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Updated TLS Server Identity Check Procedure for Email Related Protocols
[draft-ietf-uta-email-tls-certs-02](#)

Abstract

This document describes TLS server identity verification procedure for SMTP Submission, IMAP, POP and ManageSieve clients. It replaces [Section 2.4 of RFC 2595](#).

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[1.](#) Introduction

Use of TLS by SMTP Submission, IMAP, POP and ManageSieve clients is described in [[RFC3207](#)], [[RFC3501](#)], [[RFC2595](#)] and [[RFC5804](#)] respectively. Each of the documents describes slightly different rules for server certificate identity verification (or doesn't define any rules at all). In reality, email client and server developers implement many of these protocols at the same time, so it would be good to define modern and consistent rules for verifying email server identities using TLS.

This document describes the updated TLS server identity verification procedure for SMTP Submission [[RFC4409](#)] [[RFC3207](#)], IMAP [[RFC3501](#)], POP [[RFC1939](#)] and ManageSieve [[RFC5804](#)] clients. It replaces [Section 2.4 of RFC 2595](#).

Note that this document doesn't apply to use of TLS in MTA-to-MTA SMTP.

The main goal of the document is to provide consistent TLS server identity verification procedure across multiple email related protocols. This should make it easier for Certificate Authorities and ISPs to deploy TLS for email use, and would enable email client developers to write more secure code.

[2.](#) 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](#)].

3. Email Server Certificate Verification Rules

During a TLS negotiation, an email client (i.e., an SMTP, IMAP, POP3 or ManageSieve client) MUST check its understanding of the server hostname against the server's identity as presented in the server Certificate message, in order to prevent man-in-the-middle attacks. Matching is performed according to the rules specified in [Section 6 of \[RFC6125\]](#), including "certificate pinning" and the procedure on failure to match. The following inputs are used by the verification procedure used in [\[RFC6125\]](#):

1. The client MUST use the server hostname it used to open the connection as the value to compare against the server name as expressed in the server certificate (the reference identity). The client MUST NOT use any form of the server hostname derived from an insecure remote source (e.g., insecure DNS lookup). CNAME canonicalization is not done.

The rules and guidelines defined in [\[RFC6125\]](#) apply to an email server certificates, with the following supplemental rules:

1. Support for the DNS-ID identifier type (subjectAltName of dNSName type [\[RFC5280\]](#)) is REQUIRED in Email client software implementations.
2. Support for the SRV-ID identifier type (subjectAltName of SRVName type [\[RFC4985\]](#)) is REQUIRED for email client software implementations. List of SRV-ID types for email services is specified in [\[RFC6186\]](#). For ManageSieve the value "sieve" is used.
3. URI-ID identifier type (subjectAltName of uniformResourceIdentifier type [\[RFC5280\]](#)) MUST NOT be used by clients for server verification, as URI-ID were not historically used for email.
4. For backward compatibility with deployed software CN-ID identifier type (CN attribute from the subject name, see [\[RFC6125\]](#)) MAY be used for server identity verification.
5. Email protocols allow use of certain wilcards in identifiers presented by email servers. The "*" wildcard character MAY be used as the left-most name component of DNS-ID or CN-ID in the certificate. For example, a DNS-ID of *.example.com would match a.example.com, foo.example.com, etc. but would not match example.com. Note that the wildcard character MUST NOT be used as a fragment of the left-most name component (e.g., *oo.example.com, f*o.example.com, or foo*.example.com).

4. Compliance Checklist for Certificate Authorities

1. CA MUST support issuance of server certificates with DNS-ID identifier type (subjectAltName of dNSName type [[RFC5280](#)]).
2. CA MUST support issuance of server certificates with SRV-ID identifier type (subjectAltName of SRVName type [[RFC4985](#)]) for each type of email service.
3. For backward compatibility with deployed client base, CA MUST support issuance of server certificates with CN-ID identifier type (CN attribute from the subject name, see [[RFC6125](#)]).
4. CA MAY allow "*" (wildcard) as the left-most name component of DNS-ID or CN-ID in server certificates it issues.

5. Compliance Checklist for Mail Service Providers and Certificate Signing Request generation tools

1. SHOULD include the DNS-ID identifier type (subjectAltName of dNSName type [[RFC5280](#)]) in Certificate Signing Requests for both the right hand side of served email addresses, as well as for the host name where the email server(s) are running.
2. If the email services provided are discoverable using DNS SRV as specified in [[RFC6186](#)], MSP MUST include the SRV-ID identifier type (subjectAltName of SRVName type [[RFC4985](#)]) for each type of email service in Certificate Signing Requests.
3. SHOULD include CN-ID identifier type (CN attribute from the subject name, see [[RFC6125](#)]) for the host name where the email server(s) is running in Certificate Signing Requests for backward compatibility with deployed email clients. (Note, a certificate can only include a single CN-ID, so if a mail service is running on multiple hosts, either each host has to use different certificate with its own CN-ID, a single certificate with multiple DNS-IDs, or a single certificate with wildcard in CN-ID can be used).
4. MAY include "*" (wildcard) as the left-most name component of DNS-ID or CN-ID in Certificate Signing Requests.

6. Examples

Consider an IMAP-accessible email server which supports both IMAP and IMAPS (IMAP-over-TLS) at the host "mail.example.net" servicing email addresses of the form "user@example.net" and discoverable via DNS SRV lookups in domain "example.net" (DNS SRV records

"_imap._tcp.example.net" and "_imaps._tcp.example.net"). A certificate for this service needs to include SRV-IDs of "_imap.example.net" and "_imaps.example.net" (see [RFC6186]). Note that unlike DNS SRV there is no "_tcp" component in SRV-IDs) along with DNS-IDs of "example.net" and "mail.example.net". It might also include CN-IDs of "mail.example.net" for backward compatibility with deployed infrastructure.

Consider an SMTP Submission server at the host "submit.example.net" servicing email addresses of the form "user@example.net" and discoverable via DNS SRV lookups in domain "example.net" (DNS SRV records "_submission._tcp.example.net"). A certificate for this service needs to include SRV-IDs of "_submission.example.net" (see [RFC6186]) along with DNS-IDs of "example.net" and "submit.example.net". It might also include CN-IDs of "submit.example.net" for backward compatibility with deployed infrastructure.

Consider a host "mail.example.net" servicing email addresses of the form "user@example.net" and discoverable via DNS SRV lookups in domain "example.net", which runs SMTP Submission, IMAPS and POP3S (POP3-over-TLS) and ManageSieve services. Each of the servers can use their own certificate specific to their service (see examples above). Alternatively they can all share a single certificate that would include SRV-IDs of "_submission.example.net", "_imaps.example.net", "_pop3s.example.net" and "_sieve.example.net" along with DNS-IDs of "example.net" and "mail.example.net". It might also include CN-IDs of "mail.example.net" for backward compatibility with deployed infrastructure.

7. IANA Considerations

This document doesn't require any action from IANA.

8. Security Considerations

The goal of this document is to improve interoperability and thus security of email clients wishing to access email servers over TLS protected email protocols, by specifying a consistent set of rules that email service providers, email client writers and certificate authorities can use when creating server certificates.

9. References

9.1. Normative References

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- [RFC4985] Santesson, S., "Internet X.509 Public Key Infrastructure Subject Alternative Name for Expression of Service Name", [RFC 4985](#), August 2007.

9.2. Informative References

- [RFC2595] Newman, C., "Using TLS with IMAP, POP3 and ACAP", [RFC 2595](#), June 1999.
- [RFC6186] Daboo, C., "Use of SRV Records for Locating Email Submission/Access Services", [RFC 6186](#), March 2011.

Appendix A. Acknowledgements

Thank you to Chris Newman for comments on this document.

The editor of this document copied lots of text from [RFC 2595](#) and [RFC 6125](#), so the hard work of editors of these document is appreciated.

Appendix B. Changes since [draft-ietf-uta-email-tls-certs-00](#)

[[Note to RFC Editor: Please delete this section before publication]]

Added another example, clarified that subjectAltName and DNS SRV are using slightly different syntax.

As any certificate can only include one CN-ID, corrected examples.

Split rules to talk separately about requirements on MUAs, CAs and MSPs/CSR generation tools.

Updated Introduction section.

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