

417

- BGPv4

- original Internet topology

- NSFNet backbone

- tree of regional
networks

- Disbanded in 1993

- Autonomous System
(AS)

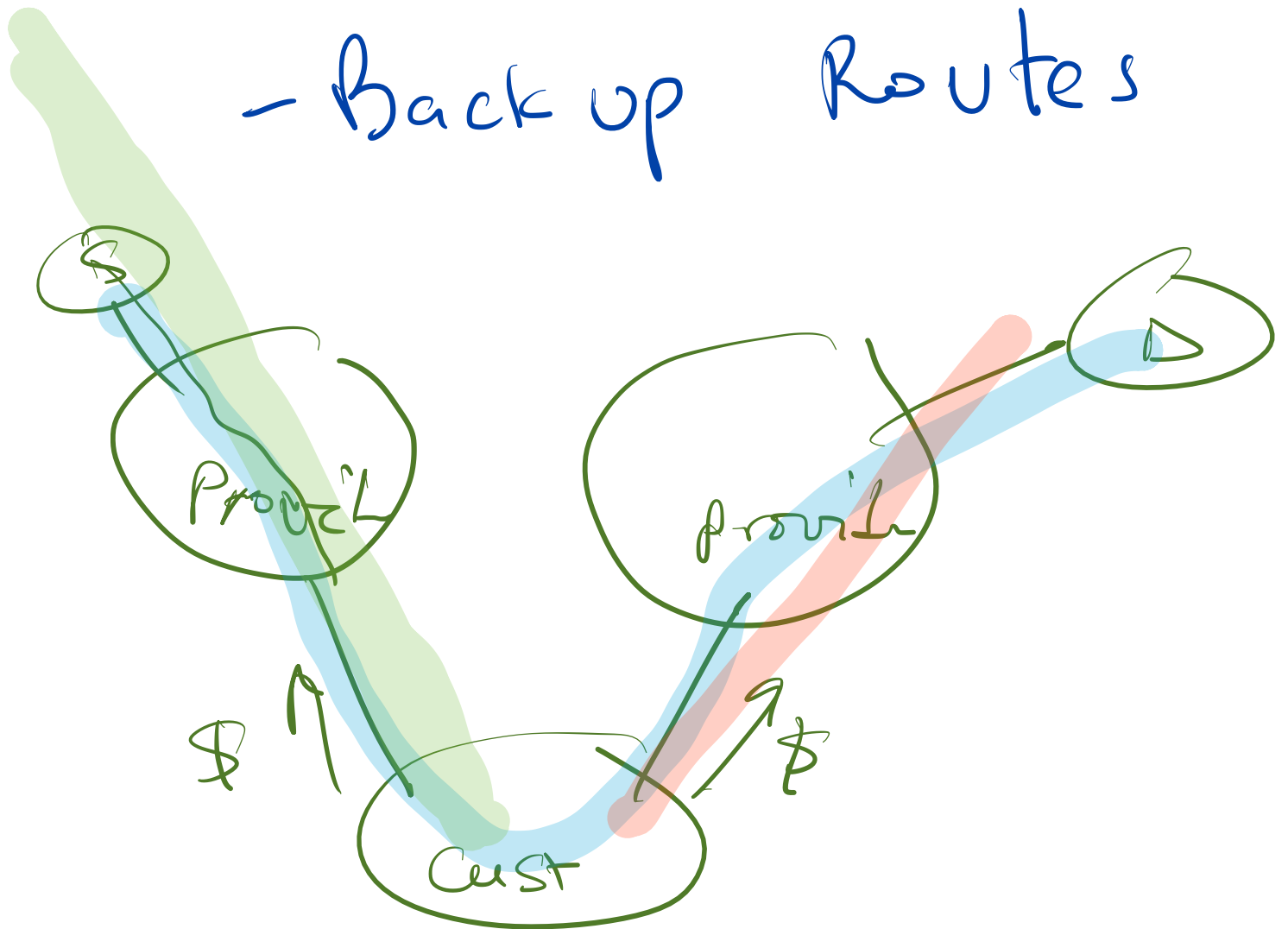
- Transit - Stub - Multi-
Homed

- Inter-Domain Routing

- policy-based
routing

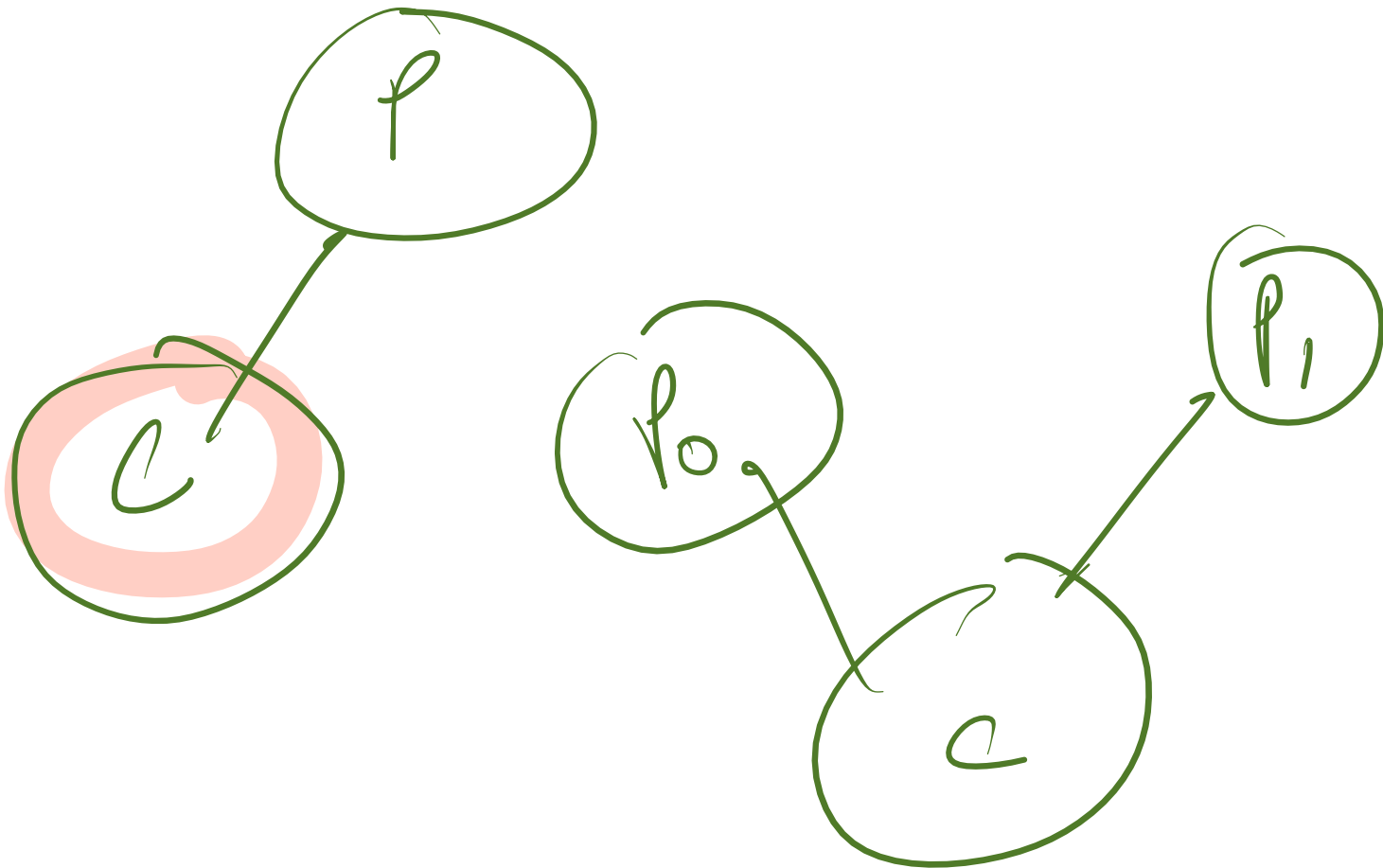
Example policies

- No Transit
- Valley free
- Back up Routes



AS types

- Stub
- Transit
- Multi-homed Stub



Terms

- Provider

- Customer

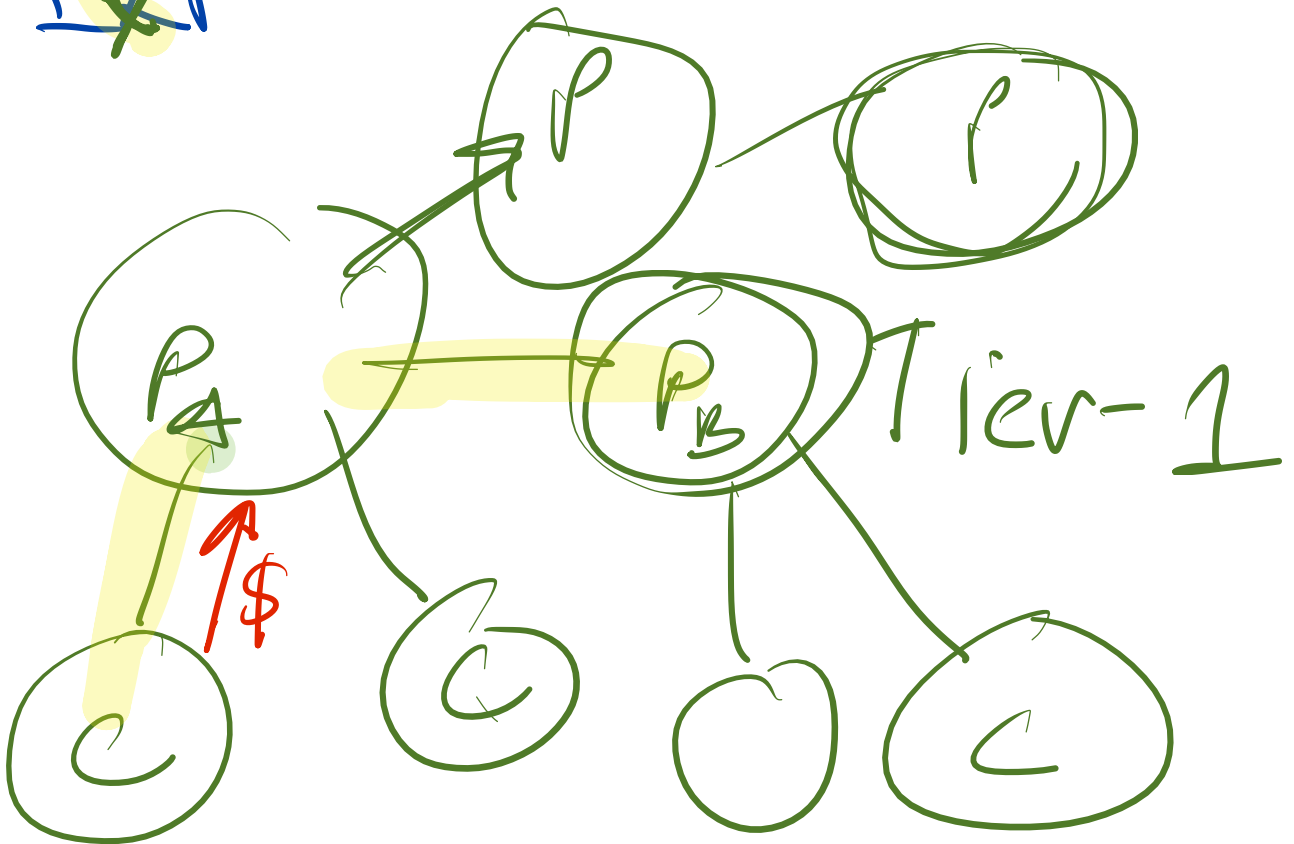
- Peer

- peering point

- ~~IX~~

- SLA

- POP



BGP

Goal

- Find best

"policy compliant"

route

BGP Overview

- Each AS has ≥ 1

BGP speaker ≥ 1

BGP gateway.

BGP: path vector

- advertises complete paths

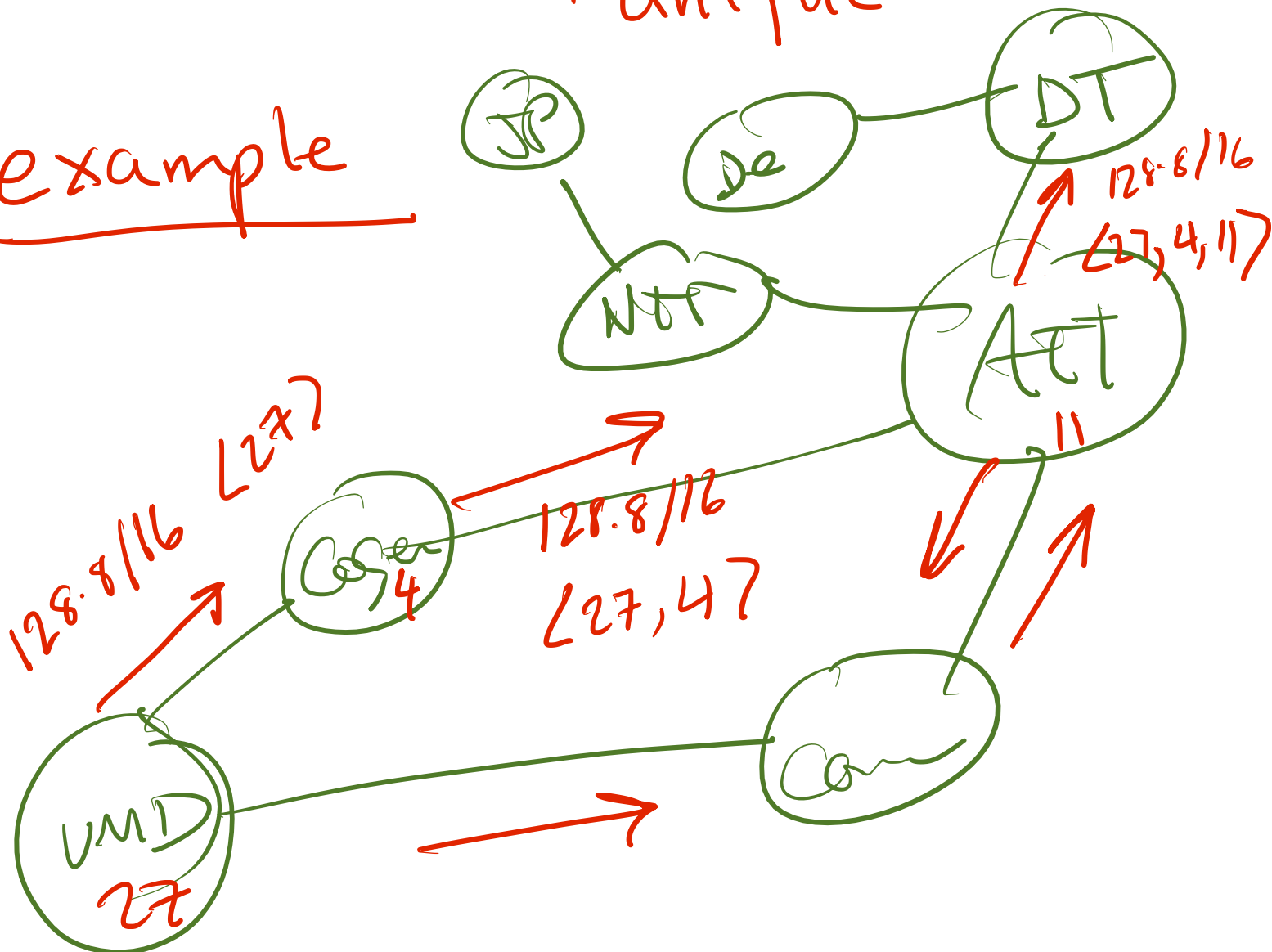


BGP adv.

{prefix / len},

< AS#, AS#, ... AS# >
"unique"

example



- AS only advertises

"best" path

depends on AS policy

- AS not compelled to
advertise any path

- BGP speakers may
cancel / withdraw
routes advertised

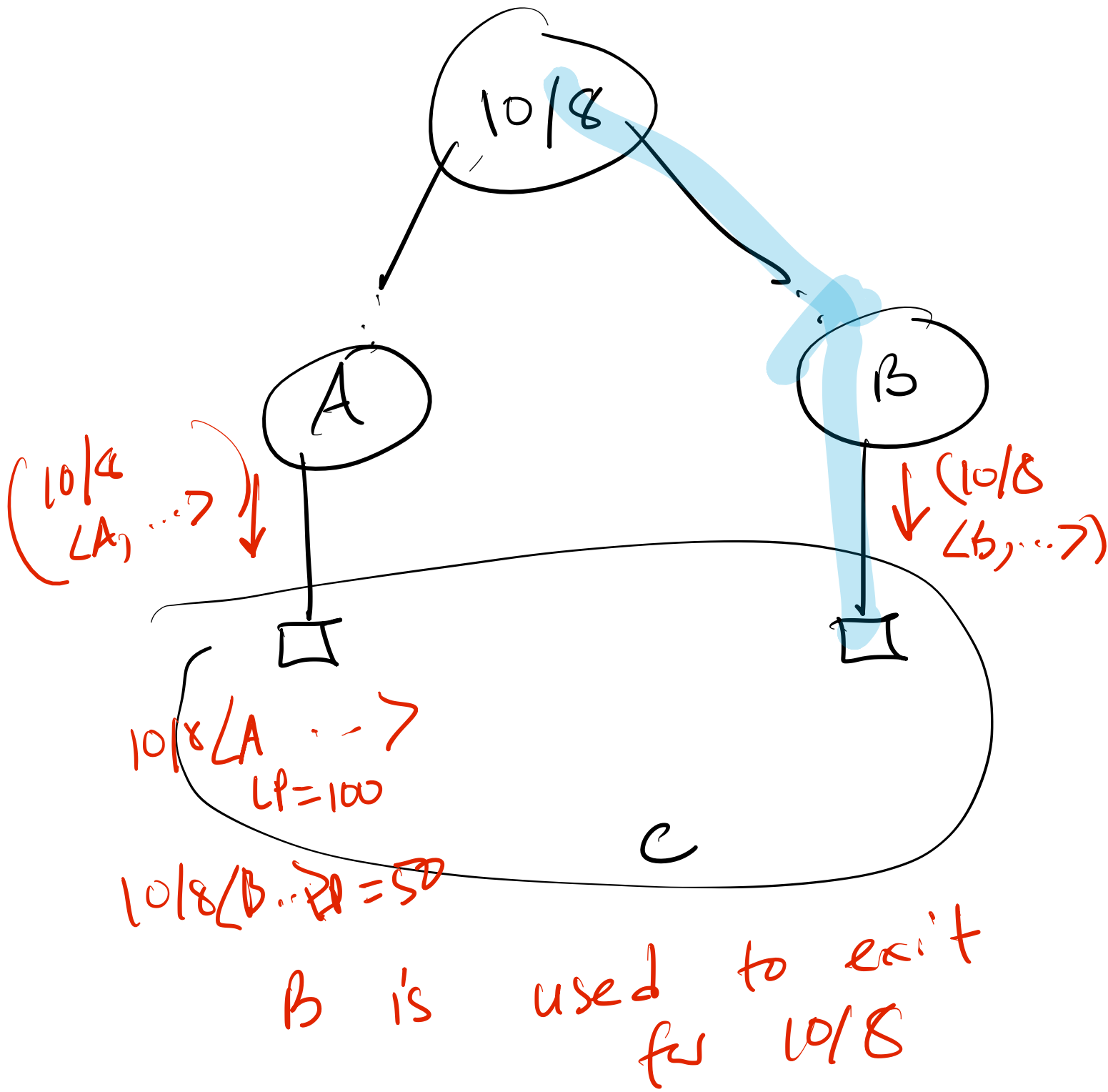
Example

BGP Best Path Selection

- Routes learned via BGP are associated w/ "attributes" that are used to select "best" path

Local Preference - AS Local

- used to select best
outbound AS



MED

Multi-Exit Discriminator

Inter-AS → used to "influence" neighboring AS's exit router choice



A & B's med in comparable
if C chooses to exit through
A, MED=100 may be
Chosen //

origin

- How did BGP learn this route?

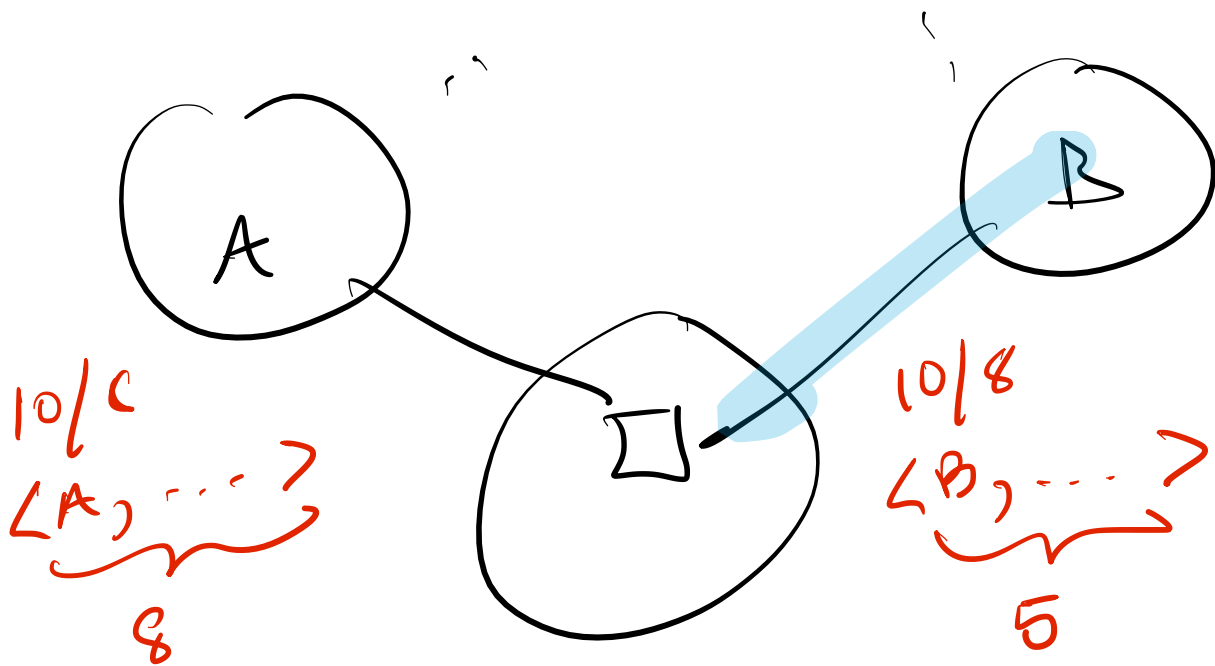
- IGP (local)

- EGP (external)

- Incomplete (injected)

AS Path

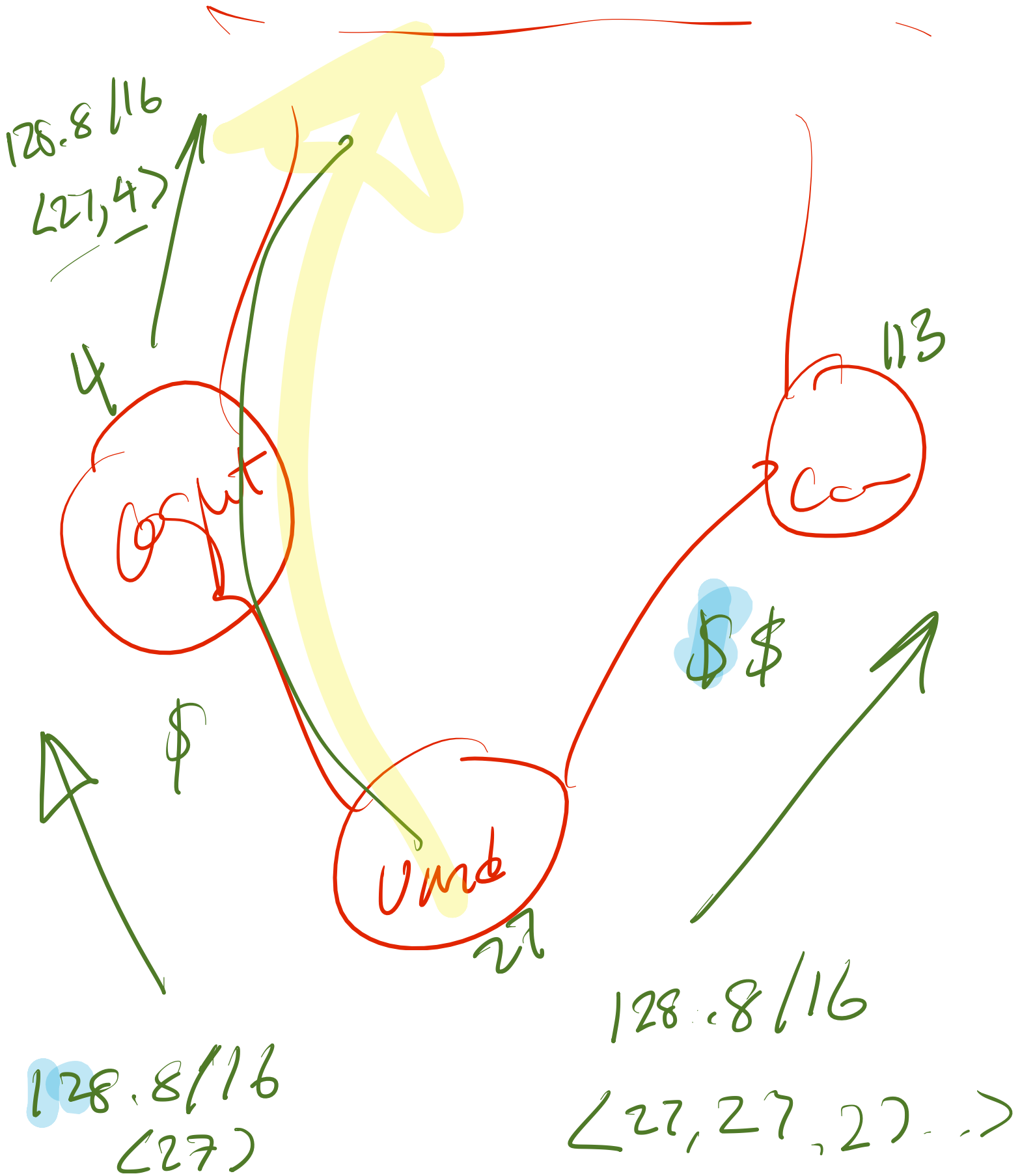
- length of AS Path
in adv.



- path prepending



Path Prepending example



Selection Rule

- weight

- local Pref

- AS Path Len

- origin

EGP < IGP < incomplete

- lowest MED

- prefer eBGP over iBGP

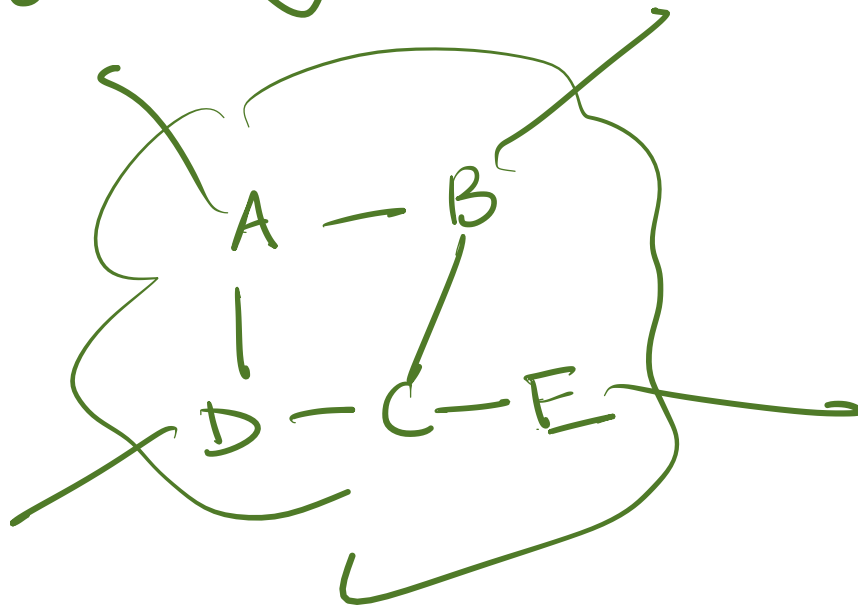
- lowest IGP metric

- older path

- lowest router id

higher priority ↑

Integrating IGP & BGP



BGP @ B

18/16	E
12/10	A
128/15	D
128.10/17	A

IGP @ B	
A	A
C	C
D	C
E	C

Join

Rt at B

18/16	C
12/10	A
128/15	C

128.10/17
→ A

BGP Community Attribute

- way of "grouping" routes

no-export : do not
export to
e-BGP

no-advertise : do not
export to
any peer

internet : tell everyone



any cast

