

Let's talk about STIR/SHAKEN

- December 11, 2020
- meta

Overview

STIR/SHAKEN is the protocol designated by the FCC for carriers like Skyetel to use to verify the validity of the Caller ID data being sent over the PSTN. We wanted to take some time and explain how this system works, why you should care, and what you need to know.

You can read a follow up to this article here: <https://skyetel.com/lets-talk-about-stir-shaken-again>

How it works

Outbound Calls

Right now, when you place an outbound call, you are only sending the 10 digits of your Caller ID to the PSTN and eventually to the person you are trying to call. Today it is up to you, the customer, to provide accurate information to Skyetel so that we can send it to the called party. STIR/SHAKEN changes that relationship and makes Skyetel verify that the Caller ID information that you are sending is indeed accurate.

This is accomplished by the Skyetel Network administratively adding a new "Identity" header in the SIP Invite that we send on your behalf to the PSTN. Don't worry – there is no personally identifying information in these headers; the information in them only references Skyetel – not our customers directly. However, by us signing these INVITES, we are guaranteeing to the called party that we have a verified relationship with the calling party and can facilitate tracebacks in cases of fraud. (this means we can help the FCC, DOJ, FBI, etc find people if they do something shady)

In practice – this is what we are doing. Here is what an ordinary INVITE looks like:

```
2020/12/11 17:24:12.341981 67.231.13.185:5060 ->
172.31.45.185:5060
INVITE sip:+1234567890@35.163.253.48:5060 SIP/2.0
Via: SIP/2.0/UDP
67.231.13.185:5060;branch=z9hG4bK08Bc3d92f8ac0e935e
f
From: "Mr. Bigglesworth"
<sip:+1234567890@6.21.103.285>;tag=gK086eed46
To: <sip:+13609865200@35.163.253.48>
Call-ID: 103326978_99595272@6.21.103.285
CSeq: 456910 INVITE
Max-Forwards: 70
Allow: INVITE,ACK,CANCEL,BYE,OPTIONS
Accept: application/sdp
Contact: "Mr. Bigglesworth"
<sip:+1234567890@6.21.103.285:5060>
Supported: replaces
Content-Length: 283
Content-Disposition: session; handling=required
Content-Type: application/sdp
P-Asserted-Identity: "Mr. Bigglesworth"
<sip:+1234567890@6.21.103.285:5060>
```

This is what an INVITE with STIR/SHAKEN support looks like:

```
2020/12/11 17:21:39.325532 172.31.45.185:5060 ->
192.81.236.31:5060
INVITE
sip:+1234567890@term.skyetel.com:5060;transport=udp
SIP/2.0
Record-Route:
<sip:35.163.253.48;lr=on;ftag=as268efb7c;did=d04.37
42;vsf=RmlyZUhvcnNlRXZlbmluZ0JwZ2t6dUVGamluVWpK;vst
=RyZVJodndgRHVlZmRoFTEmZSowM0AANCglDXkRHAg->
```

Via: SIP/2.0/UDP
35.163.253.48:5060;branch=z9hG4bKed28.81ffc2e2ff34f
8b11bba45596436de00.0
Via: SIP/2.0/UDP 192.168.98.184;branch=z9hG4bKsr-
VmFBb7lHSyZcpNk5Se1wboxIboxHSeSO6oVGUokv10coETFIETB
ZS7BHSoxGboxGSydwUvcx5ZEAFI6I9w4TaoYKDi6T2qUA9bUIE0
ETlIS71v1uRz1uBZUekISk**
Max-Forwards: 69
From: "Jack Sparrow"
<sip:+15036638100@35.163.253.48>;tag=as268efb7c
To: <sip:+1234567890@term.skyetel.com>
Contact: <sip:192.168.98.184;line=sr-
1IFG6shOUek7Uo476KxGSxk7UydwSekHSekGbolmUKrDSK4G6IN
hYTN7geSmbolOSyDOSKkHSoBm-oVGUjSB**>
Call-ID:
!!:U7lwEKcsEKxwSAEs4eEF6eEQUeBdU74mUKlGEe5dUeEkSe1w
boxIboxHSeSO6oVGUok*
CSeq: 102 INVITE
User-Agent: FPBX-12.0.68(11.20.0)
Date: Fri, 11 Dec 2020 17:21:39 GMT
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE, REFER,
SUBSCRIBE, NOTIFY, INFO, PUBLISH, MESSAGE
Supported: replaces, timer
Content-Type: application/sdp
Content-Length: 264
Identity:
eyJhbGciOiJFUzI1NiIsInBwdCI6InNoYWtlbiIsInR5cCI6InB
hc3Nwb3J0IiwieDV1IjoiaHR0cDovL3NreWV0ZWwuY29tL3N0aX
IvY2Vy
5wZW0ifQ.eyJhdHRlc3QiOiJBIiwizGVzdCI6eyJ0biI6WyIxNj
I2MzIxmTk0MiJdfSwiaWF0IjoxNjA3NzA3Mjk5LCJvcmlnIjp7I
nRuIjoikzE1MDM2N
4MTAwIn0sIm9yaWdpZCI6IjI3NmFmZDY2LWIzNGUtNGM2Yy05Nj
Y0LWNiNDM3MWFkNTFmZSJ9.NxLx0D2MNvkw4UKrE53yakHaNgct
1Se7zNqmghLZgGd8
Q7WhRaOauEJ954u0ylgPff44Oyd5UU40HR33e_7Q;info=<http
://skynetel.com/stir/cert.pem>;>alg=ES256;ppt=shaken

```
P-Asserted-Identity: "Jack Sparrow"  
<sip:+13609865200@35.163.253.48>
```

That new Identity header with all of the gibberish in there is fundamentally what differentiates STIR/SHAKEN traffic from how things are done today. Inside all of that gibberish contains two things – our signature (the gibberish itself) and a URL where the recipient can verify that the gibberish did indeed come from us.

Inbound Calls

Inbound Calls with STIR/SHAKEN support sort of work in reverse of how outbound calls work. When Skyetel receives an INVITE with the Identity header inside of it, it will contain a URL for us to lookup and validate that the party who's mentioned in the Identity header did indeed send the call.

When Skyetel receives calls like this, we will verify these calls as part of our normal originating process and send them to your PBX just like we do now. However – we will add a new SIP Header for your PBX to process called “X-STIR-Verified:.” In cases where the calling party passed verification, the result of this will be “True” and in cases where no STIR/SHAKEN data was present, or the call did not verify, this will be “False.” Here's an example:

```
2020/12/11 17:24:12.341981 67.231.13.185:5060 ->  
172.31.45.185:5060  
INVITE sip:+1234567890@35.163.253.48:5060 SIP/2.0  
Via: SIP/2.0/UDP  
67.231.13.185:5060;branch=z9hG4bK08Bc3d92f8ac0e935e  
f  
From: "Mr. Bigglesworth"  
<sip:+1234567890@6.21.103.285>;tag=gK086eed46  
To: <sip:+13609865200@35.163.253.48>  
Call-ID: 103326978_99595272@6.21.103.285  
CSeq: 456910 INVITE  
Max-Forwards: 70  
Allow: INVITE,ACK,CANCEL,BYE,OPTIONS  
Accept: application/sdp
```

Contact: "Mr. Bigglesworth"
<sip:+1234567890@6.21.103.285:5060>
Supported: replaces
Content-Length: 283
Content-Disposition: session; handling=required
Content-Type: application/sdp
X-STIR-Verified: true
P-Asserted-Identity: "Mr. Bigglesworth"
<sip:+1234567890@6.21.103.285:5060>

We will also add a new field to the CDR export so you can review what inbound calls passed or failed STIR validation. In addition to these immediate changes, we have other features on the 2021 roadmap that will allow you to filter calls based on their STIR validation – but that’s a subject for a different article!

What The Future Holds

STIR/SHAKEN is a huge step forward in telecom for two reasons.

1. STIR/SHAKEN will make call spoofing a thing of the past
2. STIR/SHAKEN will, eventually, end robocalling. Sorta...

Most immediately, STIR/SHAKEN will put an end to call spoofing. We’re about to enter into a world where people calling your Grandma claiming to be from Microsoft will no longer be feasible. Sure – they *technically could* still place those calls – however they’d be easy to find and prosecute.

Additionally, once Caller ID information is verified, it’s possible to transmit additional and verified information in the call beyond just a phone number. Instead of an unsolicited (but STIR verified) call from “(800) 221-1212,” it will say “Delta Airlines calling in regards to your upcoming flight.”

That leads to the other goal of STIR/SHAKEN – ending Robocalling... sorta. When customers think of robocalling, they think of random people from overseas calling their cell phone a thousand times selling them a car warranty. By forcing these spammers to accurately identify themselves, they’ll be much easier to find and stop. In almost all

cases, modern spam calling is done in violation of laws that are already written and *heavily* enforced. By being able to quickly find and prosecute violators of these laws, it will suddenly be a lot more expensive and risky to randomly call you and try and sell you a car warranty for a car you don't even own.

However, not all robocalling is illegal. This is where the “sorta” comes in. There are legal reasons for you being robocalled. The most common robocall that you actually want are things like your children's school being closed for snow days, your bank calling you about fraudulent activity, or Delta Airlines calling you about your flight. These are the robocalls that you want – and are authorized under laws like the TPCA.

There are also robocalls that are legal that you don't want. Your insurance company calling you to try and sell you a new policy are both unsolicited and unwanted. However, they're also probably legal – most companies will have “we can robocall you” in their terms of service. STIR/SHAKEN will not impact these kinds of calls. That being said – once the FCC has the ability to quickly find and prosecute violators of laws, they can get more and more precise with how consumers are allowed to be pestered. This is a dramatic change to the status quo – the FCC can write all kinds of laws, but if they can't stop violators they aren't worth the paper they are printed on.

What Skyetel is doing

Skyetel is actively working on our STIR/SHAKEN update and will be fully compliant by the middle of next year. Our goal is to have outbound calls verified by the end of February 2021 (though we'll probably have it done sooner than that) and inbound verification soon thereafter. Once we have completed the technical updates to our network, our portal will let you verify your traffic if our magical systems are not able to do it automatically.

FAQs

1. Will you be automatically verifying my traffic?

Yes. All outbound calls that originate using Caller ID information of phone numbers on the Skyetel network will automatically be verified. If you use Skyetel as your only carrier, this should mean that almost all of your outbound calls will be verified immediately and without any action on your part.

2. What about traffic that does not come from my Skyetel DIDs? We will offer an additional process for customers who need to verify traffic that has Caller ID information that does not match their Skyetel DIDs. We will provide additional information about this in the new year.

3. What will happen to my traffic if it is not verified by STIR/SHAKEN?

Your traffic will continue to flow normally, and in the short term, nothing should change. To our knowledge, no end user carrier will begin blocking or filtering non-verified traffic immediately. However, over time, the intention of STIR/SHAKEN is that non-verified traffic will be treated differently, and it is very likely that consumer cell phone apps will begin filtering this traffic. We do not know how quickly the market will adapt to this change, so we recommend verifying your traffic as soon as possible.

4. How much will this cost?

We are still determining what our costs are going to be for this process, so we don't quite know for sure yet. As of this writing, we plan to offer STIR/SHAKEN completely free. This might change though – so please keep an eye out for our official announcement.

Let's Talk About STIR/SHAKEN... Again.

- March 23, 2021
- meta

Overview

This is a follow up to our [recent article about STIR/SHAKEN](#). We wanted to spend some time further exploring STIR/SHAKEN and what that means for Skyetel customers. In our last post, we wrote about the technical part of STIR/SHAKEN and what it looks like in your SIP packets. Today, we want to talk a bit more about the legal side of it.

STIR/SHAKEN is the protocol designated by the FCC for carriers like Skyetel to use to verify the validity of the Caller ID data being sent over the PSTN. We wanted to take some time and explain how this system works, why you should care, and what you need to know. On June 1st, the FCC will implement an initiative, called, STIR/SHAKEN which will be a huge step forward in telecom for two reasons.

1. STIR/SHAKEN should make call spoofing a thing of the past
2. STIR/SHAKEN could, eventually, end robocalling.

STIR/SHAKEN will put an end to call spoofing. We're about to enter into a world where people calling your Grandma claiming to be from Microsoft will no longer be feasible. Furthermore, once it is possible to swiftly identify who is illegally robocalling consumers, illegal robocalls will stop.

What Skyetel Is Doing

We are in the final stages of updating our routers to sign our customer's outbound calling. This process is moving along smoothly, and we expect to release this to our customers in the coming month or

two. Once we have our routers updated, we will begin reaching out to our customers to have them configure their required attestation levels (described below). The attestation step will be optional, and should only take a few minutes of your time.

We are also in the final stages of having our own certificate signed, and published. Skyetel is not using a third party for its STIR/SHAKEN compliance; we are doing everything ourselves.

What's Coming

Once our SIP Gateways are updated to support our STIR/SHAKEN certificates, we will need to verify our customer's information and configure your Attestation level. This sounds more tedious than it actually is; we just need to make sure we have accurate contact information for you and that we know what Attestation Level your traffic should be at. This will be done through our portal and will impact your traffic account wide.

Right now – there is nothing you need to do to be compliant with Stir/Shaken. We are taking care of all of this for you and will provide a final update in the coming weeks about your next steps. As we mentioned earlier, we expect to offer this service free of charge; so don't fall for anyone telling you that you should pay them for it :).

Attestation Levels

There are 3 levels of attestation that will impact your outbound calling. Each level represents a sort of trustworthiness that will influence how your call is handled by the recipient.

Level A – Full Attestation

This is the level you will be in by default when the phone number you are calling out from matches one in your Skyetel account. Level A means that Skyetel knows for certain that your outbound caller ID is a

real number that you either own, or have authorization to use as your outbound caller ID.

We expect that outbound calls in this group will have the best deliverability. In fact, it is likely that the deliverability of a Level A call will have greater deliverability than they do now because callees will be more likely to answer verified calls.

Furthermore, one of the awesome benefits of Level A attestation will be the future ability to put a “why” to your phone call. As we mentioned in our last guide, in the future caller ID will not just be “(800) 221-1212,” instead it will say “Delta Airlines calling in regards to your upcoming flight.”

You definitely want to be in Level A.

Level B – Partial Attestation

This level means that Skyetel knows what system (PBX/ATA/Switch/etc) the call was placed through, but not that the calling party who placed the call was authorized to use that phone number as the caller ID. This is the default position for Skyetel users who have DIDs on other networks and who have not completed a manual attestation

We expect that outbound calls in Group B will be successfully delivered, but the recipients may send these calls straight to voicemail, and may even block them altogether.

Level C – Gateway Attestation

This level means that we know the call went over our network, but we do not know who was responsible for it nor if the party placing the call was authorized to use the phone number for Caller ID. This level is more applicable to things like international inbound phone calls, or calls the Skyetel network processes for other certified carriers. Skyetel customers who use us for termination via an Least Cost Routing tables or an automated soft switch will be placed into this category.

We expect outbound calls in this group to eventually have very poor deliverability. In the coming years, many carriers and cell phones will either outright block these calls or send them straight to voicemail.

Follow up FAQs

How do I make sure my outbound calls are in Level A?

If all of your outbound Caller IDs match numbers in your Skyetel account, just sit back and relax. There is nothing for you to do. If the outbound caller ID that you are sending does not match a DID you have in your Skyetel account, you will need to complete a manual attestation.

What is a manual attestation?

A manual attestation will be a form that you complete and esign with Skyetel. In it, you certify you are authorized to use the outbound caller IDs you are sending us. This process is fully automated within our portal and will take less than 2 minutes.

Will there be a cost associated with STIR/SHAKEN?

As we mentioned in our previous article, our goal at Skyetel is to offer this service for free. As of now, that is still our plan. If we are forced to charge for this feature – something we do not expect – we will only charge our costs and we will not add a mark-up.

Can I sign my own calls?

Yes. If you send us verified calls from your own equipment, we will default to your own signature instead of using ours.

Will this mean all of my calls will have a check box on people's cell phones?

Yes. Well, Sort of. Probably. **Definitely eventually.**

When we complete our STIR/SHAKEN update, we will sign all of your outbound calls at the correct attestation and send them to the recipient carriers. It will be up to the recipient carriers to actually update their

gateways to display that accurately to the callee. Right now, not all wireless carriers have updated all of their gateways with all the landline carriers to support STIR/SHAKEN. Because of this patchiness, some calls will show up as verified while others won't. We expect this irregularity to be temporary.