

Introduction to Computer Networks

IP Prefix Aggregation and Subnets (§5.6.2)



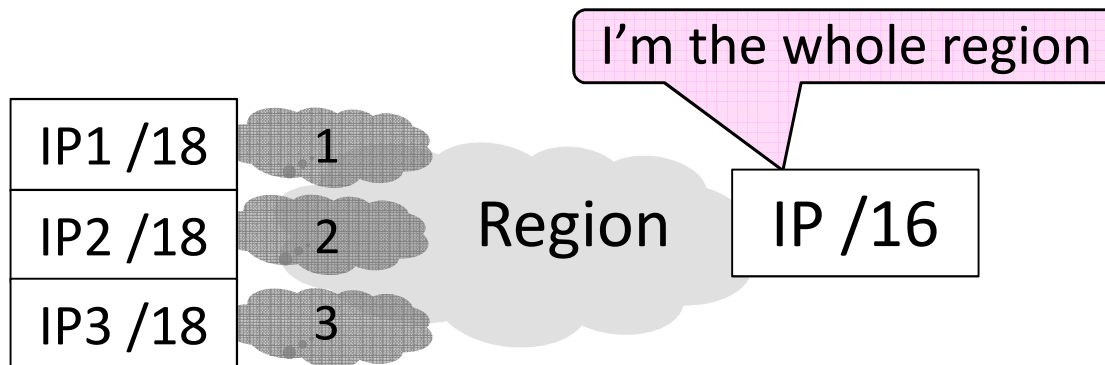
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Topic

- How to help scale routing by adjusting the size of IP prefixes
 - Split (subnets) and join (aggregation)



Recall

- IP addresses are allocated in blocks called IP prefixes, e.g., 18.31.0.0/16
 - Hosts on one network in same prefix
- A “/N” prefix has the first N bits fixed and contains 2^{32-N} addresses
 - E.g., a “/24” has 256 addresses
- Routers keep track of prefix lengths
 - Use it as part of longest prefix matching

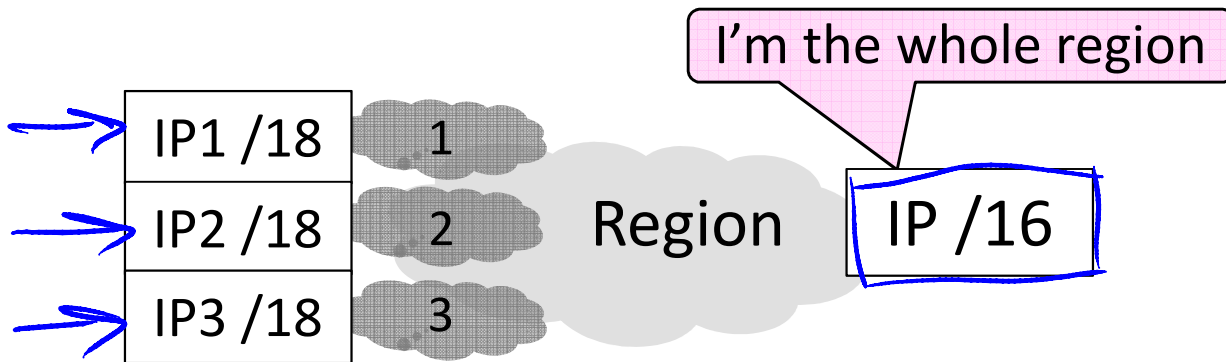
Recall (2)

- IP addresses are allocated in blocks called IP prefixes, e.g., 18.31.0.0/16
 - Hosts on one network in same prefix
- A “/N” prefix has the first N bits fixed and contains 2^{32-N} addresses
 - E.g., a “/24” has 256 addresses
- Routers keep track of prefix lengths
 - Use it as part of longest prefix matching

Routers can change prefix lengths without affecting hosts

Prefixes and Hierarchy

- IP prefixes already help to scale routing, but we can go further
 - We can use a less specific (larger) IP prefix as a name for a region



Subnets and Aggregation

- Two use cases for adjusting the size of IP prefixes; both reduce routing table

1. Subnets

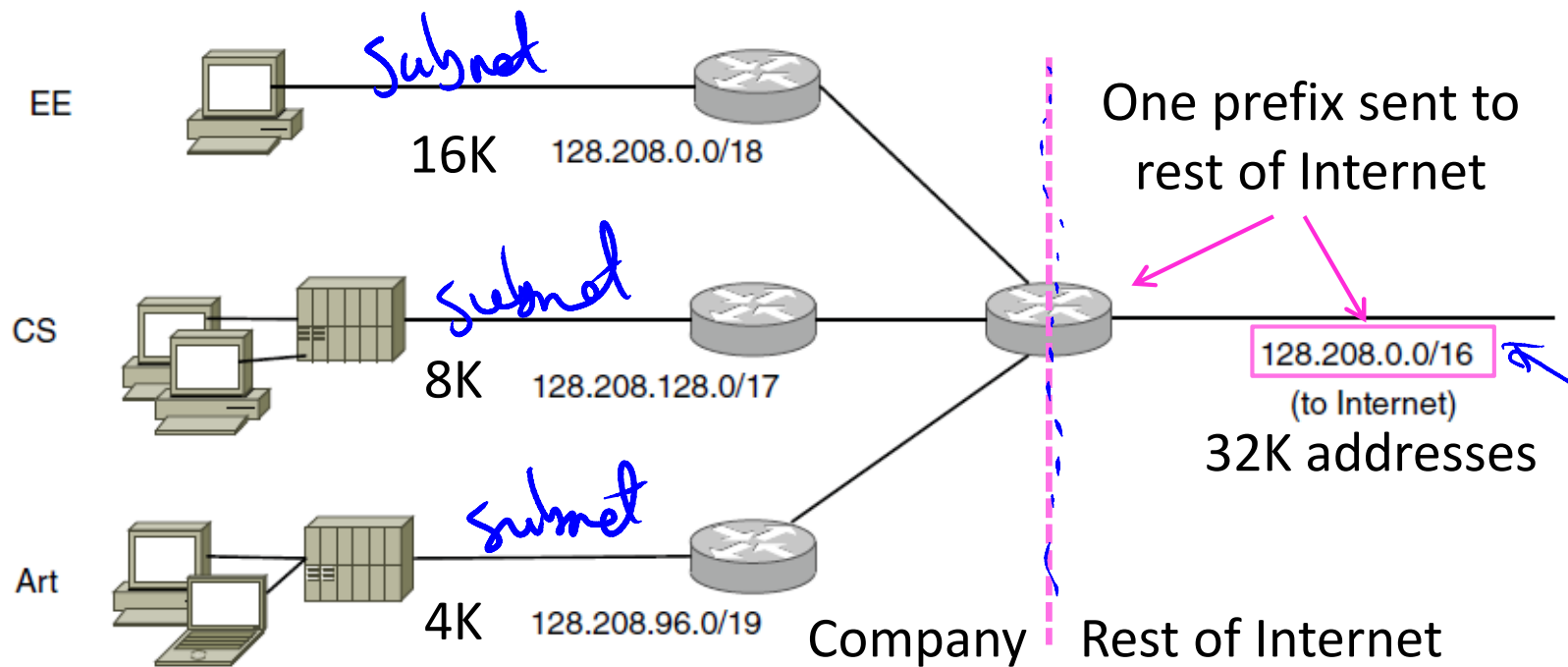
- Internally split one large prefix into multiple smaller ones

2. Aggregation

- Externally join multiple smaller prefixes into one large prefix

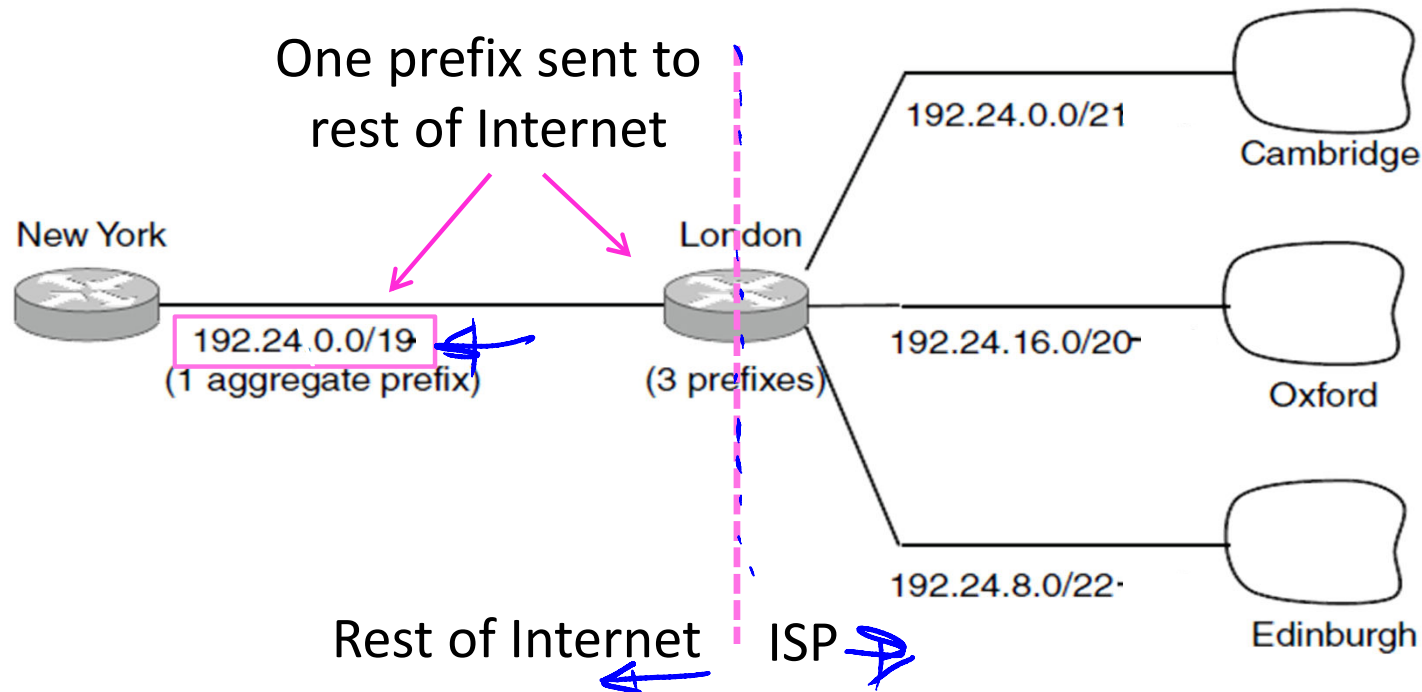
Subnets

- Internally split up one IP prefix

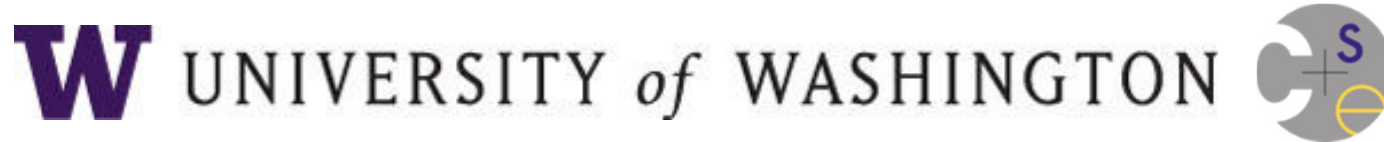


Aggregation

- Externally join multiple separate IP prefixes



END



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