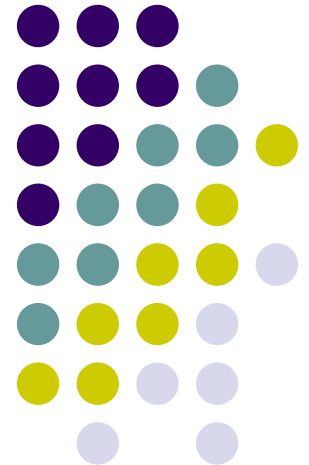


Valiant Load-Balancing in Backbone Networks

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Backbone Networks: Observations



- A few tens of “core” nodes,
- Each aggregating traffic for a region,
- Interconnected by an increasingly rich mesh of long-haul optical trunks
 - Robustness
 - Load-balancing
- Low utilization—links over-provisioned for
 - Uncertainty of traffic matrix the network is designed for
 - Headroom for future growth
 - Prepare to take over when links or routers fail
 - Minimize congestion and delay variation
- Efficiency sacrificed for robustness and flexibility



Our Approach

- Assume we know or estimate the traffic entering and leaving each Regional Network
 - Requires only local knowledge of users and market estimates
- Connect regional nodes by a logical *full-mesh*
- Use Valiant Load Balancing (VLB) over whole network
 - Can support *all* traffic matrices
 - Efficient use of capacity

Valiant Load-Balancing

