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## ***Red Hat Enterprise Linux Release 9.2 Manual Pages on 'BN\_lshift1.3ossl' command***

***\$ man BN\_lshift1.3ossl***

BN\_SET\_BIT(3ossl)            OpenSSL            BN\_SET\_BIT(3ossl)

### NAME

BN\_set\_bit, BN\_clear\_bit, BN\_is\_bit\_set, BN\_mask\_bits, BN\_lshift,  
BN\_lshift1, BN\_rshift, BN\_rshift1 - bit operations on BIGNUMs

### SYNOPSIS

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

```
int BN_set_bit(BIGNUM *a, int n);
```

```
int BN_clear_bit(BIGNUM *a, int n);
```

```
int BN_is_bit_set(const BIGNUM *a, int n);
```

```
int BN_mask_bits(BIGNUM *a, int n);
```

```
int BN_lshift(BIGNUM *r, const BIGNUM *a, int n);
```

```
int BN_lshift1(BIGNUM *r, BIGNUM *a);
```

```
int BN_rshift(BIGNUM *r, BIGNUM *a, int n);
```

```
int BN_rshift1(BIGNUM *r, BIGNUM *a);
```

### DESCRIPTION

`BN_set_bit()` sets bit  $n$  in  $a$  to 1 (" $a|=(1<<n)$ "). The number is expanded if necessary.

`BN_clear_bit()` sets bit  $n$  in  $a$  to 0 (" $a&=~(1<<n)$ "). An error occurs if  $a$  is shorter than  $n$  bits.

`BN_is_bit_set()` tests if bit  $n$  in  $a$  is set.

`BN_mask_bits()` truncates  $a$  to an  $n$  bit number (" $a&=~((~0)<<n)$ "). An error occurs if  $a$  already is shorter than  $n$  bits.

`BN_lshift()` shifts  $a$  left by  $n$  bits and places the result in  $r$  (" $r=a*2^n$ "). Note that  $n$  must be nonnegative. `BN_lshift1()` shifts  $a$  left by one and places the result in  $r$  (" $r=2*a$ ").

`BN_rshift()` shifts  $a$  right by  $n$  bits and places the result in  $r$  (" $r=a/2^n$ "). Note that  $n$  must be nonnegative. `BN_rshift1()` shifts  $a$  right by one and places the result in  $r$  (" $r=a/2$ ").

For the shift functions,  $r$  and  $a$  may be the same variable.

## RETURN VALUES

`BN_is_bit_set()` returns 1 if the bit is set, 0 otherwise.

All other functions return 1 for success, 0 on error. The error codes can be obtained by `ERR_get_error(3)`.

## SEE ALSO

`BN_num_bytes(3)`, `BN_add(3)`

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