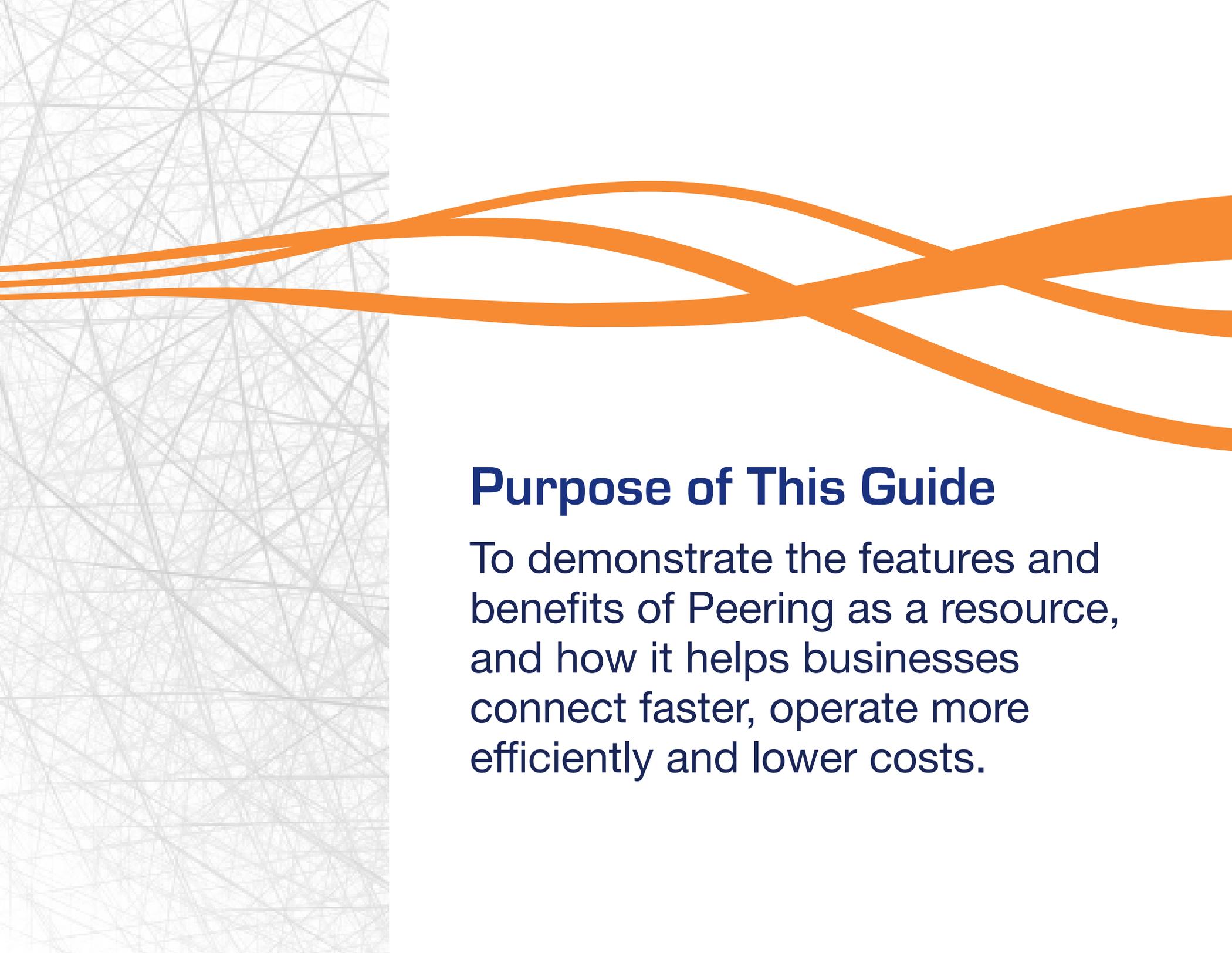




THINK
Peering
A Guide



Purpose of This Guide

To demonstrate the features and benefits of Peering as a resource, and how it helps businesses connect faster, operate more efficiently and lower costs.

Contents

.....
What is Peering?
.....

Reasons to Peer
.....

Peering Types
.....

Route Servers
.....

Requirements for Peering
.....

Tips for Positive Peering
.....

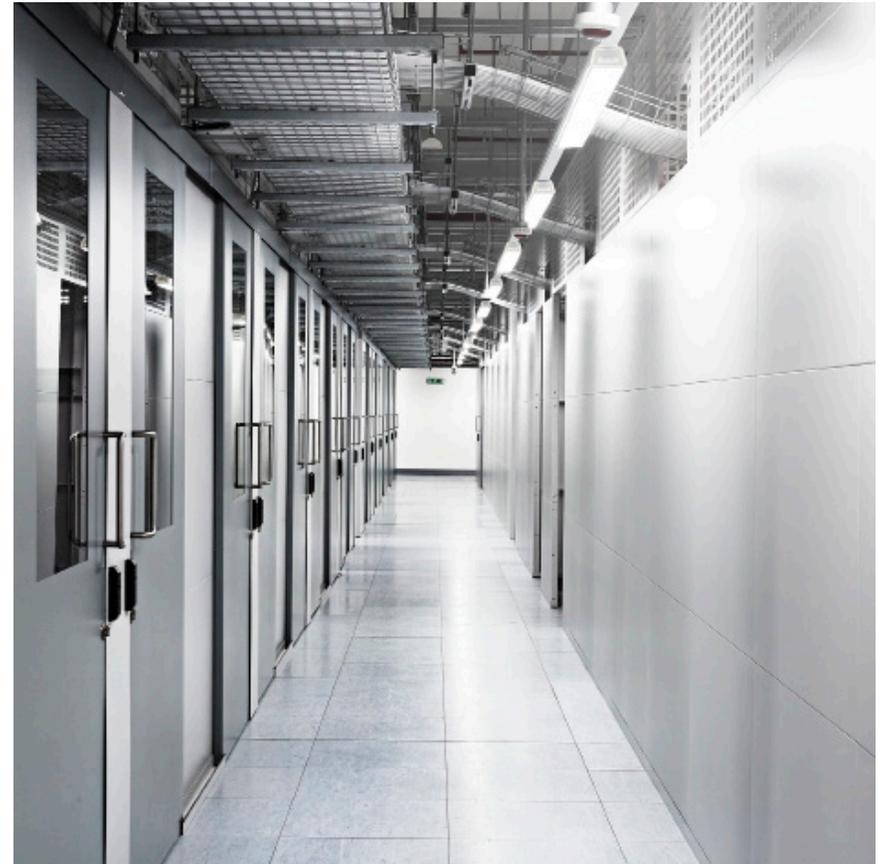
Telehouse Peering Exchanges
.....

What is Peering?

Peering is simply the settlement-free exchange of Internet traffic.

Two separate networks voluntarily interconnect for the purpose of exchanging traffic between the users of each network, without paying a third party to carry that traffic over the Internet for them.

Neither party pays the other in association with the exchange of traffic. Each derives revenue from its own customers.



Our goal as a Data Center provider is to ensure that our customers utilize their resources most efficiently.

Reasons to Peer

Three main reasons why companies Peer:

To Save Money

Since the only thing you actually pay for in a public IP peering switch is the leased port, technically, settlement charges don't exist. Your bandwidth is basically FREE.

In essence, you're averaging down your bandwidth costs.

It's More Efficient

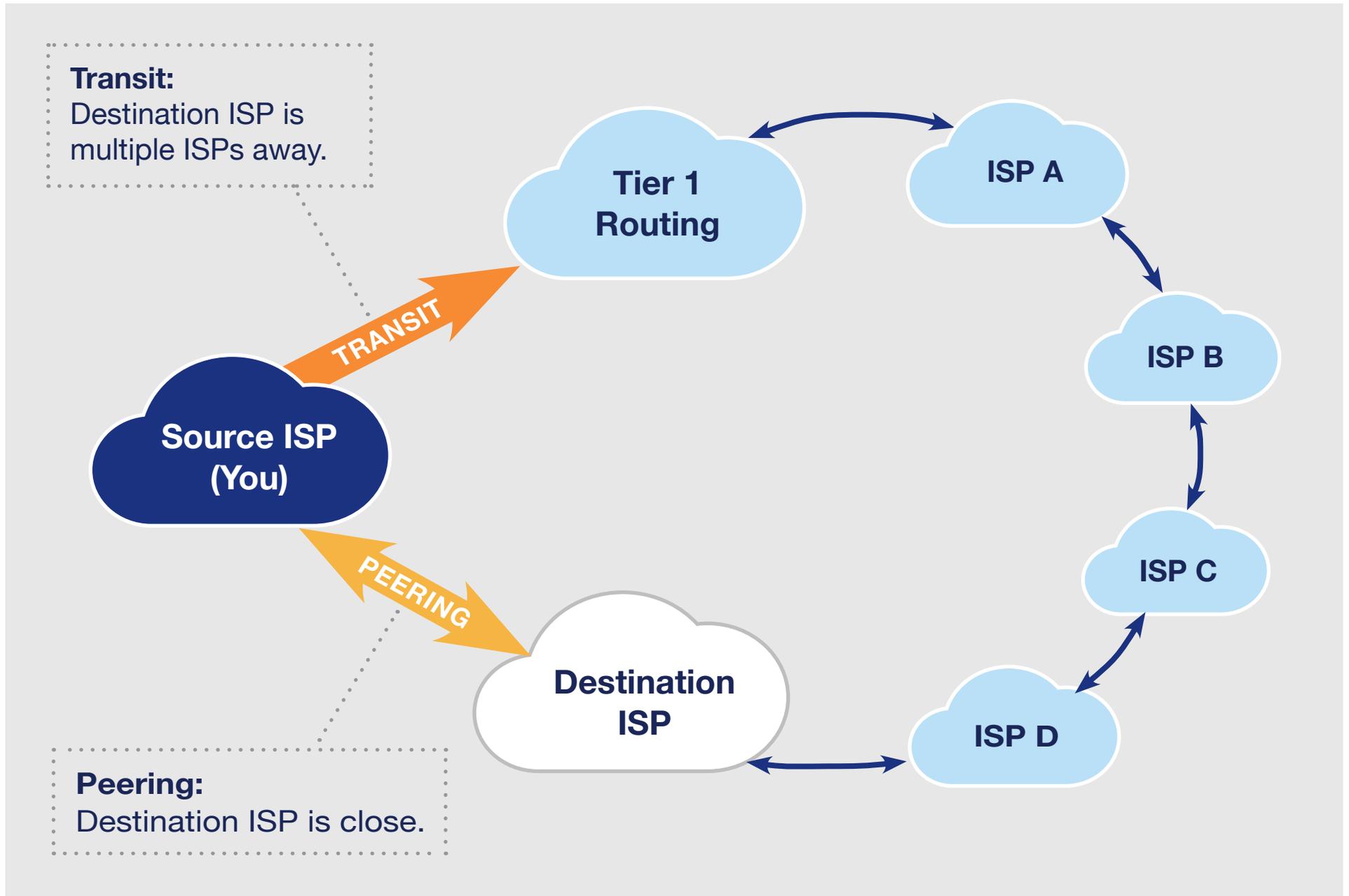
Tier 1 Internet Service Providers typically route your traffic through round-about transit. Peering keeps traffic local by identifying the fastest and most direct route. This makes for faster connectivity and lower costs.

Lower Latency

Network latency is an expression of how much time it takes for a packet of data to get from one designated point to another. In some environments, latency is measured by sending a packet that is returned to the sender; the round-trip time is considered the latency.

**Transit costs more money...
Peering offers the fastest connection, which reduces cost.**

Traffic Models: Transit vs. Peering



Peering Types

The Three Types of Peering:

1. Symmetrical

2. Asymmetrical

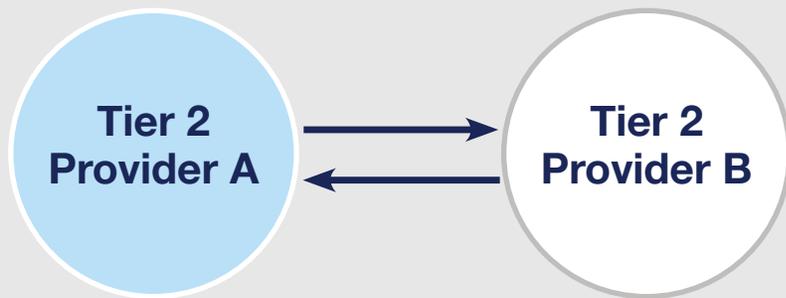
3. No Customer



Symmetrical and Asymmetrical Peering

Symmetrical

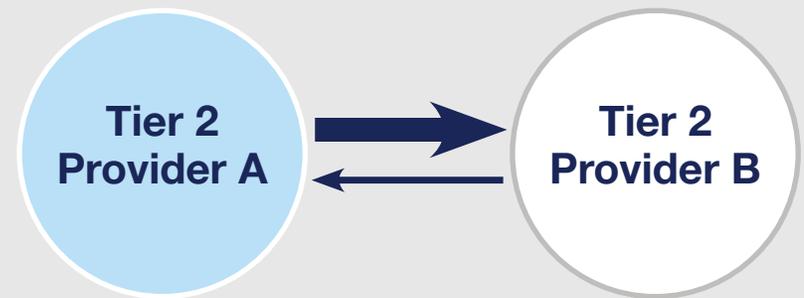
The exchange of traffic between the two ISPs is about the same amount in either direction. Both organizations have a similar profile.



Same amount of traffic in both directions.

Asymmetrical

Two traffic-laden providers exchange traffic, but one delivers more than the other. Both entities significantly reduce transit costs by peering each other.

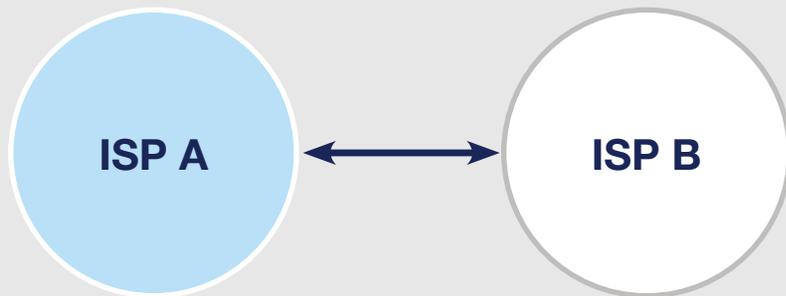


Large traffic amount in one direction.

Peering is always evolving as provider needs change and grow.

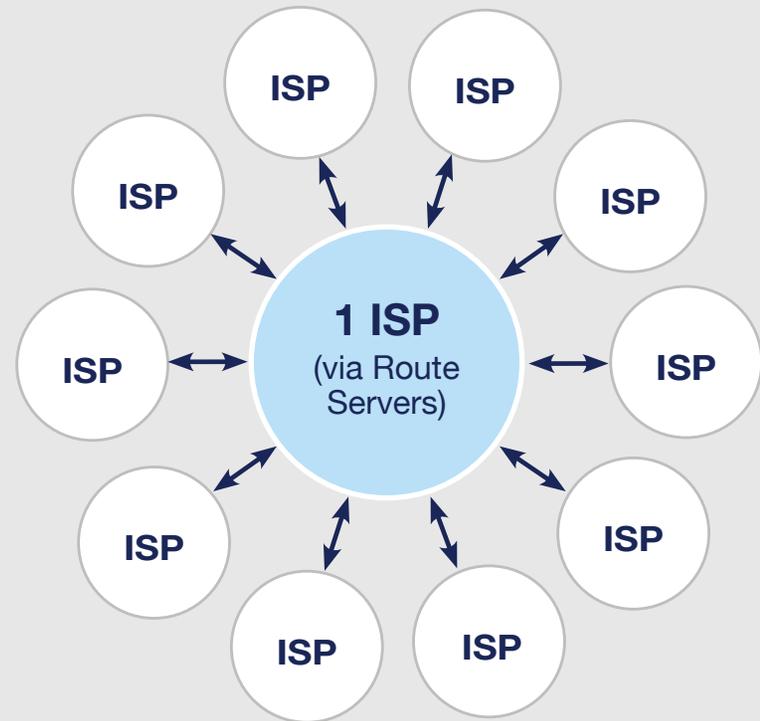
Other Peering Models

Bilateral Peering (One-to-one)



- Configure peering per peer
- Selective peering based on a policy
- Typically for mid to large providers

Multilateral Peering (One-to-many)

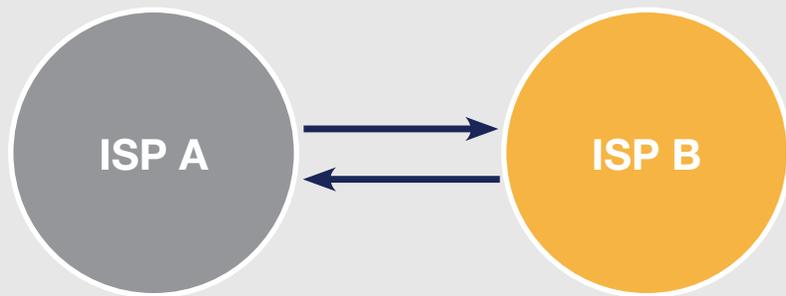


- Single peering configuration enables peering with multiple peers
- Open peering
- Typically for contents providers

Other Peering Models

Bi-Directional

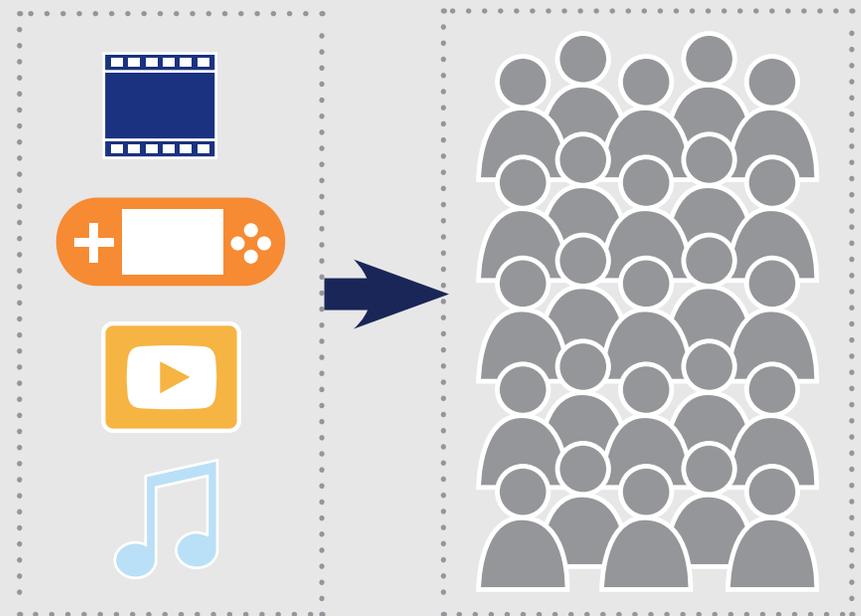
(Between network-heavy ISPs)



Exchange the same amount of traffic.

Uni-Directional

(ISP delivers contents in one direction, to viewers)



Exchange content-heavy to eyeball-heavy.

Public vs. Private Peering

Why Choose Public Over Private?

Most ISPs prefer public peering at IXPs because it's easier and more cost effective.

Private peering requires cabling, which dramatically increases cost and time.

Public peering at an IXP costs less because an ISP can Peer with multiple ISPs with a single router interface.

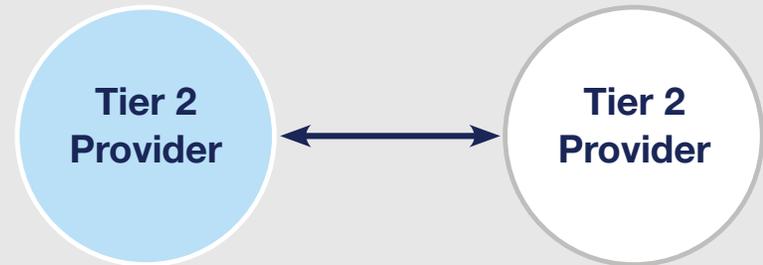
In summary, Tier 2 providers need to peer on IXPs to maintain business and stay competitive.

More About Peering Exchanges

- Over 300 known global Internet Exchange Points (IXPs)
- Operated by both profit and non-profit organizations
- Carrier neutrality is key to success

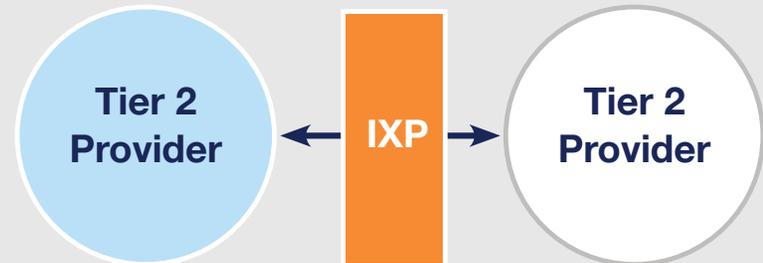
Private Peering

- Peering directly via a cross connect
- Need a cable per peering
- Secure peering



Public Peering

- Peering over an IXP
- Need a single cable all peerings
- Less secure than private peering



The Two Types of IXPs in the Global Peering Market

Layer 2

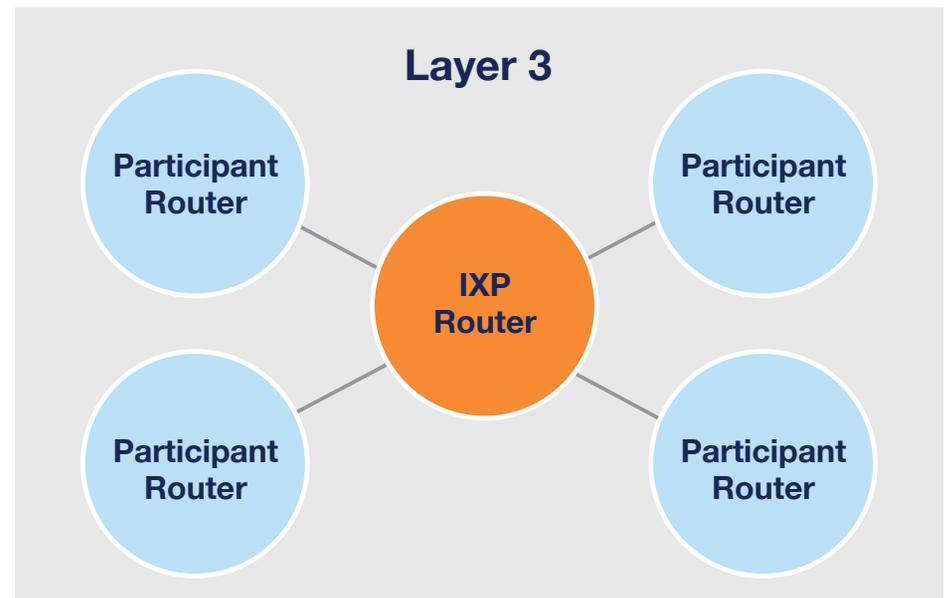
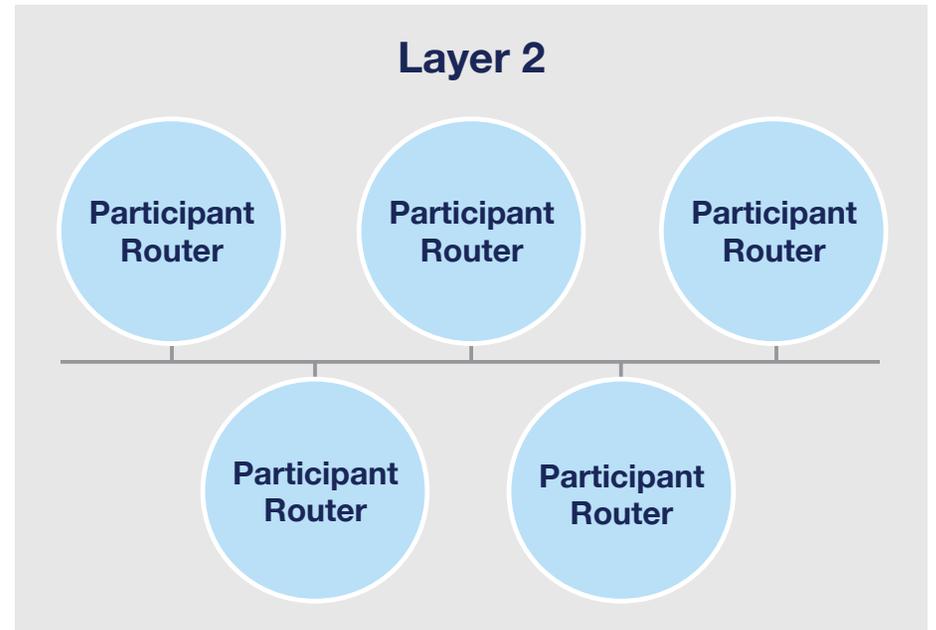
The most widely used IXP is Layer 2. It's typically known as the *Exchange Point* architecture. This type of IXP architecture is well known in the US, Europe and in most Asian markets.

Most IXPs select Layer 2 ethernet switches as their platform for many reasons:

- Proven platform for many years
- Supports high speeds, 1G/10G/100G
- Hardware cost is relatively cheap
- Easy operation (no BGP operation)
- Optional private peering via VLAN

Layer 3

In this model participants are all connected to a central router. This is something seen in countries like Korea or Australia where all of their systems have to work together. The participants all axis into one router.



Route Servers

NYIIX Route Servers (RS) (1)

- For multilateral Peering
- Must register your AS-SET in IRR
- RS has an inbound filter to accept only legitimate routes registered in AS-SET
- The filter is updated daily
- A Route Server works like a route reflector. In this case, you must register your AS-SET [AS-CUSTOMERS; AS-PEERS] in IRR [Internet Routing Registry].
The RS is Route-Set

NYIIX Route Servers (RS) (2)

- Has an outbound filter to distribute routes
- Has AS-SET AS-NYIIX, which is a combination of AS-SET of all participants
- Participants can suppress specific routes to RS. This is important. If you have a customer who is also a Peer, you can suppress routing to that customer through the exchange point.

Requirements for Peering

A connection to an exchange point:

You may need to install a router within the exchange point, or an Ethernet circuit between your facility and theirs.

Traffic

You'll need enough traffic to be worth peering with, or have good Peering arrangements.

A Peering Manger

They can determine which networks you should be peering with, contact those networks, and make arrangements.

A Peering Policy

Determine your own Peering Policies.



Positive Peering Tips

- Do NOT make a hard loop towards IXP
- Use only one MAC address
- Secure your BGP session with MD5
- Use BFD if possible (if peer agrees)
- Check max-prefix limit
- Never leak non-BGP protocols (e.g. OSPF, CDP) to IXP
- Never set default-route to an IXP participant
- Disable Proxy ARP (especially Cisco)



Telehouse Peering Exchanges

NYIIX

The New York International Internet Exchange (NYIIX) is the largest in the New York City Area. It was established in 1996.

LAIIX

The Los Angeles International Internet Exchange (LAIIX) was established in 1998. It is a smaller sibling and is part of a larger affiliation.



Colocation with TELEHOUSE is not a requirement to Peer with us.



For more information, please visit us at www.telehouse.com