

IEEE Standards Interpretation for IEEE Std 1003.1™-2001 IEEE Standard Standard for Information Technology -- Portable Operating System Interface (POSIX®)

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Interpretation Request #73

Topic: XSH 2.10.6 Socket Types, connect and sendto **Relevant Sections:** XSH 2.10.6 Socket Types Page: 60 Line: 2499

The standard is unclear regarding the behaviour of `sendto()` and `sendmsg()` on a datagram socket for which `connect()` has previously been called, in the case where the implementation does not return the optional `EISCONN` error.

The `connect()` page says: "For `SOCK_DGRAM` sockets, the peer address identifies where all datagrams are sent on subsequent `send()` functions, and limits the remote sender for subsequent `recv()` functions."

Since this only refers to `send()` and not to `sendto()`, and since the `sendto()` page clearly states: "If the socket is connectionless-mode, the message shall be sent to the address specified by `dest_addr`." this would seem to imply that an address pre-specified using `connect()` is ignored by `sendto()`.

Similar arguments apply to `sendmsg()`.

However, section 2.10.6 Socket Types states the following for the `SOCK_DGRAM` socket type: "An application may also pre-specify a peer address, in which case calls to output functions shall send to the pre-specified peer." Since this says "output functions" it implies that `send()`, `sendto()` and `sendmsg()` are all treated the same

Here are two suggested ways to fix the problem, depending on whether the intention is for the pre-specified address to be used, or for the address given to `sendto()` and `sendmsg()` to override it. (A third alternative would be to mandate the `EISCONN` errors.)

Option A

On page 60 line 2499 change: "in which case calls to output functions shall send to the pre-specified peer" to: "in which case calls to output functions that do not specify a peer address shall send to the pre-specified peer"

On page 1297 line 40671 change: "If the socket is connectionless-mode, the message shall be sent to the address specified by msghdr." to: "If the socket is connectionless-mode, the message shall be sent to the address specified by msghdr if no pre-specified peer address has been set. If a peer address has been pre-specified, either the message shall be sent to the address specified in msghdr (overriding the pre-specified peer address), or the function shall return -1 and set errno to EISCONN."

On page 1300 line 40782 change: "If the socket is connectionless-mode, the message shall be sent to the address specified by dest_addr." to: "If the socket is connectionless-mode, the message shall be sent to the address specified by dest_addr if no pre-specified peer address has been set. If a peer address has been pre-specified, either the message shall be sent to the address specified by dest_addr (overriding the pre-specified peer address), or the function shall return -1 and set errno to EISCONN."

Option B

On page 60 line 2499 change: "in which case calls to output functions shall send to the pre-specified peer" to: "in which case calls to output functions shall send to the pre-specified peer, not to the peer address specified in the call (if any)"

On page 223 line 7469 change: "datagrams are sent on subsequent send() functions" to: "datagrams are sent by subsequent output functions (overriding any address specified to the output function)"

On page 1297 line 40671 change: "If the socket is connectionless-mode, the message shall be sent to the address specified by msghdr." to: "If the socket is connectionless-mode, the message shall be sent to the address specified by msghdr if no pre-specified peer address has been set. If a peer address has been pre-specified, either the message shall be sent to that address and the destination address in msghdr shall be ignored, or the function shall return -1 and set errno to EISCONN."

On page 1300 line 40782 change: "If the socket is connectionless-mode, the message shall be sent to the address specified by dest_addr." to: "If the socket is connectionless-mode, the message shall be sent to the address specified by dest_addr if no pre-specified peer address has been set. If a peer address has been pre-specified, either the message shall be sent to that address and dest_addr shall be ignored, or the function shall return -1 and set errno to EISCONN."

Interpretation Response #73

The standard is unclear on this issue, and no conformance distinction can be made be-

tween alternative implementations based on this. This is being referred to the sponsor.

Rationale for Interpretation

None.