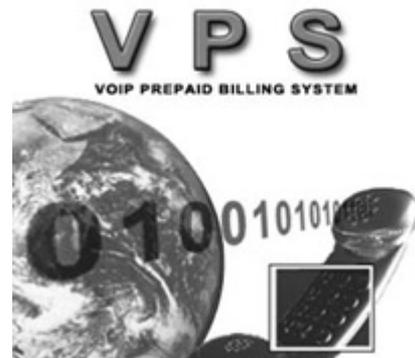


December 12, 2003



VoIP Prepaid System (VPS)

Installation and Reference manual for VPS version 1.1

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1.0 Introduction

1.1 Brief dirty Introduction of VoIP

VoIP means voice over IP and basically it means voice transmission through Internet.

So origination call side and termination call side must both have VoIP enabled gateways(equipment). Both side also can have gatekeepers. The gateway converts old telephone system signals into IP packet and communicates/transmits to peering terminating gateway. The terminating gateway does the same.

So basically gateway is the equipment which converts telephone signals into IP packets and transmits it through internet into another gateway. Also it does vice versa, it receives IP packets and converts it into telephone signals and transmits to POTS(plain old telephone system)/PSTN(public switched telephone network).

The gatekeeper is mostly used for control of gateways. The gatekeeper is not required usually and it also works as a proxy.

There are 2 protocols SIP and H323 in VoIP. Mostly Cisco H323 is used nowadays. The protocol should match for each side. So it means if you have Cisco vendor other side also better to have Cisco vendor equipments. Each vendor has own attributes added into protocols so it becomes a kind of vendor specific protocols and attributes. So better to use one vendor for both sides.

There are lots of links on the web where you can find about VoIP. There is 2 links you can take a look at it. Second one is too technical, you can just skip.

http://www.cisco.com/warp/public/788/voip/dialpeer_call_leg.html

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/vapp_dev/vsaig3.htm

There are 4 call legs in VoIP system (please see first link I provided).

So that's the brief overview as I understood from VoIP☺. Please see the picture.



There is also must be Radius server for authentication and accounting VoIP.

Radius server does the following:

When you make a call, the gateway (it is usually called NAS(network access server))receives your request and forwards your request to Radius server. Radius servers receives it and checks whether user or prepaid phone card number exists in system(usually DB). If it exists and everything is OK it returns

OK to NAS. NAS then accepts user call. If there is something wrong Radius sends Reject and NAS rejects the call.

After call finished NAS forwards accounting record to Radius, radius accepts it and stores the record into system(usually DB).

1.2 Introduction to software

VPS is a complete VoIP prepaid solution for small and medium companies. It has options such as prepaid card number generation, local provider and partner provider billing, tariff definition etc.

Main features are:

- Platform independent (recommended Unix)
- Browser based, easy to use and maintain
- User interface is customizable for future client needs
- Scalable
- High performance and reliability
- Flexible tariff definition
- Time frame, special date charge, discount support
- Multi-provider support
- User and group privilege support
- System and card journaling support
- Partner billing support
- Multi language support in IVR
- Card pin change and transfer balance support
- Unlimited cards, minutes

2.0 Prerequisite:

Open System Consultant's commercial radius server Radiator:
<http://www.open.com.au/radiator/>

Cisco AS 5300, AS5350 series routers, Quintum gateway

3.0 System requirements:

CPU: Pentium III or higher

RAM: 256MB or higher

Browser: Internet Explorer 5.0 or higher, Mozilla 1.2 or higher, Netscape 6.0 or higher. All browser types must have JavaScript enabled.

OS: Unix, Windows with PERL, apache/PHP/MySQL support

4.0 Tested environment:

FreeBSD 5.1

Windows 2000 advanced server

Cisco AS5300, AS5350, Quintum D3000

Apache 1.3.27 or higher

PHP 4.3.3
MySQL 4.x
Perl 5.6.1 or later

5.0 Installation

First prepare system with either Windows 2000 advanced server or decent Unix OS, such as Linux and FreeBSD. Install all necessary patches and hot fixes.

Next, for Windows system install ActiveState Perl v5.6.1 from <http://www.activestate.com>

Next, install latest version of Apache 1.3.2x from <http://www.apache.org> and php-4.3.x from <http://www.php.net> .

Next, install mysql-4.x version from <http://www.mysql.com>

Next step is installation of latest version of Radiator radius server with latest patches. Your radius and DB server can be installed on separate server.

Next, extract the vps distribution in some directory.

```
# mkdir vps  
# tar xvzf vps.tar.gz
```

If you are installing in Windows use Winzip to extract distribution.

Edit voip.cfg file and make appropriate changes in DB access part.

```
DBSource      dbi:mysql:voip_prepaid:localhost  
DBUsername    your_db_username  
DBAuth        your_db_password
```

Copy voip.cfg file into Radiator directory.

Change username and password for database in config.php.

Create mysql database and tables using

```
# mysql -p < vps_db.txt
```

Copy VPS directory to apache document root directory and now you are ready to use the system. You may need to secure Apache directory. It is not required but recommended for security reason.

In httpd.conf

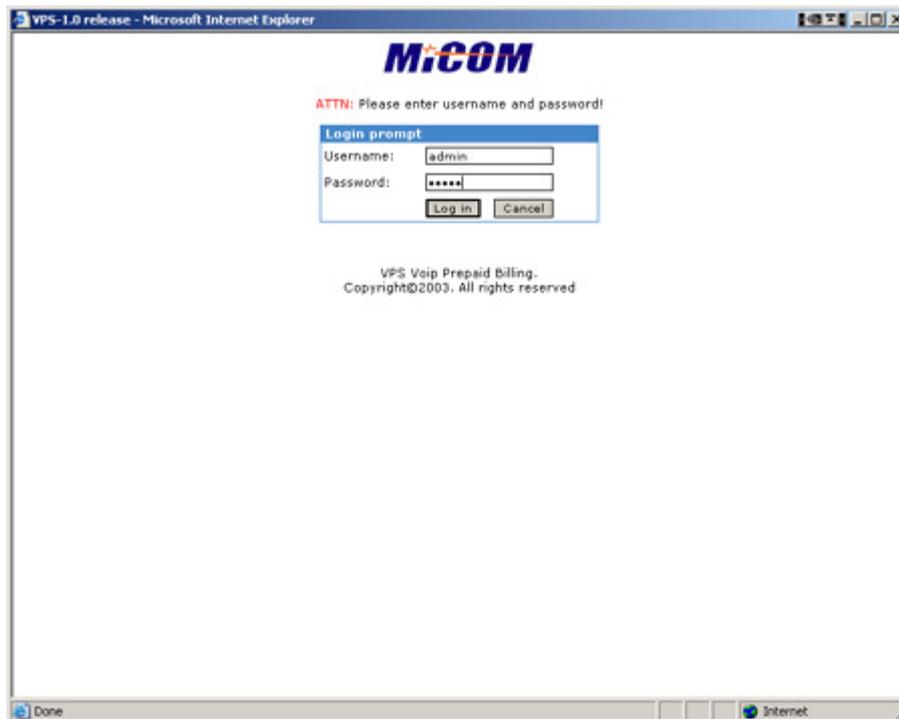
```
...  
DocumentRoot /usr/local/www/data/voip  
<Directory /usr/local/www/data/voip>  
    AllowOverride All  
    AuthName "Asiatel Staff Only!"  
    AuthType Basic  
    AuthUserFile /root/devstaff  
    require valid-user
```

</Directory>

You can put your logo in the VPS system. Just copy your logo with name logo.gif to /images directory. Logo size must be 137x42 pixels.

6.0 Post Installation and Configuration

Login as admin with password admin. There is already defined Admin user with full privileges. After successful login you will see your username and client IP address on top right of the every page.

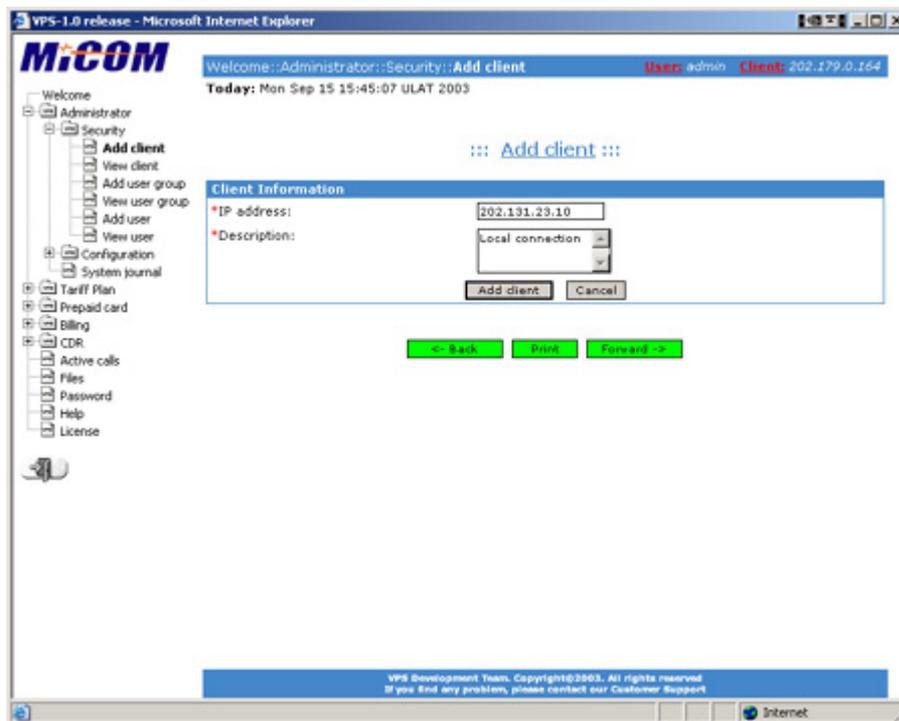


Note: If you don't see above pop-up window, please check your browser version and also check if JavaScript is enabled.

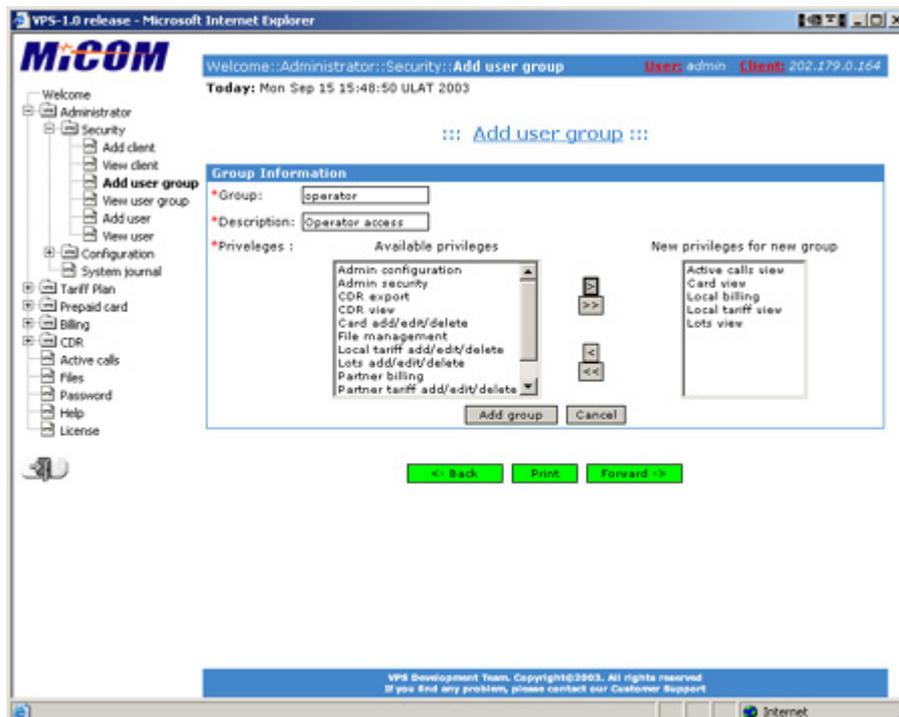
7.0 Administrator section

7.1 Security subsection

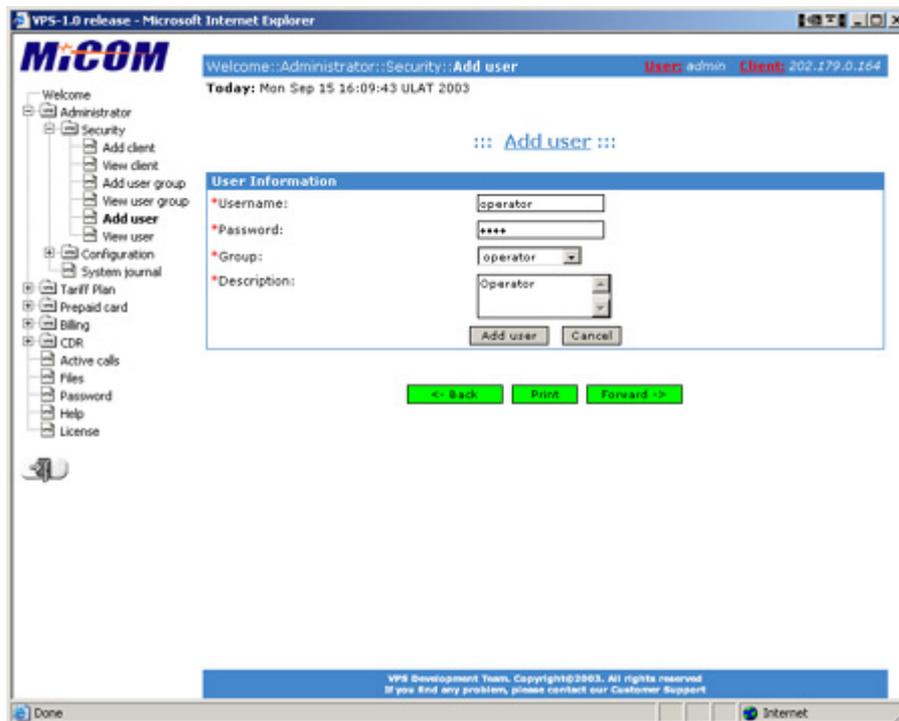
Go to Administrator-Security menu. Go to Add Client and add client IP address from where you are going to connect to the application. See following picture.



Now you can add users and groups with predefined permissions. You can define users group with set of privileges. You need to choose privileges from "Available privileges" and add them using >> or > button. See following picture.

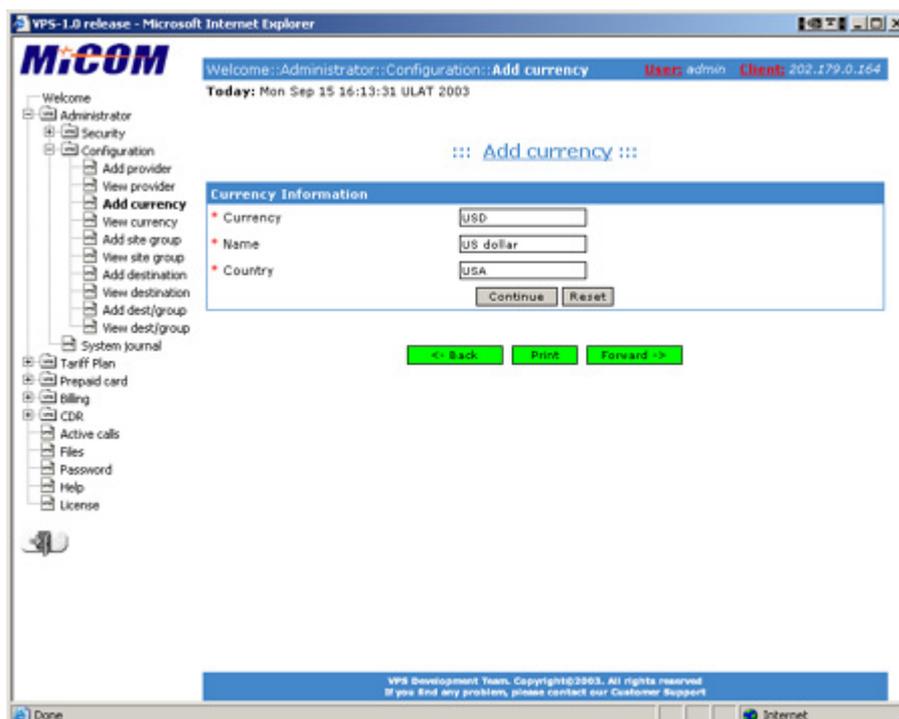


After defining additional groups you can define additional users. You may even don't need to define additional groups. It depends from your requirement. See below a sample.

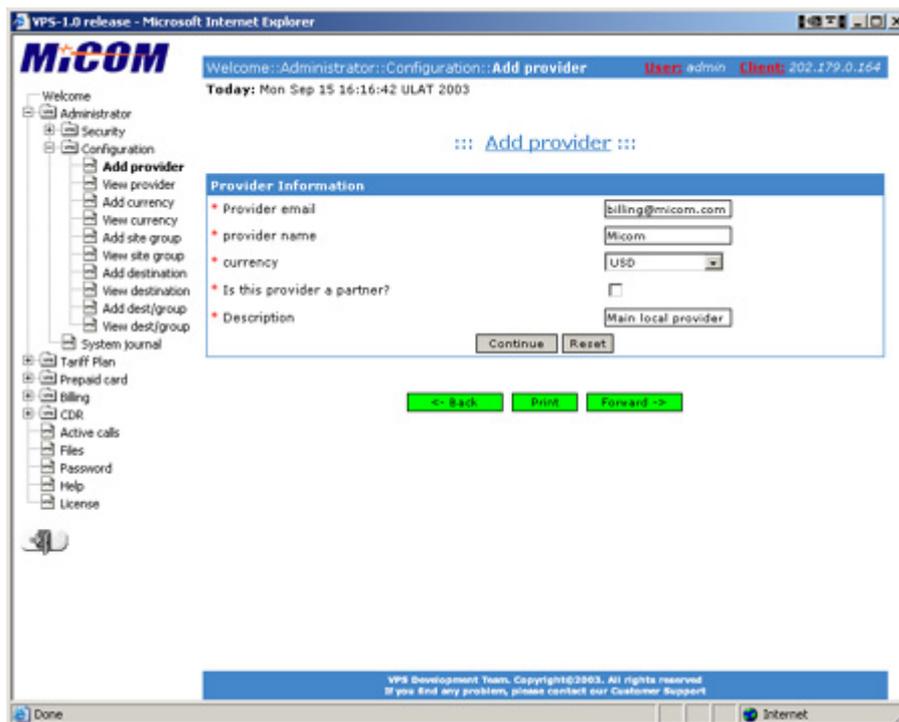


7.2 Configuration subsection

In this section you will find how to make some configuration changes. Go to Configuration. First define currencies. There might be different currencies for different providers. See following picture.

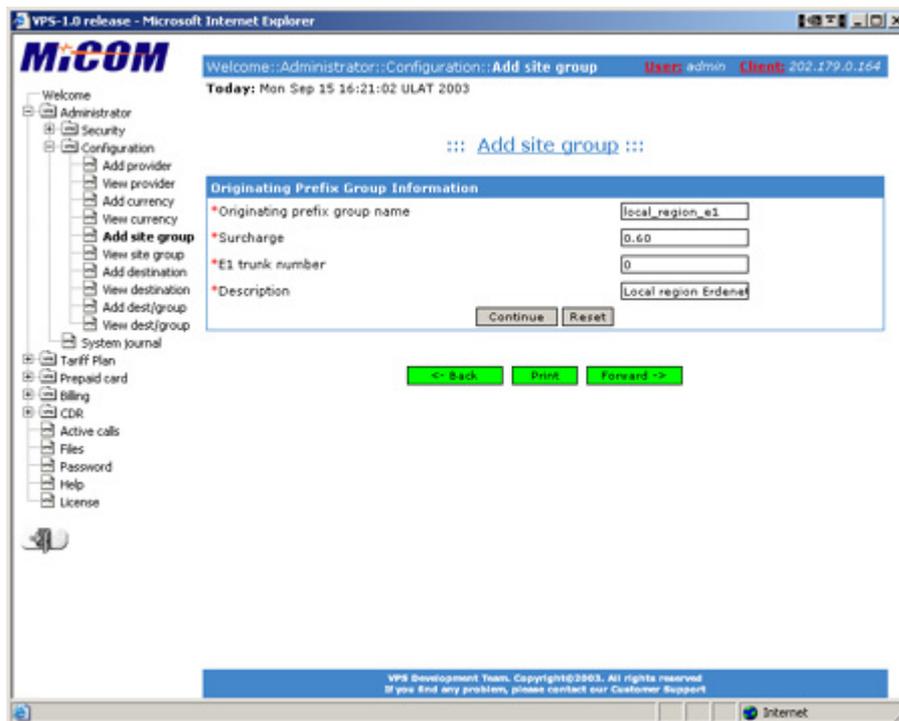


Next add providers.

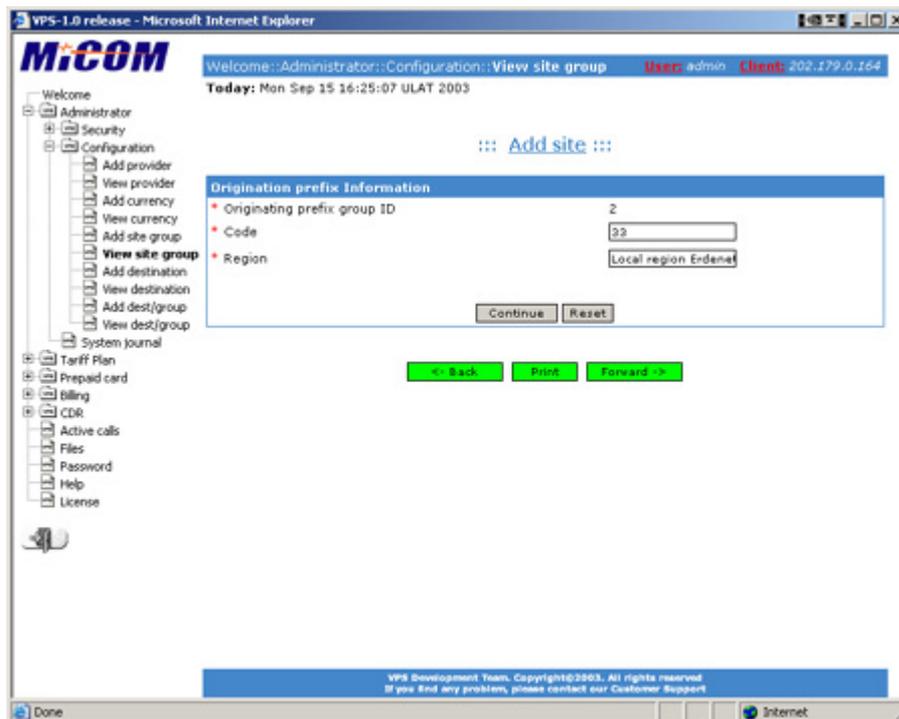


Providers can be 2 types, one is non-partner (Local provider) and other one is partner. Define partners and non-partner providers. Partner provider is the provider or VoIP carrier who is providing long distance service to non-partner provider. Non-partner provider is just a local provider. You can define multiple local and partner providers here.

Next you should add local site group. Local regions can be grouped together as one group. Site groups are useful to define local prefixes/sites. You may need to have different local prefixes/sites with different surcharges. It is useful when you want different surcharge rates for calls originating from local region. You should define E1/T1 trunk number here. Depending from your requirement you may need to group some calls using E1/T1 trunk number. You should also need to define surcharge per minute. Surcharge will be subtracted from each call, which is originated from defined site group. Please note that, site groups are required for tariff definitions. Please see following picture.



After adding site group you need to define sites under site group. To define sites go to View site group and under appropriate site group click + sign to add new sites.



Code field is necessary for distinguish calls and apply any surcharges if there is such available.

Next you should add tech prefix. This is main prefix which will be used in tariff. Tech Prefix is the 2-10 digit numbers, which will be added as a prefix to each originating/terminating calls.

Go to add tech prefix and choosing provider, tech prefix type, tech prefix and description.

The screenshot shows the 'Add tech prefix' configuration page in the VPS-1.0 release web interface. The page title is 'Add tech prefix' and the user is 'admin'. The date is 'Fri Dec 12 17:10:21 ULAT 2003'. The page contains a 'Tech Prefix Information' form with the following fields:

- *Provider: Niventel Systems (dropdown)
- *Tech Prefix type: Origination (dropdown)
- *Tech Prefix: 001 (text input)
- *Description: tech prefix (text input)

Buttons for 'Continue' and 'Reset' are located below the form. The left sidebar shows a navigation menu with 'Add tech prefix' highlighted. The bottom of the page features a 'Quick Toolbar' with buttons for Home, Back, Refresh, Forward, Print, and LogOut.

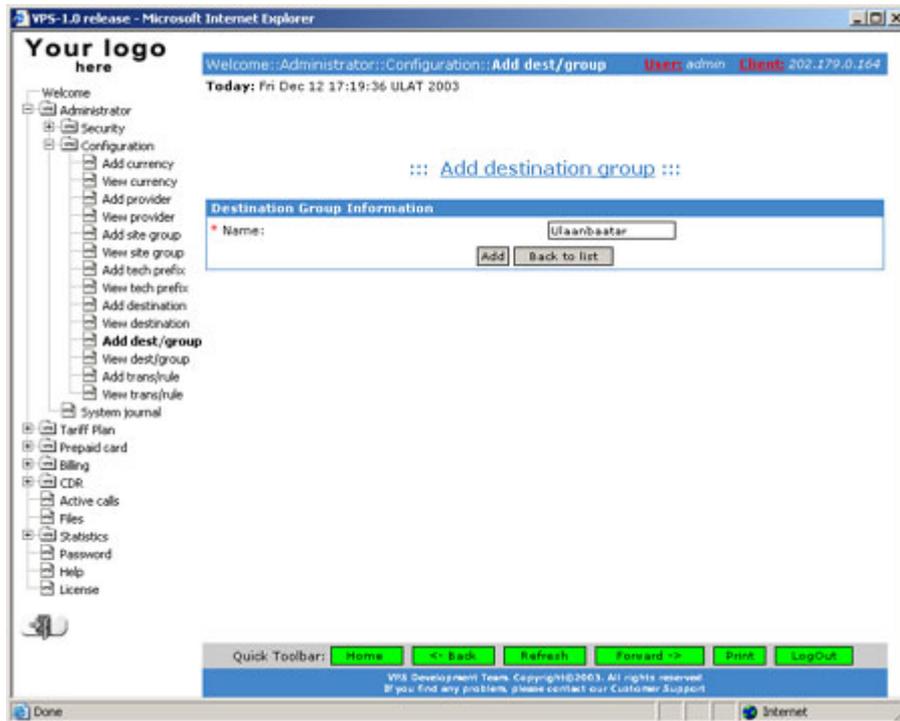
Next you should define destinations or in other word prefixes. Go to add destination and select prefix type and enter country code and country and continue. The code field will be used to determine which tariff to apply for the call.

The screenshot shows the 'Add destination' configuration page in the VPS-1.0 release web interface. The page title is 'Add destination' and the user is 'admin'. The date is 'Fri Dec 12 17:17:46 ULAT 2003'. The page contains a 'Destination Information' form with the following fields:

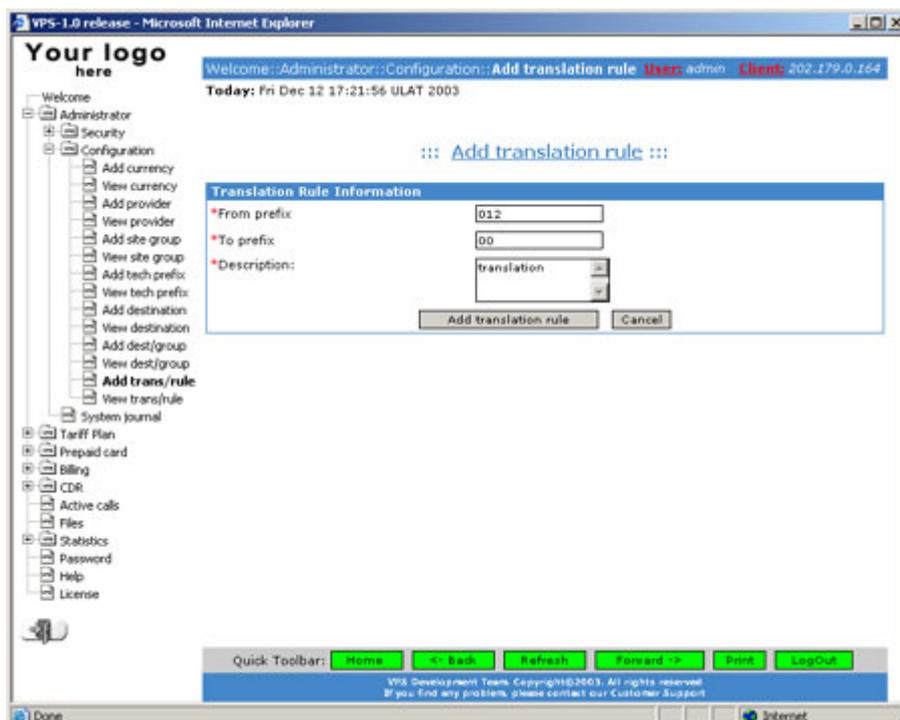
- *Destination Type: Origination (dropdown)
- *Code: 1 (text input)
- *Country: USA (text input)

Buttons for 'Continue' and 'Reset' are located below the form. The left sidebar shows a navigation menu with 'Add destination' highlighted. The bottom of the page features a 'Quick Toolbar' with buttons for Home, Back, Refresh, Forward, Print, and LogOut.

If you want to group terminating calls you have to have termination destination group. Add the name and continue. It will be helpful when you want to see termination calls billing grouped by.



If your gateway translates your tech prefix into some number when it dials, you need to have translation rule based on that. Go to add translation rule. Enter to "from prefix" field gateway translated prefix, and to "to prefix" field prefix that you defined in tech prefix.



Under Administrator menu there is System journal menu. You can view system journal where you can find who is logged when, and what user did. So system journal is detailed action logging for system.

8.0 Tariff Plan section

After defining all above there is time to define various tariffs. Go to Tariff Plan. There are 2 types of tariff. One (local provider tariff) is for non-partner local provider and another tariff (Partner tariff) is for partner provider. Partner provider tariff is for interbilling and termination purposes in other words it is settlement tariff between partner provider and local provider. In tariff definition you define charges based on destination and tech prefix.

8.1 Local provider tariff subsection

To define local provider tariff go to Local provider and choose Add tariff.

The screenshot shows a web browser window titled 'VPS-1.0 release - Microsoft Internet Explorer'. The page header includes 'Your logo here' and a welcome message: 'Welcome: Tariff Plan: Local Provider: Add tariff'. The user is identified as 'admin' with IP '202.179.0.164'. The date is 'Today: Fri Dec 12 17:24:01 ULAT 2003'. The main content area is titled 'Add tariff' and contains a form with the following fields:

- Tariff name: Call to USA
- Local provider: Mayonspuld
- Site group: UB
- Tech prefix: 00
- Destination: USA/Canada
- Charge: (currency/min): 60
- Resolution: (seconds): 6
- Minimum call duration: (seconds): 30
- Start date: 2003-12-12
- End date: 2003-12-12
- Would you like make existing tariff [Inactive]? Yes No

Buttons for 'Add tariff' and 'Cancel' are at the bottom of the form. A Quick Toolbar at the bottom of the page includes Home, Back, Refresh, Forward, Print, and LogOut.

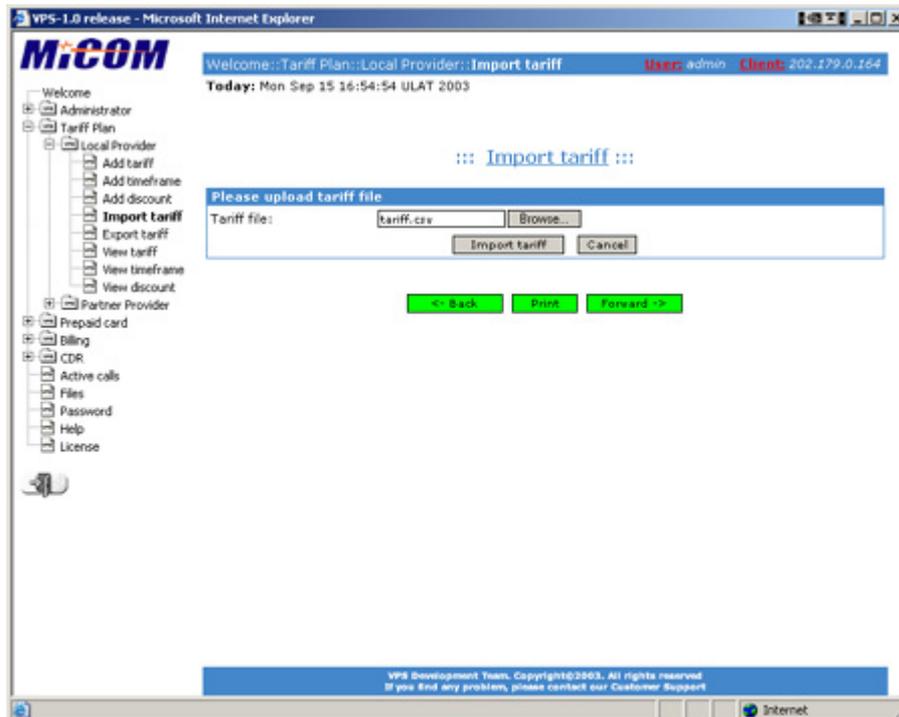
Add meaningful name to it. Choose provider, local site group and tech prefix, destination, charge, resolution, and minimum call duration. Resolution is minimum call unit to even the call duration. For example if resolution is 10 and call duration is 45 billable duration could be 50.

Minimum call duration is billable minimum duration. If call duration is less than minimum call duration billable duration will be equal to minimum call duration. During tariff definitions there might be previous active tariff in database so you have to choose whether to make current tariff active or not.

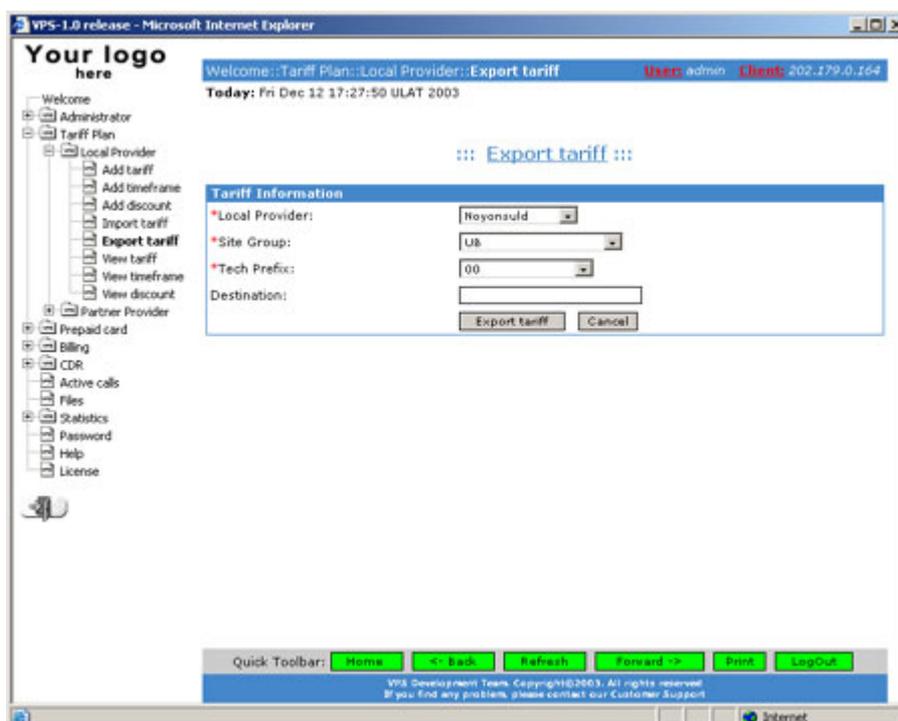
If you make new tariff active, old tariff will be deactivated.

Continue defining tariffs for each provider and for each local site groups and tech prefixes and destinations.

You can also import predefined tariffs from csv file. If there are unknown destinations in imported tariff, the program automatically adds those destinations into destinations list. Please see following picture.



You can also export tariffs and edit it in Microsoft Excel and import them back when it is ready to import. You have to choose local provider, site group, tech prefix and destination. You can leave destination field empty. In that way it will export all destinations tariff.

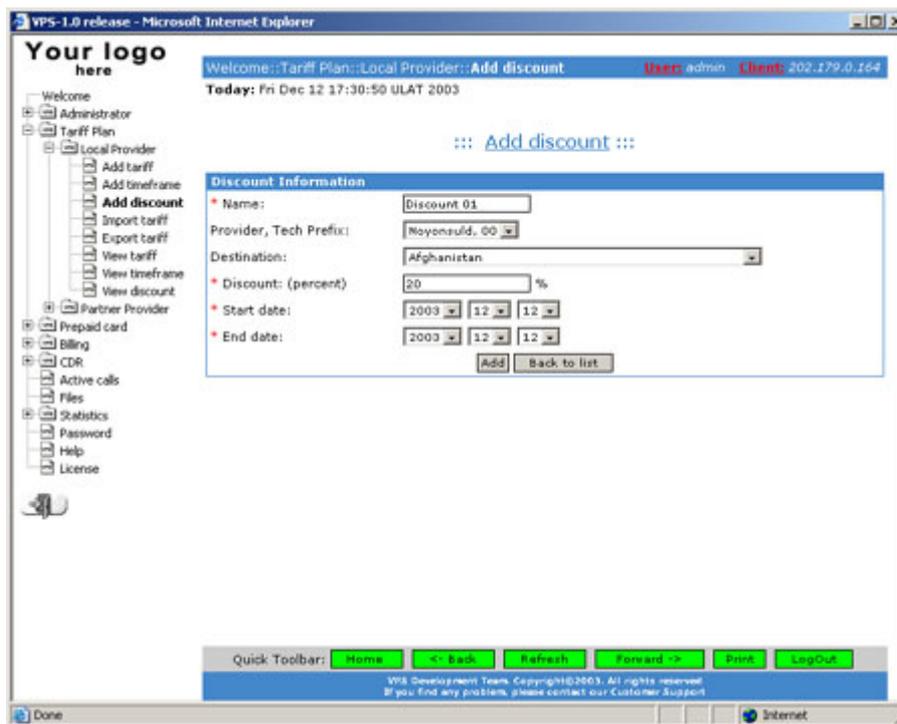


You can also define Time frames for each tariff. Time frame is special time frame where you can define charge, which overwrites tariff charge at specified time frame. All call durations within specified time frame calculated using that time frame charge. Please see following picture.

The screenshot shows a web browser window titled 'VPS-1.0 release - Microsoft Internet Explorer'. The page header includes 'Welcome::Tariff Plan::Local Provider::Add timeframe', user 'admin', client '202.179.0.164', and the date 'Today: Mon Sep 15 17:05:20 ULAT 2003'. The main content area is titled 'Add timeframe' and contains two sections: 'Hours Information' and 'Description'. The 'Hours Information' section has the following fields: '*Tariff' (dropdown menu with 'UB2USA1/Active' selected), '*Day' (dropdown menu with 'Monday' selected), '*From hour' (text input with '00:00'), '*To hour' (text input with '23:59'), '*Charge' (text input with '30' and '(currency/min)' label), and a 'Block calls' checkbox. The 'Description' section has a '*Description' text input with 'USA call in Monday'. Below the form are 'Continue' and 'Reset' buttons. At the bottom of the form area are three green buttons: '<- Back', 'Print', and 'Forward ->'. The footer of the page contains the text: 'VPS Development Team. Copyright©2003. All rights reserved. If you find any problem, please contact our Customer Support'. The browser status bar shows 'Done' and 'Internet'.

Each tariff can have as many as, except all time frame coverage lies within 24 hours a day. Time frames in one day cannot lie within each other. From hour and to hour field format is in XX:XX. Time frame has block call option which blocks all calls at specified time frame.

In tariff definition you can also define discounts. Please see following picture.



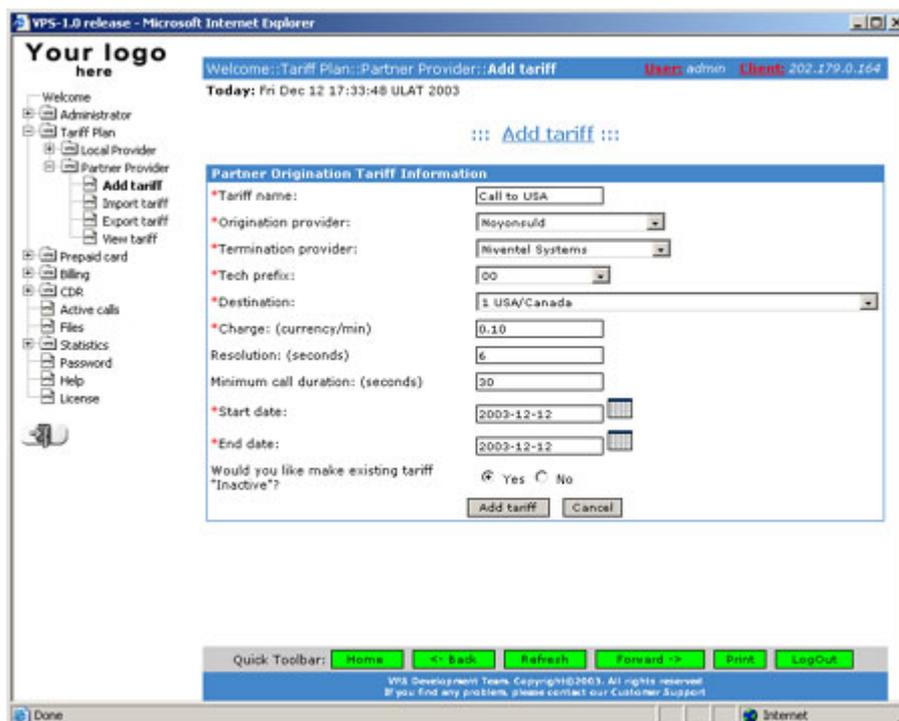
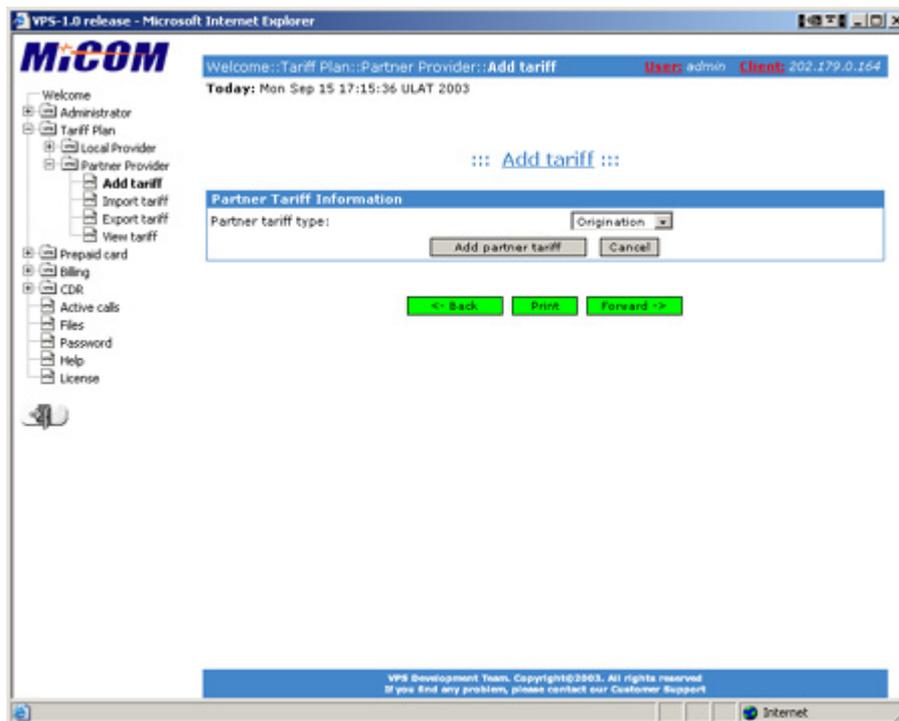
Discount can be for each provider/tech prefix, for each destination and it can cover some special days. Discount is applied last after calculating used credit amount for each call.

8.2 Partner provider tariff subsection

Partner provider tariff is for defining interbilling tariff and termination tariff with partner.

The main difference from local provider tariff is the origination and termination tariff types.

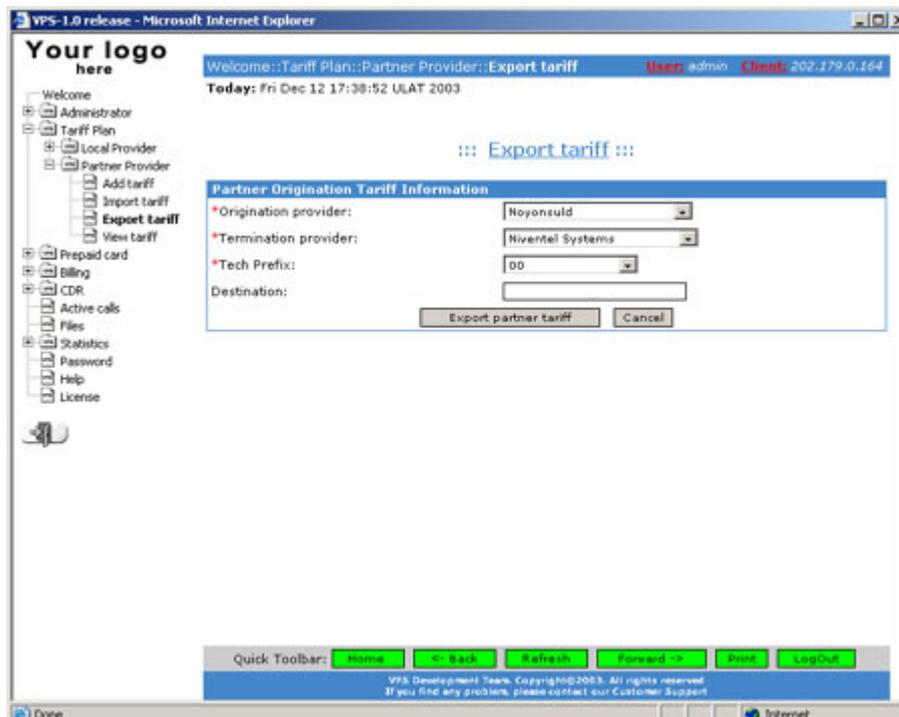
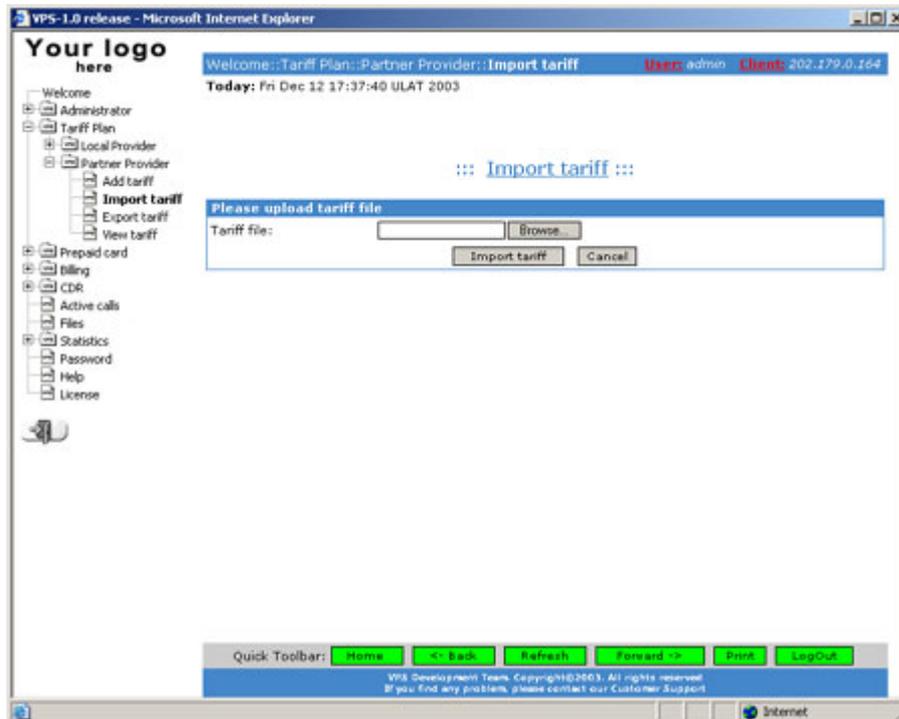
Origination tariff is for originating calls from local provider to partner provider and termination tariff is for call originated from partner provider and terminated at the local provider. Please see following picture.



If you choose origination tariff you should choose origination local provider, termination provider and tech prefix, destination. Charge, resolution, minimum call duration start date and end dates are the same as local provider tariff. You should define origination partner tariffs for each destination, tech prefix and originating and terminating providers. You can also define termination tariffs by choosing termination from Add tariff option.

In this case originating partner would be outside partner/provider and terminating partner is the local provider. The rest of the fields have same meaning as in the local provider tariff.

You can also export partner provider tariffs and make appropriate changes and import them back later. You have to choose originating, terminating providers, tech prefix and destination. You can leave destination field empty. In that way it will export all destinations tariff. See following pictures.



9.0 Prepaid card section

After making changes to local provider tariff and partner tariff you can now define lots and generate card numbers using corresponding menus under Prepaid card. Please see following picture.

The screenshot shows the 'Add lot' form in the VPS-1.0 release web interface. The browser title is 'VPS-1.0 release - Microsoft Internet Explorer'. The page header includes the MICOM logo and navigation links: Welcome, Administrator, Tariff Plan, Prepaid card, Add lot, View lot, Lots report, Card generation, Add card, View card, Card journal, Billing, CDR, Active calls, Files, Password, Help, License. The main content area is titled 'Add lots' and contains a 'Lots Information' form with the following fields:

- *Name: bonus2000
- *Provider: MICOM
- *Amount: 5000
- *Status: Active
- *Expire date: 2003, 12, 31

Buttons: Add, Back to list, <- Back, Print, Forward ->

Footer: VPS Development Team, Copyright©2003. All rights reserved. If you find any problem, please contact our Customer Support.

Give meaningful name and choose local provider. Amount is credit amount for one prepaid card. You can define here Expiration date and status of the lot. After adding a lot you can generate prepaid cards using Card generation menu. Please see following picture.

The screenshot shows the 'Card generation' form in the VPS-1.0 release web interface. The browser title is 'VPS-1.0 release - Microsoft Internet Explorer'. The page header includes the MICOM logo and navigation links: Welcome, Administrator, Tariff Plan, Prepaid card, Add lot, View lot, Lots report, Card generation, Add card, View card, Card journal, Billing, CDR, Active calls, Files, Password, Help, License. The main content area is titled 'Card generation' and contains a 'Card Information' form with the following fields:

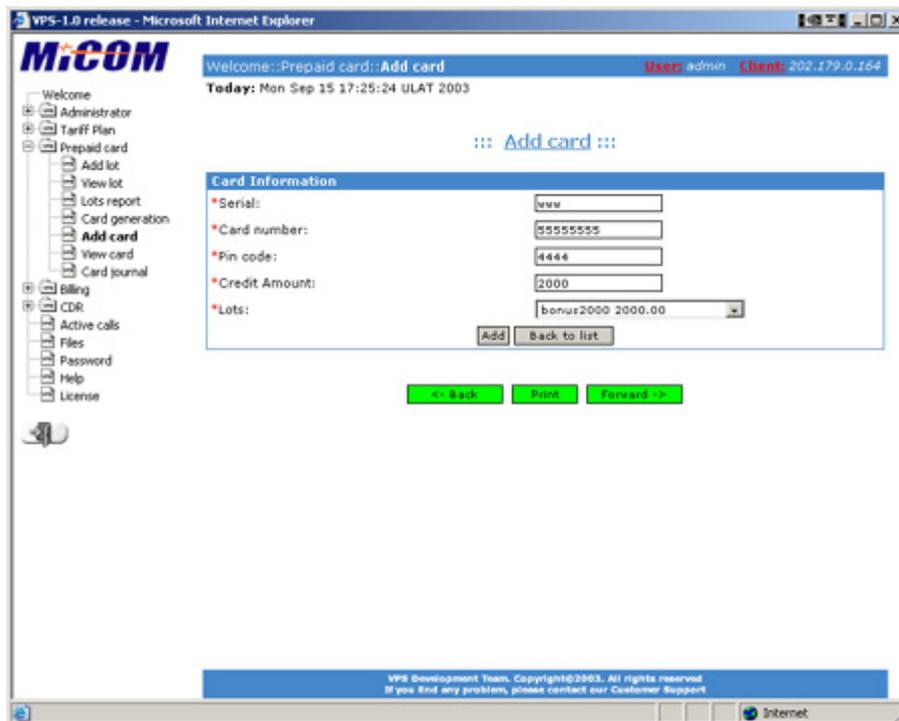
- *Number of Cards: 5000
- *Lots: bonus2000 2000.00
- *Account length: 8
- *Pin length: 4
- *Prefix: yvw
- *Interval: 5

Buttons: Generate, Back to list, <- Back, Print, Forward ->

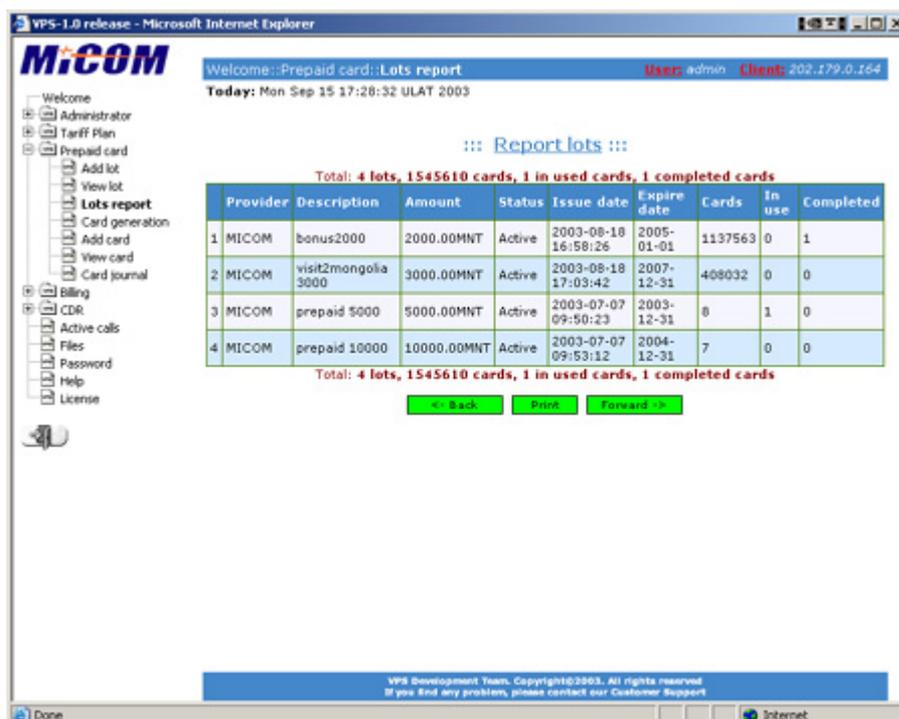
Footer: VPS Development Team, Copyright©2003. All rights reserved. If you find any problem, please contact our Customer Support.

You should define number of cards, account number length, pin length prefix or serial and account difference interval. You should choose lot here.

You can also manually add prepaid accounts using Add card menu. See picture.



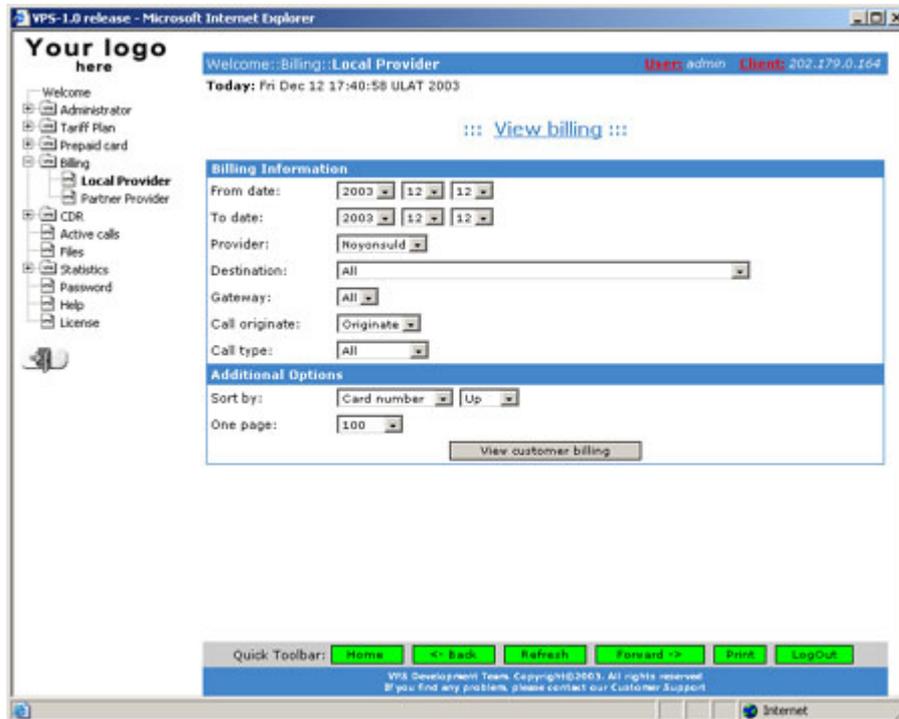
In this section you can view card journals such as card's pin change, and transfer balance logs. It is very useful to monitor customers activities. You can also see the lot report which includes some statistics such as how many lots in the system and how many cards are used in lot etc. Please see the following picture.



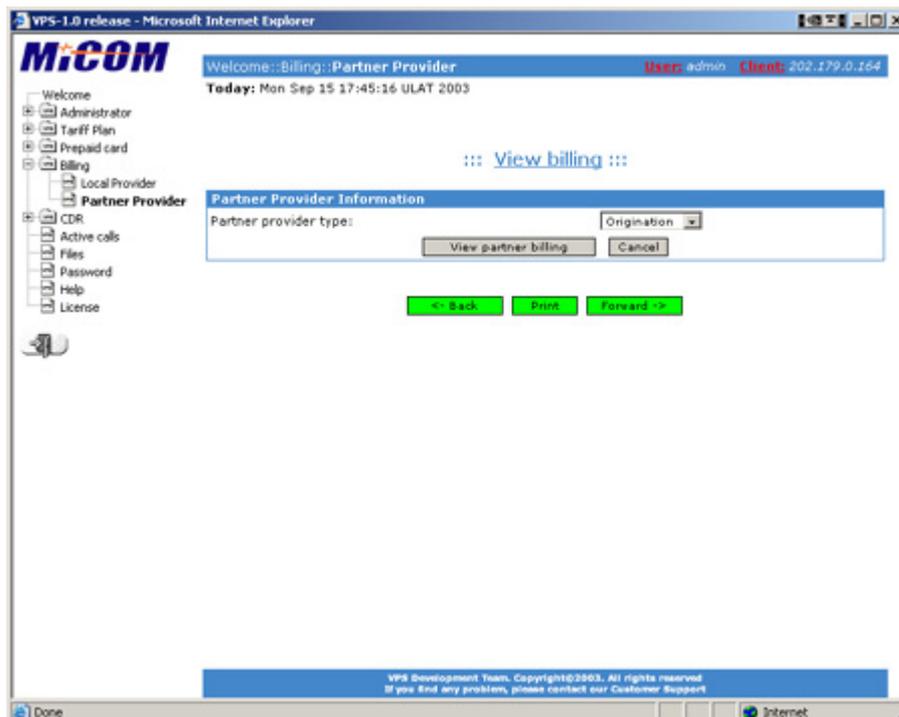
Also you can see lots by using View Lot menu.

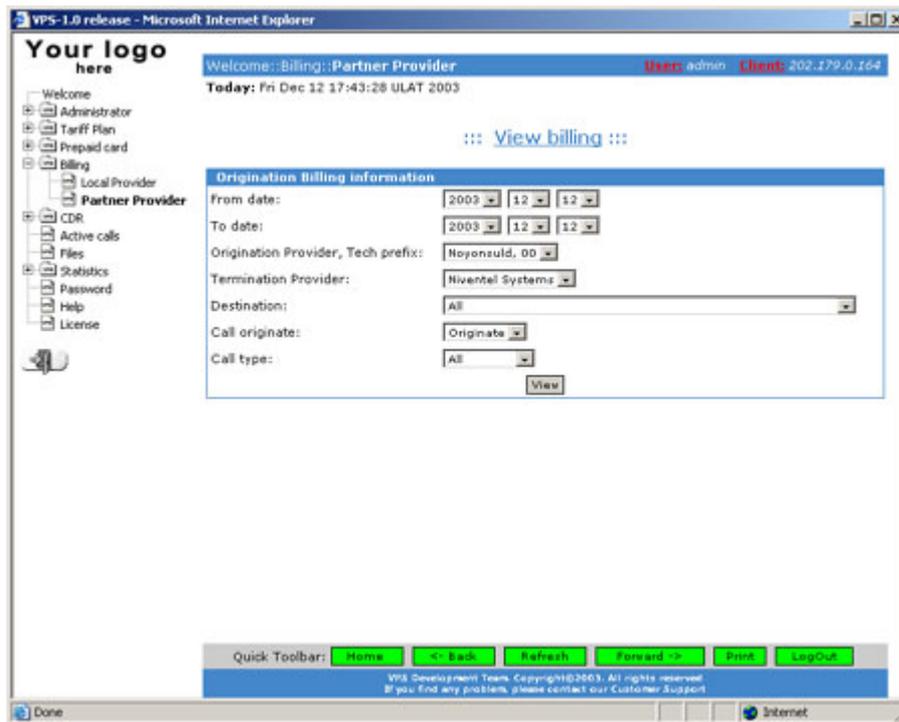
10.0 Billing section

Under billing section you can view local provider and partner provider billing defining various search criteria. Please see following pictures.



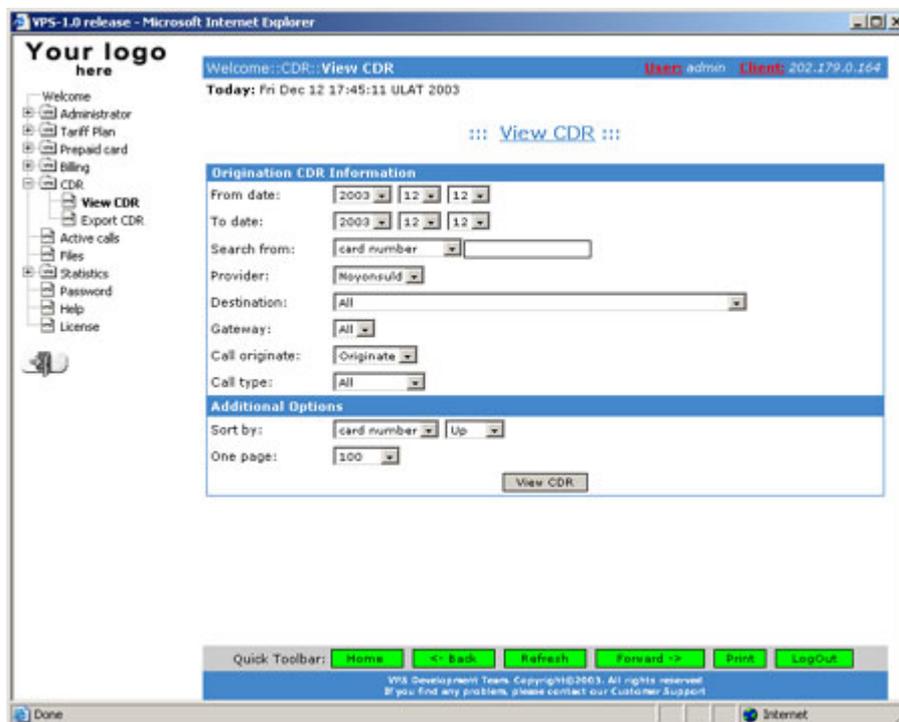
To view partner origination/termination billing you have to choose partner provider billing type. Please see following pictures.



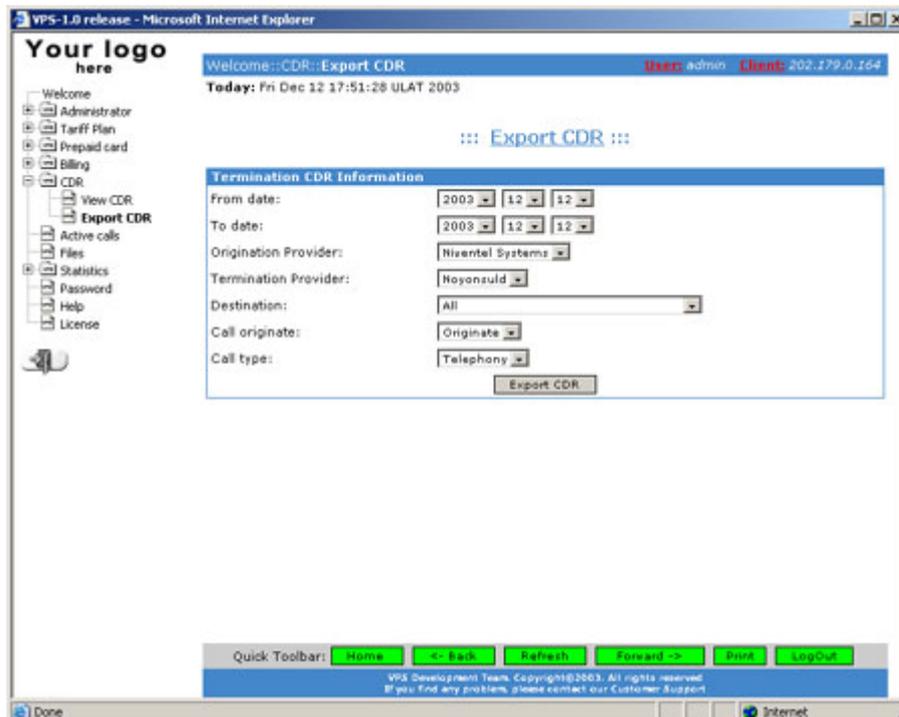
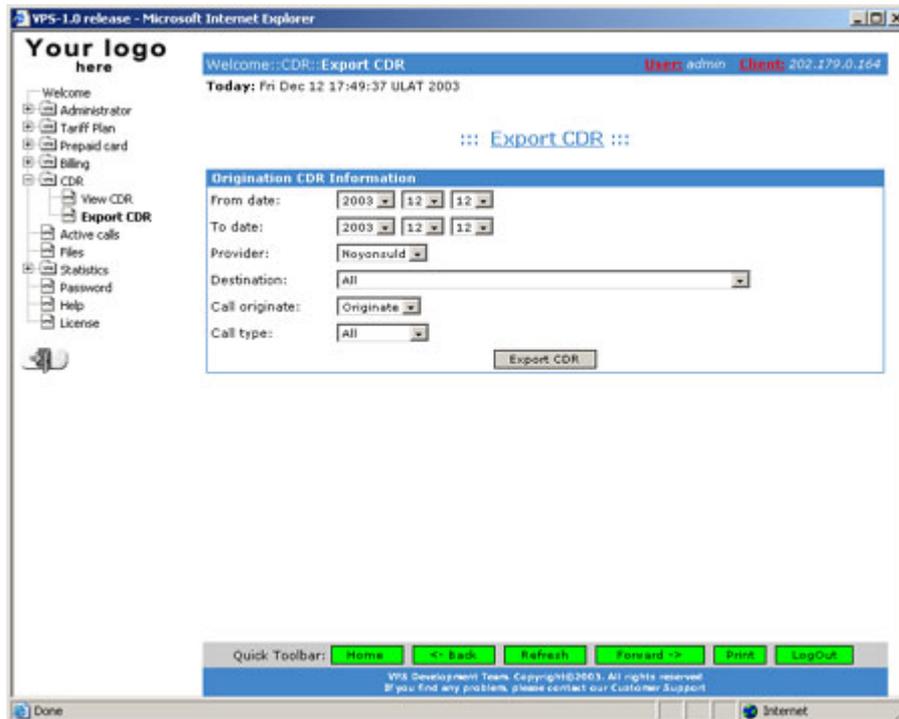


11.0 CDR section

Under CDR section you can view CDR(Call detail records, actual accounting records). CDR has 2 types. One for originating calls and one for terminating calls. You have to choose call types in order to view CDRs. See following picture.



You can also export CDR to comma separated text file using Export CDR menu. You have to choose call types in order to export CDRs. Please see following pictures.

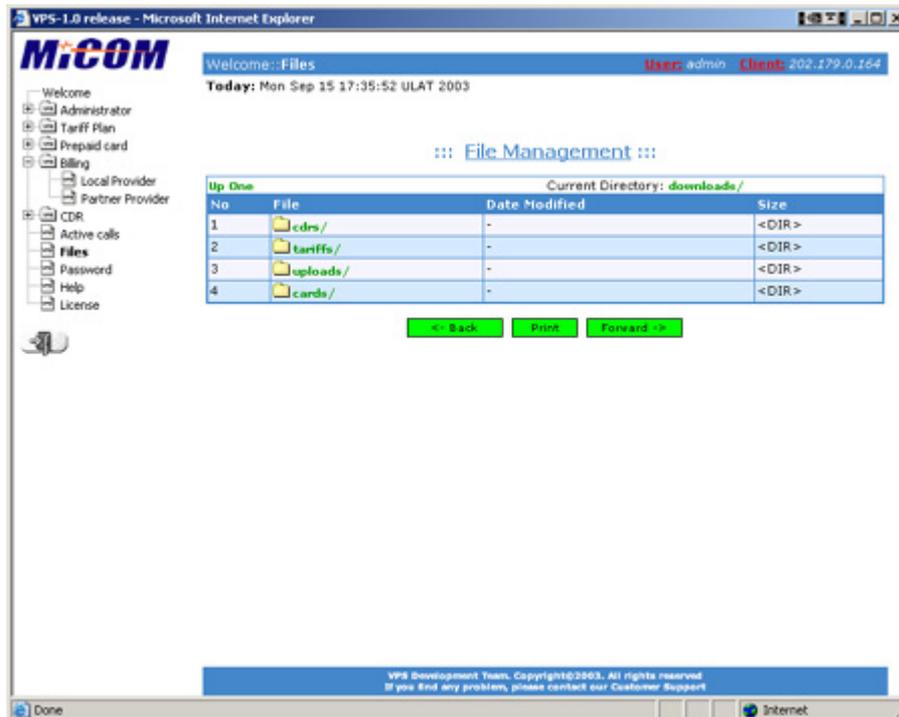


12.0 Active calls

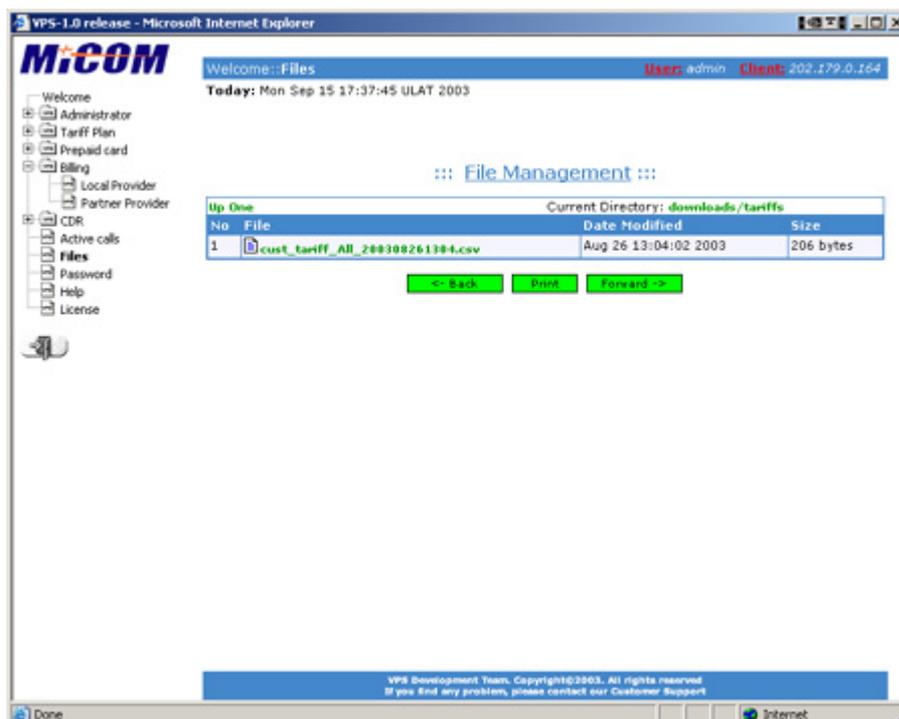
Under this section you can view online users at current moment by going Active calls menu.

13.0 Files section

Under Files section you can see different directories and files.



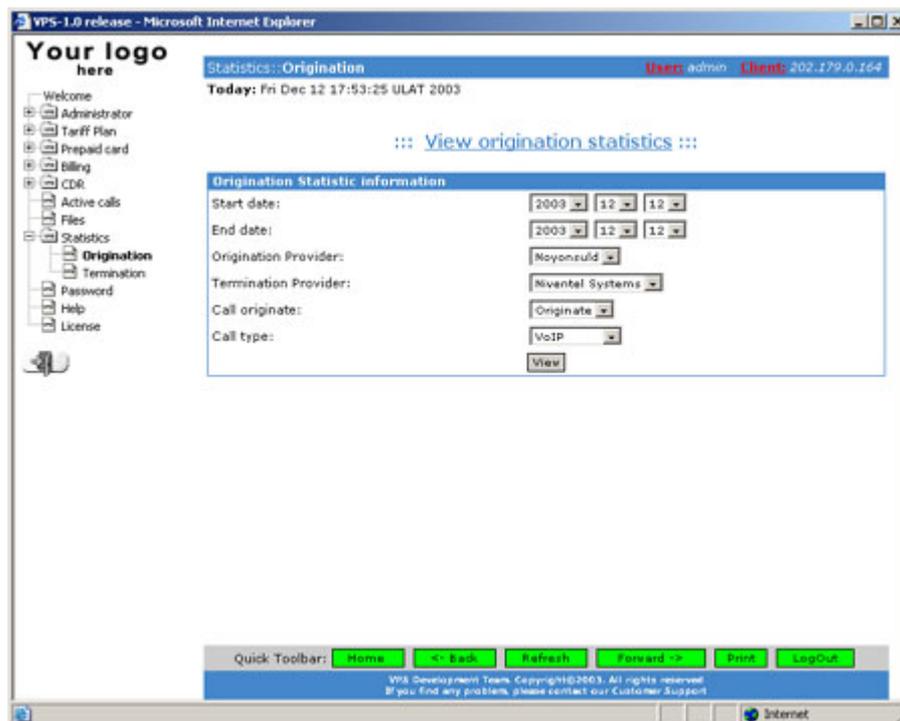
When you generate the cards the system stores those card informations as files and those files are stored under /cards directory. When you export CDRs and tariffs to files, those files are also stored under corresponding /cdrs and /tariffs directory.

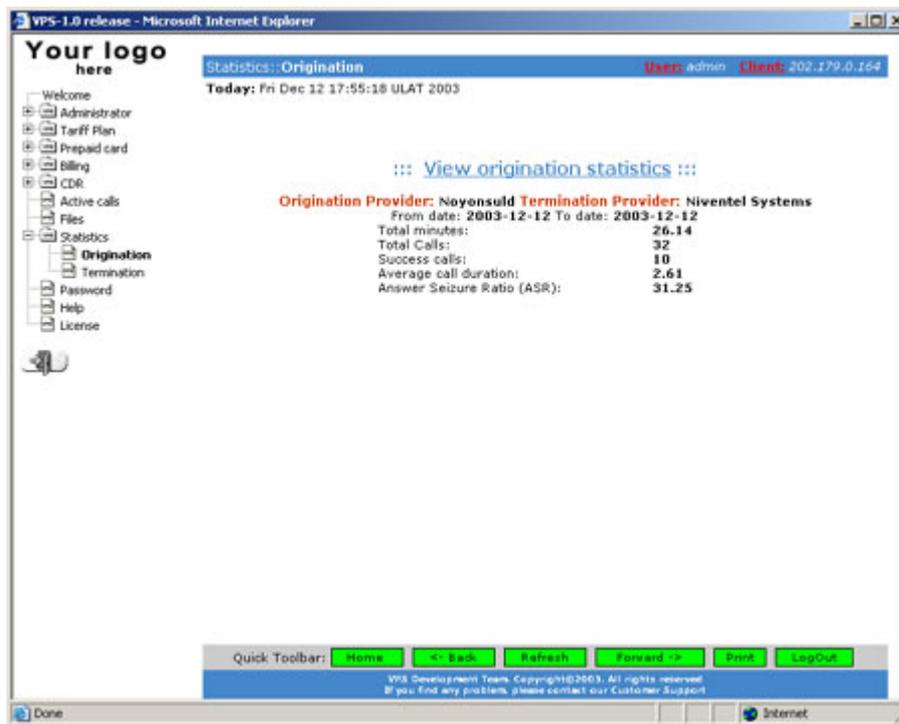


When you import partner tariffs partner tariff files are saved in part_tariff_originatingprovider_terminatingprovider_partnerdestinationgroup_date.csv format. Local provider tariff files are saved in cust_tariff_partnerdestinationgroup_date.csv format. /uploads directory contains all imported tariff files. Format is the same as previous. You can download all these files just clicking the file name links.

14.0 Statistics

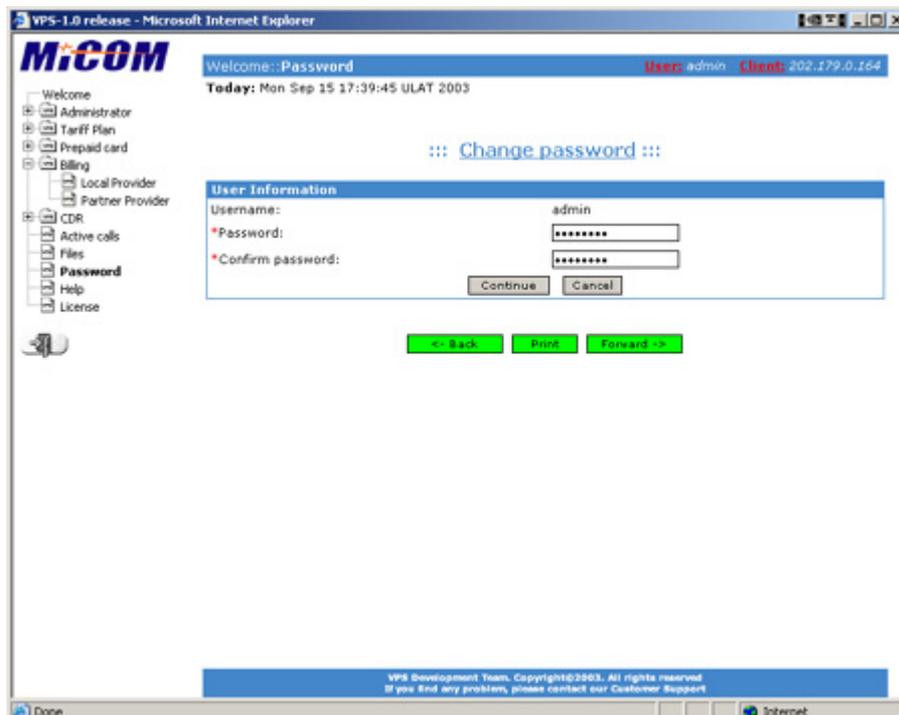
Under this section you can see Answer Seizure Ratios for the originating and terminating calls. Please see following pictures.





15.0 Password

Users can change their password using Password menu.



After using the system click Logout to exit the system.

16.0 Getting help

Some Tips

- Always give some meaningful names
- Give understandable meaningful descriptions

If have any trouble installing and configuring the software or if you have any other technical questions please mail to:

ganbold@micom.mng.net

ganbaa@micom.mng.net

tegshee@micom.mng.net

17.0 Resources

<http://www.open.com.au/radiator> - Radiator radius server

http://www.cisco.com/warp/public/788/voip/dialpeer_call_leg.html - Cisco call leg informations

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/vapp_dev/vsaig3.htm
- Radius VSA voice implementation guide