



The link to high speed Internet access is already present in your house...

First it crept in through our phone lines. Now, it is set to enter our homes through a cable connection—the kind that brings us MTV.

It is the Internet.

Scene: One fine Monday morning.

11:00 am: You are 'Connecting To' the Internet.

Twenty minutes later: You are still connecting.

11:30 am: Hurrah! Connected, finally. Start downloading the latest level for *Doom II* (2 MB).

Noon: Still downloading; 60 per cent to go.

12:30 pm: IF you are lucky, you will still

be downloading... or fuming after you got disconnected halfway through.

At present, modems can connect to the Internet at a speed of 56 Kbps. But can your Internet Service Provider (ISP) match this speed? Even with a 28.8 Kbps modem, the user often gets as low a transfer rate as 1- to 3-Kbps from a regular copper telephone line. This could mean that downloading a 10-MB file would take up to eight hours.

How would you like to do the same in eight seconds?

All Wired up and Raring to go

A relatively new development, called a cable modem, promises direct high-

speed Internet access via a Cable TV (CATV) network—via the same coaxial cable that carries TV signals to millions of homes.

In theory, cable modems zoom at 30 Mbps (million bps), which is a thousand times faster than conventional modems. Data that would take hours to reach you with a dial-up connection can be downloaded in seconds. Pilot projects in Germany have shown downstream transmission of about 43 Mbps and an upstream transmission of 10 Mbps to be possible. About 2,000 users sharing the bandwidth can simultaneously surf the Net with an ISDN speed of 64 Kbps.

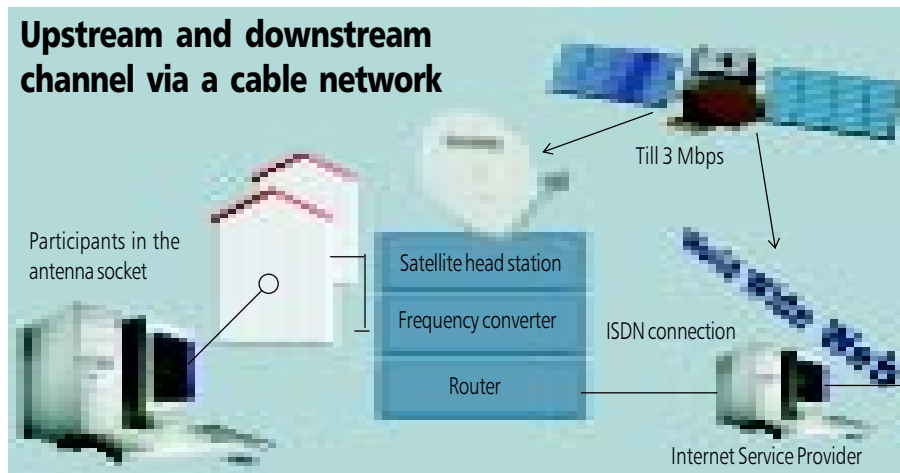
Like analog modems, cable modems modulate and demodulate the signal (cable, in this case) into a stream of data. But the likeness ends here. The cable modem is connected to a home PC via an Ethernet interface. It incorporates a tuner that splits the data signal, meant for the PC, from the TV signal.

Cable modems communicate with a Cable Modem Termination System (CMTS) at the local CATV provider centre. CMTSes and signal amplifiers build a direct connection to the ISP, but as far as the user is concerned he has a direct and uninterrupted line to the Internet. Result: No tied up phone line; no hassles in connecting; no busy signals; true multimedia capabilities, and sheer bliss.

Before you call the cablewallah...

Wait. He can't do it just yet. Because CATV networks in India (as in most places around the world) have not been designed for a two-way data transfer. Signals via the cable network can be sent in one direction only—to the viewers' homes. This works well for Television but is not suitable for the Internet. Interactivity defines the Internet—you would not want to

Upstream and downstream channel via a cable network



The data traffic runs through the wide band cable network. At the station, the Internet data is coupled with the TV signals and sent to the user, where it is separated by the cable modem.

merely view Web pages fed into the network, you want to surf the Net. For that, data has to flow in both directions and requires hybrid fibre-coax (HFC) modems which operate over an HFC cable to give you uploads and downloads via the same line.

But don't give away your almost ancient dial-up modem to the *kabadiwala* yet. One-way cable modems operating over traditional coaxial TV cables will work well for downloads, but require a dial-up modem for uploads.

And that's where your ancient

modem comes in.

The actual download speed can be a killer 10 Mbps, while the upload stream is slower—at 1.5 Mbps. But the cloud with this silver lining is that your local ISP will usually be connected to the Internet backbone through a mere 64 Kbps ISDN or leased line, restricting your access speeds to the same.

The ripple effect

Hitherto limited by the huge costs and inadequate infrastructure, space-hungry services like online gaming, video-conferencing and e-commerce will proliferate.

CATV would free users of dependence on the telephone company, and prices would be more competitive. When integrated with a set-top box, a cable modem will turn your TV set into an Internet channel. This will only complicate matters—unless you have more than one TV at home. By default, CATV technology would get to home users faster than business ones, for the simple reason that residential areas are more likely to be wired for cable. Office-goers need not fret. Think of the advantage of doing office work from home.

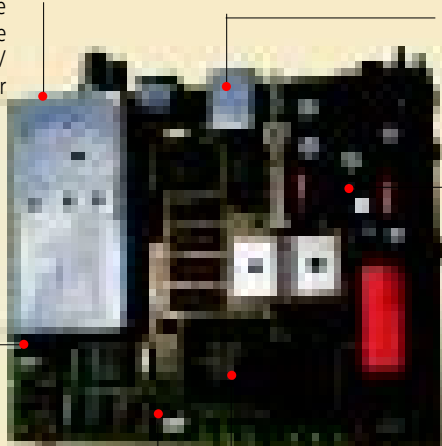
Despite advantages, such high-speed Internet access will not be without casualties. With the advent of cable networks, the bottleneck will steadily shift to the ISP's end and the backbone

The internals of a cable modem

The high frequency module is directly connected to the antenna socket of the CATV and prepares the signals for transmission.

The line interface controls the exchange of data between the processor chip and the high frequency module.

The memory in the cable modem serves as buffer between data input and output, and also supports firmware which temporarily stores important data during processing.



The Ethernet interface allows high-speed data exchange between PC and modem.

The power supply

The processor contains the data pump and the signal processor.

operator. In most of the pilot cable modem projects, there is only one 64 Kbps ISDN line between the cable network and the Internet—not enough to surf fast.

Cable modems on the same node (a neighbourhood) share bandwidth running through that single coaxial cable. The greater the number of subscribers logged on at one time, the slower will be the transmission. A single user enjoying a videoconferencing session will use up a significant portion of the shared bandwidth and slow down access for the rest. It is like sharing a water pipeline. If one day all your co-operative housing society members happened to bathe at the same time, the water reaching each house through that one pipeline would be a mere trickle.

Incompatibility issues also need to be addressed and various organisations are working towards an industry standard. Some of the present day cable modems are already adhering to the MCNS/DOCSIS (Multimedia Cable Network System/Data Over Cable System Interface Specification) which provides a direct upstream channel, without the use of a phone line. And this specification is likely to become the industry standard.

Cable Modems Vs ISDN + Leased Lines + ADSL

What about the other routes to the Superhighway?

ISDN (Integrated Services Digital Network) allows transmission of data in digital form and offers a transfer

Facts apart, can you get that cable modem right now?

Availability is expanding, but is still limited. Bay Networks, Motorola and other vendors are already manufacturing cable modems. US-based 3Com, and Elsa (a German manufacturer) have gone a step ahead and introduced these modems in the market. Both support the MCNS/DOCSIS standard.

True speed. In theory, cable modems can reach a speed of 30 Mbps. In practice, server issues and Ethernet cards needed with some modems make 500 Kbps to 1 Mbps a more realistic expectation.

Which modem/service? The biggie services right now are @Home, Road Runner and Media One. The Swiss Balcab is offering unlimited Internet access for a monthly fee of 57 Swiss Francs (approx Rs 1,500). This fee includes the cable modem rented to you, the provider access, an e-mail address and unlimited data transfer. Don't migrate just yet. In Mumbai, Siti Cable and IN Cable Net have announced plans to do the same. Siti Cable has already built up its networks using reverse path amplifiers (that allow two-way data transmission). High-speed 38 MB two-way RF cable

modems, conforming to DOCSIS specifications, are expected by June 1999. A pilot project on cable Internet has already begun in Bangalore.

Price. A cable modem is expected to cost about Rs 20,000 in India, but Siti Cable is also considering leasing these modems. Later, these will be available as standard shelf items in shops and be bought like any other electronic product. As the Internet becomes more 'accessible' and the Netizen population booms, many more people will be spending a lot more time on the Net. Slow data speeds are expensive and annoying—why not spend a bit on infrastructure.

Services such as video-on-demand and distance learning are uses envisioned for the powerful capabilities of cable Internet. But, the backbone infrastructure is virtually non-existent on land, hence it is imperative that the issue of connectivity through VSATs is resolved.

Bottom line. All those who have tried a cable modem, love it. It is having your own pool of information at a very low cost. Dust your surfboard. Ride the cable wave.

speed of up to 128 Kbps. Good, but clunky and expensive.

A **leased line** offers a dedicated (24-hour) connection to the Internet and transfer rates of up to 2 Mbps. In India, a 64 Kbps leased connection will set you back by about Rs 15 lakh.

ADSL (Asymmetrical Digital Subscriber Line) gives the phone line a second chance. Using the existing phone copper wiring, it carries three separate channels. One for plain old telephone conversations (POTS), another for downloads at 1.5- to 6-Kbps and the last for uploads at 64 to 640 Kbps. ADSL has the danger of being monopolised by the government and being high-priced.

Satellite transmission has its

limitations. It offers fast access for downstream data only; you need a separate line (regular modem) to upload signals.

Power lines could be the next participants in the 'get wired' movement. In UK, tests on lines supplying power to households have shown promising results. In India, a continuous power supply is still far from reality, getting the Internet through them seems too fantastic. And it is. This technology would be ready for the market only a decade or so later.

For now, the **cable modem** beats everything. An estimated 450,000 to 500,000 users switched to the cable modem last year. Forrester Research, an international market research company,

puts cable usage at 2 million before 2000—before the year ends. The National Cable Television Association reports that cable operators will spend \$33 billion (Rs 15,000 crore) before 2001 to upgrade infrastructures and deliver fast Internet access.

Tell your *cablewallah* to start saving.

NAINTARA JAIN ■

