International Journal of Research
Available at https://edupediapublications.org/journals
p-ISSN: 2348-6848
e-ISSN: 2348-795X
Volume 04 Issue 07
June 2017

Virtual Private Network

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Abstract: In this paper we introduced the concept of Virtual Private Network extends a private network across a public network, such as the internet. It enables the user to send and receive data across shared public network as if their computing devices were directly connected to the private network. This VPN services is fully dedicated to the small and medium size companies.

Keywords: Internet: Virtual Private Network, Packets, Protocol, Tunneling, Encapsulation, Vendors.

INTRODUCTION

A virtual private network (VPN) is a network that uses public mean of transmission (internet) as its wan link. A VPN is a type of private network that uses public telecommunication. That provides remote access to an organization's networks via the internet instead of using lines to communicate. A VPN can be created by connecting offices and single users includes mobile users to the nearest service provides POP (poi of presence).

Why VPNS?

Separate private networking solutions are expensive and cannot be updated quickly to adapt to change in business requirements. The internet is inexpensive but does not by itself ensure privacy

Who Uses VPN's?

VPN's can be found in homes, workplaces or anywhere else as

long as an ISP (Internet service provider) is available.

Features in VPN

- Provides extended connections across multiple offices in fixed locations.
- Improved security mechanism for data by using encryption techniques.
- IPSec and SSL are two solutions of VPN, which is widely used in WLAN.
- Saves time and expenses.

II. TYPES OF VPN

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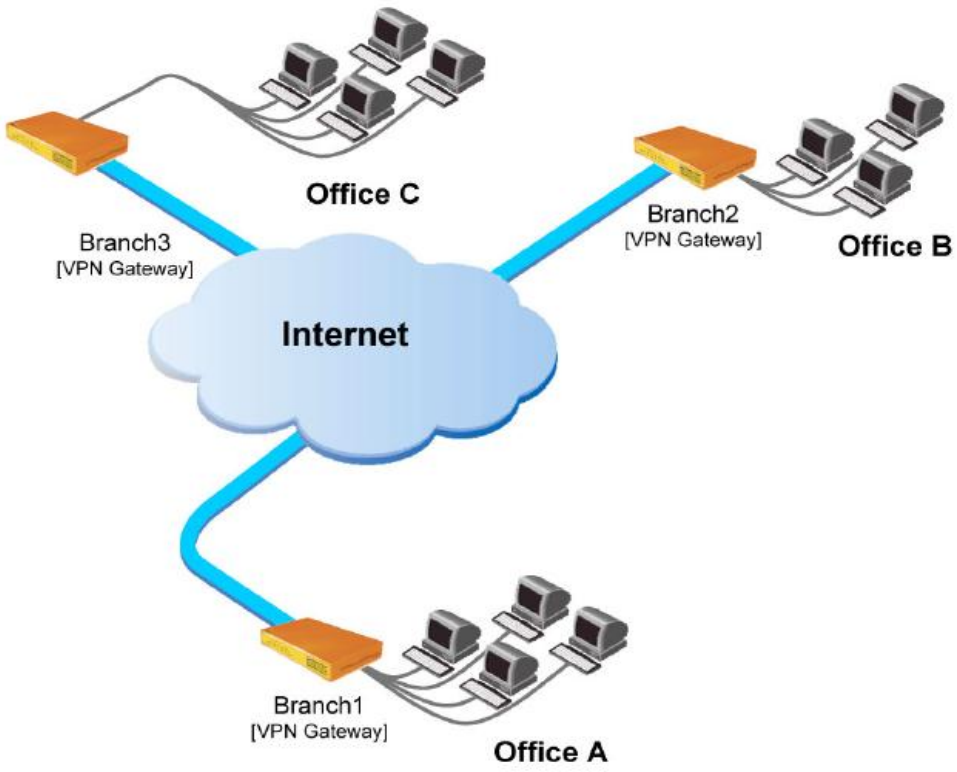
Virtual private network is of three types:

A. **Remote - Access VPN**
Remote-access, also called as virtual private dial-up network (VPDN), is a user to LAN connection. A good example of a company that needs a remote-access VPN would be larger firms with hundreds of sales peoples in the field. It provides secure, encrypted connection between a company's private network and remote users through a third-party service provider.



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Site-To-Site VPN (Internet - Based)
If a company has one or more remote locations that they wish to join in a single private network, they can create an intranet VPN to connect LAN to LAN. **C.**

Site-To-Site VPN (Extranet-Based)
When a company has a close relationship with other company (for example, a partner, supplier or customer) they can build an extranet VPN that connects LAN to LAN, and that allows all of the various companies to work in a shared environment.

III. VPN DEVICES

Devises in VPN are further divided into 3 categories as:

A. Hardware

A hardware VPN is a virtual private network (VPN) based on a single, stand-alone devices. The device, which contains a dedicated processor, manages the authentication, encryption, and other VPN functions and provides hardware firewall. Hardware VPN's provides more and more security than compared to firewall programs for the small and home business computers. But hardware VPN is more expensive than software VPN. Because of the cost, hardware VPN's are a most realist option for large business than for small business or branch offices. Several vendors offer devices that can function as hardware VPN's.

B. Firewall

A well designed VPN are several methods for keeping your connection and data secure. You can set firewalls to restrict the number of open ports, what types of packets are passed through and which protocols are allowed through. A firewall approach is still relatively costly.

C. Software

The main advantage in software approach is that user's network does not change. No extra devices are needed to be installed, and management of the network remains the same. However, one point to consider when adding software to existing hardware is performance. VPN tunneling and encryption tasks will be carried out in software, taking CPU cycle from other processes.

VPN TECHNOLOGIES

- Tunneling – Using Encapsulation
- Authentication
- Access Control
- Data Security

A. Tunneling

A virtual point-to-point connection made through a public network. It transports encapsulated datagram's.

B. Authentication

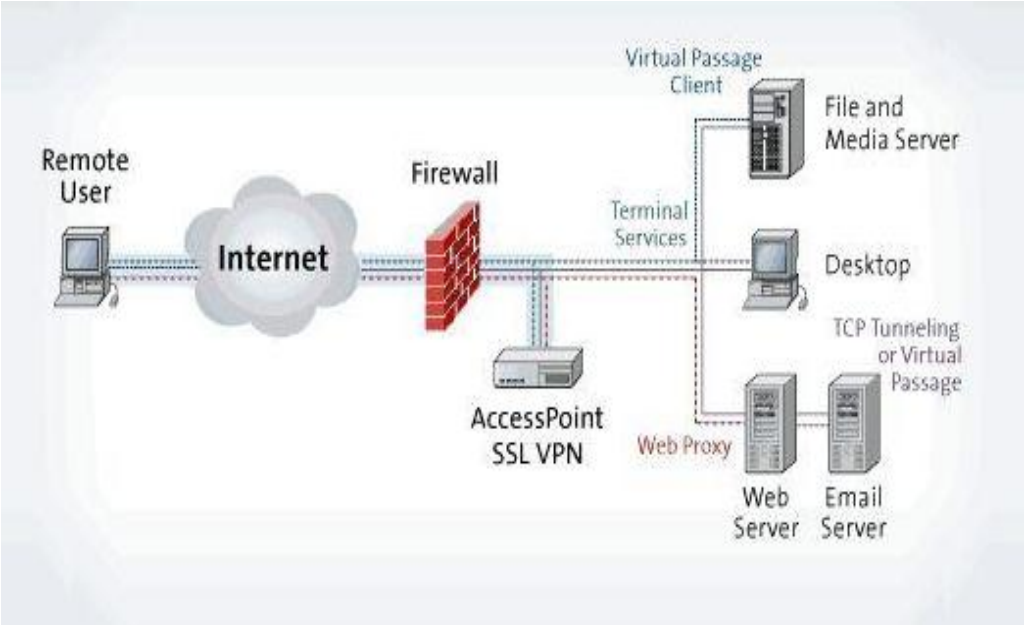
By default VPN does not provide enforce strong authentication. A VPN connection should be established by an authenticated user. Most VPN implementations provide limited authentication methods as PAP used in PPTP, transports both user name and password in a clear text.

C. Access Control

Instead of connecting directly to the network first it switches over to the access servers. VPN includes two tunneling technologies to make a connection between the user and the enterprise.

D. Data Security

A well defined VPN's uses several methods for keeping user's connection and data secure: Firewall, Encryption, IPSec and AAA server. Users can set firewall to restrict the number of ports, what types of packets are passed through and which protocols are allowed through.



Advantages of VPN:

- There are two main advantages of VPN's, namely cost saving and scalability.
- VPN's lower costs by eliminating the need for expensive long-distance leased lines.
- Data transfers are encrypted
- Cost is low to implement.

Disadvantages of VPN:

- VPN connection is slow.
- Because the connection travels over public lines, a strong understanding of network security issues and proper precautions before VPN deployment are necessary.
- VPN connection stability is mainly in control of the internet scalability, factors outside an organization control.
- Differing VPN technology. May not work together due to immature standards.
- Bad hardware and low speed connection on the user end.

CONCLUSION

Today we are living in era of optimizing hardware resources and moving toward larger enterprises day by day. The VPN server is fully based on cloud service. It is the short way of connecting a computer to a remote network.

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