

**NAME**

getifaddrs, freeifaddrs - get interface addresses

**SYNOPSIS**

```
#include <sys/types.h>
#include <ifaddrs.h>

int getifaddrs(struct ifaddrs **ifap);

void freeifaddrs(struct ifaddrs *ifa);
```

**DESCRIPTION**

The **getifaddrs()** function creates a linked list of structures describing the network interfaces of the local system, and stores the address of the first item of the list in *\*ifap*. The list consists of *ifaddrs* structures, defined as follows:

```
struct ifaddrs {
    struct ifaddrs *ifa_next; /* Next item in list */
    char *ifa_name; /* Name of interface */
    unsigned int ifa_flags; /* Flags from SIOCGIFFLAGS */
    struct sockadr *ifa_addr; /* Address of interface */
    struct sockadr *ifa_netmask; /* Netmask of interface */
    union {
        struct sockadr *ifu_broadaddr;
        /* Broadcast address of interface */
        struct sockadr *ifu_dstaddr;
        /* Point-to-point destination address */
    } ifa_ifu;
#define ifa_broadaddr ifa_ifu.ifu_broadaddr
#define ifa_dstaddr ifa_ifu.ifu_dstaddr
    void *ifa_data; /* Address-specific data */
};
```

The *ifa\_next* field contains a pointer to the next structure on the list, or NULL if this is the last item of the list.

The *ifa\_name* points to the null-terminated interface name.

The *ifa\_flags* field contains the interface flags, as returned by the **SIOCGIFFLAGS** [ioctl\(2\)](#) operation (see [netdevice\(7\)](#) for a list of these flags).

The *ifa\_addr* field points to a structure containing the interface address. (The *sa\_family* subfield should be consulted to determine the format of the address structure.) This field may contain a null pointer.

The *ifa\_netmask* field points to a structure containing the netmask associated with *ifa\_addr*, if applicable for the address family. This field may contain a null pointer.

Depending on whether the bit **IFF\_BROADCAST** or **IFF\_POINTOPOINT** is set in *ifa\_flags* (only one can be set at a time), either *ifa\_broadaddr* will contain the broadcast address associated with *ifa\_addr* (if applicable for the address family) or *ifa\_dstaddr* will contain the destination address of the point-to-point interface.

The *ifa\_data* field points to a buffer containing address-family-specific data; this field may be NULL if there is no such data for this interface.

The data returned by **getifaddrs()** is dynamically allocated and should be freed using **freeifaddrs()** when no longer needed.

**RETURN VALUE**

On success, **getifaddrs()** returns zero; on error, -1 is returned, and *errno* is set appropriately.

**ERRORS**

`getifaddrs()` may fail and set *errno* for any of the errors specified for [socket\(2\)](#), [bind\(2\)](#), [getsockname\(2\)](#), [recvmsg\(2\)](#), [sendto\(2\)](#), [malloc\(3\)](#), or [realloc\(3\)](#).

**VERSIONS**

The `getifaddrs()` function first appeared in glibc 2.3, but before glibc 2.3.3, the implementation supported only IPv4 addresses; IPv6 support was added in glibc 2.3.3. Support of address families other than IPv4 is available only on kernels that support netlink.

**CONFORMING TO**

Not in POSIX.1-2001. This function first appeared in BSDi and is present on the BSD systems, but with slightly different semantics documented—returning one entry per interface, not per address. This means *ifa\_addr* and other fields can actually be NULL if the interface has no address, and no link-level address is returned if the interface has an IP address assigned. Also, the way of choosing either *ifa\_broadaddr* or *ifa\_dstaddr* differs on various systems.

**NOTES**

The addresses returned on Linux will usually be the IPv4 and IPv6 addresses assigned to the interface, but also one **AF\_PACKET** address per interface containing lower-level details about the interface and its physical layer. In this case, the *ifa\_data* field may contain a pointer to a *struct rtnl\_link\_stats*, defined in `<linux/if_link.h>` (in Linux 2.4 and earlier, *struct net\_device\_stats*, defined in `<linux/netdevice.h>`), which contains various interface attributes and statistics.

**EXAMPLE**

The program below demonstrates the use of `getifaddrs()`, `freeifaddrs()`, and [getnameinfo\(3\)](#). Here is what we see when running this program on one system:

```
$ ./a.out
lo AF_PACKET (17)
tx_packets = 524; rx_packets = 524
tx_bytes = 38788; rx_bytes = 38788
wlp3s0 AF_PACKET (17)
tx_packets = 108391; rx_packets = 130245
tx_bytes = 30420659; rx_bytes = 94230014
em1 AF_PACKET (17)
tx_packets = 0; rx_packets = 0
tx_bytes = 0; rx_bytes = 0
lo AF_INET (2)
address: <127.0.0.1>
wlp3s0 AF_INET (2)
address: <192.168.235.137>
lo AF_INET6 (10)
address: <::1>
wlp3s0 AF_INET6 (10)
address: <fe80::7ee9:d3ff:fe5:1a91%wlp3s0>
```

**Program source**

```
#define _GNU_SOURCE /* To get defs of NI_MAXSERV and NI_MAXHOST */
#include <arpa/inet.h>
#include <sys/socket.h>
#include <netdb.h>
#include <ifaddrs.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <linux/if_link.h>
```

```

int main(int argc, char *argv[])
{
    struct ifaddrs *ifaddr, *ifa;
    int family, s, n;
    char host[NI_MAXHOST];

    if (getifaddrs(&ifaddr) == -1) {
        perror(getifaddrs);
        exit(EXIT_FAILURE);
    }

    /* Walk through linked list, maintaining head pointer so we
       can free list later */

    for (ifa = ifaddr, n = 0; ifa != NULL; ifa = ifa->ifa_next, n++) {
        if (ifa->ifa_addr == NULL)
            continue;

        family = ifa->ifa_addr->sa_family;

        /* Display interface name and family (including symbolic
           form of the latter for the common families) */

        printf("%-8s %s (%d)n",
            ifa->ifa_name,
            (family == AF_PACKET) ? AF_PACKET :
            (family == AF_INET) ? AF_INET :
            (family == AF_INET6) ? AF_INET6 : ???,
            family);

        /* For an AF_INET* interface address, display the address */

        if (family == AF_INET || family == AF_INET6) {
            s = getnameinfo(ifa->ifa_addr,
                (family == AF_INET) ? sizeof(struct sockaddr_in) :
                sizeof(struct sockaddr_in6),
                host, NI_MAXHOST,
                NULL, 0, NI_NUMERICHOST);
            if (s != 0) {
                printf(getnameinfo() failed: %sn, gai_strerror(s));
                exit(EXIT_FAILURE);
            }

            printf(ttaddress: <%s>n, host);

        } else if (family == AF_PACKET && ifa->ifa_data != NULL) {
            struct rtnl_link_stats *stats = ifa->ifa_data;

            printf(ttx_packets = %10u; rx_packets = %10un
                ttx_bytes = %10u; rx_bytes = %10un,
                stats->tx_packets, stats->rx_packets,
                stats->tx_bytes, stats->rx_bytes);
        }
    }

    freeifaddrs(ifaddr);
    exit(EXIT_SUCCESS);
}

```

**SEE ALSO**

[bind\(2\)](#), [getsockname\(2\)](#), [socket\(2\)](#), [packet\(7\)](#), [ifconfig\(8\)](#)

**COLOPHON**

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