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Application-Layer Protocol Negotiation (ALPN) Labels for Session Traversal Utilities for NAT (STUN) Usages

Abstract

Application-Layer Protocol Negotiation (ALPN) labels for Session Traversal Utilities for NAT (STUN) usages, such as Traversal Using Relays around NAT (TURN) and NAT discovery, are defined in this document to allow an application layer to negotiate STUN usages within the Transport Layer Security (TLS) connection. ALPN protocol identifiers defined in this document apply to both TLS and Datagram Transport Layer Security (DTLS).

Status of This Memo

This document is not an Internet Standards Track specification; it is published for informational purposes.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Not all documents approved by the IESG are a candidate for any level of Internet Standard; see Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc7443.

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1. Introduction

STUN can be securely transported using TLS-over-TCP (referred to as TLS [RFC5246]), as specified in [RFC5389], or TLS-over-UDP (referred to as DTLS [RFC6347]), as specified in [RFC7350].

ALPN [RFC7301] enables an endpoint to positively identify an application protocol in TLS/DTLS and distinguish it from other TLS/DTLS protocols. With ALPN, the client sends the list of supported application protocols as part of the TLS/DTLS ClientHello message. The server chooses a protocol and sends the selected protocol as part of the TLS/DTLS ServerHello message. Application protocol negotiation can thus be accomplished within the TLS/DTLS handshake, without adding network round-trips.

STUN protocol usages, such as TURN [RFC5766], can be used to identify the purpose of a flow without initiating a session.

This document proposes the following ALPN labels to identify STUN protocol [RFC5389] usages.

'stun.turn': Label to identify the specific use of STUN over (D)TLS for TURN (Section 4.6 of [RFC7350]).

'stun.nat-discovery': Label to identify the specific use of STUN over (D)TLS for NAT discovery (Section 4.1 of [RFC7350]).

2. IANA Considerations

The following entries have been added to the "Application-Layer Protocol Negotiation (ALPN) Protocol IDs" registry established by [RFC7301].

The "stun.turn" label identifies the use of TURN usage (D)TLS:

Protocol: Traversal Using Relays around NAT (TURN)

Identification Sequence: 0x73 0x74 0x75 0x6E 0x2E 0x74 0x75 0x72 0x6E ("stun.turn")

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The "stun.nat-discovery" label identifies the use of STUN for the purposes of NAT discovery over (D)TLS:

Protocol: NAT discovery using Session Traversal Utilities for NAT (STUN)

Identification Sequence: 0x73 0x74 0x75 0x6E 0x2E 0x6e 0x61 0x74 0x2d 0x64 0x69 0x73 0x63 0x6f 0x76 0x65 0x72 0x79 ("stun.nat-discovery")

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3. Security Considerations

The ALPN STUN protocol identifier does not introduce any specific security considerations beyond those detailed in the TLS ALPN Extension specification [RFC7301]. It also does not impact the security of TLS/DTLS session establishment or application data exchange.

4. References

4.1. Normative References

[RFC5246] Dierks, T. and E. Rescorla, "The Transport Layer Security (TLS) Protocol Version 1.2", RFC 5246, August 2008, <http://www.rfc-editor.org/info/rfc5246>.

[RFC5389] Rosenberg, J., Mahy, R., Matthews, P., and D. Wing, "Session Traversal Utilities for NAT (STUN)", RFC 5389, October 2008, <http://www.rfc-editor.org/info/rfc5389>.

[RFC6347] Rescorla, E. and N. Modadugu, "Datagram Transport Layer Security Version 1.2", RFC 6347, January 2012, <http://www.rfc-editor.org/info/rfc6347>.

[RFC7301] Friedl, S., Popov, A., Langley, A., and E. Stephan, "Transport Layer Security (TLS) Application-Layer Protocol Negotiation Extension", RFC 7301, July 2014, <http://www.rfc-editor.org/info/rfc7301>.

[RFC7350] Petit-Huguenin, M. and G. Salgueiro, "Datagram Transport Layer Security (DTLS) as Transport for Session Traversal Utilities for NAT (STUN)", RFC 7350, August 2014, <http://www.rfc-editor.org/info/rfc7350>.

4.2. Informative References

[RFC5766] Mahy, R., Matthews, P., and J. Rosenberg, "Traversal Using Relays around NAT (TURN): Relay Extensions to Session Traversal Utilities for NAT (STUN)", RFC 5766, April 2010, <http://www.rfc-editor.org/info/rfc5766>.

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