PORTA ONE

M2M / IOT FOR CSP

PortaSwitch

New Features Guide

79
MAINTENANCE
RELEASE

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PortaSwitch® New Features Guide, August 2019
Maintenance Release 79
V1.79.04

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Table of Contents

Preface

PortaSwitch® Maintenance Release 79 is the next leap-forward release, consistent with our "fast releases, precisely on time" ideology.

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

Conventions

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

The **exclamation mark** draws your attention to important 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 performing the action described here.

Archivist explains how the feature worked in previous releases.

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

Tips provide information that might help you solve a problem.

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Satellite Internet provisioning over Newtec Dialog platform

PortaBilling® is integrated with Newtec Dialog, a multiservice satellite communications platform. This integration allows service providers to offer prepaid data services over the satellite using PortaBilling® as the BSS system.
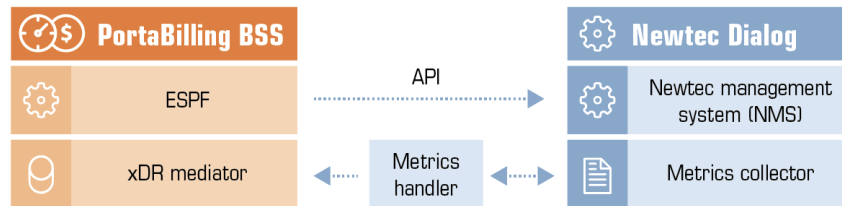
PortaBilling® interacts with these two components of the Newtec Dialog platform:

- The network management system (NMS) – is used to provision satellite modems and control user access to the network. The user can have either default or restricted access to the network. NMS manages network access using corresponding service profiles. A restricted service profile is used to block Internet access (e.g. the account quota / service wallet is used up) and a default service profile is used to resume it (e.g. upon service wallet top-up).

  PortaBilling® provisions Newtec NMS via the ESPF with this data to automate subscriber provisioning and service management: the service profile ID, a device model and MAC address and the CPE profile details.

- The metrics collector – is used to measure and report a subscriber's service usage. A subscriber is identified by their modem ID and their service usage is measured every 5 minutes. The collected data is retrieved by PortaBilling® for further import, charging and quota control.

This is how it works:

An administrator defines the speed limits for default and restricted service profiles in NMS. Let's say John Doe subscribes for satellite Internet. An administrator creates an account for John Doe in PortaBilling® and assigns a satellite modem to it. PortaBilling® provisions John Doe's

satellite modem details to Newtec NMS. Upon provisioning, NMS returns the modem ID which is assigned as an alias to John Doe's account in PortaBilling®. And that's what is used to charge him for Internet usage.

John Doe begins to use the Internet. The metrics collector measures the total amount of data transferred for the previous 5 minutes. PortaBilling® retrieves this collected data every 5 minutes, processes it and charges John for the traffic he uses.

When John Doe uses up his service wallet, PortaBilling® provisions the restricted service profile ID to NMS which then restricts John's service usage. Once he tops up his service wallet again, NMS applies the default service profile and service resumes for his account.

An administrator can view the service usage statistics on the **Internet connection load** panel for John's account in PortaBilling®.
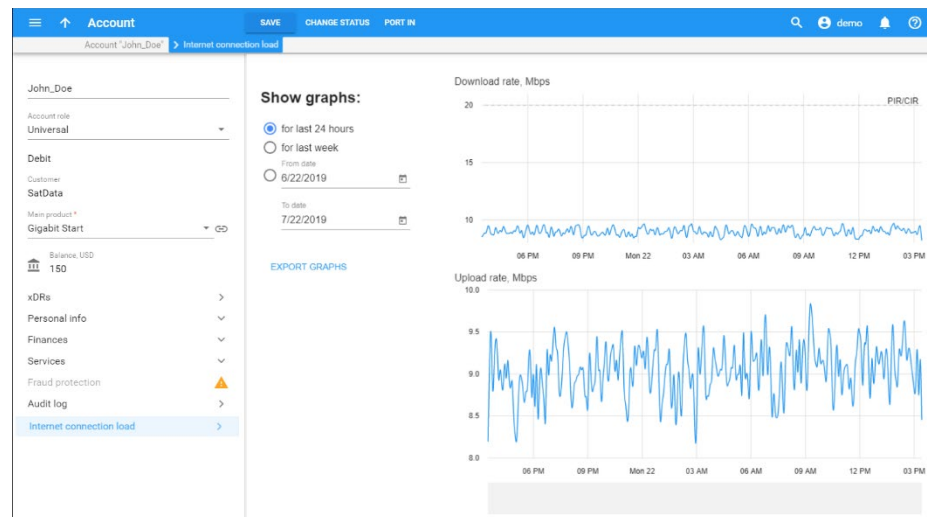
Global service usage graphs will be added in future releases to track customers' service usage statistics.

Configuration:

To provide satellite data services, configure the following in NMS:
- Create two service profiles: one for default access, another one for restricted access.
- Define the speed limits for default and restricted service profiles.

Then in PortaBilling® configure the following:
- Install the NMS provisioning plug-in. Contact PortaOne Support for assistance;

- Create Internet access policies and specify Newtec attributes (default service profile ID and restricted service profile ID);
- Configure quotas and / or service wallets to define the amount of provided data;
- Create Internet access products. Assign quotas / service wallets, subscriptions and service policies to them;
- Create a CPE profile with satellite modem details and upload modems to the CPE inventory (device model, number of ports, server IP, etc.);
- Configure an xDR mediation utility for service usage import and processing;
- Configure ESPF to enable data provisioning.

This integration enables you to provide satellite data services and manage these services from a single place. This reduces your administrators' manual work and helps prevent revenue leakage (e.g. an account is out of funds but the administrator has forgotten to block the service).

Traffic management via Sandvine SPB

Now CSPs can apply different access policies to subscribers on any network (e.g. in ADSL and wireless networks) and control the traffic flow by using PortaBilling® and Sandvine SPB (Subscriber Policy Broker). They can also shape network traffic per subscriber and improve overall network security. Sandvine SPB also enables CSPs and MVNOs who rent the network infrastructure to authenticate users and control their activity on the network.

To authenticate subscribers and apply service policies to them, Sandvine SPB must receive their username and the IP address associated with it. In network deployments with a static IP allocation (e.g. fiber-based networks), PortaBilling® stores this data and provisions it to Sandvine SPB via the ESPF (External System Provisioning Framework). In networks that have dynamic IP allocation, the subscriber's IP address is initially unknown. PortaBilling® receives a subscriber's IP in a RADIUS request from NAS and then provisions it to Sandvine SPB via RADIUS. This enables you to manage subscribers and their service availability on virtually any network.

This is how it works.
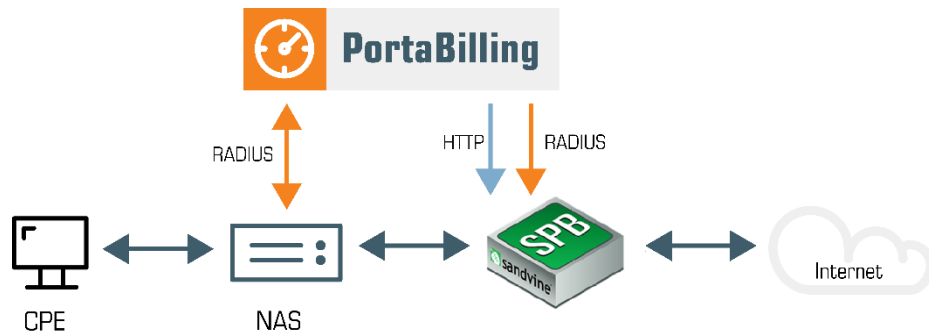
The user's account and service configuration are pre-provisioned in Sandvine SPB from PortaBilling® via the ESPF. When a user connects to the Internet, a dynamic IP address is allocated to their device. The NAS sends the Start Accounting RADIUS request to PortaBilling®. PortaBilling® extracts the user's IP address from the `Framed-IP-Address` attribute and provisions it to Sandvine SPB via RADIUS. If no subscriber record appears in Sandvine SPB, it is created in that moment. When provisioned, the Internet access policies are applied to the user and Sandvine SPB controls the user's behavior on the network.

When the user's session is over, NAS sends a Stop Accounting request to PortaBilling®. PortaBilling® then passes the RADIUS provisioning request to Sandvine SPB to clear the user's IP address.

To set up traffic management in networks with dynamic IP allocations, configure the service policies in Sandvine. Then in PortaBilling®, do the following:

- Enable the Sandvine adaptor on the Configuration server.
- Create all NASs that PortaBilling® communicates with as nodes.
- Create a special node for Sandvine SPB. Specify the Sandvine server IP address to provision the user IP addresses via RADIUS in the PoD server configuration.
- Configure Internet access policies with the same names as those defined in Sandvine SPB.
- Create Internet access products. Include the Mobile network provisioning service in the products to trigger subscriber data provisioning.
- Configure the ESPF to provision subscriber data to Sandvine SPB.

IP provisioning to Sandvine SPB allows CSPs and MVNOs to control user connectivity and manage traffic flow. CSPs can build virtual networks for other CSPs to offer pretty much the same data services.

USSD self-care

With this release, PortaBilling® is integrated with the Protei Unstructured Supplementary Service Data (USSD) gateway to provide customer care services to mobile subscribers in GSM networks. A subscriber sends a USSD message to request information (e.g. a balance check) or an action (voucher activation) by dialing a service code. In order to retrieve the requested data, the Protei USSD gateway interacts with PortaBilling® via API. PortaBilling® acts as the BSS.

Here, in more detail, is how it works:

You configure the service menu in the Protei USSD gateway and provide the service codes to your subscribers upon signup. Let's say that John Doe wants to check his account balance. He dials a short USSD code – *123#. The USSD gateway accepts his message and requests his balance information from PortaBilling® via the API. PortaBilling® identifies John's account and returns his balance amount in the API response to the USSD gateway. John Doe then receives the USSD message, "Your current balance is 43.25 USD."

By using the Protei USSD gateway in their network infrastructure, service providers automate their customer care services. This improves the customer experience and also reduces the administrative load.

Transfer of airtime among users via the API

With this release, CSPs can allow their users to transfer airtime among family and friends in such forms as GB, minutes, SMSs and money. Thus, CSPs provide their users with extended functionality. This feature also enables them to comply with the regulations of certain countries, e.g. the Independent Communications Authority of South Africa (ICASA).

Since the way that users transfer airtime may differ and also depend on their user experience, the transfer is performed via the API. The CSPs must develop custom self-care portals and / or mobile apps.

In PortaBilling®, users share airtime among their service wallets and quotas. The lifetime of transferred airtime synchronizes with the lifetime of the recipient's service wallet / quota. The transferred airtime is always used up first.

For instance, let's say that John Doe has 2 GB rolled-over quota from the previous month that will expire on August 10. John opens his custom self-care interface and transfers these 2 GB to Mary's service wallet. Now

Mary can use this quota until her service wallet expires, on August 28. Both John and Mary receive email notifications about the successful transfer.

To permit airtime transfers, enable this option within the service wallet / quota. Make sure the measured volume is identical (e.g. in GB, minutes or money) for each.

With this feature, users can manage the airtime they've paid for and use it in full. This increases their loyalty and makes CSPs more competitive in the market. In addition, CSPs are compliant with ICASA requirements.

ESPF API for asynchronous systems provisioning

When you integrate PortaBilling® with complex external systems, this may imply the provisioning of several of their subsystems (e.g. to provision the mobile core, you must provision data to the HSS and the PCRF). This can take time, as such systems have to wait for responses from their subsystems. Therefore, they provision the data asynchronously: a system accepts the request and sends notifications with the provisioning status (e.g. an hour later).

You can now process these notifications using the ESPF API and store the provisioning status for an account in PortaBilling®. Consequently, you can verify your customer's service activation and it also simplifies the provisioning of asynchronous systems.

You build the external application to provision subscriber data from PortaBilling® and process notifications from your external system. Thus, the application must:
1. Receive provisioning events from the ESPF;
2. Query the obligatory subscriber data via the PortaBilling® API;
3. Send the subscriber data to the external system using that system's API;
4. Receive and process notifications from the external system;
5. Update the provisioning status for the account via the ESPF API.
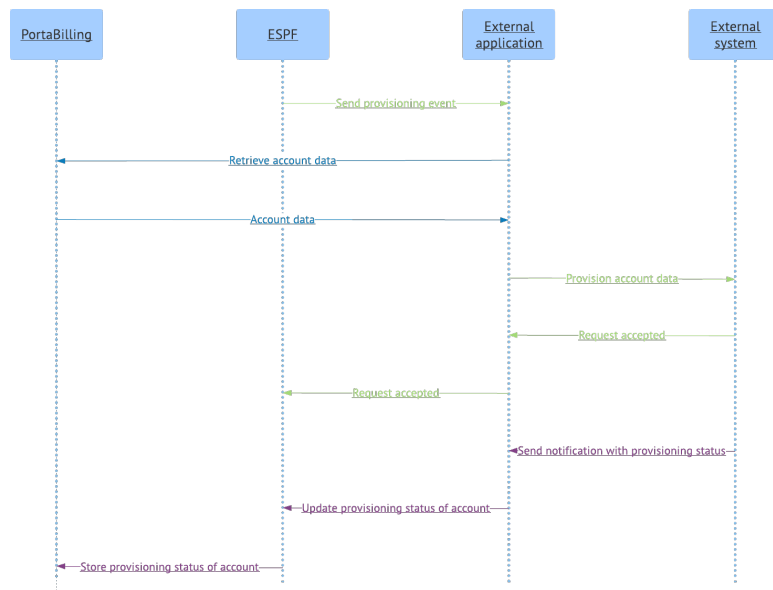
The ESPF API is available under this URL:

```
https://<portabilling-
web.yourdomain.com>/espf/v1/account/i/<i_account>/status
```
where:

- `portabilling-web.yourdomain.com` is the hostname of your PortaBilling® web server;
- `v1` is the provisioning event version;
- `i_account` is the unique ID of the PortaBilling® account; and
- `status` is the account's provisioning status.

You can also update the account's provisioning status by using the account ID. Then the URL to send requests to changes to:

```
https://<portabilling-web.yourdomain.com>/espf/v1/account/
<account_ID>/status
```

The authorization is done using the PortaBilling® administrative user's API credentials.

The API request must include these parameters in JSON format:

Parameter	Description
status	The account's provisioning status. Possible values: • OK – the provisioning is successful;

	• IN_PROGRESS – the provisioning is in progress; • RETRY – a retry is initiated after the initial failure; • FAILED – the provisioning failed.
group	A group organizes the provisioning requests per the external system (e.g. the IPTV group is used to identify provisioning requests to an IPTV platform). When the external system sends notifications, a group servers to distinguish them and store the account's provisioning status. You can use any group name to store the account's provisioning status. First, register this group in PortaSwitch® and then pass its name to the ESPF in the API request. These groups are already registered in PortaSwitch®: • VoIP ; • HSS; • PCRF; • IPTV; • WiMAX; • Netaccess; • NumberPortability; and • LawfulInterception.

This example illustrates how it works:
Let's say you integrate PortaBilling® with the Order Management System (OMS) to provision the mobile core. The OMS is asynchronous and sends notifications about the provisioning status.

A new account with `i_account=189` is created in PortaBilling® and the ESPF sends the Account / New event to the external application.

The external application queries the SIM card details from PortaBilling® via the API and provisions this data to the OMS. The OMS accepts the event and replies with 200OK to the external application. In 10 minutes, the OMS platform processes the event and sends the HTTP notification with the provisioning status to the external application. The external application sends the API request to the ESPF to update the account provisioning status:

```
POST
Request URL: https://mybilling.com/espf/v1/account/i/189/status
HTTP/1.1\
Host: https://mybilling.com
Content-Length: 19
Content-Type: application/x-www-form-urlencoded

{
 "status": "OK ",
 "group" : "HSS"
}
```

This enhancement simplifies integration with complex external systems that provision data asynchronously.

Other features and enhancements

- **Manage calls to external numbers via call control API** – An operator can monitor and manage calls to external numbers via an app (e.g. a switchboard app). For example, an operator can forward a call to another phone number or cancel it if there is no answer. This is beneficial during an unattended (blind) transfer as it ensures that the caller is connected after the transferor leaves the call. The app communicates with PortaSwitch® via the call control API.

  To monitor calls to external numbers, subscribe the app to call state notifications for the account within your IP Centrex in the usual way. When an account transfers, forwards or makes a call, the app receives call state notifications from external numbers via that account's channel.
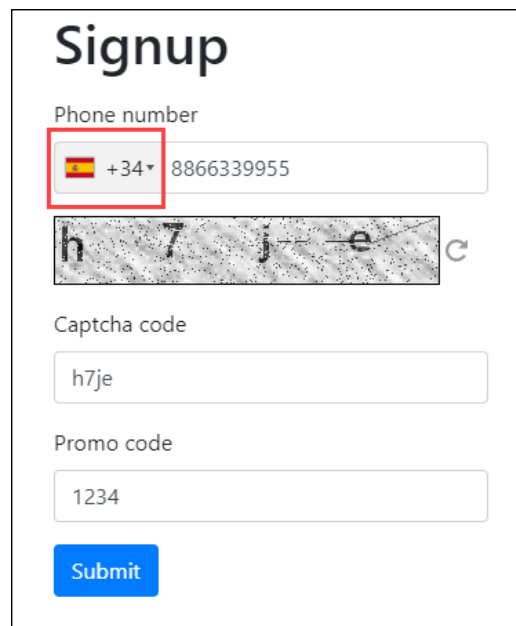
  This is how it works in detail:
  Your sales agent, John (extension number 5555), is on a call with Mary (external number 1733355800). To provide Mary with expert assistance, John makes a blind transfer of the call to his colleague Peter (external number 4244466333). Peter does not answer and the operator understands that it only rang, so the "Ringing" call state is received from Peter's external number 4244466333. Thus, the operator transfers Mary to the other sales agent – Kate (external number 4244477222.)

  Although John has left the call, the operator still controls the call from Mary. When Kate and Mary start to talk, the app receives the "Connected" call state for both parties. When they hang up, the "Terminated" call state is received.

This enhancement ensures that calls transferred to external numbers are managed and don't get lost. As a result, customers are happy to enjoy yet another level of service.

- **Set default country code for PortaPhone signup page** – To make the registration process user-friendly, define the default country code for the PortaPhone signup page, e.g. 34 for Spain. The code is displayed first in the list. Thus, your new subscribers just enter their phone numbers next to it. They do not need to scroll through the drop-down list to find their country codes. This is very useful for when your PortaPhone subscribers are mostly located in one country.

To set the country code, define it in the **DefaultPhoneNumberPrefix** option on the Configuration server.
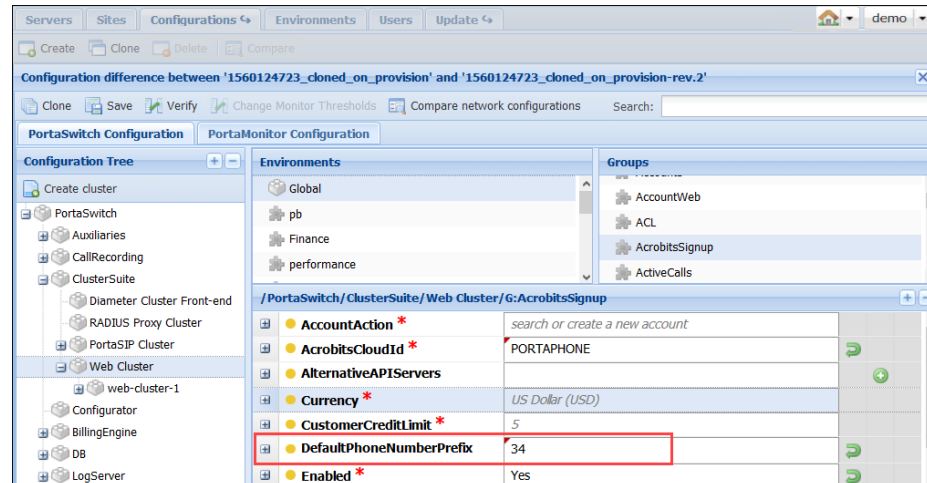
This enhancement simplifies the registration process for your subscribers.

- **Special prompt for calls via IVR when funds are locked** – End users now hear a "Your funds are locked" voice prompt when they try to use a prepaid card that someone is already using and the call is still in progress. This prompt gives end users a comprehensive reason why their call cannot go through at the moment.

  For example, let's say that John and Kate buy a prepaid card worth $10 to call their friends in London. John makes the call using this prepaid card. He dials the access number, enters the PIN and the destination number. PortaBilling® locks in all $10 to cover this call. Kate doesn't know that John is on a call. She tries to make a call using the same prepaid card, but after she enters the PIN, she hears, "Your funds are locked." Kate realizes what is happening, hangs up and decides to call later.

  For now, the prompt is added in English only. To add this prompt in other languages, contact the PortaOne Support team.

  End users receive the reason why their call cannot go through. This prompt prevents confusion and further complaints and therefore, reduces the administrative load for troubleshooting.

- **Redesigned internal communication in PortaSwitch®** – These enhancements serve to speed up data processing and increase overall system performance:
  - PortaSIP® and web servers on the secondary site now operate with the local stand-by database in both normal

and standalone modes. This reduces data processing delays.
- o PortaSIP® now uses a permanent session ID for API communication with the web server. As PortaSIP® does not have to re-authorize the API session, API execution time (e.g. the user waits less time for the IVR prompt) is decreased.

- **Validation of reseller status for API sessions by their subentities** –Now representatives, CC staff members, distributors of a reseller cannot access PortaBilling via the API if this reseller is blocked or terminated. This prevents their unauthorized access to PortaBilling®.

Web interface changes

- **Option search within an entity** – With this release, an administrator can quickly find any option / panel within these entities:
  - o User;
  - o Vendor;
  - o Discount plan;
  - o Service policy;
  - o Tariff;
  - o Representative;
  - o Reseller;
  - o Customer class;
  - o Customer;
  - o Account;
  - o Voice application;
  - o Connection;
 - o Product;
  - o Distributor.

  For example, to find the **Auto-provision DIDs via batch** option, click the icon on the toolbar. Then start to type the option name and select it from the drop-down list when it appears.
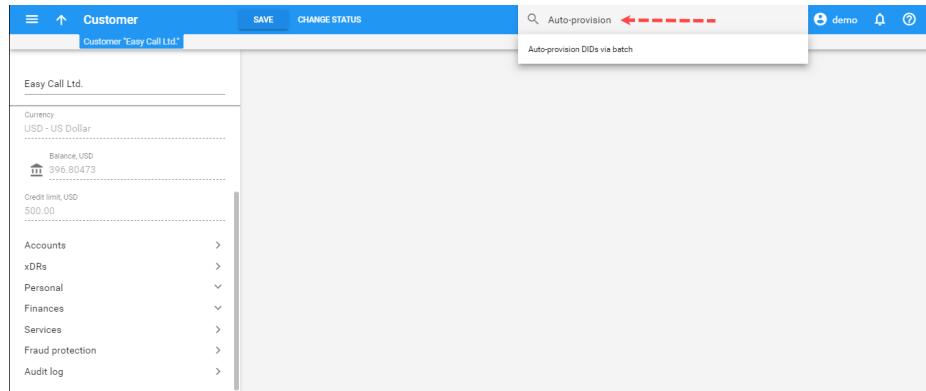
PortaBilling® will redirect you to the corresponding panel and highlight the option.
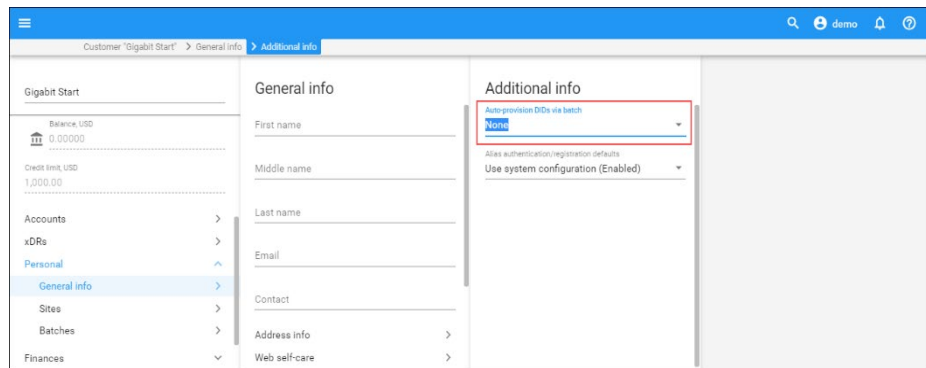
PortaBilling® saves your search queries, so you can quickly select an option from the drop-down list next time.
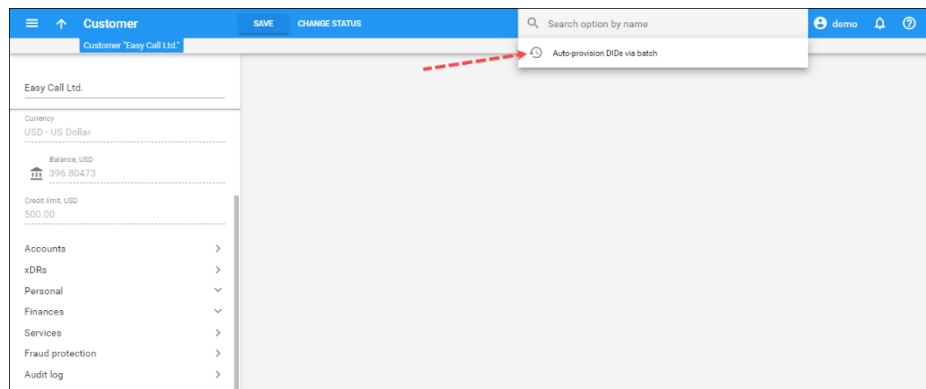
This enhancement improves navigation on the web GUI and saves an administrator a significant amount of time.