

NAME

gethostbyname, gethostbyaddr, sethostent, gethostent, endhostent, h_errno, perror, hstrerror, gethostbyaddr_r, gethostbyname2, gethostbyname2_r, gethostbyname_r, gethostent_r – get network host entry

LIBRARY

Standard C library (*libc*, *-lc*)

SYNOPSIS

```
#include <netdb.h>

void sethostent(int stayopen);
void endhostent(void);

[[deprecated]] extern int h_errno;

[[deprecated]] struct hostent *gethostbyname(const char *name);
[[deprecated]] struct hostent *gethostbyaddr(const void addr[len],
                                             socklen_t len, int type);

[[deprecated]] void perror(const char *s);
[[deprecated]] const char *hstrerror(int err);

/* System V/POSIX extension */
struct hostent *gethostent(void);

/* GNU extensions */
[[deprecated]]
struct hostent *gethostbyname2(const char *name, int af);

int gethostent_r(struct hostent *restrict ret,
                 char buf[restrict .buflen], size_t buflen,
                 struct hostent **restrict result,
                 int *restrict h_errnop);

[[deprecated]]
int gethostbyaddr_r(const void addr[restrict .len], socklen_t len,
                   int type,
                   struct hostent *restrict ret,
                   char buf[restrict .buflen], size_t buflen,
                   struct hostent **restrict result,
                   int *restrict h_errnop);

[[deprecated]]
int gethostbyname_r(const char *restrict name,
                   struct hostent *restrict ret,
                   char buf[restrict .buflen], size_t buflen,
                   struct hostent **restrict result,
                   int *restrict h_errnop);

[[deprecated]]
int gethostbyname2_r(const char *restrict name, int af,
                    struct hostent *restrict ret,
                    char buf[restrict .buflen], size_t buflen,
                    struct hostent **restrict result,
                    int *restrict h_errnop);
```

Feature Test Macro Requirements for glibc (see `feature_test_macros(7)`):

`gethostbyname2()`, `gethostent_r()`, `gethostbyaddr_r()`, `gethostbyname_r()`, `gethostbyname2_r()`:

Since glibc 2.19:

`_DEFAULT_SOURCE`

glibc up to and including 2.19:

`_BSD_SOURCE` || `_SVID_SOURCE`

herror(), hstrerror():

Since glibc 2.19:

`_DEFAULT_SOURCE`

glibc 2.8 to glibc 2.19:

`_BSD_SOURCE` || `_SVID_SOURCE`

Before glibc 2.8:

none

h_errno:

Since glibc 2.19

`_DEFAULT_SOURCE` || `_POSIX_C_SOURCE < 200809L`

glibc 2.12 to glibc 2.19:

`_BSD_SOURCE` || `_SVID_SOURCE` || `_POSIX_C_SOURCE < 200809L`

Before glibc 2.12:

none

DESCRIPTION

The **gethostbyname*()**, **gethostbyaddr*()**, **herror()**, and **hstrerror()** functions are obsolete. Applications should use **getaddrinfo(3)**, **getnameinfo(3)**, and **gai_strerror(3)** instead.

The **sethostent()** function specifies, if *stayopen* is true (1), that a connected TCP socket should be used for the name server queries and that the connection should remain open during successive queries. Otherwise, name server queries will use UDP datagrams.

The **endhostent()** function ends the use of a TCP connection for name server queries.

The **gethostbyname()** function returns a structure of type *hostent* for the given host *name*. Here *name* is either a hostname or an IPv4 address in standard dot notation (as for **inet_addr(3)**). If *name* is an IPv4 address, no lookup is performed and **gethostbyname()** simply copies *name* into the *h_name* field and its *struct in_addr* equivalent into the *h_addr_list[0]* field of the returned *hostent* structure. If *name* doesn't end in a dot and the environment variable **HOSTALIASES** is set, the alias file pointed to by **HOSTALIASES** will first be searched for *name* (see **hostname(7)** for the file format). The current domain and its parents are searched unless *name* ends in a dot.

The **gethostbyaddr()** function returns a structure of type *hostent* for the given host address *addr* of length *len* and address type *type*. Valid address types are **AF_INET** and **AF_INET6** (defined in `<sys/socket.h>`). The host address argument is a pointer to a struct of a type depending on the address type, for example a *struct in_addr ** (probably obtained via a call to **inet_addr(3)**) for address type **AF_INET**.

The (obsolete) **herror()** function prints the error message associated with the current value of *h_errno* on *stderr*.

The (obsolete) **hstrerror()** function takes an error number (typically *h_errno*) and returns the corresponding message string.

The domain name queries carried out by **gethostbyname()** and **gethostbyaddr()** rely on the Name Service Switch (**nsswitch.conf(5)**) configured sources or a local name server (**named(8)**). The default action is to query the Name Service Switch (**nsswitch.conf(5)**) configured sources, failing that, a local name server (**named(8)**).

Historical

The **nsswitch.conf(5)** file is the modern way of controlling the order of host lookups.

In glibc 2.4 and earlier, the *order* keyword was used to control the order of host lookups as defined in */etc/host.conf* (**host.conf(5)**).

The *hostent* structure is defined in `<netdb.h>` as follows:

```
struct hostent {
    char    *h_name;                /* official name of host */
    char    **h_aliases;            /* alias list */
    int     h_addrtype;             /* host address type */
```

```

    int      h_length;           /* length of address */
    char **h_addr_list;         /* list of addresses */
}
#define h_addr h_addr_list[0] /* for backward compatibility */

```

The members of the *hostent* structure are:

h_name

The official name of the host.

h_aliases

An array of alternative names for the host, terminated by a null pointer.

h_addrtype

The type of address; always **AF_INET** or **AF_INET6** at present.

h_length

The length of the address in bytes.

h_addr_list

An array of pointers to network addresses for the host (in network byte order), terminated by a null pointer.

h_addr The first address in *h_addr_list* for backward compatibility.

RETURN VALUE

The **gethostbyname()** and **gethostbyaddr()** functions return the *hostent* structure or a null pointer if an error occurs. On error, the *h_errno* variable holds an error number. When non-NULL, the return value may point at static data, see the notes below.

ERRORS

The variable *h_errno* can have the following values:

HOST_NOT_FOUND

The specified host is unknown.

NO_DATA

The requested name is valid but does not have an IP address. Another type of request to the name server for this domain may return an answer. The constant **NO_ADDRESS** is a synonym for **NO_DATA**.

NO_RECOVERY

A nonrecoverable name server error occurred.

TRY_AGAIN

A temporary error occurred on an authoritative name server. Try again later.

FILES

/etc/host.conf

resolver configuration file

/etc/hosts

host database file

/etc/nsswitch.conf

name service switch configuration

ATTRIBUTES

For an explanation of the terms used in this section, see **attributes(7)**.

Interface	Attribute	Value
gethostbyname()	Thread safety	MT-Unsafe race:hostbyname env locale
gethostbyaddr()	Thread safety	MT-Unsafe race:hostbyaddr env locale
sethostent() , endhostent() , gethostent_r()	Thread safety	MT-Unsafe race:hostent env locale
herror() , hstrerror()	Thread safety	MT-Safe
gethostent()	Thread safety	MT-Unsafe race:hostent race:hostentbuf env locale
gethostbyname2()	Thread safety	MT-Unsafe race:hostbyname2 env locale
gethostbyaddr_r() , gethostbyname_r() , gethostbyname2_r()	Thread safety	MT-Safe env locale

In the above table, *hostent* in *race:hostent* signifies that if any of the functions **sethostent()**, **gethostent()**, **gethostent_r()**, or **endhostent()** are used in parallel in different threads of a program, then data races could occur.

STANDARDS

POSIX.1-2001 specifies **gethostbyname()**, **gethostbyaddr()**, **sethostent()**, **endhostent()**, **gethostent()**, and *h_errno*; **gethostbyname()**, **gethostbyaddr()**, and *h_errno* are marked obsolescent in that standard. POSIX.1-2008 removes the specifications of **gethostbyname()**, **gethostbyaddr()**, and *h_errno*, recommending the use of **getaddrinfo(3)** and **getnameinfo(3)** instead.

NOTES

The functions **gethostbyname()** and **gethostbyaddr()** may return pointers to static data, which may be overwritten by later calls. Copying the *struct hostent* does not suffice, since it contains pointers; a deep copy is required.

In the original BSD implementation the *len* argument of **gethostbyname()** was an *int*. The SUSv2 standard is buggy and declares the *len* argument of **gethostbyaddr()** to be of type *size_t*. (That is wrong, because it has to be *int*, and *size_t* is not. POSIX.1-2001 makes it *socklen_t*, which is OK.) See also **accept(2)**.

The BSD prototype for **gethostbyaddr()** uses *const char ** for the first argument.

System V/POSIX extension

POSIX requires the **gethostent()** call, which should return the next entry in the host data base. When using DNS/BIND this does not make much sense, but it may be reasonable if the host data base is a file that can be read line by line. On many systems, a routine of this name reads from the file */etc/hosts*. It may be available only when the library was built without DNS support. The glibc version will ignore ipv6 entries. This function is not reentrant, and glibc adds a reentrant version **gethostent_r()**.

GNU extensions

glibc2 also has a **gethostbyname2()** that works like **gethostbyname()**, but permits to specify the address family to which the address must belong.

glibc2 also has reentrant versions **gethostent_r()**, **gethostbyaddr_r()**, **gethostbyname_r()**, and **gethostbyname2_r()**. The caller supplies *ahostent* structure *r* et which will be filled in on success, and a temporary work buffer *buf* of size *buflen*. After the call, *result* will point to the result on success. In case of an error or if no entry is found *result* will be NULL. The functions return 0 on success and a nonzero error number on failure. In addition to the errors returned by the nonreentrant versions of these functions, if *buf* is too small, the functions will return **ERANGE**, and the call should be retried with a larger buffer. The global variable *h_errno* is not modified, but the address of a variable in which to store error numbers is passed in *h_errnop*.

BUGS

gethostbyname() does not recognize components of a dotted IPv4 address string that are expressed in hexadecimal.

SEE ALSO

getaddrinfo(3), getnameinfo(3), inet(3), inet_ntop(3), inet_pton(3), resolver(3), hosts(5), nsswitch.conf(5), hostname(7), named(8)