Why Peer?

William B. Norton
Chief Strategy Officer, IIX
Executive Director, Dr. Peering
Blink: 50 Exposures
50 Fishing trips
The Internet Peering

Playbook

Connecting to the Core of the Internet

William B. Norton

2014 Edition
Why Peer?
Peering Saves Money

Peering vs Transit

Example

Cost of Peering = $2500 / mo
Transit Price = $5 / Mbps / mo

Peering Break Even Point = $2500 / $5 = 500 Mbps

Source: The Internet Peering Playbook: Ch. 5 The Business Case for Peering
Traditional Peering

- Router CapEx
- Colocation Fees
- Deployment/Install Fees
- Paperwork for each IXP
- Weeks or Months to turn up

Fixed Cost Circuits
Remote Peering (aka Remote Peering)

Remote Peering VLAN(s) delivered to the router

Remote Peering Provider

Remote Peering Provider Equipment

Remote Peering

No Router CapEx
No Colocation Fees
No Deployment/Install Fees
Paperwork Reduction for IXP
Near instant turn up
Tethering (aka Remote Peering)

- Remote Peering Provider
- No physical presence required
- VLAN Service Model

Remote Peering VLAN(s) delivered to the router

10Gbps Remote Peering Service

Remote Peering Provider

Remote Peering Provider Equipment

Customer Router

LINX VLAN
AMS-IX VLAN
DE-CIX VLAN

With potential many VLANs (one per exchange point) delivered to the customer router

Remote Peering
No Router CapEx
No Colocation Fees
No Deployment/Install Fees
Paperwork Reduction for IXP
Near instant turn up
Traditional Peering vs. Remote Peering vs. Internet Transit

Peering
- Colocation
- Equipment
- Transport

= Remote Peering

$/Mbps

Traditional Peering

Remote Peering

Transit

#Mbps
# One Tethering Use Case

Remote Peering VLAN(s) delivered to the router

<table>
<thead>
<tr>
<th></th>
<th>Traditional Peering</th>
<th>Remote Peering</th>
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</thead>
<tbody>
<tr>
<td><strong>CapEx</strong> for 4 European POPs</td>
<td>$1.1M one-time ($275K/POP)</td>
<td>0</td>
</tr>
<tr>
<td><strong>OpEx</strong> for 4 European POPs</td>
<td>$15K/month</td>
<td>0</td>
</tr>
<tr>
<td><strong>Circuit Costs</strong> for network of 4 European POP</td>
<td>$6K/month</td>
<td>$6K/month across MPLS cloud to 4 POPs</td>
</tr>
</tbody>
</table>

Source: Chapter 14, The Internet Peering Playbook
Tethering opens up Peering to a broader set of networks.
When does it make sense to have a physical router presence at the IX?

When does *Tethering* make sense?
Traffic Distribution: **Blend**

- Internet Transit
- Internet Peering
- Tethering (aka Remote Peering)
- CDN
- Paid Peering
- Caching
Why Peer?

1) Peering Saves Money
Why Peer?

2) Peering Improves Performance
Peering Improves Performance

3x static object download time, Telkom, South Africa

Static object download time, Ooredoo, Qatar

Source: Grzegorz Janoszka, “Is peering really faster? Let the data speak for itself,” EPF Split, Croatia
Why Peer?
3) Peering Makes Money
3) Peering Makes Money

ISPs charge on a metered basis

Peering tends to reduce latency and packet loss

Latency slows the TCP session establishment & data transfer

Packet Loss causes data transfer rate to divide by two

Packet Loss and Latency slows the transit billing meter

Peering enables the transit billing meter to spin faster

Therefore, Peering makes ISPs more money
4) Peering Improves Security
4) Peering Improves Mental Health
4) Peering Improves Mental Health

Face-to-face discussions are better than email
5) Peering Improves Security
5) Peering Improves Security

- 1) Peering Immune from side effects of DDoS
- 2) Peering Reduces “Attack Surface”
- 3) Peering *Speeds* Time to Recovery
On the Commodity Internet

Traffic traverses potentially many networks before reaching its destination
All traffic in the Commodity Internet is intermingled

Which works fine when there is plenty of interconnection. Bandwidth, networks have plenty of Memory, CPU, etc. Aggregation Efficiency are great.
But when there are DDOS attacks...

...anywhere along the transit path, Packet loss, latency, poor performance.
Result: DOS: A→G Unable to establish a secure channel.
DDoS Scale

DDOS Attacks
10G = Pea Shooter
Or Spot Events...

...anywhere along the transit path, Packet loss, latency, poor performance.
Result: DOS: A→G Unable to establish a secure channel.

Note:
Not just DDOS
Spot Events (MS Update, Oprah interview, etc.)
1) By peering, peered traffic is immune from the side affects of DDOS, Peering Improves Security
Commodity Internet has many points of vulnerability

Networks can be hijacked

Interconnects can be tapped, mirrored, redirected, captured

No visibility to upstream issues
May be in protected IDC or
On the top of a telephone pole
For the subset of peered traffic.
Hardened building
Better Visibility, peers should notice disruption.
Peering Improves Security
3) Peering Improves Recovery Time

Networks can be hijacked

Interconnects can be tapped, mirrored, redirected, captured

Practical Matter – peers exchange
Contact Info, NOC #’s, network maps,
Escalation procedures, cell phone #’s
You met the person → faster resolution times.
Peering Improves Security

1. Internet Transit intermingles traffic
   Vulnerable to DDOS side effect
   Peering bypasses the “wild wild west commodity Internet”
2. Internet Transit more points of vulnerability
   Interconnects and networks along the path
   Peering involves fewer network elements between content and eyeballs
3. Security response is faster with peers
   Upstream NOCs won’t take your call

What are some counter arguments?
Q&A

Thank you for your time!

Comments Welcome!

wbn@iix.net
Why Peer?

1. Peering Saves Money
2. Peering Improves Performance
3. Peering Increases Revenue
4. Peering Improves Mental Health
5. Peering Improves Security