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Application of the NG Application Protocol (NGAP)
to non-3GPP access
(3GPP TS 29.413 version 17.2.0 Release 17)

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650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
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Contents

Foreword

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Version x.y.z

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  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document describes the applicability of NG Application Protocol (NGAP) messages and procedures, defined in 3GPP TS 38.413 [2], to non-3GPP access. A general description for non-3GPP access can be found in 3GPP TS 23.501 [3], 3GPP TS 23.502 [4], and 3GPP TS 23.316 [6].

2 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] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

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

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

[5] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[6] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[7] 3GPP TS 24.502: "Access to the 3GPP 5G Core Network (5GCN) via Non-3GPP Access Networks (N3AN)".

3 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].

5G-RG	5G Residential Gateway
FN-RG	Fixed Network Residential Gateway
N3IWF	Non-3GPP InterWorking Function
TNAP	Trusted Non-3GPP Access Point
TNGF	Trusted Non-3GPP Gateway Function
TWIF	Trusted WLAN Interworking Function
W-AGF	Wireline Access Gateway Function

4 Principles for the use of NGAP for non-3GPP access

4.1 General

TS 23.501 [3] specifies the NGAP used between the Non-3GPP access network node and the AMF. The Non-3GPP access network node is either a Non-3GPP InterWorking Function (N3IWF), or a Trusted Non-3GPP Gateway Function (TNGF), or a Trusted WLAN Interworking Function (TWIF), or a Wireline Access Gateway Function (W-AGF). NGAP is used as specified in TS 38.413 [2] with clarifications or additions as specified in Clause 5.

5 Non-3GPP access

5.1 Use of the NGAP for non-3GPP access

The following NGAP procedures are used between the Non-3GPP access network node and the AMF:

- PDU Session Management Procedures
  - PDU Session Resource Setup
  - PDU Session Resource Release
  - PDU Session Resource Modify
  - PDU Session Resource Notify
- UE Context Management Procedures
  - Initial Context Setup
  - UE Context Release Request
  - UE Context Release
  - UE Context Modification
- Transport of NAS Messages Procedures
  - Initial UE Message
  - Downlink NAS Transport
  - Uplink NAS Transport
  - NAS Non Delivery Indication
  - Reroute NAS Request
- Interface Management Procedures
  - NG Setup
  - RAN Configuration Update
  - AMF Configuration Update
  - NG Reset
  - Error Indication
  - AMF Status Indication
  - Overload Start
  - Overload Stop
- UE TNLA Binding Procedures
  - UE TNLA Binding Release

For the NGAP procedures used between the Non-3GPP access network node and the AMF, the Non-3GPP access network node fulfils the behaviour of the NG-RAN node as specified in clause 8 of TS 38.413 [2], with clarifications as specified in Clause 5.3. The text in clause 8 of TS 38.413 [2] referring to Uu should be understood as referring to the Y2 reference point as specified in TS 23.501 [3].

5.2 NGAP messages used for non-3GPP access

The list given below shows the NGAP messages, as specified in TS 38.413 [2] subclause 9.2 (tabular format) and 9.4 (ASN.1 notation) that are used between the Non-3GPP access network node and the AMF.

- PDU SESSION RESOURCE SETUP REQUEST
- PDU SESSION RESOURCE SETUP RESPONSE
- PDU SESSION RESOURCE RELEASE COMMAND
- PDU SESSION RESOURCE RELEASE RESPONSE
- PDU SESSION RESOURCE MODIFY REQUEST
- PDU SESSION RESOURCE MODIFY RESPONSE
- PDU SESSION RESOURCE NOTIFY
- INITIAL CONTEXT SETUP REQUEST
- INITIAL CONTEXT SETUP RESPONSE
- INITIAL CONTEXT SETUP FAILURE
- UE CONTEXT RELEASE REQUEST
- UE CONTEXT RELEASE COMMAND
- UE CONTEXT RELEASE COMPLETE
- UE CONTEXT MODIFICATION REQUEST
- UE CONTEXT MODIFICATION RESPONSE
- UE CONTEXT MODIFICATION FAILURE
- INITIAL UE MESSAGE
- DOWNLINK NAS TRANSPORT
- UPLINK NAS TRANSPORT
- NAS NON DELIVERY INDICATION
- REROUTE NAS REQUEST
- NG SETUP REQUEST
- NG SETUP RESPONSE
- NG SETUP FAILURE
- RAN CONFIGURATION UPDATE
- RAN CONFIGURATION UPDATE ACKNOWLEDGE
- RAN CONFIGURATION UPDATE FAILURE
- AMF CONFIGURATION UPDATE
- AMF CONFIGURATION UPDATE ACKNOWLEDGE
- AMF CONFIGURATION UPDATE FAILURE
- NG RESET
- NG RESET ACKNOWLEDGE

- ERROR INDICATION
- AMF STATUS INDICATION
- OVERLOAD START
- OVERLOAD STOP
- UE TNLA BINDING RELEASE REQUEST

5.3 Exceptions for NGAP message contents and information element coding when used for non-3GPP access

For the NGAP messages transferred between the Non-3GPP access network node and the AMF, the following exceptions to the specification in TS 38.413 [2] shall be applied:

PDU SESSION RESOURCE SETUP REQUEST message:

- the following IEs shall be ignored, when received:
  - *RAN Paging Priority* IE
  - *UE Aggregate Maximum Bit Rate* IE (except for non-trusted non-3GPP access, trusted non-3GPP access and trusted WLAN access as specified in TS 23.501 [3]).
  - *Notification Control* IE included in the *QoS Flow Level QoS Parameters* IE
  - *Alternative QoS Parameters Set List* IE included in the *QoS Flow Level QoS Parameters* IE
  - *UE Slice Maximum Bit Rate List* IE

PDU SESSION RESOURCE RELEASE COMMAND message:

- the following IEs shall be ignored, when received:
  - *RAN Paging Priority* IE

PDU SESSION RESOURCE MODIFY REQUEST message:

- the following IEs shall be ignored, when received:
  - *RAN Paging Priority* IE
  - *Notification Control* IE included in the *QoS Flow Level QoS Parameters* IE
  - *Alternative QoS Parameters Set List* IE included in the *QoS Flow Level QoS Parameters* IE

INITIAL CONTEXT SETUP REQUEST message:

- the following IEs shall be ignored, when received:
  - *Core Network Assistance Information for RRC INACTIVE* IE
  - *Trace Activation* IE
  - *Mobility Restriction List* IE
  - *UE Radio Capability* IE
  - *Index to RAT/Frequency Selection Priority* IE
  - *Emergency Fallback Indicator* IE
  - *RRC Inactive Transition Report Request* IE
  - *UE Radio Capability for Paging* IE

- *Redirection for Voice EPS Fallback* IE
- *Location Reporting Request Type* IE
- *CN Assisted RAN Parameters Tuning* IE
- *SRVCC Operation Possible* IE
- *IAB Authorized* IE
- *Enhanced Coverage Restriction* IE
- *Extended Connected Time* IE
- *UE Differentiation Information* IE
- *NR V2X Services Authorized* IE
- *LTE V2X Services Authorized* IE
- *NR UE Sidelink Aggregate Maximum Bit Rate* IE
- *LTE UE Sidelink Aggregate Maximum Bit Rate* IE
- *PC5 QoS Parameters* IE
- *CE-mode-B Restricted* IE
- *UE User Plane CIoT Support Indicator* IE
- *Management Based MDT PLMN List* IE
- *UE Radio Capability ID* IE
- *UE Aggregate Maximum Bit Rate* IE (except for non-trusted non-3GPP access, trusted non-3GPP access and trusted WLAN access as specified in TS 23.501 [3])
- *UE Security Capabilities* IE
- *Time Synchronisation Assistance Information* IE
- *QMC Configuration Information* IE
- *Target NSSAI Information* IE
- *UE Slice Maximum Bit Rate List* IE
- *5G ProSe Authorized* IE
- *5G ProSe UE PC5 Aggregate Maximum Bit Rate* IE

- *5G ProSe PC5 QoS Parameters* IE- *RG Level Wireline Access Characteristics* IE: the information given within this IE between the W-AGF and the AMF shall be stored in the UE context by the W-AGF as specified in TS 23.316 [6].
- *Notification Control* IE included in the *QoS Flow Level QoS Parameters* IE
- *Alternative QoS Parameters Set List* IE included in the *QoS Flow Level QoS Parameters* IE

UE CONTEXT RELEASE COMPLETE message:

- the following IEs shall be ignored, when received:
  - *Information on Recommended Cells and RAN Nodes for Paging* IE
  - *Paging Assistance Data for CE Capable UE* IE

UE CONTEXT MODIFICATION REQUEST message:

- the following IEs shall be ignored, when received:
  - *RAN Paging Priority* IE
  - *Index to RAT/Frequency Selection Priority* IE
  - *Core Network Assistance Information* IE
  - *Emergency Fallback Indicator* IE
  - *RRC Inactive Transition Report Request* IE
  - *CN Assisted RAN Parameters Tuning* IE
  - *SRVCC Operation Possible* IE
  - *IAB Authorized* IE
  - *NR V2X Services Authorized* IE
  - *LTE V2X Services Authorized* IE
  - *NR UE Sidelink Aggregate Maximum Bit Rate* IE
  - *LTE UE Sidelink Aggregate Maximum Bit Rate* IE
  - *PC5 QoS Parameters* IE
  - *UE Radio Capability ID* IE
  - *UE Aggregate Maximum Bit Rate* IE (except for non-trusted non-3GPP access, trusted non-3GPP access and trusted WLAN access as specified in TS 23.501 [3])
  - *UE Security Capabilities* IE
  - *Time Synchronisation Assistance Information* IE
  - *QMC Configuration Information* IE
  - *QMC Deactivation* IE
  - *UE Slice Maximum Bit Rate List* IE
  - *Management Based MDT PLMN Modification List* IE
  - *5G ProSe Authorized* IE
  - *5G ProSe UE PC5 Aggregate Maximum Bit Rate* IE
  - *5G ProSe PC5 QoS Parameters* IE
- if this is the first message received from a new AMF, the N3IWF shall identify the old AMF and the UE using the received *RAN UE NGAP ID*, release the UE-associated logical NG-connection to the old AMF and create a new UE-associated logical NG-connection to the new AMF.
- *RG Level Wireline Access Characteristics* IE: the information given within this IE between the W-AGF and the AMF shall be stored in the UE context by the W-AGF as specified in TS 23.316 [6].

UE CONTEXT MODIFICATION RESPONSE message:

- the following IEs shall be ignored, when received:
  - *RRC State* IE

INITIAL UE MESSAGE message:

- the following IEs shall be ignored, when received:
  - *IAB Node Indication* IE

- *CE-mode-B Support Indicator* IE
- *LTE-M Indication* IE
- *EDT Session* IE
- *NPN Access Information* IE
- *RedCap Indication* IE

- *RRC Establishment Cause* IE: the information given within this IE is to indicate the Establishment cause for non-3GPP access as specified in TS 24.502 [7].
- *Selected PLMN Identity* IE: the information given within this IE provides the selected PLMN ID for untrusted non-3GPP access as specified in TS 23.502 [4].
- *Authenticated Indication* IE: the information given within this IE between the W-AGF and the AMF is to indicate that the FN-RG has been authenticated by the wireline 5G access network as specified in TS 23.316 [6].
- *Selected PLMN Identity* IE: the information given within this IE contains the PLMN Identity for wireline access as specified in TS 23.316 [6], or for trusted non-3GPP access as specified in TS 23.502 [4].

DOWNLINK NAS TRANSPORT message:

- the following IEs shall be ignored, when received:
  - *RAN Paging Priority* IE
  - *Mobility Restriction List* IE
  - *Index to RAT/Frequency Selection Priority* IE
  - *SRVCC Operation Possible* IE
  - *Enhanced Coverage Restriction* IE
  - *Extended Connected Time* IE
  - *UE Differentiation Information* IE
  - *CE-mode-B Restricted* IE
  - *UE Radio Capability* IE
  - *UE Capability Info Request* IE
  - *End Indication* IE
  - *UE Radio Capability ID* IE
  - *UE Aggregate Maximum Bit Rate* IE (except for non-trusted non-3GPP access, trusted non-3GPP access and trusted WLAN access as specified in TS 23.501 [3])
  - *Target NSSAI Information* IE

UPLINK NAS TRANSPORT message:

- *TNGF Identity Information* IE: the information given within this IE between the TNGF and the AMF contains a list of identifiers of NG-U terminations at TNGF as specified in TS 23.502 [4].
- *TWIF Identity Information* IE: the information given within this IE between the TWIF and the AMF contains a list of identifiers of NG-U terminations at TWIF as specified in TS 23.502 [4].
- *W-AGF Identity Information* IE: the information given within this IE between the W-AGF and the AMF contains a list of identifiers of NG-U terminations at W-AGF as specified in TS 23.316 [6].

NG SETUP REQUEST message:

- the following IEs shall be ignored, when received:
  - *Default Paging DRX* IE
  - *NB-IoT Default Paging DRX* IE

NG SETUP RESPONSE message:

- the following IEs shall be ignored, when received:
  - *IAB Supported* IE

RAN CONFIGURATION UPDATE message:

- the following IEs shall be ignored, when received:
  - *Default Paging DRX* IE
  - *NB-IoT Default Paging DRX* IE

OVERLOAD START message:

- *AMF Overload Response* IE: if the *Overload Action* IE is included, the contained information is used to identify the related signalling traffic corresponding to the Establishment cause for non-3GPP access as specified in TS 24.502 [7].
- *Slice Overload Response* IE: if the *Overload Action* IE is included, the contained information is used to identify the related signalling traffic corresponding to the Establishment cause for non-3GPP access as specified in TS 24.502 [7].

The *Global RAN Node ID* IE in the applicable NGAP messages includes the following IEs as specified in TS 38.413 [2]:

- *Global N3IWF ID* IE for the untrusted non-3GPP access.
- *Global TNGF ID* IE for the trusted non-3GPP access.
- *Global TWIF ID* IE for the trusted WLAN access.
- *Global W-AGF ID* IE for the wireline 5G access.

The *User Location Information* IE in the applicable NGAP messages includes the following IEs as specified in TS 38.413 [2]:

- *IP address* IE and *port number* IE for the untrusted non-3GPP access.
- *TNGF User Location Information* IE for the trusted non-3GPP access.
- *TWIF User Location Information* IE for the trusted WLAN access.
- *W-AGF User Location Information* IE for the wireline 5G access.

The *Security Key* IE in the applicable NGAP messages includes the K_{N3IWF}, or the K_{TNGF}, or the $K_{TWIF,}$ or the K_{WAGF} as specified in TS 33.501 [5].

The *RAN UE NGAP ID* IE in the applicable NGAP messages identifies the UE association over the NG interface within the N3IWF node, or the TNGF node, or the TWIF node, or the W-AGF node, as specified in TS 38.413 [2].

5.4 Handling of NGAP messages not specified to be applicable between the Non-3GPP access network node and AMF

If the Non-3GPP access network node or the AMF receive an NGAP message not listed in section 5.2 as being applicable between the Non-3GPP access network node and AMF, the receiving node shall act according to the criticality defined for the elementary procedure and ignore the message or discard the message and send an ERROR INDICATION message indicating that the procedure is not supported, as specified in in TS 38.413 [2].

Annex A (informative): Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2018-04	R3#99bis	R3-181817	-	-	-	TS skeleton	0.0.1
2018-04	R3#99bis	R3-182522	-	-	-	covering agreements of RAN3#99Bis	0.1.0
2018-05	RAN#100	R3-183589	-	-	-	covering agreements of RAN3#100	0.2.0
2018-06	RAN#80	RP-180755	-	-	-	For approval	1.0.0
2018-06	RAN#80		-	-	-	Specification approved at TSG-RAN and placed under change control	15.0.0
2018-12	RP-82	RP-182447	0001	-	F	Add the UE TNLA Binding release and overload control procedures	15.1.0
2019-07	RP-84	RP-191394	0002	1	F	N2 AMF mobility	15.2.0
2019-09	RP-85	RP-192166	0004	1	F	Correction of N3IWF key	15.3.0
2020-07	RP-88-e	RP-201092	0005	-	F	Selected PLMN ID for untrusted non-3GPP access	15.4.0
2020-07	RP-88-e	RP-201081	0003	11	B	CR for introducing WWC in RAN	16.0.0
2020-09	RP-89-e	RP-201954	0007	1	A	Update the list of IEs that is not applicable to non-3GPP access	16.1.0
2020-12	RP-90-e	RP-202310	0008	1	F	Add the support for updating RG Level Wireline Access Characteristics	16.2.0
2020-12	RP-90-e	RP-202313	0010	1	F	Handling OVERLOAD START message in the N3IWF	16.2.0
2021-09	RP-93-e	RP-211872	0011	1	F	Ignoring the notification control for WWC	16.3.0
2022-03	SA#95-e					Promotion to Release 17 without technical change	17.0.0
2022-06	RAN#96	RP-221150	0013		A	Clarify the UE Security Capabilities IE not applicable to non-3GPP access	17.1.0
2022-09	RAN#97-e	RP-222201	0014	1	F	Update for Rel-17 NGAP IEs not applicable to non-3GPP access	17.2.0

History

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