**Lab 10  
Configuring IPv4 and IPv6 Addressing**

**Worksheet**

|  |  |
| --- | --- |
| Exercise 10.1 | Calculating IP Addresses |
| Overview | In this exercise, you are responsible for subnetting a network to suit a particular network organization plan. |
| Mindset | What IPv4 addressing policies does your organization have in place? |
| Completion time | 20 minutes |

To complete this exercise, you must determine what IPv4 addresses you should use on the workgroup for which you are responsible. Your supervisor has assigned you a group of computers that consists of three servers and seven workstations. Your entire department must share an IPv4 network with the address **192.168.75.0/24**, and your supervisor has asked you to subnet that address into as many networks as possible with at least **10** hosts each.

Create a list of the network addresses your subnetting can create, using CIDR notation, and enter these in Table 10-3 under the heading IPv4 Network Addresses.

Table 10-3

**IPv4 Network Addresses, IP Addresses, and Subnet Mask**

|  |  |
| --- | --- |
|  | **IPv4 Network Addresses** |
| 0 | 192.168.75.0/28 |
| 1 | 192.168.75.16/28 |
| 2 | 192.168.75.32/28 |
| 3 | 192.168.75.48/28 |
| 4 | 192.168.75.64/28 |
| 5 | 192.168.75.80/28 |
| 6 | 192.168.75.96/28 |
| 7 | 192.168.75.112/28 |
| 8 | 192.168.75.128/28 |
| 9 | 192.168.75.144/28 |
| 10 | 192.168.75.160/28 |
| 11 | 192.168.75.176/28 |
| 12 | 192.168.75.192/28 |
| 13 | 192.168.75.208/28 |
| 14 | 192.168.75.224/28 |
| 15 | 192.168.75.240/28 |

Then choose one of the subnets for use by your computers and enter the IP addresses in that subnet in the following table. **(skipping first IP since it is network ID)**

The subnet of your choice: 192.168.75.0/28

Subnet mask: 255.255.255.240

|  |  |
| --- | --- |
|  | **IP Addresses** |
| 0 | 192.168.75.1/28 |
| 1 | 192.168.75.2/28 |
| 2 | 192.168.75.3/28 |
| 3 | 192.168.75.4/28 |
| 4 | 192.168.75.5/28 |
| 5 | 192.168.75.6/28 |
| 6 | 192.168.75.7/28 |
| 7 | 192.168.75.8/28 |
| 8 | 192.168.75.9/28 |
| 9 | 192.168.75.10/28 |
| 10 | 192.168.75.11/28 |

The MAC addresses of three computers in a network are listed in Table 10-4. Using these MAC addresses to form interface IDs, create three unique local unicast addresses on the fd00::/8 network and enter them into the table.

You can use an online MAC to IPv6 converter, such as <https://ben.akrin.com/?p=1347>

As one example, if you enter MAC address 12-AA-BC-32-23-12, the resulting IPv6 address is fe80::10aa:bcff:fe32:2312. You just need to replace fe80 with fd00 and fill in the table. fe80 is link-local address, while fd00 is unique local address (ULA, analogous to IPv4 private address).

Table 10-4

**MAC Addresses and IPv6 Addresses**

|  |  |  |
| --- | --- | --- |
| ***Computer*** | ***MAC Address*** | ***IPv6 Address*** |
| SERVERA | 12-AA-BC-32-23-12 | fd00::10aa:bcff:fe32:2312 |
| SERVERB | 12-AA-BC-32-23-11 | fd00::10aa:bcff:fe32:2311 |
| SERVERC | 00-15-5D-01-01-C1 | fd00::215:5dff:fe01:01c1 |

|  |  |
| --- | --- |
| Exercise 10.2 | Document Server IP Addresses |
| Overview | In this exercise, you document the IP addresses of the three servers. |
| Mindset | What parameters do you have to configure to ensure that the computers on your network can communicate with each other? |
| Completion time | 20 minutes |

Table 10-5

**Server IP Addresses**

|  |  |  |  |
| --- | --- | --- | --- |
|  | ***SERVERA*** | ***SERVERB*** | ***SERVERC*** |
| ***IP Address*** | 10.10.0.1 | 10.10.0.2 | 10.10.0.3 |
| ***Subnet Mask*** | 255.255.255.0 | 255.255.255.0 | 255.255.255.0 |
| ***Preferred DNS Server*** | 127.0.0.1 | 10.10.0.1 | 10.10.0.1 |