The Public Telephone Network is Broken

- The FCC says that US consumers receive over 200,000\textsuperscript{1} unwanted calls every minute, and of those calls, 47% are illegal scams.

- Fraudulent calls are costing Americans billions each year:
  - It’s projected that fraudulent calls will impact 43 million Americans and cost approximately $10.5 billion in total losses\textsuperscript{2}. In Canada, victims have lost over $\text{CDN} 30\text{M}\textsuperscript{3}
  - Of those scammed, the average loss was $244 per victim.

- Fraudsters spoof the caller ID to increase the likelihood that the call will be answered. Now over 88% of consumers won’t answer unknown calls\textsuperscript{1}.

- With consumer wariness on the rise, even legitimate calls go unanswered.

- The public telephone network is broken!

Consumers have completely lost their trust in the integrity of the public telephone network

\textsuperscript{1}2020-04-02, GlobalData, 2019-06-05, https://www.fcc.gov/news-events/blog/2019/06/05/beating-back-unwanted-robocalls


\textsuperscript{3}2020-10, https://www.antifraudcentre-centreantifraude.ca/index-eng.htm
STIR/SHAKEN is the FCC Mandated Answer

To reduce fraudulent spoofed CLI telephone calls to consumers, the FCC has mandated that carriers implement **STIR/SHAKEN:**

*(Secure Telephone Identity Revisited /Signature-based Handling of Asserted information using toKENs)*

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**Originating Provider**

Originating network provides caller authentication in the form of a cryptographic signature and attestation (see table).

The cryptographic signature covers calling and called numbers, ensuring that “man in the middle” attacks cannot succeed.

**Digital Signature**

Digital signature travels with the call. Protects Caller ID attestation, ensures no “man-in-middle” attacks can occur.

**Terminating Provider**

Terminating provider verifies the call’s cryptographic signature.

Provider decides how to convey the verification results:

- Attestation is used as one input
- Optional CVT-based call analytics can be blended in as well

Terminating provider can trace the call back to the signing (originating) provider

<table>
<thead>
<tr>
<th>Attestation Level</th>
<th>Known Customer</th>
<th>Known Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full (A)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Partial (B)</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Gateway (C)</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
But STIR/SHAKEN is Complicated...
And Time is Short. . .

The FCC deadline is June 30th, 2021!
Everything is done already. Everything is in the cloud. NetNumber has handled all the complexity. NetNumber is your “one stop shop” for the whole solution: approval, registration, certificates, call signing and call verification.

You pay a very competitive monthly fee and NetNumber takes care of the rest.

You are 100% FCC/CRTC compliant.
Guaranteed Caller™ Solution Family

The NetNumber Guaranteed Caller family consists of five STIR/SHAKEN-based solutions:

- **Guaranteed Caller National** – implements the national level infrastructure needed to administer a country-level STIR/SHAKEN trust network.

- **Guaranteed Caller Service Provider** – implements the functionality of signing and verifying known trusted calls, allowing service providers to ensure that the calls of their legitimate subscribers travel inside the STIR/SHAKEN network of trust.

- **Guaranteed Caller TDM-SHAKEN** – extends Guaranteed Caller Service Provider to provide support for TDM/SS7 networks.

- **Guaranteed Caller Enterprise** – extends the STIR/SHAKEN trust network to enterprises so that they can sign their calls with their company name, their corporate logo and the reason for their call.

- **Guaranteed Caller International** – extends the STIR/SHAKEN trust network to CSPs outside of North America that terminate calls into the US and Canada.
Cloud Connect simplifies STIR/SHAKEN network deployment:

- Interworks SIP and SS7 *signaling* to NetNumber Cloud STIR/SHAKEN.
- Sets **attestation** levels for calls, per operator defined rules, before having them signed.
- Sets **OrigID** values for calls, per operator defined rules, before having them signed.
- Provides **On-net Bypass**. Decides which calls need to be signed/verified vs. which do not (only those leaving the network, and those coming in from outside, have to be signed/verified). Automatically and transparently handles attestation for on-net calls. **No dip, no charge!**
- Cloud Connect is available as a VM or a 1U appliance.
STIR/SHAKEN can be complex – Guaranteed Caller is the “easy button”

Guaranteed Caller supports industry leading attestation and OrigID flexibility

Guaranteed Caller supports IP and TDM (TDM-SHAKEN) “out of the box”

STI-CPS is supported for TDM and SIP (resolves TDM interconnect issues)

Guaranteed Caller Cloud Connect is built on NetNumber’s field-hardened TITAN platform and incorporates 20+ years of deep SS7 and SIP expertise

NetNumber is a reliable choice, evidenced by over 20 years of successful operation in many of the world’s largest telecoms

NetNumber’s Guaranteed Caller is the most comprehensive STIR/SHAKEN solution available on the market today

The FCC clock is ticking - get Guaranteed Caller™ today!
Visit https://www.netnumber.com/services/guaranteed-caller/
There are as many potential technical approaches to introducing STIR/SHAKEN into the network as there are combinations of solution vendors and network topologies. So, what should network operators be looking for as they evaluate vendor STIR/SHAKEN solutions?

Below is a checklist based on key learning from working with service providers implementing STIR/SHAKEN solutions.

**Comprehensive Coverage:**

- The solution provides all the key elements of an operational STIR/SHAKEN solution, including certificates (STI-CA), call signing (STI-AS, SKS, SP-KMS) and signature verification (STI-VS, CRc).

  This provides the operator with a “one stop shop” deployment, where there is no waiting around for vendors to integrate with each other, no finger pointing, no unnecessary delays.

- The solution provides support for both the IP and non-IP portions of the network (STIR/SHAKEN and TDM-SHAKEN respectively).

  This ensures that the whole network is covered from “day 1”, eliminating the need to deploy both IP STIR/SHAKEN and robocall mitigation today, only to have to add TDM-SHAKEN tomorrow when the FCC mandates it (which appears to be inevitable). TCO strongly favors a solution that provides both IP and non-IP support.
**Strong Features:**

- The solution features strong and flexible call attestation capabilities.
  
  Granular and nuanced attestation rules are absolutely critical for getting the best out of STIR/SHAKEN. Customers yearn for the coveted “A” attestation, and the solution needs to have the flexibility to attest on a wide range of criteria, allowing for maximum “A” coverage.

- The solution features strong and flexible OrigID capabilities.
  
  Bad things happen. If/when bad actors manage to inject fraudulent traffic into your network, you will want to track them down and shut them off as quickly as possible. Setting an appropriately granular OrigID on each call signature will arm you to do just this. The solution needs the same degree of strength and flexibility for OrigID that it needs for attestation.

- The solution provides an optional on-net STIR/SHAKEN bypass capability.
  
  This is key! Why pay for services you don’t need? With on-net STIR/SHAKEN bypass, there is no need to pay for cloud dips for calls that are never going to leave the network and are known ahead of time to qualify for an A attestation. The percentage of on-net calls is typically large, meaning that a properly configured on-net bypass can save you significant OPEX.
Low Network Impact:

- The solution can be “ring fenced” to a specific zone, with no upstream or downstream impacts to existing network elements.

  Telecom networks thrive on predictable routine. Once the network is running and stable, disturbances to it amount to potential disturbances to customer service and to revenue flow. Ring fencing the solution ensures that any such disturbances are minimized to the extent possible, preserving both CSAT and the bottom line.

- The solution does not require widespread changes to existing call routing.

  Any significant degree of call routing change may require you to “touch” every switching element in the network, which can be a daunting and time-consuming task, not to mention being one that may break previously flawless call flows. Preserving existing call routing should be a major objective in any STIR/SHAKEN rollout.

- The solution does not require the purchase and installation of expensive new software upgrades to existing network elements.

  The network is stable, working and generating the revenue it is intended to. New software updates bring with them the risk of new bugs and new service interruptions or degradations.
Sometimes it is necessary to take this risk to introduce important new features, but a STIR/SHAKEN rollout doesn’t need to be one of those times. Minimizing impact to existing network elements should be a key consideration when deploying a STIR/SHAKEN solution.

☑️ The solution does not require the addition of expensive new network elements.

Many STIR/SHAKEN solutions require you to deploy new elements into the network and then route all calls to them for call signing or signature validation. New network elements mean new CAPEX, new space, power and environment demands and of course, new call routing requirements to reach the new nodes. This is a double whammy, to be avoided when possible. Sometimes, due to the nature of older existing equipment, this cannot be avoided entirely, but in such cases, the solution should minimize to the maximum extent the cost and the overall network impact.

**Known, Trusted and Experienced:**

☑️ The solution vendor has deep SIP roots and deep SS7 roots.

In the end, STIR/SHAKEN is a call signaling solution. Ensure that the solution is provided a vendor with deep signaling experience and you will ensure that the solution will incorporate the wisdom that comes with that. This is particularly true for TDM-SHAKEN.
Service providers operating SS7 networks know that SS7 is deep water. They absolutely do not want their vital infrastructure being disturbed by a vendor who is just dipping their toes into that particular ocean for the first time. Ensure that the solution vendor has been in the SS7 business for a great many years and has deep experience and expertise with all of the protocol layers involved.

- The solution vendor has proven STIR/SHAKEN expertise and field experience.

If you are looking for a stable, comprehensive and fully standards-compliant solution, buy from a vendor with proven STIR/SHAKEN expertise. You may “get more for less” from a new entrant, but you will pay for it!

This is a tough list of requirements to meet, but NetNumber’s Guaranteed Caller™ family of STIR/SHAKEN solutions meets them all handily, and does so with a real emphasis on easing the service provider journey to STIR/SHAKEN compliance.

NetNumber has been in the STIR/SHAKEN market for more than three years. Guaranteed Caller™ is the second generation of NetNumber’s STIR/SHAKEN market offer and incorporates all the learnings from our earlier market experiences.

Contact us at sales@netnumber.com to learn how we can help ease your path to full STIR/SHAKEN compliance.
NetNumber, Inc. brings over 20 years of experience delivering core network signaling control platforms that power global telecom and enterprise networks. Our software-based signaling-control solutions accelerate delivery of new services like Private Networks and IoT/M2M solutions across multi-gen networks, dramatically simplifying the core and reducing CAPEX and OPEX.

NetNumber’s solutions span a range of network types from 2G-3G-4G-5G and beyond, delivered on the industry’s most robust signaling platforms, TITAN and TITAN.IUM. NetNumber Data Services are essential for global inter-carrier routing, roaming, voice and messaging.

Please visit www.netnumber.com/services/guaranteed-caller or contact sales@netnumber.com for details.