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

\$ man gethostbyname.3

GETHOSTBYNAME(3) Linux Programmer's Manual GETHOSTBYNAME(3)

NAME

gethostbyname, gethostbyaddr, sethostent, gethostent, endhostent, h_errno, perror, hstrerror, 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_errnop);
```

```

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

```

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

`gethostbyname2()`, `gethostent_r()`, `gethostbyaddr_r()`, `gethostbyname_r()`, `gethostby?`
`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_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(), ? Thread safety ? MT-Unsafe race:hostent env ?

?endhostent(), ? ? locale ?

?gethostent_r() ? ? ?

??

?herror(), ? Thread safety ? MT-Safe ?

?hsterror() ? ? ?

??

?gethostent() ? Thread safety ? MT-Unsafe race:hostent ?

? ? ? race:hostentbuf env locale ?

??

?gethostbyname2() ? Thread safety ? MT-Unsafe race:hostbyname2 ?

? ? ? env locale ?

??

?gethostbyaddr_r(), ? Thread safety ? MT-Safe env locale ?

?gethostbyname_r(), ? ? ?

?gethostbyname2_r() ? ? ?
??

In the above table, hostent in race:hostent signifies that if any of the functions sethos? tent(), 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(), gethostent(), and h_errno; gethostbyname(), gethostbyaddr(), and h_errno are marked obsolete 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 database. When using DNS/BIND this does not make much sense, but it may be reasonable if the host database 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/>.

2020-12-21

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