



# *Jolly Roger*

## TELEPHONE CO

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# Agenda

- **Who we are and what we do**
- **The three levels of Honeypot analysis**
- **Stinging, trolling, & swearing**
- **Next steps**



# Our Mission – Fight Telemarketing SPAM

- **We do it by**

- Directly intervening to protect people
- Providing data/insights to the white-hat telecom community
- Acting as an advocate to the consumers for privacy and protection
- Helping prosecute cases – tracebacks, TCPA, class action lawsuits
- Providing more than CDR and metadata
  - Actual content.
  - Telemarketers talking to potential victims

# Why we are doing this

- Find impersonated enterprises
  - Identify the carriers involved
- Helps us to advise our customer base of active scams
- Looking forward – how we can do a better job to protect our customers
  - Can we use stir/shaken to help identify scammers?
- General understanding of the techniques and business processes of the scammers
- Examine the viability of a feedback process to root out false A-Level attestations



# Three levels of a Honeypot

- Level 1 – Metadata (Old school)
  - Calling number
  - Called number
  - Time of day
  - PAI/VIA
- Level 2 – STIR/SHAKEN (Recent)
  - Signer/Issuer
  - Certificate validity
  - Attestation
  - RCD
- Level 3 – Media (Brand new)
  - Front-end announcement
  - Derived company, purpose, scam type
  - Profanity





# Example call – Metadata (Level 1)

- Time of day
- Calling number
- Called number
- Caller ID Name (from/P-Asserted-Identity)
- No Red Flags

```
2025-06-02 09:45:35 0003.1049 10008 01906 variable agi.jrt.pre.accountcode=
2025-06-02 09:45:35 0002.5179 10009 01906 variable agi.jrt.pre.callerid=16265442376
2025-06-02 09:45:35 0002.2080 10010 01906 variable agi.jrt.pre.calleridname=unknown
2025-06-02 09:45:35 0004.0910 10017 01906 variable agi.jrt.pre.dnid=1253326898
2025-06-02 09:45:35 0002.1429 10022 01906 variable agi.jrt.pre.rdnis=unknown
2025-06-02 09:45:35 0002.0809 10025 01906 variable agi.jrt.pre.type=PJSIP
2025-06-02 09:45:35 0002.1501 10026 01906 variable agi.jrt.pre.uniqueid=1748882734.99909
2025-06-02 09:45:35 0002.5508 10033 05078 variable SIPHEADERFROM = <sip:16265442376@226.47.93.23>;t
2025-06-02 09:45:35 0002.6851 10034 05078 variable SIPHEADERVIA = SIP/2.0/UDP 138.92.140.28;rport=50
2025-06-02 09:45:35 0002.4159 10035 05078 variable SIPHEADERDIVERSION =
2025-06-02 09:45:35 0002.4531 10036 05078 variable SIPHEADERPAI = NELSON <sip:+16265442376@226.47.9
```

# Example call – STIR/SHAKEN Header (Level 2)

2025-06-02 09:47:33 header=

```
{
  "ppt" : "shaken",
  "typ" : "passport",
  "alg" : "ES256",
  "x5u" : "https://cr.ccid.neustar.biz/ccid/authn/v2/certs/11155.10918.pem"
}
```

2025-06-02 09:47:33 payload=

```
{
  "origid" : "e4a3e915-4a1b-48a6-a3ce-d5404dd0c6f9",
  "dest" : {
    "tn" : [
      "125332689"
    ]
  },
  "iat" : 1748882733,
  "orig" : {
    "tn" : "16265442376"
  },
  "attest" : "A"
}
```

CERTIFICATE URL: <https://cr.ccid.neustar.biz/ccid/authn/v2/certs/11155.10918.pem>

SUBJECT: C=US, O=Ringcentral, CN=SHAKEN 886G

ISSUER: C=US, O=Neustar Information Services Inc, OU=www.ccid.neustar, CN=Neustar Certified Caller ID SHAKEN CA-2

VALID FROM: Feb 9 04:30:47 2025 GMT

VALID UNTIL: Feb 9 04:30:47 2026 GMT

VALIDITY: VALID

- Signing party
- Certificate issuer
- Calling number
  - (should match FROM)
- Called number
  - (should match TO, unless redirected)
- Attestation level
  
- No red flags



# Example call – Audio and AI Analysis (Level 3)

0:36



Walmart  
Impersonator

transcription

Hey, this is Brandon from Walmart. This is not a telemarketing call. A pre-authorized purchase, PlayStation 5 with special edition impulse 3D headset is being ordered from your Walmart account for an amount of \$1. For calling Walmart, how can I assist you? Hello? Yes, I am speaking. Can you hear me? I am here. Yes, what happened? How can I help you? F███ you. F███ you.

ai\_summary

ai\_summary\_long

The caller, Brandon from Walmart, is attempting to verify a pre-authorized purchase on the customer's account. The purchase includes a PlayStation 5 and an impulse 3D headset for \$1. However, the call quickly devolves into profanity when the customer becomes frustrated with the representative's inability to assist them.

inferred\_name      Brandon

inferred\_company   Walmart

inferred\_callback

top\_brand            1

contains\_pii        0

offensive            1

- Unique to Jolly Roger Telephone
- Caller name and company
- Scam type
- Contains profanity?
- Asking for a call back?
- This call - Red flag! Obvious scam!



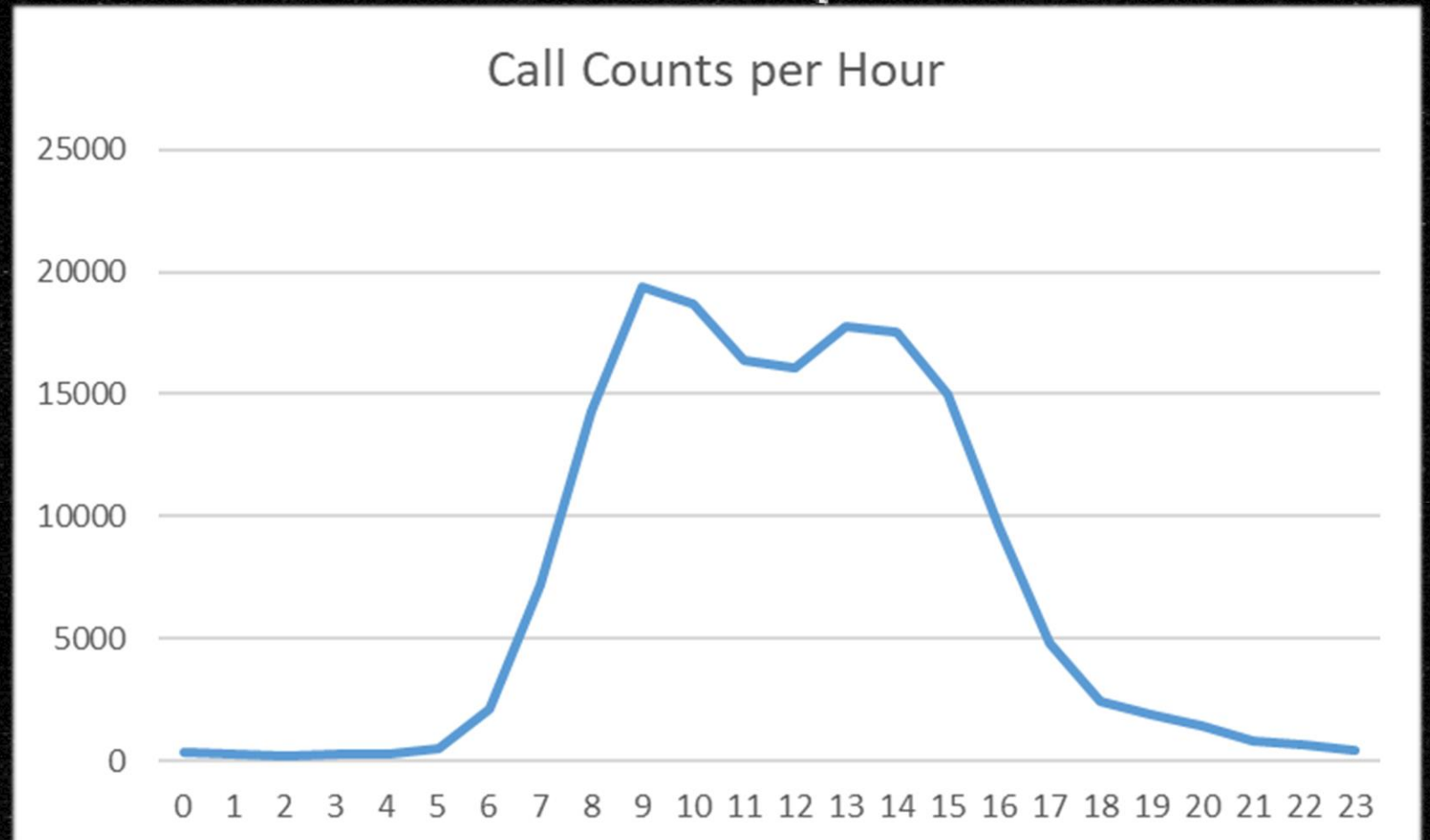
# Buried Treasure

- We analyzed 168,626 calls from April 17, 2025 to August 16, 2025
- Approximately 2,250 hours of recorded interactions
- From 129,894 unique calling numbers
- To 44,404 unique honeypot called numbers
- Able to deduce a company name from 36,651 calls
- 5,938 calls had some form of abuse, swearing, or offensive language



# Bimodal SPAM Curve

- Time-of-day counts show typical call traffic with dip at lunchtime
- This is for the Pacific Time zone





# Subjects and Issuers – ANY Attestation

- 80% of the 153,514 attested calls came from 13 subjects
- Subjects may not be the originator

STIR/SHAKEN Subject	STIR/SHAKEN Issuer	Count	Percent
Onvoy, LLC	Neustar Information Services Inc	67417	43.9%
T-Mobile USA, Inc.	TMOBILE-USA	9752	6.4%
ATT	TransNexus, Inc.	9073	5.9%
Verizon Data Services LLC	CTIA	8570	5.6%
Dial Edge Telecom LLC	Telonium Communications LLC	4354	2.8%
Peerless Network	Neustar Information Services Inc	4146	2.7%
Navitech Solutions LLC	Telonium Communications LLC	3826	2.5%
Telecom Business Network LLC	Peeringhub Inc	3732	2.4%
Telcast Networks	Peeringhub Inc	2977	1.9%
Lumen	Neustar Information Services Inc	2860	1.9%
Bandwidth.com CLEC LLC	Neustar Information Services Inc	2387	1.6%
Twilio International Inc	Neustar Information Services Inc	2320	1.5%
ABvoiptel LLC	Telonium Communications LLC	2225	1.4%



# Subjects and Issuers – A-Level Attestation

- 80% of the 51,999 A-Level calls came from 16 subjects
- As these are A-Level, subjects should be the originator

STIR/SHAKEN Subject	STIR/SHAKEN Issuer	Count	Percent
T-Mobile USA, Inc.	TMOBILE-USA	9667	18.6%
ATT	TransNexus, Inc.	9073	17.4%
Verizon Data Services LLC	CTIA	7263	14.0%
Telecom Business Network LLC	Peeringhub Inc	3732	7.2%
Peerless Network	Neustar Information Services Inc	3080	5.9%
Alpine Valley Consulting LLC	Sansay Corporation	1402	2.7%
LiveVox Inc	Neustar Information Services Inc	1337	2.6%
Convoso	Sansay Corporation	1146	2.2%
Comcast	Comcast	1143	2.2%
AM Communication Labs Inc.	Sansay Corporation	906	1.7%
Dial Edge Telecom LLC	Telonium Communications LLC	621	1.2%
Five9 Inc	Neustar Information Services Inc	538	1.0%
Eugene Perkins Group LLP	Telonium Communications LLC	516	1.0%
Lumen	Neustar Information Services Inc	495	1.0%
GTDial Data Solutions LLC	Telonium Communications LLC	470	0.9%
TextNow Inc	Neustar Information Services Inc	420	0.8%



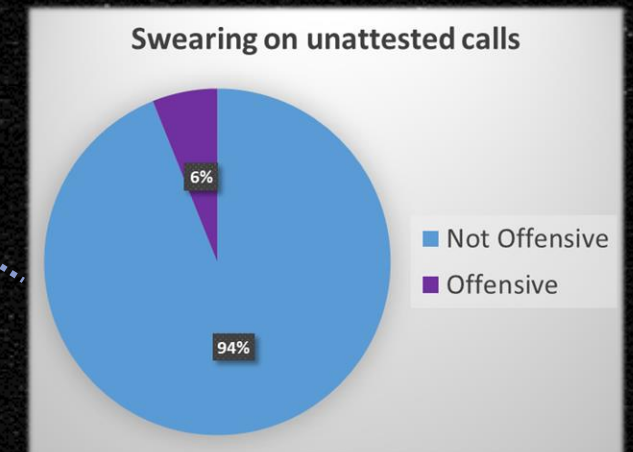
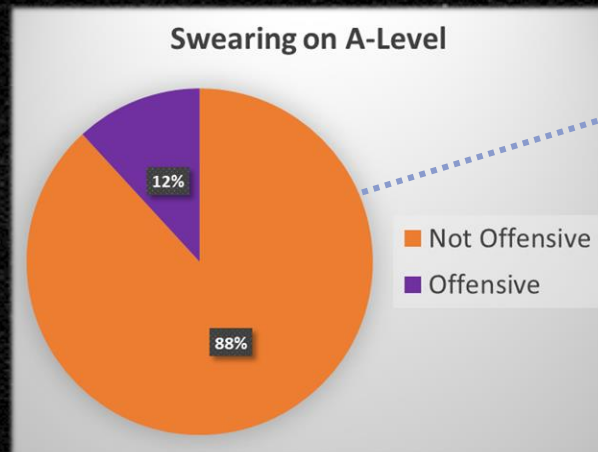
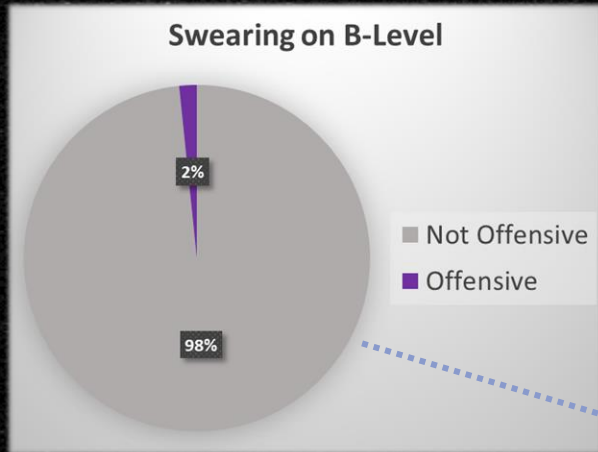
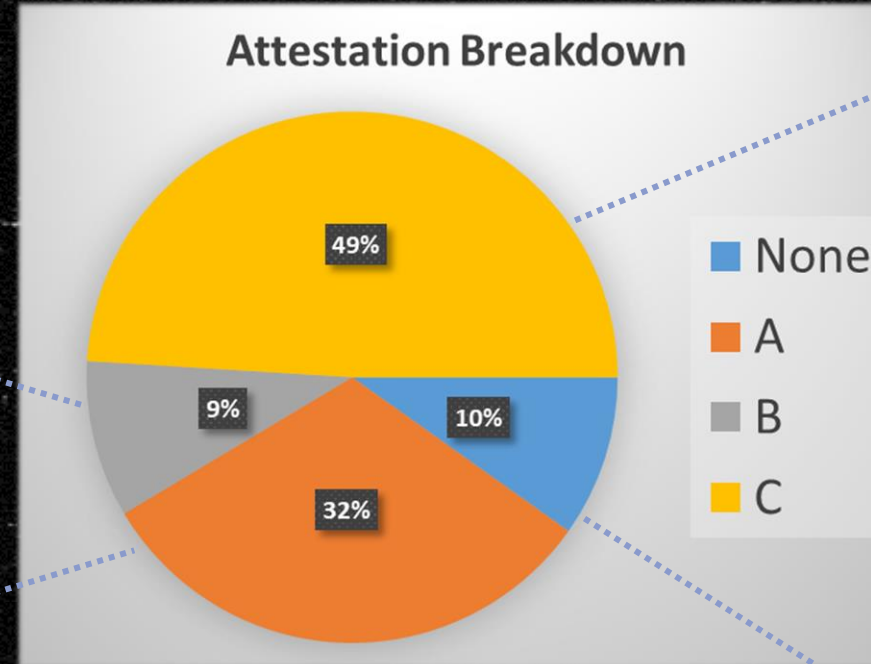
# Expired or Invalid Certificates ??

- Small number of calls have expired or invalid certificates
- Do these Issuers know?
- Who is responsible for blocking these calls?
- Malice or mistake?

Subject	Issuer	Attestation	Count
Call Tools Inc	TransNexus, Inc.	A	114
OCV	Neustar Information Services Inc	C	57
Voice SY LLC	Sansay Corporation	C	45
FastCast Networks	Sansay Corporation	C	35
Alpine Valley Consulting LLC	Sansay Corporation	A	23
Wavecall LLC	Peeringhub Inc	A	18
QEMERT Pro Technology SRL	Telonium Communications LLC	B	11
Callsy Network LLC	Telonium Communications LLC	A	2
Fibernetics	Neustar Information Services Inc	B	1
TechRx LLC	Telonium Communications LLC	A	1
Bendtel	Martini Security, LLC	A	1
Voice SY LLC	Sansay Corporation	B	1

# Offensive Attestations

- 5,938 calls with offensive language





# Inferred Companies

- Deduced a company name from 35,116 calls
- Top 25% of the calls come from these 15 companies

Inferred Company	Count	Percent
Comcast Xfinity	2374	6.76%
Chase Bank	984	2.80%
Your Filings Made Easy LLC	577	1.64%
Senior Resource Center	535	1.52%
Cashnet USA	472	1.34%
Check Into Cash	461	1.31%
American Benefit	458	1.30%
Senior Financial Solutions	428	1.22%
Speedy Cash	420	1.20%
Quote Solutions	380	1.08%
Solar Energy Group	376	1.07%
Home Improvement and Remodeling Group	351	1.00%
Advance America	347	0.99%
American Venice	346	0.99%
Benefit Review Office	338	0.96%





# Case study - Chase Bank

- Caller claims to be from Chase Bank
- Most calls start with same opening robocall greeting
- Many received A-Level attestation



1:38 Chase Bank

started_on	callerid_num	dialed	ss_attest	ss_subject_o	ss_issuer_o	transcription
2025-08-07 14:03:58	12769999495	1360969871	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
2025-08-07 12:15:05	17077700324	1360761520	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
2025-08-07 11:54:45	18404444394	1253277683	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi, do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
	Issuer	Count		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
Telecom Business Network LLC	Peeringhub Inc	642		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
	Neustar Information Services Inc	207		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi, do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
		117		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi, do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
Telecom Business Network LLC	Neustar Information Services Inc	6		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
Telecom Business Network LLC	CTIA	6		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
	Neustar Information Services Inc	2		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi, do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
Telecom Business Network LLC	CTIA	1		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
		1		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
	Sansay Corporation	1		elecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
2025-07-24 13:00:02	13333333334	1360969834	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
2025-07-24 14:29:37	18387888340	1360969819	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
2025-07-22 16:37:01	13264658848	1360969848	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
2025-07-22 15:51:26	13514004070	1360761520	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
2025-07-21 16:32:30	15343569658	1360761578	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.
2025-07-07 14:28:04	18066999376	1360761555	A	Telecom Business Network LLC	Peeringhub Inc	Hello? Hello? Hi. Do you hear me? Hello, this is Sarah calling you from Chase Bank. We're monitoring you.

Attestation	Subject	Issuer	Count
A	Telecom Business Network LLC	Peeringhub Inc	642
C	Onvoy, LLC	Neustar Information Services Inc	207
None			117
C	Bandwidth.com CLEC LLC	Neustar Information Services Inc	6
C	Verizon Data Services LLC	CTIA	6
C	Lumen	Neustar Information Services Inc	2
A	Verizon Data Services LLC	CTIA	1
A	RCN		1
B	ConvergeTel LLC	Sansay Corporation	1



# Case study – Comcast Xfinity



Two sample voicemails



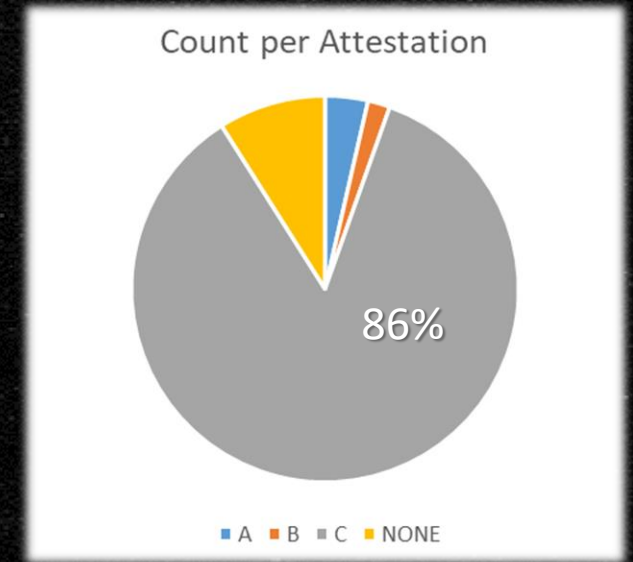
Professional Greetings when Called Back

started_on	callerid_num	dialed	ss_attest	ss_subject_o	ss_issuer_o	tr
2025-07-29 13:21:57	12232371740	1360434956	A	Peerless Network	Neustar Information Services Inc	Hello, Comcast Xfinity calling. Due to continued inaction on your part, your 50% discounts on monthly bill will be gone by end of day. If you want to avoid full charges, you must call back on the number showing on your <b>caller ID</b> now.
2025-07-29 13:10:42	14064057360	1509318160	A	Peerless Network	Neustar Information Services Inc	Hi there, this voicemail is from Comcast Xfinity. You're just moments away from losing your 50% discount on monthly bill. Time is almost up. Call back on the numbers showing on your <b>caller ID</b> right now to stop your rate from doubling. Thank you.
2025-07-29 12:50:37	13137764471	13603468650	A	Peerless Network	Neustar Information Services Inc	Hi, Comcast Xfinity calling. You're about to miss out on a 50% discount on monthly bill. It expires today. Act now. Call back on the number showing on your <b>caller ID</b> before it's gone. Thank you.
2025-07-29 12:50:37	13137764471	13603468650	A	Peerless Network	Neustar Information Services Inc	Hi, Comcast Xfinity here. We have processed the cancellation of your 50% discount on monthly bill after no response. If this wasn't intended, you must call back on the number showing on your <b>caller ID</b> immediately. Otherwise, your bill will return to the full rate. Thank you.
2025-07-29 12:50:37	13137764471	13603468650	A	Peerless Network	Neustar Information Services Inc	Hello, this is Comcast Xfinity. Your 50% discount on monthly bill is set to expire tonight. If we don't hear from you immediately, this change will be final. Please call back on the number showing on your <b>caller ID</b> now to keep your discount. Thank you.
2025-07-29 12:50:37	13137764471	13603468650	A	Peerless Network	Neustar Information Services Inc	Hi there, Comcast Xfinity here. This message serves as the final opportunity to keep your 50% discount on monthly bill, which is now being canceled. No further reminders will follow. Please call back on the number showing on your <b>caller ID</b> right now to keep this discount. Thank you.
2025-07-29 12:50:37	13137764471	13603468650	A	Peerless Network	Neustar Information Services Inc	Hello, Comcast Xfinity calling. Due to continued inaction on your part, your 50% discounts on monthly bill will be gone by end of day. If you want to avoid full

Attestation	Subject	Issuer	Count
NONE			583
A	Comcast	Comcast	1
A	Peerless Network	Neustar Information Services Inc	84
B	Lumen	Neustar Information Services Inc	7
B	Peerless Network	Neustar Information Services Inc	37
C	Bandwidth.com CLEC LLC	Neustar Information Services Inc	87
C	Brightlink Communications LLC	TransNexus, Inc.	26
C	HFA Services LLC dba Call48	TransNexus, Inc.	13
C	Lumen	Neustar Information Services Inc	47
C	Onvoy, LLC	Neustar Information Services Inc	1857
C	Verizon Data Services LLC	CTIA	2

# Case study – Comcast Xfinity

- 2374 calls from “This is Comcast Xfinity call us back on your caller ID”
- 2327 of these (98%) came from different caller IDs
- 2257 of these (97%) came to different customer numbers
- 85 of these (4%) had an A-Level attestation
- 2032 of these (86%) had a C-Level attestation
- Impossible to categorize using calling/called numbers
- This scam requests a callback... so we did! “Honeypot stinger”
  - We initiated 9515 calls to their caller ID from the number they dialed
  - Various Pirate personalities, e.g., insulting and flirty
  - 120 hours of trolling



2:11 Mashup of Trolling



# Conclusions

- Scammer calls come from A-Level attestations
- We can identify impersonators, scammers, and types of scams
- We need to incorporate Stir/Shaken into our product
- Impersonation scams harm
  - The subscriber
  - The brand
  - Perhaps soon, the carrier





# Next Steps

- Large scale “honeypot stingers” to disrupt scammers
- Work towards a rapid feedback loop to identify the source of obvious scams
- Building a process to protect enterprises, subscribers, and network operators
- Compare with control groups that provide different answering profiles
- Partnerships
  - Watching INVITEs is not enough
  - Send us your unassigned numbers
  - Send us your dirtiest unassignable numbers
  - Understand what scams are on YOUR network
  - We’ll perform a similar analysis on your traffic

