Manual

3CX Phone System for Windows

Version 12
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Version 12.0 – Last updated 15th October 2013
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1. Introduction

What is 3CX Phone System for Windows?

3CX Phone System is a software-based IP PBX that replaces a traditional PBX and delivers employees the ability to make, receive and transfer calls. The IP PBX supports all traditional PBX features but also includes many new mobility and productivity features. An IP PBX is also referred to as a VoIP Phone System, IP PABX or SIP server.

Calls are sent as data packets over the computer data network instead of via the traditional phone network. Phones share the network with computers and separate phone wiring is not required.

With the use of a VoIP/PSTN gateway, you can connect existing phone lines to the IP PBX to make and receive phone calls via a regular PSTN line. You can also use a VoIP Provider, which removes the requirement of a gateway.

3CX phone system interoperates with standard SIP softphones, IP phones or smartphones, and provides internal call switching, as well as inbound and outbound calling via the standard phone network or via a VoIP service.

Benefits of 3CX Phone System

Much Easier to Install & Configure then a Proprietary Phone System

A software program running on a computer can take advantage of the advanced processing power of the computer, as well as the easy to use Windows interface and management features of the operating system. Anyone with an understanding of computer networks and Windows can install and configure the PBX. A proprietary phone system often requires an installer trained on that particular proprietary phone system.

Easier to Manage

3CX Phone System has an easy to use web based configuration interface, allowing you to easily maintain and fine tune your phone system. Proprietary phone systems often have difficult to use interfaces which are designed to allow only trained phone system installers to use it effectively.

Call Cost Reduction

You can save substantially by using a VoIP service provider for long distance or international calls. Easily connect remote workers and remote offices to the phone system or multiple phone systems together and make free phone calls.

No Need for Separate Phone Wiring – Use Computer Network

A VoIP phone system allows you to connect hardware phones directly to a standard computer network port (which it can share with the adjacent computer). Software phones can be installed directly onto the PC. This means that you do not need to install & maintain a separate wiring network for the phone system, giving you much greater flexibility to add users/extensions. If you are moving into an office and have not yet installed phone wiring, you can save significantly by just installing a computer network.

No Vendor Lock-In

VoIP phone systems are open standard – all modern IP PBX systems use the SIP protocol. This means that you can use popular SIP IP phones or VoIP gateway hardware. In contrast, a proprietary phone system often requires proprietary phones, designed specifically for that phone system and proprietary expansion modules to add features and lines.
Scalable
Proprietary systems are easy to outgrow: Adding more phone lines or extensions often requires expensive hardware upgrades. In some cases you need an entirely new phone system. Not so with a VoIP phone system: a standard computer can easily handle a large number of phone lines and extensions – just add more phones to your network to expand!

Better Customer Service & Productivity
Because calls are computer based, it is much easier for developers to integrate with business applications. For example: an incoming call can automatically bring up the customer record of the caller, dramatically improving customer service and cutting cost. Outbound calls can be placed directly from Outlook or a CRM software, removing the need for the user to type in the phone number.

Web Based User Portal makes Phones Easier to Use
It is often difficult to use advanced phone system features such as conferencing, call recording and call transfer on proprietary phones. Not so with 3CX – using 3CXPhone for Windows, Android or iOS - all actions are easily performed from a user friendly GUI.

More Features Included as Standard
Because 3CX Phone System is software based, it is easier and more cost effective for 3CX to improve feature sets and performance. 3CX Phone Systems come with a rich feature set, including auto attendant, voice mail, call queuing, call conferencing and more. These options are often very expensive add-ons in proprietary systems.

Better Control via Better Reporting
The web-based reporting system provides the ability to generate advanced reports on inbound and outbound calls, statistical reports on queues as well as produce reports on call costs and call traffic. Reports can be exported to the most common file formats including PDF and RTF and CSV.

3CXPhone Shows Extension and Line Status
Proprietary systems often require expensive ‘system’ phones to get an idea what is going on in your phone system. Even then, status information is cryptic at best. With 3CX Phone System, the 3CXPhone client for Android, iOS and Windows clearly shows which users are available to take calls (presence). In addition, management can also see that customers are being serviced in a timely fashion in real-time.

Telesworking / Remote use via Smartphones
With the use of 3CXPhone for Windows, Android and iPhone, extension users can take and make calls via the company phone system from anywhere using their smartphone or laptop.

How an IP Phone System Works
A VoIP Phone System, also referred to as an IP PBX, generally consists of the IP PBX server, one or more SIP based phones and a VoIP/PSTN Gateway or a VoIP service provider. The IP PBX server is similar to a proxy server: SIP clients, being either soft phones or hardware based phones, register with the IP PBX server, and when they wish to make a call they ask the IP PBX to establish the connection. The IP PBX has a directory of all phones/users and their corresponding sip address and thus is able to connect an internal call or route an external call via either a VoIP/PSTN gateway or a VoIP service provider.
Figure 1 - VoIP Phone System Overview

The image illustrates how an IP PBX integrates on the network and how it uses the PSTN and/or the Internet to connect calls.

SIP Phones

A VoIP phone system requires the use of SIP phones. These phones are based on the Session Initiation Protocol (SIP), an industry standard to which all modern IP PBXs adhere. The SIP protocol defines how calls should be established and is specified in RFC 3261. SIP allows the possibility to mix and match IP PBX software, phones and gateways. This protects your investment in the phone hardware. SIP phones are available in several versions/types:

Software (based) SIP phones

A software based SIP phone is a program which makes use of your computers microphone and speakers, or an attached headset to allow you to make or receive calls. Examples of software SIP phones are 3CXPhone or X-Lite from Counterpath.
Hardware (based) SIP Phones

A hardware based SIP phone looks and behaves like a normal phone. It’s actually a mini computer that connects directly to the computer network. They have an integrated mini hub, allowing them to share a network connection point with a computer, eliminating the need for an additional network point for the phone.

Smartphones (iPhone and Android)

iPhones and Android phones can be used as clients to 3CX Phone System using the freely available 3CXPhone for Android and 3CXPhone for iPhone. Using 3CXPhone, your smartphone becomes a wireless desk phone in the office, and can be used to answer and receive company calls while out of the office via WIFI or 3G (Your mobile provider must support VoIP over 3G).

3CX Phone System Licensing

Licensing is based on the number of simultaneous calls that your company requires, including both external and internal calls. Each 3CX Phone System allows you to create an UNLIMITED number of extensions. To arrive at the correct number of simultaneous calls that you need you must usually take the projected number of extensions times three or four.

3CX Phone System Editions

3CX Phone System is available in 3 different editions – Free, Standard and Pro. The Pro edition adds the following features:
• Advanced real time statistics – With these advanced call center features, supervisors can get access to the advanced real time information in the Queues page of 3CXPhone. Besides monitoring queue status and which agents are logged on, you can see the number of callers in queue the, number of answered/unanswered calls, average and longest wait time, time an agent logged in /out of queue and more.

• Additional Queue strategies including Call Back, Longest Wait, Least Used

• Whisper – Whisper functionality on queue calls. Listen to monitor Agent responses, and if Agent responds wrongly you can provide feedback to the Agent only, allowing him / her to correct their answers.

• Listen in – Allows supervisors to listen in on calls to monitor Agent responses.

• Wrap up time – Wrap up time gives agents a configurable amount of time to enter notes in the customer record or follow up tasks before they have to take another call. Wrap up time can be configured per queue

• Wall Board feature – web page which can be displayed on large screen with total number of calls waiting, number of answered and unanswered calls and average wait time

• Alerts to file and email when a call is in the queue beyond a certain time. You can now enforce SLA requirements and get notifications whenever a call is in a queue beyond a certain time. An email notification can be sent, the agent's 3CXPhone can be configured to play a sound and the alert is also logged.

• Ability to log out an agent from the queue

• More extensive reports

A detailed feature comparison between versions is available at this location: http://www.3cx.com/phone-system/edition-comparison

What’s New in 3CX Phone System v12?

We have focused our efforts on improving 3CX Phone System from the user’s perspective and version 12 certainly gives 3CX users unparalleled mobility and productivity. We’ve really raised the bar on the new 3CXPhone client by giving it an easy to use interface and packing it with features. The new 3CXPhone client takes this version of 3CX Phone System to a whole new level.

3CXPhone is Easier to Use

• New interface with an improved Android and iPhone user experience.

• Native app for a more seamless and responsive user experience.

• Easy call forwarding setup from your smartphone.

• Many features previously available only via 3CX MyPhone can now be done from your smartphone such as:

  • Set status.
  • Login and Logout of queues.
  • Be alerted to new voicemails.
  • Create and Schedule conferences.
  • See your colleagues’ presence.
• Check your Voicemail and Recordings on your phone.

3CXPhone is Easier to Deploy and Manage

• Network auto-sensing – 3CXPhone detects if it’s not on the LAN and changes its configuration automatically.
• Easy one click auto provisioning – 3CXPhone can now be provisioned from anywhere. Users simply click on a provisioning attachment.
• Improved troubleshooting.
• Native, easily deployable app. No more Silverlight!

Integrated Softphone

The softphones have been integrated into the client and received a major revamp and many new features:

• Ability to easily perform blind or attended transfers from the interface.
• Multi Line – 3CXPhone can now handle multiple lines on all platforms – necessary for conferencing, attended transfer etc.
• Ability to easily create conference calls on 3CX Phone System.
• CTI Mode.
• When in the office, use the 3CXPhone client with your desk phone in the CTI mode to get amazing productivity gains from your IP phone.
• Call control of Yealink and snom phones.
• Initiate calls with a mouse click – no retyping of phone number.
• Easy call transfer.
• Create conference calls with a few mouse clicks.
• Uses CTI API on the phone, not call back.

Multi-Platform

3CXPhone is available for all major platforms:

• Android 2.3 and up – Available for download from Google Play.
• Tested on popular Android phones from Samsung, HTC, LG, and Sony Ericsson.
• iPhone 3, 4 and 5 – Available to download from the Apple App Store.
• Windows 7 and 8.

Unmatched Mobility with PUSH Support

We’ve taken mobility to a completely new level for users as 3CX Phone System 12 is the ONLY PBX to support PUSH Technology! Both the Android and iPhone clients support the PUSH mechanism, meaning that the client will be activated on an incoming call or chat message.

• If your phone is in sleep mode, 3CX Phone System will “wake up” the client.
• Saves battery power.
• You don’t have to remember to keep it active.
• Allows users to be reachable via the phone system from anywhere.
• Slashes company call costs because users can be reached via VoIP.
• Users do not need to give out mobile number as much.

**Unified Communications**

The new 3CXPhone is a fully featured unified communications client, not just a softphone:

• Integrated Presence – check status of other users.
• Integrated chat, available for all platforms.
• Easy one click conference call setup.
• View voicemails and call history from your smartphone & Windows desktop.
• Ability to set status from your smartphone.

**Better Integration of Phones on Cell Network**

3CX Phone System now includes a mobile agent which allows better integration of calls forwarded via the cell phone network:

• Hold or Resume calls.
• Transfer calls.
• Blind transfer.
• Attended transfer.
• Create a conference.

**IP Phone Management & Security**

**IP Phone Management**

3CX Phone System has made IP phone management drastically easier for the administrator:

• Firmware for supported phones is pre tested by 3CX.
• Easily update all IP phones on the network with a few mouse clicks.
• No more interoperability issues as firmwares are validated by 3CX BEFORE their release.
• This feature will require a valid maintenance agreement.

**Security**

3CX Phone Systems strong security has been further enhanced with the following features:

• Default HTTPS – for IIS systems – HTTPS is now enabled and configured by default.
• Improved security of provisioning folder.
2. Installing 3CX Phone System for Windows

System Requirements

3CX Phone System for Windows requires the following:

- Windows 7 (Pro or Ultimate), Windows 8, Windows Server 2008 (x64 only), Windows Server 2008 R2 and Windows Server 2012
- Port 5060 (SIP), 5080 – 5089 (Bridge connections), 5090 (Tunnel) and ports 9000 – 9049 (audio) – Calls are performed on these ports. You might need to configure your firewall to allow and route connections to these ports accordingly.
- On the 3CX Phone System server, ports 4515, 4516, 5000, 5100, 5480 - 5489, 7000 – 7499, 32000 – 32999, 40000 – 40999 are used by the 3CX Phone System processes. There should be no other application listening on these ports
- .NET Framework version 4 or higher.
- Minimum: Core2Duo processor and 2 Gigabyte Memory
- Internet Explorer 8 and higher, Firefox 3.6 and higher or Google Chrome
- If using a VoIP provider or remote extensions, you will need a fixed IP. DynDNS and similar configurations are not supported!
- 3CX supported IP Phones (full list at http://www.3cx.com/support/)
- 3CX supported VoIP Gateway or VoIP Providers
- If you are using a VoIP provider, you must have a firewall that is configured to do static port mapping. A static IP is highly recommended also! For more information see: http://www.3cx.com/blog/voip-howto/static-port-mappings/

Considerations:

- More information on system requirements including benchmark tests can be found at: http://www.3cx.com/docs/supported-operating-systems/, http://www.3cx.com/docs/recommended-hardwareSpecifications-for-3cx/ and http://www.3cx.com/blog/news/3cx-phone-system-for-large-enterprises/
- If you are planning to use 3CX Phone System in a multi-tenant system, you need to upgrade the machine specifications accordingly, depending on the number of tenants that will be hosted on each machine. You should avoid having more than 20 3CX Phone Systems running in a multi-tenant environment.
- You will need to have a good basic understanding of Windows Networking.

Download and Install 3CX Phone System


2. You will be asked to review and accept the license agreement, as well as to choose an installation location. 3CX Phone System will need a minimum of approximately 10GB free hard disk space. You will need to reserve additional space to store voice mail files & prompts.
3. Select the installation location and click Next
4. You will be asked whether you wish to use IIS or the in-built web server, Abyss. On Windows 7/8 & 2003, you must use Abyss. On Windows 2008 we recommend IIS.
5. Click ‘Install’ to start the installation of 3CX Phone System. Setup will now copy all files and install the necessary Windows services. After set-up has completed copying files and installing the services, set-up will run the 3CX Phone System Configuration Wizard. To complete the install, click ‘Finish’.

**3CX Phone System Configuration Wizard**

1. The 3CX Phone System configuration wizard walks you through a number of essential tasks that you need to do in order to get your system up and running. After it starts up, it will ask which language you want to use for 3CX Phone System.
2. The wizard will then ask you for the Local IP Address which 3CX will use by default.
3. Set-up will ask you for the public IP of the 3CX Phone System machine so that remote extensions can be provisioned. You can skip this step if you wish and enter it later.
4. If you are upgrading or moving your 3CX Phone System installation, the wizard will give you the option to restore settings that have been backed up previously.
5. The wizard will ask you how many digits you wish your extension numbers to be. This is a very important decision since it cannot be altered without re-installing and re-configuring the PBX.
6. It will ask you for your mail server name and reply to address. These settings are used to send email notifications, voice mail and faxes.
7. It will then ask you for a preferred username and password to be used to logon to the 3CX Phone System management console and manage the phone system.

**Screenshot 1 - The 3CX Configuration Wizard**

8. The wizard will ask you to create your extensions, however you might want to do this at a later stage using phone provisioning, or importing users. You do however need to create at least one extension – the one which will be used as the operator extension.
9. The wizard will then ask you to select your country, which is used to determine the International Dialling Prefix for your country.

10. In the next step it will ask you to specify the operator extension. The operator extension is the default extension used to route all inbound calls to. Select one of the extensions created in the previous step.

11. Now review the voice mail extension – this is the number that users will call to retrieve their voice mail. You need to ensure that this number is not used for any other purposes (e.g. an emergency number in your country)

12. The wizard will ask you to specify the countries and regions to which calls can be made. Calls to countries which are not selected will be rejected. This is done as a security measure against VoIP toll fraud.

13. If you want to use a VoIP provider, you can select the VoIP provider to use, specify server name, proxy (if applicable), account details and rule prefix. Click the Skip button if you are not using a VoIP, or want to specify this later.

14. 3CX Phone System Wizard will prompt you whether you would like to receive a quote for a complete phone system. If yes, fill in your details and 3CX or a 3CX partner will send you a detailed quote. You can skip this step if you do not need a quote at this stage.

After the Wizard has completed, you can connect to the 3CX Phone System Management Console by clicking on the management console shortcut in the 3CX Phone System program group.

To connect to the management console from a remote machine, start a web browser and enter the name of the machine on which 3CX Phone System is installed, followed by ':5000/Management'. (For example: http://phone-system:5000/Management) 5000 is the port used by web server in 3CX Phone System.

**Upgrading from a Previous Version of 3CX Phone System**

It is possible to upgrade a 3CX Phone System version 11 as follows:

1. Before uninstalling, backup your current configuration using the backup and restore tool located in the 3CX program group.

2. Now uninstall the old installation using Add/Remove programs.

3. Install 3CX Phone System v12 – You will be prompted for the backup file in the post install wizard. This will restore your configuration.

**Note**

Upgrades of versions 3.1, 5, 6.0, 6.1, 7.0, 7.1, 8, 9 and 10 are not supported. You will need to upgrade to an interim version before upgrading to version 12 or recreate your configuration.

**Logging into the 3CX Phone System Management Console**

After installation as completed, you can login to the 3CX Phone System management console. You can do this in two ways

- Start-up the Windows Management console from the 3CX program group (Windows based)
- Or point your web browser to the Management Console by entering the name of the machine (including port 5000), for example: http://phone-system:5000/Management
A login page will appear. Enter the Username and Password that you provided during setup, select the language you would like to use and then click on the ‘Login’ button.

**Activating 3CX Phone System**

After installation, you must activate your license by going to the Settings > Activate License page in the 3CX Management Console.

**Screenshot 2 - Activating Your License**

Enter your license key, Company, Contact Name, E-mail, Telephone, Country and the name of your Reseller (The company who you bought 3CX from) and click on “Activate” to activate your license. This information will be sent to our license key server and your license key and installation will be activated.

Please note that in order to be entitled to your first year of free upgrade insurance your details must be inserted correctly. They are reviewed at 3CX HQ and if they are not correct the upgrade insurance will not be activated.

You will need to do this each time you re-install 3CX Phone System on a new machine or when a change in the local network topology occurs (example: the local IP address changes).

**Firewall Configuration**

There are 2 scenarios in which you will need to update your router / firewall configuration:

1. If you intend to use a VoIP provider
2. If you intend to use remote extensions

Undoubtedly, the best place for 3CX Phone System is on a machine behind the firewall. This configuration is easier and more secure. If you only use PSTN lines and do not plan to have any remote extensions, you don’t even need to make any changes to your firewall configuration.
If you intend to use a VoIP Provider or remote extensions without using the 3CX Tunnel, then you will need to open the following ports to allow 3CX Phone System to communicate with the VoIP Provider:

- **Port 5060 (UDP)** for SIP communications (send & receive) **MUST BE STATICALLY MAPPED.** See sample firewall configuration at [http://www.3cx.com/blog/voip-howto/linksys-router-configuration/](http://www.3cx.com/blog/voip-howto/linksys-router-configuration/)

- **Port 5061 (TCP)** for TLS communications – If using secure SIP.

- **Port 9000-9049 (or higher) (UDP)** (send & receive) for RTP communications, which contain the actual call. Each call requires 2 RTP ports, one to control to call and one for the call data. Therefore, you must open twice as many ports as you wish to support simultaneous calls via the VoIP provider. For example, if you want to allow 4 people to make calls via the VoIP provider simultaneously, you must open port 9000 to 9007.

- **Port 5090 (UDP and TCP)** for the 3CX Tunnel (needed for remote extensions or bridges that use the 3CX Tunnel)

Note that the above port ranges are the default ports in 3CX Phone System. You can adjust these ports from the Management Console, in the Settings > Network node. From this node, you can configure the ports to be used for internal calls, and the ports to be used for external calls being made via a VoIP provider or calls to and from a remote extension.

More information on how to configure your firewall can be found at: [http://www.3cx.com/blog/voip-howto/firewall-configuration-overview/](http://www.3cx.com/blog/voip-howto/firewall-configuration-overview/)

### System Prompts Language

3CX Phone System ships with a US English prompt set by default. Prompts are voice files that are played by the system to callers and users of the system. For example, when a user picks up their voice mail, the system prompts will instruct the user what buttons to press in order to hear or delete voice messages.

To change the system prompts to a different language:

1. Go to 3CX Phone System Updates > System prompt sets node and then select the prompt set you wish to use and click on ‘Download Selected’. The prompt set will be downloaded.

2. Now go to the Settings > System prompts sets node and click on the ‘Manage Prompt sets’ button at the top of the screen.

3. Select the prompt set you have downloaded and click on ‘Set As Current Promptset’. The system will now use this new prompt set.
3. Configuring 3CX Phone System Clients – 3CXPhone

Introduction

3CXPhone is a SIP client that allows users to easily manage their extension with a few mouse clicks – rather than via a cryptic and limited phone interface. 3CXPhone can work with an existing supported IP Phone or you can use the inbuilt softphone. 3CXPhone is available for multiple platforms including Windows, Android and iOS.

Screenshot 3 - 3CXPhone

3CXPhone provides the following functions:

1. Call Pop-up - Upon receiving a call, 3CXPhone will allow you to reject the call or transfer the call to another person or to voice mail - with a single mouse click or using drag and drop.

2. Easy Call Transfer / Park - When on a call, you can transfer or park a call with a mouse click or via drag and drop, no need to learn dial codes or call transfer procedures on a phone.

3. Presence - The status of the other extensions is shown, allowing you to avoid unnecessary calls or call transfers to colleagues.

4. Click to Call - Launch calls with a mouse click – double click on an extension to call the person, or enter a name or number in the make call dialog. The call will automatically be launched without requiring you to dial the number. Calls can also be launched directly from your contact management software with the CRM integration module.

5. Hotkey Dialling – Select a number in a web page or document to launch a call

6. Queue Monitoring - View the status of queues that you are a member of. You will see callers waiting in the queue and be able to take a call from the queue.

7. Text Chat – Message other users using the in-built chat option

8. Record Calls - you can trigger the recording of a call by hitting the record button

9. Phonebook – 3CXPhone provides easy access to the company and to the personal phonebook, and allows users to trigger calls simply by typing a name – this will then automatically resolve the number and launch the call.

10. Softphone -- Allows you to make and receive calls on your computer or mobile device without using a hard phone.

11. CTI Mode (Windows only) -- Allows you to control your desk-phone from your desktop.
3CXPhone will show different information based on whether you are a standard user or a manager and depending on the customisation of your Group Rights. In the Manager role, you can see calls from anyone in your department. These rights are set by the Phone System administrator in the 3CX Management Console. For more information about Rights have a look at the Extension Groups and Rights section of this manual.

CTI Mode

The new 3CXPhone for Windows client allows you to control your desk-phone from your desktop. When 3CXPhone is controlling your desk-phone rather than using the inbuilt softphone, it is in CTI mode. When at the office, you can use the 3CXPhone client in CTI mode to take advantage of the following features:

1. Call control of Yealink and snom phones.
2. Initiate calls with a mouse click – no retyping of phone number.
3. Easy call transfer.
4. Create conference calls with a few mouse clicks.
5. Uses CTI API on the phone, not call back.

Deploying 3CXPhone

If you are going to leverage PUSH technology you must configure Android and iPhone PUSH accounts PRIOR to sending out the configuration mails.

3CXPhone is installed via the App Store, Google Play or via MSI file depending on the platform you need it for. The installation links are sent in the user's welcome email and the configuration file is attached to it as well.

Windows

3CXPhone for Windows is available as an MSI file. You can download the latest version here: http://www.3cx.com/Downloads/3CXPhoneforWindows12.msi

For Windows users you can deploy the setup file via active directory automatically as it is an MSI file.

More information about the Windows client can be found here: http://www.3cx.com/3CXPhone/Windows/Manual/Installation

Once installed, 3CXPhone gets updated automatically, for more information see the “Updating 3CXPhone” section of this document.

Android

The Android client can be installed via Google Play:


Be sure to configure Google Push before sending out the welcome emails for Android users. For more information see chapter “Configuring Google Push” below.

More information about the Android client can be found here:
http://www.3cx.com/3CXPhone/Android/Manual/Installation
Apple iOS

The iOS client can be downloaded from the Apple App store here: 

Be sure to configure Apple APNS before sending out the welcome emails for iOS users. For more information see chapter “Configuring Apple Push” below

More information about the iOS client can be found here: 
http://www.3cx.com/3CXPhone/iPhone/Manual/Installation

Sending the 3CX Welcome Email

In order to auto provision the 3CXPhone client via email you must first send the email to the user’s account. To do this:

1. Log in to the 3CX Phone System Management Console
2. Select the ‘ Extensions’ node
3. Click on the Extension that you want to provision via email

4. Click the ‘Send Welcome Email’ button on the upper right corner of the tab. Note: make sure that you have an email address specified in the extension’s properties before doing this.
5. An email will be send to the extension’s email along with an attachment for auto provisioning

Configuring the 3CXPhone Client

1. Once the user has installed the client from Google Play, the Apple App Store or via the MSI file, you can instruct the user to open the welcome email and double click/tap on the attachment to it.
2. The attachment will start up 3CXPhone on the user’s machine and automatically configure it.
3. You can resend the user’s welcome email by going to the user’s extension in the extensions node and selecting ‘Send welcome email’.

Screenshot 4.5 – Sending a Welcome Email
Configuring Google Push

3CXPhone uses PUSH technology to wake up the smartphone when a call or a text message is received. This does not require the user to keep the phone active to be able to receive calls or text messages – the phone can go to sleep mode to save battery life.

In order to leverage PUSH technology you need to setup a Gmail account with Push. This step must be performed BEFORE you deploy 3CXPhone as the Google API key is needed to allow 3CX to send push requests to the phone.

**Step 1 - Create Google API Project**

1. Login to your Gmail Account
2. Go to the Google API Console page: https://code.google.com/apis/console/

![Screenshot 4: Create a Google API Project]

3. Click Create Project. The browser URL will change to something like this: https://code.google.com/apis/console/#project:1036443389285:access

![Screenshot 5: Note the Google API Project Number]

4. Take a note of the value after #project (1036443389285 in this example). This is your project number, and it will be used later on as the GCM sender ID by 3CX Phone System.

**Step 2 - Enable the GCM Service (Google Cloud messaging service)**

1. In the main Google APIs Console page, select Services.
2. Turn the Google Cloud Messaging for Android toggle to ON.
3. Accept the Google APIs Terms of Service.
4. Now select the API Access option at the left.
Step 3: Configure 3CX Phone System for Android Push Notifications

1. Login to the 3CX Management console

2. Navigate to Settings > 3CXPhone

3. Set the URL to https://android.googleapis.com/gcm/send

4. Set the API Key obtained in Step 2. To "AlizaSyBTbWIWKgHjDIJPjdaUcgzdiGCqemIXGaE" for example.

5. Set the Project number (GCM Sender ID) to the Project ID obtained in Step 1 (1036443389285 in this example).

Screenshot 7-1 – Insert the API Key and Project Number

Screenshot 6 - Note Down the Google API Key

5. Now copy the API Key, outlined in red in the screen shot.
6. Press Apply. It might take some time to save depending on the number of extensions you have.

**NOTE:** If your organization has a firewall that restricts the traffic to or from the Internet, you need to configure it to allow connectivity with GCM in order for your Android devices to receive messages. The ports that you have to open on your firewall are: 5228, 5229, and 5230. GCM typically only uses 5228, but ports 5229 and 5230 are also used sometimes. GCM doesn’t provide specific IPs, so you should allow your firewall to accept outgoing connections to all IP addresses contained in the IP blocks listed in Google’s ASN of 15169.

**Configuring Apple Push**

1. Login to the 3CX Management console
2. Navigate to Settings > 3CXPhone
3. In the ‘Apple Push Notification Server Information’ section of the tab check the ‘Enable Push Notifications’ option

![Screenshot 7-2 – Select the Certificate and Press Apply](image)

4. Click on the ‘Certificate Path’ drop down menu and select the ‘aps_production.pfx’ certificate
5. Press ‘Apply’ and restart your services by going to the ‘Services Status’ node and pressing ‘Restart All’. This might take some time to be applied and saved depending on the number of extensions that you have.

**NOTE:** Push providers, iOS devices, and Mac computers are often behind firewalls. To send push notifications, you will need to allow inbound and outbound TCP packets on port 2195. To reach the feedback service, you will need to allow inbound and outbound TCP packets on port 2196. Devices and computers connecting to the push service over Wi-Fi will need to allow inbound and outbound TCP packets through port 5223.

The IP address range for the push service is subject to change. The reason being that providers will connect by hostname, rather than IP address. The push service uses a load balancing scheme that yields a different IP address for the same hostname. However, the entire 17.0.0.0/8 address block is assigned to Apple, so you can specify that range in your firewall rules.
Enabling/Disabling Push

After configuring your Push settings you will need to select which extensions have Push functionality enabled. To do that:

1. Login to the 3CX Management console
2. Navigate to Settings > 3CXPhone
3. Scroll down to the ‘Select 3CX Users’ section
4. Click on the extension that you want to enable push for in the left column and press ‘Add’
5. The extension will be added to the right column and Push will be enabled.
6. If you want to disable Push for an extension just select the extension from the right column and press ‘Remove’.
7. The extension will be transferred to the left column and Push functionality will be disabled

Updating 3CXPhone

Updates to 3CXPhone are deployed automatically via the 3CX Phone System Server. When a new update is available on the 3CX Website, the 3CX Phone System Server downloads the update to 3CXPhone and notifies the 3CXPhone users.

If a user has an out-dated 3CXPhone, upon starting 3CXPhone, he will be shown a message informing him that a new version of 3CXPhone is available:

Screenshot 8 – 3CXPhone Notifying the User about New Updates
Once the user accepts, the update the downloader will start and download the new installation of 3CXPhone:

![Screenshot 9 – 3CXPhone Updater Downloading the Latest Version](image)

After the file download is complete the new client will be installed automatically and 3CXPhone will restart on its own for the upgrade to complete.

The Android and iOS clients update automatically through the Google Play store and the Apple App Store when they detect a newer version of the client online.

**Using 3CXPhone for Android, iOS and Windows**

A web-based user manual exists for all three 3CXPhone platforms and can be found here:

- **Android** – [http://www.3cx.com/3CXPhone/Android/Manual](http://www.3cx.com/3CXPhone/Android/Manual)
- **iOS** – [http://www.3cx.com/3CXPhone/iPhone/Manual](http://www.3cx.com/3CXPhone/iPhone/Manual)
- **Windows** – [http://www.3cx.com/3CXPhone/Windows/Manual](http://www.3cx.com/3CXPhone/Windows/Manual)

The administrator can review all the users that are using 3CXPhone from the 3CX Management Console > 3CXPhone Clients tab. This shows all the users who are currently logged in using 3CXPhone, including their IP.

In addition, the administrator can control what configuration options are available in 3CXPhone for an extension from the properties of the extension>3CXPhone options. From here, the administrator can select to Turn off 3CXPhone, not show the extension to other users, Hide the Forwarding Rules, Extension Details or Caller ID information in 3CXPhone or enable viewing of Recordings in 3CXPhone.
4. Configuring & Managing IP Phones

Introduction

After you have installed 3CX Phone System, you will need to configure your IP phones and assign extensions to each phone.

We recommend that you have 3CX automatically configure your IP phones for use with 3CX Phone System. This process is called phone provisioning. This method is preferable to the manual configuration because it allows you to easily manage the phones from the 3CX Management Console.

Provisioning makes it easy to change extension passwords, BLF lights and so on because you can do it centrally for all phones from the 3CX Management Console and then push the changes to the phone without having to manually configure the phone (which is generally cumbersome).

This chapter explains how to configure your phones automatically using provisioning. It is also possible to manually configure your IP Phones, which in rare cases might be necessary. For information how to do this, please visit our support page at http://www.3cx.com/support/

Setting Your Time Zone

![Screenshot 10 - Setting the time zone]

3CX will automatically set the time zone on the phones to be provisioned. However, since each phone has its own time zone configuration method, you need to select the appropriate time zone for each phone from 3CX Management Console > Settings > Phone Provisioning.

Configuring snom and Yealink Phones using Plug and Play

Yeatlink and snom phones can be easily configured to be part of the 3CX Phone System using 3CX’s plug and play feature.
Proceed as follows to provision the phones:

1. Connect the IP Phone to the LAN. Ensure that the phone is on the same LAN as 3CX Phone System.

2. The phone will show up in the Phones node as a new phone.

3. Right-click on the entry and assign it to an existing extension or create a new one for the phone.

4. You can specify BLF buttons that must be configured in the Provisioning tab of the extension. More information on how to configure an extension can be found in the Extensions chapter.

5. The phone will be sent a link to a configuration file, which will be used to configure the specific phone with the settings configured in 3CX Phone System. The phone will restart with the correct extension credentials. Some phones will ask for a confirmation by the user before restarting.

Once you make changes to the phone configuration you will need to re provision the phones so as to force the IP Phones to pick up the new configuration. To do this:

1. On the phones node in the management console, select the phones to which you want to apply changes.

2. Now click on the ‘Re provision Phones’ button.

3. The phones will restart and apply the desired changes.

Configuring Cisco, Polycom and Older Model Phones

This section explains how to provision phones that do not support plug and play. Cisco and Polycom must be provisioned using this method. Provisioning a phone is done in 2 Steps:
Step 1 – Configuring the Extensions for Provisioning

1. After creating the extension in the 3CX Management Console, go to the ‘Phone Provisioning’ tab of the extension.
2. Enter the MAC address of the phone (which can be found at the bottom of the phone) in the MAC address field.
3. Select the appropriate phone model.
4. Confirm the IP address which the phone should connect to (in case your phone system server has multiple network interfaces).
5. The codecs and codec priority will be automatically configured depending on the phone model selected.
6. If your phone has BLF lights, you can automatically configure what information the BLF lights should display. Match a BLF button with an extension, so that this button will show the status of that extension. The number of available BLF buttons varies per phone.
7. You can also link a shared parking place to a BLF button. This allows users to easily park or un-park calls by hitting that BLF button. Speed dials and custom speed dials are also supported.
8. Click OK to save. The provisioning files will now be created in the provisioning directory. Each time you make a change to the extension, these files will be re-created.

Step 2 – Configure the Phone to Retrieve the Configuration File

Now you need to instruct the phone to download its configuration from the provisioning directory on the 3CX Phone System server. This can be done in two ways:

One Time Configuration via the Phone’s Web Interface

By configuring the provisioning URL in the phone via its web configuration – this is a one-time operation and makes sense in smaller networks. The exact procedure and the format of the URL to use are dependent on the model of phone. You can find configuration guides for each phone at http://www.3cx.com/support/
Using Option 66 in your DHCP Server

By using option '66' in your DHCP server, the phone will obtain the URL when it receives its IP from the DHCP server. This is recommended for larger networks. Essentially the phone will be told where to get its configuration file at the same time it receives its IP and networking info. This makes it easy to change the provisioning URL later, for example in case you wish to move your phone system to another server.

To use this option, you must configure your DHCP server to provide this information. On this link you will find a guide how to configure DHCP option '66' for Microsoft DHCP servers: http://www.3cx.com/sip-phones/DHCP-option-66.html. Keep in mind that the provisioning URL is different for different types of phones.

If you do not use Microsoft DHCP server, you will need to refer to the documentation of your DHCP server for more information on how to configure this.

Auto Provisioning Multiple IP Phones on the Same Extension

With 3CX Phone System 12 you now have the option to provision multiple IP phones to the same extension. That can be particularly useful in case you want to use one phone at home and a different phone at the office with the same extension.

There are two methods that you can follow. The first one is to provision both phones while they are in the same network and then take the one that you want out of the office at home or anywhere you want. The second method involves copying the provisioning URL in the phone’s web configuration interface and pressing ‘autoprovision now’ from within the phone’s web interface (URL location depends on the phone manufacturer in the phone web interface settings). In this guide we will describe how to provision multiple IP phones from within the home LAN. To do this follow the next steps:

1. Log into the 3CX Management console and click on the ‘Phones’ node

2. Select the first phone that you want to provision and right click on it. You now have the option to both create a new extension (by selecting ‘Add Extension’) and assign the phone to it, or assign the phone to an already existing extension (both options shown above in red). If you select the ‘Assign to...’ option you then have to select an extension from the
extension list that will appear and press ‘OK’.

3. You will be taken to the extension’s settings page in the phone provisioning tab. Notice that the MAC Address and model have been automatically filled in for your phone. You may also select the phone display language from here. If you plan on using the phone in office then in the provisioning method field select 'Local LAN'. If you will use the phone out of the office then click on the 'Select provisioning method field and select 'Remote Extension (STUN)' or 'Remote Extension (SIP proxy Manager).

**Note:** to provision a phone as a 'Remote Extension (SIP Proxy Manager)' you need to have 3CX Sip Proxy Manager installed and configured. You can also select your codec priority from this tab.

4. Scroll down to the bottom of the provisioning tab to configure your BLF settings (optional). When finished press ‘Apply’. Your IP phone will restart and provision itself.

5. To provision another phone for the same extension, go back to the ‘Phones’ node. Select the other phone that you want to provision for the same extension and right click on it.
6. Select ‘Assign to an existing extension’ and from the extension list that will appear select the same extension as you did for the previous phone you configured.

7. A notification will appear telling you that a phone has already been provisioned for this extension. Press OK to proceed.

8. You will be taken to the extensions provisioning page again where you can configure your second phone.

9. The next steps to configure your second phone are identical to steps 3 and 4 of this guide.

10. You may repeat the process to auto provision additional phones to the same extension.
Managing Your IP Phones

3CX Phone System provides an easy way to monitor and manage your phones network wide. The ‘Phones’ node in the 3CX Management console allows you to:

- View all phones in the network.
- Quickly view IP and Mac address of each phone.
- Check firmware version that the phone is running.
- Remotely reboot one or all of the phones.
- Re-provision the phones (after you have made a change you can reboot the phones to have the changes take effect).
- Launch the admin interface of the phone.
- Monitor security of extension password and PIN. Weak extension passwords and PIN's are the most common cause of security breaches.

Re-Provisioning the Phones

If you need to re-provision the phones, for example after you have made configuration changes, you can easily do this from the IP Phones node:

1. Go to the 3CX Phone System > Phones node.
2. Select the phones that you wish to reprovision.
3. Click ‘Reprovision phones’.
4. Select the phones again and select ‘Reboot’ to activate the new provisioning information on the phone.

Updating the Firmware on Your Phones

It is possible to update the firmware of your snom, Cisco and Yealink IP phones network wide from the 3CX Management Console. Each of the firmware has been interop tested by 3CX and thus it is...
recommended that you upgrade firmware using this method and not by downloading the firmware directly from the vendor's websites.

To upgrade your IP Phones to the latest 3CX tested firmware:

1. From the phones node, select the IP Phones which you wish to upgrade the firmware on and click on the 'Upgrade Firmware' button.
2. Select the model and firmware of the phone from the upgrade list and click 'Upgrade'. The firmware will be uploaded and the phone rebooted.
3. Note that this feature requires a valid maintenance agreement!

![Screenshot 14 - Updating Phone Firmware](image-url)
5. Extensions

Introduction

There are multiple ways to create an extension:

- When provisioning a new phone, you can choose to create a new extension.
- Extensions can be manually created from the Extensions node in the management console.
- Extensions can be imported from Active Directory (or any other LDAP server) or a CSV file.

Importing Extensions from Active Directory or a CSV file

If you need to create a large number of extensions it is handier to bulk import the extensions. There are two ways to do this:

- Create a spreadsheet with columns for each field that you wish to import and save this as a CSV file. You can find a detailed description of fields as well as a link to a sample import file at: [http://www.3cx.com/blog/docs/bulk-extension-import/](http://www.3cx.com/blog/docs/bulk-extension-import/)
- Alternatively you can import directly from Active Directory or other LDAP servers via LDAP. Every time a change is made to the user configuration in Active Directory, users can be re-synchronised, in which case only the updates will be imported. A description of how to do this can be found at [http://www.3cx.com/blog/docs/import-active-directory/](http://www.3cx.com/blog/docs/import-active-directory/)

Extension Configuration

![Screenshot 15 – Extension Configuration](image)
To configure an extension, click on the Extensions node in the 3CX Management Console. Click on Add Extension to create a new one or select an existing extension and click ‘Edit’.

**General**

In the User Information section you can enter the first and last name and the email address of the user. A welcome email with information on the extension created, as well as voice mail notifications (configurable) will be sent to the email address configured.

In the Authentication section, the authentication ID and password are auto generated, however they can be altered as needed. If the phone is provisioned, the authentication details will be sent to the phone automatically. If the phone is manually configured, the authentication details need to be entered manually in the phone’s configuration.

The Voice Mail Configuration section allows you to configure the extension’s voice mail preferences including the voicemail PIN number for authentication, enable/disable PIN Authentication and if you want 3CX Phone System to read out the Caller ID and the Date / time of when the message was received. You can also choose to send an email to the email address configured for the extension when voice mail is received.

**Forwarding Rules**

Each extension can have a set of call forwarding rules that define what 3CX Phone System should do when the extension user is unable to take an incoming call. This can be configured based on the user’s status, the time, the caller ID, and whether the call is an internal or external call.

Each status requires a call forwarding rule. For example, if the user is unable to take a call whilst his/her status is ‘Available’, you can forward the call to voice mail, whilst if the status is set to ‘Out of Office’ you could forward it to his/her mobile.

Call forwarding can be configured by the administrator from the management console or by the user from the 3CXphone client. Please see this web page for instructions how to configure call forwarding for an extension:

http://www.3cx.com/3CXPhone/Windows/Manual/Forwarding/

**Phone Provisioning**

You can automatically configure one hardware IP Phone with the settings of the extension using phone provisioning. See the previous chapter for information about phone provisioning.

**3CXPhone**

This tab allows you to configure settings for this extension specific to the 3CXPhone client.

- Disallow use of 3CXPhone – Blocks the user from using 3CXPhone.
- Hide Forwarding Rules – Disallows the user to change his / her forwarding rules.
- Show Call Recordings – Allows the user to listen to his recorded calls.
- Allow Deletion of Recordings – Allows the user to delete any recorded calls.
- Configure default phone to use in 3CXPhone for Windows – Configures whether 3CXPhone should use by default CTI with the users IP Phone, or the inbuilt softphone.
- Default Startup Screen – Allows the user to specify the screen 3CXPhone should start up with.
- Use 3CX Tunnel for remote connections – Forces 3CXPhone to use the tunnel for remote connections. This setting only applies to the softphone.
Other

The extension capabilities section allows you to set advanced options for a particular IP Phone registered to this extension. It is best to leave these options default.

User Information

The user information section allows you to set your status, log in and out of queues, turn DND on or off, configure the caller ID for the extension and the SIP ID.

Options

The options tab allows you to configure options, restrictions and access for the extension.

Option
- Record all calls – Records all calls for the user
• Call Screening On – Use ONLY for the Rebound feature. Will prompt the user for a name and play the name to the called party so that the person may decide to take the call or not.
• Send email notification on missed call – Triggers an email for each missed call
• Do not show extension in 3CX company phonebook – Removes extension from the phonebook

Restrictions
• Disable Extension – Disables extension
• Disable External Calls – Disallows any external calls from the extension
• Pin Protect – You can configure an extension to allow outbound calls only after the user enters a PIN. To unlock the extension, the user dials 777 followed by the PIN and a #. The PBX will inform the user that access has been granted. The user can then proceed to dial the desired external number.
• Disallow use of extension outside the LAN – Blocks any registrations from outside of the network. This setting applies to IP Phones.
• Block remote tunnel connections – Blocks the extension from being registered outside of the network, even if it uses the tunnel feature (which is seen as a local registration)

Access
This section allows you to configure to which portals this user/extension has access:
• Allow 3CX Management Access – Allows the extension to have access to the 3CX Management console.
• Allow Web Reports Access — Allows the extension to have access to the 3CX Web Reports console.
  o Allow Admin operations – Allows the extension to delete recordings and configure call types in 3CX Web Reports
• Allow Wall Board Access – Allows Access to the 3CX Wallboard
• Allow Hotel Module Access – Allows the extension to have access to the 3CX Hotel Module
• Access Password for 3CX Web Services – This is the password that has to be used for access to the above 3CX Services.

Office Hours Scheduling

![Edit Extension-102 Yealink T26 office](image)

These settings will be applied for ALL Profiles for this particular extension.

- [ ] The extension uses Global Office Hours
  - [ ] The extension uses Specific Office Hours

Automatically switch to Away during Break times

![Automatic Extension Scheduling](image)

These options will automatically change the status and functionality of your extension based on the time of the day.

- [ ] Automatically Set to Out Of Office
- [ ] Log out from queues when not available (Away / Out of office)
- [ ] Block Outbound calls outside of Office Hours
The Office hours Scheduling feature allows a user to be set to ‘Out Of Office’ status based on global office hours or specific office hours. Two functions can be performed by the PBX:

- **Automatically Set to Out Of Office** – Outside of the Office hours, the user’s status will automatically be switched to ‘Out Of Office’. By default the user will ALSO be logged out of the queue (this option can be toggled from the Extension options tab).
- **When switching to Out of Office / Away, log out from Queues** – This option will automatically log the user out from the queues when he switches to ‘Out of Office’ or ‘Away’ status
- **Block Outbound calls outside of Office Hours** – Blocks any outbound calls from this extension outside of office hours.

**Configure Office Hours**

After you have selected which actions to schedule you must configure whether to use:

- **Global Office Hours** – This extension uses the system wide office hours.
- **Specific Office Hours** – This extension uses specific hours, which can be configured using the configure button.

**Set to Away Whilst on Break**

In addition to the out of office schedule, you can also configure that the extension must be automatically set to the ‘Away’ status during Break / Lunch times. To enable this option select ‘Automatically switch to Away during Break times’ and configure the break times.

**Rights**

![Screenshot 19 – Extension Rights](Image)
The ‘Rights’ tab allows you to quickly check an extensions Group membership rights and configure them according to your preferences. All the available groups appear on the ‘Group Membership’ list on your left.

Any groups that the extension already belongs to, are checked and the role of the current extension in the group appears in the Role column. The user’s rights for the selected group are displayed on the right side of the tab.

You can modify the extension’s rights for that group by ticking off the options in the ‘Rights currently assigned part’ of the tab or even change the extension’s role by clicking on the ‘User Rights’ and selecting ‘User’ or ‘Manager’ from the drop down menu.

To add an extension to a group simply tick off the check box next to the group name that you want the extension to be a part of and select the user rights on the ‘User Rights’ part of the tab. Press ok to apply your changes.

For more information on groups and rights please see Chapter 9: Extension Groups and Rights.
6. Adding PSTN line(s) via a VoIP Gateway

Introduction

External calls can be made on PSTN/phone lines or via VoIP providers. A traditional PBX requires you to connect the PSTN lines to the PBX hardware box; however in the case of 3CX Phone System you have more options:

- Connect PSTN lines (physical phone lines) to a VoIP Gateway situated on your internal network.
- Connect PSTN lines to a VoIP add in card, installed in the 3CX Phone System machine or on another machine.
- Use a ‘hosted’ phone line from a VoIP Service Provider. In this case the VoIP service provider gives you the ability to make calls via your internet connection. This is explained in the next chapter.

To make & receive external phone calls via your regular phone lines, you will have to buy and configure a VoIP gateway or VoIP add in card. This chapter explains what they are and how to configure them.

What is a VoIP Gateway or VoIP Add-on Card?

A VoIP gateway is a device which converts telephony traffic into data, so that it can be transmitted over a computer network. In this manner PSTN/telephone lines are “converted” to SIP extensions, allowing you to receive & place calls via the regular telephony network. VoIP Gateways exist for analog lines as well as BRI, PRI/E1 lines and T1 lines. VoIP cards do the same thing, but are add in cards that are installed into an existing computer.

What is a Port?

A port is a physical line outlet on a gateway or VoIP card. In the case of an analog line, one port is used for each voice channel. In the case of BRI ISDN, one port allows for 2 voice channels, and in the case of E1 or T1 ports, each port represents 30 and 23 channels respectively.

Just as it is necessary to configure a phone to register with the phone system, it is also necessary to configure the VoIP gateway or card to register its ports with 3CX Phone System. Each port gets a SIP user ID, Password and virtual extension number. To the IP PBX, the PSTN line appears just like any other SIP extension which can be used for external calls.

Recommended VoIP Gateways

It is important to use a VoIP gateway recommended by 3CX. Supported gateways have been tested by 3CX and are automatically configured with the right settings. If using the default configuration, 3CX will also provide first line support on its use with 3CX phone System.

For the latest list of supported gateway hardware, please visit http://www.3cx.com/support/

Configuring VoIP Gateways

In order to make use of a VoIP Gateway, you have to follow the next steps:

1. In 3CX Phone System, configure the settings that will be used by the Gateway to connect to the PBX.
2. Configure the VoIP Gateway using the settings made available by the PBX

Let’s see how this is done in more detail

**Step 1: Configure the VoIP Gateway in 3CX Phone System**

The first step is to create the VoIP gateway in the 3CX management console.

**Screenshot 5 – Choosing Gateway Template**

1. In the 3CX Phone Management console menu click on Add > PSTN Gateway.
2. In the name field, enter a friendly name for the VoIP gateway. Now choose the gateway brand and model that you are using from the list. Now click “Next”.
3. Depending on the gateway you selected, you might be asked additional options, such as what country the device will be connected in. Some questions are line specific and thus you may need to check with your line provider.

**Screenshot 21 - Specifying VoIP Gateway Details**

4. Now enter the host name or IP of the VoIP Gateway in the ‘Gateway Hostname or IP’ field, and specify the SIP Port on which the gateway is operating. By default this is 5060.
5. If you selected a Generic device, you need to specify the number and type of ports the gateway supports, i.e. analog, BRI, PRI or T1. This will set up one account for each port and enable the corresponding number of calls/lines for that account. An analog line supports 1 call; a BRI port supports 2 calls, an E1 (PRI) 30, and a T1 (PRI) 23. For example, if you specify 1 x T1 port, it will create one SIP account which can handle up to 23 calls. If you wish to have each line individually addressed, simply select 23 * Analog lines. Click Next to go to the next screen.
6. The individual ports will be ‘created’ and displayed in a columnar format.

   **Virtual extension number** – In effect the VoIP Gateway “converts” each line/port to an extension, so that the phone system can receive and forward calls to it. The virtual extension number is a number assigned to it by 3CX Phone System so that it can address it as an extension. There is no need to change this field.

   **Authentication ID & Password:** These values are used to authenticate the ports with 3CX phone system.

   **Channels:** The Channels field show how many simultaneous calls the port supports. An analog line supports 1 call; a BRI port supports 2 calls, an E1 (PRI) 30, and a T1 (PRI) 23. If you prefer to address each line individually, you can create additional SIP accounts and change the number of channels supported by each account to 1. Note that your VoIP Gateway must support this – especially higher density VoIP Gateways are easier to configure if you use one account for all lines connected to a port.

   **Port Identification** – This field shows the identification number given to the port.

   **Inbound Route:** If the port will receive inbound calls, you can specify to which extension, ring group or digital receptionist a call must be routed.

7. On the next page, you can create an outbound rule for the VoIP Gateway that is being configured. For example, you can have calls where the called number starts with a prefix routed to this Gateway.

8. Click Finish to create the VoIP Gateway.

**Step 2: Configure the VoIP Gateway Device**

After you have configured the PSTN ports, a summary page is shown. The configuration of the VoIP gateway will vary depending on the brand of the device.

**BeroNet Gateways**

If you have a BeroNet gateway, you will need to:

1. Use the bfdetect tool to find the gateway on the network.
2. Configure the Gateway in 3CX as described in the previous step.
3. Click on the "configure BeroNet card" button at the bottom of the summary page
4. Login with admin/admin and follow the screen instructions to complete the setup.

More information can be found at: [http://www.3cx.com/voip-gateways/beroNet-berofix-400](http://www.3cx.com/voip-gateways/beroNet-berofix-400)
Patton SmartNode Gateways

If you are using a Patton SmartNode gateway, you will need to:

1. Use the Patton SmartNode Discovery Tool to find the gateway on the network.
2. Configure the Gateway in 3CX as described in the previous step.
3. Download the Patton configuration file from the summary page (or from the VoIP/PSTN Gateway node > Generate Config File button).
4. Upload the configuration file to the Patton gateway automatically provision it.

More information can be found at: http://www.3cx.com/blog/voip-howto/patton-smartnode-configuration/
7. Adding a VoIP Provider / SIP Trunk

Introduction

VoIP providers “host” phone lines and are replacing the traditional telco lines. VoIP providers can assign local numbers in one or more cities or countries and route these to your phone system. In most cases they also support number porting. In addition, VoIP providers are often able to offer better call rates because they have an international network or have negotiated better rates. Therefore, using VoIP providers can reduce call costs. However be aware that each VoIP call requires bandwidth. VoIP is real time, so it does place a demand on your Internet connection. As a rule of thumb, each call will consume approximately 30k-120k per second, depending on which codec you use. For more information about bandwidth consumption of particular codecs, see this article:

http://www.3cx.com/blog/docs/bandwidth-dsl-atm-isp/

3CX Phone System supports 2 types of VoIP Providers:

- **Registration Based** – These VoIP providers require the PBX to register with the provider using an authentication ID and password. Most of the VoIP providers pre-defined in 3CX Phone System are registration based.

- **IP Based / SIP Trunk** – IP Based VoIP Providers (also known as SIP Trunks) do not generally require the PBX to register with the provider. The IP address of the PBX needs to be configured with the provider, so that it knows where calls to your number should be routed.

This chapter describes the supported VoIP providers and how to configure 3CX Phone System to work with VoIP Providers.

Requirements for Using a VoIP Provider / SIP Trunk

If you plan to use a VoIP provider, you need to have a firewall/router/NAT device that supports STATIC PORT MAPPINGS. Often routers will perform port address translation, which will cause problems such as one way audio, failing inbound calls and so on. It is also highly recommended that you have a static external IP. If your external IP changes intermittently, inbound calls will fail. For more information on how to configure your firewall, review this article:

http://www.3cx.com/blog/voip-howto/linksys-router-configuration/

Configuring a VoIP Provider / SIP Trunk

**Step 1: Create an Account with a VoIP Provider**

First off, you need to have an account with a quality VoIP service provider. 3CX Phone System supports most popular SIP based VoIP service providers and we recommend using one that has been tested by 3CX. 3CX includes pre-configured templates for these VoIP providers. Simply click on the ‘Add VoIP Provider Wizard’ button to see a list of supported providers.

*If there is no VoIP provider in your country you can use Skype for SIP which has a global presence.*

**Step 2: Add the VoIP Provider Account in 3CX Phone System**

After you have created the VoIP provider account, you will need to configure the account in 3CX Phone System. To do this:
1. In the 3CX Phone Management console menu, click on the Add VoIP provider Wizard button.

2. Enter a friendly name for this VoIP provider account.

3. Select the Country that the VoIP provider operates in.

4. Select your VoIP Provider from the Provider drop down list.

5. If the provider is not listed, select ‘Generic VoIP provider’, or ‘Generic SIP Trunk’. If using a generic provider we will not able to guarantee that it will work with this VoIP provider. Click Next.

6. The SIP server hostname or IP may be pre-filled. Compare these with the details that you have received from your VoIP provider and check that these are indeed correct. Depending on the VoIP provider that you are using, some fields will be disabled. This means you do not need to change them. Click Next to continue.

7. Now enter the VoIP provider account details. In the External number field, enter the VoIP line number that has been assigned to you. Then enter the Authentication ID/user name and password of your VoIP provider account. Specify the number of simultaneous calls your provider allows. Click Next to continue. If you are using a SIP trunk, the password will be greyed out, since authentication is done via IP.

8. Now specify how calls from this VoIP provider should be routed. You can specify a different route outside office hours. The routing configured here will take affect when no inbound routing rules are matched.

9. On the next page, you can optionally configure an outbound call rule, which will be used to route outbound calls through the new provider. This is normally done by routing calls starting with a specific prefix. Enter the dialling prefix in the “Calls to numbers starting with (prefix)” text box. To make calls via this provider, precede the number to be dialled with this prefix.

   **Note:** Frequently the internet facing firewall sitting between 3CX Phone System and the VoIP provider is not correctly configured or is not able to correctly route VoIP traffic. To check the firewall configuration, it is important to perform a firewall check using the inbuilt firewall checker. You can start it by going to the Settings > Firewall Checker node. It will use the STUN server configured in Settings > Network > STUN Server to ensure that your firewall allows and correctly routes connections on Port 5060 (for SIP) and Ports 9000 – 9049 (for RTP Audio) to the PBX. If the firewall check fails, you will not be able to reliably make and receive VoIP provider calls and you will have to edit your firewall configuration. **Note: We do not provide firewall configuration support.**
Specifying a STUN Server

By default, 3CX Phone System assumes that you have a static IP and therefore the STUN server option is switched off. If you have a dynamic IP, you have to enable the STUN server. Please note that use of a dynamic IP is only suited for testing 3CX Phone System. It is not recommended for a production system. To specify a STUN server:

1. In the Management Console, go to Settings > Network node. Now click on the ‘STUN server’ tab.

2. In the edit box ‘Primary STUN server’ specify the STUN server suggested by your provider. Define the port if needed.

3. You can specify an alternate backup server, or leave the ‘stun2.3cx.com’ as the backup STUN server. This address will be used if the primary STUN server cannot be reached. Click OK to exit and save the settings.

DID’s and Inbound Call Identification

If your VoIP provider has provided you with DID numbers, you will need to specify these and depending on the VoIP provider enable Source Identification for each DID. To do this:

Step 1: Specifying the DIDs Associated With this VoIP Provider/Port

1. In the 3CX Management Console, select the VoIP provider you want to configure.

2. Change to the DID tab.

Screenshot 24 - Specifying STUN Server

Screenshot 25 - Adding DIDs which will Route to an Extension
3. Add the DID numbers associated with your account. An Inbound Rule, which can be configured at a later stage, will be created for each number specified in this list.

**Step 2 – Source Identification of Calls**

This step only needs to be done for particular VoIP Providers. To check whether you have to perform this step, make an incoming call to any one of the DIDs you specified. If the call is received by the PBX, you can skip this step. If not you must do the following:

1. Switch to the Source Identification tab and select ‘Enable Source identification by DID’.
2. Leave the default value for SIP Field containing DID numbers. It is the correct field for most VoIP Providers.
3. Click on ‘Add DID’ and select all the DIDs in the list. Click OK.
4. Make another call to any of the DIDs specified. The numbers should now ring on your PBX. If not, you will have to adjust the field ‘SIP field containing DID numbers’.
8. Creating Outbound Call Rules

Introduction

An outbound rule defines on which VoIP gateway/provider an outbound call should be placed, based on who is making the call, the number that is being dialled or the length of the number.

When configuring a VoIP Gateway or a VoIP Provider, you will be asked to create an outbound rule that will be used to route calls to the Gateway or Provider. You can also edit these rules or create new ones from the outbound rules node.

Creating an Outbound Call Rule

To create an outbound rule:

1. On the 3CX Management Console menu, click Add > Outbound Rule, and enter a name for the new rule.

2. Now specify the criteria that should be matched for this outbound rule to be triggered. In the 'Apply this rule to these calls' section, specify any of these options:

   - Calls to Numbers starting with (Prefix) – apply this rule to all calls starting with the number you specify. For example, specify 9 to specify that all calls starting with a 9 are outbound calls and should trigger this rule. Callers would dial '9123456' to reach the number '123456'

   - Calls from extension(s) – Select this option to define particular extensions or extension ranges for which this rule applies. Specify one or more extensions separated by commas, or specify a range using a -, for example 100-120

   - Calls to Numbers with a length of – Select this option to apply the rule to numbers with a particular digit length, for example 8 digits. This way you can capture calls to local area numbers or national numbers without requiring a prefix.
• Calls from extension group – rather than specifying individual extensions, you can select an extension group

3. Now specify how outbound calls matching the criteria should be handled. In the ‘Make outbound calls on’ section, select up to 3 routes for the call. Each defined gateway or provider will be listed as a possible route. If the first route is not available or busy, 3CX Phone System will automatically try the second route.

4. You can transform the number that matches the outbound rule before the call is routed to the selected gateway or provider using the ‘Strip digits’ and ‘Prepend’ fields:

• Strip digits – allows you to remove 1 or more digits from the called number. Use this to remove the prefix before it is dialled on the gateway or provider if it is not required. In the example above, you would specify to remove 1 digit, in order to remove the prefix ‘9’ before it is dialled.

• Prepend – allows you to add one or more digits at the beginning of the number if this is required by the provider or gateway.

You can configure these options per outbound rule, since a rule that applies to a VoIP gateway connected to the local PSTN would normally require different criteria than a rule that applies to a VoIP provider.

A complete example showing how to create an outbound rule in 3CX Phone System can be found at http://www.3cx.com/blog/voip-howto/outbound-rules-a-complete-example/.
9. Extension Groups & Rights

**Introduction**

3CXPhone can limit what call information is shown to the user based on extension groups. These extension groups are used to determine what information is shown to whom. In addition they help group the extension for both users and the administrator. Note than an extension has to be part of at least one group.

**Default Group**

The Default group contains all extensions, whereby users of the group have no rights, but managers of this group can see information about all the extensions. Any extension you create will automatically be assigned to this group initially (until you remove it or assign it to another group).

**Note:** The V11 management group has now been rendered obsolete and is replaced by the 'Default' group. Management Group rights is now Default Group Rights in the Default Group. If you are restoring a backup from V11 to V12 then all the users will be added as users to the Default group and any managers in the management group will be added as managers in the Default group.

The Default Group is a group is always present in 3CX Phone System. Managers assigned to this group can:

1. See the call details of ALL extensions and queues (since all extensions are part of the default group unless you remove them from the group)
2. Perform operations on ANY call in the system (Pickup, transfer, Divert, Reject, Barge-in, and Park).

To add an extension to the Default group:

1. Click on the 'Default' sub-node under the extensions node.
2. Select an extension and click Add. Press Apply/OK to save the changes.
3. Now logout and login with 3CXPhone to see the additional information.

**Group Rights Logic**

Users can be assigned rights to see details of other members in their group and managers can be assigned elevated rights to users in their group. Rights are assigned based on Group membership. That means that a manager will be able to see call details of any member of his / her group, independent of the call destination or origin.
Managing Extension Groups

Group Membership

To create an extension group:

1. In the management console, click on the Extensions node and click on the ‘Add Extension Group’ icon.

2. Now proceed to add extensions by selecting extensions from the left list and clicking on the ‘Add’ button. Note that Extensions can now be part of multiple groups.
You can select which user will be the Manager of the group by:

1. Clicking on the ‘Member Rights’ tab, then clicking on the user’s name in the ‘Extensions in this Group’ Member list.

2. You may then select the ‘Role of user in this group’ where you may select ‘Manager’ or ‘User’ and accordingly the user will be granted the rights of a manager or a user. You can configure one or more ‘Managers’ for any group. Typically this would be a department supervisor. Group Managers will be able to see the call details of everyone within that group.

**Group Default Rights**

The ‘Default Group Rights’ tab specifies the default rights that are assigned to each user role. These default ‘Manager’ and ‘User’ rights apply to the current extension group. You can configure these rights separately for each extension group.

To configure the default group rights:

1. Click on the ‘Default Group Rights’ tab. These settings pertain to what group members and users within this group can see and do in 3CXPhone.
2. Optionally you can enable the Manager extensions to perform operations on calls of the group members. Check the option “Perform operations on calls to users of this group” to enable this.
3. Similarly, you can also configure what rights User group members have.
4. Click OK to save the group and rights information. Users will need to logout and login to 3CX 3CXPhone to see their new rights reflected.
Customizing Rights for Individual Users

**Screenshot 32 - Setting Extension Group Rights**

If you want a particular user or manager to have more (or fewer) rights than the defaults specified in the “Default Group Rights” tab, you may specify those rights by:

1. Clicking on the member’s name in the ‘Extensions in this Group’ list in the “Members Rights” tab
2. Ticking off the checkboxes with the rights that you want the member to have in the “Rights currently assigned” part of the tab.
3. The options available for the users are:
   a. Can see group members – Allows the user to see group member presence
   b. Can see group calls – Allows the user to see calls made by group members
   c. Show presence to group members – Shows the user’s presence to group members
   d. Show calls to group members – Shows user’s calls to group members
   e. Perform operations (divert, transfer, take) on any active call to group members
   f. Can Barge in – Can barge in to calls made by group members
   g. Can Intercom – Allows the user to intercom other extensions
   h. Allow parking – Allows the user to park calls
   i. Allow IVR control – Allows user to control the IVR
4. Select the options that suit your needs accordingly and then click “Apply” to apply the chosen rights
10. The Digital Receptionist / Auto Attendant

Introduction

The digital receptionist feature allows you to answer phone calls automatically using 3CX Phone System and present the caller with a list of options. The caller can then choose the appropriate option using the numbers on his phone key pad.

Using this feature you can implement a menu, for example: “For sales press 1, for support press 2, or wait on the line to be transferred to the operator”. A digital receptionist is also known as an auto attendant.

You can configure different menu options and text for the menus based on which line the call comes in, as well as based on whether the call is received within or outside office hours. This way you could have a different answer outside office hours and de-activate menu options accordingly.

Recording a Menu Prompt

Before you create your digital receptionist, you must first write down the menu options you wish to offer the caller and then record the announcement. A simple example would be “Welcome to Company XYZ, for sales press 1, for support press 2 or stay on the line for an operator”

Note: It is generally recommended to put the number the user should press after the option, i.e. “for sales, press 1”, rather than “press 1 for sales”. This is because the user will wait for the desired option and only then “register” what number to press

Once you have devised the text you can create the prompt. To record the prompt:

1. You can use the Record button to record the prompt via the phone. You will be prompted for your extension number and the system will call you and prompt you to record the prompt

2. Alternatively, you can use Windows Sound Recorder or a 3rd party voice talent service to record the prompt. You must save the file in WAV format in PCM, 8 kHz, 16 bit, Mono format. (In Windows Sound Recorder you must use the ‘Save As’ option to save this format) Do not use MP3 format.

Creating a Digital Receptionist

You can create multiple digital receptionists and link them to a particular line. To create a digital receptionist:

1. In the 3CX Phone System Management Console menu, select on Add > Digital Receptionist.
2. Specify a name and virtual extension number for the digital receptionist.

3. Now click on the record button and enter your extension number. You will be called so that you can record the prompt. Alternatively click on the browse button and specify a file that you previously recorded. The file will be copied into the `<%allusersprofile%3CX\Data\Ivr\Prompts>` or `<C:\ProgramData\3CX\Data\Ivr\Prompts>` directory depending on your OS.

4. Specify the menu options. Select the appropriate key, and then select from the available actions. Then specify the extension number or virtual extension number (virtual extension number in the case of Ring Group, Call Queue or to another Digital receptionist)

5. The last option, Timeout, allows you to specify how long the system should wait for an input. If it receives no input, it will automatically perform this action. This is handy for callers who did not understand the menu or who do not have a DTMF capable phone. When ready, click OK to save the digital receptionist.

**Allowing Callers to Dial a Known Extension Directly**

Whilst a digital receptionist prompt is playing, a caller can enter the extension number directly to be connected to an extension immediately. This allows callers who know their party’s extension to avoid bothering the receptionist. This option is enabled by default. If you wish to make use of this feature simply instruct your callers by explaining this in the voice prompt. For example:
“Welcome to Company XYZ, for sales press 1, for support press 2. If you know your parties extension number, you may enter it now”

**Call by Name**

Using a Digital Receptionist, you can also direct callers to the call by name function. This allows them to find the person they wish to speak to by entering the first letters of the person’s last name on the phone dial pad. The call by name function requires:

1. A self-identification message for the user. Users without a self-identification message are not accessible via the call-by-name feature.
2. User can not have a last name with Unicode characters
3. The Call-by-name menu feature must be made available from a Digital Receptionist as one of the menu options.

**Self-Identification Message**

To record your self-identification message:

1. Go to your voice-mail menu (Default 999).
2. Enter your Voice Mail PIN number
3. Go to the options menu ('9' key).
4. Press ‘5’ key to record the self ID message.
5. Record your name only, i.e. ‘Sarah Jones’

**How it Works**

The Call-by-name feature uses the last name of the user and compares it with the input (that has been entered on the phone keypad). The following rules are used:

- The last name is converted to upper case.
- All symbols except [2-9] and [A-Z] are ignored.
- The following translations for symbols are used:
  - ‘ABC2’ => ‘2’
  - ‘DEF3’ => ‘3’
  - ‘GHI4’ => ‘4’
  - ‘JKL5’ => ‘5’
  - ‘MNO6’ => ‘6’
  - ‘PQRS7’ => ‘7’
  - ‘TUV8’ => ‘8’
  - ‘WXYZ9’ => ‘9’

The caller has to type a minimum of three digits (‘0’ – ‘9’) to call to a user. Digits ‘0’ and ‘1’ are ignored, but can be used to call to users with short last names (for example, to access someone with the last name ‘Li’, you can type ‘540’).
After the user has entered three digits, IVR queries the phone system database for matching users. If there are no matching users, it plays “extension not found”. If there is only one matching user, the IVR plays “Please hold while I transfer your call” and redirects the call to the user. If there is more than one matching user, the IVR will wait for additional digits from the user for 2 seconds.

If IVR waits for additional digits (more than one matching user) and user presses any digit, the IVR will add this digit to the current input and check currently matching users. If there are no matching users, it will play “extension not found”.

If the user does not input any more digits (2 seconds elapsed or ‘#’ has been pressed) and more than one user is matched, then the IVR will play: “To call to Van Damme press 0. To call to Van Halen press 1. To exit press pound”. In this example ‘Van Damme’ and ‘Van Hallen’ are the self-identification prompts of the matching users.

**Exchange Server IVR Integration**

**This feature requires the PRO edition!**

Exchange Server 2010 and 2013 include a voice mail and an IVR feature that can be interesting to use for companies that deploy Microsoft Exchange Server. The Exchange IVR feature allows you to leverage speech recognition in your company IVR. The Voice Mail feature allows you to convert voice mails to text and forward them via email.

Please see this article how to configure 3CX and Exchange for this integration:

http://www.3cx.com/blog/docs/exchange-server-2013-config/
11. Adding DID Numbers / Inbound Rules

Introduction

Many companies provide users and/or departments with "Direct or DID numbers", which allow their contacts to call them directly, bypassing the receptionist. DID numbers are referred to as DDI numbers in the United Kingdom and as MSN numbers in Germany. Even if you make use of a digital receptionist, a direct line / number is often preferable because it’s more convenient for the caller.

Direct numbers can be easily implemented using DID numbers. DID numbers are provided by your VoIP provider or Phone Company and are virtual numbers assigned to your physical lines. Usually you are assigned a range of numbers, which is linked to an existing BRI/T1/E1. There will be an extra charge per number or per range, but this will be a fraction of the cost of adding physical lines. Enquire with your Phone Company or VoIP provider for more information on DID numbers.

Adding DID’s

To add a DID;

1. Click on the ‘Create DID’ button in the 3CX Management Console in the toolbar.
2. Enter a name for the DID (for example sales).

Note: The DID name can be pre-pended or appended to the Caller ID so as to identify on which number a caller has called. You can enable this from the Settings > General > Global options page under ‘Append/Prepend name to caller ID’.
3. Now enter the DID number as it will appear in the SIP “to” header. 3CX Phone System will match the number inserted in this field with the “to” header, starting from the last part of the received string, thus avoiding any differences in the format of the number. For example, if you are based in the UK and your DID number is 0845-2304024, then you can enter the number 2304024. This will match any DID number inserted in the “To” field ending with these numbers, including +448452304024, 08452304024, 00448452304024, and, of course, 2304024.

4. Now select for which Gateway or Provider ports you wish to add this DID. If the DID number is associated with multiple ports, then you must select each port. An inbound rule will be created for each port that you select.

5. Now specify where you wish to direct calls made to this DID:
   - End Call
   - Connection to extension
   - Connect to Queue/Ring Group
   - Connect to Digital receptionist
   - Voicemail box for extension
   - Forward to outside number
   - Send fax to email of extension

6. You can specify that an incoming call is routed differently if it is received outside office hours. De-select the ‘Same as during office hours’ option to specify a different route.

7. Click OK to create the DID / Inbound rule.
Troubleshooting DID Numbers

If you have created the DIDs, but calls are not being forwarded as expected, do the following:

1. Go to the Server Activity log node in the 3CX management Console. The Server Status screen lists current server activity and logs calls that are being received and for which number they were received.

2. Call the DID number that you configured, and monitor the Server Status log. You will see a line similar to:
   
   *Incoming call from 1000 to <sip:789456123@3CXPhone System>*
   
   where “1000” is the internal number of the line configured to receive calls from the VoIP Gateway or VoIP Provider and <sip:789456123@3CXPhone System> is the content of the “To” header of the INVITE, i.e. the intended recipient.

3. Now analyse the “To” header carefully and ensure that the DID number you have dialled is present in the “To” header: <sip:789456123@3CXPhone System>.

4. If you see a text ‘Review invite & adjust source identification, you need to configure Source identification. See the chapter ‘Adding a VoIP Provider / SIP Trunk’ for more information.
12. Ring Groups / Paging / Intercom

Introduction

The Ring Groups / Paging and Intercom features add powerful capabilities to your PBX. Ring groups will help you not miss that important customer call, whilst the Paging feature allows you to make announcements to groups of people rather like a PA system.

Note: Features only available in the Standard and Pro editions.

Ring Groups

A ring group allows you to direct calls to a group of extensions. For example, you could define a group of 3 sales people, and have the general sales number ring on all 3 extensions at the same time or after each other. When you create a ring group, you assign it a virtual extension number. This will be the number used by the phone system to "address" the ring group.

To add a ring group:

1. In the 3CX Phone Management console menu, select Add > Ring group.
2. Now enter the ring group options:
• Virtual machine number – This number identifies the ring group from other extensions. Keep the extension number automatically generated, or specify a new one as needed. Do not specify an existing extension number.
• Name – Enter a friendly name for the ring group
• Ring strategy – Select the appropriate ring strategy for this ring group:
  ▪ Prioritised Hunt – this will start ringing on the first extension, then the second etc.
  ▪ Ring all – all phones will ring at the same time
  ▪ Paging – this will page all extensions part of the group (see next section)
• Ring time – Specify how long the phones should ring for.

3. In the section ‘Ring group members’ specify the extensions that should be part of this ring group. Simply click on the extensions to the left and click on the Add > button to add them to the ring group. Move the extensions up or down to configure the priority of an extension.

4. In the section ‘Destination if no answer’, you can define what should happen if the call does not get answered by the ring group.

**Paging**

Paging allows someone to ring a group of extensions and make an announcement via the phone speaker. The called party will not need to pick up the handset as the audio will be played via the phones speaker. The person paging will not hear any audio back from the people being paged. Both paging and intercom features require a phone that supports intercom and that is configured to allow it.

To add a paging group:

1. Click on the Add > Ring Group menu option to bring up the ‘Add Ring Group’ page.
2. Now enter the ring group options:
  • Virtual machine number – Specify an extension number which will be used for this paging group.
  • Name – Enter a friendly name for the ring group
  • Ring strategy – Select the Paging ring strategy
  • Ring time – Specify how long the phones should ring for

3. If you have phones that support multi cast, and you have a very large installation with specialized requirements, you can enable the Multi cast option. For most installations this option is not required.

4. In the section ‘Ring group members’ specify the extensions that should be part of this paging ring group. Simply click on the extensions and click on Add > to make them a member.

**Important:** Before using the Paging or Intercom feature make sure that you have specified the paging/intercom prefix number by going to the 3CX Management Console >> Settings>> Advanced>> Dial Codes tab and adding the paging prefix in the ‘Paging’ field (*11 for example)

Also make sure that the user who is trying to page a group has the right to do so. To do this go to the user’s extension properties>>Rights>> Check the ‘Can Intercom’ option in ‘Rights currently assigned’.

**Note:** The ‘Ring time’ and ‘Destination if no answer’ options will be ignored, since they are not relevant for paging.
Intercom

The intercom feature allows a phone system user to make an announcement to a single extension. In this scenario the audio is two way, and the called party can respond immediately without picking up the handset.

To call a user via the intercom function:

1. Prefix the extension you wish to call with the paging/intercom prefix (that you specified by going to Settings>>Advanced>>Dial codes>>paging field and filling in the field), followed by the extension number. For example you specified the paging prefix to be *11 to make an intercom call to extension 100 you should dial:

   "**1100"

2. You can announce your message.
13. Call Queues

Introduction

Call Queues allow calls to be queued whilst agents (members of a call queue) answer calls. Calls do not go unanswered but are queued until an agent is available to take the call. For example, you can define a group of 3 sales people, and have the general sales number route to a sales call queue. If all 3 sales people are busy, callers will be kept in the queue until the next sales person is free. When you create a call queue, you also assign it a virtual extension number. This will be the number used by the phone system to “address” the Call Queue.

Note: The features are only available in the Standard and Pro editions of 3CX Phone System.

Creating a Call Queue

To add a Call Queue:

1. Click on the Add > Call Queue menu option to bring up the ‘Add Call Queue’ page.

2. Now enter the call queue options:

   - Virtual extension number – Optionally change the suggested virtual extension number. Note that this extension number will be automatically created. Do not specify an existing extension number.
   - Name – Enter a friendly name for the ring group
Polling strategy – This option allows you to choose how calls should be distributed to the agents:

- Hunt random start – 3CX will randomly choose an agent to distribute the call to. This will evenly distribute the calls to each of the agents
- Ring All – the phones of ALL the agents will ring
- Prioritised Hunt – 3CX will distribute the call according to the order specified in the Queue members section. All calls will go to the first agent first, and only if this one is busy, it will go to the next agent. This strategy can be used to setup skills based routing, by ordering the agents according to their skills.

3. Ring timeout – Indicate the timeout in seconds, i.e. for how long the phone should keep ringing before it considers the call unanswered by that agent.

4. In the section ‘Call Queue agents’ specify the extensions that should be part of this Call queue. Simply click on the extensions and click on the -> to make them a member. Move the extensions up or down to configure the priority of an extension.

In addition to being a member, an extension/user must also login to start answering calls routed to this call queue. Users can login to a call queue using the login button in the 3CXPhone or via a schedule using the Office Hours Schedule.

5. In the section ‘Destination if no answer’, you can define what should happen if the call does not get answered by an agent. If no agent is logged into the queue, this option gets triggered immediately. In addition, this option gets triggered if the caller presses the ‘*’ button on his phone. This gives callers an option to exit out of the queue and leave a message.

6. In the section ‘Other options’, you can specify a custom introduction prompt and a custom music on hold file. You can also decide whether you wish to announce a caller’s position in the queue and what the maximum wait time should be.

**3CX Phone System PRO Edition**

3CX Phone System Pro edition adds additional Call Centre like features to 3CX Phone System. No further installation is required – you just purchase the module, reactivate your existing key and the additional call queue features will become available.

**Additional Queue Strategies**

With the Pro edition, you have these additional Queue strategies:

- Longest Waiting – will forward a call to the agent who has been waiting the longest for a call.
- Least Talk Time – will forward the call to the agent with the least total talk time.
- Fewest Answered – will forward the call to the agent that has answered the least number of calls.
- Hunt by threes prioritized – will forward the call to the top 3 agents (as configured in the call queue agent section simultaneously).
- Hunt by threes random start – will send call to 3 random agents simultaneously.
- Round Robin – will target agents in round robin manner, i.e. first call will be sent to agent 1, the second call to agent 2 and so on.
Additional Queue Options

In the PRO edition, you have additional options that you can configure:

- You can enable a Callback option – this allows callers to hang up and get called back when it’s their turn. This option requires that you specify an outbound rule on which the call back is to be triggered. The Call Back option can be requested by the caller (Option 2) or it can be offered if the timeout of the queue is reached.

- You can specify the wrap up time in minutes – this gives the agent time to enter notes into the call record after taking a call.

- You can specify the maximum number of callers in the queue – when this is reached, the caller will be routed according to the setting in the Destination if no answer section.

- Reset Call Statistics for this Queue – Detailed statistics for the queue, such as average call time, average wait time and so on are visible through the Queue Monitoring function in 3CXPhone. You can reset the Agent Call Statistics for the Queue by clicking on the Reset button.

- Call statistics can also be reset automatically using a pre-configured schedule.

- Priority Queue – The administrator can configure this queue as a priority queue. This is useful when the same people are part of 2 queues, and calls on one of the queue should receive priority over calls in the other queue. E.g. a support team might have one line (and one queue) for normal support calls, and another line (and another queue) for VIP customers. Both queues are serviced by the same people. The queue for VIP customers will have the Priority Queue feature enabled.

- Give Caller ability to opt out of recording: This gives the option to the caller to press DTMF3 to stop being recorded during a call.

- Queue Notifications – Various notifications can be enabled so that the Queue Manager is notified when certain conditions are encountered, such as the SLA time has been breached, or a call in the Queue has been lost.
14. Call Conferencing

Introduction

Call conferencing allows you to easily configure up to eight conference calls that can allow a total of 64 callers (license permitting). In other words the 64 caller limit is for all conferences, not per conference. Note that a conference with 64 participants will require a powerful machine.

Although many conference call services exist, it’s often easier and cheaper to host your own audio conferences. Conferences can be set-up ad hoc, without the need to reserve a conference room. This has been done to simplify the set-up of conference calls.

Note: The features are only available in the Standard and Pro editions of 3CX Phone System.

Configuring Conferencing

1. In the 3CX Management Console, open the Settings > Advanced node and click on the Conferencing tab.
2. Now specify the conferencing extension number. This is the number that users must call to setup a conference.
3. Specify the maximum number of conferences you wish to support. By default 4 conferences can be held at a time.
4. Now specify whether you wish to require a PIN to create a conference. If you enable this, users that create a conference must enter this conference PIN after the conference ID when creating a conference. The PIN will be used automatically if a user creates the conference via 3CXPhone.

Creating a Conference Call

Conference calls can be created using one of the following methods:

- From 3CXPhone, the user can create an ad hoc conference. For more information how to do this see the online user manual:
  - 3CXPhone for Windows: [http://www.3cx.com/3CXPhone/Windows/Manual/Conference](http://www.3cx.com/3CXPhone/Windows/Manual/Conference)
  - 3CXPhone for Android: [http://www.3cx.com/3CXPhone/Android/Manual/Conference/](http://www.3cx.com/3CXPhone/Android/Manual/Conference/)
  - 3CXPhone for iOS: [http://www.3cx.com/3CXPhone/iPhone/Manual/Conference](http://www.3cx.com/3CXPhone/iPhone/Manual/Conference)

- From the Conference section in 3CXPhone, the user can also schedule conference calls to occur in the future. Users will receive an email with the conference call details. External users need to be notified by the user.

- Users can create conference calls using their IP Phone. They will need to dial the Conference Extension number (700) by default, and follow the prompts.

For information how to create a conference call, see this page of the online extension user manual: [http://www.3cx.com/blog/extension-user-manual/create-conf-from-your-desk-phone/](http://www.3cx.com/blog/extension-user-manual/create-conf-from-your-desk-phone/)
15. The 3CX Tunnel

**Introduction**

3CX includes a SIP Proxy Tunnel to allow for easier bridging of remote 3CX Phone Systems and connecting of remote extensions. The SIP Proxy Tunnel combines all SIP (signaling) and RTP (media) VoIP Packets from one location and delivers them to and from another location (typically the PBX Server) using a custom TCP protocol. This simple concept allows 3CX to overcome firewall or telecom provider issues.

The SIP Proxy Tunnel can be used for the following reasons:

- Resolve issues of NAT Traversal at both the remote and the PBX location.
- Simplify Firewall configuration at both the remote and the PBX location.
- Overcome difficulties with ISPs that block VoIP Traffic based on port numbers.
- Allows VoIP-over-Wi-Fi in some restricted locations, such as Hotel rooms.
- “Fixes” Firewalls that cannot handle VoIP traffic correctly or which are very problematic to configure correctly, such as:
  - Microsoft ISA Server
  - SonicWall

**How it Works**

![Figure 4 – 3CX Tunnel](image)

The picture above demonstrates how the 3CX Tunnel works. In this example, the 3CX Phone System is on IP Address 10.0.0.181, and listens on TCP port 5090 (by default) for incoming Tunnel traffic. We must set up a single Port Forwarding rule on the Modem or NAT/Firewall Device, telling it that all incoming TCP traffic received on port 5090 should be delivered to LAN IP Address 10.0.0.181.

The remote setup is shown on the left hand side of the cloud. In this example, the machine with IP address 192.168.0.2 has the 3CXPhone installed. We will need to tell the VoIP Phone the public IP address of the PBX Server (which in this case is 213.165.190.51), and also the private IP address of the PBX Server (which in this case is 10.0.0.181).

Since the 3CXPhone will by default use the standard port numbers used by 3CX Phone System, typically no further configuration will be necessary!

**Configuring the Tunnel**

We will now use the above example in ‘How the 3CX Tunnel Works’ to configure a tunnel connection.

**Step 1 – Configure the PBX**

In the 3CX Management Console, go to the Settings > Network > 3CX Tunnel tab.
1. Configure the Tunnel Password (e.g. “r6W4Qi”)
2. Set the Local IP to the Local IP Address of the NIC, which will be receiving tunnel connections. If the PBX has only one NIC, then there will be no need to set this field. In our example this is 10.0.0.181
3. Set the Tunnel Listening Port to the port, which will be receiving tunnel connections. The default value is 5090.
4. Click the “OK” button. The Tunnel service will be restarted automatically.

Step 2 – Configure the Firewall

The Tunnel protocol is designed to eliminate NAT traversal problems and reduce Firewall configuration work to a minimum. There is only one Firewall setting that needs to be made – we must forward the TCP Tunnel port (set by default to 5090) to the PBX.

Screenshot 129 - Configure a Port Forward Rule

The above picture shows configuration for a Sitecom WL-183 WAN-to-LAN router - most routers will provider similar functionality. In your firewall:

1. Enable Port Forwarding
2. Specify the PBX’s Local IP Address (which we had set previously to 10.0.0.181)
3. Set the Type to “TCP”
4. Set the Port Range to be from 5090 to 5090 (only one port)
5. Set the Comment field to “3CX Tunnel”
6. Click on the “Add” button followed by the “Apply” button

Your firewall configuration is now done!

Step 3 – Configuring the Bridge, Remote IP Phones or 3CXPhone

After you have configured the local tunnel connection and the firewall, the tunnel is now “ready for use”. The 3CX Tunnel technology can be used in the following scenarios:

Connect Remote 3CXPhone Users

3CXPhone for Windows and Android have a built in tunnel that will be used automatically when 3CXPhone detects it is not on the LAN. No configuration is necessary in 3CXPhone.

In the case of 3CXPhone for iPhone, the tunnel must be downloaded as a separate app from the Apple App Store, as it’s not allowed to integrate the feature directly into 3CXPhone for iPhone. In
this case the user must switch on the 3CX Tunnel App when problems are experienced with the network connection.

For further information about 3CX Tunnel options in 3CXPhone, see the chapter ‘Configuring the 3CX Phone System Clients – 3CXPhone’.

**Connect 3CX Phone Systems via a Bridge**

When creating a Bridge to another 3CX Phone System, you can choose to use the 3CX Tunnel rather than a direct connection.

To configure a Bridge using the 3CX Tunnel, see the Chapter ‘Connecting 3CX Phone Systems’.

**Connect Remote IP Phones via the 3CX SIP Proxy Manager**

When using remote IP Phones, you can use the 3CX Tunnel technology by using the SIP Proxy Manager. The SIP Proxy manager is a small Windows service, which integrates the 3CX Tunnel technology and tunnels all VoIP traffic to the 3CX PBX. IP Phones are configured to route their traffic via the SIP Proxy manager.

In addition to resolving firewall problems, the SIP Proxy manager is also able to connect phones on the remote network directly, without having to pass the VoIP traffic to the PBX, thereby saving greatly on bandwidth. For example, if a company has a small remote office with 5 phones, employees in that office can call each other without the audio traffic being routed via the PBX. The PBX will just setup the connection but audio is sent directly between the phones.

To configure an IP Phone using the 3CX Tunnel, see the Chapter ‘Configuring Remote Extensions’.
16. Configuring Remote Extensions

Introduction

A powerful benefit of 3CX Phone System is the ability to support remote extensions, i.e. employees using their extension from home or on the go. This gives tremendous flexibility to employees and delivers true mobility, because employees working from home or away can still be seamlessly integrated with head office. They can be a member of call queues and use 3CX Phone to see presence of other users.

3CX Tunnel or Direct

There are 2 ways to configure a remote extension:

1. Directly, using standard UDP
2. Using 3CX Tunnel via the 3CX SIP Proxy Manager

A direct remote extension is generally used when just a few phones are used in the remote location. If you have more than 2/3 remote extensions, you can use the SIP Proxy Manager.

Configuring IP Phones as Remote Extensions Using Direct SIP

To provision an IP Phone to be used as a remote extension:

1. Ensure the phone is in the same network as 3CX Phone System in order to be able to provision it.
2. Go to the Extension > Phone Provisioning tab
3. In the ‘Select Provisioning Method’ select ‘Remote Extension (STUN)’

More information on provisioning of remote extensions can be found at: [http://www.3cx.com/blog/docs/provisioning-a-remote-extension/](http://www.3cx.com/blog/docs/provisioning-a-remote-extension/).

Configuring IP Phones as Remote Extensions Using SIP Proxy Manager

For information how to configure IP Phones as Remote Extensions using the SIP Proxy Manager, please follow this link: [http://www.3cx.com/blog/releases/sip-proxy-manager/](http://www.3cx.com/blog/releases/sip-proxy-manager/)
Configuring 3CXPhone for Windows, Android as Remote Extensions

3CXPhone for Android and Windows are automatically configured to be able to be used as remote extensions using the 3CX Tunnel. No configuration at all is required.

As soon as the user switches network, and 3CXphone detects that it is not on the same network as 3CX Phone System, 3CXPhone for Windows and 3CXPhone for Android will automatically configure themselves as a remote extension and re-register ‘on the fly’.

Configuring 3CXPhone for iPhone as Remote Extension

3CXPhone for iPhone is also automatically configured to be able to be used as a remote extension. No configuration at all is required. Like on Android, as soon as the user switches changes network, and 3CXphone detects that it is not on the same network as 3CX Phone System, 3CXPhone for iPhone will switch to Out of Office mode and configure itself as a remote extension and re-register ‘on the fly’.

In most cases 3CXPhone for iPhone will connect without problems. However, if there are issues, then you must:

2. Activate the 3CX Tunnel app.
3. In the ‘Remote Tunnel IP’ field enter the public IP of the 3CX PBX,
4. Insert the tunnel port (usually 5090) in the ‘Remote Tunnel Port’ field.
5. Enter the ‘Remote Tunnel Password’ (as configured by the administrator on 3CX Phone System).
6. Click on ‘Start’.
7. Switch back to 3CXPhone for iOS and go to Settings > Accounts > Select the appropriate account > scroll down and set "Use 3CXTunnel" to ON
8. Make your call.

NOTE: According to Apple iOS app standards, every time you press the home screen, and the application goes in the background, 3CXPhone for iPhone will go into background mode and must unregister. 3CXTunnel will go in the background as well and will remain active for 10 minutes. After 10 minutes, 3CXTunnel will be terminated by iOS. This is an iOS standard procedure to preserve battery life.

This means that if 3CXPhone has been idle for more than 10 minutes, you will need to do the following:

1. Launch the 3CX Tunnel app,
2. Confirm that it is started and connected. If the status is "stopped" click on ‘Start’ and wait until the status changes to “Connected”
3. Launch 3CXPhone and after a successful registration, you can proceed and make your calls.
17. Connecting 3CX Phone Systems (Bridges)

Introduction

You can connect 2 separate 3CX Phone Systems, allowing you to make calls between branch offices using your internet connection – and thus at no charge.

The “bridge” will be assigned a prefix, which users must dial to access the other 3CX Phone System or SIP phone system. This prefix must be followed by the extension number they wish to reach on the other 3CX Phone System.

For example, if you assign the prefix “2” to a bridge with another office, and within that office you want to dial someone who has extension number 105 on that phone system, you would dial 2105 to reach that person directly.

Alternatively, you can assign the extensions in one office to start with one number (e.g. 1), and the extension in the second office to start with a different number (e.g. 2 and 3). That way, the users do not need to dial a prefix, since the PBX will route the call based on the first digit of the called number. In this case, the outbound rule (with prefix 1 and 2) should not remove any digit.

Note: The features are only available in the Standard and Pro editions of 3CX Phone System.

Creating a Bridge

Each bridge must have a ‘Master’ and a ‘Slave’ Phone System. The Slave Phone system registers with the Master Phone System. To create a bridge you must first setup the ‘Master’ Phone System and then the ‘Slave’ Phone System.

Step 1: Create a Bridge on the Master Phone System

1. In the management console of the ‘Master’ 3CX Phone System, click on the Add > Bridge menu option to bring up the ‘Add Bridge’ page.

2. Enter a name for the bridge and assign a virtual extension number. A bridge must be assigned a virtual extension number so it can be addressed by the phone system. Accept the default or choose another extension that is free. The virtual extension number will also be used as the Authentication ID, so the virtual extension chosen should be available and the SAME on BOTH 3CX Phone Systems.

3. Now select the Type of bridge:
   - Master (Direct - UDP) - In Direct - UDP mode, all traffic will be sent via UDP and will use multiple ports.
   - Master (Tunnel - TCP) - The tunnel option allows all SIP and RTP traffic to be sent via a single TCP port. The 3CX Tunnel vastly simplifies firewall configuration, although it cannot provide the same quality as a direct connection. Also, the tunnel option can only be used with another 3CX Phone System.
4. If you selected ‘Master (Direct-UDP)’, enter the authentication password, which together with the Virtual extension number must be used by the slave to register with this 3CX Phone System. The Virtual extension number must be UNIQUE on this phone system and these same credentials must be used by the ‘Slave’ 3CX Phone System.

5. If you selected ‘Master (Tunnel-TCP)’ then you must enter:
   - Authentication Password – the password that will be used for authentication.
   - Remote end of the tunnel – Enter the public IP of the Slave 3CX Phone System machine.
   - Enter the remote port of the 3CX Tunnel (by default 5090)
   - Enter the port of the LOCAL end of Tunnel. For the first bridge connection it is 5081 (5080 is used for external extensions). The port will be incremented by 1 for each bridge you create that uses the tunnel.
   - **You will have to forward TCP and UDP port 5090 on the firewall behind which the ‘Master’ 3CX Phone System resides.**

6. Specify a prefix to be used for this bridge. I.e. if you specify 7, then a user must dial 7100 to reach extension 100 on the other 3CX Phone System.

7. Select if you want to publish and receive presence information from the other 3CX Phone System. Note this requires a PRO edition license.

8. Accept all other defaults and click ‘Next’ to create the bridge.

**Step 2: Create a Bridge on the Slave Phone System**

1. In the management console of the ‘Slave’ 3CX phone System, click on the Add > Bridge menu option to bring up the ‘Add Bridge’ page.

2. Enter a name for the bridge and assign a virtual extension number. This virtual extension number must be the SAME one used on the ‘Master’ Phone System!
3. If you select to create a slave bridge using direct UDP, then you must enter:
   - Public IP of the ‘Master’ 3CX Phone System
   - SIP Port of the ‘Master’ 3CX Phone System (by default 5060)
   - Authentication Password – The password set on the Master Phone System.

4. If you select to create a Slave using the (Tunnel-TCP), then you must enter:
   - Local IP of remote 3CX Phone System and port.
   - Remote end of the tunnel - Enter the public IP and port of the ‘Master’ 3CX Phone System machine (by default port is 5090).
   - Configure the port for the local end of the tunnel (5081 by default). If you have multiple network cards select the IP of the card connecting to the Master Phone System.
   - Authentication Password – This will be used to authenticate with the ‘Master’. This must match the credentials entered on the master.
   - You will have to forward TCP and UDP port 5090 on the firewall to the ‘Slave’ 3CX Phone System.

5. Specify a prefix to be used for this bridge. I.e. if you specify 7, then a user must dial 7100 to reach extension 100 on the other 3CX Phone System.
6. Select if you want to publish and receive presence information from the other 3CX Phone System. Receiving presence information from a remote PBX requires a PRO edition license. If you select to receive presence information you need to select which extensions are allowed to see presence information from the remote PBX.

7. Accept all other defaults and click ‘Next’ to create the bridge.

**Calling a Party on the Other End of the Bridge**

To dial a number on the other end of the bridge, you must dial the assigned prefix, plus the number of the person you wish to call.

For example dial 8100 to reach extension 100 on a remote phone system. The number 8 would be the prefix assigned to the bridge to reach that remote phone system.
18. Dial Codes

Introduction

Dial Codes are codes that the user can dial in order to access certain functions such as turning on DND for their extension, or picking up a call from another extension. Dial Codes are defined in the 3CX Phone System Management Console > Settings > Advanced > Dial Codes tab.

The following table describes all the dial codes available in 3CX Phone System.

<table>
<thead>
<tr>
<th>Dial Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*0</td>
<td>Parks a call. While on a call, click on the Transfer button and dial *0 followed by the parking slot. E.g. to park the call in parking slot 1, dial *01.</td>
</tr>
<tr>
<td>*1</td>
<td>Picks up a parked call. E.g. to pick up a call parked in slot 1, dial *11</td>
</tr>
<tr>
<td><em>20</em></td>
<td>Picks up a call, which is ringing at another extension. For example to pick up a call dialling on extension 106, dial <em>20</em>106</td>
</tr>
<tr>
<td>*3</td>
<td>Change the status of your profile. *3 should be followed by one of the following to change the profile accordingly:</td>
</tr>
<tr>
<td></td>
<td>• 0 - Available</td>
</tr>
<tr>
<td></td>
<td>• 1 - Away</td>
</tr>
<tr>
<td></td>
<td>• 2 – Out of Office</td>
</tr>
<tr>
<td></td>
<td>• 3 – Available 2</td>
</tr>
<tr>
<td></td>
<td>• 4 – Out of Office 2</td>
</tr>
<tr>
<td>*4</td>
<td>Connects to the voicemail of an extension. E.g. to leave a message for extension 106, dial *4106</td>
</tr>
<tr>
<td>*60</td>
<td>Disables DND for the extension.</td>
</tr>
<tr>
<td>*61</td>
<td>Enables DND for the extension.</td>
</tr>
<tr>
<td>*62</td>
<td>Logs the extension in to the Queues.</td>
</tr>
<tr>
<td>*63</td>
<td>Logs the extension out of the Queues.</td>
</tr>
<tr>
<td>*9</td>
<td>Pages an extension. Dial *9 followed by the extension number. If the receiver’s phone supports paging, the phone will pick up automatically, and the caller can start calling to the receiver.</td>
</tr>
<tr>
<td>**</td>
<td>To enter a billing code for the call. First dial the number followed by ** followed by the billing code. E.g. if the number to be dialled is 956322 and the billing code is 562, then the full number to be dialled is 956322**562</td>
</tr>
<tr>
<td>*5</td>
<td>Dial *5 before the number to be dialled to hide your caller ID from the call.</td>
</tr>
</tbody>
</table>

Emergency code

The Emergency code is used to toggle the status of the Phone System between In Office and Out of Office. This code is not defined by default. If you want to use this code, you will need to define your own code from the Dial Codes page.
Mobile Agent Service

Note: For the Mobile Transfer Service to work, the option "Ring my extension and my mobile at the same time" must be enabled in the extension’s properties.

This service provides the ability to make transfers using DTMF inputs so you can effectively make transfers from your mobile phone. Available only in CCE or 3CXPSPROF Edition.

Feature 1: Hold
While in a call press *80 - This will put the current call on hold.

Feature 2: Resume
Press *81 - this will resume a currently held call.

Feature 3: Blind transfer to an extension
Press *82# number/extension # - This will make a blind transfer of your current call to the extension or number that you want to.

Example: Transfer a call to extension 105 or an external number 099219095 where 0 is the outbound rule for the call to go out via PSTN.

Dial *82#105# OR *82#099219095# - This will make a blind transfer (*82) of your current PBX call to the dialed extension (105) or number (099219095). Your mobile will disconnect from the call and the PBX call will be connected to 105 or 099219095 respectively.

Feature 4: Attended transfer
1) Press *83# number/extension # that you want to transfer the call to
2) *84 to complete transfer once the recipient answers

Example: When you are in a call press *83#105# - This will put the current call (from the PBX) on hold and make a new call to 105. When 105 answers announce the call to the recipient and dial *84. The 3CX PBX will join the previous held call with 105 and disconnect you from both calls.

Feature 5: Conference
You can now create 3 way conferences using the Mobile Agent Service from your mobile phone.
To create a 3 way conference follow the next steps:
1. Answer the incoming call from the PBX
2. Press *83#number/extension# to put the current call on hold and call that number
3. Once the number/extension is picked up dial *85. This will un-hold your previous held call, keep your mobile connected, and blind transfer the previously held call to the number that you dialed in step 2 thus creating a conference with 3 people

Example: accept incoming call and make a 3 way conference with number 105.

Answer incoming PBX call. Dial on your phone’s keypad *83#105# (this will put the previous call on hold and dial 105)

When 105 answers dial *85 to create a conference between 105, you, and the call you answered at step 1.
19. Call Reporting

Introduction

3CX provides a number of reports via its 3CX Web Reports module:

- Call Statistics Reports – these reports provide information on the calls made and received through 3CX Phone System, statistical Information on the phone extensions and Ring Groups.
- Call Center Statistics Reports – The reports provide more detailed information on the Queue statistics, call distribution, team statistics, abandoned calls, SLA statistics, callback statistics, and other reports related to the Call Center. To access these reports you require a PRO edition.

Note: These features are only available in the Standard and Pro editions of 3CX Phone System.

Accessing the Call Reporting Module

1. Ensure that you have been enabled to access the call reporting module. This can be done from the Extension > Options tab in the Access section. If you are a member of the management group this will be enabled by default.

2. From your web browser, go to:


   Where Phone – System IP is the IP or the host name of your phone system machine.

3. Now enter your extension credentials. Insert your extension number in the ‘User Name’ field and use the Access Password for 3CX web Services in the ‘Password’ field.

4. Press the Login button to log in to the 3CX Call Reporter
20. Backup and Restore

**Introduction**

3CX Phone System includes a convenient backup and restore utility that allows you to create a complete backup of your phone system configuration and data to a file. To backup data, run the Backup and Restore utility located in the 3CX Phone System Program group.

To restore phone system data, locate the backup of the phone system data and click ‘Restore’. Note that the current configuration will be OVERWRITTEN with the backup data, and any changes that you have made **since performing the backup will be lost**. You must also close the management console BEFORE making a restore.

The Backup and Restore utility must also be used when upgrading versions. You will need to backup your configuration before you un-install your current installation. During the installation of the new version, you can restore the settings from your previous version.

![Screenshot 45 - Backup & Restore Utility](image)

**Scheduling a Backup**

Using the Windows scheduler you can easily schedule a daily phone system backup. To do this:

1. Go to Start > Accessories > System tools > Schedule Tasks
2. Double-click on ‘Add Scheduled task’
3. Browse to the 3cxbackup program. The default path is: `<C:\Program Files\3CX PhoneSystem\Bin\3cxbackup.exe>`
4. Specify schedule and account to use.
5. After it is created, you have to modify the schedule to include the command line parameters that you need:
   - **Hidden** - runs the process hidden so it will close automatically after completion
   - **Backup** - will backup the database
   - **Restore** - will restore the database
   - **Filepath** is the location of the database to restore from or backup to
• Options
  o /callhist - will include the call history database
  o /voiceprompts - will include system prompts
  o /voicemails – will include voice mails
  o /callrecordings - will include call recordings.
  o /exit – to exit the utility after backup is done.
  o /firmware – backup the firmwares of the IP Phones also

Example: Complete hidden backup with exit

3CXBackup.exe hidden backup c:\backup.zip /callrecordings /voicemails /voiceprompts /callhist /exit
21. Fax Server

**Introduction**

3CX Phone System includes a fax server that allows sending and receiving of faxes. The 3CX fax server is based on the T38 standard and requires a compatible supported T38 VoIP gateway or provider. Note that it must be configured according to our configuration guides, so that fax reception is enabled. It is also possible to use a VoIP provider that supports T38, however the quality of the fax implementation between VoIP providers varies and can therefore not be guaranteed.

Note: This feature is only available in the Standard and Pro editions of 3CX Phone System.

**Fax Receiving Configuration**

To receive faxes, you must configure a line or a DID to be dedicated to fax, so that all calls on this number are forwarded to the 3CX Fax Server. The 3CX Fax server will then receive the fax, convert it to PDF and email the fax to the configured email address.

**Screenshot 46 - Configuring a Port or DID to Receive a Fax**

To do this:

1. In the Management console, select the Inbound rule for port or DID which will be dedicated to receiving faxes.
2. From the ‘Office hours’ routing options, select ‘Send fax to email of extension’
3. Select the extension that should receive incoming faxes. If you select “Default FAX Destination”, incoming faxes will be sent to the email address configured for the virtual fax extension number. You can configure the email address of the default virtual fax extension from the Fax Machine node > 888 – 3CX Fax Server.

Alternatively you can forward incoming faxes to the email address configured for a user’s extension. This allows you to create multiple DID rules and give personal fax numbers.

**Configuring Fax Machines / Fax Servers**

The fax machines node in the management console lists all known ‘Fax extensions’ including the extension used by the 3CX Fax Server. These ‘Fax extensions’ are similar to a normal extension and require an authentication ID and password to login to the SIP server.
3CX Phone System included a pre-configured fax extension (ext: 888). This extension is used by the 3CX Fax Server for incoming fax calls, which are routed to an email address. In addition, 3CX Phone System can be configured to proxy fax calls (T38 traffic) to a fax machine connected to an ATA or another software based T38 fax server by creating additional fax.

**Fax Extension Settings**

![Screenshot 47 - Fax Extension](link)

To create a new fax extension:

1. In the 3CX management console, go to the Fax machines node. Click Add Fax Extension,
2. In the ‘Fax Server Extension Number’ field, specify the fax extension number. Any call forwarded to this extension will be assumed to be a fax and receive a fax tone.
3. Specify the Fax Server Authentication ID and Password – These credentials will be used by the ATA / 3rd party fax server to login to the 3CX Phone System.
4. If this extension is used by the 3CX Fax Server, you can specify the default email address to which all faxes should be sent, and select the network interface to which the 3CX fax server should bind to.
5. If this extension is used for an ATA or 3rd party T38 fax software, the extension will be used only to register to the SIP server and receive T38 fax traffic.

Note: You must restart the fax service for changes to take effect.

**Connecting Fax Machines Using an ATA**

Once you have configured the fax extension you must connect the fax machine to a supported ATA device and configure the ATA device to connect to the fax extension. See this link for a step by step guide: [http://www.3cx.com/docs/configure-fax-machine-with-3cx/](http://www.3cx.com/docs/configure-fax-machine-with-3cx/)
22. The Phonebook

**Introduction**

The phonebook feature allows you to easily publish a companywide phonebook. Used in tandem with a personal phonebook, it allows users to quickly launch calls without wasting time finding a person’s number and subsequently entering it in the phone.

3CX Phone System supports a company and a personal phonebook. The Company phone book is company wide and is managed from the management console. The personal phonebook is only available to a particular extension and is managed from 3CX.

The company phonebook is also published to a directory in a format that Cisco, Yealink, snom, Aastra and Polycom phones can download. These phones can then show the same phonebook on their display.

**Resolves Caller ID to Name**

One of the most important features of the phonebook is that incoming caller IDs are searched against the phonebook, and if a match is found, the caller’s name is shown in the caller ID rather than just the number.

**Company Phonebook**

To manage the company phonebook, go to the Settings > Company Phonebook node. Click ‘Add’ to add an entry.

**Importing Phonebook Entries**

You can import phonebook entries from a CSV file. Each entry should be on a new line, and the fields separated by a comma as follows:

First name, Last name, Phone number
You can download a sample Phonebook import file from here:
http://downloads.3cx.com/downloads/misc/ImportCompanyPhonebookSampleV12.csv

Using the Phonebook

To use the phonebook, users enter a name or part of the name in the ‘Dial’ edit box in 3CXPhone. 3CXPhone will automatically resolve the name or part of the name to a phonebook entry. To launch a call, the user just selects the name and clicks the ‘Call’ button.
23. Exchange Connector

This Feature Requires the Pro Edition!

The Exchange Connector allows you to connect the 3CX Phonebook with Microsoft Exchange Server 2007, 2010, 2010 SP1, 2013 and import Exchange contacts to either the company or the personal phonebook. The following import functions are available:

- Import Global Address List (GAL) into the 3CX Company Phonebook
- Ability to select a public folder of contacts to be imported into the 3CX company phonebook
- Ability to import personal contacts from one or more Exchange users and import them to their personal 3CX Phonebook

How it Works

The 3CX Exchange Connector will connect to Microsoft Exchange Server via an “impersonated user” and import all the contacts. Then, at a specified interval, the connector will login to the Exchange Server and check if there are any new contacts or if any contacts have been deleted. If contacts have been deleted, these will be deleted in the 3CX Phonebook. If contacts have been added they will be imported.

IMPORTANT: The 3CX Connector will sync Exchange to 3CX. That is to say, any changes made to that particular contact in the 3CX Phonebook will NOT be updated in Exchange Server!

Configuring the Exchange Connector

In order to configure your 3CX Phone System 12 to work and synchronize with Microsoft Exchange using the 3CX Exchange Connector, you will first need to create an impersonated Microsoft Exchange user account. To do that follow the instruction here: http://www.3cx.com/blog/docs/how-to-create-impersonated-user.

After you have created your impersonated account you may continue and configure the 3CX Exchange Connector by following the next steps:

1. Log in to your 3CX Management Console and click on the ‘Settings’ node. Then select ‘Advanced’ and click the ‘Company Directory Sync’ tab

   ![Advanced Settings](image)

   1. Synchronize contacts from Microsoft Exchange - Requires 3CX PRO License
   2. OWA link of Microsoft Exchange Server
   3. Select MS Exchange Version
   4. Use Impersonated User Account
   5. Email Addresses to Synchronize
   6. Configure Public Folders to Synchronize

2. Fill in the following fields:
   1. OWA link of the Microsoft Exchange Server (example values shown above)
   2. Select your ‘MS Exchange Version’. Note: If you are Using office 365 select ‘2010 SP1’ from the list of options here.
3. Insert your impersonated account data that you have already created following the steps described here: [http://www.3cx.com/blog/docs/how-to-create-impersonated-user](http://www.3cx.com/blog/docs/how-to-create-impersonated-user), in the 'Impersonated User Account' and 'User Account Password' fields.

3. Select the email address and the public folders that you want synchronized (as shown above) and press 'Apply'.

4. To check if your Exchange contacts have been synchronized with the 3CX Phone System Company Phonebook click on 'Settings' and then select 'Company Phonebook'.

5. You should see a list of contacts in the 3CX Company Phonebook imported from your email address that you selected to synchronize (as shown above.)

**Note**: You cannot delete any contacts synchronized through MS Exchange from your Company Phonebook. The contacts need to be deleted from Exchange first and the 3CX Company Phonebook will be updated automatically.
24. Monitoring your Phone System

Introduction

3CX Phone System is easy to monitor for any Windows administrator, since it behaves just like any other Windows Server application. You can monitor 3CX Phone System using your favourite network monitoring solution, for example ActiveXperts or Microsoft Operations manager.

Things to Monitor

Systems Extensions Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Extension</th>
<th>Type</th>
</tr>
</thead>
<tbody>
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<td>ParkExtension</td>
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<tr>
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<td>IVR</td>
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</tr>
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<tr>
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</tr>
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<td>Queue</td>
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<td>FaxExtension</td>
</tr>
<tr>
<td>Registered</td>
<td>999</td>
<td>SpecialMenu</td>
</tr>
</tbody>
</table>

Screenshot 49 - Monitoring System Extensions

3CX Phone System uses system extensions for services such as IVR, Queue, Fax, Parking and so on. Using the System extensions node in the 3CX Management Console you can quickly monitor if all these system extensions are working and registered correctly.

3CX Services

A good first check is to monitor all 3CX services are running. You can view all 3CX services from the services node in the 3CX Management Console. Any network monitoring package can monitor windows services remotely.
Server Events

The Server Event Log node lists events related to 3CX Phone System. You can configure email alerts to be sent to you for critical events from the Settings > General > Email notifications tab.

These events are also posted to the Windows events log as application events so that you can monitor the events using your network monitoring package.

The following server events are posted to the log:

a. A person dialling the Emergency number (ID 4099).
b. Changes to the status of a SIP Trunk (ID 4100).
c. A trunk failover occurs, i.e. the backup rule is triggered (ID 12289).
d. A Trunk or VoIP provider account responds with an error code (ID 12294) - This could happen if your account is inactive or reached the credit limit.
e. Upon registration or unregistering of an IP Phone (ID 4101).
f. The licence limit has been reached (ID 8193).
g. An IP is blacklisted (ID 12290) – This can happen if an IP has reached the maximum number of failed authentication attempts. Frequently this points to a hacking attempt.
h. An IP is blacklisted because of too many requests (ID 12292) – This happens if the web server anti hacking module blocks an IP because of too many requests.
i. A Call Back request is triggered by the queue module (ID 102).
j. Failure of a DNS resolution - (ID 12293) - This event occurs when the remote VoIP provider could not be contacted. This could occur when your internet connection is down or the specified IP or FQDN for the VoIP provider is incorrect or down.
k. Failure of resolving an IP via STUN (ID 12295) – This happens when the STUN server is down. This event will also be triggered when the internet goes down.
IP’s of Gateways

Additionally, you should create checks that regularly check the IP VoIP gateways.

Server Status Log

Monitor the server status log to troubleshoot issues. This utility shows the activity log of the server, and logs potential reasons for error conditions.

The Server Activity log allows you to easily filter based on Extension, or particular call. In addition, you can filter the logging by date and time. Enabling Verbose Logging will show additional advanced logging including the SIP messages for the filtered logging.
25. Getting additional information / support

This manual is covers the basic information that you require to get up and running with 3CX Phone Systems. It covers the most standard scenarios. Your setup may require information which is specific to your network. This section provides a list of other resources which can be used to find the information that you require.

**Support**

3CX Technical Support is available via our Support Portal for 3CX Partners (free) or with a 3CX Support package (Extra charge). Review our support procedures and pricing. We also have a community forum from where you can obtain user to user support for our products.

**Knowledge base / Help**

3CX maintains a knowledge base / help page on its blog at

http://www.3cx.com/Blog

**Support Page / Configuration Guides**

Be sure to follow the configuration guides for your make and model of your VoIP gateway or sip phone. The configuration guides can be found at http://www.3cx.com/Support

**3CX Phone System Blog**

We highly recommend that you follow our product blog to keep up to date with the latest updates on 3CX Phone System. The blog can be accessed from

http://www.3cx.com/Blog

You can subscribe to receive email alerts for new blog entries here:

http://feedburner.google.com/fb/a/mailverify?uri=3CXVoIPBlog

**Find us on Facebook**

We also maintain a page on Facebook. Let us know what you think of 3CX Phone System at

http://www.facebook.com/3CXPhoneSystem

We also post product news to the Facebook fan page

**Feature Requests**

If you would like to request a new feature, you can do this on our feature requests page, which can be found at

https://apps.facebook.com/threecxideas/

Take some time to review the ideas from other users and vote for the ones which you good
Get 3CX Certified – Free Online Video Training

The free 3CX Certification program is designed to boost 3CX Partners’ and users productivity and profitability by giving them the resources and knowledge they need to sell, deploy and support the award-winning 3CX Phone System for Windows.

3CX has two new certification levels – the 3CX Certified Engineer and 3CX Advanced Certified levels – as well as a complete series of online training videos which gives 3CX Partners all the information they need to prepare for both certification levels.

Taking the 3CX Certification Test

After you have watched the videos, create a 3CX Academy account or login to take the 3CX Certification test. You will need to have gained the 3CX Certified Engineer certification before taking the 3CX Advanced Certified test.

Community Support Forums

If you are evaluating 3CX or using the free edition, you can visit the forums to discuss questions with other users of 3CX. The forums are located here:

http://www.3cx.com/forums/

Please note that 3CX does not provide technical support via the forums. Official 3CX Technical support requires you to have a support package or be a 3CX partner.

Request Support via our Support System

If you are a 3CX Partner or have purchased a support package from 3CX, you can contact the 3CX support department via the support system. Login details would have been provided to you by email.

When requesting support, include the ‘Support info’ data. 3CX Phone System can automatically generate a file which includes all relevant support information. NO PASSWORDS TO PHONES OR VoIP PROVIDERS WILL BE INCLUDED. The data will NOT be sent automatically. You will be prompted for a location to save the data, so you can check what data will be sent to us before you send it to us.

To generate the support info file:

1. In the 3CX Phone System Program Group, start the ‘Backup and Restore’ tool.
2. Click on the button ‘Browse’ next to ‘Generate Support’.
3. You will be prompted for a location to save the data. Enter the file name for the support zip file to be generated. Click Save.
4. Click ‘Generate Support’ to generate the support file. You can review the file before sending it over to us.
5. Login to the 3CX support system, and attach the information to your support request.
6. Include a detailed problem description. It should clearly indicate what the problem is, and when it occurs. Mention what hardware or VoIP provider you are using with 3CX Phone System. Indicate also what tests have been performed to isolate the problem.