Plain SASL Mechanism
<draft-zeilenga-sasl-plain-01.txt>

Status of Memo

This document is an Internet-Draft and is in full conformance with all provisions of Section 10 of RFC2026.

This document is intended to be, after appropriate review and revision, submitted to the RFC Editor as a Standards Track document. Distribution of this memo is unlimited. Technical discussion of this document will take place on the IETF SASL mailing list <ietf-sasl@imc.org>. Please send editorial comments directly to the document editor <Kurt@OpenLDAP.org>.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts. Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."


Copyright 2002, The Internet Society. All Rights Reserved.

Please see the Copyright section near the end of this document for more information.

Abstract

This document defines a simple clear-text user/password Simple Authentication and Security Layer (SASL) mechanism called the PLAIN mechanism. The PLAIN mechanism intended to be used, in combination with data confidentiality services provided by a lower layer, in
protocols which lack a simple password authentication command.

Conventions

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 [KEYWORDS].

1. Background and Intended Usage

Clear-text passwords are simple, interoperate with almost all existing operating system authentication databases, and are useful for a smooth transition to a more secure password-based authentication mechanism. The drawback is that they are unacceptable for use over an unencrypted network connection.

This document defines the PLAIN Simple Authentication and Security Layer ([SASL]) mechanism for use in protocols with no clear-text login command (e.g., ACAP).

The name associated with this mechanism is "PLAIN".

The PLAIN SASL mechanism does not provide a security layer. This mechanism MUST NOT be used without adequate security protection as the mechanism affords no integrity nor confidentiality protection itself. The PLAIN SASL mechanism MUST NOT be advertised unless a strong encryption layer, such as provided by Transport Layer Security ([TLS]), is active.

This document updates RFC 2595, replacing Section 6. Changes since RFC 2595 are detailed in Appendix A.

2. PLAIN SASL mechanism

The mechanism consists of a single message from the client to the server. The client sends the authorization identity (identity to login as), followed by a NUL character, followed by the authentication identity (identity whose password will be used), followed by a NUL character, followed by the clear-text password. The client may leave the authorization identity empty if wishes the server to derive the authorization identity from the provided the authentication identity.

The authorization identity (authzid), authentication identity (authcid) and password (passwd) SHALL be transferred as [UTF-8] encoded strings of printable [Unicode] characters in Unicode
Normalisation Form KC [NFKC] delimited by the NUL (U+0000) character.

The following characters are considered non-printable:
- control characters: U+0000..U+001F, U+007F..U+009F;
- replacement character: U+FFFD; and
- special characters and noncharacter: U+FEFF, U+FFFE, U+FFFF.

The server will verify the authentication identity (authcid) and password (passwd) with the system authentication database and verify that the authentication credentials permit the client to login as the authorization identity (authzid). If both steps succeed, the user is logged in.

The server MAY also use the password to initialize any new authentication database, such as one suitable for [CRAM-MD5] or [DIGEST-MD5].

The formal grammar for the client message using Augmented BNF [ABNF] follows.

```
message   = [authzid] NUL authcid NUL passwd
authcid   = 1*SAFE ; MUST accept up to 255 octets
authzid   = 1*SAFE ; MUST accept up to 255 octets
passwd    = 1*SAFE ; MUST accept up to 255 octets
NUL       = %x00
           ;; any UTF-8 encoded Unicode printable character
UTF1      = %x01-7F
UTF2      = %xC0-DF 1(UTF0)
UTF3      = %xE0-EF 2(UTF0)
UTF4      = %xF0-F7 3(UTF0)
UTF5      = %xF8-FB 4(UTF0)
UTF6      = %xFC-FD 5(UTF0)
UTF0      = %x80-BF
```

4. Example

Here is an example of how this might be used to initialize a CRAM-MD5 authentication database for ACAP. "C:" and "S:" indicate lines sent by the client and server respectively.

```
S: * ACAP (SASL "CRAM-MD5") (STARTTLS)
C: a001 AUTHENTICATE "CRAM-MD5"
```
5. Security Considerations

The PLAIN mechanism relies on the TLS encryption layer for security. When used without TLS, it is vulnerable to a common network eavesdropping attack. Therefore PLAIN MUST NOT be advertised or used unless a suitable TLS encryption layer is active or backwards compatibility dictates otherwise.

When the PLAIN mechanism is used, the server gains the ability to impersonate the user to all services with the same password regardless of any encryption provided by TLS or other network privacy mechanisms. While many other authentication mechanisms have similar weaknesses, stronger SASL mechanisms such as the Kerberos-based GSSAPI mechanism address this issue. Clients are encouraged to have an operational mode where all mechanisms which are likely to reveal the user’s password to the server are disabled.

Clients are encouraged to have an operational mode where all mechanisms which are likely to reveal the user’s password to the server are disabled. It is RECOMMENDED that this mode be the default.

General SASL security considerations apply to this mechanism.

6. IANA Considerations

It is requested that the SASL Mechanism registry [IANA-SASL] entry for the PLAIN mechanism be updated to reflect that this document now provides its technical specification.

To: iana@iana.org
   Subject: Updated Registration of SASL mechanism PLAIN

In this example, <NUL> represents a single NUL (U+0000) character.
SASL mechanism name: PLAIN
Security considerations: See RFC XXXX.
Published specification (optional, recommended): RFC XXXX
Person & email address to contact for further information:
  Kurt Zeilenga <kurt@openldap.org>
  Chris Neuman <chris.newman@innosoft.com>
Intended usage: COMMON
Author/Change controller: IESG <iesg@ietf.org>
Note: Updates existing entry for PLAIN

7. Acknowledgement

This document is a revision of RFC 2595 by Chris Newman.

8. Normative References


9. Informative References


10. Editor’s Address

Kurt Zeilenga
OpenLDAP Foundation

Email: kurt@OpenLDAP.org

Appendix A. Changes since RFC 2595

This appendix is non-normative.

This document replaces Section 6 of RFC 2595.

The specification clarifies the normalized form to be used and details which characters are considered to be printable. The ABNF grammar was updated.

Additionally, a number of editorial changes were made.

Full Copyright Statement

Copyright 2002, The Internet Society. All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.
The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE AUTHORS, THE INTERNET SOCIETY, AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.