understanding INADDR_ANY for socket programming - c

I am trying to program some sockets and so, on the server side, I use `htonl(INADDR_ANY)`. To the extent I understood, it seems to me that this function generates a random IP (am I correct ?). In fact, I want to bind my socket with my `localhost`. But if I run this

```
printf("%d",htonl(INADDR_ANY));
```

I get 0 as a return value. Could someone bring some explanation ?

c sockets

edited May 12 '13 at 20:07

asked May 12 '13 at 15:02
Newben
4,211 ● 9 ● 36 ● 61

2 "... *I use `htonl(INADDR_ANY)`. The doc says that this function generates a random IP* ..." This is not correct. Which docs tells you so? – alk May 12 '13 at 15:06

@alk, in fact I mislead : I was reading some pdf I thought to be some official documentation. I edit my post now – Newben May 12 '13 at 20:06

3 Answers

1. bind() of INADDR_ANY DOES NOT "generate a random IP". It binds the socket to all available interfaces.
2. For a server, you typically want to bind to all interfaces - not just "localhost".
3. If you wish to bind your socket to localhost only, the syntax would be `my_sockaddress.sin_addr.s_addr = inet_addr("127.0.0.1");`, then call `bind(my_socket, (SOCKADDR *) &my_sockaddr, ...)`.
4. As it happens, "INADDR_ANY" is a constant that happens to equal "zero":

   http://www.castaglia.org/proftpd/doc/devel-guide/src/include/inet.h.html

   ```
   # define INADDR_ANY ((unsigned long int) 0x00000000)
   ...
   # define INADDR_NONE    0xffffffff
   ...
   # define INPORT_ANY 0
   ...
   ```

5. If you're not already familiar with it, I urge you to check out Beej's Guide to Sockets Programming:

   http://www.beej.us/guide/bgnet/output/html/singlepage/bgnet.html

edited Feb 21 at 10:03
thefourtheye
122k ● 16 ● 171 ● 262

answered May 12 '13 at 17:11
paulsm4
59k ● 6 ● 71 ● 94

It doesn't mean 'bind to all interfaces'. If it did that, the netstat output would be different. It means 'listen at *any* interface'. – EJP May 12 '13 at 22:09

1 To quote the above link: "When INADDR_ANY is specified in the bind call, the socket will be bound to all local interfaces." From another link: The value "INADDR_ANY" means that we will bind to any/all IP addresses that the local computer currently has. But yes - many implementions will bind to *the first* interface, (not "all"). But for one PC with one NIC, the difference is academic. With INADDR_ANY, the client can connect to any/all IP's (e.g. both 192.168.1.2 and 127.0.0.1). – paulsm4 May 13 '13 at 3:40

Is it guaranteed to equal 0? – 0x499602D2 Mar 6 '15 at 14:33

1 Sorry if this is a stupid question, but does interface mean wireless, ethernet, etc? – Smilyface Mar 18 '15 at 3:36

1 @laike9m You'd bind to 127.0.0.1 when you want to be able to connect to the socket only from the local machine. There are use cases for this when the service offered by the socket is only intended to be used by another process that is local to the machine. – dgnuff Oct 8 '15 at 22:29

`INADDR_ANY` is used when you don't need to bind a socket to a specific IP. When you use this value as the address when calling `bind()`, the socket accepts connections to all the IPs of the machine.

answered May 12 '13 at 15:17

Barmar
285k • 24 • 136 • 223

The only correct answer so far. – EJP May 12 '13 at 22:08

To *bind* socket with *localhost*, before you invoke the *bind* function, sin_addr.s_addr field of the sockaddr_in structure should be set properly. The proper value can be obtained either by

```
my_sockaddress.sin_addr.s_addr = inet_addr("127.0.0.1")
```

or by

```
my_sockaddress.sin_addr.s_addr=htonl(INADDR_LOOPBACK);
```

answered Aug 15 '13 at 10:35

MichaelGoren
455 • 2 • 9
