

# **Kerio Operator**

## **Administrator's Guide**



# Contents

---

- Installing Kerio Operator** ..... 9
  - Product Editions ..... 9
  - Kerio Operator Software Appliance ..... 9
    - How to connect Kerio Operator to network ..... 9
  - Kerio Operator VMware Appliance ..... 10
  - Kerio Operator Box ..... 11
    - How to connect box to network ..... 11
  
- Logging in to Kerio Operator** ..... 12
  - Which Kerio Operator interfaces are available ..... 12
  - Kerio Operator Administration ..... 12
    - How to login ..... 12
    - First login ..... 13
  - Kerio MyPhone ..... 14
    - What is Kerio MyPhone ..... 14
    - How to login to Kerio MyPhone ..... 14
  
- Licenses and registrations** ..... 16
  - How to register Kerio Operator in the administration interface ..... 16
    - Why to register the trial version ..... 16
    - How to register full version ..... 17
    - Importing license key ..... 17
  - How to register Kerio Operator via WWW ..... 18
  
- Securing Kerio Operator** ..... 19
  - Issues to address ..... 19
  - How to configure firewall in local network ..... 19
  - How to configure firewall integrated in Kerio Operator ..... 20
  - How to configure protection against password guessing ..... 21
  - What to do in case of an attack ..... 21
  
- Creating user accounts** ..... 22
  - What are user accounts ..... 22
  - How to add new accounts ..... 22
    - How to add local accounts ..... 22
    - How to add accounts from directory service ..... 22
      - How to connect Kerio Operator with directory service ..... 22
  - Additional Settings ..... 23
  
- Call forwarding** ..... 24

---

What is call forwarding .....	24
How to configure call forwarding in the administration .....	24
How to configure call forwarding in Kerio MyPhone .....	24
<b>Configuring multiple registration of an extension .....</b>	<b>25</b>
What is multiple registration of an extension .....	25
How to create auto attendant scripts in Kerio Operator 2.0 and later .....	25
How to create multiple registrations in Kerio Operator 1.2 and later .....	27
<b>Displaying, hiding and overriding phone numbers .....</b>	<b>28</b>
How to hide user's phone number .....	28
How to change phone number to display .....	28
<b>Connecting Kerio Operator to directory service .....</b>	<b>30</b>
Which directory services are supported in Kerio Operator .....	30
What is the connection used for .....	30
How to connect to directory service .....	31
Kerio Directory .....	31
Microsoft Active Directory .....	31
Apple Open Directory .....	32
How to activate users from a directory service .....	32
<b>Phone Provisioning Settings .....</b>	<b>34</b>
What is phone provisioning .....	34
What you need .....	34
How to add a phone in version 2.0 and newer .....	35
Adding phones manually .....	35
Importing from CSV file .....	36
Restarting provisioned phones .....	37
Firmware .....	37
What to do if you want to know the SIP password of your phone .....	38
How to add a phone in version 1.2 and older .....	38
Connecting phones manually .....	39
Importing from CSV file .....	40
Restarting provisioned phones .....	40
Firmware .....	40
How phone provisioning works .....	41
<b>Configuring parameter 66 in DHCP server in Kerio Control .....</b>	<b>43</b>
What is parameter 66 in a DHCP server? .....	43
How to set parameter 66 in Kerio Control .....	43

---

<b>Uploading configuration files to Kerio Operator TFTP server</b> .....	44
Why to use phone or other device configuration file .....	44
How to obtain the original configuration file .....	44
How to upload a new or changed configuration file to Kerio Operator .....	45
What you need .....	45
How to enable SSH in Kerio Operator .....	45
<b>Connecting to VoIP service provider</b> .....	46
How to connect Kerio Operator to the outside world .....	46
What information to get from your provider .....	46
How to add communication interface .....	46
One number .....	46
Multiple numbers .....	47
Interval of numbers .....	49
How to map numbers .....	50
Creating Alternative Connection for Route Backup .....	50
<b>Mapping external and internal numbers</b> .....	51
What is mapping of external and internal numbers? .....	51
How to map numbers for an SIP interface .....	51
How to map numbers for a standard analogue phone interface .....	53
How to configure mapping for outgoing calls .....	55
<b>Connecting head office with branch offices</b> .....	58
How to connect two PBXs .....	58
How to add SIP interface .....	58
How to configure PRI/BRI/FXO interface .....	59
<b>Configuring standard phone interface</b> .....	61
How to connect Kerio Operator to a standard telephone network .....	61
Supported analogue cards .....	61
What to have ready beforehand .....	61
How to add analogue communication interface .....	62
One number .....	62
Multiple numbers .....	63
Interval of numbers .....	63
Overlap dialing .....	64
<b>Configuring and using conferences</b> .....	65
What are telephone conferences .....	65
How to configure conferences .....	65
How to connect to conference .....	66
Where to monitor conference activities .....	66

---

<b>Configuring call queues</b>	<b>67</b>
What is call queue	67
How to configure call queue	67
How to select queue strategy	68
What is the difference between static and dynamic agents	68
How to record calls from call queues	69
How to direct calls when agents are unavailable	69
How to prioritize call queues	71
How to monitor active call queues	73
<b>Configuring auto attendant scripts</b>	<b>74</b>
What is auto attendant script	74
How to add new auto attendant script	74
<b>Setting time conditions in auto attendant scripts</b>	<b>81</b>
Time conditions are best explained in an example	81
How to set time intervals for auto attendant scripts	81
How to create auto attendant scripts in Kerio Operator 2.0 and later	82
How to create auto attendant scripts in Kerio Operator 1.2 and older	86
Condition 1 — extension 300	86
Condition 2 — extension 301	88
Condition 3 — extension 302	89
<b>Creating ringing groups</b>	<b>91</b>
What are ringing groups	91
How to add new ringing group	91
<b>Using PBX services</b>	<b>92</b>
What are PBX services	92
How to easily create voice files	92
<b>Configuring and using call parking</b>	<b>94</b>
What can you use call parking for	94
How to configure call parking	94
<b>Call Pickup</b>	<b>95</b>
What to use call pickup for	95
How to configure call pickup rooms	95
How to configure directed call pickup	96
<b>Creating and using speed dial</b>	<b>97</b>
How to use speed dial	97
How to add speed dial	97

---

<b>Configuring voicemail</b> .....	<b>98</b>
How to configure voicemail .....	98
What is direct access to voicemail inbox and how to configure it ....	98
How to configure forwarding of voicemail messages to user's email inbox .....	98
My mailserv is Keri Connect .....	98
My mailserv is a different SMTP server .....	99
How to configure the welcome message for callers .....	99
How to change the extension and voicemail PIN .....	99
How to access voicemail .....	100
How to administer voicemail via Keri MyPhone .....	100
Voicemail Menu .....	100
<b>Integrating Keri Connect and Keri Operator</b> .....	<b>102</b>
What are the possibilities of Keri Operator and Keri Connect integration	102
How to configure firewall integrated in Keri Operator .....	102
Troubleshooting .....	103
<b>Setting Emergency Numbers</b> .....	<b>104</b>
What are emergency numbers .....	104
How to add emergency numbers .....	104
How to set direct dialing .....	104
<b>Crating SSL certificates</b> .....	<b>105</b>
What are SSL certificates .....	105
How to create self-signed certificate .....	105
How to create certificate signed by certification authority .....	105
<b>Configuring languages in Keri Operator</b> .....	<b>107</b>
Languages in Keri Operator are: .....	107
How to change the application language .....	107
How to change the language of the PBX .....	107
How to change the language for individual users .....	108
How to change the PBX language for a group of users .....	109
Setting a different language for a call queue .....	109
How to add a new language to the PBX .....	110
Example .....	110
<b>Customizing voice sets</b> .....	<b>112</b>
Summary .....	112
Details .....	112

---

<b>Application integration using the AMI interface</b> .....	<b>113</b>
What to use AMI for .....	113
How to connect Kerio Operator with other applications .....	113
How to connect a client application (desktop application for dialing numbers) with Kerio Operator .....	113
How to connect a server (CRM system) with Kerio Operator .....	114
What to do when communication fails .....	114
Consult the logs in Kerio Operator: .....	114
Configure the internal firewall of Kerio Operator .....	114
<b>Outgoing calls constraints</b> .....	<b>115</b>
Why to disable outgoing calls .....	115
How to disable outgoing calls .....	115
How to restrict length of individual outgoing calls .....	115
How to restrict the number and length of outgoing calls .....	115
<b>Configuring NAT</b> .....	<b>117</b>
Kerio Operator is behind NAT and phones are in the Internet .....	117
Kerio Operator is in the company network and hardware phones are behind NAT .....	118
Kerio Operator is behind NAT and hardware phones are in the Internet ..	118
<b>Disabling outgoing calls to certain prefixes</b> .....	<b>119</b>
Why to disable outgoing calls to certain prefixes .....	119
How to disable outgoing calls .....	119
<b>Legal Notice</b> .....	<b>122</b>
Trademarks and registered trademarks .....	122
Used open source software .....	122



# Installing Kerio Operator

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## Product Editions

### Software Appliance

Kerio Operator Software Appliance is an all-in-one package of Kerio Operator which also includes a special operating system.

Designed to be installed on a computer without an operating system, this edition is distributed as an installation disc. Software Appliance cannot be installed on a computer with another operating system and it does not allow to install other applications.

### VMware Virtual Appliance

A virtual appliance designed for use in VMware products.

VMware Virtual Appliance is a Software Appliance edition pre-installed on a virtual host for VMware. The virtual appliance is distributed as OVF and VMX.

### Kerio Operator Box

Hardware device ready for network connection. There are two types which differ in performance.

## Kerio Operator Software Appliance

For Kerio Operator system requirements, refer to [the Kerio Operator product pages](#).

You obtain Kerio Operator as a standard ISO image which you need to burn on a CD. Boot from this CD and install the Kerio Operator operating system. The Kerio Operator application is also installed during the process.

### How to connect Kerio Operator to network

After booting the system, a console with the IP address for Kerio Operator is displayed.

If you use a DHCP service on your network, Kerio Operator will be assigned an IP address automatically and will connect to the network. If you do not use or do not wish to use DHCP for Kerio Operator, you have to set the IP address manually.

The current network configuration is displayed (and can be changed) in the Kerio Operator console in section **Network Configuration**. To set a static network address:

1. Select the `Assign static IP address` option in the console menu.
2. In the network interface on which the PBX should communicate, select the `Assign static IP address` option and enter the IP address, subnet mask and IP addresses of gateway and DNS server.

## Installing Kerio Operator

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If you know the DNS name of the PBX, you can connect to it and configure it [via the web interface](#).



Immediately after you connect Kerio Operator to the network, we recommend to read article [concerning the security measures](#). Meeting security principles for Kerio Operator operation is extremely important. If the PBX is not protected by a firewall and supporting security rules, your internal telephone extension can be misused which may result in unexpected financial costs.

### Kerio Operator VMware Appliance

For supported *VMware* product versions, check

<http://www.kerio.com/connect/requirements/>

Use an installation package in accordance with the type of your *VMware* product:

- For products *VMware Server*, *Workstation*, *Player* and *Fusion*, download the compressed VMX distribution file (\*.zip), unpack it and open the file with extension .vmx.
- You can import a virtual appliance directly to VMware ESX/ESXi from the URL of the OVF file — for example:

`http://download.kerio.com/dwn/operator/`

`kerio-operator-appliance-1.2.0-2500-vmware.ovf`

VMware ESX/ESXi automatically downloads the OVF configuration file and a corresponding disk image (.vmdk).

If you import virtual appliance in the OVF format, bear the following specifics in mind:

- In the imported virtual appliance, time synchronization between the host and the virtual appliance is disabled. However, Kerio Operator features a proprietary mechanism for synchronization of time with public Internet time servers. Therefore, it is not necessary to enable synchronization with the host.
- Tasks for shutdown or restart of the virtual machine will be set to default values after the import. These values can be set to “hard” shutdown or “hard” reset. However, this may cause a loss of data on the virtual appliance. Kerio Operator VMware Virtual Appliance supports so called *Soft Power Operations* which allow to shut down or restart hosted operating system properly. Therefore, it is recommended to set shutdown or restart of the hosted operating system as the value.

For more information, see section [Network Connection](#).

## Kerio Operator Box

For currently supported Kerio Operator Box configurations, refer to [the Kerio Operator product pages](#).

For detailed information on connecting the device into the network, see the [Kerio Operator Box, Installation Guide](#) manual.

### How to connect box to network

Upon the first start, the appliance has a static IP address set to 10.10.10.1 on ethernet port 1. There are two ways to change the configuration:

- in the console — use an Ethernet cable to connect to the console. In the console menu, select the **Network Configuration** option and change the configuration.
- in the [administration interface](#) in section **System**.

To connect to Kerio Operator, set the following TCP/IP parameters on your computer:

- IP address: 10.10.10.2
- Subnet mask: 255.255.255.0

To shut down the appliance:

1. Connect to Kerio Operator via the console and select the Shutdown command.
2. Kerio Operator series 1000 will shut down.

Kerio Operator series 3000 will stop the server, however, the physical appliance stays switched on. Wait until you are not able to connect to Kerio Operator via Kerio Operator administration and turn the appliance off using the **pwr** button on the appliance.

# Logging in to Kerio Operator

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## Which Kerio Operator interfaces are available

- administration interface (Kerio Operator Administration)
- user interface (Kerio MyPhone)

We recommend to use the supported browsers to connect to the interfaces. For the list of the browsers, refer to [the Kerio Operator product pages](#).

Web interfaces are currently localized into several languages. Select yours in the top right corner of the interface. The default language is set according to your browser language settings.

## Kerio Operator Administration

### How to login

Before you login the first time, make sure you have:

- DNS name of the server with Kerio Operator.
- Supported browsers

To login, enter the DNS name of the computer with Kerio Operator:

```
kerio.operator.name/admin
```

Administration runs solely via the HTTPS protocol on port 4021. The address is automatically redirected to:

```
https://kerio.operator.name:4021/admin
```



If the PBX is located behind firewall, HTTPS on port 4021 must be enabled.

If the URL is entered correctly, your browser displays a warning about a SSL certificate. After the installation, Kerio Operator creates a certificate which is not signed by a trusted certificate authority — it is a self-signed certificate (for more information, read article about the [SSL certificates](#)). Since you know the certificate can be trusted, you can add the security exception and continue to a login page.

### First login

When you connect to the PBX for the first time, a configuration wizard is displayed where you:

1. Set the configuration wizard language.
2. Accept the Kerio Operator license agreement.
3. Set a password for the administration account (be sure to remember the password, you will need it to login to the PBX).



This admin password is synchronized with password of user root in the operating system where Kerio Operator is installed (Kerio OS).

4. Set the time zone of Kerio Operator (requires a restart of the PBX).
5. Set the PBX language for communication with you and other users (warnings, auto attendant scripts, voicemail, etc.).
6. Configure the first extension number. If you use phone provisioning, extensions will be created automatically beginning with the number you enter here.

After successful configuration, the login page is displayed. Enter the username and password you created earlier.

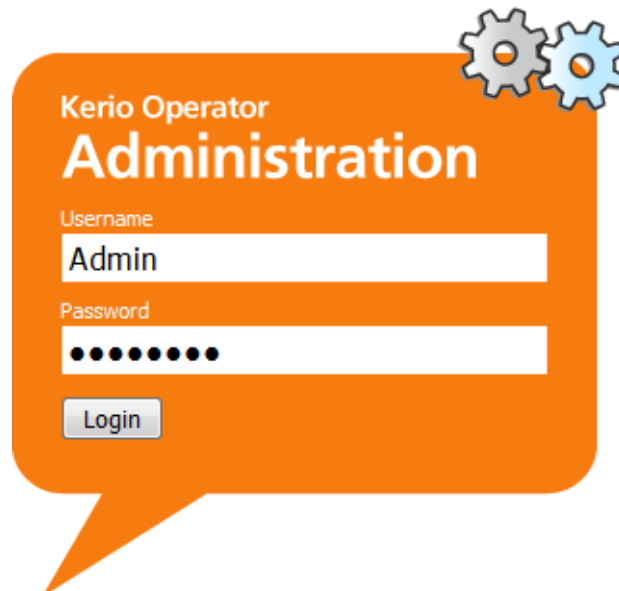


Figure 1 Login to administration

## Logging in to Kerio Operator

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To change the password, use the following steps:

1. Login to Kerio Operator using the HTTPS protocol (e.g. `https://operator.company.com/admin`)
2. Open the **Configuration** → **Users** section.
3. In the user list, select the administrator account you are logged in with and double-click on it.
4. Change the password on tab **General**.

## Kerio MyPhone

### What is Kerio MyPhone

With Kerio MyPhone, users can access their:

- voicemail,
- phone account configuration (change password, change PIN or call forwarding),
- call history.

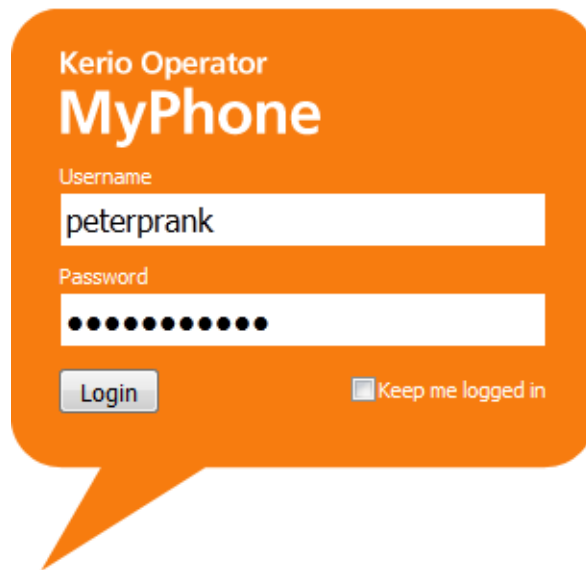
You can also dial numbers in Kerio MyPhone. You have to be connected to a phone (softphone on your computer or mobile phone or hardware phone on your desk). Dialing in Kerio MyPhone works on callback basis. This means that when you dial a number, your phone rings first. Once you answer your phone, Kerio Operator starts dialing the number and connects you.

The advantages of dialing via Kerio MyPhone are:

- If you want to dial an internal extension, you don't have to know it by heart — just type in the name of the user.
- In Kerio MyPhone, you can configure the speed dial buttons with names and numbers and dial with only one click.

### How to login to Kerio MyPhone

1. Specify URL in the browser in the following format:  
`http://kerio.operator.name/`
2. If the URL is entered correctly, Kerio MyPhone login page is displayed.
3. Use credentials of Kerio Operator user.




The image shows a login form for Kerio Operator MyPhone. The form is contained within an orange speech bubble shape. At the top, it says "Kerio Operator" and "MyPhone" in white text. Below that, there are two input fields: "Username" with the text "peterprank" and "Password" with a masked password represented by 12 black dots. At the bottom left is a "Login" button, and at the bottom right is a checkbox labeled "Keep me logged in".

Figure 2 Login to Kerio MyPhone

# Licenses and registrations

## How to register Kerio Operator in the administration interface

You can register the product from the welcome page of the administration interface which is displayed after each login.

 If Kerio Operator is protected by a firewall, it is necessary to allow outgoing HTTPS traffic for Kerio Operator at port 443. Unless HTTPS traffic is allowed, Kerio Operator cannot use the port to connect to the Kerio Technologies registration server.

When installed, the product can be registered as trial or as a full version.

## Why to register the trial version

The trial version is intended to allow the customer to become familiar with the product's features and configuration. Once you register the trial version, you will be provided free *Kerio Technologies* technical support during the entire trial period (up to 30 days).

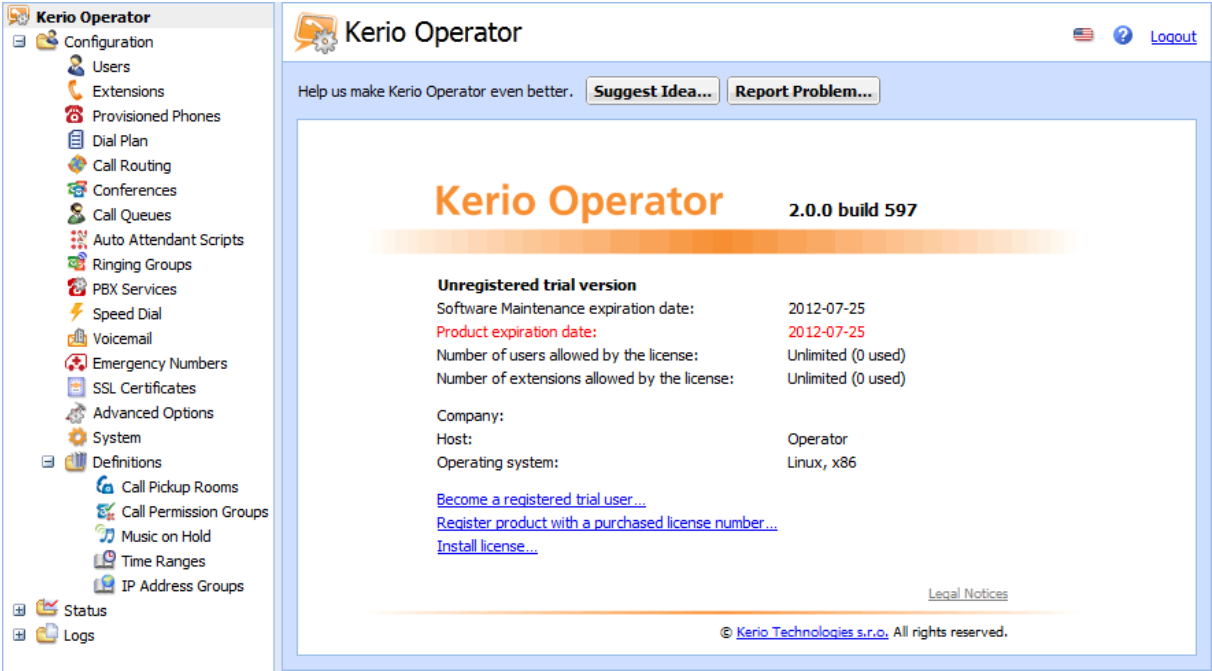


Figure 1 Product Registration



The trial version can be registered by clicking on **Become a registered trial user** on the product's main page (see figure 1). In the dialog box just opened, set the following parameters:

1. enter security code (CAPTCHA) from the image.
2. enter information about your company and agree with the privacy policy terms.
3. choose how many computers do you have in your company and how you learned of Kerio Operator.

Now, a special identification code called *Trial ID* gets generated. This ID is later required for contacting the technical support. After a successful registration, Trial ID can be found in the license information in the administration interface.

#### How to register full version

1. Open the administration interface.
2. Click on **Register product with a purchased license number** on the welcome page.
3. In the first step of the registration, enter the license number and enter the security code from the image.



The code is not case-sensitive.

Click **Next** to make Kerio Operator establish a connection to the registration server and check validity of the number entered. If the number is invalid, the registration cannot be completed.

4. Enter the [add-on licenses and Software Maintenance](#) numbers if you have any. If you have purchased only the base license so far (usually when performing registration of the product for the first time), skip this step.
5. Enter the registration information about the company the product is registered to.
6. Kerio Operator connects to the registration server, checks whether the data inserted is correct and downloads automatically the license key (digital certificate).
7. Click **Finish** to close the wizard.

#### Importing license key

1. Prepare the license key number.
2. Login to Kerio Operator administration.
3. Click **Install license** on the welcome page.

### How to register Kerio Operator via WWW

You purchased a license and your Kerio Operator cannot access the Internet? Follow these steps to register the product:

1. Go to <https://secure.kerio.com/reg/>
2. Register using your purchased license number.
3. By registering, you will receive a license key (the `licence.key` file including the corresponding certificate) which must be [imported to Kerio Operator](#).



The trial version of Kerio Operator cannot be registered via the website.

# Securing Kerio Operator

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## Issues to address

- Restrict communication on firewall to necessary IP addresses and ports, especially if the PBX runs in the Internet.
- Restrict communication on the integrated firewall in Kerio Operator.
- Create strong SIP passwords.
- Restrict the number of attempts to enter SIP passwords.
- [Using special rules, forbid international outgoing calls to countries you do not communicate with](#)
- [Restrict international outgoing calls to countries where you rarely call](#)

The following sections describe these settings in detail.

## How to configure firewall in local network

Kerio Operator is usually protected by firewall (in your local network or in the Internet). Certain ports need to be opened (or mapped) on firewall.

## Securing Kerio Operator

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Service (default port)	Outbound connection	Inbound connection
SIP (5060)	allow	allow for SIP servers of your provider
IMAP (143)	allow if integration with Kerio Connect is enabled and there is a firewall between Kerio Connect and Kerio Operator.	deny
LDAP (389)	allow	deny
LDAPS (636)	allow	allow if you use mapping from <i>Active Directory</i> or <i>Open Directory</i> and there is a firewall between the directory service and Kerio Operator.
HTTP (80)	allow	deny
HTTPS (443)	allow	allow if you wish users to be able to connect to <i>Kerio MyPhone</i> from the Internet.
HTTPS (4021)	allow	allow if you wish users to be able to connect to the administration interface from the Internet.

Table 1 Services to be allowed on the firewall

### How to configure firewall integrated in Kerio Operator

Prepare groups of IP addresses which you wish to allow for individual services (create them in **Configuration** → **Definitions** → **IP Address Groups**).

You can configure the integrated firewall in section **Configuration** → **System** on tab **Firewall**.

#### Web server

If you want to restrict connections to Kerio Operator Administration and Kerio MyPhone, check this option and select an IP group with addresses from which access will be allowed. Bear in mind that all the PBX users should be allowed to connect to *Kerio MyPhone* at least from their own workstation.

#### SIP

We recommend to restrict the SIP protocol solely to your internal network and external IP addresses of your SIP provider.

### Phone provisioning

For security reasons, we recommend to restrict automatic phone provisioning solely to your internal network because TFTP sends configuration data as plain text.



If the options are unchecked, no restrictions are set.

### How to configure protection against password guessing

Login data guessing is one of the most common attacks on a PBX. In Kerio Operator, attackers try to guess extension numbers and SIP passwords. This type of attack is defined by many unsuccessful attempts to enter extension number and SIP password during a login. Kerio Operator security settings enable you to limit the number of attempts of a phone (both software and hardware) to connect to the PBX. Apply settings as described below:

1. In the administration interface, go to **Configuration** → **Advanced Options** → **Security**.
2. Set the limit of unsuccessful attempts (usually 3 to 10 attempts) and set the time period during which attempts will be counted.

Setting the time period protects real users who have forgotten their password or who have made mistakes during several logins. When the time limit expires, they can try to login to the PBX again.

3. Set the time during which Kerio Operator will block the source IP address.
4. You can also enter an email address that will be used for sending warnings about blocked IP addresses.

#### *How to recognize there has been an attack attempt*

In log **Security** look for the Authentication failed string. If there are many messages of this kind, somebody is trying to use a dictionary attack.

### What to do in case of an attack

In case of an attack, apply the following instructions as soon as possible:

1. In section **Status** → **Calls** and in logs, look for information on which account has been abused.
2. Change the SIP password of this account.
3. Instruct users about handling their login details and secure behavior on the Internet.
4. The PBX is blocked, so it needs to be unlocked again.

# Creating user accounts

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## What are user accounts

User accounts in Kerio Operator are used for:

- login users to Kerio MyPhone,
- link users with an extension,
- set access rights to the system.

## How to add new accounts

You can add either new local accounts or existing accounts from a directory service.

### How to add local accounts

If you do not use directory services, create a local user in the Kerio Operator administration. In section **Configuration** → **Users**, click on the **Add** option.

On the **General** tab, fill in username and password. The username must not contain spaces, national and special symbols. Other items are optional.

### How to add accounts from directory service

You need basic login credentials to connect directory service to Kerio Operator.

To add users from a directory service, you need to:

- to set mapping from directory service
- activate users

### How to connect Kerio Operator with directory service

Mapping differs according to the directory service used:

- Microsoft Active Directory
- Apple Open Directory
- Kerio Directory (New in Kerio Operator 2.0!)

### **Additional Settings**

Information about adding, removing or editing users can be found in the Config log.

# Call forwarding

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## What is call forwarding

Incoming calls can be routed to different internal extensions or external numbers. Calls may either ring only at the redirected phone or at all phones at a time.

## How to configure call forwarding in the administration

Example:

Mr Peter Prank, General Manager at Live And Let Laugh Inc, requires that his calls are forwarded to:

- his desk phone (internal extension in Kerio Operator),
- to his company cell phone (to be available in case the server is down),
- we disable redirecting to voicemail because his boss hates voicemail.

Configure the redirecting as follows:

1. Thomas Punchline, the company network administrator, goes in the **Users** section in Kerio Operator and double-clicks on the IT administrator's account.
2. In the edit user dialog, he goes to the **Ringling Rules** tab.
3. He selects the **Forward to** option and enters the cell phone number in appropriate format. This means a format which is required by the VoIP service provider. He adds a prefix for outgoing calls.
4. He disables option **Fallback to voicemail**.



Users can also use the Kerio MyPhone interface to forward their calls. It is therefore necessary to be careful for them not to overwrite their own settings.

## How to configure call forwarding in Kerio MyPhone

If users wish to redirect calls to another number, they can do so in their Kerio MyPhone. The settings are described in article [Redirecting calls in Kerio MyPhone](#)



# Configuring multiple registration of an extension

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## What is multiple registration of an extension

Do you want to use your extension with various phones? Softphone in your cell phone or IP phone in your smartphone? The solution is multiple registration.



Multiple registration (in contrary to assigning more extensions to one user) gives user the possibility to call from the same extension any time they make a call.

### **Example:**

User Brenda Roar with username broar working at the Marketing department uses the extension 224. When necessary, she also works from home. She uses the following to communicate:

1. She has an automatically provisioned phone Cisco 7940 in his office.
2. She has X-Lite softphone on her home computer.
3. Occasionally, when connected via WiFi, she uses a SIP client on her mobile phone.

With correct settings of multiple registration that will be described in the following chapter she can use all the before-mentioned methods to authenticate.

## How to create auto attendant scripts in Kerio Operator 2.0 and later

1. Open section **Configuration** → **Extensions**.
2. Select Brenda Roar's extension (224). Click on **Add** → **Add Another Registration**.
3. A new registration is added to the user table. Add another registration. The result should be similar to the following image<sup>2</sup>.

## Configuring multiple registration of an extension

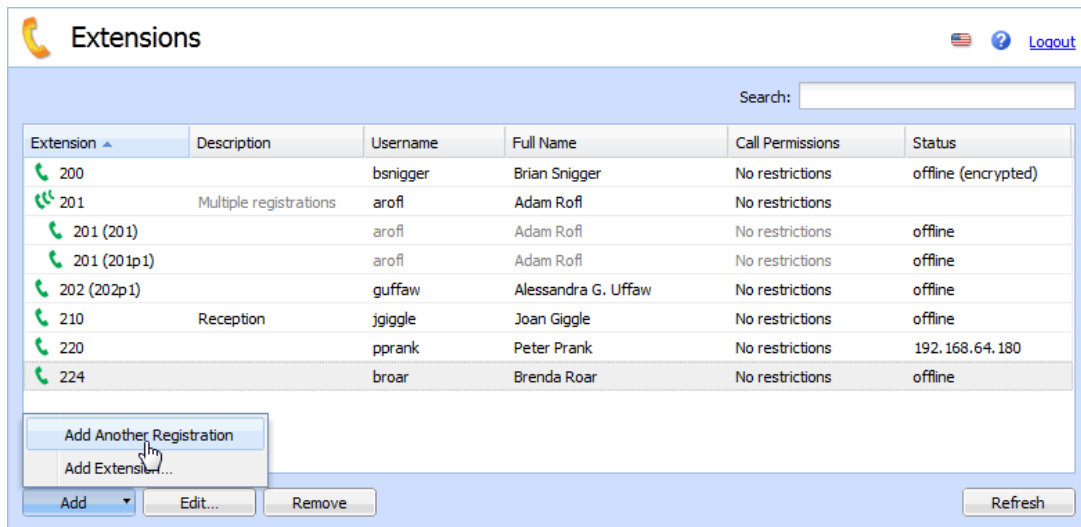


Figure 1 Extensions → Add Another Registration

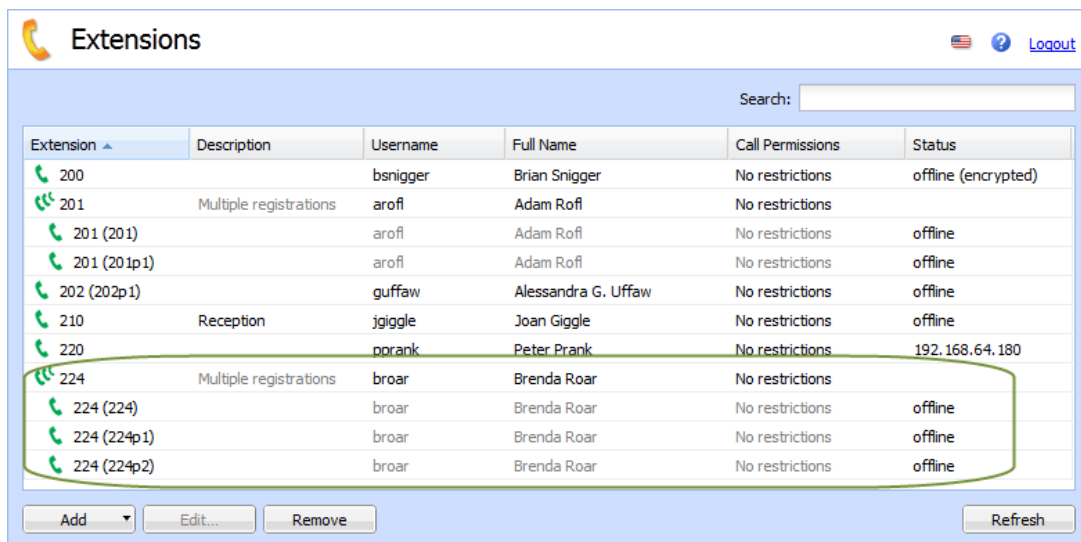


Figure 2 Extensions → Multiple registration

4. Double-click the 224p1 registration and note the SIP username and SIP password from the opened dialog (see figure 3).
5. Save the settings.
6. In the X-Lite settings (detailed info for installation can be found in article [Configuring the X-Lite software phone](#)), enter the newly generated string into **User ID** and the SIP password into **Password**.
7. Repeat steps 4 to 6 for the second registration for the SIP client on a mobile phone.

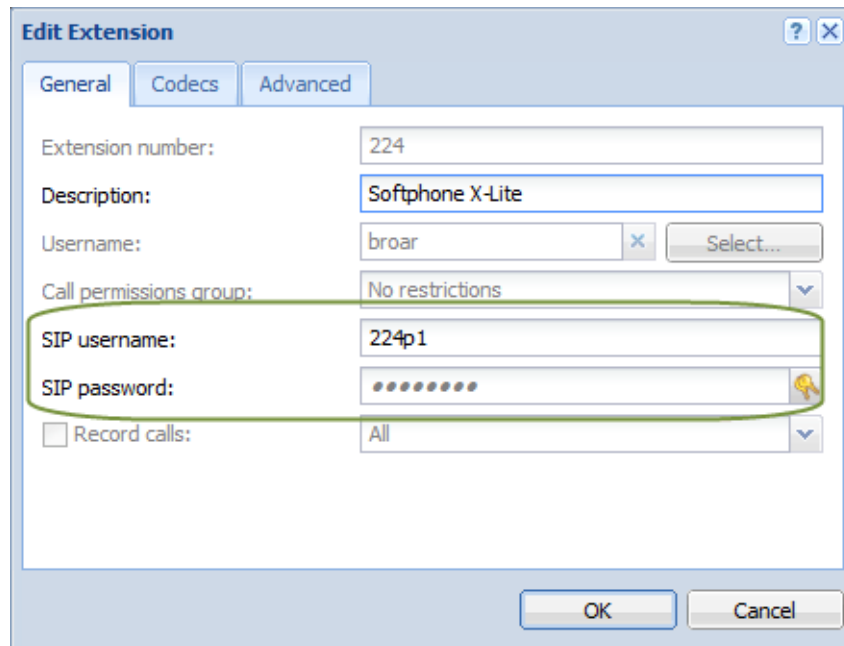


Figure 3 Edit Extension → Login information for X-Lite

## How to create multiple registrations in Kerio Operator 1.2 and later

1. Open section **Configuration** → **Extensions**.
2. Look up Brenda Roar's extension 224 and open the extension edit dialog.
3. Check the **Allow multiple registrations** and set the **Number of manually configured phones** to 2 (X-Lite and SIP client in the mobile phone).
4. Click on SIP Usernames and note the strings (with letter u at the end).
5. Save the settings.
6. In the SIP client and softphone configurations, enter the newly generated strings as User IDs.

# Displaying, hiding and overriding phone numbers

---

## How to hide user's phone number

You can hide user's phone number for outgoing calls as follows:

1. You can get the user's extension in the administration interface in section **Configuration** → **Users**.
2. Go to section **Configuration** → **Extensions**.
3. Open the **Edit Extension** dialog.
4. Go to tab **Advanced** and select the **Hide** option in the **Caller ID for outgoing calls** section.



Some registrars (VoIP service providers) do not allow to hide phone numbers. If you are connected through such registrar, the settings will not work (see article [Connecting to VoIP service provider](#)).

### *Example:*

Mr Peter Prank, General Manager at Live And Let Laugh Inc, often needs to make calls from his extension to management departments of significant customer companies. However, according to the book, only his personal assistant Alessandra G. Uffaw and the company operators Joan Giggle and Brian Snigger are allowed to know the extension number. For outgoing calls from Mr Prank's extension, Thomas Punchline sets the number as hidden.

## How to change phone number to display

You can change user's phone number for outgoing calls as follows:

1. You can get the user's extension in the administration interface in section **Configuration** → **Users**.
2. In section **Configuration** → **Extensions**, create (or make sure there is) an extension which will be used instead of the current one.
3. Go to section **Configuration** → **Extensions**.
4. Open the **Edit Extension** dialog.

5. Switch to the **Advanced** tab.
6. Select the **Override with** option and select a new extension in the list.

***Example:***

Though either Mr Oscar Jape, Sales Department Manager at Live And Let Laugh Inc, does not want customers to contact him directly, it is not very desirable for them not to see who is calling and possibly call back if they need to discuss any invoicing or orders issues. Frederic Jovial, the local market call assistant, is authorized to communicate with Mr Jape's customers. The telephony system administrator therefore sets outgoing calls from Mr Jape's extension to display direct number to Mr Jovial's extension on the callees' phone.

# Connecting Kerio Operator to directory service

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## Which directory services are supported in Kerio Operator



Kerio Operator from version 2.0 supports a new product — Kerio Directory!

Kerio Operator supports the following directory services:

- Microsoft Active Directory
- Apple Open Directory
- Kerio Directory

## What is the connection used for

In practice, mapping accounts from a directory service provides the following benefits:

### Easy account administration

Apart from the internal database of user accounts, Kerio Operator can also import accounts and groups from an LDAP database. Using LDAP, user accounts can be managed from a single location. This reduces possible errors and simplifies administration.

### Online cooperation of Kerio Operator and directory service

Additions, modifications or removals of user accounts/groups in the LDAP database are applied to Kerio Operator immediately.

### Using domain name and password for login

Users may use the same credentials for Kerio MyPhone login and domain login.



- Mapping is one-way only, data are synchronized from directory service to Kerio Operator. Adding a new user in Kerio Operator creates a local account — it will not be duplicated into the directory service database.
- When creating user accounts in a directory service, ASCII must be used to specify usernames. If the username includes special characters or symbols, user may not be able to login to Kerio MyPhone or the administration interface.
- If you disable users in Microsoft Active Directory, they are also disabled in Kerio Operator (they will not be able to login to Kerio MyPhone, make or receive calls with their extensions).
- If you disable users in Apple Open Directory, they stay enabled in Kerio Operator.

Phone extensions can be managed in a directory service (if available) or locally in Kerio Operator. Select the most convenient option.

## How to connect to directory service

To map users from a directory service:

- connect to directory service in section **Configuration** → **Advanced Options** → **Directory Service**.
- activate users in section **Configuration** → **Users**.

All information about directory services can be found in the Config log.

### Kerio Directory

For information on how to map users from Kerio Directory to Kerio Operator, see article [Connecting Kerio Directory to Kerio Operator](#).

### Microsoft Active Directory

In the administration interface, go to **Configuration** → **Advanced Options** → **Directory Service**.

1. Check the **Map user accounts from a directory service** option and select your directory service type.
2. In the **Domain name** field, enter the name of your Microsoft Active Directory domain — the domain name is then copied in other necessary fields.
3. In the **Hostname** field, enter the DNS name or IP address of the Microsoft Active Directory server. If you have a backup server, enter its name in the **Secondary hostname** field.
4. In the **Username** and **Password** fields, enter the authentication data of a user with at least read rights for Microsoft Active Directory database. Username format is `user@domain`.
5. Within the communication of the Microsoft Active Directory database with the PBX, sensitive data may be transmitted (such as user passwords). For this reason, it is recommended to secure such traffic by using SSL. To enable LDAPS in Microsoft Active Directory, it is necessary to run a certification authority on the domain controller that is considered as trustworthy by Kerio Operator.
6. The rest of the items in the dialog are completed automatically. Do not change them unless you have a special reason to do so. These items are Microsoft Apple Open Directory domain name and Kerberos Realm which has to match the Microsoft Active Directory domain name, written in capital letters.

## Connecting Kerio Operator to directory service

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### Apple Open Directory

In the administration interface, go to **Configuration** → **Advanced Options** → **Directory Service**.

1. Check the **Map user accounts from a directory service** option and select your directory service type.
2. In the **Domain name** field, enter the name of your Apple Open Directory domain — the domain name is then copied in other necessary fields.
3. In the **Hostname** field, enter the DNS name or IP address of the Apple Open Directory server. If you have a backup server, enter its name in the **Secondary hostname** field.
4. In the **Username** and **Password** fields, enter the authentication data of a user with at least read rights for Apple Open Directory database. Username format is `user@domain`.
5. Within the communication of the Apple Open Directory database with the PBX, sensitive data may be transmitted (such as user passwords). For this reason, it is recommended to secure such traffic by using SSL. To enable LDAPS in Apple Open Directory, it is necessary to run a certification authority on the domain controller that is considered as trustworthy by Kerio Operator.
6. The rest of the items in the dialog are completed automatically. Do not change them unless you have a special reason to do so. These items are Apple Open Directory domain name and Kerberos Realm which has to match the Apple Open Directory domain name, written in capital letters.

### How to activate users from a directory service

Once the mapping is set, select individual users and map them to the PBX. This is how to map users:

1. Open the **Configuration** → **Users** section.
2. In the main window, click on **Add** → **Add from Directory Service**.
3. In the dialog, select all users you wish to map (you can also add users later) and click **Next**.
4. If users in the directory service have phone extensions assigned, you can either keep them or disable them. If you disable them, you have to assign new extensions. You can do it, for example, while changing your dial plan.
5. Click on **Finish**. Activated users are displayed in section **Configuration** → **Users**.





Only extensions in attributes `telephoneNumber` (Microsoft Active Directory, Apple Open Directory) and `otherTelephone` (Microsoft Active Directory) can be mapped (are displayed). If you create special attributes in a directory service for your phone numbers, you will not be able to map such extensions.

# Phone Provisioning Settings

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## What is phone provisioning

Phone provisioning is used for automatic configurations of selected hardware SIP phones. Phone provisioning means:

- phone automatically connects to the PBX after booting and is assigned a phone extension,
- extensions are managed in the administration interface,
- if you confirm or plan it, the system will perform an automatic restart of provisioned phones if needed,
- phone firmware is automatically updated.



Automatic firmware update is not supported for the Polycom phones and the original Cisco phones (Cisco SPA is supported). However, there is a possibility to update the firmware. You can upload all necessary files to folder `/var/tftp` in Kerio Operator manually. For detailed information see article [Uploading configuration files to Kerio Operator TFTP server](#).



Use of phone provisioning is not always suitable. If Kerio Operator is located and runs in the Internet, for security reasons we do not recommend to use automatic phone provisioning.

## What you need

1. In your local network, you need a DHCP server supporting parameter 66 (TFTP server address). Enter the address of Kerio Operator in this parameter.



DHCP server integrated in [Kerio Control supports parameter 66](#).

2. Only [selected phones](#) support automatic phone provisioning.
3. Appropriate settings need to be done in Kerio Operator.



If you wish to connect a phone which is not currently supported in Kerio Operator, you cannot use automatic provisioning. The configuration must be done on the hardware phone.

## How to add a phone in version 2.0 and newer

1. In the administration interface, go to **Configuration** → **Phone Provisioning** → **tab Hardware Phones**.
2. Click on **Provisioning Settings**. The configuration dialog windows is opened.
3. Check the **Enable provisioning** option. The option must be checked.
4. Check option **Create new extension for newly registered phones** in case you create users locally (do not map them from a directory service).



The **Create new extension for newly registered phones** option is checked by default. If you uncheck it, you cannot use automatic remote phone restart — you will have to restart phones manually if needed.

5. Each telephone must be authenticated when connecting to the PBX. Extension number and password are used for SIP authentication (Master Password in this case). Option **Master password for phones** enables to create one SIP password for all provisioned phones<sup>1</sup>.

If you disable option **Master password for phones**, all phones will have their own SIP passwords (it can be viewed in the configuration dialog of each phone).

Now the general environment for the provisioned phones is configured. Once a phone is connected to your network, it will be listed in section **Provisioned Phones**.

### Adding phones manually

Phones which are not connected to the network can also be provisioned. You may do so manually — you need the phone's hardware address and the type of the phone (see figure 2). The procedure is described below:

1. In section **Configuration** → **Provisioned Phones**, click on **Add**.
2. This opens a dialog which requires the hardware address of the phone (MAC address of the network card in the phone). The address may lack the colons (see figure 1). Once you save it, the colons will be added automatically.

<sup>1</sup> The password is saved in the configuration file which is sent to the phone upon the first connection to the network and the phone will use this password to authenticate at Kerio Operator.

## Phone Provisioning Settings

Extension	Full Name
220	Peter Prank

Figure 1 Connecting a phone manually

3. Select the correct type of the hardware phone (special configuration scripts are created according to the phone type).
4. Assign the phone user or users who will use it (see figure 2).



If you do not know to which person the extension will be assigned, check option **Generate new extension number** and the extension will be assigned automatically. Phones without extensions assigned cannot be provisioned.

### Importing from CSV file

Phones can be imported from a CSV file. Data in the file must follow certain rules:

- hwAddress — hardware address of the phone,
- phoneManufacturer — name of the phone's manufacturer,
- phoneType — phone type,
- extension1; extension2; ... — extensions assigned to the phone. The maximum number of extensions depends on the phone type.

Each phone uses one line and all items are separated by a semicolon.

The file may look as follows:

00:1a:a0:be:1e:cd;Cisco;7940;111;112  
00:1b:b0:cd:e1:ca;Cisco;7960;115  
00:1c:c0:ab:a2:24;Linksys;SPA942;113;114

Import data from a CSV file as described below:

1. In section **Configuration** → **Provisioned Phones**, click on **Add** → **Import from CSV**.
2. This opens dialog **Import Phones From CSV** — click on **Upload CSV file**.
3. If the data in the file are correct, a list of all the phones and extensions is displayed. Check those you want to import.
4. Confirm selection by clicking on **OK**.
5. The imported phones are displayed in the **Provisioned Phones** table.

### Restarting provisioned phones

When you change configuration which affects provisioned phones, the phones need to be restarted (for example, when you create a new call route). When you do so, a dialog window recommending phone restart is displayed. You can do it immediately or wait for a more convenient time (for example to an off-peak time). To restart phones later:

1. Open the **Provisioned Phones** section.
2. Click on the **Advanced** → **Restart all phones** button.

### Firmware

Kerio Operator allows easy installation of phone firmware which are managed through the phone provisioning:

1. Go to section **Configuration** → **Provisioned Phones** and click on the **Advanced** → **Firmwares** button.
2. In the **Firmwares** dialog, click on **Upload**.
3. This opens a dialog where you select a firmware file and confirm the selection.
4. In the **New firmware** dialog, select the appropriate phone.
5. Click **OK** to confirm the changes.

## Phone Provisioning Settings

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### What to do if you want to know the SIP password of your phone

If any of your users needs to know the SIP password of their phone, we do not recommend to provide them with the Master Password. We have a specific solution:

1. In the administration interface, go to **Configuration** → **Phone Provisioning** → **tab Hardware Phones**.
2. Click on **Provisioning Settings**.
3. Disable Master password.

Once you disable it, each phone will have their own SIP password which can be shared with individual users.

### How to add a phone in version 1.2 and older

1. In the administration interface, go to **Configuration** → **Phone Provisioning**.
2. Check the **Enable provisioning** option.
3. In the **First extension** field, enter the extension number which will be used as a starting number for provisioning. If 10 is set, the first phone will be assigned extension 10. The next phone will be assigned 11, then 12, etc. If the extension is already used (e. g. if it has been created manually), it will be skipped.

Select the first extension number according to your dial plan — for example, if you wish to have 3-digit extensions, start numbering with 100.

4. In the **Password for phones** field, you can change the SIP password for all provisioned phones. You can use any password, however, we recommend to follow secure password policy. Each telephone must be authenticated when connecting to the PBX. Extension number and password are used for the authentication. If provisioning is used, this password will be applied for all provisioned phones.<sup>2</sup>

Clicking the icon with keys displays the current SIP password.



The **Create new extension for newly registered phones** option is checked by default. If you uncheck it, you cannot use automatic remote phone restart — you will have to restart phones manually if needed.

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<sup>2</sup> The password is saved in the configuration file which is sent to the phone upon the first connection to the network and the phone will use this password to authenticate at Kerio Operator.

### Connecting phones manually

Phones which are not connected to the network can also be provisioned. You may do so manually — you need the phone's hardware address and the type of the phone (see figure 2). The procedure is described below:

Extension	Full Name
200	Joan Giggle
210	Brian Snigger

Figure 2 Connecting a phone manually

1. In section **Configuration** → **Provisioned Phones**, click on **Add manually**.
2. This opens a dialog which requires the hardware address of the phone (MAC address of the network card in the phone).
3. Select the correct type of the hardware phone (special configuration scripts are created according to the phone type).
4. Assign the phone user or users who will use it (see figure 2).



If you do not know to which person the extension will be assigned, check option **Generate new extension number** and the extension will be assigned automatically. Phones without extensions assigned cannot be provisioned.

## Phone Provisioning Settings

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### Importing from CSV file

Phones can be imported from a CSV file. Data in the file must follow certain rules:

- hwAddress — hardware address of the phone,
- phoneManufacturer — name of the phone's manufacturer,
- phoneType — phone type,
- extension1; extension2; ... — extensions assigned to the phone. The maximum number of extensions depends on the phone type.

Each phone uses one line and all items are separated by a semicolon.

The file may look as follows:

```
00:1a:a0:be:1e:cd;Cisco;7940;111;112
00:1b:b0:cd:e1:ca;Cisco;7960;115
00:1c:c0:ab:a2:24;Linksys;SPA942;113;114
```

Import data from a CSV file as described below:

1. In section **Configuration** → **Provisioned Phones**, click on **Add** → **Import from CSV**.
2. This opens dialog **Import Phones From CSV** — click on **Upload CSV file**.
3. If the data in the file are correct, a list of all the phones and extensions is displayed. Check those you want to import.
4. Confirm selection by clicking on **OK**.
5. The imported phones are displayed in the **Provisioned Phones** table.

### Restarting provisioned phones

When you change phone provisioning configuration, all the phones need to be restarted (for example, when you create a new call route). When you do so, a dialog window recommending phone restart is displayed. You can do it immediately or wait for a more convenient time (for example to an off-peak time). To restart phones later:

1. Open the **Provisioned Phones** section.
2. Click on the **Advanced** → **Restart all phones** button.

### Firmware

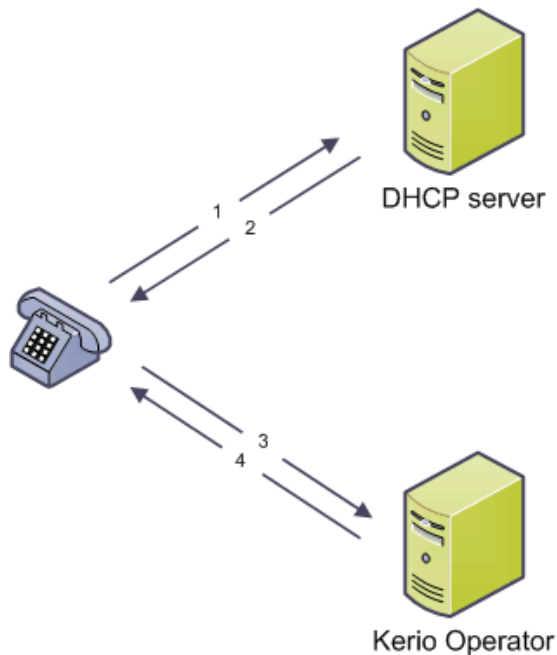
Kerio Operator allows easy installation of phone firmware which are managed through the phone provisioning:

1. Go to section **Configuration** → **Provisioned Phones** and click on the **Advanced** → **Firmwares** button.
2. In the **Firmwares** dialog, click on **Upload**.



3. This opens a dialog where you select a firmware file and confirm the selection.
4. In the **New firmware** dialog, select the appropriate phone.
5. Click **OK** to confirm the changes.

### How phone provisioning works



1) After connecting to network, the phone sends a DHCP request.

2) DHCP server sends a DHCP answer with the address of Kerio Operator in parameter 66.

3) The phone connects to Kerio Operator. Kerio Operator checks whether the phone is in its database.

4) Kerio Operator sends a configuration file to the phone. This configuration file assigns an extension/extensions to the phone and configures other parameters necessary for phone provisioning.

Figure 3 Automatic HW phone provisioning

This is how the automatic phone provisioning works:

- The telephone boots in the network and sends a DHCP request for an IP address.
- DHCP server accepts the request, assigns an IP address and sends it back in a DHCP reply. Besides the IP address, the message also contains TFTP (Trivial File Transfer Protocol) server address — Kerio Operator, in our case.
- SIP phone connects to TFTP server integrated in Kerio Operator.
- Kerio Operator checks whether the phone is new:
  - if it is new, Kerio Operator generates a new phone extension for the phone;
  - if it is not new, Kerio Operator finds the extension which the phone has used.
- Kerio Operator generates a configuration file suitable for the particular phone type and sends it via the TFTP protocol.
- The phone is configured using the values it has acquired in the configuration file and is ready to be used.

**Phone Provisioning Settings**

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 Some phones perform an automatic restart during the configuration.

# Configuring parameter 66 in DHCP server in Kerio Control

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## What is parameter 66 in a DHCP server?

The DHCP protocol assigns IP addresses. Apart from these addresses you can also send additional parameters via the DHCP protocol. Parameter 66 configures the [TFTP](#) server address.

## How to set parameter 66 in Kerio Control

1. In the administration interface, go to section **DHCP server**.
2. If you use the automatically generated scopes, use **Click to configure scopes manually**.
3. Select a scope and open its settings (the **Edit Scope** dialog).
4. Click on the **Add** button.
5. Add parameter 66.
6. Enter a public IP address through which Kerio Operator communicates.

# Uploading configuration files to Kerio Operator TFTP server

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## Why to use phone or other device configuration file



Uploading configuration files is supported in Kerio Operator 2.0

- phone provisioning of unsupported devices (hardware phones or other devices with a TFTP client)
- phone firmware upgrade
- BLF configuration, ring tones (different ring tones for different phones)
- password change for all extension assigned to one phone

## How to obtain the original configuration file

The following instructions will come in handy, if you wish to change the configuration file of a provisioned phone:

1. In the administration interface, go to **Configuration** → **Phone Provisioning**.
2. Right-click the phone whose configuration file you wish to download.
3. Click on **Download Original Configuration**.
4. The original configuration will be automatically saved on your computer.

## 12.3 How to upload a new or changed configuration file to Kerio Operator

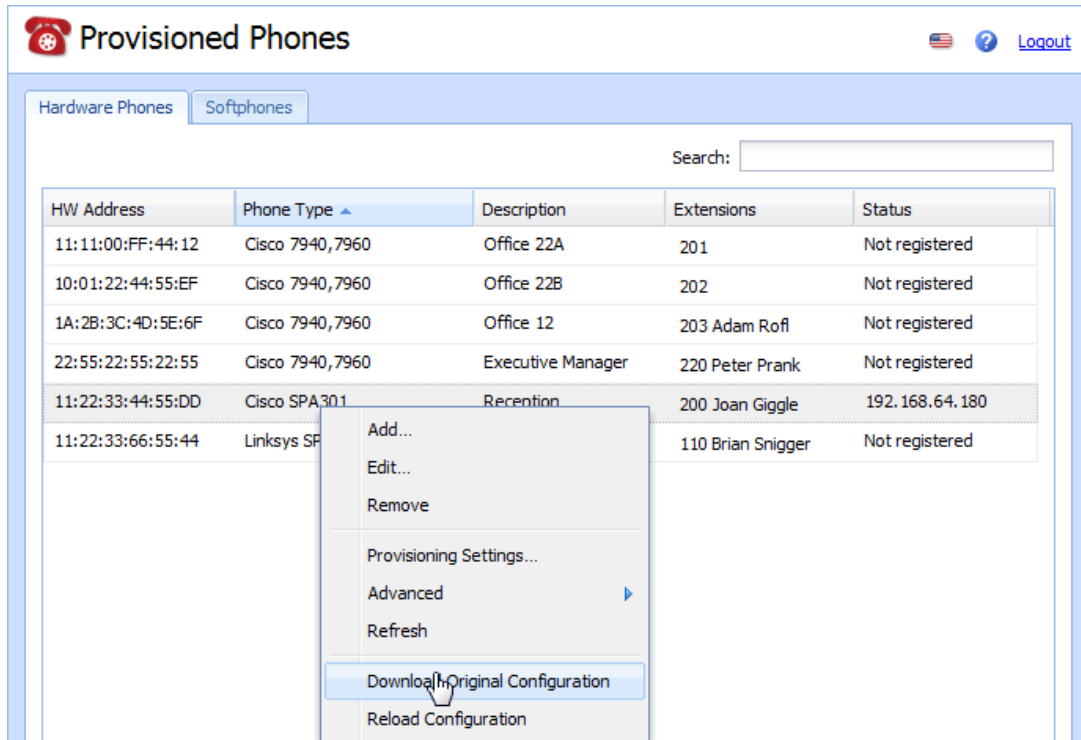


Figure 1 Downloading the original configuration



This will open a window with information about where to save the configuration file. Note down the information. Configuration files for different phones need to be saved to different directories.

## How to upload a new or changed configuration file to Kerio Operator

### What you need

The file must be uploaded via SSH using SCP.

### How to enable SSH in Kerio Operator

Follow these instructions:

1. In the administration interface, go to section **Status** → **System Health**.
2. Click on **Tasks** while pressing the **Shift** key.
3. Select **Enable SSH**.
4. Connect to Kerio Operator via SCP and upload the file via SSH using SCP. Do not forget to save it to the folder you noted down while downloading [the original configuration file](#).

# Connecting to VoIP service provider

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## How to connect Kerio Operator to the outside world

Kerio Operator can be connected to an SIP server of your VoIP service provider or to a standard analogue network. This article deals with the first option — connecting to a VoIP service provider.

## What information to get from your provider

Before you configure an interface, you need to know:

- telephone number or numbers from your SIP provider,
- DNS name of SIP server and the port (usually 5060 for TCP and UDP) on which it communicates (you get the information from your provider),
- username and password for authentication to the SIP server of the provider (you get the information from your provider).
- at least one internal extension defined in Kerio Operator (preferably an employee who will redirect the calls).

## How to add communication interface

To configure an interface, you have to configure call routing. Once you configure routing of incoming calls, routing of outbound calls will be configured automatically.

1. In the administration interface, go to section **Configuration** → **Call Routing** and click on the **Add a SIP interface** button. This opens the configuration wizard.
2. Enter a name for the interface (e.g. provider name). The name must not contain spaces, national and special characters and must be unique.
3. Select **New provider**. The configuration differs for settings with one number, multiple numbers and an SIP trunk with an interval of phone numbers:

### One number

1. If you acquired one phone number from your provider, enter the number in the **New provider** → **With external number** field (in a pattern supplied by your provider) and click on **Next**.
2. Select an extension for the operator who will direct all external calls made to the number from your provider to internal extensions created in Kerio Operator.

3. In the **Prefix to dial out** field, enter a prefix to be used for outgoing calls. The prefix is used by Kerio Operator to route calls to the SIP server of your provider.
4. Click on **Next**.
5. Enter data acquired from your provider (DNS name and port of the SIP server and username and password for authentication).
6. Check the **Required to register with Registrar** option, the first time registration to an SIP server is required by the majority of providers.
7. If the user ID differs from the telephone number, type it in the user ID field.



Some registrars that require these settings do not allow hiding phone numbers (extensions settings: **Configuration** → **Extensions** → **add or edit extension dialog** → **tab Advanced**).

**Example:**

There are many calls received at Live And Let Laugh Inc every day &mdash; calls from salesmen, business partners, customers, authorities, private calls. One of the solutions of where to direct all calls is to use the extension of the company assistants Joan Giggle and Brian Snigger, depending who is currently on duty. The assistant in service redirects calls or answer them themselves.

### Multiple numbers

1. If you acquired multiple phone numbers from your provider, enter the numbers, separated by commas, in the **New provider** → **With external number** field (in a pattern supplied by your provider) and click on **Next**.
2. Select an extension for the operator who will direct all external calls made to the number from your provider to internal extensions created in Kerio Operator.
3. In the **Prefix to dial out** field, enter a prefix to be used for outgoing calls. The prefix is used by Kerio Operator to route calls to the SIP server of your provider.
4. Click on **Next**.
5. Enter data acquired from your provider (DNS name and port of the SIP server and username and password for authentication).
6. Check the **Required to register with Registrar** option, the first time registration to an SIP server is required by the majority of providers.

## Connecting to VoIP service provider

7. If the user ID differs from the telephone number, type it in the user ID field.



Some registrars that require these settings do not allow hiding phone numbers (extensions settings: **Configuration** → **Extensions** → **add or edit extension dialog** → **tab Advanced**).

8. Save the settings.
9. In section **Call Routing** → **Interfaces and routing of incoming calls**, double-click on one of the lines with information about mapping of calls to the operator's extension (figure 1).

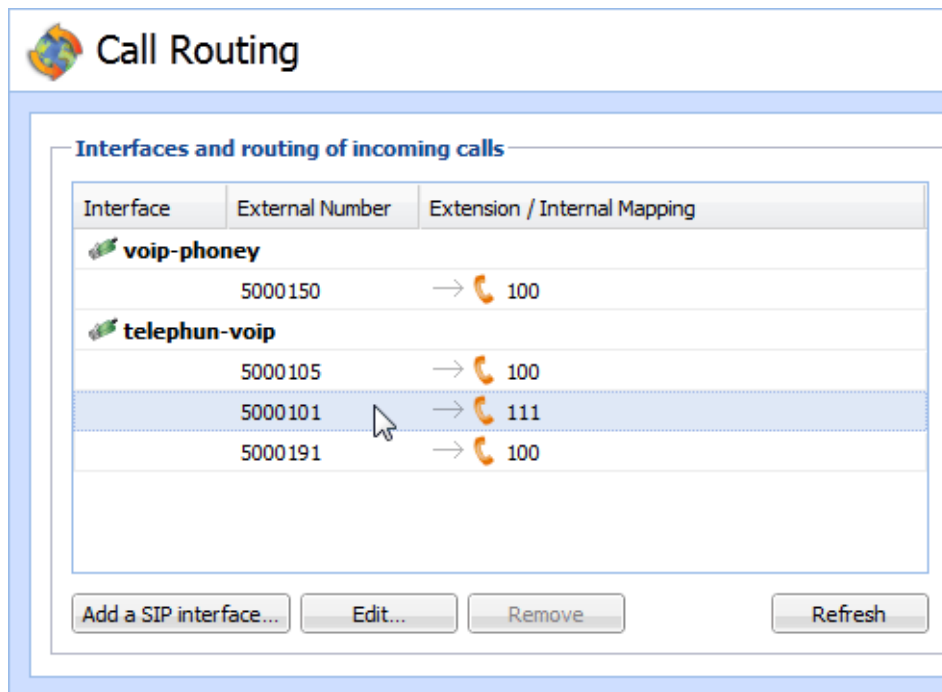


Figure 1 Mapping individual numbers to internal extensions of Kerio Operator

10. The **Edit Incoming Call** dialog is displayed (see figure 2). Click on a line in the **Extension** column to map external numbers to internal extensions.



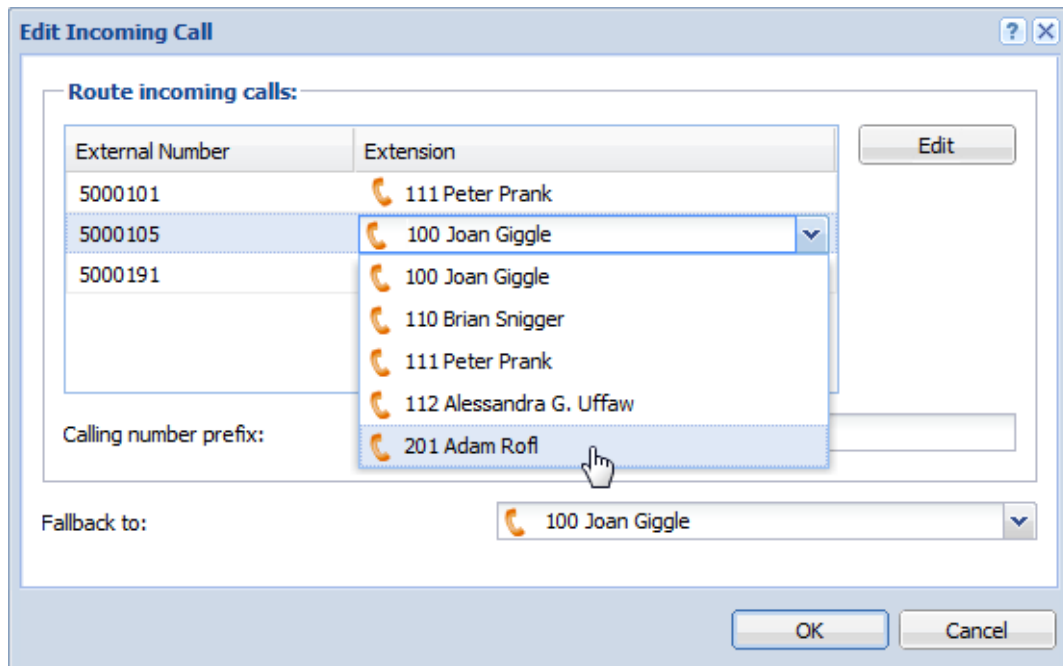


Figure 2 Mapping individual numbers to internal extensions of Kerio Operator

**Example:**

If your provider Telephon VoIP gave you a set of telephone numbers which do not cover all your internal telephone extensions, you can let part of the calls be forwarded by operators Joan Giggle and Brian Snigger. Then you can map other numbers in pairs.

### Interval of numbers

1. If you acquired an SIP trunk with an interval of numbers from your provider, enter it in this specific pattern. Use X in place of the numbers to vary.
2. Click on **Next**.
3. Select an extension for the operator who will manually direct all external calls made to the numbers from your provider to internal extensions unless mapping is configured. Some numbers from the assigned trunk may be unallocated.
4. In the **Prefix to dial out** field, enter a&nbsp;prefix to be used for outgoing calls. The prefix is used by Kerio Operator to route calls to the SIP server of your provider.
5. Click on **Next**.
6. Enter data acquired from your provider (DNS name and port of the SIP server and username and password for authentication).

## Connecting to VoIP service provider

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7. Check the **Required to register with Registrar** option only if the provider requires registration. With large number intervals (so called “trunks”), providers usually do not require registration. The registration is replaced by an IP address of Kerio Operator. The address must be fixed and the provider needs to know about any changes.
8. If the user ID differs from the telephone number, type it in the user ID field.



Some registrars that require these settings do not allow hiding phone numbers (extensions settings: **Configuration** → **Extensions** → **add or edit extension dialog** → **tab Advanced**).

9. Click OK to confirm settings.
10. Finally, create a rewriting rule for correct mapping of numbers to internal user extensions.

## How to map numbers

Mapping external numbers to internal extension is described in [a separate article](#).

## Creating Alternative Connection for Route Backup

If you wish to backup your connection to the external network, you have to ensure connection with another (backup) SIP server or analogue phone extension (PRI/BRI/FXO). You may use a backup server of your VoIP service provider or you may choose another provider.

If you have a backup server, go to section **Configuration** → **Call Routing** and:

1. Create new interface for incoming calls for the backup server.
2. Go to section **Routing of outgoing calls** and double-click on the main interface (usually interface 0 in Europe or 9 in the USA). This opens the **Edit Outbound Route** dialog.
3. In table **Use the following external interfaces**, add your backup provider.

# Mapping external and internal numbers

## What is mapping of external and internal numbers?

Mapping of internal and external numbers allows to strip the external phone number to an internal extension. Generally, mapping can strip first 0 to N digits from the number (the number may be reduced to an empty string) and then add other digits to the number. The rewriting rule allows to modify the left part of the number as needed by cutting or extending the number and/or replacing the ciphers in the beginning of the number string. See the example in figure 1.

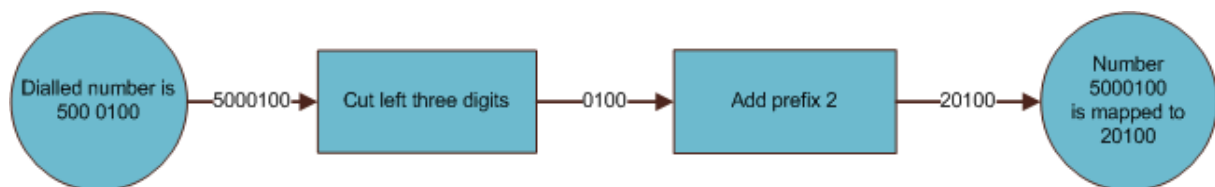


Figure 1 Rewriting rule for number 123456789

## How to map numbers for an SIP interface

The following example shows the necessity and profitability of number rewriting (see figure 2):

1. Thomas Punchline, the network administrator at Live And Let Laugh Inc, has acquired 1000 phone extensions from his provider (800225XXX, or 800225001 — 800225999). He now needs to map these external numbers 800225XXX 1:1 to the internal extensions XXX.
2. For incoming calls, he wants to add a prefix (9 in our example) to calling numbers so that it is easy for their users to dial back.

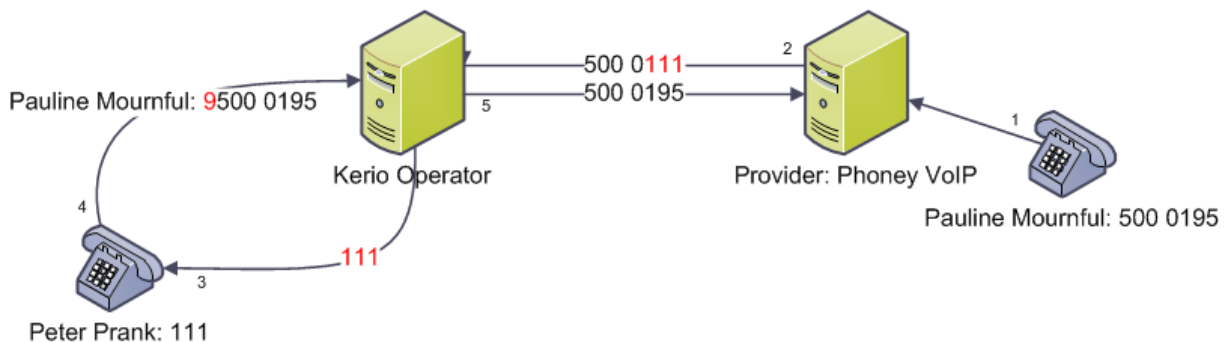
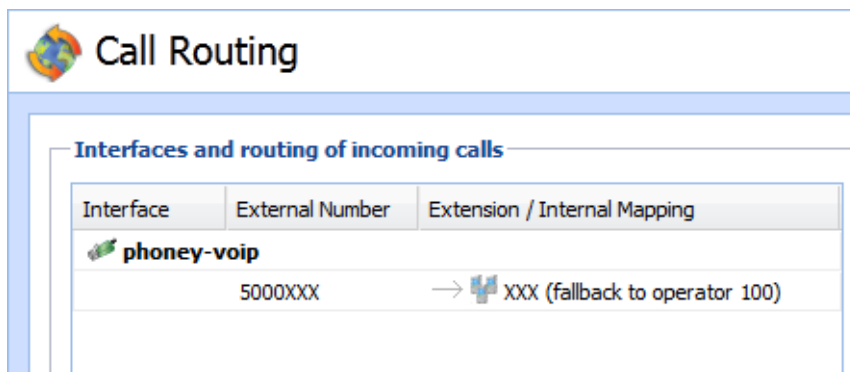


Figure 2 Incoming and answer call (read from right to left)

## Mapping external and internal numbers

To achieve this, it is necessary to modify the rule for incoming calls on the interface (phoney-voip in figure 3):

1. In the administration interface in section **Call Routing**, Thomas double-clicks on the routing rule for the interface of the SIP service provider (see figure 3).





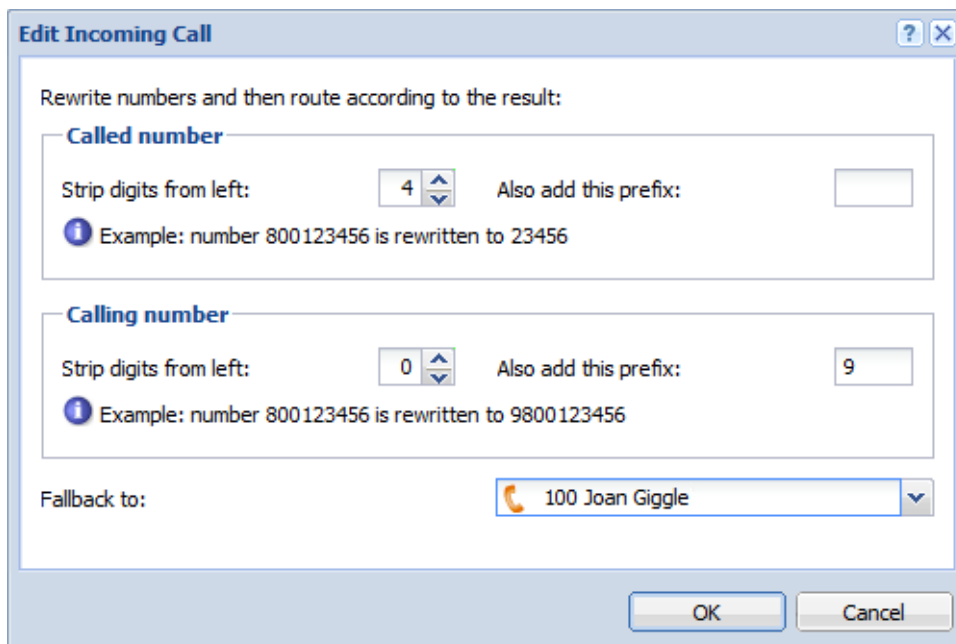
Interface	External Number	Extension / Internal Mapping
 <b>phoney-voip</b>	5000XXX	→  XXX (fallback to operator 100)

Figure 3 Rule for interface phoney voip

2. This displays the **Incoming Calls** dialog. Modify the called number so that only the extension remains. Therefore, Thomas strips first 6 ciphers from left (800225 in our example which leaves extension 111). No prefix is necessary.



**Edit Incoming Call**

Rewrite numbers and then route according to the result:

**Called number**

Strip digits from left:  Also add this prefix:

*Example: number 800123456 is rewritten to 23456*

**Calling number**

Strip digits from left:  Also add this prefix:

*Example: number 800123456 is rewritten to 9800123456*

Fallback to:

OK Cancel

Figure 4 Setting mapping

3. He does not strip any ciphers from the caller's number but adds prefix 9 to the left.



This setting applies to incoming calls. Incoming calls are such calls when someone from the external telephone network calls the internal extension of Kerio Operator. Naturally, there are also rewriting rules for outgoing calls. They are not described in our example because the initial settings usually suffice.

If you wish to understand the procedure, see article with [rules for outgoing calls](#) for standard telephone interface.

### How to map numbers for a standard analogue phone interface

Analogue interfaces use the same principles and, in addition, it is necessary to strip digits in numbers according to the needs of your telephone provider.

Telephone provider may send the callee's number whole or in a shortened form (usually last 4 digits) which are sufficient for recognition of the correct extension. Similarly, the provider may also require whole numbers or numbers in a shortened form (usually last 4 digits). Request this information from your provider before you start configuring the interface.

The following example explains mapping in detail:

- Company acquired 100 phone numbers from their telephone provider (an interval of numbers 55501XX).
- For incoming calls, the provider strips the callee's number to last four digits (the number looks like this: 01XX).
- For outgoing calls, the provider requires the caller's number in a shortened form (last 4 digits).
- Internal extension which will be bound to numbers from the acquired interval of numbers have format 2XX.
- Prefix for outgoing calls is 9.

Mapping is configured separately for incoming and outgoing calls.

#### ***Incoming calls***

[Figure](#) shows what happens when customer Joshua Spleen calls Adam Rofl in Live And Let Laugh Inc. Proceed from digit 1 from right.

1. After dialing a number, the call is automatically directed to a telephone provider based on the number's prefix.
2. Next, the number is identified by the telephone provider, stripped to the last four digits and sent to Kerio Operator.

## Mapping external and internal numbers

3. According to the rewriting rule, the number is then stripped from left to 2 digits and prefix 2 is added from left. Kerio Operator now works with internal extension 201 and the call is successfully connected.
4. There may arise a situation where user on extension 201 does not answer the call but wants to call back later. For that reason, it is necessary to define a callback rule. To achieve this, add a prefix for calling to external network (otherwise, callback will fail at the outgoing call interface).

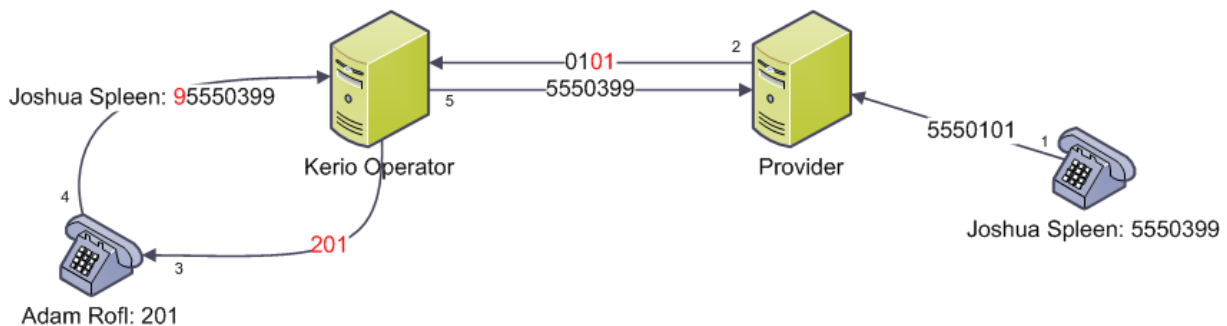


Figure 5 Incoming and answer call (read from right to left)

Make the following settings to achieve the above mentioned interface behavior:

1. Go to Kerio Operator Administration to section **Call Routing** and double-click the routing rule for the standard telephone interface (see figure 6).

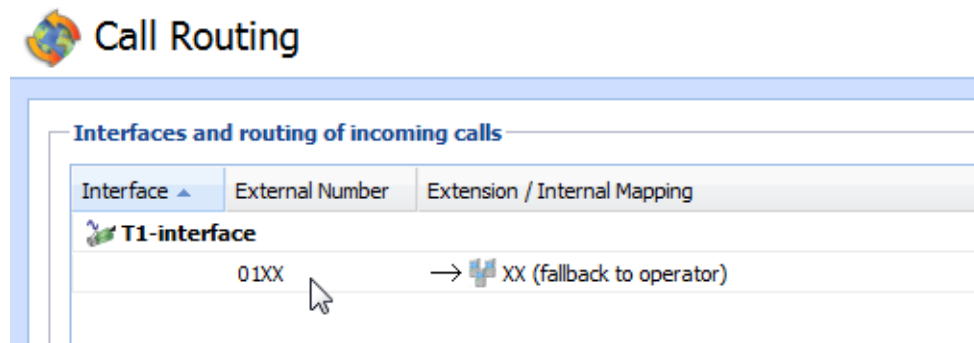


Figure 6 Rule for standard telephone interface T1

2. Dialog **Edit Incoming Call** is displayed. Bear in mind that only the last 4 digits are included in the string.  
Strip the first two digits from left. Add prefix 2 to the stripped number of two digits (see figure 7). This modification provides the final format of the internal extension (2XX).
3. We do not strip the digits in the calling number but we add prefix 9 from left (see figure 7).

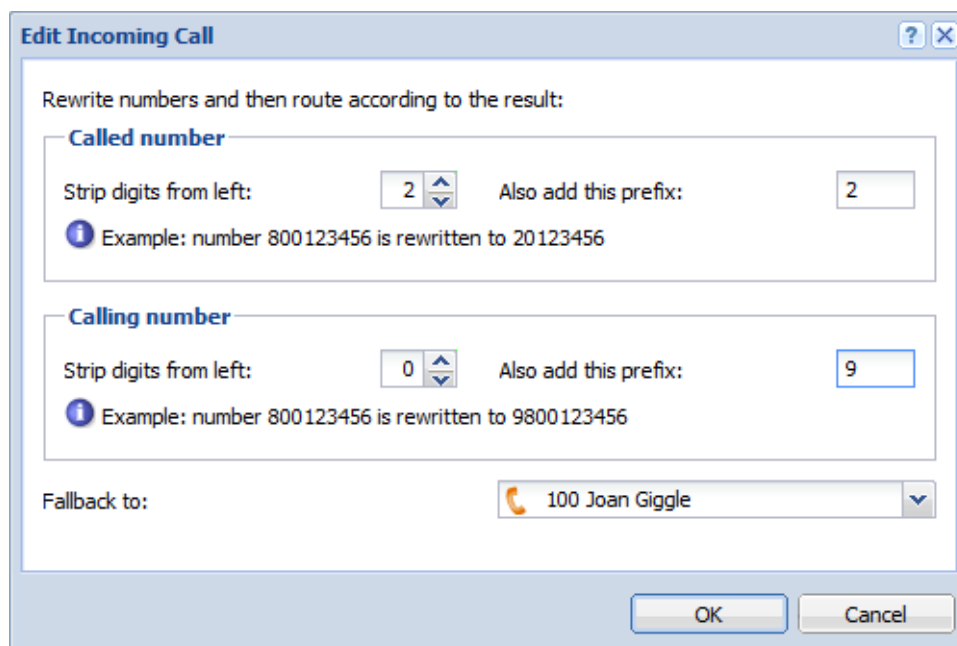


Figure 7 Rule for standard telephone interface T1

## How to configure mapping for outgoing calls

Mapping has to be also configured for outgoing calls. These are calls which are initiated by Adam Rofl and are directed to customer Taylor Poorteeth. We use the same example as in configuration of rewriting rules for incoming calls. The configuration will solve the following problems:

- Strip the prefix for outbound calls that determines to which interface (provider) the call will be directed (see figure 8).
- Adapt the internal extension which you call from in a way that the number meets the call criteria of your provider (see figure 9).

This scheme best describes the whole procedure 8 (follow the numbering):

1. Adam Rofl calls number 5550199. Since the called number is external, we must use prefix for calling external telephone network, which in our case is number 9. Final format of the number dialed by the user will be 95550199.
2. The rule strips prefix 9.
3. Kerio Operator directs the call to the called number.

The following example shows the way the internal extension changes during outgoing calls (see figure 9)>

1. Adam Rofl calls Taylor Poorteeth. Kerio Operator uses the rewriting rule which corresponds with the example in section ?? — firstly, Kerio Operator strips digit 2 from left. This leaves number 01. The rule appends number 01. The final number is 0101.

## Mapping external and internal numbers

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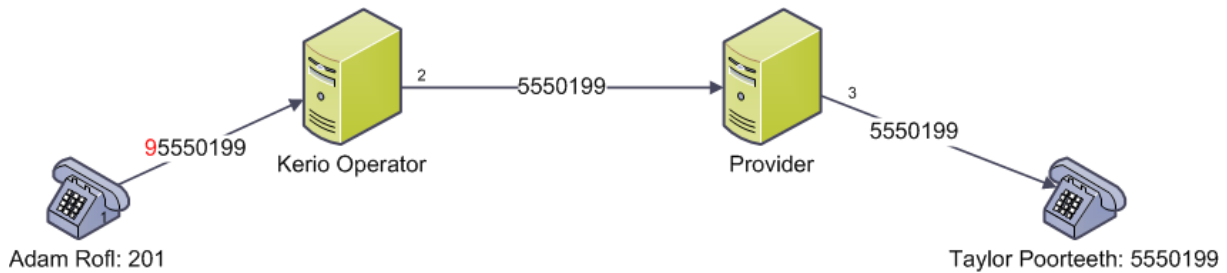


Figure 8 Scheme describing how to adapt called number

2. Since the telephone provider requires only the last four digits, the rule is complete and the number is sent.
3. Telephone provider adds the rest of the number from left and the callee sees the calling number in format 5550101.

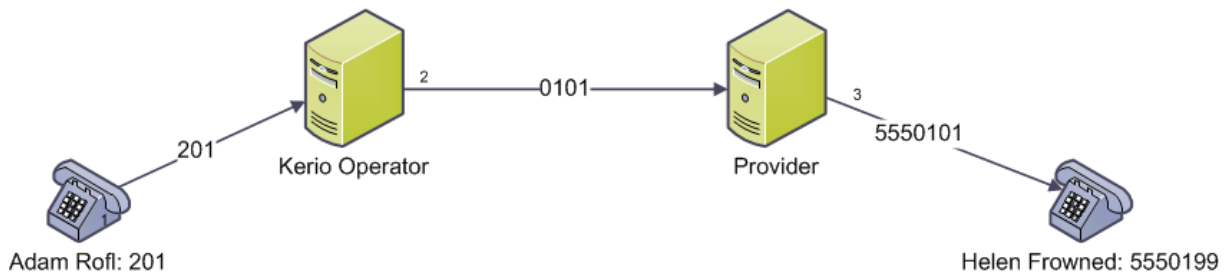


Figure 9 Scheme describing how to adapt calling number

Make the following settings to achieve the above mentioned interface behavior:

1. In the administration interface in section **Call Routing** in table **Routing of outgoing calls**, double-click the interface (interface with prefix 9 in our example).
2. This opens the **Edit Outbound Route** dialog; go to the **Rewrite Numbers** tab.
3. Strip prefix 9 from left in the called number (see figure 10).
4. Strip digit 2 from left in the calling number and add 01 (see figure 10).



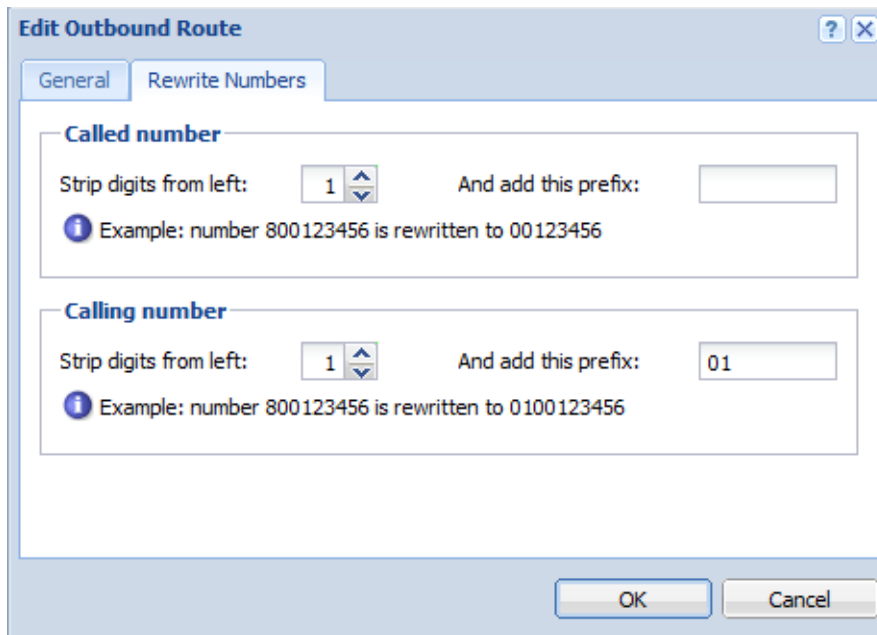


Figure 10 Outbound route

# Connecting head office with branch offices

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## How to connect two PBXs

Kerio Operator can be connected to another PBX via an SIP protocol or analogue connection.

## How to add SIP interface

If you wish to configure an interface for communication with another SIP server, follow these steps:

1. In the administration interface, go to section **Configuration** → **Call Routing** and click on the **Add a SIP interface** button. This opens the configuration wizard.
2. Enter a name for the interface (e.g. the name of the other server). The name must not contain spaces, national and special characters and must be unique.
3. Select **Connect with another PBX** and click on **Next**.
4. Enter a prefix for outgoing calls. The prefix tells the PBX which interface the call should be redirected to. If you enter 3 (the other server uses extensions 3XX), all numbers with prefix 3 will be directed to this SIP server.
5. Click on **Next**.
6. In the **Hostname or IP address** and **Port number** fields, enter the DNS name of the other SIP server and the port on which it communicates.
7. If the server requires authentication, enter valid data in the **Username** and **Password** fields.
8. If the server requires registration, check the **Required to register with registrar** option.
9. If the user ID differs from the telephone number, type it in the user ID field.
10. Click OK to confirm settings.
11. Finally, create a rewriting rule for correct mapping of numbers to internal user extensions. Instruction on how to do this can be found in article addressing [SIP interface configuration](#).

## How to configure PRI/BRI/FXO interface

If you wish to configure an interface for communication with another PBX, follow these steps:

1. In the administration interface, go to section **Configuration** → **Call Routing** and double-click on the PRI/BRI/FXO phone interface. This opens the configuration wizard.
2. Enter a name for the interface (eg. the name of the server). The name must not contain spaces, national and special characters and must be unique.
3. Select **Connect with another PBX** and click on **Next**.
4. Enter a prefix for outgoing calls. The prefix tells the PBX which interface the call should be redirected to. If you enter 3 (the other server uses extensions 3XX), all numbers with prefix 3 will be directed to this PBX.
5. Click on **Next**.
6. In the displayed dialog, select a PBX type, depending on the type used by the other PBX.
7. Click OK to confirm settings.
8. Finally, create a rewriting rule for correct mapping of numbers to internal user extensions. For more information read article addressing [analogue interface configuration](#).

### ***Connecting head office with branch offices in Live And Let Laugh Inc***

Live And Let Laugh Inc has a head office and a branch office. The head office resides in the HPR (Happy People Republic), while the branch office is located in BSL (Bliss Seekers Land). Both offices have their own instance of Kerio Operator installed. Now Thomas needs to connect both networks and make them behave as a single telephone network.

Phone numbers at Live And Let Laugh Inc use three-figure extensions. While the head office in HPR employs around fifty people, the branch office in BSL involves just one department with not even ten people employed there. Thanks to this fact, the range of 99 numbers is more than enough for this moment. The third number from the right will represent individual offices. At the branch office in BSL, any of the remaining numbers can be used (number 1 is used in this example). To keep it consistent and easy-to-remember, both sales department extensions end with 20 (i.e. 2X).

Local Sales department (headquarters, located in HPR):

- Oscar Jape, Sales Department Manager — extension 120
- Frederic Jovial, sales operator — extension 121
- Mary Merry, sales operator — extension 122
- Mr George Funpoker, sales operator — extension 123

International Sales department (branch office, BSL):

- Anne Kdotte, department manager — extension 320
- Otto Spass, sales operator — extension 321
- Tamara Bellylaugh, sales operator — extension 322
- Veronique Sarcasme, sales operator — extension 323
- Juan Broma, sales operator — extension 324
- Govinda La Scherzo, sales operator — extension 325

# Configuring standard phone interface

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## How to connect Kerio Operator to a standard telephone network

Prepare one of the following analogue cards: PRI, BRI or FXO. You can use the card distributed with Kerio Operator Box series 3000 or use your own card and connect it to your Kerio Operator server.

### Supported analogue cards

- PRI card — number of concurrent calls vary depending on whether you have contract with an American or European provider.
  - T1 (used in the USA) — allows 23 concurrent calls.
  - E1 (used in the EU) — allows 30 concurrent calls.
- BRI card — has 4 ports. Each port can operate two concurrent calls.
- FXO card — has 4 ports. Each port can operate one concurrent call.

### What to have ready beforehand

Before you configure an interface, you need to know:

- telephone number or numbers from your telephone provider,
- (only PRI/BRI) ISDN type which is used for communication (it usually differs according to your location — for example, EuroISDN for the EU, Nation ISDN Type 2 for the USA and so on),
- whether your provider's PBX requires [overlap dialing](#),
- information whether the PBX sends or requires [telephone numbers whole or in the contracted form](#),
- at least one internal extension defined in Kerio Operator (preferably an employee who will redirect the calls).

### How to add analogue communication interface

After connecting an analogue card, configure the interface:

1. In the administration interface, go to section **Status** → **Call Routing**. If the PRI card is installed correctly, the **Interface and routing of incoming calls** table shows one standard telephone interface.

If the BRI card is installed correctly, the **Interface and routing of incoming calls** table shows 4 interfaces (one for each of the four ports).

If the FXO card is installed correctly, the **Interface and routing of incoming calls** table shows 4 interfaces (one for each of the four ports).

2. Double-click on an unconfigured interface. This opens the configuration wizard.
3. Enter a name for the interface (e.g. provider name). The name must not contain spaces, national and special characters and must be unique.

#### One number

1. Enter the number in the **New provider** → **With external number** field (in a pattern supplied by your provider) and click **Next**.
2. Select an extension for the operator who will direct all external calls made to the number from your provider to internal extensions created in Kerio Operator.
3. In the **Prefix to dial out** field, enter a prefix to be used for outgoing calls. The prefix is used by Kerio Operator to route calls to the PBX of your telephone provider.
4. Click on **Next**.
5. (only PRI and BRI) Select the PBX type in the dialog:
  - if you are in the EU, select the EuroISDN option,
  - if you are in the USA, select the National ISDN Type 2 option,

#### **Example:**

There are many calls received at Live And Let Laugh Inc every day &mdash; calls from salesmen, business partners, customers, authorities, private calls. One of the solutions of where to direct all calls is to use the extension of the company assistants Joan Giggle and Brian Snigger, depending who is currently on duty. The assistant in service redirects calls or answer them themselves.

### Multiple numbers

1. If you acquired multiple phone numbers from your provider, enter the numbers, separated by commas, in the **New provider** → **With external number** field (in a pattern supplied by your provider) and click on **Next**.
2. Select an extension for the operator who will direct all external calls made to the number from your provider to internal extensions created in Kerio Operator.
3. In the **Prefix to dial out** field, enter a prefix to be used for outgoing calls. The prefix is used by Kerio Operator to route calls to the PBX of your telephone provider.
4. Click on **Next**.
5. (only PRI and BRI) Select the PBX type in the dialog:
  - if you are in the EU, select the EuroISDN option,
  - if you are in the USA, select the National ISDN Type 2 option,
6. Save the settings.
7. In section **Call Routing** → **Interfaces and routing of incoming calls**, double-click on one of the lines with information about mapping of calls to the operator's extension.
8. The **Edit Incoming Call** dialog is displayed. Click on a line in the **Extension** column to map external numbers to internal extensions.

#### *Example:*

Another method of calls redirecting in Live And Let Laugh Inc is to make calls to specific numbers in Kerio operator outside the firewall ring on specific extension (calls to the company management may be routed to the extension of Alessandra G. Uffaw, the director's personal assistant) and redirect calls to other of these numbers to the extension of the operators Joan Giggle and Brian Snigger, while calls from existing customers coming to another number are forwarded directly to the Call Center's extension.

### Interval of numbers

1. If you acquired an SIP trunk with an interval of numbers from your provider, enter it in the **New provider** → **With an external number** field in a pattern supplied by your provider. Use X in place of the numbers which vary.
2. Click on **Next**.

## Configuring standard phone interface

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3. Select an extension for the operator who will manually direct all external calls made to the numbers from your provider to internal extensions created in Kerio Operator unless mapping is configured.
4. In the **Prefix to dial out** field, enter a prefix to be used for outgoing calls. The prefix is used by Kerio Operator to route calls to the PBX of your telephone provider.
5. Click on **Next**.
6. (only PRI and BRI) Select the PBX type in the dialog:
  - if you are in the EU, select the EuroISDN option,
  - if you are in the USA, select the National ISDN Type 2 option,
7. Click OK to confirm settings.
8. Finally, create a rewriting rule for correct [mapping of numbers to internal user extensions](#).

### *Example:*

Another way how to route calls is to use extension ranges. Calls ending with 2X (range 20 to 29) will be redirected to Local Sales, calls to numbers ending with 3X (range 30 to 39) will ring at the Call Center, while any other number will be directed to operators Joan Giggle and Brian Snigger.

## Overlap dialing

Some telephone providers require telephone numbers as a whole, others require the telephone numbers one digit at a time. Ask your provider about their requirements. Follow these steps to configure the interface:

1. In the administration interface, open the **Call Routing** section.
2. Double-click the interface to open dialog **Configure PRI/BRI/FXO Interface**.
3. Switch to the LDAP tab
4. If overlap dialing is required, check the **Overlap dialing** option.



# Configuring and using conferences

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## What are telephone conferences

Telephone conference is one telephone call of three or more users on three or more extensions. Telephone conferences allow the participation of Kerio Operator users and external participants. To join a particular conference it is only necessary to dial the conference number and its access code if desired.

## How to configure conferences

1. Go to section **Configuration** → **Dial Plan** and make sure that the extension you have selected for the conference is not used.
2. You can add new conferences in section **Configuration** → **Conferences**.
3. Click on **Add**. This opens the **Add conference** dialog.
4. Enter the conference extension and its description.
5. Optionally, you can limit the number of participants. Too many participants increase demands on the server and affect its performance.
6. Each conference can be protected by a PIN required from all participants upon entering the conference. If you wish to secure a conference, set a PIN and deliver it to the members.
7. Conferences can be recorded (option **Record calls**). We recommend you notify conference members that the conference is being recorded (for example, via a voice prompt played upon entering the conference).



Please note that call recording is subject to special laws in many countries. It may not be legal in your jurisdiction, or may require notice to the other party on the call. Accordingly, you assume all liability for using the call recording functions and are responsible for notifying all users of this system of this potential restriction, if applicable.

### How to connect to conference

1. Dial the conference telephone number / extension.
2. If the conference is protected, you will be asked to enter the PIN.

To leave the conference, simply terminate the call.

### Where to monitor conference activities

All current calls can be viewed under **Status** → **Conferences**.

# Configuring call queues

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## What is call queue

Call queues coordinate calls (put them in order) and employees who operate the queues. Employees who operate the call queues are called agents.

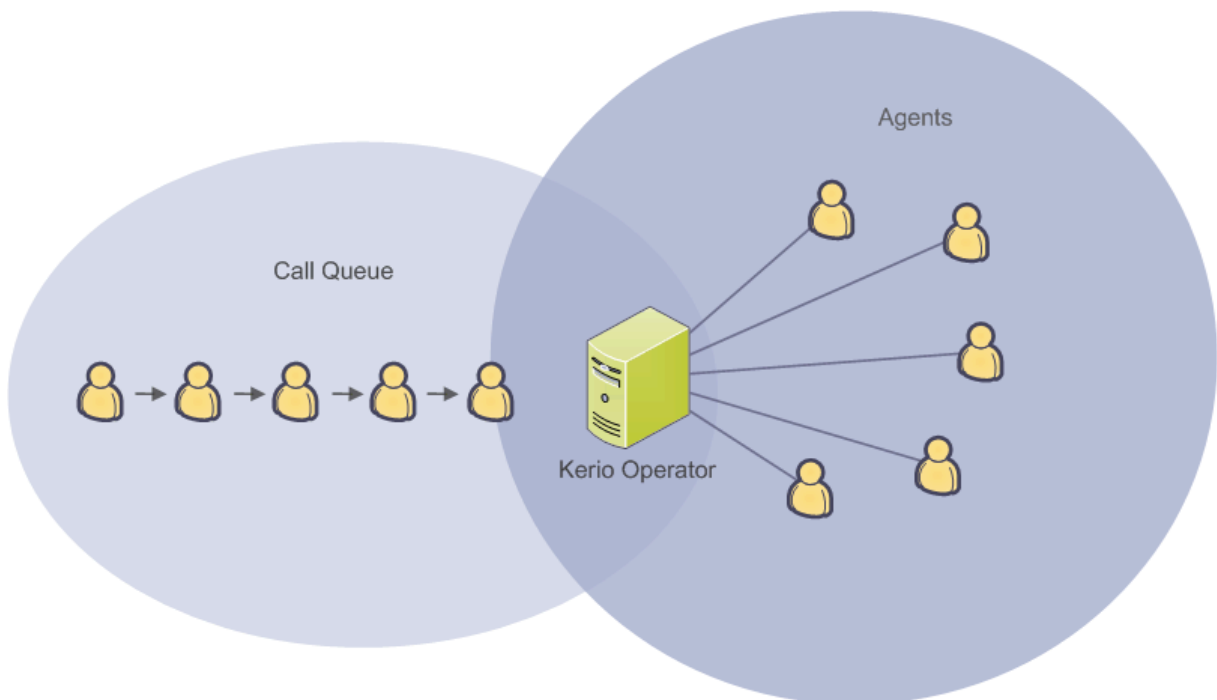


Figure 1 Call queue

## How to configure call queue

1. In the administration interface, go to section **Configuration** → **Call Queues**.
2. Open the **Add Call Queue** dialog and enter the extension number for the new queue on tab **General**.
3. Select the [queue strategy](#).
4. Switch to the **Advanced** tab.
5. If you want your agents to log in [dynamically](#), enter code for login and logout (we recommend the codes to be similar).

If you want to add [static](#) agents, add their extensions in the table.

## Configuring call queues

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Both methods can be combined. One queue may have agents who are assigned statically and agents who log in dynamically.

6. Now set the automatic announcements to be played while callers are waiting in the queue. Go to tab **Announcement** and go through the settings.
7. You can also prepare your own records. You can select from the default ones, have them recorded by professionals (Kerio Operator supports WAV and GSM formats) or record them yourselves (**Configuration** → **PBX Services** → **Record audio**).



Pay attention to announcement settings since there are no default voice files set. If these files are not set, callers have no chance to recognize they are waiting in queue.

### How to select queue strategy

- Round robin with memory — agents are called again and again in the same order.
- Ring all agents — calls always ring at all agents until one of them answers the particular call.
- Ring least recently called agent — the system selects the agents who have not answered the phone for the longest period.
- Ring agent with fewest calls — the system assigns the call to the agent with the lowest number of calls answered so far.
- Ring random agent — if you select this option, the system will choose an agent randomly.
- Ring in order — only for permanently assigned agents. You specify a fixed order in which they are always selected. This strategy is for companies where all calls are answered by a receptionist. In case the receptionist is not answering, the call is directed to the next agent in order (for example, an administration assistant).

### What is the difference between static and dynamic agents

- Permanent assignment — agent's extension is assigned permanently for the queue.
- Dynamic login — agents use special code for logging in and out of the queue.

## How to record calls from call queues

Kerio Operator allows recording calls from call queues. No other module or equipment is necessary. Setting can be done as follows:

1. Open the **Configuration** → **Call Queues** section and select the queue in which you wish to record the calls.
2. The option for recording calls is on the **General** tab.
3. Check the **Record calls** option.

### List of recorded calls



Please note that call recording is subject to special laws in many countries. It may not be legal in your jurisdiction, or may require notice to the other party on the call. Accordingly, you assume all liability for using the call recording functions and are responsible for notifying all users of this system of this potential restriction, if applicable.

Section **Status** → **Recorded Calls** displays all calls recorded from call queues. Select a call to listen to it, download it to your computer or remove it.

### Deleting Recorded Calls

Recorded calls can be periodically deleted once their total size reaches a certain limit. The limit can be set in section **Status** → **Recorded Calls**.

1. Click on button **Advanced** → **Periodically Remove Old Recorded Calls**.
2. This opens dialog **Remove Old Recorded Calls** where you enter the maximum size of recorded calls on a disk (in MB). Once the limit is reached, the oldest calls are deleted.

## How to direct calls when agents are unavailable

These settings the following situations:

- At least one agent is logged in to the queue but no one is answering (example: they forgot to log out before leaving the office).
- No agent is logged in to the queue (example: the agents are off the clock).

Configure the first example as follows:

1. Open the **Configuration** → **Call Queues** section and select a queue.
2. In the displayed dialog, go to tab **Fallback**.

## Configuring call queues

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3. Check **Fallback to another extension** and enter the extension to which the call in the queue will be directed (to an operator or chief agent). This solves the situation when agents are logged into the queue but no one is answering the calls.
4. Set the time period after which calls will be redirected to another extension.

**Example:**

Mr Anthony Griefgone, an experienced Call Center operator of the Live And Let Laugh company, is a bit absent-minded and he often happens to forget to log out of the system when leaving his office.

After implementation of the new version of Kerio Operator, the network administrator Thomas Punchline finally has an instrument to work this situation out in a way that suits all and hurts none.

Under **Configuration** → **Call Queues** he chooses a queue where Mr Griefgone is involved as an agent. Therefore, he switches to the **Fallback** tab and enables option **Fallback to another extension** and uses enters 333 where one of the company's receptionists is available 24/7. He sets time after which the call will be redirected to one minute.

Now, configure the second example as follows:

1. Check **Callers cannot join the queue** (they would keep waiting in the queue unless an agent logs in).
2. Check **Terminate calls that are already waiting** (they would keep waiting in the queue unless an agent logs in).

**Example:**

Though the Live And Let Laugh company do their best to accomodate their customers, it does not pay out to keep their Call Center running over night hours.

As such cases might harm the company's reputation, the administrator Thomas Punchline thus needs to set the telephony system in a way that callers do not keep waiting in queue when agents are off-the-clock (they have come home already or have not returned to their office yet).

For case that even the scatterbrained Mr Griefgone does not forget to log out of the system and no agent is available to attend to the queue, the administrator enables options **Callers cannot join the queue** and **Terminate calls that are already waiting** in the settings of the particular queue.

If anyone calls the extension off the working hours of the operators, a record is played with a well-known melody with the line "I will always laugh with you". The administrator has uploaded this file to the database and set it for particular options as an announcement.

## How to prioritize call queues

Agents can operate several call queues. Our example illustrates the queue use of a fictional electricity provider. This company has one queue for households, one for businesses and another one for VIP customers. Since questions about electricity outages and due invoices are similar with different services available to different customers, the queues are operated by the same agents.

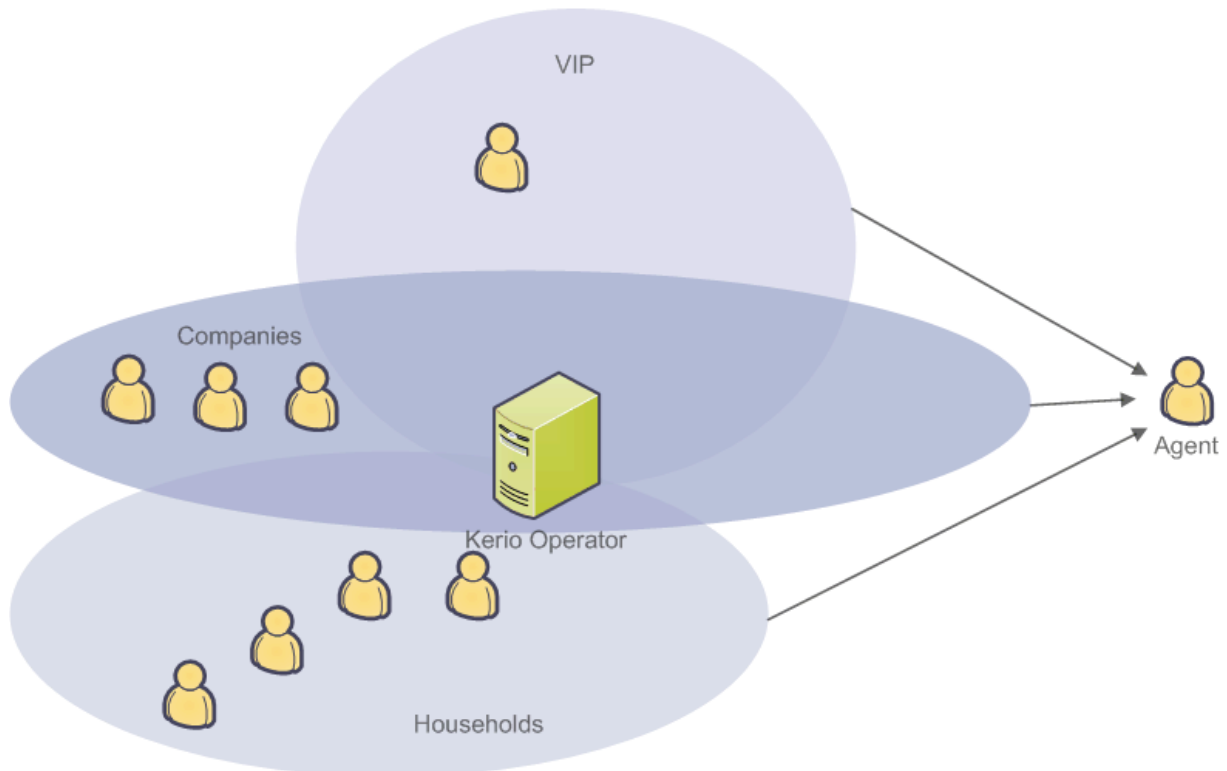


Figure 2 Operating multiple queues at once

To help agents identify the queues, you can upload various audio records for each queue. The record identifying the queue is played to the agents before a call from this queue is connected.

Upload new audio record as follows:

1. Select a call queue or create a new one in section **Configuration** → **Call Queues**.
2. In the displayed dialog, go to tab **Announcements**.
3. Check the **Help agents identify the source queue by playing this announcement** and click on **Select**.
4. This opens the **Select Audio File** dialog. You can either double-click a record to select it or upload your own record to Kerio Operator (it must be in WAV or GSM format). Use the **Upload** button.

## Configuring call queues

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It is also possible to set priorities for individual queues. Queues with higher priority will be processed earlier. In our example, the electricity provider may use the following priorities:

- VIP — high priority,
- Businesses — medium priority,
- Households — low priority.

Apply settings as described below:

1. Open the **Configuration** → **Call Queues** section.
2. Select a queue or create a new one.
3. In the displayed dialog, go to tab **General** and set the desired priority.
4. Repeat the configuration for other queues.

### **Example:**

Customers of the Live And Let Laugh company can also be divided in the above-mentioned categories:

One of their VIP clients is TV Horseplay whose employees often call the hotline when they fail to find an appropriate punchline. These are emergency cases and everything must be done for the customer not to keep them waiting. Therefore, the administrator adds this customer to the queue with the highest priority and sets the Roar With Laughter! programme's jingle as an announcement for agents to recognize the customer immediately and make them ready for an urgent and appropriate help to the customer.

One of the regular customers is also the cleaning company Mop It Inc., often finding themselves in need of making their clean ladies laugh so that they mop the floors with their special outfit while rolling in the aisles. Once an agent hears the announcement melody recorded by Rag And Broom band (famous for playing various cleaning instruments to make original music scores), they immediately know which jokes to retrieve from the database. Though this customer is also a company, their calls are not so urgent so the priority set for their queue is middle. Thanks to the melody used, agents Robert Joker, Beatrice Titter, Alan Tickle and Bumbleboo Chortle get quickly the information of the call queue the call is coming through.

Households are also represented by a wide range of regular customers, such as Helen Frowned and Joshua Spleen, users of Live And Let Laugh's top-selling products Joke Lite and Laugh Home 2012. These clients require sensitive attendance and the announcement makes the agents ready for this. The network administrator Thomas Punchline sets low priority for their calls and an announcement that makes agents Caroline Frolicsome, Marc Cheer, Andrew Widegrin and Mr Griefgone tel that one of the households in the queue is calling.



## How to monitor active call queues

1. In the administration interface, go to section **Status** → **Call Queues**.
2. The top table shows currently active queues.
3. The other tables display agents and callers in a queue. Just select a queue and the details in table **Agents** and **Callers** are updated.

You can also reset the call queue statistics to start from zero. Use the **Reset Statistics** button.

# Configuring auto attendant scripts

---

## What is auto attendant script

Auto attendant script is a simple collection of voice menus, submenus and announcements and actions defined for each of them according to the caller’s behavior. It can:

- connect to an extension or voicemail,
- play an announcement,
- navigate through menus and submenus.

Menus can be recorded in various formats. Kerio Operator supports the following formats (see table 1):

Supported formats	Audio format
<i>gsm</i>	8KHz
<i>wav</i>	8KHz, 16 bits per sample , mono (Kerio Operator encodes all WAV files into this format automatically)

Table 1 Kerio Operator — supported audio formats

## How to add new auto attendant script

See the following description of an auto attendant script as an example. Create a script which:

- starts after dialing extension 200,
- contains a voice menu with the following text: “LOL! You have just reached the Live And Let Laugh company’s hotline (fiendish laugh).”
  - For Sales Department, press 1.
  - For Quality Assurance Department, press 2.
  - For Technical Support Department, press 3.
  - If you wish to speak to the receptionist, press 4.

The Sales Department manages two flagship products of the company. Therefore, two submenus (*Joke Lite*, *Laugh Home 2012*) are created.

- For *Joke Lite*, press 1.
- For *Laugh Home 2012*, press 2.
- If you wish to talk to the receptionist, press 3.

Create the same menu for technical support.

Before creating the script, it is necessary to create extensions (in the assigned range 123456XXX) which will be used in the script.

- *extension 100* — reception of Live And Let Laugh Inc. One of the receptionists Joan Giggle or Brian Snigger will connect the calls if the caller makes no selection from the menu.
- *extension 203* — Quality Assurance Department extension (David Jester).
- *extension 301* — common extension (you can create a call queue or a ringing group) for *Joke Lite* experts, such as Frederic Jovial, George Funpoker, Anne Kdotte.
- *extension 302* — common extension for *Laugh Home 2012* experts (Tamara Bellylaugh, Otto Spass, Mary Merry).
- *extension 501* — call queue for *Joke Lite* technical support (Andrew Widegrin).
- *extension 502* — call queue for Technical Support of *Laugh Home 2012* (Alan Tickle).

### **Script settings**

Configure the script in the administration interface in section **Configuration** → **Auto Attendant Scripts**:

1. Click on **Add** and enter the **Script extension** (extension 200 in our example) and some description (see figure [1](#)).
2. Click on the **Edit** button and open the **Edit Menu** dialog.
3. In the **Announcement** field, select the recording for the main script. The **Select** button offers existing recordings or you can upload your own announcement to the PBX.
4. Set **Number of playbacks** to two which will ensure the menu is played to the caller twice.
5. Once the announcement is played, timeout is started with the default action taken upon its expiration. Set the timeout to 10 seconds. The default action is the preset hang up action. This means that if the announcement is played twice and the customer does not make any selection within 10 seconds, the call will be terminated.

## Configuring auto attendant scripts

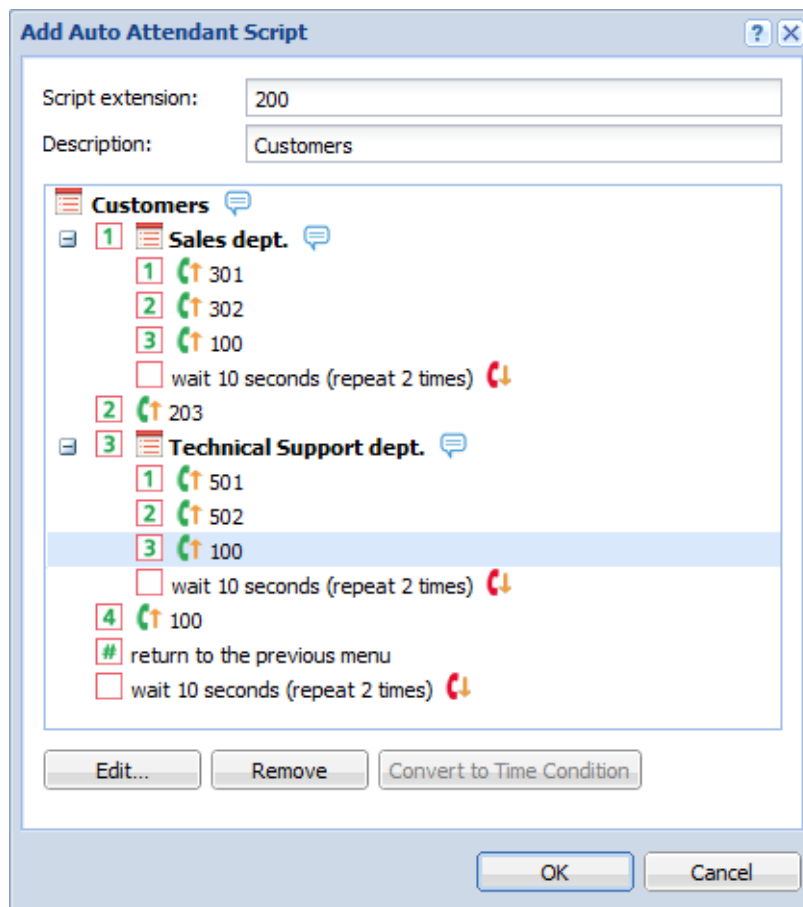


Figure 1 Auto Attendant

6. Create a new row by clicking on **Add**. The **Key** column states the key which confirms the customer's choice. Enter number 1. Enter 1 in this column. Column **Action** defines what happens when the caller presses a key on their phone. Select **Go to submenu**. We need to direct calling customers to the extension of the product they are interested in (either *Joke Lite* or *Laugh Home 2012*). In the **Announcement** column, you can add a record which will be played upon pressing the particular key (for example: Stay tuned, now you will be redirected to the Live And Let Laugh Inc Sales Department). Finish the table according to figure 1.
7. Check the **Interpret any other input as extension number and dial it** option. This option allows to specify a direct extension while the auto attendant script is running.
8. Confirm the settings and return to the **Add Auto Attendant Script** dialog which is now similar to the one in figure 1.
9. Click on menu **Sales dept.**. Again, the **Edit menu** dialog is opened but now the menu is for the Sales department. Follow the same procedure as with the main menu. The resultant menu will look as the one showed in figure 3.

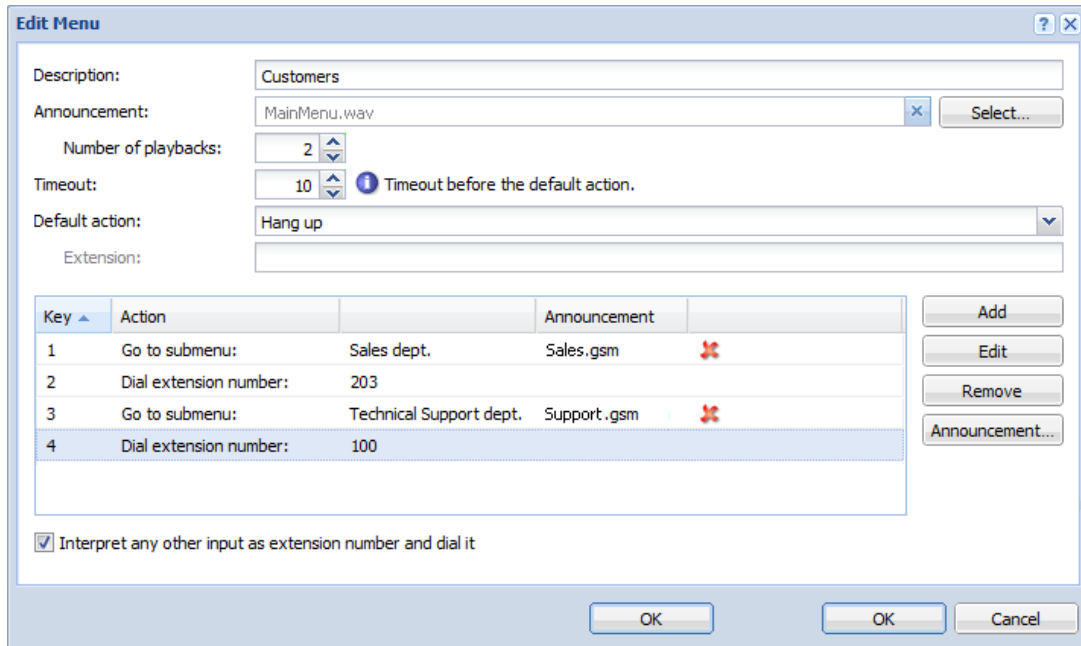


Figure 2 Editing main menu

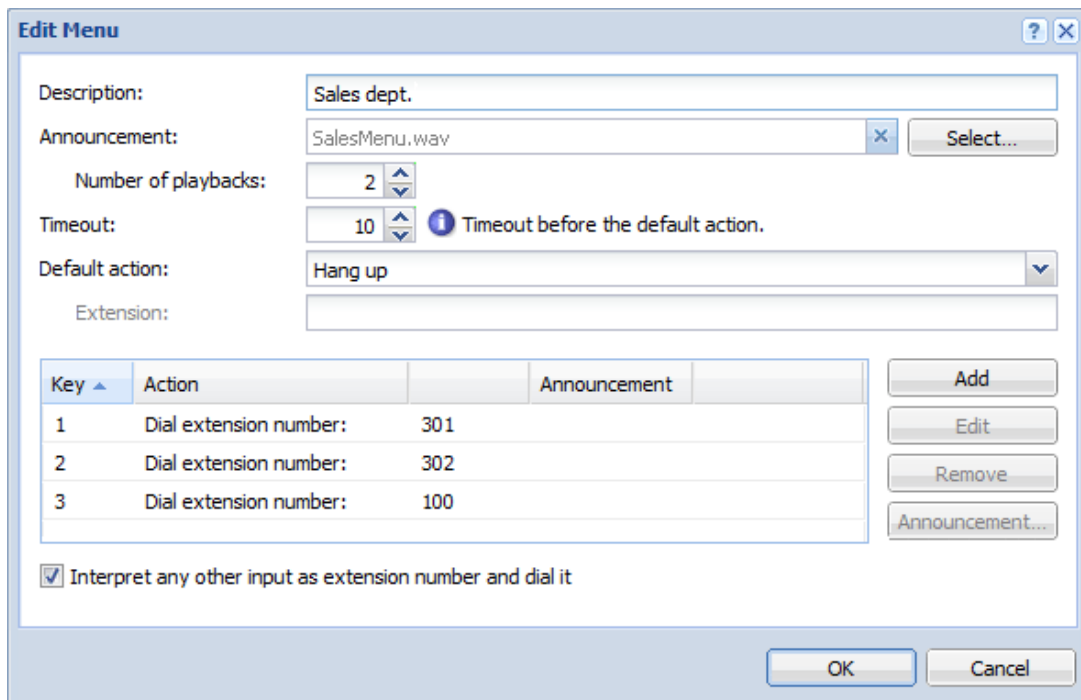


Figure 3 Submenu edit

## Configuring auto attendant scripts

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10. Do the same for the **Technical Support dept.** menu.

11. Now the script is complete.

### *Time condition*

The script can be limited to a specific time interval (office hours of your employees or night time when no call queue agents are available).

The time ranges (intervals) are configured in section **Configuration** → **Definitions** → **Time Ranges**. Once you have the time range configured, go back to the **Add Auto Attendant Script**, select the menu you wish to limit and click on the **Convert to Time Condition** button.

Instructions for time condition setting will be better understood through the following example focusing company's working hours. Sales department works from 9am to 5pm on weekdays. Configure the auto attendant script so that when customers call during office hours they will be connected to a sales department employee and when they call before or later they will hear a message announcing that the sales department is closed. To create the condition script, follow these instructions:

1. In the administration interface, go to **Configuration** → **Definitions** → **Time Ranges**.
2. Click on **Add**.
3. This open dialog **Add Time Range**. In section **Add to a group**, select the **Create new** option and enter a name for the new interval (for example, Sales Department Office Hours).
4. The **Description** is optional, for example **Weekdays from 9am to 5pm**.
5. Select **daily** in the **Type** menu and set the desired interval from 9 to 5 in the **From** and **To** fields.
6. In the **Valid on** menu, select **Weekdays**.
7. Click **OK** to confirm the changes.
8. Open the **Configuration** → **Auto Attendant Scripts** section.
9. Click on **Add**.
10. In the **Add Auto Attendant Script** dialog, create a corresponding menu (the script created in the previous section will be used in this example — see figure [1](#)).
11. Select the **Sales Department** submenu and click on **Convert to Time Condition**.
12. Divide the Sales Department submenu in two time conditions. The first one is played if the condition is met and the second if the condition is not met. Click on the red highlighted text **Set up the time condition**.

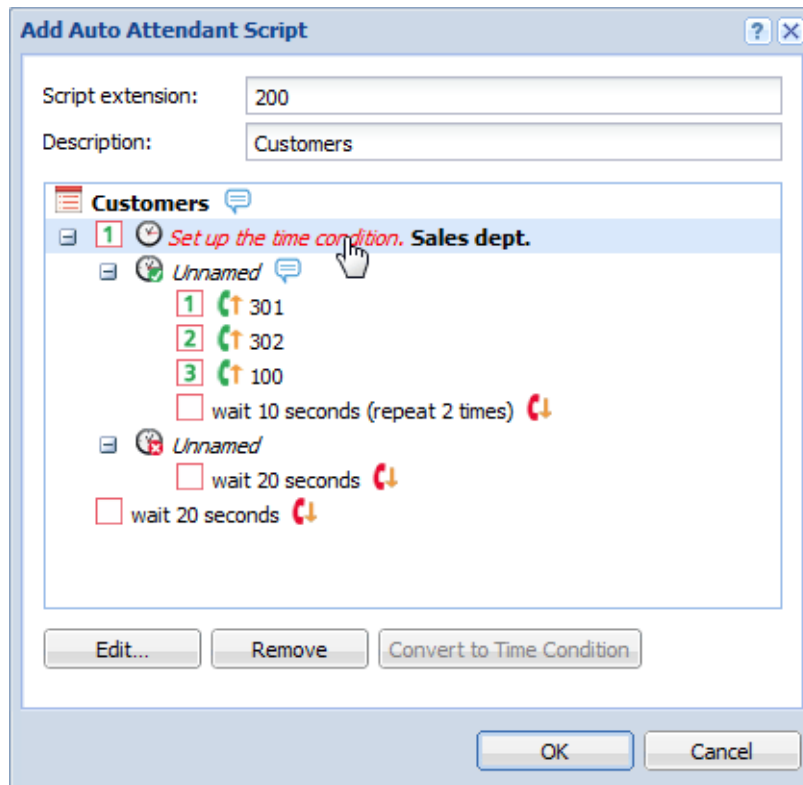


Figure 4 Setting the time condition

13. This opens dialog **Edit Time Condition**. In the **For time range** menu, select **Sales Department Office Hours**.
14. Click on the submenu representing the positive result of the condition. It is currently called **Unnamed**. In the dialog **Edit Menu** just opened, simply add a description (for example Sales Department condition met).
15. Click on the submenu representing the negative part of the condition (now it is empty and unnamed).
16. This opens dialog **Edit Time Condition** allowing to add a description (for example Sales Department --- condition not met).
17. Now you can modify the script. For example, in the **Announcement** field, add a message announcing that office hours of the Sales Department are from 9am to 5pm on weekdays.
18. Save the submenu. The resultant script is displayed in figure 5.

Configuring auto attendant scripts

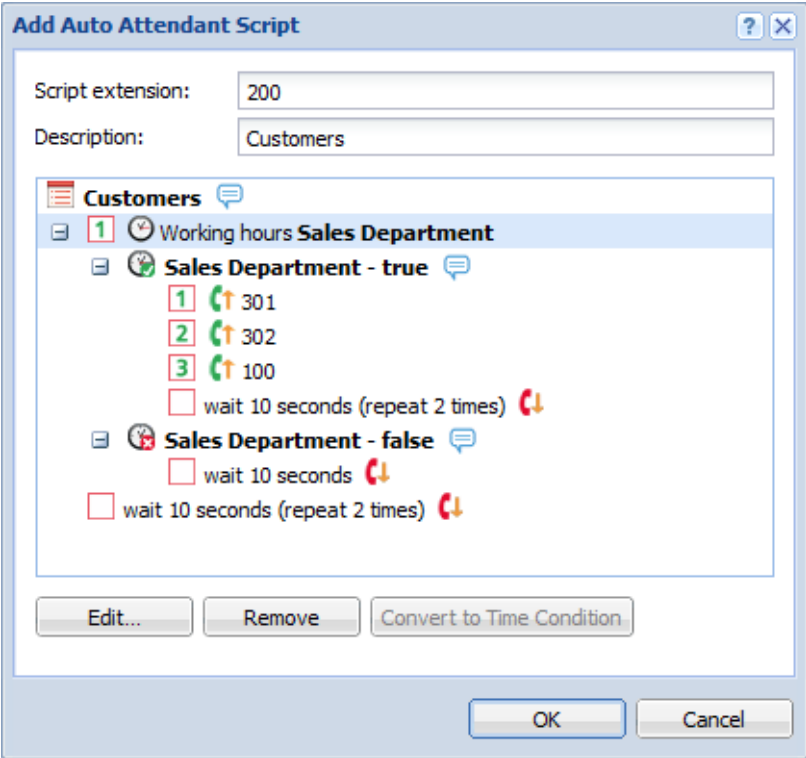


Figure 5 Time condition applied in the script



# Setting time conditions in auto attendant scripts

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## Time conditions are best explained in an example

When configuring auto attendant scripts, Thomas Punchline encountered the following problem. The company management created a new quality department. The responsible person is Ior Kidding. Thomas created a new extension for this department. Ior came to Thomas complaining that dissatisfied customers are calling constantly and he does not even have time for lunch.

Thomas knew that Ior needs an auto attendant script which will respect his working hours. And how to do it?

1. Thomas created **new time intervals** for Ior Kidding's working hours, his lunch break and also for public holidays.
2. He **created records** for the following announcements:

Hello. You are calling Live And Let Laugh Inc. We are having a delicious lunch at the moment. If you call after 1pm, we will gladly hear what you have to say. Talk to ya later!"

"Hello. You are calling Live And Let Laugh Inc. We are off the clock at the moment. Please, call us on weekdays from 8am to 12pm or after lunch from 1pm to 6pm. We will gladly hear what you have to say. Talk to ya later!"

"Hello. You are calling Live And Let Laugh Inc. Have a very merry holiday today. If you wish to make a complaint, call us on weekdays from 8am to 12pm or after lunch from 1pm to 6pm. We will gladly hear what you have to say. Talk to ya later!"

3. He **created a new auto attendant script with time conditions**.

## How to set time intervals for auto attendant scripts

1. In the administration interface, go to section **Configuration** → **Definitions** → **Time ranges**.
2. Add three new time ranges. Two ranges will be of the daily time — **Lunch break** and **Working Hours**. Both ranges will be valid on weekdays.
3. The third range will be absolute. Add the first public holiday when creating the range. Add also other public holidays and do not forget to add them into the existing group **Holidays** (see figure [1](#)).

## Setting time conditions in auto attendant scripts

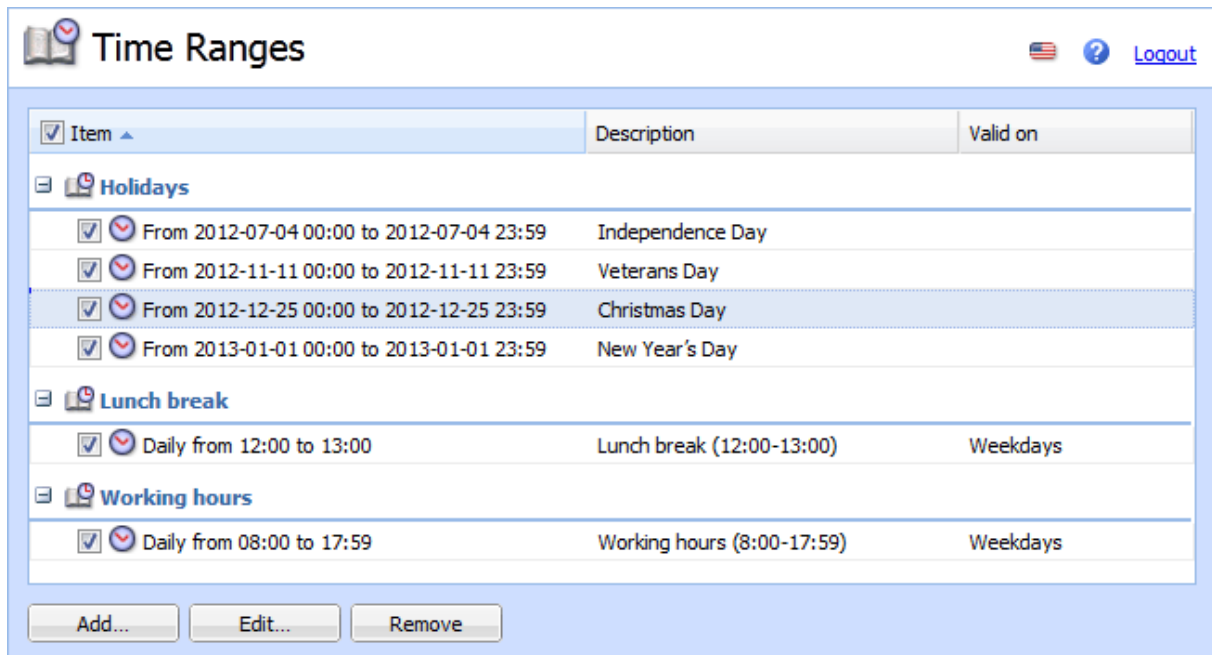


Figure 1 Setting time ranges for working hours, lunch break and holidays

## How to create auto attendant scripts in Kerio Operator 2.0 and later

The script will follow this scheme:

If Holidays

    publicholidays.wav

Else

    If Working hours

        If Lunch break

            lunchbreak.wav

        Else

            Action: Redirecting to Ior Kidding's extension.

    Else

        offtheclock.wav

1. In the administration interface, go to **Configuration** → **Auto Attendant Scripts**.
2. Add a new script, assign it extension 300 and add a description (Working hours of the Complaints department).
3. Create the first condition: Click on **Convert to Time Condition**.

Double-click on the red link **Set up the time condition** and in the **Edit Time Condition** dialog, select range Holidays (see figure 2). Save the settings.

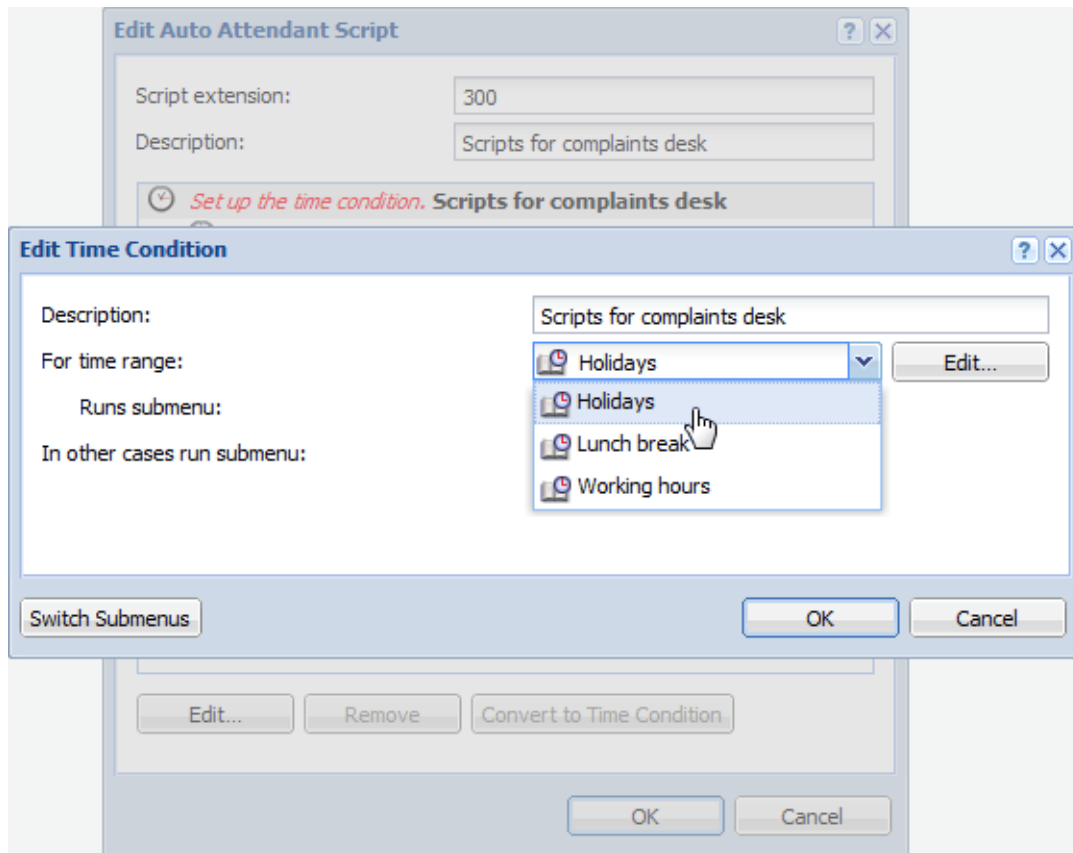





Figure 2 Auto Attendant Scripts — creating first condition

4. Now, edit the first part of the condition in dialog **Add Auto Attendant Script**. Double-click on the  *Unnamed* ).
5. In the **Edit Menu** dialog, enter description **Holidays** and add a file with the announcement about a holiday. Set timeout to 5 second (this will suffice) and save the settings.
6. Create the second condition: Select the  *Unnamed* ) icon and click on **Convert to Time Condition** (thus the “Working hours” condition will be nested into condition “Holidays”). In the **Description** field, enter **Working hours**; in the **For time range**, select **Working hours** (see figure 3). Save the settings.
7. In the **Edit Auto Attendant Script** dialog under the **Working hours** line, two new conditions appear.
8. Create the third condition: Click on the  *Unnamed* and click on **Convert to Time Condition**. In the **For time range** menu, select **Lunch break** (see figure 4). Save the settings.

Setting time conditions in auto attendant scripts

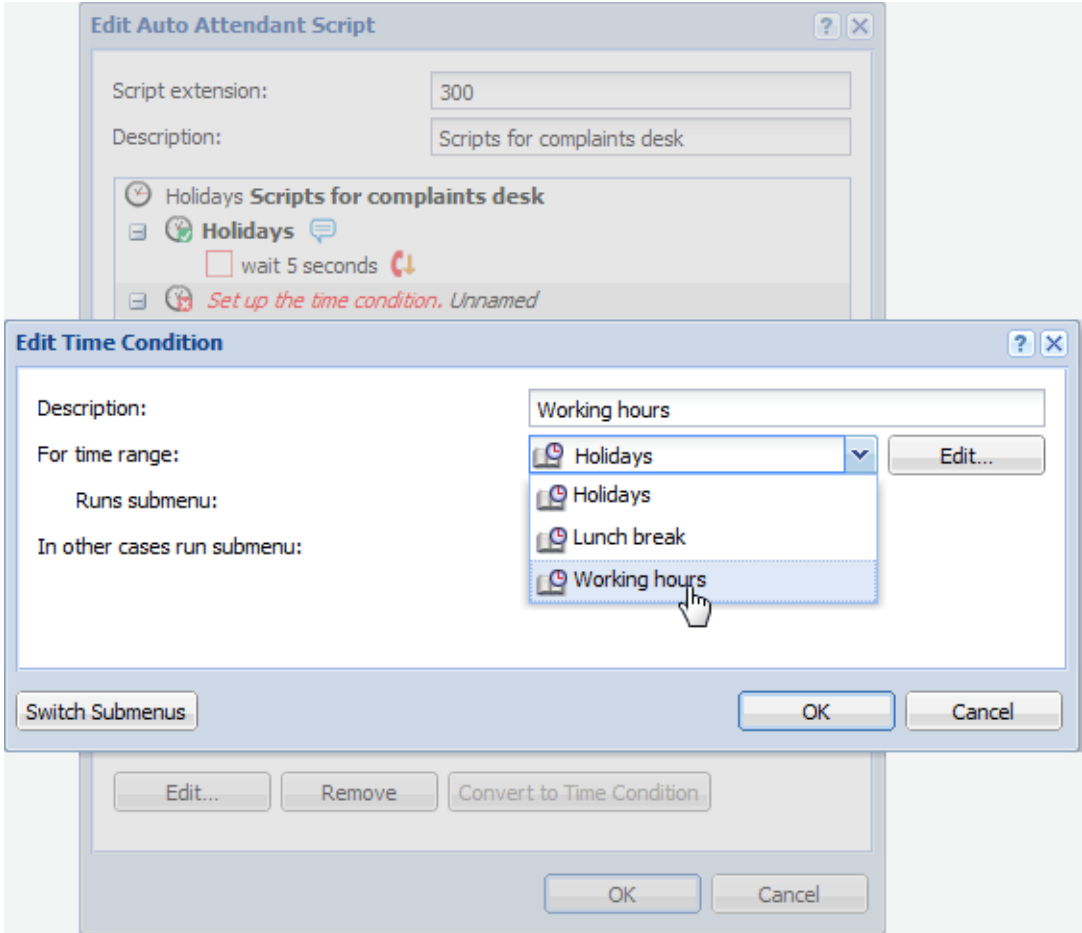


Figure 3 Auto Attendant Scripts — creating second condition

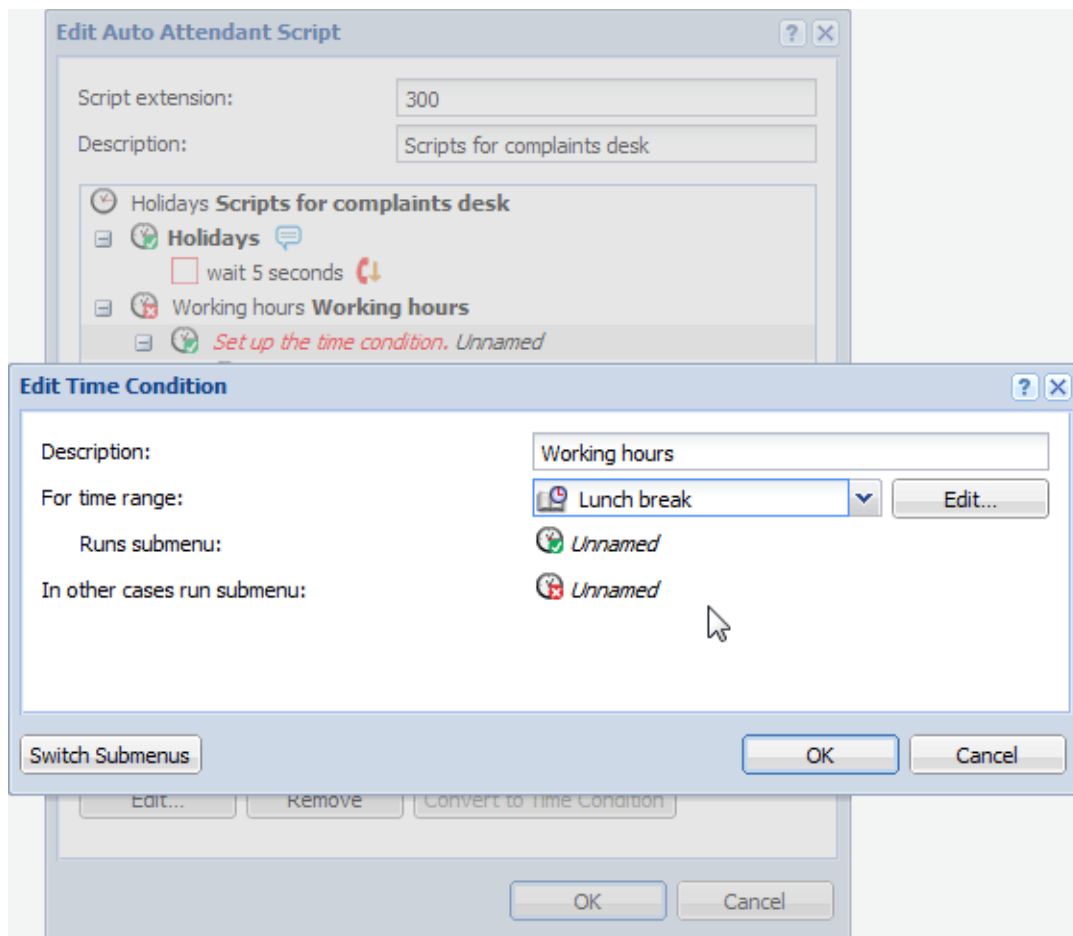





Figure 4 Auto Attendant Scripts — creating third condition

9. Double-click on the last  *Unnamed* icon. In the **Edit Menu** dialog, enter description **Lunch break** and add a file with the announcement about a lunch break. Set timeout to 5 second and save the settings.

10. Double-click on the  *Unnamed* icon (last but one in the scheme). In the **Edit Menu** dialog, enter description **Working hours (dial Ior Kidding)**.

You can add an **Announcement** with information about redirecting to the Complaints department. Set **Timeout** to 1 second. In the **Default action** menu, select **Dial extension number**. Enter Ior Kidding's extension (211) in the **Extension** field and save the settings.

11. Double-click on the last condition (icon  *Unnamed* ). In the **Edit Menu** dialog, enter description **After Hours** and add a file with the announcement that the Complaints department is close at the moment. Set timeout to 5 second and save the settings.

The resultant script is displayed in figure [Auto attendant script for the Complaints department](#).

## Setting time conditions in auto attendant scripts

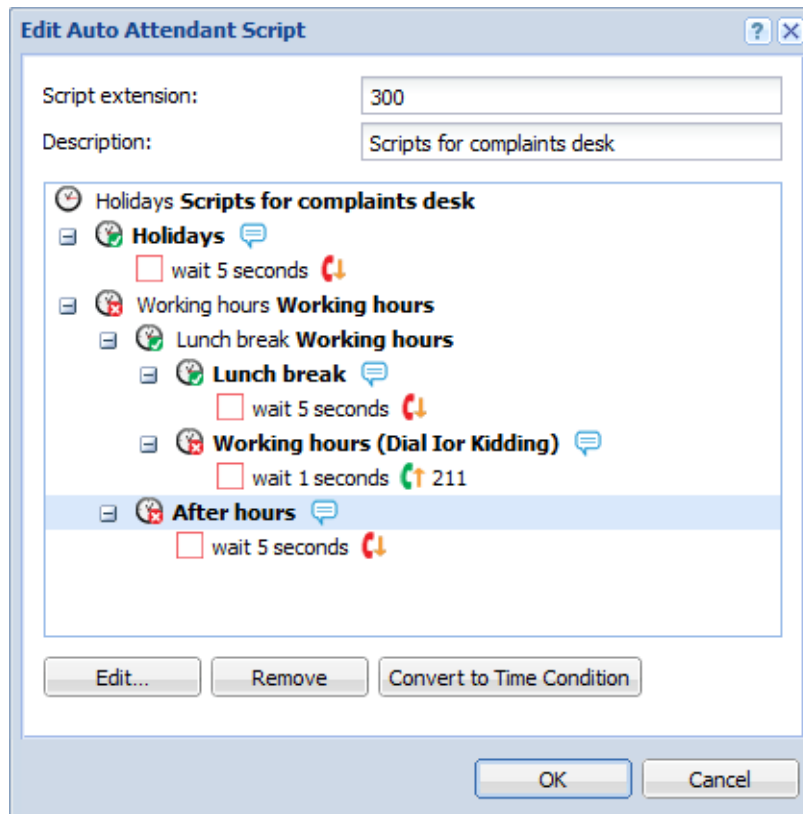


Figure 5 Auto attendant script for the Complaints department

## How to create auto attendant scripts in Kerio Operator 1.2 and older

The script will follow this scheme:

```
If Holidays
    publicHolidays.wav
Else
    If Working hours
        If Lunch break
            lunchbreak.wav
        Else
            Action: Redirecting to Ior Kidding's extension.
    Else
        offtheclock.wav
```

### Condition 1 — extension 300

1. In the administration interface, go to **Configuration** → **Auto Attendant Scripts**.
2. Add a new script, assign it extension 300 and add a description (Holidays).

3. Click on **Convert to Time Condition**.
4. Double-click on the red link **Set up the time condition** and in the **Edit Time Condition** dialog, select range Holidays (see figure 6). Save the settings.

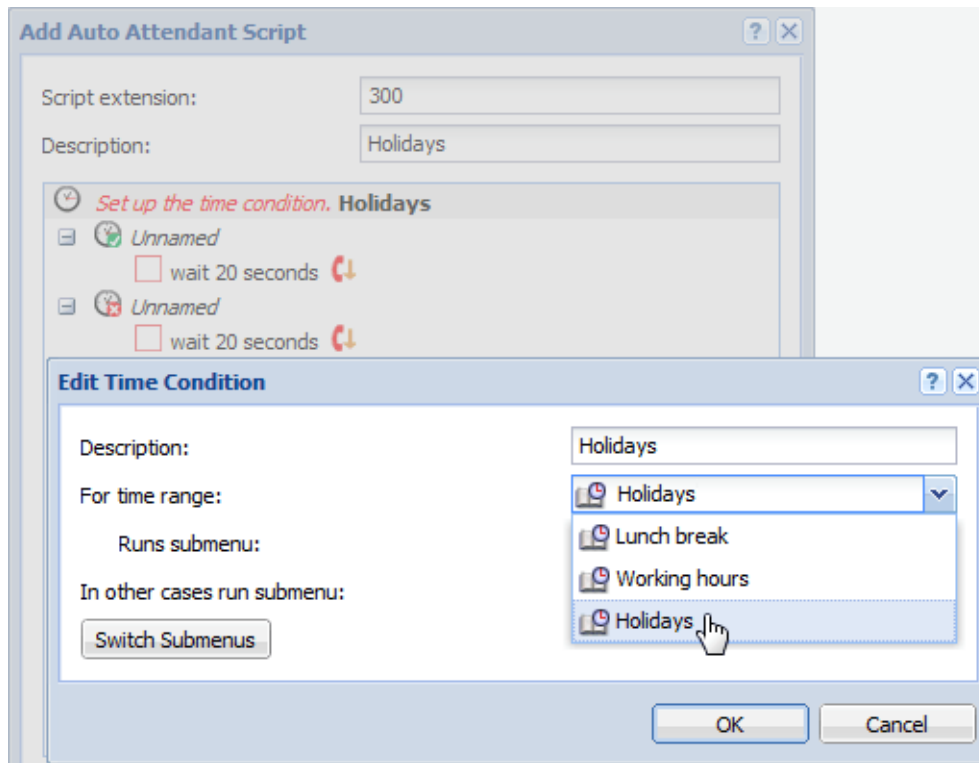


Figure 6 Auto Attendant Scripts

5. Now, edit the first part of the condition in dialog **Add Auto Attendant Script**. Double-click on *Unnamed* .
6. In the **Edit Menu** dialog, enter description Holidays and add a file with the announcement about a holiday. Save the dialog.
7. Open the dialog for the second part of the condition by clicking on *Unnamed* .
8. In the **Edit Menu** dialog, enter description Dial another extension and now an important trick for a nested condition:
  - a. Set **Timeout** to 1 second.
  - b. In the **Default action** menu, select **Dial extension number**.
  - c. Enter extension 301.
9. The final menu will look as the one in figure 7.

## Setting time conditions in auto attendant scripts

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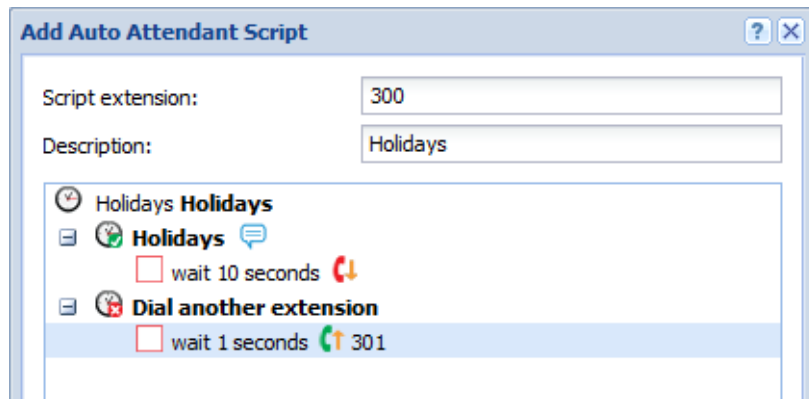




Figure 7 Script for extension 300

### Condition 2 — extension 301

1. Add a new script, assign it extension 301 and add a description (Holidays).
2. Click on **Convert to Time Condition**.
3. Double-click on the red link **Set up the time condition** and in the **Edit Time Condition** dialog, select range Working hours. Save the settings.
4. Now, edit the first part of the condition in dialog **Add Auto Attendant Script**. Double-click on  *Unnamed* .
5. In the **Edit Menu** dialog, enter description Dial another extension and perform the same trick as for a Condition 1:
  - a. Set **Timeout** to 1 second.
  - b. In the **Default action** menu, select **Dial extension number**.
  - c. Enter 302 in the **Extension** field.
6. Save the **Edit menu** dialog.
7. Click on  *Unnamed* .
8. In the **Edit Menu** dialog, enter description After working hours and add a file with the announcement. Save the dialog.
9. The final menu will look as the one in figure [8](#).



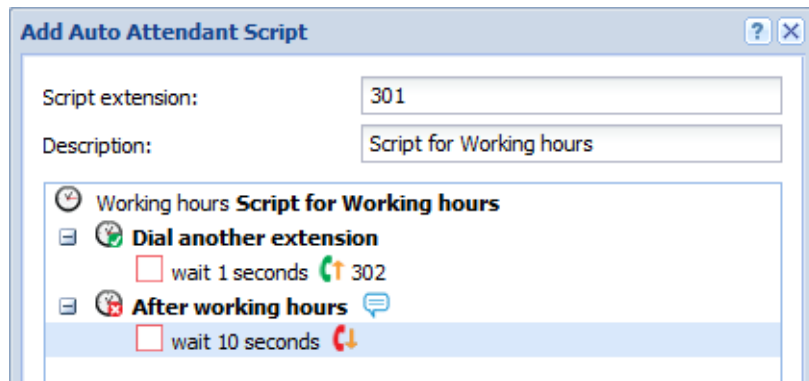


Figure 8 Script for extension 301

### Condition 3 — extension 302

1. Add a new script, assign it extension 302 and add a description (Lunch break).
2. Click on **Convert to Time Condition**.
3. Double-click on the red link **Set up the time condition** and in the **Edit Time Condition** dialog, select range Lunch break. Save the settings.
4. Now, edit the first part of the condition in dialog **Add Auto Attendant Script**. Double-click on *Unnamed* .
5. In the **Edit Menu** dialog, enter description Lunch and add a file with the announcement that Quality department is having a lunch. Save the dialog.
6. Open the dialog for the second part of the condition by clicking on *Unnamed* .
7. In the **Edit Menu** dialog, enter description Working hours (dial Ior Kidding).
8. Set **Timeout** to 1 second.
9. In the **Default action** menu, select **Dial extension number**.
10. In the **Extension** field, enter the employee's extension (Ior Kidding — 211).
11. The final menu will look as the one in figure [9](#).

Setting time conditions in auto attendant scripts

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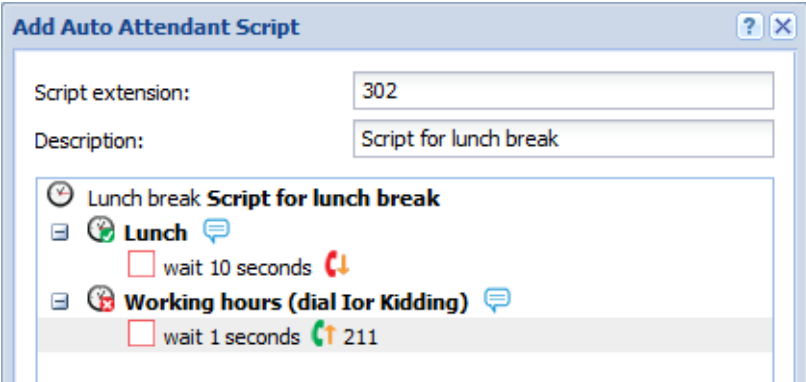


Figure 9 Script for extension 302

# Creating ringing groups

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## What are ringing groups

Ringing groups are used to make calls ring simultaneously on multiple extensions.

## How to add new ringing group

1. In the administration, go to section **Ringing Groups** and click on **Add**.
2. Enter the extension number in the **Group extension** field.
3. In the table, add extensions of all users who will belong to the group.
4. If you wish to direct the call to another person when no one from the ringing group answers the phone, check the **Fall back to another extension when the group is not responding**, set timeout and destination extension for fallback.

# Using PBX services

---

## What are PBX services

Kerio Operator has special phone extensions which run the following services:

- [Directed call pickup](#)
- [Call parking](#)
- [Call pickup](#)
- **Echo** — this option helps you monitor whether phones are correctly connected and what is the sound delay. Speak to the phone after hearing the automated message. If done correctly, your message is recorded and played back.
- **Music** — music plays upon dialing the extension (used for checking the connection).
- **Current time** — auto attendant tells the current date and time.
- **Dial by extension** — auto attendant invites the user to enter the extension which the operator will dial.
- **Dial by name** — user enters first several letters of the callee's surname and system searches among the users created in Kerio Operator and dials the extension.
- **Record audio** — Kerio Operator starts recording. Thus you can easily [create records](#) for auto attendant scripts in excellent quality.



If you wish to you any service, tick the box next to this service. Extensions offering the services are disabled by default.

## How to easily create voice files

This chapter shows how to create a records for an auto attendant script easily, fast and in sufficient quality.

1. Prepare texts.
2. In the administration interface, got to **Configuration** → **PBX Services**, enable **Record audio** and save the settings.

3. Pick up the handset of your phone which is connected to Kerio Operator.
4. Dial the *Record audio* service.
5. Say individual voice recordings into the headset.
6. The record is stored in the audio file library in Kerio Operator. You can listen to the recordings in section **Configuration** → **Auto Attendant Scripts** (the **Audio File Library** button is in the right bottom corner).

# Configuring and using call parking

---

## What can you use call parking for



New in Kerio Operator 2.0!

Call parking is used for transferring calls to somebody else.

### *Example*

Each person in the sales department manages one product. The following conversation takes place:

Phone rings. Oscar answers the phone:

"Hello, this is Oscar Jape speaking. Can I help you?"

"Hmmm, hmmm, yes. Hold on a minute, please, I'll put you through to my colleague."

And he parks the call under code \*555.

"Marry, please, this gentleman is asking about Joke Lite. I parked him on five five five."

Marry picks up the receiver, dials \*555 and is put through with the customer who is asking about Joke Lite.

## How to configure call parking

1. In the administration interface, go to section **PBX Services**.
2. Double-click **Call parking** to open the edit window.
3. Set a suitable extension for the service prefix if necessary.
4. Set the timeout for parked calls.
5. Set the number of digits which will represent the position of a parked call. Ideally, users park their calls on a number which corresponds with their extensions (Example: user's extension is 55. The prefix of the service is set to \*5. Therefore calls will be parked at \*555).

# Call Pickup

---

## What to use call pickup for

This function enables users to answer a call ringing on an extension on a device at another extension. The PBX distinguishes between two types of call pickup:

- Call pickup within defined groups (so called rooms) by using specific code (by default, this code is \*8),
- Call pickup by using a special code (by default, this code is \*\*) with the called extension appended at the end.

## How to configure call pickup rooms

1. In the administration interface, go to **Configuration** → **PBX Services**, enable **Call Pickup** and save the settings. Keep the default pickup code (\*8) unless you do have a reason to change it.
2. Go to **Configuration** → **Definitions** → **Call Pickup Rooms** and click on **Add** to open dialog **Add Call Pickup Room**.
3. Enter the name of the department or the office in the **Name** field.
4. In the table, add all users and extensions that will be able to pick up calls for one another.
5. Make sure the **Room is enabled** option is checked.

### **Example:**

The Live And Let Laugh company network administrator uses the **Add Call Pickup Room** dialog to add a group with room name Local Sales for HPR (Happy people Republic). He adds all sales assistants for local market and their extensions: Frederic Jovial, Mary Merry, George Funpoker.

Frederic Jovial has a day off today. His phone is ringing. Thanks to the call pickup rooms feature, Mary Merry does not need to dash for the Frederic's desk every time a customer calls his extension. She simply dials the magic code \*8 and serves the customer at her desk.

### How to configure directed call pickup

**Directed call pickup** is a service allowing to pickup calls directed to any extension at the PBX. Imagine the following situation:

- the managing director Peter Prank uses extension 101
- the financial director Oscar Jape uses extension 102
- they share an assistant, Ms Alessandra G. Uffaw.

If Alessandra's phone shows information that someone is calling the managing director (Peter Prank) during his meeting with the financial director (Oscar Jape), she can accept the call by dialing `**101`. Once she picks up the call, she learns that the caller is the International laughter Association manager and arranges a meeting for him and her company's executive manager. A few minutes later, the phone at the desk of the financial director Oscar Jape starts ringing. Again, the assistant can accept this call at her desk phone. now she enters the code `**102` and recommends the caller (the Cirque de Rire ringmaster) to call Mr Jape back later.

As you can see, by dialing the call pickup code, you can answer a call for any extension of the PBX.

For directed call pickup, apply settings as described below:

1. In the administration interface, go to **Configuration** → **PBX Services**.
2. enable **Directed Call Pickup**.
3. Directed call pickup is now fully functional.



# Creating and using speed dial

---

## How to use speed dial

Speed dial is a shortcut for phone numbers (for both the internal extensions and external phone numbers).

## How to add speed dial

Before you begin creating speed dial, select a numerical range you will use. Speed dial must be different from current extensions. Generally, it is convenient to create speed dial so that they will not coincide with your dial plan in future.

1. Open the **Configuration** → **Speed Dial** section.
2. Click on the **Add** button.
3. This opens a dialog where a new speed dial can be added. Enter a speed dial in the **Speed dial extension** field.
4. In **Dial number**, enter the callee's phone number including the prefix for outbound calls.
5. Save the settings.

# Configuring voicemail

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## How to configure voicemail

Voicemail does not need any configuration. It works automatically once Kerio Operator starts. All users have forwarding to voicemail inbox enabled by default:

- when unavailable
- when busy

You can change the settings in section **Configuration** → **Users** ([Ringling rules](#)). Users can also modify the settings in their Kerio MyPhone.

## What is direct access to voicemail inbox and how to configure it

Direct access to users' voicemail enables the receptionist to connect calls directly to callee's voicemail.

1. In the administration interface, go to **Configuration** → **Voicemail**.
2. Check the **Allow direct dialing to user's voicemail boxes** option.
3. Enter a prefix in the **Prefix for direct dialing** field.

Save the settings. Now the receptionist can dial the extension for direct access followed by the user's extension. The caller will be directed to the voicemail box of the person they are calling.

## How to configure forwarding of voicemail messages to user's email inbox

To send voicemail messages to email inboxes of the users, you need to set their email addresses in the Kerio Operator Administration in section **Configuration** → **Users**.



If the users' INBOXes are unavailable (the mailserver is down), the user accounts are disconnected from voicemail and try to reconnect every 5 minutes. Each attempt to connect is recorded in logs.

## My mailserver is Keri Connect

You can find more information in article [Integrating Kerio Connect and Kerio Operator](#).

### My mailserver is a different SMTP server

1. On your mail server, create a special user which will be used for sending the voicemail messages. You can name them for example **operator**.
2. Go to Kerio Operator Administration to section **Configuration** → **Voicemail** → **tab Email** and check the **Send each message to user's email** option.
3. In the **Mail server hostname** field, enter the SMTP server hostname and click on **SMTP Configuration** (example: mail.live-and-let-laugh-inc.com).
4. Set the port number to the port used by your SMTP server (usually 25 for SMTP and 465 for SMTPS).
5. Decide whether to communicate through secured connection. If the configuration of your mail server allows it, we recommend the encrypted connection to establish more secure communication.
6. If your SMTP server requires authentication, check **Server requires authentication**. Use the username and password for the account you created on your mail server in step 1.
7. Click OK to confirm settings.
8. In section **Configuration** → **Voicemail** → **tab Email**, enter a valid email address in **Sender email address** (so that your antispam rules accept it). The address should also represent the origin of the message. Example: operator@live-and-let-laugh-inc.com

### How to configure the welcome message for callers

If a call is redirected to voicemail, the caller hears a recorded message. This message can consist of two parts:

**Instructions** inform callers what they should do next: “Leave a message after the beep”.

**Message** informs callers that the callee is unavailable.

How to set the greeting message?

1. Open section **Voicemail**.
2. In the **Greeting message** menu, select whether the caller will hear the instruction, the message or both.

### How to change the extension and voicemail PIN

Users use a special extension number to access their voicemail (by default: 50) and PIN.

You can find the extension in section **Voicemail**.

## Configuring voicemail

---

To set the user's PIN, go to account configuration in section **Configuration** → **Users** to tab **Extensions**.

### How to access voicemail

- On your phone, press voicemail button or dial voicemail number and play the message.
- Through the Kerio MyPhone interface.



For users of Apple iPhone, iPod a iPad: If you cannot play your voicemail messages in Kerio MyPhone, contact the Kerio Operator administrator. [An invalid certificate may be the reason.](#)

- By forwarding voicemail to your mailbox (to get more information on this option, contact your network administrator).

### How to administer voicemail via Kerio MyPhone

You can administer your voicemail in the Kerio MyPhone interface. Login to Kerio MyPhone and go to tab **Voicemail**.

On this page, you can **Play** or **Remove** any selected message or **Dial** its caller.

Messages in Kerio MyPhone can be marked as read. To do it, select the message and choose **Advanced** → **Mark as Read**.

In Kerio MyPhone, it is also possible to control the voicemail box by using the standard context menu. You can open it by right-clicking on a message.



If your company uses Kerio Connect for email communication and you also use [integration with Kerio Connect](#), information about voicemail status (played, new) will be synchronized..

### Voicemail Menu

After reaching your voicemail, an automatic menu will navigate you through your messages and other options. You can view the whole menu in picture [1](#).

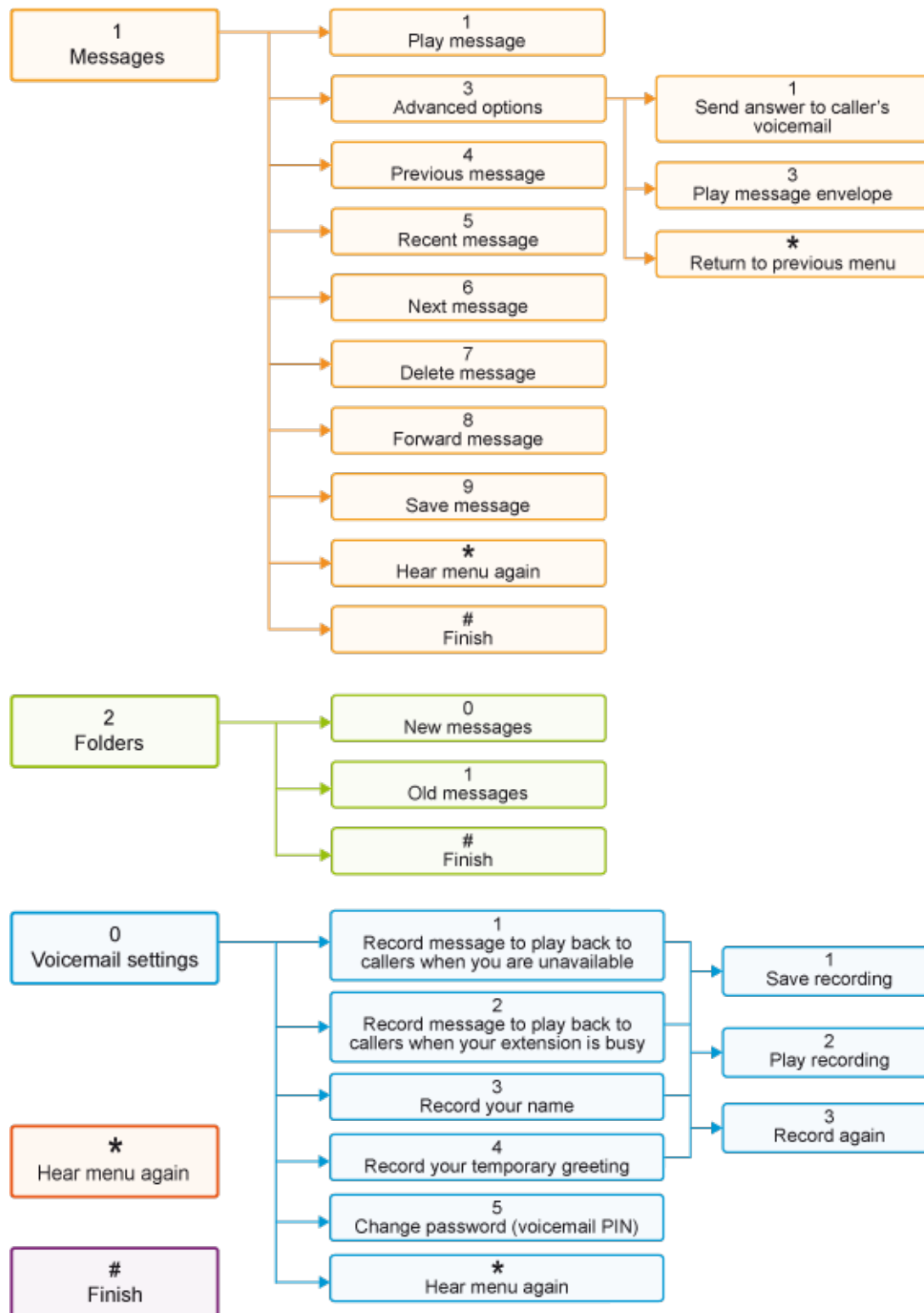


Figure 1 Voicemail Menu

# Integrating Kerio Connect and Kerio Operator

---

## What are the possibilities of Kerio Operator and Kerio Connect integration

The integration synchronizes flags which marks whether a voicemail message has been read/played. If you mark a message as read in Kerio MyPhone or if the message is marked as read after you hear it on your phone, the message will also be flagged as read in your mailbox (and vice versa).

If integration with Kerio Connect is set, voicemail messages are not stored in Kerio Operator but in user's **Inbox** on the mailserver.



Use the primary email address (not an alias) in user settings in Kerio Operator — otherwise sending of messages to Inbox will not work.

## How to configure firewall integrated in Kerio Operator

1. Switch to the **Configuration** → **Voicemail** → **Email** tab.
2. Change the SMTP server settings to **Integrate with Kerio Connect**.
3. Click on **Configure** and enter the DNS name of the Kerio Connect server.



(Valid for Kerio Operator 2.0 and later) If the IMAP service runs on a nonstandard port in Kerio Connect, enter the server name including the port number (`hostname:12345`)

4. Specify the name and password of a user with admin rights for the Kerio Connect server.

Authentication details are used for the first connection to Kerio Connect and creation of a special account using JSON-RPC2 API for authentication. Once this special account is created, the PBX drops the administrator's name and password.



To synchronize flags between the two servers, Kerio Operator uses protocol IMAP with TLS or IMAPS. If Kerio Connect is behind firewall, enable at least one service on standard port. The IMAP or IMAPS services need to be allowed on Kerio Connect server.

## Troubleshooting

If Kerio Connect is protected by firewall, open the ports for the IMAP/IMAPS protocols.

The IMAP/IMAPS services must be running in Kerio Connect.

If you cannot connect Kerio Operator with Kerio Connect, consult the following logs:

- In Kerio Operator, consult the Warning log for any problems with the IMAP service.
- In Kerio Operator, consult the Error log for problems with connection to Kerio Connect's IMAP server.
- In Kerio Connect, consult the Mail log for information about delivered voicemails.

# Setting Emergency Numbers

---

## What are emergency numbers

When configuring [Emergency Numbers](#), you can:

- add emergency numbers to the system,
- enable calling emergency numbers even if users have outgoing calls to external networks disabled,
- enable direct dialing (without the prefix for calling external networks).

## How to add emergency numbers

1. In the administration interface, go to **Configuration** → **Emergency numbers**.
2. In menu **Overwrite the list with emergency numbers for country**, select the country whose emergency numbers you wish to use and click **Overwrite**.
3. If the lists of emergency numbers do not suit your needs, you can create your own manually by clicking **Add**.

## How to set direct dialing

All outgoing calls to external networks are made using a special prefix for calls to external network. You can configure an exception for emergency numbers:

1. In section **Configuration** → **Emergency Numbers**, check option **Enable direct dialing**.
2. In the outgoing routes table, select one route and click on **Add**.



If the direct dialing is enabled, Kerio Operator does not allow creating extensions with the same numbers as emergency numbers.



# Crating SSL certificates

---

## What are SSL certificates

You need a [SSL](#) certificate if you wish to secure the PBX by SST/TLS encryption. SSL certificates are used to authenticate an identity on a server.

Kerio Operator creates the first self-signed certificate during the installation. The server can use this certificate. However, upon their first login, users will have to confirm they want to go to a page which is not trustworthy. If you do not like this, you must generate a new certificate request in Kerio Operator and send it to a certification authority for authentication.



- If you use a self-signed certificate, users with Apple mobile devices will not be able to play voice messages in Kerio MyPhone on their devices. They must have trustworthy certificate available.
- If you wish to encrypt the communication between Kerio Operator and hardware phones (and only a self-signed certificate available), you have to import or configure information in the phones that the invalid certificate is to be ignored.

## How to create self-signed certificate

To create a self-signed certificate, follow these instructions:

1. Open section **Configuration** → **SSL Certificates** and click on **New** → **New Certificate**.
2. This opens a dialog where you enter the hostname of the Kerio Operator server, the official name of your company, city and country where your company resides and the period of validity. The **Hostname** and **Country** entries are required fields.

To enable the server to use this certificate, select the certificate and click on the **Set as Active** button.

## How to create certificate signed by certification authority

If you wish to create and use a certificate signed by a trustworthy certification authority, follow these instructions:

1. Open section **Configuration** → **SSL Certificates** and click on **New** → **New Certificate Request**.
2. This opens a dialog where you enter the hostname of the Kerio Operator server, the official

## Crating SSL certificates

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name of your company, city and country where your company resides and the period of validity. The **Hostname** and **Country** entries are required fields.

3. Select the certificate and click on the **Export** button. Save the certificate to your disk and email it to a certification organization (for example, *Verisign*, *Thawte*, *SecureSign*, *SecureNet*, *Microsoft Authenticode* and so on).
4. Once you obtain your certificate signed by a certification authority, go to SSL certificate section and click on **Import**.
5. To enable the server to use this certificate, select the certificate and click on the **Set as Active** button.

# Configuring languages in Kerio Operator

---

## Languages in Kerio Operator are:

- Application language — language for the administration interface and for Kerio MyPhone
- PBX language — “the voice of the PBX” Voice records which are used for communication with users (internal and external).

## How to change the application language

The language for the administration interface and Kerio MyPhone can be set in the right top corner of the of the application window.

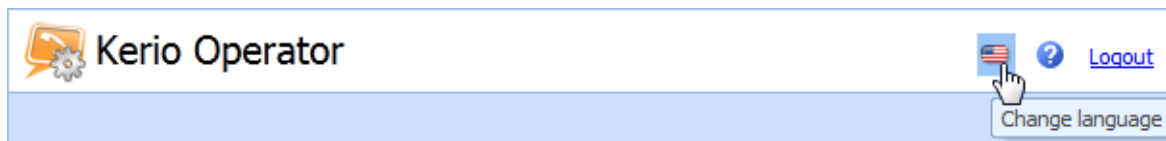


Figure 1 Changing the application language

## How to change the language of the PBX

You can change the default language of the PBX in the administration interface in section **Configuration** → **Advanced Options** → **tab General**

There, you can also upload [new language version](#) or different voice records of the same language (for example, less formal records).

When setting language, bear in mind the following rules:

- Default language set in section **Advanced Options** → **General** has lower priority than settings of individual users in section **Users**. If users do not have any language set, the default one is used.
- Default language set in section **Advanced Options** → **General** has lower priority than settings for interfaces for incoming calls (section **Call Routing**). The language set for the interface of incoming calls has lower priority than files uploaded to call queues (see figure 2). If no language is set, the default one is used. The same goes for call queues.

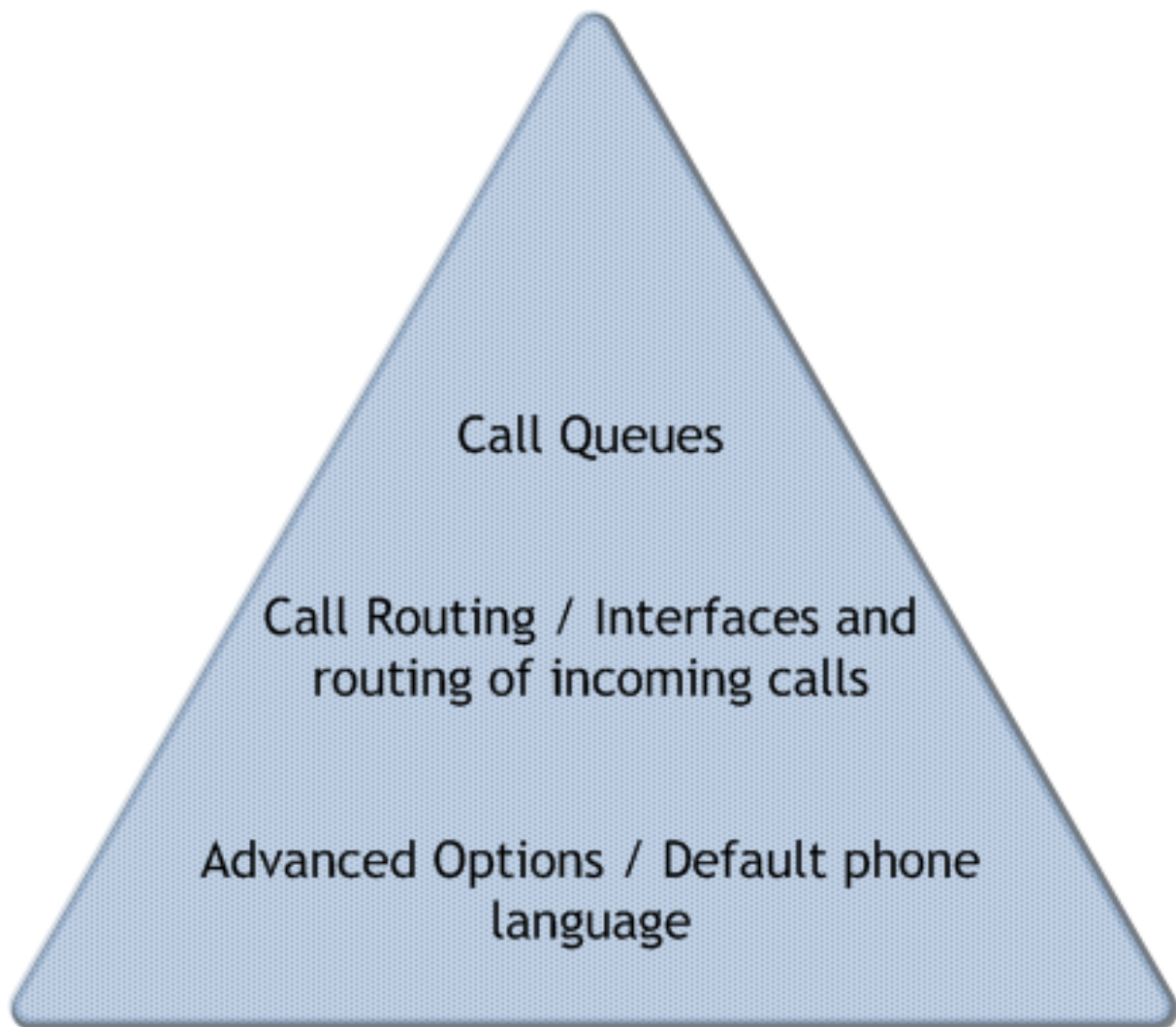


Figure 2 Language settings priority

### How to change the language for individual users

Thomas Punchline, the network administrator at Live And Let Laugh Inc, faces the following problem: New employee has arrived in the company. Alessandra G. Uffaw has moved from the Bliss Seekers Land to the Happy People Republic and cannot speak the Happish language. She complains she can't understand her voicemail. Thomas has to switch the PBX language to the Cravish language for her. Do you need to solve a similar problem? Check the following example:

1. In the administration interface, go to **Configuration** → **Users**.
2. In the user's settings, go to tab **General** and change the **Phone language**.

### How to change the PBX language for a group of users

Thomas was instructed to create a new interface in Kerio Operator and change its language to the Cravish. He has to create a new interface for incoming calls and set a language for this interface. He called his VoIP service provider and purchased new phone numbers for the employees who will communicate with foreign customers. And how he configured Kerio Operator?

1. In the administration interface in section **Configuration** → **Call Routing** , add a new route for incoming calls.
2. Connect it to the provider, open the edit dialog by clicking on the route in table **Interfaces and routing of incoming calls**.
3. Select a language on tab **Advanced**.

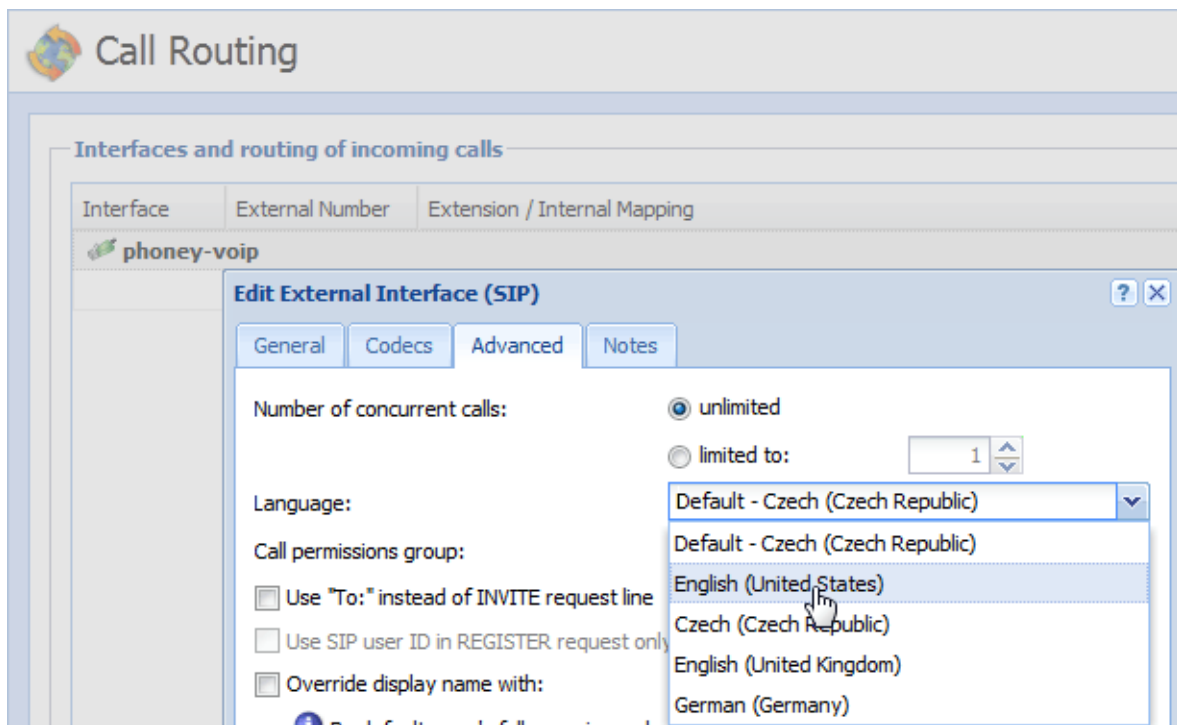


Figure 3 Changing a language for an entire route

### Setting a different language for a call queue

If you wish to change the language for call queues, not for the entire route, go to section **Configuration** → **Call Queues**.



Language files used in call queues has automatically higher priority than language set for incoming calls.

### How to add a new language to the PBX

If the language sets (voice records) provided in Kerio Operator do not satisfy your needs, you can download or buy different language sets and import them to the PBX. You can download the language sets (free or paid), for example, in the following sites:

- <http://www.voip-info.org/>
- <http://downloads.asterisk.org/>

You can extract any language set archive and create your own voice records (provided you keep the file structure).

### Example

Live And Let Laugh Inc has the following configuration:

- Joan Giggle, receptionist and operator, uses extension 100 and wishes the phone to communicate with her in the Happish language.
- Brian Snigger, receptionist and operator, uses extension 200 and is satisfied with the default language, which is English.
- Phoney VoIP, an interface for incoming calls, is configured in Kerio Operator with the default language — English. This interface is operated by Brian Snigger.
- Telephun VoIP, an interface for incoming calls, is configured in Kerio Operator for communication with customers from the Bliss Seekers Land (in Cravish). This interface is operated by Joan Giggle.
- The default language in Kerio Operator is English.
- Voicemail is enabled and the extension for accessing the voicemail is 50.

#### Scenario 1:

When Brian Snigger calls Joan Giggle (200 → 100) or when Brian Snigger calls the voicemail (200 → 50), the automatic announcements are in English.

#### Scenario 2:

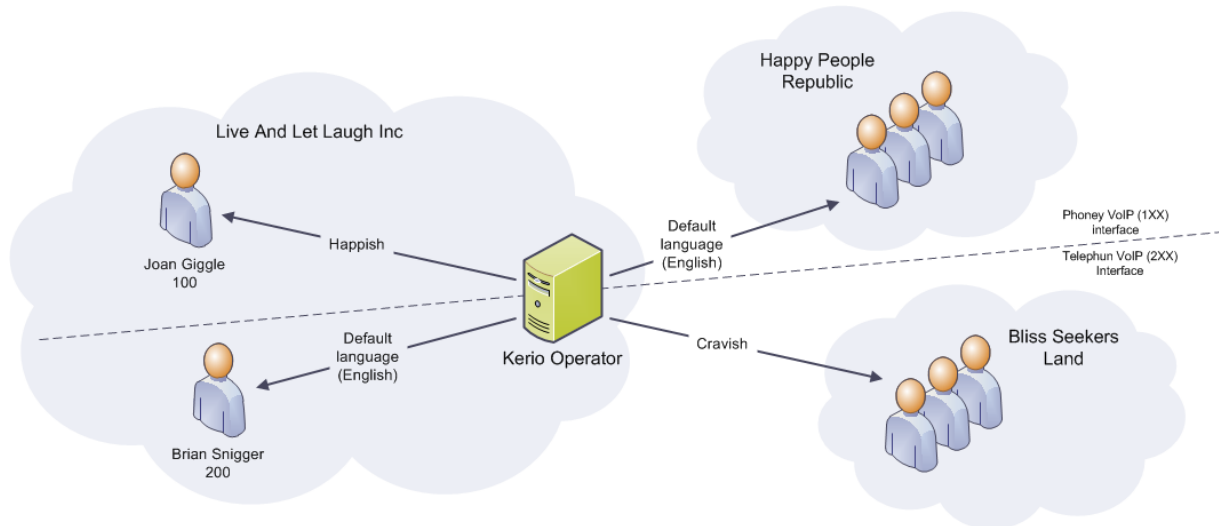
When Joan Giggle calls Brian Snigger (200 → 100) or when Joan Giggle calls the voicemail (200 → 50), the automatic announcements are in Happish.

#### Scenario 3:

Customers calling via the Phoney VOIP interfaces will hear announcements in the default language (English).

**Scenario 4:**

Customers calling via the Telephon VOIP interfaces will hear announcements in Cravish.



**Figure 4** Figure showing the language settings in Live And Let Laugh Inc

# Customizing voice sets

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## Summary

This summary provides information on how to customize/change voice sets in Kerio Operator.

## Details

The Internet provides many sources of localized and customized basic sounds and voice prompts. Voice sets for various languages can be found at <http://www.voip-info.org>.

If you wish to customize a voice set (for example, substitute numerals), begin with the basic sounds:

1. unpack them,
2. substitute relevant files,
3. renew the archive or zip the folder tree (Kerio Operator supports many formats for archiving).
4. Login to Kerio Operator administration.
5. Open the **Advanced Options** → **General** section.
6. Click on **Configure** which is located next to option **Default phone language**.

Once you upload a voice and sound set, you can use it for Kerio Operator, individual interfaces or individual users. For detailed information on this setting, refer to article [Configuring languages in Kerio Operator](#).



# Application integration using the AMI interface

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## What to use AMI for



AMI is supported in Kerio Operator 2.0 beta version.

[Asterisk Manager Interface \(AMI\)](#) is an interface which enables other applications to connect to Kerio Operator (which includes Asterisk) and to communicate via the AMI commands. You can use it to make phone calls. It enables you to:


- dial calls from your CRM system,
- monitor call statuses in your CRM system (e.g., create logs),
- direct calls to another extension or terminate calls in your CRM system.

## How to connect Kerio Operator with other applications

You can connect an application with Kerio Operator very easily. The settings are different for connections with a client (the “server-to-client” connection) and with a server (the “server-to-server” connection).

### How to connect a client application (desktop application for dialing numbers) with Kerio Operator

To connect the applications, you need the username and password of the client application user:


1. In the administration interface, go to **Configuration** → **Users**.
2. Select a user and open the **Edit User** dialog.
3. Go to tab **Advanced** and check option **Password for dialer (AMI)**.
4. Click on the  icon and note down the displayed password.
5. Enter the username and password in the client application to authenticate.

## Application integration using the AMI interface

---

### How to connect a server (CRM system) with Kerio Operator

You need the authentication data which you enter to your CRM system:

1. In the administration interface, go to **Configuration** → **Advanced Options** → **tab General**.
2. Click on **Configure** in the **CRM integration (AMI)** section.
3. Check option **CRM integration enabled**.
4. Click on the **Add** button.
5. Enter an **Account name** (usually the name of the CRM system).
6. The password is generated automatically. Click on the  icon and note down the password.
7. To test the communication, set the permissions to full control. If the communication is successful, you may limit the permissions.



Some applications allow you only to originate calls but they use asterisk commands which require a higher level of permission (usually full control).

8. Login to your CRM system and enter the password for the AMI integration.
9. Test the communication by dialing an extension.

### What to do when communication fails

#### Consult the logs in Kerio Operator:

1. In the administration interface, go to section **Logs** → **Debug**.
2. Right-click on the log screen and select option **Messages** in the context menu.
3. This opens the **Logging Messages** dialog box. Check the **AMI (CRM Integration, Desktop Dialer Applications)**.

#### Configure the internal firewall of Kerio Operator

1. In the administration interface, go to section **Configuration** → **System** → **tab Firewall** and check the settings.
2. If your CRM system is located outside your local network, add its IP address in section **Configuration** → **Definitions** → **IP Address Groups**,
3. Go back to section **Configuration** → **System** → **tab Firewall** and select a new IP address group for the integration with the CRM system.

# Outgoing calls constraints

---

## Why to disable outgoing calls

For security reasons. If anybody elicits usernames and passwords from your users (using phone, email or virus), your outgoing calls constraints will make them useless to the attacker.

The attacker obtains username and password and establishes phone services with premium numbers (usually in a country where such fraudulent behavior is not illegal). They then use your PBX to call these premium rate numbers. Thus you can lose a large amount of money.

## How to disable outgoing calls

### How to restrict length of individual outgoing calls

Maximum call duration can be done as follows:

1. Open the **Configuration** → **Advanced Options** → **Security** section in the administration interface.
2. Adjust the settings in **Maximum duration of each outgoing call** according to your needs.

### How to restrict the number and length of outgoing calls

You can limit outgoing calls by creating special rules in section **Configuration** → **Advanced options** → **Security** in table **Outgoing calls constraints**:

The table lists one default rule which limits all outgoing calls to 50 per hour and total call duration to 2 hours per day.

Follow this example while configuring additional rules.

- The rule will be configured for a manufacturer who sells and has contacts in the USA and EU. This means that we cannot limit prefixes for the Euforia and Emotion Union but we can set limits to calls to other countries.
- Prefix for calls to external network is 9 (prefix is configured in section **Configuration** → **Call Routing**).

Create the rule as described below:

1. Open the **Configuration** → **Advanced Options** → **Security** section in the administration interface and add a new item to table **Outgoing calls constraints**.
2. This opens the **Add Outgoing Call Constraint** dialog.

## Outgoing calls constraints

---

3. Enter a rule name (e.g. Constraints for any countries outside the Euforia and Emotional Union).
4. In section **Apply to these outgoing calls**, select **All except listed** and click on **Add**.
5. This opens the **Add Outgoing Call Prefix** dialog, with an example on using prefixes. International prefixes can be found, for example, on [Wikipedia](#).  
Each international call prefix should be preceded by your prefix for outgoing calls. In this case, the prefix is 9.  
Use the dialog to enter prefixes 9001 (001 for the Northern Euforia), 9003 and 9004 (003 and 004 for countries within the Emotion Union).
6. Now define the constraint. Set **Maximum calls count** to 10 per hour and **Maximum total calls duration** to 1 hour a day.
7. Select an action which will be performed when the conditions are met. You can configure either sending of a warning email or blocking of outgoing calls (which means that nobody will be able to call to external network).

The optimum use of these rules is as follows: Create one soft rule with lower limits which will send warning messages via email and one other rule with higher limits which will block the PBX.



If the limits are reached and the PBX is blocked, nobody will be able to make calls to external network. The PBX can be unlocked in section **Configuration** → **Advanced Options** → **Security**. Therefore we recommend to make a thorough analysis of your calls so that the PBX is not blocked by legal operations.

Besides the standard security rules which are configured to be used against attackers, you can set [similar rules for specific users or groups of users](#).

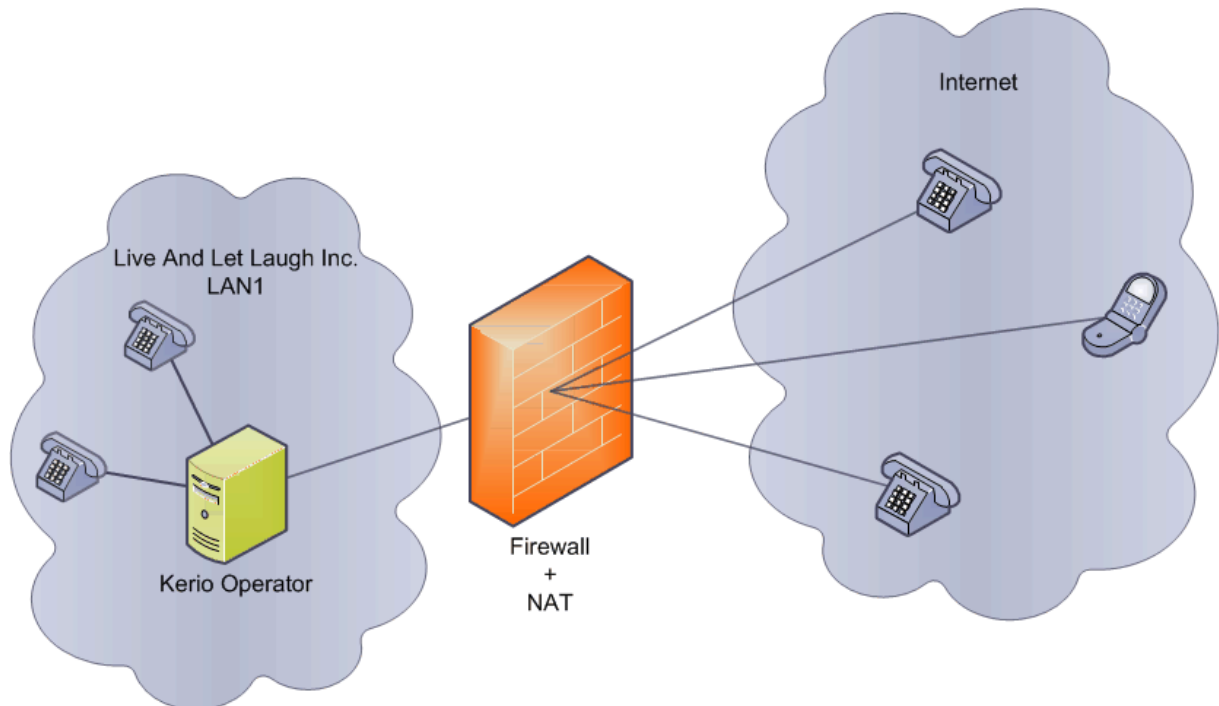
# Configuring NAT

---

## Kerio Operator is behind NAT and phones are in the Internet

1. In the administration interface, open section **Configuration** → **System** → **tab Network**.
2. In the NAT support section, enable NAT by checking the option.
3. Enter the public address which should be used in SIP protocol messages.
4. For phones in the same private network as Kerio Operator, create an appropriate IP address group in section **Configuration** → **Definitions** → **IP Address Groups** with all addresses on which phones communicate in your private network. Thus, the PBX will communicate with phones within the network directly.
5. (Optional) You can also limit the RTP port range. Bear in mind that each call requires 4 ports for communication.
6. Also, map the following ports from firewall to Kerio Operator:
  - TCP+UDP/5060
  - TCP/5061

It is usually necessary to map a port range for RTP (according to the specified interval).



**Figure 1** Kerio Operator is behind NAT and hardware phones are in the Internet

## Configuring NAT

### Kerio Operator is in the company network and hardware phones are behind NAT

Firstly, configure [NAT for Kerio Operator](#).

The scenario in [figure](#) requires only one minor configuration in the PBX settings:

1. In the administration interface, open the **Configuration** → **Extensions** section.
2. Select the extension of the user whose phone is in a private network.
3. In the **Edit extension** dialog, go to tab **Advanced**.
4. Check the **Extension is behind NAT** option.

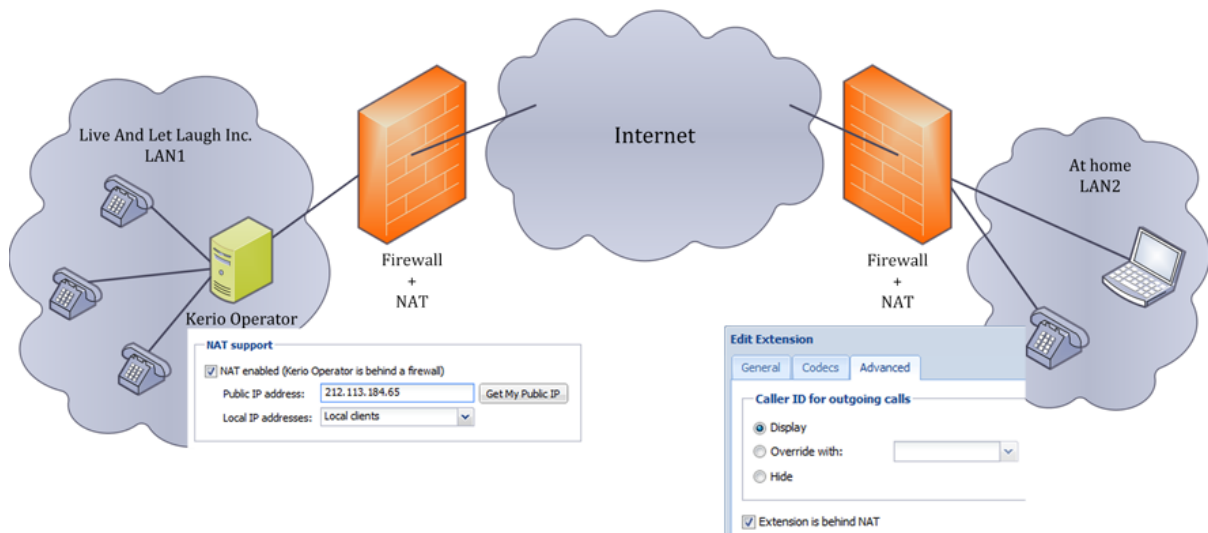


Figure 2 Kerio Operator is in the company network and hardware phones are behind NAT

### Kerio Operator is behind NAT and hardware phones are in the Internet

Firstly, configure [NAT for Kerio Operator](#).

If the telephone is in the Internet (not behind NAT), Kerio Operator does not require special configuration.



Phones which are in the Internet cannot be managed in section [Phone Provisioning](#).

# Disabling outgoing calls to certain prefixes

---

## Why to disable outgoing calls to certain prefixes

If anybody elicits usernames and passwords from your users (using phone, email or virus), your outgoing calls constraints will make them useless to the attacker.

The attacker obtains username and password and establishes phone services with premium numbers (usually in a country where such fraudulent behavior is not illegal). They then use your PBX to call these premium rate numbers. Thus you can lose a large amount of money.

For cases of a break-in, it is critical to have calls to external networks well configured. Disable calls to countries users never call. Since you may have employees with different needs, you can create call permission groups to external networks and assign them to users according to their needs.

Each group of constraints can be used easily according to the following method:

- everything is allowed except for the explicitly disallowed
- everything is disabled except for the explicitly allowed

## How to disable outgoing calls

Groups whose calls are blocked are defined in section **Definitions** → **Call Permission Groups**.

1. Click on **Add**.
2. In the **Add Call Permission Group** dialog, enter the name and description for the group.
3. Click on the **Add** button. Add a specific number or prefix and decide whether such number can be used or will be blocked.



If you wish to limit calls to external network, bear in mind that external numbers in these definitions must include the prefix for outbound calls.

4. Click **OK** to save the settings or repeat step 3 for additional numbers.



The rules are applied in order, one by one, so bear this in mind when creating permission groups.

**Disabling outgoing calls to certain prefixes**

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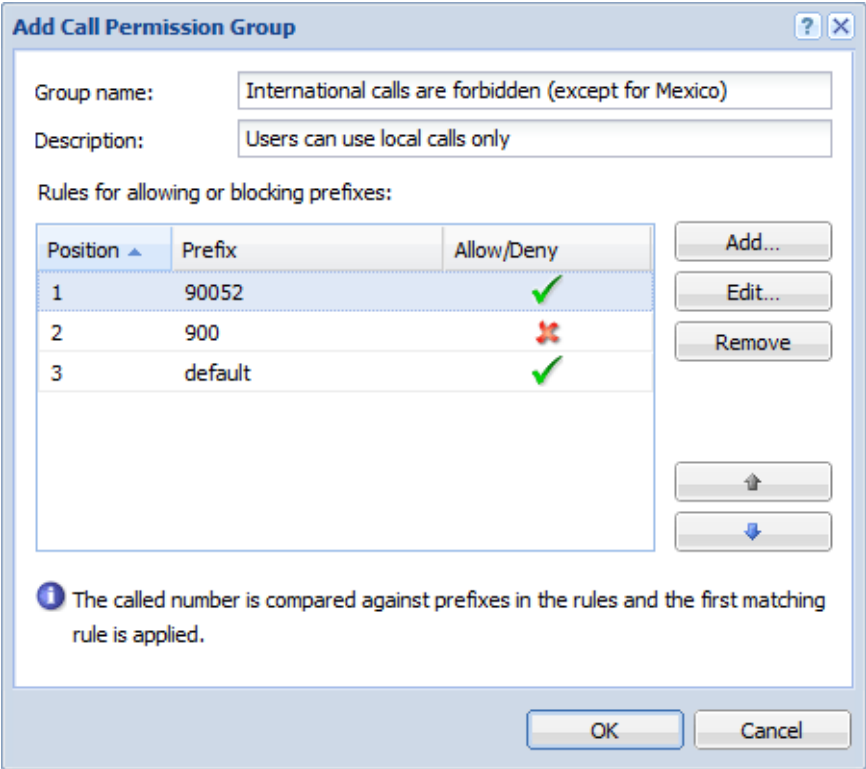


Figure 1 Call permission groups settings

Assign the created call permission groups to individual users (**Configuration** → **Users**).



**Example**

The Live And Let Laugh Inc headquarters is located in HPR, i.e. Happy People Republic. Employees in this office can make calls within the country and also to the neighboring BSL (Bliss Seekers Land). Calls to other countries (especially calls out of Emotion Union) would be costly and there is actually no reason to make such calls. Thomas Punchline (company network administrator) can change the settings easily to block such calls.

- the prefix for calling to external network must be a part of the string (in our case, it is 9)
- all international prefixes (00) are forbidden
- enable the prefix for Bliss Seekers Land — 0052 (including the prefix for calling external network, it makes 90052)

Apply settings as described below:

1. In section **Configuration** → **Definitions** → **Call Permission Groups**, click on **Add**.
2. Enter the name for the group (for example, **International calls disabled**) and a description.
3. In dialog **Add Call Permission Group**, click on **Add** and enter the prefix for international calls 00 together with your prefix for calls to external networks which is 9. The result is 900.
4. Set the rule to **Deny**.
5. To allow calls to the Bliss Seekers Land, it is necessary to add another rule. This rule allows calls to prefix 0052.
6. Figure [1](#) shows the example of the final configuration.

# Legal Notice

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## Used open source software

This product contains the following open-source libraries:

### Appliance OS Sources

Kerio Operator devices are based on open software from various resources. For detailed information on conditions of each particular software used in the product, refer to `/opt/kerio/operator/doc/Acknowledgements`

To download the source package, go to <http://download.kerio.com/archive/>.

### bluff

Bluff is a JavaScript port of the Gruff graphing library for Ruby.

Copyright (c) 2008-2009 James Cogan

Original Ruby version (c) 2005-2009 Topfunky Corporation boss@topfunky.com

### excanvas

Firefox, Safari and Opera 9 support the canvas tag to allow 2D command-based drawing operations. ExplorerCanvas brings the same functionality to Internet Explorer.

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**Heimdal Kerberos**

Heimdal is an implementation of Kerberos 5, largely written in Sweden. It is freely available under a three clause BSD style license (but note that the tar balls include parts of Eric Young's libdes, which has a different license). Other free implementations include the one from MIT, and Shishi. Also Microsoft Windows and Sun's Java come with implementations of Kerberos.

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**ctype.h**

The ctype.h library for the C programming language contains declarations for character classification features.

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**Kerio Asterisk Module**

The Kerio Asterisk Module extends the functionality of the Asterisk PBX to match Kerio Operator needs. It is distributed and licensed under GNU General Public License version 2. The complete source code is available at:

<http://download.kerio.com/archive/>

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**libcurl**

Libcurl is a free and easy-to-use client-side URL transfer library. This library supports the following protocols: FTP, FTPS, HTTP, HTTPS, GOPHER, TELNET, DICT, FILE and LDAP.

Copyright ©1996-2008, Daniel Stenberg.

**libiconv**

Libiconv converts from one character encoding to another through Unicode conversion.

Copyright ©1999-2003 Free Software Foundation, Inc.

Author: Bruno Haible

Homepage: <http://www.gnu.org/software/libiconv/>

The *libiconv* library is distributed and licensed under GNU Lesser General Public License version 3.

Kerio Operator includes a customized version of this library. Complete source codes of the customized version of *libiconv* library are available at:

<http://download.kerio.com/archive/>

## Legal Notice

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### libmbfl

*libmbfl* is a streamable multibyte character code filter and converter library. The *libmbfl* library is distributed under LGPL license version 2.

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The library is available for download at:

<http://download.kerio.com/archive/>

### libxml2

XML parser and toolkit.

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### OpenLDAP

Freely distributable *LDAP (Lightweight Directory Access Protocol)* implementation.

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### OpenSSL

An implementation of *Secure Sockets Layer (SSL v2/v3)* and *Transport Layer Security (TLS v1)* protocol.

This product includes software developed by the *OpenSSL Project* for use in the *OpenSSL Toolkit* (<http://www.openssl.org/>).

This product includes cryptographic software written by Eric Young.

This product includes cryptographic software written by Tim Hudson.

### PHP

PHP is a widely-used scripting language that is especially suited for Web development and can be embedded into HTML.

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**tftpd**

TFTP daemon. TFTP is a simple protocol used for file transmission.  
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**zlib**

General-purpose library for data compressing and decompressing.  
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