

## 5.3 ADDRESS ALLOCATION

*Address allocation is the responsibility of a global authority called the Internet Corporation for Assigned Names and Addresses (ICANN). It usually assigns a large block of addresses to an ISP to be distributed to its Internet users.*

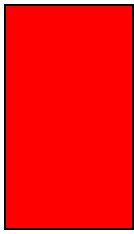


## Example 16

*An ISP is granted a block of addresses starting with 190.100.0.0/16 (65,536 addresses). The ISP needs to distribute these addresses to three groups of customers as follows:*

- a. The first group has 64 customers; each needs 256 addresses.*
- b. The second group has 128 customers; each needs 128 addresses*
- c. The third group has 128 customers; each needs 64 addresses.*

**See Next Slide**



## **Example 16** *(Continued)*

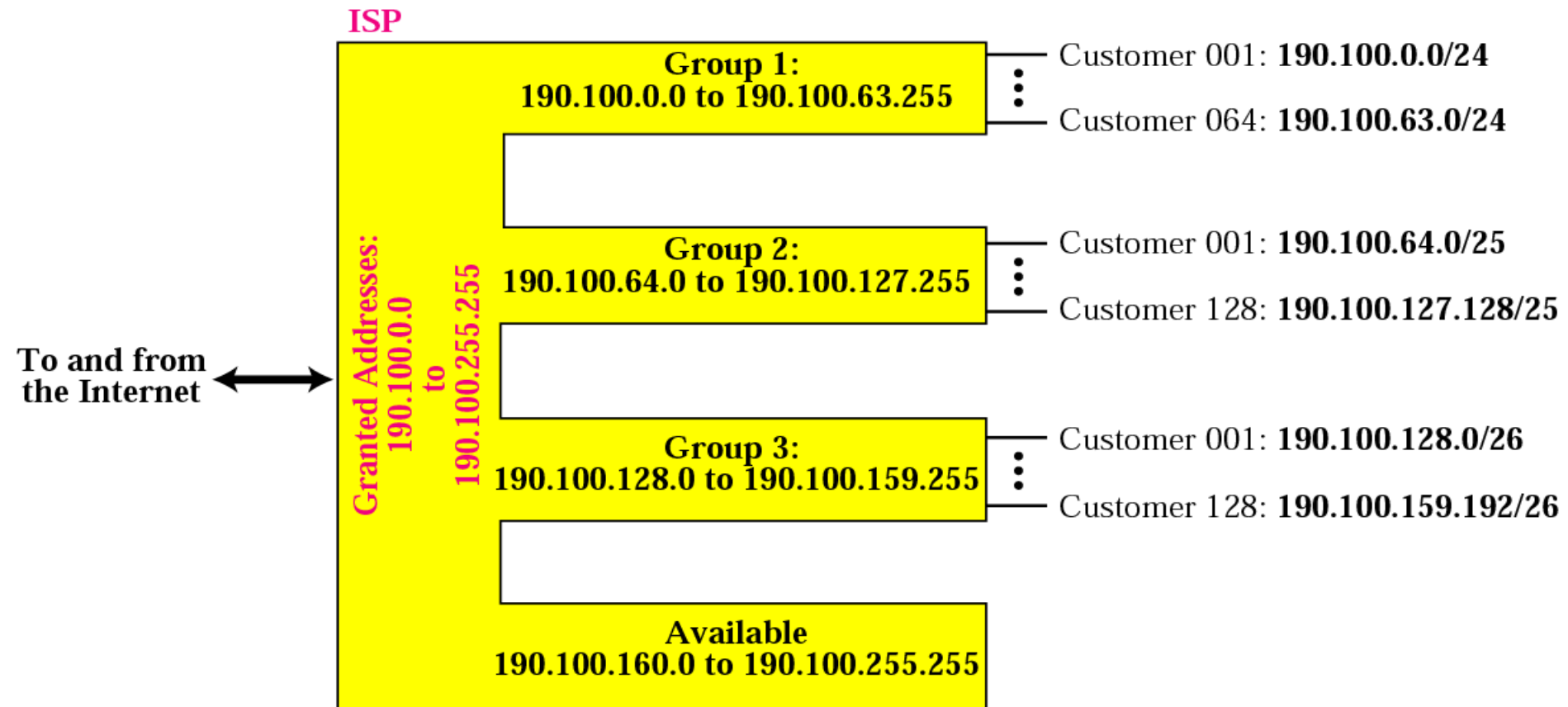
*Design the subblocks and find out how many addresses are still available after these allocations.*

### ***Solution***

*Figure 5.9 shows the situation.*

**See Next Slide**

**Figure 5.9** *Example 16*





## **Example 16** *(Continued)*

### ***Group 1***

***For this group, each customer needs 256 addresses.  
This means the suffix length is 8 ( $2^8 = 256$ ). The prefix  
length is then  $32 - 8 = 24$ . The addresses are:***

<b>1st Customer</b>	<b>190.100.0.0/24</b>	<b>190.100.0.255/24</b>
<b>2nd Customer</b>	<b>190.100.1.0/24</b>	<b>190.100.1.255/24</b>
<b>...</b>		
<b>64th Customer</b>	<b>190.100.63.0/24</b>	<b>190.100.63.255/24</b>
<b>Total = <math>64 \times 256 = 16,384</math></b>		

**See Next Slide**



## **Example 16** *(Continued)*

### **Group 2**

*For this group, each customer needs 128 addresses.  
This means the suffix length is 7 ( $2^7 = 128$ ). The prefix  
length is then  $32 - 7 = 25$ . The addresses are:*

1st Customer	190.100.64.0/25	190.100.64.127/25
2nd Customer	190.100.64.128/25	190.100.64.255/25
...		
128th Customer	190.100.127.128/25	190.100.127.255/25
Total = $128 \times 128 = 16,384$		

**See Next Slide**



## **Example 16** *(continued)*

### **Group 3**

*For this group, each customer needs 64 addresses.*

*This means the suffix length is 6 ( $2^6 = 64$ ). The prefix length is then  $32 - 6 = 26$ . The addresses are:*

1st Customer	190.100.128.0/26	190.100.128.63/26
2nd Customer	190.100.128.64/26	190.100.128.127/26
...		
128th Customer	190.100.159.192/26	190.100.159.255/26
Total = $128 \times 64 = 8,192$		

**See Next Slide**



## **Example 16** *(continued)*

*Number of granted addresses to the ISP: 65,536*

*Number of allocated addresses by the ISP: 40,960*

*Number of available addresses: 24,576*