

## Introduction

3cx is a very popular Private Branch Exchange (PBX) product; it's ease of use and simplicity, coupled with a rich feature set has ensured that it has established itself as a great option for a Windows based PBX.

The purpose of this guide is to show customers how to install a very basic setup using the free on-premise version of 3CX server to hopefully point you in the right direction for more complicated setups. It's also to answer some of the common questions we get asked about the setup here at Voip Unlimited.

We will go through, step by step, the initial installation, registering one of our SIP trunks, creating a couple of extensions and adding a DID to be displayed on outbound calls.

It is assumed that you have at least a basic understanding of SIP and some experience in setting up phone systems as well as some basic networking knowledge. There are a number of [online tutorials](#) as well as some fantastic [online courses](#) that can help you get up to speed.

## Installation

Whether you have gone for the free version or the paid for version installation is the same after going through the initial windows installer you will be prompted for a license key, once this is entered you will be presented with this screen in your web browser, we're going to go ahead and click **next** as it's detected the correct IP.



We detected your Public IP Address as 31.10.33.246

- Yes my public IP Address is 31.10.33.246
- No, I want to enter it manually

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Again, we're going to click **next** on this dialogue box as we're using a static IP. If you're using a Dynamic IP the 3cx will default to using its own STUN servers to traverse NAT etc. You can change this later if you wish.



### Type of Public IP

Is this a STATIC IP (reliable because ISP does not change your IP) or a DYNAMIC IP (unreliable residential connection where ISP may change your IP without warning). If you are not sure ask your Internet Service Provider.

- Static IP
- Dynamic IP

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A relatively new development when setting up the later versions of 3cx requires that the PBX have a Fully Qualified Domain Name (FQDN) with a trusted SSL certificate. If you have your own you can configure it here, otherwise you can create one using one of 3cx's wildcard certificates for free. We're going to go ahead and use a 3cx FQDN:



### Configure FQDN

An FQDN with a trusted SSL certificate is required. Do you want a FREE 3CX FQDN with trusted SSL or you want to use YOUR OWN FQDN and matching trusted certificate? (Note Self-signed certificates will NOT work)

- I need a 3CX FQDN
- I have my own FQDN

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Next step is to enter your preferred name:



### Select your preferred Subdomain/FQDN

Enter a name:

Select a 3CX Domain:

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Next we need to select the preferred internet facing NIC. You can also enter a local FQDN here if you have configured your local DNS appropriately. We're going to just go ahead and use the local IP to configure our phones:



### Select the default network adapter

192.168.3.16 Local Area Connection (Intel(R) 82579LM Gigabit Network Connection)

Do you want to address your phones using a local IP or using an FQDN?

- Local IP
- Enter your local FQDN (if you have a managed DNS)

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After a minute or two while 3cx configures your SSL certificate you will be prompted to choose with HTTP and HTTPS ports you would like to use in order to manage your 3cx server. We're going to use the defaults:



### Enter HTTPS and HTTP ports

HTTPS port:

5001

HTTP port:

5000

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Finish

After a short progress bar you will be re-directed to a page showing you a URL to your newly installed phone system! Once you click the link and log in we're ready to start configuring your phone system!



## Congratulations

Your 3CX Installation is ready

You can access the 3CX Management console from this URL: <https://VolPUNTest.3cx.co.uk:5001> or via IP: <https://31.10.33.246:5001>

Username:

Password:

Public IP: 31.10.33.246

FQDN: VolPUNTest.3cx.co.uk

License key is

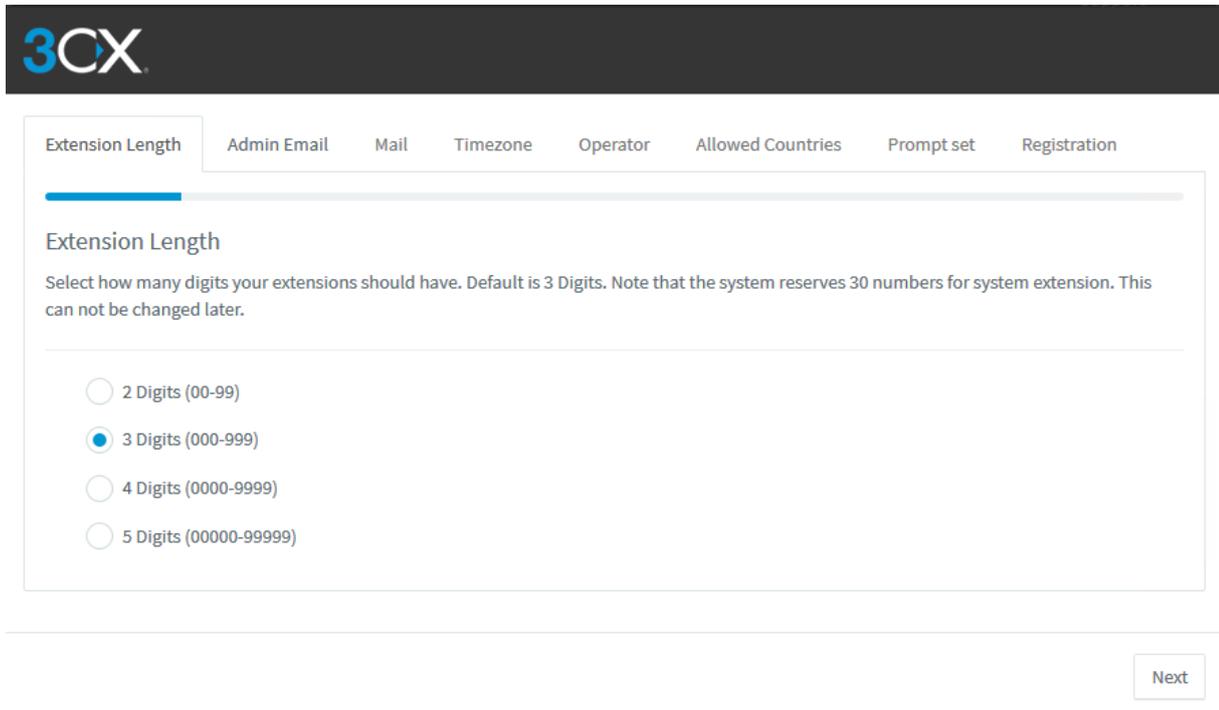
Copy and paste this information to a secure location! This dialog is displayed only ONE TIME! If you lose this information, you lose access to your installation.

6 Albany Business Park, Cabot Lane, Poole, Dorset, United Kingdom BH17 7BX

Reg No: 05225497 VAT Reg No: 854 6528 96

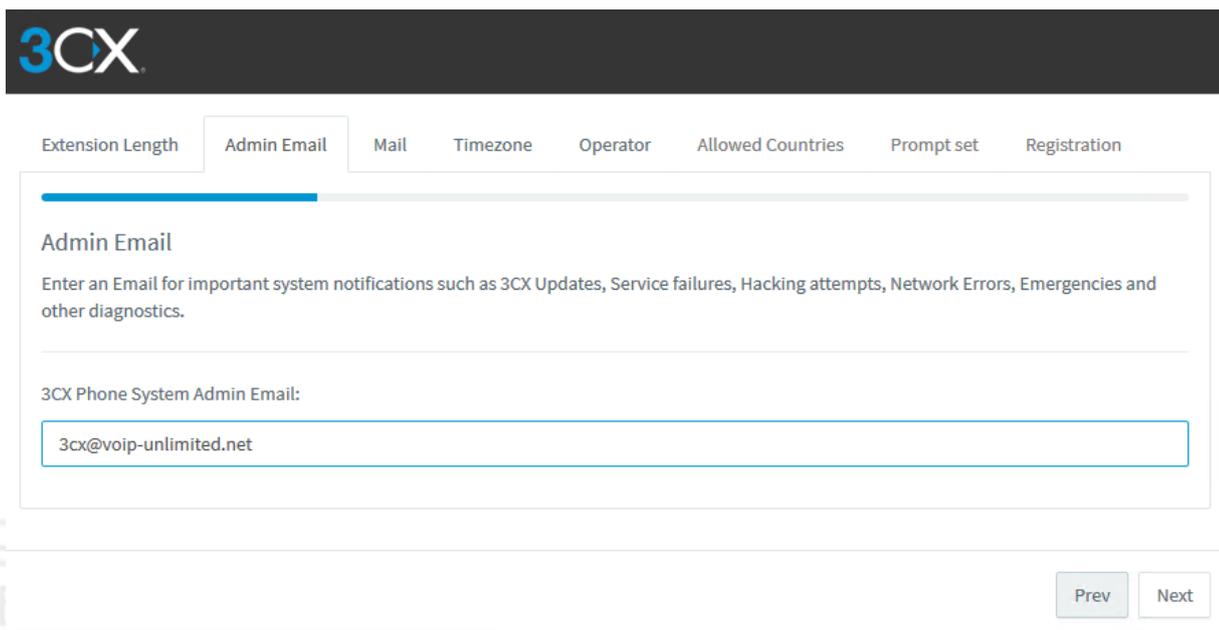
## Initial configuration

Firstly, we'll need to select how many digits we want our extension numbers to be. Again we're going to stick to the defaults here:



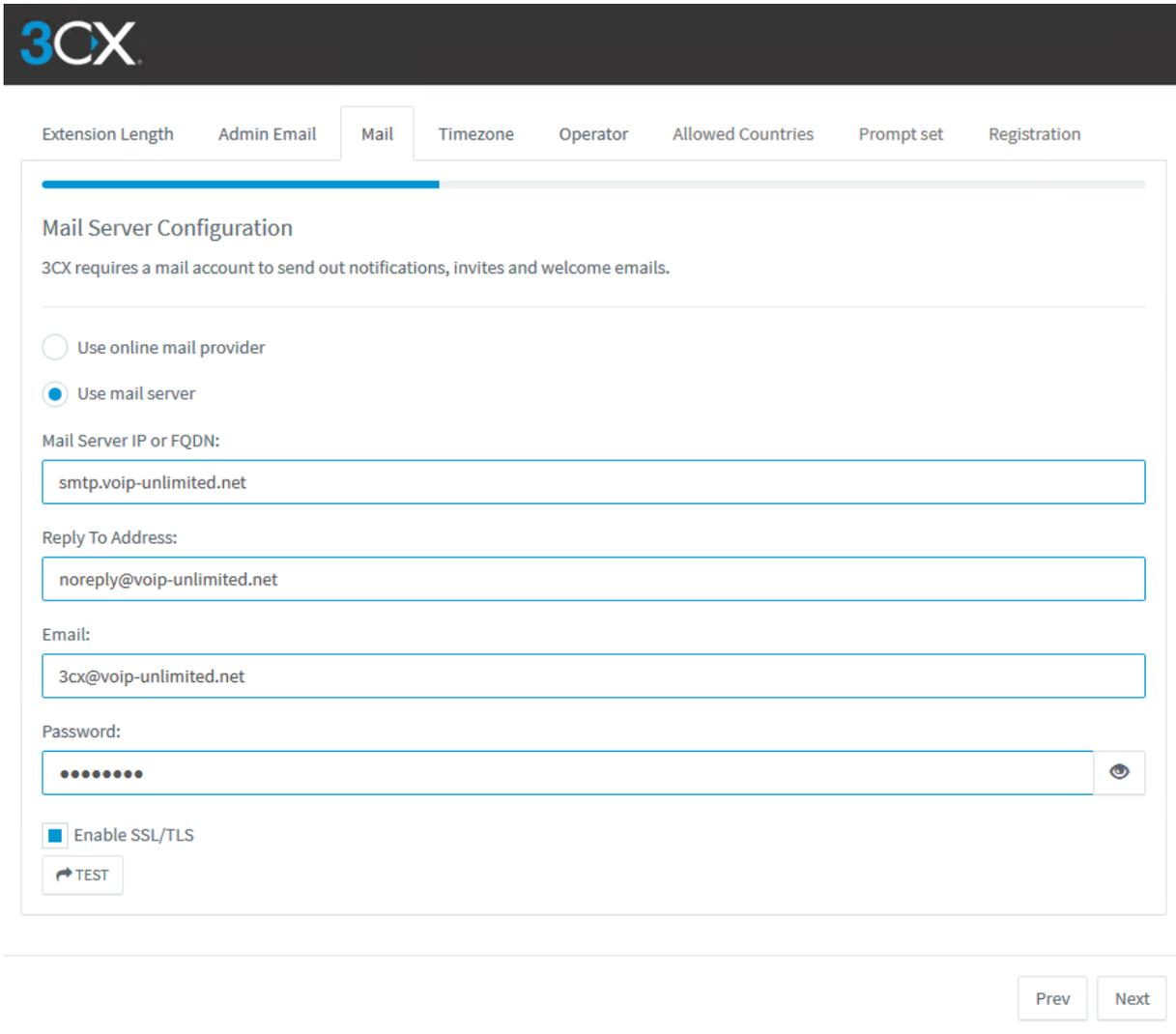
The screenshot shows the 3CX configuration interface. At the top left is the 3CX logo. Below it is a navigation bar with tabs: 'Extension Length', 'Admin Email', 'Mail', 'Timezone', 'Operator', 'Allowed Countries', 'Prompt set', and 'Registration'. The 'Extension Length' tab is selected and highlighted with a blue bar. The main content area is titled 'Extension Length' and contains the following text: 'Select how many digits your extensions should have. Default is 3 Digits. Note that the system reserves 30 numbers for system extension. This can not be changed later.' Below this text are four radio button options: '2 Digits (00-99)', '3 Digits (000-999)', '4 Digits (0000-9999)', and '5 Digits (00000-99999)'. The '3 Digits (000-999)' option is selected. At the bottom right of the form is a 'Next' button.

Next you'll need to enter your preferred admin email and mail server settings so the 3cx can send you notifications:



The screenshot shows the 3CX configuration interface. At the top left is the 3CX logo. Below it is a navigation bar with tabs: 'Extension Length', 'Admin Email', 'Mail', 'Timezone', 'Operator', 'Allowed Countries', 'Prompt set', and 'Registration'. The 'Admin Email' tab is selected and highlighted with a blue bar. The main content area is titled 'Admin Email' and contains the following text: 'Enter an Email for important system notifications such as 3CX Updates, Service failures, Hacking attempts, Network Errors, Emergencies and other diagnostics.' Below this text is a text input field labeled '3CX Phone System Admin Email:' with the value '3cx@voip-unlimited.net' entered. At the bottom right of the form are 'Prev' and 'Next' buttons.

As we have an in-house SMTP server we've selected the option **use mail server**, however you can also use an online provider such as gmail if you wish:



**3CX**

Extension Length   Admin Email   **Mail**   Timezone   Operator   Allowed Countries   Prompt set   Registration

### Mail Server Configuration

3CX requires a mail account to send out notifications, invites and welcome emails.

Use online mail provider

Use mail server

Mail Server IP or FQDN:

Reply To Address:

Email:

Password:

Enable SSL/TLS

For the time zone we've selected United Kingdom (London):



Extension Length   Admin Email   Mail   **Timezone**   Operator   Allowed Countries   Prompt set   Registration

### Select Country and Time Zone

This is important for Call Reporting, Dialling rules, Phone configuration, invites and notifications.

Select Country

United Kingdom (+44)

Set the Time Zone

0:00 United Kingdom (London)

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Next

The wizard will then get you to create you first extension. This will be the default destination for inbound calls as well as a Voice Mail extension for users to retrieve their voice mail:



Extension Length   Admin Email   Mail   Timezone   **Operator**   Allowed Countries   Prompt set   Registration

### Operator Extension

Create an Operator Extension which will be the default destination for inbound calls and a Voice Mail extension for users to retrieve their voice mail

Operator Extension Number:

100

First Name:

Joe

Last Name:

Bonnamassa

Email Address:

joe.bonnamassa@voip-unlimited.net

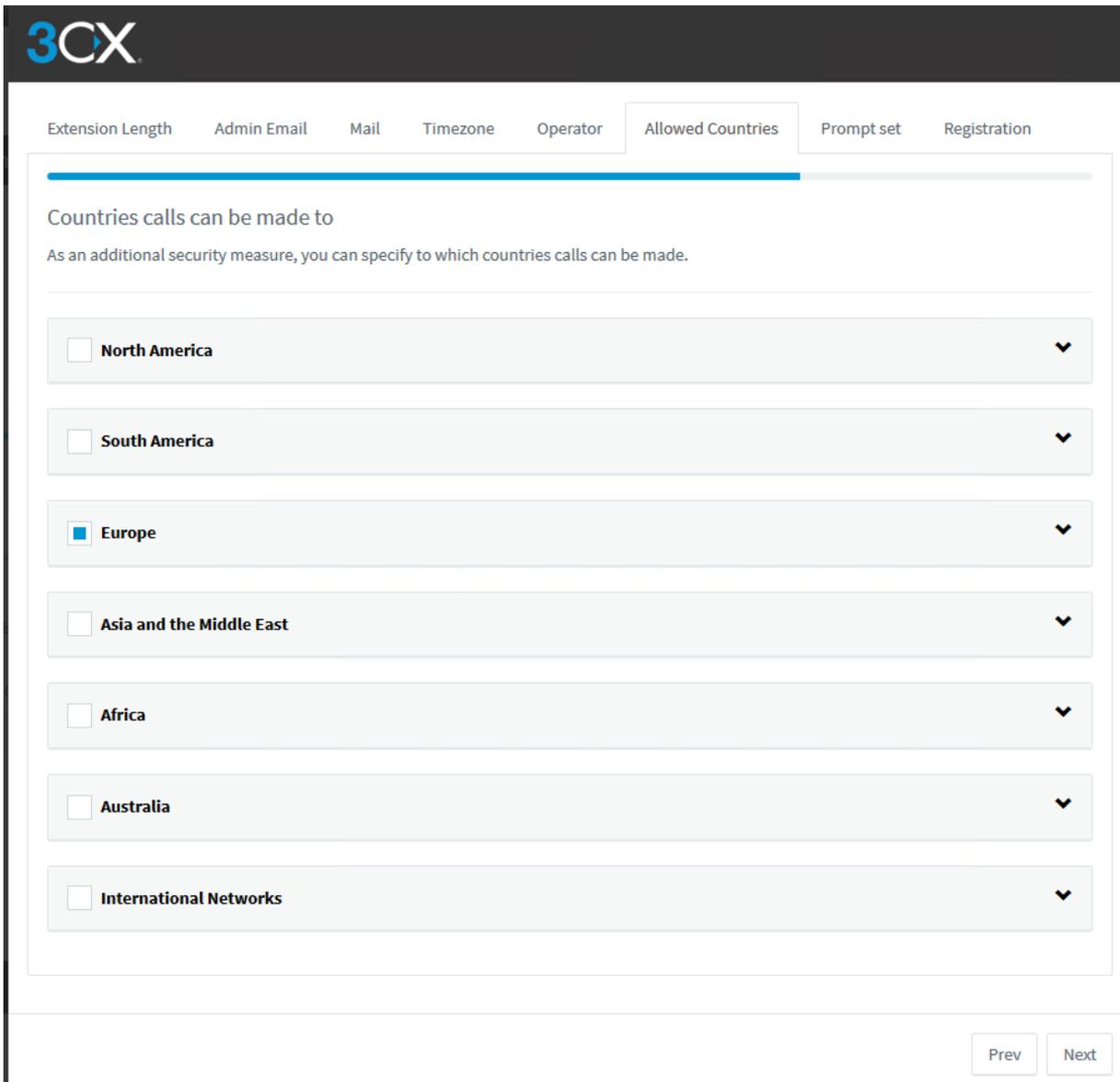
Voice Mail Extension:

666

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Next

As a security feature 3cx will not allow calls to any countries that are not specified in the allowed countries list. The default for my time zone is to only allow calls to the United Kingdom so I'm going to go ahead and keep the defaults. Of course if you need to make calls internationally you will need to choose the appropriate options here:



The screenshot shows the 3CX Admin Console interface. At the top left is the 3CX logo. Below it is a navigation bar with tabs for 'Extension Length', 'Admin Email', 'Mail', 'Timezone', 'Operator', 'Allowed Countries', 'Prompt set', and 'Registration'. The 'Allowed Countries' tab is selected and highlighted with a blue bar. Below the navigation bar is a section titled 'Countries calls can be made to' with a sub-heading: 'As an additional security measure, you can specify to which countries calls can be made.' Below this are seven rows, each representing a region with a checkbox and a dropdown arrow:

- North America
- South America
- Europe
- Asia and the Middle East
- Africa
- Australia
- International Networks

At the bottom right of the configuration area are two buttons: 'Prev' and 'Next'.

Next is the language 3CX should use for its prompts. I've chosen UK prompts rather than the default US:



Extension Length   Admin Email   Mail   Timezone   Operator   Allowed Countries   **Prompt set**   Registration

Select Language  
Select in which language you want 3CX to play system prompts.

Select Language  
UK English Prompts Set

Prev   Next

On the next dialogue you can make any adjustments you need in order to register with 3cx and receive a years' worth of updates:



Extension Length   Admin Email   Mail   Timezone   Operator   Allowed Countries   Prompt set   **Registration**

Registration Details  
Confirm your registration details to get one year of free updates/maintenance and access to the end user portal at <https://customer.3cx.com>

License Key:  
9WS6-X8V9-CAK4-2IPP

Contact Name:  
Joe Bonnamassa

Company Name:  
Joe's Chop Shop Ltd

Email:  
g727221@mvrht.net

Phone:  
+44 1234 567890

Country:  
United Kingdom

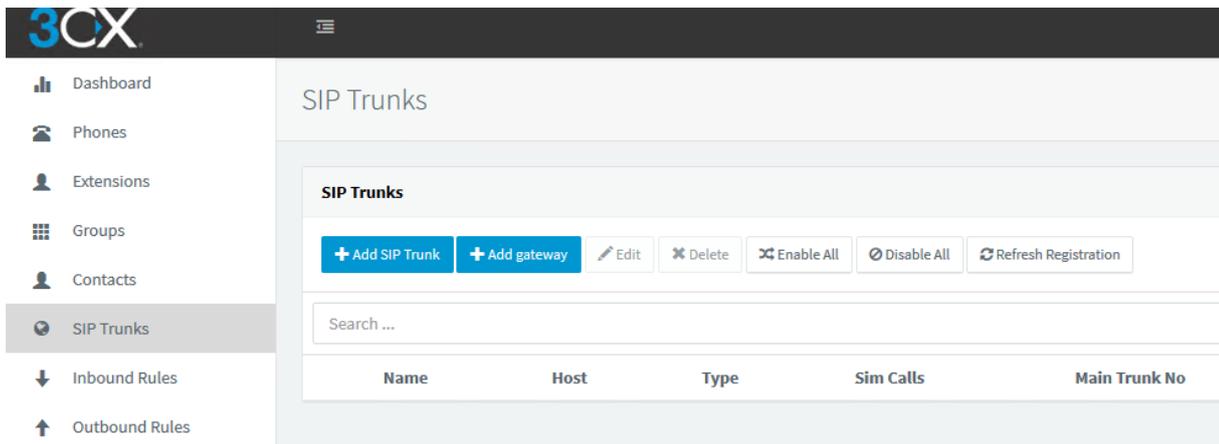
Reseller Name / ID:

After installing the prompt set the initial setup dialogue box will close and we'll be ready to begin configuring our 3cx Server in earnest!

## Registering a SIP trunk

After being met with your dashboard the first task we have is to configure your SIP trunk. Please be sure to have your SIP credentials to hand, these will have been emailed to you by our Provisioning Team.

Firstly click on **SIP Trunks** on the left hand side and click **Add SIP Trunk**:



The screenshot shows the 3CX web interface. On the left is a navigation menu with options: Dashboard, Phones, Extensions, Groups, Contacts, SIP Trunks (highlighted), Inbound Rules, and Outbound Rules. The main content area is titled 'SIP Trunks' and contains a sub-section 'SIP Trunks' with several action buttons: '+ Add SIP Trunk', '+ Add gateway', 'Edit', 'Delete', 'Enable All', 'Disable All', and 'Refresh Registration'. Below these buttons is a search bar and a table with columns: Name, Host, Type, Sim Calls, and Main Trunk No.

Here you will be met with the add SIP Trunk/VoIP Provider dialog box, please choose **Generic** as the country and **Generic VoIP Provider** for the provider as below. You will also need to enter the **Main Trunk No** this is the **SIP-ID** given to you in your SIP Credentials email.

### Add SIP Trunk/VoIP Provider ✕

---

Select Country

Select Provider in your Country

Main Trunk No

OK Cancel

Enter a name for your trunk and be sure to enter **sip.voip-unlimited.net** as the registrar and keep the port number as **5060** you can also set the number of simultaneous calls for the trunk here. As we're using the free version with a limit of 8 we're just going to accept the default value:

General | **DIDs** | Caller ID | Options | Inbound Parameters | Outbound Parameters

### Trunk Details

Enter name for Trunk

Registrar/Server/Gateway Hostname or IP

Outbound Proxy

Number of SIM Calls

Please ensure that the Authentication is set to **register/account based** and enter your trunk number as the authentication ID and the password supplied on your SIP credentials email. 3 way authentication is not required.

### Authentication

Type of Authentication

Authentication ID (aka SIP User ID)

Authentication Password

3 Way Authentication

We have left the routing of calls at their default values for now. This means that calls to the main number will route to the operator extension we configured earlier. There's also some additional options here for out of hours and holidays that you can set if you wish to, however, this is all configurable after the trunk has been set up so I'm going to skip these options for now.

### Routing of calls to Main Number

Main Trunk No

Destination for calls during office hours

Destination for calls outside office hours

Set up Specific Office Hours for this trunk

Play holiday prompt when it's a global holiday

If you have any alias numbers under your SIP trunk these can be added in the next tab along **DIDs**. I have 5 alias numbers with my SIP trunk so I will add these here now. Unfortunately you will need to add them 1 at a time which can prove a little problematic when you have more than 10!

The screenshot shows the 3CX web interface for configuring a 'Generic VoIP Provider'. The 'DIDs' tab is active, displaying a table of DID/DDI numbers. The table has a header 'DID/DDI Number' and a column with 'x' icons for removal. The numbers listed are 01258330003, 01329630076, 01329630075, 01329630077, 01329630078, and 01329630079. There is an 'Add DID' button above the table. The interface also shows 'OK' and 'Cancel' buttons at the top right of the configuration area, and a 'Help' button.

In **Caller ID** we'll leave this blank. **NB if this value is configured you will not be able to present your outbound caller ID as different to this number**

The screenshot shows the 'Default caller ID' configuration section. It has a header 'Default caller ID' and a text input field labeled 'Configure Outbound Caller ID'. The input field is currently empty.

In the **Options Tab** there are a few other options that are beyond the scope of this guide. However, you may wish to keep the re-register timeout at a value between 600 and 3600. Also it would be prudent to remove GSM from the codec priority list and add in G.729 to ensure compatibility.

Re-Register Timeout

600

Select which IP to use in 'Contact' (SIP) and 'Connection'(SDP) fields

Use Default Settings

**Codec Priority**

+ Add codecs   ↑ Move Up   ↓ Move Down

G.711 U-law

G.711 A-law

G729

You can manipulate the content of the SIP headers in both the **Inbound and Outbound parameters**, however, I would caution you to leave most of these as the default unless you are very familiar with the SIP protocol and how it works with our SIP trunks.

The exception to this is the **USER** part of the **FROM URI** in the **Outbound Parameters**

**NB If you wish to present a different number as your outbound CLI then you will need to configure the "FROM: User Part" to be ""OutboundCallerId" Oubound caller Id is taken from the Extension settings in management console"**

From : User Part

"OutboundCallerId" Outbound caller Id taken from Extension settings in manag

Once all of these values are configured you can go ahead and click OK at the top, to build your SIP trunk!

**SIP Trunks**

+ Add SIP Trunk   + Add gateway   Edit   Delete   Enable All   Disable All   Refresh Registration

Search ...

Name	Host	Type	Sim Calls	Main Trunk No	Register Sent	Register OK
VoIP Unlimited	sjp.voip-unlimited.net	Provider	10	01258330003	06/16/2017 4:39:13 PM	06/16/2017 4:39:14 PM

## Configuring additional extensions

So after we create our SIP trunk we're going to need to create a couple of extensions in order to be able to register some phones to them. The first extension is created in the initial setup so I'm going to create one additional extension and assign a DID to it.

Firstly we need to click extensions on the left and then the **Add** button:

Ext	First	Last	Email
100	Joe	Bonnamassa	joe.bonnamassa@voip-unlimited.net

Fill in the User information **please note that I have added the outbound caller ID here as I wish to present this as the outbound CLI whenever this extension makes a call**

### User Information

Extension

101

First Name

Erik

Last Name

Mongrain

Email Address

Erik.mongrain@voip-unlimited.net

Mobile Number

Mobile Number

Outbound Caller ID

01329630075

In authentication please enter in a secure password to reduce the chance of an extension hack:

### Authentication

Authentication details used by phones & client. Reprovision after a change

ID

101

Password

•••

In this example I have also assigned a DID for direct inbound dialling so that I have an inbound route for this number.

### Direct Inbound Dialing (DID)

Optionally assign a DID to receive calls directly to this extension

Add a DID/DDI

01329630075

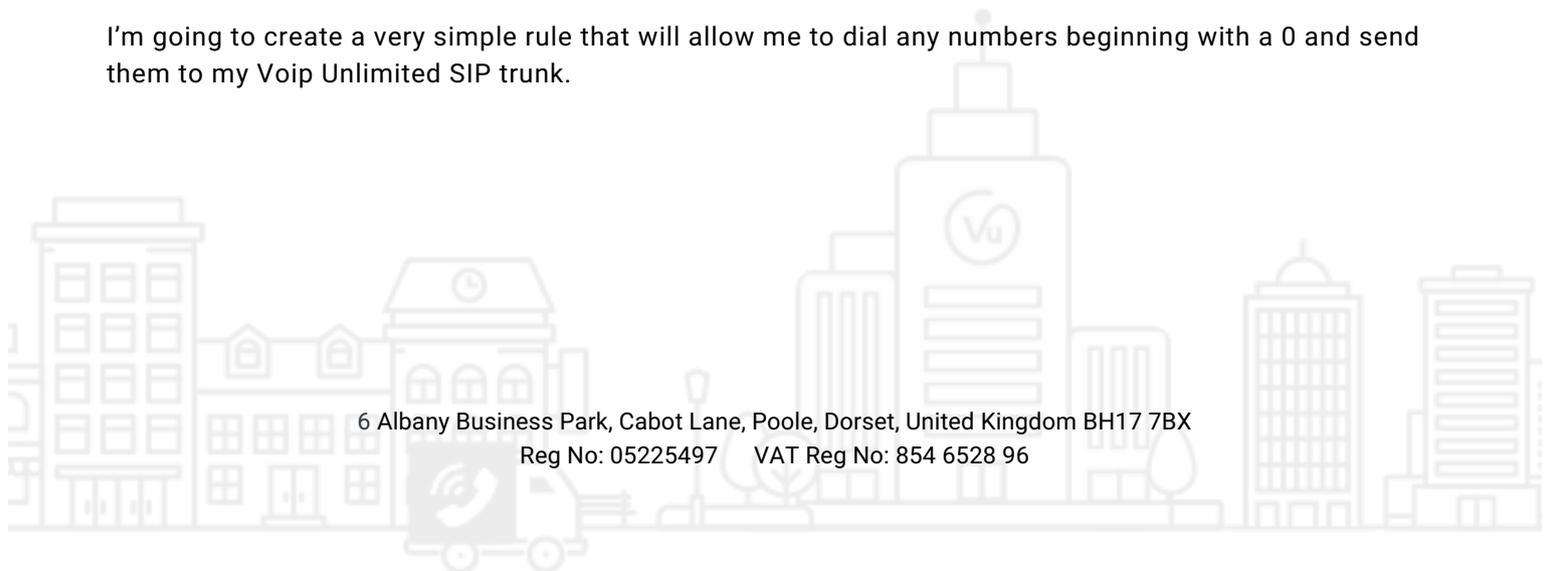
I have left all other options as their defaults and saved the extension.

### Configuring an outbound rule

Now we have calls inbound working, we need to make sure that we can dial out. We can do this by configuring an outbound rule that matches with the number we're dialling.

Firstly we need to navigate to **Outbound Rules** and click **Add**.

I'm going to create a very simple rule that will allow me to dial any numbers beginning with a 0 and send them to my Voip Unlimited SIP trunk.



**General**

Rule Name

National Outbound

**Apply this rule to these calls**

Calls to numbers starting with prefix

0

Calls from extension(s)

100,101

Calls to Numbers with a length of

11

Calls from extension group(s)

+ Add

As you can see I've given my rule a name, accepted calls from both of my extensions and matched the rule to a number which has 11 digits. This will allow me to call almost any national number.

Obviously this is an extremely simplified configuration and you will need to change yours according to your needs.

You can define where to route the numbers in the next section, with additional options to strip and prepend digits as needed:

**Make outbound calls on**

Configure up to 5 routes for calls. The second, third, fourth and fifth route will be used as backup. For each route, digits can be stripped or added.

Route			Strip Digits	Prepend
Route	1	VoIP Unlimited	0	
Route	2	BLOCK CALLS	0	
Route	3	BLOCK CALLS	0	
Route	4	BLOCK CALLS	0	
Route	5	BLOCK CALLS	0	

This concludes the Voip Unlimited 3cx setup guide, you should now have a phone system with 2 extensions configured with a main trunk number as well as a DID that can make and receive calls and present itself with a different number than the trunk.

I hope this has been useful for you, if you have any problems with any of the above please contact our support department by logging a ticket on the [portal](#) or calling into the main office number on 01202612000 and choosing option 4 for support.