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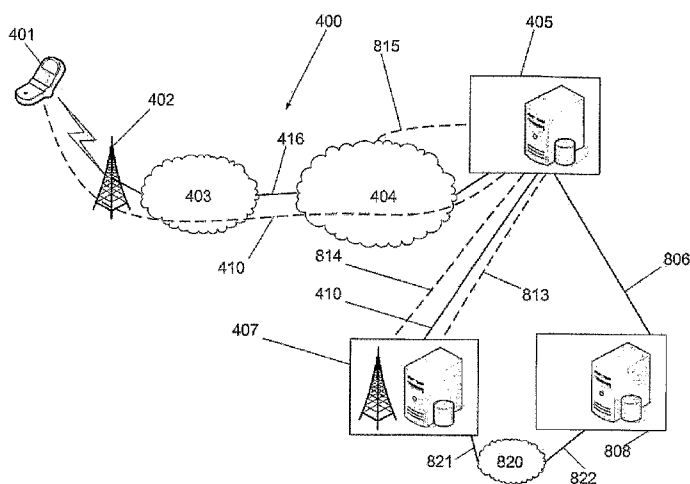
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(54) Title: METHOD IN A NETWORK NODE FOR SEPARATING CIRCUIT SWITCHED AND PACKET SWITCHED TRAFFIC



(57) Abstract: The present invention relates to a method, devices, infrastructure network, and computer program for doing policy based routing in a tunnel terminating device (7, 200, 405) for separating CS and PS traffic and increasing the perceived bandwidth by reducing capacity problems in a supporting node in the network (10). Communication data is packed into an IPSec tunnel in a mobile station (1, 401) and sent to the tunnel-terminating device in an IP based tunnel (410), e.g. an IPSec tunnel. The tunnel terminating device is arranged to perform policy based routing and transfer CS and PS traffic to different destinations depending on network structure and packet data.

HIGH SPEED MOBILE TELECOMMUNICATION

TECHNICAL FIELD

The present invention relates to a method, nodes, computer program and network for high speed data traffic in a telecommunication network and in particular to a tunneling of data
5 traffic to a central node from a mobile node.

BACKGROUND OF THE INVENTION

The current mobile stations and future mobile stations are being developed towards a combination of data and voice traffic towards an infrastructure network. This stems from
10 the demand from the customers to be "connected" wherever they are. They want to be able to communicate with coworkers, family, and others with a telephone and also be able to have connection to email, web services, file servers and other similar data applications. However, there is an increasing demand from the users that this should be done from the same mobile station, i.e. the mobile station must be arranged to handle both voice
15 applications and preferably high speed data connections.

The general trend in mobile stations are in this direction and therefore it exists several solutions, for instance for cellular phones with high speed data communication built in using 2G, 2.5G and/or 3G wireless communication for both voice and data, with mobile
20 stations with separated voice and data (e.g. 2G for voice and WLAN (Wireless Local Area Network) for data). In solutions using the same radio interface for data and voice there is a drawback in that the infrastructure needs to handle both data and voice through the same infrastructure devices and thus allocate unnecessary resources and decreasing the possible data traffic rate. Different demands may exist for packet switched data (generally
25 data traffic) and circuit switched data (generally voice traffic).

SUMMARY OF THE INVENTION

It is an object of the present invention to remedy at least some of the problems with the
30 existing technologies and provide a high speed solution for data traffic operating in conjunction with voice traffic

This is provided in a number of aspects, in which a first is presented: a method of communicating in a wireless mobile network environment, comprising the steps of:

- receiving, in a tunnel terminating device, TTD, in a tunnel connection communication information from a mobile station;
- 5 - analysing the communication information in the TTD;
- separating circuit switched data from packet switched data in the TTD;
- forwarding circuit switched data from the TTD to a communication infrastructure component arranged to handle circuit switched data; and
- 10 - forwarding packet switched data from the TTD to a receiver device arranged to handle packet switched data.

The step of forwarding the packet switched data may comprise forwarding the data in a forwarding tunnel. The forwarding tunnel may be set up as a GPRS Tunnel Packet, GTP, tunnel.

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The tunnel terminating device may also operate as a security solution. The security solution may include at least one of firewall, network address translation and filtering functions.

- 20 The connection tunnel may be set up through at least one of a home based network, a public or commercial operator based network.

The connection tunnel may be set up directly with the TTD through a service provider based network or indirectly with the TTD via a public network, e.g. the Internet.

25

The mobile station may communicate with the infrastructure using at least one of Mobile@Home, WiMAX, or MowLAN standards.

Another aspect of the present invention, a communication infrastructure device is

- 30 provided comprising at least one communication interface and a processing unit characterised in that the communication interface is arranged to receive communication information in a tunnel connection and the device further comprises means to analyse the communication information, means to separate CS data from PS data and means to communicate the CS data to a CS data receiving infrastructure components and DS data
- 35 to a DS data receiving device.

The device may further comprise a security solution, which may comprise at least one of a firewall, network address translation, and filtering functions.

- 5 Yet another aspect of the present invention, a mobile communication unit comprising at least one wireless communication interface and at least one processing unit arranged to pack circuit, CS, and packet, PS, switched data into a mutual connection tunnel packet addressed to a tunnel terminating device, the data being packed so as to allow for separation in the tunnel terminating device between CS and PS traffic.

10

The communication interface may be arranged to operate using at least one of Mobile@Home, WiMAX, or MowLAN communication protocols.

- Yet another aspect of the present invention, an infrastructure telecommunication wireless
15 network is provided, comprising at least one tunnel terminating device arranged to operate the method described above.

Still another aspect of the present invention, a computer program is provided for communicating with a mobile communication unit, comprising instructions sets for:

- 20 - receiving, in a tunnel terminating device, TTD, in a tunnel connection communication information from a mobile station;
 - analysing the communication information in the TTD;
 - separating circuit switched data from packet switched data in the TTD;
 - forwarding circuit switched data from the TTD to appropriate
25 communication infrastructure component; and
 - forwarding packet switched data from the TTD to appropriate receiver.

- With the solutions as provided by the present invention it is possible to provide high speed packet based communication access to network using existing telecommunications
30 network infrastructure with minor adjustments at low cost and it is possible to migrate existing technologies to include this high speed access as well.

BRIEF DESCRIPTION OF THE DRAWINGS

In the following the invention will be described in a non-limiting way and in more detail with reference to exemplary embodiments illustrated in the enclosed drawings, in which:

35

Fig. 1 illustrates schematically a general network topology according to the present invention;

Fig. 2 illustrates an embodiment of an infrastructure component according to the present
5 invention;

Fig. 3 illustrates an embodiment of a mobile station according to the present invention;

Fig. 4 illustrates an embodiment of a network topology according to the present invention;
10

Fig. 5 illustrates another embodiment of a network topology according to the present invention;

Fig. 6 illustrates another embodiment of a network topology according to the present
15 invention;

Fig. 7 illustrates another embodiment of a network topology according to the present invention;

20 Fig. 8 illustrates another embodiment of a network topology according to the present invention;

Fig. 9 illustrates a method according to the present invention;

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DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

In Fig. 1, reference numeral 1 generally denotes a mobile station MS communicating wirelessly 2 with a gateway 3 to a communication network 10. The communication network comprises apart from the gateway 3, communication channels 4, 6, and 8, a
30 communication infrastructure 5, tunnel terminating device TTD 7 and further communication infrastructure 9. Depending on the communication interface and protocol applied, the communication infrastructures 5, 9 will look differently. A number of examples will be shown below; however, the person skilled in the art should appreciate that these do not limit the invention to these examples. The mobile station MS 1, often referred to as
35 a mobile node (MN), for instance a cell phone or laptop or some other user equipment

(UE) communicates with the gateway 3 through some wireless interface 2, e.g. GPRS, UMTS, WCDMA, WLAN, WPAN, Mobile@Home, WiMAX, MowLAN, or similar interface compatible with packet based communication protocols. The tunnel terminating device may also perform different types of security solutions, such as but not limited to, firewall (FW), network address translation, and filtering functions (including e.g. application filtering, content filtering (parent control or similar), address filtering, service provider filtering, or other network filtering functions).

WLAN includes all wireless local area network protocols, for instance IEEE 802.11, 802.15, 802.16 based protocols, and WPAN include wireless personal area networks, e.g. Bluetooth or similar protocols.

The operation of the present invention is as follows: both circuit switched and packets switched data information are packed into tunnel packets in the mobile station 1 and sent directly to the FW/TTD 7 (similar to a Tunnel Terminating Gateway, TTG) via the appropriate infrastructure network components depending on the communication interface and protocol. The tunnel is mutual for CS and PS traffic. At the FW/TTD 7 the tunnel packets are opened for examination and a policy based routing is performed separating CS (Circuit Switched) and PS (Packet Switched) information traffic. CS information relate generally to speech traffic for instance as in GSM or GPRS protocols. PS information traffic generally relates to data traffic for instance email, HTML, FTP or similar IP based information. However, it should be understood that other protocols may be applicable within the PS channel, e.g. UDP (User Datagram Protocol) or ATM (Asynchronous Transfer Mode) based traffic protocols. The policy based routing may be coupled to information content in the data packets and/or information regarding the user or the type of business arrangement between the user and the service provider/operator; this may include service level, bandwidth paid for, services subscribed to, priority, operator, or similar business related agreements.

Traffic originating from the mobile station is sent through an IPSec based tunnel to the FW/TTD which in turn relays the traffic to appropriate channels depending on type of information. The method according to the present invention will be discussed in more detail below in this document. It should be noted that with the term IPSec is not meant any special IP security protocol but any suitable secure tunnel protocol operating in an IP environment may be used.

Fig. 2 illustrates an infrastructure device operating as FW/TTD. This infrastructure device 200 comprises a processing unit 201 that handles control over communication packets. The device 200 may further comprise a memory unit or units, volatile 202 and/or non-
5 volatile 203, for storing control software, statistics, updates, and so on as understood by the person skilled in the art. The memory units may comprise any suitable type including but not limited to: RAM, SRAM (Static RAM) or DRAM (Dynamic RAM) (e.g. DIMM RAM versions, RDRAM, Rambus), diskette, CD-ROM (Compact Disk-Read Only Memory), DVD (Digital Video Disk), flash or similar memory media (e.g. compactflash, SD secure
10 digital, memorstick, miniSD, MMC multimediocard, smartmedia, transflash, XD), HD-DVD (High Definition DVD), or Bluray DVD, USB (Universal Serial Bus) based memory media, magnetic tape media, optical storage media, magneto-optical media, bubble memory. The infrastructure device 200 may further comprise an interface unit for interfacing with a user or operator during installation, maintenance, or operation of the
15 device. The device 200 may further comprise two communication interfaces (which can be using the same physical interface) 205, 206: one for communication towards a mobile station and one towards other infrastructure network devices. The infrastructure device 200 is arranged to receive data packets from the mobile station and separate CS and PS packets and redirect these to appropriate channels depending on network topology.

20

Fig. 3 shows a mobile station operating in a network enabled according to the present invention. The mobile station 300 comprises a processing unit 301 for handling communication operations, user interface commands, and internal control data between different units in the mobile station 300. Also, the mobile station may comprise one or
25 several memory units 302, 303 of volatile and/or non-volatile type as understood by the person skilled in the art (see for instance at least parts of list exemplified for the infrastructure device 200 as shown above). The mobile station 300 may further comprise at least one communication interface 305 and a user interface 306. The station 300 may also comprise a unique identification interface 304 such as for instance for receiving a
30 SIM card (not shown). This unique identification may be used for authentication, authorization and accounting (AAA) purposes.

Fig. 4 illustrates one embodiment of a network topology and communication setup according to the present invention. The mobile station 401 connects to an access point
35 (AP) 402 located on a local network 403 (which may comprise for instance a router,

firewall and/or modem, these are not shown since they are understood by the person skilled in the art) in turn connected through some broadband access connection 416 to an external network (e.g. the Internet) 404. The FW/TTD 405 discussed earlier is in turn also connected to the same external network 404. Traffic coming from the mobile station 401 is transferred in an IPsec tunnel 410 to the FW/TTD 405 (e.g. a signalling gateway (SGW) in 3GPP networks). The FW/TTD is arranged to analyze the traffic coming from the mobile station 401 and separate different types of information depending on type using a policy based routing method. For PS traffic a GGSN (Gateway GPRS Support Node) is set as default gateway and traffic is rerouted to this GGSN 406 in a GTP tunnel 413 on a communication line 409. The GGSN 406 in turn will reroute the PS traffic to a suitable APN (Access Point Name) on a Gi interface (raw IP) 415. CS traffic is rerouted from the FW/TTD to a BSC (Base Station Controller) 407 in an Abis interface 414 on a communication line 410. The BSC may for instance be a Home BSC (HBSC) 407. The BSC 407 is connected 412 to an SGSN (Serving GPRS Support Node) 408 which in turn has a connection 411 to the GGSN 406.

The Access point 402 that the mobile station 401 connects to may belong to the users own home network 403, to a visited and operator owned network, or any other suitable network that accepts connection for the mobile station 401 and for which there is a connection to the FW/TTD 405 directly or indirectly.

Fig. 5 illustrates a network topology according to another embodiment of the present invention wherein the network to begin with is configured as a Mobile@Home network but migrates to a MowLAN network. The network shown in Fig. 5 is a Mobile@Home network topology. Similar reference numerals indicate similar entities as was discussed in relation to Fig. 4. Traffic from the mobile station 401 is tunnelled 410 to a tunnel terminating device 405. However, in this case all traffic is forwarded to a HBSC (Home Base Station Controller) 407 on an Abis interface 513 and the HBSC forwards all traffic to a SGSN 408 on a Gb interface 514. The SGSN 408 is responsible for handling PS traffic which is transferred on a GTP interface 516 to a GGSN 406 which in turn communicates the traffic via the FW/TTD 405 on a Gi (raw IP) interface 517. This solution can easily be migrated to the a solution according to the present invention by combining the Mobile@Home solution with a MowLAN solution and the network topology will then be as shown in relation to Fig. 4.

Fig. 6 illustrates a network topology according to another embodiment of the present invention wherein the network to begin with is a MowLAN network but migrates to a Mobile@Home network. Similar reference numerals indicate similar entities as was discussed in relation to Fig. 4. Traffic from the mobile station 401 is tunnelled 410 to a tunnel terminating device 405. However, in this case all/PS traffic is forwarded to a GGSN 406 on a GTP interface 613 and the GGSN forwards the PS traffic back to the Internet 404 using a Gi interface 614. This solution can easily be migrated to the a solution according to the present invention by combining the MowLAN solution with a Mobile@Home solution and the network topology will then be as shown in relation to Fig. 4.

Fig. 7 illustrates a network topology according to another embodiment of the present invention wherein the network is a SGSN termination solution network. Communication traffic from the mobile station 401 is transferred via a tunnel connection 410 to a FW/TTD 405 which forwards CS traffic to the HBSC 407 on an Abis interface 713. The HBSC in turn forwards CS traffic to the SGSN 408 on a Gb interface 412. The SGSN routes CS traffic back to the network 404 on a Gi interface 715. The FW/TTD routes PS traffic to the network 404 also on a Gi interface 716.

Fig. 8 illustrates a network topology according to another embodiment of the present invention wherein the network has a separated user and control plane on a GSN solution. Traffic from the mobile station 401 is routed in an IPsec tunnel to the FW/TTD 405 which extracts the CS traffic part and forwards this to the HBSC 407 on an Abis interface 813. The HBSC 407 in turn sends traffic (CS) back to the FW/TTD on a Gb interface 814. PS traffic is routed directly from the FW/TTD 405 to the network 404 on a Gi interface 815.

The present invention may be operated in its core application as a program code executed in a processing unit (201) as instruction sets stored in a memory (202, 203) performing the following method steps:

30

901. Receiving traffic information data in a secure tunnel from a mobile station in the FW/TTD.

902. Extracting the traffic data and separating CS and PS traffic.

903. Forwarding CS traffic to suitable communication network device.

35 904. Forwarding PS traffic to suitable network application device.

905. Optionally handling billing issues in suitable device or devices, e.g. the FW/TTD. This can be done using suitable FBC/AWARE solutions.

AAA functions (Authentication, Authorization and Accounting) may operate according to standard communication protocols or they may at least in part be implemented in the FW/TTD. For instance based on policy decision functions at least some AAA functions are advantageously performed in the FW/TTD.

The present invention allow for easy migration from different standard network configurations allowing operators and/or network providers to enhance the network utilization and optimize the performance for the customers without affecting network service negatively during setup of the solution according to the present invention. The invention provides one combined solution for tunnel termination and switching systems. Infrastructure devices may be better utilized since they may double or triple their usage, e.g. the same equipment may be used for TT, IDP/IDS and FW. It can later be scaled towards a layered architecture on GSN. Support CS replacement, i.e. it can support both a central and a distributed solution of PS termination/handling. The solution solves a Mobile@Home problem which may be found in relation to 3GPP TS 24.008 packetization of the PS part of the Mobile system. It will enhance the bandwidth experience for the users since it will reduce the bottleneck (HBSC/SGSN) in the 3GPP UMA solution.

It should be noted that the word "comprising" does not exclude the presence of other elements or steps than those listed and the words "a" or "an" preceding an element do not exclude the presence of a plurality of such elements. It should further be noted that any reference signs do not limit the scope of the claims, that at least parts of the invention may be implemented at least in part by means of both hardware and software, and that several "means", "units" and "devices" may be represented by the same item of hardware.

The above mentioned and described embodiments are only given as examples and should not be seen to be limiting to the present invention. Other solutions, uses, objectives, and functions within the scope of the invention as claimed in the below described patent claims should be apparent for the person skilled in the art.

DEFINITIONS

35 AAA Authentication, Authorization and Accounting

- APN Access Point Name
- ATM Asynchronous Transfer Mode
- BGP Border Gateway Protocol
- BGw Billing Gateway
- 5 CAS Customer Administration System
- CS Circuit Switched
- CDS Common Directory System
- CGSN Combined GSN
- CLI Command Line Interface
- 10 CN Core Network
- DIP Dynamic IP
- DMZ DeMilitarized Zone
- DNS Domain Name System
- E-AAA Ericsson AAA
- 15 EMA Ericsson Multi-Activation
- ESRP Extreme Standby Router Protocol
- FE Fast Ethernet
- FPC Flexible PICs Concentrator
- FVS Forwarding Virtual Server
- 20 FW Firewall
- GE Gigabit Ethernet
- GSN Gateway GPRS Support Node
- GSN-VIP GSN Virtual IP address (same as GTP VIP)
- GPRS General Packet Radio Service
- 25 GRD Generic Routing Domain
- GRE L2 Tunnel Protocol
- GRX GPRS Roaming Exchange
- GSM Global System for Mobile Communication
- GSN GPRS Support Node
- 30 GTP GPRS Tunneling Protocol
- HA High Availability
- HE-VASP Home Environment Value Added Service Provider
- HLR Home Location Register
- HTTP Hypertext Transfer Protocol
- 35 IBR Inband RADIUS

	iLB	internal Load Balancer
	Inet	Internet
	IPI	IP Infrastructure
	IPMP	IP MultiPathing
5	IPsec	IP Security
	ISDN	Integrated Services Digital Network
	ISP	Internet Service Provider
	L2/L3	Layer 2/ Layer 3
	LB	Load Balancer
10	LDAP	Lightweight Directory Access Protocol
	MAC	Medium Access Control
	MIB	Management Information Base
	MIEP	Mobile Internet Enabler Proxy
	MIP	Mapped IP
15	MMC	Multi-Media Center
	MMS	Multi-Media Service
	MS	Mobile Station
	MSC	Mobile Services Switching Center
	MTA	Mail Transfer Agent
20	NAT	Network Address Translation
	NOC	Network Operation Center
	OBR	Outband RADIUS
	OGw	Online Mediation Gateway
	OOB	Out of Band
25	O&M	Operations & Maintenance
	OSN	Optimization Server Node
	OSPF	Open Shortest Path First (Routing)
	PAT	Port Address Translation
	PBN	Packet Backbone Network
30	PIU	Plug-In-Unit
	PM	Provisioning Manager
	PLMN	Public Land Mobile Network
	Pol	Point of Interconnection
	PP	Product Package
35	PS	Packet Switched

- PSTN Public Switched Telephone Network
- PVC Permanent Virtual Circuit
- RADIUS Remote Authentication Dial In User Service
- RNC Radio Network Controller
- 5 SAPI Server Access and Protection Infrastructure
- SCR (or SCM) Service Configuration Registry, also called Service Configuration Manager
- SF Server Farm
- SGW Signaling Gateway
- SLB Server Load Balancer
- 10 SMS-C Short Message Service Center
- SMTP Simple Mail Transfer Protocol
- SN Service Network
- SN-IPI Service Network IP Infrastructure
- SNMP Simple Network Management Protocol
- 15 SNOC Service Network Operation and Maintenance Center
- SNOS Service Network Operation and Maintenance System
- SOS Service Ordering System
- STM Synchronous Transfer Mode
- STP Signaling Transfer Point
- 20 STP Spanning Tree Protocol
- SVS Standard Virtual Server
- SW Switch
- SD Security Domain
- SR Site Router
- 25 SZ Security Zone
- TCP Transport Control Protocol
- TPS Transactions per seconds
- TSC Transit Switching Center
- TSP Telecom Server Platform
- 30 UDP User Datagram Protocol
- UMTS Universal Mobile Telecommunication System
- USIS User Session and Identity Server
- VIP Virtual IP
- VLAN Virtual LAN
- 35 VPN Virtual Private Network

- VR Virtual Router
- VRF VPN Routing and Forwarding Table
- VRRP Virtual Router Redundancy Protocol
- WAP Wireless Application Protocol
- 5 WCDMA Wideband Code Division Multiple Access
- WLAN Wireless Local Area Network (e.g. IEEE 802.11, 802.15, 802.16 series of protocols)
- WPAN Wireless Personal Area Network (e.g. Bluetooth)

CLAIMS

1. A method of communicating in a wireless mobile network environment, comprising the steps of:
 - receiving, in a tunnel terminating device, TTD, (7, 200, 405) in a tunnel
5 connection (410) communication information from a mobile station (1, 300, 401);
 - analysing the communication information in the TTD;
 - separating circuit switched data from packet switched data in the TTD;
 - forwarding circuit switched data from the TTD to a communication
10 infrastructure component arranged to handle circuit switched data; and
 - forwarding packet switched data from the TTD to a receiver device arranged to handle packet switched data.
2. The method according to claim 1, wherein the step of forwarding the packet
15 switched data comprises forwarding the data in a forwarding tunnel.
3. The method according to claim 2, wherein the forwarding tunnel is set up as a GPRS Tunnel Packet, GTP, tunnel.
- 20 4. The method according to claims 1 or 2, wherein the tunnel terminating device operates as a security solution.
5. The method according to claim 4, wherein the security solution includes at least one of firewall, network address translation and filtering functions.
25
6. The method according to any of the preceding claims, wherein the connection tunnel is set up through at least one of a home based network, a public or commercial operator based network.
- 30 7. The method according to any of the preceding claims, wherein the connection tunnel is set up directly with the TTD through a service provider based network.
8. The method according to any of the preceding claims, wherein the connection
35 tunnel is set up indirectly with the TTD via a publicly available network.

9. The method according to any of claims 1 to 8, wherein the communication between the mobile station and the infrastructure is with at least one of Mobile@Home, WiMAX, MowLAN, and IEEE 802.11, IEEE 802.15, IEEE 802.16 standards.
- 5 10. A communication infrastructure device (7, 405) comprising at least one communication interface and a processing unit, characterised in that the communication interface is arranged to receive communication information in a tunnel connection and the device further comprises means to analyse the communication information, means to separate CS data from PS data and means
10 to communicate the CS data to a CS data receiving infrastructure components and DS data to a DS data receiving device.
11. The device according to claim 10, further comprising a security solution.
- 15 12. The device according to claim 11, wherein the security solution comprises at least one of a firewall, network address translation, and filtering functions.
13. A mobile communication unit (1, 300, 401) comprising at least one wireless communication interface (305) and at least one processing unit (301) arranged to
20 pack circuit, CS, and packet, PS, switched data into a connection tunnel packet addressed to a tunnel terminating device (7, 200, 405), the data being packed so as to allow for separation in the tunnel terminating device between CS and PS traffic.
- 25 14. The mobile communication unit according to claim 13, wherein the communication interface is arranged to operate using at least one of Mobile@Home, WiMAX, or MowLAN communication protocols.
- 30 15. The mobile communication unit according to claim 13, wherein the communication interface (305) is arranged to operate using at least one of WLAN or WPAN communication protocols.
16. An infrastructure telecommunication wireless network (10), comprising at least one tunnel terminating device arranged to operate the method according to claim 1.

17. A computer program for communicating with a mobile communication unit, comprising instructions sets for:

- receiving, in a tunnel terminating device, TTD, in a tunnel connection communication information from a mobile station;
- 5 - analysing the communication information in the TTD;
- separating circuit switched data from packet switched data in the TTD;
- forwarding circuit switched data from the TTD to appropriate communication infrastructure component; and
- forwarding packet switched data from the TTD to appropriate receiver.

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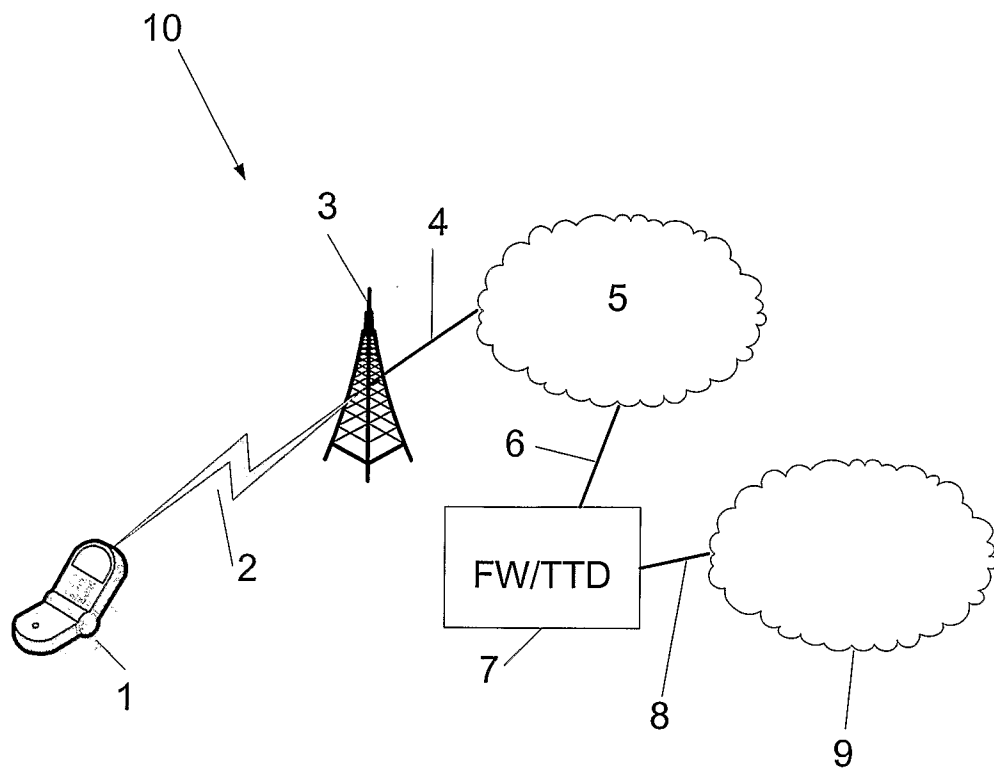


FIG. 1

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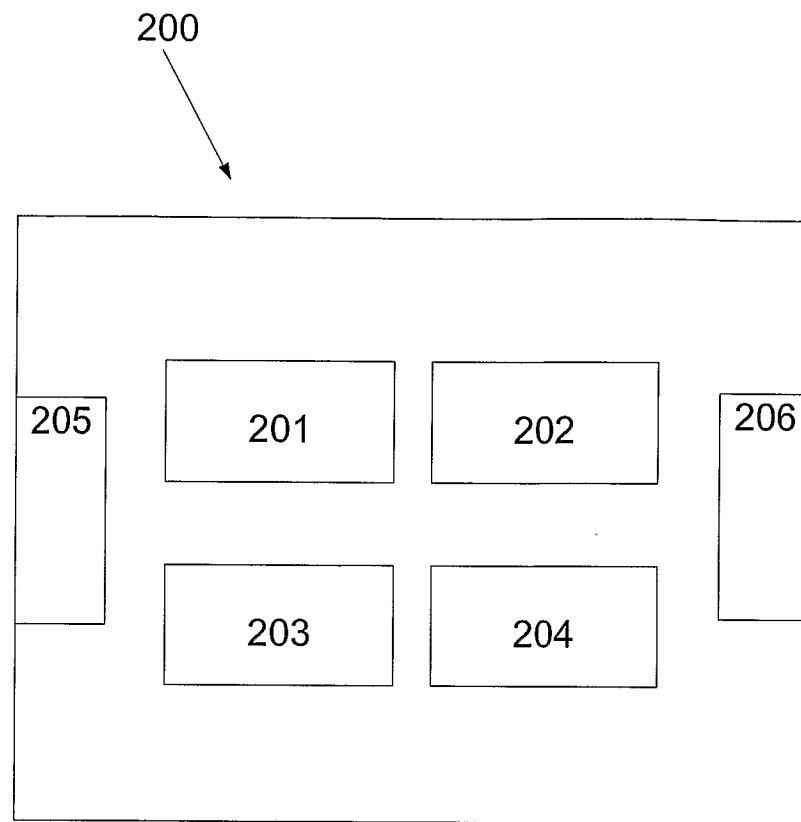


FIG. 2

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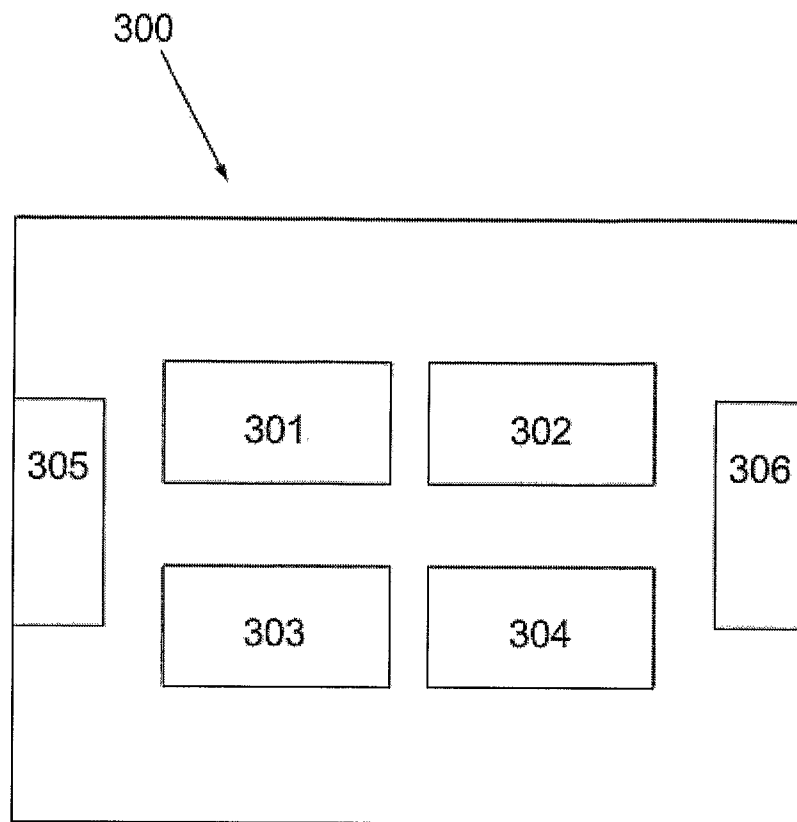


Fig. 3

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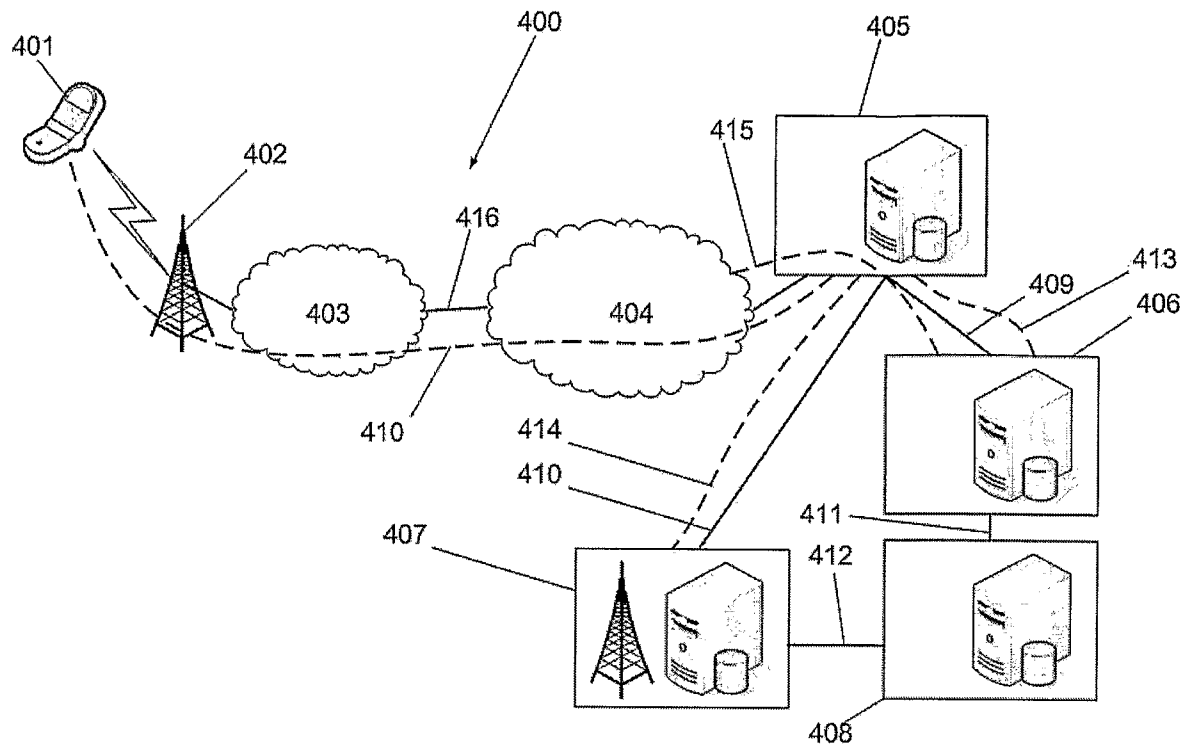


Fig. 4

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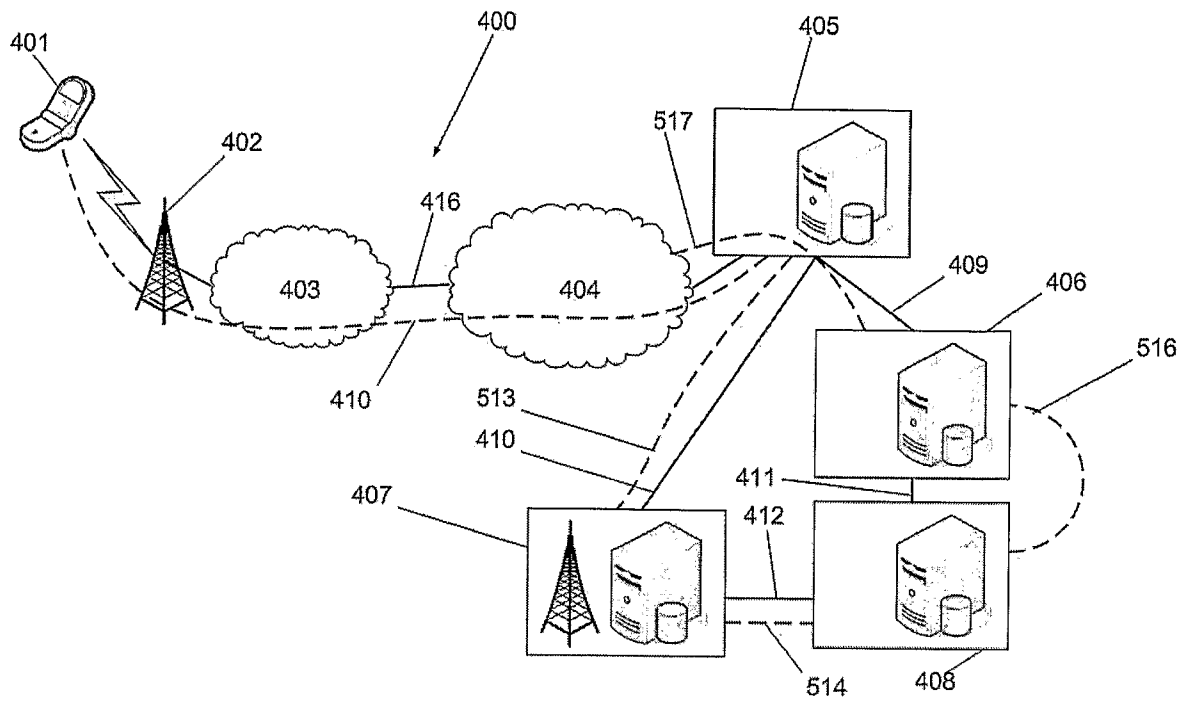


Fig. 5

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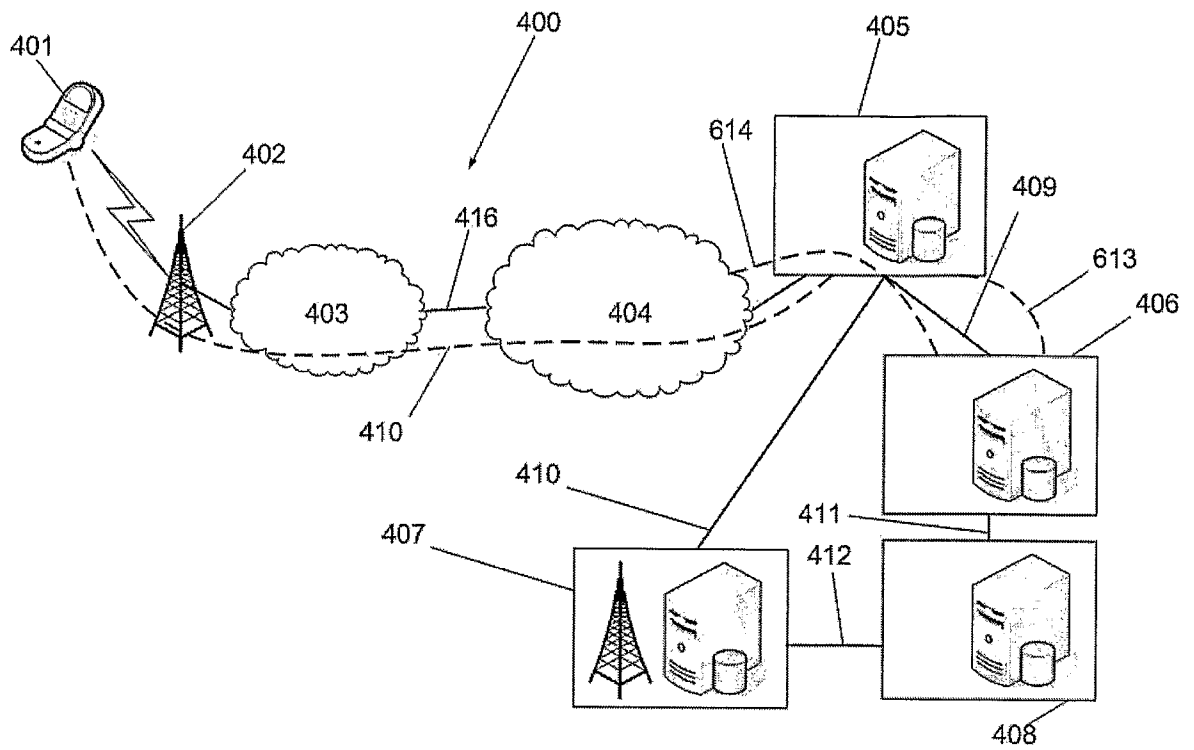


Fig. 6

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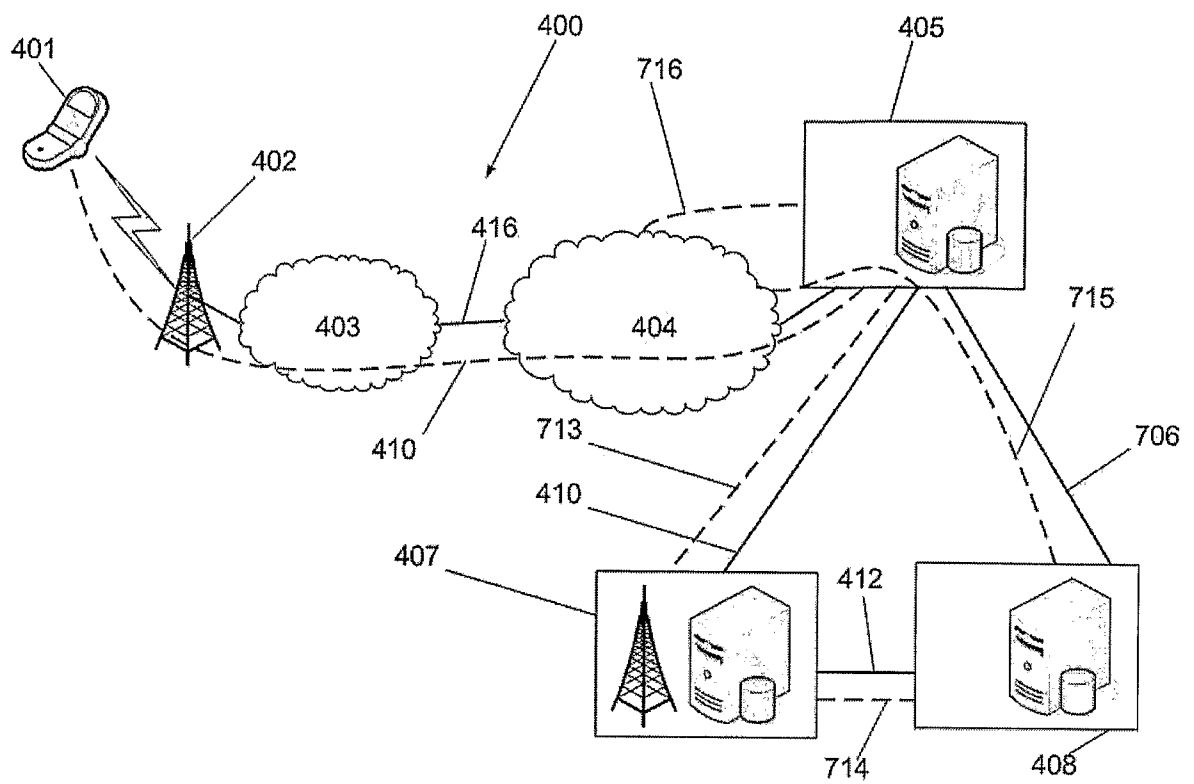


Fig. 7

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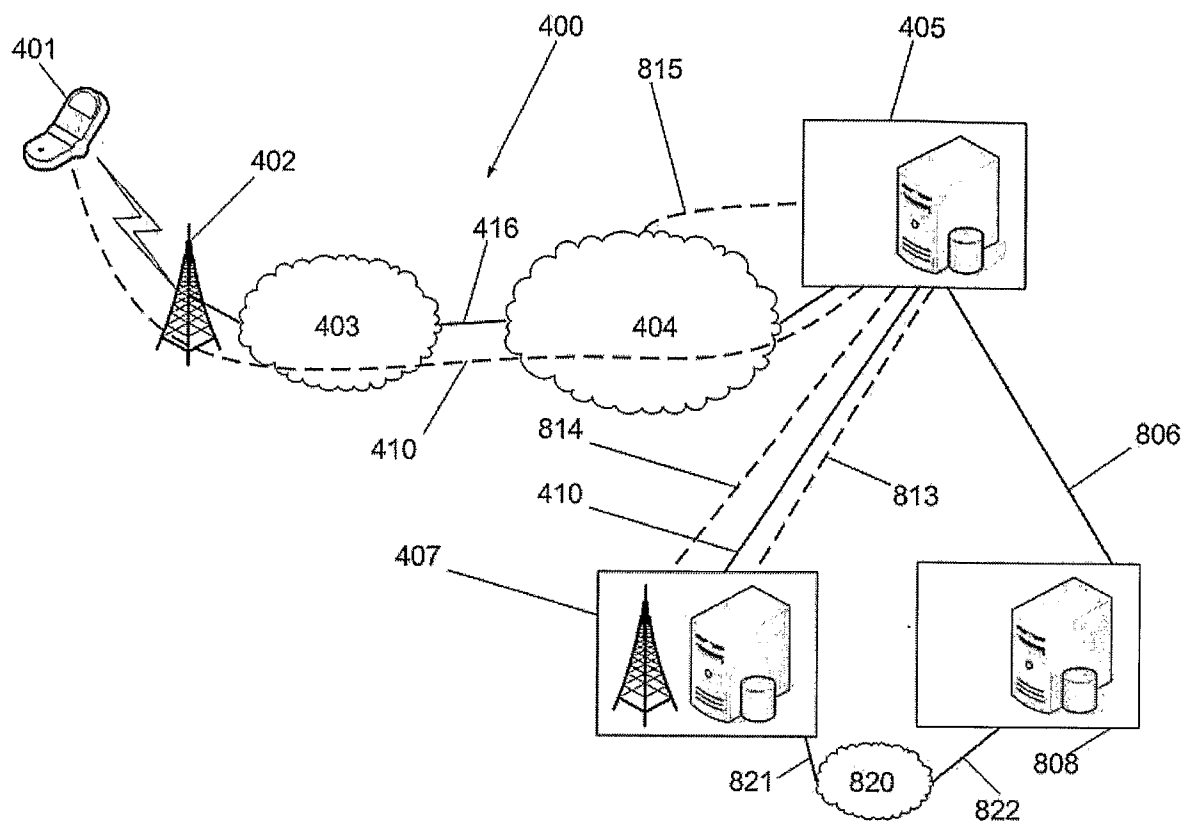


Fig. 8

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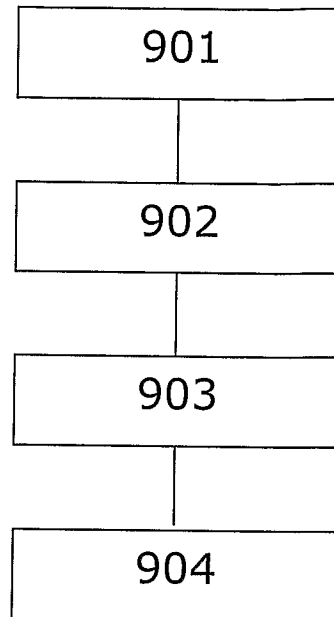


Fig. 9

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P17171PC00	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/SE2006/001512	International filing date (<i>day/month/year</i>) 28-12-2006	(Earliest) Priority Date (<i>day/month/year</i>)
Applicant Telefonaktiebolaget L M Ericsson (publ) et al		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established by this Authority to read as follows:

Method in a network node for separating circuit switched and packet switched traffic.

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 8

- ☐ as suggested by the applicant.
- ☐ as selected by this Authority, because the applicant failed to suggest a figure.
- ☒ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2006/001512

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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)

IPC: H04L, H04Q

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

SE,DK,FI,NO classes as above

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

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 20030039237 A1 (J.E.FORSLOW), 27 February 2003 (27.02.2003), [0043]-[0058],[0065],[0075]-[0079], [0106],fig.9,claims 1-19 --	1-17
X	US 6584098 B1 (S.DUTNALL), 24 June 2003 (24.06.2003), column 3, line 55 - column 5, line 10; column 10, line 1 - line 65; column 11, line 32 - line 45, abstract --	1-17
A	WO 0193607 A1 (TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)), 6 December 2001 (06.12.2001), claim 1, abstract --	1-17

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

17 Sept 2007

Date of mailing of the international search report

24-09-2007

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2006/001512

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6853648 B1 (T.KRSTANOVSKI ET AL), 8 February 2005 (08.02.2005), column 2, line 8 - line 50, claims 1-5, abstract -- -----	1-17

International patent classification (IPC)**H04L 12/28** (2006.01)**H04Q 7/22** (2006.01)**Download your patent documents at www.prv.se**

The cited patent documents can be downloaded at www.prv.se by following the links:

- In English/Searches and advisory services/Cited documents (service in English) or
- e-tjänster/anförda dokument (service in Swedish).

Use the application number as username.

The password is **UGNZICIADU**.

Paper copies can be ordered at a cost of 50 SEK per copy from PRV InterPat (telephone number 08-782 28 85).

Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

31/07/2007

International application No.

PCT/SE2006/001512

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