NETROPY® TRAFFIC GENERATOR:

APPSTORM

USER'S GUIDE

Version 1.4

APPOSITE
TECHNOLOGIES

Netropy® Traffic Generator AppStorm User's Guide

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1 Overview

Apposite Technologies would like to thank you for purchasing the Apposite Technologies' Netropy Traffic Generator AppStorm. This User's Guide is intended to describe the proper installation, configuration, and operation of this product. Please reference the *Quick Start Guide* and *Hardware Guide* for additional information. The Quick Start Guide may be used to facilitate initial configuration and the Hardware Guide to outline the specific hardware components for each model.

1.1 Netropy Traffic Generator Configuration

The Netropy Traffic Generator must be configured through the browser-based Graphical User Interface (GUI) or using the CLI. The recommended browser is Google Chrome using HTTP or HTTPS.

1.2 AppStorm Operation

The configuration and use of the AppStorm requires the following configuration steps accessed using the system's GUI:

1. Open the GUI
   Connect to the Netropy Traffic Generator using the default IP/Hostname assigned. Log in using your user account credentials.

2. Reserve Ports
   Reserve the specified quantity of ports you will need for your test.

3. Create Test Bed
   Name and select AppStorm to configure a new test bed.

4. Set Drop Application Tracks
   Add or remove tracks.

5. Configure Hosts
   Configure the client and server for your test and determine multi-site selection.

6. Set Additional Configurations
   Configure additional settings such as mode, RTT, Retries, NAT, and TTL.

7. Configure the Traffic Profile
   Configure the traffic profile for the tracks selected.

8. Adjust the Load Profile
   Adjust the Load Profile settings and configurations.

9. Summary
   Verify the Test Bed configuration.

10. Start the Test
    Click the "Start Test" button to begin capturing data on the test bed.

11. Evaluate results and logs
    View the graphs and statistics to analyze and evaluate the test results. Download any logs and reports.

12. Adjust configuration
    Alter the configuration after the initial test. This can be conducted to analyze various configurations and settings. All previous configuration steps from 4 to 8 can be adjusted on the same test bed.

2 Installation and Set-Up

To configure and operate the Netropy Traffic Generator AppStorm through its browser-based GUI, the dedicated Ethernet management port must first be configured with an appropriate IP address and subnet mask. For convenience, the MGMT interface comes pre-configured with an IP address of 10.0.0.10 and is accessible from a directly connected host on the 10.0.0.0/255.0.0.0 subnet. The IP address and subnet mask of the MGMT interface can be changed through the GUI by an account with administrator privileges or by using the CLI.

2.1 Preparation

Management of the Netropy Traffic Generator device through the GUI requires a PC running an up-to-date web browser.

Initial configuration of the management interface requires:

- a PC running a supported web browser that can be configured and placed on the 10.0.0.0/255.0.0.0 network.

2.2 Hardware Installation

The Netropy Traffic Generator appliance is designed for installation in a standard 19" rack. Refer to the *Hardware Guide* for your specific model for rack-mount installation instructions.

Plug either one or two standard power cords into the Netropy Traffic Generator device, depending on your model, and turn on the power. Either a U.S. standard or a U.S. Y-power cable will be supplied with each unit. The system will be available for use within 1-4 minutes.

2.3 IP Address Configuration via the Netropy Traffic Generator GUI

To configure the MGMT interface using the Netropy Traffic Generator GUI:

1. Configure a PC running a supported web browser with the IP address 10.0.0.2 or another address on the 10.0.0.0/255.0.0.0 subnet

2. Connect an Ethernet cable between the PC and the MGMT port on the front of the Netropy

Traffic Generator.

3. Open the browser on the PC and enter http://10.0.0.10 in the address bar.

4. Review the End User License Agreement. The Netropy Traffic Generator GUI will be displayed once the License Agreement is accepted.

5. Log in using the username "admin" and password "admin" to access the administrator portal.

6. Click on IP management in the top right corner and select change IP. Enter your network settings and select "Apply" to change these settings.

7. After the management interface has been configured, use the Ethernet cable to connect the MGMT port of the Netropy Traffic Generator to the management network.

2.4 IP Address Configuration via the Serial Console

1. Using the provided RJ45 to DB9 cable, connect the serial port of a PC running terminal emulation software to the CONSOLE port of the Netropy. Set the serial port parameters to 9600 baud, 8 bits, no parity, 1 stop bit, and disable flow control. For more details on connecting to the serial console, see the Hardware Guide for your specific model.

2. Press [ENTER] to display a login prompt. At the prompt, log in as "admin", password is "admin".

```
ntg login: admin
```

3. Use the following commands to set the IP address, netmask, and default gateway of the Netropy management interface:

```
[ntg]> mgmt set gw <default-gateway>

[ntg]> mgmt set addr <ip-address> netmask <mask>
```

IP addresses and subnet masks are entered in dotted-decimal format. For example:

```
[ntg]> mgmt set addr 192.168.1.1 netmask 255.255.255.0
```

4. Once the management interface has been configured, use an Ethernet cable to connect the MGMT port of the Netropy to the management network. Open a browser and enter the IP address of the MGMT interface in the address bar. The Netropy End User License Agreement will be displayed.

5. Review the License Agreement. The Netropy GUI will be displayed once the License Agreement is accepted.

6. Log in using username "admin" password "admin".

3 CONFIGURATION

To enable efficient configuration of the Netropy AppStorm system, it is best to develop a fundamental understanding of some basic concepts and terminology.

3.1 Tracks

Tracks are different types of application data. This data can be used in your test to simulate various traffic streams. AppStorm features many options for tracks, including the following:

- Social (ie. Facebook, Instagram, Periscope)
- Gaming
- Financial
- Web Conference
- Peer 2 Peer
- E-Commerce
- Radio
- Cab Booking
- Bus Booking
- Flight Booking
- Dating
- Chat
- Sports
- Database
- Productivity
- Streaming

Refer to Section 5 for additional information on how to configure tracks.

3.2 Hosts

Netropy Traffic Generator AppStorm uses virtual clients and servers to simulate devices on a network.

Refer to Section 7 for additional information on how to configure hosts.

4 Ports

4.1 Overview of Ports

Ports can either be set into reserve or release status. By releasing the port, you release ownership of the port, allowing it to be accessed by other users. By reserving the port, the port is retained and can be used in a new test bed.

Note: Reserving a port will not allow any other users to manage and use this same port.

These options can be enabled by clicking the switch in the Ports section of the Home page.

To configure a test bed, the necessary ports must be selected and reserved.

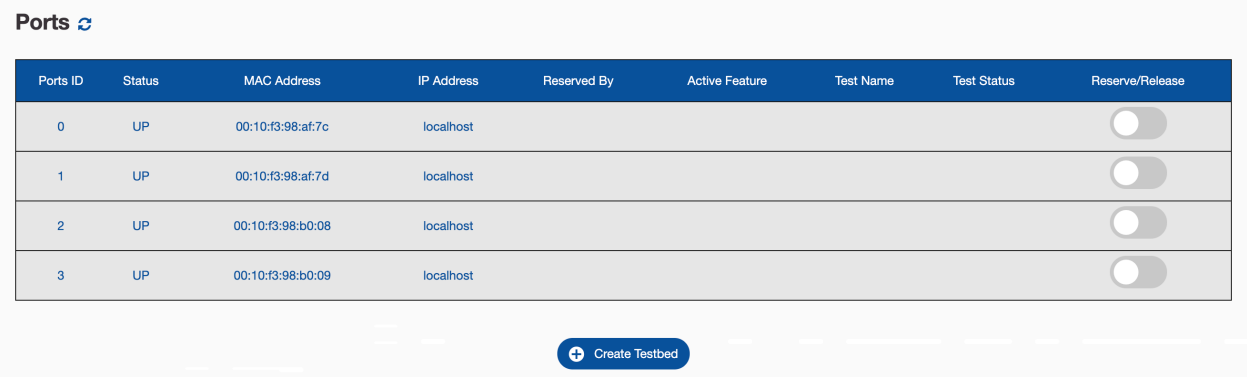

Figure 1: Reserve/Release Ports

4.2 Port Reset

To reset the ports, login using admin credentials and select the Ports tab.

The Ports tab displays the status of ports and allows the administrator to manually release ports as needed. This will override any port releases and reservations made by other user accounts.

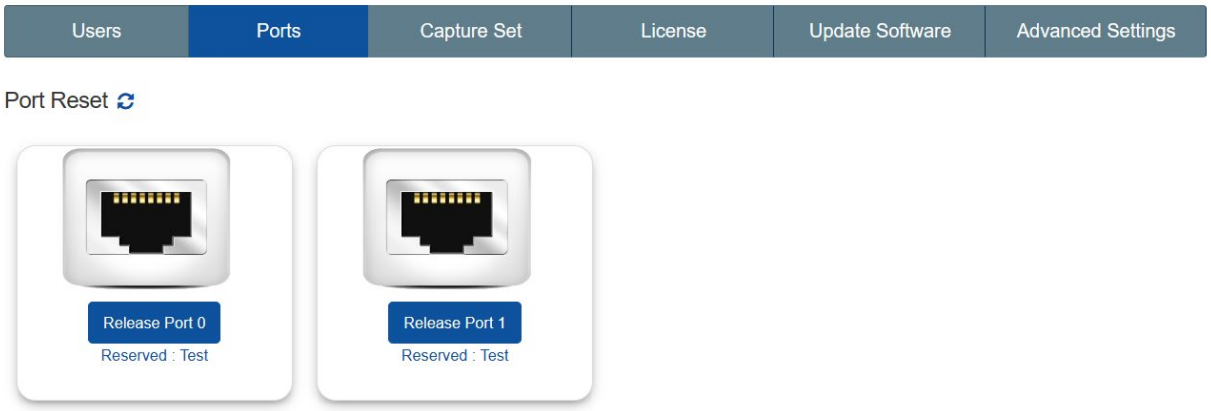

Figure 2: Port Reset

To release a port, click on the associated "Release Port X" button. As demonstrated in the figure below, this button will open a pop-up that displays the IP Address, status, speed, MAC address, and details on whether the port is reserved. By clicking "Release" the port will be released.

Refer to Section 15 for more information on Admin settings.

5 Test Beds

5.1 Test Beds Overview

A test bed is a platform used to configure and develop a simulated system. The test bed can be configured to emulate the specific hosts, data streams, and settings needed to accurately reflect the requirements of your system.

5.2 Configuring Test Beds

To create a test bed, select the "Create Testbed" button underneath the Port section. Select "AppStorm" from the menu and name the test. After naming and selecting the proper menu option, double click to add the new bed to your test environment.

The "Test Name:" field is limited to 15 characters.

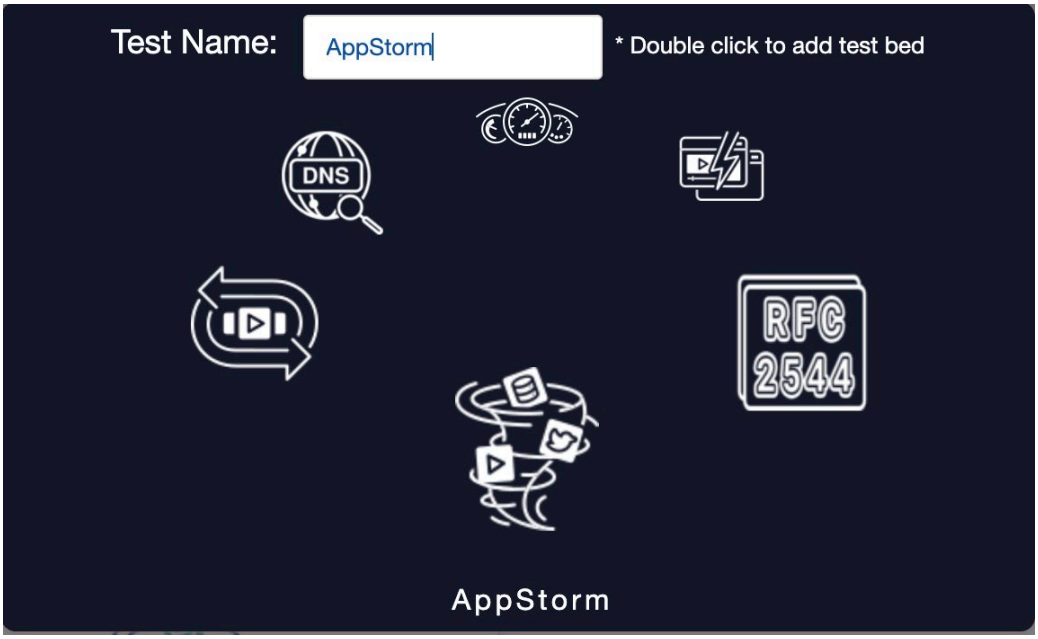

Figure 3: Naming Test Bed

After roughly 60 seconds, the new test bed should appear in the Test Bed section of the home page.

Select "Configure" to begin configuring the new test. This operation will redirect you to the five-step configuration menu, starting with Drop Application Tracks.

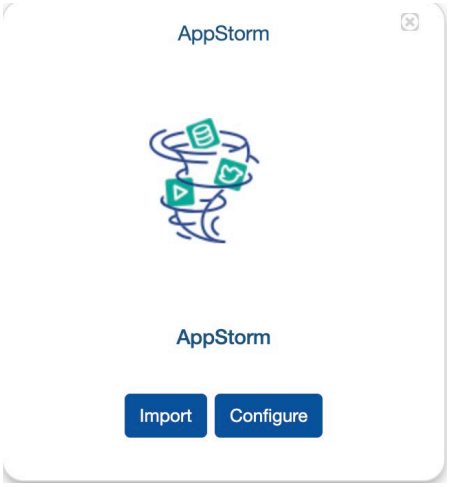

Figure 4: Configuring Test Bed

6 Test Bed: Drop Application Tracks

6.1 Drop Application Tracks Overview

The Drop Application Tracks menu allows the selection of various tracks. Each track can be adjusted, added, and removed from the test bed.

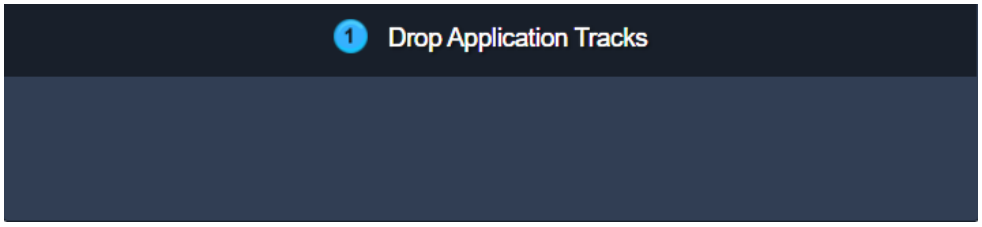

Figure 5: Drop Application Tracks

6.2 Adding Tracks

To add a track to the test bed, select a track from the Tracks menu on the left and drag it to the Drop Application Tracks menu.

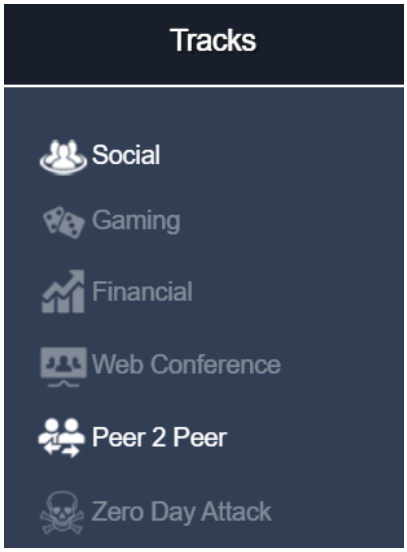

Figure 6: Tracks Menu

This action will add the track to the Drop Application Tracks menu. Each added track's logo will be displayed in the menu with an "X" to remove the track, if needed.

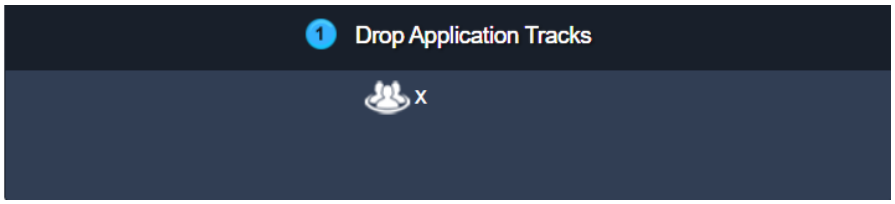

Figure 7: Adding Tracks

6.3 Track Configuration

To adjust the configuration settings on a track, double click the track image or logo, as shown in Figure 7.

6.3.1 Track Configuration Settings

By default, all options are selected through the "Select All" option. To adjust these settings, uncheck all traffic types that you wish to exclude from your test.

Click "Configure" to save the configuration.

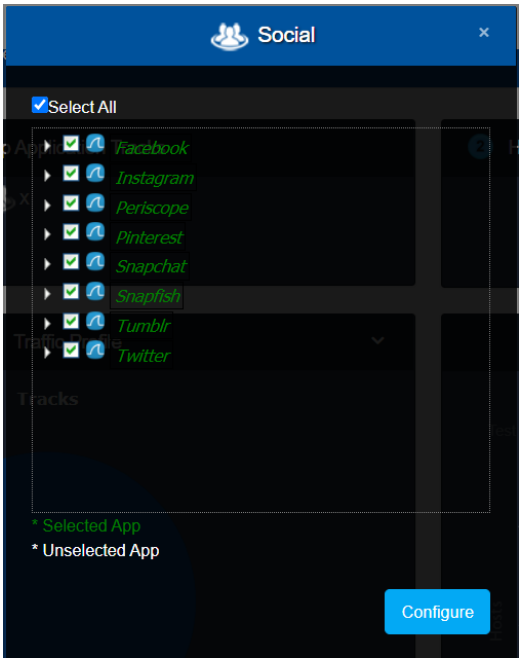

Figure 8: Track Configuration Settings

6.4 Removing Tracks

To remove a track from the Drop Application Tracks menu. Select the "X" button next to the track's icon.

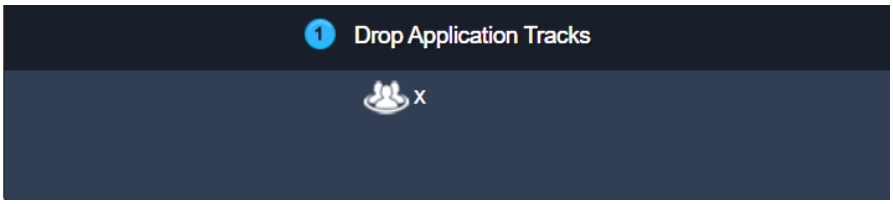

Figure 9: Removing Tracks

7 Test Bed: Host Configuration

7.1 Host Configuration Overview

The Host Configuration menu provides options to check Multi-Site.

This menu also provides the options to select "Client" or "Server".

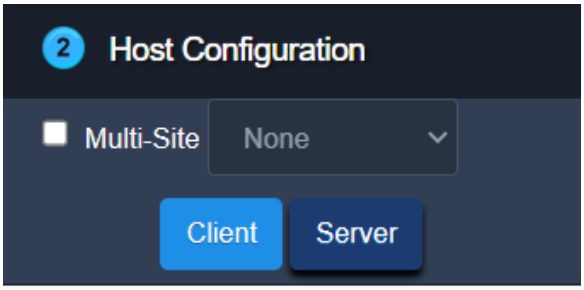

Figure 10: Host Configuration

7.2 Multi-Site Configuration

Multi-Site allows you to connect two different physical units to simulate two sites.

By default, Multi-Site is disabled. When disables, a single device is used to simulate both the client and server on the same different but different ports.

When you enable Multi-Site, a drop-down menu is available to select of the of the following options:

- None
- Client
- Server

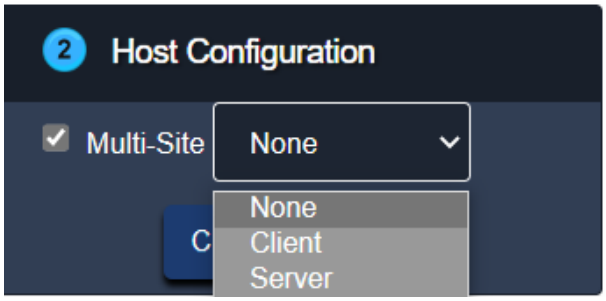

Figure 11: Multi-Site Configuration

7.3 Client Configuration

The Client Configuration menu provides options to adjust the following fields:

- Client Port
- Client MAC
- Encapsulation Type (None, VLAN, QinQ)
- IP Mode (Dynamic, Manual)
- Client IP
- Dest Mac Address
- External Gateway
- Clients

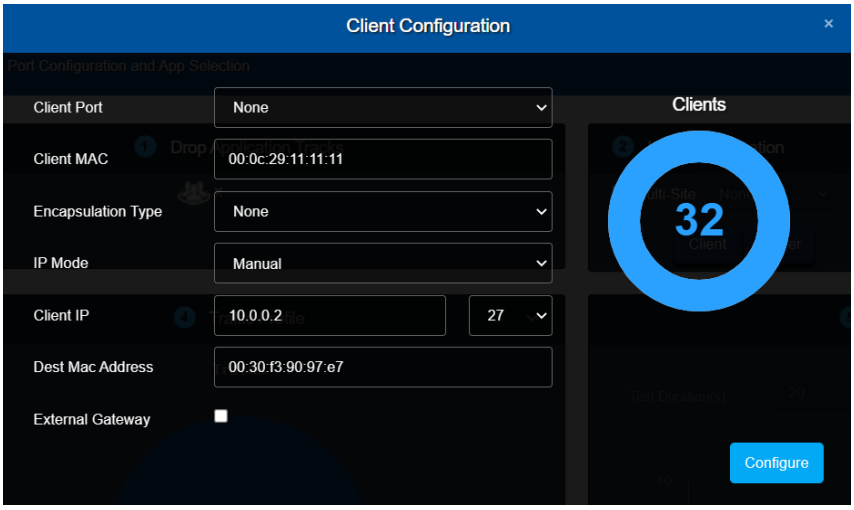

Figure 12: Client Configuration

After these values have been adjusted accordingly, the "Configure" button must be selected. By selecting "Configure", these changes will take effect.

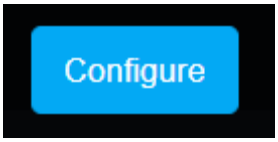

Figure 13: Configure Client

7.3.1 Client Port

By default, the port value for the client will be set to "None". To adjust this value, select one of the available ports from the drop-down menu.

Figure 14: Client Port

7.3.2 Client MAC

To figure the MAC address of the server, enter a 12-digital hexadecimal value into the "Client MAC" field.

Figure 15: Client MAC

7.3.3 Encapsulation

By default, the Encapsulation value is set to "None". To adjust this value, select an option from the drop-down menu. The available options are "None", "VLAN", and "QinQ".

Figure 16: Encapsulation

7.3.4 IP Mode

By default, the IP Mode value will be set to "Manual". This value can be changed to "Dynamic" by selecting the option from the drop-down menu.

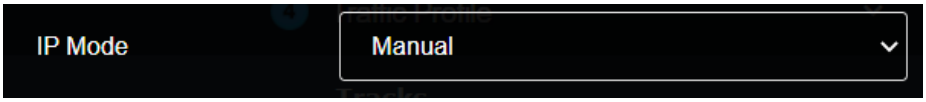

Figure 17: IP Mode

7.3.5 Client IP

By default, the Client IP address will already be set. To adjust this value, enter the appropriate dotted-decimal address.

To adjust the CIDR address select an option from the drop-down menu. The default CIDR address will be 27.

Figure 18: Client IP

7.3.6 Dest Mac Address

To figure the Dest Mac Address, enter a 12-digital hexadecimal value into the "Dest Mac Address" field.

Figure 19: Dest Mac Address

7.3.7 External Gateway

The external gateway will be disabled by default, as shown in the figure below.

Figure 20: Client Gateway Disabled

To enable this value, click the check box. Checking this box will display the "Gateway IP" address field and allow you to enter a value into the gateway field.

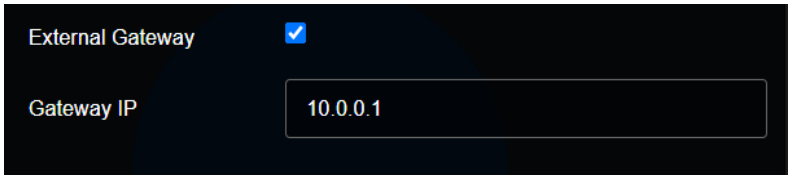

Figure 21: Server Gateway Enabled

When the External Gateway is enabled, the Dest Mac Address field is no longer available.

7.3.8 Clients

The number of hosts will adjust according to the CIDR address assigned in the Client IP configuration.

For example, a CIDR value of /27 will correspond to 32 hosts. On the other hand, a CIDR value of /16 will correspond to 65526 hosts.

The following figure depicts the CIDR value of 27:

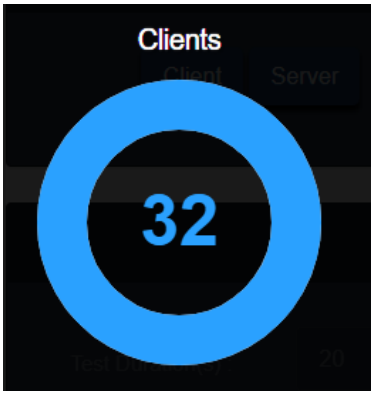

Figure 22: Clients

To adjust the number of clients, perform one of the following steps:

- Click on the outer ring of the circle to alter the number of clients
- Manually select the center of the circle and enter in a number

Adjusting the number of clients will result in an allocation of fewer hosts than available on the selected subnet.

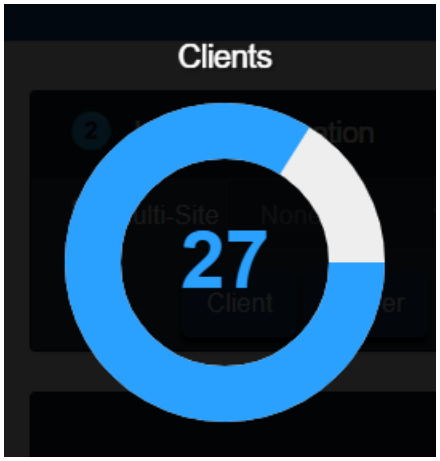

Figure 23: Host Configuration (Altered)

7.4 Server Configuration

The Server Configuration menu provides options to adjust the following fields:

- Server Port
- Server MAC
- Encapsulation Type
- IP Mode
- Server IP
- Dest Mac Address
- External Gateway

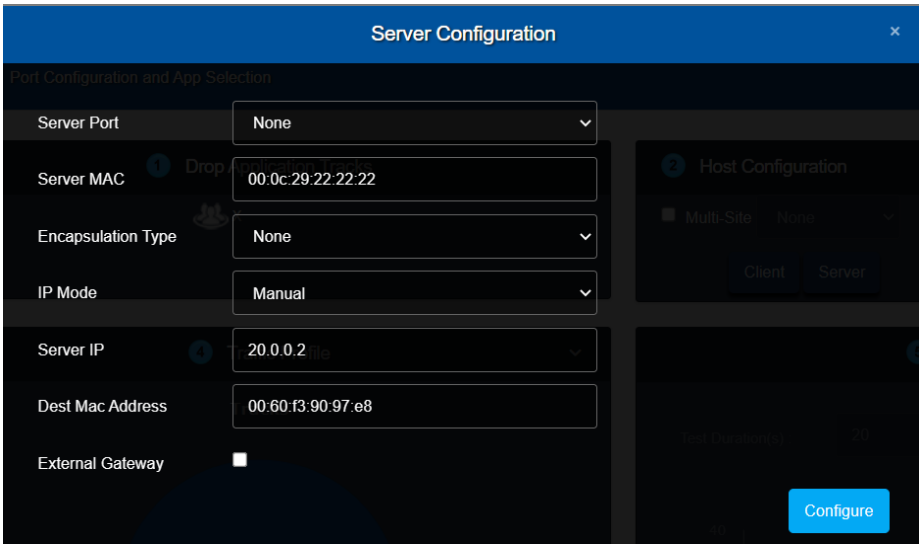

Figure 24: Server Configuration

After these values have been adjusted accordingly the "Configure" button must be selected. By selecting "Configure", these changes will take effect.

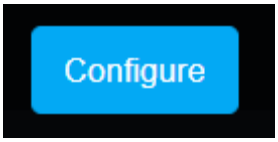

Figure 25: Configure Server

7.4.1 Server Port

By default, the port value for the server will be set to "None". To adjust this value, select one of the available ports from the drop-down menu.

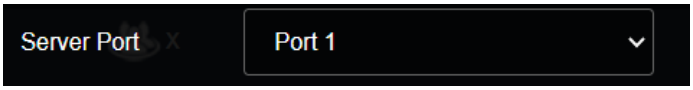

Figure 26: Server Port

7.4.2 Server MAC

To figure the MAC address of the server, enter a 12-digit hexadecimal value into the "Server MAC" field.

Figure 27: Server MAC

7.4.3 Encapsulation Type

By default, the Encapsulation Type value will be set to "None". To adjust this value, select an option from the drop-down menu. The available options are "None", "VLAN", and "QinQ".

Figure 28: Encapsulation Type

QinQ is short for 802.1Q-in-802.1Q and this configuration enables use of a single VLAN to a single VLAN to support traffic across multiple VLANs, while preserving customer VLAN IDs and keeping traffic in different customer VLANs segregated.

7.4.4 IP Mode

By default, the IP Mode value will be set to "Manual". This value can be changed to "Dynamic" by selecting the option from the drop-down menu.

Figure 29: IP Mode

7.4.5 Server IP

By default, the Server IP address will already be set. To adjust this value, enter the appropriate dotted-decimal address.

Figure 30: Server IP

7.4.6 Dest Mac Address

To figure the Dest Mac Address, enter a 12-digital hexadecimal value into the "Dest Mac Address" field.

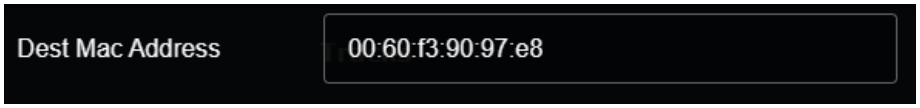

Figure 31: Dest Mac Address

7.4.7 External Gateway

The external gateway will be disabled by default, as shown in the figure below.

Figure 32: Server Gateway Disabled

To enable this value, click the check box. Checking this box will display the "Gateway IP" address field and allow you to enter a value into the gateway field.

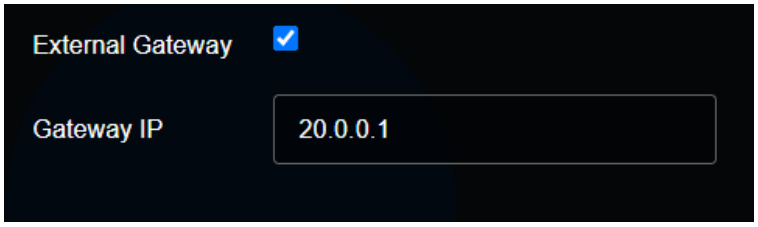

Figure 33: Server Gateway Enabled

When the External Gateway is enabled, the Dest Mac Address field is no longer available.

8 Test Bed: Additional Configuration

8.1 Additional Configuration Overview

The Additional Configuration menu provides settings that allow for adjustments to various elements of the network traffic, including mode, retries, pkts/sec, port number, RTT, payload update, stateful replay, stateless replay, speed, TTL, and NAT.

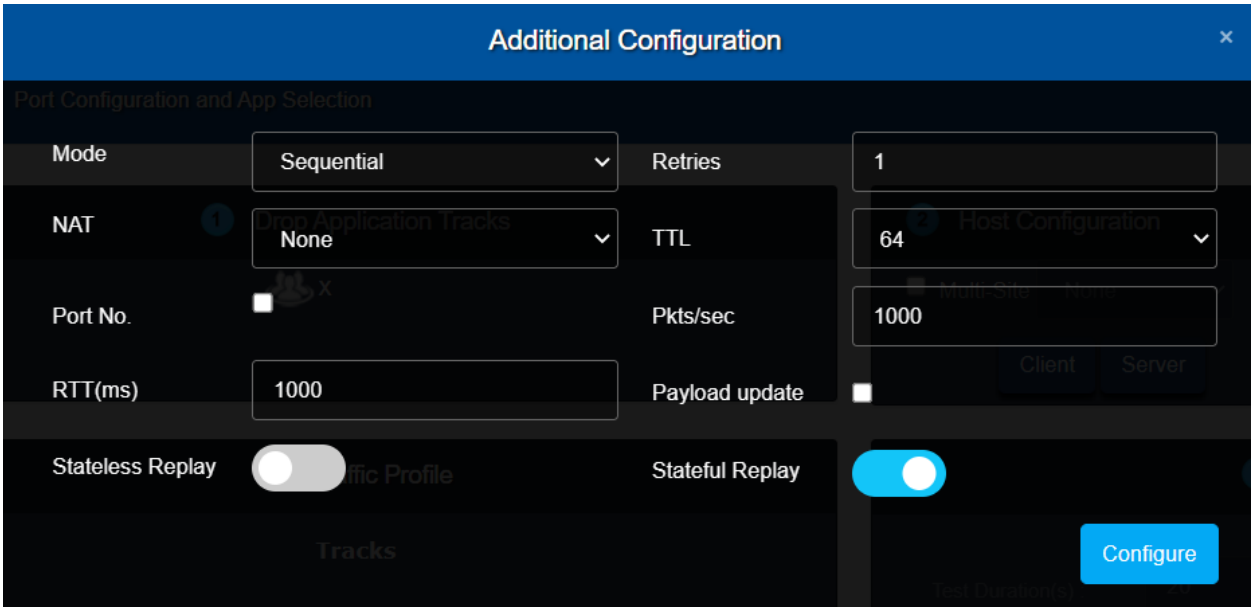

Figure 34: Additional Configuration

8.2 Additional Configuration Settings

8.2.1 Mode

To adjust the mode, select either "Sequential" or "Parallel" from the menu drop-down. By default, this mode will be set to "Sequential".

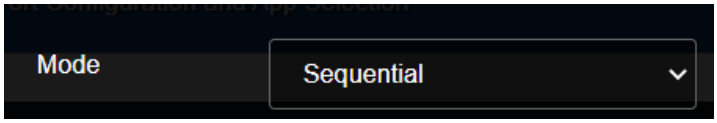

Figure 35: Mode

8.2.2 NAT

To adjust the NAT setting, select either "None", "One to One", or "Many to One" from the drop-down menu.

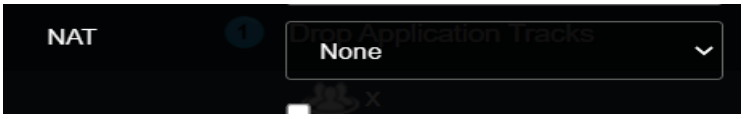

Figure 36: NAT

8.2.3 Port No.

Port No. will be unchecked by default.

Figure 37: Port Number

To enable the Port No., click on the check box. This will allow the selection of a source port and destination port to send packets.

Figure 38: Port No. Settings

8.2.4 RTT

To adjust the RTT, enter a numeric value in the RTT field.

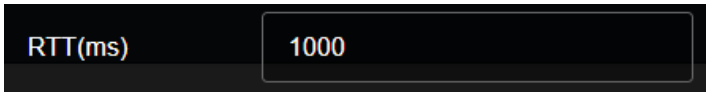

Figure 39: RTT

8.2.5 Stateless Replay

To enable stateless replay, switch on the "Stateless Replay" setting. When you enable stateless replay, the test runs in UDP. As such, packets will be sent without an acknowledgement.

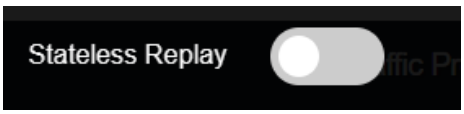

Figure 40: Stateless Replay

8.2.6 Retries

By default, the Retries is set to 1. To adjust this value either type or click on the increment button.

Figure 41: Retries

8.2.7 TTL

By default, the TTL value is set to 64. To adjust this value, select from the menu drop-down.

Figure 42: TTL

8.2.8 Pkts/sec

By default, the Pkts/sec is 1000. To adjust this value either type or click on the increment button.

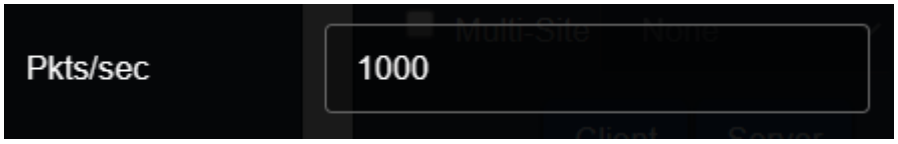

Figure 43: Pkts/sec

8.2.9 Payload Update

By default, the payload update is disabled. To enable, select the checkbox next to "Payload update". By enabling this feature, the payload will continue to update throughout the test.

Figure 44: Payload Update

8.2.10 Stateful Replay

By default, the stateful replay is enabled. With stateful replay enabled, the test runs in TDP. As such, packets will be sent with an acknowledgement as part of the TCP three-way handshake.

To disable stateless replay, switch off the "Statefull Replay" setting.

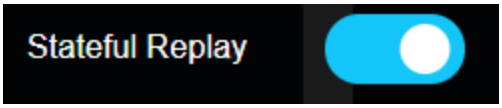

Figure 45: Stateful Replay

9 Test Bed: Traffic Profile Configuration

9.1 Traffic Profile Configuration Overview

The Traffic Profile overview provides a detailed overview of the percentage of traffic allocated to each track.

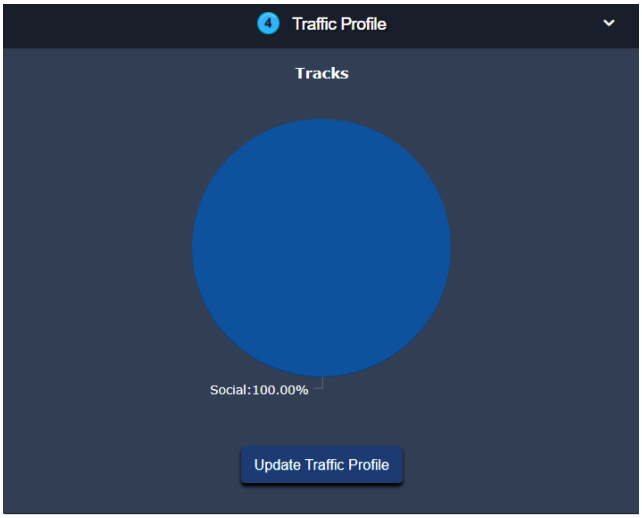

Figure 46: Traffic Profile

By clicking the Traffic Profile pie chart, you will be provided a detailed breakdown of your track's traffic streams. This information will provide you with a percentage of each traffic type.

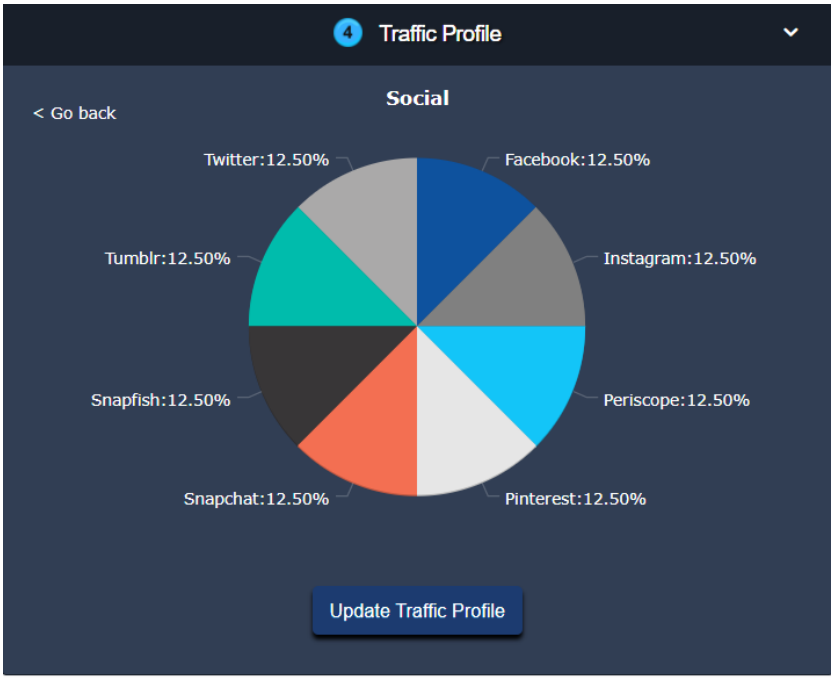

Figure 47: Traffic Profile Breakdown

9.2 Update Traffic Profile

Select the "Update Traffic Profile" button at the bottom of Traffic Profile to adjust the adjust the way traffic traversing the network.

If a user selects more than one application, percentages can be set for each application.

Selecting this button will open a pop-up that allows you to adjust the percentage of traffic allocated to each track and provide relevant statistics on what percentage of the traffic has not been configured.

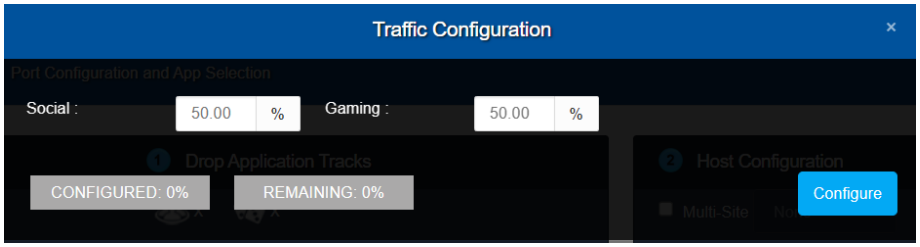

Figure 48: Traffic Configuration

Select "Configure" to save configuration settings.

10 Test Bed: Load Profile

10.1 Load Profile Overview

By default, the Load Profile is disabled. By selecting the "Load Profile" checkbox, this feature will be enabled, allowing you to adjust the load profile's settings.

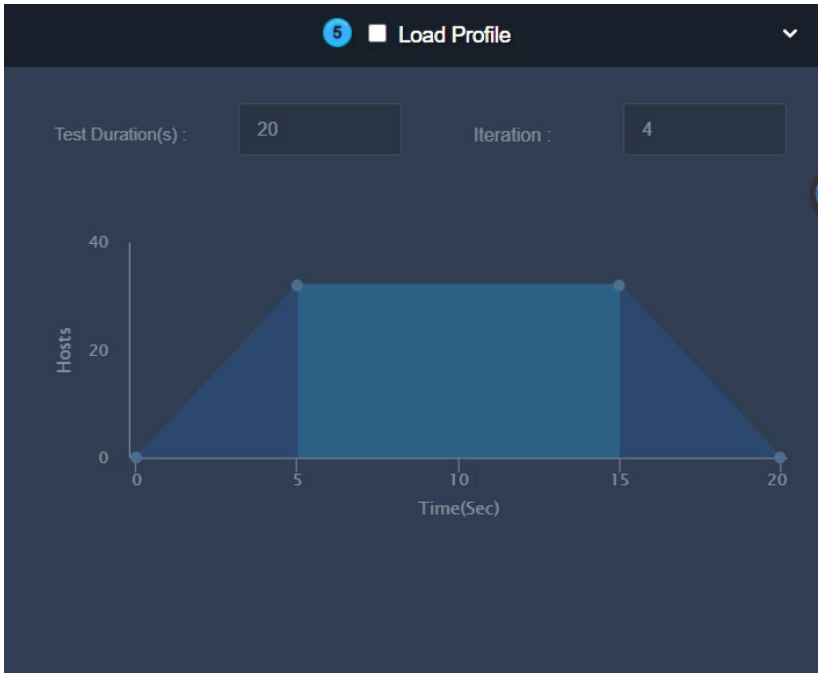

Figure 49: Load Profile

10.2 Test Duration

Changing the test duration impacts how long the test will run. To adjust the test duration, enter a value into the field, as shown below.

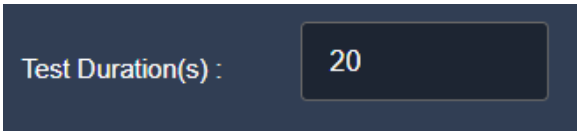

Figure 50: Test Duration

10.3 Iteration

To adjust the number of times the test will run, adjust the iteration value by entering a value into the field.

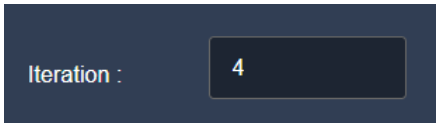

Figure 51: Iteration

10.4 Hosts/Time(Sec)

To adjust the hosts/time(sec) graph, drag the circles on the graph to the desired point. Hovering over these areas will also provide insight into specific data points.

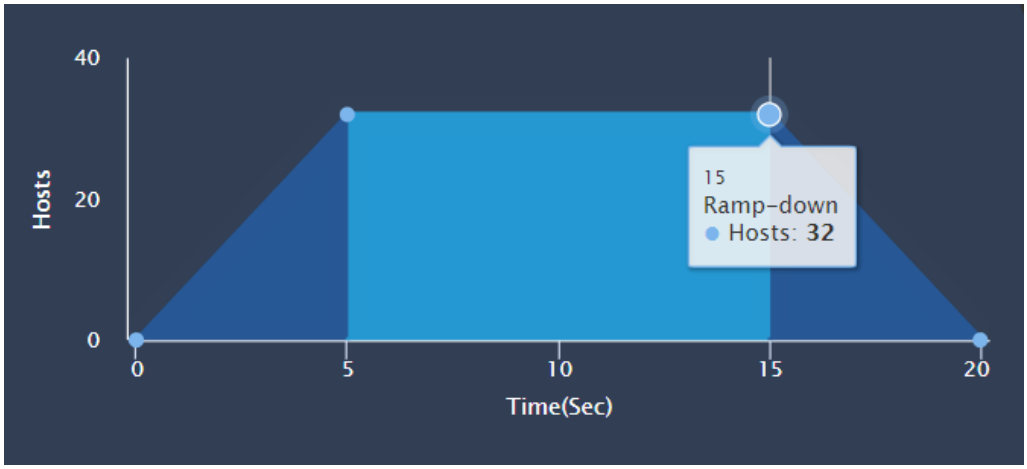

Figure 52: Host/Time(Sec) Graph

11 Test Bed: Summary

11.1 Configuration Summary

To review the configuration of your test bed, hover over the arrow icon on the right side of the GUI. This will open a small menu that allows you to click "Summary Page".

Figure 53: Summary Page

The Configuration summary provides a detailed breakdown of the configuration settings selected in the previous configuration steps.

If you note any problems or discrepancies with the summary, go back to the section that needs revisions.

Configuration

Parameters	Client	Server
Port	Port 0	Port 1
No of Clients	32	32
MAC	00:60:f3:90:97:e8	00:30:f3:90:97:e7
VLAN	Enabled	None
VLAN ID	100	NaN
IP Mode	Manual	Manual
IP	10.0.0.2	20.0.0.2

Figure 54: Configuration Summary

11.2 Selected Applications Summary

The Selected Applications Summary provides a detailed breakdown of the tracks and applications selected in the previous configuration steps.

Selected Applications

Track	Selected Apps
Social	8

Figure 55: Selected Applications

11.3 Additional Configuration Summary

The Additional Configuration Summary provides a detailed breakdown of the additional settings selected in the previous configuration steps.

Additional Configuration

Parameters	Values
Mode	Sequential
NAT	Disabled
Port Number	Disabled
RTT	1000ms
Retries	1
TTL	64
Pkts/sec	32000

Figure 56: Additional Configuration

11.4 Saving Configuration Settings

To download the test configuration summary in XML format, click the download icon in the top right corner of the GUI. This will download the XML file to the default download folder location on your computer.

Figure 57: Save As XML

11.5 Start Test

To start the test, hover over the power icon on the left side of the GUI. This will open a small menu that allows you to click "Start Test".

Figure 58: Start Test

12 STATISTICS

The Netropy Traffic Generator AppStorm platform provides Aggregate Statistics, Statistics Per App, and Offline Analyzer results. All results can be viewed in the Statistics window of the GUI.

12.1 Statistics

The Statistics tab provides detailed results for the test across all applications. This tab provides the following information:

- Statistics Table
- Client Statistics
- Server Statistics
- Packets/Second Graph
- Throughput Graph
- Latency Graph

To enable the Client and Server Statistics charts, select the "Show/Hide Stats" button in the top left corner.

Figure 59: Show/Hide Stats

To adjust the fields shown in the table, select the blue hamburger menu icon. All fields are selected by default and unchecking a field will remove it from the graph's display.

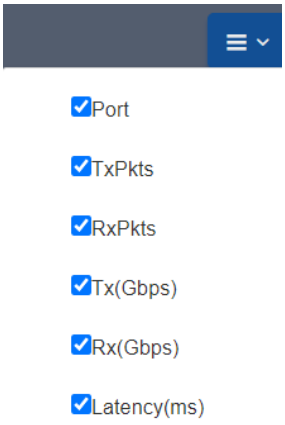

Figure 60: Statistics Filter

These statistics are further defined in Section Error! Reference source not found..

The Packets/Second Graph provides a graphical view of the packets that travel over the network per second in each direction for both client and server.

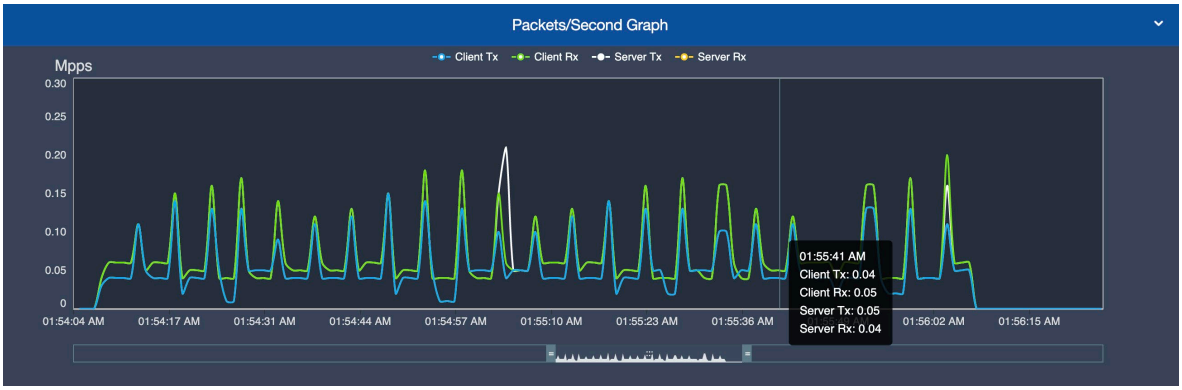

Figure 61: Packets/Second Graph

The Throughput Graph provides a graphical view of the throughput, packets sent over the network without drops, in Gbps in each direction for both client and server.

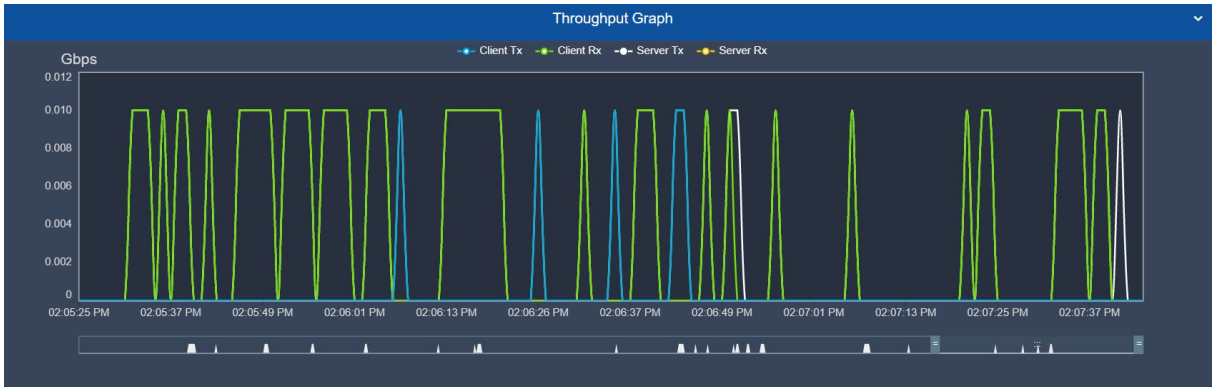

Figure 62: Throughput Graph

The Latency Graph provides a graphical view of the throughput, packets sent over the network without drops, in Gbps in each direction for both client and server.

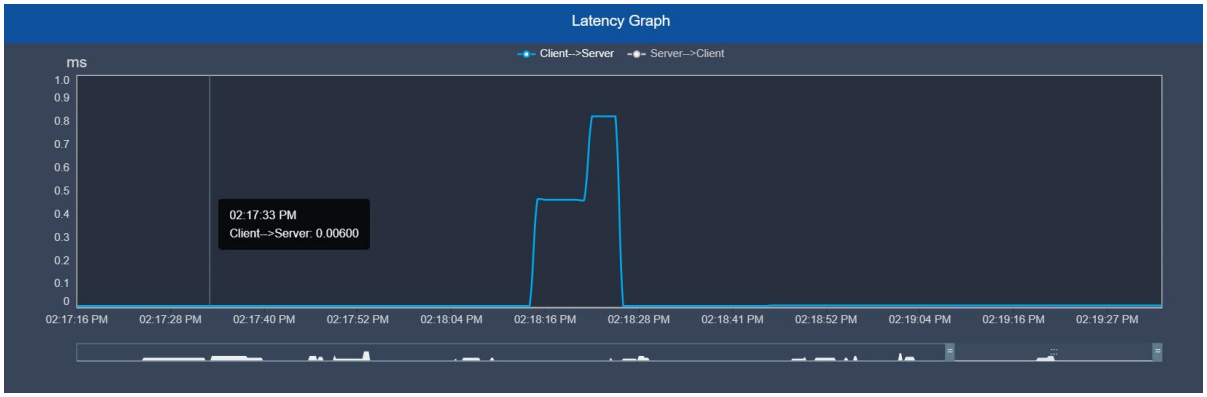

Figure 63: Latency Graph

Each of the graphs allow you to drill-down to view a single direction for either the client or server. The following graph shows the Throughput for Client Tx. In this view Client Tx is blue and all other selections have been grayed out.

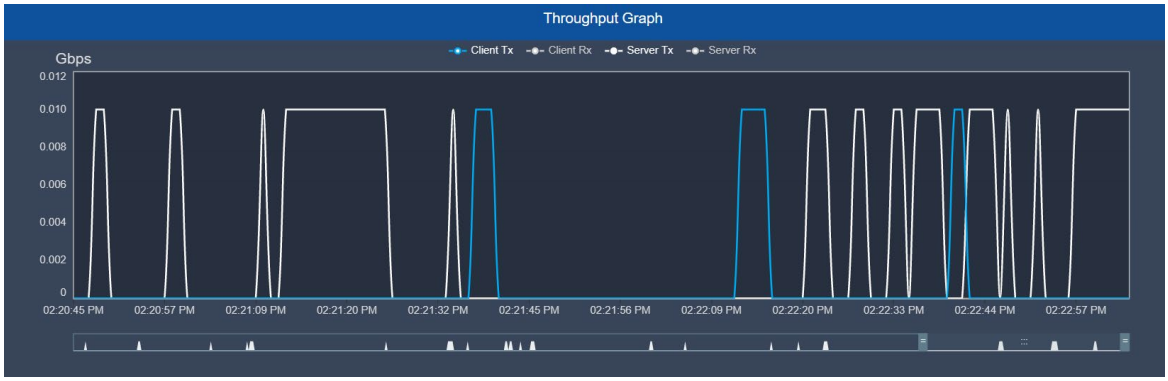

Figure 64: Throughput Graph – Client Tx

This selection can be made at the top of the graph by selecting one of the conditions.

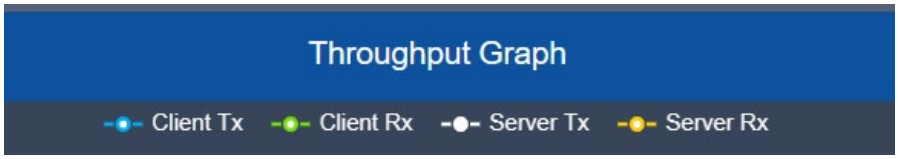

Figure 65: Graph Filters

12.2 Statistics Per App

The Statistics Per App tab provides a detailed breakdown of various statistics for both the client and server.

Figure 66: Statistics Per App Tab

These statistics are shown in a table provided and include information regarding the TX packets, RX packets, latency, drops, status, result, and direction.

To adjust the fields shown in the table, select the blue hamburger menu icon. All fields are selected by default and unchecking a field will remove it from the graph's display.

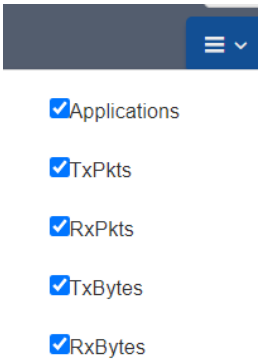

Figure 67: Statistics Per App Filter

These statistics are further defined in Section Error! Reference source not found..

To search for specific keywords from the dataset, enter data into the search field. This will filter the packets for the specified data.

Figure 68: Search

To download the results, select the Adobe icon next to the "Save to PDF" text in the top right corner.

Figure 69: Save to PDF

To set the pass/fail criteria, select the "Result Criteria" button next to the Save to PDF icon.

Figure 70: Result Criteria

The following options are available for the criteria:

Client Attributes:

- Client Tx Bytes
- Client Rx Bytes
- Server Tx Pkts
- Server Rx Pkts

Condition:

- >
- =
- <

Server Attributes:

- Server Tx Bytes
- Server Rx Bytes
- Server Tx Pkts
- Server Rx Pkts

Select the desired criteria for you pass/fail conditions and click "Apply" to enable these options. This selection will affect the available results shown in the graph under the "Result" column.

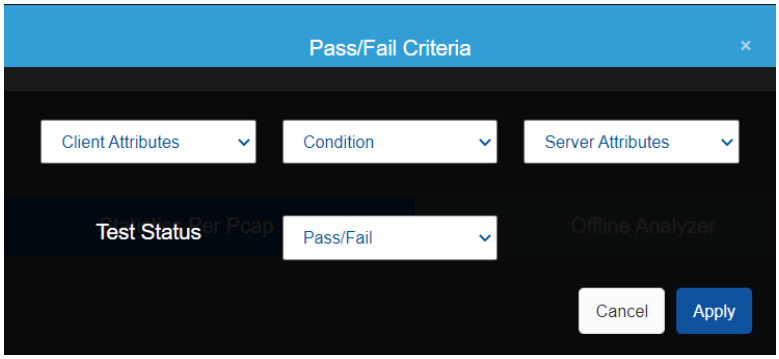

Figure 71: Pass/Fail Criteria

12.3 Offline Analyzer

The Offline Analyzer tab provides the following graphs:

- Packets/Second
- Throughput
- Latency

To download, select the download icon on the right of the graph and hover over "Download as..." to present the available download options.

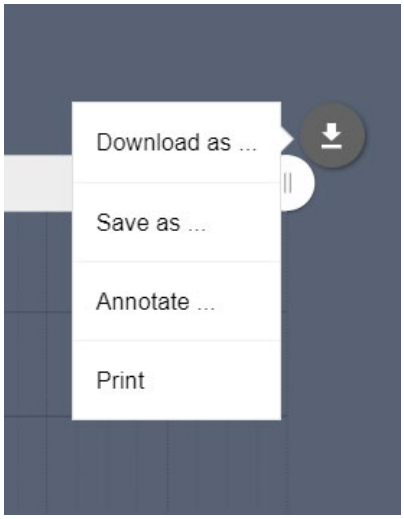

Figure 72: Downloading Graphs

Each of these graphs can be downloaded individually in either PDF, JPG, SVG, or PNG format. To

select a file format, click your desired format from the menu. The selected file will be downloaded directly to your computer's default file location for downloads.

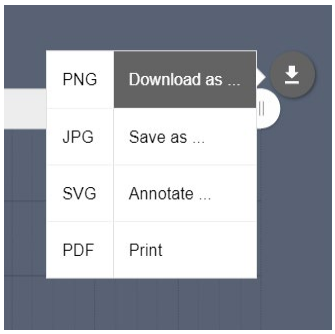

Figure 73: Download File Options

In addition, each graph can be saved as a CSV, JSON, or XSLX file. To select one of these options, hover over the "Save as…" option and select the desired file format.

Figure 74: Save As File Options

To print the graph, select the "Print" option from the menu shown in the figure above. This will open your browser's printing menu and allow you to select your default printer and settings.

These graphs also may be annotated using the built-in illustration feature. These annotated graphs can also be downloaded in the same formats. To annotate a graph, select the "Annotate…" option from the menu.

Selecting this menu option will turn the graph white and allow you to annotate the graph. Users can add shapes and text directly to the graph. In addition, users are allowed to change the color and mode of the marker and text.

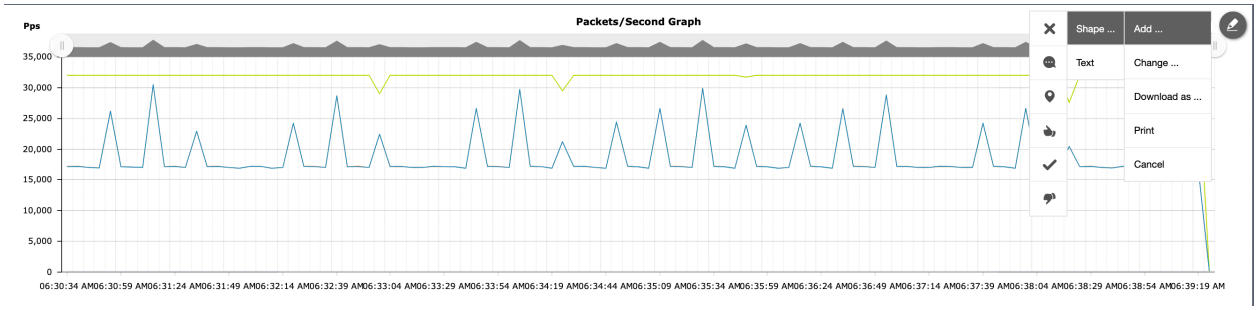

Figure 75: Annotate Graph

To change the annotated graph, hover on the edit pen on the top right corner of the graph and select "Change".

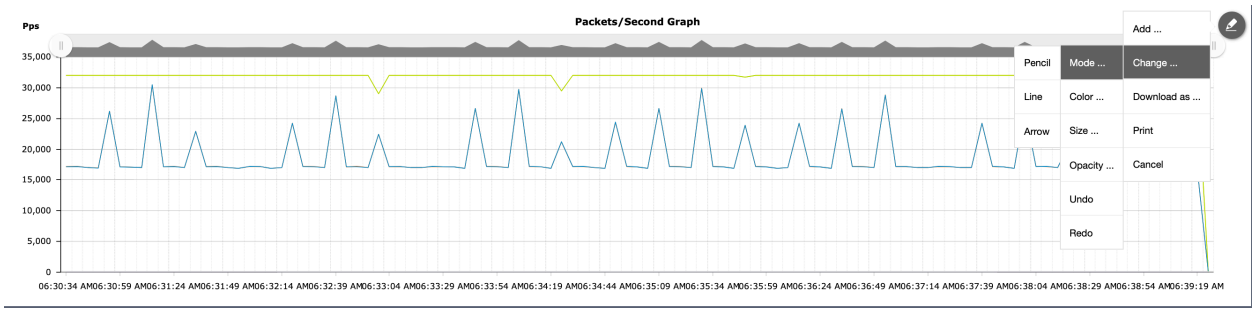

Figure 76: Change Graph

The annotated graph can be printed or downloaded in either PNG, JPG, SVG, or PDF format.

12.4 Definitions: Statistics

Segment	Statistic	Description
	Client	This provides the statistics for the client.
	Server	This provides the statistics for the server.
	Port	The Port Number for which statistics are shown.
	Drop	The total number of packets dropped on the Port from the time test was started. The drop counter gets

		updated only when the test stops.
	TXPkts	The number of packets transmitted on the port in the last 1 second interval.
	RxPkts	The number of packets received on the port in the last 1 second interval.
	TX (Gbps)	The rate of packets transmitted (in Gigabits per second) on the port in the last 1 second interval.
	RX (Gbps)	The rate of packets received (in Gigabits per second) on the port in the last 1 second interval.
	Latency(ms)	The time (in milliseconds) taken by the packet to be received on the Destination port from the time it was transmitted on the Source port. This is calculated as an average for all the packets received in the last 1 sec interval.
	TxTotalPkts	The total number of packets transmitted on the port from the time test was started.
	RxTotalPkts	The total number of packets received on the port from the time test was started.
	TxTotal (Gb)	The total number of gigabits transmitted on the port from the time test was started.
	RxTotal (Gb)	The total number of gigabits received on the port from the time test was started.
	AvgTxPkts	The average number of packets transmitted on the port per second from the time test was started.
	AvgRxPkts	The average number of packets received on the port per second from the time test was started.
	AvgTx(Gbps)	The average rate of packets transmitted (in Gigabits per second) on the port per second from the time test was started.
	AvgRx(Gbps)	The average rate of packets received (in Gigabits per second) on the port per second from the time test was started

12.5 Definitions: Statistics Per PCAP

Segment	Statistic	Description
	Applications	The Application for which statistics are shown.
	Drop	The total number of packets dropped on the Port from the time test was started. The drop counter gets updated only when the test stops.
	TXPkts	The number of packets transmitted on the port in the last 1 second interval.
	RxPkts	The number of packets received on the port in the last 1 second interval.
	TX (Gbps)	The rate of packets transmitted (in Gigabits per second) on the port in the last 1 second interval.
	RX (Gbps)	The rate of packets received (in Gigabits per second) on the port in the last 1 second interval.
	Latency(ms)	The time (in milliseconds) taken by the packet to be received on the Destination port from the time it was transmitted on the Source port. This is calculated as an average for all the packets received in the last 1 sec interval.
	Status	The status of the application traffic. Available status options include "Allowed" or "Blocked". Allowed - When TxPkts matches RxPkts. Blocked - When TxPkts doesn't match RxPkts.
	Result	The result of the application traffic either "PASS" or "FAIL". Result Criteria is configurable by selecting the "Result Criteria" button. By default, result criteria is Pass when RxPkts = TxPkts.
	Direction	The direction of application traffic from E → W or W → E. Green arrow indicates that there was no packet drop.

		Red arrow indicates that there were packet drops."
	TxBytes	The total number of bytes transmitted on the port for a specific pcap from the time test was started.
	RxBytes	The total number of bytes received on the port for a specific pcap from the time test was started.

13 TEST SETTINGS

The test provides options to capture PCAPs, pause, play or stop the test, and clear statistics. The following sections will provide additional details on these configurations.

13.1 Play/Pause/Stop

To adjust the play, pause, and stop settings for a test, select the power button on the right side of the screen.

Figure 77: Play/Pause/Stop Settings

Selecting this button will present a menu to select the pause, play, and stop buttons. When the test is stopped, the test bed will initiate the generation of a report. This report will be available within the Logs tab. If a test is paused, the user will be notified and provided the option to replay in the same menu.

If a test is played, the user will be provided the option to either pause or stop the test.

13.2 Clear Statistics

To clear the current statistics, hover over the broom icon on the left side of the screen and select "Clear Statistics". This action will clear all statistics shown in the available graphs but will not alter the contents of the Log files.

Figure 78: Clear Statistics

13.3 Start Packet Capture

To start a network packet capture of the traffic that occurs during your test, hover over the camera icon on the left side of the screen to present a green button labeled "Start Capture". Click this button to begin a network packet capture.

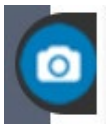

Figure 79: Network Capture

14 Logs

14.1 Logs Overview

Logs may be collected from tests to use for analysis and review by users. The system will collect and maintain these logs for future use. These files can be found within the Logs tab of the Statistics menu.

The size of these log files will vary based on the amount of data collected and the number of packets selected within the capture. All capture files will be provided in .pcap form to ensure they are compatible with Wireshark and similar software programs.

14.2 Managing Logs

The Logs tab of the Statistics window presents a list of available reports. These reports can be downloaded or deleted.

To download a report, select the download icon on the specified file. This will download a zip folder to the default download location on your device. To delete a file from the logs, select the trash can icon on the specified file.

To delete all logs, select the "Delete All" button in the top right corner.

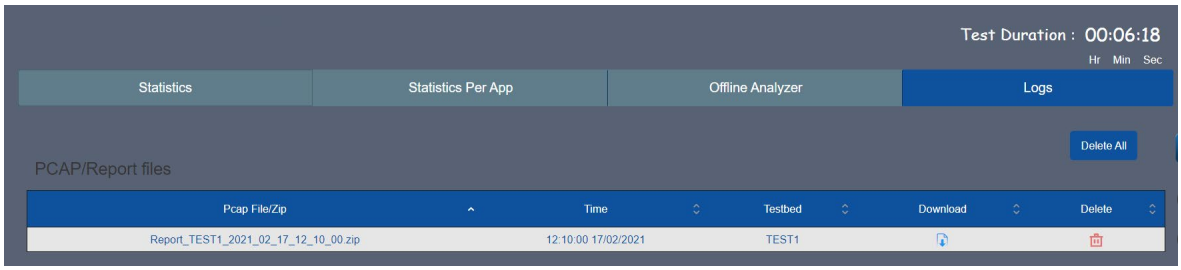

Figure 80: Logs Tab

If you select the delete icon or button, you will not be presented with a confirmation window. Unless previously downloaded, you cannot retrieve deleted reports.

14.3 Log Files

After a report has been downloaded, right click the zip folder, and select "Extract All" to extract the file's content to another location. The extracted folder may include some the following files:

- Offline Analyzer Latency (CSV)

This file includes latency data collected from the test.

- Offline Analyzer PPS (CSV)

This file includes packets per second of data collected from the test.

- Offline Analyzer Throughput (CSV)

This file includes throughput data collected from the test.

- AppStorm Per Pcaps (CSV)

This file includes AppStorm data per pcap from the test.

- Configuration (XML)

This file includes the test bed configuration, which can be imported into the test later.

- Test Report Document (PDF)

The file includes a PDF summary of the test configuration and relevant statistics recorded from the test.

15 ADMINISTRATION

The Netropy Traffic Generator AppStorm can be administered through the Administration portal accessible via browser. The administrator must log in using their administrative credentials.

15.1 User Settings

The User tab presents options to add, edit, and delete users. By default, there will only be a single user account, the administrator. To create additional accounts to manage and configure test beds, the administrator must add new users.

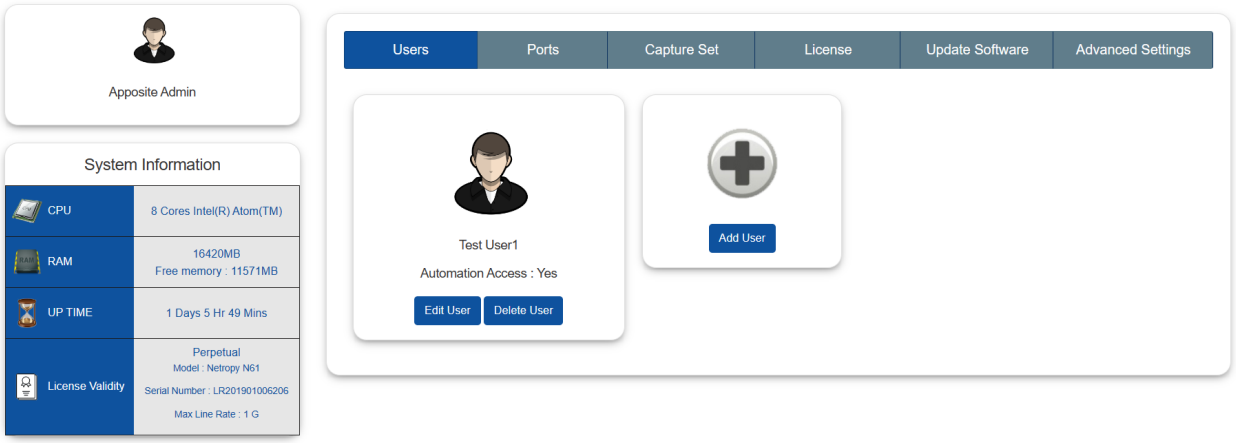

Figure 81: User Tab

When adding a new user, the following information is required:

- First Name
- Last Name
- User Name
- Email
- Password

- Automation access

The account will be created once the "Create User" button is selected. This user will then be able to access the configuration portal using their new credentials. Only the administrator will have access to these permissions. Other users will be able to make configuration changes but will not have privileges to access and manage other accounts.

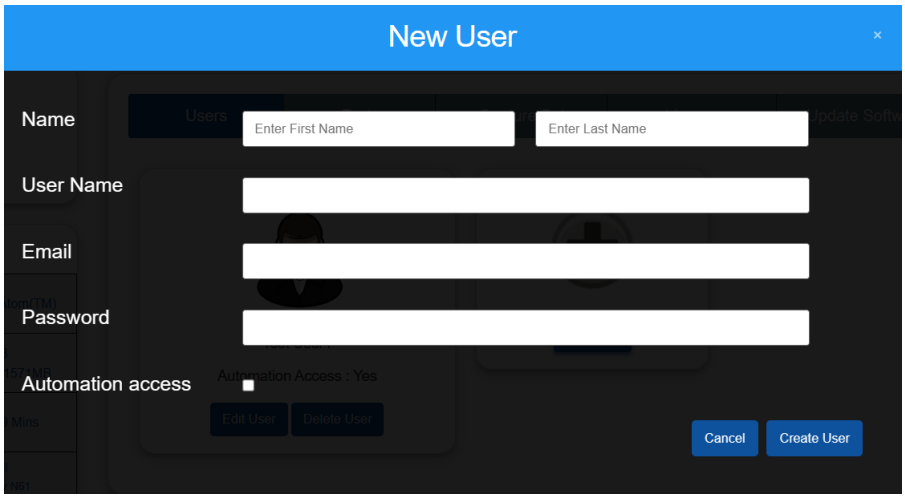

Figure 82: New User

15.2 Port Settings

The Port tab displays the status of ports and allows the administrator to manually release ports as needed. This will override any port releases and reservations made by other user accounts.

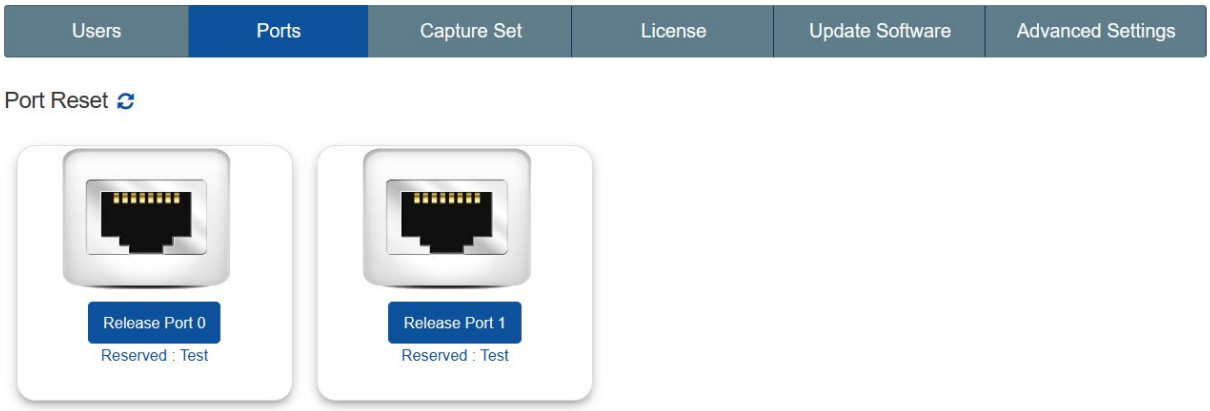

Figure 83: Port Tab

To release a port, click on the associated "Release Port X" button. As demonstrated in the figure below, this button will open a pop-up that displays the IP Address, status, speed, MAC address, and

details on whether the port is reserved. By clicking "Release" the port will be released.

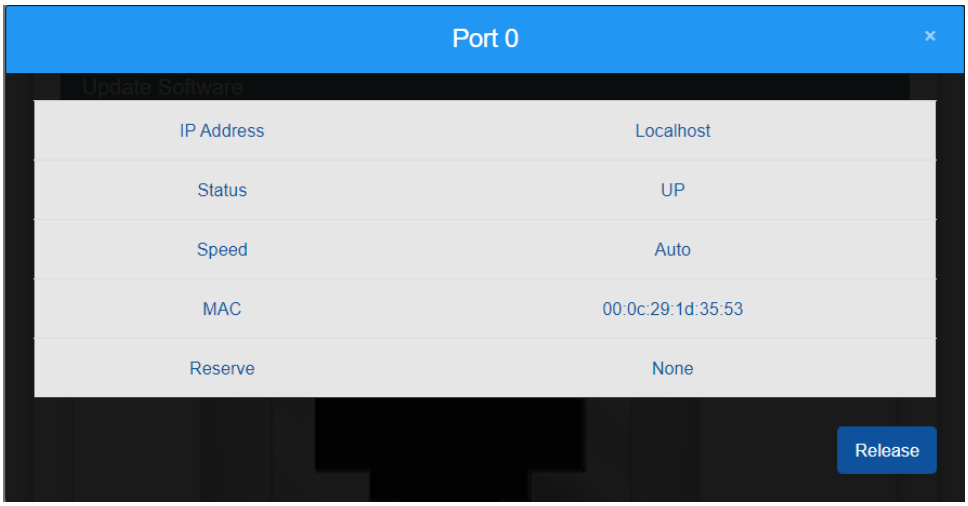

Figure 84: Release Port Settings

15.3 Capture Settings

AppStorm Engine can be configured to capture a specific number of packets during a session. By default, the number of packets to capture will be set to 100 packets. This setting can easily be altered by clicking the drop-down menu, as shown in the figure below. Options in this menu will range from 100 packets to 1,000,000 packets.

Figure 85: Capture Settings

Click "Update" to initiate these changes and ensure all future packet sessions will capture the specified number of packets.

15.4 License Settings

The License tab will display the license, license type, license validity, and the number of licensed ports. To obtain additional information on how to renew a license, visit https://www.apposite-tech.com/renewals/ to submit a renewal request form.

To add a license key, click the "Browse" button to search for files on your device. After selecting the applicable file, click "Open" in file explorer. Then, proceed by selecting "Upload" to upload the license key file into the system.

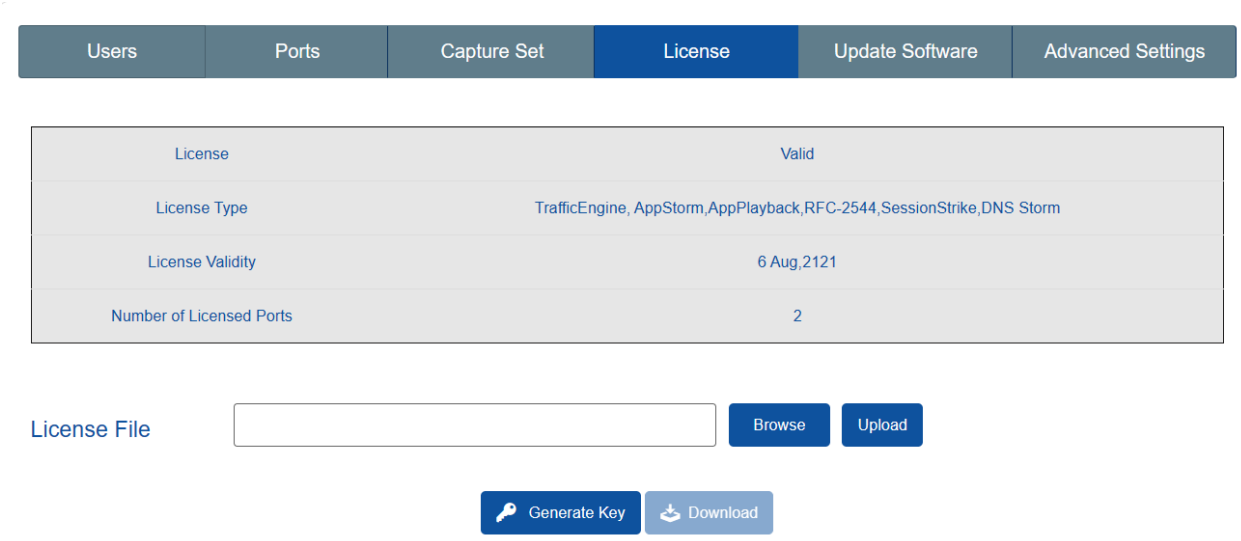

Figure 86: License Tab

15.5 Update Software Settings

The Update Settings tab allows the selection of a BIN file to update the system software. To update the BIN file, select the plus button icon, and select the appropriate file on your PC. After selecting the file, the system will request a system reboot. Select "Yes" to allow the system to apply all necessary patches and updates.

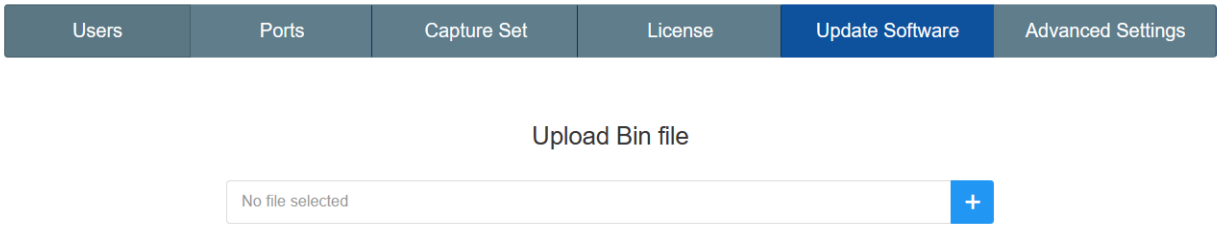

Figure 87: Update Software Tab

15.6 Advanced Settings

The Advanced Settings tab allows management of time zone, signature, binary search, DNS Queries File, and Multisite AppStorm/AppPlayback Sync Port.

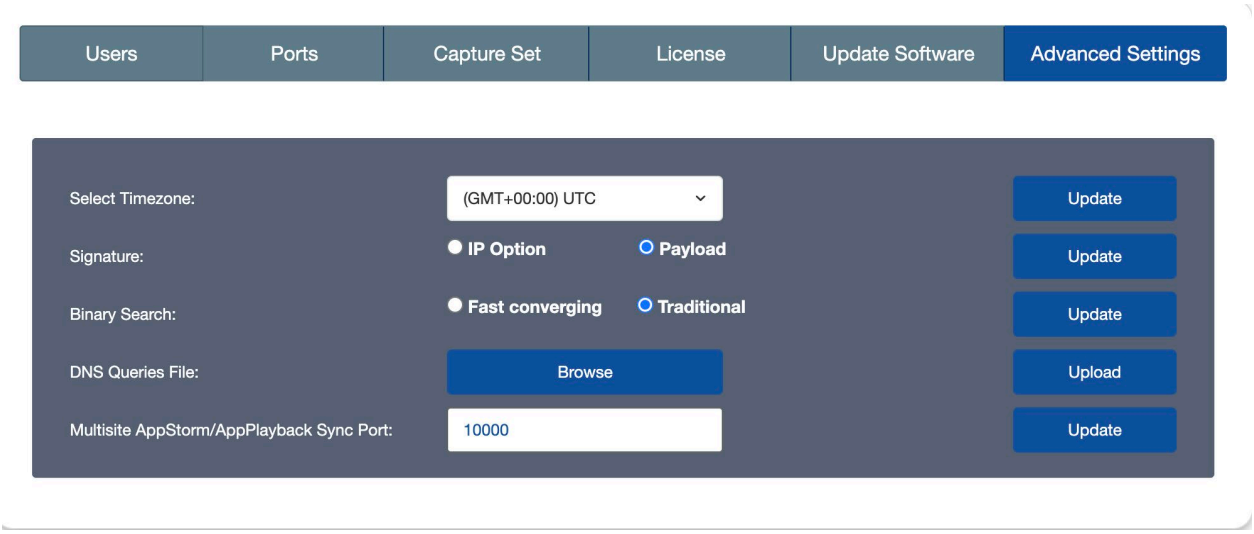

Figure 88: Advanced Settings

15.7 Time Zone

Users can select the time zone of their location. To select the time zone, click the down arrow next to the default time by the "Select Timezone" value.

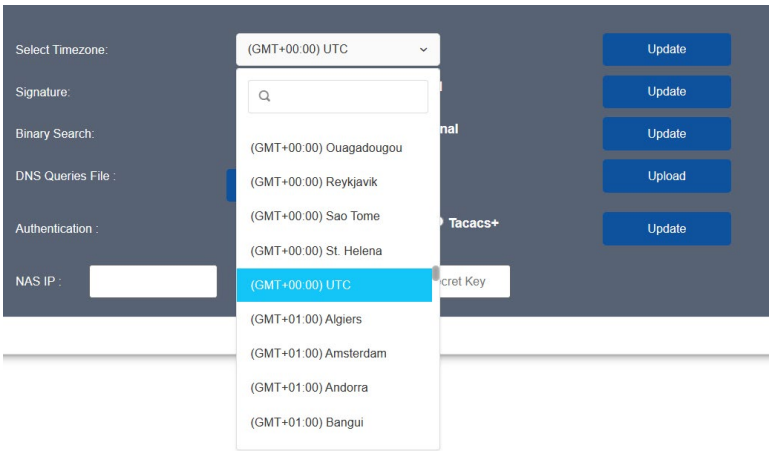

Figure 89: Time Zone

15.8 Signature

The selection determines where the control information used by NTG gets stored in the packets being transmitted.

1. IP Options: In this case, the control information is stored in the IP options field in the IP header.

2. Payload: In this case, the control information is stored in the IP Payload.

To select one of the two options, select the applicable radio button. Then, click "Update" to complete the change.

Figure 90: Signature

15.9 DNS Queries File

This is the file which consists of the lists of domain names which are used by the DNS Storm feature when sending DNS queries. DNS Storm feature cycles through this list of domain names.

Select "Browse" to choose the appropriate DNS Queries File. Then, click "Update" to complete the change after the file has been selected.

Figure 91: DNS Queries File

16 Command Line Interface

The Netropy command line interface (CLI) can be accessed via the CONSOLE interface or through a Telnet or SSH connection.

The following are the only features available through the CLI:

- ARP and PING commands
- Reinitialize the unit to factory settings
- Management functions

To access the CLI, log into the device at the prompt as "`admin`" or other configured username.

16.1 CLI Help

The CLI includes several levels of help. The "`help`" command by itself displays a list of commands. "`help`" with a command name displays the syntax and options for the command.

When entering commands, the <Tab> key can be used to complete a partially entered command name. If there are multiple possible completions, pressing the <Tab> key again will display a list of options.

16.2 CLI Top Level Commands

Command	Syntax and Description
arp	`arp show` Displays a table of IP addresses and associated MAC addresses for the MGMT interface.
clock	`clock show` Displays the current system time and date.
help	`{help | ?} [<command>]` Displays a list of available commands or syntax of a specified command. A question mark after any command also displays the syntax for that command.
init	`init config` Returns the configuration to factory default settings. Takes effect upon reboot unless the configuration is saved prior to reboot.
logout	`logout` Logout from the command line interface.

mgmt	`mgmt show`
	Displays the IP address and other management information.
	`mgmt show ntp associations`
	Displays the synchronization state with the configured NTP servers.
	`mgmt set addr {dhcp | addr <addr> netmask <mask>}`
	Sets the IPv4 address and netmask of the MGMT interface either manually or using DHCP. If DHCP is enabled, DHCP sets the default gateway.
	`mgmt set domain <domain>`
	Sets the network domain name of the device.
	`mgmt set gw <addr>`
	Sets a default gateway for the MGMT interface.
	`mgmt set hostname <name>`
	Sets the hostname of the device.
	`mgmt set nameserver <addr> [<addr2> [<addr3>]]`
	Sets up to three DNS servers for the device. This command overrides any nameservers set through DHCP and any DNS servers previously configured.
	`mgmt set ntp server <server> [<server2> [<server3>]]`
	Sets up to three network time protocol servers for the device. This command overrides any NTP servers set through DHCP and any NTP servers previously configured.

mgmt	`mgmt clear nameserver`
	Clears all manually configured DNS servers. Does not change any DNS servers set through DHCP.
	`mgmt clear ntp server`
	Clears all manually configured NTP servers. Does not change any NTP servers set through DHCP.

ping	`ping <ip-address> [<size>]` Pings from the device to the IP `address` with the specified sized packets using the MGMT interface. Use CTRL-C to stop.
reboot	`reboot` Reboots the device. Returns user to the login prompt after reboot.
serialnumber	`serialnumber` Displays the serial number of the unit.
upgrade	`upgrade <upgrade-image-url>` Upgrades the Netropy firmware. FTP, HTTP, and TFTP services are supported. Ex: upgrade ftp://server/netropy-image
version	`version` Displays the operating firmware version.

16.3 RADIUS Management Commands

Command	Syntax and Description
show	`mgmt show radius` Displays the current RADIUS configuration.

set	`mgmt set radius server <server>`
	Identifies the RADIUS server by IP address or host name. Communication to RADIUS server occurs over the default port 1812.
	Ex.: mgmt set radius server radiusserver.example.com
	`mgmt set radius secret <secret>`
	Set the shared secret that the RADIUS server uses to authorize the client.
	Ex.: mgmt set radius secret secret_key
	`mgmt set radius { on | off }`
	Turns RADIUS authentication on or off.

clear	`mgmt clear radius` Turns off RADIUS authentication and clears the RADIUS configuration.

16.4 LDAP Management Commands

Command	Syntax and Description
show	`mgmt show LDAP` Displays the current LDAP configuration.

set	`mgmt set ldap server <server> [port <#>]`
	Identifies the LDAP server by IP address or host name. Optionally specifies a non-standard port to connect to. The default port is 389.
	Ex.: mgmt set ldap server ldapserver.example.com
	`mgmt set ldap basedn <search-base-DN>`
	Identifies the Distinguished Name of the search based in the remote LDAP database. If there are embedded spaces in the base DN string, the string must be enclosed in quotation marks.
	Ex.: mgmt set ldap basedn dc=example,dc=com
	`mgmt set ldap filter attribute <string> [<LDAP-search-string>]`
	Specifies the attribute that contains the username and optionally an additional LDAP search string. The LDAP search string must be compatible with the formal definition found in RFC 4515. If there are embedded spaces in the search string, the string must be enclosed in quotation marks.
	Ex.: mgmt set ldap filter attribute uid & (&(gidNumber=20)(class=Expert))
	The resulting search string will be (&(uid=user) (&(gidNumber=20) (class=Expert))) where "user" is replaced by the login name.
	`mgmt set ldap security {disable | enable}`
	Enable or disable Transport Level Security. TLS is enabled by default.
	`mgmt set ldap bind dn <bind-DN> [password <password>]`
	Specifies a Distinguished Name and password with which to bind to the LDAP server before performing a search operation. If not configured, an anonymous bind will be used.
	Ex.: mgmt set ldap bind dn cn=user, dc=example,dc=com
	`mgmt set ldap { on | off }`
	Turns LDAP authentication on or off.

clear	`mgmt clear ldap` Turns off LDAP authentication and clears the LDAP configuration.

17 SECURITY

17.1 Users and Passwords

Initially, the AppStorm system has a single user configured with the following credentials:

- Username: admin
- Password: admin

Refer to Section 14 for additional information on proper management and addition of user accounts through the GUI interface.

18 Apposite Support

18.1 Registration

For access to the Netropy Traffic Generator support site with firmware upgrades, documentation, and other support materials, register your unit at: http://www.apposite-tech.com/register.html.

Registered users will receive an email notification whenever new firmware versions are released.

18.2 Customer Support

If you experience any problems with the Netropy Traffic Generator hardware, consult the *Hardware Guide* for your intended model. If you have any questions about the firmware that have not been answered in this *User's Guide*, please check the Apposite Technologies website at http://www.apposite-tech.com for updated firmware and supporting documentation. If the answer to your inquiry is not answered on the website, please contact Apposite Support.

All units with an active product license may receive support and maintenance for the term of the license. This support includes hardware warranty, firmware updates, and customer support. The license expiration date for limited-term licenses is shown in the Administrative portal of the Netropy Traffic Generator system on the info page.

License renewals are available from Apposite or the reseller of your unit.

If you believe the firmware is not functioning properly, please upgrade to the latest firmware release. If the problem persists, please contact Apposite Support at:

- support@apposite-tech.com
- 1.310.477.9955 ext. 2

When contacting Apposite Support, please include the following information with your request:

- Model number
- Serial number
- Your name

- Your e-mail address and phone number
- Installed firmware version
- A detailed description of the problem

Do not attempt to fix any hardware problem yourself. AppStorm hardware devices do not contain any user-serviceable parts. Opening the chassis voids the warranty.

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