




Connecting to the Core of the Internet 



Internet Peering



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INTERNET PEERING

Connecting to the Core of the Internet

Overview of this Internet Peering Section

- Introduce Internet Peering
- List 3 key points about how *Internet Peering* is different from *Internet Transit*
- List top five motivations ISPs gave for peering
- Understand the Internet Peering Process

The most common question at Peering Forums

Q: “Internet Transit is so cheap, why do we need anything else?”

- “Why bother with Peering?”
- “Transit is so cheap (\$1-\$3/Mbps)”
- “and Transit keeps getting cheaper”
- “Does Peering make sense anymore?”
- #1 Question in ISP Peering Coordinator Community
- EVERY.....YEAR

Does Peering Make sense anymore?

A: Price drops 30%, volume increases 60%

→ Transit Bill rises

10Gbps



6 Gbps

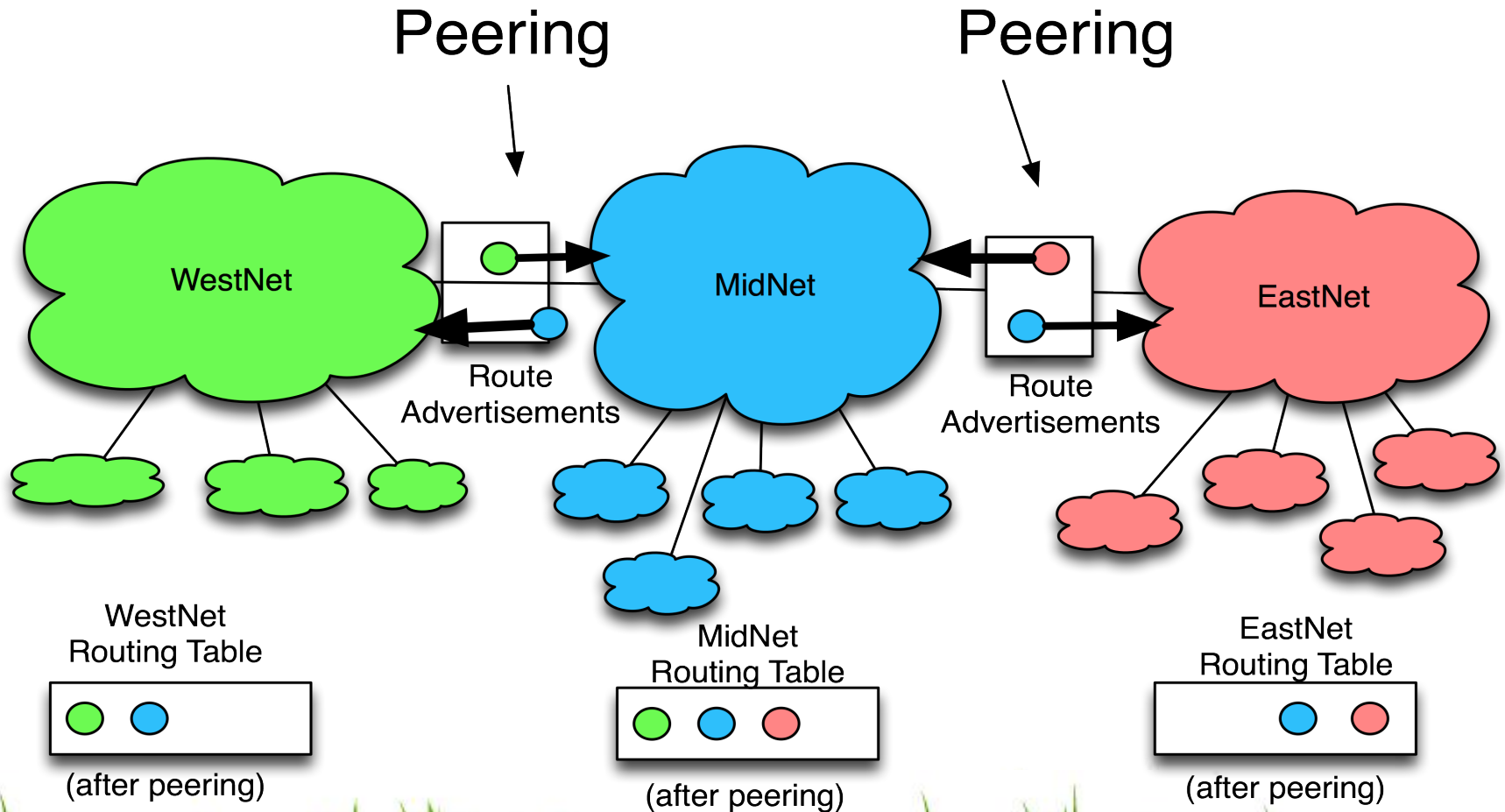
\$3/Mbps



\$2/Mbps

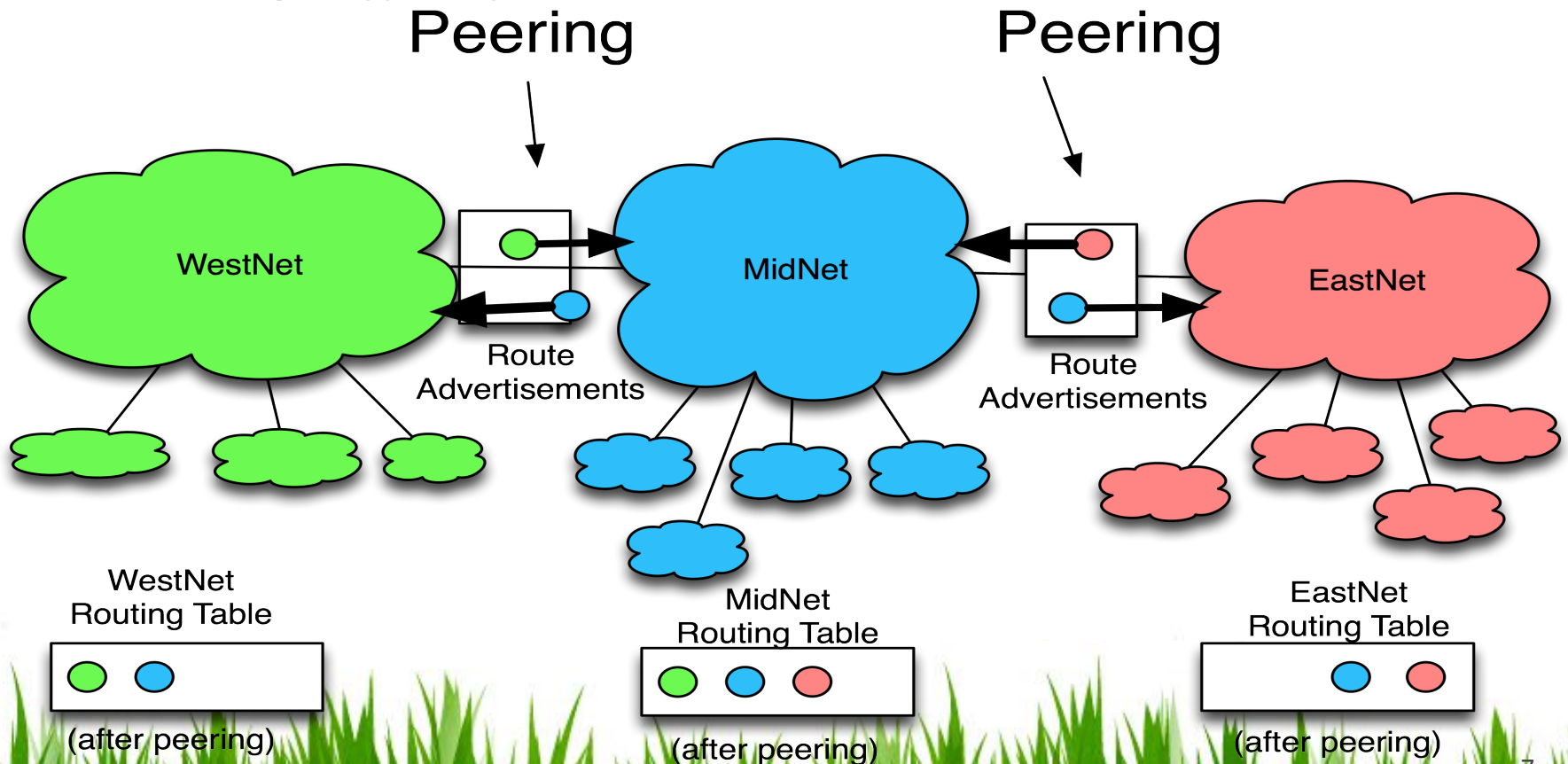
What is Internet Peering?

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

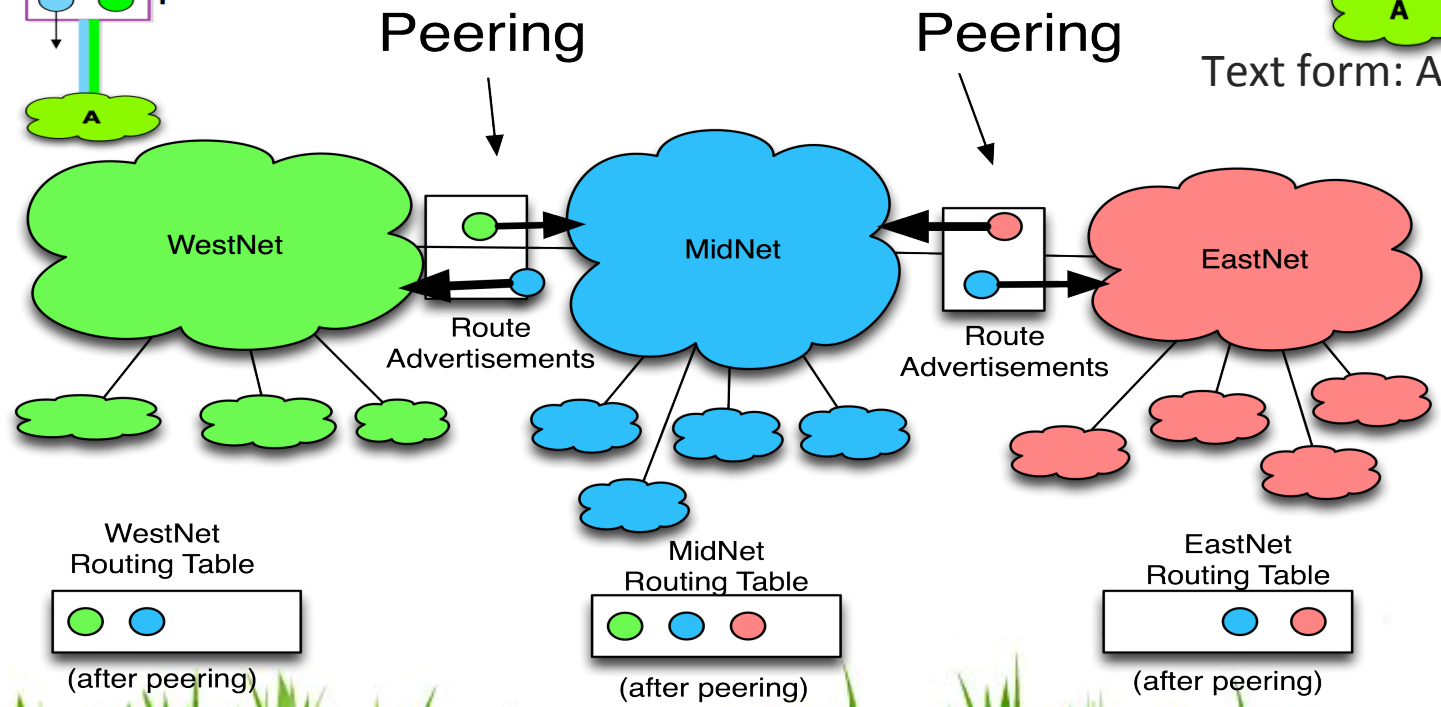
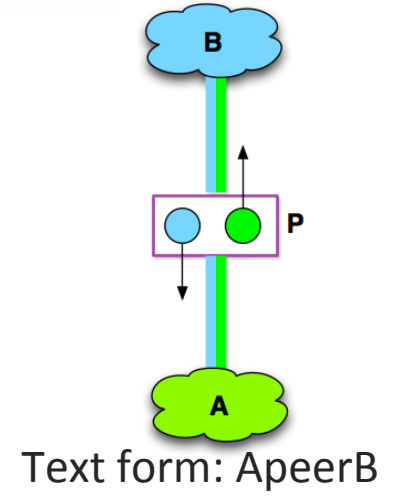
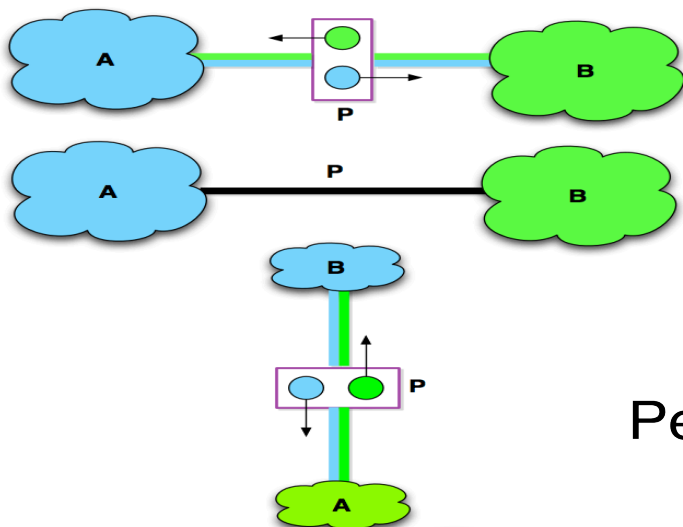


Internet Peering

- 3 Key Points
 1. Peering is not a transitive relationship
 2. Peering is not a perfect substitute
 3. Peering is typically settlement free



Equivalent Notations

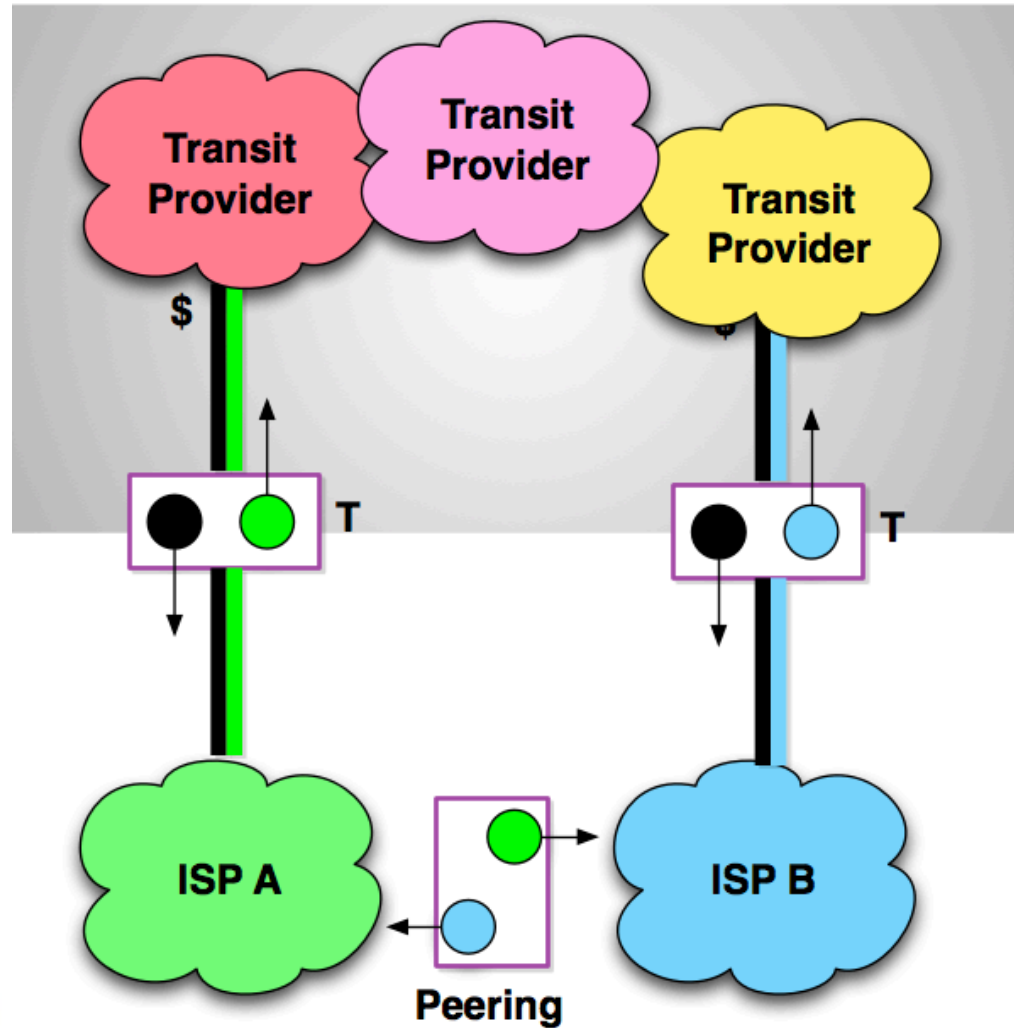


Create network diagrams

Notation shorthand to simply describe business Relationships

I use this notation when working with clients on strategies

-Where to buy, sell, peer.





TOP 5 MOTIVATIONS FOR PEERING

Differs depending on category of Network Services Company

The Top 5 Motivations to Peer

1. Lower Transit Costs
(#1 motive of ISPs)
2. Improve end user experience
(#1 motive of Content Heavy network service providers)
3. Better control over routing-strategic
(#1 from Yahoo!, NetFlix 2008)
4. Usage based billing – make more money by peering
(#1 from AboveNet)
5. Sell more underlying transport capacity
(#1 from Telecom Italia)

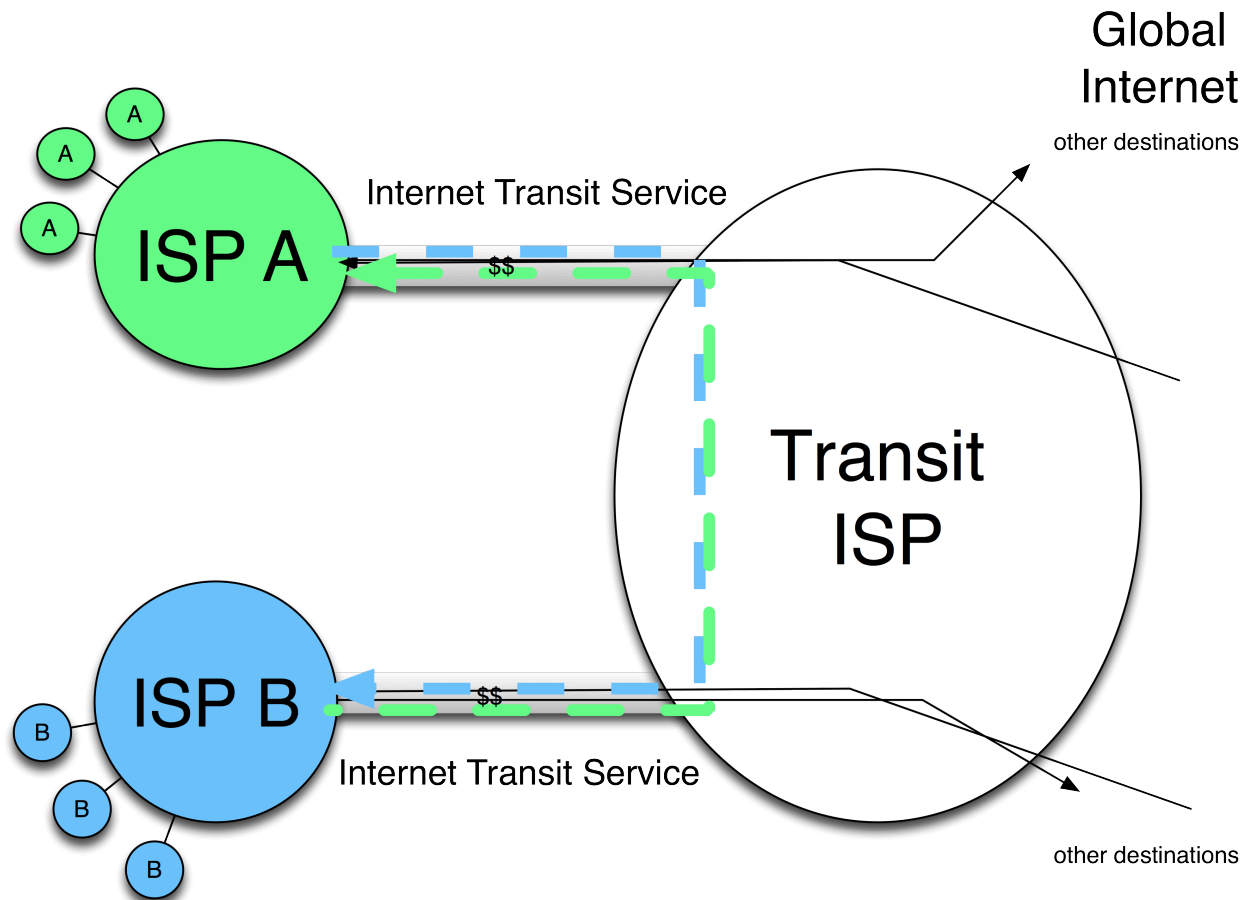


THE 3 PHASES OF PEERING

The Peering Process

Phase 1 – Identification of Peering Target

- NetFlow
- Arbor PeakFlow
- [nfsen](#)
- others



Traffic Distribution Profiles

Top Internet Transit Traffic Destinations

- Top 20-40% tend to be restrictive

% of Internet Transit Traffic



8/23/10

Peering Top 50 List

Event: _____

	Policy (O=Open, S=Selective, R=Restrictive)	ASNum	Traffic Volume (in Mbps)	Company Name	Contact Name
1	R				
2	R				
3	S				
4	S				
5	S				
6	O				
7	O				
8	O				
9	O				
10	O				

rs
next group
ls to be
ctive peers

- the rest tend to be open peers

Restrictive Peers

Selective and Open Peers

Target ISPs

Phase 2 – Initial Contact & Qualification

- “Peering Steering Committee”
- Finding the right person is a challenge
- Traveling, behind on email, too many balls in the air
- Here are the top 10 ways seasoned peering professionals use to establish contact

Peering Top 50 Target List				
Policy	ASN	Traffic Volume	Company Name	Peering Person

Top 10 Ways the Pros Contact Target ISPs

1. face-to-face at informal meeting in an Internet Operations forum like NANOG, IETF, RIPE, GPF, APNIC, AFNOG, etc.,
2. face-to-face at Commercial Peering Forums like Global Peering Forum (you must be a customer of one of the sponsoring Ixes)
3. face-to-face at IX Member Meetings like DE-CIX, LINX, or AMS-IX member meetings.
4. introductions through an *IX Chief Technical Liaison* (or a peer) that knows the right contacts

Top 10 ways the Pros Contact Target ISPs

5. via electronic mail, using the pseudo standard peering@ispdomain.net or a personal contact,
6. from contacts listed on an exchange point participant list, or peeringdb registrations,
7. with tech-c or admin-c from DNS or ASN registries,
8. Google for peering contact \$ASN peering ,
9. from the target ISP sales force, at trade show or as part of sales process,
10. from the target ISP NOC.

A Bad Peering email

Hello kind sir,

It has recently been purchased to my attention that at this moment in time both of our companies are present at the LINX in London England and that we do not at this moment in time have an agreement between our companies such that we may interchange the traffics of our people and customers over this LINX in London England but that we exchanges our traffics in other manors that are detriment to our combined interests.

Please may it be that you are in reply to my email which I write with great satisfication that we are to be setting the configuration up of the peerings at LINX in London England.

Please be in reply to this email if you are in agreement.

I am available of the email address peering@internetserviceprovidings.in

Peering Department

Internet Service Providings India

misspellings, poor grammar generally

Missing Information

AS Number?

Traffic Volume?

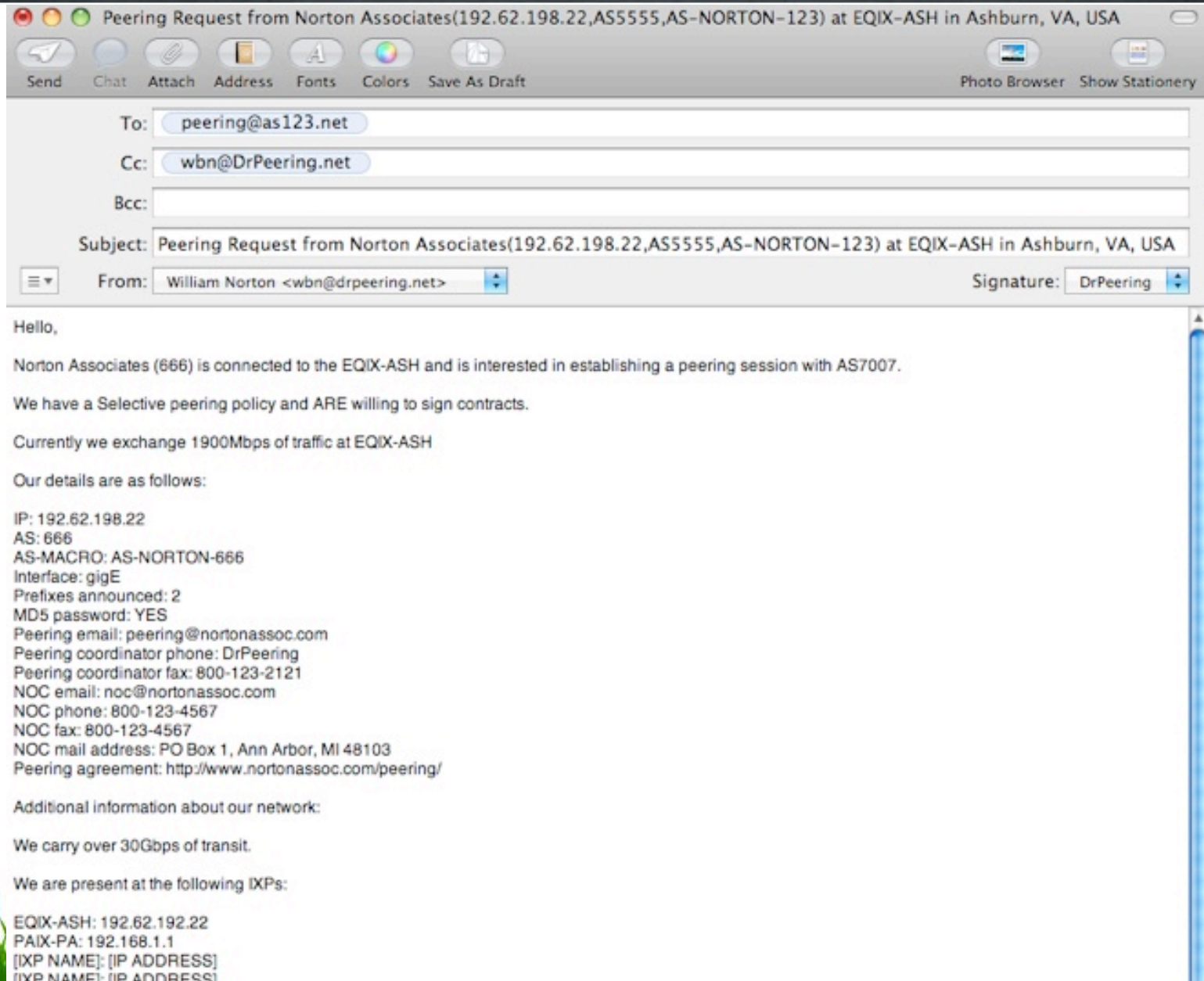
Peering Requirements (if any?)

Other Peering Locations?

URL to backbone maps, website?

What problems do you see with this peering request?

A slightly better peering email request



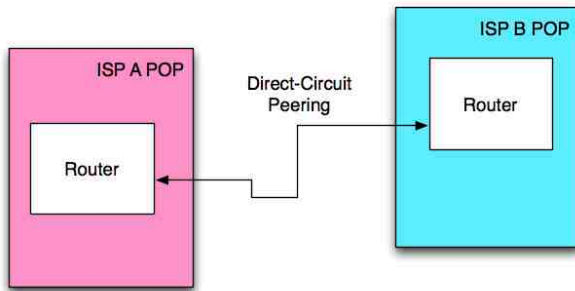
Phase 2 – Initial Discussion

- NDAs may be signed Non-Disclosure Agreements
- BLPAs examined Bi-Lateral Peering Agreements
- Discussion of prerequisites and policies
- Exchange of backbone maps
- Like a date, with a chance of long-term happiness from exchanging routes

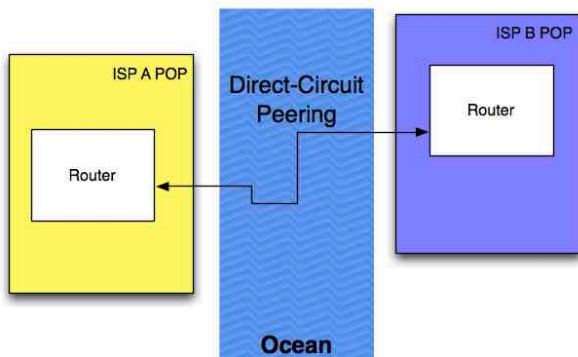
Phase 3 – Implementation Discussion

- Direct Circuit

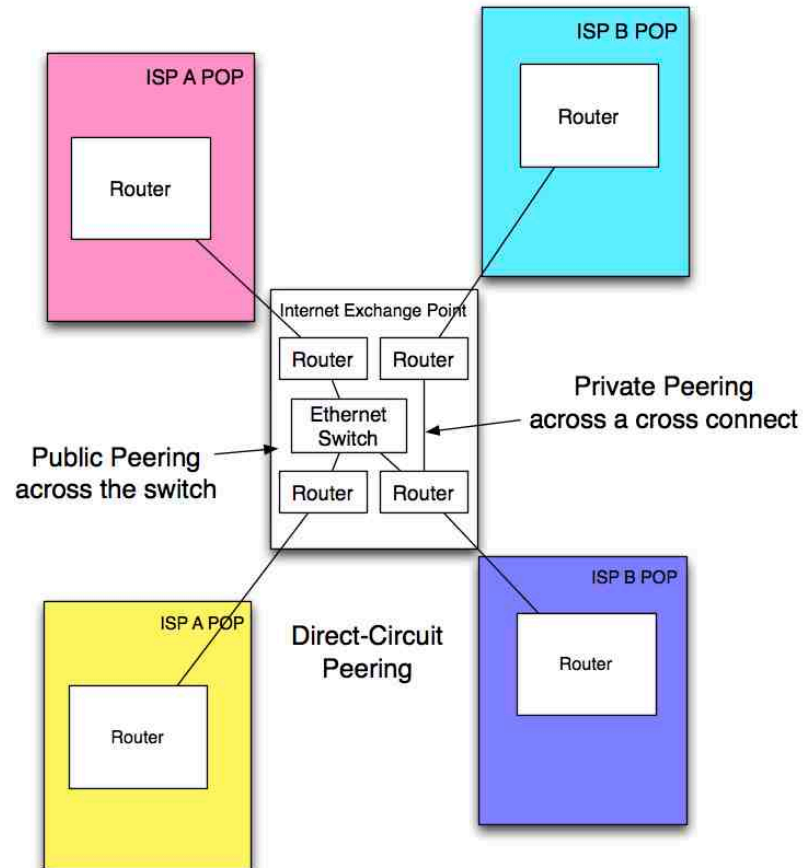
Metro Area Direct Circuit Peering



Transoceanic Half-Circuits



- Internet Exchange Point



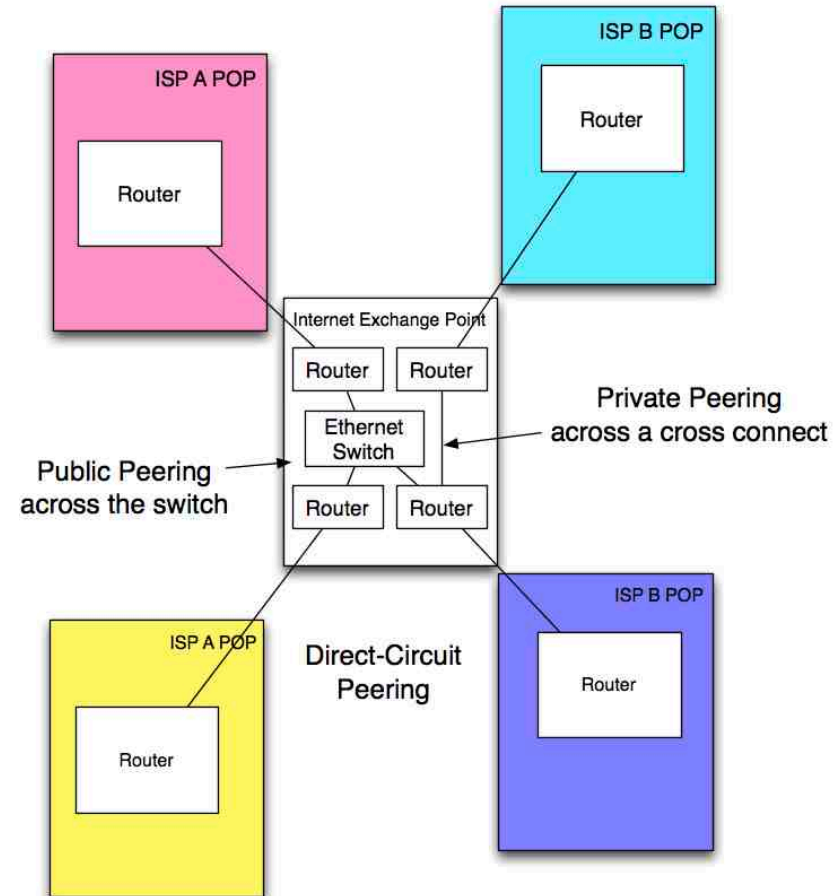
Direct Circuit vs. Internet Exchange Point

Direct Circuit Approach

- Exactly two parties connected
- Cost: circuit cost

IX Approach

- Private peering + Public Peering
- Multiple parties connected to shared peering fabric
- Cost: Transport, router, colo, peering port



A quick “Paid Peering” Aside

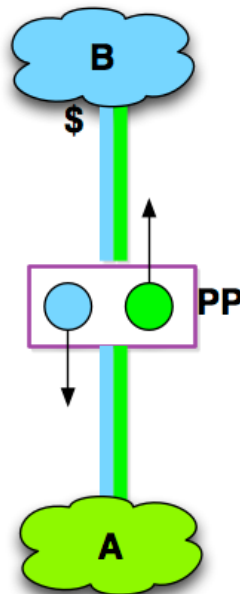
- **Definition:** A *Paid Peering* relationship is a peering relationship but with an exchange of compensation from one party to the other.

Characteristics of a Paid Peering Relationship

Metered: \$/Mbps

or Barter for services

~ Asymmetric allocation of costs of peering relationships



Paid Peering notation

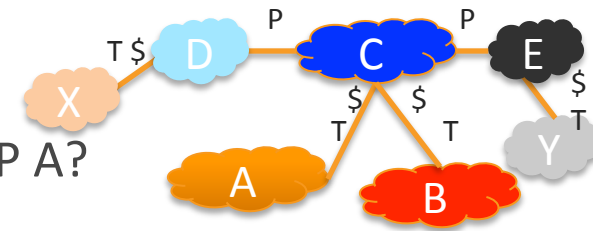
Challenges

1. “I am ISP A. If I peer with B and C, won't B and C start sending their traffic to each other through my network?”



2. In Australia we tax barter. . . How is Internet Peering like or unlike barter?

3. Draw the network diagram using the peering and transit notation for the following scenario: ISP A and ISP B purchase transit from ISP C who peers with ISP D and ISP E. ISP D sells transit to ISP X and ISP E sells transit to ISP Y.



4. In #3, would ISP C likely be interested in peering with ISP A?
5. Should paid peering be priced the same as Internet Transit? What is the case for it being priced cheaper than transit, and what is the case for pricing is higher than the price of transit?

Questions?
