BILLION

PBX

Getting Started

with

Billion PBX

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1. How to use this book

This tutorial is intended to help you start working with Billion PBX as soon as possible. We will give you answers on most frequent questions and show you how to configure the most important parameters and how to avoid the most frequent errors. Starting the work with Billion PBX by this tutorial, you will be able to continue its deeper studying by going over to detailed description of all of its functions and parameters contained in User Manual.

2. VoIP equipment. What is Billion PBX for?

In the context of VoIP, under "equipment" term we will mean PC or notebook equipped with the application-specific software such as Billion PBX.

Thus, as it appears from abbreviation, VoIP technology is built upon IP network. However, as the telephony appeared much earlier, it is necessary to integrate existing telephony networks with VoIP networks in some way. For this reason, it is important for us to separate VoIP equipment in two groups: the first one which works only in IP environment and the second one which works on the border between IP and traditional telephony.

Different gateways (both personal and carrier-class) refer to the second group of equipment. There exist also less widespread gateways connecting IP and mobile networks. From the VoIP side they seemed identically. An important point is that this group of equipment is able to transfer the call from non-IP network to IP network – and vice versa.

Different IP-phones, soft phones which can be installed to PC, PDA or mobile phone with IP network support, proxy-servers refers to the first group of VoIP equipment – i.e. they work only in IP environment. Billion PBX also refers to this group of equipment.

VoIP becomes more and more popular but it is still inferior to traditional telephony protocols by popularity. VoIP's benefits can be especially seen with long-distance calls. Just at that spot VoIP covers more and more area. However, it is quite widespread situation when the carriers perform switching of calls arrived by VoIP using traditional switching devices. In this case call is transferring from VoIP network, passing through traditional switch-board and returning back to VoIP network. It is unlikely that this scheme is optimal, especially taking into consideration the expensiveness of equipment for such kind of inversions.

It is more easily to switch such calls staying within IP network – and Billion PBX will be of service to this purpose. Installed at low-priced PC, it allows replacing three devices – and the price for each of these devices is higher than the price of Billion PBX together with PC where it is installed.

Moreover, Billion PBX implementation area isn't completed with above mentioned. Billion PBX can be also used as system core when constructing new generation SIP-based phone network. SIP-based networks become more and more popular and they are used not only on enterprise scale but also on global scale.

Billion PBX can be installed on usual office computer to create fully functional phone system over the LAN. Users will be able to make not only voice calls but also will have a whole range of additional features like call forwarding, voicemail, callback and many others.
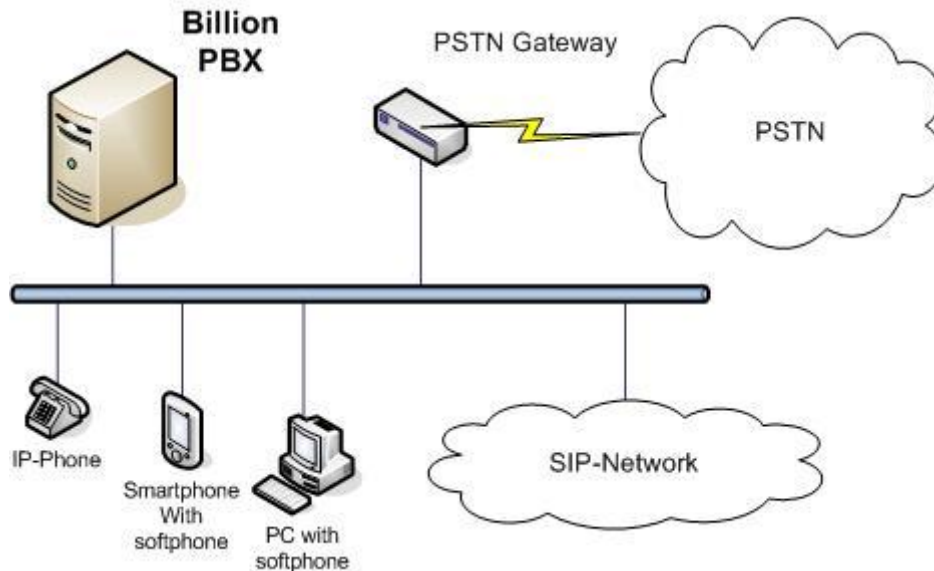
Рис. 1. How Billion PBX works with other VoIP network elements (in general).

Installation and configuration simplicity, low hardware requirements, cross-platform support, flexible licensing policy – this is all about Billion PBX.

3. Billion PBX – vocabulary

In this chapter we will discuss terms used in Billion PBX. In many cases user interface needs to be short, so used terms cannot always be evident and clear. In this chapter you will be able to find extended explanation of those terms which you will meet working with Billion PBX.

Billion PBX should be considered as software which transforms your PC into telephone switchboard. After Billion PBX installation you are able to control interconnections which are performed by popular VoIP protocols – SIP and H323. It can be calls from PC to PC, from PC to phone and vice versa, and even calls from phone to phone.

To work with Billion PBX, you will need any modern or not very modern PC equipped with NIC (Network Interface Card) and connected to LAN or Internet.

To proceed with work, let's try to clear up the main terms that Billion PBX works with.

Billion PBX establishes connections with 2 types of entities: Subscribers and Endpoints.

Subscribers register on Billion PBX by login and password, they can make outgoing calls and accept incoming calls. Besides, Subscribers have an access to advanced call features provided by Billion PBX. Subscriber is identified by login and password. Its ip-address Subscriber tells to Billion PBX during registration process. Upon completion of this process Subscriber becomes available for making and accepting calls. Subscriber can be presented by softphone or hardware ip-phone. Subscriber login can be presented by phone number or character

string. Ip-address of Subscriber can change. Billion PBX will be informed about these changes at the next Subscriber's registration.

Let's take a look at example. Suppose you travel a lot with your laptop with the softphone installed on. Billion PBX is installed on the computer at your office or residence and your name or some phone number is included to Billion PBX subscribers list. Being in different cities you connect to the Internet and gets different ip-addresses. Every time you have a new ip-address you register on the Billion PBX at your office or residence. Billion PBX always knows how to connect you. Everybody wishing to call you may not know where you are and send VoIP-calls to Billion PBX, to your name or number, and Billion PBX forwards these calls to your laptop.

Endpoints are needed to connect Subscribers with outer world – these can be gateways or SIP-providers. Endpoints can send or receive calls from Billion PBX. If call is coming from Endpoint it plays as **Originator**, If Billion PBX sends call to Endpoint it plays as **Terminator**. Any Endpoint can be both Originator and Terminator depending on use cases. Billion PBX authorizes Endpoints by ip-address or login and password.

To perform call routing management Billion PBX maintains routing table. Subscriber's accounts are automatically placed in this table. When call is coming to Billion PBX with Subscriber's name as a dialed number Billion PBX will send this call to appropriate Subscriber. If call should be sent to Endpoint you will need to create a **Route**. For example, you need to send long distance calls with "00" prefix. There can be many Routes and they can override each over. If Routes override Billion PBX will go to the next Route in case of connection problems on the first one.

Route can contain several links not only to Endpoints but also to Subscribers. Using Routes you can create dialing groups setting also dialing method – group members can be dialed simultaneously, by orderm by load or by available lines depending on your needs.

4. Billion PBX – user interface

One of the most important Billion PBX features is its ability to run under different operating systems. To make this possible, Billion PBX user interface was realized in a form of web-pages which are seemed to be the same without reference to applied OS. Moreover, it gives ability to manage Billion PBX remotely which is very important if PC with Billion PBX is located in a specialized hosting center.

Billion PBX user interface page consists of three parts. Top part contains product info, version number and licensor name. On the bottom left you will find main menu and on the bottom right – operation area. The last one changes depending on selected menu item.

Each page is represented in standard web-form supported by the most of web-browsers. There are few kinds of pages: configuration forms, lists, status pages and also log-file browsing page.

Configuration forms

Configuration forms are web-interface standard elements without any difficulties of work in with. After data input it is needed to press "Accept" button in the bottom of the form. By pressing "Reset" you retrieve previous values.

Working with lists

Each page with lists contains table and "Accept"/"Reset" control buttons. The far right table column is used for table line content management. Besides, end table line is used for adding of new line in a list. Now let's see how it works.

If the table already contains some lines they can be changed or deleted. If you want to delete some line you have to choose "Delete" value within drop-down menu of the far right table column. If some fields of table line were changed and you want to save these changes you have to choose "Keep" value within drop-down menu of the far right column. In such a manner you are able to change or mark for deleting several lines at one stroke. To make these changes effective, it is needed to press "Accept" button in the foot of the page.

To add new line you have to input necessary data to the bottom line and then choose from the drop-down menu of the far right table column "Add Top" or "Add Bottom". After pressing "Accept" button the new line will appear either on the top or at the end of the list – depending on made choice.

Besides, using drop-down menu in the far right table column you are also able to move some line up or down within the table. To perform it, you have to choose appropriate value within "Move Up/Move Down/To Top/To Bottom" of drop-down menu and then press "Accept" button. After it is done, table will be redisplayed with new lines' locations.

It is often that not all fields related to this table line are displayed at the page. For such cases "Advanced properties" column with "Edit" link is provided. After clicking this link, you will see the pop-up window with all additional data excluded from table. All data in this window are presented in a form of configuration forms with "Accept", "Reset" and "Close" buttons.

It is necessary to note that after all changes in a pop-up window are accepted, you need also accept changes at the main page. You will be informed about this by red color of "Edit" link.

Status pages

Status pages consist of two parts: refresh rate set up form and status table. Those pages are refreshed automatically. User can manage refresh rate by inputting of interested value in "Refresh interval, sec" field. New value will be applied either during the following update or after pressing "Refresh Now" button.

Log file page

This page displays the contents of Billion PBX log-file wherein different events are registered. As log-file can have quite solid size Billion PBX breaks it down into enumerated parts. Numeration begins with null. When user selects "Log-file" page, Billion PBX prompts for number of part which has to be displayed. After that – and upon condition that inquired part exists on hard disc – its contents will be displayed on the screen.

5. Building simple phone system

In this chapter we will describe all necessary steps of Billion PBX configuration to create a simple VoIP network. All the steps shown below can be done with unregistered version of Billion PBX.

Step by step we will create a system that contains the following elements:

- Billion PBX – ip-address: 10.0.0.1,

- Two ip-phones – presented by PC with Billion Phone installed – ip-addresses: 10.0.0.2 and 10.0.0.3.

- VoIP-gateway – ip-address 10.0.0.4.

Our system will also have a connection with a SIP network, for example, SIPTraffic.com to make long distance calls.

We suppose that you have already installed and started Billion PBX on your computer (hereafter: PC1).
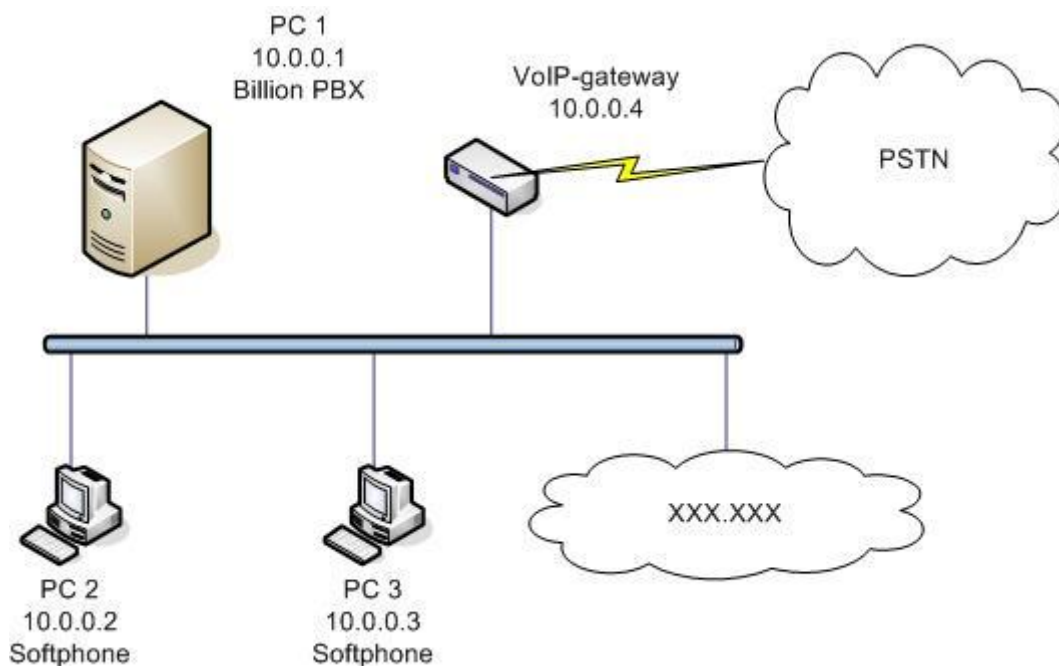
Picture 5.1. VoIP network managed by Billion PBX

Step 1. Subscribers registration on Billion PBX

IP-phones (in our case – softphones) installed on PCs can be registered on Billion PBX as Subscribers. We need it because in that case Billion PBX will be able to determine their status – online or offline. In order to register Subscribers on Billion PBX go to "Subscribers" page on Control panel and do the following:

- For PC 2:

  o Description : PC 2.

  o Account: 101.

  o In "Advanced Properties"

    ▪ Login: 101,

    ▪ Password: 101 (or any other).

    ▪ Press "Accept" button.

  o Choose "Action": "Add".

  o Press "Accept" button on "Subscribers" page.

- For PC 3:

  o Description : PC 2.

  o Account: 102.

  o In "Advanced Properties"

    ▪ Login: 102,

    ▪ Password: 102 (or any other).

    ▪ Press "Accept" button.

  o Choose "Action": "Add to bottom".

  o Press "Accept" button on "Subscribers" page.
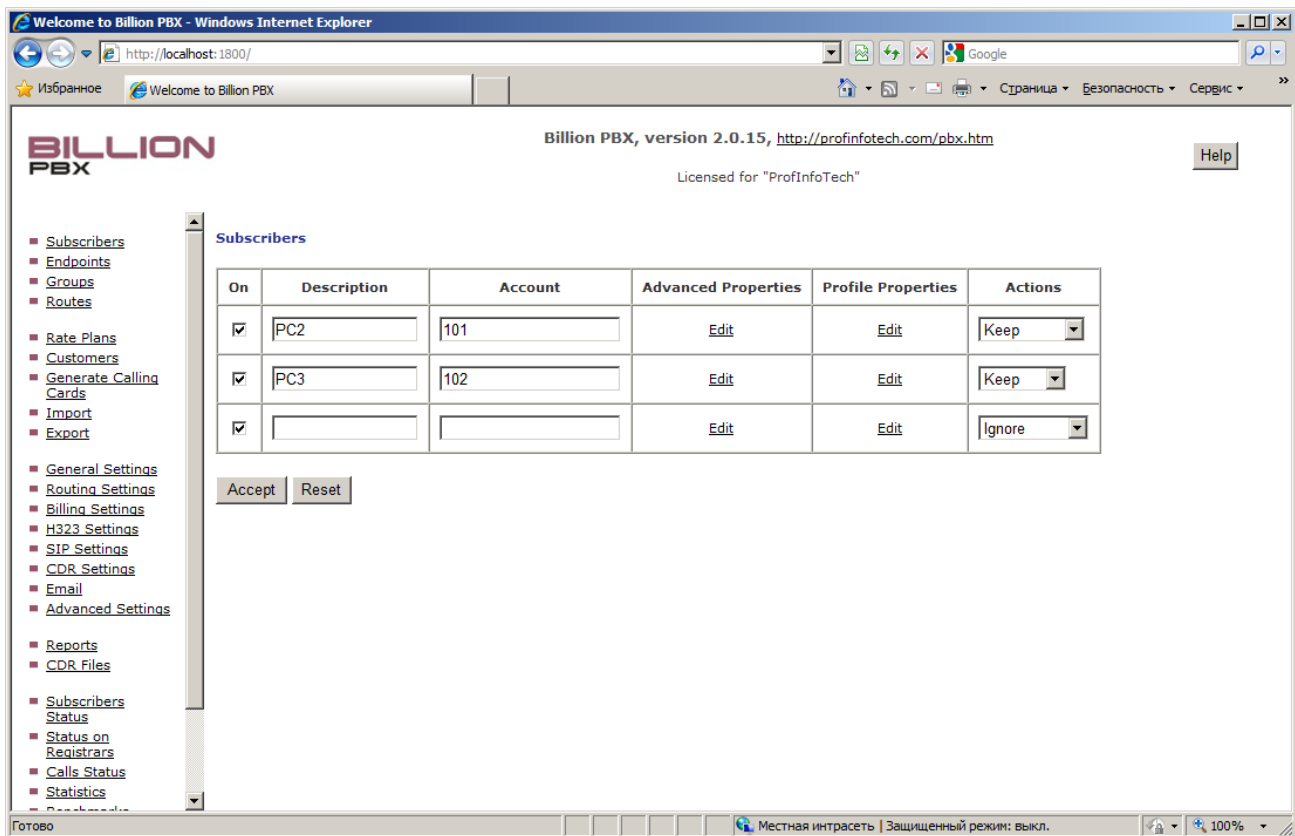
Open Billion Phone Options dialog and enter the following:

- Domain: 10.0.0.1

- User name: 101 or 102

- Password: 101 or 102 (or other password you enter for Subscriber)

- Press Ok.

Billion Phone will start registration process. The registration status of Subscribers can be viewed on "Subscribers Status" page of Billion PBX Control Panel. If you see 2 lines corresponding to our softphones then this step has been successfully completed.

Step 2. Call from one ip-phone to another through Billion PBX

Now you can make a test call from one ip-phone to another.

In the PC 2 softphone window enter the number of PC 3: 102 and press "Dial" button. The call should start. You can see the status of call on "Calls Status" page of Billion PBX Control Panel.

Step 3. Connecting to PSTN

Now after we have connected two softphones we will create our network to outer world. In order to make calls to public numbers we need to connect a gateway to our system. This gateway will transfer calls between VoIP and PSTN networks. You can choose any available gateway equipment supporting SIP protocol.

As was shown on the scheme, our gateway will have ip-address 10.0.0.4. On the page "Endpoints" of Billion PBX Control Panel create a new record:

- Description: PSTN Gateway

- Protocol: SIP

- IP-address or name: 10.0.0.4
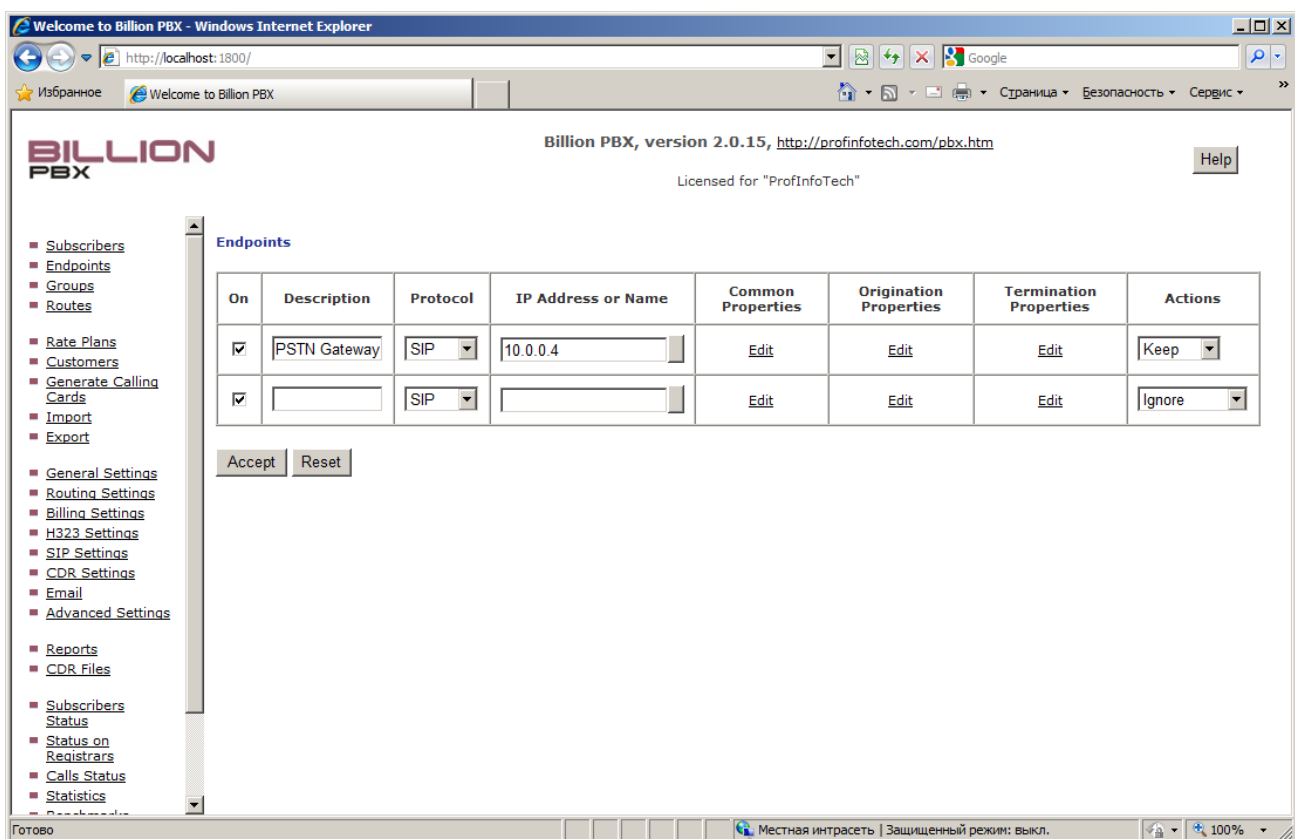
We have created an Endpoint in our system. Now we need to create a Route that Billion PBX will use for sending calls to this Endpoint. Let's agree that in order to call PSTN-numbers user should dial "9" as a prefix.

Go to "Routes" page of Billion PBX Control Panel and create a new line:

- Description: Route to PSTN

- Prefix: 9~

- Number translation rule: ~

- In Termination properties choose our Endpoint, choose Action "Add" and press "Accept" button.

- Press "Accept" button on Routes page.
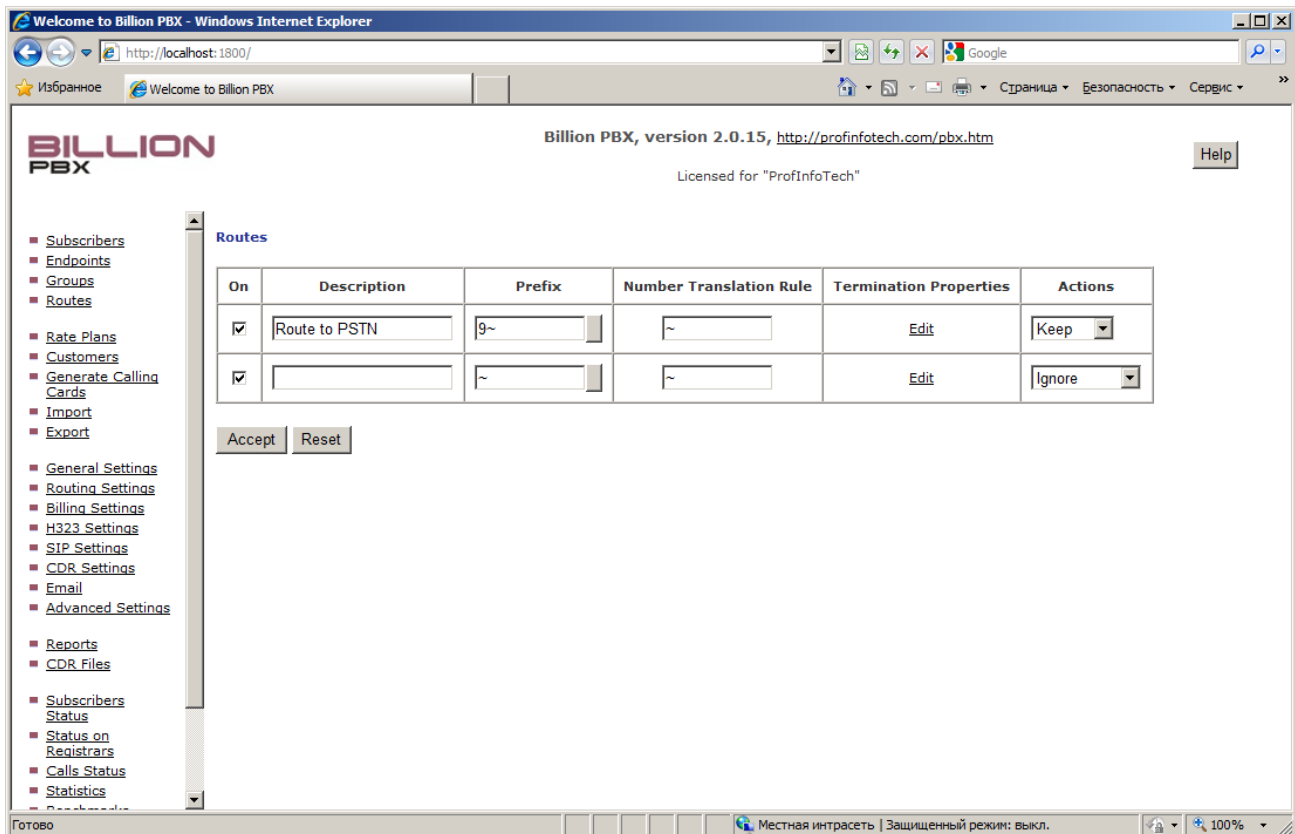
Prefix "9" means "all the calls where dialed number begins from 9". Since we have left number translation rule as "~", 9 digit will be removed from the dialed number in the call sent to Endpoint.

Now we can make a test call to PSTN-number. In the PC 2 softphone window enter the number started from 9 and press "Dial" button. The call should start. You can see the status of call on "Calls Status" page of Billion PBX Control Panel.

## Step 4. Connecting to SIP-provider

In order to make long distance calls cheaper we will connect our system to SIP-network. As an example we will take SIPTraffic.com.

As in the Step 3 we will need to create an Endpoint and a Route.

Open Endpoint page and add a new line:

- Description: SIP Skype

- Protocol: SIP

- IP-address or name: sip.skype.com

- In Common Properties dialog enter Login and Password you got during registration at SIPTraffic.com and check "Register PBX on this Endpoint".
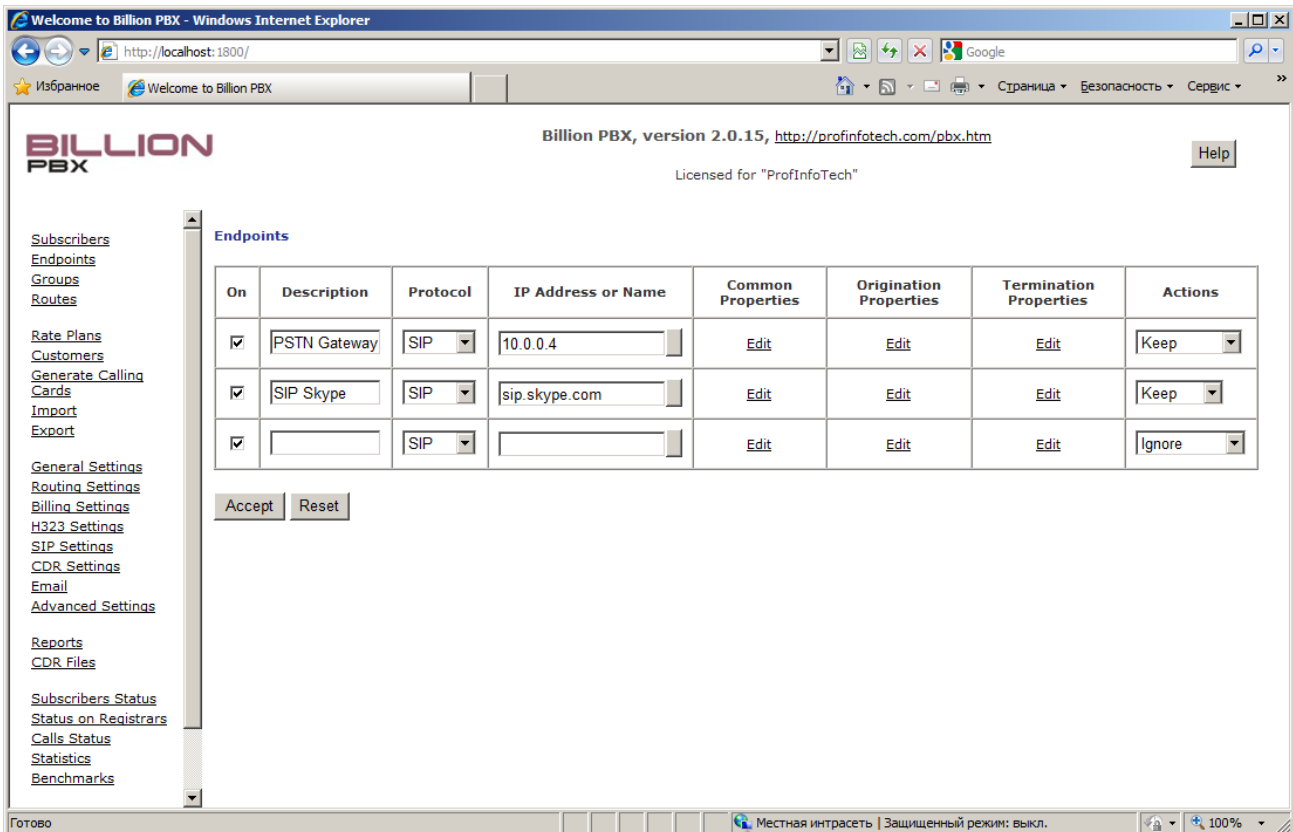
Let's agree that in order to make long distance call user should dial "00" as a prefix. Now open "Routes" page and create a new line:

- Description: SIP-provider

- Prefix: 00~

- Number translation rule: ~

- In Termination properties choose our Endpoint, choose Action "Add" and press "Accept" button.

- Press "Accept" button on Routes page.

Now we can make a test long distance call. In the PC 2 softphone window enter the number started from 00 and press "Dial" button. The call should start. You can see the status of call on "Calls Status" page of Billion PBX Control Panel.

Conclusion

We have created a simple VoIP-network allowing us to make local calls and also dial PSTN and long distance numbers.

You can extend your network functionality using various features provided by Billion PBX such as voicemail, callback, ivr and others. If you will have any ideas of how to make Billion PBX even more useful and convenient we will be happy to hear from you.

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