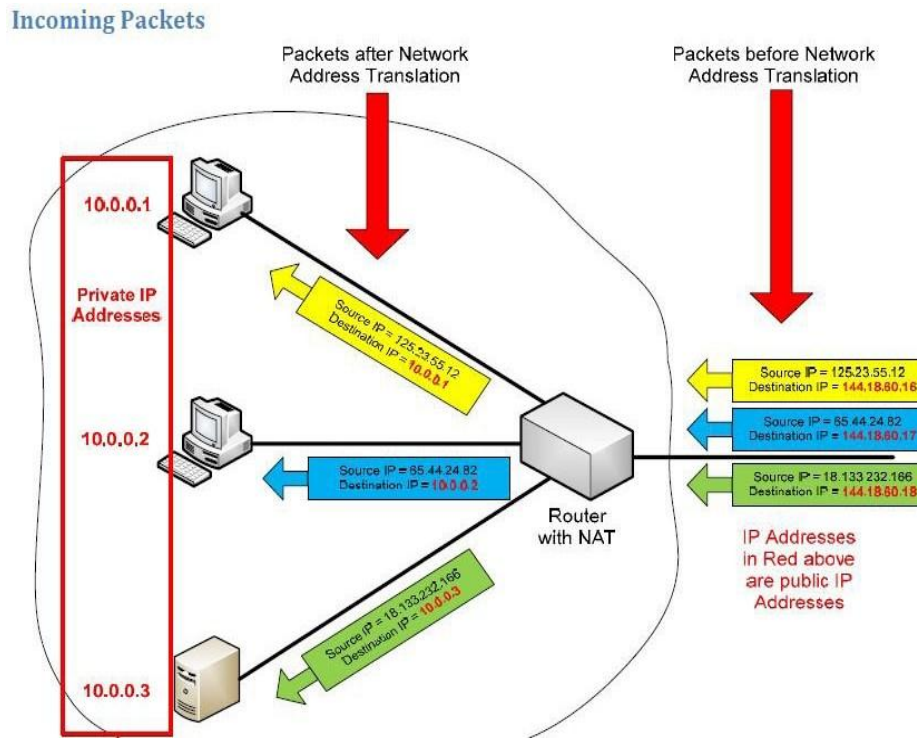
NAT and MOBILE IP

The concept of NAT is a very powerful concept for several reasons:

It shields computers in a private LAN from the Internet and therefore reduces the risks that are associated with connecting a computer to the Internet (hacking attacks).More importantly, Internet service providers usually assignone IP address to a home network or multiple IP addresses to an organization. However, the number of computers on the home network. What NAT does is that local addresses (in one of the 3 ranges of private IP addresses that start with 10,172, or 192) are translated to one public IP address assigned to the home network (in the case of DSL service) or multiple public IP addresses assigned to the organization by the Internet service provider (in the case of organizations such as KFUPM). The NAT system also translates from the public IP address(es) to the corresponding private IP addresses as the packets arrive from the Internet to the private network. In fact, all computers in a network that uses NAT appear to the outside world as having only few IP addresses.

For the case of a home network, all computers in your home network will appear to the outside world as having a single IP address. If you visit a website that records your IP address from one of your home network computers and then try to visit the same website from another computer, the website will not be able to distinguish between the two computers. The following are two examples that show how NAT works. In the first case, the network is assigned multiple public IP addresses equal to the number of machines in the network. All that the NAT does

is translate each private IP address into one of the public IP addresses and vice versa. The two situations for outgoing packets (packets going from the private network to the Internet) and incoming packets (packets going from the Internet to the private network) are shown below. In the second case, the network is assigned a single public IP address that will be used by all computers in the private network. The two situations for outgoing packets and incoming packets are shown afterwards.



Mobile IP:

Mobile IP (or IP mobility) is an Internet Engineering Task Force (IETF) standard communications protocol that is designed to allow mobile device users to move from one network to another while maintaining a permanent IP address. Mobile IP for IPv4 is described in IETF RFC 5944, and extensions are defined in IETF RFC 4721. Mobile IPv6, the IP mobility implementation for the next generation of the Internet Protocol, IPv6, is described in RFC 6275.

The Mobile IP protocol allows location-independent routing of IP datagrams on the Internet. Each mobile node is identified by its home address disregarding its current location in the Internet. While away from its home network, a mobile node is associated with a care-of address which identifies its current location and its home address is associated with the local endpoint of a tunnel to its home agent. Mobile IP specifies how a mobile node registers with its home agent and how the home agent routes datagrams to the mobile node through the tunnel.

Applications:

In many applications (e.g., VPN, VoIP), sudden changes in network connectivity and IP address can cause problems. Mobile IP was designed to support seamless and continuous Internet connectivity.

Mobile IP is most often found in wired and wireless environments where users need to carry their mobile devices across multiple LAN subnets. Examples of use are in roaming between overlapping wireless systems, e.g., IP over DVB, WLAN, WiMAX and BWA.

Changes in IPv6 for Mobile IPv6

- A set of mobility options to include in mobility messages
- A new Home Address option for the Destination Options header
- A new Type 2 Routing header
- New Internet Control Message Protocol for IPv6 (ICMPv6) messages to discover the set of home agents and to obtain the prefix of the home link
- Changes to router discovery messages and options and additional Neighbor Discovery options.

Source : http://elearningatria.files.wordpress.com/2013/10/cse-vi-computer-networks-ii-10cs64-notes.pdf