Networking Academy

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Lab 1 – Researching WAN Technologies

1st Semester 2025 – 2026

NET 301 – Computer Networking 4
City College of Calamba

Objectives

Part 1: Investigate Dedicated WAN Technologies and Providers

Part 2: Investigate a Dedicated Leased Line Service Provider in Your Area

Background / Scenario

Today's broadband Internet services are fast, affordable. With the use of VPN technology, the connection can also be secure. However, many companies still need a 24-hour dedicated connection to the Internet, or a dedicated point-to-point connection from one office location to another. In this lab, you will investigate the cost and availability of purchasing a dedicated T1 Internet connection for your home or business.

Required Resources

A device with Internet access.

Step 1: Research WAN technology characteristics.

Use search engines and websites to research the following WAN technologies. Blank lines are provided for technologies not listed in the table. Put your findings in the table below.

WAN Technology	Dedicated Connection (yes/no)	Last Mile Media: Copper (yes/no)	Last Mile Media: Fiber (yes/no)	Last Mile Media: Wireless (yes/no)	Speed/Range
T1/DS1	Yes	Yes	Yes	Yes	1.544 Mb/s
T3/DS3	Yes	Yes	Yes	Yes	44.736 Mb/s
OC3 (SONET)	Yes	No	Yes	No	155.52 Mb/s
Frame Relay	Yes	Yes	Yes	Yes	56 Kb/s - 1.544 Mb/s
ATM	Yes	Yes	Yes	Yes	155 Mb/s - 622 Mb/s
MPLS	Yes	Yes	Yes	Yes	Up to 10 Gb/s
EPL (Ethernet Private Line)	Yes	Yes	Yes	No	Up to 10 Gb/s

SD WAN	No	Yes	Yes	Yes	Broadband to 10+ Gb/s
SASE	No	Yes	Yes	Yes	Depends on underlying WAN
5G Fixed Wireless	No	No	No	Yes	100 Mb/s - 1+ Gb/s
Satellite WAN	No	No	No	Yes	25 Mb/s - 500 Mb/s
L2VPN (Layer 2 VPN)	Yes	No	Yes	No	Up to 10 Gb/s
Dark Fiber	Yes	No	Yes	No	1 Gb/s - 100+ Gb/s

Step 2: Discover dedicated WAN technology service providers.

Using a search engine, research dedicated WAN technology offered by the service providers. Complete the table below by identifying each service provider's dedicated WAN services, based on the information provided on the website. Use the extra lines provided in the table to record additional service providers in your local area.

Internet Service Provider	T1/DS1/PRI	T3/DS3	OC3 (SONET)	Frame Relay	ATM	MPLS	EPL (Ethernet Private Line)
Comcast	✗	✗	✗	✗	✗	✓	✓
CenturyLink	✗	✗	✗	✗	✗	✓	✓
AT&T	✗	✗	✗	✗	✗	✓	✓
Windstream	✗	✗	✗	✗	✗	✓	✓
XO Communications	✗	✗	✗	✗	✗	✓	✓
Verizon	✗	✗	✗	✗	✗	✓	✓
PLDT Enterprise	✗	✗	✗	✗	✗	✓	✓
Globe Business	✗	✗	✗	✗	✗	✓	✓
Converge ICT	✗	✗	✗	✗	✗	✓	✓

Reflection

1. What are the disadvantages to using a dedicated WAN connection for personal home use? What would be a better solution?

Using a dedicated WAN connection for personal home use may sound appealing at first especially if you're familiar with enterprise-grade networking but it's generally impractical and inefficient for residential settings. The biggest drawback is cost: dedicated WAN services like MPLS or Ethernet Private Line are designed for businesses that require guaranteed bandwidth, low latency, and secure point-to-point connectivity. These services often come with high monthly fees, installation charges, and maintenance costs that far exceed what a typical home user would need or want to pay. Beyond the financial aspect, the setup itself is complex, requiring specialized hardware and configuration that's not user-friendly or plug-and-play. You'd also be underutilizing the service, since most home activities like

streaming, gaming, or remote work don't demand the kind of performance that dedicated WANs offer. In fact, for privacy-conscious users, a simple encrypted VPN over a standard broadband connection can offer more control and flexibility than a provider-managed WAN.

2. Technology is always evolving. Give some examples of new WAN-related technologies encountered during your search.

WAN technologies have been undergoing a major transformation, especially as enterprises shift toward cloud-native, AI-integrated architectures. One of the most prominent developments is the rise of Secure Access Service Edge (SASE), which merges networking and security into a unified, cloud-delivered model. SASE simplifies management and enforces consistent security policies across users, devices, and locations—ideal for hybrid work environments and distributed campuses.

Another game-changer is Software-Defined WAN (SD-WAN), which continues to evolve in 2025. SD-WAN replaces rigid MPLS setups with flexible, intelligent routing over broadband, LTE, and 5G. It's not just a cost-saver—it's a strategic upgrade that boosts agility, resilience, and centralized control. Many organizations are now integrating SD-WAN with AI-powered analytics to optimize performance and security in real time.