March 23, 2020

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street NW
Washington, DC 20554

Regarding: Ex parte notice, CG Docket No. 17-59 Advanced Methods to Target and Eliminate Unlawful Robocalls; WC Docket No. 17-97, Call Authentication Trust Anchor

Dear Ms. Dortch:

I am writing in reply to an ex parte letter from USTelecom dated March 4, 2020 that recounts a meeting and discussion of the use of out-of-band STIR in the context of STIR/SHAKEN call authentication. While we agree with the goals and objectives outlined by USTelecom representatives in this letter, there are statements made about out-of-band STIR that do not agree with our experience in developing out-of-band STIR technology and deploying it in the production telephone networks of our customers.

BACKGROUND

TransNexus develops software products that voice telephone service providers use to manage and protect their telephone networks. Our customers include CLECs, ILECs, interconnected VoIP providers, and enterprises that manage telephone networks. These customers use our software products for functions such as telecom fraud prevention, robocall prevention, TDoS prevention, routing, and call authentication and verification using STIR/SHAKEN. Our STIR/SHAKEN solutions have completed the ATIS test bed and are live in production with dozens of customers.

PROBLEM STATEMENT

In developing and deploying STIR/SHAKEN in live production networks, a few key points about STIR/SHAKEN’s viability and likelihood of success became clear:

1. Effective call authentication will require widespread participation in STIR/SHAKEN.
2. Participation for voice service providers who are not among the largest will be difficult, if not impossible, for two reasons:
   a. They still have a significant call volume sent over TDM networks.
   b. A significant portion of SIP networks are not capable of processing calls where the SIP INVITE contains a SHAKEN Identity token. These calls either lose the token or fail completely.

1 See Letter from Farhan Chughtai, USTelecom, to Marlene H. Dortch, Secretary, Federal Communications Commission, CG Docket No. 17-59; WC Docket No. 17-97 (filed March 6, 2020).
SOLUTION: OUT-OF-BAND STIR/SHAKEN

There is a solution to this problem: out-of-band STIR/SHAKEN. With out-of-band STIR/SHAKEN, the SHAKEN Identity token is sent from the originating service provider’s authentication service (STI-AS) across the internet to a Call Placement Service (CPS), where the terminating service provider’s verification service (STI-VS) fetches it and uses it to verify the call authentication using standard STIR/SHAKEN methods.

Everything else about the STIR/SHAKEN process is the same. Authentication, attestation, Public Key Infrastructure, verification… everything follows the same steps described in the STIR/SHAKEN standards. The only difference is that the Identity token is sent out of band across the internet.

TransNexus originally developed our STIR/SHAKEN solutions using in-band transmission of Identity tokens per the standards. These capabilities are still available within our software.

When we realized the practical issues with sending SHAKEN Identity tokens in-band, we added out-of-band STIR/SHAKEN capabilities to our software. This required no changes to the existing STIR/SHAKEN authentication, verification, and certificate management functionality. We simply added an option for the STI-AS authentication service to send tokens out of band for the STI-VS verification service to receive tokens out-of-band.

Now our customers have the option to send and receive SHAKEN Identity tokens in-band, out-of-band, or both. They can configure these options by trunk, customer, or telephone number.

For example, if a service provider has a direct peering IP connection to another provider, they can send signed calls to that provider with in-band SHAKEN tokens. They would not use out-of-band for those calls.

But if the same service provider sends calls to another destination that uses call paths that do not support in-band, then calls to that destination can be set up to use out-of-band.

Out-of-band STIR/SHAKEN isn’t all-or-nothing.

Many of our customers are using STIR/SHAKEN in their production networks today. Of the ones originating signed calls, they all use the out-of-band option for transmission of SHAKEN Identity tokens. It works in today’s network.

Most of these customers are not sending signed calls using in-band STIR/SHAKEN. The primary reason is that they do not have SIP interconnects and must use TDM. When they do send signed calls over their SIP trunks, the calls often fail either because some network element along the call path cannot process SIP INVITEs that contain SHAKEN Identity tokens, or the Identity tokens are stripped from the SIP INVITEs somewhere along the way.
RESPONSE TO USTELCOM EX PARTE

With this background, I wish to respond to statements made in USTelecom’s ex parte letter of March 4, 2020.

“There is no standard for Out-of-band STIR.”

There are draft standards for out-of-band STIR. The original version is *STIR Out-of-Band Architecture and Use Cases*. It was written by E. Rescoria, Mozilla, and J. Peterson, Neustar.² Originally released in 2017, it’s now on its seventh iteration. It was written with a broad scope to support a variety of use cases.

Recently, a new draft standard has been published: *Out-of-Band STIR for Service Providers*. It was written by J. Peterson, Neustar.³ It carries forward with the approach describe in the *Architecture and Use Cases* version, but with a narrower scope to support more specific use cases. This enables some of the features described in the original draft, which are unnecessary in STIR/SHAKEN, to be removed.

TransNexus STIR/SHAKEN solutions include out-of-band STIR/SHAKEN capabilities that are compatible with these draft standards. Our approach is *not proprietary*. Any STIR/SHAKEN solution can send STIR/SHAKEN traffic to our customers by following the draft standards.

“The Commission’s goal should be for widespread adoption of the STIR/SHAKEN standard for as many calls as soon as possible”

We agree completely. However, in-band STIR/SHAKEN excludes a very large portion of voice service providers, an issue the NTCA has called “reverse rural call completion.”⁴

Out-of-band STIR/SHAKEN enables the participation of *all* voice service providers.

If the Commission’s goal is for widespread adoption of STIR/SHAKEN, then it should encourage out-of-band STIR/SHAKEN.

“Providers should focus their efforts on ensuring that all IP calls can be signed.”

We agree completely. However, signing an IP call is a complete waste of time if the Identity token is stripped from the SIP INVITE along the call path. Signing an IP call is dangerous if a it

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causes packet fragmentation that makes a network element drop the call somewhere along the call path. That’s right—some signed calls fail completely in today’s IP network.

There’s nothing in out-of-band STIR/SHAKEN that prevents all IP calls from being signed. In fact, out-of-band STIR/SHAKEN enables more calls, including IP and TDM calls, to be authenticated and verified successfully using STIR/SHAKEN.

“Any proposed solutions that would delay STIR/SHAKEN implementation, and worse yet, potentially negatively impact callers and providers by increasing complexity and potential security issues, must be avoided.”

We agree completely. However, out-of-band STIR/SHAKEN would not delay STIR/SHAKEN implementation—in fact, just the opposite—it accelerates implementation. We have many voice service providers using STIR/SHAKEN live and in production today thanks to out-of-band STIR/SHAKEN.

“Any proposed solutions that would... potentially negatively impact callers and providers by increasing complexity and potential security issues must be avoided.”

We agree completely. However, out-of-band STIR/SHAKEN does not negatively impact callers. Our customers are providing call authentication for their subscribers in production networks today.

Out-of-band STIR/SHAKEN does not increase complexity. These voice service providers were able to implement it very quickly, sometimes in just one day.

Here are a few statements from these providers:

“With Brightlink’s new solution, customers can now see incoming calls verified with a special signature or certificate, letting them know they can trust what they see on their caller ID.” – Joe White, CTO, Brightlink

“We are seeing some calls with a “[V]” in front of the caller name,” said Rob Good, IT Director, Rhode Island Telephone. “It surprised some of our customers. Once we explained what it means, that the caller ID was verified for that call, they were excited.”

The draft standards for out-of-band STIR include an option for a shared CPS with a public interface that allows anyone to read the tokens. This raises concerns about privacy and security. The draft standard goes to great lengths to mitigate these concerns.

The draft standards also describe an option for a service provider to deploy a CPS that’s used for their calls only. In this arrangement, only their STI-VS can read tokens in the CPS. That’s the

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5 See Brightlink, ibid
6 See Rhode Island Telephone uses ClearIP to deliver greater value to their customers while saving money, https://transnexus.com/case-studies/rhode-island-telephone/, retrieved Mar 12, 2020
approach we took in our solutions. This approach addresses the concerns about security and privacy.

“The Commission should be skeptical of the viability of Out-of-band STIR as an alternative to STIR/SHAKEN for any calls (whether as an alternative solution for TDM or IP traffic) unless and until a standard is developed for such a solution.”

Out-of-band STIR/SHAKEN is not an alternative to STIR/SHAKEN—it is STIR/SHAKEN. The only difference is that the SHAKEN Identity tokens take a different path.

The Commission should not be skeptical of the viability of out-of-band STIR/SHAKEN. We invite you to listen to our customers who are using it today. See our webinar recording, Get Ready for the STIR/SHAKEN Call Authentication Mandate. This presentation includes the following statements:

“We still have a lot of TDM traffic. We started [ClearIP STIR/SHAKEN] with our Ribbon switchboard in release 14. We have zero cost [in it]. It works very well. We’re TRACED Act compliant today.” — Dave Frigen, COO, Wabash Communications

“We’re running version 9.3 on our Metaswitch. We have a lot of TDM traffic. It was a simple process to get [ClearIP STIR/SHAKEN] up and running.” — John Smith, COO, Blue Valley Tele-Communications

“USTelecom Representatives reiterated their proposal for the Commission to require the establishment of an ‘appropriate robocall mitigation program’ for any traffic that any voice service provider originates on its network and does not sign using the STIR/SHAKEN authentication protocol – whether TDM traffic or IP traffic – until STIR/SHAKEN or another call authentication framework can be implemented.”

We agree that voice service providers should establish an appropriate robocall mitigation program. STIR/SHAKEN is an essential part of the solution to prevent illegal and unwanted robocalls, but it isn’t the entire solution. STIR/SHAKEN authentication combined with robocall mitigation using call analytics are a powerful combination that complement each other.

With out-of-band STIR/SHAKEN, all voice service providers can sign their calls using STIR/SHAKEN, regardless of whether their calls transit TDM or IP networks.

“TDM networks (which are virtually never the source of illegal robocalls) are not compatible with STIR/SHAKEN...”

While it is true that TDM networks are rarely the source of illegal robocalls, those who send illegal robocalls can spoof calling numbers assigned to providers who send their calls over TDM.

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In fact, with a piecemeal, limited deployment of STIR/SHAKEN, illegal robocallers would have a powerful incentive to do so.

With out-of-band STIR/SHAKEN, valid calls that originate on TDM networks are signed. We have customers doing this in their production networks today.

Using out-of-band STIR/SHAKEN, calls that originate from, transit, or terminate on TDM networks are compatible with STIR/SHAKEN.

OUR PERSPECTIVE

If today’s telephone network were all IP from end to end, required no expensive, time-consuming network upgrades, and required no complex discussions of intercarrier compensation schemes, then TransNexus never would have added out-of-band capabilities to our STIR/SHAKEN solutions. In-band STIR/SHAKEN works great when those problems don’t exist.

But these obstacles do exist, and they threaten to inflict severe disruptions on a telephone communications ecosystem in a headlong rush to solve problems with unwanted, illegal robocalls.

Out-of-Band STIR/SHAKEN mitigates these obstacles and disruptions. It reduces the risk that STIR/SHAKEN might be judged a failure because of a piecemeal, costly, haphazard, ineffective rollout plagued by glitches and problems with in-band token transmission.

The out-of-band mechanism is an easy extension to the STIR/SHAKEN framework that provides call authentication benefits to all subscribers and providers today, helps to solve the robocall problem for more consumers and enterprises today, and affords ample time to continue the evolution to an all-IP network.

I hope this information and experience is helpful to the Commission in exploring the current obstacles to widespread adoption of STIR/SHAKEN and the remedies that out-of-band STIR/SHAKEN provides.

Pursuant to Section 1.1206 of the Commission’s rules, a copy of this letter is being filed via ECFS.

Respectfully submitted,

/s/ Jim Dalton
Chief Executive Officer
TransNexus