

MOBILE DATA TRACK

1. Introduction to Mobile Networks
2. Operating a Mobile Core over IP/MPLS - Jan Chrillesen
3. The Future of Mobile Data - David Kessens
4. Questions and comments from you

Introduction to Mobile Network



In this brief introduction we will try to answer the following questions.

- What is a Mobile Network
- how is a mobile call set up- where does the signaling go, where does the media go
- how does mobility between the cells work for calls?
- what is roaming and how does roaming work for calls?
- mobile data -what is a packet's way from your device, connected to your operators network to the Internet?
- mobile data - what is a packet's way from your device, connected to a roaming partners network to the Internet

What is a Mobile network?

A mobile network is a network where the devices access the network via a radio link to a antenna and where the connection to the network is kept when you move from one antenna in the network to another.

WiFi is not Mobile because you cannot move between antennas.

The spectrums used for Mobile networks are licensed. This means they are limited, heavily regulated and very expensive.

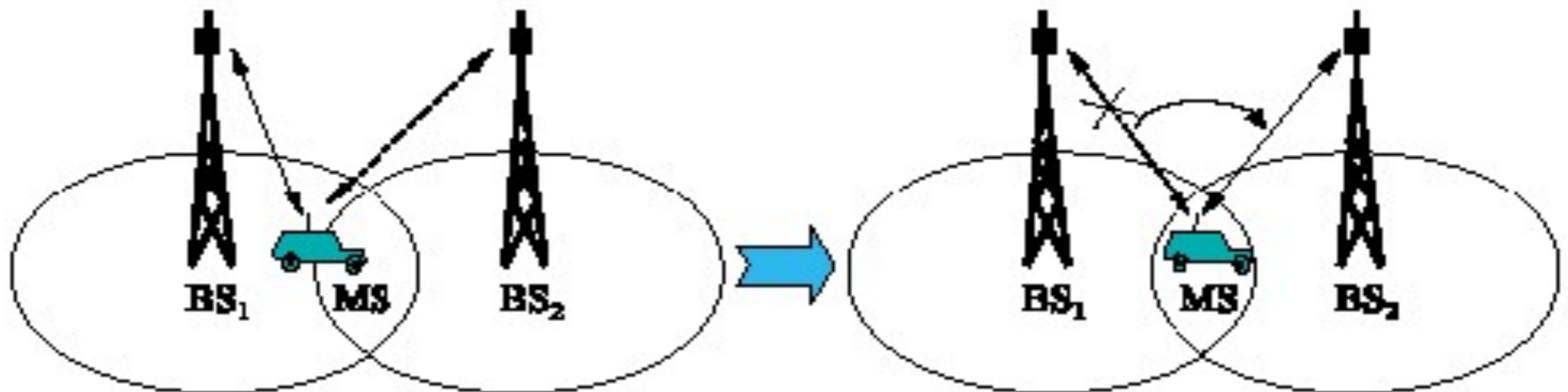
A mobile Call

When a mobile device is turned on it registers with the telephony exchange in the network. The exchange then knows where to direct at call.

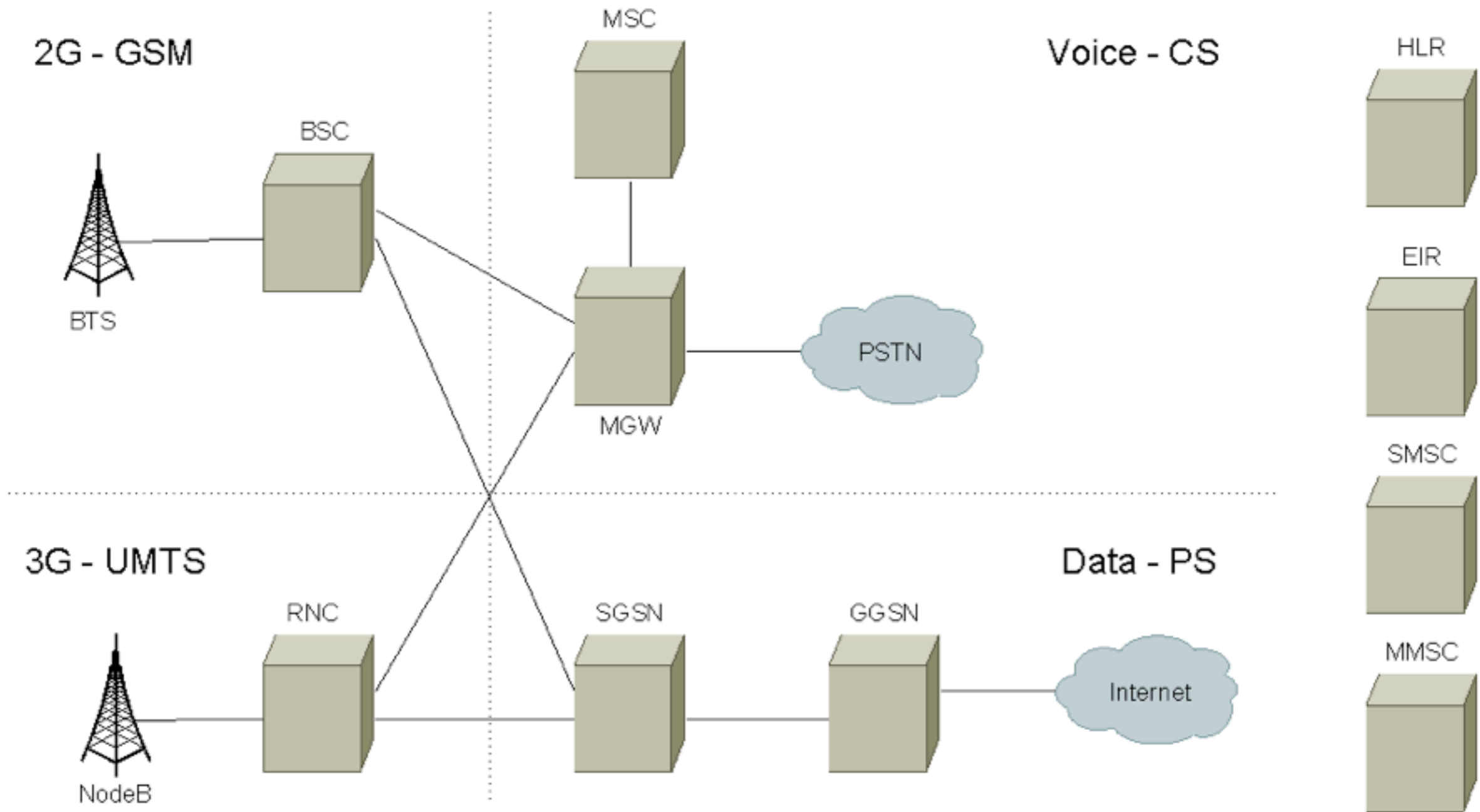
The mobile device always listens for the strongest signal of the closest antenna and will reregister to the strongest if moving around. If this happens during a call or data session the media will be directed to the new antenna by the mobile telephony exchange and the supporting systems. The call or data sessions will not be interrupted by the handover

The supporting systems for keeping track of the devices, changing the media switching are named the backbone in the Mobile Network

The call set-up process: after the number is dialed the caller phone the Mobile Switch server which is located in the mobile backbone determines the location of the called device and set up the circuit between the caller and the called.



Mobile Backbone



Roaming

When a device is outside the operators network it can connect to another operators network if a roaming agreement exists.

1. When the mobile device is turned on or is transferred via a handover to the network, this new "visited" network sees the device, notices that it is not registered with its own system, and attempts to identify its home network. If there is no roaming agreement between the two networks, maintenance of service is impossible, and service is denied by the visited network.
2. The visited network contacts the home network and requests service information (including whether or not the mobile should be allowed to roam) about the roaming device .
3. If successful, the visited network begins to maintain a temporary subscriber record for the device. Likewise, the home network updates its information to indicate that the mobile is on the host network so that any information sent to that device can be correctly routed.

Mobile data

Mobile data uses the mobile network infrastructure to provide internet access via the mobile devices.

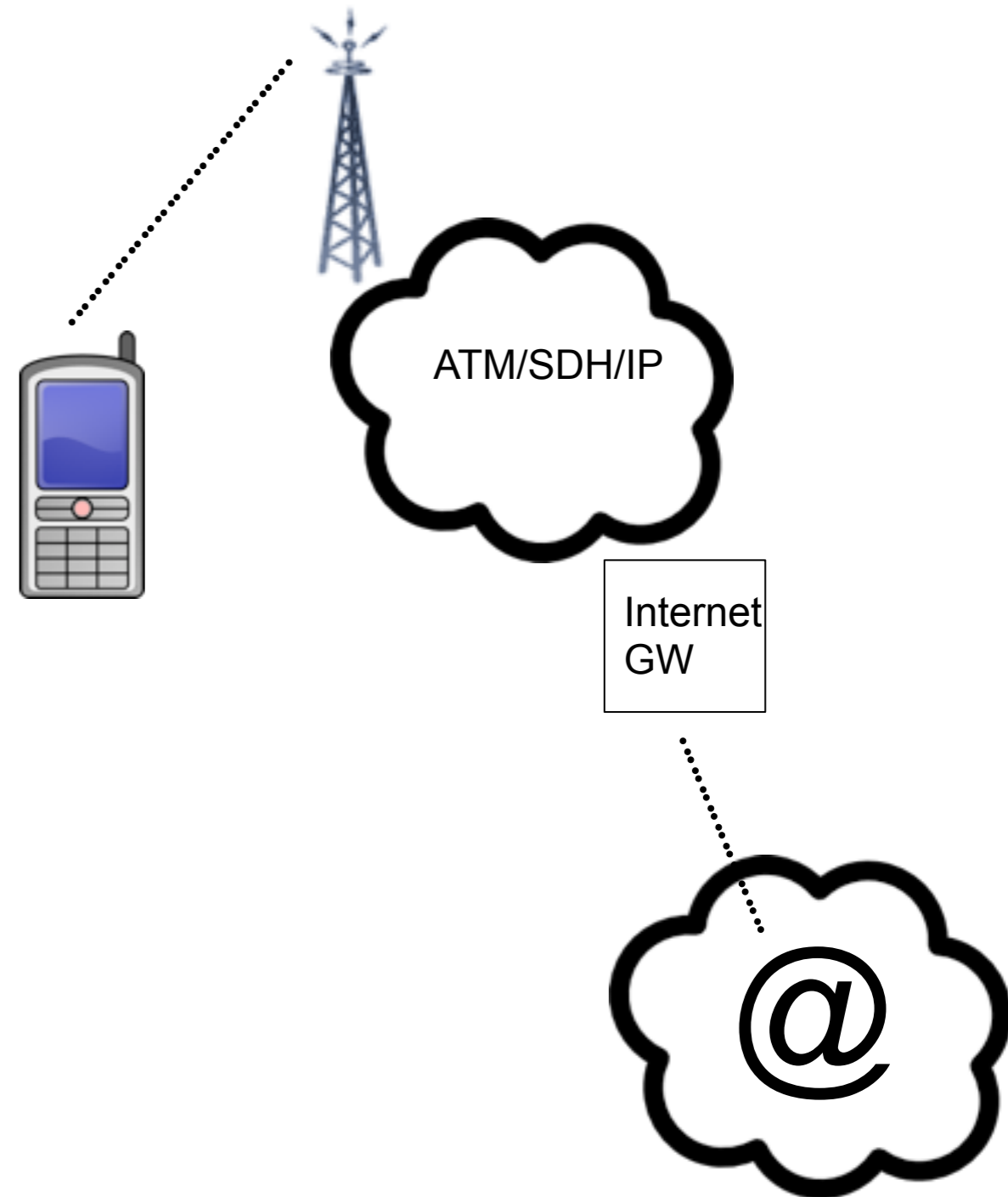
The packets go:

Device - antenna - fiber/ATM/T1/IP - internet GW/cache - the Internet.

The delay on the connection between the mobile device and the antenna often has a delay of 50 - 300 ms, depending on whether it is 3G, edge or 2G.

All devices in a cell share:

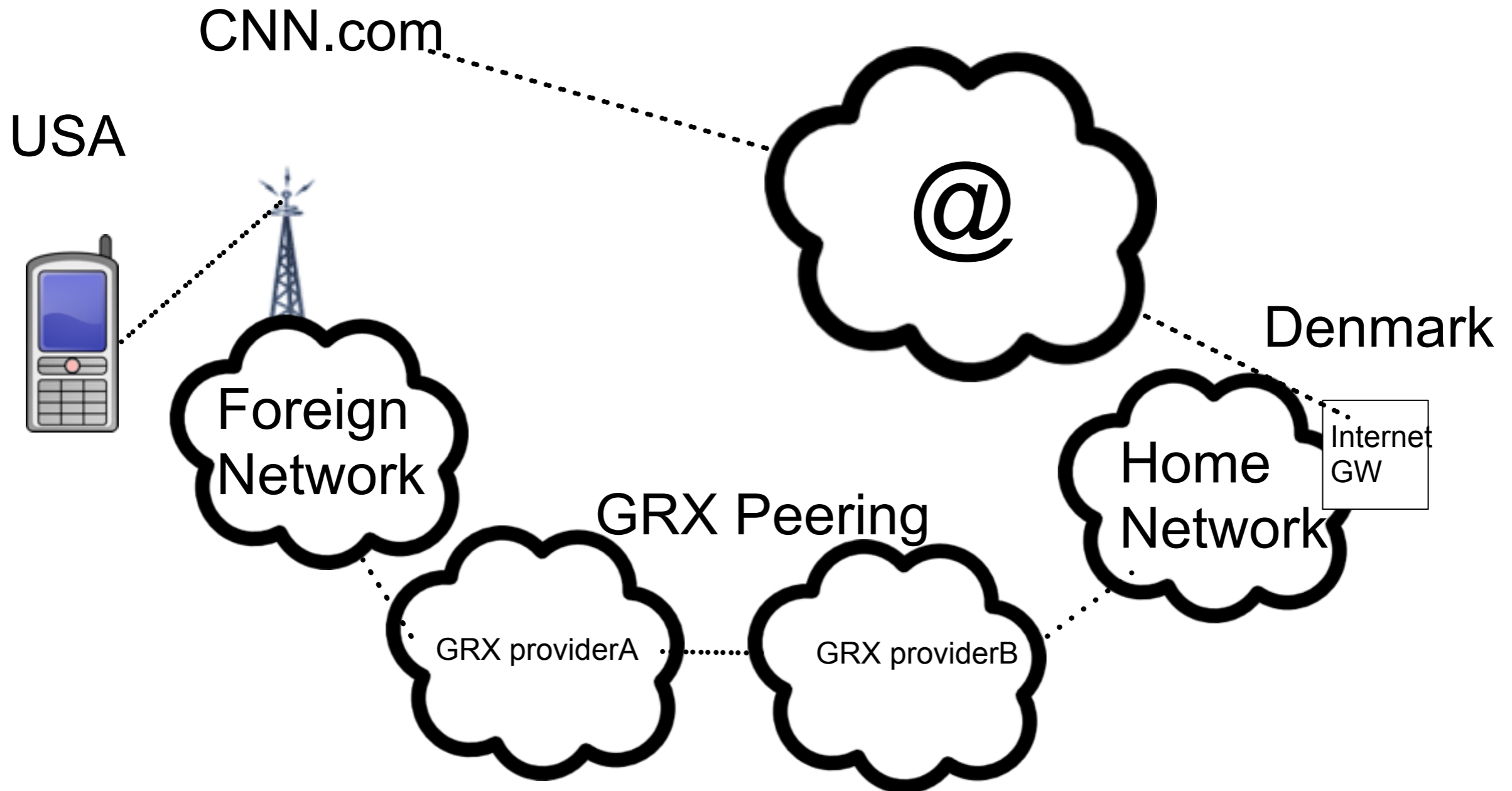
- the bandwidth available in the radio signal from the antenna - the typical values are 7,2M and up
- the bandwidth connecting the antenna mast to the transport net leading to the internet GW - n*T1 to Gigabit Ethernet and rising.



Mobile Data when connected to a roaming partner of your operator

Roaming works for mobile data too and was designed to use a dedicated Internet for that instead for the Internet. This is called the GRX network

GRX exchanges and peering



Questions and comments