ATIS-0900005

GPS Vulnerability

TECHNICAL REPORT

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ATIS Technical Report on

GPS Vulnerability

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Abstract

This technical report provides a North American telecom sector perspective on the impact of GPS vulnerabilities to telecom networks, synchronization in particular, and provides a series of comments and recommendations for consideration by the larger timing community.

Foreword

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between carriers, customers, and manufacturers. The Synchronization (SYNC) Committee engages industry expertise to develop and recommend standards and technical reports for synchronization technologies. SYNC is committed to proactive engagement with national, regional, and international standards development organizations and forums that share its scope of work. ATIS SYNC focuses on those functions and characteristics necessary to define and establish synchronization between networks and also on areas concerned with network phase/time characteristics that require theoretical, analytical, and empirical investigations to ensure that standards and reports meet the highest norms of technical integrity and completeness. ATIS SYNC also prepares recommendations on related subject matter under consideration in various North American and international standards organizations.

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

At the time it approved this document, SYNC, which is responsible for its development, had the following leadership:

L. Cosart, SYNC Chair and Technical Editor (Microsemi)
M. Calabro, SYNC Vice Chair and Technical Editor (Booz Allen Hamilton)
M. Weiss, Technical Editor (NIST)

Table of Contents

Table of Figures

Table of Tables

ATIS Technical Report on –

GPS Vulnerability

1 Scope

The telecommunications industry requires reliable delivery of precision timing signals to enable operation of cellular networks. This report notes the telecommunications industry's dependence on the Global Positioning System (GPS) and highlights GPS vulnerabilities of concern to the communications sector.

2 References

At the time of publication of this technical report, the editions of the documents listed below were valid. Documents are subject to revision, and readers of this document are encouraged to refer to the most recent editions of the documents indicated below.

[1] ITU-T Recommendation G.8271, *Time and phase synchronization aspects of packet networks*.[1]

[2] ITU-T Recommendation G.8272, *Timing characteristics of primary reference time clocks*.[2]

[3] ITU-T Recommendation G.8272.1, *Timing characteristics of enhanced primary reference time clocks*.[3]

[4] ITU-T Recommendation J.211, *Timing interface for cable modem termination systems*.[4]

[5] IEEE Std 1588 – 2008, *IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems*.[5]

[6] National Coordination Office for Space-Based Positioning, Navigation, and Timing, *Use of Foreign Satellite Navigation Signals*.[6]

[7] National Space-Based Positioning, Navigation & Timing Advisory Board Meeting Minutes, December 10-11, 2014.[7]

[8] Paige Atkins, Ron Repasi, National Telecommunications & Information Administration (NTIA)/Federal Communications Commission (FCC) *Radio Regulator Spectrum Management Perspectives & Priorities - Emerging Trends in Spectrum Efficient Technologies*, December 10, 2014.[8]

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[1] This document is available from the International Telecommunications Union (ITU) at: < https://www.itu.int/rec/T-REC-G.8271/en >.

[2] This document is available from the ITU at: < https://www.itu.int/rec/T-REC-G.8272/en >.

[3] This document is available from the ITU at: < https://www.itu.int/rec/T-REC-G.8272.1/en >/

[4] This document is available from the ITU at: < https://www.itu.int/rec/T-REC-J.211-200611-I/en >.

[5] This document is available from the Institute of Electrical and Electronics Engineers (IEEE) at: < http://shop.ieeeusa.org >.

[6] This document is available from the National Coordination Office for Space-Based Positioning, Navigation, and Timing at: < http://www.gps.gov/spectrum/foreign/ >.

[7] This document is available from the National Space-Based Positioning, Navigation & Timing Advisory Board at: < http://www.gps.gov/governance/advisory/meetings/2014-12/minutes.pdf >

[8] This document is available from the National Telecommunications & Information Administration (NTIA)/Federal Communications Commission (FCC) at: < http://www.gps.gov/governance/advisory/meetings/2014-12/atkins-repasi.pdf >