



## **Red Hat Enterprise Linux Release 9.2 Manual Pages on 'EVP\_aes\_256\_wrap\_pad.3oss1' command**

**`$ man EVP_aes_256_wrap_pad.3oss1`**

EVP\_AES\_128\_GCM(3oss1)      OpenSSL      EVP\_AES\_128\_GCM(3oss1)

### NAME

EVP\_aes\_128\_cbc, EVP\_aes\_192\_cbc, EVP\_aes\_256\_cbc, EVP\_aes\_128\_cfb,  
EVP\_aes\_192\_cfb, EVP\_aes\_256\_cfb, EVP\_aes\_128\_cfb1, EVP\_aes\_192\_cfb1,  
EVP\_aes\_256\_cfb1, EVP\_aes\_128\_cfb8, EVP\_aes\_192\_cfb8, EVP\_aes\_256\_cfb8,  
EVP\_aes\_128\_cfb128, EVP\_aes\_192\_cfb128, EVP\_aes\_256\_cfb128,  
EVP\_aes\_128\_ctr, EVP\_aes\_192\_ctr, EVP\_aes\_256\_ctr, EVP\_aes\_128\_ecb,  
EVP\_aes\_192\_ecb, EVP\_aes\_256\_ecb, EVP\_aes\_128\_ofb, EVP\_aes\_192\_ofb,  
EVP\_aes\_256\_ofb, EVP\_aes\_128\_cbc\_hmac\_sha1, EVP\_aes\_256\_cbc\_hmac\_sha1,  
EVP\_aes\_128\_cbc\_hmac\_sha256, EVP\_aes\_256\_cbc\_hmac\_sha256,  
EVP\_aes\_128\_ccm, EVP\_aes\_192\_ccm, EVP\_aes\_256\_ccm, EVP\_aes\_128\_gcm,  
EVP\_aes\_192\_gcm, EVP\_aes\_256\_gcm, EVP\_aes\_128\_ocb, EVP\_aes\_192\_ocb,  
EVP\_aes\_256\_ocb, EVP\_aes\_128\_wrap, EVP\_aes\_192\_wrap, EVP\_aes\_256\_wrap,  
EVP\_aes\_128\_wrap\_pad, EVP\_aes\_192\_wrap\_pad, EVP\_aes\_256\_wrap\_pad,  
EVP\_aes\_128\_xts, EVP\_aes\_256\_xts - EVP AES cipher

### SYNOPSIS

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

```
const EVP_CIPHER *EVP_ciphertype(void)
```

EVP\_ciphertype is used a placeholder for any of the described cipher

functions, such as `EVP_aes_128_cbc`.

## DESCRIPTION

The AES encryption algorithm for EVP.

`EVP_aes_128_cbc()`, `EVP_aes_192_cbc()`, `EVP_aes_256_cbc()`,  
`EVP_aes_128_cfb()`, `EVP_aes_192_cfb()`, `EVP_aes_256_cfb()`,  
`EVP_aes_128_cfb1()`, `EVP_aes_192_cfb1()`, `EVP_aes_256_cfb1()`,  
`EVP_aes_128_cfb8()`, `EVP_aes_192_cfb8()`, `EVP_aes_256_cfb8()`,  
`EVP_aes_128_cfb128()`, `EVP_aes_192_cfb128()`, `EVP_aes_256_cfb128()`,  
`EVP_aes_128_ctr()`, `EVP_aes_192_ctr()`, `EVP_aes_256_ctr()`,  
`EVP_aes_128_ecb()`, `EVP_aes_192_ecb()`, `EVP_aes_256_ecb()`,  
`EVP_aes_128_ofb()`, `EVP_aes_192_ofb()`, `EVP_aes_256_ofb()`

AES for 128, 192 and 256 bit keys in the following modes: CBC, CFB with 128-bit shift, CFB with 1-bit shift, CFB with 8-bit shift, CTR, ECB, and OFB.

`EVP_aes_128_cbc_hmac_sha1()`, `EVP_aes_256_cbc_hmac_sha1()`

Authenticated encryption with AES in CBC mode using SHA-1 as HMAC, with keys of 128 and 256 bits length respectively. The authentication tag is 160 bits long.

WARNING: this is not intended for usage outside of TLS and requires calling of some undocumented ctrl functions. These ciphers do not conform to the EVP AEAD interface.

`EVP_aes_128_cbc_hmac_sha256()`, `EVP_aes_256_cbc_hmac_sha256()`

Authenticated encryption with AES in CBC mode using SHA256 (SHA-2, 256-bits) as HMAC, with keys of 128 and 256 bits length respectively. The authentication tag is 256 bits long.

WARNING: this is not intended for usage outside of TLS and requires calling of some undocumented ctrl functions. These ciphers do not

conform to the EVP AEAD interface.

EVP\_aes\_128\_ccm(), EVP\_aes\_192\_ccm(), EVP\_aes\_256\_ccm(),  
EVP\_aes\_128\_gcm(), EVP\_aes\_192\_gcm(), EVP\_aes\_256\_gcm(),  
EVP\_aes\_128\_ocb(), EVP\_aes\_192\_ocb(), EVP\_aes\_256\_ocb()

AES for 128, 192 and 256 bit keys in CBC-MAC Mode (CCM), Galois Counter Mode (GCM) and OCB Mode respectively. These ciphers require additional control operations to function correctly, see the "AEAD Interface" in EVP\_EncryptInit(3) section for details.

EVP\_aes\_128\_wrap(), EVP\_aes\_192\_wrap(), EVP\_aes\_256\_wrap(),  
EVP\_aes\_128\_wrap\_pad(), EVP\_aes\_192\_wrap(), EVP\_aes\_192\_wrap(),  
EVP\_aes\_256\_wrap(), EVP\_aes\_192\_wrap\_pad(), EVP\_aes\_128\_wrap(),  
EVP\_aes\_192\_wrap(), EVP\_aes\_256\_wrap(), EVP\_aes\_256\_wrap\_pad()

AES key wrap with 128, 192 and 256 bit keys, as according to RFC 3394 section 2.2.1 ("wrap") and RFC 5649 section 4.1 ("wrap with padding") respectively.

EVP\_aes\_128\_xts(), EVP\_aes\_256\_xts()

AES XTS mode (XTS-AES) is standardized in IEEE Std. 1619-2007 and described in NIST SP 800-38E. The XTS (XEX-based tweaked-codebook mode with ciphertext stealing) mode was designed by Prof. Phillip Rogaway of University of California, Davis, intended for encrypting data on a storage device.

XTS-AES provides confidentiality but not authentication of data. It also requires a key of double-length for protection of a certain key size. In particular, XTS-AES-128 (EVP\_aes\_128\_xts) takes input of a 256-bit key to achieve AES 128-bit security, and XTS-AES-256 (EVP\_aes\_256\_xts) takes input of a 512-bit key to achieve AES 256-bit security.

The XTS implementation in OpenSSL does not support streaming. That

is there must only be one `EVP_EncryptUpdate(3)` call per `EVP_EncryptInit_ex(3)` call (and similarly with the "Decrypt" functions).

The `iv` parameter to `EVP_EncryptInit_ex(3)` or `EVP_DecryptInit_ex(3)` is the XTS "tweak" value.

## RETURN VALUES

These functions return an `EVP_CIPHER` structure that contains the implementation of the symmetric cipher. See `EVP_CIPHER_meth_new(3)` for details of the `EVP_CIPHER` structure.

## SEE ALSO

`evp(7)`, `EVP_EncryptInit(3)`, `EVP_CIPHER_meth_new(3)`

## COPYRIGHT

Copyright 2017-2020 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>.

3.0.7                    2023-07-13            `EVP_AES_128_GCM(3oss)`