RRAPTOR

A STIR/SHAKEN Report from the Real World of Robocalls

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SIP FORUM

STIR/SHAKEN ENTERPRISE SUMMIT

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Agenda – All About RRAPTOR

- ZipDX Background / History
- RRAPTOR Strategy & Objectives
- What Does It Do?
- How Does It Work?
- Action-packed Live Demo
- What Are We Learning?
- How Can We Best Leverage It?
  - Providers, Brands, Enforcers

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ZipDX & Robocalls Through the Ages

- 2013: Federal Trade Commission Robocall Challenge
  - Our contest entry proposes Traceback (we did not win)
- 2018: ZipDX develops the “Secure Traceback Portal” adopted by USTelecom’s ITG
- 2019-2020: Thousands of calls traced back using our platform
- 2021: Robocall Mitigation Database Explorer (https://portal.legalcallsonly.org/rmd)
  - On-line searchable history of the RMD
  - Evaluation, scoring and ranking of Robocall Mitigation Plans
- 2022: STIR/SHAKEN Toolkit Introduced
  - IDENTITY Header Decoder (https://portal.legalcallsonly.org/shaken)
  - SHAKEN test numbers display signature details (http://portal/legalcallsonly.org/identity)
- Subscribe to our Blog at https://legalcallsonly.org/subscribe/

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Strategy & Objectives

- Call Authentication can validate Caller-ID and deter malicious spoofing
  - Call recipients can (perhaps) know to be trusting or skeptical before they answer
- But STIR/SHAKEN also identifies the PROVIDER that put the call on the network
- We've always said the best place to stop illegal calls is at the source
- The signer of the call is closest to the source and best positioned to act

SHAKEN

STIR

- We can usually identify a call as likely illegal only after answer with the audio available
- Increasingly, illegal robocall signaling includes the Identity header
- Given the audio & the signer we know which providers contribute most to the problem
- We can deliver actionable, real-time data to those providers
- The Provider and Enforcement communities can know providers' reputations
- This is effective even when less than 100% of calls are signed

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What's In A Signature?

identity=eyJhbGciOiJFUzI1NiIsInBwdCI6InNoYWtlbiIsInR5cCI6InBhc3Nwb3J0IiwieDV1IjoiaHR0cHM6Ly9zdG9yYWdlLmdvb2dsZWFwaXMuY29tL3N0aXJzaGFrZW4vU2hha2VOQmFrZUNlcnQucGVtIn0.eyJhdHRlc3QiOiJCIiwiZGVzdCI6eyJ0biI6WyIxNzI2MjA4NTc3MSJdfSwiaWF0IjoxNjYwMDcwMTczLCJvcmlnIjp7InRuIjoiMTgzMzM4MTMwNTMifSwib3JpZ2lkIjoiOGFjNGFkYWYtYmVhOC00NDE4LTkyODktY2NiNzA2NDdiYTA3In0.Ddu8Y1wp_J9SFwxIhTUK_-7wm7uOLYVQVaXRhElUXmtaAmvrgoe4ICXdkeImn-QCMDBLJDu1M-CLdja7MRctoQ%3Binfo%3D%3Chttps%3A%2F%2Fstorage.googleapis.com%2Fstirshaken%2FShakeNBakeCert.pem%3E%3Bppt%3D%22shaken%22

STIR/SHAKEN Tackles Robocalls Today

- Virtually ALL Originating Providers are required to sign calls
  - 47 CFR § 64.6301(a)(2)
  - Exception still for small facilities-based providers, but they originate few robocalls
- ALL Providers must take measures to prevent origination of illegal calls
  - 47 CFR § 64.1200(n)(3)
  - One measure: vetting customer RMD entries
  - Another: ensuring all calls are properly signed by the originator
- There are still gaps due to TDM networks
  - But the vast majority of robocalls travel via SIP
- We're already equipped to stop most illegal robocalls

What do you think?

Poll #1

What Are We Learning?

- RRAPTOR currently receives almost 10,000 calls per workday
- We recognize about one-third of those as SUSPECT
  - Others are short or silent or hang up before answer; also legit calls to old or wrong numbers
- About two-thirds of suspect calls are signed
- A third of THOSE calls are signed by three major intermediate providers
- Many calls do not carry the signature of the ORIGINATING provider
  - Providers are improperly relying on the signature of their downstream intermediate
- Some providers are signing carelessly
  - Improper format for FROM and/or TO numbers; expired and missing certificates

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Two Ways To Stop Illegal Calls

- **IDEAL: STOP AT THE SOURCE**
- Illegal calls never get on the network
- Responsible providers refuse to accept calls from nefarious originators
- Calls that sneak past are quickly identified and the caller shut down

- **OR: MITIGATE DOWNSTREAM**
- Originating providers that continue to facilitate illegal calls quickly earn a bad reputation
- Analytics tools recognize calls from those providers
- Calls are labeled and/or routed appropriately

- Legal calls are properly labeled and delivered based on the positive reputation of the originating provider

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What Does RRAPTOR Do?

- RRAPTOR is a surveillance network for robocalls
- It operates automatically and passively, on the theory that robocallers placing a large volume of calls will end up calling our numbers
- SCALABILITY is a key objective – robocalling is a huge problem; we want to automate whatever we can to get our arms around the problem
- URGENCY is critical – RRAPTOR can immediately alert a provider when it sees their signature on a nefarious call
- RRAPTOR is OBJECTIVE – it just presents what the data says
- Our first priority is to get PROVIDERS to be part of the solution; we want to give them actionable data
- All RRAPTOR information is owned by ZipDX; none of it is bound by any confidentiality agreements

- RRAPTOR is NOT PERFECT
  - We're focused on the highest volume callers / signers
  - Once we address those, we'll move onto the next batch
  - We might miss some suspect calls; limit false positives
  - Most robocalls go via SIP (cheapest), but not all
- RRAPTOR does not address ALL nefarious calling
  - Does not address Denial of Service, Social Engineering, etc.
  - Robotexts are a future feature
- Our focus is not evidence-gathering for a court case
  - We are a tool for understanding behaviors and trends
- We are not lawyers & not focused on regulatory nuances
  - We're trying to convince providers to use their discretion to behave the way they SHOULD, not just the way they MUST
- Not all providers are as altruistic as we would like
  - Strategic enforcement will always be a critical element

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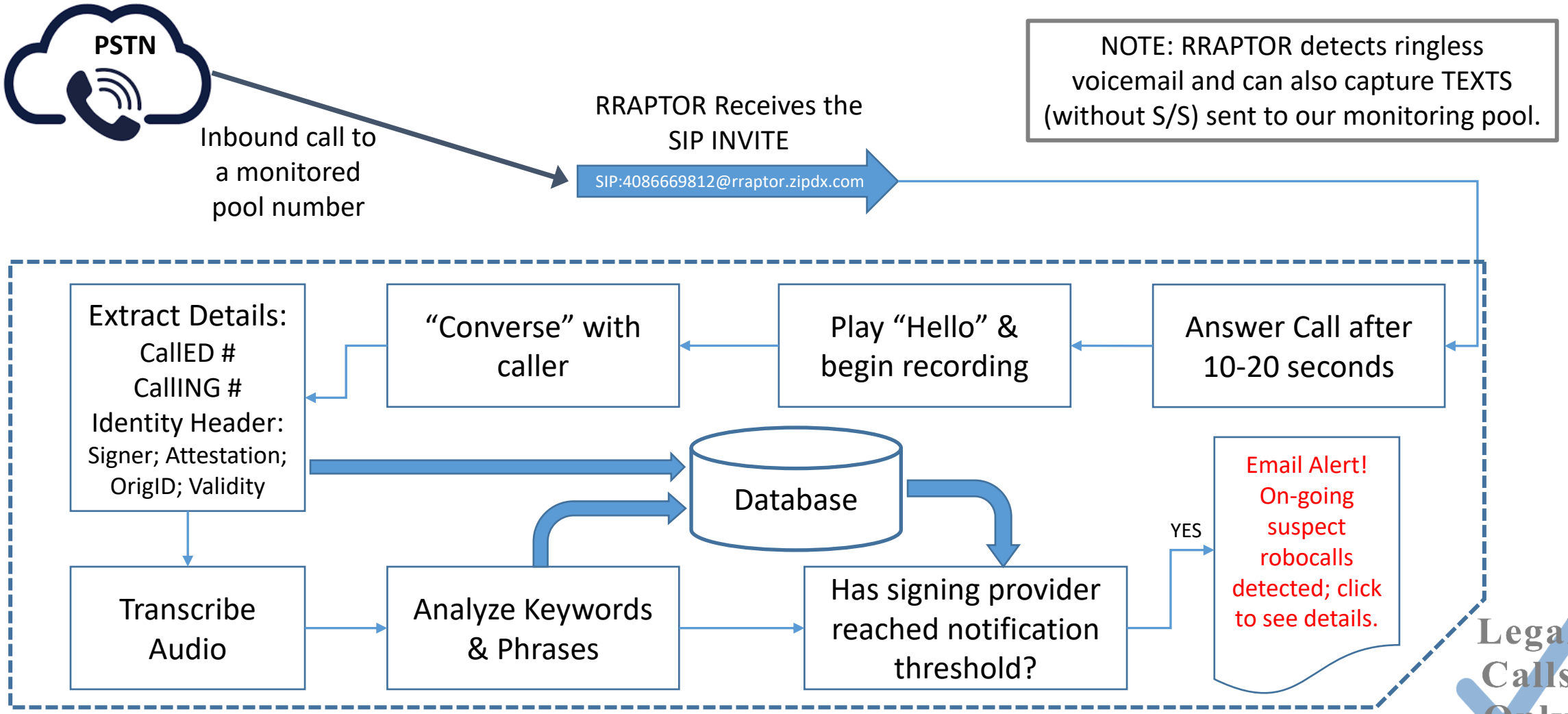
How Does RRAPTOR Work?



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Let's RRAP!

- RRAPTOR displays its data in real time
- Slice the data by KEYWORDs in the messages
- OR by the PROVIDER associated with the signatures
- See summaries: called numbers, ANIs, attestations, invalids
- Examine specific time windows
  - I like *TODAY* and *PAST 7 DAYS* best – what's happening now?!
- DRILL DOWN to read the transcripts & hear the audio
- See signature details, DNC stats, etc.

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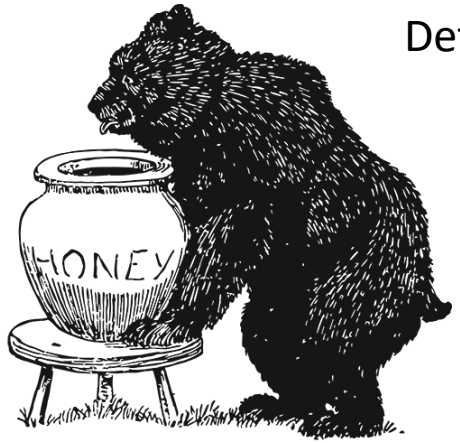
Signature Defects from the Real World

- Mis-formatted FROM and TO numbers
  - Missing leading 1 (should be 1NPANXXYYYY)
  - Spurious prefix digits (112175551212 or 300012175551212)
- Wrong Time Zone (US ET vs. UTC)
- Time in the future (inaccurate clock)
- Expired Certificate
- Signature verification via Public Key does not match (forgery?)

- These and other errors will result in Vertstat TN-Validation-Fail for terminating providers and analytics engines

Is RRAPTOR A Honeypot?



Definitions from the Internet:

- a person or thing that acts as a lure or decoy in a trap, scam, or scheme
- something that is attractive or rewarding and that entices a specific group of people
- a computer system established as bait to lure malicious hackers into engaging with it, thereby revealing the identity or technique of the perpetrator

- RRAPTOR does not lure or entice
  - We are doing nothing to solicit or encourage these calls
  - We do not publish our numbers, nor do we sign up at any website and we certainly do not give consent to call
  - Many of our numbers are on the national Do-Not-Call list
- We just answer calls that are already being made
- Presumably our numbers are on stale lists, perhaps bought or stolen by today's robocallers
  - Or maybe they are being called at random

Marrying RRAPTOR with Traceback

- Until now, Traceback has been our best method for identifying robocall sources
- The traceback process is semi-automated and reasonably fast, but limited in scope
- Daily, RRAPTOR associates signers with dozens of campaigns and thousands of calls

- Traceback can fill gaps in RRAPTOR's surveillance
- Why are certain calls unsigned, or carrying an intermediate provider signature?
  - Originators are failing to sign as required
  - Calls are originating via exempt providers
  - Calls are transiting via TDM
  - Intermediate providers are dropping Identity headers

Ending Whack-a-Mole

- Illegal robocalls persist because a cottage industry of providers choose to accept payment to facilitate these calls
- Stakeholders complain that if calls are rejected at one spot they just crop up somewhere else
- With tools like RRAPTOR, SHAKEN establishes provider reputations
- Those that persist in facilitating these calls will find it impossible to send their traffic onward
- Everybody that wants to contribute to solving this problem needs to step up to a higher level of engagement – the status quo is not sufficient

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Reputation is Everything

- RRAPTOR's goal is to establish provider reputations based on the calls they do (or do not) facilitate, and to help them maintain an excellent reputation
- Providers that have been part of the problem can become part of the solution
- A provider's participation in problematic robocalling will be on display for all to see
- Downstream providers can opt to increase scrutiny when considering traffic from problematic upstreams
- Analytics providers can use signer reputation to inform call treatment

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RRAPTOR Subscriptions for Service Providers

- $2,500/month or $20K annually
- Web Portal shows:
  - Statistical summaries for all providers and/or all categories, incl. total calls, A/B/C attestations, unique called and calling numbers, numbers on Federal DNC (who is signing suspect calls?)
  - Drill-down with individual call dates/times, called and calling #'s, audio recording, transcript, signature decoding, days on DNC (full detail only for Subscriber's signed calls)
  - Filter by date window, category, state area code
  - Defective signatures
- Email alerts (configurable for weekly, daily, immediate)
- Comments (visible to all or restricted)

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What do you think?

Poll #2

Provider Priorities based on Today's Rules

Everybody needs to follow the rules we already have:	Intermediate providers need to ensure their upstreams are following the rules	Originating providers are responsible for the calls they put on the network
• Originating Providers must sign (or have their downstream sign) with the OP's Certificate • Providers must assign attestation level according to their knowledge of the SUBSCRIBER (Caller)	• Reference the RMD; look at certifications and RMPs • Call sources must adhere to their obligations: verify that calls that should be signed ARE signed	• They need to know ALL the rules • They need to confirm that their subscribers are following ALL the rules

Can ZipDX Help?

- Our SHAKEN test tool lets you verify your calls are being properly signed
  - http://portal/legalcallsonly.org/identity
- Use the Robocall Mitigation Database Explorer as part of your KYC process for new and renewing customers
  - https://portal.legalcallsonly.org/rmd
- RRAPTOR will show you:
  - Full details for suspect calls you are signing
  - Defects in your signatures
  - Data on suspect calls signed by other providers (perhaps your current or future customers)
- Email support@zipdx.com to activate a free RRAPTOR trial

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