



# calling number verification service for international calls

## answering the call

Americans were inundated with more than 2,000 robocalls<sup>1</sup> every second in October 2019. That's a 25 percent increase in just one month — and enough to put the annual total over 49 billion. In fact, roughly half of all calls to U.S. mobile phones in 2019 were spam, the FCC reports<sup>2</sup>.

The new Signature-based Handling of Asserted information using toKENs<sup>3</sup> (SHAKEN) framework will help mitigate illegal robocalls and help consumers once again trust the number displayed on their caller ID. The catch is that legitimate calls from overseas are at risk of being caught in SHAKEN's net.

That's a big problem for those callers — and the service providers terminating those calls in the U.S. Simply put, the nation's new, SHAKEN-based Calling Number Verification Service could result in legitimate international calls not getting answered and potentially even blocked. Take the example of a multinational enterprise. When employees in its Germany or U.K. offices call their U.S. colleagues, customers or business partners, it's possible that the country's service will not accurately present some of those caller IDs as verified. The same is true of any overseas consumer calling the U.S. from their fixed or mobile line.

Now, for some good news. There are several solutions to help service providers ensure that non-

spam calls from their international counterparts are successfully terminated in the U.S. Here's an overview of how the service works, points to consider for international traffic and what can be done to ensure that legitimate calls from international numbers are appropriately verified and displayed to the called party.

## how trust can be restored

SHAKEN is the result of an industry-led initiative to mitigate illegal robocalls. Developed by the Alliance for Telecommunications Industry Solutions (ATIS) and the SIP Forum, SHAKEN uses Secure Telephone Identity Revisited (STIR) standards from the Internet Engineering Task Force (IETF).



<sup>1</sup> <https://www.cnn.com/2019/11/16/robocalls-hit-record-numbers-as-carriers-and-lawmakers-fight-back.html>

<sup>2</sup> <https://docs.fcc.gov/public/attachments/DOC-356196A1.pdf>

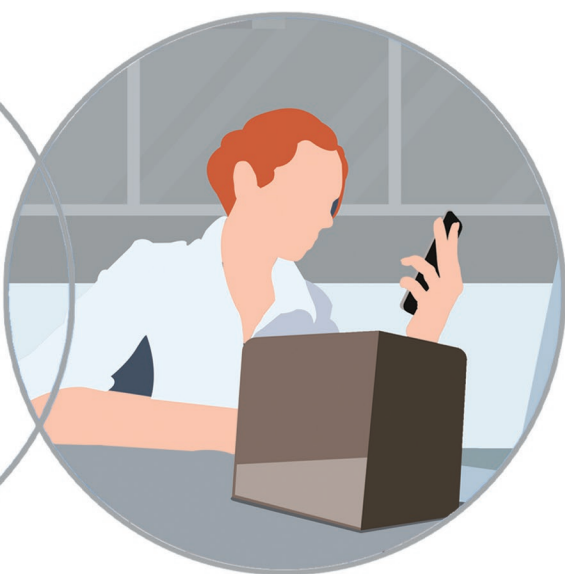
<sup>3</sup> <https://www.atlas.org/sti-ga/>

<sup>3</sup> <https://bgr.com/2019/01/29/smartphone-usage-statistics-new-data/>

SHAKEN outlines the tools for signing and verifying calling party information, which can help trace these calls and stop them at their source. It also makes it possible for consumers to know — before answering — that the caller ID information they receive is verified.

Studies show<sup>4</sup> that in the U.S., 76 percent of calls from an unidentified or unfamiliar number are left unanswered. That means each year, consumers don't answer hundreds of millions of legitimate calls — such as calls from doctor's offices and schools — simply because they're wary of who might be on the other line.

The verification process, combined with call validation analytics, significantly increases the probability that those calls would be answered. For businesses — including those based outside of the U.S. — the service helps improve customer satisfaction and employee productivity by eliminating the phone tag that occurs when people let calls from unfamiliar numbers drop into voicemail. And that's assuming their voicemail is actually set up. If it is, there's also a good chance that it's already filled to capacity with older messages and thus unable to accept more.



In fact, phone tag highlights the hefty price that businesses pay when calls go unanswered. Take that aforementioned example of a major multinational company: When its U.S. employees, customers and business partners don't trust an incoming call from outside the country, they'll let it drop into voicemail. If they check voicemail later and call back, there's a chance the person calling has left the office for the day. If that person is a customer, they might not have been able to wait and instead took their business to a competitor. If that person is a colleague, then two employees are wasting time on phone tag. And if that company has tens of thousands of employees, and just one percent play phone tag each day, the combined cost of lost productivity and business quickly adds up over the course of a year.

Service providers pay the price, too. For example, the Federal Communications Commission (FCC) reports<sup>5</sup> that service providers spend \$10 fielding each customer service call. Remember that roughly half of all calls to U.S. mobile phones in 2019 were spam, which means a lot of customer service calls.

## how SHAKEN is implemented

In the U.S., iconectiv is the Secure Telephone Identity Policy Administrator<sup>6</sup> (STI-PA) for the Calling Number Verification Service. iconectiv's role is to confirm which service providers are authorized to request certificates and review and approve Certification Authorities (CAs) to issue them.

With this policy administration in place, calling party information such as the origination of the call and caller ID can finally be authenticated end-to-end. The service will capture this for each call and will securely convey that information to the called party's service provider and, ultimately, to the recipient's call display.

<sup>4</sup> <https://bgr.com/2019/01/29/smartphone-usage-statistics-new-data/>

<sup>5</sup> <https://www.fcc.gov/news-events/blog/2019/06/05/beatng-back-unwanted-robocalls>

<sup>6</sup> <https://iconectiv.com/news-events/mitigating-illegal-robocalling-advances-secure-telephone-identity-governance-authority>



To support the SHAKEN framework, including the signing and verifying of calls, service providers and network operators need to add several capabilities, for example:

- A key management system (KMS) to the originating network back office to house their private key and the authority token provided by the Policy Administrator to use with CAs. This system needs to interface with the CA to request certificates in a secure manner.
- An authentication service (AS) to handle the signing process when originating calls. The AS would determine whether there's a verified association between the phone number and the customer using that number. The unique origination identifier in the calling party information is used for traceback, which is a key way to not only block illegal robocalls but to stop them at the source.
- A verification service (VS) to the terminating network to handle the analysis of the signed calling party information using the public key certificate provided by the originating service provider. This information would be used to check for tampering by using the signature and would be provided to the Call Validation Treatment (CVT) module.
- Providing the CVT to a terminating network component to provide call blocking and display decisions using a variety of data sources, including information provided by the Calling Number Verification Service.

In addition, service providers will need to use the above capabilities in an environment that includes the following:

- An approved CA from whom to request certificates. The certificate is used to secure the public key that allows terminating service providers to trust the authenticity of calling party information that is digitally signed with such a certificate.
- A policy administrator that has arranged for the above CA to be trusted by other service providers in the ecosystem that they intend to send their signed calls.

It is possible that the CA and policy administrator could be provided as a combined entity in some jurisdictions.

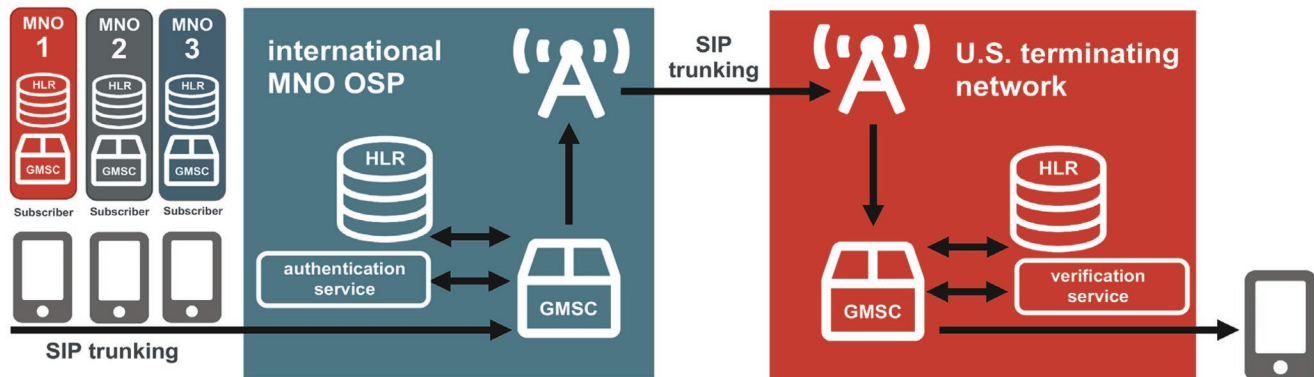
## SHAKEN for cross-border verification

The SHAKEN framework can be used for calls that originate and terminate within the same country, as well as, for calls that originate in one country and terminate in another. For example, when Canada implements SHAKEN<sup>7</sup> for all IP-based voice calls, which is mandated to happen in 2020, then caller ID verification will be possible between the U.S. and Canada since both will have a SHAKEN-based framework implemented. There is also the scenario in which a call originates from a country that does not implement SHAKEN and terminates in a country that does.



<sup>7</sup> <https://crtc.gc.ca/eng/archive/2018/2018-32.htm>

## international originated calls to U.S.



the subscriber on a subtending network initiates a call back to the USA

The MNO transits the call to the International MNO OSP for delivery to the Terminating Network

The International MNO OSP has a commercial agreement with each subtending MNO to only send their directly connected subscribers (including in-roamers) over the trunk so the Caller ID can be attested to.

The International MNO OSP adds SIP Identify Header using standard SHAKEN procedures and signs the call with the origin

The Terminating Network in the USA uses standard SHAKEN procedures to verify and terminate the call

MNO OSP can also sign their own mobile subscriber calls destined for USA

### about iconectiv

Your business and your customers need to access and exchange information simply, seamlessly and securely. iconectiv's extensive experience in information services and its unmatched numbering intelligence helps you do just that. In fact, more than 2B people count on our platforms each day to keep their networks, devices and applications connected. Our cloud-based Software as a Service (SaaS) solutions span network and operations management, numbering, trusted communications and fraud prevention. For more information, visit [www.iconectiv.com](http://www.iconectiv.com). Follow us on Twitter and LinkedIn.

### make the connection.

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