



ATIS STANDARD

ATIS-1000095

ATIS Standard on -

Extending STIR/SHAKEN over TDM



As a leading technology and solutions development organization, the Alliance for Telecommunications Industry Solutions (ATIS) brings together the top global ICT companies to advance the industry's most pressing business priorities. ATIS' nearly 200 member companies are currently working to address the All-IP transition, 5G, network functions virtualization, big data analytics, cloud services, device solutions, emergency services, M2M, cyber security, network evolution, quality of service, billing support, operations, and much more. These priorities follow a fast-track development lifecycle — from design and innovation through standards, specifications, requirements, business use cases, software toolkits, open source solutions, and interoperability testing.

ATIS is accredited by the American National Standards Institute (ANSI). The organization is the North American Organizational Partner for the 3rd Generation Partnership Project (3GPP), a founding Partner of the oneM2M global initiative, a member of the International Telecommunication Union (ITU), as well as a member of the Inter-American Telecommunication Commission (CITEL). For more information, visit www.atis.org.

Notice of Disclaimer & Limitation of Liability

The information provided in this document is directed solely to professionals who have the appropriate degree of experience to understand and interpret its contents in accordance with generally accepted engineering or other professional standards and applicable regulations. No recommendation as to products or vendors is made or should be implied.

NO REPRESENTATION OR WARRANTY IS MADE THAT THE INFORMATION IS TECHNICALLY ACCURATE OR SUFFICIENT OR CONFORMS TO ANY STATUTE, GOVERNMENTAL RULE OR REGULATION, AND FURTHER, NO REPRESENTATION OR WARRANTY IS MADE OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. ATIS SHALL NOT BE LIABLE, BEYOND THE AMOUNT OF ANY SUM RECEIVED IN PAYMENT BY ATIS FOR THIS DOCUMENT, AND IN NO EVENT SHALL ATIS BE LIABLE FOR LOST PROFITS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. ATIS EXPRESSLY ADVISES THAT ANY AND ALL USE OF OR RELIANCE UPON THE INFORMATION PROVIDED IN THIS DOCUMENT IS AT THE RISK OF THE USER.

NOTE - The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights. By publication of this standard, no position is taken with respect to whether use of an invention covered by patent rights will be required, and if any such use is required no position is taken regarding the validity of this claim or any patent rights in connection therewith. Please refer to <https://www.atis.org/policy/patent-assurances/> to determine if any statement has been filed by a patent holder indicating a willingness to grant a license either without compensation or on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain a license.

Published by

Alliance for Telecommunications Industry Solutions
1200 G Street, NW, Suite 500
Washington, DC 20005

Copyright © 2021 by Alliance for Telecommunications Industry Solutions
All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher. For information contact ATIS at 202.628.6380. ATIS is online at < <http://www.atis.org> >.

Extending STIR/SHAKEN over TDM

Alliance for Telecommunications Industry Solutions

Approved June 25, 2021

Abstract

The SHAKEN framework enables a SHAKEN-authorized VoIP Service Provider to deliver cryptographic proof to a called user via SIP signaling that the calling user is authorized to use the calling telephone number. This specification extends the SHAKEN framework to enable conveyance of verified “shaken” attestation levels over TDM interconnects.

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 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, 1200 G Street NW, Suite 500, Washington, DC 20005.

The **Non-IP Call Authentication Test Force** under the **ATIS Packet Technologies and Systems Committee (PTSC)** was responsible for the development of this document.

At the time it approved this standard, the PTSC had the following leadership:

- M. Dolly, PTSC Chair
- V. Shaikh, PTSC Vice Chair

Table of Contents

1 SCOPE, PURPOSE, & APPLICATION 1

1.1 SCOPE 1

1.2 PURPOSE 1

2 REFERENCES 1

2.1 NORMATIVE REFERENCES 1

2.2 INFORMATIVE REFERENCES 2

3 DEFINITIONS, ACRONYMS, & ABBREVIATIONS 2

3.1 DEFINITIONS 2

3.2 ACRONYMS & ABBREVIATIONS 2

4 STIR/SHAKEN EXTENSION OVER TDM INTERCONNECT 1

4.1 OVERVIEW 1

4.2 PROCEDURES 3

4.2.1 *Example Mappings with ISUP Screening Indicator* 4

4.2.1.1 TDM Interconnect 4

4.2.1.2 TDM Termination 5

4.2.1.3 TDM Origination 6

4.3 BACKWARD TRACEABILITY 7

4.4 DIVERSION IMPACT 7

4.5 SUPPORT FOR SIMULTANEOUS CALLS 8

4.6 SUPPORT FOR OTHER CLAIM TYPES 8

4.6.1 *Support for “rph” Claim* 8

4.6.2 *Support for “rcd” and “crn” Claims* 8

4.7 SECURITY CONCERNS 8

4.8 DEPLOYMENT MODELS 9

4.9 END-TO-END ORIGINATION INFORMATION PRESERVATION 10

4.10 INTERWORKING WITH “ATIS-1000679, INTERWORKING BETWEEN SESSION INITIATION PROTOCOL (SIP) AND ISDN USER PART” 11

4.11 INTERWORKING WITH “3GPP 29.163 INTERWORKING BETWEEN THE IP MULTIMEDIA (IM) CORE NETWORK (CN) SUBSYSTEM AND CIRCUIT SWITCHED (CS) NETWORKS” 12

Table of Figures

FIGURE 4-1: USE OF DIFFERENT MECHANISMS AMONG OPERATORS 1

FIGURE 4-2: CARRYING ATTESTATION OVER MULTIPLE TDM INTERCONNECTS 2

FIGURE 4-3: CARRYING ATTESTATION AMONG MULTIPLE OPERATORS 2

FIGURE 4-4: EXTENDING STIR/SHAKEN OVER TDM INTERCONNECT ARCHITECTURE WITH MULTIPLE STIR/SHAKEN LEGS 3

FIGURE 4-5: TDM INTERCONNECT TOPOLOGY 4

FIGURE 4-7: TDM TERMINATION TOPOLOGY 6

FIGURE 4-8: TDM ORIGINATION TOPOLOGY 6

FIGURE 4-10: SIP FRONT-END ENTITY POPULATING ISUP MIME PARAMETER FOR ATTESTATION 10

Table of Tables

TABLE 1: MAPPING FROM IDENTITY VERIFICATION TO SCREENING INDICATOR 5

TABLE 2: MAPPING FROM SCREENING INDICATOR TO IDENTITY HEADER OR VERSTAT 5

TABLE 3: MAPPING FROM IDENTITY VERIFICATION STATUS TO SCREENING INDICATOR 6

TABLE 4: MAPPING FROM SCREENING INDICATOR TO ATTESTATION LEVEL OR VERSTAT 7

TABLE 5: SIP/ISUP INTERWORKING WITH PAI 11

TABLE 6: SIP/ISUP INTERWORKING WITH CGPN 12