PORTA ONE

Porta Switch®

Handbook:

Wholesale and Traffic Exchange Services
Maintenance Release 24

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PortaSwitch® Handbook: Wholesale Services, March 2012
Maintenance Release 24
V1.24.10

Please address your comments and suggestions to: Sales Department, PortaOne, Inc. Suite #408, 2963 Glen Drive, Coquitlam, BC, V3B 2P7 Canada.

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Preface

This document provides PortaBilling® users with step-by-step instructions and examples for setting up wholesale services on a VoIP network.

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 between minor releases. The online copy of this guide is always up to date, and integrates the latest changes to the product. You can access the latest copy of this guide at: **www.portaone.com/support/documentation/**

Conventions

This publication uses the following conventions:
- Commands and keywords are given in **boldface**
- Terminal sessions, console screens, or system file names are displayed in `fixed width font`

The **exclamation mark** draws your attention to important information or actions.

NOTE: Notes contain helpful suggestions about or references to materials not contained in this manual.

Timesaver means that you can save time by taking the action described in the paragraph.

Tips provide information that might help you solve a problem.

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1. Setting up a Wholesale Traffic Exchange

This chapter will demonstrate how to set up a wholesale exchange platform, when you will be accepting calls from your customers (a customer in this context is a carrier, which terminates calls to your network) and sending these calls to the actual carriers, thus earning your profit margin on each call.

Please refer to the **PortaBilling Web Reference Guide** PDF file for detailed instructions on how to navigate and operate the web interface, as well as detailed explanations of particular fields.

Checklist

Print the following page and use it to check off the operations you have completed while performing system setup according to the instructions in this chapter. Please be sure to perform all of the operations (all of the boxes must be checked), otherwise the service will not work.

Operation	Done
General configuration	
Enter company data in My Company.	[ ]
Specify a base currency.	[ ]
For any other currency you plan to use, specify the exchange rate source and define exchange rates.	[ ]
Create all the required destinations you plan to serve.	[ ]
Network configuration	
Create a node for PortaSIP.	[ ]
Rating configuration (Vendor)	
Create a tariff A, which describes your termination costs and routing for the first vendor (make sure it has the **Routing** type!).	[ ]
Enter rates in tariff A for destinations you plan to terminate to this vendor.	[ ]
Create an off-net calls vendor A.	[ ]
Create a connection for this vendor using tariff A.	[ ]
Create any other vendors required.	[ ]
Rating configuration (Customer)	
Create route categories.	[ ]
Create a tariff B, which contains your selling rates to customers.	[ ]
Enter rates in tariff B for the destinations your customers will call.	[ ]
Create a routing plan which will be applied to your customers.	[ ]
Create a wholesale exchange product.	[ ]
Create rating entry for this product, using the PortaSIP node and tariff B.	[ ]
Account provisioning	
Create a customer class for your traffic exchange customers.	[ ]
Create a retail customer who will use the traffic exchange service.	[ ]
Create an account to authorize this customer.	[ ]
Testing	
Check the routing by using the **Test Dialplan** feature.	[ ]
Make a test call.	[ ]

Initial Configuration of PortaSwitch®

The following steps are normally performed only once, after the system is installed. Proceed as follows:

Visit **My Company** on the main menu. Enter information about your company and set up your base currency. Naturally, this does not limit your operations to this currency only. However, on cost / revenue reports and the like different currencies will be converted to the one you specify here.

NOTE: Once you set up a base currency it cannot be changed. If you make a mistake, you will have to start with a new PortaBilling® environment.

From the main menu, choose **Users** and create login entries for users who will be working with the system. It is not recommended that the default PortaBilling® root user (pb-root) be used for any operations other than initial setup. Make sure you are able to login as the newly-created user, and change the password for the pb-root user.

If you plan to do billing in multiple currencies, define them and specify exchange rates in **Currencies** section**.**

Create Destinations

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

- One-by-one, using the ⊞ **Add** functionality on the web interface.
- A bulk update, by uploading destinations from a file.

NOTE: PortaBilling® supplies a file with a set default destination, which you can download and then upload to the server. However, it is possible that your business requires different types of prefixes, so please check the data in the file before uploading.

Creating Destinations "One-by-One"

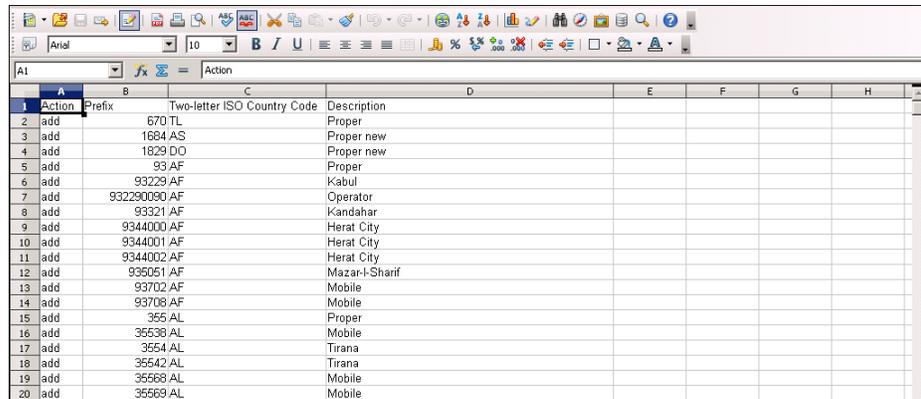1. In the **Rating** section of Admin-Index, choose **Destinations**.

2. Click on the ⊞ **Add** button.
3. Fill in the required information. This includes the phone prefix and country name. The country subdivision is optional. You can use the **Description** column to store extra information about the destination (for example, if it is a mobile or fixed number).
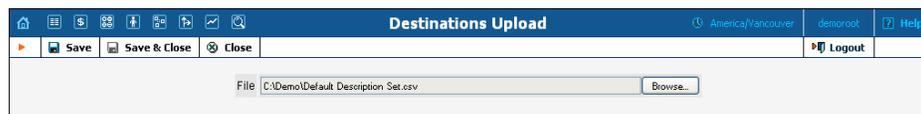

4. Click **Save**.
5. Repeat these steps for any additional destinations you would like to add.

Uploading a Set of Destinations from a File

1. In the **Rating** section of Admin-Index, choose **Destinations**.
2. Click on **Get default set** to download a 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 necessary.
4. Save the file and close it in Excel.
5. Switch back to the PortaBilling® web interface, and click ⬆ **Upload** on the Destinations screen.

6. Type in the filename for the file you have edited, or click on the **Browse…** button and select the file.
7. Click ⊟ **Save&Close.**

Create PortaSIP Node

Now you have to enter your SIP server and, optionally, other gateways as nodes. PortaBilling® requires some key information about your network equipment, such as the IP address, Node ID, Radius shared secret, and so on.

1. In the **Networking** 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** – a short descriptive name for your SIP server (this will be used in the select menus).
    o **Manufacturer** – select **PortaOne**.
    o **Type** – VoIP node type; select **PortaSIP**.
    o **Node ID** – PortaSIP® server's hostname (recommended: `hostname.domainname`).
    o **NAS-IP-Address** – the IP address of the PortaSIP® server.
    o **Auth. Translation rule** – leave this blank (you can use customer-based translation rules later to allow your customers to dial a number in their own numbering format).
    o **Radius Client** – Make sure this check-box is enabled, since the gateway (node) must be able to communicate with PortaBilling via RADIUS.
    o **Radius Key** – Enter the RADIUS secret key you have specified in the configuration of the gateway.

- o **Radius Source IP** – See the **Node ID, NAS IP address and Radius source IP** section in the **PortaBilling Administrator Guide** for more information. Unless your PortaSIP® server uses multiple network interfaces, the value here should be the same as the NAS-IP-Address.
- o **POD Server** – This checkbox relates to ISP billing. Leave it unchecked for now.
4. Click 🔲 **Save&Close**.

Create a Vendor Tariff

The tariff is a price list for calling services or for your termination costs.

1. In the **Rating** section of the Admin-Index page, choose **Tariffs**.
2. On the Tariff Management page, choose ➕ **Add**.
3. Fill in the **Add Tariff** form:
   - o **Name** – A short name for the tariff object; this is the name you will then see in the select menus.
   - o **Currency** – Indicates the currency, in which the vendor charges you.

NOTE: The currency for the tariff may be chosen only once, and cannot be changed later.

   - o **Applied To** – Choose **Vendor**, as this tariff describes your vendor's termination costs.

o **Routing** – Leave the box **Routing** checked, as this tariff will be used not only to calculate termination costs, but also to route SIP calls.
o **Service** – Choose **Voice Calls** here.
o **Short Description** – A short tariff description.
o **Description** – An extended tariff description.
4. Click 💾 **Save**.

Enter Rates in Tariffs with Routing Extensions

Rates define how a call to a specific destination will be charged (e.g. what the price per minute is, how to round off the total call duration, etc.). Please refer to the *Call Billing Parameters* section in the **PortaBilling Administrator Guide** for more details on available parameters for rating voice calls.

Managing Rates Online

Managing rates online is very convenient for maintaining existing rate tables, as well as for reference purposes. For new price lists or for major updates, importing the rates from a file is better.

1. On the Tariff Management page you will see a list of the available tariffs. Click the 📋 **Rates** icon before the name of the tariff.
2. On the **Edit Rates** screen, click ➕ **Add**.
3. Fill in the required information:

   o **Destination** – A destination prefix may be entered directly, e.g. **420** for Czech Republic, or you can access the destinations directory by clicking the **Destination** link (in the column header). Here you can find the desired prefix by country name.

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

- o **Route category** – You can split your available routes into several categories, such as "High quality", "Premium", and so on, and then create routing plans for your customers. Choose one of the previously created route categories applicable to this particular route.
- o **Preference** – Routing priority for the specific destination. 10 is the highest priority, 0 is the lowest (i.e. do not use destination for routing at all). For now, you can just set all of your vendor rates at preference 5, and the system will organize available routes according to cost (LCR).
- o **Huntstop** – Do not try any routes with a lower preference.
- o **Interval First** – first billing unit in seconds
- o **Interval Next** – next billing unit in seconds
- o **Price First** – per minute price for first interval
- o **Price Next** – per minute price for next interval
- o **Off-peak Interval First**– first billing unit in seconds for off - peak time
- o **Off-peak Interval Next** – next billing unit in seconds for off- peak time
- o **Off-peak Price First** – per minute price for first interval for off- peak time
- o **Off-peak Price Next** – per minute price for next interval for off-peak time

NOTE: Off-peak fields appear only if this tariff has already been assigned an **off-peak period** in the **Tariff Info** screen.

- o **Rate Formula Wizard** 🧰 – 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 in a date manually, or use the calendar (click on the DD-MM-YYYY link).

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

- o The **Payback Rate**, **Hidden**, **Forbidden** or **Discontinued** flags are optional.
4. Click the 💾 **Save** button in the toolbar, or the 💾 icon on the left side of the row.
5. Repeat these steps if you need to enter more rates.

Importing Rates from a File

Please see the *Rate Import* chapter on how you can import rates from a .CSV or .XLS file for complete details.

Perform the *Create Tariff* and *Enter Rates* steps described above until you
have created a tariff with the termination costs for each termination
partner you have; these tariffs are created as "Applied to: Vendor".

Create Vendors

Vendors are your termination partners, i.e. companies you send calls to.
1. In the **Participants** section of the admin interface, choose **Vendors**.
2. On the Vendor Management page, choose ➕ **Add**.

3. Fill in the **Add Vendor** form. Please note that there are three tabs
available on the screen. The most important fields are:

Main form (top)

- o **Vendor name** – short name for the Vendor object; this will be
used on the web interface.
- o **Currency** – the currency in which this vendor charges you.

> o **Opening balance** – starting balance for the vendor; the default is zero.

Additional info:

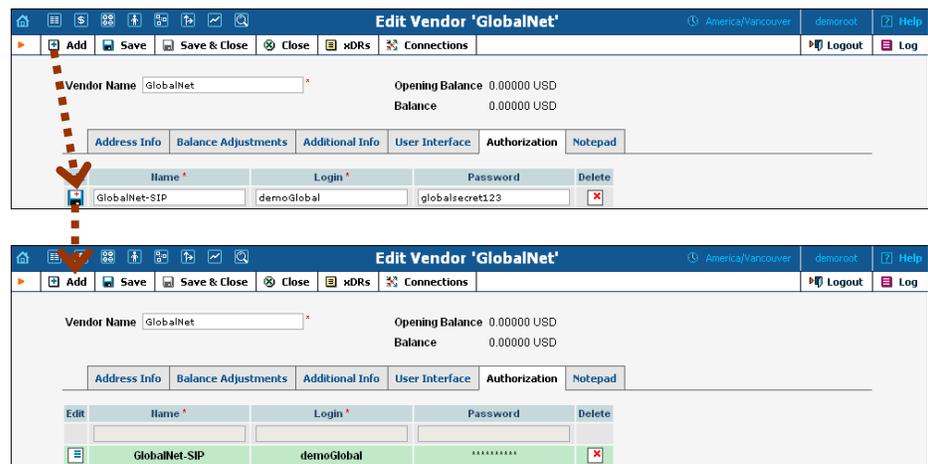> o **Billing period** – split period for vendor statistics.

User Interface:

> o **Time zone** – the time zone that the vendor uses for his billing period (when sending you an invoice). Statistics will be split into periods in this time zone, so your statistics will match the vendor's.

4. Click 🔲 **Save**. Three more tabs now appear on the screen.

When a call is sent from your network to the vendor's gateway, the vendor performs an authorization for the call. Authorization can be done based on your PortaSIP IP address (in this case you just need to supply that information to the vendor and no further action is required on your part) or the vendor can provide you with a SIP username and password to use for call authorization. These credentials should be stored in the "vendor authorization" info and then associated with a specific connection so they can be used during actual call processing.

5. In this case, to create the account for digest authorization of outgoing calls:

- In the **Edit Vendor** form click the **Authorization** tab, then click ➕ **Add** and enter the credentials provided by the vendor.
- Click the 🔲 **Save** button in the toolbar, or the 🔲 icon on the left end of the row.
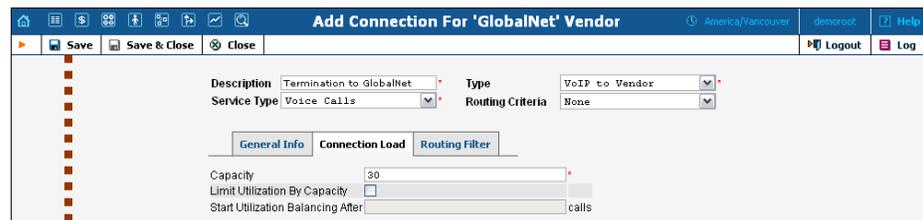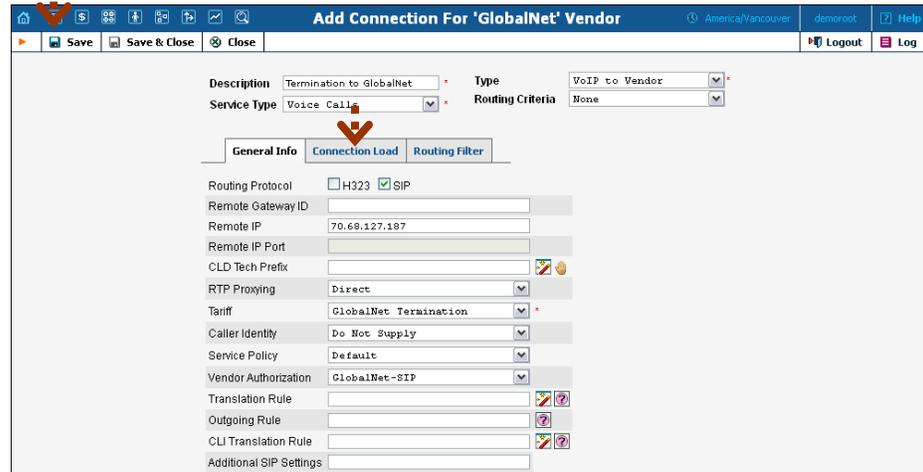

6. Click **Close** in order to return to the **Vendors** admin page.
7. Repeat steps 2-6 to add all of your vendors.

Define Connections

Connections are points at which calls leave or enter a network and are directed to or from vendors, whereby costing occurs.

1. In the **Participants** section of the admin interface, choose **Vendors**.
2. Click on the **Connections** icon next to the vendor name.

3. Press ➕ **Add** to add a new connection.
4. Fill in the connection information. Choose the type of connection (for a wholesale exchange platform, usually **VoIP to Vendor**) and enter the remote IP address (address of the vendor's gateway or SIP server).

Choose the tariff which defines your termination costs for this connection / vendor. **Description** and **Capacity** are mandatory for all connection types. For VoIP connections where you have been assigned a login name and password, choose the corresponding vendor authorization.

5. On the **Connection Load** tab you can configure load balancing. **Limit Utilization by Capacity** allows you to limit the number of simultaneous calls that are routed through the connection and the **Start Utilization Balancing After** parameter performs load-balancing using other connections (that would normally assume a lower position in the routing list) when the threshold of simultaneous calls is reached. Please consult the **PortaBilling Administrator Guide** for more information about Load Balancing.
6. Click 🖫 **Save&Close**.
7. Repeat steps 3-5 to add more connections to the same vendor, then click **Close** to exit to the **Vendor Management** screen.
8. Repeat steps 2-6 to add connections for other vendors.

Create Route Categories

Route categories are tags (e.g. Cheap or Premium) which you use to designate specific routes, so that later you can organize individual routing plans for your customers. It is possible to have a separate route category for every termination carrier, although this is not advisable, as it would make maintenance of routing plans quite complicated due to the large number of categories in each. The recommended method is to create several route categories (Low-cost, Normal, Expensive, etc.) and then assign each route to one of them.

1. In the **Routing** section of the Admin-Index page, choose **Route Categories**.
2. On the Route Categories Management page, choose ⊞ **Add**.
3. Enter the route category name and description.
4. Click the 🖫 **Save** button in the toolbar, or the 🖫 icon on the left end of the row.
5. Repeat steps 2-4 if you need to create more route categories.
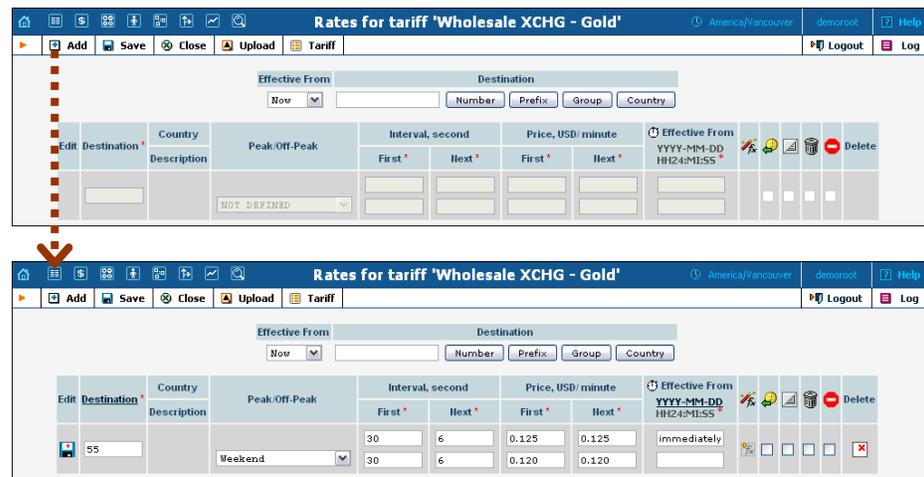
Create Customer Tariffs

1. In the **Rating** section of the Admin-Index page, choose **Tariffs**.
2. On the Tariff Management page, choose ⊞ **Add**.
3. Fill in the **Add Tariff** form:
    o   **Name** – A short name for the tariff object; this is the name you will then see in the select menus.
    o   **Currency** – Indicates the currency in which you charge your traffic exchange customers.

NOTE: The currency for the tariff may be chosen only once, and cannot be changed later.

    o   **Applied To** – Choose **"Customer"** in the **Applied To** field.
    o   **Managed By** – Choose "**Administrator Only**" here (this option is only visible after you select **Applied to: Customer** above).
    o   **Service** – Choose **Voice Calls** here.

PortaSwitch®

- o **Default Off-peak Period** – If you do not differentiate between peak and off-peak rates, just choose **Not defined**; otherwise, select one of the previously defined off-peak periods.
- o **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.
- o **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.
- o **Description** – An extended tariff description.
4. Click ![save] **Save**.

Enter Rates

1. While on the **Edit Tariff** page, click on **Rates** in the toolbar.
2. On the **Edit Rates** screen, click ![add] **Add**.
3. Fill in the required information:
   - o **Destination** – A destination prefix may be entered directly, e.g. **420** for Czech Republic, or you can access the destinations directory by clicking the **Destination** link (in the column header). Here you can find the desired prefix by country name.

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

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

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

NOTE: Off-peak fields appear only if this tariff has already been assigned an **off-peak period** in the **Tariff Info** screen.

o **Rate Formula Wizard** 🧰 – 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 in a date manually, or use the calendar (click on the DD-MM-YYYY link).

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

o The **Payback Rate**, **Hidden**, **Forbidden** or **Discontinued** flags are optional.
4. Click the 💾 **Save** button in the toolbar, or the 💾 icon on the left side of the row.
5. Repeat these steps if you need to enter more rates.

Perform the *Create Tariff* and *Enter Rates* steps described above until you have created a tariff for each billing scheme for your clients; these tariffs are created as "Applied to: Customer". For example, if you plan to have two types of clients (e.g. Silver and Gold) with different rates, you will need two separate tariffs.

Create a Routing Plan

A routing plan allows you to apply individual routing methods to certain customers, i.e. blocking them from using certain carriers for termination, or, conversely, only allowing them to use certain carriers in a specific order. If you do not define any custom routing plans, the system default routing plan will be used, allowing access to all available carriers.

1. In the **Routing** section of the Admin-Index page, choose **Routing Plans**.
2. On the Routing Plans Management page, choose ⊞ **Add**.
3. Fill in the "Add Routing Plan" form:
    o **Name** – The name of the routing plan.
    o **Selection Code** – The code your customers will dial before the destination number to select this routing plan.
    o **Description** – Your designation of the intended purpose of this routing plan.
4. Click **Save**.
5. Define which route categories will be included in this routing plan:
    1. Click the ⊞ **Add** icon on the **Included Route Categories** tab.
    2. Choose a route category from the list and define its order in the routing list. Higher numbers will be at the top of the routing list. It is possible to include two or more categories with the same order number; in this case, PortaSwitch® simply sorts the routes according to preference and cost. If you do not include a certain route category in the list, customers will not have access to any routes in that category.
    3. Click the 🖫 **Save** button in the toolbar, or the 🖫 icon on the left end of the row.
    4. Repeat steps 1-3 if you need to include more route categories.
6. Click the **Profit Guarantee** tab and define your settings:

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> **Choose only routes which guarantee profit** – If this checkbox is selected, vendors whose price per minute is higher than the selling price to the customer will be automatically removed from the routing list. It is highly recommended that you use this option for wholesale traffic exchange, as it may protect you from financial losses in the case of routing problems.

7. Click 🖫 **Save**.

Create a Product

Your wholesale customers' remote gateways are represented as accounts and are therefore billed according to the products you create for those accounts.

1. In the **Rating** section of the Admin-Index page, choose **Products**.
2. On the Product Management page, click the ➕ **Add** icon.
3. Fill in the "Add product" form:
   o **Product name** – Product object name.
   o **Currency** – Product currency; only tariffs which have the same currency will be permitted in the rating list.
   o **Managed by** – Choose **Administrator only** here, since we are setting up a service without the involvement of resellers.
   o **Breakage** – This parameter is typically used only for prepaid accounts, so leave it empty.
   o **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.
   o **Default Discount Plan** – Leave **None** as the selected entry if you do not plan to offer any discounted rates based on call volume.
   o **Description** – your comments about the intended use of this product.
4. Click 💾 **Save**.
5. On the **Services and Rating** tab, edit this product's rating list.

Enter Node and Tariff in the Product's Rating List

The rating list has two functions: it defines permitted access points (nodes and access numbers) and specifies which tariff should be used for billing in each of these points.

1. When the **Services and Rating** tab is selected, click on the ➕ **Add** icon.
2. Choose **Voice Calls** in the **Service** select menu.
3. In the **Add Services and Rating** window, select the PortaSIP® node and choose the appropriate tariff which applies to your customers when they terminate calls to your network.
4. The **Access code** or **Info Digits** fields only make sense when a call originates from your customer in a public telephony network. Therefore, just leave this empty for the SIP service.
5. Configure overdraft protection for this product on the **Overdraft Protection** tab. (Please consult the *Rating* section in the **PortaBilling Web Reference Guide** for a description of parameters available here.)
6. Click 🖫 **Save** to save this rating entry.

Create a Customer Class

Customer class provides the ability to define a group of parameters in a centralized way, then apply those parameters to many customers at once. (If you have already created a customer class that you can use for prepaid card distributors, skip this step and go to the next one.)
1. In the **Billing** section of the Admin interface, choose **Customer Classes**.
2. On the Customer Class Management page, choose ➕ **Add**.

3. Fill in the customer class parameters:

    - **Name** – Short name for this customer class.
    - **Currency** – Specify the currency in which you want to set the **Collection Threshold**. If specified, this customer class can only be assigned to customers with the same currency. Once the currency selection is saved, it cannot be changed.
    - **Send Statistics** – Select whether you want to send statistics to a customer.
    - **Invoice Template** – Select the appropriate template which will be used to create a PDF file with the invoice for your SIP customers.
    - **Send Invoices** – Check the box to automatically send an invoice to a customer at the end of the billing period.
    - Please consult the **PortaBilling Web Reference Guide** for a description of other parameters available here. For now you may leave these empty. If you change them later, these changes will automatically affect all customers who are already assigned to this customer class.
    - **Description** – Your comments about the intended use of this customer class.
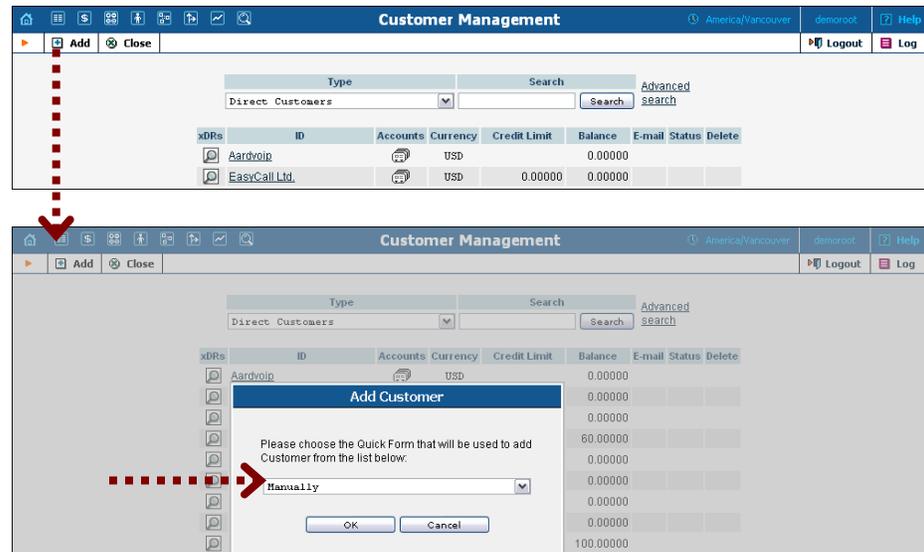
4. Click ☐ **Save&Close**.

Create a Customer

A customer is a company which sends you traffic for termination and pays you according to the amount of traffic sent. The customer's contact information is used to distribute account usage information, call statistics, invoices, and so on.
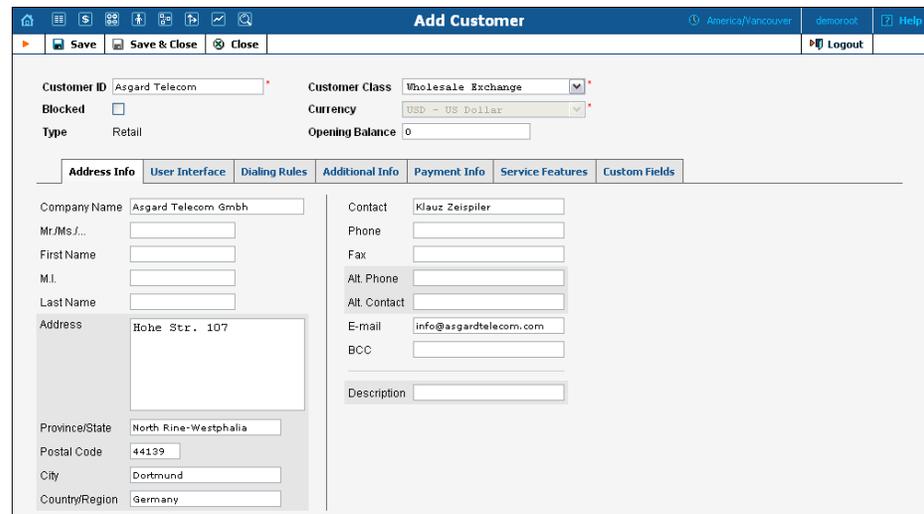
In this example we will describe how to create a new customer manually, without using a Quick Form.

1. In the **Participants** section of the Admin-Index page, choose **Customers**.
2. On the Customer Management page, click ⊞ **Add Customer** and choose **Manually**.

NOTE: If no Quick Forms have been created, you will go directly to the **Add Customer** page.

3. Fill in the **New Customer** form. Please note that there are several tabs with extra information available on the screen.

The most important fields are:

Main form (top)

o **Customer ID** – short name for the customer object; this will be used on the web interface.
o **Currency** – the currency in which this customer will be billed.
o **Opening balance** – a starting balance for the customer; the default is zero.
o **Type** – Since your normal wholesale traffic exchange clients send you calls and pay for them, they are your **Retail** customers. Even if they resell the traffic to somebody else, they are not resellers in PortaBilling®, since they do not manage their subscribers in your system.
o **Customer Class** – Customer class allows you to define a policy for automated payment collection. By choosing a specific class here the customer will automatically inherit all of the class properties (grace period, invoice template, etc.).

Address info tab

o **E-mail** – An email address for the distribution of accounting information. After the billing period is over, a list of xDRs and other statistics will be sent to this address
o **Bcc** – Blind carbon copy in email; may be used for debug and archiving purposes.

Additional info tab

o **Billing Period** – Frequency of invoice generation. For more details about the different available billing periods, see the **PortaBilling Administrator Guide**.
o **Send Statistics** – If you choose "Summary only", the statistics email will include only a brief call summary, without an attached details file; for most customers, the xDR file will be too large to send via email.

Payment info tab

o **Credit Limit** – For prepaid traffic exchange, enter 0 in this field, so that the customer can only send you calls after he makes a payment (deposit).
o **Balance Warning Threshold** – The customer can be notified by email when his balance is dangerously close to the credit limit and service will soon be blocked. Here you can enter the value for such a warning threshold. This can be entered:
- as a percentage (e.g. 90%). The warning will be sent when the customer's balance exceeds that percentage of his credit limit. So, if the credit limit is USD 1000.00 and the threshold is 90%, a warning will be sent as soon as the balance exceeds

USD 900.00. This is only applicable when the customer has a positive credit limit.

- as an absolute value. The warning will be sent as soon as the balance goes over the specified value. For prepaid traffic exchange, where the credit limit is zero, you can enter 100.00 here.

User Interface tab

o **Time Zone** – The time zone in which customer will see his xDRs and also that which defines his billing period. For example, if you choose **America / New_York** here and the billing period is **Monthly**, it means the billing period will start on the first day of the month, midnight (12 am) New York time.

o **Web Interface Language** – language to be used on the customer self-care web interface.

Dialing Rules tab

Here you should specify how the customer will be dialing phone numbers; you may also use one of the pre-defined examples. For instance, if your customer wishes to use a tech-prefix when sending calls to your network, you may describe this in the dialing rules. PortaSwitch® will then automatically strip this tech-prefix from all incoming calls from this customer.

4. Click 🖫 **Save**.

Create Accounts

Accounts enable authorization of the customer's actual end-points. There are two main types of applicable authorizations:

- via SIP digest (the most robust and secure method)
- via remote gateway (or proxy) IP address

In the following examples, we assume that you are using the SIP digest method. In the case of IP authentication, the only difference is that the account ID must be identical to the signaling IP address of the remote gateway / proxy.
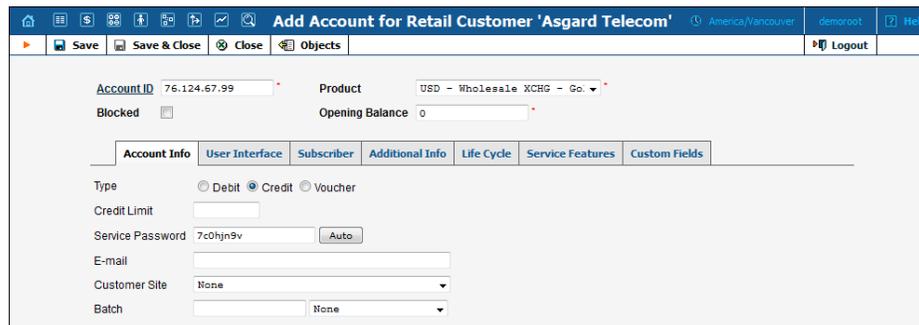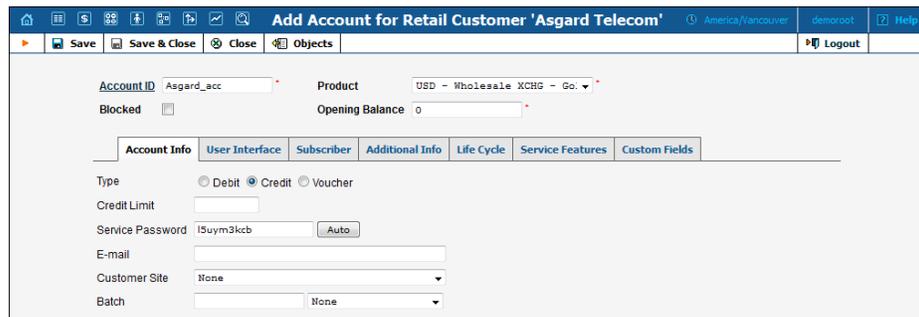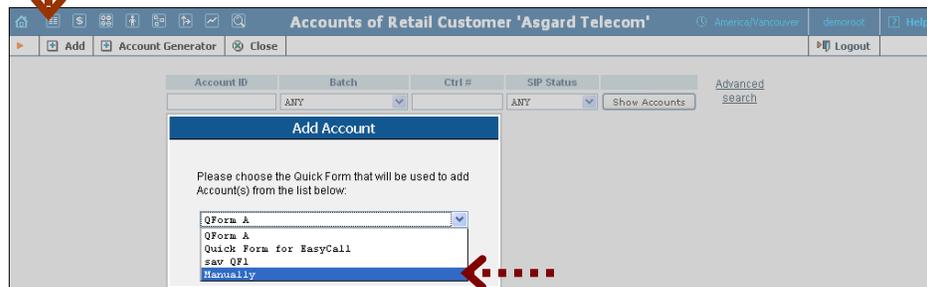
1. Go to the **Customers** screen (the one containing the list of customers). It should resemble the screenshot below.

2. Next to the customer name, click on the ⬚ icon (the one in the **Accounts** column) to go to the account management for that customer.
3. Click on ⊞ **Add**.
4. In this example, we assume that you are creating the account manually, so choose **Manually** from the drop-down menu (do not use any of the Quick Form options).

5. Fill in the "Add Account" form:
   o **Account ID** – SIP ID which will be used to authorize calls coming from the customer's SIP proxy or gateway, or the IP address for the customer's SIP proxy or gateway.

- o **Product** – Choose the previously created wholesale exchange product.
- o **Opening balance** – The initial balance on the account.

Account Info tab

- o **Type** – Select credit (yes, in general credit accounts are used for a post-paid service, but since credit limit is controlled on the customer level – you can set it up in such a way that customer will be working in the pre-paid mode).
- o **Credit Limit** – For wholesale services you would normally assign a credit limit on the customer level (to be applied to all of the customer's accounts), so you may leave the credit limit empty for individual accounts.
- o **Service Password** – The account ID and this password will be used to authorize calls. Make sure you choose a password which is difficult to guess or crack. In the case of IP authentication, it is especially important to assign a secure password for this account, so that nobody can misuse it. Use the **Auto** button next to the **Password** field to generate a secure password.
- o **E-mail** – Enter the account owner's e-mail address here. If he ever forgets his password for the web self-care pages, he will be able to reset it, and a new password will be sent to this email address. You can also just leave this field empty.
- o **Batch** – You normally don't need a batch for your wholesale customer (since there will only be a few of them) so you may leave that space empty.
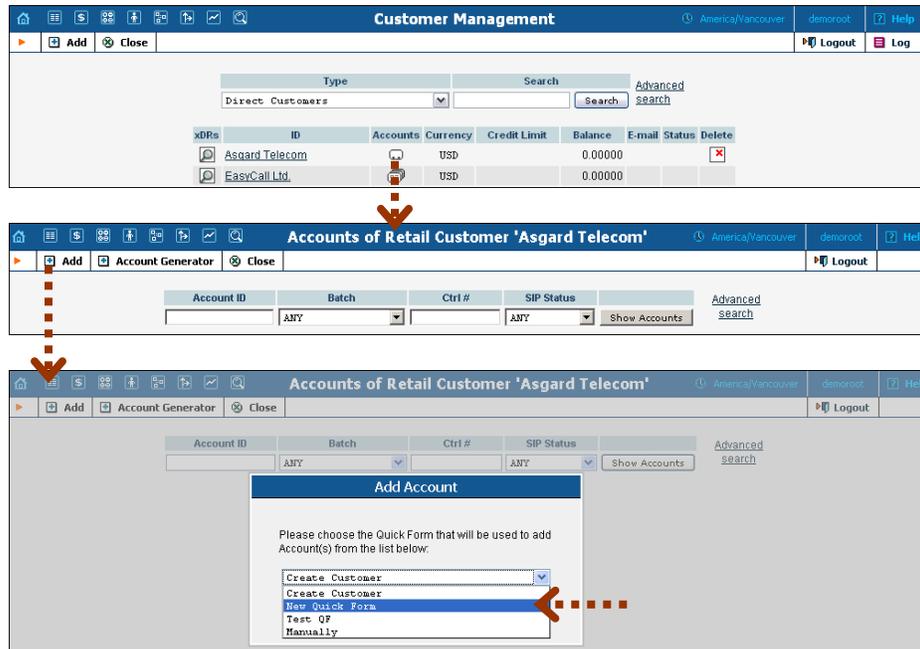
Life Cycle tab

- o **Activation date** – Account activation date.
- o **Expiration date** – Account expiration date; since we are setting up a postpaid service, which should function for a long time, leave this field blank.
- o **Life Time** – Relative expiration date; since we are setting up a postpaid service, which should function for a long time, leave this field blank.

6. After clicking 💾 **Save&Close**, you will see a confirmation screen announcing that a new account has been created.
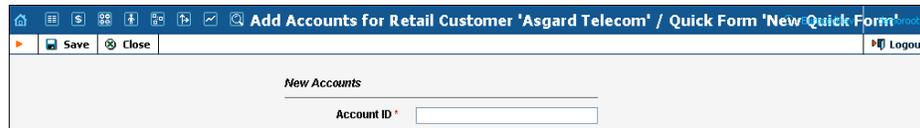7. Repeat steps 3-6 if the customer has more than one phone line (extension).

Creating a new Account using a Quick Form:

1. Go to the **Customers** screen (the one containing the list of customers).

2. Next to the customer name, click on the ⊞ icon (the one in the
    Accounts column) to go to account management for that customer.
3. Click on ⊞ **Add** and choose one of the available Quick Forms.

4. Fill in the "Add Account" form.

Set up Dialing Rules for a Customer (Optional)

Your customer may wish to use a custom numbering format, e.g. if his
VoIP system requires a tech-prefix for routing or adds an international
dialing prefix to a number.

1. On the Customer Information screen, select the **Dialing Rules** tab.
2. Select **Enable Dialing Rules** from drop-down menu.
3. Choose the load sample from the drop-down menu.

4. Click 🔲 **Save.**

Test Routing with Test Dialplan

You may check the routing in your system prior to actually making a phone call. This significantly simplifies troubleshooting, especially when test calls are to be performed by the customer, who may be not be available at the moment.

1. In the **Routing** section of the Admin-Index page, choose **Test Dialplan.**
2. Enter the destination phone number and choose a specific routing plan.
3. Click **Search** to display a list of applicable routes.

Test the Whole System

Make sure that the PortaBilling® Radius and PortaSIP® servers are running.

Configure the remote gateway or SIP proxy to send calls to your
PortaSIP® server (make sure the authorization username and password
are also configured on the remote side). Initiate a call and monitor the
results in PortaBilling®.

Check Log Files with SIP Log Viewer

You can browse the SIP log file from the PortaBilling® web interface
using a SIP log viewer, which offers added convenience: for instance,
automatically drawing call flow diagrams for you.

1. Choose the **SIP Log Viewer** item from the main menu.
2. Choose your PortaSIP® node in the **PortaSIP node** select menu and
   select the time interval on the right side of the screen. Now you will
   see all call attempts in that interval. Press the **Generate** button to
   produce a call attempts list.

3. To obtain a detailed log view, click on the call-id for the call you are
   interested in. In the lower frame you will see a detailed copy of all SIP
   messages in this call. The upper frame provides a call-flow diagram,

representing the main participating entities (SIP phone, SIP proxy, B2BUA, remote SIP UA, etc.) If you click on a particular dialogue element here, the lower frame scrolls automatically to display the corresponding SIP message.

Check Call History

If you want to see a list of all calls going through the system, or perhaps only ones for a particular destination, use the **Trace Session** function.

- In the Helpdesk section of Admin-Index choose **Trace Session**.
- Fill in the check phone number form:
  - o **h323-conf-id** – if you need to trace a specific call, enter h323-conf-id here; otherwise leave this empty.
  - o **Rate Pattern** – the phone number you are looking for or a destination pattern (first digits and a percent sign, for example **44%**).
  - o **From, To Date –** the date range. Click on the "10 min." icon to limit the time interval to the last 10 minutes only.
- Click **Search Session.**

For the administrator's convenience, account xDRs may also be accessed from the Account Management window by clicking the **xDR** icon for the account.

2. Routing Info - LCR Blending

In a multi-carrier environment where every termination partner offers different prices to the same destinations, it can be a challenging task to come up with a proper (profitable) price list for your resellers and customers. This is because you have to consider the price of every carrier while making decisions on how exactly to charge end customers. Further, you might use different routing plans for different products, which requires precise pricing in order to avoid losses on cheap calls via expensive premium vendors. So it all seems like a not so easily manageable task. PortaBilling®, however, incorporates an LCR blending report tool, which is just what you need to deal with these issues.

NOTE: This type of report is available for root and admin users only.

The Goal

The ultimate goal is to analyze the available routes, calculate the average termination price for each destination, and then use this as a basis for computing the rate for a given customer. The most important step is to "blend" the prices of different vendors according to a realistic scenario. For example, if there are three available carriers for destination 4471, with rates of $0.12, $0.18 and $0.30 per minute, calculating just a plain average (0.12 + 0.18 + 0.30) / 3 = 0.20 would be incorrect, since it assumes that each of these carriers gets an equal share of traffic. Since you are using a real-time routing engine in PortaBilling®, you will be utilizing least-cost routing and other features so that the cheaper carrier will get more calls, thus increasing your revenue. As a result, the cheaper carrier's rate will have a bigger effect on the average termination price.

Therefore, routes are assigned "weight" parameters, where the weight reflects the share of calls going to this route compared to the other routes. In our example above, we may assign a weight of 80 to the first route, 15 to the second one, and 5 to the third (thus assuming that calls are distributed 80% / 15% / 5% between the three vendors). As a result, the average termination price will be $0.138 per minute.

Create a Report

You can easily access this type of report from the main page of the web interface – just follow the Custom Report link:

1. On the **Custom Reports** management page, click ⊞ **Add.**
2. Select the "Routing info – LCR blending" report type, then click 💾 **Save**.

3. Once the report type is saved, new configuration options are available – "Input Parameters" and "Output Data":

Let's have a closer look at the input & output parameters we can configure:

List of Input Values:

Name	Mandatory	Range of values	Description
Routing plan	Y	Available routing plans; "All available routes" by default	Produce a routing list according to the specified routing plan.

Use only Destination Prefixes	Y	Destination pattern	The available options are: • **Matching the Pattern** – Produces a routing list only for a specific destination, e.g. 49%. To produce a list of all available destinations, use %. • **From a Destination Group Set** - Produces a routing list only for destinations available in the specified destination group set (which can be selected from the drop-down list). • **From an Existing Tariff** – The report will only include destinations present in the specified tariff. The tariff can be chosen from the drop-down list.
Date	N	Date + time; by default – empty	Calculate routing at a specified time (if empty, use the current time at report generation).
Number of routes	Y	Numeric up to 10; default – 3	How many routes (from all available routes) should be displayed for each destination.
1st route weight	Y	Numeric	How often this route is used; e.g. if the first route has a weight of 80 and the second, 20 – this means that we assume that, on average, 80% of calls go via the first route. Note: weight is not a percentage; rather, it is the number of calls which go via this route during the sampling interval. So, if you enter 7 for the first route, and 3 for the second, it means that, on average, for every 10 calls 7 calls will go

			via the first route and 3 will go via the second (or 70 / 30% split). Of course, you can enter the actual percent values here; e.g. in this example, you can achieve the same result by entering 70 and 30.
Nth route weight	Y	Numeric	Same as above, for **1st route weight** field.
Currency	Y	List of "available" currencies (base + ones with a defined exchange rate)	By default the base currency should be selected.
Selling rate markup, %	N	Numeric, can be negative; by default, empty (0)	Percentage to be added to the average vendor destination price as your profit.
Compare with Tariff	N	List of available tariffs; by default, empty	The list produced and its price will be compared with the selected tariff (use only if you need to compare the result with some existing tariff; if not, leave this blank).

List of Output Fields:

Column	Description
Destination	Phone number prefix of the destination.
Country	Country corresponding to the current destination.
Description	A short description of the specified destination.
Route N vendor	
Route N price	
Route N, %	
Aggregated Price	Average price to the specified destination.
Suggested Sale Price	Suggested price calculated in accordance with the selling rate markup.
Tariff Destination	The destination in the tariff that was chosen for comparison.
Tariff X price	The price for this destination in the specified tariff.

Tariff <X> difference	Difference between "Tariff_x_price" and the suggested sale price.

Behind the Web Interface

How are all the things mentioned above compiled into a human-readable report? Let's assume we are generating an LCR blending report for all available routes where the "Destination pattern" is 44 (Great Britain), "Number of routes" is 2, and "1st route weight" is 80% (or just 80) while "2nd route weight" is 20%.

When the Execute button is pressed, the system finds all vendors who can terminate a call to the destination defined in the report parameters. Prices from all matched vendors' tariffs with a destination like 44% are fetched and processed in accordance with the defined "route weights" for each available vendor.

NOTE: If you set "Number of routes" to 2, all other routes available for that routing plan will be ignored. So the best way to get a clear and correct report is to set the "Number of routes" parameter equal to the number of route categories included in that particular routing plan.

The next step is to calculate the average price for all the vendors involved. In our example, 8 out of 10 calls will go to the 1st route (we set its "weight" at 80%). Then all the gathered data is analyzed and the average price is calculated. The 1st vendor's price will have the highest "priority" in the calculations, to reflect the fact that it will be the most used.

NOTE: When calculating the aggregated price only vendors are taken into account, not connections. This helps to prevent a situation when one single vendor with 5 gateways (5 different connections – same price) occupies a whole list of routes where we have specified displaying only 2 routes. In such a case, the "aggregated price" will be equal to this vendor's price, which is not correct.

Additionally, the percentage defined as "selling rate markup" is added to the average destination price calculated during the previous step to form the recommended selling prices for each destination matching the 44% pattern.

The final step is to display the prices of an existing tariff next to the new ones produced by the LCR blending report (if you have specified a tariff for comparison when configuring the report).

How to Manage LCR Blending Reports

When a report has been configured and saved, two additional tabs appear. These tabs are related to effective management of this specific report.

Schedule tab

This allows you to run a report in "unattended" mode, and may be configured to run this report at any time on any date. Additionally, this can be done as a periodical task with daily, weekly and monthly intervals. You can schedule this report to run on a weekly basis at 1:00 pm on Fridays, so that by the time your weekly meeting is over, the report will be compiled and ready for review:

To create a new periodical task, click ⊞ **Add**.
1. **Start time.** Date and time when the report should be produced. You may use the **YYY-MM-DD HH24:MI:SS** link (in the column header) to easily access the calendar and assign a start date.
2. **Periodic**. Specifies whether the report should be produced only once, or generated every day, week, or month. Use the drop-down menu to select the desired interval. Add an interval if you want this report to be periodic. The possible values are: daily, weekly, monthly.
3. **Last run**. The date when the report was last executed (if applicable).
4. **Status**. Current status of the report. Waiting - Report execution has not started yet, and is scheduled for the future. Completed - The report was to be executed only once, and this has already been done. Running - The report is currently being produced.
5. **Suspend**. Allows you to temporarily disable report execution (but not delete the entry from the report schedule). This may be convenient if you are leaving for vacation and would like to avoid having reports pile up in your inbox during your absence.
6. Click the 🔲 **Save** button.

NOTE: Start time specifies only the preferred start time for the report. Report execution will not start earlier than the specified time, but it may start later if there are some other conflicting tasks at that time. For instance, if two reports are scheduled to be executed at 6:00 am, only one of them will start at that time, while the other will start after the first one has finished.

Reports tab

This tab allows you to browse results for up to ten previous report executions stored in CSV format. Thus you do not have to run the reports

again if you did not save the original result. Click on the icon to see the corresponding file.

When & How to Use

New routing plan created

One example of cases in which this report is applicable is a situation where you have created a new routing plan for premium customers, and need to generate a price list to bill calls accordingly. For providing services to the most demanding premium customers, you will most likely be using a special routing plan like "Premium". This will definitely include the most expensive and most reliable vendors with the highest ASR and sound quality. When the new routing plan is ready to use, you will need to have an appropriate tariff & product to make use of it. Please refer to the Voice Services section in the **PortaBilling Administrator Guide** for more details on how to configure routing parameters and routing plans.

It is then time to start using LCR blending reports. They can save you a lot of time, since recommended prices are generated automatically according to route analysis and routing cost. Open the Report template and enter the appropriate data in all the necessary fields on the Input Parameters tab and, if needed, the Output Data tab as well. See the *List of Input* and *Output Values* above for a detailed description of all the available fields. As you are not comparing any tariffs, in this case you may leave the **Compare with Tariff** field blank. This report will use the following input parameters:

- o **Routing plan** - Premium
- o **Use only Destination Prefixes** – Matching the Pattern "%" (meaning every available destination)
- o **Number of rotes** – 3 (there are 3 vendors in the routing plan)
- o **Weight of route 1** – 80% (you assume 80% of calls will go to this vendor)
- o **Weight of route 2** – 15% (you assume 15% of calls will go to this vendor)
- o **Weight of route 3** – 5% (you assume 5% of calls will go to this vendor)
- o **Selling Rate Markup** – 8% (expected profit margin)

o **Currenc**y – US Dollar
o **Compare with Tariff** – skipped for now

NOTE: You need to select a newly created routing plan in the "Routing plan" field in order to have the correct results, since by default the "All available routes" option is selected.

Press Execute in the upper toolbar when you are ready. This is a rather large report, so it can take a while to produce the result, which will open in a new window:

How to read it

When you created the "Premium" routing plan you included 3 vendors in it. All of them have a different priority, so that the first one will handle the vast majority of calls (since it is first on the list, with the highest priority), while other vendors will have the opportunity to terminate a call in case the first one fails to do so for some reason. This first vendor's info is shown as Route 1 and as Route 1 Price on the LCR blending report results page. The Route 1 price will be the basis for the suggested sale price, since you will be sending about 80% of calls to it. In spite of possible differences in prices, the Route 2 and Route 3 prices will have less influence on the resulting sale price, since you will be using those vendors mostly as a failover solution.

The results page provides you with a routing and price data overview for each of the 3 vendors. The most important columns are:
o **Destination** – destination phone prefix.
o **Route 1 %** – you assume that on average 80% of calls go via the first route.
o **Route N %** – you assume that on average x% of calls go via the Nth route.
o **Route 1 Price** – the price vendor 1 charges you for calls to that destination.

- **Route N Price** – the price vendor N charges you for calls to that destination.
- **Aggregated Price** – the average price of all vendors combined, with each route's weight taken into consideration.
- **Suggested Sale Price** – the aggregated price + 8% (which you have defined as the selling rate markup).

Modifying the report format

As the only intention is to generate a profitable price list, and no routing analysis is needed in this case, you can hide some unnecessary data.

In the Visible column, un-tick the checkboxes next to the unneeded elements to prevent them from showing up on the results page (in this example, only "Destination", "Description", "Suggested sale price" are left).

There is also a post-processing rule. Here you can define a Perl regular expression which will accordingly rewrite the original values.

The report results page will look like this (no extra data, just destination and price):

Destination	Description	Suggested Sale Price
12		1.08000
1242	Bahamas	1.08000
1242357	Bahamas - Mobile	1.08000
1242359	Bahamas - Mobile	1.08000
1242375	Bahamas - Mobile	1.08000
1242376	Bahamas - Mobile	1.08000
1242395	Bahamas - Mobile	1.08000
1242422	Bahamas - Mobile	1.08000
1242423	Bahamas - Mobile	1.08000

After successful completion, the system will email the report to the addresses defined on the **Query Info** tab, and you can also download it from the results page. Click Download on the upper menu bar and choose the location where you want to save it. Now, having the LCR blending report in a CSV file, it is a matter of just a couple mouse clicks to convert it into a profitable price list.

Quick way to check and redesign existing tariffs

In addition to the information about routes and the suggested price list for the selected routing plan, an LCR blending report can compare its suggested price with a specified existing tariff. It may be helpful to compare your current prices for different end-user groups with those computed with the help of the LCR blending report, and to modify the existing tariffs, if needed.

Before starting report compilation, simply define the tariff you wish to compare the report's results to on the Input Parameters tab, and then execute the report:

Destination	Description	Aggregated Price	Suggested Sale Price	Tariff Destination	Tariff Price	Tariff Difference
12		0.00000	0.00000	12	0.00000	0.00000
1242	Bahamas	1.00000	1.08000	12	0.00000	-1.08000
1242357	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242359	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242375	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242376	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242395	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242422	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242423	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242424	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242425	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242426	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242427	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242428	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242429	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000
1242431	Bahamas - Mobile	1.00000	1.08000	12	0.00000	-1.08000

With a tariff defined, the results page will have several new columns:

- o **Tariff Destination** – the corresponding destination in the tariff that was chosen for comparison.
- o **Tariff Price** – the price to make calls to this destination within the defined tariff.
- o **Tariff Difference** – the difference between the recommended sale price and the current price in the tariff.

Fields like "Route N Price" and "Route N %" have been excluded from this report to give you a clearer view of the new columns on the results page.

Tariff upload

Uploading vendors' tariffs is not a problem, since vendors themselves provide you with a file containing all the destinations and prices. In case this is your own tariff, you will need to create such a file yourself. If the suggested sale price suits you, you can create a new tariff and easily upload rates for it, using a CSV file with report results as a template. Refer to the "Rate Import" chapter of this guide for more information about uploading rates.

NOTE: You must have at least the **Destination** and **Suggested Sale Price** data fields visible to be able to use a CSV file for tariff upload.

Summary

The LCR blending report is a tool primarily designed to display routing options for each destination and produce a suggested selling price. It creates a list of available routes for every destination and presents them in a form that allows easy calculation of "blended" route pricing.

3. Rate Import

When operating as a VoIP service provider, you will routinely receive rate updates from your partners. Each carrier may send you updates as frequently as several times per week, so you can expect to need to work on uploading new rates daily in order to keep your rating and routing consistent. Obviously, you want to be able to upload the files you receive and let the system process them automatically, instead of entering each rate manually.

Upload Rate Data Into a Tariff

Unfortunately, each carrier uses a different format for rate presentation: some use CSV files, while others use Microsoft Excel format; the layout of columns in these files usually varies; some carriers will provide phone numbers in E.164 format, while others will provide them in the local dialing format. If you were to process the data in each file individually so as to convert it into a format acceptable to your system, it would require a fair amount of manual processing each day, and might result in data errors.

PortaBilling® offers the ability to program data processing rules (called templates) for each type of rate file you receive, so that you can eliminate the need for any manual data conversion and save yourself a lot of time. Also, the rate upload process is interactive and provides a comparison between new rates and existing ones, so that you can review the rates being uploaded for validity and accuracy.

Let's have a look at how a rate import is performed. We will perform the rate upload for the "X-Telecom" termination tariff, proceeding step by step. You can then use this as a model for uploading any other tariffs.

NOTE: In PortaBilling®, the proper name for the initial portion of the phone number (used to determine which location or type of phone network this number belongs to) is **destination** (e.g. 44 for the United Kingdom and 442 for London, United Kingdom). In the VoIP business the same entity is frequently called **prefix** – so we will use these terms interchangeably.

Start the Import

1. On the Tariff Management page, click on the tariff name.
2. In the Edit Tariff window, click the ▲ **Upload** button. You will see a screen like the one below:

Let's now discuss the available options and their effect.

Add or replace rates

This radio button controls behavior in respect to rates which were already defined in the tariff at the time of import. The default is to **add** new rates into the tariff. So when the new rates appear, and there is an existing rate for a certain prefix, the new rate will simply override the old one. If a rate for a certain prefix is in the tariff but is not given in the file you received from the carrier, it will stay unchanged. This mode is frequently used, since most of the time your partners will send you rate updates only, i.e. the file will contain only a small subset of prefixes for which the price has changed.

In some cases, however, you need to ensure following import that the tariff structure matches the provided file exactly, so that there are no "old" rates remaining. This is normally done when your carrier changes the structure of the prefixes and sends you a "replacement" rate update. In this case, you will want to use **replace** mode, which uploads all the new rates and then marks rates for all prefixes not present in the uploaded file as discontinued.

NOTE: To prevent a situation where some rates would be discontinued erroneously because a new rate was not uploaded due to a data error (e.g. a typo in the price column), discontinuation of rates will take place only if there were no errors in uploading the new rates.

In our example, we assume that a normal, "incremental" rate import is being used; thus we will be **adding** rates.

Effective from

PortaBilling® allows each rate to be assigned an "effective from" date, so that an automated rate change can be easily scheduled for the future. Thus if your carrier sends you a file which indicates the date when a specific rate becomes effective, this can be extracted from the file and added to the rate information in PortaBilling®. Sometimes it may happen, though, that you receive the file later than expected, when the moment at which

the rate was supposed to become effective has already passed. In order to protect data integrity, it is impossible to upload the rate and assign an "effective from" date in the past, since CDRs for calls previously made will have already been rated according to the old rate and stored in the database (see the xDR rerating topic for more information about how this situation can be resolved). By default, a rate entry effective from a date in the past will be rejected and not inserted into the tariff. Alternatively, you may choose to insert these rates into the tariff, but effective from the current moment; to do so, please tick the appropriate check-box.

Skip duplicate rates

Sometimes carriers will include all prefixes in a rate update file, even if for some of them no change in pricing has occurred. If you upload the whole rate file, it will create duplicate rate rows. This has no effect on the way calls are billed, but it will increase the amount of entries in the rate table and, in the long run (if it occurs continually), have a negative effect on performance.

In order to prevent this, simply activate the option to skip duplicate rates. This will slightly increase the time it takes to upload the whole rate file (since PortaBilling® will have to check the already existing rates and compare them with the new ones). If rate parameters such as price, preference, and so on turn out to be identical, no extra (excess) rate will be inserted. We use this mode in our example (and certainly recommend using it whenever possible).

Finally, choose the rate file and click **Next**. The file is uploaded to the server, and we move on to the next step.

Review File Parsing

The purpose of this screen is to verify that the general structure of the file has been determined correctly, so that the data can be properly extracted. There are different ways to organize data files: for instance, CSV files, despite their name (comma-separated values) can use semi-colons or other characters as a separator. PortaBilling® attempts to make a best guess, but it is important to review the results and, if necessary, change the settings according to your preference.

Multiple prefixes in the same cell

Typically one row in the table contains the rate information for a single phone prefix (destination) such as 447 or 447527. Sometimes you may receive a file from the vendor where multiple prefixes are placed in the same table cell as shown in the screenshot below.

You can easily process such files – you just need to specify which character (e.g., comma (,), semicolon (;) or something else) will be used to separate the individual prefixes in the **Delimiter For Multiple Destinations** field. This way, during the upload, the system will treat each occurrence as if there is a separate row in the table for each prefix.

In our case, it looks as if the file was parsed properly, so we can click **Next** and move on to the next step

Review Data Fields Definition

This is a very important step, since we need to identify where individual data elements (e.g. destination prefix or price) are located in the file, and map them to the attributes (data fields) for the rate. You can imagine what would happen if the system were to confuse them.

PortaBilling® applies some artificial intelligence, and usually guesses quite well where the specific columns are; but, obviously, you need to check whether the data fields have been assigned to the proper columns, and adjust them if necessary.

On the right you see the **Available Fields** select menu, which represents all the attributes of the rate record. You can drag and drop fields from here to the table headers in order to associate a particular data field with a column. A blue label will then remain at the top of the column, signaling that the values in this column (e.g. column A) will be used for the specified rate data field (e.g. **Destination**). Also, the data field in the list will be highlighted – this allows you to quickly see which data fields are already assigned.

You can also drag a label to a different column (thus associating the data field with a different column) or back to the **Available Fields** menu (the data field will then not receive any input values from the file).

The **Format** select menu allows you to adjust the way PortaBilling®
interprets the values in the table cells, e.g. whether a leading 00 should be
stripped off or considered part of the phone prefix, or whether a comma
(,) or a dot (.) should be considered as a decimal separator for numbers.

Finally, you have the post-processing rule. Here you can write a mini-
program in Perl which will alter the original value, e.g. append or remove
characters, increase or decrease numeric values. It can also perform
advanced operations, e.g. look up the current exchange rate for the
vendor's currency and convert the value into the currency you use.

What if the file does not contain a value for a certain data field?
This is another common situation: the carrier may not have included
some important information (e.g. rounding intervals) in the file, or it
could be that you simply need to assign the value based on your own
decision (e.g. when uploading rates from carrier ABC, you will mark them
as the Cheap route category). In this case, you may leave the data field
unassigned to any column in the file, and simply type a value in the
Default Value field.

**What if you need to associate a single column with more than one
data field?**
For instance, the carrier only supports a single "rounding interval" rating
parameter, and so they provide a single column only (column D, in our
example). In PortaBilling®, however, you have **First Interval** and **Next
Interval**. In this case, you will associate one data field with the column,
and then click on the other data field and link it to the first one (select the
first field name in the **Link With** menu).

What if you want to "preserve" some of the already assigned rate attributes?

Quite often you will initially upload all the rates from a given carrier with a default preference (e.g. 5) or route category (e.g. Default). After that, you start to fine-tune your routing based on quality reports, testing, customer feedback, and so on. Let's assume that, in this particular vendor's tariff, the preference for prefix 44 was changed to 8 (to reflect the fact that this is our preferred vendor for this destination) and the preference for prefix 447 was changed to 3 (here we actually decided to move the vendor to the bottom of the routing list for this particular destination). Now, if we were to simply upload the rate file, it would assign the default value (5) for preference to all the new rates, and our subsequent routing adjustments will be lost.

To prevent this, you may specify that the default value should only be applied if there are no existing rates for this prefix in the tariff.

Thus the parameter value from the existing rate will be copied into the new one, so that the new rate for 44 will retain preference 8, and the rate for 447 – preference 3.

Tip: In PortaBilling® you configure the rate information using two parameters: the price for the first interval (**First Price**) and the price for subsequent intervals (**Next Price**). Most of the wholesale carriers do the rating using only one parameter: price per minute. So when importing such a file into PortaBilling® you would need to assign the **First Price** data field to the column that contains the price and then link the **Next Price** to it. Since it is a very common operation, for your convenience the rate import wizard contains a special data field: **Price**. If this "virtual" data field is assigned to a column, then the value found there will be used for both **First Price** and **Next Price** rate parameters.

Ready to move forward?

In order to proceed, you must assign the **Destination** and **Price** data fields to columns in the file.

The **Destination Description** field is not required for the actual rate import, but it will be very useful later on if there are any new destinations created.

Tip: In order for the destination description to be *automatically* filled in it is needed to create a "**Destination Description**" column and fill in some descriptive information in the file before the upload procedure.

Click **Next** to proceed.

Review Rate Information

The rate import wizard will process the rate data according to the rules previously specified and present the results on the screen for review before storing them in the database.

The **Status** column shows the comparison between the current rate and the new rate in the PortaBilling® file so you can quickly understand exactly how the rate will change. A red arrow indicates a price increase (this destination is more expensive) and a green arrow indicates a price decrease (making it cheaper to call that destination). In **Price** field you can also view the actual price differences.

You can edit the rate data right here (for instance, you negotiated a special last-minute rate change with the carrier or wish to fix a data error in the file) – just double-click on the specific cell in the table and enter a new value.

As you can see in the screenshot, for the 447 destination, the price per minute has increased by $0.01. Also, the value of the **Preference** parameter of this rate is 3 (while most other rates have preference 5) – this is because there is an existing rate for this destination, and it is already assigned preference 3.

Click **Next** in order to proceed.

Managing New Prefixes

This screen only appears if the rate file contains any prefixes you haven't yet defined in your system and it allows you to add new prefixes quickly and efficiently. This process takes a very little time and reduces the chances for error.

Carriers frequently send rate files containing prefixes that have not yet been defined in your system. These prefixes must be added into the system in order for rates to be created for them – so the big questions are: 'how will this affect the routing and billing on your system in general?' and 'how will other carriers and customers be affected?'

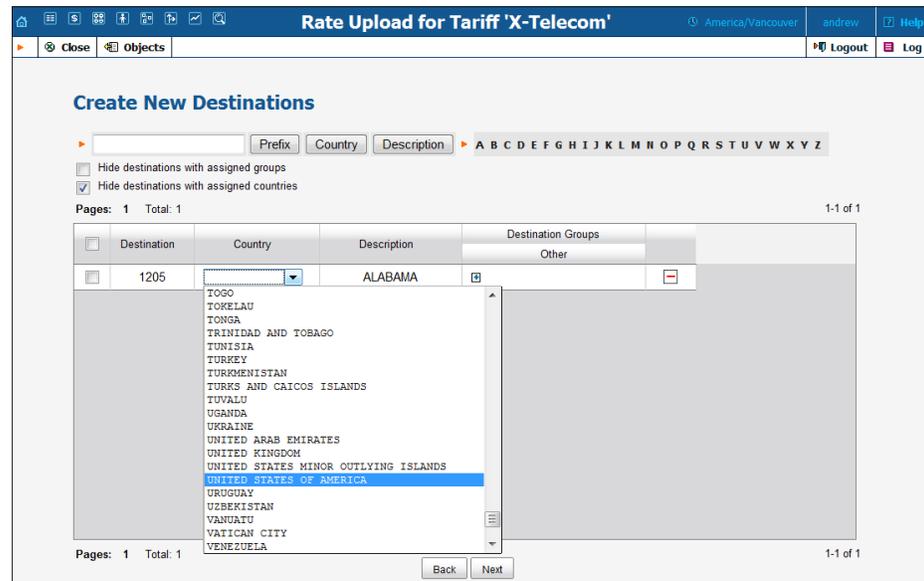When adding a new destination, extra parameters may be provided in addition to the actual prefix - see below.

Assigning the country

Each destination is associated with a country. For a new destination the association has to be made before it can be inserted into the database. It is a good idea to upload the default set of destinations provided with PortaBilling®, or some other set that contains, at the least, destinations for each country, e.g. United Kingdom – 44, Germany – 49, etc. Then PortaBilling® can correctly assign the country name to the majority of new prefixes. Thus you do not need to choose the country for *each* destination manually (e.g. if you try to upload a destination 33040, but there is already a more generic one 33 in the system and the country has been defined as France – the upload wizard will propose assigning the number 33040 to France as well). If required, a country for the new destination may be chosen from the drop-down list on the **Create New Destinations** page.
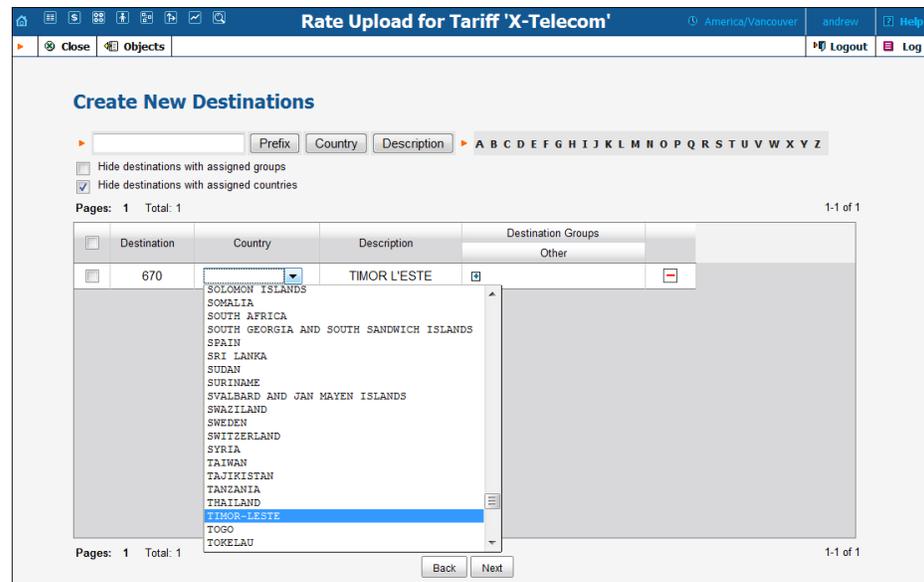
NOTE: This is a required step – the rate import cannot proceed until each of the new prefixes has been assigned to a country.

Sadly, both the US & Canada pose the biggest challenges, since they (plus a handful of other countries, like Bermuda) share the prefix 1. This makes it impossible to guess the country code just by looking at the phone number. For instance, 1204 is Manitoba, Canada and 1205 is Alabama,

US! In these cases you will need to manually assign country codes for these destinations. The good news is that new area codes for the US & Canada do not appear that often.
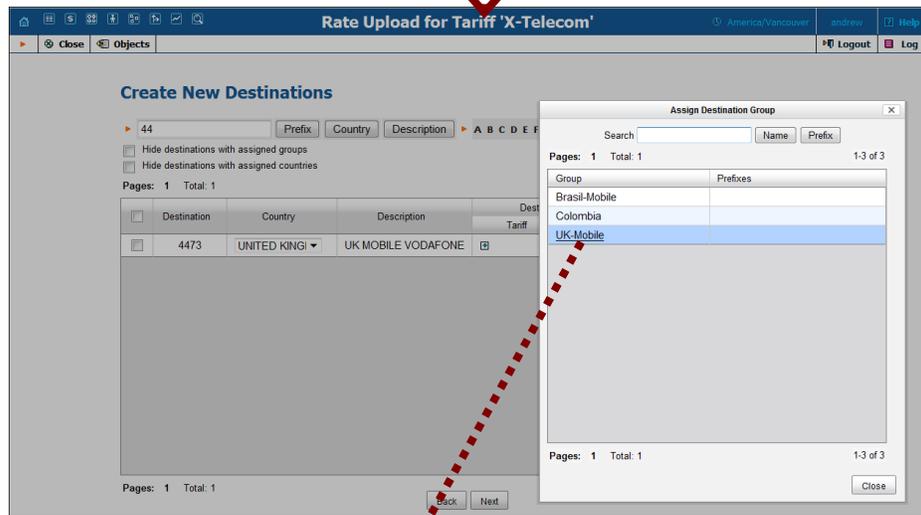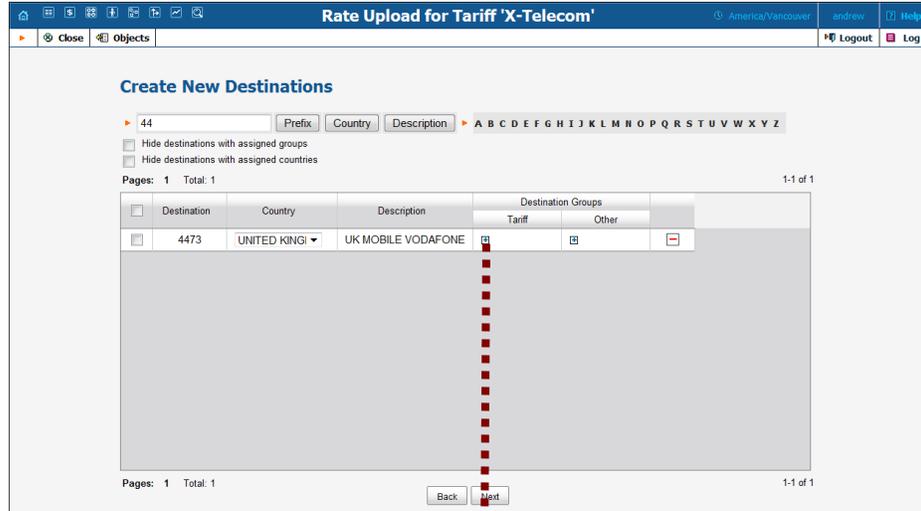

In our example we will assign the 670 destination to the country East Timor.
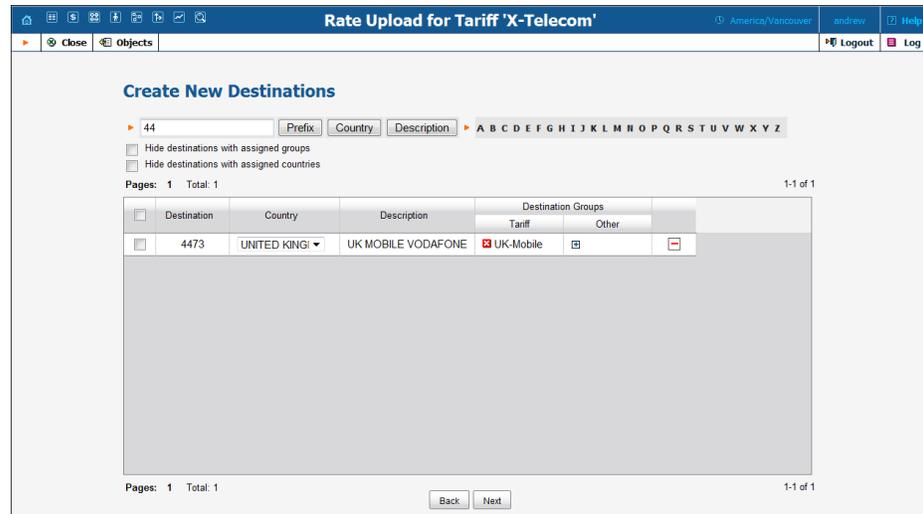

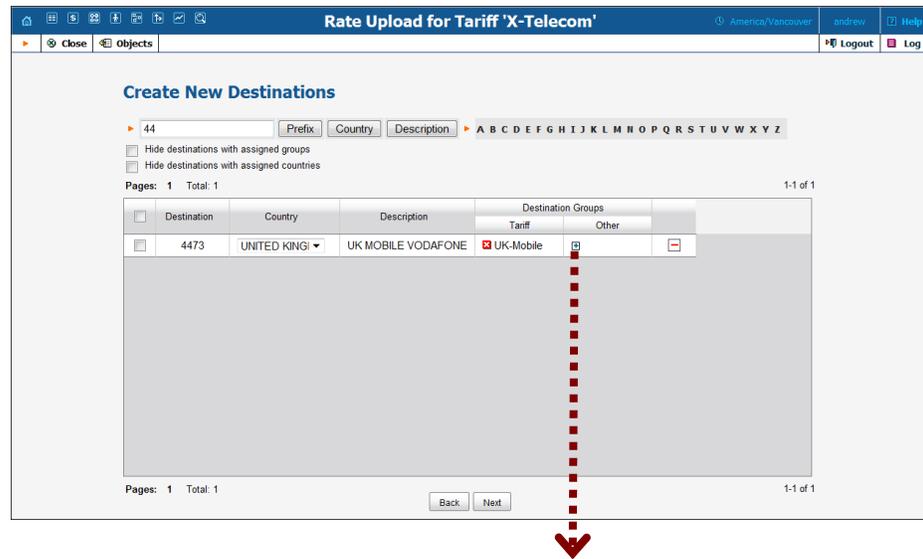## Including a destination into a destination group

Destination groups are invaluable for saving hours of time and for avoiding mistakes, since one can change the rate for a whole group with just a single click instead of modifying rates for many destinations (and many could literally mean thousands), manually. So for instance, when the new destination 4473 is being added – it may be a good idea to
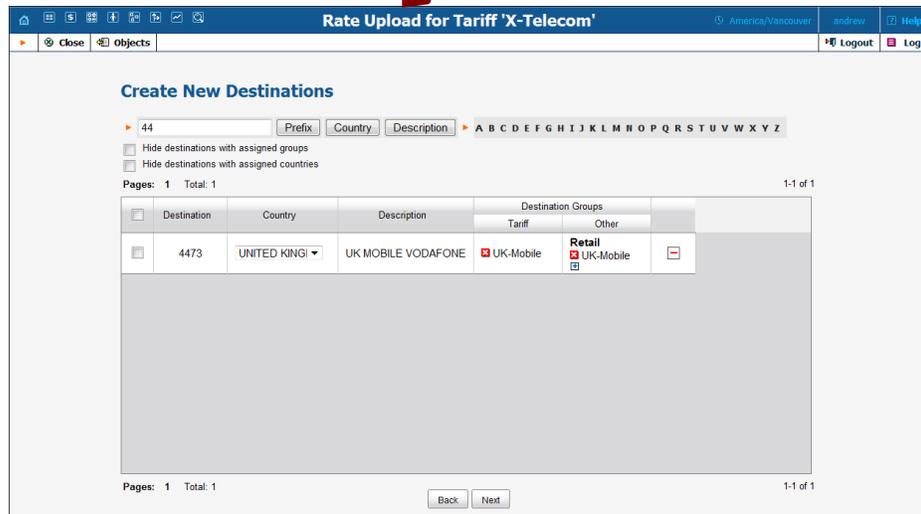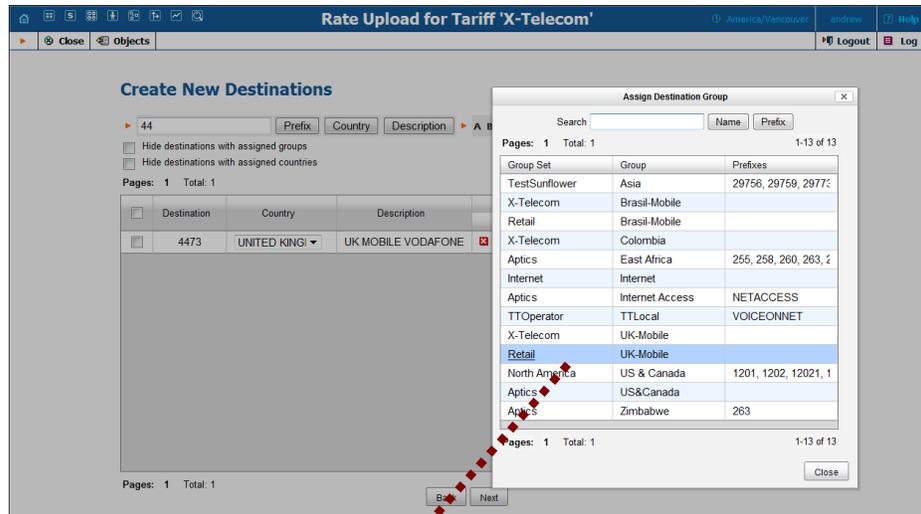
immediately include it into a destination group (within the destination group set that's associated with this tariff) – UK-Mobile in this case. Then the next time someone updates the UK-Mobile rate, the change will be applied to this prefix as well. See the screenshots below for the sequence of actions.
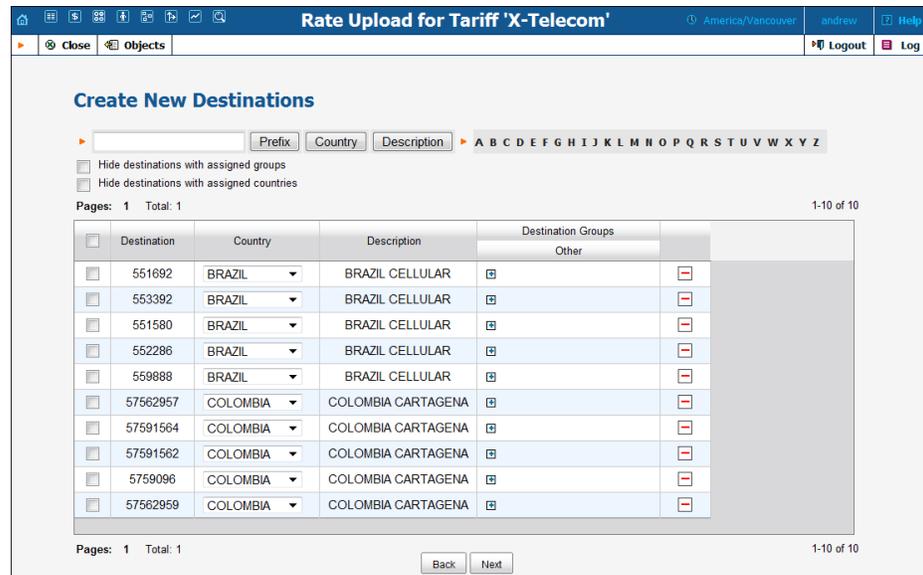
In some cases it may also be beneficial to include this destination into groups that are in other destination group sets. In our example, the new destination 4473 (UK-Mobile-Vodafone) is detected while uploading rates into the tariff of carrier X-Telecom (which has the X-Telecom destination group set associated with it). You may want to immediately add it into the UK-Mobile destination group in the Retail-Customers destination group set. This way the next time your colleague is generating rates to be applied to your customers – this prefix will appear and he can apply the special pricing for it.

Multiple similar destinations

In our example you may notice that there are several destinations (55123, 55124, 55125, etc.) which look very similar. That's because they belong to the same country (Brazil) and they are in the same destination group (Brazil-Mobile).

In order to save time and avoid assigning parameters to each one of them manually, you can do the following: assign the required parameters to just one of them, select the others using the checkbox on the left side of each row and then move the mouse over to the rows that don't have parameters assigned. A popup menu will appear – choose **Apply to Selected** and this will automatically change all the rows.

Please see how the change is applied to several prefixes for Brazil below.

Tip: You can filter the list of new destinations by country or hide the destinations that have already been assigned a country or destination group. For this action, use the **Select All** button in conjunction with **Apply To Selected** to quickly apply settings to hundreds of destinations.

If I add a new destination while uploading rates for carrier ABC will it affect my other carriers?

Customers who are used to old-style routing systems are very concerned about adding new prefixes, since on many of those, a carrier with a longer prefixes in their tariff would all of a sudden get priority routing (although it is not the cheapest or the one with better quality). Attempts to "harmonize" the prefixes (to ensure that all carriers use the same prefix set) require lots of manual labor and are Sisyphean in scope: the moment you finish changing the prefixes and things are finally looking good, one of the carriers sends you an updated prefix list and you have to start the task all over again.

This is not the case with PortaBilling®, which uses a true real-time routing engine giving each carrier their own set of prefixes for the tariff. When the routing is calculated, available routes are compared based on cost, preference and route category – never on the prefix length. So if you upload the rate for 4471 for carrier A (and other carriers only have prefixes 44 and 447) – when a routing for a call to 4471234567 is computed, the 4471 rate will be compared by price and preference with the rates for 44 or 447 from other carriers (who don't have the 4471 prefix). Consequently, the system always produces a correct routing and you don't have to worry about adding new prefixes that are only used by a few carriers.

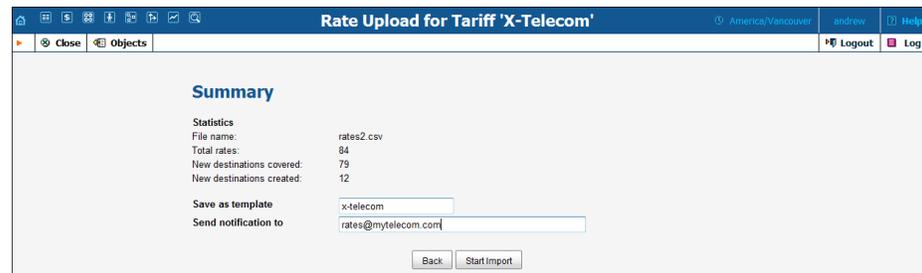### I do not want to add a destination right now, what do I do?

You can delete the destination from the list of destinations that will be automatically created during the import by using the ▭ delete button. Note that in this case, the rate for this destination will not be imported

(since there is no destination to associate it with). To undo the delete destination action, click the ➕ button, respectively.

Summary

On the **Summary page**, you will see an overview of information about the number of rate records to be processed. You can also specify a name under which the current import settings will be saved as a template. Later you can re-use them when uploading rates into this or other tariffs.

You may specify who should receive a report about the rates being uploaded, and then click **Start Import** to launch the rate import process. The report will contain following information:

- Total rates processed - the total number of rates in the imported file
- Total rates created - the total number of rates created including the newly created rates (the rates which were not present in the tariff prior to the import) and the overwritten ones
- Old rates overridden - reflects the total number of rates, which were updated (i.e. the previous rates were replaced by the new ones for some destination)
- Skipped (due to errors) – the number of rates that contained errors (e.g. a typo in the price column) and therefore were not added to the tariff. The information about the occurred errors you can see in the e-mail with the tariff upload report
- Skipped (duplicates) – the number of skipped duplicate rates. It means that if some rates (rate parameters) in the uploaded file were identical with the ones already present in the tariff, the system skipped the duplicates i.e. no extra (excess) rate were inserted into the tariff
- Rates for destinations, previously absent in this tariff, created – the number of rates created for destinations which were not in the tariff prior to the import
- Destinations, previously absent in the system, created – the number of new destinations created in the system (billing environment)

In the attached file you can see the detailed information about the result of the rate upload procedure in order to quickly understand exactly how the existent rates were changed. You can also see information about new rates added if there are any. See the example of the file on the screenshot below:

4. Wholesale Termination via a Gateway

Wholesale voice is a growth market, with service providers building new capacities and launching new services. The primary wholesale service is long-distance transport and aggregation, with the key advantage being 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 services.

Typical Business Case

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

The provider in this scenario is the owner of termination node (POP) gw-example. This is a typical example of a VoIP network where customers pay the provider to terminate traffic at point (A), while the provider himself pays the vendor for traffic at point (B). The provider makes his profit on the difference between:

- the tariff he charges his customer (A1 or A2), and
- the tariff he is being charged by the vendor (B).

The following configuration assumes that the service is provided using only PortaBilling® and a termination gateway. Please consult the *Setting up a Wholesale Traffic Exchange* chapter for an example of advanced wholesale VoIP services using PortaSIP®.

Setting up Your Network Components

Configuring Gateway

Obtain the remote authentication script

The default Cisco remote IP authentication application (app_remote_ip_autneticate.2.0.0.tcl) is provided free of charge to all users with a valid Cisco support contract (CCO). Please note that this script does not support the extra features available in PortaOne's **Advanced Remote Authenticate** script, such as:

- Ability to perform authentication by tech-prefix, ANI, DNIS, fixed string or SIP username, in addition to just an IP address
- Ability to translate the authentication ID in the script before sending it to RADIUS (e.g. remove the last part of the IP address after the dot)
- Ability to perform authorization (as opposed to only performing authentication)
- Ability to forward calls to an account's redirect number defined in the billing
- Using an authentication method different than the default (so that authentication requests from this script may go to a different RADIUS server)

You may obtain the **Advanced Remote Authenticate** script by contacting PortaOne sales team.

Place the authentication script on your TFTP server. For your convenience, the TFTP server is already pre-configured in the /tftpboot directory on the PortaBilling® slave server.

1. Basic router configuration

It is highly recommended to use the latest telephony IOS and DSP firmware, and that the hostname be 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 to these new ports when possible.

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

8. Voice-card

9. Controller

10. Voice-port

Depends on your hardware configuration

11. Call application voice & dial-peers

```
call application voice remote_ip
ftp://…./app_remote_authenticate.tcl
call application voice remote_ip authenticate-by ip
call application voice remote_ip authorize yes


!
dial-peer voice 10 pots
 destination-pattern .
 port 0:D
!
dial-peer voice 11 voip
 application remote_ip
 incoming called-number .
```

Checklist

Print the following page and use it to check off the operations you have completed while performing system setup according to the instructions in this chapter. Please be sure to perform all of the operations (all of the boxes must be checked), otherwise the service will not work.

Operation	Done
General configuration	
Enter company data under My Company.	[ ]
Specify a base currency.	[ ]
For any other currency you plan to use, specify the exchange rate source and define exchange rates.	[ ]
Create all the required destinations.	[ ]
Network configuration	
Create a node for your gateway.	[ ]
Configure your gateway.	[ ]
Rating configuration (Vendor)	
Create a tariff A, which describes your termination costs.	[ ]
Insert rates in tariff A for destinations you will terminate to PSTN.	[ ]
Create a vendor.	[ ]
Create a connection for this vendor using tariff A.	[ ]
Rating configuration (Customer)	
Create a tariff B, which will apply to customers who send you traffic for termination.	[ ]
Insert rates in tariff B for destinations which will be covered by your termination service.	[ ]
Create a wholesale product.	
Create one rating entry for this product, using the node you created and tariff B.	[ ]
Account provisioning	
Create a customer class which will apply to your customers.	[ ]
Create a **retail** customer who owns the accounts representing remote gateways.	[ ]
Create an account for each of this customer's remote gateways.	[ ]
Testing	
Try to make a test call.	[ ]

PortaSwitch® Configuration

Please refer to the **PortaBilling Web Reference Guide** PDF file for detailed instructions on how to navigate and operate the web interface, as well as detailed explanations of particular fields.

Initial Configuration of PortaBilling

Please refer to the *Initial Configuration of PortaSwitch®* section above for more information about initial configuration.

Create Destinations

Please refer to the *Create Destinations* section above for detailed instruction on how to insert new destinations into the system.

Create Nodes

This step is only required if you have not entered your gateways into the system before. In this case, you must enter your gateways as nodes. PortaBilling® requires some key information about your network equipment such as IP address, Node ID, Radius shared secret, etc.

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

1. In the **Networking** 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:
   - **Node Name** – A short descriptive name for this node (will be used in the select menus).
   - **Manufacturer** – Select **Cisco** or **Quintum**.
   - **Type** – VoIP node type; select **VOIP-GW**.
   - **Node ID** – h323-id (recommended `hostname.domainname`)
   - **NAS-IP-Address** – IP address of the gateway.
   - **Auth. Transl. Rule** – Leave this empty for now; see the *Translation Rules* section of the **PortaBilling Administrator Guide**.
   - **RTP Proxying** – Leave the default selection (Optimal); for more details regarding NAT traversal, see the **PortaSIP Administrator Guide**.
   - **RADIUS Client** – Make sure this check-box is enabled, since the gateway (node) must be able to communicate with PortaBilling via RADIUS.
   - **RADIUS Key** – Enter the RADIUS secret key you have specified in the configuration of the gateway.
   - **RADIUS Source IP** – Unless your gateway has multiple network interfaces, the value here should be the same as the NAS-IP-Address.
4. Click 🖫 **Save&Close.**
5. Repeat steps 2-4 until all of your nodes have been entered.

Create a Vendor Tariff

A tariff is a single price list for call services. A tariff combines:
- conditions which are applicable to every call regardless of the called destination;
- per destination rates.

1. In the **Rating** section of Admin-Index, choose **Tariffs**.
2. On the Tariff Management page, choose ⊞ **Add**.
3. Fill in the **Add Tariff** form (please refer to the *Create a Vendor Tariff* section above for a detailed description of the available tariff attributes).
4. Click 💾 **Save**.

Enter Rates

Managing Rates Online

1. On the Tariff Management page you will see a list of available tariffs. Click the 🔳 **Rates** icon in front of the name of the tariff.
2. In the **Edit Rates** screen, click ⊞ **Add**.
3. Fill in the required information (please refer to the *Enter Rates in Tariffs with Routing Extensions* section above for a detailed description of the available rate attributes).
4. Click the 💾 **Save** button in the toolbar, or the icon on the left end of the row.
5. Repeat these steps if you need to enter more rates.

Managing Rates Offline

You also can upload rates from a .CSV or .XLS file – please refer to the description of this process in the *Rate Import* chapter.

Perform the *Create Tariff* and *Enter Rates* steps described above until you have created a tariff with the termination costs for each termination partner you have.

Create Vendors

1. In the **Participants** 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 three tabs available on the screen (refer to the *Create Vendors* section above for a detailed description of the available attributes).
4. Click 🖫 **Save&Close**.
5. Repeat steps 2-4 to add all of your vendors.

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 the providers of incoming toll-free lines.

1. In the **Participants** section of the Admin interface, choose **Vendors**.
2. Click on the **Connections** icon next to the vendor name.
3. Press ⊞ **Add** to add a new connection.
4. Fill in the connection information. If you send traffic to the vendor via telephony, choose the node and enter an optional port pattern. If you send traffic via VoIP, enter the remote IP address. Choose the tariff which defines your termination costs for this

connection / vendor. **Description** field is mandatory for all connection types.

5. 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.

6. The **Connection Load** tab specifies the maximum number of simultaneous calls the connection can support.

7. Click ▣ **Save&Close**.

8. Repeat steps 3-7 to add more connections to the same vendor, then click ⊗ **Close** in order to exit to the **Vendor Management** screen.

9. Repeat steps 2-8 to add connections for other vendors.

Create a Customer Tariff

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

1. In the **Rating** section of Admin-Index, choose **Tariffs**.
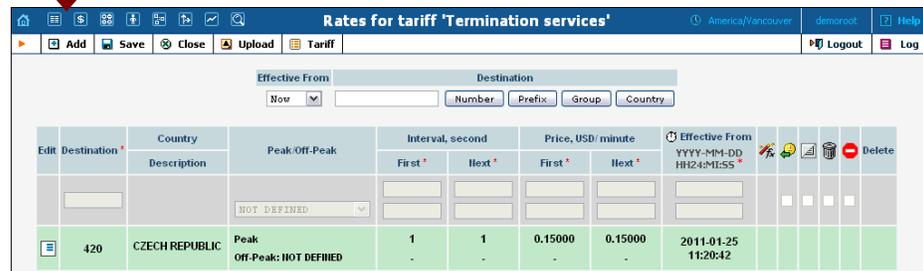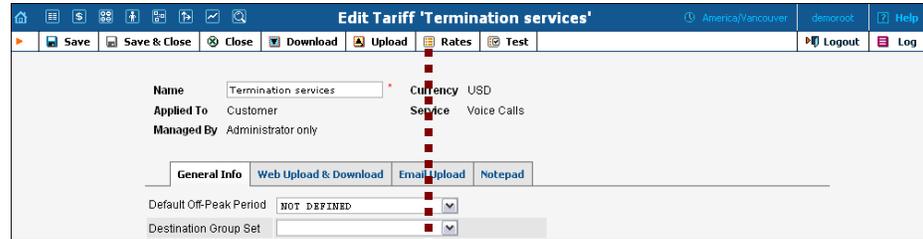
2. On the Tariff Management page, choose ⊞ **Add**.

3. Fill in the **Add Tariff** form (please refer to the *Create Customer Tariffs* section above for a detailed description of the available tariff attributes).

4. Click ▣ **Save**.

Enter Rates

1. While on the **Edit Tariff** page, click the 🔳 **Rates** icon in the toolbar.

2. In the **Edit Rates** screen, click ➕ **Add**.
3. Fill in the required information (please refer to the *Enter Rates* section above for a detailed description of the available rate attributes):
   o **Effective From** – If you want this rate to take effect sometime in the future, you can either type in a date manually, or use the calendar (click 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 are entering is in a different time zone than your current one. PortaBilling® will then automatically adjust the time.

4. Click the 💾 **Save** button in the toolbar, or the ⊞ icon on the left end of the row.
5. Repeat these steps if you need to enter more rates.

⏳ Perform the *Create Tariff* and *Enter Rates* steps described above until you have created a tariff for each account's billing scheme. For example, if you plan to have two types of service packages (Termination-Easy and Termination-Gold) with different rates, you will need to create two separate tariffs.

Create a Product

1. In the **Rating** section of the Admin-Index page, choose **Products**.
2. On the Product management page, click the ⊞ **Add** icon.
3. Fill in the "Add Product" form (please refer to the *Create a Product* section above for a detailed description of the available product attributes).
4. Click 💾 **Save**.

Click on the **Services and Rating** tab to edit this product's rating list.

Enter Node and Tariff into the Product's Rating Entry

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

1. When the **Services and Rating** tab is selected, click on the ⊞ **Add** icon.
2. Choose **Voice Calls** in the **Service** select menu.
3. Choose the node you previously created, choose the tariff with which you want to bill your customer, and leave the **Access Code** field empty.
4. Click 🖫 **Save** to save this rating entry.

Create a Customer Class

1. In the **Billing** section of the Admin interface, choose **Customer Classes**.
2. On the Customer Class Management page, choose ⊞ **Add**.

3. Fill in the **Name** parameter; the other fields can be left empty for now.
4. Click 🖫 **Save&Close**.

Create a Customer

1. In the **Participants** section of Admin-Index, choose **Customers**.
2. On the Customer Management page, choose ✚ **Add Customer** (In this example, we assume that you are creating the customer manually, so choose **Manually** from the drop-down menu (do not use any of the Quick Form options)).
3. Fill in the **New Customer** form (please refer to the *Create a Customer* section above for a detailed description of the available fields).

4. Click 💾 **Save**.

Create Accounts

1. Go to the **Customers** screen (the screen which contains a list of customers).
2. Next to the customer name, click on the 🗐 icon (the one in the **Accounts** column), which will take you to the account management for that customer.

3. Now click on ⊞ **Add** (In this example, we assume that you are creating the account manually, so choose **Manually** from the drop-down menu (do not use any of the Quick Form options)).
4. Fill in the **Add account** form:
   o **Account ID** – Identification of the account (value to be sent in the **User-Name** attribute). For an account which represents a remote gateway, this is normally an IP address.
   o **Product** – Choose the product which you would like your accounts to use.
   o **Opening Balance** – The initial balance on the account. For credit accounts, the opening balance is normally zero.

Account Info

   o **Type** – Account type; select **Credit**.
   o **Credit Limit** – Maximum allowed credit.
   o **Service Password** – Password for authentication / authorization. If you are using the default Cisco `remote_ip_authenticate` script, put **cisco** here.
   o **Batch** – You normally don't need a batch for wholesale customers (since there will only be a few of them) so you may leave that space empty.

Life Cycle

   o **Activation Date** – Account activation date.
   o **Expiration Date** – Account expiration date; since we are setting up a postpaid service, which should function for a long time, leave this field blank.
   o **Life Time** – Relative expiration date; since we are setting up a postpaid service, which should function for a long time, leave this field blank.
5. Click 🖫 **Save&Close**; a confirmation screen will indicate that the account has been created.
6. Repeat steps 3-5 if the customer has more than one remote gateway.

5. Adaptive Routing and Quality of Service

PortaBilling® allows you to automate the process for controlling the call quality which becomes increasingly important today. That is, if you want to evaluate acceptable vendors for terminating VoIP calls, there is no need to hire numerous human operators or network engineers, who will track and analyze the specific route. All you need is to implement adaptive routing model.

Setting up Adaptive Routing

The main idea of adaptive routing is to dynamically measure a vendor's quality parameters, and adjust the routing priority accordingly. These quality requirements are predefined in the form of threshold parameters on the **Routing Criteria** page, and are then automatically applied to specific vendors. Any vendor who fails to satisfy your quality requirements will go to the "penalty box" – the very bottom of the routing list. This means that the system will try first to terminate calls using other carriers (with a good quality evaluation). However, if all of them fail or are unavailable, the "penalized" carrier will have a chance to terminate the call. It is still better to send a call via an inferior vendor than to have it fail completely.

Thus, if the quality requirements are applied, a carrier's place on the routing list is determined not only by the route category, the assigned preference value, and the cost parameters (LCR model), but additionally by quality criteria.

Add / Edit Routing Criteria

1. In the **Routing** section of Admin-Index, choose **Routing Criteria**.
2. On the **Routing Criteria** page, choose ⊞ **Add**.
   An existing routing criterion can be edited by clicking on its name in the list.

3. Fill in the required information:
   - **Name** - The logical name of the routing criterion for use within PortaBilling®;
   - **Description** - A description of the routing criterion.
   - **Sampling Interval** - The time interval for which statistics are computed. Smaller intervals will make the system "quicker" to notice any change in a vendor's quality, but there is also a higher chance that a short-term problem on the vendor's side (which can be fixed in a matter of minutes) will penalize his route for a relatively long period of time.
   - **Destination Group Set** - A set of destination groups you would like to use for more convenient quality criteria entry.
4. In the **Criteria Defaults** table, specify the initial default values to be applied for all routing criteria you will create next:

- o **Minimum Calls** – The minimal required amount of calls via a given connection for the statistics to be considered representative. If the number of calls is below the specified value, the quality parameters will not be matched against the threshold, and no routing adjustments will be made.
- o **Penalty Time** – The time interval for which a connection will be "penalized" (at the very bottom of the routing list) if a given vendor does not meet the quality criteria.
- o **ASR** – (Answer Seizure Ratio) – The number of successfully connected calls divided by the total number of call attempts. (Post Dial Delay) – The time interval between the connection request to the vendor and ring-back.
- o **PDD** – (Post Dial Delay) – The time interval between the connection request to the vendor and ring-back.
- o **ALOC** – Average Length of Call
- o **PPM** – (Profit per Minute) – The aggregated profit, i.e. the difference between the actual charged amounts in your customers' and vendors' CDRs.

NOTE: The **ASR, PDD, ALOC, PPM parameters** require two values that define the warning and penalty thresholds, respectively.

5. Click the 🖬 **Save** button to save your progress when done.

Define Routing Criteria for Individual Destination Groups

1. Click ➕ **Add** in the toolbar to define routing criteria for the specific destination group.

An existing routing criterion can be edited by clicking the 🔲 **Edit** icon on the row containing the details.

2. Click the **Destination Groups** column header link to choose a group from a searchable list inside the pop-up window. You can access only groups associated with **Destinations Groups Set** defined previously.
3. Provide the quality parameters to be applied to your vendors:
    o **ASR** - (Answer Seizure Ratio) – The number of successfully connected calls divided by the total number of call attempts. (Post Dial Delay) – The time interval between the connection request to the vendor and ring-back.
    o **PDD** - (Post Dial Delay) – The time interval between the connection request to the vendor and ring-back.
    o **ALOC** -Average Length of Call
    o **PPM** - (Profit per Minute) – The aggregated profit, i.e. the difference between the actual charged amounts in your customers' and vendors' CDRs.

NOTE: The **ASR, PDD, ALOC, PPM parameters** require two values that define the warning and penalty thresholds, respectively.

4. Click the 🖫 **Save** button to save your progress when done.

Instead of entering the same values for each destination group, you can simply leave quality parameters fields empty. They will be automatically filled with values from **Criteria Defaults** table.

Define Routing Criteria for Specific Connection

After you configure the **Routing Criteria,** you can now apply your quality requirements to specific vendor's connection. Thus, when such a routing model is associated with a connection, PortaBilling® will automatically arrange routes according to your quality preferences.

1. In the **Participants** section of the Admin interface, choose **Vendors**.
2. Click on the **Connections** icon next to the vendor name.
3. In the **Routing Criteria** box, select the routing model you want to apply.

4. Click the ⊞ **Save** button.

When saved, the additional **Tracking** tab will appear.

Tracking Connection Status

When the value of a parameter reaches the predetermined threshold, the administrator receives an e-mail alert about the latest connection threats. The administrator can track the current connection status on the **Tracking** page. This status is represented by different colors, as follows:

- ⚪ GREY – the number of calls is not enough to apply filtering differentiation;
- 🟢 GREEN – the route meets the quality requirements;
- 🟡 YELLOW – the route is active, but some of its quality parameters are outside the warning thresholds;
- 🛑 BLOCKED - this route is currently being penalized.

NOTE: The penalized route will be on the "penalty row" for a certain period of time, specified in the **Penalty Time** box and then will be unblocked automatically. Alternately, you can click the **Unblock Now** button to unblock the penalized route manually.

- 🔴 RED – the route was manually unblocked; this status will remain unchanged till the next time interval for which the statistics will be computed.

6. Configuration Examples for Cisco Gateways

Bill Customers Who Are Connected via T1 / E1 Directly to a Port on Your Gateway

Typically, you do not use authentication or authorization for such "port-based billing", since you are always sure that your customer is on the other end of the physical line. Although it might be a good idea to implement call authorization so that you can control which destinations the customer is allowed to call to, we will not discuss this here. For port-based billing, you need only do the following:

1. For each such customer, create a tariff that you want to use to bill the customer and a product. Only one row in rating entry is necessary, with the node "ANY" and the tariff you have created.

2. Now you must make sure that each call made by that customer is tagged as belonging to him. Use the corresponding application on your gateway to handle the call. You can use the PortaOne's "Session name" application, or create your own.

The often difficult part in gateway configuration is designing dial-peers to match certain voice ports. Dial-peers should resemble the following configuration:

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

They will be listed with an operation status of down, as the port specification must be accompanied by 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, i.e. this dial-peer will match any port. The solution is to use a number-matching scheme that 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
```

This solution may be considered a "hack", yet it 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 a number is near zero. So the configuration should look as follows:

```
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 an Account ID identical to the name you entered in the configuration for the applications (**abc_ltd** and **xyz_inc** in our example).

Implement Authentication for Incoming VoIP Calls

When your gateway is installed and connected to the Internet via the network interface, it can accept incoming VoIP calls and send them onward. This is fine, assuming that calls are coming in from one of your customers; but potentially *anyone* on the Internet can send you traffic if they know your gateway's IP address. This could happen due to a mistake, or it could be done intentionally; in any case, it is not good for your business if this happens. How to prevent this and make sure that only your customers and you yourself are able to use your VoIP network?

There are a few methods which enable you to do this:

1. Set up an access list (ACL) on your gateways so that VoIP traffic will be allowed **only** from certain IP addresses / subnets. This is a very reliable method. Unfortunately it has one drawback: it is difficult to maintain, since everything is configured on the individual gateways. For example, if you have 12 gateways and you wish to add a new customer, you have to change the ACL 12 times.

2. Set up an application to handle incoming VoIP calls. This application will authenticate the remote party (by IP address or some other parameter) in PortaBilling® and, if authentication is successful, will connect the call. There are several advantages to this approach:
   - Information about authorized gateways is stored in one place, so it is easy to maintain.
   - The application can include data required for IP-based billing in the call information (so the User-Name attribute will contain an Account ID).
   - It may be combined with authorization, so that you can also check if a remote gateway is allowed to call a particular number.
   - You can use more sophisticated ways of identifying a remote gateway. For example, instead of IP address you can use an IP+MAC address combination.

3. An improved version of the previous item is a solution in which all calls to your network arrive to a proxy (such as PortaSIP®) which will take care of call authorization, while your gateways will only accept incoming calls from that proxy. Again, the easiest way to implement this is by using IP authentication on both the proxy and gateways.

We assume that you will use either method 2 or 3, i.e. your terminating gateway will authenticate incoming VoIP calls (to check that the remote gateway is allowed to send you traffic). This may be done by sending an authentication request to PortaBilling®, where the User-Name contains an identification of the remote gateway; typically this is an IP address. You can use the Cisco application remote_ip_authenticate.1.1.1.tcl provided as part of the TCL Ware package, or you can purchase an improved version called **Advanced Remote Authenticate** from PortaOne, Inc. See the configuration guidelines for Cisco gateway below.

Authenticate and Bill Customers by the IP Address of their Gateway

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

1. Create a tariff and a product. Since "Node" and "Access Code" are insignificant for this type of service, set node to "ANY" and leave Access Code blank for the IP-based billing product.

2. Use the corresponding application on your gateway to handle the call. You can use the Cisco application remote_ip_authenticate, PortaOne's "Advanced Remote Authenticate" (recommended), or create your own. The only important thing is that the IP address of the remote GW be in the User-Name attribute in the AAA requests which will go to the billing. Here is a sample 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://…/portaone.tcl
call application voice remote_ip authenticate-by ip
call application voice remote_ip_auth password cisco
!
dial-peer voice 11 voip
  application remote_ip
  incoming called-number .
!
```

3. Create a customer who will own these accounts.

4. Create accounts with an Account ID identical to the IP address of the remote gateway, and enter cisco as the Service password for this account. (The password cisco has been chosen only for backward compatibility with the Cisco remote_ip_authenticate script. With PortaOne's "Advanced Remote Authenticate" you can use a different password; just change the list in the application config).

Handle Technical Prefixes and Numbering Formats

Different termination partners often require that you send them numbers 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), while your local phone provider requires that outgoing call numbers be dialed without the 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 different numbering formats. Of course it is better to use a single numbering format internally. Our recommendation is to use the E.164 format in billing and on your network. An E.164 compliant number is one consisting 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 for converting all outside numbering formats into the unified format which is to be used in billing. For every connection to a vendor you can specify a translation rule that will convert the number into E.164 format. Here are some ready-to-use examples of translation rules:

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

Always test your translation rules before entering them into the billing. A special test window is available on the web interface. To access it, click on the test icon 🔘 next to the translation rule field.

This will enable you to check if your translation rule has the proper syntax, and you can also immediately see if it performs the translation you need.

Configure an Outgoing Connection to a Vendor, matched by Tech-prefix instead of by remote IP address

Although matching the connection by IP address is the simplest and error-proof method, in some situations it is not applicable.

Billing only

It may be that your external switch uses routing via an H323 gatekeeper, where the actual IP address of the remote gateway is provided by the remote gatekeeper only during a call attempt. In this case, PortaBilling® is not involved in the routing, and all that is needed is to ensure that these calls are accounted to the correct vendor. To do this, enter the tech-prefix in the **CLD Tech Prefix** field of the connection; for example, if you are using appending the tech-prefix 334567# to the phone number when sending a call to the vendor, enter **334567#**.

NOTE: When a value entered into the CLD Tech Prefix field, this automatically creates proper translation rules for this connection.

Matching by tech-prefix takes lower precedence than matching by remote IP. Thus if a call is sent to remote IP 1.2.3.4 with tech-prefix 123#, and you have defined a connection to vendor A with remote IP 1.2.3.4 and a connection to vendor B with tech-prefix 123#, the call will be billed to vendor A.

Routing and billing

A typical case is one in which a vendor offers you several categories of route quality. Although calls will always go to the same IP address (the vendor's switch), the termination cost would be different based on the tech-prefix transmitted as a part of the number. In this case, PortaSwitch® must also route the calls properly to the vendor, adding the required tech-prefix.

To do this, create multiple connections for the same vendor, for each one of them specify the corresponding tech-prefix in the **CLD Tech Prefix** field (make sure you keep the translation rules, automatically created after that) and use different values in the **Remote Gateway ID** field. Obviously these connections will have different tariffs associated with them. For example, if the vendor's proxy address is 5.6.7.8, and tech-prefix 345# offers low-cost routes, while tech-prefix 789# offers premium routes, there would be two connections, with the Remote IP field containing the same value (5.6.7.8), but the the **CLD Tech Prefix** field will contain 345# and 789# respectively.