CS551
ISP Peering
[Norton01]

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Definitions

**Peering:**
- provide connectivity to each others’ customers
- non-transitive relationship

**Transit:**
- one ISP sells transit to another ISP

**Tier-1 ISP:**
- has access to global routing table
- does not purchase transit from anyone
Peering is not a transitive relationship
Transit Example

ISP1

Upstream Transit Provider(s)

Transit $$$
Why Peer?

- Reduced cost
  - buying transit is expensive

- Reduced latency
  - reduced number of hops
Why Not Peer?

- Traffic asymmetry (and investment asymmetry)
- Potential transit sale
- Peering consumes resources
  - staff, router cards, etc.
- Peering makes a peer ISP appear stronger
  - makes a peer into competition
- Peering relations have less contractual teeth
  - no incentive to repair problems
Decision Phases

- Phase 1: Identify peer
- Phase 2: Contact potential peer
- Phase 3: Agree on peering methodology
Phase 1: Identify Peer

- Traffic engineering, data collection and analysis
- Technical, business and legal issues
- Intuition
- Broader business arrangements (CEO’s play golf together)
- Peering policies (open, exclusive)
  - *open* peering policy: we will peer with anyone
  - policies are often exposed only under NDA
Phase 2: Contact Peer

- Find the right *person*!
- Sign NDA (optional)
- Share traffic statistics
Phase 3: Peering Methodology

- Direct-circuit v.s. exchange-based interconnection (or a combination)
  - depends on
    - number of peers participating in the region
    - bandwidth required for the regional interconnections

- Cost sharing
  - split equally
  - I will peer with you if you pay all the cost
Value of the Internet Exchange

Value of Exchange vs. # of participants

- Capacity
- Cost

The Exchange Startup Hump

Critical Mass Point (value = cost)

Large Facility Scaling