

# Twilio setup for StarLeaf VoiceConnect

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## Introduction

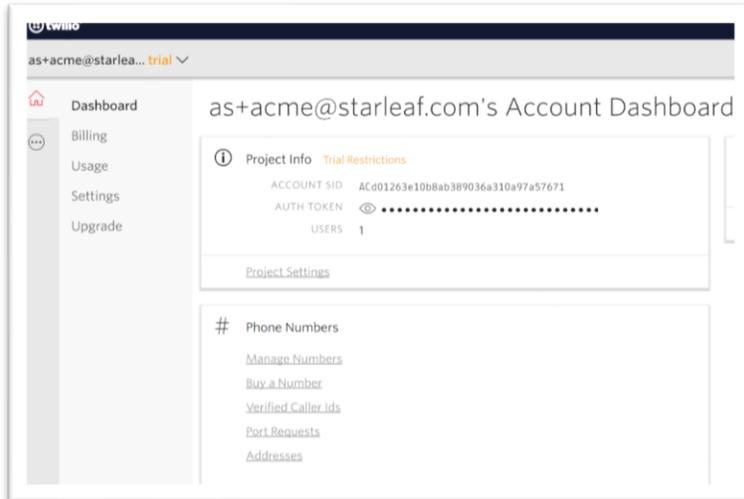
StarLeaf relies on third-party SIP trunking providers to enable calls to and from the PSTN. This feature is called VoiceConnect and is available on Enterprise account licenses. Twilio is one of our certified worldwide providers and offers fast setup and low per-minute call rates. This document gives step-by-step instructions on how to create your own Twilio account in Twilio and configure it for use with StarLeaf VoiceConnect, including the option to allow StarLeaf Support to complete the detailed aspects of the process. These steps are accurate as of May 2018 but Twilio frequently adds new sections and features to its console, so the exact details are subject to change – please let us know if you have any questions or find any discrepancies.

### 1. Go to <https://www.twilio.com> and click the 'Sign Up' button

(If you already have a Twilio account that you use for other purposes, you might want to set up a new sub account just for use with your StarLeaf org. Then go to Step 5 below.)



You should now be at the main Twilio console, which should look like this. You might also get a 'welcome' pop-up or two – just cancel these.



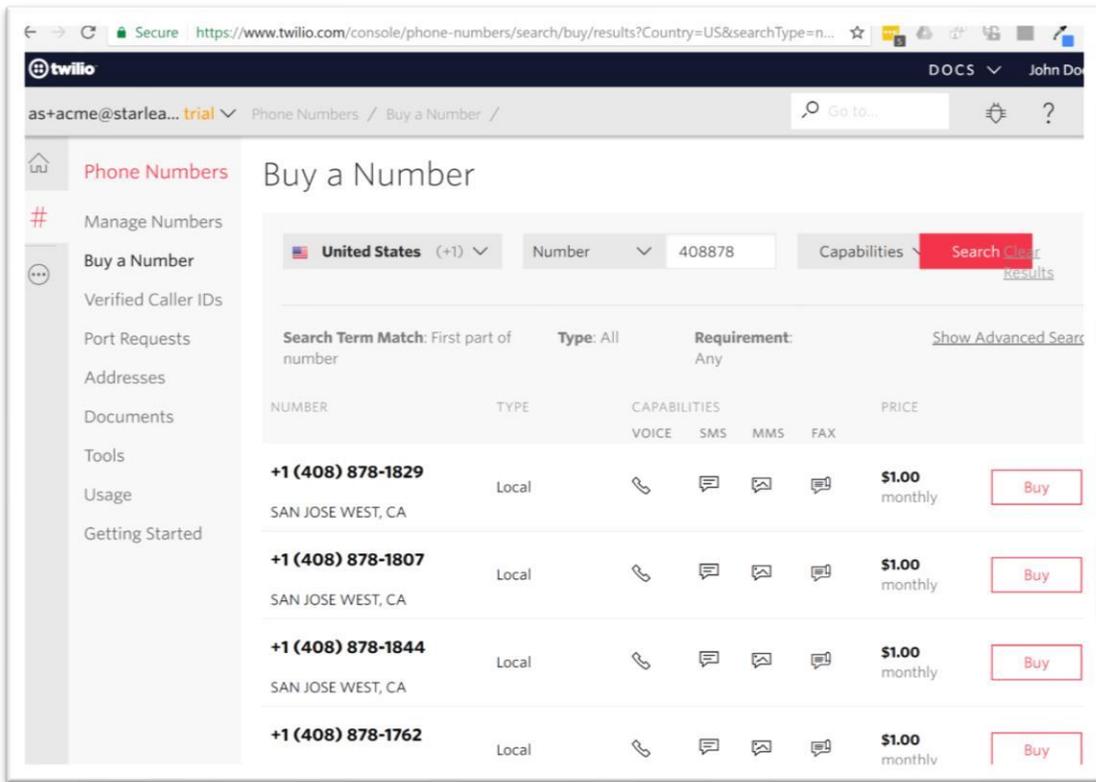
The 'trial restrictions' part will disappear after you have added some credit to your account.

#### 4. Add some credit to your account

Select 'Billing' -> 'Upgrade to full account'. **We cannot integrate with free trial Twilio accounts so this step is required.** Complete the 'Enter your payment information' (using a credit card or Paypal) and 'Add funds' steps. We recommend leaving the billing amount set to the minimum \$20 and setting autorecharge to On.

#### 5. Buy phone numbers

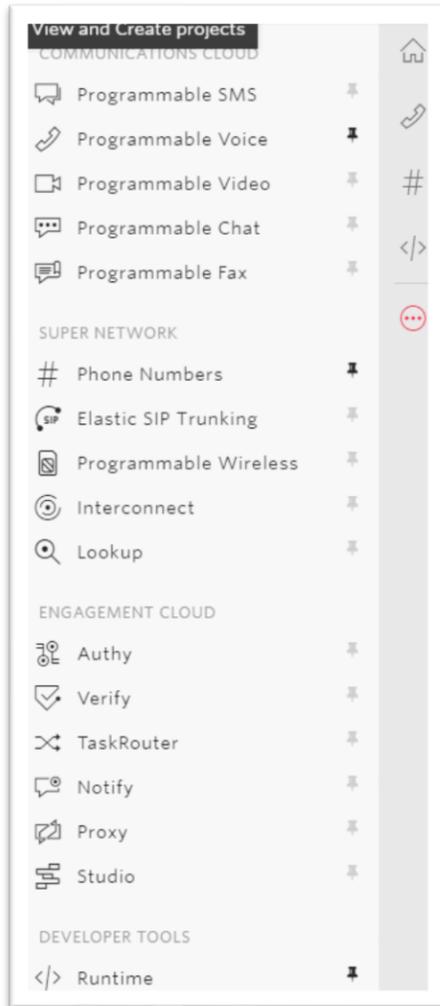
Back at the main console dashboard, select 'Buy a Number'. On the Buy A Number page, use the country drop-down and number filter to choose and buy the phone number(s) of your choice. You need at least one phone number, even if you only want to enable outbound dialing on your StarLeaf org (i.e you don't want to have DID numbers for your individual StarLeaf room systems or users) – that phone number will be presented as your outbound caller ID. Typically you would buy one phone number for each of your StarLeaf meeting rooms (and maybe users as well) – we'll then configure those numbers to work as DIDs to allow each room system to be directly dialed from the PSTN using that phone number, and also present that number as its own outbound caller ID. You might also want to buy another phone number to act as your 'mainline' phone number, and have it directed to your receptionist or a reception hunt group. US phone numbers cost \$1/month, which is deducted from the balance that you added in step 4. If you are buying a significant quantity of numbers you might choose to increase the account recharge amount from step 4.



**NOTE** if you intend to make International calls (to numbers in countries other than the countries in which you bought numbers) go to the Geo Permissions page of your Twilio account and enable calls to the required countries or continents. <https://www.twilio.com/console/voice/calls/geo-permissions/lowrisk>

## 6. Pin menu items

For ease of navigation, expand out the left-hand menu and pin the following items: Programmable Voice, Phone Numbers, Runtime.



## 7. Create TwiML Bins

TwiML is Twilio's own markup language, used for directing phone calls. We create 2 TwiML bins, one for inbound calls and the other for outbound. Click Runtime -> TwiML Bins -> '+'.

### 9a. Add the following TwiML bin with the friendly name 'Outbound':

```
<?xml version="1.0" encoding="UTF-8"?>
<Response>
  <Dial
callerId="{{#e164}}{{From}}{/e164}}">{{#e164}}{{To}}{/e164}}</Dial>
</Response>
```

It should look like this:

## Twiml Bin

Properties

SID: EHfc9ce8f33902a58058d706eba7a74724      DATE CREATED: 2

URL: <https://handler.twilio.com/twiml/EHfc9ce8f33902>      DATE UPDATED: 2

Configuration

FRIENDLY NAME: Outbound

TWIML

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <Response>
3   <Dial callerId="{{#e164}}{{From}}{/e164}}>{{#e164}}{{To}}{/e164}}</Dial>
4 </Response>

```

Copy and paste its URL to a temporary location e.g sticky note for later use.

### 9b. TWIML for inbound call routing

Now create another Twiml bin called 'Inbound' containing the code below (where XXXXXXXXXX is your StarLeaf organization ID), save it and copy its URL also.

```

<?xml version="1.0" encoding="UTF-8"?>
<Response>
  <Dial>
    <Sip>
      {{#e164}}{{To}}{/e164}}@starleafXXXXXXX.sip.us1.twilio.com
    </Sip>
  </Dial>
</Response>

```

## 8. Create a SIP domain for registering your StarLeaf lines

Click Programmable Voice -> SIP Domains -> '+' to arrive at a page like this:

starleaf89965.sip.twilio.com

**Configure** Registered SIP Endpoints

**Properties**

FRIENDLY NAME: StarLeaf Internal - Portal PSTN Numbers

SIP URI: starleaf89965 .sip.twilio.com

SIP DOMAIN SID: SD5f5bea0130ce6826fc71b87cc29791cf

**Voice Configuration**

REQUEST URL: https://handler.twilio.com/twiml/EHfc9ce8f33902a58058d706eba7a7472 HTTP GET

Add a friendly name of your choosing, and a subdomain for your SIP URI. The subdomain of the SIP URI should exactly match the 'starleafXXXXXXXXX' value that you created in your TWIML Bin in step 9. In Voice Configuration -> Request URL, paste the URI of your 'Outbound' TwiML bin from step 9. Change the request method from *HTTP POST* to *HTTP GET*. 'Fallback URL' and 'Status Callback URL' can be left blank.

Continuing down the page to [Voice Authentication](#), the next field you need to use is 'Credential Lists'. Click the '+' to the right of the Credential Lists field to create your own credential list. For each phone number that you bought in step 5, add a username/password entry where the username matches the phone number (in the form +1xxxxxxxxx) exactly, and the password is minimum 12 characters as per the requirements stated on the 'Add Credential' form. It's easiest just to use the same password for all your phone numbers.

Under [SIP Registration](#), enable endpoint SIP registration and select your credential list by name in the 'Credential Lists' field under that. Check that the name of your Credential List appears under both the 'Voice Authentication' and 'SIP Registration' sections. Save your configuration.

## 9. Attach webhooks to your phone numbers

Click 'Phone Numbers'. A list of all your active numbers appears. Click on a number to configure it. Configure it with the 'Webhooks...' choice. For the 'A Call Comes In' action, set 'TwiML' and enter the name of the Inbound TwiML bin that you created in step 9b.

The screen shot below shows an example.

### Properties

FRIENDLY NAME	unassigned
SID	PNe02e942cb3113161057e9b2d29b9c88c
PHONE NUMBER	+441923695002
LOCATION	GB
CAPABILITIES	Voice, Fax

### Voice & Fax

ACCEPT INCOMING	Voice Calls	▼
CONFIGURE WITH	Webhooks, TwiML Bins, Functions, Studio, or Proxy	▼
A CALL COMES IN	TwiML	▼
	Inbound StarLeaf Internal	

The other fields can be left as they are. Save your phone number configuration and complete the same steps for your other phone numbers.

The Twilio console configuration is now complete.

## 10. Access PSTN configuration on StarLeaf Portal

Log into <https://portal.starleaf.com> as an admin or reseller user and access the customer/organization that you're setting up Twilio access for. Click PSTN SIP Trunks -> Add PSTN SIP trunk. If you don't see this option, contact your StarLeaf reseller or account manager (it's an Enterprise level feature).

Under the 'Trunk' section, select **Provider: Twilio (Worldwide)** and enter a name and description of your choosing. Under 'Advanced', set **Gateway:** to be the entire SIP subdomain that you created in step 10, **BUT** with 'us1' inserted after the 'sip' part of the gateway FQDN (this is a current Twilio requirement and is always *us1* regardless of what country you are located in). For example, if you created starleaf123456 .sip.twilio.com in Step 10, your gateway value will be **starleaf123456.sip.us1.twilio.com**

Under 'PSTN numbers' hit '+' and add the numbers that you configured in step 11. The values should be entered as follows:

**PSTN number:** The phone number without the leading +1

**Registration name:** Complete phone number from the Credential List that you created in Step 10.

**Extension authentication:** Complete phone number from the Credential List that you created in Step 10.

**Extension password:** Password from the Credential List that you created in Step 10.

Hit 'Apply' when done and check that a green check mark appears to show that the trunk is online.

**Final step:** allocate individual numbers to StarLeaf endpoints. The purpose of this step is to control which number each StarLeaf endpoint presents as its outbound caller ID (one number will be the default. This is configured by selecting 'PSTN SIP numbers' from the StarLeaf portal and mapping StarLeaf extensions to your phone numbers one by one.

Select one number to be the org default (this will be presented as the outbound caller ID for all accounts/room systems that do not have their own dedicated caller ID.

**Edit PSTN SIP trunk**

Trunk ✔ Online

Provider: Twilio (Worldwide)

Name: DIDs - USA

Advanced

Gateway: starleaf89905.sip.us1.twilio.com

PSTN numbers

Site: USA

PSTN number	Registration name	Extension authentication	Extension password	Assigned
+1 (1) 4088781746	+14088781746	+14088781746	[REDACTED]	✔ Abe Sharp
+1 (1) 4088781738	+14088781738	+14088781738	[REDACTED]	✔ Nora Shevick