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SDP: Session Description Protocol

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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Abstract

This document defines the Session Description Protocol, SDP. SDP is intended for describing multimedia sessions for the purposes of session announcement, session invitation, and other forms of multimedia session initiation.

This document is a product of the Multiparty Multimedia Session Control (MMUSIC) working group of the Internet Engineering Task Force. Comments are solicited and should be addressed to the working group's mailing list at confctrl@isi.edu and/or the authors.

1. Introduction

On the Internet multicast backbone (Mbone), a session directory tool is used to advertise multimedia conferences and communicate the conference addresses and conference tool-specific information necessary for participation. This document defines a session description protocol for this purpose, and for general real-time multimedia session description purposes. This memo does not describe multicast address allocation or the distribution of SDP messages in detail. These are described in accompanying memos. SDP is not intended for negotiation of media encodings.

2. Background

The Mbone is the part of the internet that supports IP multicast, and thus permits efficient many-to-many communication. It is used extensively for multimedia conferencing. Such conferences usually have the property that tight coordination of conference membership is not necessary; to receive a conference, a user at an Mbone site only has to know the conference's multicast group address and the UDP ports for the conference data streams.

Session directories assist the advertisement of conference sessions and communicate the relevant conference setup information to prospective participants. SDP is designed to convey such information to recipients. SDP is purely a format for session description - it does not incorporate a transport protocol, and is intended to use different transport protocols as appropriate including the Session Announcement Protocol [4], Session Initiation Protocol [11], Real-Time Streaming Protocol [12], electronic mail using the MIME extensions, and the Hypertext Transport Protocol.

SDP is intended to be general purpose so that it can be used for a wider range of network environments and applications than just multicast session directories. However, it is not intended to support negotiation of session content or media encodings - this is viewed as outside the scope of session description.

3. Glossary of Terms

The following terms are used in this document, and have specific meaning within the context of this document.

Conference

A multimedia conference is a set of two or more communicating users along with the software they are using to communicate.

Session

A multimedia session is a set of multimedia senders and receivers and the data streams flowing from senders to receivers. A multimedia conference is an example of a multimedia session.

Session Advertisement

See session announcement.

Session Announcement

A session announcement is a mechanism by which a session description is conveyed to users in a proactive fashion, i.e., the session description was not explicitly requested by the user.

Session Description

A well defined format for conveying sufficient information to discover and participate in a multimedia session.

3.1. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

4. SDP Usage

4.1. Multicast Announcements

SDP is a session description protocol for multimedia sessions. A common mode of usage is for a client to announce a conference session by periodically multicasting an announcement packet to a well known multicast address and port using the Session Announcement Protocol (SAP).

SAP packets are UDP packets with the following format:

```
|-----|
| SAP header |
|-----|
| text payload |
|//////////|
```

The header is the Session Announcement Protocol header. SAP is described in more detail in a companion memo [4]

The text payload is an SDP session description, as described in this memo. The text payload should be no greater than 1 Kbyte in length. If announced by SAP, only one session announcement is permitted in a single packet.

4.2. Email and WWW Announcements

Alternative means of conveying session descriptions include electronic mail and the World Wide Web. For both email and WWW distribution, the use of the MIME content type "application/sdp" should be used. This enables the automatic launching of applications for participation in the session from the WWW client or mail reader in a standard manner.

Note that announcements of multicast sessions made only via email or the World Wide Web (WWW) do not have the property that the receiver of a session announcement can necessarily receive the session because the multicast sessions may be restricted in scope, and access to the WWW server or reception of email is possible outside this scope. SAP announcements do not suffer from this mismatch.

5. Requirements and Recommendations

The purpose of SDP is to convey information about media streams in multimedia sessions to allow the recipients of a session description to participate in the session. SDP is primarily intended for use in an internetwork, although it is sufficiently general that it can describe conferences in other network environments.

A multimedia session, for these purposes, is defined as a set of media streams that exist for some duration of time. Media streams can be many-to-many. The times during which the session is active need not be continuous.

Thus far, multicast based sessions on the Internet have differed from many other forms of conferencing in that anyone receiving the traffic can join the session (unless the session traffic is encrypted). In such an environment, SDP serves two primary purposes. It is a means to communicate the existence of a session, and is a means to convey sufficient information to enable joining and participating in the session. In a unicast environment, only the latter purpose is likely to be relevant.

Thus SDP includes:

- o Session name and purpose
- o Time(s) the session is active
- o The media comprising the session
- o Information to receive those media (addresses, ports, formats and so on)

As resources necessary to participate in a session may be limited, some additional information may also be desirable:

- o Information about the bandwidth to be used by the conference
- o Contact information for the person responsible for the session

In general, SDP must convey sufficient information to be able to join a session (with the possible exception of encryption keys) and to announce the resources to be used to non-participants that may need to know.

5.1. Media Information

SDP includes:

- o The type of media (video, audio, etc)
- o The transport protocol (RTP/UDP/IP, H.320, etc)
- o The format of the media (H.261 video, MPEG video, etc)

For an IP multicast session, the following are also conveyed:

- o Multicast address for media
- o Transport Port for media

This address and port are the destination address and destination port of the multicast stream, whether being sent, received, or both.

For an IP unicast session, the following are conveyed:

- o Remote address for media
- o Transport port for contact address

The semantics of this address and port depend on the media and transport protocol defined. By default, this is the remote address and remote port to which data is sent, and the remote address and local port on which to receive data. However, some media may define to use these to establish a control channel for the actual media flow.

5.2. Timing Information

Sessions may either be bounded or unbounded in time. Whether or not they are bounded, they may be only active at specific times.

SDP can convey:

- o An arbitrary list of start and stop times bounding the session
- o For each bound, repeat times such as "every Wednesday at 10am for one hour"

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