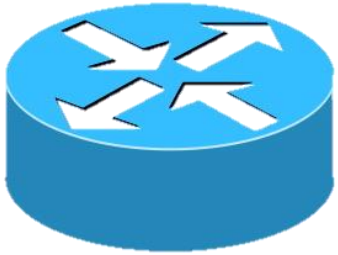


Department of Electronics Engineering, NTU

Network Traffic Generator

Speaker: Yi-Ta Chen

Advisor: Tsung-Nan Lin

Date: 20180507

Outline

- Ostinato
  - 安裝
  - 使用教學
- Lab 3-1: Ostinato simple test
- Lab 3-2: Multiple interface

Ostinato

- Open Source
- 跨平台- Windows, Linux, BSD, and Mac OS X
  - Friendly GUI
  - Python API for network test automation
- Network traffic generator & analyzer
  - 擷取網路封包
  - 製作和修改pcap檔
- 支援標準協定
  - Ethernet/802.3/LLC SNAP
  - VLAN
  - ARP, ICMP, IPv4, IPv6
  - TCP, UDP, ICMPv4, ICMPv6, IGMP

Ostinato安裝

- 官方網站:http://ostinato.org/

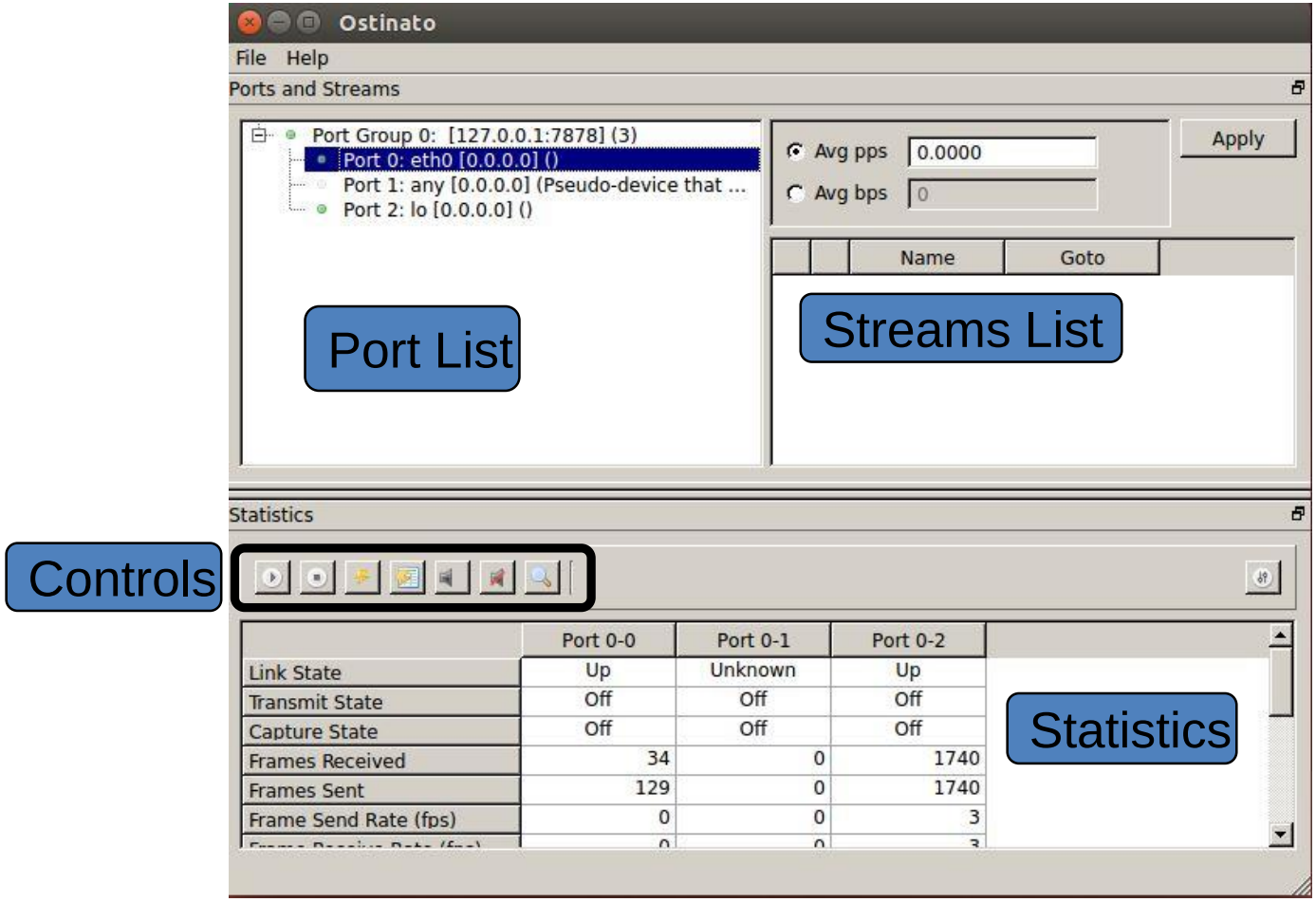
- Ubuntu作業系統
  - 使用指令安裝: sudo apt-get install ostinato

Ostinato使用教學

- 官方網站教學
  - User Guide
  - Developer Guide
- sudo apt-get install ostinato

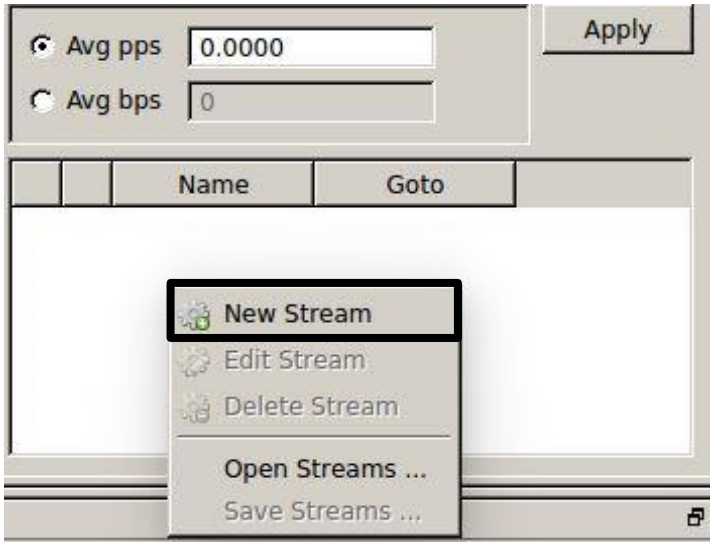
Ostinato使用教學

- 開啟終端機，輸入指令: sudo ostinato

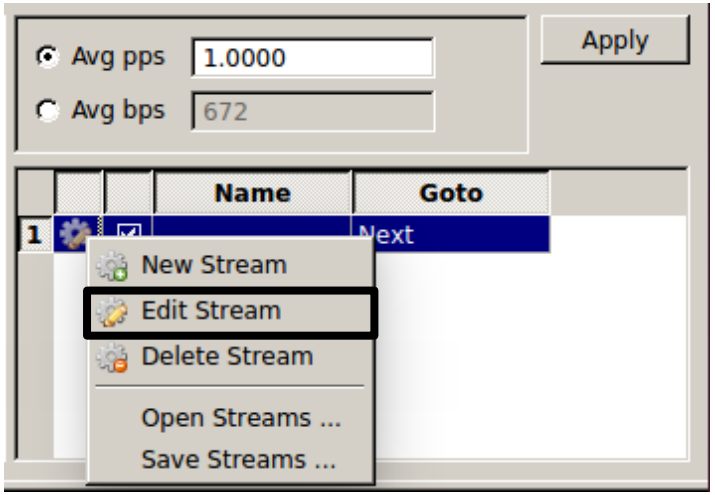


Ostinato使用教學

- 新增一個Stream
  - 空白處點選右鍵
  - 選擇New Stream

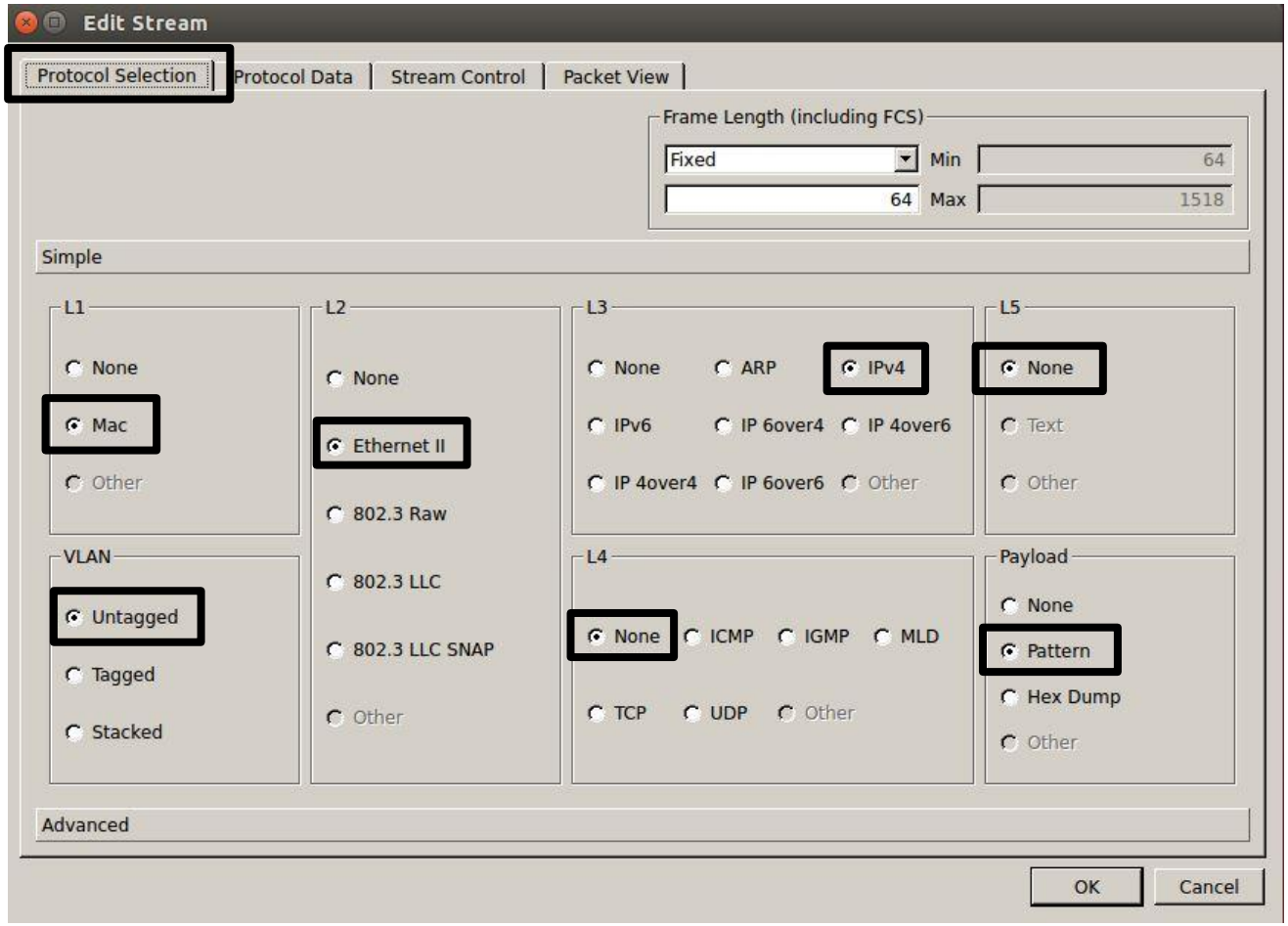


- 編輯Stream
  - 在新增的Stream點選右鍵
  - 選擇Edit Stream



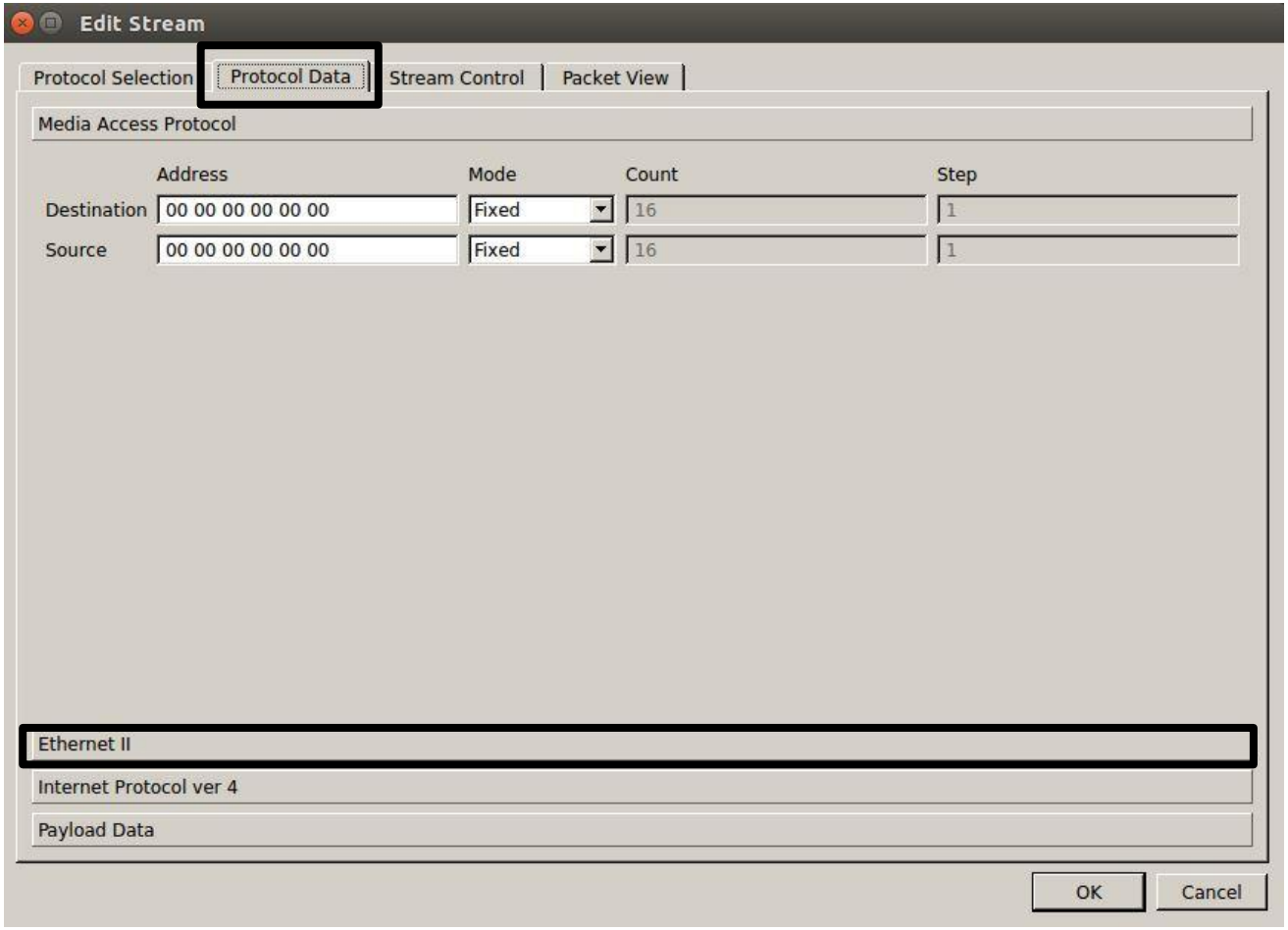
Ostinato使用教學

- 設定封包



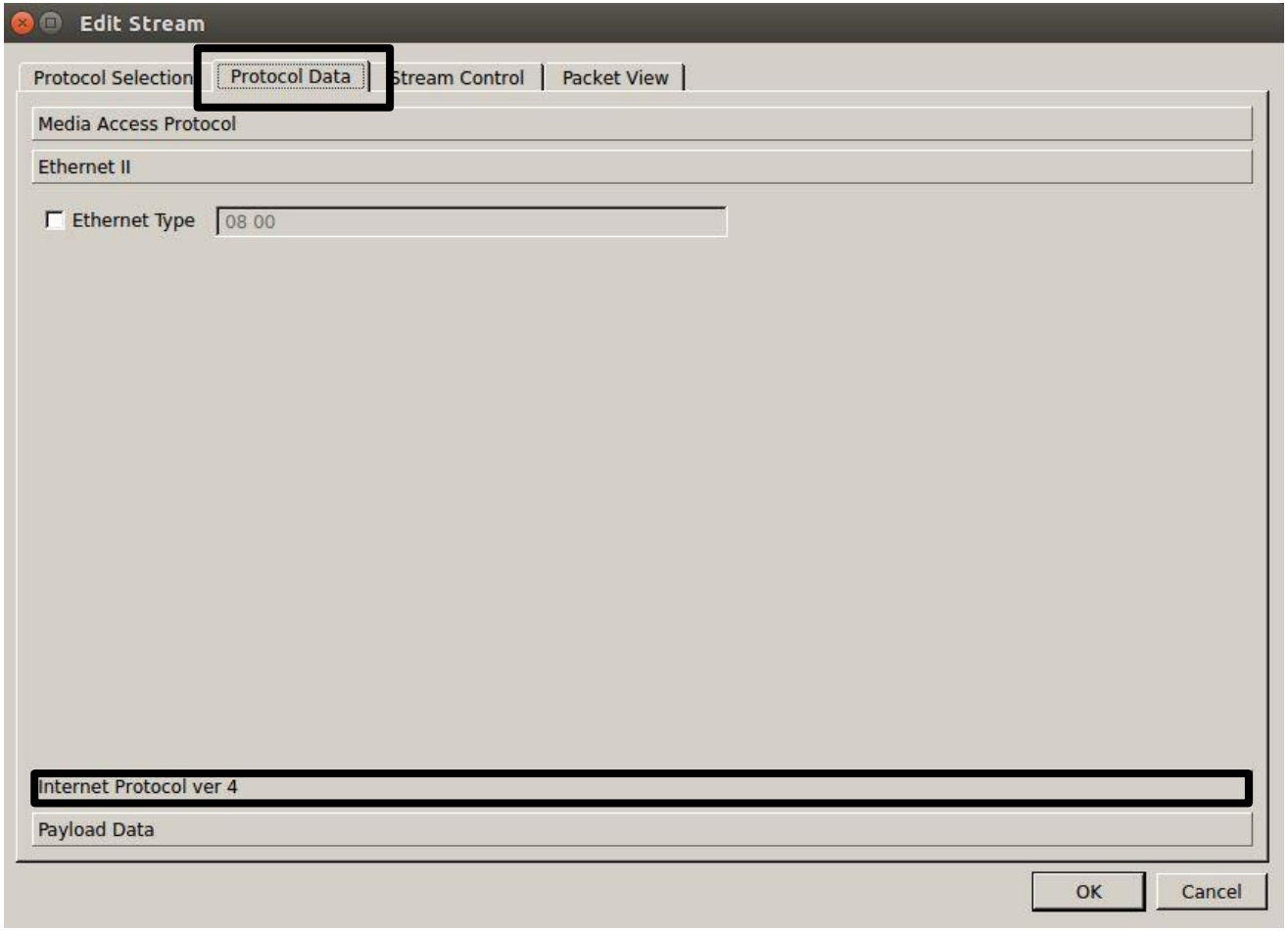
Ostinato使用教學

- 輸入協定資訊



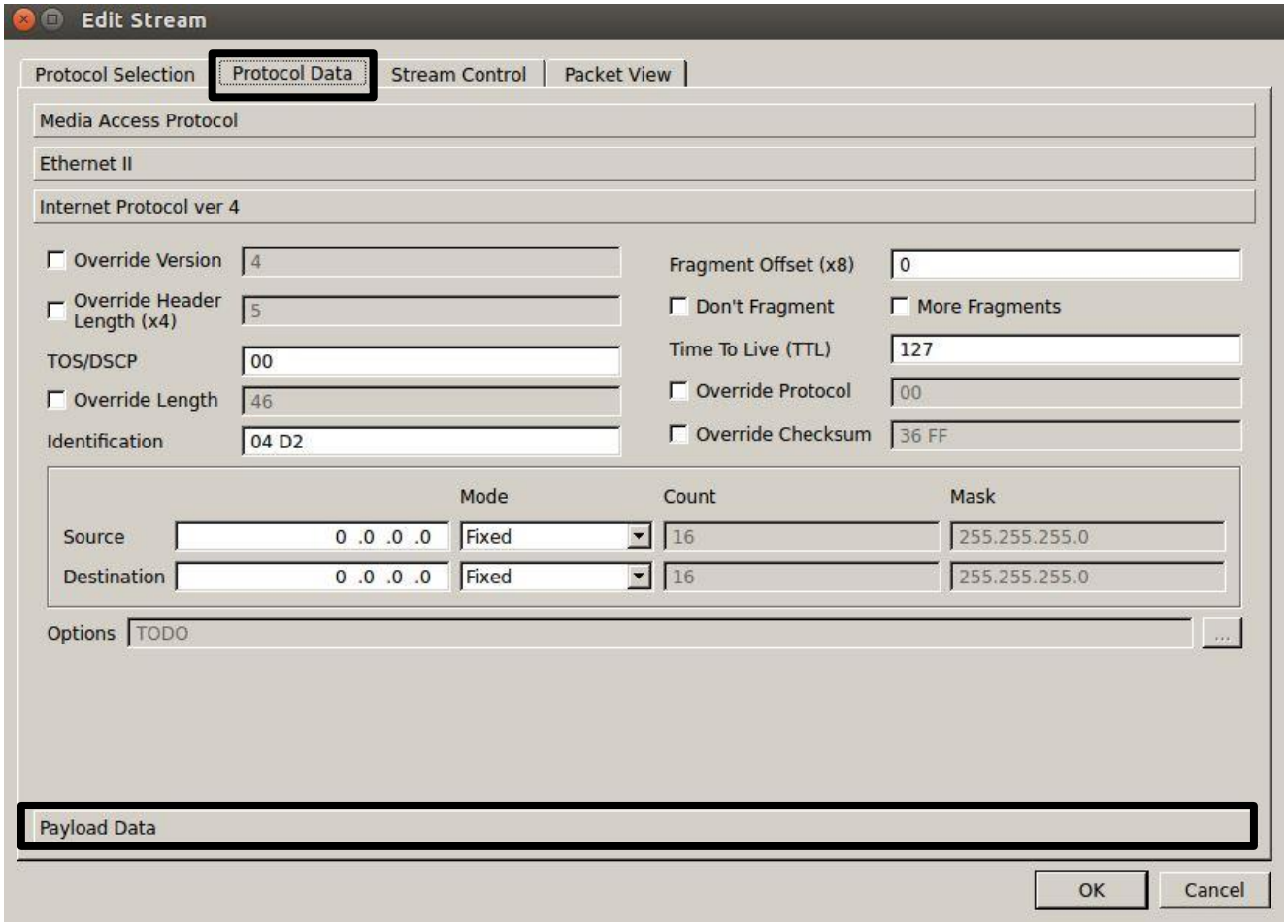
Ostinato使用教學

- 輸入協定資訊



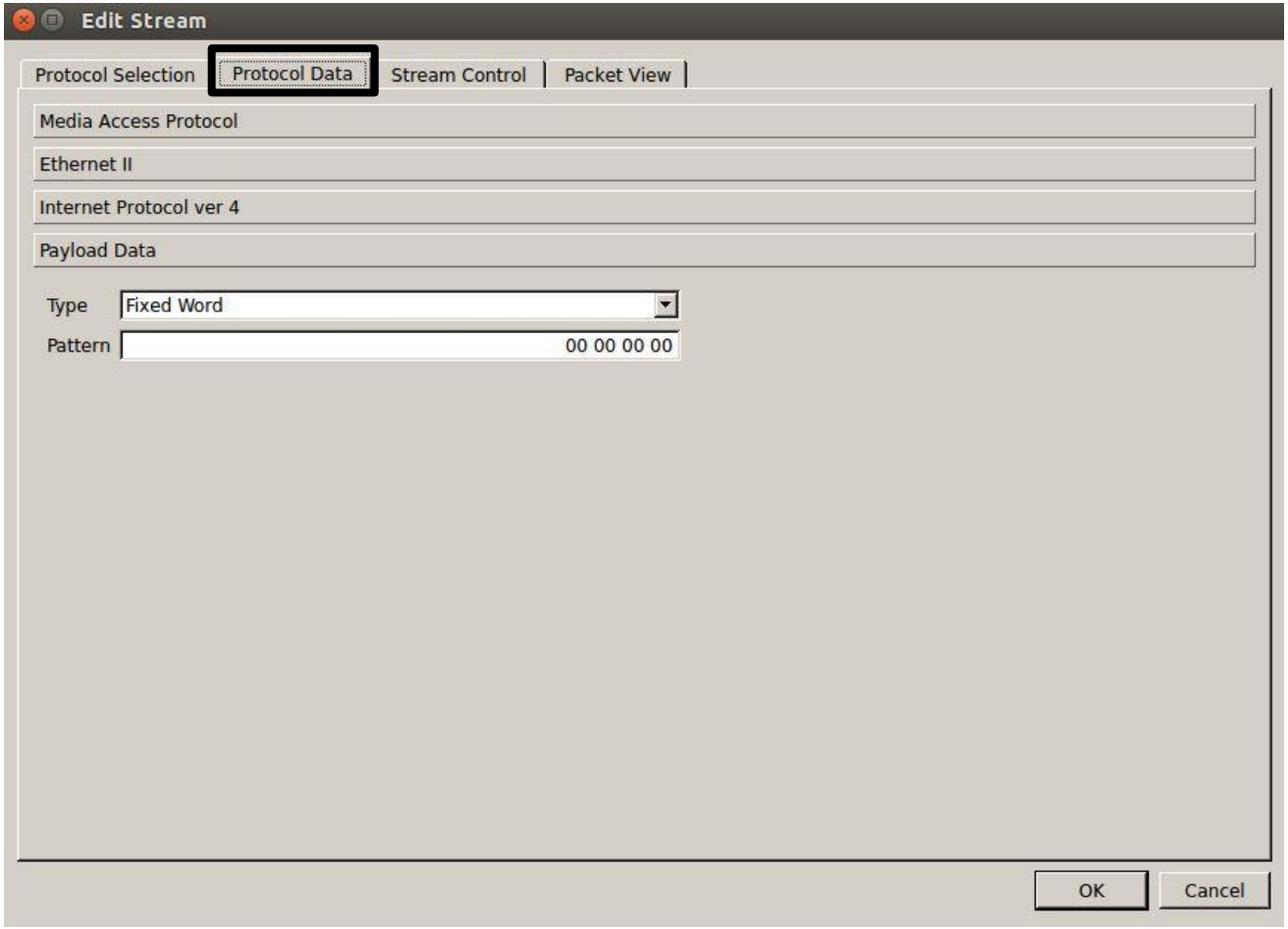
Ostinato使用教學

- 輸入協定資訊



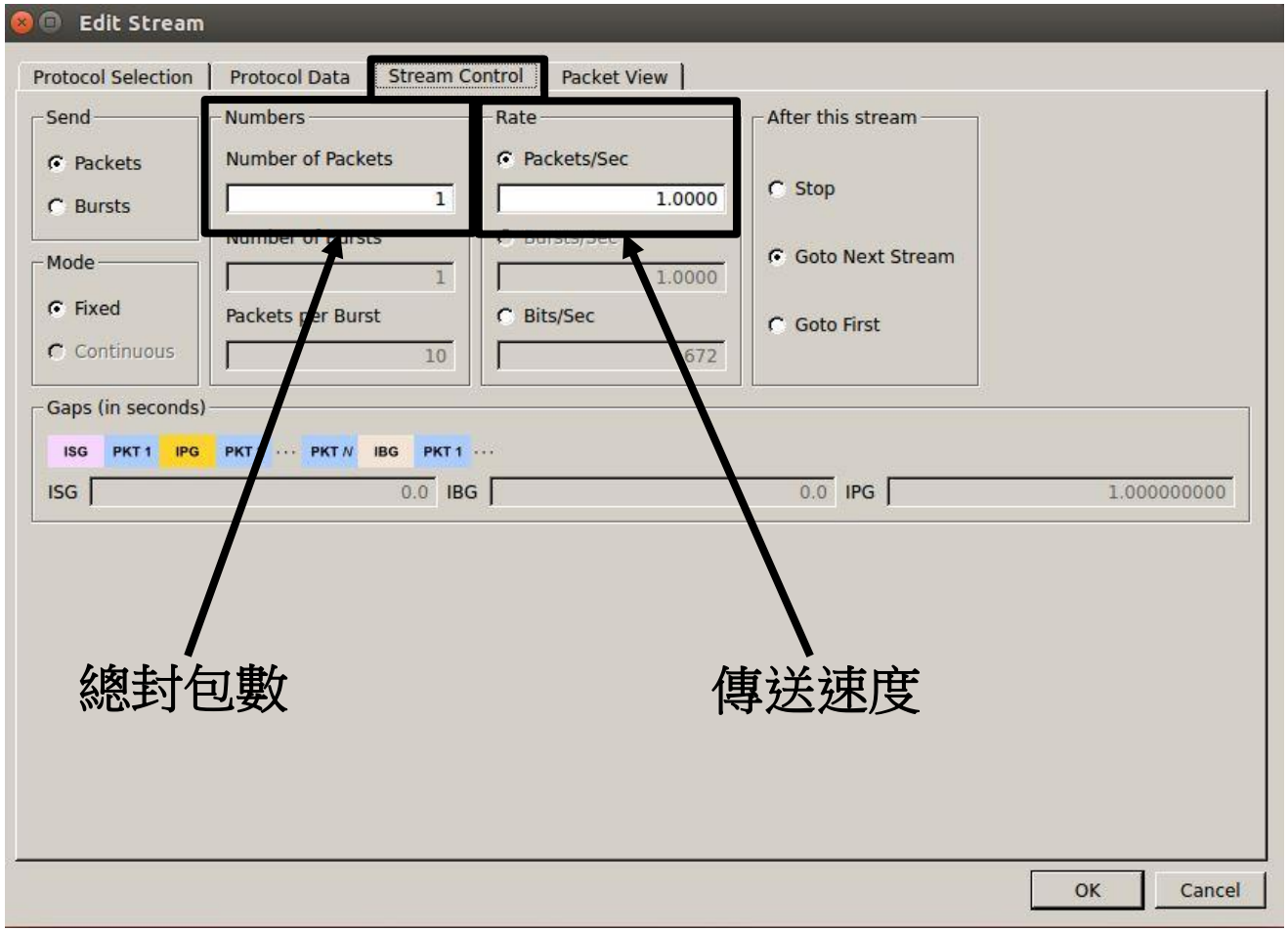
Ostinato使用教學

- 輸入協定資訊



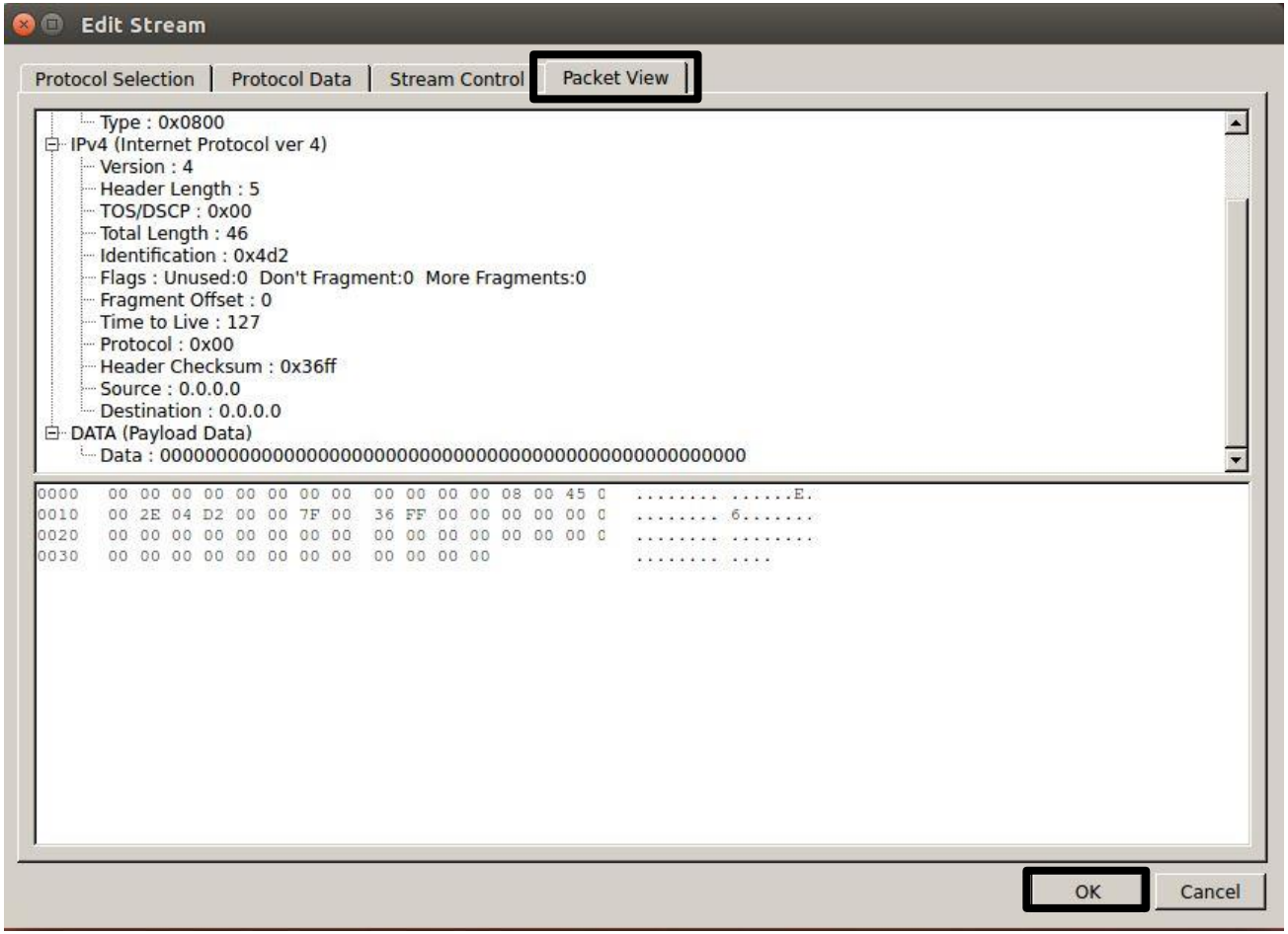
Ostinato使用教學

- 設定封包個數



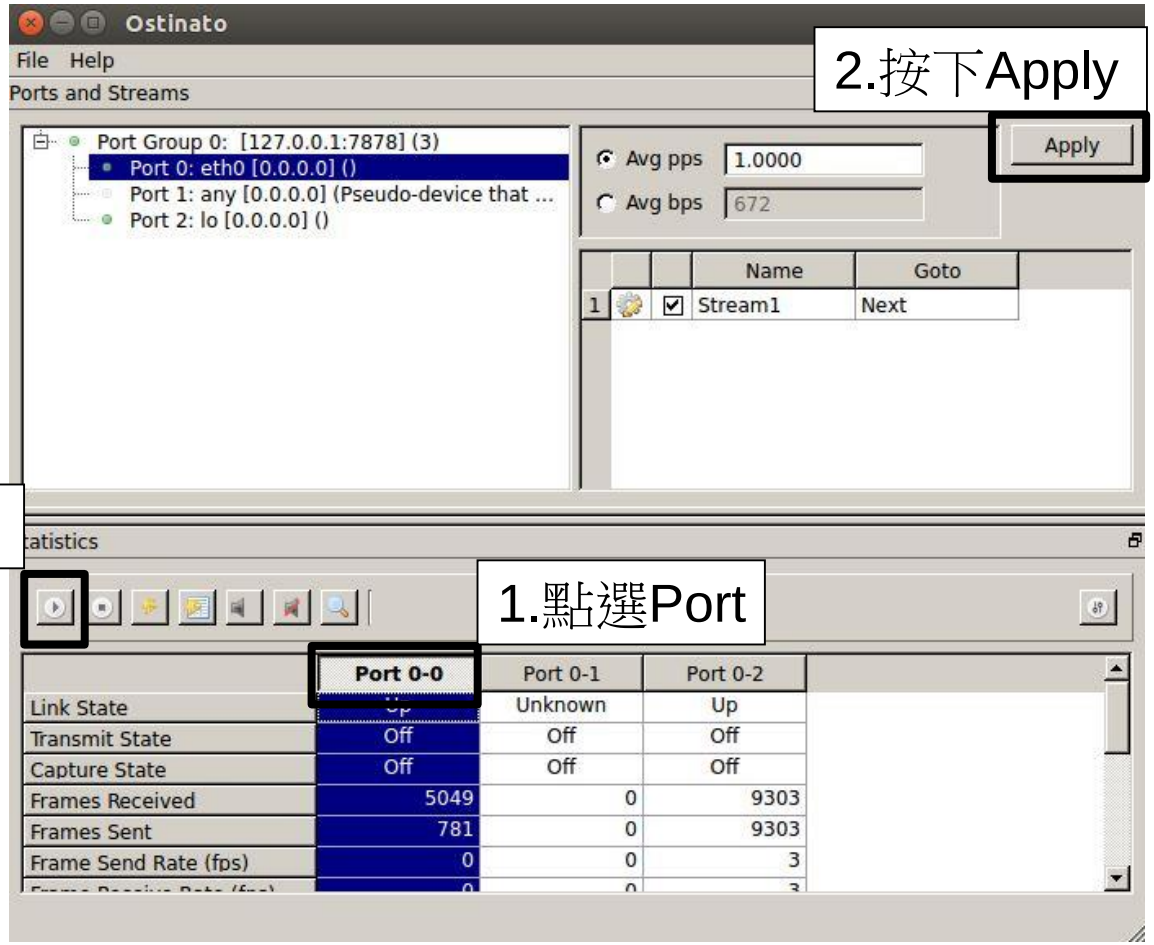
Ostinato使用教學

- 封包內容



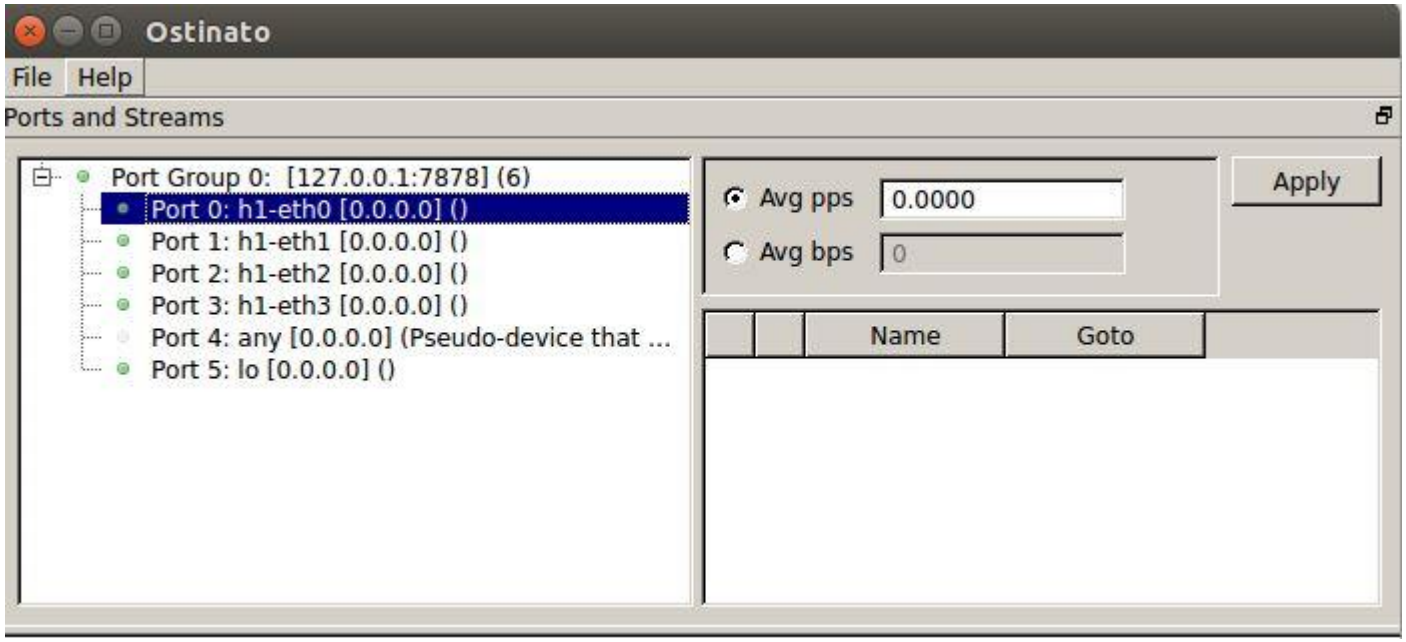
Ostinato使用教學

- 發送封包



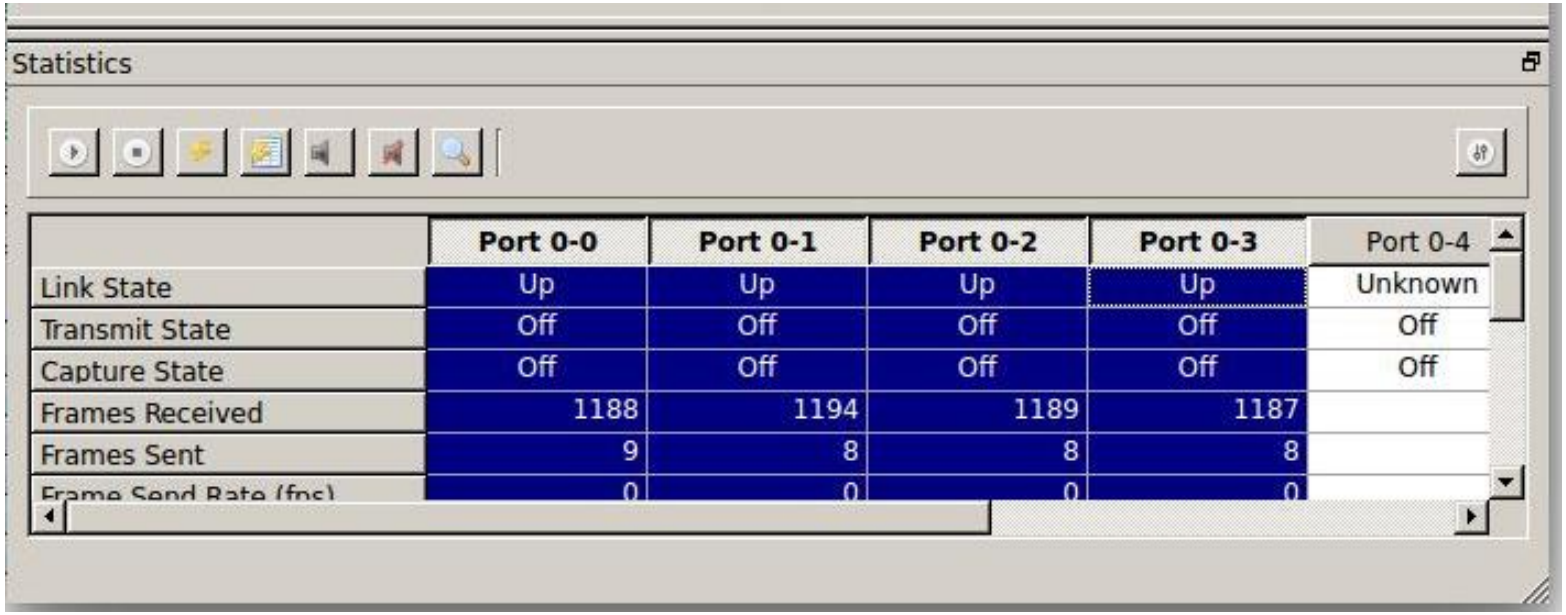
Ostinato使用教學

- 同時多個介面發送封包
  - 每一個port都必須匯入一個pcap檔案



Ostinato使用教學

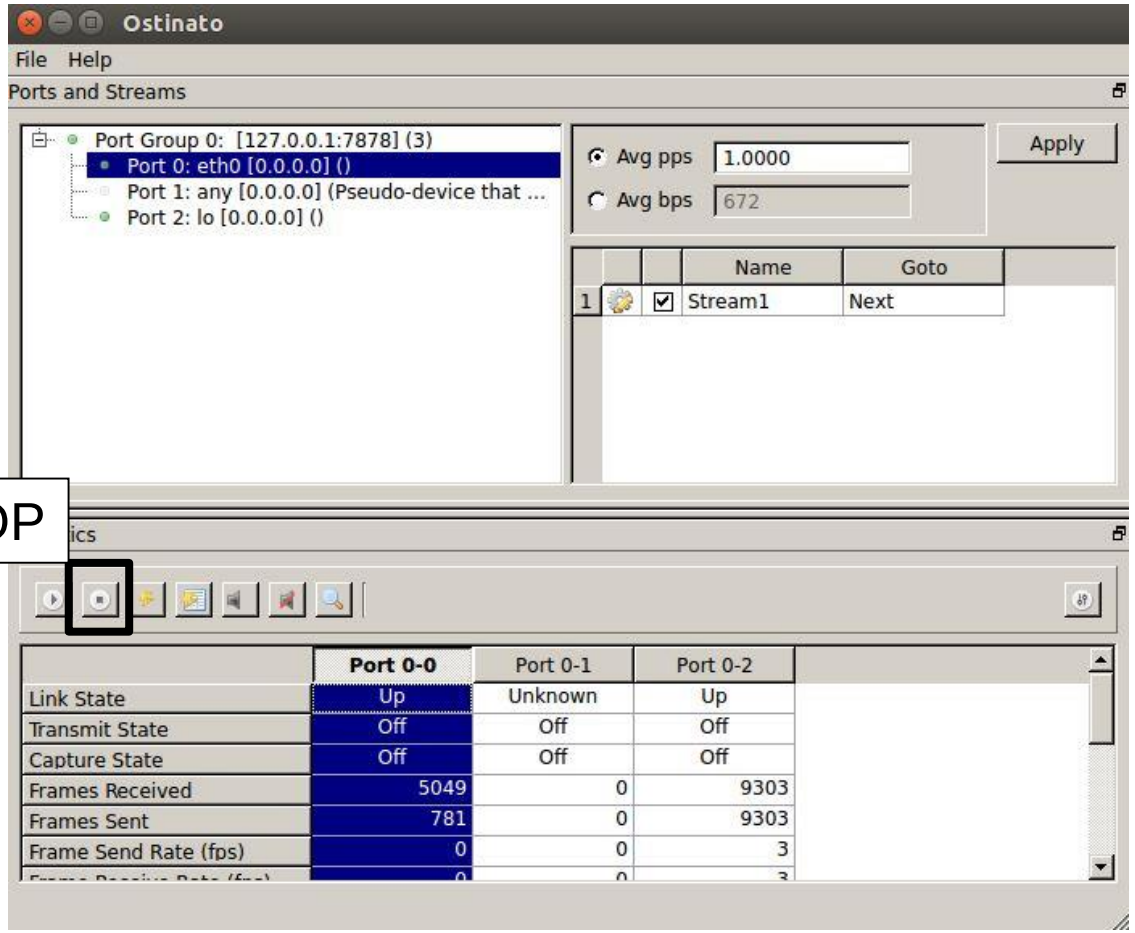
- 同時多個介面發送封包
  1. 在Statistics列按住Ctrl並選擇需要發送的Port
  2. 按下Apply
  3. 按下Transmit button



Ostinato使用教學

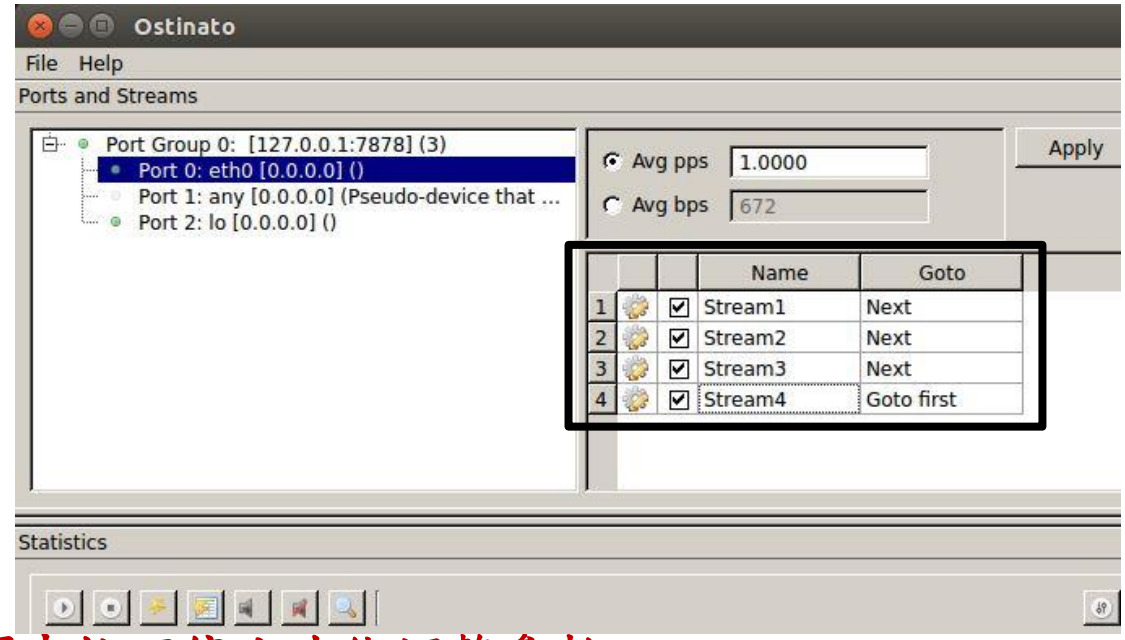
- 停止發送

4. 停止按下STOP



Ostinato使用教學

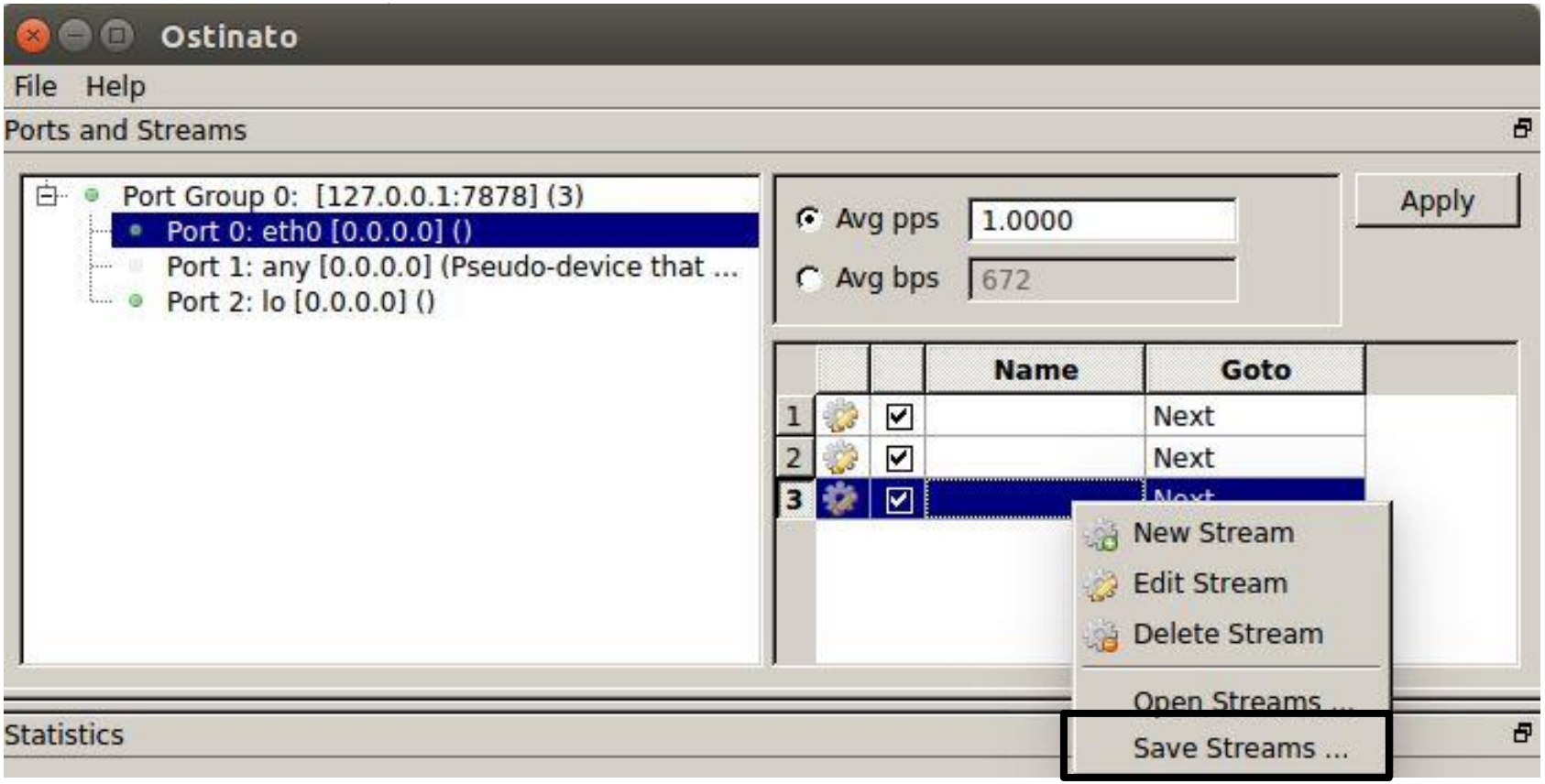
- 多個Stream



- **注意: 發送封包時，必須先按下停止才能調整參數**
- 對Stream調整參數後，再按下Apply後方能生效

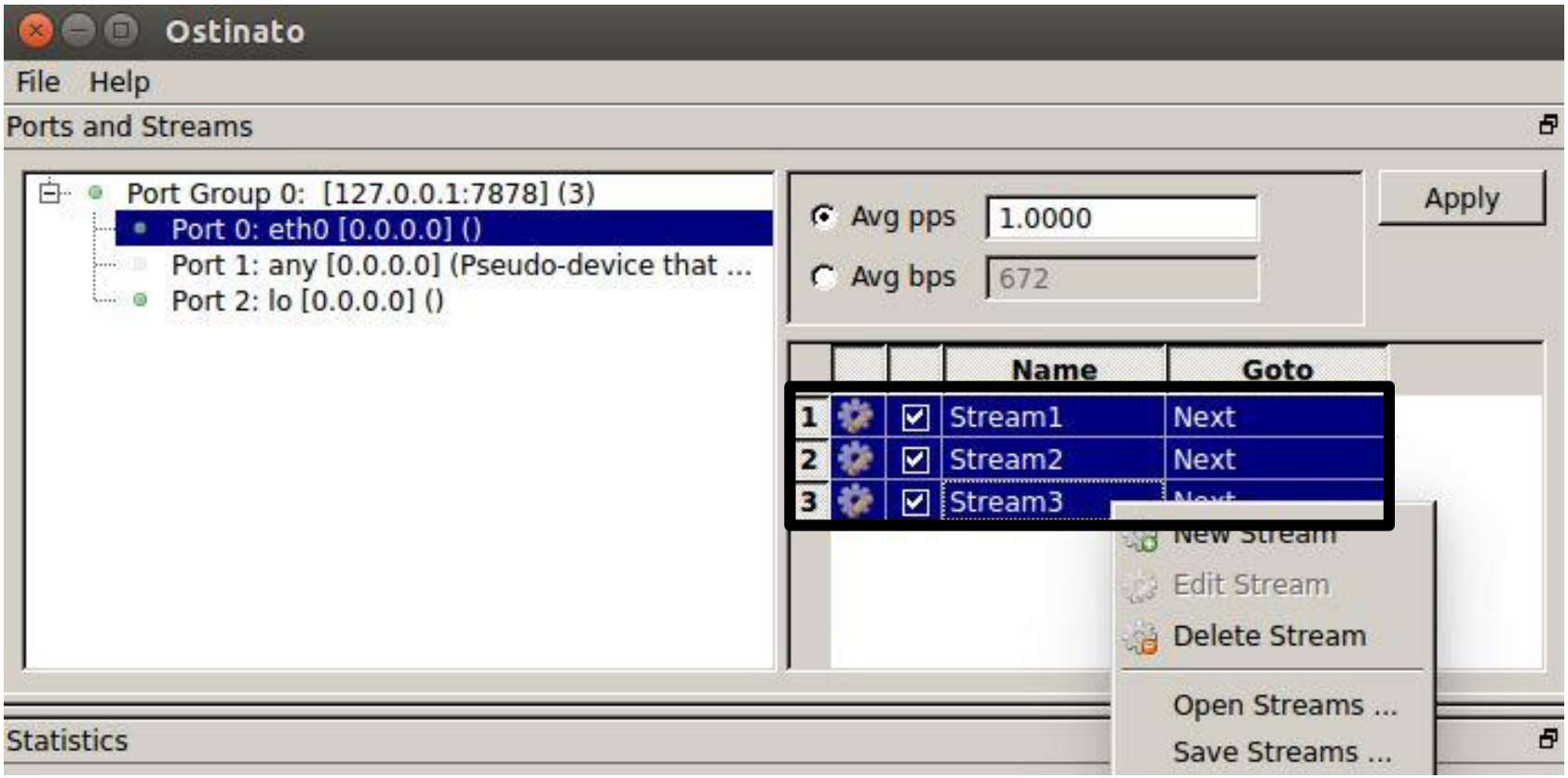
Ostinato使用教學

- 製作pcap檔



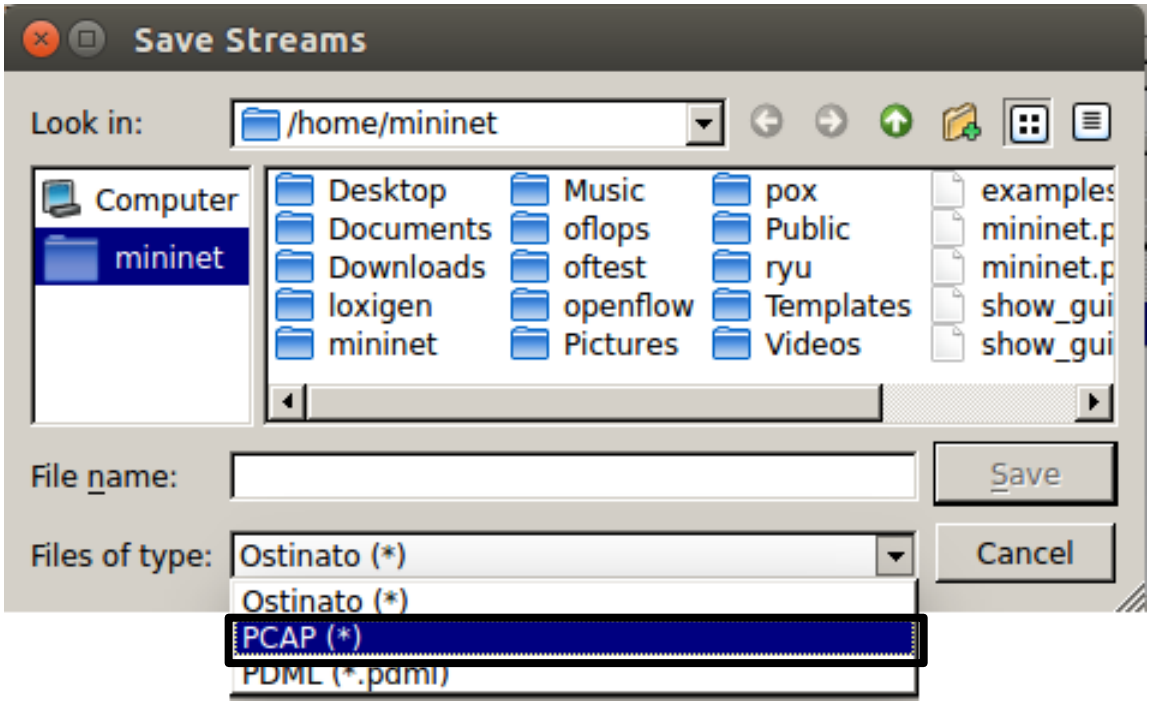
Ostinato使用教學

- 儲存多個Stream至一個pcap檔
  - 按Ctrl並選擇多個Stream



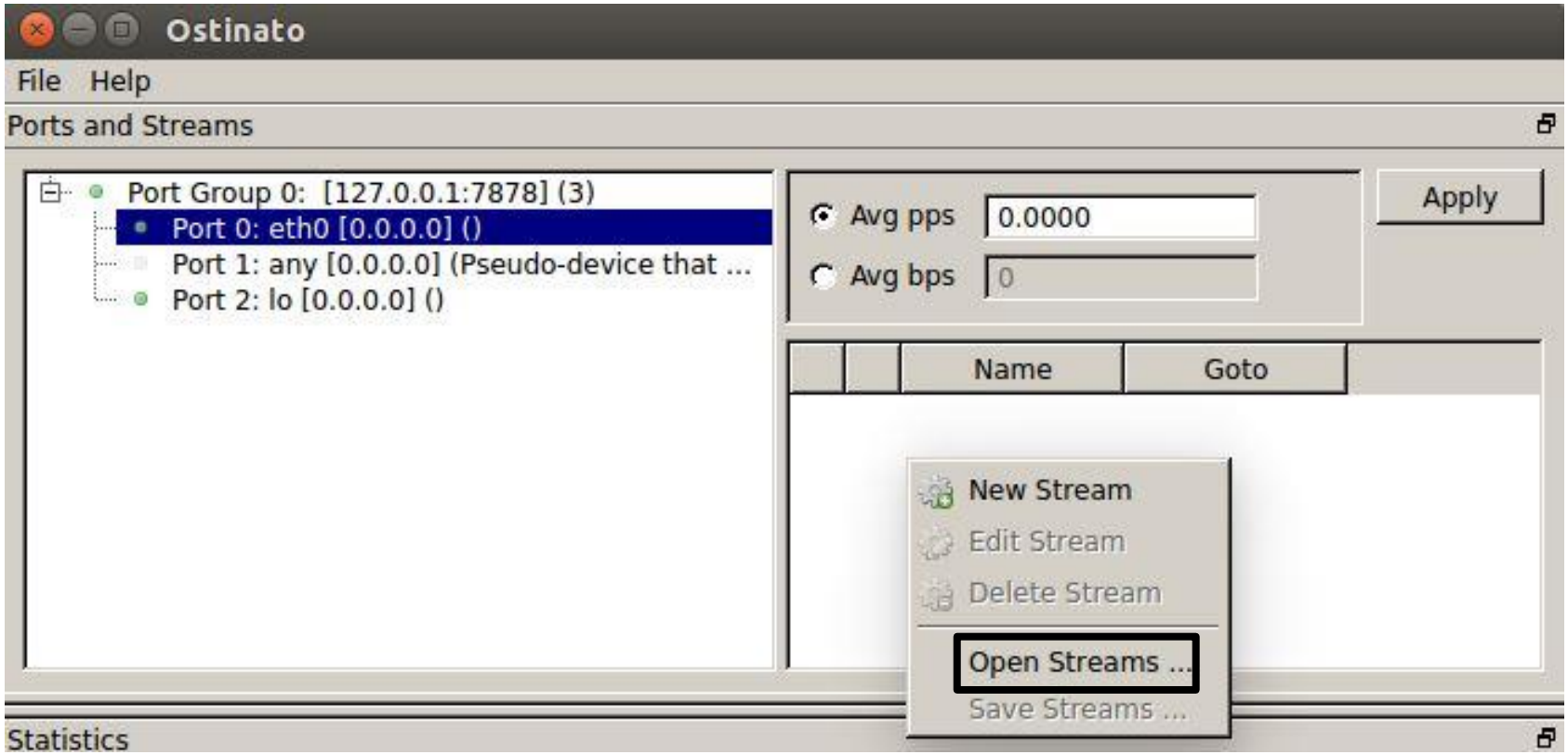
Ostinato使用教學

- 選擇pcap檔按下Save即可



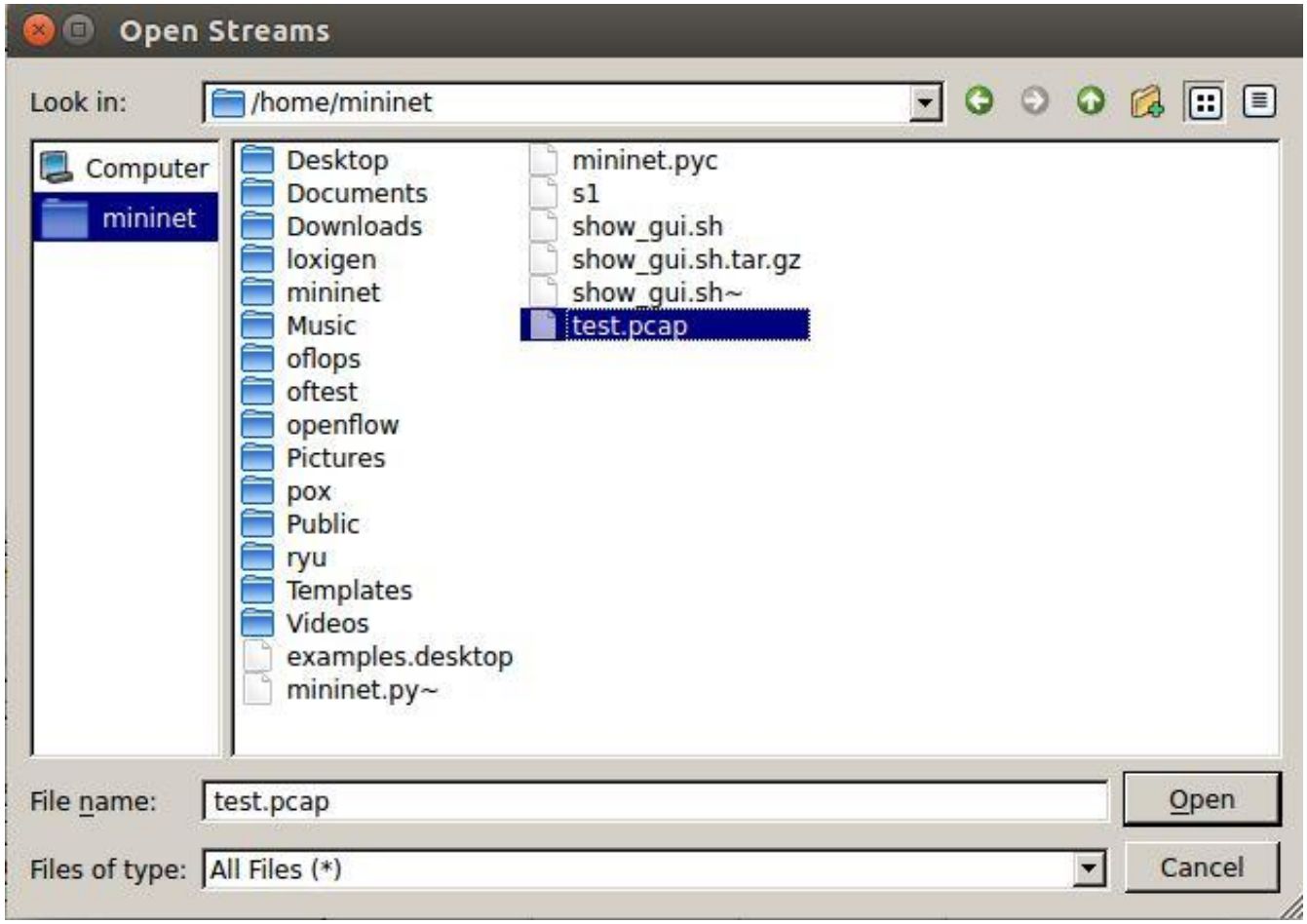
Ostinato使用教學

- 匯入pcap檔
  - 點選Open Streams



Ostinato使用教學

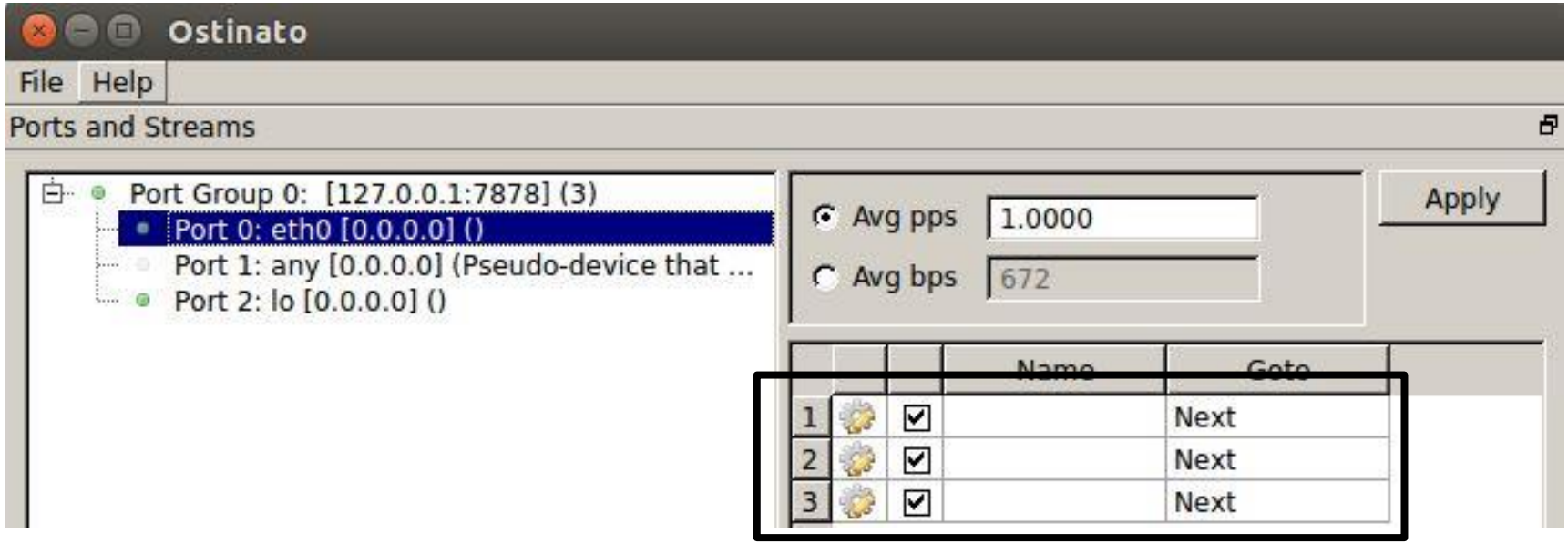
- 選擇要開啟的pcap檔，按下Open



Ostinato使用教學

- 詢問是否要自動轉換格式
  - 點選OK

- 匯入完成

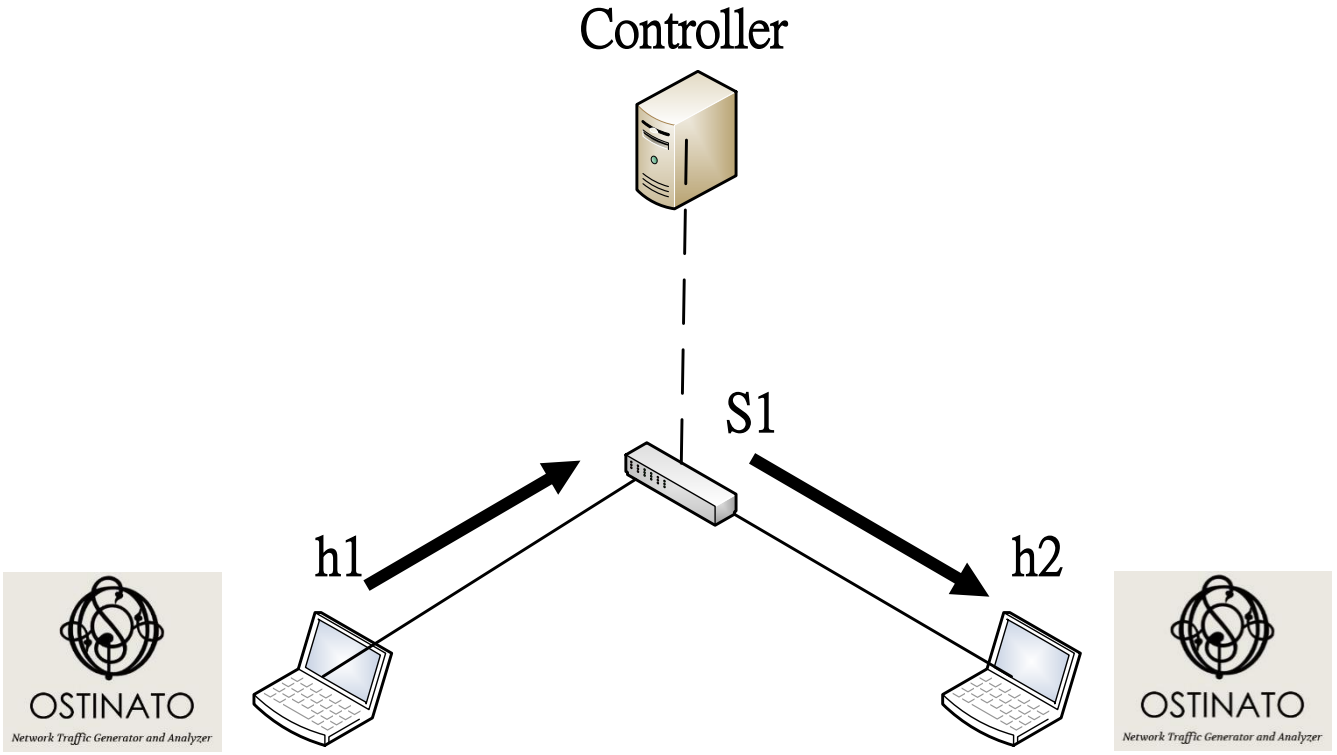


Outline

- Ostinato
  - 安裝
  - 使用教學
- Lab 3-1: Ostinato simple test
- Lab 3-2: Multiple interface

Lab 3-1: Ostinato simple test

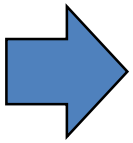
- 使用mininet預設拓樸
  - 指令: sudo mn --mac
- 利用Ostinato將封包從h1送往h2



Lab 3-1: Ostinato simple test

- Step1: h1發送封包
  - 在mininet中使用指令xterm h1 進入h1命令列模式

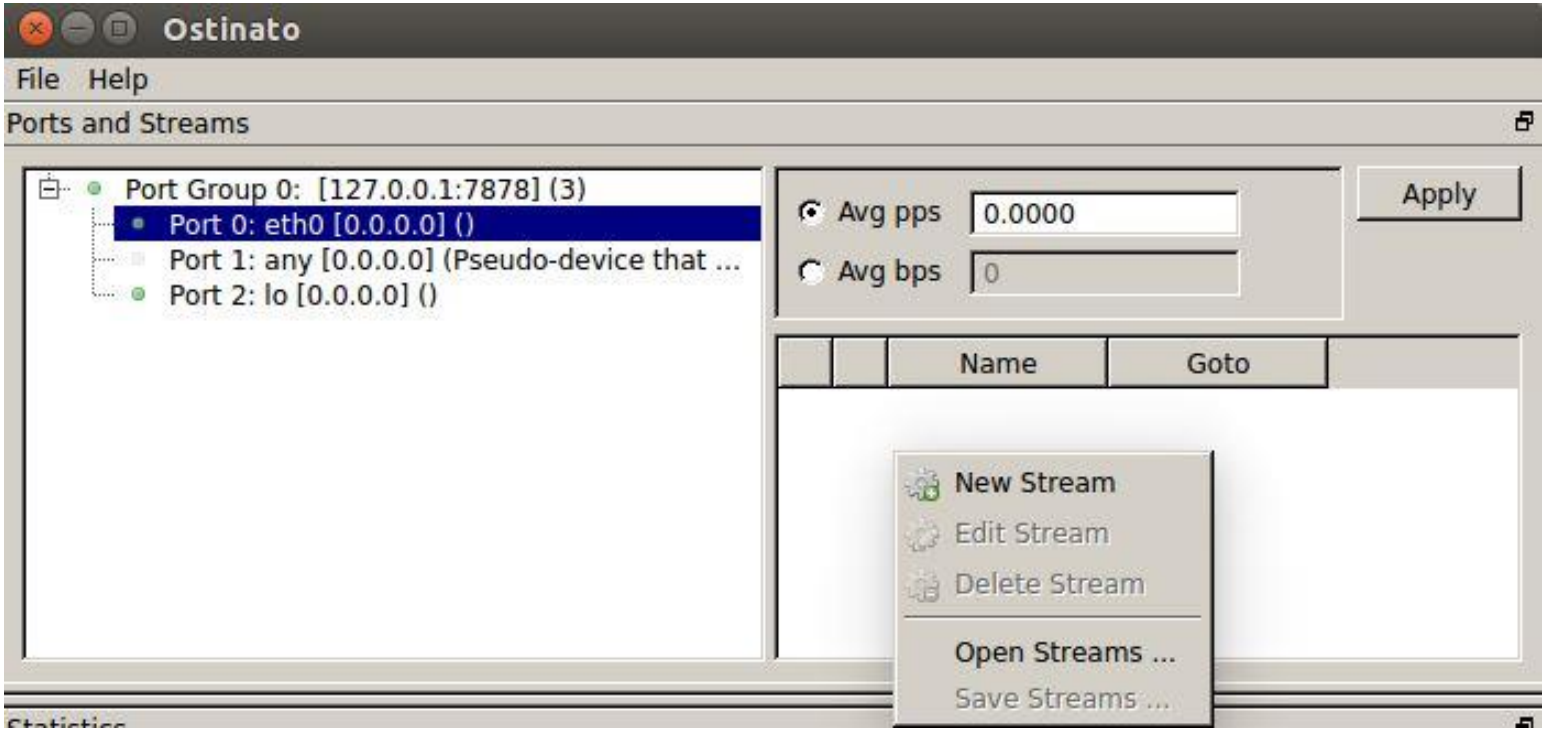
```
mininet@mininet-VirtualBox: ~
mininet@mininet-VirtualBox:~$ sudo mn
[sudo] password for mininet:
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2
*** Adding switches:
s1
*** Adding links:
(h1, s1) (h2, s1)
*** Configuring hosts
h1 h2
*** Starting controller
c0
*** Starting 1 switches
s1 ...
*** Starting CLI:
mininet> xterm h1
```



```
"Node: h1"
root@mininet-VirtualBox:~#
```

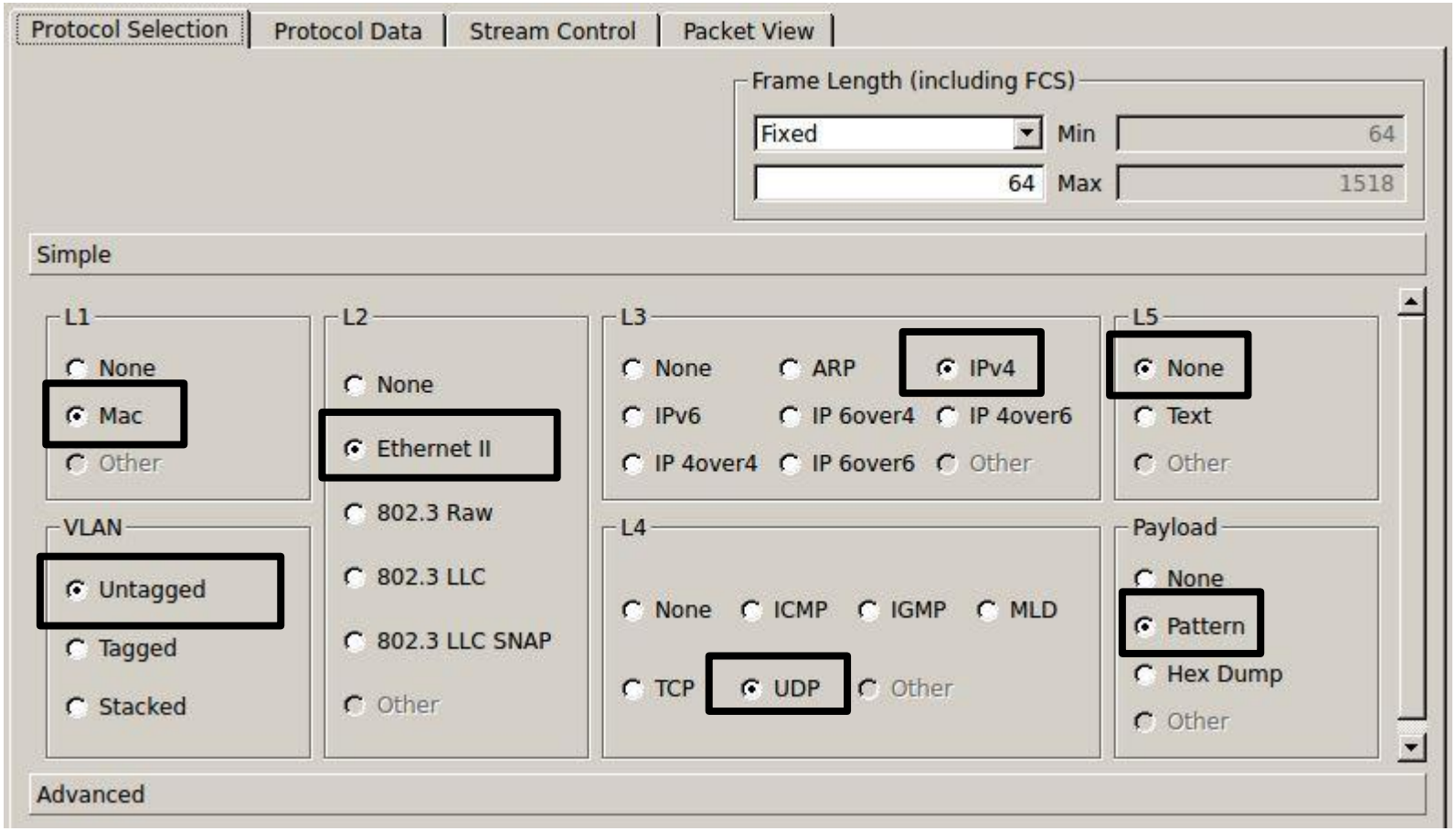
Lab 3-1: Ostinato simple test

- 使用h1的命令列打開Ostinato
  - sudo ostinato &
  - & 可以讓你在同一終端機裡, 繼續輸入指令
- 在Ostinato裡, 新增Stream



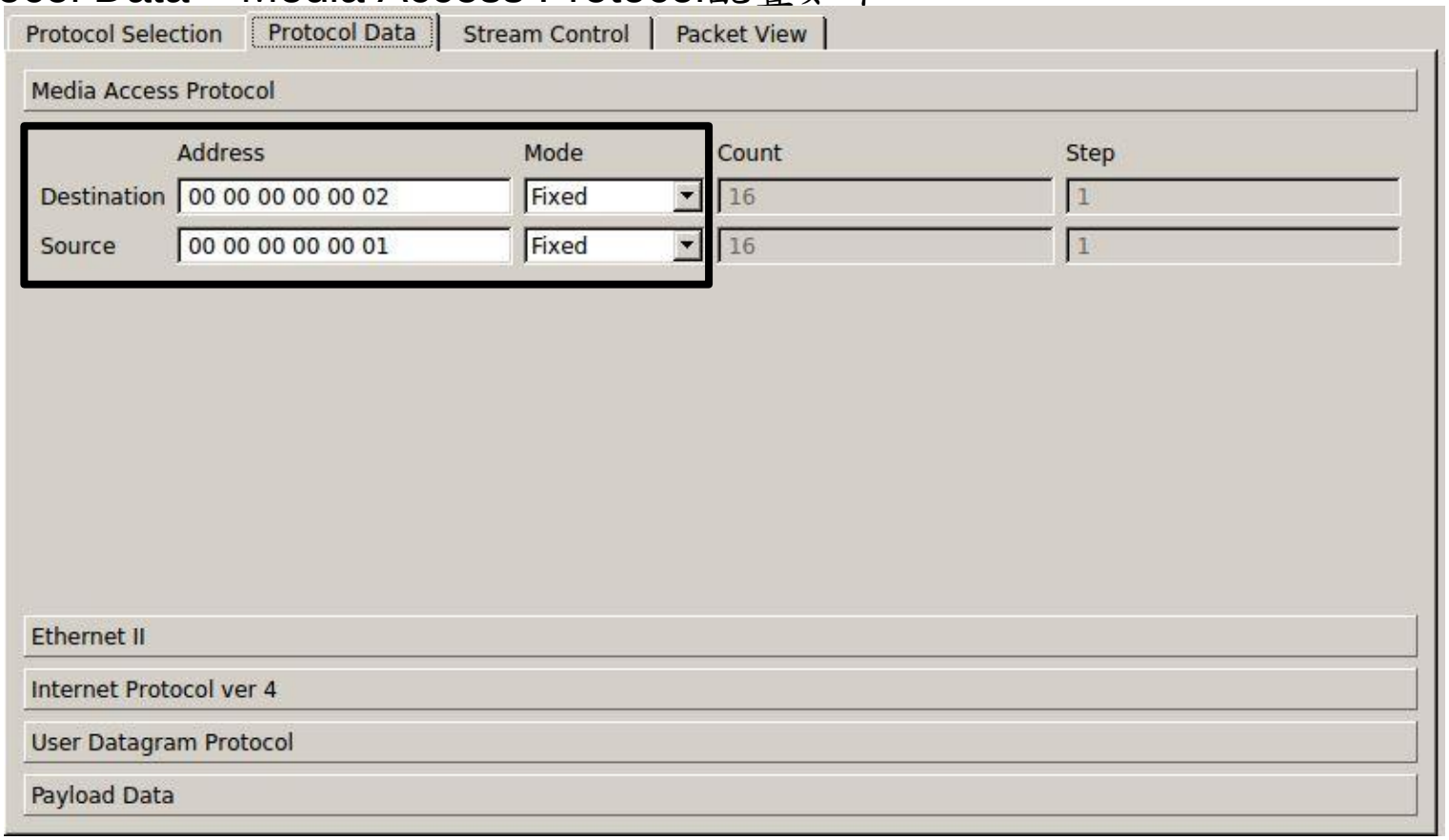
Lab 3-1: Ostinato simple test

- 設定從h1之Port0:h1-eth0發送封包
  - Protocol Selection配置如下



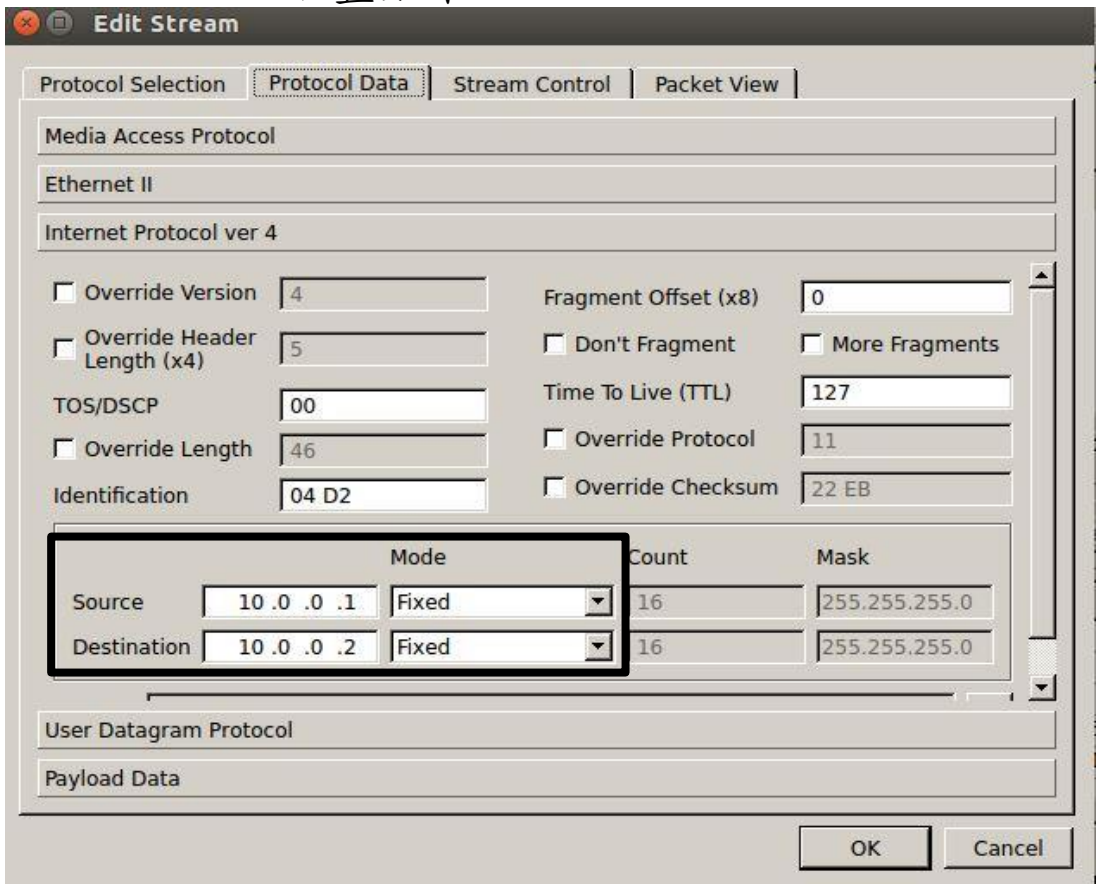
Lab 3-1: Ostinato simple test

- 設定從h1之Port0:h1-eth0發送封包
  - Protocol Data – Media Access Protocol配置如下



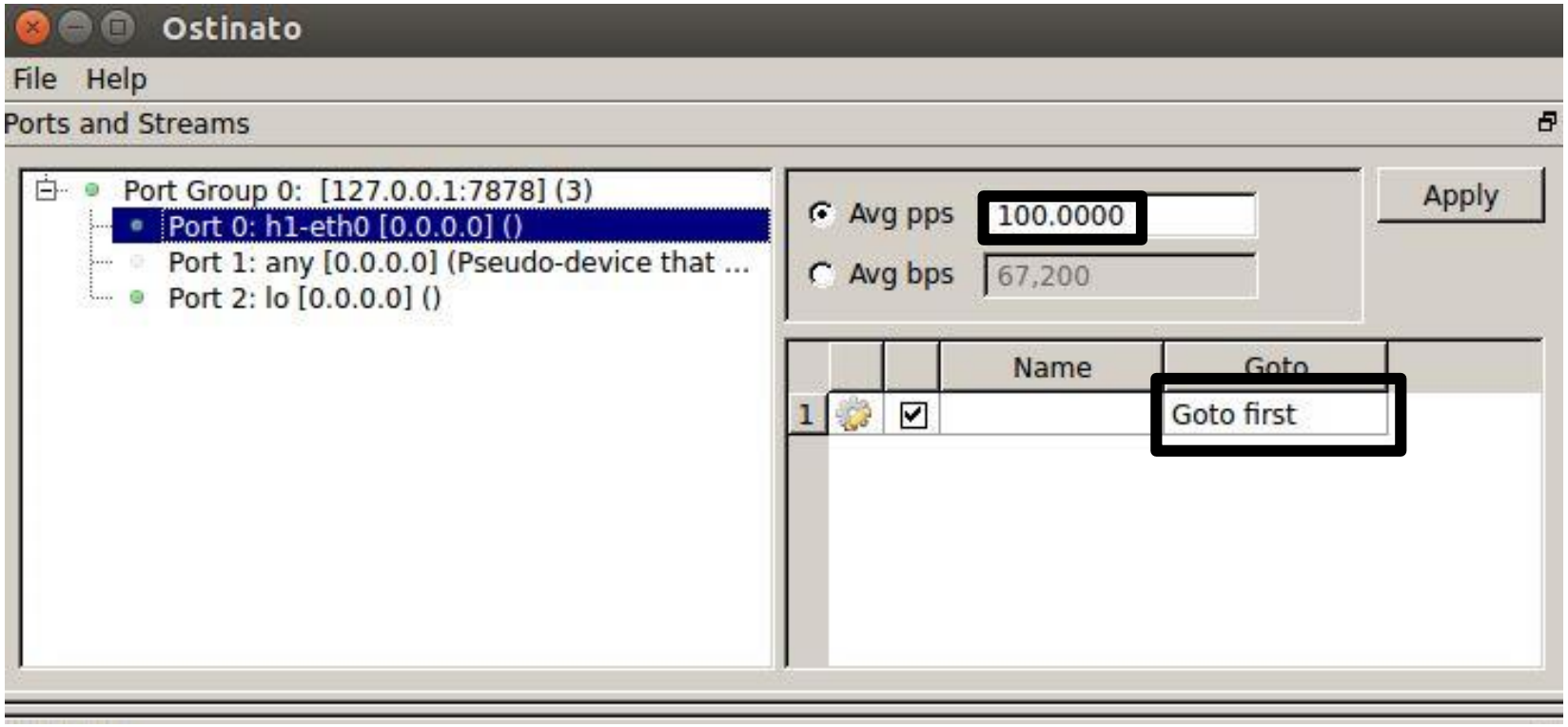
Lab 3-1: Ostinato simple test

- 設定從h1之Port0:h1-eth0發送封包
  - Protocol Data – Internet Protocol Ver 4配置如下



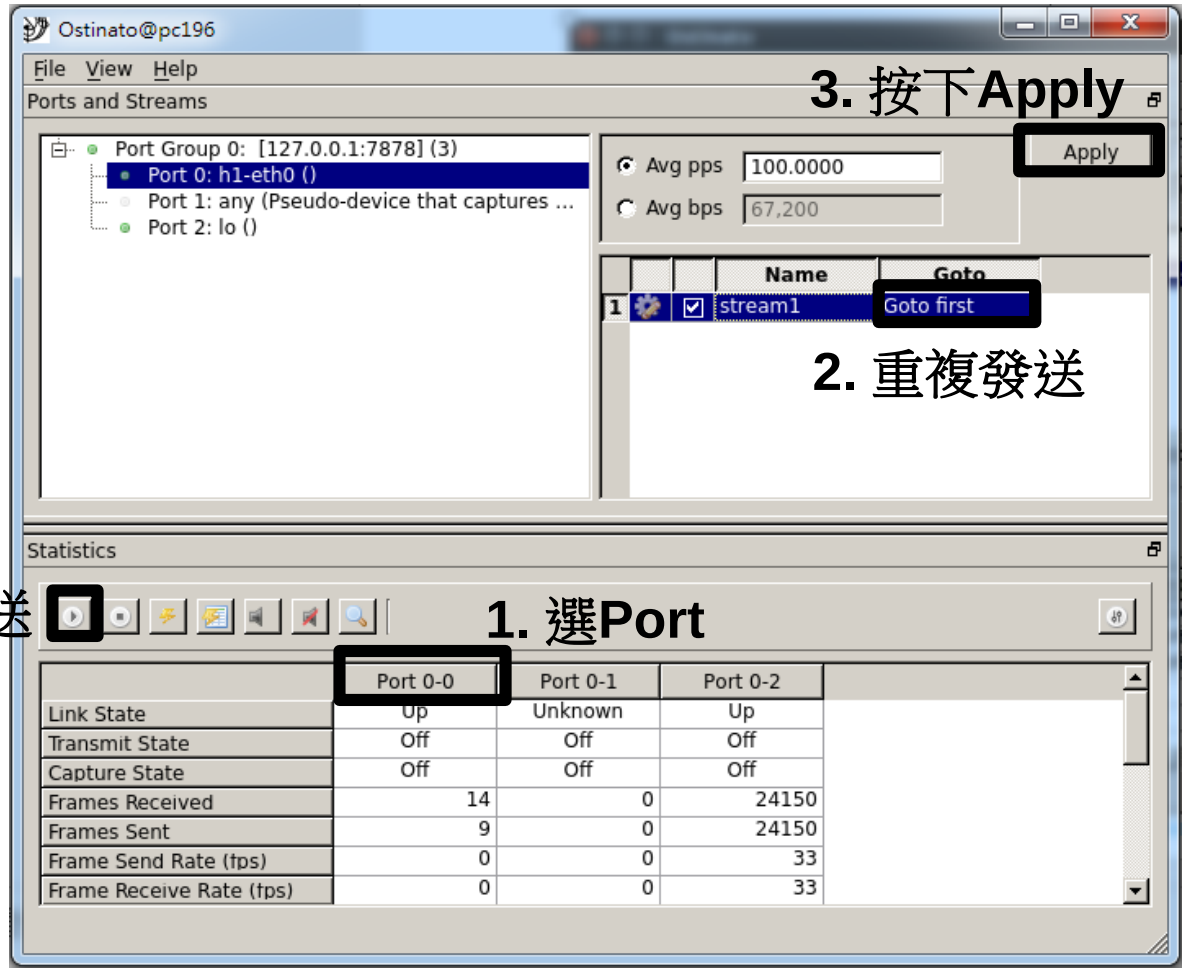
Lab 3-1: Ostinato simple test

- 設定從h1之Port0:h1-eth0發送封包
  - 每秒送100個封包
  - 重複發送封包 (Goto first)



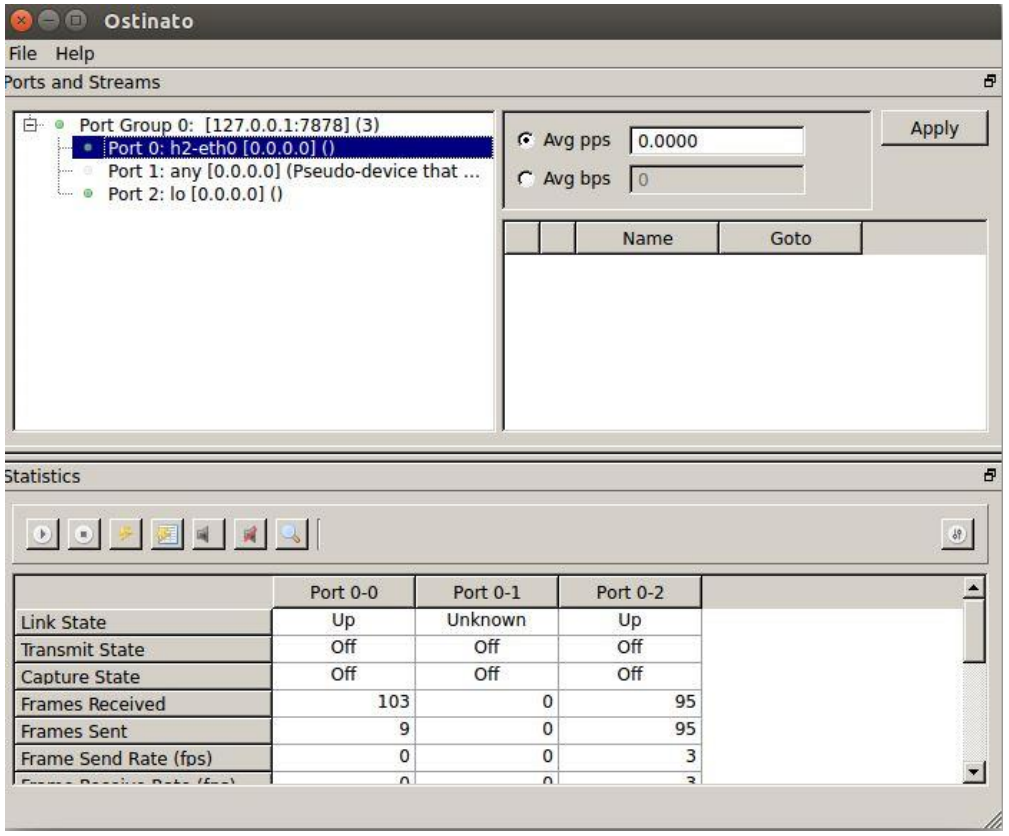
Lab 3-1: Ostinato simple test

- 按下OK回到主畫面



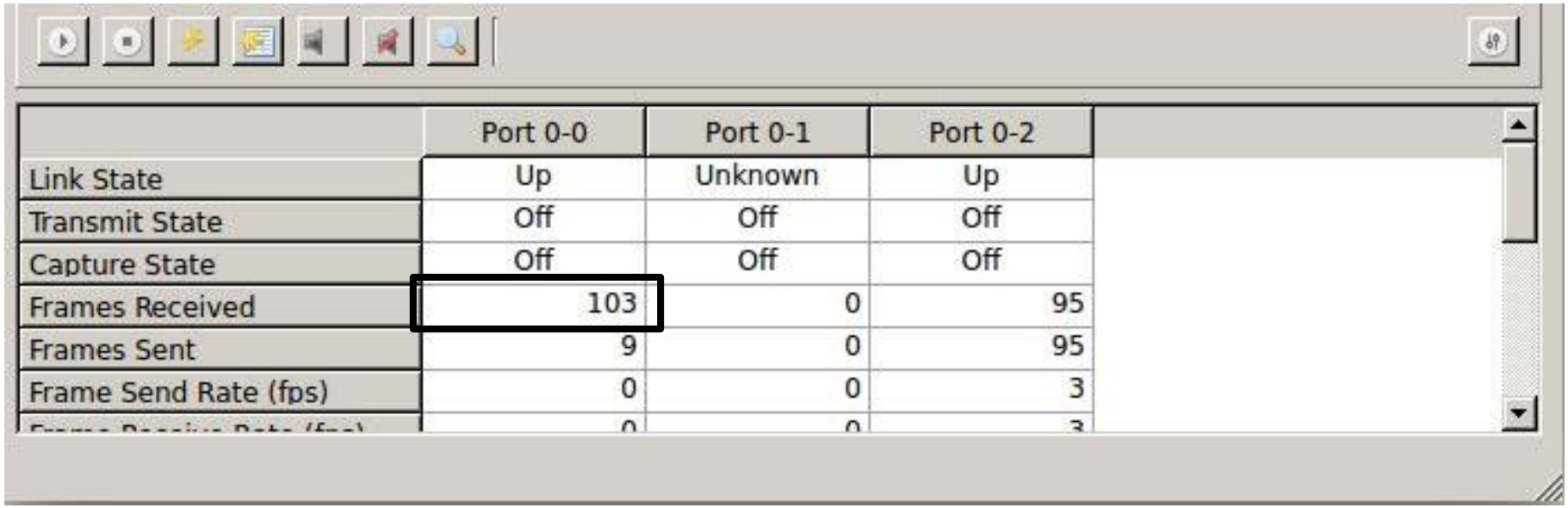
Lab 3-1: Ostinato simple test

- Step 2: h2接收封包
  - 在mininet中使用指令xterm h2 進入h2命令列模式
  - 使用h2的命令列打開Ostinato



Lab 3-1: Ostinato simple test

- Step 2: h2接收封包
  - 在mininet中使用指令xterm h2 進入h2命令列模式
  - 使用h2的命令列打開Ostinato
- 觀察h2的Statistics列表
  - 確認Frames Received是否有增加



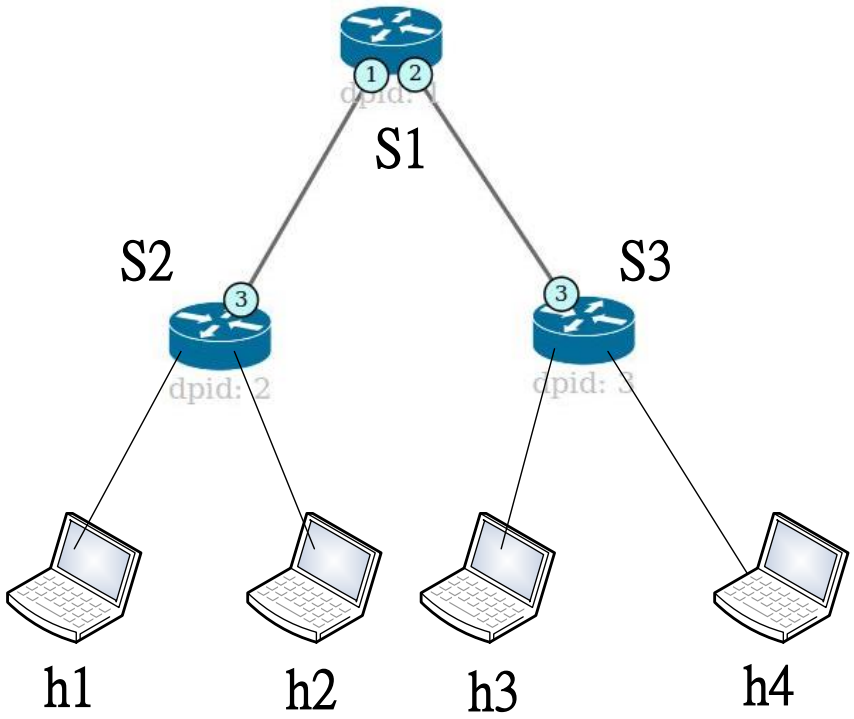
	Port 0-0	Port 0-1	Port 0-2
Link State	Up	Unknown	Up
Transmit State	Off	Off	Off
Capture State	Off	Off	Off
Frames Received	103	0	95
Frames Sent	9	0	95
Frame Send Rate (fps)	0	0	3

Outline

- Ostinato
  - 安裝
  - 使用教學
- Lab 3-1: Ostinato simple test
- Lab 3-2: Multiple interface

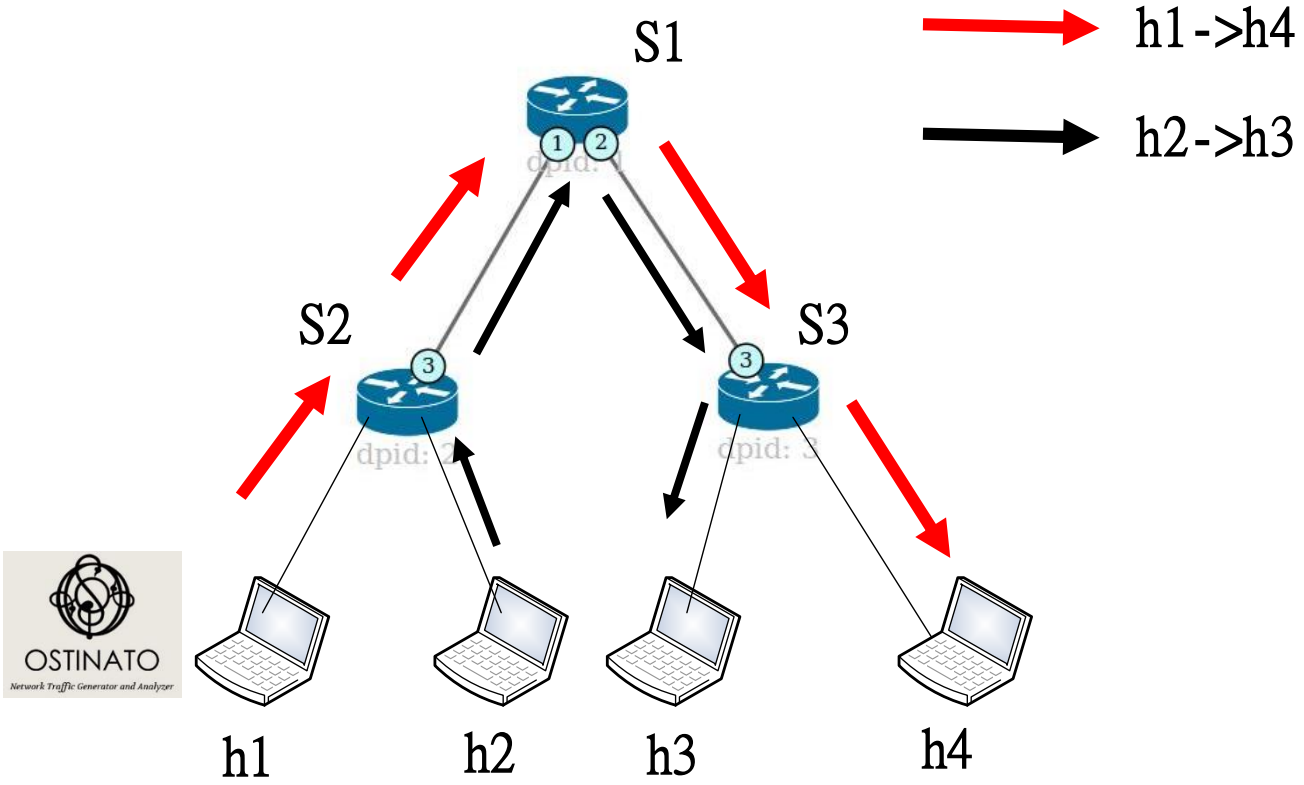
Lab 3-2: Multiple interface

- 使用自訂拓樸建立以下拓樸檔案位置
- 指令: cd ~/mininet/custom/
- 指令: vim multiple_interface.py (自行完成)
- 指令: sudo mn --custom mininet/custom/multiple_interface.py --topo=mytopo



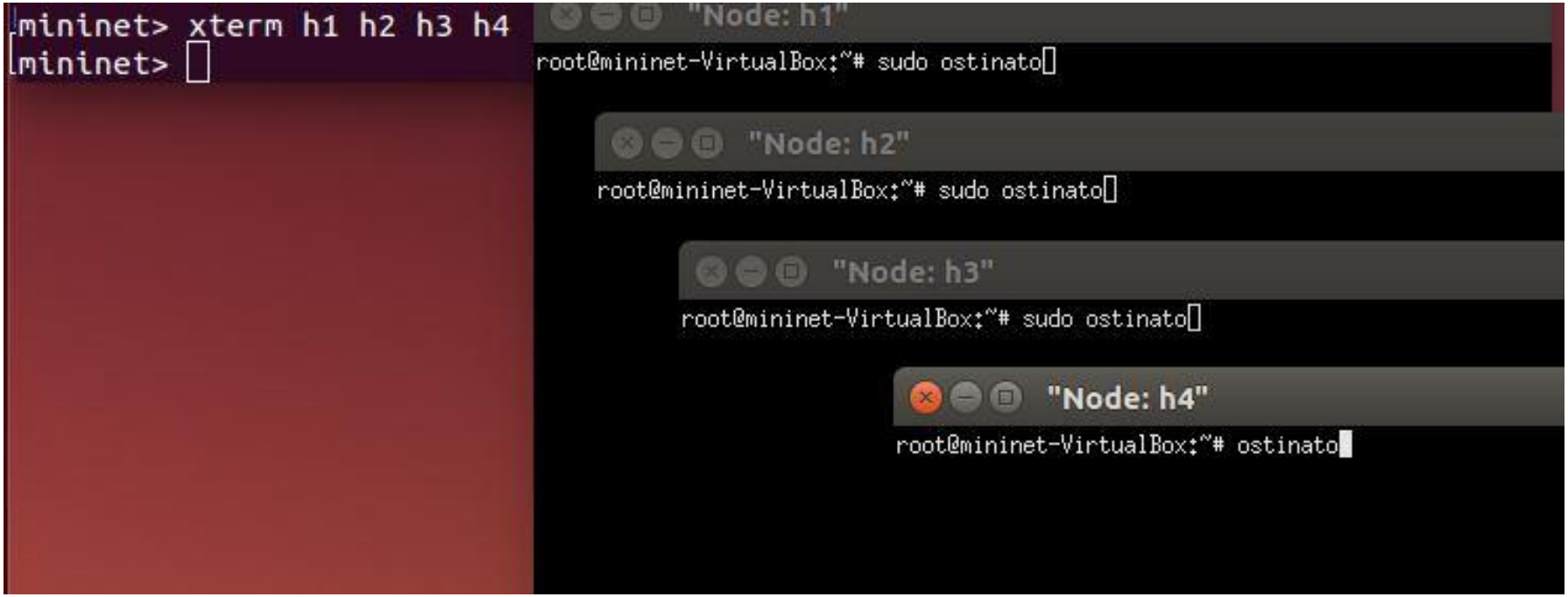
Lab 3-2: Multiple interface

- 使用Ostinato從h1->h4、h2->h3發送封包



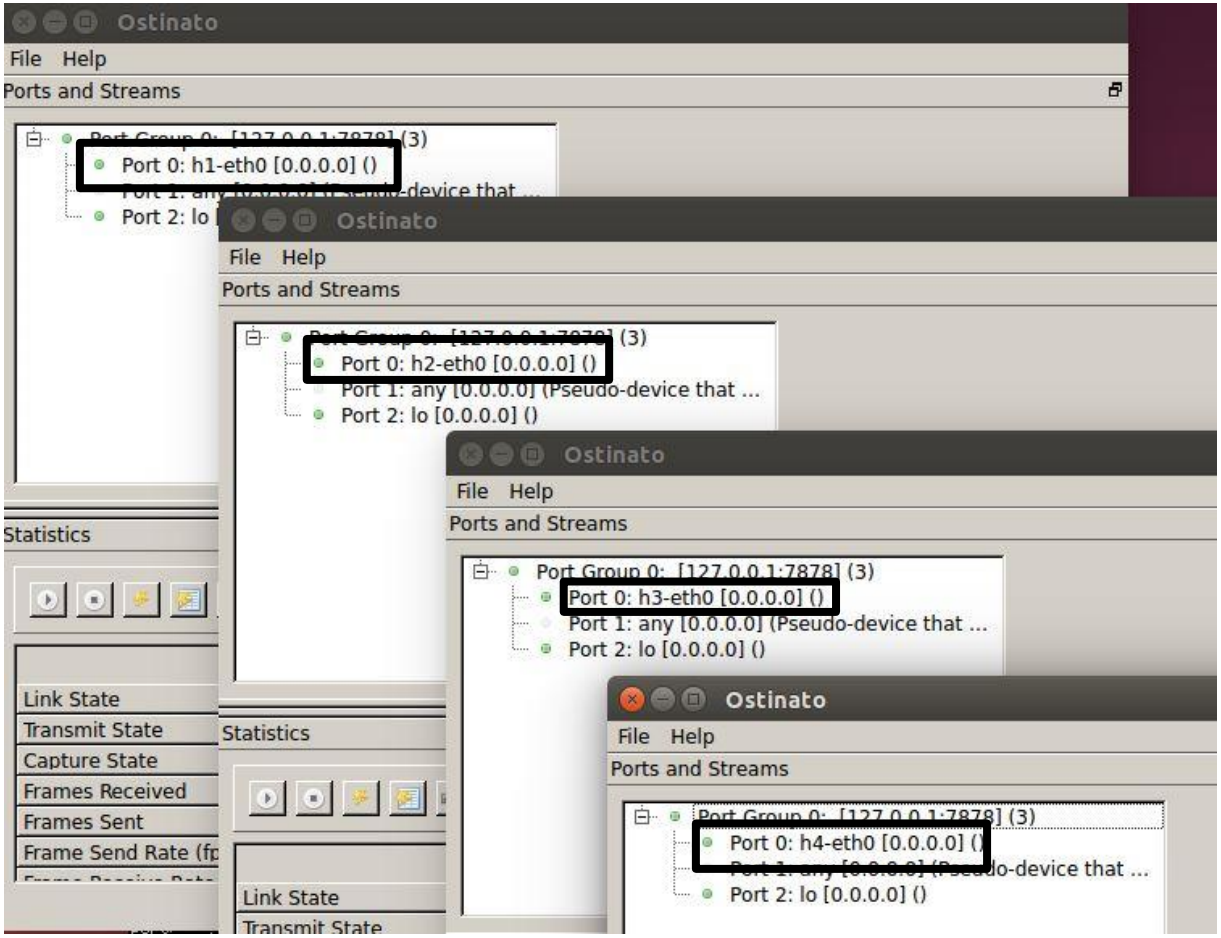
Lab 3-2: Multiple interface

- Step 1: 在Mininet 中輸入指令
  - 指令: xterm h1 h2 h3 h4
- 於h1 h2 h3 h4 分別開啟Ostinato
  - 指令: sudo ostinato



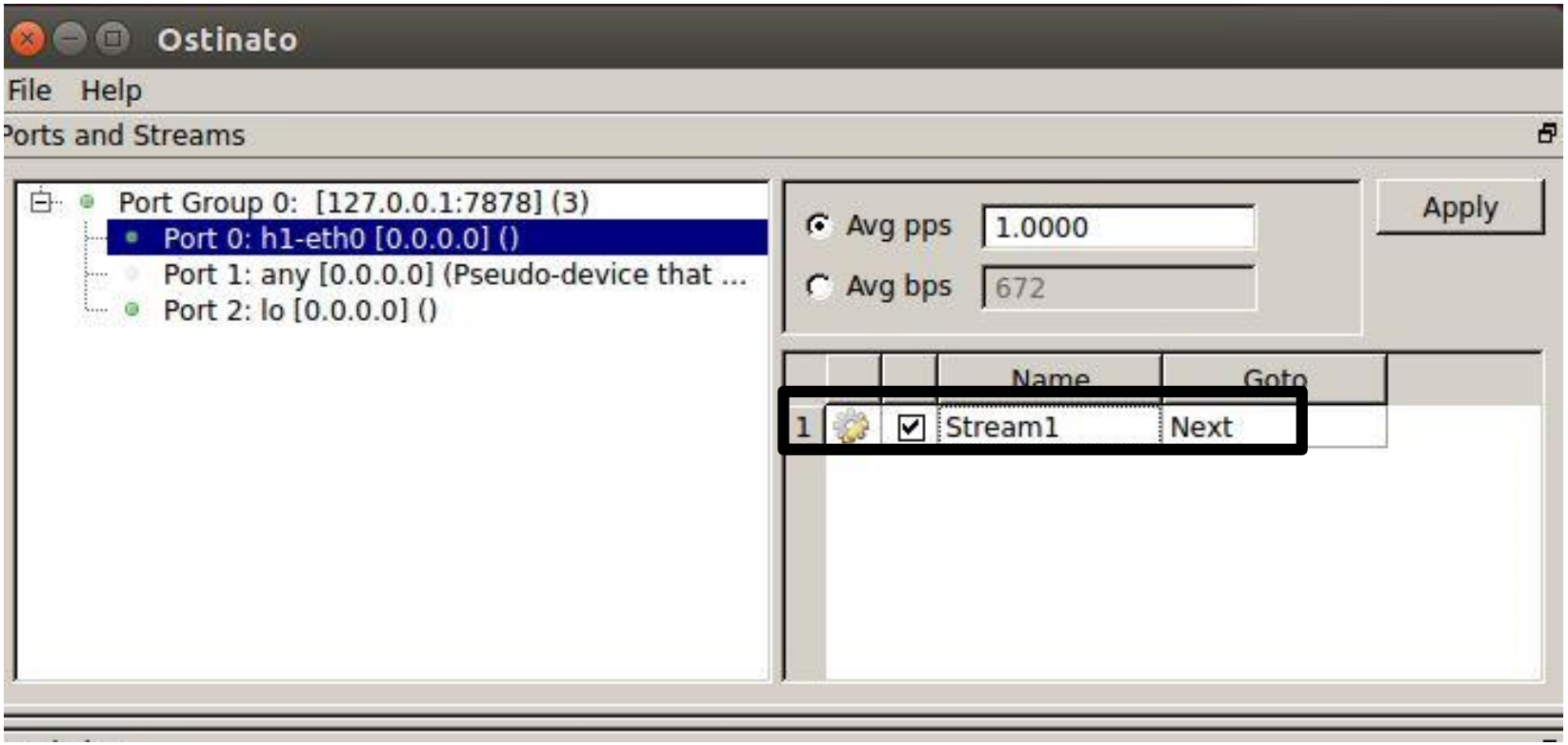
Lab 3-2: Multiple interface

- 從Port 0可以看出分別為h1 h2 h3 h4



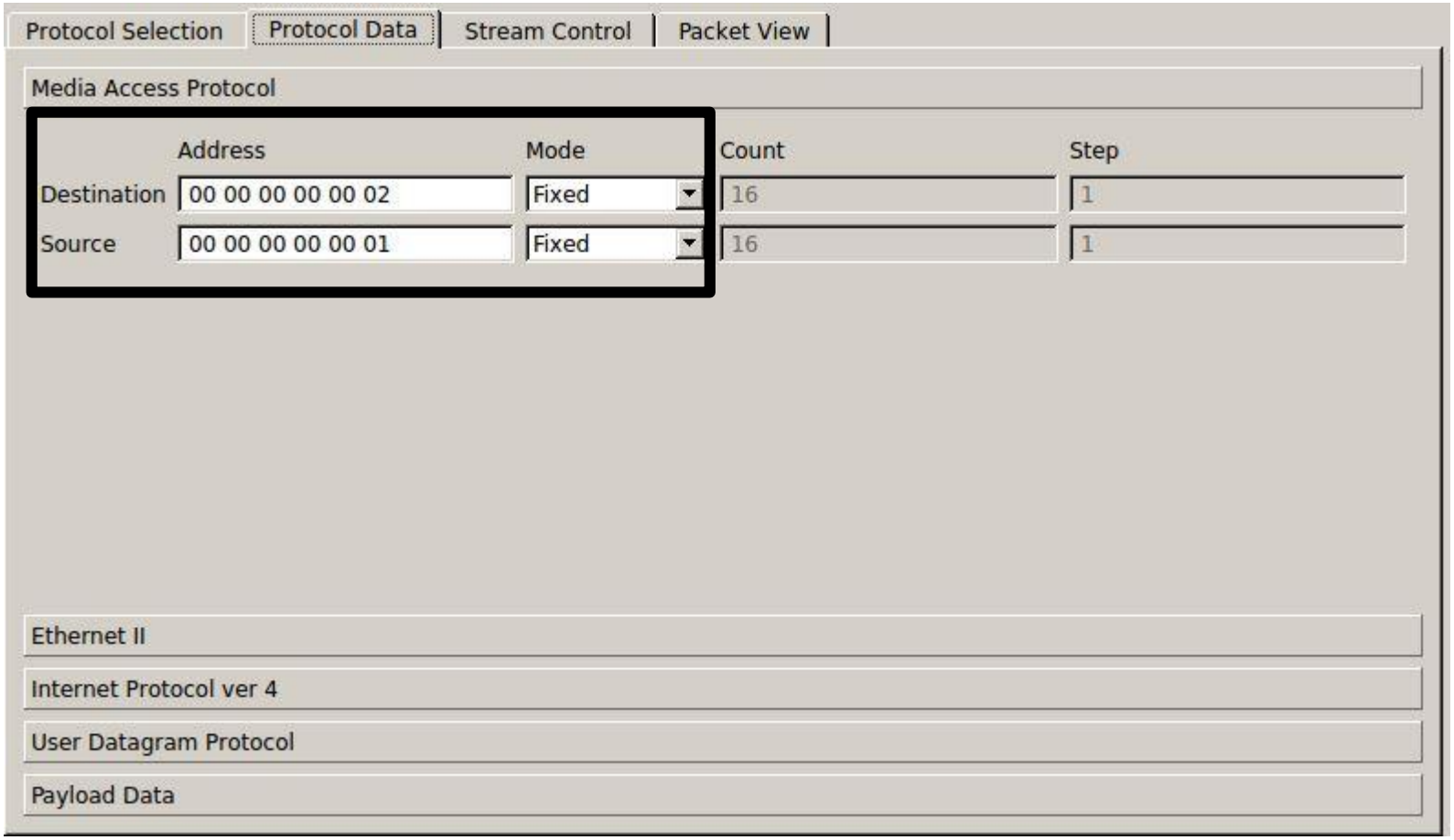
Lab 3-2: Multiple interface

- Step 2: 使用Lab 3-1所建立之pcap檔案匯入h1的Ostinato
  - 修改Stream1的Destination MAC與 Destination IP (下兩頁)
  - 封包來源為h1, 目的為h4



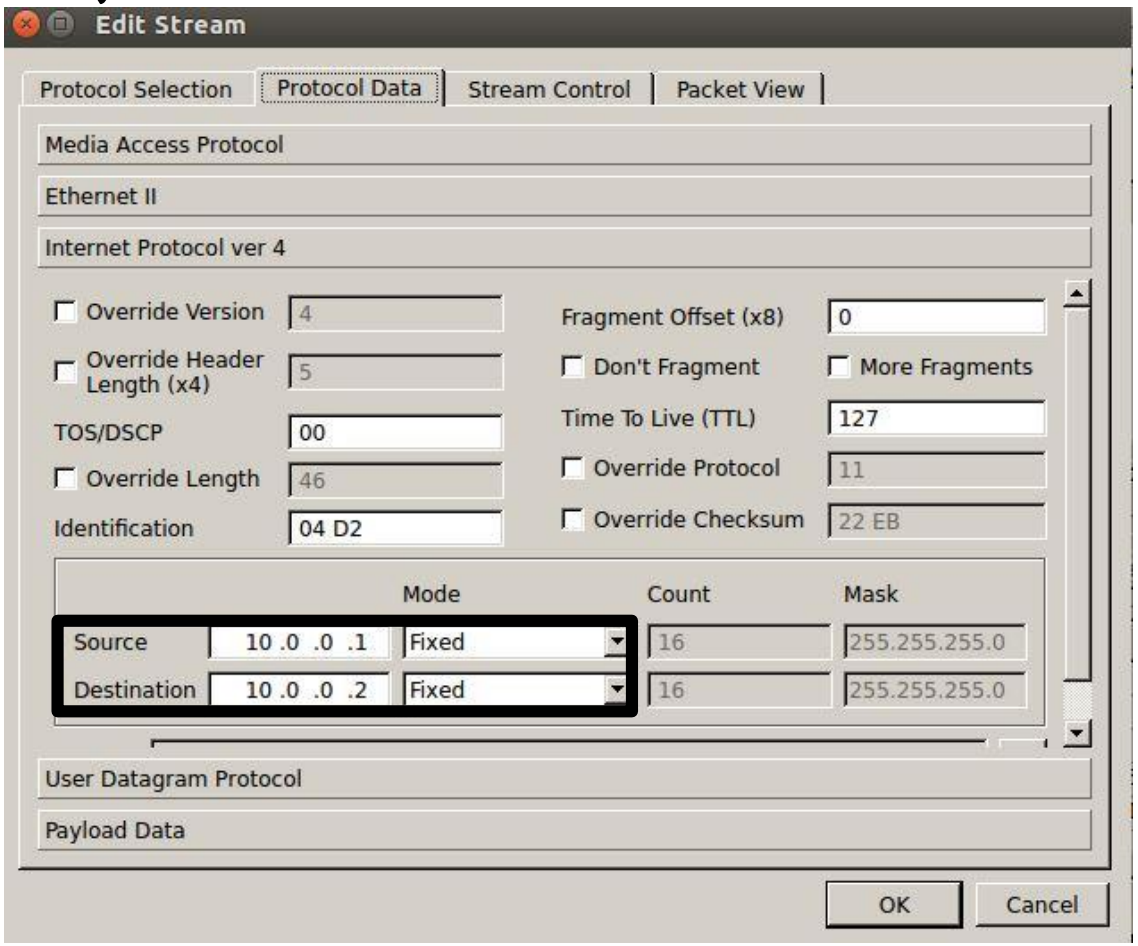
Lab 3-2: Multiple interface

- 配置如下 Destination MAC改為04



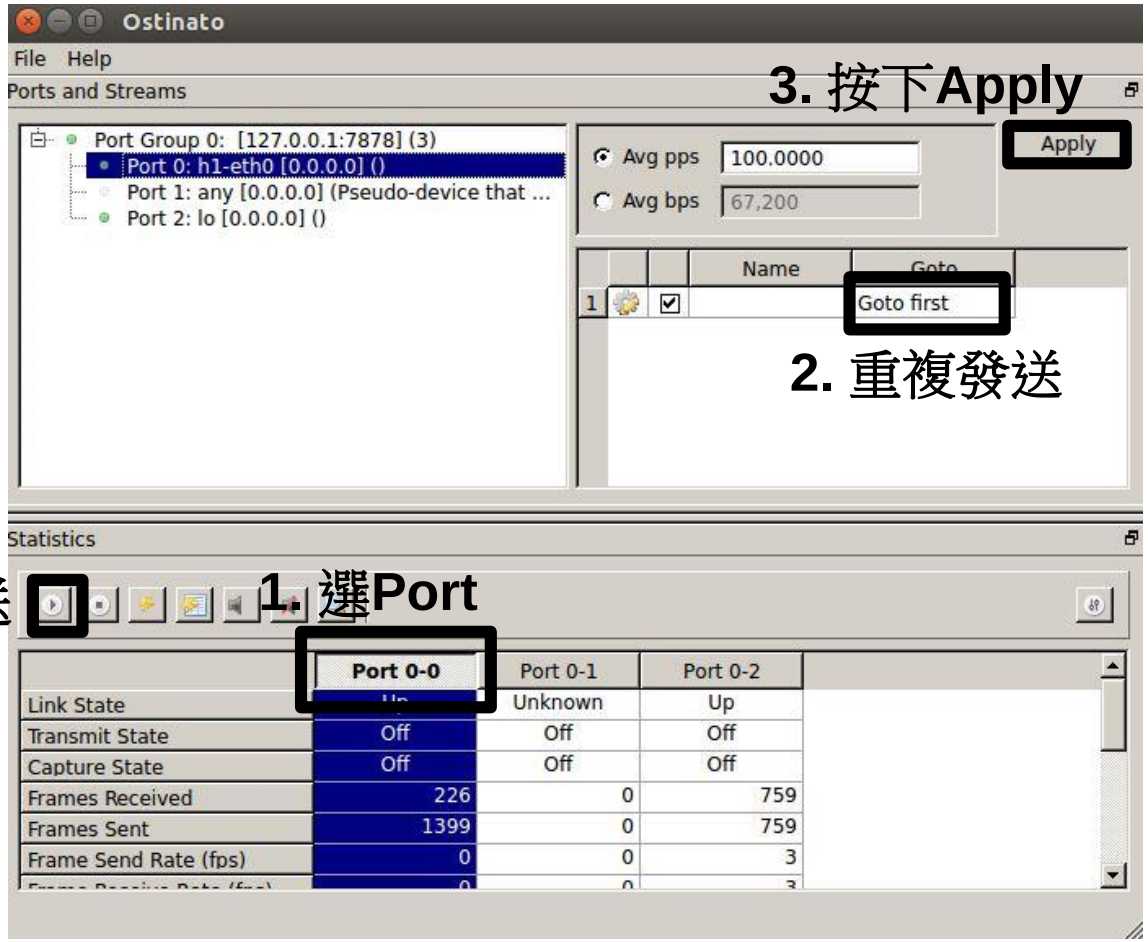
Lab 3-2: Multiple interface

- 配置如下 Destination IP改為10.0.0.4



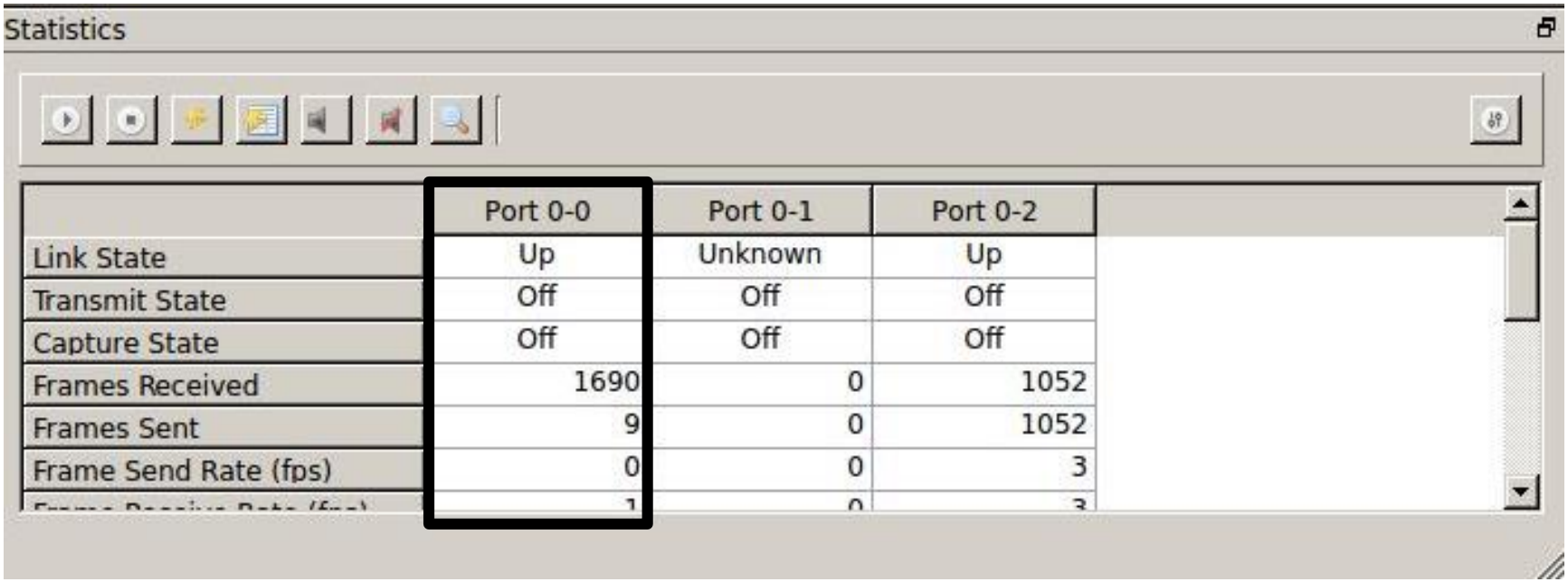
Lab 3-2: Multiple interface

- 按下OK回到主畫面



Lab 3-2: Multiple interface

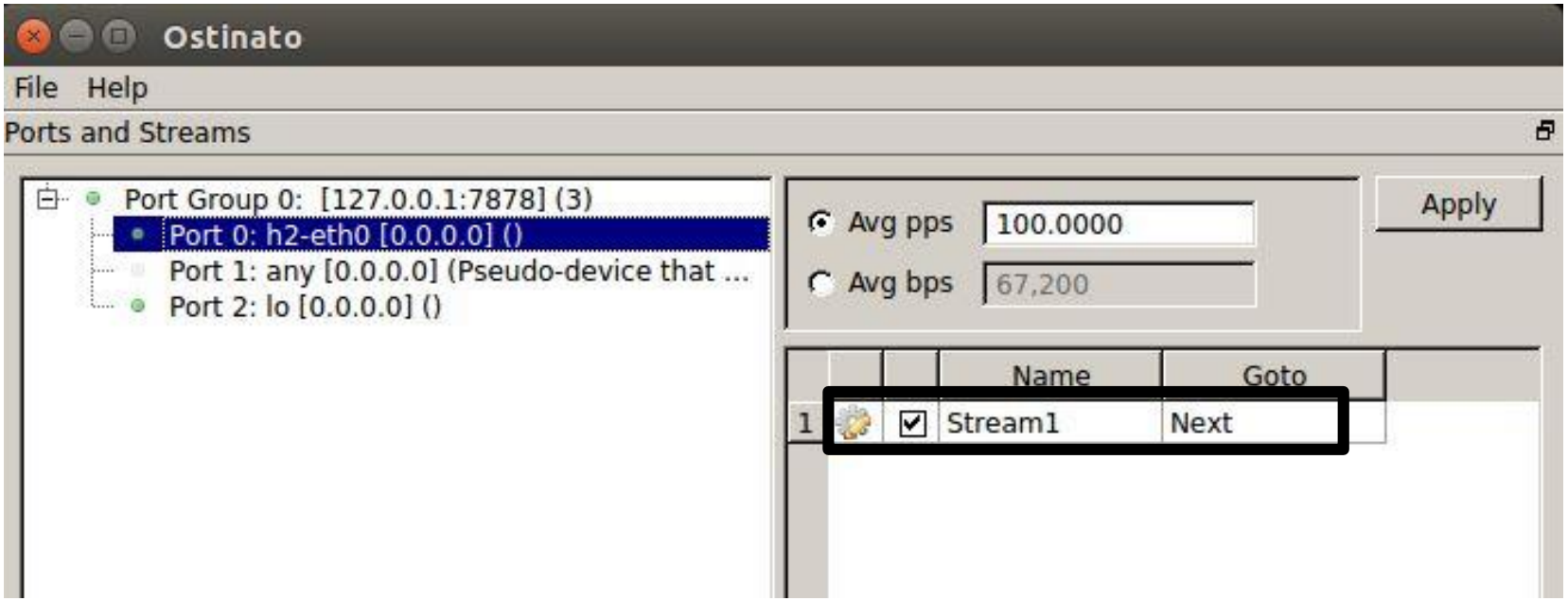
- 觀察h4的Statistics列表
  - 確認Port 0-0中Frames Received欄位是否有增加



	Port 0-0	Port 0-1	Port 0-2
Link State	Up	Unknown	Up
Transmit State	Off	Off	Off
Capture State	Off	Off	Off
Frames Received	1690	0	1052
Frames Sent	9	0	1052
Frame Send Rate (fps)	0	0	3

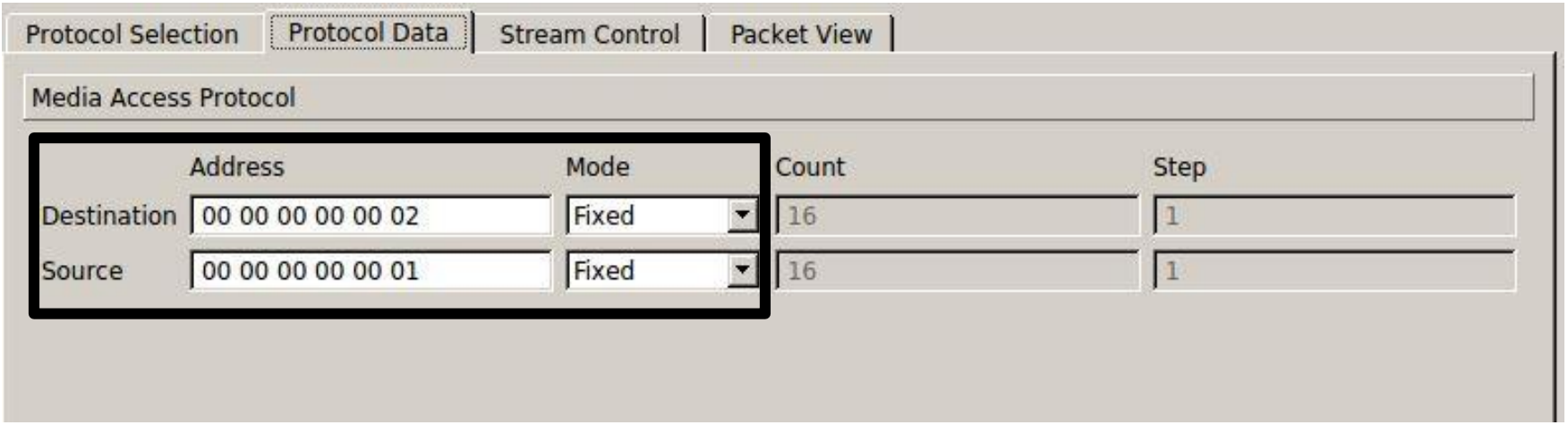
Lab 3-2: Multiple interface

- Step 3: 使用Lab 3-1所建立之pcap檔案匯入h2的Ostinato
  - 修改Stream1的Destination MAC與 Destination IP (下兩頁)
  - 封包來源為h2, 目的為h3



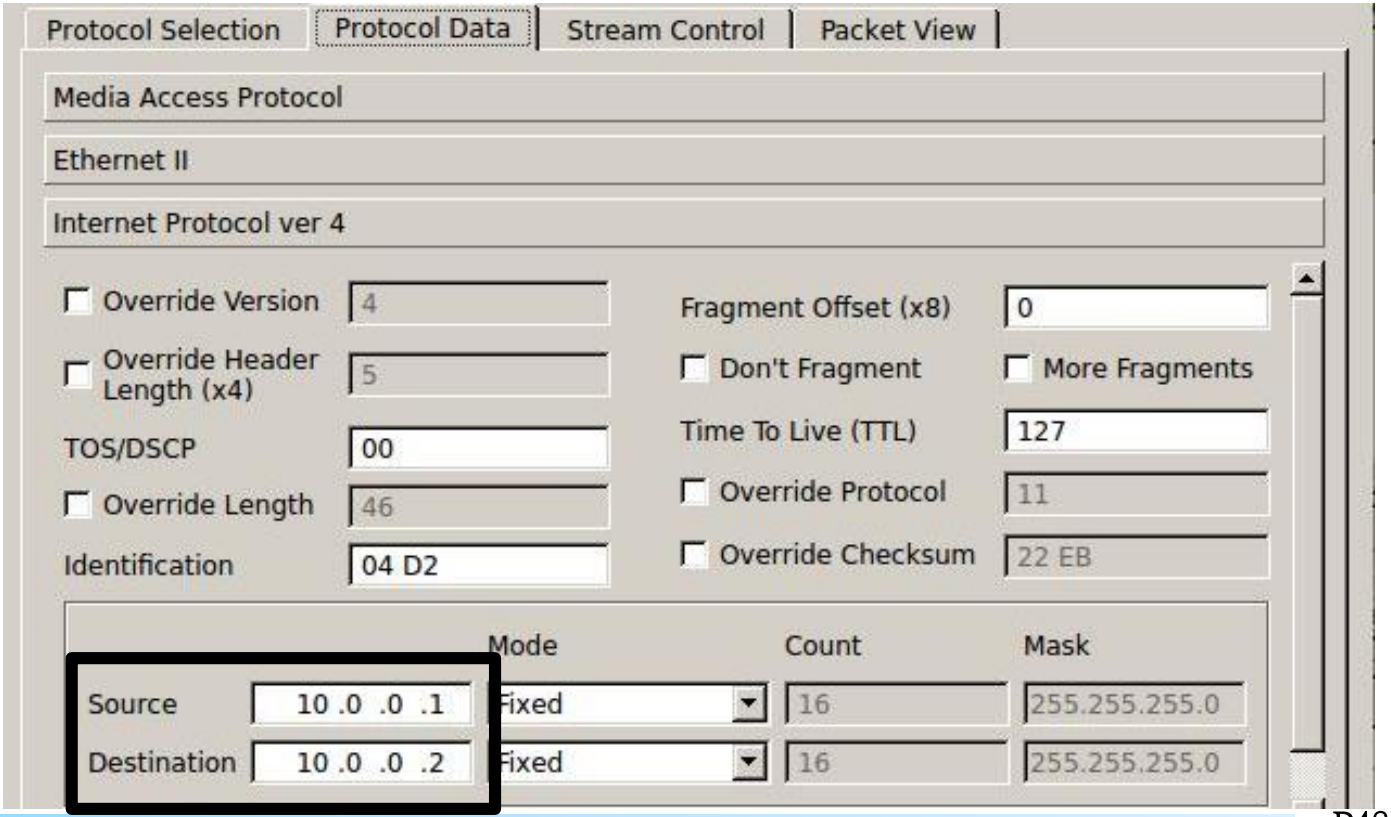
Lab 3-2: Multiple interface

- 配置如下
  - Source MAC改為02
  - Destination MAC改為03



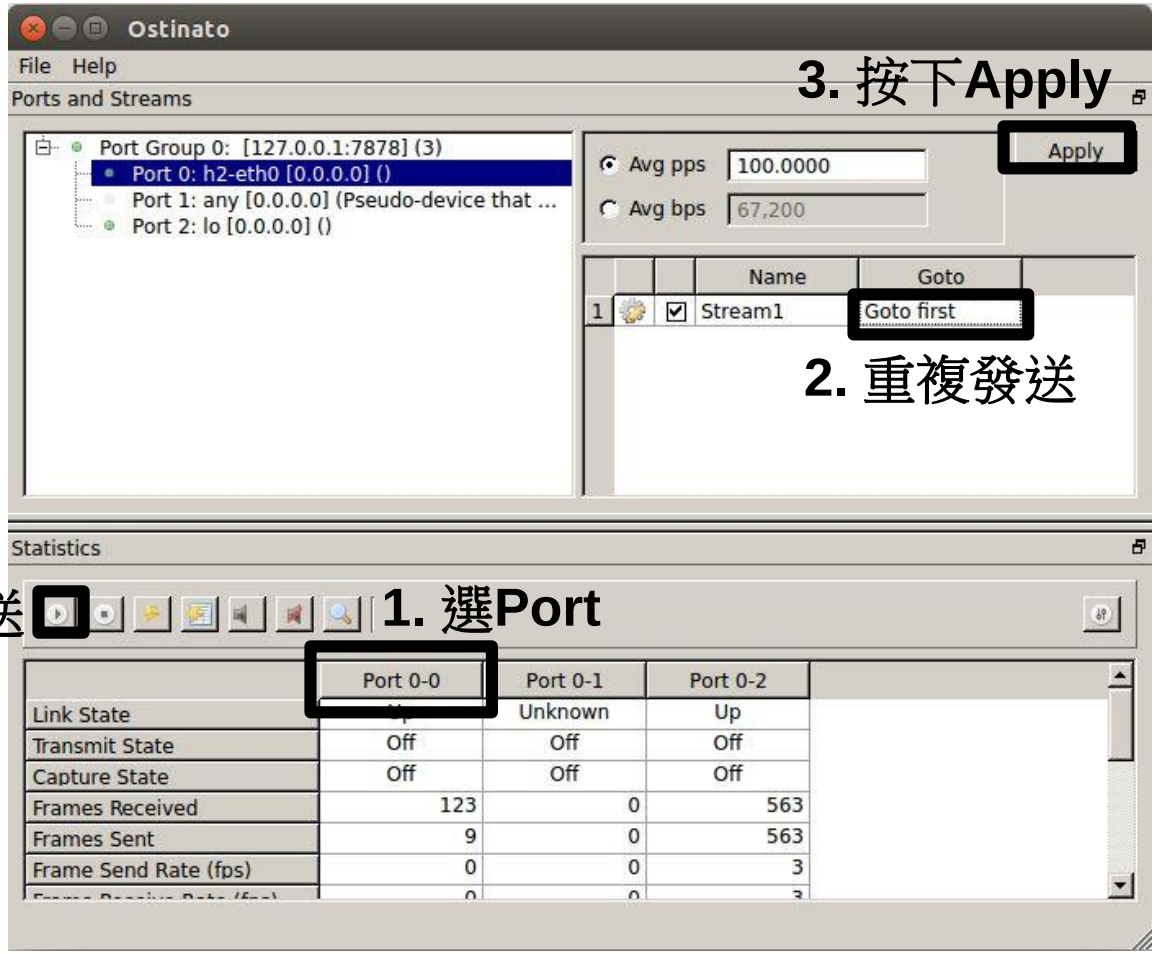
Lab 3-2: Multiple interface

- 封包配置如下
  - Source IP改為02
  - Destination IP改為03



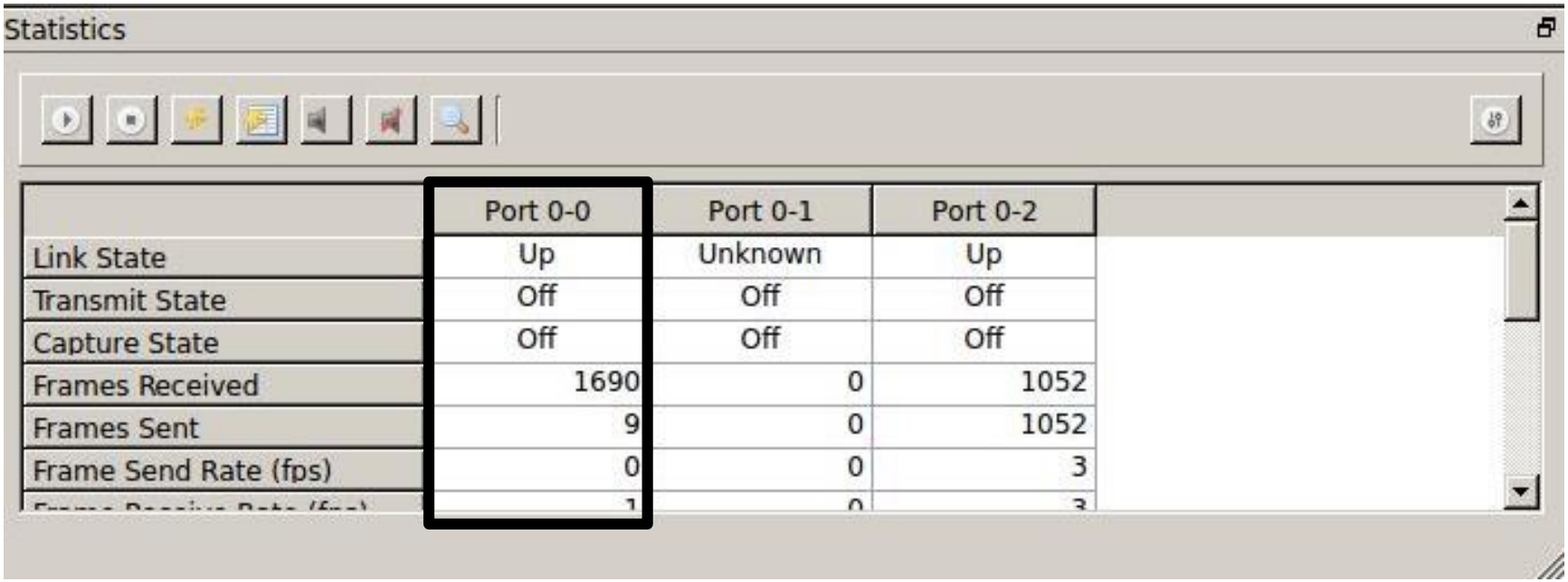
Lab 3-2: Multiple interface

- 按下OK回到主畫面



Lab 3-2: Multiple interface

- 觀察h3的Statistics列表
  - 確認Port 0-0中Frames Received欄位是否有增加



	Port 0-0	Port 0-1	Port 0-2
Link State	Up	Unknown	Up
Transmit State	Off	Off	Off
Capture State	Off	Off	Off
Frames Received	1690	0	1052
Frames Sent	9	0	1052
Frame Send Rate (fps)	0	0	3

Thank you