Short description of the invention

The present invention is defined by a method for continuous and optimal utilization of the capacity of a mobile network that is serving mobile phones covering a specific selected geographical area. The purpose is optimal handling of network traffic in a period with heavy network traffic to and/or from said area without overloading said mobile network. In one aspect, there is provided a method for optimal utilization of the capacity of a mobile network serving mobile phones located in a selected geographical area, and for handling of network traffic in a period with heavy network load exerted by network traffic to or from, or both to and from said geographical area for avoiding overloading of said mobile network, comprises the following steps:

a) establishing an overview of maximum network capacity of said mobile network serving said selected geographical area as well as adjacent areas;

b) establishing an overview of the identity of mobile phones located within said selected geographical area as well as in adjacent areas served by said mobile network, and determining possible maximum traffic load that may be exerted by the identified mobile phones on the network based on a scenario where each connected phone exerts maximum load on the network;

c) monitoring current traffic load of the mobile network as well as traffic load of each of different mobile services requiring different bandwidth on the network;

d) determining type of barring, of one or more of said different types of mobile services to be set or removed for network traffic to or from, or both to and from the mobile phones identified in step b), and where this is based on the maximum network capacity, determined possible maximum traffic load, and current monitored traffic load, where barring is set if current monitored traffic load is determined to be above the maximum network capacity, and where type of service to be barred is based on the service contributing the most to the load, and where a set barring is removed if current monitored traffic load is determined to be below the maximum capacity of the network;

e) setting type of barring or removing set type of barring, determined in step d), of said mobile phones identified in step b) and which are served by said mobile network for utilizing maximum network capacity of the network without overloading the network during a period with heavy network load, and without shutting down all mobile services for a particular mobile phone;

f) repeating steps b) to e).

Further features of the method are described in the dependent claims.

The invention is also defined by a device and system for performing the method described above with features as defined in the claims.

In another aspect, there is provided a device for performing optimal utilization of the capacity of a mobile network serving mobile phones located in a selected geographical area, and for handling of network traffic in a period with heavy network load exerted by network traffic to or from, or both to and from said area for avoiding overloading of said mobile network, comprising:

a) input means for receiving information of a selected geographical area;
b) input means for receiving an overview of maximum network capacity of said mobile network serving said selected geographical area as well as adjacent areas;
c) input means for receiving an overview of the identity of mobile phones located within said selected geographical area as well as in adjacent areas served by said mobile network for determining maximum traffic load that may be exerted by identified mobile phones on the mobile network;
d) input means for receiving data regarding current traffic load of the mobile network as well as traffic load of each of different mobile services requiring different bandwidth on the network;
e) means for determining type of barring, of one or more of said different types of mobile services to be set or removed for network traffic to or from, or both to and from the mobile phones identified in step c), and where this is based on the maximum network capacity, determined possible maximum traffic load, and current monitored traffic load, where barring is set if current monitored traffic load is determined to be above the maximum network capacity; and where type of service to be barred is based on the service contributing the most to the load, and where a set barring is removed if current monitored traffic load is determined to be below the maximum capacity of the network;
f) means for setting type of barring or removing set type of barring, determined in step e), of said mobile phones identified in step c) and which are served by said mobile network for utilizing maximum network capacity of the network without overloading the network during a period with heavy network load, and without shutting down all mobile services for a particular mobile phone.

In another aspect, there is provided a system for performing optimal utilization of the capacity of a mobile network serving mobile phones located in a selected geographical area, and for handling of network traffic in a period with heavy network load exerted by network traffic to or from, or both to and from said area for avoiding overloading of said mobile network, comprising:

a) means for selecting said geographical area;

b) means for establishing an overview of maximum network capacity of said mobile network serving said selected geographical area as well as adjacent areas;

c) means for establishing an overview of the identity of mobile phones located within said selected geographical area as well as in adjacent areas served by said mobile network for determining maximum traffic load that may be exerted by mobile phones on the mobile network;

d) means for establishing an overview of the current traffic load exerted by different types of mobile services delivered via said mobile network;

e) a location based barring device for determining if type of barring, of one or more of said different types of mobile services to be set or removed for network traffic to or from, or both to and from the mobile phones identified in step c), and where this is based on the maximum network capacity, determined possible maximum traffic load, and current monitored traffic load, where barring is set if current monitored traffic load is determined to be above the maximum network capacity; and where type of service to be barred is based on the service contributing the most to the load, and where a set barring is removed if current monitored traffic load is determined to be below the maximum capacity of the network;

f) a mobile switching centre for setting type of barring or removing set type of barring determined in step e), of said mobile phones identified in step c), said switching centre having input means for receiving the identity of mobile phones where barring and type of barring is to be set or removed, determined by said location based barring device.

Detailed description of the invention

The invention will now be described in details with reference to the drawings where:

Figure 1 shows an overview of the method steps;

Figure 2 shows details of the barring process for selecting type of barring, and

Figure 3 illustrate how the inventive method will work when implemented in a 2G/3G network.

CLAIMS

1. Method for optimal utilization of the capacity of a mobile network serving mobile phones located in a selected geographical area, and for handling of network traffic in a period with heavy network load exerted by network traffic to or from, or both to and from said geographical area for avoiding overloading of said mobile network, comprising the following steps:
   a) establishing an overview of maximum network capacity of said mobile network serving said selected geographical area as well as adjacent areas;
   b) establishing an overview of the identity of mobile phones located within said selected geographical area as well as in adjacent areas served by said mobile network, and determining possible maximum traffic load that may be exerted by the identified mobile phones on the network based on a scenario where each connected phone exerts maximum load on the network;
   c) monitoring current traffic load of the mobile network as well as traffic load of each of different mobile services requiring different bandwidth on the network;
   d) determining type of barring, of one or more of said different types of mobile services to be set or removed for network traffic to or from, or both to and from the mobile phones identified in step b), and where this is based on the maximum network capacity, determined possible maximum traffic load, and current monitored traffic load, where barring is set if current monitored traffic load is determined to be above the maximum network capacity, and where type of service to be barred is based on the service contributing the most to the load, and where a set barring is removed if current monitored traffic load is determined to be below the maximum capacity of the network;
   e) setting type of barring or removing set type of barring, determined in step d), of said mobile phones identified in step b) and which are served by said mobile network for utilizing maximum network capacity of the network without overloading the network during a period with heavy network load, and without shutting down all mobile services for a particular mobile phone;
   f) repeating steps b) to e).

2. Method according to claim 1, where prioritized mobile phones are excluded from barring.

3. Method according to claim 1, where barring of the selected type of service to or from, or both to and from, mobile phones located inside said selected area is performed.

4. Method according to claim 1, where barring of the selected type of service to or from, or both to and from, mobile phones in areas adjacent to said selected area is performed.

5. Method according to claim 1, where barring of the selected type of service to or from, or both to and from, mobile phones located both inside said selected area and areas adjacent to said selected area is performed.

6. Method according to claims 3, 4 or 5, where mobile phones in the selected area are grouped in at least two groups, and where network services are barred for one group at a time set by time intervals.

7. Method according to claim 6, where barring of network services rotates between the groups set by time intervals, such that each group will have access to network services for a limited time in a period with heavy network load.

8. Method according to one of the claims 1 to 7, where type of mobile service barred is SMS, voice and/or different type of data.

9. Method according to claim 8, where the different type of data barred are low bandwidth demanding services such as browsing and/or high bandwidth demanding services such as streaming of video and voice.

10. Method according to one of the claims 1 to 9, where gradual barring of different types of mobile services for identified mobile phones is performed based on current traffic load on the mobile network.

11. Device for performing optimal utilization of the capacity of a mobile network serving mobile phones located in a selected geographical area, and for handling of network traffic in a period with heavy network load exerted by network traffic to or from, or both to and from said area for avoiding overloading of said mobile network, comprising:
    a) input means for receiving information of a selected geographical area;
    b) input means for receiving an overview of maximum network capacity of said mobile network serving said selected geographical area as well as adjacent areas;

c) input means for receiving an overview of the identity of mobile phones located within said selected geographical area as well as in adjacent areas served by said mobile network for determining maximum traffic load that may be exerted by identified mobile phones on the mobile network;

d) input means for receiving data regarding current traffic load of the mobile network as well as traffic load of each of different mobile services requiring different bandwidth on the network;

e) means for determining type of barring, of one or more of said different types of mobile services to be set or removed for network traffic to or from, or both to and from the mobile phones identified in step c), and where this is based on the maximum network capacity, determined possible maximum traffic load, and current monitored traffic load, where barring is set if current monitored traffic load is determined to be above the maximum network capacity; and where type of service to be barred is based on the service contributing the most to the load, and where a set barring is removed if current monitored traffic load is determined to be below the maximum capacity of the network;

f) means for setting type of barring or removing set type of barring, determined in step e), of said mobile phones identified in step c) and which are served by said mobile network for utilizing maximum network capacity of the network without overloading the network during a period with heavy network load, and without shutting down all mobile services for a particular mobile phone.

12. Device according to claim 11, further comprising input means for receiving data regarding prioritised mobile phones that are not to be barred.

13. System for performing optimal utilization of the capacity of a mobile network serving mobile phones located in a selected geographical area, and for handling of network traffic in a period with heavy network load exerted by network traffic to or from, or both to and from said area for avoiding overloading of said mobile network, comprising:

a) means for selecting said geographical area;

b) means for establishing an overview of maximum network capacity of said mobile network serving said selected geographical area as well as adjacent areas;

c) means for establishing an overview of the identity of mobile phones located within said selected geographical area as well as in adjacent areas served by said mobile network for determining maximum traffic load that may be exerted by mobile phones on the mobile network;

d) means for establishing an overview of the current traffic load exerted by different types of mobile services delivered via said mobile network;

e) a location based barring device for determining if type of barring, of one or more of said different types of mobile services to be set or removed for network traffic to or from, or both to and from the mobile phones identified in step c), and where this is based on the maximum network capacity, determined possible maximum traffic load, and current monitored traffic load, where barring is set if current monitored traffic load is determined to be above the maximum network capacity; and where type of service to be barred is based on the service contributing the most to the load, and where a set barring is removed if current monitored traffic load is determined to be below the maximum capacity of the network;

f) a mobile switching centre for setting type of barring or removing set type of barring determined in step e), of said mobile phones identified in step c), said switching centre having input means for receiving the identity of mobile phones where barring and type of barring is to be set or removed, determined by said location based barring device.

14. System according to claim 13, further comprising a priority database with the identity of prioritised mobile phones that are not to be barred.