

NAME

connect – initiate a connection on a socket

LIBRARY

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

SYNOPSIS

```
#include <sys/socket.h>
```

```
int connect(int sockfd, const struct sockaddr *addr,  
            socklen_t addrlen);
```

DESCRIPTION

The **connect()** system call connects the socket referred to by the file descriptor *sockfd* to the address specified by *addr*. The *addrlen* argument specifies the size of *addr*. The format of the address in *addr* is determined by the address space of the socket *sockfd*; see **socket(2)** for further details.

If the socket *sockfd* is of type **SOCK_DGRAM**, then *addr* is the address to which datagrams are sent by default, and the only address from which datagrams are received. If the socket is of type **SOCK_STREAM** or **SOCK_SEQPACKET**, this call attempts to make a connection to the socket that is bound to the address specified by *addr*.

Some protocol sockets (e.g., UNIX domain stream sockets) may successfully **connect()** only once.

Some protocol sockets (e.g., datagram sockets in the UNIX and Internet domains) may use **connect()** multiple times to change their association.

Some protocol sockets (e.g., TCP sockets as well as datagram sockets in the UNIX and Internet domains) may dissolve the association by connecting to an address with the *sa_family* member of *sockaddr* set to **AF_UNSPEC**; thereafter, the socket can be connected to another address. (**AF_UNSPEC** is supported since Linux 2.2.)

RETURN VALUE

If the connection or binding succeeds, zero is returned. On error, *-1* is returned, and *errno* is set to indicate the error.

ERRORS

The following are general socket errors only. There may be other domain-specific error codes.

EACCES

For UNIX domain sockets, which are identified by pathname: Write permission is denied on the socket file, or search permission is denied for one of the directories in the path prefix. (See also **path_resolution(7)**.)

EACCES**EPERM**

The user tried to connect to a broadcast address without having the socket broadcast flag enabled or the connection request failed because of a local firewall rule.

EACCES

It can also be returned if an SELinux policy denied a connection (for example, if there is a policy saying that an HTTP proxy can only connect to ports associated with HTTP servers, and the proxy tries to connect to a different port).

EADDRINUSE

Local address is already in use.

EADDRNOTAVAIL

(Internet domain sockets) The socket referred to by *sockfd* had not previously been bound to an address and, upon attempting to bind it to an ephemeral port, it was determined that all port numbers in the ephemeral port range are currently in use. See the discussion of */proc/sys/net/ipv4/ip_local_port_range* in **ip(7)**.

EAFNOSUPPORT

The passed address didn't have the correct address family in its *sa_family* field.

EAGAIN

For nonblocking UNIX domain sockets, the socket is nonblocking, and the connection cannot be completed immediately. For other socket families, there are insufficient entries in the routing cache.

EALREADY

The socket is nonblocking and a previous connection attempt has not yet been completed.

EBADF

sockfd is not a valid open file descriptor.

ECONNREFUSED

A **connect()** on a stream socket found no one listening on the remote address.

EFAULT

The socket structure address is outside the user's address space.

EINPROGRESS

The socket is nonblocking and the connection cannot be completed immediately. (UNIX domain sockets failed with **EAGAIN** instead.) It is possible to **select(2)** or **poll(2)** for completion by selecting the socket for writing. After **select(2)** indicates writability, use **getsockopt(2)** to read the **SO_ERROR** option at level **SOL_SOCKET** to determine whether **connect()** completed successfully (**SO_ERROR** is zero) or unsuccessfully (**SO_ERROR** is one of the usual error codes listed here, explaining the reason for the failure).

EINTR

The system call was interrupted by a signal that was caught; see **signal(7)**.

EISCONN

The socket is already connected.

ENETUNREACH

Network is unreachable.

ENOTSOCK

The file descriptor *sockfd* does not refer to a socket.

EPROTOYPE

The socket type does not support the requested communications protocol. This error can occur, for example, on an attempt to connect a UNIX domain datagram socket to a stream socket.

ETIMEDOUT

Timeout while attempting connection. The server may be too busy to accept new connections. Note that for IP sockets the timeout may be very long when syncookies are enabled on the server.

VERSIONS

Portable programs must ensure that *addr.sun_path* is a null-terminated string for **AF_UNIX** sockets.

STANDARDS

POSIX.1-2024.

HISTORY

POSIX.1-2001, SVr4, 4.2BSD.

NOTES

If **connect()** fails, consider the state of the socket as unspecified. Portable applications should close the socket and create a new one for reconnecting.

EXAMPLES

An example of the use of **connect()** is shown in **getaddrinfo(3)**.

SEE ALSO**accept(2), bind(2), getsockname(2), listen(2), socket(2), path_resolution(7), selinux(8)**