On the Use of Channel Bindings to Secure Channels

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Abstract

This document defines a form of channel bindings for TLS (Transport Layer Security), namely the concatenation of the initial client and server "finished" messages for a TLS connection.

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1. Conventions used in this document

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 [RFC2119].
2. Naming TLS Connections

Whenever a "name" is needed for a TLS connection such that the "name" is cryptographically bound to the said TLS [RFC4346] connection (its pre-master secret, negotiation, messages, etc...) such a name may be constructed as described below; we term this a "channel binding."

The channel bindings for TLS connections consist of one, the other or both of the initial client or server "finished" TLS messages section 7.4.9 [RFC4346] (note: the unencrypted messages). The initial TLS finished messages are the first pair of TLS finished messages exchanged after TLS channel establishment. It is irrelevant whether the TLS channel was established with a previous SessionID section 7.4.1.2 [RFC4346] or not.

Application protocols MUST specify which of the two initial finished messages, or combination of both of them, to use.

The process by which applications perform "channel binding," that is, the process by which applications establish that the channel bindings for a given TLS connection are observed to be the same at both application ends of the TLS connection is not described here.
3. Recommended Application Programming Interfaces

TLS implementations supporting the use of initial TLS finished messages as channel bindings should provide application programming interfaces to enable higher level protocol implementations to obtain the initial TLS finished messages for both the client and server endpoints.
4. IANA Considerations

There are no IANA considerations for this document.
5. Security Considerations

The TLS finished messages section 7.4.9 [RFC4346] are known to both TLS endpoints and can therefore be safely used as a channel binding provided that the higher level protocol binding to the TLS channel provides integrity protection for the TLS finished messages and only communicates the TLS finished messages across the TLS channel that it is binding to.

If there is an active man-in-the-middle attack, the attacker will already possess knowledge of the TLS finished messages for both inbound and outbound TLS channels. Therefore, there is no additional information obtained by the attacker via the use of the TLS finished messages as a channel binding.

The Security Considerations section of [I-D.williams-on-channel-bindings] applies to this document.
6. Normative References

[I-D.williams-on-channel-bindings]
Williams, N., "On Channel Binding",
draft-williams-on-channel-bindings-00 (work in progress),
July 2006.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate

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