

**NAME**

MD2, MD4, MD5, MD2\_Init, MD2\_Update, MD2\_Final, MD4\_Init, MD4\_Update, MD4\_Final, MD5\_Init, MD5\_Update, MD5\_Final - MD2, MD4, and MD5 hash functions

**SYNOPSIS**

```
#include <openssl/md2.h>
```

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)**:

```
unsigned char *MD2(const unsigned char *d, unsigned long n, unsigned char *md);
```

```
int MD2_Init(MD2_CTX *c);
```

```
int MD2_Update(MD2_CTX *c, const unsigned char *data, unsigned long len);
```

```
int MD2_Final(unsigned char *md, MD2_CTX *c);
```

```
#include <openssl/md4.h>
```

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)**:

```
unsigned char *MD4(const unsigned char *d, unsigned long n, unsigned char *md);
```

```
int MD4_Init(MD4_CTX *c);
```

```
int MD4_Update(MD4_CTX *c, const void *data, unsigned long len);
```

```
int MD4_Final(unsigned char *md, MD4_CTX *c);
```

```
#include <openssl/md5.h>
```

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)**:

```
unsigned char *MD5(const unsigned char *d, unsigned long n, unsigned char *md);
```

```
int MD5_Init(MD5_CTX *c);
```

```
int MD5_Update(MD5_CTX *c, const void *data, unsigned long len);
```

```
int MD5_Final(unsigned char *md, MD5_CTX *c);
```

**DESCRIPTION**

All of the functions described on this page are deprecated. Applications should instead use **EVP\_DigestInit\_ex(3)**, **EVP\_DigestUpdate(3)** and **EVP\_DigestFinal\_ex(3)**.

MD2, MD4, and MD5 are cryptographic hash functions with a 128 bit output.

**MD2()**, **MD4()**, and **MD5()** compute the MD2, MD4, and MD5 message digest of the **n** bytes at **d** and place it in **md** (which must have space for MD2\_DIGEST\_LENGTH == MD4\_DIGEST\_LENGTH == MD5\_DIGEST\_LENGTH == 16 bytes of output). If **md** is NULL, the digest is placed in a static array.

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

**MD2\_Init()** initializes a **MD2\_CTX** structure.

**MD2\_Update()** can be called repeatedly with chunks of the message to be hashed (**len** bytes at **data**).

**MD2\_Final()** places the message digest in **md**, which must have space for MD2\_DIGEST\_LENGTH == 16 bytes of output, and erases the **MD2\_CTX**.

**MD4\_Init()**, **MD4\_Update()**, **MD4\_Final()**, **MD5\_Init()**, **MD5\_Update()**, and **MD5\_Final()** are analogous using an **MD4\_CTX** and **MD5\_CTX** structure.

Applications should use the higher level functions **EVP\_DigestInit(3)** etc. instead of calling the hash functions directly.

**NOTE**

MD2, MD4, and MD5 are recommended only for compatibility with existing applications. In new applications, hashes from the SHA-2 or SHA-3 family should be preferred.

**RETURN VALUES**

**MD2()**, **MD4()**, and **MD5()** return pointers to the hash value.

**MD2\_Init()**, **MD2\_Update()**, **MD2\_Final()**, **MD4\_Init()**, **MD4\_Update()**, **MD4\_Final()**, **MD5\_Init()**, **MD5\_Update()**, and **MD5\_Final()** return 1 for success, 0 otherwise.

**CONFORMING TO**

RFC 1319, RFC 1320, RFC 1321

**SEE ALSO**

**EVP\_DigestInit(3)**, **EVP\_MD-SHA2(7)**, **EVP\_MD-SHA3(7)**

**HISTORY**

All of these functions were deprecated in OpenSSL 3.0.

**COPYRIGHT**

Copyright 2000-2023 The OpenSSL Project Authors. All Rights Reserved.

Licensed under the Apache License 2.0 (the "License"). You may not use this file except in compliance with the License. You can obtain a copy in the file LICENSE in the source distribution or at <https://www.openssl.org/source/license.html>.