



Ethical selection of our Internet access provider

Guide for users



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1

WHAT IS AN INTERNET ACCESS PROVIDER?

An Internet Service Provider (ISP) is an organisation that provides services to access or participate in the Internet.

Internet services, typically offered by providers, may include Internet access, Internet transit, domain name registration, web hosting, mail service, and server collocation.

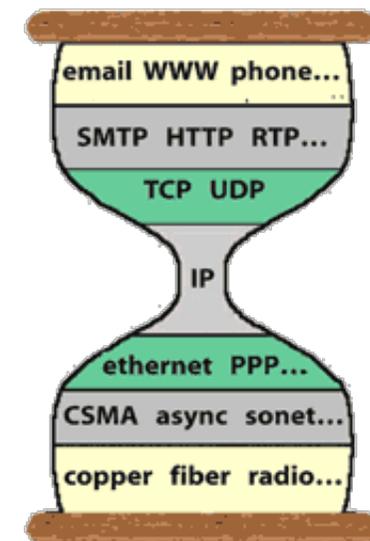
An ISP is usually the access point or gateway that provides a user with access to everything available on the Internet or vice versa: it brings what a user provides to the Internet.

Internet Service Providers can be organised in various ways, including commercial, community-owned, not-for-profit, or privately owned.

Access **providers** provide internet access. They allow the exchange of data packets between routers, following the Internet communication protocols (IP). To do this, they use different ways to connect users to their network and the Internet. These forms use different wired networks (fibre optic, Ethernet cable, ADSL telephone cable) or wireless (mobile network or Wi-Fi).

Internet access providers need access to buildings and conduits in public and private spaces to place cables, antennas, routers, towers, base stations, and servers that make up their **access network**. There are also **virtual operators**, which do not have their own access but resell the access service through public or private access infrastructure rental agreements to operators with their own coverage. An access provider also has to offer **transit** to the rest of

The "hourglass" model of internet protocols





the internet by connecting with other networks to exchange traffic between networks on the internet (internetworking, hence the name internet), as well as manage essential resources such as IP addresses, ports, and basic services such as traffic routing, security, names (DNS) that your customers need.

A provider of **servers and services** usually has its own data centre or is hosted in one, connected to the internet, with servers that provide various application services, such as web, mail, and virtual servers, among many more.

Pangea is a provider of web services, mail and virtual servers. Pangea's servers and services are hosted in the server space that the guifi.net Foundation has in the Equinix data centre in Barcelona, where we share several carriers to the internet and local access providers.

For people to be able to connect with our devices to the Internet, where Pangea services are also located, we have to choose the form of access. There are many Internet connection offers, which we want to classify to help you choose.

Pangea members need their own Internet connection, with coverage in their geographical area. This can be provided by:

Entities such as guifi.net or access operators that are part of guifi.net, some non-profit associations such as eXO.cat in Barcelona or commercial operators such as xta.cat, with their own infrastructure and zones of coverage:

[https:// fundacio.guifi.net/coverage](https://fundacio.guifi.net/coverage)

- Entities of the social economy, such as somconnexio.coop, with its own customer service under a cooperative model of organisation, but without its own infrastructure,



resellers of the Masmóvil and Vodafone commercial operators, which provide them with their coverage.

- Any commercial operator available.

The offer is immense. The National Market Commission has registered 2,646 Internet access provider entities in Spain: <https://numeracionyoperadores.cnmc.es/operadores>

A market analysis company offers a data perspective on the sector:

<https://es.statista.com/temas/3725/telecommunications-operators-in-spain/>

Internet access services are highly controversial. The Spanish Office for Telecommunications User Complaints, in its 2020 annual report, offers the number of complaints per 10,000 subscribers as a quality indicator. As for mobile communications, Vodafone (3.71) more than doubles the rest. In terms of fixed communications, MásMóvil (50) is the one with the most, and curiously, the one with the least is Euskaltel (2.7), also incorporated into the MásMóvil group.



2

DIMENSIONS TO CONSIDER AND CRITERIA TO CHOOSE FROM?

The first restriction is given by **supply**: which providers are available in my location. Each operator usually reports its coverage area, which can be local (neighbourhood, municipality), regional, national or even several countries.

Our **demand or need** gives the second decision:

Do we want to connect a single device, several people in a family, a small or individual office, or many people, such as an apartment building, a school or a company?

Do we want a fixed connection or to accompany us (mobile)?

Once we have a list of options, we have to select based on the characteristics of the service we need, the economic cost, and the characteristics of the operator.

Many offers are reduced to the service's price: a fee for traffic volume or an unlimited monthly fee (with certain restrictions).

To compare different services, it is not always enough to compare the regular price; we have to analyse if it includes a specific volume of traffic (with additional costs or reduced speeds once this volume is exceeded) or if it is about unlimited quotas (with certain restrictions).

Other offers also have a separate installation cost (taking the connection to the access location) and the device that connects us to the provider: the **router**, which can be transferred, rented or has to be returned in case of service cancellation.



There are other dimensions to consider if we are concerned with more than just prices, such as ethical criteria about our choice and the effect our decision has on local supply and the market.



3

CHARACTERISTICS AND CRITERIA OF SERVICE

3.1 For any access provider

3.1.1 Conditions

Minimum contract period.

Promotions.

The service package included: television, telephony, and Wi-Fi access.

Privacy Policy.

Customer service and management of incidents or claims.

Fault management: response time and conditions: connection alternatives during fault.

Usage limit: volume of traffic, having servers, private or public IP address (NAT) and fixed or variable, limitation of applications or port filtering (VPN, P2P), service offer with IPv6, limitations to share the connection with other people, limitations to servers, fixed or variable IP address, neutrality limitations (some operators limit or enhance the speed of specific portals following commercial criteria, such as video platforms).



3.1.2 Costs

Initial: If the operator provides the router, I rent it, or I can reuse mine.

Promotion for a period, long-term, cancellation cost of the service.

Taxes: VAT included or not.

Cancellation cost (permanence).

3.1.3 Services

Internet with speed limitation (until ...), or data transit (until ...).

Maintenance: in case of breakdown, pay attention to user incidents.

Other services included: telephony.

3.1.4 Characteristics and quality

Typical download speed and maximum or minimum: Any speed (download from the Internet to us) above an average of 20 Mbits/second (Mbps) can be sufficient. With fibre, deals typically start at 100 Mbps, which is considered fast. But beware, we can count 20 Mbps per person who shares the connection. As on a highway, you may occasionally go faster or slower due to traffic congestion. If it happens frequently, because too many users share the access network, we have to take that value as a reference, not an occasional maximum.

Typical upload speed: This speed depends on what we send to the internet. Today's internet is similar to interactive television: we receive a lot and send little. For an internet consumer,



starting at 3 Mbps may be enough. In contrast, if we have a server that offers content to the Internet, this speed should be close to, equal to (called symmetric), or higher than the download speed.

Typical latency: the time of interaction with the internet, resulting from the time the IP packets can go and return to a nearby server on the internet (for a distant one, the latency depends on the geographical distance). This value is significant for interactive applications such as video conferencing or interactive network games.

Reliability: history of service interruptions.

3.1.5 Connection

Router: It is integrated or separated from the data link. If so, I may reuse a router I already have.

I have a public IP address, or it is local with address translation (CGNAT): IP addresses (IPv4) are over, and operators are increasingly assigning local (private) IP addresses. If we are assigned a private address, it will not be possible to offer internet services with this connection, and we will only be network users.

Fixed or variable IP address: A fixed address is reasonably necessary if we have servers that can be accessed from the internet. In contrast, having a variable IP gives us privacy regarding internet portals and services. It is important to remember that this does not make us anonymous and, in particular, that the connection provider keeps a record of who uses which IP at what time.

3.2 For a fixed access provider

A typical minimum speed in both directions, depending on our needs, is decisive.

3.3 For a mobile access provider

The typical speed depends on each operator's coverage and our mobile technology (generation). Some applications, such as Open Signal, allow you to see the coverage and speed values reported in a location according to the mobile phone provider¹.

Mobile data plans typically cap monthly data volume (measured in GBytes, not bits) at a cost. Our usage in previous months is the best predictor of future usage. Usage studies show typical values between 2 and 5 GB per month². It depends on our frequency of use, whether it is our only access to the Internet or whether the access is mainly for text mail and messaging or mainly content and video conferencing.

It is also necessary to consider the cost of the contracted limit is exceeded or if the surplus of unused data can be transferred to the following month.

Possibility or limitations to connect with a router (Mi-Fi) or Tethering, to share the connection with fixed devices such as a computer or other people.

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- 1 There is usually no data roaming nationwide. Therefore, the choice of operator determines the speed and coverage. In Open Signal, you can choose a location, see coverage maps and telephone generation, as well as user measurements (Network statistics).
 - 2 <https://www.ericsson.com/en/reports-and-papers/mobility-report/articles/shifting-mobile-data-consumption-data-plans>



3.4 Limitations of use for fixed or mobile

Any restrictions on the use of an access contract should be reviewed. This can limit:

Sharing: Limited service is usually limited to one device and one person or can be extended to a family or organisation (this is a retail service). On the other hand, a service with a wholesale contract (interconnection of networks) could not have a limitation to sharing it with users of a neighbourhood, town, city, region, etc.

Privacy: Access providers can introduce port filtering, content monitoring and limiting³, or traffic neutrality limitations⁴.

³ Deep packet inspection to detect and block words and content.

⁴ Speed limitations for certain applications or destinations (content providers).



4

CHARACTERISTICS AND SUSTAINABILITY CRITERIA

Contribution to the universalisation of the offer:

Do you have coverage in my location, or can I apply for coverage?

If I connect, does it make it easy for others to connect as well?

(For example, contribute to reaching some requests in the area to ensure feasibility)

Infrastructure: what technology does the provider use? Is it respectful of the environmental impact on people and their houses or landscape? It uses a separate or shared line with other operators and infrastructures; it is visible on the facades, aerial or underground?

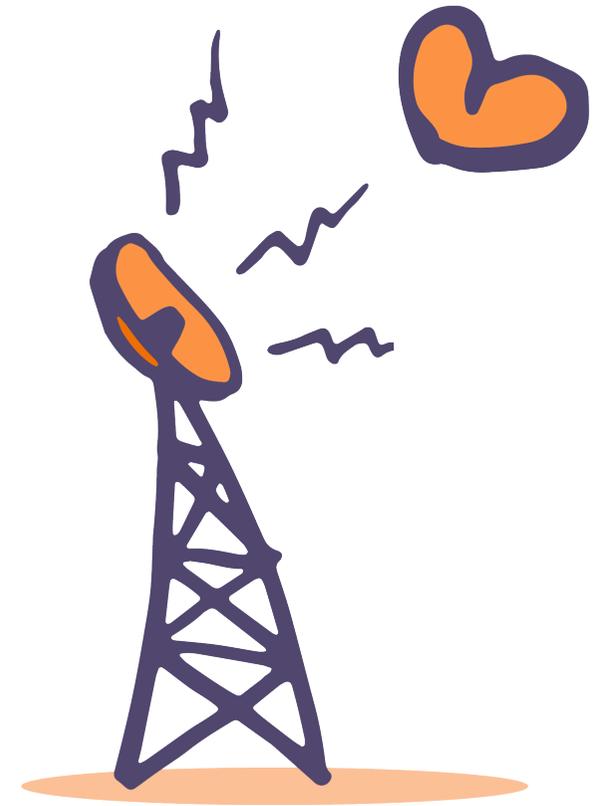
Sovereignty over the infrastructure you use:

- It installs and manages its own infrastructure: cables or base stations, towers, routers, and internet interconnection.
- Virtual operator: offers the service of a “white label” operator or resells.

Business model:

- For-profit (remuneration and debt to third parties: investors or shareholders).
- Non-profit (margin reinvestment, users = investors).

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**Governance and participation:**

- Participation mechanisms in user decision-making: (in terms of investment, coverage, prices, and other decisions) for all or only for shareholders or directors.

Environmental:

It takes into account, calculates, shares, and has among its plans to minimise the environmental impact it has:

- the access service (provider),
- the generation of waste from its suppliers and its operation,
- the impact on public space and the natural environment,
- the occupation of the radio spectrum.



5

RECOMMENDATIONS

Our recommendation would be:

If we want technological sovereignty, join a community network like [guifi.net](https://fundacio.guifi.net) directly or through a [guifi.net](https://fundacio.guifi.net) member association or operator. Our connection will make it easier for others to join the network, share costs, and universalise access to the network. This can be over fibre or Wi-Fi. The cost and complexity can vary widely, but it is advisable to collaborate with others in the community. Look at <https://fundacio.guifi.net/coverage>

A mobile phone operator can be a good option if we want sporadic internet. You can connect a single device (one SIM) or several if a router is used (with the SIM).

A fibre operator is the best option if we want frequent and reliable internet.

If we are willing to pay more than the cheapest commercial operators, somconnexio.coop is a consumer cooperative that collectively purchases mobile and fixed internet (ADSL and fibre). Our fee helps this cooperative grow and have more negotiating capacity with the commercial operators it resells (Vodafone and MásMóvil).

We cannot maintain the list of commercial operators and their complex offers full of hooks and conditions. If you want to look, there are sites on the internet to compare offers; you have to search.



Suppose you want the maximum environmental impact of your connection. In that case, Starlink is by far the best option, especially if you like space junk (the tragedy of the orbital commons) and are not interested in astronomy. Yes, it gives service under any sky with good performance and makes a single rich person even richer.

If you live in a place with few options, you don't choose; others do. You must find other neighbours to organise and set up a local cooperative operator (acting as a wholesaler instead of waiting for a retail offer to arrive). Bringing fibre to a community, no matter how remote, usually pays off. If electricity and water arrive, the internet can sometimes take advantage of electricity or water lines. The cost is distributed among the neighbours, and perhaps, in the long run, it will be cheaper than any commercial operator. The decisions will depend on you and the interests of your community⁵.

⁵ The documentary "Last Mile" is a good example: <https://ultimamilla.guifi.net>



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