

Source: CT3
Title: CR to Rel-6 on Work Item "OAM-Trace"
Agenda item: 9.25
Document for: APPROVAL

Introduction:

This document contains 1 CR to Rel-6 on Work Item "OAM-Trace" that have been agreed by TSG CT WG3, and are forwarded to TSG CT Plenary for approval.

WG tdoc	Spec	CR	R	Cat	Title	Rel	C_Ver	Work Item
C3-050411	29.061	163	4	F	Tracing information for MBMS	Rel-6	6.4.0	OAM-Trace

CHANGE REQUEST

⌘ **29.061 CR 163** ⌘ rev **4** ⌘ Current version: **6.4.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Tracing information for MBMS		
Source:	⌘ Vodafone		
Work item code:	⌘ OAM-Trace	Date:	⌘ 25/04/2005
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: Ph2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6) Rel-7 (Release 7)

Reason for change:	⌘ The trace facility enables subscriber administration and network management to trace the activities of various entities when specific events occur within the PLMN. The facility may be used by the operator for subscriber observation, e.g. following a customer complaint, or on suspicion of equipment malfunction. SA2 decided in CR 23.246-143r1 (S2-050887) to include the stage 2 requirement to allow tracing in the BM-SC. All the necessary information to activate subscriber and equipment tracing are transferred from the GGSN to the BM-SC. The mechanisms and information needed to activate tracing in the BM-SC are missing in stage 3.
Summary of change:	⌘ To enable BM-SC tracing the GGSN may optionally send trace information to the BM-SC over the Gmb interface. The tracing information coming from the SGSN in the Create MBMS Context Request and/or Update MBMS Context Request is missing on the Gmb interface. This information is therefore added to the Gmb interface in a separate AAR message from the GGSN to the BM-SC in order to activate a Trace Session. It is also specified that the STR command shall be used to deactivate a Trace Session. A new AVP carrying trace information is defined. Signalling flows for Trace Session activation/deactivation are specified in new clauses. A new reference to a trace specification (TS 32.422) is defined.
Consequences if not approved:	⌘ BM-SC tracing will not be possible. Misalignment with a stage 2 requirement. The operator will not be able to use an important tool for network monitoring.

Clauses affected:	⌘	2, 17.6.1, 17.6.2, 17.6.3, 17.7, new clauses added										
Other specs affected:		<table border="1"><tr><td>Y</td><td>N</td></tr><tr><td>X</td><td></td></tr><tr><td></td><td>X</td></tr><tr><td>X</td><td></td></tr></table>	Y	N	X			X	X		Other core specifications	⌘ TS 29.060 CR554, TS 29.002 CR769
	Y	N										
	X											
	X											
X												
		Test specifications										
		O&M Specifications	⌘ TS 32.421, TS 32.422, TS 32.423									
Other comments:	⌘											

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

***** FIRST MODIFIED CLAUSE *****

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] Void.
- [2] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".
- [3] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".
- [4] Void.
- [5] Void.
- [6] Void.
- [7] Void.
- [8] Void.
- [9] Void.
- [10] 3GPP TS 27.060: "Packet Domain; Mobile Station (MS) supporting Packet Switched services".
- [11] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".
- [12] Void.
- [13] Void.
- [14] Void.
- [15] IETF RFC 768 (1980): "User Datagram Protocol" (STD 6).
- [16] IETF RFC 791 (1981): "Internet Protocol" (STD 5).
- [17] IETF RFC 792 (1981): "Internet Control Message Protocol" (STD 5).
- [18] IETF RFC 793 (1981): "Transmission Control Protocol" (STD 7).
- [19] IETF RFC 1034 (1987): "Domain names - concepts and facilities" (STD 7).
- [20] Void.
- [21a] IETF RFC 1661 (1994): "The Point-to-Point Protocol (PPP)" (STD 51).
- [21b] IETF RFC 1662 (1994): "PPP in HDLC-like Framing".
- [22] IETF RFC 1700 (1994): "Assigned Numbers" (STD 2).
- [23] 3GPP TS 44.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".
- [24] 3GPP TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface".

- [25] IETF RFC 2794 (2000): "Mobile IP Network Address Identifier Extension for IPv4", P. Calhoun, C. Perkins.
- [26] IETF RFC 2131 (1997): "Dynamic Host Configuration Protocol".
- [27] IETF RFC 1542 (1993): "Clarification and Extensions for the Bootstrap Protocol".
- [28] IETF RFC 2373 (1998): "IP Version 6 Addressing Architecture".
- [29] IETF RFC 2462 (1998): "IPv6 Stateless Address Autoconfiguration".
- [30] IETF RFC 3344 (2002): "IP Mobility Support", C. Perkins.
- [31] IETF RFC 2486 (1999): "The Network Access Identifier", B. Aboba and M. Beadles.
- [32] IETF RFC 1112 (1989): "Host extensions for IP multicasting", S.E. Deering.
- [33] IETF RFC 2236 (1997): "Internet Group Management Protocol, Version 2", W. Fenner.
- [34] IETF RFC 2362 (1998): "Protocol Independent Multicast-Sparse Mode (PIM-SM): Protocol Specification", D. Estrin, D. Farinacci, A. Helmy, D. Thaler, S. Deering, M. Handley, V. Jacobson, C. Liu, P. Sharma, L. Wei
- [35] IETF RFC 1075 (1988): "Distance Vector Multicast Routing Protocol", D. Waitzman, C. Partridge, S.E. Deering.
- [36] IETF RFC 1585 (1994): "MOSPF: Analysis and Experience", J. Moy.
- [37] IETF RFC 2290 (1998): "Mobile-IPv4 Configuration Option for PPP IPCP", J. Solomon, S. Glass.
- [38] IETF RFC 2865 (2000): "Remote Authentication Dial In User Service (RADIUS)", C. Rigney, S. Willens, A. Rubens, W. Simpson.
- [39] IETF RFC 2866 (2000): "RADIUS Accounting", C. Rigney, Livingston.
- [40] 3GPP TS 23.003: "Numbering, addressing and identification".
- [41] IETF RFC 3576 (2003): "Dynamic Authorization Extensions to Remote Authentication Dial In User Service (RADIUS)", M.Chiba, M.Eklund, D.Mitton, B.Aboba.
- [42] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [43] Void.
- [44] IETF RFC 2461 (1998): "Neighbor Discovery for IP Version 6 (IPv6)", T. Narten, E. Nordmark, W. Simpson
- [45] IETF RFC 3118 (2001): "Authentication for DHCP Messages", R. Droms, W. Arbaugh.
- [46] IETF RFC 3315 (2003) "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", R. Droms, J. Bound, B. Volz, T. Lemon, C. Perkins, M. Carney.
- [47] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP"
- [48] IETF RFC 2710 (1999): "Multicast Listener Discovery (MLD) for IPv6", S. Deering, W. Fenner, B. Haberman.
- [49] IETF RFC 2460 (1998): "Internet Protocol, Version 6 (IPv6) Specification", S.Deering, R.Hinden.
- [50] IETF RFC 3162 (2001): "RADIUS and IPv6", B. Adoba, G. Zorn, D. Mitton.
- [51] IETF RFC 2548 (1999): "Microsoft Vendor-specific RADIUS Attributes", G.Zorn.
- [52] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [53] 3GPP TS 29.207: "Policy control over Go interface".
- [54] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network protocols; Stage 3".

- [55] Void.
- [56] 3GPP TS 29.208: "End to end Quality of Service (QoS) signalling flows".
- [57] Void.
- [58] IETF RFC 1035 (1987): "Domain names - implementation and specification" (STD 13).
- [59] Void.
- [60] IETF RFC 1771 (1995): "A Border Gateway Protocol 4 (BGP-4)".
- [61] IETF RFC 1825 (1995): "Security Architecture for the Internet Protocol".
- [62] IETF RFC 1826 (1995): "IP Authentication Header".
- [63] IETF RFC 1827 (1995): "IP Encapsulating Security Payload (ESP)".
- [64] IETF RFC 2044 (1996): "UTF-8, a transformation format of Unicode and ISO 10646".
- [65] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS) Architecture and Functional Description".
- [66] IETF RFC 3588 "Diameter Base Protocol".
- [67] draft-ietf-aaa-diameter-nasreq-17.txt: "Diameter Network Access Server Application", work in progress.
- [68] 3GPP TS 23.141: "Presence Service; Architecture and functional description".
- [xx] [3GPP TS 32.422: "Subscriber and equipment trace: Trace Control and Configuration Management"](#).

***** END OF MODIFIED CLAUSE *****

***** NEXT MODIFIED CLAUSE *****

17.5.x Trace Session Activation procedure

The Trace Session Activation procedure occurs when the GGSN indicates to the BM-SC that a Trace Session needs to be activated.

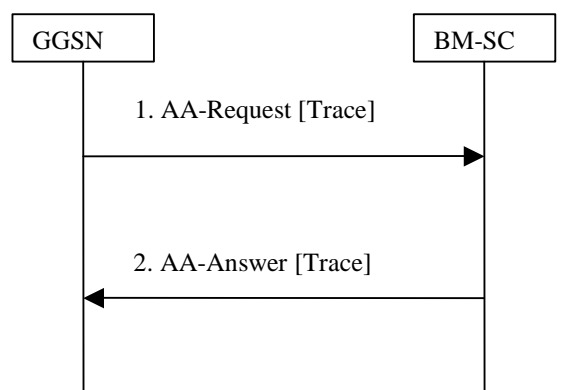


Figure xx: Trace Session Activation procedure

1. When the GGSN has received a Trace Activation message from the SGSN, in a Create MBMS Context Request/Update MBMS Context Request, that requires the activation of a Trace Session in the BM-SC, the GGSN sends an AAR message (containing the IMSI and the Additional MBMS Trace Info AVPs) to activate a trace session in the BM-SC.

- 2. Upon reception of an AAR from a GGSN to activate a Trace Session, the BM-SC responds with an AAA message.

17.5.y Trace Session Deactivation procedure

The Trace Session Deactivation procedure occurs when the GGSN indicates to the BM-SC that a Trace Session, previously activated, needs to be deactivated.

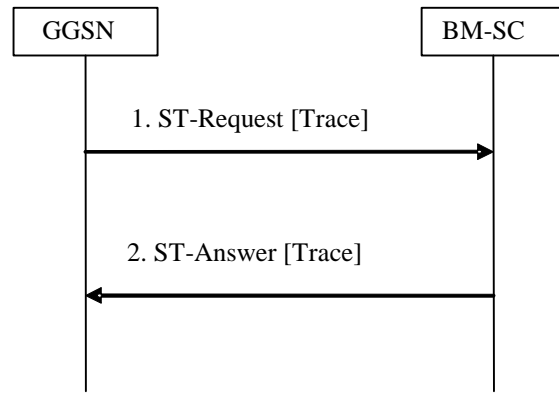


Figure yy: Trace Session Deactivation procedure

- 1. When the GGSN has received a Trace Deactivation message from the SGSN, in a Create MBMS Context Request/Update MBMS Context Request, that requires the deactivation of a Trace Session in the BM-SC, the GGSN sends a STR message (containing the Additional MBMS Trace Info AVP) to deactivate a trace session in the BM-SC and to tear down the corresponding Diameter Session previously established to activate the Trace Session.
- 2. Upon reception of an STR from a GGSN to deactivate a Trace Session, the BM-SC responds with an STA message.

***** NEXT MODIFIED CLAUSE *****

17.6.1 AAR Command

The AAR command, defined in Diameter NASREQ[67], is indicated by the Command-Code field set to 265 and the ‘R’ bit set in the Command Flags field. It, is sent by the GGSN to the BM-SC to request user authorization (authorize the activating UE to receive Data) or to register the GGSN for a particular multicast MBMS bearer service. When used for these purposes, the Additional-MBMS-Trace-Info AVP shall not be included.

The AAR command is also used when the GGSN needs to activate a Trace Session in the BM-SC. In this case the Called-Station-Id AVP, Calling-Station-Id AVP, Framed-IP-Address AVP, Framed-IPv6-Prefix AVP, Framed-Interface-Id AVP, 3GPP-GPRS-Negotiated-QoS-Profile AVP and RAI AVP shall not be included. For more detailed description of Trace Session activation/deactivation procedures see 3GPP TS 32.422 [xx].

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

The bold marked AVPs in the message format indicate new optional AVPs for Gmb, or modified existing AVPs.

Message Format:

```

<AA-Request> ::= < Diameter Header: 265, REQ, PXY >
    < Session-Id >
    { Auth-Application-Id }
    { Origin-Host }
    { Origin-Realm }
    { Destination-Realm }
    { Auth-Request-Type }
    
```

```

[ Destination-Host ]
[ Called-Station-Id ]
[ Calling-Station-Id ]
[ Framed-IP-Address ]
[ Framed-IPv6-Prefix ]
[ Framed-Interface-Id ]
* [ Proxy-Info ]
* [ Route-Record ]
[ 3GPP-GPRS-Negotiated-QoS-Profile ]
[ 3GPP-IMSI ]

[ RAI ]
[ Additional-MBMS-Trace-Info ]

```

The GGSN shall allocate a new Session-Id for each time an AAR command is sent.

A request for user authorisation for an MBMS bearer service is indicated by the presence of the MSISDN within the Calling-Station-Id AVP and the 3GPP-IMSI. Otherwise the request is for the GGSN to be authorised (i.e. registered) to receive the MBMS bearer service.

The Framed-IPv6-Prefix AVP contains the IPv6 prefix of the multicast address identifying the MBMS bearer service.

The Framed-Interface-Id AVP contains the IPv6 interface identifier of the multicast address identifying the MBMS bearer service.

The Framed-IP-Address AVP contains the IPv4 multicast address identifying the MBMS bearer service.

The Called-Station-Id AVP contains the Access Point Name (APN) on which the MBMS bearer service authorisation request was received.

***** NEXT MODIFICATIONS *****

17.6.2 AAA Command

The AAA command, defined in Diameter NASREQ [67], is indicated by the Command-Code field set to 265 and the 'R' bit cleared in the Command Flags field., It is sent by the BM-SC to the GGSN in response to the AAR command.

When the AAA command is used to acknowledge an AAR that activated a Trace Session, the only Gmb specific AVP that shall be included is the 3GPP-IMSI AVP.

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

The bold marked AVPs in the message format indicate new optional AVPs for Gmb, or modified existing AVPs.

Message Format:

```

<AA-Answer> ::= < Diameter Header: 265, PXY >
    < Session-Id >
    { Auth-Application-Id }
    { Origin-Host }
    { Origin-Realm }
    [ Result-Code ]
    [ Experimental-Result ]
    [ Error-Message ]
    [ Error-Reporting-Host ]
    * [ Failed-AVP ]
    * [ Proxy-Info ]
    [ Alternative-APN ]
    [ 3GPP-GPRS-Negotiated-QoS-Profile ]
    [ 3GPP-IMSI ]
    [ TMGI ]
    [ Required-MBMS-Bearer-Capabilities ]

```


***** NEXT MODIFIED CLAUSE *****

17.6.3 STR Command

The STR command, defined in IETF RFC3588 (DIAMETER BASE) [66], is indicated by the Command-Code field set to 275 and the ‘R’ bit set in the Command Flags field, It is sent by the GGSN to the BM-SC to terminate a DIAMETER session.

A DIAMETER session for a multicast MBMS service is terminated when the last MBMS UE context for the MBMS bearer service is deleted. This informs the BM-SC that the GGSN would like to be deleted from the distribution tree of a particular MBMS bearer service (De-registration procedure).

A DIAMETER session for an individual UE’s multicast MBMS service authorisation is terminated when the UE has requested to the GGSN to leave the MBMS bearer service.

The STR command is also used to deactivate a Trace Session previously activated in the BM-SC and to terminate the associated Diameter Session initiated by the AAR that activated the Trace session. The Gmb specific AVP Additional-MBMS-Trace-Info shall be included in the STR command only in the case of a Trace Session deactivation. For more detailed description of Trace Session activation/deactivation procedures see 3GPP TS 32.422 [xx].

The relevant AVPs that are of use for the Gmb interface are detailed in the ABNF description below. Other valid AVPs for this command are not used for Gmb purposes and should be ignored by the receiver or processed according to the relevant specifications.

Message Format:

```
<ST-Request> ::= < Diameter Header: 275, REQ, PXY >
    < Session-Id >
    { Origin-Host }
    { Origin-Realm }
    { Destination-Realm }
    { Auth-Application-Id }
    { Termination-Cause }
    [ Destination-Host ]
    * [ Class ]
    [ Origin-State-Id ]
    * [ Proxy-Info ]
    * [ Route-Record ]
    [ Additional-MBMS-Trace-Info ]
```

***** END OF MODIFIED CLAUSE *****

17.7 Gmb specific AVPs

Table 10 describes the Gmb specific Diameter AVPs. The Vendor-Id header of all Gmb specific AVPs defined in the present specification shall be set to 3GPP (10415).

The Gmb specific AVPs require to be supported to be compliant to the present specification. All AVPs in table 10 are mandatory within Gmb interface unless otherwise stated.

Table 10: Gmb specific AVPs

Attribute Name	AVP Code	Section defined	Value Type	AVP Flag rules				
				Must	May	Should not	Must not	May Encr.
TMGI	900	17.7.2	OctectString	M,V	P			Y

Required-MBMS- Bearer-Capabilities	901	17.7.3	UTF8String	M,V	P			Y
MBMS-StartStop- Indication	902	17.7.5	Enumerated	M,V	P			Y
MBMS-Service- Area	903	17.7.6	OctectString	M,V	P			Y
MBMS-Session- Duration	904	17.7.7	Unsigned32	M,V	P			Y
3GPP-GPRS- Negotiated-QoS- Profile	5	16.4.7 (see Note)	UTF8String	M,V	P			Y
3GPP-IMSI	1	16.4.7 (see Note)	UTF8String	M,V	P			Y
Alternative-APN	905	17.7.8	UTF8String	M,V	P			Y
MBMS-Service- Type	906	17.7.9	Enumerated	M,V	P			Y
3GPP-SGSN- Address	6	16.4.7 (see note)	UTF8String	M, V	P			Y
3GPP-SGSN-IPv6- Address	15	16.4.7 (see note)	UTF8String	M, V	P			Y
MBMS-2G-3G- Indicator	907	17.7.10	Enumerated	M, V	P			Y
MBMS-Session- Identity	908	17.7.11	OctetString	M,V	P			Y
RAI	909	17.7.12	UTF8String	M, V	P			Y
Additional- MBMS-Trace-Info	9kk	17.7.k	OctetString	M,V	P			Y
NOTE: The use of Radius VSA as a Diameter vendor AVP is described in Diameter NASREQ [67] and the P flag may be set.								

Table 11 lists the set of Diameter AVPs that are not Gmb specific, but are reused from other Diameter applications by the Gmb interface. A reference is done to the specifications where the AVPs are specified. This set of AVPs requires to be supported to be compliant to the present specification.

Table 11: Gmb reused AVPs from other Diameter applications.

AVP Name	Reference
Called-Station-Id	draft-ietf-aaa-diameter-nasreq-17.txt [67]
Calling-Station-Id	draft-ietf-aaa-diameter-nasreq-17.txt [67]
Framed-Interface-Id	draft-ietf-aaa-diameter-nasreq-17.txt [67]

Framed-IP-Address	draft-ietf-aaa-diameter-nasreq-17.txt [67]
Framed-IPv6-Prefix	draft-ietf-aaa-diameter-nasreq-17.txt [67]

NOTE: Diameter Base AVPs are not listed as support of them is mandated by IETF RFC 3588 [66].

***** NEXT MODIFIED CLAUSE *****

17.7.k Additional-MBMS-Trace-Info AVP

The Additional-MBMS-Trace-Info AVP (AVP Code 9kk) is of type OctetString. This AVP contains Trace Reference2, Trace Recording Session Reference, Triggering Events in BM-SC, Trace Depth for BM-SC, List of interfaces in BM-SC, Trace Activity Control For BM-SC which are all part of the Additional MBMS Trace Info IE as specified in TS 29.060 [24].