



SHDSL

G.991.2, Single-pair high-speed digital subscriber line (SHDSL) transceivers

Duplex operation over one copper pair. Optional multi-pair operation for extended reach or higher net data rates. Net data rate of 192 kbit/s to 2.312 Mbit/s. Optional extensions allow net data rates up to 5.696 Mbit/s. Line code: Trellis Coded Pulse Amplitude Modulation (TC-PAM).

ADSL

G.992.1, Asymmetric digital subscriber line (ADSL) transceivers

One copper pair. Net data rate ranging up to a minimum of 6 Mbit/s downstream and 640 kbit/s upstream. Optional support of higher net data rates. Line code: Discrete MultiTone (DMT).

G.992.3, Asymmetric digital subscriber line transceivers 2 (ADSL2)

One copper pair. Net data rate ranging up to a minimum of 8 Mbit/s downstream and 800 kbit/s upstream. Optional support of higher net data rates. Line code: Discrete MultiTone (DMT).

G.992.5, Asymmetric Digital Subscriber Line (ADSL) transceivers – Extended bandwidth ADSL2 (ADSL2+)

One copper pair. Net data rate ranging up to a minimum of 16 Mbit/s downstream and 800 kbit/s upstream. Optional support of higher net data rates. Line code: Discrete MultiTone (DMT).

VDSL

G.993.1, Very high speed digital subscriber line foundation

One copper pair. Permits the transmission of asymmetric and symmetric aggregate data rates up to tens of Mbit/s on twisted pairs. It includes worldwide frequency plans that allow asymmetric and symmetric services in the same group of twisted pairs. Line code: Discrete MultiTone (DMT) or, alternatively, Quadrature Amplitude Modulation (QAM).

Handshake

G.994.1, Handshake procedures for digital subscriber line (DSL) transceivers

Provides a flexible mechanism for DSL transceivers to exchange capabilities and to select a common mode of operation. It includes parameters relating to service and application requirements as well as parameters pertinent to various DSL transceivers.

Related Recommendations

G.991.1 – High bit rate digital subscriber line (HDSL) transceivers

G.995.1 – Overview of digital subscriber line (DSL) Recommendations

G.996.1 – Test procedures for digital subscriber line (DSL) transceivers

G.997.1 – Physical layer management for digital subscriber line (DSL) transceivers

G.989.x – Phoneline networking transceivers



- **Support for wide range of services**
 - IP-based services
 - Audio/video services
 - ATM-based services
 - Frame relay services
 - N-ISDN and B-ISDN
 - 64 kbit/s-based voice and data services
- **Exploiting existing infrastructure**

Provides cost-effective transport of high-speed digital signals over existing copper wire infrastructure
- **Advanced technology**

Modulation techniques such as:

 - DMT (Discrete MultiTone)
 - QAM (Quadrature Amplitude Modulation)
 - TC-PAM (Trellis Coded Pulse Amplitude Modulation)
 - Handshake procedures

DSL

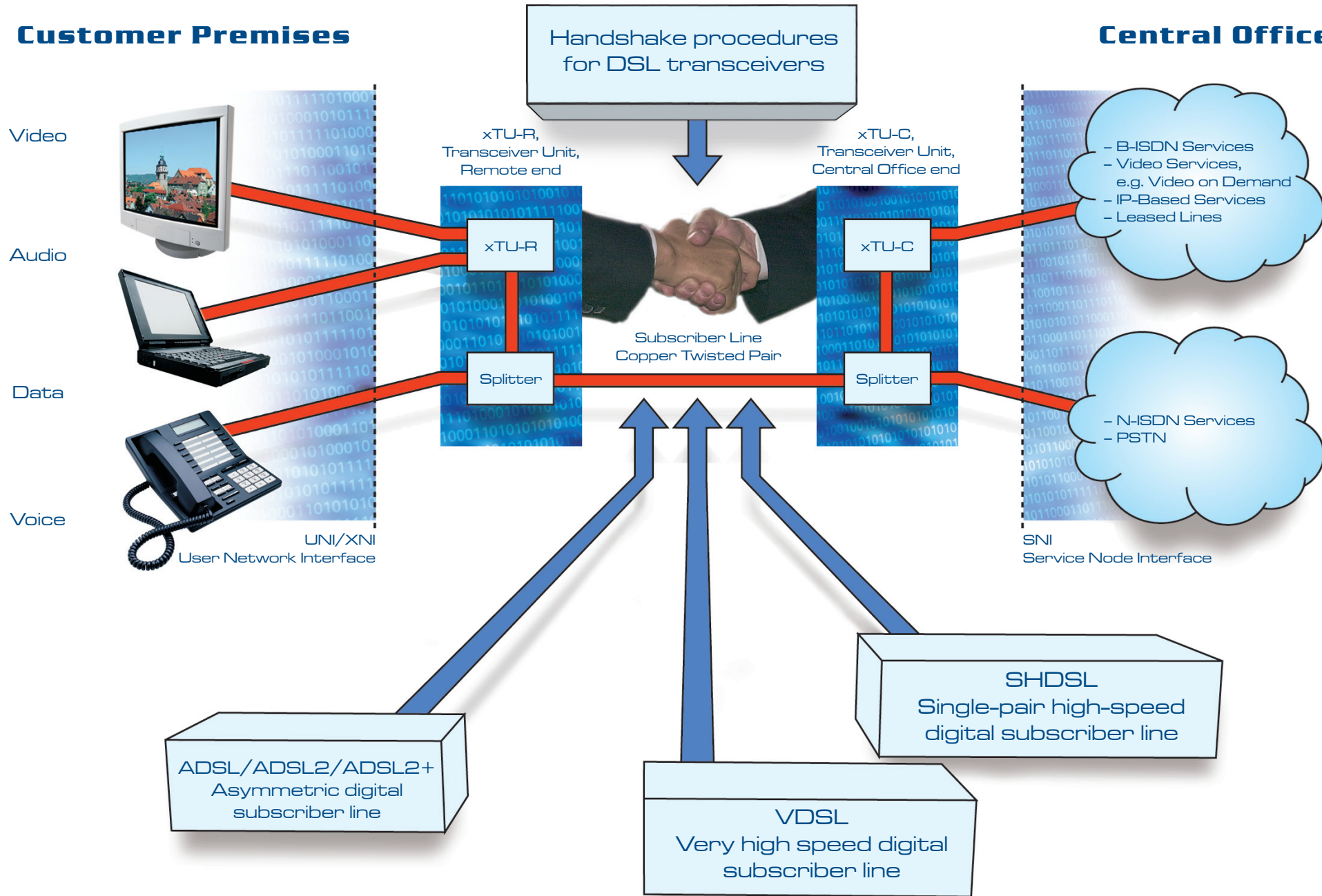
Digital Subscriber Line

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future services**

For more information on ongoing GPON Recommendation activities, please check the ITU-T Study Groups website at: <http://www.itu.int/ITU-T>

Customer Premises

Central Office



ITU-T is responsible for the development of Recommendations in the area of "Transceivers for customer access and in-premises phone line networking systems on metallic pairs". For more detailed information, see also Recommendation G.995.1, "Overview of digital subscriber line (DSL) Recommendations".