Leased Line

What is a Leased Line ?

A leased line is a dedicated, fixed-bandwidth, symmetric data connection. I'll explain what that means in a minute.

What is a leased line used for ?

It is used to link two locations together. The first location is typically a corporate office. The second location is typically another corporate office, a data centre that’s connected to the Internet or a data centre that’s connected to the company’s existing Wide Area Network.

What is a Leased Line Used For?

Businesses use leased lines to...

- connect to the Internet
- link PCs and servers in different corporate offices
- carry phone calls
- enable staff to connect to their work PCs from home

What is a leased line for ?

Carrying data and phone calls, typically from business premises such as this one.

Leased Lines are Dedicated

By definition, leased lines are **'dedicated'**. This means that all along the route of your leased line, the bandwidth you need has been reserved solely for your use.

Unlike consumer Internet connections, the bandwidth available does not fall at peak times, when other customers of the same ISP try to use their connections at the same time as you.

Leased Lines are Symmetric

This means they can upload data at the same fast speed at which they can download data. This can be useful if staff need to…

- access their work PC's desktops from home
- send large files
- upload sizable files to your web sites
- backup data using online services
- host web sites on a server at your office
- use VoIP telephony

Leased Line ≠ Internet Connection

It's common for companies to buy Internet access at the same time they buy a leased line. However a leased line is NOT the same thing as an Internet connection.

Just as a pipe could be used to carry a number of different things (e.g.water, gas, sewage), so a leased line can be used to carry a number of different types of data traffic (Internet traffic, phone calls, corporate VPN traffic). There's no requirement to buy Internet access on a leased line.

If you DO get Internet access, there's no requirement that you get enough to fill the leased line. For example, you might choose to get 15Mbit/s of Internet access on a 20Mbit/s leased line, which in turn could be provisioned over a 100Mbit/s circuit. You could use 5Mbit/s for WAN traffic and VoIP calls, and there would be 80Mbit/s spare for future usage.

What is a Leased Line Likely to Deliver, Speed-wise?

2Mbps, 10Mbps and 100Mbps are the most popular connection speeds, though connections of 10,000 Mbit/s (10 Gigabits per second) are possible if money is no object.

What is a leased line likely to cost you? As a rough rule of thumb, 10Mbps connections cost twice as much as 2Mbps

connections. And 100Mbps connections cost twice as much as 10Mbps connections.

Advantages of a Dedicated Connection (compared to ADSL)

- **Faster download speeds** are usually available
- **Faster upload speeds**
- **Connections that don't slow down at peak times**
- **Greater reliability**
- **Better support**

Disadvantages of a Dedicated Connection (compared to ADSL)

- **Cost** – Leased line costs have fallen, but leased lines are still a LOT more expensive than ADSL connections.
- **Longer Wait** – Leased lines may take about three months to install rather than two weeks.
- **Physical Installation** – Installing leased lines is also more complex than installing ADSL, as ADSL can be provided over a pre-existing circuit (your phone line). A leased line will require a new circuit, and is likely to require some construction work to connect your building to the leased line provider's network.

VSAT

VSAT (Very Small Aperture Terminal) is a satellite communications system that serves home and business users. A VSAT end user needs a box that interfaces between the user's computer and an outside antenna with a transceiver. The tranceiver receives or sends a signal to a satellite transponder in the sky. The satellite sends and receives signals from an earth station computer that acts as a hub for the system. Each end user is interconnected with the hub station via the satellite in a star topology. For one end user to communicate with another, each transmission has to first go to the hub station which retransmits it via the satellite to

the other end user's VSAT. VSAT handles data, voice, and video signals.

VSAT is used both by home users who sign up with a large service such as DirecPC and by private companies that operate or lease their own VSAT systems. VSAT offers a number of advantages over terrestrial alternatives. For private applications, companies can have total control of their own communication system without dependence on other companies. Business and home users also get higher speed reception than if using ordinary telephone service or ISDN.

What are VSAT Terminals ?

VSAT Terminals, also known as "private earth stations," are used primarily for business, but also are also used for military and government applications. That satellite dish on a neighbor's home or the roof a corporate building is a VSAT Terminal.

The "very small" part of the acronym refers to the size of the antenna reflector, typically less than 3.8 meters in diameter. A VSAT terminal is relatively simple, consisting of two primary components: The Outdoor and Indoor units.

The Outdoor Unit (ODU) encompasses everything you see outside the building where the terminal is located. This is the equipment that enables the terminal to transmit and receive signals to and from the satellite. The ODU includes:

- the reflector
- the feed, which both transmits signals toward and receives signals back from the reflector
- the Block Upconverter (BUC) which is used for transmission, and consists of a local oscillator and a power amplifier
- the Low Noise Block Downconverter (LNB) which is used for receiving signals.

The Outdoor Unit is connected to the indoor VSAT component with an Intra-Facility Link (IFL) cable. A coax cable is often used for this purpose. The Indoor Unit (IDU) consists of the satellite modem and an IP router which connects to an Ethernet interface, and it is here that the data being received by end users, and data and commands, are entered in to be transmitted back to the satellite.

VSAT networks typically follow a network architecture form called a VSAT "Star Network", which consists of multiple VSAT terminals spread throughout a designated service area and controlled by a central hub computer. VSAT networks can also make use of a mesh topology, a method where one terminal will transmit information to other terminals via the satellite, minimizing the need for an uplink site.

However, Star and Mesh topologies are not mutually exclusive, and it can be more cost-effective to use them together via multiple uplink sites connected through multi-star network architecture.

What Are VSAT Terminals Used For ?

A VSAT terminal is used to provide satellite-based telecommunications and internet access to companies and individuals. For businesses, the primary advantage to setting up a VSAT network is that it allows the users to have their own private communications infrastructure that they have complete control over, as opposed to relying on existing infrastructure controlled by other parties.

Perhaps the most widely understood use of VSAT networks would be the service offered by satellite TV providers like DirecTV. Customers pay to have a terminal installed at their home and subscribe to the service to gain access to the network. But that's just scratching the surface of what VSAT networks can do.

VSAT terminals are used in military and naval applications to ensure communication even in remote locations. They are also used in narrowband financial applications like point-of-sale transactions, and broadband data like Voice over Internet Protocol (VoIP), and satellite internet. VSAT networks can be used to facilitate communication in emergency and disaster relief efforts, as well as industrial applications, scientific research and more.

Anywhere reliable, stable, narrowband and broadband communication is required, VSAT networks can be a great solution for users who either don’t have access to existing telecom infrastructure or prefer not to use it. If satellite communications are an integral feature of the modern world, VSAT terminals are one of the most important technologies that make it all possible.