

FREQUENTLY ASKED QUESTION

Prepaid Services

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Prepaid calling cards are becoming more and more popular in SIP-based VoIP telephony. This FAQ show how the snom 4S can be used to implement a prepaid service.

Limited Trust

Prepaid calling cards are often sold without exact knowledge about the user's credit, bank account or credit card number. This implies that abuse of calling cards must be avoided as there is no way to charge costs beyond the already paid amount. Specifically, that means when the calling cards becomes empty, the active call must be terminated. In order to avoid surprises, the user should get an indication shortly before the calling card gets empty ("Your calling card is almost empty!").

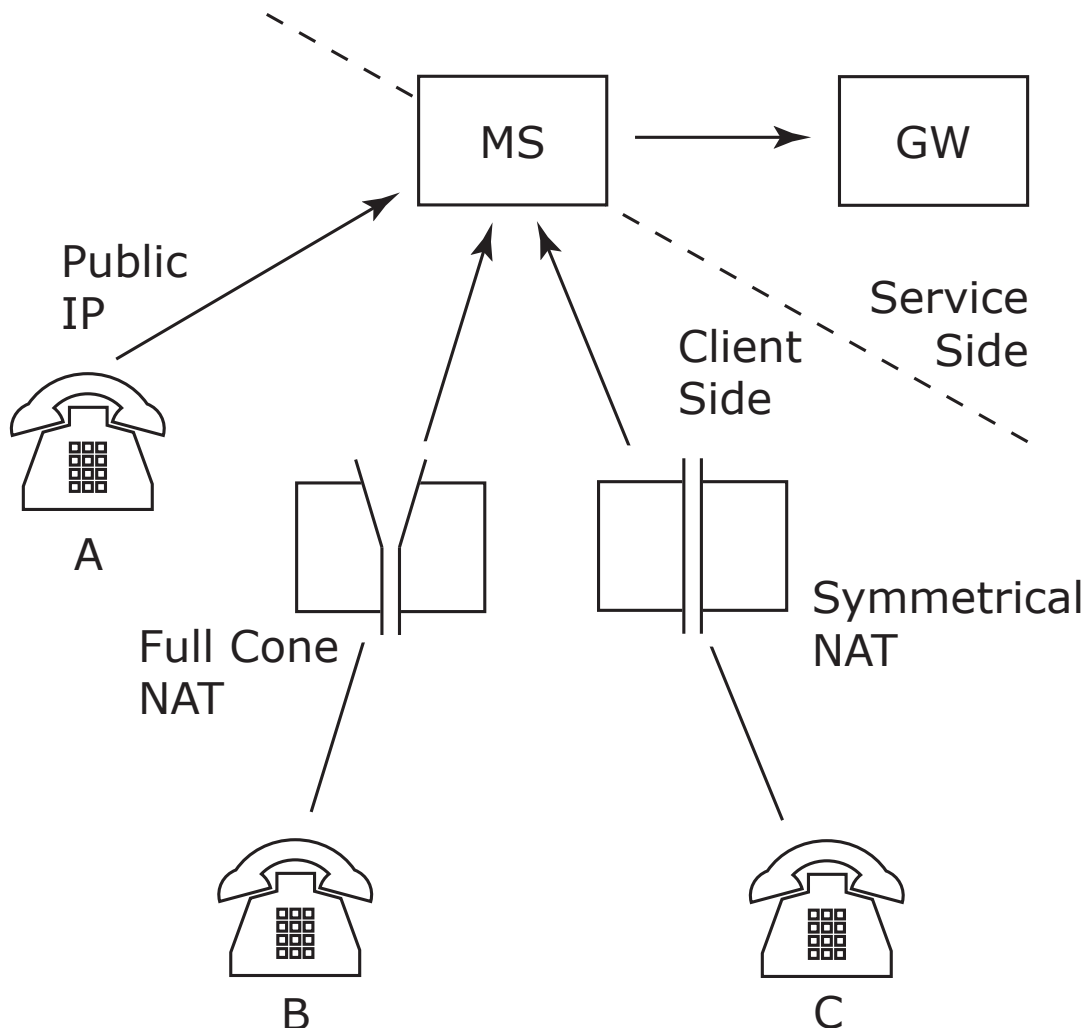
When the user dials into the calling card system, he is also interested in how much credit is left on this calling card. An IVR system should be able to indicate this credit.

The system must also be robust against cheating attempts like calling the account twice at the same time, bypassing a proxy or "pulling the plug" before the end of the call (no BYE message). In many cases it is desirable to hide the true destination of the call, may it be a gateway or another Internet Telephony Service Provider (no Record-Route on the client side).

This all makes it necessary that the calling card service provides both SIP and RTP data streams. By handling RTP, the system becomes able to play announcements and mix messages into the conversation.

Eavesdropping PINs

In many cases in SIP, it is not secure to choose "pin codes" for authentication. Eavesdroppers that monitor the SIP traffic can easily try 10,000 or even 100,000 combinations with all valid pins to guess the pin for this account.



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When a user authenticates with the media server, the situation is a little bit different. The PINs will not be visible in SIP, they will be transported in RTP. Because RTP is transported without encryption, an eavesdropper can just monitor the PIN. On the other hand, it will be relatively hard for him to try 10,000 combinations, because that would require 10,000 call attempts to the calling card server. In addition, he would have to try out a number of calling cards. In total, this would be an obvious attack which can easily be detected. Therefore, we believe that choosing a 10-digit calling card number together with a 4 digit PIN gives sufficient security for the calling card application.

Calling cards in snom 4S

Calling cards are normally not part of the standard media server. You need to have a "cc" license type (for example, cc1). Please approach your snom sales contact if you need such a license key.

The snom 4S handles calling cards on the "media server". The media server does more than just handling RTP, it includes an application server that performs the necessary actions to interact with the user and keep track of the account's credit. By the close interaction between application server and put media handling, synchronization problems and database integrity problems are avoided.

Technically, this architecture is called "back to back user agent" (B2BUA). In this

FAQ, the side to the customer is called "client side", while the side to the gateway or ITSP is called "service side". The figure illustrates the situation.

In the ideal case, the caller uses a phone on the public Internet (A). However, many customers are using phones in private networks behind full cone (B) or symmetrical NAT (C). Because the media server is located on the public Internet, it is relatively easy to deal with the NAT problems.

The proxy is usually used for the routing of the calls. A dial plan can find the cheapest route for this call and keep track of additional information, for example CDR for the service side. From a architectural point of view, adding a proxy on the client side or the service side does not make a difference.

Setting up the snom 4S

First of all, you need to make sure that the media server can be found via DNS. If you want that the users directly go to the media server, you should set up the DNS SRV and A records accordingly.

On the media server, you need to set up at least one calling card account. Currently, this account type has the name "Calling Card Type 2".

The card account has a few parameters which control the behavior:

- `card_length`: This entry describes how many digits the media server expects for

Account Administration [? Help](#)

On this page you see the current accounts of the proxy. You can delete users by clicking in the delete icon and you can edit users by clicking on the edit button.

Add Account:

Account:

Type:

- Auto Attendant
- Auto Attendant
- Calling Card Type 2
- Conference
- Error Information
- Mailbox
- Media Bridge
- Music on Hold

Account	Type	Edit	Delete
100	Calling Card Type 2		
101	Mailbox		
102	Auto Attendant		

the calling card number. A typical value is 10.

- **pass_length:** This is the length of the password. A value of 4 or 5 is a typical value.
- **gateway:** When the media server receives the destination number, it needs a domain name to create a SIP URL. It appends the gateway string to the entry and will attempt to dial this number. A typical example would be "example.com" or "12.23.34.45:5062".
- **warning:** Before the card expires, the media server plays an announcement. This setting tells the media server, how many seconds before the active call is terminated the warning messages is mixed into the conversation.

When you edit such an account type, you will see additional fields appear on the web page (the default fields are described in the media server manual). These fields take care about the rates that are charged for a call. To import rate, you need to define a CSV (described below) and load it into the account. Rates are stored together with the other account information. That means, that each calling card account has its own rates associated with it.

Load rates:

Filename:

Rate Definition

To define rates, you need to create a comma separated values (CSV)-file. This can be easily done with a normal text editor. The CSV file has the following format.

Every rate is described in a line. A rate consists of a country code, a pattern, a name and a price.

The country code can be any number. Special characters like # or * are not allowed. It is allowed to use the same country in different lines. The media server will take the line which matches best according to the pattern.

The pattern consists of a list of country code extensions. The list elements are separated with commas (no space). The elements themselves may contain a range with a dash between the minimum and maximum

value. For example, the element 100-104 would describe the extensions 100, 101, 102, 103 and 104. The length of the numbers in the range must be the same. So the pattern 100-104,110,120 would describe the extensions 100, 101, 102, 103, 104, 110 and 120.

The name is just descriptive and has not specific function.

The price can be any positive fixed or floating point number. The price is measured in price per minute.

If the country code is "*", the line describes the default price for a call. This line will be taken if no other line matches the number entered. If the "*" line is not present, the media server will not initiate a call and report an error about a wrong number.

A typical CSV file would look like this:

```
01149;177;Germany Cell;0.12
01149;;Germany General;0.18
01141;;Switzerland;0.28
*;;Default;0.20
```

The media server shows the current rate table below the load dialog. After importing the rate table, you should check if the import was successful.

Creating Calling Cards

After you have created one or more calling card accounts, you need to set up calling cards. Typically, this job is done automatically. Therefore, the user interface to this function is minimal.

On the navigation bar, you find the link "Calling Card". If you click on this link, you will find the following dialog:

General Behavior:

Calling Card Account:

Calling Card Number:

Code:

Credit:

In the field "Calling Card Account" you need to enter the account name (e.g. "100" in the above example). The media server does not perform any checks on this field, so please make sure that this account exists.

The "Calling Card Number" field takes the number of the new calling card. The length must be as set up in the "card_length" field

of the account. The "Code" field takes the PIN code, the length must match "pass_length".

The "Credit" field takes the initial amount that is put into this account. Note that writing this value overwrites previous values.

Typically, you will use automatic tools that load a large number of calling cards into your account (note that you need only one account for them, no matter how many accounts you load). "curl" is a good tool for performing this job. Please refer to the FAQ on remote control of the snom 4S on details of this feature or ask your support engineer for a ready script.

Testing

Once everything is set up, you should make a test call to you account and use one of the calling cards that you have set up.

To see the effect of your action, you can take a look at the accounts files. The media server will create subdirectories inside the chosen account and put the calling card information into these directories. The files code.txt and balance.txt contain the PIN and the remaining credit for this calling card. You can easily retrieve this information for statistics.

Creating Backups

The calling card database contains important information that must not get lost during a server failure (you don't want to loose the current balances on the calling cards). This release of the media server does not include automatic replication of stateful information in the media server.

However, with some simple tricks you can minimize the risk of loosing data. All you need to have is a background process that periodically copies the accounts directory into a safe place. The period depends on the safely level that you want to achieve. For example, if you tolerate a maximum loss of 30 minutes calling card history, this background process must run every 30 minutes. In Linux, such a background process could look like this:

```
while [ 1 ]; do
sleep 600
cp -rp accounts /home/backup/accounts
done
```

You may also use cron(8) to perform this task for you.

You can estimate your risk using a stochastic approach. If your telephone termination costs are 100 USD per hour, you replicate your file system every hour and statistically the calls are evenly distributed, that means that your failure damage expectation is 50 USD. However, this simple estimation does not take lost business into account; therefore you should make sure that your hardware is suited for business.

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