

GNU SASL API Reference Manual

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Chapter 1

GNU SASL API Reference Manual

GNU SASL is an implementation of the Simple Authentication and Security Layer framework and a few common SASL mechanisms. SASL is used by network servers (e.g., IMAP, SMTP) to request authentication from clients, and in clients to authenticate against servers.

GNU SASL consists of a library (`libgsasl`), a command line utility (`gsasl`) to access the library from the shell, and a manual. The library includes support for the framework (with authentication functions and application data privacy and integrity functions) and at least partial support for the ANONYMOUS, CRAM-MD5, DIGEST-MD5, EXTERNAL, GS2-KRB5, GSSAPI, LOGIN, NTLM, PLAIN, SCRAM-SHA-1, SCRAM-SHA-1-PLUS, SAML20, OPENID20, and SECURID mechanisms.

The library is easily ported because it does not do network communication by itself, but rather leaves it up to the calling application. The library is flexible with regards to the authorization infrastructure used, as it utilizes a callback into the application to decide whether a user is authorized or not.

GNU SASL is developed for the GNU/Linux system, but runs on over 20 platforms including most major Unix platforms and Windows, and many kind of devices including iPAQ handhelds and S/390 mainframes.

GNU SASL is written in pure ANSI C89 to be portable to embedded and otherwise limited platforms. The entire library, with full support for ANONYMOUS, EXTERNAL, PLAIN, LOGIN and CRAM-MD5, and the front-end that support client and server mode, and the IMAP and SMTP protocols, fits in under 60kb on an Intel x86 platform, without any modifications to the code. (This figure was accurate as of version 0.0.13.)

The library is licensed under the GNU Lesser General Public License version 2.1 or later. The command-line application (`src/`), examples (`examples/`), self-test suite (`tests/`) are licensed under the GNU General Public License license version 3.0 or later. The documentation (`doc/`) is licensed under the GNU Free Documentation License version 1.3 or later.

A conceptual view of how your application, the library, and each mechanism interact is shown in Figure [1.1](#).

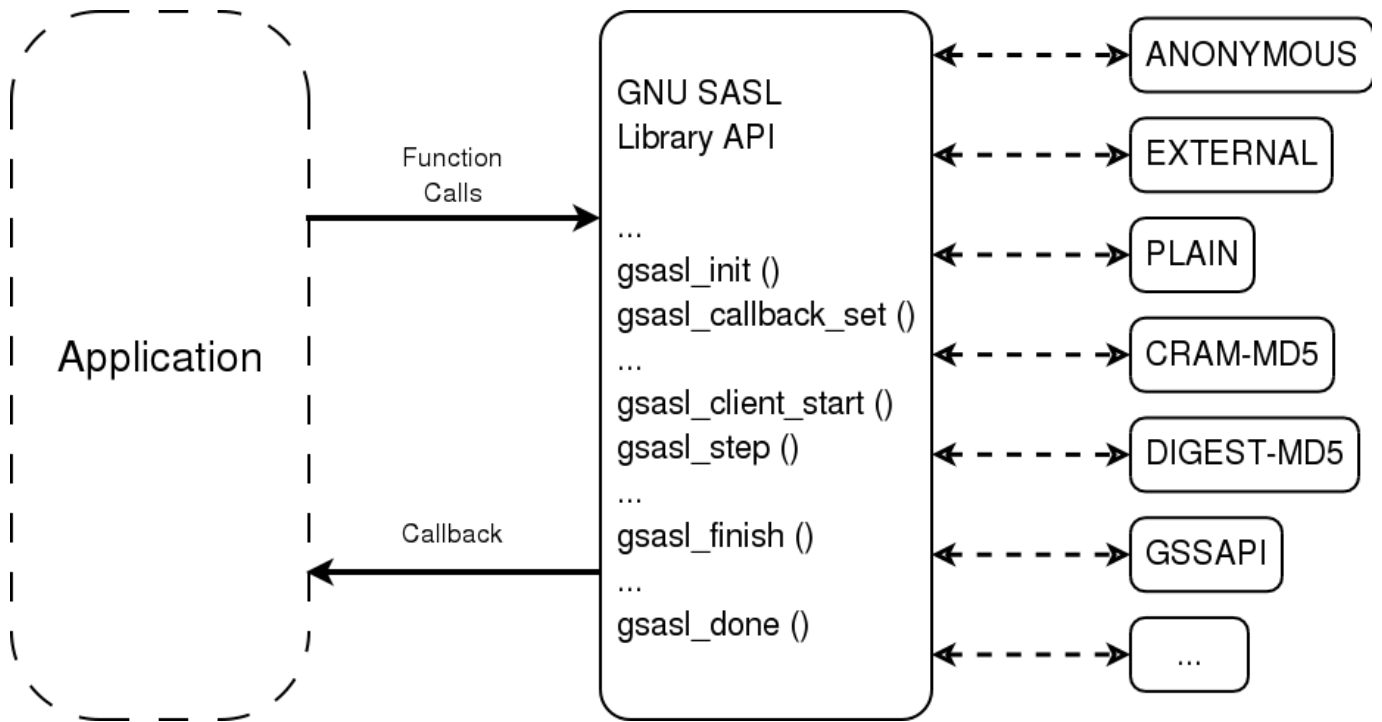


Figure 1.1: Illustration of separation between application and individual mechanism

The operation of an application using the library can best be understood in terms of a flow chart diagram, as shown in Figure 1.2. The details on how the actual negotiation are carried out are illustrated in Figure 1.3.

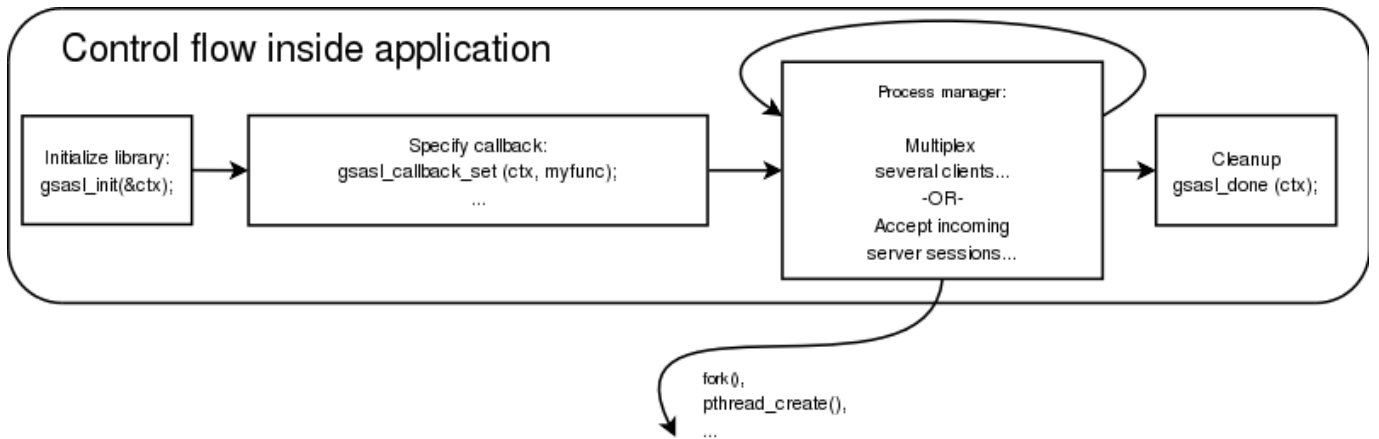


Figure 1.2: High-level control flow of SASL application

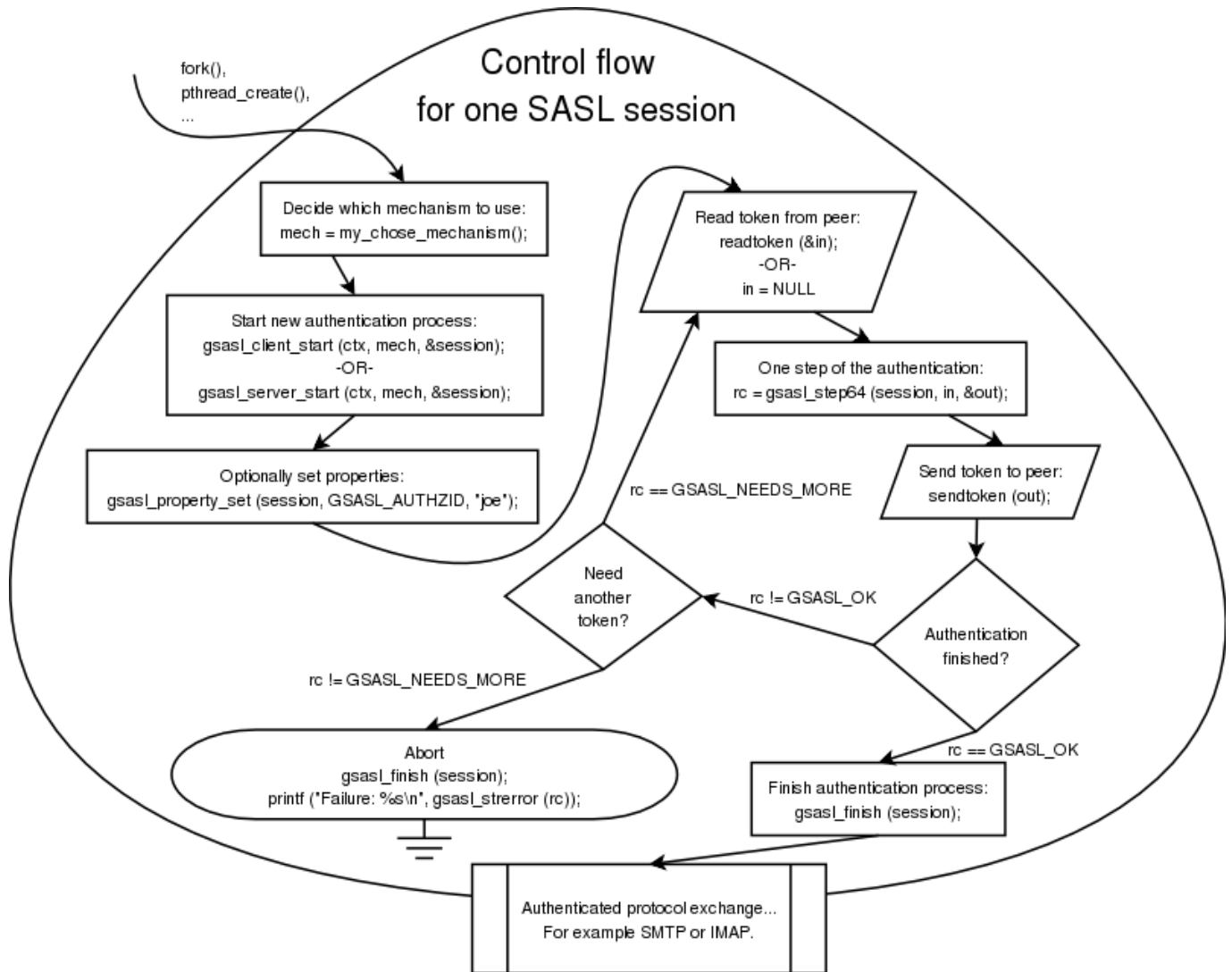


Figure 1.3: Low-level control flow of SASL application

1.1 gsasl

gsasl —

Synopsis

```

#define GSASL_API
#define GSASL_VERSION
#define GSASL_VERSION_MAJOR
#define GSASL_VERSION_MINOR
#define GSASL_VERSION_NUMBER
#define GSASL_VERSION_PATCH
typedef int (*Gsasl_callback_function)
(Gsasl *ctx,
Gsasl_session *sctx,
Gsasl_property prop);

```

```

enum          Gsasl_cipher;
enum          Gsasl_property;
enum          Gsasl_qop;
enum          Gsasl_rc;
enum          Gsasl_saslprep_flags;
typedef       Gsasl_session;
int           gsasl_base64_from          (const char *in,
                                         size_t inlen,
                                         char **out,
                                         size_t *outlen);
int           gsasl_base64_to           (const char *in,
                                         size_t inlen,
                                         char **out,
                                         size_t *outlen);
int           gsasl_callback           (Gsasl *ctx,
                                         Gsasl_session *sctx,
                                         Gsasl_property prop);
void *        gsasl_callback_hook_get  (Gsasl *ctx);
void         gsasl_callback_hook_set  (Gsasl *ctx,
                                         void *hook);
void         gsasl_callback_set       (Gsasl *ctx,
                                         Gsasl_callback_function cb);
const char *  gsasl_check_version     (const char *req_version);
int           gsasl_client_mechlist   (Gsasl *ctx,
                                         char **out);
int           gsasl_client_start      (Gsasl *ctx,
                                         const char *mech,
                                         Gsasl_session **sctx);
const char *  gsasl_client_suggest_mechanism (Gsasl *ctx,
                                         const char *mechlist);
int           gsasl_client_support_p  (Gsasl *ctx,
                                         const char *name);
int           gsasl_decode            (Gsasl_session *sctx,
                                         const char *input,
                                         size_t input_len,
                                         char **output,
                                         size_t *output_len);
void          gsasl_done              (Gsasl *ctx);
int           gsasl_encode            (Gsasl_session *sctx,
                                         const char *input,
                                         size_t input_len,
                                         char **output,
                                         size_t *output_len);
void          gsasl_finish            (Gsasl_session *sctx);
void          gsasl_free              (void *ptr);
int           gsasl_hmac_md5          (const char *key,
                                         size_t keylen,
                                         const char *in,
                                         size_t inlen,
                                         char *outhash[16]);
int           gsasl_hmac_sha1         (const char *key,
                                         size_t keylen,
                                         const char *in,
                                         size_t inlen,
                                         char *outhash[20]);
int           gsasl_init              (Gsasl **ctx);
int           gsasl_md5               (const char *in,

```

		size_t inlen, char *out[16]);
const char *	gsasl_mechanism_name	(Gsasl_session *sctx);
int	gsasl_nonce	(char *data, size_t datalen);
const char *	gsasl_property_fast	(Gsasl_session *sctx, Gsasl_property prop);
const char *	gsasl_property_get	(Gsasl_session *sctx, Gsasl_property prop);
void	gsasl_property_set	(Gsasl_session *sctx, Gsasl_property prop, const char *data);
void	gsasl_property_set_raw	(Gsasl_session *sctx, Gsasl_property prop, const char *data, size_t len);
int	gsasl_random	(char *data, size_t datalen);
int	gsasl_saslprep	(const char *in, Gsasl_saslprep_flags flags, char **out, int *stringpreprc);
int	gsasl_server_mechlist	(Gsasl *ctx, char **out);
int	gsasl_server_start	(Gsasl *ctx, const char *mech, Gsasl_session **sctx);
int	gsasl_server_support_p	(Gsasl *ctx, const char *name);
void *	gsasl_session_hook_get	(Gsasl_session *sctx);
void	gsasl_session_hook_set	(Gsasl_session *sctx, void *hook);
int	gsasl_shal	(const char *in, size_t inlen, char *out[20]);
int	gsasl_simple_getpass	(const char *filename, const char *username, char **key);
int	gsasl_step	(Gsasl_session *sctx, const char *input, size_t input_len, char **output, size_t *output_len);
int	gsasl_step64	(Gsasl_session *sctx, const char *b64input, char **b64output);
const char *	gsasl_strerror	(int err);
const char *	gsasl_strerror_name	(int err);

Description

Details

GSASL_API

```
#define GSASL_API __attribute__((__visibility__("default")))
```

GSASL_VERSION

```
#define GSASL_VERSION "1.8.0"
```

Pre-processor symbol with a string that describe the header file version number. Used together with `gsasl_check_version()` to verify header file and run-time library consistency.

GSASL_VERSION_MAJOR

```
#define GSASL_VERSION_MAJOR 1
```

Pre-processor symbol with a decimal value that describe the major level of the header file version number. For example, when the header version is 1.2.3 this symbol will be 1.

Since 1.1

GSASL_VERSION_MINOR

```
#define GSASL_VERSION_MINOR 8
```

Pre-processor symbol with a decimal value that describe the minor level of the header file version number. For example, when the header version is 1.2.3 this symbol will be 2.

Since 1.1

GSASL_VERSION_NUMBER

```
#define GSASL_VERSION_NUMBER 0x010800
```

Pre-processor symbol with a hexadecimal value describing the header file version number. For example, when the header version is 1.2.3 this symbol will have the value 0x010203.

Since 1.1

GSASL_VERSION_PATCH

```
#define GSASL_VERSION_PATCH 0
```

Pre-processor symbol with a decimal value that describe the patch level of the header file version number. For example, when the header version is 1.2.3 this symbol will be 3.

Since 1.1

Gsasl

```
typedef struct Gsasl Gsasl;
```

Handle to global library context.

Gsasl_callback_function ()

```
int (*Gsasl_callback_function) (Gsasl *ctx,
                               Gsasl_session *sctx,
                               Gsasl_property prop);
```

Prototype of function that the application should implement. Use [gsasl_callback_set\(\)](#) to inform the library about your callback function.

It is called by the SASL library when it need some information from the application. Depending on the value of *prop*, it should either set some property (e.g., username or password) using [gsasl_property_set\(\)](#), or it should extract some properties (e.g., authentication and authorization identities) using [gsasl_property_fast\(\)](#) and use them to make a policy decision, perhaps returning GSASL_AUTHENTICATION_ERROR or GSASL_OK depending on whether the policy permitted the operation.

ctx : libgsasl handle.

sctx : session handle, may be NULL.

prop : enumerated value of Gsasl_property type.

Returns : Any valid return code, the interpretation of which depend on the *prop* value.

Since 0.2.0

enum Gsasl_cipher

```
typedef enum {
    GSASL_CIPHER_DES = 1,
    GSASL_CIPHER_3DES = 2,
    GSASL_CIPHER_RC4 = 4,
    GSASL_CIPHER_RC4_40 = 8,
    GSASL_CIPHER_RC4_56 = 16,
    GSASL_CIPHER_AES = 32
} Gsasl_cipher;
```

Encryption types (DIGEST-MD5) for confidentiality services of application data. We recommend that you use TLS instead as it is generally more secure and have better chance of working.

GSASL_CIPHER_DES Cipher DES.

GSASL_CIPHER_3DES Cipher 3DES.

GSASL_CIPHER_RC4 Cipher RC4.

GSASL_CIPHER_RC4_40 Cipher RC4 with 40-bit keys.

GSASL_CIPHER_RC4_56 Cipher RC4 with 56-bit keys.

GSASL_CIPHER_AES Cipher AES.

enum Gsasl_property

```
typedef enum {
    /* Information properties, e.g., username. */
    GSASL_AUTHID = 1,
    GSASL_AUTHZID = 2,
    GSASL_PASSWORD = 3,
    GSASL_ANONYMOUS_TOKEN = 4,
    GSASL_SERVICE = 5,
```

```
GSASL_HOSTNAME = 6,  
GSASL_GSSAPI_DISPLAY_NAME = 7,  
GSASL_PASSCODE = 8,  
GSASL_SUGGESTED_PIN = 9,  
GSASL_PIN = 10,  
GSASL_REALM = 11,  
GSASL_DIGEST_MD5_HASHED_PASSWORD = 12,  
GSASL_QOPS = 13,  
GSASL_QOP = 14,  
GSASL_SCRAM_ITER = 15,  
GSASL_SCRAM_SALT = 16,  
GSASL_SCRAM_SALTED_PASSWORD = 17,  
GSASL_CB_TLS_UNIQUE = 18,  
GSASL_SAML20_IDP_IDENTIFIER = 19,  
GSASL_SAML20_REDIRECT_URL = 20,  
GSASL_OPENID20_REDIRECT_URL = 21,  
GSASL_OPENID20_OUTCOME_DATA = 22,  
/* Client callbacks. */  
GSASL_SAML20_AUTHENTICATE_IN_BROWSER = 250,  
GSASL_OPENID20_AUTHENTICATE_IN_BROWSER = 251,  
/* Server validation callback properties. */  
GSASL_VALIDATE_SIMPLE = 500,  
GSASL_VALIDATE_EXTERNAL = 501,  
GSASL_VALIDATE_ANONYMOUS = 502,  
GSASL_VALIDATE_GSSAPI = 503,  
GSASL_VALIDATE_SECURID = 504,  
GSASL_VALIDATE_SAML20 = 505,  
GSASL_VALIDATE_OPENID20 = 506  
} Gsasl_property;
```

Callback/property types.

GSASL_AUTHID Authentication identity (username).

GSASL_AUTHZID Authorization identity.

GSASL_PASSWORD Password.

GSASL_ANONYMOUS_TOKEN Anonymous identifier.

GSASL_SERVICE Service name

GSASL_HOSTNAME Host name.

GSASL_GSSAPI_DISPLAY_NAME GSS-API credential principal name.

GSASL_PASSCODE SecurID passcode.

GSASL_SUGGESTED_PIN SecurID suggested PIN.

GSASL_PIN SecurID PIN.

GSASL_REALM User realm.

GSASL_DIGEST_MD5_HASHED_PASSWORD Pre-computed hashed DIGEST-MD5 password, to avoid storing passwords in the clear.

GSASL_QOPS Set of quality-of-protection values.

GSASL_QOP Quality-of-protection value.

GSASL_SCRAM_ITER Number of iterations in password-to-key hashing.

GSASL_SCRAM_SALT Salt for password-to-key hashing.

GSASL_SCRAM_SALTED_PASSWORD Pre-computed salted SCRAM key, to avoid re-computation and storing passwords in the clear.

GSASL_CB_TLS_UNIQUE Base64 encoded tls-unique channel binding.

GSASL_SAML20_IDP_IDENTIFIER SAML20 user IdP URL.

GSASL_SAML20_REDIRECT_URL SAML 2.0 URL to access in browser.

GSASL_OPENID20_REDIRECT_URL OpenID 2.0 URL to access in browser.

GSASL_OPENID20_OUTCOME_DATA OpenID 2.0 authentication outcome data.

GSASL_SAML20_AUTHENTICATE_IN_BROWSER Request to perform SAML 2.0 authentication in browser.

GSASL_OPENID20_AUTHENTICATE_IN_BROWSER Request to perform OpenID 2.0 authentication in browser.

GSASL_VALIDATE_SIMPLE Request for simple validation.

GSASL_VALIDATE_EXTERNAL Request for validation of EXTERNAL.

GSASL_VALIDATE_ANONYMOUS Request for validation of ANONYMOUS.

GSASL_VALIDATE_GSSAPI Request for validation of GSSAPI/GS2.

GSASL_VALIDATE_SECURID Request for validation of SecurID.

GSASL_VALIDATE_SAML20 Request for validation of SAML20.

GSASL_VALIDATE_OPENID20 Request for validation of OpenID 2.0 login.

enum Gsasl_qop

```
typedef enum {
    GSASL_QOP_AUTH = 1,
    GSASL_QOP_AUTH_INT = 2,
    GSASL_QOP_AUTH_CONF = 4
} Gsasl_qop;
```

Quality of Protection types (DIGEST-MD5 and GSSAPI). The integrity and confidentiality values is about application data wrapping. We recommend that you use *GSASL_QOP_AUTH* with TLS as that combination is generally more secure and have better chance of working than the integrity/confidentiality layers of SASL.

GSASL_QOP_AUTH Authentication only.

GSASL_QOP_AUTH_INT Authentication and integrity.

GSASL_QOP_AUTH_CONF Authentication, integrity and confidentiality.

enum Gsasl_rc

```
typedef enum {
    GSASL_OK = 0,
    GSASL_NEEDS_MORE = 1,
    GSASL_UNKNOWN_MECHANISM = 2,
    GSASL_MECHANISM_CALLED_TOO_MANY_TIMES = 3,
    GSASL_MALLOC_ERROR = 7,
    GSASL_BASE64_ERROR = 8,
    GSASL_CRYPTO_ERROR = 9,
    GSASL_SASLPREP_ERROR = 29,
    GSASL_MECHANISM_PARSE_ERROR = 30,
    GSASL_AUTHENTICATION_ERROR = 31,
```

```
GSASL_INTEGRITY_ERROR = 33,
GSASL_NO_CLIENT_CODE = 35,
GSASL_NO_SERVER_CODE = 36,
GSASL_NO_CALLBACK = 51,
GSASL_NO_ANONYMOUS_TOKEN = 52,
GSASL_NO_AUTHID = 53,
GSASL_NO_AUTHZID = 54,
GSASL_NO_PASSWORD = 55,
GSASL_NO_PASSCODE = 56,
GSASL_NO_PIN = 57,
GSASL_NO_SERVICE = 58,
GSASL_NO_HOSTNAME = 59,
GSASL_NO_CB_TLS_UNIQUE = 65,
GSASL_NO_SAML20_IDP_IDENTIFIER = 66,
GSASL_NO_SAML20_REDIRECT_URL = 67,
GSASL_NO_OPENID20_REDIRECT_URL = 68,
/* Mechanism specific errors. */
GSASL_GSSAPI_RELEASE_BUFFER_ERROR = 37,
GSASL_GSSAPI_IMPORT_NAME_ERROR = 38,
GSASL_GSSAPI_INIT_SEC_CONTEXT_ERROR = 39,
GSASL_GSSAPI_ACCEPT_SEC_CONTEXT_ERROR = 40,
GSASL_GSSAPI_UNWRAP_ERROR = 41,
GSASL_GSSAPI_WRAP_ERROR = 42,
GSASL_GSSAPI_ACQUIRE_CRED_ERROR = 43,
GSASL_GSSAPI_DISPLAY_NAME_ERROR = 44,
GSASL_GSSAPI_UNSUPPORTED_PROTECTION_ERROR = 45,
GSASL_KERBEROS_V5_INIT_ERROR = 46,
GSASL_KERBEROS_V5_INTERNAL_ERROR = 47,
GSASL_SHISHI_ERROR = GSASL_KERBEROS_V5_INTERNAL_ERROR,
GSASL_SECURID_SERVER_NEED_ADDITIONAL_PASSCODE = 48,
GSASL_SECURID_SERVER_NEED_NEW_PIN = 49,
GSASL_GSSAPI_ENCAPSULATE_TOKEN_ERROR = 60,
GSASL_GSSAPI_DECAPSULATE_TOKEN_ERROR = 61,
GSASL_GSSAPI_INQUIRE_MECH_FOR_SASLNAME_ERROR = 62,
GSASL_GSSAPI_TEST_OID_SET_MEMBER_ERROR = 63,
GSASL_GSSAPI_RELEASE_OID_SET_ERROR = 64
/* When adding new values, note that integers are not necessarily
   assigned monotonously increasingly. */
} Gsasl_rc;
```

Error codes for library functions.

GSASL_OK Successful return code, guaranteed to be always 0.

GSASL_NEEDS_MORE Mechanism expects another round-trip.

GSASL_UNKNOWN_MECHANISM Application requested an unknown mechanism.

GSASL_MECHANISM_CALLED_TOO_MANY_TIMES Application requested too many round trips from mechanism.

GSASL_MALLOC_ERROR Memory allocation failed.

GSASL_BASE64_ERROR Base64 encoding/decoding failed.

GSASL_CRYPTO_ERROR Cryptographic error.

GSASL_SASLPREP_ERROR Failed to prepare internationalized string.

GSASL_MECHANISM_PARSE_ERROR Mechanism could not parse input.

GSASL_AUTHENTICATION_ERROR Authentication has failed.

GSASL_INTEGRITY_ERROR Application data integrity check failed.

GSASL_NO_CLIENT_CODE Library was built with client functionality.

GSASL_NO_SERVER_CODE Library was built with server functionality.

GSASL_NO_CALLBACK Application did not provide a callback.

GSASL_NO_ANONYMOUS_TOKEN Could not get required anonymous token.

GSASL_NO_AUTHID Could not get required authentication identity (username).

GSASL_NO_AUTHZID Could not get required authorization identity.

GSASL_NO_PASSWORD Could not get required password.

GSASL_NO_PASSCODE Could not get required SecurID PIN.

GSASL_NO_PIN Could not get required SecurID PIN.

GSASL_NO_SERVICE Could not get required service name.

GSASL_NO_HOSTNAME Could not get required hostname.

GSASL_NO_CB_TLS_UNIQUE Could not get required tls-unique CB.

GSASL_NO_SAML20_IDP_IDENTIFIER Could not get required SAML IdP.

GSASL_NO_SAML20_REDIRECT_URL Could not get required SAML redirect URL.

GSASL_NO_OPENID20_REDIRECT_URL Could not get required OpenID redirect URL.

GSASL_GSSAPI_RELEASE_BUFFER_ERROR GSS-API library call error.

GSASL_GSSAPI_IMPORT_NAME_ERROR GSS-API library call error.

GSASL_GSSAPI_INIT_SEC_CONTEXT_ERROR GSS-API library call error.

GSASL_GSSAPI_ACCEPT_SEC_CONTEXT_ERROR GSS-API library call error.

GSASL_GSSAPI_UNWRAP_ERROR GSS-API library call error.

GSASL_GSSAPI_WRAP_ERROR GSS-API library call error.

GSASL_GSSAPI_ACQUIRE_CRED_ERROR GSS-API library call error.

GSASL_GSSAPI_DISPLAY_NAME_ERROR GSS-API library call error.

GSASL_GSSAPI_UNSUPPORTED_PROTECTION_ERROR An unsupported quality-of-protection layer was requested.

GSASL_KERBEROS_V5_INIT_ERROR Init error in KERBEROS_V5.

GSASL_KERBEROS_V5_INTERNAL_ERROR General error in KERBEROS_V5.

GSASL_SHISHI_ERROR Same as **GSASL_KERBEROS_V5_INTERNAL_ERROR**.

GSASL_SECURID_SERVER_NEED_ADDITIONAL_PASSCODE SecurID mechanism needs an additional passcode.

GSASL_SECURID_SERVER_NEED_NEW_PIN SecurID mechanism needs a new PIN.

GSASL_GSSAPI_ENCAPSULATE_TOKEN_ERROR GSS-API library call error.

GSASL_GSSAPI_DECAPSULATE_TOKEN_ERROR GSS-API library call error.

GSASL_GSSAPI_INQUIRE_MECH_FOR_SASLNAME_ERROR GSS-API library call error.

GSASL_GSSAPI_TEST_OID_SET_MEMBER_ERROR GSS-API library call error.

GSASL_GSSAPI_RELEASE_OID_SET_ERROR GSS-API library call error.

enum Gsasl_saslprep_flags

```
typedef enum {
    GSASL_ALLOW_UNASSIGNED = 1
} Gsasl_saslprep_flags;
```

Flags for the SASLprep function, see [gsasl_saslprep\(\)](#). For background, see the GNU Libidn documentation.

GSASL_ALLOW_UNASSIGNED Allow unassigned code points.

Gsasl_session

```
typedef struct Gsasl_session Gsasl_session;
```

Handle to SASL session context.

gsasl_base64_from ()

```
int          gsasl_base64_from          (const char *in,
                                        size_t inlen,
                                        char **out,
                                        size_t *outlen);
```

Decode Base64 data. The *out* buffer must be deallocated by the caller.

in : input byte array

inlen : size of input byte array

out : pointer to newly allocated output byte array

outlen : pointer to size of newly allocated output byte array

Returns : Returns **GSASL_OK** on success, **GSASL_BASE64_ERROR** if input was invalid, and **GSASL_MALLOC_ERROR** on memory allocation errors.

Since 0.2.2

gsasl_base64_to ()

```
int          gsasl_base64_to          (const char *in,
                                        size_t inlen,
                                        char **out,
                                        size_t *outlen);
```

Encode data as base64. The string is zero terminated, and *outlen* holds the length excluding the terminating zero. The *out* buffer must be deallocated by the caller.

in : input byte array

inlen : size of input byte array

out : pointer to newly allocated output byte array

outlen : pointer to size of newly allocated output byte array

Returns : Returns **GSASL_OK** on success, or **GSASL_MALLOC_ERROR** if input was too large or memory allocation fail.

Since 0.2.2

gsasl_callback ()

```
int                gsasl_callback                (Gsasl *ctx,  
                                                Gsasl_session *sctx,  
                                                Gsasl_property prop);
```

Invoke the application callback. The *prop* value indicate what the callback is expected to do. For example, for **GSASL_ANONYMOUS_TOKEN** the function is expected to invoke `gsasl_property_set(SCTX, GSASL_ANONYMOUS_TOKEN, "token")` where "token" is the anonymous token the application wishes the SASL mechanism to use. See the manual for the meaning of all parameters.

Note that if no callback has been set by the application, but the obsolete callback interface has been used, this function will translate the old callback interface into the new. This interface should be sufficient to invoke all callbacks, both new and old.

ctx : handle received from `gsasl_init()`, may be NULL to derive it from *sctx*.

sctx : session handle.

prop : enumerated value of Gsasl_property type.

Returns : Returns whatever the application callback returns, or **GSASL_NO_CALLBACK** if no application was known.

Since 0.2.0

gsasl_callback_hook_get ()

```
void *            gsasl_callback_hook_get      (Gsasl *ctx);
```

Retrieve application specific data from libgsasl handle.

The application data is set using `gsasl_callback_hook_set()`. This is normally used by the application to maintain a global state between the main program and callbacks.

ctx : libgsasl handle.

Returns : Returns the application specific data, or NULL.

Since 0.2.0

gsasl_callback_hook_set ()

```
void                gsasl_callback_hook_set    (Gsasl *ctx,  
                                                void *hook);
```

Store application specific data in the libgsasl handle.

The application data can be later (for instance, inside a callback) be retrieved by calling `gsasl_callback_hook_get()`. This is normally used by the application to maintain a global state between the main program and callbacks.

ctx : libgsasl handle.

hook : opaque pointer to application specific data.

Since 0.2.0

gsasl_callback_set ()

```
void                gsasl_callback_set                (Gsasl *ctx,
                                                    Gsasl_callback_function cb);
```

Store the pointer to the application provided callback in the library handle. The callback will be used, via `gsasl_callback()`, by mechanisms to discover various parameters (such as username and passwords). The callback function will be called with a `Gsasl_property` value indicating the requested behaviour. For example, for `GSASL_ANONYMOUS_TOKEN`, the function is expected to invoke `gsasl_property_set(CTX, GSASL_ANONYMOUS_TOKEN, "token")` where "token" is the anonymous token the application wishes the SASL mechanism to use. See the manual for the meaning of all parameters.

ctx : handle received from `gsasl_init()`.

cb : pointer to function implemented by application.

Since 0.2.0

gsasl_check_version ()

```
const char *       gsasl_check_version              (const char *req_version);
```

Check GNU SASL Library version.

See `GSASL_VERSION` for a suitable `req_version` string.

This function is one of few in the library that can be used without a successful call to `gsasl_init()`.

req_version : version string to compare with, or NULL.

Returns : Check that the version of the library is at minimum the one given as a string in `req_version` and return the actual version string of the library; return NULL if the condition is not met. If NULL is passed to this function no check is done and only the version string is returned.

gsasl_client_mechlist ()

```
int                gsasl_client_mechlist           (Gsasl *ctx,
                                                    char **out);
```

Return a newly allocated string containing SASL names, separated by space, of mechanisms supported by the libgsasl client. `out` is allocated by this function, and it is the responsibility of caller to deallocate it.

ctx : libgsasl handle.

out : newly allocated output character array.

Returns : Returns `GSASL_OK` if successful, or error code.

gsasl_client_start ()

```
int                gsasl_client_start              (Gsasl *ctx,
                                                    const char *mech,
                                                    Gsasl_session **sctx);
```

This functions initiates a client SASL authentication. This function must be called before any other `gsasl_client_*`() function is called.

ctx : libgsasl handle.

mech : name of SASL mechanism.

sctx : pointer to client handle.

Returns : Returns `GSASL_OK` if successful, or error code.

gsasl_client_suggest_mechanism ()

```
const char *      gsasl_client_suggest_mechanism      (Gsasl *ctx,  
                                                    const char *mechlist);
```

Given a list of mechanisms, suggest which to use.

ctx : libgsasl handle.

mechlist : input character array with SASL mechanism names, separated by invalid characters (e.g. SPC).

Returns : Returns name of "best" SASL mechanism supported by the libgsasl client which is present in the input string, or NULL if no supported mechanism is found.

gsasl_client_support_p ()

```
int              gsasl_client_support_p              (Gsasl *ctx,  
                                                    const char *name);
```

Decide whether there is client-side support for a specified mechanism.

ctx : libgsasl handle.

name : name of SASL mechanism.

Returns : Returns 1 if the libgsasl client supports the named mechanism, otherwise 0.

gsasl_decode ()

```
int              gsasl_decode                       (Gsasl_session *sctx,  
                                                    const char *input,  
                                                    size_t input_len,  
                                                    char **output,  
                                                    size_t *output_len);
```

Decode data according to negotiated SASL mechanism. This might mean that data is integrity or privacy protected.

The *output* buffer is allocated by this function, and it is the responsibility of caller to deallocate it by calling `free(output)`.

sctx : libgsasl session handle.

input : input byte array.

input_len : size of input byte array.

output : newly allocated output byte array.

output_len : size of output byte array.

Returns : Returns **GSASL_OK** if encoding was successful, otherwise an error code.

gsasl_done ()

```
void             gsasl_done                         (Gsasl *ctx);
```

This function destroys a libgsasl handle. The handle must not be used with other libgsasl functions after this call.

ctx : libgsasl handle.

gsasl_encode ()

```
int                gsasl_encode                (Gsasl_session *sctx,  
                                              const char *input,  
                                              size_t input_len,  
                                              char **output,  
                                              size_t *output_len);
```

Encode data according to negotiated SASL mechanism. This might mean that data is integrity or privacy protected.

The *output* buffer is allocated by this function, and it is the responsibility of caller to deallocate it by calling `free(output)`.

sctx : libgsasl session handle.

input : input byte array.

input_len : size of input byte array.

output : newly allocated output byte array.

output_len : size of output byte array.

Returns : Returns **GSASL_OK** if encoding was successful, otherwise an error code.

gsasl_finish ()

```
void                gsasl_finish                (Gsasl_session *sctx);
```

Destroy a libgsasl client or server handle. The handle must not be used with other libgsasl functions after this call.

sctx : libgsasl session handle.

gsasl_free ()

```
void                gsasl_free                (void *ptr);
```

Invoke `free(ptr)` to de-allocate memory pointer. Typically used on strings allocated by other libgsasl functions.

This is useful on Windows where libgsasl is linked to one CRT and the application is linked to another CRT. Then `malloc/free` will not use the same heap. This happens if you build libgsasl using `mingw32` and the application with Visual Studio.

ptr : memory pointer

Since 0.2.19

gsasl_hmac_md5 ()

```
int                gsasl_hmac_md5                (const char *key,  
                                              size_t keylen,  
                                              const char *in,  
                                              size_t inlen,  
                                              char *outhash[16]);
```

Compute keyed checksum of data using HMAC-MD5. The *outhash* buffer must be deallocated by the caller.

key : input character array with key to use.

keylen : length of input character array with key to use.

in : input character array of data to hash.

inlen : length of input character array of data to hash.

outhash : newly allocated character array with keyed hash of data.

Returns : Returns **GSASL_OK** iff successful.

gsasl_hmac_sha1 ()

```
int          gsasl_hmac_sha1          (const char *key,
                                     size_t keylen,
                                     const char *in,
                                     size_t inlen,
                                     char *outhash[20]);
```

Compute keyed checksum of data using HMAC-SHA1. The *outhash* buffer must be deallocated by the caller.

key : input character array with key to use.

keylen : length of input character array with key to use.

in : input character array of data to hash.

inlen : length of input character array of data to hash.

outhash : newly allocated character array with keyed hash of data.

Returns : Returns **GSASL_OK** iff successful.

Since 1.3

gsasl_init ()

```
int          gsasl_init              (Gsasl **ctx);
```

This functions initializes libgsasl. The handle pointed to by *ctx* is valid for use with other libgsasl functions iff this function is successful. It also register all builtin SASL mechanisms, using **gsasl_register()**.

ctx : pointer to libgsasl handle.

Returns : **GSASL_OK** iff successful, otherwise **GSASL_MALLOC_ERROR**.

gsasl_md5 ()

```
int          gsasl_md5              (const char *in,
                                     size_t inlen,
                                     char *out[16]);
```

Compute hash of data using MD5. The *out* buffer must be deallocated by the caller.

in : input character array of data to hash.

inlen : length of input character array of data to hash.

out : newly allocated character array with hash of data.

Returns : Returns **GSASL_OK** iff successful.

gsasl_mechanism_name ()

```
const char *      gsasl_mechanism_name      (Gsasl_session *sctx);
```

This function returns the name of the SASL mechanism used in the session.

sctx : libgsasl session handle.

Returns : Returns a zero terminated character array with the name of the SASL mechanism, or NULL if not known.

Since 0.2.28

gsasl_nonce ()

```
int              gsasl_nonce                (char *data,
                                           size_t datalen);
```

Store unpredictable data of given size in the provided buffer.

data : output array to be filled with unpredictable random data.

datalen : size of output array.

Returns : Returns **GSASL_OK** iff successful.

gsasl_property_fast ()

```
const char *      gsasl_property_fast      (Gsasl_session *sctx,
                                           Gsasl_property prop);
```

Retrieve the data stored in the session handle for given property *prop*.

The pointer is to live data, and must not be deallocated or modified in any way.

This function will not invoke the application callback.

sctx : session handle.

prop : enumerated value of Gsasl_property type, indicating the type of data in *data*.

Returns : Return property value, if known, or NULL if no value known.

Since 0.2.0

gsasl_property_get ()

```
const char *      gsasl_property_get      (Gsasl_session *sctx,
                                           Gsasl_property prop);
```

Retrieve the data stored in the session handle for given property *prop*, possibly invoking the application callback to get the value.

The pointer is to live data, and must not be deallocated or modified in any way.

This function will invoke the application callback, using **gsasl_callback()**, when a property value is not known.

If no value is known, and no callback is specified or if the callback fail to return data, and if any obsolete callback functions has been set by the application, this function will try to call these obsolete callbacks, and store the returned data as the corresponding property. This behaviour of this function will be removed when the obsolete callback interfaces are removed.

sctx : session handle.

prop : enumerated value of Gsasl_property type, indicating the type of data in *data*.

Returns : Return data for property, or NULL if no value known.

Since 0.2.0

gsasl_property_set ()

```
void                gsasl_property_set                (Gsasl_session *sctx,  
                                                    Gsasl_property prop,  
                                                    const char *data);
```

Make a copy of *data* and store it in the session handle for the indicated property *prop*.

You can immediately deallocate *data* after calling this function, without affecting the data stored in the session handle.

sctx : session handle.

prop : enumerated value of Gsasl_property type, indicating the type of data in *data*.

data : zero terminated character string to store.

Since 0.2.0

gsasl_property_set_raw ()

```
void                gsasl_property_set_raw            (Gsasl_session *sctx,  
                                                    Gsasl_property prop,  
                                                    const char *data,  
                                                    size_t len);
```

Make a copy of *len* sized *data* and store a zero terminated version of it in the session handle for the indicated property *prop*.

You can immediately deallocate *data* after calling this function, without affecting the data stored in the session handle.

Except for the length indicator, this function is identical to `gsasl_property_set`.

sctx : session handle.

prop : enumerated value of Gsasl_property type, indicating the type of data in *data*.

data : character string to store.

len : length of character string to store.

Since 0.2.0

gsasl_random ()

```
int                gsasl_random                      (char *data,  
                                                    size_t datalen);
```

Store cryptographically strong random data of given size in the provided buffer.

data : output array to be filled with strong random data.

datalen : size of output array.

Returns : Returns **GSASL_OK** iff successful.

gsasl_saslprep ()

```
int          gsasl_saslprep          (const char *in,
                                     Gsasl_saslprep_flags flags,
                                     char **out,
                                     int *stringprepc);
```

Prepare string using SASLprep. On success, the *out* variable must be deallocated by the caller.

in : a UTF-8 encoded string.

flags : any SASLprep flag, e.g., **GSASL_ALLOW_UNASSIGNED**.

out : on exit, contains newly allocated output string.

stringprepc : if non-NULL, will hold precise stringprep return code.

Returns : Returns **GSASL_OK** on success, or **GSASL_SASLPREP_ERROR** on error.

Since 0.2.3

gsasl_server_mechlist ()

```
int          gsasl_server_mechlist  (Gsasl *ctx,
                                     char **out);
```

Return a newly allocated string containing SASL names, separated by space, of mechanisms supported by the libgsasl server. *out* is allocated by this function, and it is the responsibility of caller to deallocate it.

ctx : libgsasl handle.

out : newly allocated output character array.

Returns : Returns **GSASL_OK** if successful, or error code.

gsasl_server_start ()

```
int          gsasl_server_start     (Gsasl *ctx,
                                     const char *mech,
                                     Gsasl_session **sctx);
```

This functions initiates a server SASL authentication. This function must be called before any other *gsasl_server_**() function is called.

ctx : libgsasl handle.

mech : name of SASL mechanism.

sctx : pointer to server handle.

Returns : Returns **GSASL_OK** if successful, or error code.

gsasl_server_support_p ()

```
int          gsasl_server_support_p      (Gsasl *ctx,  
                                         const char *name);
```

Decide whether there is server-side support for a specified mechanism.

ctx : libgsasl handle.

name : name of SASL mechanism.

Returns : Returns 1 if the libgsasl server supports the named mechanism, otherwise 0.

gsasl_session_hook_get ()

```
void *      gsasl_session_hook_get      (Gsasl_session *sctx);
```

Retrieve application specific data from libgsasl session handle.

The application data is set using [gsasl_callback_hook_set\(\)](#). This is normally used by the application to maintain a per-session state between the main program and callbacks.

sctx : libgsasl session handle.

Returns : Returns the application specific data, or NULL.

Since 0.2.14

gsasl_session_hook_set ()

```
void        gsasl_session_hook_set      (Gsasl_session *sctx,  
                                         void *hook);
```

Store application specific data in the libgsasl session handle.

The application data can be later (for instance, inside a callback) be retrieved by calling [gsasl_session_hook_get\(\)](#). This is normally used by the application to maintain a per-session state between the main program and callbacks.

sctx : libgsasl session handle.

hook : opaque pointer to application specific data.

Since 0.2.14

gsasl_sha1 ()

```
int          gsasl_shal                  (const char *in,  
                                         size_t inlen,  
                                         char *out[20]);
```

Compute hash of data using SHA1. The *out* buffer must be deallocated by the caller.

in : input character array of data to hash.

inLen : length of input character array of data to hash.

out : newly allocated character array with hash of data.

Returns : Returns **GSASL_OK** iff successful.

Since 1.3

This is a simple wrapper around `gsasl_step()` that base64 decodes the input and base64 encodes the output.

The contents of the `b64output` buffer is unspecified if this functions returns anything other than `GSASL_OK` or `GSASL_NEEDS_MORE`. If this function return `GSASL_OK` or `GSASL_NEEDS_MORE`, however, the `b64output` buffer is allocated by this function, and it is the responsibility of caller to deallocate it by calling `free(b64output)`.

sctx : libgsasl client handle.

b64input : input base64 encoded byte array.

b64output : newly allocated output base64 encoded byte array.

Returns : Returns `GSASL_OK` if authenticated terminated successfully, `GSASL_NEEDS_MORE` if more data is needed, or error code.

gsasl_strerror ()

```
const char *      gsasl_strerror          (int err);
```

Convert return code to human readable string explanation of the reason for the particular error code.

This string can be used to output a diagnostic message to the user.

This function is one of few in the library that can be used without a successful call to `gsasl_init()`.

err : libgsasl error code

Returns : Returns a pointer to a statically allocated string containing an explanation of the error code `err`.

gsasl_strerror_name ()

```
const char *      gsasl_strerror_name    (int err);
```

Convert return code to human readable string representing the error code symbol itself. For example, `gsasl_strerror_name(GSASL_OK)` returns the string "GSASL_OK".

This string can be used to output a diagnostic message to the user.

This function is one of few in the library that can be used without a successful call to `gsasl_init()`.

err : libgsasl error code

Returns : Returns a pointer to a statically allocated string containing a string version of the error code `err`, or NULL if the error code is not known.

Since 0.2.29

1.2 gsasl-mech

gsasl-mech —

Synopsis

```

int (*Gsasl_code_function) (Gsasl_session *sctx,
                           void *mech_data,
                           const char *input,
                           size_t input_len,
                           char **output,
                           size_t *output_len);

void (*Gsasl_done_function) (Gsasl *ctx);
void (*Gsasl_finish_function) (Gsasl_session *sctx,
                               void *mech_data);

int (*Gsasl_init_function) (Gsasl *ctx);
typedef Gsasl_mechanism;
typedef Gsasl_mechanism_functions;
int (*Gsasl_start_function) (Gsasl_session *sctx,
                             void **mech_data);

int (*Gsasl_step_function) (Gsasl_session *sctx,
                            void *mech_data,
                            const char *input,
                            size_t input_len,
                            char **output,
                            size_t *output_len);

int gsasl_register (Gsasl *ctx,
                  const Gsasl_mechanism *mech);

```

Description

Details

Gsasl_code_function ()

```

int (*Gsasl_code_function) (Gsasl_session *sctx,
                           void *mech_data,
                           const char *input,
                           size_t input_len,
                           char **output,
                           size_t *output_len);

```

Gsasl_done_function ()

```

void (*Gsasl_done_function) (Gsasl *ctx);

```

Gsasl_finish_function ()

```

void (*Gsasl_finish_function) (Gsasl_session *sctx,
                               void *mech_data);

```

Gsasl_init_function ()

```

int (*Gsasl_init_function) (Gsasl *ctx);

```

```

                                const char *authorization_id,
                                const char *passcode,
                                char *pin,
                                char *suggestpin,
                                size_t *suggestpinlen);
int      (*Gsasl_server_callback_service) (Gsasl_session *sctx,
                                char *service,
                                size_t *servicelen,
                                char *hostname,
                                size_t *hostnamelen);
int      (*Gsasl_server_callback_validate) (Gsasl_session *sctx,
                                const char *authorization_id,
                                const char *authentication_id,
                                const char *password);
void *   gsasl_appinfo_get      (Gsasl_session *sctx);
void     gsasl_appinfo_set      (Gsasl_session *sctx,
                                void *appdata);
void *   gsasl_application_data_get (Gsasl *ctx);
void     gsasl_application_data_set (Gsasl *ctx,
                                void *appdata);
int      gsasl_base64_decode    (char const *src,
                                char *target,
                                size_t targsize);
int      gsasl_base64_encode    (char const *src,
                                size_t srclength,
                                char *target,
                                size_t targsize);
void *   gsasl_client_application_data_get (Gsasl_session *sctx);
void     gsasl_client_application_data_set (Gsasl_session *sctx,
                                void *application_data);
Gsasl_client_callback_anonymous gsasl_client_callback_anonymous_get
                                (Gsasl *ctx);
void     gsasl_client_callback_anonymous_set (Gsasl *ctx,
                                Gsasl_client_callback_anonymous cb);
Gsasl_client_callback_authentication_id gsasl_client_callback_authentication_id_get
                                (Gsasl *ctx);
void     gsasl_client_callback_authentication_id_set
                                (Gsasl *ctx,
                                Gsasl_client_callback_authentication_id cb);
Gsasl_client_callback_authorization_id gsasl_client_callback_authorization_id_get
                                (Gsasl *ctx);
void     gsasl_client_callback_authorization_id_set
                                (Gsasl *ctx,
                                Gsasl_client_callback_authorization_id cb);
Gsasl_client_callback_maxbuf gsasl_client_callback_maxbuf_get
                                (Gsasl *ctx);
void     gsasl_client_callback_maxbuf_set (Gsasl *ctx,
                                Gsasl_client_callback_maxbuf cb);
Gsasl_client_callback_passcode gsasl_client_callback_passcode_get
                                (Gsasl *ctx);
void     gsasl_client_callback_passcode_set (Gsasl *ctx,
                                Gsasl_client_callback_passcode cb);
Gsasl_client_callback_password gsasl_client_callback_password_get
                                (Gsasl *ctx);
void     gsasl_client_callback_password_set (Gsasl *ctx,
                                Gsasl_client_callback_password cb);
Gsasl_client_callback_pin gsasl_client_callback_pin_get (Gsasl *ctx);

```

```

void          gsasl_client_callback_pin_set      (Gsasl *ctx,
                                                Gsasl_client_callback_pin cb);
Gsasl_client_callback_qop gsasl_client_callback_qop_get (Gsasl *ctx);
void          gsasl_client_callback_qop_set      (Gsasl *ctx,
                                                Gsasl_client_callback_qop cb);
Gsasl_client_callback_realm gsasl_client_callback_realm_get
                                                (Gsasl *ctx);
void          gsasl_client_callback_realm_set    (Gsasl *ctx,
                                                Gsasl_client_callback_realm cb);
Gsasl_client_callback_service gsasl_client_callback_service_get
                                                (Gsasl *ctx);
void          gsasl_client_callback_service_set  (Gsasl *ctx,
                                                Gsasl_client_callback_service cb);
Gsasl *       gsasl_client_ctx_get              (Gsasl_session *sctx);
void          gsasl_client_finish              (Gsasl_session *sctx);
int           gsasl_client_listmech            (Gsasl *ctx,
                                                char *out,
                                                size_t *outlen);
int           gsasl_client_step                 (Gsasl_session *sctx,
                                                const char *input,
                                                size_t input_len,
                                                char *output,
                                                size_t *output_len);
int           gsasl_client_step_base64         (Gsasl_session *sctx,
                                                const char *b64input,
                                                char *b64output,
                                                size_t b64output_len);
Gsasl *       gsasl_ctx_get                    (Gsasl_session *sctx);
int           gsasl_decode_inline              (Gsasl_session *sctx,
                                                const char *input,
                                                size_t input_len,
                                                char *output,
                                                size_t *output_len);
int           gsasl_encode_inline              (Gsasl_session *sctx,
                                                const char *input,
                                                size_t input_len,
                                                char *output,
                                                size_t *output_len);
int           gsasl_md5pwd_get_password         (const char *filename,
                                                const char *username,
                                                char *key,
                                                size_t *keylen);
int           gsasl_randomize                  (int strong,
                                                char *data,
                                                size_t datalen);
void *        gsasl_server_application_data_get (Gsasl_session *sctx);
void          gsasl_server_application_data_set (Gsasl_session *sctx,
                                                void *application_data);
Gsasl_server_callback_anonymous gsasl_server_callback_anonymous_get
                                                (Gsasl *ctx);
void          gsasl_server_callback_anonymous_set (Gsasl *ctx,
                                                Gsasl_server_callback_anonymous cb);
Gsasl_server_callback_cipher gsasl_server_callback_cipher_get
                                                (Gsasl *ctx);
void          gsasl_server_callback_cipher_set  (Gsasl *ctx,
                                                Gsasl_server_callback_cipher cb);
Gsasl_server_callback_cram_md5 gsasl_server_callback_cram_md5_get

```

```

void          gsasl_server_callback_cram_md5_set      (Gsasl *ctx,
Gsasl_server_callback_digest_md5 gsasl_server_callback_digest_md5_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_digest_md5_set
                                                    (Gsasl *ctx,
Gsasl_server_callback_external gsasl_server_callback_external_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_external_set     (Gsasl *ctx,
Gsasl_server_callback_gssapi gsasl_server_callback_gssapi_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_gssapi_set      (Gsasl *ctx,
Gsasl_server_callback_maxbuf gsasl_server_callback_maxbuf_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_maxbuf_set      (Gsasl *ctx,
Gsasl_server_callback_qop gsasl_server_callback_qop_get (Gsasl *ctx);
void          gsasl_server_callback_qop_set         (Gsasl *ctx,
Gsasl_server_callback_realm gsasl_server_callback_realm_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_realm_set       (Gsasl *ctx,
Gsasl_server_callback_retrieve gsasl_server_callback_retrieve_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_retrieve_set    (Gsasl *ctx,
Gsasl_server_callback_securid gsasl_server_callback_securid_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_securid_set     (Gsasl *ctx,
Gsasl_server_callback_service gsasl_server_callback_service_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_service_set     (Gsasl *ctx,
Gsasl_server_callback_validate gsasl_server_callback_validate_get
                                                    (Gsasl *ctx);
void          gsasl_server_callback_validate_set    (Gsasl *ctx,
Gsasl *      gsasl_server_ctx_get                  (Gsasl_session *sctx);
void          gsasl_server_finish                   (Gsasl_session *sctx);
int          gsasl_server_listmech                 (Gsasl *ctx,
char *out,
size_t *outlen);
int          gsasl_server_step                      (Gsasl_session *sctx,
const char *input,
size_t input_len,
char *output,
size_t *output_len);
int          gsasl_server_step_base64              (Gsasl_session *sctx,
const char *b64input,
char *b64output,
size_t b64output_len);

```

Gsasl_client_callback_pin ()

```
int (*Gsasl_client_callback_pin) (Gsasl_session *sctx,
char *suggestion,
char *out,
size_t *outlen);
```

Gsasl_client_callback_qop ()

```
Gsasl_qop (*Gsasl_client_callback_qop) (Gsasl_session *sctx,
Gsasl_qop serverqops);
```

Gsasl_client_callback_realm ()

```
int (*Gsasl_client_callback_realm) (Gsasl_session *sctx,
char *out,
size_t *outlen);
```

Gsasl_client_callback_service ()

```
int (*Gsasl_client_callback_service) (Gsasl_session *sctx,
char *service,
size_t *servicelen,
char *hostname,
size_t *hostnamelen,
char *servicename,
size_t *servicenamelen);
```

Gsasl_server_callback_anonymous ()

```
int (*Gsasl_server_callback_anonymous) (Gsasl_session *sctx,
const char *token);
```

Gsasl_server_callback_cipher ()

```
Gsasl_cipher (*Gsasl_server_callback_cipher) (Gsasl_session *sctx);
```

Gsasl_server_callback_cram_md5 ()

```
int (*Gsasl_server_callback_cram_md5) (Gsasl_session *sctx,
char *username,
char *challenge,
char *response);
```

Gsasl_server_callback_digest_md5 ()

```
int (*Gsasl_server_callback_digest_md5) (Gsasl_session *sctx,
char *username,
char *realm,
char *secrethash);
```

Gsasl_server_callback_external ()

```
int (*Gsasl_server_callback_external) (Gsasl_session *sctx);
```

Gsasl_server_callback_gssapi ()

```
int (*Gsasl_server_callback_gssapi) (Gsasl_session *sctx,  
const char *clientname,  
const char *authentication_id);
```

Gsasl_server_callback_maxbuf ()

```
size_t (*Gsasl_server_callback_maxbuf) (Gsasl_session *sctx);
```

Gsasl_server_callback_qop ()

```
Gsasl_qop (*Gsasl_server_callback_qop) (Gsasl_session *sctx);
```

Gsasl_server_callback_realm ()

```
int (*Gsasl_server_callback_realm) (Gsasl_session *sctx,  
char *out,  
size_t *outlen,  
size_t nth);
```

Gsasl_server_callback_retrieve ()

```
int (*Gsasl_server_callback_retrieve) (Gsasl_session *sctx,  
const char *authentication_id,  
const char *authorization_id,  
const char *realm,  
char *key,  
size_t *keylen);
```

Gsasl_server_callback_secured ()

```
int (*Gsasl_server_callback_secured) (Gsasl_session *sctx,  
const char *authentication_id,  
const char *authorization_id,  
const char *passcode,  
char *pin,  
char *suggestpin,  
size_t *suggestpinlen);
```

Gsasl_server_callback_service ()

```
int (*Gsasl_server_callback_service) (Gsasl_session *sctx,  
char *service,  
size_t *servicelen,  
char *hostname,  
size_t *hostnamelen);
```

Gsasl_server_callback_validate ()

```
int (*Gsasl_server_callback_validate) (Gsasl_session *sctx,
                                       const char *authorization_id,
                                       const char *authentication_id,
                                       const char *password);
```

gsasl_appinfo_get ()

```
void * gsasl_appinfo_get (Gsasl_session *sctx);
```

**Warning**

`gsasl_appinfo_get` is deprecated and should not be used in newly-written code. Use [gsasl_callback_hook_get\(\)](#) instead.

Retrieve application specific data from libgsasl session handle. The application data is set using [gsasl_appinfo_set\(\)](#). It is normally used by the application to maintain state between the main program and the callback.

sctx : libgsasl session handle.

Returns : Returns the application specific data, or NULL.

gsasl_appinfo_set ()

```
void gsasl_appinfo_set (Gsasl_session *sctx,
                       void *appdata);
```

**Warning**

`gsasl_appinfo_set` is deprecated and should not be used in newly-written code. Use [gsasl_callback_hook_set\(\)](#) instead.

Store application specific data in the libgsasl session handle. The application data can be later (for instance, inside a callback) be retrieved by calling [gsasl_appinfo_get\(\)](#). It is normally used by the application to maintain state between the main program and the callback.

sctx : libgsasl session handle.

appdata : opaque pointer to application specific data.

gsasl_application_data_get ()

```
void * gsasl_application_data_get (Gsasl *ctx);
```

**Warning**

`gsasl_application_data_get` is deprecated and should not be used in newly-written code. Use [gsasl_callback_hook_get\(\)](#) instead.

Retrieve application specific data from libgsasl handle. The application data is set using [gsasl_application_data_set\(\)](#). It is normally used by the application to maintain state between the main program and the callback.

ctx : libgsasl handle.

Returns : Returns the application specific data, or NULL.

gsasl_application_data_set ()

```
void                gsasl_application_data_set        (Gsasl *ctx,  
                                                    void *appdata);
```



Warning

[gsasl_application_data_set](#) is deprecated and should not be used in newly-written code. Use [gsasl_callback_hook_set\(\)](#) instead.

Store application specific data in the libgsasl handle. The application data can be later (for instance, inside a callback) be retrieved by calling [gsasl_application_data_get\(\)](#). It is normally used by the application to maintain state between the main program and the callback.

ctx : libgsasl handle.

appdata : opaque pointer to application specific data.

gsasl_base64_decode ()

```
int                gsasl_base64_decode             (char const *src,  
                                                    char *target,  
                                                    size_t targsize);
```



Warning

[gsasl_base64_decode](#) is deprecated and should not be used in newly-written code. Use [gsasl_base64_from\(\)](#) instead.

Decode Base64 data. Skips all whitespace anywhere. Converts characters, four at a time, starting at (or after) *src* from Base64 numbers into three 8 bit bytes in the target area.

src : input byte array

target : output byte array

targsize : size of output byte array

Returns : Returns the number of data bytes stored at the target, or -1 on error.

gsasl_base64_encode ()

```
int          gsasl_base64_encode      (char const *src,
                                     size_t srclength,
                                     char *target,
                                     size_t targsize);
```

**Warning**

`gsasl_base64_encode` is deprecated and should not be used in newly-written code. Use [gsasl_base64_to\(\)](#) instead.

Encode data as base64. Converts characters, three at a time, starting at `src` into four base64 characters in the target area until the entire input buffer is encoded.

src : input byte array

srclength : size of input byte array

target : output byte array

targsize : size of output byte array

Returns : Returns the number of data bytes stored at the target, or -1 on error.

gsasl_client_application_data_get ()

```
void *      gsasl_client_application_data_get  (Gsasl_session *sctx);
```

**Warning**

`gsasl_client_application_data_get` is deprecated and should not be used in newly-written code. Use [gsasl_callback_hook_get\(\)](#) or [gsasl_session_hook_get\(\)](#) instead.

Retrieve application specific data from libgsasl client handle. The application data is set using [gsasl_client_application_data_set\(\)](#). It is normally used by the application to maintain state between the main program and the callback.

sctx : libgsasl client handle.

Returns : Returns the application specific data, or NULL.

gsasl_client_application_data_set ()

```
void      gsasl_client_application_data_set  (Gsasl_session *sctx,
                                             void *application_data);
```

**Warning**

`gsasl_client_application_data_set` is deprecated and should not be used in newly-written code. Use [gsasl_callback_hook_set\(\)](#) or [gsasl_session_hook_set\(\)](#) instead.

**Warning**

`gsasl_client_callback_authentication_id_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_authentication_id_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_authentication_id_set()`.

gsasl_client_callback_authentication_id_set ()

```
void gsasl_client_callback_authentication_id_set
                                     (Gsasl *ctx,
                                      Gsasl_client_callback_authentication_id ←
                                      cb);
```

**Warning**

`gsasl_client_callback_authentication_id_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to set the authentication identity. The function can be later retrieved using `gsasl_client_callback_authentication_id_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_callback_authorization_id_get ()

```
Gsasl_client_callback_authorization_id gsasl_client_callback_authorization_id_get
                                     (Gsasl *ctx);
```

**Warning**

`gsasl_client_callback_authorization_id_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_authorization_id_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_authorization_id_set()`.

gsasl_client_callback_authorization_id_set ()

```
void          gsasl_client_callback_authorization_id_set
              (Gsasl *ctx,
               Gsasl_client_callback_authorization_id cb);
```

**Warning**

`gsasl_client_callback_authorization_id_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to set the authorization identity. The function can be later retrieved using `gsasl_client_callback_authorization_id_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_callback_maxbuf_get ()

```
Gsasl_client_callback_maxbuf gsasl_client_callback_maxbuf_get
                              (Gsasl *ctx);
```

**Warning**

`gsasl_client_callback_maxbuf_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_maxbuf_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_maxbuf_set()`.

gsasl_client_callback_maxbuf_set ()

```
void          gsasl_client_callback_maxbuf_set      (Gsasl *ctx,
                                                    Gsasl_client_callback_maxbuf cb);
```

**Warning**

`gsasl_client_callback_maxbuf_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to inform the server of the largest buffer the client is able to receive when using the DIGEST-MD5 "auth-int" or "auth-conf" Quality of Protection (qop). If this directive is missing, the default value 65536 will be assumed. The function can be later retrieved using `gsasl_client_callback_maxbuf_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_callback_passcode_get ()

```
Gsasl_client_callback_passcode gsasl_client_callback_passcode_get
                                (Gsasl *ctx);
```

**Warning**

`gsasl_client_callback_passcode_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_passcode_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_passcode_set()`.

gsasl_client_callback_passcode_set ()

```
void gsasl_client_callback_passcode_set (Gsasl *ctx,
                                         Gsasl_client_callback_passcode cb) ←
                                         ;
```

**Warning**

`gsasl_client_callback_passcode_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to set the passcode. The function can be later retrieved using `gsasl_client_callback_passcode_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_callback_password_get ()

```
Gsasl_client_callback_password gsasl_client_callback_password_get
                                (Gsasl *ctx);
```

**Warning**

`gsasl_client_callback_password_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_password_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_password_set()`.

gsasl_client_callback_password_set ()

```
void          gsasl_client_callback_password_set  (Gsasl *ctx,
                                                Gsasl_client_callback_password cb) ←
                                                ;
```

**Warning**

`gsasl_client_callback_password_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to set the password. The function can be later retrieved using `gsasl_client_callback_password_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_callback_pin_get ()

```
Gsasl_client_callback_pin gsasl_client_callback_pin_get  (Gsasl *ctx);
```

**Warning**

`gsasl_client_callback_pin_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_pin_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_pin_set()`.

gsasl_client_callback_pin_set ()

```
void          gsasl_client_callback_pin_set          (Gsasl *ctx,
                                                Gsasl_client_callback_pin cb);
```

**Warning**

`gsasl_client_callback_pin_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to chose a new pin, possibly suggested by the server, for the SECURID mechanism. This is not normally invoked, but only when the server requests it. The function can be later retrieved using `gsasl_client_callback_pin_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_callback_qop_get ()

```
Gsasl_client_callback_qop gsasl_client_callback_qop_get (Gsasl *ctx);
```

**Warning**

`gsasl_client_callback_qop_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_qop_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_qop_set()`.

gsasl_client_callback_qop_set ()

```
void gsasl_client_callback_qop_set (Gsasl *ctx,
                                     Gsasl_client_callback_qop cb);
```

**Warning**

`gsasl_client_callback_qop_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to determine the qop to use after looking at what the server offered. The function can be later retrieved using `gsasl_client_callback_qop_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_callback_realm_get ()

```
Gsasl_client_callback_realm gsasl_client_callback_realm_get
                                     (Gsasl *ctx);
```

**Warning**

`gsasl_client_callback_realm_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_realm_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_realm_set()`.

gsasl_client_callback_realm_set ()

```
void                gsasl_client_callback_realm_set    (Gsasl *ctx,  
                                                       Gsasl_client_callback_realm cb);
```

**Warning**

`gsasl_client_callback_realm_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to know which realm it belongs to. The realm is used by the server to determine which username and password to use. The function can be later retrieved using `gsasl_client_callback_realm_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_callback_service_get ()

```
Gsasl_client_callback_service gsasl_client_callback_service_get  
                               (Gsasl *ctx);
```

**Warning**

`gsasl_client_callback_service_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_client_callback_service_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_client_callback_service_set()`.

gsasl_client_callback_service_set ()

```
void                gsasl_client_callback_service_set (Gsasl *ctx,  
                                                       Gsasl_client_callback_service cb);
```

**Warning**

`gsasl_client_callback_service_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the client to set the name of the service. The service buffer should be a registered GSSAPI host-based service name, hostname the name of the server. Servicename is used by DIGEST-MD5 and should be the name of generic server in case of a replicated service. The function can be later retrieved using `gsasl_client_callback_service_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_client_ctx_get ()

```
Gsasl *          gsasl_client_ctx_get          (Gsasl_session *sctx);
```

**Warning**

`gsasl_client_ctx_get` is deprecated and should not be used in newly-written code. This function is not useful with the new 0.2.0 API.

Get the libgsasl handle given a libgsasl client handle.

sctx : libgsasl client handle

Returns : Returns the libgsasl handle given a libgsasl client handle.

gsasl_client_finish ()

```
void            gsasl_client_finish          (Gsasl_session *sctx);
```

**Warning**

`gsasl_client_finish` is deprecated and should not be used in newly-written code. Use `gsasl_finish()` instead.

Destroy a libgsasl client handle. The handle must not be used with other libgsasl functions after this call.

sctx : libgsasl client handle.

gsasl_client_listmech ()

```
int            gsasl_client_listmech        (Gsasl *ctx,
                                             char *out,
                                             size_t *outlen);
```

**Warning**

`gsasl_client_listmech` is deprecated and should not be used in newly-written code. Use `gsasl_client_mechlist()` instead.

Write SASL names, separated by space, of mechanisms supported by the libgsasl client to the output array. To find out how large the output array must be, call this function with a NULL `out` parameter.

ctx : libgsasl handle.

out : output character array.

outlen : input maximum size of output character array, on output contains actual length of output array.

Returns : Returns `GSASL_OK` if successful, or error code.

gsasl_client_step ()

```
int          gsasl_client_step          (Gsasl_session *sctx,
                                       const char *input,
                                       size_t input_len,
                                       char *output,
                                       size_t *output_len);
```

**Warning**

`gsasl_client_step` is deprecated and should not be used in newly-written code. Use `gsasl_step()` instead.

Perform one step of SASL authentication in client. This reads data from server (specified with `input` and `input_len`), processes it (potentially invoking callbacks to the application), and writes data to server (into variables `output` and `output_len`).

The contents of the output buffer is unspecified if this functions returns anything other than **GSASL_NEEDS_MORE**.

sctx : libgsasl client handle.

input : input byte array.

input_len : size of input byte array.

output : output byte array.

output_len : size of output byte array.

Returns : Returns **GSASL_OK** if authenticated terminated successfully, **GSASL_NEEDS_MORE** if more data is needed, or error code.

gsasl_client_step_base64 ()

```
int          gsasl_client_step_base64  (Gsasl_session *sctx,
                                       const char *b64input,
                                       char *b64output,
                                       size_t b64output_len);
```

**Warning**

`gsasl_client_step_base64` is deprecated and should not be used in newly-written code. Use `gsasl_step64()` instead.

This is a simple wrapper around `gsasl_client_step()` that base64 decodes the input and base64 encodes the output.

sctx : libgsasl client handle.

b64input : input base64 encoded byte array.

b64output : output base64 encoded byte array.

b64output_len : size of output base64 encoded byte array.

Returns : See `gsasl_client_step()`.

**Warning**

`gsasl_encode_inline` is deprecated and should not be used in newly-written code. Use `gsasl_encode()` instead.

Encode data according to negotiated SASL mechanism. This might mean that data is integrity or privacy protected.

sctx : libgsasl session handle.

input : input byte array.

input_len : size of input byte array.

output : output byte array.

output_len : size of output byte array.

Returns : Returns `GSASL_OK` if encoding was successful, otherwise an error code.

Since 0.2.0

gsasl_md5pwd_get_password ()

```
int          gsasl_md5pwd_get_password      (const char *filename,
                                           const char *username,
                                           char *key,
                                           size_t *keylen);
```

**Warning**

`gsasl_md5pwd_get_password` is deprecated and should not be used in newly-written code. Use `gsasl_simple_getpass()` instead.

Retrieve password for user from specified file. To find out how large the output array must be, call this function with `out=NULL`.

The file should be on the UoW "MD5 Based Authentication" format, which means it is in text format with comments denoted by `#` first on the line, with user entries looking as "usernameTABpassword". This function removes CR and LF at the end of lines before processing. TAB, CR, and LF denote ASCII values 9, 13, and 10, respectively.

filename : filename of file containing passwords.

username : username string.

key : output character array.

keylen : input maximum size of output character array, on output contains actual length of output array.

Returns : Return `GSASL_OK` if output buffer contains the password, `GSASL_AUTHENTICATION_ERROR` if the user could not be found, or other error code.

gsasl_randomize ()

```
int          gsasl_randomize          (int strong,
                                     char *data,
                                     size_t datalen);
```

**Warning**

`gsasl_randomize` is deprecated and should not be used in newly-written code. Use [gsasl_random\(\)](#) or [gsasl_nonce\(\)](#) instead.

Store cryptographically random data of given size in the provided buffer.

strong : 0 iff operation should not block, non-0 for very strong randomness.

data : output array to be filled with random data.

datalen : size of output array.

Returns : Returns **GSASL_OK** iff successful.

gsasl_server_application_data_get ()

```
void *      gsasl_server_application_data_get  (Gsasl_session *sctx);
```

**Warning**

`gsasl_server_application_data_get` is deprecated and should not be used in newly-written code. Use [gsasl_callback_hook_get\(\)](#) or [gsasl_session_hook_get\(\)](#) instead.

Retrieve application specific data from libgsasl server handle. The application data is set using [gsasl_server_application_data_set\(\)](#). It is normally used by the application to maintain state between the main program and the callback.

sctx : libgsasl server handle.

Returns : Returns the application specific data, or NULL.

gsasl_server_application_data_set ()

```
void      gsasl_server_application_data_set  (Gsasl_session *sctx,
                                             void *application_data);
```

**Warning**

`gsasl_server_application_data_set` is deprecated and should not be used in newly-written code. Use [gsasl_callback_hook_set\(\)](#) or [gsasl_session_hook_set\(\)](#) instead.

Store application specific data in the libgsasl server handle. The application data can be later (for instance, inside a callback) be retrieved by calling [gsasl_server_application_data_get\(\)](#). It is normally used by the application to maintain state between the main program and the callback.

sctx : libgsasl server handle.

application_data : opaque pointer to application specific data.

gsasl_server_callback_anonymous_get ()

```
Gsasl_server_callback_anonymous gsasl_server_callback_anonymous_get
                                (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_anonymous_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_anonymous_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_anonymous_set()`.

gsasl_server_callback_anonymous_set ()

```
void gsasl_server_callback_anonymous_set (Gsasl *ctx,
                                         Gsasl_server_callback_anonymous cb ←
                                         );
```

**Warning**

`gsasl_server_callback_anonymous_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server for deciding if user is permitted anonymous access. The function can be later retrieved using `gsasl_server_callback_anonymous_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_cipher_get ()

```
Gsasl_server_callback_cipher gsasl_server_callback_cipher_get
                                (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_cipher_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_cipher_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_cipher_set()`.

gsasl_server_callback_cipher_set ()

```
void          gsasl_server_callback_cipher_set      (Gsasl *ctx,
                                                    Gsasl_server_callback_cipher cb);
```

**Warning**

`gsasl_server_callback_cipher_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server to inform the client of the cipher suites supported. The DES and 3DES ciphers must be supported for interoperability. It is currently used by the DIGEST-MD5 mechanism. The function can be later retrieved using `gsasl_server_callback_cipher_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_cram_md5_get ()

```
Gsasl_server_callback_cram_md5 gsasl_server_callback_cram_md5_get
                                                    (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_cram_md5_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_cram_md5_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_cram_md5_set()`.

gsasl_server_callback_cram_md5_set ()

```
void          gsasl_server_callback_cram_md5_set  (Gsasl *ctx,
                                                    Gsasl_server_callback_cram_md5 cb) ↵
                                                    ;
```

**Warning**

`gsasl_server_callback_cram_md5_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server for deciding if user is authenticated using CRAM-MD5 challenge and response. The function can be later retrieved using `gsasl_server_callback_cram_md5_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_digest_md5_get ()

```
Gsasl_server_callback_digest_md5  gsasl_server_callback_digest_md5_get
                                   (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_digest_md5_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_digest_md5_set()`.

ctx : libgsasl handle.

Returns : Return the callback earlier set by calling `gsasl_server_callback_digest_md5_set()`.

gsasl_server_callback_digest_md5_set ()

```
void                                gsasl_server_callback_digest_md5_set
                                   (Gsasl *ctx,
                                   Gsasl_server_callback_digest_md5  ←
                                   cb);
```

**Warning**

`gsasl_server_callback_digest_md5_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server for retrieving the secret hash of the username, realm and password for use in the DIGEST-MD5 mechanism. The function can be later retrieved using `gsasl_server_callback_digest_md5_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_external_get ()

```
Gsasl_server_callback_external  gsasl_server_callback_external_get
                                   (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_external_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_external_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_external_set()`.

gsasl_server_callback_external_set ()

```
void          gsasl_server_callback_external_set (Gsasl *ctx,
                                                Gsasl_server_callback_external cb) ←
                                                ;
```

**Warning**

`gsasl_server_callback_external_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server for deciding if user is authenticated out of band. The function can be later retrieved using `gsasl_server_callback_external_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_gssapi_get ()

```
Gsasl_server_callback_gssapi gsasl_server_callback_gssapi_get
                             (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_gssapi_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_gssapi_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_gssapi_set()`.

gsasl_server_callback_gssapi_set ()

```
void          gsasl_server_callback_gssapi_set (Gsasl *ctx,
                                                Gsasl_server_callback_gssapi cb);
```

**Warning**

`gsasl_server_callback_gssapi_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server for checking if a GSSAPI user is authorized for username (by, e.g., calling `krb5_kuserok`). The function should return `GSASL_OK` if the user should be permitted access, or an error code such as `GSASL_AUTHENTICATION_ERROR` on failure. The function can be later retrieved using `gsasl_server_callback_gssapi_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_maxbuf_get ()

```
Gsasl_server_callback_maxbuf gsasl_server_callback_maxbuf_get
                               (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_maxbuf_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_maxbuf_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_maxbuf_set()`.

gsasl_server_callback_maxbuf_set ()

```
void gsasl_server_callback_maxbuf_set (Gsasl *ctx,
                                       Gsasl_server_callback_maxbuf cb);
```

**Warning**

`gsasl_server_callback_maxbuf_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server to inform the client of the largest buffer the server is able to receive when using the DIGEST-MD5 "auth-int" or "auth-conf" Quality of Protection (qop). If this directive is missing, the default value 65536 will be assumed. The function can be later retrieved using `gsasl_server_callback_maxbuf_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_qop_get ()

```
Gsasl_server_callback_qop gsasl_server_callback_qop_get (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_qop_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_qop_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_qop_set()`.

gsasl_server_callback_qop_set ()

```
void          gsasl_server_callback_qop_set      (Gsasl *ctx,
                                                Gsasl_server_callback_qop cb);
```

**Warning**

`gsasl_server_callback_qop_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server to know which quality of protection it accepts. The quality of protection eventually used is selected by the client though. It is currently used by the DIGEST-MD5 mechanism. The function can be later retrieved using `gsasl_server_callback_qop_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_realm_get ()

```
Gsasl_server_callback_realm gsasl_server_callback_realm_get
                                                (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_realm_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_realm_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_realm_set()`.

gsasl_server_callback_realm_set ()

```
void          gsasl_server_callback_realm_set   (Gsasl *ctx,
                                                Gsasl_server_callback_realm cb);
```

**Warning**

`gsasl_server_callback_realm_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server to know which realm it serves. The realm is used by the user to determine which username and password to use. The function can be later retrieved using `gsasl_server_callback_realm_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_retrieve_get ()

```
Gsasl_server_callback_retrieve gsasl_server_callback_retrieve_get
                                (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_retrieve_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_retrieve_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_retrieve_set()`.

gsasl_server_callback_retrieve_set ()

```
void gsasl_server_callback_retrieve_set (Gsasl *ctx,
                                        Gsasl_server_callback_retrieve cb) ←
                                        ;
```

**Warning**

`gsasl_server_callback_retrieve_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server for deciding if user is authenticated using authentication identity, authorization identity and password. The function can be later retrieved using `gsasl_server_callback_retrieve_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_securid_get ()

```
Gsasl_server_callback_securid gsasl_server_callback_securid_get
                                (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_securid_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_securid_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_securid_set()`.

gsasl_server_callback_securid_set ()

```
void          gsasl_server_callback_securid_set    (Gsasl *ctx,
                                                  Gsasl_server_callback_securid cb);
```

**Warning**

`gsasl_server_callback_securid_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server for validating a user via the SECURID mechanism. The function should return `GSASL_OK` if user authenticated successfully, `GSASL_SECURID_SERVER_NEED_ADDITIONAL_PASSCODE` if it wants another passcode, `GSASL_SECURID_SERVER_NEED_NEW_PIN` if it wants a PIN change, or an error. When (and only when) `GSASL_SECURID_SERVER_NEED_NEW_PIN` is returned, `suggestpin` can be populated with a PIN code the server suggests, and `suggestpinlen` set to the length of the PIN. The function can be later retrieved using `gsasl_server_callback_securid_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_service_get ()

```
Gsasl_server_callback_service gsasl_server_callback_service_get
                                                                    (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_service_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_service_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_service_set()`.

gsasl_server_callback_service_set ()

```
void          gsasl_server_callback_service_set    (Gsasl *ctx,
                                                  Gsasl_server_callback_service cb);
```

**Warning**

`gsasl_server_callback_service_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server to set the name of the service. The service buffer should be a registered GSSAPI host-based service name, `hostname` the name of the server. The function can be later retrieved using `gsasl_server_callback_service_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_callback_validate_get ()

```
Gsasl_server_callback_validate gsasl_server_callback_validate_get
                                (Gsasl *ctx);
```

**Warning**

`gsasl_server_callback_validate_get` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Get the callback earlier set by calling `gsasl_server_callback_validate_set()`.

ctx : libgsasl handle.

Returns : Returns the callback earlier set by calling `gsasl_server_callback_validate_set()`.

gsasl_server_callback_validate_set ()

```
void gsasl_server_callback_validate_set (Gsasl *ctx,
                                         Gsasl_server_callback_validate cb) ←
                                         ;
```

**Warning**

`gsasl_server_callback_validate_set` is deprecated and should not be used in newly-written code. This function is part of the old callback interface. The new interface uses `gsasl_callback_set()` to set the application callback, and uses `gsasl_callback()` or `gsasl_property_get()` to invoke the callback for certain properties.

Specify the callback function to use in the server for deciding if user is authenticated using authentication identity, authorization identity and password. The function can be later retrieved using `gsasl_server_callback_validate_get()`.

ctx : libgsasl handle.

cb : callback function

gsasl_server_ctx_get ()

```
Gsasl * gsasl_server_ctx_get (Gsasl_session *sctx);
```

**Warning**

`gsasl_server_ctx_get` is deprecated and should not be used in newly-written code. This function is not useful with the new 0.2.0 API.

Get the libgsasl handle given a libgsasl server handle.

sctx : libgsasl server handle

Returns : Returns the libgsasl handle given a libgsasl server handle.

gsasl_server_finish ()

```
void                gsasl_server_finish                (Gsasl_session *sctx);
```

**Warning**

`gsasl_server_finish` is deprecated and should not be used in newly-written code. Use `gsasl_finish()` instead.

Destroy a libgsasl server handle. The handle must not be used with other libgsasl functions after this call.

sctx : libgsasl server handle.

gsasl_server_listmech ()

```
int                gsasl_server_listmech                (Gsasl *ctx,
                                                         char *out,
                                                         size_t *outlen);
```

**Warning**

`gsasl_server_listmech` is deprecated and should not be used in newly-written code. Use `gsasl_server_mechlist()` instead.

Write SASL names, separated by space, of mechanisms supported by the libgsasl server to the output array. To find out how large the output array must be, call this function with a NULL `out` parameter.

ctx : libgsasl handle.

out : output character array.

outlen : input maximum size of output character array, on output contains actual length of output array.

Returns : Returns `GSASL_OK` if successful, or error code.

gsasl_server_step ()

```
int                gsasl_server_step                (Gsasl_session *sctx,
                                                         const char *input,
                                                         size_t input_len,
                                                         char *output,
                                                         size_t *output_len);
```

**Warning**

`gsasl_server_step` is deprecated and should not be used in newly-written code. Use `gsasl_step()` instead.

Perform one step of SASL authentication in server. This reads data from client (specified with `input` and `input_len`), processes it (potentially invoking callbacks to the application), and writes data to client (into variables `output` and `output_len`).

The contents of the output buffer is unspecified if this functions returns anything other than `GSASL_NEEDS_MORE`.

sctx : libgsasl server handle.

input : input byte array.

input_len : size of input byte array.

output : output byte array.

output_len : size of output byte array.

Returns : Returns **GSASL_OK** if authenticated terminated successfully, **GSASL_NEEDS_MORE** if more data is needed, or error code.

gsasl_server_step_base64 ()

```
int          gsasl_server_step_base64          (Gsasl_session *sctx,
                                               const char *b64input,
                                               char *b64output,
                                               size_t b64output_len);
```



Warning

gsasl_server_step_base64 is deprecated and should not be used in newly-written code. Use [gsasl_step64\(\)](#) instead.

This is a simple wrapper around [gsasl_server_step\(\)](#) that base64 decodes the input and base64 encodes the output.

sctx : libgsasl server handle.

b64input : input base64 encoded byte array.

b64output : output base64 encoded byte array.

b64output_len : size of output base64 encoded byte array.

Returns : See [gsasl_server_step\(\)](#).

gsasl_server_suggest_mechanism ()

```
const char *  gsasl_server_suggest_mechanism  (Gsasl *ctx,
                                               const char *mechlist);
```



Warning

gsasl_server_suggest_mechanism is deprecated and should not be used in newly-written code. This function was never useful, since it is the client that chose which mechanism to use.

Get name of "best" SASL mechanism supported by the libgsasl server which is present in the input string.

ctx : libgsasl handle.

mechlist : input character array with SASL mechanism names, separated by invalid characters (e.g. SPC).

Returns : Returns name of "best" SASL mechanism supported by the libgsasl server which is present in the input string.

**Warning**

`gsasl_stringprep_trace` is deprecated and should not be used in newly-written code. No replacement functionality in GNU SASL, use GNU Libidn instead.

Process a Unicode string for use as trace information, according to the "trace" stringprep profile. The profile is designed for use with the SASL ANONYMOUS Mechanism.

in : input ASCII or UTF-8 string with data to prepare according to "trace".

stringprep_rc : pointer to output variable with stringprep error code, or NULL to indicate that you don't care about it.

Returns : Return a newly allocated string that is the "trace" processed form of the input string, or NULL on error, in which case *stringprep_rc* contain the stringprep library error code.

Chapter 2

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