

**NAME**

X509\_LOOKUP, X509\_LOOKUP\_TYPE, X509\_LOOKUP\_new, X509\_LOOKUP\_free, X509\_LOOKUP\_init, X509\_LOOKUP\_shutdown, X509\_LOOKUP\_set\_method\_data, X509\_LOOKUP\_get\_method\_data, X509\_LOOKUP\_ctrl\_ex, X509\_LOOKUP\_ctrl, X509\_LOOKUP\_load\_file\_ex, X509\_LOOKUP\_load\_file, X509\_LOOKUP\_add\_dir, X509\_LOOKUP\_add\_store\_ex, X509\_LOOKUP\_add\_store, X509\_LOOKUP\_load\_store\_ex, X509\_LOOKUP\_load\_store, X509\_LOOKUP\_get\_store, X509\_LOOKUP\_by\_subject\_ex, X509\_LOOKUP\_by\_subject, X509\_LOOKUP\_by\_issuer\_serial, X509\_LOOKUP\_by\_fingerprint, X509\_LOOKUP\_by\_alias - OpenSSL certificate lookup mechanisms

**SYNOPSIS**

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

```
typedef x509_lookup_st X509_LOOKUP;
```

```
typedef enum X509_LOOKUP_TYPE;
```

```
X509_LOOKUP *X509_LOOKUP_new(X509_LOOKUP_METHOD *method);
```

```
int X509_LOOKUP_init(X509_LOOKUP *ctx);
```

```
int X509_LOOKUP_shutdown(X509_LOOKUP *ctx);
```

```
void X509_LOOKUP_free(X509_LOOKUP *ctx);
```

```
int X509_LOOKUP_set_method_data(X509_LOOKUP *ctx, void *data);
```

```
void *X509_LOOKUP_get_method_data(const X509_LOOKUP *ctx);
```

```
int X509_LOOKUP_ctrl_ex(X509_LOOKUP *ctx, int cmd, const char *argc, long argl,  
                        char **ret, OSSL_LIB_CTX *libctx, const char *propq);
```

```
int X509_LOOKUP_ctrl(X509_LOOKUP *ctx, int cmd, const char *argc,  
                    long argl, char **ret);
```

```
int X509_LOOKUP_load_file_ex(X509_LOOKUP *ctx, char *name, long type,  
                            OSSL_LIB_CTX *libctx, const char *propq);
```

```
int X509_LOOKUP_load_file(X509_LOOKUP *ctx, char *name, long type);
```

```
int X509_LOOKUP_load_file_ex(X509_LOOKUP *ctx, char *name, long type,  
                            OSSL_LIB_CTX *libctx, const char *propq);
```

```
int X509_LOOKUP_add_dir(X509_LOOKUP *ctx, char *name, long type);
```

```
int X509_LOOKUP_add_store_ex(X509_LOOKUP *ctx, char *uri, OSSL_LIB_CTX *libctx,  
                            const char *propq);
```

```
int X509_LOOKUP_add_store(X509_LOOKUP *ctx, char *uri);
```

```
int X509_LOOKUP_load_store_ex(X509_LOOKUP *ctx, char *uri, OSSL_LIB_CTX *libctx,  
                            const char *propq);
```

```

int X509_LOOKUP_load_store(X509_LOOKUP *ctx, char *uri);

X509_STORE *X509_LOOKUP_get_store(const X509_LOOKUP *ctx);

int X509_LOOKUP_by_subject_ex(X509_LOOKUP *ctx, X509_LOOKUP_TYPE type,
                             const X509_NAME *name, X509_OBJECT *ret,
                             OSSL_LIB_CTX *libctx, const char *propq);
int X509_LOOKUP_by_subject(X509_LOOKUP *ctx, X509_LOOKUP_TYPE type,
                             const X509_NAME *name, X509_OBJECT *ret);
int X509_LOOKUP_by_issuer_serial(X509_LOOKUP *ctx, X509_LOOKUP_TYPE type,
                             const X509_NAME *name,
                             const ASN1_INTEGER *serial, X509_OBJECT *ret);
int X509_LOOKUP_by_fingerprint(X509_LOOKUP *ctx, X509_LOOKUP_TYPE type,
                             const unsigned char *bytes, int len,
                             X509_OBJECT *ret);
int X509_LOOKUP_by_alias(X509_LOOKUP *ctx, X509_LOOKUP_TYPE type,
                             const char *str, int len, X509_OBJECT *ret);

```

## DESCRIPTION

The **X509\_LOOKUP** structure holds the information needed to look up certificates and CRLs according to an associated **X509\_LOOKUP\_METHOD**(3). Multiple **X509\_LOOKUP** instances can be added to an **X509\_STORE**(3) to enable lookup in that store.

**X509\_LOOKUP\_new**() creates a new **X509\_LOOKUP** using the given lookup *method*. It can also be created by calling **X509\_STORE\_add\_lookup**(3), which will associate a **X509\_STORE** with the lookup mechanism.

**X509\_LOOKUP\_init**() initializes the internal state and resources as needed by the given **X509\_LOOKUP** to do its work.

**X509\_LOOKUP\_shutdown**() tears down the internal state and resources of the given **X509\_LOOKUP**.

**X509\_LOOKUP\_free**() destructs the given **X509\_LOOKUP**.

**X509\_LOOKUP\_set\_method\_data**() and **X509\_LOOKUP\_get\_method\_data**() associates and retrieves a pointer to application data to and from the given **X509\_LOOKUP**, respectively.

**X509\_LOOKUP\_ctrl\_ex**() is used to set or get additional data to or from a **X509\_LOOKUP** structure or its associated **X509\_LOOKUP\_METHOD**(3). The arguments of the control command are passed via *argc* and *argl*, its return value via *\*ret*. The library context *libctx* and property query *propq* are used

when fetching algorithms from providers. The meaning of the arguments depends on the *cmd* number of the control command. In general, this function is not called directly, but wrapped by a macro call, see below. The control *cmds* known to OpenSSL are discussed in more depth in "Control Commands".

**X509\_LOOKUP\_ctrl()** is similar to **X509\_LOOKUP\_ctrl\_ex()** but uses NULL for the library context *libctx* and property query *propq*.

**X509\_LOOKUP\_load\_file\_ex()** passes a filename to be loaded immediately into the associated **X509\_STORE**. The library context *libctx* and property query *propq* are used when fetching algorithms from providers. *type* indicates what type of object is expected. This can only be used with a lookup using the implementation **X509\_LOOKUP\_file(3)**.

**X509\_LOOKUP\_load\_file()** is similar to **X509\_LOOKUP\_load\_file\_ex()** but uses NULL for the library context *libctx* and property query *propq*.

**X509\_LOOKUP\_add\_dir()** passes a directory specification from which certificates and CRLs are loaded on demand into the associated **X509\_STORE**. *type* indicates what type of object is expected. This can only be used with a lookup using the implementation **X509\_LOOKUP\_hash\_dir(3)**.

**X509\_LOOKUP\_add\_store\_ex()** passes a URI for a directory-like structure from which containers with certificates and CRLs are loaded on demand into the associated **X509\_STORE**. The library context *libctx* and property query *propq* are used when fetching algorithms from providers.

**X509\_LOOKUP\_add\_store()** is similar to **X509\_LOOKUP\_add\_store\_ex()** but uses NULL for the library context *libctx* and property query *propq*.

**X509\_LOOKUP\_load\_store\_ex()** passes a URI for a single container from which certificates and CRLs are immediately loaded into the associated **X509\_STORE**. The library context *libctx* and property query *propq* are used when fetching algorithms from providers. These functions can only be used with a lookup using the implementation **X509\_LOOKUP\_store(3)**.

**X509\_LOOKUP\_load\_store()** is similar to **X509\_LOOKUP\_load\_store\_ex()** but uses NULL for the library context *libctx* and property query *propq*.

**X509\_LOOKUP\_load\_file\_ex()**, **X509\_LOOKUP\_load\_file()**, **X509\_LOOKUP\_add\_dir()**, **X509\_LOOKUP\_add\_store\_ex()**, **X509\_LOOKUP\_add\_store()**, **X509\_LOOKUP\_load\_store\_ex()** and **X509\_LOOKUP\_load\_store()** are implemented as macros that use **X509\_LOOKUP\_ctrl()**.

**X509\_LOOKUP\_by\_subject\_ex()**, **X509\_LOOKUP\_by\_subject()**, **X509\_LOOKUP\_by\_issuer\_serial()**, **X509\_LOOKUP\_by\_fingerprint()**, and

**X509\_LOOKUP\_by\_alias()** look up certificates and CRLs in the **X509\_STORE**(3) associated with the **X509\_LOOKUP** using different criteria, where the looked up object is stored in *ret*. Some of the underlying **X509\_LOOKUP\_METHOD**s will also cache objects matching the criteria in the associated **X509\_STORE**, which makes it possible to handle cases where the criteria have more than one hit.

## Control Commands

The **X509\_LOOKUP\_METHOD**s built into OpenSSL recognize the following **X509\_LOOKUP\_ctrl()** *cmds*:

### **X509\_L\_FILE\_LOAD**

This is the command that **X509\_LOOKUP\_load\_file\_ex()** and **X509\_LOOKUP\_load\_file()** use. The filename is passed in *argc*, and the type in *argl*.

### **X509\_L\_ADD\_DIR**

This is the command that **X509\_LOOKUP\_add\_dir()** uses. The directory specification is passed in *argc*, and the type in *argl*.

### **X509\_L\_ADD\_STORE**

This is the command that **X509\_LOOKUP\_add\_store\_ex()** and **X509\_LOOKUP\_add\_store()** use. The URI is passed in *argc*.

### **X509\_L\_LOAD\_STORE**

This is the command that **X509\_LOOKUP\_load\_store\_ex()** and **X509\_LOOKUP\_load\_store()** use. The URI is passed in *argc*.

## RETURN VALUES

**X509\_LOOKUP\_new()** returns a **X509\_LOOKUP** pointer when successful, or NULL on error.

**X509\_LOOKUP\_init()** and **X509\_LOOKUP\_shutdown()** return 1 on success, or 0 on error.

**X509\_LOOKUP\_ctrl()** returns -1 if the **X509\_LOOKUP** doesn't have an associated **X509\_LOOKUP\_METHOD**, or 1 if the doesn't have a control function. Otherwise, it returns what the control function in the **X509\_LOOKUP\_METHOD** returns, which is usually 1 on success and 0 in error.

**X509\_LOOKUP\_get\_store()** returns a **X509\_STORE** pointer if there is one, otherwise NULL.

**X509\_LOOKUP\_by\_subject\_ex()**, **X509\_LOOKUP\_by\_subject()**, **X509\_LOOKUP\_by\_issuer\_serial()**, **X509\_LOOKUP\_by\_fingerprint()**, and **X509\_LOOKUP\_by\_alias()** all return 0 if there is no **X509\_LOOKUP\_METHOD** or that method

doesn't implement the corresponding function. Otherwise, it returns what the corresponding function in the **X509\_LOOKUP\_METHOD** returns, which is usually 1 on success and 0 in error.

## SEE ALSO

**X509\_LOOKUP\_METHOD(3)**, **X509\_STORE(3)**

## HISTORY

The functions **X509\_LOOKUP\_by\_subject\_ex()** and **X509\_LOOKUP\_ctrl\_ex()** were added in OpenSSL 3.0.

The macros **X509\_LOOKUP\_load\_file\_ex()**, **X509\_LOOKUP\_load\_store\_ex()** and **X509\_LOOKUP\_add\_store\_ex()** were added in OpenSSL 3.0.

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