

**NAME**

X509\_LOOKUP\_METHOD, X509\_LOOKUP\_meth\_new, X509\_LOOKUP\_meth\_free,  
 X509\_LOOKUP\_meth\_set\_new\_item, X509\_LOOKUP\_meth\_get\_new\_item,  
 X509\_LOOKUP\_meth\_set\_free, X509\_LOOKUP\_meth\_get\_free, X509\_LOOKUP\_meth\_set\_init,  
 X509\_LOOKUP\_meth\_get\_init, X509\_LOOKUP\_meth\_set\_shutdown,  
 X509\_LOOKUP\_meth\_get\_shutdown, X509\_LOOKUP\_ctrl\_fn, X509\_LOOKUP\_meth\_set\_ctrl,  
 X509\_LOOKUP\_meth\_get\_ctrl, X509\_LOOKUP\_get\_by\_subject\_fn,  
 X509\_LOOKUP\_meth\_set\_get\_by\_subject, X509\_LOOKUP\_meth\_get\_get\_by\_subject,  
 X509\_LOOKUP\_get\_by\_issuer\_serial\_fn, X509\_LOOKUP\_meth\_set\_get\_by\_issuer\_serial,  
 X509\_LOOKUP\_meth\_get\_get\_by\_issuer\_serial, X509\_LOOKUP\_get\_by\_fingerprint\_fn,  
 X509\_LOOKUP\_meth\_set\_get\_by\_fingerprint, X509\_LOOKUP\_meth\_get\_get\_by\_fingerprint,  
 X509\_LOOKUP\_get\_by\_alias\_fn, X509\_LOOKUP\_meth\_set\_get\_by\_alias,  
 X509\_LOOKUP\_meth\_get\_get\_by\_alias, X509\_OBJECT\_set1\_X509,  
 X509\_OBJECT\_set1\_X509\_CRL - Routines to build up X509\_LOOKUP methods

**SYNOPSIS**

```
#include <openssl/x509_vfy.h>
```

```
typedef x509_lookup_method_st X509_LOOKUP_METHOD;
```

```
X509_LOOKUP_METHOD *X509_LOOKUP_meth_new(const char *name);
```

```
void X509_LOOKUP_meth_free(X509_LOOKUP_METHOD *method);
```

```
int X509_LOOKUP_meth_set_new_item(X509_LOOKUP_METHOD *method,  
                                  int (*new_item) (X509_LOOKUP *ctx));
```

```
int (*X509_LOOKUP_meth_get_new_item(const X509_LOOKUP_METHOD* method))  
    (X509_LOOKUP *ctx);
```

```
int X509_LOOKUP_meth_set_free(X509_LOOKUP_METHOD *method,  
                              void (*free) (X509_LOOKUP *ctx));
```

```
void (*X509_LOOKUP_meth_get_free(const X509_LOOKUP_METHOD* method))  
    (X509_LOOKUP *ctx);
```

```
int X509_LOOKUP_meth_set_init(X509_LOOKUP_METHOD *method,  
                              int (*init) (X509_LOOKUP *ctx));
```

```
int (*X509_LOOKUP_meth_get_init(const X509_LOOKUP_METHOD* method))  
    (X509_LOOKUP *ctx);
```

```
int X509_LOOKUP_meth_set_shutdown(X509_LOOKUP_METHOD *method,  
                                  int (*shutdown) (X509_LOOKUP *ctx));
```

```
int (*X509_LOOKUP_meth_get_shutdown(const X509_LOOKUP_METHOD* method))
    (X509_LOOKUP *ctx);

typedef int (*X509_LOOKUP_ctrl_fn)(X509_LOOKUP *ctx, int cmd, const char *argc,
    long argl, char **ret);
int X509_LOOKUP_meth_set_ctrl(X509_LOOKUP_METHOD *method,
    X509_LOOKUP_ctrl_fn ctrl_fn);
X509_LOOKUP_ctrl_fn X509_LOOKUP_meth_get_ctrl(const X509_LOOKUP_METHOD *method);

typedef int (*X509_LOOKUP_get_by_subject_fn)(X509_LOOKUP *ctx,
    X509_LOOKUP_TYPE type,
    const X509_NAME *name,
    X509_OBJECT *ret);
int X509_LOOKUP_meth_set_get_by_subject(X509_LOOKUP_METHOD *method,
    X509_LOOKUP_get_by_subject_fn fn);
X509_LOOKUP_get_by_subject_fn X509_LOOKUP_meth_get_get_by_subject(
    const X509_LOOKUP_METHOD *method);

typedef int (*X509_LOOKUP_get_by_issuer_serial_fn)(X509_LOOKUP *ctx,
    X509_LOOKUP_TYPE type,
    const X509_NAME *name,
    const ASN1_INTEGER *serial,
    X509_OBJECT *ret);
int X509_LOOKUP_meth_set_get_by_issuer_serial(
    X509_LOOKUP_METHOD *method, X509_LOOKUP_get_by_issuer_serial_fn fn);
X509_LOOKUP_get_by_issuer_serial_fn X509_LOOKUP_meth_get_get_by_issuer_serial(
    const X509_LOOKUP_METHOD *method);

typedef int (*X509_LOOKUP_get_by_fingerprint_fn)(X509_LOOKUP *ctx,
    X509_LOOKUP_TYPE type,
    const unsigned char* bytes,
    int len,
    X509_OBJECT *ret);
int X509_LOOKUP_meth_set_get_by_fingerprint(X509_LOOKUP_METHOD *method,
    X509_LOOKUP_get_by_fingerprint_fn fn);
X509_LOOKUP_get_by_fingerprint_fn X509_LOOKUP_meth_get_get_by_fingerprint(
    const X509_LOOKUP_METHOD *method);

typedef int (*X509_LOOKUP_get_by_alias_fn)(X509_LOOKUP *ctx,
    X509_LOOKUP_TYPE type,
```

```

        const char *str,
        int len,
        X509_OBJECT *ret);
int X509_LOOKUP_meth_set_get_by_alias(X509_LOOKUP_METHOD *method,
    X509_LOOKUP_get_by_alias_fn fn);
X509_LOOKUP_get_by_alias_fn X509_LOOKUP_meth_get_get_by_alias(
    const X509_LOOKUP_METHOD *method);

int X509_OBJECT_set1_X509(X509_OBJECT *a, X509 *obj);
int X509_OBJECT_set1_X509_CRL(X509_OBJECT *a, X509_CRL *obj);

```

## DESCRIPTION

The **X509\_LOOKUP\_METHOD** type is a structure used for the implementation of new X509\_LOOKUP types. It provides a set of functions used by OpenSSL for the implementation of various X509 and X509\_CRL lookup capabilities. One instance of an X509\_LOOKUP\_METHOD can be associated to many instantiations of an **X509\_LOOKUP** structure.

**X509\_LOOKUP\_meth\_new()** creates a new **X509\_LOOKUP\_METHOD** structure. It should be given a human-readable string containing a brief description of the lookup method.

**X509\_LOOKUP\_meth\_free()** destroys a **X509\_LOOKUP\_METHOD** structure.

**X509\_LOOKUP\_get\_new\_item()** and **X509\_LOOKUP\_set\_new\_item()** get and set the function that is called when an **X509\_LOOKUP** object is created with **X509\_LOOKUP\_new()**. If an X509\_LOOKUP\_METHOD requires any per-X509\_LOOKUP specific data, the supplied new\_item function should allocate this data and invoke **X509\_LOOKUP\_set\_method\_data(3)**.

**X509\_LOOKUP\_get\_free()** and **X509\_LOOKUP\_set\_free()** get and set the function that is used to free any method data that was allocated and set from within new\_item function.

**X509\_LOOKUP\_meth\_get\_init()** and **X509\_LOOKUP\_meth\_set\_init()** get and set the function that is used to initialize the method data that was set with **X509\_LOOKUP\_set\_method\_data(3)** as part of the new\_item routine.

**X509\_LOOKUP\_meth\_get\_shutdown()** and **X509\_LOOKUP\_meth\_set\_shutdown()** get and set the function that is used to shut down the method data whose state was previously initialized in the init function.

**X509\_LOOKUP\_meth\_get\_ctrl()** and **X509\_LOOKUP\_meth\_set\_ctrl()** get and set a function to be used to handle arbitrary control commands issued by **X509\_LOOKUP\_ctrl()**. The control function is

given the `X509_LOOKUP ctx`, along with the arguments passed by `X509_LOOKUP_ctrl`. `cmd` is an arbitrary integer that defines some operation. `argc` is a pointer to an array of characters. `argl` is an integer. `ret`, if set, points to a location where any return data should be written to. How `argc` and `argl` are used depends entirely on the control function.

`X509_LOOKUP_set_get_by_subject()`, `X509_LOOKUP_set_get_by_issuer_serial()`, `X509_LOOKUP_set_get_by_fingerprint()`, `X509_LOOKUP_set_get_by_alias()` set the functions used to retrieve an X509 or X509\_CRL object by the object's subject, issuer, fingerprint, and alias respectively. These functions are given the `X509_LOOKUP` context, the type of the `X509_OBJECT` being requested, parameters related to the lookup, and an `X509_OBJECT` that will receive the requested object.

Implementations must add objects they find to the `X509_STORE` object using `X509_STORE_add_cert()` or `X509_STORE_add_crl()`. This increments its reference count. However, the `X509_STORE_CTX_get_by_subject()` function also increases the reference count which leads to one too many references being held. Therefore, applications should additionally call `X509_free()` or `X509_CRL_free()` to decrement the reference count again.

Implementations should also use either `X509_OBJECT_set1_X509()` or `X509_OBJECT_set1_X509_CRL()` to set the result. Note that this also increments the result's reference count.

Any method data that was created as a result of the `new_item` function set by `X509_LOOKUP_meth_set_new_item()` can be accessed with `X509_LOOKUP_get_method_data(3)`. The `X509_STORE` object that owns the `X509_LOOKUP` may be accessed with `X509_LOOKUP_get_store(3)`. Successful lookups should return 1, and unsuccessful lookups should return 0.

`X509_LOOKUP_get_get_by_subject()`, `X509_LOOKUP_get_get_by_issuer_serial()`, `X509_LOOKUP_get_get_by_fingerprint()`, `X509_LOOKUP_get_get_by_alias()` retrieve the function set by the corresponding setter.

## RETURN VALUES

The `X509_LOOKUP_meth_set` functions return 1 on success or 0 on error.

The `X509_LOOKUP_meth_get` functions return the corresponding function pointers.

## SEE ALSO

`X509_STORE_new(3)`, `SSL_CTX_set_cert_store(3)`

**HISTORY**

The functions described here were added in OpenSSL 1.1.0i.

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