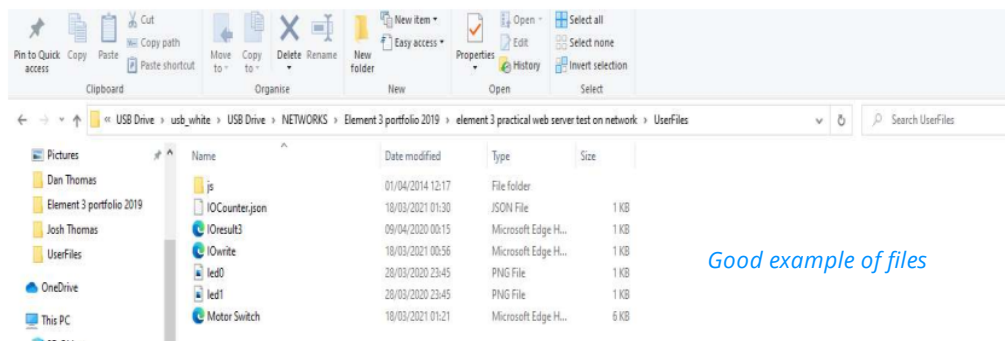
Figure 63 Files

A short, embedded program using a HTML and two images will visually represent the PLC conditions. This is the way Industry 4.0 is developed especially with the PLC's. The next development stage is to implement the JavaScript libraries such as jquery and json which will enable the real time data monitoring without the need to refresh the page. This will have a smoother graphic and an increased speed of the data refresh.

The applications such as motor speed control and the variable data values can be implemented as web pages for remote control and monitoring of the system.

In the 'UserFiles' include the motor switch.htm which is the main download file of data to the PLC server.

Good explanation of the server side program to run the DC motor.



Good example of files

Figure 64 Files

Testing of the PLC Web Server
This is the DC motor running with a 20% PWM duty cycle selected with the motor status off.



Figure 65 20% PWM duty cycle

Good evidence of browser page control of DC motor

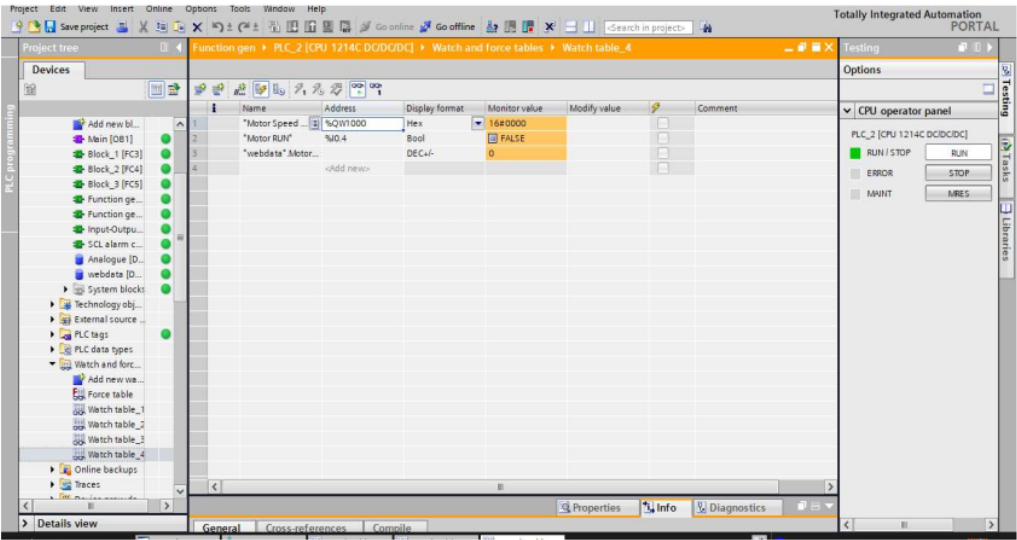
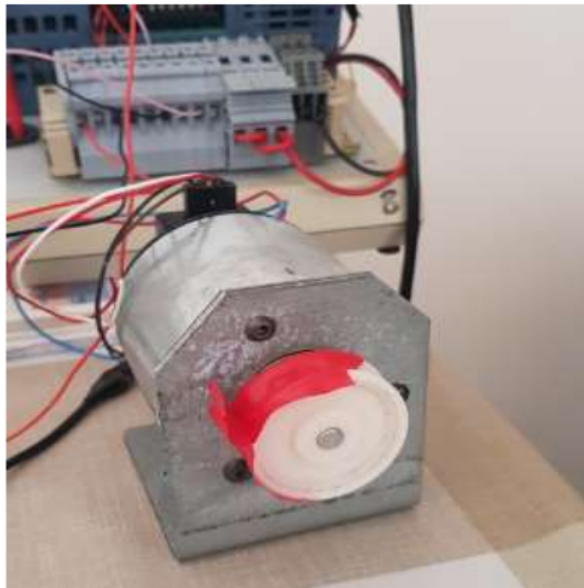


Figure 66 20% PWM duty cycle

The motor, shown in screenshot 67 below, has a 20% PWM cycle which has been set from the software shown in the screenshot 65 and 66 above.



Good evidence of prac setup

Figure 67 20% PWM duty cycle

The screenshots below show the DC motor running with 60% PWM duty cycle with the motor run status as on.

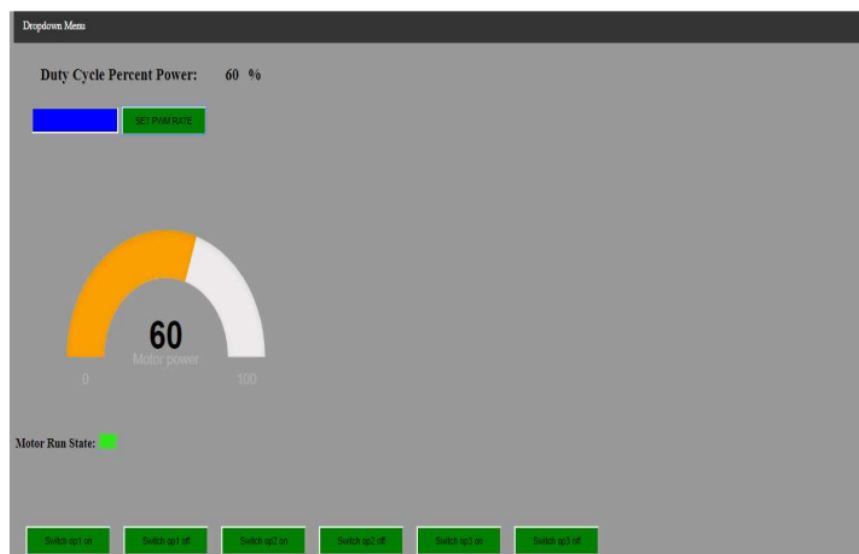


Figure 68 60% PWM duty cycle

Good evidence of prac test from browser

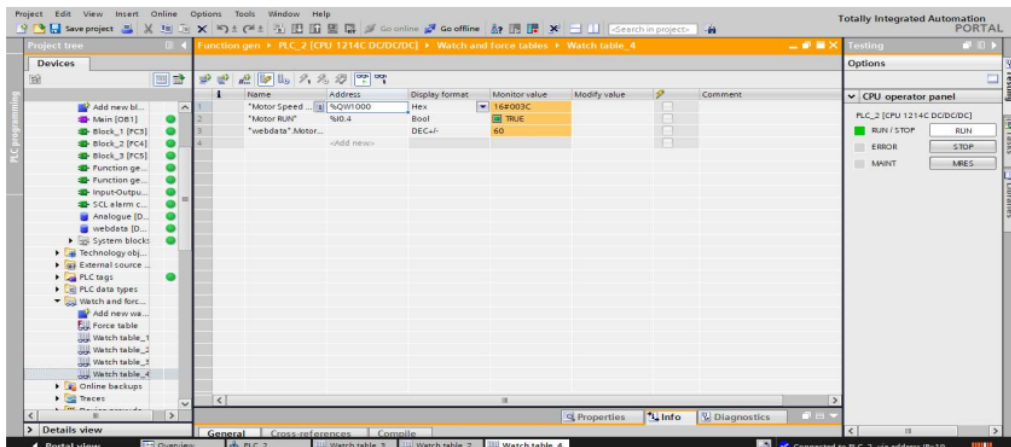
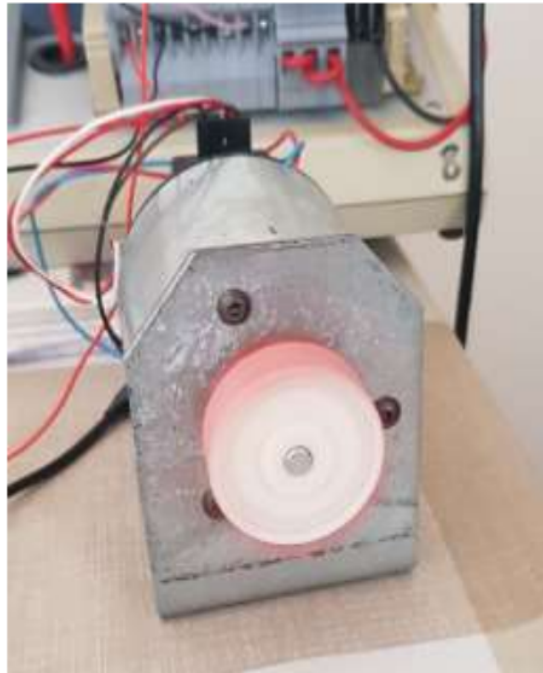


Figure 69 60% PWM duty cycle

This motor, shown in screenshot 70 below, has a 60% PWM cycle which has been set from the software shown in the screenshot 68 and 69 above.



Good evidence

Figure 70 60% PWM duty cycle

This is the Motor Switch.htm program listing with the comments.

```

1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4  <meta charset="utf-8">
5  <meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1">
6  <meta name="viewport" content="user-scalable=yes, width=device-width, initial-scale=1.0, maximum-scale=1.0">
7
8  <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
9  <!--All the above code is standard and is given in all HTML program pages. This does not effect the program function
10
11  <!-- Aligns the gauge graphic. g1 is the dynamic variable for the gauge. This is contained in a <style> tag-->
12  <style>
13  body {
14      text-align: center;
15  }
16
17  #g1 {
18      width:500px; height:350px;
19      display: inline-block;
20      margin: 1em;
21      title: "Result 1";
22  }
23
24
25
26  p {
27      display: block;
28      width: 450px;
29      margin: 2em auto;
30      text-align: left;
31  }
32  </style>
33
34  </head> <!--Working in the <head> </head> tags is displayed in the web page. Only the values between the <body> and </body> tags is displayed

```

Figure 71 Motor Switch.htm

```

35  </style>
36
37  </head> <!--Nothing in the <head> </head> tags is displayed in the web page. Only the values between the <body> and </body> tags is displayed
38
39  <!--Everything inside the <body> tag is displayed on screen-->
40  <body bgcolor="#999999">
41
42  <!--table for a text heading and then read the duty cycle % value-->
43  <table style="height: 100px; width: 450px; font size="16" face="calibri" cellpadding="10">
44  <tr>
45  <th><b>Duty Cycle Percent Power:</b></th>
46  <td><b>0</b></td>
47  </tr>
48
49  <!--this is the button for setting the duty cycle %-->
50  <!--This button modifies the value in the background using JavaScript without a postback-->
51  <tr>
52  <td><input id="setvar" type="text" style="width: 150px; height: 30px; background-color:white;color:black;" />
53  <button style="height: 70px; width="70px" SET PWM RATE </button></td>
54  </tr>
55  </table>
56
57  <!--declare .js sources which are given libraries-->
58  <script src="js/jquery-2.0.2.min.js"></script>
59  <script src="js/raphael.2.1.0.min.js"></script>
60  <script src="js/jstestpage.1.0.1.min.js"></script>
61
62  <!--Give an id to the g1 dynamic gauge variable contained inside a <div> tag -->
63  <div style="float: center">
64  <table>
65  <tr>

```

Figure 72 Motor Switch.htm

```

60
61
62
63 <!--Give an id to the gl dynamic guage variable contained inside a <div> tag -->
64 <div style="float: center">
65 <table>
66 <tr>
67 <td><div id="gl"></div></td>
68 </tr>
69 </table>
70 </div>
71
72 <!--Give id to the variables for reading the digital value for the MOTOR RUN state LED.
73 The img variable will hold the red or green LED images-->
74 <div>
75 <table>
76 <tr>
77 <td><div id="Motor Run State"></div></td>
78 <td><div id="Motor Run"></div></td>
79 </tr>
80 </table>
81 </div>
82
83 </body>
84
85 <!--End of the <body> tag. Everything from here on are function call which will send data values
86 to all the ID tag names in the <body> tag-->
87
88
89 <!-- This is the JSON function call for reading the Motor_PWM vvalue from the tag in the IOCounter.json file.
90 Script to refresh every 1000ms -->
91
92 <script type="text/javascript">
93 //All ajax and JSON is held in this document.
94 $(document).ready(function()
95 {
96
97 //ajax JSON to read the PLC Tag values
98 $.ajaxSetup({ cache: false });
99 setInterval(function()
100 {
101 $.getJSON("IOCounter.json", function(result)
102 {
103 $("#Motor_PWM").text(result["Motor_PWM"]);
104 $("#Motor_RUN").text(result["Motor_RUN"]);
105
106 //condition image RED / GREEN for 'Motor RUN' tag. Images are held in the User file in the PLC program directory
107 if(result["Motor_RUN"]==0){
108
109 //change image to red if condition is off
110 $('img').html('');
111
112
113
114 //change image to green if condition is on
115 $('img').html('');
116
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114 //change image to green if condition is on
115 $('img#').html('');
116 }
117
118
119
120
121
122 //Refresh rate in ms.
123 1000 //this timing value is critical for the write to tag function
124 //If this is too small the write misses the first pole and takes too long to update.
125 //If this is too large the inputs will take too long to update. 1000ms is about right.
126
127 //END OF THE JSON FUNCTION CALL
128
129
130
131
132 <!--Initilise the gauge dynamic variables. Only g1, g2 and g3 used. g1 and g3 are dynamic variables form PLC Tags-->
133 var g1:
134
135 var g1 = new JustGage({
136   id: "g1",
137   value: getRandomInt(0, 100),
138   min: 0,
139   max: 100,
140   title: "Duty Cycle %",
141   label: "Motor power"
142 });
143
144
145 //ajax call function for g1 dynamic variable which is linked to Motor_PWM tag in file IOresult3 in PLC directory/////
146 //call the ajax function. This can easily be converted to JSON if necessary
147 $.ajaxSetup({ cache: false });
148
149

```

Figure 75 Motor Switch.htm

```

144
145 //ajax call function for g1 dynamic variable which is linked to Motor_PWM tag in file IOresult3 in PLC directory/////
146 //call the ajax function. This can easily be converted to JSON if necessary
147 $.ajaxSetup({ cache: false });
148 $.getInterval(function() {
149   $.get("IOresult3.htm", function(result){
150     g1.refresh(parseInt(result));
151   });
152 },1000); //END OF THIS AJAX FUNCTION CALL
153
154
155
156
157
158
159
160 //modify the counter value from button. This is the part that writes to the PLC Tag variable i.e.Motor Speed PWM
161 //This is the function that writes the PWM values and sends using the button
162 $('#button').click(function(){
163   url="IOwrite.htm";
164   name="Motor Speed PWM";
165   val=$('#input[id=sevar]').val();
166   sdata=escape(name)+"="+val;
167   $.post(url,sdata,function(result){});
168   document.getElementById('sevar').value='';
169 });
170
171
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```

Figure 76 Motor Switch.htm

Bibliography

Contemporary Control Systems Inc, 2011. *Understanding Ethernet Switches and Routers*. [Online]
Available at: <https://www.ccontrols.com/pdf/Essentials0411.pdf>
[Accessed 15 2024].

G., F., 2009. *University of Aberdeen..* [Online]
Available at: <https://erg.abdn.ac.uk/users/gorry/course/intro-pages/uni-b-mcast.html>
[Accessed 15 2024].

geeksforgeeks, 2023. *What is Broadcasting in Computer Network?*. [Online]
Available at: <https://www.geeksforgeeks.org/what-is-broadcasting-in-computer-network/>
[Accessed 15 2024].

Study CCNA, N/A. *Encapsulation in OSI and TCP/IP Models*. [Online]
Available at: <https://study-ccna.com/encapsulation/>
[Accessed 15 2024].

There should be more sources

Appendix

This should have a heading to indicate purpose i.e. Vlan testing

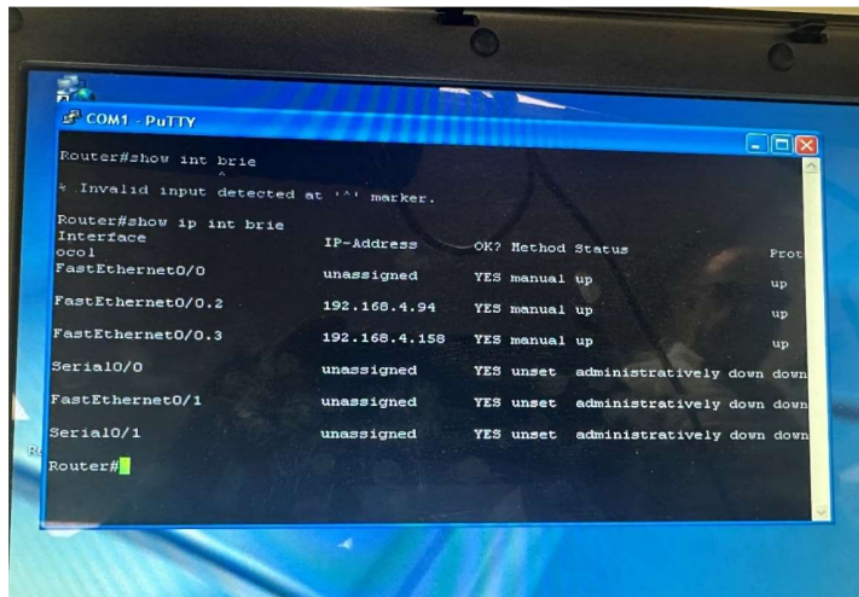


Figure 77 Vlan Configuration

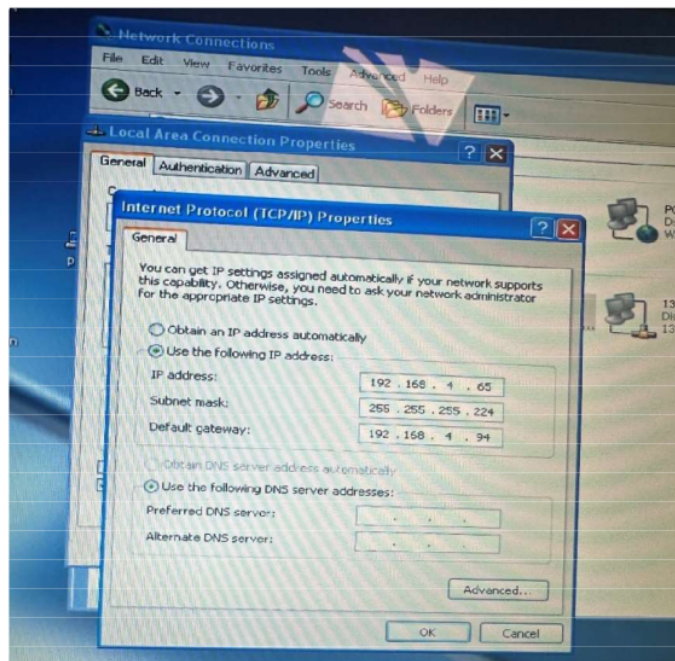


Figure 78 Subnet Table

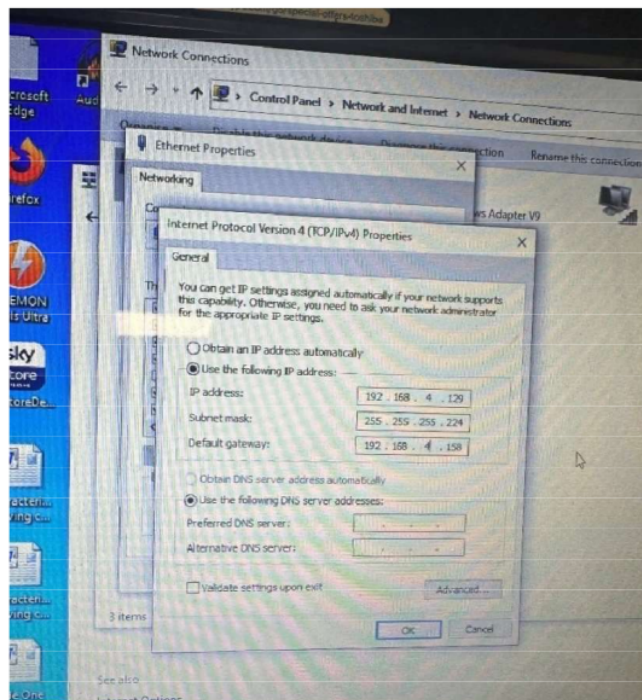
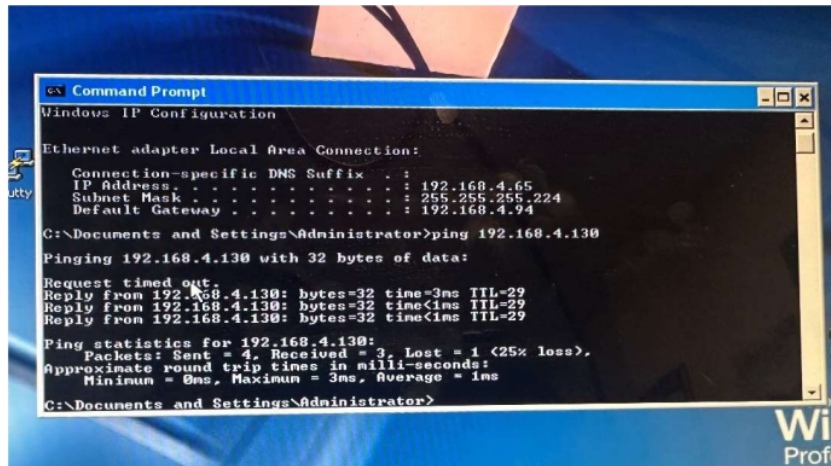
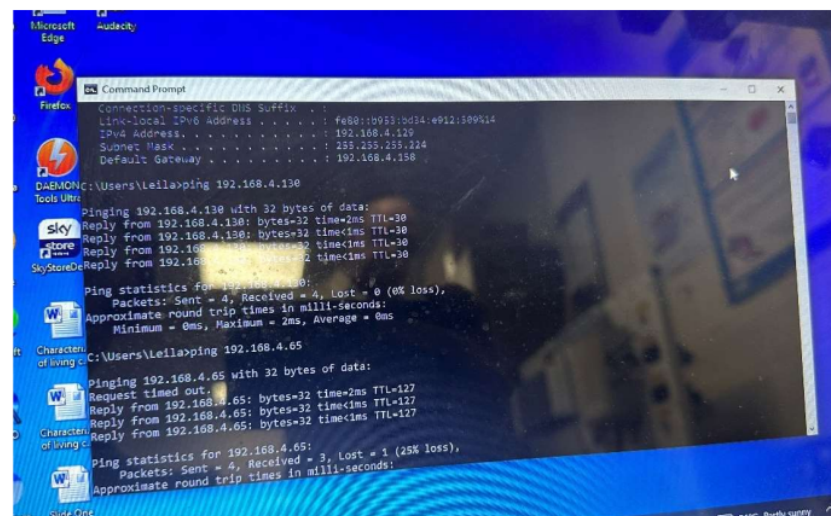


Figure 79 Subnet Table



*Vlan test using
ping commands
from host*

Figure 80 I/P Configuration



*Good test evidence
showing ping
command from host*

Figure 81 I/P Configuration

49/100

PAGE 1

PAGE 2

Text Comment. These need to be defferentiated

Text Comment. Table of contents has structure

PAGE 3

PAGE 4

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PAGE 5

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Text Comment. Good supporting diagram

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PAGE 6

Text Comment. OSI 7 layer model is identified in the diagram.

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Text Comment. Encapsulation and decapsulation is explained, but should not be mixed with the 7 and 4 layer models.

Text Comment. Encapsulation and decapsulation are explained

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PAGE 7

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PAGE 8

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PAGE 9

Text Comment. Good address schema for the three different classes of networks

PAGE 10

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PAGE 21

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PAGE 22

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Text Comment. Diagram shows port allocation, but no net addresses

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Text Comment. Address schedule for /28 is correct

Text Comment. Address schedule for CIDR /27 is correct

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Text Comment. This is not clear here.

PAGE 25

Text Comment. Good evidence for /28 configuration

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Text Comment. RIP tables for /28 are correct

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Text Comment. Test for /28 is good with both directions tested across all nets

PAGE 28

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Text Comment. This is CIDR /27 and /30

PAGE 29

PAGE 30

Text Comment. RIP tables for /27 and /30 are correct

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Text Comment. Good test results for /27 and /30

PAGE 31

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Text Comment. This needs more explanation on what a Vlan offers

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Text Comment. Inter-Vlan routing is identified

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PAGE 32

Text Comment. Good evidence of Vlan config

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PAGE 33

Text Comment. Flow chart does not serve any purpose here.

PAGE 34

Text Comment. This is the config for PLC on Vlan gateway

Text Comment. Good evidence

Text Comment. Program files for server on PLC

PAGE 35

Text Comment. Tags to drive DC motor

PAGE 36

Text Comment. Simple function blocks to drive PWM to DC motor

Text Comment. Good evidence. This is the main function block to activate the server inside the PLC

PAGE 37

Text Comment. Vlan gateway address set in PLC and via router.

PAGE 38

Text Comment. Good explanation of the server side program to run the DC motor.

Text Comment. Good example of files

PAGE 39

Text Comment. Good evidence of browser page control of DC motor

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Text Comment. Good evidence of prac setup

Text Comment. Good evidence of prac test from browser

PAGE 41

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Text Comment. There should be more sources

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PAGE 46

PAGE 47

Text Comment. Vlan test using ping commands from host

Text Comment. Good test evidence showing ping command from host

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CERY'S JOSEPH

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RESEARCH-INFORMED LITERATURE



OSI 7 and 4 layer models have not been explained or compared. The 7 layer model is referred to as part of encapsulation.

Missing headings in this section.

There are good points with broadcasting, but the content is disjointed and lacking structure in this section.

3/10

KNOWLEDGE AND UNDERSTANDING



E1. Headings missing to identify content.

Evaluation missing.

The three networks diagram with port allocation

15/30

is missing net addresses.

Testing methods are good and supported with good evidence. 5/10

E2. Network diagram is missing the net addresses.

Parts missing for Vlan and evaluation. 5/10

E3. No network diagram of Vlans with addresses and port allocation. No evidence of prac setup.

The system has been implemented and tested, but documentation is missing and disjointed. 5/10

ANALYSIS



E1. Good set of test results for the three network classes.

Missing evaluation. 3/5

E2. Test for Vlan is missing.

Missing evaluation. 5/10

E3. Vlan test is in appendix with no heading to identify.

No evaluation. 5/10

13/25

PRACTICAL APPLICATION AND DEP.



E1. Net addresses should be included on diagram. The implementation is not structured very well due to missing headings.

The system is implemented and there is evidence to support this, however, the order is not structured. Testing methods are good but should be identified. 2.5/5

E2. CIDR implementation is disjointed and missing headings to identify content in this section. Some minor errors with identification for CIDR networks. 2.5/5

10/20

E3. Vlan diagram with port allocation and net addresses is missing.

Disjointed content with missing headings.

No evaluation.

The config has been achieved with evidence. 5/10

SKILLS FOR PROFESSIONAL PRACTICE.



Report is missing headings to identify content. There is content to prove the system operations with good evidence, however, the presentation is lacking structure.

8/15