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

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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 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).

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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 capability is useful and adds efficiency, as shown in the following scenarios.

1. Consider an Enterprise network that deploys a TURN server in a DeMilitarized Zone (DMZ) to audit all media sessions from inside the Enterprise premises to any external peer. In this deployment, an Enterprise firewall could use the TURN ALPN identifier to detect the use of a TURN server that is outside the Enterprise domain (i.e., a TURN server provided by an application server, access network, etc).

2. If a firewall is configured to block all outgoing traffic except for TCP traffic to specific ports (e.g., 443 for HTTPS), a TURN
server listening on its default ports (3478 for TCP/UDP, 5349 for TLS) would not be reachable. However, despite the restrictions imposed by the firewall, a TURN server can still be reached on the allowed HTTPS port if the TURN ALPN identifier is used to establish usage of TURN as part of the TLS handshake.

This document defines entries in the "Application Layer Protocol Negotiation (ALPN) Protocol IDs" registry established by [RFC7301] to identify STUN protocol usages.

2. ALPN Labels for STUN

The 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]).

3. IANA Considerations

The following entries are to be 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")

Specification: This document (RFCXXXX)

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")

Specification: This document (RFCXXXX)
4. 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 security of TLS/DTLS session establishment nor application data exchange.

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6. References

6.1. Normative References


6.2. Informative References

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