

Configuring Your Raspberry Pi As A Console Server

NOVEMBER 11, 2013 by ROWELL DIONICIO — 5 COMMENTS

You get very excited once you get your own physical lab of routers and switches going. You just can't wait to start managing and configuring switchport security, spanning-tree, etc. And then you get tired of having to move the console cable from one switch to the other. And you don't have the ability to play with your lab remotely. Ugh.

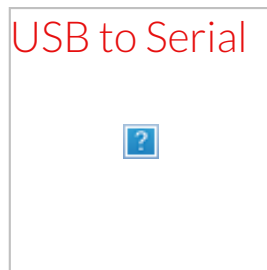
Initially, I was going to buy into some sort of console server. Either utilize an old 2500 router or look at OpenGear. But why not use an RPi which would cost less than \$100! That just made me happy. And from there I could access my lab anywhere!

My tutorial is very similar and I've included my experience below.

What you will need:

- [Raspberry Pi](#)
- [USB to 4 Port Serial Cable](#)

I purchased my USB to serial cable on [Amazon](#).
Wasn't cheap but it works.



To get started, I installed Raspbian. Download the [latest Raspbian](#) image and extract the zip file. You can use [win32diskimager](#)-v0.9-binary to load the image to your SD card.

Go through the initial setup of Raspbian and be sure to enable SSH. Before accessing the RPi server remotely, I had to configure the Ethernet interface:

```
sudo nano /etc/network/interfaces
```

This is my following static configuration:

```
iface eth0 inet static
address 10.1.10.250
gateway 10.1.10.1
netmask 255.255.255.0
network 10.1.10.0

```

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```
sudo reboot
```

I'd like to change the hostname from raspberrypi to
CONSOLE:

```
sudo nano /etc/hosts
127.0.0.1 localhost
::1 localhost ip6-localhost ip6-loop
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
127.0.1.1 CONSOLE
```

Then modify the hostname file:

```
sudo nano /etc/hostname
CONSOLE
```

Now moving on to the actual console portion of this project. We'll use [Ser2net](#) which allows you access the serial ports via telnetting into the RPi.

```
wget http://downloads.sourceforge.net
tar -xzvf ser2net-2.9.1.tar.gz
cd ser2net-2.9.1/
./configure
make
sudo make install
make clean
```

Now lets find out where our USB to Serial is connected:

```
pi@CONSOLE ~ $ dmesg | grep tty
[ 0.000000] Kernel command line: dm
[ 0.000000] console [tty1] enabled
[ 0.585230] dev:f1: ttyAMA0 at MMIO
[ 0.916712] console [ttyAMA0] enabl
[ 6.574040] usb 1-1.3: FTDI USB Ser
[ 7.049168] usb 1-1.3: FTDI USB Ser
[ 7.232239] usb 1-1.3: FTDI USB Ser
[ 7.392448] usb 1-1.3: FTDI USB Ser
```

My RPi recognized all the connectors but the actual device is connected to ttyUSB0.

Let's edit the ser2net configuration to get things going. The following is my configuration for each serial connection:

```
sudo nano /etc/ser2net.conf
```

```
BANNER:banner:CONSOLE LAB Terminal S
```

```
TRACEFILE:tr1:/var/log/ser2net/p-Y-M  
4001:telnet:0:/dev/ttyUSB0:9600 8DAT
```

```
TRACEFILE:tr2:/var/log/ser2net/p-Y-M  
4002:telnet:0:/dev/ttyUSB1:9600 8DAT
```

```
TRACEFILE:tr3:/var/log/ser2net/p-Y-M  
4003:telnet:0:/dev/ttyUSB2:9600 8DAT
```

```
TRACEFILE:tr4:/var/log/ser2net/p-Y-M  
4004:telnet:0:/dev/ttyUSB3:9600 8DAT
```



```
ser2net-config
```

Save that file and lets make sure Ser2Net starts up automatically:

```
sudo nano /etc/rc.local
```

Add the following above *exit 0*

```
/usr/local/sbin/ser2net -n -c /etc/s
```

Create a log directory for ser2net sessions:

```
sudo mkdir /var/log/ser2net
```

The ser2net.conf file follows the following format:

`<TCP port>:<state>:<timeout>:<device>:<options>`

The Banner statement follows this format:

*“ BANNER:<banner name>:banner
This will create a banner, if the banner name
is given in the
options of a line, that banner will be printed.
This takes the
standard “C” x characters (r is carriage
return, n is newline,
etc.). It also accepts d, which prints the
device name, p,
which prints the TCP port number, and s
which prints the serial
parameters (eg 9600 N81), and a large
number of date related
items. See the man page for details.. Banners
can span lines if
the last character on a line is “. Note that you
must use
rn to start a new line.*

The TRACEFILE statement creates a log for each

session, as you can see here:

```
pi@CONSOLE /var/log/ser2net $ ls
4001-2013-Nov-11-10:05:58.981929
```

What does the log look like?

```
pi@CONSOLE /var/log/ser2net $ sudo c
2013/11/11 10:05:58 OPEN (x.x.x.x:5
P1-CORE-SW1>
P1-CORE-SW1>en
Password:
Password:
P1-CORE-SW1#
P1-CORE-SW1#conf t
Enter configuration commands, one p
P1-CORE-SW1(config)#
P1-CORE-SW1(config)#int f0/1
P1-CORE-SW1(config-if)#
P1-CORE-SW1(config-if)#switchport a
% Access VLAN does not exist. Creat
P1-CORE-SW1(config-if)#
P1-CORE-SW1(config-if)#exit
P1-CORE-SW1(config)#
P1-CORE-SW1(config)#exit
P1-CORE-SW1#
P1-CORE-SW1#wr
```



```
Building configuration...
[OK]
P1-CORE-SW1#
P1-CORE-SW1#
*Mar 4 20:13:49.321: %SYS-5-CONFIG_
P1-CORE-SW1#2013/11/11 10:05:58 OPE
P1-CORE-SW1>
P1-CORE-SW1>en
Password:
Password:
P1-CORE-SW1#
P1-CORE-SW1#conf t
Enter configuration commands, one p
P1-CORE-SW1(config)#
P1-CORE-SW1(config)#int f0/1
P1-CORE-SW1(config-if)#
P1-CORE-SW1(config-if)#switchport a
% Access VLAN does not exist. Creat
P1-CORE-SW1(config-if)#
P1-CORE-SW1(config-if)#exit
P1-CORE-SW1(config)#
P1-CORE-SW1(config)#exit
P1-CORE-SW1#
P1-CORE-SW1#wr
Building configuration...
[OK]
```

```
P1-CORE-SW1#  
P1-CORE-SW1#  
*Mar 4 20:13:49.321: %SYS-5-CONFIG_  
P1-CORE-SW1#pi@CONSOLE /var/log/ser
```

Test out your console server. My console server IP address is 10.1.10.250. The ports I have configured for each console connection is 4001, 4002, 4003, 4004, respectively.

```
telnet 10.1.10.250 4001  
CONSOLE LAB Terminal Server TCP por  
P1-CORE-SW1#  
P1-CORE-SW1#
```

Caveats

I only noticed one thing. After consoling in, each new line is done twice. So far I haven't seen it submit any commands twice but I'm still looking into why this is happening.

My Setup

raspberry pi console server



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ABOUT ROWELL DIONICIO

I am [Rowell Dionicio](#), a network engineer with a coffee addiction and a passion for Wi-Fi. Follow me on [Twitter](#), [LinkedIn](#), [Facebook](#) and [YouTube](#).

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viju • 2 years ago

Wow... works great.. Thanks for ur post. :)

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viju • 2 years ago

Hi Rowell Dionicio,

Thanks for your post. I am following your steps for serial mapping in raspberry pi2. Actually I am new to linux and ser2net concept. Now I have created a ser2net.conf file inside /etc. I restarted ser2net and trying to access from my host PC but its failed.

I have copied my ser2net.conf file here. If you have any idea please let me know.Thanks.

```
BANNER:banner1:this is ser2net TCP port \p device \d
serial parms \s\r\n
```

```
# Don't do this by default
```

```
#CONTROLPORT:23
```

```
2000:telnet:20:/dev/ttyUSB0:115200 8DATABITS NONE  
1STOPBIT banner
```

```
2001:telnet:20:/dev/ttyUSB1:115200 8DATABITS NONE  
1STOPBIT banner
```

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Malcolm Kelly • 3 years ago

Does the mapping of TTYUSB* to the actual device stay the same after a reboot? I found that deviceA would be ttyUSB0 and deviceB would be ttyUSB1. But if you restart there's a 50/50 chance they've swapped around.

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Rowell Dionicio Mod → [Malcolm Kelly](#)
• 3 years ago

Hi Malcom,

I've had the mapping actually stay the same after reboot with the configuration I have. Now I haven't tried it with the new Raspberry Pi's. I'll have to test that out once I get a new one.

^ | v • [Share](#) ›



John • 3 years ago

works great. THANKS!
I followed the directions and it worked great.

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