

Peering Arithmetic

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Plan

- **What** is P2P?

Opportunity to decrease costs for AS.

- **Who** are interested in P2P?

ASes with difference in Customer Core

- **When to** P2P?

Money, money...

- From theory to practice

Main features

1. Keeps traffic local to region;
2. Decreases latency;
3. Decreases costs for transit networks.

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Who are interested in P2P?



Most common answer:

“ASes with similar size!”

But what is **size**?

AS Size

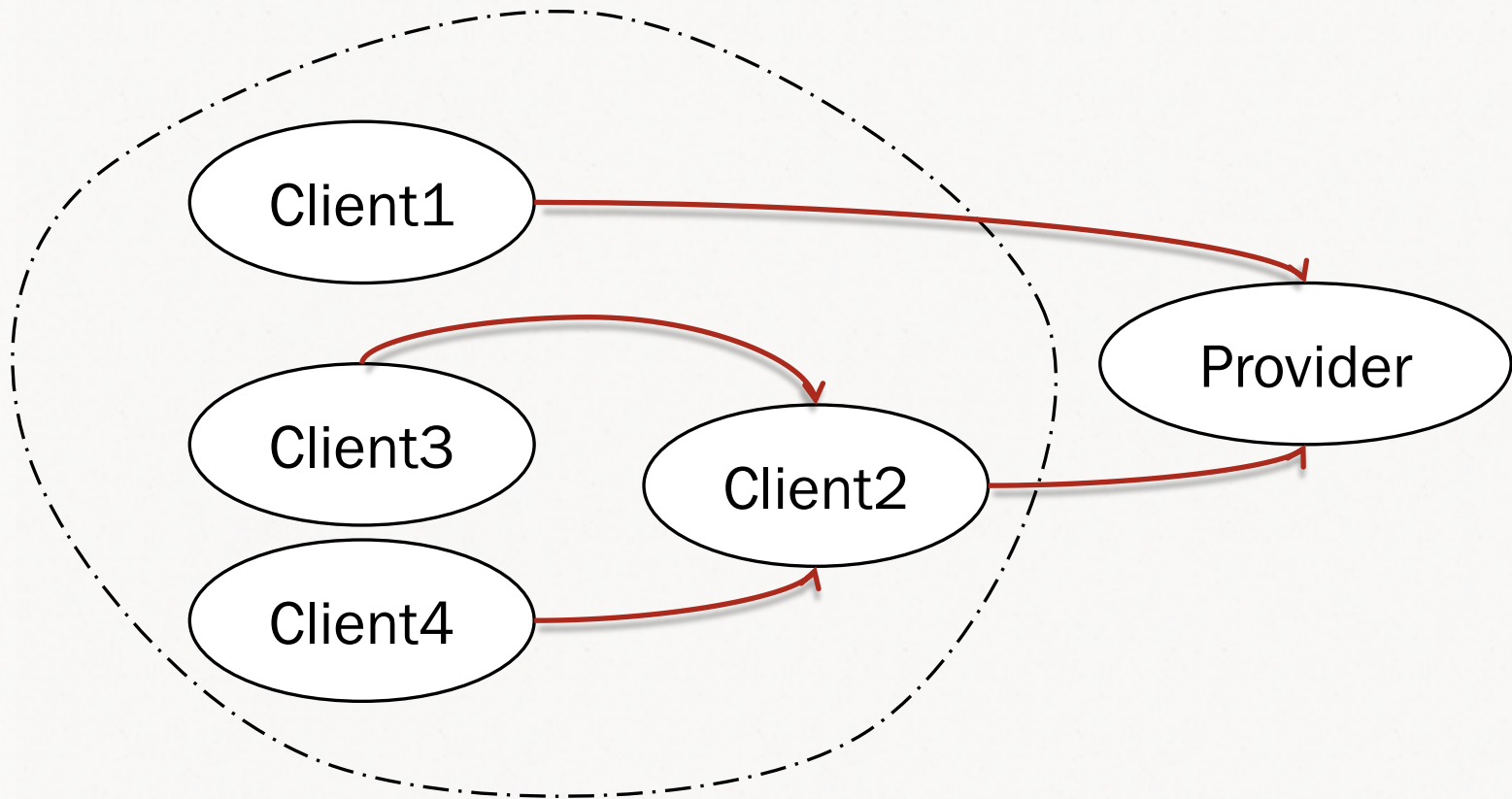
1. Channels?
2. Prefixes?
3. Connections?
4. Traffic?

AS Size

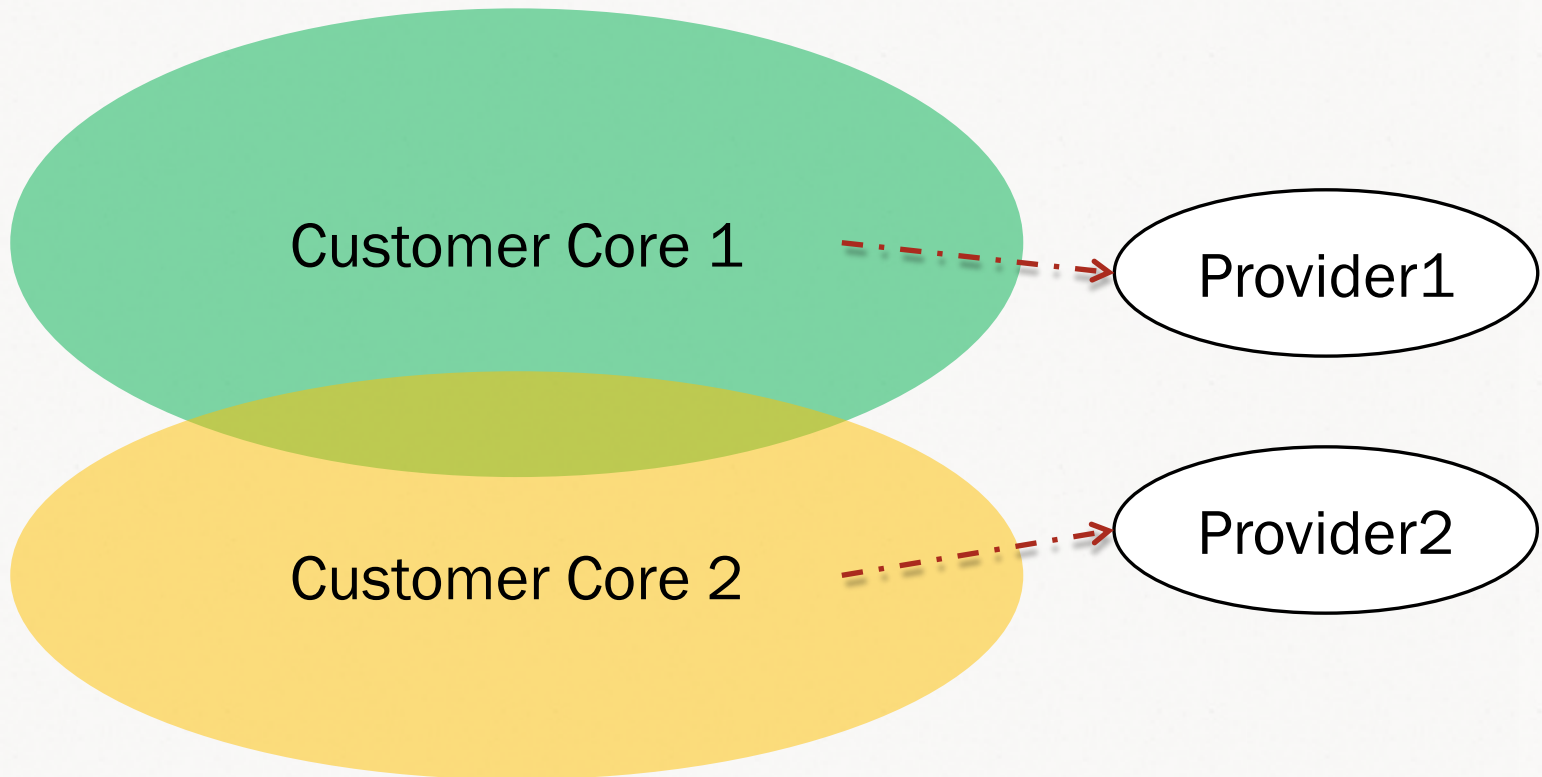


Or parrots?

AS Size = Customer Core

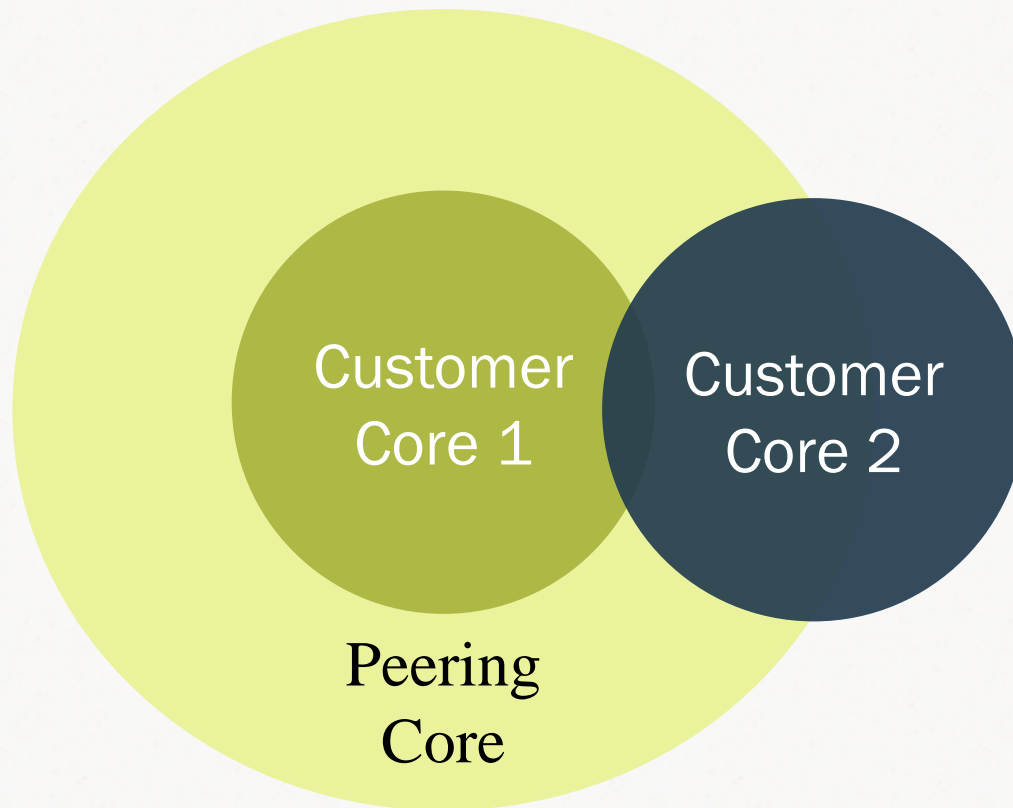


Difference



Greater difference in Customer Core – better P2P

P2P Graphics



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When to peer?

$$M_1 \times \frac{c2p}{N} - M_2 \times \frac{N - c2p - p2p}{N}$$

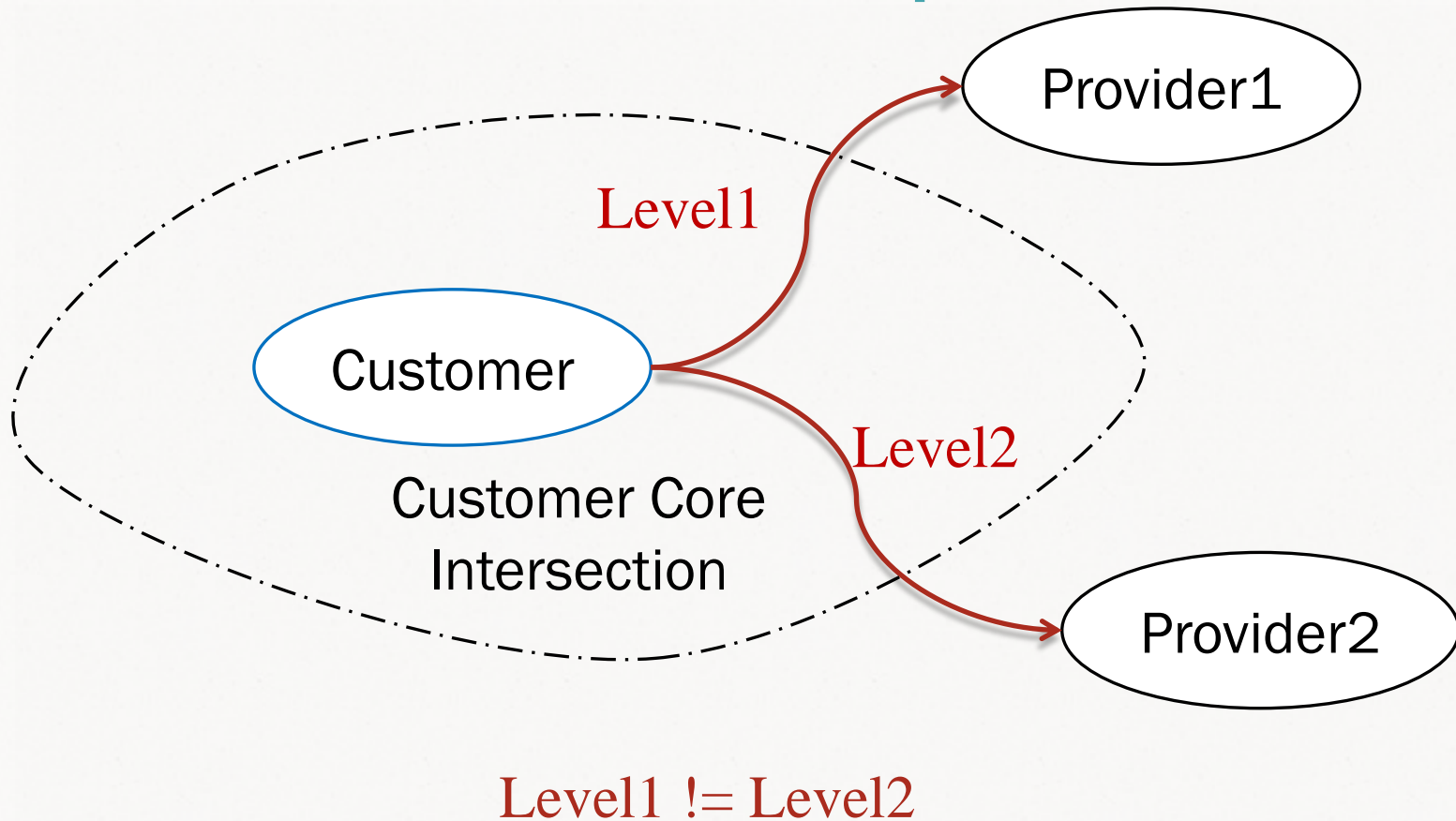
Peering could result in reduction of costs.

When not to peer?

$$M_1 \times \frac{c2p}{N} - M_2 \times \frac{N - c2p - p2p}{N}$$

Peering could result in decrease in profit.

When not to peer?



P2P arithmetic

$$N = c2p + p2p + p2c$$

$$\triangle_{+} = \text{level}(\text{provider}_1) < \text{level}(\text{provider}_2)$$

$$\triangle_{-} = \text{level}(\text{provider}_1) > \text{level}(\text{provider}_2)$$

$$M_1 \times \frac{c2p + \triangle_{+} - \triangle_{-}}{N} - M_2 \times \frac{N - c2p - p2p}{N}$$

Plan

- **What** is P2P?

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ASes with difference in Customer Core.

- **When to** P2P?

When it gives profit. Could be predicted.

- **From theory to practice.**

Regional ASes

Russia	Ukraine	CIS
12389	9002	9002
20485	8359	20485
8359	21219	8359
9002	20485	12389
3216	3255	3216
31133	35320	31133

Ordered by size (customer core).

Peering 01.06.2013

	9002	20485	8359	12389	3216	31133
9002	X					
20485		X	p2p	p2p		p2p
8359		p2p	X	p2p	p2p	p2p
12389		p2p	p2p	X	p2p	p2p
3216			p2p	p2p	X	p2p
31133		p2p	p2p	p2p	p2p	X

Suspicious?



P2P prediction

	9002	20485	8359	12389	3216	31133
9002	X	8%	8%	0%	0%	12%
20485	2%	X	p2p	P2p	3%	p2p
8359	-1%	p2p	X	P2p	p2p	p2p
12389	3%	p2p	p2p	X	p2p	p2p
3216	14%	8%	p2p	p2p	X	p2p
31133	0%	p2p	p2p	p2p	p2p	X

Summer Diff

22.06.2013

9002 (+0%) P2P 12389 (+3%)

Peering 01.09.2013

	9002	20485	8359	12389	3216	31133
9002	X			p2p		
20485		X	p2p	p2p		p2p
8359		p2p	X	p2p	p2p	p2p
12389	p2p	p2p	p2p	X	p2p	p2p
3216			p2p	p2p	X	p2p
31133		p2p	p2p	p2p	p2p	X

No P2P Prediction

	9002	20485	8359	12389	3216	31133
9002	X			0%		
20485		X	-16%	-3%		-5%
8359		-4%	X	4%	2%	0%
12389	-3%	-5%	-3%	X	1%	-2%
3216			-19%	-15%	X	-5%
31133		-4%	-2%	-5%	-1%	X

Results

1. P2P relations could be ineffective or even harmful for AS.
2. The result could be predicted. There is no magic.
3. P2P must be ordered only by economic means. No politics. Otherwise only regulation.

Qrator Radar

radar.qrator.net