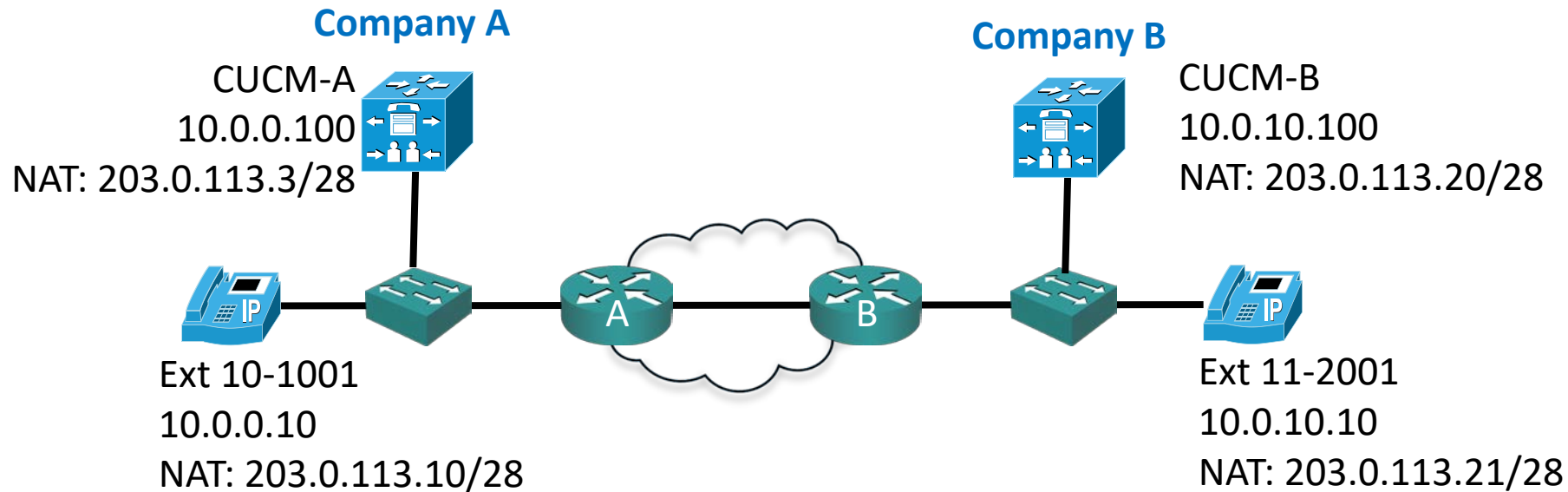


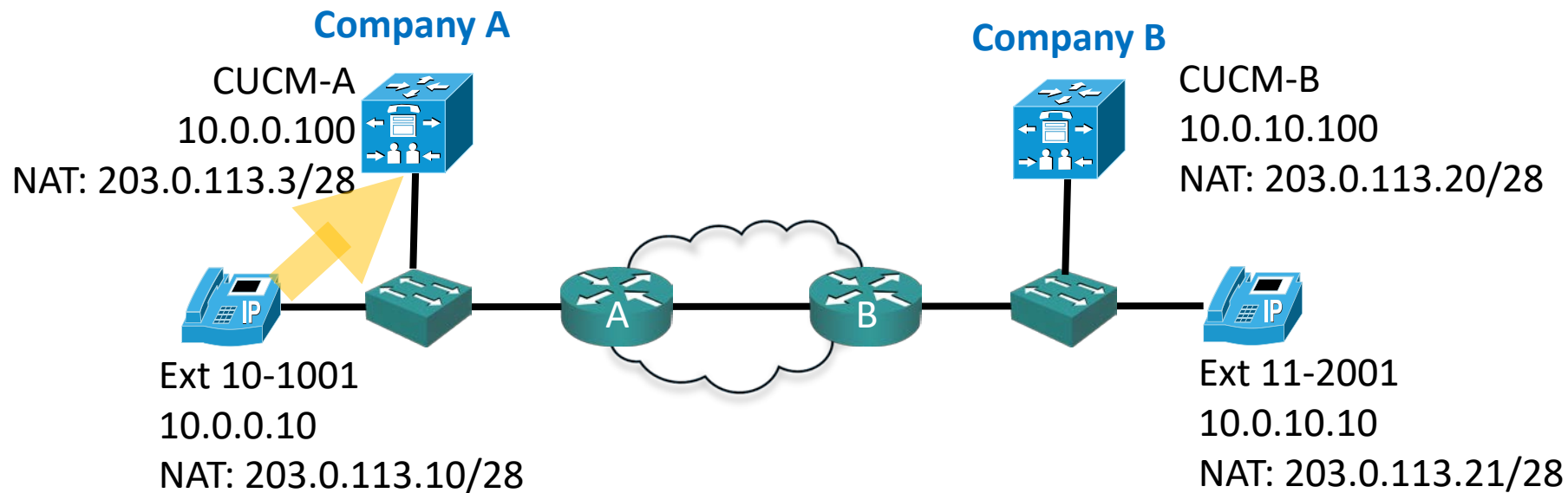
Problems with NAT

- NAT breaks the end to end IP model
- This can cause issues with security and with some applications



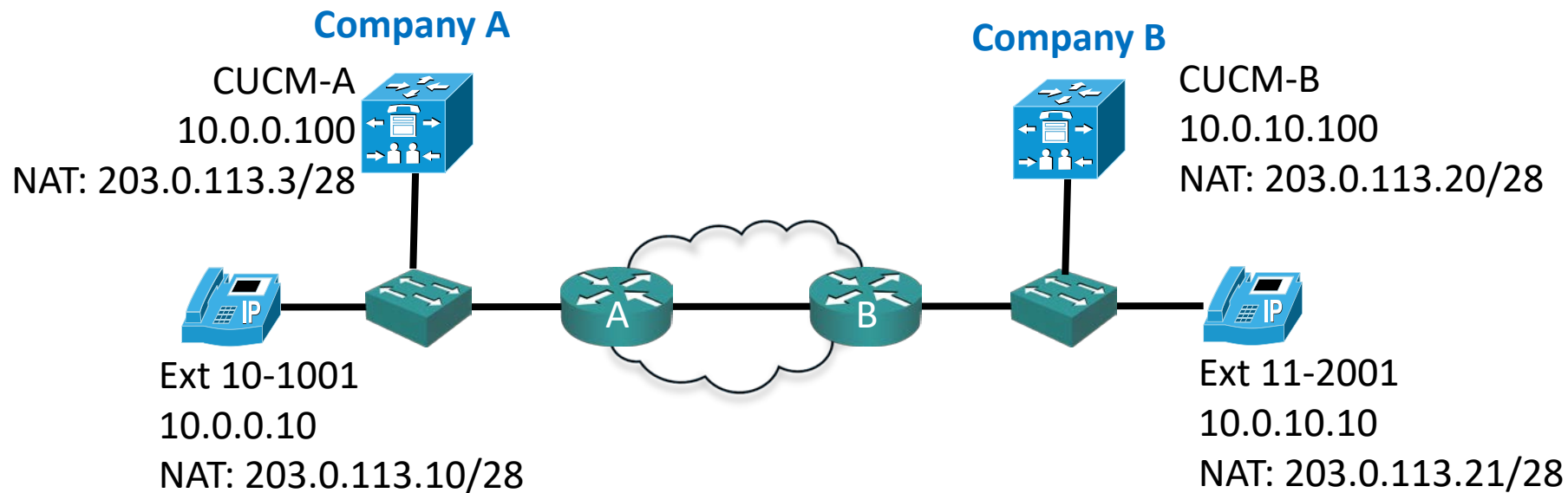
NAT Problem Example

- 10.0.0.10 > 10.0.0.100 : 'I'd like to call 11-2001 please'



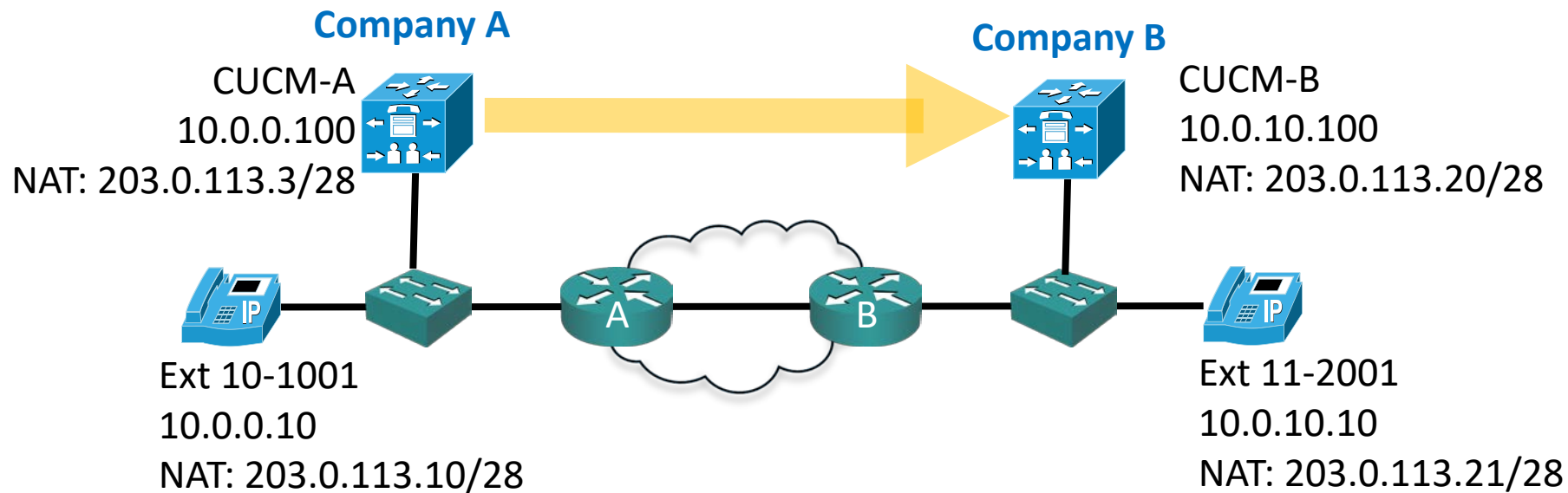
NAT Problem Example

- CUCM-A Dial Plan : 11-xxxx is available at 203.0.113.20



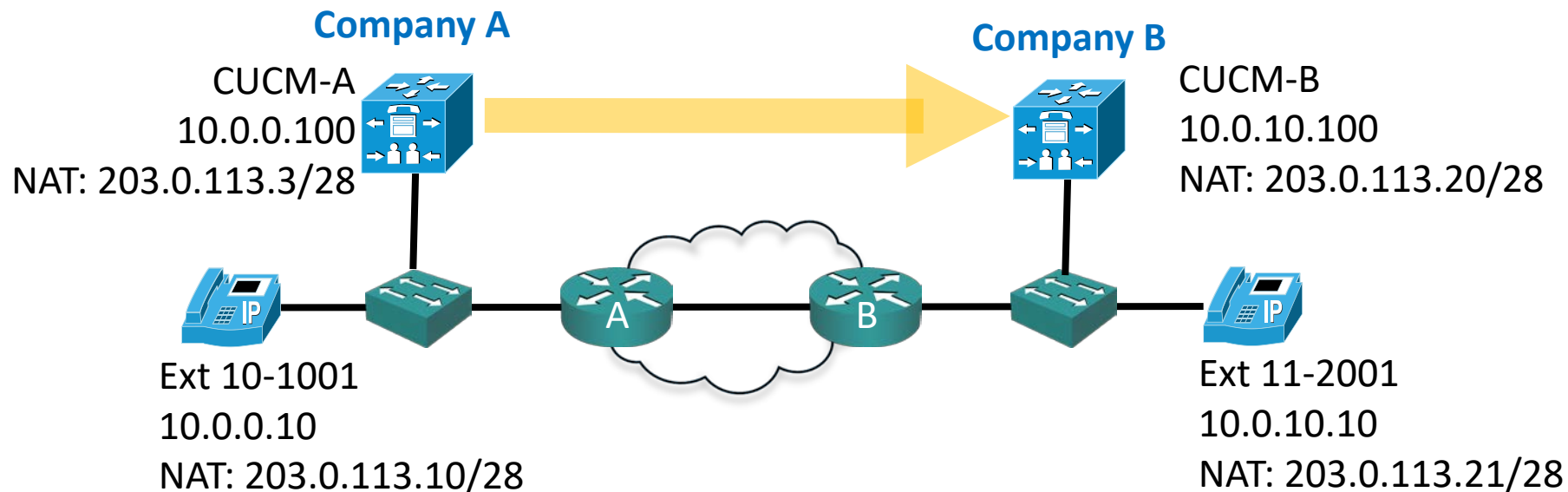
NAT Problem Example

- 10.0.0.100 > 203.0.113.20 : 'Call for 11-2001 from 10.0.0.10'



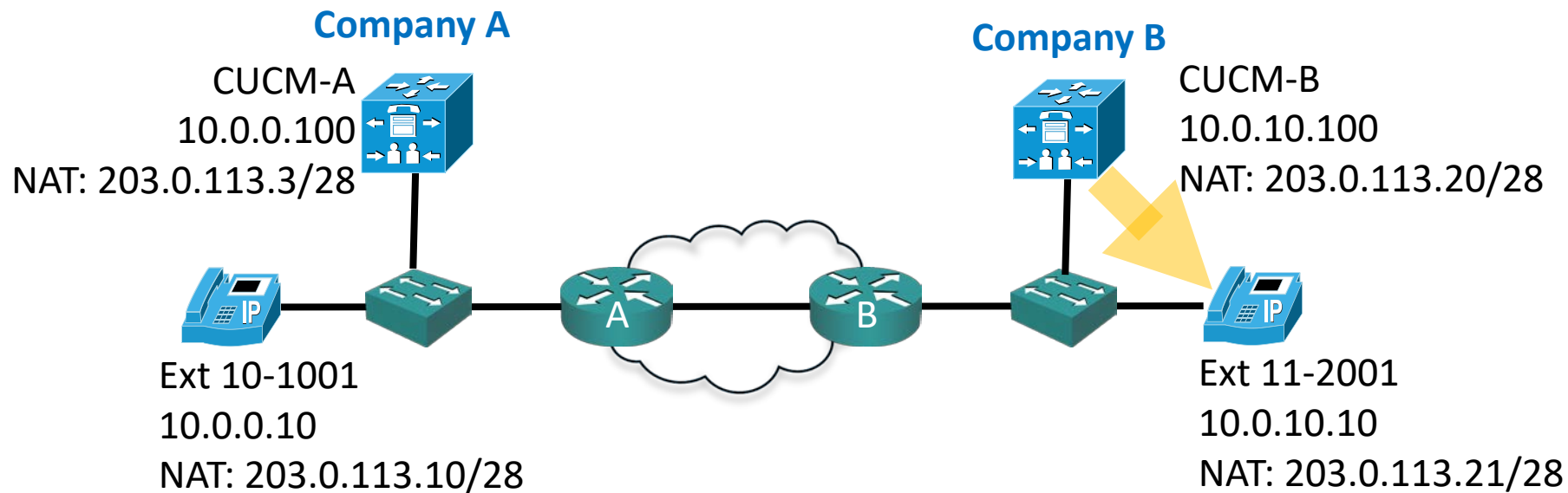
NAT Problem Example

- Router A NATs source address 10.0.0.100 to 203.0.113.3
- Router B NATs destination address 203.0.113.20 to 10.0.10.100



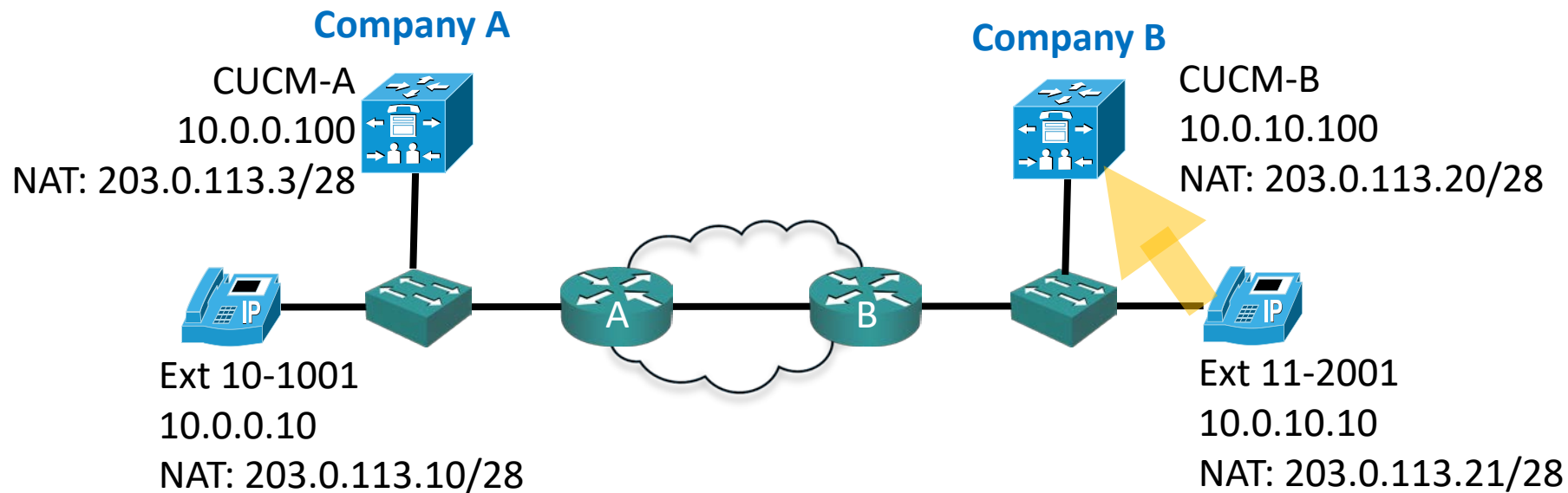
NAT Problem Example

- 10.0.10.100 > 10.0.10.10: 'Call for you, please ring'



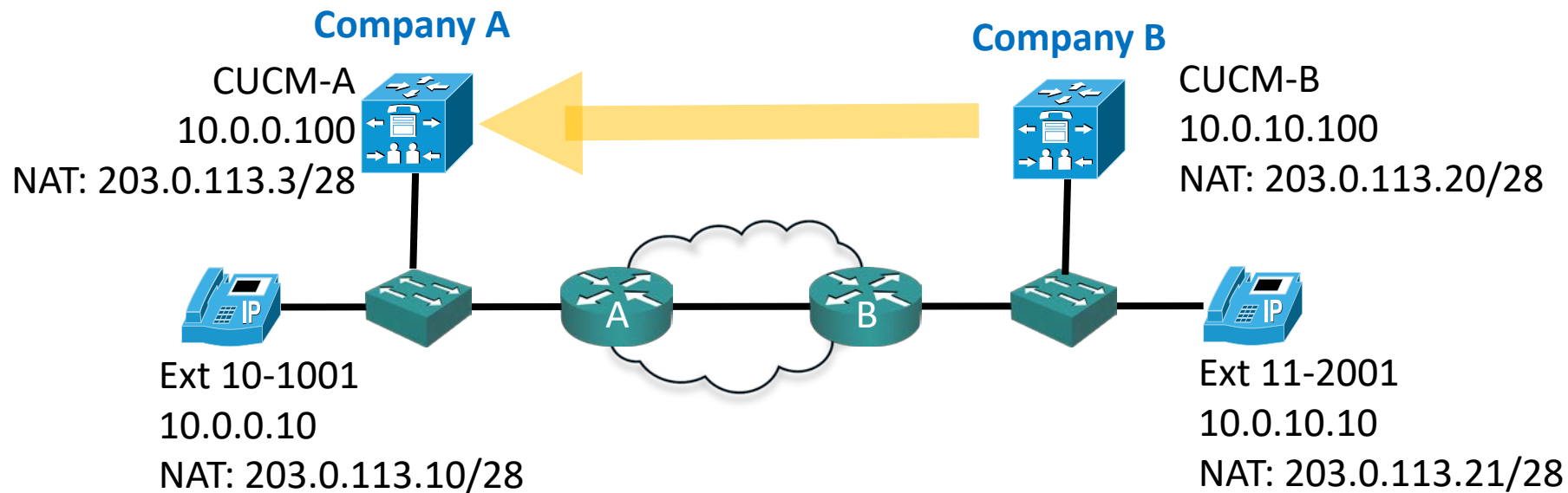
NAT Problem Example

- 10.0.10.10 > 10.0.10.100: 'User picked up, ready for call'



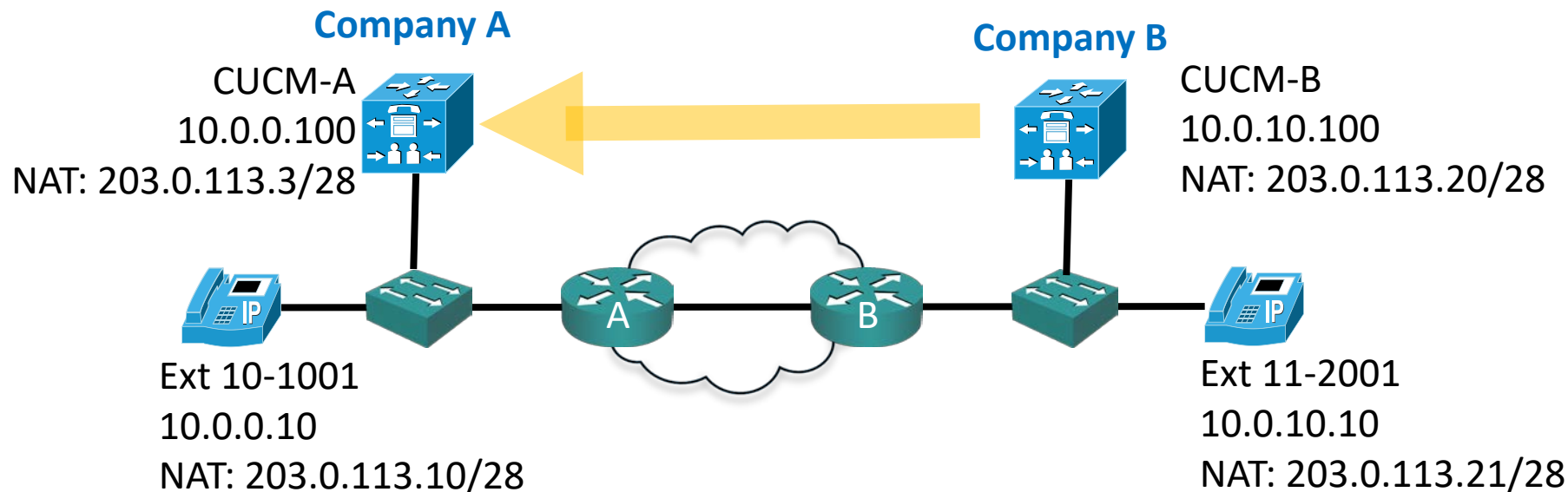
NAT Problem Example

- 10.0.10.100 > 203.0.113.3 : 'Ext 11-2001 is ready for call at 10.0.10.10'



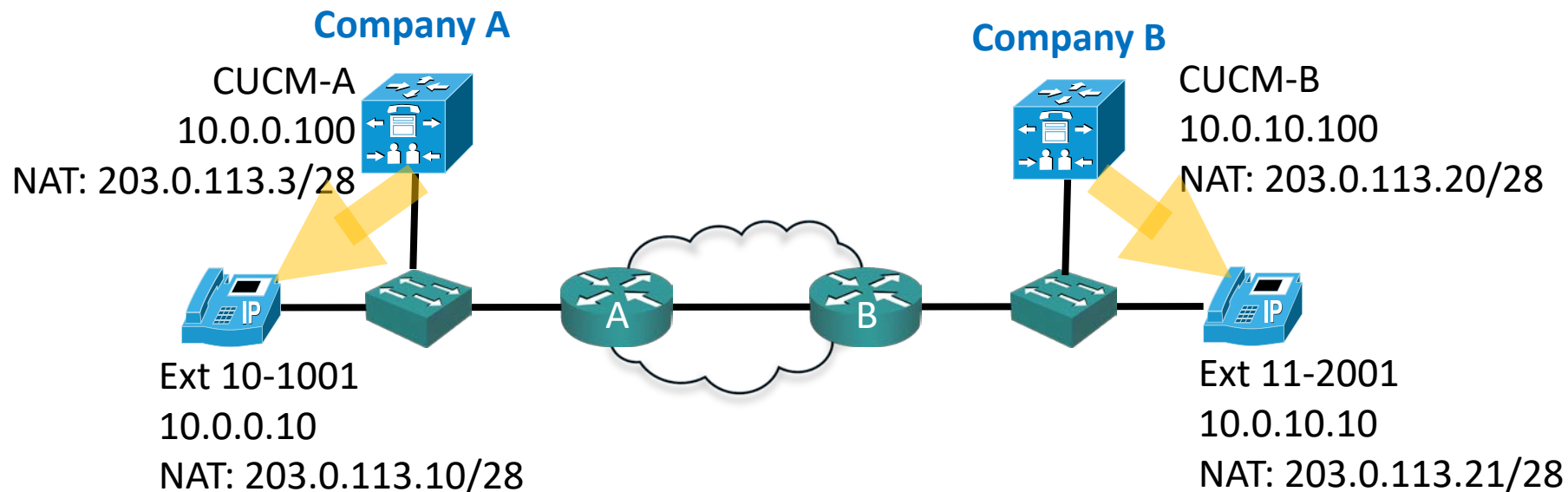
NAT Problem Example

- Router B NATs source address 10.0.10.100 to 203.0.113.20
- Router A NATs destination address 203.0.113.3 to 10.0.0.100



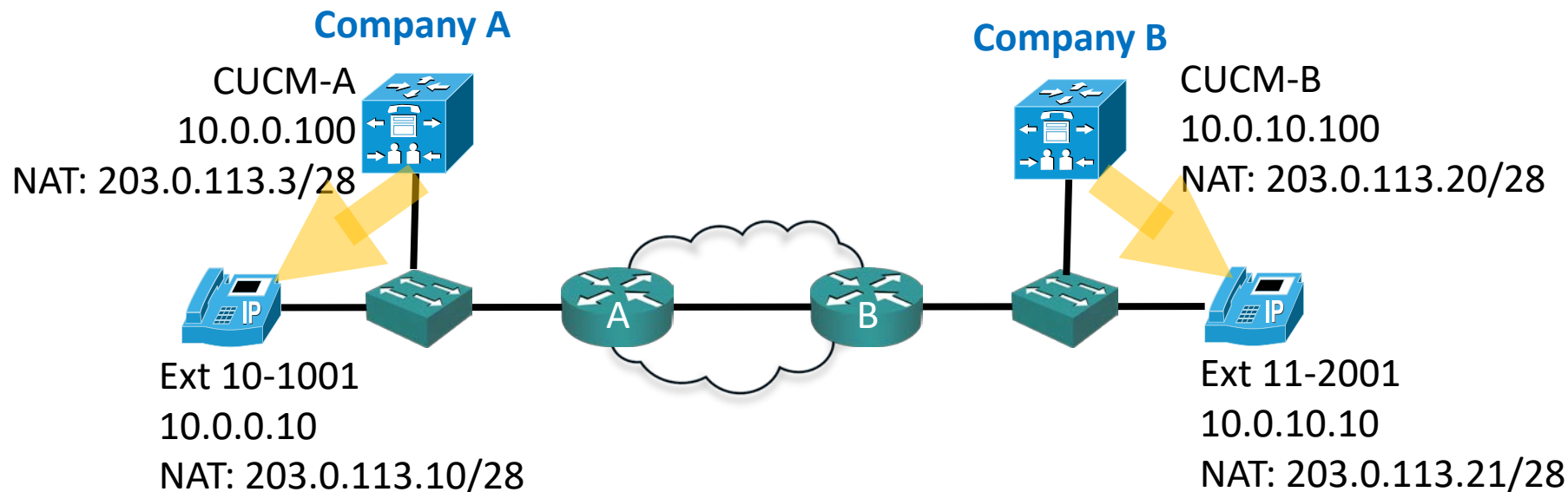
NAT Problem Example

- CUCM-A to Phone A: 'Stream your voice to 10.0.10.10'
- CUCM-B to Phone B: 'Stream your voice to 10.0.0.10'



NAT Problem Example

- The phones only have connectivity to each other on their NAT'd public IP addresses, not via internal private addresses, so the call fails



NAT Problem



- Devices such as application layer firewalls, traversal servers and proxy servers can help with these issues
- It would be a cleaner solution if IP supported an addressing scheme which was big enough to give all devices in the world a publicly reachable address
- ... Enter IPv6. It uses a 128 bit address, compared to IPv4's 32 bit address
- IPv6 provides more than 7.9×10^{28} times as many addresses as IPv4

Other IPv6 Enhancements



- In addition to the larger address space, IPv6 was designed to support built-in security and host mobility

Dual Stack



- IPv4 and IPv6 does not have to be an 'either or' decision
- In a 'dual stack' implementation a network interface can have both an IPv4 and an IPv6 address at the same time
- It can then communicate using either protocol
- Dual stack can be enabled long term to support both IPv4 and IPv6 applications or as an IPv4 to IPv6 transition strategy