Reliable Provisioning of Deadline-driven Content Requests Using Multipath, Multidatacenter Anycasting

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Previous works

- Given information in a request:
  - ✓ Desired bandwidth
  - ✓ Acceptable degraded service
  - ✓ Holding time

- So, the outputs are:
  - ✓ Just enough bandwidth for the request (total/sum BW)
  - ✓ Number of paths and BW on each path to guarantee degraded service
  - ✓ How to route paths

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Out current scenario

- A content request with given information:
  - ✓ Content size
  - ✓ Deadline to deliver (this parameter is without tolerance)

- Major outputs:
  - ✓ Total/sum BW for the request (can be more than enough BW to even meet the deadline if one random single-link failure happens)
  - ✓ Number of paths/DCs
  - ✓ BW on each path
  - ✓ Routing and scheduling of paths
 - ✓ Multipath previsioning = inherently degraded service

Scenarios

- Node 1 requests for a 100 GB content in deadline is 20 seconds

- Just enough BW: 5 Gbps (total)

- Example optimal outputs: Total BW 8 Gbps
  - ✓ B1 = 3 Gbps
  - ✓ B2 = 3 Gbps
  - ✓ B3 = 2 Gbps

- If one of paths is disconnected, there is till at least 5 Gbps to meet the deadline

- We may not need a degraded service input because the above constraint implies degraded service

B1=3 Gbps

B2=3 Gbps

B3=2 Gbps
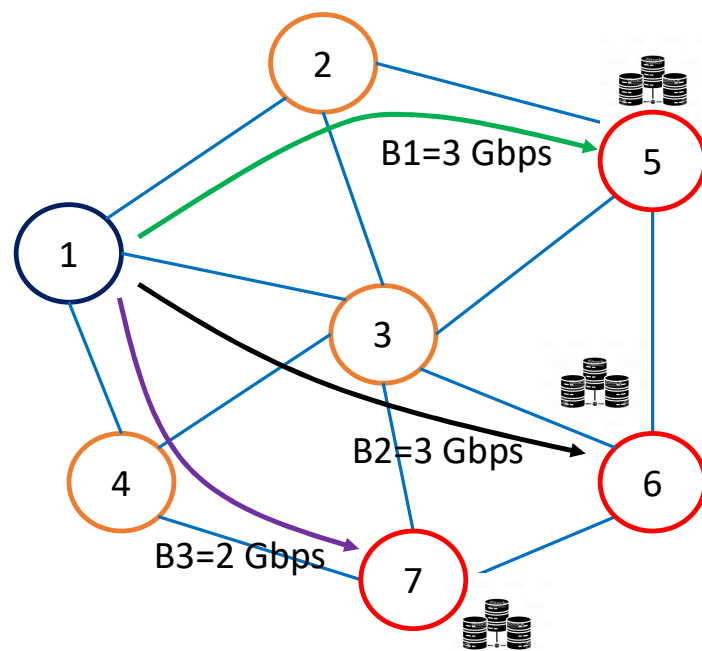
Reference model 1

- Two paths to the same DC

- Number of paths: always 2

- Primary path BW (green) = just enough BW

- Backup path BW (dashed) = just enough BW
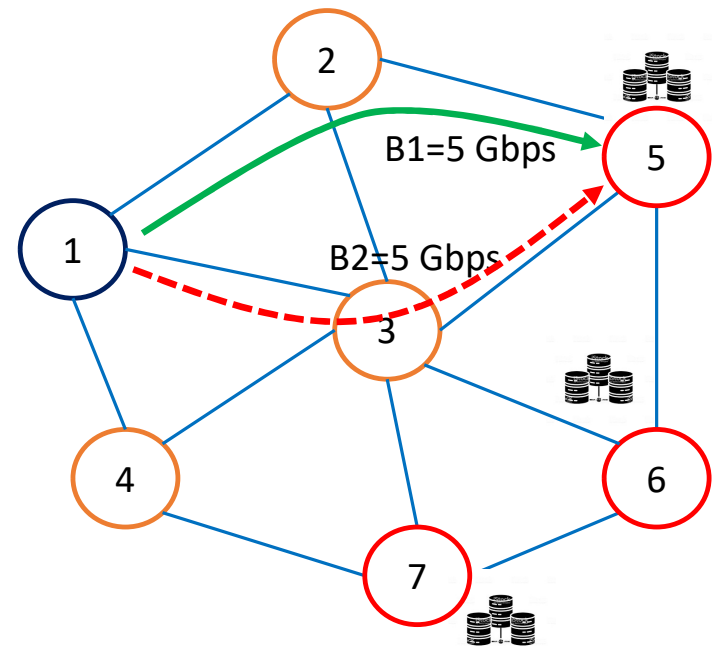
Reference model 2

- Multiple paths to the same DC

- Number of paths: variable

- Total BW may be more than enough (5 Gbps)

- In case one paths is down, there is still BW enough to meet the deadline

- Expectations: our current proposed model outperforms models 1 and 2 in terms of acceptance rate, network resource usage

B1=3 Gbps

B2=3 Gbps

B1=2 Gbps