

NAME

BN_bn2binpad, BN_bn2bin, BN_bin2bn, BN_bn2lebinpad, BN_lebin2bn, BN_bn2nativepad, BN_native2bn, BN_bn2hex, BN_bn2dec, BN_hex2bn, BN_dec2bn, BN_print, BN_print_fp, BN_bn2mpi, BN_mpi2bn - format conversions

SYNOPSIS

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

```
int BN_bn2bin(const BIGNUM *a, unsigned char *to);
int BN_bn2binpad(const BIGNUM *a, unsigned char *to, int tolen);
BIGNUM *BN_bin2bn(const unsigned char *s, int len, BIGNUM *ret);

int BN_bn2lebinpad(const BIGNUM *a, unsigned char *to, int tolen);
BIGNUM *BN_lebin2bn(const unsigned char *s, int len, BIGNUM *ret);

int BN_bn2nativepad(const BIGNUM *a, unsigned char *to, int tolen);
BIGNUM *BN_native2bn(const unsigned char *s, int len, BIGNUM *ret);

char *BN_bn2hex(const BIGNUM *a);
char *BN_bn2dec(const BIGNUM *a);
int BN_hex2bn(BIGNUM **a, const char *str);
int BN_dec2bn(BIGNUM **a, const char *str);

int BN_print(BIO *fp, const BIGNUM *a);
int BN_print_fp(FILE *fp, const BIGNUM *a);

int BN_bn2mpi(const BIGNUM *a, unsigned char *to);
BIGNUM *BN_mpi2bn(unsigned char *s, int len, BIGNUM *ret);
```

DESCRIPTION

BN_bn2bin() converts the absolute value of **a** into big-endian form and stores it at **to**. **to** must point to `BN_num_bytes(a)` bytes of memory.

BN_bn2binpad() also converts the absolute value of **a** into big-endian form and stores it at **to**. **tolen** indicates the length of the output buffer **to**. The result is padded with zeros if necessary. If **tolen** is less than `BN_num_bytes(a)` an error is returned.

BN_bin2bn() converts the positive integer in big-endian form of length **len** at **s** into a **BIGNUM** and places it in **ret**. If **ret** is NULL, a new **BIGNUM** is created.

BN_bn2lebinpad() and **BN_lebin2bn()** are identical to **BN_bn2binpad()** and **BN_bin2bn()** except the buffer is in little-endian format.

BN_bn2nativepad() and **BN_native2bn()** are identical to **BN_bn2binpad()** and **BN_bin2bn()** except the buffer is in native format, i.e. most significant byte first on big-endian platforms, and least significant byte first on little-endian platforms.

BN_bn2hex() and **BN_bn2dec()** return printable strings containing the hexadecimal and decimal encoding of **a** respectively. For negative numbers, the string is prefaced with a leading '-'. The string must be freed later using **OPENSSL_free()**.

BN_hex2bn() takes as many characters as possible from the string **str**, including the leading character '-' which means negative, to form a valid hexadecimal number representation and converts them to a **BIGNUM** and stores it in ****a**. If ***a** is NULL, a new **BIGNUM** is created. If **a** is NULL, it only computes the length of valid representation. A "negative zero" is converted to zero. **BN_dec2bn()** is the same using the decimal system.

BN_print() and **BN_print_fp()** write the hexadecimal encoding of **a**, with a leading '-' for negative numbers, to the **BIO** or **FILE fp**.

BN_bn2mpi() and **BN_mpi2bn()** convert **BIGNUM**s from and to a format that consists of the number's length in bytes represented as a 4-byte big-endian number, and the number itself in big-endian format, where the most significant bit signals a negative number (the representation of numbers with the MSB set is prefixed with null byte).

BN_bn2mpi() stores the representation of **a** at **to**, where **to** must be large enough to hold the result. The size can be determined by calling **BN_bn2mpi(a, NULL)**.

BN_mpi2bn() converts the **len** bytes long representation at **s** to a **BIGNUM** and stores it at **ret**, or in a newly allocated **BIGNUM** if **ret** is NULL.

RETURN VALUES

BN_bn2bin() returns the length of the big-endian number placed at **to**. **BN_bin2bn()** returns the **BIGNUM**, NULL on error.

BN_bn2binpad(), **BN_bn2lebinpad()**, and **BN_bn2nativepad()** return the number of bytes written or -1 if the supplied buffer is too small.

BN_bn2hex() and **BN_bn2dec()** return a NUL-terminated string, or NULL on error. **BN_hex2bn()** and **BN_dec2bn()** return the number of characters used in parsing, or 0 on error, in which case no new

BIGNUM will be created.

BN_print_fp() and **BN_print()** return 1 on success, 0 on write errors.

BN_bn2mpi() returns the length of the representation. **BN_mpi2bn()** returns the **BIGNUM**, and **NULL** on error.

The error codes can be obtained by **ERR_get_error(3)**.

SEE ALSO

ERR_get_error(3), **BN_zero(3)**, **ASN1_INTEGER_to_BN(3)**, **BN_num_bytes(3)**

COPYRIGHT

Copyright 2000-2021 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>.