ATIS-1000089.v002

Study of Full Attestation Alternatives for Enterprises and Business Entities with Multi-Homing and Other Arrangements

TECHNICAL REPORT

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Alliance for Telecommunications Industry Solutions

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Abstract

This Technical Report describes use cases where a Signature-based Handling of Asserted information using toKENs (SHAKEN) Originating Service Provider (OSP) may not have complete locally available information to establish a verified association between a calling telephone number (calling TN) and its direct Customer, as the basis for assigning a "full attestation" value to particular calls. In addition, this report summarizes six different mechanisms: Delegated Certificates, LEveraging Models for Originating eNtity authentication – Full Attestation with Entity Identity in a Secure Token (LEMON-TWIST), Enterprise Certificates, Extended Validation (EV) Certificates with TN Letter of Authorization (TNLoA), Central TN Database, and Distributed Ledger Technology (DLT), that have been proposed to provide the OSP with additional information regarding the entity placing a call and the telephone numbers that entity has a valid association with in order to support the OSP marking the call with the highest attestation level.

Foreword

The Alliance for Telecommunications Industry Solutions (ATIS) serves the public through improved understanding between carriers, customers, and manufacturers. The Packet Technologies and Systems Committee (PTSC) develops and recommends standards and technical reports related to services, architectures, and signaling, in addition to related subjects under consideration in other North American and international standards bodies. PTSC coordinates and develops standards and technical reports relevant to telecommunications networks in the U.S., reviews and prepares contributions on such matters for submission to U.S. International Telecommunication Union Telecommunication Sector (ITU-T) and U.S. ITU Radiocommunication Sector (ITU-R) Study Groups or other standards organizations, and reviews for acceptability or per contra the positions of other countries in related standards development and takes or recommends appropriate actions.

The SIP Forum is an IP communications industry association that engages in numerous activities that promote and advance SIP-based technology, such as the development of industry recommendations, the SIPit, SIPconnect-IT, and RTCWeb-it interoperability testing events, special workshops, educational seminars, and general promotion of SIP in the industry. The SIP Forum is also the producer of the annual SIP Network Operators Conference (SIPNOC), focused on the technical requirements of the service provider community. One of the Forum's notable technical activities is the development of the SIPconnect Technical Recommendation – a standards-based SIP trunking recommendation for direct IP peering and interoperability between IP Private Branch Exchanges (PBXs) and SIP-based service provider networks. Other important Forum initiatives include work in Video Relay Service (VRS) interoperability, security, Network-to-Network Interoperability (NNI), and SIP and IPv6.

The mandatory requirements are designated by the word *shall* and recommendations by the word *should*. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages. The word *may* denotes an optional capability that could augment the standard. The standard is fully functional without the incorporation of this optional capability.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, PTSC, 1200 G Street NW, Suite 500, Washington, DC 20005.

The **ATIS/SIP Forum IP-NNI Task Force** under the **ATIS Packet Technologies and Systems Committee (PTSC)** and the **SIP Forum Technical Working Group (TWG)** was responsible for the development of this document.

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1 Executive Summary

This Technical Report describes use cases where a Signature-based Handling of Asserted information using toKENs (SHAKEN) Originating Service Provider (OSP) may not have complete locally available information to establish a verified association between a calling telephone number (calling TN) and its direct Customer, as the basis for assigning a "full attestation" value to particular calls. In addition, this report summarizes several different mechanisms that have been proposed to provide the OSP with additional information regarding the entity placing a call and the telephone numbers that entity has a valid association with in order to support the OSP marking the call with the highest attestation level.

These are:

1) Delegate Certificates,
2) LEveraging Models for Originating eNtity authentication - Full Attestation with Entity Identity in a Secure Token (LEMON-TWIST),
3) Enterprise Certificates,
4) Extended Validation (EV) Certificates with TN Letter of Authorization (TNLoA),
5) Central TN Database, and
6) Enterprise Identity using Distributed Ledger.

All six approaches are considered viable; however, they do present different tradeoffs in terms of complexity, cost to service providers and enterprises, and the assumptions around the relationship between service providers, their customers, and other entities in the SHAKEN and voice network ecosystems. It is difficult to predict how these tradeoffs will influence industry acceptance of one solution over another, and it is likely that the "best" solution will vary based on the deployment use case.

The assessment in Annex A is a relative comparison of how these different solution mechanisms approach solving the added complexities in these use cases. The six approaches in Annex A provide different solution alternatives to provide the OSP with sufficient information to fully attest that the calling TN is associated with the calling entity where that might not otherwise be supported by local policy and locally available information.

It should be noted that all these approaches are not mutually exclusive, and more than one approach can be implemented without impacting the other(s). Likewise, these approaches and the description of each herein may not be exhaustive, and carriers and other stakeholders may deploy variations. As shown in the Solution Comparison Matrix in Table A-1, all six solution approaches are technically viable in terms of their ability to support the principles listed in Clause 6. The six approaches share the following fundamental constructs:

- Enterprises and their trusted vendors are vetted by the Telephone Number Service Provider (TNSP) or a selected vetting agency,
- The OSP continues to perform its role of setting attestation via a SHAKEN Identity header field.

This report recommends that the industry consider all six mechanisms as viable. It is ultimately a matter of OSP local policy to determine how to address the more complex attestation use cases. The OSP's reputation and continued membership in the SHAKEN ecosystem may be directly dependent on how rigorously they have applied the principles in this report when implementing any of these mechanisms or other policy approaches in their SHAKEN attestation decisions.