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| **Practicum Case** |  |
| CPEN6098 | CPEN6098001 | CPEN6098016 | CPEN6098049 | CPEN6108 | CPEN6108001 | CPEN6109 | CPEN6109001  Computer Networks |
| **Computer Engineering** | **O221-CPEN6098-PH01-03** |
| ***Valid on*** *Odd Semester Year 2021/2022* | **Revision 00** |

## Learning Outcomes

* LO1 – basic concepts of network

## Topic

* Session 3 – Advanced Subnetting

## Sub Topics

* Classless Subnetting (VLSM)
* Creating LAN
* Exercises

## Soal

*Case*

1. **Variable Length Subnet Mask (VLSM)**

VLSM or Variable Length Subnet Mask is a subnetting technique similar to FLSM (Fixed Length Subnet Mask). The difference between VLSM and FLSM is, in VLSM we can have different sizes of a subnet. Therefore, we can have a subnet for the needed amount of hosts.

For example we have the following case,

**Network Address** = 199.10.15.0

**Subnet Mask** = /24 or 255.255.255.0

**Requirements**:

* **Staff** room needs **47** hosts
* **Admin** room needs **12** hosts
* **Front office** room needs **27** hosts

1. **Sort the host in a descending order**

Staffroom: 47 hosts

Front office: 27 hosts

Admin room: 12 hosts

1. **Find the new subnet for each network**

For finding a new subnet, we will be using the following formula,

* Staffroom

New subnet mask:

11111111.11111111.11111111. 11000000

or

255.255.255.192

* Admin room

New subnet mask:

11111111.11111111.11111111. 11100000

or

255.255.255.224

* Front office

New subnet mask:

11111111.11111111.11111111. 11110000

or

255.255.255.240

1. **Determine each network IP host**

After the new subnet mask has been found, then we can proceed to the next step which is determining the network IP for each host.

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| Host | Network Address | Broadcast Address | Usable IP |
| Staff | 199.10.15.0 | 199.10.15.63 | 199.10.15.1 - 199.10.15.62 |
| Front Office | 199.10.15.64 | 199.10.15.95 | 199.10.15.65 – 199.10.15.94 |
| Admin | 199.10.15.96 | 199.10.15.111 | 199.10.15.97 – 199.10.15.110 |

1. **Case**

Quantum & Clock wanted to make changes to their previous office. The previous office uses FLSM as a subnetting method. They later realized that it is taking a lot more resources than it should. Therefore, they are planning to change their subnetting method to VLSM hoping to save resources. The network will still be the same, which is 192.168.36.0/24. Below are the details that you need,

* Staff room – 68 computers
* IT room – 27 computers
* Designer room – 33 computers
* Operational room – 12 computers

With the room details already explained above, the CEO of Quantum & Clock wanted you to do the following task,

1. Create a new subnet mask for every network above using VLSM.
2. Open the .pka file and follow the instruction written inside the file to create a LAN connection. Make sure that each device can connect.

