

*****Default*****

pico_w or
nano-rp2040-connect
access point
for pico_w
10/29/22

*****Default*****

This needs to be appended to the end of .bashrc file.

export PICO_SDK_PATH=/home/devel/sdk/pico-sdk

The pico-sdk is required in this folder with its sub modules.

The submodules are tinyusb and the wifi lib

The FreeRTOS-Kernel is needed in **/home/devel/FreeRTOS-Kernel**

Several of files need modifications when you want to change the WIFI_SSID and WIFI_PASSWORD if the first character WIFI_PASSWORD is not a number it can be put in the pw_ssid.h file

modified: pico_w/freertos/iperf/picow_freertos_iperf.c
modified: pico_w/freertos/iperf/pw_ssid.h
modified: pico_w/freertos/ping/picow_freertos_ping.c
modified: pico_w/freertos/ping/pw_ssid.h
modified: pico_w/iperf/picow_iperf.c
modified: pico_w/iperf/pw_ssid.h
modified: pico_w/ntp_client/picow_ntp_client.c
modified: pico_w/ntp_client/pw_ssid.h
modified: pico_w/tcp_client/picow_tcp_client.c
modified: pico_w/tcp_client/pw_ssid.h
modified: pico_w/tcp_server/picow_tcp_server.c
modified: pico_w/tcp_server/pw_ssid.h

Either the pico_w or the Arduino Nano-RP2040-connect can be used as the access -point.

This will require minor changes in the file pico-examples/pico_w/access_point

line 130 const char *ap_name = "picow_test"; -> const char *ap_name = "nanotest";

line 132 const char *password = "password"; -> const char *password = "12345678";

line 140 IP4_ADDR(&gw, 192, 168, 4, 1); -> IP4_ADDR(&gw, 10, 0, 1, 10);

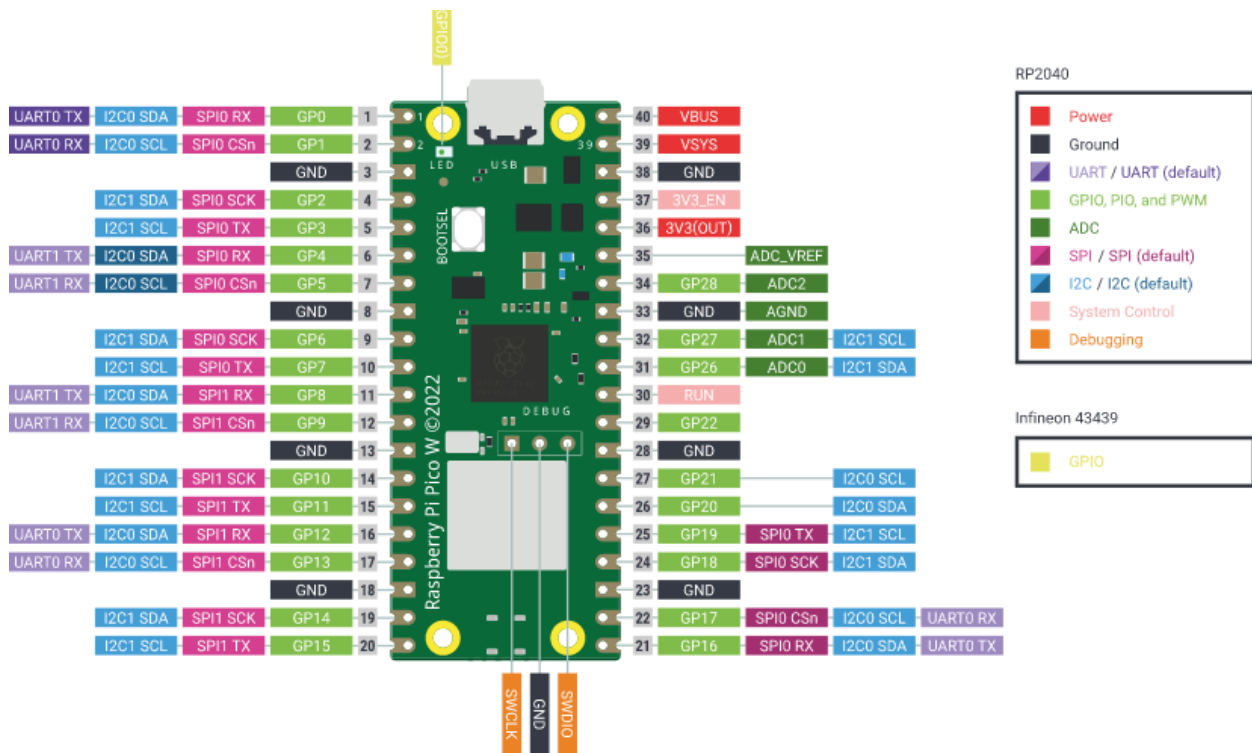
Pico_W

https://www.amazon.com/Vis-Viva-Raspberry-Basic-PICO-W/dp/B0BDSPXP2R/ref=mp_s_a_1_2?crid=2RQUZH6WT21DV&keywords=pico_w&qid=1666627291&srefix=pico_w%2Caps%2C269&sr=8-2

\$17,95



pico_w pins



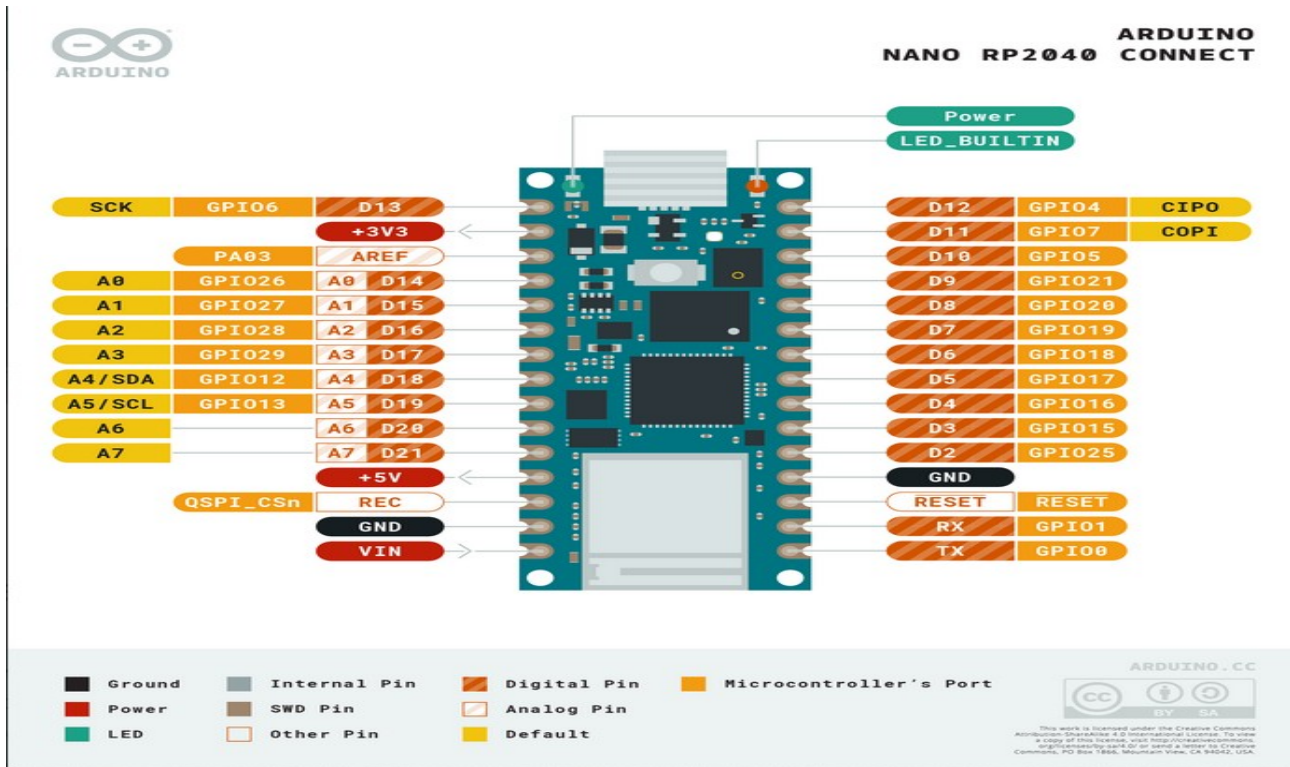
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 Arduino Nano-RP2040-Connect

https://www.amazon.com/Arduino-Nano-RP2040-Connect-Headers/dp/B095J4KFVT/ref=asc_df_B095J4KFVT/?tag=hyprod-20&linkCode=df0&hvadid=533458241275&hvpos=&hvnetw=g&hvrand=11004597131761763700&hvpone=&hvptwo=&hvqmt=&hvdev=m&hvdvcmdl=&hvlocint=&hvlocphy=9028705&hvtargid=pla-1588131359952&psc=1

\$34.99



XX



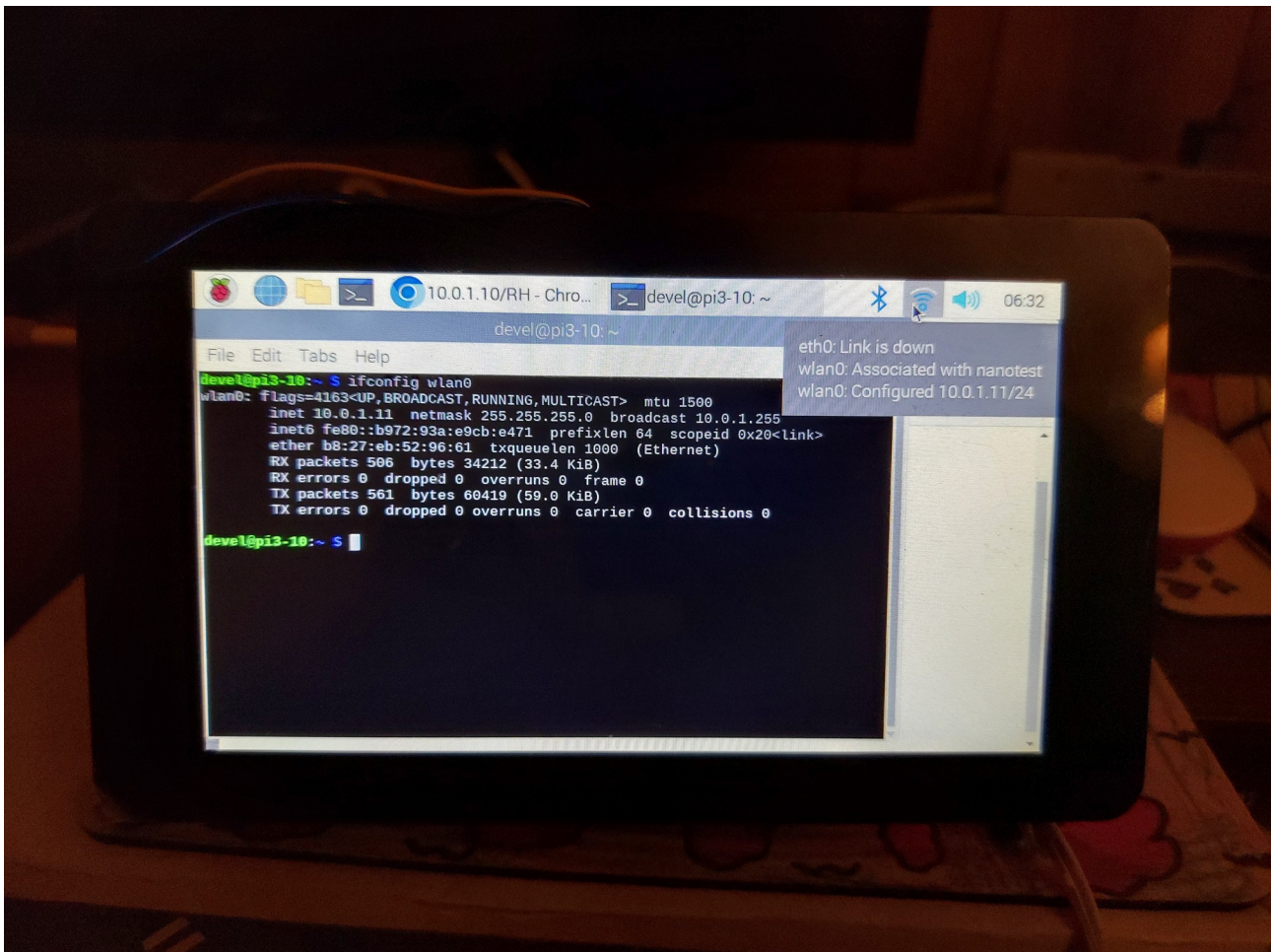
Programmed the Arduino Nano-RP2040-Connect as WIFI access point. This provides a DHCP server.

```

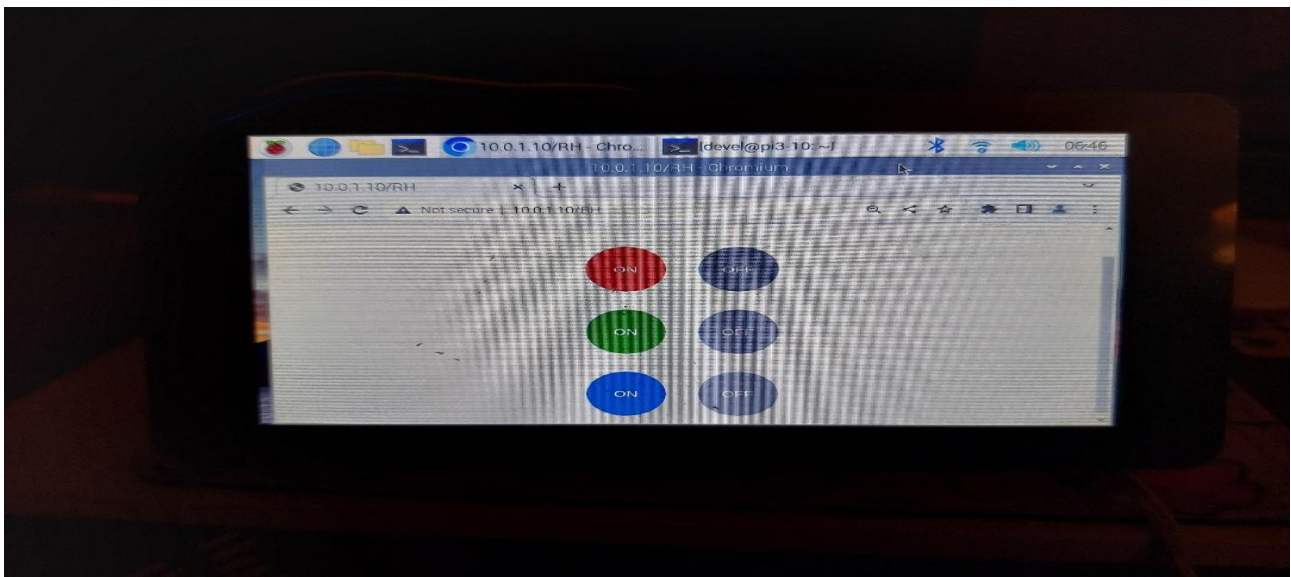
05:54:34.872 -> Access Point Web Server
05:54:35.298 -> Creating access point named: nanotest
05:54:46.500 -> SSID: nanotest
05:54:46.500 -> IP Address: 10.0.1.10
05:54:46.500 -> To see this page in action, open a browser to http://10.0.1.10
  
```

Autoscroll Show timestamp Newline 115200 baud Clear output

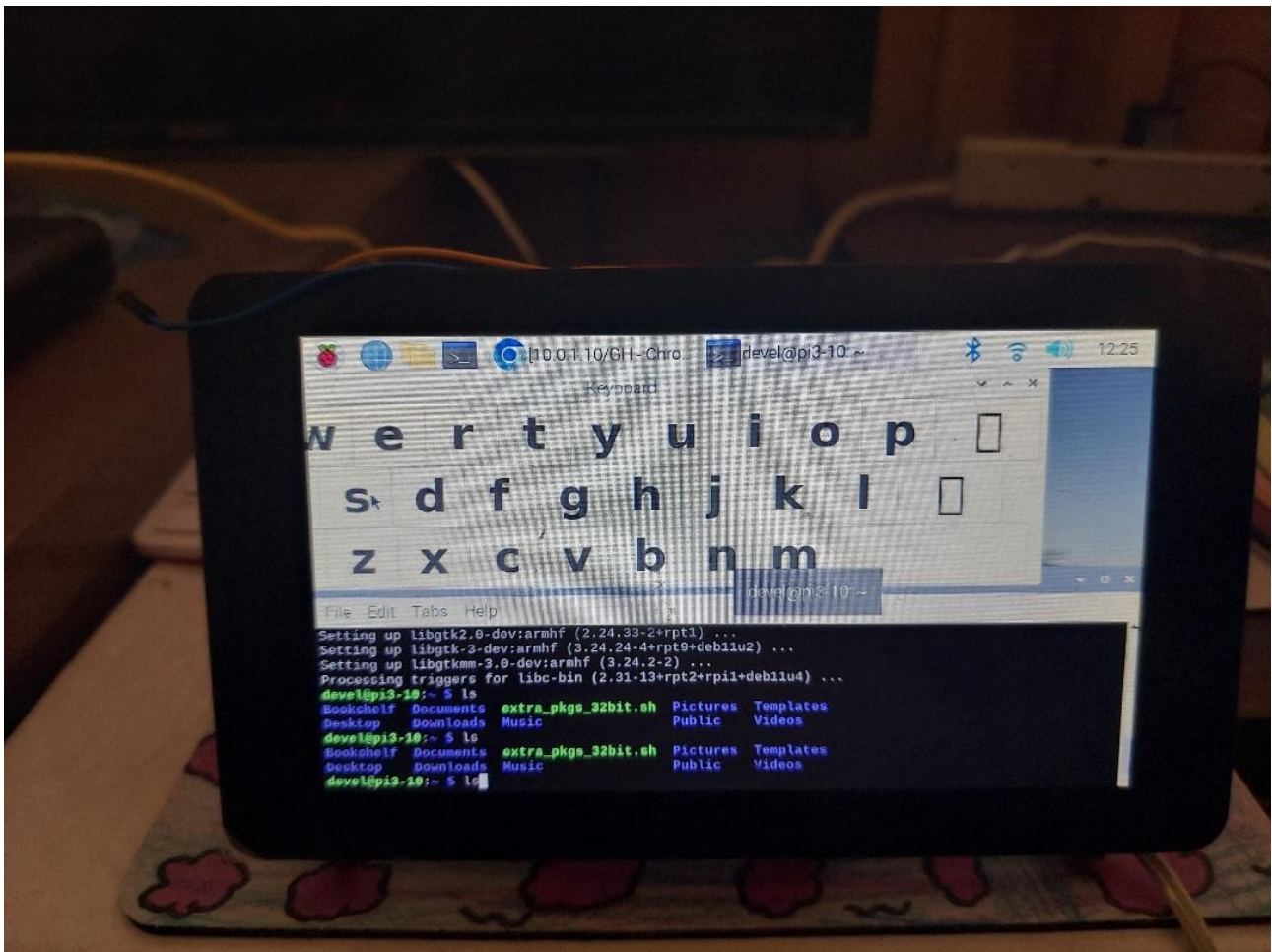
Two Raspberry Pi3B with 7 in displats were used as remotes on this network. The IP assigned to pi3-10 was 10.0.1.11. The IP assigned to pi3-11 was 10.0.1.12.



The access point also provides a web server to control the RGB Led on the Nano-RP2040-Connect.



Adding a virtual keyboard will make it easier to do the field tests.



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Press CTRL-A Z for help on special keys

Connecting to WiFi...
Connected.

Ready, running iperf server at 10.0.1.13
Completed iperf transfer of 10 MBytes @ 8.3 Mbits/sec
Total iperf megabytes since start 10 Mbytes

iperf -c 10.0.1.13

Client connecting to 10.0.1.13, TCP port 5001
TCP window size: 43.8 KByte (default)

[3] local 10.0.1.11 port 43808 connected with 10.0.1.13 port 5001
[ID] Interval Transfer Bandwidth
[3] 0.0000-10.0892 sec 10.0 MBytes 8.31 Mbits/sec

Client/Server

cmake -DPICO_BOARD=pico_w -DTEST_TCP_SERVER_IP="10.0.1.13" -
DWIFI_SSID="nanotest" -DWIFI_PASSWORD="12345678" ..

```
cmake -DPICO_BOARD=pico_w -DTEST_TCP_SERVER_IP="10.0.1.13" -  
DWIFI_SSID="nanotest" -DWIFI_PASSWORD="12345678" -  
DFREERTOS_KERNEL_PATH="/home/devel/FreeRTOS-Kernel" ..
```

```
openocd -f interface/raspberrypi-swd.cfg -f target/rp2040.cfg -c "program  
pico_w/wifi_scan/picow_wifi_scan_poll.elf verify reset exit"
```

Press CTRL-A Z for help on special keys

Performing wifi scan

ssid: nanotest	rssi: -50 chan: 3 mac: 30:c6:f7:01:8f7
ssid: ATTtpHTfPi	rssi: -11 chan: 1 mac: cc:ab:2c:c7:5e5
ssid: ATT3TV6WQs	rssi: -70 chan: 1 mac: c8:52:61:4e:d25
ssid: ATTtpHTfPi	rssi: -12 chan: 1 mac: cc:ab:2c:c7:5e5
ssid: nanotest	rssi: -51 chan: 3 mac: 30:c6:f7:01:8f7
ssid: ATT3TV6WQs	rssi: -71 chan: 1 mac: c8:52:61:4e:d25
ssid: House	rssi: -74 chan: 3 mac: c4:41:1e:4e:c35
ssid: nanotest	rssi: -53 chan: 3 mac: 30:c6:f7:01:8f7
ssid: nanotest	rssi: -51 chan: 3 mac: 30:c6:f7:01:8f7
ssid:	rssi: -71 chan: 3 mac: ca:41:1e:4e:c35
ssid:	rssi: -76 chan: 3 mac: ca:41:1e:4e:c35
ssid: ATTjw8tqXi	rssi: -82 chan: 6 mac: f4:17:b8:de:a65
ssid: ATTtpHTfPi	rssi: -46 chan: 1 mac: cc:ab:2c:c7:5e5
ssid: ATT47CJH5z_EXT	rssi: -70 chan: 11 mac: 3c:84:6a:46:987
ssid: ATT47CJH5z_EXT	rssi: -73 chan: 11 mac: 3c:84:6a:46:987
ssid: ATT47CJH5z_EXT	rssi: -73 chan: 11 mac: 3c:84:6a:46:987
ssid: ATT47CJH5z_EXT	rssi: -71 chan: 11 mac: 3c:84:6a:46:987
ssid: ATT47CJH5z_EXT	rssi: -74 chan: 11 mac: 3c:84:6a:46:987

```
openocd -f interface/raspberrypi-swd.cfg -f target/rp2040.cfg -c "program  
pico_w/ipperf/picow_iperf_server_background.elf verify reset exit"
```

```
openocd -f interface/raspberrypi-swd.cfg -f target/rp2040.cfg -c "program  
pico_w/tcp_server/picow_tcpip_server_background.elf verify reset exit"
```

Back from buildCRCTable

0xd3 0x1 0x2e

Connecting to WiFi...

Connected.

Starting server at 10.0.1.13 on port 4242

Client connected

Writing 2048 bytes to client

tcp_server_sent 1460

tcp_server_sent 588

Waiting for buffer from client

tcp_server_recv 1460/0 err 0

tcp_server_recv 588/1460 err 0

tcp_server_recv buffer ok

[illegible]


```
Writing 2048 bytes to server
tcp_client_sent 1460
tcp_client_sent 588
Waiting for buffer from server
recv 1460 err 0
recv 588 err 0
Writing 2048 bytes to server
tcp_client_sent 1460
tcp_client_sent 588
Waiting for buffer from server
recv 1460 err 0
recv 588 err 0
Writing 2048 bytes to server
tcp_client_sent 1460
tcp_client_sent 588
Waiting for buffer from server
recv 1460 err 0
recv 588 err 0
Writing 2048 bytes to server
tcp_client_sent 1460
tcp_client_sent 588
Waiting for buffer from server
recv 1460 err 0
recv 588 err 0
Writing 2048 bytes to server
tcp_client_sent 1460
tcp_client_sent 588
test success
```

```
openocd -f interface/raspberrypi-swd.cfg -f target/rp2040.cfg -c "program
pico_w/freertos/iperf/picow_freertos_iperf_server_sys.elf verify reset exit"
```

Welcome to minicom 2.8

OPTIONS: I18n
Port /dev/ttyUSB0, 05:23:50

Press CTRL-A Z for help on special keys

Back from buildCRCTable
0xd3 0x1 0x2e
Starting FreeRTOS on core 0:
Connecting to WiFi...
Connected.

Ready, running iperf server at 10.0.1.13
blink_task starts

iperf -c 10.0.1.13

Client connecting to 10.0.1.13, TCP port 5001
TCP window size: 43.8 KByte (default)

```
-----  
[ 3] local 10.0.1.12 port 47696 connected with 10.0.1.13 port 5001  
[ ID] Interval    Transfer    Bandwidth  
[ 3] 0.0000-10.3064 sec  7.13 MBytes  5.80 Mbits/sec  
devel@pi3-11:~ $ iperf -c 10.0.1.13  
-----
```

```
Client connecting to 10.0.1.13, TCP port 5001  
TCP window size: 43.8 KByte (default)  
-----
```

```
[ 3] local 10.0.1.11 port 50480 connected with 10.0.1.13 port 5001  
[ ID] Interval    Transfer    Bandwidth  
[ 3] 0.0000-10.1188 sec  7.50 MBytes  6.22 Mbits/sec
```

```
Completed iperf transfer of 7 MBytes @ 6.2 Mbits/sec  
Total iperf megabytes since start 7 Mbytes
```

```
openocd -f interface/raspberrypi-swd.cfg -f target/rp2040.cfg -c "program  
pico_w/freertos/iperf/picow_freertos_iperf_server_nosys.elf verify reset exit"
```

```
Welcome to minicom 2.8
```

```
OPTIONS: I18n  
Port /dev/ttyUSB0, 05:23:50
```

```
Press CTRL-A Z for help on special keys
```

```
Back from buildCRCTable  
0xd3 0x1 0x2e  
Starting FreeRTOS on core 0:  
Connecting to WiFi...  
Connected.
```

```
Ready, running iperf server at 10.0.1.13  
blink_task starts
```

```
iperf -c 10.0.1.13
```

```
-----  
Client connecting to 10.0.1.13, TCP port 5001  
TCP window size: 43.8 KByte (default)  
-----
```

```
[ 3] local 10.0.1.11 port 50480 connected with 10.0.1.13 port 5001  
[ ID] Interval    Transfer    Bandwidth  
[ 3] 0.0000-10.1188 sec  7.50 MBytes  6.22 Mbits/sec  
devel@pi3-11:~ $ iperf -c 10.0.1.13  
-----
```

```
Client connecting to 10.0.1.13, TCP port 5001  
TCP window size: 43.8 KByte (default)  
-----
```

```
[ 3] local 10.0.1.11 port 60174 connected with 10.0.1.13 port 5001  
[ ID] Interval    Transfer    Bandwidth  
[ 3] 0.0000-10.2288 sec  7.88 MBytes  6.46 Mbits/sec
```

Completed iperf transfer of 7 MBytes @ 6.4 Mb/s/sec
Total iperf megabytes since start 7 Mbytes

```
openocd -f interface/raspberrypi-swd.cfg -f target/rp2040.cfg -c "program  
pico_w/freertos/ping/picow_freertos_ping_nosys.elf verify reset exit"
```

Starting FreeRTOS on core 0:

Connecting to WiFi...

Connected.

ping 10.0.1.10 10.0.1.10

ping 10.0.1.10 10.0.1.10

ping 10.0.1.10 10.0.1.10

ping 10.0.1.10 10.0.1.10

ping 10.0.1.10 10.0.1.10

ping 10.0.1.10 10.0.1.10