

VDSL is still in the definition stage; some preliminary products exist, but not enough is known yet about telephone line characteristics, RFI emissions and susceptibility, upstream multiplexing protocols, and information requirements to frame a set of definitive, standardizable properties. *One large unknown is the maximum distance that VDSL can reliably realize for a given data rate.*

This is unknown because real line characteristics at the frequencies required for VDSL are speculative and items such as short-bridged taps or unterminated extension lines in homes, which have no affect on telephony, ISDN or ADSL, may have very detrimental affects on VDSL in certain configurations.

Furthermore, VDSL invades the frequency ranges of amateur radio, and every above-ground telephone wire is an antenna that both radiates and attracts energy in amateur radio bands.

Balancing low signal levels to prevent emissions that interfere with amateur radio with higher signals needed to combat interference by amateur radio could be the dominant factor in determining line reach.

VDSL has an odd technical resemblance to ADSL. VDSL achieves data rates nearly ten times greater than ADSL, but ADSL is the more complex transmission technology, in large part because ADSL must contend with much larger dynamic ranges than VDSL. However, the two are essentially cut from the same cloth.

ADSL employs advanced transmission techniques and forward error correction to realize data rates from 1.5 to 9 Mbps over twisted-pair ranging to 18,000 feet;

VDSL employs the same advanced transmission techniques and forward error correction to realize data rates from 13 to 55 Mbps over twisted pair ranging to 4500 feet. Indeed, the two can be considered a continuum, a set of transmission tools that delivers about as much data as theoretically possible over varying distances of existing telephone wiring.

VDSL is clearly a technology suitable for a full service network (assuming "full service" does not imply more than two HDTV channels over the highest rate VDSL). It is equally clear that telephone companies cannot deploy ONUs overnight, even if all the technology were available.

ADSL may be not a "full service network" technology, but it has the singular advantage of offering service over lines that exist today, and ADSL products are closer in time than VDSL.

Many new services being contemplated today can be delivered at speeds at or below T1/E1 rates -- video conferencing, Internet access, video on demand, remote LAN access. For such services, ADSL/VDSL provides an ideal combination for network evolution.

On the longest lines, ADSL delivers a single channel. As line length shrinks, either from natural proximity to a central office or deployment of fiber-based access nodes, ADSL and VDSL simply offer more channels, and capacity for services that require rates above T1/E1 (such as digital live television or virtual CD-ROM access).

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