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**Requirements for an End-to-End Session Identification in
IP-Based Multimedia Communication Networks
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Abstract

This document specifies the requirements for an end-to-end session identifier in IP-based multimedia communication networks. This identifier would enable endpoints, intermediate devices, and management and monitoring systems to identify a session end-to-end, associate multiple endpoints with a given multipoint conference, and track communication sessions when they are redirected.

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[1. Introduction](#)

IP-based multimedia communication systems like SIP [[1](#)] and H.323 [[2](#)] have the concept of a "call identifier" that is globally unique. The identifier is intended to represent an end-to-end communication session from the originating device to the terminating device. Such an identifier is useful for troubleshooting, billing, session tracking, and so forth.

Unfortunately, there are a number of factors that contribute to the fact that the current call identifiers defined in SIP and H.323 are not suitable for end-to-end session identification. Perhaps most significant is the fact that the syntax for the call identifier in SIP and H.323 is different between the two protocols. This important fact makes it impossible for call identifiers to be exchanged end-to-end when a network utilizes one or more session protocols.

Another reason why the current call identifiers are not suitable to identify the session end-to-end is that in real-world deployments devices like session border controllers often change the values as

the session signaling passes through. This is true even when a

single session protocol is employed and not a byproduct of protocol interworking.

Lastly, identifiers that might have been used to identify a session end-to-end fail to meet that need when sessions are manipulated through supplementary service interactions. For example, when a session is transferred or if a PBX joins two communication sessions together locally, the end-to-end properties of currently-defined identifiers are lost.

This draft specifies the requirements for an end-to-end session identifier. With this draft, the authors would like to encourage discussion and progress work in the dispatch working group or working group as designated by the IETF, the outcome of which will be a new RFC that defines a session ID in conformance with these requirements.

2. Terminology

SIP defines additional terms used in this document that are specific to the SIP domain such as "proxy"; "registrar"; "redirect server"; "user agent server" or "UAS"; "user agent client" or "UAC"; "back-to-back user agent" or "B2BUA"; "dialog"; "transaction"; "server transaction".

In this document, the word "session" refers to a "communication session" that may exist between two SIP user agents or that might pass through one or more intermediary devices, including B2BUAs or SIP Proxies.

The term "end-to-end" in this document means the communication session from the point of origin, passing through any number of intermediaries, to the ultimate point of termination. It is recognized that legacy devices may not support the "end-to-end" session identifier, though an identifier might be created by an intermediary when it is absent from the session signaling.

3. Session Identifier Use Cases

The Session Identifier is intended to uniquely identify a communication session end-to-end. This document does not specify how the Session Identifier is to be used, but merely defines the identifier in such a way as to enable it to be used for situations encountered in real-world deployments of IP-based multimedia communication systems, including:

- * End-to-end identification of a communication session
- * End-to-end identification of a communication session that includes a plurality of signaling protocol (e.g., SIP, H.323, and

XMPP) wherein a session might originate using one protocol and terminate using a different protocol

- * Identification of devices taking part in the same multipoint conference
- * Tracking sessions transferred from one endpoint to another
- * Facilitate the recording of SIP sessions and correlating those sessions
- * Logging for the purposes of accounting, billing, debugging, communication tracking (such as for security purposes in case of theft of service), etc.

{ NOTE: the above simple use case examples are to be replaced with more elaborate text as we have started to do below. Once all use case text is submitted to the editor, the above simple cases will be removed from the document. }

3.1. Session Recording

A SIP Session is established between UA-A and UA-B with a SIP B2BUA acting as a middlebox. Both UA-A and UA-B establish a recording session with a session recording server (SRS) using the SIPREC protocol. The SRS needs to be able to determine from the metadata provided by UA-A and UA-B that the media streams are associated with the same communication session (CS).

Derived Requirements: REQ1, REQ3, REQ4

3.2. Protocol Interworking

A communication session might originate in an H.323 endpoint and pass through a Session Border Controller before ultimately reaching a terminating SIP user agent. Likewise, a call might originate on a SIP user agent and terminate on an H.323 endpoint. It MUST be possible to identify such sessions end-to-end across the plurality of devices, networks, or administrative domains.

It is expected that the ITU-T will define protocol elements for H.323 to make the end-to-end signaling possible.

Derived Requirements: REQ7, REQ9a.

3.3. More Use Cases

{ Additional use cases will be added as additional sub-sections. }

4. Requirements for the End-to-End Session Identifier

The following requirements are derived from the use cases and additional constraints regarding the construction of the identifier.

REQ1: It must be possible for an administrator or an external device which monitors the SIP-traffic to use the identifier to identify those dialogs which were at some point in time components of a single end-to-end SIP session (e.g., parts of the same call).

REQ1a: { Requirement 1 for non-dialog creating transactions. Text solicited. }

REQ2: It must be possible to correlate two end-to-end sessions when a session is transferred or if two different sessions are joined together via an intermediary (e.g., a PBX). This might result in a change in the value of the end-to-end Session-Identifier.

REQ3: It must be possible for a device other than the conference focus to correlate sessions participating in a multipoint or multiparty conference on a single focus by observing the end-to-end session identifiers of each session.

REQ4: It must be possible to pass the identifier unchanged through SIP B2BUAs or other intermediaries.

REQ5: The identifier must not reveal any information related to any SIP user, device or domain identity. This includes any IP Address, port, hostname, domain name, username, Address-of-Record, MAC address, IP address family, transport type, subscriber ID, Call-ID, tags, or other SIP header or body parts.

REQ7: It must be possible to identity SIP traffic with an end-to-end session identifier from and to end devices that do not support this new identifier, such as by allowing an intermediary to inject an identifier into the session signaling.

REQ8: The identifier should be unique in time and space, similar to the Call-ID.

REQ9a: The identifier should be constructed in such a way as to make it suitable for transmission in SIP and H.323.

REQ9b: The identifier should be constructed in such a way as to make it suitable for transmission in SIP and RSVP [\[3\]](#).

REQ9c: The identifier should be constructed in such a way as to make it suitable for transmission in SIP and RTCP [\[4\]](#).

5. Related Work in other Standards Organizations

5.1. Coordination with the ITU-T

IP multimedia networks are often comprised of a mix of session protocols like SIP and H.323. A benefit of the Session Identifier is that it uniquely identifies a communication session end-to-end across session protocol boundaries. Therefore, the need for coordinated standardization activities across Standards Development Organizations (SDOs) is imperative.

To facilitate this, a parallel effort is underway in the ITU-T to introduce the Session Identifier for the H.323 protocol. The ITU-T SG16 has approved contribution C.552 [5] as a work item with the intent that it be a coordinated and synchronized effort between the ITU-T and the IETF.

5.2. Requirements within 3GPP

3GPP identified in their Release 9 the need for a Session Identifier for O&M purposes to correlate flows in an end-to-end communication session. TS24.229 (IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP)) [6] points to the fact that the Session Identifier can be used to correlate SIP messages belonging to the same session. In the case where signaling passes through SIP entities like B2BUAs, the end-to-end session identifier indicates that these dialogs belong to the same end-to-end SIP communication session.

6. Security Considerations

An end-to-end identifier, if not properly constructed, could provide information that would allow one to identify the individual, device, or domain initiating or terminating a communication session. In adherence with REQ5, the solution produced in accordance with these requirements MUST NOT provide any information that allow one to identify a person, device, or domain. This means that information elements such as the MAC address or IP address MUST NOT be used when constructing the end-to-end session identifier.

7. IANA Considerations

There are no IANA considerations associated with this document.

8. Acknowledgments

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This document was prepared using 2-Word-v2.0.template.dot.

9. References

9.1. Normative References

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9.2. Informative References

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- [5] International Telecommunications Union, "End-to-End Session Identifier for IP-based Multimedia Communication Systems", March 2011, ITU-T Contribution C.552, http://ftp3.itu.int/av-arch/avc-site/2009-2012/1103_Gen/SessionID.zip.
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