

# Packet Tracer - Examine NAT on a Wireless Router

## Objectives

- Examine NAT configuration on a wireless router
- Set up 1 PC to connect to a wireless router using DHCP
- Examine traffic that crosses the network using NAT

## Part 1: Examine the configuration for accessing external network.

Click **Status** menu option in the upper right-hand corner. When selected, it displays the Router sub-menu page.

- f. Scroll down the router page to the Internet connection option. The IP address assigned here is the address assigned by the ISP. If no IP address is present (0.0.0.0 appears), close the window, wait for a few seconds and try again. The wireless router is in the process of obtaining an IP address from the ISP DHCP server.

The screenshot shows a web browser window titled 'Web Browser' with the address bar set to 'http://192.168.1.1/Status\_Router.asp'. The browser displays the 'Status' page of a 'Wireless Tri-Band Home Router'. The page has a navigation menu with options: Status, Setup, Wireless, Security, Access Restrictions, Applications & Gaming, and Administration. The 'Status' page is divided into two main sections: 'Router Information' and 'Internet Connection'.

Router Information	
Firmware Version:	v0.9.7
Current Time:	Not Available
Internet MAC Address:	0040.0B2D.0601
Host Name:	
Domain Name:	

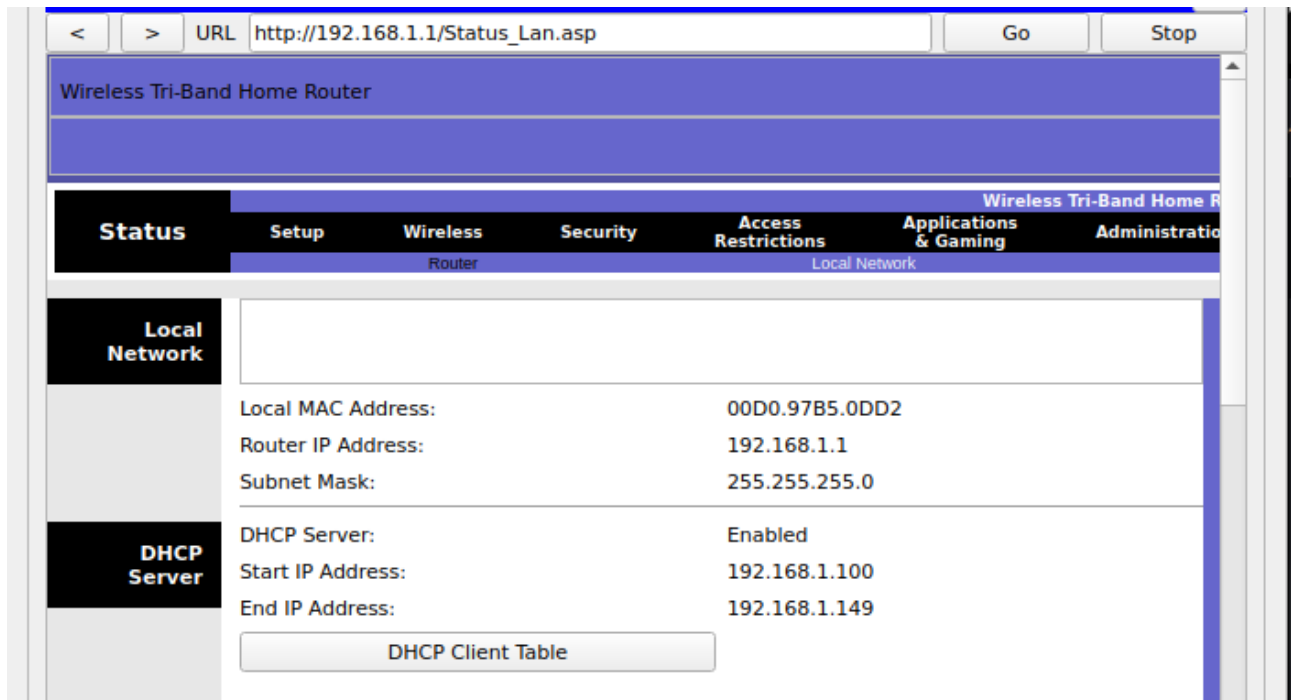
  

Internet Connection	
Connection Type:	Automatic Configuration - DHCP
Internet IP Address:	209.165.200.227
Subnet Mask:	255.255.255.224
Default Gateway:	209.165.200.225
DNS1:	209.165.200.226
DNS2:	209.165.200.226
DNS3:	
MTU:	1500
DHCP Lease Time:	1 days 0:0:0

At the bottom of the 'Internet Connection' section, there are two buttons: 'IP Address Release' and 'IP Address Renew'.

## Part 2: Examine the configurations for accessing the internal network.

- Click **Local Network** within the Status sub-menu bar.
- Scroll down to examine the Local Network information. This is the address assigned to the internal network.
- Scroll down further to examine the DHCP server information, and range of IP addresses that can be assigned to connected hosts.



Click Command Prompt to verify each device IP configuration using `ipconfig` command.

```
Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

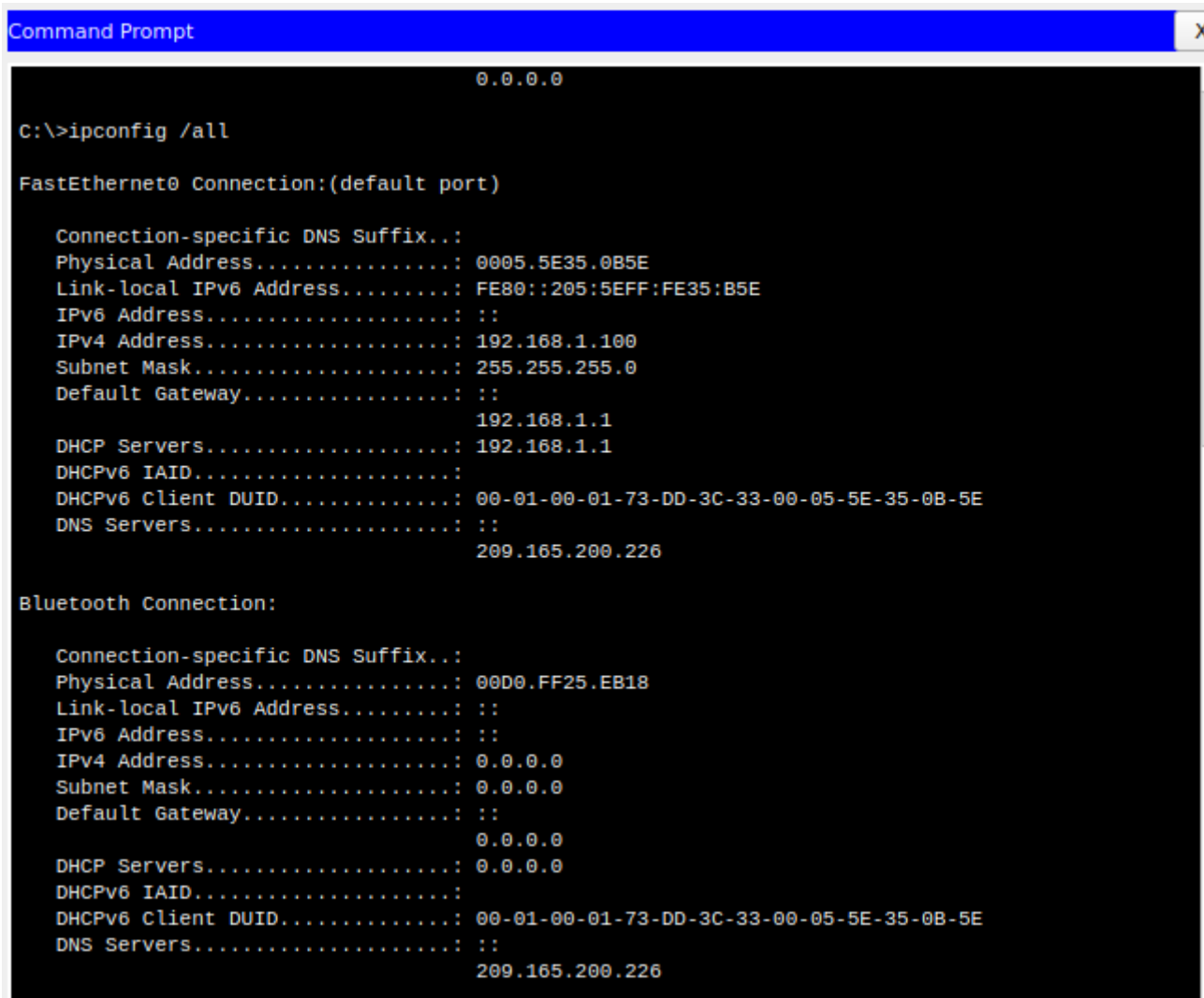
FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::205:5EFF:FE35:B5E
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 192.168.1.100
    Subnet Mask . . . . .: 255.255.255.0
    Default Gateway . . . . .: ::
                                192.168.1.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                0.0.0.0
```

See the difference with **ipconfig /all**



```
0.0.0.0

C:\>ipconfig /all

FastEthernet0 Connection:(default port)

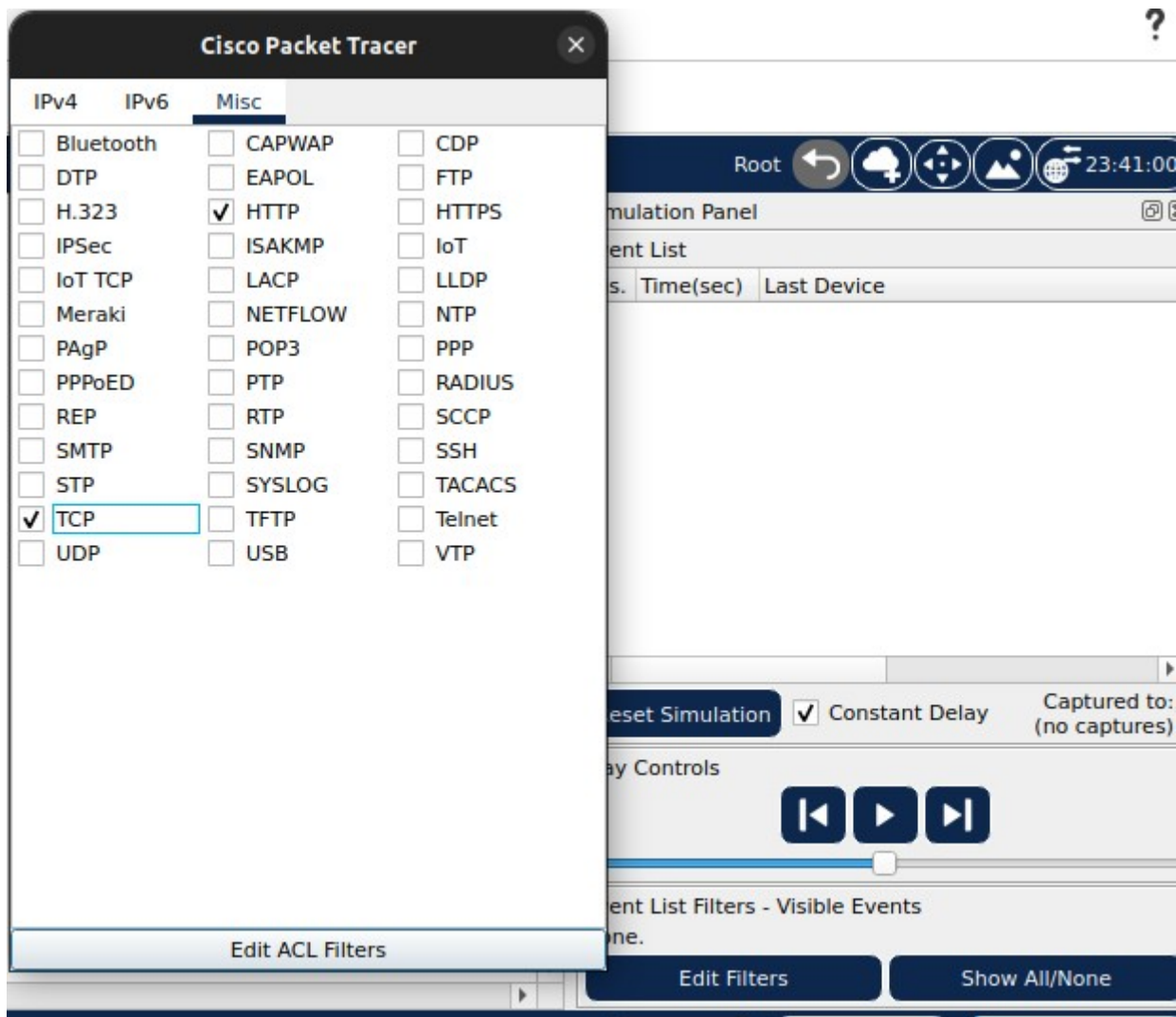
    Connection-specific DNS Suffix...:
    Physical Address. . . . .: 0005.5E35.0B5E
    Link-local IPv6 Address . . . . .: FE80::205:5EFF:FE35:B5E
    IPv6 Address. . . . .: ::
    IPv4 Address. . . . .: 192.168.1.100
    Subnet Mask. . . . .: 255.255.255.0
    Default Gateway. . . . .: ::
                                   192.168.1.1
    DHCP Servers. . . . .: 192.168.1.1
    DHCPv6 IAID. . . . .:
    DHCPv6 Client DUID. . . . .: 00-01-00-01-73-DD-3C-33-00-05-5E-35-0B-5E
    DNS Servers. . . . .: ::
                                   209.165.200.226

Bluetooth Connection:

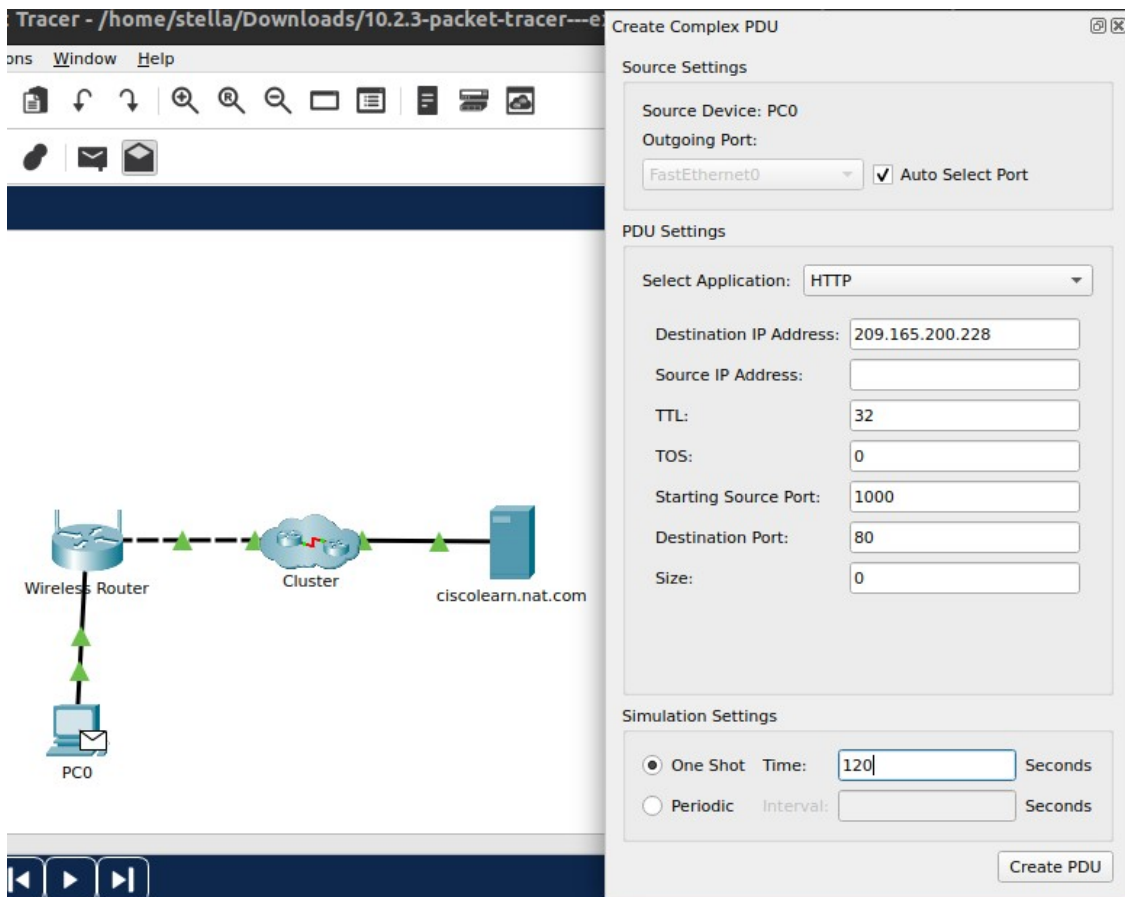
    Connection-specific DNS Suffix...:
    Physical Address. . . . .: 00D0.FF25.EB18
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address. . . . .: ::
    IPv4 Address. . . . .: 0.0.0.0
    Subnet Mask. . . . .: 0.0.0.0
    Default Gateway. . . . .: ::
                                   0.0.0.0
    DHCP Servers. . . . .: 0.0.0.0
    DHCPv6 IAID. . . . .:
    DHCPv6 Client DUID. . . . .: 00-01-00-01-73-DD-3C-33-00-05-5E-35-0B-5E
    DNS Servers. . . . .: ::
                                   209.165.200.226
```

### Part 3: View NAT translation across the wireless router.

- a. Enter Simulation mode by clicking the Simulation tab in the lower right-hand corner. The Simulation tab is located next to the Realtime tab and has a stopwatch symbol.
- b. View traffic by creating a Complex PDU in Simulation mode:
  - 1) From the Simulation Panel, click **Show All/None** to change visible events to none. Now click **Edit Filters** and under the **Misc** tab checkmark the boxes for **TCP** and **HTTP**. Close the window when done.

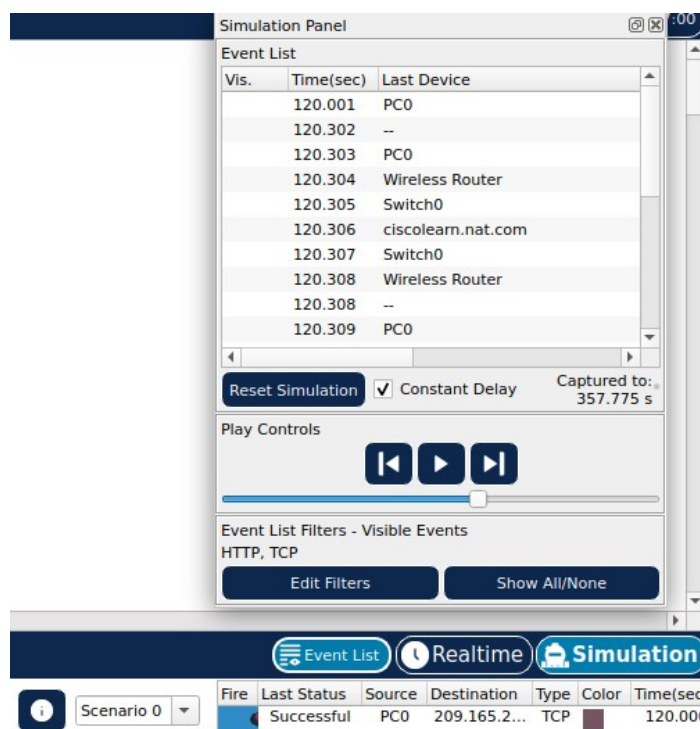


- 2) Add a Complex PDU by clicking on the opened envelope located in upper menu.
- 3) Click one of the PCs to specify it as the source.
- c. Specify the Complex PDU settings by changing the following within the complex PDU window:
  - 1) Under **PDU Settings** > Select Application should be set to: **HTTP**.
  - 2) Click **ciscolearn.nat.com** server to specify it as the destination device.
  - 3) For the Source Port, enter **1000**.
  - 4) Under Simulation Settings, select **Periodic**. Enter **120** seconds for the Interval.



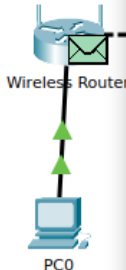
- 5) Click **Create PDU** in the Create Complex PDU window.
- d. Double click the simulation panel to unlock it from the PT window. This allows you to move the simulation panel to view the entire network topology.
- e. Observe the traffic flow by clicking **Play** in the simulation panel. Speed up the animation by sliding the play control slider to the right.

**Note:** Click **View Previous Events** when the Buffer Full message is displayed.



## Part 5: View the header information of the packets that traveled across the network.

- a. Examine the headers of the packets sent between a PC and the web server.
  - 1) In the Simulation Panel, double click the 3rd line down in the event list. This displays an envelope in the work area that represents that line.
  - 2) Click the envelope in the work area window to view the packet and header information.
- b. Click the Inbound PDU details tab. Examine the packet information for the source (SRC) IP address and destination IP address.



The screenshot displays the 'PDU Information at Device: Wireless Router' window with the 'Inbound PDU Details' tab selected. The 'EthernetII' section shows the packet structure in bytes, and the 'IP' section shows the structure in bits. The packet details are as follows:

EthernetII		Bytes	
0	8		
PREAMBLE: 101010...10		DEST ADDR: 00D0.97B5.0DD2	
SRC ADDR: 0005.5E35.0B5E	TYP E: 0x	DATA (VARIABLE LENGTH)	FCS: 0x00000000

IP		Bits	
0	8	16	24
VER: 4	IHL: 5	DSCP: 0x00	TL: 44
ID: 0x0024		FLAG S: 0x	FRAG OFFSET: 0x000
TTL: 128	PRO: 0x06	CHKSUM	
SRC IP: 192.168.1.100			
DST IP: 209.165.200.228			
DATA (VARIABLE LENGTH)			

The 'Simulation Panel' on the right shows the 'Event List' with the following entries:

Vis.	Time(sec)	Last Device	At Device	Type
	120.001	PC0	Wireless Router	
	120.302	--	PC0	
	120.303	PC0	Wireless Router	
	120.304	Wireless...	Switch0	
	120.305	Switch0	ciscolearn.nat.com	
	120.306	ciscolea...	Switch0	
	120.307	Switch0	Wireless Router	
	120.308	Wireless...	PC0	
	120.308	--	PC0	
	120.309	PC0	Wireless Router	

The 'Play Controls' section includes a 'Reset Simulation' button, a 'Constant Delay' checkbox, and a 'Captured to: 357.775 s' indicator. The 'Event List Filters' section shows 'Visible Events' as 'HTTP, TCP'.

- c. Click the Outbound PDU details tab. Examine the packet information for the source (SRC) IP address and destination IP address.

Notice the change in SRC IP address.

The screenshot displays the 'PDU Information at Device: Wireless Router' window with the 'Outbound PDU Details' tab selected. The 'EthernetII' section shows the packet structure in bytes, and the 'IP' section shows the structure in bits. The packet details are as follows:

EthernetII		Bytes	
0	8		
PREAMBLE: 101010...10		DEST ADDR: 0001.6434.459A	
SRC ADDR: 0040.0B2D.060	TYP E: 0x	DATA (VARIABLE LENGTH)	FCS: 0x00000000

IP		Bits	
0	8	16	24
VER: 4	IHL: 5	DSCP: 0x00	TL: 44
ID: 0x0024		FLAG S: 0x	FRAG OFFSET: 0x000
TTL: 127	PRO: 0x06	CHKSUM	
SRC IP: 209.165.200.227			
DST IP: 209.165.200.228			
DATA (VARIABLE LENGTH)			