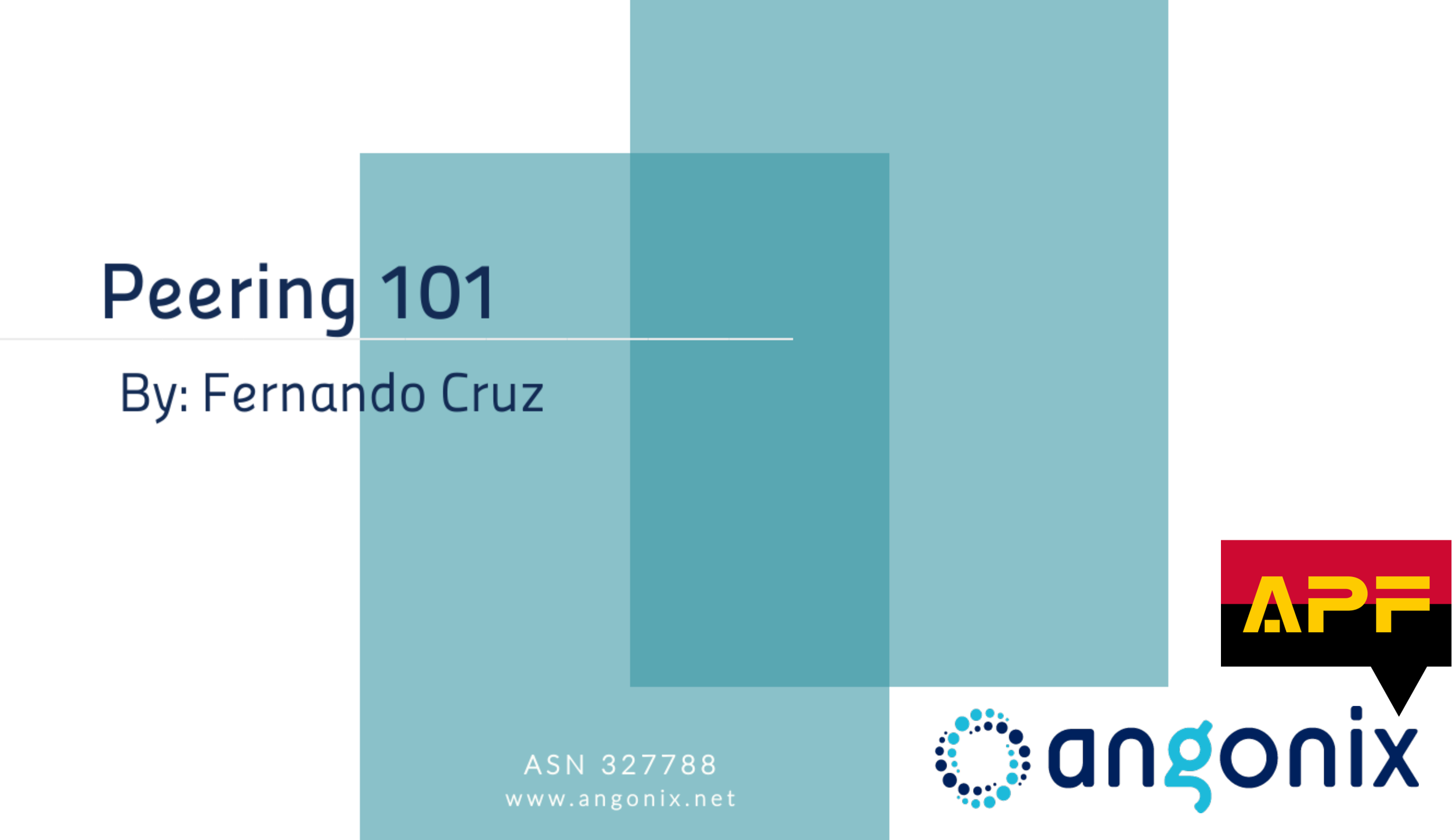
Peering 101

By: Fernando Cruz



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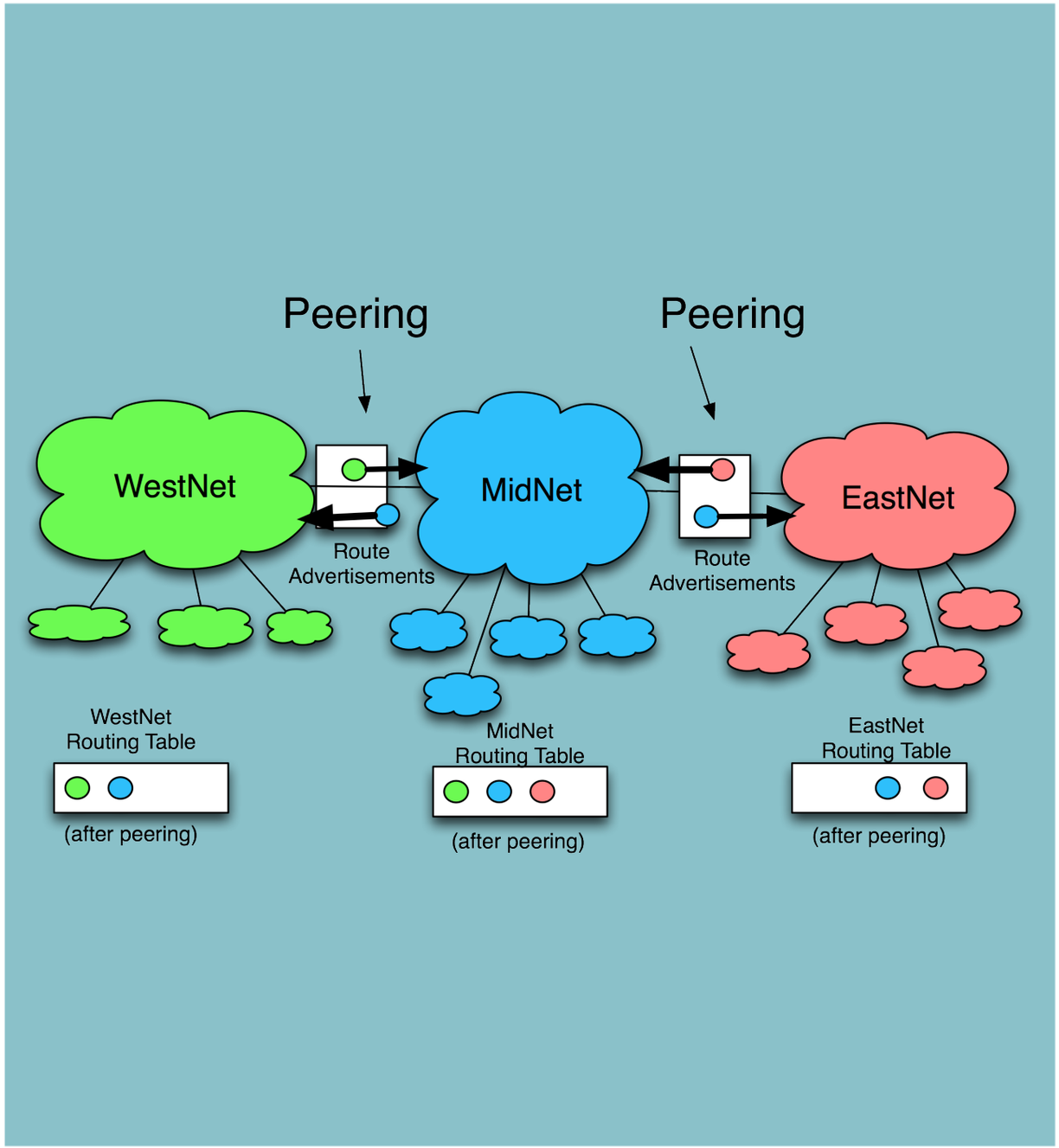
What is Peering?

Is the business relationship whereby two companies reciprocally provide access to each other's customers and network

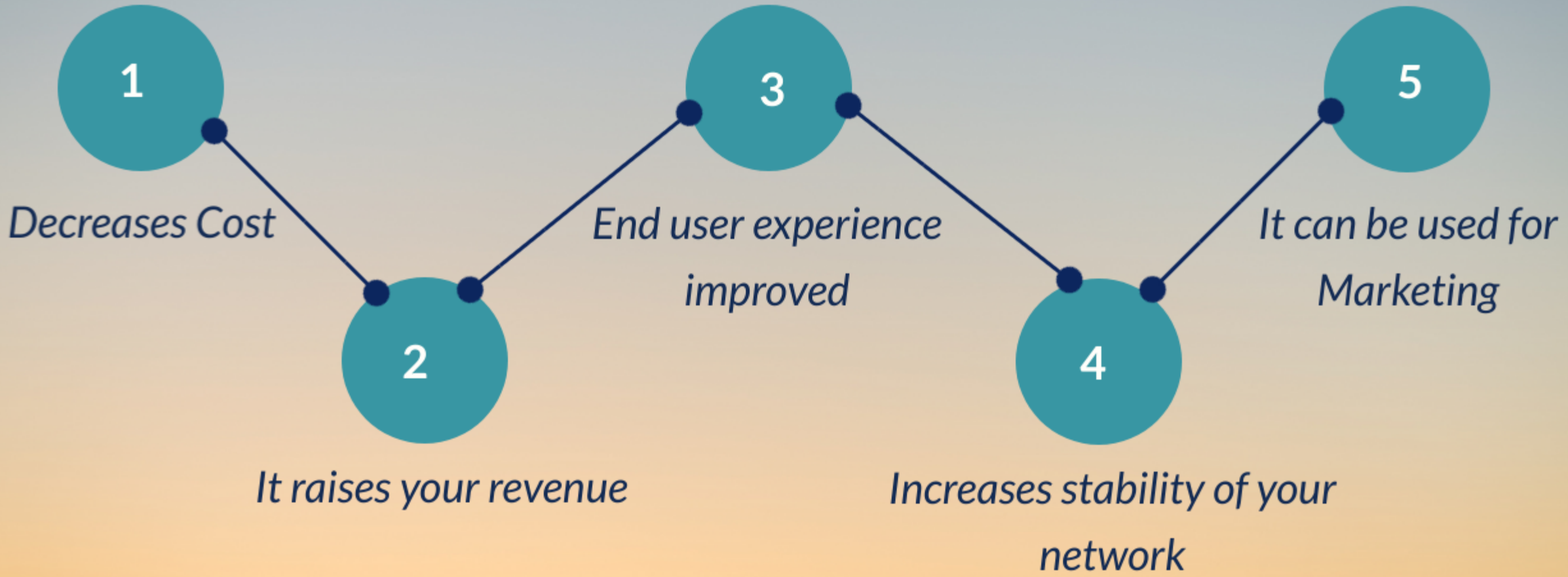
Key Points

- Peering is not transative
- It is not a perfect substitute for transit
- It is usually settlement free, but can be paid as well



Benefits of Peering

5 Reasons Why You Should Peer



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Cost of Peering

Peering over a 10GE Port - Distant IXP

- Assuming that transit cost is 1,5$/Mbps
- You'd have to build into the IXP (Colocation + Circuit)

If you have to build into a foreign IXP		Transit (USD)	IXP (USD)
Non Recurring Costs (10Gbps)	Device Port	200	200
	Set-up fee: Xconnect	450	450
	Set-up fee: Service	700	300
Recurring Costs	Commit Price (1000 Gbps)	1500	0
	Colocation	1000	1000
	Circuit	2000	2000
	Price per port	0	780
	Xconnect	150	150
Total		**4650**	**3930**

Given this, how much does it cost to peer 1Gbps over this 10Gbps infrastructure?

Cost of peering (X)Mbps = **Cost of peering / (X)Mbps**

In our present case: 3930/1000 = **3,93$/Mbps**

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Cost of Peering

When does it make fanancial sense peer?

We can see that after peering away about **2.7Gbps**, your cost of peering (**1,46$/Mbps**) is less than your cost of transit (**1,5 $/Mbps**)

The more you peer, the cheaper it gets		
Mbps	Peering Cost ($/Mbps)	Transit Cost ($/Mbps)
1000	3,93	1,5
1100	3,57	1,5
1200	3,28	1,5
1300	3,02	1,5
1400	2,81	1,5
1500	2,62	1,5
1600	2,46	1,5
1700	2,31	1,5
1800	2,18	1,5
1900	2,07	1,5
2000	1,97	1,5
2100	1,87	1,5
2200	1,79	1,5
2300	1,71	1,5
2400	1,64	1,5
2500	1,57	1,5
2600	1,51	1,5
2700	1,46	1,5
2800	1,40	1,5
2900	1,36	1,5
3000	1,31	1,5

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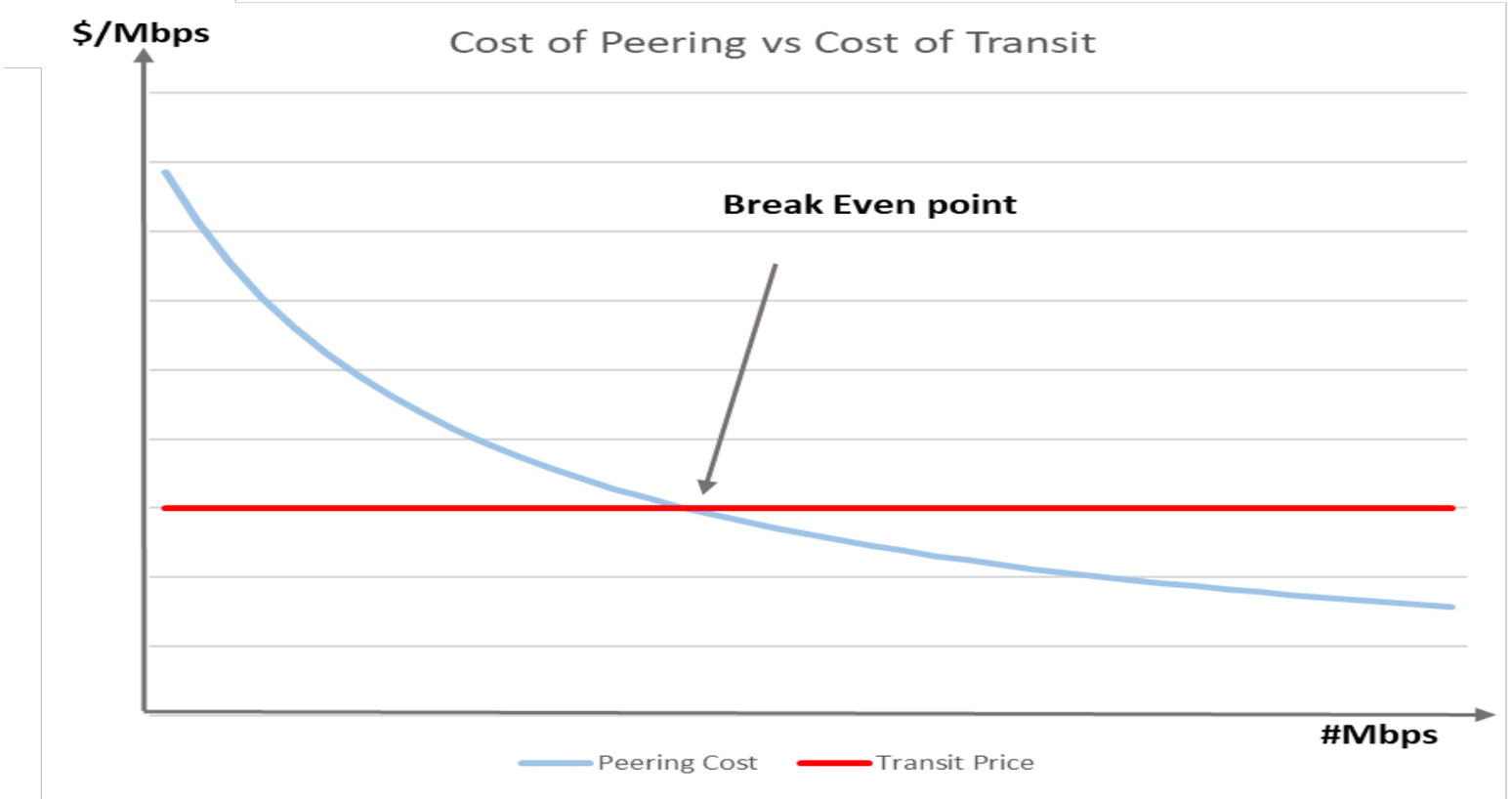
Cost of Peering

When does it make fanancial sense peer?

- Once the price per Mbps for peering equals the price of transit, it is considered the Break even point.
- This is the minimum traffic you should be peering, in order to have a cheaper price per Mbps than transit.



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Is money all that matters?

Other meaningful reasons to join an IXP

1. **Uniqueness of routes**
   Some IXPs are known for having specific set of routes (e.g.: gaming content providers) or offer a unique product (e.g.: selling comcast routes)

2. **Contractual reasons**
   E.g.: Being offered a port for free in and IXP that owns the DC where you're paying for collocation already

3. **Increases credibility within the community**
   Being in some IXs is like having a stamp. It might pass on the impression of your commitment to grow within that region, how concerned you are about the quality of your network, etc.

4. **Number and quality of participants**
   Usually the more participants connected in the switching fabric, the better.
   Also the participants with a large portion of where your traffic goes to and/or comes from

Number vs Quality

Many Small vs Few Big

1. **Have a strategy!**
   Depending on the size of your network and your strategy you might want to peer with anybody in a certain region, be more cautious in another region and even not want to peer at all in another!

2. **Ideally...**
   You'd want to peer the largest possible amount of traffic with the least possible number of peers

3. **80-20 Rule**
   Aim to peer with the 20% potential peers that deliver 80% of your total traffic

Which leads to the segregation of the networks into different categories within the ecosystem

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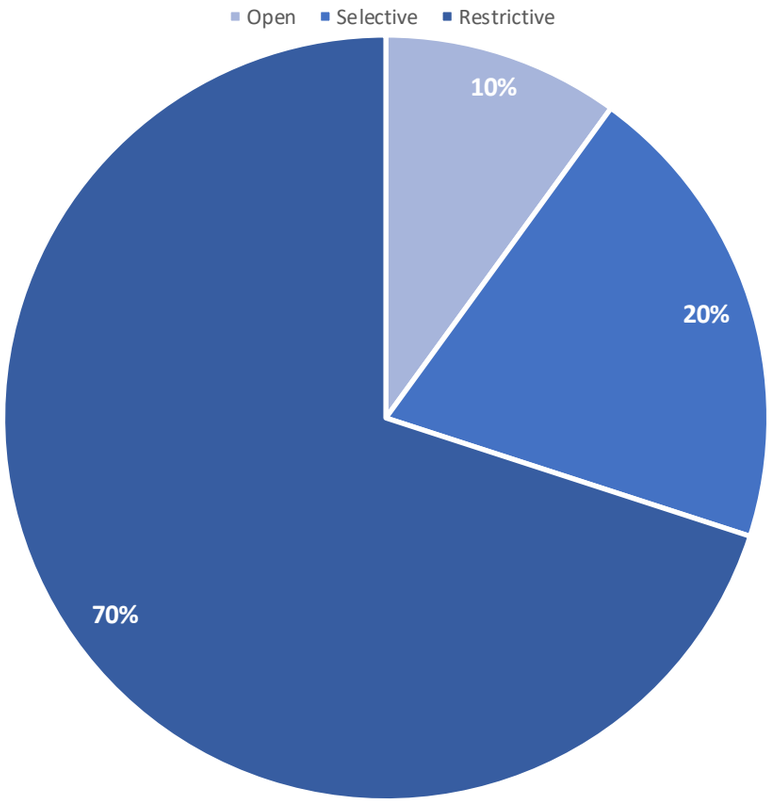
Types of peering Policies

- **Open:** They are inclined to peer with any other entity
- **Selective:** They will peer with whom meets their requirements
- **Restrictive:** These are severely inclined not to peer, unless you are one of their existing peers already
- **No Peering:** Reflects the desire not to peer at all, transit will be offered most likely

Top 50 Networks Exchanged Traffic



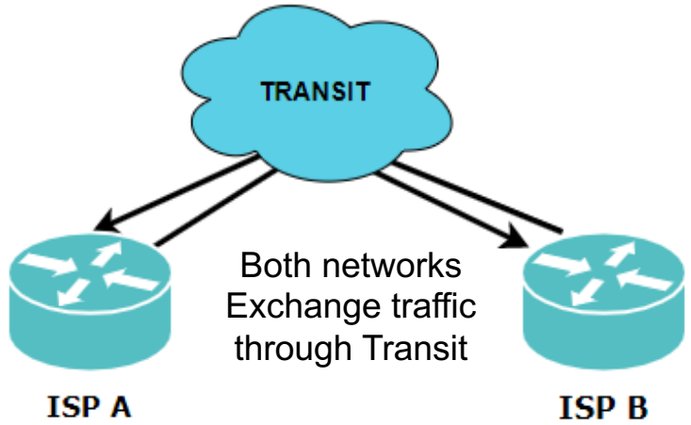
Choose your peer partners

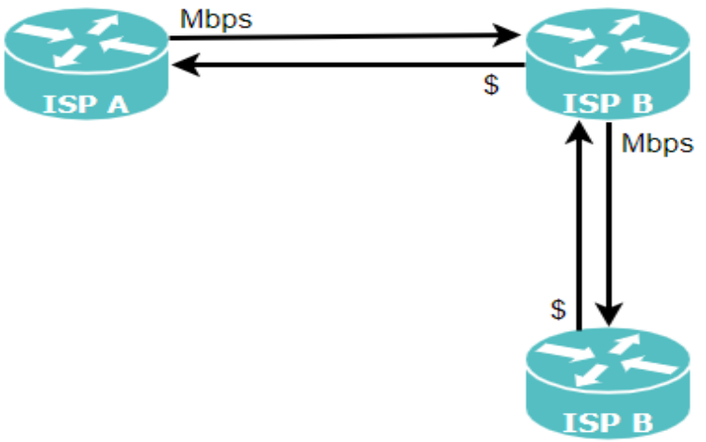
How to choose the right ones?

1. **Netflow**
   find where your traffic goes to and comes from

2. **Study their background**
   E.g.: Check whether the peering request is coming from one of your clients

3. **Peer with content provider**
   They usually will want to peer with as well, as they'd like to stay as close to the eyeballs as possible





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Use communities

Keep your routing tidy!

1 Have better control of your routing

Tag your inbound routes with the desired communities, so that you can choose which ones will be advertised to which peer

2 This is usually published in your company's website

So your customers and peers may steer their traffic according with their strategy as well

3 Tables may have different categories and granularity

Descriminate by country, city, IXP, Transit, customers, etc.

As an exemple ASN 37268 below

UPSTREAM INFORMATION

Angola Cables adopts the following code structure to tag the prefixes learned from public UPSTREAMs:

37468:1CXY, where **C**=CONTINENT | **X**=COUNTRY, **Y**=IXP_CODE where the route was learned.

Continent	Country	Community	Description
-	-	37468:1000	Represents all routes learned through Upstreams
Africa (1)	-	37468:1100	Represents all routes learned at Upstreams in Africa
	Angola (1)	37468:1110	Represents all routes learned at Upstreams in Angola (AO)
	South Africa (2)	37468:1120	Represents all routes learned at Upstreams in South Africa (ZA)
		37468:1121	Represents all routes learned at China Telecom in Johannesburg (ZA)
	Nigeria (3)	37468:1130	Represents all routes learned at Upstream in Nigeria (NG)
	Ghana (4)	37468:1140	Represents all routes learned at Upstream in Ghana (GN)
Europe (2)	-	37468:1200	Represents all routes learned at Upstreams in Europe
	Portugal (1)	37468:1210	Represents all routes learned at Upstreams in Portugal (PT)
		37468:1211	Represents all routes learned at Cogent in Lisbon (PT)
		37468:1214	Represents all routes learned at Tata in Lisbon (PT)
	Spain (2)	37468:1220	Represents all routes learned at Upstreams in Spain (SP)

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Maximize the benefits of peering

1. Keep your peeringDB page updated
2. Use route server
3. Have direct sessions
4. PNIs with large or important operators
5. Verify your prefix amounts
6. Use IPv6 too
7. Adjust your Local Preference and MED value

Prefixes	LP Priority	Example
Internal	Highest	999
Customer	Lower	300
Peering	Lower	200
Transit	Lowest	100

IXP Distance	MED Priority	Example
Closest	Best	10
Medium	Less	15
Far	Least	20

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Public vs Private peering

	Public	Private
Pros	1. Aggregates a large number of sessions across a single port 2. Ease of turning up or turning down sessions 3. You can turn up trial sessions and it's a no brainer	1. Easier to monitor the in and outbound traffic level 2. Easier to warn your peer when to upgrade the port capacity to avoid packet loss 3. More reliable and easier to debug
Cons	1. It's very hard to monitor how much each peers is trafficking there 2. You cannot tell whether your peer is congesting the port	1.Requires a cross-connect per session 2. Requires an additional interface per session

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Security

1. Have redundant sessions with the same peer
2. Set maximum prefix limit on every session
3. Use filters to accept only valid routes from your peer's ASN
4. Deny private IPs and bogons

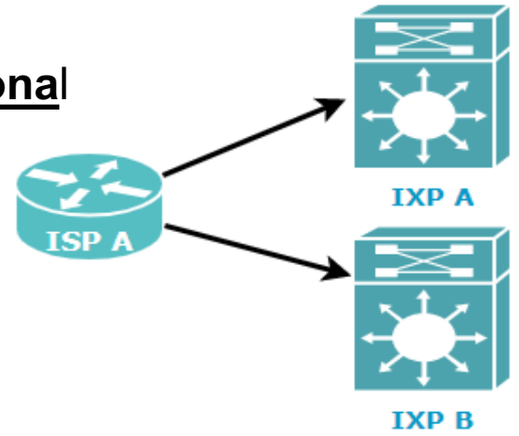
Remote Peering

1 - *It's becoming more and more common*

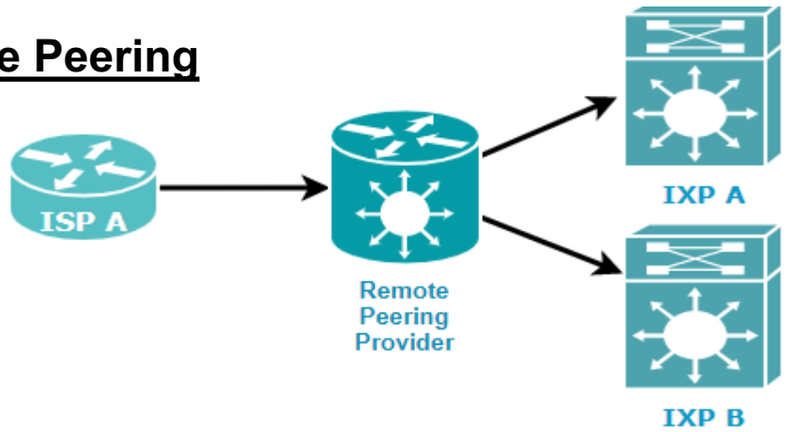
2 - *Simplicity and Speedy implementation*

3 - *One-to-many Model*

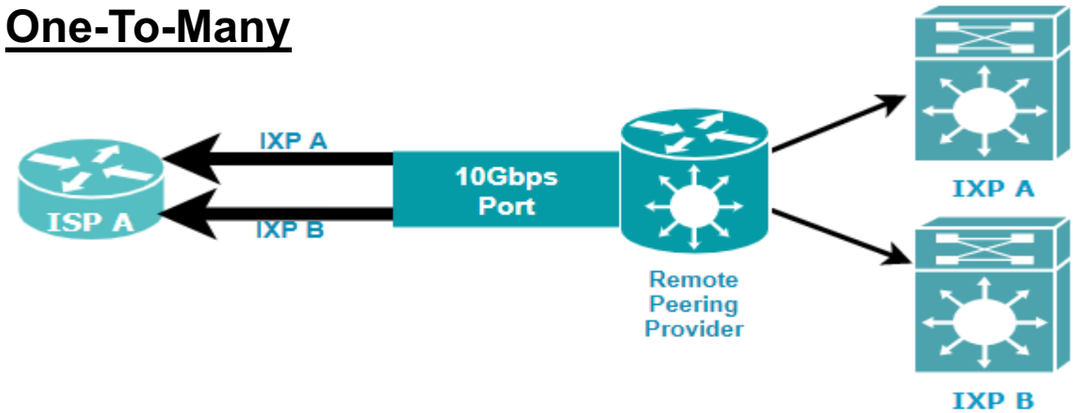
Traditional



Remote Peering



One-To-Many



Remote or traditonal peering?

Go with traditional if....

1. Costs are not an issue

2. Control and visibility over transport is crucial

3. You're required to buy Transit on-site

4. You're willing to set private peering sessions

VS

Go with reemote if....

1. The goal is to peer as widely as possible

2. Capital and engineering resources are limited

3. You're required to improve the customer base in a certain region asap

Thank you
Obrigado

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