Web Appendix-6 SUBMAP

Network maps for subnet examples

Practical TCP/IP:
Designing, Using, and Troubleshooting TCP/IP Networks on Linux and Windows

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Network maps for subnet examples

This relates to the text in Module-6.8 (page 165). We have public IP address range 192.0.2.0/25, i.e. 192.0.2.0–192.0.2.127, and we want to create an internal subnet.

Example 1

Here we assume that all the numbers you have used on your main network conveniently fall into the lower half of your public range, i.e. they are all within 192.0.2.0–192.0.2.63.

The only changes needed to the original network are highlighted in blue in Figure-1. The netmask for all machines on the main network is 255.255.255.192 (instead of 255.255.255.128). Of course the internal interface of the Internet router, Rupert, is included in this and must be changed along with all the other machines.

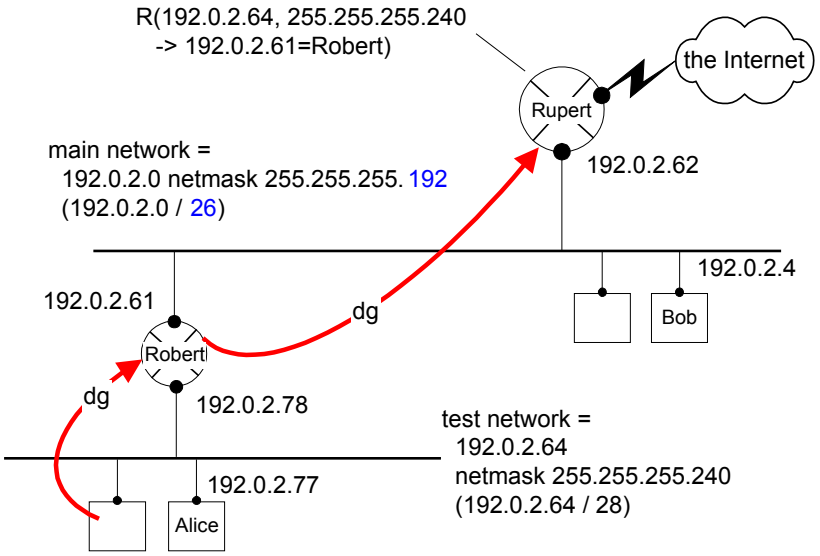

Figure-1 correcting the subnetting of Figure-6.14.

Example 2

What do you do if the numbers you are already using on your main network *don't* conveniently fall into the lower half only, or top half only, of your public IP address range? This is shown in Figure-2:

- Dave's address is in the high end of the 192.0.2.0/25 range, and Bob's address is at the low end. Therefore we cannot split our range as it stands. This gives us two alternatives:
  1. Renumber some of the existing machines so they all fall in one half of the range, and then do exactly as we did above in Figure-1.

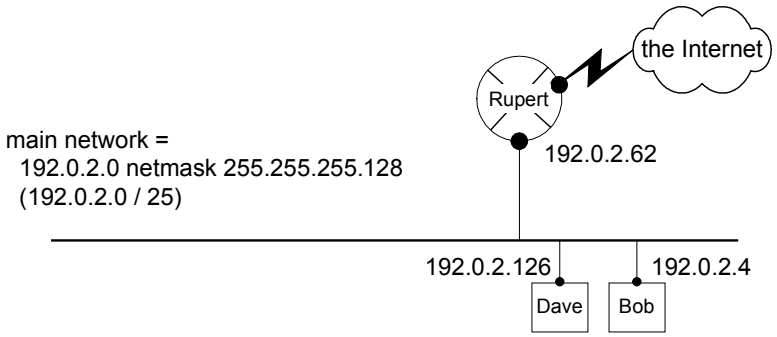

Figure-2 IP addresses across whole range are already in use, making subnetting difficult.

2. Add the test network using a completely different set of IP numbers, as shown in Figure-3.

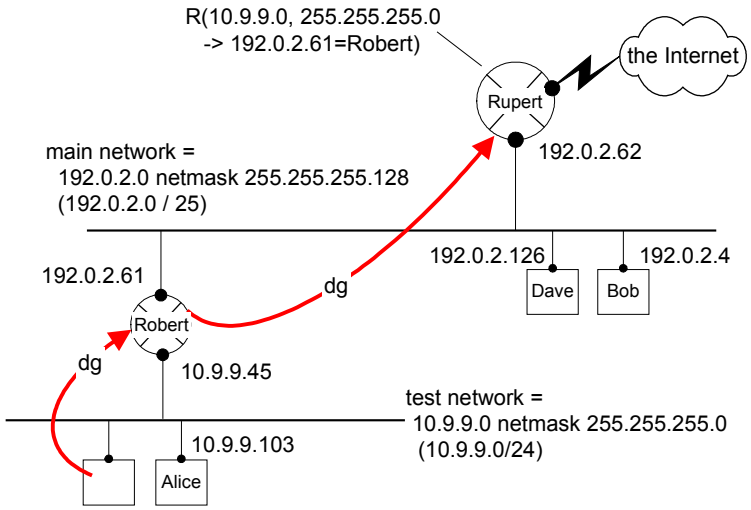

Figure-3 Adding a subnet to Figure-2 using a separate set of (private) IP numbers.

This second approach has the disadvantage that the 10.9.9/24 network can't reach the Internet for two reasons:

a. because the 10.9.9.* numbers are private, non-routable IP numbers

b. more importantly, because the only IP numbers that are routed to this site are 192.0.2.0/25 – the public IP address range for this site. Even if we had used routable IP numbers – say 18.19.20.* – for the test network, these belong to someone else and will not be routed to our site

If we want machines on the test network to be able to access the Internet, we have no alternative: we have to renumber some of the machines on the main network and use the method of Figure-1.