

(Re-)introduction to packet processing

CSE 599N1

Autumn 2019

Different forms of packet processing

Simple

- ACLs
- Forwarding based on longest prefix matching

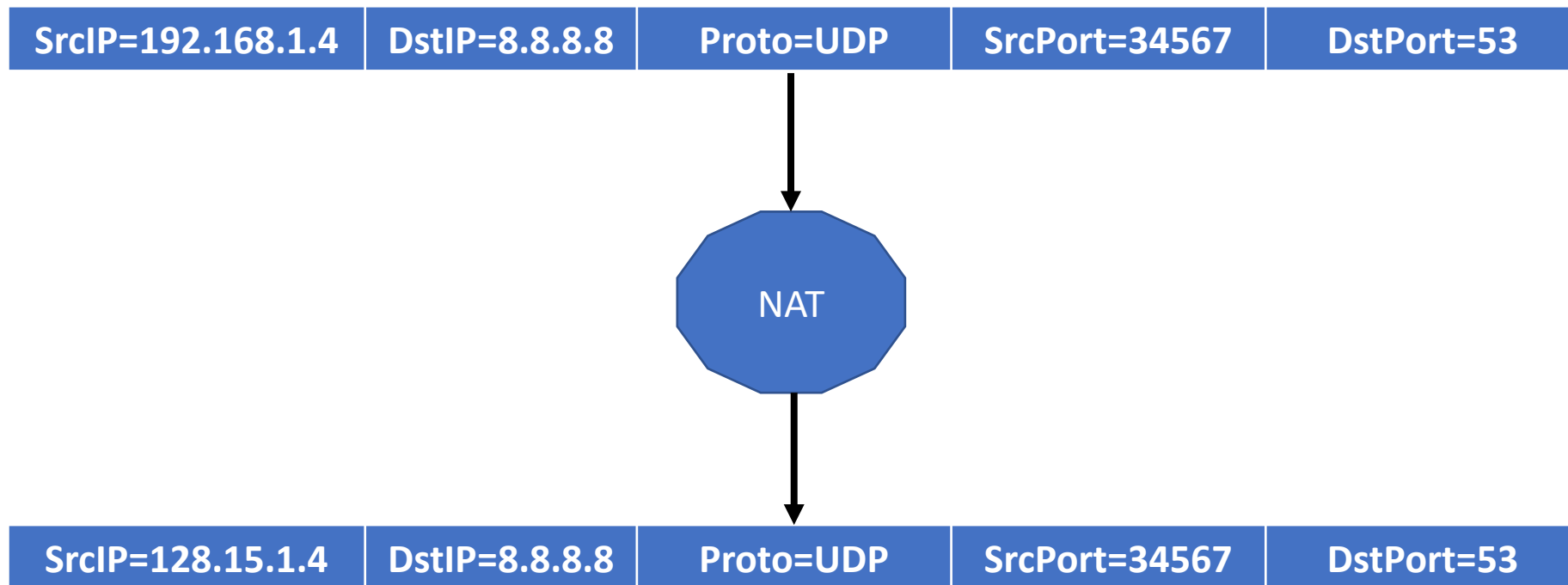
Stateless transformation

- NATs
- Encapsulation/decapsulation

Stateful processing

- Based on state setup by previous packets
- Common examples: Stateful NATs and firewalls

NATs



Different types of NATs

Static: One-to-one mapping of IP addresses

Dynamic: Many-to-many mapping

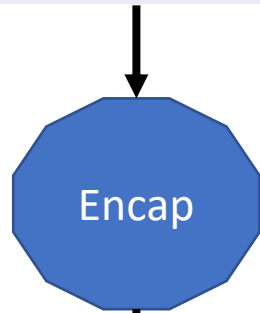
Port address translation: Change ports and addresses

Source NAT

Destination NAT

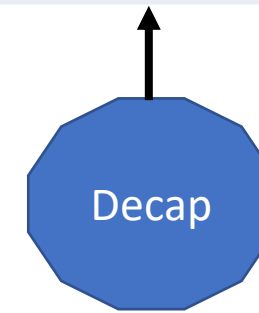
Encapsulation/decapsulation

SrcIP	DstIP	Proto	SrcPort	DstPort
192.168.1.4	8.8.8.8	UDP	34567	53
Payload				

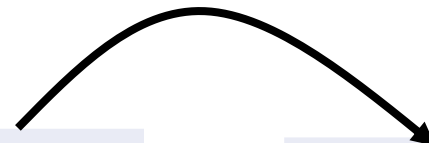


SrcIP	DstIP	Proto	SrcPort	DstPort
192.168.1.4	8.8.8.8	UDP	34567	53
192.168.1.4	8.8.8.8	UDP	34567	53
Payload				

SrcIP	DstIP	Proto	SrcPort	DstPort
192.168.1.4	8.8.8.8	UDP	34567	53
Payload				



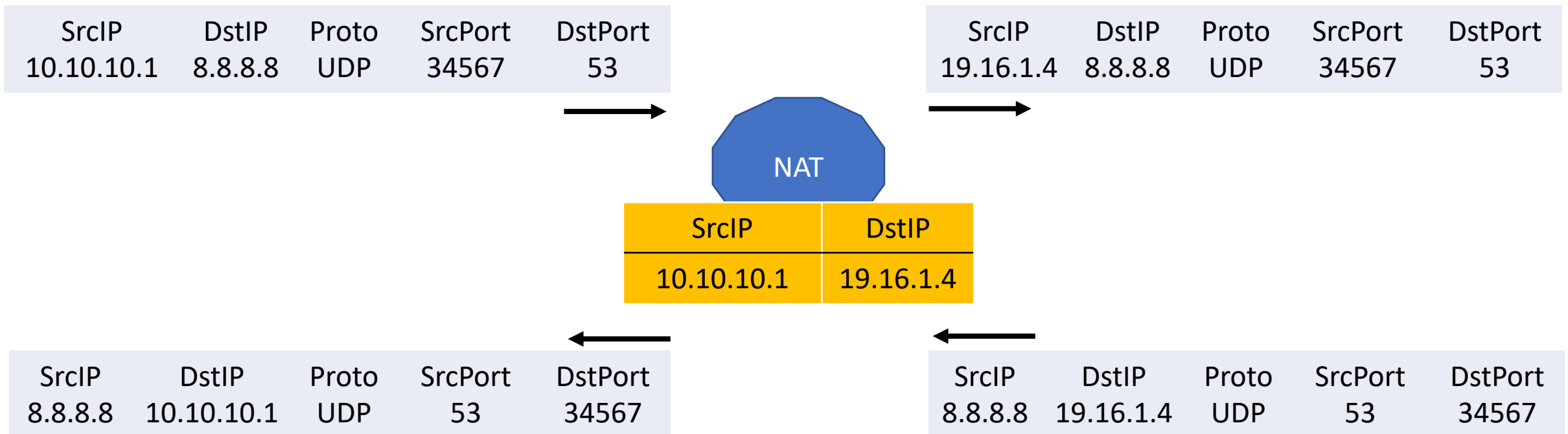
SrcIP	DstIP	Proto	SrcPort	DstPort
192.168.1.4	8.8.8.8	UDP	34567	53
192.168.1.4	8.8.8.8	UDP	34567	53
Payload				



Stateful processing

Prior packets setup state that determines the fate of future packets.

Example: Stateful NAT table



Stateful processing

Prior packets setup state that determines the fate of future packets.

Example: Stateful NAT table

Example: Flow sessions

Example: Load balancers

Middlebox: A generic name for devices that do stateful processing