netnod

FACT SHEET

WHAT IS PEERING?

What is peering?
Peering is a process by which two Internet networks connect and exchange traffic. It allows them to directly hand off traffic between each other's customers, without having to pay a third party to carry that traffic across the Internet for them. Peering is distinct from transit, the more usual way of connecting to the Internet, in which an end user or network operator pays another, usually larger, network operator to carry all their traffic for them.

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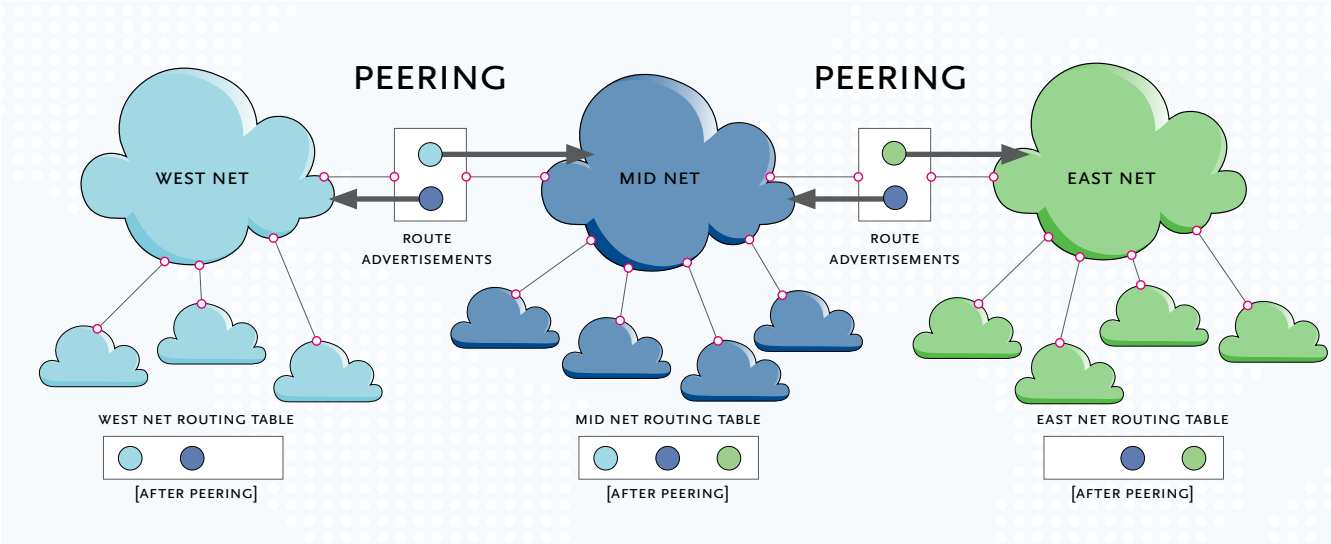


Why peer?
Network operators may peer for many reasons. Sometimes it's cheaper to hand off traffic themselves rather than paying somebody else to do it. Sometimes it gives greater control over their traffic flows, or allows them to better serve local populations. If you're paying USD 10 per Mb/s per month, and somebody you are pushing 100 Mb/s of traffic to is willing to accept that traffic from you for free, you could save USD 1,000 per month. In practice, things are not quite so simple, as the infrastructure required to peer also costs money, but that gives a basic idea. Network operators who peer have more control over their traffic. If an operator sends or receives traffic out of a transit connection, it goes across the Internet via whatever path the transit provider decides to use, leaving no control to the operator buying transit. If there's a problem – slow connections or packet loss, for instance – the network is at the mercy of its transit provider, leaving the operator with very little control over its service. A network operator who peers has more control over external paths, and can easily adjust

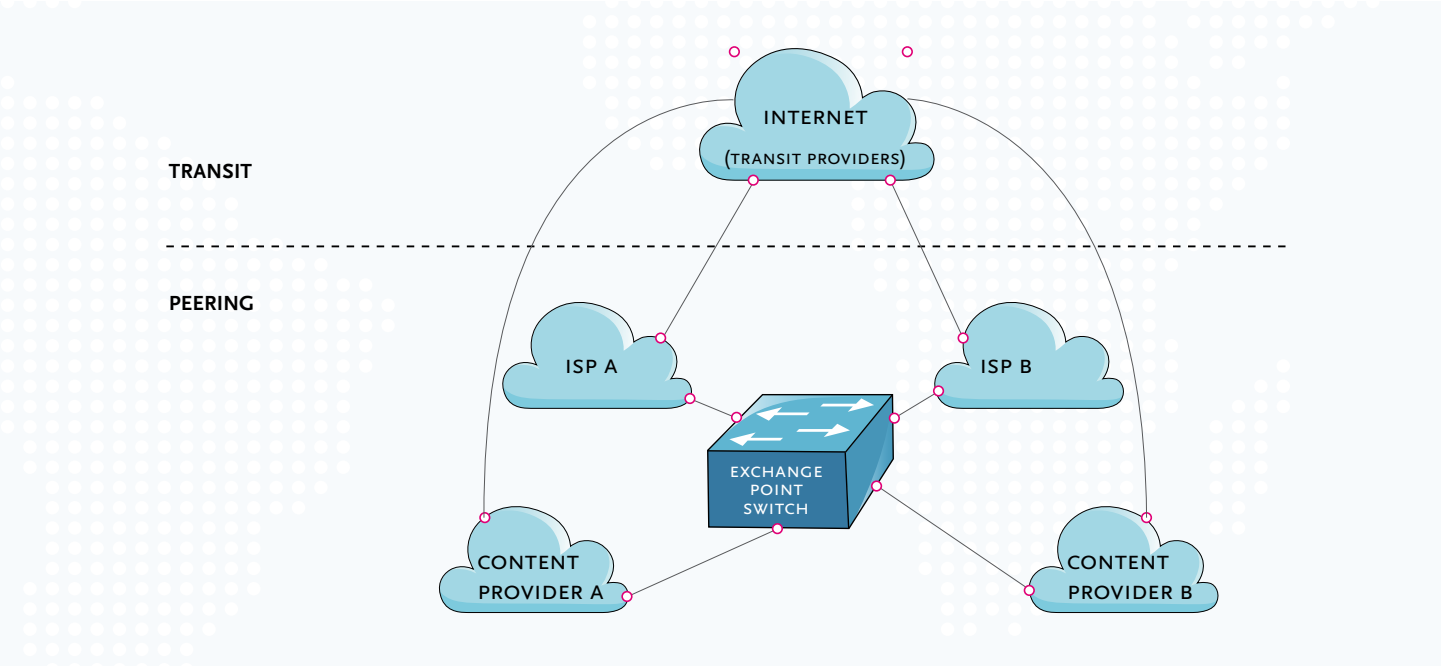
routing to avoid problem network segments. Peering keeps traffic local and improves performance. Transit providers often cover large areas, and connect to other networks in few locations. If you buy transit in Stockholm, for instance, you may find that your path to another Stockholm network goes through London or Amsterdam. As you understand, that is not a very efficient or fast path. Peering keeps traffic local, providing faster connections between the two networks!

> "Network operators who peer have more control over their traffic, which improves performance and quality."

Why not peer?
Peering has advantages, but still requires work. Arranging peering requires active participation. For each network you peer with, you have to negotiate an agreement. You have to connect to them. You have to work with them to set up the connection. You have to deal with them when it goes down. Sometimes the economics doesn't work.

Types of peering
There are several types of peering connection. Peering just means that two networks connect somehow. This could involve running a circuit across town from one network's facility to the other's. However, that arrangement requires covering the cost of a metro circuit between the peers. With a lot of peers, that would get expensive fast.

Public peering, done through an Internet exchange, is more common and more efficient. An Internet exchange is an Ethernet switch (or set of Ethernet switches) in a colocation facility, which all the networks peering in the facility connect to. Using an Internet exchange,



> Peering can keep traffic local, providing faster connections between the two networks.

a network can peer with many other networks through a single connection, making it very efficient. Peering arrangements still need to be negotiated with each peer, but no new cabling needs to be done.

Private peering within a colocation facility combines the two approaches. Two networks put routers in the same building, but run a direct cable between them rather than connecting via the exchange point switch. This is sometimes done when the networks are exchanging a large volume of traffic, which won't fit on a shared connection to an exchange point.

There are also several types of peering arrangement. Under the usual definition of peering, the networks exchange all traffic from any of their customers to any of the other's, any where in the network.

A variant of this is for networks to exchange traffic only between certain customers, generally customers in a certain region. For instance, a global network peering with a local Swedish network might use the peering session only for traffic from and to its Swedish customers. This would relieve them of the burden of having to haul traffic all over the world to the Swedish network, when the Swedish network wasn't doing the same for them. This is known as partial or regional peering.

Another variant is what's sometimes called "paid peering", also known as "partial transit." This looks to those outside just like a regular peering session, but one network pays the other to participate in the arrangement. This is done when one network values the arrangement more than the other does. This is normally something arranged between the two networks, and not something an exchange point intervenes in.

Requirements for peering

There are several things you need in order to start peering. The first is a connection to an exchange point. This may involve installing a router in the exchange point's building, or may involve a metro Ethernet circuit connecting equipment in one of your existing facilities to the exchange point switch. You may need to pay the exchange operator for the switch port, the colocation provider for space, and metro Ethernet provider for connectivity. If connecting to the exchange point using a new router, rather than an extra port on an existing one, you may need to buy a router.

You will need somebody to manage your peering for you. They need to figure out which networks you should be peering with, contact those networks, and make arrangements. Sometimes that means sending email, and sometimes it involves making phone calls or seeking out other network operators' employees in person. Many peering arrangements are facilitated through face-to-face meetings so if you can, make sure to go to the peering forums and the IXP meetings! Some networks will say yes or no without much discussion, but in some cases you may need to explain how much traffic is being exchanged between your network and theirs, and why peering would benefit them.

What is peering?

Also, you will need to make some decisions about your own peering policy. Will you peer with anybody who asks, or will you analyze each request and make case-by-case decisions?

Route servers
Netnod operates route servers at the Stockholm IX as well as the Netnod COMIX exchange point (Copenhagen-Malmö.) A route server facilitates the administration of peering arrangements for networks present at an exchange point. By connecting to the route server, you can replace some, or all of your separate BGP sessions to your peers, with one single session towards the route server. Not only does a route server make it easier for networks to manage their peering arrangements, but it also makes it easier for new peers to start exchanging traffic at the exchange point, from day one.

What's right for you?
Whether peering is right for you will depend on several factors. Some of them have to do with economics. How much traffic do you have? How much are you paying for transit? How much of that traffic could be easily shifted to peering? How much will peering cost? Will it save you money? These costs are easy to put into a spreadsheet and see how they stack up for you.

Then there are the less quantifiable, but equally important factors: How much control do you want over your traffic? Do you prefer hands-on involvement in your traffic routing? Does your network have any requirements that the available transit providers can't deal well with? Is speed and latency important for you? Is keeping traffic local a priority for you? Is the robustness, stability and efficiency an exchange point offers important to you?
If the benefits stack up favorably, peering may be the right thing to do!

Peering benefits:
- Lower cost
- Lower latency
- Increased speed
- Increased quality
- Control of traffic

An Internet exchange point with four ISP and two Content Providers