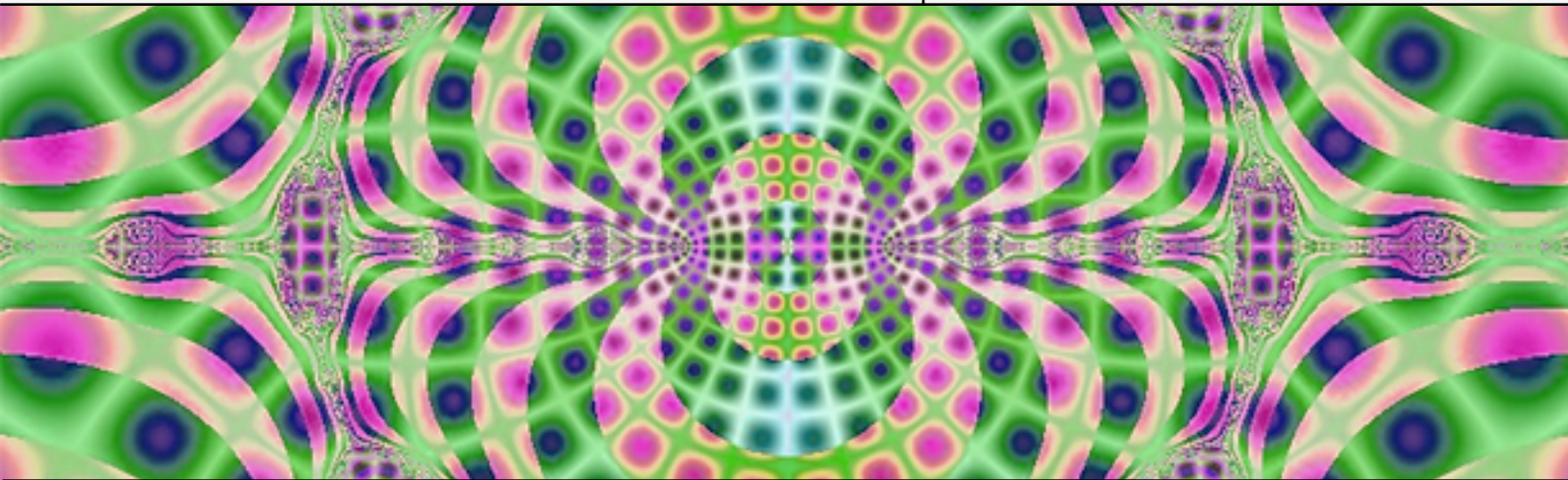


Porta  Billing100[®]

Maintenance Release 9



User Guide, Part II

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**PortaBilling100 User Guide Part II
V.1.9.1 June 2004**

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Canada

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Preface

This document provides PortaBilling100 user with the most common examples and guidelines on setting up a VoIP network. The last section of the document answers the most frequent questions users encounter after running PortaBilling100 for the first time.

Where to Get the Latest Version of this Guide

The hard copy of this guide is updated at major releases only, and does not always contain the latest material on enhancements occurring in-between minor releases. The online copy of this guide is always up-to-date, integrating the latest changes to the product. You can access the latest copy of this guide at:

www.portaone.com/solutions/billing/docs.

Conventions

This publication uses the following conventions:

- Commands and keywords are in **boldface**
- Terminal sessions, console screens, or system file names are displayed in fixed width font



Caution means ‘reader be careful’. You are capable of doing something that might result in program malfunction or loss of data.

NOTE: Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.



Timesaver means the described action saves time. You can save time by performing the action described in the paragraph.



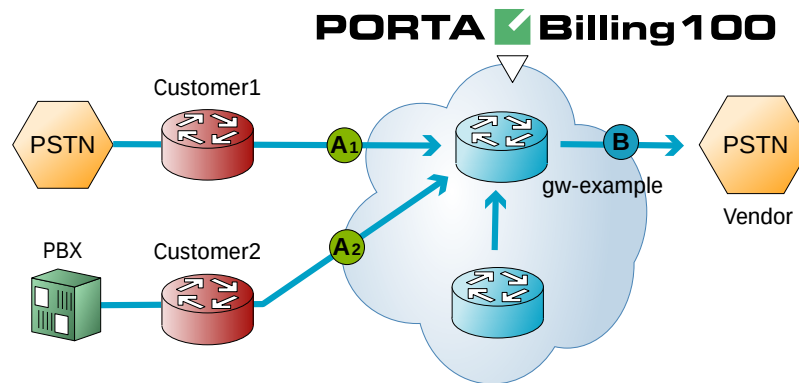
Tips Means the following information might help you solve a problem.

4. Setting up a Wholesale IP Telephony Company

Wholesale voice is a growth market, with service providers building new capacity and launching new services. The primary wholesale service is long-distance transport and aggregation, with the key advantage that country-specific features and domestic calling regulations are not required. The principal beneficiaries are developing countries, where, in many cases, the quality of VoIP is superior to that of traditional PSTN service.

Typical business case

Central to the delivery of wholesale voice services are voice points-of-presence (POPs), which are interconnected to other service providers. Minutes Aggregation and Resale (Including ASP Termination) service allows wholesale network providers to collect traffic from multiple originating providers, then aggregate and deliver it to termination providers they select.



The provider in this scenario is the owner of termination node (POP) gw-example1. It is a typical example of a VoIP network where Customers pay the provider to terminate traffic at point (An), and the provider himself pays the Vendor for the traffic at point (B). The provider makes its profit on difference between:

- Tariff he charges his customer (An), and
- Tariff he is being charged by the vendor (B).

Setting up your network components

Configuring NAS gw-example1

1. Basic router configuration

It is highly recommended to use the latest telephony IOS and DSP firmware, and to set the hostname the same as the h323-id.

```
hostname <h323_id>
ip domain name <default domain>
```

NOTE: VSA h323-gw-id="hostname.domain"

2. NTP

NOTE: it is very important to have reliable time services.

```
ntp server <name/IP>
.....
ntp server <name/IP>
ntp master 5
clock timezone <your time zone> 1
clock summer-time <your summer time zone> recurring <your rules>
```

NOTE: It is important that you only use well-known time zone abbreviations which are supported by the billing engine. If unsure, use the UTC time zone.

3. AAA

```
aaa new-model
aaa authentication login h323 group radius
aaa authorization exec h323 group radius
aaa accounting connection h323 stop-only group radius
```

4. VoIP interface

```
interface <your interface to the world>
 h323-gateway voip interface
 h323-gateway voip id <gatekeeper id> ipaddr <IP> <port>
 h323-gateway voip h323-id <h323_id>
```

NOTE: if you want to use a virtual interface then add the line:

```
h323-gateway voip bind srcaddr <IP>
```

5. Enable gateway functionality

```
gateway
```

6. Enable gateway accounting

For older IOS versions:

```
gw-accounting h323 vsa
For newer IOS versions (12.2T or 12.3):
gw-accounting aaa
  acct-template callhistory-detail
```

NOTE: VSA does not work for all platforms.

7. Radius

IMPORTANT NOTE: Ports 1645/1646 are the traditional Radius ports used by many vendors without obtaining an official IANA assignment. The official assignment is now ports 1812/1813 and users are encouraged to migrate when possible to these new ports.

Cisco notes:

- “radius-server” commands will be available only after issuing “aaa new-model” command.
- UDP port for RADIUS accounting server - default is 1646 (see note above)
- UDP port for RADIUS authentication server - default is 1645 (see note above)

Keep in mind:

- Default ports for Cisco are 1645/1646
- Defaults in /etc/services are 1812/1813

```
radius-server host <name/IP> acct-port 1812 auth-port 1813
radius-server key <key>
radius-server vsa send accounting
radius-server vsa send authentication
```

8. voice-card

9. controller

10. voice-port

Dependant on your hardware configuration

11. call application voice & deal-peer's

```
call application voice remote_ip ftp://.../remote_ip_authenticate.1.1.1.tcl
!
dial-peer voice 10 pots
  destination-pattern .
  port 0:D
!
dial-peer voice 11 voip
  application remote_ip
  incoming called-number .
```

NOTE: There is an “Advanced remote authenticate” application available at <http://store.portaone.com>. It contains many extra features beyond the default Cisco application, and so we recommend using it instead of that application.

Billing configuration

Please see the **PortaBilling Administrator Interface** PDF file for detailed instructions how to navigate and operate on the web interface and for detailed explanation of particular fields.

Initial configuration of the PortaBilling

The following steps normally are performed only once, after the system is installed. This includes:

- Visit the **Company Info** from the main menu. Enter information about your company and set up base currency. This of course does not limit your operations to only this currency. However on the reports such as cost/revenue different currencies will be converted to the one you specify here.
- From the main admin menu choose **Users** and create login entries for users who will be working with the system. It is not recommended to use the default PortaBilling root user (**pb-root**) for any other operations except initial set up.
- Make sure you are able to login as a newly created user and change the password for the **pb-root** user.

NOTE: It is possible that you will require assistance from the PortaBilling support personnel in the future. In order to provide support they will need access to the web interface. So when you submit a problem report please either provide them with a new password for the **pb-root** user, or create a special user for them.

- If you plan to do billing in more than one currency, define these in the **Currencies** and specify exchange rates in the **Exchange Rates**

Create destinations

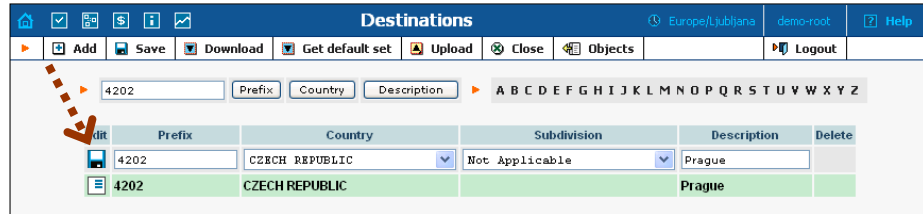
This step is only required if you have not define necessary destinations before. There are two ways to insert new destination into the system:

- One-by-one, using  **Add** functionality on the web interface
- Bulk update, by uploading destinations from the file

NOTE: There is a file with the default destination set supplied with the PortaBilling. You can download it and then upload it to the server. However it might be possible that your business requires different types of prefixes, so please check the data in the file before the upload.

Creating destinations in “one-by-one”:

1. In the Management section of Admin-Index choose **Destinations**



Prefix	Country	Subdivision	Description	Delete
4202	CZECH REPUBLIC	Not Applicable	Prague	

2. Click on the  **Add** button.
3. Fill the required information. This includes the phone prefix and the country. Country subdivision is optional. You can use the **Description** column to store some extra information about the destination (for example if it is mobile or fixed number).
4. Click  **Save**
5. Repeat steps 2-4 for each additional destination

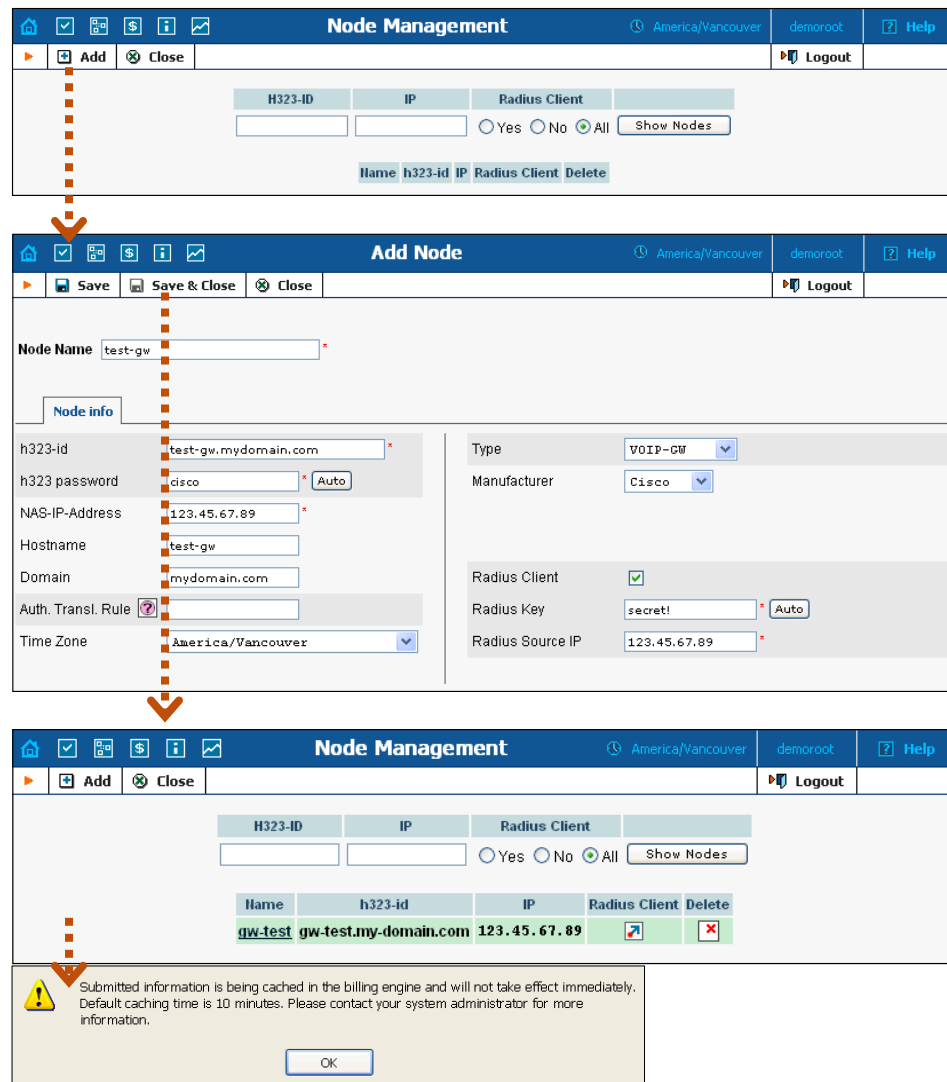
Uploading a set of destinations from the file

1. In the Management section of the Admin-Index choose **Destinations**
2. Click on the **Get default set** to download set of destinations as a CSV (Comma-Separated Values) file
3. Open this file in Microsoft Excel or any other suitable program. Edit the data if required.
4. Save the file and close it in Excel
5. Switch back to the PortaBilling web interface, and click the **Upload** on the Destinations screen.
6. Type in the filename of the file you have edited or click on the **Browse** button and select the file.
7. Click  **Save&Close**

Create Nodes

This step is only required if you have not entered all of your gateways into the system before. Now you have to enter your gateways as nodes. PortaBilling requires some key information about your network equipment such as the IP address, h323-id, Radius shared secret, etc.

NOTE: Only your own gateways have to be entered as nodes. Remote gateways which belong to the customer or the ones which legally belong to you but are solely used by customer are not considered as nodes.



The screenshot shows the 'Node Management' interface. At the top, there's a navigation bar with icons for home, check, add, save, info, and a graph. The main title is 'Node Management'. Below it, there's a sub-header with 'Add' and 'Close' buttons. The main content area has a table with columns: H323-ID, IP, Radius Client, and a 'Show Nodes' button. Below the table, there's a list of nodes with columns: Name, h323-id, IP, Radius Client, and Delete. A red dashed arrow points from the 'Add' button to the 'Add Node' form below. The 'Add Node' form has a 'Node Name' field with 'test-gw'. Below it, there's a 'Node info' section with fields for h323-id (test-gw.mydomain.com), h323 password (cisco), NAS-IP-Address (123.45.67.89), Hostname (test-gw), Domain (mydomain.com), Auth. Transl. Rule (empty), and Time Zone (America/Vancouver). To the right, there's a 'Type' dropdown (VOIP-GW), a 'Manufacturer' dropdown (Cisco), a 'Radius Client' checkbox (checked), a 'Radius Key' field (secret!), and a 'Radius Source IP' field (123.45.67.89). Below the form, there's a 'Node Management' section with a table showing the added node: gw-test, gw-test.my-domain.com, 123.45.67.89. A red dashed arrow points from the 'Add Node' form to the 'Node Management' section. At the bottom, there's a yellow warning box with a triangle icon and the text: 'Submitted information is being cached in the billing engine and will not take effect immediately. Default caching time is 10 minutes. Please contact your system administrator for more information. OK'.

H323-ID	IP	Radius Client	
		☐ Yes ☐ No ☒ All	Show Nodes

Name	h323-id	IP	Radius Client	Delete
gw-test	gw-test.my-domain.com	123.45.67.89	☒	X

Submitted information is being cached in the billing engine and will not take effect immediately. Default caching time is 10 minutes. Please contact your system administrator for more information.

1. In the management section of the Admin-Index page choose **Nodes**.
2. In the Node management window click the  **Add** icon.
3. Fill in the New Node form:
 - o **Node name** – some short descriptive name for this node (will be used in the select menus).

- o **H323-ID** – h323-id (recommended hostname.domainname)
 - o **H323 Password** – If you plan to use default Cisco remote IP authentication script, put **cisco** here.
 - o **NAS-IP-Address** – IP address of the h323 interface.
 - o **Auth. Translation rule** – use to converts dialed number in the desired format.
 - o **Type** – VoIP node type, select VOIP-GW.
 - o **Manufacturer** - Select **Cisco** or **Quintum**.
 - o **Radius Client** – Check this if this node will be communicating with the billing.
 - o **Radius Key** – If this node is a radius client, put the shared secret here; it must be same as configured on the NAS as a **key** in the configuration of the radius server.
 - o **Radius Source IP** – Unless your gateway has multiple network interfaces, the value here should be the same as NAS-IP-Address
4. Click  **Save&Close**.
 5. Repeat steps 2-4 until all of your nodes are entered.

NOTE: There is some propagation delay between the database and the Radius server configuration file; no more than 15 minutes.

Create Tariff

A tariff is a single price list for calling services. A tariff combines:

- Conditions, which are applicable for every call regardless of the called destination.
- Per destination rates.

Normally you need a separate tariff for each of your customers.

1. In the Management section of the Admin-Index choose **Tariffs**
2. On the Tariff Management page choose  **Add**
3. Fill in the **New Tariff** form:
 - o **Name** – the short name for tariff object. This is the name you will see later in the select menus.
 - o **Currency** – indicates in which currency the pricing information is defined. All pricing information for a single tariff must be defined in the same currency.

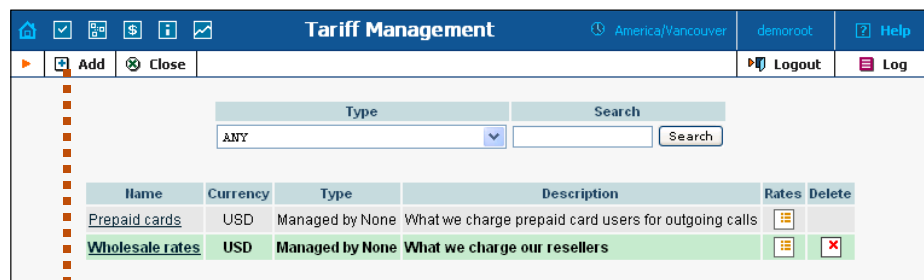
NOTE: Currency for the tariff is chosen only once, and you cannot change it later.

- o **Type** – if you plan for this tariff to be used for your wholesale customer's accounts, so that the customer himself can edit rates in this tariff, choose "Managed by NNN", where NNN is the customer's name. Otherwise, if this tariff is for the retail customer's accounts or for your termination costs to the vendor, choose **Managed by None** here.
- o **Off-peak Period** – defines the off-peak period. Click on the Off-peak period wizard icon () to summon the wizard, which will

help you to construct the correct period definition. Click **Help** to get more information on period format definition. If you do not differentiate between peak and off-peak rates, just leave this field blank.

- 0 **Off-Peak Description** – a description of the off-peak period, automatically filled in by the off-peak period wizard. You do not have to fill in this field.
- 0 **Destination group set** – if you wish to enter rates in the tariff not for every individual prefix, but for a whole group of prefixes at once, you should create a destination group set and destination groups beforehand. Leave this select menu empty for now.
- 0 **Free seconds** – the number of free seconds granted for each call. In order to claim free seconds, the length of the call must be at least one billing unit (first interval; see the ‘Enter Rates’ section above)
- 0 **Post Call Surcharge** – percentage of the amount charged for the call
- 0 **Login Fee** – amount to be charged immediately after the first user authentication (i.e. after user enters his PIN)
- 0 **Connect Fee** – amount to be charged for each connected call (calls with a non-zero duration)
- 0 **Short Description** – a short tariff description. This will be shown in the rate lookup on the admin interface and the self-care pages for your accounts and customers. For example, you can have a tariff named **cust-ABC-Easy Call-1800**, and the short description will provide better information for your wholesale customer ABC, who will be using this tariff, such as: **EasyCall – via a toll-free number**. This field is mandatory; if unsure what to enter here, just use the same value as for the name of the tariff.
- 0 **Description** – extended tariff description

4. Click **Save**



The screenshot shows the 'Tariff Management' interface. At the top, there's a navigation bar with icons for home, checkmark, calendar, dollar sign, information, and a graph. The title 'Tariff Management' is in the center, with 'America/Vancouver' on the right. Below the navigation bar, there are buttons for 'Add', 'Close', 'Logout', and 'Log'. A search bar is also present. Below the search bar, there's a table with columns: Name, Currency, Type, Description, Rates, and Delete. The table contains two rows: 'Prepaid cards' and 'Wholesale rates'. The 'Wholesale rates' row is highlighted in green. A red dashed arrow points from the 'Add' button to the 'Wholesale rates' row.

Name	Currency	Type	Description	Rates	Delete
Prepaid cards	USD	Managed by None	What we charge prepaid card users for outgoing calls		
Wholesale rates	USD	Managed by None	What we charge our resellers		

Add Tariff America/Vancouver demoroot Help

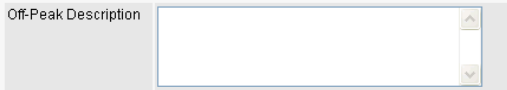
Save **Save & Close** **Close** **Logout** **Log**

Name Termination services * **Currency** USD - US Dollar

Type Managed by None

General Info

Off-Peak Period 

Off-Peak Description 

Destination Group Set 

Free seconds 0

Post Call Surcharge 0 %

Login Fee 0

Connect Fee 0

Short Description Termination services *

Description What we charge our customers for calls they terminate on our network

Add Tariff America/Vancouver demoroot Help

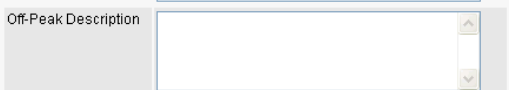
Save **Save & Close** **Close** **Download** **Upload** **Rates** **Logout** **Log**

Name Termination services * **Currency** USD

Managed by None

General Info **Web Upload & Download** **Email Upload** **Notepad**

Off-Peak Period 

Off-Peak Description 

Destination Group Set 

Free seconds 0

Post Call Surcharge 0.00000 %

Login Fee 0.00000 USD

Connect Fee 0.00000 USD

Short Description Termination services *

Description What we charge our customers for calls they terminate on our network

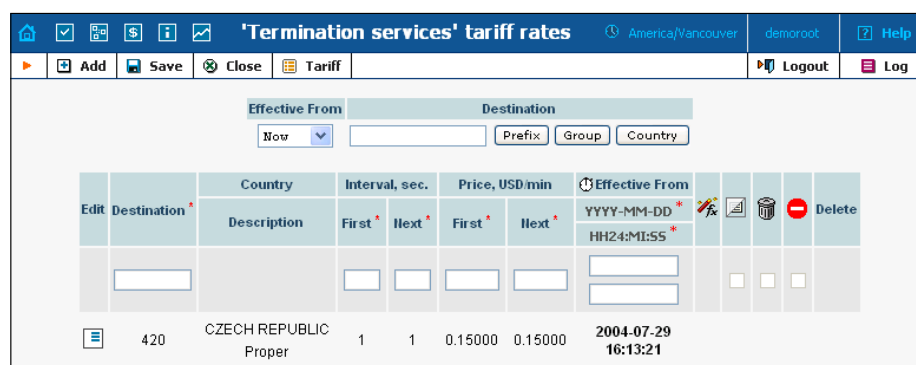
'Termination services' tariff rates America/Vancouver demoroot Help

Add **Save** **Close** **Tariff** **Logout** **Log**

Effective From **Destination**

Now   **Prefix** **Group** **Country**

Destination *	Country	Interval, sec.		Price, USD/min		Effective From	Delete
		First *	Next *	First *	Next *		
420	CZECH REPUBLIC Proper	1	1	0.15	0.15	immediately	   



Effective From	Destination	Country	Interval, sec.	Price, USD min	Effective From
Now	Prefix	Group	Country		
First	Next	First	Next	First	Next
YYYY-MM-DD	HH24:MI:SS				
420	CZECH REPUBLIC	1	1	0.15000	0.15000
	Proper				
					2004-07-29 16:13:21

Enter Rates

Rates are per-destination prices. Please refer to the **System Concepts** chapter for more details on the billing parameters.

Managing rates online

Managing rates online is very convenient for maintenance of existing rate tables and for reference purposes. For new price lists or for major updates, the offline method is better.

- When you are on the Tariff management page and you see the list of the available tariffs, click the  **Rates** icon next to the name of the tariff. When you are in the Tariff management for a particular tariff – then click on the  **Rates** in the toolbar.
- When in the **Edit Rates** screen click  **Add**
- Fill in required information:
 - Destination** – destination prefix, may be entered directly, e.g. 47 for Norway, or you can access destinations directory by clicking the **Destination** link (in the column header). In the destinations directory you can find the desired prefix by country name.

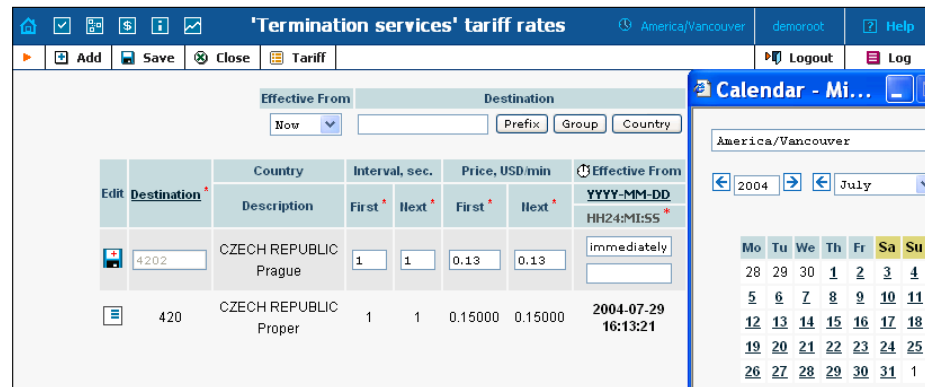
NOTE: The phone prefix you are trying to create a rate for has to exist already in the Destinations.

- Interval First** – first billing unit in seconds
- Interval Next** – next billing unit in seconds
- Price First** – per minute price for first interval
- Price Next** – per minute price for next interval
- Off-peak Interval First** – first billing unit in seconds for off-peak time
- Off-peak Interval Next** – next billing unit in seconds for off-peak time
- Off-peak Price First** – per minute price for first interval for off-peak time
- Off-peak Price Next** – per minute price for next interval for off-peak time

NOTE: Off-peak fields appear only if **off-peak period** has been defined for tariff.

- o **Formula**  – launches the wizard for creating a custom rating formula
- o **Effective from** – if you want this rate to take effect sometime in the future, you can either type a date manually or use a calendar (click on the DD-MM-YYYY link). Click on the  Stop Watch icon to make the rate effective **immediately**.

NOTE: When using the calendar, you can specify that the date you entering is in the different time zone than your current one. PortaBilling will automatically adjust the time then.



Edit	Destination	Country	Description	Interval, sec.		Price, USD/min		Effective From
				First	Next	First	Next	YYYY-MM-DD HH24:MI:SS
	4202	CZECH REPUBLIC	Prague	1	1	0.13	0.13	immediately
	420	CZECH REPUBLIC	Proper	1	1	0.15000	0.15000	2004-07-29 16:13:21

- o **Hidden, Forbidden or Discontinued** flags are optional
4. Click  **Save** button in the toolbar, or  icon on the left side of the row
 5. Repeat if you need more rates to be entered

Managing rates offline

NOTE: There are **Templates** available in the PortaBilling - powerful tool for uploading rates from the custom format data files. However for this particular example we would assume that you prepare data in the default format of PortaBilling.

The rates table may be prepared with spreadsheet processor (i.e. Microsoft Excel) and imported into PortaBilling easily. This is very convenient if you are going to make many changes. For example, you might increase all the prices by 10%.

1. If you are not on the Tariff Management for your tariff, go to the main menu, click on the **Tariffs**, and then click on the tariff name
2. In the Edit Tariff window move mouse over the **Download** button and hold it there until popup menu will appear. Choose **Now** menu item and click on it. This will download the current set of rates (empty), but will also provide you with an overview of the file structure.
3. You will see **File download** dialog and will be prompted if you would like to save the file or open it from the current location. We

recommend you to save file into some folder you will be using in future for storing tariff data files, and then open it in the Excel.

4. You should see something similar to the screenshot below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Name	Currency	Description											
2	(An) Termi	USD	What we charge our customers for their calls we terminate											
3	Off-peak P	Free Seconds	Post Call \$	Login Fee	Connect Fee									
4	0	0	0	0	0									
5	Destination Country	Description	Interval 1	Interval N	Price 1	Price N	Off-peak In	Off-peak In	Off-peak P	Off-peak P	Forbidden	Hidden	Discontin	Effective From
6	420 CZECH REPUBLIC	Proper	1	1	0.05	0.05	1	1	0.05	0.05				12-12-03 03:33

5. Edit the file by adding more rows with the rate data, so it looks similar to the screenshot below.
6. Note that columns **Country** and **Description** are only for reference purposes and are ignored during the import. Also, when using the default template you have to fill out the data in the Offpeak columns even if your tariff does not have an off-peak period (use the clipboard to easy copy the values of 4 peak columns).
7. Also note that you may use only those phone prefixes which you already have defined as destinations (see **Create destinations** step above)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Name	Currency	Description											
2	(An) Termi	USD	What we charge our customers for their calls we terminate											
3	Off-peak P	Free Seco	Post Call \$	Login Fee	Connect Fee									
4	0	0	0	0	0									
5	Destination Country	Description	Interval 1	Interval N	Price 1	Price N	Off-peak In	Off-peak In	Off-peak P	Off-peak P	Forbidden	Hidden	Discontin	Effective Fr
6	420 CZECH REPUBLIC	Proper	1	1	0.05	0.05	1	1	0.05	0.05				12-12-03 03:33
7	420602	Mobile	1	1	0.09	0.09	1	1	0.09	0.09				12-12-03 03:33

8. Save the file in Excel. You will probably get a warning from the Excel that your file “*may contain features that are not compatible with CSV (Comma delimited)*”. Ignore this, and choose **Yes** to keep the CSV format.
9. Close the file in Excel. If you performed step 6, then disregard message “*Do you want to save the changes you made*”, because it is only caused by the fact your format is not in the native Excel XLS format.
10. Go back to the PortaBilling web interface, to the **Edit Tariff** screen.
11. Click on the **Upload** button.
12. Either enter the name of your file manually, or click **Browse ...** and choose the file.
13. Click  **Save&Close**. You should return to the **Edit Tariff** screen, and a message will tell you the status of the import. Also you will receive an email confirmation about the tariff upload. If any operation

has failed you will receive the portion of data which was not uploaded as an attachment so you can try to import them later.
You can verify your work using the **Edit Rates** feature. After you have done so, go to the **Main menu** (by clicking on the **Home** icon).

Create all required tariffs

Repeat the *Create Tariff* and *Enter Rates* steps, until you have created:

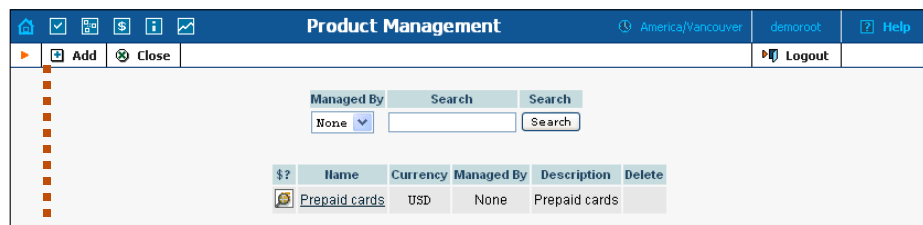
- A tariff for each account billing scheme. For the wholesale termination business model, you will usually need one tariff per customer, which will be used to charge all of the customer's accounts.
- A tariff with the termination costs for each of your termination partners.
- If you have resellers, you must also create the tariffs that you will use for charging each of them. Do not create the tariffs, which will be applied to subscribers of your resellers yet. First create the customers, then return to this step. Make sure that, when creating these subscriber tariffs, you choose "Managed by NNN" in the **Type** menu, where NNN is the name of the corresponding reseller.

Create Product

Each of the remote customer gateways will be represented as an account and will be billed accordingly. Hence, we need to create a product which this account will have, so it will have a defined way to bill the account. If you have per-customer specific rates/tariffs then you will need a product for each customer.

1. In the Management section of the Admin-Index page choose **Products**
2. On the Product management page click  **Add** icon
3. Fill in the "Add product" form:
 - o **Product name** – the product object name
 - o **Currency** – Product currency. Only tariffs which have the same currency will be permitted in the accessibility list
 - o **Managed by** - if you plan for this product to be used for your reseller's accounts, so that the reseller himself can change the parameters of this tariff and create new accounts with this product, choose the customer's name from the menu. Otherwise choose **None** here.
 - o **Breakage** – Balance left over which is considered "useless" (for statistical purposes). Accounts with a balance below the breakage will be counted as *depleted*. This does not affect account authentication or authorization, so the account can still make calls if there is enough money left to cover at least the first interval.

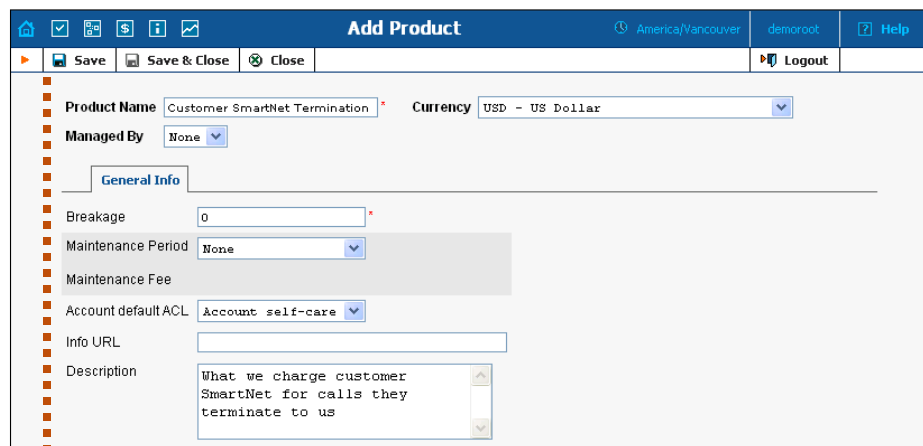
- 0 **Maintenance period** – surcharge application interval; will be reflected in call history as separate line each time when charged. Charged at the end of a specified period.
 - 0 **Maintenance fee** – surcharge amount
 - 0 **Account default ACL** – the access level assigned by default to new accounts created with this product. The ACL determines which operations may be performed by accounts on the self-care pages. The default value is “Account self-care” (pre-defined ACL), which allows all possible operations.
 - 0 **Description** – your description of the intended use of this product.
4. Click  **Save**
- Click on the **Accessibility** tab to edit this product’s accessibility



Product Management

Managed By: None Search Search

Icon	Name	Currency	Managed By	Description	Delete
	Prepaid cards	USD	None	Prepaid cards	



Add Product

Product Name: Customer SmartNet Termination * Currency: USD - US Dollar

Managed By: None

General Info

Breakage: 0 *

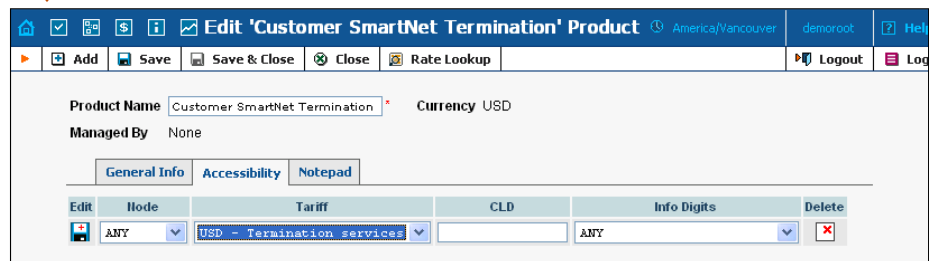
Maintenance Period: None

Maintenance Fee:

Account default ACL: Account self-care

Info URL:

Description: What we charge customer SmartNet for calls they terminate to us



Edit 'Customer SmartNet Termination' Product

Product Name: Customer SmartNet Termination * Currency: USD

Managed By: None

General Info Accessibility Notepad

Edit	Node	Tariff	CLD	Info Digits	Delete
	ANY	USD - Termination services		ANY	

Enter Node and Tariff into accessibility list of the product

For the incoming VoIP traffic normally we do not really need different accessibility entries, only one row with **ANY** node and a tariff should be enough. However, if, for example, for some customer you want to let him send traffic to your gateway A but not gateway B – this can be achieved by using the accessibility entries.

1. When Accessibility tab is selected, click on the  **Add** icon
2. Choose **ANY** as a node, choose tariff with which you want to bill your customer, and leave the CLD field empty.
3. Click **Save** to save this accessibility entry.

Create Vendors

This step is only required if you have not entered information about your vendors into the system before. Vendors are your termination partners or providers of the incoming toll-free lines.

1. In the Management section of the admin interface choose **Vendors**.
2. On the Vendor Management page choose  **Add**.
3. Fill in the **New Vendor** form. Please note that there are two tabs available on the screen. The most important fields are:

Main form (top)

- o **Vendor Name** – short name for the Vendor object, will be used on the web interface
- o **Currency** – in which currency this customer will be billed.
- o **Opening balance** – starting balance for the customer, default is zero

Additional info

- o **Billing period** – split period for vendor statistics.

User-Interface

- o **Time zone** – the time zone which the vendor uses for his billing period. Statistics will be divided by periods according to this time zone.
4. Click  **Save&Close**.
 5. Repeat steps 2-4 to add all of your vendors

Vendor Management America/Vancouver demoroot Help

Add Close Logout

Search Search

CDRs	Name	Connections	Currency	Balance	E-mail	Delete
	X-Telecom		USD	43.37330	yoip@x-telecom.com	

Add Vendor America/Vancouver demoroot Help

Save Save & Close Close Logout

Vendor Name Currency Opening Balance

Address Info Additional Info User Interface

Company Name Contact

Mr./Ms./... Phone

First Name M.I. Fax

Last Name Alt Phone

Address Alt Contact

Province/State E-mail

Postal Code BCC

City Summary Only ☐

Country/Region Description

Add Vendor America/Vancouver demoroot Help

Save Save & Close Close Logout

Vendor Name Currency Opening Balance

Address Info Additional Info User Interface

Categorizing and Defaults

Billing Period

Add Vendor America/Vancouver demoroot Help

Save Save & Close Close Logout

Vendor Name Currency Opening Balance

Address Info Additional Info User Interface

Login Time Zone

Password Auto Web Interface Language

Access Level

Output Format

Date

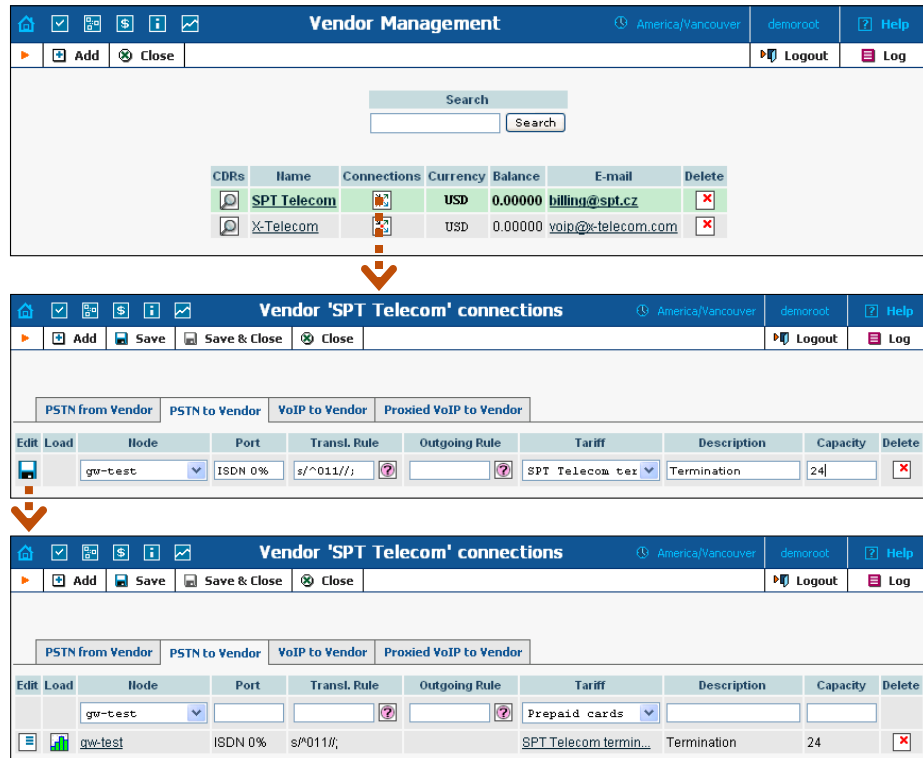
Time

Date & Time

Input Format

Date

Time



Vendor Management

Search

CDRs	Name	Connections	Currency	Balance	E-mail	Delete
	SPT Telecom		USD	0.00000	billing@spt.cz	
	X-Telecom		USD	0.00000	voip@x-telecom.com	

Vendor 'SPT Telecom' connections

PSTN from Vendor PSTN to Vendor VoIP to Vendor Proxied VoIP to Vendor

Edit	Load	Node	Port	Transl. Rule	Outgoing Rule	Tariff	Description	Capacity	Delete
		gw-test	ISDN 0%	s/^011//;		SPT Telecom ter	Termination	24	

Vendor 'SPT Telecom' connections

PSTN from Vendor PSTN to Vendor VoIP to Vendor Proxied VoIP to Vendor

Edit	Load	Node	Port	Transl. Rule	Outgoing Rule	Tariff	Description	Capacity	Delete
		gw-test				Prepaid cards			
		gw-test	ISDN 0%	s/^011//;		SPT Telecom termin...	Termination	24	

Define connections

This step is only required if you have not entered information about your vendors into the system before. Vendors are your termination partners or providers of the incoming toll-free lines.

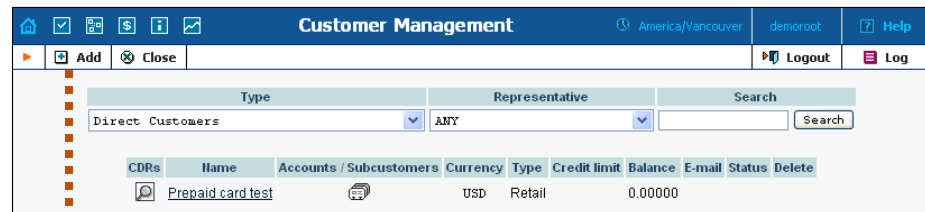
1. In the Management section of the admin interface choose **Vendors**.
2. Click on the **Connections** icon next to the vendor name.
3. Choose type of the connection **PSTN to Vendor**, **VoIP to Vendor**, etc., by clicking on the corresponding tab.
4. Press **Add** to add a new connection.
5. Fill in the connection information. If you send traffic to vendor via telephony, choose node and enter optional port pattern. If you send traffic via VoIP, enter the remote IP address. Choose tariff which defines your termination costs for this connection/vendor. For all connection types **Description** and **Capacity** are mandatory.
6. The **translation rule** is necessary if you send calls to the vendor in a format different from the one you use (e.g. the number 420296111222 is sent to the vendor as 004202111222), so that you can convert the phone number to the correct format. **Outgoing rule** is only present if PortaSIP is installed, and is used to convert the number into the vendor-specific format.
7. Click **Save**.

8. Repeat steps 3-5 to add more connections to the same vendor, then click **Close** to exit to the **Vendor Management** screen.
9. Repeat steps 2-7 to add connections for other vendors.

Create a Customer

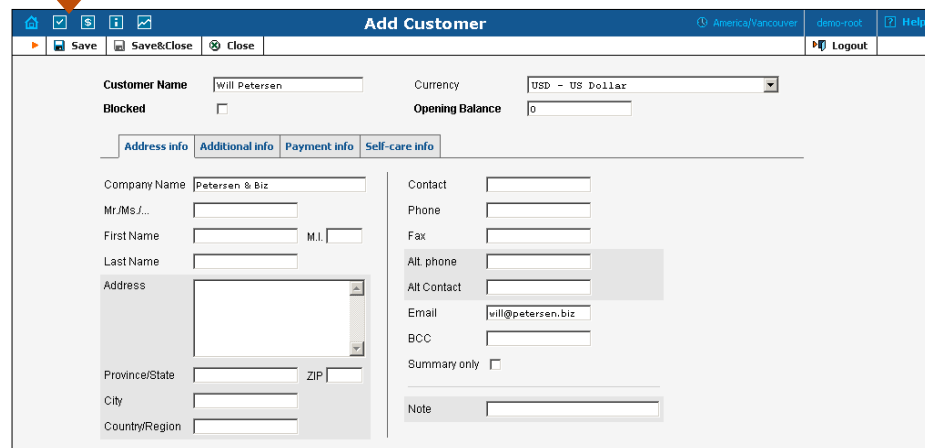
A Customer is an owner of Accounts. The Customer's contact information is used to distribute generated accounts data and account usage information.

In the Management section of the Main Menu choose **Customers**. On the Customer Management page choose  **Add**. Fill the New Customer form. Please note that there are several tabs available on the screen with the extra information. The most important fields are:



Type	Representative	Search
Direct Customers	ANY	

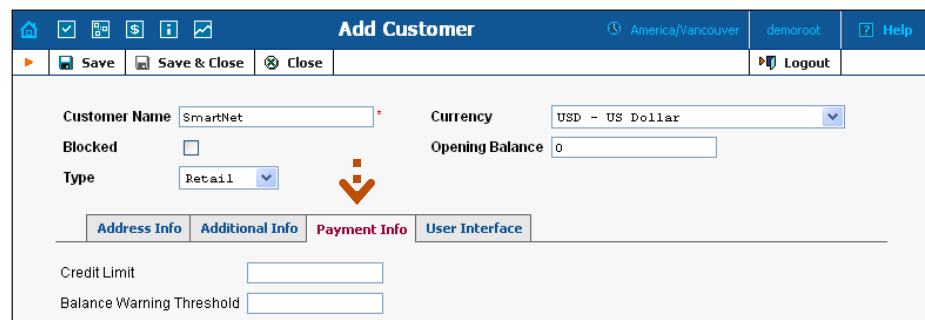
CDRs	Name	Accounts / Subcustomers	Currency	Type	Credit limit	Balance	E-mail	Status	Delete
	Prepaid card test		USD	Retail		0.00000			



Customer Name Will Petersen **Currency** USD - US Dollar
Blocked ☐ **Opening Balance** 0

Address info **Additional info** **Payment info** **Self-care info**

Company Name Petersen & Biz **Contact**
Mr./Ms./... **Phone**
First Name **M.I.** **Fax**
Last Name **Alt phone**
Address **Alt Contact**
Province/State **ZIP** **Email** will@petersen.biz
City **BCC**
Country/Region **Summary only** ☐
Note

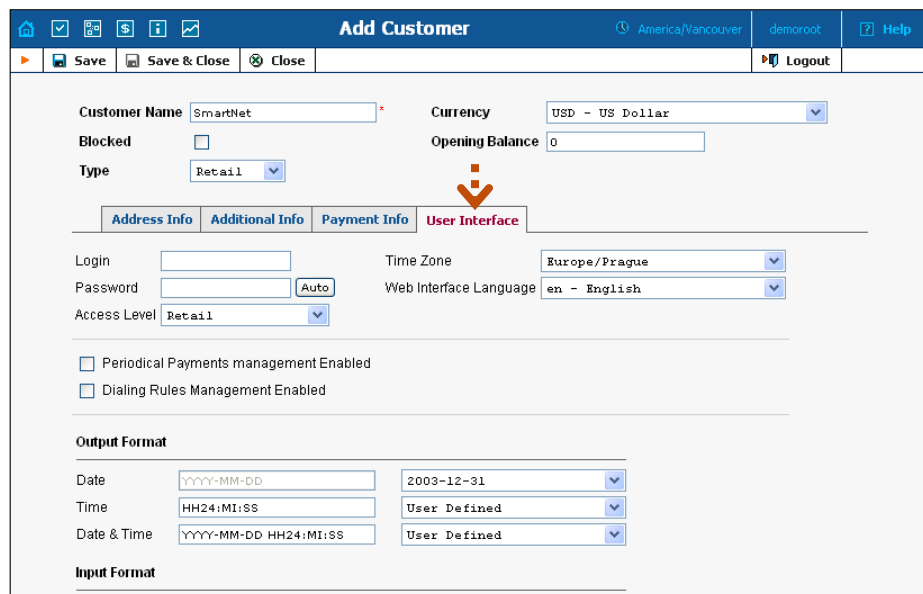
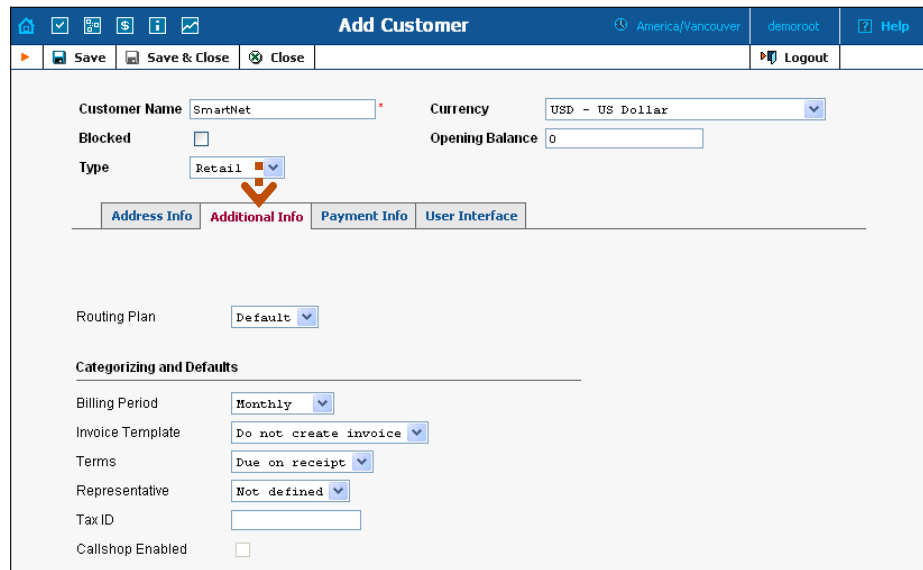


Customer Name SmartNet **Currency** USD - US Dollar
Blocked ☐ **Opening Balance** 0

Type Retail

Address Info **Additional Info** **Payment Info** **User Interface**

Credit Limit
Balance Warning Threshold



Main form (top)

- o **Name** – a short name for the Customer object, will be used on the web interface
- o **Currency** – in which currency this customer will be billed.
- o **Opening balance** – the starting balance for the customer; default is zero
- o **Type** – is it a reseller or retail (direct) customer? (Normally, most of your customers would be retail customers. Only if a customer is reselling your services, and you are providing services and billing to his subscribers, would he be created as a reseller).

Address info tab

- o **Email** – email address for distribution of accounting information. After the billing period is over, a list of CDRs and other statistics will be sent to this address
- o **Bcc** – blind carbon copy in email; may be used for debug and archiving purposes
- o **Summary only** – distribute summary only, do not attach details file; might be useful when amount of calls is very large.

Additional info tab

- o **Billing period** – frequency of accounting information distribution. Available billing periods:
 - **Daily** – one day, midnight to midnight, sent on the next day
 - **Weekly** – [Mon-Sun] inclusive – sent on Monday
 - **Bi-weekly** – [1-15] inclusive – sent on the 16th day of the month and [16-last day] inclusive - sent on the 1st of the following month
 - **Monthly** – [1-last day] inclusive – sent the 1st of the following month

Payment info tab

- o **Credit limit** – if left empty, then there is no credit limit for this customer
- o **Balance Warning Threshold** – customer can be notified by the email, when his balance is dangerously close to the credit limit, and his service will be blocked soon. Here you can enter the value for the warning threshold. It can be entered
 - In percents (e.g. 90%). Warning will be send when customer balance will exceed that percentage of his credit limit. So if credit limit is 1000.00 and threshold is 90%, warning will be sent as soon as the balance is over 900.00. Only applicable when customer has positive credit limit.
 - As absolute value. Warning will be sent as soon as the balance is over the specified value.

User Interface

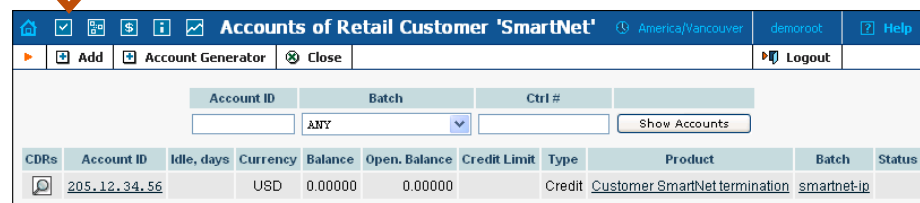
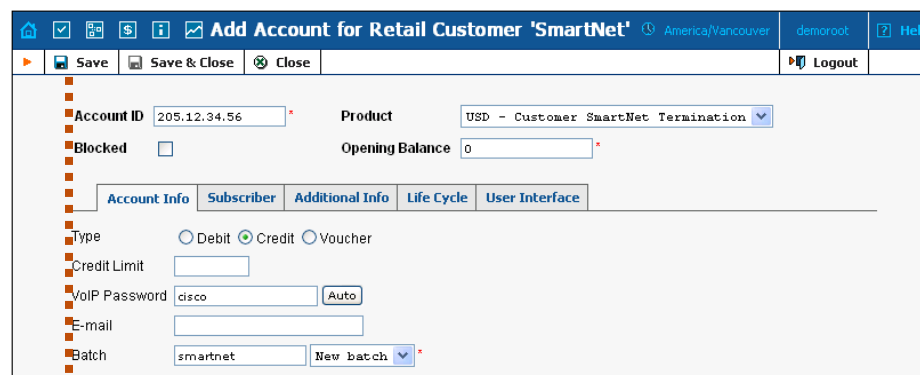
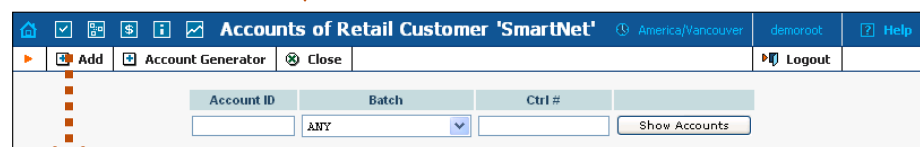
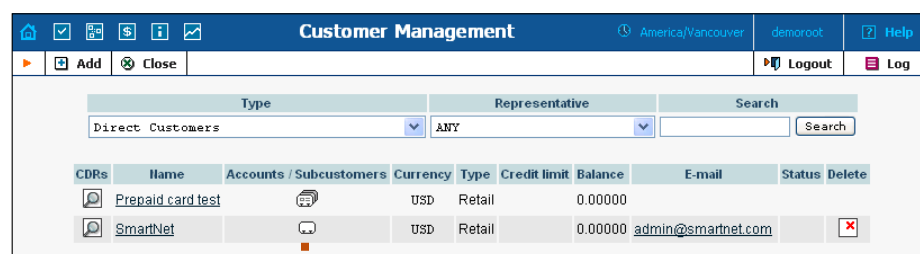
- **Time zone** – this parameter serves two purposes. First of all, it defines in which time zone customer will see his CDRs. It also defines which time zone will be used to separate the customer's billing periods. For example, if you choose America/New York with a monthly billing period here, the customer's invoice will cover the period starting at 00:00 EST on the 1st of every month.
- **Web Interface Language** – the language to be used on the customer self-care web interface.

Click  **Save&Close** to save your work. See [PortaBilling Administrator Interface](#) for more information.

Create Accounts

NOTE: before generating accounts for a production system, read section “Provisioning of prepaid accounts”.

1. If you are not yet in the **Customers** screen (the one which contains a list of customers) – enter there. It should look like the screenshot below.
2. Next to the customer name click on the  icon (the one in the **Accounts** column), it will take you to the account management for that customer.



3. After you are in the account management form, click on the  **Add**
4. Fill out the “Add account” form:

- **Account ID** – Identification of the account (value which will be sent in the **User-Name** attribute). For the account which represents remote gateway it is normally an IP address.
- **Product** – choose the product which you would like your accounts to use.
- **Blocked** – check this if you want to create this account as initially blocked.
- **Opening balance** – the initial balance on the card. For the credit accounts opening balance normally is a zero.

Account info tab:

- **Account type** – account type, select credit.
- **Credit limit** – Maximum allowed credit.
- **VoIP Password** – password for authentication/authorization. If you are using default Cisco remote_ip_authenticate script, put **cisco** here.
- **Batch** – batch is a management unit for accounts. Batch name is alphanumeric. You can type a new name here or use the existing name in order to generate more accounts for same batch

Additional Info tab:

- **Preferred language** – this is a custom attribute which is transferred to the IVR. Leave English here if you are not sure if your IVR supports it.
- **Redirect number** – redirect number (discussed in the **Advanced features** section), leave it empty.

Life Cycle tab:

- **Activation date** – account activation date.
- **Expiration date** – account expiration date.
- **Life time** – relative expiration date, account will expire on “first usage date” + “life time” days. If you do not want to use this feature, leave the field blank

User Interface tab:

- **Login** – login name this account will use to access the self-care page. This can be the same as the account ID, or choose something different for increased security. This field is mandatory.
- **Password** – Password for self-care pages.
- **Time zone** – when an account owner accesses the web self-care pages to view the list of his calls, the time can be shown in the time zone most appropriate for him.
- **Web Interface Language** – the language to be used on the customer self-care web interface.

5. Click  **Save&Close**, you'll get confirmation popup saying that the account has been created.
6. Repeat steps 3-5 if customer has more than one remote gateway.

5. Statistics and Monitoring Tools

Billing servers health monitoring

Entire system load

These statistics are accessible from the main admin menu via **System load** link in the **Statistics** section.

This graph shows number of calls registered by a production system every 15 minutes. Normal calls with duration > 0 (green areas) and calls with zero duration (red line). The most recent information appearing on the right-hand of the graphs is up to an hour old.

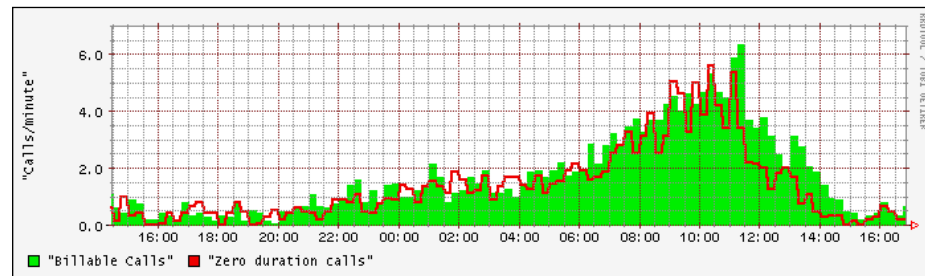


Figure 5-1

Number of calls

If the disconnect time on the CDR does not lie within the past 15 minutes, the call may not be finished and will not be reflected in the graph. (See picture below, call types 3 and 4.)

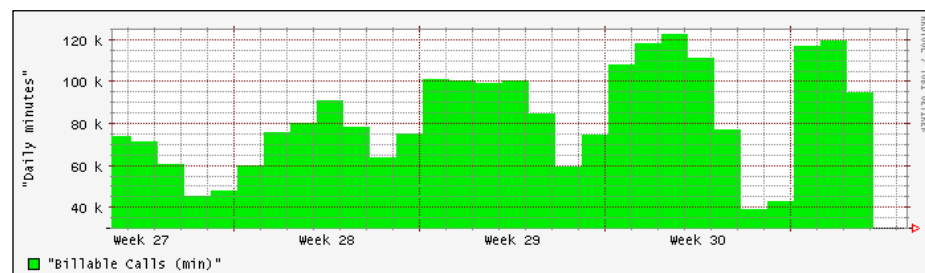
Zero duration calls

The graph can also display possible problems in our system, such as unexpectedly high number of failed calls.

By default this graph displays statistics for the last 30 hours

Total minutes statistics

The graph below gives you the ability to monitor how the call volume in your system changes each day.



Master and slave MySQL servers statistics

These statistics are accessible from the main admin menu via **Database** link in the **Statistics** section.

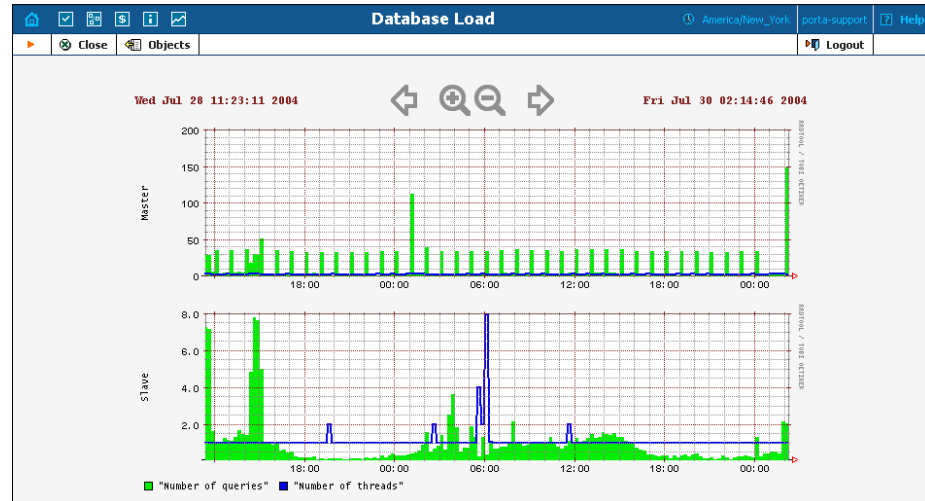


Figure 5-2

These two graphs show values from status of our MySQL servers. The green line indicates the number of queries processed by server every 15 minutes, blue indicates number of threads running on the server.

Queries.

The graph indicates how many times clients are querying the database. On recommended hardware the value can be more than 200 without any problems. High peaks with number of requests over 2000 can indicate wrong configuration of the system or temporary problems. Also these peaks can appear when replication was restored after a system fault.

Threads.

Normal values for these graphs are:

- for the Master server ≤ 2
- for the Slave server ≥ 1 and ≤ 3

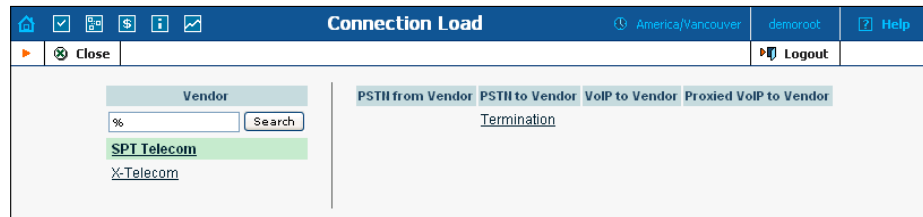
Normally these values depend on processes that run on the server, such as the Radius daemon, the Apache httpd server, statistics collection tools, etc.

Greater values can indicate other client connections to the server. If the number of threads on the slave name server is 0, it means the replication process is down and requires administrator attention (see 2.4 for details).

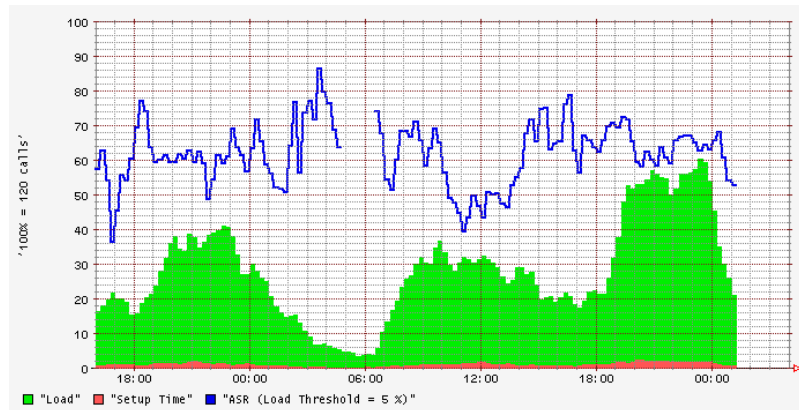
VoIP network performance statistics

Connection load

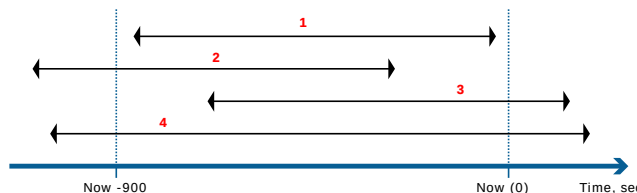
You can monitor load and quality parameters of the individual connections. To see list of the available connections, from the **Statistics** section in the main menu follow **Connections** link.



After you will pick a vendor and particular connection, you can see it's load graph



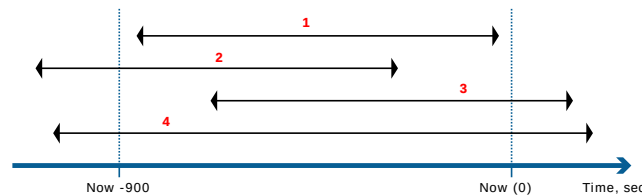
This graph shows the node load, setup time and ASR (Average Success Rate) statistics. The green area indicates node load, red shows relative setup time and the blue line indicates ASR. Information appears on this graph with a one hour delay.



Assumptions: calls with duration more then 3600 seconds are rare and don't affect our statistics very much; zero duration calls need an average duration of 10 seconds to be processed by the router.

Connection load calculations

For better understanding of the calculations performed, consider the following diagram:



The total duration must be calculated for all calls processed by the system fitting the interval between “now - 1 hour 15 minutes”, and “now - 1 hour”.

Four different call types are recognized in the above diagram; an additional call type is that of zero duration:

1. Sum of durations of all these calls.
2. Sum of durations between `t0` and `disconnect_time`.
3. Sum of durations between `connect_time` and `t1`.
4. Calculate sum as number of calls * 900 seconds.
5. Calculate sum as number of calls * 10 sec.

Maximum value of seconds which a connection can hold in the 900 sec. interval is calculated as $\text{capacity} * 900\text{sec}$. The load of the connection is calculated as the sum of durations for all call types divided by the Maximum value in seconds. The result will be shown as percentage value (multiplied by 100).

ASR calculations

Assumption: connection load less than 5% is not representative for ASR calculating.

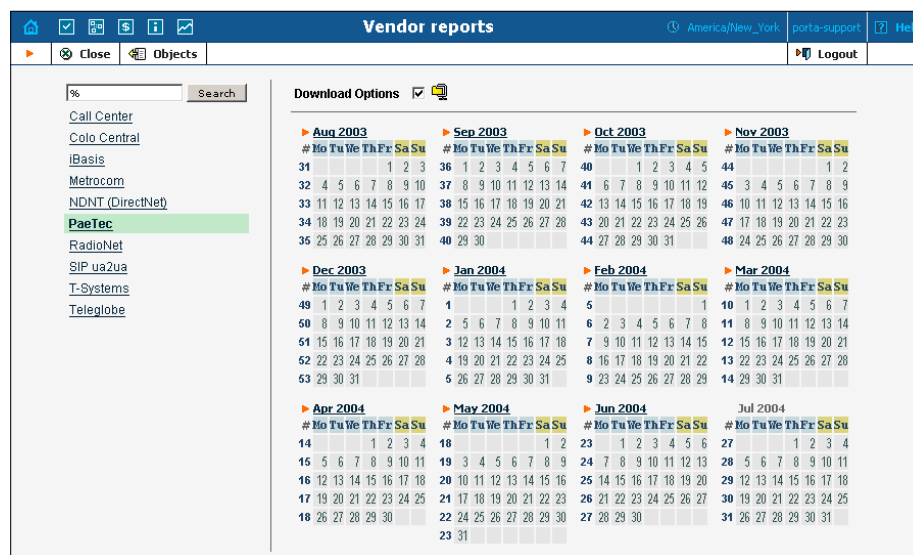
The ASR is calculated as the number of type 5 calls divided by the total number of calls. The result is shown as a percentage value (multiplied by 100).

Relative setup time calculations

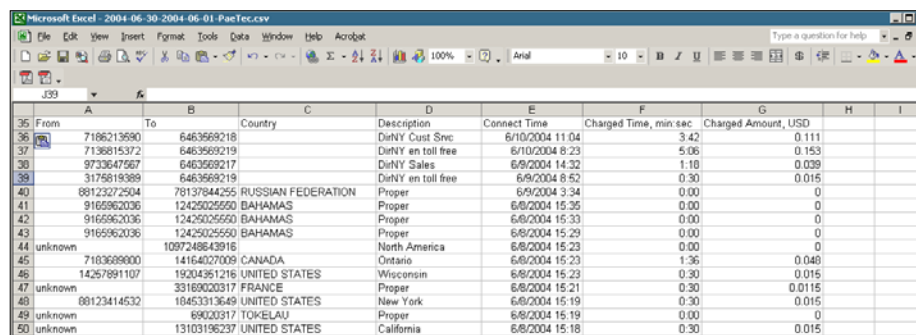
Relative setup time calculated as a ratio between total setup time of all calls during the period and maximum value of seconds ($\text{capacity} * 900\text{sec}$).

ASR statistics

From the **Statistics** section in the main menu follow **ASR** link.



You can download pre-calculated statistics in .CSV format (for previous days) or obtain data online using **Custom Query**. For pre-calculated statistics click on the vendor on the left side, and then choose statistics period in the calendar. Pre-calculated statistics will look similar to the example below



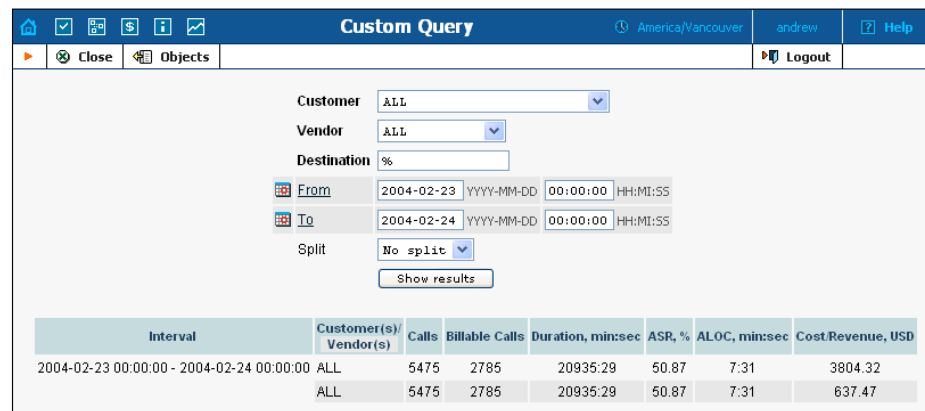
	From	To	Country	Description	Connect Time	Charged Time, min sec	Charged Amount, USD
35	7186213690	6463569218		DenNY Cust Svc	6/10/2004 11:04	3:42	0.111
36	7136815372	6463569219		DenNY en toll free	6/10/2004 8:23	5:06	0.153
37	9733647567	6463569217		DenNY Sales	6/9/2004 14:32	1:18	0.039
38	3175918389	6463569219		DenNY en toll free	6/9/2004 8:52	0:30	0.016
40	88123272504	78137844255	RUSSIAN FEDERATION	Proper	6/9/2004 3:34	0:00	0
41	9165962036	12425025550	BAHAMAS	Proper	6/8/2004 15:35	0:00	0
42	9165962036	12425025550	BAHAMAS	Proper	6/8/2004 15:33	0:00	0
43	9165962036	12425025550	BAHAMAS	Proper	6/8/2004 15:29	0:00	0
44	unknown	1097248643916		North America	6/8/2004 15:23	0:00	0
45	7103698900	14164027009	CANADA	Ontario	6/8/2004 15:23	1:36	0.048
46	14267891107	19204361216	UNITED STATES	Wisconsin	6/8/2004 15:23	0:30	0.015
47	unknown	33189020317	FRANCE	Proper	6/8/2004 15:21	0:30	0.015
48	88123414532	10453313649	UNITED STATES	New York	6/8/2004 15:19	0:30	0.015
49	unknown	69020317	TOKELAU	Proper	6/8/2004 15:19	0:00	0
50	unknown	13103196237	UNITED STATES	California	6/8/2004 15:18	0:30	0.015

The following data is available:

- Total number of calls
- Number of calls with non-zero duration (Billable calls)
- ASR
- Total calls duration
- Average Length of Call (ALOC)

Numbers are aggregated per destination prefix, with sub-total per country and total for all calls.

In case if you need statistics for today, or report with some other parameters (for example split by hour, so you see how did the ASR evolve during the day) – you can use **Custom query** report. It extracts data directly from the database, so use with caution in order to do not overload the server.



Interval	Customer(s)/Vendor(s)	Calls	Billable Calls	Duration, min:sec	ASR, %	ALOC, min:sec	Cost/Revenue, USD
2004-02-23 00:00:00 - 2004-02-24 00:00:00	ALL	5475	2785	20935:29	50.87	7:31	3804.32
	ALL	5475	2785	20935:29	50.87	7:31	637.47

Note that on the **Custom Query** report both ASR and Cost/Revenue parameters are shown.

Billing statistics

Customers CDRs

List of all customers' CDR are calculated daily, and are split into files according to the customer's billing period. These pre-calculated statistics could be automatically mailed to customer. Also they are available for download by customer on the customer self-care pages and for your staff on admin interface.

Different types of CDR files are available, depending on the type of customer:

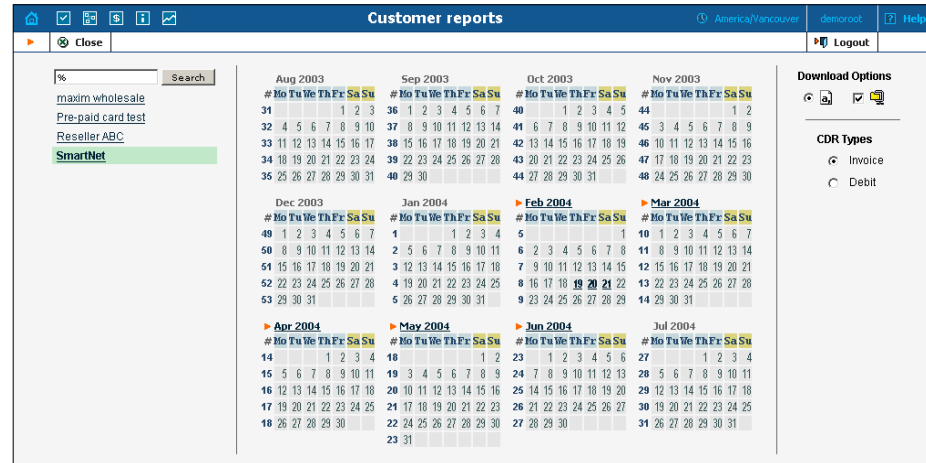
CDR files for retail customers

- **Invoice** – calls made by the credit accounts of this customer. These calls will be included on the customer's invoice for the corresponding billing period.
- **Debit** – calls made by the debit accounts of this customer. Since debit accounts are prepaid, calls made by them do not affect the customer's balance or invoice. Therefore, they are included in a separate file, so that the customer can easily monitor activities on his debit accounts.

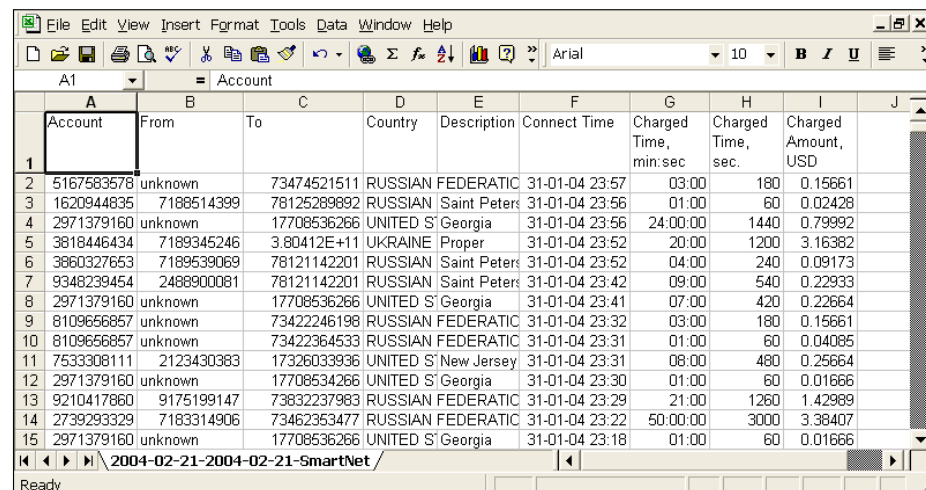
CDR files for resellers

- **Wholesale** – CDRs calculated using the reseller's wholesale tariff. These are the charges applied to the reseller and reflected on the his invoice.
- **Retail** – calls made by an account of this customer and charged using the account's tariff. This allows a wholesale customer to monitor the charges applied to his accounts.

NOTE: Since now there are sub-customers under the reseller, with statistics for each of them calculated individually, this type of statistics is now obsolete. This item has been left here only for backward compatibility, so that you can download statistics for the previous billing periods.



Choose customer and then click on the calendar to choose statistics for desired period. CSV file will have structure as shown below:



A	B	C	D	E	F	G	H	I	J
Account	From	To	Country	Description	Connect Time	Charged Time, min:sec	Charged Time, sec	Charged Amount, USD	
5167583578	unknown	73474521511	RUSSIAN FEDERATIC		31-01-04 23:57	03:00	180	0.15661	
1620944835	7188514399	78125289892	RUSSIAN	Saint Peters	31-01-04 23:56	01:00	60	0.02428	
2971379160	unknown	17708536266	UNITED S' Georgia		31-01-04 23:56	24:00:00	1440	0.79992	
3818446434	7189345246	3.80412E+11	UKRAINE	Proper	31-01-04 23:52	20:00	1200	3.16382	
3860327653	7189539069	78121142201	RUSSIAN	Saint Peters	31-01-04 23:52	04:00	240	0.09173	
9348239454	2488900081	78121142201	RUSSIAN	Saint Peters	31-01-04 23:42	09:00	540	0.22933	
2971379160	unknown	17708536266	UNITED S' Georgia		31-01-04 23:41	07:00	420	0.22664	
8109656857	unknown	73422246198	RUSSIAN FEDERATIC		31-01-04 23:32	03:00	180	0.15661	
8109656857	unknown	73422364533	RUSSIAN FEDERATIC		31-01-04 23:31	01:00	60	0.04085	
7533308111	2123430383	17326033936	UNITED S' New Jersey		31-01-04 23:31	08:00	480	0.25664	
2971379160	unknown	17708534266	UNITED S' Georgia		31-01-04 23:30	01:00	60	0.01666	
9210417860	9175199147	73832237983	RUSSIAN FEDERATIC		31-01-04 23:29	21:00	1260	1.42989	
2739293329	7183314906	73462353477	RUSSIAN FEDERATIC		31-01-04 23:22	50:00:00	3000	3.38407	
2971379160	unknown	17708536266	UNITED S' Georgia		31-01-04 23:18	01:00	60	0.01666	

The following data is available:

- Account ID (if applicable; not available for a wholesale customer's CDRs, but available for his account's CDRs)
- CLI or ANI (From)
- CLD or DNIS (To)
- Country and description of the destination
- Call start time
- Charged time (in minutes:seconds)

NOTE: When browsing data in Microsoft Excel, extra trailing zeros might be added, for example **345:37** (three hundred forty-five minutes and thirty-seven seconds) will

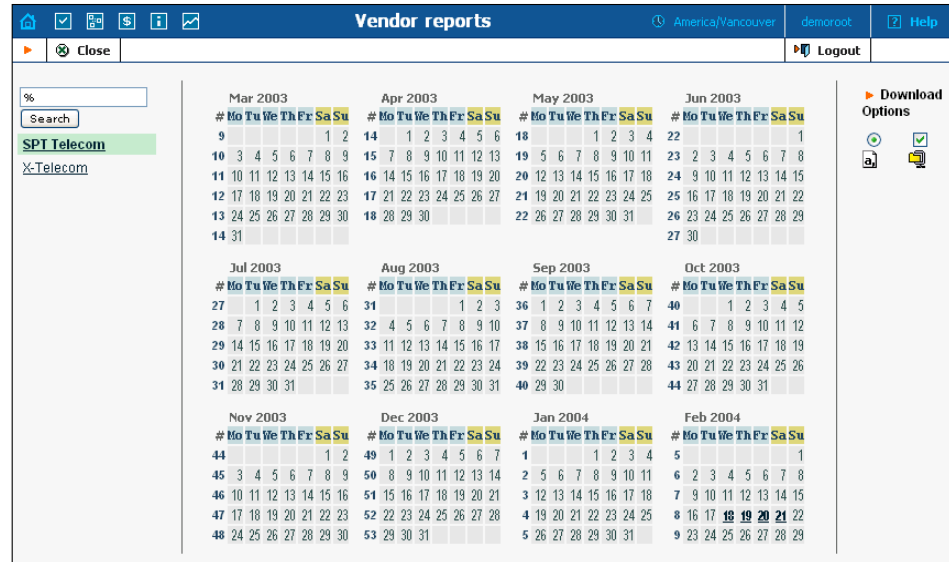
be shown as **345:37:00**. Use proper call formatting in Excel to eliminate this problem.

- Charged time (in seconds)
- Charged amount

NOTE: Call duration shown in the file is based on the charged duration for the call and not the actual call duration. So, for instance, if you bill by 6 seconds intervals, total call duration here will be higher than the actual duration of the calls.

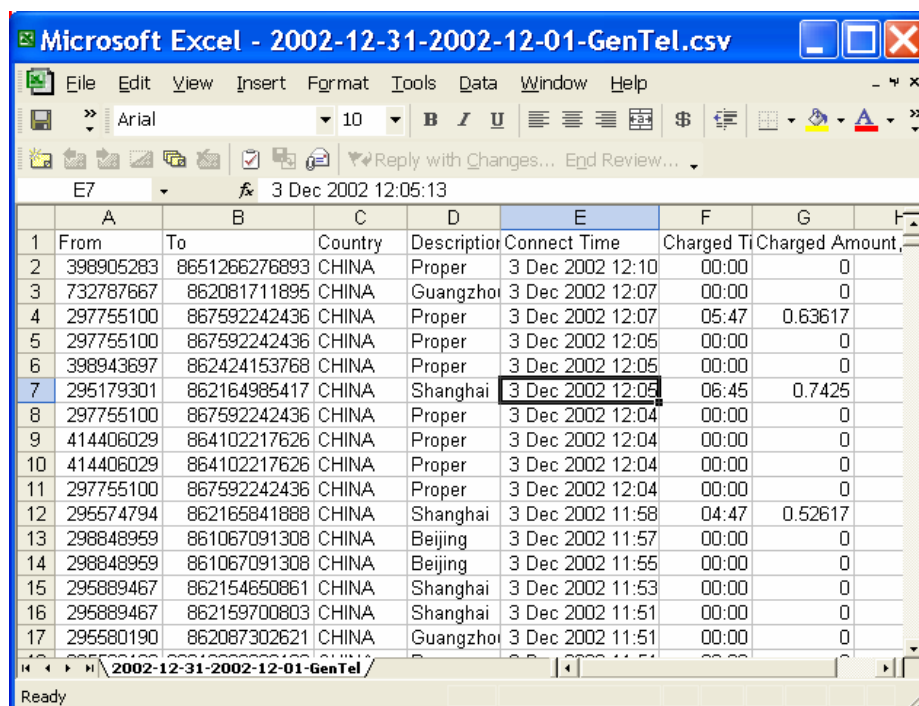
Vendor CDRs

It is very useful to have detailed list of call for specific vendor in case of dispute over amount of terminated traffic. These statistics are calculated daily, and are split into files according to the vendor's billing period.



The screenshot displays the 'Vendor reports' interface. At the top, there's a navigation bar with icons for home, check, print, currency, and help, along with the title 'Vendor reports' and user information 'America/Vancouver', 'demoroot', and a 'Help' link. Below the navigation bar, there's a 'Close' button and a 'Logout' button. The main area features a search bar with a '%' symbol and a 'Search' button. Below the search bar, there are two vendor names: 'SPT Telecom' (highlighted in green) and 'X-Telecom'. To the right of the search bar, there's a 'Download Options' section with a 'Download' button and a 'Help' icon. The central part of the interface shows a grid of 12 monthly calendars for the year 2003, from March to February 2004. Each calendar has a header with the month and year, and a grid of days. The days are color-coded: blue for Monday, Tuesday, Wednesday, Thursday, and Friday; yellow for Saturday and Sunday. The numbers 1 through 31 are placed in the corresponding cells. The 'SPT Telecom' vendor is selected, and the 'Download' button is visible.

Choose vendor and then click on the calendar to download statistics for desired period. CSV file will have structure as shown below:



Microsoft Excel - 2002-12-31-2002-12-01-GenTel.csv

File Edit View Insert Format Tools Data Window Help

3 Dec 2002 12:05:13

	A	B	C	D	E	F	G
	From	To	Country	Description	Connect Time	Charged Time	Charged Amount
1	398905283	8651266276893	CHINA	Proper	3 Dec 2002 12:10	00:00	0
2	732787667	862081711895	CHINA	Guangzhou	3 Dec 2002 12:07	00:00	0
3	297755100	867592242436	CHINA	Proper	3 Dec 2002 12:07	05:47	0.63617
4	297755100	867592242436	CHINA	Proper	3 Dec 2002 12:05	00:00	0
5	398943697	862424153768	CHINA	Proper	3 Dec 2002 12:05	00:00	0
6	295179301	862164985417	CHINA	Shanghai	3 Dec 2002 12:05	06:45	0.7425
7	297755100	867592242436	CHINA	Proper	3 Dec 2002 12:04	00:00	0
8	414406029	864102217626	CHINA	Proper	3 Dec 2002 12:04	00:00	0
9	414406029	864102217626	CHINA	Proper	3 Dec 2002 12:04	00:00	0
10	297755100	867592242436	CHINA	Proper	3 Dec 2002 12:04	00:00	0
11	295574794	862165841888	CHINA	Shanghai	3 Dec 2002 11:58	04:47	0.52617
12	298848959	861067091308	CHINA	Beijing	3 Dec 2002 11:57	00:00	0
13	298848959	861067091308	CHINA	Beijing	3 Dec 2002 11:55	00:00	0
14	295889467	862154650861	CHINA	Shanghai	3 Dec 2002 11:53	00:00	0
15	295889467	862159700803	CHINA	Shanghai	3 Dec 2002 11:51	00:00	0
16	295580190	862087302621	CHINA	Guangzhou	3 Dec 2002 11:51	00:00	0

The following data is available:

- CLI or ANI (From)
- CLD or DNIS (To)
- Country and description of the destination
- Call start time
- Charged time
- Charged amount

Cost/Revenue statistics

These are essential tool for monitoring your business growth. Working with different partners, different currencies and different prices it is very easy to make a mistake and start carry out non-profitable calls.

Cost/Revenue reports allow you to monitor this and stay out of troubles. To access Cost/Revenue reports, follow **Cost/Revenue reports** link from the **Statistics** section of the main menu.

Cost/Revenue reports											
America/Vancouver demoroot Help											
Close Custom Query Logout											
Inbound by Country											
Inbound by Customer											
Outbound by Country											
Outbound by Vendor											
Inbound											
Download Options											

There are five variants of pre-calculated reports

- **Inbound by Country** – information is split by customer and destination and sorted by country.
- **Inbound by Customer** – information is split by customer and destination and sorted by customer.
- **Outbound by Country** – information is split by vendor and destination and sorted by country.
- **Outbound by Vendor** – information is split by vendor and destination and sorted by vendor.
- **Inbound** - information is split only by destination.

File Edit View Insert Format Tools Data Window Help											
A1 = Customer											
A	B	C	D	E	F	G	H	I	J	K	
Customer	Destination	Country	Description	Calls	Gross margin, USD	Rated, sec.	Rated, min.	Total Cost, USD	Total Revenue, USD		
SmartNet	3741	ARMENIA	Yerevan	7	0.80521	839	13.983333	1.19768	2.00289		
SUBTOTAL				7	0.80521	839	13.983333	1.19768	2.00289		
SmartNet	61	AUSTRALIA	Proper	7	1.27417	8027	133.78333	3.05561	4.32978		
SmartNet	61404	AUSTRALIA		1	0.43478	369	6.15	0.98769	1.42247		
SUBTOTAL				8	1.70895	8396	139.93333	4.0433	5.75225		
SmartNet	43	AUSTRIA	Proper	8	2.35228	12856	214.26667	3.20971	5.56199		
SUBTOTAL				8	2.35228	12856	214.26667	3.20971	5.56199		
SmartNet	994	AZERBAIJAN	Proper	6	1.51933	1305	21.75	3.66377	5.1831		
SmartNet	99450	AZERBAIJAN	Mobile	1	0.18463	130	2.1666667	0.40983	0.59446		
SUBTOTAL				7	1.70396	1435	23.916667	4.0736	5.77756		
Pre-paid can	375	BELARUS	Proper	2	106.21	2126	35.433333	5.58076	111.7908		
SmartNet	375	BELARUS	Proper	20	11.2362	5279	87.983333	14.06189	25.29809		
Pre-paid can	37517	BELARUS	Minsk	1	-0.18254	517	8.6166667	1.70489	1.52235		
SmartNet	37517	BELARUS	Minsk	1	0.261	178	2.9666667	0.58698	0.84798		

The following data is available:

- Name of customer/vendor
- Destination prefix
- Country and description of destination

- Total number of successful calls
- Gross margin – difference between total revenue and the cost for this destination
- Rated, sec. – sum of the time charged for all calls to this destination, in seconds
- Rated, min. – sum of the time charged for all calls to this destination, in minutes. This is the same value as in the previous column, only expressed in different units. So, for instance, if *Rated, sec* contains **180**, here **3.0** will be shown.
- Total Cost – summary of the amount charged for all the vendor's CDRs for this destination. If the vendor uses a currency different than your base one, this will be converted using the current exchange rate.
- Total Revenue – summary for the amount charged for all the customer's CDRs for this destination. If the customer uses a currency different than your base one, this will be converted using the current exchange rate. Note that, in the case of wholesale customers, we use the value of the customer's CDR, not the account's, since your revenue is what is invoiced to the wholesale customer.

In addition you can use **Custom Query** report, which is identical to the **Custom Query** report in the ASR statistics.

6. How to ...

Charge my calling card customers XX/min extra when they call toll-free line

This is very easy to accomplish using the PortaBilling **Accessibility** feature.

1. Create two tariffs – one with your normal rates (for example 0.13 dollar/min for calls to Czech Republic) and the other one with the “toll-free” rates, including your toll-free cost there (for example 0.17 dollar/min for calls to Czech Republic).

TIP: When calculating the price for the toll-free line it is not enough to add together your ordinary price and costs of 1 minute of the toll-free line. In order to make a 3 minutes call, customer will spend about 4 minutes on the line while listening to voice prompts, entering PIN / destination and waiting for an answer. Additionally, the situations where a customer will enter the incorrect PIN or is unable reach his party at all should be taken into account. So usually:

$\text{TollFree_Price} = \text{Ordinary_Price} + X * \text{Toll_FreeCost}$

where **X** is a ratio between the total duration of your incoming toll-free calls and the total duration of the outgoing calls.

2. Make sure your IVR script supports “PortaBilling Original CLD feature”
3. Create a product for your calling cards and put two entries into the Accessibility:
 - One with CLD equal to your toll-free number and “Toll-free tariff”
 - Another one with CLD equal to your local access number and “Ordinary tariff”

Authorize and bill my customers by the phone number they are calling from (ANI-based billing)

PortaBilling gives you great flexibility in choosing how you would like to authorize and bill your customers. For the ANI-based billing you just have to

1. Create a tariff (or tariffs) and a product.

Note: If you are providing both prepaid cards and ANI-based billing, take measures to prevent frauds (e.g., someone could dial to your IVR and enter their neighbor's home phone number as the PIN). When creating accessibility for the ANI-based billing product, separate it from the prepaid cards (by using a different access phone number, a different node or different PIN lengths for the prepaid cards).

2. On your gateway use the corresponding application to handle the call. You can use one of the Cisco default applications (clid_*) or create your own. The only important thing is that ANI (CLI) must be in the User-Name attribute in the AAA requests which go into the billing.

Cisco gateways usually have a number of ANI (CLI) authentication TCL scripts embedded into IOS. The application set may be slightly different on different platforms. The richest set available at the time of this writing is shown below.

```
Router#show call application voice summary
name          description
session       Basic app to do DID, or supply dialtone.
fax_hop_on    Script to talk to a fax redialer
clid_authen   Authenticate with (ani, dnis)
clid_authen_collect Authenticate with (ani, dnis), collect if that fails
clid_authen_npw Authenticate with (ani, NULL)
clid_authen_col_npw Authenticate with (ani, NULL), collect if that fails
clid_col_npw_3 Authenticate with (ani, NULL), and 3 tries collecting
clid_col_npw_npw Authenticate with (ani, NULL) and 3 tries without pw
DEFAULT       Default system session application
session.t.old  Session Application in TCL
fax_hop_on.t.old Script to talk to a fax redialer
clid_authen.t.old Authenticate with (ani, dnis)
clid_authen_collect. Authenticate with (ani, dnis), collect if that fails
clid_authen_npw.t.ol Authenticate with (ani, NULL)
clid_authen_col_npw. Authenticate with (ani, NULL), collect if that fails
clid_col_npw_3.t.old Authenticate with (ani, NULL), and 3 tries collecting
clid_col_npw_npw.t.o Authenticate with (ani, NULL) and 3 tries without pw
prepaid       flash:debitcard.1.1.3.tcl
prepaid_v2    flash:app_debitcard.2.0.0.tcl
test_v1       flash:test_api_v1.tcl
test_v2       flash:test_api_v2.tcl
```

Use the clid_* application that corresponds to your authentication configuration, or develop your own. From the billing point of view, this is transparent as it uses ANI (CLI) as User-name. Configuration example:

```
aaa new-model
aaa authentication login h323 group radius
aaa authorization exec h323 group radius
aaa accounting connection h323 stop-only group radius
!
gw-accounting h323 vsa
!
dial-peer voice 1 pots
  application clid_authen_npw
  incoming called-number .
  port 1:D
!
gateway
!
```

3. Create a customer who will own those accounts.
4. Create accounts with the Account ID equal to the phone number from which the service will be used.

TIP: check in which format ANI (CLI) numbers are reported by your gateway. For example, for the phone number +420 2 1234567 might be reported as “21234567”, “021234567”, “42021234567” or may be something different. You have to use exactly the same format for the Account ID (or change your application to convert it to the desired format).

Bill my customers who are connected via T1/E1 directly to some port on my gateway

Typically for such “port-based billing” you do not use authentication or authorization, since you are always sure that your customer is on the other end of the physical line. It might be a good idea though to implement call authorization, so you may control which destinations customer is allowed to call – but we leave it out of this example. For the port-based billing you just have to:

1. For each of such customers, create a tariff that you want bill your customer and a product. Only one row in the accessibility is necessary with the node “ANY” and the tariff which you have created.
2. Now we have to make sure that each call made by that customer is tagged as belonging to him. On your gateway use the corresponding application to handle the call. You can use the Cisco application `app_session_name` or create your own.

The often difficult part in gateway configuration is to design dial-peers for matching certain voice ports. Dial-peers should like the following configuration example:

```
dial-peer voice 1 pots
  application client_on_port_1
  direct-inward-dial
  port 1:D
```

They will be listed as having an operation status of down as the port specification must be accompanied with a number matching a specification, for example:

```
dial-peer voice 1 pots
  application client_on_port_1
  incoming called-number .
  direct-inward-dial
  port 1:D
```

This dial-peer is not adequate for our needs because any number matching the specification will prefer the port specification. This dial-peer will match any port. The solution is to use a number matching scheme which will not match any number.

```
dial-peer voice 1 pots
  application client_on_port_1
  incoming called-number A
  direct-inward-dial
  port 1:D
```

The solution may be considered a “hack” but is functional and secure. For increased security you may specify a 32 character string with a random sequence of “ABCD” characters. The probability of receiving such number is near zero.

So the configuration should look like the following:

```
aaa new-model
aaa authentication login h323 group radius
aaa authorization exec h323 group radius
aaa accounting connection h323 stop-only group radius
!
call application voice client_on_port_1
flash:app_session_name.2.1.0.tcl
call application voice client_on_port_1 user-name abc_ltd
!
call application voice client_on_port_2
flash:app_session_name.2.1.0.tcl
call application voice client_on_port_2 user-name xyz_inc
!
gw-accounting h323 vsa
!
dial-peer voice 1 pots
    application client_on_port_1
    incoming called-number A
    direct-inward-dial
    port 1:D
!
dial-peer voice 2 pots
    application client_on_port_2
    incoming called-number B
    direct-inward-dial
    port 2:D
!
gateway
!
```

1. Create customers who will own these accounts.
2. Create accounts with the Account ID equal to the name you put in the configuration of the applications (**abc_ltd** and **xyz_inc** in our example)

Authenticate and bill my customers by the IP address of their gateway

This is another example of how easy you can implement different billing schemes with PortaBilling. For the IP-based billing you just have to:

1. Create a tariff and product. Since “Node” and “CLD” only make sense for the incoming telephony calls – for the IP-based billing product set node to “ANY” and leave CLD blank.
2. On your gateway use the corresponding application to handle the call. You can use the Cisco application `remote_ip_authenticate` or create your own. The only important thing is that the IP address of the remote GW is in the User-Name attribute in the AAA requests which will go into the billing. Here is an example of the configuration:

```
aaa new-model
authentication login h323 group radius
aaa authorization exec h323 group radius
aaa accounting connection h323 stop-only group radius
!
gw-accounting h323 vsa
!
call application voice remote_ip
tftp://.../remote_ip_authenticate.1.1.1.tcl
!
dial-peer voice 11 voip
    application remote_ip
    incoming called-number .
!
```

3. Create a customer who will own these accounts.
4. Create accounts with the Account ID equal to the IP address of the remote gateway.

Use volume-based billing

When you define the rate in a volume-based tariff and assign a volume lot to it, it will decrease with every call. Note that the volume lot data is associated with the tariff, so normally you will need a separate volume-based tariff for each of your volume-based customers.

When the volume lot parameter of the rate reaches zero, the rate will be marked as discontinued, so that some other rate (which has not been discontinued and has an **Effective From** date in the past) can be used instead. Thus, usually some “normal” (non-volume-based) rates are first created in the tariff, and these define policy in the event that all the volume rates are used up. Let’s look at how to implement the most typical volume-based services.

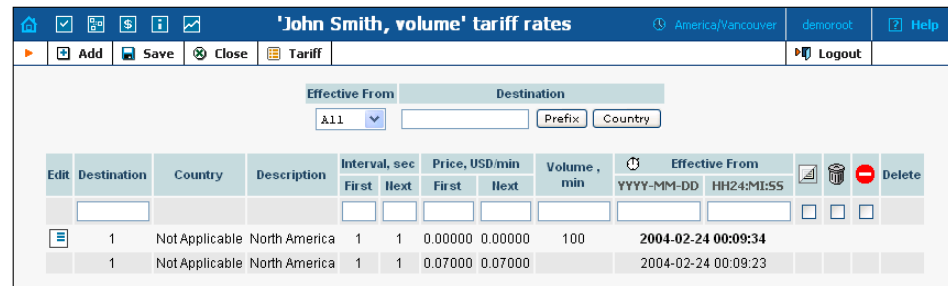
Volume threshold

If you would like to give your customer 100 minutes of calls to the US & Canada for free, and after that charge him 0.07/min:

1. Create a new volume-based tariff (choose **Volume Based** in the **Type** menu in the **Add tariff** form).
2. Enter the default rates. These rates should not be volume-based (keep the **Volume Time** column empty); rather, they are the rates to be used if the volume lot has been used up. So, in our example, we will enter a rate for destination **1** with a price of 0.07/min.
3. Now create another rate for prefix **1**. This rate will be volume-based, thus we enter **100** in the **Volume Time**.

The volume-based rate we have created will be now effective, so if a call is made to the US or Canada, it will be subtracted from the volume lot, but will not affect the customer’s balance. This will continue until all of the 100 minutes are used up. After that, this rate will be discontinued, and, if

another call is made, it will be charged according to the 0.07 rate, and so will be reflected in the customer's balance.



Edit	Destination	Country	Description	Interval, sec	Price, USD/min	Volume, min	Effective From	Delete
				First	Next	First	Next	
	1	Not Applicable	North America	1	1	0.00000	0.00000	100
								2004-02-24 00:09:34
	1	Not Applicable	North America	1	1	0.07000	0.07000	
								2004-02-24 00:09:23

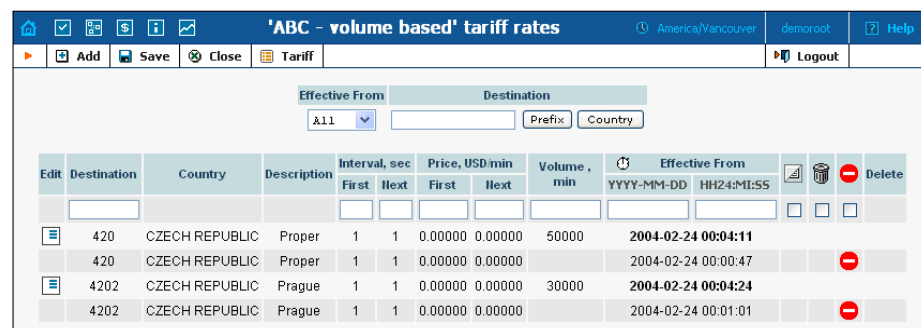
If the customer is to receive more prepaid minutes, you will simply create another volume-based rate. Or, if you wish to give him 100 minutes every month, simply create volume rates for 100 minutes effective from the 1st of February, the 1st of March, etc.

Wholesale volume lot

Let us suppose a customer buys from you 50,000 minutes to the Czech Republic and 30,000 minutes to Prague. Since he has prepaid you for these minutes, you want to make sure that, as soon as his lot to the given destination is used up, no further service is provided.

1. Create a new volume-based tariff (choose **Volume Based** in the **Type** menu in the **Add tariff** form)
2. Enter the default rates. These rates should not be volume-based (keep the **Volume Time** column empty), as they are the rates to be used if the volume lot is used up. So, in our example, we will enter the rate for destinations **420** and **4202**, marking them **Forbidden**.
3. Now create a rate for prefix **420** with volume lot 50,000 and a rate for prefix **4202** with volume lot 30,000.

So now the customer can make calls to both the Czech Republic and Prague. If he tries to call **4202123456** and his lot for Prague is used up, the **Forbidden** rate will be applied during authorization, thus the call will be rejected. At the same time, however, he can still call the rest of the Czech Republic.



Edit	Destination	Country	Description	Interval, sec	Price, USD/min	Volume, min	Effective From	Delete
				First	Next	First	Next	
	420	CZECH REPUBLIC	Proper	1	1	0.00000	0.00000	50000
								2004-02-24 00:04:11
	420	CZECH REPUBLIC	Proper	1	1	0.00000	0.00000	
								2004-02-24 00:00:47
	4202	CZECH REPUBLIC	Prague	1	1	0.00000	0.00000	30000
								2004-02-24 00:04:24
	4202	CZECH REPUBLIC	Prague	1	1	0.00000	0.00000	
								2004-02-24 00:01:01

Have reliable cost/revenue figures if volume-based billing is used

If, in addition to the volume lot, you want to include price parameters in the rate, then this will not be used to create a CDR for the customer, and the customer's CDR will still show zero as the charged amount. It will, however, be used to calculate your estimated revenue, and will be stored in the vendor's CDR so it can be used for cost/revenue calculations. For example, suppose you sold a volume lot of 50,000 minutes to Prague, Czech Republic, to a customer, and he has now used it all up. If you created his volume-based rate with price 0, and your termination cost to the Czech Republic is 0.08/min, then your cost/revenue report will show -4000, which is incorrect. However, if you configured your rate as shown below and entered an average price per minute, the cost/revenue statistics would show the actual figure of +1500.



'ABC - volume based' tariff rates												America/Vancouver		demoroot		Help					
Add Save Close Tariff												Logout									
Effective From												Destination									
Now												4202		Prefix		Country					
Edit	Destination	Country	Description	Interval, sec		Price, USD/min		Volume, min	Effective From												
				First	Next	First	Next		YYYY-MM-DD	HH24:MI:SS											
	4202	CZECH REPUBLIC	Prague	1	1	0.11000	0.11000	50000	2004-02-24 00:19:42												

Charge reseller for incoming calls

This is a very common situation: You provide your reseller with the billing, gateways and other required components. When the end-user makes a call, you charge the reseller according to your wholesale rates. But now the reseller wishes to give his subscribers the ability to use either a local access line or a toll-free line to access the service. The reseller can use the accessibility feature to charge subscribers by different tariffs, depending on the access number. But what about the amount you charge the reseller? Obviously when somebody calls a toll-free line and then calls China your cost is higher than when somebody calls a local access line and then calls the same number in China. This fact should be reflected in the reseller charges.

PortaBilling allows you to charge your reseller not just for outgoing calls, but also for incoming ones. This is done when the call is crossing PSTN from the vendor connection. In order to implement this, follow these instructions:

1. Create a tariff which defines your incoming line costs.
2. Create a separate tariff which will describe charges for the incoming access numbers you would like to apply to your reseller (for instance, incoming calls to 1800 numbers will cost your

reseller 0.02/min, while calls to 1718 and 1206 numbers will be free).

3. Activate the “incoming charges” feature (disabled by default).
 - On the PortaBilling master, edit the `/home/porta-billing/etc/porta-billing.conf` and make sure the following line is present in the `[Features]` section:
`ChargeCustomerForIncomingCalls=yes`
 - On the PortaBilling slave, edit the `/home/porta-admin/etc/porta-admin.conf` and make sure the following line is present in the `[Customers]` section:
`ChargeCustomerForIncomingCalls=1`
4. Define a **PSTN from vendor** connection, which will describe the point when calls are delivered to your network from the vendor – and therefore have costs associated with them. Associate the tariff created in step 1 with this connection.
5. Edit your reseller information. Now, on the **Additional Info** tab, you will see a new select menu – **Incoming tariff**. Choose the tariff you created in step 2, then click  **Save&Close**.

So now, when an account belonging to the reseller makes a call to the toll-free number 18001234567 (and there is a matching PSTN from the vendor connection), then makes an outgoing call to the Czech Republic 42021234567 and hangs up, the following charges will be applied:

- The account will be charged for an outgoing call to 42021234567 according to his rates to the Czech Republic; a CDR will be written to the database.
- For the vendor who terminated this call to the Czech Republic, a CDR will be written which describes our termination cost.
- For the vendor who provided the toll-free line, a CDR will be created which describes our incoming call cost.
- For the reseller, two CDRs will be created (and his balance will be modified accordingly):
 - For the call to 42021234567, according to his “outgoing” tariff (wholesale rates)
 - For the call to 18001234567, according to his “incoming” tariff

Please note that these two calls will usually have a different duration. The incoming call will be longer, because the customer needs time to enter the prompts, wait to be connected, and so on. In this case we charge the reseller for the actual incoming call duration, i.e. exactly the same duration we are charged by the toll-free line vendor.

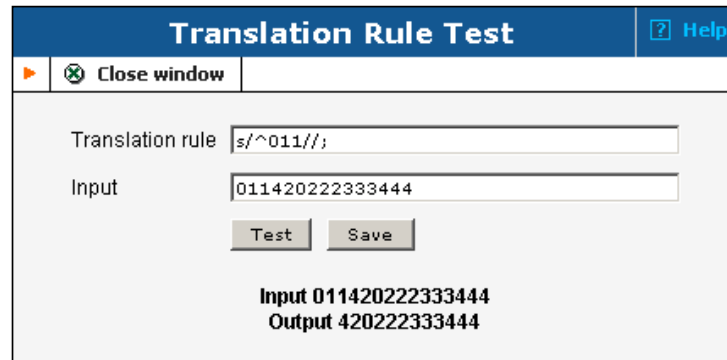
Deal with technical prefixes and numbering formats

Different termination partners often require you to send number to them in some specific format. For example your termination partner might require usage of the technical prefix *58901#* (so you have to send him *58901#42021234567* instead of *42021234567*), and your local phone provider requires that for outgoing calls numbers will be dialed without country code (so a call to *42021234567* has to be dialed as *21234567*). The more partners you have, the more likely it is you will run into these problems with the different number formats. Of course it is better to use single numbering format internally. Our recommendation is to use E.164 format in billing and on your network. E.164 compliant number is such number which consists of *<countrycode><areacode><phone#>*. Examples of valid E.164 numbers are **42021234567** and **16049876543**. The following numbers are not valid E.164 numbers: *6049876543* (NANP format), *01142021234567* (US overseas dialing format), *021234567* (local format). PortaBilling provides you with a powerful tool to convert all such strange numbers into the unified format to be used in billing.

For every connection to vendor you can specify translation rule, which will convert number into the E.164 format. Here are some ready to use examples of the translation rules:

- Convert NANP (North America Numbering Plan) phone number (area code + phone number, e.g. **604 888 7766**) into the E.164:
`s/^1/;`
- Convert European international dialing format (00 + country code + area code + phone number, e.g. **00 1 604 888 7766**) into the E.164:
`s/^00//;`
- Convert North-America international dialing format (011 + country code + area code + phone number, e.g. **011 1 604 888 7766**) into the E.164:
`s/^011//;`
- Convert Australian international dialing format (0011 + country code + area code + phone number, e.g. **0011 1 604 888 7766**) into the E.164:
`s/^0011//;`
- Convert tech prefix format (tech prefix + country code + area code + phone number, e.g. **6789# 1 604 888 7766**) into the E.164:
`s/^6789#//;`
- Convert European domestic dialing format (0 + area code + phone number, e.g. **0 5 888 7766**) into the E.164 (assuming that the country code is **44**):
`s/^0/44/;`

Always test your translation rules before inserting them into the billing. There is a special test window available on the web interface, in order to access it click on the test icon  next to the translation rule field.



Translation Rule Test

Close window

Translation rule: s/^011//;

Input: 011420222333444

Test Save

Input 011420222333444
Output 420222333444

It will let you check if your translation rule has a proper syntax and also you can immediately see if it does the translation you need.

Troubleshoot incorrectly billed call

1. Make sure that someone in your organization is subscribed to the PortaBilling mail alerts (especially “Missing critical information”). This will help you detect problems early.
2. Find the h323-conf-id of this call. This is unique ID (string of four hex numbers), generated by the gateway when the call was started, and it will help you to exactly identify this particular call among the others. You can find this ID by either:
 - See statistics on your gateway
 - Go to the radius details directory (`/var/log/radacc`), enter the subdirectory for the corresponding gateway and use program like `more` or `less` to browse the file. You can search by the number you dialed, account (PIN) number or just browse records near the end of the file.
 - Browse the PortaBilling log (`/var/log/porta-billing.log`) – search by the number you dialed, account (PIN) number or just browse records near the end of the file.
3. Look in the PortaBilling log (`/var/log/porta-billing.log`) or use **View logs** on the web interface and find all of the information there about the call processing.

Note: Normally we receive information about each of the call legs separately, so it is necessary that you check log entry for processing **all** of the call legs and the final call clean up.

4. Typical error situations are:
 - **Call was not billed at all.** It was considered as “on-net” call, because we did not detect that it went to any

of the vendors. Check that you have correctly defined connections to your vendors.

- **Call was billed only to vendor, but not to an account or customer** (and when you received email alert). The billing engine needs Account ID in the User-Name attribute to correctly identify account and customer. Check the logs and see what was in the User-Name attribute. Typical situations are:
 1. **Incorrect value in User-Name** (for example phone number instead of the IP address of the remote gateway). Cause: Required application was not used to handle the call. Remedy: check that application is configured, and associated with the corresponding *incoming* dial-peer.
 2. **On some of the call legs there is correct value in the User-Name, on others there is some IP address.** In the situation when call is originated on your gateway A and is terminated on your gateway B – then we will have “real” username only on the accounting from the gateway A. On the gateway’s B accounting username will be the IP address of the gateway A, because gateway A had to authenticate itself before being able to make a call. This is perfectly normal situation. PortaBilling recognizes this situation and will replace username equal to the node’s ID (IP address) with a “real” username from the other call legs.
 3. **Value in the User-Name is correct, but it says “Did not find account/customer”.** Check accessibility for the account’s product. It might be that even if you have such account, accessibility is incorrect.
- **Call was billed, but the phone number I see in the billing is incorrect (not in the E.164 format) and I get “Mismatch in rates or destinations” error.** Cause: missing or incorrect translation rule on the connection to the vendor. Remedy: Assign translation rule, read the *Charge reseller for incoming calls*
- *This is a very common situation: You provide your reseller with the billing, gateways and other required components. When the end-user makes a call, you charge the reseller according to your wholesale rates. But now the reseller wishes to give his subscribers the ability to use either a local access line or a toll-free line*

to access the service. The reseller can use the accessibility feature to charge subscribers by different tariffs, depending on the access number. But what about the amount you charge the reseller? Obviously when somebody calls a toll-free line and then calls China your cost is higher than when somebody calls a local access line and then calls the same number in China. This fact should be reflected in the reseller charges.

PortaBilling allows you to charge your reseller not just for outgoing calls, but also for incoming ones. This is done when the call is crossing PSTN from the vendor connection. In order to implement this, follow these instructions:

6. Create a tariff which defines your incoming line costs.
7. Create a separate tariff which will describe charges for the incoming access numbers you would like to apply to your reseller (for instance, incoming calls to 1800 numbers will cost your reseller 0.02/min, while calls to 1718 and 1206 numbers will be free).
8. Activate the “incoming charges” feature (disabled by default).
 - On the PortaBilling master, edit the `/home/porta-billing/etc/porta-billing.conf` and make sure the following line is present in the [Features] section:
`ChargeCustomerForIncomingCalls=yes`
 - On the PortaBilling slave, edit the `/home/porta-admin/etc/porta-admin.conf` and make sure the following line is present in the [Customers] section:
`ChargeCustomerForIncomingCalls=1`
9. Define a **PSTN from vendor** connection, which will describe the point when calls are delivered to your network from the vendor – and therefore have costs associated with them. Associate the tariff created in step 1 with this connection.
10. Edit your reseller information. Now, on the **Additional Info** tab, you will see a new select menu – **Incoming tariff**. Choose the tariff you created in step 2, then click  **Save&Close**.

So now, when an account belonging to the reseller makes a call to the toll-free number 18001234567 (and there is a matching PSTN from the vendor connection), then makes an outgoing call to the Czech Republic 42021234567 and hangs up, the following charges will be applied:

- The account will be charged for an outgoing call to 42021234567 according to his rates to the Czech Republic; a CDR will be written to the database.
- For the vendor who terminated this call to the Czech Republic, a CDR will be written which describes our termination cost.
- For the vendor who provided the toll-free line, a CDR will be created which describes our incoming call cost.

- For the reseller, two CDRs will be created (and his balance will be modified accordingly):
 - For the call to 42021234567, according to his “outgoing” tariff (wholesale rates)
 - For the call to 18001234567, according to his “incoming” tariff

Please note that these two calls will usually have a different duration. The incoming call will be longer, because the customer needs time to enter the prompts, wait to be connected, and so on. In this case we charge the reseller for the actual incoming call duration, i.e. exactly the same duration we are charged by the toll-free line vendor.

- Deal with technical prefixes and numbering formats chapter.
 - **Call was billed and the phone number I see in the billing is correct but I get “Mismatch in rates or destinations” error.** Cause: missing rate for that phone prefix in the tariff. Remedy: Create a rate for this destination in the tariff.
5. If you are unable to solve the problem by yourself, submit problem report to support@portaone.com. Please make sure that you include in your email:
- Detailed description of the call flow and what seem to be incorrect.
 - H323-conf-id of the call
 - Relevant pieces from the `porta-billing.log`

Create a custom TCL application

Sometimes you need special call handling or IVR functionality which is not available in the applications you already have. For example, you need a prepaid card IVR which will try to do ANI authentication prior to the PIN authentication.

First of all, check TCL applications available as a part of Cisco TCLWare package, perhaps what you are looking for (or something similar) is already there. If you find some application similar to what you need, you can use it as template.



There is a productivity tool for the TCL IVR development available from the Porta Software Ltd. **FastIVR** is an emulator of Cisco in regard to the script execution, TCL API, VoIP-related IOS commands. You can find more information at <http://www.portaone.com/solutions/fastivr>.

Make a custom report from PortaBilling

PortaBilling provides you with an open data model. ER-diagram of the database structure is not included in this document, but available from the Porta Software Ltd upon request. If you want to prepare custom reports on your workstation or some non-PortaBilling server you will need to:

- Make sure the remote computer has installed database drivers to access the PortaBilling database. Normally you would use native MySQL connectivity on the Unix-based hosts and ODBC on the Windows-based hosts.
- For any data-mining solutions (extracting data from the database) use **only** slave database.
- Use some tool like Crystal Reports, Microsoft Access or custom application to retrieve data from the database, process it and present to user.

Use ODBC to connect to PortaBilling

ODBC (Open Database Connectivity) provides a way for client programs to access a wide range of databases or data sources. If you need extended customized reporting not available in PortaBilling, you can do it using external tools such as MS Access or Crystal Reports.

Create a MySQL user to be used for reports

1. Login into your Portabilling slave server using ssh
2. Start MySQL command tool
andrew@demo:/home/porta-admin\$mysql -u root mysql
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

```
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 42122 to server version: 4.0.17-log
```

```
Type 'help;' or '\h' for help. Type '\c' to clear the  
buffer.
```

```
mysql>
```

3. Create a new user using GRANT command:
mysql> grant ALL PRIVILEGES on `porta-billing`.* to
'reports'@'192.168.0.5' identified by 'pod23uk';
Query OK, 0 rows affected (0.02 sec)

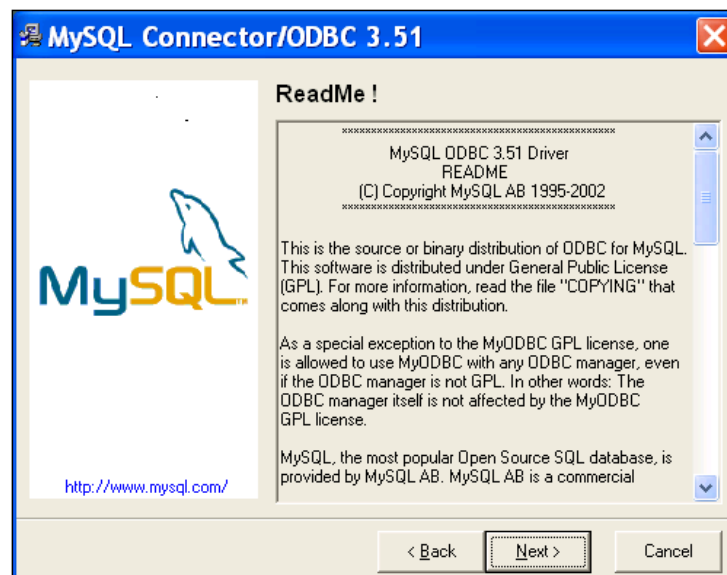
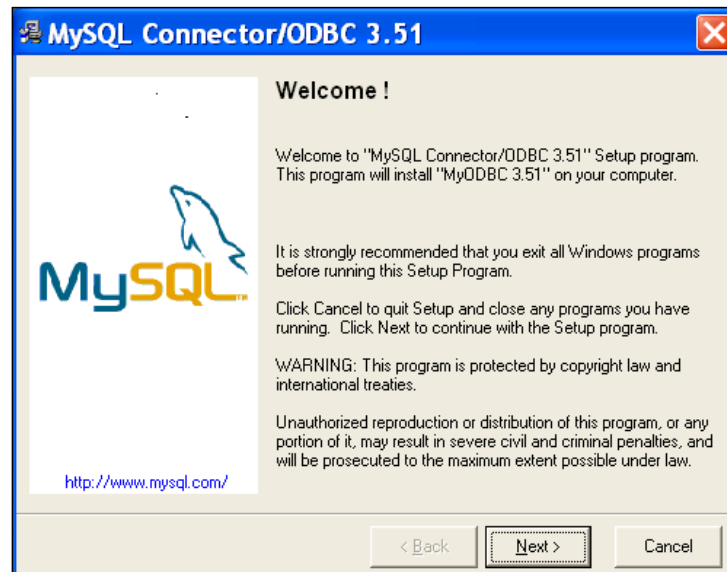
```
mysql>
```

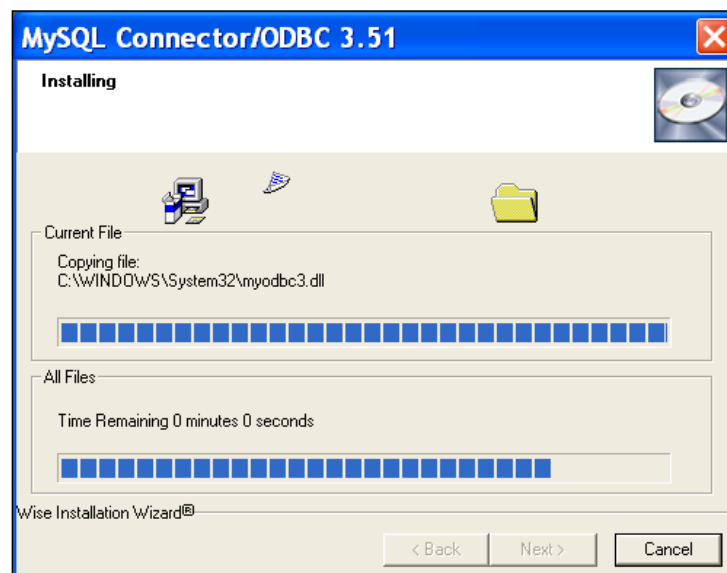
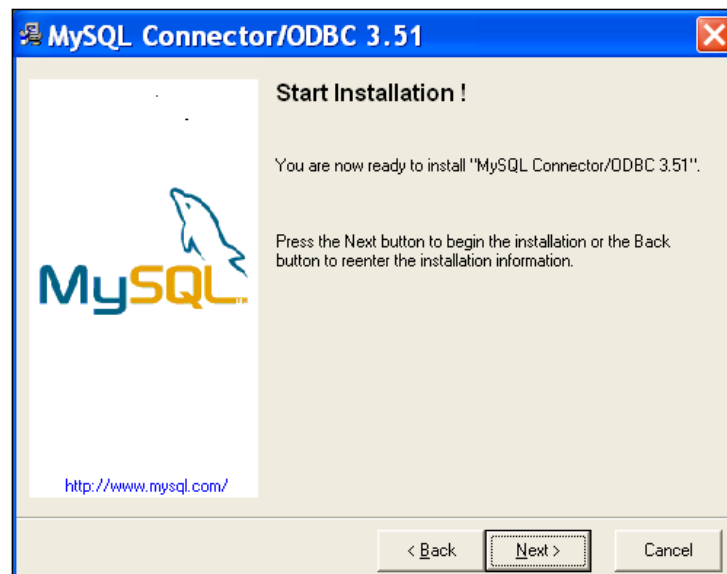
NOTE: The command above will give access to all of the tables in the database. It is provided just as an example, modify it accordingly to your actual needs.

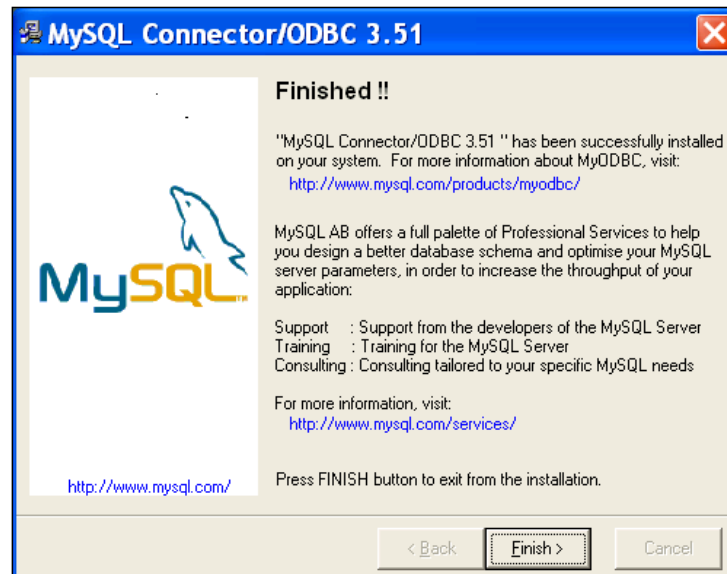
4. Flush the privileges
mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.07 sec)

Installing the MySQL ODBC driver

1. Download and run the installation package from the <http://www.mysql.com>
2. Press **Next** on the information screens







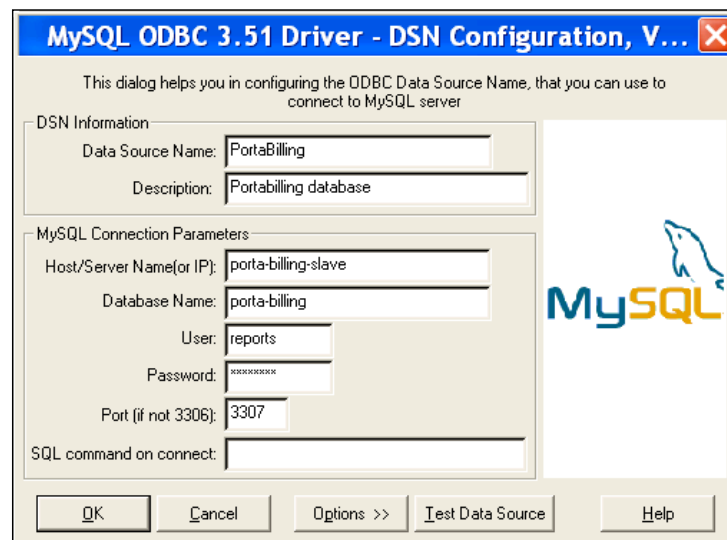
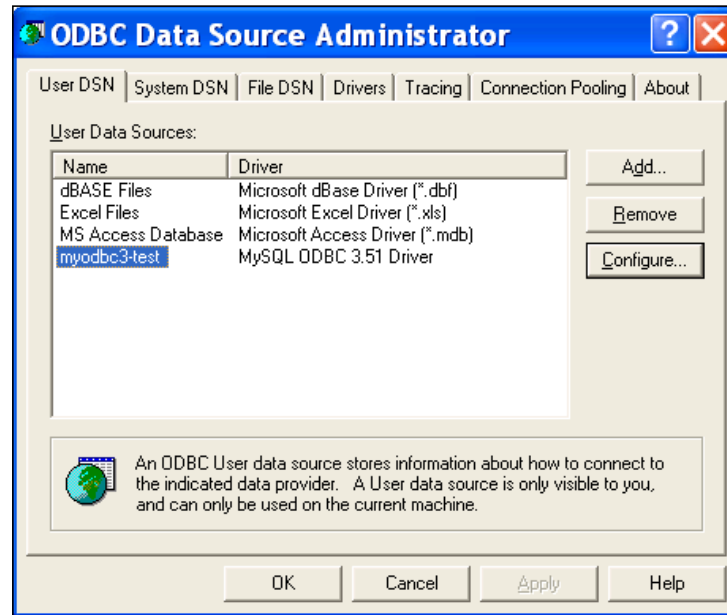
3. Press **Finish**

Configuring ODBC

Before configuring data source, create MySQL user on slave DB with read-only permissions. Please consider the following document on how to add new user accounts to MySQL:

http://www.mysql.com/doc/en/Adding_users.html

1. Control panel -> Administrative tools -> Data sources (ODBC)
2. Select myodbc3-test and click **Configure...** Fill out the configuration form:

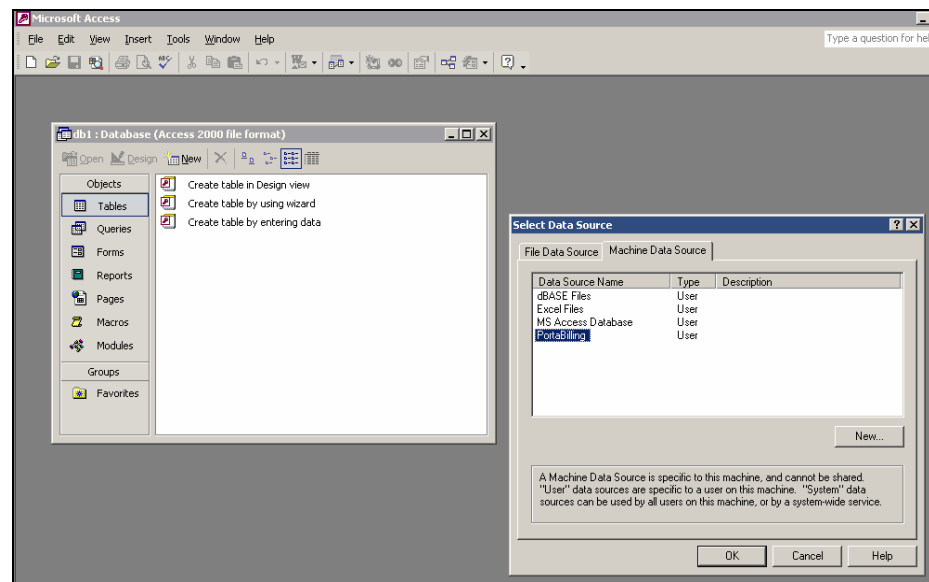


Important parameters are:

- **Host/Server Name (or IP)** – hostname (or IP address) of your slave server
- **Database Name** – porta-billing
- **User, Password** – username and password of the MySQL user you have created for the report purposes
- **Port** – the port on which the database service is accessible; enter 3307 here.

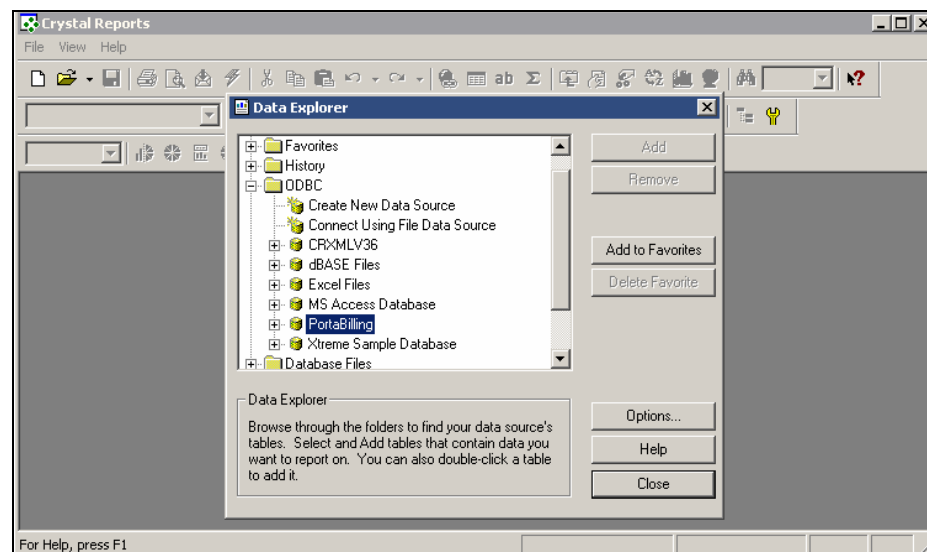
Note: This port number differs from the one used by default.

Using ODBC



At MS Access

1. Create a blank database
2. Right-click in the table design view, and choose **Link tables...**
3. Choose **ODBC databases** from “Files of type...” list
4. Select **Machine data source**
5. Select **PortaBilling** and press OK
6. Select desired tables



At Crystal Reports

1. Create a *New Report*
2. In *Data Explorer* open **ODBC** branch
3. Select **PortaBilling**
4. Select desired tables

Using redirect-number feature

Each Account in PortaBilling has redirect number field. If field is not empty, PortaBilling will include an h323-redirect-number in each authorization confirm message and use an h323-return-code of 52. How to proceed in this case is determined by the gateway. The account owner is allowed to modify the redirect number using customer self-provisioning web.

There are no scripts for any redirect number functionality in the Cisco TCL package. You may desire to implement this functionality in-house, or Porta Software may be able to assist you.

Customer support number

PortaBilling allows you to enter the redirect number during the process of account generation so that you may specify different redirect numbers for different account batches. Different batches may be distributed in different regions and only a slight modification to the prepaid card script can make it more intelligent about how to choose a customer support center.

IP telephony private line auto ringdown

In the case of the combination of ANI (CLI) authentication and immediate call forward, you may map phone lines from one world region to another. This is advantageous as you will require only one local access number. The mapping is dependant on the ANI (CLI).

Know which H323 proxy is right for me

There are two possible implementations of the H323 proxy: hardware and software. Hardware is a VoIP gateway with some of the voice ports connected to the others (or two back-to-back gateways can be used). Software proxy is a Cisco router (no DSP or voice ports required) with certain IOS extensions.

Hardware solution advantages:

- Simplicity, out of the box functionality
- In most cases there is only one option for negotiating heterogeneous protocols
- Rapid deployment
- Almost no maintenance is necessary

Hardware solution disadvantages:

- It is expensive
- Unnecessary protocol translations
- Late problem detection, it is always necessary to place a call first

Software solution advantages:

- Cost efficient
- In the case of network interconnection, running the same protocol it is a native solution with maximum interoperability and transparency
- Early problem detection, the system is aware of the remote network state

Software solution disadvantages:

- There is the potential need for protocol translation
- More complex
- Both parties' software versions must be synchronized

Isolate network of “Big client”, so you do not have to track their individual gateways

If the client has more than one gateway, it is possible to enter all gateways into the PortaBilling as separate accounts. Each of them will be billed separately, and Customer who owns them will carry a total balance. Usually this is fine if all gateways are owned and provisioned by your client for himself, or, in other words, if the client is the “end user”. This case could be outlined as:

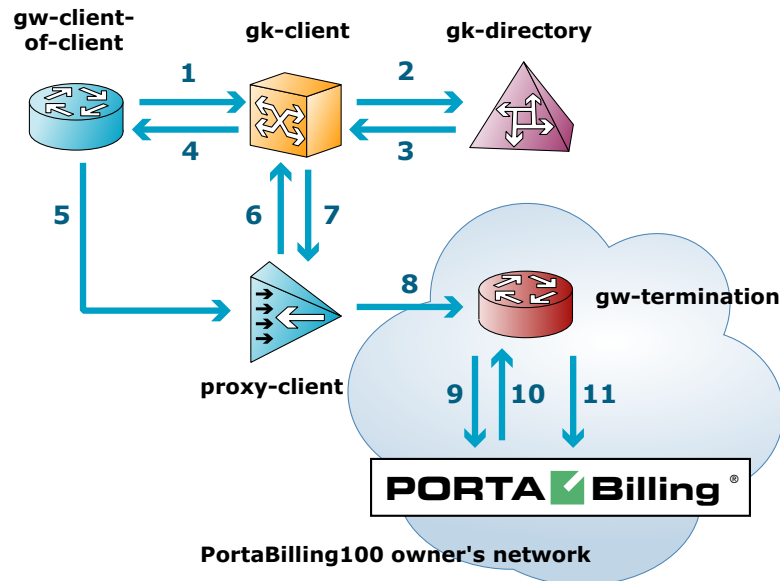
- Low and stable number of gateways
- Stable gateway configuration
- Stable billing relationships

If your client is the service provider then your case may look more like this:

- A large number of unstable gateways (service installation and cancellation)
- Unstable gateways configuration (IP, h323_id)
- Different billing procedures for different gateways

In this case it is possible to isolate client's network by using H.323 proxy. All of the customer's gateways send traffic to the proxy, and then it resends traffic to your network. So for you and for the Portabilling it looks like customer has a single gateway, which sends all the traffic.

Sample network



In the example above **gw-termination** belongs to you (PortaBilling owner), the rest belongs to your client or your client's client. If gateway **gw-client-of-client** in Zone **gk-client** wants to call gateway **gw-termination** in **gk-directory**, the following sequence of events occurs:

1. **gw-client-of-client** asks **gk-client** for permission to call certain destination.
2. **gk-client** locates **gk-directory** as the gatekeeper for that destination. **gk-client** asks **gk-directory** for address of the termination gateway.
3. **gk-directory** responds with **gw-termination** address.
4. **gk-client** knows that to get to **gw-termination**, the call must go through **proxy-client**, hence **gk-client** returns **proxy-client** address to **gw-client-of-client**.
5. **gw-client-of-client** calls **proxy-client**.
6. **proxy-client** consults **gk-client** to discover the true call's destination (which is **gw-termination** in this example).
7. **gk-client** instructs **proxy-client** to call **gw-termination**.
8. **proxy-client** completes the call to **gw-termination**.
9. **gw-termination** asks PortaBilling to authenticate **proxy-client** IP address.
10. Assuming that there is an account with Account ID equal to this IP address, PortaBilling sends authentication confirm message.
11. Upon call completion **gw-termination** sends the stop accounting record to PortaBilling with User-Name = **proxy-client** IP, and account with such Account ID is billed for the call.

We would recommend a single proxy configuration in this case. Installation must be done in cooperation with the client, and include gatekeeper and proxy installation on the client network, and PortaBilling configuration. No gatekeeper or any other H.323 server reconfiguration in your network is necessary. (Today this should not be an issue as current Cisco gatekeeper/proxy/gateway software can be executed on the same box).

Client gatekeeper & proxy configuration

Provided below are important sample configurations.

NOTE: all 3 logical instances in this sample could be configured on single Cisco chassis.

Sample “client of the client” gateway

```
interface
description VoIP
ip address 1.1.1.1 255.255.255.0
h323-gateway voip interface
h323-gateway voip id gk-client ipaddr 2.2.2.2 1718
h323-gateway voip h323-id gw-client-of-client
```

Gatekeeper

```
gatekeeper
zone local gk-client client.domain 2.2.2.2
zone remote gk-directory your.domain 3.3.3.3 1719
zone prefix gk-directory *
use-proxy gk-client remote-zone gk-directory outbound-from
gateway
use-proxy gk-client remote-zone gk-directory outbound-from
terminal
no shutdown
```

H323 proxy

(shown on the same chassis as gatekeeper)

```
hostname proxy
ip domain-name client
!
proxy h323
!
interface
ip address 2.2.2.2 255.255.255.0
h323 interface
h323 h323-id proxy.client
h323 gatekeeper ipaddr 2.2.2.2
```

Your termination gateway and PortaBilling

Configuration is the same as in case of billing by remote IP address, see *Authenticate and bill my customers by the IP address of their gateway* and *Setting up a Wholesale IP Telephony Company*.

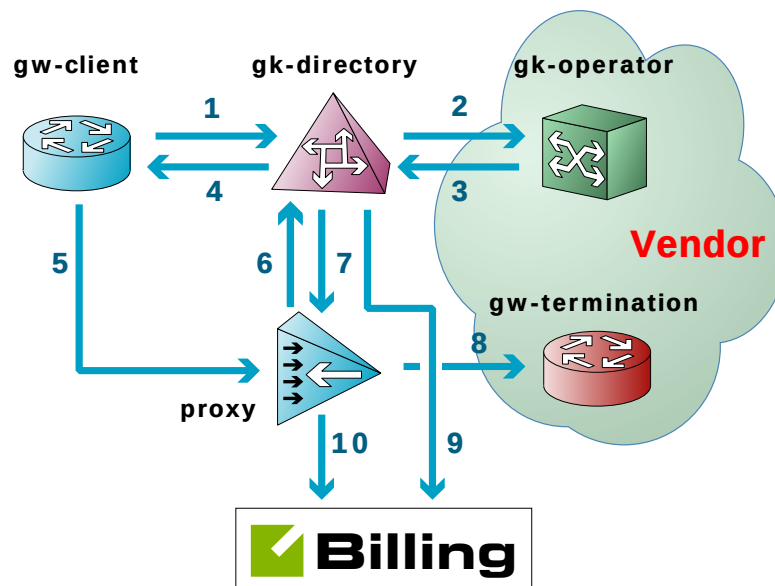
Make sure your customers do not know who your real termination partners are and never communicate directly with them
See *Isolate your network* below.

Isolate your network

Two carriers interested in interconnecting will desire a single interconnection point, which is convenient for management and billing. Another reason why you might need this is to make sure that your clients do not directly send traffic to your termination partners, since they might try to avoid billing in this way or get a direct contract with the termination partner.

Sample network

We assume that **gk-directory** and **proxy** belong to you (PortaBilling owner), **gk-operator** and **gw-termination** belong to your termination partner and **gw-client** is either your own gateway, or your customer's. If gateway **gw-client** in Zone **gk-directory** wants to call gateway **gw-termination** in **gk-operator**, the following sequence of events occurs:



1. **gw-client** asks **gk-directory** for permission to call certain destination.
2. **gk-directory** locates **gk-operator** as the gatekeeper handling that destination.
3. **gk-directory** asks **gk-operator** for address of the termination gateway. **gk-operator** responds with **gw-termination** address.
4. **gk-directory** knows that to get to **gw-termination**, the call must go through proxy, hence **gk-directory** returns **proxy** address to **gw-client**.

5. **gw-client** calls **proxy**.
6. **proxy** consults **gk-directory** to discover the true call's destination (which is **gw-termination** in this example).
7. **gk-directory** instructs **proxy** to call **gw-termination**.
8. **proxy** completes the call to **gw-termination**.
9. Upon call completion **gk-directory** sends a stop accounting record to PortaBilling with h323-gw-id = **gw-client** h323-id (NOT hostname.domain)
10. Upon call completion **proxy** sends a stop accounting record to PortaBilling WITHOUT h323-remote-ip

Network components configuration

Provided are sample configurations. **NOTE:** all 3 logical instances could be configured on single Cisco chassis.

Sample "client" gateway

```
interface
description VoIP
ip address 1.1.1.1 255.255.255.0
h323-gateway voip interface
h323-gateway voip id gk-directory ipaddr 2.2.2.2 1718
h323-gateway voip h323-id gw-client
```

Common part for Gatekeeper and Proxy

```
aaa new-model
aaa authentication login h323 group radius
aaa authorization exec h323 group radius
aaa accounting connection h323 stop-only group radius
!
radius-server host PortaBilling.your.domain
radius-server key your-top-secret
radius-server vsa send accounting
radius-server vsa send authentication
```

Gatekeeper

```
gatekeeper
zone local gk-directory your.domain 2.2.2.2
zone remote gk-operator operator.domain 3.3.3.3 1719
zone prefix gk-operator *
accounting vsa
lrq forward-queries
use-proxy gk-directory remote-zone gk-operator outbound-from gateway
use-proxy gk-directory remote-zone gk-operator outbound-from terminal
no shutdown
```

H323 proxy

(shown on same chassis as gatekeeper)

```
hostname proxy
ip domain-name client
!
gw-accounting h323 vsa
```

```
proxy h323
!
interface
ip address 2.2.2.2 255.255.255.0
h323 interface
h323 h323-id proxy.client
h323 gatekeeper ipaddr 2.2.2.2
```

PortaBilling configuration

If **Gw-client** is a client's gateway, it should be entered as an account (see *Setting up a Wholesale IP Telephony Company*, otherwise (if it your own gateway) it should be entered as a node. If the **Gk-directory** is separate from the proxy, it should be entered as a node, make sure type is "H323-GK". **Proxy** should be entered as a node with type "H323-GW". The last and the most important thing is to create a "Proxied VoIP to vendor connection" with **proxy** node.

Restrictions

- Only total proxy traffic accounting is possible. If you will have more than one operator behind the proxy, it will not be possible separate accounting information. This is a Cisco limitation and may be resolved in a future IOS revision. As a temporary solution, it is suggested to use a separate proxy instance for each operator.
- The origination point (gw-client) must be the gateway (not the terminal). In the case of an FXS port dial peer, use "no register e164".

Configure outgoing connection to vendor, if I send calls using gatekeeper, so remote IP address is not known in advance

In this situation you indeed cannot use **VoIP to Vendor** connection, since IP address of the remote gateway will be assigned dynamically. Solution in this case is to set up h323-proxy and send traffic to this vendor via proxy. See *Isolate your network* chapter above. Then you can create **Proxied VoIP to Vendor** connection.

If you only have one such vendor, where termination IP address is unknown beforehand, and you are sure that everything, which goes to the unknown IP address goes to this vendor – you can use a special feature in PortaBilling to handle this situation. You can create a "VoIP to Vendor" connection and put **ANY** as a remote IP address. Any outgoing VoIP call, which goes neither to one of your trusted nodes nor IP addresses explicitly defined in other connections will match this connection. This method can be used as quick solution, but has a few disadvantages comparing to using h323-proxy. The most important is the fact that using

h323-proxy you can bill traffic, which goes directly from your customer's GW to your vendor's GW.

Force PortaBilling to disconnect after a customer talks over his credit limit

There is no need for the PortaBilling to do this, because gateway is able to do it by itself. When gateway authorizes account to make a call in the PortaBilling, in case of successful authorization PortaBilling returns maximum credit time (in the h323-credit-time RADIUS attribute). When gateway connects the call, it starts the timer and when timer hits the zero, it automatically disconnects the call.

Create accounts be to used for SIP services

There are no special requirements how such accounts should be created. For all services, supported by PortaBilling (H323, SIP) you use the same interface to create and manage accounts. After that, accounts can use H323, SIP or SIP & H323 services, depending on their product's accessibility. So if you plan that accounts with the certain product should be able to login to SIP server and make outgoing calls – make sure you will include the PortaSIP node with the appropriate tariff into the **Accessibility** for this product.

Integrate PB logins in your web site

You can include the login form on your website using the following HTML code.

```
<form name=log method=post action=https://pb.mycompany.com/login.html>
  Login <input type="text" name="user" value="">
  Password <input type="password" name="password" value="">
  <input type=button value="Login" onClick="submit()">
  <input type=hidden name="redirectOnLoginError" value="www.myweb.com">
</form>
```

"redirectOnLoginError" – in case if unsuccessful login, PortaBilling will redirect the browser to the URL specified in the value attribute.

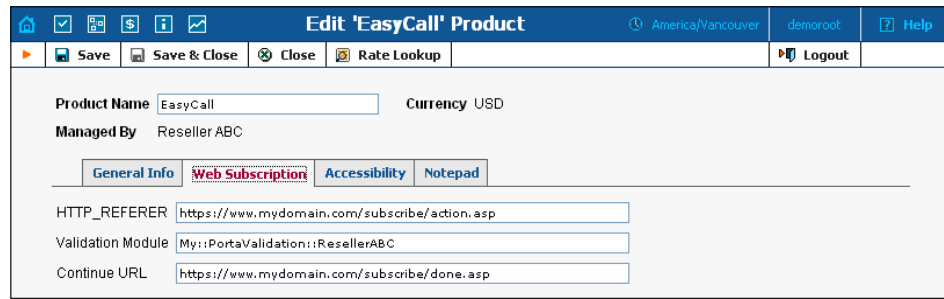
Configure Web Subscription

Typical steps of Web Subscription configuration:

- Decide where you going to host your Web Subscription page. (It could be your corporate web site for instance). Find out, what is the URL of the page which will submit request for creating an account in PortaBilling. You will need to put it into the “Subscription HTTP_REFERER” field. You will need https server and digital certificate in order to secure credit card transactions.
- Create Web Subscription HTML form using example provided with PortaBilling and put it to your web site. You can add or remove some fields in order to achieve the functionality you need i.e. you can request to enter account ID if you are doing ANI based service or may not if you are in debit card business etc.
- In the configuration file of the web server:
`/usr/local/etc/apache/porta.htpd.conf`, uncomment the section about the virtual host for the web subscription; by default it runs on port 8500.
- Create a validation module or use the one provided with PortaBilling. By customizing the validation module, you can implement the advanced restrictions you require (e.g. allow creation of accounts with a balance of 10, 20 or 50 dollars only, or ensure that lifetime is no more than 180 days). Place this module somewhere on the web server so that it will be accessible for `mod_perl`; for example, in: `/usr/local/lib/perl5/site_perl`. Thus, if you decided to name your module: `My::PortaValidation::ResellerABC`, the actual program code would reside in:
`/usr/local/lib/perl5/site_perl/My/PortaValidation/ResellerABC.pm`

NOTE: Make sure that you restart the web server (`apachectl restart`) after making changes in the module.

- Create Wholesale Customer
- Create Product/Tariff set managed by Wholesale Customer
- Fill in the form on the Product “Web Subscription” Tab
- Login into customer self-provisioning interface and enter merchant account data (Company Info -> Merchant Account tab)



How it works:

- To start using your services a person must open your web site and proceed to the subscription page
- Once the subscription form is completed, the data will be posted to PortaBilling server.
- After receiving the subscription form data PortaBilling searches for “Subscription HTTP_REFERER”, and accepts it only if the host is found in the database. If not found then transaction is rejected.
- PortaBilling associates the Subscription Host with the product for the account that is being created.
- PortaBilling will use the appropriate validation module to check if the supplied data are correct.
- Validation module will check the data, fill any non-mandatory fields and return the data along with the acquired status to PortaBilling
- If status is indicating an error then registration is rejected and browser is redirected using “Continue URL”
- If status is OK then PortaBilling proceeds with registration and executes credit card transaction
- If status is indicating an error then registration is rejected and browser is redirected using “Continue URL”
- If status is OK then PortaBilling creates an account and redirect browser using “Continue URL”
- Each time when browser is redirected using “Continue URL” PortaBilling provides a comprehensive set of parameters.

List of “Continue URL” parameters and possible values:

- status “OK”, “ERROR”
- message “CC rejected”
- session_id – unique session ID supplied by the web subscription server
- account_id – generated account ID

Sample files:

Can be found on your PortaBilling installation in the following directories:

```
~porta-admin/apache/subscription/subscription.html  
~porta-admin/apache/subscription/subscription_result.html  
~porta-admin/site_lib/Porta/Subscription.pm
```

Web Subscription HTML form can be found at the following URL

<https://myPortaBilling.myCompany.com:8500/subscription.html>

where myPortaBilling.myCompany.com is URL of your PortaBilling Web Interface, and 8500 is the port on which the subscription virtual host is running.

7. Maintenance

Configuration files

There are two separate configuration files, one for the billing engine (master server) and one for the web interface (slave server)

Billing engine

The configuration file is called the `porta-billing.conf` and located in the `/home/porta-billing/etc` directory. It is automatically created by the installation program and populated with the initial configuration. You do not have to edit it unless you want to alter the default behavior.

porta-billing.conf:

```
# Only full qualified email addresses, no local aliases please
#
```

```
[Global]
```

```
last_resort_email=admin@yourdomain.com
```

In case critical condition is detected (e.g. radius server is down) who should receive the email alert

```
email_header_from=porta-billing@yourdomain.com
```

What should be in the **From:** field of the email alerts

```
Suspicious_Time_Threshold_sec=86400
```

Maximum acceptable difference in time, sent by gateway and current time on server. Default is 24 hours.

```
SQL_Trace=0
```

If all SQL queries and their results should be logged to the PortaBilling log file. Use with caution and only when detailed debug is necessary, since it produces a huge log files.

```
[Master]
```

```
DSN=DBI:mysql:database=porta-billing
```

```
User=root
```

```
Password=xxxxxx
```

Connect parameters for the master database

```
# Simultaneous login prevention for debit accounts
```

```
#
```

```
[Fraud_Detection]
```

```
Active=Yes
```

Turn the fraud protection on.

```
Test_Mode=No
```

Turn the fraud detection on. Debit account will be allowed to login more than once, but email alert will be sent.

```
Recovery_Time_sec=1800
```

After debit account is successfully authenticated, how long this information should be kept in the memory. Default is 30 minutes. Longer recovery time will increase amount of memory, required by the billing engine.

```
# Node IP Cache
```

```
#
```

```
[Node IP Cache]
```

```
Cache_Cleanup_Time_sec=600
```

How often information about nodes and connections should be updated from the database. You can force nodes/connections reload by sending HUP signal to radius daemon.

```
# Email flood prevention.
```

```
#
```

```
[Email]
```

```
Max_Sequential_Emails=5
Look_Behind_sec=450
If within Look_Behind_sec interval Max_Sequential_Emails already have been
sent, any extre email alert will be blocked. This is done to protect email flood.
Mail_Templates_Dir=Mail_Templates

# radcheck.pl
#
[Self Test]
Timeout_sec=5
Test_Frequency_sec=60
Errors_Before_Restart=3
Path_To_Lock_File=/var/run/radcheck.pid
NAS-IP-Address=127.0.0.1
Shared_Secret=SecretKey
User-Name=127.0.0.1
Password=cisco
This sections defines parameters for the PortaBilling self-test suite. Periodically script
sends authentication request to the radius server, and expects positive answer.

# radcheck.pl & porta-clients.pl
#
[Radius]
Host=127.0.0.1
Path_To_radius.sh=/home/porta-billing/radius_scripts/radius.sh
Path_To_Config=/var/db/raddb
Path_To_PID_File=/var/run/radiusd.pid
General parameters of radius server, required by scripts like self check.

[Log]
# Where logs should go. Possible values are:
# Syslog, File and Console
Log_To=File
This would write PortaBilling log to the file on disk. This is the default option, and
normally it is sufficient for both production and debugging. Use other ways of logging
only for special debug purposes.
# For logging to file, give the filename.
# For logging to the syslog, give description in
# form of syslog:<facility>:<priority>
Log_Dest=/var/log/porta-billing.log
Path to log file. Default is /var/log/porta-billing.log
#Log_Dest=syslog:daemon:warn
#NAS=13.232.103.106
#Username=0007777777

[Call_Cleanup]
Parameters in this section configure life time on the calls in the call cache.
Radius_Retransmits=5
Radius_Timeout=3
In order to know, when we should no expect any more packets, we should know what
is the maximum possible delay that the request can be delivered to the Radius (last
possible retransmit)
Alive_Interval=60
If we bill by the keep-alive requests, we need to know what is the interval between
them.
Incoming_Session_Lifetime=10
Call lifetime after incoming call leg was disconnected.
Default_Lifetime=120
Default lifetime of the call.

[Suggestions]
No_Remote_IP_Auth=no
```

If PortaBilling should not warn you when it seems that your gateways do not authenticate incoming VoIP sessions.

Admin server and web interface

The configuration file is called the `porta-admin.conf` and located in the `/home/porta-admin/etc` directory. It is automatically created by the installation program and populated with the initial configuration. You might want to edit, so system will better suite your needs.

porta-admin.conf:

```
[Global]
System_Name=MyBilling
Put some distinctive name of your system here
sendmail=/usr/sbin/sendmail
ZIP=/usr/local/bin/zip
UNZIP=/usr/local/bin/unzip
TempDir=/var/tmp/porta
maintainer=PortaBilling <porta-100@mybilling.com>
What shall be in the From: address of the outgoing emails
Time_Zone=America/New_York
Default timezone (when creating new objects such as user, customer, etc.)
Debug=0

Check_Age=2
Pager=30
How many entries per page should be shown in tables. This is master parameter, can
be altered for the individual forms.

[Porta_Realm]
admin=443
accounts=8445
cc_staff=8446
customer=8444
Ports that different web interface parts are using

[Master]
DSN=DBI:mysql:database=porta-billing;host=porta-billing-master
User=root
Password=xxxx
PrintError=1
Connect parameters for the master database

[Slave]
DSN=DBI:mysql:database=porta-billing;mysql_socket=/tmp/mysql-
slave.sock
User=root
Password=xxxxx
PrintError=1
Connect parameters for the slave database

[Backup]
Keep=1

[X-Rates]
# Max age (days)
Max_age = 60
Pager = 25
```

```
Base_Currency = USD

[Web]
# Login expiration (seconds)
Login_expire=172800
# Login expire if not used (seconds)
Passive_expire=86400

[Currency]
Pager = 25

# Default values for Card generator
Default values for "Account generator"
# Billing_model={Debit| Credit | Voucher}
# Preferred_language=<2-chars language name from iso-639-1>
[Cardissue]
Amount=1000
Balance=10
Life_time=90
Length=12
Default PIN length
Billing_model=Debit
Preferred_language=en

# Default values for 'Add card manually'
# Billing_model={Debit| Credit | Voucher}
# Preferred_language=<2-chars language name from iso-639-1>
[Addcard]
Balance=0
Life_time=90
Batch=
Billing_model=Credit
Preferred_language=en

# Default values for Rates
# Pager Lines per page
# Cleanup_Interval -- interval for cleanup in days
[Rates]
Pager=50
Cleanup_Interval=90
How long old (not effective) rates should be kept

[CustomerWeb]
Pager=50
Interval=1

[AccountWeb]
Interval=1
Pager=50

[TraceCall]
Pager=50
Interval=1

[Invoice]
Pager=50
Interval=1

[Stats]
GrossMargin_Interval=1
# GrossMargin_Measure = day | month
GrossMargin_Measure=day
# GrossMargin_MaxAge = max age in days
```

```
GrossMargin_MaxAge=1000
ASR_days = 90
ASR_weeks = 52
ASR_month = 10

[RRD]
It is not recommended to change these parameters without deep understanding of the
RRD principles
Load_delay_seconds = 3600
Zero_call_length = 10
Load_delay_interval = 900
# % when ASR graph appears
ASR_Threshold = 5

[StatCalc]
Interval=0
Mask=%

[OnlinePayment]
PassFile=/home/porta-admin/etc/passphrase.txt
Encryption key for merchant account passwords
Pager=25

[CDR]
How long CDRs should be kept in the database
Keep_month=2
Keep_month_failed=2
```

Replication repair



For better understanding of the following material it is highly recommended to read the "Replication in MySQL" chapter from **www.mysql.com**, or follow the link:
<http://www.mysql.com/doc/R/e/Replication.html>.

In the most common situation, recovering the replication process after a fault resembles setting up replication from scratch.

You should follow the instructions in the "How to Set up Replication" chapter of MySQL documentation. But in our case, master database shouldn't be stopped.

Let's go through the procedure step by step:

1. Make sure slave database has stopped the slave thread

Logon to the MySQL slave database using the `mysql` command. At the slave server shell command prompt enter following command:

```
mysql -uroot -p<mysql root password> porta-billing
```

After that you will see the `mysql` command prompt. Query the slave server status by entering command:

```
show slave status;
```

MySQL displays the table with a status of slave replication.

Important: You should see 'No' as a value in the 'Slave_Running' column. If You see 'Yes', stop the replication process using this command:

```
slave stop;
```

2. Make master database snapshot

The MySQL distribution provides a special tool for this: 'mysqlhotcopy'. To use this tool, logon to the master server and at command prompt enter:

```
mysqlhotcopy --flushlog -u root -p <root password> porta-billing
```

After the program completes, you can find the `porta-billing_copy` database in your `mysql` data directory. Normally, the data directory is located at `/usr/local/var` or `/var/db/mysql`, but may vary by installation. Consult your `mysql.conf` or system administrator if unsure.

Now you have a fresh snapshot of your database.

3. Make archive of snapshot and copy it to the slave server

As `root` user, go to the `mysql` data directory.

Enter the following command:

```
tar czvf porta-billing.tgz porta-billing_copy/
```

This command creates an archive of the snapshot. Now it can be copied to the slave server. The best way of doing that is by using the secure copy tool 'scp':

```
scp porta-billing.tgz porta-admin@<slave server name>:
```



You will be prompted for the 'porta-admin' user password, and then the archive will be copied into the porta-admin user home directory on the slave server. With a provided username and password the archive can be stored in any user home directory. In a single server configuration, the secure copy tool is not necessary. The regular copy command can be used instead.

4. Remember the master binary logs position

Login to the master MySQL server and enter the command:

```
show master logs;
```

Remember the last `log_name` -- you will need it to start replication on the slave server later.

5. Restoring database from archive on the slave server

Logged in as 'root' on the slave server, unpack the archive file to the mysql data directory. To do this, simply `cd` to the mysql data dir and enter command:

```
tar xvzf <path to>/porta-billing.tgz
```

If you used the `scp` copy command as described earlier the `<path to>` may be replaced by the `~porta-admin`.

Delete old database stored in `porta-billing` directory:

```
rm -rf porta-billing
```

and then rename newly created `porta-billing_copy` to `porta-billing`

```
mv porta-billing_copy porta-billing
```

Check the permissions on the unpacked files. Normally all files and the `porta-billing` directory must be owned by the 'mysql' user. In a single server configuration it will be the 'porta-admin' user.



Note: The above described action doesn't completely agree with MySQL documentation, which instructs the user to dump the whole database to sql statements and then restore it on the slave machine. Performing such an action on the production database with a large amount of traffic could result in significant latency.

Resume replication

Logon to the slave mysql server using the `mysql` command:

```
mysql -uroot -p<root password> porta-billing
```

Recall `log_name` from the previous step and use it in the following statement:

```
CHANGE MASTER TO MASTER_LOG_FILE='<log_name>',  
MASTER_LOG_POS=4;
```

At this point the mysql server must be restarted for replication to continue. Following are the commands to stop and start mysql on a typical FreeBSD system.

```
/usr/local/etc/rc.d/mysql.server stop ;  
/usr/local/etc/rc.d/mysql.server start
```

On RedHat Linux systems the commands may be:

```
/usr/etc/init.d/mysql stop ; /usr/etc/init.d/mysql start
```

The location may vary depending on operating system. If in doubt, ask your system administrator.

To ensure replication has resumed, logon to the server and check slave status:

```
show slave status;
```

In the second row of 'Slave_Running' column you will see 'Yes'.