



Hardly a “Brand” New Idea

**Why Your Toll-Free Numbers Need
Digital Identity Protection NOW**

Meet Your Presenters



Jaime Zetterstrom
VP of Product Management



Chris Wendt
VP of Systems Engineering



Digital Identity:
Can telephone
numbers be
the trusted public
identifier?

Digital Identity for the Enterprise

- It's essential that enterprises are vigilant in safeguarding their valuable numbering assets against spoofers, scammers and other bad actors.
- Businesses must also be hyper-aware to protect their digital identities.

Why Toll-Free?

- For over 50 years, Toll-Free Numbers have served as an extension of a brand's identity
- As the neutral administrator for the TFNRegistry™, Somos has made strengthening trust, confidence and security in Toll-Free mission critical – especially as it relates to the different attributes of phone numbers.

The Evolution from Fraud to Truth



Fraud detection by content-based monitoring along with event-based monitoring tries to separate traffic into "good" and "bad"



Trusted and vetted call authentication further separates "good" from "bad" driving "bad" into a corner

Let's Launch a Poll!

Impersonation

Impersonation



Impersonation



Telephone Number Spoofing / Robocalling

Spoofing has been in practice for many years

Setting the Calling Line Identifier (CLI)

Applications or Auto-dialers

Legitimate and Illegitimate uses of Robocalling

Spoofting and Robocalls



Impersonation

Consumer Complaints

Truth in Caller ID Act of 2009

Implied Trust

While spoofing was conceived as a practice that had legitimate purpose

Implied trust that rules of Truth in Caller ID Act would be followed

Implicit Trust – Where we ended up

Number
Reputation –
Clean and Dirty
Numbers

Breaking
Analytics/
Playing statistics
game

Floating under
radar of “Good”
vs “Bad”

Call Authentication

TRACED Act – December, 2019

STIR/SHAKEN – why we are here



**Trusted identity is about
representing truth**

Path to Truth

Nonrepudiation/Certificates

Trust is not with the telephone identity, rather who claimed you should trust it.

Path to Truth

Nonrepudiation proves who told the truth
Nonrepudiation also proves who lied

Trust but Verify

Path to Truth

Nonrepudiation proves who told the truth
Nonrepudiation also proves who lied

Trust and Enforcement

Trusted Calling is a journey

Policy: Certificate usage as part of Certificate Policy and Service provider best practices

Enforcement: Eco-system participants are bound to those policies

Trusted Calling is a journey

FCC has been on a path to slowly bring all calls using US telephone numbers under a common security framework

Generally, compliance has been, to put it mildly, inconsistent, many are still learning what compliance means

FCC NANC CATA

Call Authentication/Trust Anchor WG

Four reports that have led to creation of STI-GA and US PKI and recommendations of best practices for the policies of the eco-system

Trusted Calling is a journey

Good: Retail calls, the direct from provider calls have shown very good adoption

Bad: the highest value calls, enterprise calls and the lowest value calls, illegitimate robocalls make up the “bucket” of the calls that are primarily not being signed

Trusted Calling is a journey

These are hardest calls for a provider to
"attest" to because they come from
aggregate traffic products

Attestation alone can not solve this problem,
trunk groups can not solve this problem

Implied trust can not solve the impersonation problem

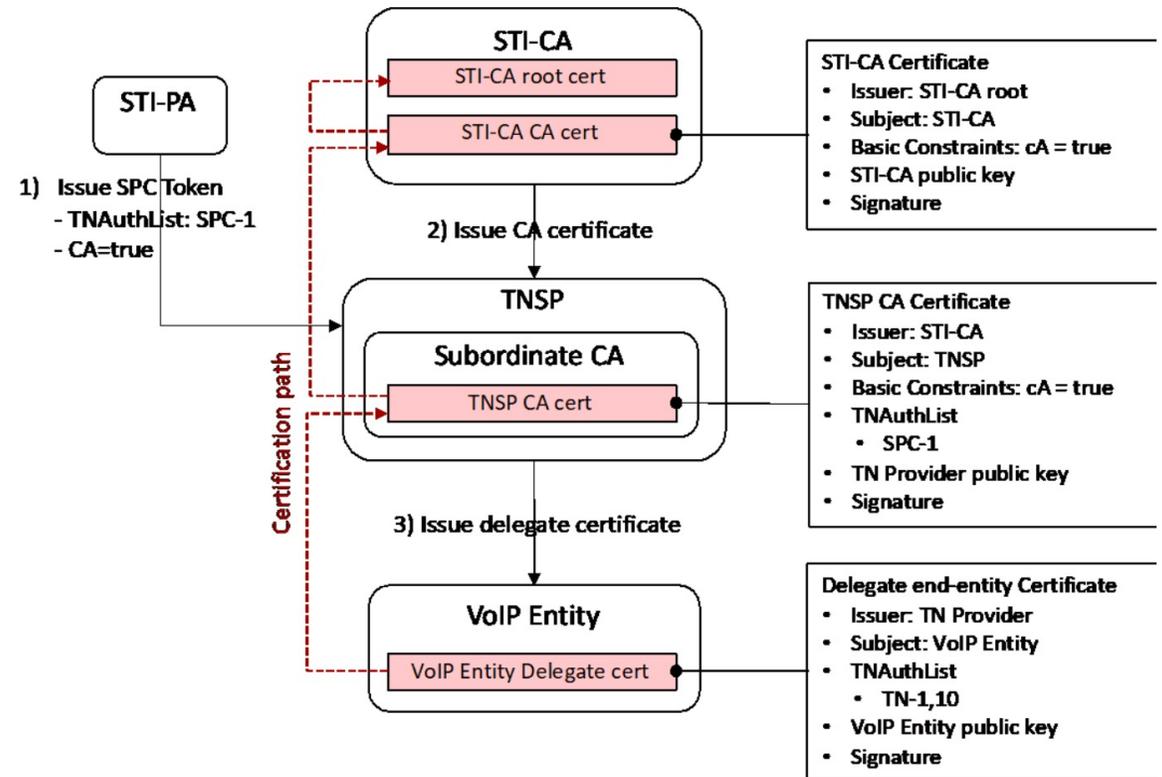
Trust in vetted and authoritative data attributes using STIR / SHAKEN

Rich Call Data
Delegate Certificates



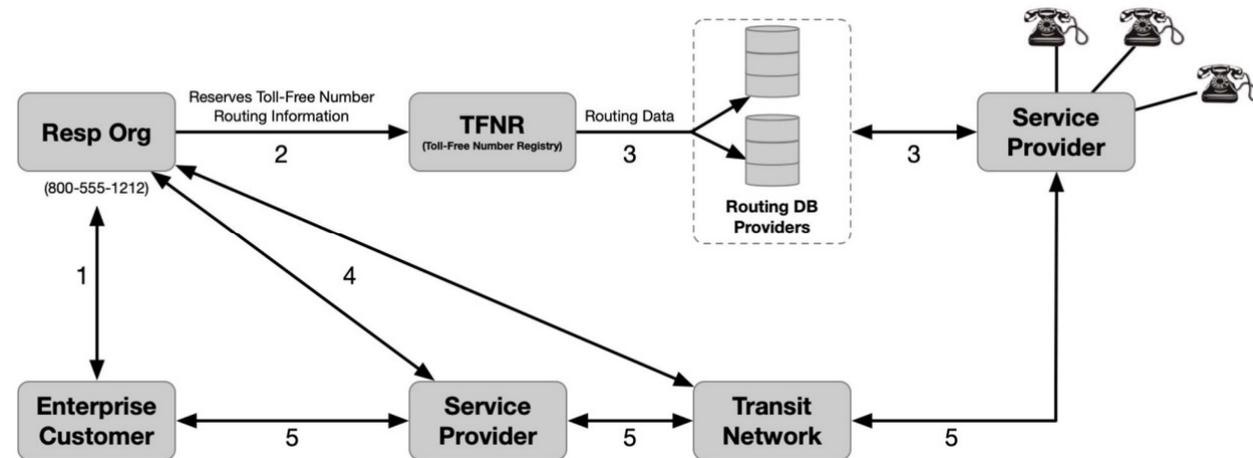
Trust in vetted and authoritative data attributes using STIR / SHAKEN

Delegate Certificates



Trust in vetted and authoritative data attributes using STIR / SHAKEN

Toll-free Framework using Delegate Certificates



Trust in vetted and authoritative data attributes using STIR / SHAKEN

Rich Call Data

```
{
  "crn": "Rendezvous for Little Nellie",
  "orig": {"tn": "12125551212"},
  "dest": {"tn": ["12155551213"]},
  "iat": 1443208345,
  "rcd": {
    "nam": "Q Branch Spy Gadgets",
    "jcl": "https://example.com/qbranch.json"
  },
  "rcdi": {
    "/jcl": "sha256-
Gb0l0kj7Z9+plqb0kN32H+YX0Yav3fbioSk7DxQdGZU",
    "/jcl/1/3/3": "sha256-
RojgWwU6xUtI4q82+kHPyHm1JKbm7+663bMvzymhkl4"
  }
}

["vcard",
  [ ["version", {}, "text", "4.0"],
    ["fn", {}, "text", "Q Branch"],
    ["org", {}, "text", "MI6;Q Branch Spy Gadgets"],
    ["photo", {}, "uri", "https://example.com/photos/q-
256x256.png"]
  ]
]
```

RCD Security/Integrity Model

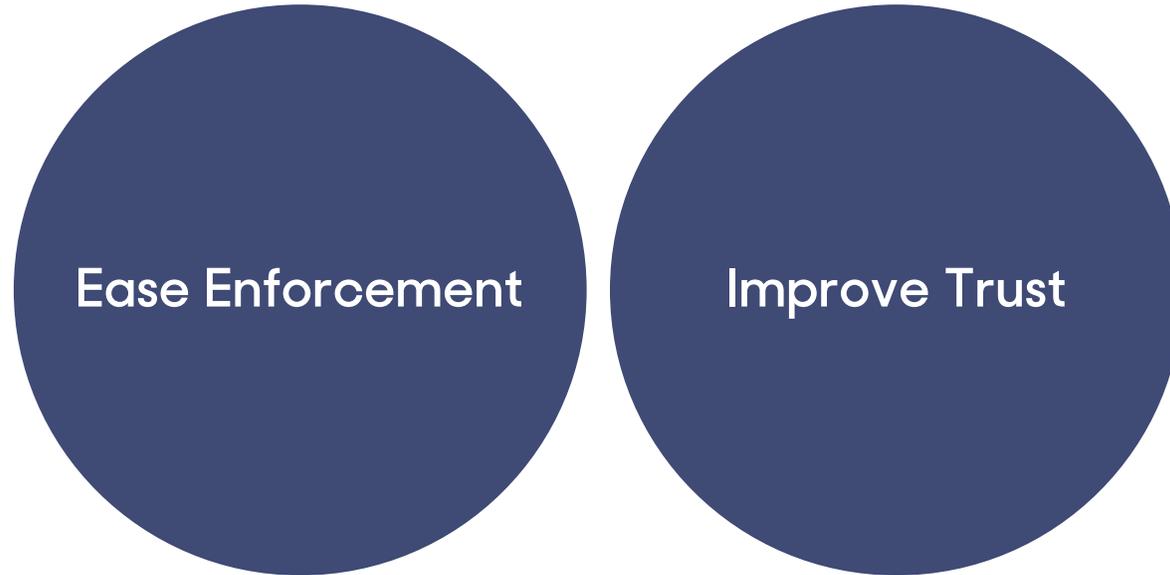
TN Validation – TN-level certificate

Vetting of Rich Call Data – Certificate claim constraints and integrity

Certificate chain/issuance can represent who vouched for whom, trusted vetting

Trust / Policy / Enforcement

The goal of evolving the policy should be to



Improving trust beyond, I have
an SPC, "please trust me"

Trust / Policy / Enforcement

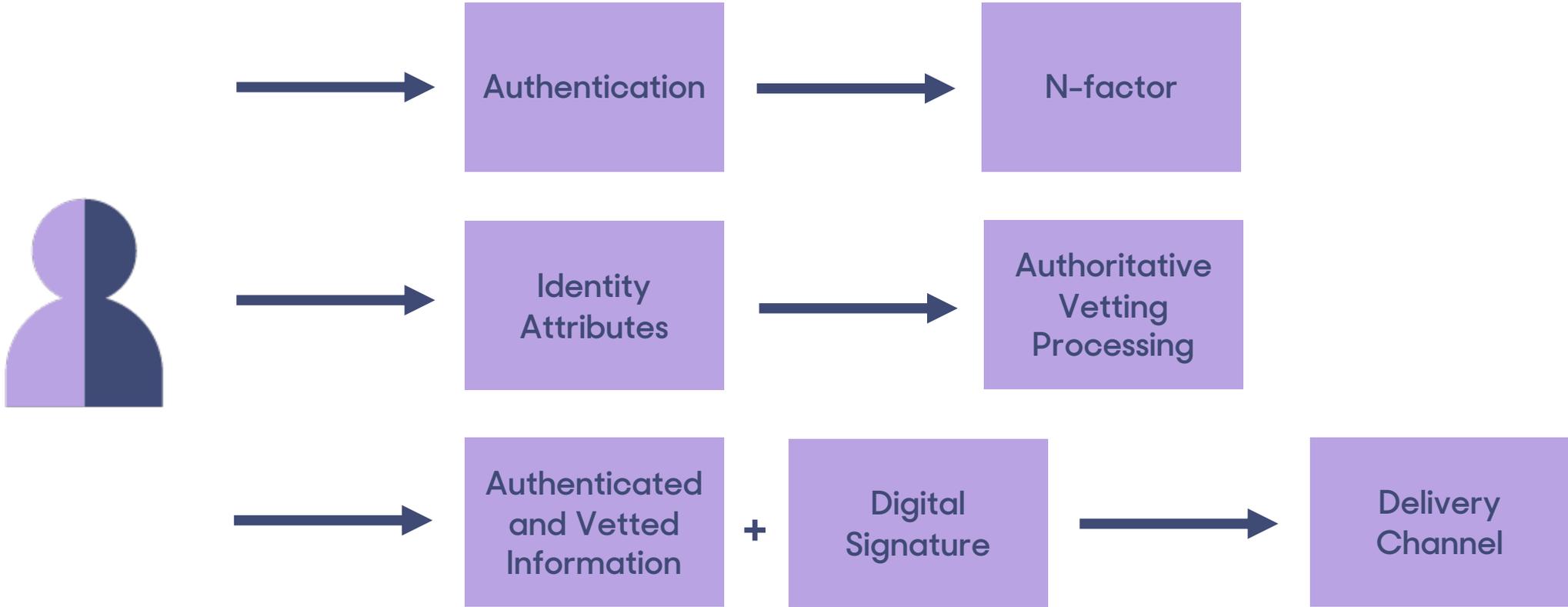
A “please trust me” model is after the fact, hard to enforce

An a priori vetting and validation model will generally

Lessen enforcement
required

Due to
reputational
incentives for
veters

Achieving Truth - A data-oriented approach



Vetted and Authoritative Attributes Association

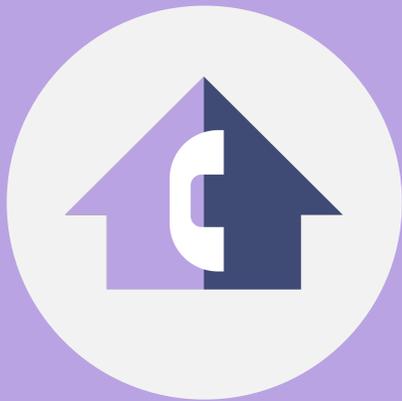
Right to Use

Rich Call Data –
Calling Name,
Logo

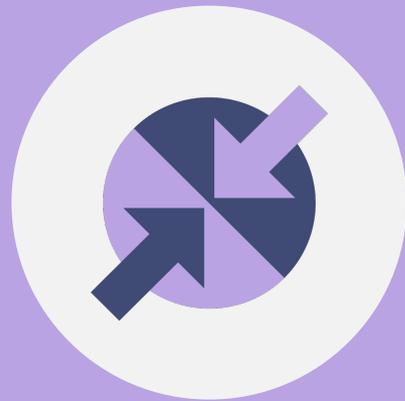
Allocation and
assignment –
DNO

What Numbers are Do Not Originate DNO

Do Not Originate



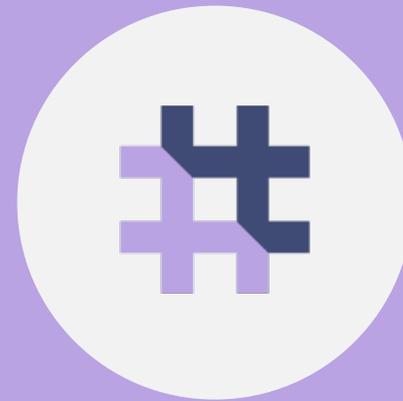
Call Centers



Inbound Only



Billing Numbers



IoT

What is "Reasonable DNO" per the FCC's Gateway Provider Report and Order

Invalid and
Unallocated
Numbers

Unused
Numbers

Numbers for
which the
subscriber to
the number has
requested
blocking

RealNumber[®] DNO



High Confidence
Of Accuracy



Robust Dataset
Of Toll-Free &
Local Numbers



Auto &
Manual Set
DNO



Flexible
Access

DNO by The Numbers

28 MILLION

Auto Set Toll-Free Numbers

2.25 MILLION

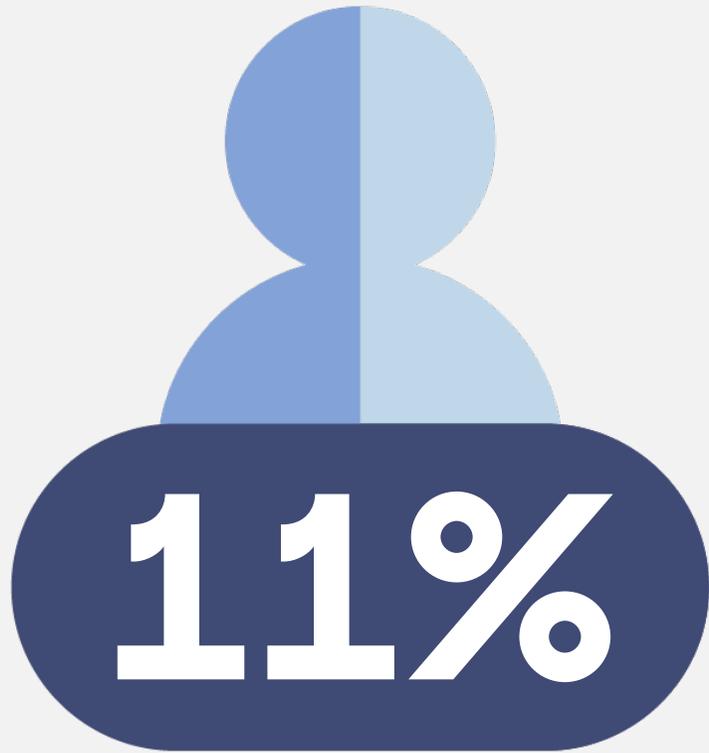
Subscriber Set Numbers

6+ BILLION

Auto Set Local Numbers

1 Billion+

Calls per day compared against RealNumber DNO



**A leading VoIP
Provider noted 11% of
their voice traffic was
identified as DNO**

Let's Launch a Poll!

Thank you!

Jaime Zetterstrom

Vice President of Product Management

Email | jzetterstrom@somos.com

Chris Wendt

Vice President of Systems Engineering

Email | cwendt@somos.com



[somos.com](https://www.somos.com)

Explicit Trust



Vetting +
Authoritative
Attributes



Change the incentives to maintain
the integrity of voice and
messaging communications