WEBINAR

Restore Trust in Phone Calls
Meeting the FCC Call to Action with STIR/SHAKEN

Thursday, March 14, 2019  1-2 PM EDT
<table>
<thead>
<tr>
<th>Section</th>
<th>Speaker / Leader</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market &amp; Regulatory Landscape</td>
<td>Jonjie Sena</td>
<td>0:10</td>
</tr>
<tr>
<td>Standards &amp; Technology Landscape</td>
<td>Jon Peterson</td>
<td>0:20</td>
</tr>
<tr>
<td>Commercial Landscape</td>
<td>Marybeth Degeorgis</td>
<td>0:10</td>
</tr>
<tr>
<td>Q&amp;A</td>
<td>All</td>
<td>0:10</td>
</tr>
</tbody>
</table>
Market & Regulatory Landscape:

The need for Call Authentication

Jonjie Sena
60% of all FCC Complaints are about robocalls

Nearly half of all mobile calls will be scam...

47.8B robocalls in 2018, +57%

YouMail, 2019

FCC, 2019

First Orion, 2019
Call centers efficiency plunging due to inbound and outbound fraud

Spoofing of phone numbers erodes brand and risks potential liability

Calls to consumers blocked or mislabeled

SPAM? MYCORP
301-234-5678

Epidemic of robocalls & call fraud mean consumers no longer answer their phones

ACCEPT

DECLINE
2 issues: Robocalling vs. Spoofing

**ROBOCALLS**
- Autodial or programmatic calls
- Automation enables high-volume calls

**CALL SPOOFING**
- Alter phone number, so look like call comes from someone else

- Related, but different.
- May be legal or illegal.
- Many fraud calls today are a combo: i.e., spoofed robocall
The Feds are Serious

Nov 5, 2018:
“Combatting illegal robocalls is our top consumer priority at the FCC.”

“By this time next year, I expect that consumers will begin to see this on their phones… If it does not appear that this system is on track to get up and running next year, then we will take action to make sure that it does.”

ENFORCEMENT

Pai: “The biggest fines in the FCC’s history have been imposed on robocallers”

- **Sept 2018**: $82M fine against Philip Roesel and his companies for illegal caller ID spoofing, to market health insurance products.
- **May 2018**: $120M fine against Adrian Abramovich, for making 100M robocalls to market vacation deals.

INDUSTRY PRESSURE

Pai: “We’ve demanded that the phone industry step up and adopt call authentication”

- **Nov 2018**: sent letters to phone companies to adopt call authentication. Acknowledged some operators are “well on their way”, and urged carriers with lack of concrete STIR/SHAKEN plans "to do so without delay".
The Legislators are Serious

POLICY

Bicameral & bipartisan support for battling robocalls.

- **Nov 2018**, Senate introduced TRACED Act. Now in front of Senate Committee
- **Feb 2019**, House reintroduced the Stopping Bad Robocalls Act
- **Mar 2019**, A coalition of attorneys-general from 54 states and territories expressed support for TRACED

**SENATE BILL**

**TRACED Act:** Telephone Robocall Abuse Criminal Enforcement and Deterrence

**HOUSE BILL**

**Stopping Bad Robocalls Act**

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**S. 3655**

To deter criminal robocall violations and improve enforcement of section 227(b) of the Communications Act of 1934, and for other purposes.

**IN THE SENATE OF THE UNITED STATES**

November 15, 2018

Mr. THUNE (for himself, Mr. MARKKULA, and Mr. WICKER) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

**A BILL**

To deter criminal robocall violations and improve enforcement of section 227(b) of the Communications Act of 1934, and for other purposes.

1. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,
2. **SECTION 1. SHORT TITLE.**
3. **SECTION 2. Prohibitions.**
4. This Act may be cited as the “Telephone Robocall Abuse Criminal Enforcement and Deterrence Act” or the “TRACED Act”.

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**H. R. 6026**

To amend the Communications Act of 1934 to clarify the prohibitions on making robocalls, and for other purposes.

**IN THE HOUSE OF REPRESENTATIVES**

June 7, 2018

Mr. Pallone introduced the following bill, which was referred to the Committee on Energy and Commerce

**A BILL**

To amend the Communications Act of 1934 to clarify the prohibitions on making robocalls, and for other purposes.

1. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,
2. **SECTION 1. SHORT TITLE.**
3. **SECTION 2. Prohibitions.**
4. This Act may be cited as the “Stopping Bad Robocalls Act”.
5. **SECTION 3. Definitions.**
6. **SECTION 4. Enforcement.**
7. **SECTION 5. Effective Date.**
Operators Have Rolled Out Robocall & Spam Solutions

Use analytics to identify robocalls. Focus on stopping bad calls.
Industry Testing Has Reached Critical Mass

Industry Robocall Testbed

- 45 Registered
  - 65% Vendors
  - 35% Operators
- 16 Completed
- 10 In-progress/Pending

Since Dec 2017…
- Registrations up 85%
- Test activity up 188%
Operators Have Committed to STIR/SHAKEN

Summary of STIR/SHAKEN deployment plans based on FCC ex parte comments

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<tr>
<th>Organization</th>
<th>Timeline</th>
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<tr>
<td>AT&amp;T</td>
<td>2018 – 2019</td>
</tr>
<tr>
<td>CenturyLink</td>
<td>beginning in 2019</td>
</tr>
<tr>
<td>Comcast</td>
<td>2018 – 2019</td>
</tr>
<tr>
<td>Cox</td>
<td>2018 – 2019</td>
</tr>
<tr>
<td>T-Mobile</td>
<td>2018 – 2019</td>
</tr>
<tr>
<td>U.S. Cellular</td>
<td>second-half 2019</td>
</tr>
<tr>
<td>Verizon</td>
<td>2018 – 2019</td>
</tr>
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Use certificates to identity spoofing. Identify legitimate calls, flag fraud.
POLLING QUESTION

Which robocall mitigation techniques to date have been MOST EFFECTIVE for your subscribers?

1. Analytics / Mobile App
2. Anti-robocall Service
3. Customer Service Setting
4. Multiple Techniques
5. None
Standards & Technology: Background and Considerations

Jon Peterson
Which is more secure?

The Telephone Network vs. The Internet
The Phone Network Used To Be Secure

Once, the telephone network had a clear advantage
- Closed vs. Open – only carriers could signal SS7

The Internet was initially kind of a mess
- Now we have the web PKI, better email spam prevention
- Not perfect, but cryptography and analytics help

But when the Internet connected to the PSTN, the mess followed it
The Problem

Interconnection of VoIP networks and the PSTN helped enable virtually untraceable abusive calls

so what’s the plan?
1. Bring together best of Internet & Phone Security

Big idea: Bring PKI certificate security to phone calls
- Carriers - and some newcomers - can sign calls with certs
- Recipients rely on those certs to validate callers

X.509 certificates have been extended for telephone network identifiers
- Recipients can validate the calling number
- With a valid calling number, get a valid calling name or brand
- Beyond TNs, certs attest OCNs or similar indicators (e.g., SHAKEN requirements)
SIP architecture: For IMS and beyond
SHAKEN Per-Call Certification Example

Service Provider A (VoIP/IMS) → Authentication Service (STI-AS) → Service Provider B (VoIP/IMS) → Verification Service (STI-VS) → Analytics

Attestation/Trust Indication = “A”
Built on Core (and Evolving) Industry Standards

STIR = Secure Telephone Identity Revisited

- In scope: robocalling, voicemail hacking, swatting, impersonation (spoofing)

RFCs (Neustar co-author of each):

- PASSporT: Personal Assertion Token, RFC 8225
  - Identity token specification
  - Network protocol independent

- Authenticated Identity Management in the Session Initiation Protocol (SIP), RFC 8224
  - SIP token procedures for detecting identity impersonation

- Secure Telephone Identity Credentials: Certificates, RFC 8226
  - Credential management systems for supporting call authentication

IP-NNI Task Force w/SIP Forum
(Neustar contributor to each)

- “Signature based Handling of Asserted information using ToKENs” or SHAKEN; ATIS-1000074-E
- SHAKEN: SHAKEN Support of “div” PASSporT; ATIS-1000085
- “SHAKEN: Governance Model and Certificate Management”; ATIS-1000080-E

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ATIS = Alliance for Telecommunications Industry Solutions
IETF = Internet Engineering Task Force
Effectively being mandated to address illegal robocalls

- Embrace and get involved (e.g., standards, testing, targeted implementations)
- Support industry efforts to ensure openness and interoperability
- Grow vendor support to help operators implement

It’s more than just signing and verifying phone calls

- Don’t forget analytics and its likely significance over time!
- Expect changes – we don’t want to go too fast or too slow

2. First Major Calling Feature In Years; Start Simple
There’s more to life than SIP

Most problem calls in the PSTN start in the IP world

- Making sure they are certified on the Internet is key
- Not much prospect for updating legacy switching fabric

IETF also developing “out of band” ways to send PASSporTs

- Suitable for enterprise cases with legacy infrastructure
- Someday, apps could share PASSporTs through an intermediary
SHAKEN is carrier centric

- Some enterprises have significant SIP infrastructure
- They want branded display for their customers

Work is underway on “delegation” features for STIR/SHAKEN

- Carriers can grant credentials to their enterprise customers
- Help them participate in the infrastructure and securely connect to people

Rich call display features are also in the works

- Render logos and other enterprise brand data to callees
- Let them feel confident when they pick up the phone!
The End Goal

An identity platform that brings telephone numbers into the 21st century
What stage of implementing call authentication (STIR/SHAKEN) are you?

1. Complete / Near Complete
2. In Progress
3. Planning
4. Haven’t Started
5. No Plans
Commercial Solutions: How to Build a Trusted Call Environment

Marybeth Degeorgis
Perspective

It’s not just about blocking calls.

Deliver identity & context to give subscribers control over their phone experience.

Restore trust in phone calls. Protect consumers. Improve customer engagement.
Neustar Trusted Call Solutions

Robocall Mitigation
Apply analytics to detect, block or warn agents and employees of illegal and unwanted inbound calls.

Certified Caller (STIR/SHAKEN)
Digitally sign outbound calls to battle spoofing, and assure customers of legitimacy calls.

Caller Name Optimization
Central management of caller name across carriers, landline & mobile. Publish numbers to industry to mitigate call blocking & spam labeling.

Branded Call Display
Personalize mobile screen for contextual and branded customer call experience.
Robocall Mitigation

Use Analytics to Detect & Warn of Unwanted & Fraudulent Calls

- Apply Neustar call analytics model to compute per-call fraud score
- Overwrite CNAM to notify customers
- Supports operators’ customizable policies for display
- Supports FCC’s Nov 2017 Robocall Blocking Order to authoritatively identify invalid & unassigned numbers.
- Supports integration with other analytics providers
Certified Caller (STIR/SHAKEN)

- Apply STIR/SHAKEN-compliant authentication and verification checks for per-call certification
- Overwrite CNAM to notify customers
- Supports operators’ customizable policies for display
- Neustar’s STIR / SHAKEN solutions serve as reference implementation for industry interoperability test labs
Robocall mitigation: Call Fraud Modeling

Leverage A Broad Range Of Data Sources To Maximize Value

Our Insights & Visualization Identify Robocalls, Spoofers & Scammers

Gain near real-time access to Neustar’s reliable, proven data

Identify high-volume robocalls & spoofers so carriers can confidently respond

Empower carrier team to report on CNAM service metrics

<table>
<thead>
<tr>
<th>Call Volume</th>
<th>Fraud Score</th>
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<tbody>
<tr>
<td>Low</td>
<td>Low Risk</td>
</tr>
<tr>
<td>Med</td>
<td>Watch</td>
</tr>
<tr>
<td>High</td>
<td>Watch, Analyze, Block</td>
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External Inputs:
- Call lists
- FCC complaints
- External “bad” lists
- Carrier feedback

Master Data Set for Modeling:
- Line Change Detail
- Phone Attributes
- VoIP Attributes
- Name, Address
- Demographics Attributes
- IP Intelligence
- Repository of “bad” numbers
- Repository of “good” numbers

Fraud Score

Neustar Data

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LetVerified Business Manage How Brand Appears on Calls

- Standardize caller name, or customize by extension or department
- On-demand updates
- Register verified business numbers (improve blocking, labeling analytics)
- Blacklist inbound-only numbers (prevent spoofing)
- Neustar updates partner service providers and mobile apps
Personalize mobile screen for a branded call experience

- Give customers a reason to answer and to engage in the conversation
- Provide expanded name information, business location, title, department
- Neustar provides enhanced caller information to Caller ID mobile apps
- New business model: Brand pays, free to consumer.
Why Neustar

Pioneer in Call Authentication
Co-author of STIR standards, and early contributor to SHAKEN framework. Ongoing leadership role in defining industry standards with ATIS, IETF and CRTC.

Industry's Reference Implementation of STIR/SHAKEN
As exclusive operator of the ATIS Robocalling Testbed, real-world STIR/SHAKEN implementations have and continue to be tested for interoperability with Neustar’s Testbed (and commercial) implementation.

Future-Proof Call Authentication Solution
Fully-compliant to STIR/SHAKEN specifications, including all required and emerging components: SKS, SP-KMS, STI-AS, STI-VS, and STI-CR.

More Ways to Monetize
Flexible interfaces, STIR/SHAKEN software licensing and deployment support for both vendors and carriers to expand services and features, including enterprise-specific applications.

Full Portfolio of Caller Intelligence Solutions
Set of integrated, market-leading solutions for robocall mitigation, call authentication, caller ID for mobile and landline, and branded call display.

Identity Resolution Is In Our DNA
Expertise in advanced analytics and identity resolution & verification to enable trusted communications.

Leading Customer Network Of Carriers & Enterprises
Neustar provides Caller Identification services to over 800 carriers, and identity resolution solutions to over 7,000 leading brands and businesses.
What is the MOST IMPORTANT driver to your organization for implementing call authentication?

1. Regulatory Compliance
2. Risk & Security
3. Customer Retention / Care
4. Customer Growth / Experience
Questions?

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Slides will be shared after the webinar