ATIS-0700044

ATIS Standard on -

Study of Emergency Services and National Security Emergency Preparedness Next Generation Network Priority Service (NS/EP NGN-PS) Coexistence on LTE Access Networks

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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.

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Alliance for Telecommunications Industry Solutions

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Abstract

This technical report is a study of contention issues between different access classes such as Emergency Services and National Security / Emergency Preparedness Next Generation Priority Services (NS/EP NGN-PS) communications on Long-Term Evolution (LTE) Access during network degradation conditions (e.g., network congestion during certain disaster events).

Foreword

The Alliance for Telecommunications Industry Solutions (ATIS) serves the public through improved understanding between carriers, customers, and manufacturers. This ATIS Standard was developed jointly between ESIF, PTSC, and WTSC.

The Emergency Services Interconnection Forum (ESIF) provides a forum to facilitate the identification and resolution of technical and/or operational issues related to the interconnection of wireline, wireless, cable, satellites, Internet and emergency services networks.

PTSC develops standards related to services, architectures, signaling, network interfaces, next generation carrier interconnect, cybersecurity, lawful intercept, and government emergency telecommunications service within next generation networks. As networks transition to all-IP, PTSC will evaluate the impact of this transition and develop solutions and recommendations where necessary to facilitate and reflect this evolution.

The Wireless Technologies and Systems Committee (WTSC) develops and recommends standards and technical reports related to wireless and/or mobile services and systems, including service descriptions and wireless technologies. WTSC develops and recommends positions on related subjects under consideration in other North American, regional, and international standards bodies.

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

At the time of initiation or issuance of the letter ballot for this document, the committees responsible for its development, had the following leadership:

R. Marshall, ESIF Chair (Comtech)
J. Green, ESIF First Vice Chair (Sprint)
R. Muscat, ESIF Second Vice Chair (Bexar Metro 911)

M. Dolly, PTSC Chair (AT&T)
V. Shaikh, PTSC Vice Chair (Perspecta Labs)

D. Zelmer, WTSC Chair (AT&T)
M. Younge, WTSC Vice Chair (T-Mobile)
F. Khatibi, WTSC RAN and NSEP Chair (Qualcomm)

G. Pollini, Technical Editor (Perspecta Labs)
R. Singh, Technical Editor (Perspecta Labs)

The WTSC NSEP Subcommittee was responsible for the development of this document.

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1 Scope, Purpose, & Application

Emergency Services and National Security/Emergency Preparedness (NS/EP) Next Generation Network Priority Services (NGN-PS) will have to coexist in commercial Long-Term Evolution (LTE) network service deployments. Both are expected to be served along with commercial priority services, and non-priority commercial services under network degradation conditions (e.g., congestion and overload conditions). There are 3GPP defined mechanisms for admission and congestion controls such as the Access Class Barring (ACB) mechanism, and scheduler imposed restrictions on throughput; however, it is not clear how and when these capabilities may be invoked in an optimal manner. For example, it might be possible for a flood of Emergency Services sessions and normal sessions (e.g., voice, video and messaging sessions), initiated as a result of a disaster or emergency event, to monopolize LTE access resources.

This technical report provides a study analyzing contention issues between different services such as Emergency Services and NS/EP NGN-PS communications during network degradation conditions (e.g., network congestion during certain disaster events). The analysis involves:

- Identifying and analyzing network admission and congestion control capabilities and mechanisms defined in 3GPP LTE specifications to determine adequacy and identify gaps in addressing the problem,
- Investigating operational (i.e., network element and resource management) means,
- Consideration of regulatory rules/policy implications, and
- Providing guidance on how 3GPP-defined mechanisms can be used.

The analysis in this report examines all of the network admission and congestion control capabilities and mechanisms defined in 3GPP specifications through Release 14 inclusive independent of whether they are implemented and supported in service provider networks. However, it is possible that not all of the network admission and congestion control capabilities and mechanisms defined in 3GPP specifications are implemented and supported in a given service provider network. Furthermore, the analysis in this report does not imply that all the network admission and congestion control capabilities and mechanisms defined in 3GPP specifications should be supported by service provider networks. The analysis in this report is intended to be a complete analysis of the network admission and congestion control capabilities and mechanisms defined in 3GPP specifications through Release 14 inclusive.

Although NS/EP NGN-PS and Emergency Services will have to coexist with other priority services, the report focuses only on contention between NS/EP NGN-PS and Emergency Services. Contention with other priority services (e.g., Public Safety) including commercial priority services offered by service providers [e.g., Mission Critical Push to Talk (MCPTT) for utility and transportation organizations] is not included in the scope of this report.

This analysis report is applicable to North American public LTE networks consisting of the radio access network (RAN) and the Evolved Packet Core (EPC).

2 References

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and