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(54) Title: METHOD AND SYSTEM FOR SETTING UP A VOICE CONNECTION
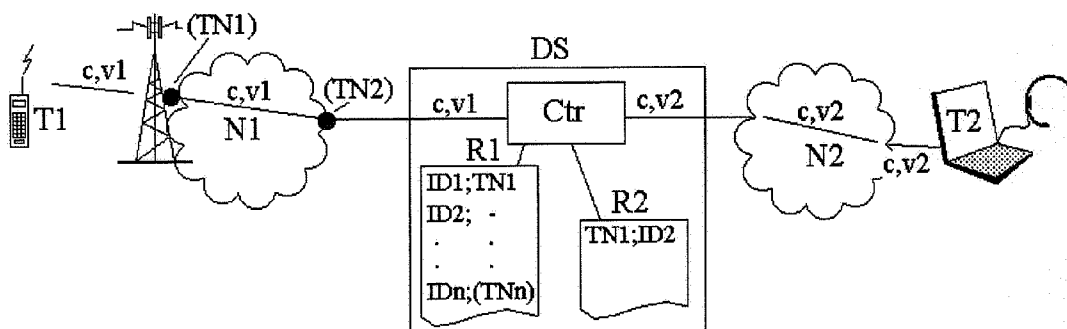
(57) Abstract: Method for setting up a voice connection between a first terminal set (T1), arranged for the transfer of IP data (c) and of non-VoIP voice signals (v1) via a non-VoIP voice network (N1), and a second terminal set (T2). By the first terminal set (T1) a voice connection is initiated utilizing an interconnection system, (DS) which are arranged to exchange IP data (c) for setting up the desired voice connection with the non-VoIP voice network (N1) and the VoIP voice network (N2). The interconnection system (DS) is arranged for setting up, by means of the IP data (c), a first partial voice connection with the first terminal set (T1) via the non-VoIP voice network (N1) and of one or more further partial voice connections with the second terminal set (T2), and for coupling through the first and the one or more further partial voice connections.

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Title: Method and system for setting up a voice connection

Field

The invention concerns a method or system respectively for
setting up a voice connection between a first terminal set,
which is arranged for not IP (Internet Protocol) based voice
traffic (non-VoIP) and IP data traffic at a low bitrate, and a
second terminal set which is or is not arranged for IP (with a
relative high bitrate) based voice traffic (VoIP) or IP data
traffic respectively.

Particularly - however, not exclusively - the invention concerns
a method or system respectively for setting up a voice
connection between a mobile terminal set, e.g. a modern GSM
terminal set, which is not pre-eminently arranged or suitable
for VoIP voice, but which is arranged or suitable indeed for
exchanging IP data at a low bitrate, and another, second
terminal set, which is pre-eminently arranged or suitable for
VoIP voice, like e.g. a PC which, via ADSL or another broadband
medium, is connected with the Internet. Moreover, the invention
concerns setting up connections between other terminal sets.

Background

For long-distance voice connection more and more frequently use
is made of VoIP voice (speech) solutions. VoIP voice, however,
does not work when using the present, popular standard mobile
telephone sets (GSM). It does work with mobile telephone sets
which use UMTS; UMTS, however, is still very expensive and is
not widespread.

Addressing within Instant Messaging (IM) and (standard) VoIP-to-
VoIP voice often occurs on the basis of labeled IP addresses,
called buddies. Users know and recognize their relatives,

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friends and acquaintances as their buddies, and it would be
convenient - what would be one aim of the present invention -
if, in addition to services like IM and VoIP voice, also other,
non-VoIP communication forms (e.g. based on GSM or POTS), could
make use of this way of addressing.

Summary

An important aim of the invention is providing a coupling
between a first terminal set and a second terminal set,
utilizing the possibilities offered by the Internet, even when
one or both terminal sets are not arranged or suitable in
themselves for voice via the Internet (VoIP). A further aim of
the invention is that such terminal sets, which are not suitable
for VoIP (IP voice/speech), nevertheless are enabled to set up
connections by using a list of buddies or users having IP
addresses (IP data).

For the realization of those aims the invention - roughly
formulated - provides that IP data connections, having a rather
low bitrate, may be used to set up a voice connection between
terminal sets of which either one or both are not arranged for
VoIP (which requests a high bitrate); that for voice traffic
where necessary a non-VoIP partial voice connection (e.g. via
the GSM network) but where possible a VoIP partial voice
connection (via the Internet) will be set up; which partial
voice connections (e.g. GSM - VoIP) subsequently are
interconnected, thus realizing a complete voice connection
between both terminal sets. In such a configuration an aim will
be, for the voice connection, to utilize the Internet, i.e.
VoIP, as much as possible.

Formulated more formally, the invention comprises a method for
setting up a voice connection between a first terminal set which
is arranged for the transfer of IP based control data at a low

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bitrate, hereinafter indicated with IP data, via a connection
which is arranged for such IP data, hereinafter indicated with
IP data connection, and for the transfer of non-VoIP voice
signals via a network which is arranged for such a non-VoIP
voice signals, e.g. a GSM or POTS telephony network, hereinafter
indicated with non-VoIP voice network, which thus, due to the
restricted bandwidth, is not arranged for voice via IP, and a
second terminal set, which is arranged for the transfer of IP
data and of either VoIP voice signals via a network which is
arranged for such VoIP voice signals, e.g. the (broadband)
Internet, hereinafter indicated with VoIP voice network, either
of non-VoIP voice signals via the (or another than the first
mentioned one) non-VoIP voice network, wherein, by the first
terminal set or by the second terminal set a voice connection
between both terminal sets is initiated by utilizing an
interconnection system, comprising one or more interconnection
servers, which interconnection system is arranged

- to exchange IP data, relevant for setting up the voice
  connection between the first and second terminal set;
- for setting up, by means of those IP data, a first partial
  voice connection between the first terminal set and the
  interconnection system via the non-VoIP voice network;
- for setting up, preferably by means of those IP data, one or
  more further partial voice connections between the
  interconnection system and the second terminal set via the
  VoIP voice network and/or the non-VoIP voice network,
- and for coupling through or interconnecting the first and said
  one or more further partial voice connections.

Different situations may occur which - based on the preceding -
may be elaborated in somewhat different ways. Diverse actions in
setting up the voice connection and diverse relevant options
will be discussed hereinafter. The sequence of the actions may
differ from the order in which they will be mentioned (A., B.,

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C. etc.) and discussed below.

A. Via an IP data connection - at a low bitrate - the first terminal set passes to the interconnection system its own, first IP address (IP1), as well as a second IP address (IP2), belonging to the second terminal set to be called; both IP addresses are, linked to each other (IP1 - IP2), stored into the interconnection system. Further below the situation will be discussed in which the second terminal set does not have an IP address.

B. Of the first terminal set - at any moment - in the interconnection server its IP address (IP1) is stored linked to a network address (NA1) which is valid for the non-VoIP voice network and which is - temporality or permanently - characteristic for that first terminal set. Both addresses are, linked to each other (IP1 - NA1), stored into the interconnection system. This action may precede action A. or may be performed after, partly dependent of what will be used as a characteristic network address.

The characteristic network address may be the own (usually permanent) telephone number ("A-number") of that first terminal set, which can be recognized by the interconnection system by means of CLI (Calling Line Identification), or a telephone number that the interconnection server itself makes available (e.g. temporarily) as a call number ("B-number") and, via IP data, passes to the first terminal set in order to arrange that it can be called by the first terminal set for setting up the first partial voice connection, i.e. between that first terminal set and the interconnection system. Under D. the characteristic network address will be discussed more in detail.

B'. Optionally

If, like the first terminal set, also the second terminal set

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only be can reached via the (or a) non-VoIP (telephone) network
(e.g., the second terminal set is, like the first terminal set,
a GSM set too), for that second terminal set the combination of
IP address (IP2) - characteristic (telephone) network address
(NA2) is linked (IP2 - NA2) en stored into the interconnection
system. Also here the characteristic network address can be the
telephone number ("A-number") of that second terminal set or a
special to be called (by that second terminal set) number ("B-
number") in order to reach the interconnection server.

C. The characteristic non-VoIP-network address (NA1) of the
first terminal set, stored in connection with the first terminal
set's IP address (IP1), is stored by the interconnection system,
linked with the IP address of the second terminal set (IP2)
towards which a connection is desired (NA1 - IP2). In other
words, the IP address of the first terminal set (IP1) is, by the
interconnection server, converted into or replaced by the
characteristic non-VoIP network address which is valid for that
terminal set, in other words, its characteristic telephone
number (NA1).

C'. Optionally

When - as mentioned under 'B'. Optionally" - also the second
terminal set is accessible via the (or a) non-VoIP network, also
for that terminal set, from the previously stored (linked) data
pair IP address - characteristic (telephone) network address
(IP2 - NA2), the IP address of the second terminal set is
converted into or replaced by the non-VoIP network address which
is characteristic for that terminal set, so that, in this
optional case, the characteristic non-VoIP network address of
the first terminal set is linked, by the interconnection system,
with the characteristic network address of the second terminal
set (NA1 - NA2).

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D. Via IP data the interconnection system subsequently passes to
the first terminal set that this must/may call the
interconnection system for realizing the first partial voice
connection, i.e. the one between the first terminal set and the
interconnection system. For setting up this partial voice
connection use is made of the characteristic telephone number
(NA1) of that first terminal set. There are - as mentioned
before - two options possible:

a. The characteristic network address may be formed by the A-
number, i.e. the telephone number of the terminal set. In this
option the B-number, i.e. the telephone number of the
interconnection system which to be called by the terminal set is
therefore not-characteristic for that first terminal set. It can
be that e.g. there is known a generally (e.g. 0900) number at
the side of the first terminal set, which has to be called. It
may also be that the number to be called (B-number) is
communicated to the first terminal set via IP data (which will
be preferred), where it is either displayed on the screen of the
terminal set, or where it is read in by software which has been
installed in the first terminal set for the benefit of the
present service, so that the user of the first terminal set, by
means of only one "press of the button"(or even without), can
set up the partial voice connection to the interconnection
system. In this option the characteristic telephone number of
the first terminal set is formed by its own telephone number,
assigned, at the time, by its telephone provider. In that case
that telephone number must have been stored in the
interconnection system at any previous moment in accordance with
the step mentioned under B. (see above). When the first terminal
set thus calls - for setting up the first partial voice
connection - the interconnection system, the interconnection
system has to detect which first terminal set is involved with
that call (after all, in practice the interconnection system

will, more or less at the same moment, have to process several
different calls from the non-VoIP (read: telephone) network) by
means of detecting the telephone number of that first terminal
set, using CLI (Calling Line Identification).

b. The characteristic network address may also be formed by the
B-number, i.e. the telephone number of the interconnection
system which the terminal set has to call. In this option no use
is made of detection of the (permanent) A-number (CLI) - there
exist, after all, systems and/or situations in which CLI cannot
be utilized - , but the first terminal set is characterized, at
any moment, by a temporary B-number which is assigned to the
first terminal set by the interconnection system. In this case
it is - via IP data - passed to the first terminal set which
specific telephone number (B-number) the first terminal set has
to call for setting up of the partial voice connection between
the first terminal set and the interconnection system. In this
option the value of the characteristic telephone number is thus
originating from the interconnection system. That number will
have a restricted "storage life". Thus under par. B (see above)
the IP address of the first terminal set (IP1) and the call
number of the interconnection system, determined by the
interconnection system and usable for a restricted period, are
stored. For making the partial voice connection to the
interconnection system, the first terminal set thus calls the
relevant, to be used only for that connection and
characteristic, call number of the interconnection system.
Obviously, that characteristic call number has, at any moment,
to be passed to the first terminal set. From all - in practice -
more or less simultaneous calls originating from the telephone
network, the interconnection system thus can determine, from the
value of the telephone number (of the node) at which the call
enters - the B-number - which is specific for the first
terminal set. Also in this case the relevant - but

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characteristic and temporary now - telephone number may, by
means of IP data, be displayed on the screen of the first
terminal set, or - and preferably - be used by the software of
the first terminal set to set up (semi-)automatically the
partial voice connection. After the partial voice connection
between the first terminal set and the interconnection system
has been finished, the temporary characteristic B-number will be
released again for other partial voice connections. When the
first terminal set does not set up the partial voice connection
within the relevant "storage life period", the temporary
characteristic B-number will be released and the first terminal
set will be informed about that via IP data.

E. When the second terminal set is a VoIP enabled terminal set,
the second partial voice connection between the interconnection
system and the second terminal set can be initiated starting
from the interconnection system according to the standard VoIP
protocol, under control of (its own IP address and) the IP
address of the second terminal set (IP2). By which the second
partial voice connection thus will be realized.

E'. Optionally

What was explained in the preceding under D. about the partial
voice connection between the first terminal set and the
interconnection system (via the non-VoIP network), can, mutatis
mutandis, be used in the same way for setting up a - second -
partial voice connection between the interconnection system and
the second terminal set in the case that - see under B' and C' -
also the second terminal set, just like the first terminal set,
is accessible via a/the non-VoIP (e.g. GSM) network and also for
that terminal set use is made of a (telephone) network address
(NA2) which is characteristic for that second terminal set,
which (see under B'.) is stored into the interconnection system.
Also for setting up that second partial voice connection thus

use can be made of a characteristic A-telephone number (option
a.) or a characteristic B-telephone number (option b.).

F. Finally, after both partial voice connections - the first one
between the first terminal set and the interconnection system
and the second one between the second terminal set and the
interconnection system - have been established, the
interconnection system couples both partial voice connections to
one voice connection between the first and the second terminal
set, after which the user of the first and second terminal set
can talk with each other. After disconnecting the voice
connection, starting from the first or the second terminal set,
also the interconnection system disconnects the partial voice
connections which are not necessary any longer and removes
temporary parameters, like a possibly temporary characteristic
B-number, assigned to the first terminal set, and possibly a
temporary characteristic B-number, assigned to the second
terminal set. Permanent parameters, like characteristic A-
numbers (after all having a permanent character in most cases)
of the first or second terminal set respectively, may, if
desired, remain stored in the interconnection system for future
connection sessions.

Some additional options will be discussed now, which may be
important within the scope of this invention.

In a preferred embodiment according to the invention, the first
terminal set passes via an IP data connection to the
interconnection system its own, first IP address (IP1), as well
as a second IP address (IP2) belonging to the second terminal
set to be called and/or a network address (NA2) which is valid
for the non-VoIP voice network and which is characteristic for
the second terminal set to be called, the first IP address (IP1)
as well as the second IP address (IP2) and/or the network
address (NA2) are, linked to each other, stored into the

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interconnection system (IP1 - IP2) ; (IP1 - NA2).

In a further preferred embodiment according to the invention,
the interconnection system passes via IP data to the first
and/or second terminal set enabling the first and/or second
terminal set, respectively, to call the interconnection system
for effecting the first and/or second partial voice connection,
respectively, between the first and/or second terminal set,
respectively, and the interconnection system; for setting up the
one or more partial voice connections, use is made of the
characteristic network address (NA1; NA2) of the first and/or
second terminal set, respectively.

In an additional preferred embodiment according to the
invention, the interconnection system brings about said first
and/or second partial voice connection with the first and/or
second terminal set, respectively, via a VoIP network, or via
said or another non-VoIP voice network.

In a yet further preferred embodiment according to the
invention, the interconnection system passes via IP data to the
first or second terminal set enabling the first and/or second
terminal set, respectively, to call the second or first terminal
set, respectively for effecting a direct voice connection
between the first and second terminal set via said non-VoIP
network; the first and/or second partial voice connection,
respectively, between the first and/or second terminal set,
respectively, and the interconnection system; for setting up the
one or more partial voice connections, use is made of the
characteristic network addresses (NA1; NA2) of the first and
second terminal set.

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It is noted that instead of or in addition to establishing a
voice connection, a video connection can be established. In this
context, a voice connection means a connection for contacting
multiple users via voice, such as speech, music, etc. In
principle, the terminal set type is not limited to a
conventional telephone terminal or a mobile phone, but can also
be a computer or server provided with sound input and output
means, such as a microphone and a speaker set. Therefore, the
voice connection can be extended to a particular user, using
various services, e.g. a common telephone connection or Internet
embedded services, such as chatting, or web-based social
communities.

Further, the method according to the invention can be used to
arrange an interconnection between more than two terminal sets,
e.g. three or four or more terminals sets, thereby generating a
conference interconnection or a so-called group call.

When the second terminal set is arranged for the transfer of
VoIP voice signals via the VoIP voice network and those second
(VoIP enabled) terminal set wants (the other way about than
above) set up a connection to the (non-VoIP enabled) first
terminal set, two options are possible:

a. The second terminal set may, via IP data, request the first
terminal set to set up a connection to the second terminal set.
With it that connection can be set up subsequently as elaborated
hereinabove, as, after all, the connection - after having been
provoked thereto by the second terminal set - starts from the
first terminal set and, using the interconnection system, will
be set up to the second terminal set.

b. Another option is not to address the request for setting up a
connection to the first terminal set but - via IP data -

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directly to the interconnection system. Which then - if provided
with the relevant parameters, supplied by the second terminal
set or already obtained during an earlier session with the
relevant first terminal set - will set up a partial voice
connection with that first terminal set and couple it with a
VoIP partial voice connection with the (in this case) initiating
second terminal set.

When the second terminal set, just like the first terminal set,
is arranged for non-VoIP voice signals via the non-VoIP voice
network, in other words, when neither terminal set is arranged
for VoIP, the terminal sets, as already mentioned in the
preceding, under B', C' and D' ("Optionally"), may be connected
one another by (under B') linking, also for the second terminal
set (just as for the first terminal set), the IP address (IP2)
with a (telephone) network address which is characteristic for
the second terminal set, and storing that into the
interconnection system (IP2 - NA2). The characteristic network
address may be the telephone number (A-number) of that second
terminal set or a special number (B-number) to be called by the
second terminal set, of the interconnection server (temporarily
reserved by the interconnection server), as discussed in
detailed in the preceding. Subsequently, also for the second
terminal set, from the stored link (IP2 - NA2) the IP address of
the second terminal set is converted (under C') into or replaced
by the non-VoIP network address which is characteristic for that
terminal set, so that, by the interconnection system, the
characteristic non-VoIP network address of the first terminal
set is linked with the characteristic network address of the
second terminal set (NA1 - NA2), with which the interconnection
system is able to set up a partial voice connection with the
first terminal set and a partial voice connection with the
second terminal set, utilizing both characteristic network
addresses (A- or B-numbers) (NA1 - NA2) and to couple both

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partial voice connections. This optional method thus is suitable
for the situation that neither terminal set is VoIP enabled
indeed, but that both, by means of IP data, can use each other's
IP addresses with the help of a list of buddies or users having
IP data; e.g. both terminal sets may be "state-of-the-art" GSM
telephone sets.

When, however, neither of both terminal sets is arranged for
VoIP (in other words neither of both terminal sets is VoIP
enabled) and, besides, only one, only the first terminal set is
IP data enabled and has an own IP address, while the second
terminal set is e.g. a somewhat older, not IP data enabled GSM
or (even) a conventional POTS telephone apparatus, the method
according to the invention may nevertheless be performed,
however, adapted as follows:

In that case, in the action A. mentioned hereinabove, the IP
address of the second terminal set will not be entered - since
the second terminal set does not have an IP address as it is not
IP enabled - but, instead, a characteristic network address
(NA2) of the second terminal set will be entered. In this
situation, the first (IP enabled) terminal set either will have
to have entered e.g. the telephone number (NA2) of the terminal
set to be called in its list of buddies or users, or will have
to enter (to key in) that telephone number manually, in order to
initiate a connection with that second terminal set. Under
action A. then the IP address (IP1) of the first terminal set
and the network address (NA2) of the second terminal set thus
will be linked to each other (IP1 - NA2) and stored into the
interconnection server.

Under action B. then the IP address (IP1) of the first terminal
set will be stored, linked (IP1 - NA1) to its characteristic
network address (NA1). Based on that, the interconnection system
may request the first terminal set, via IP data, to set up a

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voice connection to the interconnection system via the non-VoIP
network (e.g. GSM), the interconnection system makes, via the
(relevant) non-VoIP network a partial voice connection with the
second terminal set (NA2) and couples both partial voice
connections to each other.

In the preceding there always has been spoken of a (first of
second respectively) terminal set instead of, e.g., a (first of
second respectively) terminal. This item will be discussed now.

The first terminal set or each of both terminal sets may
comprise a module which is arranged for non-VoIP voice signals -
therefore not arranged for VoIP voice signals - , as well as a
module which is arranged for IP data. For instance, the first
terminal set is or both terminal sets are "state-of-the-art" GSM
telephone sets, not arranged for VoIP voice indeed - requiring a
large bandwidth or transmission rate - but which is arranged,
via a built-in IP data module, for exchanging IP data including
IP addresses), as a result of which lists of buddies or users
may be utilized. In this option the module arranged for non-VoIP
voice signals and a module arranged for IP data thus are
physically located within the same terminal. Particularly the
terminal set may be formed by a telephony terminal, e.g. a
modern GSM telephone set.

The first terminal set or each of both terminal sets may
comprise a telephony terminal which is arranged for non-VoIP
voice signals - unsuitable (not arranged) for VoIP voice signals
- which, however is also neither arranged for IP data, in other
words a telephony terminal which is not suitable/arranged at all
for any form of IP, e.g. an older GSM set or a conventional POTS
telephone device. This deficiency, however, may be compensated
by having the terminal set to consist of the telephone device
which is not suitable/arranged for IP, together with a computer
terminal ("PC") which is suitable/arranged for IP data. With the

latter then, e.g. using a list of buddies or users installed at
that PC, via IP data a voice connection between both telephone
devices may be initiated which partly goes via the non-VoIP
network (e.g. GSM or POTS), partly via the IP network (e.g. the
Internet or an Intranet).

The entire connection - to be set up via IP data - e.g. may
schematically look like this:

terminal A (non-VoIP) <-> telephony network A (non-VoIP) <->
interconnection server A (non-VoIP/VoIP) <-> Internet (VoIP) <->
interconnection server B (VoIP/non-VoIP) <-> telephony network B
(or A) (non-VoIP) <-> terminal B (non-VoIP).

In this diagram interconnection server A and interconnection
server B are considered to belong to one interconnection system,
in this case, however, distributed over two servers, viz. the
servers A and B. Especially when terminal A and terminal B are
located in the vicinity of each other, the interconnection
system may be formed by one interconnection server, having one
coupling unit. However, when terminal A and terminal B are
located at a larger geographical distance from each other, the
interconnection system may be formed by separate - separated
physically and geographically from each other - cooperating
coupling units, in separate interconnection servers A and B,
which may be interconnected by means of the VoIP network (the
Internet).

Besides the method as presented in the preceding, the invention
also comprises a system arranged for performing that method
according the invention. An exemplary embodiment of such a
system will be discussed hereinafter, referring to some figures.

Exemplary embodiment

Figure 1 shows an exemplary embodiment of a system that is

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arranged for performing the method as discussed hereinabove.

Figure 2 shows a second exemplary embodiment of such a system
arranged for performing the method as discussed hereinabove.

Figure 1 shows a system for setting up a voice connection
between a first terminal set T1 and a second terminal set T2.
Terminal set T1 is suitable for the transfer of non-VoIP voice
signals v1, e.g. GSM, and IP data c at a low bitrate, via a
first network N1, in this case a public GSM network.

Terminal set T2 is suitable for the transfer of VoIP voice
signals v2 (VoIP) and IP data c via a VoIP voice network N2,
e.g. the Internet. The shown system, moreover, comprises an
interconnection server DS which is arranged for initiating, via
an IP data connection (c) at a low bitrate between the first
terminal set and the second terminal set, a voice connection
(v1-v2) between that first and second terminal set. The
interconnection server DS is provided with among others a
control unit Ctr for the exchange of the relevant control data c
for setting up the desired voice connection (v1-v2) between the
first and second terminal set, between the non-VoIP voice
network N1 at one side and the VoIP voice network N2 at the
other side.

The control unit Ctr provides, together with a first register R1
and a second register R2, for setting up, by means of the IP
data c, a first voice connection v1 through the non-VoIP voice
network N1, between the first terminal set T1 and the
interconnection server DS. Moreover, the control unit Ctr
provides, together with the first and second register, for
setting up, by means of the IP data c, of a second voice
connection v2 through the VoIP voice network N2 between the
interconnection server DS and the second terminal set T2 and,
finally, for coupling through the first voice connection v1 and

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the second voice connection v2.

As mentioned, the interconnection server DS comprises a first
register R1, arranged for storing, for the first terminal set, a
first IP address IP1 and with that a (or the) valid network
address ("GSM telephone number") TN1 of that first terminal set
at the non-VoIP voice network ("IP1; TN1"), as well as, for the
second terminal set, a second IP address IP2 (without telephone
number: "IP2; - ").

The interconnection server DS is - by means of the control unit
Ctr - arranged to receive from that first terminal set T1 the
value of its IP address IP1 as well as the value of the IP
address IP2 of the second terminal set, when the first terminal
set T1 - via an IP data connection - desires to set up a voice
connection with the second terminal set. Terminal set T1 may
e.g. pass IP1 and IP2 to the interconnection server DS in that
the user of the terminal set T1 uses his/her list of buddies or
users stored in a memory of terminal set T1. IP1 and IP2 are,
e.g., the IP addresses of T1 and T2.

It is noted that a list of buddies or users is a table
comprising a multiple number of user names wherein a user name
is linked to one or more corresponding IP addresses, one or more
identifications in a database in a particular Internet domain,
such as name@domainname.com, and/or one or more corresponding
network addresses of a non-VoIP voice network. The state of a
user or buddy can e.g. be online or offline. Online means that
there is a live IP data connection to the interconnection server
DS. Offline means that the IP data connection has been
terminated.

The control unit Ctr is arranged to retrieve from the first
register R1 the first terminal set's network address TN1 (the
telephone number) at the non-VoIP voice network N1 (the

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telephone network), belonging to the first terminal set's IP
address IP1.

The network address TN1 of terminal set T1 at the non-VoIP voice
network N1, retrieved in the register R1 based on the received
first IP address IP1, is temporarily (e.g. for a period p)
stored in a second register R2, together with the IP address IP2
of the terminal set T2 to which a connection has to be set up:
register R1 then thus contains a record having the content
"TN1;IP2".

The interconnection server DS is arranged - by means of the
control unit Ctr - to pass, via an IP data connection (c) with a
low bitrate, to the first terminal set T1 a network address TN2
valid for the non-VoIP voice network, e.g. a 0800 or 0900 number
established for that. This may be a telephone number which is
equal for all connections to set up, e.g. the number 0900 123456
or which, e.g. for the benefit of spreading connection requests
in busy periods, may be different per new connection request.

The control unit Ctr further is arranged to, as soon as terminal
set T1 - within period p - calls, via network N1, the network
address TN2 passed by the interconnection system, to detect the
network address TN1 by means of "Calling Line Identification"
(CLI). When period p has been expired without T1 has called, the
relevant record in register R2 can be deleted, thus preventing
register pollution.

The control unit Ctr is further arranged to retrieve, in the
second register R2, the IP address IP2 of the second terminal,
linked to the network address TN1 received - by CLI - via the
non-VoIP voice network, which belongs to the terminal set T2 to
which a connection is to be set up, and to establish a voice
connection v2 with the second terminal set via the VoIP voice
network.

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The control unit Ctr, finally, is arranged to couple through the
first voice connection v1 and the second voice connection v2
with each other, thus realizing the desired voice connection v1
<-> v2, formed by (non-VoIP) voice connection v1 and (VoIP)
voice connection v2.

Users (who must have registered into register R1 in the initial
phase) may keep on their telephone or PDA - the first terminal
set T1 - a list of buddies or users comprising (in this case)
VoIP voice users - hereinabove mentioned as second terminal sets
T2. When such a VoIP voice user is online, this can be called
with a "press on the button", by which IP1 (of T1) and IP2 (of
T2) will be transferred to the interconnection system.
Subsequently, telephone T1 calls telephone number TN2, passed by
the interconnection server DS - or known beforehand, e.g. from
printed documentation - and passes its own telephone number,
TN1, by means of "CLI". The interconnection system derives from
the content of register R1 from TN1 the target address IP2, by
which server DS is capable to interconnect the voice connection
v1 (TN1 <-> DS via the GSM network N1) with the VoIP voice
connection v2 (DS <-> IP2 via the Internet N2).

When the second terminal set T2 is arranged for the transfer of
VoIP voice signals v2 via the VoIP voice network N2 and the
first terminal set T1 - not suitable for VoIP voice signals -
wants to set up a connection to the second terminal set T2, the
process thus goes as outlined in the preceding.

When - the other way round - the second terminal set T2 wants to
set up a connection to the first terminal set T1, the process
may, according to a first option, go as follows:

• via an IP data connection (c) the terminal set T2 transfers -
  e.g. utilizing it "address book" or list of buddies or users -
  to the interconnection server DS its own IP address IP2 as

well as the IP address IP1, belonging to the terminal set T1
to be called;

• from the first register R1 the network address TN1 of that
  first terminal set at the non-VoIP voice network N1, belonging
  to the IP address IP1 of the first terminal set T1, will be
  retrieved

• via IP data c the interconnection server DS sends a request to
  the first terminal set T1 to be called, to initiate, from that
  side, a connection with the calling second terminal set T2.
  When that request - via the user of terminal set T1 or
  automatically, bypassing the user - is honored, subsequently a
  voice connection from T1 to T2 will be set up in the way
  explained in the preceding under Ia.

When the second terminal set T2 is arranged for the transfer of
VoIP voice signals via the VoIP voice network and that second
terminal set T2 desires to set up a connection to the first
terminal set T1, the process according to a second option may go
as follows:

• via an IP data connection (c) the second terminal set T2
  passes to the interconnection system DS its own IP address
  IP2, as well as the IP address IP1 belonging to the terminal
  set T1 to be called;

• from the first register R1 of the interconnection server DS
  the network address TN1 of that first terminal set T1 at the
  non-VoIP voice network T1, belonging to the IP address IP1 of
  the first terminal set T1 to be called, is retrieved;

• the interconnection server DS initiates a non-VoIP voice
  connection v1 via the non-VoIP voice network N1 with the
  relevant first terminal set T1 and a VoIP voice connection v2

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via the VoIP voice network with the calling second terminal
set and interconnects both voice connections (v1 <-> v2).

For the following there is (also) referred to figure 2,
representing a situation in which both, the first and the second
terminal set T1 and T2 are not arranged for VoIP.

Moreover, in figure 2 each of the terminal sets are formed by a
voice terminal which is not arranged for IP (neither for VoIP,
nor for IP data) - an "old fashioned" (fixed or mobile)
telephone device T1a and T2a respectively - and a first and a
second data terminal T1b and T2b respectively, e.g. a PC. In
figure 2 T1a and T1b thus form together terminal set T1 and T2a
and T2b form together terminal set T2.

Further, figure 2 represents a situation that there is a large
distance between T1 and T2, e.g. that they are separated from
each other by country or continent borders. In that case the
interconnection system DS may have to be formed in many cases by
at least two interconnection servers, i.e. one at the side of T1
and one at the side of T2.

Hereinbelow these items will be discussed in a regular order.
Not all options treated in the preceding paragraph will be
elaborated in detail. The most important options will be
presented again in short at the end of this paragraph. The
various possible embodiments are deemed to form no problem for
any person skilled in the art after reading the figure
descriptions.

When the second terminal set T2, just like the first terminal
set T1, is arranged for non-VoIP voice signals via the non-VoIP
voice network N1 (N1a and N1b respectively in figure 2), in
other words, when neither terminal set is arranged for VoIP,
according to a first option the terminal sets may be
interconnected in a way as indicated below. This optional method

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thus is suitable for the situation that neither of both terminal sets is VoIP enabled indeed, but that both are IP data enabled and, via IP data c, can use each other's IP addresses with the help of list of buddies or users; both terminal sets, e.g., may be "state-of-the-art" GSM telephone devices which include an IP data module. The process may go as follows:

- Into the first register R1 a first IP address IP1 is stored for the first terminal set T1 connected with a valid network address TN1 of that first terminal set T1 at the non-VoIP voice network N1, as well as for the second terminal set T2 a second IP address IP2 connected with a valid network address of that second terminal set T2 at the non-VoIP voice network N1;

- The first terminal set T1 or the second terminal set T2 initiates a connection to the second terminal set T2 resp. first terminal set T1 (the situation is symmetrical as both terminals T1 and T2 are IP data enabled but not VoIP enabled) by performing next steps:

  o via an IP data connection (c) the initiating terminal set (e.g. T1) passes to the interconnection system DS its own IP address IP1, as well as the IP address IP2 belonging to the terminal set to be called;

  o from the first register R1 the network address TN1 (TN1a in figure 2) of the initiating terminal set at the non-VoIP voice network N1, belonging to the IP address is retrieved, as well as the network address TN1' (TN1b in figure 2) of the terminal set T2 at the non-VoIP voice network N1 (N1b in figure 2), belonging to the IP address;

  o the network address TN1 of that terminal set at the

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non-VoIP voice network N1, retrieved in the first
register R1 based on the IP address of the initiating
terminal set, is stored by the interconnection server
DS in a second register R2, together with the IP
address IP2 of the second terminal set T2 to which a
connection is desired;

o   next, the first terminal set T1 calls, via the non-VoIP
    voice network N1, a network address TN2 at the non-VoIP
    voice network N1 which is valid for the interconnection
    server DS and at the same time passes its own network
    address TN1 at the non-VoIP voice network N1, which
    network address TN1 is passed on to the interconnection
    server DS by the non-VoIP voice network N1;

o   the interconnection server DS retrieves in the second
    register R2 the network address TN1 thus received via
    the non-VoIP voice network N1, belonging to the IP
    address of the second terminal, linked to the second
    terminal set T2 to which a connection is desired and
    subsequently realizes a voice connection v with the
    second terminal set T2 via the first network N1 which
    is arranged for non-VoIP voice signals v1;

o   the interconnection server DS couples the first and the
    second voice connection v2 with each other.

When - like in the situation as described hereinabove - the
second terminal set T2, just like the first terminal set T1, is
arranged for non-VoIP voice signals v1 via the non-VoIP voice
network N1, in other words, when neither of both terminal sets
is arranged for VoIP, according to a second option the terminals
may be interconnected in a way as indicated hereinbelow. This
second optional method is suitable for the situation that
neither of both terminal sets are VoIP enabled and that only

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one, only the first terminal set T1 has an own IP address; the
second terminal is e.g. a somewhat older, not IP enabled GSM or
a conventional POTS telephone apparatus. The process according
to this second option may go as follows:

- into first register R1 for the first terminal set T1 a first
  IP address IP1 is stored, linked with a valid network address
  TN1 of that first terminal set T1 at the non-VoIP voice
  network N1;

- the first terminal set T1 initiates a connection to the second
  terminal set T2 by performing next steps:

  o via an IP data connection (c) the first terminal set T1
     passes to the interconnection system DS its own IP
     address IP1, as well as the network address TN1' (TN1b
     in figure 2) of the second terminal set T2 at the non-
     VoIP voice network N1 (N1b in figure 2);

  o from the first register R1 the network address is
     retrieved of the first terminal set T1 at the non-VoIP
     voice network N1, belonging to the IP address IP1;

  o the network address TN1 of that terminal set T1 at the
     non-VoIP voice network N1, retrieved in the first
     register R1 based on the IP address of the first
     terminal set T1, is stored by the interconnection
     server DS into the second register R2, together with
     the network address TN1'(TN1b in figure 2) of the
     second terminal set T2 at the non-VoIP voice network
     N1 (N1b in figure 2);

  o next, the first terminal set T1 calls, via the non-VoIP
     voice network N1, a network address TN2 (TN2a in figure
     2) at the non-VoIP voice network N1 which is valid for
     the interconnection server DS, and passes at the same

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time its own network address at the non-VoIP voice
network N1, which network address is passed on to the
interconnection server DS by the non-VoIP voice network
N1 ("CLI");

o   the interconnection server DS retrieves in the second
    register R2 the network address TN1' (TN1b in figure 2)
    of the second terminal set T2 (to be precise, the
    telephone number of the POTS telephone device T2a),
    belonging to the network address TN1a of the first
    terminal and received via the non-VoIP voice network
    N1, and subsequently realizes a voice connection v with
    the second terminal set T2 via the first network N1
    arranged for non-VoIP voice signals v1 (in figure 2
    formed by both for non-VoIP arranged networks -
    telephony networks - N1a and N1b in figure 2).

o   the interconnection server DS (both cooperating
    interconnection servers DSa and DSb) couples the first
    and the second voice connection v2 with each other.

In the preceding always has been spoken about a first or second
terminal set respectively T1 and T2 respectively. As indicated
in the preceding, the first terminal set T1 or each of both
terminal sets T1 and T2 may comprise a module which is arranged
for non-VoIP voice signals v1 - therefore not suitable for VoIP
voice signals v2 - , as well as a module which is suitable for
IP data. For instance, the first terminal set T1 is or both
terminal sets are "state-of-the-art" GSM telephone sets, not
arranged for VoIP voice indeed - requiring a large bandwidth or
transmission rate - but made suitable, via a built-in IP data
module, for exchanging IP data (like IP addresses), thus
enabling the use of lists of buddies or users etc. In this
situation the module arranged for non-VoIP voice signals v1 and
the module arranged for IP data therefore are physically located

within the same terminal.

The first terminal set T1 or each of both terminal sets T1 and
T2 may comprise a telephony terminal which is arranged for non-
VoIP voice signals v1 - not arranged for VoIP voice signals v2 -
which is neither arranged for IP data; in other words, a
telephony terminal which is not arranged at all for any form of
IP, e.g. an older GSM set or a conventional POTS telephone
device. This deficiency, however, may - as illustrated in figure
2 - be compensated by having the terminal set to consist of the
telephone device T1a or T2a respectively, which is not arranged
for IP, together with a computer terminal ("PC") T1b or T2b
respectively which is arranged for IP data. With the latter
then, e.g. using a list of buddies or users installed at that
PC, via IP data a voice connection between both telephone
devices may be initiated which partly goes via the non-VoIP
network (e.g. GSM or POTS; voice connection v1)partly via the IP
network (e.g. the Internet or an Intranet; voice connection v2).

The entire connection - set up via IP data c - schematically
then looks like this:

terminal T1a (non-VoIP) <-> telephony network N1a (non-VoIP) <->
interconnection server DSa (non-VoIP/VoIP) <-> Internet N2
(VoIP) <-> interconnection server DSb (VoIP/non-VoIP) <->
telephony network N1b (non-VoIP) <-> terminal T2a (non-VoIP).

It is noted that de interconnection server DSa and the
interconnection server DSb both belong to the interconnection
system mentioned in the preceding paragraph; it could be stated
that both servers together form one interconnection server DS
distributed over two locations. In particular when terminal T1a
and terminal T2a are located geographically in the vicinity of
each other, both of them may, via the same telephony network N1
make connection with the same interconnection server DS. When -

as illustrated in figure 2 - terminal T1a and terminal T2a are
located at a larger geographical distance from each other, the
interconnection server thus may be formed by the separate -
separated physically and geographically from each other -
interconnection servers DSa and DSb, which are interconnected by
means of the IP data and VoIP network (the Internet).

Concerning the registers in the interconnection servers DSa and
DSb, each of these interconnection servers may be provided with
a first register R1a and R1b respectively and a second register
R2a and R2b respectively, wherein the interconnection servers
DSa and DSb are arranged to exchange, if necessary, the data
written into the registers, viz. the addresses IP1, IP2, TN1a,
TN1b, TN2a and TN2b, mentioned in the preceding, and their
mutual relations, and in that way, like the interconnection
servers DSa and DSb, will form distributed (first and second)
registers.

In figure 2 the corresponding units, signals etc. have been
labeled with "a" and "b" respectively; in the preceding text
those labels have not always used for the sake of the
readability.

For the sake of completeness, may be unnecessary, it is noted:

- that (among others as appears from the figures) it is presumed
  that the IP data may be transferred via the telephony network
  (e.g. utilizing ADSL);

- that where is spoken of a non-VoIP voice network, a network is
  meant which is suitable or arranged for non-VoIP voice
  signals, what, however, does not include that the non-VoIP
  voice network would be unsuitable for the transfer of VoIP
  voice signals; such a network - e.g. the conventional POTS
  telephony network - after all is, e.g. by means of ADSL etc.,

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suitable indeed for the transfer of IP traffic, both IP data
at a low bandwidth and IP traffic - including VoIP - for which
a larger bandwidth is requested;

- that where is spoken of a non-VoIP terminal set, a terminal
  set is meant - being one integral terminal or the combination
  of a voice terminal which is not arranged for IP and a
  terminal which is suitable for IP data - which is suitable for
  (small band) IP data indeed but not for (broadband) VoIP
  voice.

Finally, hereinbelow the most important options will be
summarized again, which were discussed in the preceding
paragraph "Summary" more in detail but could not or only
partially be worked out in the exemplary embodiments.

When both terminal sets are arranged for IP data and only the
second terminal set for VoIP voice signals, the IP addresses of
both terminals are stored into the interconnection system:
(IP1 - IP2). At any moment, before or after it, the IP address
of the first terminal set is stored into the interconnection
server, linked to its characteristic network address:
(IP1 - NA1). From those combinations, (IP1 - IP2) and
(IP1 - NA1), (NA1 - IP2) is determined, viz. the characteristic
network address of the first terminal set and the IP address of
the second terminal set. Via IP data the interconnection system
passes to the first terminal set that this must or can call the
interconnection system utilizing its characteristic network
address (NA1), i.e. its own network address (A-number) or a
temporary and specific call number (B-number) given out by the
interconnection server. The interconnection system realizes the
partial voice connection with the second terminal set via the
VoIP network and couples, after both partial voice connections
have come about, both partial voice connections to one voice
connection between the first and the second terminal set.

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When both terminal sets are arranged for IP data and both for
non-VoIP voice signals (both not suitable for VoIP), into the
interconnection system is stored again: (IP1 - IP2) and
(IP1 - NA1). Moreover, in this situation it will be stored into
the interconnection system for the second terminal set: (IP2 -
NA2). Subsequently, from the data combinations
(IP1 - IP2),(IP1 - NA1) and (IP2 - NA2) will be derived:
(NA1 - NA2), in other words, the IP addresses of the first and
second terminal set are converted into the characteristic
network addresses of that first and second terminal set, after
which the interconnection system realizes partial voice
connections with both terminal sets, both via the/a non-VoIP
network and couples both into one voice connection between the
first and the second terminal set.

When only the first terminal set is suitable for IP data and
both terminal sets are suitable for non-VoIP voice signals, then
(e.g. going from the list of buddies or users of the first
terminal set) the IP address of the first terminal set and the
characteristic non-VoIP voice network address (read: telephone
number) of the second terminal set will be entered: (IP1 - NA2).
At any moment for the first terminal set will be stored in the
interconnection system (IP1 - NA1), just like also in the
preceding situations. From these registrations both
characteristic network addresses (NA1 - NA2) may be determinated
and the interconnection system can pass to the first terminal
set that it must or may call the interconnection system and the
interconnection system can also realize the partial voice
connection with the second terminal set and couple through both
partial voice connections. It is noted here that for the first
partial voice connection this voice connection thus is set up -
invited to that via IP data by the interconnection system -
starting from the first terminal set (which, in consequence,
bears the costs for the connection), while in this case the

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second partial voice connection will have to be initiated
starting from the interconnection system, after all, the
connection cannot be set up - invited via IP data - from the
side of the second terminal set.

In the preceding exemplary embodiments for the characteristic
network address of the first or second terminal set respectively
the network address of that first or second terminal set
respectively at the relevant non-VoIP voice network was used,
which was recognized by the interconnection system by means of
CLI (Calling Line Identification). For the benefit of that CLI
recognition it was desirably that the characteristic "A-number"
of the first or second terminal set was transferred to the
interconnection system timely, e.g. during an initial
registration step.

When on the other hand as the characteristic network address of
the first or second terminal set respectively a network address
at the non-VoIP voice network is used which is given out as a
call number ("B-number") by the interconnection server for a
certain time period to be called by the first or second terminal
set respectively for realizing the first or second partial voice
connection respectively, the characteristic network address may
be transferred in a later stage, via IP data, to the first or
second terminal set respectively, in order to be called by the
first or second terminal set respectively for setting up the
partial voice connection between that first or second terminal
set respectively and the interconnection system. In this option
it is not necessary that the characteristic network address need
to be registered into the register R1, e.g. in an initial
registration step, and the user of the first or second terminal
set respectively even does not need to register beforehand at
all - which may be an advantage when exploiting the
interconnection system - as the - in this case temporary -

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characteristic network number is determined, by the
interconnection system, "on the fly" and passed on to the
relevant terminal set(s).

Claims

1. Method for setting up a voice connection between a first
terminal set (T1) which is arranged for the transmission of IP
based control data having a low bitrate, hereinafter indicated
as IP data (c), via a connection arranged for such IP data,
hereinafter indicated as IP data connection, and for the
transmission of non-VoIP voice signals (v1) via a network (N1)
arranged for such non-VoIP voice signals, e.g., a GSM or POTS
telephony network, hereinafter indicated as non-VoIP voice
network, which is not arranged for voice via IP, and a second
terminal set (T2) which is or is not arranged for the
transmission of IP data and for the transmission of either VoIP
voice signals (v2) via a network arranged for VoIP voice
signals, e.g. the Internet, hereinafter indicated as VoIP voice
network, or non-VoIP voice signals via said non-VoIP voice
network or another non-VoIP voice network, wherein, by either
the first terminal set or the second terminal set a voice
connection between both terminal sets is initiated using an
interconnection system (DS), comprising one or more
interconnection servers, which interconnection system is
arranged

- for exchanging IP data, relevant for setting up the voice
  connection between the first and second terminal set;

- for setting up, by means of those IP data, a first partial
  voice connection between the first terminal set and the
  interconnection system via the non-VoIP voice network;

- for setting up, by means of those IP data or not by means of
  those IP data, one or more further partial voice connections
  between the interconnection system and the second terminal set
  via the VoIP voice network and/or the non-VoIP voice network;

- and for coupling through the first and said one or more
  further partial voice connections.

2. Method according to claim 1, wherein both terminal sets are
arranged for IP data and only the second terminal set for VoIP
voice signals, comprising next actions:

A. Via an IP data connection the first terminal set passes to
the interconnection system its own, first IP address (IP1), as
well as a second IP address (IP2), belonging to the second
terminal set to be called; both IP addresses are, linked to each
other, stored into the interconnection system (IP1 - IP2);

B. At any moment, before, during or after the action under A.,
the first terminal set's IP address (IP1) is stored into the
interconnection server linked to a network address (NA1) which
is valid for the non-VoIP voice network and which is
characteristic for that first terminal set, its characteristic
network address, and both addresses are linked to each other
stored into the interconnection system (IP1 - NA1);

C. The characteristic non-VoIP-network address (NA1) of the
first terminal set, stored in connection with the first terminal
set's IP address (IP1), is stored by the interconnection system,
and linked with the IP address of the second terminal set (IP2)
towards which a connection is desired (NA1 - IP2);

D. Via IP data the interconnection system passes to the first
terminal set that the latter may call the interconnection system
for effecting the first partial voice connection between the
first terminal set and the interconnection system; for setting
up this partial voice connection use is made of the
characteristic network address (NA1) of the first terminal set;

E. The interconnection system brings about said second partial
voice connection with the second terminal set via the VoIP

network;

F. After both partial voice connections, viz. the one between
the first terminal set and the interconnection system and the
one between the second terminal set and the interconnection
system, have been established, the interconnection system
couples both partial voice connections to one voice connection
between the first and the second terminal set.

3. Method according to claim 1, wherein both terminal sets are
arranged for IP data and both for non-VoIP voice signals,
comprising next actions:

A. Via an IP data connection the first terminal set passes to
the interconnection system its own, first IP address (IP1), as
well as a second IP address (IP2), belonging to the second
terminal set to be called; both IP addresses are, linked to each
other, stored into the interconnection system (IP1 - IP2);

B. At any moment, before, during or after the action under A.,
the first terminal set's IP address (IP1) is stored into the
interconnection server, linked to a network address (NA1) which
is valid for the non-VoIP voice network and which is
characteristic for that first terminal set, its characteristic
network address, and both addresses are, linked to each other
stored, into the interconnection system (IP1 - NA1); also for
the second terminal set the combination of its IP address (IP2)
and a network address (NA2) which is valid for the non-VoIP
voice network and which is characteristic for the second
terminal set, its characteristic network address, are linked and
stored into the interconnection system (IP2 - NA2);

C. The characteristic non-VoIP-network address (NA1) of the
first terminal set, stored in connection with the first terminal
set's IP address (IP1), is stored by the interconnection system,
linked with the IP address of the second terminal set (IP2)

towards which a connection is desired (NA1 - IP2); also for the
second terminal set, in the same way as for the first terminal
set, from the linked data pair, IP address - characteristic
network address (IP2 - NA2), the IP address of the second
terminal set is converted into a non-VoIP voice network address
which is characteristic for that terminal set, so that the
characteristic non-VoIP network address of the first terminal
set can be linked, by the interconnection system, with the
characteristic network address of the second terminal set (NA1 -
NA2);

D. Via IP data, the interconnection system passes to the first
terminal set that the latter may call the interconnection system
for effecting the first partial voice connection between the
first terminal set and the interconnection system; for setting
up this partial voice connection use being made of the
characteristic network address (NA1) of the first terminal set;

E. The interconnection system brings about said second partial
voice connection with the second terminal set via said or
another non-VoIP voice network;

F. After both partial voice connections, viz. the one between
the first terminal set and the interconnection system and the
one between the second terminal set and the interconnection
system, have been established, the interconnection system
couples both partial voice connections to one voice connection
between the first and the second terminal set.

4. Method according to claim 1, wherein only the first terminal
set is arranged for IP data and both terminal sets for non-VoIP
voice signals, comprising next actions:

A. Via an IP data connection the first terminal set passes to
the interconnection system its own, first IP address (IP1), as
well as a network address (NA2), which is valid for the non-VoIP

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voice network and which is characteristic for the second
terminal set to be called, its characteristic network address;
both addresses are, linked to each other, stored into the
interconnection system (IP1 - NA2);

B. At any moment, before, during or after the action under A.,
the first terminal set's IP address (IP1) is stored into the
interconnection server, linked to a network address (NA1) which
is valid for the non-VoIP voice network and which is
characteristic for that first terminal set, its characteristic
network address, and both addresses are, linked to each other
stored, into the interconnection system (IP1 - NA1);

C. The characteristic non-VoIP-network address (NA1) of the
first terminal set, stored in connection with the first terminal
set's IP address (IP1), is stored by the interconnection system,
linked with the characteristic network address of the second
terminal set (NA2) to which a connection is targeted (NA1 -
NA2);

D. Via IP data, the interconnection system passes to the first
terminal set that the latter may call the interconnection system
for effecting the first partial voice connection between the
first terminal set and the interconnection system; for setting
up this partial voice connection use is made of the
characteristic network address (NA1) of the first terminal set;

E. The interconnection system brings about said second partial
voice connection with the second terminal set via said or
another non-VoIP voice network;

F. After both partial voice connections, viz. the one between
the first terminal set and the interconnection system and the
one between the second terminal set and the interconnection
system, have been established, the interconnection system
couples both partial voice connections to one voice connection

between the first and the second terminal set.

5. Method according to one of the claims 2 through 4, wherein the characteristic network address of the first or second terminal set respectively is the network address of the first or second terminal set respectively at the relevant non-VoIP voice network, which can be recognized by the interconnection system by means of CLI (Calling Line Identification).

6. Method according to one of the claims 2 through 4, wherein the characteristic network address of the first or second terminal set respectively is a network address which is valid for the relevant non-VoIP voice network, which the interconnection server, at least for a certain time period, makes available as a call number which can be called by the first or second terminal set respectively for realizing the first or second partial voice connection respectively and, via IP data, passes that to the first or second terminal set respectively in order to facilitate to be called by the first or second terminal set respectively for setting up the partial voice connection between the first or second terminal set respectively and the interconnection system.

7. Method according to claim 2 or 3, wherein the second terminal set wants to set up a connection to the first terminal set, comprising the action that the second terminal set, via IP data, requests the first terminal set to set up a connection to the second terminal set; after which the connection as requested by the second terminal set, is, originating from the first terminal set, set up to the second terminal set in accordance with the actions of claim 2, using the interconnection system.

8. Method according to claim 2 or 3, wherein the second terminal set wants to set up a connection to the first terminal set, comprising the action that the second terminal set, via IP data,

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requests the interconnection system to set up a connection
between the first and the second terminal set; after which the
interconnection system sets up the requested connection in
accordance with the actions of claim 2.

9. Method according to one of the preceding claims, wherein the
first terminal set (T1) or each of both terminal sets comprise a
module which is arranged for non-VoIP voice signals (v1) and a
module which is arranged for IP data (c).

10. Method according to claim 9, wherein of the first terminal
set (T1) or of each of both terminal sets the module which is
arranged for non-VoIP voice signals (v1) and the module which is
arranged for IP data (c) belong to a telephony terminal which is
arranged for non-VoIP voice signals (v1) and for IP data (c).

11. Method according to claim 9, wherein of the second terminal
set (T2) the module which is arranged for VoIP voice signals and
the module which is arranged for IP data (c) is a data or
telephony terminal which is arranged for VoIP voice signals and
IP data (c).

12. Method according to claim 9, wherein of the first terminal
set (T1) or of each of both terminal sets the module which is
arranged for non-VoIP voice signals (v1) is a neither for VoIP
voice signals nor for IP data (c) arranged telephony terminal
and the for IP data (c) arranged module is a for IP data (c)
arranged data terminal.

13. System arranged for performing the method according to one
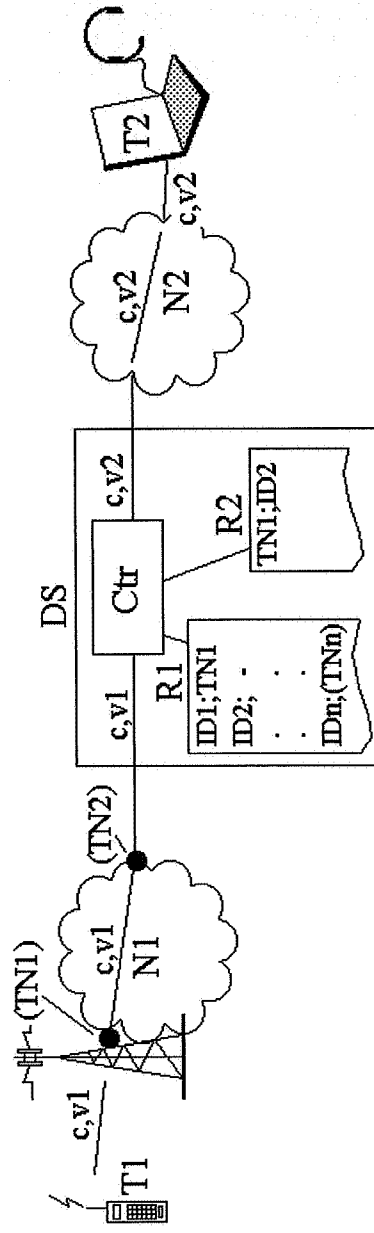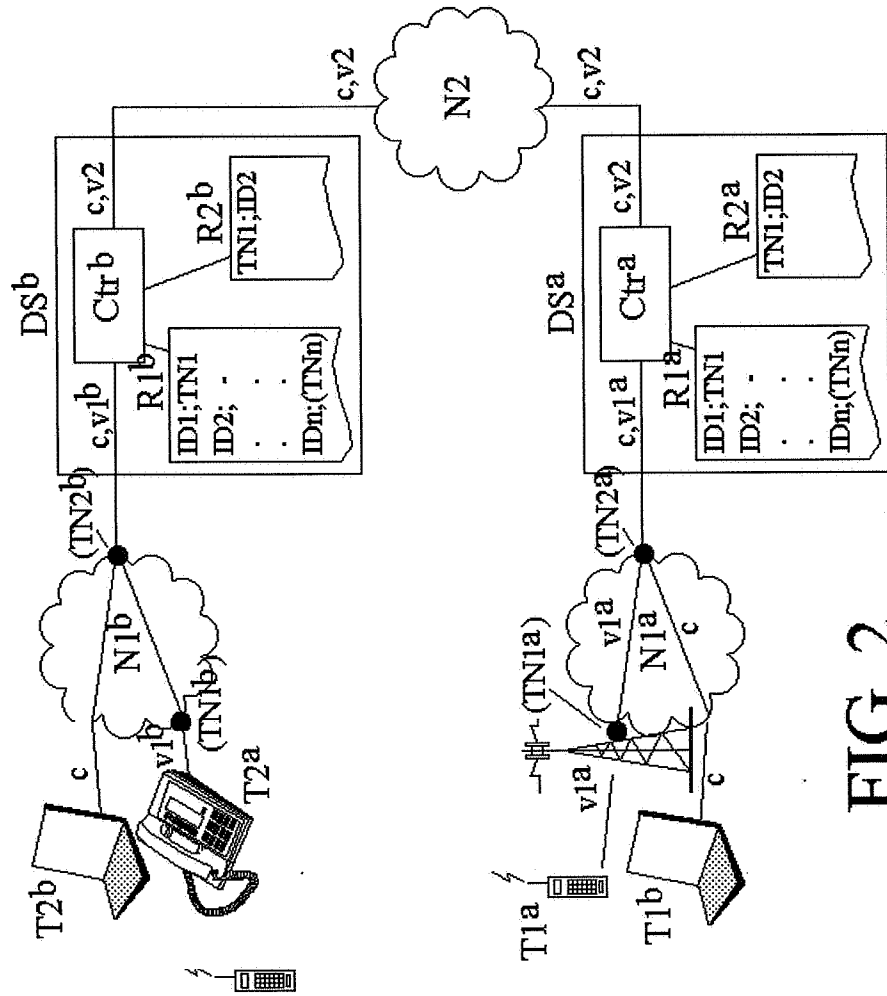or more of the preceding claims, comprising said interconnection
system (DS).

FIG. 1

FIG. 2

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04M7/00   H04L12/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04M   H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 915 596 A2 (AT & T CORP [US]) 12 May 1999 (1999-05-12) paragraphs [0020], [0027], [0049] - [0052], [0059], [0064]; figures 1,2A	1-13
A	WO 01/24501 A (3COM CORP [US]; SCHUSTER GUIDO M [US]; DEAN FREDERICK D [US]; MAHLER J) 5 April 2001 (2001-04-05) the whole document	1-13
A	WO 02/093889 A (WORLDCOM INC [US]) 21 November 2002 (2002-11-21) the whole document	1-13

☐ Further documents are listed in the continuation of Box C.   ☒ See patent family annex.

* Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 July 2007	27/07/2007

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