IP Addressing

Network Address Translation

5-5 NAT

The distribution of addresses through ISPs has created a new problem. If the business grows or the household needs a larger range, the ISP may not be able to grant the demand because the addresses before and after the range may have already been allocated to other networks. In most situations, however, only a portion of computers in a small network need access to the Internet simultaneously. A technology that can help in this cases is *network address translation (NAT)*.

Figure 5.39 *NAT*

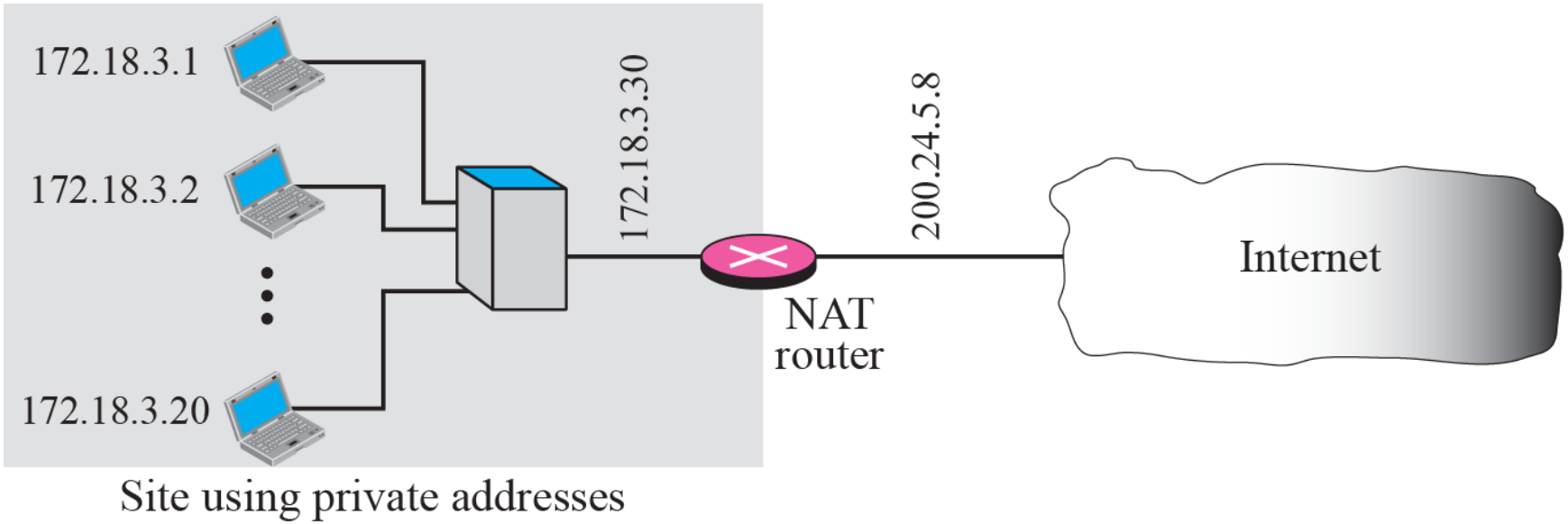


Figure 5.40 *Address resolution*

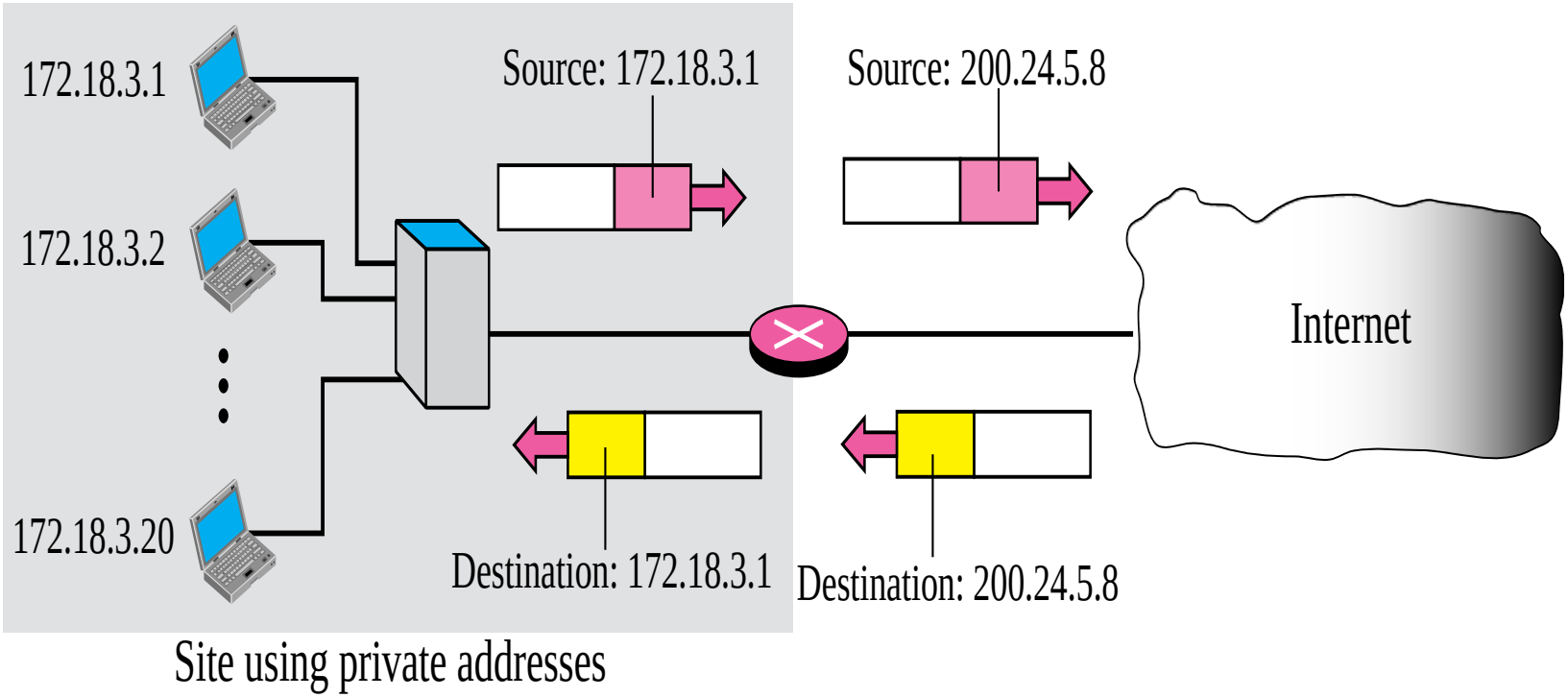
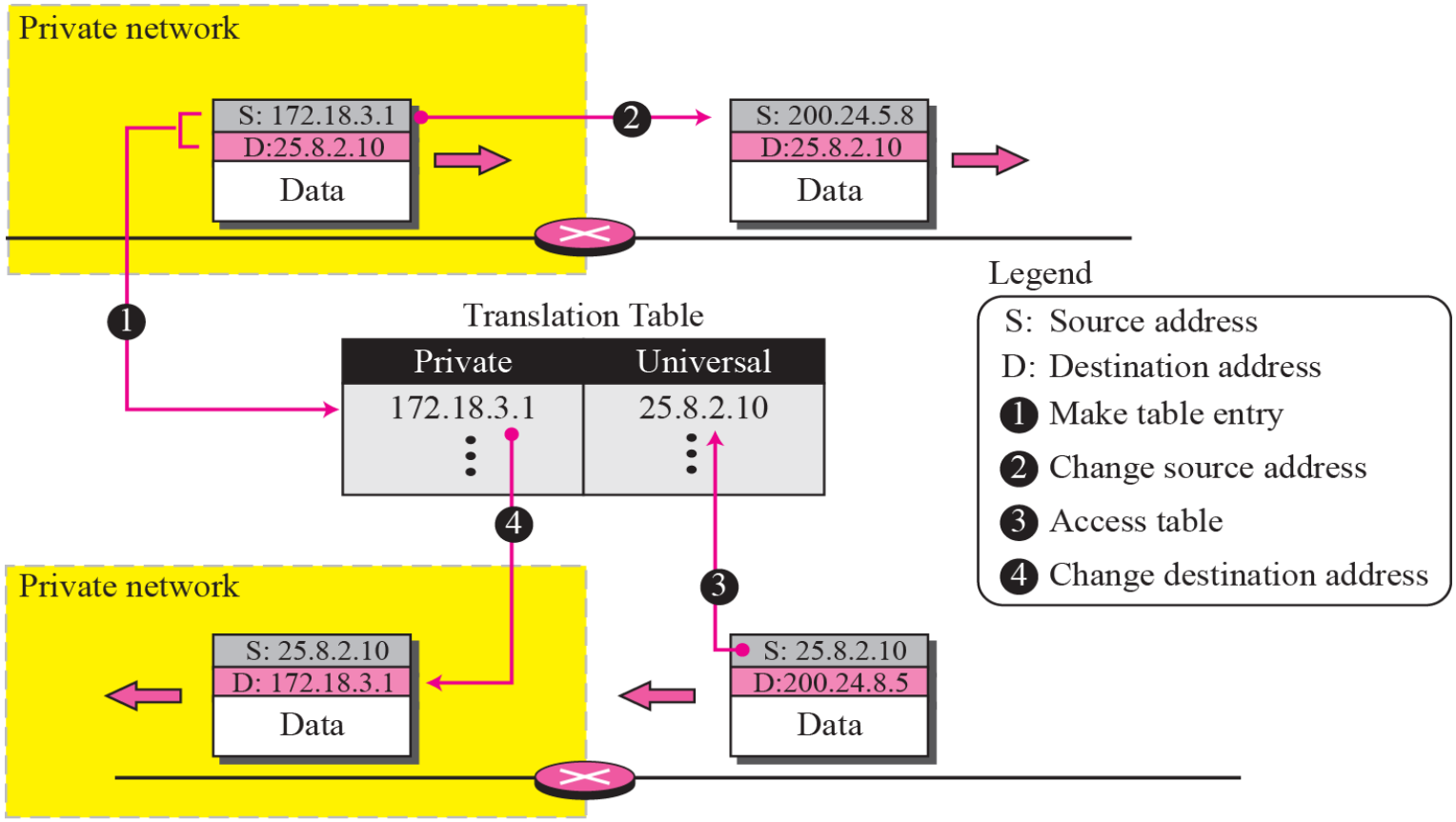
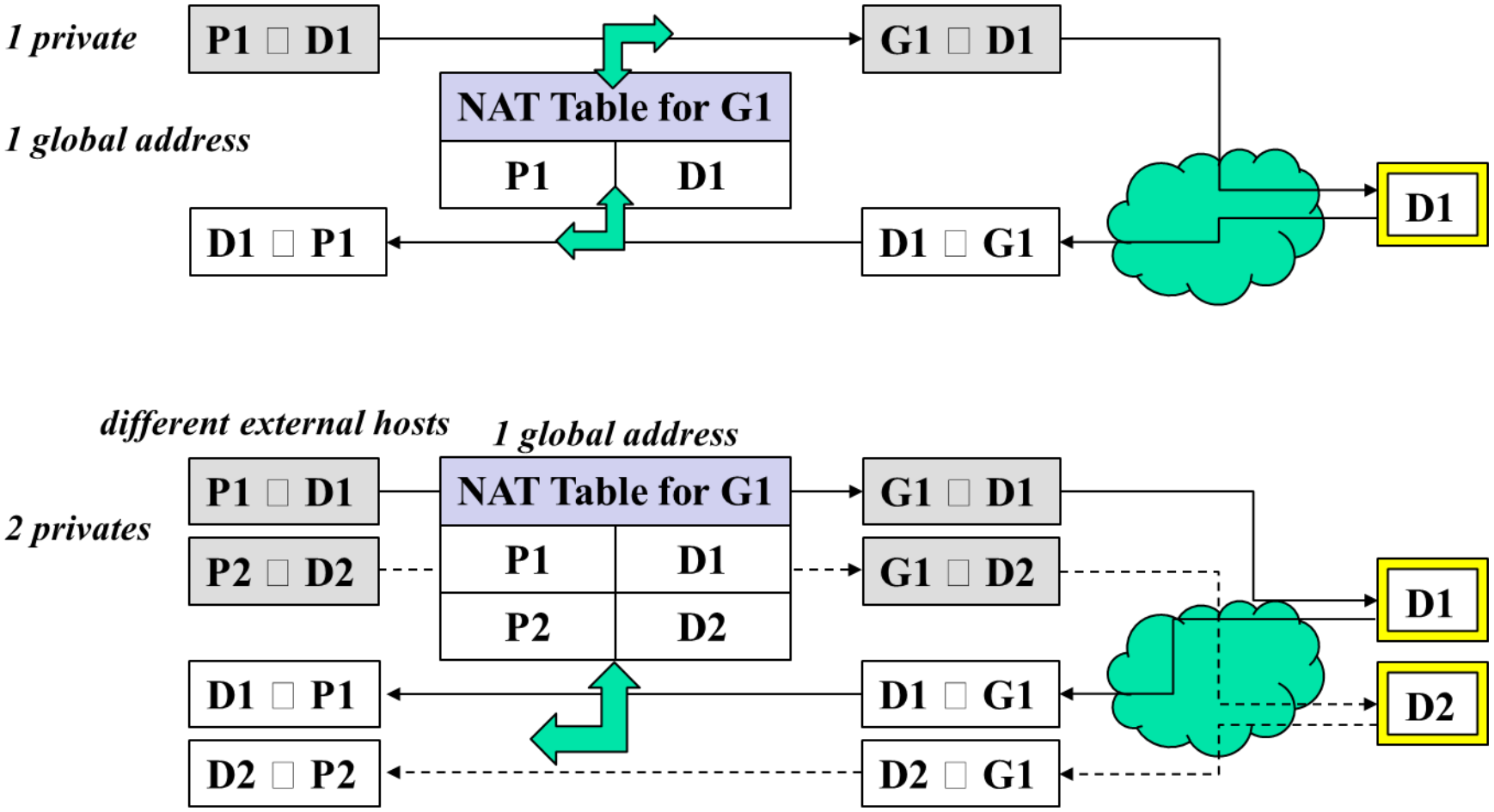


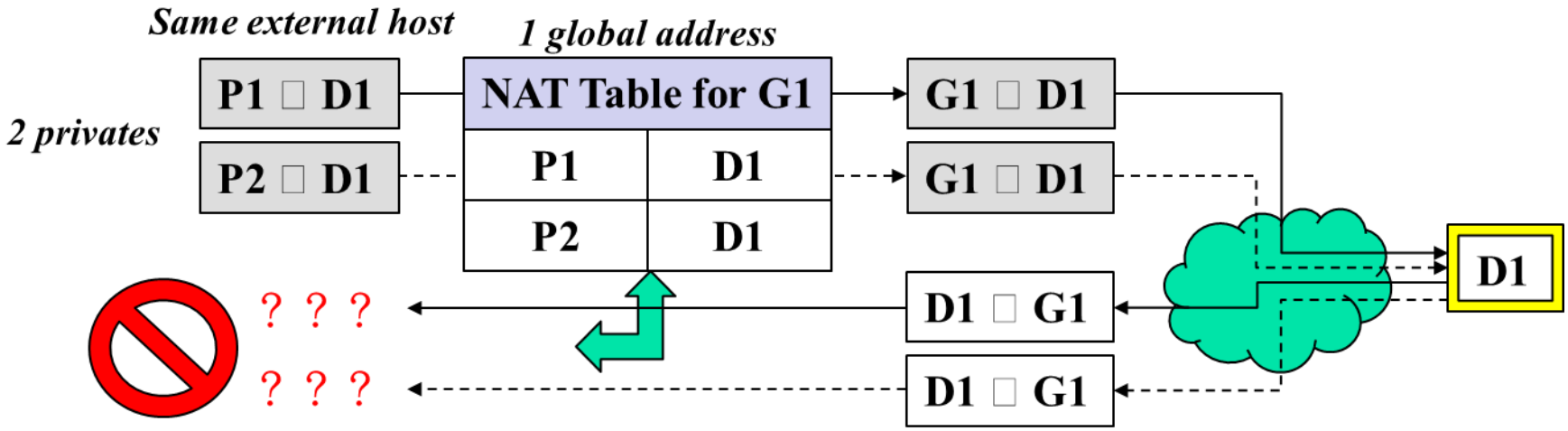
Figure 5.41 *Translation*

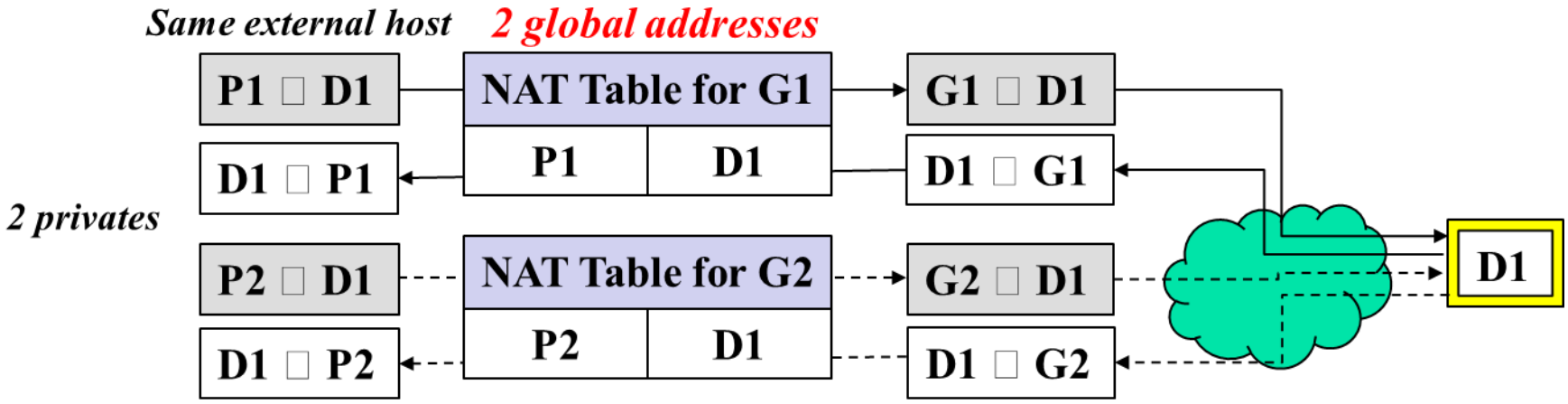


NAT Table with only IP addresses



NAT Table with only IP addresses

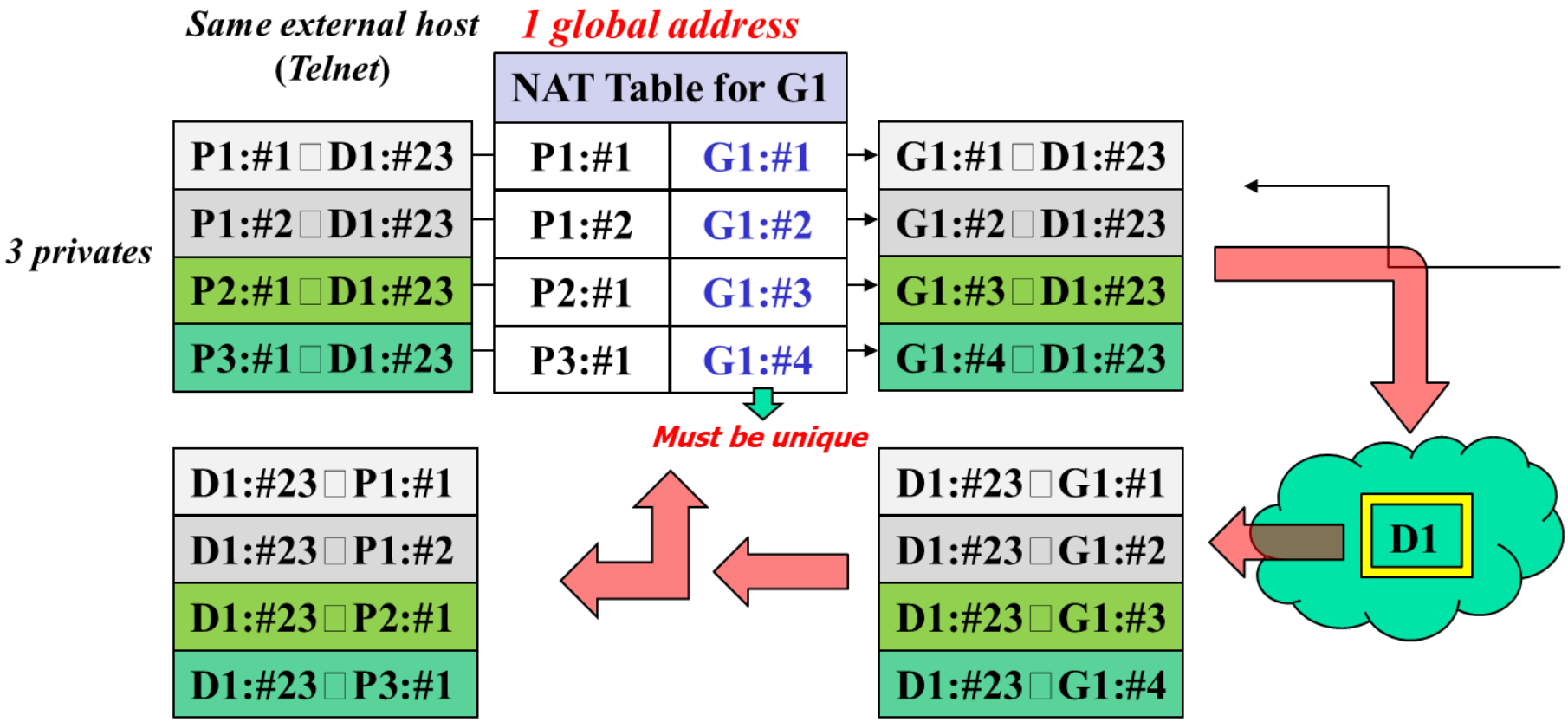




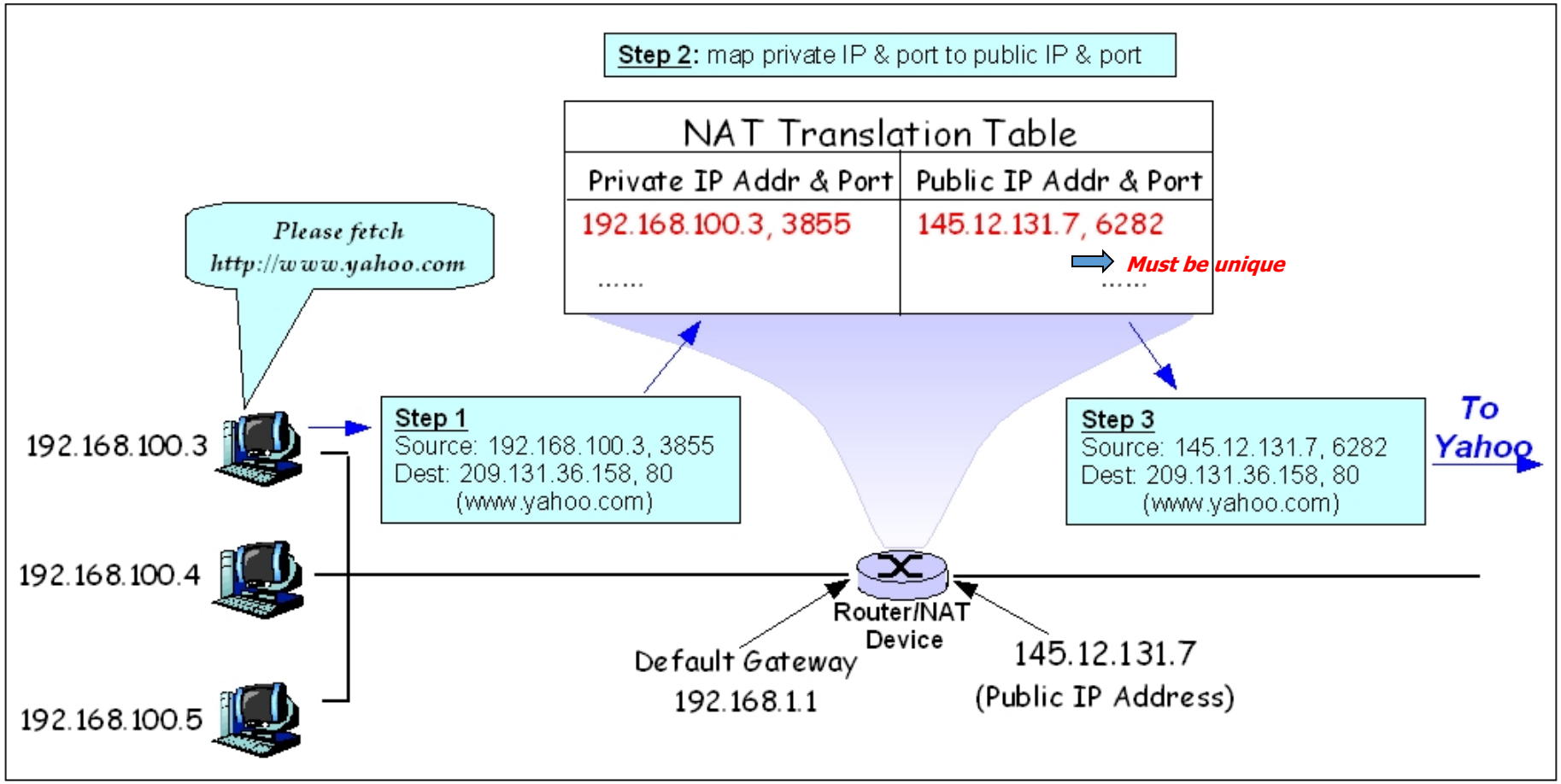
NAT Table with only IP addresses (3)

- If using only one global address
  - Only one private-network host to access the same external host
- Two private-network hosts cannot access the same external server program at the same time (by using the same global address)
- If using a pool of global addresses (e.g. 4 addr)
  - No more than 4 connections can be made to the same destination
  - No private-network host can access two external server programs (e.g. HTTP and TELNET) at the same external host at the same time **???**

NAT Table with IP address & Port



NAT Table with IP address & Port # (2)



NAT Table with IP address & Port # (3)