



Azure RTOS NetX Duo Iperf User Guide

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Contents

Chapter 1 Introduction.....	1
Iperf Background	1
Chapter 2 Installation and Use	2
Installing the Demonstration	2
Installing Iperf	2
Setting the IP Address	2
Network Assumptions	2
Running the Demonstration	2
Browse to the Demonstration	3
Running Jperf	4
Chapter 3 Running the Demonstration	5
Running the UDP Transmit Test.....	5
Running the UDP Receive Test.....	8
Running the TCP Transmit Test	11
Running the TCP Receive Test	14

Chapter 1 Introduction

The NetX Duo Iperf Demonstration is designed to run a variety of evaluation boards in order to assess NetX Duo performance as well as the performance of the underlying hardware. This demonstration may also be used as a general platform for doing some limited network programming using NetX Duo.

Iperf Background

Iperf is a standard network testing program that runs on both Windows and Linux hosts. Iperf is designed to test TCP and UDP network throughput. The examples in this document are based on the Java-based Iperf implementation called Jperf. For more information on Iperf, please see reference the Wikipedia link:

<http://en.wikipedia.org/wiki/Iperf>

Chapter 2 Installation and Use

This chapter contains a description of various issues related to installation, setup, and usage of the NetX Duo Iperf Demonstration.

Installing the Demonstration

Please follow the platform specific installation instructions supplied in the distribution.

Installing Iperf

There is a variety of Iperf programs that you may use. However, the examples in this document are based on the Java-based ***Jperf 2.0.2***, which is available from multiple sources on the Internet.

Note: Jperf requires that Java is installed on the host machine.

Setting the IP Address

By default, the IP address the NetX Duo Iperf Demonstration is set to ***192.2.2.149***. This is setup in the file ***demo_netx_duo_iperf.c*** as a parameter to the call to ***nx_ip_create***.

Network Assumptions

This demonstration assumes that the Iperf host machine and the target board running the NetX Duo Iperf Demonstration are connected to a 100Mbps full-duplex Ethernet switch. To achieve best performance, there should be no other traffic on the test network.

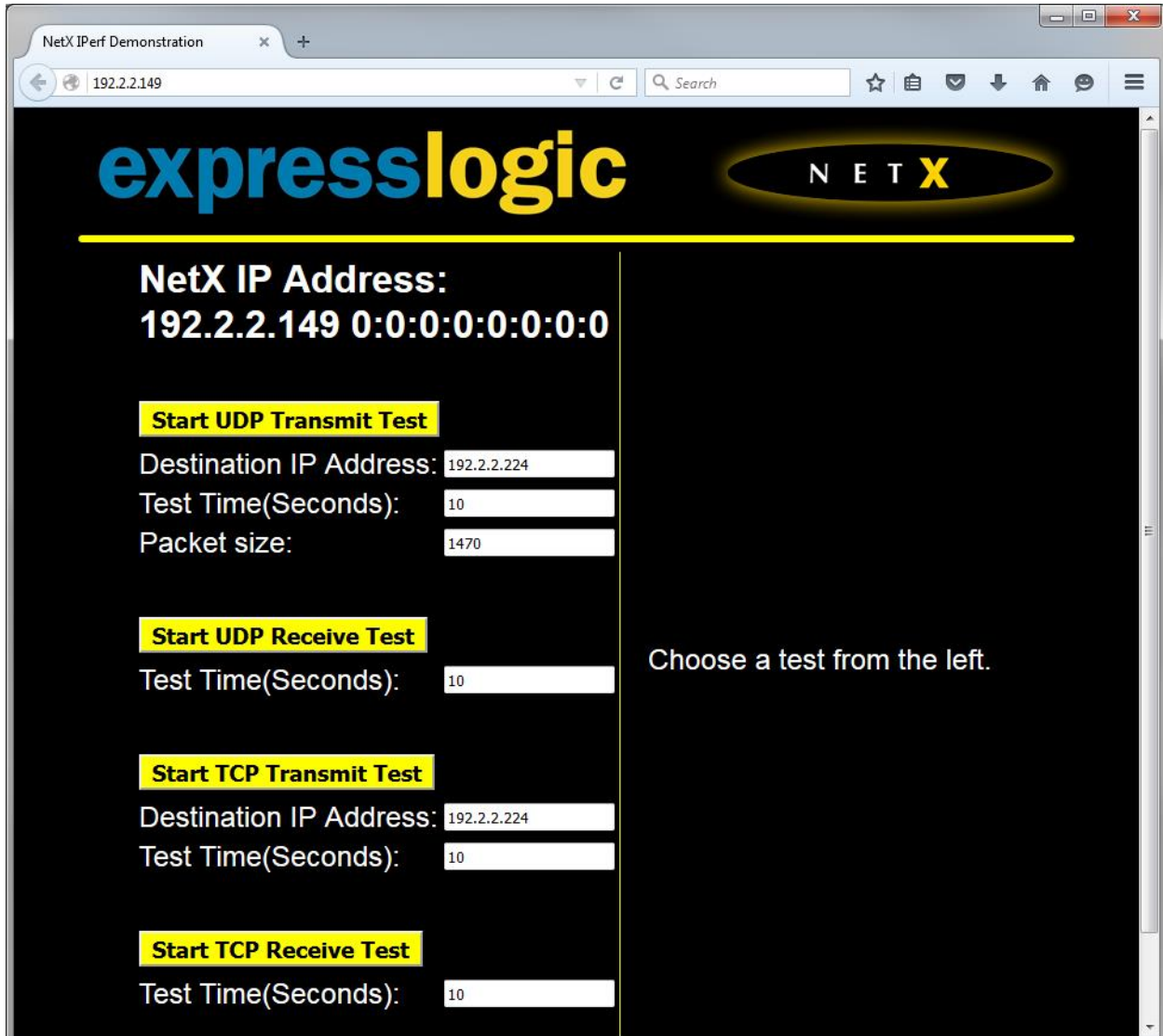
It is also possible to connect the Iperf host and the NetX Duo target board back-to-back with a cross-over Ethernet cable.

Running the Demonstration

Running the demonstration is easy; simply load, build and execute the NetX Duo Iperf Demonstration project – typically named ***demo_netx_duo_iperf***.

Browse to the Demonstration

Browse to the target board via a browser on the Iperf host platform. Assuming the target board IP address of **192.2.2.149**, the following is an example of the NetX Duo Iperf Demonstration initial web page:



NetX IPerf Demonstration

192.2.2.149

expresslogic **NETX**

NetX IP Address:
192.2.2.149 0:0:0:0:0:0:0:0

Start UDP Transmit Test

Destination IP Address: 192.2.2.224

Test Time(Seconds): 10

Packet size: 1470

Start UDP Receive Test

Test Time(Seconds): 10

Start TCP Transmit Test

Destination IP Address: 192.2.2.224

Test Time(Seconds): 10

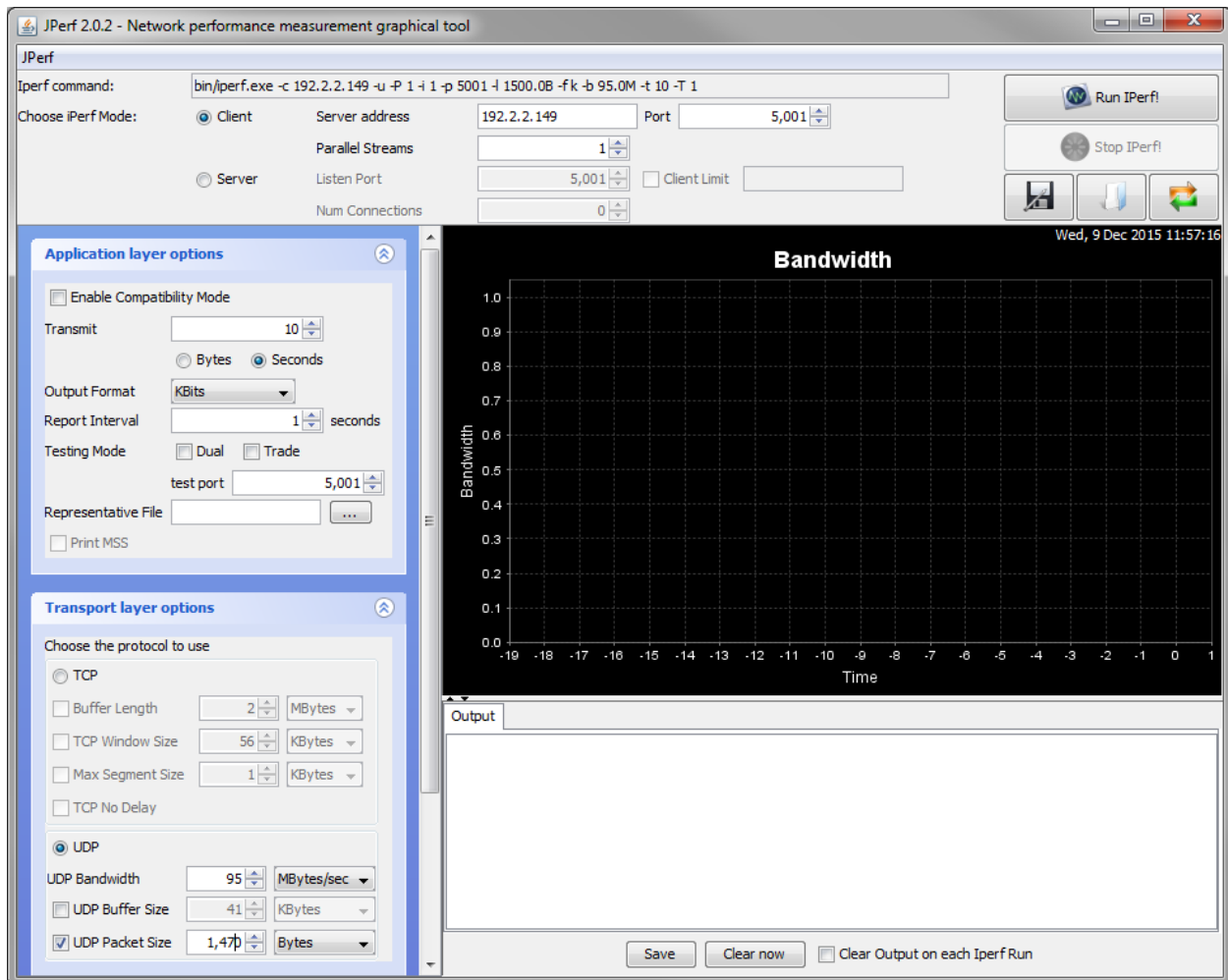
Start TCP Receive Test

Test Time(Seconds): 10

Choose a test from the left.

Running Jperf

Running Jperf is easy, simply double-click on the Windows batch file **jperf.bat**. This launches the Jperf IDE, as shown below. Once the Jperf IDE is displayed, the **Server Address** field must be set to the IP address of the NetX Duo Iperf Demonstration target board. In this example, the NetX Duo target board IP address is **192.2.2.149**. Also worth noting are the **UDP Bandwidth** and **UDP Packet Size** fields. These need to be setup for optimal UDP receive performance, as shown below:

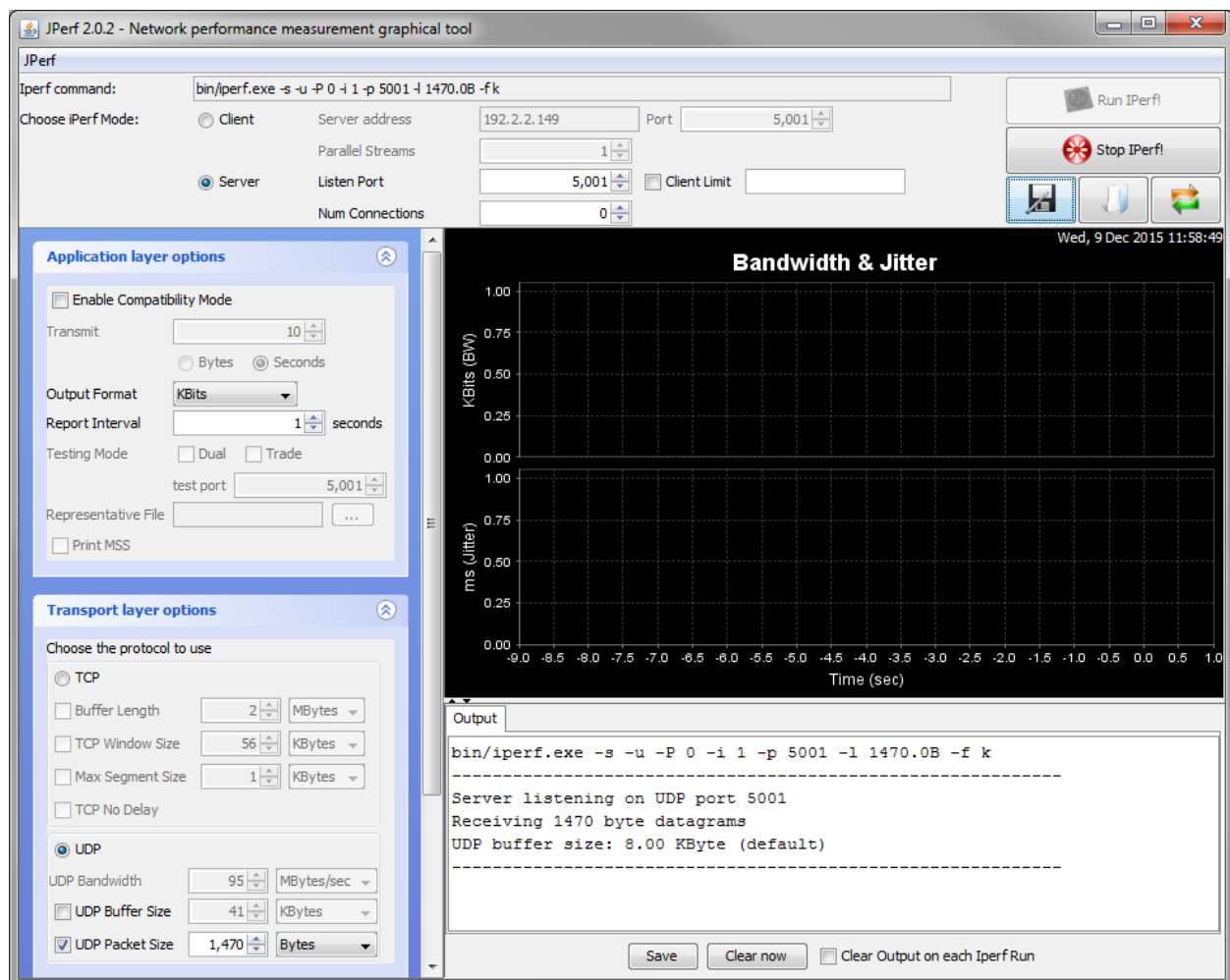


Chapter 3 Running the Demonstration

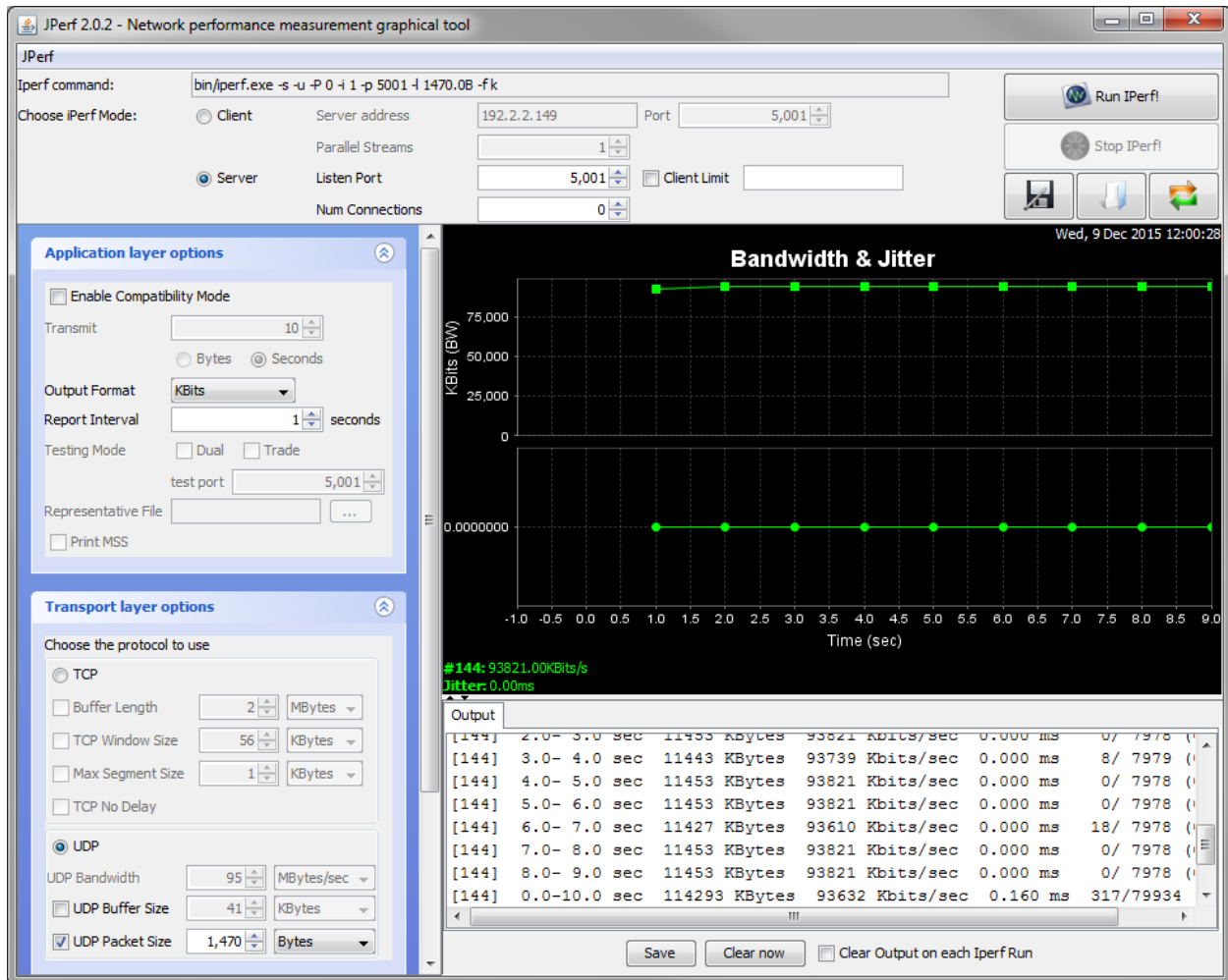
Assuming the host browser is displaying the NetX Duo Iperf Demonstration web page as shown previously and Jperf is running on the host, this chapter describes how to execute each Iperf test.

Running the UDP Transmit Test

The UDP Transmit Test determines the performance of NetX Duo UDP transmission to the host. In this test, the NetX Duo target is the client and the Jperf host is the server. First, select **Server** and **UDP** in the Jperf IDE. Next, select **Run IPerf!** to initiate the Iperf server, as shown below:



Now, from the NetX Duo Iperf Demonstration web page, select the **Start UDP Transmit Test** button to initiate the test. You should now observe performance statistics in the Jperf IDE and the NetX Duo web page updated, as shown below:



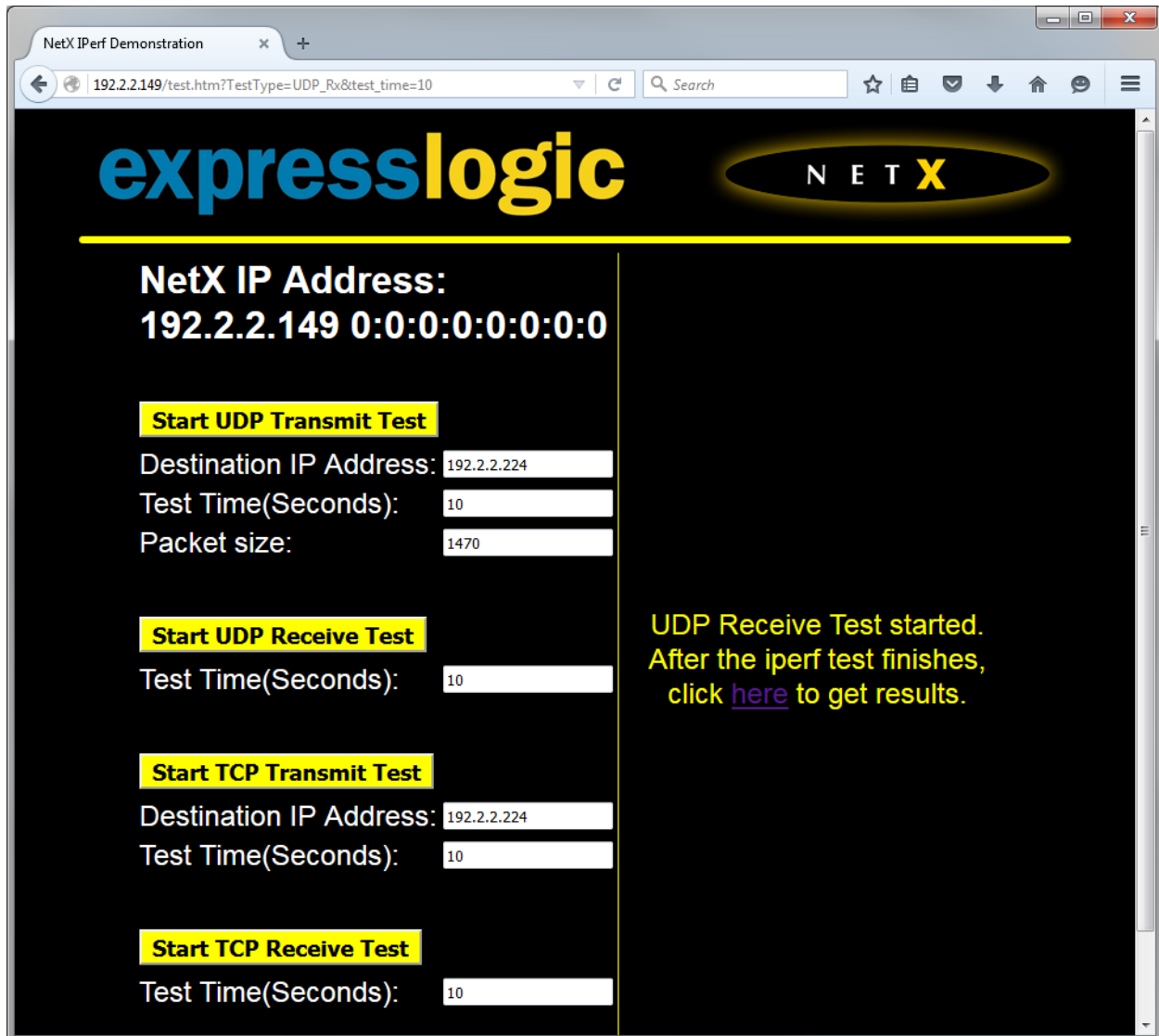
To complete the test, select **here** link on the NetX Duo Iperf Demonstration web page. You should now observe the performance results of the test. In this example, the UDP transmission performance on the NetX Duo target to the Iperf host was 94Mbps on the NetX Duo target, as shown below:

The screenshot shows a web browser window titled "NetX IPerf Demonstration" with the address bar displaying "192.2.2.149". The page features the ExpressLogic logo and a "NETX" badge. The main content is divided into two columns. The left column contains four test configuration sections, each with a yellow "Start" button and input fields for Destination IP Address, Test Time (Seconds), and Packet size. The right column displays the results of the "UDP Transmit Test Done:", including Destination IP Address, Test Time (milliseconds), Number of Packets Transmitted, Number of Bytes Transmitted, and Throughput (Mbps).

Test Type	Destination IP Address	Test Time (Seconds)	Packet size	Test Time (milliseconds)	Number of Packets Transmitted	Number of Bytes Transmitted	Throughput (Mbps)
UDP Transmit Test	192.2.2.224	10	1470	10000	79934	117502980	94
UDP Receive Test		10					
TCP Transmit Test	192.2.2.224	10					
TCP Receive Test		10					

Running the UDP Receive Test

The UDP Receive Test determines the performance of NetX Duo UDP reception on the NetX Duo target. In this test, the NetX Duo target is the server and the Jperf host is the client. First, select **Client** and **UDP** in the Jperf IDE. Next, select **Start UDP Receive Test** on the NetX Duo Iperf Demonstration web page, as shown:

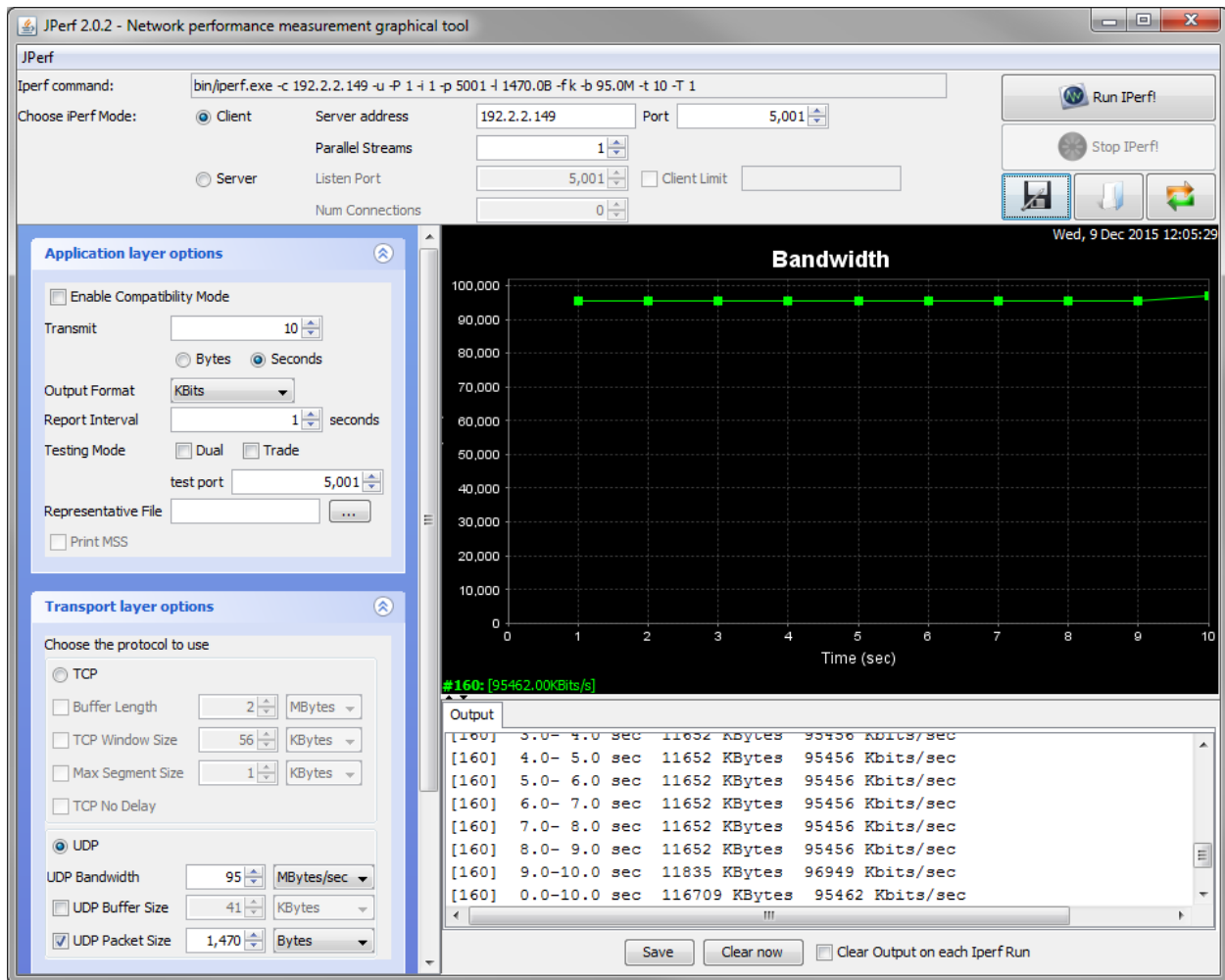


The screenshot shows a web browser window titled "NetX Iperf Demonstration" with the URL "192.2.2.149/test.htm?TestType=UDP_Rx&test_time=10". The page features the ExpressLogic and NetX logos at the top. Below the logos, the "NetX IP Address" is displayed as "192.2.2.149 0:0:0:0:0:0:0:0". The page is divided into two main sections. The left section contains four test configuration blocks, each with a yellow button and input fields for "Destination IP Address", "Test Time(Seconds)", and "Packet size". The right section contains a yellow text message indicating the test status and a link to view results.

Test Type	Destination IP Address	Test Time(Seconds)	Packet size
Start UDP Transmit Test	192.2.2.224	10	1470
Start UDP Receive Test		10	
Start TCP Transmit Test	192.2.2.224	10	
Start TCP Receive Test		10	

UDP Receive Test started.
After the iperf test finishes,
click [here](#) to get results.

Now select Run IPerf! from the Jperf IDE and observe statistics in the Jperf IDE, as shown below:



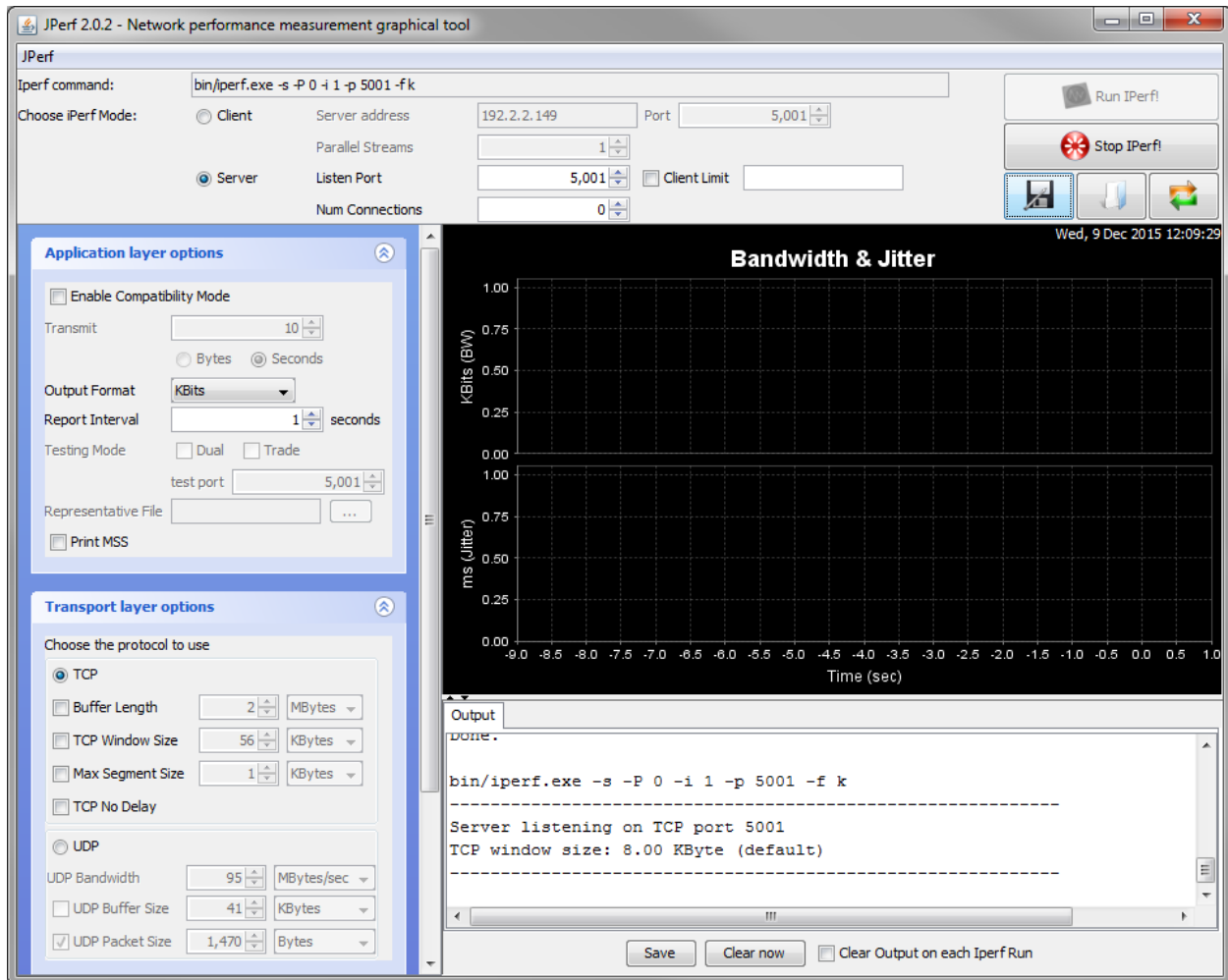
To complete the test, select the **here** link on the NetX Duo Iperf Demonstration web page. You should now observe the performance results of the test. In this example, the UDP reception performance on the NetX Duo target was 95Mbps, as shown below:

The screenshot shows a web browser window titled "NetX IPerf Demonstration" with the address bar displaying "192.2.2.149". The page features the ExpressLogic logo and a "NETX" badge. The main content is divided into two columns. The left column contains four test configuration sections, each with a yellow "Start" button and input fields for Destination IP Address, Test Time(Seconds), and Packet size. The right column displays the results of the "UDP Receive Test Done:".

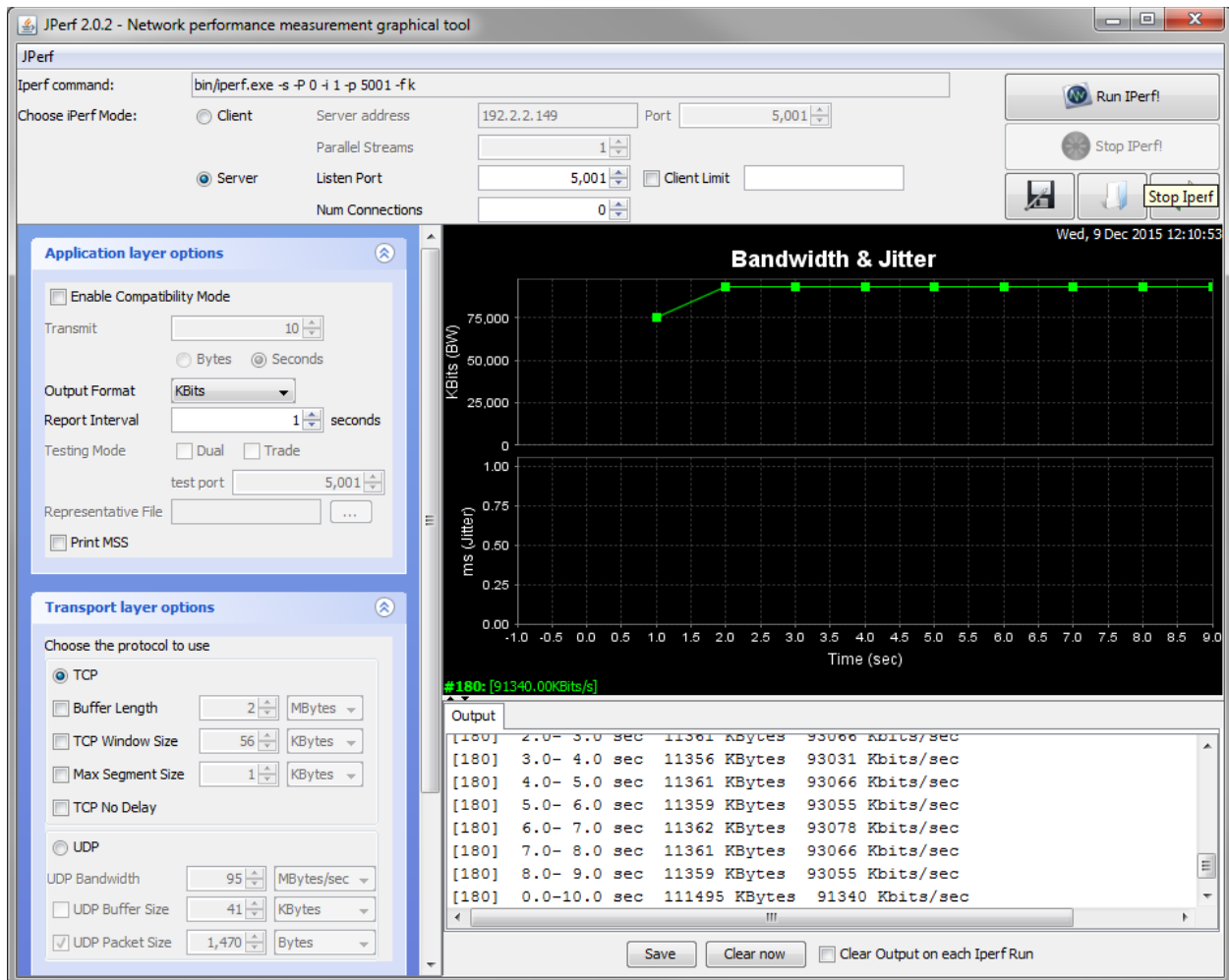
Test Configuration	Test Results
Start UDP Transmit Test Destination IP Address: 192.2.2.224 Test Time(Seconds): 10 Packet size: 1470	Source IP Address: 192.2.2.224 Test Time(milliseconds): 10000 Number of Packets Received: 81227
Start UDP Receive Test Test Time(Seconds): 10	Number of Bytes Received: 119403690 Throughput(Mbps): 95
Start TCP Transmit Test Destination IP Address: 192.2.2.224 Test Time(Seconds): 10	
Start TCP Receive Test Test Time(Seconds): 10	

Running the TCP Transmit Test

The TCP Transmit Test determines the performance of NetX Duo TCP transmission to the host. In this test, the NetX Duo target is the client and the Jperf host is the server. First, select **Server** and **TCP** in the Jperf IDE. Next, select **Run IPerf!** to initiate the Iperf server, as shown below:



Now, from the NetX Duo Iperf Demonstration web page, select the **Start TCP Transmit Test** button to initiate the test. You should now observe performance statistics in the Jperf IDE and the NetX Duo Iperf Demonstration web page updated, as shown below:



To complete the test, select the **here** link on the NetX Duo Iperf Demonstration web page. You should now observe the performance results of the test. In this example, the TCP transmission performance on the NetX Duo target was 91Mbps, as shown below:

The screenshot shows a web browser window titled "NetX IPerf Demonstration" with the address bar displaying "192.2.2.149". The page features the "expresslogic" logo and a "NETX" logo. The main content is divided into two columns. The left column contains four test configuration sections, each with a yellow "Start" button and input fields for "Destination IP Address" (all set to 192.2.2.224) and "Test Time(Seconds)" (all set to 10). The right column displays the results of a "TCP Transmit Test Done:", including "Destination IP Address: 192.2.2.224", "Test Time(milliseconds): 10000", "Number of Packets Transmitted: 78199", "Number of Bytes Transmitted: 114170540", and "Throughput(Mbps): 91".

Test Type	Destination IP Address	Test Time(Seconds)
Start UDP Transmit Test	192.2.2.224	10
Start UDP Receive Test	192.2.2.224	10
Start TCP Transmit Test	192.2.2.224	10
Start TCP Receive Test	192.2.2.224	10

Test Results
TCP Transmit Test Done:
Destination IP Address: 192.2.2.224
Test Time(milliseconds): 10000
Number of Packets Transmitted: 78199
Number of Bytes Transmitted: 114170540
Throughput(Mbps): 91

Running the TCP Receive Test

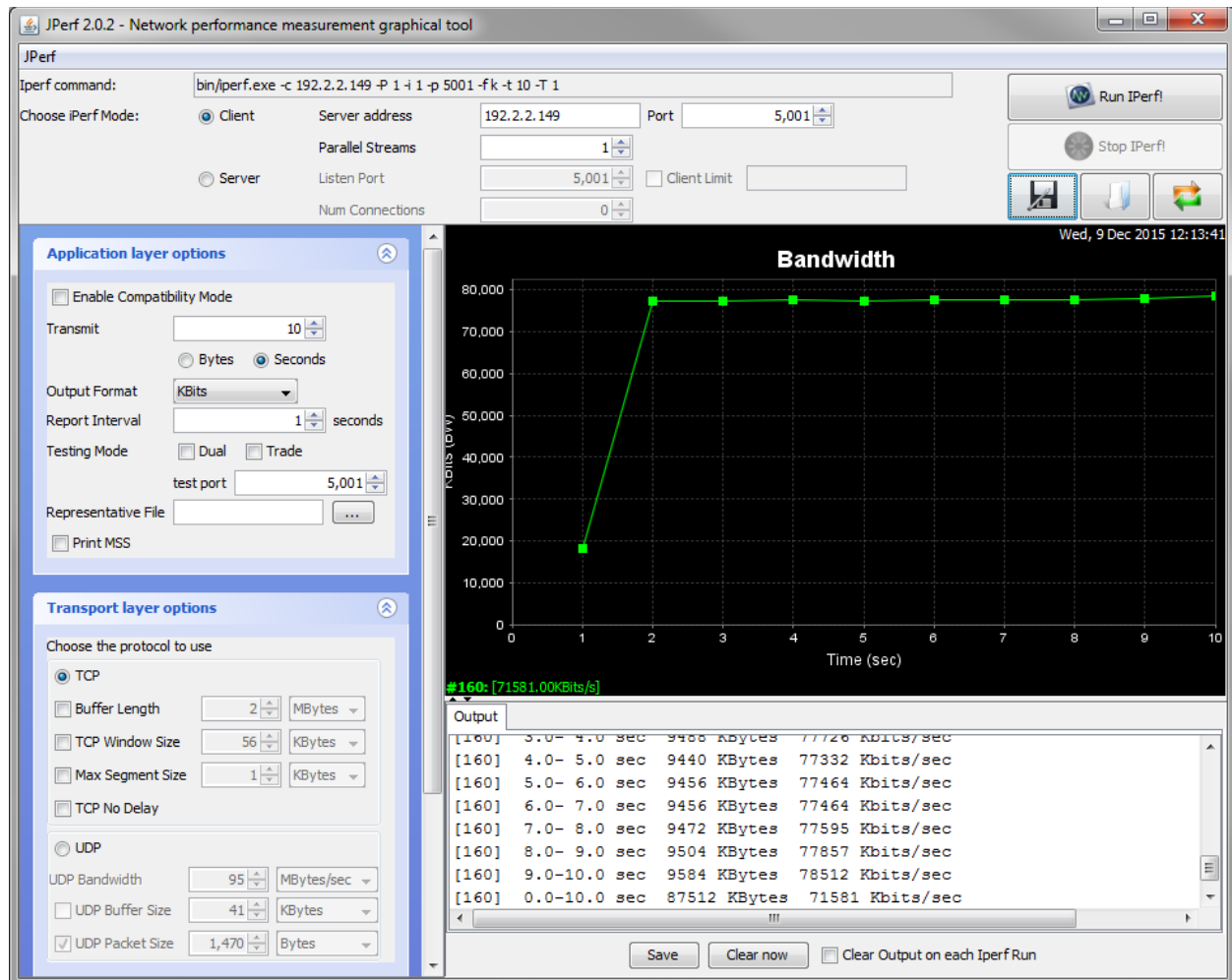
The TCP Receive Test determines the performance of NetX Duo TCP reception on the NetX Duo target. In this test, the NetX Duo target is the server and the Jperf host is the client. First, select **Client** and **TCP** in the Jperf IDE. Next, select **Start TCP Receive Test** on the NetX Duo web page, as shown:

The screenshot shows a web browser window titled "NetX IPPerf Demonstration" with the URL "192.2.2.149/test.htm?TestType=TCP_Rx&test_time=10". The page features the ExpressLogic and NetX logos. On the left, there are four test configuration sections, each with a yellow button and input fields:

- NetX IP Address:** 192.2.2.149 0:0:0:0:0:0:0:0
- Start UDP Transmit Test**
 - Destination IP Address: 192.2.2.224
 - Test Time(Seconds): 10
 - Packet size: 1470
- Start UDP Receive Test**
 - Test Time(Seconds): 10
- Start TCP Transmit Test**
 - Destination IP Address: 192.2.2.224
 - Test Time(Seconds): 10
- Start TCP Receive Test**
 - Test Time(Seconds): 10

On the right side of the page, a message states: "TCP Receive Test started. After the iperf test finishes, click [here](#) to get results."

Now select **Run IPerf!** from the Jperf IDE and observe statistics in the Jperf IDE, as shown below:



To complete the test, select the **here** link on the NetX Duo Iperf Demonstration web page. You should now observe the performance results of the test. In this example, the TCP reception performance on the NetX Duo target was 71Mbps, as shown below:

The screenshot shows a web browser window titled "NetX Iperf Demonstration" with the address bar displaying "192.2.2.149". The page features the ExpressLogic logo and a "NETX" badge. The main content is divided into two columns. The left column contains four test configuration sections, each with a yellow button and input fields for Destination IP Address, Test Time(Seconds), and Packet size. The right column displays the results of a completed TCP Receive Test.

Test Configuration	Test Results
Start UDP Transmit Test Destination IP Address: 192.2.2.224 Test Time(Seconds): 10 Packet size: 1470	TCP Receive Test Done: Source IP Address: 192.2.2.224 Test Time(milliseconds): 10010 Number of Packets Received: 65635 Number of Bytes Received: 89612312 Throughput(Mbps): 71
Start UDP Receive Test Test Time(Seconds): 10	
Start TCP Transmit Test Destination IP Address: 192.2.2.224 Test Time(Seconds): 10	
Start TCP Receive Test Test Time(Seconds): 10	