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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, track communication sessions when they are redirected, and associate one or more media flows with a given communication session.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on November 20, 2011.

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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 help form a globally unique value that represents an end-to-end communication session. 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. Requirements for the End-to-End Session Identifier

REQ1: It must be possible for an administrator or an external device which monitors the SIP-traffic to use the identifier to identify a set of dialogs which have a relationship with each other, such that they represent the same SIP session, with as high a probability as possible.

REQ2: It must be possible to identify the end-to-end session when a session is transferred or if two different sessions are joined together via an intermediary (e.g., a PBX).

REQ3: It must be possible to identify all sessions participating in a multipoint or multi-party conference 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 device or domain identity, including IP Address, port, hostname, domain name, username, Address-of-Record, MAC address, IP address family, transport type, etc.

REQ6: The identifier must not reveal to the receiver of it that the Call-ID, tags, or any other SIP header or body portion have been changed by middleboxes, with as high a probability as possible.

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.

REQ9: The identifier should be constructed in such a way as to make it suitable for transmission in SIP, H.323, RSVP [3], and RTCP [4].

4. 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

* Association of session signaling and media flows, made possible by including the session identifier in media-related messages (e.g., RSVP or RTCP)

* 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.

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

TBD

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

[1] Rosenberg, J., et al., "SIP: Session Initiation Protocol", RFC 3261, June 2002.

[2] Recommendation ITU-T H.323, "Packet-based multimedia communications systems", December 2009.

9.2. Informative References

[3] Braden, R., et al., "Resource ReSerVation Protocol (RSVP) -- Version 1 Functional Specification", RFC 2205, September 1997.

[4] Schulzrinne, H., et al., "RTP: A Transport Protocol for Real-Time Applications", RFC 3550, July 2003.

[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.

[6] 3GPP, "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3", 3GPP TS 24.229 10.3.0, April 2011.

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