**Odin TeleSystems Inc**

# Advantages of a PC based WAN Card Platform

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**Odin TeleSystems Inc**

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# Advantages of a PC Based Wide Area Network Card Platform

## Abstract

*Usage of PCI WAN Cards installed on powerful servers presents significant cost advantages over traditional dedicated router boxes with an independent CSU/DSU unit. This paper examines current and emerging WAN protocols, provides a high level understanding of LAN/WAN connectivity using PC based WAN cards, and its prospects for the future.*

## Overview

Growth of the internet with reducing cost of personal computers has led to accelerated deployment of networks across the globe leading to a rise in demand for information exchange between networks. This demand is pushing the need for high performance cost effective WAN equipment.

A typical enterprise LAN/WAN interconnect elements are LAN, hub, dedicated router, independent CSU/DSU unit connected over a T1, ISDN or a 56k link as shown below.
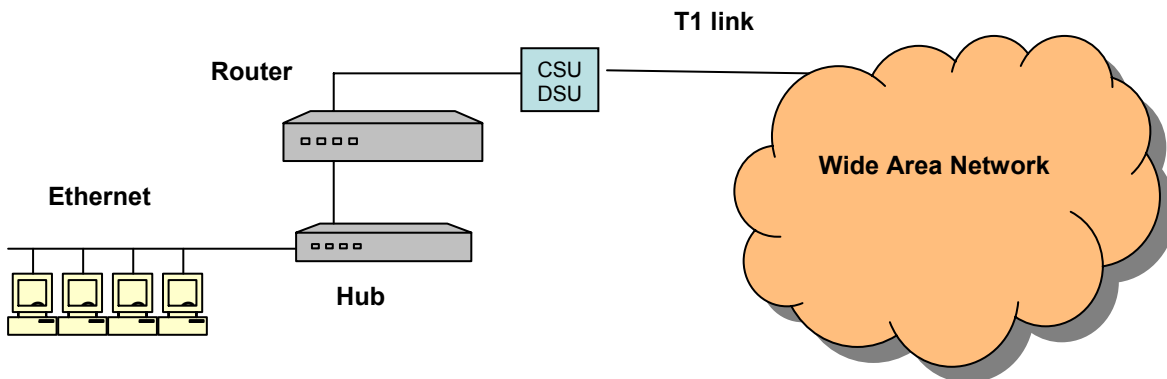


Advancement in the processor speeds, and higher computer bus-interconnect standards has paved way for cheaper PC based WAN cards in PCI form factors. These PC WAN cards offer distinct advantages over a traditional interconnect setup such as:

1. Integrated CSU/DSU unit which reduces the effort and space in installing, purchasing and configuring an independent unit.
2. Significant cost reductions due to higher integration of network elements and reduced maintenance.
3. Added flexibility.

Today's PC based WAN cards support a wide variety of WAN protocols which are examined in the following section.

WAN Protocols: A Comparative study

Most popular WAN protocols are Frame relay, X.25, and PPP. We will briefly discuss each protocol below.

X.25 WAN protocol:
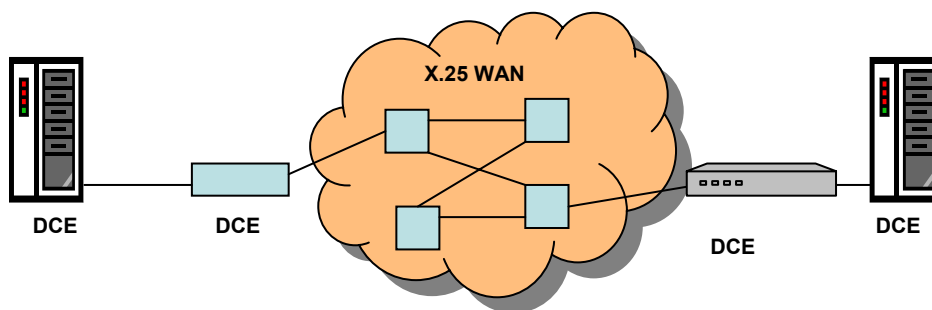


X.25 is a legacy WAN protocol which is time tested and established primarily to communicate over private digital links. X.25 uses packet switching over virtual connection oriented circuits. X.25 packets are switched packet by packet based on the address. LAPB, an implementation of HDLC is responsible for error free communication between two nodes. Error check is done at each node on each packet resulting in high data integrity and increased latency. The above diagram shows a typical X.25 network with DTE (Data Terminal Equipment) and DCE (Data Communication Equipment).

Typical packet size varies between 64bytes to 4096bytes with speeds of 100kbps or below. X.25 WAN protocol is suitable for applications that require a temporary virtual connection for a short duration such as credit card authorization application.

Frame Relay:

Frame Relay takes advantage of low error rates on digital links to route HDLC packets end to end. Unlike X.25, frame relay does not offer high data integrity. This results in very low delay as each switch can now route packets without conducting an error check. Frame sizes can extend up to 4kbytes.

Frame relay offers the following advantages:

1. High throughput with low delays.
2. Variable packet switching.
3. Flow control and congestion control.
4. Increased inter operability as more and more vendors and service providers are adhering to frame relay protocol.

Frame relay relies on the network layer protocol to perform re-transmission and error recovery.

PPP:

PPP encapsulates IP internet data, IPX/SPX, TCP/IP and token ring. PPP can support configuration and management of links between router software through a serial interface in both synchronous and asynchronous modes.

PPP works well in a small router based network environment. The disadvantages come into play as the number of networks increases. A physical connection is required at each site in case of a leased line. This adds to the cost in terms of additional router ports, modems and private leased lines.

## Odin's WAN Platform

Odin offers a robust PC based WAN platform in the PCI form factor. Odin's Sleipnir-1-PCI fulfills today's WAN strategy by providing high performance cost effective WAN connectivity over a T1 or E1 circuit. Sleipnir platform is scalable, flexible and resilient WAN card which can be deployed in a multitude of network scenarios covering a myriad of applications.

Sleipnir-1-PCI offers the following features:

1.  32 bit data DMA reducing host processor utilization
2.  Fractional T1 or E1 (64kbps to 2048kbps) with support for both sub channels and super channels
3.  Support for Windows NDIS WAN miniport driver
4.  PCI SIG 2.2, PCI-X PC bus interconnect standards supported
5.  Support for both asynchronous and synchronous WAN connections providing more flexibility

Application Scenarios:

1.  Enterprise Intranets with several branch offices connected over a WAN to the central office
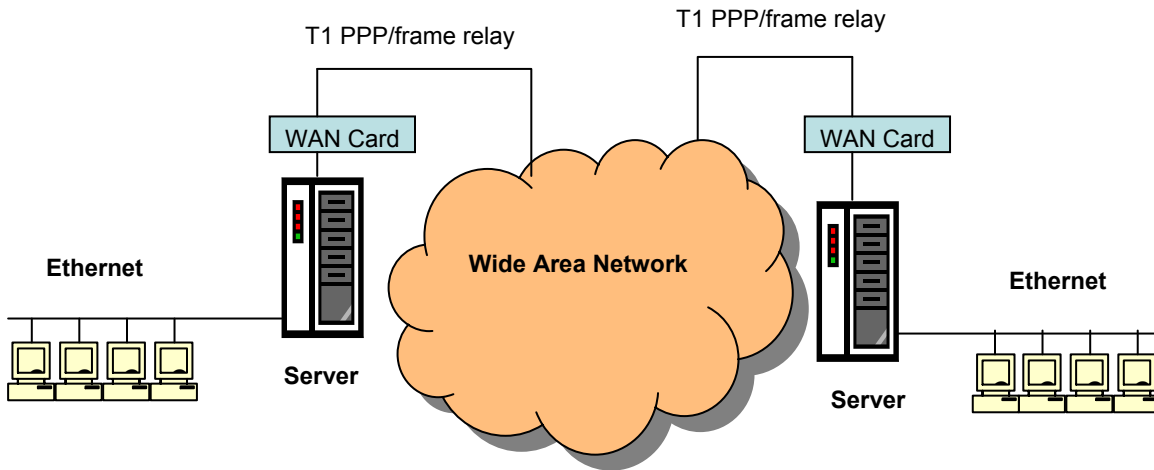
2. Reservation systems where several terminal computers are connected to the central server system over a WAN
3. Automated Teller Machines connected to the bank over a WAN.

## Conclusion

PCI based WAN cards present significant cost savings without sacrificing high performance. PC based WAN cards provide flexibility, low maintenance and faster deployment rate. With new access technologies such as xDSL emerging, newer WAN cards with support for these new technologies will emerge in the future.

### About Odin TeleSystems Inc

Odin TeleSystems Inc. is a privately held Texas corporation specializing in manufacturing, design, and sale of OEM-subsystems for the Telecommunications industry. Odin's award-winning products represent outstanding cost/performance value for today's service providers and telecom equipment manufacturers. Innovative and flexible systems enable service providers and equipment manufacturers to provide reliable and leading-edge communications services and products for T1/E1/J1, Integrated Services Digital Networks (ISDN), Frame Relay, Voice over IP (VoIP), Signaling System Number 7 (SS#7), and Digital Wireless (e.g. GSM).
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