If definitions are helpful to you, use these vocabulary terms in order to get you started:

- **Address -** The unique number ID assigned to one host or interface in a network.
- **Subnet -** A portion of a network that shares a particular subnet address.

In a Class A address, the first octet is the network portion, so the Class A example in Figure 1 has a major network address of 1.0.0.0 - 127.255.255.255. Octets 2, 3, and 4 (the next 24 bits) are for the network manager to divide into subnets and hosts as he/she sees fit. Class A addresses are used for networks that have more than 65,536 hosts (actually, up to 16777214 hosts!).

In a Class B address, the first two octets are the network portion, so the Class B example in Figure 1 has a major network address of 128.0.0.0 - 191.255.255.255. Octets 3 and 4 (16 bits) are for local subnets and hosts. Class B addresses are used for networks that have between 256 and 65534 hosts.

In a Class C address, the first three octets are the network portion. The Class C example in Figure 1 has a major network address of 192.0.0.0 - 223.255.255.255. Octet 4 (8 bits) is for local subnets and hosts - perfect for networks with less than 254 hosts.

Network Masks

A network mask helps you know which portion of n i0 02r.t718onieet is the netwTm (now wnets)Tj 1 0 0 1

subnets you have available. However, the more subnets available, the less host addresses available per subnet. For example, a Class C network of 204.17.5.0 and a mask of 255.255.255.224 (/27) allows you to have eight subnets, each with 32 host addresses (30 of which could be assigned to devices). If you use a mask of 255.255.255.240 (/28), the break down is:

```
204.17.5.0 -      11001100.00010001.00000101.00000000
255.255.255.240 - 11111111.11111111.11111111.11110000
                  --------------------------|sub |---
```

Since you now have four bits to make subnets with, you only have four bits left for host addresses. So idou aw6 1 3626lcan have up to 16 subnets, each of whichlcan have up to 16 host addresses (14 of whichlcan be assigned to devices).

Take a look at how a Class B network might be subnetted. If you have network 172.16.0.0 ,then you know that its natural mask aw6255.255.0.0 or 172.16.0.0/16. Extending the mask to anyu ang beyond 255.255.0.0 means you are subnettang. Y26lcan quickly see that you have the ability to create a lot more subnets than with the Class C network. If you use a mask of 255.255.248.0 (/21), how many subnets and hosts per subnet doesou aw6allow for?

```
172.16.0.0  -   10101100.00010000.00000000.00000000
255.255.248.0 - 11111111.11111111.11111000.00000000
                -----------------| sub |-----------
```

```
netB: must support 28 hosts
netC: must support 2 hosts
netD: must support 7 hosts
netE: must support 28 host
```

Determine what mask allows the required numbeof (ofosts)T.j ET BT 1 0 0 1 36 74215.7m /F4 9 Tf (netB:/

Figure 5 illustrates how using VLSM helped save more than half of the address space.

CIDR

Classless Interdomain Routing (CIDRy da as introduc sa Roo719.51eer to impro thboths space.

!(subnet 64)