

What is a Network Operator

A network operator is an entity which is running a TCP/IP based network infrastructure, connected to or planning to connect to the global Internet, and providing access to:

- **end users**: these end users could be residential, businesses, content developers and hosts, educational institutions, charities, government departments, and so on. The Internet operations and peering communities call these end-users "*eyeballs*".
- **other network operators**: the Internet is hierarchical and some network operators only provide Internet access to other network operators; others may also provide Internet access to **end users** as well.

Network operators have a number of important goals to make their existence sustainable (whether as a service provider, enterprise or other commercial entity, or a Research & Education network).

These goals are:

- Internet Resources
- Access
- Peering
- Transit
- Costs

Internet Resources

A network operator will have their **own** Internet resources. This means that they have obtained their **own** IP address space (IPv4 or IPv6 or both) and their **own** Autonomous System number (the globally unique identifier for their network as used by the Border Gateway Protocol (BGP), the routing protocol of the Internet).

Entities without their own Internet resources are not considered network operators for the purposes of this toolbox as they cannot participate in the activities being described here without those independent resources.

Internet resources are obtainable from the Regional Internet Registries (AfriNIC, APNIC, ARIN, LACNIC, RIPE NCC) and their websites should be consulted for further information about membership and obtaining resources. Each RIR has its own process and the Peering Toolbox recommends any prospective obtainer of Internet resources to talk with their RIR's member services team on what needs to be done (if clarification of the respective RIR website is needed).

Access

The primary goal of a network operator is to provide Internet access to their users or customers (be these end-users or other network operators).

The vast majority of content consumed by Internet users today is made up of social media and videos. This content is distributed by the multi-national content providers and content distribution networks.

To provide the highest bandwidth and highest quality access to this content, a network operator positions their infrastructure as close as possible to the content providers and content distribution networks. There are two ways of doing this: peering, and transit.

Peering

(UPDATED)

Peering is the connection of one network operator to another network operator to exchange traffic originated by each network operator.

The vast majority of peering does not attract traffic charges - it is known as “settlement-free peering”.

Peering can take place in two forms:

1. Private peering is where there is a private connection between the two network operators for the purpose of exchanging traffic.
2. Public peering takes place at a public peering point, commonly known as an Internet Exchange Point.

Peering is described in more detail in the What is Peering page. To implement peering, a network operator will require knowledge of BGP, the Border Gateway Protocol.

Transit

Transit is the purchasing of Internet access by a network operator from another network operator (known as their upstream provider).

Transit is the first thing a newcomer network operator will require when they are establishing their Internet connectivity.

Transit costs money and it is usually a significant expense for any entity wishing to gain Internet access.

Transit is described in more detail in the What is Transit page.

Costs

Network Operators strive to minimise the cost of access to the content their end users demand.

Transit costs money, peering does not (after the initial set-up), which means that network operators strive to peer as much as possible. Transit is mandatory for any network operator, but is considered a last resort, only to be used for low volume content sources and other destinations which cannot be reach by peering.

It is estimated today that around 80% of all traffic for a typical access provider can be obtained by peering. (This is based on observations of real traffic profiles by the author in many parts of the world.) The reason for this is that the majority of the major content providers have presence at many of the IXPs or peering infrastructures around the world. Participating in peering means a considerable cost-saving for every organisation that takes part.

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