

A Straw-Man Pricing Model Addressing the Multicast Deployment Problem

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The Problem:

The technological problems of multicast routing are relatively well in-hand, and...

There are users and applications which would benefit from being able to use a multicast routed infrastructure, and...

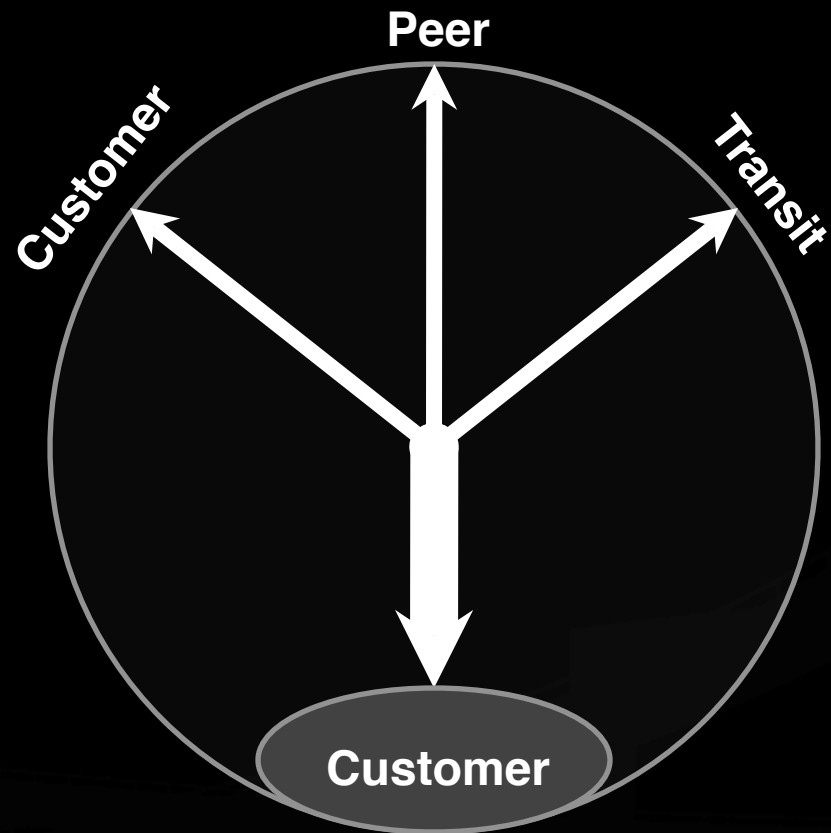
Multicast unquestionably provides advantages of economy and efficiency, but...

The Problem:

The billing model which evolved in the unicast environment is too inequitable when applied in a multicast environment to provide ISPs with any incentive.

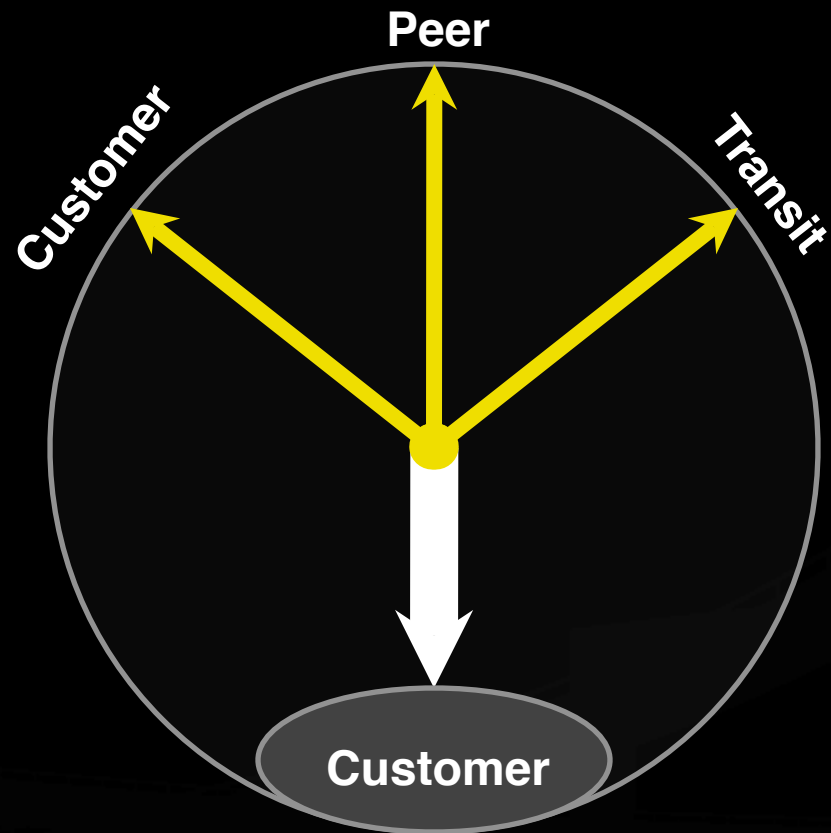
The Unicast Economic Model

ISPs sell access to their combined mix of network edges (customers, peers, and transit providers) to their customers.



The Unicast Economic Model

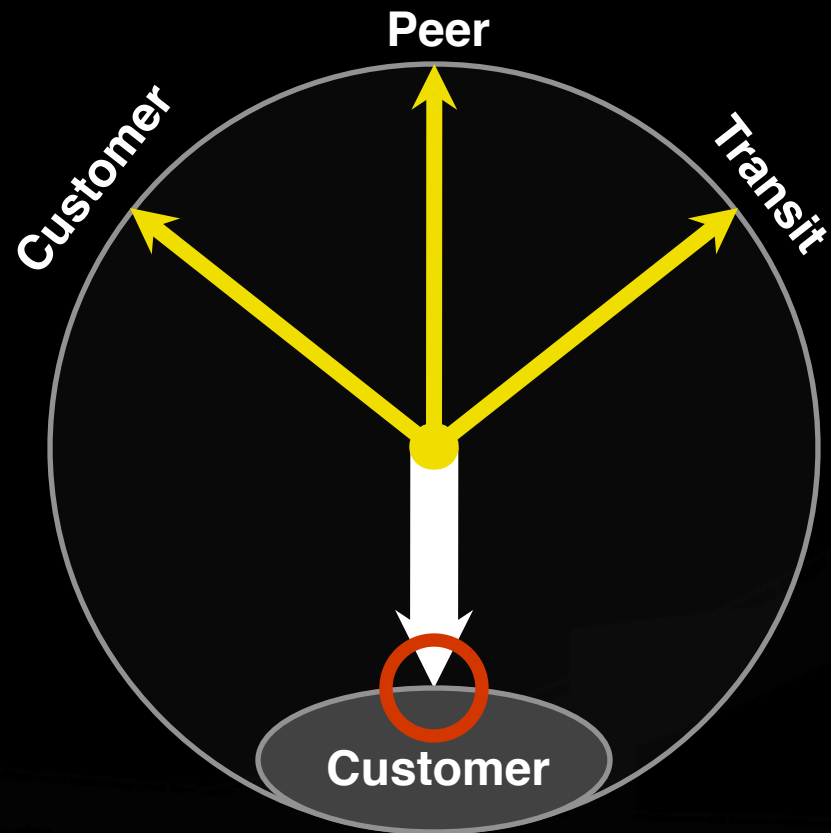
The **sum** of the customer's use of the ISP's network...



The Unicast Economic Model

The **sum** of the customer's use of the ISP's network...

can be measured at the **point** at which it's aggregated, facing the customer.

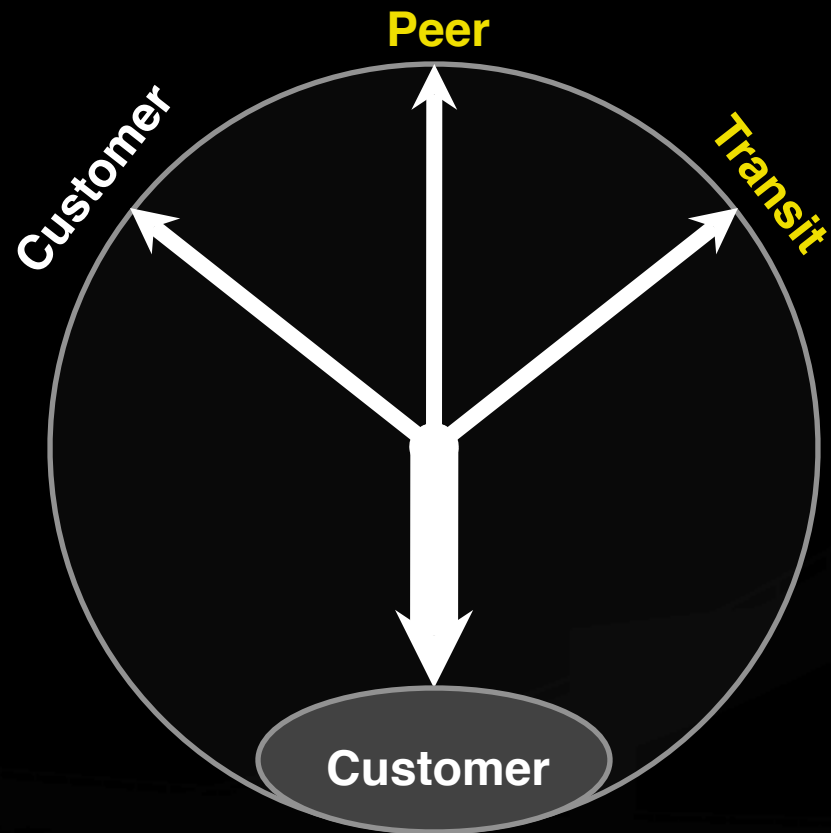


The Unicast Economic Model

The sum of the customer's use of the ISP's network...

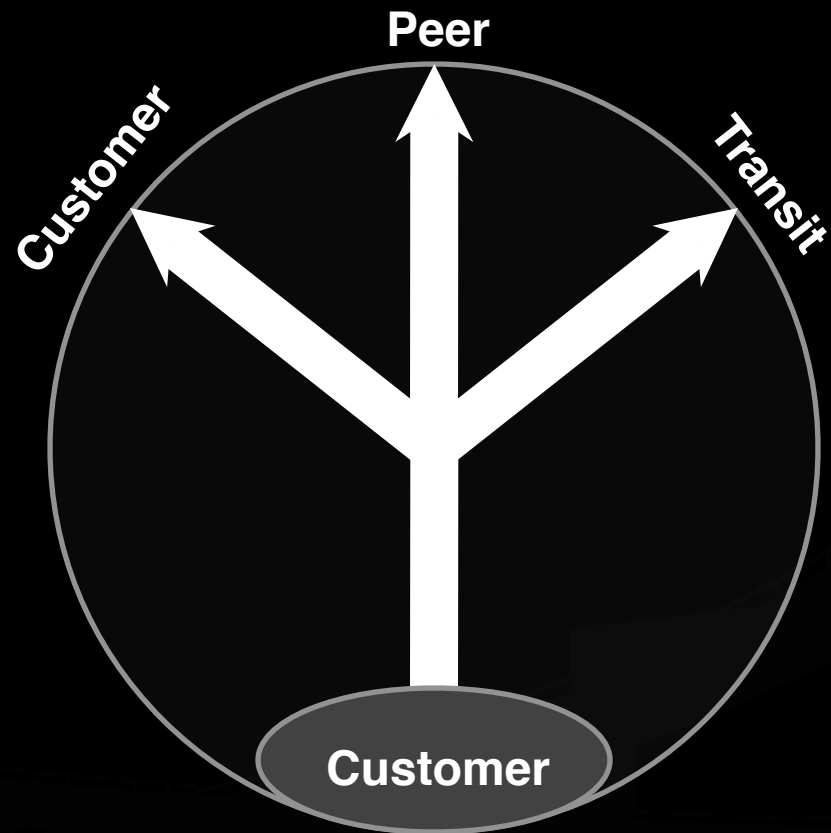
can be measured at the point at which it's aggregated, facing the customer.

Other expenses can be amortized proportionately across all customers.



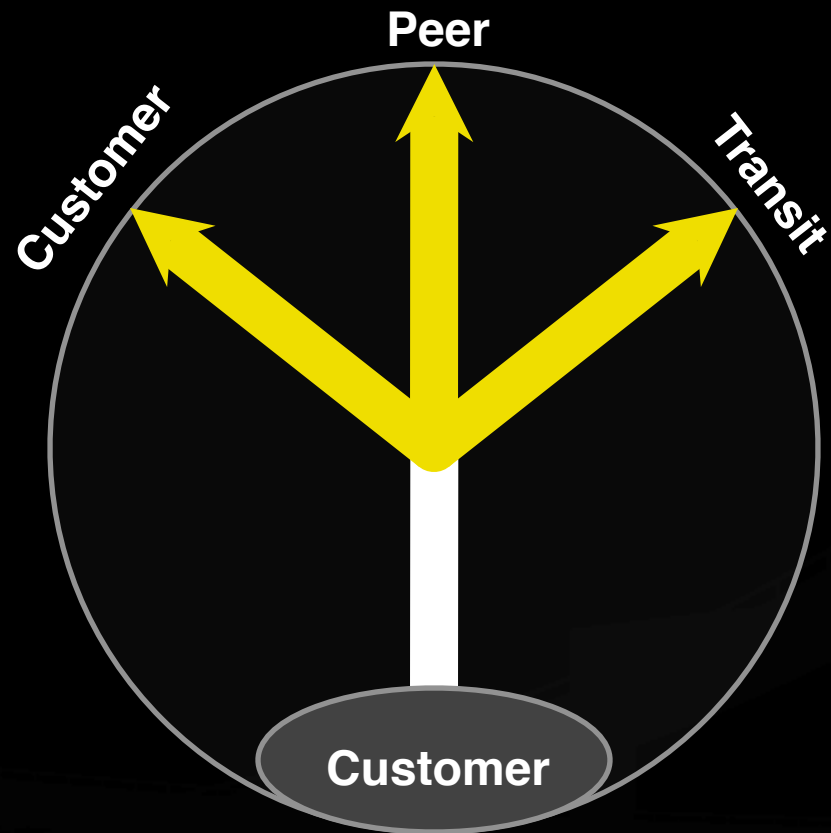
How Multicast Breaks This Model

Multicast traffic is multiplied within the ISP's network



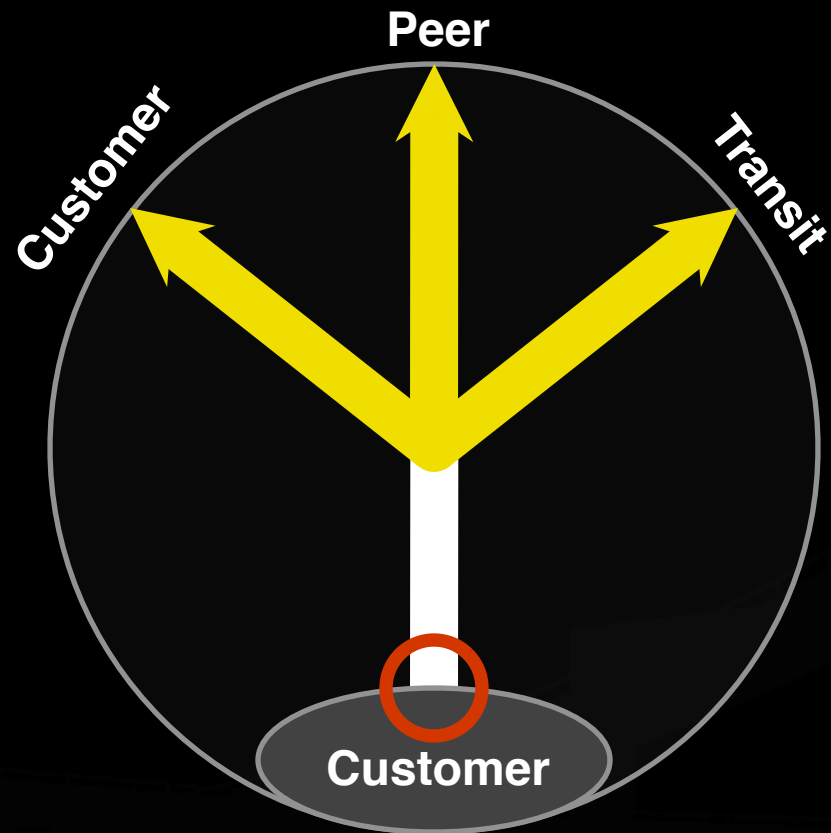
How Multicast Breaks This Model

Multicast traffic is multiplied within the ISP's network...
such that the **sum** of the edge utilization...



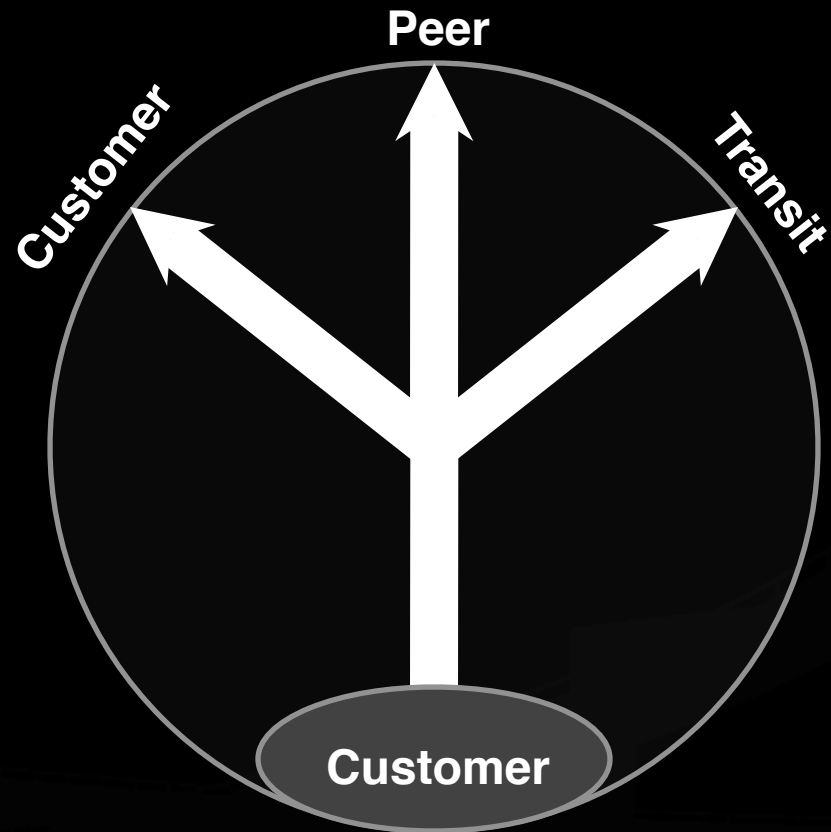
How Multicast Breaks This Model

Multicast traffic is multiplied within the ISP's network... such that the **sum** of the edge utilization... may be far **greater** than what's observed at the point at which it enters from the customer.



But That's Just a Billing Problem

In terms of efficient use of the network, multicast is far preferable...



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to filling the backbone with redundant **unicast**



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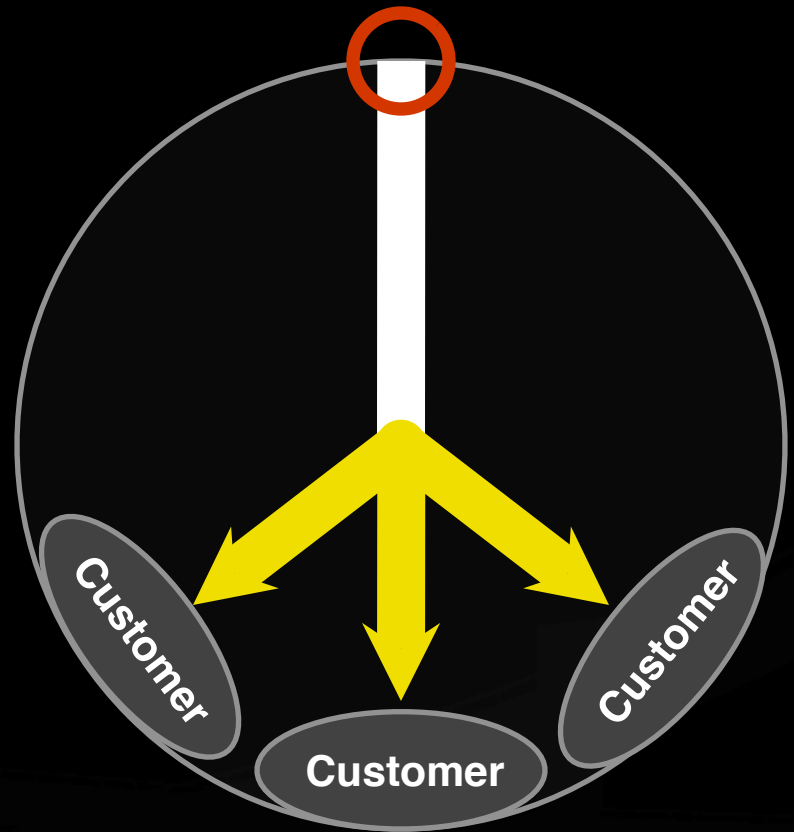


But That's Just a Billing Problem

And for the recipient's ISP, multicast is an unqualified benefit...

since the **sum** of the exit points...

is **greater** than the bandwidth required to bring it into the network.



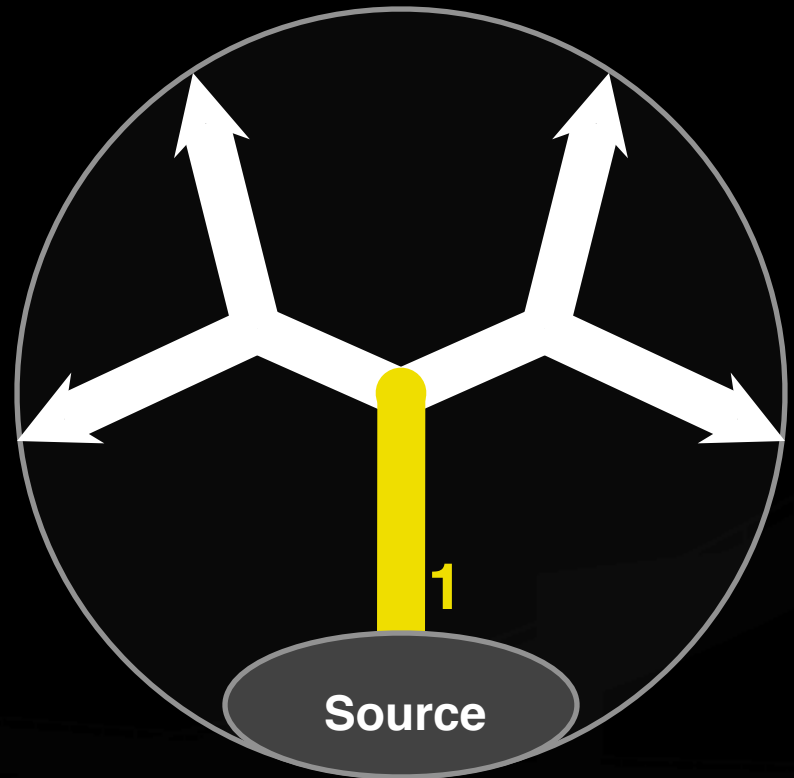
So How Do We Characterize the Inequity?

As a starting point, customers who send multicast are already paying for a connection, and paying for unicast utilization.

So we need to identify the difference between what the customer currently pays for, and what the ISP has to provide in a multicast environment.

So How Do We Characterize the Inequity?

In this example, the customer is paying for **one** unit of service...



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but receiving **four**...

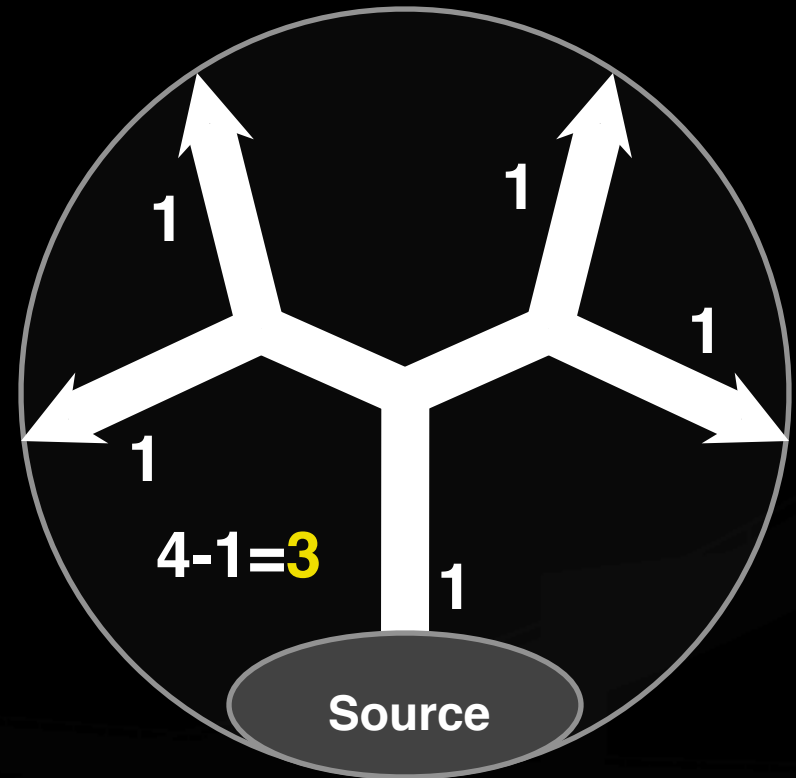


So How Do We Characterize the Inequity?

In this example, the customer is paying for one unit of service...

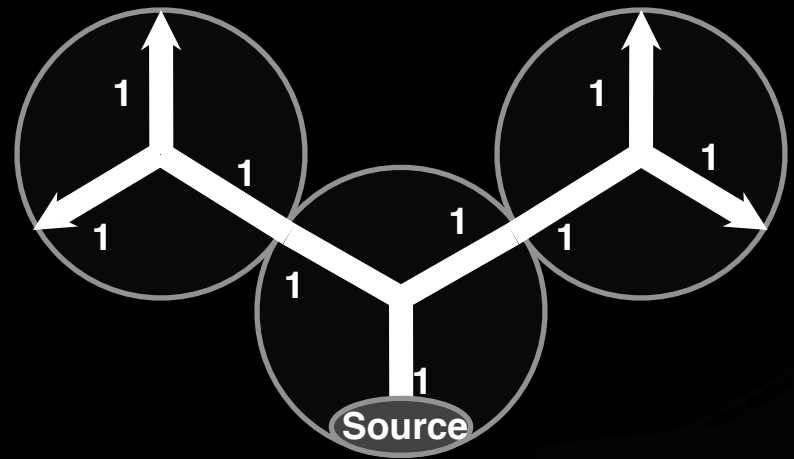
but receiving four...

for a difference of **three**.



The Difference is Transitive

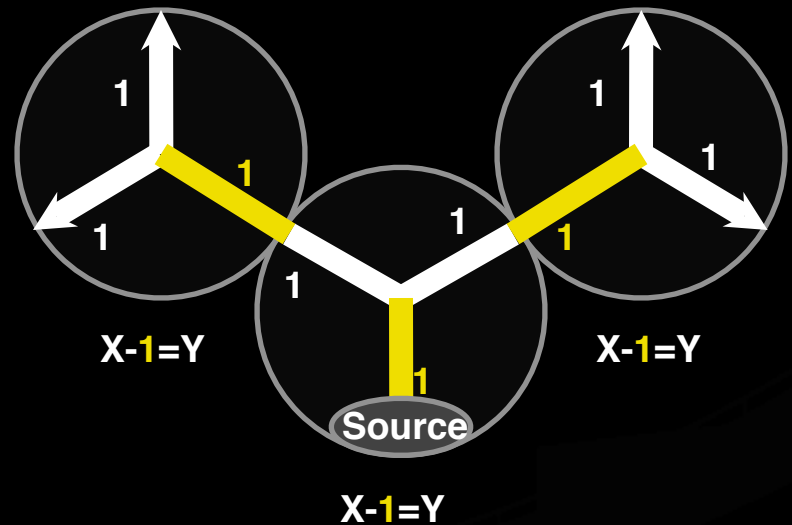
If the source's transit providers also split the traffic...



The Difference is Transitive

If the source's transit providers also split the traffic...

each of the three ASes receives revenue from **one** customer circuit...

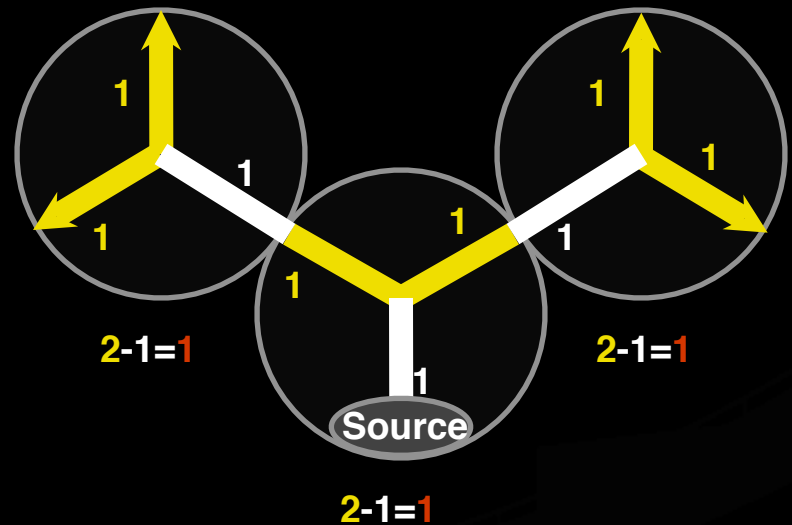


The Difference is Transitive

If the source's transit providers also split the traffic...

each of the three ASes receives revenue from one customer circuit...

and replicates it to **two** destinations...



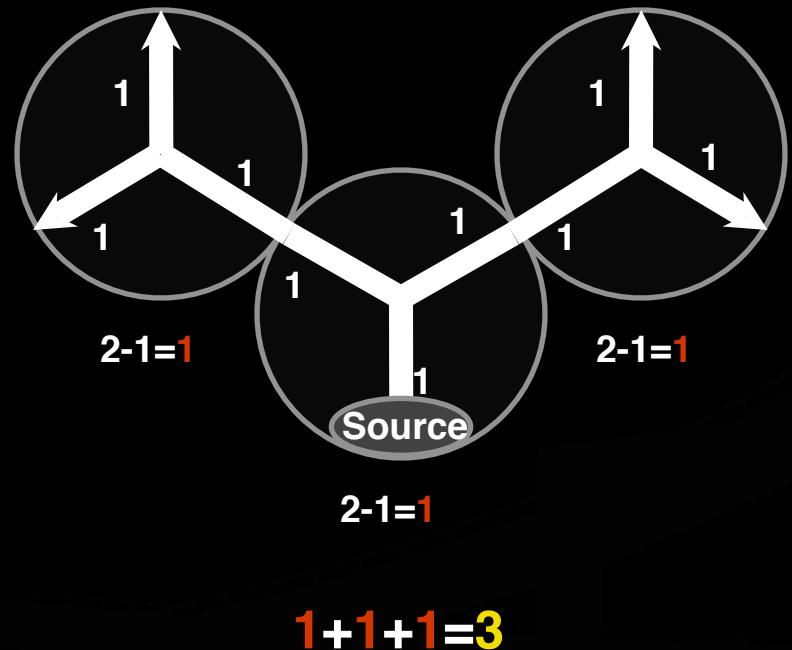
The Difference is Transitive

If the source's transit providers also split the traffic...

each of the three ASes receives revenue from one customer circuit...

and replicates it to two destinations...

so we have the same overall replication factor of **three**.



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www.pch.net/resources/papers/multicast-billing