

The Internet Eco-System

The global Internet is made up of all types of network infrastructure operators. They might be categorised as follows:

- Access Providers
- Regional Providers
- Global Providers
- "Tier-1s"
- Content Providers
- Content Distribution Networks
- Internet Exchange Points

All these network infrastructure operators interconnect with each other in a variety of ways.

Access Providers

The vast majority of network operators participating in the Internet today are Access Providers.

Access Providers provide consumer access (fixed broadband, WiFi, mobile 3G/4G/5G). National research and education networks are also Access Providers, connecting universities, research institutions, schools, colleges, and tertiary education institutions.

They buy transit from upstream providers and participate at Internet Exchange Points.

Some Access Providers may also provide transit to other (smaller) Access Providers.

Regional Providers

Have a presence in many economies. They provide transit to Access Providers, and may be Access Providers themselves (either directly or through specific local subsidiaries).

They buy transit from their upstream providers and usually participate at Internet Exchange Points.

Global Providers

Global providers normally have a presence in two or more continents (for example, North America and Europe, or Europe and Asia, or Africa and Europe).

They provide transit to Access and Regional Providers, but are unlikely to be Access Providers themselves.

They might participate at Internet Exchange Points (either directly or through specific local subsidiaries).

"Tier-1s"

Tier-1s are a specific type of Global Provider who does not need any transit. Tier-1s only peer with each other.

They do not participate at Internet Exchange Points, although subsidiaries of theirs may well do so.

Tier-1s have multiple high bandwidth links for their global backbones, and also have multiple high bandwidth interconnects with their peers in most continents.

There is no published list of Tier-1s - very few operators of this size publicly disclose their interconnect agreements.

Content Providers

Content Providers are responsible for generating the distributed content that most end-users are interested in accessing.

Content providers have their own infrastructure and transit networks, and participate actively at Internet Exchange Points. For them Internet Exchange Points are the easiest and most scalable way of accessing “eye-balls”, the end-users of the IXP members who will be consuming their content.

Note that once content providers traffic to any particular IXP member exceeds a pre-determined level, the content provider will quite often request a Private Network Interconnect (PNI) or private peering with the IXP member, separate from the IXP fabric.

Content Distribution Networks

Content distribution networks use their own infrastructure and transit networks to deliver content either by private peering or by peering at Internet Exchange Points to the Access Providers whose end users consume it.

Content distribution networks participate actively at Internet Exchange Points and often will provide caches to be hosted either at the IXP or even within the network operator infrastructure itself.

For content distribution networks, Internet Exchange Points are the easiest and most scalable way of accessing “eye-balls”, the end-users of the IXP members who will be consuming the content being distributed on behalf of their customers.

Internet Exchange Points

The Internet Exchange Point is the foundation on which the entire Internet is built.

Most network operators want to peer as much as possible (because traffic across the IXP attracts no charges).

IXPs facilitate large volumes of peering and traffic exchange between the different types of network infrastructure operators listed above.

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