Lesson 06-03: IPv4 and NAT

CS 356 Computer Networks

Mikyung Han

mhan@cs.utexas.edu

Internet Reference Model

Example Protocols		Responsible for
FTP, HTTP, SMTP	Application	application specific needs
TCP, UDP	Transport	process to process data transfer
IP	Network	host to host data transfer across different network
Ethernet, WiFi	Link	data transfer between physically adjacent nodes
802.3 PHY	Physical	bit-by-bit or symbol-by-symbol delivery

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Outline

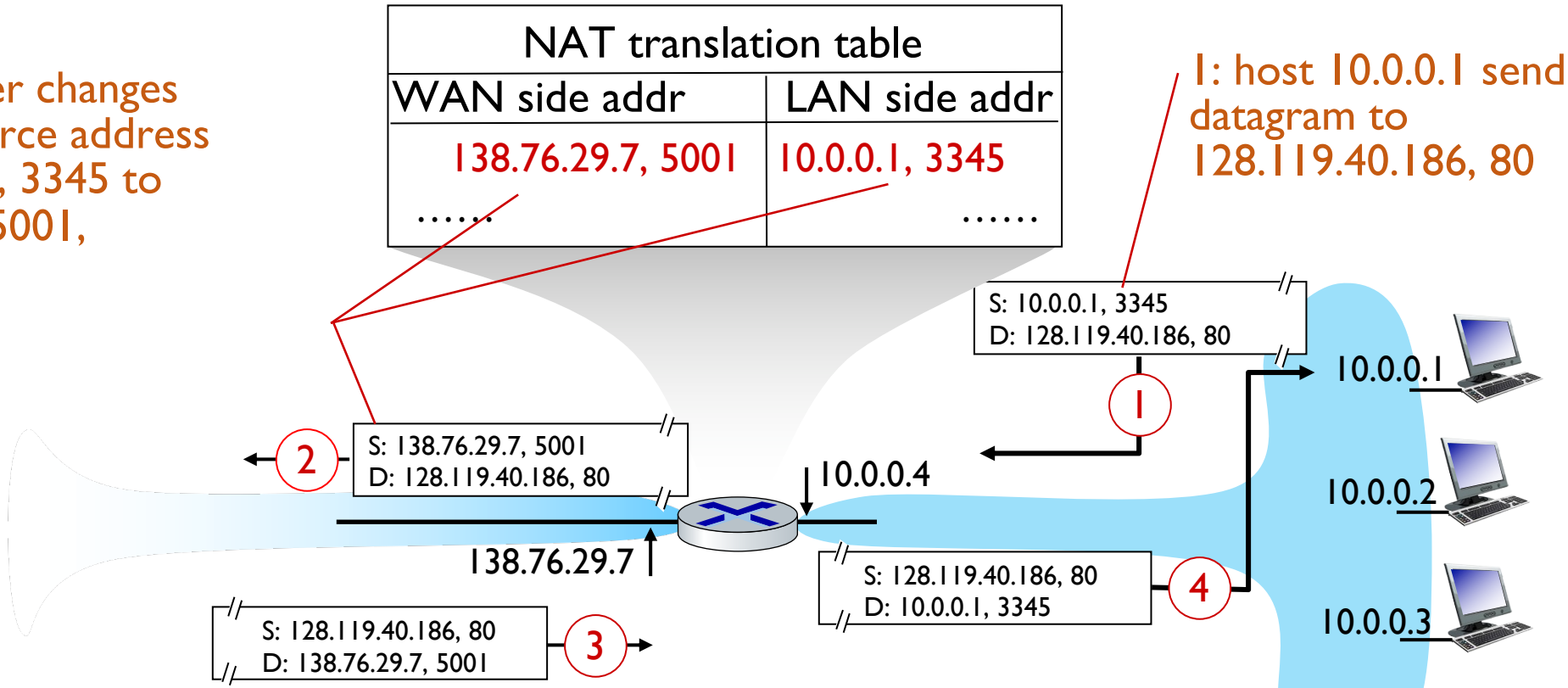
1. IPv4 Address Format
2. How to obtain an IP address
3. NAT and IPv6

Motivation: IPv4 addresses are being exhausted!

- How many total addresses? 2^{32} (About 4 billion still not enough)
- Let's try to reuse within local network: NAT
- Let's use twice as long IP address: IPv6
  - And let's do some other improvements as well such as flow-based forwarding and a simplified header for faster performance in forwarding

NAT: network address translation

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



3: reply arrives, destination address: 138.76.29.7, 5001

Acknowledgements

Slides are adopted from Kurose' Computer Networking Slides