Porta**Switch**

New Features Guide

68
MAINTENANCE
RELEASE

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Preface

PortaSwitch® Maintenance Release 68 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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PortaSwitch® as the IMS Application Server

To begin providing mobile services, you do not need to build your own mobile network. Instead, you can become an MVNO (Virtual Mobile Network Operator). Negotiate the network capacity of an existing mobile network operator (MNO) and then integrate PortaSwitch® with the MNO's IMS (IP Multimedia Subsystem). This way you can deliver calls to subscribers using the mobile network – without needing to deploy a full network core. This significantly reduces your initial investment.

In IMS, PortaSwitch® functions as the Application Server. In order for PortaSwitch® to receive call requests from IMS, the MNO sets up a routing rule. It instructs the IMS core to route calls made by or to your subscribers to PortaSwitch®. PortaSwitch® communicates with the IMS core via the SIP protocol.

In the mobile network, the CSCF (Call Session Control Function) is the IMS core component responsible for the call setup. It performs user authentication, service policy control with PCRF and routing functions.

The functions of PortaSwitch® as the Application Server include:
- Real-time authorization;
- Routing to the IMS CSCF for call delivery; and
- Managing user data and service configurations.

Let's take a closer look at call flow when a mobile subscriber calls another one. As an example, let's say it's a VoLTE call, though the call flow is the same for a 3G network. This means you have choices for which network to operate in.

VoLTE to VoLTE call

During a VoLTE call two requests are triggered: the mobile originated request and the mobile terminated request. According to the rules defined by the MNO, the CSCF loops both the mobile originated and the mobile terminated requests through PortaSwitch®.

So, let's say Peter and John are your mobile subscribers. When Peter calls John, the following occurs:
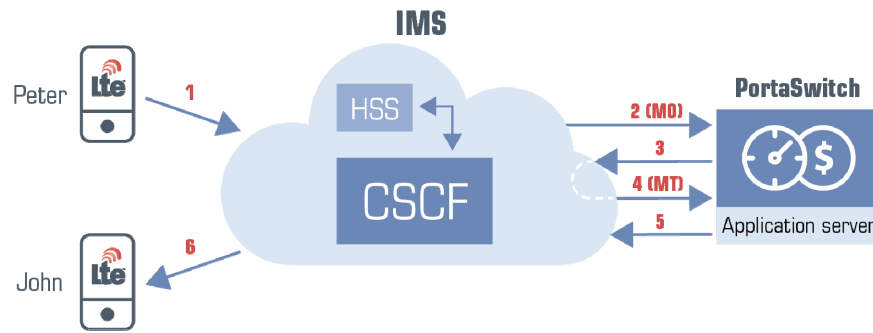
- Peter's phone sends an INVITE request to the CSCF (**1**).
- The CSCF sends a mobile originated request to PortaSwitch® (**2**). This request contains the P-Served-User header with information about which party to bill for the outgoing call (Peter's account).
- PortaSwitch® authenticates the call by the P-Served-User header, and authorizes Peter's account for the outgoing call.
- Upon successful authorization, PortaSwitch® routes the call to the CSCF (**3**).
- The CSCF sends a mobile terminated request to PortaSwitch® (**4**).
- PortaSwitch® performs the same authorization check towards the called party (John) and checks the service policy configuration for John's account.
- PortaSwitch® identifies that the service policy attribute **append_incoming_headers** is set to *Yes* and that the account is not registered on an IP phone. So now PortaSwitch® routes the call to the CSCF (**5**).
- The CSCF terminates the call on John's mobile phone (**6**).
- Peter and John start to talk.
- When the call is complete, PortaSwitch® calculates the charges and produces xDRs for both the calling and the called parties.

To make and receive calls over the LTE network, the user accounts must not be registered on IP devices. Otherwise, the account registration will override the service policy settings and PortaSwitch® will attempt to deliver the call over the VoIP network.

Though this is the initial step of the interoperation between PortaSwitch® and the IMS, service providers benefit from it by being able to:
- Provide mobile calls and bill for them in real time;
- Provide emergency services for mobile subscribers; and
- Bundle mobile and VoIP services, thereby enabling mobile subscribers to reach IP PBX extensions.

Integration with Cisco Jasper

PortaBilling® is integrated with Cisco Jasper, the automated connectivity management platform. This integration allows you to deliver IoT connectivity services to all of your subscribers so that they can connect any devices (phones, tablets, etc.) via their SIM card.

Within your infrastructure, PortaBilling® serves as the service and revenue management system. It provisions account and SIM card information to Cisco Jasper, manages customer balances, collects billing information and issues invoices.

Cisco Jasper handles communication with mobile network to activate the SIM cards for your subscribers. When a subscriber signs up for the service, their record is created in PortaBilling® and their SIM card is automatically activated in Cisco Jasper. Similarly, when a subscriber stops using your services, their SIM card is deactivated.

Cisco Jasper keeps track of the subscribers' total service usage. When a subscriber uses up all their allocated Internet quota, PortaBilling® receives notification from Cisco Jasper and blocks service availability. The SIM card is deactivated in Cisco Jasper. As soon as the subscriber purchases a new quota, their service is restored and the SIM card is automatically activated. The subscriber once again has access to the Internet.

This integration empowers you to become the communication service provider for the IoT and fit into the IoT value chain.

Connect Two PSTN Calls via Call Control API

Using the call control API you can integrate voice call service into web or mobile applications and enable your users to make and receive calls, modify calls in progress and receive notifications about the state of a call from within the application.

PortaSwitch® is capable of establishing two outgoing calls to PSTN numbers and then bridging them together via the call control API. The account that pays for this call is the one registered for the API. Thereby you can program web / mobile applications to trigger callback calls to user phones and automatically connect them with the desired destinations.

For example, for your customer "Quick & Tasty" bistro you can integrate the voice call service with their web application. So when customer Alice

opens the application and decides to reserve a table, all she needs to do is enter her phone number and click the Call button. She immediately receives a call back on her phone. Once she answers, she is connected with the bistro. The "Quick & Tasty" account in PortaSwitch® is predefined for the application and is the one that pays for the call.

This is what happens in PortaSwitch® after Alice presses Call (in the application):

- The application sends the API request to PortaSwitch® to initiate the call. The API request contains the originating and destination numbers plus the account info to bill for this call.
- PortaSwitch® authorizes the account to bill for calls to both destinations. PortaSwitch® first establishes a call to Alice, then to the "Quick & Tasty" number, and lastly connects both call legs.
- When Alice hangs up, the charges for both call legs are applied to the account.

To establish a call between external numbers, adjust your applications to use the new **originate_advanced_call** API method. Of course, you can use this method for making calls to and / or from an extension.

For backward compatibility, the call control API still supports the originate_call method; however, it is considered obsolete and will be removed in future releases.

With this enhancement, you introduce Twilio-like services and provide custom-tailored solutions for your customers.

# Integration with the Virtual Card Services Payment Processor

As of this release, PortaBilling® is integrated with Virtual Card Services (VCS) – one of the leading payment processors in South Africa. This enables South African ITSPs to let their customers make online payments as well as manage their payment operations in PortaBilling®.

VCS is an external payment processor. This means that a user is redirected to the VCS's portal to enter their credit card details and complete a payment. Since all sensitive information such as credit card details, CVVs, etc. is not stored in PortaBilling®, this simplifies the security certification process for an ITSP. However, automatic payments are not supported.

The payment flow via VCS looks like this:

When a customer initiates a payment from their self-care interface, they are redirected to the VCS portal to enter their credit card details and confirm the payment.

Upon submitting payment, the customer is redirected back to their self-care interface where they see the payment status.
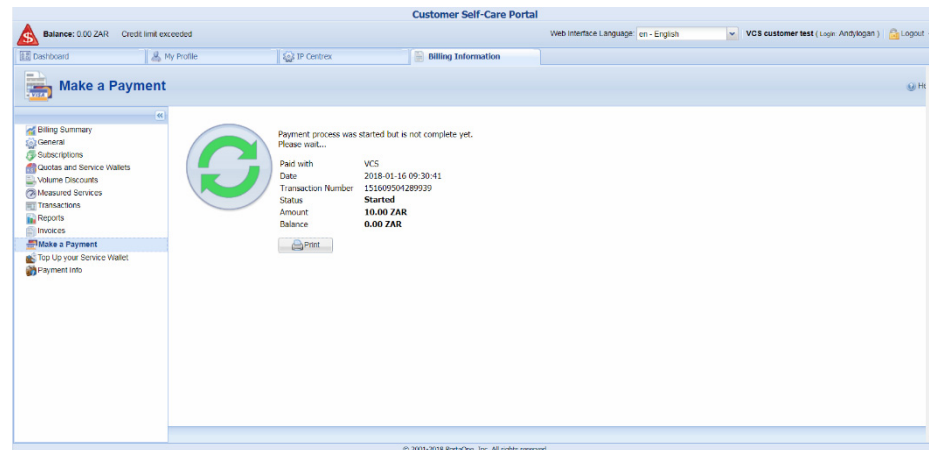
NOTE: The VCS uses SSLv3 certificates, which PortaBilling® considers obsolete and no longer supports. Therefore, the VCS cannot access the PortaBilling® web server directly to deliver transaction statuses. Instead, PortaBilling® schedules periodic checks of transactions statuses. This may result in delayed customer balance updates.

This integration with VCS expands the list of payment processors that service providers can use to organize their payment flow.

Migration from MR50 to MR65 via Dual-Version PortaSwitch®

Now service providers who use the older yet popular MR 50 can gradually migrate their customers straight to MR 65 by using dual-version PortaSwitch®.

This gives your customer access to all the features developed to address global user feedback during the past 2.5 years. PortaSwitch® seamlessly delivers calls to accounts in both the main and new systems via the dispatching SBC and therefore, customers do not even notice being moved to the new system.

Integration with YateUCN EPC

PortaBilling® is now integrated with YateUCN – an LTE EPC. This latest integration enables wireless operators to provide Internet access while charging their mobile subscribers for it in real time.

Within this integration, PortaBilling® operates as an OCS (online-charging system) and communicates with the YateUCN EPC using the Diameter (Gy) protocol for real-time user authorization and rating. It also instructs YateUCN EPC to redirect users to the hotlining portal when they run out of funds / lack available quota.

YateUCN EPC supports rating groups. This enables you to introduce content-based charging. For example, you can charge users for watching YouTube videos or visiting social networks while the traffic for using your self-care portal comes free of charge.

YateUCN is yet another LTE solution available for organizing your network infrastructure. YateUCN implements all EPC components in the software and runs on a single commodity hardware. As a result, you benefit from reducing your initial deployment costs.

Integration with Mida Queue Manager

PortaSwitch® is now integrated with the Mida Queue Manager. This application is used for call queuing and routing of incoming phone calls. It allows all call queues to be customized to have their own set of messages, working hours, timeouts, overflows and routing algorithms.

A call queue in the Mida Queue Manager is linked to an IP PBX phone line that receives all incoming calls. PortaSwitch® routes the calls from an IP PBX phone line to the Mida Queue Manager, where they are queued. The Mida Queue Manager distributes these calls in a predefined fashion among the dedicated phone lines on this IP PBX.

This integration allows service providers to offer advanced call queue features to their IP PBX customers.

Auto-Provisioning for New GrandStream IP Devices

The list of IP devices that are auto-provisioned by PortaSwitch® has been extended to include the following analog telephone adapters:

- GrandStream HT802 (1.0.5.11 firmware version).
  The HT802 comes with 2 ports for connecting 2 analog phones to a VoIP network.
- GrandStream GXW4216 (1.0.5.28 firmware version).
  The GXW4216 comes with 16 ports for connecting 16 analog phones to a VoIP network. This allows small-to-medium businesses to turn it into a mini IP PBX and enjoy the benefits it provides (e.g. call forwarding, voicemail, etc.). For more information, please refer to the adapter's official documentation.

These analog telephone adapters act as an intermediary between VoIP and PSTN networks. Thus, end users and businesses can save on call costs while using their analog phones.

Other Features and Enhancements

- **Improved call hold via the API** – By using the call control API, end users can put calls on hold from an external application as if they had pressed the Hold key on their IP phones.

  Previously, PortaSwitch® instructed IP phones to put calls on hold by sending third party proprietary headers. This limited using the API to put calls on hold only to specific IP phones.

  With this release, the call hold operation is performed by PortaSwitch®.

  This ensures that using the API to put calls on hold works correctly on any IP phone.

- **Same IP address for the dispatching SBC on the main and secondary site** – The dispatching SBC serves as the visible entry point to your site-redundant PortaSwitch® for both your user devices and your vendor gateways. It accepts all registration and call initiation requests and then dispatches them across sites for processing. This makes the interconnection with vendor and customer equipment transparent.

  In earlier releases, the dispatching SBC ran only on the main site. Now you can add the dispatching SBC on both the main and fully-redundant secondary site and assign the same virtual IP address to both of them. This increases high-availability for the dispatching SBC.

  In the normal mode of operations, only the main site's dispatching SBC is active and therefore it handles all requests. When there is

an outage at the main site, the virtual IP address switches to the secondary site. This site's dispatching SBC becomes active and accepts registration and call initiation requests from all end user devices. Thus, the communication flow with PortaSwitch® for user devices and vendor equipment remains unchanged. This simplifies service configuration and system management.

To ensure that the dispatching SBC is reachable in PortaSwitch®, configure the IP routing to the dispatching SBC's virtual IP address on both sites (e.g. using such technologies as BGP / EGP, LISP protocols, Tinc tunneling, policy-based routing, etc.).

• **Increased length for the Tax ID field** – In some countries (e.g. the Netherlands), the tax ID format includes delimiters such as dots and dashes, etc. and exceeds the 16-character length used by default in PortaBilling®.

With this release, the tax ID field can include a value of up to 32 characters. This enables an administrator to define the tax ID in the format used in the country it comes from.

• **Single-step volume discount plan upgrade** – Add-on products serve to provide additional services (such as volume discount plans) to customers. Add-on products include a priority level which PortaBilling® uses to determine the correct order for applying these additional services.

Some add-on product combinations can be conflicting, for instance, when the volume discount plan for two products of the same priority applies to the same destination group. With this release, you can seamlessly change the customer's volume discount plan assigned to them via add-on products of the same priority.

Consider the following example:
Let's say that in addition to a Mobile Services product you offer both 2 GB and 4 GB Internet quotas via your add-on products. A customer who already has a 2 GB quota decides to call customer service and upgrade the quota to 4GB.

So now, when you assign an add-on product that has the same priority, PortaBilling® suggests that you:
 o **Replace the already active add-on product with the new one.**
    PortaBilling® applies the volume discount plan that's defined in the new add-on product.
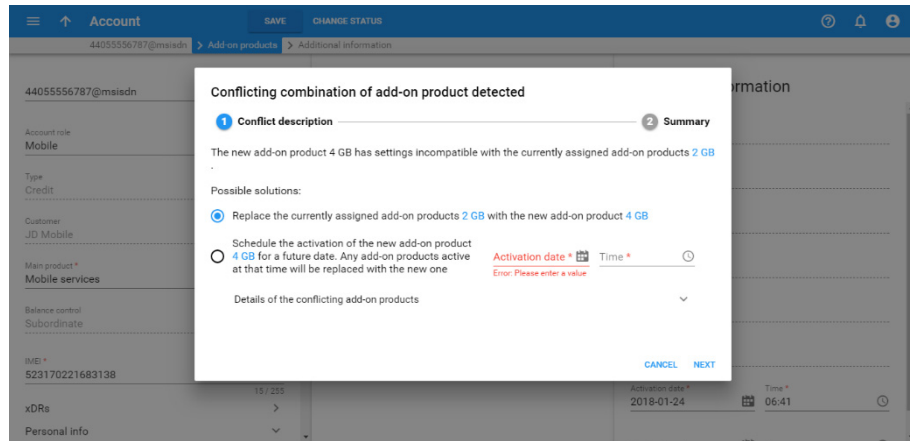
- o **Schedule when the new add-on product will be activated.**
  PortaBilling® will replace the active add-on product with the new one on the stated date.

Note that volume discount plan counters will be preserved during the product change.

You can see the reasons for the add-on product conflict. Just click the ∨ arrow to the right of **Details of the add-on product conflict.**
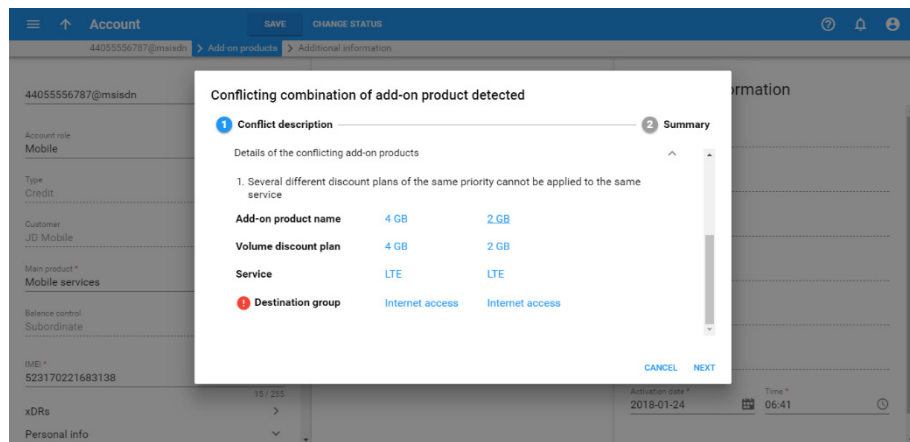
This enhancement allows you to change volume discount plans with only one mouse click.

- • **Define default authentication configuration for aliases** – When an IP Centrex customer assigns a DID number as an alias for their main phone line, the authentication option for this alias is enabled by default. It is assumed that this DID number will be used independently for making and receiving calls. Therefore, it must be registered on the IP phone as a separate phone line.

When a customer adds a set of aliases but only wants to use them to forward incoming calls to their main phone line, the alias authentication option must be disabled. Previously, the administrator had to disable that option manually for each alias.

As of this release, the administrator can define the alias authentication option at the customer level via the **Alias authentication / registration defaults** option. Thus, when a customer adds an alias, the alias inherits the configuration.

Consider the following example:

Your IP Centrex customer EasyCall Ltd. wants calls arriving to their aliases 127349026123, 60455577123, etc. to be forwarded to their main phone line 6045557755. To configure this, the administrator disables the alias authentication for EasyCall Ltd.


This ability to define the default alias authentication option simplifies customer management and reduces the administrator's workload.

- **Specify translation rules for call handling** – Call handling rules serve to authorize calls using the User-Name taken from a certain field in the INVITE request. This field can be a tech-prefix, P-Served-User, RPID, etc. The User-Name can arrive in a custom format, e.g. contain a + sign or a prefix, etc. An administrator can now define the translation rule to adjust this value to the format used within the system.

For example, let's say your vendor TATA sends you calls that you authorize by the P-Served-User header. The User-Name in the P-

Served-User header is the number with a + added before it. Since accounts in your system are defined without a +, you need to strip it from the number. To do this, create a translation rule as a Python regular expression as follows:

```
s/^+?(.*)$/\\1/;
```

Then when TATA sends you a call with the User-Name in the P-Served-User header as +12065552213, PortaSIP® authorizes the call using the P-Served-User header, strips the + from it and sends it as 12065552213 in the authorization request to PortaBilling®.
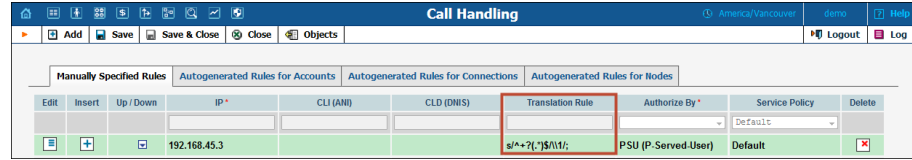
This enhancement allows you to adjust User-Names to ensure proper call processing.

Web Interface Changes

- **Stop support for the yahoo.com currency exchange rates source** – Since Yahoo.com discontinued its currency exchange service, it is no longer supported in PortaBilling®. Use **Manual entry** or **XE.com** instead.
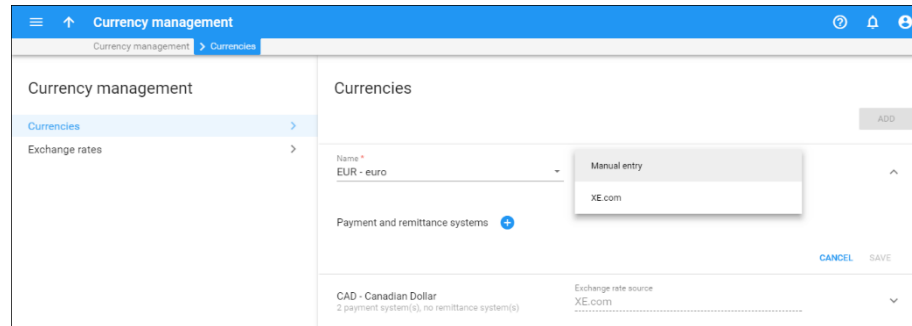
Before the software update, make sure you change the exchange rates source for the existing currencies to the ones that are currently supported.

- The list of **countries and their subdivisions has been updated** in accordance to the latest version of ISO 3166:
  - **Albania's list of counties has been decreased to 12. The previous subdivision list is preserved for backward compatibility.**

To assure proper functioning after a system update, check the addresses for Albanian customers and update them if necessary.

- o **The list of subdivisions for the Philippines has been extended with regions and provinces.**

These changes keep the system up-to-date.

- **Updated list of payment processors** – These payment processors were re-branded and have changed their names as follows:
  - o **Beanstream** was renamed **Bambora** (**www.bambora.com**);
  - o **LinkPoint** was renamed **First Data Global Gateway**^{sm} **Virtual Terminal** (**https://www.firstdata.com**);
  - o **Moneybookers** was renamed **Skrill** (**https://www.skrill.com**);
  - o **TripleDeal** was renamed **Docdata Payments** (**https://www.docdatapayments.com**);
  - o **Ogone** was renamed **Ingenico Payment Services** (**https://payment-services.ingenico.com**).

Important Upgrade Notes

- **Discontinue obsolete invoice templates support** – Beginning with maintenance release 58, taxation is no longer defined for an invoice template. Administrators define taxation for a customer via a customer class. Therefore, they can use one invoice template for customers with any taxation method.

  For backward compatibility, PortaBilling® supported obsolete invoice templates for customers created before maintenance release 58. This also gives administrators time to reconfigure taxation parameters for existing customers.

  With this release, PortaBilling® stops the support of obsolete invoice templates. To prevent update failure, before updating to this release make sure you are no longer using obsolete invoice templates for customers.

- **Prevent DID upload to vendor batches for on-demand DID provisioning** – Vendor DID batches enable an administrator to keep track of numbers purchased from a DID provider and then group them by certain parameters such as country, cost, etc.

DID numbers provisioned from external providers such as DIDWW or DIDX are added to their respective vendor batches automatically. The administrator must upload the DID numbers only to the batches defined for vendors who do not have on-demand DID provisioning configured. To prevent human error during the DID upload, PortaBilling® regulates this behavior starting with this release.

If there are DID numbers that were previously uploaded to vendor batches used for on-demand DID provisioning, PortaOne Support will gladly assist you with reassigning them to their proper batches.

- **Disallow manual reverse of tax xDRs** – The xDR revert operation enables administrators to correct a customer's balance by reversing charges applied to them by mistake.

  An administrator can manually reverse any xDR (for payments, usage charges, etc.) that was produced during a customer's current billing period. For charges that occurred during a previous billing period, PortaBilling® calculates the taxes and adds them to an invoice. Since taxes are calculated automatically, the administrator is not allowed to reverse tax xDRs manually. Instead, the administrator must first void the invoice so that PortaBilling® adjusts taxation amounts, and then revert the selected xDRs.

  Follow the same instructions when reverting xDRs that are included in an out-of-turn invoice.

  This 2-step procedure ensures that the customer balance is correct.