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## **Red Hat Enterprise Linux Release 9.2 Manual Pages on 'SHA1\_Final.3oss1' command**

**\$ man SHA1\_Final.3oss1**

SHA256\_INIT(3oss1)            OpenSSL            SHA256\_INIT(3oss1)

### NAME

SHA1, SHA1\_Init, SHA1\_Update, SHA1\_Final, SHA224, SHA224\_Init, SHA224\_Update, SHA224\_Final, SHA256, SHA256\_Init, SHA256\_Update, SHA256\_Final, SHA384, SHA384\_Init, SHA384\_Update, SHA384\_Final, SHA512, SHA512\_Init, SHA512\_Update, SHA512\_Final - Secure Hash Algorithm

### SYNOPSIS

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

```
unsigned char *SHA1(const unsigned char *data, size_t count, unsigned char *md_buf);  
unsigned char *SHA224(const unsigned char *data, size_t count, unsigned char *md_buf);  
unsigned char *SHA256(const unsigned char *data, size_t count, unsigned char *md_buf);  
unsigned char *SHA384(const unsigned char *data, size_t count, unsigned char *md_buf);  
unsigned char *SHA512(const unsigned char *data, size_t count, unsigned char *md_buf);
```

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):

```
int SHA1_Init(SHA_CTX *c);  
int SHA1_Update(SHA_CTX *c, const void *data, size_t len);
```

```
int SHA1_Final(unsigned char *md, SHA_CTX *c);
```

```
int SHA224_Init(SHA256_CTX *c);
```

```
int SHA224_Update(SHA256_CTX *c, const void *data, size_t len);
```

```
int SHA224_Final(unsigned char *md, SHA256_CTX *c);
```

```
int SHA256_Init(SHA256_CTX *c);
```

```
int SHA256_Update(SHA256_CTX *c, const void *data, size_t len);
```

```
int SHA256_Final(unsigned char *md, SHA256_CTX *c);
```

```
int SHA384_Init(SHA512_CTX *c);
```

```
int SHA384_Update(SHA512_CTX *c, const void *data, size_t len);
```

```
int SHA384_Final(unsigned char *md, SHA512_CTX *c);
```

```
int SHA512_Init(SHA512_CTX *c);
```

```
int SHA512_Update(SHA512_CTX *c, const void *data, size_t len);
```

```
int SHA512_Final(unsigned char *md, SHA512_CTX *c);
```

## DESCRIPTION

All of the functions described on this page except for SHA1(), SHA224(), SHA256(), SHA384() and SHA512() are deprecated. Applications should instead use EVP\_DigestInit\_ex(3), EVP\_DigestUpdate(3) and EVP\_DigestFinal\_ex(3), or the quick one-shot function EVP\_Q\_digest(3). SHA1(), SHA224(), SHA256(), SHA384(), and SHA512() can continue to be used. They can also be replaced by, e.g.,

```
(EVP_Q_digest(d, n, md, NULL, NULL, "SHA256", NULL) ? md : NULL)
```

SHA-1 (Secure Hash Algorithm) is a cryptographic hash function with a 160 bit output.

SHA1() computes the SHA-1 message digest of the n bytes at d and places it in md (which must have space for SHA\_DIGEST\_LENGTH == 20 bytes of

output). If md is NULL, the digest is placed in a static array. Note:  
setting md to NULL is not thread safe.

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

SHA1\_Init() initializes a SHA\_CTX structure.

SHA1\_Update() can be called repeatedly with chunks of the message to be  
hashed (len bytes at data).

SHA1\_Final() places the message digest in md, which must have space for  
SHA\_DIGEST\_LENGTH == 20 bytes of output, and erases the SHA\_CTX.

The SHA224, SHA256, SHA384 and SHA512 families of functions operate in  
the same way as for the SHA1 functions. Note that SHA224 and SHA256 use  
a SHA256\_CTX object instead of SHA\_CTX. SHA384 and SHA512 use  
SHA512\_CTX. The buffer md must have space for the output from the SHA  
variant being used (defined by SHA224\_DIGEST\_LENGTH,  
SHA256\_DIGEST\_LENGTH, SHA384\_DIGEST\_LENGTH and SHA512\_DIGEST\_LENGTH).  
Also note that, as for the SHA1() function above, the SHA224(),  
SHA256(), SHA384() and SHA512() functions are not thread safe if md is  
NULL.

## RETURN VALUES

SHA1(), SHA224(), SHA256(), SHA384() and SHA512() return a pointer to  
the hash value.

SHA1\_Init(), SHA1\_Update() and SHA1\_Final() and equivalent SHA224,  
SHA256, SHA384 and SHA512 functions return 1 for success, 0 otherwise.

## CONFORMING TO

US Federal Information Processing Standard FIPS PUB 180-4 (Secure Hash

Standard), ANSI X9.30

## SEE ALSO

EVP\_Q\_digest(3), EVP\_DigestInit(3)

## HISTORY

All of these functions except SHA\*() were deprecated in OpenSSL 3.0.

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