Confidential

# EDS-10G Emulator User Manual

*Firmware Version 3.0*

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# 1 Overview

## 1.1 Product Family

Ethernet Delay Simulator emulates Network traffic conditions in many ways, based on input rules/configurations/simulation-profiles from user, the system would be used to emulate real traffic scenarios. Network emulation is commonly used to evaluate and examine the behavior and performance of applications on a congested and slow network.

The EDS-10G can forward up to 10 Gbps of packets in each direction on the 10 Gbps interfaces, and 1 Gbps of packets in each direction on the 1 Gbps interfaces

## 1.2 Operation

EDS-10g emulates the bandwidth, delay, loss, and other properties of the wide area network link between two local networks.

Depending on the model, the EDS-10G product emulates the traffic on pair of Ethernet ports.

Each pair, the EDS-10G Emulator is installed as either a bridge or router between the Ethernet segments connected to the eth1 and eth2 ports on the device. Frames received on one port are subjected to the emulated conditions before being forwarded to the opposite port

For each link, frames are processed by the EDS-10G Emulator in the following steps:

1/ Ethernet frames arrive on the eth1 or eth2 interface.

2/ Frames are subjected to random duplication at the configured duplication rate. Duplicated frames are added to the data stream immediately following the original frames.

3/ Random frames are selected for reordering according to the configured reordering probability.

4/ Ethernet frames are held for the specified delay before being reinserted into the data stream.

5/ Frames are throttled to the specified bandwidth.

6/ Frames are subjected to random discard based on the configured packet loss and bit-corruption.

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7/ Ethernet frames are bridged or routed to the opposite interface and transmitted to the destination address

## 1.3 Configuration

The EDS-10G Emulator is usually configured through the web browser-based EDS-10G GUI (Graphical User Interface). The GUI is accessible from any PC or other device with a standard web browser. The GUI is accessed through a dedicated Ethernet Management port on the EDS device through the ***Mgmt-1*** or ***Mgmt-2*** interface In addition to the GUI, the EDS-10G Emulator includes a ***command line interface (CLI)*** that can be accessed over the network using ***Telnet*** or ***SSH***

EDS-10G Emulator can be configured as either bridge or router between the Ethernet segments connected to the pair of LAN ports (eth1 and eth2) on the device. Frames received on each port are subjected to emulate conditions before being forwarded to the opposite port.

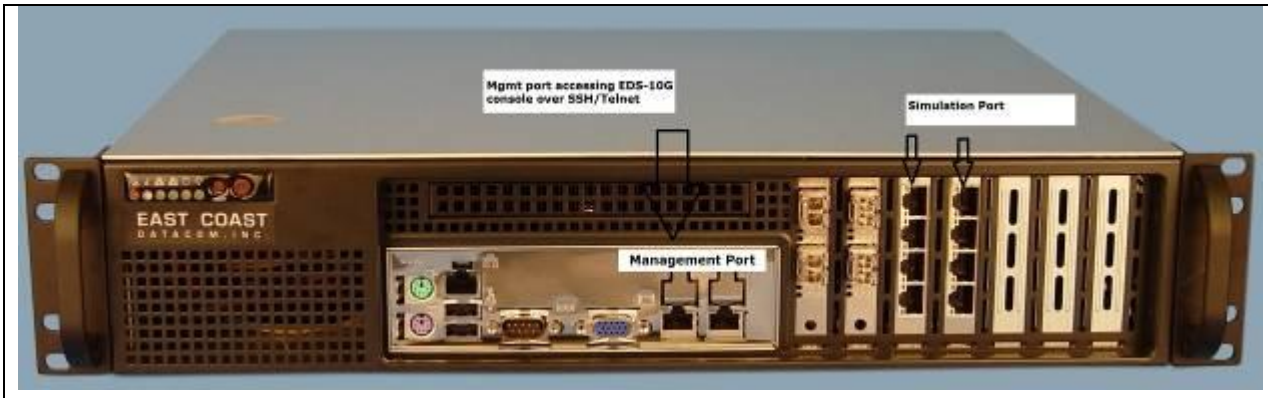


**Figure 1 EDS-10G simulator**

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**Application**
Interconnection of 10GbE or 10/100/1000 devices simulating bandwidth, latency, packet loss and congestion on two independent LAN channels

**Protocols Supported**
UDP, TCP, MPLS, VLAN, ESP, LPD, Encrypted Packets and etc…

**Password Protection**
Implemented via the user LAN Management Port

**Configuration Ports**
Two Independent 10/100/1000 Ethernet Ports

**Data Interface on Delay Ports**
10/100/1000 or 10GbE, Copper or Fiber with SFP

**Link Rates**
300bps - 10GbE in 1bps increments, bi-directional or split speed, bps, Kbps, Mbps or Gbps

**Link Throughput**
Line Rate or Near Line Rate(90-100%) for any Packet Size with advanced user space drivers

**Emulated Latency**
0 ms to 8 sec. in 1ms increments for constant and variable

**Emulation Statistics**
Each link is capable of independent output statistics settings via the software scheduler

**Packet Loss**
0 to 100% in increments of 0.001%

**Re-Ordering**
Settings for Probability & Delay Min/Max

**Surge Protection**
Main Power Supply

**Power Source**
Mains: 100-240V AC@ 10%, 50/60HZ, 0.16/0.08A, Auto Range

**Environmental**
Operating Temperature....32º to 104º F (0º to 40º C)
Relative Humidity.....5 to 85% Non-Condensing
Altitude.....0 to 10,000 feet

**Dimensions**
Height ..... 3.50 inches (88.90 mm)
Width ..... 17.20 inches (436.88 mm)
Length ..... 14.50 inches (368.30mm)

**Warranty**
Three Years hardware, includes software support and software feature upgrades/improvements

**Software Upgrade**
Administered via the LAN user management Port

**Regulatory Approvals**
UL, CSA, CE, FCC and RoHS

**System Accessing/Configuration**
SSH, Telnet(over Management Port) & DVI

**ORDERING INFORMATION**
Main Unit Part Number: 210000
Model: EDS-10G
Description: EDS-10G Ethernet Delay Simulator

Part Number: 226000
Model: 4-Port 1G Copper
Description: 4-Port 10/100/1000 Copper Interface

Part Number: 226001
Model: 2-Port 1G Fiber
Description: 2-Port 10/100/1000 Fiber Interface

Part Number: 226002
Model: 2-Port 10G Copper
Description: 2-Port 10G Copper Interface

Part Number: 226003
Model: 2-Port 10G Fiber(SFP Included)
Description: 2-Port 10G Fiber Interface

**INCLUDED WITH EACH UNIT:**
1) Operations Manual
2) Power Cord
3) Rackmount Kit Ears

**Other East Coast Datacom Products**
RDS-PLUS, Serial Network Latency Simulator
(Supports all serial interfaces, T1, E1, DS3 ect..
STG-10G, 1G to 10GbE IP Traffic Generator

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# 2 Getting Started

The EDS-10G Emulator is managed through a web browser-based GUI over an Ethernet connection to a dedicated management interface (***MGMT-1*** and ***MGMT-2***).

For convenience ***MGMT-1***, the management interface comes preconfigured with an IP address of 192.168.1.1, and the GUI is accessible from a directly-connected host on the 192.168.1.10/255.255.255.0 subnet.

Explanation on how to configure and use the ***MGMT-2 is*** *given in the following sections.*

## 2.1 Arrangement

Management of the EDS-10G Emulator requires a PC running with supported web browser (Firefox, Chrome, or Safari)

Initial configuration of the management interface requires either:

1/ PC running a supported web browser that configured and placed on the 192.168.1.2 or other address on the range 192.168.1.2/255.255.255.0

2/ Connect an Ethernet cable between the PC and the ***MGMT-1*** port of the Emulator

3/ Open the browser on the PC and enter ***http://192.168.1.1:8080/eds*** (the preconfigured management address) in the address bar.

4/ The webbrowser displays with EDS-10G Login page, were user can login to the Emulator to configure the Device

5/ Below are the Login credentials

- ***User:*** admin
- ***Password:*** 12345

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# 3 Management Interface Configuration [MGMT-1/MGMT-2]

By default, when the unit is powered on, MGMT-1 port will be active with an IP-Address 192.168.1.1, user can change the same as explained in the ***section 16.4***. And also there is a provision to configure the ***MGMT-1 & MGMT-2*** port using the Web browser UI as well as from the Command Line Interface.

User can access the EDS unit using either of these IP-addresses.

Note:

- ✓ **On Power Cycle of the EDS Unit, MGMT-1 IP address reverts back to 192.168.1.1**
- ✓ **But MGMT-2 IP address will be retained same**

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# 4 Command Line Interface

The EDS-10G Emulator includes a command line interface (CLI) that can be accessed remotely over the network through a Telnet or SSH connection. To access the CLI, log into the device over **MGMT-1 or MGMT-2(if configured)**, SSH can be used to either log into the EDS-10G CLI, similar to Telnet. The SSH and Telnet services are enabled by default. Multiple simultaneous sessions are allowed.

To login to the system over SSH, execute the below command on remote Machine to access the EDS-10G CLI

- ssh 192.168.1.1 (Management Port)

Same as over telnet

- telnet 192.168.1.1 (Management Port)

Username and password details to access EDS-10G CLI from SSH and Telnet

- Username: eds-10g
- Password: madmax13

**Once you login to the EDS-10G system over SSH/Telnet**

1/ Provide the sudoer's password (madmax13)

2/ Then after provide Application password (eds@10g)

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# 5 Password Recovery

If user forget the password for Logging to EDS system then follow the below steps for accessing

1/ Connect DVI monitor to EDS System

2/ Login to system with user_id: recovery (no password)

3/ Execute the command **eds_recovery** on console terminal

It will perform the below operations

a. Application password with default password (eds@10g)

b. System Login **root** password with default password (eds@10g)

c. Management IP address to 192.168.1.1

d. Print the password and IP address on the console terminal for user reference

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# 6 Main Menu

After log-in to EDS-10G System (Refer section 2 for the login details) main menu will appear on the console terminal as shown below.

```
****************************************
        East Coast Datacom,Inc.
        EDS-10G      Version: V0.2.2
****************************************
       TOP LEVEL SYSTEM MENU
  1    :    Scan Ethernet Interface
  2    :    Display Profile Statistics
  3    :    Profile Settings
  4    :    System Settings
  5    :    Exit
Enter Choice:
```

**Figure 2 Main Menu**

It displays the Organization name, Product name, Version number along with System Configuration menu.

This **Top Level System Menu** explains about all the

- Scan Ethernet Interface:
  - Ethernet Link status
  - IP address
  - MAC address
  - Link Speed
- Display Profile Status
  - Mode (Bridge, Route)
  - Current running profile on each Ethernet Interface
  - Emulation Parameters on profile (Bandwidth, Delay, Loss, Reordering, Duplication, etc…)

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- Statistic of each Ethernet Interface (Rx Bytes/Packets, Tx Bytes/Packets)

- Profile Settings
  - Mode of operation (Bridge, Route)
  - Configure Emulation Parameters (Bandwidth, Delay, Loss, Reordering, Duplication, Bit error rate, log, etc…)
  - Run the Instance
  - Scheduling the Instance
- System Settings
  - System Upgrade
  - System Health
  - Password Change
  - Management port Configuration
  - Factory Default
  - Delete all profile

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# 7 Scan Ethernet Interfaces

- ✓ Scans all the interfaces present in the current system and display each interface with Link status (Up/Down)
- ✓ Displays the Link speed of each interface (1G or 10G)
- ✓ Displays IP Address, MAC Address along with type of interface i.e. Management / LAN port

Gives detail information about all the Ethernet ports, so the user can get clear idea about each interface.

```
********************************************* System Ethernet Interface Information ******************************
**************

INTERFACE       LINK STATUS             IP              MAC                             SPEED

*****************************************************************************************************************
**************
eth0            LINK UP                 0.0.0.0     a0:36:9f:33:29:20           10baseT/Half  10baseT/Full
                                                                                100baseT/Half  100baseT/Full
                                                                                1000baseT/Full

eth1            LINK DOWN               0.0.0.0     a0:36:9f:33:29:21           10baseT/Half  10baseT/Full
                                                                                100baseT/Half  100baseT/Full
                                                                                1000baseT/Full

eth2(MGMT)      LINK DOWN               0.0.0.0     0c:c4:7a:00:d7:18           10baseT/Half  10baseT/Full
                                                                                100baseT/Half  100baseT/Full
                                                                                1000baseT/Full

eth3            LINK DOWN               0.0.0.0     a0:36:9f:33:29:22           10baseT/Half  10baseT/Full
                                                                                100baseT/Half  100baseT/Full
                                                                                1000baseT/Full
Type of Interface
eth4            LINK DOWN               0.0.0.0     a0:36:9f:33:29:23           10baseT/Half  10baseT/Full
                                                                                100baseT/Half  100baseT/Full
                                                                                1000baseT/Full

eth5(MGMT)      LINK UP             192.168.1.10    0c:c4:7a:00:d7:19           10baseT/Half  10baseT/Full
                                                                                100baseT/Half  100baseT/Full
                                                                                1000baseT/Full
                                Status of the link
eth6            LINK DOWN               0.0.0.0     a0:36:9f:4a:29:e0           100baseT/Full
                                                                                1000baseT/Full
                                                                                10000baseT/Full
                                                                                                Speed of the
                                                                                                interfaces
eth7            LINK DOWN               0.0.0.0     a0:36:9f:4a:29:e2           100baseT/Full
                                                                                1000baseT/Full
                                                                                10000baseT/Full

Press q and Hit Enter to go back to Main Menu
```

**Figure 3 Scan Ethernet Interfaces**

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# 8 Display Profile Statistics

This Menu displays detailed information about the current Configured/Running/Scheduled profile on each pair of Ethernet Interfaces (As user configured)

- ✓ Displays each interface name (i.e. eth0, eth1 etc…)
- ✓ Current Configured/Running/Scheduled Profile name
- ✓ Mode (Bridge or Route)
- ✓ Traffic control parameters (i.e. Delay, Loss etc…)
- ✓ Displays Tx and Rx Packets/Bytes counter value

```
****************************************** Displaying Ethernet Interface Statistics ******************************************

           PROFILE
LAN   R/S  NAME  Mode    B/W     Delay   Loss   Reorder  Duplicate   RxPctr     RxBctr    TxPctr     TxBctr    PktL  PktR   PktD
-------------------------------------------------------------------------------------------------------------------------------------

 eth0 R     all bridge   10gbit   100ms 0.500   0.500   0.500      2902481   93463428      91167  137001910   1451960 30259 30225

 eth1 R     all bridge   10gbit   100ms 0.500   0.500   0.500       834962 1262344745    2708930 4082110931   416675 897166 899955

 eth3 S    NONE   NONE     NONE     0ms 0.000   0.000   0.000            0          0          0          0       0     0     0

 eth4 S    NONE   NONE     NONE     0ms 0.000   0.000   0.000            0          0          0          0       0     0     0

 eth6 S    NONE   NONE     NONE     0ms 0.000   0.000   0.000            0          0          0          0       0     0     0

 eth7 S    NONE   NONE     NONE     0ms 0.000   0.000   0.000            0          0          0          0       0     0     0

 eth8 S    NONE   NONE     NONE     0ms 0.000   0.000   0.000            0          0          0          0       0     0     0

 eth9 S    NONE   NONE     NONE     0ms 0.000   0.000   0.000            0          0          0          0       0     0     0

 R-Running   S-Stopped

Press q and Hit Enter to go back to Main Menu
```

**Figure 4 Display Profile Statistics**

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# 9 Display Filter Statistics

This Menu displays detailed information about the current Running Filter profile on each pair of Ethernet Interfaces (As user configured)

- ✓ Displays running interface name (i.e. eth0, eth1 etc…)
- ✓ Current running Profile name
- ✓ Displays the type of Filter chosen by user for running profile
- ✓ Based on type of Filtering it will show protocol, Port number, IP address, MAC address is running for that profile.

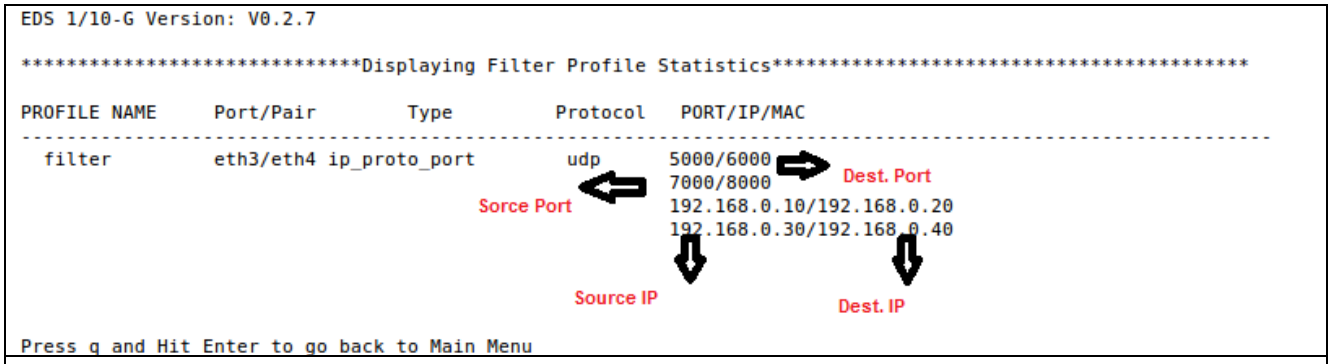


**Figure 5 Display Filter Statistics**

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# 10 Interface Emulation Parameters Configuration

The Traffic Configuration Settings menu contains all the Emulation parameters for configuration. All the Emulation parameters are configured separately for each Interface on egress packets

```
        Configure Emulation Parameter settings for Interface -1

  1   :   Bandwidth
  2   :   Packet Loss
  3   :   Packet Reordering
  4   :   Packet Duplication
  5   :   Packet Corruption
  6   :   Exit
Enter Choice
```

**Figure 6 Traffic Config Settings**

## 10.1 Delay

The Delay parameter specifies the link latency in milliseconds. Delay is the amount of time the packet waits after coming from ingress interface and the time it exits on the egress interface for all incoming packets

User can set the Delay from 0 milliseconds to 10 seconds. If entered delay value is not within the range then it will show it is not valid input please enter valid input

Delay distribution types

1/ Uniform Delay

Delay ranging between the configured minimum and maximum values.

```
          Variable Delay Emulation Parameters

  1   :   Minimum Delay Range
  2   :   Maximum Delay Range
  3   :   Exit
Enter choice :
```

**Figure 7 Variable Delay**

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2/ Constant Delay

Fixed value for delay on each Independent interface

```
          Delay Emulation On Interface 1/2

  1   :   Interface-1 Delay
  2   :   Interface-2 Delay
  3   :   Exit
Enter Choice
```

**Figure 8 Constant Delay**

3/ Jitter Delay

It can be applied for constant and uniform delay. It can be applied for independent interface. For constant delay, it is varying in tolerance of jitter value.

```
          Jitter Emulation On Interface 1/2

  1   :   Interface-1 Jitter
  2   :   Interface-2 Jitter
  3   :   Exit
Enter Choice
1

Input will be taken in terms of milliseconds(Valid Range 0-5000)

Enter the amount of delay to be applied on interface-1: (eg: 5,100,1000....)
1000
```

**Figure 9 Constant Delay**

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## 10.2 Bandwidth

The bandwidth option displays the configured link rate of emulated WAN. The Minimum bandwidth is set to 300 bps. Link rate is set independently in each direction. The link rate is set in units of bps, kbps, Mbps or Gbps.

```
        Configure Emulation Parameter settings for Interface -1

  1   :   Bandwidth
  2   :   Packet Loss
  3   :   Packet Reordering
  4   :   Packet Duplication
  5   :   Packet Corruption
  6   :   Exit
Enter Choice
1
Bandwidth input has to be given in terms of kbit/mbit/gbit

For 10/100/1000 Ports:  kbit: 1kbit - 999kbit (eg: 50kbit,500kbit, etc)
                        mbit: 1mbit - 1000mbit (eg: 100mbit etc..,  For Max B/W input 1000mbit)
-------------------------------------------------------------------------------------------
For 10-G Ports:         kbit: 1kbit - 999kbit (eg: 50kbit,500kbit, etc)
                        mbit: 1mbit - 1000mbit (eg: 500mbit etc..,  For Max B/W input 10gbit)

Enter the amount of bandwidth to be applied on interface-1:1000mbit
```

**Figure 10 Bandwidth**

Note: *Link rate should not be greater than Physical interface rate*

## 10.3 Packet Loss

Loss is measured in number of packets lost or dropped with respect to the number of packets transmitted.

Packet Loss rate can be set from 0 to 1 percent (e.g. input 0.1 to simulate 10 percent packet loss)

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```
        Configure Emulation Parameter settings for Interface -1

  1   :   Bandwidth
  2   :   Packet Loss
  3   :   Packet Reordering
  4   :   Packet Duplication
  5   :   Packet Corruption
  6   :   Exit
Enter Choice
2
Loss input  ranges from 0 to 1 with min increment of 0.1 (eg, input 0.1 to simulate 10 percent packet loss)

Enter the amount of packet loss to be applied on interface-1:0.2
```

**Figure 11 Packet Loss**

## 10.4 Reordering

Packet reordering is a well-known phenomenon that the order of packets is gets inverted. Reordering can affect the performance of both the network and the packets receive

The Reordering row specifies the probability that each frame is reordered and the amount of time that reordered frames are delayed from their original position

Reordering value can also be set in Percentage. Range is 0 to 1 (e.g. input 0.1 to simulate 10 percent reordering). To reorder the packets Delay should be configured, it specifies how long each reordered frame is held before being reinserted into the data stream

```
        Configure Emulation Parameter settings for Interface -1

  1   :   Bandwidth
  2   :   Packet Loss
  3   :   Packet Reordering
  4   :   Packet Duplication
  5   :   Packet Corruption
  6   :   Exit
Enter Choice
3
Reordering input  ranges from 0 to 1 with min increment of 0.1 (eg, input 0.1 to simulate 10 percent packet reordering)

Enter the amount of packet reordering to be applied on interface-1:0.2
```

**Figure 12 Packet Reordering**

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## 10.5 Packet Duplication

The Duplication parameter specifies the probability that a frame will be duplicated. Copy of original frame is inserted into the data stream immediately after the original frame.

Duplication value can be set from range of 0 to 1%. (E.g., input 0.1 to simulate 10 percent packet loss)

```
        Configure Emulation Parameter settings for Interface -1

  1   :   Bandwidth
  2   :   Packet Loss
  3   :   Packet Reordering
  4   :   Packet Duplication
  5   :   Packet Corruption
  6   :   Exit
Enter Choice
4
Duplication input  ranges from 0 to 1 with min increment of 0.1 (eg, input 0.2 to simulate 20 percent packet duplication)

Enter the amount of packet duplication to be applied on interface-1:0.5
```

**Figure 13 Packet Duplication**

## 10.6 Packet Corruption

Random noise can be emulated with the corrupt option. This introduces a single bit error at a random offset in the packet

```
**************** Data corruption option **********

1. Random layer Corruption
2. Layer 3 Corruption
3. Layer 4 Corruption
4. Vlan pkt Corruption
5. mpls pkt Corruption
6. Exit

Enter choice:
```

**Figure 14 Packet corruption**

Packet corruption rate value can be within the range of 0 to 1(e.g. input 0.1 to simulate 10 percent bit error rate)

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It can of 3 types

**I. Random corruption**

This introduces a single bit error at a random offset in the packet based on percentage.

**II. Layer 3 corruption**

It is of 2 types

- Random corruption : This introduces a single bit random offset error of layer 3 header
- Checksum corruption: This introduces a single bit error in checksum field of layer 3 header

**III. Layer 4 corruption**

It is of 2 types

- Random corruption : This introduces a single bit random offset error of layer 4 header(Tcp/Udp/Icmp/All)
- Checksum corruption : This introduces a single bit error in checksum field of layer 4 header(Tcp/Udp/Icmp/All)

**IV. MPLS Corruption**

- Single packet corruption: After single MPLS label it corrupts any of the bit
- All packet corruption: After multiple MPLS label it corrupts any of the bit

```
**************** Layer2 corruption options **********

1. Single Packet Corruption
2. Multiple Packet Corruption
3. Exit

Enter choice:
```

**Figure 15 MPLS corruption**

**V. VLAN Corruption**

- Single packet corruption : After single VLAN ID it corrupts any of the bit

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- All packet corruption: After multiple VLAN ID it corrupts any of the bit

```
**************** Layer2 corruption options **********

1. Single Packet Corruption
2. Multiple Packet Corruption
3. Exit

Enter choice:
```

**Figure 16 VLAN corruption**

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# 11 Bridge and Route Mode Configuration

The EDS-10G Emulator can be installed as either a bridge or router to forward frames between Ethernet interfaces. By default, the EDS-10G Emulator is not configured to any mode of operation (bridge, route), and this mode is recommended for simplicity unless the interfaces need to be on separate subnets.

To switch to Routing Mode from Bridging Mode, configure through Mode of Operation Menu.

Bridge/Route settings are not stored with emulation parameters and will not change when a stored emulation is loaded.

## 11.1 Bridge Mode

In Bridging Mode, the EDS device functions as a bridge between the Ethernet segments connected to the LAN A and LAN B ports. In this mode, it can forward any Ethernet- based frame regardless of network layer protocol, including IP, IPv6, IPX, and Apple Talk. VLAN tagged frames (IEEE 802.1Q) are supported

This option enables the simulation in bridge mode. Both the Interface should have same speed. Example both interfaces can be 1G port or 10G ports, but it is invalid if one port is 1G and other is 10G

```
********** SELECT MODE ***********

 1   :   Bridge Mode
 2   :   Route Mode
 3   :   Exit
Enter Choice:1
************* Bridge Mode Selected
```

**Figure 17 Bridge Mode**

## 11.2 Route Mode

Routing mode provides a default routing mechanism that elimates the need for multiple status routes. When a gateway address is set for both interfaces, the default next hop for packets received on one interface is the gateway address of the opposite interface. For example, if a packet is received on the LAN A interface and

A

has a destination address on a sub-net that is not directly connected to either the LAN A or LAN B interface, the packet is forwarded across the emulated link to the LAN B gateway router

This option enables the simulation in route mode. Both the Interface should have same speed. Example both interfaces can be 1G port or 10G ports, but it is invalid if one port is 1G and other is 10G

```
********** SELECT MODE ************

 1   :   Bridge Mode
 2   :   Route Mode
 3   :   Exit
Enter Choice:2
*************** Route Mode Selected ***
```

**Figure 18 Route Mode**

On selection of the mode, IP-Address needs to be configured for each interface. All addresses are entered in dotted-decimal notation

```
************ INTERFACE SETTINGS *************

 1   :   Interface Name
 2   :   Interface Ip-Address
 3   :   Exit
Enter Choice:1
Enter Port-1 interface name: (eg: eth0, eth1.....ethN)
eth0
************ Port-1 interface name entered successfully
########### 1G Port Selected #########
************ INTERFACE SETTINGS *************

 1   :   Interface Name
 2   :   Interface Ip-Address
 3   :   Exit
Enter Choice:2
 Port1 Name  :   eth0
Enter Port-1 ip address : 192.168.0.10
****** Port 1 ip address entered succesfully***
```

```
************ INTERFACE SETTINGS *************

 1   :   Interface Name
 2   :   Interface Ip-Address
 3   :   Exit
Enter Choice:1
Enter Port-2 interface name: (eg: eth0, eth1.....ethN)
eth1
************ Port-2 interface name entered successfully
########### 1G Port Selected #########
************ INTERFACE SETTINGS *************

 1   :   Interface Name
 2   :   Interface Ip-Address
 3   :   Exit
Enter Choice:2
 Port2 Name  :   eth1
Enter Port-2 ip address : 10.20.30.1
****** Port 2 ip address entered succesfully*****
```

**Figure 19 Interface- 1/2 Route Mode Configuration**

A

# 12 Filtering and Non-Filtering

Filters are used to capture specific data packets for predefined operations. Network Emulator uses filters to capture certain packets and passes them to the emulation engine. Filters under the Filters tab are used with Multi-Link emulations

By default if any packet arrives on any of the configured Interface, the Emulation rules will apply on the egress interface

There are 3 options

1. Filter
2. Non Filter
3. Clear Filter
4. Exit

```
**************** Packet Emulation verdict **********

1. Filtering
2. Non-Filtering
3. Clear Filters
4. Exit

Enter choice:3
```

**Figure 20 Traffic Config Settings**

## 12.1 Filtering Menu

All of the filters are are applied to all ports during the start of the emulation. Filters are always defined for the egress port of an emulation. Therefore, when defining filters users should pay close attention to the location of servers or network devices, which will generate the traffic going through Network Emulator.

Network Emulator provides filtering on the data link, network and transport layers. Emulation rules were applied only to the specific packets / frames these can be controlled with filtering mechanism. This emulator is supporting only **IPV4** Filter

Packet filtering configuration can be based on MAC, IP, Port, Protocol and combination A

```
************ FILTERING_OPTIONS ****

  1    :    Ip filtering
  2    :    Mac filtering
  3    :    Port filtering
  4    :    Protocol filtering
  5    :    Proto_Port filtering
  6    :    Ip_Port filtering
  7    :    Ip_Proto filtering
  8    :    Ip_Proto_Port filtering
  9    :    Mpls label filtering
  10    :   Vlan label filtering
  11   :    Drop Packets
  12   :    Exit
Enter the choice:
```

**Figure 21 Filtering Menu**

## I. IP filtering

Emulation rules were applied based on Source and Destination IP address match. It asks for Source IP, Destination IP address along with all traffic control parameters

Note: *In IP filtering traffic control rules work only on user entered source IP and destination IP*

```
************ IP FILTERING ********

  1    :    Source ip address
  2    :    Destination ip address
  3    :    Delay
  4    :    Packet Loss
  5    :    Bandwidth
  6    :    Reordering
  7    :    Duplication
  8    :    Exit
Enter the choice :
```

**Figure 22 IP Filtering**

## II. MAC filtering

Emulation rules were applied on Source and Destination MAC address match. It asks for Source, Destination MAC address along with all traffic control parameters

A

Note: *In MAC filtering traffic control rules work only on user entered source MAC and destination MAC*

```
************ MAC FILTERING ********

  1   :    Source mac address
  2   :    Destination mac address
  3   :    Delay
  4   :    Packet Loss
  5   :    Bandwidth
  6   :    Reordering
  7   :    Duplication
  8   :    Exit
Enter the choice
```

**Figure 23 MAC Filtering**

### III. Port filtering

Emulation rules were applied based on Source and Destination port number match. It asks source port, destination port address along with all traffic control parameters

***Port number ranges from 1024- 65535***

Note: *In PORT filtering traffic control parameters work only on user entered source PORT and destination PORT number*

```
************ PORT FILTERING ********

  1   :    Source port
  2   :    Destination port
  3   :    Delay
  4   :    Packet Loss
  5   :    Bandwidth
  6   :    Reordering
  7   :    Duplication
  8   :    Exit
Enter the choice :
```

**Figure 24 Port Filtering**

### IV. Protocol Filtering

Emulation rules were applied based on Protocol match. It asks for protocol along with all traffic control parameters.

A

***Valid protocols: TCP, UDP, ICMP***

Note: *In this filtering traffic control parameters work only on user entered Protocol*

```
************ PROTO FILTERING ***

  1    :     Enter Protocol
  2    :     Delay
  3    :     Packet Loss
  4    :     Bandwidth
  5    :     Reordering
  6    :     Duplication
  7    :     Exit
Enter the choice :
```

**Figure 25 Protocol Filtering**

## V. Protocol and Port Filtering

It filters the packet based on the combination of Protocol and Port. Emulation rules were applied based on combination of protocol and port number match.

***Valid protocols: TCP, UDP***

Note: *ICMP protocol is not valid for this option, as its packet header is not having any port number*

*Traffic control parameter work on combination of protocol and port number*

```
************ PROTO_PORT FILTERING *********

  1    :     Source port
  2    :     Destination port
  3    :     Protocol
  4    :     Delay
  5    :     Packet Loss
  6    :     Bandwidth
  7    :     Reordering
  8    :     Duplication
  9    :     Exit
Enter the choice :
```

**Figure 26 Protocol Port Filtering**

## VI. IP and Port filtering

It filters the packet based on the combination of IP address and Port number. Emulation rules were applied based on combination of IP and port number match.

A

Note: *In this filtering traffic control parameters work only on combination of user entered IP and port number*

```
************ IP_PORT FILTERING ********

  1    :     Source port
  2    :     Destination port
  3    :     Source ip address
  4    :     Destination ip address
  5    :     Delay
  6    :     Packet Loss
  7    :     Bandwidth
  8    :     Reordering
  9    :     Duplication
  10   :     Exit
Enter the choice
```

**Figure 27 IP Port Filtering**

## VII. IP and Protocol filtering

It filters the packet based on IP and protocol. Emulation rules were applied based on combination of IP and port number match.

Note: *In this filtering traffic control, parameters work only on combination of user entered IP and protocol*

```
************ IP_PROTO FILTERING *******

  1    :     Enter Protocol
  2    :     Source ip address
  3    :     Destination ip address
  4    :     Delay
  5    :     Packet Loss
  6    :     Bandwidth
  7    :     Reordering
  8    :     Duplication
  9    :     Exit
Enter the choice :
```

**Figure 28 IP Protocol Filtering**

## VIII. IP, Protocol and Port Filtering

It filters the packet based on the combination of IP address, Protocol and port. Emulation rules were applied based on combination of IP, protocol and port number match.

Note: *In this filtering traffic control parameters work only on combination of user entered IP and protocol and Port number*

A

```
************ IP_PROTO_PORT FILTERING **********

 1   :    Source port
 2   :    Destination port
 3   :    Source ip address
 4   :    Destination ip address
 5   :    Enter Protocol
 6   :    Delay
 7   :    Packet Loss
 8   :    Bandwidth
 9   :    Reordering
 10   :   Duplication
 11   :   Exit
Enter the choice :
```

**Figure 29 IP Protocol Port Filtering**

## IX. MPLS Filtering

Emulation rule were applied on all MPLS packet or for specific label MPLS packet along with traffic control parameters.

Note: *In this filtering traffic control rules work only on of user entered MPLS label*

```
************ MPLS FILTERING ********

 1   :    Mpls label
 2   :    Delay
 3   :    Packet Loss
 4   :    Bandwidth
 5   :    Reordering
 6   :    Duplication
 7   :    Exit
Enter the choice :
```

**Figure 30 MPLS Filtering**

## X. VLAN filtering

In this option user can select either for all VLAN packet or for specific tag VLAN packet along with traffic control parameters.

Note: *In this filtering traffic control, parameters work only on of user entered VLAN tag.*

A

```
************ VLAN FILTERING ********

  1   :    VLAN id
  2   :    Delay
  3   :    Packet Loss
  4   :    Bandwidth
  5   :    Reordering
  6   :    Duplication
  7   :    Exit
Enter the choice :
```

**Figure 31 VLAN Filtering**

## XI. Drop packets

- ✓ **IP deny** it ask for source and destination IP. Packets will get dropped only in that particular user entered IP address.
- ✓ **MAC deny**: It ask for source and destination MAC. Packets will get dropped only in that particular user entered MAC address.
- ✓ **Protocol deny**: It ask for protocol. Packets of specified protocol will get dropped
- ✓ **IP and protocol deny**: It ask for protocol along with IP address. Packets with same protocol and IP specified by user will get dropped.

```
************ DROP PACKETS *******

  1   :    Ip deny
  2   :    Mac deny
  3   :    Protocol deny
  4   :    Ip_Protocol deny
  5   :    Exit
Enter the choice :
```

**Figure 32 Drop Packets**

A

## 12.2 Non Filtering

Emulation rules applies to all the egress packets for every packets

```
          Traffic Emulation On Interface 1/2

  1   :   Delay Type
  2   :   Interface-1 Setting
  3   :   Interface-2 Setting
  4   :   Exit
Enter Choice
```

**Figure 33 Non filtering**

## 12.3 Clear Filters

While editing a (Filtering) profile it will clear all Filtering parameter. That profile can be used for Non Filtering setting.

```
 **************** Packet Emulation verdict **********

1. Filtering
2. Non-Filtering
3. Clear Filters
4. Exit

Enter choice:3
Want to clear the filters
1.yes
2.no
```

**Figure 34 Clear filters**

A

# 13 Profile Setting

This Profile configuration is used for creating/editing/deleting profiles which are created in order to enable the simulation in either Bridge mode or Route mode, even option for stopping simulation is also present. The profile setting is having sub menu options as shown below

```
*************  PROFILE CONFIGURATION *********

  1   :   Add New Profile
  2   :   Delete Profile
  3   :   Edit Profile
  4   :   Stop Simulation
  5   :   Display Scheduled Profile
  6   :   Remove Profile from Scheduler
  7   :   Logs
  8   :   Exit
Enter Choice:
```

**Figure 35 Profile Configuration**

## 13.1 Add New Profile

To Perform/Run simulation on any of the Ethernet interface, new profile needs to be created before running any Traffic Emulation. On selection of this menu user can Configure/Create new profile, by entering profile name

```
*************  PROFILE CONFIGURATION *********

  1   :   Add New Profile
  2   :   Delete Profile
  3   :   Edit Profile
  4   :   Stop Simulation
  5   :   Display Scheduled Profile
  6   :   Remove Profile from Scheduler
  7   :   Logs
  8   :   Exit
Enter Choice:1

************  PROFILE SETUP *************

  1   :   Profile Name
  2   :   Mode
  3   :   Port-1 Interface Name
  4   :   Port-2 Interface Name
  5   :   Traffic Config Settings
  6   :   Log
  7   :   Save
  8   :   Apply
  9   :   Exit
Enter Choice:1
Enter name of the Profile
test
```

**Figure 36 Add New Profile**

A

### 1/ Profile Name

Enter the profile name to create new profile, it will only accept characters and numbers as input, special characters are not valid

***The maximum length of profile name can be 7 characters***

### 2/ Mode Selection

Through this option user can select on which mode the simulation to be run (i.e. Route, Bridge). Both the Interface should paired with same Link speed

***Example: eth2 and eth3 both interfaces should be 1G port or 10G ports, but it is invalid if one of the port is 1G and if other is 10G***

### 3/ Traffic Config Setting

User can configure the traffic emulation rules on every packet flows between each port on egress traffic, Delay, Loss, Bandwidth and etc are the emulation rules were applied. All rules were applied on basis of Filtering and Non Filtering method

```
************  PROFILE SETUP *************

  1   :   Profile Name
  2   :   Mode
  3   :   Port-1 Interface Name
  4   :   Port-2 Interface Name
  5   :   Traffic Config Settings
  6   :   Log
  7   :   Save Profile
  8   :   Apply/Load Profile
  9   :   Exit
Enter Choice:5
Traffic Control Configuration for Port-1 and Port-2
 *************** Packet Emulation verdict *******

 1. Filtering
 2. Non-Filtering
 3. Exit

 Enter choice:
```

**Figure 37 Traffic Config Settings**

A

## 4/ Save Profile

The Save option is used to store current emulation parameters to a named profile. The saved profile stored on the EDS-10G Device. On selection of save profile emulation parameters will not be loaded on the Interface

```
************  PROFILE SETUP *************

 1   :   Profile Name
 2   :   Mode
 3   :   Port-1 Interface Name
 4   :   Port-2 Interface Name
 5   :   Traffic Config Settings
 6   :   Log
 7   :   Save Profile
 8   :   Apply/Load Profile
 9   :   Exit
Enter Choice:7
Saving configured parameters to xml file......
```

**Figure 38 Save Profile**

## 5/ Apply/Load Profile

Configured emulation profile can be loaded to run the simulation. Once loaded user can view the current profile status ***Display Profile Statistics*** page

```
************  PROFILE SETUP *************

 1   :   Profile Name
 2   :   Mode
 3   :   Port-1 Interface Name
 4   :   Port-2 Interface Name
 5   :   Traffic Config Settings
 6   :   Log
 7   :   Save Profile
 8   :   Apply/Load Profile
 9   :   Exit
Enter Choice:8
8

********* Types Of Simulation *********

1  : Instant Simulation
2  : Schedule Simulation
3  : Exit
```

**Figure 39 Apply Profile**

A

## 13.2 Edit Profile

This is used to edit existing profile. Profile name, mode, interface name along with all traffic control parameters can be edited.

Note: *If profile is running, it cannot be edited*

```
**************  PROFILE CONFIGURATION ********

  1    :    Add New Profile
  2    :    Delete Profile
  3    :    Edit Profile
  4    :    Stop Simulation
  5    :    Display Scheduled Profile
  6    :    Remove Profile from Scheduler
  7    :    Logs
  8    :    Exit
Enter Choice:3
1: aaa.xml
2: test.xml
3: bbb.xml
4: www.xml
5: test2.xml
******** Choose Profile to Edit **********


Enter profile to edit:
```

**Figure 40 Edit Profile**

A

## 13.3 Stop simulation

It will show all current running profile. It can stop any running profile simulation and can clear the statistics. Once it is stopped user can edit the profile

```
*************  PROFILE CONFIGURATION *************

  1   :   Add New Profile
  2   :   Delete Profile
  3   :   Edit Profile
  4   :   Stop Simulation
  5   :   Display Scheduled Profile
  6   :   Remove Profile from Scheduler
  7   :   Logs
  8   :   Exit
Enter Choice:4
1. test.xml
2. Exit

Enter Choice:1

************ Profile stopped Successfully ***********

Want to clear statistics for this profile:
1. Yes
2. No

Enter Choice:1


********** Statistics cleared successfully **********
```

**Figure 41 Stop Simulation**

A

# 14 Profile Scheduling

After creating the profile, user can schedule the profile for simulation in 2 ways

- Instant Simulation
- Schedule Simulation

## 14.1 Instant simulation

It will start running the simulation immediately. There is no time span for this simulation. This simulation will run continuously until and unless it is stopped by user.

```
********* Types of Simulation *********

1  : Instant Simulation
2  : Schedule Simulation
3  : Exit

Enter choice :1

Applying saved parameters and starting the simulation

Build on Apr 27 2015 @ 15:13:27
EDS 1/10-G Version: V0.2.2
```

**Figure 42 Instant Simulation**

## 14.2 Scheduled simulation

EDS-10G provides a mechanism to automate running a sequence of different profiles on time basis.

This can be useful for both of emulating traffic dynamically changing link conditions and for automating a series of independent tests.

The basic operation of scheduler consists of configuring one or more emulation profiles by configuring the time for each profile to run by providing ***Start/End Time*** between each profile. This is also called as future simulation.

A

Note: *User has to specify manually or can enter duration in minute's ex- 40mins, so simulation will run that duration starting from start time*

Note: *Time has to be entered in 24 hour format*

```
********* Types of Simulation *********

1   : Instant Simulation
2   : Schedule Simulation
3   : Exit

Enter choice :2
----------------------------------------
Present Date ::   29.4.2015
Present Time ::   12:0:53
----------------------------------------
Enter the start Date :
Entered Start Date ::   29.4.2015

Enter the start time :
Entered Start Time :12:0:57

Enter the end Date :
Entered End Date ::   29.4.2015

Enter the end time :16:0:0
```

**Figure 43 Schedule Simulation**

## 14.3 Display Scheduled profile

This menu displays the detailed information of the scheduled profile.

- ✓ Profile name
- ✓ Status of the Profile (i.e. Running or Pending)
- ✓ Interface name
- ✓ Start date and Start time
- ✓ End date and End time

A

```
*************  PROFILE CONFIGURATION *************

  1   :   Add New Profile
  2   :   Delete Profile
  3   :   Edit Profile
  4   :   Stop Simulation
  5   :   Display Scheduled Profile
  6   :   Remove Profile from Scheduler
  7   :   Logs
  8   :   Exit
Enter Choice:5


*************************************************************
1:  Profile Name :  test              < Running >
Ethernet Pair < eth0  > - <   eth1  >
DATE          Start date : < 29.4.2015 > End date : < 29.4.2015 >
Time          Start time : < 12:0:57 >   End time : < 16:0:0 >


*************************************************************
```

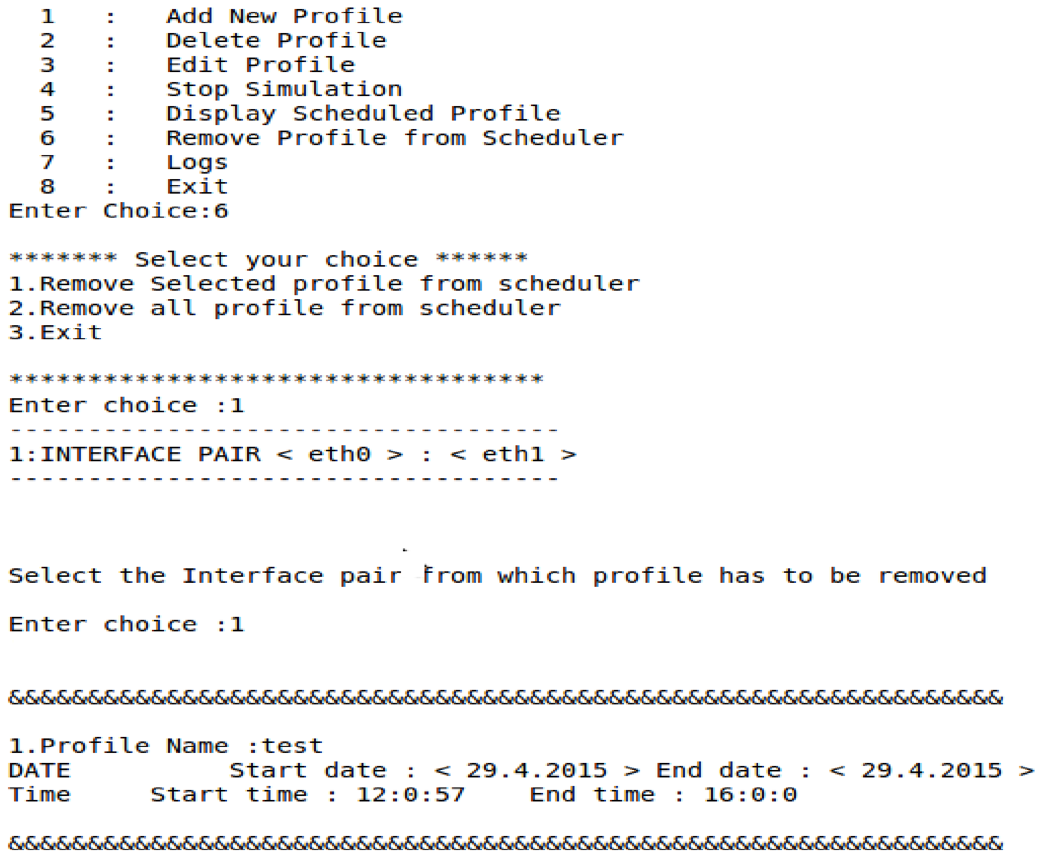
**Figure 44 Display Scheduled Profile**

## 14.4 Remove profile from scheduler

It is used for removing scheduled profile. User can remove all scheduled profile at one instance or user can remove selected scheduled profile. While removing selected scheduled profile it asks for selection of interface pair once user select for one interface pair it displays all scheduled profile of that interface pair

Note: *This is only for removing profile from scheduler list; it will not delete that profile*

A



```
  1   :   Add New Profile
  2   :   Delete Profile
  3   :   Edit Profile
  4   :   Stop Simulation
  5   :   Display Scheduled Profile
  6   :   Remove Profile from Scheduler
  7   :   Logs
  8   :   Exit
Enter Choice:6

******* Select your choice ******
1.Remove Selected profile from scheduler
2.Remove all profile from scheduler
3.Exit

**********************************
Enter choice :1
-----------------------------------
1:INTERFACE PAIR < eth0 > : < eth1 >
-----------------------------------



Select the Interface pair from which profile has to be removed

Enter choice :1


&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&

1.Profile Name :test
DATE          Start date : < 29.4.2015 > End date : < 29.4.2015 >
Time     Start time : 12:0:57    End time : 16:0:0

&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
```

**Figure 45 Remove Profile**

# 15 Log

Log feature is for individual profile. The number of bytes forwarded, number of bytes lost, delayed, duplicated along with profile name start date and start time can be recorded in log file.

## 15.1 Enable Logging

It can be enabled for individual profile. In log enabled profile number of bytes forwarded, number of bytes lost, delayed, duplicated etc can be recorded in every 10 sec

```
***** LOG ENABLE SETUP ****

  1    :    Enable LOG
  2    :    Exit
Enter the choice:
```

**Figure 46 Log Enable Setup**

## 15.2 Disable Logging

Log can be stopped for current running logs. User can view on which profiles data Logging enabled, user can stop the current running log on the specific profile. Once it is stopped by user, log file record is also stopped at that moment.

Note: *If user stopped current running logs, only log file record is stopped for that profile but profile simulation is still running*

```
******* LOG PROFILE STATUS ********

 1 : Stop current running logs
 2 : List log file path
 3 : Delete all existing log files
 4 : Exit
Enter the choice :
```

**Figure 47 Log Enable Setup**

A

## 15.3 View Logs

Every log file of particular profile is stored in predefined Hard Drive path for permanent storage. It can be viewed by ***List log File path Option***. Log file can be distinguished by its profile name and time. The entire existing log file can be deleted from Hard Drive

```
EDS 1/10-G
Version             : V0.2.2
Starting Time       : 18:19:28
profile name        : all
Mode                : bridge
  TIME     LAN    B/W     Delay  Loss   Reorder Duplicate   RxPCtr    RxBCtr       TxPCtr    TxBCtr     PktL   PktR   PktD
*****************************************************************************************************************************

18:19:38  eth0  10gbit  100ms   0.500   0.500   0.500           4      1360          1       590       1      0      0
18:19:38  eth1  10gbit  100ms   0.500   0.500   0.500           1        81          3      1261       0      0      1
18:19:48  eth0  10gbit  100ms   0.500   0.500   0.500           8      2720          1       590       3      0      0
18:19:48  eth1  10gbit  100ms   0.500   0.500   0.500           1        81          4      1851       0      0      1
18:19:58  eth0  10gbit  100ms   0.500   0.500   0.500           9      2810          1       590       3      0      0
18:19:58  eth1  10gbit  100ms   0.500   0.500   0.500           2       162          4      1851       1      0      1
18:20:8  eth0   10gbit  100ms   0.500   0.500   0.500          12      4080          1       590       4      0      0
18:20:8  eth1   10gbit  100ms   0.500   0.500   0.500           2       162          7      3621       1      0      2
18:20:18  eth0  10gbit  100ms   0.500   0.500   0.500          13      4670          1       590       5      0      0
18:20:18  eth1  10gbit  100ms   0.500   0.500   0.500           2       162          7      3621       1      0      2
18:20:28  eth0  10gbit  100ms   0.500   0.500   0.500          13      4670          1       590       5      0      0
18:20:28  eth1  10gbit  100ms   0.500   0.500   0.500           2       162          7      3621       1      0      2
18:20:38  eth0  10gbit  100ms   0.500   0.500   0.500          15      5850          1       590       5      0      0
18:20:38  eth1  10gbit  100ms   0.500   0.500   0.500           2       162         10      5391       1      0      3
18:20:48  eth0  10gbit  100ms   0.500   0.500   0.500          20      6710          1       590       6      0      0
18:20:48  eth1  10gbit  100ms   0.500   0.500   0.500           2       162         15      5691       1      0      5
18:20:58  eth0  10gbit  100ms   0.500   0.500   0.500          20      6710          1       590       6      0      0
18:20:58  eth1  10gbit  100ms   0.500   0.500   0.500           3       243         15      5691       2      0      5
18:21:8  eth0   10gbit  100ms   0.500   0.500   0.500          25      8108          3       710      11      0      1
18:21:8  eth1   10gbit  100ms   0.500   0.500   0.500           5       363         15      5691       3      0      5
18:21:18  eth0  10gbit  100ms   0.500   0.500   0.500          39      9858          9      1184      14      0      3
18:21:18  eth1  10gbit  100ms   0.500   0.500   0.500          16      1251         31      7713      10      0     10
18:21:28  eth0  10gbit  100ms   0.500   0.500   0.500          59     11818         27      2948      24      2      9
18:21:28  eth1  10gbit  100ms   0.500   0.500   0.500          35      3113         46      9183      17      2     15
18:21:38  eth0  10gbit  100ms   0.500   0.500   0.500          66     13488         33      3536      27      2     11
```

**Figure 48 View Logs**

A

# 16 System setting

On selection of settings menu, user can perform Factory defaults and System Upgrade and some other system level settings

```
***** System Settings ********

  1   :   Change Password
  2   :   Delete All Profiles
  3   :   Factory Defaults
  4   :   Mgmt Port Configuration
  5   :   Upgrade
  6   :   Port Flapping
  7   :   System Health
  8   :   Exit
Enter Choice:
```

**Figure 49 System Settings**

## 16.1 Change password

User can change the password for login user accounts, on selection it prompted with new password option, after that the password is then encrypted and stored on the system.

## 16.2 Delete all profile

On deletion of all profiles current running profile simulations will be stopped and clears the statistics parameter

## 16.3 Factory default

It's known factory reset, is software restore the EDS-10G System to its original system state by erasing all of the information stored on the device in an attempt to restore the EDS-10G system software to its original manufacturer settings. Doing so will effectively erase all of the data, settings, and applications that were previously configured on the device, it will delete all profile and reset the password to default password (eds@10G)

A

## 16.4 Management port configuration

Management port IP address is used for accessing EDS emulator. EDS emulator supports two management ports physical interfaces. For configuring management port user should specify IP address, subnet mask, and gateway. User should enter IP address manually but for mask and gateway either it can be entered manually or user can press **Enter key** for default value

```
***** System Settings ********

  1   :   Change Password
  2   :   Delete All  Profiles
  3   :   Factory Defaults
  4   :   Mgmt Port Configuration
  5   :   Upgrade
  6   :   Port Flapping
  7   :   Exit
Enter Choice:4

************* Choose Port for Configuration *************

1. Port-1 Configuration
2. Port-2 Configuration
3. Exit

Enter Choice:1

Enter IP Address for Mgmt Port-1: 192.168.0.100

Enter Subnet mask for Mgmt Port-1: 255.255.255.0

Enter Gateway for Mgmt Port-1: 192.168.0.1

 *************** IP Address Configured Successfully for Mgmt port-1 **************
```

**Figure 50 Management port configuration**

A

## 16.5 Upgrade

It is used for replacing the software to newer or better version. It is used to bring the system up to date. It will ask for file path to upgrade.

```
***** System Settings ********

  1   :   Change Password
  2   :   Delete All Profiles
  3   :   Factory Defaults
  4   :   Mgmt Port Configuration
  5   :   Upgrade
  6   :   Port Flapping
  7   :   System Health
  8   :   Exit
Enter Choice:5
 Enter the filename
/home/shruthi/Desktop/eds_app
```

**Figure 51 System Settings**

## 16.6 System health

It will take all system kernel log and save that in a file on desktop names as system_health_date.txt

## 16.7 Port flapping

Port flap means that the Ethernet interface continually goes up and down in EDS-10G System on the user selected interface

A

```
******* PORT FLAPPING ********

1. Display Ports
2. Stop Flapping
3. exit
Select the option : 1
****** Choose Port to Flap *********
eth0
eth1
eth3
eth4
eth6
eth7
Select Port :
```

**Figure 52 Port flapping**

On **Scan Ethernet interface menu** (refer section 4 ) user can check the selected interface link status (up/down). On selection of port flapping the Ethernet link status will take approximately 10sec for up and down

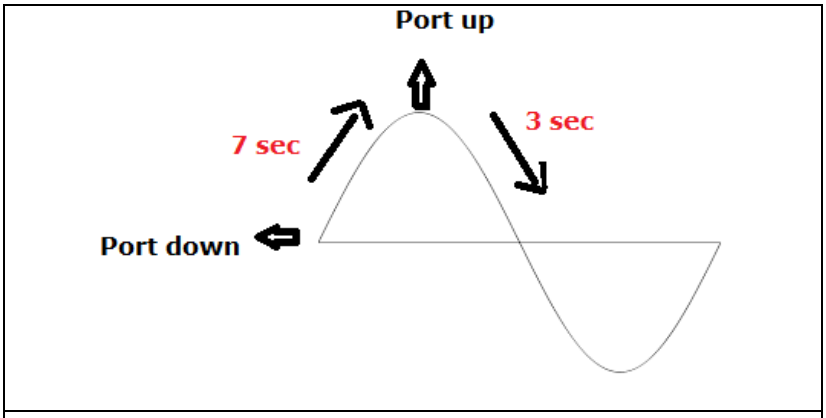



**Figure 53 Time duration of port flapping**

A

# 17 Example

## 17.1 Creating profile with Filtering

Follow with the below steps to create a new profile with filtering option.

Step 1: To Log-in to the EDS system (Refer Section 2 for login details)

Step 2: On successful log-in, you will get the main menu on console terminal (Refer Section 3 for main menu details).

Step 3: Select option 3 (**Profile Settings**) from the main menu to create profile configurations

Step 4: On selection of option 3 (**Profile Settings**), you will get the submenu for profile configurations on the console terminal (Refer Section 11 for submenu details).

Step 5: Select option 1 (**Add New Profile**) from the submenu to enter add new profile section.

Step 6: On selection of option 1 (**Add New Profile**), you will get the "Profile Setup" details on the console terminal (Refer Section 11.1 for profile setup details).

Step 7: Now you can create new profile by entering the respective fields asked under the "**Profile Setup**" (Refer Section 11.1).

Note: *3 things are mandatory (**1/ profile name 2/ mode (Bridge/Route) 3/ interface name (eth0, eth1 etc)**)*

Step 8: Non Filtering option will appear on selection of option 5 (**Traffic Config Settings**) of "**Profile Setup**" menu (Refer Section 11.1_3).

Step 9: On selection of **filtering** menu following submenu will displayed (Refer Section 10.1)

Step 10: You can choose any of the **Filtering** type

Step 11: Here we are taking an example of **IP-PORT Filtering**, on selection of IP-Port Filtering following submenu will displayed (Refer Section 10.1_6)

Step 12: Now provide source/destination port and source/destination IP address along with any emulating parameter

Step 14: After configuring go back to **Profile Setup** menu. (Refer Section 11.1)

Step 15: Save the configured profile using **Save Profile** option, after all necessary fields are filled (Refer Section 11.1_4)

A

Step 16: Now you can **Apply/Load** the simulation by selection **Apply/Load Profile** option (Refer Section 11.1_5)

**Flow of the Profile creation**:

*Login to the EDS system → Profile Settings → Add New Profile → Profile Name → Mode → Port 1 Name → Port 2 Name → Traffic Config Settings →Filtering → Save →Apply/Load profile →Instant/Scheduled simulation*

## 17.2 Creating profile with Non Filtering

Follow below steps to create a new profile with non filtering option

Step 1: To log-in to the EDS system (Refer Section 2 for login details)

Step 2: On successful log-in, you will get the main menu on console terminal (Refer Section 4 for main menu details)

Step 3: Select option 3 (**Profile Settings**) from the main menu to configure profile configurations

Step 4: On selection of option 3 (**Profile Settings**), you will get the submenu for profile configurations on the console terminal (Refer Section 11 for submenu details).

Step 5: Select option 1 (**Add New Profile**) from the submenu to enter add new profile section.

Step 6: On selection of option 1 (**Add New Profile**), you will get the "Profile Setup" details on the console terminal (Refer Section 11.1 for profile setup details).

Step 7: Now you can create new profile by entering the respective fields asked under the "**Profile Setup**" (Refer Section 11.1).

Note: *3 things are mandatory (**1/ profile name 2/ mode (Bridge/Route) 3/ interface name (eth0, eth1 etc)**)*

Step 8: Non Filtering option will appear on selection of option 5 (**Traffic Config Settings**) of "**Profile Setup**" menu (Refer Section 11.1_3).

Step 9: On selection of **Non filtering** menu following submenu will displayed (Refer Section 10.2).

Step 10: It will ask for delay type. Here we are taking example of constant delay

Step 11: Now provide value of emulating parameters on any interface setting

Step 12: After configuring go back to **Profile Setup** menu. (Refer Section 11.1)

Step 13: Save the configured profile using **Save Profile** option, after all necessary fields are filled (Refer Section 11.1_4)

A

Step 14: Now you can **Apply/Load** the simulation by selection **Apply/Load Profile** option (Refer Section 11.1_5)

**Flow of the Profile creation**:

*Login to the EDS system → Profile Settings → Add New Profile → Profile Name → Mode → Port 1 Name → Port 2 Name → Traffic Config Settings →Non-Filtering → Save →Apply/Load profile →Instant/Scheduled simulation*

## 17.3 Creating profile with MPLS Packet Corruption

Follow below steps to create a new profile with non filtering option

Step 1: To log-in to the EDS system (Refer Section 2 for login details)

Step 2: On successful log-in, you will get the main menu on console terminal (Refer Section 4 for main menu details)

Step 3: Select option 3 (**Profile Settings**) from the main menu to configure profile configurations

Step 4: On selection of option 3 (**Profile Settings**), you will get the submenu for profile configurations on the console terminal (Refer Section 11 for submenu details).

Step 5: Select option 1 (**Add New Profile**) from the submenu to enter add new profile section.

Step 6: On selection of option 1 (**Add New Profile**), you will get the "Profile Setup" details on the console terminal (Refer Section 11.1 for profile setup details).

Step 7: Now you can create new profile by entering the respective fields asked under the "**Profile Setup**" (Refer Section 11.1).

Note: *3 things are mandatory (**1/ profile name 2/ mode (Bridge/Route) 3/ interface name (eth0, eth1 etc)**)*

Step 8: Non Filtering option will appear on selection of option 5 (**Traffic Config Settings**) of "**Profile Setup**" menu (Refer Section 11.1_3).

Step 9: On selection of **Non filtering** menu following submenu will displayed (Refer Section 10.2).

Step 10: It will ask for delay type. Here we are taking example of constant delay

Step 11: Go back to Interface emulation parameters settings (Refer Section 8).

Step 12: Select option 5 from the menu for packet corruption. Once selected you will get the packet corruption sub menu (Refer Section 8.6)

A

Step 13: Select option 5 from the submenu for MPLS packet corruption. Once selected you will get 2 options as "Single packet corruption" and "Multiple packet corruption". You can select as per the need. Once value entered, you need to exit from the menus.

Step 14: After configuring go back to **Profile Setup** menu. (Refer Section 11.1)

Step 15: Save the configured profile using **Save Profile** option, after all necessary fields are filled (Refer Section 11.1_4)

Step 16: Now you can **Apply/Load** the simulation by selection **Apply/Load Profile** option (Refer Section 11.1_5)

## 17.4 Creating profile with VLAN Packet Corruption

Follow below steps to create a new profile with non filtering option

Step 1: To log-in to the EDS system (Refer Section 2 for login details)

Step 2: On successful log-in, you will get the main menu on console terminal (Refer Section 4 for main menu details)

Step 3: Select option 3 (**Profile Settings**) from the main menu to configure profile configurations

Step 4: On selection of option 3 (**Profile Settings**), you will get the submenu for profile configurations on the console terminal (Refer Section 11 for submenu details).

Step 5: Select option 1 (**Add New Profile**) from the submenu to enter add new profile section.

Step 6: On selection of option 1 (**Add New Profile**), you will get the "Profile Setup" details on the console terminal (Refer Section 11.1 for profile setup details).

Step 7: Now you can create new profile by entering the respective fields asked under the "**Profile Setup**" (Refer Section 11.1).

Note: *3 things are mandatory (**1/ profile name 2/ mode (Bridge/Route) 3/ interface name (eth0, eth1 etc)**)*

Step 8: Non Filtering option will appear on selection of option 5 (**Traffic Config Settings**) of "**Profile Setup**" menu (Refer Section 11.1_3).

Step 9: On selection of **Non filtering** menu following submenu will displayed (Refer Section 10.2).

Step 10: It will ask for delay type. Here we are taking example of constant delay

Step 11: Go back to Interface emulation parameters settings (Refer Section 8).

Step 12: Select option 5 from the menu for packet corruption. Once selected you will get the packet corruption sub menu (Refer Section 8.6)

A

Step 13: Select option 4 from the submenu for VLAN packet corruption. Once selected you will get 2 options as "Single packet corruption" and "Multiple packet corruption". You can select as per the need. Once value entered, you need to exit from the menus.

Step 14: After configuring go back to **Profile Setup** menu. (Refer Section 11.1)

Step 15: Save the configured profile using **Save Profile** option, after all necessary fields are filled (Refer Section 11.1_4)

Step 16: Now you can **Apply/Load** the simulation by selection **Apply/Load Profile** option (Refer Section 11.1_5)

## 17.5 Creating profile with scheduling simulation

On successful creation of new profile (Refer above section for profile creation), save the profile and run the simulation. While running the scheduled simulation it will ask for time (Refer Section 12.2). You need to specify manually or can enter duration in minute's ex-40mins, so simulation will run that duration starting from start time

Then at that, particular date and time profile will run the simulation. For seeing, the statuses of the scheduled profile go to the **Profile setup menu** and select **Display scheduled profile** submenu (Refer Section 12.3)

If you want to remove that profile from scheduler list, go to **profile setting** menu and select **Remove profile from scheduler** (Refer Section 12.4)

Note: *Start date, start time, end date can be entered manually or user can also be used* ***enter key*** *for current date and current time*

**Flow of the Profile creation**:

*Login to the EDS system → Profile Settings → Add New Profile → Profile Name → Mode → Port 1 Name → Port 2 Name → Traffic Config Settings →Filtering → Save →Apply/Load profile →Scheduled simulation →Start Date → Start Time →End Date →End Time*

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# 18 Support and Guidelines

If you change the password to the EDS-10G, write it down for your records.
If you cannot locate your new password, you will not be able to login to the EDS-10G.

The EDS-10G has experiments configured for all ports.
Only two such experiments can be executed at a time.

We could observe a slight drop in performance when more than two experiments are running concurrently.

This is because each experiment binds to a specific core, while it is running.

**For support:**
Richard Barger
Email: rbarger@ecdata.com
Tel: 321.637.9922 Ext: 1 Sales or Ext: 2 Chris Starr

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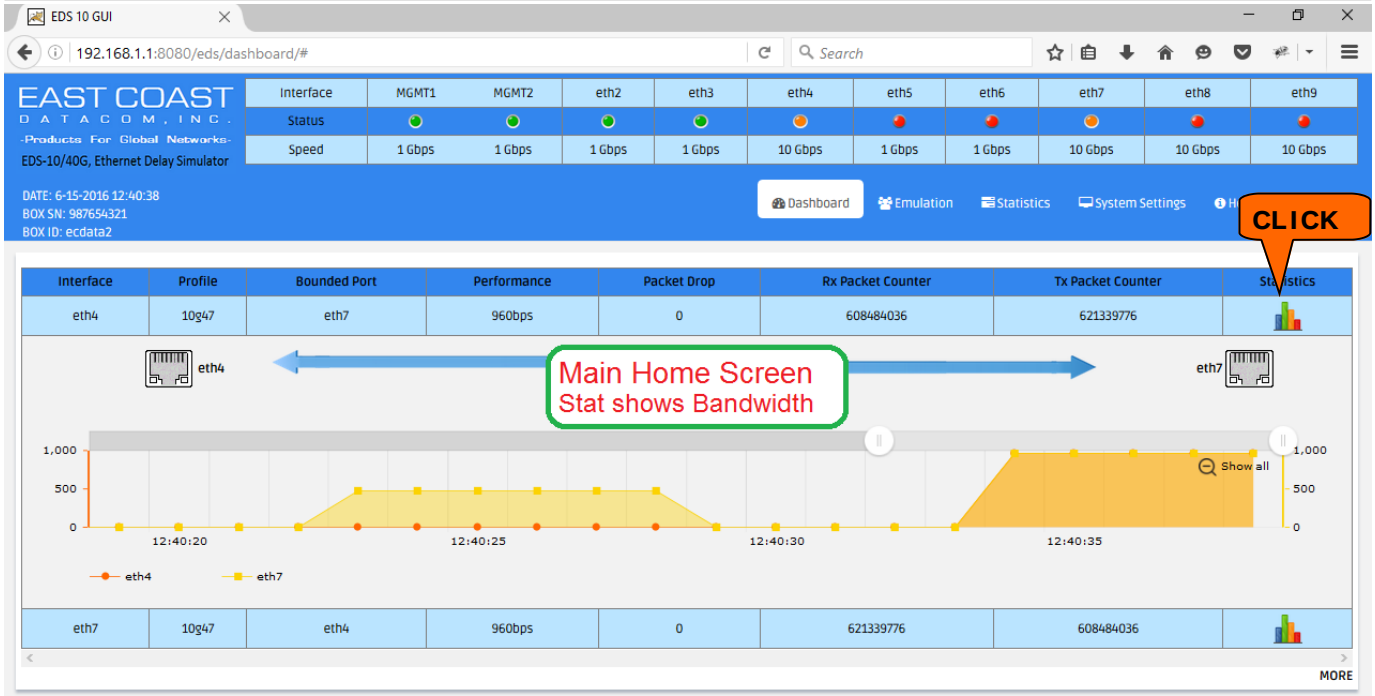
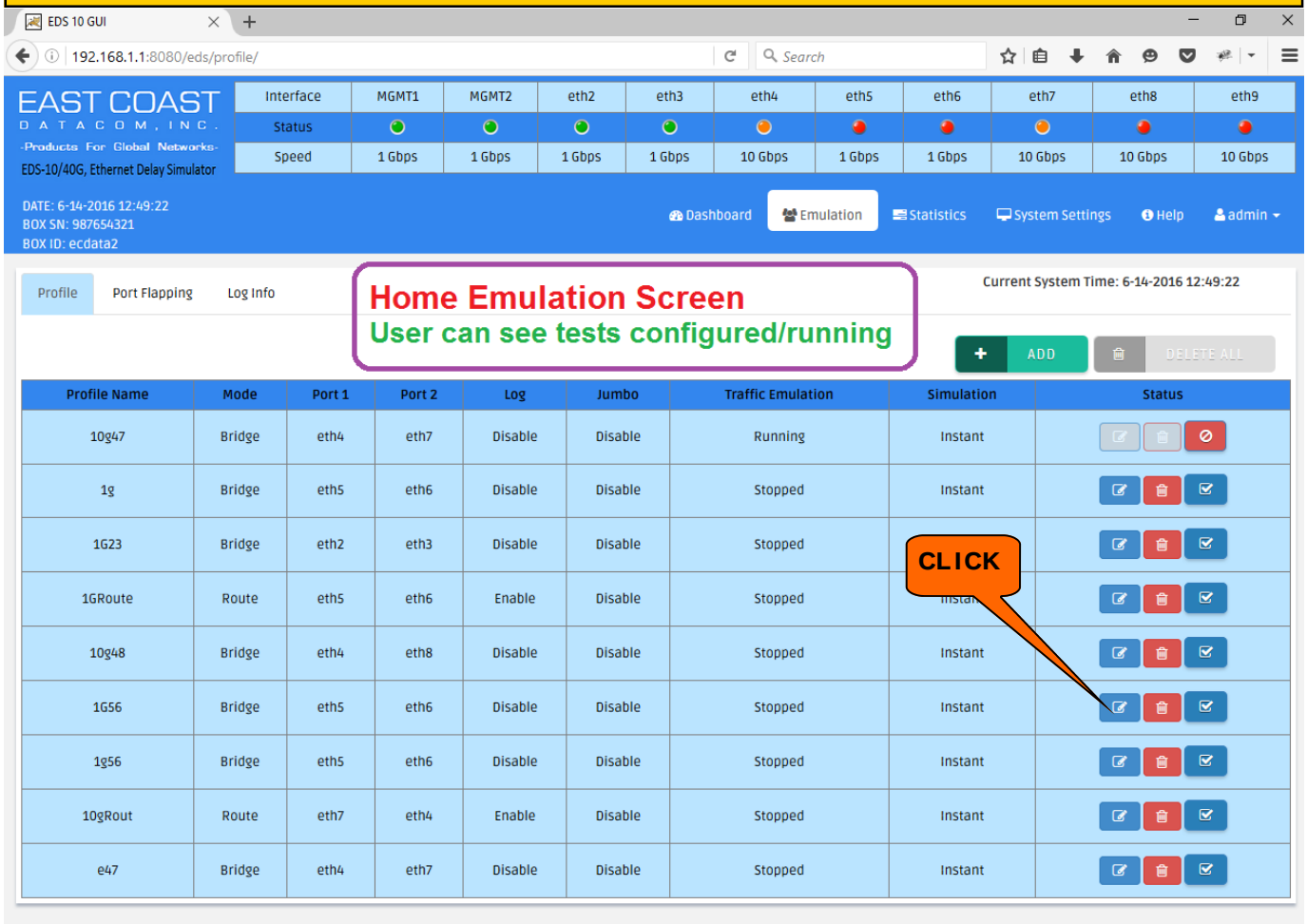
# Overview of the EDS-10G, WAN Delay Emulator User Interface

The **Dashboard Tab** is the main landing screen. The user can easily see the status of the LAN ETH Interfaces and system assigned port numbers in the top of the GUI interface. The user can view the active running profiles and active bandwidth as well.

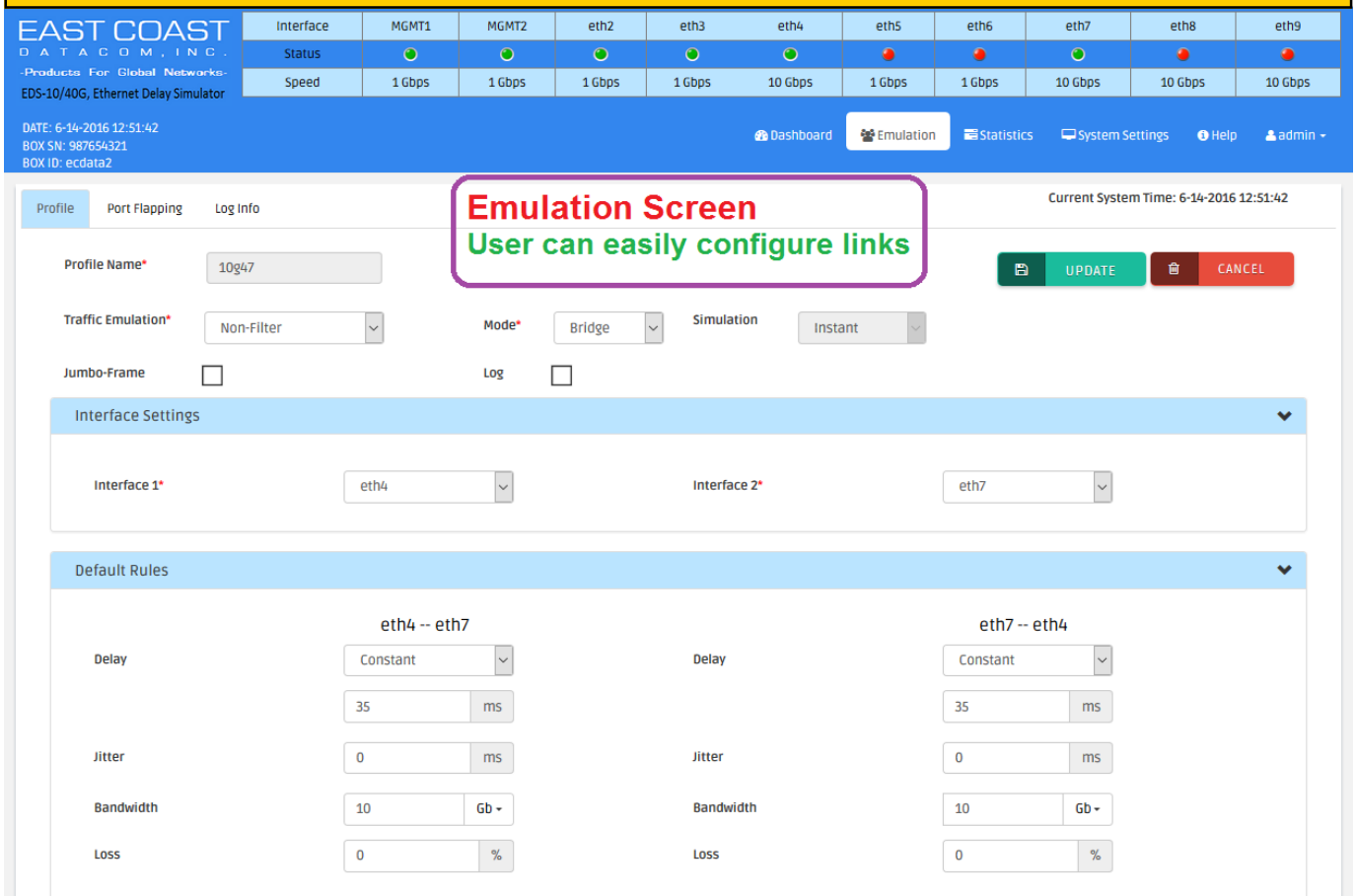


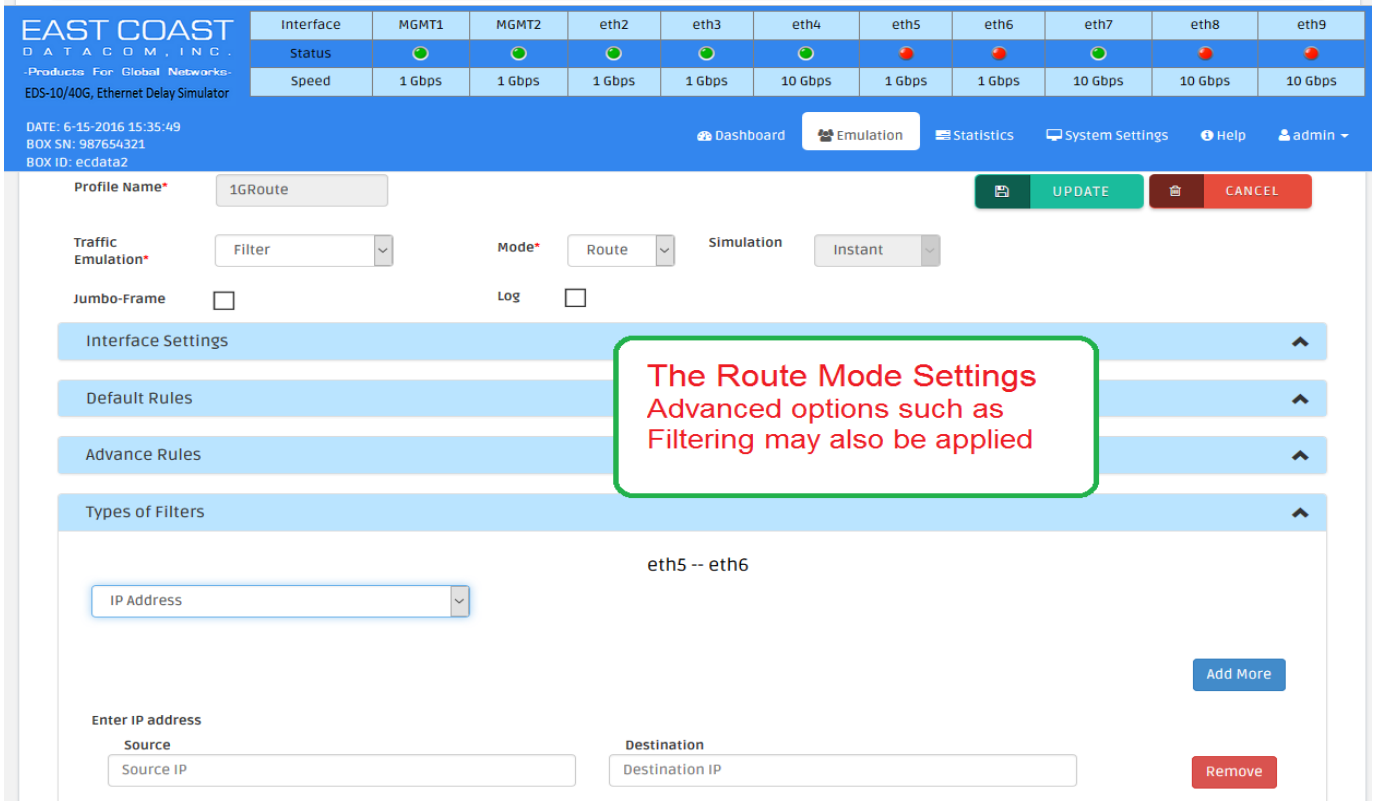

The **Emulation Screen** shows all user created profiles. The user simply clicks as shown below to edit the profile.



# Overview of the EDS-10G, WAN Delay Emulator User Interface

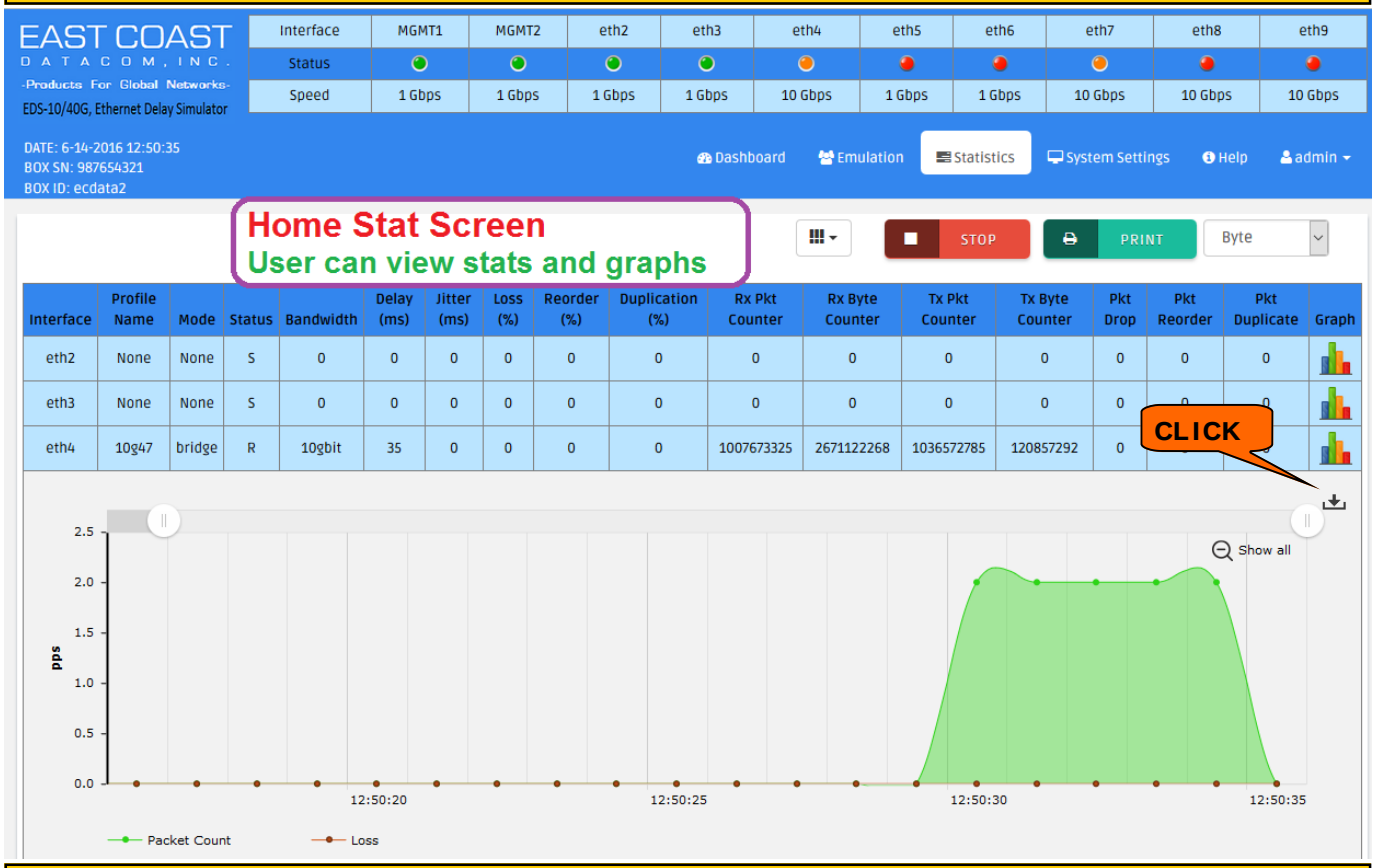
The **Emulation Profile Tab** allows the user to create and edit emulations for experiments. The user can select any of the ETH port interfaces to be bound together. This tab allows all settings for emulation such as Bridge or Route Mode, Band Width, Delay, Loss and other advanced rules such as Packet Re-Ordering, Duplication & Corruption. All settings are on a per port basis if desired. The Route Mode also offers further advanced filtering techniques based upon MAC, IP Address, Port Number, Protocol and several other user defined settings. Custom filters may also be purchased from East Coast Datacom, Inc.



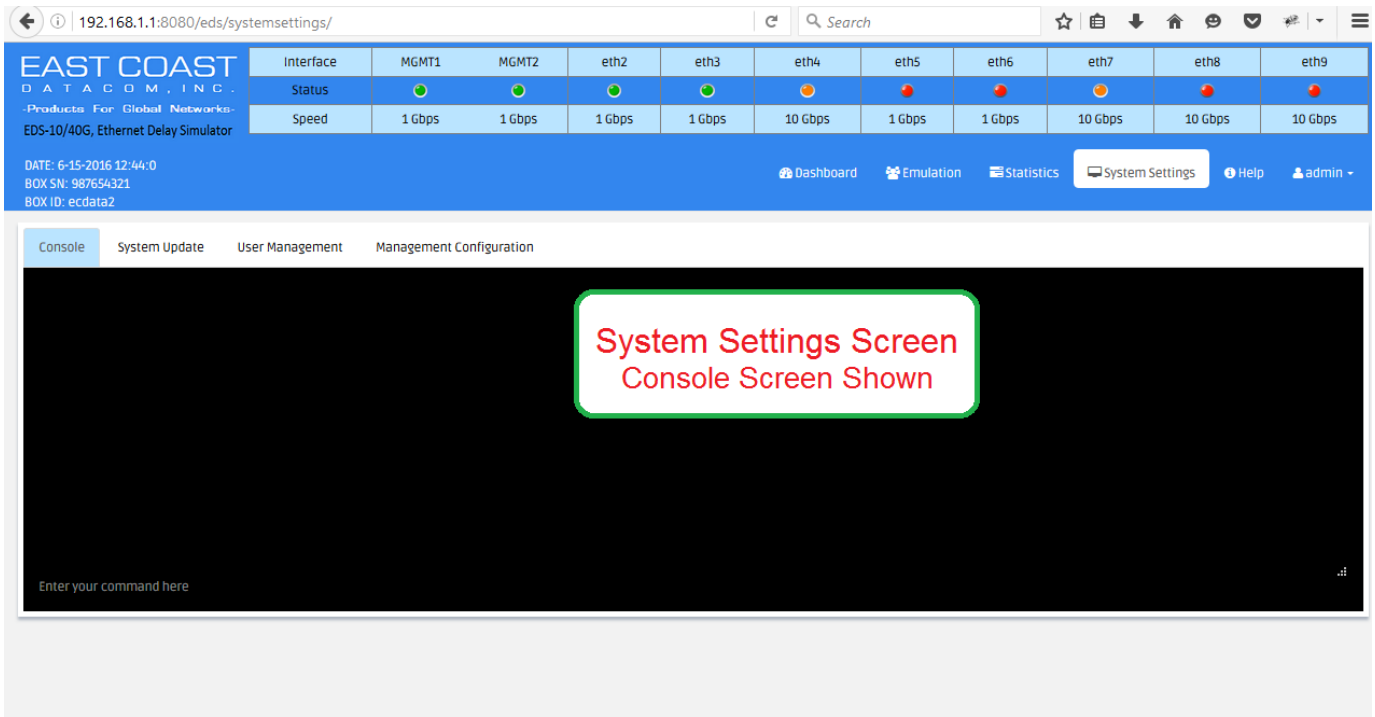



# Overview of the EDS-10G, WAN Delay Emulator User Interface

The **Statistics Tab** allows the user an intuitive view of the EDS-10G WAN Emulation stats. The screen displays the defined settings for the user profile. As well an easy to follow Packet Counter for TX, RX, Drops, Re-Order and Duplicate. If the user clicks on the graph symbol, a real time graph will display packets in Packets Per Second(PPS) and a Loss Graph will also appear if the user experiences any Packet Loss.

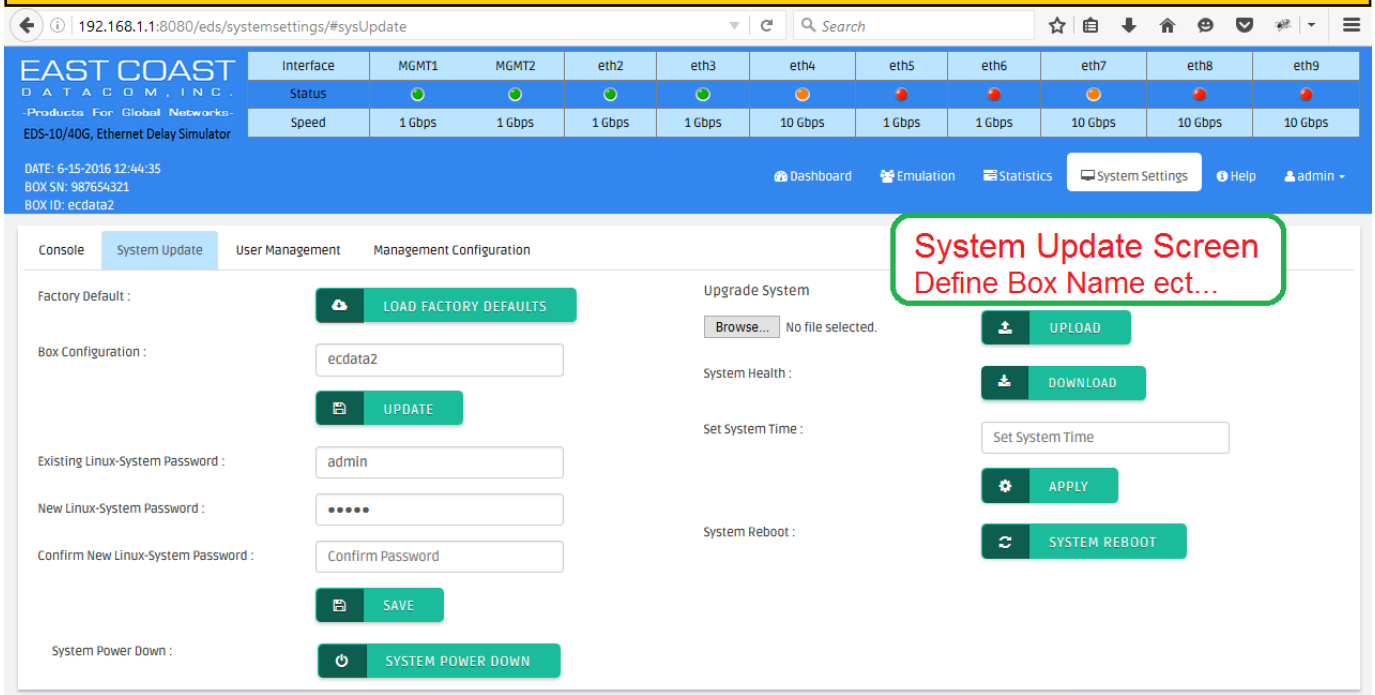



The **System Settings Tab** allows the user access to the Console Port, System Update, User Management and Management Configuration.

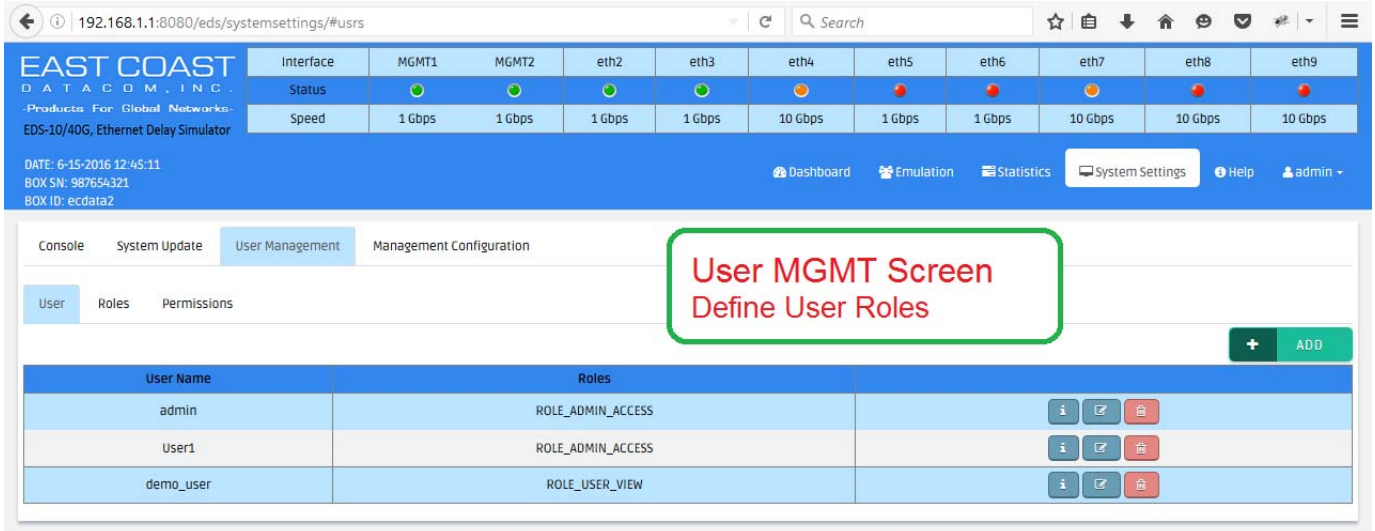


# Overview of the EDS-10G, WAN Delay Emulator User Interface

The **System Settings Tab** allows the user set the EDS-10G for a user defined box name or test lab location. Other important options are also presented to the user.




The **User Management Tab** allows the ADMIN to set-up individual users access levels for the EDS-10G. Only the ADMIN has access to individual users authority to testing.




The **Edit MGMT Port Tab** allows the ADMIN to set-up MGMT 2 access port for any user defined address and be retained after power boot. MGMT 1 always reverts to 192.168.1.1 after any power boot. This will guarantee access to the EDS-10G.

# Overview of the EDS-10G, WAN Delay Emulator User Interface

The EDS-10G also has a full **Command Line Interface (CLI)** that supports all features of the box. The CLI is accessed via SSH on the IP Port.

192.168.1.1 - PuTTY

```
*****************************************
East Coast Datacom, Inc.
Model: EDS-10/40G, Ethernet Delay Simulator
Software Version: v0.5.0
*****************************************
Customer Box ID: ecdata2
Serial Number: 987654321
*****************************************

       TOP LEVEL SYSTEM MENU

  1   :   Scan Ethernet Interface

  2   :   Display Profile Statistics

  3   :   Profile Settings

  4   :   System Settings

  5   :   Help

  6   :   Exit

Enter Choice:
```

Full Command Line Interface (CLI) is also Included in EDS-10G for SSH Access

The **CLI** allows is easy to use and very responsive. The screen below shows a scan of the ETH ports in the EDS-10G. This includes MGMT 1 and MGMT 2 as well as all ETH ports installed in the box. The ETH ports support specific INTEL NIC cards and the NIC cards are loaded at the factory with specific drivers that are optimized with special user space drivers. All of these have been carefully tuned for optimum performance. The result is Line Rate Performance with superb delay accuracy that rivals FPGA based systems for half the cost.

192.168.1.1 - PuTTY

```
EDS 1/10-G Version: v0.5.0

********************************************* System Ethernet Interface Information *********************************************

INTERFACE       LINK STATUS            IP             MAC             FW-VERSION                      SPEED

*****************************************************************************************************************************
eth0(MGMT1)     LINK UP            192.168.1.1    0c:c4:7a:c7:cf:b8    2.1-2                           10baseT/Half 10baseT/Full
                                                                                                         100baseT/Half 100baseT/Full
                                                                                                         1000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth1(MGMT2)     LINK UP            192.168.1.9    0c:c4:7a:c7:cf:b9    2.1-2                           10baseT/Half 10baseT/Full
                                                                                                         100baseT/Half 100baseT/Full
                                                                                                         1000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth2            LINK UP                0.0.0.0    a0:36:9f:87:79:25    1.63, 0x80000cbc                10baseT/Half 10baseT/Full
                                                                                                         100baseT/Half 100baseT/Full
                                                                                                         1000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth3            LINK UP                0.0.0.0    a0:36:9f:87:79:24    1.63, 0x80000cbc                10baseT/Half 10baseT/Full
                                                                                                         100baseT/Half 100baseT/Full
                                                                                                         1000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth4            LINK UP                0.0.0.0                                                          1000baseT/Full
                                                                                                         10000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth5            LINK DOWN              0.0.0.0                                                          10baseT/Half 10baseT/Full
                                                                                                         100baseT/Half 100baseT/Full
                                                                                                         1000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth6            LINK DOWN              0.0.0.0    a0:36:9f:87:79:26    1.63, 0x80000cbc                10baseT/Half 10baseT/Full
                                                                                                         100baseT/Half 100baseT/Full
                                                                                                         1000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth7            LINK UP                0.0.0.0    3c:fd:fe:9d:b2:8d    4.42 0x80001920 0.0.0           1000baseT/Full
                                                                                                         10000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth8            LINK DOWN              0.0.0.0    3c:fd:fe:9d:b2:94    4.42 0x80001920 0.0.0           1000baseT/Full
                                                                                                         10000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
eth9            LINK DOWN              0.0.0.0    3c:fd:fe:9d:b2:95    4.42 0x80001920 0.0.0           1000baseT/Full
                                                                                                         10000baseT/Full
-----------------------------------------------------------------------------------------------------------------------------------
Press q and Hit Enter to go back to Main Menu
```

CLI Interface of ETH Ports
Easily Identify ETH Settings

The **Display Ethernet Interface Statistics** page displays the current state of running or stopped created profiles.

192.168.1.1 - PuTTY

```
EDS 1/10-G Version: v0.5.0

****************************************** Displaying Ethernet Interface Statistics ******************************************

            PROFILE
LAN   R/S  NAME  Mode    B/W     Delay(ms) Loss Reorder  Duplicate   RxPctr     RxBctr    TxPctr     TxBctr    PktL  PktR   PktD
-------------------------------------------------------------------------------------------------------------------------------------

 eth2 S   NONE   NONE     NONE   0          0%    0%      0%             0          0          0          0       0     0     0

 eth3 S   NONE   NONE     NONE   0          0%    0%      0%             0          0          0          0       0     0     0

 eth4 R  10g47 bridge   10gbit  35          0%    0%      0%     539660034  857859000  546935004 1294357200       0     0     0

 eth5 S   NONE   NONE     NONE   0          0%    0%      0%             0          0          0          0       0     0     0

 eth6 S   NONE   NONE     NONE   0          0%    0%      0%             0          0          0          0       0     0     0

 eth7 R  10g47 bridge   10gbit  35          0%    0%      0%     546935004 1294357200  539660034  857859000       0     0     0

 eth8 S   NONE   NONE     NONE   0          0%    0%      0%             0          0          0          0       0     0     0

 eth9 S   NONE   NONE     NONE   0          0%    0%      0%             0          0          0          0       0     0     0

 R-Running   S-Stopped


Press q and Hit Enter to go back to Main Menu
```

CLI Interface for ETH Stats
An intuative overview for users

**In Closing:**

The EDS-10G offers many features only found is very high end systems. The unit offers a secure SSH CLI interface and an easy to use GUI interface, each accessible from MGMT-1 or MGMT-2 Ethernet Ports.

**The EDS-10G supports Interfaces of:**

10/100/1000 in copper or Fiber,

10GbE with SFP+ for Fiber or Twin Axial Copper

40GbE with QSFP+ for Fiber, Twin Axial Copper or 1-4 Breakout Cables for 4-Ports 10G

*** All sales include 3-Years Warranty, Support and Maintenance Upgrades ***

**Please review our data sheet or user manual for further details located at:**

https://www.ecdata.com/network-latency-simulators.html

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