

**OTRS Asterisk PBX Integration Module PIM v2.0.0b**  
**Administrator's Guide**

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## **Introduction**

Add-ons PIMv2.0.0b (PBX Integration Module) is intended for helpdesk and call centers that use the OTRS system.

With the new Add-ons module, you can immediately notify customers of the ticket number without filling fields on form.

Functions of the module:

- Informing agents about the call and the customer by CallerID
- Create a ticket with one click in the agent notification window

Features

Database type: MySQL

The PIM module uses the client-server architecture

The service is running on the OTRS server, it uses TCP port 11010 for client applications connections.

## Preparing Asterisk PBX for integration with OTRS

The AMI (Asterisk Manager Interface) interface is used to interact with Asterisk.

Connect to Asterisk server with full rights (sudo).

On the Asterisk server, create a user to connect to the AMI interface:

### for general Asterisk versions:

Open the manager.conf file for editing

```
nano /etc/asterisk/manager.conf
```

Add the lines by replacing the value of "IP\_address\_OTRS" with the IP address of your OTRS server:

```
[otrs]
```

```
secret = SomePassword
```

```
deny=0.0.0.0/0.0.0.0
```

```
permit=IP_address_OTRS/255.255.255.255
```

```
read = system,call
```

### for some versions of Asterisk (13.1.x):

Create the otrs.conf file in the /etc/asterisk/manager.d/ directory:

```
nano /etc/asterisk/manager.d/otrs.conf
```

Add the lines by replacing the value of "IP\_address\_OTRS" with the IP address of your OTRS server:

```
[otrs]
```

```
secret = SomePassword
```

```
deny=0.0.0.0/0.0.0.0
```

```
permit= IP_address_OTRS /255.255.255.255
```

```
read = system,call
```

After making the changes, restart Asterisk using the CLI:

**asterisk -r**

by executing the command:

**core restart gracefully**

After restarting, Asterisk server is ready to work with PIM module for OTRS.

## **Install the PIM package on the OTRS server**

The PIM v2.0.0b package uses additional perl-libraries which are required to be installed:

### **AnyEvent**

### **IO::Socket::Timeout**

To install required perl-libraries on Ubuntu execute the command:

```
sudo apt-get install -y libplack-test-anyevent-perl libio-socket-timeout-perl
```

To install required perl-libraries on CentOS execute the command:

```
yum install perl-AnyEvent
```

```
yum install perl-IO-Socket-Timeout
```

To install required perl-libraries on FreeBSD execute the command

```
cpan AnyEvent
```

```
cpan IO::Socket::Timeout
```

The specified modules will be installed.

Next install the PIMv2.0.0b package via the OTRS Web interface on the "**Administration-> Package Manager**" page.

For OTRS version 5.0.X, the package pim\_v2.0.0b\_otrs5.opm is installed.

After installing the package, restart the CRON service by running:

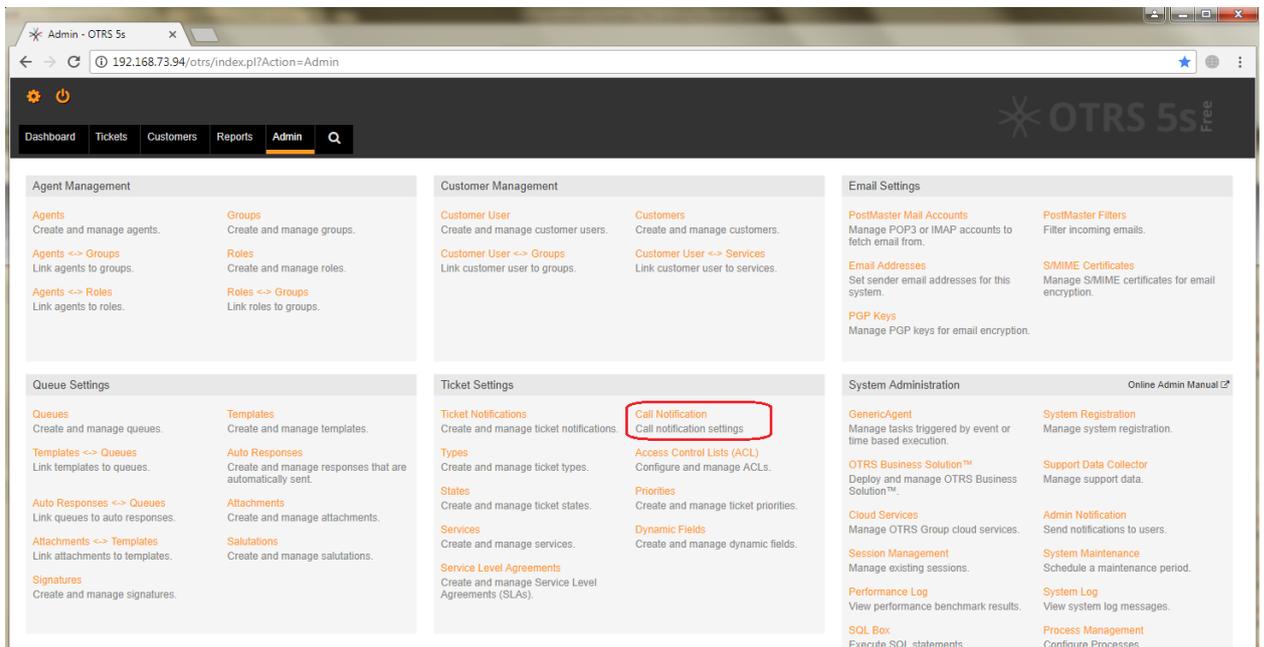
```
/opt/otrs/bin/Cron.sh restart otrs
```

The PIMv2.0.0b module is ready for use.

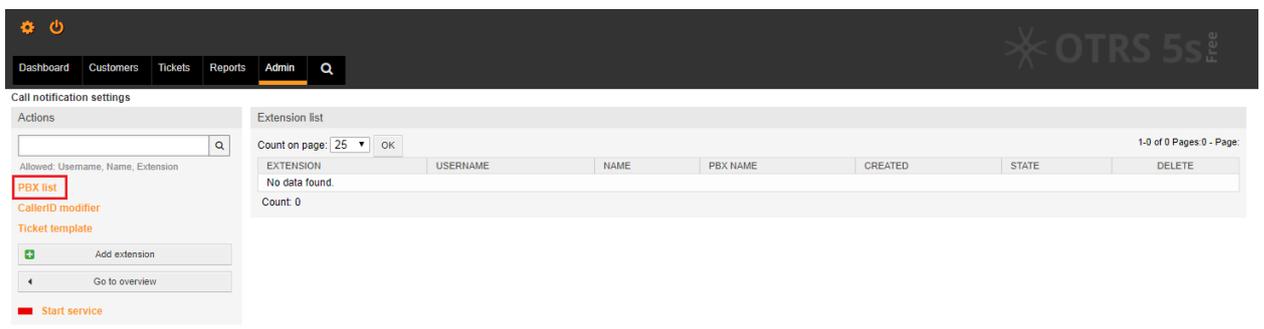
## Configuring the PIMv2.0.0b module

The module is configured via the OTRS Web interface.

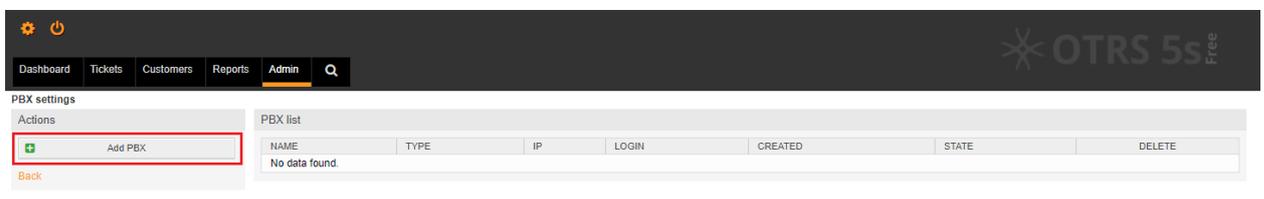
On the "Administration" page, in the "Ticket Settings" block, click on the "Call Notification" link:



Go to the "Call notification settings" page, to add a new PBX, click the "PBX list":



On the PBX settings page, click the "Add PBX" button:



Configure the connection parameters to the PBX "Asterisk" and confirm the changes with the "Submit" button:

The screenshot shows the OTRS 5s Free Admin interface. The top navigation bar includes 'Dashboard', 'Customers', 'Tickets', 'Reports', and 'Admin'. The 'Admin' section is active, and the 'PBX settings' menu is open. The 'Add PBX' form is displayed with the following fields: 'PBX name' (Asterisk), 'Type' (asterisk), 'PBX IP' (192.168.73.50), and 'State' (invalid). A 'Submit' button and a 'Back' link are located at the bottom of the form.

After adding the new PBX, you will go to the edit page.

In this editing section, add your PBX Login, PBX Password and "Tracking number":

The screenshot shows the OTRS 5s Free Admin interface. The top navigation bar includes 'Dashboard', 'Customers', 'Tickets', 'Reports', and 'Admin'. The 'Admin' section is active, and the 'PBX settings' menu is open. The 'Edit PBX settings' form is displayed with the following fields: 'PBX name' (Asterisk), 'Type' (asterisk), 'PBX IP' (192.168.73.50), 'PBX Login' (otrs), 'PBX Password' (masked), 'Use MD5' (checkbox), 'State' (valid), and 'Tracking number' (76543210). A 'Submit' button and a 'Back' link are located at the bottom of the form.

Note: "Tracking number" is the external DID of the support service number, which receives calls from customers.

The PIM module as the "Tracking number" uses the value of the Exten field received from the Asterisk server.

The "Use MD5" option is used for MD5 authentication with password encryption for the case where the connection to the Asterisk server is not via a trusted network.

## Definition of "Tracking number"

If you do not know the Exten DID number, to start, assign the "Tracking Number" - the symbol \*

In this case, all numbers from the Exten field will be tracked.

In the PIM module, each processed call is output to the CDR file named:

pim\_cdr\_YYYYMM.log

File output path: /opt/otrs/var/log

From this file you can determine which external Exten needs to track.

The file pim\_cdr\_YYYYMM.log contains 14 fields, the fields are separated by the symbol "|" (pipe) and have the following structure:

PBX\_ID|Uniqueid|UnixTimeRing|UnixTimeAnswer|UnixTimeHangUp|CallStartTime|AnsweredExtension|Exten|CID|RingTime, sec|CallDuration, sec|Cause|CustomerUserLogin|TicketNumber

Description of fields:

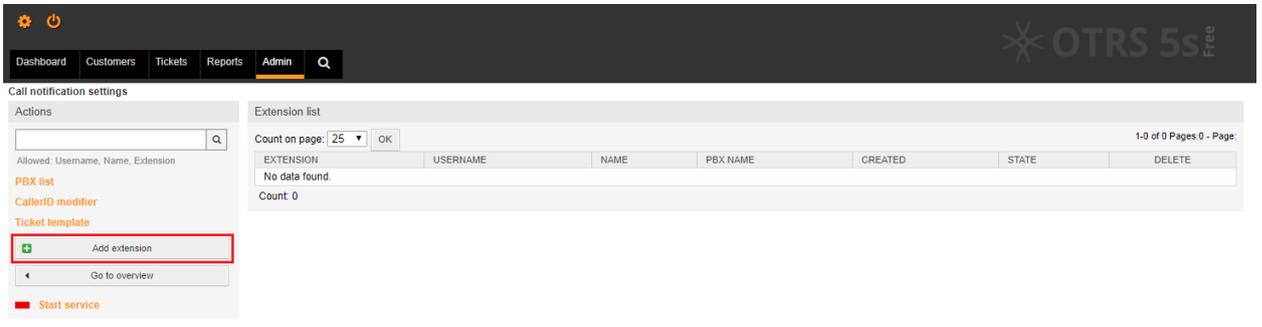
#	Field Value	Description
1	PBX ID	- PBX ID
2	Uniqueid	- Unique Call ID
3	UnixTimeRing	- Call ring, unixtime
4	UnixTimeAnswer	- Call answer, unixtime
5	UnixTimeHangUp	- Call end, unixtime
6	CallStartTime	- Call Start time
7	AnsweredExtension	- Answered subscriber (agent extension number)
8	Exten	- Exten field (DID number)
9	CID	- CallerID
10	RingTime, sec	- Waiting time before answer, sec.
11	CallDuration, sec	- Duration of conversation, sec.
12	Cause	- Cause for hanging Q.931
13	CustomerUserLogin	- CustomerUser login (if defined)
14	TicketNumber	- Ticket number (if created)

The file pim\_cdr\_YYYYMM.log is output with rotation by month.

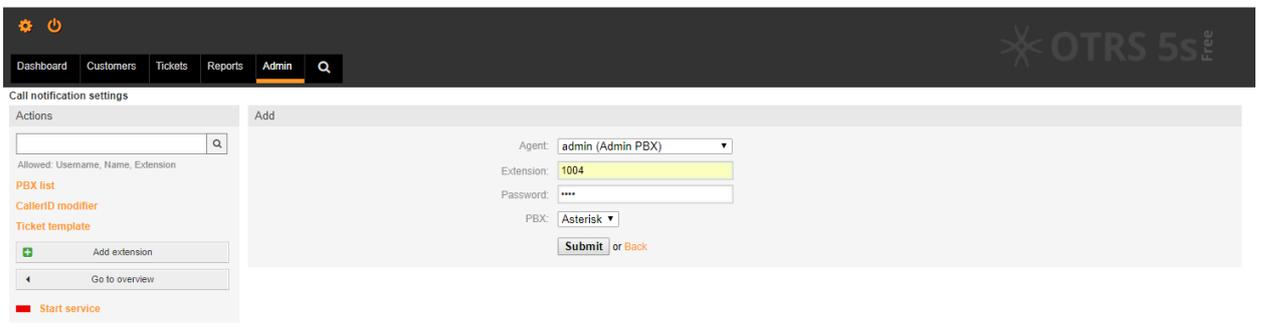
## Setting agent extensions

On the "Call notification settings" page, specify the agent extensions and specify a password for connecting client application.

To do this, click on the "Add extension" button:



On the Add page, add data for each extension number:



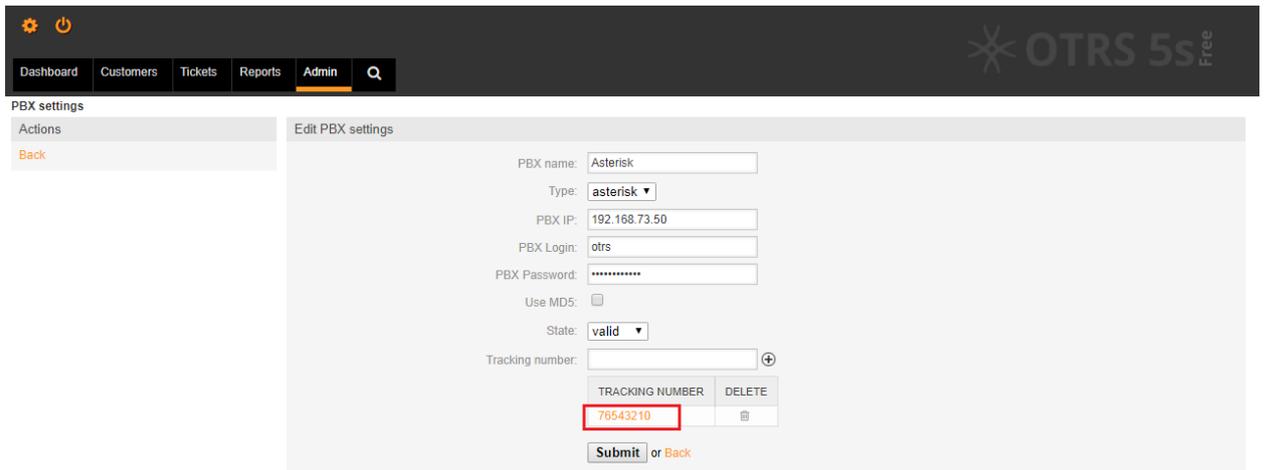
Each agent can be assigned several internal numbers(extensions), which this agent uses.

## Assign agent extensions to the "Tracking Number"

This version uses a scheme with the agents groups for sending selective incoming notifications by assign extensions to the tracking number.

This scheme allows you to use several different groups of agents, for example: help desk and managers, each of which uses its tracking number independently of other groups.

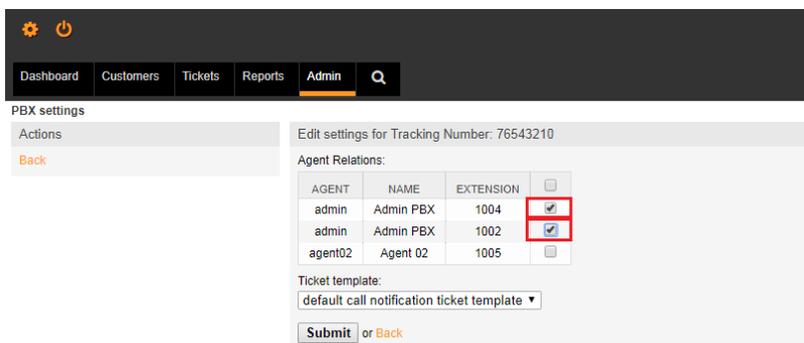
To connect agent extensions to the tracking number, on the "PBX settings" page, click the link on the tracking number:



The screenshot shows the "Edit PBX settings" page in OTRS 5s Free. The PBX name is "Asterisk", Type is "asterisk", PBX IP is "192.168.73.50", PBX Login is "otrs", and PBX Password is masked. The "Tracking number" field is empty, but a table below it shows a tracking number "76543210" with a "DELETE" button next to it. The "Tracking number" field is highlighted with a red box.

TRACKING NUMBER	DELETE
76543210	

On the next page, set the flags for the desired agent extensions, as shown in the example:



The screenshot shows the "Edit settings for Tracking Number: 76543210" page. The "Agent Relations" table is shown with the following data:

AGENT	NAME	EXTENSION	<input type="checkbox"/>
admin	Admin PBX	1004	<input checked="" type="checkbox"/>
admin	Admin PBX	1002	<input checked="" type="checkbox"/>
agent02	Agent 02	1005	<input type="checkbox"/>

The "Ticket template" is set to "default call notification ticket template".

The "Ticket template" option allows you to set an own ticket template for each tracking number.

## Customer User identification

The customer identification is based on the received CallerID.

When an incoming call arrives, searches by CallerID in the customer database for the "Phone", "Mobile", "Fax" fields set on the "Customer User Management" page:

Form fields and values:

- Title or salutation: Mr.
- \* Firstname: John
- \* Lastname: Doe
- \* Username: johndoe
- Password: (empty)
- \* Email: john@ip-lab.ru
- \* CustomerID: NIC Customer company
- Phone: +7(123) 456-78-90, +7(812) 123-32-23
- Fax: +7(123) 789-06-54
- Mobile: +7(987) 654-32-10
- Street: Camp Road, East Main Street, VA4210
- Zip: 123456
- City: Saint Petersburg
- Country: Russia
- Comment: Some comments
- \* Valid: valid
- Interface language: English (United States)

You can specify several numbers separated by commas or space in each phone number field.

## CallerID modification

If your ISP does not transmit CallerID in E.164 format (international number format), identification may be difficult or impossible.

This happens, for example, when the provider adds a national or international prefix to CallerID.

To solve this problem, use the CallerID modification mode on the "CallerID modifier" page.

In this example, the prefix "0" is deleted from CallerID. The modifier rule will be applied for CallerID starting with the prefix "0" and the length from 7 to 11 characters:

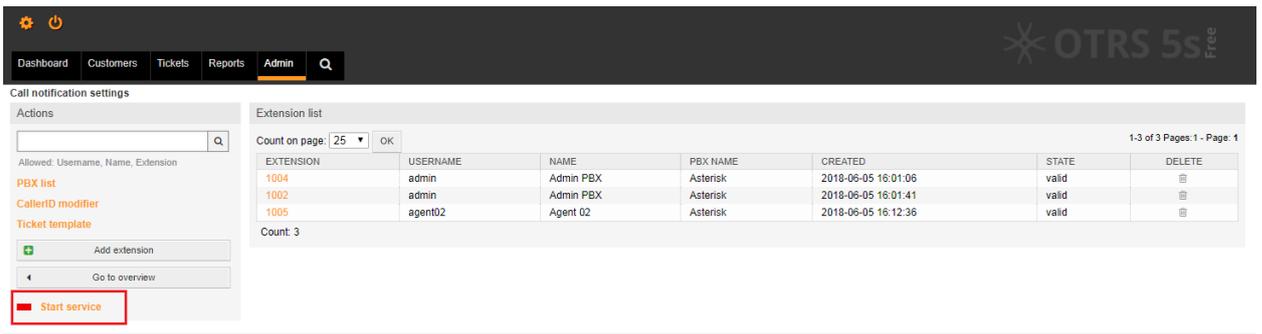
Form fields and values:

- Name: National
- Template: 0
- Replace: (empty)
- Length from: 7
- Length to: 11
- Comment: Delete national prefix
- State: valid
- Show modified CID:
- Buttons: Submit or Back

The "Show modified CID" option sets the modified CallerID for displaying the current rule in the client application.

## Starting the service

Start the PIM service by clicking on the "Call notification settings" link "**Start service**":



The screenshot shows the OTRS 5s Free Admin interface. The top navigation bar includes 'Dashboard', 'Customers', 'Tickets', 'Reports', and 'Admin'. The 'Admin' section is active, and the 'Call notification settings' page is displayed. On the left, there are several links: 'PBX list', 'CallerID modifier', and 'Ticket template'. Below these links are buttons for 'Add extension' and 'Go to overview'. The 'Start service' button is highlighted with a red box. The main content area shows an 'Extension list' table with columns for EXTENSION, USERNAME, NAME, PBX NAME, CREATED, STATE, and DELETE. The table contains three rows of data. The 'Count on page' is set to 25, and the total count is 3.

EXTENSION	USERNAME	NAME	PBX NAME	CREATED	STATE	DELETE
1004	admin	Admin PBX	Asterisk	2018-06-05 16:01:06	valid	
1002	admin	Admin PBX	Asterisk	2018-06-05 16:01:41	valid	
1005	agent02	Agent 02	Asterisk	2018-06-05 16:12:36	valid	

The indicator on the left shows 3 states:

-  - Service is stopped
-  - Service starts, waiting
-  - Service started

Note:

The service starts on CRON and runs for up to 1 minute.

After a successful start, the service will go into the "running" state.

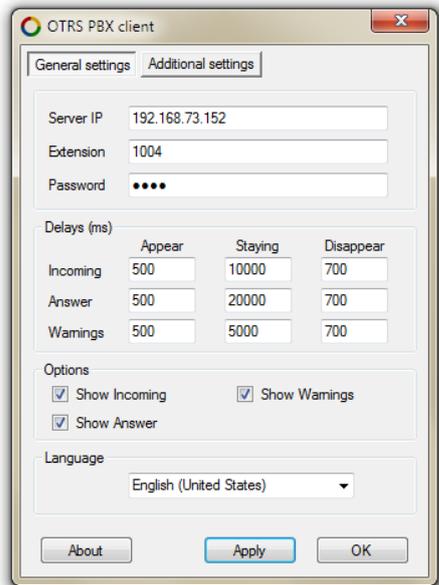
To update the status of the indicator, click on the indicator icon.

## Configuring client application

Client applications are installed on workstations with Windows.

The minimum requirements are the installed package of Microsoft: NET Framework 4 and higher.

In the application settings window, fill in the settings fields as shown in the example:



Description of fields:

**Server IP** – IP address of the OTRS server.

**Extension** – Agent extension

**Password** – Password of the agent on the OTRS page "Call notification settings"

### Delays (ms) block

You can change the time of appearance, display and disappearance of the notification window for events:

**Incoming** – notification of an incoming call

**Answer** – notification of answering a call

**Warnings** – warning notices

Delays time is set in milliseconds.

### Options block

In this block, you can turn off notifications in message classes by removing the desired flag.

**Language** – Selecting the language of the user interface.

On the **Additional settings** tab, specify the address of the OTRS server in the **Web path** field.

In the **CID-Link** field, specify the preferred Search Engine.

The CallerID info in the **CID-Link** field sets via the <PIM\_CID> tag.

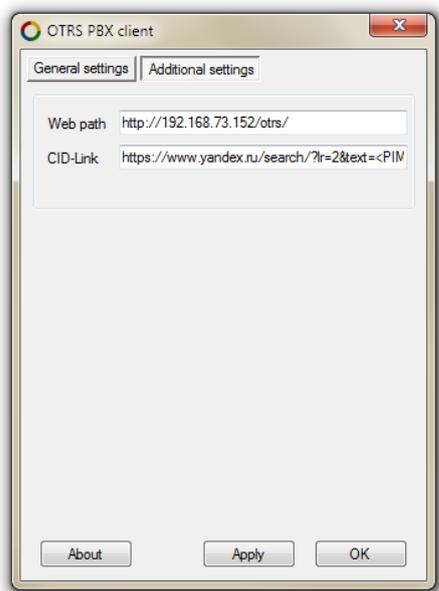
For Google search engine, use CID-Link:

`https://www.google.com/search?q=<PIM_CID>`

For Yandex search engine, use CID-Link:

`https://www.yandex.ru/search/?lr=2&text=<PIM_CID>`

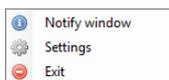
Example of the **Additional settings** tab:



### Close client application

When you click the OK button  or close button , application is minimized to the system tray and continues to work.

To end the application, right-click the application icon  in the tray and click Exit:

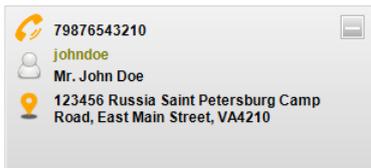


### Sample notifications:

### Warnings:

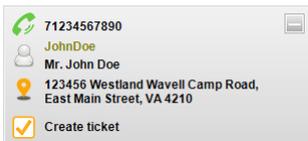


### Incoming call information:



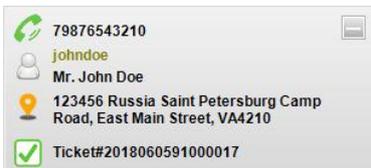
Note: Clicking on the CallerID link (**CID-Link**) will open a search result in a new browser window

### Answer:



### Answer options:

Clicking on the "OK" button  will create a ticket, with its number in the notification window:



## Setting up with LDAP customer backend

The PIM module also supports LDAP customer directories.

The standard OTRS interface is used to connect to the LDAP database in the Kernel/Config.pm file.

In general, you do not need to change it.

For proper operation, it is required to place customers in the Windows AD security group, for example, "OTRS\_Customers" and apply the filter in Config.pm.

For example, for the otrsdc.inc domain, the filter entry will be as follows:

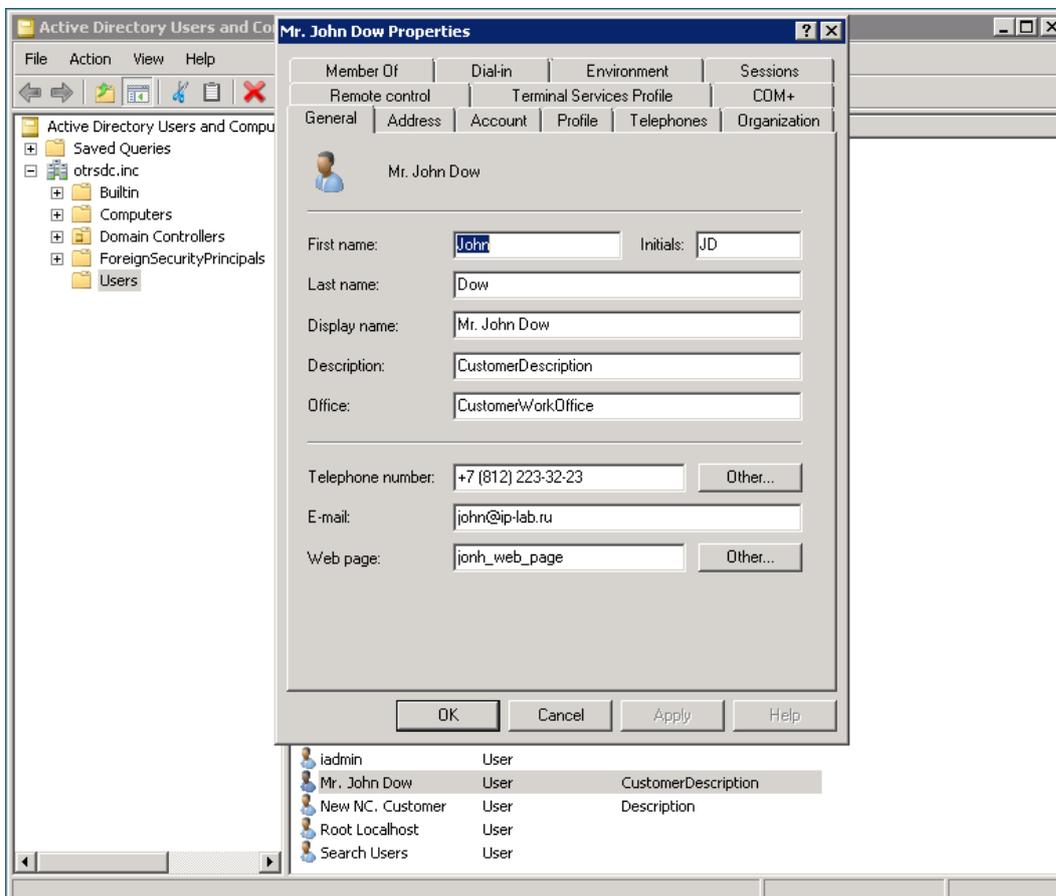
```
AlwaysFilter => '(&(objectclass=user)(memberof=CN=OTRS_Customers,CN=Users,DC=otrsdc,DC=inc))'
```

The customer search in the PIM module is performed by the fields 'UserPhone', 'UserHomePhone', 'UserFax', 'UserMobile'. To identify the customer, at least one of these fields must be filled.

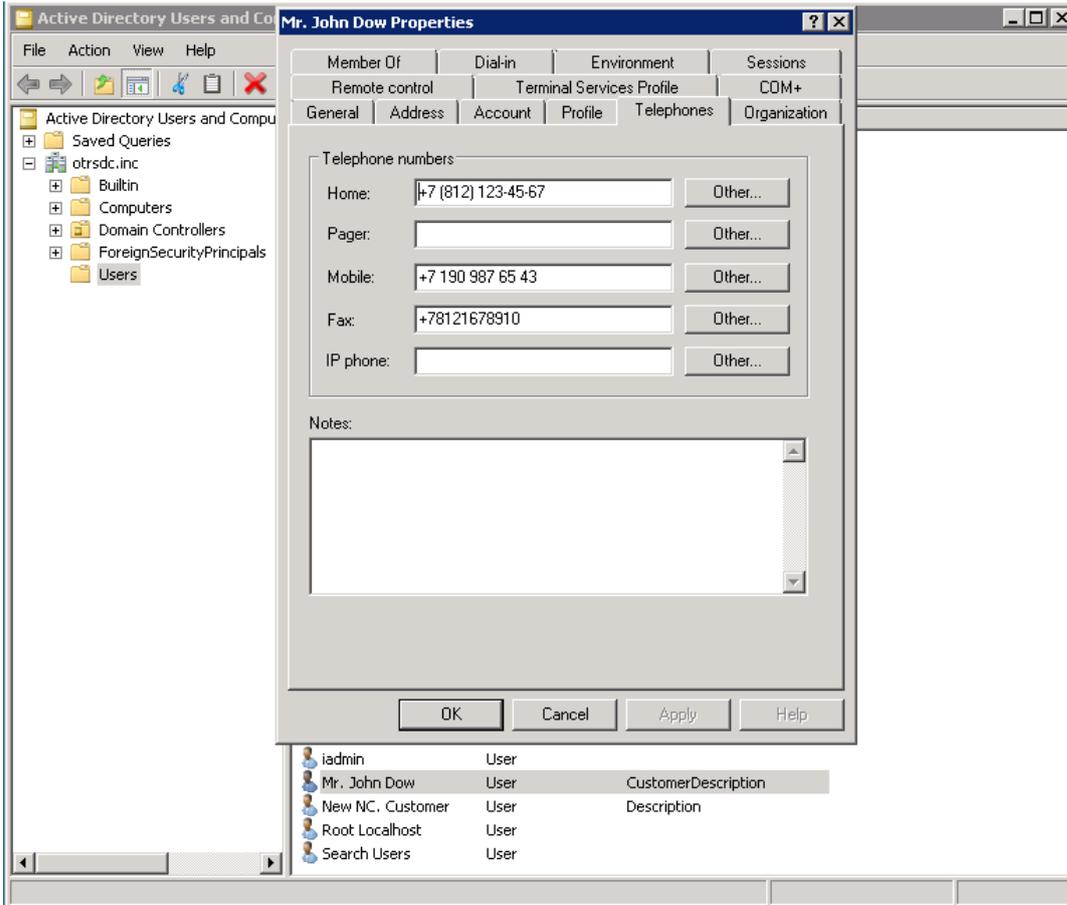
Updating LDAP data for customers occurs every 60 minutes. To immediately get LDAP changes, you need restart the PIM service.

Example of user fields in AD:

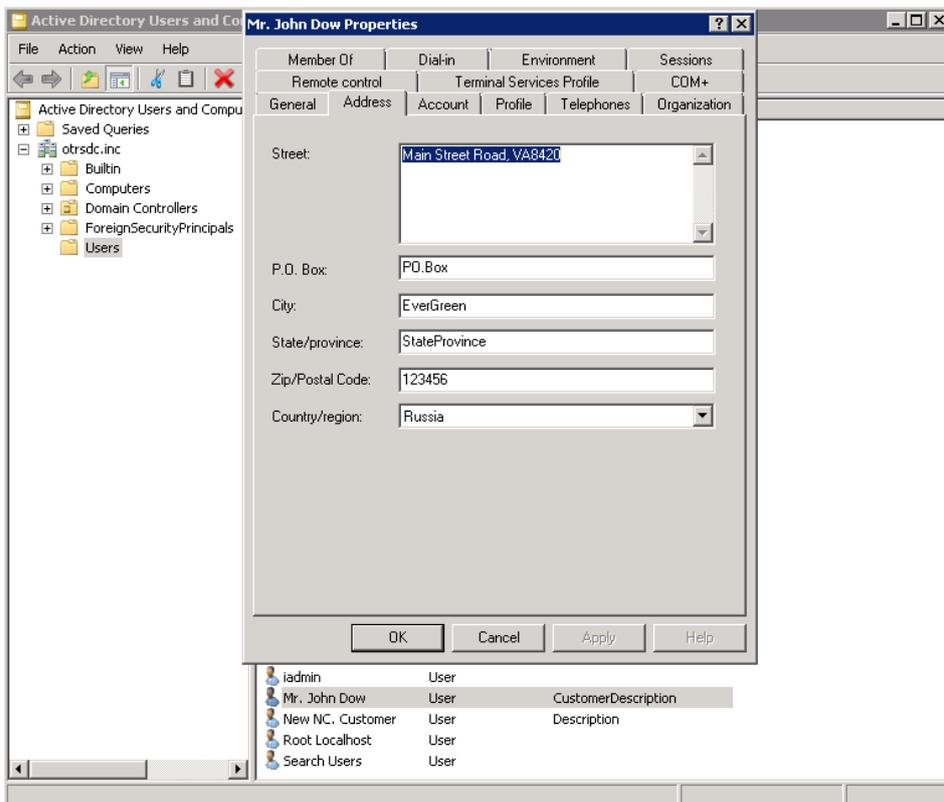
The "General" tab:



The "Phones" tab:



The "Address" tab:



Example of part of the Config.pm file of LDAP data for customers:

```
$Self->{CustomerUser} = {
    Module => 'Kernel::System::CustomerUser::LDAP',
    Params => {
        Host => '10.10.12.11',
        BaseDN => 'dc=otrsdc,dc=inc',
        SSCOPE => 'sub',
        UserDN => 'root@otrsdc.inc',
        UserPw => 'SomePassword',
        AlwaysFilter => '(&(objectclass=user)(memberof=CN=OTRS_Customers,CN=Users,DC=otrsdc,DC=inc))',
        SourceCharset => 'utf-8',
        DestCharset => 'utf-8',
    },

    CustomerKey => 'sAMAccountName',
    CustomerID => 'mail',
    CustomerUserListFields => ['sAMAccountName', 'givenName', 'sn', 'mail'],
    CustomerUserSearchFields => ['sAMAccountName', 'givenName', 'sn', 'mail'],
    CustomerUserSearchPrefix => "",
    CustomerUserSearchSuffix => '*',
    CustomerUserSearchListLimit => 250,
    CustomerUserPostMasterSearchFields => ['mail'],
    CustomerUserNameFields => ['givenname', 'sn'],

    Map => [
        ['UserInitials', 'Initials', 'initials', 1, 0, 'var'],
        ['UserFullname', 'Full name', 'cn', 1, 0, 'var'],
        ['UserFirstname', 'Firstname', 'givenName', 1, 1, 'var'],
        ['UserLastname', 'Lastname', 'sn', 1, 1, 'var'],
        ['UserLogin', 'Login', 'sAMAccountName', 1, 1, 'var'],
        ['UserEmail', 'Email', 'mail', 1, 1, 'var'],
        ['UserCustomerID', 'CustomerID', 'mail', 0, 1, 'var'],
        ['UserPhone', 'Phone', 'telephonenumber', 1, 0, 'var'],
        ['UserFax', 'Fax', 'facsimiletelephonenumber', 1, 0, 'var'],
        ['UserHomePhone', 'Home phone', 'homephone', 1, 0, 'var'],
        ['UserMobile', 'Mobile', 'mobile', 1, 0, 'var'],
        ['UserZip', 'Zip', 'postalcode', 1, 0, 'var'],
        ['UserCountry', 'Country', 'co', 1, 0, 'var'],
        ['UserCity', 'City', 'l', 1, 0, 'var'],
        ['UserStreet', 'Street', 'streetAddress', 1, 0, 'var'],
        ['UserOffice', 'Office', 'physicalDeliveryOfficeName', 1, 0, 'var'],
        ['UserDepartment', 'Department', 'department', 1, 1, 'var', "", 0],
        ['UserDescription', 'Description', 'description', 1, 0, 'var', "", 0],
    ],
};
```

## Trouble shooting

The server part of the module is executed on the scripts `pim_chat.pl` and `pim_asterisk.pl`, scripts are located in the path `/opt/otrs/var`.

The scripts are started by CRON and are checked once a minute.

In case of startup problems, check that the scripts are in the CRON job by running the command:

**`crontab -l -u otrs`**

There should be these lines:

```
*/1 * * * * $HOME/var/pim_chat.pl >> /dev/null
```

```
*/1 * * * * $HOME/var/pim_asterisk.pl >> /dev/null
```

Additional information about errors and events is output to the following log files:

`pim_chat_log_YYYYMM.log` – PIM server module messages

`pim_ast_log_YYYYMM.log` – Asterisk connector messages

Log files output path: `/opt/otrs/var/log`

The log files are rotated by the month.

## Feedback

If you need additional information or have any suggestions, comments on the modules or you find a bug in the package PIM v2.0.0b, write to us to the email address on the website <http://ip-lab.ru/> on the "Contact Us" page.