ATIS-0100030.2012(R2017)

MEAN TIME BETWEEN OUTAGES – A GENERALIZED METRIC FOR ASSESSING PRODUCTION FAILURE RATES IN TELECOMMUNICATIONS NETWORK ELEMENTS

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ATIS-0100030.2012, *Mean Time Between Outages – A Generalized Metric for Assessing Production Failure Rates in Telecommunications Network Elements*

Is an American National Standard developed by the **ATIS Network Performance, Reliability, and Quality of Service Committee (PRQC)**.

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Mean Time Between Outages – A Generalized Metric for Assessing Production Failure Rates in Telecommunications Network Elements

Alliance for Telecommunications Industry Solutions

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American National Standards Institute, Inc.

Abstract

The Mean Time Between Outages (MTBO) metric provides the frequency of all telecommunications network element failures (hardware and software) attributed to equipment supplier – including customer impacting short duration outages. By contrast, the traditional Mean Time Between Failure (MTBF) metric only addresses total failures that lead to element replacement. The MTBO metric has been accepted as a key industry metric by the QuEST Forum/TL9000 organization.

Foreword

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Network Performance, Reliability, and Quality of Service Committee (PRQC) develops and recommends standards, requirements, and technical reports related to the performance, reliability, and associated security aspects of communications networks, as well as the processing of voice, audio, data, image, and video signals, and their multimedia integration. PRQC also develops and recommends positions on, and foster consistency with, standards and related subjects under consideration in other North American and international standards bodies.

ANSI guidelines specify two categories of requirements: mandatory and recommendation. 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.

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

This version of ATIS-0100030 replaces ATIS-0100030.2010, *Mean Time Between Outages – A Metric for Assessing Production Failure Rates in IP Routers*. The historical version of ATIS-0100030.2010 can be accessed by sending a completed ATIS Research Request Form, which is located at < http://www.atis.org/docstore/ATIS_Research_Request.pdf >. To request the historical version of ATIS-0100030.2010, please return completed form to ATIS via email to < doccenter@atis.org > or via fax to 202-347-7125, Attn: Kerrianne Conn.

At the time it approved this document, PRQC, which is responsible for the development of this Standard, had the following leadership:

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1 Scope & Purpose

Telecommunications Service Providers (SPs) face the challenge of needing to continuously upgrade the network and grow network capacity, while providing a service that meets stringent customer reliability expectations. While telecommunications companies have significant experience providing reliable telephone service, the challenge for an SP is more difficult because changes in Internet technology -- particularly router software -- are significantly more frequent and less rigorously tested than was the case in circuit-switched telephone networks. SPs cannot wait until the technology matures – a large SP has to meet high reliability requirements for critical applications like financial transactions, Voice over IP (VoIP), Internet Protocol Television (IPTV), streaming video, telepresence, and on-line gaming using commercially available technology. The most critical driver for high reliability requirements is that these applications are very sensitive to short interruptions (~1 second) that arise from component glitches with self-restoration. Such outages are different from hardware failures which require component replacement whose frequency is captured in the traditional Mean Time Between Failure (MTBF) reliability metric.

An initial examination of the inability of the MTBF metric to adequately address short duration outages was undertaken in [ATIS-0100025] and the first publication of ATIS-0100030[1]. The focus of this effort was on the SP edge router, which is recognized as the key element of modern day Internet-based SP networks. Routers comprise a wide range of components such as line, control, and switching cards, as well as power supplies and cooling units – typically from multiple equipment suppliers -- leading to the possibility of several types of failures with different customer impacts. The Mean Time Between Outage (MTBO) metric was introduced as a practical method to characterize the impact of all outages, including short duration outages, by defining MTBO in terms of failure frequency of Customer Facing Line Cards.

This document generalizes the MTBO metric definition as an industry standard applicable for any type of network element and provides additional illustrative examples for metric development and assessment for the following:

- Set of Software Controlled Devices (power amplifiers in the UMTS nodeB)
- Ethernet Virtual Connections (eVC)
- Radio Network Controller (RNC)

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