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## ***Red Hat Enterprise Linux Release 9.2 Manual Pages on 'HMAC.3oss!' command***

***\$ man HMAC.3oss!***

HMAC(3oss!)                      OpenSSL                      HMAC(3oss!)

### NAME

HMAC, HMAC\_CTX\_new, HMAC\_CTX\_reset, HMAC\_CTX\_free, HMAC\_Init, HMAC\_Init\_ex, HMAC\_Update, HMAC\_Final, HMAC\_CTX\_copy, HMAC\_CTX\_set\_flags, HMAC\_CTX\_get\_md, HMAC\_size - HMAC message authentication code

### SYNOPSIS

```
#include <openssl/hmac.h>
```

```
unsigned char *HMAC(const EVP_MD *evp_md, const void *key, int key_len,  
                  const unsigned char *data, size_t data_len,  
                  unsigned char *md, unsigned int *md_len);
```

The following functions have been deprecated since OpenSSL 3.0, and can be hidden entirely by defining OPENSSL\_API\_COMPAT with a suitable version value, see openssl\_user\_macros(7):

```
HMAC_CTX *HMAC_CTX_new(void);  
int HMAC_CTX_reset(HMAC_CTX *ctx);
```

```
int HMAC_Init_ex(HMAC_CTX *ctx, const void *key, int key_len,
```

```

    const EVP_MD *md, ENGINE *impl);
int HMAC_Update(HMAC_CTX *ctx, const unsigned char *data, size_t len);
int HMAC_Final(HMAC_CTX *ctx, unsigned char *md, unsigned int *len);

void HMAC_CTX_free(HMAC_CTX *ctx);

int HMAC_CTX_copy(HMAC_CTX *dctx, HMAC_CTX *sctx);
void HMAC_CTX_set_flags(HMAC_CTX *ctx, unsigned long flags);
const EVP_MD *HMAC_CTX_get_md(const HMAC_CTX *ctx);

size_t HMAC_size(const HMAC_CTX *e);

```

The following function has been deprecated since OpenSSL 1.1.0, and can be hidden entirely by defining `OPENSSL_API_COMPAT` with a suitable version value, see `openssl_user_macros(7)`:

```

int HMAC_Init(HMAC_CTX *ctx, const void *key, int key_len,
              const EVP_MD *md);

```

## DESCRIPTION

HMAC is a MAC (message authentication code), i.e. a keyed hash function used for message authentication, which is based on a hash function.

HMAC() computes the message authentication code of the `data_len` bytes at `data` using the hash function `evp_md` and the key `key` which is `key_len` bytes long. The key may also be NULL with `key_len` being 0.

It places the result in `md` (which must have space for the output of the hash function, which is no more than `EVP_MAX_MD_SIZE` bytes). If `md` is NULL, the digest is placed in a static array. The size of the output is placed in `md_len`, unless it is NULL. Note: passing a NULL value for `md` to use the static array is not thread safe.

evp\_md is a message digest such as EVP\_sha1(), EVP\_ripemd160() etc.

HMAC does not support variable output length digests such as

EVP\_shake128() and EVP\_shake256().

All of the functions described below are deprecated. Applications should instead use EVP\_MAC\_CTX\_new(3), EVP\_MAC\_CTX\_free(3), EVP\_MAC\_init(3), EVP\_MAC\_update(3) and EVP\_MAC\_final(3) or the 'quick' single-shot MAC function EVP\_Q\_mac(3).

HMAC\_CTX\_new() creates a new HMAC\_CTX in heap memory.

HMAC\_CTX\_reset() clears an existing HMAC\_CTX and associated resources, making it suitable for new computations as if it was newly created with HMAC\_CTX\_new().

HMAC\_CTX\_free() erases the key and other data from the HMAC\_CTX, releases any associated resources and finally frees the HMAC\_CTX itself.

The following functions may be used if the message is not completely stored in memory:

HMAC\_Init\_ex() initializes or reuses a HMAC\_CTX structure to use the hash function evp\_md and key key. If both are NULL, or if key is NULL and evp\_md is the same as the previous call, then the existing key is reused. ctx must have been created with HMAC\_CTX\_new() before the first use of an HMAC\_CTX in this function.

If HMAC\_Init\_ex() is called with key NULL and evp\_md is not the same as the previous digest used by ctx then an error is returned because reuse of an existing key with a different digest is not supported.

HMAC\_Init() initializes a HMAC\_CTX structure to use the hash function

evp\_md and the key key which is key\_len bytes long.

HMAC\_Update() can be called repeatedly with chunks of the message to be authenticated (len bytes at data).

HMAC\_Final() places the message authentication code in md, which must have space for the hash function output.

HMAC\_CTX\_copy() copies all of the internal state from sctx into dctx.

HMAC\_CTX\_set\_flags() applies the specified flags to the internal EVP\_MD\_CTXs. These flags have the same meaning as for EVP\_MD\_CTX\_set\_flags(3).

HMAC\_CTX\_get\_md() returns the EVP\_MD that has previously been set for the supplied HMAC\_CTX.

HMAC\_size() returns the length in bytes of the underlying hash function output.

## RETURN VALUES

HMAC() returns a pointer to the message authentication code or NULL if an error occurred.

HMAC\_CTX\_new() returns a pointer to a new HMAC\_CTX on success or NULL if an error occurred.

HMAC\_CTX\_reset(), HMAC\_Init\_ex(), HMAC\_Update(), HMAC\_Final() and HMAC\_CTX\_copy() return 1 for success or 0 if an error occurred.

HMAC\_CTX\_get\_md() return the EVP\_MD previously set for the supplied HMAC\_CTX or NULL if no EVP\_MD has been set.

HMAC\_size() returns the length in bytes of the underlying hash function output or zero on error.

## CONFORMING TO

RFC 2104

## SEE ALSO

SHA1(3), EVP\_Q\_mac(3), evp(7)

## HISTORY

All functions except for HMAC() were deprecated in OpenSSL 3.0.

HMAC\_CTX\_init() was replaced with HMAC\_CTX\_reset() in OpenSSL 1.1.0.

HMAC\_CTX\_cleanup() existed in OpenSSL before version 1.1.0.

HMAC\_CTX\_new(), HMAC\_CTX\_free() and HMAC\_CTX\_get\_md() are new in OpenSSL 1.1.0.

HMAC\_Init\_ex(), HMAC\_Update() and HMAC\_Final() did not return values in OpenSSL before version 1.0.0.

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