Internet Peering:
Connecting to the Core of the Internet

4 out of the 5 largest Internet properties peer at the Core of the Internet.

In one hour, you will understand why.

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10AM Pacific Time

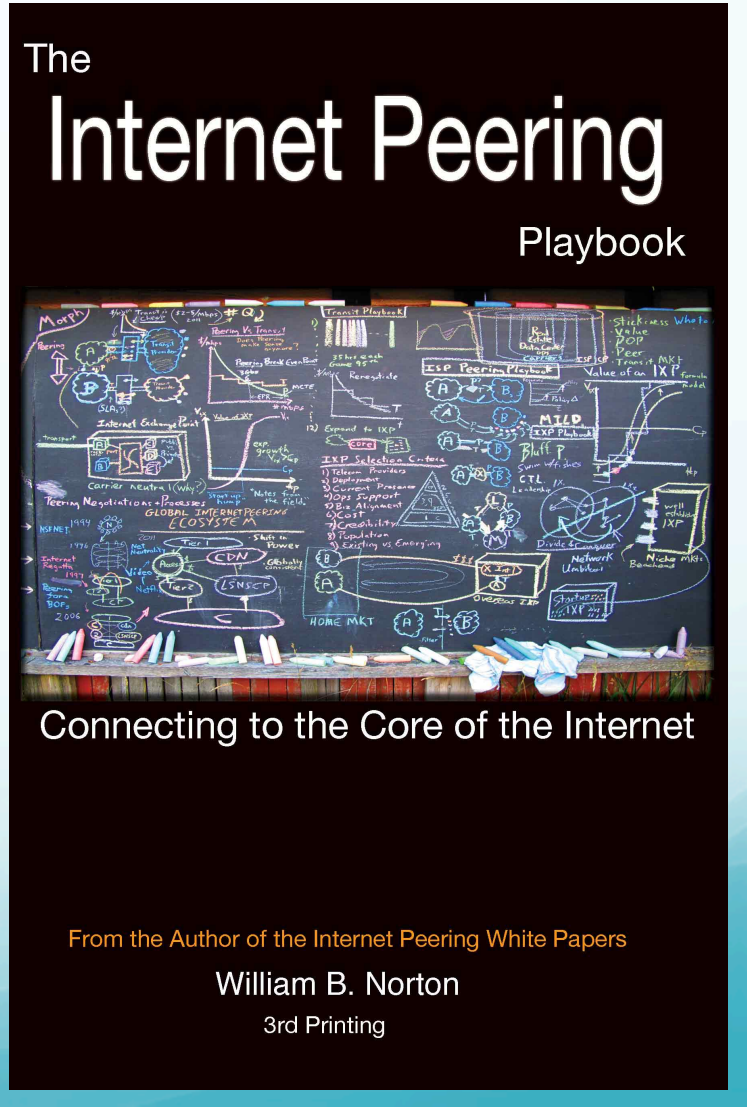
DRPEERING INTERNATIONAL

William B. Norton

- 1988 NSFNET / 1995-1998 NANOG Chair
- Equinix, 1998-2008, Co-Founder & Chief Technical Liaison
  - “The pied piper of peering”
  - “The Digital Pimp”
- 2008-Present - DrPeering, Executive Director

Discount on The Internet Peering Playbook

- For all webinar participants
- http://TheCoreOfTheInter.net
- wbn@DrPeering.net
- Book discount details will be sent via e-mail ($49.99 signed pBook+eBooks+free shipping)



Assuming no background knowledge

Agenda

- Internet=network of networks
- Interconnection of the Internet
  - Internet Transit
  - Internet Peering
- Most companies connect to the “edge” by buying “Internet Transit”
- Bigger players connect to the “core” with “Internet Peering”
- The Business Case for Peering=Peering vs. Transit

Internet Transit

Connecting to the **Edge** of the Internet

Internet Transit

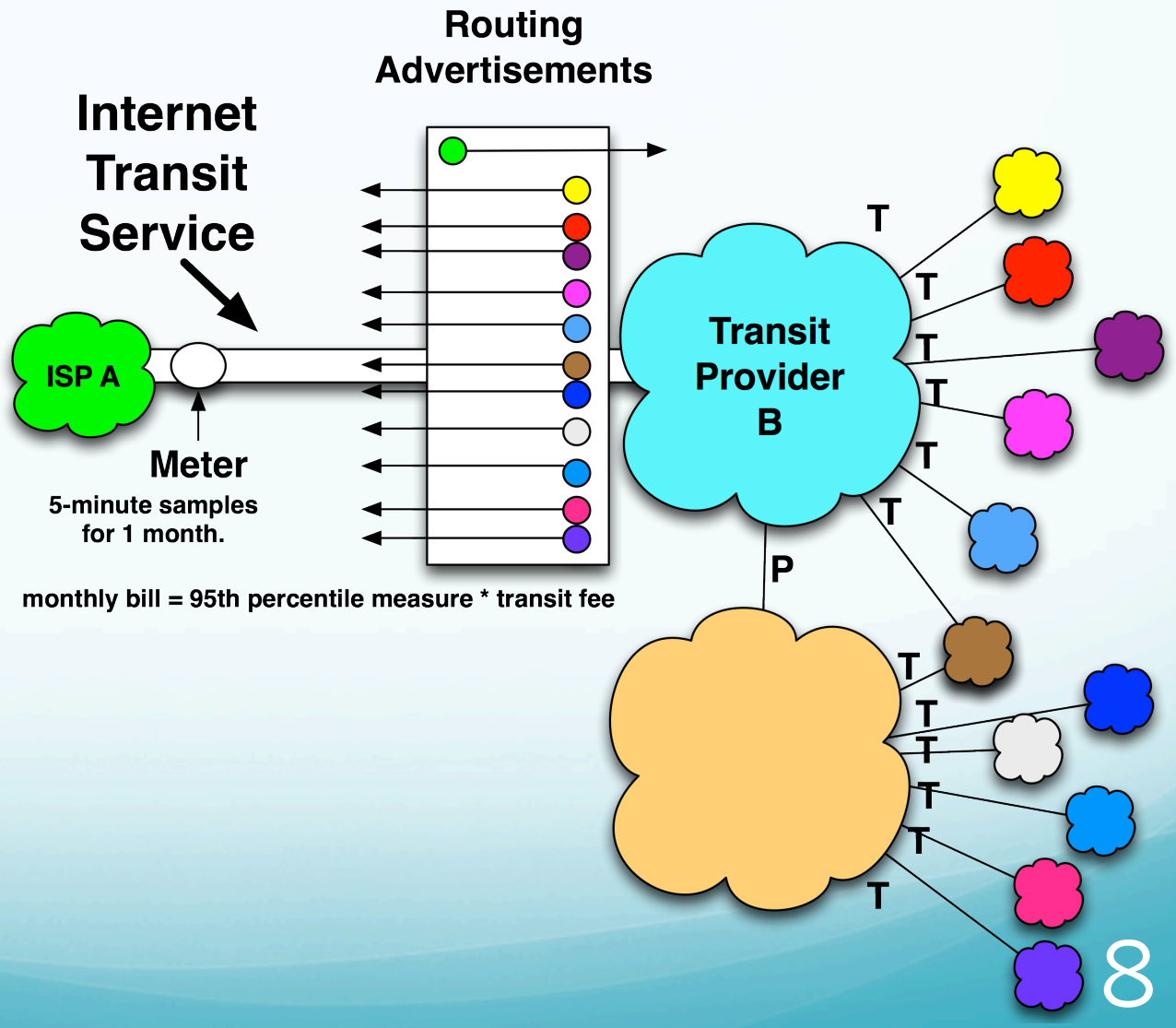
- **Definition**: Internet Transit is a business relationship whereby an Internet Service Provider provides (usually sells) access to the global Internet.
- Typically metered (at the 95th percentile)

Internet Transit

Routing Diagram

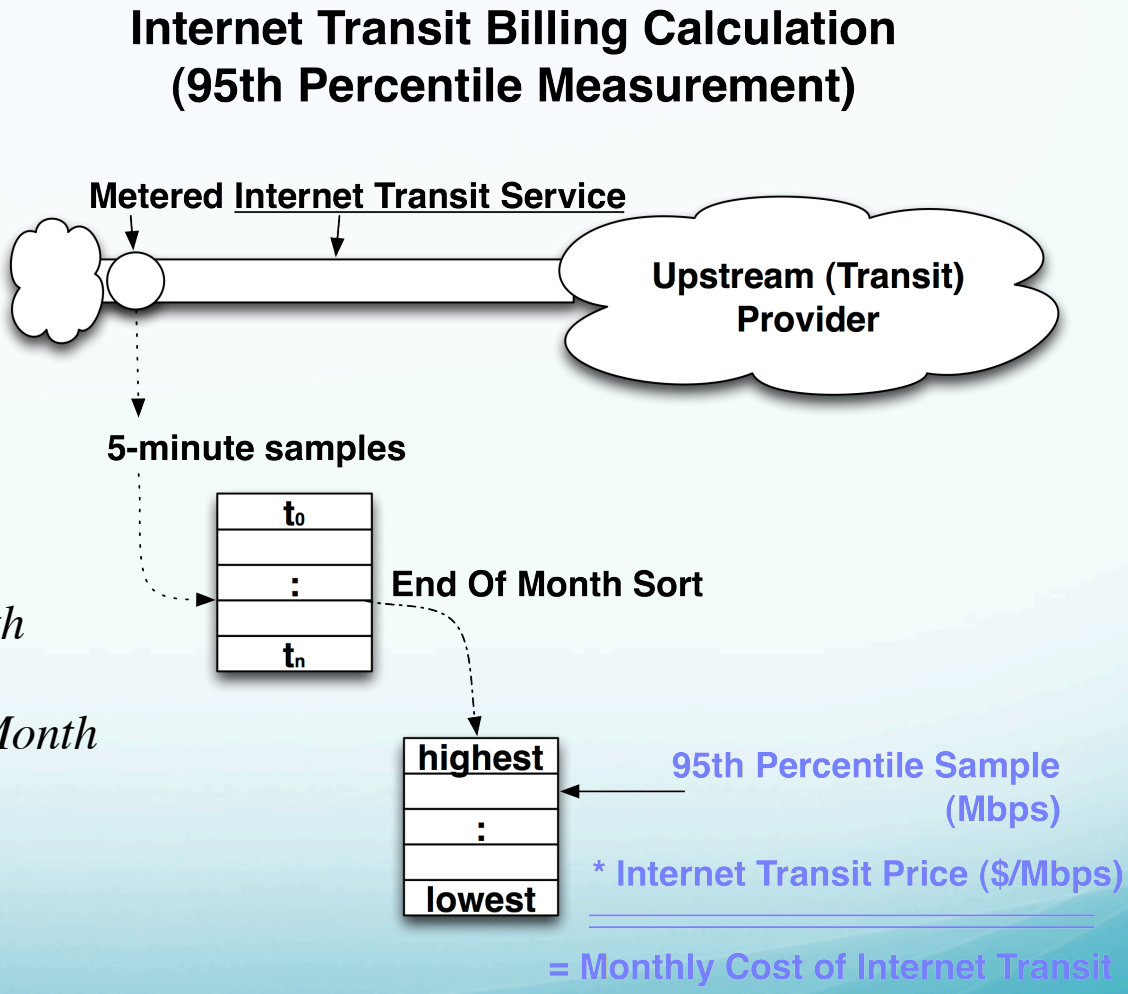
<u>ISP A</u>
"Send all traffic
To Transit Provider B"

<u>Transit Provider B</u>
To the Internet:
"Send all traffic to
ISP A through me"



95th Percentile Billing

- Monthly Bill
- Rate*volume



$$\frac{\$}{Mbps} * Mbps@95th\% = \$ / Month$$

$$\$2 / Mbps * 700 Mbps = \$1400 / Month$$

Transit Commits

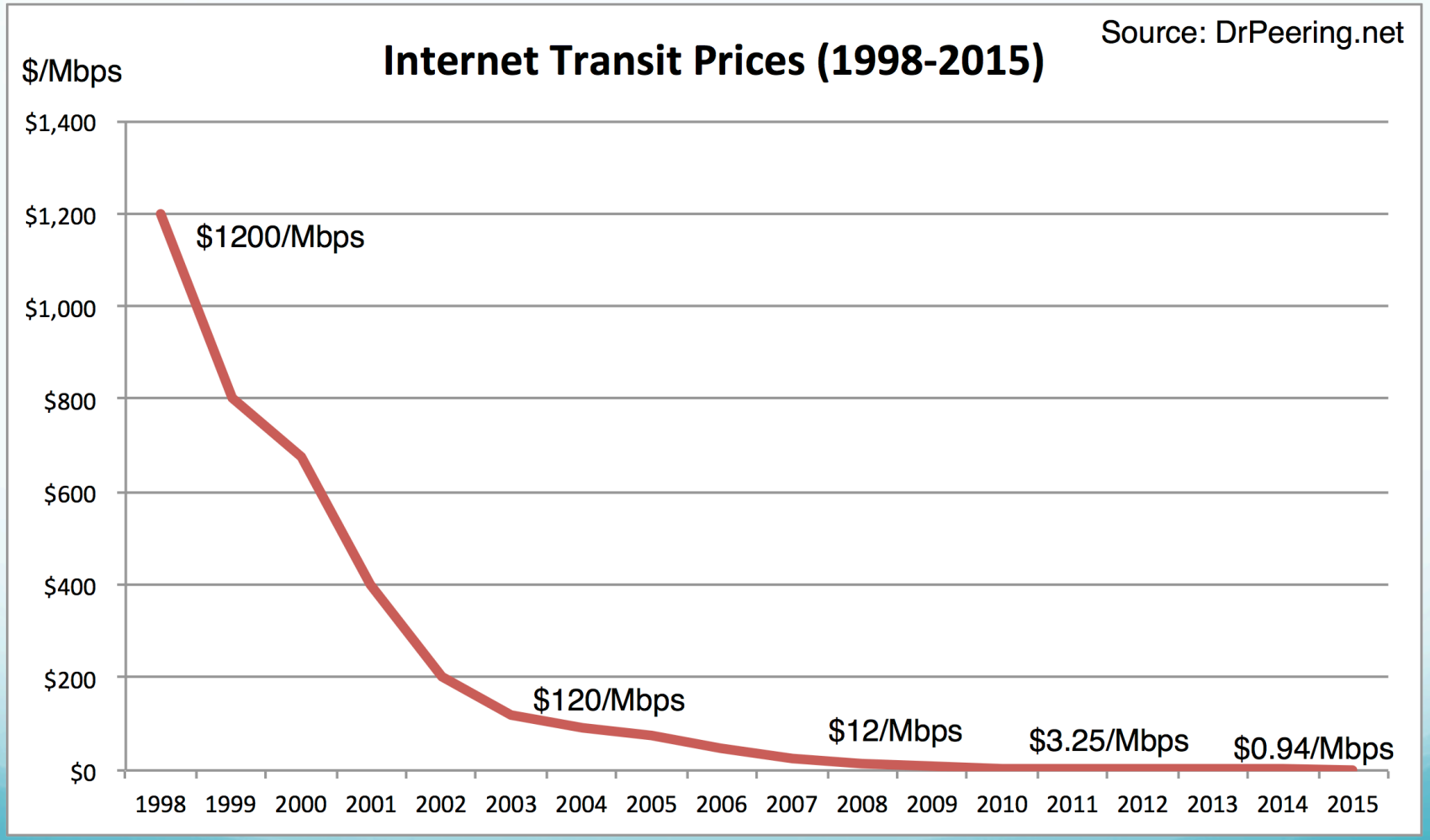
The more you commit to, the lower the unit cost.

But you are on the hook for at least the MinSpend regardless of how much you use.

Contract terms, duration.

Commit		Unit Price		MinSpend	
10	Mbps	$12	per Mbps	$120	/month
100	Mbps	$5	per Mbps	$500	/month
1	Gbps	$3.50	per Mbps	$3,500	/month
10	Gbps	$1.20	per Mbps	$12,000	/month
100	Gbps	$0.70	per Mbps	$70,000	/month

Transit Prices Decline every year



Summary Observations: Internet Transit Service

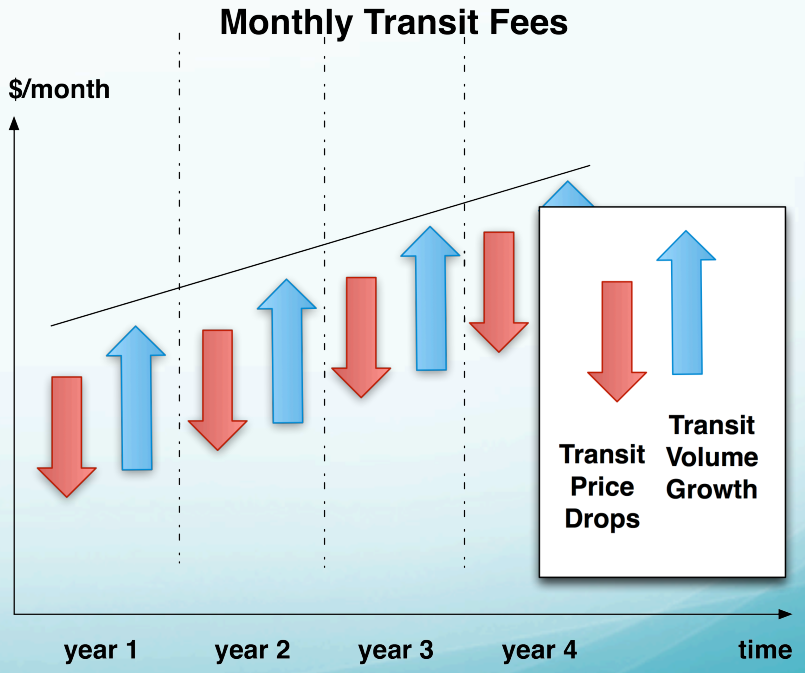
- Simple
- Metered
- Commits
- Contracts
- Price drops

Internet Peering

Connecting to the Core of the Internet

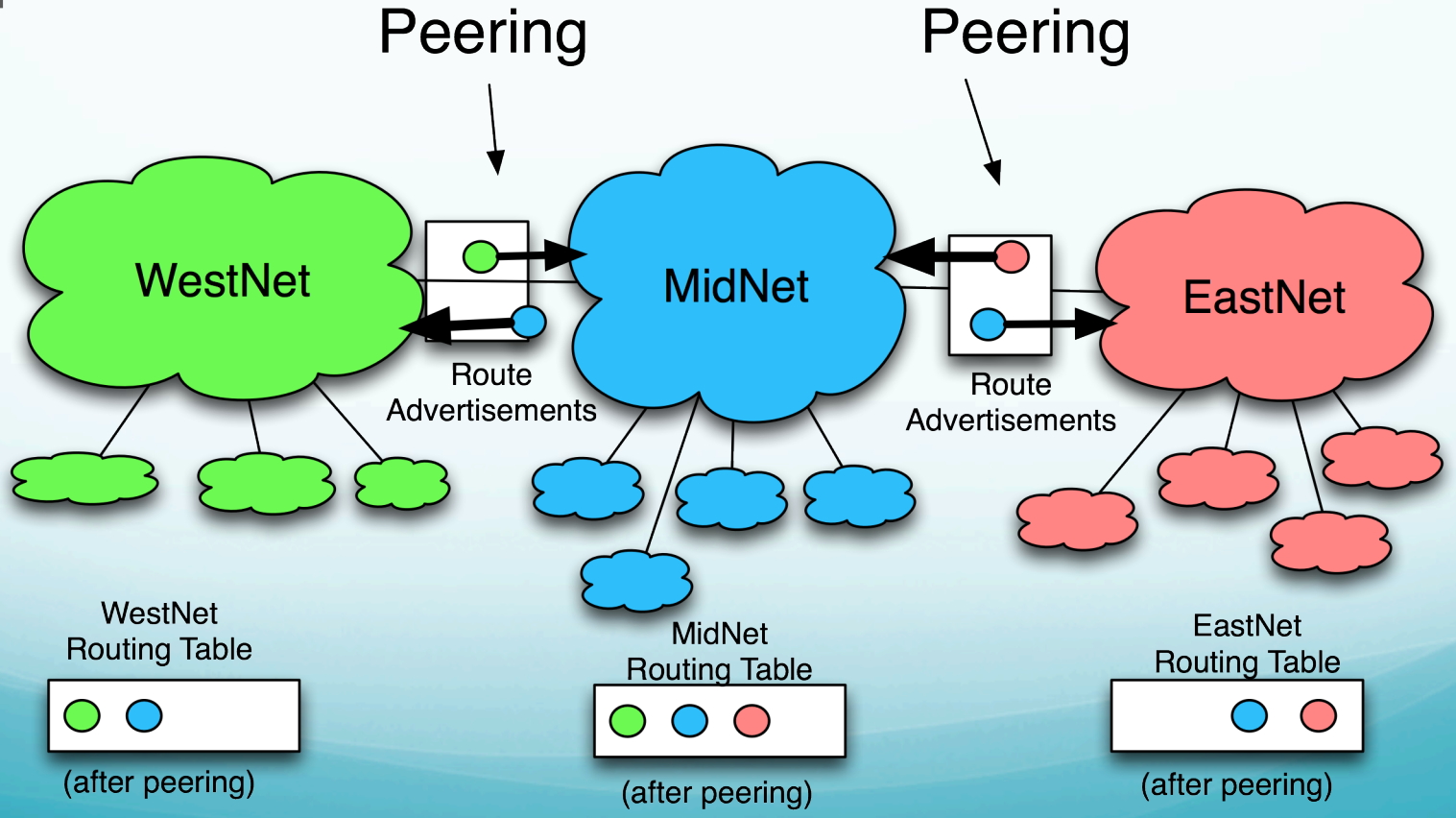
Internet Peering ?

- Does Peering Make Sense Anymore?
- So if transit prices are so cheap, why need anything else?
- Motivation



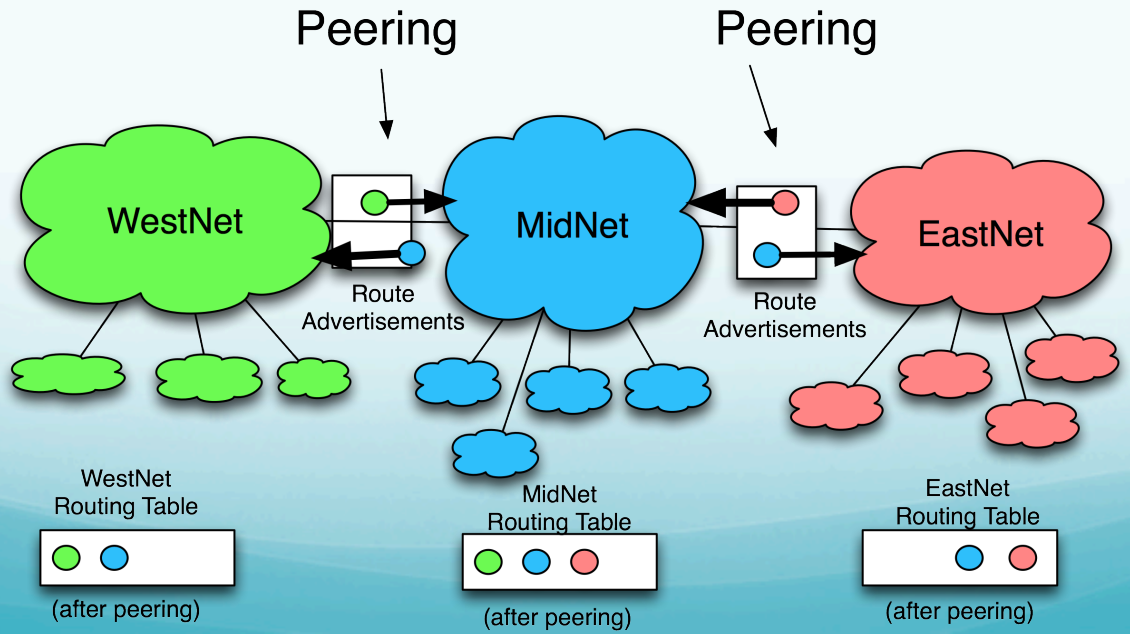
Internet Peering

- **Definition**: *Internet Peering* is the business relationship whereby two companies reciprocally provide access to each other's customers.



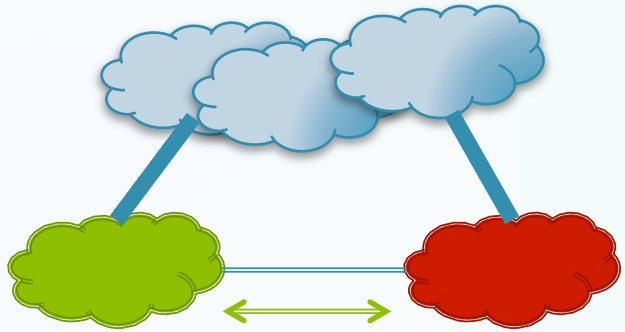
3 key points about Peering

1. **Internet Peering is not a transitive relationship**
2. **Internet Peering is not a perfect substitute for Internet Transit**
3. **Internet Peering is typically settlement-free**



Top 5 Motivations for Peering

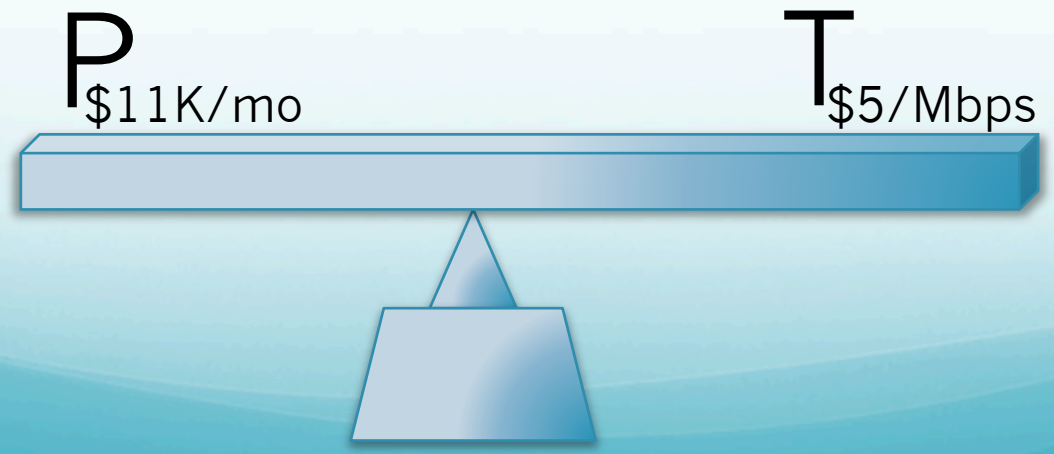
1. Transit costs are reduced
2. End user experience is better
3. Control over routing is strategic
4. Traffic (& billing) is usage-based
5. Marketing benefits



Peering
Shortest-path

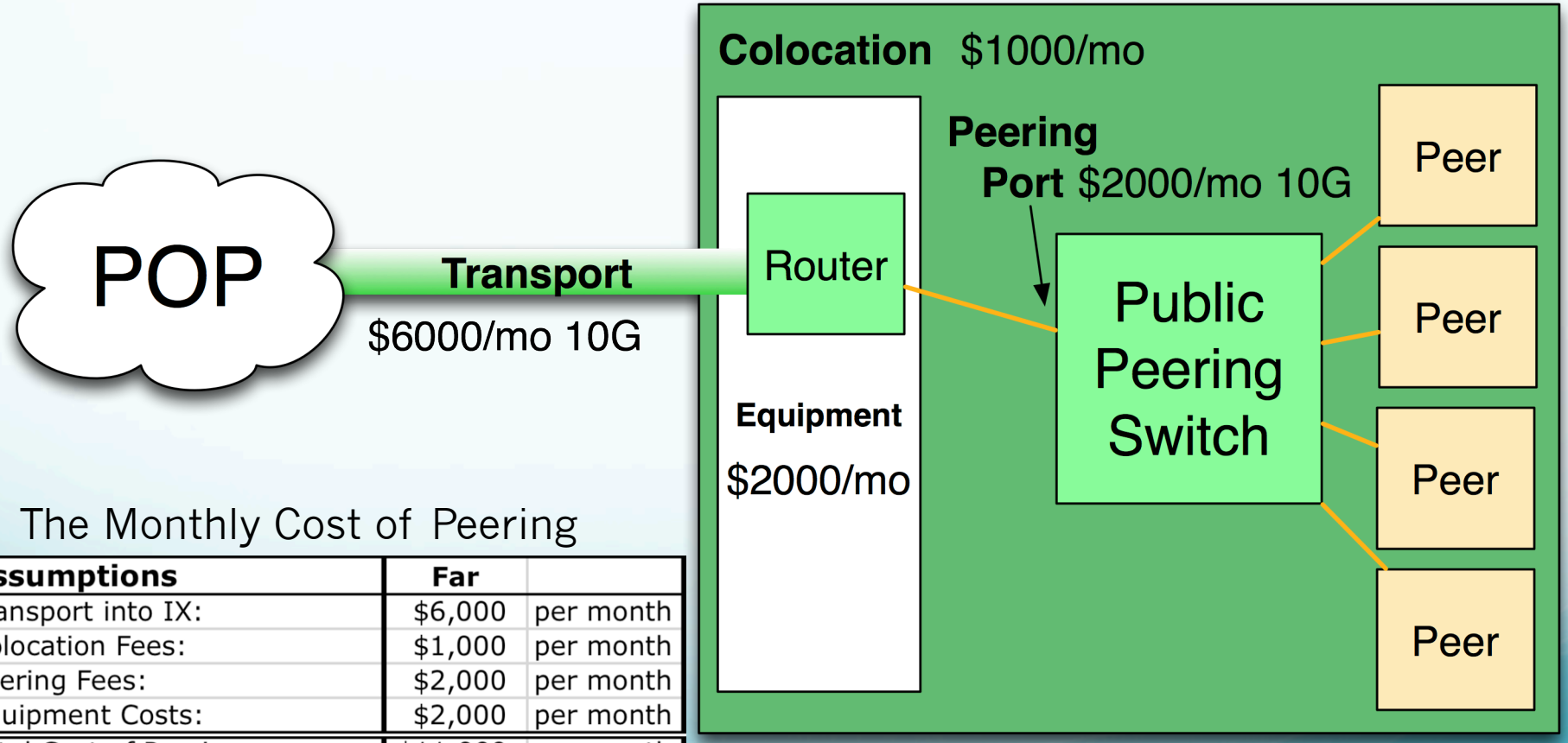
The Business Case for Peering

- "It's a CFO decision"
- "A (short) provable business case"
- Q: When does peering make sense financially?
- A: When Cost of Peering < Cost of Transit



The Business Case for Peering

(Assuming 10G public peering model at an IXP (Internet Exchange Point)



The Monthly Cost of Peering

Assumptions	Far	
Transport into IX:	$6,000	per month
Colocation Fees:	$1,000	per month
Peering Fees:	$2,000	per month
Equipment Costs:	$2,000	per month
Total Cost of Peering:	$11,000	per month

Cost of Peering

Mbps	Peering Cost	
100	$110.00	per Mbps
200	$55.00	per Mbps
300	$36.67	per Mbps
400	$27.50	per Mbps
500	$22.00	per Mbps
600	$18.33	per Mbps
700	$15.71	per Mbps
800	$13.75	per Mbps
900	$12.22	per Mbps
1000	$11.00	per Mbps
1100	$10.00	per Mbps
1200	$9.17	per Mbps
1300	$8.46	per Mbps
1400	$7.86	per Mbps
1500	$7.33	per Mbps
1600	$6.88	per Mbps
1700	$6.47	per Mbps
1800	$6.11	per Mbps
1900	$5.79	per Mbps
2000	$5.50	per Mbps
2100	$5.24	per Mbps
2200	$5.00	per Mbps
2300	$4.78	per Mbps
2400	$4.58	per Mbps
2500	$4.40	per Mbps

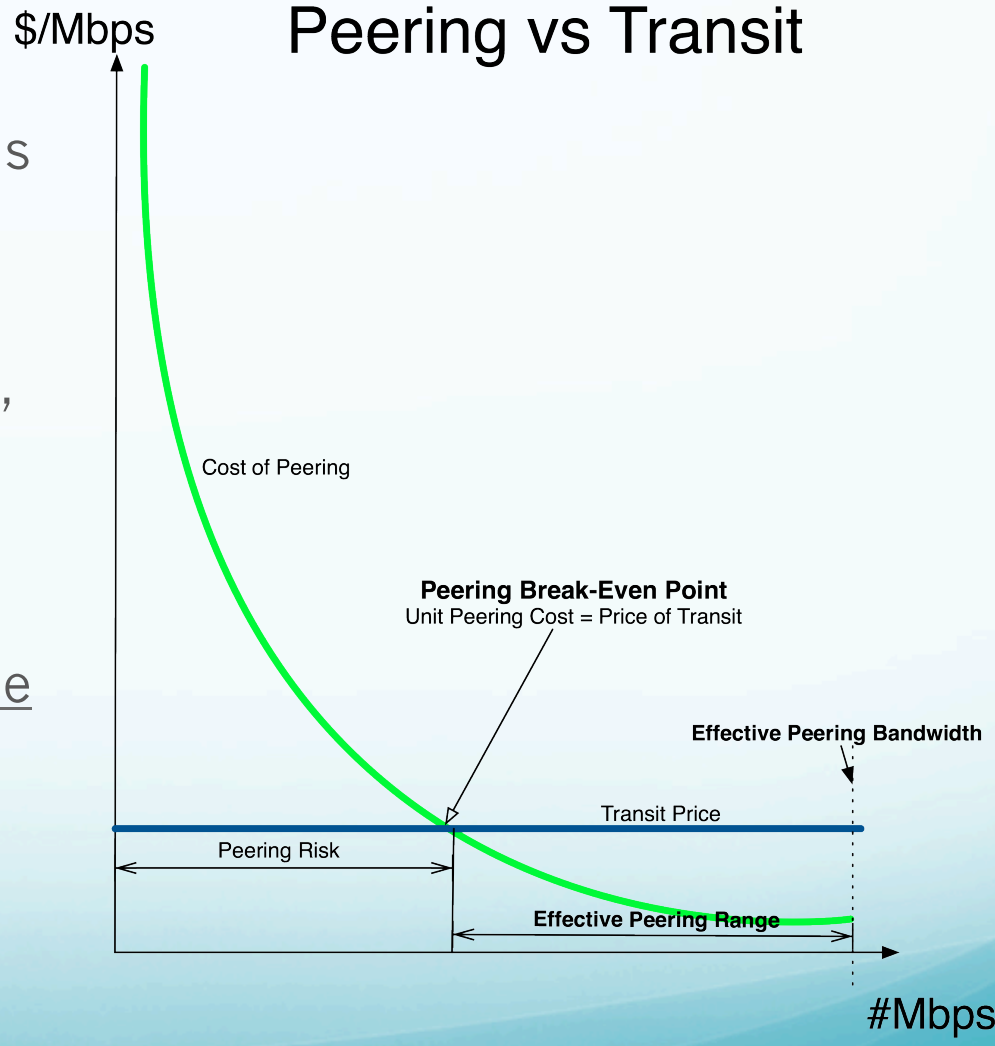
- Total Peering Cost=$11,000/mo
- Unit Cost of traffic exchange over peering depends on volume of freely 'peered' traffic
- Peer 1Gbps?

$$\frac{\$11{,}000\,/\,mo}{1000\,Mbps} = \$11\,/\,Mbps$$

- The more you peer, the lower the unit cost.
- If you pay $5/Mbps for transit, how much traffic do you need to peer for peering to make sense?

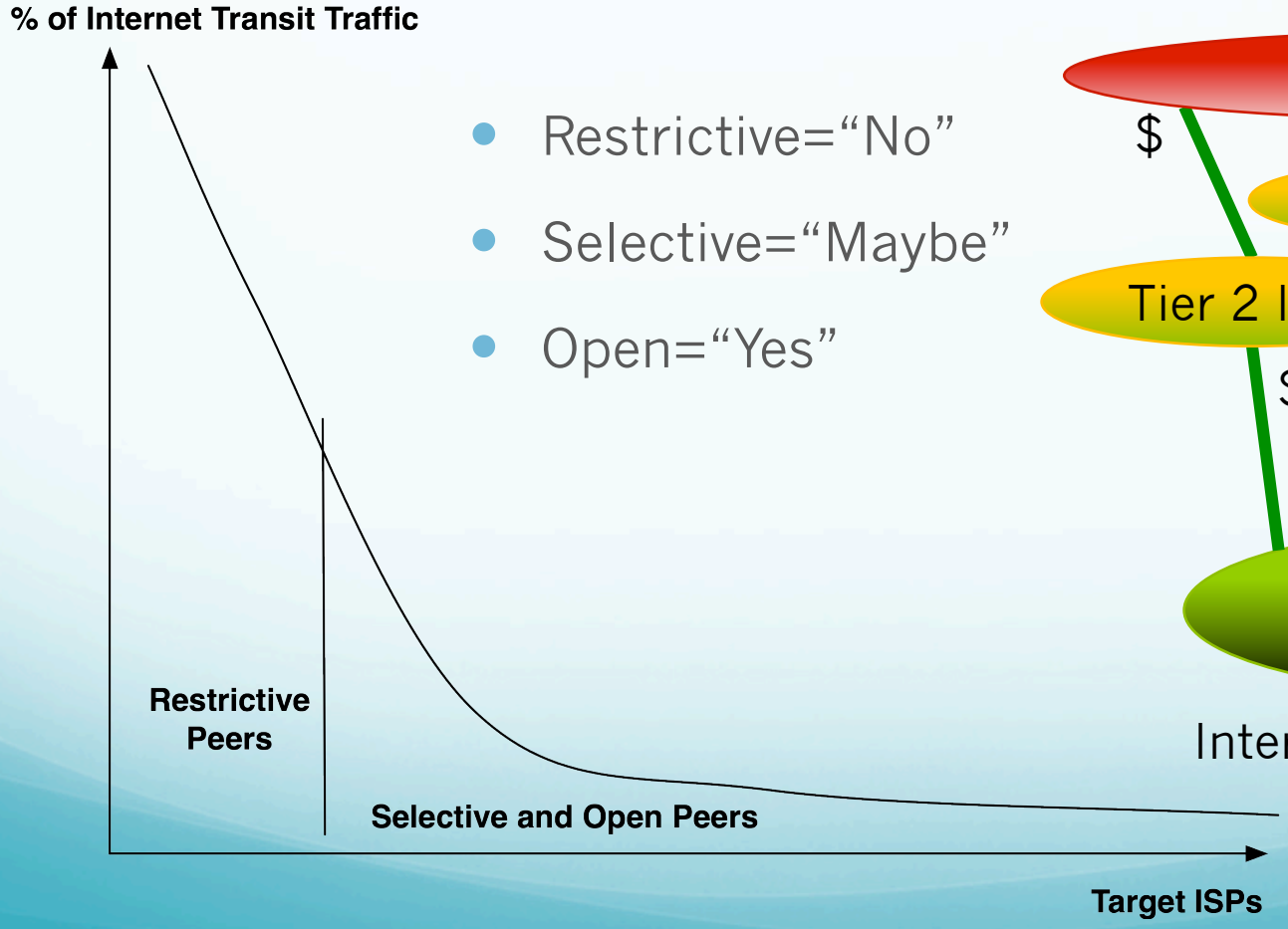
Peering Break-Even Point

- Where the cost of peering exactly equals the unit price of transit.
- If you can peer more, peering provably makes sense.
- Not just a convincing argument – a provable business case for peering.

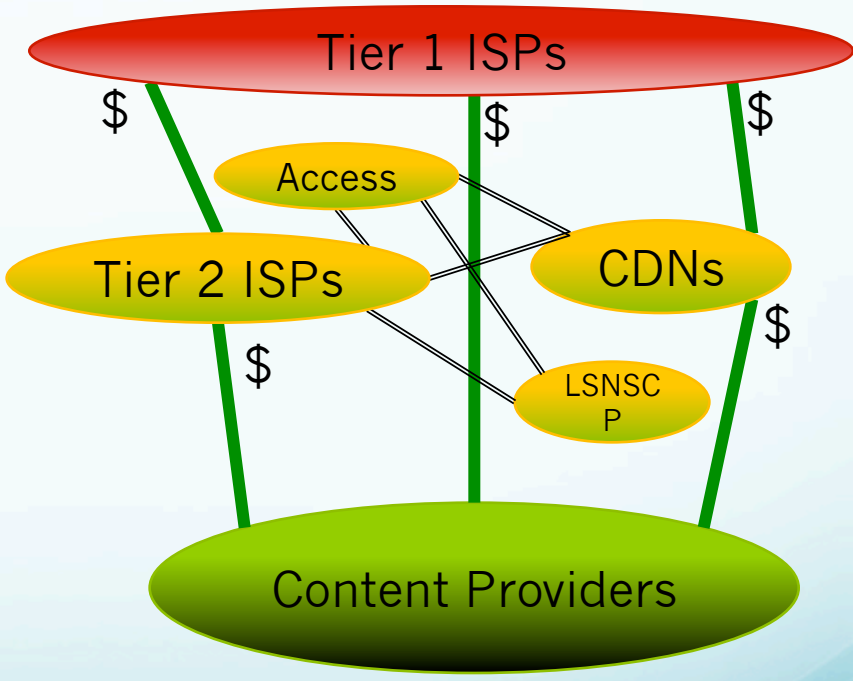


3 Categories of Peers

Top Internet Transit Traffic Destinations



- Restrictive="No"
- Selective="Maybe"
- Open="Yes"



Internet Peering Ecosystem

Network-Dense Colo

- Side Effect of Peering Deployment
- An “Open Market” for transit
- Prices up to 30% cheaper
- Competitive pressures
- Their Core routers are there
- So…Capacity available
- Immediate set up

Summary

- Peering can be a powerful tool
- Especially for networks of scale
- Especially for video and viral content networks
- Simple Math
- My role for 10 years – peering introductions

The Internet Peering Playbook

- You have seen excerpts from the first chapters
- Internet Peering Ecosystem, tactics in the field
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- Book Discount details for registered attendees