PORTA ONE

PortaBilling

Templates Guide

55

Maintenance Release

Documentation

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Preface

The PortaBilling® Templates Guide gives a detailed explanation of the template module. This manual also describes in detail how to optimally import and export data from PortaBilling®.

Where to get the latest version of this guide

The hard copy of this guide is updated upon major releases only, and does not always contain the latest material on enhancements that occur in-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/resources/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`.

Exclamation mark draws your attention to important actions that must be taken for proper configuration.

NOTE: Notes contain additional information to supplement or accentuate important points in the text.

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

Tips provide information that might help you solve a problem.

Gear points out that this feature must be enabled on the Configuration server.

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1. Template Concepts

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Real Life Situation

Before discussing some technical details about PortaBilling® and templates, let's take a look at a "real life" example which will help us learn more.

Situation

You are the owner of a VoIP billing system. You receive list of rates from your vendors, which you need to import into the system.

Solution 1: Manual Entry

In order to do this, you decide to hire a temporary worker to type in all the data. This person does not know much about your business, so you will have to give him or her detailed instructions on how to proceed. These might be similar to the following:

1. This is an Excel file from our vendor.
2. After you open it, in the first row of the second worksheet, entitled "Rates", you will see a title and a list of rates underneath it.
3. The value in column C (entitled "Prefix") goes in the "Destination" field on the web interface, but do not enter **011** at the beginning of the number, if for example, your vendor provides the phone prefix for the Czech Republic as **011420**. The value in column F (entitled "Price per minute") goes in the "Price 1" and "Price N" fields on the web. There is no "Effective From" data in the file, so just enter the current date in that field on the web.

Does this sound complicated? Let's now take a look at what you have just done:

- You have specified the file format which the data is in ("**an Excel file**").
- You have specified where the required data is to be found within that file ("**in the first row of the second worksheet, entitled 'Rates'**").
- And, finally, for each data element which needs to be imported into the system (Destination, Price) you have specified:
    - Which column the data is in ("**column C (entitled 'Prefix')**").
    - The format of the data (whether it needs to be changed somehow prior to being entered into the system) ("**do not enter 011 at the beginning**").

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Now, let's take a look at an alternative way of handling the same process more easily, faster, and with fewer errors.

Solution 2: Template Engine

Instead of having your employees type in all the data, you can entrust this job to PortaBilling®! The PortaBilling® rate upload wizard and templates allow you to do the following:

- Upload your XLS or CSV rate file to the server and immediately see the result of file processing (in order to verify that the file was recognized correctly, and to adjust parameters such as the field delimiter).
- Using a drag-and-drop interface, you can place markers on columns in the file to identify where particular groups of data are located in it (e.g. the destination prefix in the third column, and the price in the fifth column). In fact, the rate upload wizard will try to automatically recognize data elements, so most of the time you will only need to confirm the proposed column assignment.
- You can adjust the format which each data element is in (for example, whether the phone prefix is given as **011420** or as **420**). You can also apply post-processing rules (analogous to formulas in spreadsheet editors).
- The upload wizard will process all the rate information and allow you to compare new rates with the existing rates and make adjustments if necessary.
- If there are new destination prefixes in the file (not in the database yet), they can be created automatically during rate upload. Also, you can assign new prefixes into specific destination groups during the upload process.
- Once the new rates are uploaded into the system, PortaBilling® saves all of your changes as a template associated with this tariff. Thus, the next time you receive a new file from the vendor and need to upload it, everything is ready and no special actions are required.

Template Engine

The template engine allows you to define and use data conversion rules (templates) during the rate upload process. There are two methods of template-based data processing and, accordingly, two types of templates.

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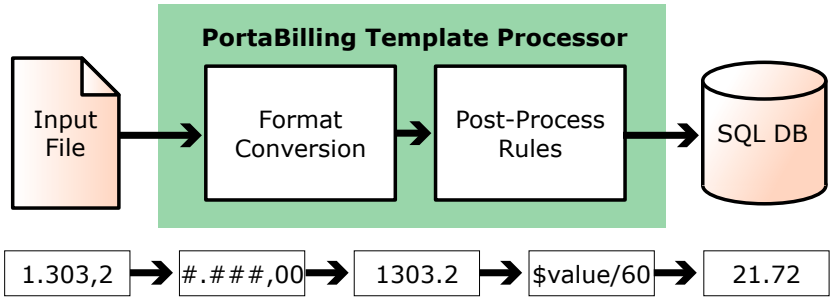
Import Data into PortaBilling (Upload)



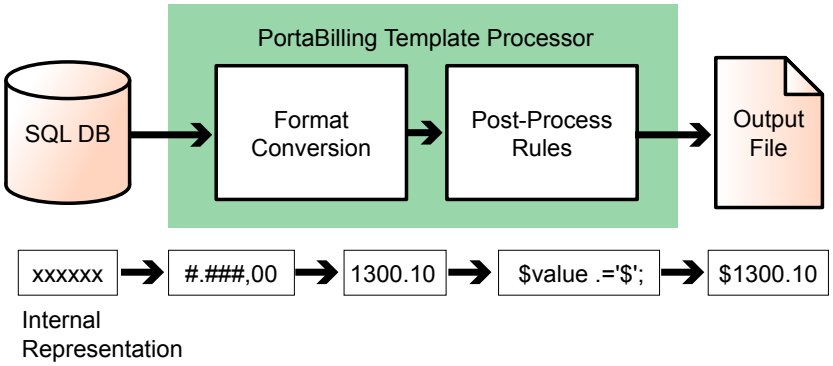
Such a template (called an upload template) is defined via a user-friendly rate upload wizard during the first upload of rates from a tariff with a specific format.

The Rate upload wizard provides:

- Rate upload with visual results review at each successive step
- Rate change analysis
- Automatic creation of new destinations
- Prefix assignment to destination groups
- Rate update notifications
- Definition of changes to apply to the data before entering it into the database
- Saving all of the steps performed as a template associated with this tariff that can be used later on during subsequent rate uploads

When rate data is being uploaded into a tariff, the template engine parses the input file according to its type, locates the data inside the file, converts it into an internal representation according to the specification predefined during the first upload, applies post-processing rules and then writes the data to the database.

Export Data from PortaBilling® (Download)



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Such a template (called a download template) defines:

- The output data format.
- How the data is to be processed before being downloaded into the file.
- How the data should be arranged in the output file.

When data processing takes place, the template engine extracts data from the database, converts it into the specified format, applies post-processing rules, and then creates a file of the specified type, entering the data in the appropriate places in the file.

Template Components

Data for an invoice or a tariff may have a very complex structure. In order to facilitate such cases, data within the template is split into different groups, called "template components", so that it can be managed separately.

Look at the sample invoice in the picture below:

Page 1 of 2

Your company logo

Porta Software Ltd
902 - 2181 West 38th Ave.
Vancouver
V6M 1R8

Invoice

Date	Invoice #
2004-03-30	22

Bill To:
Retail test Customer Mr. Vasiliy N Ivanov Wall str., 22 New-York USA

Statement Period			
From	To	Terms	Due Date
2004-02-11	2004-02-11	Due on receipt	'Invoices.due_date' not

Description	Amount
Voice Over IP Services	12.17 USD
GST 7%	0.85 USD
PST 7.5%	0.91 USD
Previous balance	0.00 USD

We can clearly identify a few independent groups of data here:

1. **Invoice header** – This is present only once in the file, and contains global information.
2. **Invoice line(s)** – Groups of data which repeat multiple times in the file, each time with different values.
3. **Invoice footer** – This is present only once in the file, and contains global information.

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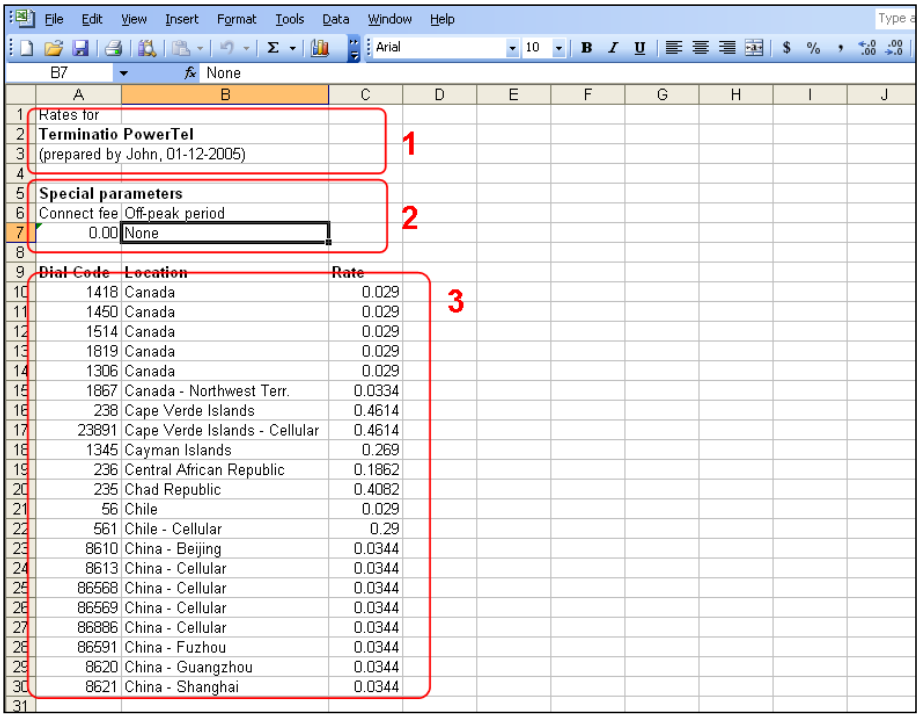
Here is another example, this time for a tariff:



	A	B	C
1	Rates for		
2	**Terminatio PowerTel**		
3	(prepared by John, 01-12-2005)		
4			
5	**Special parameters**		
6	Connect fee	Off-peak period	
7	0.00	None	
8			
9	**Dial Code**	**Location**	**Rate**
10	1418	Canada	0.029
11	1450	Canada	0.029
12	1514	Canada	0.029
13	1819	Canada	0.029
14	1306	Canada	0.029
15	1867	Canada - Northwest Terr.	0.0334
16	238	Cape Verde Islands	0.4614
17	23891	Cape Verde Islands - Cellular	0.4614
18	1345	Cayman Islands	0.269
19	236	Central African Republic	0.1862
20	235	Chad Republic	0.4082
21	56	Chile	0.029
22	561	Chile - Cellular	0.29
23	8610	China - Beijing	0.0344
24	8613	China - Cellular	0.0344
25	86568	China - Cellular	0.0344
26	86569	China - Cellular	0.0344
27	86886	China - Cellular	0.0344
28	86591	China - Fuzhou	0.0344
29	8620	China - Guangzhou	0.0344
30	8621	China - Shanghai	0.0344
31			

Again, we have several different groups here:

1. **Header** – This is present only once in the file, and contains global information.
2. **Tariff parameters** – This is also present only once in the file, and likewise contains global information.
3. **Rate data** – A data grouping which repeats multiple times in the file, with different values.

Thus there are six possible template components:

Header

A header contains data fields with global data for the object. On an invoice, for example, this would be the invoice number or the name of the company issuing the invoice. A tariff header contains the tariff name, currency and description.

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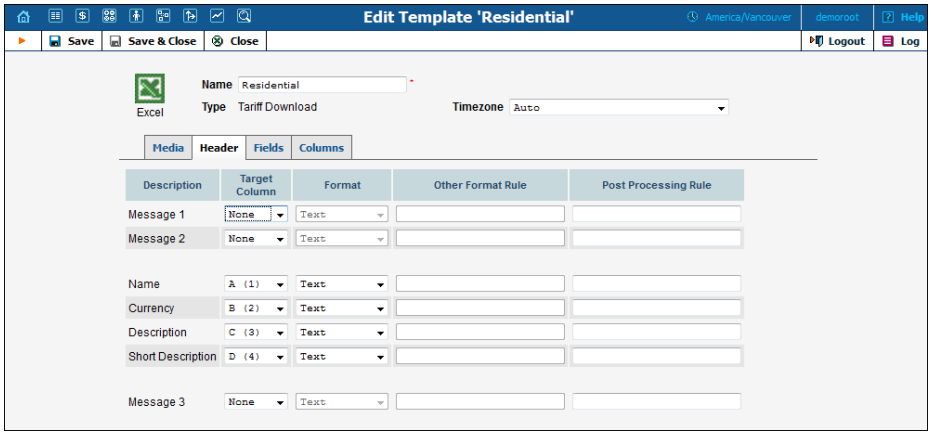

Page Header

This template component is available only for printable forms in which data is split across several pages. (For CSV or Excel files, the data is included as one single set). Data fields defined in this component will be placed at the top of each printed page.

NOTE: This component may not be available in *a single page with totals only* invoice templates.

Fields

Similar to the **Header**, this component contains global data for the object to be processed (tariff, invoice, etc.). Data fields are split between the **Header** and **Fields** simply for convenience, with the **Header** containing the main parameters, while **auxiliary** parameters are included in **Fields**. For instance, templates for tariff download contain specialized **Fields:** off-peak period definition, free seconds, connection fee, and so on.

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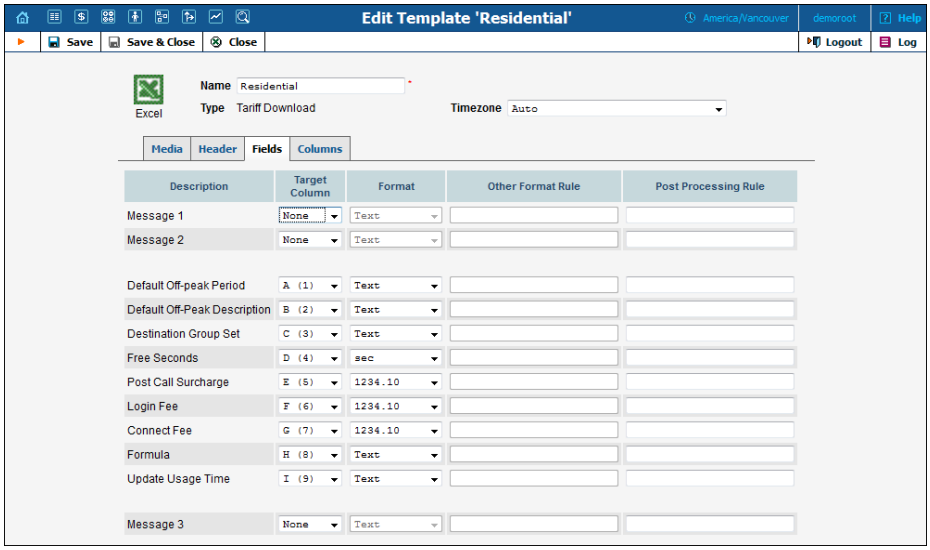

Columns (repeating groups)

This is the most important component, since it describes the variable portion of the data. For example, rate entries all have the same structure and format (phone prefix in the first column, country name in the second, price in the third, and so forth). However, there are many such rows in the file, and each row is an independent object. Thus, you define how one single row of data is to be formatted, and this will then be applied to all rows in the file.

Footer

Contains additional data about the object; for example, invoice totals.

Page Footer

Available only for printable forms; data fields to be placed at the end of each printed page.

Groups

See the *Template Groups* section.

Template Parameters

Template Type

The template type defines the intended use of the template:

- Whether it is for generating invoices (based on a standard or a custom invoice template) or for exporting data from PortaBilling®.

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- What kind of data is involved (invoice data or tariff data, etc.).

Template Media

This defines the file format to be processed, for example .CSV (Comma-Separated Values), .XLS (Microsoft Excel), or a printable form (a specific HTML, which might be converted into a PDF file).

Template Time Zone

Normally, when people specify a point in time, they name the day of the month, the month, the year, the hour and the minute, and, optionally, seconds as well. However, in order to be absolutely precise, this definition should also include a time zone.

Let's assume that your vendor sends you a data file containing his new rates and, for each rate, the date on which it becomes effective. This is fine; but is **01-May-2009 00:00** in the Pacific Standard time zone, or the Central European one? Obviously, time zone misinterpretation can render the rest of the data invalid. In most cases, specification of a time zone is not included in the date itself, but is defined externally.

For example, your vendor might tell you that all of the given times are in Eastern Standard Time. Or, there might be a note in the file saying this. In any case, the template engine needs to know what time zone is to be used. This is specified in the **Template time zone** parameter. If the parameter is set to "Auto", this means that the time zone of the user performing the upload is to be used. This is convenient when working with your own tariffs, but is not usually acceptable when uploading tariffs from vendors.

NOTE: If the date includes a time zone (for example, 2009-04-10 12:00:00 Australia/Sydney,) this time zone will take precedence over the template's time zone. However, make sure in this case that the time zone specification is both supported and unambiguous. For example, EST could mean Eastern Standard Time in both the US (GMT -5) and Australia (GMT +10) – quite a big difference!

Media Parameters

Media parameters define the data layout within the file, where the data for individual components should be located in the file, and whether they are present at all.

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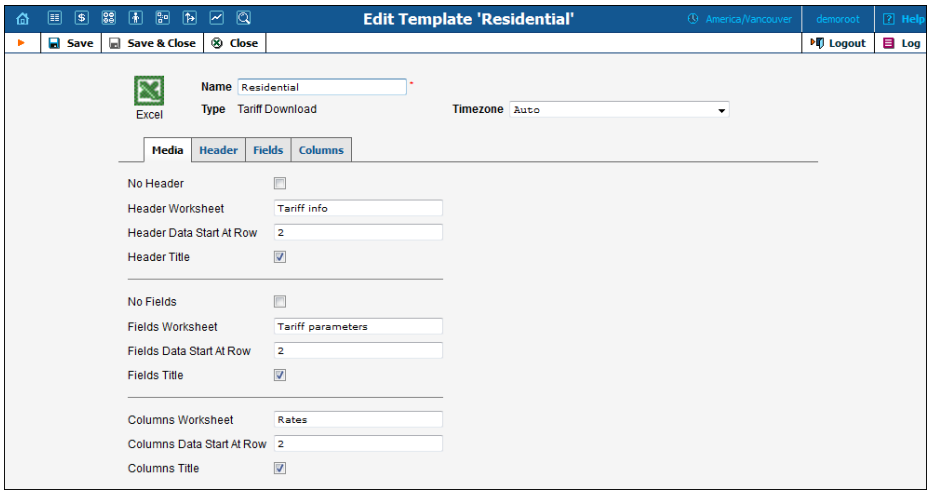
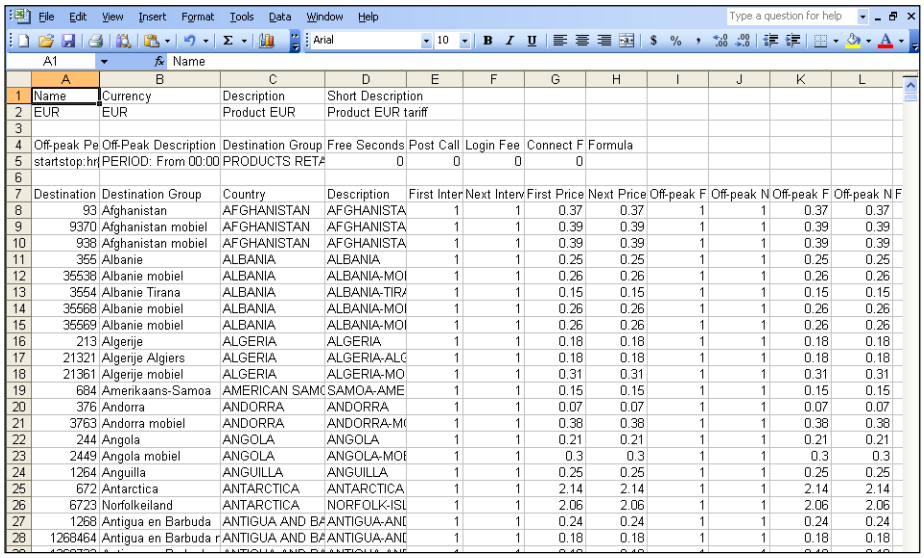


Here is a sample data file that matches this template. Note that "…Data start at row" means the first row with actual data, not including the title. For example, line 7 contains titles for column data, and so 8, the number of the first row with rate data (4066667….), appears in **Column Data Start At Row**.



	A	B	C	D	E	F	G	H	I	J	K	L
1	Name	Currency	Description	Short Description								
2	EUR	EUR	Product EUR	Product EUR tariff								
3												
4	Off-peak Pe	Off-Peak Description	Destination Group	Free Seconds	Post Call	Login Fee	Connect F	Formula				
5	startstop:hr(	PERIOD: From 00:00	PRODUCTS RETA	0	0	0	0					
6												
7	Destination	Destination Group	Country	Description	First Inter	Next Interv	First Price	Next Price	Off-peak F	Off-peak N	Off-peak F	Off-peak N F
8	93	Afghanistan	AFGHANISTAN	AFGHANISTA	1	1	0.37	0.37	1	1	0.37	0.37
9	9370	Afghanistan mobiel	AFGHANISTAN	AFGHANISTA	1	1	0.39	0.39	1	1	0.39	0.39
10	938	Afghanistan mobiel	AFGHANISTAN	AFGHANISTA	1	1	0.39	0.39	1	1	0.39	0.39
11	355	Albanie	ALBANIA	ALBANIA	1	1	0.25	0.25	1	1	0.25	0.25
12	35538	Albanie mobiel	ALBANIA	ALBANIA-MOI	1	1	0.26	0.26	1	1	0.26	0.26
13	3554	Albanie Tirana	ALBANIA	ALBANIA-TIRA	1	1	0.15	0.15	1	1	0.15	0.15
14	35568	Albanie mobiel	ALBANIA	ALBANIA-MOI	1	1	0.26	0.26	1	1	0.26	0.26
15	35569	Albanie mobiel	ALBANIA	ALBANIA-MOI	1	1	0.26	0.26	1	1	0.26	0.26
16	213	Algerije	ALGERIA	ALGERIA	1	1	0.18	0.18	1	1	0.18	0.18
17	21321	Algerije Algiers	ALGERIA	ALGERIA-ALG	1	1	0.18	0.18	1	1	0.18	0.18
18	21361	Algerije mobiel	ALGERIA	ALGERIA-MO	1	1	0.31	0.31	1	1	0.31	0.31
19	684	Amerikaans-Samoa	AMERICAN SAMO	SAMOA-AME	1	1	0.15	0.15	1	1	0.15	0.15
20	376	Andorra	ANDORRA	ANDORRA	1	1	0.07	0.07	1	1	0.07	0.07
21	3763	Andorra mobiel	ANDORRA	ANDORRA-MO	1	1	0.38	0.38	1	1	0.38	0.38
22	244	Angola	ANGOLA	ANGOLA	1	1	0.21	0.21	1	1	0.21	0.21
23	2449	Angola mobiel	ANGOLA	ANGOLA-MOE	1	1	0.3	0.3	1	1	0.3	0.3
24	1264	Anguilla	ANGUILLA	ANGUILLA	1	1	0.25	0.25	1	1	0.25	0.25
25	672	Antarctica	ANTARCTICA	ANTARCTICA	1	1	2.14	2.14	1	1	2.14	2.14
26	6723	Norfolkeiland	ANTARCTICA	NORFOLK-ISL	1	1	2.06	2.06	1	1	2.06	2.06
27	1268	Antigua en Barbuda	ANTIGUA AND BA	ANTIGUA-AND	1	1	0.24	0.24	1	1	0.24	0.24
28	1268464	Antigua en Barbuda r	ANTIGUA AND BA	ANTIGUA-AND	1	1	0.18	0.18	1	1	0.18	0.18

Template Data Fields

Data fields describe a single element of data, such as "invoice number", "price" or "company name". For each data field in the template you specify the following:

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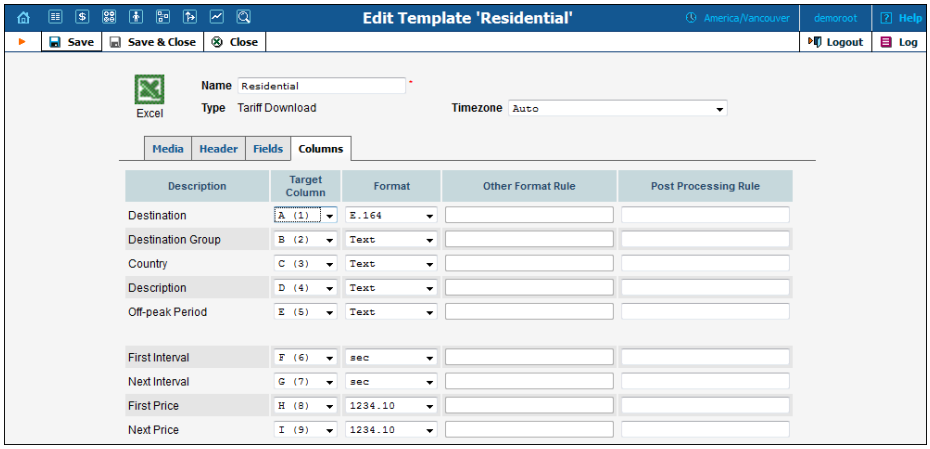

Target Columns (for Download Templates)

Target columns define where to position the result value. If you want to skip the downloading of specific data, then choose **None** for this data field. Multiple data fields can be populated from the same target column.

NOTE: This option is not available for download templates with printable form media, since in that case you will specify where you would like the value to appear using Layout Designer.

Format

A format describes data fields so that they may be converted from the database (default) format to a specific format during download.

For example, if you choose format "**011E.164**" for the "Destination" data field, then the template engine will know that you require the downloaded numbers to be in a US dialing format, so the international number must be prefixed by "**011.**" Therefore, "**011**" will be prefixed to the number "**4201234567**" during the download, so the number in the output file will be "**0114201234567.**"

In order to provide better quality control of data, PortaBilling® supports several data types. These define what kind of data appears in the data field, as well as possible ways to process it. Currently supported data types include:

- Destination (phone number).
- Date/time
- Number
- Time interval (number of minutes/seconds)
- Text
- Boolean (yes/no)

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A data type is predefined for each data field, so you do not need to specify one. For each data type in PortaBilling® there is a set of default formats, so that you will usually not have to invent anything from scratch. If you encounter a data format for which there is no suitable data type in PortaBilling®, you may choose "Other". You will then be able to specify a custom format rule.

"Other" Format Rule

If none of the PortaBilling® default formats suit your needs, you can choose "Other" and enter your own formatting rule. See below for a description of how a format rule works for data fields of a particular type.

Number

For numeric data fields (for example, "Price 1" or "Connect fee"), the value you enter in the **Other Format** field is considered to be the format specification **###,###.##**, where:

- A **#** sign or the digits 0-9 represent one digit of the input or output number.
- The first character from the *right* which is not a digit or # (e.g. . in #,###.00) specifies a decimal separator.
- The first character from the *left* which is not a digit or # (e.g. , in #,###.00) specifies a group separator.
- The number of characters after the decimal separator specifies the precision of the number. However, # indicates no zero padding, and 0 indicates zero padding.
- If the number has too many digits for the format specification, it will be rounded to the number of decimal digits specified in the format.
- A group separator (if present) specifies which character should be used to split groups of 3 digits in the number. If none is specified, then no group separation will be done.
- It is sufficient to specify a group separator only once, even if your real numbers will be large and contain more than one digit group. All digits to the left of the decimal point are always shown, regardless of how many of them are actually shown in the format.

This is important mainly for download templates, where the format or precision you use to present numbers in documents differs from the format in which data is stored in the database. For upload templates, number format specification is mainly used to handle non-standard group or decimal separators. See the table below for examples of formats for converting numbers.

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Format	Number	Result	Comment
#,###.##	1.6	1.6	No zero padding
#,###.00	1.6	1.60	Zero padding
#,###.00	34567.6	34,567.60	Digit groups
####.00	34567.6	34567.60	No digit groups
#.#	2.382	2.4	Rounding
#.#	2569.31	2569.3	Significant part is never truncated
#.###,##	2569.31	2.569,31	German format
# ###,##	7892569.31	7 892 569,31	Yet another custom format

Table 1-1 – Examples of number formats.

Date and Time

This type is used for data fields that contain either both the date and time (e.g. **Effective from**) or just the date (e.g. **Invoice date**). Each data field has a default format. For instance, for **Period From Date** on the **Field** tab of the invoice template it is YYYY-MM-DD. This means that end users see dates in this format: 2015-08-23. All of the date and time format specifiers are listed below:

- **YYYY** – Year (four digits, e.g. 2009).
- **YY** – Year (short format, e.g. 05). Note that this format can lead to potential data interpretation problems, since "10" could be either 2010 or 1910. The PortaBilling® template engine considers the year values 00-30 to be in the 21st century, and 31-99 to be in the 20th century.
- **MM** – Number of the month (01…12).
- **MON** – Abbreviated name of the month (e.g. `Jan`). Only English names of the months are currently supported.
- **MONTH** – Full name of the month (e.g. `January`). Only English names of the months are currently supported.
- **DD** – Day of the month with a leading zero for 1 through 9; for example, 01, 06, 14, 25.
- **D** – Day of the month without a leading zero for 1 through 9; for example, 1, 6, 14, 25.
- **HH** or **HH24** – Hour (24-hour format).
- **HH12** – Hour (12-hour format).
- **AM/PM** – AM or PM indicator.
- **MI** – Minutes.

NOTE: Very often people make the mistake of using **MM** as a format for minutes. This is incorrect, as **MM** is a format for month. Thus, **HH:MM:SS** will clearly not work correctly.

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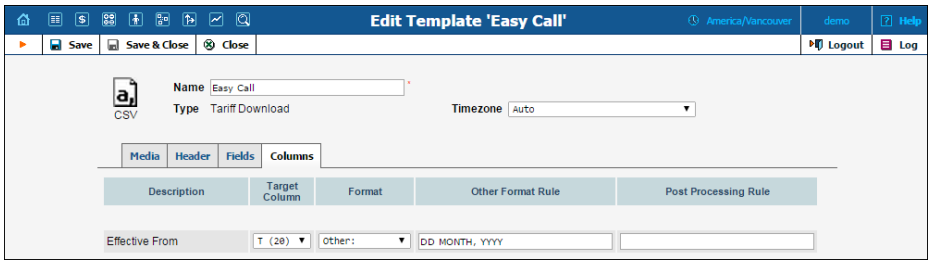
- **SS** – Seconds.
- **TZ** – Time zone name (e.g. CET).
- **XXX** – Any combination of non-space characters; used in formats for parsing dates to skip a variable part of the date, for example, the name of a weekday (see examples below in Table 1-2).
- All other symbols in the format (spaces, delimiters like **/**, **-**, **:** or **;** and other characters) represent themselves. So they are placed as-is in the output date string, and must be found in the input string exactly as they were entered.

PortaBilling® administrators can customize date and time formats according to their needs and we show you how to do it for different template types.

Rate Upload and Download templates

Specify your customized date and time format for the required data field within the **Other Format Rule** field. Click **Save** to apply the changes:



Let's take a look at some examples for importing dates into:

Date / time string	Description	Correct format specification
07/04/2009	July 4th 2009, US date format	MM/DD/YYYY
04-07-2009	July 4th 2009, European date format	DD-MM-YYYY
07-04-09	July 4th 2009, US date format, short year format	MM-DD-YY
11:05 am	Time, 12-hour format	HH12:MI AM/PM
11:05	Time, 24-hour format	HH:MI
18:58:00	Time with seconds	HH:MI:SS
2009-07-04 14:00:00	Date and time, ISO format	YYYY-MM-DD HH:MI:SS
07/04/09 2:00:00 pm	Date and time, US format	MM/DD/YY HH12:MI:SS AM/PM

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1-May-2009 18:52	Date and time, abbreviated month name	D-MON-YYYY HH:MI
Sun, 16 Mar 09	Date and time, skip weekday name	XXX D MON YY
12th of March, 2009	Date with "as is" elements	Dth of MONTH, YYYY

Table 1-2 – Examples of date and time formats for upload.

The following table gives examples for using templates to convert values in the PortaBilling® database to the desired format.

Date / time in	Format specification	Resulting value
01-May-2014 12:34:56	MM/DD/YYYY	05/01/2014
01-May-2014 12:34:56	DD-MM-YYYY	01-05-2014
01-May-2014 12:34:56	MM-DD-YY	05-01-14
01-May-2014 12:34:56	HH12:MI AM/PM	12:34 pm
01-May-2014 12:34:56	HH:MI	12:34
01-May-2014 12:34:56	HH:MI:SS	12:34:56
01-May-2014 12:34:56	YYYY-MM-DD HH:MI:SS	2014-05-01 12:34:56
01-May-2014 12:34:56	MM/DD/YY HH12:MI:SS AM/PM	05/01/14 12:34:56 pm
01-May-2014 12:34:56	D-MON-YY	1-May-14
01-May-2014 12:34:56	D of MONTH, YYYY	1 of May, 2014
01-May-2014 12:34:56	YYYYMMDD HHMISS	20140501 123456

Table 1-3 – Examples of date and time formats for download.

Invoice template

To apply your customized date and time format for the invoice template, insert this code into the **Other Format Rule** field of the required data field:

```
Porta::Date->new_iso($value)->asCustomFormat('DD-MM-
YYYY')
```

where `'DD-MM-YYYY'` is an example of date format.

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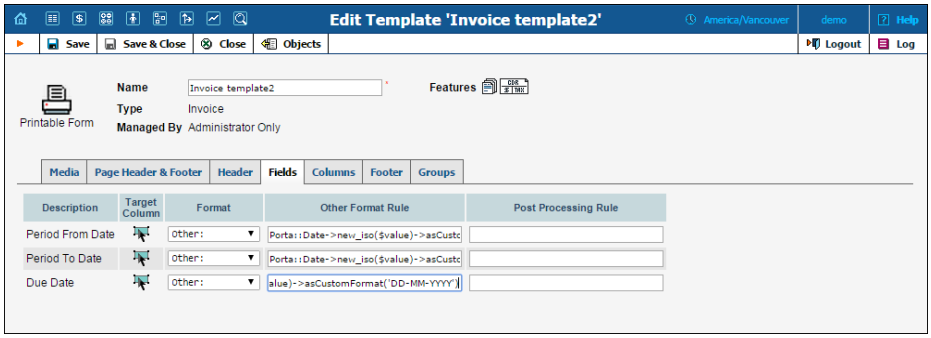

Parsing module

Please note that when importing data that has dates in a customized format (e.g. rate upload), you can use the Time::ParseDate module to recognize the date format. This module examines a data string and finds bits of data, regardless of how they are placed or separated there. In order to use the Time::ParseDate module for parsing dates, choose "Auto" as the format.

Unfortunately, in some situations even Time::ParseDate is unable to properly identify the date. For example, the string "02-01-2009" could either mean February 1st or January 2nd. In such situations, an exact format specification is required.

Other data types

For other data types (e.g. **Destination**, **Text** or **Interval**) there are no specific format elements. The "Other" format rule is regarded as a Perl macro; thus it is evaluated, and the result of the evaluation is considered a new value. For a detailed description of Perl macros, see the Post-processing rules section below. The original string value is received as a parameter, and the converted value should be returned in the required format.

The following table provides a description of which type of output value is required for other format rules, depending on the data field type.

Data field type	Other format rule in	Output value
Destination	Perl code	string
Number	Number format	N/A
Boolean	Perl code	string ('Y' or 'N')
Interval	Perl code	number
DateTime	Date/time format	N/A
Text	Perl code	string

Table 1-4 – Output value type for other format rules.

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Post-processing Rules

Sometimes you will need to perform a very specific conversion which is not possible using the standard PortaBilling® formats. In this case, you can use post-processing rules. A post-processing rule is a piece of Perl code which is executed at run-time, and the value it returns becomes the final value for a field. This is similar to formulas or macros in Excel, giving you a virtually unlimited ability to change your data as you need to. There are a few requirements for writing post-processing rules:

- A processing rule is Perl code, i.e. one or more Perl operations separated by semicolons.
- The input value (to be processed) is in the **$value** variable.
- The final result is the value returned by the last expression in the list.

TIP: One of the most useful things post-processing rules can do is to create new data which is not based on the input data. This is required, for example, when certain data fields (e.g. **Interval 1** and **Interval N**) are absent from the input file. If you know that **Interval 1** is 30 seconds, and **Interval N** is 6 seconds, you can simply assign these values as constants in the post-processing rule.

Let's look at a few examples:

Post-processing rule	Input data	Result
Remove all leading white space from the string		
`$value =~ s/^\s+//;$value`	Aruba	Aruba
Remove all leading and trailing white space from the string		
`$value =~ s/^\s+//;` `$value =~ s/\s+$//;$value`	Aruba	Aruba
Add 1 before the phone number, but only if it does not start with 0		
`$value =~ m/^0/ ? $value : '1'.$value;`	6041234567	16041234567
Take only the part of the input string following the hyphen		
`my @a = split('-', $value, 2); $a[-1];`	Norway-Oslo	Oslo
Assign a constant value to the field		
`$value = 30`	None	30
30	None	30

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Replace all hyphens with spaces and remove all quotes		
`$value =~ s/-/ /g; $value =~ s/\"//; $value`	Germany-'Berlin'	Germany Berlin
Use an external (custom) module to translate English country names into Czech		
`use Czech::Translate; transl_data($value);`	Austria	Rakousko

Table 1–5 – Examples of using post-processing rules.

NOTE: This manual does not cover details of programming in Perl. There are excellent books on this subject, for example:

- Programming Perl by Larry Wall, Tom Christiansen, Jon Orwant (ISBN 0-596-00027-8)
- Learning Perl by Randal L. Schwartz, Tom Phoenix (ISBN 0-596-00132-0)
- Perl Cookbook by Tom Christiansen, Nathan Torkington (ISBN 1-56592-243-3)

Values returned by a post-processing rule should have the same type as the input value it receives. The following table provides information about types of input values for post-processing rules, depending on the data field type.

Data field type	Input value ($_)
Destination	String
Number	number
Boolean	string ('Y' or 'N')
Interval	number
DateTime	unixtime
Text	string

Table 1–6 – Input value type for post-processing rules.

Template Groups

Concepts

Template groups are necessary for performing sorting/subtotals on large sets of data. For example, you might need to make a list of all phone calls, with a subtotal for each country.

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Call Detals Records By Country

CANADA						
3804424471821	160452152771	CANADA	Quebec	2004-02-12 08:08:25	38	0.10
3804424471825	160452152771	CANADA	Alberta	2004-02-12 08:09:07	3	0.49
3804424471825	160421971327	CANADA	British	2004-02-12 08:09:13	31	0.26
3804424471825	160421971325	CANADA	Ontario	2004-02-12 08:09:54	3	0.04
TOTAL By CANADA					**2**	**0.88**
CZECH REPUBLIC						
3804424471821	420608076502	CZECH	Mobile	2004-02-12 07:23:07	14	0.75
TOTAL By CZECH REPUBLIC					**0**	**0.75**
UKRAINE						
3804424471825	380688763541	UKRAINE	Mobile	2004-02-12 06:20:29	66	0.36
3804424471825	380442447182	UKRAINE	Kiev Region	2004-02-12 07:09:35	1	0.95
3804424471825	380503425341	UKRAINE	Mobile	2004-02-12 07:10:16	20	0.24
3804424471825	380664729846	UKRAINE	Mobile	2004-02-12 07:14:25	2	0.13
3804424471825	380672345123	UKRAINE	Mobile	2004-02-12 07:15:07	21	0.15
TOTAL By UKRAINE					**2**	**1.83**

Group

Each group is a portion of data which has an identical value for some parameter or parameters. All of the input data will be sorted according to groups, and rows within the same group will be presented together. In the example above, three groups are visible, each of them containing all calls made to a certain country. Groups can also be nested; for example, the group "By Country" will contain several sub-groups "By Prefix". These are sorted in the list of groups according to their include order, so that the outermost group is on top, and the innermost at the bottom.

Group Break

This is a parameter which defines which group the data should belong to. All of the available data are sorted according to this field. In the example above, the list of all calls is sorted by the name of the destination country (so that calls made to **Slovenia** appear before calls made to **Ukraine**). Next, rows which have the same group break expression value are joined in the same group, as seen in the example above for all calls made to Slovenia, Ukraine or the US.

Normally, you will just choose one of the available columns for breaking the group (in the example above, this is the "Country" column). You can also create a custom group break, specifying any valid SQL expression.

Group Header

This is a template component which is inserted into the document immediately before the group data. Besides static text, variable fields (e.g.

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"Destination") can also be used. In the example above, this is the row containing the name of the country.

Group Footer

Similar to the group header, this element is placed immediately after the last row of the group. It can consist of static text and variable fields. In the example above, this is the row containing "TOTAL by" and the name of the country, as well as the total number of seconds and amount for the country.

Group Fields

These variable elements are very similar to data fields in the **Columns** section of a template (and are actually based on them). You can alter their parameters (such as format or post-processing rules) in exactly the same way as you would for standard elements of the **Columns** section.

Group Totals

Since one group may consist of many rows of data, what would be the value in the group fields for the header/footer? The fields in the group header have the value of the first row in the group. You can specify how you would like to populate the value of fields in the group footer. Possible pre-defined options include:

- Summary (sum of values for the corresponding column across all rows)
- Count (number of rows in the group)
- Last value (value of this column in the last row)

You can always write your own custom total rules. These are very similar to post-processing rules, in that you can specify any Perl expression. The current value of the column is given in the **$value** variable, the current value of the total is given in the **$total** variable, and the result returned by the expression becomes the new total.

In the example below you see what a list of calls might look like if you were to use two groups:

1. Break group by country (so that each group contains all calls made to the same country).
2. Break group by destination. This group exists within the first group, so it contains all calls made to a specific destination within a certain country.

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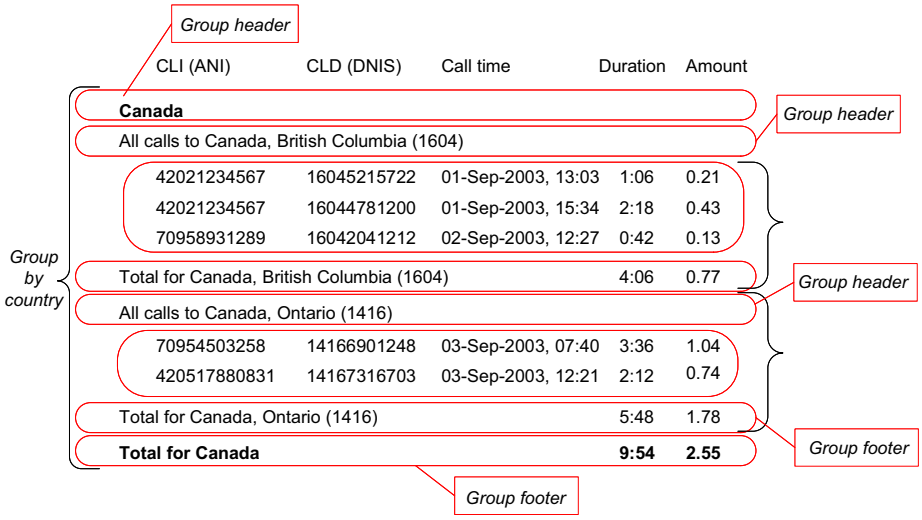

Things to Remember

XDR Number Limitation in the Invoice

In order to avoid high resource consumption while generating vast invoices, the number of rows in the invoice is limited to 1000 by default, but it can be changed via the configuration server.

Custom Fields

Sometimes service providers must supply customers with additional information (for example, tax code, contract number, etc.) on the invoices. In PortaBilling®, additional information can be filled in on the **Custom Fields** tab when you add a new customer or edit an existing one. Later this information can be added in the **Layout Designer** of the invoice template.

If you need to add extra fields to the invoice perform the following steps:

- Add necessary custom fields on the **Web Interface** page.
- Ensure that all required information is specified on the **Custom Fields** tab for the customers who require additional information on their invoices.
- Open the invoice template where you would like to add custom fields.
- Launch **Layout Designer**.
- Right-click on the layout designer sheet and select the desired custom field from the available list in the **Header** section.

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NOTE: There are up to 10 custom fields available for adding to the invoice template and all custom fields are sorted by the order of their addition to the Web Interface page.

The Suppress Columns Option

Suppress Columns allows to show in the invoice only totals per each, service such as total payments, total credits and total calls' duration and cost to specific countries.

In the figure below you can see an invoice example with the **Suppress Columns** option disabled.

12004577824	Payment/Refund transaction		E-Commerce Charge		21-02-00	-4.10
12004577824	Payment/Refund transaction		E-Commerce Charge		25-02-00	-2.15
TOTAL Payments						**-24.08**
Credits						
	Balance adjustment		Manual charge		09-02-00	20.50
	Balance adjustment		Manual charge		11-02-00	4.50
	Balance adjustment - Manual		Manual refund		12-02-00	-10.00
TOTAL Credits						**15.00**
Subscriptions						
12001234507	Subscription Fee		Follow Me	00-02-00	13-02-00	3.00
12001234507	Subscription Fee		SuperCall	01-02-00	01-03-00	7.99
TOTAL Subscriptions						**10.99**
CANADA						
12001234507	100438130379	CANADA	Newfoundland	2000-02-12 10:04:54	0:28	0.29
12001234507	88005554433	CANADA	Quebec	2000-02-12 10:08:25	1:10	0.70
12001234507	100471374925	CANADA	Quebec	2000-02-12 10:08:25	0:38	0.10
12004577824	100452152771	CANADA	Alberta	2000-02-12 10:09:07	0:38	58.48
12004577824	100421971327	CANADA	British	2000-02-12 10:09:13	0:31	0.20
12004577824	100421971325	CANADA	Ontario	2000-02-12 10:09:54	0:31	0.04
12001234507	8-800-SMS	CANADA	Quebec	2000-02-13 12:12:01	0:14	0.34
TOTAL By CANADA					**4:10**	**60.20**

In the figure below you can see an invoice example with the **Suppress Columns** option enabled.

Payments		
TOTAL Payments		**-24.08**
Credits		
TOTAL Credits		**15.00**
Subscriptions		
TOTAL Subscriptions		**10.99**
CANADA		
TOTAL By CANADA	**4:10**	**60.20**

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Destination Upload

Why can't I use custom templates for destination upload/download?

There is only one format available for uploading destinations at the moment, since:

- The format is fairly simple.
- You almost never need to upload new destinations alone; normally, you will need to input new rates in the system which requires the new destinations, and in this case the PortaBilling® template processor will add new destinations automatically.

However, functionality for creating custom templates for destination upload or download is available, and may be included in future releases.

How to fill in country information for a destination

For each destination entered into PortaBilling®, it is necessary to provide information on which country (and, optionally, administrative subdivision in that country) the destination belongs to. This will help you keep better track of rates for a specific country, and will also be used to ensure a correct description in call details and statistics for you and your customers. PortaBilling® comes with a complete list of countries registered with the International Standards Organization, providing each country's ISO code (e.g. **US** for United States of America, **CA** for the Canada, and so on). When a new destination is manually entered using the PortaBilling® web interface, you can choose the country from a list. When importing many new destinations at once, country information must be provided for each in the form of the two-letter ISO code. Why not the country name? Unfortunately, country names can be very ambiguous. For example, *UK*, *United Kingdom*, *Great Britain*, *Britain* and *England* are all synonyms for the same country (which could also could be called *The United Kingdom of Great Britain and Northern Ireland*), and you never know which version of the name your vendor will decide to use. Moreover, country names in local languages (e.g. *Velka Britanie* in Czech), spelling errors (e.g. *Untied Kigndom*), punctuation marks, and the like further complicate the matter. This is why PortaBilling® uses country codes instead, since they define exactly which country is meant.

Does this mean that you now have to fill in country codes for several hundred missing destinations manually? No, there is a better way!

TIP: When uploading destinations with empty country codes, PortaBilling® will try to find country information based on data which is already in the database. For example, if the prefix **61** already exists in the database, and is assigned to Australia, then when you upload a new

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destination with prefix **61881** PortaBilling® will automatically fill in the country information for you.

NOTE: Of course, in order for this method to work effectively you need to have an initial set of destinations in the database already. PortaBilling® comes with a default set of almost 3,000 destinations, which covers most of the countries of the world and popular destinations in those countries. You can download it using the **Get default set** button in the Destinations screen, customize it according to your needs, and then upload it.

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2. Rate Upload

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Upload via the Rate Upload Wizard

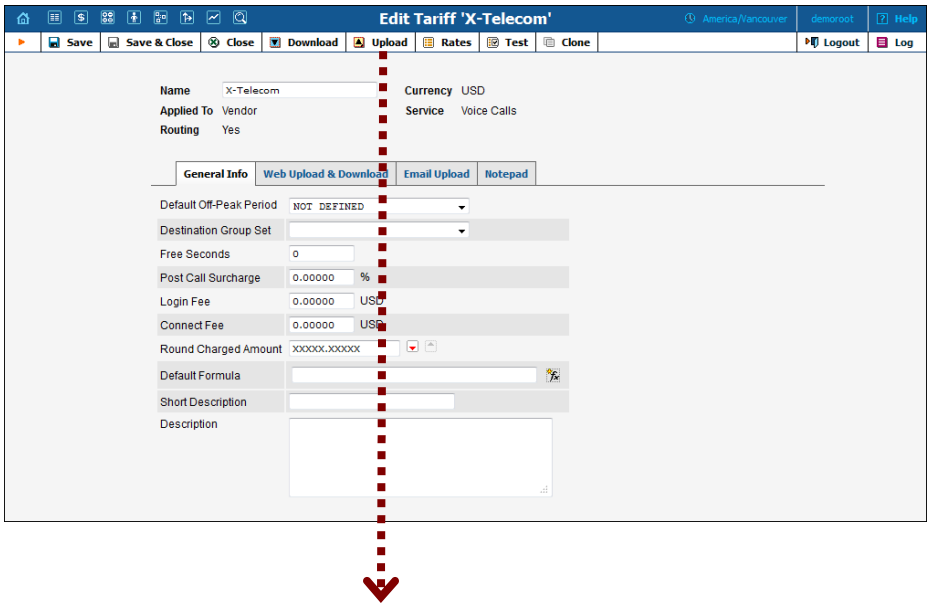
PortaBilling® offers the ability to program data processing rules (called templates) for each type of rate file you receive, so that you can eliminate the need for any manual data conversion and save yourself a lot of time. Also, the rate upload process is interactive and provides a comparison between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



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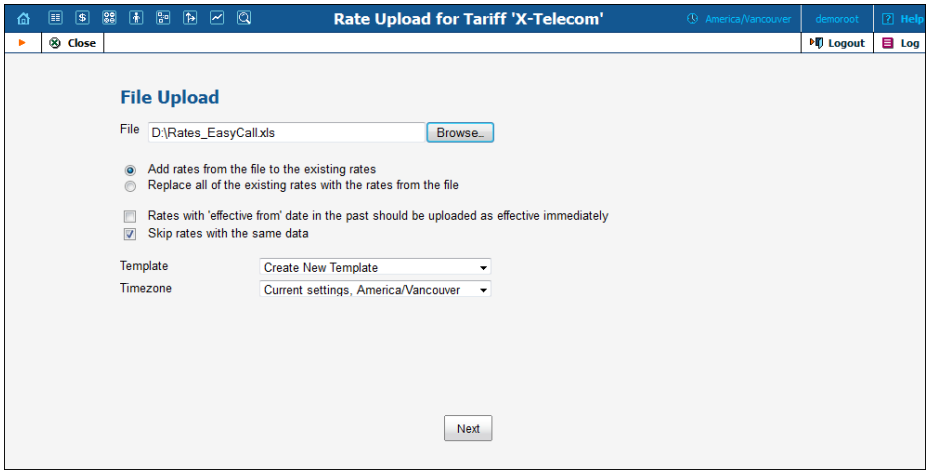

Let's now discuss the available options and their effect.

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

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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 xDRs 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). Consequently, you have the choice to either skip these rates or upload them as effective immediately. This can be adjusted by using the **Rates with 'effective from' date from the past should be uploaded as effective immediately** 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.

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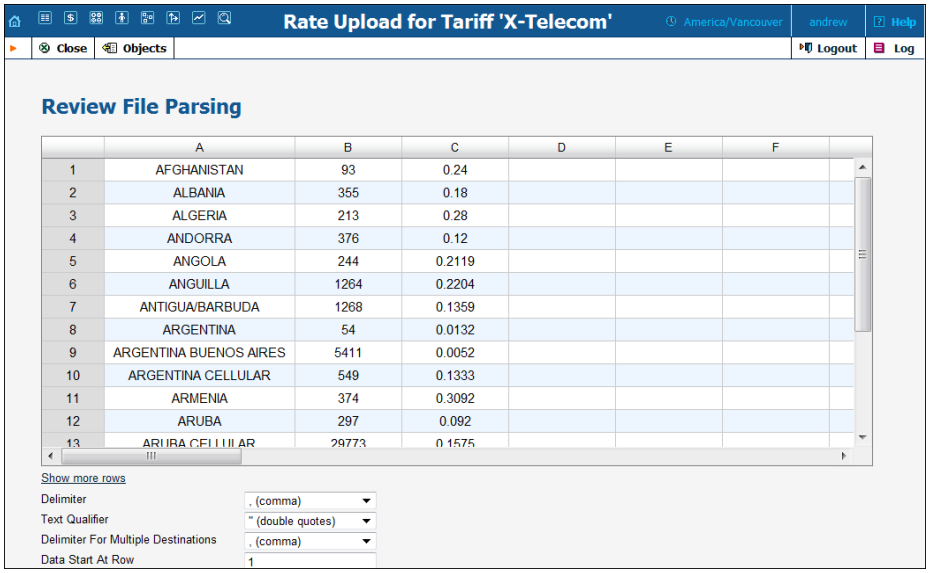
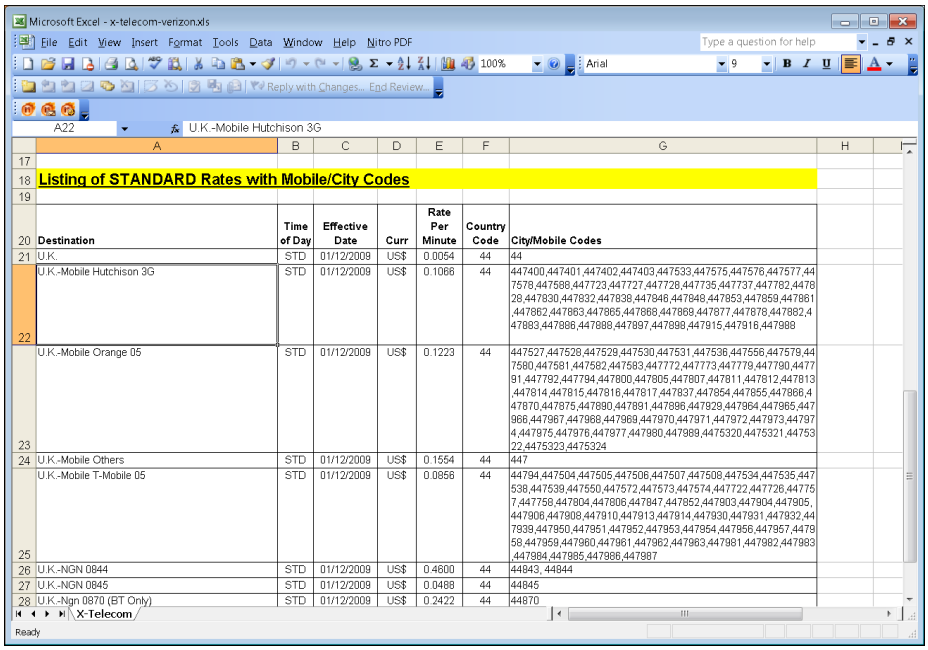


	A	B	C	D	E	F
1	AFGHANISTAN	93	0.24			
2	ALBANIA	355	0.18			
3	ALGERIA	213	0.28			
4	ANDORRA	376	0.12			
5	ANGOLA	244	0.2119			
6	ANGUILLA	1264	0.2204			
7	ANTIGUA/BARBUDA	1268	0.1359			
8	ARGENTINA	54	0.0132			
9	ARGENTINA BUENOS AIRES	5411	0.0052			
10	ARGENTINA CELLULAR	549	0.1333			
11	ARMENIA	374	0.3092			
12	ARUBA	297	0.092			
13	ARUBA CELLULAR	29773	0.1575			

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.



Destination	Time of Day	Effective Date	Curr	Rate Per Minute	Country Code	City/Mobile Codes
U.K.	STD	01/12/2009	US$	0.0054	44	44
U.K.-Mobile Hutchison 3G	STD	01/12/2009	US$	0.1066	44	447400,447401,447402,447403,447533,447575,447576,447577,447578,447588,447723,447727,447728,447735,447737,447782,447828,447830,447832,447839,447846,447849,447853,447859,447861,447862,447863,447865,447868,447869,447877,447878,447882,447883,447886,447888,447897,447898,447915,447916,447988
U.K.-Mobile Orange 05	STD	01/12/2009	US$	0.1223	44	447527,447528,447529,447530,447531,447536,447556,447579,447580,447581,447582,447583,447772,447773,447779,447790,447791,447792,447794,447800,447805,447807,447811,447812,447813,447814,447815,447816,447817,447837,447854,447855,447866,447870,447875,447890,447891,447896,447929,447964,447965,447966,447967,447968,447969,447970,447971,447972,447973,447974,447975,447976,447977,447980,447989,4475320,4475321,4475322,4475323,4475324
U.K.-Mobile Others	STD	01/12/2009	US$	0.1554	44	447
U.K.-Mobile T-Mobile 05	STD	01/12/2009	US$	0.0856	44	44794,447504,447505,447506,447507,447508,447534,447535,447538,447539,447550,447572,447573,447574,447722,447726,447757,447758,447804,447806,447847,447852,447903,447904,447905,447906,447908,447910,447913,447914,447930,447931,447932,447939,447950,447951,447952,447953,447954,447956,447957,447958,447959,447960,447961,447962,447963,447981,447982,447983,447984,447985,447986,447987
U.K.-NGN 0844	STD	01/12/2009	US$	0.4600	44	44843, 44844
U.K.-NGN 0845	STD	01/12/2009	US$	0.0488	44	44845
U.K.-Ngn 0870 (BT Only)	STD	01/12/2009	US$	0.2422	44	44870

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.

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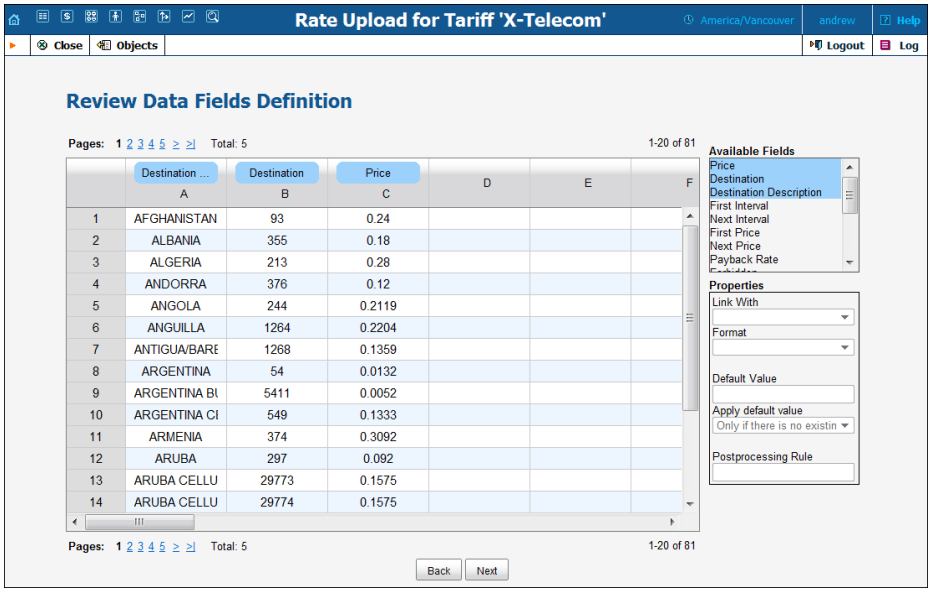
In our case, it looks as if the file was parsed properly, so we can click **Next** and move on to the next step

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-hand pane 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).

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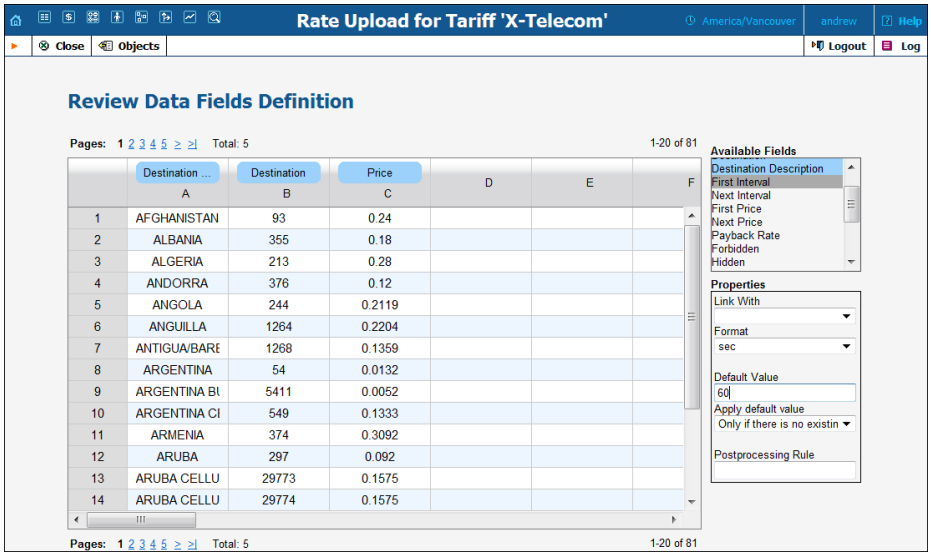
The **Format** select menu allows you to adjust the way PortaBilling® interprets the values in the table cells, e.g. whether a leading 00 should be stripped off or considered part of the phone prefix, or whether a comma (,) or a dot (.) should be considered as a decimal separator for numbers.

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).

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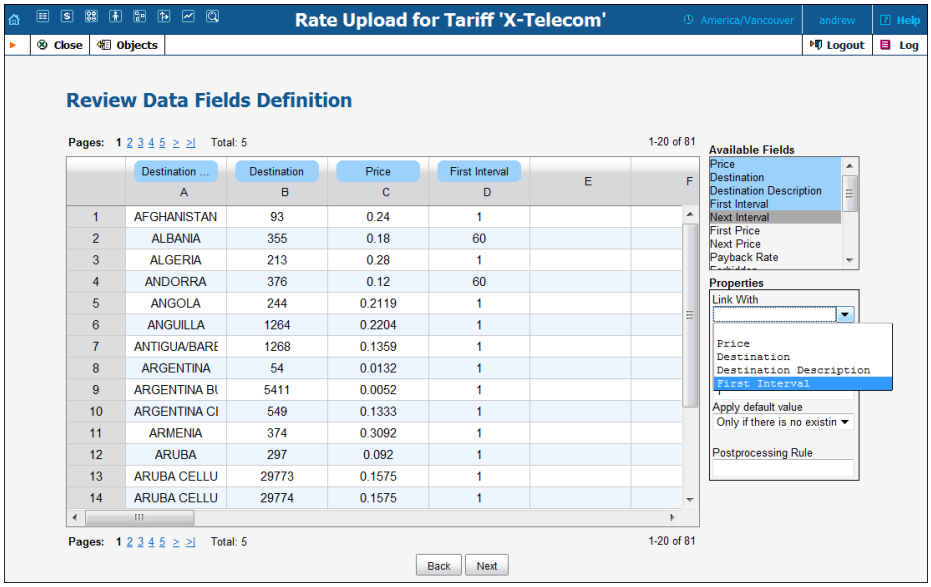

What if you want to "preserve" some of the already assigned rate attributes?

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.

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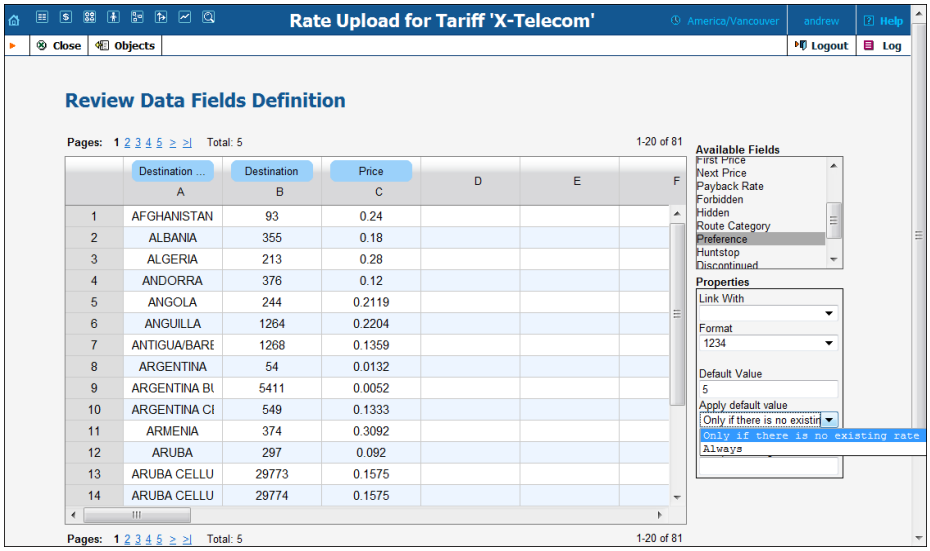

Thus the parameter value from the existing rate will be copied into the new one, so that the new rate for 44 will retain preference 8, and the rate for 447 – preference 3.

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.

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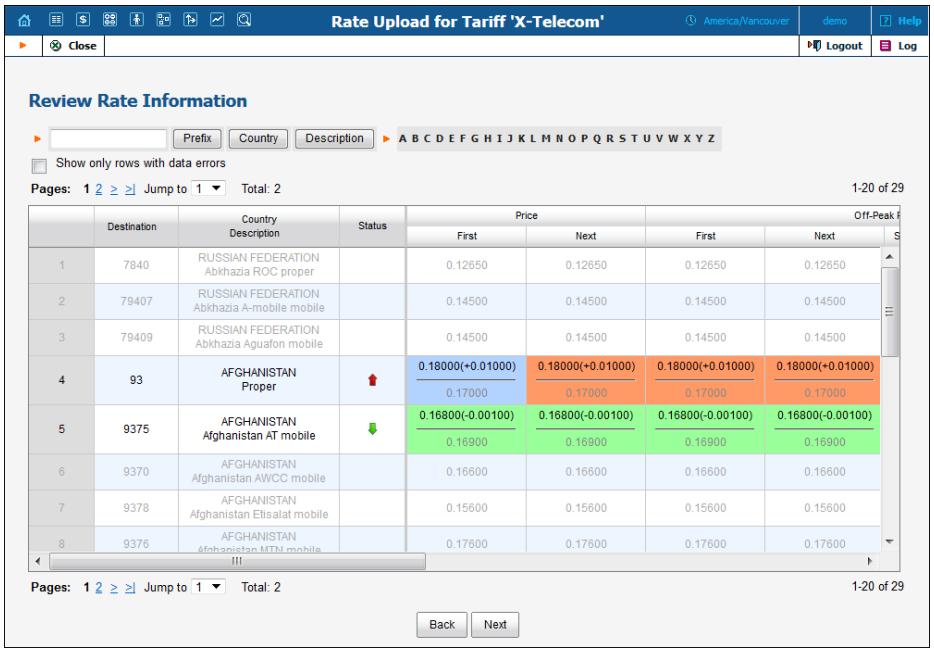
Review Rate Information

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 the **Price** field you can also view the actual price differences.

The duplicate rates (i.e. the rates that have exactly the same parameters as already existing ones in the database) are highlighted as inactive and therefore appear grey.

If you *do* wish to add an inactive rate, it is necessary to manually activate it. Click on the ⊞ icon at the end of the row to activate the rate. When activated, the rate color will change to black.

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

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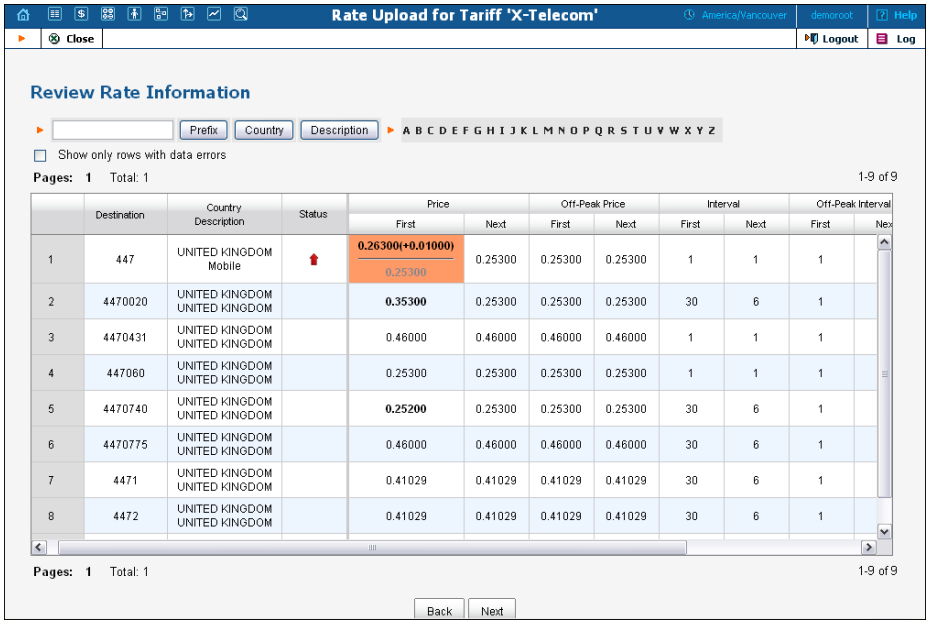

	Destination	Country Description	Status	Price First	Price Next	Off-Peak Price First	Off-Peak Price Next	Interval First	Interval Next	Off-Peak Interval First	Off-Peak Interval Next
1	447	UNITED KINGDOM Mobile		0.26300(+0.01000) / 0.25300	0.25300	0.25300	0.25300	1	1	1	
2	4470020	UNITED KINGDOM UNITED KINGDOM		0.35300	0.25300	0.25300	0.25300	30	6	1	
3	4470431	UNITED KINGDOM UNITED KINGDOM		0.46000	0.46000	0.46000	0.46000	1	1	1	
4	447060	UNITED KINGDOM UNITED KINGDOM		0.25300	0.25300	0.25300	0.25300	1	1	1	
5	4470740	UNITED KINGDOM UNITED KINGDOM		0.25200	0.25300	0.25300	0.25300	30	6	1	
6	4470775	UNITED KINGDOM UNITED KINGDOM		0.46000	0.46000	0.46000	0.46000	30	6	1	
7	4471	UNITED KINGDOM UNITED KINGDOM		0.41029	0.41029	0.41029	0.41029	30	6	1	
8	4472	UNITED KINGDOM UNITED KINGDOM		0.41029	0.41029	0.41029	0.41029	30	6	1	

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 a preference of 5) – this is because there is an existing rate for this destination, and it is already assigned preference 3.

NOTE: Only active rates can be edited.

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.

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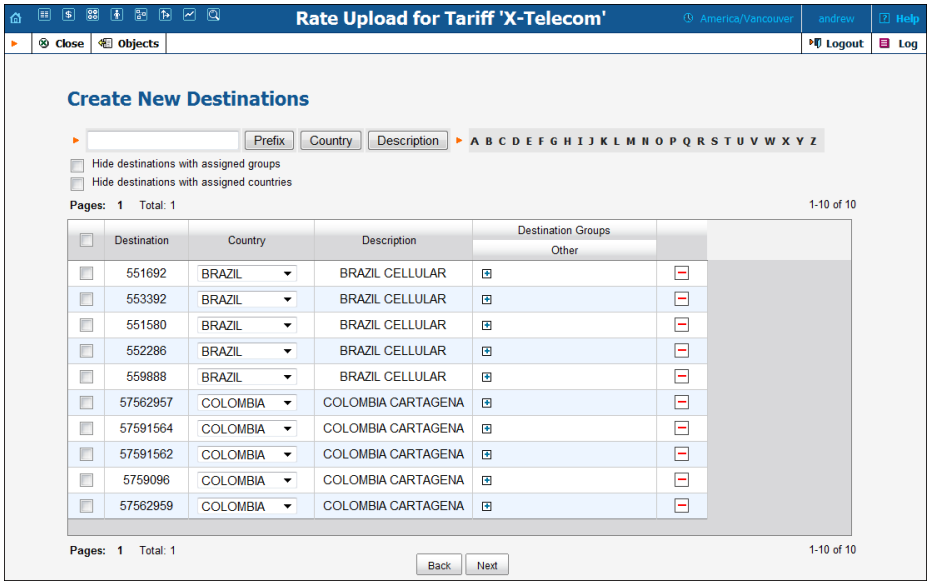

Carriers frequently send rate files containing prefixes that have not yet been defined in your system. These prefixes must be added into the system in order for rates to be created for them – so the big questions are: 'how will this affect the routing and billing on your system in general?' and 'how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

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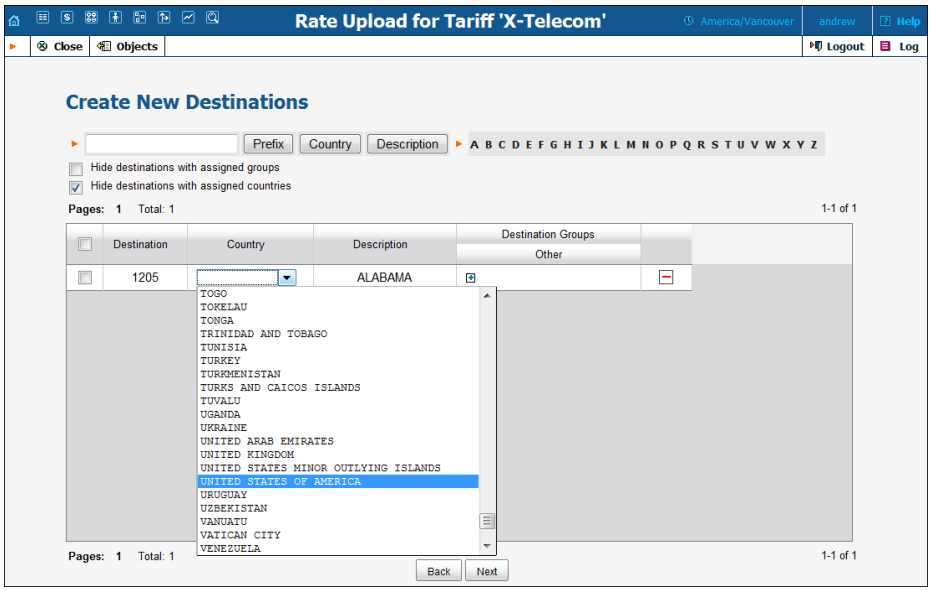
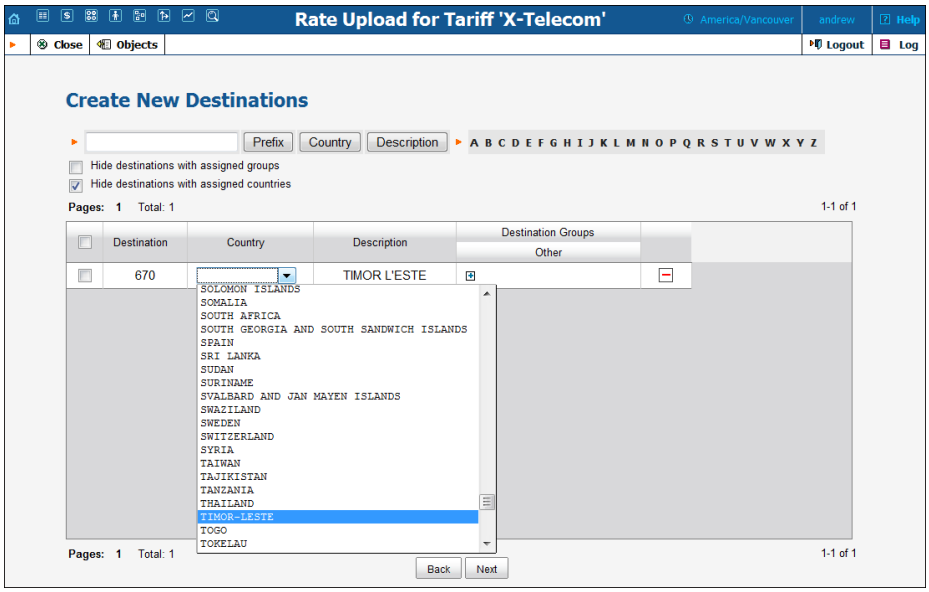
number. For instance, 1204 is Manitoba, Canada and 1205 is Alabama, US! In these cases you will need to manually assign country codes for these destinations. The good news is that new area codes for the US & Canada do not appear that often.



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

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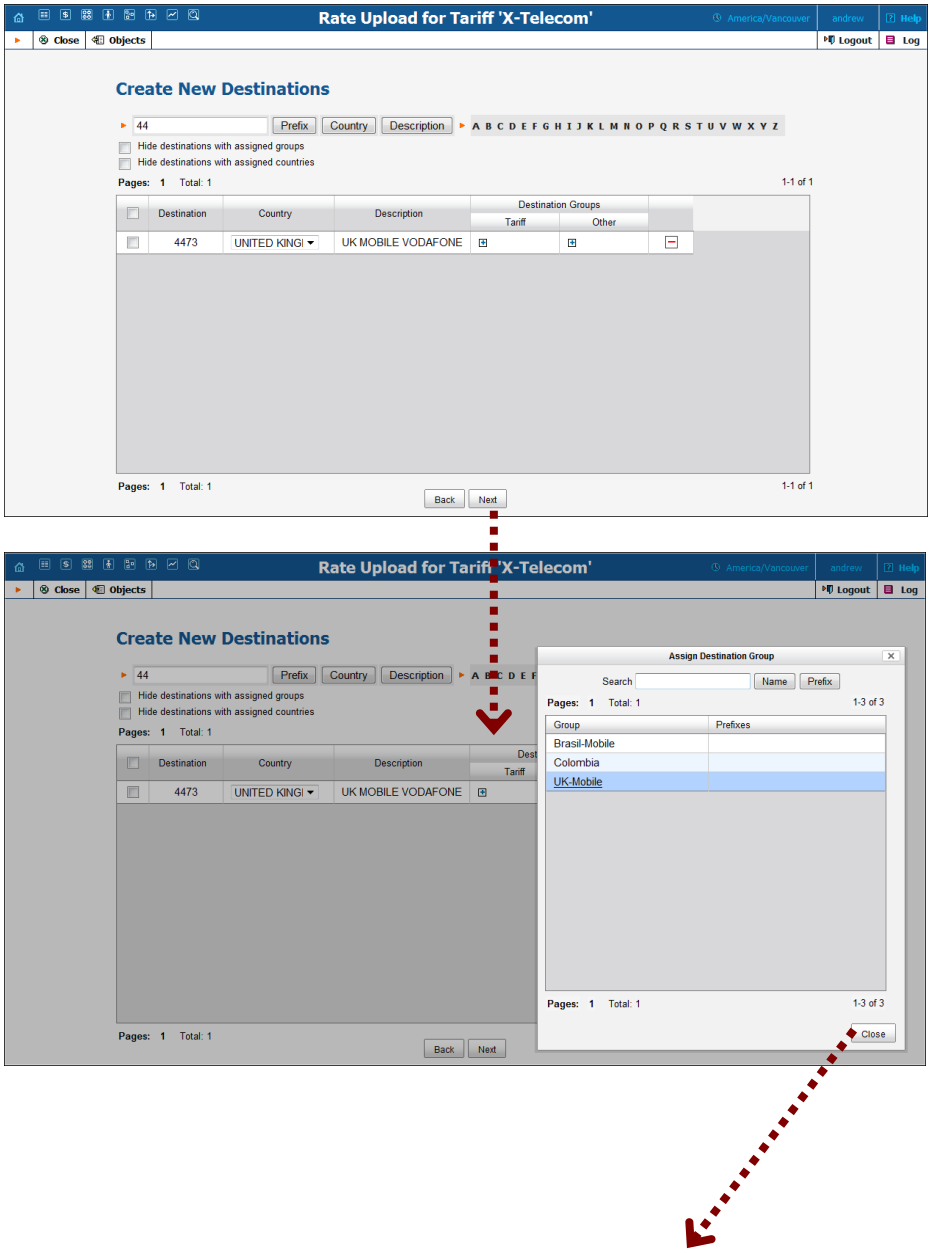
many could literally mean thousands), manually. So for instance, when the new destination 4473 is being added – it may be a good idea to immediately include it into a destination group (within the destination group set that's associated with this tariff) – UK-Mobile in this case. Then the next time someone updates the UK-Mobile rate, the change will be applied to this prefix as well. See the screenshots below for the sequence of actions.



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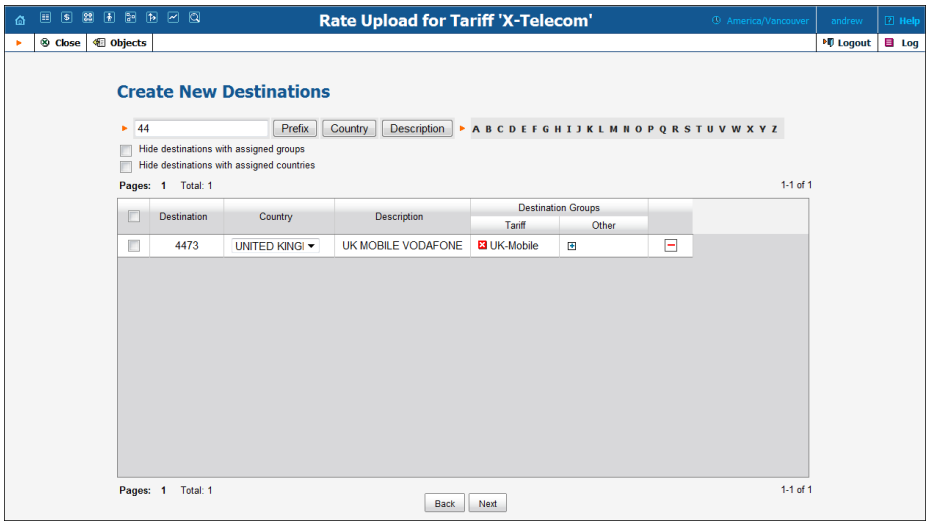
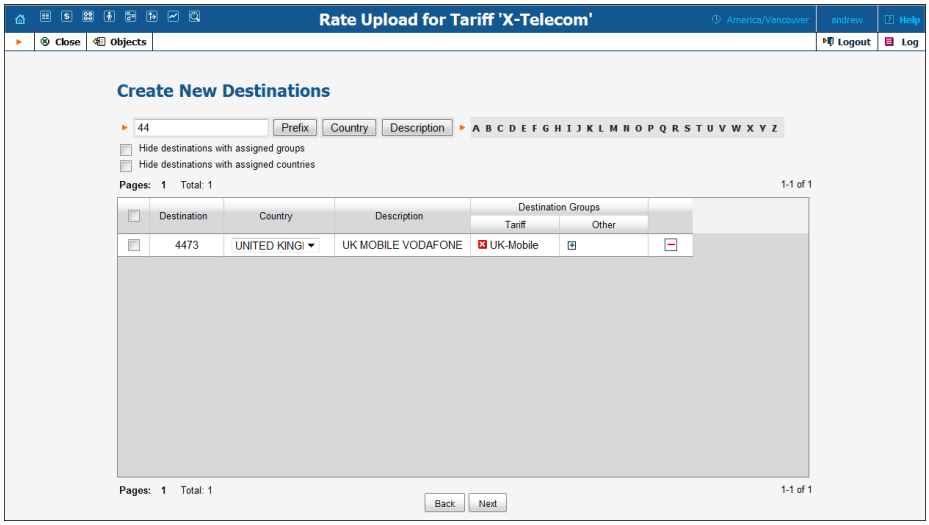


In some cases it may also be beneficial to include this destination into groups that are in other destination group sets. In our example, the new destination 4473 (UK-Mobile-Vodafone) is detected while uploading rates into the tariff of carrier X-Telecom (which has the X-Telecom destination group set 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.



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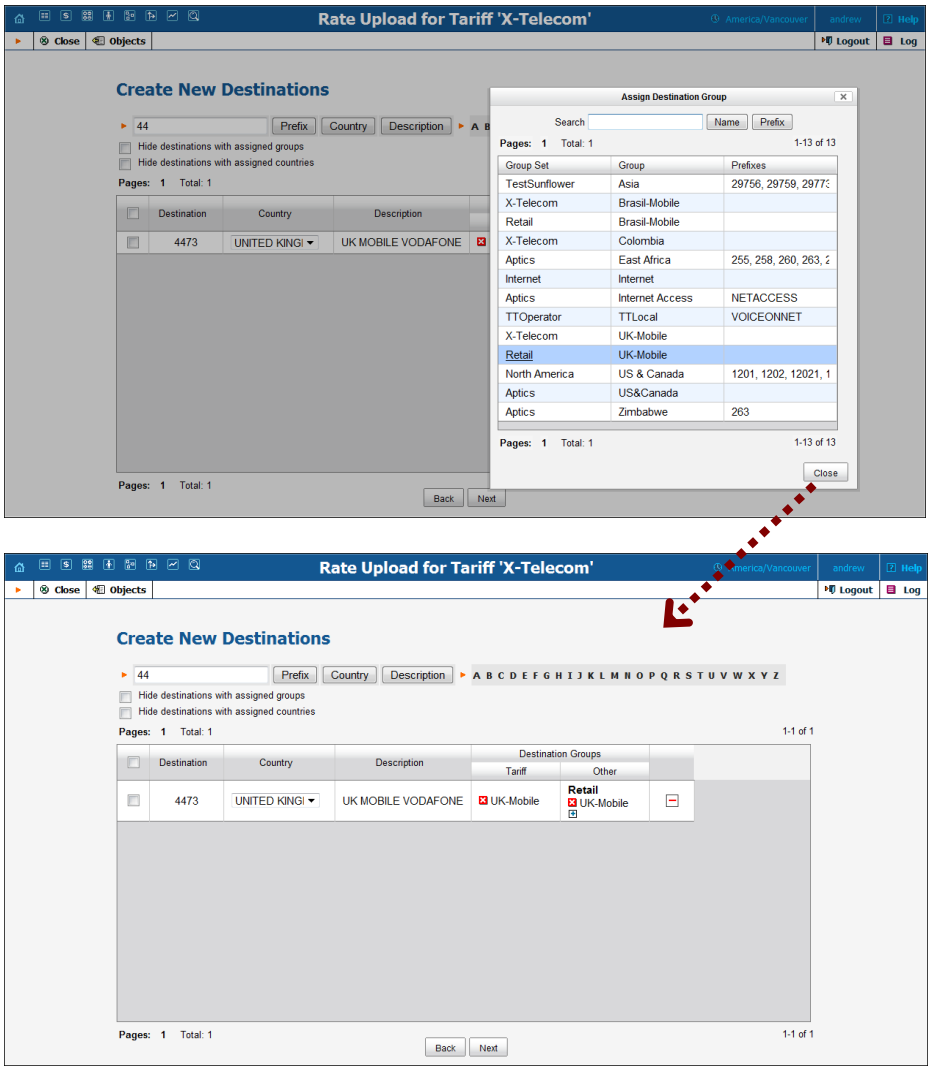

Multiple similar destinations

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).

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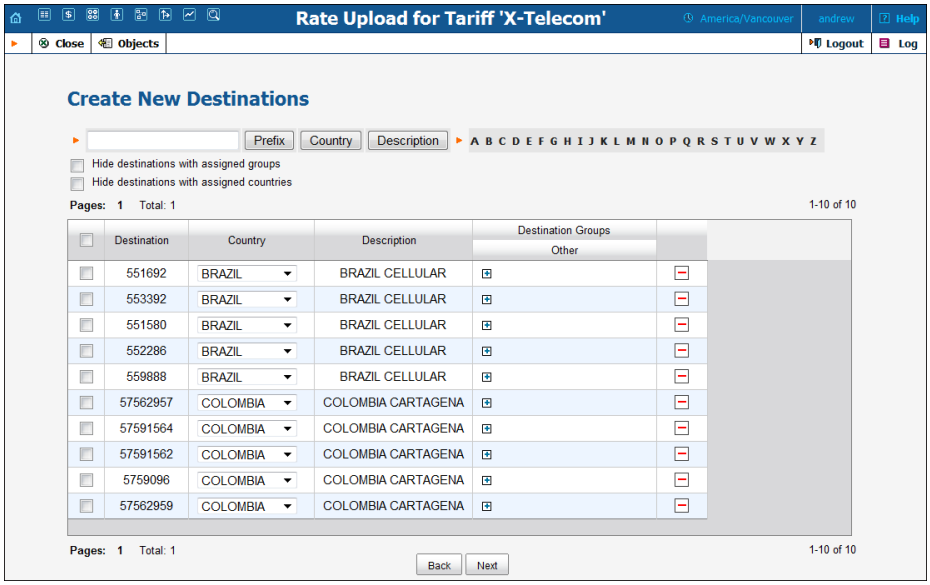
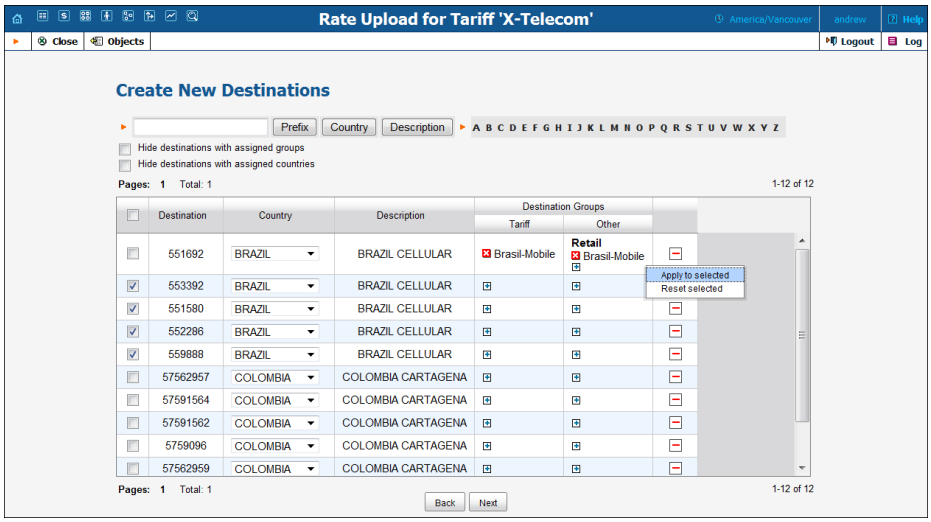


In order to save time and avoid assigning parameters to each one of them manually, you can do the following: assign the required parameters to just one of them, select the others using the checkbox on the left side of each row and then move the mouse over to the rows that don't have parameters assigned. 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.



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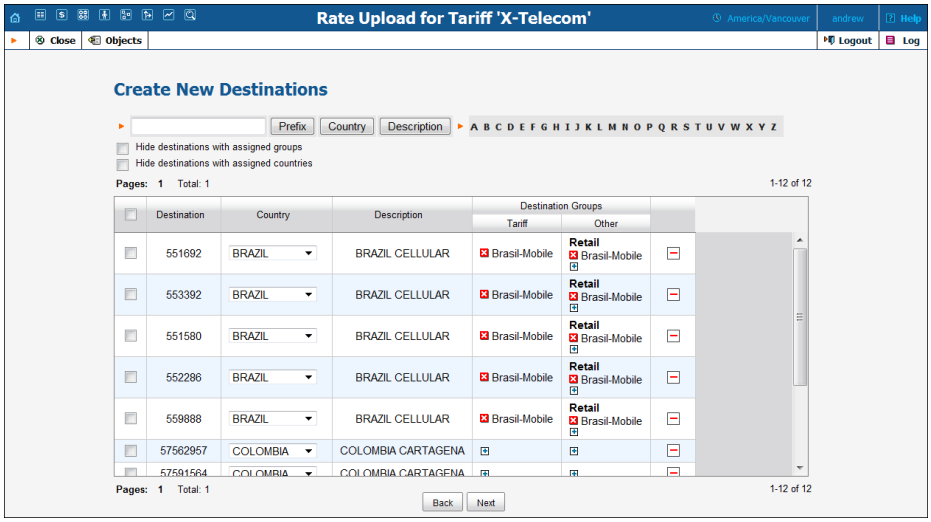

Tip: You can filter the list of new destinations by country or hide the destinations that have already been assigned a country or destination group. For this action, use the **Select All** button in conjunction with **Apply To Selected** to quickly apply settings to hundreds of destinations.

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.

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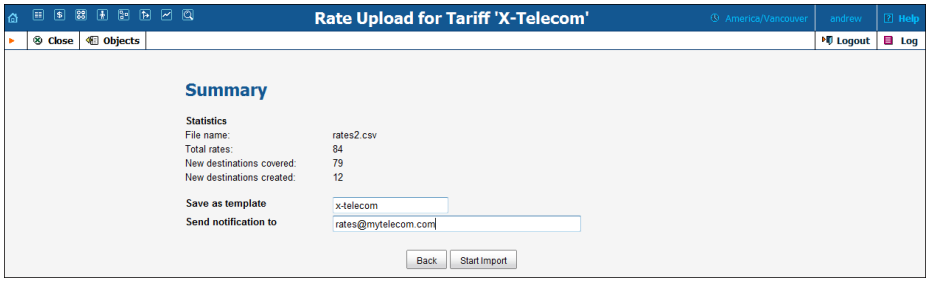
Note that in this case, the rate for this destination will not be imported (since there is no destination to associate it with). To undo the delete destination action, click the ⊞ button, respectively.

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 email 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).

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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:

Microsoft Excel - Tariff_Upload_Report.xls

	A	B	C	D	E	F	G	H
1	Destination	Country	Description	First Price	Change	Next Price	Change	Status
2	4470000	UNITED KINGDOM	UNITED KINGDOM	0.25300	0.00000	0.25100	-0.00200	decrease
3	4470020	UNITED KINGDOM	UNITED KINGDOM	0.25300	0.00100	0.25300	0.00000	
4	4470431	UNITED KINGDOM	UNITED KINGDOM	0.46000	0.00000	0.46000	-0.01000	decrease
5	447060	UNITED KINGDOM	UNITED KINGDOM	0.25300	0.00100	0.25300	0.00000	
6	4470740	UNITED KINGDOM	UNITED KINGDOM	0.25300	0.00000	0.25200	-0.00100	decrease
7	4470775	UNITED KINGDOM	UNITED KINGDOM	0.47000	0.01000	0.46000	0.00000	increase
8	4471	UNITED KINGDOM	UNITED KINGDOM	0.42029	0.01000	0.41029	0.00000	increase
9	4472	UNITED KINGDOM	UNITED KINGDOM	0.41029	0.00000	0.41029	0.00000	
10	44551	UNITED KINGDOM	Mobile	0.32000	0.00000	0.32000	0.00000	new rate
11	44552	UNITED KINGDOM	Mobile	0.33000	0.00000	0.33000	0.00000	new rate
12								

Usage of the Effective from Field

You can only upload rates that are effective immediately or for the future

Since billing is done in real time, calls are billed immediately and an xDR is written to the database. In order to modify xDRs that are already in the database, a re-feed should be used. Therefore, when you are copying a rate entry between tariffs that includes the **Effective from** column with a date from the past, PortaBilling® adds / updates this rate entry as effective immediately (if the appropriate check box is selected, otherwise these rates are skipped). This protects the integrity of the data and ensures that updated rates will be used to charge end users for new calls only.

You can schedule the discontinuation of a rate

It is possible to schedule a rate for a certain prefix to be discontinued on a given date in the future. This simplifies the management of the vendor's tariffs, since an announcement that a rate for a prefix is no longer available is typically received in advance. If you perform the upload immediately after receiving the updated rate sheet, the system will continue using the current rate for that prefix until the moment it actually becomes inactive (the date and time specified in the **Effective from** field).

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When Is Importing Tariff Data Not Possible?

Despite all the flexibility and power of the PortaBilling® template engine, sometimes it may still not be possible to directly import certain files. Let's take a look at the most typical cases.

File format not supported by PortaBilling®

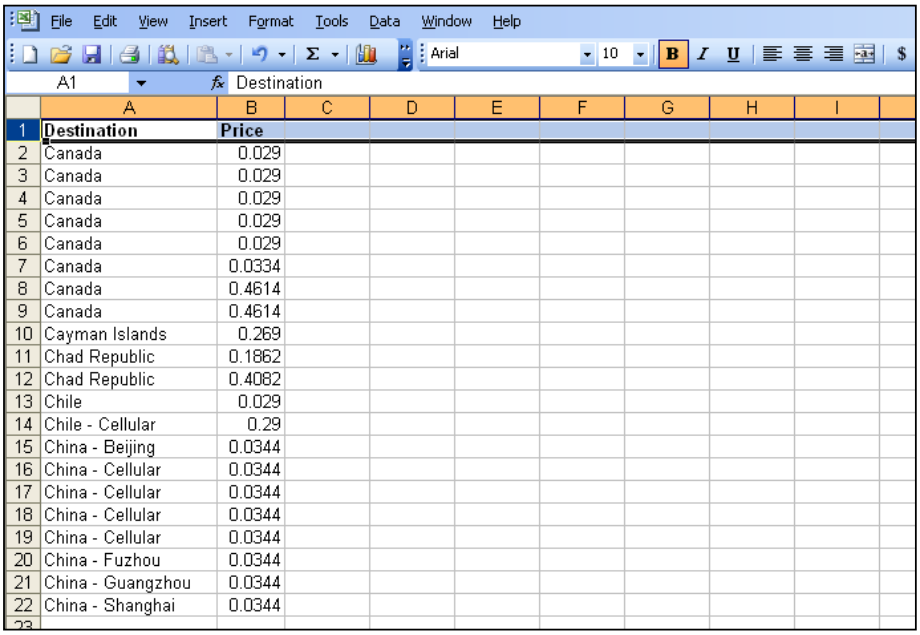
It could be that your vendor sends you data in PDF, Microsoft Word, or another format which is not currently supported by the PortaBilling® template engine. PortaBilling® currently supports:

- Comma-separated values files (CSV)
- Microsoft Excel files (XLS)

So either ask your vendor to use a different format, or try to perform conversion yourself before importing the data.

No Phone Prefix Information in the File

Unfortunately, this is a very common situation: your partner sends you a list of rates, but only includes the country or location name, as in the example below.



	A	B
1	Destination	Price
2	Canada	0.029
3	Canada	0.029
4	Canada	0.029
5	Canada	0.029
6	Canada	0.029
7	Canada	0.0334
8	Canada	0.4614
9	Canada	0.4614
10	Cayman Islands	0.269
11	Chad Republic	0.1862
12	Chad Republic	0.4082
13	Chile	0.029
14	Chile - Cellular	0.29
15	China - Beijing	0.0344
16	China - Cellular	0.0344
17	China - Cellular	0.0344
18	China - Cellular	0.0344
19	China - Cellular	0.0344
20	China - Fuzhou	0.0344
21	China - Guangzhou	0.0344
22	China - Shanghai	0.0344

1. Go to **Destination Group Sets** and add a new destination group set to be assigned to this tariff.

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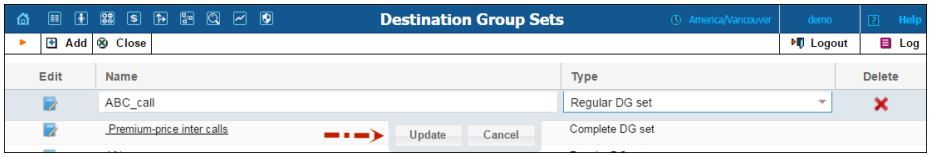
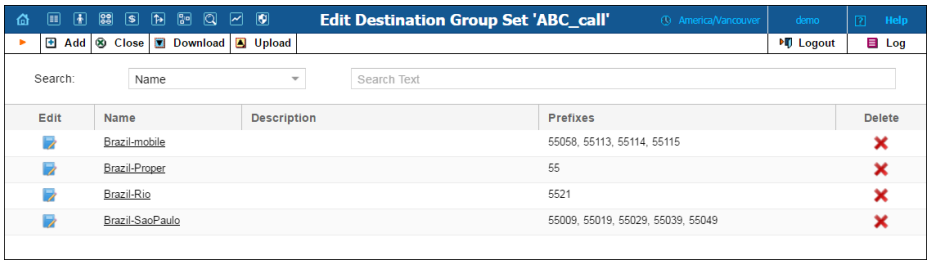
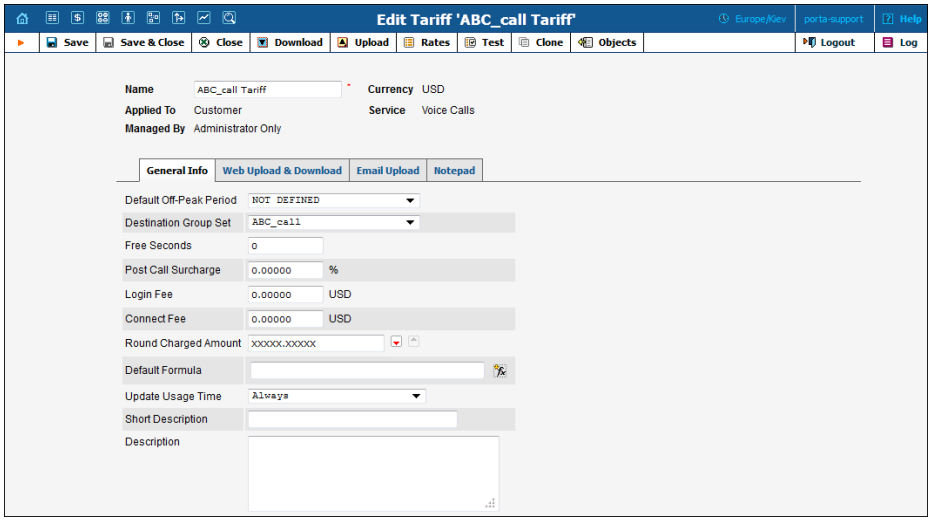


2. After that, create destination groups. Click the **Add** button and fill in the name of the destination group that will coincide with the name of the destination (the country or location name) in the tariff and specify the prefixes for this destination group. Create a destination group for every name provided in the tariff.



3. When creating a new tariff, select the already created destination group set in the **Destination Group Set** field and click **Save**.



4. Click **Upload** and select the document that contains rates. You can see an example of rates below.

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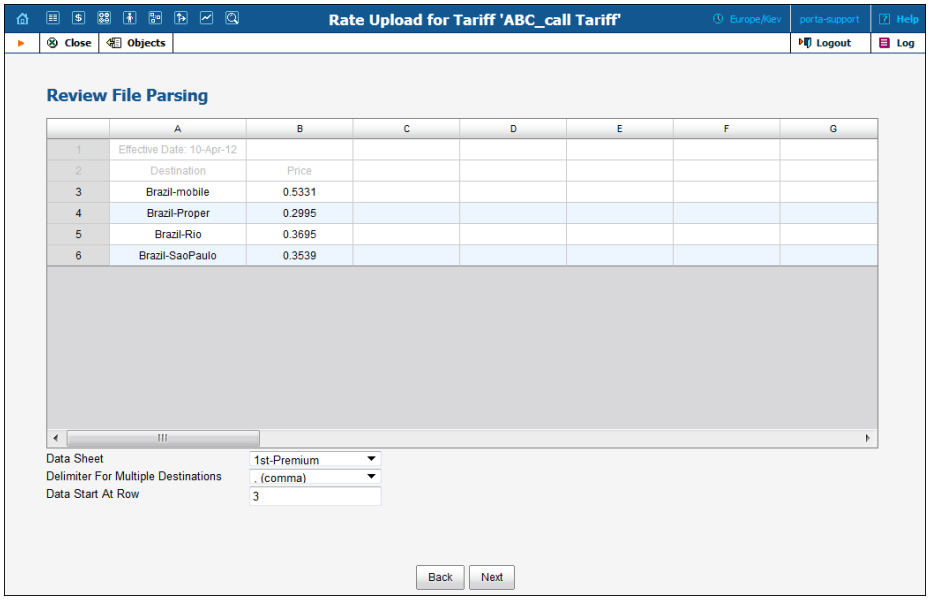
	A	B	C	D
1				
2	Effective Date: 10-Apr-12			
3	Destination	Price		
4				
5	Brazil-mobile	0.8331		
6	Brazil-Proper	0.8395		
7	Brazil-Rio	0.8395		
8	Brazil-SaoPaulo	0.8395		
9				
10				

5. Click **Next** to proceed with a review of file parsing.



6. Click **Next** to review the data field definition. When you locate the "Destination" column A, select it and drag it back to the **Available Fields** list and assign the "Destination Group" instead.

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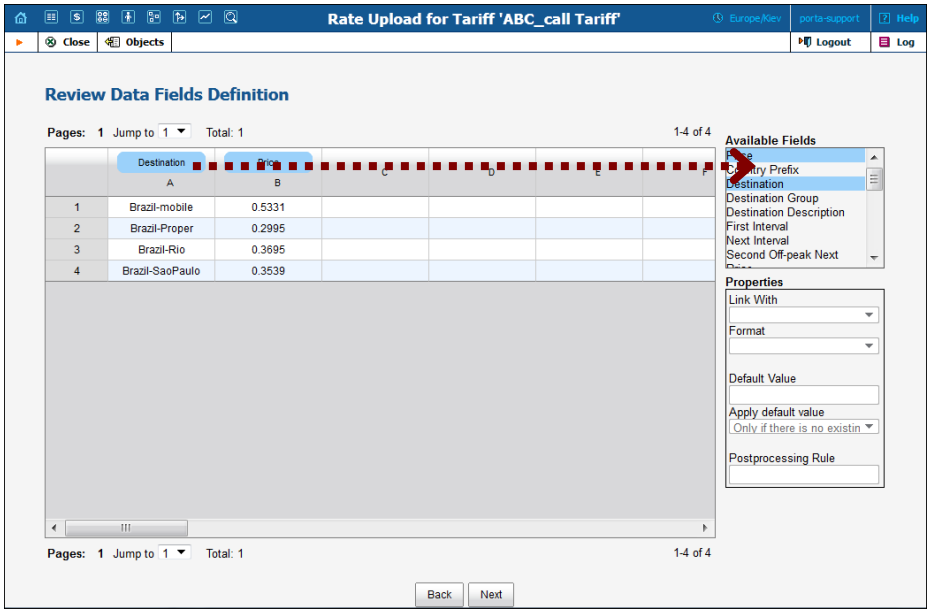

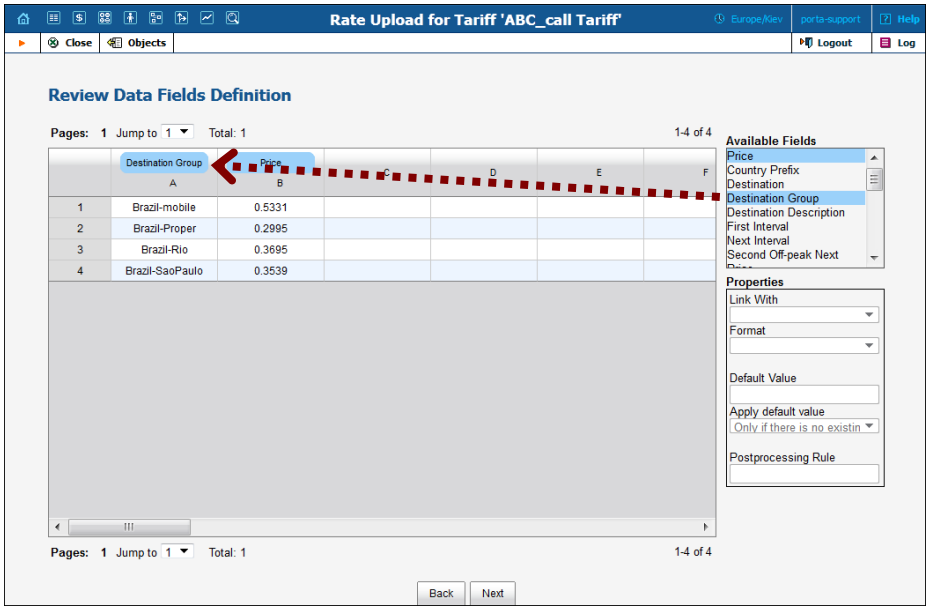

7. Click **Next** to view the rate information**.** Make sure the rates coincide with the predefined destination groups and click **Next**.

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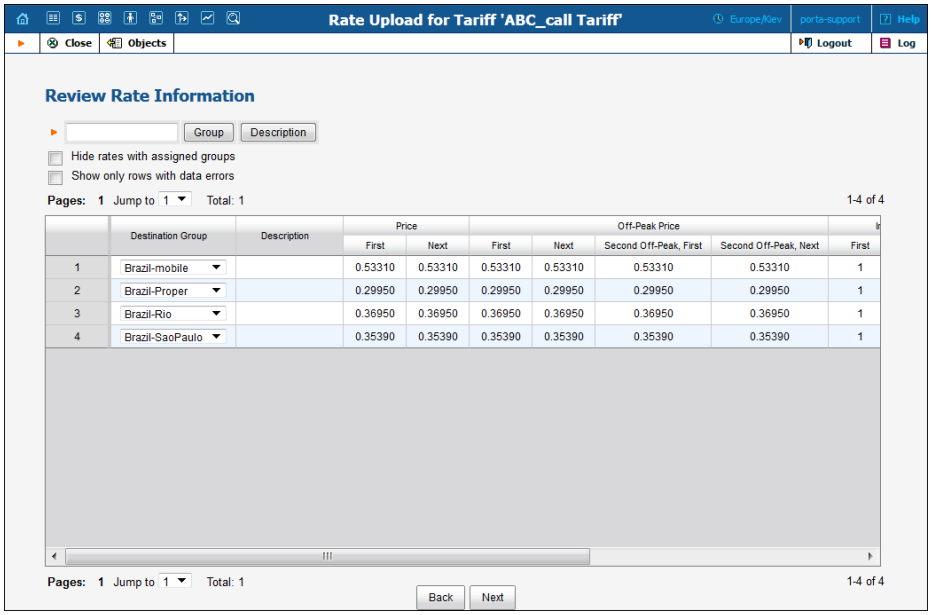

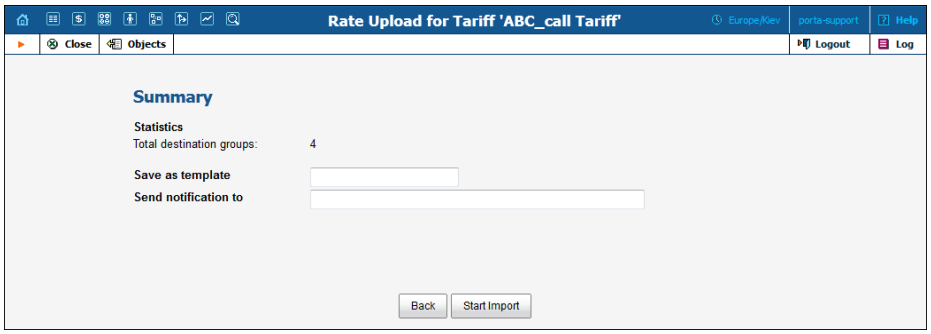

How to ...

...upload tariff rates with country code and area codes in separate columns

Sometimes vendors may send you tariffs in a format with country codes and area codes in separate columns. To upload rates in this format, there is no need to edit manually .xls files in order to merge these two columns into one beforehand.

You can upload rates with country code and area codes that are in separate columns. During the upload, the value of the **Country Prefix** column will join each destination value of the **Destination** column. For area codes you can use comma-separated values or the values separated by dashes (see an example below). The .xls file in this case should look like the following:

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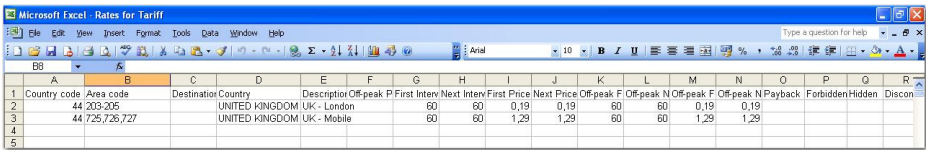
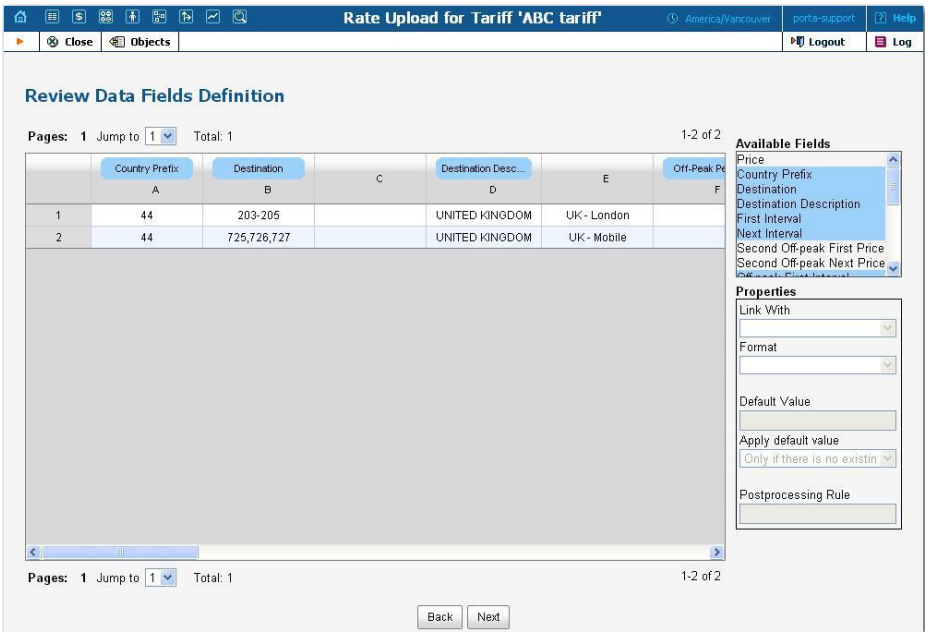


During upload on the **Review Data Fields Definition** page, assign the **Country Prefix** data field to the column with country codes and the **Destination** data field to the column containing area codes.



The result of performing the above-mentioned actions should look like the following:

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...upload US inter- / intra- state rates

You may also specify whether the destination pertains to this category before the rate upload. Simply specify "_USInterIntraState_" in the **Off-peak Period** field. For interstate rates specify the price in the **First Price** and **Next Price** fields; for intrastate – in the **Second Off-peak First Price** and **Second Off-peak Next Price** fields. During the upload, the system will automatically recognize the destinations marked as inter / intra state and appropriate rates will be applied.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
4	Default Off	Default	Destination C	Free Seco	Post Call Surcharge	Login F	Conne	Formula	Update Usage Time						
5				0	0	0	0		Always						
6															
7	Destinatio	Destin	Country	Descriptio	Off-peak Period	First Int	Next Ir	First Price	Next Price	Off-pea	Off-p	Off-pea	Off-p	Second Off-peak First Price	Second Off-peak Next Price
8	1352		UNITED STA	Florida	_USInterIntraState_	1	1	1.5	1.5	1	1	1	1	0.5	0.5
9	1202		UNITED STA	Kentucky	USInterIntraState	1	1	2.22	0.7	1	1	1	1	0.3	0.3

After successfully configuring the inter / intra state rates for calls between different states the interstate price will be used. For calls within the state, the intrastate price will be used.

... upload tariff rates in E.212 format

Typically your SMS providers send you rates for destinations defined in the E.212 format. This is a format used in mobile networks and it defines destinations as combinations of mobile country codes (MCC) and mobile network codes (MNC).

NOTE: You can upload rates in E.212 only for tariffs for the Messaging services type of service.

PortaBilling® can upload rates in the E.212 format as easily and effectively as it does with the E.164 rates. The upload procedure is very similar. The only difference is that the rate upload in E.212 is based on MCC, MNC and Unit Price data parameters. Therefore, verify that PortaBilling® assigns **MCC**, **MNC** and **Unit Price** column headers to the appropriate columns and adjust them if necessary.

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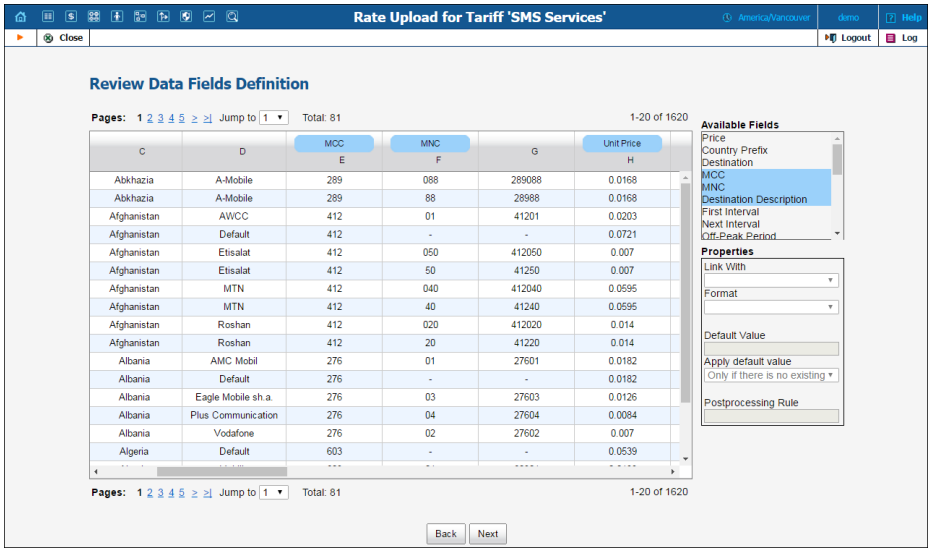
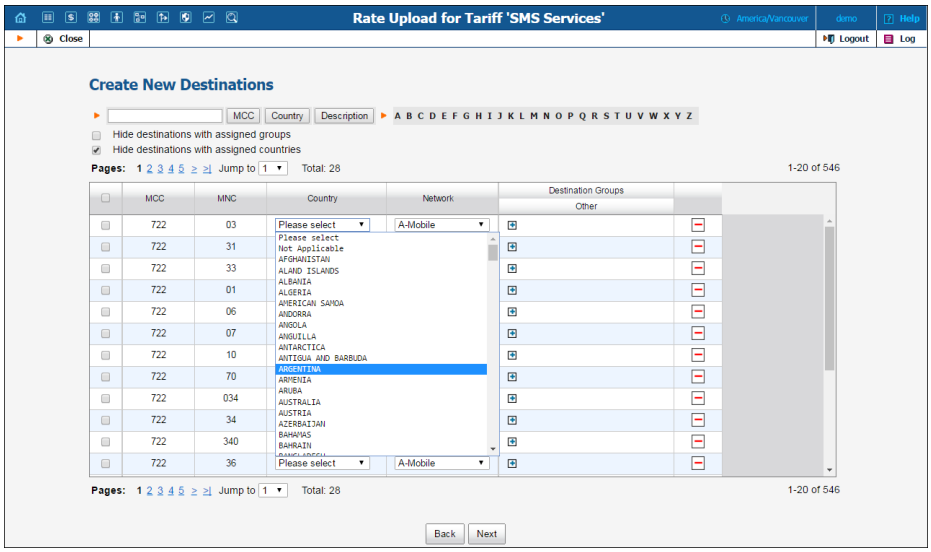


Associate the country with new destinations:



The result of the rate upload will look like the following:

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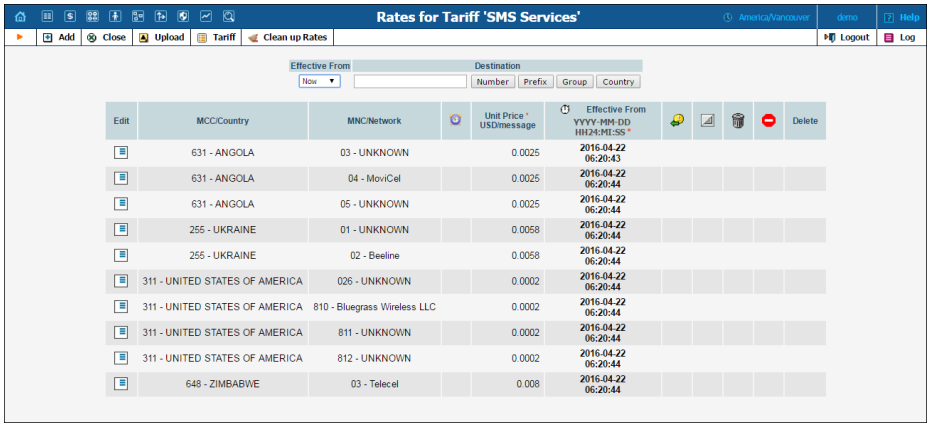

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3. Invoicing

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How Does Invoicing Work in PortaBilling®?

PortaBilling® provides a ready-to-use invoice function. You can design how your invoices will look. Internal invoices are created automatically based on calls the customer has made. To generate and store invoices as .pdf files, the administrator must enable this functionality. The invoices can be automatically emailed to the customer (if this option is enabled and the customer has an email address set up in his properties). The invoices can be viewed online or printed via the administrator and customer self-care web interfaces.

Who Is Invoiced?

Only customers (both resellers and retail customers) are invoiced, since only they have all the information required for invoicing, such as address, taxpayer ID, and so forth. Individual accounts are not invoiced.

How Often?

Each customer has his own billing period, which could be:

- Daily
- Weekly
- Semimonthly
- Monthly (anniversary or on the first day of every month)
- 30 calendar days.

When the current billing period is over (for example, on the first day of the month) a summary of all the calls made by the customer is calculated. Customer call statistics are generated and stored on the server (optionally, they can also be mailed to the customer automatically) and an invoice is created.

Note that the billing period is based on the customer's time zone. For example, if the customer has a weekly billing period and his time zone is Australia/Melbourne, his statistics would cover the period from 24-Mar-2009 00:00 Melbourne time (23-Mar-2009 14:00 GMT) until 31-Mar-2009 00:00 Melbourne time (30-Mar-2009 14:00 GMT). For another customer, who also has a weekly billing period but is in the New York time zone, this billing period will cover calls made from 24-Mar-2009 00:00 New York time (24-Mar-2009 05:00 GMT) to 31-Mar-2009 00:00 New York time (30-Mar-2009 14:00 GMT).

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When are PortaBilling® Invoices Generated?

Statistics are generated with a sufficient delay to make sure that the billing period for a particular customer (according to that customer's time zone) has ended. Also, statistics calculation takes place only at a certain time of day (usually during night hours, when there is the least amount of activity in the system). Weekly invoices cover Monday through Sunday. Assuming that your system does statistical calculation from 2am until 8am Central European Time every day, then statistics for those customers whose time zone is in Asia or Europe should be available each Monday morning. For customers with a time zone in the US, the billing period will not have ended yet when statistics are calculated on Monday morning; thus they are created on Monday night and made available Tuesday morning.

It might occur that in the middle of a billing period, a customer wants to pay for services consumed and does not want to wait until the end to receive an invoice. For such customers, administrators may generate a midterm invoice. For example, a customer with a monthly billing period wishes to pay for services consumed up to the 13th of May. On the 14th of May the administrator generates a midterm invoice for this customer, which covers the period from the 1st of May until the 13th of May. The midterm invoice is generated within the hour.

Sometimes invoices for extra services such as a technician visit or an equipment purchase need to be provided at the time when such service is rendered so the customer can immediately proceed with payment. The administrator can generate an out-of-turn invoice (to cover only a few specific items) on demand. The out-of-turn invoice is generated immediately.

More detailed information about midterm and out-of-term invoices can be found in the **PortaBilling Administrator Guide**.

Invoice Total

There are two methods available for calculating the invoice total:

All charges during the period

This is the simpler method – the invoice contains all of the call charges for the specified period, with the invoice total equaling the sum of these charges. Balance adjustments, refunds and payments made by a customer via the online payment system are not included, since these refer to transactions which have already been made and will not occur again. So, for example, if during August a customer makes calls for $120 and pays $100 for his services in July on August 10, his invoice will show $120. Of

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course, the customer's payment will be recorded in the system, and will affect his balance.

Including the previous balance

The invoice total will be calculated as:

- Previous invoice total
- + Sum of all charges during the period (call-related or manual charges)
- - Sum of all payments or refunds made during the period.

So, taking our previous example: if the customer's invoice for July was $110, and he paid $100 and made calls for $120 during August, his total on the August invoice will be $110 + $120 - $100 = $130

Invoicing modes are controlled by the `New_Style_Invoice_Calculation` configuration option.

Basis of Invoices

For a reseller, the call charges on the invoice are based on the sum total of all his xDRs in a given period.

For a retail customer, the call charges on the invoice are the sum total of all CDRs (call charges and maintenance fees) for this customer's credit accounts. Debit accounts are prepaid, and so since they have been already paid in full there is no need to invoice these calls.

Invoice Template

The invoice template is a specially formatted HTML document, which is created using either the PortaBilling® layout designer or an external tool (e.g. any third-party HTML editor). We suggest generating large invoices (hundreds of pages and more) using the external template uploaded into PortaBilling® as it requires less computing power for .pdf file generation in comparison with the layout designer. See the following chapters for a detailed description for each approach. It defines how the invoice should look, with information on fonts, colors, pictures, and placement of the components. When you view the invoice on the web interface, or when the invoice is automatically emailed to the customer, the template engine takes the invoice template and simply fills in the data fields (such as **Header.Invoice Number**) with their real values (for example, **1001** as the invoice number). The result of this processing is a .pdf file.

Requirements for invoices vary greatly from country to country (and even within the same country). The default invoice templates supplied with the

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system are suitable for British Columbia, Canada, and are provided as examples only. Be sure to create your own invoice template and assign it to your customers.

Two predefined invoice templates for Layout Designer are supplied with PortaBilling®: "A single page with totals only" and "First page with totals + usage details attached on additional pages." What is the difference between them?

A single page with totals only invoice

This is a traditional-style invoice. It consists of a single page with an invoice header (your company name, customer name, etc.), invoice fields (invoice number, invoice date), and invoice footer (subtotal, total).

First page with totals + usage details attached on additional pages invoice

This template's first page is identical to the **single page with totals only** invoice template. In addition to this, it contains multiple pages with details of calls related to the invoice. You can use the **Details Page** button in Layout Designer to switch between the main page and the call details page. All of the calls made by a customer can be included, or only the summaries.

Billing, Invoicing and Taxes

Does PortaBilling® perform billing with or without taxes? Actually, PortaBilling® is a rating engine, so it all depends on how you use it. PortaBilling® does all the calculations based on rates you enter into the system, as well as tariff parameters and call duration. So, in this sense, it makes no difference whether the price includes tax or not.

Thus, there are two scenarios available for dealing with taxes, and each has its own advantages.

Calculating Taxation CDRs at the End of the Billing Period

If you enter rates without tax into PortaBilling®, the CDRs for calls (and other services) will not include the taxes. You can include all the necessary tax calculations when you create an invoice for your customer. The calculation of taxation CDRs is performed prior to invoice calculation at the end of the billing period. The customer's actual balance will be identical to the invoice total and will reflect all proper tax charges.

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The advantage of this method is that it gives unlimited flexibility: you can implement support for any taxation scheme you need. Note that since all the CDRs exclude taxes, customer balances do not include taxes until the end of the billing period when a taxation CDR is created. Be advised that this method will not work with prepaid cards: if a customer buys a $10 calling card, he naturally expects to spend $10 on calls and wants to know what his price per minute will be – without complications like taxes.

Calculating CDRs with Taxes

If you enter rates into PortaBilling® including taxes, you will get a "final" price, and the CDRs are calculated accordingly (with tax included). In this case, the balances are correct, and prepaid products work fine. To provide tax information on the invoice (if this is required), deduct the taxes from the amounts (for more details, see the **Back-Calculating Taxes Based on Invoice Total** chapter).

This is the recommended method as it provides accurate billing for both prepaid and postpaid customers. The default invoice template supplied with PortaBilling® provides an example of how to set up invoicing in this way.

Back-Calculating Taxes Based on Invoice Total

If you wish to include tax in your rates, you need to show proper tax information on the invoice. Five data fields are available for different types of taxes (for example, GST and PST in Canada), which you can fill in using different formulas. These all receive a total invoice value as their input value; then you can calculate the actual tax value using your own formula in a **post-processing rule**.

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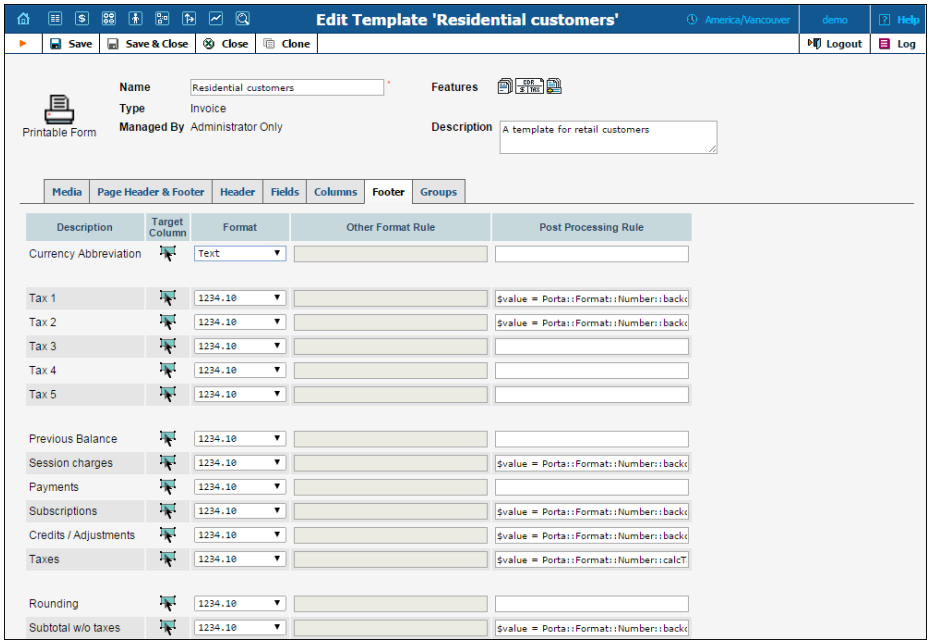

The PortaBilling® template library has a function which can be used to easily calculate the amount of certain types of tax. The `Porta::Format::Number::backcalcTax` function consists of three parameters:

- Total amount
- Total tax percentage
- Percentage value of this tax type

Let's take the example of British Columbia, Canada. You would need to include two types of tax: GST (7%) and PST (7.5%). Then, for the **Tax1** data field, you just have to assign this post-processing rule:

```
Porta::Format::Number::backcalcTax($value, 7 + 7.5, 7.0);
```

while for **Tax2** the post-processing rule would be:

```
Porta::Format::Number::backcalcTax($value, 7 + 7.5, 7.5);
```

As you can see, this is quite simple. Instead of writing `7 + 7.5` you could have written `14.5` – but why do the calculations if the template processor can do them for you?

Finally, it is only necessary to put **Footer.Tax1** and **Footer.Tax2** fields on the invoice where you want them to be, and label them appropriately.

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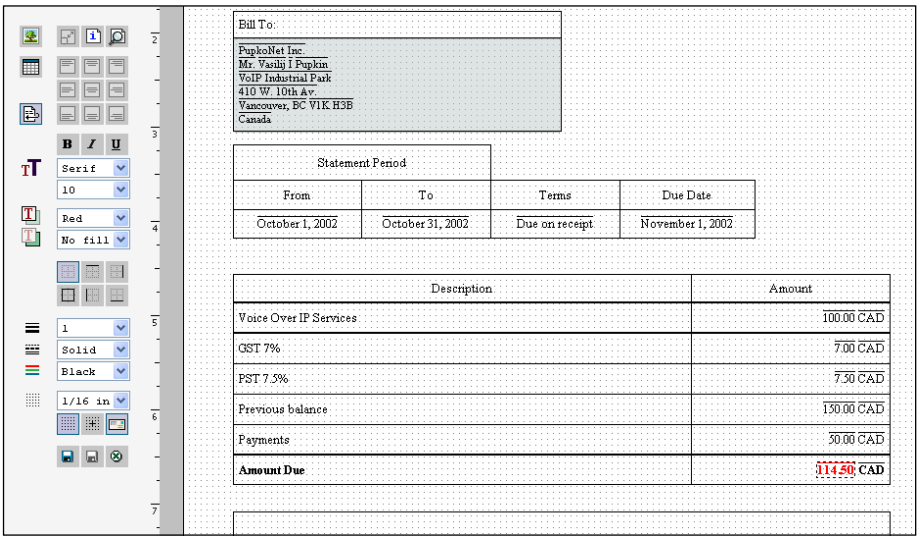

NOTE: The default **Invoice** template represents an invoice sample that is applicable for BC, Canada locale. So, be sure to customize it to your needs.

NOTE: If any plug-in for calculating tax amounts is integrated with the billing system (like the one for EZtax® (formerly known as BillSoft®) suite, etc.), back-calculation of taxes via the template should not be used, since it will produce incorrect results.

Applying fixed VAT rate using customer classes

Let's consider the example of including a fixed tax into a customer class, which will then be applied to the customer:

1. Go to the **Templates** page.
   - Create a new invoice template.
   - Tick **Via Taxation Plugin** in the **Taxation** tab.
   - Click **Save**.

2. Go to the **Customer Classes** page.
   - Create a new customer class or modify an existing one.
   - Select **Fixed VAT Rate** in the **Taxation Method** field.
   - Enable generation of invoices.
   - Select the created above template in the **Invoice Template** field on the **Invoices** tab.
   - Go to the **Taxation** tab on the same page.
   - Leave **Exempt From Tax** box empty.
   - Specify the desired percentage in the **VAT percentage** field and click **Save**.

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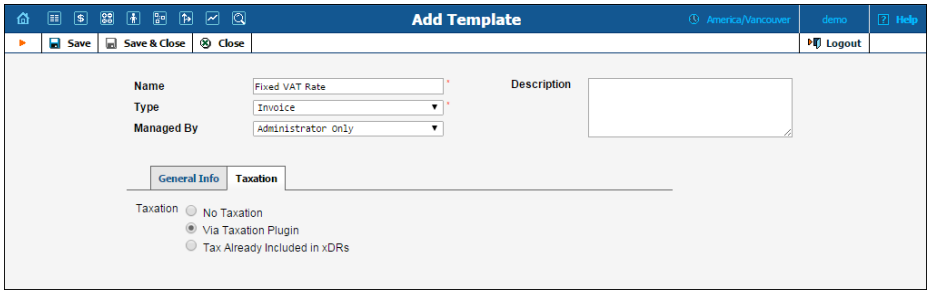

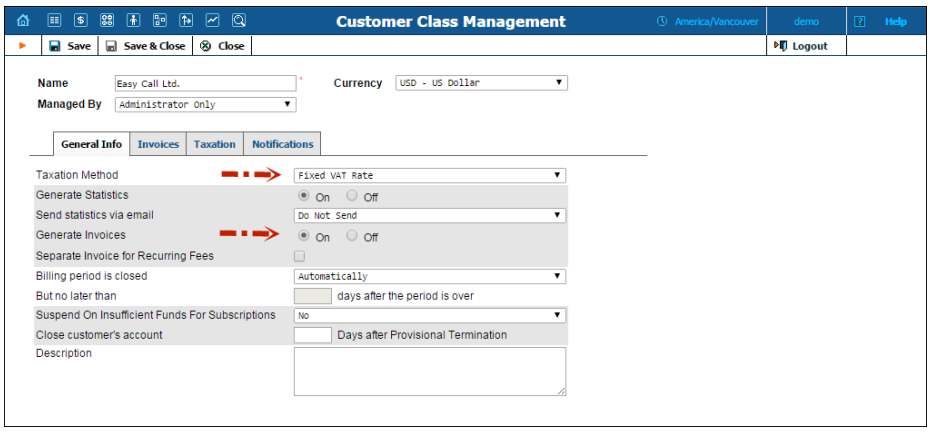

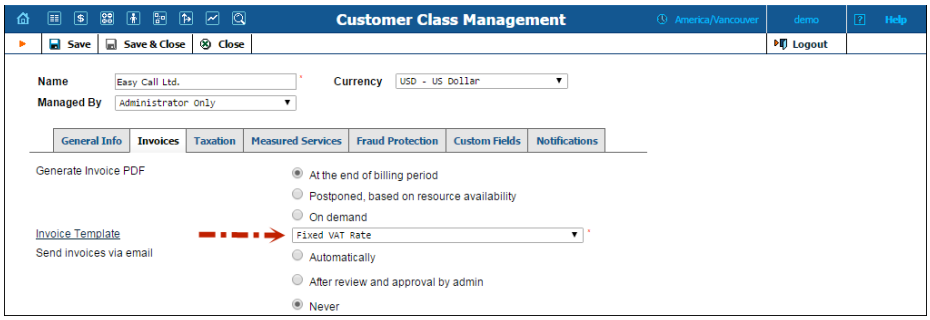

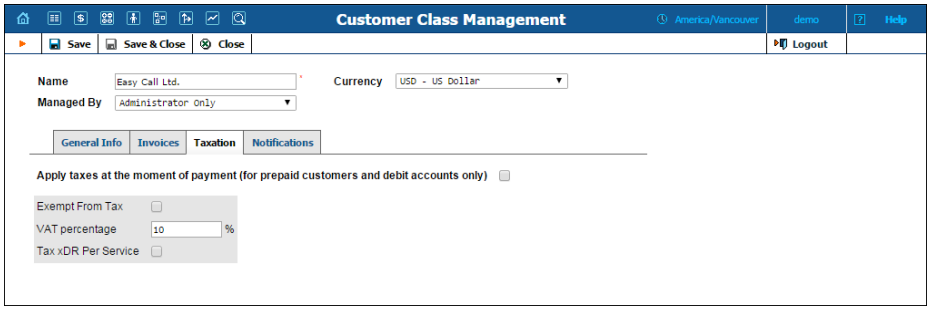

Applying fixed VAT rate without using customer classes

To apply a fixed tax directly to the customer, do the following:

- Go to the **Invoices & Taxation** tab on the **Customer** page.
- Select **Fixed VAT Rate.**

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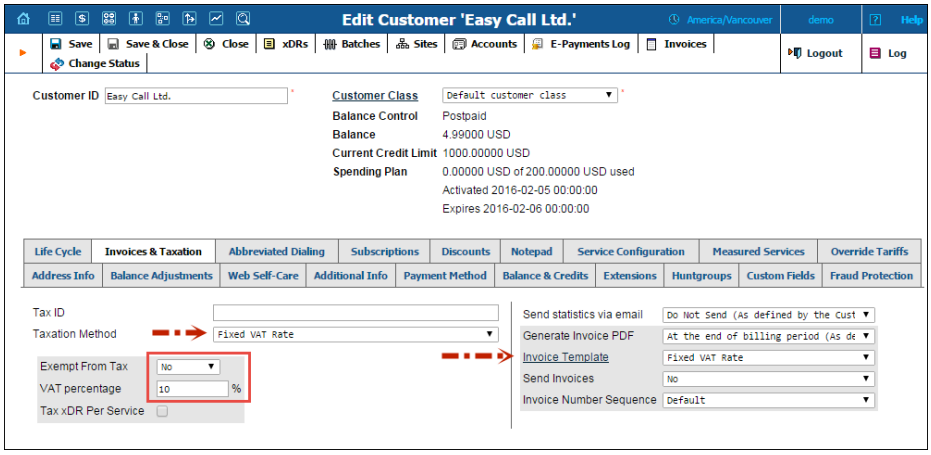
- Choose **No** in the **Exempt From Tax** field.
- Specify the required tax percentage.
- Select the above-created template in the **Invoice Template** field.

NOTE: Make sure you are using an invoice template for the exclusive method (Via Taxation Plugin).



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4. Layout Designer

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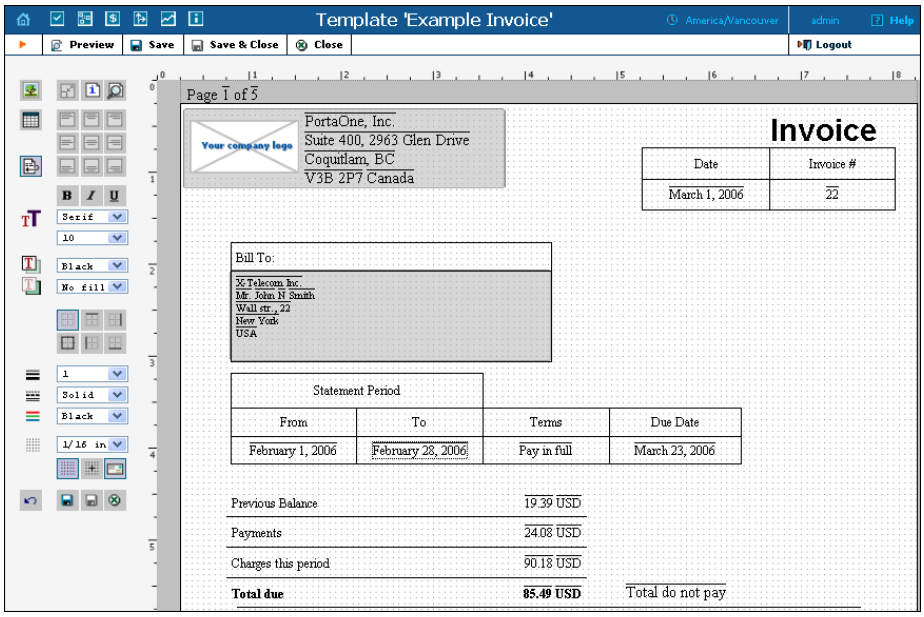
Layout Designer is a visual (WYSIWYG) tool for creating document templates. It is implemented using only Javascript and DOM HTML extensions, so it will work in the MS IE or Mozilla web browser, and no installation of extra components on the user's computer is required.

When you design a template in Layout Designer, you define how the document should look: the location of components, pictures, fonts, and colors. You also place the data fields on the document. These are containers for real data, defining where the data element should appear.

For example, on the invoice template you put an **Invoice.number** data field in the place where you would like the invoice number to be printed (top-right corner, in the example below). When the actual invoice is generated based on this template, **Invoice.number** will be replaced by the actual invoice number (e.g. **557**). Make sure you insert the data field using the pop-up menu, because if you simply type **Invoice.number** it will be regarded as a text string, and so will appear on the invoice exactly as you have typed it.

NOTE: During design, data fields are represented on the screen by sample data, e.g. **25** for the invoice number. This data is provided only for your convenience, and is used only in design mode. All sample data are shown in over lined font, which makes it easy to recognize.



Layout Designer consists of two main parts:

- Toolbar (on the left). It contains buttons and controls for manipulating content in the editor window.
- Worksheet (on the right). It contains the document itself.

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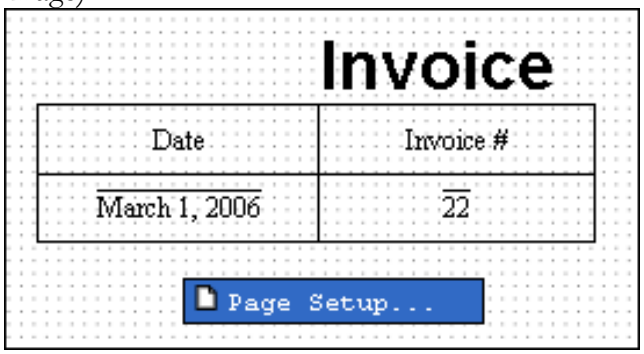
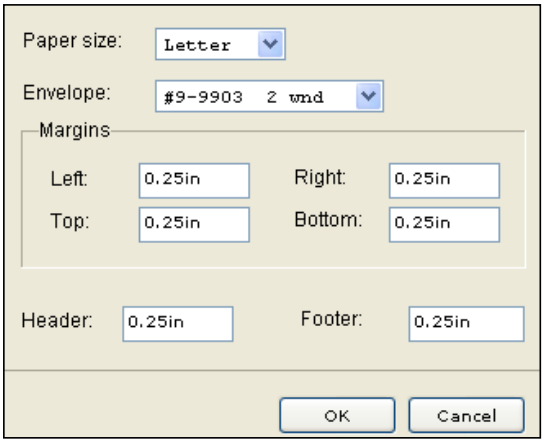
General Document Properties

Page Setup

In order to access page setup properties, right click on the empty background of a template window (i.e. not on an object such as a table or image).



Choose the "Page Setup" item.



You can choose the paper format, margins, and the position of envelope windows. Consult the online help for a detailed description of different envelope styles.

Grid Properties

The grid helps you easily adjust objects in the template. There are a few buttons on the toolbar which control the grid's behavior:

- - Turn the grid on or off (by default it is on).
- - Turn snap to grid on or off. When snap to grid is on, object edges will always be on one of the grid lines, so you cannot place an object between the grid lines when dragging or resizing it.

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- The select menu allows you to choose the size of grid cells.
- - Shows or hides the envelope window on the template.

Working with Images

You can add your own images to the template. These images will then be stored on the server for use by anyone browsing documents created from the template. To add a new image:

- Click on the empty background of the template (i.e. no other object, such as a picture or table, should be selected). The **Add picture** button will become enabled.
- Click on the **Add Picture** button.
- The **Open File** dialog will appear. Choose a picture on your local disk in the .jpg, .png or .gif format.
- Click **Open** and the picture will be transferred to your template. You can now move or resize it.

Placing Data Elements

The main object of the Layout Designer is the table, a placeholder for all inserted information. A table contains text or data fields which otherwise could not be put into the template. To add a new table to a template:

- Click on the empty background of the template (i.e. no other object, such as a picture or table, should be selected). The **Add Table** button should become enabled.
- Click on the **Add Table** button.

A new table will then be added to the template. This is a very basic table, consisting only of a single cell. However, you can change it. To move the table to the desired place, simply drag it there (click on the table and move the mouse without releasing the mouse button). To perform advanced operations on the table (e.g. adding a row), right click on the table so that a menu appears.

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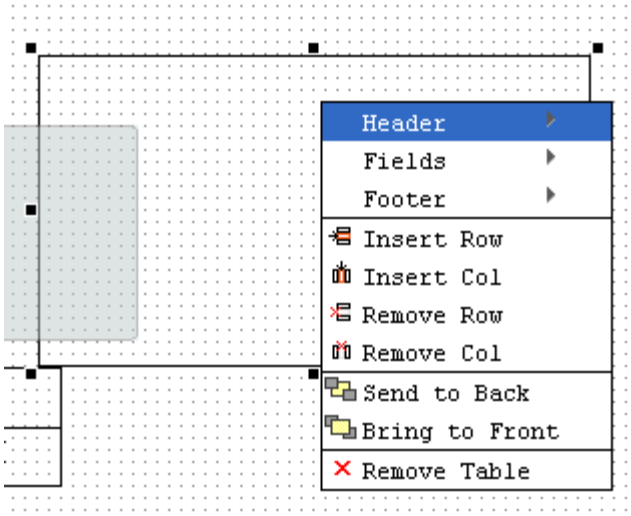

A table or a cell within a table can be moved and scaled by dragging the cell handles. Double click a table or a cell to enter cell editing mode, where you can type in or edit the cell's text. To change the attributes of the cell's text, make sure the cell is selected (8 black square handles are visible) and set the text attributes in the toolbar on the left.

Changing a cell's text attributes in the toolbar will affect all text in the current cell. To change the attributes of part of the text, enter cell editing mode (double-click), select part of the text, and use the keyboard shortcuts listed below:

- Ctrl + B - Bold
- Ctrl + I - Italic
- Ctrl + U - Underlined

To insert data fields into the cell, do the following:

- Right-click on the cell where the data field should be inserted.
- In the top part of the menu, click on the component name to which the data field belongs (e.g. **Header**). A submenu with a list of all data fields in this component will appear.
- Click on the name of the data field you would like to insert.

You can always go into cell editing mode and add text before or after the data field. Also, by removing all of the over lined data field name, you can completely delete the data field from the cell.

Changing Text Attributes

You can apply multiple formatting styles to text elements in a table (this includes both static text and data fields), namely:

- Text alignment within the cell.

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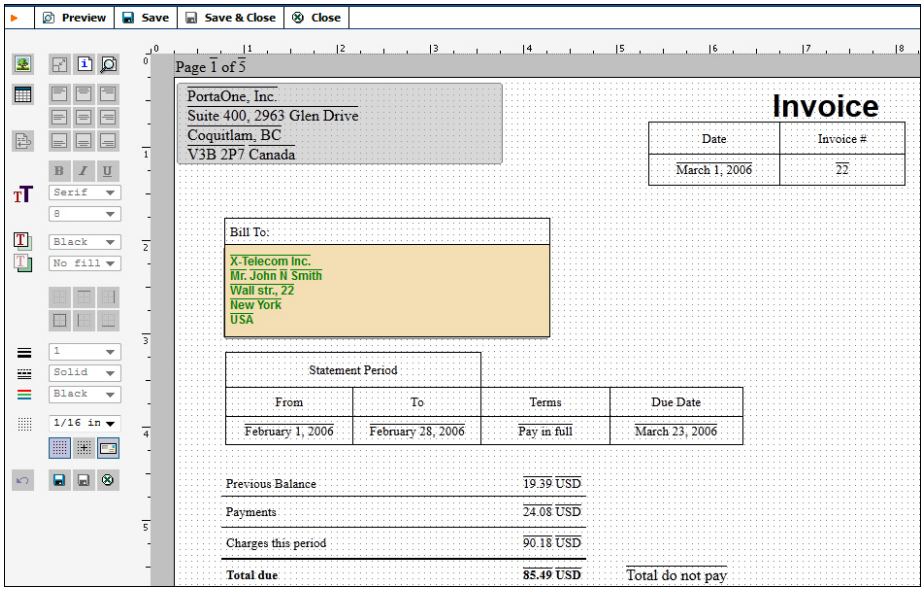
- Text font and font attributes, text color.
- Table cell borders and border style.

Let's consider the example of changing the "Bill To:" table text attributes:

- Align the text to the middle left position.
- Change font style to Bold, font Family to Fantasy and set Font Size to 9.
- Apply green Foreground Color and wheat Background color.
- Set square Table Border.

Then click **Save**. Now you can generate a preview by pressing the **Preview** button.



Consult the online help for a complete list of all possible text operations.

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5. External Invoice Templates

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As an alternative to the WYSIWYG invoice layout designer (built into the system), you can use another approach in which an invoice template can be designed as an HTML+CSS file and then uploaded into the system (CSS stands for Cascading Style Sheets). This simplifies the process if the invoice template is created by an external design agency (that does not have access to PortaBilling®) and allows advanced template customizations (e.g. arrangement of data to exactly match "legacy" invoices or insertion of dynamic content such as banners) by third-party developers. Also we suggest using this approach for large invoices (hundreds of pages and more) as it requires less computing power for PDF file generation in comparison with the WYSIWYG invoice layout designer.

Industry-leading PDF generation software PrinceXML is used to produce the actual PDF files. The license for PrinceXML is provided as a part of an OEM agreement for all PortaOne customers.

Creating an External Invoice Template

The external invoice template is a HTML + CSS file. This file consists of ordinary HTML/CSS code and special placeholders (variables) that define which relevant invoice data should be shown in your invoice (i.e. company name, invoice number or invoice due date). When a template file is parsed for output, the variables are replaced with their actual values by a template processing engine (also known as a template processor). The CSS part of the code defines how your invoice will look and may include special style sheets for proper PDF styling which will be used by PrinceXML to convert HTML documents into PDF files.

Add Variables to Your Invoice Template

Your invoice template includes changeable and unchangeable content. The unchangeable (boilerplate) part of the template is defined by plain HTML code with style classes, while the changeable part is defined by means of *variables* – variable values that show up in your invoice. Variables are included in special tags to clearly indicate where in the document they must be placed and they are then auto-replaced with the actual values by a template processing engine. PortaBilling® uses the Template Toolkit to process external invoice templates (the manual can be found at **https://metacpan.org/pod/Template::Manual**). By default, the [% ... %] tags are used to indicate variables in the Template Toolkit.

The following code demonstrates how to include the variables `invoice.issue_date` (indicates the date when the invoice was created) and `invoice.invoice_number` (indicates the invoice's order number) in an invoice template:

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```
<table class="abs date-num">
<tr>
    <td>Date</td>
    <td>Invoice #</td>
</tr>
<tr>
    <td>[% invoice.issue_date | html %]</td>
    <td>[% invoice.invoice_number | html %]</td>
</tr>
</table>
```

In **APPENDIX A. Variables that Can Be Used in an External Invoice Template**, you will find a list of variables (and their descriptions) that can be used to show different information in the invoice.

Template Toolkit Directives

Besides the use of variables, the Template Toolkit provides a set of *directives* that allows more complex processing operations to be performed. These include accessing and updating template variables, processing templates files and blocks (for example, including another template onto the current one), and ways of selecting and grouping the data based on a particular condition, etc.

The **Template::Manual::Directives** page lists all the Template Toolkit directives, complete with examples of their use.

PDF Specific CSS

PrinceXML – the PDF conversion tool used in PortaBilling® – converts HTML documents into PDF files by applying Cascading Style Sheets (CSS). In order to adjust generated PDF files to your own look and feel, customize the style sheets written in CSS according to PrinceXML's guidelines for CSS customization (available on their web site: **http://www.princexml.com/doc/8.1/**).

For example, the following CSS code sets the page size and borders for your PDF files:

```
@page {
    size: A4 portrait;
    margin-left:   0.25in;
    margin-right:  0.25in;
    margin-top:    0.25in;
    margin-bottom: 0.25in;
}
```

The following CSS code can be used to add a custom footer to the bottom of every PDF page in your invoice:

```
@page {
@bottom-left {
```

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```
    content: "2000-2015 PortaOne, Ink. Thank you for choosing our
    company!";
    font-family: serif;
    font-size: 10pt;
    }
}
```

Advanced Template Customization

This section provides some code examples to help in designing a unique template that best meets your needs.

For example, the following code adds a separate page in your invoice with details about voice calls made during a billing period:

```
<!-- xdrs -->
<!-- only voice calls -->
    [% SET iter = services.3 -%]
    [% SET row = iter.next_row -%]
[% IF row -%]
    <table class="xdrs">
    <thead>
     <tr>
       <td style="table-column-span: 7;"><b>Voice Calls</b></td>
     </tr>
    </thead>
    <tbody>
    [% SET total_amount = 0 -%]
    [% SET total_time = 0 -%]
    [% SET prev_row = undef -%]
  [% WHILE row -%]
    <tr>
      <td>[% row.xdr_cli | html %]</td>
      <td>[% row.xdr_cld | html %]</td>
      <td>[% row.country_name | html -%]</td>
      <td>[% row.destination_description | html %]</td>
      <td>[% row.xdr_connect_time | html %]</td>
      <td>[% row.xdr_charged_quantity %]</td>
      <td>[% money(row.xdr_charged_amount) %] [% customer.iso_4217 |
html %]</td>
    </tr>
      [% SET total_amount = total_amount + money(row.xdr_charged_amount)
-%]
      [% SET total_time = total_time + row.xdr_charged_quantity -%]
      [% SET prev_row = row -%]
      [% SET row = iter.next_row -%]
    [% END -%]
    [% IF prev_row -%]
      <tr>
        <td style="table-column-span: 5;"><b>Total:</b></td>
        <td>[% total_time %]</td>
        <td>[% total_amount %] [% customer.iso_4217 %]</td>
      </tr>
  [% END -%]
    </tbody>
    </table>
[% END -%]
```

The resulting invoice page with details on voice calls will look like this:

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Voice Calls						
12061234567	13146168933	UNITED STATES OF AMERICA	Missouri	2006-02-12	3	0.46 USD
12061234567	17187691417	UNITED STATES OF AMERICA	New York	2006-02-12	3	0.34 USD
12061234567	17142639028	UNITED STATES OF AMERICA	California	2006-02-12	3	0.57 USD
12061234567	12064174761	UNITED STATES OF AMERICA	Washington	2006-02-12	3	0.23 USD
12061234567	12013134800	UNITED STATES OF AMERICA	New Jersey New Jersey	2006-02-12	65	0.12 USD
12064577824	380688763541	UKRAINE	Mobile	2006-02-12	66	0.36 USD
12064577824	380442447182	UKRAINE	Kiev Region	2006-02-12	19	0.95 USD
12064577824	380503425341	UKRAINE	Mobile	2006-02-12	20	0.23 USD
12064577824	380664729846	UKRAINE	Mobile	2006-02-12	21	0.13 USD
12064577824	380672345123	UKRAINE	Mobile	2006-02-12	21	0.15 USD
12061234567	420603568336	CZECH REPUBLIC	Mobile	2006-02-12	14	0.34 USD
12061234567	420608076502	CZECH REPUBLIC	Mobile	2006-02-12	14	0.75 USD
12061234567	160438136379	CANADA	Newfoundland	2006-02-12	28	0.29 USD
12061234567	420224947237	CZECH REPUBLIC	Prague	2006-02-12	29	0.38 USD
12061234567	160471374925	CANADA	Quebec	2006-02-12	38	0.10 USD
12064577824	160452152771	CANADA	Alberta	2006-02-12	38	58.48 USD
12064577824	160421971327	CANADA	British Columbia	2006-02-12	31	0.26 USD
12064577824	160421971325	CANADA	Ontario	2006-02-12	31	0.04 USD
Total:					447	64.18 USD

The following code demonstrates how to group voice calls made during a billing period by country name:

```
<!-- xdrs -->
<!-- only voice calls -->
    [% SET iter = services.3 -%]
<!-- group resulted CDRs by country name -->
    [% SET row = iter.next_row('country_name') -%]
[% IF row -%]
    <table class="xdrs">
    <thead>
     <tr>
       <td style="table-column-span: 7;"><b>Voice Calls</b></td>
     </tr>
    </thead>
    <tbody>
    [% SET total_amount = 0 -%]
    [% SET total_time = 0 -%]
    [% SET prev_row = undef -%]

  [% WHILE row -%]
      [% IF prev_row AND prev_row.country_name != row.country_name -%]
      <tr>
        <td style="table-column-span: 5;"><b>Total by [%
prev_row.country_name | html -%]</b></td>
        <td>[% total_time %]</td>
        <td>[% total_amount %] [% customer.iso_4217 %]</td>
      </tr>
      <tr>
        <td style="table-column-span: 7;">[% row.country_name | html -
%]</td>
      </tr>
       [% SET total_amount = 0 -%]
       [% SET total_time = 0 -%]
      [% ELSIF NOT prev_row %]
      <tr>
        <td style="table-column-span: 7;">[% row.country_name | html -
%]</td>
      </tr>
      [% END %]
```

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```
    <tr>
      <td>[% row.xdr_cli | html %]</td>
      <td>[% row.xdr_cld | html %]</td>
      <td>[% row.country_name | html -%]</td>
      <td>[% row.destination_description | html %]</td>
      <td>[% row.xdr_connect_time | html %]</td>
      <td>[% row.xdr_charged_quantity %]</td>
      <td>[% money(row.xdr_charged_amount) %] [% customer.iso_4217 |
html %]</td>
    </tr>
      [% SET total_amount = total_amount + money(row.xdr_charged_amount)
-%]
      [% SET total_time = total_time + row.xdr_charged_quantity -%]
      [% SET prev_row = row -%]
      [% SET row = iter.next_row -%]
    [% END -%]
    [% IF prev_row -%]
      <tr>
        <td style="table-column-span: 5;"><b>Total by [%
prev_row.country_name | html -%]</b></td>
        <td>[% total_time %]</td>
        <td>[% total_amount %] [% customer.iso_4217 %]</td>
      </tr>
  [% END -%]
    </tbody>
    </table>
[% END -%]
```

The resulting invoice page summarizing voice calls grouped by country name will look as follows:

Voice Calls						
CANADA						
12061234567	160471374925	CANADA	Quebec	2006-02-12	38	0.10 USD
12064577824	160421971327	CANADA	British Columbia	2006-02-12	31	0.26 USD
12064577824	160421971325	CANADA	Ontario	2006-02-12	31	0.04 USD
12061234567	160438136379	CANADA	Newfoundland	2006-02-12	28	0.29 USD
12064577824	160452152771	CANADA	Alberta	2006-02-12	38	58.48 USD
Total by CANADA					166	59.17 USD
CZECH REPUBLIC						
12061234567	420224947237	CZECH REPUBLIC	Prague	2006-02-12	29	0.38 USD
12061234567	420608076502	CZECH REPUBLIC	Mobile	2006-02-12	14	0.75 USD
12061234567	420603568336	CZECH REPUBLIC	Mobile	2006-02-12	14	0.34 USD
Total by CZECH REPUBLIC					57	1.47 USD
UKRAINE						
12064577824	380688763541	UKRAINE	Mobile	2006-02-12	66	0.36 USD
12064577824	380672345123	UKRAINE	Mobile	2006-02-12	21	0.15 USD
12064577824	380442447182	UKRAINE	Kiev Region	2006-02-12	19	0.95 USD
12064577824	380664729846	UKRAINE	Mobile	2006-02-12	21	0.13 USD
12064577824	380503425341	UKRAINE	Mobile	2006-02-12	20	0.23 USD
Total by UKRAINE					147	1.82 USD
UNITED STATES OF AMERICA						
12061234567	13146168933	UNITED STATES OF AMERICA	Missouri	2006-02-12	3	0.46 USD
12061234567	12013134800	UNITED STATES OF AMERICA	New Jersey New Jersey	2006-02-12	65	0.12 USD
12061234567	17187691417	UNITED STATES OF AMERICA	New York	2006-02-12	3	0.34 USD
12061234567	17142639028	UNITED STATES OF AMERICA	California	2006-02-12	3	0.57 USD
12061234567	12064174761	UNITED STATES OF AMERICA	Washington	2006-02-12	3	0.23 USD
Total by UNITED STATES OF AMERICA					77	1.72 USD

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In **APPENDIX C. Advanced Template Customizations**, you can find other examples of advanced template customizations (e.g. arrangements of data that exactly match "legacy" invoices).

General Recommendations

Below are a few general points to remember when creating your own invoice template:

1. If you are planning to develop a multiple page template (for example, with summary information on the first page and detailed information on the second page), we recommend that you write the code for each page individually and then combine it later on. If the code is contained in one single file, pages may overlap when viewed in a web browser.
2. If the Template Toolkit construction is included in a custom invoice template, some template blocks might be displayed incorrectly in a web browser until the final HTML output is produced. This is normal and is corrected when the template passes through the template processor.
3. It is a good idea to work out the overall design of your invoice template first, and then proceed with adding the Template Toolkit constructions.
4. You may link the template HTML file to an external CSS file as PrinceXML does not apply any restrictions on this.

Uploading an Invoice Template to PortaBilling®

To upload an external invoice template to PortaBilling®, follow these steps:

1. Locate the HTML+CSS file for your custom template. An improved external invoice template is now available and can be downloaded from **www.portaone.com**: **http://portaone.com/resources/invoice_template.zip**
2. Prepare image files to be inserted into the template. The images must be defined in the HTML+CSS file with the following tag:
   `<img class="advert" src="[% image_path %]ad.jpg" />`
3. Upload the new invoice template to the PortaBilling® administrative web interface.

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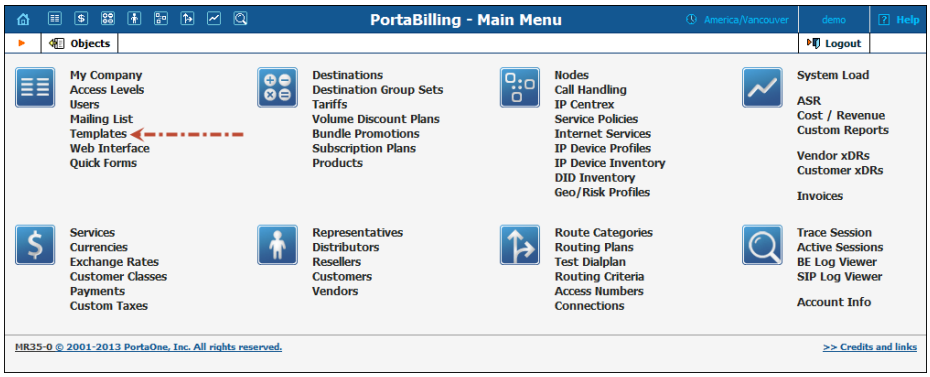

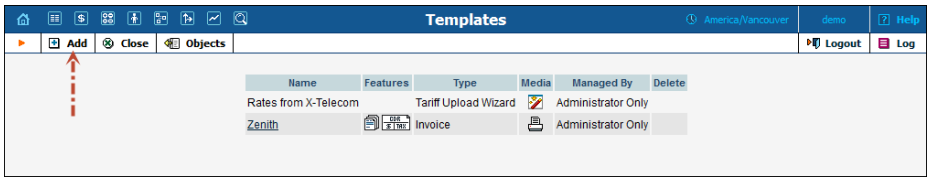

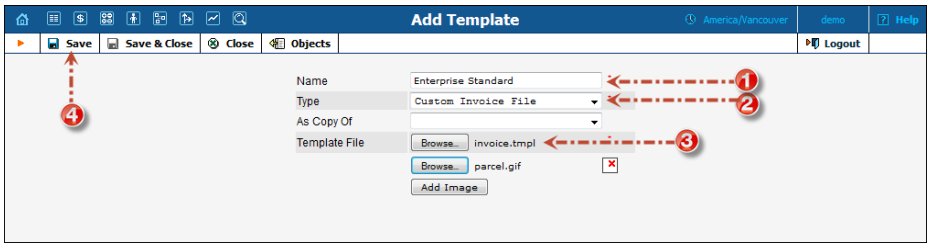

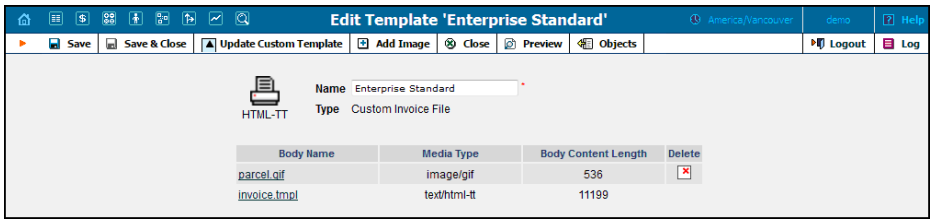

4. Check the look of the invoice template. When you click **Preview**, a PDF-file showing the final layout is generated.
5. Assign the uploaded invoice template to a new or existing customer.

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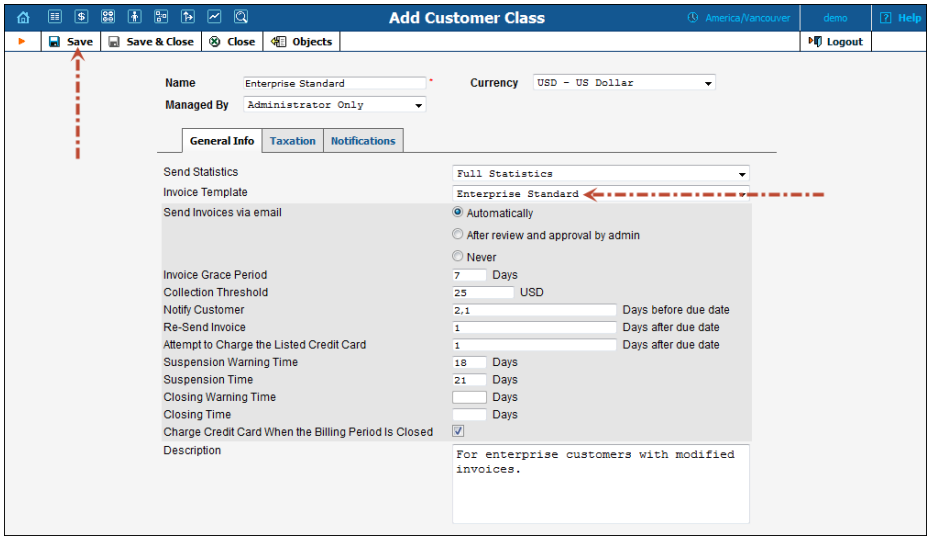

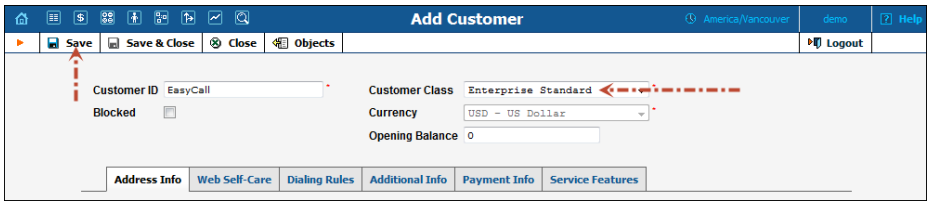

6. Below is an example of the invoice generated using a custom invoice template.

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PORTA ONE

contact@portaone.com
1-866-SIP VOIP

Dave Ming Chang
Account #: 12345678910

17815 80TH AVE NE APT C1
KENMORE, WA 98028-1832

Simple is possible

Invoice Number	22
Billing Date	2013-04-05

STATEMENT PERIOD	
From	2013-04-05
To	2013-05-06
Terms	Pay in full
Due date	**2013-05-06**

STATEMENT SUMMARY	
Previous Balance	10.00
Payments	-5.00

NEW CHARGES	
Usage charges	7.00
Subscription charges	12.00
Credits / Refunds	-3.00
Taxes	0.00
Total new charges	**16.00**
Amount Due	**21.00 USD**

PORTA ONE

Account number	12345678910
Total due	**21.00 USD**

DAVE MING CHANG
17815 80TH AVE NE APT C1
KENMORE, WA 98028-1832

PortaOne
1234 North Pole ave,
Seattle, WA 54321

Pay now - scan this code

In **APPENDIX B. External Invoice Template Example**, you can find another example of the custom invoice template. This example is analogous to the invoice layout designer's default template.

Updating an Earlier Uploaded Template

To introduce changes and adjustments to an invoice template that was already uploaded follow these steps:

1. Update the HTML+CSS file for your custom template according to your requirements.
2. Prepare new image files to be inserted into the template.
3. Upload the updated invoice template on the PortaBilling® administrative web interface.

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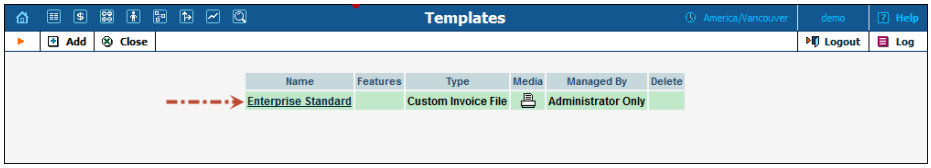
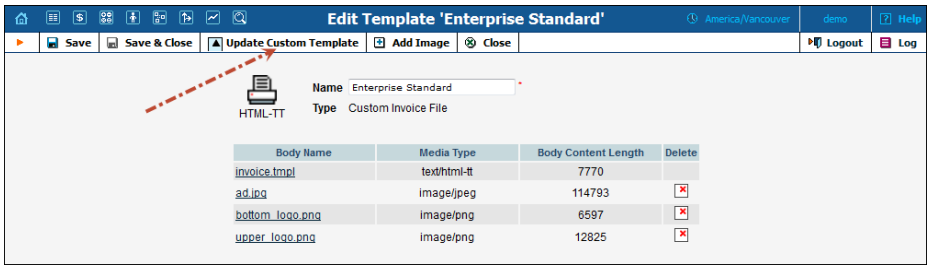
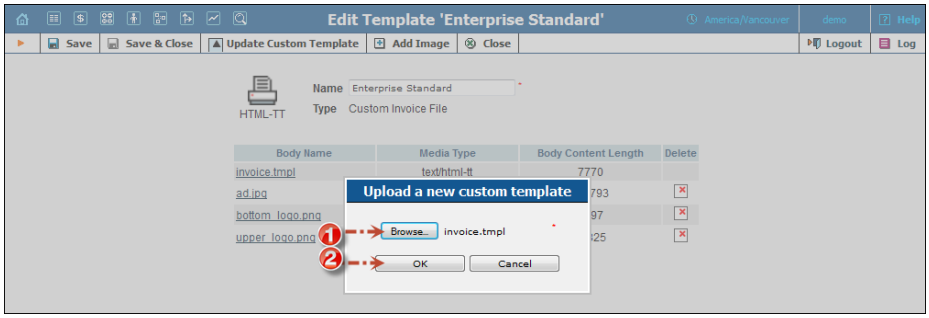
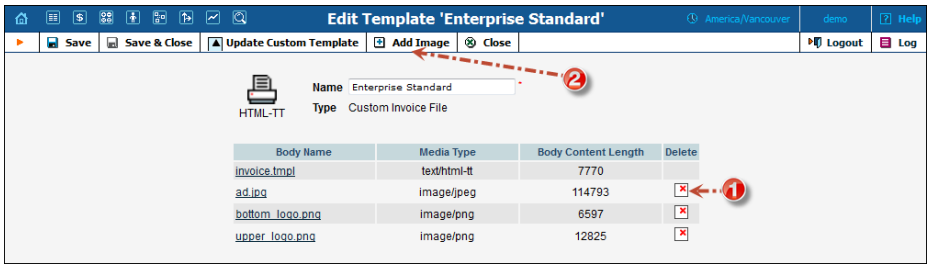






4. Delete images that are no longer used and upload new images defined in the invoice template.



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6. Templates for Outgoing Notification Messages

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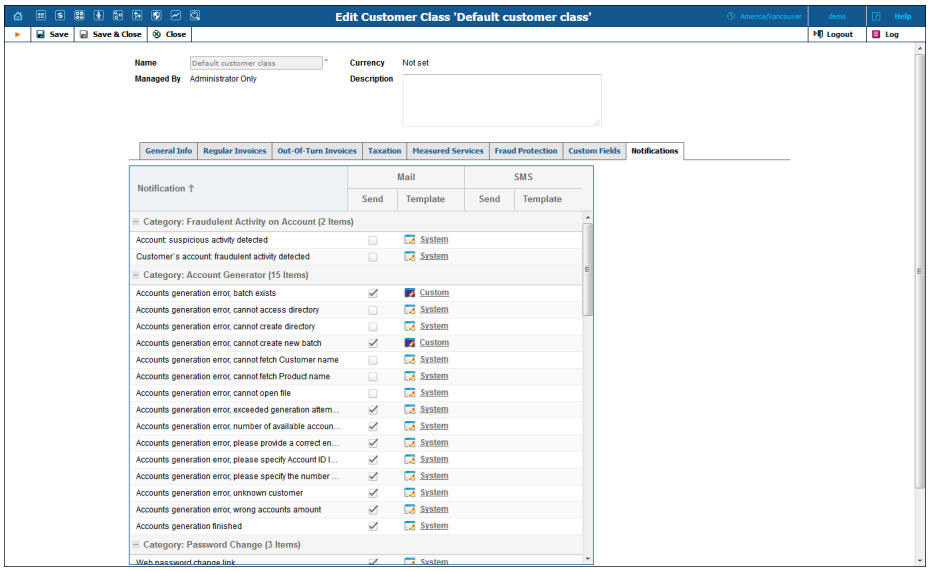
Notification Templates

There are many types of email and SMS messages sent from PortaBilling® to your administrative and end users: notifications about a balance being dangerously close to the credit limit, emails with statistics and / or an invoice, different alerts sent to administrators and so on. It is possible to customize the language and content of these messages.

The **Notifications** tab belongs to an admin user's configuration as well as a customer class configuration.



To edit a notification template, click the **System** / **Custom** link or the corresponding icon on the **Notification** tab. On the page that opens, you can modify the subject, BCC, body of the notification.
The page title reflects the type of template being edited and can be either **Edit Email Template** or **Edit SMS Template**.

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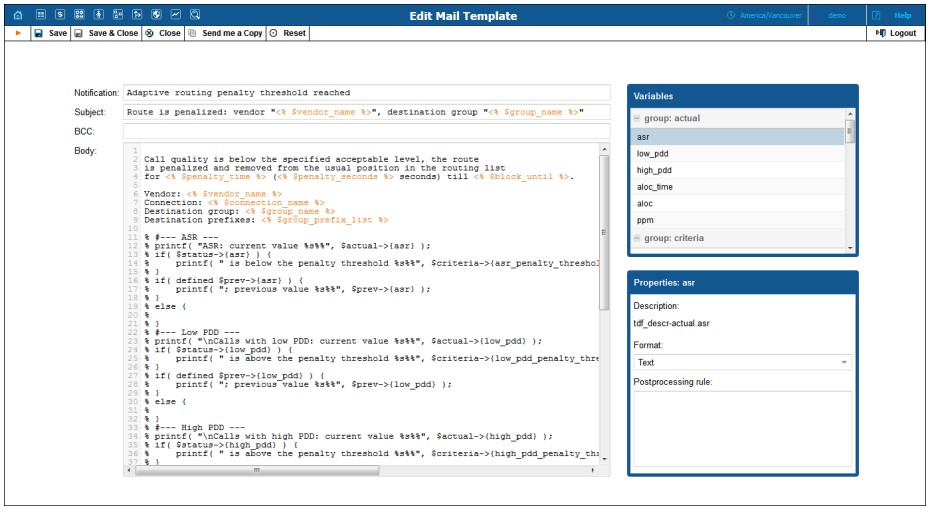

Mail Template Syntax

NOTE: Mail templates use basic HTML::Mason syntax; you can find more information on the **HTML::Mason homepage**.

Here is an example of the default **Credit limit exceeded** template:

Subject: Credit limit exceeded - services are now blocked

BCC: admin@portaone.com

Body:

```
Dear <% $greetings %>,

We would like to inform you that the current balance on your
account <% $companyname ? $companyname : $name %>
has reached its credit limit and your service is now blocked.

Your balance:      <% $balance %><% $currency %>
Your credit limit: <% $credit_limit %><% $currency %>
```

Variables:

```
greetings
companyname
name
balance
credit_limit
currency
```

Each template contains **subject, BCC, body** and **variables** sections. The **variables** section defines the parameters (e.g. Current customer balance) that can be used in the body section.

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The **subject** section contains the text to be entered in the subject line of the outgoing email (e.g. Credit limit exceeded).

The **BCC** section contains email addresses of persons who want to receive a copy of this notification. You can specify more than one valid email address; make sure you separate them with commas.

The **body** section contains the text which will be used as the email body text. Any normal text entered here will appear unchanged in the email. If you want to include the current value of a certain parameter in the text, enclose the parameter variable in `<% %>` as shown below:

```
Your credit limit: <% $credit_limit %><% $currency %>.
```

In fact, you may include mini-pieces of Perl code in `<% %>`. For instance, the line below includes a conditional statement, and will produce either a company name (if one is defined) or a customer name:

```
<% $companyname ? $companyname : $name %>
```

You may also use the following service functions for editing email notification templates:

- `column (text, width => N, align => 'left'|'right')` – This outputs a space padding string of a given width. The text alignment can be either flush left or flush right. By default, text alignment is set to the left. The function's parameters are:
  - `text` – defines the text to output
  - `N` – defines the width of the output string
  - `align` – defines the string alignment (can be ether `left-` or `right-aligned`)
- `line (char, width)` – This outputs a string of repeated characters (e.g. it can be used to display underlined text). The function's parameters are:
  - `char` – defines the character to output
  - `width` – defines how many times to output the `char` parameter

For example, the following code:

```
<% column('Previous Balance:', width => 45) %>
<% column($previous_balance, width => 10, align => 'right') %>
<% line('-', 25) %>
```

will output the following string:

```
Previous Balance: 10.00
-------------------------
```

In **APPENDIX D. Available Notification Templates**, you can find email templates and their descriptions.

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7. Appendices

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APPENDIX A. Variables that Can Be Used in an External Invoice Template

Template Name	Description
Environment for direct customers, Reseller for sub-customers	
env.i_env	ID
env.name	Environment name
env.lname	Proper, legally-recognized form of the company's name
env.lcountry	Country in which the company is legally registered
env.lcity	City in which the company is legally registered
env.subdivision	Country subdivision name
env.iso_3166_2	Country Subdivision code
env.laddr1	Address where this company name is legally registered
env.laddr2	...
env.lzip	Postal code for the company's registered location
env.tax_id	Locally-designated tax number
env.iso_4217	The company's internal currency.
env.companyname	The conventional form of your company's name
env.addr1	Street address of the company
env.addr2	...
env.addr3	...
env.addr4	...
env.country	Country name
env.iso_3166_1_a2	Country code
env.phone	Primary telephone number for the company
env.email	Primary email contact
env.faxnum	Primary fax number
env.web	Web address of the company.
Customer information	
customer.i_customer	Unique numeric number of customer
customer.name	Customer ID, defines the customer name as it will appear in the PortaBilling system
customer.companyname	The conventional form of company's name
customer.salutation	Something like 'Mr.', 'Ms.'
customer.firstname	First name
customer.lastname	Last name

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customer.midinit	Middle name
customer.lname	Either Company Name, or First Name + Last Name
customer.country	Country name
customer.city	City name
customer.address	Full address line
customer.baddr1	Address line
customer.baddr2	...
customer.baddr3	...
customer.baddr4	...
customer.baddr5	...
customer.zip	Postal code
customer.cont1	Primary contact
customer.email	Primary email contact
customer.phone1	Primary telephone number
customer.cont2	Alternative contact
customer.phone2	Alternative telephone number
customer.faxnum	Primary fax number
customer.TZ	Time Zone
customer.out_date_format	Preferable date format
customer.out_date_time_format	Preferable date-time format
customer.out_time_format	Preferable time format
customer.balance	Customer's balance at the time of PDF generation
customer.tax_id	Locally-designated tax number
customer.billing_period	Defines the frequency of invoicing for this customer
customer.iso_4217	The customer's currency
customer.opening_balance	The starting balance for this customer
customer.bp_charge_cc	Y or N, defines if the Customer's Credit Card will be charged when the invoice is made
customer.creation_date	Date when customer was added into PortaBilling system
customer.credit_limit	Customer's current credit limit
customer.discount_rate	Amount of discount applied by default to all subscriptions of this customer
customer.i_customer_class	numeric ID of the Customer Class assigned to Customer
customer.i_customer_type	1 (Retail), 2 (Reseller), 3 (Distributor)

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customer.i_lang	Localization language, 2-characters ISO639-1 code (examples: en, es)
customer.login	Customer self-care login
customer.notepad	Text entered in Notepad field on web
customer.custom_field1	Value of the first Custom Field
customer.custom_field2	Value of the second Custom Field
...	...
customer.custom_fieldN	Value of the Nth Custom Field
Invoice information	
invoice.i_env	Environment ID
invoice.i_invoice	ID number
invoice.invoice_number	Visible invoice number
invoice.i_customer	Reference to Customer's ID number
invoice.period_from	the start date of invoice period
invoice.period_to	the end date of invoice period
invoice.issue_date	the date when the invoice was created
invoice.due_date	Due date of the invoice
invoice.due_days	Days left to the due date
invoice.payments	Sum of payments made in the invoice period
invoice.manual_charges	Sum of manual charges made in the invoice period
invoice.subscriptions	Sum of subscription charges made in the invoice period
invoice.taxes	Sum of taxes, non-zero only if Taxation plugin used
invoice.calls	Sum of charges for all other services
invoice.amount_net	Total amount for the invoice period
invoice.subtotal	Equal to amount_net. Available only if taxation plug-in used
invoice.subtotal_without_taxes	Equal to (amount_net – taxes). Available only if taxation plug-in used
invoice.previous_balance	Due amount from the previous invoice
invoice.amount_due	Due amount for the current invoice
invoice.i_invoice_status	Invoice status, refer to value from Invoice_Status_Attribs table
invoice.invoice_status_desc	Invoice status description
invoice.is_void	N for normal invoices, Y for voided
invoice.iso_4217	Currency

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invoice.tax_method	1 if taxation plug-in used, 0 if taxes are included into rates
invoice.last_invoice	amount_due from previous regular invoice
invoice.additional_invoices	sum of out-of-turn invoices for period
Service totals for given invoice	
services	Array indexed by i_service number, value is 'Service totals'
Service totals (allow to get xDRs for the chosen Services)	
i_service	The unique ID number of the Service
name	Service name
i_service_type	The unique ID number of the service Type
rating_base	Either 'quantity' or 'session-time'
period_totals.records	Accumulated number of records
period_totals.quantity	Sum of quantity-based service
period_totals.amount	Accumulated sum of charged amount
period_totals.tax_amount	Accumulated sum of taxes
period_totals.total_amount	Accumulated sum of charges + taxes
next_row	Iterator, which returns next xDRs row for this service, or undefined if there are no more records
xDR row	
account_id	Master Account ID
account_batch	Account Batch name
xdr_account_id	Account ID in xDR, may be Account Alias
xdr_id	ID of xDR
xdr_table	Table name: cdr_accounts or cdr_customers
xdr_connect_time	Connect date-time
xdr_disconnect_time	Disconnect date-time
xdr_bill_time	Bill date-time
xdr_cli	CLI
xdr_cld	CLD
xdr_h323_conf_id	H323-conf-id
xdr_h323_incoming_conf_id	incoming H323-conf-id
xdr_originating_ip	Originating IP
xdr_call_id	Call-id
xdr_charged_amount	Charged amount
xdr_charged_quantity	Service quantity charged
xdr_used_quantity	Service quantity used

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xdr_peak_level	Peak level applied
destination_destination	Destination used
destination_description	Destination description
destination_group_name	Destination Group name
country_name	Country corresponding to Destination
country_subdivision_name	Country subdivision corresponding to Destination
tariff_i_tariff	Tariff ID used
tariff_name	Tariff name used
rate_i_rate	Rate ID used
rate_effective_from	Date when rate becomes effective
rate_is_off_peak	'Y' for off-peak period rate, 'N' otherwise
rate_interval_1	Rates.interval_1 (Rates.op_interval_1 for off-peak)
rate_interval_n	Rates.interval_n (Rates.op_interval_n for off-peak)
rate_price_1	Rates.price_1 (Rates.op_price_1 for off-peak)
rate_price_n	Rates.price_n (Rates.op_price_n for off-peak)
rate_off_peak_period	0, 1, 2 for 'normal', off-peak and second off-peak periods
Other variables	
image_path	Path to the template images, used to make a full link to the included image

APPENDIX B. External Invoice Template Example

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html>
[% USE format -%]
[% money = format('%.2f') -%]
<html>
<head>
<style type="text/css">
@page {
    size: A4 portrait;
    margin-left:   0.25in;
    margin-right:  0.25in;
    margin-top:    0.25in;
    margin-bottom: 0.25in;
}

@page {
    @top-left {
        content: "Page " counter(page) " of " counter(pages);
```

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```
        font-family: serif;
        font-size: 9pt;
    };
}

table { border-collapse: collapse; }
body { font-family: serif; }

.abs { position: absolute; }

.logo { top: 10mm; left: 10mm; }
.company { top: 10mm; left: 40mm; width: 50mm; }
.invoice { top: 10mm; left: 150mm; font-size: 24pt; font-weight: bold; }
.date-num {
    top: 20mm;
    left: 120mm;
    width: 70mm;
}
.date-num td {
    border: black solid 1px;
    font-size: 10pt;
    text-align: center;
    vertical-align: center;
    height: 8mm;
}

.bill-to { top: 50mm; left: 10mm; width: 80mm; }
.bill-to td { border: black solid 1px; padding-left: 3px; }
.bill-to-header { height: 10mm; }
.bill-to-body { height: 30mm; }

.statement { top: 95mm; left: 10mm; width: 130mm; }
.statement-header1 { table-column-span: 2; border: black solid 1px;
text-align: center; height: 10mm; font-size: 10pt; }
.statement-header2 { border: black solid 1px; text-align: center;
height: 7mm; font-size: 10pt; }
.statement-row { border: black solid 1px; text-align: center; height:
7mm; font-size: 10pt; }

.due { top: 120mm; left: 10mm; width: 100mm; }
.due .label { width: 70mm; border-bottom: 1px solid black; height: 10mm;
font-size: 10pt; }
.due .amount { border-bottom: 1px solid black; height: 10mm; font-size:
10pt; text-align: right; }
.due .total { font-weight: bold; border-top: 3px solid black; border-
bottom: none }

.rule { top: 160mm; left: 15mm; width: 160mm; height: 1px; }
.rule td { border-top: 1px solid black; }

.totals { top: 160mm; left: 80mm; width: 100mm; }
.totals .label { width: 75mm; border-bottom: 1px solid black; height:
10mm; font-size: 10pt; }
.totals .amount { border-bottom: 1px solid black; height: 10mm; font-
size: 10pt; text-align: right; }
.totals .total { font-weight: bold; border-top: 3px solid black; border-
bottom: none }
.totals .subtotal { border-top: 3px solid black; }

.details { top: 225mm; left: 10mm; width: 170mm; height: 30mm; border:
1px solid black;
    font-size: 10pt; text-align: center; vertical-align: top; padding-
top: 2mm; }

.disclaimer { top: 260mm; left: 10mm; width: 170mm; height: 20mm;
border: 1px solid black;
    font-size: 10pt; text-align: center; vertical-align: top; padding-
top: 2mm; }

.xdrs { width: 200mm; font-size: 9pt; }
```

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```
.xdrs td { height: 7mm; text-align: left; }

</style>
</head>
<body>

<img class="abs logo" src="[% image_path %]parcel.gif"/>
<div class="abs company">
[% env.companyname | html %]<br>
[% env.addr1 | html %]<br>
[% env.addr2 | html %]<br>
[% env.addr3 | html %]<br>
[% env.addr4 | html %]
</div>

<div class="abs invoice">Invoice</div>

<table class="abs date-num">
<tr>
  <td>Date</td>
  <td>Invoice #</td>
</tr>
<tr>
  <td>[% invoice.issue_date | html %]</td>
  <td>[% invoice.invoice_number | html %]</td>
</tr>
</table>

<table class="abs bill-to">
<tr>
  <td class="bill-to-header">Bill To:</td>
</tr>
<tr>
  <td class="bill-to-body">
    [% customer.companyname | html %]<br>
    [% customer.salutation | html %] [% customer.firstname | html %] [%
customer.midinit | html %] [% customer.lastname | html %] <br>
    [% customer.baddr1 %]<br>
    [% customer.baddr2 %]<br>
    [% customer.baddr3 %]
  </td>
</tr>
</table>

<table class="abs statement">
<tr>
  <td class="statement-header1">Statement Period</td>
  <td></td>
  <td></td>
</tr>
<tr>
  <td class="statement-header2">From</td>
  <td class="statement-header2">To</td>
  <td class="statement-header2">Terms</td>
  <td class="statement-header2">Due Date</td>
</tr>
<tr>
  <td class="statement-row">[% invoice.period_from | html %]</td>
  <td class="statement-row">[% invoice.period_to | html %]</td>
  <td class="statement-row">Pay in full</td>
  <td class="statement-row">[% invoice.due_date | html %]</td>
</tr>
</table>

<table class="abs due">
<tr>
  <td class="label">Previous Balance</td>
  <td class="amount">[% money(invoice.previous_balance) %] [%
customer.iso_4217 %]</td>
</tr>
```

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```
<tr>
  <td class="label">Payments</td>
  <td class="amount">[% money(0 - invoice.payments) %] [%
customer.iso_4217 %]</td>
</tr>
<tr>
  <td class="label">Charges this period</td>
  <td class="amount">[% money(invoice.amount_net - invoice.taxes) %] [%
customer.iso_4217 %]</td>
</tr>
<tr>
  <td class="label total">Total due</td>
  <td class="amount total">[% money(invoice.amount_due) %] [%
customer.iso_4217 %]</td>
</tr>
</table>

<table class="abs rule"><tr><td></td></tr></table>

<table class="abs totals">
<tr>
 <td class="label">Session charges</td>
 <td class="amount">[% money(invoice.calls) %] [% customer.iso_4217
%]</td>
</tr>
<tr>
 <td class="label">Subscription charges</td>
 <td class="amount">[% money(invoice.subscriptions) %] [%
customer.iso_4217 %]</td>
</tr>
<tr>
 <td class="label">Credits</td>
 <td class="amount">[% money(invoice.manual_charges) %] [%
customer.iso_4217 %]</td>
</tr>
<tr>
 <td class="label subtotal">Subtotal</td>
 <td class="amount subtotal">[% money(invoice.amount_net -
invoice.taxes) %] [% customer.iso_4217 %]</td>
</tr>
<tr>
 <td class="label">Taxes</td>
 <td class="amount">[% money(invoice.taxes) %] [% customer.iso_4217
%]</td>
</tr>
<tr>
 <td class="label total">Total</td>
 <td class="amount total">[% money(invoice.amount_net) %] [%
customer.iso_4217 %]</td>
</tr>
</table>

<div class="abs details">Payment Details:<br>Explain how to pay
here</div>

<div class="abs disclaimer">Fine Print / Disclaimer</div>

<div style="page-break-before: always;"></div>

<!-- xdrs -->

<!-- Payments -->
[% SET iter = services.2 -%]
[% SET row = iter.next_row -%]
[% IF row -%]
<table class="xdrs">
<thead>
 <tr>
   <td style="table-column-span: 5;"><b>Payments</b></td>
 </tr>
```

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```
</thead>
<tbody>
[% SET total_amount = 0 -%]
[% WHILE row -%]
<tr>
  <td>[% row.account_id | html %]</td>
  <td>[% row.destination_description | html %]</td>
  <td>[% row.xdr_cld | html %]</td>
  <td>[% row.xdr_connect_time | html %]</td>
  <td>[% money(row.xdr_charged_amount) %] [% customer.iso_4217 | html
%]</td>
</tr>
  [% SET total_amount = total_amount + money(row.xdr_charged_amount) -%]
  [% row = iter.next_row %]
[% END %]
</tbody>
<tfoot>
 <tr>
   <td style="table-column-span: 4;"><b>Total Payments</b></td>
   <td>[% money(total_amount) %] [% customer.iso_4217 | html %]</td>
 </tr>
</tfoot>
</table>
[% END -%]


<!-- Credits/Adjustments -->
[% SET iter = services.1 -%]
[% SET row = iter.next_row -%]
[% IF row -%]
<table class="xdrs">
<thead>
 <tr>
   <td style="table-column-span: 5;"><b>Credits</b></td>
 </tr>
</thead>
<tbody>
[% SET total_amount = 0 -%]
[% WHILE row -%]
<tr>
  <td>[% row.account_id | html %]</td>
  <td>[% row.destination_description | html %]</td>
  <td>[% row.xdr_cld | html %]</td>
  <td>[% row.xdr_connect_time | html %]</td>
  <td>[% money(row.xdr_charged_amount) %] [% customer.iso_4217 | html
%]</td>
</tr>
  [% SET total_amount = total_amount + money(row.xdr_charged_amount) -%]
  [% row = iter.next_row %]
[% END %]
</tbody>
<tfoot>
 <tr>
   <td style="table-column-span: 4;"><b>Total Credits</b></td>
   <td>[% money(total_amount) %] [% customer.iso_4217 | html %]</td>
 </tr>
</tfoot>
</table>
[% END -%]

<!-- Subscriptions -->
[% SET iter = services.4 -%]
[% SET row = iter.next_row -%]
[% IF row -%]
<table class="xdrs">
<thead>
 <tr>
   <td style="table-column-span: 6;"><b>Subscriptions</b></td>
 </tr>
</thead>
```

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```
<tbody>
[% SET total_amount = 0 -%]
[% WHILE row -%]
<tr>
  <td style="width: 30mm;">[% row.account_id | html %]</td>
  <td>[% row.destination_description | html %]</td>
  <td>[% row.xdr_cld | html %]</td>
  <td>[% row.xdr_connect_time | html %]</td>
  <td>[% row.xdr_disconnect_time | html %]</td>
  <td>[% money(row.xdr_charged_amount) %]</td>
</tr>
[% SET total_amount = total_amount + money(row.xdr_charged_amount) -%]
[% row = iter.next_row -%]
[% END -%]
</tbody>
<tfoot>
 <tr>
   <td style="table-column-span: 5;"><b>Total Subscriptions</b></td>
   <td><b>[% money(total_amount) %]</b></td>
 </tr>
</tfoot>
</table>
[% END -%]

<!-- Taxes -->
[% SET iter = services.12 -%]
[% SET row = iter.next_row -%]
[% IF row -%]
<table class="xdrs">
<thead>
 <tr>
   <td style="table-column-span: 6;"><b>Taxes</b></td>
 </tr>
</thead>
<tbody>
[% SET total_amount = 0 -%]
[% WHILE row -%]
<tr>
  <td>[% row.account_id | html %]</td>
  <td>[% row.destination_description | html %]</td>
  <td>[% row.xdr_cld | html %]</td>
  <td>[% row.xdr_connect_time | html %]</td>
  <td>[% row.xdr_disconnect_time | html %]</td>
  <td>[% money(row.xdr_charged_amount) %] [% customer.iso_4217 | html
%]</td>
</tr>
  [% SET total_amount = total_amount + money(row.xdr_charged_amount) -%]
  [% row = iter.next_row %]
[% END %]
</tbody>
<tfoot>
 <tr>
   <td style="table-column-span: 5;"><b>Total Taxes</b></td>
   <td>[% money(total_amount) %] [% customer.iso_4217 | html %]</td>
 </tr>
</tfoot>
</table>
[% END -%]

<!-- all other... 3, 4, 6, 7, 8, 9, 10, 14, 15 -->
[% FOREACH srv = services -%]
  [% NEXT UNLESS srv -%]
  [% SET i_service = srv.i_service -%]

  [% NEXT IF i_service == 1 -%]
  [% NEXT IF i_service == 2 -%]
  [% NEXT IF i_service == 11 -%]
  [% NEXT IF i_service == 12 -%]
  [% NEXT IF i_service == 100 -%]
```

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```
    [% SET row = srv.next_row -%]
    [% IF row -%]
    <table class="xdrs">
    <thead>
     <tr>
       <td style="table-column-span: 7;"><b>[% srv.name | html
%]</b></td>
     </tr>
    </thead>
    <tbody>
    [% SET total_amount = 0 -%]
    [% SET total_time = 0 -%]
    [% SET prev_row = {} -%]
    [% WHILE row -%]
      [% IF prev_row AND prev_row.country_name != row.country_name -%]
      <tr>
        <td style="table-column-span: 5;"><b>Total by [%
prev_row.country_name | html -%]</b></td>
        <td>[% total_time %]</td>
        <td>[% total_amount %] [% customer.iso_4217 %]</td>
      </tr>
      <tr>
        <td style="table-column-span: 7;">[% row.country_name | html -
%]</td>
      </tr>
       [% SET total_amount = 0 -%]
       [% SET total_time = 0 -%]
      [% END -%]
    <tr>
      <td>[% row.xdr_cli | html %]</td>
      <td>[% row.xdr_cld | html %]</td>
      <td>[% row.country_name | html -%]</td>
      <td>[% row.destination_description | html %]</td>
      <td>[% row.xdr_connect_time | html %]</td>
      <td>[% row.xdr_charged_quantity %]</td>
      <td>[% money(row.xdr_charged_amount) %] [% customer.iso_4217 |
html %]</td>
    </tr>
      [% SET total_amount = total_amount + money(row.xdr_charged_amount)
-%]
      [% SET total_time = total_time + row.xdr_charged_quantity -%]
      [% SET prev_row = row -%]
      [% SET row = srv.next_row -%]
    [% END -%]
    [% IF prev_row -%]
    [% END -%]
    [% IF prev_row -%]
      <tr>
        <td style="table-column-span: 5;"><b>Total by [%
prev_row.country_name | html -%]</b></td>
        <td>[% total_time %]</td>
        <td>[% total_amount %] [% customer.iso_4217 %]</td>
      </tr>
    [% END -%]
    </tbody>
    </table>
    [% END -%]

[% END -%]

</body>
</html>
```

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APPENDIX C. Advanced Template Customizations

You can use extra tools to customize templates so that information in invoices is provided in the most convenient and suitable form for your customers. Advanced template customization makes it possible to sort, group and sum up xDR information in the ways you need.

To do this, use the template toolkit engine. Discover its syntax on this website: **http://template-toolkit.org**.

NOTE: Advanced template customizations require basic knowledge of template markup language and programming algorithms. Please contact the PortaOne support team to order a template that meets your individual needs.

PortaBilling® clients are encouraged to create customized templates themselves. To make this task easy for you we provide typical algorithms that are useful for the most common queries.

Grouping by a Single Parameter

Basic algorithm

You may need to display your xDRs grouped by account ID, destination country or some other key parameter. To do this, follow this basic algorithm:

1. Define a key parameter for sorting and grouping. The `SET` directive updates the variable's value:

```
[% SET row = iter.next_row('key') -%]
```

In this statement the template engine forms a DB query and assigns the first entry from the xDR tables to the `row` variable. The variable called *`key`* in our example defines the key parameter for the xDR grouping. To insert you own key parameter use its DB name from the ***xDR row*** section of **Appendix A.**

The following table rows can be obtained by consecutive calls to `iter.next_row('key')`.

NOTE: The default value for the `key` variable is billing time – `xdr_bill_time`. It will be applied if you do not mention any key:
`[% SET row = iter.next_row() -%]`

2. Use WHILE loop and the following block of code to define and group xDRs with the same key parameter:

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```
[% WHILE row -%]
  [% IF prev_row AND prev_row.key != row.key -%]
```

The `prev_row` variable stores the previous value of the `row` variable. The template engine compares these values to find if the `key` values differ in these adjacent rows. If they do differ, it means that the previous group of xDRs has ended and a new group starts.

3. Output data by the key parameter:

```
<tr>
  <td> Result is [% prev_row.key %]</td>
</tr>
```

Detailed code example

To see how to apply this algorithm for the template, please consider the code with detailed comments. In this template the system sorts and groups xDRs by account ID (`account_id`), and then calculates and outputs the total amount for the calls from each account:

```
<!-- Define the service for a table of your template. It
    must be one of the services represented in the xDRs. In
    this example we will work with voice calls (i_service
    3). Refer to the Choosing the service subsection for
    detailed information -->
    [% SET iter = services.3 -%]

<!-- Previous row is undefined -->
[% SET prev_row = undef -%]

<-- Reset the counter -->
[% SET total_amount = 0 -%]

    <!--Select the key parameter for sorting. In this
    example - account ID -->
    [% SET row = iter.next_row('account_id') -%]

<-- Repeat for all xDRs for a current account. The WHILE
    loop repeats until all account xDRs are processed -->
[% WHILE row -%]

<-- If the values of key parameter differ in any two
    adjacent rows, it means that the previous group of xDRs
    has ended and a new group starts. In this example, the
    xDRs for the previous account has ended, so the billing
    engine outputs the subtotals for it, resets the counters
    and then processes the next account's xDRs -->
  [% IF prev_row AND prev_row.account_id != row.account_id -
    %]

    <!-- Output subtotals for the previous account -->
    <tr>
      <td>Total for the account #[% prev_row.account_id
    %]</td>
```

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```
      <td>[% total_amount %]</td>
    </tr>

    <!-- Reset the counters for the next group. In our
    example - for the next account -->
    [% SET total_amount = 0 -%]
   [% END -%]

   <!-- Sum up the values for a particular group of xDRs. To
    do this, add the current xDR's value to the total sum --
    >
   [% SET total_amount = total_amount +
    row.xdr_charged_amount -%]
   [% SET prev_row = row -%]
   [% SET row = srv.next_row -%]
    [% END -%]

<-- The WHILE section's code ends and the loop repeats anew
    -->
```

Grouping by Multiple Parameters

You may need to group the xDRs by two or more parameters. For instance, if your end users often make calls abroad, then you can provide information regarding how much each call to each foreign country costs. For this template two key parameters are needed – account ID `(account_ID)` and destination country `(country_name)`.

Basic algorithm

Let's consider the algorithm of grouping by two parameters:

1. Define the variables for counting and set them to zero:

```
[% SET total_amount = 0 -%]
[% SET country_amount = 0 -%]
```

2. Define the key parameters for sorting and grouping using a comma:

```
[% SET row = iter.next_row('account_id,country_name') -%]
```

When you apply this statement, data is sorted in the following way (account ID, destination country, total amount spent):

```
11125557100, Austria, $5
11125557100, Austria, $3
11125557100, Brazil, $10
11125557100, Brazil, $3
18887123555, Austria, $1
18887123555, Austria, $3
18887123555, France, $5
```

3. Use the WHILE loop and compare the adjacent rows in order to group the xDRs with the same key parameters:

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```
[% WHILE row -%]
[% IF prev_row %]
[% IF prev_row.account_id != row.account_id -%]
```

4. Count subtotals for the groups of xDRs that belong to the current account and current destination country:

```
[% SET total_amount = total_amount + row.xdr_charged_amount
   -%]
[% SET country_amount = country_amount +
   row.xdr_charged_amount -%]
```

When the WHILE loop is executed for the first time, the `prev_row` variable is empty, so the variables for counting are simply updated:

```
total_amount = 5 (0+5)
country_amount = 5 (0+5)
```

After this, the row with `100, Austria, $5` data is saved to the `prev_row` variable. When the WHILE loop is executed for the second time, the system finds out that the `account_id` and `country_name` in the adjacent rows are the same. That is why the variables for counting are easily updated:

```
total_amount = 8 (5+3)
country_amount = 8 (5+3)
```

5. Output the total amount for the service when a key parameter (either destination country or account ID) in the adjacent rows differs.

In the third WHILE loop execution, the account remains the same for the adjacent rows, but the countries differ. It means that it is time to output the variable for counting total amount per country:

```
   <tr>
      <td> Total amount for calls to [%
   prev_row.country_name %] for the account #[%
   prev_row.account_id ] is [% country_amount %]
</td>
      </tr>
```

In this case the invoice will represent the following information:

Total amount for calls to Austria for account #100 is $8.

Zeroize the variable for counting the total amount per country:

```
<!-- Reset the counter for a country -->
 [% SET country_amount = 0 -%]
```

After this, the WHILE loop processes the next country for the same account.

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Detailed code example

We provide the full code of the current example with detailed comments about each fragment:

```
<!-- Define the service for your template's table. It must
   be one of the services represented in the xDRs. In this
   example we will work with voice calls. Refer to the
   Choosing the service subsection for detailed information
   -->
   [% SET iter = services.3 -%]

<!-- Previous row is undefined -->
[% SET prev_row = undef -%]

<-- Reset the counters -->
[% SET total_amount = 0 -%]
[% SET country_amount = 0 -%]


   <!--Select the key parameters for sorting. In this
   example - account ID and destination country -->
   [% SET row = iter.next_row('account_id,country_name') -
   %]

[% WHILE row -%]
 [% IF prev_row %]
  [% IF prev_row.account_id != row.account_id -%]

    <!-- Output subtotals for the current account if further
   xDRs belong to the next account -->
    <tr>
     <td>Total amount for the account #[%
   prev_row.account_id %]</td>
     <td>[% total_amount %]</td>
    </tr>

    <!-- Reset the counters -->
    [% SET total_amount = 0 -%]
       [% SET country_amount = 0 -%]

   [% ELSIF prev_row.country_name != row.country_name -%]

<!-- Processing the next country name for the same account -
   ->
<!-- Output subtotals for the current country as further
   xDRs represent calls to the next country -->
     <tr>
      <td>Total for the account #[% prev_row.country_name
   %]</td>
      <td>[% country_amount %]</td>
     </tr>

 <!-- Reset the counter for a country -->
 [% SET country_amount = 0 -%]
   [% END %-]
 [% END -%]

 <-- Update all counters -->
 [% SET total_amount = total_amount + row.xdr_charged_amount
   -%]
```

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```
 [% SET country_amount = country_amount +
   row.xdr_charged_amount -%]
[% SET row = srv.next_row -%]

[% END -%]
```

Choosing the service

Service ID

Before processing the xDRs, you must specify which service the xDRs were created for. To do this, you need the service's unique database ID that can be found in the *Services* table of the PortaBilling® database. To specify a service, use this code at the very beginning of a template:

```
[% SET iter = services.X -%]
```

where `x` indicates the service's ID.

NOTE: Each table in your template may contain data that represents only one service. Specify a service ID every time you process xDRs with a different type of service.

Predefined services with their unique IDs can be found in the following table:

i_service	Name
1	Credits / Adjustments
2	Payments
3	Voice Calls
4	Subscriptions
5	Data Service [KB]
6	Data Service [MB]
7	Quantity Based
8	Wi-Fi
9	Dial-up
10	Messaging Service
11	Cleanup
12	Taxes
14	Conferencing
15	DID Usage
16	IPTV

If required for business, an ITSP can create customized services via the administrator web-interface. To process the xDRs of such customized services, the administrator must retrieve the service's unique ID from the *Services* table. There are two ways to do this:

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1. API methods – Use `get_service_list` to see the full list of services.
2. SQL query – Input this query to see customized services:
   `'SELECT i_env, i_service, name FROM Services WHERE i_env != 0'`

One day you might want to expand your business and provide additional services. For this reason it would be good to have an adjusted template to represent charges for new services. In order to check whether other services need to be output to the template, use this code:

```
[% FOREACH srv = services -%]
   [% NEXT UNLESS srv -%]
   [% SET i_service = srv.i_service %]
   [% SER service_name = srv.name %]
```

This code seeks each service from the *Services* table, one by one. If a service is found in the xDRs, start the process of sorting and grouping as described previously.

Detailed code example

In addition, we provide the full code for the system to check whether other services are present. If they are, they are sorted and grouped by their key parameters. We refer to the previous case with multiple key parameters – account ID and destination country.

NOTE: Add this code at the very end of your template.

```
<-- Searching for other services -->

[% FOREACH srv = services -%]
  [% NEXT UNLESS srv -%]
  [% SET i_service = srv.i_service -%]

<!-- Skip the already processed service -->
  [% NEXT IF i_service == 3 -%]

<!-- Skip the internal 'Cleanup' service -->
[% NEXT IF i_service == 11 -%]

<!-- This service refers to taxes. We skip them in this
   example, but do not forget to process them if it is
   required for your business -->
  [% NEXT IF i_service == 12 -%]

<!-- Skip internal 'Placeholder' service -->
  [% NEXT IF i_service == 100 -%]


  <!-- Get service name -->
  [% SET service_name = srv.name %]

    <!-- Use name 'iter' instead of 'srv' for convenience --
   >
    [% SET iter = srv %]
```

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```
 <!-- output xDRs for service -->

 <!-- Previous row is undefined -->
 [% SET prev_row = undef -%]
 <-- Reset the counters -->
 [% SET total_amount = 0 -%]
 [% SET country_amount = 0 -%]
 <!--Select the key parameters for sorting. In this
example - account ID and destination country -->
 [% SET row = iter.next_row('account_id,country_name') -
%]

 [% IF row %]
   <!-- if have at least one xDR - show header with
service name -->
    <tr>
     <td colspan=2>Service: [% service_name %]</td>
    </tr>
 [% END %]

 [% WHILE row -%]
   [% IF prev_row %]
     [% IF prev_row.account_id != row.account_id -%]
       <!-- Output subtotals for the current account if
further xDRs belong to the next account -->
       <tr>
         <td>Total amount for the account #[%
prev_row.account_id %]</td>
         <td>[% total_amount %]</td>
       </tr>
       <!-- Reset the counters -->
       [% SET total_amount = 0 -%]
       [% SET country_amount = 0 -%]
     [% ELSIF prev_row.country_name != row.country_name -
%]
       <!-- Processing the next country name for the same
account -->
       <!-- Output subtotals for the current country as
further xDRs represent calls to the next country -->
       <tr>
         <td>Total for the account #[%
prev_row.country_name %]</td>
         <td>[% country_amount %]</td>
       </tr>
       <!-- Reset the counter for a country -->
       [% SET country_amount = 0 -%]
     [% END %-]
   [% END -%]
   <-- Update all counters -->
   [% SET total_amount = total_amount +
row.xdr_charged_amount -%]
   [% SET country_amount = country_amount +
row.xdr_charged_amount -%]
   [% SET row = srv.next_row -%]
[% END -%]

<!-- end of services loop -->
[% END %]
```

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APPENDIX D. Available Notification Templates

The following table provides a brief summary of notification templates included in PortaBilling®.

Template name	Description
Fraudulent Activity on Account	
Account: suspicious activity detected	This notification alerts you that suspicious activity has been detected on behalf of your account.
Customer's account: fraudulent activity detected	This notification alerts you that customer's account attempted to use the service from an unusual location.
Account Generator	
Accounts generation error, batch exists	This notification asserts that the batch name the administrator is trying to use already exists.
Accounts generation error, cannot access directory	This notification asserts that the directory used during account generation cannot be accessed due to permissions issues.
Accounts generation error, cannot create directory	This notification asserts that the directory required for account generation does not exist and an attempt to create it failed.
Accounts generation error, cannot create new batch	This notification asserts that batch generation failed.
Accounts generation error, cannot fetch Customer name	This notification is produced because this customer was deleted by another administrator during account batch generation.
Accounts generation error, cannot fetch Product name	This notification asserts that the wrong product was selected to generate the account batch. For example, when the batch was being generated, the product was deleted by another administrator.
Accounts generation error, cannot open file	The notification asserts that a report file used during account generation cannot be open.
Accounts generation error, exceeded generation attempts	This notification asserts that batch generation failed due to excessive number of generation attempts.

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Accounts generation error, number of available account exceeded	This notification asserts that the batch cannot be generated because the amount of available DID numbers in the selected DID batch has been exceeded.
Accounts generation error, please provide a correct environment	This notification asserts that the billing environment was not specified.
Accounts generation error, please specify Account ID length	This notification asserts that the account ID length was not specified.
Accounts generation error, please specify the number of Accounts	This notification asserts that the number of accounts has not been specified.
Accounts generation error, unknown customer	This notification asserts that the account batch cannot be generated because this customer is not found in PortaBilling. It is possible that the customer was terminated after the account generation procedure was scheduled.
Accounts generation finished	This notification confirms that the accounts have been successfully created.
	BE Mailing List
Error in translation rule	This notification asserts that a translation rule cannot be properly applied due to a programming error.
General billing misconfiguration	This notification is sent when: • A debit account attempts to make a call that costs more than its available funds. • An unresolved call is detected (in most cases this indicates a connection misconfiguration).
Mismatch in the Destination or Rates table	This notification is sent when the cost of a call cannot be determined because no matching rate is found in the specific tariff.
Missing critical billing information (Account/Tariff)	This notification asserts that a call cannot be billed due to missing information (e.g. unable to identify the account to be charged for the call).
No remote IP authentication on your gateway	This notification asserts that your gateway accepts all incoming VoIP calls. See the *Implement Authentication for Incoming VoIP Calls* section in the **Configuration Examples for Cisco Gateways** handbook for more details.

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No routes to destination	This notification is sent when a customer attempts to place a call to a destination covered by his tariff plan but no valid routes exist for it in the system.
Not defined or empty Called-Station-Id	This notification is sent when in a request, the Called-Station-ID (DNIS) field is empty, and therefore PortaBilling® is unable to determine which number was dialed. This might happen due to a firmware problem on Quintum.
Profit monitor event detected	This notification is sent when call cost (amount charged by vendor) is greater than revenue (amount charged to customer).
Reject attempt to authorize for simultaneous use	This notification is sent when PortaBilling® cannot establish another simultaneous session due to overdraft protection.
Time problems (NTP/Format/ Suspicious)	This notification is sent when the time in the accounting record is in the wrong format or seems suspicious (e.g. the time is in the future or too far in the past).
Clone Product	
Failed to clone product	This notification asserts that an attempt to clone the product failed.
Product cloned successfully	This notification confirms that the product was successfully cloned.
Clone Tariff	
Tariff cloned successfully	This notification confirms that the tariff was successfully cloned.
Failed to clone tariff	This notification asserts that an attempt to clone the tariff failed.
Custom Report	
Custom report	This notification includes the results of custom report execution.
Customer	
Accounts closing report	This notification asserts that some customer accounts have been closed.
Destination	
Destination Group Set has been uploaded	This notification confirms that a destination group set upload has been completed and includes information on how many prefixes were added, removed or ignored.

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Destination Group Set upload failed	This notification asserts that some update operations failed during a destination group set upload. The file, including data that was not properly imported, is attached to this message.
Destinations have been uploaded	This notification confirms that a destination upload has been completed and includes information on how many destinations were added, removed or ignored.
Destinations upload failed	This notification asserts that some update operations failed during destination upload. The file, including data that was not properly imported, is attached to this message.
DID	
DID Numbers have been uploaded	This notification confirms that DID numbers have been uploaded. The message provides a list of successfully uploaded DID numbers and a list of DID numbers that were not uploaded due to error.
DID upload error	This notification asserts that some update operations failed during DID upload. The file, including data that was not properly imported, is attached to this message.
Invoice	
Failed to re-generate Invoice	This notification asserts that the attempt to re-generate the invoice failed.
Failed to re-generate Invoice, no invoice number or customer ID	This notification asserts that invoice re-generation failed because invoice number or customer ID was not identified.
Invoice re-generated successfully	This notification confirms that the invoice was re-generated successfully.
Recalculation of invoices has been finished	This notification informs whether the recalculation of invoices was finished successfully, with warnings or with errors. This message includes a list of invoice IDs which were not recalculated.
Mailing List	
Account screened	This notification is sent when an account's status is changed to screened. The notification includes information about the reason for account screening.

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Adaptive routing penalty threshold reached	This notification asserts that call quality for a particular route is below the specified acceptable level. The route is penalized and removed from its usual position in the routing list.
Adaptive routing warning threshold reached	This notification asserts that call quality for a particular route is below the specified warning threshold.
Auto-payment error	This notification asserts that an error occurred during invoice auto-payment. Because of this, auto-payment functionality is frozen and must be manually unlocked.
Balance mismatch detected	This notification is sent when a discrepancy between customer balance (an amount owed to the ITSP) and invoice amount due is detected.
Exchange rate actualizing error	This notification asserts that an error occurred while processing an exchange rate.
List of the Auto-Approved Invoices	This notification provides a list of invoices auto-approved by the system.
List of the Invoices Under Review	This notification provides a list of invoices that are under administrator's review.
No Store Name configured for LinkPoint Online Processor	This notification asserts that the Store Name option required for processing payments via the First Data Global Gateway Virtual Terminal (formerly known as LinkPoint) was not configured in the porta-admin.conf file.
No currency exchange rate found	This notification asserts that no exchange rates were found for converting a different currency to the base currency.
No keyfile configured for LinkPoint Online Processor	This notification asserts that no keyfile for processing payments via the First Data Global Gateway Virtual Terminal (formerly known as LinkPoint) was configured or that the pass to the keyfile is incorrect.
No partner configured for PayflowPro Online Processor	This notification asserts that the Merchant Account Partner Name option required for processing payments via PayflowPro online processor was not configured.

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No temporary directory for LinkPoint Online Processor	This notification asserts that no temporary directory for processing payments via the First Data Global Gateway Virtual Terminal (formerly known as LinkPoint) was configured or that the pass to this directory is incorrect.
No vendor configured for PayflowPro Online Processor	This notification asserts that the Merchant Account Vendor Name option required for processing payments via PayflowPro online processor was not configured.
No wrapper configured for LinkPoint Online Processor	This notification asserts that the LinkPoint wrapper (LPERL) used for processing payments via the First Data Global Gateway Virtual Terminal (formerly known as LinkPoint) was not configured.
Not defined base currency for environment	This notification asserts that no base currency was defined for the environment.
Online Payment Processor configured improperly	This notification asserts that an online payment processor was not properly configured.
Payment processing error	This notification asserts that an error occurred during payment processing via the payment processor.
Replication problems	This notification asserts that a problem with replication of the main database was detected.
Task rejected	This notification asserts that a task from the TaskStack queue was rejected.
Tax Calculations errors	This notification asserts that tax calculation scheduled for a customer has failed.
User Error Report	This notification is sent to an administrator when a user submits a report about an unsuccessful call via the web interface.
Web self-care password change	The notification is sent if a user changes their password on the web self-care interface. This message contains the new password.
	Password change

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Web password change link	The notification is sent when the "Password recovery" feature on the web self-care interface has been used. The message contains the reset password link.
Web self-care password reset	The notification is sent when a password for the web self-care interface has been reset. The message contains the new password.
Re-rating	
Rerating complete	The notification informs that the xDR re-rating procedure has been completed. The message includes a list of xDRs processed.
Spending Plan	
Spending plan limit ratio can be crossed soon	This notification alerts an administrator that a customer has reached the threshold configured for their spending plan.
Spending plan limit ratio is crossed	This notification alerts an administrator that a customer has exhausted their spending limit.
Subscription	
Reapplying subscriptions for product	The notification informs that a product's subscription has been reapplied. The message includes the number of affected accounts.
Tariff Upload	
Tariff upload failed	The notification informs that some update operations failed during tariff upload. The file including the data which has not been imported is attached to the message.
Tariff uploaded	The notification informs that a tariff has been successfully uploaded. The message includes a summary about total rates processed.

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