



TRƯỜNG ĐẠI HỌC CÔNG NGHỆ THÔNG TIN - ĐHQG-HCM
KHOA MẠNG MÁY TÍNH VÀ TRUYỀN THÔNG

NETWORK ADDRESS TRANSLATION

QUẢN TRỊ MẠNG VÀ HỆ THỐNG
Networks and Systems Administration

MSc. Trần Thị Dung



Content

- NAT Overview
- NAT Operation

○ Private IP address

Network Connection Details	
Network Connection Details:	
Property	Value
Connection-specific DN...	Home
Description	Intel(R) Dual Band Wireless-AC 8260
Physical Address	E4-B3-18-92-30-88
DHCP Enabled	Yes
IPv4 Address	192.168.1.9
IPv4 Subnet Mask	255.255.255.0
Lease Obtained	Saturday, November 13, 2021 9:23:57
Lease Expires	Wednesday, November 17, 2021 9:35
IPv4 Default Gateway	192.168.1.1
IPv4 DHCP Server	192.168.1.1
IPv4 DNS Servers	123.26.26.26
	123.23.23.23

○ Public IP address

what is my ip

Tất cả Video Sách Tin tức Thêm Công cụ

Khoảng 7.050.000.000 kết quả (0,39 giây)

What's my IP

14.227.78.214

Your public IP address

→ Learn more about IP addresses

- Network Address Translation - NAT
- **Case 1:** All devices in local network share one or many public IPv4 addresses to access Internet
- **Case 2:** The Internet client wants to connect to server behind NAT with public IP address

Content

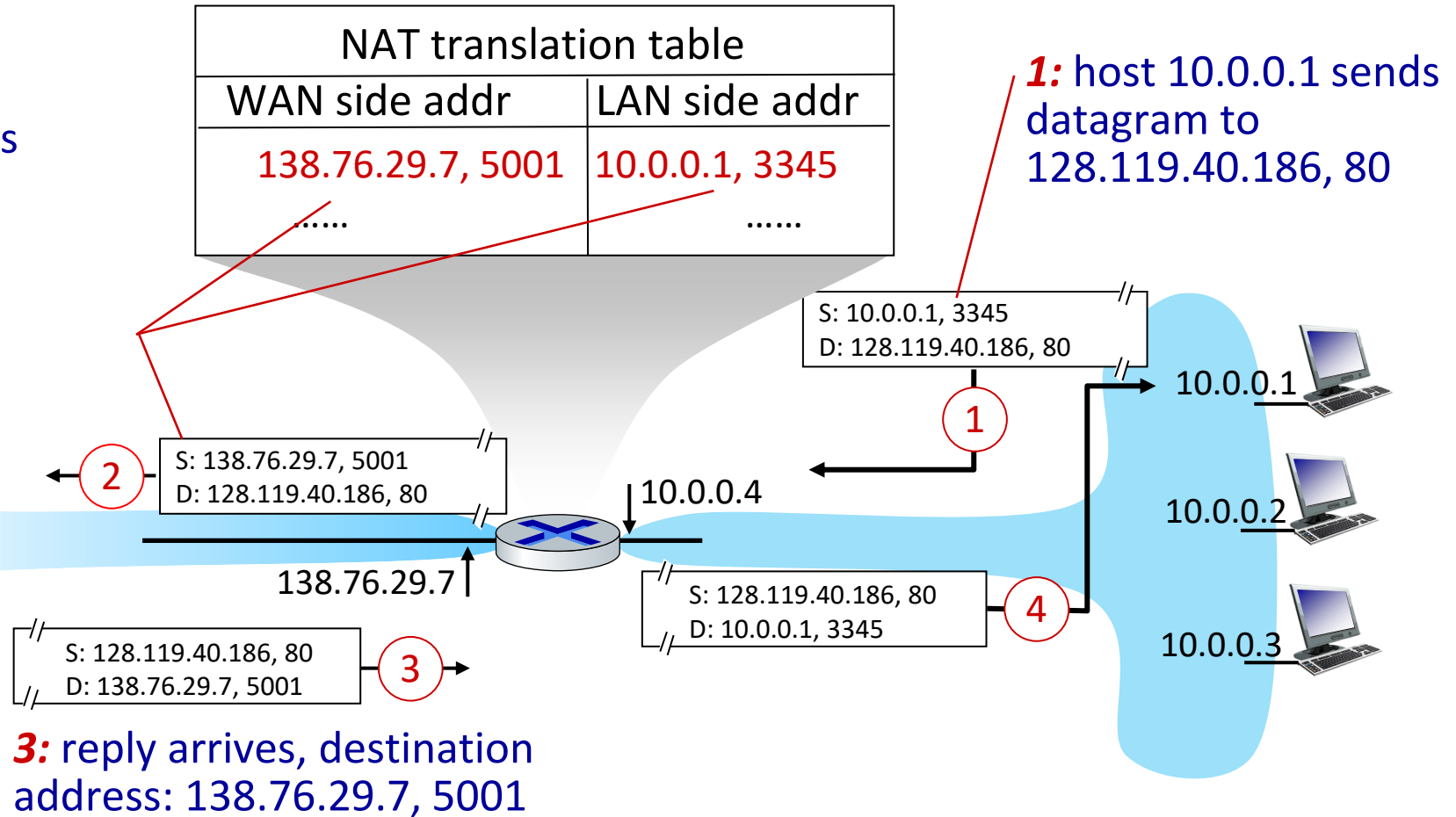
- NAT Overview
- **NAT Operation**

NAT operation

- Case 1: All devices in local network share one or many public IPv4 addresses to access Internet

NAT Operation

2: NAT router changes datagram source address from 10.0.0.1, 3345 to 138.76.29.7, 5001, updates table



NAT Operation

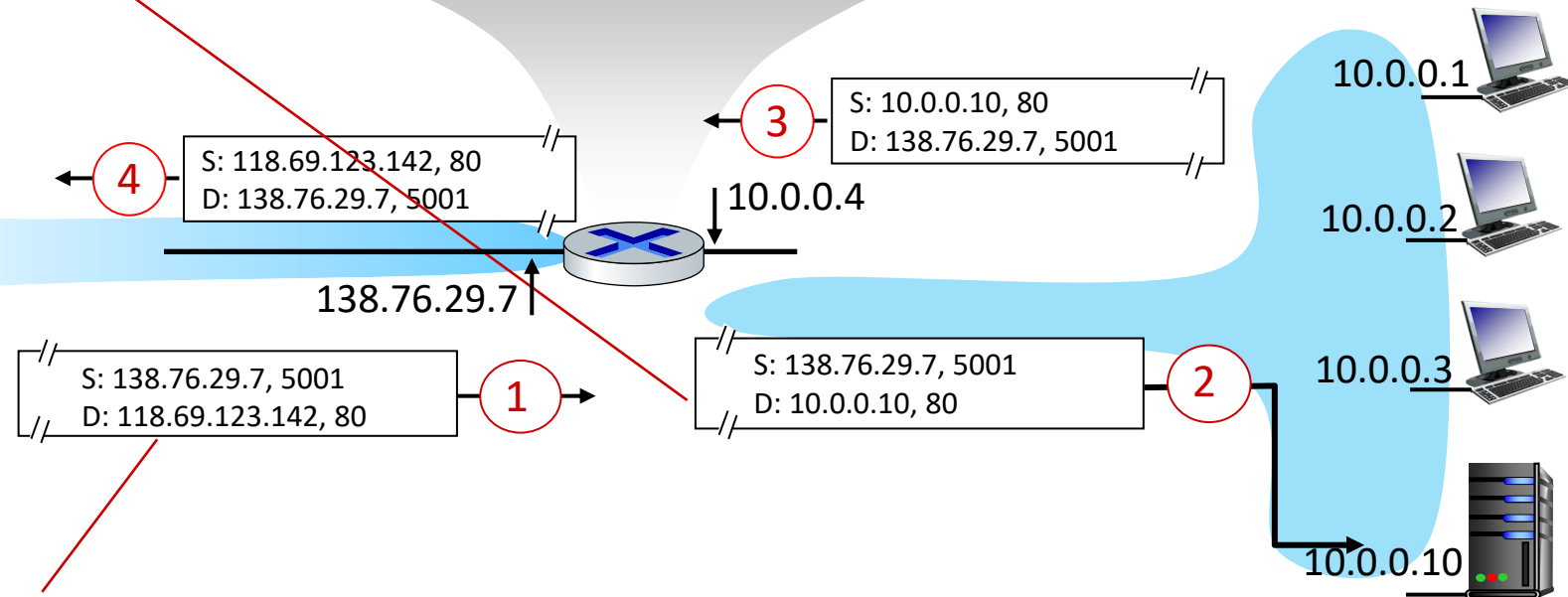
- Case 2: The Internet client wants to connect to server behind NAT with public IP address

NAT Operation

2: NAT router changes datagram destination address from 118.69.123.142, 80 to 10.0.0.10, 80, that is pre-defined in the table

NAT translation table	
WAN side addr	LAN side addr
118.69.123.142, 80	10.0.0.10, 80
.....

3: server replies, source address: 10.0.0.10, 80



1: Client 138.76.29.7 sends datagram to 118.69.123.142, 80

NAT Forwarding – Port Forwarding

The image shows the TP-Link router web interface. The top navigation bar includes 'Quick Setup', 'Basic', and 'Advanced' (highlighted with a red box). The left sidebar contains 'Status' (highlighted with a red box), 'Network', 'Operation Mode', 'Wireless', 'Guest Network', and 'USB Settings'. The main content area is divided into two panels: 'Internet' and 'Wireless'.

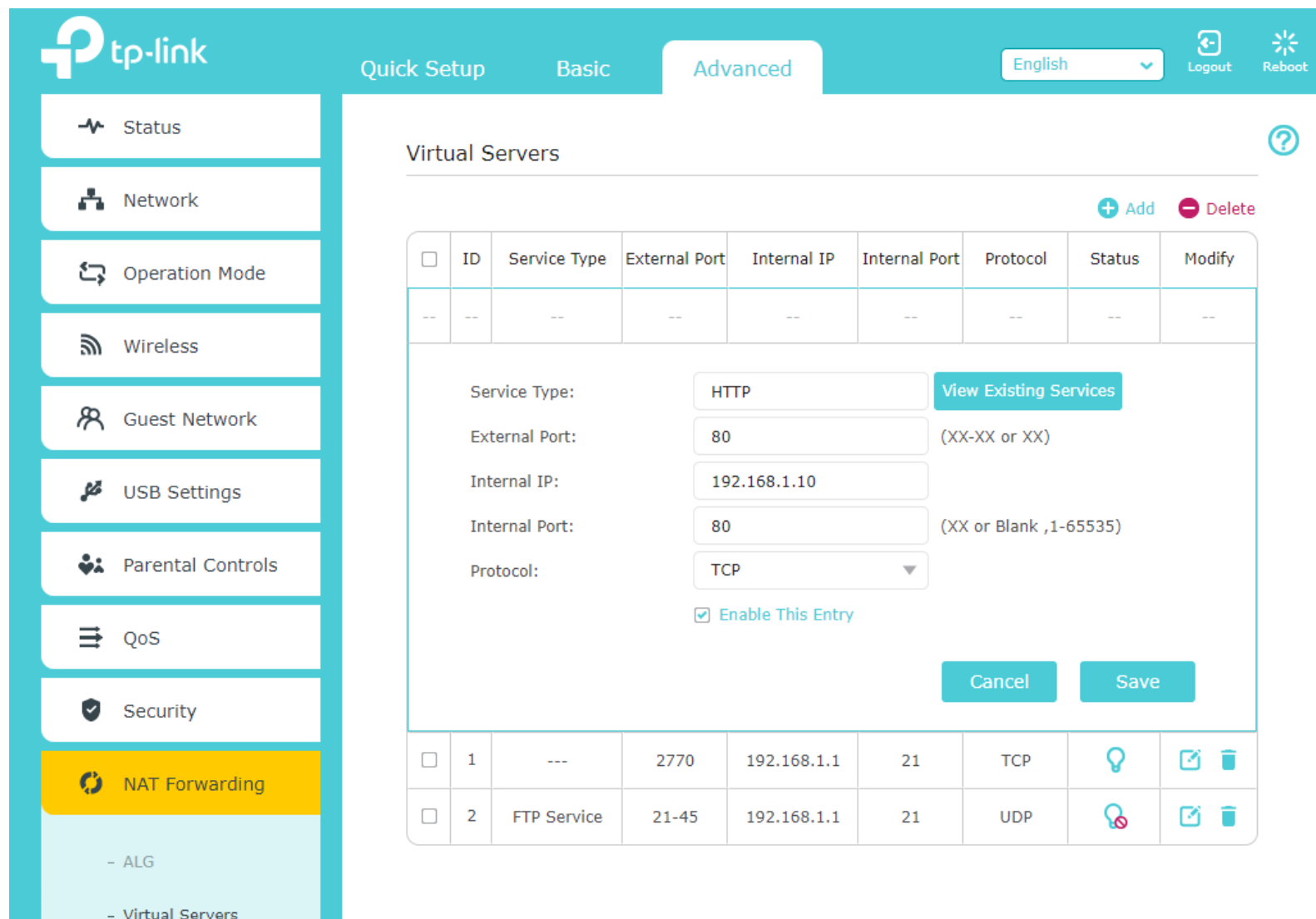
Internet Settings (IPv4):

Parameter	Value
MAC Address	C4-E9-83-EF-59-3D
IP Address	218.18.232.154
Subnet Mask	255.255.255.0
Default Gateway	218.18.232.1
Primary DNS	192.168.66.25
Secondary DNS	192.168.66.1
Connection Type	Dynamic IP

Wireless Settings (2.4GHz):

Parameter	Value
Network Name (SSID)	TP-Link_593D
Wireless Radio	On
Mode	802.11b/g/n mixed
Channel Width	Auto
Channel	Auto (Current Channel 6)
MAC Address	C4-E9-83-EF-59-3C
WDS Status	Disabled

NAT Forwarding – Port Forwarding



The image shows the TP-Link web interface for configuring NAT Forwarding. The left sidebar contains navigation links: Status, Network, Operation Mode, Wireless, Guest Network, USB Settings, Parental Controls, QoS, Security, NAT Forwarding (highlighted), and sub-options for NAT Forwarding: - ALG and - Virtual Servers. The main content area is titled 'Virtual Servers' and includes a table with columns: ID, Service Type, External Port, Internal IP, Internal Port, Protocol, Status, and Modify. Below the table is a form for adding a new service type, with fields for Service Type (HTTP), External Port (80), Internal IP (192.168.1.10), Internal Port (80), and Protocol (TCP). The form also includes a checkbox for 'Enable This Entry' and buttons for 'Cancel' and 'Save'. The table shows two existing entries: Entry 1 (ID 1, Service Type ---, External Port 2770, Internal IP 192.168.1.1, Internal Port 21, Protocol TCP) and Entry 2 (ID 2, Service Type FTP Service, External Port 21-45, Internal IP 192.168.1.1, Internal Port 21, Protocol UDP).

tp-link Quick Setup Basic **Advanced** English Logout Reboot

Status Network Operation Mode Wireless Guest Network USB Settings Parental Controls QoS Security

NAT Forwarding

- ALG
- Virtual Servers

Virtual Servers

+ Add - Delete

<input type="checkbox"/>	ID	Service Type	External Port	Internal IP	Internal Port	Protocol	Status	Modify
<input type="checkbox"/>	--	--	--	--	--	--	--	--

Service Type: HTTP View Existing Services

External Port: 80 (XX-XX or XX)

Internal IP: 192.168.1.10

Internal Port: 80 (XX or Blank ,1-65535)

Protocol: TCP

☒ Enable This Entry

Cancel Save

<input type="checkbox"/>	1	---	2770	192.168.1.1	21	TCP		
<input type="checkbox"/>	2	FTP Service	21-45	192.168.1.1	21	UDP		