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Rocky Enterprise Linux 9.2 Manual Pages on command 'h_errno.3'

\$ man h_errno.3

GETHOSTBYNAME(3)

Linux Programmer's Manual

GETHOSTBYNAME(3)

NAME

gethostbyname, gethostbyaddr, sethostent, gethostent, endhostent, h_errno, perror, hstr?
error, gethostbyaddr_r, gethostbyname2, gethostbyname2_r, gethostbyname_r, gethostent_r -
get network host entry

SYNOPSIS

```
#include <netdb.h>

extern int h_errno;

struct hostent *gethostbyname(const char *name);

#include <sys/socket.h>      /* for AF_INET */

struct hostent *gethostbyaddr(const void *addr,
                             socklen_t len, int type);

void sethostent(int stayopen);

void endhostent(void);

void perror(const char *s);

const char *hstrerror(int err);

/* System V/POSIX extension */

struct hostent *gethostent(void);

/* GNU extensions */

struct hostent *gethostbyname2(const char *name, int af);

int gethostent_r(
    struct hostent *ret, char *buf, size_t buflen,
    struct hostent **result, int *h_errno);
```

```
int gethostbyaddr_r(const void *addr, socklen_t len, int type,
    struct hostent *ret, char *buf, size_t buflen,
    struct hostent **result, int *h_errno);
int gethostbyname_r(const char *name,
    struct hostent *ret, char *buf, size_t buflen,
    struct hostent **result, int *h_errno);
int gethostbyname2_r(const char *name, int af,
    struct hostent *ret, char *buf, size_t buflen,
    struct hostent **result, int *h_errno);
```

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

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

`name2_r()`:

Since glibc 2.19:

`_DEFAULT_SOURCE`

Glibc versions up to and including 2.19:

`_BSD_SOURCE || _SVID_SOURCE`

`herror()`, `hstrerror()`:

Since glibc 2.19:

`_DEFAULT_SOURCE`

Glibc 2.8 to 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 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 `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`. 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 `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 (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_ADRESS` 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.

?gethostbyname2_r() ? ?
??

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.

CONFORMING TO

POSIX.1-2001 specifies `gethostbyname()`, `gethostbyaddr()`, `sethostent()`, `endhostent()`, `gethostbyname2_r()`, 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 a `hostent` structure `ret` 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)

COLOPHON

This page is part of release 5.10 of the Linux man-pages project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at <https://www.kernel.org/doc/man-pages/>.

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