# Mobile Communication
## Summer 2008

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## Assignment Sheet #1

Release date: Tuesday April 8th 2008.
Discussion date: Tuesday April 15th 2008

During the first meeting at the above mentioned discussion dates, general and administrational issues about the lecture and exercises will be discussed, together with the following tasks:

**Exercise 1** (Radio Broadcast - Cellular Technology)

It is possible to enlarge the capacity of mobile networks by using overlapping cells. The cells are often drawn as hexagons. However, the concept of overlapping cells is also used by radio broadcast stations.

On the homepage of the radio broadcast stations Eins-Live and SWR3 there is information on the frequencies used:

> http://www.einslive.de/sendungen/frequenzen/frequenzkarte.jsp
> http://www1.swr3.de/presse/SWR3/frequenzen.htm

Draw a diagram that shows the distribution of frequencies using hexagonal cells.

Is the cellular technology suitable for radio broadcast networks?

A mobile receiver has to change frequencies when leaving one cell. Is it possible to do it automatically? Think about challenges and solutions?

**Exercise 2** (Mobility of IP hosts)

Consider the following simple network graph (as also depicted on lecture slide 30 of chapter 1/2).
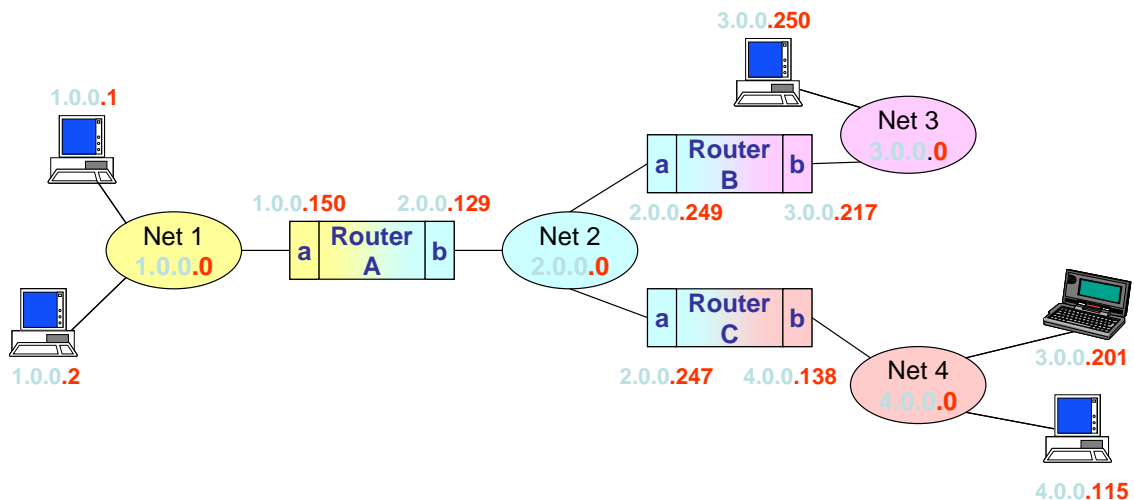
The mobile host 3.0.0.201 has moved from Net 3 to Net 4 but still wants to use the old IP address.

Host-specific routing entries in the routing tables (in addition to the usual network-specific routing entries – see slide 30 of chapter 1/2) may help to achieve reachability of the host in the foreign network.

a) Which routing tables need such host-specific entries to allow for reachability of the mobile host from all other networks? How do these entries look like?

b) Imagine more complex network scenarios (more networks, more routers) and try to describe which routers need host-specific routing entries? Do all routers in an arbitrary network topology need those host-specific entries? Can you derive a general statement on this topic?

c) Compare the routing path length (e.g. simple router hop count) from an arbitrary host to the mobile host when the mobile host is in the home network and when the mobile host is in a visited network (using host-specific routes). In which cases will the path length increase and in which cases will it decrease compared to the home network path?