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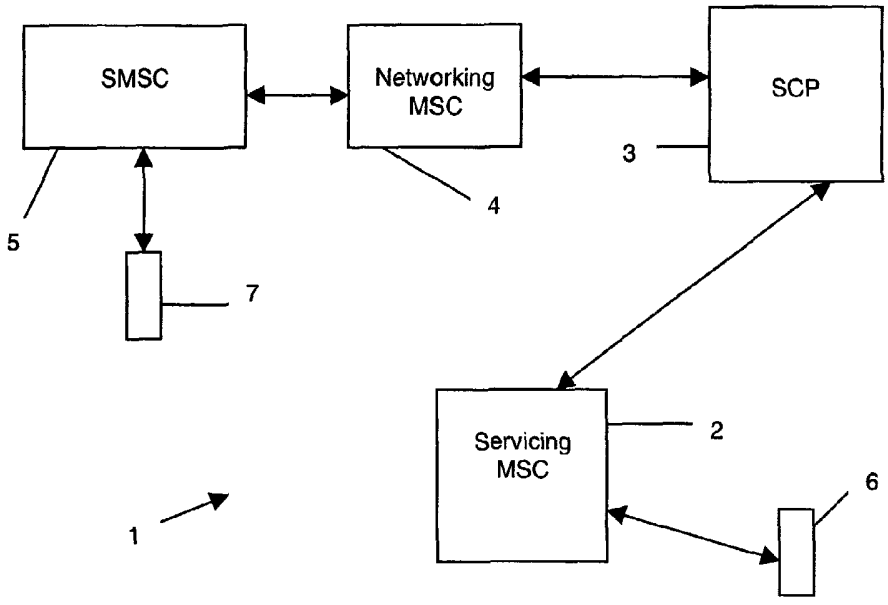
[Continued on next page]

(54) Title: MOBILE PHONE TELEPHONY



(57) Abstract: A method of operating a mobile phone telecommunications network (1) is provided, comprising using at least one mobile switching centre (MSC) (2) of the network to receive at least one message, and as a result to generate a mobile application part (MAP) message, transmitting the MAP message from the MSC (2) to at least one service control point (SCP) (3) of the network, and operating the SCP (3) to process the MAP message. Processing of the MAP message by the SCP (3) may comprise, for example, determining the subsequent handling of the MAP message, charging a sender of the message received by the MSC. The message received by the MSC (2) may comprise a text message, for example a text message generated using the short message service (SMS).

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MOBILE PHONE TELEPHONY

This invention relates to mobile phone telephony, and particularly, but not exclusively, to mobile phone telephony involving the sending and receiving of text messages using the short message service (SMS).

Conventionally, mobile phone telephony networks include mobile switching centres (MSCs) for switching of application part messages, for example mobile application part (MAP) messages or CAMEL application part (CAP) messages, around the network from sender to receiver, and service control points (SCPs) which provide intelligent networks (INs) for control of the handling of the messages in the network according to a call model such as CAMEL2 (Customised Applications for Mobile Network Enhanced Logic 2). For example, speech messages sent from a pre-pay mobile phone are switched by an MSC to a receiver. The MSC alerts an SCP that a call has been made, and the SCP debits the account of the sender. In the case of SMS text messages, however, these are switched by an MSC to a short message service centre (SMSC) and on to the receiver. Neither the MSC nor the SMSC alerts the SCP that a message has been sent, and the SCP cannot therefore charge for the message at the time it is sent. Instead the SMS text message can only be charged for once it has reached the SMSC, this is usually achieved by down-loading message details for post-processing off-line. By the time this is achieved, the recipient may already have retrieved the message. The sender may be using a pre-pay mobile phone and may not have had sufficient credit to send the SMS text message. This is only detected after the message has been sent to the SMSC, i.e. delivery of the message can be effectively free which is undesirable to the

network providers. It is desirable for credit to be checked and charges levied before onward transmission of the SMS text message to the SMSC. Onward transmission can thereby be prevented if the sender has insufficient credit.

According to a first aspect of the present invention there is provided a method of operating a mobile phone telecommunications network, comprising using at least one mobile switching centre (MSC) of the network to receive at least one message and, as a result, to generate a mobile application part (MAP) message, transmitting the MAP message from the MSC to at least one service control point (SCP) of the network, and operating the SCP to process the MAP message.

The message received by the MSC may comprise a signalling message, for example relating to the connection of a speech message. The message received by the MSC may comprise a text message, for example a text message generated using the short message service (SMS), an 'SMS text message'. The MSC may receive the message from, for example, a mobile phone or from a management system of the network. The MAP message generated by the MSC may contain information about the message received by the MSC. The MAP message generated by the MSC may contain at least part of the message received by the MSC. For example, when the message received by the MSC comprises a text message, the MAP message generated by the MSC may contain part or all of the text of the text message.

Processing of the MAP message by the SCP may comprise interrogation of the MAP message. For example, processing of the MAP message by the SCP may comprise interrogation of the MAP message to obtain information from the MAP message.

Processing of the MAP message by the SCP may comprise determining the subsequent handling of the MAP message. For example, processing of the MAP message by the SCP may comprise determining whether or not the MAP message should be sent onwards towards an intended receiver. Processing of the MAP message by the SCP may comprise interrogation of the MAP message to obtain information from the MAP message, and using the information in determining the subsequent handling of the MAP message. For example, the information may comprise details of the identity of the sender of the message received by the MSC, and may be used to access an account of the sender and to determine whether or not there is sufficient credit to allow sending of the message onwards towards an intended receiver. The information may comprise details of the identity of the sender of the message received by the MSC, and may be used in determining whether or not messages from such a sender should be sent onwards towards an intended receiver.

When processing of the MAP message by the SCP comprises determining that the MAP message should not be sent onwards towards an intended receiver, the SCP may be used to discard the MAP message.

When processing of the MAP message by the SCP comprises determining that the MAP message should be sent onwards towards an intended receiver, the SCP may send the

MAP message onwards towards the receiver by sending it to one or more MSCs, or one or more store and forward centres. The SCP may change the destination address of the MAP message to send it onwards towards the receiver. When the MAP message received by the SCP comprises an SMS text MAP message, i.e. a MAP message generated by the MSC as a result of receiving an SMS text message, the SCP may send the SMS text MAP message onwards towards the receiver by sending it to a short message service centre (SMSC).

The SCP may be operated to expect to receive a notification message containing information on successful sending of the MAP message onwards towards an intended receiver. The SCP may be operated to use a lack of receipt of the notification message to, for example, trigger crediting of the account of the sender of the message to the MSC.

Processing of the MAP message by the SCP may comprise charging a sender of the message received by the MSC. For example, processing of the MAP message by the SCP may comprise charging a sender of the message received by the MSC if the MAP message is sent onwards towards an intended receiver. Processing of the MAP message by the SCP may comprise charging a sender of the message received by the MSC before the MAP message is sent onwards towards an intended receiver. Thus 'real-time' charging is possible. Processing of the MAP message by the SCP may comprise interrogation of the MAP message to obtain information from the MAP message, and using the information in charging a sender of the message received by the MSC. For example, the information may comprise details of the identity of the sender of the

message received by the MSC, and may be used to access an account of the sender and to charge the sender. The information may comprise details of the length of the MAP message, and may be used to charge the sender.

Processing of the MAP message by the SCP may comprise triggering dispatch of a message to the sender of the message received by the MSC. Processing of the MAP message by the SCP may comprise interrogation of the MAP message to obtain information from the MAP message, and using the information in triggering dispatch of a message to the sender of the message received by the MSC. For example, the information may comprise details of the identity of the sender of the message received by the MSC, and may be used to access an account of the sender, to determine the credit available, and to trigger dispatch of a message to the sender if the credit is insufficient to allow sending of the message onwards towards an intended receiver.

Processing of the MAP message by the SCP may comprise analysis of the MAP message. Processing of the MAP message by the SCP may comprise interrogation of the MAP message to obtain information from the MAP message, and using the information in analysis of the MAP message. A number of MAP messages may be received by the SCP, and processing of these messages may comprise interrogating the messages to obtain information therefrom, and using the information to perform an analysis of the MAP messages, for example to analyse the sources of the MAP messages.

The SCP may provide one or more service logic programs (SLPs). Each SLP may define one or more processes carried out by the SCP. Processing of the MAP message by the SCP may comprise running one or more SLPs. Processing of the MAP message by the SCP may comprise using the MAP message to trigger running of one or more SLPs.

The MAP message received by the SCP may comprise an SMS text MAP message, i.e. a MAP message generated by the MSC as a result of receipt of an SMS text message. The SMS text MAP message may comprise part or all of the text of the SMS text message. The SCP may provide one or more SLPs, 'SMS SLPs', which define one or more processes carried out by the SCP on SMS text MAP messages. Processing of an SMS text MAP message by the SCP may comprise running one or more SMS SLPs. Processing of an SMS text MAP message by the SCP may comprise using the SMS text MAP message to trigger running of one or more SMS SLPs.

The invention may be readily implemented in known mobile phone telecommunications networks, such as CAMEL2 telecommunications networks. Such networks include one or more SCPs which are already configured to accept MAP messages, therefore modification of the SCP hardware is not necessary. Such networks may also include one or more SMSCs which are already configured to accept SMS text MAP messages, and no modification of the SMSC hardware is necessary. To implement the invention in known networks it is necessary to change the destination address of the MAP messages generated by the MSC as a result of the messages received by the MSC, so that the MAP messages are directed to the SCP. This is a straightforward modification,

and can be made by modifying data held in the MSC, or by programming the SCP address into the SIM cards of mobile phones already subscribing to the network and new phones being introduced to the network, such addresses then being passed on to the generated MAP messages. The operator of the network has the option of changing the address for certain types of mobile phone call, or certain groups of customers. The invention therefore has generic application, i.e. it can be implemented in a variety of different networks, network specific alterations are not necessary.

According to a second aspect of the present invention there is provided a mobile phone telecommunications network comprising at least one mobile switching centre (MSC) having a message receiver, a MAP message generator, and a MAP message transmitter, and at least one service control point (SCP) having a MAP message receiver and a MAP message processor, wherein the MSC receives at least one message and as a result thereof generates a MAP message and sends this to the SCP, and the SCP receives and processes the MAP message.

The MAP message generated by the MSC and received by the SCP may comprise an SMS text MAP message, i.e. a MAP message generated by the MSC as a result of receipt of an SMS text message. The SMS text MAP message generated by the MSC may contain part or all of the text of the SMS text message. Processing of the MAP message by the SCP processor may comprise, for example, interrogation of the MAP message, determining the subsequent handling of the MAP message, charging a sender of the message received by the MSC, triggering dispatch of a message to a sender of the message received by the MSC, analysis of the MAP message.

According to a third aspect of the present invention there is provided a service control point (SCP) comprising a receiver for receiving at least one MAP message, and a processor for processing the MAP message.

The SCP may comprise a computer. The SCP receiver may provide or access software for receiving the MAP message. The SCP processor may provide or access software for processing the MAP message. Processing of the MAP message by the SCP processor may comprise, for example, interrogation of the MAP message, determining the subsequent handling of the MAP message, charging a sender of the message received by the MSC, triggering dispatch of a message to a sender of the message received by the MSC, analysis of the MAP message. The processing software may comprise one or more service logic programs (SLPs). Each SLP may define one or more processes carried out by the SCP. Processing of a MAP message by the SCP may comprise running one or more SLPs. Processing of a MAP message by the SCP may comprise using the MAP message to trigger running of one or more SLPs. The MAP message received by the SCP may comprise an SMS text MAP message, i.e. a MAP message generated by the MSC as a result of receipt of an SMS text message. The processing software may comprise one or more SLPs, 'SMS SLPs', which define one or more of the processes carried out by the SCP on SMS text MAP messages. Processing of an SMS text MAP message by the SCP may comprise running one or more SMS SLPs. Processing of an SMS text MAP message by the SCP may comprise using the SMS text MAP message to trigger running of one or more SMS SLPs. The SCP may comprise a transmitter for sending the MAP message onwards towards an intended receiver.

An embodiment of the second aspect of the present invention will now be described by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a schematic representation of a mobile phone telecommunications network according to the present invention, and

Figure 2 is a schematic representation of the service control point (SCP) of the network of Figure 1.

With reference to Figure 1, the mobile phone telecommunications network 1 comprises a servicing mobile switching centre (MSC) 2, a service control point (SCP) 3, a networking mobile switching centre (MSC) 4, and a short message service centre (SMSC) 5. The servicing MSC 2 is connected to the SCP 3, the SCP 3 is connected to the networking MSC 4, and the networking MSC 4 is connected to the SMSC 5, as shown. The connections allow two-way transmission of messages between the various components of the network.

In this embodiment, a text message is sent via the short message service (SMS) from a mobile phone 6 of a sender to the servicing MSC 2. As a result of the receipt of the SMS text message, the servicing MSC 2 generates an SMS text MAP message which contains the text of the SMS text message. The SMS text MAP message is sent to the SCP 3, which receives and processes it. If appropriate, the SCP 3 then sends the SMS text MAP message to the networking MSC 4. The networking MSC 4 receives the

SMS text MAP message and sends it to the SMSC 5. The SMSC 5 receives the SMS text MAP message and sends it to the mobile phone 7 of a receiver.

The structure of the SCP 3 is shown in more detail in Figure 2. The SCP 3 illustrated here comprises a computer, which comprises a switch control 10, a service logic program (SLP) storage facility 11, and a customer database storage facility 12. The switch control 10 is connected via a set of signalling links 13, 14 to the mobile phone telecommunications network 1. An SMS text MAP message from the servicing MSC 2 of the network 1 is sent to the SCP 3 and is received by the switch control 10 via the signalling link 13. The switch control 10 processes the SMS text MAP message by using it to trigger running of one or more of the SLPs stored in the SLP storage facility 11. For example, an SLP may be run which interrogates the SMS text MAP message to obtain details of the identity of the sender. The SLP then uses this information to interrogate the customer database in the storage facility 12. This contains details of the account of the sender, and the SLP checks the balance of the account to ascertain that the sender has sufficient credit to pay for sending the message to the receiver. If this is the case, the SLP instructs the switch control 10 to change the destination address of the SMS text MAP message to the SMSC 5 of the network. The switch control 10 changes the address and sends the SMS text MAP message to the SMSC 5 via the signalling link 14 and networking MSC 4. The SLP causes the account of the sender held in the storage facility 12 to be debited. The SMSC 5 sends the message onwards to the mobile phone 7 of the receiver. If the sender does not have sufficient credit to pay for sending the message to the receiver, the SLP instructs the switch control 10 to discard the SMS

text MAP message, and to send a notification message to the servicing MSC 2 of the network for onward transmission to the sender.

In this embodiment, operation of only one SLP is described. It will be appreciated that the SCP 3 may provide many SLPs, which define other processes undertaken by the SCP, for SMS text messages and other types of messages.

CLAIMS

1. A method of operating a mobile phone telecommunications network (1), characterised by comprising using at least one mobile switching centre (MSC) (2) of the network (1) to receive at least one message and, as a result, to generate a mobile application part (MAP) message, transmitting the MAP message from the MSC (2) to at least one service control point (SCP) (3) of the network (1), and operating the SCP (3) to process the MAP message.

2. A method according to claim 1 characterised in that the message received by the MSC (2) comprises a signalling message.

3. A method according to claim 1 characterised in that the message received by the MSC (2) comprises a text message.

4. A method according to claim 3 characterised in that the text message is generated using the short message service (SMS).

5. A method according to any preceding claim characterised in that the MSC (2) receives the message from a mobile phone (6).

6. A method according to any preceding claim characterised in that the MAP message generated by the MSC (2) contains information about the message received by the MSC (2).

7. A method according to any preceding claim characterised in that the MAP message generated by the MSC (2) contains at least part of the message received by the MSC (2).

8. A method according to any preceding claim characterised in that processing of the MAP message by the SCP (3) comprises interrogation of the MAP message to obtain information from the MAP message.

9. A method according to any preceding claim characterised in that processing of the MAP message by the SCP (3) comprises determining the subsequent handling of the MAP message.

10. A method according to claim 9 characterised in that processing of the MAP message by the SCP (3) comprises determining whether or not the MAP message should be sent onwards towards an intended receiver (7).

11. A method according to claim 9 or claim 10 characterised in that processing of the MAP message by the SCP (3) comprises interrogation of the MAP message to obtain information from the MAP message, and using the information in determining the subsequent handling of the MAP message.

12. A method according to claim 11 characterised in that the information comprises details of the identity of the sender (6) of the message received by the MSC (2), and is used to access an account of the sender (6) and to determine whether or

not there is sufficient credit to allow sending of the message onwards towards an intended receiver (7).

13. A method according to claim 11 or claim 12 characterised in that the information comprises details of the identity of the sender (6) of the message received by the MSC (2), and is used in determining whether or not messages from such a sender (6) should be sent onwards towards an intended receiver (7).

14. A method according to any of claims 9 to 13 characterised in that when processing of the MAP message by the SCP (3) comprises determining that the MAP message should not be sent onwards towards an intended receiver (7), the SCP (3) is used to discard the MAP message.

15. A method according to any of claims 9 to 13 characterised in that when processing of the MAP message by the SCP (3) comprises determining that the MAP message should be sent onwards towards an intended receiver (7), the SCP (3) sends the MAP message onwards towards the receiver (7) by sending it to one or more MSCs (4), or one or more store and forward centres.

16. A method according to claim 15 characterised in that the SCP (3) changes the destination address of the MAP message to send it onwards towards the receiver (7).

17. A method according to any preceding claim characterised in that processing of the MAP message by the SCP (3) comprises charging a sender (6) of the message received by the MSC (2).

18. A method according to claim 17 characterised in that processing of the MAP message by the SCP (3) comprises charging a sender (6) of the message received by the MSC (2) if the MAP message is sent onwards towards an intended receiver (7).

19. A method according to claim 17 or claim 18 characterised in that processing of the MAP message by the SCP (3) comprises charging a sender (6) of the message received by the MSC (2) before the MAP message is sent onwards towards an intended receiver (7).

20. A method according to any of claims 17 to 19 characterised in that processing of the MAP message by the SCP (3) comprises interrogation of the MAP message to obtain information from the MAP message, and using the information in charging a sender (6) of the message received by the MSC (2).

21. A method according to claim 20 characterised in that the information comprises details of the identity of the sender (6) of the message received by the MSC (2), and is used to access an account of the sender (6) and to charge the sender (6).

22. A method according to claim 20 or claim 21 wherein the information comprises details of the length of the MAP message, and is used to charge the sender (6).

23. A method according to any preceding claim characterised in that processing of the MAP message by the SCP (3) comprises triggering dispatch of a message to the sender (6) of the message received by the MSC (2).

24. A method according to claim 23 characterised in that processing of the MAP message by the SCP (3) comprises interrogation of the MAP message to obtain information from the MAP message, and using the information in triggering dispatch of a message to the sender (6) of the message received by the MSC (2).

25. A method according to claim 24 characterised in that the information comprises details of the identity of the sender (6) of the message received by the MSC (2), and is used to access an account of the sender (6), to determine the credit available, and to trigger dispatch of a message to the sender (6) if the credit is insufficient to allow sending of the message onwards towards an intended receiver (7).

26. A method according to any preceding claim characterised in that processing of the MAP message by the SCP (3) comprises analysis of the MAP message.

27. A method according to any preceding claim characterised in that the SCP (3) provides one or more service logic programs (SLPs), each SLP defining one or more processes carried out by the SCP (3).

28. A method according to claim 27 characterised in that processing of a MAP message by the SCP (3) comprises running one or more SLPs.

29. A method according to any preceding claim characterised in that the MAP message received by the SCP (3) comprises an SMS text MAP message, i.e. a MAP message generated by the MSC (2) as a result of receipt of an SMS text message.

30. A method according to claim 29 characterised in that the SCP (3) provides one or more SMS SLPs which define one or more processes carried out by the SCP (3) on SMS text MAP messages.

31. A method according to claim 30 characterised in that processing of an SMS text MAP message by the SCP (3) comprises running one or more SMS SLPs.

32. A mobile phone telecommunications network (1) characterised by comprising at least one mobile switching centre (MSC) (2) having a message receiver, a MAP message generator, and a MAP message transmitter, and at least one service control point (SCP) (3) having a MAP message receiver (10) and a MAP message processor (10), wherein the MSC (2) receives at least one message and

as a result thereof generates a MAP message and sends this to the SCP (3), and the SCP (3) receives and processes the MAP message.

33. A network (1) according to claim 32 characterised in that the MAP message received by the SCP (3) comprises an SMS text MAP message, i.e. a MAP message generated by the MSC (2) as a result of receipt of an SMS text message.

34. A service control point (SCP) (3) characterised by comprising a receiver (10) for receiving at least one MAP message, and a processor (10) for processing the MAP message.

35. A service control point (SCP) (3) according to claim 34 characterised in that the SCP processor (10) provides or accesses software for processing the MAP message.

36. A service control point (SCP) (3) according to claim 35 characterised in that the processing software comprises one or more service logic programs (SLPs).

37. A service control point (SCP) (3) according to claim 36 characterised in that processing of a MAP message by the SCP (3) comprises running one or more SLPs.

38. A service control point (SCP) (3) according to claim 36 characterised in that the MAP message received by the SCP (3) comprises an SMS text MAP message, i.e. a MAP message generated by the MSC (2) as a result of receipt of an SMS text message, and the processing software comprises one or more SMS SLPs which define one or more of the processes carried out by the SCP (3) on SMS text MAP messages.

39. A service control point (SCP) (3) according to claim 38 characterised in that processing of an SMS text MAP message by the SCP (3) comprises running one or more SMS SLPs.

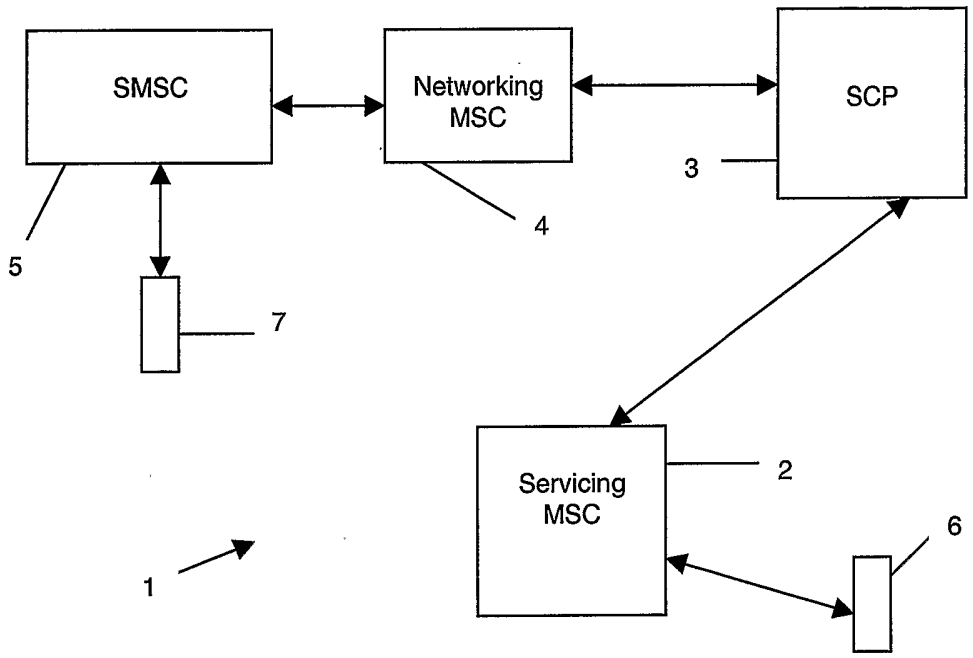
SMSC
Networking MSC
SCP
3
4
5
7
Servicing MSC
2
6
1

Fig 1

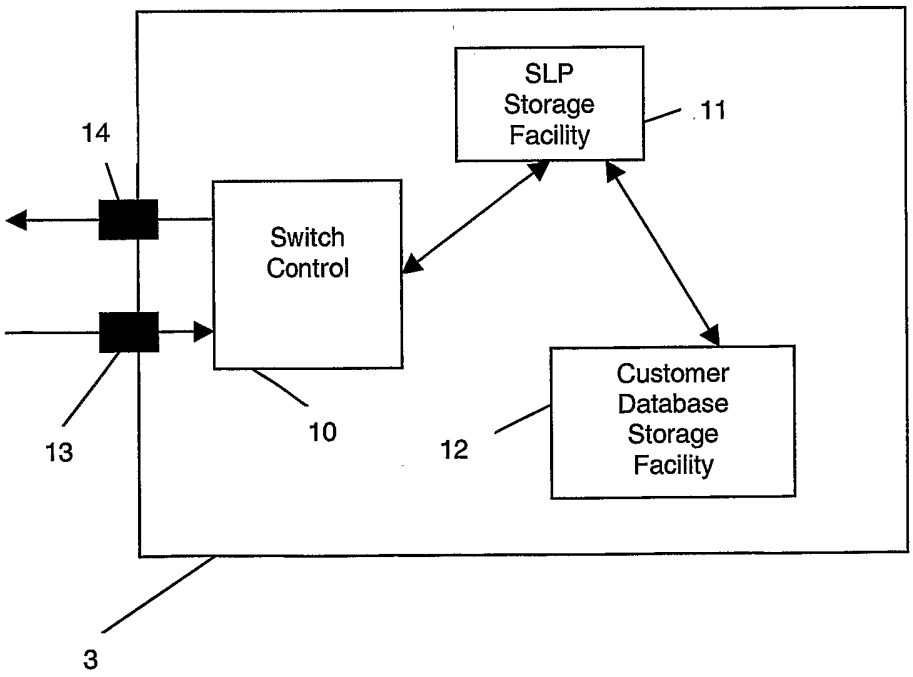
SLP Storage Facility
11
14
Switch Control
10
13
12
Customer Database Storage Facility
3

Fig 2

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 02/03905

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/22

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 7 H04Q

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 107 617 A (SIEMENS AG) 13 June 2001 (2001-06-13) column 1, line 1 -column 3, line 25 claim 1	1,32
A	WO 01 19104 A (NOKIA NETWORKS OY ;LEINONEN TUURE (FI); VIKMAN TUIJA (FI)) 15 March 2001 (2001-03-15) page 7, line 9 -page 9, line 15 page 13, line 12 -page 14, line 5 abstract	1-39

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

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

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Date of the actual completion of the international search	Date of mailing of the international search report
23 January 2003	30/01/2003

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 02/03905

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1107617 A	13-06-2001	DE 19958707 A1	07-06-2001
		EP 1107617 A2	13-06-2001
		US 2001039191 A1	08-11-2001
WO 0119104 A	15-03-2001	WO 0119104 A1	15-03-2001
		AU 5973099 A	10-04-2001
		EP 1208706 A1	29-05-2002
		US 2002123360 A1	05-09-2002