Segment Routing Use Cases

- Generic SR Use Cases
  - draft-filsfils-rtgwg-segment-routing-use-cases-02.txt
- SR/LDP Interoperability
  - draft-filsfils-spring-segment-routing-ldp-interop-00.txt
- OAM
  - draft-geib-spring-oam-usecase-00.txt
- To be published:
  - FRR: draft-francois-segment-routing-resiliency-use-cases
  - Service Chaining
  - SR for IPv6
- Many authors of different drafts
  - and even more contributors…

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Segment Routing Use Cases

Use Cases	Section
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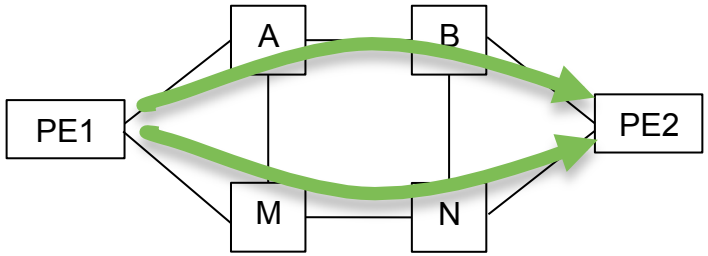
Simple and Efficient Transport of MPLS services



All VPN services ride on the node segment
to PE2

- Efficient packet networks leverage ecmp-aware shortest-path
  - node segment
- Simplification
  - no complex LDP/ISIS synchronization to troubleshoot
  - one less protocol to operate
- IPv6 over MPLS can be deployed directly with SR
  - no need for LDPv6

CoS-based TE

- Japan to UK
  - data: via US, cheap capacity
  - voip: via Asia, low latency
- CoS-based TE with SR
  - IGP metric set such as
    - > Japan to Asia: via Asia
    - > Japan to UK: via US
    - > Asia to UK: via Europe
  - Anycast segment “Asia” advertised by Asia core routers
- Tokyo CoS-based policy
  - Data and UK: push the node segment to UK
    - ➔ ECMP-aware shortest-path to UK
  - VoIP and UK: push the anycast node to Asia, push UK
    - ➔ ECMP-aware shortest-path to Asia, followed by ECMP-aware shortest-path to UK

No TE tunnel enumeration,
no TE state in the core

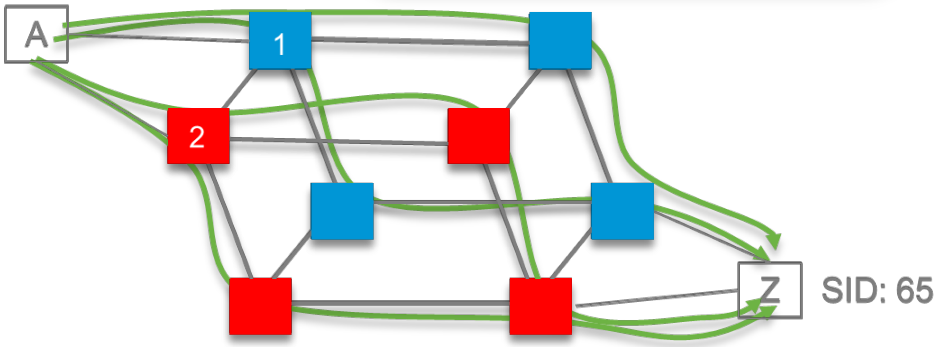
Simple Disjointness

SR avoids state in the core

SR avoids enumerating RSVP-TE tunnels for each ECMP paths

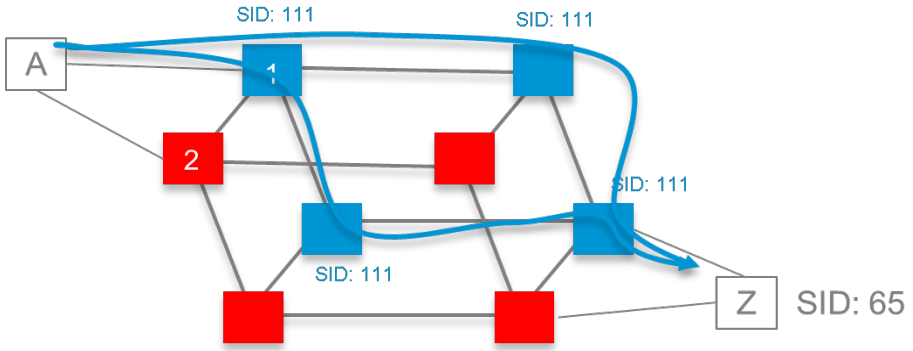
- A sends traffic with [65]

  Classic ecmp “a la IP”



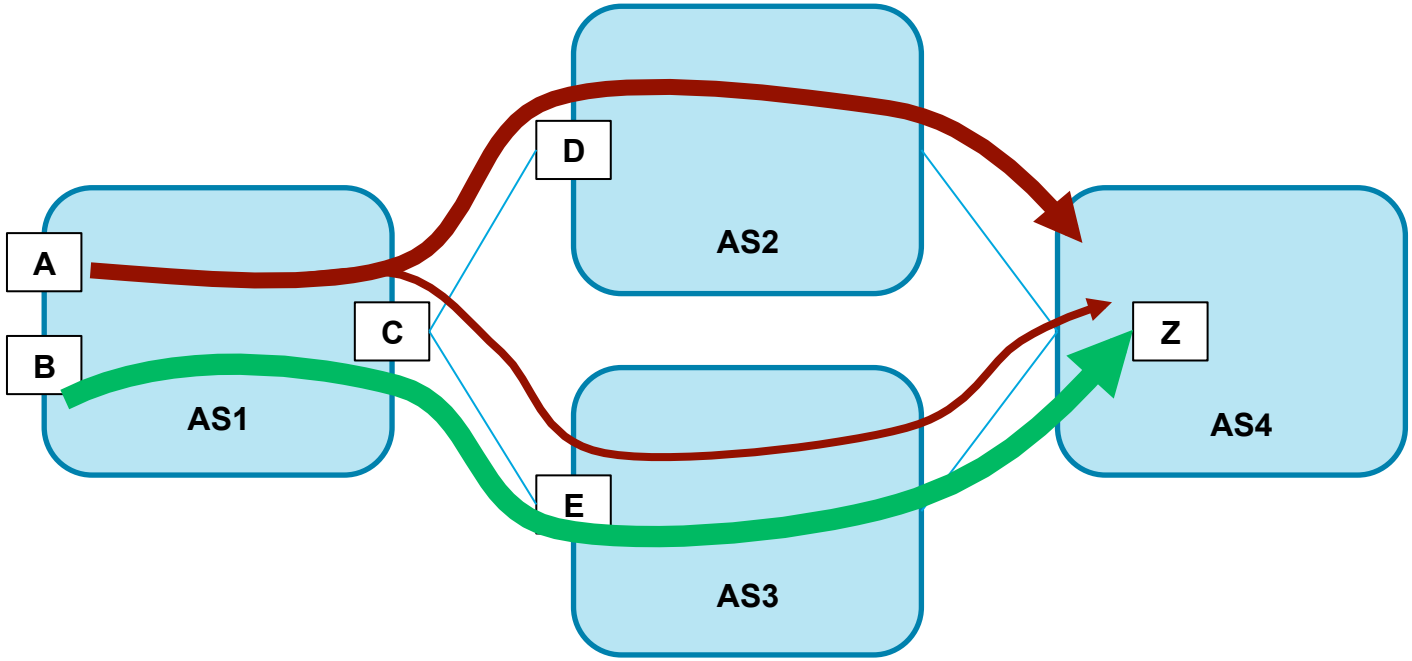
- A sends traffic with [111, 65]

  Packet gets attracted in blue plane and then uses classic ecmp “a la IP”



ECMP-awareness!

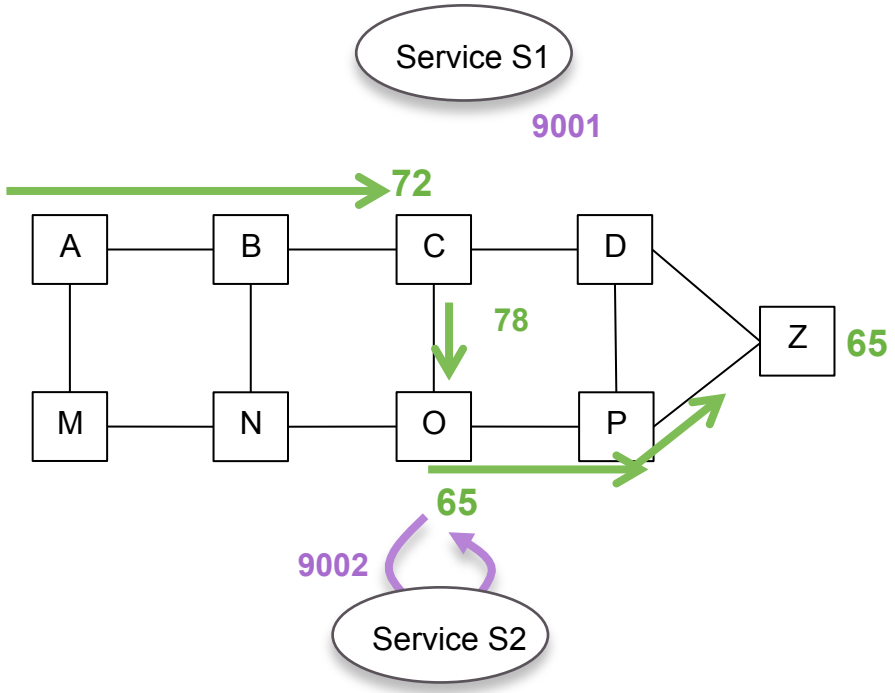
Engineer traffic towards egress peers



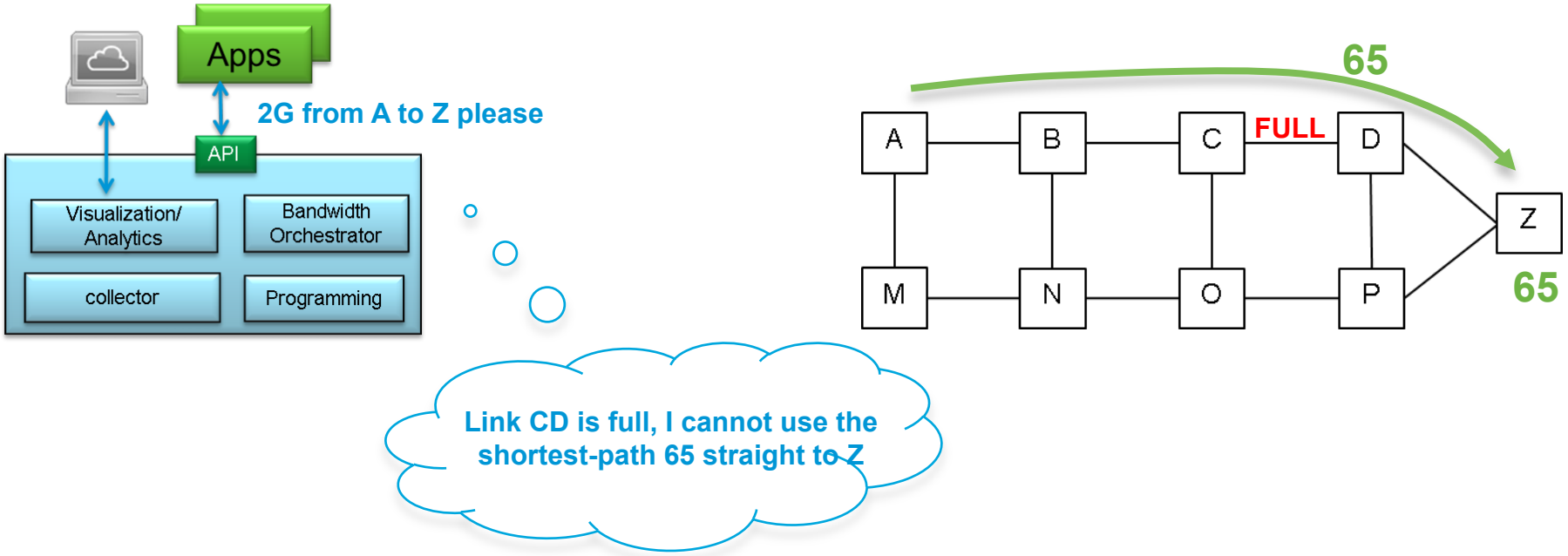
- Ingress border routers control how their traffic is balanced between peers
  - Overriding BGP decision at egress border

Local Service Segment

- 72, 78, 65: global segments representing the shortest-path respectively to C, O and Z
- 9001: local segment to C representing a local service S1
- 9002: local segment to O representing a local service S2
- Ingress node A enforces a source route of forwarding and service instructions on flow F by appending the SR list {72, 9001, 78, 9002, 65} on its packets
- 9001 and 9002 represent local services

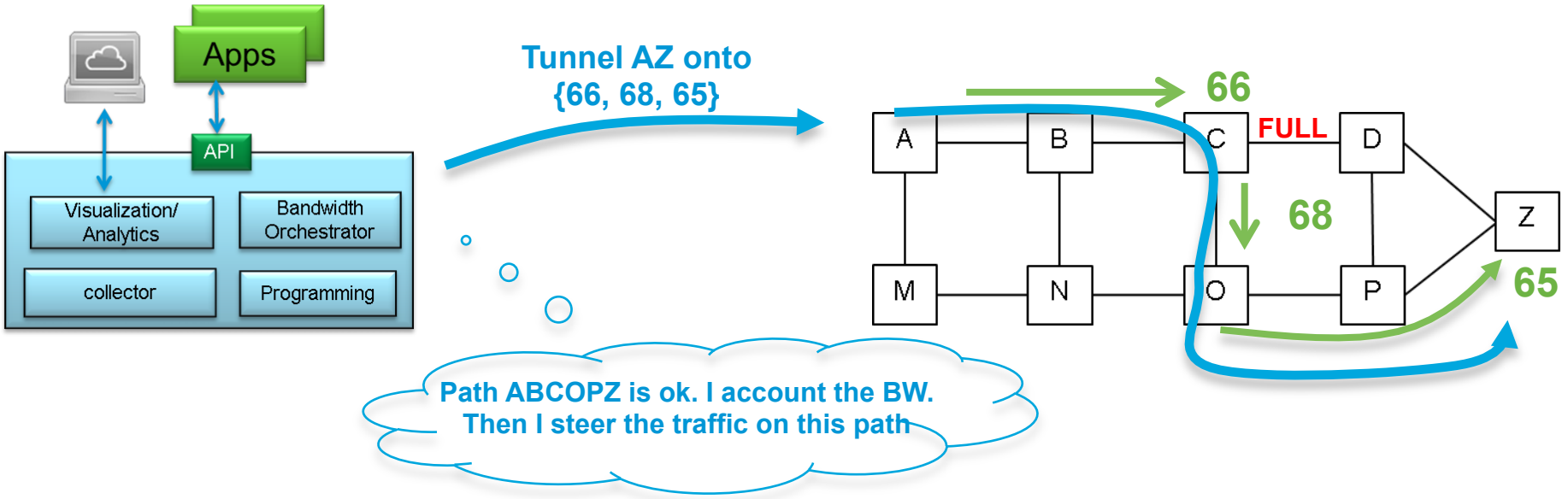


Application controls – network delivers



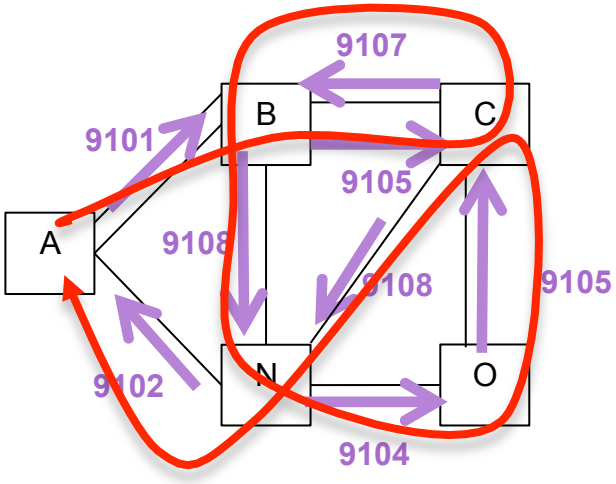
- The network is simple, highly programmable and responsive to rapid changes
  - perfect support for centralized optimization efficiency, if required

Application controls – network delivers



- The network is simple, highly programmable and responsive to rapid changes

OAM



9101
9105
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Localizing packet loss

In a large complex network

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