## 6.12 Explores the role of ISPs and technologies used for Connecting Home Networks to the Internet

**ISPs**:
An ISP (Internet service provider) is a company that provides individuals and other organizations access to the Internet and other related services such as Web site building and virtual hosting.
Internet service providers may be organized in various forms, such as commercial, community-owned, non-profit, or otherwise privately owned.

ISPs in SriLanka

| Provider Name | Download Speed |
|---|---|
| Dialog Telekom Plc | 5.68 Mb/s |
| Etisalat Lanka (Private) Limited. | 1.03 Mb/s |
| Hutch Sri Lanka | 2.07 Mb/s |
| Lanka Bell Limited | 4.59 Mb/s |
| Lanka Education and Research Network | 12.69 Mb/s |
| Mobitel | 14.06 Mb/s |
| MTT Network Pvt | 8.93 Mb/s |
| Sri Lanka Telecom | 15.67 Mb/s |

**Types of ISPs**

In the 1990s, there were three types of ISPs: dial-up services, high-speed Internet (also referred to as "broadband") offered by cable companies, and DSL (Digital Line Subscribers) offered by phone companies. By 2013, dial-up services were

rare (even though they were cheap), because they were very slow and the other ISP options were typically readily available and much, much faster.
Use of MODEMs to connect with ISP.

**DSL Modem**

DSL modem is a network device that can be used to connect your computer to Internet via DSL (Digital Subscriber Line) connection. Nowadays it's common to find router with built-in DSL modem feature too, and so it could be connected to multiple computers to connect to Internet at the same time.

DSL connection operates on telephone network, the same network which is used for dial up Internet connection, but the bandwidth offered by DSL connection is much higher than dial up connection. The bandwidth provided by DSL can be from 128Kbps to 3-7Mbps or higher.

Common DSL connections are **ADSL (Asymmetric Digital Subscriber Line)** and **SDSL (Symmetric Digital Subscriber Line)**. ADSL offers Internet connection with different upload/download bandwidth (download bandwidth is higher that upload bandwidth), whereas both download and upload bandwidth are the same for SDSL connection.

Once you got the DSL modem, connect the working phone line to the modem's phone port, then use network cable to connect computer's network card to modem's LAN port and power up the modem, finally proceed to configure the DSL modem and also computer to make it work as advised by ISP (Internet Service Provider).

**Advantages of DSL**

- Independent services: Loss of high speed data does not mean you lose your telephone service. Imagine your telephone, television, and Internet access going out when a cable company amplifier/repeater dies.

- Security: Unlike cable modems, each subscriber can be configured so that it will not be on the same network. In some cable modem networks, other computers on the cable modem network are left visibly vulnerable and are easily susceptible to break ins as well as data destruction.

- Integration: DSL will easily interface with ATM, Nx64, and WAN technology. Telecommuting may get even easier.

**Advantages ADSL**

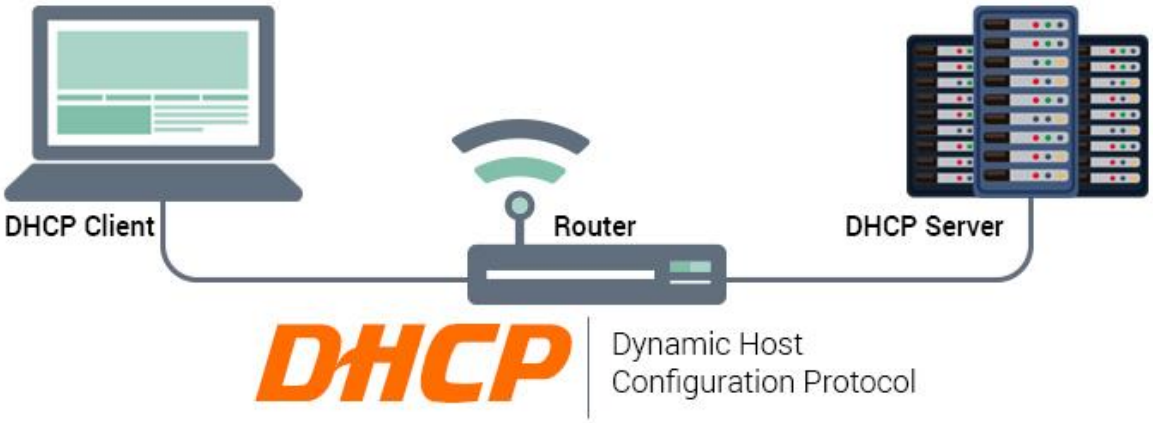
- Cheaper rates. Internet service providers (ISPs) provide a simple ADSL connection to the Internet, using the highest possible speed with usually a static IP address.

- Fully configurable. WAN engineers have total control over the VPN tunnel created between sites. They are able to perform on-the-fly configuration changes to compensate for any network problems or help rectify any problem that might arise.

- High-speed access which enables easy net surfing and fast streaming contents access: ADSL is a broadband service. It offers data transmission at much greater speeds and capacity than narrowband services like ISDN and dial-up analog modems. ADSL enables you to download high-volume data files effortlessly.

**A home LAN that uses private IPs**

A public IP address is an IP address that can be accessed over the Internet. Like postal address used to deliver a postal mail to your home, a public IP address is the globally unique IP address assigned to a computing device. Your public IP address can be found at what is my IP Address page. Private IP address, on the other hand, is used to assign computers within your private space without letting them directly expose to the Internet. For example, if you have multiple computers within your home you may want to use private IP addresses to address each computer within your home. In this scenario, your router gets the public IP address, and each of the computers, tablets and smartphones connected to your router (via wired or wifi) gets a private IP address from your router via DHCP protocol.




Dynamic Host Configuration Protocol (DHCP) provides quick, automatic, and central management for the distribution of IP addresses in a network.

DHCP is also used to configure the correct subnet mask, default gateway, and DNS server information on a device.
A DHCP server issues unique IP addresses and automatically configures other network information. In most homes and small businesses, the router acts as the DHCP server. In large networks, a single computer might act as the DHCP server.

The process goes like this: A device (the client) requests an IP address from a router (the host), after which the host assigns an available IP address to allow the client to communicate on the network.

Network Address Translation /Proxies Network address translation (NAT) is a method of remapping one IP address space into another by modifying network address information in Internet Protocol (IP) datagram packet headers while they are in transit across a traffic routing device. The technique was originally used for ease of rerouting traffic in IP networks without readdressing every host.

Proxies in a LAN that uses Private IPs A proxy server is a computer that acts as an intermediary between the user's computer and the Internet. It allows client computers to make indirect network connections to other network services. A Proxy server solves the IP address issues when connecting a large corporation to the internet.

**Why Should You Use a Proxy Server?**

There are several reasons organizations and individuals use a proxy server.

- To control internet usage of employees and children: Organizations and parents set up proxy servers to control and monitor how their employees or kids use the internet. Most organizations don't want you looking at specific websites on company time, and they can configure the proxy server to deny access to specific sites, instead redirecting you with a nice note asking you to refrain from looking at said sites on the company network. They can also monitor and log all web requests, so even though they might not block the site, they know how much time you spend cyberloafing.

- Bandwidth savings and improved speeds: Organizations can also get better overall network performance with a good proxy server. Proxy servers can cache (save a copy of the website locally) popular websites – so when you ask for www.varonis.com, the proxy server will check to see if it has the most recent copy of the site, and then send you the saved copy. What this means is that when hundreds of people hit www.varonis.com at the same

time from the same proxy server, the proxy server only sends one request to varonis.com. This saves bandwidth for the company and improves the network performance.

- Privacy benefits: Individuals and organizations alike use proxy servers to browse the internet more privately. Some proxy servers will change the IP address and other identifying information the web request contains. This means the destination server doesn't know who actually made the original request, which helps keeps your personal information and browsing habits more private.

- Improved security: Proxy servers provide security benefits on top of the privacy benefits. You can configure your proxy server to encrypt your web requests to keep prying eyes from reading your transactions. You can also prevent known malware sites from any access through the proxy server. Additionally, organizations can couple their proxy server with a Virtual Private Network (VPN), so remote users always access the internet through the company proxy. A VPN is a direct connection to the company network that companies provide to external or remote users. By using a VPN, the company can control and verify that their users have access to the resources (email, internal data) they need, while also providing a secure connection for the user to protect the company data.

- Get access to blocked resources: Proxy servers allow users to circumvent content restrictions imposed by companies or governments. Is the local sportsball team's game blacked out online? Log into a proxy server on the other side of the country and watch from there. The proxy server makes it look like you are in California, but you actually live in North Carolina. Several governments around the world closely monitor and restrict access to the internet, and proxy servers offer their citizens access to an uncensored internet.

**Reference**

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https://whatismyipaddress.com/isp
https://www.home-network-help.com/modem.html
https://www.lifewire.com/what-is-dhcp-2625848