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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