

2117076 - AL

by Aaron Lupton

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Name: Aaron Lupton

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Good extensive list of figures

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Good detailed table of contents

Element 1

Introduction

routing

This project involves creating and developing the three types of router; static, dynamic and DHCP with the outcome of designing a fully functional network, containing of class A, B and C addressing. The research was to investigate OSI 7 layer and a 4-layer model, that refers to the network design as well as the encapsulation broadcasting and port allocation.

The design stages involve simplifying a complex network into three local area networks (LAN) connected to two wider area networks (WAN). For each of the LAN's classful addressing was used for the individual LAN's to represent network classes A, B and C. Then, with the network created, static addressing and routing were implemented and tested. On successful testing of the static implementation, dynamic addressing and routing were then implemented. Finally, for the dynamic host configuration protocol (DHCP) addressing and routing was completed and all tested successfully.

Good intro

Research

Network Layers

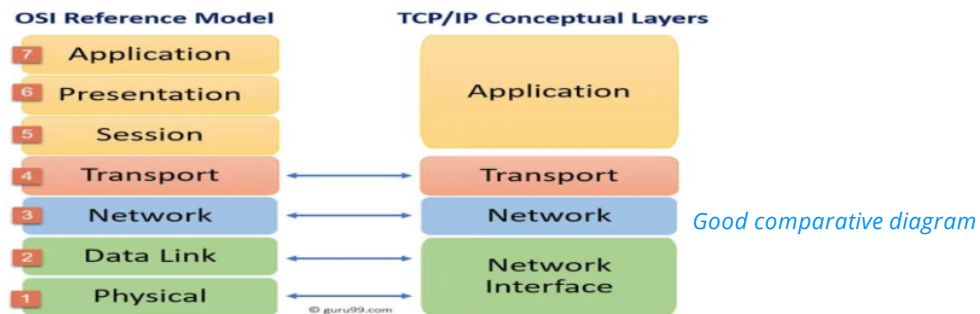


Figure 1 OSI 7 Layers TCP/IP illustration

(CheckPoint, 2019)*Citation is correct*

When the systems are able to connect to each other, they are able to communicate with the additional systems and then the networking communication will be able to showed by the logical theoretical OSI Model. Then, in command to find how the transmission between the computer and the internet can happen, and how they can be interconnected, the TCP/IP can be used. Any issues that are found at each step can be fixed during the testing stages. (Impera, 2021) *Reasonable explanation to differentiate between the two models*

TCP/IP	OSI
Implementation of OSI model	Reference model
Model around which Internet is developed	This is a theoretical model
Has only 4 layers	Has 7 layers
Considered more reliable	Considered a reference tool
Protocols are not strictly defined	Stricter boundaries for the protocols
Horizontal approach	Vertical approach
Combines the session and presentation layer in the application layer	Has separate session and presentation layer
Protocols were developed first and then the model was developed	Model was developed before the development of protocols
Supports only connectionless communication in the network layer	Supports connectionless and connection-oriented communication in the network layer
Protocol dependent standard	Protocol independent standard InstrumentationTools.com

Figure 2 Comparison of OSI 7 layer and TCP/IP Configuration

Good table of comparison. This would have been better in a table of your own creation

OSI Model	
Layer	Layer Description
Layer 7	Allows for human and computer interaction. Enables applications to access/interact with the network
Layer 6	Enabling data in a format that is accessible/useable. Data encryption also occurs at here.
Layer 5	Connections are maintained, ports and sessions are controlled
Layer 4	TCP and UDP are used for data transmission
Layer 3	The decision of the physical path for the data to take
Layer 2	Data format on the network is decided at this layer.
Layer 1	'Raw' bit data stream is transmitted.

Figure 3 OSI Model

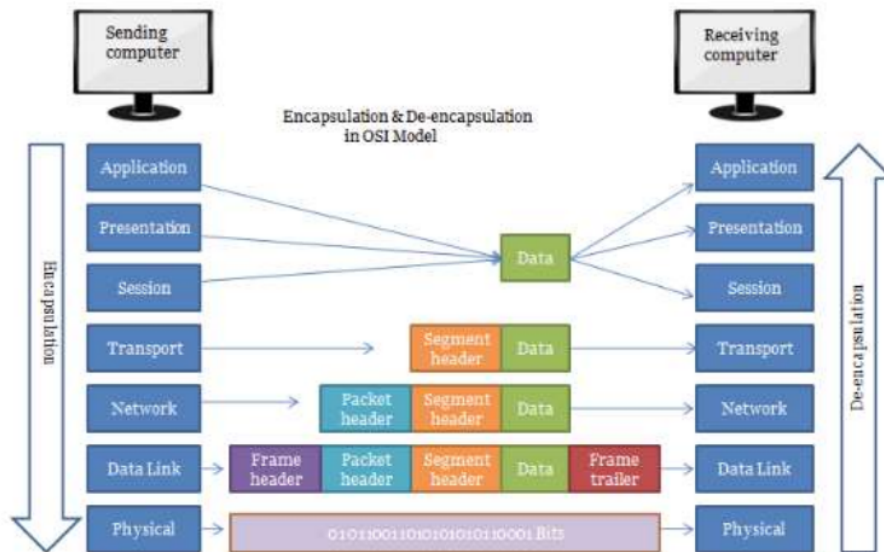
TCP/IP Model	
Layer	Layer Description
Layer 4	Assumes layer 5, 6 and 7 of the OSI model
Layer 3	Transmits data using TCP and UDP
Layer 2	The decision of the physical path for the data to take
Layer 1	Assumes layer 1 and 2 of the OSI model

Model layers are identified

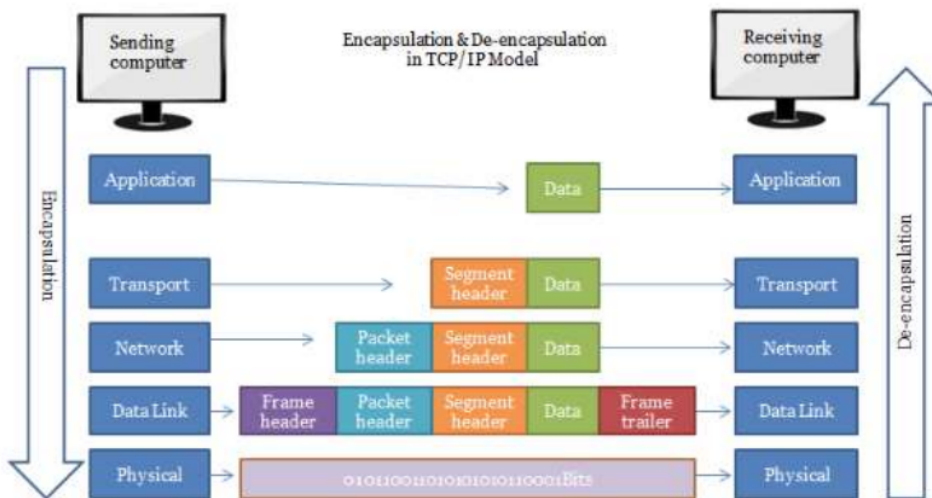
Figure 4 TCP/IP Model

Both of these images are found on (Impera, 2021)[Citation is correct](#)

Encapsulation



The following figure shows the encapsulation and de-encapsulation process in the TCP/IP model.



(Stackify, 2021) *Citation is correct*

Two very good diagrams that show the encapsulation transmit and decapsulation receive.

The TCP/IP suite, also referred to as the Internet Protocol suite, consists of the most commonly used network protocols. Unlike the OSI model, the TCP/IP model was designed to be compatible with various computer systems. Although both models share similar design principles, they have distinct differences. One key distinction is that the TCP/IP model combines Layers 5–7 of the OSI model into a single application layer. Additionally, it is widely utilized for integrating the physical and data link layers, also known as the network interface or network access layer. The encapsulation and decapsulation processes of TCP/IP follow the same layer progression as in the OSI model. (GeeksforGeeks, 2019). Encapsulation involves the attachment of extra details as data moves through an OSI or TCP/IP model. These details are added by the sender, starting from the Application layer and extending all the way to the Physical layer. (Oracle, 2022) *Good explanation*

Broadcasting

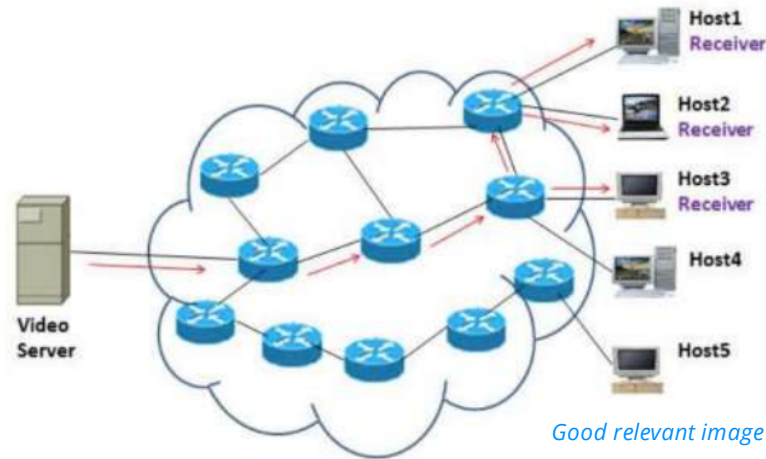


Figure 5 Broadcasting Design

There should be a ref here

Broadcasting is the act of sending information to multiple devices, depending on the type of broadcast, which can be on the same or different networks. In a local area network (LAN) setting, Address Resolution Protocol (ARP) is utilized to access Internet Protocol (IP) and Media Access Control (MAC) addresses. Unicast and Multicast are two other broadcasting options, allowing for one sender and receiver, or multiple devices to send and receive simultaneously. To address network performance problems caused by heavy broadcasting traffic, increasing the number of broadcast networks can be a simple solution. (Britannica, 2021)*Citation is correct*

The solution should be further explained

Port Allocation

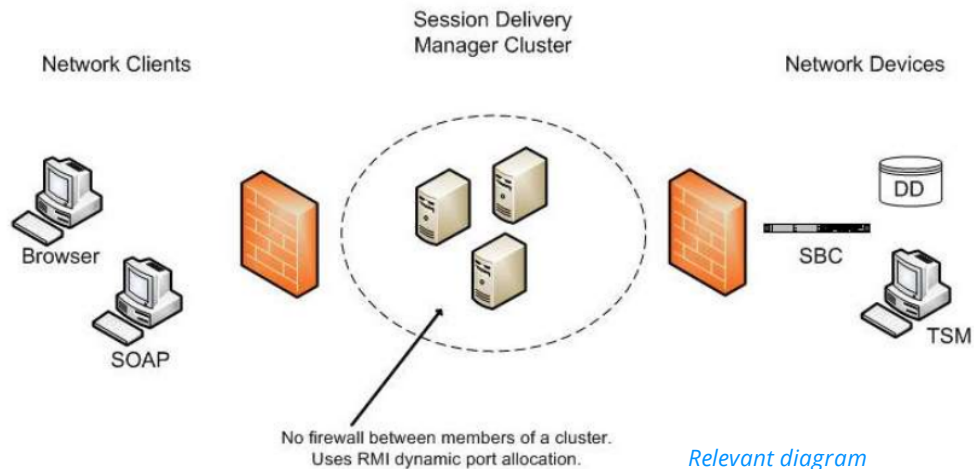


Figure 6 Port Allocation Design

(Oracle, 2020)

The well-known ports, ranging from 0 to 1023, are software ports that are allocated specifically. System processes providing network services that are commonly used utilize these ports. Registered ports, from 1024 to 49151, are assigned upon request from the Internet Assigned Numbers Authority (IANA) for a particular service. Generally, superuser privileges are not needed for registered ports. Private or customized services, temporary use, or automatic allocation of ephemeral ports fall under the dynamic or private port allocations from 49152 to 65535. These ports cannot be registered with IANA.

*Good point.
The ports are
software ports*

NETWORK PORTS

Well-known Ports	0 - 1023
Registered Ports	1024 - 49151
Dynamic Ports	49152 - 65565

Good useful diagram

Figure 7 Well Known Networking Ports

*There could have been some common port
allocation examples given here to support the
diagram*

(Cloudflare, 2020)

Task 1 - Design Requirements

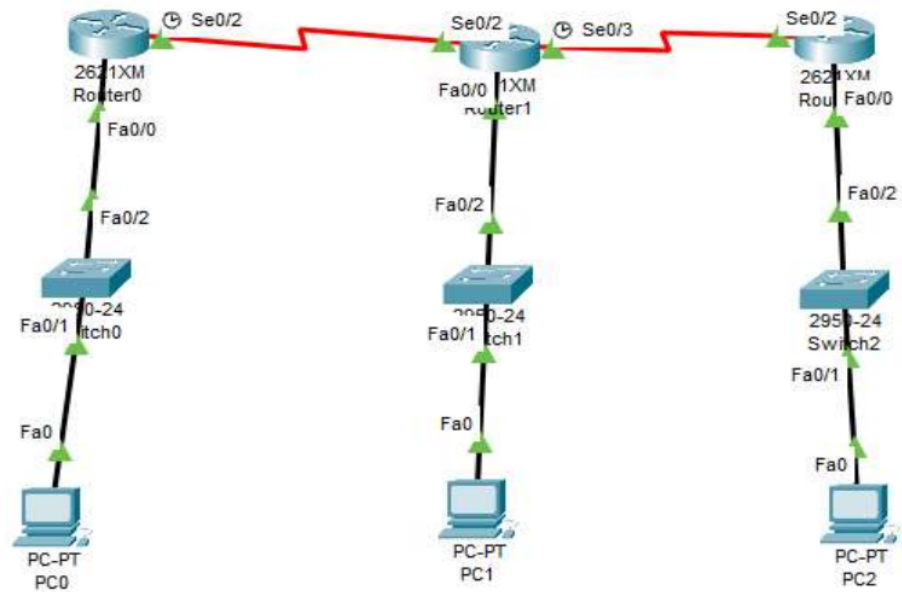


Figure 8 Configuration of the routers, switches and PCs

Port allocation is identified, there should also be the network addresses here.

Task 2 - Design Requirements

Class C

192.168.1.0 – net address

192.168.1.254 – gateway address

192.168.1.1 – initial device address

Class B

170.21.0.0 – net address

170.21.0.254 – gateway address

170.21.0.1 – initial device address

Class A

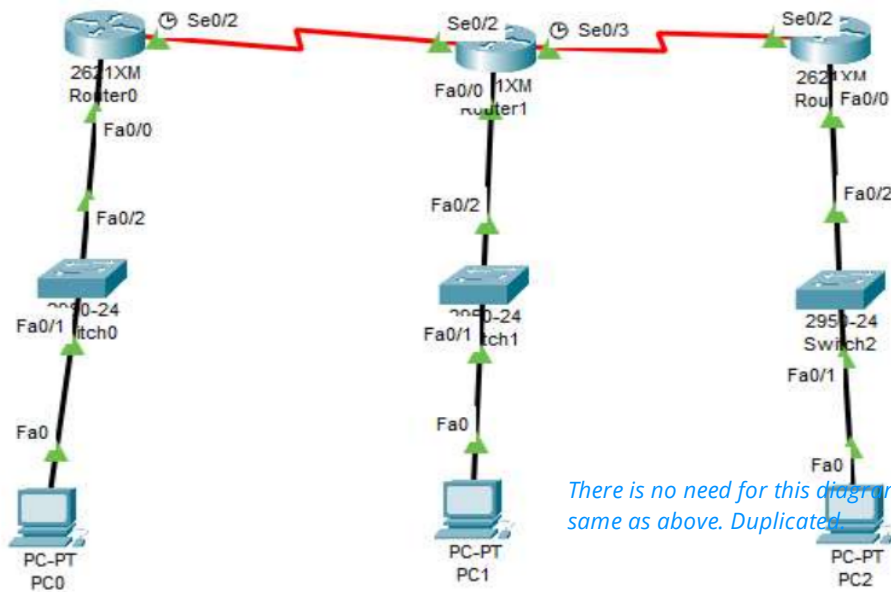
101.0.0.0 – net address

101.0.0.254 – gateway address

101.0.0.1 – initial device address

Router addresses should be listed here as part of schematic

Task 3 – Implementation



There is no need for this diagram as this is the same as above. Duplicated

Figure 9 Configuration of the routers, switches and PCs

Routers

R0:

This should be headed as static routing

10.0.0.1

Network Address
170.21.0.0/16 via 10.0.0.2
101.0.0.0/8 via 10.0.0.2

Table is correct

Figure 10 Router 0

```
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    101.0.0.0/8 [1/0] via 10.0.0.2
S    170.21.0.0/16 [1/0] via 10.0.0.2
C    192.168.1.0/24 is directly connected, FastEthernet0/0
```

Good evidence

Router(config)#

Figure 11 Router 0

R1:

10.0.0.2

11.0.0.1

Network Address
170.21.0.0/16 via 11.0.0.2
192.168.1.0/24 via 10.0.0.1

Table is correct

Figure 12 Router 1

```
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    101.0.0.0/8 is directly connected, FastEthernet0/0
S    170.21.0.0/16 [1/0] via 11.0.0.2
S    192.168.1.0/24 [1/0] via 10.0.0.1

Router(config)#
```

Good evidence

Figure 13 Router 1

R2;

11.0.0.2

Network Address
192.168.1.0/24 via 11.0.0.1
101.0.0.0/8 via 11.0.0.1

Tabl is correct

Figure 14 Router 2

```
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    101.0.0.0/8 [1/0] via 11.0.0.1
C    170.21.0.0/16 is directly connected, FastEthernet0/0
S    192.168.1.0/24 [1/0] via 11.0.0.1
```

Good evidence

Router(config)#

Figure 15 Router 2

Test Configuration

This needs to be named as static routing test

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 16 Testing Successful

Task 4 – Dynamic routing using RIP

Router 0:

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
S	101.0.0.0/8	---	10.0.0.2	1/0
S	170.21.0.0/16	---	10.0.0.2	1/0
C	192.168.1.0/24	FastEthernet0/0	---	0/0

Table is correct

Figure 17 Routing Table for Router 0

```
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 192.168.1.0
Router(config-router)#net 10.0.0.0
Router(config-router)#net 101.0.0.0
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
```

Good evidence of config

Figure 18 CLI for Router 0

Router 1:

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	101.0.0.0/8	FastEthernet0/0	---	0/0
S	170.21.0.0/16	---	11.0.0.2	1/0
S	192.168.1.0/24	---	10.0.0.1	1/0

Table is correct

Figure 19 Routing Table for Router 1

```
Router>en
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 101.0.0.0
Router(config-router)#net 10.0.0.0
Router(config-router)#net 11.0.0.0
Router(config-router)#net 192.168.1.0
Router(config-router)#net 170.21.0.0
                        ^
% Invalid input detected at '^' marker.

Router(config-router)#net 170.21.0.0
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

Good evidence of config

Figure 20 CLI for router 1

Router 2;

Routing Table for Router2				
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
S	101.0.0.0/8	---	11.0.0.1	1/0
C	170.21.0.0/16	FastEthernet0/0	---	0/0
S	192.168.1.0/24	---	11.0.0.1	1/0

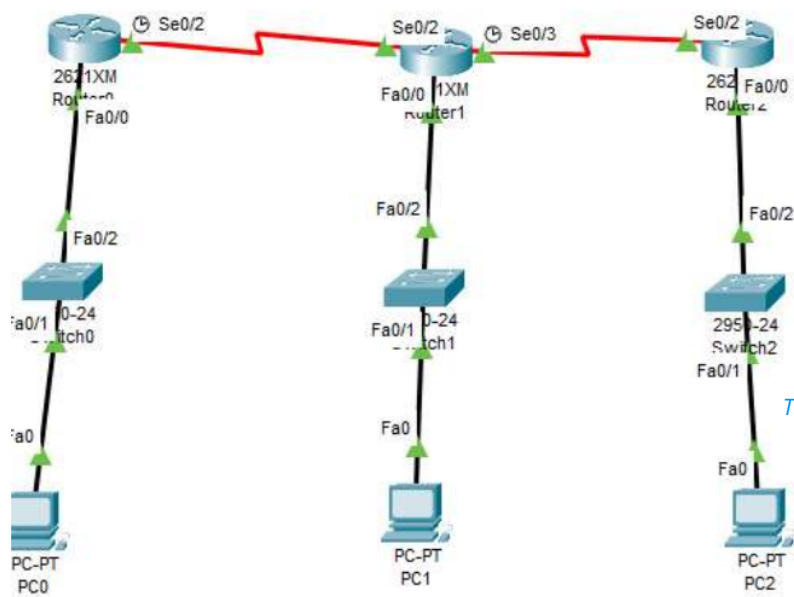
Table is correct

Figure 21 Routing Table for Router 2

```
Router>en
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 170.21.0.0
Router(config-router)#net 11.0.0.0
Router(config-router)#net 101.0.0.0
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
Router#
```

Good evidence of config

Figure 22 CLI for Router 2



This does not need to be duplicated

Figure 23 RIP Routers

PDU List Window

Heading needed here to indicate test of dynamic routing RIP

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 24 RIP Testing Successful

Task 5 - DHCP Testing – without helper address

Router 0;

192.168.1.1
255.255.255.0
192.168.1.254
192.168.1.254

Figure 25 Router 0 without helper address

The address configuration has been set dynamically.

Router 1;

169.254.142.129
255.255.0.0
0.0.0.0
0.0.0.0

Figure 26 Router 1 without helper address

Router 2;

169.254.145.192
255.255.0.0
0.0.0.0
0.0.0.0

Good test showing error

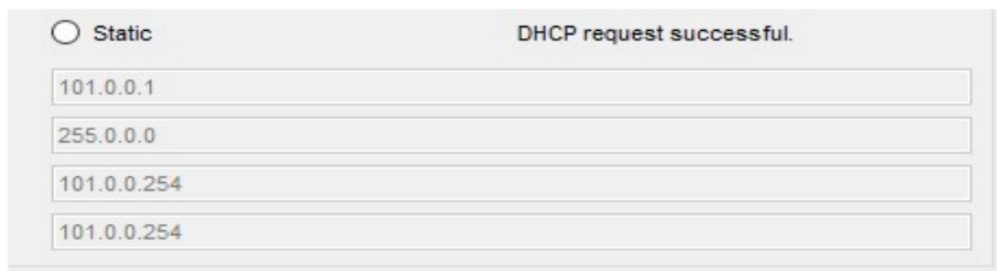
Figure 27 Router 2 without helper address

ddress

is set. This is because the router needs the helper address to get across the network. The helper address is the control router serial port address (10.0.0.1).

DHCP - with helper address

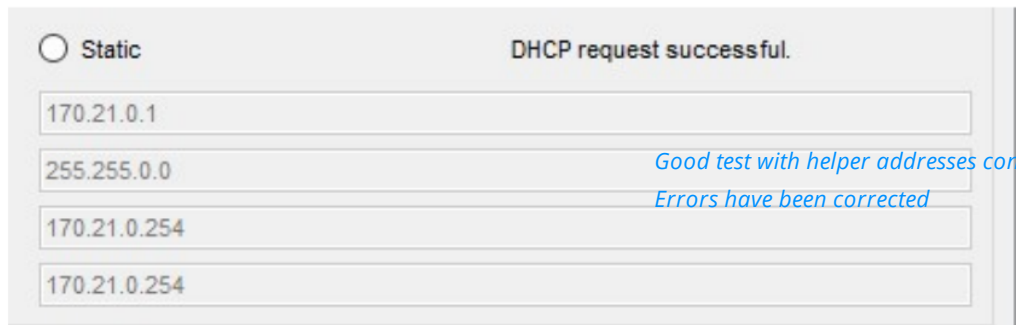
Router1;



The screenshot shows the DHCP configuration interface for Router1. At the top, there is a radio button labeled "Static" and a status message "DHCP request successful." Below this, there are four input fields containing the following values: "101.0.0.1", "255.0.0.0", "101.0.0.254", and "101.0.0.254".

Figure 28 Router 1with helper address

Router 2;



The screenshot shows the DHCP configuration interface for Router2. At the top, there is a radio button labeled "Static" and a status message "DHCP request successful." Below this, there are four input fields containing the following values: "170.21.0.1", "255.255.0.0", "170.21.0.254", and "170.21.0.254".

*Good test with helper addresses configured.
Errors have been corrected*

Figure 29 Router 2 with helper address

The test shows that devices PC1 and PC2 on routers 2 and 3 are now configured dynamically.

Address Exclusion Configuration

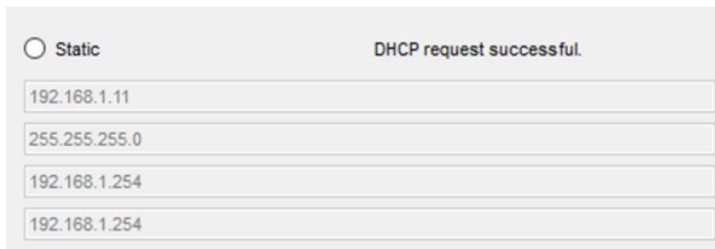
```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dhcp excluded-address 192.168.1.10
      ^
% Invalid input detected at '^' marker.

Router(config)#ip dhcp excluded-address 192.169.1.10
Router(config)#ip dhcp excluded-address 192.168.1.10
Router(config)#ip dhcp excluded-address 101.0.0.1 101.0.10
      ^
% Invalid input detected at '^' marker.

Router(config)#ip dhcp excluded-address 101.0.0.1 101.0.0.10
Router(config)#ip dhcp excluded-address 192.168.1.1 192.168.1.10
Router(config)#ip dhcp excluded-address 170.21.0.1 170.21.0.10
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Good evidence of exclusion addresses. First 10 addresses are taken.

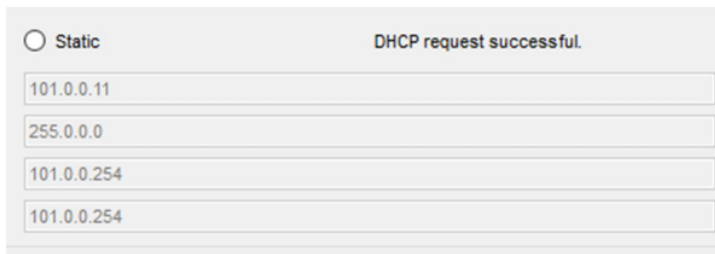
PC 0;



The screenshot shows a configuration window for PC 0. At the top, there is a radio button labeled "Static" and a status message "DHCP request successful." Below this, there are four input fields for IP configuration. The first field contains "192.168.1.11". The second field contains "255.255.255.0". The third and fourth fields both contain "192.168.1.254".

Figure 30 PC 0 with excluded address

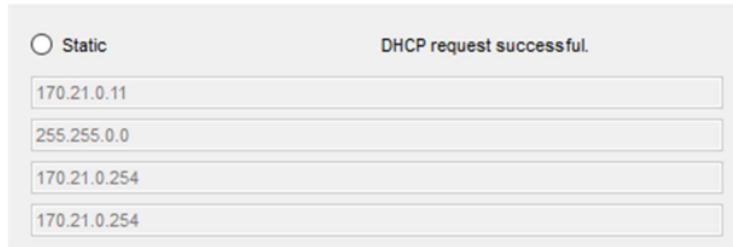
PC 1;



The screenshot shows a configuration window for PC 1. At the top, there is a radio button labeled "Static" and a status message "DHCP request successful." Below this, there are four input fields for IP configuration. The first field contains "101.0.0.11". The second field contains "255.0.0.0". The third and fourth fields both contain "101.0.0.254".

Figure 31 PC 1 with excluded address

PC 2;



Good test results showing first 10 addresses excluded

Figure 32 PC 2 with excluded address

The test proves that the excluded addresses from 1 to 10 in each LAN has been successful and this means that addresses for specific controllers can be kept static and not be affected by the DHCP dynamic addressing protocol. *Good point made*

Networking Analysis and testing

The final test to show the running configuration of the routers in Element 1;

Router 0;

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

```
Current configuration: 1463 bytes
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Router
ip dhcp excluded-address 192.169.1.10
ip dhcp excluded-address 192.168.1.10
ip dhcp excluded-address 101.0.0.1 101.0.0.10
ip dhcp excluded-address 192.168.1.1 192.168.1.10
ip dhcp excluded-address 170.21.0.1 170.21.0.10

ip dhcp pool net1
```

```
network 192.168.1.0 255.255.255.0
default-router 192.168.1.254
dns-server 192.168.1.254
ip dhcp pool net2
network 101.0.0.0 255.0.0.0
default-router 101.0.0.254
dns-server 101.0.0.254
ip dhcp pool net3
network 170.21.0.0 255.255.0.0
default-router 170.21.0.254
dns-server 170.21.0.254
no ip cef
no ipv6 cef
interface FastEthernet0/0
ip address 192.168.1.254 255.255.255.0
duplex auto
speed auto
interface FastEthernet0/1
no ip address
duplex auto
speed auto
shutdown
interface Serial0/0
no ip address
clock rate 2000000
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 2
network 10.0.0.0
network 101.0.0.0
network 192.168.1.0
ip classless
ip route 170.21.0.0 255.255.0.0 10.0.0.2
ip route 101.0.0.0 255.0.0.0 10.0.0.2
ip flow-export version 9
line con 0
line aux 0
line vty 0 4
login
end
```

Router 1:

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

Current configuration : 993 bytes
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Router
no ip cef
no ipv6 cef
interface FastEthernet0/0
ip address 101.0.0.254 255.0.0.0
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 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 101.0.0.0
network 170.21.0.0
network 192.168.1.0
ip classless
ip route 170.21.0.0 255.255.0.0 11.0.0.2
ip route 192.168.1.0 255.255.255.0 10.0.0.1
ip flow-export version 9
line con 0
```

```
line aux 0
line vty 0 4
login
```

```
end
```

Router 2;

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

```
Current configuration : 948 bytes
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
hostname Router
no ip cef
no ipv6 cef
interface FastEthernet0/0
ip address 170.21.0.254 255.255.0.0
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 101.0.0.0
network 170.21.0.0
```

```
ip classless
ip route 192.168.1.0 255.255.255.0 11.0.0.1
ip route 101.0.0.0 255.0.0.0 11.0.0.1
ip flow-export version 9
line con 0
line aux 0
line vty 0 4
login
end
```

Router reports show all configurations

Evaluation

Avoid first person terms

The project requirements have been fulfilled. We have established three local area networks (LANs) connected through two wide area networks (WANs). Each LAN has its own unique IP addressing using network classes A, B, and C.

Initially, we manually configured every device and router from the terminal for static routing. However, to enhance routing efficiency, we later implemented dynamic routing. Remote configuration was possible if the router's IP address was known. To simplify IP address allocation, we added DHCP (Dynamic Host Communication Protocol) routing, which automatically assigns IP addresses to connected devices. We also had the flexibility to exclude specific addresses from automatic allocation if needed. After configuring each router and device, we tested the networks by simulating communication using the built-in feature in the packet tracer system. The communication between devices was successfully transmitted.

These practical applications align with our research.

Evaluation includes significant points, however, you must avoid first person terms.

Element 2

Introduction

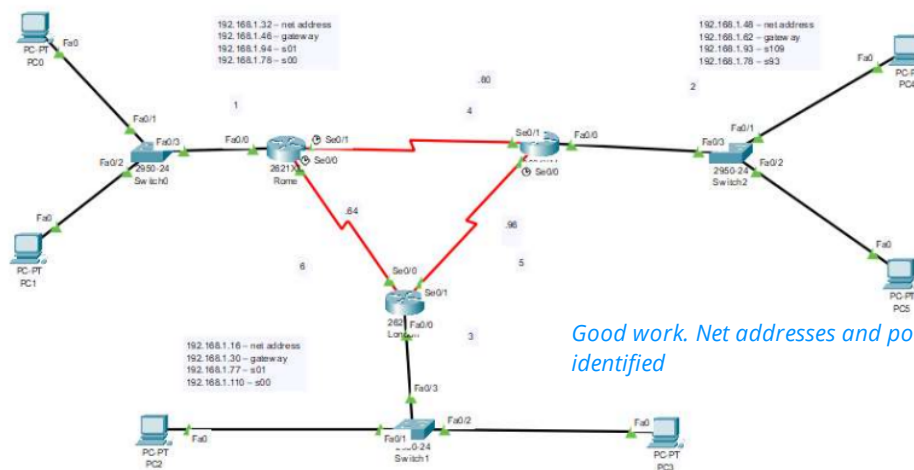
You must avoid first person terms

In this section, we will look into the knowledge and understanding of the previous element. A new network was established, consisting of three local area networks (LAN) connected through three wider area networks (WAN). To gain a better understanding of CIDR (Classless Inter-domain Routing), we utilized CIDR/28 throughout the network. Additionally, we explored how RIP routing can be implemented in WAN, along with CIDR/27, CID/30, Virtual Local Area Network (VLAN), and Access Control List (ACL). By implementing VLANs, we were able to merge the networks into a single broadcast domain.

Good point included, but avoid first person terms

Implementation

CIDR 28



Good work. Net addresses and port allocation are identified

Networking Subnetting CIDR/28

CIDR/28 London Network 3 Lan address 16. (192.168.1.16)

Subnet mask	1	1	1	1	0	0	0	0	255.255.255.240 /28
	0	0	0	0	0	0	0	0	Not used
Net add 16	0	0	0	1	0	0	0	1	Lowest host add 17
Net add 16	0	0	0	1	0	0	1	0	Next host add 18
Default gateway	0	0	0	1	1	1	1	0	Fast Ethernet 0/0 add 30
Broadcast	0	0	0	1	1	1	1	1	Broadcast 31

CIDR/28 Rome Network 1 Lan address 32. (192.168.1.32)

Subnet mask	1	1	1	1	0	0	0	0	255.255.255.240 /28
	0	0	0	0	0	0	0	0	Not used
Net add 32	0	0	1	0	0	0	0	1	Lowest host addr 33
Net addr 32	0	0	1	0	0	0	1	0	Next host addr 34
Default gateway	0	0	1	0	1	1	1	0	Fast Ethernet 0/0 addr 46
Broadcast	0	0	1	0	1	1	1	1	Broadcast 47

CIDR/28 Paris Network 2 Lan address 48. (192.168.1.48)

Subnet mask	1	1	1	1	0	0	0	0	255.255.255.240 /28
	0	0	0	0	0	0	0	0	Not used
Net addr 48	0	0	1	1	0	0	0	1	Lowest host addr 49
Net addr 48	0	0	1	1	0	0	1	0	Next host addr 50
Default gateway	0	0	1	1	1	1	1	0	Fast Ethernet 0/0 addr 62
Broadcast	0	0	1	1	1	1	1	1	Broadcast 63

Good work. LAN net addresses are established

WAN Networks 4, 5 and 6

London – Rome Network 6 Network address 64

London Router	0	1	0	0	1	1	0	1	Serial 0/0 addr 77
Rome Router	0	1	0	0	1	1	1	0	Serial 0/1 addr 78

Rome – Paris Network 4 Network address 80

Paris Router	0	1	0	1	1	1	0	1	Serial 0/0 addr 93
Rome Router	0	1	0	1	1	1	1	0	Serial 0/0 addr 94

Paris –London Network 5 Network address 96

Paris Router	0	1	1	0	1	1	0	1	Serial 0/1 addr 109
London Router	0	1	1	0	1	1	1	0	Serial 0/1 addr 110

Serial link addresses are established

RIP Routing Table for Rome

Type	Network	Port	Next Hop IP	Metric
C	192.168.1.16/28	FastEthernet0/0	---	0/0
R	192.168.1.32/28	Serial0/0	192.168.1.78	120/1
R	192.168.1.48/28	Serial0/1	192.168.1.109	120/1
C	192.168.1.64/28	Serial0/0	---	0/0
R	192.168.1.80/28	Serial0/0	192.168.1.78	120/1
R	192.168.1.80/28	Serial0/1	192.168.1.109	120/1
C	192.168.1.96/28	Serial0/1	---	0/0

RIP Routing Table for Paris

Type	Network	Port	Next Hop IP	Metric
R	192.168.1.16/28	Serial0/1	192.168.1.77	120/1
C	192.168.1.32/28	FastEthernet0/0	---	0/0
R	192.168.1.48/28	Serial0/0	192.168.1.93	120/1
C	192.168.1.64/28	Serial0/1	---	0/0
C	192.168.1.80/28	Serial0/0	---	0/0
R	192.168.1.96/28	Serial0/1	192.168.1.77	120/1
R	192.168.1.96/28	Serial0/0	192.168.1.93	120/1

RIP routing table for London router

Type	Network	Port	Next Hop IP	Metric
R	192.168.1.16/28	Serial0/1	192.168.1.110	120/1
R	192.168.1.32/28	Serial0/0	192.168.1.94	120/1
C	192.168.1.48/28	FastEthernet0/0	---	0/0
R	192.168.1.64/28	Serial0/1	192.168.1.110	120/1
R	192.168.1.64/28	Serial0/0	192.168.1.94	120/1
C	192.168.1.80/28	Serial0/0	---	0/0
C	192.168.1.96/28	Serial0/1	---	0/0

Tables are correct. The config evidence is missing

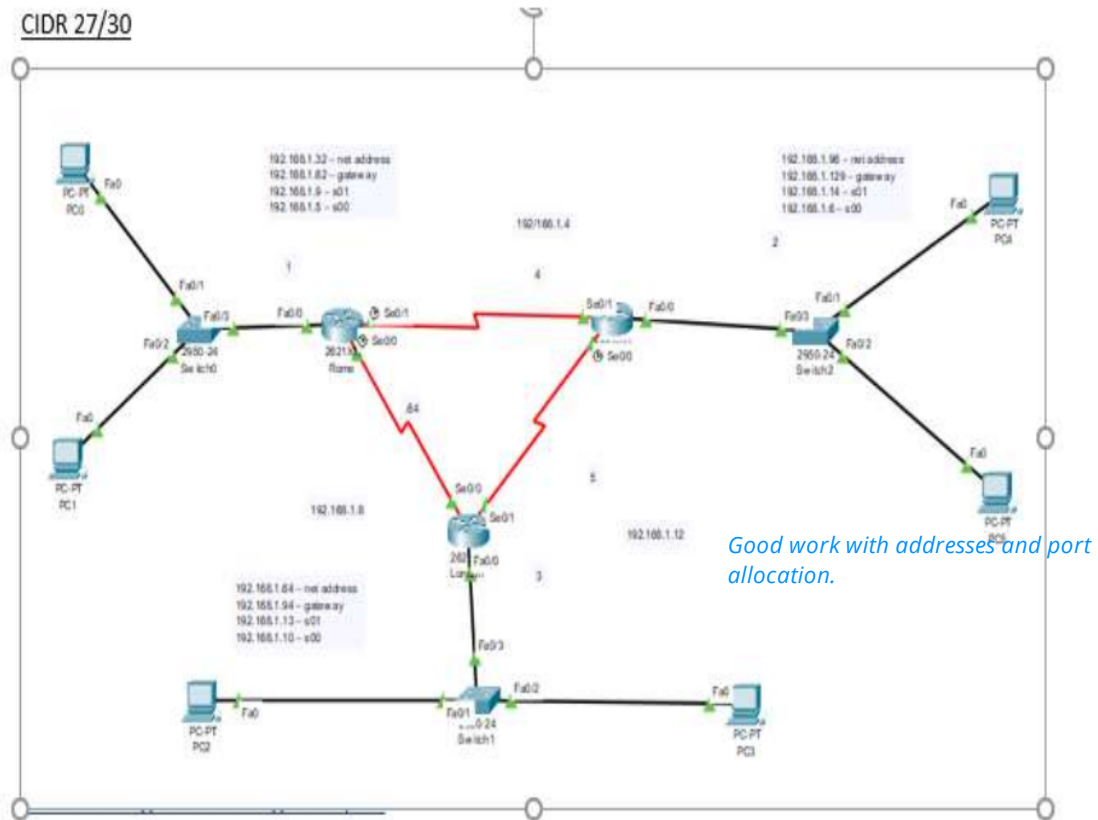
CIDR /28 Network Test

PDU List Window								
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num
	Successful	PC3	PC5	ICMP		0.000	N	
	Successful	PC4	PC2	ICMP		0.000	N	
	Successful	PC2	PC1	ICMP		0.000	N	
	Successful	PC0	PC3	ICMP		0.000	N	
	Successful	PC5	PC1	ICMP		0.000	N	

Good set of test results

Some eplanation needed here

RIP routing CIDR 27/30



3. CIDR/27 and CIDR/30

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

Good work with /27 networks

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

Good work with /30 networks

Dynamic Routing for Rome

```
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 192.168.1.32
Router(config-router)#net 192.168.1.4
Router(config-router)#net 192.168.1.8
Router(config-router)#exit
Router(config)#
Router(config)#interface Serial0/0
Router(config-if)#ip address
% Incomplete command.
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1
Router(config-if)#ip address 192.168.1.5 255.255.255.252
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0
Router(config-if)#ip address 192.168.1.9 255.255.255.252
Router(config-if)#ip address 192.168.1.9 255.255.255.252
Router(config-if)#
```

Good evidence RIP

Figure 33 Dynamic Routing for Rome

Routing Table for Rome					
Type	Network	Port	Next Hop IP	Metric	
C	192.168.1.4/30	Serial0/1	---	0/0	
C	192.168.1.8/30	Serial0/0	---	0/0	
R	192.168.1.12/30	Serial0/1	192.168.1.6	120/1	
C	192.168.1.32/27	FastEthernet0/0	---	0/0	
R	192.168.1.64/27	Serial0/0	192.168.1.10	120/1	
R	192.168.1.96/27	Serial0/1	192.168.1.6	120/1	

Figure 34 Routing Table for Rome

Dynamic Routing for Paris

```
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 192.168.1.64
Router(config-router)#net 192.168.1.8
Router(config-router)#net 192.168.1.12
Router(config-router)#exit
Router(config)#
Router(config-router)#net 192.168.1.96
Router(config-router)#net 192.168.1.4
Router(config-router)#net 192.168.1.12
Router(config-router)#exit
Router(config)#
```

Good evidence RIP

Figure 36 Dynamic Routing for Paris

Routing Table for Paris

Type	Network	Port	Next Hop IP	Metric
C	192.168.1.4/30	Serial0/1	---	0/0
R	192.168.1.8/30	Serial0/0	192.168.1.13	120/1
R	192.168.1.8/30	Serial0/1	192.168.1.5	120/1
C	192.168.1.12/30	Serial0/0	---	0/0
R	192.168.1.32/27	Serial0/1	192.168.1.5	120/1
R	192.168.1.64/27	Serial0/0	192.168.1.13	120/1

Figure 37 Routing Table for Paris

Dynamic Routing for London

Routing Table for London				
Type	Network	Port	Next Hop IP	Metric
R	192.168.1.4/30	Serial0/1	192.168.1.14	120/1
R	192.168.1.4/30	Serial0/0	192.168.1.9	120/1
C	192.168.1.8/30	Serial0/0	---	0/0
C	192.168.1.12/30	Serial0/1	---	0/0
R	192.168.1.32/27	Serial0/0	192.168.1.9	120/1
C	192.168.1.64/27	FastEthernet0/0	---	0/0

Figure 38 Routing Table for London

```
London(config)#router rip
London(config-router)#ver 2
London(config-router)#net 192.168.1.64
London(config-router)#net 192.168.1.12
London(config-router)#net 192.168.1.8
London(config-router)#exit
London(config)#
```

Good evidence RIP

```
London con0 is now available
```

Router tables are correct

Networking Subnetting CIDR 27/30

CIDR 27/30 Test Table

PDU List Window								
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num
	Successful	PC3	PC5	ICMP		0.000	N	4
	Successful	PC4	PC2	ICMP		0.000	N	3
	Successful	PC2	PC1	ICMP		0.000	N	3
	Successful	PC0	PC3	ICMP		0.000	N	3
	Successful	PC5	PC1	ICMP		0.000	N	4

Good set of test results

VLANS London Router/Switch for CIDR/27 Sub Network

VLANS London Router/Switch for CIDR/27 sub network

FastEthernet 0/0.1 0 1 0 1 1 1 1 0 Net addr 64 i/f addr 94 *Inter-Vlan routing is identified with trunking for gateways*

FastEthernet 0/0.2 1 0 0 1 1 1 1 0 Net addr 128 i/f addr 158

PC1 London 0 1 0 0 0 0 0 1 Net addr 64 host addr 65

PC2 London 1 0 0 0 0 0 0 1 Net addr 128 host addr 129

London Router – FastEthernet 0/0.1 ip address 192.168.1.94 255.255.255.224

London Router – FastEthernet 0/0.2 ip address 192.168.1.158 255.255.255.224

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#show ip int brie
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0    unassigned      YES unset   up          up
FastEthernet0/0.2  192.168.1.94    YES manual   up          up
FastEthernet0/0.3  192.168.1.158  YES manual   up          up
FastEthernet0/1    unassigned      YES unset   up          down
Serial0/0          unassigned      YES unset   up          up
Serial0/1          unassigned      YES unset   up          up
London#
```

Good evidence

Evaluation

Good point here

Element 2 aimed to implement Classless Inter-domain Routing (CIDR) and Virtual Local Area Network (VLAN) in a network. Tables were created to determine the necessary IP addresses, including host and broadcast IP addresses. CIDR/28 routes, CIDR/27, and CIDR/30 were applied using version 2 RIP routing, which helped identify the gateway and verify the *CIDR*.

Two methods were successfully used to locate the applied routes: using the '#show ip route' command on the command line interface or accessing the router's routing tables. To test the CIDR, packets were transferred between devices across WANs and different LANs. All tests were completed successfully, and any errors were corrected.

Good points included

Element 3

Introduction

Avoid first person terms

In this part, we will further develop our knowledge and understanding of the second part. We utilized the London LAN from the second part and set up a physical LAN for practical purposes. Two PCs were used and set up, one for the network terminal and the other for the PLC terminal. VLANs were applied throughout the LAN. After configuring the network, we also configured a Siemens webserver to be used on the London WAN. This allowed us to adjust speeds and control the duty cycle of a motor, showcasing the capabilities of Industry 4.0.

Good points highlighted, but must avoid first person terms

System Configuration

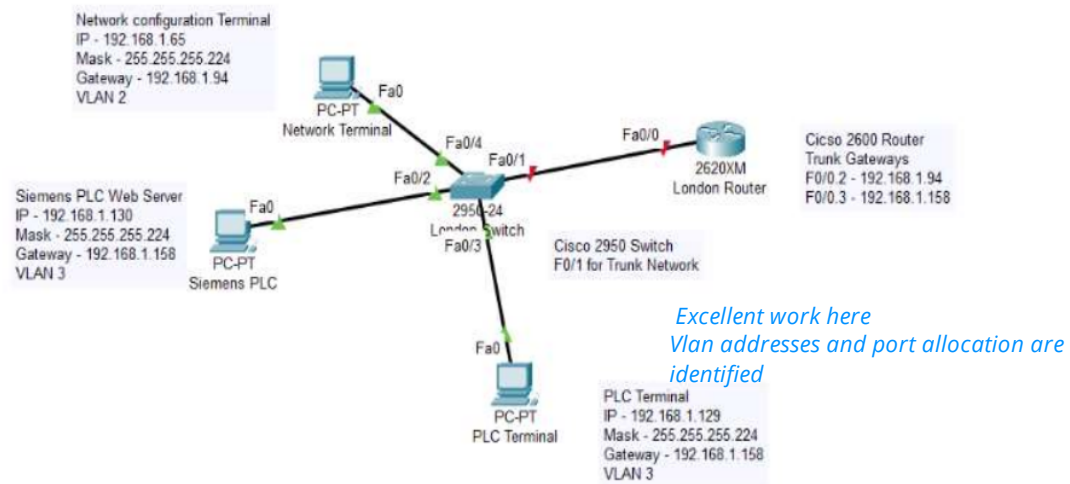


Figure 39 Network Topology

Heading needed here

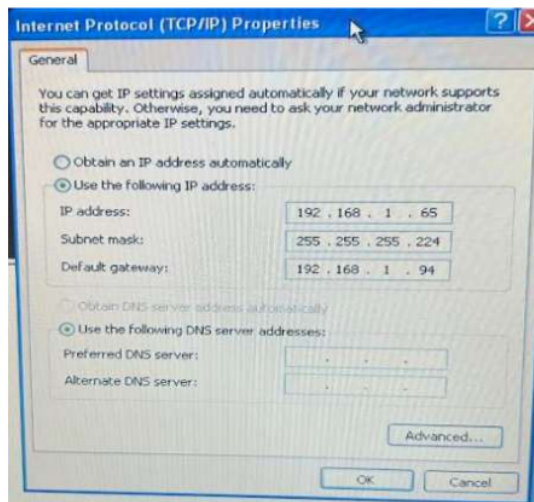


Figure 40 System Configuration

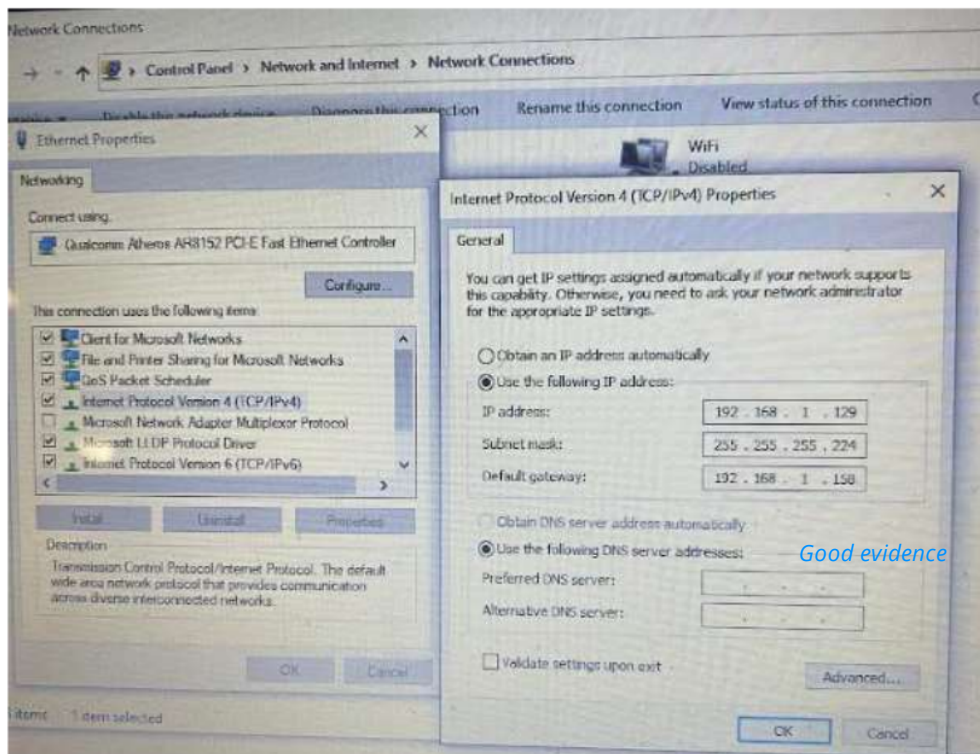
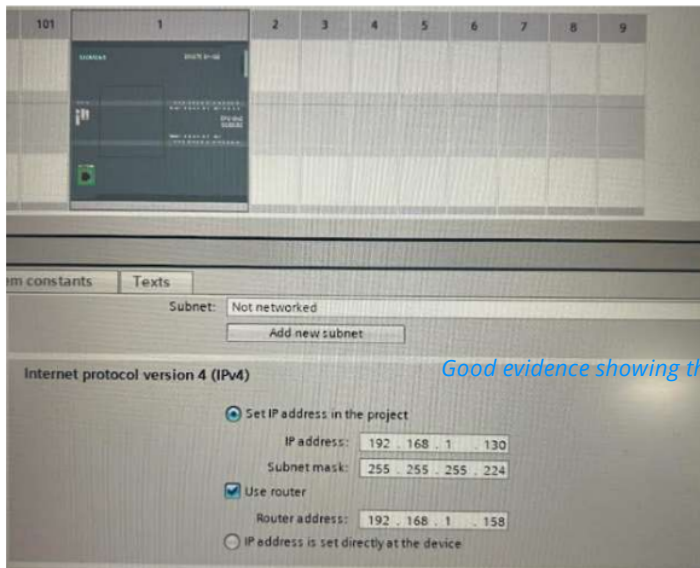
Good image of practical setup

Implementation

VLAN Configuration;



Good evidence



There should be a headin here for testing Vlan

```
Select Command Prompt
Microsoft Windows [Version 10.0.19045.2965]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Leila>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::b953:bd34:e912:509%14
    IPv4 Address. . . . . : 192.168.1.129
    Subnet Mask . . . . . : 255.255.255.224
    Default Gateway . . . . . : 192.168.1.158

C:\Users\Leila>
```

```
Command Prompt
C:\Documents and Settings\Administrator>ping 192.168.1.130

Pinging 192.168.1.130 with 32 bytes of data:

Reply from 192.168.1.130: bytes=32 time=5ms TTL=29
Reply from 192.168.1.130: bytes=32 time<1ms TTL=29
Reply from 192.168.1.130: bytes=32 time<1ms TTL=29
Reply from 192.168.1.130: bytes=32 time=1ms TTL=29

Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 1ms

C:\Documents and Settings\Administrator>
```

Successful test from host

```
ca Command Prompt
C:\Documents and Settings\Administrator>ping 192.168.1.130
Pinging 192.168.1.130 with 32 bytes of data:
Reply from 192.168.1.130: bytes=32 time=5ms TTL=29
Reply from 192.168.1.130: bytes=32 time<1ms TTL=29
Reply from 192.168.1.130: bytes=32 time<1ms TTL=29
Reply from 192.168.1.130: bytes=32 time=1ms TTL=29
Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 1ms
C:\Documents and Settings\Administrator>ipconfig
'ipconfig' is not recognized as an internal or external command,
operable program or batch file.
C:\Documents and Settings\Administrator>ipconfig
Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : 192.168.1.65
    Subnet Mask . . . . . : 255.255.255.224
    Default Gateway . . . . . : 192.168.1.94
C:\Documents and Settings\Administrator>
```

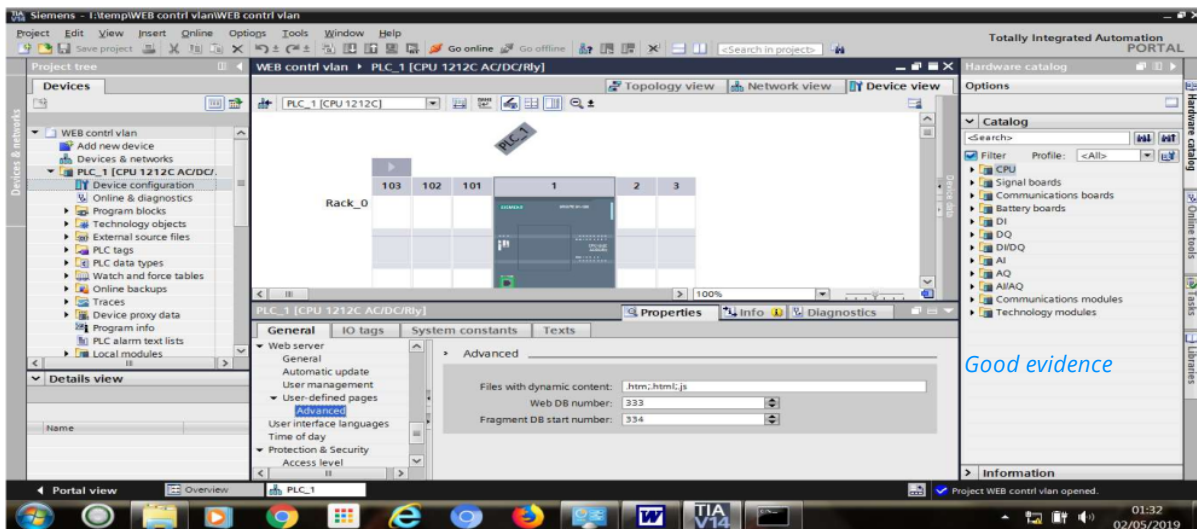
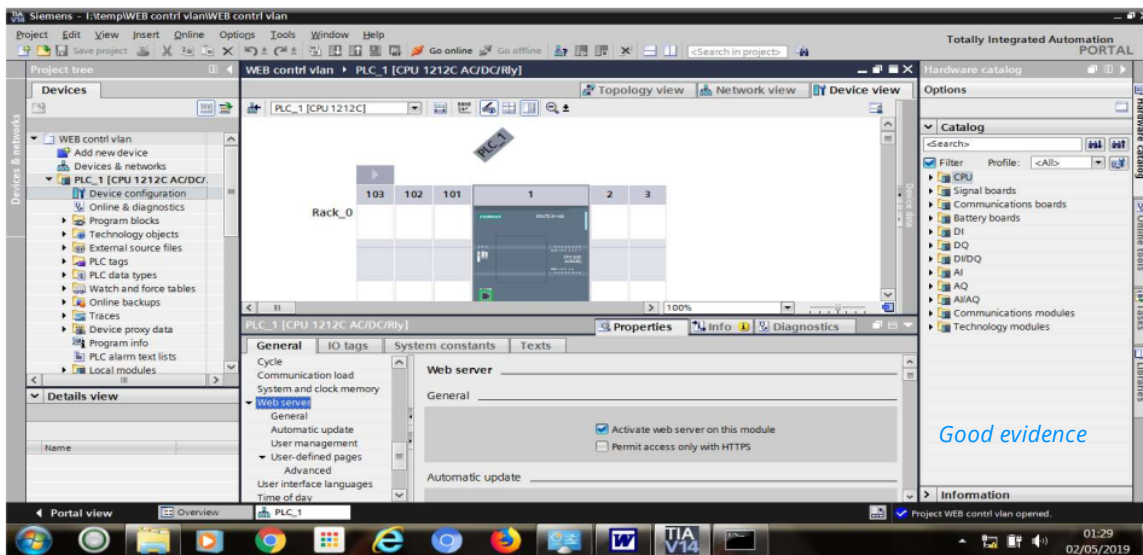
```
ca Command Prompt
Link-local IPv6 Address . . . . . : fe80::b953:bd34:e912:509%14
IPv4 Address. . . . . : 192.168.1.129
Subnet Mask . . . . . : 255.255.255.224
Default Gateway . . . . . : 192.168.1.158

C:\Users\Leila>ping 192.168.1.65
Pinging 192.168.1.65 with 32 bytes of data:
Reply from 192.168.1.65: bytes=32 time<1ms TTL=127
Reply from 192.168.1.65: bytes=32 time<1ms TTL=127
Reply from 192.168.1.65: bytes=32 time=1ms TTL=127
Reply from 192.168.1.65: bytes=32 time<1ms TTL=127
Ping statistics for 192.168.1.65:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\Users\Leila>ping 192.168.1.130
Pinging 192.168.1.130 with 32 bytes of data:
Reply from 192.168.1.130: bytes=32 time<1ms TTL=30
Reply from 192.168.1.130: bytes=32 time<1ms TTL=30
Reply from 192.168.1.130: bytes=32 time<1ms TTL=30
Reply from 192.168.1.130: bytes=32 time<1ms TTL=30
Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Successful tests across Vlans from hosts

Tests are good, but these need to be identified with a heading

Activate the web server for the PLC;



Here the file extensions are .html, .htm and .js
Other file extensions can be .json.
HTML – Hypertext Markup Language
HTM – Allowable short version of HTML. Both extensions are permitted.

.js – javascript (jquery, ajax)

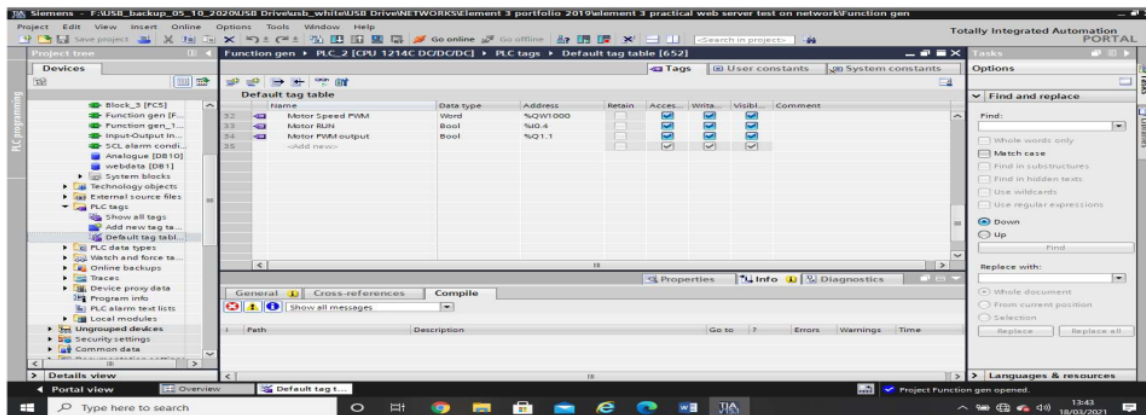
.json – an extension library of javascript

The .js generally is not accepted on PLC models lower than 1500. Therefore the .js program can be embedded in the HTML or HTM using .json.

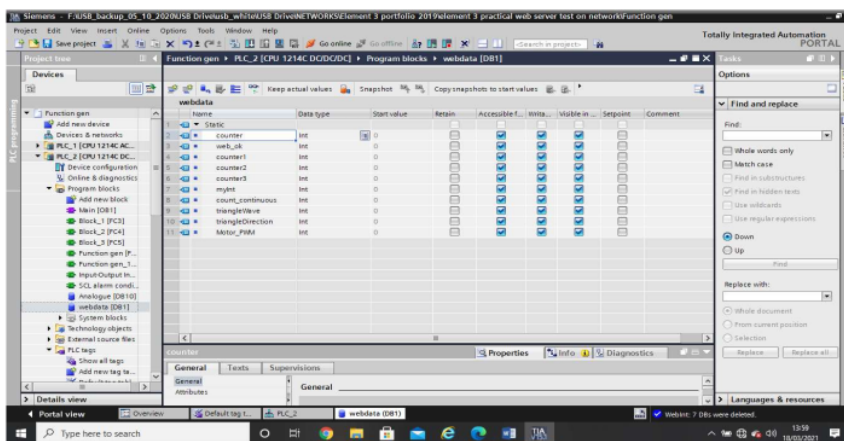
Graphic extensions can be used also such as .png and .gif and can be embedded in the ajax scripts. The LED's are .png images.

program files are identified

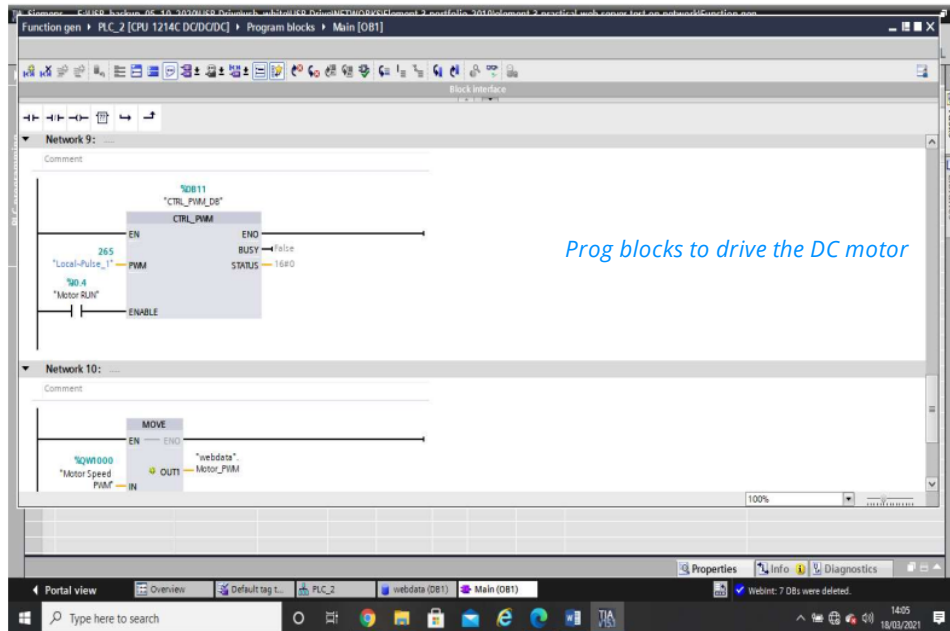
Create the default tags for motor control and monitor:



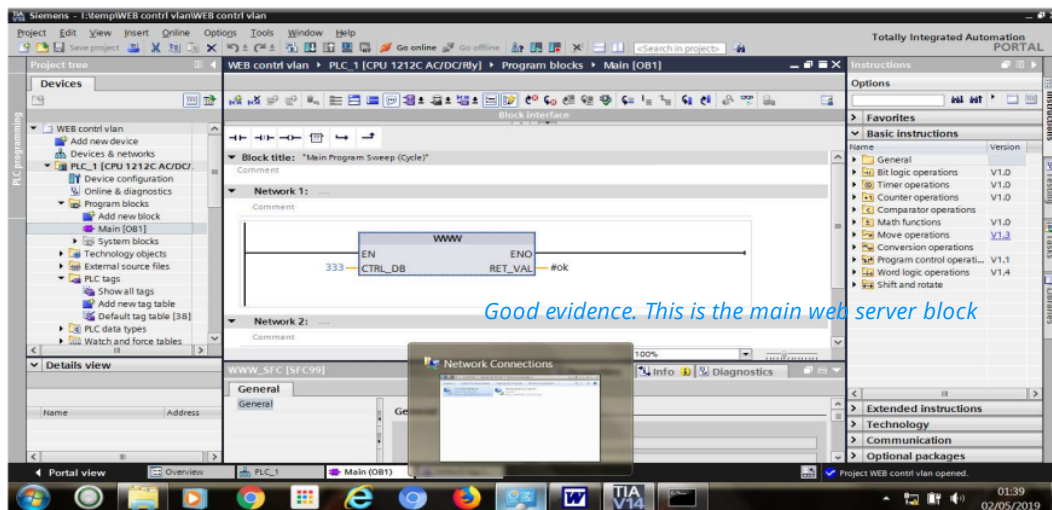
Create the tags in the web data [DB1] data block:



The Motor drive PWM function is in the main part of the PLC program:

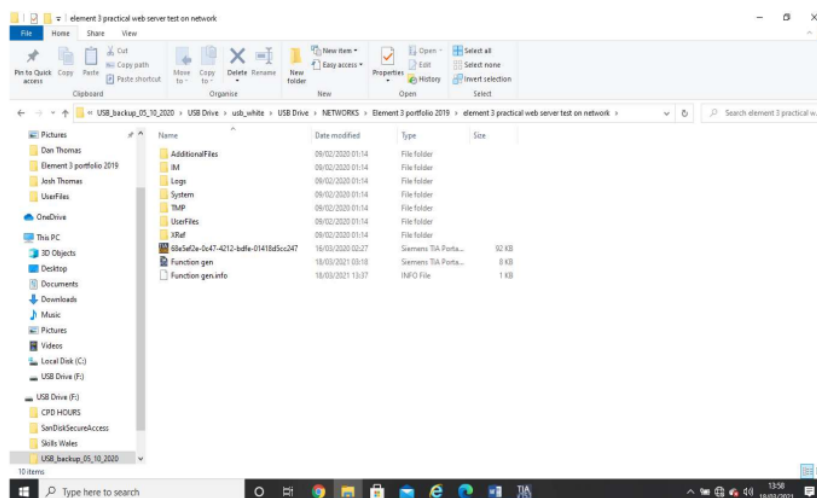
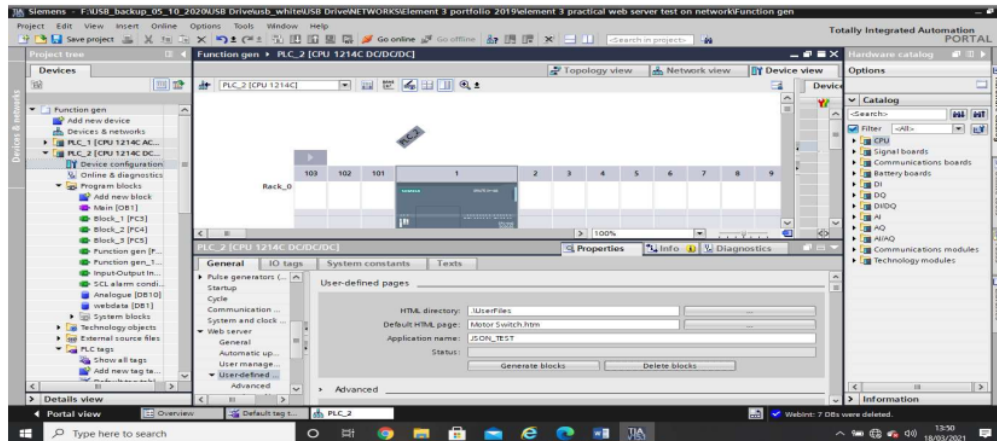


In the main function block add the web server as shown below;



The web server is now configured and is ready for web pages to be downloaded.

Download the index .html page with the http:// source for the Motor Switch.htm page as shown.



Good evidence of the setup

A short embedded program using HTML and two images can visually represent PLC conditions.

This is the way that Industry 4.0 is being developed especially with PLC's. The next development stage is to implement the Javascript libraries such as jquery and json which enable real time data monitoring without page refresh. This will have a smoother graphic and increased speed of data refresh.

Applications such as motor speed control and variable data values can be implemented as web pages for remote control and monitoring.

The pages here are in the 'UserFiles' and include: Motor Switch.htm which is the main file downloaded to the PLC server.

Good explanation

VLAN

```
Switch>enable
```

```
Switch#conf t
```

```
Switch(config)#vlan 2
```

```
Switch(config-vlan)#name vlan2
```

```
Switch(config-vlan)#exit
```

```
Switch(config)#vlan 3
```

```
Switch(config-vlan)#name vlan3
```

```
Switch(config-vlan)#exit
```

```
Switch(config)#^Z
```

```
Switch#show vlan
```

```
////////////////////////////////report on vlan config////////////////////////////////
```

```
Switch#conf t
```

```
Switch(config)#int f0/2
```

```
Switch(config-if)#switchport mode access
```

```
Switch(config-if)#switchport access vlan 3
```

```
Switch(config-if)#exit
```

```
Switch(config)#int f0/3
```

```
Switch(config-if)#switchport mode access
```

```
Switch(config-if)#switchport access vlan 3
```

```
Switch(config-if)#exit
```

```
Switch(config)#int f0/4
```

```
Switch(config-if)#switchport mode access
```

```
Switch(config-if)#switchport access vlan 2
```

```
Switch(config-if)#exit
```

```
Switch(config)#^Z
```

```
Switch#
```

```
Switch#show vlan
```

```
////////report shows vlans with port config////////
```

End of VLAN configuration

Inter VLAN routing

Switch config:

```
Switch#conf t
```

```
Switch(config)#int f0/1
```

```
Switch(config-if)#switchport mode trunk
```

```
Switch(config-if)#^Z
```

```
Switch#
```

```
Switch#show interface trunk
```

```
//////////report shows trunk config//////////
```

```
//////////might have to show this again after router config//////////
```

Router config:

```
Router>enable
```

```
Router#conf t
```

```
Router(config)#int f0/0
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#exit
```

```
Router(config)#int f0/0
```

```
Router(config-if)#no ip address
```

```
Router(config-if)#exit
```

```
Router(config)#int f0/0.2
```

```
Router(config-subif)#encapsulation dot1Q 2
```

```
Router(config-subif)#ip address 192.168.1.94 255.255.255.224
```

```
Router(config-subif)#no shutdown
```

```
Router(config-subif)#exit
```

```
Router(config)#int f0/0.3
```

```
Router(config-subif)#encapsulation dot1Q 3
```

```
Router(config-subif)#ip address 192.168.1.158 255.255.255.224
```

Router(config-subif)#no shutdown

Router(config-subif)#exit

Router(config)#^Z

Good evidence of Vlan config

Router#show ip interfaces brie

//////////report int status for f0/0.2 and f0/0.3//////////

Router#show run

//////////running config for router//////////

Note: Don't forget to implement the gateways on the PC's and PLC

PLC gateway – 192.168.1.158

Terminal PC – 192.168.1.94

PLC program control PC – 192.168.1.158

Reset the Cisco Switch:

Switch#delete vlan.dat

Switch#reload

Reset the Cisco Router:

Router#erase startup-config

Router#reload

Test the ip config of any PC form the command line:

C>ipconfig

Discrepancies from VLAN Element 2:

Switch used in Element 2 system – 2950-24 – this is a 24-channel switch

Switch used in Element 3 system – 2950-12 – this is a 12-channel switch

The Trunk port used in Element 2 was F0/24

The trunk port used in Element 3 was F0/1

Testing the dynamics of the PLC

This is an example of a developed web system to control the speed of a motor using JavaScript technology.

The program was written using jQuery using Ajax and JSON libraries and is the future development of industry 4.0. *This is a good point*

DC motor running with 20% PWM duty cycle selected and motor run status off:

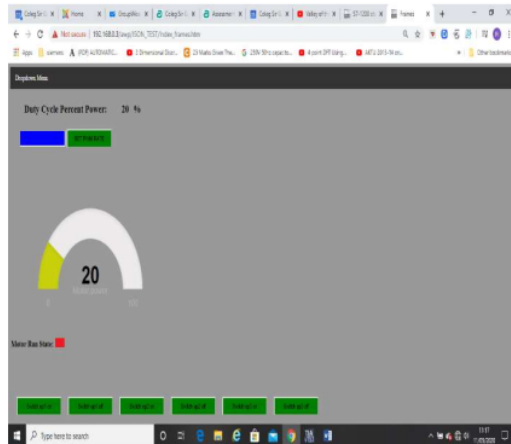


Figure 41 Test 1

Good evidence of test from browser page

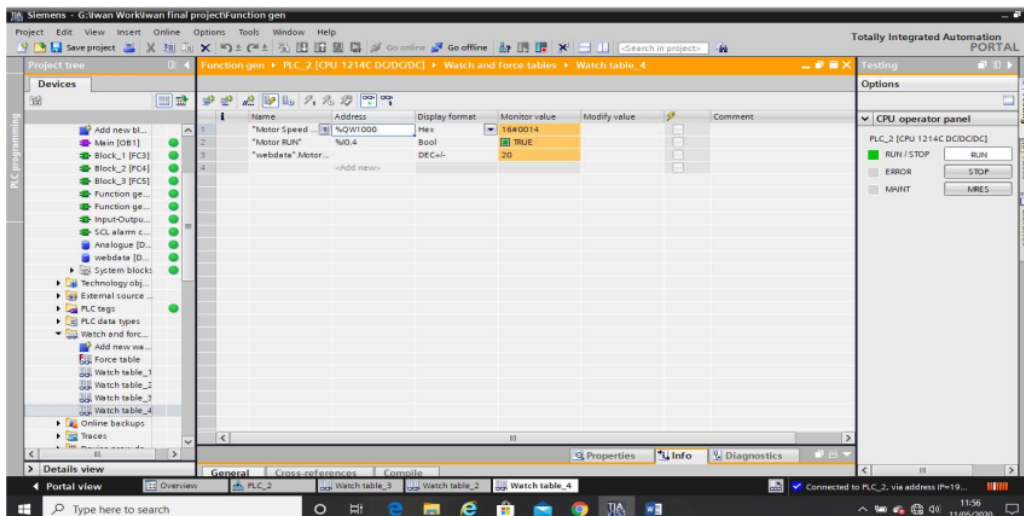


Figure 42 Watch table for Test 1

DC motor running with 35% PWM duty cycle selected and motor run status on:

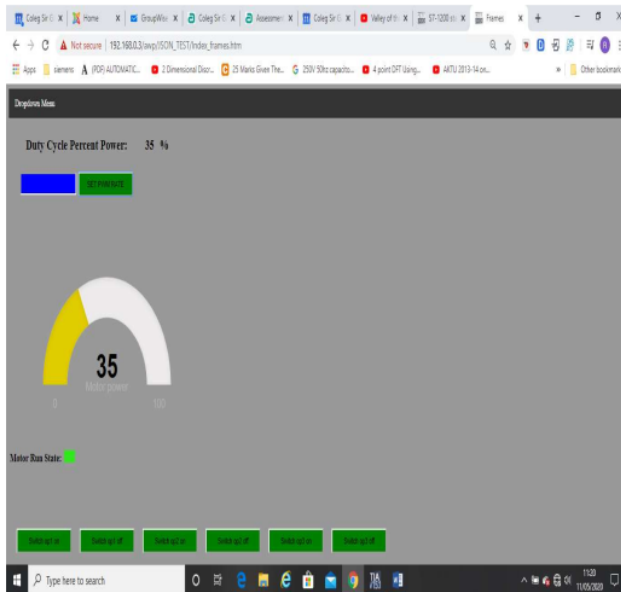


Figure 43 Test 2

Good test evidence from browser page

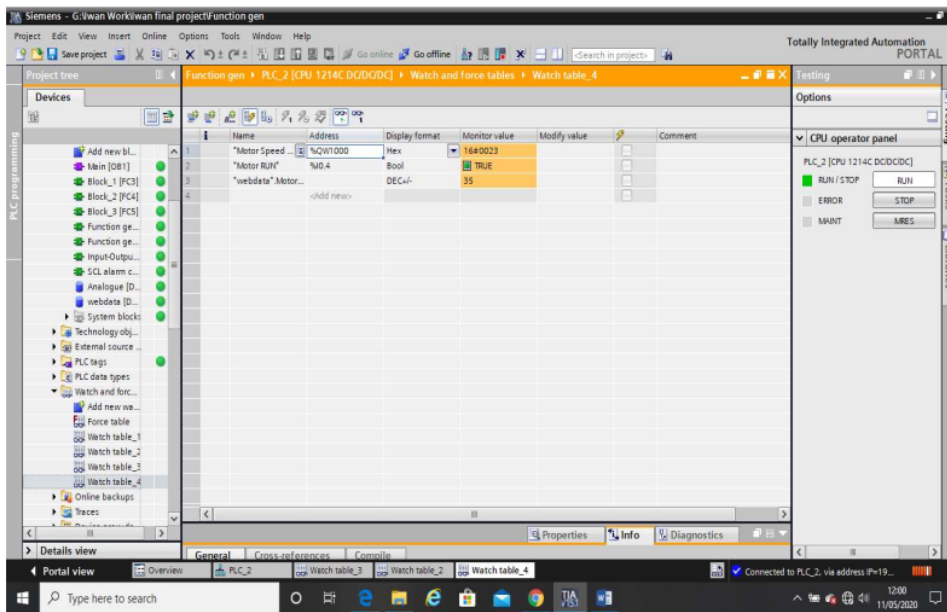


Figure 44 Test Table for Test 2

Evaluation

The final part of the project has shown that simple HTML programs can replicate the conditions of a PLC. The program was created using Query and JSON libraries, which are the future of Industry 4.0. Although the motor's operation was only tested with nearby PLCs and PCs, it was still considered a successful implementation and test. In a real-world scenario, with some security adjustments, this network could function on a much larger scale, spanning across industrial plants or even countries. This is the fundamental idea behind Industry 4.0, where all devices are connected and communicate with each other, providing engineers and operators with detailed information and the possibility of self-diagnostics. As PLC systems continue to improve and JavaScript is applied, web pages could become more complex. With proper security measures, global access to the PLC for monitoring purposes becomes a real possibility.

Good evaluation

*Good
significant
point*

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Good number of sources

62/100

PAGE 1

PAGE 2

Text Comment. Good extensive list of figures

PAGE 3

PAGE 4

Text Comment. Good detailed table of contents

PAGE 5

Text Comment. routing

Text Comment. Good intro

PAGE 6

Text Comment. Good comparative diagram

Text Comment. Citation is correct

Text Comment. Reasonable explanation to differentiate between the two models

Text Comment. Good table of comparison. This would have been better in a table of your own creation

Text Comment. Model layers are identified

Text Comment. Citation is correct

Text Comment. Two very good diagrams that show the encapsulation transmit and decapsulation receive.

Text Comment. Citation is correct

Text Comment. Good explanation

Text Comment. Good relevant image

Text Comment. There should be a ref here

Text Comment. Citation is correct

Text Comment. The solution should be further explained

Text Comment. Relevant diagram

Text Comment. Good point. The ports are software ports

Text Comment. Good useful diagram

Text Comment. There could have been some common port allocation examples given here to support the diagram

Text Comment. Port allocation is identified, there should also be the network addresses here.

Text Comment. Router addresses should be listed here as part of schematic

Text Comment. There is no need for this diagram as this is the same as above.
Duplicated.

Text Comment. This should be headed as static routing

Text Comment. Table is correct

Text Comment. Good evidence

Text Comment. Table is correct

Text Comment. Good evidence

Text Comment. Tabl is correct

Text Comment. Good evidence

Text Comment. This needs to be named as static routing test

Text Comment. Good set of test results

Text Comment. Table is correct

Text Comment. Good evidence of config

Text Comment. Table is correct

Text Comment. Good evidence of config

PAGE 21

Text Comment. Table is correct

Text Comment. Good evidence of config

PAGE 22

Text Comment. This does not need to be duplicated

Text Comment. Heading needed here to indicate test of dynamic routing RIP

Text Comment. Good set of test results

PAGE 23

Text Comment. Good test showing error

PAGE 24

Text Comment. Good test with helper addresses configured. Errors have been corrected

PAGE 25

Text Comment. Good evidence of exclusion addresses. First 10 addresses are taken.

PAGE 26

Text Comment. Good test results showing first 10 addresses excluded

Text Comment. Good point made

PAGE 27

PAGE 28

PAGE 29

PAGE 30

Text Comment. Router reports show all configurations

Text Comment. Avoid first person terms

Text Comment. Evaluation includes significant points, however, you must avoid first person terms.

PAGE 31

Text Comment. You must avoid first person terms

Text Comment. Good point included, but avoid first person terms

Text Comment. Good work. Net addresses and port allocation are identified

PAGE 32

Text Comment. Good work. LAN net addresses are established

PAGE 33

Text Comment. Serial link addresses are established

PAGE 34

PAGE 35

Text Comment. Tables are correct. The config evidence is missing

Text Comment. Good set of test results

Text Comment. Some eplanation needed here

PAGE 36

Text Comment. Good work with addresses and port allocation.

PAGE 37

Text Comment. Good work with /27 networks

Text Comment. Good work with /30 networks

Text Comment. Good evidence RIP

Text Comment. Good evidence RIP

Text Comment. Good evidence RIP

Text Comment. Router tables are correct

Text Comment. Good set of test results

Text Comment. Inter-Vlan routing is identified with trunking for gateways

Text Comment. Good evidence

Text Comment. Good point here

Text Comment. CIDR

Text Comment. Good points included

Text Comment. Avoid first person terms

Text Comment. Good points highlighted, but must avoid first person terms

Text Comment. Excellent work here

Text Comment. Vlan addresses and port allocation are identified

Text Comment. Heading needed here

Text Comment. Good image of practical setup

Text Comment. Good evidence

PAGE 45

Text Comment. Good evidence showing the Vlan gateway config on PLC

Text Comment. Good evidence

PAGE 46

Text Comment. There should be a headin here for testing Vlan

Text Comment. Successful test from host

PAGE 47

Text Comment. Successful tets across Vlans from hosts

Text Comment. Tests are good, but these need to be identified with a heading

PAGE 48

Text Comment. Good evidence

Text Comment. Good evidence

PAGE 49

Text Comment. program files are identified

PAGE 50

Text Comment. Prog blocks to drive the DC motor

Text Comment. Good evidence. This is the main web server block

PAGE 51

Text Comment. Good evidence of the setup

Text Comment. Good explanation

PAGE 52

PAGE 53

PAGE 54

PAGE 55

Text Comment. Good evidence of Vlan config

PAGE 56

Text Comment. This is a good point

Text Comment. Good evidence of test from browser page

PAGE 57

Text Comment. Good test evidence from browser page

PAGE 58

Text Comment. Good significant point

Text Comment. Good evaluation

PAGE 59

Text Comment. Good number of sources

GRADING FORM: CSG-RUBIC

AARON LUPTON

0

RESEARCH-INFORMED LITERATURE



Research includes good relative points supported with good diagrams. There are parts where further explanations and examples should have been included.

Good number of sources used.

6/10

KNOWLEDGE AND UNDERSTANDING



E1. Net addresses not identified on net diagram for requirements. Serial port addresses are missing from address schematic.

Duplicated diagram is unnecessary.

Reasonable evaluation.

Missing headings to identify content in parts.

Missing config evidence for DHCP. This could have been explained if no evidence is available. This is evident in the router reports. 6/10

E2. Config evidence missing for RIP routing /28.

Explanations missing in parts. 6/10

E3. Headings missing to identify content. 6/10

All sections have been implemented. Explanations and headings would have improved structure.

18/30

ANALYSIS



E1. Test explanations are limited and missing in parts. Test evidence is included. 3/5

E2. Test results prove the operation of the network for all CIDR arrangements. The VLAN is developed from the final CIDR design and tests prove the configuration. 6.5/10

E3. Practical VLAN is implemented and tested. No explanations are included for the ping test for

16/25

Vlans. PLC is tested using browser and DC motor was controlled. 6.5/10

PRACTICAL APPLICATION AND DEP.



E1. Tasks have been carried out to meet requirements. Explanations are limited in parts.

Tests proved the network operation. 3/5

E2. Implementation evidence for CIDR has been carried out successfully.

Some parts have limited explanations. The tests are successful that prove configurations. 3/5

E3. Practical network has been successfully implemented and tested. PLC test evidence to match browser is included and explained.

Prac test carried out is good, but headings should be used to identify tasks. 6/10

12/20

SKILLS FOR PROFESSIONAL PRAC.



Report follows a logical sequence. Some headings are missing to identify content.

10/15