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CS 348 Computer Networks

Spring 2019

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- Private Networks and NAT
- Gateways and Firewalls

Addressing (Recap)

APPLICATION	Application-specific addresses. Examples: URL (for web-browsing), Skype ID, torrent file, email ID ....
TRANSPORT	**Port Number**. 16b
NETWORK	**IP address**. 32b (for IPv4). 4 octets in dec. Example: 192.168.5.3
LINK	**Physical (MAC) address**. 48b (for Ethernet, WiFi). Written as 6 octets in hex. Example: 01:AF:34:93:12:2E

Private IP address blocks

10.0.0.0/8 **172.16.0.0/12** **192.168.0.0/16**

- Not routable over the public internet
- Original Purpose: Delay IPv4 address exhaustion
- Other uses: Portability, Security

NAT (Network Address Translation)

- Translate one IP address to another...on the fly
- IP masquerading: hide an entire block of private addresses behind a single public IP address
- Reverse mapping: Use port numbers.
  - <Source private IP, source port, destination IP, destination port> used for demultiplexing
  - Stateful translation
  - Need to replace checksums too!
- **ISSUES:**
  - NAT breaks the “end-to-end” connectivity principle!
  - End-hosts outside the private network cannot initiate a connection with hosts inside
  - Some applications (such as Skype) work around this

Loopback and Localhost

127.0.0.0/8 : LOOPBACK “Localhost”= 127.0.0.1

- The Link layer redirects packets with this destination it back to the same machine, without passing it to the network interface card (NIC)
- Useful for troubleshooting, client/server processes on the same machine etc.


THERES NO PLACE LIKE
127.0.0.1
memegenerator.net