



MIDDLE EAST TECHNICAL UNIVERSITY
NORTHERN CYPRUS CAMPUS

DEPARTMENT
OF COMPUTER ENGINEERING

CNG 435
Data Communications and Computer Networking
Assignment 1

Name: Mert Can
Surname: Bilgin
Student ID: 2453025

Logical Design

The IP Address: 197.25.25.0

In this logical design, each workgroup is equipped with a dedicated switch to facilitate local communication. Then the IPv4 addresses for the switches are assigned based on the next available IP addresses for each workgroup. After that, Classrooms, Labs, Admin, Staff, and Accommodation switches are each connected to a router. The IPv4 addresses for the router interfaces are set to the next available IP addresses within the respective workgroup. PCs within each workgroup are configured with gateways pointing to the router's interface. Then, routers are connected to each other using serial interfaces. The next available IP addresses in the range of 197.25.25.161-174 and 197.25.25.177-190 are used for serial interfaces. Serial interfaces are configured with IP addresses, facilitating point-to-point communication between routers. At the end, RIP is set as 197.25.25.0 for each router. Also, /28 subnets are used to provide enough usable IP addresses. The details are provided below.

Subnetting:

- Administration has 1 work group, and each work group has 9 hosts.
- Classroom has 2 work groups, and each one has 12 hosts.
- Lab has 4 work groups, and each one has 12 hosts.
- Student Accommodation has 2 work group, and each one has 12 hosts.
- Staff has 1 work group, and each one has 9 hosts.

The implementation is started with Classrooms.

Classroom-1:

- Subnet: 197.25.25.0/28
 - Network address is 197.25.25.0
 - Usable IPs: 197.25.25.1 to 197.25.25.14
 - Broadcast Address: 197.25.25.15
 - IP Addresses for PCs in Classroom-1:
 - PC 1: 197.25.25.1
 - PC 2: 197.25.25.2
 - PC 3: 197.25.25.3
 - PC 4: 197.25.25.4
 - PC 5: 197.25.25.5
 - PC 6: 197.25.25.6
 - PC 7: 197.25.25.7
 - PC 8: 197.25.25.8
 - PC 9: 197.25.25.9
 - PC 10: 197.25.25.10
 - PC 11: 197.25.25.11
 - PC 12: 197.25.25.12

Classroom-2:

- Subnet: 197.25.25.16/28
 - Network Address: 197.25.25.16
 - Usable IPs: 197.25.25.17 to 197.25.25.30
 - Broadcast Address: 197.25.25.31
 - IP Addresses for PCs in Classroom-2:
 - PC 1: 197.25.25.17
 - PC 2: 197.25.25.18
 - PC 3: 197.25.25.19
 - PC 4: 197.25.25.20
 - PC 5: 197.25.25.21
 - PC 6: 197.25.25.22
 - PC 7: 197.25.25.23
 - PC 8: 197.25.25.24
 - PC 9: 197.25.25.25

- PC 10: 197.25.25.26
- PC 11: 197.25.25.27
- PC 12: 197.25.25.28

For both classrooms, the subnet mask is 255.255.255.240.

Lab-1:

- Subnet: 197.25.25.32/28
 - Network Address: 197.25.25.32
 - Usable IPs: 197.25.25.33 to 197.25.25.46
 - Broadcast Address: 197.25.25.47
 - IP Addresses for PCs in Lab-1:
 - PC 1: 197.25.25.33
 - PC 2: 197.25.25.34
 - ...
 - PC 12: 197.25.25.44

Lab-2:

- Subnet: 197.25.25.48/28
 - Network Address: 197.25.25.48
 - Usable IPs: 197.25.25.49 to 197.25.25.62
 - Broadcast Address: 197.25.25.63
 - IP Addresses for PCs in Lab-2:
 - PC 1: 197.25.25.49
 - PC 2: 197.25.25.50
 - ...
 - PC 12: 197.25.25.60

Lab-3:

- Subnet: 197.25.25.64/28
 - Network Address: 197.25.25.64
 - Usable IPs: 197.25.25.65 to 197.25.25.78
 - Broadcast Address: 197.25.25.79
 - IP Addresses for PCs in Lab-3:
 - PC 1: 197.25.25.65
 - PC 2: 197.25.25.66
 - ...
 - PC 12: 197.25.25.76

Lab-4:

- Subnet: 197.25.25.80/28
 - Network Address: 197.25.25.80
 - Usable IPs: 197.25.25.81 to 197.25.25.94
 - Broadcast Address: 197.25.25.95
 - IP Addresses for PCs in Lab-4:
 - PC 1: 197.25.25.81
 - PC 2: 197.25.25.82
 - ...
 - PC 12: 197.25.25.92

For all Labs, the subnet mask is 255.255.255.240.

Admin:

- Subnet: 197.25.25.96/28
 - Network Address: 197.25.25.96
 - Usable IPs: 197.25.25.97 to 197.25.25.110
 - Broadcast Address: 197.25.25.111
 - IP Addresses for PCs in Administration:
 - PC 1: 197.25.25.97
 - PC 2: 197.25.25.98

- PC 3: 197.25.25.99
- PC 4: 197.25.25.100
- PC 5: 197.25.25.101
- PC 6: 197.25.25.102
- PC 7: 197.25.25.103
- PC 8: 197.25.25.104
- PC 9: 197.25.25.105

For the Administration workgroup, the subnet mask is 255.255.255.240.

Staff:

- Subnet: 197.25.25.112/28
 - Network Address: 197.25.25.112
 - Usable IPs: 197.25.25.113 to 197.25.25.126
 - Broadcast Address: 197.25.25.127
 - IP Addresses for PCs in Staff:
 - PC 1: 197.25.25.113
 - PC 2: 197.25.25.114
 - PC 3: 197.25.25.115
 - PC 4: 197.25.25.116
 - PC 5: 197.25.25.117
 - PC 6: 197.25.25.118
 - PC 7: 197.25.25.119
 - PC 8: 197.25.25.120
 - PC 9: 197.25.25.121

For the Staff workgroup, the subnet mask is 255.255.255.240.

Student Accommodation-1:

- Subnet: 197.25.25.128/28
 - Network Address: 197.25.25.128
 - Usable IPs: 197.25.25.129 to 197.25.25.142
 - Broadcast Address: 197.25.25.143
 - IP Addresses for PCs in Student Accommodation-1:
 - PC 1: 197.25.25.129
 - PC 2: 197.25.25.130
 - PC 3: 197.25.25.131
 - PC 4: 197.25.25.132
 - PC 5: 197.25.25.133
 - PC 6: 197.25.25.134
 - PC 7: 197.25.25.135
 - PC 8: 197.25.25.136
 - PC 9: 197.25.25.137
 - PC 10: 197.25.25.138

Student Accommodation-2:

- Subnet: 197.25.25.144/28
 - Network Address: 197.25.25.144
 - Usable IPs: 197.25.25.145 to 197.25.25.158
 - Broadcast Address: 197.25.25.159
 - IP Addresses for PCs in Student Accommodation-2:
 - PC 1: 197.25.25.145
 - PC 2: 197.25.25.146
 - PC 3: 197.25.25.147
 - PC 4: 197.25.25.148
 - PC 5: 197.25.25.149
 - PC 6: 197.25.25.150
 - PC 7: 197.25.25.151

- PC 8: 197.25.25.152
- PC 9: 197.25.25.153
- PC 10: 197.25.25.154

For Student Accommodations, the subnet mask is 255.255.255.240.