程序出处：

STM32Cube\_FW\_H7\_V1.3.0\Projects\STM32H743I\_EVAL\Applications\LwIP\LwIP\_UDPTCP\_Echo\_Server\_Netconn\_RTOS

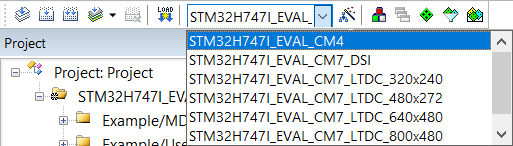
功能：

使用Echo传输协议实现的UDP及TCP服务器的测试程序，由于使用到Netconn编程接口需要加入FreeRTOS操作系统。程序将客户端发送过来的数据直接发送回去，主要用来测试客户端与服务器之间的网络传输速度。

测试方法：

见LwIP\_TCP\_Echo\_Server及LwIP\_UDP\_Echo\_Server两个文件夹里面的程序说明文件。

1. 按下图选M4内核的配置然后点击LOAD按钮下载M4内核的程序。



1. 按下图选M7内核的配置然后点击LOAD按钮下载M7内核的程序，M7内核的程序可以选择六种型号的液晶屏，带DSI字符的是MIPI接口的液晶屏，接20P的DSI接口。带LTDC字符的是RGB接口的液晶屏，接40P的RGB接口。

补充说明：

LWIP有三种编程接口：

1. RAW 可以不需要操作系统，但是复杂，需要用到回调函数。

2. NETCONN 需要操作系统支持，但是简单。

3. SOCKET 需要操作系统支持，简单，有内存拷贝会浪费内存。

Echo Protocol

From Wikipedia, the free encyclopedia

The **Echo Protocol** is a service in the [Internet Protocol Suite](https://en.wikipedia.org/wiki/Internet_Protocol_Suite) defined in [RFC 862](https://tools.ietf.org/html/rfc862). It was originally proposed for testing and measurement of [round-trip times](https://en.wikipedia.org/wiki/Round-trip_time)in IP networks.

A host may connect to a server that supports the Echo Protocol using the [Transmission Control Protocol](https://en.wikipedia.org/wiki/Transmission_Control_Protocol) (TCP) or the [User Datagram Protocol](https://en.wikipedia.org/wiki/User_Datagram_Protocol) (UDP) on the [well-known](https://en.wikipedia.org/wiki/List_of_well-known_ports_(computing)) [port number](https://en.wikipedia.org/wiki/Port_number) 7. The server sends back an identical copy of the data it received.

Round-trip delay time

From Wikipedia, the free encyclopedia

In [telecommunications](https://en.wikipedia.org/wiki/Telecommunication), the **round-trip delay time** (**RTD**) or **round-trip time** (**RTT**) is the length of time it takes for a signal to be sent plus the length of time it takes for an acknowledgement of that signal to be received. This time delay includes the [propagation times](https://en.wikipedia.org/wiki/Propagation_time) for the paths between the two [communication endpoints](https://en.wikipedia.org/wiki/Communication_endpoint).

In [space technology](https://en.wikipedia.org/wiki/Space_technology), the round-trip delay time or **round-trip light time** is the time light (and hence any signal) takes to go to a [space probe](https://en.wikipedia.org/wiki/Space_probe) and return.

In the context of computer networks, the signal is generally a [data packet](https://en.wikipedia.org/wiki/Network_packet), and the RTT is also known as the **ping time**. An internet user can determine the RTT by using the [ping command](https://en.wikipedia.org/wiki/Ping_command).

[End-to-end delay](https://en.wikipedia.org/wiki/End-to-end_delay) is the length of time it takes for a signal travel one direction and is often approximated by half the RTT.