



Effective STIR/SHAKEN
and Robocall Solutions
that Work Today

About *TransNexus*[®]

- Software to help organizations manage and protect their telecom networks
- Applications include:
 - Telecom fraud prevention
 - Unwanted robocall prevention
 - STIR/SHAKEN
 - Least cost routing
 - Telephony Denial of Service (TDoS) prevention
- We've been providing such solutions for over 20 years

Agenda

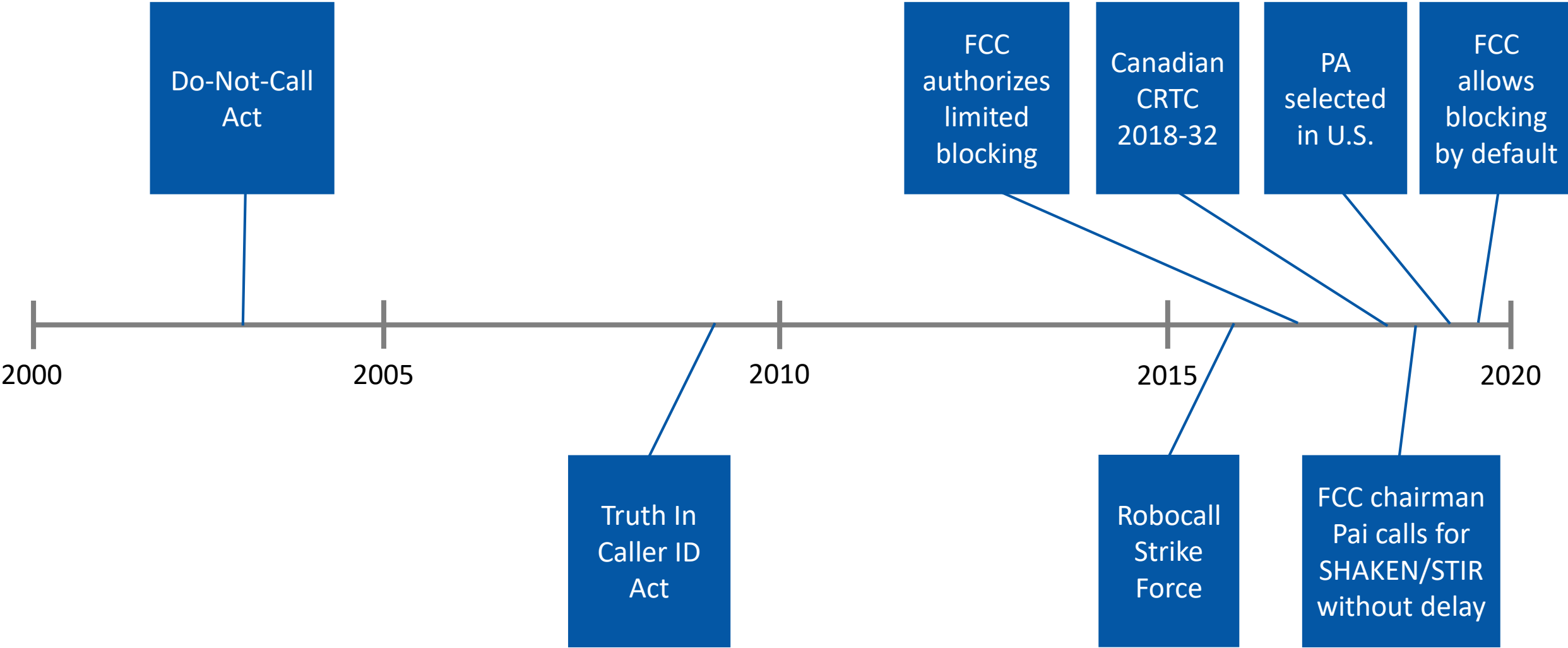
1. A brief history of robocalls, legislation and regulations
2. STIR/SHAKEN overview
3. Robocall prevention
4. Integration
5. Questions and answers



A brief history of robocalls, legislation and regulations



A brief history of robocalls, legislation and regulations



“I’ve been clear that I expect major voice service providers to implement SHAKEN/STIR by the end of 2019...

“I’ve also made clear that if this deadline is not met, the FCC will act to ensure that SHAKEN/STIR is implemented. “

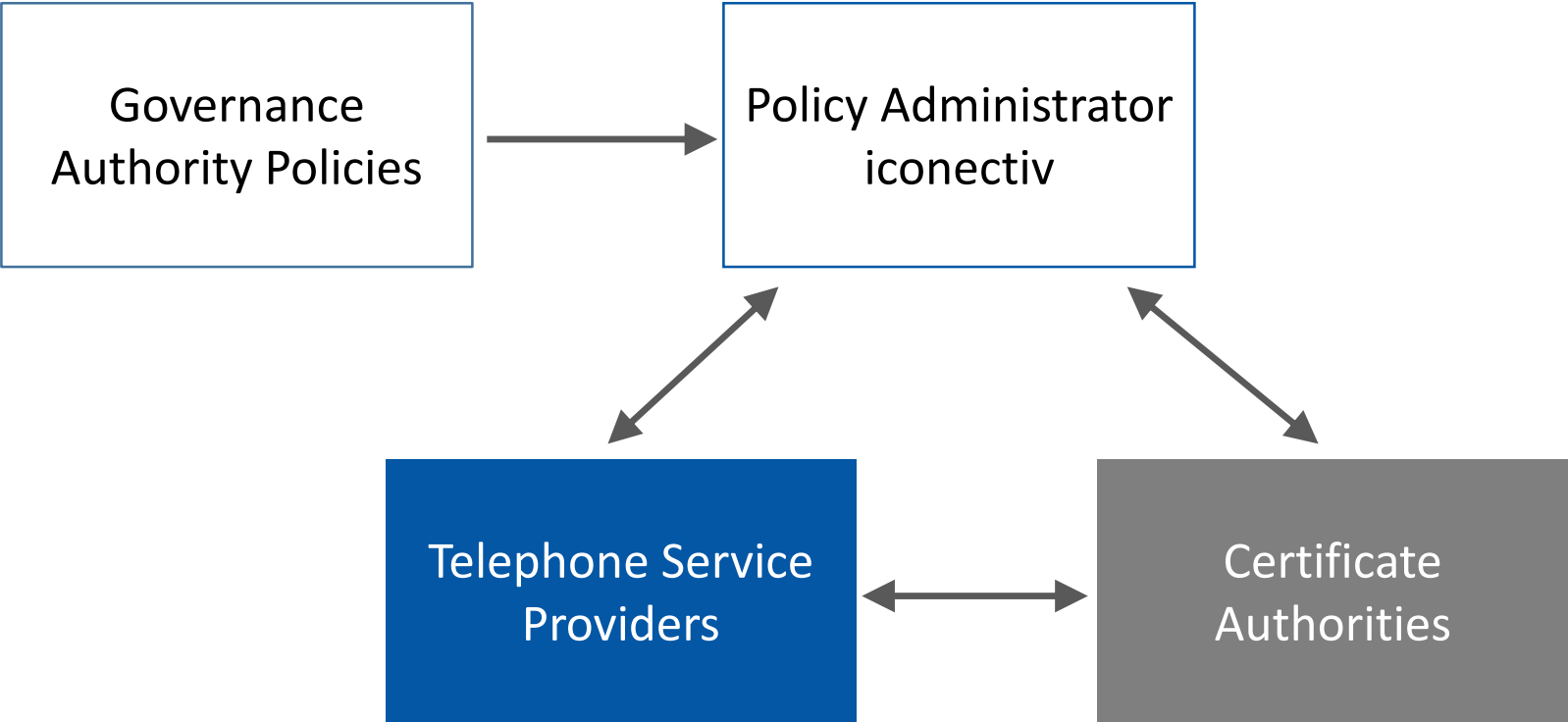
– Ajit Pai, FCC Chairman
address to USTelecom robocall forum
June 11, 2019



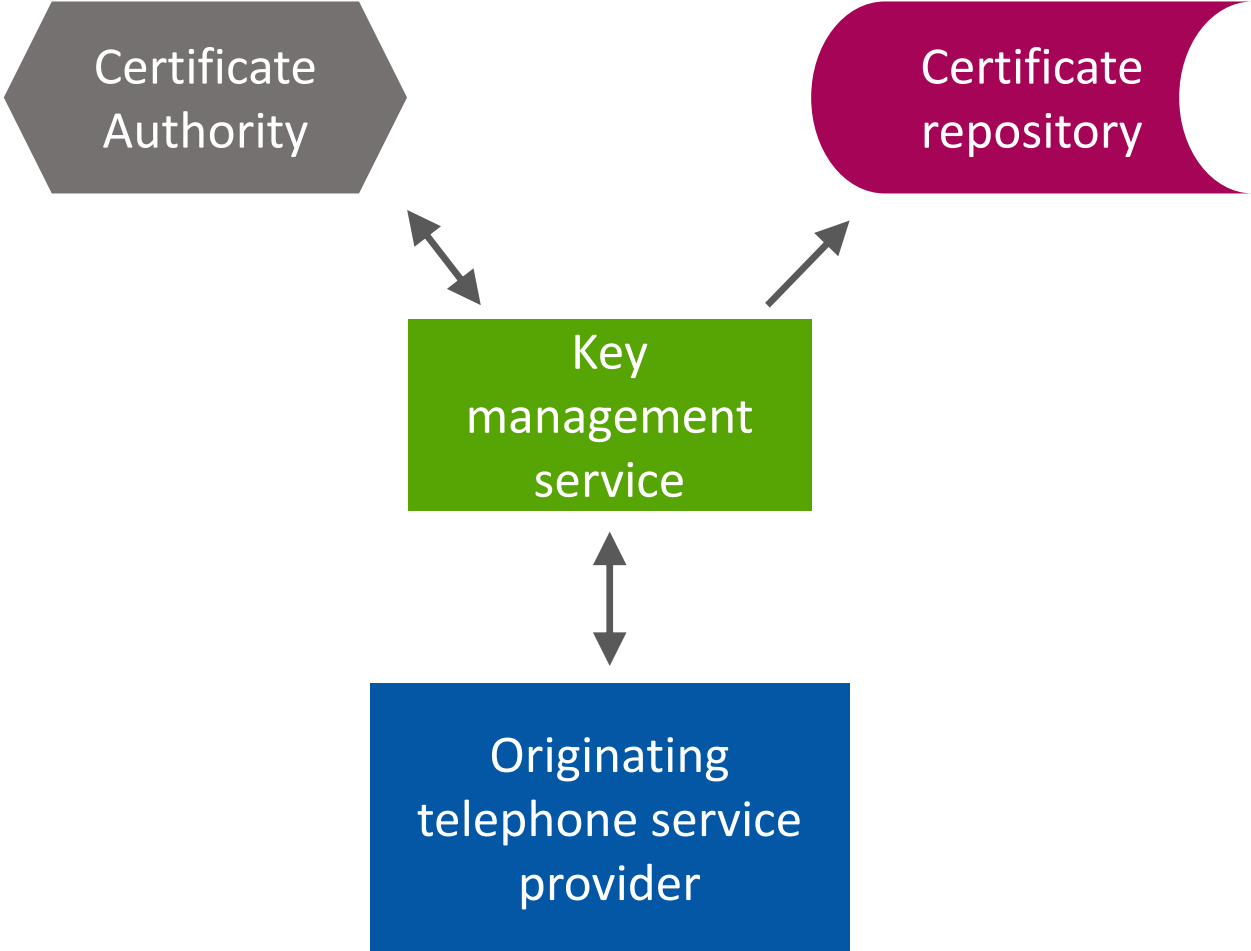
STIR/SHAKEN overview



Triangle of trust

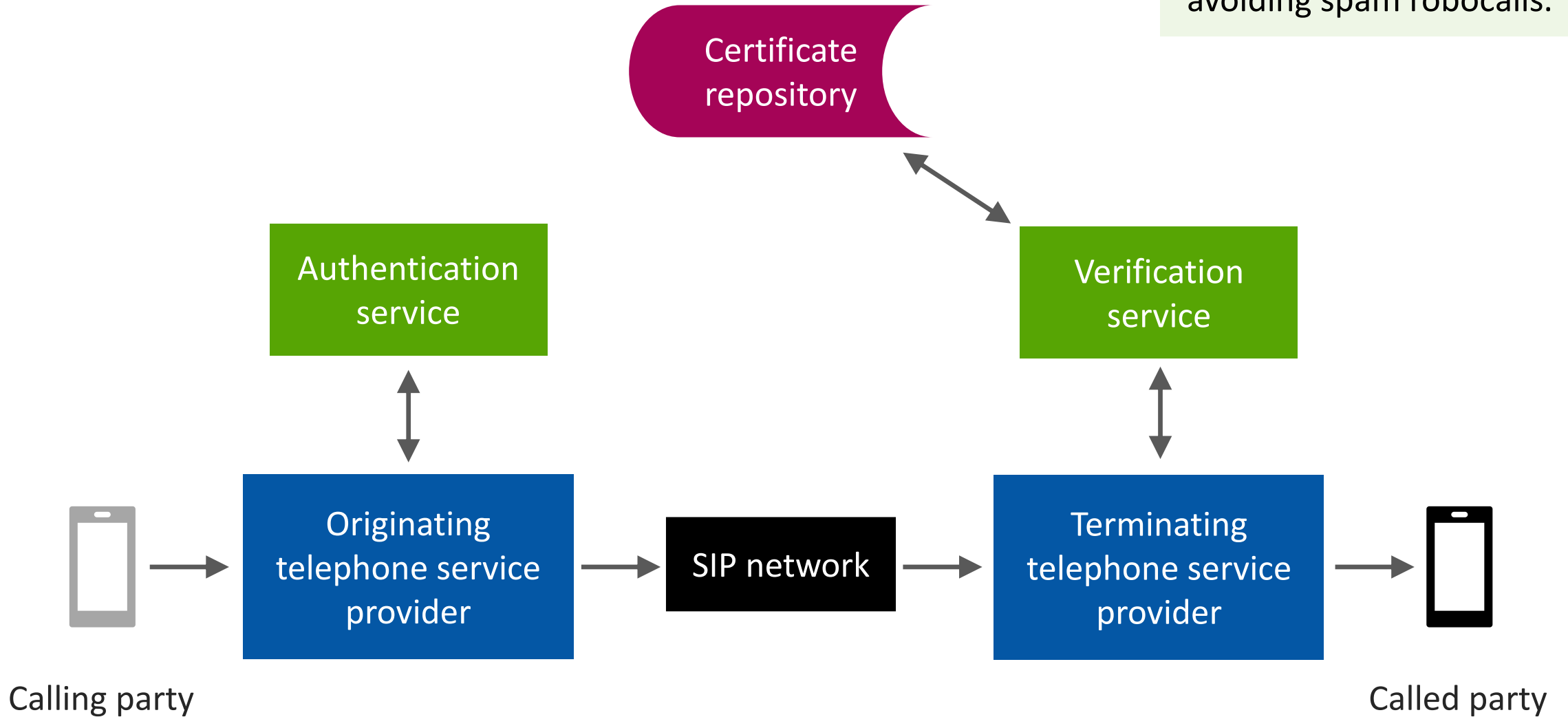


Certificate infrastructure



STIR/SHAKEN: the big picture

STIR/SHAKEN doesn't prevent robocalls. It *prevents caller ID spoofing* so you can answer more calls you want while avoiding spam robocalls.



SIP INVITE with Identity header

INVITE sip:18001234567@example.com:5060 SIP/2.0

Via: SIP/2.0/UDP example.com:5060

From: "Alice" <sip:14045266060@5.6.7.8:5060>;tag=123456789

To: "Bob" <sip:18001234567@1.2.3.4:5060>

Call-ID: 1-12345@5.6.7.8

CSeq: 1 INVITE

Max-Forwards: 70

Identity:

eyJhbGciOiAiA1RVMYNTYiLCJwchHQiOiAic2hha2VuliwidHlwljogInBhc3Nwb3J0liwieDV1ljogImh0dHBzOi8vY2VydGlmaWNhdGVzLmNsZWYyaXAUy29tL2lxNWQ3Y2M5LTBmMjYtNDZjMi04M2VhLWVzZTYzYTgyZWZmYS83Y2M0ZGI2OTVkbWVzLmNsZWYyaXAUy29tL2lxNWQ3Y2M5LTBmMjYtNDZjMi04M2VhLWVzZTYzYTgyRlc3QiOiB7InRuljogWylxNDA0NTI2NjA2MCIJdfSwiaWF0IjogMTU0ODg1OTk4Miwib3JpZyI6IHsidG4iOiAiMTgwMDEyMzQ1NjcifSwib3JpZ2lkjogIjNhNDdjYTlzlWQ3YWItNDQ2Yi04MjYtNDZjMi04M2VhLWVzZTYzYTgyNCJ9.S_vqkgCk88ee9rtk89P6a6ru0ncDfSrdb1GyK_mJj-10hsLW-dMF7eCjDYARLR7EzSZwiu0fd4H_QD_9Z5U2bg;info=<https://certificates.clearip.com/b15d7cc9-0f26-46c2-83ea-a3e63a82ec3a/7cc4db695d13edada4d1f9861b9b80fe.crt>alg=ES256;ppt=shaken

Authentication Identity token decoded

```
"header" :  
  "alg" : "ES256"  
  "typ" : "passport"  
  "ppt" : "shaken"  
  "x5u" : https://certificates.clearip.com/4a8eb5-461b.crt  
"payload" :  
  "attest" : "A"  
  "dest" : { "tn" : [ "14695858065" ] }  
  "iat" : 1529071382  
  "orig" : { "tn" : "12013776051" }  
  "origid" : "4aec94e2-508c-4c1c-907b-3737bac0a80e"
```

Attestation level

Called number

Timestamp

Calling number

Origination identifier

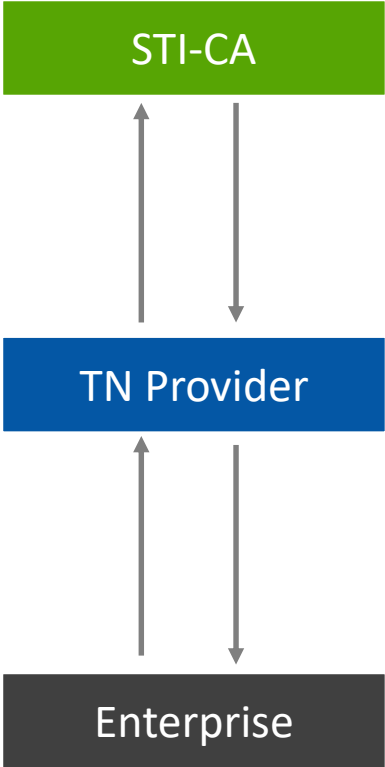
STIR/SHAKEN future developments

- Authentication for non-carriers (e.g., enterprises)
 - Critical for outbound call centers
 - Enables Least Cost Routing and Load Balancing among carriers
 - Carriers for SHAKEN Authentication and call delivery may be different
- Rich Call Data
- Out-of-Band STIR

Authentication for non-carriers (enterprises)

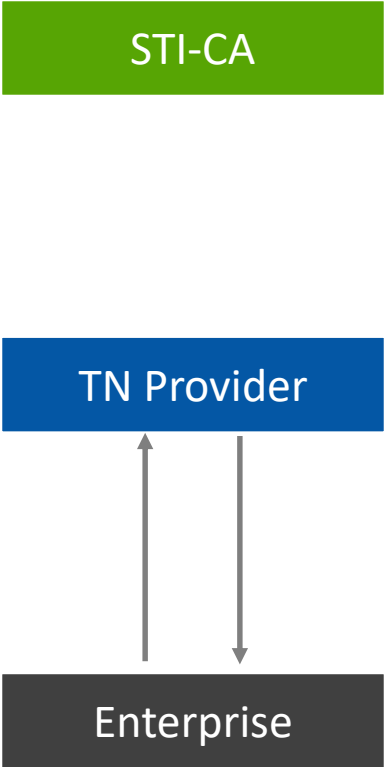
Proof of Possession

TN Provider proxies certificate signing request



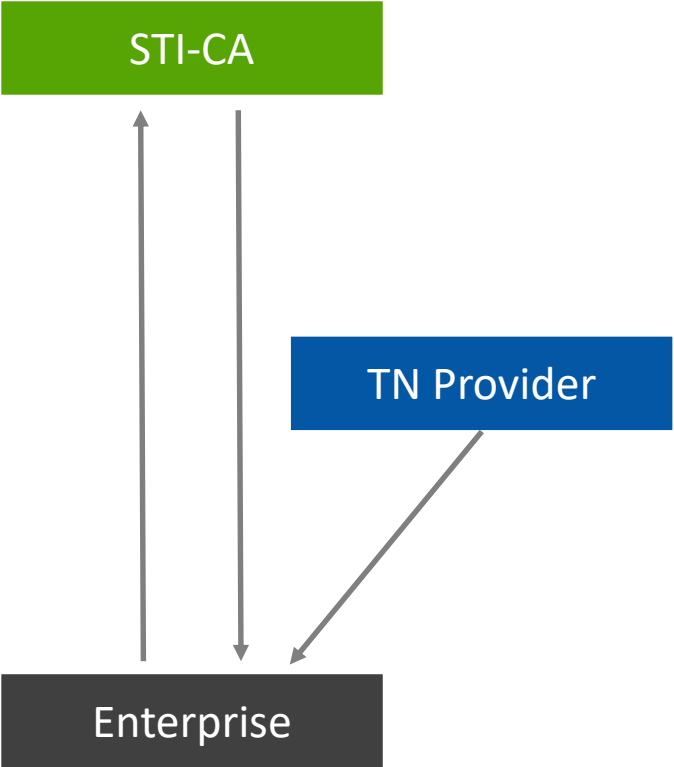
Delegated

TN Provider issues certificate



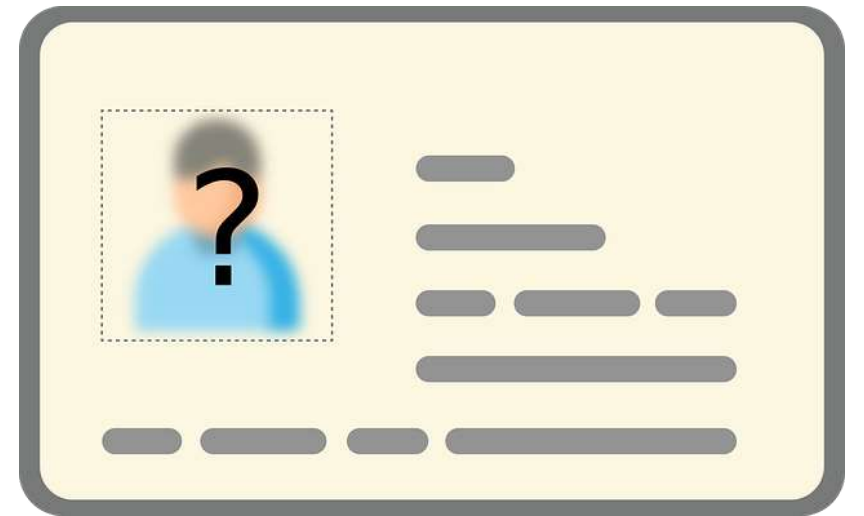
LEMON-TWIST

TN Provider issues token to Enterprise for CA authentication



Rich Call Data

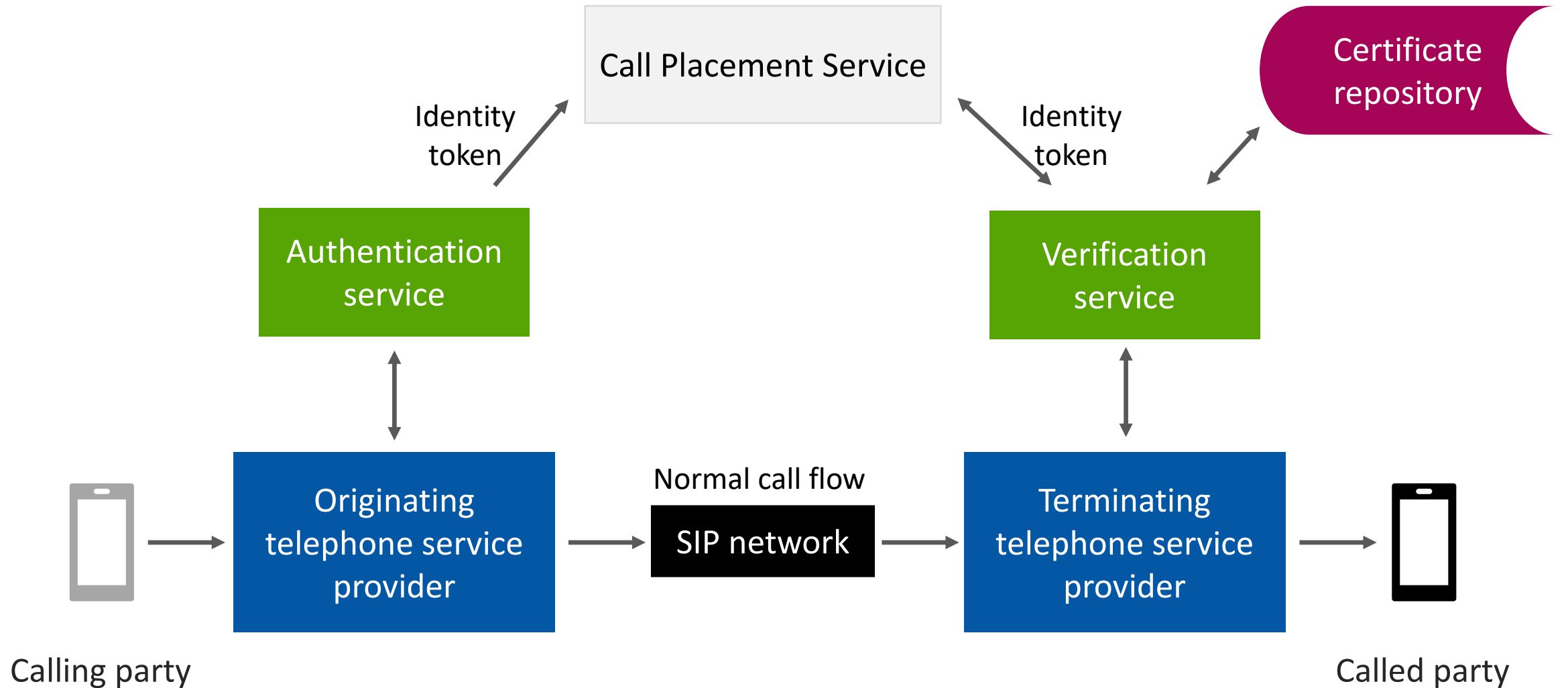
- Additional information about the caller that can be displayed to the called party, such as:
 - Display name
 - Hyperlinks to related info, e.g., image of the caller or company logo
 - Flexible set of caller information, e.g., address, email, birthday, etc.
- Similar to enhanced CNAM
 - Except done at origination instead of termination
- Cryptographically secure
- Gives source party greater control over info presented



Example of Rich Call Data in SHAKEN Token

```
"attest": "A",
"dest": { "tn": [ "12155551213" ] },
"iat": 1443208345,
"orig": { "tn": "12155551212" },
"origid": "123e4567-e89b-12d3-a456-426655440000",
"rcd": {
  "nam": "James Bond",
  "jcd": [
    "vcard",
    [
      [ "version", {}, "text", "4.0" ],
      [ "fn", {}, "text", "James Bond" ],
      [
        "adr", { "type": "work" }, "text",
        [ "3100 Apple Ave", "Washington", "DC", "20008", "USA" ]
      ],
      [ "email", {}, "text", "bond@example.com" ],
      [ "tel", { "type": [ "voice", "text" ] }, "uri", "tel:+1-202-555-1000" ],
      [ "logo", {}, "uri", "https://example.com/logo.jpg" ]
    ]
  ]
}
```

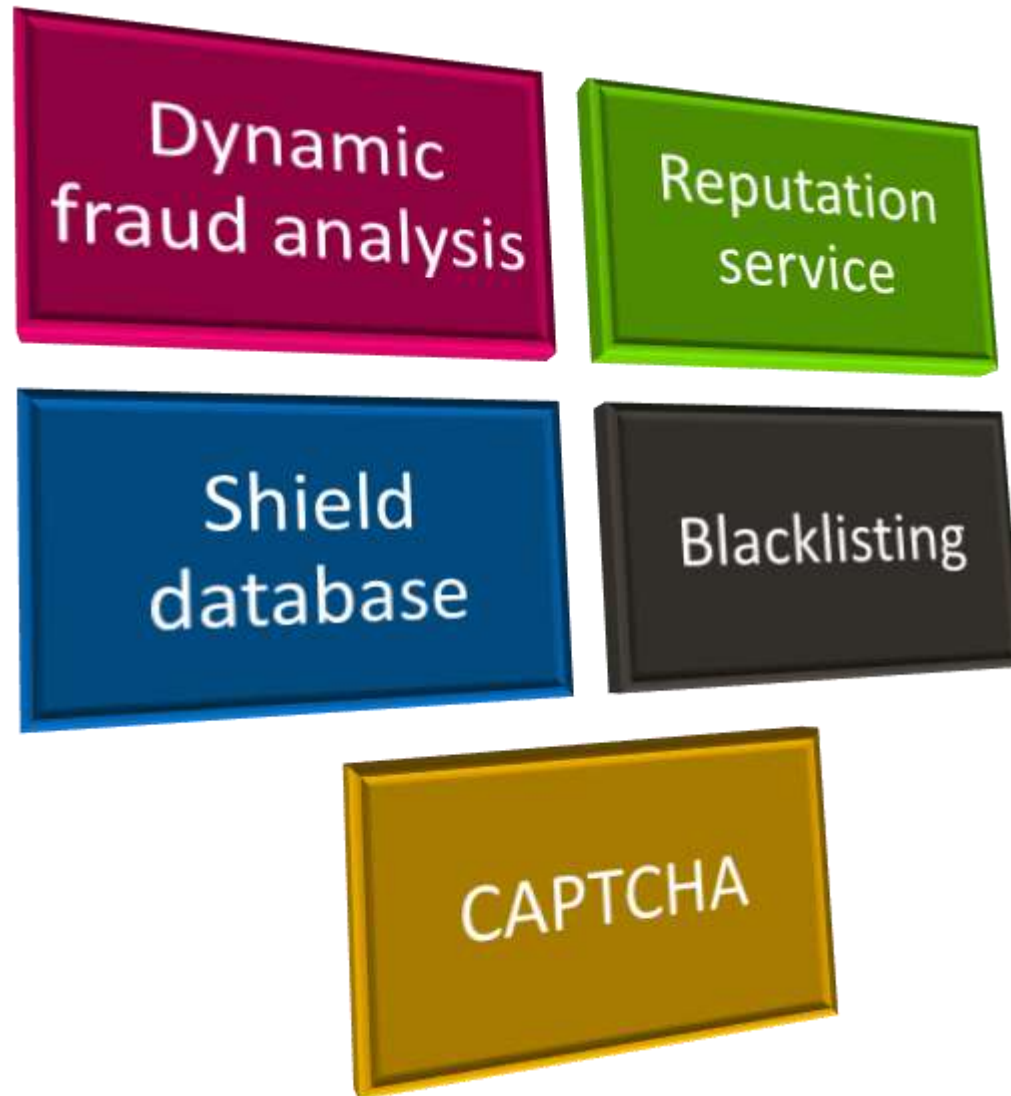

Out-of-Band STIR



Robocall prevention



Robocall prevention methods work well with SHAKEN



Nuisance call detection methods

- On-net calls from external networks
 - By OCN
 - By DID
- Invalid calling numbers
- High risk calling numbers
- Calling numbers with poor reputation
- Real time traffic analysis
- STIR/SHAKEN verification



Nuisance call treatment options per subscriber

- Report only
- Block
- Send to voicemail
- Send to CAPTCHA
- Send to a honeypot
- Modify caller display name (CNAM)



Can be configured for each subscriber

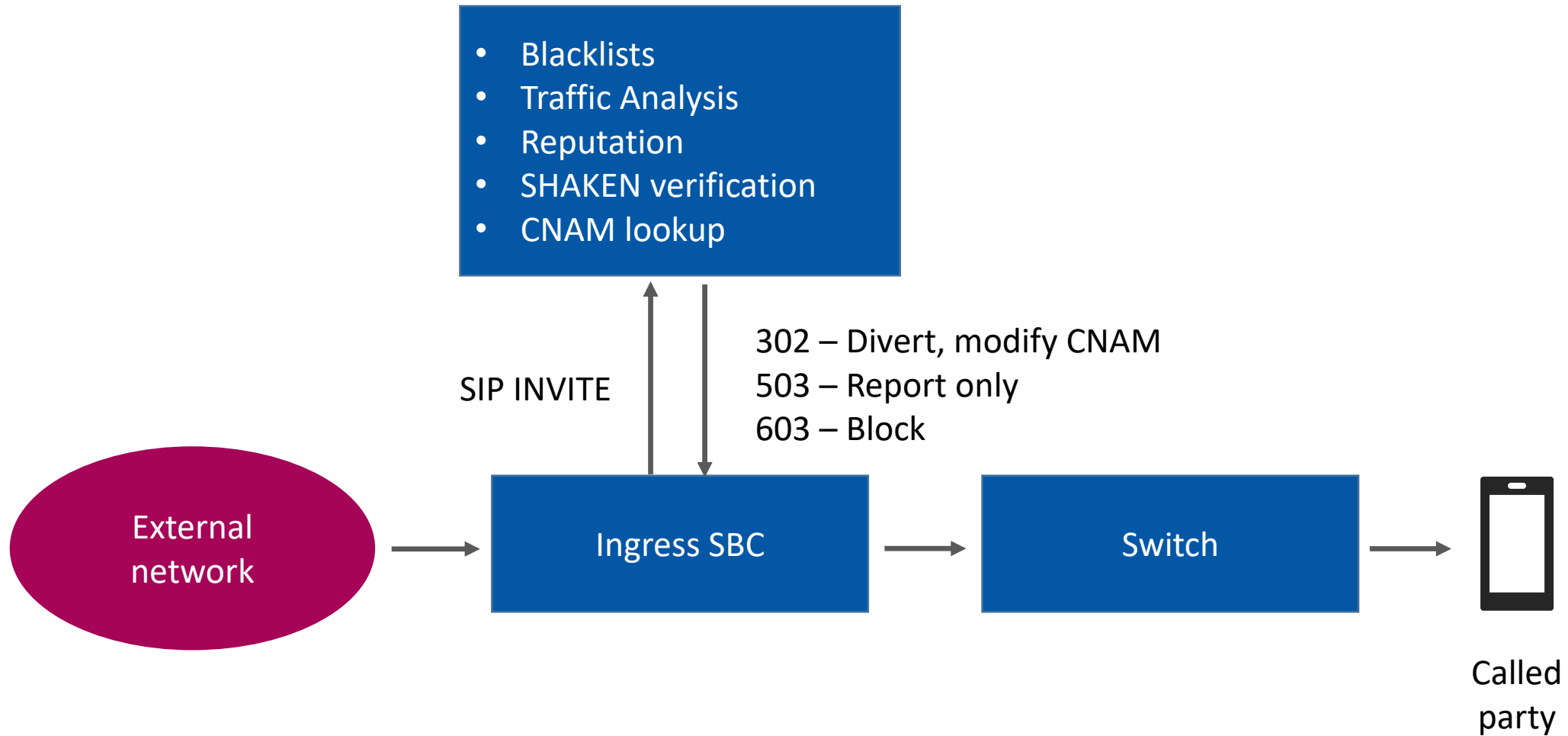
Caller display name

| SHAKEN outcome | Reputation | Privacy header | Digital display | Character display |
|--------------------|------------|----------------|-----------------|-------------------|
| Verified | Good | No | Caller ID ✓ | [V]Caller ID |
| Verified | Good | Yes | Anonymous ✓ | [V]Anonymous |
| Verified | Poor | Yes or No | <SPAM> ✓ | [V]<SPAM> |
| Failed or no token | Good | No | Caller ID | Caller ID |
| Failed or no token | Good | Yes | Anonymous | Anonymous |
| Failed or no token | Poor | Yes or No | <SPAM> | <SPAM> |

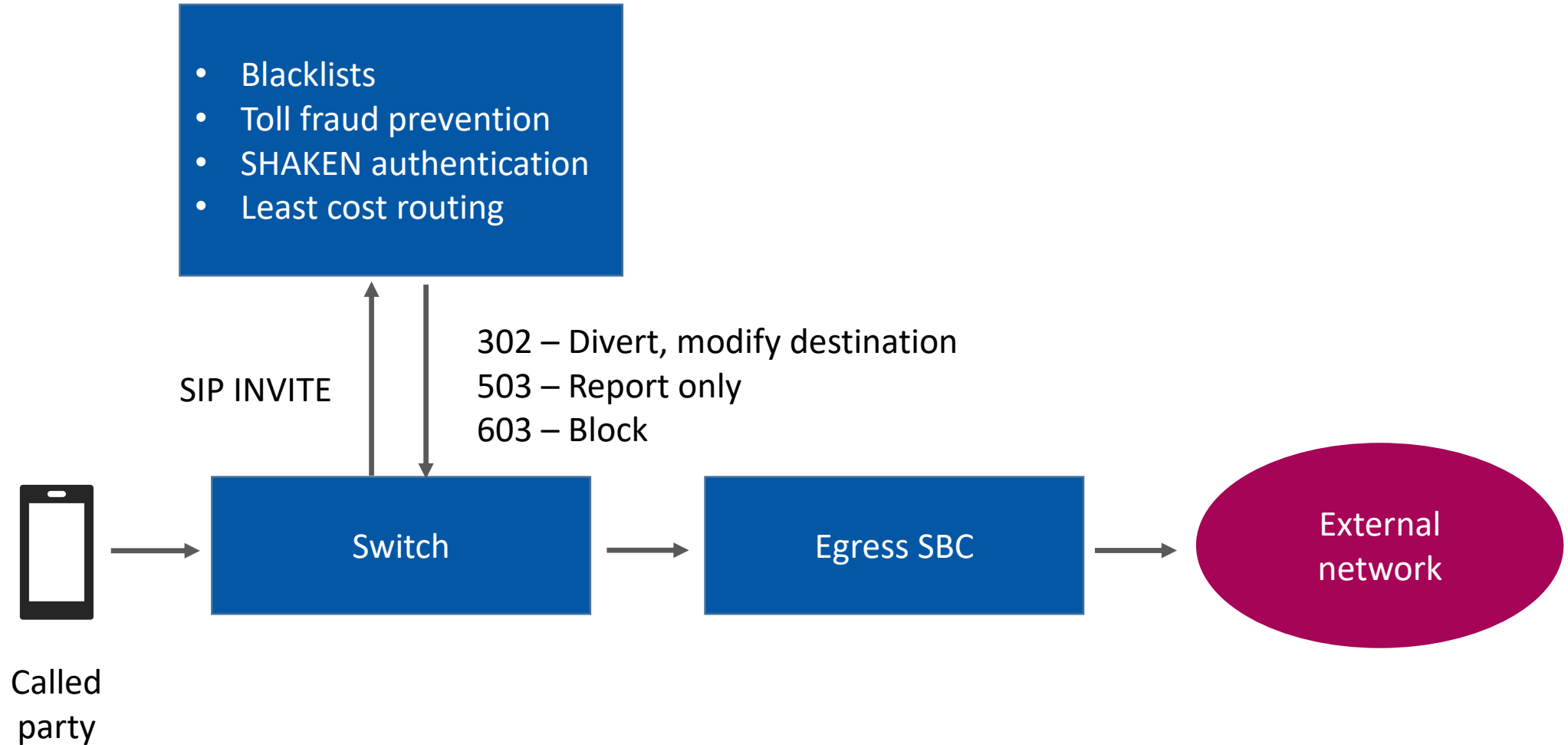
Integration



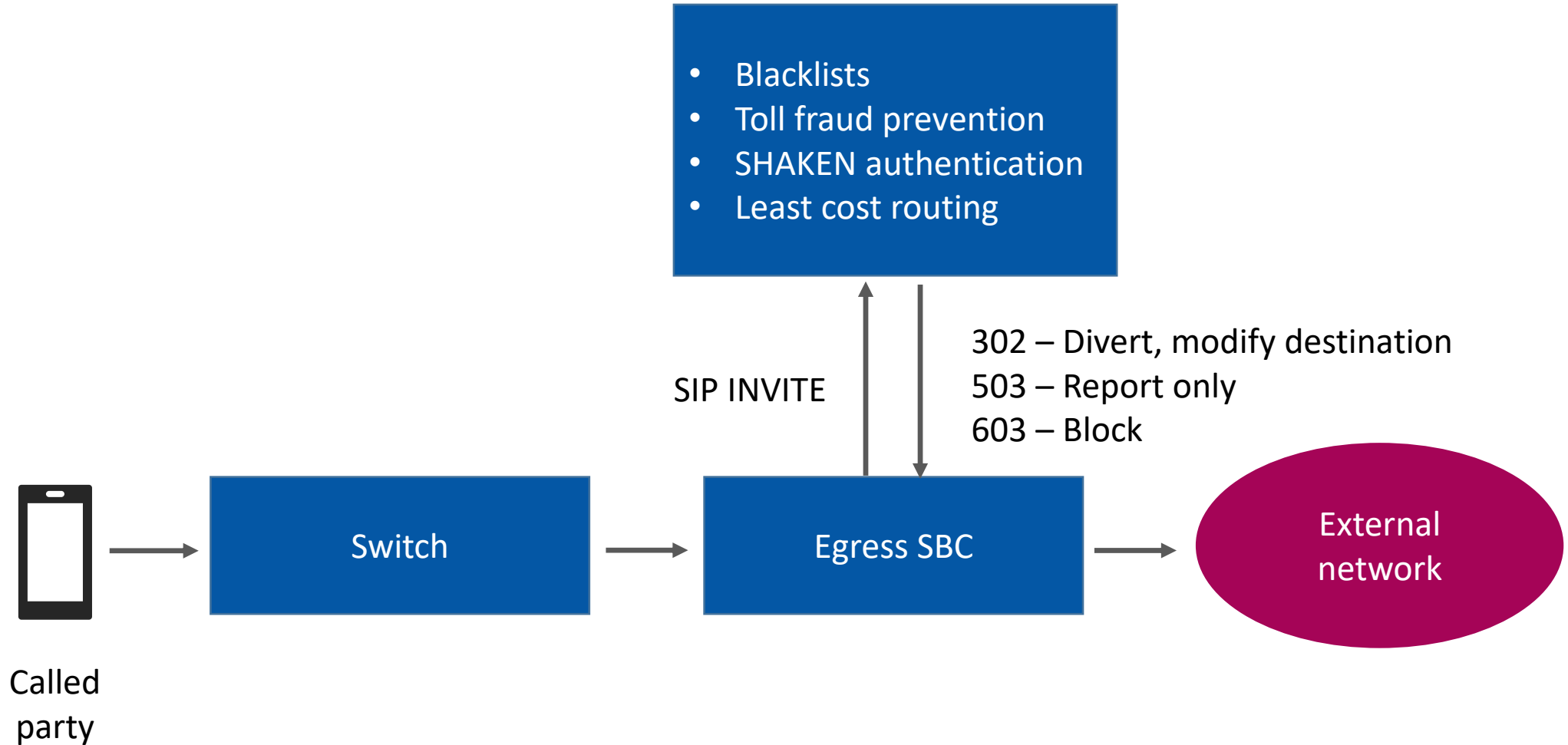
Inbound integration



Outbound integration – option 1



Outbound integration – option 2



Questions, answers and discussion

- Get started now!
- Free trial offer
 - Month-to-month billing
 - No contract – no commitment
 - Up to 2 million calls – no charge
- transnexus.com
- info@transnexus.com
- 1-404-526-6060

