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IPCablecom

Cx and Dx Interfaces based on the Diameter protocol; Protocol details

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Recommendation J.366.6

Cx and Dx Interfaces based on the Diameter protocol; Protocol details

Summary

This Recommendation defines a transport protocol for use in the IP multimedia (IM) Core Network (CN) subsystem based on Diameter.

The present document is applicable to:

- The Cx interface between the I-CSCF/S-CSCF and the HSS.
- The Dx interface between the I-CSCF/S-CSCF and the SLF.

The Third Generation Partnership Project (3GPP) has developed the specification in a form optimized for the wireless environment. This Recommendation references the ETSI version of the 3GPP specification and specifies only the modifications necessary to optimize it for the cable environment.

Draft new Recommendation J.366.6 Cx/Dx Interfaces based on the Diameter Protocol Specification

1 Scope

The present document defines a transport protocol for use in the IP multimedia (IM) Core Network (CN) subsystem based on Diameter.

The present document is applicable to:

- The Cx interface between the I-CSCF/S-CSCF and the HSS.
- The Dx interface between the I-CSCF/S-CSCF and the SLF.

Whenever it is possible, this document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of Diameter. Where this is not possible, extensions to Diameter are defined within this document.

The Third Generation Partnership Project (3GPP) has developed the specification in a form optimized for the wireless environment. This Recommendation references the ETSI version of the 3GPP specification and specifies only the modifications necessary to optimize it for the cable environment. Additions are shown in blue underline and deletions in ~~violet strikethrough~~. It is an important objective of this work that interoperability between IP-Cablecom 2.0 and 3GPP IMS is provided. IP-Cablecom 2.0 is based upon 3GPP IMS, but includes additional functionality necessary to meet the requirements of cable operators. Recognizing developing converged solutions for wireless, wireline, and cable, it is expected that further development of IP-Cablecom 2.0 will continue to monitor and contribute to IMS developments in 3GPP, with the aim of alignment of 3GPP IMS and IP-Cablecom 2.0.

The modifications to ETSI TS 29.229 V6.7.0 (2005-12) Cx/Dx Interfaces based on the Diameter Protocol Specification are listed below.

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*.
- IP-Cablecom2 defines several Recommendations which are based on 3GPP technical specifications. These IP-Cablecom2 Recommendations are commonly referred to as IP-Cablecom2 Delta Recommendations. For references within this Recommendation which have a corresponding IP-Cablecom2 Delta Recommendation, the IP-Cablecom2 Delta Recommendation must be used. The list of IP-Cablecom2 Delta Recommendations is:

[J.366.1 \(TS-23.008\)](#)

[J.366.5 \(TS-29.228\)](#)

[J.366.2 \(TS-23.218\)](#)

[J.366.6 \(TS-29.229\)](#)

[J.366.3 \(TS-23.228\)](#)

[J.366.7 \(TS-33.203\)](#)

References which have corresponding delta specifications are highlighted with an *

- [1] [*3GPP TS 29.228 "IP Multimedia \(IM\) Subsystem Cx and Dx interface; signalling flows and message contents"](#)
- [2] [*3GPP TS 33.210 "3G Security; Network Domain Security; IP Network Layer Security"](#)
- [3] IETF RFC 3261 "SIP: Session Initiation Protocol"
- [4] IETF RFC 2396 "Uniform Resource Identifiers (URI): generic syntax"
- [5] IETF RFC 2960 "Stream Control Transmission Protocol"
- [6] IETF RFC 3588 "Diameter Base Protocol"
- [7] IETF RFC 2234 "Augmented BNF for syntax specifications"
- [8] IETF RFC 3966 "The tel URI for Telephone Numbers"
- [9] void
- [10] IETF RFC 3309: "SCTP Checksum Change"
- [11] [*3GPP TS 29.329 "Sh Interface based on the Diameter protocol; protocol details"](#)
- [12] IETF RFC 3589 "Diameter Command Codes for Third Generation Partnership Project (3GPP) Release 5"
- [13] [IETF RFC 2617 "HTTP Authentication: Basic and Digest Access Authentication"](#)

3 Definitions, symbols and abbreviations

<There are no changes to Clause 3>

4 General

The Diameter Base Protocol as specified in IETF RFC 3588 [6] shall apply except as modified by the defined support of the methods and the defined support of the commands and AVPs, result and event codes specified in clause 5 of this specification. Unless otherwise specified, the procedures (including error handling and unrecognised information handling) are unmodified.

5 Use of the Diameter base protocol

With the clarifications listed in the following subclauses the Diameter Base Protocol defined by IETF RFC 3588 [6] shall apply.

5.1 Securing Diameter Messages

For secure transport of Diameter messages, see 3GPP TS 33.210 [2].

5.2 Accounting functionality

Accounting functionality (Accounting Session State Machine, related command codes and AVPs) is not used on the Cx interface.

5.3 Use of sessions

Both between the I-CSCF and the HSS and between the S-CSCF and the HSS, Diameter sessions are implicitly terminated. An implicitly terminated session is one for which the server does not maintain state information. The client does not need to send any re-authorization or session termination requests to the server.

The Diameter base protocol includes the Auth-Session-State AVP as the mechanism for the implementation of implicitly terminated sessions.

The client (server) shall include in its requests (responses) the Auth-Session-State AVP set to the value NO_STATE_MAINTAINED (1), as described in IETF RFC 3588 [6]. As a consequence, the server does not maintain any state information about this session and the client does not need to send any session termination request. Neither the Authorization-Lifetime AVP nor the Session-Timeout AVP shall be present in requests or responses.

5.4 Transport protocol

Diameter messages over the Cx interface shall make use of SCTP IETF RFC 2960 [5] and shall utilise the new SCTP checksum method specified in RFC 3309 [10].

5.5 Routing considerations

This clause specifies the use of the Diameter routing AVPs Destination-Realm and Destination-Host.

If an I-CSCF or S-CSCF knows the address/name of the HSS for a certain user, both the Destination-Realm and Destination-Host AVPs shall be present in the request. Otherwise, only the Destination-Realm AVP shall be present and the command shall be routed to the next Diameter node, e.g. the SLF (see 3GPP TS 29.228 [1]), based on the Diameter routing table in the client. Once the redirector function (SLF) has returned the address or the destination HSS (using Redirect-Host AVP), the redirected request to the HSS shall include both Destination-Realm and Destination-Host AVPs. Consequently, the Destination-Host AVP is declared as optional in the ABNF for all requests initiated by an I-CSCF or an S-CSCF. The S-CSCF shall store the address of the HSS for each user, after a first request sent to the redirector function.

Requests initiated by the HSS towards an S-CSCF shall include both Destination-Host and Destination-Realm AVPs. The HSS obtains the Destination-Host AVP to use in requests towards an S-CSCF, from the Origin-Host AVP received in previous requests from the S-CSCF. Consequently, the Destination-Host AVP is declared as mandatory in the ABNF for all requests initiated by the HSS.

Destination-Realm AVP is declared as mandatory in the ABNF for all requests.

5.6 Advertising Application Support

The HSS, S-CSCF and I-CSCF shall advertise support of the Diameter Multimedia Application by including the value of the application identifier (see chapter 6) in the Auth-Application-Id AVP within the Vendor-Specific-Application-Id grouped AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands.

The vendor identifier values of 3GPP (10415) [and CableLabs \(4491\)](#) shall be included in the Supported-Vendor-Id AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-