The Need for the Viptela SEN

Legacy networking technology has become increasingly expensive and complex, and it cannot scale to meet the needs of today's multisite enterprises. The Viptela Secure Extensible Network (SEN), which is based on time-tested and proven elements of networking, offers an elegant, software-based solution that reduces the costs of running enterprise networks and provides straightforward tools to simplify the provisioning and management of large and complex networks that are distributed across multiple locations and geographies. Built in to the Viptela SEN are inherent authentication and security processes that ensure the safety and privacy of the network and its data traffic.

The Viptela SEN represents an evolution of networking from an older, hardware-based model to a secure, software-based, virtual IP fabric. The Viptela fabric, also called an overlay network, forms a software overlay that runs over standard network transport services, including the public Internet, MPLS, and broadband. The overlay network also supports next-generation software services, thereby accelerating your shift to cloud networking.

Challenges in Legacy Network Design

The traditional approach to network design cannot scale to meet today's needs for four fundamental reasons:

- **Cost**—Legacy networks run on expensive hardware such as routers and switches, which require time-consuming configuration and maintenance. In addition, these networks require expensive transport connections or carrier circuits to secure and segment the network.

- **Complexity**—Legacy networks operate on the old model of a distributed control plane, which means that every node in the network must be configured with routing and security rules. Remote site management, change control, and network maintenance represent major logistical challenges.

- **Lengthy installation times**—Legacy networks that run on dedicated carrier circuits depend on the carrier to install new circuits, which can take several months. This can dramatically delay the launch of new branch locations.

- **Control**—Legacy networks that run on carrier circuits sacrifice control to the ISP, from network design to configuration to monitoring. Requesting changes from the ISP also requires extra time and is prone to communication errors.

Cost and complexity become even more prohibitive for legacy networks in the face of today's requirements, including:

- **Rigorous end-to-end security**

- **Disparate transport networks**

- **High-bandwidth cloud applications that are hosted in multiple data centers**

- **Ongoing increase in the number of mobile end users**

- **Any-to-any connectivity over fluid topologies**

- **Unique needs of particular businesses**
The Viptela SEN is a Software-Defined WAN (SD-WAN). As with all SD-WANs, it is based on the same routing principles that allowed the Internet to scale during the 1990s and 2000s. What separates the Viptela SEN from other SD-WANs is that it re-imagines the WAN for a new generation of enterprise networks, separating the data plane from the control plane and virtualizing much of the routing that used to require dedicated hardware.

The virtualized network runs as an overlay on cost-effective hardware, whether physical routers, called vEdge routers, or virtual machines in the cloud, called vEdge Cloud routers. Centralized controllers, called vSmart controllers, oversee the control plane of the Viptela fabric, efficiently managing provisioning, maintenance, and security for the entire SEN overlay network. Another device, called the vBond orchestrator, automatically authenticates all other Viptela devices when they join the SEN overlay network.

This division of labor allows each networking layer to focus on what it does best. The control plane manages the rules for the routing traffic through the overlay network, and the data plane passes the actual data packets among the network devices. The control plane and data plane form the warp and weft of a flexible, robust fabric that you weave according to your needs, on your schedule, over existing circuits.

The Viptela vManage NMS provides a simple, yet powerful, set of graphical dashboards for monitoring network performance on all devices in the overlay network, from a centralized monitoring station. In addition, the vManage NMS provides centralized software installation, upgrade, and provisioning, whether for a single device or as a bulk operation for many devices simultaneously.
The Viptela SEN is ideally suited to the needs of cloud networking. Viptela's virtual IP fabric supports software services that streamline and optimize cloud networking, allowing you to take full advantage of the power of the overlay network for individual cloud applications.

**Additional Information**

[The Virtual IP Fabric](https://sdwan-docs.cisco.com/Product_Documentation/Getting_Started/System_Overview/01The_Viptela_SEN/02The_Viptela_S)