

**FACT SHEET\***

**Mandating STIR/SHAKEN and Proposing Additional Measures to Combat Illegal Spoofing**  
Report and Order and Further Notice of Proposed Rulemaking – WC Docket Nos. 17-97, 20-67

**Background:** Each day, Americans receive millions of unwanted phone calls, including calls that “spoof” or falsify caller ID information with a malicious intent. These spoofed calls are not simply an annoyance—they result in billions of dollars lost to fraud, degrade consumer confidence in the voice network, and harm public safety. This *Report and Order and Further Notice of Proposed Rulemaking* would take a critical step in the Commission’s multi-pronged approach to ending illegal caller ID spoofing by requiring voice service providers to implement caller ID authentication technology. Known as STIR/SHAKEN, this technology enables voice service providers to verify that the caller ID information transmitted with a particular call matches the caller’s number—and provides valuable information to detect illegally spoofed calls. Widespread implementation of STIR/SHAKEN will reduce the effectiveness of illegal spoofing, allow law enforcement to identify bad actors more easily, and help voice service providers identify calls with illegally spoofed caller ID information before those calls reach their subscribers. Most importantly, it will help restore Americans’ trust in the voice network, which has been eroded by the prevalence of illegal caller ID spoofing.

**What the Order Would Do:**

- Require originating and terminating voice service providers to implement the STIR/SHAKEN caller ID authentication framework in the Internet Protocol (IP) portions of their networks by June 30, 2021, a deadline that is consistent with the TRACED Act, which was recently passed by Congress.

**What the Further Notice Would Do:**

- Propose to extend the STIR/SHAKEN implementation mandate to intermediate providers.
- Propose to implement caller ID authentication and other provisions of the TRACED Act, including through proposals to:
  - Grant an extension for compliance with the STIR/SHAKEN implementation mandate for small voice service providers so long as those providers implement a robocall mitigation program.
  - Require voice service providers using non-IP technology to either (i) upgrade their networks to IP to enable STIR/SHAKEN implementation, or (ii) work to develop non-IP caller ID authentication technology and implement a robocall mitigation program in the interim.
  - Establish a process by which a voice service provider may be exempt from the STIR/SHAKEN implementation mandate if the provider has achieved certain implementation benchmarks.
  - Prohibit voice service providers from imposing additional line item charges on consumers and small businesses for caller ID authentication.

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\* This document is being released as part of a “permit-but-disclose” proceeding. Any presentations or views on the subject expressed to the Commission or its staff, including by email, must be filed in WC Docket Nos. 17-97 and 20-67, which may be accessed via the Electronic Comment Filing System (<http://www.fcc.gov/ecfs/>). Before filing, participants should familiarize themselves with the Commission’s *ex parte* rules, including the general prohibition on presentations (written and oral) on matters listed on the Sunshine Agenda, which is typically released a week prior to the Commission’s Meeting. See 47 CFR § 1.1200 *et seq.*

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of )
Call Authentication Trust Anchor ) WC Docket No. 17-97
Implementation of TRACED Act Section 6(a) — ) WC Docket No. 20-67
Knowledge of Customers by Entities with Access )
to Numbering Resources )

REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING\*

Adopted: []

Released: []

Comment Date: May 15, 2020
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By the Commission:

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\* This document has been circulated for tentative consideration by the Commission at its March 2020 open meeting. The issues referenced in this document and the Commission’s ultimate resolution of those issues remain under consideration and subject to change. This document does not constitute any official action by the Commission. However, the Chairman has determined that, in the interest of promoting the public’s ability to understand the nature and scope of issues under consideration, the public interest would be served by making this document publicly available. The FCC’s ex parte rules apply and presentations are subject to “permit-but-disclose” ex parte rules. See, e.g., 47 C.F.R. §§ 1.1206, 1.1200(a). Participants in this proceeding should familiarize themselves with the Commission’s ex parte rules, including the general prohibition on presentations (written and oral) on matters listed on the Sunshine Agenda, which is typically released a week prior to the Commission’s meeting. See 47 CFR §§ 1.1200(a), 1.1203.

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## I. INTRODUCTION

1. Each day, Americans receive millions of unwanted phone calls.<sup>1</sup> These include “spoofed” calls whereby the caller falsifies caller ID information that appears on a recipient’s phone to deceive them into thinking the call is from someone they know or can trust.<sup>2</sup> And these spoofed calls are not simply an annoyance—they result in billions of dollars lost to fraud,<sup>3</sup> degrade consumer confidence in the voice network, and harm our public safety.<sup>4</sup>

2. The Commission, Congress, and state attorneys general all agree on the need to protect consumers and put an end to illegal caller ID spoofing.<sup>5</sup> Over the past three years, the Commission has taken a multi-pronged approach to this problem—issuing hundreds of millions of dollars in fines for violations of our Truth in Caller ID rules;<sup>6</sup> expanding those rules to reach foreign calls and text messages;<sup>7</sup> enabling voice service providers to block certain clearly unlawful calls before they reach

<sup>1</sup> One source indicates that Americans received over 58 billion such calls in 2019 alone. YouMail, Historical Robocalls by Time, <https://www.robocallindex.com/history/time> (last visited Jan. 17, 2020).

<sup>2</sup> Spoofing has legal and illegal uses. For example, medical professionals calling patients from their mobile phones often legally spoof the outgoing phone number to be the office phone number for privacy reasons, and businesses often display a toll-free call-back number. Illegal spoofing, on the other hand, occurs when a caller transmits misleading or inaccurate caller ID information with the intent to defraud, cause harm, or wrongly obtain anything of value. See FCC, Caller ID Spoofing (last updated Jan. 6, 2020), <https://www.fcc.gov/consumers/guides/spoofing-and-caller-id>.

<sup>3</sup> A 2019 survey estimated that spoofing fraud affected one in six Americans and cost approximately \$10.5 billion in a single 12-month period. Kim Fai Kok, *Truecaller Insights: Phone Scams Cause Americans to Lose \$10.5 Billion in Last 12 Months Alone* (Apr. 17, 2019), <https://truecaller.blog/2019/04/17/truecaller-insights-2019-us-spam-phone-scam-report>.

<sup>4</sup> See Octavio Blanco, *Mad About Robocalls?*, Consumer Rep. (Apr. 2, 2019), <https://www.consumerreports.org/robocalls/mad-about-robocalls> (finding that 70% of Americans do not answer calls from unrecognized numbers); see also, e.g., Adrian Abramovich, *Marketing Strategy Leaders, Inc., and Marketing Leaders, Inc.*, Forfeiture Order, 33 FCC Rcd 4663, 4664, para. 5 (2018) (involving a large-scale robocalling campaign that disrupted emergency medical communications).

<sup>5</sup> See, e.g., Press Release, FCC, Chairman Pai Calls on Industry to Adopt Anti-Spoofing Protocols to Help Consumers Combat Scam Robocalls (Nov. 5, 2018), <https://docs.fcc.gov/public/attachments/DOC-354933A1.pdf>; Fifty-One State Attorneys General, *Anti-Robocall Principles*, <https://ncdoj.gov/download/141/files/17821/state-ags-provider-antirobocall-principles-with-signatories>; Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act, Pub. L. No. 116-105 (2019) (TRACED Act).

<sup>6</sup> See, e.g., Adrian Abramovich, *Marketing Strategy Leaders, Inc., and Marketing Leaders, Inc.*, 33 FCC Rcd 4663.

<sup>7</sup> See generally *Implementing Section 503 of the RAY BAUM’S Act; Rules and Regulation Implementing the Truth in Caller ID Act of 2009*, WC Docket Nos. 18-335 and 11-39, Second Report and Order, 34 FCC Rcd 7303 (2019).

consumers' phones;<sup>8</sup> and clarifying that voice service providers may offer call-blocking services by default.<sup>9</sup> We have also called on industry to “trace back” illegal spoofed calls and text messages to their original sources<sup>10</sup> and encouraged industry to develop and implement new caller ID authentication technology.<sup>11</sup> That technology, known as STIR/SHAKEN,<sup>12</sup> allows voice service providers to verify that the caller ID information transmitted with a particular call matches the caller's number. Its widespread implementation will reduce the effectiveness of illegal spoofing, allow law enforcement to identify bad actors more easily, and help voice service providers identify calls with illegally spoofed caller ID information before those calls reach their subscribers.<sup>13</sup>

3. Today, we build on our aggressive and multi-pronged approach to ending illegal caller ID spoofing. First, we mandate that all voice service providers implement the STIR/SHAKEN caller ID authentication framework in the Internet Protocol (IP) portions of their networks by June 30, 2021.<sup>14</sup> In establishing this requirement, we both act on our proposal to require voice service providers to implement the STIR/SHAKEN caller ID authentication framework if major voice service providers did not voluntarily do so by the end of 2019,<sup>15</sup> and implement Congress's direction in the recently enacted Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence (TRACED) Act to mandate STIR/SHAKEN not later than 18 months after the date of enactment of that Act.<sup>16</sup> Second, we propose and seek comment on additional measures to combat illegal spoofing, including further implementation of the TRACED Act.

## II. BACKGROUND

4. Technological advancements and marketplace developments in IP-based telephony have made caller ID spoofing easier and more affordable than ever before. Today, widely available Voice over Internet Protocol (VoIP) software allows malicious callers to make spoofed calls with minimal experience

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<sup>8</sup> See *Advanced Methods to Target and Eliminate Unlawful Robocalls*, CG Docket No. 17-59, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 9706, 9709, para. 9 (2017).

<sup>9</sup> See *Advanced Methods to Target and Eliminate Unlawful Robocalls; Call Authentication Trust Anchor*, CG Docket No. 17-59, WC Docket No. 17-97, Declaratory Ruling and Third Further Notice of Proposed Rulemaking, 34 FCC Rcd 4876, 4884-90, paras. 26-42 (2019) (*2019 Robocall Declaratory Ruling and Further Notice* or *2019 Further Notice*).

<sup>10</sup> See Press Release, FCC, FCC Calls on Network Voice Providers to Join Effort to Combat Illegal Spoofed Scam Robocalls (Nov. 6, 2018), <https://docs.fcc.gov/public/attachments/DOC-354942A1.pdf>.

<sup>11</sup> See Press Release, FCC, Chairman Pai Calls on Industry to Adopt Anti-Spoofing Protocols to Help Consumers Combat Scam Robocalls (Nov. 5, 2018), <https://docs.fcc.gov/public/attachments/DOC-354933A1.pdf>.

<sup>12</sup> Entities variously refer to this technology as either “SHAKEN/STIR” or “STIR/SHAKEN.” In the past, the Commission has referred to the technology as “SHAKEN/STIR.” See, e.g., *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd 4876. To ensure consistency with the TRACED Act, we use “STIR/SHAKEN” here.

<sup>13</sup> See USTelecom Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 4-5 (rec. July 24, 2019) (US Telecom Comments).

<sup>14</sup> In recognition of the fact that it is caller ID information transmitted with a call that is authenticated, we use the term “caller ID authentication” in this Report and Order and Further Notice of Proposed Rulemaking. We understand this term to be interchangeable with the term “call authentication” as used in other contexts, including the TRACED Act.

<sup>15</sup> See *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4877, para. 2.

<sup>16</sup> See Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act, Pub. L. No. 116-105, § 4(b)(1)(A), 133 Stat. 3274, 3277 (2019) (TRACED Act).

and cost.<sup>17</sup> Taking advantage of the ability to use spoofing to mask the true identity of an incoming call, these callers have turned to this technology as a quick and cheap way to defraud targets and avoid being discovered.<sup>18</sup> Driven in part by the rise of VoIP, the telecommunications industry has transitioned from a limited number of carriers that all trusted each other to provide accurate caller origination information to a proliferation of different voice service providers and entities originating calls,<sup>19</sup> which allows consumers to enjoy the benefits of far greater competition but also creates new ways for bad actors to undermine this trust.

5. To combat illegal spoofing, industry technologists from the Internet Engineering Task Force (IETF) and the Alliance for Telecommunications Industry Solutions (ATIS) developed standards for the authentication and verification of caller ID information for calls carried over an IP network using the Session Initiation Protocol (SIP).<sup>20</sup> The IETF formed the Secure Telephony Identity Revisited (STIR) working group, which has produced several protocols for authenticating caller ID information.<sup>21</sup> ATIS, together with the SIP Forum,<sup>22</sup> produced the Signature-based Handling of Asserted information using toKENs (SHAKEN) specification which standardizes how the protocols produced by STIR are implemented across the industry.<sup>23</sup> Together, these technical standards comprise the “STIR/SHAKEN” framework for caller ID authentication. The STIR/SHAKEN framework consists of two high-level components: (1) the technical process of authenticating and verifying caller ID information; and (2) the certificate governance process that maintains trust in the caller ID authentication information transmitted along with a call.

6. *Authenticating and Verifying Caller ID Information Through STIR/SHAKEN.* The STIR/SHAKEN authentication and verification processes center on the transmission of encrypted information used to attest to the accuracy of caller ID information transmitted with a call.<sup>24</sup> Specifically,

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<sup>17</sup> See First Orion, *What Is Number Spoofing?* (Aug. 6, 2018), <https://firstorion.com/what-is-number-spoofing> (“In the past, caller ID spoofing required advanced knowledge and expensive equipment. Now, open source Voice over IP (VoIP) software makes it easy to spoof with minimal experience and cost.”).

<sup>18</sup> See FCC and TIGTA Warn Consumers of IRS Impersonation Phone Scam: Scam Has Cost Victims Tens of Millions of Dollars, DA 16-1392, Enforcement Advisory, 31 FCC Rcd 13184 (EB 2016) (warning consumers of scam callers claiming to be from the Internal Revenue Service and in which caller ID is spoofed to display an IRS telephone number or “IRS”).

<sup>19</sup> IETF, *Secure Telephone Identity Problem Statement and Requirements*, RCF 7340, at 3 (2014), [https://datatracker.ietf.org/doc/rfc7340/?include\\_text=1](https://datatracker.ietf.org/doc/rfc7340/?include_text=1).

<sup>20</sup> See Robocall Strike Force, *Robocall Strike Force Report* at 3 (2016), <https://transition.fcc.gov/cgb/Robocall-Strike-Force-Final-Report.pdf>. The Session Initiation Protocol (SIP) is “an application-layer control (signaling) protocol for creating, modifying, and terminating sessions” such as Internet Protocol (IP) telephony calls. IETF, *SIP: Session Initiation Protocol*, RFC 3261, at 1 (2002), <https://tools.ietf.org/html/rfc3261>.

<sup>21</sup> See IETF, *Secure Telephone Identity Revisited (stir): About*, <https://datatracker.ietf.org/wg/stir/about> (last visited Jan. 17, 2020) (describing IETF STIR standards and efforts); IETF, *Secure Telephone Identity Revisited (stir): Documents*, <https://datatracker.ietf.org/wg/stir/documents> (last visited Jan. 23, 2020) (listing standards and current work-in-progress).

<sup>22</sup> The SIP Forum is “an industry association with members from . . . IP communications companies,” with a mission “[t]o advance the adoption and interoperability of IP communications products and services based on SIP.” SIP Forum, Home, <https://www.sipforum.org>.

<sup>23</sup> See All. Telecomms. Indus. Sol. & SIP Forum, *Joint ATIS/SIP Forum Standard—Signature-Based Handling of Asserted Information Using toKENs (SHAKEN)* (2017), <https://www.sipforum.org/download/sip-forum-twg-10-signature-based-handling-of-asserted-information-using-tokens-shaken-pdf/?wpdmdl=2813>.

<sup>24</sup> See *Call Authentication Trust Anchor*, WC Docket No. 17-97, Notice of Inquiry, 32 FCC Rcd 5988, 5991, para. 8 (2017) (*Call Authentication NOI*); see also TransNexus, *Understanding STIR/SHAKEN*, <https://transnexus.com/whitepapers/understanding-stir-shaken> (last visited Feb. 3, 2020).

an originating voice service provider adds a unique header to the network-level message used to initiate a SIP call (the SIP INVITE).<sup>25</sup> When a subscriber places a call, the originating voice service provider uses an authentication service to create this “Identity” header,<sup>26</sup> which contains encrypted identifying information as well as the location of the public key that can be used to decode this information.<sup>27</sup> When the terminating voice service provider receives the call, it sends the SIP INVITE with the Identity header to a verification service,<sup>28</sup> which uses the public key that corresponds uniquely to the originating voice service provider’s private key to decode the encrypted information and verify that it is consistent with the information sent without encryption in the SIP INVITE.<sup>29</sup> The verification service then sends the results of the verification process—including whether the decoding process was successful and whether the encrypted information is consistent with the information sent without encryption—to the terminating voice service provider.<sup>30</sup> STIR/SHAKEN thus establishes a chain of trust back to the originating voice service provider.

7. Because the STIR/SHAKEN framework relies on transmission of information in the Identity header of the SIP INVITE, it only operates on the IP portions of a voice service provider’s network—that is, those portions served by network technology that is able to initiate, maintain, and terminate SIP calls.<sup>31</sup> If a call terminates on a network or is routed at any point over an intermediate provider network that does not support the transmission of SIP calls, the Identity header will be lost. Because STIR/SHAKEN only operates on IP networks, some stakeholders have advocated for a solution referred to as “out-of-band STIR,” in which caller ID authentication information is sent across the Internet, *out-of-band* from the call path, allowing STIR/SHAKEN to be implemented on networks that are not fully IP.<sup>32</sup> Out-of-band STIR remains in the early stages of development.<sup>33</sup>

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<sup>25</sup> See *Call Authentication NOI*, 32 FCC Rcd at 5990, para. 6; see also TransNexus, *Understanding Common Header Fields in a SIP INVITE*, <https://transnexus.com/whitepapers/sip-invite-header-fields> (last visited Feb. 3, 2020) (explaining that the SIP INVITE request “invit[es] the [call] recipient for a session”). This SIP INVITE contains a series of unencrypted headers which provides information about the message, such as a “From” header, giving information about the calling party; a “To” header, giving information about the called party; and a “Via” header, which “indicates the path taken by the request so far and helps in routing the responses back along the same path.” *Id.* Both originating and downstream providers are technically capable of appending headers to the SIP INVITE.

<sup>26</sup> The authentication service can be provided by the voice service provider itself, or by a third party acting under the voice service provider’s direction. See IETF, *Authenticated Identity Management in the Session Initiation Protocol (SIP)*, RFC 8224, at 14 (2018), <https://tools.ietf.org/html/rfc8224>.

<sup>27</sup> See *Call Authentication NOI*, 32 FCC Rcd at 5991, para. 8; see also IETF, *Authenticated Identity Management in the Session Initiation Protocol (SIP)*, RFC 8224, at 14 (2018), <https://tools.ietf.org/html/rfc8224>.

<sup>28</sup> Like the corresponding authentication service on the originating voice service provider’s end, the terminating voice service provider’s verification service can be performed internally or by a trusted third-party service. See *Call Authentication NOI*, 32 FCC Rcd at 5991, para. 8 n.28; see also IETF, *Authenticated Identity Management in the Session Initiation Protocol (SIP)*, RFC 8224, at 22-23 (2018), <https://tools.ietf.org/html/rfc8224>.

<sup>29</sup> See *Call Authentication NOI*, 32 FCC Rcd at 5991, para. 8; see also TransNexus, *Understanding STIR/SHAKEN*, <https://transnexus.com/whitepapers/understanding-stir-shaken> (last visited Feb. 3, 2020).

<sup>30</sup> See *Call Authentication NOI*, 32 FCC Rcd at 5991, para. 8; see also TransNexus, *Understanding STIR/SHAKEN*, <https://transnexus.com/whitepapers/understanding-stir-shaken> (last visited Feb. 12, 2019) (“The verification service returns the results to the terminating service provider’s softswitch or SBC.”).

<sup>31</sup> See *Call Authentication NOI*, 32 FCC Rcd at 5999, para. 39; see also Joint ATIS/SIP Forum Standard - Signature-Based Handling of Asserted Information Using toKENs (SHAKEN), ATIS-1000074, § 1.1, at 1 (2017), [https://access.atis.org/apps/group\\_public/download.php/46770/ATIS-1000074-E.zip](https://access.atis.org/apps/group_public/download.php/46770/ATIS-1000074-E.zip) (ATIS/SIP Forum Standard).

<sup>32</sup> Letter from Jim Dalton, CEO, TransNexus, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, at 5 (filed July 19, 2019); see also TransNexus, *Out-of-Band STIR/SHAKEN call authentication*, <https://transnexus.com/whitepapers/out-of-band-stir> (last visited Feb. 16, 2020).

8. The STIR/SHAKEN framework relies on the originating voice service provider attesting to the subscriber's identity. The SHAKEN specification allows an originating voice service provider to provide different "levels" of attestation. Specifically, the voice service provider can indicate that (i) it can confirm the identity of the subscriber making the call, and that the subscriber is using its associated telephone number ("full" or "A" attestation); (ii) it can confirm the identity of the subscriber but not the telephone number ("partial" or "B" attestation); or merely that (iii) it is the point of entry to the IP network for a call that originated elsewhere, such as a call that originated abroad or on a domestic network that is not STIR/SHAKEN-enabled ("gateway" or "C" attestation).<sup>34</sup>

9. To maintain trust in the voice service providers that vouch for caller ID information, the STIR/SHAKEN framework uses digital "certificates" issued through a neutral governance system.<sup>35</sup> The framework requires that each voice service provider receive its own certificate that contains, among other components, that voice service provider's public key, and states, in essence, that (i) the voice service provider is that which it claims to be; (ii) the voice service provider is authorized to authenticate the caller ID information; and (iii) the voice service provider's claims about the caller ID information it is authenticating can thus be trusted.<sup>36</sup> Every time an originating voice service provider originates an authenticated call, it transmits the location of its certificate in the Identity header,<sup>37</sup> allowing the verification service to acquire the public key and verify the caller ID information, and have certainty that the public key is truly associated with the voice service provider that originated the call.

10. The STIR/SHAKEN governance model requires several roles in order to operate: (1) a *Governance Authority*, which defines the policies and procedures for which entities can issue or acquire certificates; (2) a *Policy Administrator*, which applies the rules set by the governance authority, confirms that certification authorities are authorized to issue certificates, and confirms that voice service providers are authorized to request and receive certificates; (3) *Certification Authorities*, which issue the certificates used to authenticate and verify calls; and (4) the *voice service providers* themselves, which, as call initiators, select an approved certification authority from which to request a certificate, and which, as call recipients, check with certification authorities to ensure that the certificates they receive were issued by the correct certification authority.<sup>38</sup>

11. *Commission and North American Numbering Council Action to Promote STIR/SHAKEN Deployment.* In July 2017, the Commission released a *Notice of Inquiry*, launching a broad inquiry into caller ID authentication and how to expedite its development and implementation.<sup>39</sup> In the *Notice of Inquiry*, the Commission recognized the potential of caller ID authentication to "reduc[e] the risk of fraud and ensur[e] that callers be held accountable for their calls."<sup>40</sup> Among other issues, the Commission

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<sup>33</sup> See IETF, *STIR Out-of-Band Architecture and Use Cases*, Draft (2019), <https://tools.ietf.org/html/draft-ietf-stir-oob-06> (draft standards for out-of-band STIR).

<sup>34</sup> See *ATIS/SIP Forum Standard*, § 5.2.3, at 8-9.

<sup>35</sup> The STIR/SHAKEN credentials are based on an X.509 credential system. X.509 is a specific standard for a type of public key infrastructure system that uses certificates to facilitate secure Internet communications. See generally IETF, *Internet x.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile*, RFC 5280 (2008), <https://tools.ietf.org/html/rfc5280>.

<sup>36</sup> See Joint ATIS/SIP Forum Standard -Signature-Based Handling of Asserted Information Using toKENs (SHAKEN): Governance Model and Certificate Management, ATIS-1000080, at 16-20 (2017), [https://access.atis.org/apps/group\\_public/download.php/46769/ATIS-1000080-E.zip](https://access.atis.org/apps/group_public/download.php/46769/ATIS-1000080-E.zip) (explaining process by which a voice service provider applies for a certificate).

<sup>37</sup> The "location" is sent unencrypted in the form of a Uniform Resource Locator (URL).

<sup>38</sup> *Call Authentication Trust Anchor NOI*, 32 FCC Rcd 5988, 5992-93, para. 11.

<sup>39</sup> *Id.* at 5988, para. 1.

<sup>40</sup> *Id.*

sought comment on its role in promoting implementation of caller ID authentication technology;<sup>41</sup> what involvement, if any, it should have in STIR/SHAKEN governance;<sup>42</sup> and how to address caller ID authentication for networks that use non-IP technology.<sup>43</sup>

12. In February 2018, the Commission directed the Call Authentication Trust Anchor Working Group of the North American Numbering Council (NANC) to recommend “criteria by which a [Governance Authority] should be selected” and a “reasonable timeline or set of milestones for adoption and deployment of a SHAKEN/STIR call authentication system, including metrics by which the industry’s progress can be measured.”<sup>44</sup> In its May 2018 report, the NANC recommended that representatives from various industry stakeholders comprise a board overseeing the Governance Authority,<sup>45</sup> and that “individual companies capable of signing and validating VoIP calls using SHAKEN/STIR should implement the standard within a period of approximately one year after completion of the NANC CATA report.”<sup>46</sup> Chairman Pai accepted these recommendations shortly after they were issued by the NANC.<sup>47</sup>

13. In November 2018, drawing on the NANC’s May 2018 recommendation that capable voice service providers rapidly implement STIR/SHAKEN, Chairman Pai sent letters to major voice service providers urging them to implement a robust caller ID authentication framework by the end of 2019.<sup>48</sup> He asked these providers for specific details about their implementation plans, and encouraged those that did not appear to have established concrete plans to promptly protect their subscribers with STIR/SHAKEN.<sup>49</sup> In response, the providers submitted letters detailing their implementation efforts.<sup>50</sup> Since that time, Commission staff has closely tracked the progress of major voice service providers in implementation of the STIR/SHAKEN framework.<sup>51</sup>

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<sup>41</sup> *Id.* at 5993-94, paras. 14-17.

<sup>42</sup> *Id.* at 5994-96, paras. 18-27.

<sup>43</sup> *Id.* at 5999, para. 39.

<sup>44</sup> Letter from Kris Anne Monteith, Chief, Wireline Competition Bureau, FCC, to Travis Kavulla, Chair, NANC at 1-2 (Dec. 7, 2017).

<sup>45</sup> Call Authentication Trust Anchor Working Grp., N. Am. Numbering Council, Report on Selection of Governance Authority and Timely Deployment of SHAKEN/STIR at 7 (2018), [http://nanc-chair.org/docs/mtg\\_docs/May\\_18\\_Call\\_Authentication\\_Trust\\_Anchor\\_NANC\\_Final\\_Report.pdf](http://nanc-chair.org/docs/mtg_docs/May_18_Call_Authentication_Trust_Anchor_NANC_Final_Report.pdf) (2018 NANC CATA Working Group Report).

<sup>46</sup> *Id.* at 17.

<sup>47</sup> Press Release, FCC, Chairman Pai Welcomes Call Authentication Recommendations from the North American Numbering Council (May 14, 2018), [http://nanc-chair.org/docs/mtg\\_docs/May18\\_FCC\\_Chairman\\_Welcomes\\_CATA\\_Recommendations.pdf](http://nanc-chair.org/docs/mtg_docs/May18_FCC_Chairman_Welcomes_CATA_Recommendations.pdf).

<sup>48</sup> See Press Release, FCC, Chairman Pai Calls on Industry to Adopt Anti-Spoofing Protocols to Help Consumers Combat Scam Robocalls (Nov. 5, 2018), <https://docs.fcc.gov/public/attachments/DOC-354933A1.pdf>.

<sup>49</sup> *Id.*

<sup>50</sup> See FCC, Combating Spoofed Robocalls with Caller ID Authentication, <https://www.fcc.gov/call-authentication> (last visited Mar. 3, 2020).

<sup>51</sup> See, e.g., Letter from Randy Clarke, Vice President, Federal Regulatory Affairs, CenturyLink, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97 (filed Feb. 18, 2020) (CenturyLink *Ex Parte*); Letter from Jenny Prime, Senior Director, Regulatory Affairs, Cox Enterprises, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97 (filed Jan. 27, 2020) (Cox *Ex Parte*); Letter from Sara Cole, Regulatory Counsel, TDS, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97 (filed Jan. 30, 2020) (TDS *Ex Parte*); Letter from Grant B. Spellmeyer, Vice President, Federal Affairs & Public Policy, U.S. Cellular, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97 (filed Jan. 27, 2020) (U.S. Cellular *Ex Parte*); Letter from Brita D. Strandberg, Counsel to

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14. In June 2019, the Commission adopted a *Declaratory Ruling and Third Further Notice of Proposed Rulemaking* that proposed and sought comment on mandating implementation of STIR/SHAKEN in the event that major voice service providers did not voluntarily implement the framework by the end of 2019.<sup>52</sup> We stressed that “[i]mplementation of the SHAKEN/STIR framework across voice networks is important in the fight against unwanted, including illegal, robocalls”<sup>53</sup> and proposed to extend any mandate to “wireline, wireless, and Voice over Internet Protocol (VoIP) providers”;<sup>54</sup> sought comment on what we should require voice service providers to accomplish to meet an implementation mandate;<sup>55</sup> and asked for comment on how long voice service providers should be given to comply with such a mandate.<sup>56</sup> We further sought comment on whether we should establish requirements regarding the display of STIR/SHAKEN attestation information, what role the Commission should have in STIR/SHAKEN governance, and how we could encourage caller ID authentication on non-IP networks.<sup>57</sup>

15. In July 2019, the Commission held a summit focused on implementation of STIR/SHAKEN.<sup>58</sup> Summit participants included representatives from large and small voice service providers, analytics companies, vendors, and members of the Governance Authority.<sup>59</sup> The participants discussed implementation progress made by major voice service providers; using STIR/SHAKEN to improve the consumer experience; and implementation challenges faced by small voice service providers.<sup>60</sup>

16. *Developments in STIR/SHAKEN Governance.* Currently, the Secure Telephone Identity Governance Authority (STI-GA), established by ATIS, fills the Governance Authority role.<sup>61</sup> The STI-GA’s membership was designed to provide a diverse representation of stakeholders from across the industry.<sup>62</sup> The STI-GA selected the Policy Administrator, iconectiv, in May 2019.<sup>63</sup> In December 2019,

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Vonage Holdings Corp., to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97, (filed Jan. 21, 2020) (Vonage *Ex Parte*).

<sup>52</sup> *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4898, para. 71.

<sup>53</sup> *Id.* at 4899, para. 72.

<sup>54</sup> *Id.* at 4900, para. 75.

<sup>55</sup> *Id.* at 4900, para. 76.

<sup>56</sup> *Id.* at 4900-01, para. 78.

<sup>57</sup> *Id.* at 4900-01, paras. 77, 79, 80. The *Declaratory Ruling and Third Further Notice of Proposed Rulemaking* also affirmed that voice service providers may, by default, block unwanted calls based on reasonable call analytics, as long as their customers are informed and have the opportunity to opt out of the blocking; proposed to create a safe harbor for voice service providers that block calls which fail STIR/SHAKEN verification; and sought comment on whether we should create a safe harbor for voice service providers that block calls which do not have authenticated caller ID information. *See id.* at 4886-87, 4892-96, paras. 33-34, 49-62.

<sup>58</sup> *Chairman Pai Convenes SHAKEN/STIR Robocall Summit*, Public Notice, DA 19-413 (May 13, 2019); Press Release, FCC, FCC Chairman Announces Another Step in Fight Against Spoofed Robocalls (May 13, 2019), <https://docs.fcc.gov/public/attachments/DOC-357422A1.pdf>.

<sup>59</sup> Press Release, FCC, Chairman Pai Announces Agenda for SHAKEN/STIR Robocall Summit (July 9, 2019), <https://docs.fcc.gov/public/attachments/DA-19-635A1.pdf>.

<sup>60</sup> *Id.*

<sup>61</sup> STI Governance Authority, *Secure Telephone Identity Governance Authority*, <https://www.atis.org/sti-ga> (last visited Jan. 17, 2019).

<sup>62</sup> *See* 2018 NANC CATA Working Group Report at 5-8.

<sup>63</sup> Press Release, ATIS, Mitigating Illegal Robocalling Advances with Secure Telephone Identity Governance Authority Board’s Selection of iconectiv as Policy Administrator (May 30, 2019),

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the Policy Administrator approved the first Certification Authorities,<sup>64</sup> and announced that voice service providers are now able to register with the Policy Administrator to obtain the credentials necessary to receive certificates from approved Certification Authorities.<sup>65</sup>

17. *Implementation by Voice Service Providers.* We recognize that a number of providers have been working hard to implement caller ID authentication. Some voice service providers reported that, by the end of 2019, they had completed the necessary network upgrades to support the STIR/SHAKEN framework and that they were exchanging a limited amount of traffic with authenticated caller ID information with other voice service providers. Others, however, reported only that they had completed necessary network upgrades by the end of 2019, but had not begun exchanging authenticated traffic with other voice service providers. Still others have shown little to no progress in upgrading their networks to be STIR/SHAKEN-capable.

18. More specifically, as of the end of 2019, AT&T, Bandwidth, Charter, Comcast, Cox, T-Mobile, and Verizon announced that they had upgraded their networks to support STIR/SHAKEN.<sup>66</sup> AT&T, for example, confirmed that it “authenticates all calls on its network that originate from [Voice over LTE] and consumer VoIP customers” and “estimates that approximately 90 percent of its wireless customer base (prepaid and postpaid) and more than 50 percent of its consumer wireline customer base are SHAKEN/STIR capable.”<sup>67</sup> Charter stated that it “fulfilled [its] commitment to complete the implementation of the STIR/SHAKEN framework by the end of [2019].”<sup>68</sup> Similarly, Comcast reported that “virtually all calls originating from a Comcast residential subscriber and terminating with a Comcast residential subscriber are fully authenticated through the STIR/SHAKEN protocol.”<sup>69</sup> Cox reported that it “has deployed SHAKEN/STIR to over 99% of [its] residential customers enabling Cox to sign originating

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<https://sites.atis.org/insights/mitigating-illegal-robocalling-advances-with-secure-telephone-identity-governance-authority-boards-selection-of-iconectiv-as-policy-administrator>; Press Release, ATIS, STI-GA Executes iconectiv Contract as Secure Telephone Identity Policy Administrator (Aug. 27, 2019), <https://sites.atis.org/insights/sti-ga-executes-iconectiv-contract-as-secure-telephone-identity-policy-administrator>.

<sup>64</sup> See Press Release, Neustar, Neustar Approved as Initial Secure Telephone Identity Certification Authority (Dec. 12, 2019), <https://www.home.neustar/about-us/news-room/press-releases/2019/neustar-approved-as-initial-secure-telephone-identity-certification-authority>; Press Release, TransNexus, TransNexus Approved by the STI Policy Administrator as a SHAKEN Certification Authority (Dec. 12, 2019), <https://transnexus.com/news/2019/transnexus-sti-ca>.

<sup>65</sup> Press Release, ATIS, Industry Solution to Detect, Mitigate, and Deter Illegal Robocalling Passes Important Milestone (Dec. 12, 2019), <https://sites.atis.org/insights/industry-solution-to-detect-mitigate-and-deter-illegal-robocalling-passes-important-milestone>.

<sup>66</sup> See Letter from Linda S. Vandeloop, Assistant Vice President, Regulatory Affairs, AT&T Services, Inc., to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, at 1 (filed Feb. 5, 2020) (*AT&T Ex Parte*); Letter from Greg Rogers, Head of Global Policy and Regulatory Affairs, Bandwidth, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97, at 1 (Jan. 31, 2020) (*Bandwidth Ex Parte*); Letter from Audrey Connors, Senior Director, Government Affairs, Charter Communications, to Hon. Ajit V. Pai, Chairman, FCC, WC Docket No. 17-97, at 1 (filed Dec. 13, 2019) (*Charter Ex Parte*); Letter from Beth Choroser, Vice President, Regulatory Affairs, Comcast Corporation, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, CG Docket No. 17-59, at 2 (filed Jan. 31, 2020) (*Comcast Ex Parte*); *Cox Ex Parte* at 1; Letter from Cathleen A. Massey, Vice President, Federal Regulatory Affairs, T-Mobile, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, at 1 (filed Jan. 30, 2020) (*T-Mobile Ex Parte*); Letter from Joe Russo, Senior Vice President, Network Operations, Verizon, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, at 1 (filed Feb. 7, 2020) (*Verizon Ex Parte*).

<sup>67</sup> *AT&T Ex Parte* at 1.

<sup>68</sup> *Charter Ex Parte* at 1.

<sup>69</sup> *Comcast Ex Parte* at 2 (also explaining that “virtually all calls originating from a Comcast residential subscriber and bound for customers of other voice providers are signed with a STIR/SHAKEN-compliant header when the call is initiated”).

and terminating calls.”<sup>70</sup> T-Mobile stated that it was “the first wireless provider to fully implement STIR/SHAKEN standards on [its] network” and is “capable of signing and authenticating 100% of SIP traffic that both originates and then terminates on [its] network.”<sup>71</sup> According to Verizon, it “finished deploying STIR/SHAKEN to its wireless customer base (which constitutes more than 95% of [its] total traffic) in March 2019,” “is devoting substantial resources to deploying STIR/SHAKEN to wireline customers that receive service on IP platforms capable of being upgraded with the STIR/SHAKEN protocol” and expects “to achieve deployment of STIR/SHAKEN to Fios Digital customers later this year.”<sup>72</sup>

19. These voice service providers, however, were exchanging only a limited amount of authenticated traffic with other voice service providers as of the end of 2019.<sup>73</sup> For instance, Comcast has begun to exchange authenticated calls with AT&T and T-Mobile,<sup>74</sup> and explained that, as of December 2019, approximately 14.25% of all calls “originating on other voice providers’ networks and bound for Comcast residential subscribers had a STIR/SHAKEN-compliant header and were verified by Comcast.”<sup>75</sup> T-Mobile explained that it is also authenticating some traffic exchanged with AT&T, Comcast, and Inteliquent.<sup>76</sup> According to AT&T, it “exchanges approximately 40 percent of its SHAKEN/STIR consumer VoIP traffic with one terminating service provider.”<sup>77</sup> Verizon stated that it was signing “under half of [its] outbound traffic” with one provider as of the end of 2019, and that “for the other three partners,” its production levels were under 5%.<sup>78</sup> Cox explained that it is “exchanging authenticated traffic with four carriers resulting in over 14% of all calls on Cox’ residential IP network being verified.”<sup>79</sup> Charter stated that it is “exchanging signed and authenticated customer call traffic end-to-end with Comcast.”<sup>80</sup> Bandwidth is also in early stages of exchanging traffic and “has designed, tested and deployed the capability to exchange some of its production traffic with Verizon Wireless directly utilizing ‘self-signed’ certifications that are in keeping with the STIR/SHAKEN framework.”<sup>81</sup>

20. Other voice service providers—namely Frontier, Sprint, U.S. Cellular, and Vonage—stated that they have performed necessary network upgrades, but had only begun the negotiating and testing phase of exchanging authenticated traffic with other voice service providers as of the end of 2019.<sup>82</sup> Frontier reported that it “established the capability to authenticate and sign calls” and is in the

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<sup>70</sup> Cox *Ex Parte* at 1.

<sup>71</sup> T-Mobile *Ex Parte* at 1.

<sup>72</sup> Verizon *Ex Parte* at 1.

<sup>73</sup> See AT&T *Ex Parte*; Bandwidth *Ex Parte*; Comcast *Ex Parte* at 1-2; T-Mobile *Ex Parte* at 2; Verizon *Ex Parte* at 2.

<sup>74</sup> Comcast *Ex Parte* at 1-2.

<sup>75</sup> *Id.* at 2.

<sup>76</sup> T-Mobile *Ex Parte* at 2.

<sup>77</sup> AT&T *Ex Parte* at 2.

<sup>78</sup> Verizon *Ex Parte* at 2.

<sup>79</sup> Cox *Ex Parte* at 1.

<sup>80</sup> Charter *Ex Parte* at 1.

<sup>81</sup> Bandwidth *Ex Parte* at 1.

<sup>82</sup> See Letter from Diana Eisner, Director, Federal Regulatory, Frontier Communications, to Marlene H. Dortch, Secretary, FCC, WC Docket No 17-97, at 1 (filed Feb. 21, 2020) (Frontier *Ex Parte*); Letter from Charles W. McKee, Vice President, Government Affairs, Sprint Corporation, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97, at 1 (filed Feb. 13, 2019) (Sprint *Ex Parte*); U.S. Cellular *Ex Parte* at 1; Vonage *Ex Parte* at 1.

negotiating and testing phase regarding authenticating traffic exchanged with other voice service providers.<sup>83</sup> Sprint reported that it “deployed the core STIR/SHAKEN capability in its network” and was testing the exchange of authenticated traffic with Comcast and T-Mobile.<sup>84</sup> In 2019, U.S. Cellular “successfully implemented the STIR/SHAKEN technology in its network” and is currently “in various stages of the [interconnection agreement] process with three of the four national wireless carriers . . . including, the successful exchange of traffic on a test basis with at least one of . . . those carriers.”<sup>85</sup> Vonage reported that it was testing with “its two largest peering partners” and had “reached out to twenty additional carriers to implement outbound and inbound testing schedules.”<sup>86</sup>

21. An additional category of voice service providers—namely CenturyLink, TDS, and Google—has indicated limited progress in making the necessary network upgrades.<sup>87</sup> CenturyLink, for instance, stated that as of late 2019 it had “taken the steps necessary to prepare its network for SHAKEN/STIR deployment” and is currently conducting testing for wider deployment on its IP networks.<sup>88</sup> TDS, meanwhile, reported that it had completed work in 2019 to evaluate, select, and lab test a vendor solution to allow it to integrate STIR/SHAKEN in the IP portions of its network.<sup>89</sup> It is in the process of developing implementation plans, but because many of its interconnection points with other providers are not IP-enabled, it “forecast[s] that only a small percentage of traffic will be exchanged in IP when SHAKEN/STIR is initially deployed in the TDS IP network.”<sup>90</sup> Google provided limited detail about the status of implementation but stated that it “remains committed to implementing SHAKEN/STIR and . . . ha[s] taken considerable steps toward doing so.”<sup>91</sup>

22. *Congressional Direction to Require STIR/SHAKEN Implementation.* On December 30, 2019, Congress enacted the TRACED Act, with the stated purpose of “helping to reduce illegal and unwanted robocalls” through numerous mechanisms.<sup>92</sup> Along with other provisions directed at addressing robocalls, the TRACED Act directs the Commission to require, no later than 18 months from enactment, all voice service providers to implement STIR/SHAKEN in the IP portions of their networks and implement an effective caller ID authentication framework in the non-IP portions of their networks.<sup>93</sup> The TRACED Act further creates processes by which voice service providers (1) may be exempt from this mandate if the Commission determines they have achieved certain implementation benchmarks, and (2) may be granted an extension for compliance based on a finding of undue hardship because of burdens or barriers to implementation or based on a delay in development of a caller ID authentication protocol

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<sup>83</sup> Frontier *Ex Parte* at 1.

<sup>84</sup> Sprint *Ex Parte* at 1.

<sup>85</sup> U.S. Cellular *Ex Parte* at 1.

<sup>86</sup> Vonage *Ex Parte* at 1.

<sup>87</sup> See CenturyLink *Ex Parte* at 1-2; TDS *Ex Parte* at 1.

<sup>88</sup> CenturyLink *Ex Parte* at 2.

<sup>89</sup> TDS *Ex Parte* at 1.

<sup>90</sup> See *id.*

<sup>91</sup> Letter from Darah Franklin, Counsel, Google, LLC, to G. Patrick Webre, Bureau Chief, Consumer and Government Affairs Bureau, FCC, CG Docket No. 17-59, WC Docket No. 17-97, at 2 (filed Feb. 28, 2020) (Google *Ex Parte*) (noting that Google “began a SHAKEN/STIR implementation with Comcast in December 2019, and that we are working toward a similar integration with another major voice service provider this year”).

<sup>92</sup> S. Comm. on Com., Sci., & Transp., Telephone Robocall Abuse Criminal Enforcement and Deterrence Act, S. Rep. No. 116-41, at 1 (2019).

<sup>93</sup> See TRACED Act § 4(b)(1)(A)-(B).

for calls delivered over non-IP networks.<sup>94</sup>

23. Today's Report and Order and Further Notice is one of several steps we are taking to implement the TRACED Act. For instance, we recently adopted a Notice of Proposed Rulemaking that proposes rules to establish a registration process for a "single consortium that conducts private-led efforts to trace back the origin of suspected unlawful robocalls."<sup>95</sup> Additionally, the Wireline Competition Bureau (Bureau) has charged the NANC Call Authentication Trust Anchor Working Group with providing recommendations regarding the TRACED Act's direction that the Commission "issue best practices that providers of voice service may use as part of the implementation of effective call authentication frameworks . . . to take steps to ensure the calling party is accurately identified."<sup>96</sup> We will continue to work swiftly and carefully to implement the TRACED Act and protect Americans from illegal robocalls.

### III. REPORT AND ORDER

24. In this Report and Order, we require all originating and terminating voice service providers to implement the STIR/SHAKEN framework in the IP portions of their networks by June 30, 2021. We adopt this mandate for several reasons, including that (1) widespread implementation will result in significant benefits from American consumers; (2) the record overwhelmingly reflects support from a broad array of stakeholders for rapid STIR/SHAKEN implementation; (3) the state of industry-wide implementation at the end of 2019 demonstrates that further government action is necessary for timely, ubiquitous implementation; and (4) the TRACED Act expressly directs us to require timely STIR/SHAKEN implementation. Below, we discuss these reasons in more detail; describe the specific requirements that comprise our mandate; discuss our legal authority to adopt these requirements; respond to the limited record opposition to a mandate; and find that the benefits of STIR/SHAKEN implementation will far exceed the costs.

#### A. Mandating the STIR/SHAKEN Framework

25. We require all originating and terminating voice service providers to implement the STIR/SHAKEN framework in the IP portions of their networks by June 30, 2021 for several compelling reasons. First, ubiquitous STIR/SHAKEN implementation will yield substantial benefits for American consumers. We estimate that the benefits of eliminating the wasted time and nuisances caused by illegal scam robocalls will exceed \$3 billion annually.<sup>97</sup> And more importantly, we expect STIR/SHAKEN paired with call analytics to serve as a tool to effectively protect American consumers from fraudulent robocall schemes that cost Americans approximately \$10 billion annually.<sup>98</sup> Further, we anticipate that implementation will increase consumer trust in caller ID information and encourage consumers to answer

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<sup>94</sup> See *id.* §§ 4(b)(2), 4(b)(5)(A)-(B). The TRACED Act further directs us, not later than December 30, 2020, to submit a report to Congress that includes: (1) an analysis of the extent to which voice service providers have implemented caller ID authentication frameworks and whether the availability of necessary equipment and equipment upgrades has impacted such implementation; and (2) an assessment of the efficacy of the call authentication frameworks. *Id.* § 4(b)(3).

<sup>95</sup> *Id.* § 13(d)(1); *Implementing Section 13(d) of the Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act (TRACED Act)*, EB Docket No. 20-22, Notice of Proposed Rulemaking, FCC 20-11, at 1 (Feb. 6, 2020).

<sup>96</sup> Letter from Kris Anne Monteith, Chief, Wireline Competition Bureau, FCC, to Jennifer K. McKee, Chair, NANC (Feb. 27, 2020).

<sup>97</sup> See *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4889, para. 40.

<sup>98</sup> See Fifty-One State Attorneys General Reply at 4 (stating that "[c]onsumer fraud often originates with an illegal call, and robocalls regularly interrupt our daily lives"); Kim Fai Kok, *Truecaller Insights: Phone Scams Cause Americans to Lose \$10.5 Billion in Last 12 Months Alone*, Truecaller (Apr. 17, 2019), <https://truecaller.blog/2019/04/17/truecaller-insights-2019-us-spam-phone-scam-report/>.

the phone, thereby benefitting businesses, healthcare providers, and non-profit charities.<sup>99</sup> Widespread implementation also benefits public safety by decreasing disruptions to healthcare and emergency communications systems, and as a result, saving lives.<sup>100</sup> Additional benefits include significantly reducing costs for voice service providers by eliminating unwanted network congestion and decreasing the number of consumer complaints about robocalls.<sup>101</sup> Ultimately, we expect widespread STIR/SHAKEN implementation to reduce the scourge of illegal robocalls that plague Americans every day.<sup>102</sup>

26. Second, the record overwhelmingly reflects support from a broad array of stakeholders for rapid STIR/SHAKEN deployment, and many commenters support a STIR/SHAKEN mandate.<sup>103</sup> Commenters, including the attorneys general of all fifty states and the District of Columbia, consumer groups, and major voice service providers expressed support for Commission action if widespread voluntary implementation did not occur.<sup>104</sup> The unified state attorneys general argue that a mandate is necessary “in the absence of prompt voluntary implementation” by the end of 2019 because without such action, “[b]ad actors exploit inexpensive and ubiquitous technology to scam consumers and to intrude upon consumers’ lives, and the problem shows no signs of abating.”<sup>105</sup> Consumer group commenters, including Consumer Reports, the National Consumer Law Center, Consumer Action, the Consumer

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<sup>99</sup> See TNS Comments at 20 (recognizing that STIR/SHAKEN will contribute to “reducing unlawful calls and restoring trust in voice communications”); INCOMPAS Reply at 1 (“Robocalls constitute an ongoing hazard to the public and threaten consumer confidence in the reliability of voice networks.”); Consumer Reports et al. Comments at 1 (describing how robocalls “harass” consumers and “interfere with [their] peace of mind”); Tim Harper, *Why Robocalls Are Even Worse Than You Thought*, Consumer Rep. (May 15, 2019), <https://www.consumerreports.org/robocalls/why-robocalls-are-even-worse-than-you-thought/>.

<sup>100</sup> See Consumer Reports et al. Comments at 1 (describing the safety risks to consumers posed by robocalls); see also Tony Romm, *Robocalls Are Overwhelming Hospitals and Patients, Threatening a New Kind of Health Crisis*, Wash. Post (June 17, 2019), <https://www.washingtonpost.com/technology/2019/06/17/robocalls-are-overwhelming-hospitals-patients-threatening-new-kind-health-crisis/>; Nick Wingfield, *Swindlers Use Telephones, with Internet’s Tactics*, N.Y. Times (Jan. 20, 2014), <https://www.nytimes.com/2014/01/20/technology/swindlers-use-telephones-with-internets-tactics.html>.

<sup>101</sup> See Sprint Corp Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 9 (rec. July 24, 2019) (Sprint Comments) (acknowledging that like consumers, carriers “do not benefit from the surge in illegal calls”); see also *2019 Robocall Declaratory Ruling and Further Notice* at 4902, para. 81.

<sup>102</sup> See Fifty-One State Attorneys General Reply at 6 (stating that “State Attorneys General are on the front lines of . . . helping people who are scammed and harassed by [illegal and unwanted robocalls]” and “[f]or this reason, [they] support . . . the timely implementation of the STIR/SHAKEN Caller ID authentication framework”).

<sup>103</sup> See, e.g., App Association Comments at 6; AT&T Comments at 4 n.8; Comcast Corp. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 3, 10 (rec. July 24, 2019) (Comcast Comments); Consumer Reports Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 1 (rec. July 11, 2019) (Consumer Reports July 11, 2019 Comments); Fifty-One (51) State Attorneys General Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 4 (rec. Aug. 23, 2019) (Fifty-One State Attorneys General Reply); Mass. Dep’t of Telecomms. & Cable Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 3, 4 (rec. July 24, 2019) (MDTC Comments); Neustar, Inc. Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 5 (rec. Aug. 23, 2019) (Neustar Reply); Sprint Comments at 6-7; Transaction Network Services, Inc. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 15 (rec. July 24, 2019) (TNS Comments); Verizon Comments at 3; cf. Professional Ass’n for Customer Engagement Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 8 (rec. July 24, 2019) (PACE Comments) (“PACE believes it would be appropriate to mandate [voice service providers] complete deployment by the end of 2021 . . . .”); USTelecom Comments at 3, 12 (“[T]he Commission should require voice service providers acting as gateway providers . . . to implement the SHAKEN/STIR framework.”).

<sup>104</sup> AT&T Comments at 4 n.8; MDTC Comments at 3,4; Verizon Comments at 1; Fifty-One State Attorneys General Reply at 4-5.

<sup>105</sup> Fifty-One State Attorneys General Reply at 2, 4.

Federation of America, the National Association of Consumer Advocates, and Public Knowledge, observe that “cross-carrier implementation has been relatively limited” and state that we “should require phone companies to adopt effective call-authentication policies and technologies.”<sup>106</sup> AT&T explains that “SHAKEN/STIR must be widely deployed to be effective.”<sup>107</sup> Verizon similarly explains that STIR/SHAKEN only works if all voice service providers have implemented the framework in the call path—increasing the utility of a mandate.<sup>108</sup> Other providers, including Comcast and Transaction Network Services, support a “measured” STIR/SHAKEN requirement that accounts for existing implementation challenges.<sup>109</sup> And even commenters who express hesitation about a mandate are receptive to one that accounts for the burdens and barriers confronted by rural and small voice service providers,<sup>110</sup> which we proposed to address through the process established in the TRACED Act. For example, the Voice of America’s Broadband Providers and Teliix are receptive to a mandate that “focus[es] on implementation of . . . legislation Congress enacts”<sup>111</sup> and provides for a more flexible implementation timeframe for small and rural providers.<sup>112</sup>

27. Third, although some major voice service providers have taken significant steps towards STIR/SHAKEN implementation, the level of implementation by the Commission’s end of 2019 deadline shows that, absent further governmental action, we will not have timely ubiquitous implementation. As Verizon states, “verifying [c]aller ID for consumers using STIR/SHAKEN presents a classic collectivity challenge that industry may not be able to overcome on its own.”<sup>113</sup> As we have explained, some voice service providers reported that, by the end of 2019, they completed the necessary network upgrades to support the STIR/SHAKEN framework and that they were exchanging a limited amount of traffic with authenticated caller ID information with other voice service providers.<sup>114</sup> Others, however, reported only that they had completed necessary network upgrades by the end of 2019, but had not begun exchanging with other voice service providers.<sup>115</sup> Still others have shown little to no progress in upgrading their

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<sup>106</sup> Consumer Reports et al. Comments at 3.

<sup>107</sup> AT&T Comments at 4 n.8.

<sup>108</sup> See Verizon Comments at 2.

<sup>109</sup> Comcast Comments at 4, 10; TNS Comments at 15. We find that our June 30, 2021 implementation date and application of the STIR/SHAKEN mandate to only the IP portions of originating and terminating voice service providers’ networks satisfies these commenters’ concerns.

<sup>110</sup> See, e.g., ITTA Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 4 (rec. Aug. 23, 2019) (ITTA Reply); West Telecom Services, LLC Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 2 (rec. Aug. 23, 2019) (West Telecom Services Reply); cf. ACA Connects Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 4 (rec. Aug. 23, 2019) (ACA Connects Reply) (urging “the Commission not to impose a SHAKEN/STIR mandate on smaller and legacy providers at this time, but rather give the marketplace more time to develop”); NTCA Comments at ii (“[T]o the extent that the Commission considers a mandate necessary, it should grant rural carriers compliance timeframes that recognize that these providers will need additional time . . . .”); Teliix, Inc. Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 5 (rec. Aug. 23, 2019) (Teliix Reply) (“While Teliix supports the need for the entire industry to move to SHAKEN/STIR, there must be flexibility for smaller operators’ adoption of SHAKEN/[STIR].”).

<sup>111</sup> ITTA Reply at 4.

<sup>112</sup> See, e.g., ITTA Reply at 4; Teliix, Inc. Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 5 (rec. Aug. 23, 2019) (Teliix Reply) (“While Teliix supports the need for the entire industry to move to SHAKEN/STIR, there must be flexibility for smaller operators’ adoption of SHAKEN/[STIR].”); cf. NTCA Comments at ii (“[T]o the extent that the Commission considers a mandate necessary, it should grant rural carriers compliance timeframes that recognize that these providers will need additional time . . . .”).

<sup>113</sup> See Verizon Reply at 3.

<sup>114</sup> See AT&T *Ex Parte* at 1; Comcast *Ex Parte* at 2; T-Mobile *Ex Parte* at 1; Verizon *Ex Parte* at 1.

<sup>115</sup> See Charter *Ex Parte* at 1; Cox *Ex Parte* at 1; Frontier *Ex Parte* at 1; Sprint *Ex Parte* at 1; US Cellular *Ex Parte* at 1; Vonage *Ex Parte* at 1.

networks to be STIR/SHAKEN-capable.<sup>116</sup> We find that the lack of common exchange among these voice service providers—and the absence of substantial progress by several of them—demonstrate that major voice service providers have failed to meet the goal of achieving full implementation by the end of 2019. We therefore must act to ensure faster progress to protect the public from the scourge of illegal robocalls.

28. Finally, confirming our decision is the recently-enacted TRACED Act, which provides additional support for the implementation mandate we set forth today. The TRACED Act directs the Commission to “require a provider of voice service to implement the STIR/SHAKEN authentication framework in the [IP] networks of the provider of voice service.”<sup>117</sup> Congress’s clear direction to require timely STIR/SHAKEN implementation further encourages us to adopt the mandate in this Report and Order.

29. *Limited Record Opposition to a STIR/SHAKEN Implementation Mandate.* We disagree with those commenters who argue that we should not move forward with a STIR/SHAKEN implementation mandate. First, we specifically disagree with the argument that we should delay a mandate while industry develops technical solutions to allow the STIR/SHAKEN framework to accommodate certain more challenging scenarios.<sup>118</sup> According to some commenters, the standards for attestation do not fully account for the situation where an enterprise subscriber places outbound calls through a voice service provider other than the voice service provider that assigned the telephone number.<sup>119</sup> In such scenarios, commenters claim, it would be difficult for an outbound call to receive “full” or “A” attestation<sup>120</sup> because the outbound call “will not pass through the authentication service of the voice service provider that controls the numbering resource.”<sup>121</sup> We are optimistic that standards bodies, which remain engaged on the impact of STIR/SHAKEN on more challenging use cases and business models, will be able to resolve those issues—just as they have overcome numerous other barriers to caller ID authentication so far.<sup>122</sup> For instance, the Internet Engineering Task Force (IETF) has proposed a “certificate delegation” solution that would allow “the carrier who controls the numbering

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<sup>116</sup> See *CenturyLink Ex Parte* at 1-2; *Google Ex Parte* at 2; *TDS Ex Parte* at 1.

<sup>117</sup> TRACED Act § 4(b)(1)(A).

<sup>118</sup> See, e.g., Cloud Comm. All. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 5 (rec. July 24, 2019) (CCA Comments) (describing the challenges presented by enterprise use cases); INCOMPAS Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 6, 13 (rec. July 24, 2019) (INCOMPAS Comments) (describing attestation challenges for enterprise providers); Telnix, LLC Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 1-2 (rec. July 24, 2019) (Telnix Comments) (describing challenges posed by small providers using dynamic least-cost routing).

<sup>119</sup> See, e.g., CCA Comments at 5; INCOMPAS Comments at 6, 13; Telnix Comments at 1-2.

<sup>120</sup> See *ATIS/SIP Forum Standard*, § 5.2.3, at 8-9. To provide “full” or “A” attestation, the voice service provider must be able to confirm the identity of the subscriber making the call, and that the subscriber is using its associated telephone number. See *ATIS/SIP Forum Standard*, § 5.2.3, at 8-9.

<sup>121</sup> See IETF, *STIR Certificate Delegation*, Draft, at 3 (2019), <https://tools.ietf.org/html/draft-ietf-stir-cert-delegation-01>.

<sup>122</sup> See IETF, *STIR Certificate Delegation*, Draft (2019), <https://tools.ietf.org/html/draft-ietf-stir-cert-delegation-01> (draft standards for proposed “certificate delegation” solution for certain unique use cases); see also ATIS SIP Forum IPNNI Joint Task Force, *Study of Full Attestation Alternatives for Enterprises and Business Entities with Multi-Homing and Other Arrangements*, Draft § 8 (2019), [https://access.atis.org/apps/group\\_public/download.php/48148/IPNNI-2019-00071R002.docx](https://access.atis.org/apps/group_public/download.php/48148/IPNNI-2019-00071R002.docx) (analyzing different use cases); SIP Forum, SIPNOC 2019 Overview, <https://www.sipforum.org/news-events/sipnoc-2019-overview> (last visited Feb. 6, 2020) (including multiple presentations and speakers on solutions to incorporate enterprise use cases into the STIR/SHAKEN framework). We will continue to monitor industry progress towards solutions to these issues.



resource . . . to delegate a credential that could be used to sign calls regardless of which network or administrative domain handles the outbound routing for the call.”<sup>123</sup> Further, granting a delay until standards bodies address every possible issue would risk creating an incentive for some parties to draw out standards-setting processes, to the detriment of widespread STIR/SHAKEN implementation. In any event, the TRACED Act requires that voice service providers implement the STIR/SHAKEN framework in their IP networks and so the point is moot.

30. Second, we disagree with Competitive Carriers Association’s argument that adopting a STIR/SHAKEN mandate would “risk impeding development of other potential new strategies to block robocalls”<sup>124</sup> The STIR/SHAKEN framework is one important solution that should be part of an arsenal of effective remedies to combat robocalls, and its implementation does not preclude voice service providers from pursuing additional solutions. Further, consistent with Congress’s direction in the TRACED Act, we will plan to revisit our caller ID authentication rules periodically to ensure that they remain up to date.<sup>125</sup>

31. Finally, we disagree with ACA Connects’ suggestion that we limit our implementation mandate to only those voice service providers that originate large volumes of illegal robocalls.<sup>126</sup> ACA Connects fails to account for the importance of network-wide implementation to the effectiveness of STIR/SHAKEN in reducing spoofed robocalls. Moreover, it fails to explain how we would identify or define such carriers or how such a scheme would stop malicious callers from simply using a different voice service provider.

### **1. STIR/SHAKEN Implementation Requirements**

32. We adopt our proposal in the *2019 Further Notice* to require voice service providers to implement the STIR/SHAKEN framework. Specifically, we require all originating and terminating voice service providers to fully implement STIR/SHAKEN on the portions of their voice networks that support the transmission of SIP calls and exchange calls with authenticated caller ID information with the providers with which they interconnect. This STIR/SHAKEN mandate will create the trust ecosystem necessary for effective caller ID authentication.

33. As part of today’s mandate, we adopt the following three requirements: (i) a voice service provider that originates a call that exclusively transits its own network must authenticate and verify the caller ID information in accordance with the STIR/SHAKEN authentication framework; (ii) a voice service provider originating a call that it will exchange with another voice service provider or intermediate provider must authenticate the caller ID information in accordance with the STIR/SHAKEN authentication framework and, to the extent technically feasible, transmit that caller ID information with authentication to the next provider in the call path; and (iii) a voice service provider terminating a call with authenticated caller ID information it receives from another provider must verify that caller ID information in accordance with the STIR/SHAKEN authentication framework. We discuss these requirements below.

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<sup>123</sup> IETF, *STIR Certificate Delegation*, Draft, at 4 (2019), <https://tools.ietf.org/html/draft-ietf-stir-cert-delegation-01>; see also Numeracle, Inc. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 3 (rec. July 24, 2019) (Numeracle Comments) (“Using delegated certificates in conjunction with SHAKEN/STIR not only provides protected identity header information regarding the entity behind the call, it also creates a secure way to prevent critical calls numbers from being spoofed.”); Telnyx Comments at 3 (“Telnyx has been working on a solution with subject matter experts that would modify the proposed delegate certificate framework to allow large enterprises to apply directly for certificate authorization from the STI-PA and attest to calls they or their end users originate.”).

<sup>124</sup> CCA Comments at 4-5; see also ACA Connects Reply at 2 (stating that “a mandate would more likely frustrate than advance the deployment of robust solutions that protect voice customers from spoofed calls”).

<sup>125</sup> See TRACED Act § 4(b)(4).

<sup>126</sup> ACA Connects Reply at 4.

34. First, a voice service provider must authenticate and verify, in accordance with the STIR/SHAKEN authentication framework, the caller ID information of those calls that it originates and terminates exclusively in the IP portions of its own network. The most effective caller ID authentication system requires the application of STIR/SHAKEN to all calls, including calls solely originating and terminating on the same voice service provider's network.

35. Our next two requirements relate to the exchange of caller ID authentication information. In the *2019 Further Notice*, we sought comment on whether we should “require providers to sign calls on an intercarrier basis.”<sup>127</sup> The record demonstrated support for this approach,<sup>128</sup> and we add specificity by outlining particular obligations on voice service providers for this requirement. More specifically, a voice service provider that originates a call which it will exchange with another voice service provider or intermediate provider must use an authentication service and insert the Identity header in the SIP INVITE and thus authenticate the caller ID information in accordance with the STIR/SHAKEN authentication framework; it further must transmit that call with authentication to the next voice service provider or intermediate provider in the call path, to the extent technically feasible. Additionally, a voice service provider that terminates a call with authenticated caller ID information it receives from another voice service provider or intermediate provider must use a verification service, which uses a public key to review the information stored in the Identity header to verify that caller ID information in accordance with the STIR/SHAKEN authentication framework. These actions are at the core of an effective STIR/SHAKEN ecosystem, and each action requires the other: A terminating voice service provider can only verify caller ID information that has been authenticated by the originating voice service provider and transmitted with authentication,<sup>129</sup> while an originating voice service provider's authentication has little value if the terminating voice service provider fails to verify that caller ID information.

36. *Definitions and Scope.* For purposes of the rules we adopt today, and consistent with the TRACED Act, we define “STIR/SHAKEN authentication framework” as “the secure telephone identity revisited and signature-based handling of asserted information using tokens standards.”<sup>130</sup> For purposes of compliance with this definition, we find that it would be sufficient to adhere to the three ATIS standards that are the foundation of STIR/SHAKEN—ATIS-1000074, ATIS-1000080, and ATIS-1000084—and all documents referenced therein.<sup>131</sup> We recognize that industry is actively working to improve STIR/SHAKEN. Compliance with the most current versions of these three standards as of March 31, 2020, including any errata,<sup>132</sup> represents the minimum requirement to satisfy our rules. ATIS

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<sup>127</sup> *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4900, para. 76.

<sup>128</sup> See T-Mobile USA, Inc. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 11 (rec. July 24, 2019) (T-Mobile Comments) (arguing that any implementation mandate should also require “complet[ing] implementation protocols with at least one large provider”); Verizon Comments at 2 (explaining that it “can only validate the Caller ID of an incoming call for its customer if the provider that originated the call has also implemented STIR/SHAKEN”); Verizon Reply Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 3 (rec. Aug. 23, 2019) (Verizon Reply); see also *ATIS/SIP Forum Standard* at 3.

<sup>129</sup> See Sprint Corp. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 6 (rec. July 24, 2019) (Sprint Comments); Verizon Reply Comments at 3.

<sup>130</sup> See TRACED Act § 4(a)(1).

<sup>131</sup> See *ATIS/SIP Forum Standard*; Joint ATIS/SIP Forum Standard -Signature-Based Handling of Asserted Information Using toKENs (SHAKEN): Governance Model and Certificate Management, ATIS-1000080 (2017), [https://access.atis.org/apps/group\\_public/download.php/46769/ATIS-1000080-E.zip](https://access.atis.org/apps/group_public/download.php/46769/ATIS-1000080-E.zip); Joint ATIS/SIP Forum Standard -Technical Report on Operational and Management Considerations for SHAKEN STI Certification Authorities and Policy Administrators, ATIS-1000084 (2018), [https://access.atis.org/apps/group\\_public/download.php/46529/ATIS-1000084-E.zip](https://access.atis.org/apps/group_public/download.php/46529/ATIS-1000084-E.zip).

<sup>132</sup> See Joint ATIS/SIP Forum Standard -Errata on ATIS Standard on Signature-based Handling of Asserted information using toKENs (SHAKEN), ATIS-1000074-E (2019), [https://access.atis.org/apps/group\\_public/download.php/46770/ATIS-1000074-E.zip](https://access.atis.org/apps/group_public/download.php/46770/ATIS-1000074-E.zip); Joint ATIS/SIP Forum

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and the SIP Forum conceptualized ATIS-1000074 as “provid[ing] a baseline that can evolve over time, incorporating more comprehensive functionality and a broader scope in a backward compatible and forward looking manner.”<sup>133</sup> We intend for our rules to provide this same room for innovation, while maintaining an effective caller ID authentication ecosystem. Voice service providers may incorporate any improvements to these standards or additional standards into their respective STIR/SHAKEN authentication frameworks, so long as any changes or additions maintain the baseline call authentication functionality exemplified by ATIS-1000074, ATIS-1000080, and ATIS-1000084.

37. For purposes of our rules, we also adopt a definition of “voice service” that aligns with the TRACED Act. The TRACED Act employs a broad definition of “voice service” that includes “without limitation, any service that enables real-time, two-way voice communications, including any service that requires internet protocol-compatible customer premises equipment . . . and permits out-bound calling, whether or not the service is one-way or two-way voice over internet protocol.”<sup>134</sup> The TRACED Act definition is limited, however, to service “that is interconnected with the public switched telephone network and that furnishes voice communications *to an end user*.”<sup>135</sup> Thus, the rules we adopt today apply to originating and terminating voice service providers and exclude intermediate providers.

38. In recognition of the fact that STIR/SHAKEN is a SIP-based solution,<sup>136</sup> we limit application of the rules we adopt today to only the IP portions of voice service providers’ networks—those portions that are able to initiate, maintain, and terminate SIP calls. This approach is consistent with section 4(b)(1)(A) of the TRACED Act, which directs us to require implementation of STIR/SHAKEN “in the internet protocol networks of the provider of voice service.” We agree with commenters that it would be inappropriate to simply extend the mandate we adopt to non-IP networks.<sup>137</sup>

39. We adopt the proposal from the *2019 Further Notice* that our implementation mandate apply to all types of “voice service providers—wireline, wireless, and Voice over Internet Protocol (VoIP) providers.”<sup>138</sup> For STIR/SHAKEN to be successful, all voice service providers capable of implementing the framework must participate.<sup>139</sup> If a subset of voice service providers continue operating on IP networks without implementing STIR/SHAKEN, it will undercut the framework’s effectiveness.<sup>140</sup> Congress demonstrated its recognition of this fact when it adopted a broad definition of “voice service” in the TRACED Act, which includes “any service that is interconnected with the public switched telephone network and that furnishes voice communications to an end user using resources from the North

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Standard -Signature-Based Handling of Asserted Information Using toKENs (SHAKEN): Governance Model and Certificate Management, ATIS-1000080.v002 (2019),

[https://access.atis.org/apps/group\\_public/download.php/50027/ATIS-1000080.v002.pdf](https://access.atis.org/apps/group_public/download.php/50027/ATIS-1000080.v002.pdf); Joint ATIS/SIP Forum Standard -Errata to ATIS Technical Report on Operational and Management Considerations for SHAKEN STI Certification Authorities and Policy Administrators, ATIS-1000084-E (2019), [https://access.atis.org/apps/group\\_public/download.php/46529/ATIS-1000084-E.zip](https://access.atis.org/apps/group_public/download.php/46529/ATIS-1000084-E.zip).

<sup>133</sup> See *ATIS/SIP Forum Standard* at 1.

<sup>134</sup> TRACED Act § 4(a)(2)(B).

<sup>135</sup> *Id.* § 4(a)(2)(A) (emphasis added).

<sup>136</sup> See *ATIS/SIP Forum Standard* at 1.

<sup>137</sup> See NTCA Comments at 7-9; USTelecom Comments at 3-4; WTA –Advocates for Rural Broadband (WTA) Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 2-3 (rec. July 24, 2019) (WTA Comments).

<sup>138</sup> *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4900, para. 75. This includes both two-way and one-way interconnected VoIP providers. See TRACED Act § 4(a)(2)(B) (extending the mandate to VoIP providers “whether or not the service is one-way or two-way voice over internet protocol”).

<sup>139</sup> See AT&T Comments at 4 n.8; Sprint Comments at 6-7; Verizon Comments at 1-2.

<sup>140</sup> See Verizon Comments at 2; AT&T Comments at 21 (citing to the 2018 Senate testimony of Adrian Abramovich for the idea that there are VoIP providers in the U.S. generating robocall traffic).

American Numbering Plan.”<sup>141</sup> We find that our conclusion to apply the mandate to a broad category of voice service providers is consistent with Congress’s language in the TRACED Act.

40. Finally, we clarify that the rules we adopt today do not apply to providers that lack control of the network infrastructure necessary to implement STIR/SHAKEN.<sup>142</sup>

41. *Implementation Deadline.* We set the implementation deadline of June 30, 2021 for two reasons. First, it is consistent with the TRACED Act, which requires us to set a deadline for implementation of STIR/SHAKEN that is not later than 18 months after enactment of the Act, *i.e.*, no later than June 30, 2021.<sup>143</sup> Second, this deadline will provide sufficient time for us to implement, and for voice service providers to gain, a meaningful benefit from the implementation exemption and extension mechanisms established by the TRACED Act.<sup>144</sup> Because we find that this implementation deadline is necessary to accommodate the various exemption and extension mechanisms established by the TRACED Act, we decline to adopt the suggestion of some commenters that we mandate implementation by June 1, 2020.<sup>145</sup>

## 2. Legal Authority

42. We conclude that section 251(e) of the Communications Act of 1934, as amended (the Act), provides authority to mandate the adoption of the STIR/SHAKEN framework in the IP portions of voice service providers’ networks.<sup>146</sup> Section 251(e) provides us “exclusive jurisdiction over those portions of the North American Numbering Plan that pertain to the United States.”<sup>147</sup> Pursuant to this

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<sup>141</sup> TRACED Act § 4(a)(2)(A). This includes, “without limitation, any service that enables real-time, two-way voice communications, including any service that requires internet protocol-compatible customer premises equipment (commonly known as ‘CPE’) and permits out-bound calling, whether or not the service is one-way or two-way voice over internet protocol.” *Id.* at § 4(a)(2)(B).

<sup>142</sup> See TracFone Wireless, Inc. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 1-3 (July 24, 2019).

<sup>143</sup> TRACED Act § 4(b)(1)(A).

<sup>144</sup> TRACED Act §§ 4(b)(2), (b)(5)(A).

<sup>145</sup> See Consumer Reports et al. Comments at 3. As we note in the accompanying Further Notice, the TRACED Act contemplates compliance extensions and exemptions for those providers that we determine meet certain criteria by December 30, 2020. We see no way to square this statutory requirement with imposition of a mandate six months before that date.

<sup>146</sup> The Commission has previously concluded that its numbering authority allows it to extend numbering-related requirements to interconnected VoIP providers that use telephone numbers. See *Numbering Policies for Modern Communications et al.*, WC Docket Nos. 13-97 et al., Report and Order, 30 FCC Rcd 6839, 6878, para. 78 (2015) (*VoIP Direct Access Order*); see also *IP-Enabled Services et al.*, WC Docket No. 04-36, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245, 10265, para. 33 (2005); *Telephone Number Requirements for IP-Enabled Services Providers et al.*, WC Docket Nos. 07-243 et al., Report and Order, Declaratory Ruling, Order on Remand, and Notice of Proposed Rulemaking, 22 FCC Rcd at 19531, 19543, para. 22 (2007). As the Commission has explained, “the obligation to ensure that numbers are available on an equitable basis is reasonably understood to include not only how numbers are made available but to whom, and on what terms and conditions. Thus, we conclude that the Commission has authority under section 251(e)(1) to extend to interconnected VoIP providers both the rights and obligations associated with using telephone numbers.” See *VoIP Direct Access Order*, 30 FCC Rcd at 6878, para. 78; see also *id.* at 6879, para. 80 (finding that “[n]othing in section 251(e) restricts the Commission’s jurisdiction to telecommunications carriers”).

<sup>147</sup> See 47 U.S.C. § 251(e); see also *Call Authentication NOI*, 32 FCC Rcd at 6001, para. 48; *Advanced Methods to Target and Eliminate Unlawful Robocalls*, CG Docket No. 17-59, Second Notice of Inquiry, 32 FCC Rcd 6007, 6009-10, para. 7 (2017) (“Section 251(e)(1) of the [Act], gives the Commission plenary authority over that portion of the North American Numbering Plan (NANP) that pertains to the United States and the Commission has authority to set policy on all facets of numbering administration in the United States.”) (citing *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996 et al.*, CC Docket No. 96-98 et al., Second Report

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provision, we retain “authority to set policy with respect to all facets of numbering administration in the United States.”<sup>148</sup> Our exclusive jurisdiction over numbering policy enables us to act flexibly and expeditiously with regard to important numbering matters.<sup>149</sup> When bad actors unlawfully falsify or spoof the caller ID that appears on a subscriber’s phone, they are using numbering resources to advance an illegal scheme. Mandating that voice service providers deploy the STIR/SHAKEN framework will help to prevent the fraudulent exploitation of North American Numbering Plan (NANP) resources by permitting those providers and their subscribers to identify when caller ID information has been spoofed. Section 251(e) thus grants us authority to mandate that voice service providers implement the STIR/SHAKEN caller ID authentication framework in order to prevent the fraudulent exploitation of numbering resources.<sup>150</sup> Moreover, as the Commission has previously found, section 251(e) extends to “the use of . . . unallocated and unused numbers”; it thus gives us authority to mandate that voice service providers implement the STIR/SHAKEN framework to address the spoofing of unallocated and unused numbers.<sup>151</sup> In the *2019 Further Notice*, we proposed to rely on section 251(e) of the Act for authority to mandate implementation of caller ID authentication technology and, specifically, the STIR/SHAKEN framework;<sup>152</sup> no commenter challenged that proposal.<sup>153</sup>

43. The TRACED Act confirms our authority to mandate the adoption of the STIR/SHAKEN framework in the IP portions of voice service providers’ networks. Indeed, the TRACED Act expressly directs us to require voice service providers to implement the STIR/SHAKEN framework in the IP portions of their networks no later than 18 months after the date of the Act’s enactment.<sup>154</sup> The TRACED Act thus provides a second clear source of authority for the rules we adopt today.

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and Order and Memorandum Opinion and Order, 11 FCC Rcd 19392, 19512, para. 271 (1996) (*Local Competition Second Report and Order*)).

<sup>148</sup> *Local Competition Second Report and Order*, 11 FCC Rcd at 19512, para. 271.

<sup>149</sup> *See Local Competition Second Report and Order*, 11 FCC Rcd at 19512, para. 271.

<sup>150</sup> The Commission has previously concluded that its numbering authority allows it to extend numbering-related requirements to interconnected VoIP providers that use telephone numbers. *See Numbering Policies for Modern Communications et al.*, WC Docket Nos. 13-97 et al., Report and Order, 30 FCC Rcd 6839, 6878, para. 78 (2015) (*VoIP Direct Access Order*); *see also IP-Enabled Services et al.*, WC Docket No. 04-36, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245, 10265, para. 33 (2005); *Telephone Number Requirements for IP-Enabled Services Providers et al.*, WC Docket Nos. 07-243 et al., Report and Order, Declaratory Ruling, Order on Remand, and Notice of Proposed Rulemaking, 22 FCC Rcd 19531, 19543, para. 22 (2007). As the Commission has explained, “the obligation to ensure that numbers are available on an equitable basis is reasonably understood to include not only how numbers are made available but to whom, and on what terms and conditions. Thus, we conclude that the Commission has authority under section 251(e)(1) to extend to interconnected VoIP providers both the rights and obligations associated with using telephone numbers.” *VoIP Direct Access Order*, 30 FCC Rcd at 6878, para. 78; *see also id.* at 6879, para. 80 (finding that “[n]othing in section 251(e) restricts the Commission’s jurisdiction to telecommunications carriers”).

<sup>151</sup> *See 2017 Call Blocking Report and Order and Further Notice*, 32 FCC Rcd at 9727, para. 62. The Commission previously relied on this authority to make clear that voice service providers may block calls that spoof invalid, unallocated, or unused numbers, none of which can actually be used to originate a call. *See id.*

<sup>152</sup> *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4903, para. 86.

<sup>153</sup> We note, however, that because STIR/SHAKEN implementation is not a “numbering administration arrangement,” section 251(e)(2), which provides that “[t]he cost of establishing telecommunications numbering administration arrangements . . . shall be borne by all telecommunications carriers on a competitively neutral basis,” does not apply here. 47 U.S.C. § 251(e)(2). Even if section 251(e)(2) did apply, we find that it is satisfied by our requirement that each carrier bear its own costs, since each carrier’s costs will be proportional to the size and quality of its network.

<sup>154</sup> *See TRACED Act* § 4(b)(1)(A).

44. Finally, we note that Congress charged us with prescribing regulations to implement the Truth in Caller ID Act, which made unlawful the spoofing of caller ID information “in connection with any telecommunications service or IP-enabled voice service . . . with the intent to defraud, cause harm, or wrongfully obtain anything of value.”<sup>155</sup> Given the constantly evolving tactics by malicious callers to use spoofed caller ID information to commit fraud, we find that the rules we adopt today are necessary to enable voice service providers to help prevent these unlawful acts and to protect voice service subscribers from scammers and bad actors. Thus, section 227(e) provides additional independent authority for these rules.<sup>156</sup>

## **B. Summary of Costs and Benefits**

45. We are convinced that the benefits of requiring STIR/SHAKEN implementation far outweigh the costs, even if adoption of the TRACED Act makes a comprehensive cost-benefit analysis of a STIR/SHAKEN implementation mandate unnecessary. Because STIR/SHAKEN is a part of a broader set of technological and regulatory efforts necessary to address illegal calls,<sup>157</sup> and its limited deployment makes it difficult to measure its full effects at this time, we compare the estimated costs of implementing STIR/SHAKEN to the overall foreseeable range of quantifiable and non-quantifiable benefits of eliminating illegal calls, recognizing that STIR/SHAKEN is necessary but not, alone, a solution to the problem.<sup>158</sup> These benefits include reduction in nuisance calls, increased protection from illegally spoofed calls restoration of consumer confidence in incoming calls, fewer robocall-generated disruptions of healthcare and emergency communications, reduction in regulatory enforcement costs, and reduction in provider costs. We conclude that, based on any plausible assumption about the scope of illegal calls deterred by STIR/SHAKEN, the foreseeable benefits of STIR/SHAKEN implementation—including reduction in calls that cost Americans billions of dollars each year—will far exceed estimated implementation and initial annual recurring operating costs of between \$280 million to \$750 million. It is implausible that total implementation costs will come close to the expected benefits of our actions. For example, broad industry support for deploying STIR/SHAKEN strongly indicates that the benefits to industry alone outweigh implementation costs, even before considering the benefits to consumers of implementation.<sup>159</sup>

### **1. Expected Benefits**

46. We supplement our estimate of the benefits of eliminating illegal and unwanted robocalls in the *2019 Further Notice* with additional data. Consistent with our earlier conclusion, we find that the

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<sup>155</sup> 47 U.S.C. § 227(e)(1); *see* 47 CFR § 64.1604(a).

<sup>156</sup> While we sought comment in the *2019 Robocall Declaratory Ruling and Further Notice* on the applicability of sections 201(b) and 202(a) as sources of authority, we did so in the context of adopting rules to create a safe harbor for certain call-blocking programs and requiring voice service providers that offer call-blocking programs to maintain a Critical Calls List. *See 2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4903, paras. 84-85. Because we did not seek comment in that item on whether these provisions grant the Commission authority to mandate caller ID authentication, and specifically STIR/SHAKEN, we do not rely on them here as sources of authority.

<sup>157</sup> USTelecom Comments at 2 (stating that “while the SHAKEN/STIR framework is not a silver bullet, it is an important tool in the robocall prevention toolbox that will help end illegal robocall campaigns by identifying the source of illegal robocalls which will greatly assist in traceback efforts”); West Telecom Reply at 4-5 (noting that “a successful SHAKEN/STIR framework cannot in itself be a complete solution to solving illicit robocall problems”).

<sup>158</sup> AT&T Comments at 15; Consumer Reports Comments at 1; NTCA Comments at 12-13; West Telecom Reply at ii; TNS Comments at 14-15.

<sup>159</sup> *See generally* AT&T Comments at 4-5 (noting that “AT&T helped to developed the SHAKEN/STIR protocols”); CTIA Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 2 (rec. July 24, 2019) (CTIA Comments) (stating “voice service providers have led the way in developing and deploying SHAKEN/STIR”); T-Mobile Comments at 3 (indicating it was the “first wireless provider to implement STIR/SHAKEN”).

deployment requirements set forth in this Report and Order will be integral to solving illegal robocall spoofing specifically and illegal robocalling generally.

47. *Eliminating Nuisance.* In the 2019 *Further Notice*, we estimated benefits of at least \$3 billion from eliminating illegal scam robocalls. That estimate assumed a benefit of ten cents per call and multiplied it across a figure of 30 billion illegal scam robocalls per year, derived from third-party data.<sup>160</sup> We also sought comment on this \$3 billion estimate and concluded that “most of these benefits can be achieved . . . primarily because SHAKEN/STIR will inform providers of the call’s true origination.”<sup>161</sup> We received no comment on this conclusion.<sup>162</sup> We agree with commenters that STIR/SHAKEN is one important part of a broader set of tools to solve illegal robocalls.<sup>163</sup> We thus reaffirm our finding that the potential benefits resulting from eliminating the wasted time and nuisances caused by illegal scam robocalls will exceed \$3 billion annually.

48. *Reducing Fraud.* Fraudulent robocall schemes cost Americans an estimated \$10.5 billion annually, according to a third-party survey.<sup>164</sup> A recent civil action filed by the U.S. Department of Justice against five VoIP carriers identifies several examples of fraud where consumers individually lost between \$700 and \$9,800 in a single instance.<sup>165</sup> While STIR/SHAKEN will not itself stop a malicious party from using the voice network to commit fraud, it will inform a call recipient that the caller has used deceptive caller ID information to try to convince the called party to answer the phone. Many commenters noted value in pairing STIR/SHAKEN with call analytics,<sup>166</sup> and we expect this will significantly reduce the effectiveness of spoofing fraud that costs Americans billions of dollars each year, and similarly reduce the incidence of such fraud.

49. *Restoring Confidence in Caller ID Information.* STIR/SHAKEN implementation and other efforts to minimize illegal robocalls will begin to restore trust in caller ID information and make call recipients more likely to answer the phone. Declines in willingness to answer incoming calls in recent years have harmed businesses, healthcare providers, and non-profit charities.<sup>167</sup> Such organizations likely

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<sup>160</sup> 2019 *Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4889, para. 40. Ten cents per call was used as a conservative estimate. *See id.*

<sup>161</sup> *See 2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4902, para. 81.

<sup>162</sup> In its comments, Smithville Telephone Company states that a \$3 billion benefit amounts to 55 cents per voice line per month (calculated by dividing the \$3 billion benefit by 456 million retail voice telephone service connections based on the FCC’s Voice Telephone Services Status as of June 30, 2017), and questions whether such benefit is enough to drive this decision. Smithville Telephone Co. Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 6 (rec. Aug. 23, 2019) (Smithville Reply). The estimate of 30 billion scam calls consists of an estimated 47% of all robocalls. If the average line receives approximately 5 to 6 scam calls per month, Smithville’s calculation is consistent with our previous estimate. Our burden is to determine that benefits exceed costs, and we find that the benefits of implementing STIR/SHAKEN far exceed the costs.

<sup>163</sup> USTelecom Comments at 2; West Telecom Reply at 4-5.

<sup>164</sup> Kim Fai Kok, *Truecaller Insights: Phone Scams Cause Americans to Lose \$10.5 Billion in Last 12 Months Alone*, Truecaller (April 17, 2019), <https://truecaller.blog/2019/04/17/truecaller-insights-2019-us-spam-phone-scam-report/>. To reach \$10.5 billion, Truecaller multiplied the 17% of survey respondents who reported losing money in a scam during the past 12 months by the 2018 U.S. Census adult population estimate of 253 million. The estimated 43 million phone scam victims was then multiplied by the average loss of \$244.

<sup>165</sup> Decl. of Samuel Bracken at paras. 7, 11, *United States v. Palumbo*, No. 20-473 (E.D.N.Y. Jan. 28, 2020).

<sup>166</sup> Sprint Comments at 7-8 (stating the “best use of SHAKEN/STIR information is to be a data input into a call analytics algorithm . . . to make an informed determination of whether a call is illegal or not). *See, e.g.,* Comcast Comments at 7-8; Letter from Deirdre Menard, CEO, LucidTech, LLC, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97, at 2 (filed June 20, 2019) (LucidTech *Ex Parte*).

<sup>167</sup> For example, utility companies often call to confirm installation appointments, “[b]ut if the customer doesn’t answer the phone for the appointment reminder and the truck shows up when they’re not there, by one estimate,

(continued....)

will benefit because recipients should be more likely to answer their phones if caller ID information is authenticated. Furthermore, while we do not adopt any display mandates in this item, we anticipate that voice service providers will implement voluntary efforts to restore confidence in caller ID information. Studies conducted by Cequent indicate that including additional caller ID information (e.g., showing a business logo along with caller ID information on a smartphone display to convey legitimacy) increased pick up rates from 21% to 71%.<sup>168</sup> Such information will enhance the benefits achieved by STIR/SHAKEN implementation.

50. *Ensuring Reliable Access to Emergency and Healthcare Communications.* Implementing STIR/SHAKEN will lead to fewer disruptions of healthcare and emergency communication systems that needlessly put lives at risk. Hospitals and 911 dispatch centers have reported that robocall surges have disabled or disrupted their communications network, and such disruptions have the potential to impede communications in life-or-death emergency situations. In one instance, Tufts Medical Center in Boston received more than 4,500 robocalls in a two-hour period.<sup>169</sup> In another, the phone lines of several 911 dispatch centers in Tarrant County, Texas, were disabled because of an hour long surge in robocalls.<sup>170</sup> Enabling voice service providers to more effectively identify illegal calls, including spoofed calls, to healthcare and emergency communication systems should reduce the risk of such situations. The benefit to public safety will be considerable.

51. *Reducing Costs to Voice Service Providers.* An overall reduction in robocalls will “greatly lower network costs by eliminating unwanted traffic and by eliminating the labor costs of handling numerous customer complaints.”<sup>171</sup> Illegal robocalls have led to unnecessary network congestion with broader possible impacts than the targeted disruption of healthcare and emergency operations described above.<sup>172</sup> We agree with Comcast’s assessment that “the ability to identify and address illegally spoofed robocalls using STIR/SHAKEN will help reduce network costs for voice service providers.”<sup>173</sup> Voice service providers should also realize cost savings through the reduced need for customer service regarding illegal calls.<sup>174</sup> We find that the overall benefit of these anticipated cost savings will be substantial and represent a long-term reduction in provider costs attributable to

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that’s a \$150 cost.” Tim Harper, *Why Robocalls Are Even Worse Than You Thought*, Consumer Rep. (May 15, 2019), <https://www.consumerreports.org/robocalls/why-robocalls-are-even-worse-than-you-thought>. Similarly, medical providers have indicated that patients often fail to answer scheduling calls from specialists’ offices and eventually the office will give up after repeated attempts. *Id.* Donations to charities have also declined as a result of the decreased likelihood of answering the phone. *Id.*

<sup>168</sup> TNS Comments Ex. 1 at 15.

<sup>169</sup> Tony Romm, *Robocalls Are Overwhelming Hospitals and Patients, Threatening a New Kind of Health Crisis*, Wash. Post (June 17, 2019), <https://www.washingtonpost.com/technology/2019/06/17/robocalls-are-overwhelming-hospitals-patients-threatening-new-kind-health-crisis/>.

<sup>170</sup> Nick Wingfield, *Swindlers Use Telephones, with Internet’s Tactics*, N.Y. Times (Jan. 20, 2014), <https://www.nytimes.com/2014/01/20/technology/swindlers-use-telephones-with-internets-tactics.html>. In 2018, the Commission imposed a \$120 million penalty for an illegal robocall campaign that disrupted an emergency medical paging service. *See Adrian Abramovich, Marketing Strategy Leaders, Inc., and Marketing Leaders, Inc.*, File No. EB-TCD-15-00020488, Forfeiture Order, 33 FCC Rcd 4663, 4663, para. 1 (2018).

<sup>171</sup> *2019 Robocall Declaratory Ruling and Further Notice* at 4902, para. 81. We treat these anticipated reductions in cost as a benefit to providers in order to limit our analysis of expected costs to those for implementation and operation.

<sup>172</sup> *2019 Robocall Declaratory Ruling and Further Notice* at 4889, para. 39.

<sup>173</sup> Comcast Comments at 10. One commenter argues that this benefit may be realized by larger providers more than smaller providers, Smithville Reply at 7, and we acknowledge that the benefits of changes in network capacity will vary by provider.

<sup>174</sup> *See* ITTA Reply at 21; Smithville Reply at 7.



STIR/SHAKEN. Voice service providers may pass on the cost savings to subscribers in the form of lower prices, resulting in additional benefit to their subscribers.

52. *Reducing Spending on Enforcement Actions.* Broad STIR/SHAKEN implementation will both reduce the need for enforcement against illegally spoofed robocalls and make continued enforcement less resource intensive. The Commission has brought at least six enforcement actions against apparently liable actors for illegally spoofing caller ID,<sup>175</sup> and issued 38 warning citations for violations of the Truth in Caller ID Act or the Telephone Consumer Protection Act.<sup>176</sup> The Federal Trade Commission has taken 145 enforcement actions against companies for Do Not Call Registry violations,<sup>177</sup> and 25 other federal, state, and local agencies brought 87 enforcement actions as part of a single 2019 initiative.<sup>178</sup> By reducing overall numbers of robocalls and providing additional information for enforcement, industry-wide implementation of STIR/SHAKEN will save resources at federal, state, and local agencies. While we do not quantify these savings, we believe they add to the benefits of STIR/SHAKEN implementation that will accrue.

## 2. Expected Costs

53. Implementation costs for STIR/SHAKEN will vary depending on a voice service provider's existing network configuration. Commenters indicated that voice service providers will incur ongoing costs in addition to one-time implementation costs, such as those for authentication and verification service.<sup>179</sup> Estimated one-time costs include software and hardware upgrades to network elements such as session border controllers, as well as connectivity and network configuration changes, depending on current network configuration. Recurring annual costs will include fees associated with authenticating and verifying calls, plus certificate fees. Based on estimates discussed by panelists at the Commission's July 2019 SHAKEN/STIR Robocall Summit and in confidential filings submitted in the record, FCC staff estimate that each voice service provider will face average annual costs ranging from \$15,000 to \$300,000 for implementing and operating STIR/SHAKEN.<sup>180</sup> We estimate the approximately 2,500 voice service providers together would initially spend between roughly \$280 million and \$750 million annually.<sup>181</sup> We anticipate that voice service providers may be able to streamline their costs over time. Additionally, this estimate likely overstates costs because non-IP portions of the network are not included in the requirements we adopt today. We also recognize that voice service providers may choose different solutions and these choices will result in different implementation and operating costs.<sup>182</sup>

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<sup>175</sup> FCC Consumer and Governmental Affairs Bureau, Report on Robocalls at 11 (2019), <https://docs.fcc.gov/public/attachments/DOC-356196A1.pdf>.

<sup>176</sup> *Id.* at 10.

<sup>177</sup> FTC, *FTC, Law Enforcement Partners Announce New Crackdown on Illegal Robocalls*, <https://www.ftc.gov/news-events/press-releases/2019/06/ftc-law-enforcement-partners-announce-new-crackdown-illegal>.

<sup>178</sup> *Id.*

<sup>179</sup> NTCA Comments at 9; ITTA Reply at 21.

<sup>180</sup> *SHAKEN/STIR Robocall Summit* at 3:28:35 (Jul. 11, 2019), <https://www.fcc.gov/SHAKENSTIRSummit> (Panelists affirmed estimates of implementation costs in the range of “\$100,000 or tens of thousands to hundreds of thousands to upgrade and \$100,000 per year to operate” in response to a question from Eric Burger, Former FCC Chief Technologist, seeking confirmation of previously discussed estimates); Letter from John Ayers, VP Govt Affairs, First Orion Corp., to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97, Attach. A (filed Feb. 13, 2020); Letter from Joseph Weeden, VP, Product Management, Metaswitch, to Marlene H. Dortch, Secretary, FCC, GC Docket No. 17-59, WC Docket No. 17-97, at 2 (filed Feb. 14, 2020).

<sup>181</sup> Approximately 2,500 companies offered mobile voice or fixed voice service in December 2017. *See* FCC, *Form 477 Filers by State*, <https://www.fcc.gov/general/form-477-filers-state-0>.

<sup>182</sup> For example, voice service providers choosing to directly implement STIR/SHAKEN will likely face larger one-time costs than voice service providers choosing a hosted solution, which is likely to have larger recurring costs.

Moreover, we recognize that smaller voice service providers may have different costs and challenges than larger providers,<sup>183</sup> but we are confident that benefits to all Americans far exceed implementation costs.<sup>184</sup>

### C. Other Issues

54. *Display.* We are pleased by voice service providers' efforts to incorporate STIR/SHAKEN verification results in the information that they display to their customers.<sup>185</sup> Voice service providers so far are taking a variety of approaches to leveraging STIR/SHAKEN verification result information to protect their subscribers from fraudulently spoofed calls, including through display of that information.<sup>186</sup> For instance, AT&T announced that it would display a green checkmark and the words "Valid Number" to subscribers if the call has been authenticated and passed through screening.<sup>187</sup> T-Mobile announced that it would display the words "Caller Verified," on the end user's device when it has verified that the call is authentic.<sup>188</sup> Other voice service providers have not yet announced plans to display STIR/SHAKEN authentication information. Because we expect voice service providers to have marketplace incentives to make the best possible use of STIR/SHAKEN information once it is available, and because industry practices regarding display of STIR/SHAKEN verification results are in their early stages of development,<sup>189</sup> we decline at this time to require voice service providers to display STIR/SHAKEN verification results to their subscribers or mandate the specifications voice service providers must use if they choose to display.<sup>190</sup> We do not seek to prevent the market from determining

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<sup>183</sup> ITTA Reply Comments at 19 and 21. One small, rural provider, using estimates from the Commission's 2019 SHAKEN/STIR Robocall Summit, concludes that an annual recurring cost of \$100,000 will result in a cost of \$26 per line for its 319 customers. Smithville Reply at 4.

<sup>184</sup> Additionally, in the Further Notice, we propose to extend the compliance deadline for smaller voice service providers and anticipate that increased competition between vendors may result in lower prices and higher quality solutions.

<sup>185</sup> See Press Release, AT&T, AT&T Activates Call Validation Displays (Dec. 18, 2019), [https://about.att.com/story/2019/call\\_validation\\_displays.html](https://about.att.com/story/2019/call_validation_displays.html) (announcing that customers "will see a green checkmark and the words, 'Valid Number,'" if a call is verified by using STIR/SHAKEN and AT&T's own "Call Protect" engine).

<sup>186</sup> See Press Release, Comcast, AT&T, Comcast Announce Anti-Robocalling Fraud Milestone Believed to be Nation's First (Mar. 20, 2019), <https://corporate.comcast.com/press/releases/att-comcast-announce-anti-robocalling-fraud-milestone-believed-to-be-nations-first> ("[A] call that is illegally 'spoofed'—or shows a faked number—will fail the SHAKEN/STIR Caller ID verification and will not be marked as verified. By contrast, verification will confirm that a call is really coming from the identified number or entity."); T-Mobile, *T-Mobile First to Launch Caller Verification to Help Protect Customers from Scams* (Jan. 10, 2019), <https://www.t-mobile.com/news/caller-verified-note9> ("[C]ustomers see 'Caller Verified' on the incoming call screen when T-Mobile has verified that the call is authentic and not intercepted by scammers/spammers.").

<sup>187</sup> See Press Release, AT&T, AT&T Activates Call Validation Displays (Dec. 18, 2019), [https://about.att.com/story/2019/call\\_validation\\_displays.html](https://about.att.com/story/2019/call_validation_displays.html); AT&T *Ex Parte* at 2 ("AT&T has incorporated SHAKEN/STIR information into the analytics powering AT&T Call Protect, as well as AT&T's other blocking programs that target suspected illegal calls . . . Including SHAKEN/STIR information as an additional data point thus will benefit AT&T customers receiving AT&T Call Protect . . .").

<sup>188</sup> See T-Mobile, *T-Mobile First to Launch Caller Verification to Help Protect Customers from Scams* (Jan. 10, 2019), <https://www.t-mobile.com/news/caller-verified-note9>.

<sup>189</sup> See, e.g., TNS Comments at 17 ("The industry is still experimenting with display information and display formats, and there is much still to be learned regarding what information is meaningful to consumers.").

<sup>190</sup> See *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4900, para. 77 (seeking comment on whether we "should require [voice service] providers to adopt a uniform display showing consumers whether a call has been authenticated"). AARP and CUNA advocate for a display requirement but do not identify a reason for a mandate beyond merely pointing to the value of displaying verification information. See AARP Comments, CG Docket No. 17-59, at 6-7 (rec. July 24, 2019) (AARP Comments) ("AARP believes that a uniform display for call

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which form of display, if any, is most useful; instead, we seek to encourage voice service providers to find the solutions that work best for their subscribers.<sup>191</sup>

55. *Governance.* Several commenters advocate changing the governance structure. These commenters suggest we play an adjudicatory role in disputes that may arise between voice service providers,<sup>192</sup> or direct the Governance Authority to take action on specific use cases,<sup>193</sup> or change the membership requirements of the Governance Authority.<sup>194</sup>

56. We decline to impose new regulations on the STIR/SHAKEN governance structure. Stakeholders met the aggressive timeline laid out in the report issued by the North American Numbering Council (NANC),<sup>195</sup> establishing a collaborative Governance Authority and selecting the Policy Administrator by May 2019.<sup>196</sup> By December 2019, the Policy Administrator approved the first Certification Authorities,<sup>197</sup> and voice service providers were able to register with the Policy Administrator to obtain credentials necessary to receive certificates from approved Certificate Authorities.<sup>198</sup> We agree with T-Mobile that, at this time, it “is not necessary for the Commission to have a role in STIR/SHAKEN governance.”<sup>199</sup> STIR/SHAKEN is a flexible solution with an industry-led

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authentication is a good idea. Consumers may rely upon multiple voice service providers and receiving standardized call display information would improve the effectiveness of robocall blocking technology and empower consumers to make choices regarding calls that they are receiving.”); Credit Union Nat’l Ass’n Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 5 (rec. July 24, 2019) (CUNA Comments) (supporting “efforts either by industry or through FCC guidance, to develop a uniform presentation . . . [because d]ifferent treatment of the same calls will exacerbate the considerable consumer confusion that is likely to occur once this framework becomes more prevalent”). While display of verification information may be valuable, we decline to adopt a mandate on that basis because we expect the marketplace to drive display efforts, and because we anticipate that marketplace solutions will be superior to a static regulatory mandate. In December 2019, the Consumer Advisory Committee recommended that stakeholders “conduct studies and solicit input on what factors voice service providers should consider for displaying caller ID information to consumers, including . . . SHAKEN/STIR verification.” FCC Consumer Advisory Committee, Recommendation Regarding Caller ID Authentication at 3 (2019).

<sup>191</sup> See TNS Comments at 17.

<sup>192</sup> Am. Ass’n of Healthcare Admin. Mgmt. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 6 (rec. July 24, 2019) (AAHAM Comments).

<sup>193</sup> RingCentral, Inc. Comments, CG Docket No. 17-59, WC Docket No. 17-97, at 5 (rec. July 24, 2019) (RingCentral Comments).

<sup>194</sup> See Consumer Reports et al. Comments at 6.

<sup>195</sup> 2018 NANC CATA Working Group Report at 13.

<sup>196</sup> See Press Release, ATIS, Mitigating Illegal Robocalling Advances with Secure Telephone Identity Governance Authority Board’s Selection of iconectiv as Policy Administrator (May 30, 2019), <https://sites.atis.org/insights/mitigating-illegal-robocalling-advances-with-secure-telephone-identity-governance-authority-boards-selection-of-iconectiv-as-policy-administrator>.

<sup>197</sup> See Press Release, Neustar, Neustar Approved as Initial Secure Telephone Identity Certification Authority (Dec. 12, 2019), <https://www.home.neustar/about-us/news-room/press-releases/2019/neustar-approved-as-initial-secure-telephone-identity-certification-authority>; Press Release, TransNexus, TransNexus Approved by the STI Policy Administrator as a SHAKEN Certification Authority (Dec. 12, 2019), <https://transnexus.com/news/2019/transnexus-sti-ca>.

<sup>198</sup> See Press Release, ATIS, Industry Solution to Detect, Mitigate, and Deter Illegal Robocalling Passes Important Milestone (Dec. 12, 2019), <https://sites.atis.org/insights/industry-solution-to-detect-mitigate-and-deter-illegal-robocalling-passes-important-milestone>.

<sup>199</sup> T-Mobile Comments at 11.

governance system that can adapt and respond to new developments.<sup>200</sup> We do not think that our intervention in the governance structure is appropriate at this stage given that we do not know the nature and scope of the problems that may arise and industry is already working to address specific use cases. Additionally, because the Governance Authority is made up of a variety of stakeholders representing many perspectives,<sup>201</sup> we have no reason to believe it will not operate on a neutral basis.

#### IV. FURTHER NOTICE OF PROPOSED RULEMAKING

57. Building on the important steps we take in today's Report and Order, we offer proposals and seek comment on further efforts to promote caller ID authentication and implement section 4 of the TRACED Act. We also seek comment on implementing section 6(a) of the TRACED Act, which concerns access to numbering resources.

##### A. Caller ID Authentication Requirements Definitions and Scope

58. In the accompanying Report and Order, we adopted a definition of "STIR/SHAKEN authentication framework" that aligns with the statutory language of the TRACED Act.<sup>202</sup> We believe the definition we adopted of the "STIR/SHAKEN authentication framework" is sufficient for our implementation of the TRACED Act. We seek comment on this view.

59. We also adopted a definition of "voice service" in the Report and Order that aligns with the statutory language of the TRACED Act.<sup>203</sup> In section 4(a)(2) of the TRACED Act, Congress provided a definition of "voice service" that is similar, but not identical, to the preexisting definition found in section 64.1600(r) of our rules, which adopts the definition Congress provided in Section 503 of the RAY BAUM'S Act.<sup>204</sup> Both provisions define voice service as "any service that is interconnected with the public switched telephone network and that furnishes voice communications to an end user using resources from the North American Numbering Plan or any successor to the North American Numbering Plan adopted by the Commission under section 251(e)(1) of the [Act]."<sup>205</sup> In the TRACED Act, Congress included a similar definition but added a provision that "without limitation, any service that enables real-time, two-way voice communications, including any service that requires internet protocol-compatible customer premises equipment (commonly known as 'CPE') and permits out-bound calling, whether or not the service is one-way or two-way voice over internet protocol."<sup>206</sup> We seek comment on how, if at all, the scope of the TRACED Act definition varies from the section 64.1600(r) definition on the basis of the foregoing language. Should we provide further guidance on the meaning of the "without limitation" language in the TRACED Act, or is it clear as written? Looking at the two definitions as a whole, we seek comment on whether Congress intended to create two distinct definitions with different scopes or whether the similarity between the definitions means that we should harmonize our interpretations of the

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<sup>200</sup> See ATIS, *Frequently Asked Questions on SHAKEN* at 3, <https://www.atis.org/sti-ga/resources/docs/shaken-faqs.pdf> (last visited Feb. 10, 2020).

<sup>201</sup> See 2018 NANC CATA Working Group Report at 7. The current STI-GA Leadership and Board of Directors is available at <https://www.atis.org/sti-ga/leadership>.

<sup>202</sup> See TRACED Act § 4(a).

<sup>203</sup> See TRACED Act § 4(a).

<sup>204</sup> See 47 CFR § 64.1600(r) ("The term 'voice service': (1) means any service that is interconnected with the public switched telephone network and that furnishes voice communications to an end user using resources from the North American Numbering Plan or any successor to the North American Numbering Plan adopted by the Commission under section 251(e)(1); and (2) includes transmissions from a telephone facsimile machine, computer, or other device to a telephone facsimile machine."); Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, Div. P, Title V, § 503, 132 Stat. 348, 1091-94 (2018) (codified as amended in 47 U.S.C. § 227(e)) (RAY BAUM'S Act).

<sup>205</sup> TRACED Act § 4(a)(2)(B); 47 CFR § 64.1600(r).

<sup>206</sup> TRACED Act § 4(a)(2)(B)(ii).

two definitions. Additionally, we seek comment on whether the TRACED Act's definition of "voice service" should cause us to revisit our decision in the accompanying Report and Order to exempt from our rules providers that lack control of the network infrastructure necessary to implement STIR/SHAKEN.

60. Congress directed many of the requirements in the TRACED Act to "providers of voice service."<sup>207</sup> On one reading, an entity is a provider of voice service only with respect to calls that meet the definition of "voice service," *i.e.*, "provider" is defined on a call-by-call basis. On another reading, an entity that provides any voice service is always a "provider of voice service," *i.e.*, "provider" is defined on an entity-by-entity basis. We propose adopting the former interpretation. Based on this interpretation, a provider is not subject to the TRACED Act for all services simply because some fall under the TRACED Act definition of "voice service"; instead, only those services that meet the TRACED Act definition of "voice service" are subject to TRACED Act obligations. We propose this interpretation because it gives meaning to Congress's inclusion of a definition for "voice service" and appears to best comport with the TRACED Act's allocation of duties on the basis of call technology, *e.g.*, differentiating duties between calls over IP and non-IP networks. Further, we have previously used a call-by-call understanding of intermediate providers in our rules.<sup>208</sup> We seek comment on this interpretation. Should we instead read the TRACED Act to establish a status-based approach, thus capturing a provider's entire network if some parts of its network meet the statutory definition?

#### **B. Extending the STIR/SHAKEN Implementation Mandate to Intermediate Providers**

61. To further help ensure that caller ID authentication information reaches call recipients, we propose extending our STIR/SHAKEN mandate to intermediate providers. We seek comment on this proposal, in general, and on the specific implementing measures we propose below for authenticated and unauthenticated calls that intermediate providers receive. In each case, we propose applying the obligations we establish for IP calls both to calls that an intermediate provider passes to a terminating voice service provider and to calls that it passes to a subsequent intermediate provider. We seek comment on this proposed scope. We further propose adopting these rules pursuant to our authority under the Communications Act. We seek comment on this proposal, as well as whether we have independent authority under either the TRACED Act or the Truth in Caller ID Act.

62. *Authenticated Calls.* We propose to require intermediate providers to pass any Identity header they receive to the subsequent intermediate or voice service provider in the call path. Technically, this proposal would require that the Identity header be forwarded downstream in the SIP INVITE transmitted by the intermediate provider. This proposal is consistent with the NANC's recommendation "that all carriers that route calls between originating and terminating carriers, such as long-distance providers and least-cost routers, maintain the integrity of the required SHAKEN/STIR signaling."<sup>209</sup> We anticipate that imposing such a mandate on intermediate providers is necessary to ensure that calls transmitted in IP retain authentication information across the entire call path.<sup>210</sup> If any of the intermediate providers in the call path are unable or unwilling to transmit the Identity header through their network, the terminating voice service provider will be unable to verify the caller ID information.<sup>211</sup> If fully implemented, the STIR/SHAKEN framework creates an "end-to end" system for authenticating the

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<sup>207</sup> See, *e.g.*, TRACED Act §§ 4(b)(1) (implementation mandate), 4(b)(2) (exemption process), 4(b)(5)(A)-(B) (extension process).

<sup>208</sup> See 47 CFR § 64.1600(f) (defining "intermediate provider" according to whether an entity originates or terminates the traffic they carry).

<sup>209</sup> NANC CATA Working Group Report at 17.

<sup>210</sup> See Verizon Comments at 11; Sprint Comments at 6-7; see also AT&T Comments at 4 n.8 (agreeing that "SHAKEN/STIR must be widely deployed to be effective").

<sup>211</sup> See Verizon Comments at 11.

identity of the calling party.<sup>212</sup> The component SHAKEN standard specifically addresses the reality that call paths often involve voice service providers that do not connect directly with each other, but rather connect indirectly through one or more third party networks.<sup>213</sup> Indeed, a framework like STIR/SHAKEN that identifies the true origination of calls is expressly required because voice service providers do not have direct peering relationships with all other voice service providers.<sup>214</sup> We therefore anticipate that adopting our proposal will be essential to preventing gaps that would undermine the value of STIR/SHAKEN implementation by voice service providers that originate and terminate calls that may transit over intermediate provider networks. We seek comment on this preliminary view. What are the benefits or drawbacks to imposing this obligation on intermediate providers? What, if any, are the technical barriers preventing intermediate providers from complying with this obligation? Are market forces alone sufficient to drive intermediate providers to implement STIR/SHAKEN, making regulatory action unnecessary? If we were to adopt our proposal, should we create any limitations or exceptions? In addition to this proposed requirement, should we require intermediate providers to append to the SIP INVITE their own additional Identity header to more accurately and easily support traceback to each provider in the call path?<sup>215</sup> Are there any other actions reasonably necessary for implementation of STIR/SHAKEN that we should require of intermediate providers?

63. Additionally, we propose to require intermediate providers to pass the Identity header *unaltered*, thereby prohibiting the manipulation of STIR/SHAKEN Identity header information by intermediate providers when transmitting this information along with a SIP call. This prohibition would prevent a downstream provider from altering or stripping the caller ID authentication information in the Identity header and ensure such providers do not tamper with authenticated calls after they leave the originating voice service provider's network. Based on comments filed earlier in this proceeding, we anticipate that such a prohibition would be beneficial because it would better ensure the integrity of authentication information that reaches the terminating voice service provider and call recipient.<sup>216</sup> We seek comment on our proposal. Are there legitimate reasons, technical or otherwise, for an intermediate provider to alter or strip STIR/SHAKEN header information? Would establishing this prohibition impact the ability of intermediate providers to complete calls if, for instance, a terminating voice service provider is unable to accept the STIR/SHAKEN header information for a technical reason? If so, how can we distinguish between malicious or negligent manipulation and manipulation done for legitimate technical reasons? In the absence of a Commission prohibition, could the practice of malicious or negligent manipulation of the Identity header be adequately policed by participating providers or the industry through the STI-GA? We do not propose prohibiting a terminating voice service provider from altering or stripping the Identity header for a call that it receives before attempting to verify it. We regard this scenario as unlikely since terminating voice service providers need to verify the Identity header information in order for their subscribers to receive the benefits of STIR/SHAKEN, and we do not believe our rules need to address it. Do commenters agree? Is there any reason we should extend this prohibition to terminating voice service providers?

64. *Unauthenticated Calls.* We propose that when an intermediate provider receives an unauthenticated call that it will exchange with another intermediate or voice service provider as a SIP call, it must authenticate such a call with a "gateway" or "C" attestation.<sup>217</sup> Such attestation conveys that the provider has no relationship with the initiator of the call, but it records the entry point of the call into

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<sup>212</sup> See *ATIS/SIP Forum Standard* at 4.

<sup>213</sup> See *id.*

<sup>214</sup> See *id.*

<sup>215</sup> See, e.g., See IETF, *Authenticated Identity Management in the Session Initiation Protocol (SIP)*, RFC 8224, at 31 (2018), <https://tools.ietf.org/html/rfc8224> (addressing possibility of multiple Identity headers).

<sup>216</sup> See Verizon Comments at 11; Numeracle Comments at 3.

<sup>217</sup> See *ATIS/SIP Forum Standard* at 9.

its IP network.<sup>218</sup> This action is already contemplated in the industry standards.<sup>219</sup> We propose requiring it because, although this attestation level lacks any assertion of the calling party's identity, we understand from the record developed thus far that it would provide a useful data point to inform analytics and allow for traceback of the call to the gateway source.<sup>220</sup> We seek comment on this proposal. What are the benefits of or drawbacks to imposing this obligation on intermediate providers? What, if any, are the technical barriers preventing intermediate providers from complying with this obligation? Should we create any limitations or exceptions to a rule requiring gateway attestation? Are there any circumstances where an originating voice service provider would need to be subject to this requirement? Multiple commenters support imposing STIR/SHAKEN requirements on gateway providers as a way to identify robocalls that originate abroad and to identify which provider served as the entry point for these calls to U.S. networks.<sup>221</sup> Is this an effective way to use STIR/SHAKEN to combat illegal calls originating outside the United States?<sup>222</sup> Are there other rules involving STIR/SHAKEN that we should consider regarding intermediate providers to further combat illegal calls originating abroad? In response to our questions in the *2019 Robocall Declaratory Ruling and Further Notice* regarding the use of STIR/SHAKEN to combat illegally spoofed calls originating abroad,<sup>223</sup> Verizon suggests that we impose an obligation to use STIR/SHAKEN on any provider, regardless of its geographic location, if it intends to allow its customers to use U.S. telephone numbers.<sup>224</sup> And USTelecom suggests that we consider obligating gateway providers to pass international traffic only to downstream providers that have implemented STIR/SHAKEN.<sup>225</sup> They argue that such an obligation would help ensure that any gateway attestation is not stripped out downstream by a provider's network that does not have STIR/SHAKEN capability and consequently frustrate efforts to trace calls originating abroad back to the gateway provider. Should we consider adopting either of these ideas instead of, or in addition to, our proposed rules?

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<sup>218</sup> See *id.*

<sup>219</sup> See *id.* at 8-9.

<sup>220</sup> See USTelecom Comments at 12-13.

<sup>221</sup> See USTelecom Comments at 12-13; USTelecom Reply, CG Docket No. 17-59, WC Docket No. 17-97, at 7 (rec. Aug. 23, 2019) (USTelecom Reply); Verizon Comments at 3.

<sup>222</sup> ATIS has been working on technical standards intended as potential mechanisms for implementing STIR/SHAKEN for international calls. The first technical report addresses how calls authenticated in one country can be verified in a second country through bilateral arrangements between the two countries. ATIS Technical Report – Mechanism for Initial Cross-Border Signature-based Handling of Asserted information using toKENs (SHAKEN), ATIS-100087 (2019), [https://access.atis.org/apps/group\\_public/download.php/50584/ATIS-1000087.pdf](https://access.atis.org/apps/group_public/download.php/50584/ATIS-1000087.pdf). A second draft technical report under current consideration addresses how the SHAKEN trust environment could be extended to full international deployment in the absence of bilateral arrangements. Joint ATIS/SIP Forum Technical Report – Mechanism for International Signature-base Handling of Asserted information using toKENs (SHAKEN) (2019). [http://access.atis.org/apps/group\\_public/document.php?document\\_id=51306&wg\\_abbrev=ipnni](http://access.atis.org/apps/group_public/document.php?document_id=51306&wg_abbrev=ipnni). Both approaches are intended to support caller ID authentication and traceback for cross-border calls.

<sup>223</sup> *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4902, para. 82.

<sup>224</sup> See Verizon Comments at 3-4. Verizon suggests, however, that the STIR/SHAKEN rules need only apply to calls to U.S. consumers that involve the use of numbers from the U.S. portion of the NANP. *Id.* at 4. According to Verizon, U.S.-inbound international calls originating from foreign carriers only with numbers from their countries' numbering plans do not materially contribute to the robocall problem. *Id.*

<sup>225</sup> See USTelecom Comments at 14. USTelecom notes that the Commission implemented a similar framework with respect to intermediate providers in the *Third Rural Call Completion Report and Order* and argues that a similar approach adopted in the SHAKEN context would ensure a heightened degree of transparency and accountability. USTelecom Comments at 14, n.27 (citing *Rural Call Completion*, Third Report and Order, 33 FCC Rcd 4199, 4228, para. 69 (2018)).

65. *Limiting Intermediate Provider Requirements to IP Networks.* As with the rules adopted in the Report and Order, we propose to limit the application of these obligations to calls that an intermediate provider receives in SIP and will exchange with another intermediate or voice service provider in SIP. We preliminarily believe this is an appropriate scope given that STIR/SHAKEN is limited to SIP calls. We seek comment on this proposal. Is there any reason to require intermediate providers to implement caller ID authentication solutions in the non-IP portions of their networks? In this regard, we specifically invite comment on whether out-of-band STIR, a potential STIR/SHAKEN solution for non-IP networks,<sup>226</sup> will include a role for intermediate providers as it develops.

66. We further seek comment on how to prevent the use of non-IP intermediate providers as a way to circumvent our rules. How can we prevent a gateway or originating voice service provider from concealing its identity as the source of a call by purposefully routing that call through an intermediate provider that uses non-IP technology?<sup>227</sup> By doing so, the provider could both fool terminating providers—who otherwise may have seen that the caller ID verification failed—and stymie traceback efforts. We also seek comment on the seriousness of this threat. Are there technical or economic reasons why this is not likely to occur? Would call pattern analysis minimize the effectiveness of this conduct? And would the ability to trace a call back to the gateway provider allow sufficient traceback to identify the originating provider? Or is this threat credible such that we should take action to prevent it? If so, what action should we take?

67. *Definition of Intermediate Provider.* We propose using the definition of “intermediate provider” found in section 64.1600(f) of our rules.<sup>228</sup> This section provides that an “intermediate provider” is “any entity that carries or processes traffic that traverses or will traverse the PSTN at any point insofar as that entity neither originates nor terminates that traffic.”<sup>229</sup> The broad scope of this definition seems well-suited to further the goal of widespread implementation of the STIR/SHAKEN framework. We seek comment on this proposal. Are there alternative formulations to the definition of “intermediate provider” that more accurately capture its role and characteristics for the purpose of STIR/SHAKEN implementation? In the context of rural call completion, the Commission’s rules use a slightly narrower definition to exclude from their scope intermediate providers that may only incidentally transmit voice traffic, such as Internet Service Providers.<sup>230</sup> Is this narrower definition a better fit for STIR/SHAKEN, or does the broader definition we propose better support the goal of ubiquitous deployment?

68. *Legal Authority.* We propose relying on our authority under section 251(e) of the Act to apply these rules to intermediate providers. We concluded in the Report and Order that our exclusive jurisdiction over numbering policy provides authority to require voice service providers to implement

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<sup>226</sup> See IETF, *STIR Out-of-Band Architecture and Use Cases*, Draft (2019), <https://tools.ietf.org/html/draft-ietf-stir-oob-06> (draft standards for out-of-band STIR); see also TransNexus, *Out-of-Band STIR/SHAKEN Call Authentication*, <https://transnexus.com/whitepapers/out-of-band-stir> (last visited Feb. 16, 2020).

<sup>227</sup> See USTelecom Comments at 14 (suggesting we consider obligating gateway providers to pass international traffic only to downstream providers that have implemented STIR/SHAKEN).

<sup>228</sup> 47 CFR § 64.1600(f).

<sup>229</sup> *Id.*

<sup>230</sup> 47 CFR § 64.2101 (“The term ‘intermediate provider’ means any entity that (1) Enters into a business arrangement with a covered provider or other intermediate provider for the specific purpose of carrying, routing, or transmitting voice traffic that is generated from the placement of a call placed (i) From an end user connection using a North American Numbering Plan resource; or (ii) To an end user connection using such a numbering resource; and (2) Does not itself, either directly or in conjunction with an affiliate, serve as a covered provider in the context of originating or terminating a given call.”); *Rural Call Completion*, Third Report and Order, 33 FCC Rcd 8400, 8403-04, paras. 9-10 (2018) (explaining that in the context of rural call completion, the Commission adopted a slightly different definition in accord with Congressional intent).



STIR/SHAKEN in order to prevent the fraudulent abuse of NANP resources. We preliminarily believe that this same analysis extends to intermediate providers. Just as with calls displaying a falsified or spoofed caller ID on an originating or terminating voice service provider's network, calls with illegally spoofed caller ID that transit intermediate providers' networks are exploiting numbering resources to further illegal schemes. By imposing these requirements on intermediate providers, we would protect consumers and prevent bad actors from abusing NANP resources. We seek comment on this proposal. Consistent with our conclusion in today's Report and Order, we propose concluding that the section 251(e)(2) requirements do not apply in the context of our establishing STIR/SHAKEN requirements. Alternatively, even if section 251(e)(2) does apply, we propose that competitive neutrality is satisfied in this instance because each carrier is responsible for bearing its own implementation costs. We seek comment on these proposals.

69. We also seek comment on two potential additional sources of authority. First, we seek comment on whether the TRACED Act provides us with authority to impose the obligations we propose for intermediate providers. In the TRACED Act, Congress directs the Commission to require voice service providers to implement STIR/SHAKEN in the IP portions of their networks.<sup>231</sup> Section 4(a)(2) defines "voice service" in part as any service that "that furnishes voice communications to an end user using resources from the North American Numbering Plan."<sup>232</sup> We do not preliminarily read this definition to include intermediate providers. Is this a correct interpretation, or can we rely on the TRACED Act to reach intermediate providers? At the same time, we propose concluding that we are not foreclosed by the limited definition of "voice service" from imposing STIR/SHAKEN requirements on intermediate providers. We propose reaching this conclusion for two independent reasons. First, section 4(d) of the TRACED Act states that "[n]othing in this section shall preclude the Commission from initiating a rulemaking pursuant to its existing statutory authority."<sup>233</sup> Second, the STIR/SHAKEN framework creates a chain of trust between the originating and terminating voice service providers. Each intermediate provider operating between the originating and terminating voice service provider in the call path must transmit the call's Identity header unaltered in order to successfully provide end-to-end caller ID authentication. We believe that in directing us to require providers of voice service to implement the "STIR/SHAKEN authentication framework" as defined in the TRACED Act, Congress intended to refer to the standards created by the information and communications technology industry. These standards are designed to enable caller ID authentication through an end-to-end chain of trust. Intermediate providers play a critical role in ensuring the success of such a system. We believe Congress intended for the STIR/SHAKEN framework, as mandated in section 4 of the TRACED Act, to be an effective means of battling unlawful robocalls,<sup>234</sup> and we therefore propose concluding that Congress took this aspect of STIR/SHAKEN into account in enacting the TRACED Act and allowed us latitude to impose requirements on intermediate providers in support of its direction to require voice service providers to implement the STIR/SHAKEN authentication framework.<sup>235</sup> We also believe that our proposals lie within the Commission's statutory authority to adopt rules "necessary in the execution of its functions."<sup>236</sup> We seek comment on this proposed analysis.

70. Second, we seek comment on whether our authority under the Truth in Caller ID Act allows us to impose the rules described above. In the Truth in Caller ID Act, Congress charged us with prescribing rules to make unlawful the spoofing of caller ID information "in connection with any

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<sup>231</sup> TRACED Act § 4(b)(1)(A).

<sup>232</sup> TRACED Act § 4(a)(2)(A).

<sup>233</sup> TRACED Act § 4(d).

<sup>234</sup> See S. Rep. No. 116-41, at 5 ("it is necessary to implement call authentication technologies to reduce robocalls.").

<sup>235</sup> TRACED Act § 4(b)(1)(A).

<sup>236</sup> 47 U.S.C. § 154(i).

telecommunications service or IP-enabled voice service . . . with the intent to defraud, cause harm, or wrongfully obtain anything of value.”<sup>237</sup> Does imposing STIR/SHAKEN implementation obligations on intermediate providers fit within this directive? We also seek comment on what other sources of authority we have to apply STIR/SHAKEN obligations on intermediate providers.

71. *Alternatives.* To the extent that commenters believe we cannot or should not apply such obligations to intermediate providers, we seek comment on alternative measures we could take to ensure that STIR/SHAKEN information traverses the entire call path. In the *Second Rural Call Completion Report and Order*, the Commission required larger originating long-distance providers to monitor the performance of downstream intermediate providers with regard to call completion.<sup>238</sup> Should we impose a comparable requirement here? For instance, should we require originating voice service providers to ensure, by contract and/or through periodic monitoring, that all intermediate providers in the call path transmit STIR/SHAKEN information? Should we require originating voice service providers to take remedial measures where necessary because of intermediate provider failures, as in the rural call completion context? What are the benefits and drawbacks of this approach compared to our proposal? We expect that the same sources of authority that we rely on in the Report and Order to impose direct STIR/SHAKEN obligations on originating voice service providers would allow us to impose a monitoring duty on them as well. We seek comment on this view and, in general, on sources of authority we may have for any alternatives that commenters propose.

### C. Assessment of Burdens or Barriers to Implementation

72. The TRACED Act directs the Commission, not later than December 30, 2020 “and as appropriate thereafter,” to assess any burdens and barriers to (1) voice service providers that use time-division multiplexing network technology (TDM), a non-IP network technology; (2) small voice service providers; and (3) rural voice service providers.<sup>239</sup> It further directs us to assess burdens and barriers created by the “inability to purchase or upgrade equipment to support the call authentication frameworks, or lack of availability of such equipment.”<sup>240</sup>

73. To this end, we seek comment on the burdens and barriers to implementation for the classes of providers identified, particularly the burdens presented by equipment availability and cost. In comments previously filed, parties contended that small and rural providers, and operators of TDM networks, may incur substantial costs upgrading their networks, and updating or replacing service agreements.<sup>241</sup> Do commenters agree with this position? What are other burdens and barriers to implementation for such voice service providers? Does cost and/or the availability of necessary

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<sup>237</sup> 47 U.S.C. § 227(e)(1); *see also* 47 CFR § 64.1604(a).

<sup>238</sup> *Rural Call Completion*, Second Report and Order and Third Further Notice of Proposed Rulemaking, 33 FCC Rcd 4199, 4204-4213, paras. 14-30 (2018).

<sup>239</sup> TRACED Act § 4(b)(5)(A)(i)(I)-(II).

<sup>240</sup> TRACED Act § 4(b)(5)(A)(i)(III).

<sup>241</sup> *See, e.g.* ACA Connects FNPRM Comments at 6; CCA Comments at 4-5; NTCA FNPRM Comments at ii, 7-8 (arguing that NCTA members that have not moved to IP switching facilities “will face additional, potentially substantial costs that in some cases could threaten their ability to continue offering affordable voice and broadband service or even to remain viable at all”); WTA Comments at 3 (stating that “small voice providers lack the financial ability and in-house professional expertise necessary to quickly implement the SHAKEN/STIR framework”), 4 (stating “that upgrading to an all-IP voice network is an expensive proposition for RLECs.”); INCOMPAS FNPRM Reply at 2 (“As an IP-based solution, there are barriers for legacy networks, such as cost and professional expertise, which may delay these providers’ ability to implement SHAKEN/STIR.”); ITTA Reply at 21 (stating that “cost considerations could be further exacerbated by smaller providers, given their limited resources and personnel, being particularly likely to rely on third-party vendor solutions, and the adoption of an implementation mandate providing vendors with leverage to charge higher rates than they could charge otherwise in an open market”).

equipment and equipment updates pose barriers to implementation for voice service providers that are not small, rural, or operators of TDM networks?

74. We also seek comment on how we should interpret the TRACED Act's direction to assess burdens and barriers to implementation "as appropriate thereafter."<sup>242</sup> Should we coordinate this assessment with our revision of any granted extensions in compliance?<sup>243</sup> Or should we do so on a specific schedule or as-needed basis, separate from our extension review process?

#### **D. Extension of Implementation Deadline**

75. The TRACED Act includes two provisions for extension of the June 30, 2021 implementation date for caller ID authentication frameworks. First, in connection with an assessment of burdens or barriers to implementation, the Commission "may, upon a public finding of undue hardship, delay required compliance" with the June 30, 2021 date for caller ID authentication framework implementation.<sup>244</sup> Second, we "shall grant a delay of required compliance" with the June 30, 2021 implementation date "to the extent that . . . a provider or class of providers of voice services, or type of voice calls, materially relies on a non-[IP] network for the provision of such service or calls."<sup>245</sup> Under either provision, an extension may be provider-specific or apply to a "class of providers of voice service, or type of voice calls."<sup>246</sup> We must annually reevaluate any granted extension for compliance.<sup>247</sup> When granting an extension of the implementation deadline under either provision, we must require that provider to "implement an appropriate robocall mitigation program to prevent unlawful robocalls from originating on the network of the provider."<sup>248</sup> Based on these directives, we propose granting a one-year implementation extension to small, including small rural, voice service providers due to undue hardship; and propose granting an extension for the parts of a voice service provider's network that rely on technology that cannot initiate, maintain, and terminate SIP calls. We seek comment on these proposals, whether to grant additional extensions, and related issues below.

76. *Extensions for Undue Hardship by Category of Provider.* The TRACED Act grants us the discretion to delay a provider's obligation to comply with the June 30, 2021 call authentication framework implementation date upon a public finding of hardship.<sup>249</sup> It states that the extension may be "for a reasonable period of time . . . as necessary . . . to address the identified burdens and barriers."<sup>250</sup>

77. The first category of voice service providers identified by the TRACED Act for a potential extension due to undue hardship is voice service providers that use TDM network technology. Because the TRACED Act includes a separate extension for voice service providers that "material[ly] rely" on non-IP technology,<sup>251</sup> we propose to grant the same extension to voice service providers that use TDM technology under the undue hardship standard as we grant to providers that materially rely on non-IP technology. We believe that such a solution minimizes complexity and aligns the compliance requirements for similarly-situated voice service providers. We seek comment on this proposal. To give

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<sup>242</sup> TRACED Act § 4(b)(5)(A)(i).

<sup>243</sup> See TRACED Act § 4(b)(5)(F).

<sup>244</sup> TRACED Act § 4(b)(5)(A)(ii).

<sup>245</sup> TRACED Act § 4(b)(5)(B).

<sup>246</sup> TRACED Act §§ 4(b)(5)(A)(ii), 4(b)(5)(B).

<sup>247</sup> TRACED Act § 4(b)(5)(F).

<sup>248</sup> TRACED Act § 4(b)(5)(C).

<sup>249</sup> TRACED Act § 4(b)(5)(A)(ii).

<sup>250</sup> TRACED Act § 4(b)(5)(A)(ii).

<sup>251</sup> TRACED Act § 4 (b)(5)(B).

meaning to each provision from Congress, should we instead distinguish an undue hardship extension on the basis of TDM technology from the extension for providers that materially rely on non-IP technology, and if so how?

78. The second category of voice service providers identified by the TRACED Act for a potential extension due to undue hardship is small voice service providers. We propose granting a one-year implementation extension for such providers and we seek comment on this proposal. According to NTCA, small voice service providers face numerous burdens and barriers to implementation, including the inability to “procure ready-to-install solutions on the same timeframe as the nation’s largest carriers.”<sup>252</sup> It contends that a delayed compliance date would allow small voice service providers to “obtain solutions from vendors,”<sup>253</sup> and benefit from the competition among vendors which, over time, will likely “drive down prices and improve the quality of SHAKEN/STIR offerings for smaller providers.”<sup>254</sup> We tentatively conclude that granting such an extension to small voice service providers addresses the concerns in the record, such as vendor availability, and grants sufficient time for them to implement STIR/SHAKEN on their IP networks. Do commenters agree? Alternatively, would granting such an extension to small voice service providers compromise the efficacy of the STIR/SHAKEN framework unduly? Given the TRACED Act’s implementation deadline of June 30, 2021, is it necessary to grant small voice service providers an implementation extension?<sup>255</sup> Or does this deadline already provide small voice service providers with sufficient time to implement STIR/SHAKEN on their IP networks?

79. We propose to define “small providers of voice service”<sup>256</sup> for the purposes of our assessment of burdens and barriers and of our implementation extension as those that have 100,000 or fewer voice subscriber lines (counting the total of all business and residential fixed subscriber lines and mobile phones and aggregated over all of a provider’s affiliates). In the *First Rural Call Completion Order*, the Commission determined that the 100,000-subscriber-line threshold ensured that many subscribers would continue to benefit from our rules while also limiting the burden on smaller voice service providers.<sup>257</sup> We seek comment on this proposal. What are the benefits and drawbacks of establishing a 100,000 subscriber-line threshold? Is there an alternative measure the Commission should use to define “small providers of voice service”? How should we distinguish small providers that must overcome significant technical challenges to implement STIR/SHAKEN from those that are able to implement it without hardship? Do commenters agree that a class-based extension for small providers is appropriate, or should we review each small provider seeking an implementation extension on a case-by-case basis?

80. The third category of voice service providers identified by the TRACED Act for a potential extension due to undue hardship is rural voice service providers. We believe it is unnecessary to grant a separate implementation extension for rural voice service providers as the challenges faced by these providers are already addressed by either the small voice service provider extension or the extension for voice service providers that materially rely on a non-IP network. We seek comment on this view. Alternatively, by using the separate terms “small” and “rural,” did Congress intend to create two distinct

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<sup>252</sup> NTCA Comments at ii; *see also id.* at 9-10.

<sup>253</sup> NTCA Comments at ii; *see also id.* at 9-10.

<sup>254</sup> ACA Connects Comments at 5.

<sup>255</sup> *See* West Telecom Reply at 2 (“[S]hould the Commission mandate implementation of the framework by at least all IP-based providers, the implementation deadline for smaller providers should be no earlier than January 1, 2021.”).

<sup>256</sup> TRACED Act § 4(b)(5)(A)(i)(II).

<sup>257</sup> *Rural Call Completion*, WC Docket No. 13-29, Report and Order and Further Notice of Proposed Rulemaking, 28 FCC Rcd 16154, 16168, para. 27 (2013) (*First Rural Call Completion Order*).

extensions for rural and small voice service providers? Are there rural voice service providers that face unique challenges not addressed by either proposed extension and, if so, what definition of “rural” should we adopt to appropriately capture those entities?<sup>258</sup>

81. We seek comment on whether we should grant an implementation extension for any other voice service providers or classes of voice service providers, or types of voice calls. We specifically seek comment on Congress’s direction to consider whether to grant an extension on the basis of “the inability to purchase or upgrade equipment to support the call authentication frameworks under this section, or lack of availability of such equipment.”<sup>259</sup> Are there entities, or a class of entities, that should receive an extension on this basis? Are there voice service providers other than small voice service providers who face a burden due to the inability to purchase or unavailability of equipment necessary to participate in caller ID authentication? Are there other specific voice service providers or classes of voice service providers, or types of voice calls, for which we should grant an extension of the implementation deadline? On what basis would we grant such an extension? What would constitute a sufficient burden or barrier to justify a finding of undue hardship? What type of evidence should the voice service provider or class of voice service providers be required to present to demonstrate undue hardship? And what is a reasonable length of time to extend the deadline for such voice service providers and why?

82. We do not interpret the TRACED Act’s extension provisions to extend to intermediate providers, because its definition of “voice service” refers to “furnish[ing] voice communications to an end user.”<sup>260</sup> Should we nonetheless choose to provide an extension based on undue hardship for intermediate providers? On what basis would we grant such an extension, to whom should we grant it, and how long should any such extension last? Would granting an extension for some intermediate providers have unique negative impacts on the operation of STIR/SHAKEN across the voice network?

83. Furthermore, should we adopt an extension for voice service providers that have legal obligations to maintain extensive networks in high cost areas, such as eligible telecommunications carriers<sup>261</sup> and carriers of last resort that bear particularly extensive obligations?<sup>262</sup> Or would we adequately address the burdens and barriers faced by such voice service providers by the other extensions we propose, including the extension for non-IP network technology?

84. *Extension for Undue Hardship Due to Challenges in Interconnecting in IP.* The record developed in response to the 2019 *Further Notice* reflects that, for certain voice service providers, a barrier to the exchange of authenticated calls occurs at the interconnection point.<sup>263</sup> Specifically, voice service providers reported that even if they were able to authenticate calls on their own network, they could not exchange authenticated calls with another voice service provider in certain instances because the interconnection point was not IP-enabled, even if the receiving voice service provider itself operates on an IP network.<sup>264</sup> We seek comment on whether we should provide an implementation extension pursuant to TRACED Act section 4(b)(5)(A)(ii) to voice service providers that will not be able to carry

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<sup>258</sup> See, e.g., 47 CFR § 61.26(a)(6) (defining “rural CLEC”); *id.* at § 51.5 (defining “rural telephone company”); *id.* at § 153(44) (defining “rural telephone company”).

<sup>259</sup> TRACED Act § 4(b)(5)(A)(i)(III).

<sup>260</sup> TRACED Act § 4(a)(2)(A).

<sup>261</sup> An eligible telecommunications carrier must, throughout the service area for which the designation is received, “offer the services that are supported by Federal universal service support mechanisms . . . either using its own facilities or a combination of its own facilities and resale of another carrier’s services (including the services offered by another eligible telecommunications carrier).” 47 U.S.C. § 214(e)(1)(A).

<sup>262</sup> Carriers of last resort are “required to fulfill all reasonable requests for service within [their] territory.” See, e.g., CA PUC § 275.6.

<sup>263</sup> See NTCA Comments at 3-4; Telnix Comments at 2; WTA Comments at 2.

<sup>264</sup> See NTCA Comments at 3-7.

authentication information to the next intermediate or voice service provider in the call path due to an inability to interconnect in IP. To what extent should a terminating or originating voice service provider's implementation extension on this basis depend on the actions of the intermediate or voice service provider with which it is seeking IP interconnection in order to exchange authenticated calls? Although the accompanying Report and Order requires transmission of authenticated calls by originating voice service providers only where technically feasible, it requires authentication of all SIP calls. Under what circumstances would challenges in interconnecting in IP constitute an "undue hardship" such that the voice service provider should be excused from authentication? Would it be appropriate to limit any such extension to rural local exchange carriers or some other subset of small and/or rural voice service providers? Is such an extension an appropriate way to avoid requiring voice service providers to invest in network upgrades that they cannot make use of? Or would such an extension discourage voice service providers from coming to a negotiated resolution and transitioning to IP? We also seek comment on ways to address this issue and to encourage the voluntary adoption of IP interconnection agreements between voice service providers. We also seek comment on barriers to end-to-end STIR/SHAKEN transmission, including the degree to which barriers to IP interconnection hinder end-to-end caller ID authentication.<sup>265</sup>

85. *Extension for Certain Non-IP Networks.* The TRACED Act specifically directs that "the Commission shall grant a delay" "for any provider or class of providers of voice service, or type of voice calls, only to the extent that such a provider or class of providers of voice service, or type of voice calls, materially relies on a non-internet protocol network for the provision of such service or calls . . . until a call authentication protocol has been developed for calls delivered over non-[IP] networks and is reasonably available."<sup>266</sup> We propose to grant such an extension only for those portions of a voice service provider's network that rely on technology that cannot initiate, maintain, and terminate SIP calls. Do commenters agree with this approach? Under this reading of the statute, we would interpret "material[]" to mean "important or having an important effect";<sup>267</sup> and, consistent with our call-by-call interpretation of the TRACED Act, we would read "reli[ance]" with reference to the particular portion of the network in question. Altogether, under this reading, we would treat reliance on a non-internet protocol network as material if that portion of the network is incapable of using SIP. We seek comment on whether, within the framework we propose, we should adopt a different interpretation of "non-internet protocol network."

86. We also seek comment on other approaches to this statutory provision. For instance, should we grant an extension for a voice service provider's entire network if that voice service provider materially relies on non-IP technology? On this view, how should we interpret "materially relies"? Would we find that a voice service provider "materially relies on a [non-IP] network" if its network substantially relies on non-IP technology, and on that reading what portion of a network must be non-IP for reliance to be substantial? Would we measure that percentage by a technical measure, such as the percentage of non-IP switches in the network? Alternatively, should we consider gauging substantial reliance by the percentage of a voice service provider's subscriber base served by non-IP network technology?

87. Additionally, we seek comment on how the Commission should determine if a caller ID authentication protocol developed for calls delivered over non-IP networks is "reasonably available"

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<sup>265</sup> See Letter from Michael Romano, Senior Vice President, NTCA, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97, CC Docket No. 01-92, WC Docket No. 10-90, at 2 (filed Jan. 16, 2020) ("NTCA asserted that the absence of basic 'rules of the road' that provide all parties a clear path and clear incentives to enter into IP interconnection agreements for the exchange of voice traffic stands as the primary barrier to SHAKEN/STIR implementation for wide swaths of rural America."); see also *Parties Asked to Refresh the Record on Intercarrier Compensation Reform Related to the Network Edge, Tandem Switching and Transport, and Transit*, WC Docket No. 10-90, CC Docket No. 01-92, Public Notice, 32 FCC Rcd 6856 (WCB 2017).

<sup>266</sup> TRACED Act § 4(b)(5)(B).

<sup>267</sup> Cambridge Dictionary, Material, <https://dictionary.cambridge.org/us/dictionary/english/material> (last visited Feb. 16, 2020).

under section 4(b)(5)(B) such that this extension period would end. For example, should we conclude that reasonable availability varies by voice service provider, e.g., based on size and cost, and if so, how? Should we conclude that reasonable availability depends on whether an effective protocol can be purchased or otherwise obtained by a certain percentage of providers with non-IP networks? While some commenters have referred to out-of-band STIR as a framework that could potentially allow non-IP voice service providers to participate in STIR/SHAKEN,<sup>268</sup> it is our understanding that this framework is still in its infancy and is not readily available to be implemented. We seek comment on this understanding. Are there other available technologies to enable legacy networks to participate in caller ID authentication for which we should consider encouraging development and, ultimately, mandate implementation? If so, what are they, how do they operate, and how might they best be implemented? What efforts, if any, are currently underway to develop such technologies, and how near are they to viability?

88. The TRACED Act further provides that we should limit or terminate an extension of compliance if we determine in a future assessment that a voice service provider “is not making reasonable efforts to develop the call authentication protocol” for non-IP networks.<sup>269</sup> We propose to interpret the “reasonable efforts” requirement as being satisfied so long as a voice service provider is actively working to develop a caller ID authentication protocol for non-IP networks. We also propose that a voice service provider satisfies this obligation if it is able to provide the Bureau upon request documented proof that it is participating, either on its own or through a representative, as a member of a working group or consortium that is working to develop a non-IP solution, or actively testing such a solution. We propose that the Bureau would have authority to determine whether the provider is meeting the standard we establish. We seek comment on this approach. Should we impose a different standard on larger voice service providers that have more resources available to invest in technology development and network upgrades? Should we impose a stricter standard for the steps voice service providers must take to develop a non-IP solution? If so, what should we require as part of this more stringent standard? Should we adopt our proposed standard initially but shift to a more stringent standard if we find that the voice service provider in question, or industry as a whole, is not making sufficient progress toward implementation of caller ID authentication on non-IP networks?

89. *Extensions Based on Type of Voice Call.* We seek comment on Congress’s direction that extensions may be voice service provider-specific or apply to a class of voice service providers or type of voice calls.<sup>270</sup> Are there any interpretive issues we should consider with respect to this provision? Would it be practical to grant an extension based on a type of voice call, or would that be unnecessarily complicated for voice service providers?

90. *Reevaluating Granted Extensions.* We propose directing the Bureau to reevaluate any extensions annually after the first extension is granted, as required by the TRACED Act, and revise or extend them as necessary.<sup>271</sup> We seek comment on this proposal. Should we direct the Bureau to consider any specific criteria beyond the statutory criteria? We propose directing the Bureau to issue a Public Notice seeking comment on its annual review and consider the comments it receives before issuing a Public Notice of its decision.<sup>272</sup> Are there other specific administrative steps that we should direct the

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<sup>268</sup> TransNexus Comments at 8; TNS Comments at 16-17; *see also* Consumer Reports et al. Reply at 5 (“[W]e were pleased to note that several commenters cited the existence of call authentication tools that are compatible with traditional landline service, such as out-of-band SHAKEN/STIR and tools offered by TNS.”); Neustar Reply at 6 (“Neustar continues to support the implementation of complementary call authentication technologies, such as out-of-band authentication that can be integrated into the STIR/SHAKEN authentication framework.”).

<sup>269</sup> TRACED Act § 4(b)(5)(D).

<sup>270</sup> TRACED Act § 4(b)(5)(A)(ii).

<sup>271</sup> TRACED Act § 4(b)(5)(F).

<sup>272</sup> TRACED Act § 4(b)(5)(F)(iii).

Bureau to include in the reevaluation process? Should the Bureau be able to expand or only contract the scope of entities that are entitled to a class-based or other extension?

91. *Robocall Mitigation During Extension Period.* The TRACED Act directs us to require any voice service provider that has been granted an extension to, during the time of an extension, “implement an appropriate robocall mitigation program to prevent unlawful robocalls from originating on the network of the provider.”<sup>273</sup> We seek comment on the requirements we should adopt for such a program. Should we prescribe specific robocall mitigation practices for these voice service providers? If so, what practices should we prescribe and why? Should we implement a system, proposed by Verizon, where a voice service provider that originates traffic but does not participate in STIR/SHAKEN certifies that “it takes appropriate measures to ensure that it is not contributing to the robocall problem”?<sup>274</sup> Would requiring this type of certification meet the TRACED Act robocall mitigation program requirement? If yes, why? Conversely, does certification allow too much discretion for voice service providers to determine the scope of the robocall mitigation program? If we require a certification, should we specify minimum standards that a certifying voice service provider must meet, and should we require the certification to be made in a public registry?<sup>275</sup> How can we allow for some voice service provider discretion to create a program that is workable while ensuring an effective robocall mitigation program?

92. *Alternative Methodologies During an Extension.* The TRACED Act directs us to “identify, in consultation with small providers of voice service, and those in rural areas, alternative effective alternative effective methodologies to protect consumers from unauthenticated calls during any delay of compliance.”<sup>276</sup> Accordingly, we ask such voice service providers to share the most effective alternative methodologies. Have small and rural voice service providers already developed any effective methods to protect their subscribers from illegal robocalls on their networks? Or are any small or rural voice service providers in the process of developing such methodologies? If so, at what stage in development are these potential solutions and when could they be deployed? What are the specific challenges to such development? Is there any other information on this issue that small and rural voice service providers would like to share? How can the Commission and other voice service providers support the efforts of small and rural voice service providers to develop alternative effective methodologies to protect their subscribers from unauthenticated calls? For instance, would it be helpful for us to convene small and rural voice service providers to identify potential solutions? Alternatively, should voice service providers that receive an extension be required to participate in industry-led traceback efforts?<sup>277</sup>

93. *Preventing Abuse of Extension Process.* We also seek comment on ways to combat potential evasion of our caller ID authentication rules using the extension process. For instance, how can we prevent a voice service provider from avoiding participating in STIR/SHAKEN by purposefully using non-IP network technology to avoid our mandate for the duration of the extension granted to voice service providers that materially rely on non-IP network technology? We seek comment on the seriousness of

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<sup>273</sup> TRACED Act § 4(b)(5)(C)(i).

<sup>274</sup> Verizon Comments at 4.

<sup>275</sup> See Letter from Farhan Chughtai, Director, Policy & Advocacy, USTelecom, to Marlene Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97, at 2 (Feb. 24, 2019) (“Every provider would be required to certify that for all traffic not signed with STIR/SHAKEN, it has an appropriate robocall mitigation program designed to prevent the origination of illegal calls and has measures in place to identify if its network is being used to generate such illegal calls, and to quickly mitigate such activity once detected. Providers would be required to certify that they have such a program in place that meets certain minimum requirements.”).

<sup>276</sup> TRACED Act § 4(b)(5)(E).

<sup>277</sup> See *Implementing Section 13(d) of the Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act (TRACED Act)*, FCC 20-11, EB Docket No. 20-22 (Feb. 6, 2020) (seeking comment on establishing a “single consortium that conducts private-led efforts to trace back the origin of suspected unlawful robocalls”).



this threat. Are there economic or technological reasons why this is unlikely to occur? Does the TRACED Act's requirement that the Commission limit an extension if it determines a voice service provider "is not making reasonable efforts to develop" a non-IP caller ID authentication protocol give us leverage to prevent such conduct?<sup>278</sup> Should we take specific further action to prevent this behavior? If so, what action should we take? And how can we distinguish between a voice service provider with genuine reasons to use non-IP technology and a voice service provider doing so to avoid participating in STIR/SHAKEN?

94. *Full Participation.* Section 4(b)(5)(D) of the TRACED Act requires us to "take reasonable measures" to address any issues observed in our assessment of the burdens and barriers to the implementation of caller ID authentication frameworks, and to "enable as promptly as reasonable full participation of all classes of providers of voice service and types of voice calls to receive the highest level of trust."<sup>279</sup> According to the legislation, such measures "shall include, without limitation, as appropriate, limiting or terminating a delay of compliance granted to a provider" under section 4(b)(5)(B) of the TRACED Act if we determine in our assessment that the voice service provider is not making reasonable efforts to develop the required caller ID authentication protocol for non-IP networks.<sup>280</sup> We seek comment on this requirement and how best to fulfill the "full participation" element of this provision beyond the existing proposals contained herein. Are there further steps we might take, beyond those already proposed, to enable full participation of all classes of voice service providers in a caller ID authentication framework? If so, what are they and how would any such steps be implemented?

#### **E. Caller ID Authentication in Non-IP Networks**

95. Because STIR/SHAKEN is a SIP-based solution, those portions of a voice service provider's network that are not capable of initiating, maintaining, and terminating SIP calls cannot authenticate or verify calls under that framework. The TRACED Act directs us, not later than June 30, 2021, to require voice service providers to take "reasonable measures" to implement an effective caller ID authentication framework in the non-IP portions of their networks.<sup>281</sup> We propose to interpret the TRACED Act's requirement that a voice service provider take "reasonable measures" to implement an effective caller ID authentication framework in the non-IP portions of its network as being satisfied only if the voice service provider is actively working to implement a caller ID authentication framework on those portions of its network, either by upgrading its non-IP networks to IP so that the STIR/SHAKEN authentication framework may be implemented, or by working to develop a non-IP authentication solution. Consistent with our proposed approach to assessing whether a provider is making "reasonable efforts" to develop a call authentication protocol in the context of determining whether to limit or terminate an extension of compliance granted under section 4(b)(5)(B) for non-IP networks, we propose that a provider satisfies the "reasonable measures" requirement under section 4(b)(1)(B) if it is able to provide the Commission upon request documented proof that it is participating, either on its own or through a representative, as a member of a working group or consortium that is working to develop a non-IP solution, or actively testing such a solution.

96. Although some commenters have referred to out-of-band STIR as a framework that could potentially allow non-IP voice service providers to participate in STIR/SHAKEN,<sup>282</sup> our preliminary view

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<sup>278</sup> TRACED Act § 4(b)(5)(D).

<sup>279</sup> See TRACED Act § 4(b)(5)(D).

<sup>280</sup> See TRACED Act § 4(b)(5)(D).

<sup>281</sup> See TRACED Act § 4(b)(1)(B).

<sup>282</sup> See TransNexus Comments at 8; TNS Comments at 16-17; see also Consumer Reports et al. Reply at 5 ("[W]e were pleased to note that several commenters cited the existence of call authentication tools that are compatible with traditional landline service, such as out-of-band SHAKEN/STIR and tools offered by TNS."); Neustar Reply at 6 ("Neustar continues to support the implementation of complementary call authentication technologies, such as out-of-band authentication that can be integrated into the STIR/SHAKEN authentication framework.").

is that out-of-band STIR is still in its infancy and is not sufficiently widespread or readily available to be implemented. Indeed, the TRACED Act itself acknowledges that no viable non-IP solution currently exists insofar as it directs us to grant an extension for voice service providers that “materially rel[y] on a non-internet protocol network . . . until a call authentication protocol has been developed for calls delivered over non-internet networks and is reasonably available.”<sup>283</sup> Given this, we believe the best approach is to continue to promote the transition to IP while simultaneously encouraging voice service providers to develop a non-IP solution that may benefit those legacy networks that are not yet in transition.

97. We seek comment on this approach. Is our proposed approach an appropriate interpretation of the TRACED Act’s “reasonable measures” requirement? Should we implement a different standard? If we adopt the standard we propose, do commenters agree with our proposals on how to evaluate whether a company is “actively working” toward developing an authentication framework? Should the standard be the same for all voice service providers, or should this standard vary according to the size or resources of a voice service provider? If commenters believe this standard should be variable, how should it vary across different types or classes of voice service providers? How should voice service providers be separated out under such a variable standard—according to size, resources, cost, or some other metric? How should the obligations of this requirement vary between the different classes of voice service providers?

98. We also seek comment on our preliminary view that out-of-band STIR is not yet sufficiently developed or widespread to form the basis of a specific implementation requirement at present. Do commenters anticipate that it will be technologically possible for voice service providers to have the capability to implement this framework on a widespread basis by June 30, 2021? Are there reasons we should or should not encourage its development and, in turn, implementation?

99. We encourage voice service providers to transition their networks to IP, and one of the many benefits of the IP transition is the ability to implement STIR/SHAKEN. We wish to ensure that the framework we develop in this proceeding is consistent with our efforts in other proceedings to promote the transition to IP.<sup>284</sup> We believe that our proposed approach balances encouraging the transition to IP with Congress’s goal of promoting an effective caller ID authentication solution for non-IP networks. Do commenters agree with this assessment? Does our proposed approach appropriately account for the technological limits of legacy networks and the challenges of upgrading those networks while simultaneously encouraging the transition to IP? Is there an alternative approach or additional steps we should take to better promote the IP transition in this case? If so, what alternative approach or steps should we take?

100. We further propose to revisit our approach to the TRACED Act’s “reasonable measures” requirement for non-IP networks and the extension for non-IP networks if industry fails to make sufficient progress in overcoming this barrier to the ubiquitous implementation of caller ID authentication through either transitioning to IP or implementing a non-IP authentication solution. We seek comment on this

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<sup>283</sup> See TRACED Act § 4(b)(5)(B).

<sup>284</sup> See, e.g., *Communications Marketplace Report et al.*, GN Docket No. 18-231 et al., Report, 33 FCC Rcd 12558, 12729, para. 335 (2018); *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment et al.*, WC Docket No. 17-84 et al., Third Report and Order and Declaratory Ruling, 33 FCC Rcd 7705 (2018); *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment et al.*, WT Docket No. 17-79 et al., Declaratory Ruling and Third Report and Order, 33 FCC Rcd 9088 (2018); *Business Data Services in an Internet Protocol Environment et al.*, WC Docket No. 16-143 et al., Report and Order on Remand and Memorandum Opinion and Order, 34 FCC Rcd 5767 (2019); *Petition of USTelecom for Forbearance Pursuant to 47 U.S.C. § 160(c) to Accelerate Investment in Broadband and Next-Generation Networks*, WC Docket No. 18-141, Memorandum Opinion and Order, 34 FCC Rcd 6503 (2019); *Modernizing Unbundling and Resale Requirements in an Era of Next-Generation Networks and Services*, WC Docket No. 19-308, Notice of Proposed Rulemaking, 34 FCC Rcd 11290 (2019).

proposal. At what point should we reconsider this issue? If the Commission finds, at a later date, that insufficient progress in developing a non-IP solution has been made, should we impose a more stringent requirement as to the steps that voice service providers must take to develop and implement such a solution? What kinds of stricter requirements should we impose? Should we require voice service providers to either deploy a non-IP solution or upgrade their network technology to participate in STIR/SHAKEN?

#### F. Voluntary STIR/SHAKEN Implementation Exemption

101. Although the TRACED Act directs us to require each voice service provider to implement STIR/SHAKEN in its IP network,<sup>285</sup> section 4(b)(2) of the TRACED Act frees a voice service provider from this requirement if we determine, by December 30, 2020, that “such provider of voice service”: (A) “in internet protocol networks”—(i) “has adopted the STIR/SHAKEN authentication framework for calls on the internet protocol networks of the provider of voice service; (ii) has agreed voluntarily to participate with other providers of voice service in the STIR/SHAKEN authentication framework; (iii) has begun to implement the STIR/SHAKEN authentication framework; and (iv) will be capable of fully implementing the STIR/SHAKEN authentication framework” not later than June 30, 2021; and (B) “in non-internet protocol networks”—(i) “has taken reasonable measures to implement an effective call authentication framework; and (ii) will be capable of fully implementing an effective call authentication framework” not later than June 30, 2021.<sup>286</sup> We seek comment on the substantive standards and appropriate processes by which to implement this forward-looking exemption.

102. *Relationship of IP Network and Non-IP Networks Provisions.* We propose to read section 4(b)(2) of the TRACED Act as creating two exemptions: one for IP calls and one for non-IP calls. Thus, in our proposal, a provider may seek the exemption for its “IP networks” if it meets all four criteria for all calls it originates or terminates in SIP, and a provider may seek the exemption for its “non-IP networks” if it meets both of the criteria for all non-SIP calls it originates or terminates. We seek comment on this proposal and any alternative approaches.

103. We believe that our proposal best implements Congress’ policy and is consistent with principles of statutory construction when considering the statute as a whole. First, we believe our reading better limits the portion of the exemption that is at risk of being a nullity. Given the presence of the word “and” between the IP and non-IP networks criteria, we recognize that the exemption could potentially be read as applying only if the provider meets both the IP and non-IP networks criteria. Yet, practically speaking, such a reading would render the exemption an empty set or nearly so. As we have discussed, we believe that non-IP caller ID authentication solutions are not likely to be ready for widespread deployment in the near future. We therefore anticipate that few, if any, voice service providers will be able to claim that they will be capable of “fully implementing” an effective non-IP caller ID authentication framework by June 30, 2021. If we require any party seeking the exemption to attest to this requirement, we risk rendering the exemption in its entirety a near-nullity. We believe our proposed reading cabins the nullity risk more narrowly, thus better effectuating Congress’s goal of creating a meaningful exemption. We seek comment on this interpretation, and again invite comment on the likely state of development of non-IP caller ID authentication solutions in the next year and a half. Must “and” be read as creating only one exemption, or are we correct in assuming that such a reading would essentially nullify the exemption, thus reading it out of the statute and negating Congress’s intent?

104. Second, we believe our proposal encourages prompt deployment of STIR/SHAKEN. The statutory exemption rewards early progress in deployment. Therefore, by giving providers a path to exemption solely for their IP networks, we anticipate that we would encourage faster progress in STIR/SHAKEN deployment. We seek comment on this view.

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<sup>285</sup> See TRACED Act § 4(b)(1).

<sup>286</sup> See TRACED Act § 4(b)(2).

105. Third, our proposal here would align our interpretation of the exemption with our proposal to read requirements in the TRACED Act applying to voice service providers as applying on a call-by-call basis. Because networks are often mixed and capable of transmitting both in IP and non-IP, we preliminarily believe that reading the word “networks” in the statute to refer to the transmission technology of a particular call is the best interpretation of the statute. We thus preliminarily believe we could distinguish the duty that applies to “such provider of voice service in internet protocol networks” and “such provider of voice service in non-internet protocol networks” on the basis of the call in question. We seek comment on this proposal and of our proposed reading of section 4(b)(2) as creating two distinct exemptions.

106. *Threshold for IP Networks Exemption.* To ensure that the exemption only applies where warranted and to provide parties with adequate guidance, we propose expanding on each of the four substantive prongs that a voice service provider must meet to obtain an exemption. With respect to prong (A)(i), we propose interpreting the phrase “has adopted the STIR/SHAKEN authentication framework for calls on the internet protocol networks of the provider of voice service” to mean that the voice service provider has publicly committed, via a certification, to complete implementation of STIR/SHAKEN by June 30, 2021.<sup>287</sup> Because the exemption in section 4(b)(2)(A) requires a voice service provider to have “adopted” STIR/SHAKEN for calls on the IP portions of their networks prior to obtaining an exemption, but does not require full implementation of STIR/SHAKEN until not later than June 30, 2021,<sup>288</sup> we believe that the best approach is to interpret section 4(b)(2)(A) as requiring a provider, prior to obtaining an exemption, to make a public commitment to completely implement STIR/SHAKEN by June 30, 2021. We seek comment on this proposed interpretation. What are the potential benefits and drawbacks to this approach? Does our proposed interpretation align with the language and intended purpose of the statute? Are there any plausible alternative interpretations of this subsection of the TRACED Act that would account for both the stated requirement that a voice service provider “has adopted” STIR/SHAKEN for calls on the IP portions of its network prior to receiving an exemption, with the later “capable of fully implementing” date?

107. We propose reading the phrase “has agreed voluntarily to participate with other providers of voice service in the STIR/SHAKEN authentication framework” in prong (A)(ii) to mean that the voice service provider has written, signed agreements with at least two other voice service providers to exchange calls with authenticated caller ID information.<sup>289</sup> We seek comment on this approach. What are the potential benefits and drawbacks attendant in this interpretation? Does our proposed interpretation align with the language and intended purpose of the statute? Should we mandate that a voice service provider seeking to qualify for the exemption have agreements with more than two other voice service providers? If so, how many agreements should we require before a voice service provider may qualify for the exemption under section 4(b)(2)(A)? Should the “other providers of voice service” be unaffiliated with the provider seeking the exemption? Should voice service providers be required to establish such agreements only with those voice service providers with which they interconnect directly? Must these agreements include specific terms? Should we go further and require voice service providers to have reached agreements with all others with which they directly interconnect? We preliminarily are disinclined to adopt such a stringent requirement because, pursuant to the statute, voice service providers will have time between December 30, 2020, and June 30, 2021, to complete full implementation. Are there consortia or industry groups that would allow voice service providers to reach agreements with numerous other voice service providers at once and, if so, should meeting prong (A)(ii) require participation in such an entity? Should we impose specific recordkeeping requirements so that we can verify that such agreements are in place? Should voice service providers be required to provide proof of such agreements directly to the Commission upon request? Are there any plausible alternatives to our

<sup>287</sup> See TRACED Act § 4(b)(2)(A)(i).

<sup>288</sup> See TRACED Act § 4(b)(1)(A).

<sup>289</sup> See TRACED Act § 4(b)(2)(A)(ii).

proposed interpretation of prong (A)(ii)? For example, should we consider prong (A)(ii) to be satisfied if a service provider has registered with and been approved by the Policy Administrator? Why or why not?

108. We propose interpreting the phrase “has begun to implement the STIR/SHAKEN authentication framework” in prong (A)(iii) to mean that the voice service provider has completed the necessary network upgrades to at least one network element (e.g., a single switch or session border controller) to enable the authentication and verification of caller ID information consistent with the STIR/SHAKEN standards.<sup>290</sup> This proposal would require a voice service provider to make meaningful progress on implementation by the time of certification, while taking into account that voice service providers will have limited time between adoption of a Report and Order and the December 30, 2020 deadline for exemption determinations. We seek comment on this proposed interpretation and on potential alternatives. Is this proposed standard too lenient and, if so, what standard should we adopt? We recognize that the standard we propose may be more challenging for smaller voice service providers than larger voice service providers. Should we vary our expectations by voice service provider size and, if so, how?

109. Lastly, we propose interpreting the phrase “will be capable of fully implementing the STIR/SHAKEN authentication framework” in prong (A)(iv) to mean that the voice service provider reasonably foresees that it will have completed all necessary network upgrades to its network infrastructure to be able to authenticate and verify caller ID information for all SIP calls exchanged with STIR/SHAKEN-enabled partners, by June 30, 2021.<sup>291</sup> We seek comment on this proposed interpretation. Are there any plausible alternatives to our proposed interpretation of this prong of the section 4(b)(2)(A) exemption? For example, should we interpret this prong to require only that a provider reasonably foresees that it will have the capability to fully implement STIR/SHAKEN by June 30, 2021? How would such a reading align with Congress’s goal of broad STIR/SHAKEN deployment? Would a standard other than reasonable foreseeability be appropriate and, if so, how can we account for the statute’s requirement that voice service providers must make a prediction about the future? We encourage commenters to support any alternative interpretation of the implementation requirements in section 4(b)(2)(A) with reference not only to the statutory language of each provision, but specific technological and marketplace realities of how voice service providers can expect to foreseeably meet the qualifications that Congress has established.

110. *Threshold for Non-IP Networks Exemption.* A voice service provider is excused from the requirement to take reasonable measures to implement an effective caller ID authentication framework in the non-IP portions of its network if we find that it has: (1) taken reasonable measures to implement an effective caller ID authentication framework in the non-IP portions of its network; and (2) will be capable of fully implementing an effective caller ID authentication framework in the non-IP portions of its network not later than June 30, 2021.<sup>292</sup> As we have stated, we anticipate that in the non-IP context, few if any voice service providers will seek to take advantage of this exemption because of the difficulties in “fully implementing” an effective caller ID authentication framework. We seek comment on this view and whether there is an acceptable interpretation of the “fully implementing” prong that would make it more achievable for voice service providers to qualify for the exemption. What constitutes an “effective” call authentication framework? Must such a framework be comparable to STIR/SHAKEN? We also seek comment on how to interpret “reasonable measures” under prong (B)(i). How do “reasonable measures” under this prong differ from the “reasonable measures” required under section 4(b)(1)(B)?

111. *Compliance Certifications.* We propose to implement the TRACED Act exemption provision using a certification process. Specifically, we propose requiring a voice service provider that wishes to receive an exemption to submit a certification that it meets the criteria for the IP networks

<sup>290</sup> See TRACED Act § 4(b)(2)(A)(iii).

<sup>291</sup> See TRACED Act § 4(b)(2)(A)(iv).

<sup>292</sup> See TRACED Act § 4(b)(2)(B).

exemption that we propose to establish pursuant section 4(b)(2)(A); the criteria for the non-IP networks exemption that we propose to establish pursuant section 4(b)(2)(B); or both. Under this proposal, each voice service provider who wishes to qualify for the section 4(b)(2)(A) and/or (B) exemption must have an officer, as an agent of the voice service provider, sign a compliance certificate stating that the officer has personal knowledge that the company meets each of the stated criteria. We also propose requiring the voice service provider to submit an accompanying statement explaining, in detail, how the company is working to accomplish the four prongs of the exemption.<sup>293</sup> We believe a certification process is necessary to allow us to meet Congress's deadline for completion of exemption determinations by December 30, 2020.

112. We propose requiring these certifications to be filed no later than December 1, 2020. We propose requiring all certifications and supporting statements to be filed electronically in a new docket established specifically for such filings in the Commission's Electronic Comment Filing System (ECFS).<sup>294</sup> We propose directing the Bureau to provide additional directions and filing information regarding the certifications in the Public Notice announcing OMB approval. And we propose directing the Bureau to review the certifications and accompanying documents for completeness and to determine whether the certifying party has met the standard we establish. We further propose directing the Bureau to issue a list of parties that have filed compliant certifications and thus receive the exemption(s) on or before December 30, 2020. Because of the limited time for review of certifications, we propose that any voice service providers that file inadequate certifications will not receive an opportunity to cure and will, instead, be subject to the general duty we establish in the Report and Order to implement STIR/SHAKEN by June 30, 2021. We preliminarily view this consequence as reasonable and appropriate because the purpose of the certification is merely to determine which voice service providers would, in the absence of the STIR/SHAKEN obligation, nonetheless be able to implement STIR/SHAKEN in a timely manner.

113. We seek comment on this proposed certification process. Are there ways that we can streamline the process without sacrificing certainty that an exemption is warranted? For instance, should we allow a less senior company official to sign the certification and, if so, who should be allowed to sign? Should we impose any additional requirements? Is there an additional or different way for voice service providers to demonstrate that they have met the implementation requirements in section 4(b)(2)(A) and/or (B) of the TRACED Act that would allow us to reach the determinations required by the statute by December 30, 2020? If so, how should we structure and implement any such process? Should we treat any of the information that voice service providers submit in their accompanying statement as presumptively confidential?

114. *Retrospective Review.* The section 4(b)(2)(A) and (B) exemptions are, by their nature, based on a voice service provider's prediction of its future ability to implement STIR/SHAKEN by June 30, 2021. We preliminarily believe that Congress intended for us to verify, after the fact, that voice service providers claiming the exemption completed full implementation in accordance with their commitments. We believe that such a review is consistent with the TRACED Act both because the broad structure of section 4 aims toward full implementation of caller ID authentication and because section 4(b)(2)(A)(iv) and (B)(ii) each state that a voice service provider may receive the exemption only if it "will" be capable of "fully" implementing a call authentication framework (STIR/SHAKEN or "an effective call authentication framework," respectively). We seek comment on this view. We are concerned that, absent a look back at whether voice service providers that receive the exemption later fulfill their expectations, voice service providers may receive the exemption but later not implement STIR/SHAKEN or a non-IP call authentication framework completely in a timely manner. This would

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<sup>293</sup> Cf. *Implementation of the Telecommunications Act of 1996: Telecommunications Carriers' Use of Customer Proprietary Network Information and Other Customer Information; IP-Enabled Services*, CC Docket No. 96-115, WC Docket No. 04-36, Report and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 6927, 6953-54, para. 52 (2007).

<sup>294</sup> This system is accessible at <https://www.fcc.gov/ecfs>.

harm the public because it would create pockets of unauthenticated calls and give the voice service providers that claimed the exemption but fall short a significant loophole—a circumstance that would invite bad actors to claim the exemption without any intent of completing the obligation. We seek comment on this view and whether there are alternatives to looking back at voice service providers claiming the exemption after the compliance deadline that would address the risk of gaps and abusive claims of the exemption.

115. We specifically propose requiring a voice service provider that receives an exemption to file a second certification after June 30, 2021, stating whether it in fact achieved the implementation goal to which it committed. We propose requiring the certification to be filed in ECFS subject to the same allowance for confidentiality and requirements for sworn signatures and detailed support as the initial certifications. We propose directing the Bureau to issue a Public Notice setting a specific deadline no later than three months after June 30, 2021 and providing detailed filing requirements. We propose directing the Bureau to seek public comment on each certification and, following review of the certifications, supporting materials, and responsive comments, to issue a Public Notice identifying which voice service providers remain subject to the exemption. We seek comment on these proposals and on possible alternatives.

116. If a voice service provider cannot certify to full implementation upon retrospective review but demonstrates to the Bureau that it filed its initial certification in good faith and made good faith efforts to complete implementation, we propose that the consequence for such a shortcoming would be loss of the exemption and application of the general rule requiring full STIR/SHAKEN implementation, effective immediately. We believe an immediate effective date would be important to ensure that certain voice service providers do not receive an extension not granted to similarly situated providers simply because they filed a certification they later failed to meet. If the Bureau finds that a voice service provider filed its initial certification in bad faith or failed to take good faith steps toward implementation, we propose to require full implementation immediately and further to direct the Bureau to refer the voice service provider to the Enforcement Bureau for possible enforcement action based on filing a false certification and/or other possible violations. We believe we have legal authority to adopt the foregoing proposals under the TRACED Act, and that we have independent authority to do so under section 251(e). We seek comment on these proposals and on other possible alternatives.

117. *Providers Eligible for Exemption.* We preliminarily do not interpret the TRACED Act's exemption process to include intermediate providers, because its definition of "voice service" refers to "furnish[ing] voice communications to an end user."<sup>295</sup> We seek comment on whether and how we should extend the exemption process to intermediate providers, in addition to originating and terminating voice service providers. What would be the benefits and drawbacks of such an approach?

#### **G. Prohibiting Line Item Charges for Caller ID Authentication**

118. The TRACED Act explicitly directs us to "prohibit providers of voice service from adding any additional line item charges to consumer or small business customer subscribers for the effective call authentication technology" mandated by the Act.<sup>296</sup> Accordingly, we propose prohibiting voice service providers from imposing additional line item charges on consumer or small business subscribers for caller ID authentication. We believe this proposal is a straightforward implementation of Congress's clear direction. We propose to interpret "consumer" as used in the TRACED Act to refer to residential mass-market subscribers, and we propose to interpret "small business" to refer to business entities that meet the Small Business Administration (SBA) definition of "small business."<sup>297</sup> We note that the record developed in response to the *2019 Robocall Declaratory Ruling and Further Notice*

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<sup>295</sup> TRACED Act § 4(a)(2)(A).

<sup>296</sup> *Id.* § 4(b)(6).

<sup>297</sup> 13 CFR Part 121, Subpart A.

reflects support for such a prohibition.<sup>298</sup> We seek comment on our proposal and proposed interpretation of this section of the TRACED Act. Should we adopt different definitions? For instance, should we define “small business” with respect to line count, and if so, what line count limitation is appropriate? We recognize that a line count-based definition would be easier for providers to administer, but would it leave out small businesses that Congress intended to protect from line item charges?

119. To provide additional clarity regarding the prohibition on line item charges, we specifically propose to prohibit voice service providers from imposing a line-item charge on consumers or small businesses for the cost of upgrading network elements as necessary to implement STIR/SHAKEN, for any recurring costs associated with the authentication and verification of calls, or for any display of STIR/SHAKEN verification information on their subscribers’ phones. ITTA argues that “SHAKEN/STIR implementation costs should be fully recoverable via . . . any line item that recovers government-mandated charges . . . .”<sup>299</sup> We disagree and propose to reject this suggestion with respect to consumer and small business subscribers, on the basis that Congress directly addressed this issue in the TRACED Act.<sup>300</sup> We seek comment on whether we should extend our prohibition to other types of subscribers. We additionally seek comment on our proposal and whether it has the correct scope. Are there other caller ID authentication-related costs or services we should specifically address in our prohibition? Should we list all categories of prohibited charges, or should our list merely provide examples of the types of charges barred by the general prohibition on line-item charges? Should we address whether voice service providers may recover caller ID authentication costs from consumers and small businesses through rate increases, and if so how and on what legal basis?

#### **H. Benefits and Costs**

120. The proposals in this Further Notice generally reflect mandates from the TRACED Act, and we have no discretion to ignore such congressional direction. To the extent that we are seeking comment on multiple possible options to implement any given mandate, we urge commenters, where possible, to include an assessment of relative costs and benefits for competing options. We found in the accompanying Report and Order that widespread deployment of STIR/SHAKEN will increase the effectiveness of the framework for both voice service providers and their subscribers. Among the considerable and varied benefits identified in the Report and Order are the reduction in nuisance calls, protection from illegally spoofed calls, and restoration of confidence in incoming calls. The proposals in this Further Notice are intended to, consistent with the TRACED Act, encourage further deployment of this technology and thus expand these benefits. We thus propose to reaffirm our finding of considerable benefit to widespread caller ID authentication implementation, and we propose to conclude that implementation of the TRACED Act provisions and other proposals discussed above will make considerable progress in unlocking those benefits, and that those benefits far exceed the costs. We seek comment on this proposal. We further seek detailed comments on the costs of the proposals in this Further Notice. What are the upfront and recurring costs associated with each? Will these costs vary according to the size of the voice service provider? What costs would specifically burden intermediate providers? We preliminarily believe that intermediate providers would be faced with similar upfront costs as originating and terminating voice service providers, but will not have the recurring costs related to STIR/SHAKEN authentication and verification service. Is this view accurate? Do the benefits of our proposals outweigh the costs in each case?

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<sup>298</sup> See Consumer Report et al. Comments at 3 (“The [Commission] should require phone companies to adopt effective call-authentication policies and technologies, at no additional line item charge to subscribers.”); Fifty-One State Attorneys General Reply at 3-4 (“[S]ervice should also be offered to consumers for free with no line-item charge . . . .”).

<sup>299</sup> ITTA Reply at 21.

<sup>300</sup> See TRACED Act § 4(b)(6).



## I. Access to Numbering Resources

121. Section 6(a) of the TRACED Act directs us to examine whether and how our policies regarding access to both toll free and non-toll free numbering resources can be modified to help reduce access to numbers by potential perpetrators of illegal robocalls,<sup>301</sup> and it directs us to prescribe regulations to implement any such policy modifications.<sup>302</sup> In addition, section 6(b) provides a forfeiture penalty, pursuant to section 503(b) of the Act, for a knowing violation of any regulation we prescribe pursuant to section 6(a).<sup>303</sup>

122. *Background.* Currently, voice service providers that are telecommunications carriers access non-toll free numbers through the NANP Administrator (NANPA) and the Pooling Administrator (collectively, the “Numbering Administrators”).<sup>304</sup> Applicants for numbering resources must comply with Commission rules and with guidelines from the Alliance for Telecommunications Industry Solutions (ATIS) Industry Numbering Committee (INC) and the Numbering Administrators.<sup>305</sup> These rules and guidelines require such voice service providers to provide contact information,<sup>306</sup> provide Operating Company Number information,<sup>307</sup> disclose the primary type of business for which the numbers will be used,<sup>308</sup> file a NANP Numbering Resource Utilization/Forecast (NRUF) Report with the NANPA,<sup>309</sup> and

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<sup>301</sup> TRACED Act § 6(a)(1); *see also* 47 U.S.C. 227(b).

<sup>302</sup> TRACED Act § 6(a)(2).

<sup>303</sup> *Id.* § 6(b). Our obligation to examine and implement policy modifications does not extend to the forfeiture provision of section 6(b). In light of this distinction, as well as the forfeiture procedures that the Commission already has in place, *see* 47 CFR § 1.80, we do not consider it necessary to seek comment on how section 6(b) of the TRACED Act would be implemented.

<sup>304</sup> *See* 47 CFR §§ 52.13, 52.15, 52.20(b), 52.20(d); *see also* 47 CFR § 52.15(g)(2)(i); *Numbering Policies for Modern Communications et al*, Report and Order, 30 FCC Rcd 6839, 6841–42, para 4 (2015) (*VoIP Direct Access to Numbers Order*).

<sup>305</sup> *See* 47 CFR § 52.15(g)(1)-(2); ATIS Guidelines for the Administration of Telephone Numbers, ATIS-0300070, § 1.0, at 2 (2019), [https://access.atis.org/apps/group\\_public/download.php/49754/ATIS-0300070\(2019-10\).zip](https://access.atis.org/apps/group_public/download.php/49754/ATIS-0300070(2019-10).zip) (*ATIS Administration Guidelines*); ATIS, Thousands-Block (NPA[Numbering Plan Area]-NXX-X) & Central Office Code (NPA-NXX) Administration Guidelines, ATIS-0300119, at §§ 2.4, 7.0 (2020), [https://access.atis.org/apps/group\\_public/download.php/50684/ATIS-0300119\(2020-01\).zip](https://access.atis.org/apps/group_public/download.php/50684/ATIS-0300119(2020-01).zip) (*ATIS Pooling and Code Guidelines*). We require the Numbering Administrators to follow ATIS INC guidelines, which, in turn, provides additional requirements for voice service providers accessing numbering resources. *See* 47 CFR § 52.13(b)(3).

<sup>306</sup> NANPA, NANP Administration System (NAS) User Registration Guide at 2.1.1 (2019) [https://www.nationalnanpa.com/tools/trainGuides/NAS\\_User\\_Registration\\_Guide.pdf](https://www.nationalnanpa.com/tools/trainGuides/NAS_User_Registration_Guide.pdf) (*NAS User Guide*); Pooling Administrator, Pooling Administration System (PAS) Service Providers (SPs) and Service Provider Consultants (SPCs) Registration Guide at 3, 9 (2019) [https://www.nationalpooling.com/documents/user\\_guides/user\\_guide\\_sp/SP\\_and\\_SPC\\_User\\_Registration.pdf](https://www.nationalpooling.com/documents/user_guides/user_guide_sp/SP_and_SPC_User_Registration.pdf) (*PAS Registration Guide*).

<sup>307</sup> 47 CFR § 52.15(g)(1); *NAS User Guide* at 2.1.1; *PAS Registration Guide* at 3-4, 9-10. If applicable, a voice service provider’s company and parent company Operating Company Numbers are both required. *See* 47 CFR § 52.15(g)(1).

<sup>308</sup> 47 CFR § 52.15(g)(1).

<sup>309</sup> *ATIS Pooling and Code Guidelines* at 4.4.1; ATIS, North American Numbering Plan Numbering Resource Utilization/Forecast Reporting (Guidelines, ATIS-0300068, § 1.0, at 2 (2019), [https://access.atis.org/apps/group\\_public/download.php/49758/ATIS-0300068\(2019-10\).zip](https://access.atis.org/apps/group_public/download.php/49758/ATIS-0300068(2019-10).zip). The NANPA uses the reporting data to both “project the exhaust date of the individual [Numbering Plan Areas] as well as the life span of the [NANP]. *Id.*”

disclose the states for which they will request numbering resources.<sup>310</sup> Applicants for initial numbering resources must also include evidence that the applicant is capable of providing service within 60 days of the numbering resources activation date (facilities readiness requirement).<sup>311</sup> Voice service providers must also maintain internal records of numbering resources for reporting purposes.<sup>312</sup>

123. While traditionally only telecommunications carriers were permitted to request and receive numbers from the Numbering Administrators, in 2015 the Commission adopted rules establishing a process for interconnected VoIP providers to request numbers directly from the Numbering Administrators.<sup>313</sup> To apply for Commission authorization for direct access to numbers,<sup>314</sup> interconnected VoIP providers must provide contact information;<sup>315</sup> agree to comply with Commission rules, numbering authority delegated to the states, and industry guidelines and practices regarding numbering as applicable to telecommunications carriers;<sup>316</sup> provide 30-day notice to relevant state commission(s) before requesting numbering resources from Numbering Administrators;<sup>317</sup> provide proof of facilities readiness;<sup>318</sup> and certify that the applicant possesses the requisite expertise to provide reliable service,<sup>319</sup> that key personnel are not being nor have been investigated for failure to comply with any law, rule, or order,<sup>320</sup> that the applicant complies with its Universal Service Fund (USF), Telecommunications Relay Services, NANP and local number portability administration contribution obligations, its regulatory fee obligations, and its 911 obligations,<sup>321</sup> and that no party to the application is subject to denial of Federal benefits pursuant to section 5301 of the Anti-Drug Abuse Act.<sup>322</sup> All voice service providers, including interconnected VoIP providers, must comply with a number of obligations in order to maintain their authorization to access numbers, including USF reporting and contributions,<sup>323</sup> 911 service obligations,<sup>324</sup> and maintaining

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<sup>310</sup> *NAS User Guide* at 2.1.1; *PAS Registration Guide* at 3, 10-11.

<sup>311</sup> 47 CFR § 52.15(g)(2); *VoIP Direct Access to Numbers Order*, 30 FCC Rcd at 6850, para 24 (referring to section 52.12(g)(2) as the Commission's facilities readiness requirement).

<sup>312</sup> 47 CFR § 52.15(f); *ATIS Administration Guidelines*, § 1.0, at 2.

<sup>313</sup> *VoIP Direct Access to Numbers Order*, 30 FCC Rcd at 6840–41, paras. 1, 3. Direct access to telephone numbers by interconnected VoIP providers is restricted to only those interconnected VoIP providers that can demonstrate that they are authorized to provide service by a state-level certification in a given area for which they are requesting numbers or by a Commission-level authorization.

<sup>314</sup> 47 CFR § 52.15(g)(3)(ii). Applicants for direct access authorization must submit applications through the Commission's Electronic Comment Filing System.

<sup>315</sup> 47 CFR § 52.15(g)(3)(i)(A).

<sup>316</sup> 47 CFR § 52.15(g)(3)(i)(B).

<sup>317</sup> 47 CFR § 52.15(g)(3)(i)(C).

<sup>318</sup> 47 CFR § 52.15(g)(3)(i)(D).

<sup>319</sup> 47 CFR § 52.15(g)(3)(i)(F).

<sup>320</sup> 47 CFR § 52.15(g)(3)(i)(F).

<sup>321</sup> 47 CFR § 52.15(g)(3)(i)(E).

<sup>322</sup> 47 CFR § 52.15(g)(3)(i)(G). *See also* 21 U.S.C. 862.

<sup>323</sup> 47 CFR § 52.15(g)(3)(i)(E); 47 CFR Part 54.

<sup>324</sup> *See* 47 CFR Part 9.

sufficient and auditable data to demonstrate compliance with applicable guidelines,<sup>325</sup> among other obligations in the Commission's rules and industry guidelines.<sup>326</sup>

124. A Responsible Organization (RespOrg) obtains toll free numbers, on a toll free subscriber's behalf,<sup>327</sup> by reserving and assigning a number from the SMS/800 Toll Free Number Registry (TFN Registry).<sup>328</sup> The Commission-designated Toll Free Numbering Administrator (TFNA) manages the TFN Registry and certifies RespOrgs.<sup>329</sup> To access the TFN Registry, RespOrgs must complete a Service Establishment Application;<sup>330</sup> obtain a logon identification code from the TFNA requiring the disclosure of information including general contact information, type of access sought, and the interexchange carrier providing the connection; demonstrate that one or more employees possess adequate TFN Registry training; and pass a TFN Registry certification test.<sup>331</sup> RespOrgs must also follow the *ATIS Toll Free Guidelines*, adhere to agreements established through the ATIS industry forum process,<sup>332</sup> and acknowledge that the RespOrg is bound by the terms and conditions contained in TFN Registry Functions Tariff.<sup>333</sup> RespOrgs have sole responsibility for the accuracy of subscriber records and information in the TFN Registry.<sup>334</sup> Toll free numbers must be available to RespOrgs and subscribers on an equitable basis, and typically are assigned first-come, first-served.<sup>335</sup> In 2019, the TFNA held an auction of toll-free numbers in the 833 code for which there were two or more requests for assignment.<sup>336</sup> Individual bidders and RespOrgs bid on specific numbers through a competitive bidding process and, unlike other toll free numbers, are able to sell those numbers won at auction in a secondary market.<sup>337</sup>

<sup>325</sup> *ATIS Pooling and Code Guidelines*, § 8.1.1(n).

<sup>326</sup> See, e.g., 47 CFR §§ 52.15(g)(3)(iv); 52.15(g)(4)(iv), 52.15(g)(5); *ATIS Pooling and Code Guidelines*, §§ 8.1, 8.2, 8.3.

<sup>327</sup> 47 CFR §§ 52.101(b), 52.101(d), 52.101(e); ATIS, Industry Guidelines for Toll Free Number Administration, ATIS-0417001-003, at 18 (2017) (*ATIS Toll Free Guidelines*); SOMOS, 800 Service Management System (SMS/800) Toll-Free Number Registry (TFN Registry) Functions at 53 (2020), [https://s3.amazonaws.com/files-drupal8-prod.somos.com/s3fs-public/media/file/SMS800%20TFN%20Registry%20Functions%20Tariff\\_Feb2020.pdf](https://s3.amazonaws.com/files-drupal8-prod.somos.com/s3fs-public/media/file/SMS800%20TFN%20Registry%20Functions%20Tariff_Feb2020.pdf) (*Somos Tariff*) (defining toll free subscriber as "any individual, business, or government agency that has arranged with a LEC or an [interexchange carrier] to have a toll-free service, and that has been assigned a toll-free number").

<sup>328</sup> See *Toll Free Service Access Codes, Petition to Change the Composition of SMS/800, Inc.*, Order, 28 FCC Rcd 15328, 15328, para. 1 n.3 (2013) (*Toll Free Governance Order*); *Somos Tariff* at 53; *ATIS Toll Free Guidelines* at 1.

<sup>329</sup> 47 CFR § 52.101(a); *Toll Free Governance Order*, 28 FCC Rcd 15328 at para. 1 (establishing SMS/800, later known as Somos, Inc. as the toll free numbering administrator, subject to a tariff); *SOMOS Tariff* at 32-33; FCC, *What Is a Toll-Free Number and How Does it Work*, <https://www.fcc.gov/consumers/guides/what-toll-free-number-and-how-does-it-work> (last visited Jan. 29, 2020).

<sup>330</sup> Somos, *Service Establishment Application*, <https://portal.somos.com/Controls/ONFOREG/PublicForms/PublicSMS-SE.aspx> (last visited Jan. 30, 2020).

<sup>331</sup> *Somos Tariff* at 32-33.

<sup>332</sup> *ATIS Toll Free Guidelines* at 2.

<sup>333</sup> Somos, *How to Submit a Request – User Guides* at 4-5 (2019), [https://s3.amazonaws.com/files-drupal8-prod.somos.com/s3fs-public/media/file/How%20to%20Submit%20a%20Request\\_4.pdf](https://s3.amazonaws.com/files-drupal8-prod.somos.com/s3fs-public/media/file/How%20to%20Submit%20a%20Request_4.pdf); see generally *Somos Tariff*.

<sup>334</sup> *SOMOS Tariff* at 38.

<sup>335</sup> 47 CFR § 52.111. The Commission may use competitive bidding and/or other alternative assignment methodologies for toll free numbers; *id.*

<sup>336</sup> See generally *Toll Free Assignment Modernization, Toll Free Service Access Codes*, Report and Order, 33 FCC Rcd 9274 (2019) (*Toll Free Assignment Modernization Order*); *Auction of Toll Free Numbers in the 833 Code*, Public Notice, 34 FCC Rcd 6560 (2019) (*833 Auction Procedures Public Notice*).

<sup>337</sup> See *Toll Free Assignment Modernization Order*, 33 FCC Rcd at 9288-89, 9301, paras. 38-41, 79.

125. *Discussion.* We seek comment on whether and how we should modify our policies regarding access to toll free and non-toll free numbering resources to help reduce illegal robocallers' access to numbering resources. Specifically, we seek comment on whether any new or modified registration and compliance obligations would be appropriate to help reduce illegal robocallers' access to numbering resources. We ask commenters to identify specific modifications to our rules and Numbering Administrator policies. For example, should we require applicants for numbering resources to provide a certification that they "know their customers" through some sort of customer identity verification, perhaps explaining the steps that they take to do so? Should we require voice service providers to provide information about their customers to the Numbering Administrators? Should we modify our NRUF reporting requirements concerning carriers that assign numbering resources to intermediate providers, and if so, in what way?<sup>338</sup> Should we impose U.S. residency requirements for access to U.S. telephone numbers? Would imposing U.S. residency requirements reduce the likelihood of bad actors generating large-scale robocall campaigns beyond the reach of U.S. law enforcement? Further, would U.S. residency requirements increase accuracy and efficiency regarding attestation levels under the STIR/SHAKEN protocols? If we did impose U.S. residency requirements, would it reduce the number of voice service providers in the international voice market, thus reducing downward competitive pressure on international voice calling rates?<sup>339</sup> Would imposing residency requirements harm domestic voice communications? Should we require minimal state contacts to obtain numbering resources in a particular state? Should we delegate enforcement of any modifications to our policies to the states, at least in the first instance? We invite parties to comment on these or other potential policy modifications that might limit illegal robocalling.

126. We seek comment on the potential costs that would be imposed by any changes that commenters recommend to our policies regarding access to numbering resources. What costs do specific changes impose on entities that use numbers, Numbering Administrators, and consumers? Would any modifications to our policies unreasonably increase the difficulty for consumers and businesses (and their voice service providers) that are not perpetrators of illegal robocalling to obtain U.S. telephone numbers?<sup>340</sup> We seek specific comment on the burdens of imposing potential certification requirements on applicants for numbering resources, particularly on small businesses. Additionally, we seek comment on how we can ensure that any "know your customer" requirements do not harm consumer privacy.

127. We also seek comment on the effects that any proposed modifications to our policies for access to numbering resourcing could have on competition and innovation in the voice marketplace.<sup>341</sup> Could any market-distorting differential effects on voice service providers result? We seek comment on whether any suggested modifications could provide an unreasonable advantage to one type of technology or business model over another.<sup>342</sup> For example, would modifications such as "in-person presentation of documents or identity verification tend to favor non-Internet-based companies or those with physical lines over those who do business via the Internet or use newer technologies?"<sup>343</sup> How could we minimize any negative ramifications for competition<sup>344</sup> in the voice services market?

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<sup>338</sup> 47 CFR § 52.15(f)(1)(v) (defining intermediate numbers as "numbers that are made available for use by another telecommunications carrier or non-carrier entity for the purpose of providing telecommunications service to an end user or customer").

<sup>339</sup> S. Rep. No. 116-41, at 18.

<sup>340</sup> *Id.*

<sup>341</sup> *Id.*

<sup>342</sup> *See Id.*

<sup>343</sup> *Id.*

<sup>344</sup> *Id.*

128. We recognize that any potential modifications to our rules and policies may need to be uniquely tailored to particular industry segments in order to reduce access to numbers by bad actors while avoiding undesirable consequences. How could modifications be tailored to providers of toll free service, voice service providers that are telecommunications carriers, and interconnected VoIP providers in order to effectively prevent bad actors from accessing numbering resources while avoiding undesirable consequences? For example, would adding a “know your customer” certification to the application for numbering resources work better for one industry than another (such as, for example, non-toll-free versus toll-free service)? Should we require that subscriber information be included in the TFN Registry, as opposed to RespOrg information alone? Should rules for any future Commission auctions of toll-free numbers also include these requirements? Further, are there specific policy modifications that we can adopt in the voice services wholesale market that will achieve the Commission’s goal to reduce access to numbers by potential perpetrators of illegal robocalls?

## V. PROCEDURAL MATTERS

129. *Final Regulatory Flexibility Analysis.* As required by the Regulatory Flexibility Act of 1980 (RFA),<sup>345</sup> an Initial Regulatory Flexibility Analysis (IRFA) was incorporated into the *2019 Robocall Declaratory Ruling and Further Notice*.<sup>346</sup> The Commission sought written public comment on the possible significant economic impact on small entities regarding the proposals addressed in the *2019 Robocall Declaratory Ruling and Further Notice*, including comments on the IRFA.<sup>347</sup> Pursuant to the RFA, a Final Regulatory Flexibility Analysis is set forth in Appendix C. The Commission’s Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this *Report and Order*, including the FRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).<sup>348</sup>

130. *Ex Parte Rules.* This proceeding shall be treated as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.<sup>349</sup> Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter’s written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with Rule 1.1206(b). In proceedings governed by Rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (*e.g.*, .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission’s *ex parte* rules.

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<sup>345</sup> See 5 U.S.C. § 603.

<sup>346</sup> *2019 Robocall Declaratory Ruling and Further Notice*, 34 FCC Rcd at 4916, Appx. F

<sup>347</sup> *Id.* at 4906, para. 97.

<sup>348</sup> See 5 U.S.C. § 603(a).

<sup>349</sup> 47 CFR §§ 1.1200 *et seq.*

131. *Filing of Comments and Reply Comments.* Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers. Comments may be filed electronically using the Internet by accessing the ECFS: [www.fcc.gov/ecfs](http://www.fcc.gov/ecfs).
- Paper Filers. Parties who choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th Street, S.W., Room TW-A325, Washington, D.C., 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of *before* entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, S.W., Washington, D.C., 20554.
- Comments Containing Proprietary Information. Commenters that file what they consider to be proprietary information may request confidential treatment pursuant to section 0.459 of the Commission's rules. Commenters should file both their original comments for which they request confidentiality and redacted comments, along with their request for confidential treatment. Commenters should not file proprietary information electronically. See *Examination of Current Policy Concerning the Treatment of Confidential Information Submitted to the Commission*, Report and Order, 13 FCC Rcd 24816 (1998), Order on Reconsideration, 14 FCC Rcd 20128 (1999). Even if the Commission grants confidential treatment, information that does not fall within a specific exemption pursuant to the Freedom of Information Act (FOIA) must be publicly disclosed pursuant to an appropriate request. See 5 U.S.C. § 552; 47 CFR § 0.461. We note that the Commission may grant requests for confidential treatment either conditionally or unconditionally. As such, we note that the Commission has the discretion to release information on public interest grounds that falls within the scope of a FOIA exemption.
- People with Disabilities. To request materials in accessible formats for people with disabilities (braille, large print, electronic files, or audio format), send an e-mail to [fcc504@fcc.gov](mailto:fcc504@fcc.gov) or call the Consumer & Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (tty).
- Availability of Documents. Comments, reply comments, and *ex parte* submissions will be available for public inspection during regular business hours in the FCC Reference Center, Federal Communications Commission, 445 12th Street, S.W., CY-A257, Washington, D.C., 20554. These documents will also be available via ECFS.

Documents will be available electronically in ASCII, Microsoft Word, or Portable Document formats.

132. *Initial Regulatory Flexibility Analysis.* As required by the RFA,<sup>350</sup> the Commission has prepared an IRFA of the possible significant economic impact on small entities of the policies and rules proposed in this *Call Authentication Further Notice of Proposed Rulemaking*. The IRFA is set forth in Appendix D. We request written public comment on this IRFA. Comments must be filed by the deadlines for comments on the *Call Authentication Further Notice of Proposed Rulemaking* indicated on the first page of this document and must have a separate and distinct heading designating them as responses to the IRFA. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this *Call Authentication Further Notice of Proposed Rulemaking*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).<sup>351</sup>

133. *Paperwork Reduction Act.* This document contains proposed new or modified information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.<sup>352</sup>

134. *Congressional Review Act.* [The Commission will submit this draft Report & Order and Further Notice of Proposed Rulemaking to the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, for concurrence as to whether this rule is "major" or "non-major" under the Congressional Review Act, 5 U.S.C. § 804(2).] The Commission will send a copy of this Report & Order and Further Notice of Proposed Rulemaking to Congress and the Government Accountability Office pursuant to 5 U.S.C. § 801(a)(1)(A).

135. *Comment Filing Dates.* In light of statutory deadlines under section 4 of the TRACED Act requiring Commission action by December 30, 2020, we have established date-certain comment and reply dates of May 15, 2020, and May 29, 2020, respectively. Receiving comments and replies by these dates is necessary to provide the Commission with sufficient time to consider the record before establishing the rules and implementing the processes necessary to fulfill Congress's requirements by the statutory deadlines. In particular, we find these date-certain comment deadlines necessary with respect to the process regarding the voluntary implementation exemption that we propose. To implement that proposal, we must review the record and adopt a Report and Order, and then the Bureau must obtain Office of Management and Budget approval for an information collection and collect and review certifications, all before December 30, 2020.<sup>353</sup> Therefore, we find that good cause exists to support the comment dates we establish necessary to meet Congress' deadlines.<sup>354</sup>

136. *Contact person.* For further information about this proceeding, please contact Mason Shefa, FCC Wireline Competition Bureau, Competition Policy Division, 445 12th Street, S.W., Washington, D.C., 20554, at (202) 418-2962, or mason.shefa@fcc.gov.

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<sup>350</sup> See 5 U.S.C. § 603.

<sup>351</sup> See 5 U.S.C. § 603(a).

<sup>352</sup> See 44 U.S.C. § 3506(c)(4).

<sup>353</sup> If we were to decline to adopt a certification process, we would either (1) need to follow the same process for a different information collection or (2) allot substantially more time for review of individualized exemption requests.

<sup>354</sup> 5 U.S.C. § 553(b)(B); see *Fla. Power & Light v. United States*, 846 F.2d 765, 772 (D.C. Cir. 1988) (upholding 15-day comment period where agency was facing statutory deadlines).

**VI. ORDERING CLAUSES**

137. Accordingly, IT IS ORDERED, pursuant to sections 4(i), 4(j), 227(e), 227b, 251(e), and 303(r), of the Communications Act of 1934, as amended (the Act), 47 U.S.C. §§ 154(i), 154(j), 227(e), 227b, 251(e), and 303(r), that this *Report and Order* IS ADOPTED.

138. IT IS FURTHER ORDERED that Part 64 of the Commission's rules IS AMENDED as set forth in Appendix A.

139. IT IS FURTHER ORDERED that, pursuant to sections 1.4(b)(1) and 1.103(a) of the Commission's rules, 47 CFR §§ 1.4(b)(1), 1.103(a), this *Report and Order* SHALL BE EFFECTIVE 30 days after publication in the *Federal Register*.

140. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of this *Report and Order* to Congress and to the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A).

141. IT IS FURTHER ORDERED, pursuant to sections 4(i), 4(j), 227(e), 227b, 227b-1, 251(e), and 303(r), of the Act, 47 U.S.C. §§ 154(i), 154(j), 227 (e), 227b, 227b-1, 251(e), and 303(r), that that this *Further Notice of Proposed Rulemaking* IS ADOPTED.

142. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Report and Order*, including the Final Regulatory Flexibility Analysis (FRFA), and *Further Notice of Proposed Rulemaking*, including the Initial Regulatory Flexibility Analysis (IRFA), to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch  
Secretary



## APPENDIX A

## Final Rules

The Federal Communications Commission amends part 64 of Title 47 of the Code of Federal Regulations as follows:

**PART 64 – MISCELLANEOUS RULES RELATING TO COMMON CARRIERS**

\* \* \* \* \*

1. The authority citation for part 64 is revised to read as follows:

**Authority:** 47 U.S.C. 154, 201, 202, 217, 218, 220, 222, 225, 226, 227, 227b, 228, 251(a), 251(e), 254(k), 262, 403(b)(2)(B), (c), 616, 620, 1401-1473, unless otherwise noted; Pub. L. 115-141, Div. P, sec. 503, 132 Stat. 348, 1091.

2. Amend Part 64 of Title 47 of the Code of Federal Regulations by adding a new Subpart HH to read as follows:

**Subpart HH – Caller ID Authentication****§ 64.6300 Definitions**

- (a) *Authenticate caller identification information.* The term “authenticate caller identification information” refers to the process by which a voice service provider attests to the accuracy of caller identification information transmitted with a call it originates.
- (b) *Caller identification information.* The term “caller identification information” has the same meaning given the term “caller identification information” in 47 CFR 64.1600(c) as it currently exists or may hereafter be amended.
- (c) *Intermediate provider.* The term “intermediate provider” means any entity that carries or processes traffic that traverses or will traverse the PSTN at any point insofar as that entity neither originates nor terminates that traffic.
- (d) *SIP call.* The term “SIP call” refers to calls initiated, maintained, and terminated using the Session Initiation Protocol signaling protocol.
- (e) *STIR/SHAKEN authentication framework.* The term “STIR/SHAKEN authentication framework” means the secure telephone identity revisited and signature-based handling of asserted information using tokens standards.
- (f) *Verify caller identification information.* The term “verify caller identification information” refers to the process by which a voice service provider confirms that the caller identification information transmitted with a call it terminates was properly authenticated.
- (g) *Voice Service.* The term “voice service”—
- (1) means any service that is interconnected with the public switched telephone network and that furnishes voice communications to an end user using resources from the North American Numbering Plan or any successor to the North American Numbering Plan adopted by the Commission under section 251(e)(1) of the Communications Act of 1934, as amended; and

(2) includes—

(A) transmissions from a telephone facsimile machine, computer, or other device to a telephone facsimile machine; and

(B) without limitation, any service that enables real-time, two-way voice communications, including any service that requires internet protocol-compatible customer premises equipment and permits out-bound calling, whether or not the service is one-way or two-way voice over internet protocol.

**§ 64.6301 Caller ID authentication.**

(a) *STIR/SHAKEN Implementation by Voice Service Providers.* Not later than June 30, 2021, a voice service provider shall fully implement the STIR/SHAKEN authentication framework in its internet protocol networks. To fulfill this obligation, a voice service provider shall:

(1) authenticate and verify caller identification information for all SIP calls that exclusively transit its own network;

(2) authenticate caller identification information for all SIP calls it originates and that will exchange with another voice service provider or intermediate provider and, to the extent technically feasible, transmit that call with caller ID authentication information to the next voice service provider or intermediate provider in the call path; and

(3) verify caller identification information for all SIP calls it receives from another voice service provider or intermediate provider which it will terminate and for which the caller identification information has been authenticated.

(b) [reserved]

**APPENDIX B**  
**Draft Proposed Rules**

The Federal Communications Commission amends part 64 of Title 47 of the Code of Federal Regulations as follows:

**PART 64 – MISCELLANEOUS RULES RELATING TO COMMON CARRIERS**

\* \* \* \* \*

3. The authority citation for part 64 is revised to read as follows:

**Authority:** 47 U.S.C. 154, 201, 202, 217, 218, 220, 222, 225, 226, 227, 227b, 228, 251(a), 251(e), 254(k), 262, 403(b)(2)(B), (c), 616, 620, 1401-1473, unless otherwise noted; Pub. L. 115-141, Div. P, sec. 503, 132 Stat. 348, 1091.

4. Amend § 64.6300 by renumbering paragraphs (b)-(g) to (c)-(h) and inserting new paragraph (b) as follows:

**§ 64.6300 Definitions**

\* \* \* \* \*

(b) *Caller identification authentication information.* The term “caller identification authentication information” refers to the information transmitted along with a call that represents the originating voice service provider’s attestation to the accuracy of the caller identification information.

\* \* \* \* \*

5. Amend § 64.6301 by revising paragraph (a) and inserting paragraphs (b)-(f) to read as follows:

**§ 64.6301 Caller ID authentication.**

(a) *STIR/SHAKEN Implementation by Voice Service Providers.* Except as provided in subparagraphs (d) and (e), not later than June 30, 2021, a voice service provider shall fully implement the STIR/SHAKEN authentication framework in its internet protocol networks. To fulfill this obligation, a voice service provider shall:

\* \* \* \* \*

(b) *STIR/SHAKEN Implementation by Intermediate Providers.* Not later than June 30, 2021, an intermediate provider shall fully implement the STIR/SHAKEN authentication framework in its internet protocol networks. To fulfill this obligation, a voice service provider:

(1) shall pass unaltered to subsequent providers in the call path any caller identification authentication information it receives with a SIP call; and

(2) shall authenticate caller identification information for all SIP calls it receives for which the caller identification information has not been authenticated and which it will exchange with another provider as a SIP call.

(c) *Call Authentication in Non-IP Networks.* Except as provided in subparagraph (e), not later than June 30, 2021, a voice service provider shall either:

(1) upgrade its entire network to allow for the initiation, maintenance, and termination of SIP calls and fully implement the STIR/SHAKEN framework as required in paragraph (a) of this section throughout its network; or

(2) maintain and be ready to provide the Commission on request documented proof that it is participating, either on its own or through a representative, as a member of a working group or consortium that is working to develop a non-IP call authentication solution, or actively testing such a solution.

(d) *Extension of Implementation Deadline.*

(1) *Small providers.*

(A) Small providers are exempt from the requirements of paragraph (a) until June 30, 2022.

(B) For purposes of this paragraph, “small provider” means a provider that has 100,000 or fewer voice service subscriber lines (counting the total of all business and residential fixed subscriber lines and mobile phones and aggregated over all of the provider’s affiliates).

(2) The Wireline Competition Bureau may, upon a public finding of undue hardship, provide an extension for compliance with paragraph (a), for a reasonable period of time, for a voice service provider or class of voice service providers, or type of voice calls, as necessary for that voice service provider or class of voice service providers or type of calls to address identified burdens and barriers to implementation of caller ID authentication technology.

(3) The Wireline Competition Bureau shall annually review the scope of any extension and, after notice and an opportunity for comment, may extend it or terminate it and may expand or contract the scope of entities subject to the extension.

(4) During the period of extension, any provider subject to such extension shall implement an appropriate robocall mitigation program to prevent unlawful robocalls from originating on the network of the provider.

(e) *Exemption.*

(1) A voice service provider may seek an exemption from the requirements of paragraph (a) of this section by, before December 1, 2020, certifying that for those portions of its network served by technology that allows for the transmission of SIP calls, it:

(A) has adopted the STIR/SHAKEN authentication framework for calls on the internet protocol networks of the voice service provider, by publicly committing to complete implementation of the STIR/SHAKEN authentication framework by June 30, 2021;

(B) has agreed voluntarily to participate with other voice service providers in the STIR/SHAKEN authentication framework, by having written, signed agreements with at least two other voice service providers to exchange SIP calls with authenticated caller ID information;

(C) has begun to implement the STIR/SHAKEN authentication framework, by completing the necessary network upgrades to at least one network element to enable the authentication and verification of caller ID information for SIP calls; and

(D) will be capable of fully implementing the STIR/SHAKEN authentication framework not later than June 30, 2021, because it reasonably foresees that it will have completed all necessary network upgrades to its network infrastructure to enable the authentication and verification of caller ID information and authenticate and verify all SIP calls exchanged with STIR/SHAKEN-enabled partners by June 30, 2021.

(2) A voice service provider may seek an exemption from the requirements of paragraph (c) of this section by, before December 1, 2020, certifying that for those portions of its network that do not allow for the transmission of SIP calls, it:

(A) has taken reasonable measures to implement an effective call authentication framework; and

(B) will be capable of fully implementing an effective call authentication framework not later than June 30, 2021.

(3) All certifications shall be filed in ECFS in WC Docket No. 20-68, shall be signed by an officer in conformity with section 1.16 of the Commission's rules, and shall be accompanied by detailed support as to the assertions in the certification.

(4) The Wireline Competition Bureau shall determine whether to grant or deny timely requests for exemption on or before December 30, 2020.

(5) All voice service providers granted an exemption under subparagraph (1) shall file an additional certification on or before a date specified by the Wireline Competition Bureau, and consistent with the requirements of subparagraph (3) above, attesting to whether the voice service provider fully implemented the STIR/SHAKEN authentication framework not later than June 30, 2021. The Wireline Competition Bureau, after notice and an opportunity for comment on the certifications, will determine whether to revoke the exemption for each certifying voice service provider based on whether it completed implementation.

(f) *Line-Item Charges.* Providers of voice service are prohibited from adding any additional line item charges to consumer customer subscribers or small business customer subscribers for the effective call authentication technology required by paragraphs (a) and (c) above.

(1) For purposes of this paragraph, "consumer customer subscribers" means residential mass-market subscribers.

(2) For purposes of this paragraph, "small business customer subscribers" means subscribers that are business entities that meet the size standards established in 13 CFR Part 121, Subpart A, as they currently exist or may hereafter be amended.

## APPENDIX C

## Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),<sup>1</sup> an Initial Regulatory Flexibility Analysis (IRFA) was incorporated into the Third Further Notice of Proposed Rulemaking entitled *Advanced Methods to Target and Eliminate Unlawful Robocalls, Call Authentication Trust Anchor (Notice)*, released June 2019.<sup>2</sup> The Commission sought written public comment on the proposals in the *Notice*, including comment on the IRFA. No comments were filed addressing the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.<sup>3</sup>

**A. Need for, and Objectives of, the Rules**

2. Nefarious schemes that manipulate caller ID information to deceive consumers about the name and phone number of the party that is calling them, in order to facilitate fraudulent and other harmful activities, continue to plague American consumers. In this *Report and Order (Order)*, we both act on our proposal to require voice service providers to implement the STIR/SHAKEN caller ID authentication framework if major voice service providers did not voluntarily do so by the end of 2019,<sup>4</sup> and implement the Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence (TRACED) Act, which directs the Commission to require all voice service providers to implement STIR/SHAKEN in the IP portions of their networks.

**B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA**

3. There were no comments filed that specifically addressed the proposed rules and policies presented in the IRFA.

**C. Response to Comments by the Chief Counsel for Advocacy of the SBA**

4. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rules as a result of those comments.<sup>5</sup>

5. The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

**D. Description and Estimate of the Number of Small Entities to Which the Rules Will Apply**

6. The RFA directs agencies to provide a description and, where feasible, an estimate of the number of small entities that may be affected by the final rules adopted pursuant to the *Order*.<sup>6</sup> The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,”

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<sup>1</sup> See 5 U.S.C. § 603. The RFA, see 5 U.S.C. §§ 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 847 (1996).

<sup>2</sup> See *Advanced Methods to Target and Eliminate Unlawful Robocalls, Call Authentication Trust Anchor*, CG Docket No. 17-59, WC Docket No. 17-97, Declaratory Ruling and Third Further Notice of Proposed Rulemaking, 34 FCC Rcd 4876 (2019) (*Notice*).

<sup>3</sup> See 5 U.S.C. § 604.

<sup>4</sup> See *Advanced Methods to Target and Eliminate Unlawful Robocalls; Call Authentication Trust Anchor*, CG Docket No. 17-59, WC Docket No. 17-97, Declaratory Ruling and Third Further Notice of Proposed Rulemaking, 34 FCC Rcd 4876, 4877, para. 2 (2019) (*2019 Robocall Declaratory Ruling and Further Notice*).

<sup>5</sup> 5 U.S.C. § 604(a)(3).

<sup>6</sup> See 5 U.S.C. § 604(a)(4).

“small organization,” and “small governmental jurisdiction.”<sup>7</sup> In addition, the term “small business” has the same meaning as the term “small-business concern” under the Small Business Act.<sup>8</sup> A “small-business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.<sup>9</sup>

## 1. Wireline Carriers

7. *Wired Telecommunications Carriers.* The U.S. Census Bureau defines this industry as “establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired communications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services, wired (cable) audio and video programming distribution, and wired broadband internet services. By exception, establishments providing satellite television distribution services using facilities and infrastructure that they operate are included in this industry.”<sup>10</sup> The SBA has developed a small business size standard for Wired Telecommunications Carriers, which consists of all such companies having 1,500 or fewer employees.<sup>11</sup> Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees.<sup>12</sup> Thus, under this size standard, the majority of firms in this industry can be considered small.

8. *Local Exchange Carriers (LECs).* Neither the Commission nor the SBA has developed a size standard for small businesses applicable to local exchange services. The closest applicable NAICS Code category is for Wired Telecommunications Carriers, as defined in paragraph 7 of this FRFA. Under that size standard, such a business is small if it has 1,500 or fewer employees.<sup>13</sup> Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees.<sup>14</sup> The Commission therefore estimates that most providers of local exchange carrier service are small entities.

9. *Incumbent Local Exchange Carriers (incumbent LECs).* Neither the Commission nor the SBA has developed a small business size standard for incumbent local exchange services. The closest applicable NAICS Code category is Wired Telecommunications Carriers as defined in paragraph 7 of this

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<sup>7</sup> See 5 U.S.C. § 601(6).

<sup>8</sup> See 5 U.S.C. § 601(3) (incorporating by reference the definition of “small-business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

<sup>9</sup> See 15 U.S.C. § 632.

<sup>10</sup> U.S. Census Bureau, 2012 NAICS Definitions, “517311 Wired Telecommunications Categories,” <http://www.census.gov/cgi-bin/sssd/naics/naicsrch>.

<sup>11</sup> See 13 CFR § 120.201, NAICS Code 517311.

<sup>12</sup> 2012 U.S. Economic Census, NAICS Code 517311, [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ2&prodTpe=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodTpe=table).

<sup>13</sup> See 13 CFR § 120.201, NAICS Code 517311, [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ2&prodTpe=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodTpe=table).

<sup>14</sup> 2012 U.S. Economic Census, NAICS Code 517311, [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ2&prodTpe=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodTpe=table).

FRFA. Under that size standard, such a business is small if it has 1,500 or fewer employees.<sup>15</sup> According to Commission data, 3,117 firms operated in that year. Of this total, 3,083 operated with fewer than 1,000 employees.<sup>16</sup> Consequently, the Commission estimates that most providers of incumbent local exchange service are small businesses that may be affected by the rules and policies adopted. 1,307 Incumbent Local Exchange Carriers reported that they were incumbent local exchange service providers.<sup>17</sup> Of this total, an estimated 1,006 have 1,500 or fewer employees.<sup>18</sup> Thus using the SBA's size standard the majority of incumbent LECs can be considered small entities.

10. *Competitive Local Exchange Carriers (competitive LECs), Competitive Access Providers (CAPs), Shared-Tenant Service Providers, and Other Local Service Providers.* Neither the Commission nor the SBA has developed a small business size standard for these service providers. The appropriate NAICS Code category is Wired Telecommunications Carriers, as defined in paragraph 7 of this FRFA. Under that size standard, such a business is small if it has 1,500 or fewer employees. U.S. Census data for 2012 indicate that 3,117 firms operated during that year. Of that number, 3,083 operated with fewer than 1,000 employees.<sup>19</sup> Based on this data, the Commission concludes that the majority of Competitive LECs, CAPs, Shared-Tenant Service Providers, and Other Local Service Providers are small entities. According to Commission data, 1,442 carriers reported that they were engaged in the provision of either competitive local exchange services or competitive access provider services.<sup>20</sup> Of these 1,442 carriers, an estimated 1,256 have 1,500 or fewer employees. In addition, 17 carriers have reported that they are Shared-Tenant Service Providers, and all 17 are estimated to have 1,500 or fewer employees.<sup>21</sup> In addition, 72 carriers have reported that they are Other Local Service Providers.<sup>22</sup> Of this total, 70 have 1,500 or fewer employees.<sup>23</sup> Consequently, based on internally researched FCC data, the Commission estimates that most providers of competitive local exchange service, competitive access providers, Shared-Tenant Service Providers, and Other Local Service Providers are small entities.

11. We have included small incumbent LECs in this present RFA analysis. As noted above, a "small business" under the RFA is one that, *inter alia*, meets the pertinent small-business size standard (e.g., a telephone communications business having 1,500 or fewer employees) and "is not dominant in its field of operation."<sup>24</sup> The SBA's Office of Advocacy contends that, for RFA purposes, small incumbent LECs are not dominant in their field of operation because any such dominance is not "national" in scope.<sup>25</sup> We have therefore included small incumbent LECs in this RFA analysis, although we emphasize

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<sup>15</sup> See 13 CFR § 120.201, NAICS Code 517311.

<sup>16</sup> 2012 U.S. Economic Census, NAICS Code 517311, [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ2&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodType=table).

<sup>17</sup> See FCC, *Trends in Telephone Service*, 5-5, Tbl. 5.3 (Sept. 2010) (*Trends in Telephone Service*), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-301823A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf).

<sup>18</sup> *Id.*

<sup>19</sup> [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ5&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ5&prodType=table).

<sup>20</sup> See FCC, *Trends in Telephone Service*, 5-5, Tbl. 5.3 (Sept. 2010) (*Trends in Telephone Service*), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-301823A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf).

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

<sup>23</sup> *Id.*

<sup>24</sup> 5 U.S.C. § 601(3).

<sup>25</sup> Letter from Jere W. Glover, Chief Counsel for Advocacy, SBA, to William E. Kennard, Chairman, FCC (filed May 27, 1999). The Small Business Act contains a definition of "small business concern," which the RFA

(continued....)



that this RFA action has no effect on Commission analyses and determinations in other, non-RFA contexts.

12. *Interexchange Carriers (IXCs)*. Neither the Commission nor the SBA has developed a definition for Interexchange Carriers. The closest NAICS Code category is Wired Telecommunications Carriers as defined in paragraph 7 of this FRFA. The applicable size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.<sup>26</sup> According to Commission data, 359 companies reported that their primary telecommunications service activity was the provision of interexchange services.<sup>27</sup> Of this total, an estimated 317 have 1,500 or fewer employees and 42 have more than 1,500 employees.<sup>28</sup> Consequently, the Commission estimates that the majority of interexchange service providers that may be affected by the adopted rules are small entities.

13. *Cable System Operators (Telecom Act Standard)*. The Communications Act of 1934, as amended, also contains a size standard for small cable system operators, which is “a cable operator that, directly or through an affiliate, serves in the aggregate fewer than one percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000.” There are approximately 52,403,705 cable video subscribers in the United States today.<sup>29</sup> Accordingly, an operator serving fewer than 524,037 subscribers shall be deemed a small operator if its annual revenues, when combined with the total annual revenues of all its affiliates, do not exceed \$250 million in the aggregate.<sup>30</sup> Based on available data, we find that all but nine incumbent cable operators are small entities under this size standard.<sup>31</sup> We clarify that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose gross annual revenues exceed \$250 million.<sup>32</sup> Although it seems certain that some of these cable system operators are affiliated with entities whose gross annual revenues exceed \$250,000,000, we are unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under *the* definition in the Communications Act.

## 2. Wireless Carriers

14. *Wireless Telecommunications Carriers (Except Satellite)*. This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless internet access, and

(Continued from previous page) \_\_\_\_\_  
incorporates into its own definition of “small business.” 15 U.S.C. § 632(a); 5 U.S.C. § 601(3). SBA regulations interpret “small business concern” to include the concept of dominance on a national basis. 13 CFR § 121.102(b).

<sup>26</sup> 13 CFR § 121.201, NAICS Code 517311.

<sup>27</sup> See FCC, *Trends in Telephone Service*, 5-5, Tbl. 5.3 (Sept. 2010) (*Trends in Telephone Service*), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-301823A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf).

<sup>28</sup> *Id.*

<sup>29</sup> *Assessment and Collection of Regulatory Fees for Fiscal Year 2016*, Notice of Proposed Rulemaking, 31 FCC Rcd 5757, Appx. E para. 23 (2016) (citing Office of Management and Budget (OMB) Memorandum M-10-06, Open Government Directive, Dec. 8, 2009).

<sup>30</sup> 47 CFR § 76.901(f).

<sup>31</sup> *Assessment & Collection of Regulatory Fees for Fiscal Year 2016*, Notice of Proposed Rulemaking, 31 FCC Rcd 5757, Appx. E para. 23 (2016).

<sup>32</sup> The Commission does receive such information on a case-by-case basis if a cable operator appeals a local franchise authority's finding that the operator does not qualify as a small cable operator pursuant to section 76.901(f) of the Commission's rules. See 47 CFR § 76.901(f).

wireless video services.<sup>33</sup> The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.<sup>34</sup> For this industry, U.S. Census data for 2012 show that there were 967 firms that operated for the entire year.<sup>35</sup> Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.<sup>36</sup> Thus under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

15. The Commission's own data—available in its Universal Licensing System—indicate that, as of October 25, 2016, there are 280 Cellular licensees that will be affected by our actions today.<sup>37</sup> The Commission does not know how many of these licensees are small, as the Commission does not collect that information for these types of entities. Similarly, according to internally developed Commission data, 413 carriers reported that they were engaged in the provision of wireless telephony, including cellular service, Personal Communications Service, and Specialized Mobile Radio Telephony services.<sup>38</sup> Of this total, an estimated 261 have 1,500 or fewer employees, and 152 have more than 1,500 employees.<sup>39</sup> Thus, using available data, we estimate that the majority of wireless firms can be considered small.

16. *Satellite Telecommunications.* This category comprises firms “primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.”<sup>40</sup> Satellite telecommunications service providers include satellite and earth station operators. The category has a small business size standard of \$32.5 million or less in average annual receipts, under SBA rules.<sup>41</sup> For this category, U.S. Census Bureau data for 2012 show that there were a total of 333 firms that operated for the entire year.<sup>42</sup> Of this total, 299 firms had annual receipts of less than \$25 million.<sup>43</sup> Consequently, we estimate that the majority of satellite telecommunications providers are small entities.

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<sup>33</sup> See U.S. Census Bureau, *American Fact Finder—About the Data*, <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en/ECN.NAICS2012.517210> (NAICS Code 517210).

<sup>34</sup> 13 CFR § 121.201 (NAICS code 517210).

<sup>35</sup> U.S. Census Bureau, *American Fact Finder* (Jan 08, 2016), [https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ2&prodType=table](https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodType=table) (NAICS 51720, “Subject Series - Estab & Firm Size: Employment Size of Establishments for the U.S.: 2012”).

<sup>36</sup> *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “1000 employees or more.”

<sup>37</sup> See FCC, *Universal Licensing System*, <http://wireless.fcc.gov/uls> (last visited June 20, 2017). For the purposes of this FRFA, consistent with Commission practice for wireless services, the Commission estimates the number of licensees based on the number of unique FCC Registration Numbers.

<sup>38</sup> See FCC, *Trends in Telephone Service*, 5-5, Tbl. 5.3 (Sept. 2010) (*Trends in Telephone Service*), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-301823A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf).

<sup>39</sup> See *id.*

<sup>40</sup> U.S. Census Bureau, 2017 NAICS Definitions, “517410 Satellite Telecommunications”; <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517410&search=2017+NAICS+Search&search=2017>.

<sup>41</sup> 13 CFR § 121.201, NAICS code 517410.

<sup>42</sup> U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012, NAICS code 517410 [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ4/naics~517410](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4/naics~517410).

<sup>43</sup> *Id.*

### 3. Resellers

17. *Local Resellers.* The SBA has developed a small business size standard for Telecommunications Resellers which includes Local Resellers.<sup>44</sup> The Telecommunications Resellers industry comprises establishments engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling wired and wireless telecommunications services (except satellite) to businesses and households.<sup>45</sup> Establishments in this industry resell telecommunications; they do not operate transmission facilities and infrastructure. Mobile virtual network operators (MVNOs) are included in this industry.<sup>46</sup> Under the SBA's size standard, such a business is small if it has 1,500 or fewer employees.<sup>47</sup> U.S. Census Bureau data for 2012 show that 1,341 firms provided resale services during that year.<sup>48</sup> Of that number, all operated with fewer than 1,000 employees.<sup>49</sup> Thus, under this category and the associated small business size standard, the majority of these resellers can be considered small entities. According to Commission data, 213 carriers have reported that they are engaged in the provision of local resale services.<sup>50</sup> Of these, an estimated 211 have 1,500 or fewer employees.<sup>51</sup> Consequently, the Commission estimates that the majority of Local Resellers are small entities.

18. *Toll Resellers.* The Commission has not developed a definition for Toll Resellers. The closest NAICS Code Category is Telecommunications Resellers. The Telecommunications Resellers industry comprises establishments engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling wired and wireless telecommunications services (except satellite) to businesses and households. Establishments in this industry resell telecommunications; they do not operate transmission facilities and infrastructure. Mobile virtual network operators (MVNOs) are included in this industry.<sup>52</sup> The SBA has developed a small business size standard for the category of Telecommunications Resellers.<sup>53</sup> Under that size standard, such a business is small if it has 1,500 or fewer employees.<sup>54</sup> Census data for 2012 show that 1,341 firms provided resale services during that year. Of that number, 1,341 operated with fewer than 1,000 employees.<sup>55</sup> Thus, under this category and the associated small business size standard, the majority of

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<sup>44</sup> See 13 CFR § 121.201; NAICS Code 517911.

<sup>45</sup> U.S. Census Bureau, 2012 NAICS Definition, NAICS Code 517911 "Telecommunications Resellers," <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517911&search=2017+NAICS+Search&search=2017>.

<sup>46</sup> *Id.*

<sup>47</sup> 13 CFR § 121.201, NAICS code 517911.

<sup>48</sup> See U.S. Census Bureau, 2012 *Economic Census of the United States*, Table No. EC1251SSSZ5, *Information: Subject Series - Estab & Firm Size: Employment Size of Firms: 2012* (517911 Telecommunications Resellers), [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5//naics~517911](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517911).

<sup>49</sup> *Id.*

<sup>50</sup> See FCC, *Trends in Telephone Service*, 5-5, Tbl. 5.3 (Sept. 2010) (*Trends in Telephone Service*), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-301823A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf).

<sup>51</sup> *Id.*

<sup>52</sup> U.S. Census Bureau, 2012 NAICS Definition, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517911&search=2012+NAICS+Search&search=2012> (last visited June 20, 2017) (NAICS 517911 Telecommunications Resellers).

<sup>53</sup> 13 CFR § 121.201 (NAICS code 517911).

<sup>54</sup> See U.S. Census Bureau, *American Fact Finder* (Jan. 08, 2016), [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ2&prodTtype=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodTtype=table).

<sup>55</sup> *Id.*

these resellers can be considered small entities. According to Commission data, 881 carriers have reported that they are engaged in the provision of toll resale services.<sup>56</sup> Of this total, an estimated 857 have 1,500 or fewer employees.<sup>57</sup> Consequently, the Commission estimates that the majority of toll resellers are small entities.

19. *Prepaid Calling Card Providers.* The Commission has not developed a definition for prepaid calling card providers. The closest NAICS Code Category is Telecommunications Resellers and therefore the associated definition and data for Telecommunications Resellers has been used for prepaid calling card providers. The Telecommunications Resellers industry comprises establishments engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling wired and wireless telecommunications services (except satellite) to businesses and households. Establishments in this industry resell telecommunications; they do not operate transmission facilities and infrastructure. Mobile virtual network operators (MVNOs) are included in this industry.<sup>58</sup> Under that size standard, such a business is small if it has 1,500 or fewer employees.<sup>59</sup> Census data for 2012 show that 1,341 firms provided resale services during that year. Of that number, all operated with fewer than 1,000 employees.<sup>60</sup> Thus, under this category and the associated small business size standard, the majority of these prepaid calling card providers can be considered small entities.

#### 4. Other Entities

20. *All Other Telecommunications.* This category is comprised of establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation.<sup>61</sup> This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems.<sup>62</sup> Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.<sup>63</sup> The SBA has developed a small business size standard for All Other Telecommunications, which consists of all such firms with annual receipts of \$32.5 million or less.<sup>64</sup> For this category, U.S. Census Bureau data for 2012 shows that there were 1,442 firms that operated for the entire year.<sup>65</sup> Of those firms, a total of 1,400 had annual receipts less than \$25 million and 42 firms had annual receipts of \$25 million to \$49,

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<sup>56</sup> FCC, *Trends in Telephone Service*, 5-5, Tbl. 5.3 (Sept. 2010) (*Trends in Telephone Service*), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-301823A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf).

<sup>57</sup> *Id.*

<sup>58</sup> <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517911&search=2012+NAICS+Search&search=2012>.

<sup>59</sup> 13 CFR § 121.201, NAICS code 517911.

<sup>60</sup> U.S. Census Bureau, 2012 Economic Census, Subject Series: Information, “Establishment and Firm Size,” NAICS code 517911.

<sup>61</sup> See U.S. Census Bureau, 2017 NAICS Definitions, NAICS Code “517919 All Other Telecommunications,” <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517919&search=2017+NAICS+Search&search=2017>.

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

<sup>64</sup> See 13 CFR § 121.201, NAICS code 517919.

<sup>65</sup> U.S. Census Bureau, *2012 Economic Census of the United States*, Tbl. EC1251SSSZ4, Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012, NAICS code 517919, [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ4/naics~517919](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4/naics~517919).

999,999.<sup>66</sup> Thus, the Commission estimates that the majority of “All Other Telecommunications” firms potentially affected by our action can be considered small.

**E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities**

21. This *Order* modifies the Commission’s rules in accordance with our proposal to require voice service providers to implement the STIR/SHAKEN caller ID authentication framework if major voice service providers did not voluntarily do so by the end of 2019,<sup>67</sup> and implements Congress’s direction in the TRACED Act to mandate STIR/SHAKEN. The amended rules adopted in the *Order* do not contain reporting or recordkeeping requirements.

**F. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered**

22. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its approach, which may include the following four alternatives (among others): “(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof for such small entities.”<sup>68</sup>

23. While the rules enacted in today’s *Order* do not distinguish between small entities and other entities and individuals, we seek comment on our proposal in the attached *Further Notice* to extend the STIR/SHAKEN implementation deadline for small voice service providers to June 30, 2022; on other ways our proposed rules would impact such voice service providers; and on proposals to lessen that impact.

**G. Report to Congress**

24. The Commission will send a copy of the *Order*, including this FRFA, in a report to Congress pursuant to the Congressional Review Act.<sup>69</sup> In addition, the Commission will send a copy of the *Order*, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the *Order* and FRFA (or summaries thereof) will also be published in the *Federal Register*.<sup>70</sup>

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<sup>66</sup> *Id.*

<sup>67</sup> See *Advanced Methods to Target and Eliminate Unlawful Robocalls; Call Authentication Trust Anchor*, CG Docket No. 17-59, WC Docket No. 17-97, Declaratory Ruling and Third Further Notice of Proposed Rulemaking, 34 FCC Rcd 4876, 4877, para. 2 (2019).

<sup>68</sup> 5 U.S.C. § 603(c)(1)-(4).

<sup>69</sup> See 5 U.S.C. § 801(a)(1)(A).

<sup>70</sup> See 5 U.S.C. § 604(b).

## APPENDIX D

## Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),<sup>1</sup> the Commission has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities by the policies and rules proposed in this *Further Notice of Proposed Rulemaking (Further Notice)*. The Commission requests written public comments on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments provided on the first page of the *Further Notice*. The Commission will send a copy of the *Further Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).<sup>2</sup> In addition, the *Further Notice* and IRFA (or summaries thereof) will be published in the Federal Register.<sup>3</sup>

**A. Need for, and Objectives of, the Proposed Rules**

2. The *Further Notice* continues the Commission's efforts to combat illegal spoofed robocalls. Specifically, the *Further Notice* proposes to require intermediate providers to pass unaltered any STIR/SHAKEN Identity header they receive to the subsequent provider in the call path., and authenticate caller ID information for all SIP calls it receives for which the caller ID information has not been authenticated and which it will exchange with another provider as a SIP call.<sup>4</sup> The *Further Notice* also proposes implementing provisions of section 4 of the Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence (TRACED) Act as follows: prohibiting providers from imposing additional line item charges on consumer and small business subscribers for caller ID authentication technology;<sup>5</sup> granting an exemption from our implementation mandate for providers which have certified that they have reached certain implementation goals;<sup>6</sup> granting an extension in compliance with our implementation mandate for small providers;<sup>7</sup> and requiring providers to take "reasonable measures" to implement an effective caller ID authentication framework in their non-IP networks by either upgrading non-IP networks to IP or by actively working to develop a non-IP authentication solution.<sup>8</sup> The *Further Notice* seeks comment on all of these proposals, and on how we should implement section 6(a) of the TRACED Act. The proposals in the *Further Notice* will help promote effective caller ID authentication and fulfill our obligations under the TRACED Act.

**B. Legal Basis**

3. The *Further Notice* proposes to find authority for these proposed rules under section 251(e) of the Communications Act of 1934, as amended (the Act),<sup>9</sup> and section 4 of the TRACED Act.<sup>10</sup> Section 251(e) gives us exclusive jurisdiction over numbering policy and the TRACED Act directs us to make rules to ensure the implementation of caller ID authentication frameworks by all voice service

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<sup>1</sup> See 5 U.S.C. § 603. The RFA, see 5 U.S.C. § 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

<sup>2</sup> See 5 U.S.C. § 603(a).

<sup>3</sup> See 5 U.S.C. § 603(a).

<sup>4</sup> See *supra* paras. 61-71.

<sup>5</sup> See *supra* paras. 118-19.

<sup>6</sup> See *supra* paras. 101-17.

<sup>7</sup> See *supra* paras. 75-83.

<sup>8</sup> See *supra* paras. 95-100.

<sup>9</sup> 47 U.S.C. § 251(e).

<sup>10</sup> Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act, Pub. L. No. 116-105 (2019) (TRACED Act).

providers. We propose that section 251(e) grants us the authority to require intermediate providers to pass STIR/SHAKEN information unaltered because such an action would prevent the fraudulent abuse of North American Numbering Plan resources by callers making calls which transit intermediate providers' networks. We propose that the TRACED Act authorizes the remaining proposed rules because they implement the TRACED Act's language. We solicit comment on these proposals, and whether section 227(e) of the Act, as amended by the Truth in Caller ID Act,<sup>11</sup> or the TRACED Act, would provide additional authority for our proposal to extend our mandate to intermediate providers.

**C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply**

4. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules and by the rule revisions on which the Notice seeks comment, if adopted.<sup>12</sup> The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."<sup>13</sup> In addition, the term "small business" has the same meaning as the term "small-business concern" under the Small Business Act.<sup>14</sup> A "small-business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.<sup>15</sup>

**1. Wireline Carriers**

5. *Wired Telecommunications Carriers.* The U.S. Census Bureau defines this industry as "establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired communications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services, wired (cable) audio and video programming distribution, and wired broadband internet services. By exception, establishments providing satellite television distribution services using facilities and infrastructure that they operate are included in this industry."<sup>16</sup> The SBA has developed a small-business size standard for Wired Telecommunications Carriers, which consists of all such companies having 1,500 or fewer employees.<sup>17</sup> Census data for 2012 shows that there were 3,117 firms that operated that year and that of this total, 3,083 operated with fewer than 1,000 employees.<sup>18</sup> Thus,

<sup>11</sup> Truth in Caller ID Act of 2009, Pub. L. No. 111-331, 124 Stat. 3572, 3572 (2010) (Truth in Caller ID Act).

<sup>12</sup> See 5 U.S.C. § 603(b)(3).

<sup>13</sup> See 5 U.S.C. § 601(6).

<sup>14</sup> 5 U.S.C. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

<sup>15</sup> See 15 U.S.C. § 632.

<sup>16</sup> U.S. Census Bureau, *NAICS Code Description*, <https://www.naics.com/naics-code-description/?code=51731>.

<sup>17</sup> 13 CFR § 121.201 (NAICS Code 517311). The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017, the U.S. Census Bureau definition shows the NAICS Code as 517311 for Wired Telecommunications Carriers. See U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

<sup>18</sup> See U.S. Census Bureau, *American Fact Finder* (Jan. 08, 2016) [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ2&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodType=table).

under this size standard, the majority of firms in this industry can be considered small.

6. *Local Exchange Carriers (LECs)*. Neither the Commission nor the SBA has developed a size standard for small businesses specifically applicable to local exchange services. The closest applicable NAICS Code category is Wired Telecommunications Carriers.<sup>19</sup> Under the applicable SBA size standard, such a business is small if it has 1,500 or fewer employees.<sup>20</sup> U.S. Census Bureau data for 2012 shows that 3,117 firms operated for the entire year.<sup>21</sup> Of that total, 3,083 operated with fewer than 1,000 employees.<sup>22</sup> Thus under this category and the associated size standard, the Commission estimates that the majority of local exchange carriers are small entities.

7. *Incumbent LECs*. Neither the Commission nor the SBA has developed a small-business size standard specifically for incumbent local exchange services. The closest applicable NAICS Code category is Wired Telecommunications Carriers.<sup>23</sup> Under the applicable SBA size standard, such a business is small if it has 1,500 or fewer employees.<sup>24</sup> U.S. Census Bureau data for 2012 indicates that 3,117 firms operated the entire year.<sup>25</sup> Of this total, 3,083 operated with fewer than 1,000 employees.<sup>26</sup> Consequently, the Commission estimates that most providers of incumbent local exchange service are small businesses that may be affected by our actions. According to Commission data, 1,307 Incumbent Local Exchange Carriers reported that they were incumbent local exchange service providers.<sup>27</sup> Of this total, an estimated 1,006 have 1,500 or fewer employees.<sup>28</sup> Thus, using the SBA's size standard, the majority of incumbent LECs can be considered small entities.

8. *Competitive Local Exchange Carriers (Competitive LECs), Competitive Access Providers (CAPs), Shared-Tenant Service Providers, and Other Local Service Providers*. Neither the Commission nor the SBA has developed a small-business size standard specifically for these service providers. The most appropriate NAICS Code category is Wired Telecommunications Carriers. Under that size standard, such a business is small if it has 1,500 or fewer employees.<sup>29</sup> U.S. Census Bureau data for 2012 indicate that 3,117 firms operated during that year.<sup>30</sup> Of that number, 3,083 operated with fewer than 1,000 employees.<sup>31</sup> Based on these data, the Commission concludes that the majority of Competitive LECs, CAPs, Shared-Tenant Service Providers, and Other Local Service Providers are small entities. According to Commission data, 1,442 carriers reported that they were engaged in the provision of either competitive

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<sup>19</sup> See 13 CFR § 121.201 (NAICS Code 517311).

<sup>20</sup> *Id.*

<sup>21</sup> See U.S. Census Bureau, *2012 Economic Census of the United States*, Table No. EC1251SSSZ5, *Information: Subject Series - Estab & Firm Size: Employment Size of Firms: 2012* (517110 Wired Telecommunications Carriers), [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5//naics~517110](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517110).

<sup>22</sup> *Id.*

<sup>23</sup> See 13 CFR § 121.201 (NAICS Code 517311).

<sup>24</sup> *Id.*

<sup>25</sup> See U.S. Census Bureau, *Information: Subject Series - Estab & Firm Size: Employment Size of Firms: 2012*, [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5//naics~517110](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517110).

<sup>26</sup> *Id.*

<sup>27</sup> See *Trends in Telephone Service*, Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division at Table 5.3 (Sept. 2010) (*Trends in Telephone Service*).

<sup>28</sup> *Id.*

<sup>29</sup> See 13 CFR § 121.201.

<sup>30</sup> See U.S. Census Bureau, *Information: Subject Series - Estab & Firm Size: Employment Size of Firms: 2012*, [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5//naics~517110](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517110).

<sup>31</sup> *Id.*



local exchange services or competitive access provider services.<sup>32</sup> Of these 1,442 carriers, an estimated 1,256 have 1,500 or fewer employees.<sup>33</sup> In addition, 17 carriers have reported that they are Shared-Tenant Service Providers, and all 17 are estimated to have 1,500 or fewer employees.<sup>34</sup> Additionally, 72 carriers have reported that they are Other Local Service Providers.<sup>35</sup> Of this total, 70 have 1,500 or fewer employees.<sup>36</sup> Consequently, based on internally researched FCC data, the Commission estimates that most providers of competitive local exchange service, competitive access providers, Shared-Tenant Service Providers, and Other Local Service Providers are small entities.

9. We have included small incumbent LECs in this present RFA analysis. As noted above, a “small business” under the RFA is one that, *inter alia*, meets the pertinent small-business size standard (e.g., a telephone communications business having 1,500 or fewer employees) and “is not dominant in its field of operation.”<sup>37</sup> The SBA’s Office of Advocacy contends that, for RFA purposes, small incumbent LECs are not dominant in their field of operation because any such dominance is not “national” in scope.<sup>38</sup> We have therefore included small incumbent LECs in this RFA analysis, although we emphasize that this RFA action has no effect on Commission analyses and determinations in other, non-RFA contexts.

10. *Interexchange Carriers (IXCs)*. Neither the Commission nor the SBA has developed a definition for Interexchange Carriers. The closest NAICS Code category is Wired Telecommunications Carriers.<sup>39</sup> The applicable size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.<sup>40</sup> U.S. Census Bureau data for 2012 indicate that 3,117 firms operated for the entire year.<sup>41</sup> Of that number, 3,083 operated with fewer than 1,000 employees.<sup>42</sup> According to internally developed Commission data, 359 companies reported that their primary telecommunications service activity was the provision of interexchange services.<sup>43</sup> Of this total, an estimated 317 have 1,500 or fewer employees.<sup>44</sup> Consequently, the Commission estimates that the majority of interexchange service providers are small entities.

11. *Cable System Operators (Telecom Act Standard)*. The Communications Act of 1934, as amended, also contains a size standard for small cable system operators, which is “a cable operator that, directly or through an affiliate, serves in the aggregate fewer than one percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate

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<sup>32</sup> See *Trends in Telephone Service*, at Table 5.3.

<sup>33</sup> *Id.*

<sup>34</sup> *Id.*

<sup>35</sup> *Id.*

<sup>36</sup> *Id.*

<sup>37</sup> 5 U.S.C. § 601(3).

<sup>38</sup> Letter from Jere W. Glover, Chief Counsel for Advocacy, SBA, to William E. Kennard, Chairman, FCC (filed May 27, 1999). The Small Business Act contains a definition of “small business concern,” which the RFA incorporates into its own definition of “small business.” 15 U.S.C. § 632(a); 5 U.S.C. § 601(3). SBA regulations interpret “small business concern” to include the concept of dominance on a national basis. 13 CFR § 121.102(b).

<sup>39</sup> See 13 CFR § 121.201.

<sup>40</sup> *Id.*

<sup>41</sup> See U.S. Census Bureau, *Information: Subject Series - Estab & Firm Size: Employment Size of Firms: 2012*, [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5//naics~517110](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517110).

<sup>42</sup> *Id.*

<sup>43</sup> See *Trends in Telephone Service*, at Table 5.3.

<sup>44</sup> *Id.*

exceed \$250,000,000.” There are approximately 52,403,705 cable video subscribers in the United States today.<sup>45</sup> Accordingly, an operator serving fewer than 524,037 subscribers shall be deemed a small operator if its annual revenues, when combined with the total annual revenues of all its affiliates, do not exceed \$250 million in the aggregate.<sup>46</sup> Based on available data, we find that all but nine incumbent cable operators are small entities under this size standard.<sup>47</sup> We clarify that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose gross annual revenues exceed \$250 million.<sup>48</sup> Although it seems certain that some of these cable system operators are affiliated with entities whose gross annual revenues exceed \$250,000,000, we are unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under *the* definition in the Communications Act.

## 2. Wireless Carriers

12. *Wireless Telecommunications Carriers (except Satellite)*. This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless internet access, and wireless video services.<sup>49</sup> The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.<sup>50</sup> For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.<sup>51</sup> Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.<sup>52</sup> Thus under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

13. The Commission’s own data—available in its Universal Licensing System—indicate that, as of October 25, 2016, there are 280 Cellular licensees that will be affected by our actions today.<sup>53</sup> The Commission does not know how many of these licensees are small, as the Commission does not collect that information for these types of entities. Similarly, according to internally developed Commission data, 413 carriers reported that they were engaged in the provision of wireless telephony, including cellular service, Personal Communications Service (PCS), and Specialized Mobile Radio (SMR) Telephony

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<sup>45</sup> *Assessment and Collection of Regulatory Fees for Fiscal Year 2016*, Notice of Proposed Rulemaking, 31 FCC Rcd 5757, Appx. E para. 23 (2016) (citing Office of Management and Budget (OMB) Memorandum M-10-06, Open Government Directive, Dec. 8, 2009).

<sup>46</sup> 47 CFR § 76.901(f).

<sup>47</sup> *Assessment & Collection of Regulatory Fees for Fiscal Year 2016*, Notice of Proposed Rulemaking, 31 FCC Rcd 5757, Appx. E para. 23 (2016).

<sup>48</sup> The Commission does receive such information on a case-by-case basis if a cable operator appeals a local franchise authority's finding that the operator does not qualify as a small cable operator pursuant to section 76.901(f) of the Commission's rules. See 47 CFR § 76.901(f).

<sup>49</sup> NAICS Code 517210. See <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en/ECN.NAICS2012.517210>.

<sup>50</sup> 13 CFR § 121.201, NAICS code 517210.

<sup>51</sup> U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ5, Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012 NAICS Code 517210 (rel. Jan. 8, 2016). [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5/naics~517210](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5/naics~517210).

<sup>52</sup> *Id.* Available census data does not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “1000 employees or more.”

<sup>53</sup> See <http://wireless.fcc.gov/uls>. For the purposes of this IRFA, consistent with Commission practice for wireless services, the Commission estimates the number of licensees based on the number of unique FCC Registration Numbers.

services.<sup>54</sup> Of this total, an estimated 261 have 1,500 or fewer employees, and 152 have more than 1,500 employees.<sup>55</sup> Thus, using available data, we estimate that the majority of wireless firms can be considered small.

14. *Satellite Telecommunications.* This category comprises firms “primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.”<sup>56</sup> Satellite telecommunications service providers include satellite and earth station operators. The category has a small business size standard of \$32.5 million or less in average annual receipts, under SBA rules.<sup>57</sup> For this category, U.S. Census Bureau data for 2012 show that there were a total of 333 firms that operated for the entire year.<sup>58</sup> Of this total, 299 firms had annual receipts of less than \$25 million.<sup>59</sup> Consequently, we estimate that the majority of satellite telecommunications providers are small entities.

### 3. Resellers

15. *Local Resellers.* The SBA has developed a small-business size standard for Telecommunications Resellers that includes Local Resellers.<sup>60</sup> The Telecommunications Resellers industry comprises establishments engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling wired and wireless telecommunications services (except satellite) to businesses and households.<sup>61</sup> Establishments in this industry resell telecommunications; they do not operate transmission facilities and infrastructure. Mobile virtual network operators (MVNOs) are included in this industry.<sup>62</sup> Under the SBA’s size standard, such a business is small if it has 1,500 or fewer employees.<sup>63</sup> U.S. Census Bureau data for 2012 shows that 1,341 firms provided resale services during that year.<sup>64</sup> Of that number, all operated with fewer than 1,000 employees.<sup>65</sup> Thus, under this category and the associated small-business size standard, the majority of these resellers can be considered small entities. According to Commission data, 213 carriers have reported that they are engaged in the provision of local resale services.<sup>66</sup> Of these, an estimated 211

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<sup>54</sup> See *Trends in Telephone Service* at Table 5.3.

<sup>55</sup> See *id.*

<sup>56</sup> U.S. Census Bureau, 2017 NAICS Definitions, “517410 Satellite Telecommunications”; <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517410&search=2017+NAICS+Search&search=2017>.

<sup>57</sup> 13 CFR § 121.201, NAICS code 517410.

<sup>58</sup> U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012, NAICS code 517410 [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ4//naics~517410](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~517410).

<sup>59</sup> *Id.*

<sup>60</sup> See 13 CFR § 121.201; NAICS Code 517911.

<sup>61</sup> U.S. Census Bureau, *2012 NAICS Definition*, NAICS Code 517911 “Telecommunications Resellers,” <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517911&search=2017+NAICS+Search&search=2017>.

<sup>62</sup> *Id.*

<sup>63</sup> 13 CFR § 121.201 (NAICS Code 517911).

<sup>64</sup> See U.S. Census Bureau, *Information: Subject Series - Estab & Firm Size: Employment Size of Firms: 2012*, [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ5//naics~517911](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5//naics~517911).

<sup>65</sup> *Id.*

<sup>66</sup> See *Trends in Telephone Service*, at Table 5.3.

have 1,500 or fewer employees.<sup>67</sup> Consequently, the Commission estimates that the majority of Local Resellers are small entities.

16. *Toll Resellers.* The Commission has not developed a definition for Toll Resellers. The closest NAICS Code category is Telecommunications Resellers. The Telecommunications Resellers industry comprises establishments engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling wired and wireless telecommunications services (except satellite) to businesses and households. Establishments in this industry resell telecommunications; they do not operate transmission facilities and infrastructure. Mobile virtual network operators (MVNOs) are included in this industry.<sup>68</sup> The SBA has developed a small-business size standard for the category of Telecommunications Resellers.<sup>69</sup> Under that size standard, such a business is small if it has 1,500 or fewer employees.<sup>70</sup> Census data for 2012 shows that 1,341 firms provided resale services during that year. Of that number, 1,341 operated with fewer than 1,000 employees.<sup>71</sup> Thus, under this category and the associated small-business size standard, the majority of these resellers can be considered small entities. According to Commission data, 881 carriers have reported that they are engaged in the provision of toll resale services.<sup>72</sup> Of this total, an estimated 857 have 1,500 or fewer employees.<sup>73</sup> Consequently, the Commission estimates that the majority of toll resellers are small entities.

17. *Prepaid Calling Card Providers.* The Commission has not developed a definition for prepaid calling card providers. The closest NAICS Code Category is Telecommunications Resellers and therefore the associated definition and data for Telecommunications Resellers has been used for prepaid calling card providers. The Telecommunications Resellers industry comprises establishments engaged in purchasing access and network capacity from owners and operators of telecommunications networks and reselling wired and wireless telecommunications services (except satellite) to businesses and households. Establishments in this industry resell telecommunications; they do not operate transmission facilities and infrastructure. Mobile virtual network operators (MVNOs) are included in this industry.<sup>74</sup> Under that size standard, such a business is small if it has 1,500 or fewer employees.<sup>75</sup> Census data for 2012 show that 1,341 firms provided resale services during that year. Of that number, all operated with fewer than 1,000 employees.<sup>76</sup> Thus, under this category and the associated small business size standard, the majority of these prepaid calling card providers can be considered small entities.

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<sup>67</sup> *Id.*

<sup>68</sup> U.S. Census Bureau, *2012 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517911&search=2012+NAICS+Search&search=2012> (NAICS 517911 Telecommunications Resellers).

<sup>69</sup> 13 CFR § 121.201 (NAICS Code 517911).

<sup>70</sup> *Id.*

<sup>71</sup> U.S. Census Bureau, *American Fact Finder* (Jan. 08, 2016), [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2012\\_US\\_51SSSZ2&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodType=table).

<sup>72</sup> *Trends in Telephone Service*, at Table 5.3.

<sup>73</sup> *Id.*

<sup>74</sup> <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517911&search=2012+NAICS+Search&search=2012>.

<sup>75</sup> 13 CFR § 121.201, NAICS code 517911.

<sup>76</sup> U.S. Census Bureau, 2012 Economic Census, Subject Series: Information, “Establishment and Firm Size,” NAICS code 517911.

#### 4. Other Entities

18. *All Other Telecommunications.* The “All Other Telecommunications” category is comprised of establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation.<sup>77</sup> This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems.<sup>78</sup> Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.<sup>79</sup> The SBA has developed a small-business size standard for All Other Telecommunications, which consists of all such firms with annual receipts of \$35 million or less.<sup>80</sup> For this category, U.S. Census Bureau data for 2012 shows that there were 1,442 firms that operated for the entire year.<sup>81</sup> Of those firms, a total of 1,400 had annual receipts less than \$25 million and 42 firms had annual receipts of \$25 million to \$49,999,999.<sup>82</sup> Thus, the Commission estimates that the majority of “All Other Telecommunications” firms potentially affected by our action can be considered small.

##### D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

19. The *Further Notice* seeks comment on a proposed requirement that, in order to receive a voluntary exemption from our implementation mandate, a provider must file a certification reflecting that it has and is in a reasonably foreseeable position to meet certain implementation goals; and that, in order to maintain that exemption, a provider must make a later filing reflecting its achievement of those goals it stated it was in a reasonably foreseeable position to meet. If the Commission were to move forward with this proposal, providers would have new reporting, recordkeeping, and other compliance requirements with regard to these certifications.

##### E. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

20. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rules for such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities.<sup>83</sup>

21. We seek comment on our proposal in the *Further Notice* to extend the STIR/SHAKEN implementation deadline for small voice service providers to June 30, 2022 and on other ways our proposed rules would impact such voice service providers; and on proposals to lessen that impact. We expect to take into account the economic impact on small entities, as identified in comments filed in

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<sup>77</sup> See U.S. Census Bureau, *2017 NAICS Definitions*, NAICS Code “517919 All Other Telecommunications,” <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517919&search=2017+NAICS+Search&search=2017>.

<sup>78</sup> *Id.*

<sup>79</sup> *Id.*

<sup>80</sup> See 13 CFR § 121.201 (NAICS Code 517919).

<sup>81</sup> U.S. Census Bureau, *Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States*, [https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012\\_US/51SSSZ4/naics~517919](https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4/naics~517919).

<sup>82</sup> *Id.*

<sup>83</sup> 5 U.S.C. § 603(c)(1)-(4).

response to the *Further Notice* and this IRFA, in reaching our final conclusions and promulgating rules in this proceeding.

**F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules**

22. None.