Application Note – Deploying HVDL Systems from Remote Equipment Cabinets

Application

This application note describes how to deploy HVDL (**H**igh-Speed **V**oice and **D**ata **L**ink) systems from remote equipment cabinets or locations with limited rack space.

Description

The HVDL system is designed to provide high-speed data and POTS service to customers located outside the range of other high-speed data technologies, such as ADSL. HVDL is an Ethernet based system, which means it easily connects to Ethernet/IP networks both at the Central Office and at the customer premise. HVDL uses G.SHDSL technology on the span between the COT and RT, making HVDL spectrally compatible with other signals in cable bundles, such as ADSL and T1.

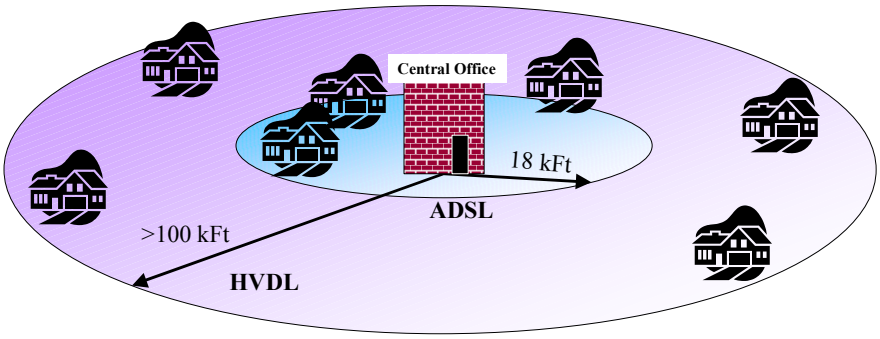

Figure 1 – HVDL and ADSL

A basic HVDL system consists of at least 2 components – a Central Office Terminal (COT), and a Remote Terminal (RT). The COT, as its name implies, is typically located in the Central Office. There are 2 CO shelves available for HVDL COTs – a 19" shelf, and a 23" wide shelf. Each shelf is 3RU (5.25") in height. The RT is located at the customer premise. If needed, the HVDL system can also be equipped with multiple repeaters to extend its reach. (Figure 2 only shows 1 repeater, although HVDL systems will support up to 3 repeaters if needed.)

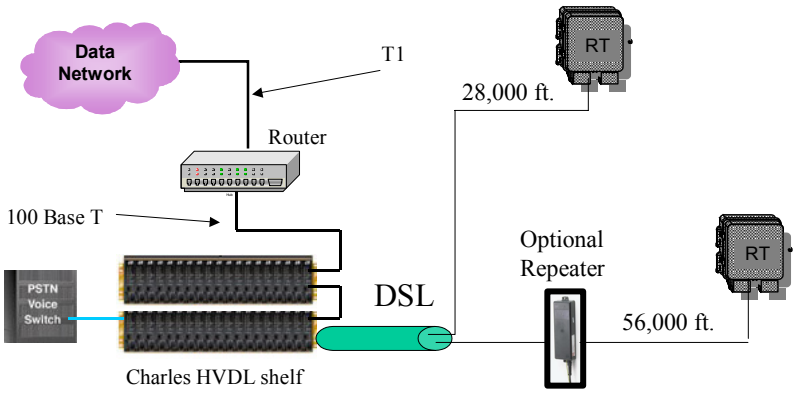

Figure 2 – Typical HVDL Configuration

Remotely deploying HVDL

HVDL COTs need not be installed in a Central Office, however. HVDL COTs can be deployed from small remote offices or even remote equipment cabinets that have an Ethernet/IP connection. This allows HVDL systems to extend high-speed data services over 100 Kft (about 19 miles) from remote equipment cabinets, which may be several miles from a central office themselves.

This arrangement is shown in Figure 3 below. In the figure, 3 remote cabinets are shown connected to the central office via a SONET OC-x (x=3, 12, 48, 192) ring. Remote cabinets are typically equipped to provide analog dial-tone POTS service, but they can also be equipped to provide data services as well. With an Ethernet/IP connection in the cabinet, the cabinet can then be equipped with HVDL systems to provide high-speed data services over 100 Kft (19 miles) from the remote cabinet, as shown by the coverage areas extending out from the cabinets sites.

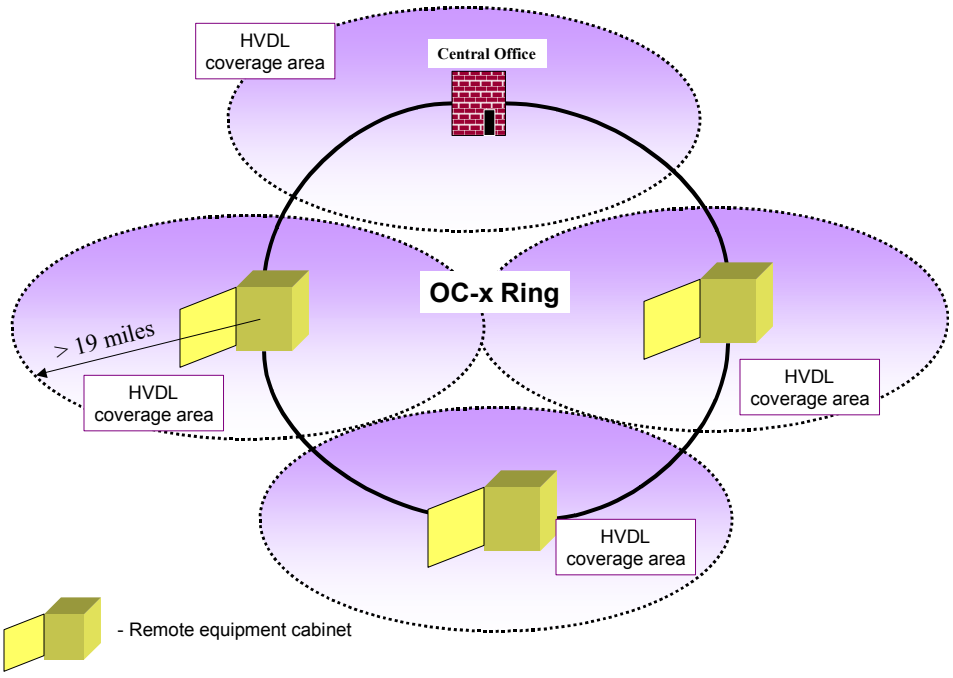

Figure 3 – HVDL Remote Deployment

HVDL 1 RU Remote COT Shelf

Remote cabinets are usually tightly packed with equipment, with little or no room for Central Office shelves. Therefore, Charles Industries has designed a 1 RU shelf to accommodate 3 HVDL COT cards. The COT modules are designed to operate in the temperature extremes that exist in outdoor cabinets.

Figure 4 - 1 RU HVDL Remote shelf

Figure 4 shows detail of an HVDL remote cabinet installation. Each card slot needs 4 connections:

1. –48 vdc and earth ground.
2. Ethernet for data. Each COT card has an 8-pin RJ-45 style jack for an Ethernet connection. The COT's Ethernet port is 10 Base-T.
3. POTS lines. These are analog POTS pairs, sometimes referred to as "dial tone" lines.
4. A single copper pair going out to the customer premise. Sometimes this is referred to as the "span", borrowing a term from the T1 world.

All connections, with the exception of the Ethernet data, are wire wrapped onto the back of the 1 RU shelf. The COT will then combine up to 3 POTS lines and the Ethernet data and digitally transport them to the customer premise. This solution allows HVDL systems to be deployed from remote equipment cabinets where space is limited.

Further Information:

Further information on Charles Industries products may be found at:
http://www.charlesindustries.com

For further information on this application, please contact:

Jeff Warren
Systems Engineer
Charles Industries
847 258-8470
mailto:jwarren@charlesindustries.com?subject=App note question