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**Agenda item:** 16.2

**Source:** Samsung

**Title:** (TP to TS 38.412 BL CR) SCTP and other aspects

**Document for:** Discussion and decision

# Introduction

This contribution provides TP to TS 38.412 BL CR on SCTP and other aspects.

# Text Proposal

References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] IETF RFC 4960: "Stream Control Transmission Protocol".

[3] 3GPP TS 23.501: "System Architecture for the 5G System".

[4] 3GPP TS 23.502: "Procedures for the 5G System".

[5] IETF RFC 8200 (2017-07): "Internet Protocol, Version 6 (IPv6) Specification".

[6] IETF RFC 791 (1981-09): "Internet Protocol".

[7] IETF RFC 2474 (1998-12): "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers".

[8] IETF RFC 6083 (2011-01): "Datagram Transport Layer Security (DTLS) for Stream Control Transmission Protocol (SCTP)".

[9] IETF RFC 6335 (2011-08): "Internet Assigned Numbers Authority (IANA) Procedures for the Management of the Service Name and Transport Protocol Port Number Registry".

[x] 3GPP TS 23.369: “Architecture support for Ambient power-enabled Internet of Things”

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## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

**NG:** interface between a NG-RAN node and a 5GC, providing an interconnection point between the NG-RAN and the 5GC.

**NG-C**: Reference point for the control plane protocol between NG-RAN and AMF or between NG-RAN and AIOTF.

**SCTP endpoint:** as defined in IETF RFC 4960 (2007-09) [5]

**SCTP association:** as defined in IETF RFC 4960 (2007-09) [5]

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5GC 5G Core Network

A-IoT Ambient IoT

AIOTF Ambient IoT Function

IP Internet Protocol

SCTP Stream Control Transmission Protocol

DiffServ Differentiated Service

PPP Point to Point Protocol

IANA Internet Assigned Number Authority

AMF Access and Mobility management Function

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7 Transport layer

SCTP (IETF RFC 4960 [2]) shall be supported as the transport layer of NG-C signalling bearer. The Payload Protocol Identifier (ppid) to be used by SCTP for the application layer protocol NGAP and for DTLS over SCTP (IETF RFC 6083 [8]) is assigned by IANA in [10]. The byte order of the ppid shall be big-endian.

SCTP refers to the Stream Control Transmission Protocol developed by the Sigtran working group of the IETF for the purpose of transporting various signalling protocols over IP network.

NG-RAN node and AMF shall support a configuration with a single SCTP association per NG-RAN node/AMF pair. Configurations with multiple SCTP endpoints per NG-RAN node/AMF pair should be supported. When configurations with multiple SCTP associations are supported, the AMF may request to dynamically add/remove SCTP associations between the NG-RAN node/AMF pair. Within the set of SCTP associations established between one AMF and NG-RAN node pair, the AMF may request the NG-RAN node to restrict the usage of SCTP association for certain types of NG-C signalling. If no restriction information is provided for an SCTP association, any type of NG-C signalling is allowed via the SCTP association. Selection of the SCTP association by the NG-RAN node and the AMF is specified in TS 23.501 [3] and TS 23.502 [4]. The NG-RAN node shall establish the SCTP association. The SCTP Destination Port number value to be used by NGAP is assigned by IANA in [11]. When the AMF requests to dynamically add additional SCTP associations between the NG-RAN node/AMF pair, the SCTP Destination Port number value may be the one assigned by IANA in [11], or any dynamic port value (IETF RFC 6335 [9]). When the configuration with multiple SCTP endpoints per NG-RAN node is supported and the NG-RAN node wants to add additional SCTP endpoints, the RAN configuration update procedure shall be the first NGAP procedure triggered on an additional TNLA of an already setup NG-C interface instance after the TNL association has become operational, and the AMF shall associate the TNLA to the NG-C interface instance using the included Global RAN node ID.

Between one AMF and NG-RAN node pair:

- A single pair of stream identifiers shall be reserved over at least one SCTP association for the sole use of NGAP elementary procedures that utilize non UE-associated signalling.

- At least one pair of stream identifiers over one or several SCTP associations shall be reserved for the sole use of NGAP elementary procedures that utilize UE-associated signallings. However, a few pairs (i.e. more than one) should be reserved.

- For a single UE-associated signalling, the NG-RAN node shall use one SCTP association and one SCTP stream, and the SCTP association/stream should not be changed during the communication of the UE-associated signalling until after current SCTP association is failed or removed, or TNL binding update is performed as described in TS 23.502 [3].

Transport network redundancy can be achieved by SCTP multi-homing between two end-points, of which one or both is assigned with multiple IP addresses. SCTP end-points shall support a multi-homed remote SCTP end-point. For SCTP endpoint redundancy, an SCTP endpoint (in the NG-RAN node or AMF) may send an INIT, at any time for an already established SCTP association, which the other SCTP endpoint shall handle as defined in IETF RFC 4960 [2] in subclause 5.2.

The SCTP congestion control may, using an implementation specific mechanism, initiate higher layer protocols to reduce the signalling traffic at the source and prioritise certain messages.

All principles and requirements specified for non UE-associated signalling across the NG interface apply for A-IoT related signalling. If NG-C is established between an A-IoT enabled NG-RAN node and an AIOTF, as specified in TS 23.369 [x], all principles and requirements specified for the AMF for support of non UE-associated signalling apply for the AIOTF.

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