

Picking Your IP Address for Modbus/TCP

RobustDC Application Note #29

Quick Index:

- Overview - you likely do not need to register / pay for an official IP address?
 - Quotes from RFC 1918
 - Example IP Addresses Suitable Per RFC 1918
-

• Overview

We are often asked the question "Don't I need to register with someone for a special, unique IP address before we can set up our TCP/IP network?" The answer is Yes and No. **Yes** if you expect to set up a router to allow anyone in the world to send you IP packets directly. **No** if you expect to only set up a "private" TCP/IP network with no direct connection to the outside world.

If you are using TCP/IP for industrial control, then chances are you expect to keep your TCP/IP network very private! The "Internet" folks have issues guidelines for just such a situation.

• Quotes from RFC 1918:

Many applications require connectivity only within one enterprise and do not need external (outside the enterprise) connectivity for the majority of internal hosts. In larger enterprises it is often easy to identify a substantial number of hosts using TCP/IP that do not need network layer connectivity outside the enterprise.

...

The Internet Assigned Numbers Authority (IANA) has reserved the following three blocks of the IP address space for private internets:

10.0.0.0 - 10.255.255.255 (10/8 prefix)

172.16.0.0 - 172.31.255.255 (172.16/12 prefix)

192.168.0.0 - 192.168.255.255 (192.168/16 prefix)

...

An enterprise that decides to use IP addresses out of the address space defined in this document can do so without any coordination with IANA or an Internet registry. The address space can thus be used by many enterprises. Addresses within this private address space will only be unique within the enterprise, or the set of enterprises which choose to cooperate over this space so they may communicate with each other in their own private internet.

As before, any enterprise that needs globally unique address space is required to obtain such addresses from an Internet registry. An enterprise that requests IP addresses for its external connectivity will never be assigned addresses from the blocks defined above.

So following RFC1918 you can pick a real, honest IP address of your very own - err ... actually, it will be shared by thousands of people "out there", but since your network is "private" and not connected to "out there" you don't need to worry about this sharing.

So you may ask, "If I'm not connected & sharing an IP anyway, why not just randomly pick any IP?" Well, the reason is for long-term good-will. ***If you just randomly pick an IP, then you are probably using an IP legally assigned to someone else.*** So someday if your network is accidentally linked through a router (perhaps by an over eager technician playing with his new LINUX software?), then you could cause a lot of confusion "out there". In theory you could even end up with FBI agents knocking at your door asking you why you are trying to "break" into some secret computer officially assigned that IP - or more likely your corporate Internet system may be "shutdown" by your ISP when they recognize network traffic with invalid IP's being sent out. Explain that to the CEO!

This wouldn't happen if you follow the RFC1918 guidelines, because everyone "out there" accepts these IP addresses as private. Following RFC1918, the worst you can expect from an "IP leak" is some email from your ISP warning that private IP traffic is leaking from your site.

- **Example IP Addresses Suitable Per RFC 1918**

Starting IP	Ending IP	SubNet Mask	Host Bits	Number of Devices
192.168.000.000	192.168.000.255	255.255.255.000	8	256
192.168.000.000	192.168.001.255	255.255.254.000	9	512
192.168.000.000	192.168.003.255	255.255.252.000	10	1024
192.168.000.000	192.168.007.255	255.255.248.000	11	2048
192.168.000.000	192.168.015.255	255.255.240.000	12	4096
192.168.000.000	192.168.031.255	255.255.224.000	13	8192
172.016.000.000	172.016.255.255	255.255.000.000	16	65,535
172.031.000.000	172.031.255.255	255.255.000.000	16	65,535
010.000.000.000	010.255.255.255	255.000.000.000	24	16,777,215

- **For More Information**

Robust DataComm can truly make your data flow like water - safely, sanely, and silently.

For more information, contact:

Robust DataComm, Inc.
 26471 Portola Pkway, Suite 1E-242
 Foothill Ranch, CA 92610-1743 U.S.A.
 US Sales: (972)248-7466 Fax: (972)248-9533
 email : info@robustdc.com

Robust DataComm Pte Ltd
 18 Kaki Bukit Road 3 #02-08
 Entrepreneur Business Center Singapore 415978
 Tel: (65)6487-5624 Fax: (65)6288-3306
 web : http://www.robustdc.com

Copyright © 1999 Robust DataComm, USA and Singapore, All Rights Reserved.