Can two network interfaces have the same ip address

Technology, Information Technology

College: Networks Problem R-5. 5 Can two network interfaces have the same IP address? Why or why not?

It is possible for two interfaces to have the same IP address through NAT (Network Address Translation) technology. The rationale behind NAT is to have an IP address (or rather private IP addresses) of an interface not exposed to the public Internet. However, the two would have to exist inside two separate LANs (local area networks) that use NAT internally to route packets within the LAN from addresses in the public Internet. Without NAT, IP addresses on the general/public Internet are unique; otherwise routing would not make sense.

Problem C-5. 3

Show how to extend the man-in-the-middle attack described in Section 5. 2. 3 to intercept all documents sent to a printer in a local-area network.

Beatrice an attack in the form of the man-in-the-middle attack between numerous users of a network and the printer used for the particular network. She impersonates a legitimate user to avoid detection. This makes the users think that the IP address for the printer is associated with the MAC (Media Access Control) address of Beatrice. Consequently, the software for the printer thinks that each of the users printing a document has Beatrice’s MAC address. As a matter of fact, Beatrice (as a man in the middle) passively eavesdrops on all the documents being sent by users to the printer.

Problem C-5. 6

Describe a data structure for keeping track of all open TCP connections for a machine. The data structure should support e_ciently adding and deleting

connections and searching by the host, source port, and destination port.

For the data structure, one needs to create a record for each connection of available TCP (transmission control protocol) connection and store all records in a doubly-linked list Q. the double linked list ought to support insertions and deletions within constant time; assuming that a link to the record to be deleted/inserted is provided. In order to search competently for a TCP connection record by either using host or source port or destination port, create three search structures such as red-black trees or hash tables that store items of the type (x; y), in which x is the search key and y is a link to a connection record in Q.

Problem C-6. 6

Explain how it would give a potential intruder an additional advantage if he can spend a week stealthily watching the behaviors of the users on the computer he plans to attack.

All in all, the intruder would find it relatively easy to attack such a machine by watching and analyzing the user’s behavior.

Problem C-6. 13

Describe a modi_cation to the random port scan, as described in the previous exercise, so that it still uses a randomly generated sequence of port numbers but will now have exactly the same number of attempted TCP connections as a sequential port scan.