

CS 305 Lab Tutorial

Lab9 eNSP & Simple network topology

Dept. Computer Science and Engineering
Southern University of Science and Technology

Simulator: eNSP



eNSP Enterprise Network Simulation Platform (eNSP) is a free, extensible, and graphic network simulation platform developed by Huawei.

- By simulating Huawei enterprise routers and switches, it demonstrates device deployment scenarios.
- eNSP can simulate large-sized networks. Users can perform trial tests and learn network technologies without using real devices.

Installation package could be found on the following URL:

<https://pan.baidu.com/s/1KGfkMHCabJ9Bwl78eHKSsw?pwd=1xi5>

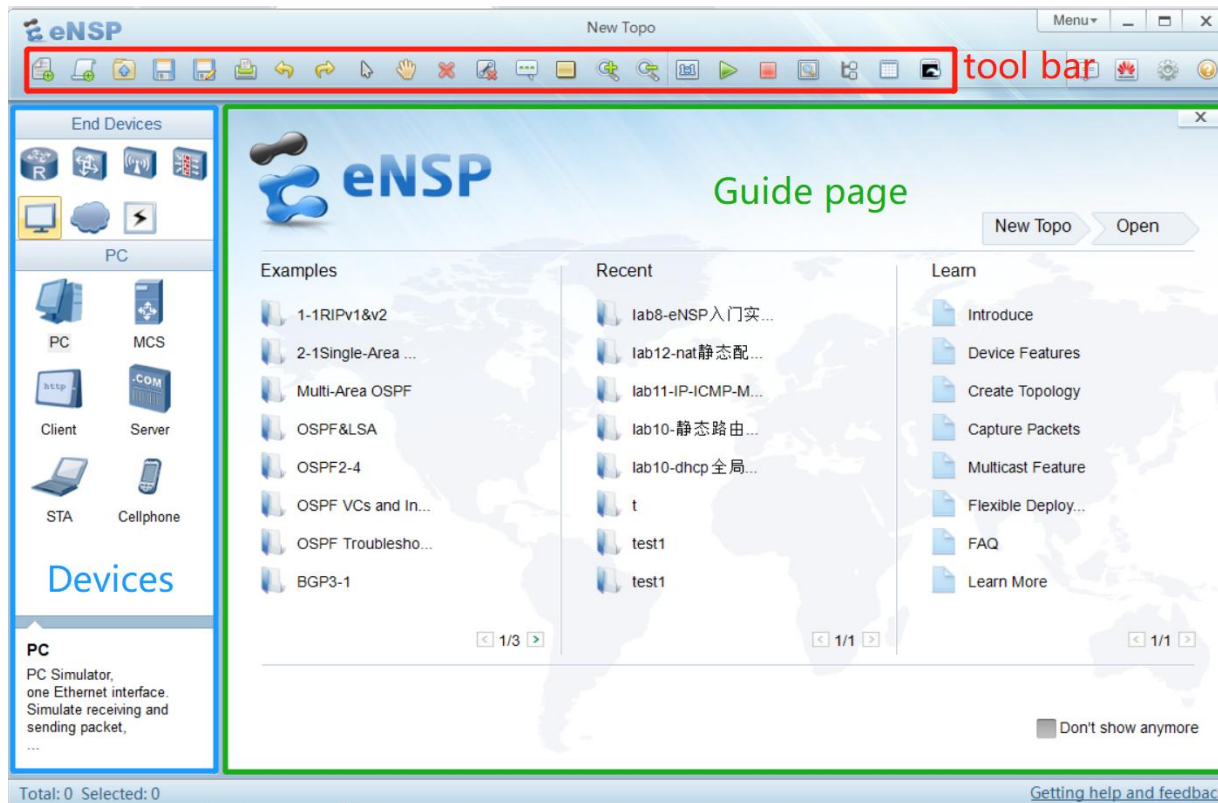
Dependence

The normal use of eNSP depends on WinPcap, Wireshark and VirtualBox. The supported versions are as follows:

Software category	Version
WinPcap	4.1.3
Wireshark	2.6.6
VirtualBox	4.2.X-5.2.X

Lecture hall #3 room# 504 is valid for the experiment on every Thursday afternoon.

First Page



1. **“tool bar”** (on the top) which lists almost all the tools in the eNSP.

2. **“Devices”** (on the left) which lists all the devices and connections that supported by eNSP

3. **“Guide page”** (on the right) includes:

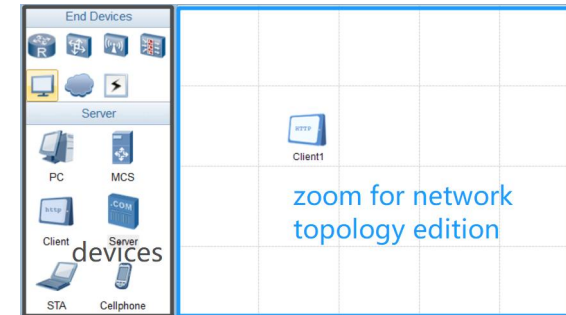
3-1. short cut of “New Topo” and “Open”

3-2. Learning guidance and Examples

Build a network and make it work

1. Build a network topology

- 1-1) new a network topo
- 1-2) add the device to the network topology
- 1-3) connect the device
- 1-4) add text for necessary comments(optional)

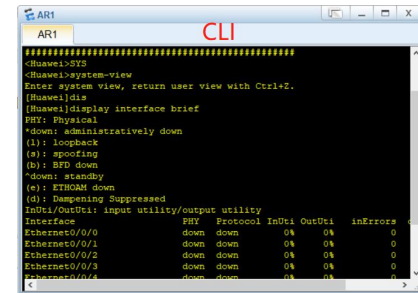
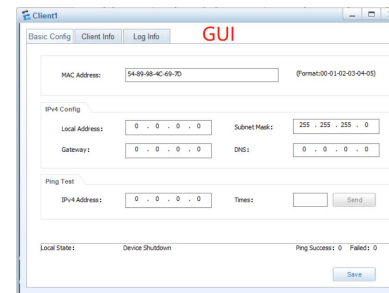


2. Start the device

3. Configure the device(GUI, CLI)

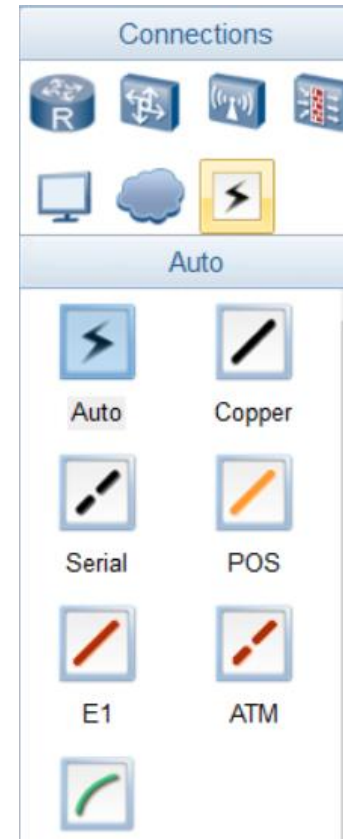
4. Verify and analysis the network

5. Save the network topology



Device & Connection

- 1. network device
 - Router
 - Switch
 - Wireless device
 - Firewall
- 2. End device
 - PC
 - Client
 - Server
 - ...
- 3. Connections
 - Auto
 - CTL
 - ...



TIPS: The device is configurable only if it has been added to the network topology; The device works only if it has been started.

Network Device

- 1. network device

- Router, Switch, Wireless device, Firewall, ...



- Two configuration ways:

- GUI : used for adding modules to the device before the device started (supported by ONLY part types of the device)

- CLI(Command Line Interface):

- most common way for setting the network device

- ONLY be used after the device is started.

- 3 setting view in the CLI: user、system、function setting

- common commands:

- » system-view

- » quit (back to previous view)

- » display (to show some information)

- » undo (used with other command, means to revoke the command)

- » "tab" key (to complete the command)

- » ? (to find the usage of the command)

```
<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]interface ethernet 0/0/0
[Huawei-Ethernet0/0/0]
```

End Device

- **2. End device (set by GUI ONLY)**



- **PC**

- with ethernet interface, console interface
 - NO application which works on application Layer
 - support basic network command

- **Client**

- with ethernet interface
 - contains DNS, HTTP, FTP client
 - NO network command

- **Server**

- with ethernet interface
 - contains DNS, HTTP, FTP server, but no DHCP and EMAIL server

- ...

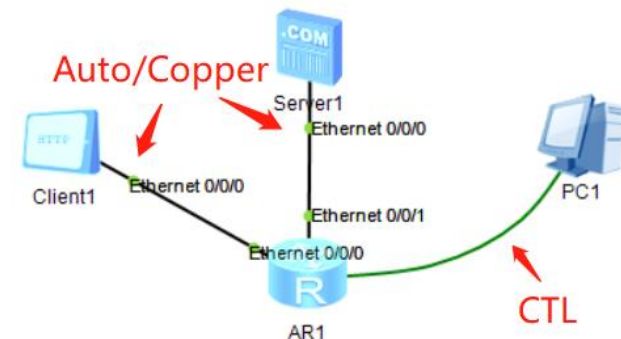
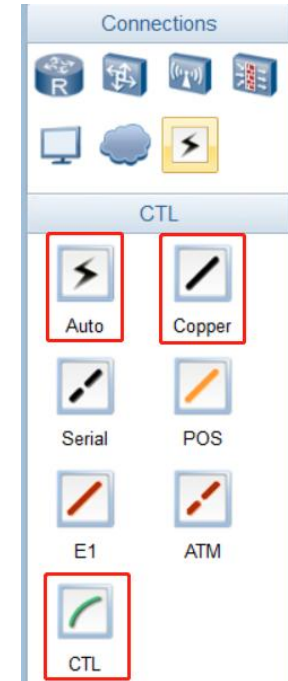


TIPS: The device is configurable only if it has been added to the network topology;
The device work only if it has been started.

Connections



- 3. Connections
 - Auto (most commonly used)
 - Automatically choose the appropriate interfaces of the device
 - Copper
 - Connect GE and Ethernet interfaces of the device
 - CTL
 - Console line between PC and device
 - In real scenarios, the computer used for configuration is connected to the network device by CTL, and the network device is configured through command line tools which works on the computer...



Demo1: a simple network(design)

Task: Build the network with two computers(PC1 and PC2) in it, PC1 connects with PC2 by the ethernet interface. Both PC1 and PC2 could send/receive packets to/from eachother.

Task analysis:

1. Device:

- ✓ PC is a better choice than Client and Server

2. Connections:

- ✓ use auto connection or copper connection

3. Settings:

- ✓ Both PC1 and PC2 are in the same network which means PC1 and PC2 share the same network ID while keep the host ID different.
 - ✓ 192.168.1.100 255.255.255.0
 - ✓ 192.168.1.200 255.255.255.0

4. Tests:

- ✓ Using “ping” to test the connect between PC1 and PC2

Demo1: a simple network(step1-4/6)

Task: Build the network with two computers(PC1 and PC2) in it, PC1 connects with PC2 by the ethernet interface. Both PC1 and PC2 could send/receive packets to/from eachother.

Task steps(1-4/6):

1. New a network topology

- Click on the tool “new topo”



2. Add device to the network topology edit page:

- Drag and drop devices to the network topology edit page

3. Make the connection in the network topology edit page:

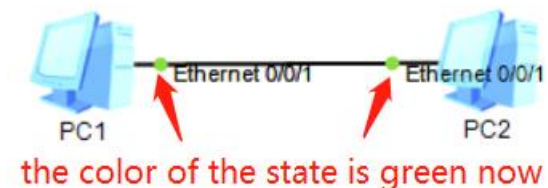
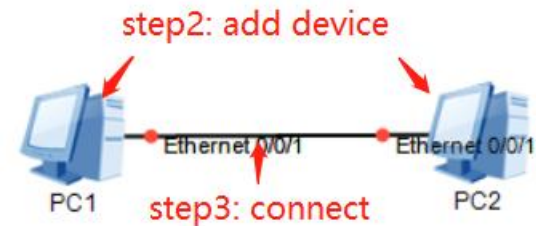
- Click on the “auto connection”, then click on PC1, finally click on PC2.

4. Start the device

- Click the device first, then click on the tool “Start Device”



After the connecting and starting, the color of the connection state would switch from red to green.



Demo1: a simple network(step5/6)

Task: Build the network with two computers(PC1 and PC2) in it, PC1 connects with PC2 by the ethernet interface. Both PC1 and PC2 could send/receive packets to/from eachother.

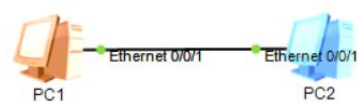
Task steps(5/6):

5. Set the devices(PC1, PC2)

- Double click on the device
- Click “Basic Config”,
- On the Basic config page, click “Static” on IPv4 Configuration, set its **IP address** and **subnet Mask**
- After setting, click on “Apply”

NOTES:

- 1) If the device use DNS service, the **DNS** MUST be set;
- 2) If the devices are in different subnet, the **Gateway** MUST be set.



PC1 configuration window (Basic Config tab):

- Host Name: PC1
- MAC Address: 54-89-98-A6-6A-B7
- IPv4 Configuration: ☒ Static (highlighted), ☐ DHCP
- IP Address: 192 . 168 . 1 . 100 (highlighted)
- Subnet Mask: 255 . 255 . 255 . 0 (highlighted)
- Gateway: 0 . 0 . 0 . 0
- DNS1: 0 . 0 . 0 . 0
- DNS2: 0 . 0 . 0 . 0
- ☐ Obtain DNS server address automatically

PC2 configuration window (Basic Config tab):

- Host Name: PC2
- MAC Address: 54-89-98-B6-5B-B7
- IPv4 Configuration: ☒ Static, ☐ DHCP
- IP Address: 192 . 168 . 1 . 200
- Subnet Mask: 255 . 255 . 255 . 0
- Gateway: 0 . 0 . 0 . 0
- DNS1: 0 . 0 . 0 . 0
- DNS2: 0 . 0 . 0 . 0
- ☐ Obtain DNS server address automatically

IPv6 Configuration (Static selected):

- IPv6 Address: ::
- Prefix Length: 128
- IPv6 Gateway: ::

Apply button (highlighted with a red arrow)

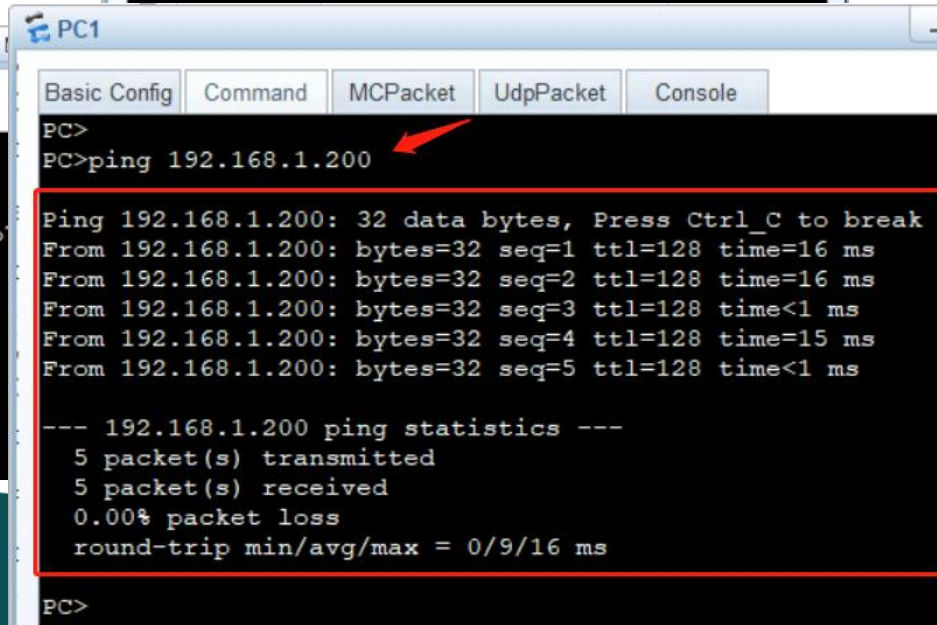
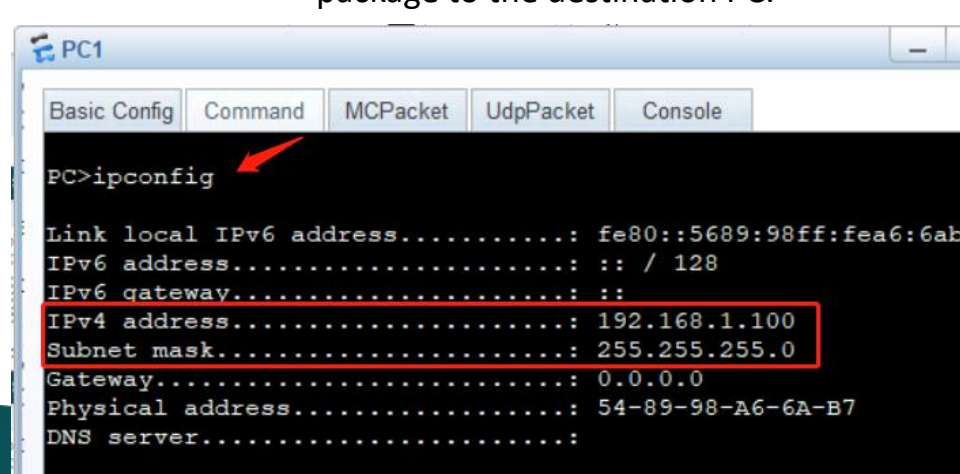
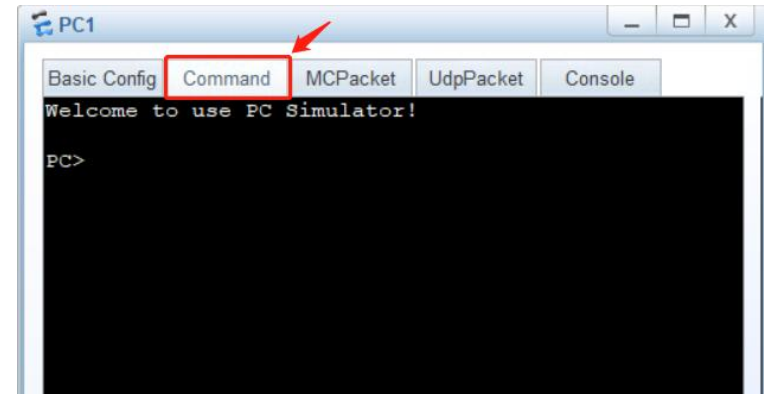
Demo1: a simple network(step6/6)

Task: Build the network with two computers(PC1 and PC2) in it, PC1 connects with PC2 by the ethernet interface. Both PC1 and PC2 could send/receive packets to/from eachother.

Task steps(6/6):

6. Test the connction between PC1 and PC2

- Double click on the PC, click “Command” page
- Check the network configuration
 - using command “**ipconfig**”
- Check if PC1 and PC2 could send/receive the packets to/from eachother.
 - using command “**ping**” to send the testing package to the destination PC.



Demo2: a simple C/S network(design)

Task: Build the network with a Client and a Web Server in it, the Client connects with the Server by the ethernet interface. Client sends a http request to Web Server, Web Server receives the request and sends the response to the Client.

Task analysis:

1. Device:

- ✓ choose **Client** and **Server**

2. Connections:

- ✓ use **auto connection** or **copper connection**

3. Settings:

- ✓ Both Client and Server are in the same network which means Client and Server share the same network ID while keep the host ID different.
 - ✓ 192.168.100.1 255.255.255.0
 - ✓ 192.168.100.2 255.255.255.0

4. Tests:

- ✓ Using “**ping**” to test the **connection** between the Client and Server
- ✓ Using **http client** to communicate the **http server**

Demo2: a simple C/S network(step1-4/6)

Task: Build the network with a Client and a Web Server in it, the Client connects with the Server by the ethernet interface. Client sends a http request to Web Server, Web Server receives the request and sends the response to the Client.

Task steps(1-4/6):

1. New a network topology

- Click on the tool “new topo”



2. Add device to the network topology edit page:

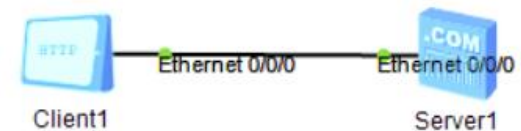
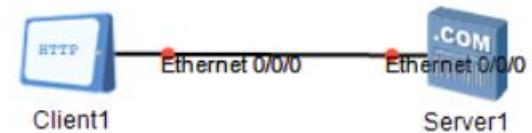
- Drag and drop devices to the network topology edit page

3. Make the connection in the network topology edit page:

- Click on the “auto connection”, then click on Client1, finally click on Server1.

4. Start the device

- Click the device fist, then click on the tool “Start Device”



After the connecting and starting, the color of the connction state would switch from red to green.

Demo2: a simple C/S network(step5.1/6)

Task: Build the network with a Client and a Web Server in it, the Client connects with the Server by the ethernet interface. Client sends a http request to Web Server, Web Server receives the request and sends the response to the Client.

Task steps(5.1/6):

5.1. Set the devices(Client)

- **Double click** on the device
- Click **“Basic Config”**,
- On the Basic config page, set its **IP address** and **subnet Mask**
- After setting, click on **“Save”**

NOTES:

- 1) If the device use DNS service, the **DNS** MUST be set;
- 2) If the devices are in different subnet, the **Gateway** MUST be set.

The screenshot shows the 'Client1' configuration window. The 'Basic Config' tab is selected. The 'IPv4 Config' section is highlighted with a red box, showing the following settings:

- Local Address: 192 . 168 . 100 . 1
- Subnet Mask: 255 . 255 . 255 . 0
- Gateway: 0 . 0 . 0 . 0
- DNS: 0 . 0 . 0 . 0

The 'Ping Test' section shows the following settings:

- IPv4 Address: 0 . 0 . 0 . 0
- Times: 4
- Send button

The 'Local State' section shows the following information:

- Device boot
- ping success: 0 failed: 0
- Save button (indicated by a red arrow)

Demo2: a simple C/S network(step5.2/6)

Task: Build the network with a Client and a Web Server in it, the Client connects with the Server by the ethernet interface. Client sends a http request to Web Server, Web Server receives the request and sends the response to the Client.

Task steps(5.2/6):

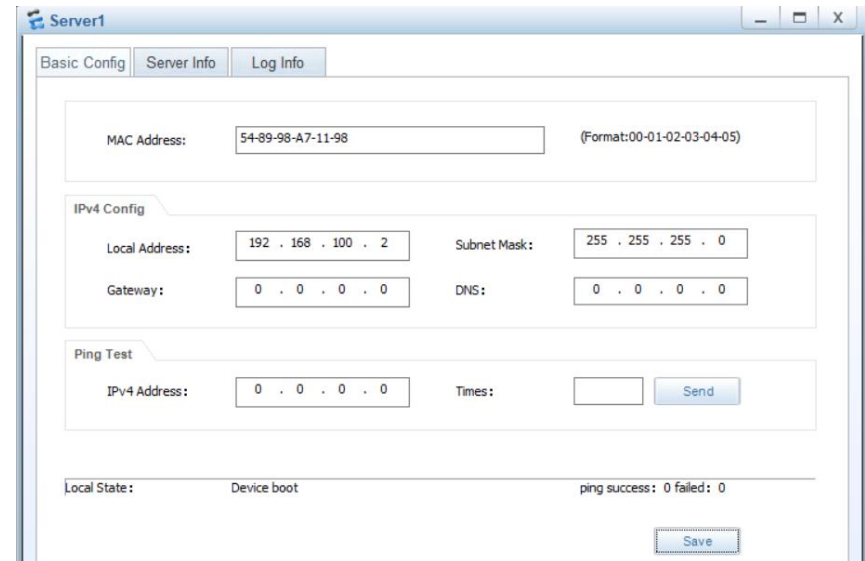
5.2. Set the devices(Server)

5.2-1) Basic Config

- **Double click** on the device
- Click **“Basic Config”**
- On the Basic config page, set its **IP address, subnet Mask ...**
- After setting, click on **“Save”**

5.2-1) Server Info

- click **“Server Info”**
- On the Server Info page, click **“HttpServer”**
- Choose a directory as **Root Path**
- click **“Start”** to start the http server



Demo2: a simple C/S network(step6/6)

Task: Build the network with a Client and a Web Server in it, the Client connects with the Server by the ethernet interface. Client sends a http request to Web Server, Web Server receives the request and sends the response to the Client.

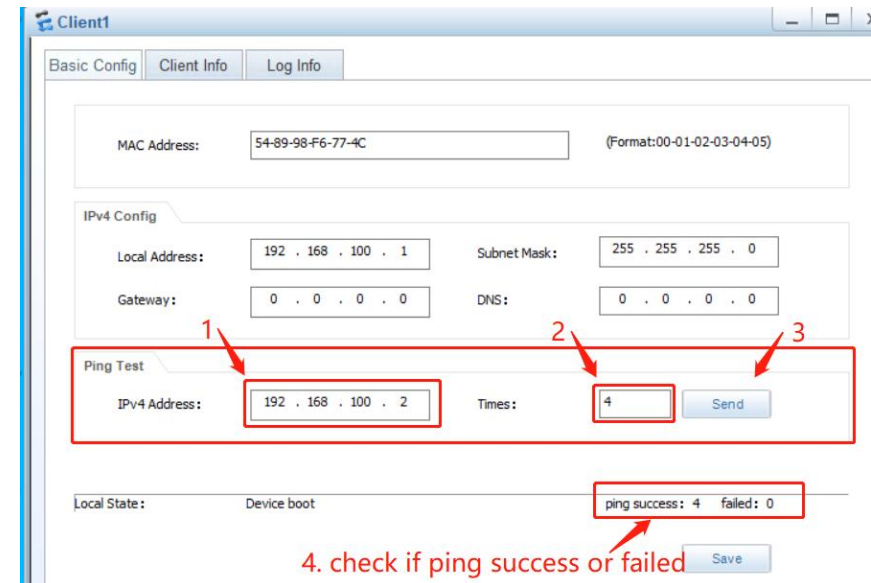
Task steps(6/6):

6.1. Test connection between Client and Server

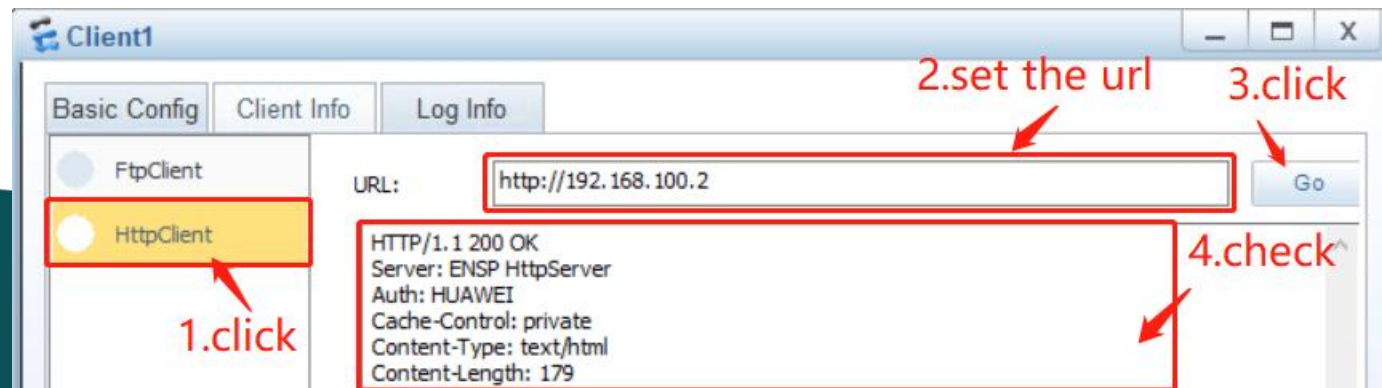
- Double click on the **Client**, click “**Basic Config**” page
 - in “**Ping Test**”, set the destination and the number of packets for testing, then click “**Send**”, check the number of “**ping success**” and “**failed**”

6.2. Test HTTP service

- Double click on the **Client**, click “**Client Info**” page
 - Click “**HttpClient**”, set the **URL of the Http Server**, then click “**GO**”, check the response info received from the Http Server.



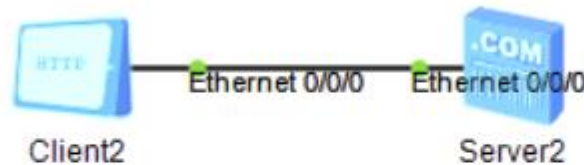
4. check if ping success or failed



Practise 9.1: Practice on eNSP

9.1 DNS and HTTP service configuration and test

- Create a network with a Client and a Server
 - Both the client and server are in the same subnet.
 - Do the basic configuration, add relevant configurations description in “text”
- Connect the two network nodes.
- Configure the Client as HTTP client.
- Configure the Server as HTTP server and DNS server.
- Test if DNS server and HTTP server work.



```
DNS and HTTP Client
IP address: ?
subnet mask: 255.0.0.0
net id: 10.0.0.0
```

```
DNS and HTTP Server
IP address: ?
subnet mask: 255.0.0.0
net id: 10.0.0.0
```

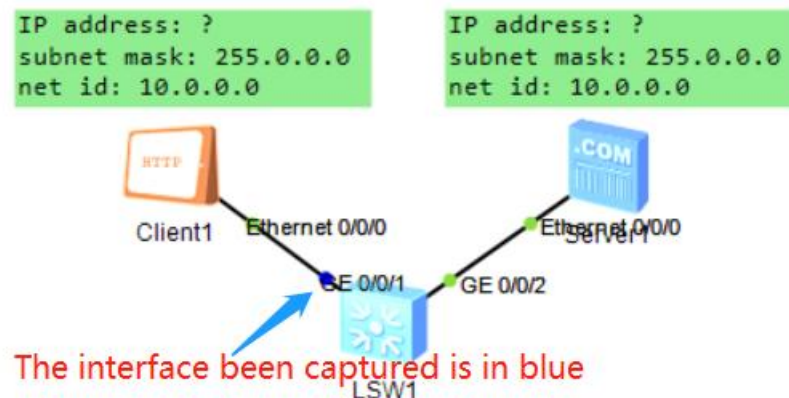
Practise 9.2: Practice on eNSP

9.2 You are encouraged to practice more on the eNSP

- Capture packets of the DNS session and HTTP session by wireshark and analysis.
 - What's the port number of DNS server?
 - Is there any TCP session? such as TCP handshake, TCP wave farewell?
 - In DNS session and HTTP session, are the ports of client same or not? 不一样

NOTES: In eNSP, the interface of network device and PC excepts Client and Server could be captured.

- While the Client and Server are in different subnet, which device need to be added to the network topology? Does the Client and the Server need to set the gateway? try to build the network and make it work.



Network device(1)

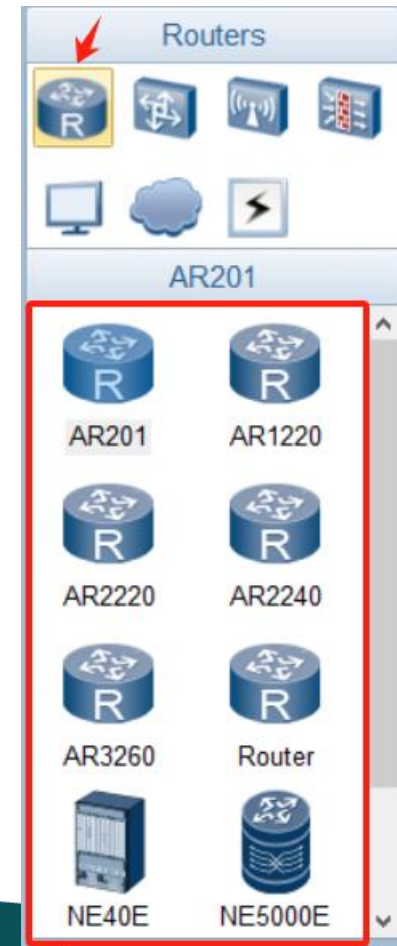
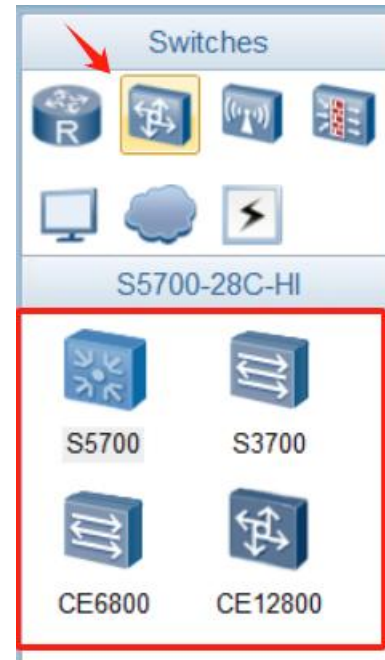
- Router, Switch, Wireless device, Firewall, ...
- Router vs Switch

➤ Router

- Connect different networks
- Route table
- Gateway
- DHCP server
-

➤ Switch

- used in a local area network
- plug and play
- Layer 2 switch vs Layer 3 switch
- VLAN
- ...



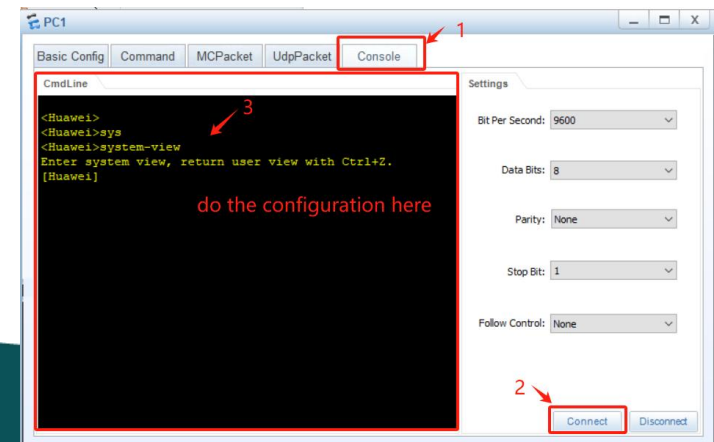
Network device(2)

How to do the configuration on the network device:

- In real work scenarios
 - Using PC to connect with the network device, then do the configure by the PC (telnet, web, console)
- On the simulator eNSP
 - configure the network device directly
 - » add the network device to network topology, start it, then double click on the device, do the configuration by CLI (Command Line Interface)
 - using PC to do the configuration
 - » connect the PC with the network device by CTL connection
 - » start both the PC and the network device
 - » open the “console” window on the PC
 - » click on the “connect”
 - » do the configuration in the “Cmd Line”



```
<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]interface ethernet 0/0/0
[Huawei-Ethernet0/0/0]
```



Demo3. two subnets(design)

Task: Build the network with two computers(PC1 and PC2) in it, PC1 and PC2 are in different network, add a network device to connect with PC1 and PC2, Configure the network to make both PC1 and PC2 could send/receive packets to/from eachother.

Task analysis:

1. Device: Router is used to connect with two different network

2. Connections: use auto connection or copper connection

3. Settings:

✓ PC1 and PC2 are in the different network which means the network ID of PC1 and PC2 are different.

✓ PC1: IPv4: 192.168.1.100 subnet mask:255.255.255.0 Gateway: 192.168.1.x

✓ PC2: IPv4: 192.168.2.100 subnet mask:255.255.255.0 Gateway: 192.168.2.y

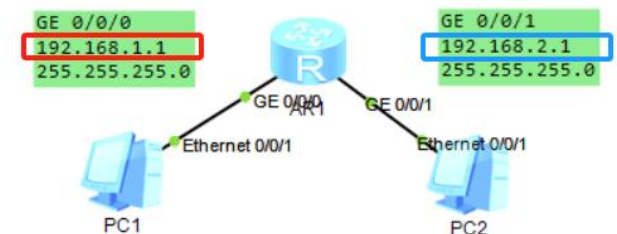
✓ Router

✓ interface A connect with PC1, its IPv4 address: 192.168.1.x

✓ interface B connect with PC2, its IPv4 address: 192.168.2.y

4. Tests:

✓ Using “ping” to test the connect between PC1 and PC2



Demo3. two subnets

(setting on network device)-1

Step: The configuration on PC are same as demo1 (here Gateway MUST be set)

While configure the router A1, start it first, then double click on it, do the following configuration by CLI

Configure the route

1. using cmd “**system-view**” to switch the “user view” to “system view”

2. using cmd “**interface GigabitEthernet 0/0/0**” to switch to the “function configuration view” of interface GE0/0/0

```
AR1
The device is running!

<Huawei>sys
<Huawei>system-view 1
Enter system view, return user view with Ctrl+Z.
[Huawei]interface gi
[Huawei]interface GigabitEthernet 0/0/0 2
[Huawei-GigabitEthernet0/0/0]ip address 192.168.1.1 24 3
[Huawei-GigabitEthernet0/0/0]
Nov  8 2023 21:09:36-08:00 Huawei %01IFNET/4/LINK_STATE(1)[0]:The line protocol
IP on the interface GigabitEthernet0/0/0 has entered the UP state.
```

3. using cmd “**ip address 192.168.1.1 24**” to set the IPv4 address of the interface GigabitEthernet 0/0/0 as 192.168.1.1, its subnet mask is 255.255.255.0 (there are 24 1-bit1s in the subnet mask)



Demo3. two subnets

(setting on network device -2)

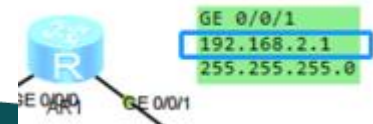
Step: in the CLI, continue to set the interface GE 0/0/1

Configure the router
1. using cmd “**quit**” to switch from “function configuration view” to “system view”

2. using cmd “**interface GigabitEthernet 0/0/1**” to switch to the function configuration view of interface GE0/0/1

```
[Huawei-GigabitEthernet0/0/0]dis this
[V200R003C00]
#
interface GigabitEthernet0/0/0
 ip address 192.168.1.1 255.255.255.0
#
return
[Huawei-GigabitEthernet0/0/0]quit 1
[Huawei]int g 0/0/1 2
[Huawei-GigabitEthernet0/0/1]ip address 192.168.2.1 24 3
Nov  8 2023 21:10:32-08:00 Huawei %01IFNET/4/LINK_STATE(1)[1]:The line protocol
IP on the interface GigabitEthernet0/0/1 has entered the UP state.
[Huawei-GigabitEthernet0/0/1]dis this
[V200R003C00]
#
interface GigabitEthernet0/0/1
 ip address 192.168.2.1 255.255.255.0
#
return
```

3. using cmd “**ip address 192.168.2.1 24**” to set the IPv4 address of the interface GigabitEthernet 0/0/1 as 192.168.2.1, its subnet mask is 255.255.255.0 (there are 24 1-bit1s in the subnet mask)



Demo3. two subnets (test)

```
PC1
Basic Config Command MCPacket UdpPacket Console
PC>ipconfig
Link local IPv6 address.....: fe80::5689:98ff:fe09:63b2
IPv6 address.....: :: / 128
IPv6 gateway.....: ::
IPv4 address.....: 192.168.1.100
Subnet mask.....: 255.255.255.0
Gateway.....: 192.168.1.1
Physical address.....: 54-89-98-09-63-B2
DNS server.....:

PC>ping 192.168.2.100

Ping 192.168.2.100: 32 data bytes, Press Ctrl_C to break
Request timeout!
From 192.168.2.100: bytes=32 seq=2 ttl=127 time=15 ms
From 192.168.2.100: bytes=32 seq=3 ttl=127 time=16 ms
From 192.168.2.100: bytes=32 seq=4 ttl=127 time=15 ms
From 192.168.2.100: bytes=32 seq=5 ttl=127 time=16 ms

--- 192.168.2.100 ping statistics ---
5 packet(s) transmitted
4 packet(s) received
20.00% packet loss
round-trip min/avg/max = 0/15/16 ms
```

```
PC2
Basic Config Command MCPacket UdpPacket Console
PC>ipconfig
Link local IPv6 address.....: fe80::5689:98ff:fe28:1c4b
IPv6 address.....: :: / 128
IPv6 gateway.....: ::
IPv4 address.....: 192.168.2.100
Subnet mask.....: 255.255.255.0
Gateway.....: 192.168.2.1
Physical address.....: 54-89-98-28-1C-4B
DNS server.....:

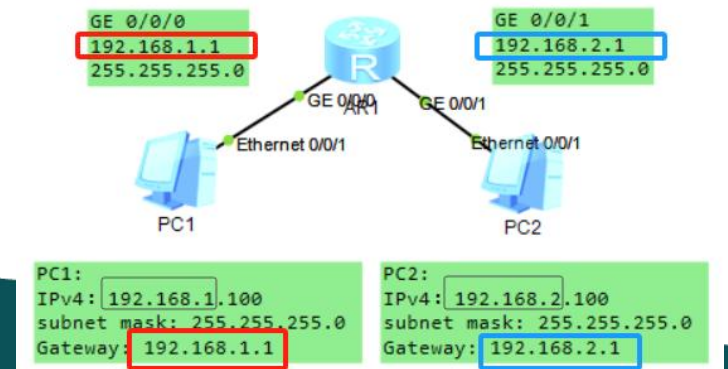
PC>ping 192.168.1.100

Ping 192.168.1.100: 32 data bytes, Press Ctrl_C to break
From 192.168.1.100: bytes=32 seq=1 ttl=127 time=16 ms
From 192.168.1.100: bytes=32 seq=2 ttl=127 time=16 ms
From 192.168.1.100: bytes=32 seq=3 ttl=127 time=31 ms
From 192.168.1.100: bytes=32 seq=4 ttl=127 time=15 ms
From 192.168.1.100: bytes=32 seq=5 ttl=127 time=16 ms

--- 192.168.1.100 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 15/18/31 ms
```

Test the connction between PC1 and PC2

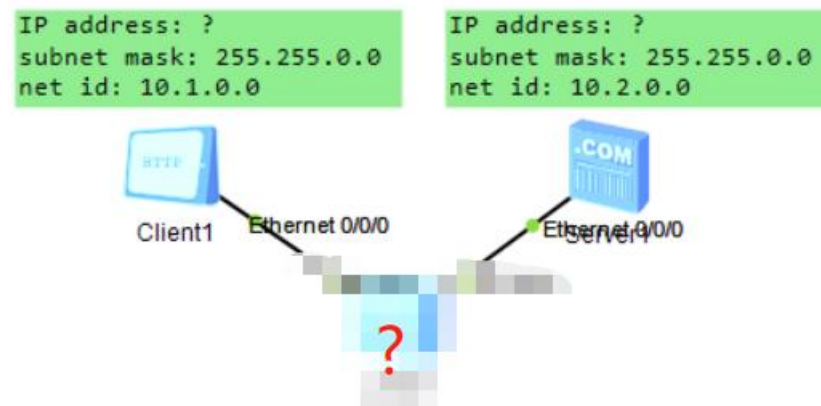
- Double click on the PC, click “Command” page
- Check the network configuration: “ipconfig”
- Check if PC1 and PC2 could send/receive the packets to/from eachother. “ping”



Practise 9.3: Practice on eNSP

9.3 DNS and HTTP service configuration and test

- Create a network with a Client and a Server,
 - The client and server are in the different subnet.
 - Do the basic configuration, add relevant configurations description in “text”
- Configure C/S
 - configure the Client as HTTP client. Configure the Server as HTTP server and DNS server.
- Test if DNS server and HTTP server work.
- Capture packets of the DNS session and HTTP session by wireshark and analysis.
 - What's the port number of DNS server?
 - Is there any TCP session? such as TCP handshake, TCP wave farewell?
 - In DNS session and HTTP session, are the ports of client same or not?

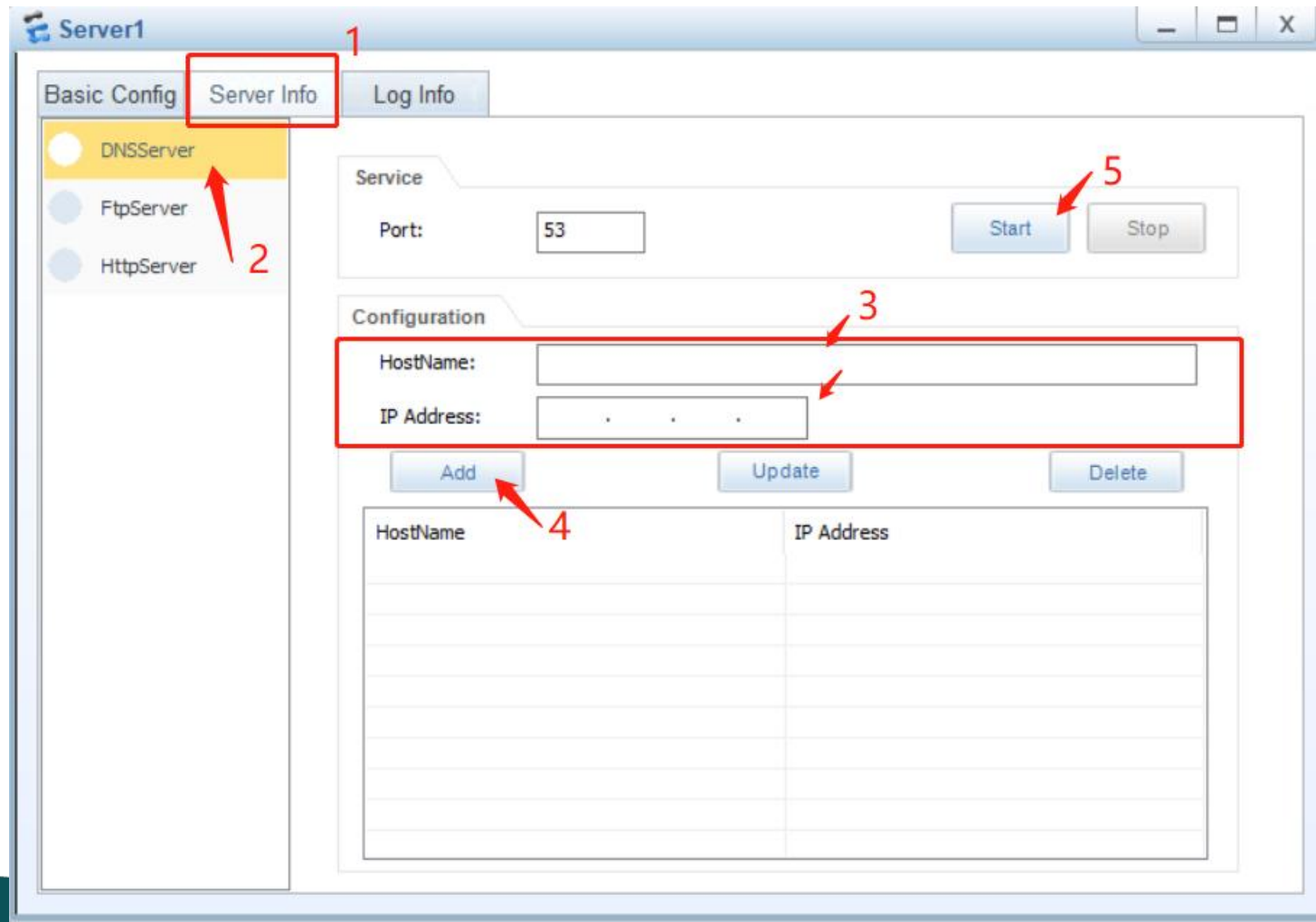


Tips summary on eNSP

- 1. All devices need to be started before they can be configured
- 2. Cannot directly capture packets on clients and servers
- 3. If the computer on which eNSP is installed is set to hibernate, please turn off hibernation, otherwise it will affect the use of eNSP.
- 4. It is recommended to add necessary comments to the network topology to view the basic configuration of related devices.
- 5. Save in a timely manner, especially the configuration on network devices.

```
<Huawei>
<Huawei>save
The current configuration will be written to the device.
Are you sure to continue? (y/n)[n]:y
It will take several minutes to save configuration file, please wait.....
Configuration file had been saved successfully
Note: The configuration file will take effect after being activated
<Huawei>
```

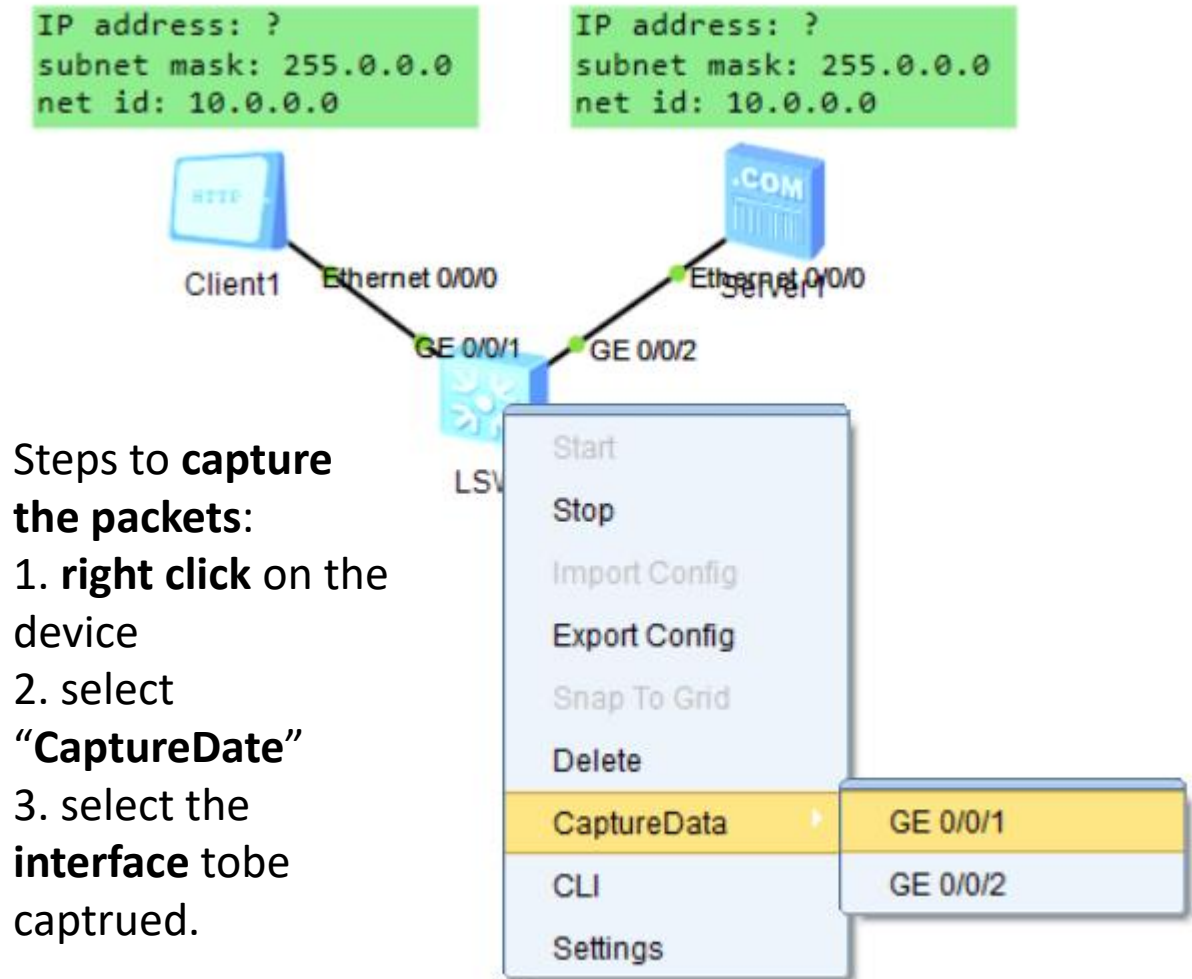

Tips1: set and start DNSServer in eNSP



Tips2: capture packets in eNSP(1)

NOTES:

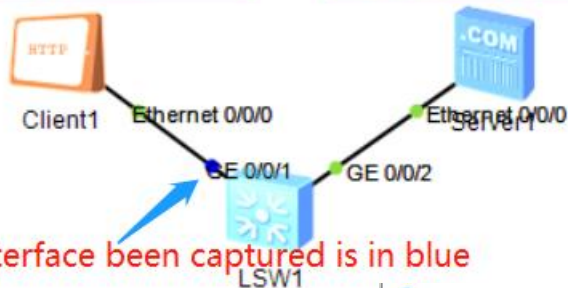
1. In eNSP, the interface of network device and PC excepts **Client and Server** could be captured.
2. For common usage, **switch is plug and play**, which means while it is added to the topology and started, it could work without setting.



Tips2: capture packets in eNSP(2)

IP address: ?
subnet mask: 255.0.0.0
net id: 10.0.0.0

IP address: ?
subnet mask: 255.0.0.0
net id: 10.0.0.0



The interface been captured is in blue

File(F) 编辑(E) 视图(V) 跳转(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(T) 帮助(H)

http

No.	Time	Source	Protocol	Destination	Length	Info
✓ 27	27.781000	192.168.100.1	HTTP	192.168.100.2	213	GET / HTTP/1.1 Continuation
28	27.797000	192.168.100.2	HTTP	192.168.100.1	361	HTTP/1.1 200 OK (text/html)

< >

> Frame 28: 361 bytes on wire (2888 bits), 361 bytes captured on interface 0/0/1, 361 bytes from 192.168.100.2 to 192.168.100.1 on interface 0/0/1

> Ethernet II, Src: HuaweiTe_a7:11:98 (54:89:98:a7:11:98), Dst: 192.168.100.1 (08:00:27:00:00:00)

> Internet Protocol Version 4, Src: 192.168.100.2, Dst: 192.168.100.1

> Transmission Control Protocol, Src Port: 80, Dst Port: 80

> Hypertext Transfer Protocol

> HTTP/1.1 200 OK\r\n

Server: ENSP HttpServer\r\n

Auth: HUAWEI\r\n

Cache-Control: private\r\n

Content-Type: text/html\r\n

> Content-Length: 179\r\n

\r\n

[HTTP response 1/1]

[Time since request: 0.016000000 seconds]

[Request in frame: 27]

[Request URI: http://192.168.100.2/]

File Data: 179 bytes

> Line-based text data: text/html (10 lines)

0000	54 89 98 f6 77 4c 54 89	98 a7 11 98 08 00 45 00
0010	01 5b 00 06 00 00 ff 06	71 42 c0 a8 64 02 c0 a8
0020	64 01 00 50 08 03 00 00	22 4d 00 00 1a 15 50 18
0030	1f 61 a8 f5 00 00 48 54	54 50 2f 31 2e 31 20 32
0040	30 30 20 4f 4b 0d 0a 53	65 72 76 65 72 3a 20 45
0050	4e 53 50 20 48 74 74 70	53 65 72 76 65 72 0d 0a
0060	41 75 74 68 3a 20 48 55	41 57 45 49 0d 0a 43 61
0070	63 68 65 2d 43 6f 6e 74	72 6f 6c 3a 20 70 72 69
0080	76 61 74 65 0d 0a 43 6f	6e 74 65 6e 74 2d 54 79
0090	70 65 3a 20 74 65 78 74	2f 68 74 6d 6c 0d 0a 43
00a0	6f 6e 74 65 6e 74 2d 4c	65 6e 67 74 68 3a 20 31
00b0	37 39 0d 0a 0d 0a 3c 68	74 6d 6c 20 78 6d 6c 6e
00c0	73 3d 22 68 74 74 70 3a	2f 2f 77 77 77 2e 77 33
00d0	2e 6f 72 67 2f 31 39 39	39 2f 78 68 74 6d 6c 22
00e0	20 3e 0d 0a 3c 68 65 61	64 3e 0d 0a 3c 74 69 74
00f0	6c 65 3e bb b6 d3 ad b7	c3 ce ca b6 e0 d3 f2 c3
0100	fb 48 54 54 50 b7 fe ce	f1 c6 f7 3c 2f 74 69 74
0110	6c 65 3e 0d 0a 3c 2f 68	65 61 64 3e 0d 0a 3c 62
0120	6f 64 79 3e 0d 0a 3c 70	3e bb b6 d3 ad b7 c3 ce
0130	ca b6 e0 d3 f2 c3 fb 48	54 54 50 b7 fe ce f1 c6