DSL Versus ISDN:
THE REAL TRUTH ABOUT HIGH-SPEED CONNECTIONS

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DSL—Digital Subscriber Lines—are the hot new product being offered by Telcos to customers hungry for fast, relatively inexpensive online connections. You can hardly pick up a newspaper or magazine without seeing ads promising connections "100 times faster than a 56k modem" and the temptation to sign up immediately is great.

Many audio professionals, especially radio stations, wonder why they can't order x-DSL lines and use them for a "one-stop connectivity" approach—for the Internet and everything else--including the real-time audio transmission now afforded with dial-up ISDN through codecs like the **Telos Zephyr**. Why order ISDN when DSL is the hot new thing?

Others have come to us wanting to use Zephyr with x-DSL lines they have just installed. Let's help clear up the confusion by looking at the current offerings from the phone companies and discussing their appropriateness for the applications now served by Zephyr and ISDN lines.

The Telcos are pushing x-DSL so hard for a lot of reasons, but chief among them is cost--their cost. But that doesn't make it the right choice for every application. Unfortunately, the Telcos add to the problem by telling people ISDN is an obsolete technology when that isn't really true.

ISDN For Internet?

ISDN is not the ideal choice for packet connections to the Internet. This is one area where the Telcos have it right when they push the new technologies for that purpose. The "circuit switched" nature of dial up technology, combined with the long connections typically employed for Internet use, cause difficulties for them. Packet data allows for data to be lost and then resent. For this reason it does not readily support "real-time" applications such as the Telos Zephyr and **Zephyr Xstream**, which require a continuous uninterrupted stream of data.

Systems designed for Internet use, such as Telos' **Audioactive MPEG Realtime Hardware Encoder**, have large buffers, which allow time for packet retransmission. In fact, the Audioactive Encoder will work perfectly with the various x-DSL technologies by taking the audio input and providing a data stream output that is compatible with IP technologies such as x-DSL. The new **Telos Zephyr Xstream** series of codecs also include this option and offer connectivity to DSL and other packet technologies through the usual Ethernet port.

But ISDN is still the ideal choice where circuit switched connections are needed. If you need play-by-play from the live game or you're in a network broadcast situation feeding other stations, the Zephyr and ISDN are your most flexible, reliable and cost-effective way to go. Just as with a POTS connection, once you are dialed up you have the full connection to yourself.

Unfortunately, the phone companies seem to be making some of the same mistakes with ADSL and the other newer DSL types (technically ISDN and T1 lines are types of DSL) they did in marketing ISDN. Currently, many phone companies are using a proprietary technology. That

means you probably have little or no choice in the manufacturer of the "Data Communications Equipment" (“DCE”, or modem). In other words, if you move to another region, you will need to buy new equipment. Fortunately, the providers frequently include this equipment as part of the service package.

Furthermore, most of the ADSL/DSL offerings are meant for connecting directly to an Internet Service Provider. They do not allow one to dial to other users—one of the main benefits afforded by ISDN. They also do not allow a call to an ISDN line. Since one of the advantages of having an audio codec is to dial up the tens of thousands of other codecs around the world, ISDN is again the best choice for the needs of most audio broadcast and professional audio applications. Another important consideration is the availability and widespread installed base of ISDN. In many European countries, ISDN lines are more common than POTS lines.

Other concerns about DSL

There are a few other questions about DSL--especially in this early stage of its marketing--that might be cause for concern. One is cost--your cost. While it's true that many companies are offering DSL lines at a low price to generate a frenzy of interest, the pricing can be deceptive. Sometimes a particular Telco may be actually a re-seller, having had to buy DSL from another company. Several "middlemen" like this--and the price of DSL could certainly vary drastically from one place to another. The recent “shakedown” in the Telecom industry has also led to termination of service for thousands of low cost ADSL/DSL lines.

Another is the reliability of the network. Your next-gen DSL connection might actually have to go through several networks to get to its final destination, your ISP--and each hop can potentially cause lost data. Unlike a T1 connection directly to your ISP, these connections go over a common packet network between the local Telco central office and the ISP.

Then there is the fact that DSL is currently not available everywhere. It is in major cities, and the second tier penetration is proceeding, but there is no definitive answer on how soon it will be before it is offered in even the remotest locations. This is problematic, as you will need some sort of IP connection at each end for this to work: No connectivity to codecs on ISDN lines is possible.

An interesting question that might give next-gen DSL some fascinating applications is whether the Telco can provide next-gen DSL line (i.e. SDSL or HDSL) directly between the studio and the transmitter? If so, the technology has some potential for certain types of full time connections. But as is generally the case, the phone company end of a DSL line either goes to the Telco-owned ISP, or through the packet switched network to another ISP.

While the phone companies keep promoting the new technologies as "replacements for ISDN", they really appear to be "alternatives to ISDN for connecting to your Internet provider" which is very cool in today’s day and age, but not an equivalent technology, and certainly not a good choice as a replacement. Which leads us to the $64,000 question:

Can you use Zephyr with DSL?

Technically, you might be able to use these DSL offerings with the classic Zephyr if the DCE allows two synchronous data streams at 56 or 64 kbps. An engineer would rightly be skeptical about finding such a beast, since Terminal Adapters around today have Ethernet only, which does not support synchronous constant bit rate connections to guarantee constant data throughput.

When you consider all the pros and cons, Zephyr and ISDN is the way to go for most broadcasters' remote audio needs, and probably will be for quite some time to come.

Our **Zephyr Xstream** codec supports streaming audio over IP through its 10 Base-T Ethernet port. This could be connected to a local network and routed via x-DSL to a WAN or Internet gateway to provide streamed point-to-point audio. Coupled with a sufficiently well managed network, good results can be achieved for program link and delivery applications.

Visit **www.zephyr.com** to find out more.

If you want to focus on audio streaming on the Internet, our **Audioactive** solutions will work very nicely with x-DSL and allow you to get the benefits of the cost-savings being marketed by so many telecommunications companies today. With Zephyr and Audioactive, Telos can find a way to solve most, if not all of a broadcasters' need to send high quality audio from one place to another.

*(We invite readers' questions about this and other technical issues. E-mail us at **info@telos-systems.com** if you have more questions about DSL vs. ISDN.)*