Why Peer?

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Blink: 50 Exposures

50 Fishing trips

The Internet Peering Playbook

Connecting to the Core of the Internet

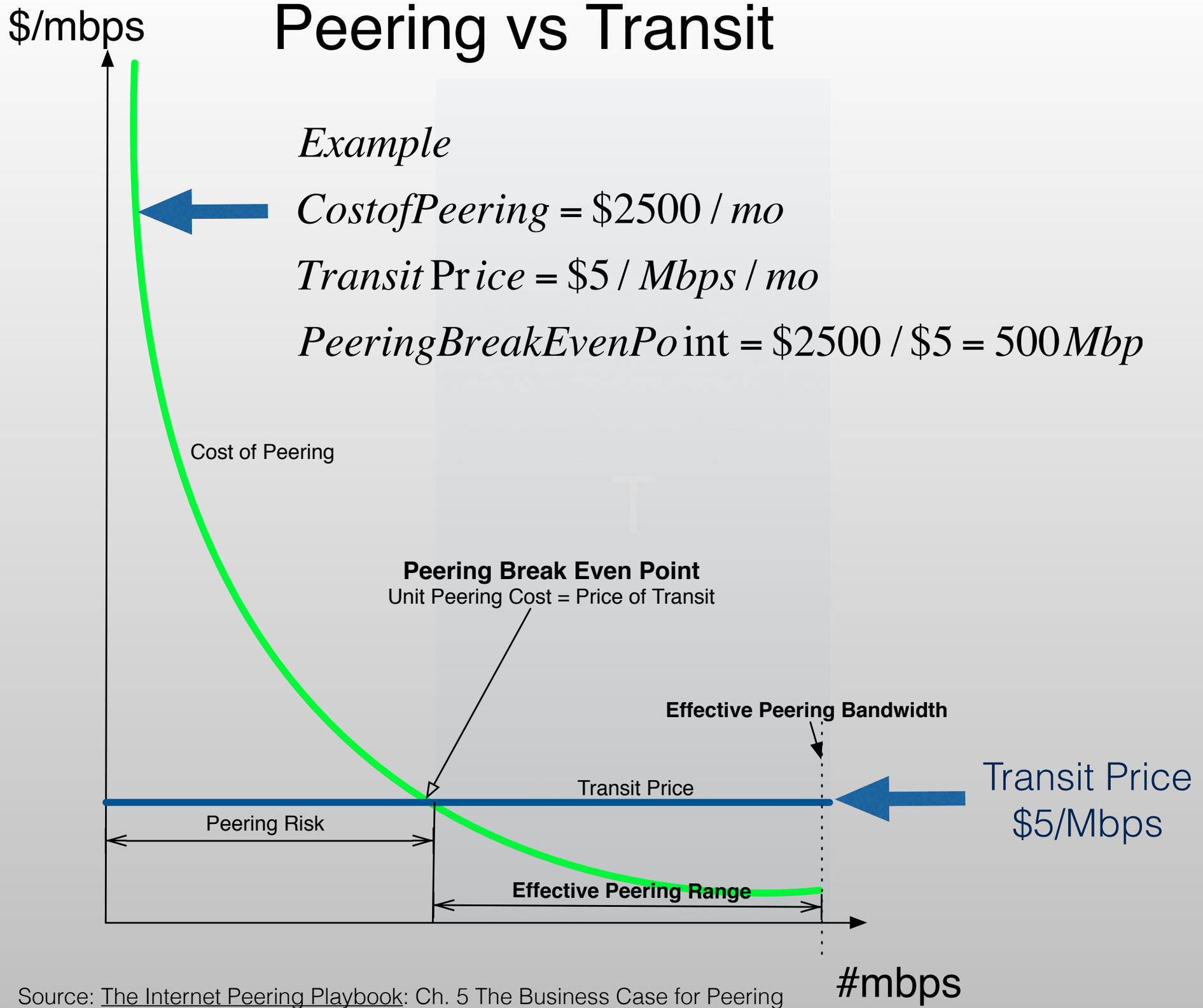
William B. Norton

2014 Edition

Why Peer?

Peering Saves Money

Peering vs Transit



Example

$$CostofPeering = \$2500 / mo$$

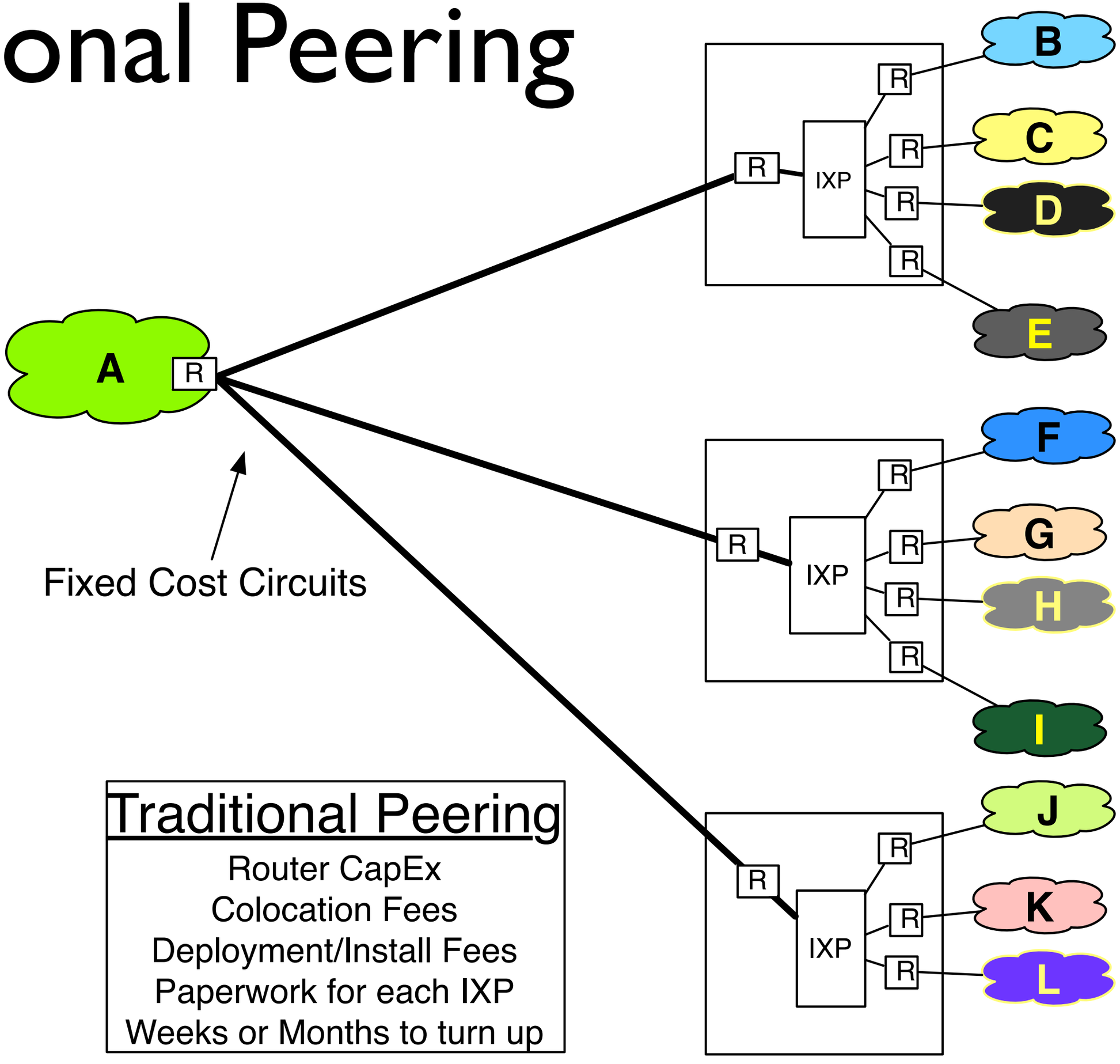
$$Transit\ \mathrm{Pr}ice = \$5 / Mbps / mo$$

$$PeeringBreakEvenPo\,\mathrm{int} = \$2500 / \$5 = 500\,Mbp$$

Transit Price
$5/Mbps

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

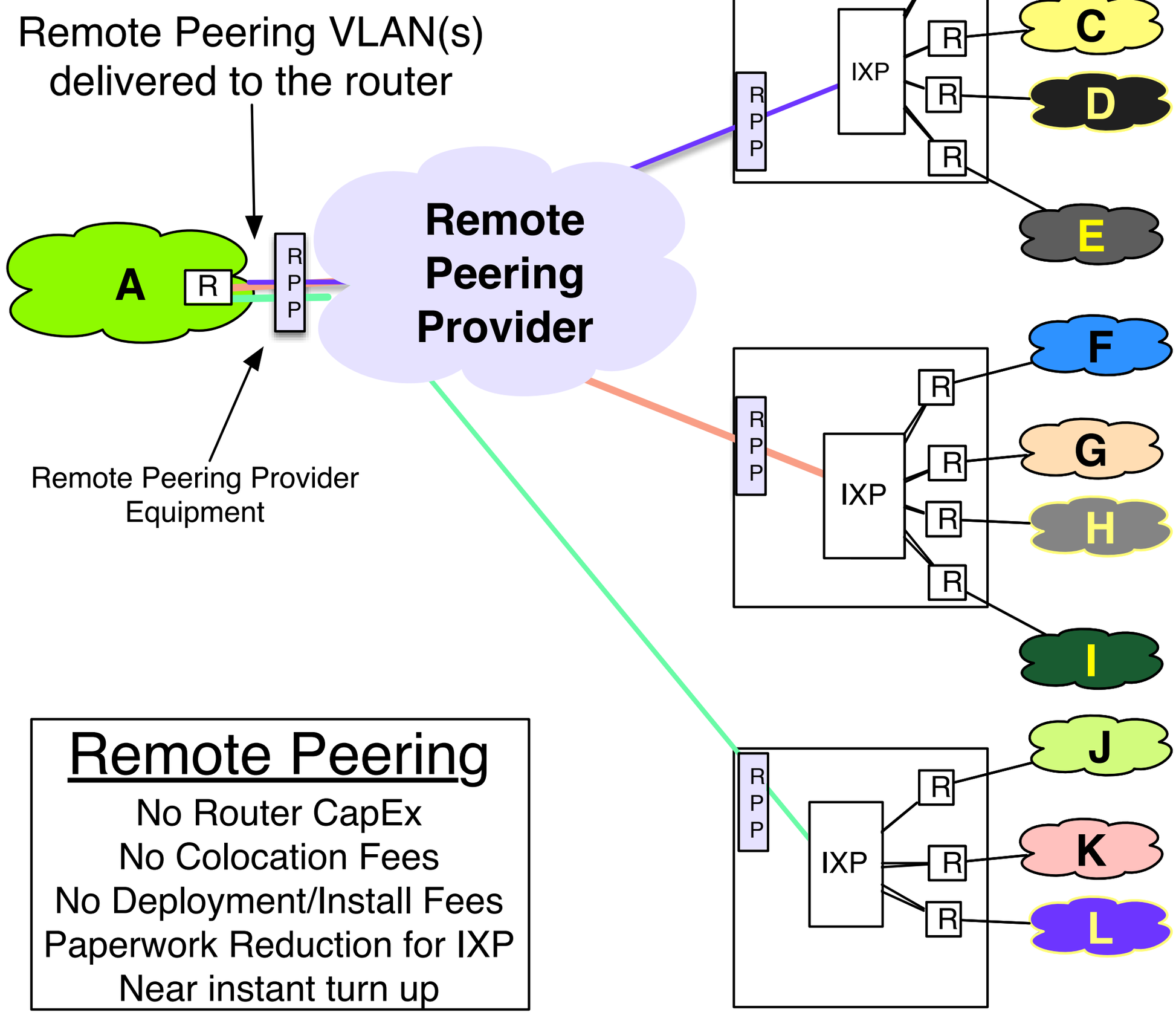
Traditional Peering



Traditional Peering

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

Tethering (aka Remote Peering)

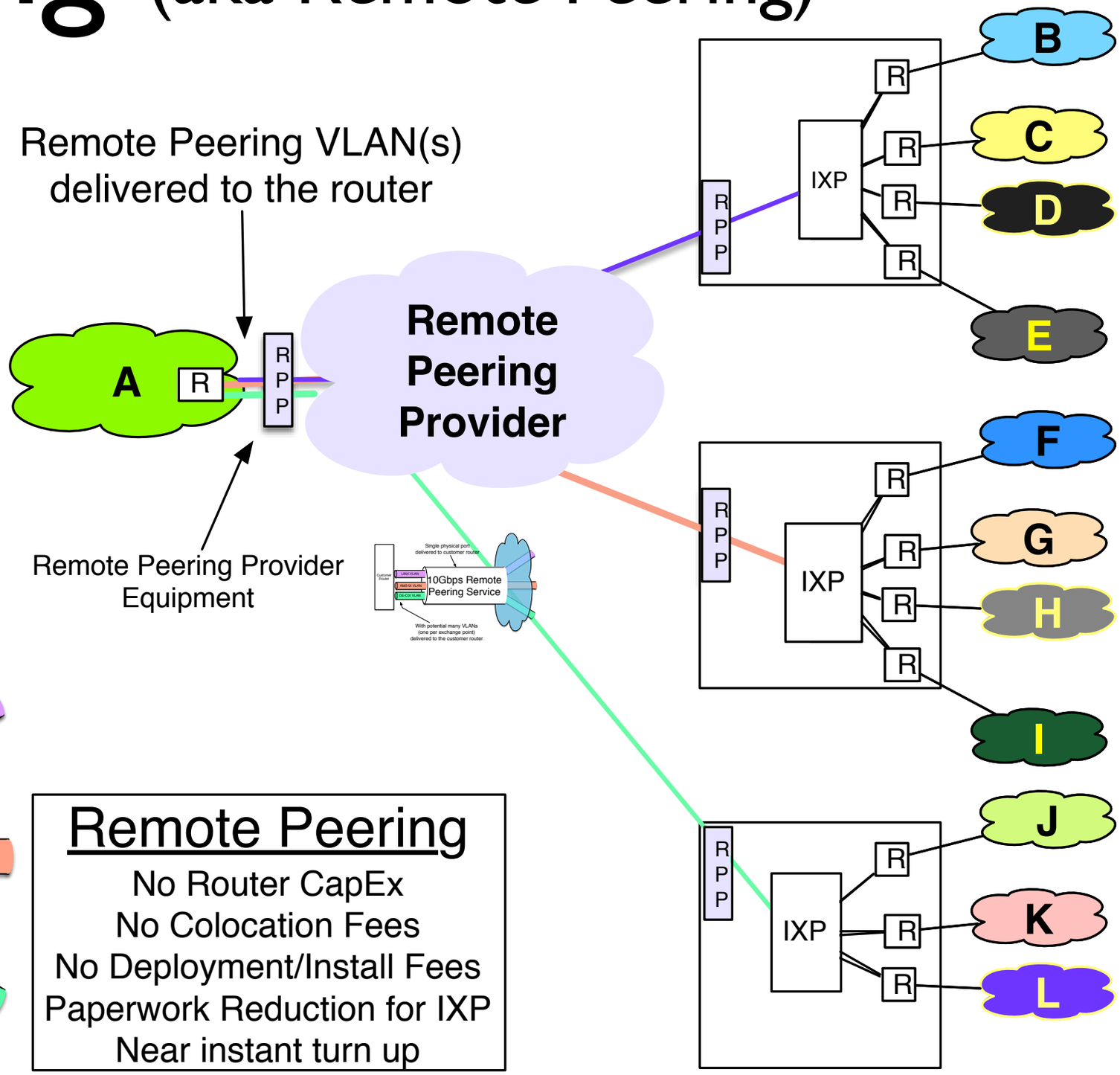


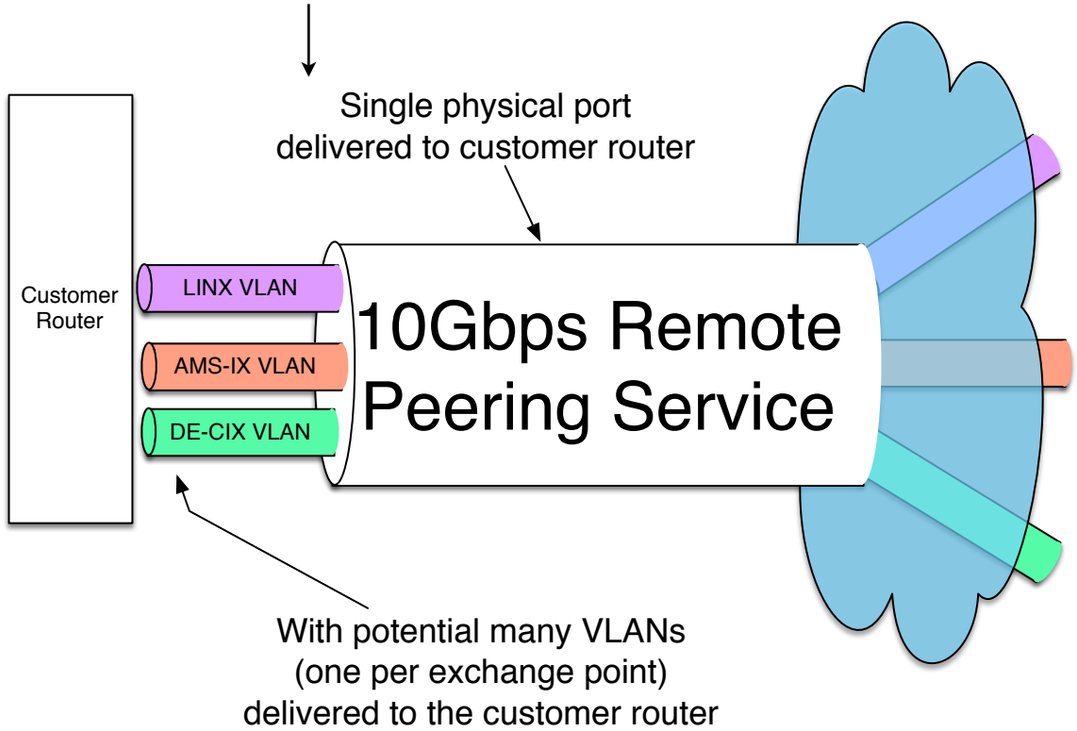
Remote Peering

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

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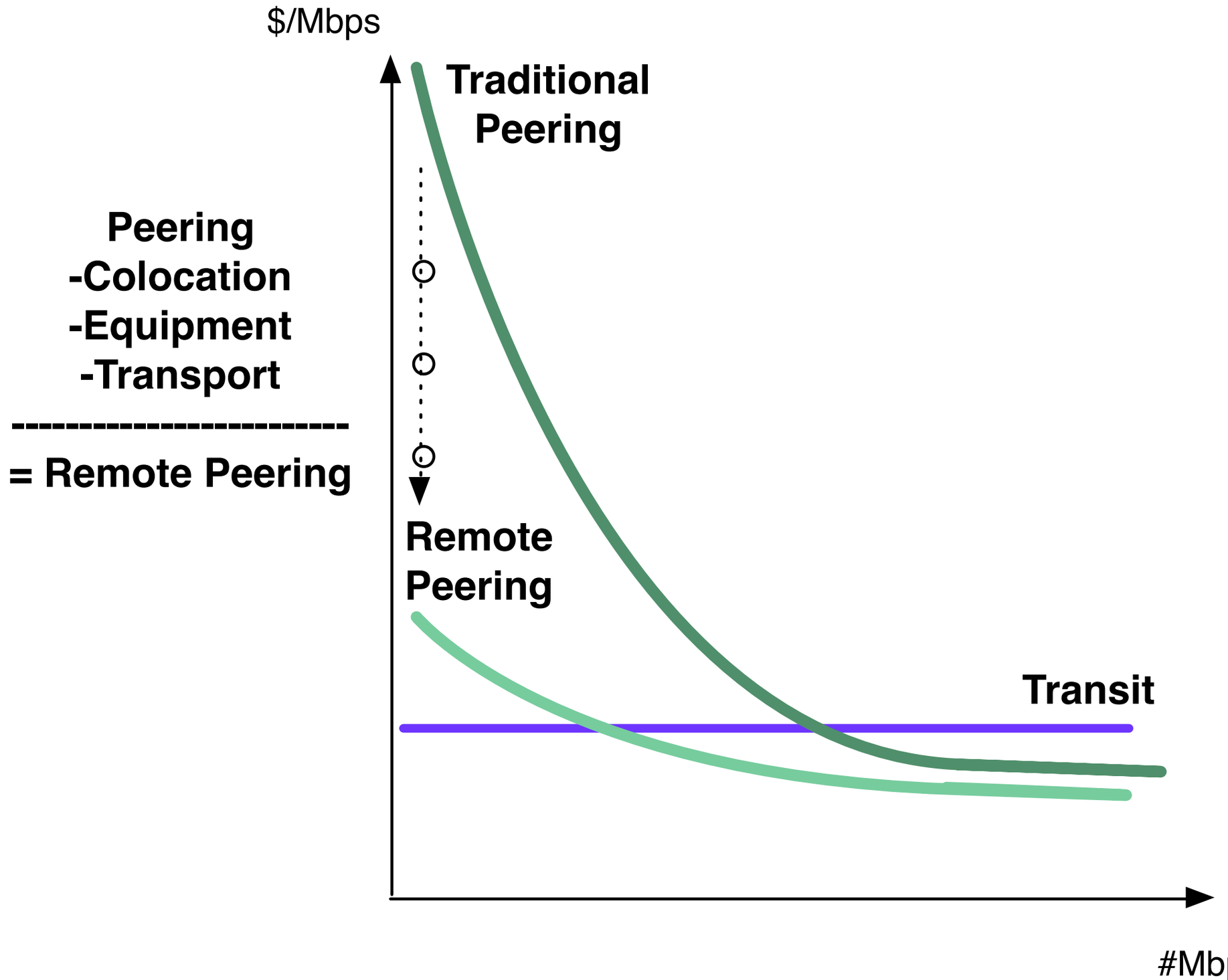
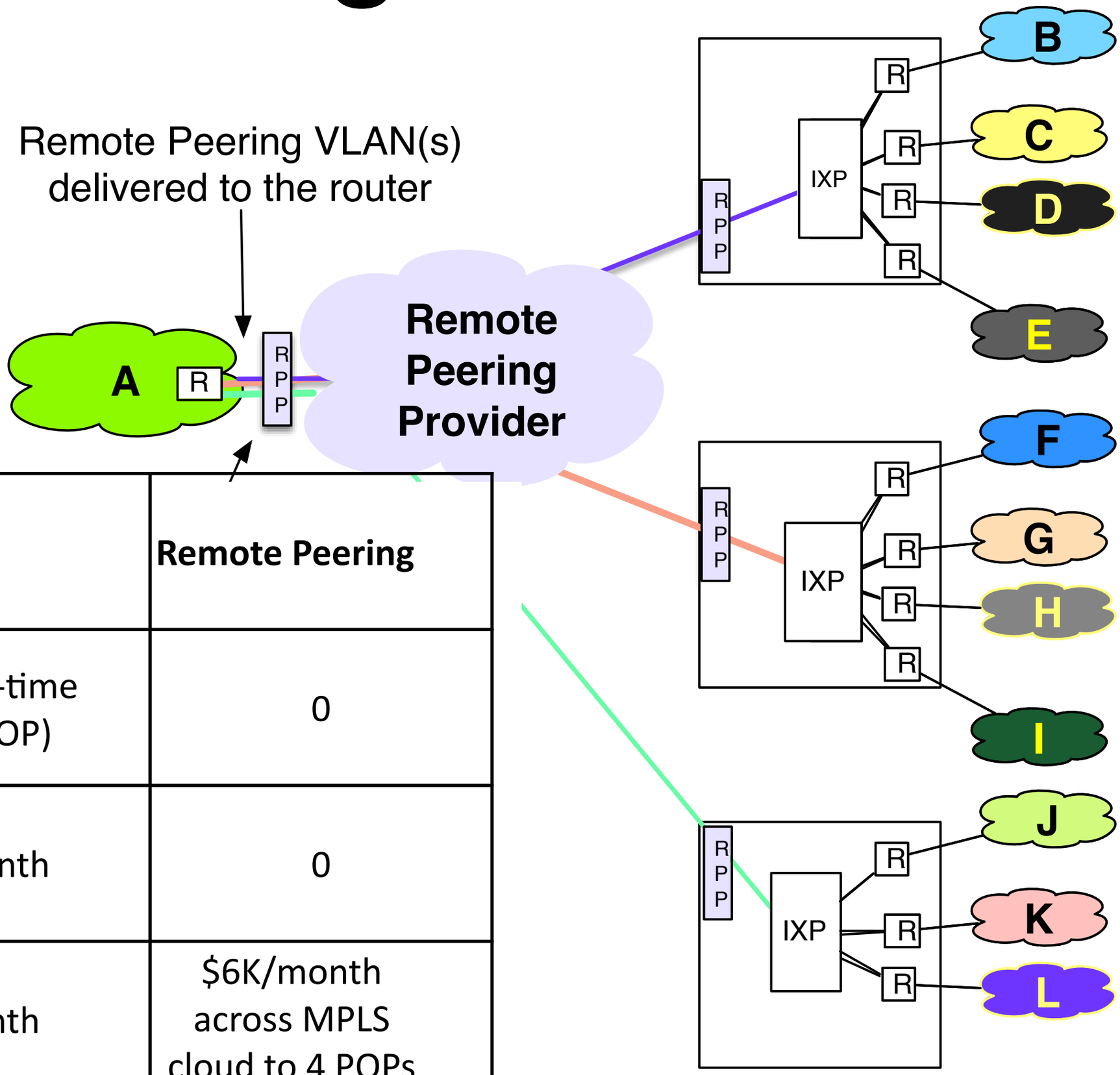
Traditional Peering vs. Remote Peering vs. Internet Transit



One Tethering Use Case



	Traditional Peering	Remote Peering
CapEx for 4 European POPs	$1.1M one-time ($275K/POP)	0
OpEx for 4 European POPs	$15K/month	0
Circuit Costs for network of 4 European POP	$6K/month	$6K/month across MPLS cloud to 4 POPs

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

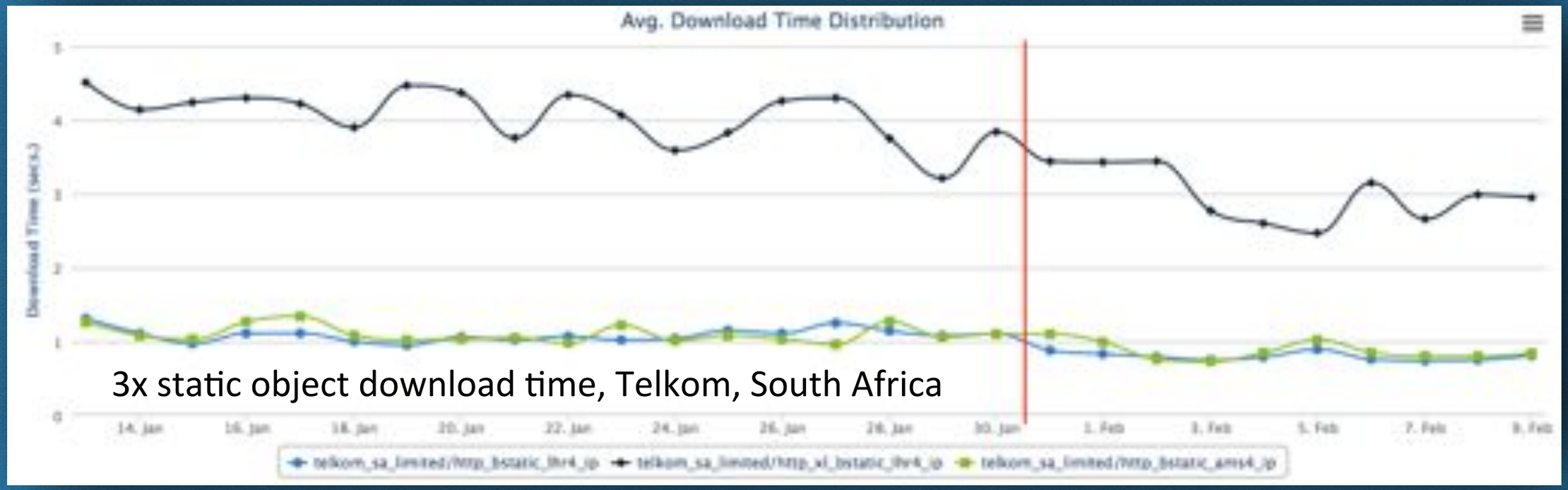
Optimal Traffic Distribution Blend

Why Peer?
1) Peering Saves Money

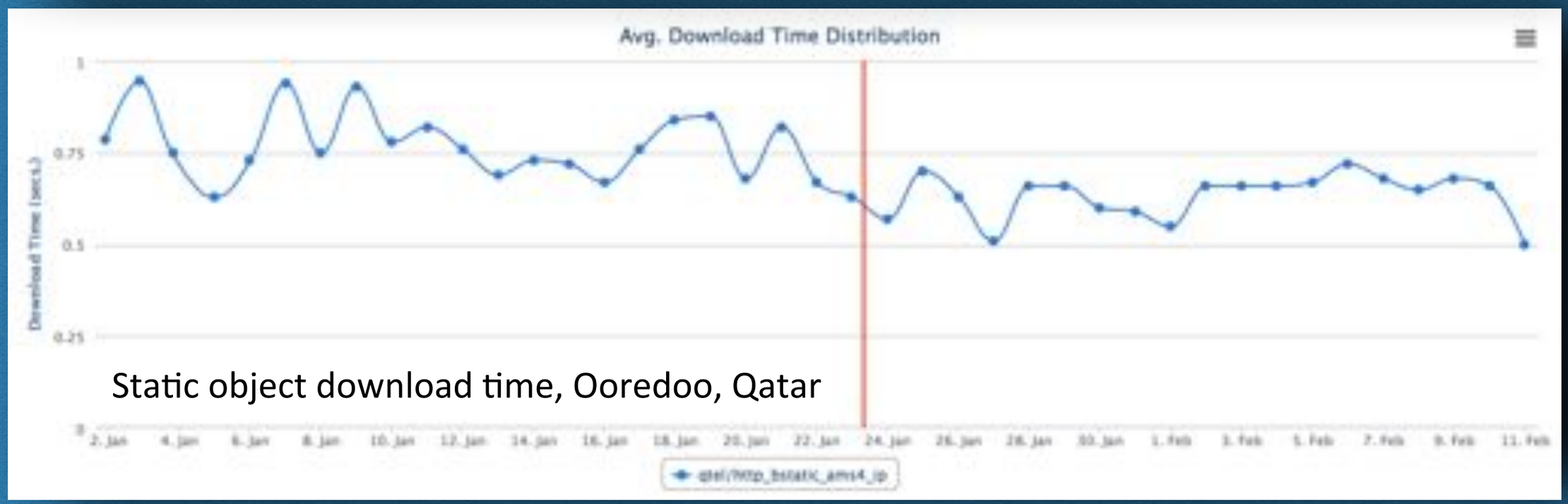
Why Peer?

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/ Pairing improves Security

4) Peering Improves Mental Health

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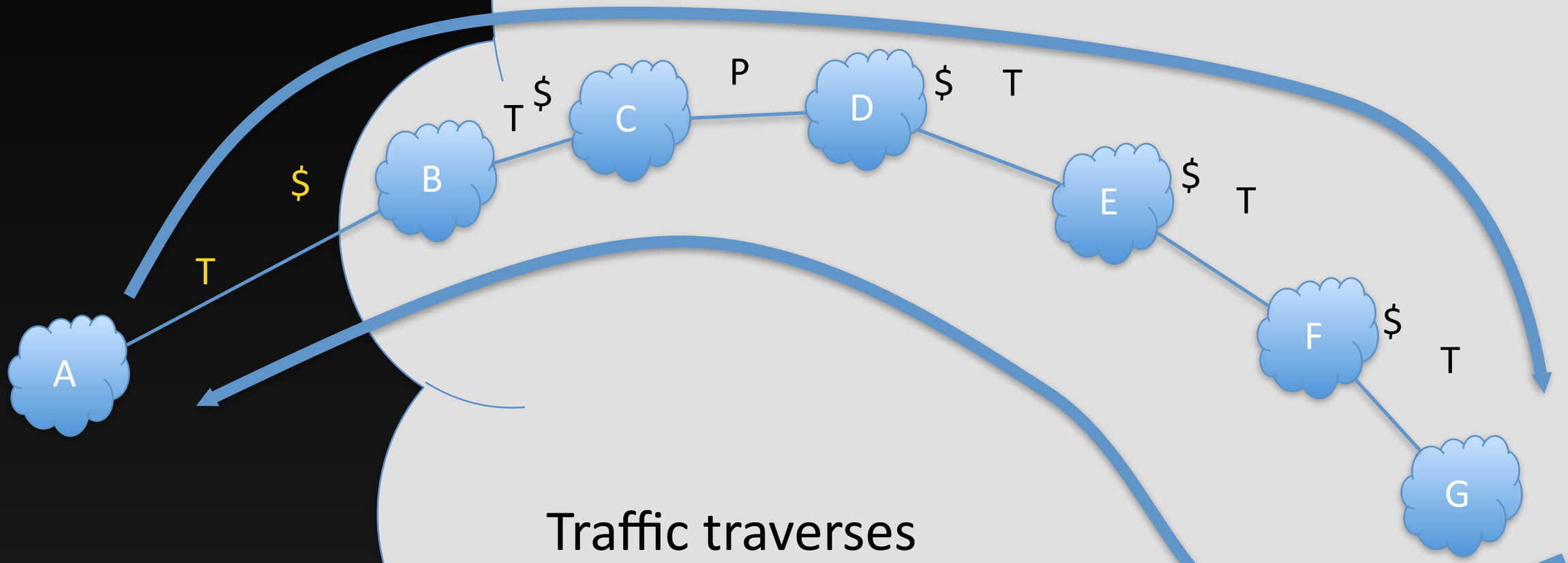
Face-to-face discussions are better than email

5) Peering Improves Security

5) Peering Improves Security

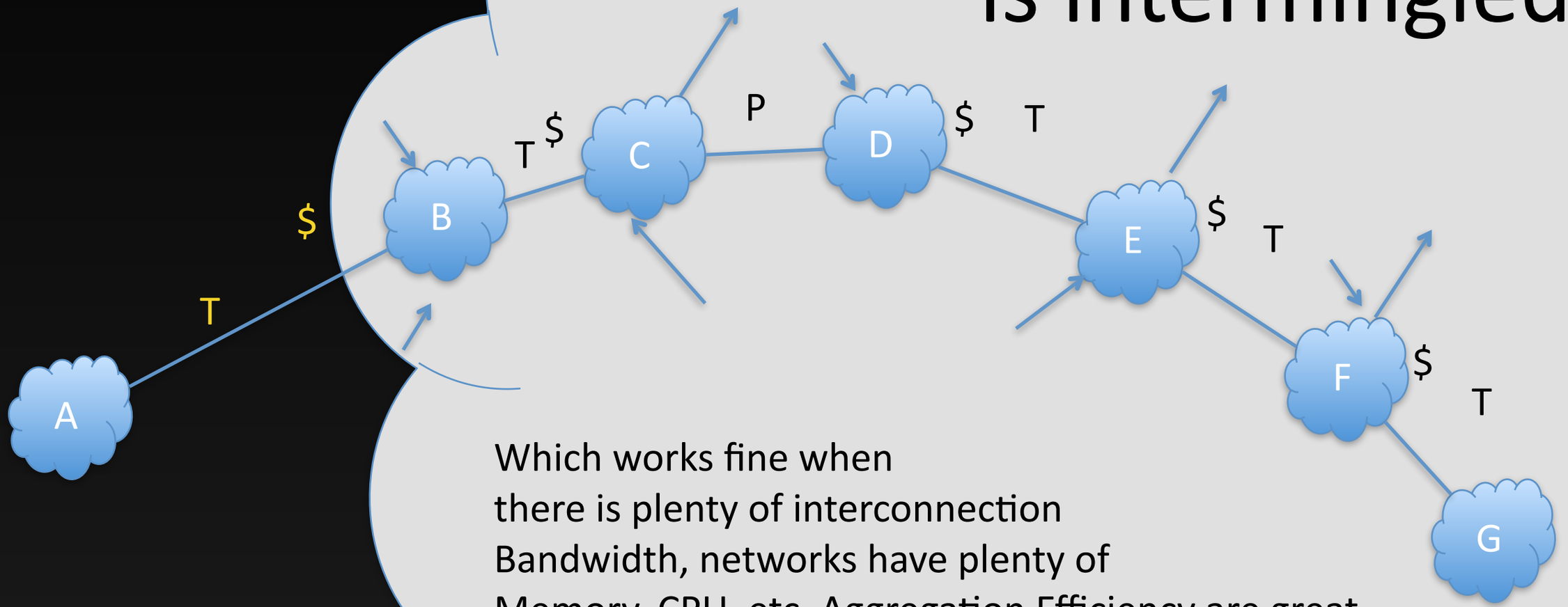
- 1) Peering Immune from side effects of DDoS
- 2) Peering Reduces “Attack Surface”
- 3) Peering *Speeds* Time to Recovery

On the Commodity Internet



Traffic traverses
potentially **many networks**
before reaching its destination

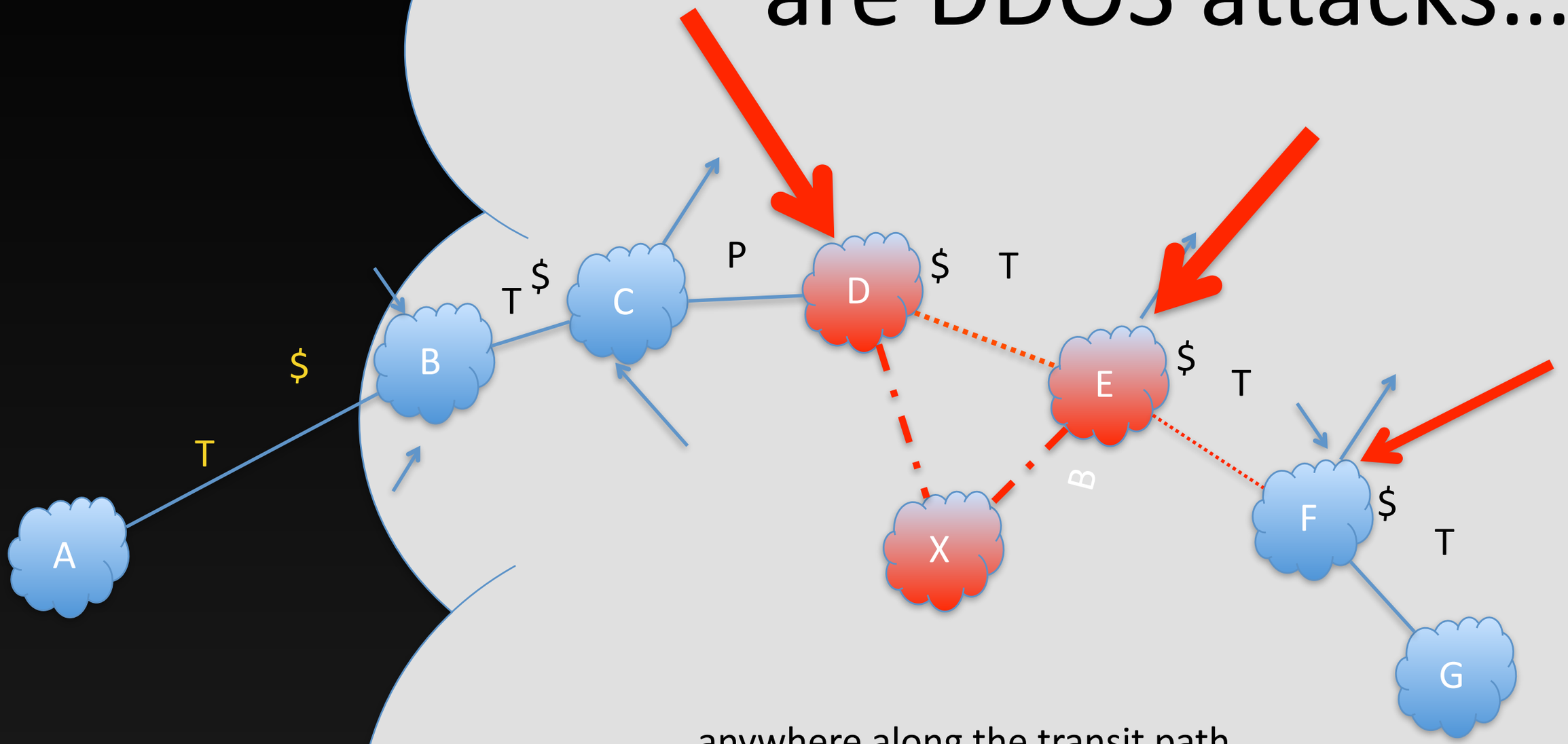
All traffic in the Commodity Internet is intermingled



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

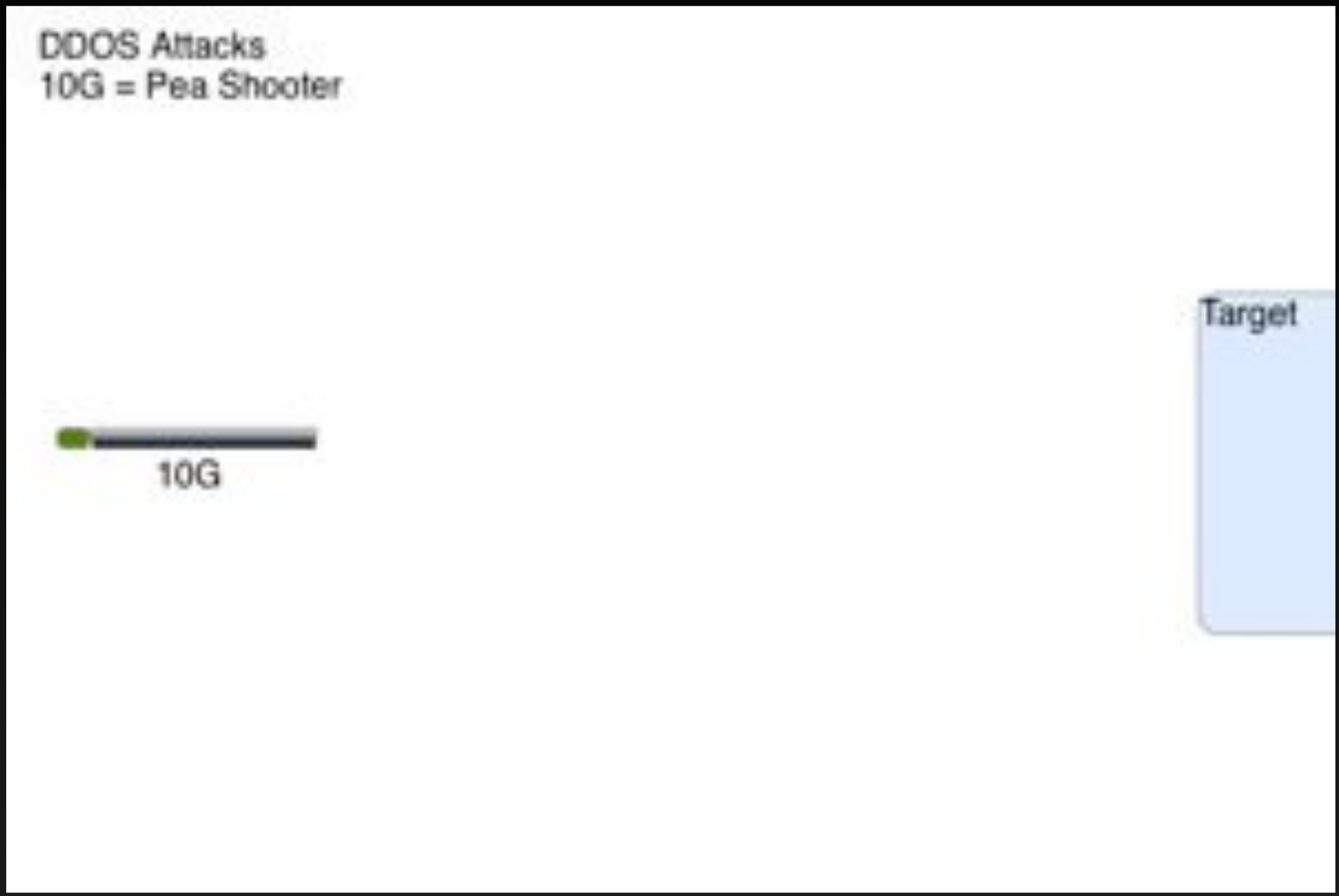
Works fine until

But when there are DDOS attacks…

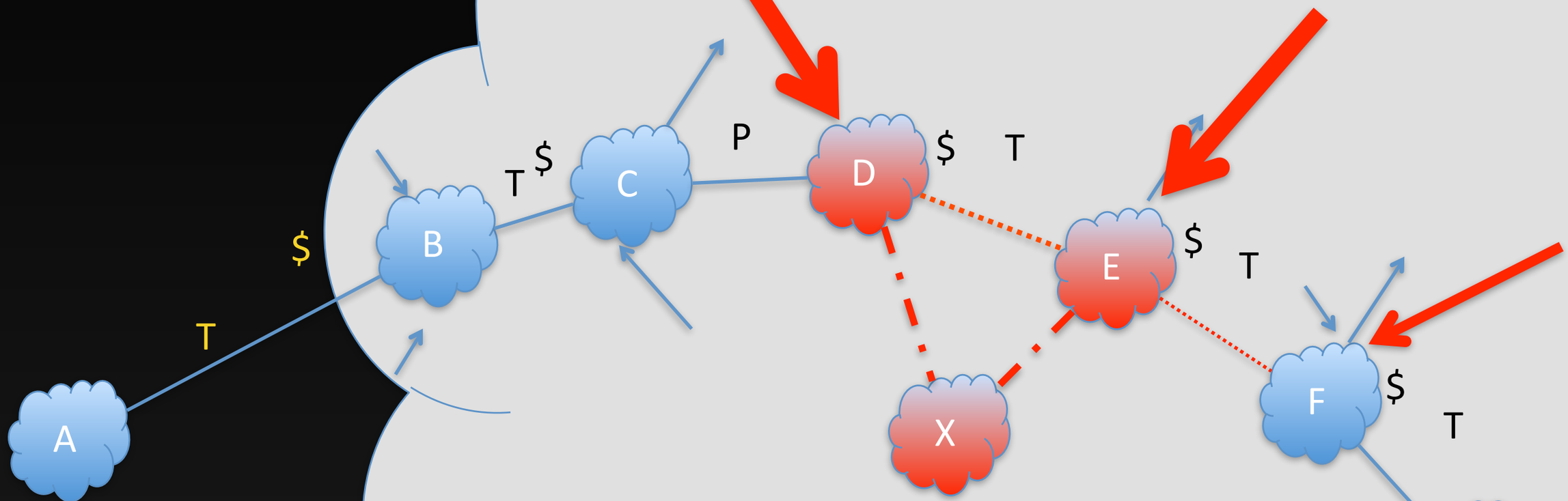


…anywhere along the transit path,
Packet loss, latency,
poor performance.
Result: DOS: A→G Unable to establish a secure channel.

DDoS Scale



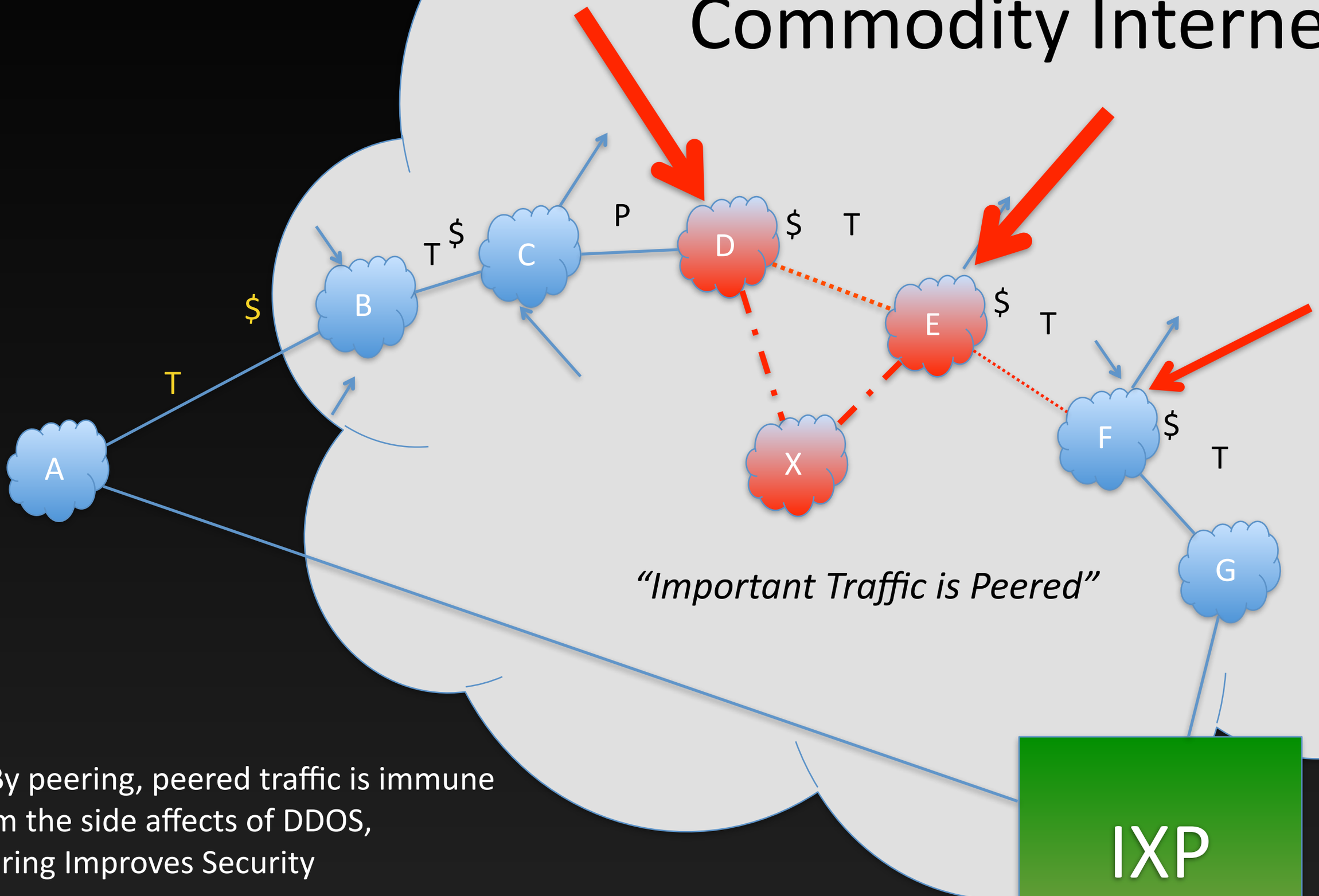
Or Spot Events…



…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.)

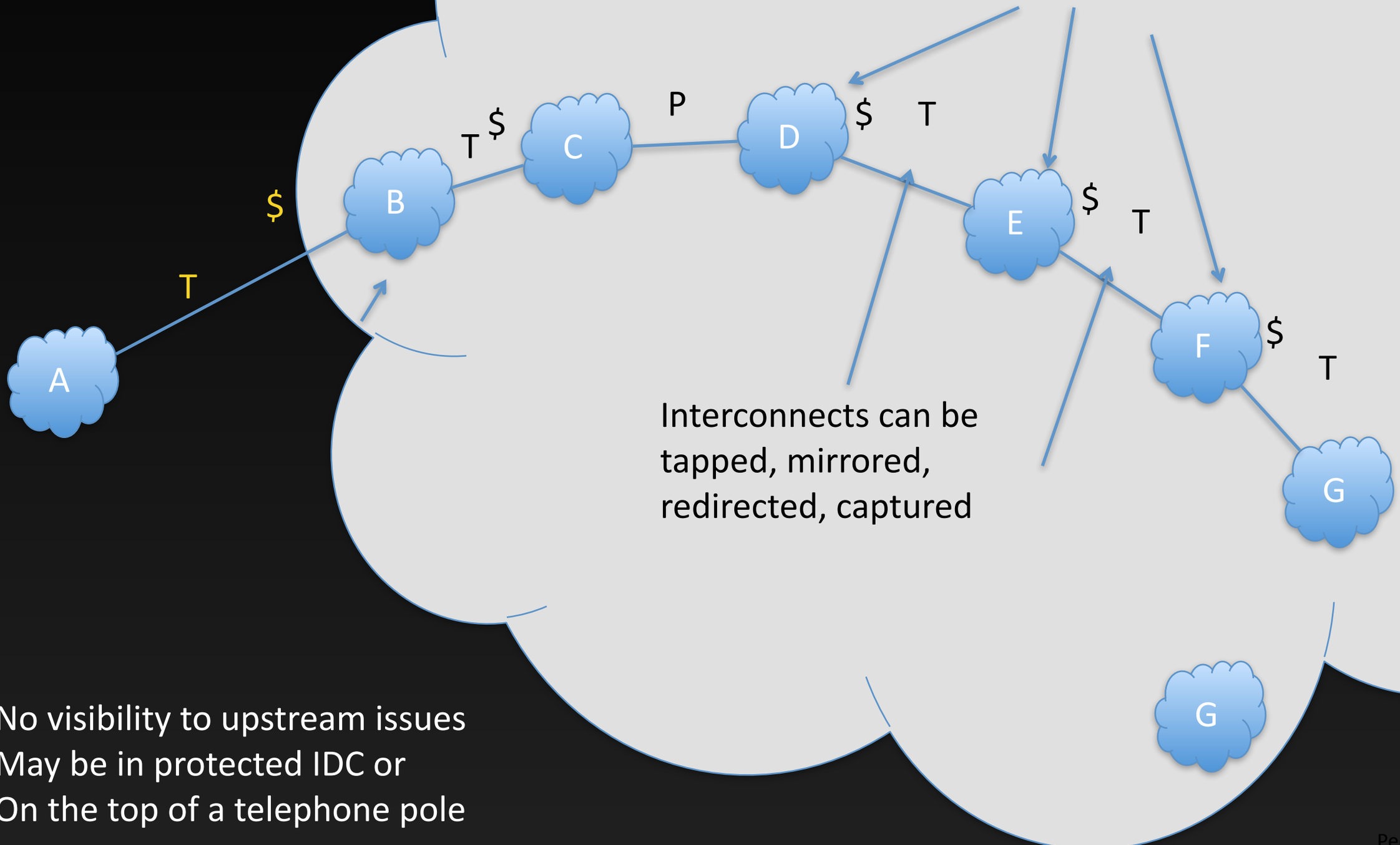
1) Peering Bypasses the Commodity Internet



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

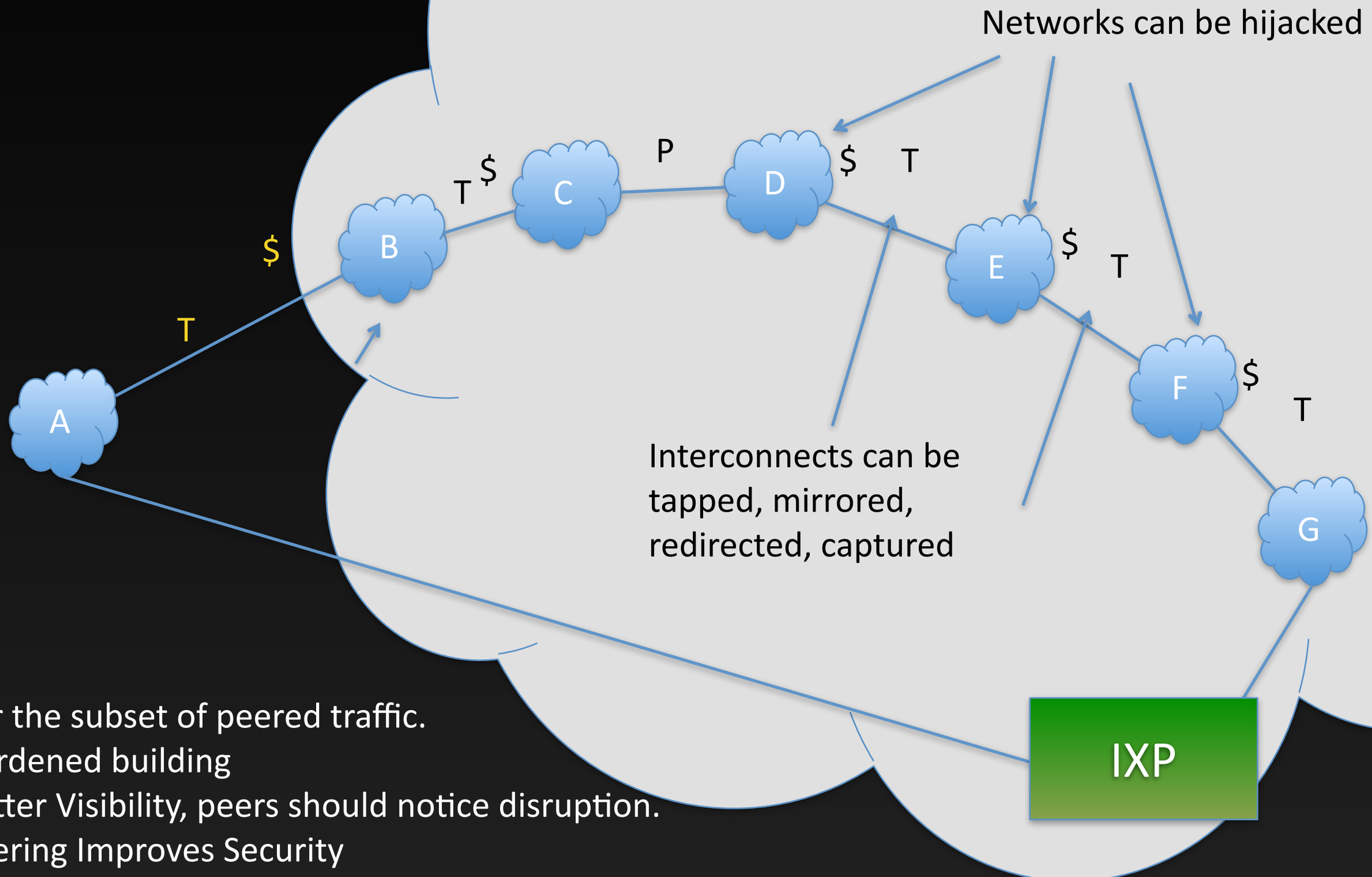


Interconnects can be tapped, mirrored, redirected, captured

No visibility to upstream issues
May be in protected IDC or
On the top of a telephone pole

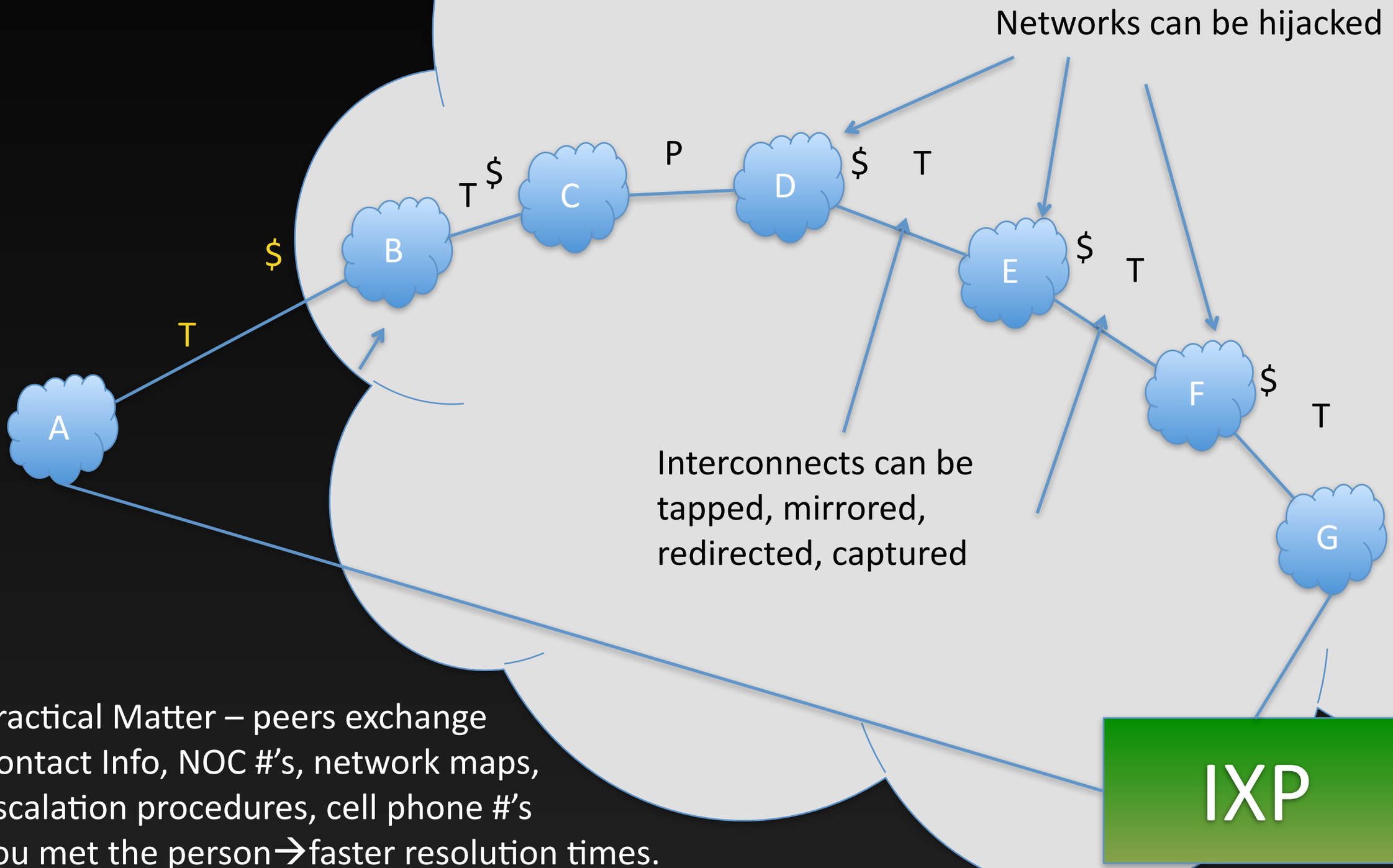
Peering bypass

2) Peering Reduces the network vulnerability



For the subset of peered traffic.
Hardened building
Better Visibility, peers should notice disruption.
Peering Improves Security

3) Peering Improves Recovery Time



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!

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Why Peer?

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